TSG RAN Meeting #17 **RP-020474**
Biarritz, France, 3 - 6 September, 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.123**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021113	25.123	242		F	R99	3.10.0	Definition of “Out of service area” conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states	TEI
R4-021114	25.123	243		A	Rel-4	4.5.0	Definition of “Out of service area” conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states	TEI
R4-021115	25.123	244		A	Rel-5	5.1.0	Definition of “Out of service area” conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states	TEI
R4-021116	25.123	245		F	R99	3.10.0	Corrections to TDD-GSM measurement requirements and test cases	TEI
R4-021117	25.123	246		A	Rel-4	4.5.0	Corrections to TDD-GSM measurement requirements and test cases	TEI
R4-021118	25.123	247		A	Rel-5	5.1.0	Corrections to TDD-GSM measurement requirements and test cases	TEI
R4-021353	25.123	248	2	F	R99	3.10.0	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode	TEI
R4-021354	25.123	249	2	A	Rel-4	4.5.0	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode	TEI
R4-021355	25.123	250	2	A	Rel-5	5.1.0	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode	TEI

3GPP TSR RAN WG4 Meeting #24 **R4-021113**

Helsinki, Finland 12 - 16 August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **242** ⌘ **rev** ⌘ Current version: **3.10.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Definition of "Out of service area" conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	"Out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states are currently not specified in TS25.123 and corresponding procedures as specified in TS25.331 once this condition has been detected by the UE can therefore not be started. TS25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, it refers to TS25.123 and TS25.133 for a proper definition of when the UE shall consider itself to be "out of service area'.
Summary of change:	⌘	**Definition of "out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states added:** A UE in CELL_FACH shall consider to be in "out of service area", if the S-criterion for its current serving cell is not fulfilled during a 4 s time period and if no new suitable cell has been found among its neighbouring cells during this time period. A UE in CELL_PCH or URA_PCH shall consider to be in "out of service area", if no suitable cell among its neighbouring cells is found during the 12s period following the N_{serv} number of DRX cycles with Cell selection criteria S not being fulfilled for its current serving cell.
Consequences if not approved:	⌘	A missing definition of "out of service area" conditions will lead to non-uniform UE behaviour in the area of initiating cell selection procedures with respect to RRC timers T316 and T317 and with critical impact on service continuity in CELL_FACH, CELL_PCH and URA_PCH states. **Isolated impact analysis:** Correction of a requirement where the specification (TS25.331 and TS25.123)

	was ambiguous or not sufficiently explicit. Proposed corrrections in this CR will not affect network implementation.

Clauses affected:	⌘	4; 5.4.2.3; 5.5.2; 5.6.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR243 cat. A to 25.123 v4.5.0, CR244 cat. A to 25.123 v5.1.0,			

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] 3GPP TS 25.321: “MAC protocol specification”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE ~~p~~Procedures in ~~i~~Idle mode and Procedures for Cell Reselection in Connected Mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 05.05: "Radio transmission and reception".

[21] 3GPP TS 05.08: “Radio subsystem link control”.

[22] 3GPP TS 05.10: “Radio subsystem synchronization”.

[23] 3GPP TS 25.214: “Physical layer procedures (FDD)”.

< Next changed section >

4 Idle Mode

4.1 Cell Selection

4.1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in ~~TS25.304~~[18]. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

4.2 Cell Re-selection

4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a TDD cell, the UE shall attempt to detect, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in ~~TS25.304~~[18], allowing the UE to limit its measurement activity if certain conditions are fulfilled.

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S defined in ~~TS25.304~~[18] for the serving cell at least every DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in ~~TS25.304~~[18].

4.2.2.2 Measurement of intra-frequency cells

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurement of inter-frequency TDD cells

The UE shall measure PCCPCH RSCP at least every ($N_{carrier}$-1) * $T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells.. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within ($N_{carrier}$-1) * $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurement of inter-frequency FDD cells

The UE shall measure the CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering of CPICH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD}$ * $T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non- identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The ranking of the cells shall be made according to the cell reselection criteria specified in ~~TS25.304~~[18]. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection..

4.2.2.5 Measurement of inter-RAT GSM cells

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in ~~TS25.304~~[18], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell re-selection criteria in ~~TS25.304~~[18]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE can not demodulate the BSIC of that GSM BCCH carrier.

4.2.2.6 Evaluation of cell reselection criteria

The UE shall evaluate the cell re-selection criteria defined in ~~TS 25.304~~[18] for the cells, which have new measurement results available, at least once every DRX cycle.

UE shall perform cell reselection immediately after the UE has found a better ranked suitable cell, unless less than 1 second has elapsed from the moment the UE started camping on the current serving cell.

4.2.2.7 Maximum interruption time in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection the interruption time shall not exceed T_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time shall not exceed T_{BCCH} + 50 ms.

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in ~~TS25.331~~[16] for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in ~~TS05.08~~[21].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

Table 4.1: $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

4.2.2.8 Number of cells in cell lists

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - TDD mode cells on maximum 2 additional TDD carriers, and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers, and
- Depending on UE capability, 32 inter RAT GSM cells,

as indicated in cell information lists sent in system information (BCCH).

< Next changed section >

5.4.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the P-CCPCH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{\text{Measurement period intra}}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{\text{S-criteria}} = 5 \times T_{\text{measurement period intra}} \text{ ms}$$

where

$T_{\text{measurement period intra}}$ is specified in 8.4.2.2.2.

If the UE has evaluated that the serving cell does not fulfil the cell selection criterion S during 4 s and if during this time period the UE has not found any new suitable cell based on measurements of neighbour cells as indicated in the measurement control system information, the UE shall consider having detected "out of service area" and initiate actions according to [16] and [18].

< Next changed section >

5.5 Cell Re-selection in Cell_PCH

5.5.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.5.2 Requirements

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

5.6 Cell Re-selection in URA_PCH

5.6.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.6.2 Requirements

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

3GPP TSR RAN WG4 Meeting #24 **R4-021114**

Helsinki, Finland 12 - 16 August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **243** ⌘ **rev** ⌘ Current version: **4.5.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Definition of "Out of service area" conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states (3.84 Mcps option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘ "Out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states are currently not specified in TS25.123 and corresponding procedures as specified in TS25.331 once this condition has been detected by the UE can therefore not be started.

TS25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, it refers to TS25.123 and TS25.133 for a proper definition of when the UE shall consider itself to be "out of service area'.

Summary of change: ⌘ **Definition of "out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states added:**

A UE in CELL_FACH shall consider to be in "out of service area", if the S-criterion for its current serving cell is not fulfilled during a 4 s time period and if no new suitable cell has been found among its neighbouring cells during this time period.

A UE in CELL_PCH or URA_PCH shall consider to be in "out of service area", if no suitable cell among its neighbouring cells is found during the 12s period following the N_{serv} number of DRX cycles with Cell selection criteria S not being fulfilled for its current serving cell.

Consequences if not approved: ⌘ A missing definition of "out of service area" conditions will lead to non-uniform UE behaviour in the area of initiating cell selection procedures with respect to RRC timers T316 and T317 and with critical impact on service continuity in CELL_FACH, CELL_PCH and URA_PCH states.

Isolated impact analysis:

Correction of a requirement where the specification (TS25.331 and TS25.123)

	was ambiguous or not sufficiently explicit. Proposed corrrections in this CR will not affect network implementation.

Clauses affected:	⌘	4; 5.4.2.3; 5.5.2; 5.6.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	none Equivalent CRs in other Releases: CR242 cat. F to 25.123 v3.10.0, CR244 cat. A to 25.123 v5.1.0			

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
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[1] (void)

[2] (void)

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] 3GPP TS 25.321: “MAC protocol specification”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE ~~p~~Procedures in ~~i~~Idle ~~m~~Mode and Procedures for Cell Reselection in Connected Mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Radio transmission and reception".

[21] 3GPP TS 45.008: “Radio subsystem link control”

[22] 3GPP TS 45.010: “Radio subsystem synchronization”

[23] 3GPP TS 25.214: “Physical layer procedures (FDD)”.

< Next changed section >

4 Idle Mode

4.1 Cell Selection

4.1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in ~~TS25.304~~[18]. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

4.2 Cell Re-selection

4.2.1 Introduction

4.2.1.1 3.84 Mcps TDD option

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally state or Camped on Any Cell* state on a TDD cell, the UE shall attempt to identify, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in ~~TS25.304~~[18], allowing the UE to limit its measurement activity if certain conditions are fullfilled.

4.2.1.2 1.28 Mcps TDD option

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a TDD cell, the UE shall attempt to identify, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fullfilled.

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

4.2.2.1.1 3.84 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S_{rxlev} defined in ~~TS25.304~~[18] for the serving cell at least every DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in ~~TS25.304~~[18].

4.2.2.1.2 1.28 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S defined in TS25.304 for the serving cell at least every DRX cycle. The UE shall filter the PCCPCH RSCP level of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$ (see table 4.1A).

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

4.2.2.2 Measurement of intra-frequency cells

4.2.2.2.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.2.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table 4.1A) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureNTDD}$ is defined in Table 4.1A. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateNTDD}$ (see table 4.1A), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurement of inter-frequency TDD cells

4.2.2.3.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-

frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureNTDD}$ (see table 4.1A) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 1.28 Mcps TDD OPTION cells. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateNTDD}$ from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3A 1.28 Mcps TDD to 3.84 Mcps TDD cell re-selection

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The ranking of the low and high chip rate TDD cells shall be made according to the cell reselection criteria specified in TS25.304.

The UE shall measure PCCPCH RSCP at least every $N_{TDDcarrier} * T_{measureTDD}$ (see table 4.1A) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 3.84 Mcps TDD cells. The UE shall filter PCCPCH RSCP measurements of each measured high chip rate TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that a high chip rate TDD cell has become better ranked than the serving cell within $N_{TDDcarrier} * T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency 3.84Mcps TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency 3.84Mcps TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurement of inter-frequency FDD cells

4.2.2.4.1 3.84 Mcps option

The UE shall measure the CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$..

The filtering of CPICH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD} * T_{evaluateFDD}$ from the moment the inter-

frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The ranking of the cells shall be made according to the cell reselection criteria specified in ~~TS25.304~~[18]. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.4.2 1.28 Mcps option

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The UE shall measure the CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1A). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

CPICH RSCP is used as basic measurement quantity for cell ranking, the filtering of CPICH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD} * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

If Treselection timer has a non zero value and the inter-frequency FDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency FDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.5 Measurement of inter-RAT GSM cells

4.2.2.5.1 3.84 Mcps option

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in ~~TS25.304~~[18], The UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell re-selection criteria in ~~TS25.304~~[18]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE can not demodulate the BSIC of that GSM BCCH carrier.

4.2.2.5.2 1.28 Mcps option

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureGSM}$ (see table 4.1A). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in TS25.304, the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell re-selection criteria in TS25.304. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE can not demodulate the BSIC of that GSM BCCH carrier.

4.2.2.6 Evaluation of cell reselection criteria

4.2.2.6.1 3.84 Mcps option

The UE shall evaluate the cell re-selection criteria defined in ~~TS 25.304~~ [18] for the cells, which have new measurement results available, at least once every DRX cycle.

UE shall perform cell reselection immediately after the UE has found a better ranked suitable cell unless less than 1 second has elapsed from the moment the UE started camping on the current serving cell.

4.2.2.6.2 1.28 Mcps option

The UE shall evaluate the cell re-selection criteria defined in TS 25.304 for the cells, which have new measurement results available, at least every DRX cycle.

Cell reselection shall take place immediately after the UE has found a better ranked suitable cell unless the UE has made cell reselection within the last 1 second.

4.2.2.7 Maximum interruption time in paging reception

4.2.2.7.1 3.84 Mcps option

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection, the interruption time shall not exceed T_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time shall not exceed T_{BCCH} + 50 ms.

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in ~~TS25.331~~[16] for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in ~~TS45.008~~[21].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

Table 4.1: $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

4.2.2.7.2 1.28 Mcps option

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection he interruption time must not exceed T_{SI} + 50 ms. For inter-Rat cell re-selection the interruption time must not exceed T_{BCCH}+50 ms.

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell [20].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.

Table 4.1A: $T_{measureNTDD}$, $T_{evaluateNTDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} (DRX cycles)	$T_{measureNTDD}$ [s] (number of DRX cycles)	$T_{evaluateNTDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s.

4.2.2.8 Number of cells in cell lists

4.2.2.8.1 3.84 Mcps option

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - TDD mode cells on maximum 2 additional TDD carriers, and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers, and
- Depending on UE capability, 32 inter RAT GSM cells,

as indicated in cell information lists sent in system information (BCCH).

4.2.2.8.2 1.28 Mcps option

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - TDD mode cells on maximum 3 additional TDD carriers, and
  - Depending on UE capability, FDD mode cells distributed on up to 3 FDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers,

as indicated in cell information lists sent in system information (BCCH).

< Next changed section >

5.4.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the P-CCPCH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{\text{Measurement period intra}}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{\text{S-criteria}} = 5 \times T_{\text{measurement period intra}} \text{ ms}$$

where

$T_{\text{measurement period intra}}$ is specified in 8.4.2.2.2.

If the UE has evaluated that the serving cell does not fulfil the cell selection criterion S during 4 s and if during this time period the UE has not found any new suitable cell based on measurements of neighbour cells as indicated in the measurement control system information, the UE shall consider having detected “out of service area” and initiate actions according to [16] and [18].

< Next changed section >

5.5 Cell Re-selection in Cell_PCH

5.5.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.5.2 Requirements

5.5.2.1 3.84 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

5.5.2.2 1.28 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to [16].

5.6 Cell Re-selection in URA_PCH

5.6.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.6.2 Requirements

5.6.2.1 3.84 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

5.6.2.2 1.28 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to [16].

3GPP TSR RAN WG4 Meeting #24 **R4-021115**

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CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **244** ⌘ **rev** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Definition of "Out of service area" conditions for Connected Mode CELL_FACH, CELL_PCH and URA_PCH states (3.84 Mcps option)
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change:	⌘	"Out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states are currently not specified in TS25.123 and corresponding procedures as specified in TS25.331 once this condition has been detected by the UE can therefore not be started. TS25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, it refers to TS25.123 and TS25.133 for a proper definition of when the UE shall consider itself to be "out of service area'.
Summary of change:	⌘	**Definition of "out of service area" conditions for CELL_FACH, CELL_PCH and URA_PCH states added:** A UE in CELL_FACH shall consider to be in "out of service area", if the S-criterion for its current serving cell is not fulfilled during a 4 s time period and if no new suitable cell has been found among its neighbouring cells during this time period. A UE in CELL_PCH or URA_PCH shall consider to be in "out of service area", if no suitable cell among its neighbouring cells is found during the 12s period following the N_{serv} number of DRX cycles with Cell selection criteria S not being fulfilled for its current serving cell.
Consequences if not approved:	⌘	A missing definition of "out of service area" conditions will lead to non-uniform UE behaviour in the area of initiating cell selection procedures with respect to RRC timers T316 and T317 and with critical impact on service continuity in CELL_FACH, CELL_PCH and URA_PCH states. **Isolated impact analysis:** Correction of a requirement where the specification (TS25.331 and TS25.123)

	was ambiguous or not sufficiently explicit. Proposed corrrections in this CR will not affect network implementation.

Clauses affected:	⌘	4; 5.4.2.3; 5.5.2; 5.6.2			
Other specs affected:	⌘	**Y**	**N**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	none Equivalent CRs in other Releases: CR242 cat. F to 25.123 v3.10.0, CR243 cat. A to 25.123 v4.5.0			

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] (void)

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TR 25.922: "RRM Strategies".

[13] 3GPP TS 25.321: “MAC protocol specification”.

[14] 3GPP TS 25.225: "Physical layer measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by physical layer".

[16] 3GPP TS 25.331: "RRC protocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE ~~p~~Procedures in ~~i~~Idle ~~m~~Mode and Procedures for Cell Reselection in Connected Mode".

[19] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "Radio transmission and reception".

[21] 3GPP TS 45.008: “Radio subsystem link control”

[22] 3GPP TS 45.010: “Radio subsystem synchronization”

[23] 3GPP TS 25.214: “Physical layer procedures (FDD)”.

< Next changed section >

4 Idle Mode

4.1 Cell Selection

4.1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in ~~TS25.304~~[18]. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

4.2 Cell Re-selection

4.2.1 Introduction

4.2.1.1 3.84 Mcps TDD option

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally state or Camped on Any Cell* state on a TDD cell, the UE shall attempt to identify, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in ~~TS25.304~~[18], allowing the UE to limit its measurement activity if certain conditions are fullfilled.

4.2.1.2 1.28 Mcps TDD option

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a TDD cell, the UE shall attempt to identify, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fullfilled.

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

4.2.2.1.1 3.84 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S_{rxlev} defined in ~~TS25.304~~[18] for the serving cell at least every DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in ~~TS25.304~~[18].

4.2.2.1.2 1.28 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S defined in TS25.304 for the serving cell at least every DRX cycle. The UE shall filter the PCCPCH RSCP level of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$ (see table 4.1A).

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

4.2.2.2 Measurement of intra-frequency cells

4.2.2.2.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.2.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table 4.1A) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureNTDD}$ is defined in Table 4.1A. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateNTDD}$ (see table 4.1A), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra frequency cell is better ranked than the serving cell, the UE shall evaluate this intra frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurement of inter-frequency TDD cells

4.2.2.3.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-

frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureNTDD}$ (see table 4.1A) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 1.28 Mcps TDD OPTION cells. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateNTDD}$ from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3A 1.28 Mcps TDD to 3.84 Mcps TDD cell re-selection

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The ranking of the low and high chip rate TDD cells shall be made according to the cell reselection criteria specified in TS25.304.

The UE shall measure PCCPCH RSCP at least every $N_{TDDcarrier} * T_{measureTDD}$ (see table 4.1A) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 3.84 Mcps TDD cells. The UE shall filter PCCPCH RSCP measurements of each measured high chip rate TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that a high chip rate TDD cell has become better ranked than the serving cell within $N_{TDDcarrier} * T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency 3.84Mcps TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency 3.84Mcps TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurement of inter-frequency FDD cells

4.2.2.4.1 3.84 Mcps option

The UE shall measure the CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$..

The filtering of CPICH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD} * T_{evaluateFDD}$ from the moment the inter-

frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The ranking of the cells shall be made according to the cell reselection criteria specified in ~~TS25.304~~[18]. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.4.2 1.28 Mcps option

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The UE shall measure the CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1A). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

CPICH RSCP is used as basic measurement quantity for cell ranking, the filtering of CPICH RSCP shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD} * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

If Treselection timer has a non zero value and the inter-frequency FDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency FDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.5 Measurement of inter-RAT GSM cells

4.2.2.5.1 3.84 Mcps option

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[18], at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in ~~TS25.304~~[18], The UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell re-selection criteria in ~~TS25.304~~[18]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE can not demodulate the BSIC of that GSM BCCH carrier.

4.2.2.5.2 1.28 Mcps option

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureGSM}$ (see table 4.1A). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in TS25.304, the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell re-selection criteria in TS25.304. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE can not demodulate the BSIC of that GSM BCCH carrier.

4.2.2.6 Evaluation of cell reselection criteria

4.2.2.6.1 3.84 Mcps option

The UE shall evaluate the cell re-selection criteria defined in ~~TS 25.304~~ [18] for the cells, which have new measurement results available, at least once every DRX cycle.

UE shall perform cell reselection immediately after the UE has found a better ranked suitable cell unless less than 1 second has elapsed from the moment the UE started camping on the current serving cell.

4.2.2.6.2 1.28 Mcps option

The UE shall evaluate the cell re-selection criteria defined in TS 25.304 for the cells, which have new measurement results available, at least every DRX cycle.

Cell reselection shall take place immediately after the UE has found a better ranked suitable cell unless the UE has made cell reselection within the last 1 second.

4.2.2.7 Maximum interruption time in paging reception

4.2.2.7.1 3.84 Mcps option

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection, the interruption time shall not exceed T_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time shall not exceed T_{BCCH} + 50 ms.

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in ~~TS25.331~~[16] for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in ~~TS45.008~~[21].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

Table 4.1: $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

4.2.2.7.2 1.28 Mcps option

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection he interruption time must not exceed T_{SI} + 50 ms. For inter-Rat cell re-selection the interruption time must not exceed T_{BCCH}+50 ms.

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell [20].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.

Table 4.1A: $T_{measureNTDD}$, $T_{evaluateNTDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} (DRX cycles)	$T_{measureNTDD}$ [s] (number of DRX cycles)	$T_{evaluateNTDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s.

4.2.2.8 Number of cells in cell lists

4.2.2.8.1 3.84 Mcps option

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - TDD mode cells on maximum 2 additional TDD carriers, and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers, and
- Depending on UE capability, 32 inter RAT GSM cells,

as indicated in cell information lists sent in system information (BCCH).

4.2.2.8.2 1.28 Mcps option

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - TDD mode cells on maximum 3 additional TDD carriers, and
  - Depending on UE capability, FDD mode cells distributed on up to 3 FDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers,

as indicated in cell information lists sent in system information (BCCH).

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5.4.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the P-CCPCH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{\text{Measurement period intra}}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{\text{S-criteria}} = 5 \times T_{\text{measurement period intra}} \text{ ms}$$

where

$T_{\text{measurement period intra}}$ is specified in 8.4.2.2.2.

If the UE has evaluated that the serving cell does not fulfil the cell selection criterion S during 4 s and if during this time period the UE has not found any new suitable cell based on measurements of neighbour cells as indicated in the measurement control system information, the UE shall consider having detected “out of service area” and initiate actions according to [16] and [18].

< Next changed section >

5.5 Cell Re-selection in Cell_PCH

5.5.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.5.2 Requirements

5.5.2.1 3.84 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

5.5.2.2 1.28 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to [16].

5.6 Cell Re-selection in URA_PCH

5.6.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in [18], based on radio measurements, and if a better cell is found that cell is selected.

5.6.2 Requirements

5.6.2.1 3.84 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to [16].

The UE shall consider having detected "out of service area" and initiate actions according to [16] and [18], if the serving cell does not fulfil the cell selection criterion S in N_{serv} consecutive DRX cycles and if during the following 12 s no new suitable cell based upon measurements of all neighbour cells indicated in the measurement control system information has been found.

5.6.2.2 1.28 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to [16].

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Helsinki, Finland 12 - 16 August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **245** ⌘ **rev** ⌘ Current version: **3.10.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-GSM measurement requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘

Requirements on inter-RAT cell change order in CELL_FACH state missing

Currently there are no processing delay and execution delay requirements on RRC CELL CHANGE ORDER message, which is used in CELL_FACH and CELL_DCH states to transfer a connection between the UE and UTRAN TDD to GSM.

Corrections to TDD-GSM cell re-selection requirements in CELL_FACH state

Correction needed because some key time delays for TDD-GSM cell re-selection delay in CELL_FACH are not taken into account yet.

Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)

Not all possible idle interval lengths are covered for requirements on GSM carrier RSSI samples taken

Scheduling of measurement opportunities and resulting identification times for initial BSIC confirmation and BSIC reconfirmation not defined for CELL_DCH state.

Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst missing.

Procedural clarifications needed.

Requirements on event-triggered reporting for GSM measurements still missing.

Correction to TDD-GSM cell re-selection test case in Idle Mode

Test requirement still in square brackets and missing test parameters.

	Introduction of TDD-GSM handover test case TDD/GSM HO test case on handover delay requirements in section 5.3 still missing. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Test case missing and identification time requirements in section 8.1.2.5 not tested. **Completion of GSM carrier RSSI measurement accuracy test cases** Test conditions and parameter settings completely missing.
Summary of change: ⌘	**Requirements on inter-RAT cell change order in CELL_FACH state added:** Introduction of delay and interruption time requirements corresponding to TDD/GSM handover case. **Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)** Table 8.1 updated to cover all possible idle interval lengths for requirements on GSM carrier RSSI samples taken Scheduling of measurement opportunities in CELL_DCH state. Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst introduced in net tabel 8.1A. Additional requirements on event-triggered reporting for GSM measurements. **Correction to TDD-GSM cell re-selection test case in Idle Mode** Test requirement set to 26 s + T_{BCCH} and completion of test parameters settings. **Introduction of TDD-GSM handover test case** Introduction of TDD/GSM handover test case for known target cell case. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Introduction of test case for Event 3B and 3C triggered reporting for GSM neighbours in CELL_DCH state. **Completion of GSM carrier RSSI measurement accuracy test cases** Introduction of measurement test case for GSM carrier RSSi accuracy.
Consequences if not approved: ⌘	Critical TDD-GSM requirements on Cell Re-selection in CELL_FACH state and Connected Mode measurement performance incomplete or missing and corresponding test cases missing or not feasible. Critical test cases on TDD/GSM handover and neighbour reporting missing. **Isolated impact analysis:** This CR contains corrections to TDD-GSM relevant parts of TS25.123 where this specification is incomplete and where parts of critical dual-mode TDD-GSM UE requirements and test cases are missing. Note that this CR does only impact requirements on TDD-GSM inter-working as set by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	5.4.2.1.4; new 5.8; 8.1.2.5; 8.4.2.5; A.4.2.4; A.5.3; new A.8.4; A.9.1.5			
Other specs affected:	⌘	**Y** / **N** [ ] / [X]	Other core specifications	⌘	
		[X] / [ ]	Test specifications		TS34.122

	X	O&M Specifications
Other comments:	⌘	No test cases covering A.5.3, A.8.4 and A.9.1.5 currently exist in TS34.122. Equivalent CRs in other Releases: CR246 cat. A to 25.123 v4.5.0, CR247 cat. A to 25.123 v5.1.0

5.4.2.1.4 Inter-RAT cell re-selection

The requirements in this section shall apply to UE supporting TDD and GSM.

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

~~$T_{reselection,GSM} = T_{identify,GSM} + T_{Measurement\_GSM} + T_{SI}$~~

$T_{reselection\ GSM} = T_{identify\ GSM} + T_{measurement\ GSM} + 40 + T_{BCCH} + T_{RA}$ ms

where

T_{BCCH} is the maximum time allowed to read the BCCH data from a GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure.

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

$T_{identify,\ GSM}$ ~~= Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.~~ is specified in section 8.4.2.5.2.1.

~~T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.~~

~~$T_{Measurement,\ GSM}$ is the worst case time for measuring one previously identified GSM carrier.~~

~~$T_{Measurement,GSM} = Max\left\{480ms, 8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}\right\}$~~

$T_{measurement\ GSM} = Max\left\{8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}, 4 * T_{meas}, 480ms\right\}$

where:

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ ~~can be~~shall be derived from the values in table 8.7 section 8.4.2.5.1.

T_{meas} is specified in section 8.4.2.1.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

$T_{identify\ GSM}$ = 150 ms

$T_{measurement\ GSM}$ = 480 ms

< Next changed section >

5.8 Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH

5.8.1 Introduction

The purpose of inter-RAT cell change order from UTRA TDD to GSM is to transfer a connection between the UE and UTRA TDD to GSM. This procedure may be used in CELL_DCH and CELL_FACH state. The cell change order procedure is initiated by UTRAN with an RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in [16].

5.8.2 Requirements

The requirements in this section shall apply to UE supporting TDD and GSM.

5.8.2.1 Delay

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.1A from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.1A: Inter-RAT cell change order from UTRAN - delay

UE synchronisation status	delay [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$90 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$190 + T_{BCCH} + T_{RA}$

where

T_{BCCH} is the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure

5.8.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.1B. The requirement in table 5.1B for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.1B: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$40 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$140 + T_{BCCH} + T_{RA}$

where

T_{BCCH} is the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure

< Next changed section >

8.1.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_DCH state, measurement opportunities for GSM measurements are provided by means of idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when idle intervals ~~signalled~~ are used~~by UTRAN during CELL_DCH state~~for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.1.2.5.2 "BSIC verification". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.1.2.5.2 "BSIC verification".~~

- In section 8.1.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.1.2.1 shall be allocated for GSM initial BSIC identification.

- The remaining measurements opportunities scheduled for GSM measurements shall be used as follows. 3 measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~If the UE does not need to perform GSM measurements in the idle intervals only, the requirements of handover measurements in TS 05.08 shall apply.~~

b) In CELL_DCH state, when signaled by UTRAN and when the UE does not need idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set.

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.1.2.5.1 GSM carrier RSSI

a) For a UE using idle intervals to perform GSM measurements

A~~n~~ UE supporting GSM measurements using idle intervals shall ~~be able to measure~~meet the minimum number of GSM carrier RSSI ~~levels~~ measurements ~~of GSM cells from the monitored set with acquisition speed defined~~ specified in table 8.1.

~~-~~In the CELL_DCH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 05.08~~[21], when the given measurement time allows the UE to the take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.1

Idle ~~I~~interval ~~L~~length (timeslots)	Number of GSM carrier RSSI ~~measurements~~samples in each idle interval
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14

~~For the description of the idle intervals see Annex A of 25.225.~~

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

8.1.2.5.2 BSIC verification

a) For a UE using idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1~~, "Initial BSIC identification"~~

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. ~~The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.2~~, "BSIC re-confirmation"~~

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified, the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

If UTRAN requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to Section 8.1.2.5.1 and the UE shall perform measurement reporting as defined in Section 8.6.7.6 of [16].
- The UE shall use the last available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation according to Section 8.1.2.5.2.2

The UE shall perform event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the last available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting. Periodic reports shall be triggered according to the given reporting period even if the BSIC of a GSM cell has

not been verified as defined in Sections 8.6.7.5 and 8.6.7.6 of [16]. Non verified BSIC shall be indicated in the measurement report.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the UE~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). ~~and from that moment~~ From that time instant, the UE shall attempt to re-confirm the BSIC ~~shall be re-confirmed~~ at least once every $T_{re\text{-}confirm\ abort}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM cell ~~is considered as~~to be "non-verified".

~~-~~The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within an idle interval, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the idle interval is within the limits specified in Table 8.1A.

Table 8.1A

Idle interval length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398

The UE shall be able to perform BSIC verification ~~-~~at levels down to the reference sensitivity level or reference interference levels as specified in ~~TS 05.05~~[20].

b) For a UE not using idle intervals to perform GSM measurements

If a BSIC is decoded and matches the expected value, the UE shall consider it as "verified", otherwise it shall consider it as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.1.2.5.2.1 Initial BSIC identification

~~This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~

For GSM cells that are requested with BSIC verified, the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strenght levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

If the BSIC of a GSM BCCH carrier has been successfully decoded, the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC decoding attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC decoding of the next GSM BCCH carrierin signal strength order. The GSM BCCH carrier for which the BSIC decoding failed shall not

be re-considered for BSIC decoding until BSIC decoding attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with~~

Where,

$T_{identify\ abort}$ = ~~-~~5000 ms.~~ This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of at least 8 identified GSM cells. Initial timing information is obtained from the initial BSIC decoding. The timing information shall be updated every time the BSIC is decoded.

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM BCCH carrier within $T_{re\text{-}confirm\_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier. The GSM BCCH carrier shall be treated as a new GSM BCCH carrier with un-identified BSIC and the GSM BCCH carrier shall be moved to the initial BSIC decoding procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

~~This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

$T_{re\text{-}confirm\ abort}$ =5000 ms.~~ This is the BSIC reconfirmation interval.~~

~~It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.5.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered reporting delay requirement is valid, when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{measurement\ period\ GSM}$ (see section 8.1.2.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than 2*$T_{measurement\ period\ GSM}$, where $T_{measurement\ period\ GSM}$ is defined in Section 8.1.2.5.1. When L3 filtering is used an additional delay can be expected. For a GSM cell with non-verified BSIC an additional delay according to section 8.1.2.5.2.1 Initial BSIC identification can be expected.

< Next changed section >

8.4.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_FACH state, measurement opportunities for GSM measurements are provided by means of measurement occasions and idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when measurement occasions and idle intervals ~~signalled~~ are used ~~by UTRAN during CELL_FACH state~~for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified.~~

- In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

- ~~The measurement windows due to idle intervals and measurements occasions used~~ The remaining measurement opportunities scheduled for GSM measurements shall be scheduled as follows. 3 ~~occasions~~ measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement ~~windows~~ opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~For the UE performing GSM measurements, the requirements in GSM 05.08 shall apply.~~

b) In CELL_FACH state, when signaled by UTRAN and when the UE does not need measurement occasions and idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set.

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.4.2.5.1 GSM carrier RSSI

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

A~~n~~ UE supporting GSM measurements using measurement occasions and idle intervals shall meet the minimum number of ~~-~~GSM carrier RSSI measurements specified in table 8.7.

In ~~the~~ CELL_FACH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 05.08~~[21], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.7

Measurement ~~Window~~opportunity ~~L~~length (timeslots)	Number of GSM carrier RSSI ~~measurements.~~samples per measurement opportunity
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14
15	16
30	32
60	64
120	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

In case UTRA RACH procedure prevents the UE from acquiring the required number of samples per GSM carrier during one measurement period, the GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.4.2.5.2 BSIC verification

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within 50% of the available measurement windows.~~ The requirements for Initial BSIC identification can be found in section 8.4.2.5.2.1~~, "Initial BSIC identification"~~.

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed~~. The UE shall trigger the BSIC re-confirmation within the available measurement windows.~~ The requirements for Initial BSIC identification can be found in section 8.4.2.5.2.2~~, "BSIC re-confirmation"~~.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the UE~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification)~~, and from that moment~~From that time instant, the UE shall attempt to rec-confirm the BSIC ~~shall be re-confirmed~~ at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM ~~cell is considered as~~to be "non-verified".

The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within a measurement opportunity, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement opportunity is within the limits specified in Table 8.7A.

Table 8.7A

Idle Interval Length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398
15	± 4100
30	± 9100
60	± 19100
120	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in ~~GSM 05.05~~[20].

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The UE shall attempt to verify the BSIC for at least the 6 strongest GSM carriers at least every 10 seconds, to confirm that it is monitoring the same cell, as far as UTRA RACH procedure does not prevent UE from decoding BSIC.

If a BSIC is decoded and matches the expected value, the UE shall consider it as “verified”, otherwise it shall consider it as “non-verified”.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.4.2.5.2.1 Initial BSIC identification

This measurement ~~is~~ shall be performed ~~in~~ during the measurement ~~windows~~ opportunities as described in 8.4.2.5.

~~For GSM cells that are requested with BSIC verified t~~The UE shall continuously attempt to decode the BSIC of the SCH on the BCCH carrier of the ~~8~~ 6 strongest ~~-~~BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value ~~after layer 3 filtering~~.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurement~~s occasions~~ opportunities allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully ~~identified~~ decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH ~~-~~carrier in signal strength order. ~~The~~ The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the ~~8~~6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified, the time is changed to N *$T_{identify\ abort}$, with~~ Where,

$T_{identify\ abort}$ is specified in section 8.1.2.5.

8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of ~~8~~6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement ~~window~~ opportunity allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC ~~falling within the effective idle interval duration~~occuring during the measurement opportunity. When the UE has to select one out of several possible GSM cells to reconfirm ~~If more than one BSIC can be decoded within~~ during the same measurement ~~window~~opportunity, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts ~~or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds~~, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with un-identified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the ~~8~~6 strongest GSM cells in the monitored list.

~~The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

~~It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.~~

< Next changed section >

A.4.2.4 Scenario 4: inter RAT cell re-selection

A.4.2.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA~~N~~ TDD to GSM cell re-selection delay reported in section 4~~.3~~.2.~~1.~~

This scenario implies the presence of 1 UTRA~~N~~ TDD serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRA TDD carrier and 12 GSM cells. Test parameters are given in Table, A.4.7, A.4.8, A.4.9. Cell 1 and Cell 2 shall belong to different Location Areas.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the TDD cell 1 is better ranked as the GSM cell 2 during T1 and the GSM cell 2 is better ranked than the TDD cell 1 during T2.

~~Cell 1 and cell 2 shall belong to different Location Areas.~~

Table A.4.7: General test parameters for UTRA~~N~~ TDD to GSM ~~C~~cell ~~R~~re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UTRA TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
HCS			Not used	
DRX cycle length		s	1,28	UTRA~~N~~ TDD cell
~~BCCH repetition period (GSM cell)~~		~~s~~	~~1,87~~	~~In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)~~
T1		s	~~1~~45	
T2		s	~~1~~35	

Table A.4.8: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA TDD)			
Timeslot Number		**0**		**8**	
		T1	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2
I_{oc}	dBm/3, 84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75	n.a.	n.a.
Propagation Condition		AWGN		AWGN	
Qrxlevmin	dBm	-102			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
Qhyst1	dB	0			
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table A.4.9: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-~~8~~90	-7~~0~~5
RXLEV_ACCESS_MIN	dBm	-10~~0~~4	
MS_TXPWR_MAX_CCH	dBm	3~~0~~3	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/GSM re-selection process, it is not intended to give reasonable values for a TDD/GSM cell re-selection.~~

A.4.2.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send ~~LOCATION UPDATING REQUEST message to perform a Location update~~the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than ~~[8]~~26 s + T_{BCCH}, where T_{BCCH} is the maximum time allowed to read BCCH data in the GSM cell [21].

The rate of correct cell re-selections observed during repeated tests shall be at least 90%.

~~NOTE: The UE shall keep a running average of 4 measurements, thus gives 4*1280ms ($T_{measureGSM}$ Table 4.1), means 5.12 seconds can elapse from the beginning of time period T2 before the UE has finished the measurements to evaluate that the GSM cell fulfils the re-selection criteria.~~

~~The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.~~

NOTE: The cell re-selection delay can be expressed as: 4 * $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$	Equal to the value specified in Table 4.1 in section 4.2
T_{BCCH}	Equal to 1.9 s, i.e. the maximum time allowed to read BCCH data when synchronised to a BCCH carrier from a GSM cell [21].

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

< Next changed section >

A.5.3 TDD/GSM Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the UTRA TDD to GSM handover delay reported in section 5.4.2.1.

The test parameters are given in Tables A.5.3.1, A.5.3.2 and A.5.3.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a HANDOVER FROM UTRAN COMMAND message with activation time at beginning of T3 with one active cell, cell 2. The HANDOVER FROM UTRAN COMMAND message shall be sent to the UE such that the delay between the last the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16]. In the GSM Handover command contained in this message, IE starting time shall not be included.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.5.3.1: General test parameters for TDD/GSM handover

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	UTRA TDD cell
	Neighbour cell	Cell 2	GSM cell
Final condition	Active cell	Cell 2	GSM cell
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Event 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.5.3.2: Cell 1 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 1					
DL timeslot number		0			1		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	6			6		
PCCPCH RSCP	dBm	-68			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.3.3: Cell 2 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 2	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.3.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

< Next changed section >

A.8.4 GSM measurements

A.8.4.1 Correct reporting of GSM neighbours in AWGN propagation condition

A.8.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing GSM measurements. This test will partly verify the requirements in section 8.1.2.5. The requirements are also applicable for a UE not requiring idle intervals to perform GSM measurements.

The test parameters are given in Tables A.8.4.1, A.8.4.2 and A.8.4.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3B and 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.8.4.1: General test parameters for correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Events 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.8.4.2: Cell 1 specific parameters for correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Cell 1	
		T1, T2, T3	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
$\hat{I}$or/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

Table A.8.4.3: Cell 2 specific parameters for correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Cell 2		
		T1	T2	T3
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-85	-75	-85

A.8.4.1.2 Test Requirements

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T3.

The UE shall not send any Event 3B or 3C triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

< Next changed section >

A.9.1.5 GSM carrier RSSI

~~NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.~~

A.9.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.5.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be provided in timeslot 0 and no second Beacon timeslot shall be provided for cell 1. In the measurement control information it is indicated to the UE that periodic reporting of the GSM carrier RSSI measurement is used. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.5.1.1 Inter frequency test parameters

GSM carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.6A and A.9.6B.

The limits of the GSM test parameters are defined in [21].

Table A.9.6A: General GSM carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL reference measurement channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		No	
Monitored cell list size		6 GSM neighbours including ARFCN 1	

Table A.9.6B: Cell 1 specific GSM carrier RSSI test parameters

Parameter	Unit	Cell 1	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
Îor/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

A.9.1.5.2 Test Requirements

The GSM carrier RSSI measurement accuracy shall meet the requirements in section 9.1.5.

The rate of correct measurements observed during repeated tests shall be at least 90%.

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CHANGE REQUEST

⌘ **25.123** **CR** **246** ⌘ **rev** ⌘ Current version: **4.5.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-GSM measurement requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘

Requirements on inter-RAT cell change order in CELL_FACH state missing

Currently there are no processing delay and execution delay requirements on RRC CELL CHANGE ORDER message, which is used in CELL_FACH and CELL_DCH states to transfer a connection between the UE and UTRAN TDD to GSM.

Corrections to TDD-GSM cell re-selection requirements in CELL_FACH state

Correction needed because some key time delays for TDD-GSM cell re-selection delay in CELL_FACH are not taken into account yet.

Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)

Not all possible idle interval lengths are covered for requirements on GSM carrier RSSI samples taken

Scheduling of measurement opportunities and resulting identification times for initial BSIC confirmation and BSIC reconfirmation not defined for CELL_DCH state.

Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst missing.

Procedural clarifications needed.

Requirements on event-triggered reporting for GSM measurements still missing.

Correction to TDD-GSM cell re-selection test case in Idle Mode

Test requirement still in square brackets and missing test parameters.

	Introduction of TDD-GSM handover test case TDD/GSM HO test case on handover delay requirements in section 5.3 still missing. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Test case missing and identification time requirements in section 8.1.2.5 not tested. **Completion of GSM carrier RSSI measurement accuracy test cases** Test conditions and parameter settings completely missing.
Summary of change: ⌘	**Requirements on inter-RAT cell change order in CELL_FACH state added:** Introduction of delay and interruption time requirements corresponding to TDD/GSM handover case. **Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)** Table 8.1 updated to cover all possible idle interval lengths for requirements on GSM carrier RSSI samples taken Scheduling of measurement opportunities in CELL_DCH state. Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst introduced in net table 8.1A. Additional requirements on event-triggered reporting for GSM measurements. **Correction to TDD-GSM cell re-selection test case in Idle Mode** Test requirement set to 26 s + T_{BCCH} and completion of test parameters settings. **Introduction of TDD-GSM handover test case** Introduction of TDD/GSM handover test case for known target cell case. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Introduction of test case for Event 3B and 3C triggered reporting for GSM neighbours in CELL_DCH state. **Completion of GSM carrier RSSI measurement accuracy test cases** Introduction of measurement test case for GSM carrier RSSi accuracy.
Consequences if not approved: ⌘	Critical TDD-GSM requirements on Cell Re-selection in CELL_FACH state and Connected Mode measurement performance incomplete or missing and corresponding test cases missing or not feasible. Critical test cases on TDD/GSM handover and neighbour reporting missing. **Isolated impact analysis:** This CR contains corrections to TDD-GSM relevant parts of TS25.123 where this specification is incomplete and where parts of critical dual-mode TDD-GSM UE requirements and test cases are missing. Note that this CR does only impact requirements on TDD-GSM inter-working as set by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	5.4.2.1.4; new 5.8; 8.1.2.5; 8.4.2.5; A.4.2.4; A.5.3; new A.8.4; A.9.1.5			
Other specs affected:	⌘	**Y** / **N** **N**	Other core specifications	⌘	
		Y	Test specifications		TS34.122

	X	O&M Specifications
Other comments:	⌘	No test cases covering A.5.3, A.8.4 and A.9.1.5 currently exist in TS34.122. Equivalent CRs in other Releases: CR245 cat. F to 25.123 v3.10.0, CR247 cat. A to 25.123 v5.1.0

5.4.2.1.4 Inter-RAT cell re-selection

The requirements in this section shall apply to UE supporting TDD and GSM.

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

~~$T_{reselection,GSM} = T_{identify,GSM} + T_{Measurement\_GSM} + T_{SI}$~~

$$T_{reselection\,GSM} = T_{identify\,GSM} + T_{measurement\ GSM} + 40 + T_{BCCH} + T_{RA}$$ ms

where

T_{BCCH} is the maximum time allowed to read the BCCH data from a GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure.

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

$T_{identify,GSM}$ ~~= Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.~~ is specified in 8.4.2.5.2.1.

~~$T_{Measurement,GSM}$ = is the worst case time for measuring one previously identified GSM carrier~~

~~T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.~~

~~$T_{Measurement,GSM} = Max\left\{480ms,\ 8\cdot\frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}}\cdot T_{meas}\right\}$~~

$$T_{measurement,GSM} = Max\left\{8\cdot\frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}}\cdot T_{meas}, 4*T_{meas}, 480ms\right\}$$

where:

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ ~~can be~~shall be derived from the values in table 8.7 section 8.4.2.5.1.

T_{meas} is specified in section 8.4.2.1.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

$T_{identify\,GSM}$ = 150 ms

$T_{measurement\,GSM}$ = 480 ms

< Next changed section >

5.8 Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH

5.8.1 Introduction

5.8.1.1 3.84 Mcps TDD option

The purpose of inter-RAT cell change order from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. This procedure may be used in CELL_DCH and CELL_FACH state. The cell change order procedure is initiated from UTRAN with a RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in [16].

5.8.1.2 1.28 Mcps TDD option

void

5.8.2 Requirements

The requirements in this section shall apply to UE supporting TDD and GSM.

5.8.2.1 Delay

5.8.2.1.1 3.84 Mcps TDD option

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.1A from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.1A: Inter-RAT cell change order from UTRAN - delay

UE synchronisation status	delay [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$90 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$190 + T_{BCCH} + T_{RA}$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} = the additional delay caused by the random access procedure

5.8.2.1.2 1.28 Mcps TDD option

void

5.8.2.2 Interruption time

5.8.2.2.1 3.84 Mcps TDD option

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.1B. The requirement in table 5.1B for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.1B: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	40 + T_{BCCH} +T_{RA}
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	140 + T_{BCCH}+T_{RA}

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} = the additional delay caused by the random access procedure

5.8.2.2.2 1.28 Mcps TDD option

void

< Next changed section >

8.1.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_DCH state, measurements opportunities for GSM measurements are provided by means of idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when idle intervals ~~signalled~~ are used~~by UTRAN during CELL_DCH state~~for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.1.2.5.2 "BSIC verification". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.1.2.5.2 "BSIC verification"~~

- In section 8.1.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.1.2.1 shall be allocated for GSM initial BSIC identification.

- The remaining measurements opportunities scheduled for GSM measurements shall be used as follows. 3 measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~If the UE does not need to perform GSM measurements in the idle intervals only, the requirements of handover measurements in TS 45.008 shall apply.~~

b) In CELL_DCH state, when signaled by UTRAN and when the UE does not need idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.1.2.5.1 GSM carrier RSSI

a) For a UE using idle intervals to perform GSM measurements

A~~n~~ UE supporting GSM measurements using idle intervals shall ~~be able to measure~~meet the minimum number of GSM carrier RSSI ~~levels~~ measurements ~~of GSM cells from the monitored set with acquisition speed defined~~ specified in table 8.1.

~~-~~In the CELL_DCH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 45.008~~[21], when the given measurement time allows the UE to the take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.1

Idle ~~I~~interval ~~L~~length (timeslots)	Number of GSM carrier RSSI ~~measurements~~samples in each idle interval
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14

~~For the description of the idle intervals see Annex A of 25.225.~~

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

8.1.2.5.2 BSIC verification

a) For a UE using idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1.~~,"Initial BSIC identification"~~

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. ~~The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.2.~~, "BSIC re-confirmation"~~

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified, the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

If the UTRAN requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to Section 8.1.2.5.1 and the UE shall perform measurement reporting as defined in Section 8.6.7.6 of [16].
- The UE shall use the last available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation according to Section 8.1.2.5.2.2

The UE shall perform event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the last available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting. Periodic reports shall be triggered according to the given reporting period even if the BSIC of a GSM cell has

not been verified as defined in Sections 8.6.7.5 and 8.6.7.6 of [16]. Non verified BSIC shall be indicated in the measurement report.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the Ue~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). ~~and from that moment~~ From that time instant, the UE shall attempt to re-confirm the BSIC ~~shall be re-confirmed~~ at least once every $T_{re\text{-}confirm\ abort}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM cell ~~is considered as~~to be "non-verified".

The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within an idle interval, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the idle interval is within the limits specified in Table 8.1.A.

Table 8.1A

Idle Interval Length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398

The UE shall be able to perform BSIC verification ~~-~~at levels down to the reference sensitivity level or reference interference levels as specified in ~~TS 45.005~~[20].

b) For a UE not using idle intervals to perform GSM measurements

If a BSIC is decoded and matches the expected value, the UE shall consider it as "verified", otherwise it shall consider it as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.1.2.5.2.1 Initial BSIC identification

~~This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~

For GSM cells that are requested with BSIC verified, the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strenght levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

If the BSIC of a GSM BCCH carriers has been successfully decoded, the UE shall immediately continue BSIC identification with the next BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC decoding attempts for that GSMBCCH carrier. The UE shall continue to try to perform BSIC decoding of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC decoding failed shall not

be re-considered for BSIC decoding until BSIC decoding attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with~~

Where,

$T_{identify\ abort}$ = ~~-~~5000 ms. ~~This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of at least 8 identified GSM cells. Initial timing information is obtained from the initial BSIC decoding. The timing information shall be updated every time the BSIC is decoded.

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM BCCH carrier within $T_{re\text{-}confirm\_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier. The GSM BCCH carrier shall be treated as a new GSM BCCH carrier with un-identified BSIC and the GSM BCCH carrier shall be moved to the initial BSIC decoding procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

~~This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

$T_{re\text{-}confirm\ abort}$ =5000 ms. ~~This is the BSIC reconfirmation interval.~~

~~It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.5.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered reporting delay requirement is valid, when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{measurement\ period\ GSM}$ (see section 8.1.2.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than 2*$T_{measurement\ period\ GSM}$, where $T_{measurement\ period\ GSM}$ is defined in Section 8.1.2.5.1. When L3 filtering is used an additional delay can be expected. For a GSM cell with non-verified BSIC an additional delay according to section 8.1.2.5.2.1 Initial BSIC identification can be expected.

< Next changed section >

8.4.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_FACH state, measurements opportunities for GSM measurements are provided by means of measurement occasions and idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when measurement occasions and idle intervals ~~signalled~~ are used ~~by UTRAN during CELL_FACH state~~ for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified.~~

- In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

- ~~The measurement windows due to idle intervals and measurements occasions used~~ The remaining measurement opportunities scheduled for GSM measurements shall be scheduled as follows. 3 ~~occasions~~ measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement ~~windows~~ opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~For the UE performing GSM measurements, the requirements in TS 45.008 shall apply.~~

b) In CELL_FACH state, when signaled by UTRAN and when the UE does not need measurement occasions and idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.4.2.5.1 GSM carrier RSSI

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

A ~~n~~ UE supporting GSM measurements using measurement occasions and idle intervals shall meet the minimum number of ~~-~~GSM carrier RSSI measurements specified in table 8.7.

In ~~the~~ CELL_FACH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 45.008~~[21], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.7

Measurement ~~Window~~opportunity ~~L~~length (time slots)	Number of GSM carrier RSSI ~~measurements.~~ samples per measurement opportunity.
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14
15	16
30	32
60	64
120	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

In case UTRA RACH procedure prevents the UE from acquiring the required number of samples per GSM carrier during one measurement period, the GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.4.2.5.2 BSIC verification

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within 50% of the available measurement windows.~~ The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1 ~~Initial BSIC identification~~.

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed~~. The UE shall trigger the BSIC re-confirmation within the available measurement windows.~~ The requirements for Initial BSIC identification can be found in 8.4.2.5.2.2 ~~BSIC re-confirmation~~.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the UE~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). ~~and from that moment~~From that time instant, the UE shall attempt to re-confirm the BSIC ~~shall be re-confirmed~~ at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM cell ~~is considered as~~to be "non-verified".

The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within a measurement opportunity, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement opportunity is within the limits specified in Table 8.7.A.

Table 8.7A

Idle Interval Length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398
15	± 4100
30	± 9100
60	± 19100
120	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in ~~TS 45.005~~[20].

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The UE shall attempt to verify the BSIC for at least the 6 strongest GSM carriers at least every 10 seconds, to confirm that it is monitoring the same cell, as far as UTRA RACH procedure does not prevent UE from decoding BSIC.

If a BSIC is decoded and matches the expected value, the UE shall consider it as “verified”, otherwise it shall consider it as “non-verified”.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.4.2.5.2.1 Initial BSIC identification

This measurement ~~is~~ shall be performed in the measurement ~~windows~~ opportunities as described in 8.4.2.5.

~~For GSM cells that are requested with BSIC verified t~~The UE shall continuously attempt to decode the BSIC of the SCH on the BCCH carrier of the ~~8~~ 6 strongest ~~-~~BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value ~~after layer 3 filtering~~.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurement~~s occasions~~ opportunities allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully ~~identified~~ decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH ~~-~~carrier in signal strength order. ~~The~~ The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the ~~8~~6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified, the time is changed to N *$T_{identify\ abort}$, with~~

___$T_{identify\ abort}$ is specified in section 8.1.2.5~~.~~

8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of ~~8~~6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement ~~window~~ opportunity allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC ~~falling within the effective idle interval duration~~occurring during the measurement opportunity. When the UE has to select one out of several possible GSM cells to reconfirm~~. If more than one BSIC can be decoded within~~ during the same measurement ~~window~~opportunity, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts ~~or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds~~, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with un-identified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the ~~8~~6 strongest GSM cells in the monitored list.

~~The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

___$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

~~It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.~~

< Next changed section >

A.4.2.4 Scenario 4: inter RAT cell re-selection

A.4.2.4.1 Test Purpose and Environment

A.4.2.4.1.1 3.84 Mcps TDD option

This test is to verify the requirement for the UTRA~~N~~ TDD to GSM cell re-selection delay reported in section 4~~.3~~.2.~~1.~~

This scenario implies the presence of 1 UTRA~~N~~ TDD serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRA TDD carrier and 12 GSM cells. Test parameters are given in Table, A.4.7, A.4.8, A.4.9. Cell 1 and Cell 2 shall belong to different Location Areas.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the TDD cell 1 is better ranked as the GSM cell 2 during T1 and the GSM cell 2 is better ranked than the TDD cell 1 during T2.

~~Cell 1 and cell 2 shall belong to different Location Areas.~~

Table A.4.7: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UTRA TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
HCS			Not used	
DRX cycle length		s	1,28	UTRA~~N~~ TDD cell
~~BCCH repetition period (GSM cell)~~		~~s~~	~~1,87~~	~~In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)~~
T1		s	~~1~~45	
T2		s	~~1~~35	

Table A.4.8: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA TDD)			
Timeslot Number		**0**		**8**	
		T1	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2
I_{oc}	dBm/3, 84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75	n.a.	n.a.
Propagation Condition		AWGN		AWGN	
Qrxlevmin	dBm	-102			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
Qhyst1	dB	0			
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table A.4.9: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-~~8~~90	-7~~0~~5
RXLEV_ACCESS_MIN	dBm	-10~~0~~4	
MS_TXPWR_MAX_CCH	dBm	3~~0~~3	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/GSM re-selection process, it is not intended to give reasonable values for a TDD/GSM cell re-selection.~~

A.4.2.4.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. Test parameters are given in Table A.4.7A, A.4.8A, A.4.9A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. Cell 1 and cell 2 shall belong to different location areas.

Table A.4.7A: General test parameters for UTRAN (1.28 Mcps TDD OPTION) to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	
T1		s	15	
T2		s	15	

Table A.4 8A: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
$\hat{I}_{or}/I_{oc}$	dB	13	-1	13	-1
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-70	-84		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
$Ssearch_{RAT}$	dB	Not sent			
Qrxlevmin	dBm	-103			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
$Qhyst1_{s}$	dB	0			

Table A.4.9A: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-75	-70
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.4.2.4.2 Test Requirements

A.4.2.4.2.1 3.84 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send ~~LOCATION UPDATING REQUEST message to perform a Location update~~the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than ~~[8]~~26 s + T_{BCCH}, where T_{BCCH} is the maximum time allowed to read BCCH data in the GSM cell [21].

The rate of correct cell re-selections observed during repeated tests shall be at least 90%.

~~NOTE: The UE shall keep a running average of 4 measurements, thus gives 4*1280ms ($T_{measureGSM}$ Table 4.1), means 5.12 seconds can elapse from the beginning of time period T2 before the UE has finished the measurements to evaluate that the GSM cell fulfils the re-selection criteria.~~

~~The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.~~

NOTE: The cell re-selection delay can be expressed as: 4 * $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$	Equal to the value specified in Table 4.1 in section 4.2
T_{BCCH}	Equal to 1.9 s, i.e. the maximum time allowed to read BCCH data when synchronised to a BCCH carrier from a GSM cell [21].

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

A.4.2.4.2.2 1.28 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send LOCATION UPDATING REQUEST message to perform a Location update.

The cell re-selection delay shall be less than 8 s + T_{BCCH} where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$\text{Max}(3*T_{measureTDD} , T_{measure\ GSM} + 1\text{DRX}) + T_{BCCH}$$

where:

$T_{measureTDD}$ Specified in 4.2.2.7.2 Table 4.1A.

DRX cycle length 1.28s see Table A.4.7.A

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [20].

This gives a total of 7.68s +T_{BCCH}, thus allow 8s +T_{BCCH}.

< Next changed section >

A.5.3 TDD/GSM Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test Purpose and Environment

A.5.3.1.1 3.84 Mcps TDD option

The purpose of this test is to verify the requirement for the UTRA TDD to GSM handover delay reported in section 5.4.2.1.

The test parameters are given in Tables A.5.3.1, A.5.3.2 and A.5.3.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a HANDOVER FROM UTRAN COMMAND message with activation time at beginning of T3 with one active cell, cell 2. The HANDOVER FROM UTRAN COMMAND message shall be sent to the UE such that the delay between the last the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16]. In the GSM Handover command contained in this message, IE starting time shall not be included.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.5.3.1: General test parameters for TDD/GSM handover

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	UTRA TDD cell
	Neighbour cell	Cell 2	GSM cell
Final condition	Active cell	Cell 2	GSM cell
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Event 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.5.3.2: Cell 1 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 1					
DL timeslot number		0			1		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	6			6		
PCCPCH RSCP	dBm	-68			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.3.3: Cell 2 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 2	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.3.1.2 1.28Mcps TDD option

void

A.5.3.2 Test Requirements

A.5.3.2.1 3.84 Mcps TDD option

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.3.2.2 1.28 Mcps TDD option

void

< Next changed section >

A.8.4 GSM measurements

A.8.4.1 Correct reporting of GSM neighbours in AWGN propagation condition

A.8.4.1.1 Test Purpose and Environment

A.8.4.1.1.1 3.84 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing GSM measurements. This test will partly verify the requirements in section 8.1.2.5. The requirements are also applicable for a UE not requiring idle intervals to perform GSM measurements.

The test parameters are given in Tables A.8.4.1, A.8.4.2 and A.8.4.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3B and 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.8.4.1: General test parameters for correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Events 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.8.4.2: Cell specific parameters for correct reporting of GSM neighbours in AWGN propagation condition (cell 1)

Parameter	Unit	Cell 1	
		T1, T2, T3	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
Îor/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

Table A.8.4.3: Cell specific parameters for correct reporting of GSM neighbours in AWGN propagation condition (cell 2)

Parameter	Unit	Cell 2		
		T1	T2	T3
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-85	-75	-85

A.8.4.1.1.2 1.28 Mcps TDD option

void

A.8.4.1.2 Test Requirements

A.8.4.1.2.1 3.84 Mcps TDD option

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T3.

The UE shall not send any Event 3B or 3C triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.4.1.2.2 1.28 Mcps TDD option

void

< Next changed section >

A.9.1.5 GSM carrier RSSI

~~NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.~~

A.9.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.5.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be provided in timeslot 0 and no second Beacon timeslot shall be provided for cell 1. In the measurement control information it is indicated to the UE that periodic reporting of the GSM carrier RSSI measurement is used. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.5.1.1 Inter frequency test parameters

GSM carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.6A and A.9.6B.

The limits of the GSM test parameters are defined in [21].

Table A.9.6A: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL reference measurement channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		No	
Monitored cell list size		6 GSM neighbours including ARFCN 1	

Table A.9.6B: Cell 1 specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
Îor/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

A.9.1.5.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.5.

The rate of correct measurements observed during repeated tests shall be at least 90%.

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CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **247** ⌘ **rev** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-GSM measurement requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘

Requirements on inter-RAT cell change order in CELL_FACH state missing

Currently there are no processing delay and execution delay requirements on RRC CELL CHANGE ORDER message, which is used in CELL_FACH and CELL_DCH states to transfer a connection between the UE and UTRAN TDD to GSM.

Corrections to TDD-GSM cell re-selection requirements in CELL_FACH state

Correction needed because some key time delays for TDD-GSM cell re-selection delay in CELL_FACH are not taken into account yet.

Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)

Not all possible idle interval lengths are covered for requirements on GSM carrier RSSI samples taken

Scheduling of measurement opportunities and resulting identification times for initial BSIC confirmation and BSIC reconfirmation not defined for CELL_DCH state.

Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst missing.

Procedural clarifications needed.

Requirements on event-triggered reporting for GSM measurements still missing.

Correction to TDD-GSM cell re-selection test case in Idle Mode

Test requirement still in square brackets and missing test parameters.

	Introduction of TDD-GSM handover test case TDD/GSM HO test case on handover delay requirements in section 5.3 still missing. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Test case missing and identification time requirements in section 8.1.2.5 not tested. **Completion of GSM carrier RSSI measurement accuracy test cases** Test conditions and parameter settings completely missing.
Summary of change: ⌘	**Requirements on inter-RAT cell change order in CELL_FACH state added:** Introduction of delay and interruption time requirements corresponding to TDD/GSM handover case. **Completion of TDD-GSM measurement requirements in CELL_DCH and CELL_FACH states (sections 8.1.2.5 and 8.4.2.5)** Table 8.1 updated to cover all possible idle interval lengths for requirements on GSM carrier RSSI samples taken Scheduling of measurement opportunities in CELL_DCH state. Requirements on BSIC decoding within idle intervals with respect to time alignment to GSM synchronisation burst introduced in net table 8.1A. Additional requirements on event-triggered reporting for GSM measurements. **Correction to TDD-GSM cell re-selection test case in Idle Mode** Test requirement set to 26 s + T_{BCCH} and completion of test parameters settings. **Introduction of TDD-GSM handover test case** Introduction of TDD/GSM handover test case for known target cell case. **Introduction of test case for event-triggered reporting of GSM neighbours in CELL_DCH state in AWGN** Introduction of test case for Event 3B and 3C triggered reporting for GSM neighbours in CELL_DCH state. **Completion of GSM carrier RSSI measurement accuracy test cases** Introduction of measurement test case for GSM carrier RSSi accuracy.
Consequences if not approved: ⌘	Critical TDD-GSM requirements on Cell Re-selection in CELL_FACH state and Connected Mode measurement performance incomplete or missing and corresponding test cases missing or not feasible. Critical test cases on TDD/GSM handover and neighbour reporting missing. **Isolated impact analysis:** This CR contains corrections to TDD-GSM relevant parts of TS25.123 where this specification is incomplete and where parts of critical dual-mode TDD-GSM UE requirements and test cases are missing. Note that this CR does only impact requirements on TDD-GSM inter-working as set by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	5.4.2.1.4; new 5.8; 8.1.2.5; 8.4.2.5; A.4.2.4; A.5.3; new A.8.4; A.9.1.5			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	

	X	O&M Specifications
Other comments:	⌘	none Equivalent CRs in other Releases: CR245 cat. F to 25.123 v3.10.0, CR246 cat. A to 25.123 v4.5.0

5.4.2.1.4 Inter-RAT cell re-selection

The requirements in this section shall apply to UE supporting TDD and GSM.

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

~~$T_{reselection,GSM} = T_{identify,GSM} + T_{Measurement\_GSM} + T_{SI}$~~

$$T_{reselection\,GSM} = T_{identify\,GSM} + T_{measurement\ GSM} + 40 + T_{BCCH} + T_{RA}$$ ms

where

T_{BCCH} is the maximum time allowed to read the BCCH data from a GSM cell [21].

T_{RA} is the additional delay caused by the random access procedure.

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

$T_{identify,GSM}$ ~~= Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.~~ is specified in 8.4.2.5.2.1.

~~$T_{Measurement,GSM}$ = is the worst case time for measuring one previously identified GSM carrier~~

~~T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.~~

~~$T_{Measurement,GSM} = Max\left\{480ms,\ 8\cdot\frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}}\cdot T_{meas}\right\}$~~

$$T_{measurement,GSM} = Max\left\{8\cdot\frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}}\cdot T_{meas}, 4*T_{meas}, 480ms\right\}$$

where:

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ ~~can be~~shall be derived from the values in table 8.7 section 8.4.2.5.1.

T_{meas} is specified in section 8.4.2.1.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

$T_{identify\,GSM}$ = 150 ms

$T_{measurement\,GSM}$ = 480 ms

< Next changed section >

5.8 Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH

5.8.1 Introduction

5.8.1.1 3.84 Mcps TDD option

The purpose of inter-RAT cell change order from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. This procedure may be used in CELL_DCH and CELL_FACH state. The cell change order procedure is initiated from UTRAN with a RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in [16].

5.8.1.2 1.28 Mcps TDD option

void

5.8.2 Requirements

The requirements in this section shall apply to UE supporting TDD and GSM.

5.8.2.1 Delay

5.8.2.1.1 3.84 Mcps TDD option

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.1A from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.1A from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.1A: Inter-RAT cell change order from UTRAN - delay

UE synchronisation status	delay [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$90 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$190 + T_{BCCH} + T_{RA}$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} = the additional delay caused by the random access procedure

5.8.2.1.2 1.28 Mcps TDD option

void

5.8.2.2 Interruption time

5.8.2.2.1 3.84 Mcps TDD option

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.1B. The requirement in table 5.1B for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.1B: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$40 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$140 + T_{BCCH} + T_{RA}$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

T_{RA} = the additional delay caused by the random access procedure

5.8.2.2.2 1.28 Mcps TDD option

void

< Next changed section >

8.1.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_DCH state, measurements opportunities for GSM measurements are provided by means of idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when idle intervals ~~signalled~~ are used~~by UTRAN during CELL_DCH state~~for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.1.2.5.2 "BSIC verification". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.1.2.5.2 "BSIC verification"~~

- In section 8.1.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.1.2.1 shall be allocated for GSM initial BSIC identification.

- The remaining measurements opportunities scheduled for GSM measurements shall be used as follows. 3 measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~If the UE does not need to perform GSM measurements in the idle intervals only, the requirements of handover measurements in TS 45.008 shall apply.~~

b) In CELL_DCH state, when signaled by UTRAN and when the UE does not need idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.1.2.5.1 GSM carrier RSSI

a) For a UE using idle intervals to perform GSM measurements

A~~n~~ UE supporting GSM measurements using idle intervals shall ~~be able to measure~~meet the minimum number of GSM carrier RSSI ~~levels~~ measurements ~~of GSM cells from the monitored set with acquisition speed defined~~ specified in table 8.1.

~~-~~In the CELL_DCH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 45.008~~[21], when the given measurement time allows the UE to the take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.1

Idle ~~I~~interval ~~L~~length (timeslots)	Number of GSM carrier RSSI ~~measurements~~samples in each idle interval
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14

~~For the description of the idle intervals see Annex A of 25.225.~~

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

8.1.2.5.2 BSIC verification

a) For a UE using idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1~~,"Initial BSIC identification"~~

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. ~~The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~ The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.2~~, "BSIC re-confirmation"~~

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified, the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

If the UTRAN requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to Section 8.1.2.5.1 and the UE shall perform measurement reporting as defined in Section 8.6.7.6 of [16].
- The UE shall use the last available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation according to Section 8.1.2.5.2.2

The UE shall perform event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the last available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting. Periodic reports shall be triggered according to the given reporting period even if the BSIC of a GSM cell has

not been verified as defined in Sections 8.6.7.5 and 8.6.7.6 of [16]. Non verified BSIC shall be indicated in the measurement report.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the Ue~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). ~~and from that moment~~ From that time instant, the UE shall attempt to re-confirm the BSIC ~~shall be re-confirmed~~ at least once every $T_{re\text{-}confirm\ abort}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM cell ~~is considered as~~to be "non-verified".

The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within an idle interval, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the idle interval is within the limits specified in Table 8.1.A.

Table 8.1A

Idle Interval Length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398

The UE shall be able to perform BSIC verification ~~a~~t levels down to the reference sensitivity level or reference interference levels as specified in ~~TS 45.005~~[20].

b) For a UE not using idle intervals to perform GSM measurements

If a BSIC is decoded and matches the expected value, the UE shall consider it as "verified", otherwise it shall consider it as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.1.2.5.2.1 Initial BSIC identification

~~This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).~~

For GSM cells that are requested with BSIC verified, the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strenght levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

If the BSIC of a GSM BCCH carriers has been successfully decoded, the UE shall immediately continue BSIC identification with the next BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC decoding attempts for that GSMBCCH carrier. The UE shall continue to try to perform BSIC decoding of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC decoding failed shall not

be re-considered for BSIC decoding until BSIC decoding attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with~~

Where,

$T_{identify\ abort}$ = ~~-~~5000 ms. ~~This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of at least 8 identified GSM cells. Initial timing information is obtained from the initial BSIC decoding. The timing information shall be updated every time the BSIC is decoded.

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM BCCH carrier within $T_{re\text{-}confirm\_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier. The GSM BCCH carrier shall be treated as a new GSM BCCH carrier with un-identified BSIC and the GSM BCCH carrier shall be moved to the initial BSIC decoding procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

~~This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

$T_{re\text{-}confirm\ abort}$ =5000 ms. ~~This is the BSIC reconfirmation interval.~~

~~It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

8.1.2.5.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.5.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered reporting delay requirement is valid, when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{measurement\ period\ GSM}$ (see section 8.1.2.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than 2*$T_{measurement\ period\ GSM}$, where $T_{measurement\ period\ GSM}$ is defined in Section 8.1.2.5.1. When L3 filtering is used an additional delay can be expected. For a GSM cell with non-verified BSIC an additional delay according to section 8.1.2.5.2.1 Initial BSIC identification can be expected.

< Next changed section >

8.4.2.5 GSM measurements

The requirements in this section shall ~~applies~~ apply ~~only~~ to UE supporting TDD and GSM.

In CELL_FACH state, measurements opportunities for GSM measurements are provided by means of measurement occasions and idle intervals.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

a) In CELL_DCH state, when signaled by UTRAN and ~~W~~when measurement occasions and idle intervals ~~signalled~~ are used ~~by UTRAN during CELL_FACH state~~ for GSM measurements, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified.~~

- In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement opportunity scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

- ~~The measurement windows due to idle intervals and measurements occasions used~~ The remaining measurement opportunities scheduled for GSM measurements shall be scheduled as follows. 3 ~~occasions~~ measurement opportunities out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement ~~windows~~ opportunities between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

~~For the UE performing GSM measurements, the requirements in TS 45.008 shall apply.~~

b) In CELL_FACH state, when signaled by UTRAN and when the UE does not need measurement occasions and idle intervals to perform GSM measurements, the UE shall measure all GSM cells present in the monitored set

- the relevant requirements for GSM dedicated mode when a TCH channel is assigned in [21] shall apply. This is further detailed in the following sub-sections.

8.4.2.5.1 GSM carrier RSSI

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

A ~~n~~ UE supporting GSM measurements using measurement occasions and idle intervals shall meet the minimum number of ~~-~~GSM carrier RSSI measurements specified in table 8.7.

In ~~the~~ CELL_FACH state the measurement period, $T_{measurement\ period\ GSM}$, for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in ~~TS 45.008~~[21], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.7

Measurement ~~Window~~opportunity ~~L~~length (time slots)	Number of GSM carrier RSSI ~~measurements.~~ samples per measurement opportunity.
3	1
4	2
5	3
6	4
7	6
8	7
9	8
10	10
11	11
12	12
13	14
15	16
30	32
60	64
120	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per GSM carrier RSSI measurement. The measurement period shall be 480 ms.

In case UTRA RACH procedure prevents the UE from acquiring the required number of samples per GSM carrier during one measurement period, the GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.4.2.5.2 BSIC verification

a) For a UE using measurement occasions and idle intervals to perform GSM measurements

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. ~~The UE shall trigger the initial BSIC identification within 50% of the available measurement windows.~~ The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1 ~~Initial BSIC identification~~.

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed~~. The UE shall trigger the BSIC re-confirmation within the available measurement windows.~~ The requirements for Initial BSIC identification can be found in 8.4.2.5.2.2 ~~BSIC re-confirmation~~.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The UE shall consider ~~T~~the BSIC of a GSM cell ~~is considered~~ to be "verified", if ~~the UE~~ it has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). ~~and from that moment~~From that time instant, the UE shall attempt to re-confirm the BSIC ~~shall be re-confirmed~~ at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise, the UE shall consider the BSIC of the GSM cell ~~is considered as~~to be "non-verified".

The time requirement for initial BSIC identification, $T_{identify\ abort}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ abort}$ can be found in the sections below.

~~The worst case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.~~

The UE shall be able to decode a BSIC for the purpose of initial BSIC identification or BSIC reconfirmation within a measurement opportunity, when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement opportunity is within the limits specified in Table 8.7.A.

Table 8.7A

Idle Interval Length (timeslots)	Maximum time difference [µs]
3	± 65
4	± 398
5	± 732
6	± 1065
7	± 1398
8	± 1732
9	± 2065
10	± 2398
11	± 2732
12	± 3065
13	± 3398
15	± 4100
30	± 9100
60	± 19100
120	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in ~~TS 45.005~~[20].

b) For a UE not using measurement occasions and idle intervals to perform GSM measurements

The UE shall attempt to verify the BSIC for at least the 6 strongest GSM carriers at least every 10 seconds, to confirm that it is monitoring the same cell, as far as UTRA RACH procedure does not prevent UE from decoding BSIC.

If a BSIC is decoded and matches the expected value, the UE shall consider it as “verified”, otherwise it shall consider it as “non-verified”.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [20].

8.4.2.5.2.1 Initial BSIC identification

This measurement ~~is~~ shall be performed in the measurement ~~windows~~ opportunities as described in 8.4.2.5.

~~For GSM cells that are requested with BSIC verified t~~The UE shall continuously attempt to decode the BSIC of the SCH on the BCCH carrier of the ~~8~~ 6 strongest ~~-~~BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value ~~after layer 3 filtering~~.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurement~~s occasions~~ opportunities allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully ~~identified~~ decoded the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH ~~-~~carrier in signal strength order. ~~The~~ The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the ~~8~~6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

~~The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified, the time is changed to N *$T_{identify\ abort}$, with~~

___$T_{identify\ abort}$ is specified in section 8.1.2.5~~.~~

8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of ~~8~~6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement ~~window~~ opportunity allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC ~~falling within the effective idle interval duration~~occurring during the measurement opportunity. When the UE has to select one out of several possible GSM cells to reconfirm~~. If more than one BSIC can be decoded within~~ during the same measurement ~~window~~opportunity, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts ~~or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds~~, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with un-identified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the ~~8~~6 strongest GSM cells in the monitored list.

~~The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

Where,

___$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

~~It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.~~

< Next changed section >

A.4.2.4 Scenario 4: inter RAT cell re-selection

A.4.2.4.1 Test Purpose and Environment

A.4.2.4.1.1 3.84 Mcps TDD option

This test is to verify the requirement for the UTRA~~N~~ TDD to GSM cell re-selection delay reported in section 4~~.3~~.2.~~1.~~

This scenario implies the presence of 1 UTRA~~N~~ TDD serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRA TDD carrier and 12 GSM cells. Test parameters are given in Table, A.4.7, A.4.8, A.4.9. Cell 1 and Cell 2 shall belong to different Location Areas.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the TDD cell 1 is better ranked as the GSM cell 2 during T1 and the GSM cell 2 is better ranked than the TDD cell 1 during T2.

~~Cell 1 and cell 2 shall belong to different Location Areas.~~

Table A.4.7: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UTRA TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
HCS			Not used	
DRX cycle length		s	1,28	UTRA~~N~~ TDD cell
~~BCCH repetition period (GSM cell)~~		~~s~~	~~1,87~~	~~In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)~~
T1		s	~~1~~45	
T2		s	~~1~~35	

Table A.4.8: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA TDD)			
Timeslot Number		**0**		**8**	
		T1	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2
I_{oc}	dBm/3, 84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75	n.a.	n.a.
Propagation Condition		AWGN		AWGN	
Qrxlevmin	dBm	-102			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
Qhyst1	dB	0			
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table A.4.9: Cell re-selection UTRA~~N~~ TDD to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-~~8~~90	-7~~0~~5
RXLEV_ACCESS_MIN	dBm	-10~~0~~4	
MS_TXPWR_MAX_CCH	dBm	3~~0~~3	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/GSM re-selection process, it is not intended to give reasonable values for a TDD/GSM cell re-selection.~~

A.4.2.4.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. Test parameters are given in Table A.4.7A, A.4.8A, A.4.9A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. Cell 1 and cell 2 shall belong to different location areas.

Table A.4.7A: General test parameters for UTRAN (1.28 Mcps TDD OPTION) to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	
T1		s	15	
T2		s	15	

Table A.4 8A: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
$\hat{I}_{or}/I_{oc}$	dB	13	-1	13	-1
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-70	-84		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
$Ssearch_{RAT}$	dB	Not sent			
Qrxlevmin	dBm	-103			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
$Qhyst1_{s}$	dB	0			

Table A.4.9A: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-75	-70
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.4.2.4.2 Test Requirements

A.4.2.4.2.1 3.84 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send ~~LOCATION UPDATING REQUEST message to perform a Location update~~the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than ~~[8]~~26 s + T_{BCCH}, where T_{BCCH} is the maximum time allowed to read BCCH data in the GSM cell [21].

The rate of correct cell re-selections observed during repeated tests shall be at least 90%.

~~NOTE: The UE shall keep a running average of 4 measurements, thus gives 4*1280ms ($T_{measureGSM}$ Table 4.1), means 5.12 seconds can elapse from the beginning of time period T2 before the UE has finished the measurements to evaluate that the GSM cell fulfils the re-selection criteria.~~

~~The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.~~

NOTE: The cell re-selection delay can be expressed as: 4 * $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$	Equal to the value specified in Table 4.1 in section 4.2
T_{BCCH}	Equal to 1.9 s, i.e. the maximum time allowed to read BCCH data when synchronised to a BCCH carrier from a GSM cell [21].

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

A.4.2.4.2.2 1.28 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send LOCATION UPDATING REQUEST message to perform a Location update.

The cell re-selection delay shall be less than 8 s + T_{BCCH} where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [20].

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$\text{Max}(3*T_{measureTDD} , T_{measure\ GSM} + 1\text{DRX}) + T_{BCCH}$$

where:

$T_{measureTDD}$ Specified in 4.2.2.7.2 Table 4.1A.

DRX cycle length 1.28s see Table A.4.7.A

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [20].

This gives a total of 7.68s +T_{BCCH}, thus allow 8s +T_{BCCH}.

< Next changed section >

A.5.3 TDD/GSM Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test Purpose and Environment

A.5.3.1.1 3.84 Mcps TDD option

The purpose of this test is to verify the requirement for the UTRA TDD to GSM handover delay reported in section 5.4.2.1.

The test parameters are given in Tables A.5.3.1, A.5.3.2 and A.5.3.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a HANDOVER FROM UTRAN COMMAND message with activation time at beginning of T3 with one active cell, cell 2. The HANDOVER FROM UTRAN COMMAND message shall be sent to the UE such that the delay between the last the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16]. In the GSM Handover command contained in this message, IE starting time shall not be included.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.5.3.1: General test parameters for TDD/GSM handover

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	UTRA TDD cell
	Neighbour cell	Cell 2	GSM cell
Final condition	Active cell	Cell 2	GSM cell
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Event 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.5.3.2: Cell 1 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 1					
DL timeslot number		0			1		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/Ior	dB	-3			n.a.		
SCH_Ec/Ior	dB	-9			n.a.		
SCH_t_{offset}	dB	0			n.a.		
DPCH_Ec/Ior	dB	n.a.			Note 1		n.a.
OCNS_Ec/Ior	dB	-3,12			Note 2		n.a.
$\hat{I}_{or}/I_{oc}$	dB	6			6		
PCCPCH RSCP	dBm	-68			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior .							

Table A.5.3.3: Cell 2 specific test parameters for TDD/GSM handover

Parameter	Unit	Cell 2	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.3.1.2 1.28Mcps TDD option

void

A.5.3.2 Test Requirements

A.5.3.2.1 3.84 Mcps TDD option

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.3.2.2 1.28 Mcps TDD option

void

< Next changed section >

A.8.4 GSM measurements

A.8.4.1 Correct reporting of GSM neighbours in AWGN propagation condition

A.8.4.1.1 Test Purpose and Environment

A.8.4.1.1.1 3.84 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing GSM measurements. This test will partly verify the requirements in section 8.1.2.5. The requirements are also applicable for a UE not requiring idle intervals to perform GSM measurements.

The test parameters are given in Tables A.8.4.1, A.8.4.2 and A.8.4.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3B and 3C shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table A.8.4.1: General test parameters for correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Events 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
$T_{identify\ abort}$	s	5	As specified in section 8.1.2.5
$T_{reconfirm\ abort}$	s	5	As specified in section 8.1.2.5
T1	s	10	
T2	s	10	
T3	s	10	

Table A.8.4.2: Cell specific parameters for correct reporting of GSM neighbours in AWGN propagation condition (cell 1)

Parameter	Unit	Cell 1	
		T1, T2, T3	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
Îor/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

Table A.8.4.3: Cell specific parameters for correct reporting of GSM neighbours in AWGN propagation condition (cell 2)

Parameter	Unit	Cell 2		
		T1	T2	T3
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-85	-75	-85

A.8.4.1.1.2 1.28 Mcps TDD option

void

A.8.4.1.2 Test Requirements

A.8.4.1.2.1 3.84 Mcps TDD option

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 960 ms from the start of time period T3.

The UE shall not send any Event 3B or 3C triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.4.1.2.2 1.28 Mcps TDD option

void

< Next changed section >

A.9.1.5 GSM carrier RSSI

~~NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.1.5 exists.~~

A.9.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.5.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be provided in timeslot 0 and no second Beacon timeslot shall be provided for cell 1. In the measurement control information it is indicated to the UE that periodic reporting of the GSM carrier RSSI measurement is used. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

A.9.1.5.1.1 Inter frequency test parameters

GSM carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.6A and A.9.6B.

The limits of the GSM test parameters are defined in [21].

Table A.9.6A: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL reference measurement channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		No	
Monitored cell list size		6 GSM neighbours including ARFCN 1	

Table A.9.6B: Cell 1 specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1	
DL timeslot number		0	1
UTRA RF Channel number		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.
SCH_Ec/Ior	dB	-9	n.a.
SCH_t_{offset}		0	n.a.
OCNS_Ec/Ior	dB	-3,12	Note 2
DPCH_Ec/Ior	dB	n.a.	Note 1
Îor/Ioc	dB	6	6
Io, Note 1	dBm / 3.84 MHz	-70	
Propagation condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior.			

A.9.1.5.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.5.

The rate of correct measurements observed during repeated tests shall be at least 90%.

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CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **248** ⌘ **rev** **2** ⌘ Current version: **3.10.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘ **Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and CELL_FACH states**

Measurement scheduling for CELL_DCH state unclear and misleading for split between intra-frequency TDD and inter-frequency TDD or FDD and GSM neighbour cells.

Correction needed for existing requirements and conditions on identification time and measurement period for inter-frequency TDD and FDD cells because not adapted to a TDD measurement approach in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Corrections to test case for TDD-FDD cell re-selection in Idle Mode

Clarification to test conditions and parameter settings needed.

Completion of test case for TDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing.

Completion of test case for FDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing. Test requirement in square brackets.

Summary of change: ⌘ **Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and**

	CELL_FACH states Assumptions underlying the scheduling for CELL_DCH state defined for split between intra-frequency TDD and inter-frequency TDD/FDD/GSM measurements. Definition of measurement opportunities and measurement requirements aligned with those in CELL_DCH state for CELL_FACH state. TDD intra-frequency measurement requirements in both CELL_DCH and CELL_FACH state independent from inter-frequency measurement scheduling, i.e. 6 cells during 200 ms and 800 ms identification time. Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. **Corrections to test case for TDD-FDD cell re-selection in Idle Mode** Clarifications to test conditions and parameter settings. **Completion of test case for TDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. **Completion of test case for FDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. Test requirement set to 5 sec..
Consequences if not approved: ⌘	CELL_DCH and CELL_FACH inter-frequency TDD-TDD/FDD measurement requirements incomplete or not feasible. Basic requirements on number of TDD and FDD neighbour cells to be measured during an inter-frequency measurement period for both CELL_DCH and CELL_FACH missing. Non-uniform UE behaviour when inter-frequency TDD and FDD measurements are scheduled in CELL_DCH state. Test cases for TDD and FDD neighbour reporting in AWGN not feasible. **Isolated impact analysis:** This CR contains corrections to TDD to inter-frequency TDD/FDD relevant parts of TS25.123 where this specification is incomplete and where especially parts of critical dual-mode TDD-FDD UE requirements are missing.

Clauses affected:	⌘	8.1.2.1; 8.1.2.2; 8.1.2.3; 8.1.2.4; 8.1.2.6; 8.4.2.1; 8.4.2.2; 8.4.2.3; 8.4.2.4; A.4.2.3; A.8.2; A.8.3			
Other specs affected:	⌘	**Y** / **N** **N** Other core specifications **Y** Test specifications **N** O&M Specifications	⌘	TS34.122	
Other comments:	⌘	No test cases covering A.8.2 and A.8.3 currently exist in TS34.122. Equivalent CRs in other Releases: CR249r2 cat. A to 25.123 v4.5.0, CR250r2 cat. A to 25.123 v5.1.0			

8 UE Measurements Procedures

8.1 General Measurements Requirements in CELL_DCH State

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see ~~TS 25.225, Annex A~~[14].

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

The UE shall be able to monitor up to:

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

~~Performance requirements for different types of measurements and different number of cells are defined in the following sections.~~

The requirements in section 9 are applicable for a UE performing measurements according to this section.

For measurements on intra- and inter-frequency TDD, inter-frequency FDD and GSM cells, idle intervals as described in [14] can be used. The time $T_{measure}$ per 480 ms period available for these measurements is the sum of the duration of all idle intervals during any given 480 ms period, i.e. the amount of time not used by the UE for receiving in active DL timeslots or for transmission in active UL timeslots. Note that Beacon timeslots of the serving cell can be located inside idle intervals and that implementation margin due to frequency switching is not taken into account for $T_{measure}$.

The requirements in this section are based upon the assumption, that the time durations T_{intra} and T_{inter} during any given 480 ms period for the purpose of measurements on intra-frequency TDD cells and for measurements on inter-frequency TDD, inter-frequency FDD and GSM cells are respectively,

$$T_{intra} = \left[96 + 24 \cdot \text{Floor}\left\{ \frac{M_{intra} + 3}{4} \right\} \right] \text{ ms}$$

$$T_{inter} = 480 \text{ ms} - T_{intra}$$

where,

M_{intra} Equal to the number of intra-frequency TDD cells in the neighbour list.

The time duration T_{inter} shall be equally shared for inter-frequency measurements on the different modes and systems which the UE has capability for and that are in the monitored set signalled by UTRAN, i.e.

$$T_{inter} = N_{TDD} \cdot T_{TDD\ inter} + N_{FDD} \cdot T_{FDD\ inter} + N_{GSM} \cdot T_{GSM\ inter}$$

For this, the following parameters are defined,

$T_{TDD\ inter}$	is the time duration allocated for the purpose of TDD inter-frequency measurements.
$T_{FDD\ inter}$	is the time duration allocated for the purpose of FDD inter-frequency measurements.
$T_{GSM\ inter}$	is the time duration allocated for the purpose of GSM measurements.
N_{TDD}	Equal to 1 if there are inter-frequency TDD cells in the neighbour list, equal to 0 otherwise.
N_{FDD}	Equal to 1 if the UE has capability for FDD and if there are inter-frequency FDD cells in the neighbour list, equal to 0 otherwise.
N_{GSM}	Equal to 1 if the UE has capability for GSM and if there are GSM cells in the neighbour list, equal to 0 otherwise.

8.1.2.2 TDD intra frequency measurements

During the CELL_DCH state, the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the ~~monitoring~~ monitored set. In case ~~the network~~UTRAN requests the UE to report detected set cells, the UE shall also search for intra frequency TDD cells outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set and are identified by the UE, belong to the detected set according to [16]. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~

In order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell or non-overlapping in time with the active ~~DL and~~ UL timeslots used by the UE for ~~reception and~~ transmission, such that the UE can measure an intra-frequency ~~cell~~ TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify ~~-~~a new detectable intra-frequency TDD cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$~~

$T_{identify\ intra}$ = 800 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_DCH state ~~the measurement period for intra frequency P-CCPCH RSCP measurements is 200 ms. When no inter frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ = 6 (cells)

$T_{measurement\ period\ intra}$ = 200 ms.

~~and t~~The UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$.

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency TDD cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from the UE physical layer to higher layers may be decreased. ~~When inter frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods.~~ The measurement accuracy for all measured cells shall be as specified in the section 9.

~~$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}} \right\}$$~~

~~whereby function Floor(x) takes the integer part of x.~~

~~$X_{basic\ measurement\ TDD}$ = 6 (cells)~~

~~$T_{Measurement\_Period,\ Intra}$ = 200 ms. The measurement period for Intra frequency P-CCPCH RSCP measurements.~~

~~T_{Intra}: This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~

~~$T_{basic\_identify\_TDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).~~

8.1.2.2.2A Timeslot ISCP measurement capability

In ~~the~~ CELL_DCH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing Timeslot ISCP measurements for a total of 10 different combinations of an arbitrary DL timeslot and an intra-frequency cell [16], including the current serving cell. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

When inter-frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements for at least $Y_{measurement\ intra\ ISCP}$ different combinations, where $Y_{measurement\ intra\ ISCP}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.

~~$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra,\ ISCP}} \right\}$$~~

$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{5}{6} \frac{T_{intra}}{T_{measurement\ period\ intra\ ISCP}} \right\}$$

whereby function Floor(x) takes the integer part of x.

- $X_{basic\ measurement\ ISCP}$ = 10 (combinations of an arbitrary DL timeslot and an intra-frequency cell)
- $T_{~~M~~measurement\_~~P~~period,\ ~~i~~intra,\ ISCP}$ = 400 ms. The measurement period for ~~i~~intra frequency Timeslot ISCP measurements.
- $T_{~~i~~intra}$~~: This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~ is specified in 8.1.2.1.

8.1.2.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.4 Event-triggered Periodic Reporting

Reported measurements in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.2.5 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

For P-CCPCH RSCP measurements the event triggered measurement reporting delay, on cells belonging to the monitored set, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected.

If a cell, belonging to the monitored set, has been detectable at least for the time period $T_{identify,\ intra}$ and then enters the reporting range, the event triggered P-CCPCH RSCP measurement reporting delay shall be less than $T_{measurement\_period\ intra}$ when the L3 filter has not been used and the UE P-CCPCH RSCP measurement capabilities of section 8.1.2.2.21 are valid.

8.1.2.3 TDD inter frequency measurements

When signalled by the networkUTRAN during CELL_DCH state, the UE shall continuously measure detected inter-frequency TDD cells and search for new inter-frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall be non-overlapping in time with the active DL and UL timeslots used by the UE for reception and transmission such that the UE can measure an inter-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin for frequency switching per idle interval.

8.1.2.3.1 Identification of a new cell

When idle intervals are used for TDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ inter} = Max\left\{5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{measurement\ period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq,TDD}\right\} ms$$

If the UE does not require idle intervals to perform TDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.3.2 P-CCPCH RSCP measurement period

When idle intervals are used for TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 and with a measurement period given byof $T_{measurement\ inter}$.

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{\text{measurement inter}} = Max\left\{T_{\text{measurement period TDD inter}}, N_{\text{basic measurement TDD inter}} \cdot \frac{T_{\text{measurement period TDD inter}}}{N_{\text{TDD inter}}} \cdot N_{Freq,TDD}\right\} ms$$

~~In case of a dual receiver UE~~If the UE does not require idle intervals to perform TDD inter-frequency measurements, the measurement period for inter frequency P-CCPCH RSCP measurements ~~is~~ shall be 480 ms.

Where,

$X_{\text{measurement TDD inter}}$ = 6 (cells)

$T_{\text{measurement period TDD inter}}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_inter}$ for inter frequency P-CCPCH RSCP measurements.

~~N~~$T_{\text{TDD inter}}$: ~~This is the minimum time (representing a time corresponding to an integer number of full slots) available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~: This is the available number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{\text{TDD inter}}$. The UE shall consider that a measurement opportunity on a Beacon timeslot of an inter-frequency TDD cell is provided if an idle interval of length equal to or greater than 3 timeslots less 2*0.5 ms implementation margin for frequency switching per idle interval completely overlaps in time with the Beacon timeslot of the inter-frequency TDD cell.

~~T~~$N_{\text{basic\_identify\_TDD\_inter}}$ = 80~~0 ms~~. This is ~~the time period~~ a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new detectable inter-frequency TDD cell is defined. ~~(side conditions are defined in subclause 8.1.2.6).~~

~~T~~$N_{\text{basic\_measurement\_TDD inter}}$ = 5~~0 ms~~. ~~This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH RSCP measurements.~~This is a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{\text{TDD inter}}$ used in the inter-frequency TDD equation where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

$N_{\text{Freq, TDD}}$: This is the number of ~~-~~TDD frequencies indicated in the inter-frequency measurement control information.

Note that the number of measurement opportunities available to the UE depends on UL and DL timeslot assignments for transmission and reception and on Beacon timeslot allocations in the inter-frequency TDD cells.

8.1.2.3.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

~~The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.4 Event Triggered Reporting.~~

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH~~-~~. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify inter}}$ defined in Section 8.1.2.3.1~~-~~ When L3 filtering is used an additional delay can be expected.

If an inter-frequency TDD cell has been detectable at least for the time period $T_{identify\_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Mmeasurement\_Pperiod\ Iinter}$ when the L3 filter has not been used.

8.1.2.4 FDD measurements

The requirements in this section shall apply only to UE supporting both TDD and FDD mode.

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.1.2.4.1 Identification of a new cell

When idle intervals are used for FDD inter-frequency measurements, Tthe UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within —

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq,FDD}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.4.2 UE CPICH Mmeasurement periodcapability

When idle intervals are used for FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter\ available}} \cdot N_{Freq,FDD}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$.

$X_{basic\ measurement\ FDD\ inter}$ = 6 (cells)

$T_{Mmeasurement\_Pperiod\ FDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter\ available}$: ~~This is the minimum time as full slots that is available for inter frequency measurements, during the period $T_{Measurement\_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~: This is the available time for measurements on inter-frequency FDD cells. $T_{FDD\ inter\ available}$ shall be derived from $T_{FDD\ inter}$ by assuming 2*0.5 ms implementation margin for frequency switching per idle interval and by only taking into account the remaining number of full timeslots per idle interval. Idle intervals smaller than 3 timeslots shall not be taken into account for calculating $T_{FDD\ inter\ available}$.

$T_{basic\_identify\_FDD\_inter}$ = 800 ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new detectable inter-frequency FDD cell is defined.

$T_{basic\_measurement\_FDD\ inter}$ = 50 ms. This is the time period used in the inter-frequency equation for defining the measurement period for inter frequency CPICH measurements.

$N_{Freq,\ FDD}$: This is the ~~N~~number of FDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ FDD\ inter}$ defined in Section 8.1.2.4.1. When L3 filtering is used an additional delay can be expected.

If an inter-frequency FDD cell has been detectable at least for the time period $T_{identify\_FDD\ inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_period\ FDD\ inter}$ provided the timing to that cell has not changed more than +/-32 chips ~~while transmission gap has not been available~~ during the time period $T_{identify\ FDD\ inter}$ and the L3 filter has not been used.

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8.1.2.6 TDD Synchronisation to new cells

~~Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.~~

~~These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.~~

~~The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:~~For the requirements in section 8 and 9 to apply, an intra-frequency or inter-frequency TDD cell shall be considered detectable when,

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

< Next changed section >

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see ~~TS 25.225, Annex A~~[14].

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM ~~-~~cell re-selection, measurement occasions as specified in ~~TS 25.331~~[16] and idle intervals as described in ~~TS 25.225~~[14] are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on the assumption that the time during the measurement occasions and idle intervals that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

The UE is required to measure periodically once every time period T_{meas} on each of the modes and systems, ~~-~~FDD interfrequency cells, TDD interfrequency cells and GSM carriers, for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1, within the measurement time T_{meas}

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot N_{TTI} \cdot \text{M\_REP} \cdot 10\right] \text{ms}$$

where the following parameters are defined:

N_{TDD} = 0 or 1. If there are inter-frequency TDD cells in the neighbour list N_{TDD}=1, otherwise N_{TDD}=0.

N_{FDD} = 0 or 1. If the UE is capable of FDD and there are FDD cells in the neighbour list N_{FDD}=*1* otherwise N_{FDD}=0.

N_{GSM} = 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

M_REP is the Measurement Occasion cycle length in number of frames as specified in ~~TS 25.331~~[16].

- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.

N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

Table 8.6A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

8.4.2.2 TDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the monitor~~inged~~ set. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~ If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

In case no measurement occasion is activated, in order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell, ~~or non-overlapping in time with the DL timeslots used by the UE for reception of S-CCPCH's~~ such that the UE can measure an intra-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify ~~-~~a new detectable intra-frequency TDD cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$~~

$T_{identify\ intra}$ is specified in section 8.1.2.2.1.

8.4.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_FACH state ~~the measurement period for intra-frequency P-CCPCH RSCP measurements is 200 ms. When no inter-frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ is specified in section 8.1.2.2.2

$T_{measurement\ period\ intra}$ is specified in section 8.1.2.2.2

~~and t~~The UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$.

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from UE physical layer to higher layers may be decreased. ~~When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods.~~ The measurement accuracy for all measured cells shall be as specified in the section 9.

~~$$Y_{measurement\ intra} = Floor\left\{X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}}\right\}$$~~

~~whereby function Floor(x) takes the integer part of x.~~

- ~~$X_{basic\ measurement\ TDD}$ is specified in section 8.1.2.2.2~~
- ~~$T_{Measurement\_Period,\ Intra}$ is specified in section 8.1.2.2.2~~
- ~~T_{Intra}: is specified in section 8.1.2.2.2~~
- ~~$T_{basic\_identify\_TDD,\ intra}$ is specified in section 8.1.2.2.2~~

8.4.2.2.3 void

8.4.2.2.4 void

8.4.2.2.5 Timeslot ISCP measurement capability

In ~~the~~ CELL_FACH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. ~~When no inter frequency measurement is scheduled, t~~The UE shall be capable of performing Timeslot ISCP measurements on the current serving cell for 10 arbitrary DL timeslots. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

~~When inter-frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements on the current serving for at least $Y_{measurement\ intra\ ISCP}$ arbitrary DL timeslots, where $Y_{measurement\ intra\ ISCP}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.~~

~~$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra,\ ISCP}} \right\}$$~~

~~whereby function Floor(x) takes the integer part of x,~~

- ~~$X_{basic\ measurement\ ISCP}$ = 10 (arbitrary DL timeslots of the current serving cell)~~
- ~~$T_{Measurement\_Period,\ Intra,\ ISCP}$ is specified in section 8.1.2.2.6,~~
- ~~T_{Intra} is specified in section 8.1.2.2.6.~~

8.4.2.2.6 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9.

8.4.2.3 TDD inter frequency measurements

When signalled by ~~the network~~UTRAN during CELL_FACH state, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for TDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

8.4.2.3.1 Identification of a new cell

When measurement occasions and idle intervals are used for TDD inter-frequency measurements, ~~T~~the UE shall be able to identify ~~-~~a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,TDD}\right\} ms$$

If the UE does not require measurement occasions and idle intervals to perform TDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

8.4.2.3.2 P-CCPCH RSCP measurement period

When measurement occasions and idle intervals are used for TDD inter-frequency measurements When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by of $T_{measurement\ inter}$.

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ inter} = Max\left\{T_{measurement\ period\ TDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,TDD}\right\}$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the measurement period for inter frequency P-CCPCH RSCP measurements shall be 480 ms.

Where,

$X_{measurement\ TDD\ inter}$ is specified in section 8.1.2.3.2.

$T_{Mmeasurement\ Pperiod\ TDD\ Iinter}$ is specified in section 8.1.2.3.2.

T_{meas} is specified in section 8.4.2.1.

$T_{Inter\ FACH}$: This is the minimum time as full slots that is available for the inter frequency P-CCPCH RSCP measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls. is equal to (N_{TTI}*10 - 2*0.5) ms.

$T_{basic\_identify\_TDD\_inter}$ is specified in section 8.1.2.3.2= 800 ms.

$T_{basic\_measurement\_TDD\ inter}$ is specified in section 8.1.2.3.2= 50 ms.

$N_{Freq,\ TDD}$ is specified in section 8.1.2.3.2

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480ms.

8.4.2.3.3 Periodic ReportingVoid

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.4.2.3.4 ~~Event Triggered Reporting~~Void

~~Reported measurements in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

8.4.2.4 FDD measurements

The requirements in this section shall apply ~~only~~ to UE supporting ~~both~~ TDD and FDD ~~mode~~.

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for FDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

~~The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.~~

8.4.2.4.1 Identification of a new cell

When measurement occasions and idle intervals are used for FDD inter-frequency measurements, ~~T~~the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within ~~—~~

~~$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{identify\ FDD\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. ~~When L3 filtering is used an additional delay can be expected.~~

8.4.2.4.2 UE CPICH ~~M~~measurement ~~period~~capability

When measurement occasions and idle intervals are used for FDD inter frequency measurements ~~are scheduled~~, the UE ~~physical layer~~ shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

~~$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform FDD inter-frequency measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$:

- $X_{basic\ measurement\ FDD\ inter}$ is specified in section 8.1.2.4.2.

$T_{Mmeasurement\_Pperiod\ FDD\ inter}$ is specified in section 8.1.2.4.2

$T_{Inter\ FACH:}$is specified in section 8.4.2.3.2

$T_{basic\_identify\_FDD,\_inter}$ is specified in section 8.1.2.4.2

$T_{basic\_measurement\_FDD\ inter}$ is specified in section 8.1.2.4.2.

$N_{Freq,\ FDD}$ is specified in section 8.1.2.4.2

8.4.2.4.3 Periodic ReportingVoid

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.4.2.4.4 Event Triggered ReportingVoid

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

< Next changed section >

A.4.2.3 Scenario 3: TDD/FDD cell re-selection

A.4.2.3.1 Test Purpose and Environment

This test is to verify the requirement for the TDD/FDD cell re-selection delay reported in section 4.2.2.

This scenario implies the presence of 1 UTRA TDD and 1 UTRA FDD cell as given in Table A.4.5 and A.4.6. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.6: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		**0**		**8**		**n.a**	**n.a.**
		T1	**T2**	**T 1**	**T 2**	**T 1**	**T 2**
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH_t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection and reselectionquality_measure		CPICH_RSCP				CPICH_RSCP	
Qrxlevmin	dBm	-102				-115	
Qoffset1$_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
Qhyst1$_s$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent				not sent	
Propagation Condition		AWGN				AWGN	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/FDD re-selection process, it is not intended to give reasonable values for a TDD/FDD cell re-selection.~~

A.4.2.3.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$	See Table 4.1 in section 4.2.2.
T_{SI}	Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.8.2 TDD inter frequency measurements

A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2~~.2~~ and 9.1.

The test consists of 2 successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.8.2A and A.8.2B below. Two cells shall be present in the test, cell 1 being the serving cell and cell 2 being a UTRA TDD neighbour cell on an unused frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing. ~~This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" General test parameters are given in the table A.8.2A below and they are signalled from test device.~~

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell on the unused frequency ~~has to~~ shall be reported together with Event 2C reporting. ~~New measurement control information, which defines neighbour cells etc., is always sent before the event starts.~~ The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

~~The cell specific test parameters are shown in Table A.8.2B.~~ The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter		Unit	Value	Comment
DPCH parameters~~ active cell~~			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2~~. The DPCH is located in an other timeslot than 0 or 8~~
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA TDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-71	~~Absolute P-CCPCH RSCP threshold~~Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			24 on channel 1 16 on channel 2	~~Measurement control information is sent before T1 starts.~~
T1		s	10	
T2		s	10	

Table A.8.2B: Cell ~~S~~specific test ~~P~~parameters for ~~C~~correct ~~R~~reporting of TDD inter frequency ~~N~~neighbours in AWGN ~~P~~propagation ~~C~~condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
P-CCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	9	-Infinity	9
I_{oc}	dBm/ 3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-64		
Propagation Condition		AWGN							

~~NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8~~

A.8.2.1.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 s from the beginning of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly reported ~~observed~~ during repeated tests shall be at least 90%.

A.8.3 FDD measurements

A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

The purpose of ~~T~~this test ~~will derive~~ is to verify that the ~~terminal~~ UE makes correct reporting of ~~an~~ events when measuring on UTRA FDD cells. This test will partly verify the requirements in section 8.1.2 and 9.1.

~~Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH_RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3A below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The test parameters are given in Table A.8.3B below.~~

The test parameters are given in Table A.8.3A and A.8.3B below. The test consists of two successive time periods, with time durations of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA TDD cell and cell 2 being a UTRA FDD neighbour cells on the unused frequency.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used and that CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.3A: General test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DPCH parameters active cell~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8~~
~~Power Control~~		~~On~~	
~~Active cell~~		~~Cell 1~~	
~~Threshold non used frequency~~	~~dB~~	~~-86~~	~~Absolute CPICH RSCP threshold for event 2C~~
~~Hysteresis~~	~~dB~~	~~0~~	
~~W non-used frequency~~		~~1~~	~~Applicable for event 2C~~
~~Time to Trigger~~	~~ms~~	~~0~~	
~~Filter coefficient~~		~~0~~	
~~Monitored cell list size~~		~~24 on channel 1 16 on channel 2~~	~~Measurement control information is sent before T1 starts.~~
~~T1~~	~~s~~	~~10~~	
~~T2~~	~~s~~	~~10~~	

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA FDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-18	Applicable for event 2C
W non-used frequency			1	Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			24 TDD neighbours on channel 1 16 FDD neighbours on channel 2	
T1		s	15	
T2		s	10	

Table A.8.3B: Cell ~~S~~specific test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		8		n.a	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	
PCCPCH_Ec/Ior	dB	-3	-3			-12	
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	
SCH_t_{offset}		0	0	0	0	n.a.	
PICH_Ec/Ior				-3	-3	-15	
OCNS	dB	-3,12	-3,12	-3,12	-3,12	-0,941	
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-infinity	-~~2~~1.8
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_~~RSCP~~Ec/Io		n.a.				-infinity	-~~82~~14
PCCPCH_RSCP	dB	-70	-70	-70	-70	n.a.	
Propagation Condition		AWGN				AWGN	

~~NOTE: The DPCH of the TDD cell is located in an other timeslot than 0 or 8~~

A.8.3.1.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than ~~[~~5~~]~~ seconds from the start of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly observed during repeated tests shall be at least 90%.

3GPP TSR RAN WG4 Meeting #24 **R4-021354**

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CHANGE REQUEST

⌘ **25.123** **CR** **249** ⌘ **rev** **2** ⌘ Current version: **4.5.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and CELL_FACH states

Measurement scheduling for CELL_DCH state unclear and misleading for split between intra-frequency TDD and inter-frequency TDD or FDD and GSM neighbour cells.

Correction needed for existing requirements and conditions on identification time and measurement period for inter-frequency TDD and FDD cells because not adapted to a TDD measurement approach in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Corrections to test case for TDD-FDD cell re-selection in Idle Mode

Clarification to test conditions and parameter settings needed.

Completion of test case for TDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing.

Completion of test case for FDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing. Test requirement in square brackets.

Summary of change: ⌘ **Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and**

	CELL_FACH states Assumptions underlying the scheduling for CELL_DCH state defined for split between intra-frequency TDD and inter-frequency TDD/FDD/GSM measurements. Definition of measurement opportunities and measurement requirements aligned with those in CELL_DCH state for CELL_FACH state. TDD intra-frequency measurement requirements in both CELL_DCH and CELL_FACH state independent from inter-frequency measurement scheduling, i.e. 6 cells during 200 ms and 800 ms identification time. Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. **Corrections to test case for TDD-FDD cell re-selection in Idle Mode** Clarifications to test conditions and parameter settings. **Completion of test case for TDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. **Completion of test case for FDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. Test requirement set to 5 sec..
Consequences if not approved: ⌘	CELL_DCH and CELL_FACH inter-frequency TDD-TDD/FDD measurement requirements incomplete or not feasible. Basic requirements on number of TDD and FDD neighbour cells to be measured during an inter-frequency measurement period for both CELL_DCH and CELL_FACH missing. Non-uniform UE behaviour when inter-frequency TDD and FDD measurements are scheduled in CELL_DCH state. Test cases for TDD and FDD neighbour reporting in AWGN not feasible. **Isolated impact analysis:** This CR contains corrections to TDD to inter-frequency TDD/FDD relevant parts of TS25.123 where this specification is incomplete and where especially parts of critical dual-mode TDD-FDD UE requirements are missing.

Clauses affected:	⌘	8.1.2.1; 8.1.2.2; 8.1.2.3; 8.1.2.4; 8.1.2.6; 8.4.2.1; 8.4.2.2; 8.4.2.3; 8.4.2.4; A.4.2.3; A.8.2; A.8.3			
Other specs affected:	⌘	**Y** / **N** **N** X — Other core specifications **Y** X — Test specifications **N** X — O&M Specifications	⌘	TS34.122	
Other comments:	⌘	No test cases covering A.8.2 and A.8.3 currently exist in TS34.122. Equivalent CRs in other Releases: CR248r2 cat. F to 25.123 v3.10.0, CR250r2 cat. A to 25.123 v5.1.0			

8 UE Measurements Procedures

8.1 General Measurements Requirements in CELL_DCH State (3.84 Mcps option)

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in TS 25.225[14], the measurement model is defined in TS 25.302[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see TS 25.225, Annex A[14].

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

Performance requirements for different types of measurements and different number of cells are defined in the following sections.

The requirements in section 9 are applicable for a UE performing measurements according to this section.

For measurements on intra- and inter-frequency TDD, inter-frequency FDD and GSM cells, idle intervals as described in [14] can be used. The time $T_{measure}$ per 480 ms period available for these measurements is the sum of the duration of all idle intervals during any given 480 ms period, i.e. the amount of time not used by the UE for receiving in active DL timeslots or for transmission in active UL timeslots. Note that Beacon timeslots of the serving cell can be located inside idle intervals and that implementation margin due to frequency switching is not taken into account for $T_{measure}$.

The requirements in this section are based upon the assumption, that the time durations T_{intra} and T_{inter} during any given 480 ms period for the purpose of measurements on intra-frequency TDD cells and for measurements on inter-frequency TDD, inter-frequency FDD and GSM cells are respectively,

$$T_{intra} = \left[96 + 24 \cdot \text{Floor}\left\{ \frac{M_{intra} + 3}{4} \right\} \right] \text{ ms}$$

$$T_{inter} = 480\ \text{ms} - T_{intra}$$

where,

M_{intra} Equal to the number of intra-frequency TDD cells in the neighbour list

The time duration T_{inter} shall be equally shared for inter-frequency measurements on the different modes and systems which the UE has capability for and that are in the monitored set signalled by UTRAN, i.e.

$$T_{inter} = N_{TDD} \cdot T_{TDD\ inter} + N_{FDD} \cdot T_{FDD\ inter} + N_{GSM} \cdot T_{GSM\ inter}$$

For this, the following parameters are defined,

$T_{TDD\ inter}$	is the time duration allocated for the purpose of TDD inter-frequency measurements.
$T_{FDD\ inter}$	is the time duration allocated for the purpose of FDD inter-frequency measurements.
$T_{GSM\ inter}$	is the time duration allocated for the purpose of GSM measurements.
N_{TDD}	Equal to 1 if there are inter-frequency TDD cells in the neighbour list, equal to 0 otherwise.
N_{FDD}	Equal to 1 if the UE has capability for FDD and if there are inter-frequency FDD cells in the neighbour list, equal to 0 otherwise.
N_{GSM}	Equal to 1 if the UE has capability for GSM and if there are GSM cells in the neighbour list, equal to 0 otherwise.

8.1.2.2 TDD intra frequency measurements

During the CELL_DCH state, the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the ~~monitoring~~ monitored set. In case the ~~network~~ UTRAN requests the UE to report detected set cells, the UE shall also search for intra frequency cells TDD outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to [16]. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~

In order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell or non-overlapping in time with the active ~~DL and~~ UL timeslots used by the UE for ~~reception and~~ transmission, such that the UE can measure an intra-frequency ~~cell~~ TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify ~~a~~ new detectable intra-frequency TDD cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$~~

$T_{identify\ intra}$ = 800 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_DCH state ~~the measurement period for intra frequency P-CCPCH RSCP measurements is 200 ms. When no inter frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ = 6 (cells)

$T_{measurement\ period\ intra}$ = 200 ms

~~and t~~The UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$.

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency TDD cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from the UE physical layer to higher layers may be decreased. ~~When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in~~

~~the following measurement periods.~~ The measurement accuracy for all measured cells shall be as specified in the section 9.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}} \right\}$$

~~whereby function Floor(x) takes the integer part of x.~~

~~$X_{basic\ measurement\ TDD}$ =6 (cells)~~

~~$T_{Measurement\_Period,\ Intra}$ =200 ms. The measurement period for Intra frequency P-CCPCH RSCP measurements.~~

~~T_{Intra} : This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~

~~$T_{basic\_identify\_TDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).~~

8.1.2.2.2A Timeslot ISCP measurement capability

In ~~the~~ CELL_DCH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing Timeslot ISCP measurements for a total of 10 different combinations of an arbitrary DL timeslot and an intra-frequency cell [16], including the current serving cell. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

When inter-frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements for at least $Y_{measurement\ intra\ ISCP}$ different combinations, where $Y_{measurement\ intra\ ISCP}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.

~~$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra,\ ISCP}} \right\}$$~~

$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{5}{6} \frac{T_{intra}}{T_{measurement\ period\ intra\ ISCP}} \right\}$$

whereby function Floor(x) takes the integer part of x.

- $X_{basic\ measurement\ ISCP}$ = 10 (combinations of an arbitrary DL timeslot and an intra-frequency cell)
- $T_{~~M~~measurement\_~~P~~period,\ ~~I~~intra,\ ISCP}$ = 400 ms. The measurement period for ~~I~~intra frequency Timeslot ISCP measurements.
- $T_{~~I~~intra}$ ~~: This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~ is specified in 8.1.2.1.

8.1.2.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.4 Event-triggered Periodic Reporting

Reported measurements in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.2.5 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

For P-CCPCH RSCP measurements, the event triggered measurement reporting delay, on cells belonging to the monitored set, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected.

If a cell, belonging to the monitored set, has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered P-CCPCH RSCP measurement reporting delay shall be less than $T_{measurement\ Period\ intra}$ when the L3 filter has not been used and the UE P-CCPCH RSCP measurement capabilities of section 8.1.2.2.1 are valid.

8.1.2.3 TDD inter frequency measurements

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure detected inter-frequency TDD cells and search for new inter-frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall be non-overlapping in time with the active DL and UL timeslots used by the UE for reception and transmission such that the UE can measure an inter-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin for frequency switching per idle interval.

8.1.2.3.1 Identification of a new cell

When idle intervals are used for inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ inter} = Max\left\{5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{measurement\ period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.3.2 P-CCPCH RSCP measurement period

When idle intervals are used for TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 and with a measurement period given by of $T_{measurement\ inter}$.

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ inter} = Max\left\{T_{measurement\ period\ TDD\ inter}, N_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{measurement\ period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

In case of a dual receiver UEIf the UE does not require idle intervals to perform TDD inter-frequency measurements, the measurement period for inter frequency P-CCPCH RSCP measurements is shall be 480 ms.

Where,

$X_{measurement\ TDD\ inter}$ = 6 (cells)

$T_{Mmeasurement\_Pperiod\ TDD\ Iinter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_inter}$ for inter frequency P-CCPCH RSCP measurements.

$NT_{TDD\ Iinter}$: This is the minimum time (representing a time corresponding to an integer number of full slots) available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.: This is the available number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$. The UE shall consider that a measurement opportunity on a Beacon timeslot of an inter-frequency TDD cell is provided if an idle interval of length equal to or greater than 3 timeslots less 2*0.5 ms implementation margin for frequency switching per idle interval completely overlaps in time with the Beacon timeslot of the inter-frequency TDD cell.

$TN_{basic\_identify\_TDD\_inter}$ = 800 ms. This is the time period a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new detectable inter-frequency TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

$TN_{basic\_measurement\_TDD\ inter}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH RSCP measurements.This is a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$ used in the inter-frequency TDD equation where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

N_{Freq_TDD}: This is the number of TDD frequencies indicated in the inter-frequency measurement control information.

Note that the number of measurement opportunities available to the UE depends on UL and DL timeslot assignments for transmission and reception and on Beacon timeslot allocations in the inter-frequency TDD cells.

8.1.2.3.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.4 Event Triggered Reporting.

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.

If an intra frequency TDD cell has been detectable at least for the time period $T_{identify\_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_period\ inter}$ when the L3 filter has not been used.

8.1.2.4 FDD measurements

The requirements in this section shall apply only to UE supporting both TDD and FDD mode.

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.1.2.4.1 Identification of a new cell

When idle intervals are used for inter-frequency FDD measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.4.2 UE CPICH Mmeasurement periodcapability

When idle intervals are used for FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter\ available}} \cdot N_{Freq,FDD}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$.

$X_{basic\ measurement\ FDD\ inter}$ = 6 (cells)

$T_{Mmeasurement\_Pperiod\ FDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter:\ available}$ ~~This is the minimum time as full slots that is available for inter frequency measurements, during the period $T_{Measurement\_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~ : This is the available time for measurements on inter-frequency FDD cells. $T_{FDD\ inter\ available}$ shall be derived from $T_{FDD\ inter}$ by assuming 2*0.5 ms implementation margin for frequency switching per idle interval and by only taking into account the remaining number of full timeslots per idle interval. Idle intervals smaller than 3 timeslots shall not be taken into account for calculating $T_{FDD\ inter\ available}$.

$T_{basic\_identify\_FDD\_inter}$ = 800 ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new detectable inter-frequency FDD cell is defined.

$T_{basic\_measurement\_FDD\ inter}$ = 50 ms. This is the time period used in the inter-frequency equation for defining the measurement period for inter frequency CPICH measurements.

$N_{Freq,\ FDD}$: This is the ~~N~~number of FDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ FDD\ inter}$ defined in Section 8.1.2.4.1. When L3 filtering is used an additional delay can be expected.

If an inter frequency FDD cell has been detectable at least for the time period $T_{identify\_FDD\ inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Mmeasurement\_Pperiod\ FDD\ inter}$ provided the timing to that cell has not changed more than +/-32 chips ~~while transmission gap has not been available~~ during the time period $T_{identify\ FDD\ inter}$ and the L3 filter has not been used.

< Next changed section >

8.1.2.6 TDD Synchronisation to new cells

~~Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.~~

~~These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.~~

~~The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:~~For the requirements in section 8 and 9 to apply, an intra-frequency or inter-frequency TDD cell shall be considered detectable when,

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

< Next changed section >

8.4 Measurements in CELL_FACH State (3.84 Mcps option)

8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~ [15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see ~~TS 25.225, Annex A~~[14].

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM- cell re-selection, measurement occasions as specified in ~~TS 25.331~~[16] and idle intervals as described in ~~TS 25.225~~[14-] are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on the assumption that the time during the measurement occasions and idle intervals that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

The UE is required to measure periodically once every time period T_{meas} on each of the modes and systems, -FDD interfrequency cells, TDD interfrequency cells and GSM carriers, for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1, within the measurement time T_{meas}

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot N_{TTI} \cdot \text{M\_REP} \cdot 10\right] \text{ms}$$

where the following parameters are defined:

N_{TDD}	= 0 or 1. If there are inter-frequency TDD cells in the neighbour list N_{TDD}=1, otherwise N_{TDD}=0.
N_{FDD}	= 0 or 1. If the UE is capable of FDD and there are FDD cells in the neighbour list N_{FDD}=*1* otherwise N_{FDD} =0.
N_{GSM}	= 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM} =0.
M_REP	is the Measurement Occasion cycle length in number of frames as specified in ~~TS 25.331~~[16].
N_{TTI}	is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.

Table 8.6A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

8.4.2.2 TDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the monitor~~inged~~ set. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~ If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

In case no measurement occasion is activated, in order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell, ~~or non-overlapping in time with the DL timeslots used by the UE for reception of S-CCPCH's~~ such that the UE can measure an intra-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new inter frequency TDD detectable cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$~~

$T_{identify\ intra}$ is specified in section 8.1.2.2.1.

8.4.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_FACH state ~~the measurement period for intra-frequency P-CCPCH RSCP measurements is 200 ms. When no inter-frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ is specified in section 8.1.2.2.2

$T_{measurement\ period\ intra}$ is specified in section 8.1.2.2.2

~~and T~~the UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from UE physical layer to higher layers may be decreased. ~~When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods~~. The measurement accuracy for all measured cells shall be as specified in the section 9.

~~$$Y_{measurement\ intra} = Floor\left\{X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}}\right\}$~~

~~whereby function Floor(x) takes the integer part of x.~~

~~$X_{basic\ measurement\ TDD}$ is specified in section 8.1.2.2.2~~

~~$T_{Measurement\_Period,\ Intra}$ is specified in section 8.1.2.2.2~~

~~T_{Intra}: is specified in section 8.1.2.2.2~~

~~$T_{basic\_identify\_TDD,\ intra}$ is specified in section 8.1.2.2.2~~

8.4.2.2.3 void

8.4.2.2.4 void

8.4.2.2.5 Timeslot ISCP measurement capability

In ~~the~~ CELL_FACH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. ~~When no inter frequency measurement is scheduled, t~~The UE shall be capable of performing Timeslot ISCP measurements on the current serving cell for 10 arbitrary DL timeslots. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

~~When inter frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements on the current serving for at least $Y_{measurement\ intra\ ISCP}$ arbitrary DL timeslots, where $Y_{measurement\ intra\ ISCP}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.~~

~~$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra,\ ISCP}} \right\}$$~~

~~whereby function Floor(x) takes the integer part of x,~~

- ~~$X_{basic\ measurement\ ISCP}$ = 10 (arbitrary DL timeslots of the current serving cell)~~
- ~~$T_{Measurement\_Period,\ Intra,\ ISCP}$ is specified in section 8.1.2.2.6,~~
- ~~T_{Intra} is specified in section 8.1.2.2.6.~~

8.4.2.2.6 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9.

8.4.2.3 TDD inter frequency measurements

When signalled by ~~the network~~UTRAN during CELL_FACH state, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for TDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

8.4.2.3.1 Identification of a new cell

When measurement occasions and idle intervals are used for inter-frequency TDD measurements, ~~T~~the UE shall be able to identify ~~-~~a new detectable inter frequency TDD cell belonging to the monitored set within

~~$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{identify\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,TDD}\right\}$$ ms

If the UE does not require measurement occasions and idle intervals to perform TDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

8.4.2.3.2 P-CCPCH RSCP measurement period

When measurement occasions and idle intervals are used for inter-frequency TDD measurements~~When TDD inter frequency measurements are scheduled~~, the UE ~~physical layer~~ shall be capable of ~~reporting~~ performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 ~~-~~with measurement period ~~given by~~ of $T_{measurement\ inter}$.

~~$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{measurement\ inter} = Max\left\{T_{measurement\ period\ TDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq}\right\}$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the measurement period for inter frequency P-CCPCH RSCP measurements shall be 480 ms.

Where,

- $X_{measurement\ TDD\ inter}$ is specified in section 8.1.2.4.2.
- $T_{~~M~~measurement\_~~P~~period\ TDD\ ~~i~~nter}$ is specified in section 8.1.2.3.2.
- T_{Meas} is specified in section 8.4.2.1.
- $T_{Inter\ FACH}$: ~~This is the minimum time as full slots that is available for the inter frequency P-CCPCH RSCP measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.~~ is equal to $(N_{TTI}*10 - 2*0.5)$ ms.
- $T_{basic\_identify\_TDD\_inter}$ ~~is specified in section 8.1.2.3.2~~= 800 ms.
- $T_{basic\_measurement\_TDD\ inter}$ ~~is specified in section 8.1.2.3.2~~= 50 ms.
- $N_{Freq,\ TDD}$ is specified in section 8.1.2.3.2

~~If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter-frequency measurements is 480ms.~~

8.4.2.3.3 ~~Periodic Reporting~~Void

~~Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.~~

8.4.2.3.4 ~~Event Triggered Reporting~~Void

~~Reported measurements in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

8.4.2.4 FDD measurements

The requirements in this section shall apply ~~only~~ to UE supporting ~~both~~ TDD and FDD ~~mode~~.

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for FDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

~~The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.~~

8.4.2.4.1 Identification of a new cell

When measurement occasions and idle intervals are used for inter-frequency FDD measurements, ~~T~~the UE shall be able to identify a new detectable inter frequency FDD cell belonging to the monitored set within

~~$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{identify\ FDD\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. ~~When L3 filtering is used an additional delay can be expected.~~

8.4.2.4.2 UE CPICH ~~M~~measurement ~~period~~capability

When measurement occasions and idle intervals are used for FDD inter frequency measurements ~~are scheduled~~, the UE ~~physical layer~~ shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

~~$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform inter-frequency FDD measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$.

$X_{basic\ measurement\ FDD\ inter}$ is specified in section 8.1.2.4.2.

- $T_{Mmeasurement\_period\ FDD\ inter}$ is specified in section 8.1.2.4.2
- $T_{Inter\ FACH:}$ is specified in section 8.4.2.3.2
- $T_{basic\_identify\_FDD,inter}$ is specified in section 8.1.2.4.2
- $T_{basic\_measurement\_FDD\ inter}$ is specified in section 8.1.2.4.2.
- $N_{Freq\ FDD}$ is specified in section 8.1.2.4.2

8.4.2.4.3 Periodic ReportingVoid

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.4.2.4.4 Event Triggered ReportingVoid

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

< Next changed section >

A.4.2.3 Scenario 3: TDD/FDD cell re-selection

A.4.2.3.1 Test Purpose and Environment

A.4.2.3.1.1 3.84 Mcps TDD option

This test is to verify the requirement for the TDD/FDD cell re-selection delay- reported in section 4.2.2.

This scenario implies the presence of 1 UTRA TDD and 1 UTRA FDD cell as given in Table A.4.5 and A.4.6. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	During T1 cell 1 better ranked than cell 2
T2		s	15	During T2 cell 2 better ranked than cell 1

Table A.4.6: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		**0**		**8**		**n.a**	**n.a.**
		T1	T2	T 1	T 2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH_t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_EcIor	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection_and reselection_quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-102				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_s$	dB	0				0	
Treselection	s	0				0	
Propagation Condition		AWGN				AWGN	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/FDD re-selection process, it is not intended to give reasonable values for a TDD/FDD cell re-selection.~~

A.4.2.3.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the 1.28 Mcps TDD OPTION/FDD cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 low chip rate TDD and 1 FDD cell as given in Table A.4.5A and A.4.6A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5A: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	1.28 Mcps TDD OPTION cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.6A: Test parameters for the 1.28 Mcps TDD OPTION/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPts		n.a.	
		T1	T2	T 1	T 2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
DwPCH_Ec/Ior	dB			0	0	n.a.	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
SCH_Ec/Ior	dB	n.a.		n.a.		-12	-12
PICH_Ec/Ior	dB					-15	-15
OCNS_Ec/Ior	dB	n.a.		n.a.		-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]			[ ]	[ ]
I_{oc}	dBm/1.28 MHz	-70					
PCCPCH_RSCP	dBm	[ ]	[ ]			n.a.	n.a.
CPICH_RSCP		n.a.				[ ]	[ ]
Cell_selection_and_reselection quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-103				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent					
Propagation Condition		AWGN					

A.4.2.3.2 Test Requirements

A.4.2.3.2.1 3.84 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1 in section 4.2.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.3.2.2 1.28 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1A in section 4.2.

T_{SI} Time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms). 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.8.2 TDD inter frequency measurements

A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

A.8.2.1.1 Test Purpose and Environment

A.8.2.1.1.1 3.84Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.~~2~~ and 9.1.

The test consists of 2 successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.8.2A and A.8.2B below. Two cells shall be present in the test, cell 1 being the serving cell and cell 2 being a UTRA TDD neighbour cell on the unused frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing. ~~This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event". General test parameters are given in the table A.8.2A below and they are signalled from test device.~~

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell on the unused frequency ~~has to~~ shall be reported together with Event 2C reporting. ~~New measurement control information, which defines neighbour cells etc., is always sent before the event starts.~~ The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

~~The cell specific test parameters are shown in Table A.8.2B.~~ The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter		Unit	Value	Comment
DPCH parameters~~ active cell~~			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2~~. The DPCH is located in an other timeslot than 0 or 8~~
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA TDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-71	~~Absolute P-CCPCH RSCP threshold~~Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			24 on channel 1 16 on channel 2	~~Measurement control information is sent before T1 starts.~~
T1		s	10	
T2		s	10	

Table A.8.2B: Cell ~~S~~specific test ~~P~~parameters for ~~C~~correct ~~R~~reporting of TDD inter frequency ~~N~~neighbours in AWGN ~~P~~propagation ~~C~~condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
P-CCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	9	-Infinity	9
I_{oc}	dBm/ 3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-64		
Propagation Condition		AWGN							

~~NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8~~

A.8.2.1.1.2 1.28Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event". General test parameters are given in the table A.8.2C below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The cell specific test parameters are shown in Table A.8.2D.

Table A.8.2C: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 2C
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.2D Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	3	3			-Infinity	6		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	-70	-70			-Infinity	-67		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.2.1.2 Test Requirements

A.8.2.1.2.1 3.84Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 s from the beginning of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly reported ~~observed~~ during repeated tests shall be at least 90%.

A.8.2.1.2.2 1.28Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.3 FDD measurements

A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

A.8.3.1.1.1 3.84 Mcps TDD option

The purpose of ~~T~~this test ~~will derive~~is to verify that the ~~terminal~~ UE makes correct reporting of ~~an~~ events when measuring on UTRA FDD cells. This test will partly verify the requirements in section 8.1.2 and 9.1.

~~Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH_RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3A below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The test parameters are given in Table A.8.3B below.~~

The test parameters are given in Table A.8.3A and A.8.3B below. The test consists of two successive time periods, with time durations of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA TDD cell and cell 2 being a UTRA FDD neighbour cells on the unused frequency.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used and that CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.3A: General test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DPCH parameters active cell~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8~~
~~Power Control~~		~~On~~	
~~Active cell~~		~~Cell 1~~	
~~Threshold non used frequency~~	~~dB~~	~~-86~~	~~Absolute CPICH RSCP threshold for event 2C~~
~~Hysteresis~~	~~dB~~	~~0~~	
~~W non-used frequency~~		~~1~~	~~Applicable for event 2C~~
~~Time to Trigger~~	~~ms~~	~~0~~	
~~Filter coefficient~~		~~0~~	
~~Monitored cell list size~~		~~24 on channel 1 16 on channel 2~~	~~Measurement control information is sent before T1 starts.~~
~~T1~~	~~s~~	~~10~~	
~~T2~~	~~s~~	~~10~~	

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA FDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-18	Applicable for event 2C
W non-used frequency			1	Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on channel 1 6 FDD neighbours on channel 2	
T1		s	15	
T2		s	10	

Table A.8.3B: Cell ~~S~~specific test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		8		n.a	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	
PCCPCH_Ec/Ior	dB	-3	-3			-12	
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	
SCH_t_{offset}		0	0	0	0	n.a.	
PICH_Ec/Ior				-3	-3	-15	
OCNS	dB	-3,12	-3,12	-3,12	-3,12	-0,941	
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-infinity	-~~2~~1.8
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_~~RSCP~~Ec/Io		n.a.				-infinity	-~~82~~14
PCCPCH_RSCP	dB	-70	-70	-70	-70	n.a.	
Propagation Condition		AWGN				AWGN	

~~Note: The DPCH of the TDD cell is located in an other timeslot than 0 or 8~~

A.8.3.1.1.2 1.28 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3C below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The test parameters are given in Table A.8.3D below.

Table A.8.3C: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0.
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-86	Absolute CPICH RSCP threshold for event 2C
Hysteresis	dB	0	
W non-used frequency		1	Applicable for event 2C
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.3D Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition:

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPTS		n.a	n.a.
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB					-12	-12
PICH_Ec/Ior	dB					-15	-15
DwPCH_Ec/Ior	dB			0	0	n.a.	n.a.
OCNS	dB	[ ]	[ ]			-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	-2
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_RSCP		n.a.				-Infinity	-82
PCCPCH_RSCP	dB	-70	-70			n.a.	n.a.
Propagation Condition		AWGN				AWGN	

Note: The DPCH of cell 1 is located in a timeslot other than 0.

A.8.3.1.2 Test Requirements

A.8.3.1.2.1 3.84 Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the start of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly observed during repeated tests shall be at least 90%.

A.8.3.1.2.2 1.28 Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than ~~[~~5~~]~~ s from the beginning of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

3GPP TSR RAN WG4 Meeting #24 **R4-021355**

Helsinki, Finland 12 - 16 August 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.123** **CR** **250** ⌘ **rev** **2** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to TDD-TDD/FDD measurement requirements in Connected Mode
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	21/08/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘ **Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and CELL_FACH states**

Measurement scheduling for CELL_DCH state unclear and misleading for split between intra-frequency TDD and inter-frequency TDD or FDD and GSM neighbour cells.

Correction needed for existing requirements and conditions on identification time and measurement period for inter-frequency TDD and FDD cells because not adapted to a TDD measurement approach in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ are missing in both CELL_DCH and CELL_FACH states.

Corrections to test case for TDD-FDD cell re-selection in Idle Mode

Clarification to test conditions and parameter settings needed.

Completion of test case for TDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing.

Completion of test case for FDD neighbour reporting in CELL_DCH state

Test conditions incomplete and some parameter settings still missing. Test requirement in square brackets.

Summary of change: ⌘ **Completion of TDD-TDD/FDD measurement requirements in CELL_DCH and**

		CELL_FACH states Assumptions underlying the scheduling for CELL_DCH state defined for split between intra-frequency TDD and inter-frequency TDD/FDD/GSM measurements. Definition of measurement opportunities and measurement requirements aligned with those in CELL_DCH state for CELL_FACH state. TDD intra-frequency measurement requirements in both CELL_DCH and CELL_FACH state independent from inter-frequency measurement scheduling, i.e. 6 cells during 200 ms and 800 ms identification time. Requirements on number $X_{\text{basic measurement TDD inter}}$ of TDD cells to be measured during $T_{\text{measurement TDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. Requirements on number $X_{\text{basic measurement FDD inter}}$ of FDD cells to be measured during $T_{\text{measurement FDD inter}}$ in both CELL_DCH and CELL_FACH states set to 6. **Corrections to test case for TDD-FDD cell re-selection in Idle Mode** Clarifications to test conditions and parameter settings. **Completion of test case for TDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. **Completion of test case for FDD neighbour reporting in CELL_DCH state** Completion of test conditions and missing parameter settings. Test requirement set to 5 sec..
Consequences if not approved:	⌘	CELL_DCH and CELL_FACH inter-frequency TDD-TDD/FDD measurement requirements incomplete or not feasible. Basic requirements on number of TDD and FDD neighbour cells to be measured during an inter-frequency measurement period for both CELL_DCH and CELL_FACH missing. Non-uniform UE behaviour when inter-frequency TDD and FDD measurements are scheduled in CELL_DCH state. Test cases for TDD and FDD neighbour reporting in AWGN not feasible. **Isolated impact analysis:** This CR contains corrections to TDD to inter-frequency TDD/FDD relevant parts of TS25.123 where this specification is incomplete and where especially parts of critical dual-mode TDD-FDD UE requirements are missing.

Clauses affected:	⌘	8.1.2.1; 8.1.2.2; 8.1.2.3; 8.1.2.4; 8.1.2.6; 8.4.2.1; 8.4.2.2; 8.4.2.3; 8.4.2.4; A.4.2.3; A.8.2; A.8.3			
Other specs affected:	⌘	**Y** / **N** ( ) / **X** Other core specifications ( ) / **X** Test specifications ( ) / **X** O&M Specifications	⌘		
Other comments:	⌘	none Equivalent CRs in other Releases: CR248r2 cat. F to 25.123 v3.10.0, CR249r2 cat. A to 25.123 v4.5.0			

8 UE Measurements Procedures

8.1 General Measurements Requirements in CELL_DCH State (3.84 Mcps option)

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in TS 25.225[14], the measurement model is defined in TS 25.302[15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see TS 25.225, Annex A[14].

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

Performance requirements for different types of measurements and different number of cells are defined in the following sections.

The requirements in section 9 are applicable for a UE performing measurements according to this section.

For measurements on intra- and inter-frequency TDD, inter-frequency FDD and GSM cells, idle intervals as described in [14] can be used. The time $T_{measure}$ per 480 ms period available for these measurements is the sum of the duration of all idle intervals during any given 480 ms period, i.e. the amount of time not used by the UE for receiving in active DL timeslots or for transmission in active UL timeslots. Note that Beacon timeslots of the serving cell can be located inside idle intervals and that implementation margin due to frequency switching is not taken into account for $T_{measure}$.

The requirements in this section are based upon the assumption, that the time durations T_{intra} and T_{inter} during any given 480 ms period for the purpose of measurements on intra-frequency TDD cells and for measurements on inter-frequency TDD, inter-frequency FDD and GSM cells are respectively,

$$T_{intra} = \left[96 + 24 \cdot \text{Floor}\left\{ \frac{M_{intra} + 3}{4} \right\} \right] \text{ ms}$$

$$T_{inter} = 480\ \text{ms} - T_{intra}$$

where,

M_{intra} Equal to the number of intra-frequency TDD cells in the neighbour list

The time duration T_{inter} shall be equally shared for inter-frequency measurements on the different modes and systems which the UE has capability for and that are in the monitored set signalled by UTRAN, i.e.

$$T_{inter} = N_{TDD} \cdot T_{TDD\ inter} + N_{FDD} \cdot T_{FDD\ inter} + N_{GSM} \cdot T_{GSM\ inter}$$

For this, the following parameters are defined,

$T_{TDD\ inter}$	is the time duration allocated for the purpose of TDD inter-frequency measurements.
$T_{FDD\ inter}$	is the time duration allocated for the purpose of FDD inter-frequency measurements.
$T_{GSM\ inter}$	is the time duration allocated for the purpose of GSM measurements.
N_{TDD}	Equal to 1 if there are inter-frequency TDD cells in the neighbour list, equal to 0 otherwise.
N_{FDD}	Equal to 1 if the UE has capability for FDD and if there are inter-frequency FDD cells in the neighbour list, equal to 0 otherwise.
N_{GSM}	Equal to 1 if the UE has capability for GSM and if there are GSM cells in the neighbour list, equal to 0 otherwise.

8.1.2.2 TDD intra frequency measurements

During the CELL_DCH state, the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the ~~monitoring~~ monitored set. In case the ~~network~~ UTRAN requests the UE to report detected set cells, the UE shall also search for intra frequency cells TDD outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to [16]. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~

In order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell or non-overlapping in time with the active ~~DL and~~ UL timeslots used by the UE for ~~reception and~~ transmission, such that the UE can measure an intra-frequency ~~cell~~ TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify ~~a~~ new detectable intra-frequency TDD cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$~~

$T_{identify\ intra}$ = 800 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_DCH state ~~the measurement period for intra frequency P-CCPCH RSCP measurements is 200 ms. When no inter frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ = 6 (cells)

$T_{measurement\ period\ intra}$ = 200 ms

~~and t~~The UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$.

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency TDD cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from the UE physical layer to higher layers may be decreased. ~~When inter frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in~~

~~the following measurement periods.~~ The measurement accuracy for all measured cells shall be as specified in the section 9.

$$Y_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement TDD}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement Period, Intra}}} \right\}$$

~~whereby function Floor(x) takes the integer part of x.~~

~~$X_{\text{basic measurement TDD}}$ =6 (cells)~~

~~$T_{\text{Measurement\_Period, Intra}}$ =200 ms. The measurement period for Intra frequency P-CCPCH RSCP measurements.~~

~~T_{Intra} : This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~

~~$T_{\text{basic\_identify\_TDD, intra}}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).~~

8.1.2.2.2A Timeslot ISCP measurement capability

In ~~the~~ CELL_DCH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing Timeslot ISCP measurements for a total of 10 different combinations of an arbitrary DL timeslot and an intra-frequency cell [16], including the current serving cell. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

When inter-frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements for at least $Y_{\text{measurement intra ISCP}}$ different combinations, where $Y_{\text{measurement intra ISCP}}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.

~~$$Y_{\text{measurement intra ISCP}} = Floor\left\{ X_{\text{basic measurement ISCP}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement Period, Intra, ISCP}}} \right\}$$~~

$$Y_{\text{measurement intra ISCP}} = Floor\left\{ X_{\text{basic measurement ISCP}} \cdot \frac{5}{6} \frac{T_{\text{intra}}}{T_{\text{measurement period intra ISCP}}} \right\}$$

whereby function Floor(x) takes the integer part of x.

- $X_{\text{basic measurement ISCP}}$ = 10 (combinations of an arbitrary DL timeslot and an intra-frequency cell)
- $T_{\text{~~M~~measurement ~~\_P~~period, ~~I~~intra, ISCP}}$ = 400 ms. The measurement period for ~~I~~intra frequency Timeslot ISCP measurements.
- $T_{\text{~~I~~intra}}$ ~~: This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.~~ is specified in 8.1.2.1.

8.1.2.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.4 Event-triggered Periodic Reporting

Reported measurements in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.2.5 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

For P-CCPCH RSCP measurements, the event triggered measurement reporting delay, on cells belonging to the monitored set, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected.

If a cell, belonging to the monitored set, has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered P-CCPCH RSCP measurement reporting delay shall be less than $T_{measurement\ period\ intra}$ when the L3 filter has not been used and the UE P-CCPCH RSCP measurement capabilities of section 8.1.2.2.1 are valid.

8.1.2.3 TDD inter frequency measurements

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure detected inter-frequency TDD cells and search for new inter-frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall be non-overlapping in time with the active DL and UL timeslots used by the UE for reception and transmission such that the UE can measure an inter-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin for frequency switching per idle interval.

8.1.2.3.1 Identification of a new cell

When idle intervals are used for inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ inter} = Max\left\{5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{measurement\ period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used, an additional delay can be expected.

8.1.2.3.2 P-CCPCH RSCP measurement period

When idle intervals are used for TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 and with a measurement period given byof $T_{measurement\ inter}$.

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ inter} = Max\left\{T_{measurement\ period\ TDD\ inter}, N_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{measurement\ period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

In case of a dual receiver UEIf the UE does not require idle intervals to perform TDD inter-frequency measurements, the measurement period for inter frequency P-CCPCH RSCP measurements is shall be 480 ms.

Where,

$X_{measurement\ TDD\ inter}$ = 6 (cells)

$T_{Mmeasurement\_Pperiod\ TDD\ Iinter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_inter}$ for inter frequency P-CCPCH RSCP measurements.

NT_{TDD_Iinter}: This is the minimum time (representing a time corresponding to an integer number of full slots) available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.: This is the available number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$. The UE shall consider that a measurement opportunity on a Beacon timeslot of an inter-frequency TDD cell is provided if an idle interval of length equal to or greater than 3 timeslots less 2*0.5 ms implementation margin for frequency switching per idle interval completely overlaps in time with the Beacon timeslot of the inter-frequency TDD cell.

$TN_{basic\_identify\_TDD\_inter}$ = 800 ms. This is the time period a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new detectable inter-frequency TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

$TN_{basic\_measurement\_TDD\ inter}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH RSCP measurements.This is a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$ used in the inter-frequency TDD equation where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

N_{Freq_TDD}: This is the number of TDD frequencies indicated in the inter-frequency measurement control information.

Note that the number of measurement opportunities available to the UE depends on UL and DL timeslot assignments for transmission and reception and on Beacon timeslot allocations in the inter-frequency TDD cells.

8.1.2.3.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.4 Event Triggered Reporting.

8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.

If an intra frequency TDD cell has been detectable at least for the time period $T_{identify\_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_period\_inter}$ when the L3 filter has not been used.

8.1.2.4 FDD measurements

The requirements in this section shall apply only to UE supporting both TDD and FDD mode.

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.1.2.4.1 Identification of a new cell

When idle intervals are used for inter-frequency FDD measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.4.2 UE CPICH Mmeasurement periodcapability

When idle intervals are used for FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{measurement\ period\ FDD\ inter}}{T_{FDD\ inter\ available}} \cdot N_{Freq,FDD}\right\} ms$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$.

$X_{basic\ measurement\ FDD\ inter}$ = 6 (cells)

$T_{Mmeasurement\_Pperiod\ FDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter:\ available}$ ~~This is the minimum time as full slots that is available for inter frequency measurements, during the period $T_{Measurement\_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~ : This is the available time for measurements on inter-frequency FDD cells. $T_{FDD\ inter\ available}$ shall be derived from $T_{FDD\ inter}$ by assuming 2*0.5 ms implementation margin for frequency switching per idle interval and by only taking into account the remaining number of full timeslots per idle interval. Idle intervals smaller than 3 timeslots shall not be taken into account for calculating $T_{FDD\ inter\ available}$.

$T_{basic\_identify\_FDD\_inter}$ = 800 ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new detectable inter-frequency FDD cell is defined.

$T_{basic\_measurement\_FDD\ inter}$ = 50 ms. This is the time period used in the inter-frequency equation for defining the measurement period for inter frequency CPICH measurements.

$N_{Freq,\ FDD}$: This is the ~~N~~number of FDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ FDD\ inter}$ defined in Section 8.1.2.4.1. When L3 filtering is used an additional delay can be expected.

If an inter frequency FDD cell has been detectable at least for the time period $T_{identify\_FDD\ inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Mmeasurement\_Pperiod\ FDD\ inter}$ provided the timing to that cell has not changed more than +/-32 chips ~~while transmission gap has not been available~~ during the time period $T_{identify\ FDD\ inter}$ and the L3 filter has not been used.

< Next changed section >

8.1.2.6 TDD Synchronisation to new cells

~~Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.~~

~~These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.~~

~~The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:~~For the requirements in section 8 and 9 to apply, an intra-frequency or inter-frequency TDD cell shall be considered detectable when,

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where the received P-CCPCH E_c/I_o is defined as

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

< Next changed section >

8.4 Measurements in CELL_FACH State (3.84 Mcps option)

8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The requirements are split in TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in ~~TS 25.225~~[14], the measurement model is defined in ~~TS 25.302~~ [15] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in ~~TS 25.331~~[16] and parallel measurements are specified in section 8.2. For the description of the idle intervals see ~~TS 25.225, Annex A~~[14].

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells (including serving cell), and
- 32 inter frequency cells, including
  - TDD mode cells distributed on up to 2 additional TDD carriers and
  - Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.
- Depending on UE capability, 32 inter RAT GSM cells.

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM- cell re-selection, measurement occasions as specified in ~~TS 25.331~~[16] and idle intervals as described in ~~TS 25.225~~[14-] are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on the assumption that the time during the measurement occasions and idle intervals that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

The UE is required to measure periodically once every time period T_{meas} on each of the modes and systems, -FDD interfrequency cells, TDD interfrequency cells and GSM carriers, for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1, within the measurement time T_{meas}

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot N_{TTI} \cdot \text{M\_REP} \cdot 10\right] \text{ms}$$

where the following parameters are defined:

N_{TDD}	= 0 or 1. If there are inter-frequency TDD cells in the neighbour list N_{TDD}=1, otherwise N_{TDD}=0.
N_{FDD}	= 0 or 1. If the UE is capable of FDD and there are FDD cells in the neighbour list N_{FDD}=*1* otherwise N_{FDD} =0.
N_{GSM}	= 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM} =0.
M_REP	is the Measurement Occasion cycle length in number of frames as specified in ~~TS 25.331~~[16].
N_{TTI}	is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.

Table 8.6A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

8.4.2.2 TDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency TDD cells and search for new intra frequency TDD cells in the monitor~~inged~~ set. ~~Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.~~ If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

In case no measurement occasion is activated, in order for the requirements in the following subsections to apply, the Beacon timeslots of the intra-frequency TDD cells indicated in the measurement control information shall either be synchronised with the Beacon timeslots of the serving cell, ~~or non-overlapping in time with the DL timeslots used by the UE for reception of S-CCPCH's~~ such that the UE can measure an intra-frequency cell TDD cell at least once every frame for the slot allocation case in use in this cell. The UE shall be capable of intra frequency measurements during active DL timeslots.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new inter frequency TDD detectable cell belonging to the monitored set within $T_{identify\ intra}$ ms, where

~~$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$~~

$T_{identify\ intra}$ is specified in section 8.1.2.2.1.

8.4.2.2.2 UE P-CCPCH RSCP measurement capability

In ~~the~~ CELL_FACH state ~~the measurement period for intra-frequency P-CCPCH RSCP measurements is 200 ms. When no inter-frequency measurement is scheduled,~~ the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{measurement\ intra}$ ~~6~~ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{measurement\ period\ intra}$, where

$X_{measurement\ intra}$ is specified in section 8.1.2.2.2

$T_{measurement\ period\ intra}$ is specified in section 8.1.2.2.2

~~and T~~the UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period ~~of 200 ms~~ $T_{measurement\ period\ intra}$

If the UE has identified more than $X_{measurement\ intra}$ intra-frequency cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from UE physical layer to higher layers may be decreased. ~~When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH RSCP measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods~~. The measurement accuracy for all measured cells shall be as specified in the section 9.

~~$$Y_{measurement\ intra} = Floor\left\{X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}}\right\}$~~

~~whereby function Floor(x) takes the integer part of x.~~

~~$X_{basic\ measurement\ TDD}$ is specified in section 8.1.2.2.2~~

~~$T_{Measurement\_Period,\ Intra}$ is specified in section 8.1.2.2.2~~

~~T_{Intra}: is specified in section 8.1.2.2.2~~

~~$T_{basic\_identify\_TDD,\ intra}$ is specified in section 8.1.2.2.2~~

8.4.2.2.3 void

8.4.2.2.4 void

8.4.2.2.5 Timeslot ISCP measurement capability

In ~~the~~ CELL_FACH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. ~~When no inter frequency measurement is scheduled, t~~The UE shall be capable of performing Timeslot ISCP measurements on the current serving cell for 10 arbitrary DL timeslots. The UE physical layer shall be capable of reporting Timeslot ISCP measurements to higher layers with the measurement period of 400 ms.

~~When inter-frequency measurements are required by the network, the UE shall be capable of performing Timeslot ISCP measurements on the current serving for at least $Y_{measurement\ intra\ ISCP}$ arbitrary DL timeslots, where $Y_{measurement\ intra\ ISCP}$ is defined in the following equation. Any Timeslot ISCP measurement that could not be performed during that measurement period, shall be measured in the following measurement periods. The measurement accuracy of the Timeslot ISCP measurement shall be as specified in the section 9.~~

~~$$Y_{measurement\ intra\ ISCP} = Floor\left\{ X_{basic\ measurement\ ISCP} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra,\ ISCP}} \right\}$$~~

~~whereby function Floor(x) takes the integer part of x,~~

- ~~$X_{basic\ measurement\ ISCP}$ = 10 (arbitrary DL timeslots of the current serving cell)~~
- ~~$T_{Measurement\_Period,\ Intra,\ ISCP}$ is specified in section 8.1.2.2.6,~~
- ~~T_{Intra} is specified in section 8.1.2.2.6.~~

8.4.2.2.6 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9.

8.4.2.3 TDD inter frequency measurements

When signalled by ~~the network~~UTRAN during CELL_FACH state, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for TDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

8.4.2.3.1 Identification of a new cell

When measurement occasions and idle intervals are used for inter-frequency TDD measurements, ~~T~~the UE shall be able to identify ~~-~~a new detectable inter frequency TDD cell belonging to the monitored set within

~~$$T_{identify\ inter} = Max\left\{5000, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{identify\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,TDD}\right\}$$ ms

If the UE does not require measurement occasions and idle intervals to perform TDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

8.4.2.3.2 P-CCPCH RSCP measurement period

When measurement occasions and idle intervals are used for inter-frequency TDD measurements~~When TDD inter frequency measurements are scheduled~~, the UE ~~physical layer~~ shall be capable of ~~reporting~~ performing P-CCPCH RSCP measurements for $X_{measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 ~~-~~with measurement period ~~given by~~ of $T_{measurement\ inter}$.

~~$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{measurement\ inter} = Max\left\{T_{measurement\ period\ TDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ TDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq}\right\}$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the measurement period for inter frequency P-CCPCH RSCP measurements shall be 480 ms.

Where,

- $X_{measurement\ TDD\ inter}$ is specified in section 8.1.2.4.2.
- $T_{~~M~~measurement\_~~P~~period\ TDD\ ~~i~~nter}$ is specified in section 8.1.2.3.2.
- T_{Meas} is specified in section 8.4.2.1.
- $T_{Inter\ FACH}$: ~~This is the minimum time as full slots that is available for the inter frequency P-CCPCH RSCP measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.~~ is equal to $(N_{TTI}*10 - 2*0.5)$ ms.
- $T_{basic\_identify\_TDD\_inter}$ ~~is specified in section 8.1.2.3.2~~= 800 ms.
- $T_{basic\_measurement\_TDD\ inter}$ ~~is specified in section 8.1.2.3.2~~= 50 ms.
- $N_{Freq,\ TDD}$ is specified in section 8.1.2.3.2

~~If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter-frequency measurements is 480ms.~~

8.4.2.3.3 ~~Periodic Reporting~~Void

~~Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.~~

8.4.2.3.4 ~~Event Triggered Reporting~~Void

~~Reported measurements in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

8.4.2.4 FDD measurements

The requirements in this section shall apply ~~only~~ to UE supporting ~~both~~ TDD and FDD ~~mode~~.

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency FDD cells indicated in the measurement control information.

In CELL_FACH state, measurements opportunities for FDD inter-frequency measurements are provided by means of measurement occasions and idle intervals.

~~The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.~~

8.4.2.4.1 Identification of a new cell

When measurement occasions and idle intervals are used for inter-frequency FDD measurements, ~~T~~the UE shall be able to identify a new detectable inter frequency FDD cell belonging to the monitored set within

~~$$T_{identify\ FDD\ inter} = Max\left\{5000, T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{identify\ FDD\ inter} = Max\left\{5000, Ceil\left\{\frac{T_{basic\ identify\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. ~~When L3 filtering is used an additional delay can be expected.~~

8.4.2.4.2 UE CPICH ~~M~~measurement ~~period~~capability

When measurement occasions and idle intervals are used for FDD inter frequency measurements ~~are scheduled~~, the UE ~~physical layer~~ shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

~~$$T_{measurement\ FDD\ inter} = Max\left\{T_{Measurement\ Period\ FDD\ inter}, T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ Period\ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$~~

$$T_{measurement\ FDD\ inter} = Max\left\{T_{measurement\ period\ FDD\ inter}, 2 \cdot T_{meas}, Ceil\left\{\frac{T_{basic\ measurement\ FDD\ inter}}{T_{Inter\ FACH}}\right\} \cdot T_{meas} \cdot N_{Freq,FDD}\right\} \text{ ms}$$

If the UE does not require measurement occasions and idle intervals to perform inter-frequency FDD measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

The UE shall be capable of performing CPICH measurements for $X_{measurement\ FDD\ inter}$ inter-frequency FDD cells per frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ FDD\ inter}$.

$X_{basic\ measurement\ FDD\ inter}$ is specified in section 8.1.2.4.2.

- $T_{Mmeasurement\_period\ FDD\ inter}$ is specified in section 8.1.2.4.2
- $T_{Inter\ FACH:}$ is specified in section 8.4.2.3.2
- $T_{basic\_identify\_FDD,inter}$ is specified in section 8.1.2.4.2
- $T_{basic\_measurement\_FDD\ inter}$ is specified in section 8.1.2.4.2.
- $N_{Freq\ FDD}$ is specified in section 8.1.2.4.2

8.4.2.4.3 ~~Periodic Reporting~~Void

~~Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.~~

8.4.2.4.4 ~~Event Triggered Reporting~~Void

~~Reported measurements in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

< Next changed section >

A.4.2.3 Scenario 3: TDD/FDD cell re-selection

A.4.2.3.1 Test Purpose and Environment

A.4.2.3.1.1 3.84 Mcps TDD option

This test is to verify the requirement for the TDD/FDD cell re-selection delay reported in section 4.2.2.

This scenario implies the presence of 1 UTRA TDD and 1 UTRA FDD cell as given in Table A.4.5 and A.4.6. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	During T1 cell 1 better ranked than cell 2
T2		s	15	During T2 cell 2 better ranked than cell 1

Table A.4.6: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		**0**		**8**		**n.a**	**n.a.**
		T1	T2	T 1	T 2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH_t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_EcIor	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection_and reselection_quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-102				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Propagation Condition		AWGN				AWGN	

~~NOTE: The purpose of this test case is to evaluate the delay of the TDD/FDD re-selection process, it is not intended to give reasonable values for a TDD/FDD cell re-selection.~~

A.4.2.3.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the 1.28 Mcps TDD OPTION/FDD cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 low chip rate TDD and 1 FDD cell as given in Table A.4.5A and A.4.6A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5A: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	1.28 Mcps TDD OPTION cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.6A: Test parameters for the 1.28 Mcps TDD OPTION/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPts		n.a.	
		T1	T2	T 1	T 2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
DwPCH_Ec/Ior	dB			0	0	n.a.	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
SCH_Ec/Ior	dB	n.a.		n.a.		-12	-12
PICH_Ec/Ior	dB					-15	-15
OCNS_Ec/Ior	dB	n.a.		n.a.		-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]			[ ]	[ ]
I_{oc}	dBm/1.28 MHz	-70					
PCCPCH_RSCP	dBm	[ ]	[ ]			n.a.	n.a.
CPICH_RSCP		n.a.				[ ]	[ ]
Cell_selection_and_reselection quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-103				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent					
Propagation Condition		AWGN					

A.4.2.3.2 Test Requirements

A.4.2.3.2.1 3.84 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1 in section 4.2.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.3.2.2 1.28 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1A in section 4.2.

T_{SI} Time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms). 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.8.2 TDD inter frequency measurements

A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

A.8.2.1.1 Test Purpose and Environment

A.8.2.1.1.1 3.84Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.~~2~~ and 9.1.

The test consists of 2 successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.8.2A and A.8.2B below. Two cells shall be present in the test, cell 1 being the serving cell and cell 2 being a UTRA TDD neighbour cell on the unused frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing. ~~This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event". General test parameters are given in the table A.8.2A below and they are signalled from test device.~~

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell on the unused frequency ~~has to~~ shall be reported together with Event 2C reporting. ~~New measurement control information, which defines neighbour cells etc., is always sent before the event starts.~~ The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

~~The cell specific test parameters are shown in Table A.8.2B.~~ The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter		Unit	Value	Comment
DPCH parameters~~ active cell~~			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2~~. The DPCH is located in an other timeslot than 0 or 8~~
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA TDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-71	~~Absolute P-CCPCH RSCP threshold~~Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			24 on channel 1 16 on channel 2	~~Measurement control information is sent before T1 starts.~~
T1		s	10	
T2		s	10	

Table A.8.2B: Cell ~~S~~specific test ~~P~~parameters for ~~C~~correct ~~R~~reporting of TDD inter frequency ~~N~~neighbours in AWGN ~~P~~propagation ~~C~~condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
P-CCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	9	-Infinity	9
I_{oc}	dBm/ 3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-64		
Propagation Condition		AWGN							

~~NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8~~

A.8.2.1.1.2 1.28Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event". General test parameters are given in the table A.8.2C below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The cell specific test parameters are shown in Table A.8.2D.

Table A.8.2C: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 2C
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.2D Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	3	3			-Infinity	6		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	-70	-70			-Infinity	-67		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.2.1.2 Test Requirements

A.8.2.1.2.1 3.84Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 s from the beginning of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly reported ~~observed~~ during repeated tests shall be at least 90%.

A.8.2.1.2.2 1.28Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.3 FDD measurements

A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

A.8.3.1.1.1 3.84 Mcps TDD option

The purpose of ~~T~~this test ~~will derive~~is to verify that the ~~terminal~~ UE makes correct reporting of ~~an~~ events when measuring on UTRA FDD cells. This test will partly verify the requirements in section 8.1.2 and 9.1.

~~Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH_RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3A below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The test parameters are given in Table A.8.3B below.~~

The test parameters are given in Table A.8.3A and A.8.3B below. The test consists of two successive time periods, with time durations of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA TDD cell and cell 2 being a UTRA FDD neighbour cells on the unused frequency.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used and that CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table A.8.3A: General test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DPCH parameters active cell~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8~~
~~Power Control~~		~~On~~	
~~Active cell~~		~~Cell 1~~	
~~Threshold non used frequency~~	~~dB~~	~~-86~~	~~Absolute CPICH RSCP threshold for event 2C~~
~~Hysteresis~~	~~dB~~	~~0~~	
~~W non-used frequency~~		~~1~~	~~Applicable for event 2C~~
~~Time to Trigger~~	~~ms~~	~~0~~	
~~Filter coefficient~~		~~0~~	
~~Monitored cell list size~~		~~24 on channel 1 16 on channel 2~~	~~Measurement control information is sent before T1 starts.~~
~~T1~~	~~s~~	~~10~~	
~~T2~~	~~s~~	~~10~~	

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA FDD cell
Final conditions	Active cell		Cell 1	
Threshold non used frequency		dB	-18	Applicable for event 2C
W non-used frequency			1	Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on channel 1 6 FDD neighbours on channel 2	
T1		s	15	
T2		s	10	

Table A.8.3B: Cell ~~S~~specific test parameters for ~~C~~correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		8		n.a	
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	
PCCPCH_Ec/Ior	dB	-3	-3			-12	
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	
SCH_t_{offset}		0	0	0	0	n.a.	
PICH_Ec/Ior				-3	-3	-15	
OCNS	dB	-3,12	-3,12	-3,12	-3,12	-0,941	
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-infinity	-~~2~~1.8
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_~~RSCP~~Ec/Io		n.a.				-infinity	-~~82~~14
PCCPCH_RSCP	dB	-70	-70	-70	-70	n.a.	
Propagation Condition		AWGN				AWGN	

~~Note: The DPCH of the TDD cell is located in an other timeslot than 0 or 8~~

A.8.3.1.1.2 1.28 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3C below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The test parameters are given in Table A.8.3D below.

Table A.8.3C: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0.
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-86	Absolute CPICH RSCP threshold for event 2C
Hysteresis	dB	0	
W non-used frequency		1	Applicable for event 2C
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.3D Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition:

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPTS		n.a	n.a.
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB					-12	-12
PICH_Ec/Ior	dB					-15	-15
DwPCH_Ec/Ior	dB			0	0	n.a.	n.a.
OCNS	dB	[ ]	[ ]			-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	-2
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_RSCP		n.a.				-Infinity	-82
PCCPCH_RSCP	dB	-70	-70			n.a.	n.a.
Propagation Condition		AWGN				AWGN	

Note: The DPCH of cell 1 is located in a timeslot other than 0.

A.8.3.1.2 Test Requirements

A.8.3.1.2.1 3.84 Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the start of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of ~~correct~~ events correctly observed during repeated tests shall be at least 90%.

A.8.3.1.2.2 1.28 Mcps TDD option

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than ~~[~~5~~]~~ s from the beginning of time period T2.

The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.