**3GPP TSG- RAN WG4 Meeting #97 *R4-2017355***

**Electronic Meeting, November 2nd - 13th**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.133** | **CR** | **1338** | **rev** | 2 | **Current version:** | **16.5.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | CR on UE requirement for MR-DC early measurement reporting in 38.133 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NR\_DC\_CA\_enh-Core | | | | |  | ***Date:*** | | | 2020-11-13 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change 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](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | UE requirements for MR-DC early measurement reporting in TS 38.133 are not finalized. This CR brings changes for finalization of the feature. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Following changes are introduced: into TS 38.133:   * Clarification to the total number of carrier frequency layers * Clarification to general requirements in 4.2.2.7 * clarification to detected cell requirement * Updates to section Measurements of inter-frequency CA/DC candidate cells:   + capturing the agrements related to carriers to monitor   + clarifying measurement requirements   + capturing agreement related to SSB measurement requirements   + Move LTE inter-RAT EMR requirements to separate section (aligning with 36.133)   + Adding new section 4.4.2.4 Measurements of E-UTRAN inter-RAT DC candidate cells | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | UE requirement for MR-DC early measurement reporting in 38.133 will be imcomplete | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.2.1, 4.2.2.7, 4.2.2.4, 4.2.2.5, 4.4. New section 4.4.2.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of Change 1>

4 SA: RRC\_IDLE state mobility

4.1 Cell Selection

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS 38.304 [1]. 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 cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated by the serving cell. For intra-frequency and inter-frequency cells the serving cell may not provide explicit neighbour list but carrier frequency information and bandwidth information only. UE measurement activity is also controlled by measurement rules defined in TS 38.304 [1], allowing the UE to limit its measurement activity

In the requirements of clause 4.2, the exceptions for side conditions apply as follows:

- for the UE capable of CA, the applicable exceptions for side conditions are specified in Annex B, clause B.3.2.1, B.3.2.3, or B.3.2.5 for UE supporting CA in FR1, CA in FR2 and CA between FR1 and FR2, respectively;

- for the UE capable of SUL, the applicable exceptions for side conditions are specified in Annex B, clause B.3.4.1 for UE supporting SUL in FR1.

4.2.2 Requirements

4.2.2.1 UE measurement capability

For idle mode cell re-selection purposes, and for UE supporting *IdleInactiveMeasurements-r16* or *idleInactiveEUTRA-MeasReport-r16*, for NR CA and MR-DC measurement purpose, the UE shall be capable of monitoring at least:

- Intra-frequency carrier, and

- Depending on UE capability, 7 NR inter-frequency carriers, and

- Depending on UE capability, 7 FDD E-UTRA inter-RAT carriers, and

- Depending on UE capability, 7 TDD E-UTRA inter-RAT carriers.

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC\_IDLE state shall be capable of monitoring a total of at least 14 carrier frequency layers, which includes serving layer, comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD and NR layers.

<Start of Change 2>

#### 4.2.2.7 General requirements

The UE shall search every layer of higher priority at least every Thigher\_priority\_search = (60 \* Nlayers) seconds, where Nlayers is the total number of higher priority NR and E-UTRA carrier frequencies broadcasted in system information.

For a UE configured with early measurement reporting, while T331 is running, Nlayers is the combined total number of higher priority NR and E-UTRA carrier frequencies broadcasted in system information and carriers configured for idle mode CA measurements.

Note: combined total number means that if a carrier is a high priority carrier and additionally a carrier configured for idle mode CA measurements, it only counts as one carrier.

<Start of Change 3>

#### 4.2.2.4 Measurements of inter-frequency NR cells

The UE shall be able to identify new inter-frequency cells and perform SS-RSRP or SS-RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ then the UE shall search for inter-frequency layers of higher priority at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2.7.

If Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below in this clause.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS38.304 [1] within Kcarrier \* Tdetect,NR\_Inter if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when Treselection = 0 provided that the reselection criteria is met by a margin of at least 5 dB in FR1 or 6.5dB in FR2 for reselections based on ranking or 6dB in FR1 or 7.5dB in FR2 for SS-RSRP reselections based on absolute priorities or 4dB in FR1 and 4dB in FR2 for SS-RSRQ reselections based on absolute priorities.

The parameter Kcarrier is the number of NR inter-frequency carriers indicated by the serving cell. The parameter Kcarrier for a UE configured with idle mode CA measurements (while T331 is running), is the combined number of NR inter-frequency carriers indicated by the serving cell and the number of NR inter-frequency carriers configured for idle mode CA measurements.

Note: combined total number means that if a carrier is a high priority carrier and additionally a carrier configured for idle mode CA measurements, it only counts as one carrier.

An inter-frequency cell is considered to be detectable according to the conditions defined in Annex B.1.3 for a corresponding Band.

When higher priority cells are found by the higher priority search, they shall be measured at least every Tmeasure,NR\_Inter. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure SS-RSRP or SS-RSRQ at least every Kcarrier \* Tmeasure,NR\_Inter (see table 4.2.2.4-1) for identified lower or equal priority inter-frequency cells. If the UE detects on a NR carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter SS-RSRP or SS-RSRQ measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least Tmeasure,NR\_Inter/2.

The UE shall not consider a NR neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 38.304 [1] within Kcarrier \* Tevaluate,NR\_Inter when Treselection = 0as specified in table 4.2.2.4-1 provided that the reselection criteria is met by

- the condition when performing equal priority reselection and

when *rangeToBestCell* is not configured:

- the cell is at least 5dB better ranked in FR1 or 6.5dB better ranked in FR2 or.

when *rangeToBestCell* is configured:

- the cell has the highest number of beams above the threshold *absThreshSS-BlocksConsolidation* among all detected cells whose cell-ranking criterion R value in TS38.304 [1] is within *rangeToBestCell* of the cell-ranking criterion R value of the highest ranked cell.

- if there are multiple such cells, the cell has the highest rank among them

- the cell is at least 5dB better ranked in FR1 or 6.5dB better ranked in FR2 if the current serving cell is among them. or

- 6dB in FR1 or 7.5dB in FR2 for SS-RSRP reselections based on absolute priorities or

- 4dB in FR1 or 4dB in FR2 for SS-RSRQ reselections based on absolute priorities.

When evaluating cells for reselection, the SSB side conditions apply to both serving and inter-frequency cells.

If Treselection timer has a non zero value and the inter-frequency cell is satisfied with the reselection criteria, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

The UE is not expected to meet the measurement requirements for an inter-frequency carrier under DRX cycle=320 ms defined in Table 4.2.2.4-1 under the following conditions:

- TSMTC\_intra = TSMTC\_inter = 160 ms; where TSMTC\_intra and TSMTC\_inter are periodicities of the SMTC occasions configured for the intra-frequency carrier and the inter-frequency carrier respectively, and

- SMTC occasions configured for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the SMTC occasions configured for the intra-frequency carrier, and

- SMTC occasions configured for the intra-frequency carrier and for the inter-frequency carrier occur up to 1 ms before the start or up to 1 ms after the end of the paging occasion in TS38.304 [1].

Table 4.2.2.4-1: Tdetect,NR\_Inter, Tmeasure,NR\_Inter and Tevaluate,NR\_Inter

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DRX cycle length [s] | Scaling Factor (N1) | | Tdetect,NR\_Inter [s] (number of DRX cycles) | Tmeasure,NR\_Inter [s] (number of DRX cycles) | Tevaluate,NR\_Inter [s] (number of DRX cycles) |
| FR1 | FR2Note1 |
| 0.32 | 1 | 8 | 11.52 x N1 x 1.5 (36 x N1 x 1.5) | 1.28 x N1 x 1.5 (4 x N1 x 1.5) | 5.12 x N1 x 1.5 (16 x N1 x 1.5) |
| 0.64 |  | 5 | 17.92x N1 (28 x N1) | 1.28 x N1 (2 x N1) | 5.12 x N1 (8 x N1) |
| 1.28 |  | 4 | 32 x N1 (25 x N1) | 1.28 x N1 (1 x N1) | 6.4 x N1 (5 x N1) |
| 2.56 |  | 3 | 58.88 x N1 (23 x N1) | 2.56 x N1 (1 x N1) | 7.68 x N1 (3 x N1) |
| Note 1: Applies for UE supporting power class 2&3&4. For UE supporting power class 1, N1 = 8 for all DRX cycle length. | | | | | |

4.2.2.5 Measurements of inter-RAT E-UTRAN cells

If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ then the UE shall search for inter-RAT E-UTRAN layers of higher priority at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2

If Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ then the UE shall search for and measure inter-RAT E-UTRAN layers of higher, lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT E-UTRAN layers shall be the same as that defined below for lower priority RATs.

The requirements in this clause apply for inter-RAT E-UTRAN FDD measurements and E-UTRA TDD measurements. When the measurement rules indicate that inter-RAT E-UTRAN cells are to be measured, the UE shall measure RSRP and RSRQ of detected E-UTRA cells in the neighbour frequency list at the minimum measurement rate specified in this clause.

The parameter NEUTRA\_carrier is the total number of configured E-UTRA carriers indicated to meet non high speed requirements in the neighbour frequency list. The parameter NEUTRA\_carrier\_HST is the total number of configured E-UTRA carriers indicated to meet high speed requirements in the neighbour frequency list. The parameter NEUTRA\_carrier for a UE configured with idle mode CA measurements (while T331 is running), is the combined number of configured E-UTRA carriers in the neighbour frequency list and E-UTRA carriers configured for idle mode CA measurements.

Note: combined total number means that if a carrier is a high priority carrier and additionally a carrier configured for idle mode CA measurements, it only counts as one carrier.

The UE shall filter RSRP and RSRQ measurements of each measured E-UTRA cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

An inter-RAT E-UTRA cell is considered to be detectable provided the following conditions are fulfilled:

- the same conditions as for inter-frequency RSRP measurements specified in TS 36.133 [15, Annex B.1.2] are fulfilled for a corresponding Band, and

- the same conditions as for inter-frequency RSRQ measurements specified in TS 36.133 [15, Annex B.1.2] are fulfilled for a corresponding Band.

- SCH conditions specified in TS 36.133 [15, Annex B.1.2] are fulfilled for a corresponding Band

The UE shall be able to evaluate whether a newly detectable inter-RAT E-UTRAN cell meets the reselection criteria defined in TS38.304 [1] within NEUTRA\_carrier\_HST \* Tdetect,EUTRAN\_HST + NEUTRA\_carrier \* Tdetect,EUTRAN when Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ when Treselection = 0 provided that the reselection criteria is met by a margin of at least 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

Cells which have been detected shall be measured at least every NEUTRA\_carrier\_HST \* Tmeasure,EUTRAN\_HST + NEUTRA\_carrier \* Tmeasure,EUTRAN when Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ.

When higher priority cells are found by the higher priority search, they shall be measured at least every Tmeasure,EUTRAN. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this clause shall still be met by the UE before it makes any determination that it may stop measuring the cell.

If the UE detects on an inter-RAT E-UTRAN carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall not consider an inter-RAT E-UTRA cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-RAT E-UTRA cell has met reselection criterion defined in TS 38.304 [1] within NEUTRA\_carrier\_HST \* Tevaluate,EUTRAN\_HST + NEUTRA\_carrier \* T evaluate,EUTRAN when Treselection = 0as speficied in table 4.2.2.5-1 and 4.2.2.5-2 provided that the reselection criteria is met by a margin of at least 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

If Treselection timer has a non zero value and the inter-RAT E-UTRA cell is satisfied with the reselection criteria which are defined in TS 38.304 [1], the UE shall evaluate this E-UTRA cell for the Treselection time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

**Table 4.2.2.5-1: Tdetect,EUTRAN, Tmeasure,EUTRAN, and Tevaluate,EUTRAN**

|  |  |  |  |
| --- | --- | --- | --- |
| **DRX cycle length [s]** | **Tdetect,EUTRAN [s] (number of DRX cycles)** | **Tmeasure,EUTRAN [s] (number of DRX cycles)** | **Tevaluate,EUTRAN**  **[s] (number of DRX cycles)** |
| 0.32 | 11.52 (36) | 1.28 (4) | 5.12 (16) |
| 0.64 | 17.92 (28) | 1.28 (2) | 5.12 (8) |
| 1.28 | 32(25) | 1.28 (1) | 6.4 (5) |
| 2.56 | 58.88 (23) | 2.56 (1) | 7.68 (3) |

**Table 4.2.2.5-2: Tdetect,EUTRAN\_HST, Tmeasure,EUTRAN\_HST, and Tevaluate,EUTRAN\_HST for UE configured with RRM enhancements for high speed**

|  |  |  |  |
| --- | --- | --- | --- |
| **DRX cycle length [s]** | **Tdetect,EURAN\_HST [s] (number of DRX cycles)** | **Tmeasure,EUTRAN\_HST [s] (number of DRX cycles)** | **Tevaluate,EUTRAN\_HST**  **[s] (number of DRX cycles)** |
|  |
| 0.32 | 4.16 (13) | 0.64 (2) | 0.96 (3) |
| 0.64 | 7.68 (12) | 1.28 (2) | 1.92 (3) |
| 1.28 | 8.96 (7) | 1.28 (1) | 3.84 (3) |

<Start of Change 4>

## 4.4 Idle Mode CA/DC Measurements

### 4.4.1 Introduction

A UE supporting *IdleInactiveMeasurements-r16* or *idleInactiveEUTRA-MeasReport-r16* shall perform the idle mode measurement on the inter-frequency CA and DC candidate frequencies/cells and E-UTRAN inter-RAT DC candidate frequencies/cells indicated by higher layers and meet the requirement specified in this clause. The UE shall perform idle mode measurements provided that the serving cell support early measurement and is within the validity area. The idle mode measurement requirements apply to a configured carrier frequency the carrier frequency and the serving cell are among the supported band combination of the UE.

### 4.4.2 Measurement Requirements

For a UE which supports *IdleInactiveMeasurements-r16* or *idleInactiveEUTRA-MeasReport-r16* the UE shall support the idle mode CA measurements on the serving cell, and carriers configured for idle mode CA/DC measurement reporting provided T331 has not expired, the serving cell is supporting idle mode CA/DC measurement reporting and the serving cell is in the validity area.

#### 4.4.2.1 Detected cell requirement during state transition and Idle mode

This subclause defines the requirements for the detected cell status for the idle mode CA/DC measurement when UE transitions from RRC Connected mode to Idle mode and after UE has entered Idle mode. The requirements are applicable to an NE-DC and NR carrier aggregation capable UE which has been configured with one or more of following, one or more SCells, one E-UTRAN PSCell or one or more downlink E-UTRAN SCells during the Connected mode and which supports *IdleInactiveMeasurements-r16* or *idleInactiveEUTRA-MeasReport-r16.* The requirements are applicable for SCell(s) and E-UTRAN FDD and TDD PSCell and SCells.

Upon releasing the connection and if the UE has been configured with idle mode CA measurement reporting, following requirements apply concerning the detected cells in Connected mode upon state transitioning to Idle mode and during Idle mode:

- A cell which is detected cell in Connected mode prior to connection release, shall remain detected after UE has entered Idle mode and during Idle mode, provided that the following conditions are met:

- The UE has been provided with a list of cells and/or carrier frequencies for early measurement reporting by dedicated RRC signaling and

- The detected cell is among the list of cells or on a carrier frequency provided for early measurement reporting, and

- The UE is provided with a valid timer T331 by dedicated RRC signaling, and

- The detected cell and SSBs remains detectable until UE reconnect to the network and transmits the early measurement report, and

- The carrier frequency of the detected cell and the carrier frequency of the serving cell are among the supported band combination of the UE.

An inter-RAT E-UTRAN cell is considered detectable according to RSRP, RSRP Ês/Iot, SCH\_RP and SCH Ês/Iot defined in Annex B.1.1 and Annex B.1.2 in [15] for a corresponding Band. An inter-frequency cell is considered detectable according to the conditions in Annex B.1.2 and B.1.3 for a corresponding band. An SSB of an inter-frequency cell is considered detectable according to SSB\_RP and SSB Ês/Iot defined in Annex B.1.2 and B.1.3 for a corresponding Band.

#### 4.4.2.2 Measurements of inter-frequency CA/DC candidate cells

While T331 is running, the UE shall perform measurement on the configured inter-frequency carriers for idle mode CA measurement reporting according to the UE measurement capability.

A UE which supports *IdleInactiveMeasurements-r16* shall support idle mode CA/DC measurements of:

* at least 7 inter-frequency carriers which are also configured for inter-frequency mobility measurements, and
* at least 7 inter-frequency carriers which are not configured for inter-frequency mobility measurements.

The UE shall be capable of monitoring a total of at least 7 inter-frequency carriers for idle mode CA/DC measurements comprising of carriers configured for inter-frequency mobility measurements and carriers not configured for inter-frequency mobility measurements.

For inter-frequency carriers configured for idle mode CA/DC measurements, if Srxlev ≤ SnonIntraSearchP and Squal ≤ SnonIntraSearchQ the inter-frequency measurement requirements in clause 4.2.2.4 shall apply, where UE shall search for and measure inter-frequency layers configured for idle mode CA/DC measurements in preparation for possible reporting. If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ the UE shall search for inter-frequency layers configured for idle mode CA/DC measurements at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2.7, where UE shall search for and measure inter-frequency layers configured for idle mode CA/DC measurements in preparation for possible reporting.

For UE supporting *idleInactiveNR-MeasBeamReport-r16*, if the UE is configured with *beamMeasConfigIdle-r16* for idle mode CA/DC measurement, the UE shall be capable of performing SS-RSRP, SS-RSRQ for at least

- 7 SSBs with different SSB index and/or PCI on an inter-frequency layer in FR1,

- 10 SSBs with different SSB index and/or PCI on an inter-frequency layer in FR2.

If the UE is configured with *beamMeasConfigIdle-r16* for idle mode DC measurement, the UE shall be able to acquire the SSB index for a newly detectable inter-RAT NR cell and perform RSRP/RSRQ measurement within the requirements defined in clause 4.2.2.4 plus TSSB\_index,NR, where TSSB\_index,NR is the additional time period used to acquire the index of the SSB being measured as defined in table 4.4.2.2-1.

**Table 4.4.2.2-1: TSSB\_index,NR\_Inter**

|  |  |  |  |
| --- | --- | --- | --- |
| **DRX cycle length [s]** | **Scaling Factor (N1)** | | **TSSB\_index,NR\_Inter [s] (number of DRX cycles)** |
| **FR1** | **FR2Note1** |
| 0.32 | 1 | 8 | N2 x 1.28 x N1 x 1.5 (N2 x 4 x N1 x 1.5) |
| 0.64 | 5 | N2 x 1.28 x N1 (N2 x 2 x N1) |
| 1.28 | 4 | N2 x 1.28 x N1 (N2 x 1 x N1) |
| 2.56 | 3 | N2 x 2.56 x N1 (N2 x 1 x N1) |
| Note 1: Applies for UE supporting power class 2&3&4. For UE supporting power class 1, N1 = 8 for all DRX cycle length.  NOTE 2: N2 = 3 if the NR inter-frequency carrier for idle mode CA/DC measurement reporting is in FR1, and N2=[3, 5] if the NR inter-frequency carrier for idle mode CA/DC measurement reporting is in FR2. | | | |

In the absence or expiration of T331, it is up to UE implementation to perform the idle mode DC measurement.

For inter-frequency carriers configured for idle mode CA/DC measurements, the UE shall be capable of performing SS-RSRP and SS-RSRQ measurements of the carriers, and the UE physical layer shall be capable of reporting SS-RSRP and SS-RSRQ measurements of the carriers configured for idle mode CA/DC measurements to higher layers, with measurement accuracy as specified in clauses [38.133] and [38.133], respectively.

The UE shall be able to report idle mode CA measurements when idle mode CA measurement reporting is requested by the network.

#### 4.4.2.3 Measurements on serving cell

The UE shall measure the RSRP and RSRQ level of the serving cell and evaluate the cell selection criterion S defined in clause 4.2.2.2 and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements of the serving cell to higher layers, with measurement accuracy as specified in [38.133]

#### 4.4.2.4 Measurements of E-UTRAN inter-RAT DC candidate cells

While T331 is running, the UE shall perform measurement on the configured inter-RAT carriers for idle mode CA/DC measurement reporting according to the UE measurement capability.

A UE which supports *idleInactiveEUTRA-MeasReport-r16* shall support idle mode DC measurements of:

* at least 7 E-UTRAN inter-RAT carriers which are also configured for inter-frequency mobility measurements, and
* at least 1 E-UTRAN inter-RAT carrier which is not configured for inter-frequency mobility measurements.

The UE shall be capable of monitoring a total of at least 7 inter-RAT carriers for idle mode CA/DC measurements comprising of carriers configured for inter-frequency mobility measurements and carriers not configured for inter-frequency mobility measurements.

For inter-RAT carriers configured for idle mode CA/DC measurements, if Srxlev ≤ SnonIntraSearchP and Squal ≤ SnonIntraSearchQ the inter-RAT measurement requirements in clause 4.2.2.5 shall apply, where UE shall search for and measure inter-RAT layers configured for idle mode CA/DC measurements in preparation for possible reporting. If Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ the UE shall search for inter-RAT layers configured for idle mode CA/DC measurements at least every Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2, where UE shall search for and measure inter-RAT layers configured for idle mode CA/DC measurements in preparation for possible reporting.

For overlapping inter-RAT carriers configured for idle mode CA/DC measurements, the UE shall be capable of performing RSRP and RSRQ measurements of the carriers, and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements of the carriers configured for idle mode CA/DC measurements to higher layers, with measurement accuracy as specified in clauses in [36.133] and [36.133], respectively.

The UE shall be able to report idle mode CA measurements when idle mode CA measurement reporting is requested by the network.

<End of Changes>