TSG-RAN Meeting #16 *RP-020341*
Marco Island, FL, USA, 4 - 7 June 2002

Title: **Agreed CRs (Rel-5) for WI "High Speed Downlink Packet Access (HSDPA) - Layer 2 and 3 aspects"**

Source: **TSG-RAN WG2**

Agenda item: **8.1.17**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio	Workite
R2-021456	agreed	25.301	066		Rel-5	HSDPA specific corrections	F	5.0.0	5.1.0	HSDPA-L23
R2-021457	agreed	25.302	128		Rel-5	HSDPA corrections	F	5.0.0	5.1.0	HSDPA-L23
R2-021408	agreed	25.306	040		Rel-5	Corrections in HSDPA UE capabilities	F	5.0.0	5.1.0	HSDPA-L23
R2-021409	agreed	25.306	041		Rel-5	HSDPA TDD UE capabilities	F	5.0.0	5.1.0	HSDPA-L23
R2-021458	agreed	25.306	045		Rel-5	DPCH capabilities with simultaneous HSDPA configuration	B	5.0.0	5.1.0	HSDPA-L23
R2-021461	agreed	25.321	121		Rel-5	HSDPA related MAC corrections	F	5.0.0	5.1.0	HSDPA-L23
R2-021462	agreed	25.321	122		Rel-5	Description for MAC-hs reset	F	5.0.0	5.1.0	HSDPA-L23
R2-021459	agreed	25.331	1499		Rel-5	HS-DSCH related corrections	F	5.0.0	5.1.0	HSDPA-L23
R2-021460	agreed	25.331	1500		Rel-5	Removal of BLER threshold from IE "Measurement Feedback info"	F	5.0.0	5.1.0	HSDPA-L23

3GPP TSG-RAN WG2 Meeting #29
Gyeongju , Korea, 13 - 17 May 2002

Tdoc R2-021456

CR-Form-v5

CHANGE REQUEST

⌘ **25.301** **CR** **066** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	HSDPA specific corrections
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	22.04.2002
Category:	⌘	**F**
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)*

Reason for change:	⌘	Correction to inclusion of HSDPA features
Summary of change:	⌘	Inclusion of description of MAC-d flow numbering References to two step signalling approach are removed Protocol termination points corrected Addition of H-RNTI in list of UE identifiers
Consequences if not approved:	⌘	Incorrect and incomplete description of HSDPA

Clauses affected:	⌘	5.3.6, 5.6.9.1, 5.6.9.2, 5.6.9.3, 6.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.3.6 Transport Channel, ~~and~~ Logical Channel and MAC-d flow Numbering

The UE model for transport channel and logical channel numbering is defined by the following:

- For FACH transport channels:
  - A transport channel identity is associated with each FACH transport channel. Each identity is unique within the downlink FACHs mapped onto the same physical channel.
  - Transport channel identities can be allocated non sequentially.
  - Transport channel identity is not used to determine the radio bearer mapping. The transport channels that can be used are determined from the available physical channels.
  - Each downlink DCCH and DTCH has a unique logical channel identity.
- For RACH and CPCH transport channels:
  - A transport channel identity is associated with each RACH transport channel. Each identity is unique within the RACHs mapped onto the same PRACH.
  - A transport channel identity is associated with each CPCH transport channel. Each identity is unique within the CPCHs mapped onto the same CPCH set.
  - Transport channel identities can be allocated non sequentially.
  - Transport channel identity is not used to determine the radio bearer mapping. The transport channels that can be used are determined from the available physical channels.
  - Each uplink DCCH and DTCH has a unique logical channel identity.
- For downlink DCH and DSCH transport channels:
  - A transport channel identity is associated with each downlink DCH transport channel. Each identity is unique within the downlink DCHs configured in the UE;
  - Transport channel identities can be allocated non sequentially.
  - A transport channel identity is associated with each DSCH transport channel. Each identity is unique within the DSCHs configured in the UE;
  - A logical channel identity is associated with each logical channel that is multiplexed with other logical channels before being mapped to a transport channel. Each identity is unique within the logical channels mapped to the same transport channel.
  - A logical channel that is mapped to DCH and DSCH simultaneously has one logical channel identity.
- For HS-DSCH ~~transport channels~~:
  - A MAC-flow identity is associatd with each MAC-d flow. Each identity is unique within the MAC-d flows configured in the UE;
  - A logical channel identity is associated with each logical channel that is multiplexed with other logical channels before being mapped to a MAC-d flow. Each identity is unique within the logical channels mapped to the same MAC-d flow.
  - A logical channel that is mapped to DCH and HS-DSCH simultaneously has one logical channel identity.
- For uplink DCH and USCH transport channels:
  - A transport channel identity is associated with each downlink DCH transport channel. Each identity is unique within the DCHs configured in the UE;
  - Transport channel identities can be allocated non sequentially.

- A transport channel identity is associated with each USCH transport channel. Each identity is unique within the USCHs configured in the UE;
- A logical channel identity is associated with each logical channel that is multiplexed with other logical channels before being mapped to a transport channel. Each identity is unique within the logical channels mapped to the same transport channel.

5.6.9 Protocol termination for HS-DSCH

5.6.9.1 HS-DSCH definition

The HS-DSCH is a resource that exists in downlink only. It has only impact on the physical and transport channel levels, so there is no definition of shared channel in the logical channels provided by MAC.

The HS-DSCH is a transport channel for which a common pool of radio resources is shared dynamically between several UEs. The HS-DSCH is mapped to one or several physical channels such that a specified part of the downlink resources is employed. For the HS-DSCH no macrodiversity is applied, i.e. a specific HS-DSCH is transmitted in a single cell only.

- The HS-DSCH is defined as an extension to DCH transmission. ~~A two-step signalling approach~~Physical channel signalling is used for indicating to a UE when it has been scheduled and then the necessary signalling information for the UE to decode the HS-PDSCH.

In every HS-DSCH TTI, one or several HS-PDSCHs can be used in the downlink. Therefore, the HS-DSCH supports code multiplexing. MAC multiplexing of different UEs shall not be applied within an HS-DSCH TTI, i.e. within one HS-DSCH TTI an HS-PDSCH is assigned to a single UE. However, MAC multiplexing is allowed on a TTI by TTI basis, i.e. one HS-PDSCH may be allocated to different UEs at each TTI.

5.6.9.2 Resource allocation and UE identification on HS-DSCH

~~A two-step signalling approach is used for individual resource allocation on the HS-DSCH.~~

For each HS-DSCH TTI, each HS-SCCH carries HS-DSCH related downlink signalling for one UE, along with a UE identity (via a UE specific CRC) that identifies the UE for which this information is necessary in order to decode the scheduled HS-PDSCH.

5.6.9.3 Protocol termination

The protocol termination points for HS-DSCH in the control and user planes are presented in Figure x and Figure y, respectively. ~~For the user plane t~~Two configurations exist, a Configuration with MAC-c/sh and a Configuration without MAC-c/sh.

- Configuration with MAC-c/sh: In this case, the MAC-hs in Node B is located below MAC-c/sh in CRNC.
- Configuration without MAC-c/sh: In this case, the CRNC does not have any ~~user plane~~ function for the HS-DSCH. MAC-d in SRNC is located directly above MAC-hs in Node B, i.e. in the HS-DSCH ~~user plane~~ the SRNC is directly connected to the Node B, thus bypassing the DRNC.

Both configurations are transparent to both the UE and Node B. Figures y and ya show the respective user plane protocol architecture with termination points for the above two configurations.

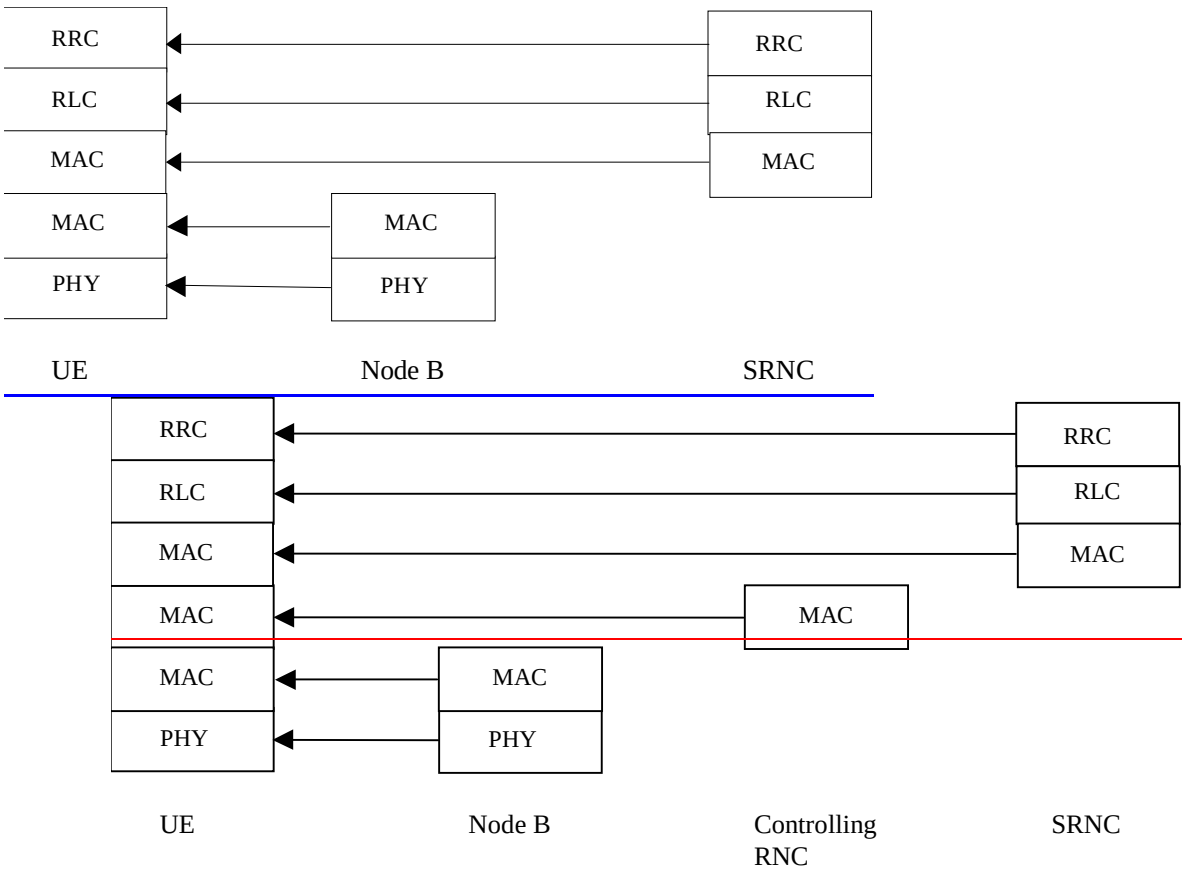
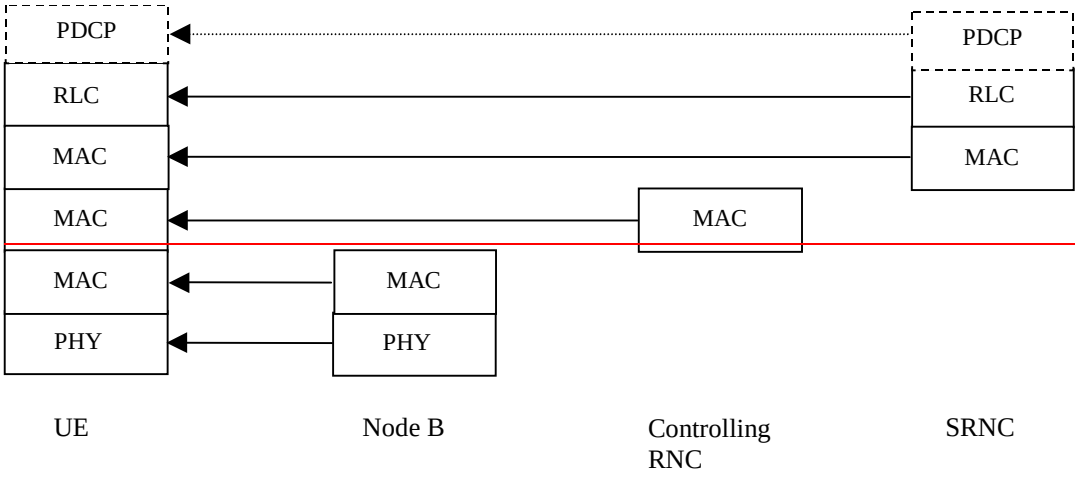


Figure x: Protocol termination points for HS-DSCH, control plane



~~**Figure y: Protocol termination points for HS-DSCH, user plane, Configuration with MAC-c/sh**~~

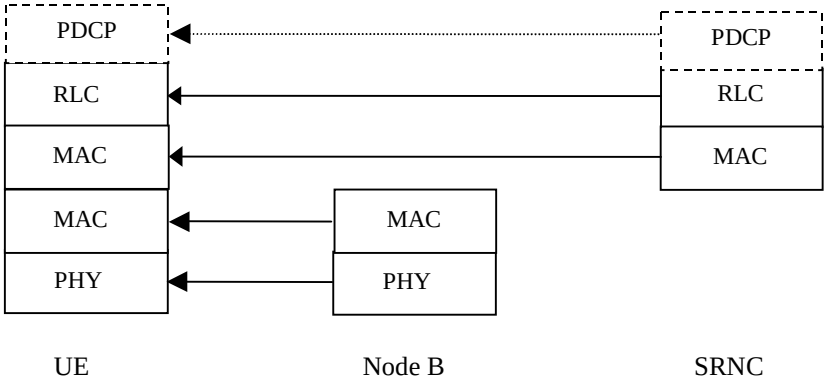


Figure ya: Protocol termination points for HS-DSCH, user plane~~, Configuration without MAC-c/sh~~

6 User Identification and RRC Connection Mobility

6.1 UE identification on the radio interface

A Radio Network Temporary Identity (RNTI) is used as an UE identifier on RACH/FACH, RACH+CPCH/FACH or, for FDD mode, also on DSCH by the MAC protocol, or on PCH by the RRC, when a RRC connection exists. For the HS-DSCH the UE identification is included by the physical layer with the help of an UE specific CRC.

Definition of UE identifiers

~~Two~~ Three types of RNTIs exist. One is used within the Serving RNC and it is denoted by Serving RNC RNTI (S-RNTI), ~~the other~~one is used within a cell controlled by a CRNC, when applicable, and it is denoted by Cell RNTI (C-RNTI) and one is used within a cell controlled by a CRNC when a HS-DSCH is configured and it is denoted by HS-DSCH-RNTI (H-RNTI).

S-RNTI is allocated for all UEs having a RRC connection. It is allocated by the Serving RNC and it is unique within the Serving RNC. S-RNTI is reallocated always when the Serving RNC for the RRC connection is changed and deallocated when the RRC connection is released.

In addition for each UE having an RRC connection, there is an identifier of its current serving RNC, which is denoted as SRNC identifier. The SRNC identifier together with S-RNTI is a unique identifier of the RRC connection within PLMN. The combination of SRNC identifier and S-RNTI is referred to as U-RNTI (UTRAN Radio Network Temporary Identity), which is used on the radio interface.

C-RNTI for an UE is allocated by a controlling RNC and it is unique within one cell controlled by the allocating CRNC. C-RNTI can be reallocated when a UE accesses a new cell with the cell update procedure.

H-RNTI for an UE is allocated by a controlling RNC and it is unique within one cell controlled by the allocating CRNC. H-RNTI is reallocated when an HS-DSCH cell change is performed.

Usage of UE identifiers

U-RNTI is allocated to an UE having a RRC connection. It identifies the UE within UTRAN and is used as a UE identifier in cell update, URA update, RRC connection reestablishment and (UTRAN originated) paging messages and associated responses on the radio interface. The SRNC identifier within the U-RNTI is used by the Controlling RNC to route the received uplink messages towards the Serving RNC.

C-RNTI is used as a UE identifier in all other DCCH/DTCH common channel messages on the radio interface.

H-RNTI is used as an UE identifier for the HS-DSCH.

NAS identifiers are used as the UE identifier in the initial access CCCH message on the radio interface.

3GPP TSG-RAN WG2 Meeting #29
Gyeongju , Korea, 13 - 17 May 2002

Tdoc R2-021457

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.302** **CR** **128** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	HSDPA corrections
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	5.5.2002
Category:	⌘	**F**
Release:	⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
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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)

Reason for change:	⌘	Cleanup of HSDPA related additions Some R99 models were erroneously removed in this version of the specification
Summary of change:	⌘	Models for physical channels reintroduced (erroneously removed) Parameter TTI within CFN included in order to apply a similar model for the interface between physical layer and MAC as exists in R99 (account for smaller TTI) Description of transport formats to be included in an update of this document
Consequences if not approved:	⌘	Information that existed in R99 would be missing Parameter in primitive missing (unclean model)

Clauses affected:	⌘	6.1, 6.2, 10.1, 10.1.3, Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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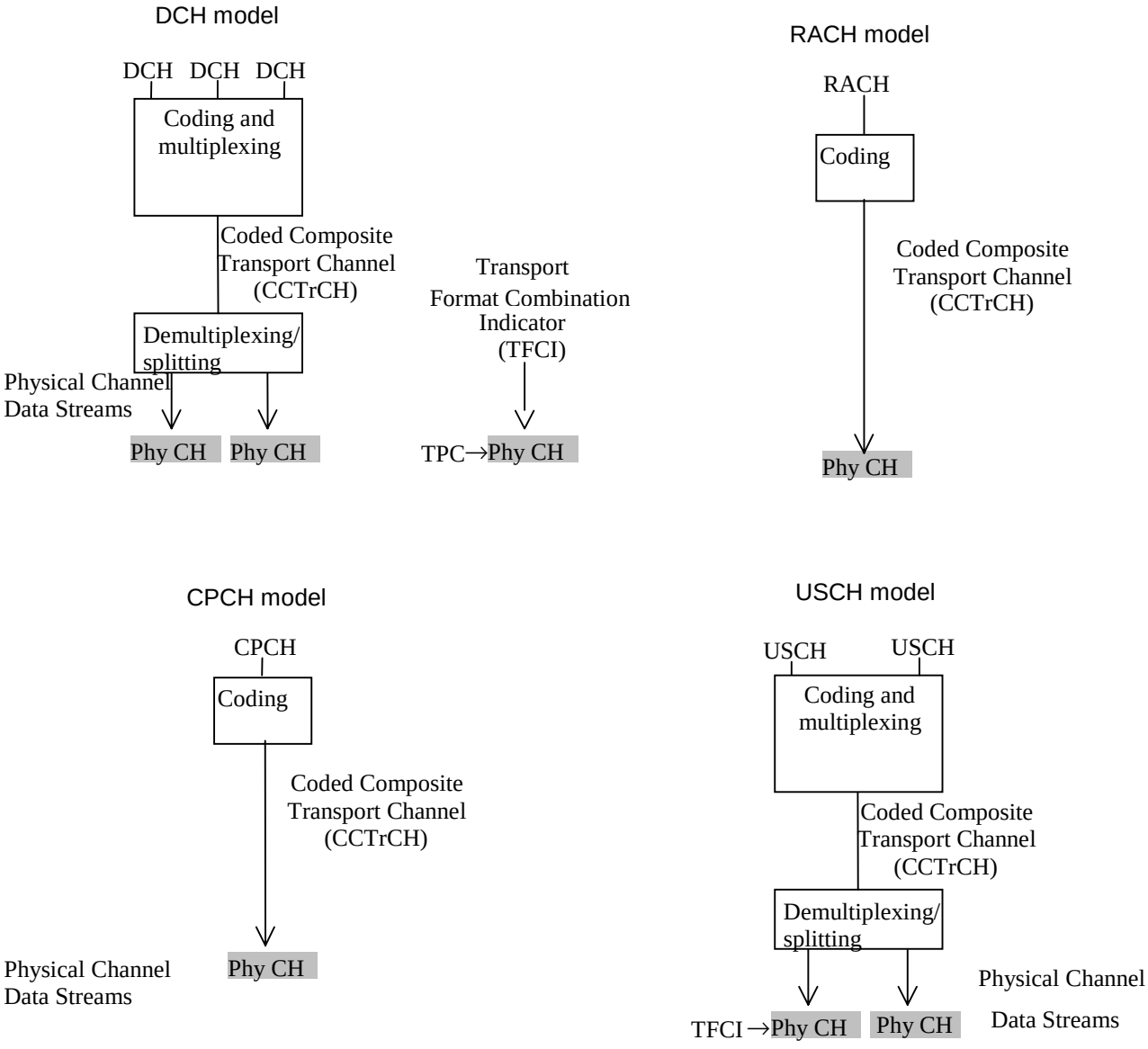
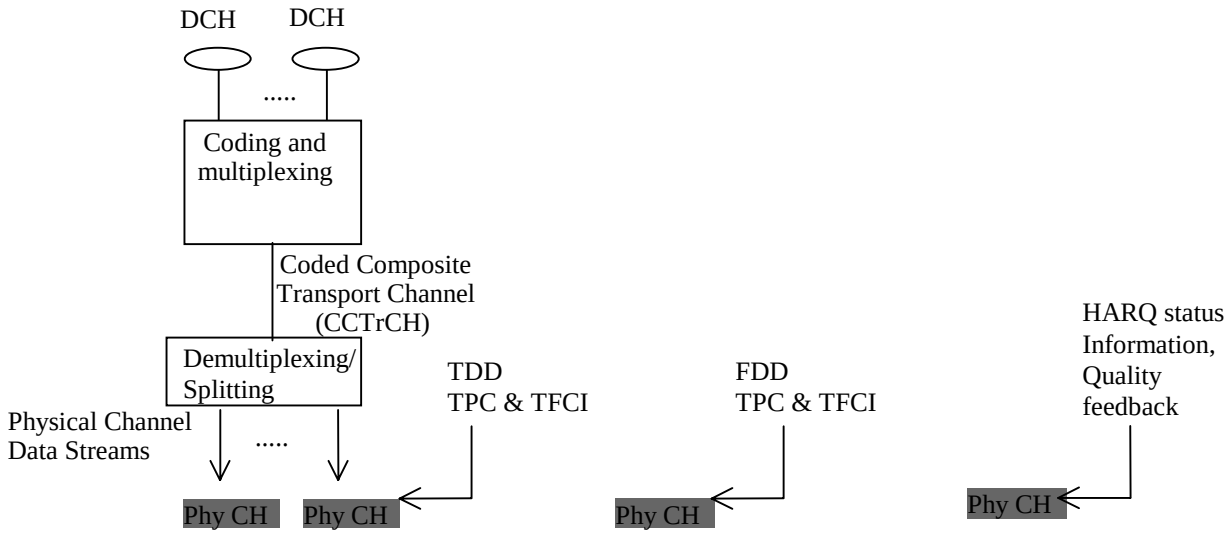
6 Model of physical layer of the UE

6.1 Uplink models

Figure 2 shows models of the UE's physical layer in the uplink for both FDD and TDD mode. It shows the models for DCH, RACH, CPCH (the latter two used in FDD mode only) and USCH (TDD only). Some restriction exist for the use of different types of transport channel at the same time, these restrictions are described in the clause "UE Simultaneous Physical Channel combinations". More details can be found in [3] and [4].



DCH model with HS-DSCH support



NOTE 1: CPCH is for FDD only.

NOTE 2: USCH is for TDD only.

Figure 2: Model of the UE's physical layer - uplink

The DCH model shows that one or several DCHs can be processed and multiplexed together by the same coding and multiplexing unit. The detailed functions of the coding and multiplexing unit are not defined in the present document but in [3] and [4]. The single output data stream from the coding and multiplexing unit is denoted *Coded Composite Transport Channel (CCTrCH)*.

The bits on a CCTrCH Data Stream can be mapped on the same Physical Channel and should have the same C/I requirement.

On the downlink, multiple CCTrCH can be used simultaneously with one UE. In the case of FDD, only one fast power control loop is necessary for these different CCtrCH, but the different CCtrCH can have different C/I requirements to provide different QoS on the mapped Transport Channels. In the case of TDD, different power control loops can be applied for different CCTrCH. One physical channel can only have bits coming from the same CCTrCH.

On the uplink and in the case of FDD, only one CCTrCH can be used simultaneously. On the uplink and in the case of TDD, multiple CCTrCH can be used simultaneously.

When multiple CCTrCH are used by one UE, one or several TFCI can be used, but each CCTrCH has only zero or one corresponding TFCI. In the case of FDD, these different words are mapped on the same DPCCH. In the case of TDD, these different TFCIs can be mapped on different DPCH.

The data stream of the CCTrCH is fed to a data demultiplexing/splitting unit that demultiplexes/splits the CCTrCH's data stream onto one or several *Physical Channel Data Streams*.

The current configuration of the coding and multiplexing unit is either signalled to, or optionally blindly detected by, the network for each 10 ms frame. If the configuration is signalled, it is represented by the *Transport Format Combination Indicator (TFCI)* bits. Note that the TFCI signalling only consists of pointing out the current transport format combination within the already configured transport format combination set. In the uplink there is only one TFCI representing the current transport formats on all DCHs of one CCTrCH simultaneously. In FDD mode, the physical channel data stream carrying the TFCI is mapped onto the physical channel carrying the power control bits and the pilot. In TDD mode the TFCI is time multiplexed onto the same physical channel(s) as the DCHs. The exact locations and coding of the TFCI are signalled by higher layers.

The DCH and USCH have the possibility to perform Timing Advance in TDD mode.

The model for the RACH case shows that RACH is a common type transport channel in the uplink. RACHs are always mapped one-to-one onto physical channels (PRACHs), i.e. there is no physical layer multiplexing of RACHs, and there can only be one RACH TrCH and no other TrCH in a RACH CCTrCH. Service multiplexing is handled by the MAC layer. In one cell several RACHs/PRACHs may be configured. If more than one PRACH is configured in a cell, the UE performs PRACH selection as specified in [4].

In FDD, the RACHs mapped to the PRACHs may all employ the same Transport Format and Transport Format Combination Sets, respectively. It is however also possible that individual RACH Transport Format Sets are applied on each available RACH/PRACH.

In TDD, there is no TFCI transmitted in the burst, and therefore each RACH is configured with a single transport format within its TFS. The RACHs mapped to the PRACHs may all employ the same Transport Format. It is however also possible that individual RACH Transport Formats are applied on each available RACH/PRACH combination.

The available pairs of RACH and PRACHs and their parameters are indicated in system information. In FDD mode, the various PRACHs are distinguished either by employing different preamble scrambling codes, or by using a common scrambling code but distinct (non-overlapping) partitions of available signatures and available subchannels. In TDD mode, the various PRACHs are distinguished either by employing different timeslots, or by using a common timeslot but distinct (non-overlapping) partitions of available channelisation codes and available subchannels. Examples of RACH/PRACH configurations are given in [6].

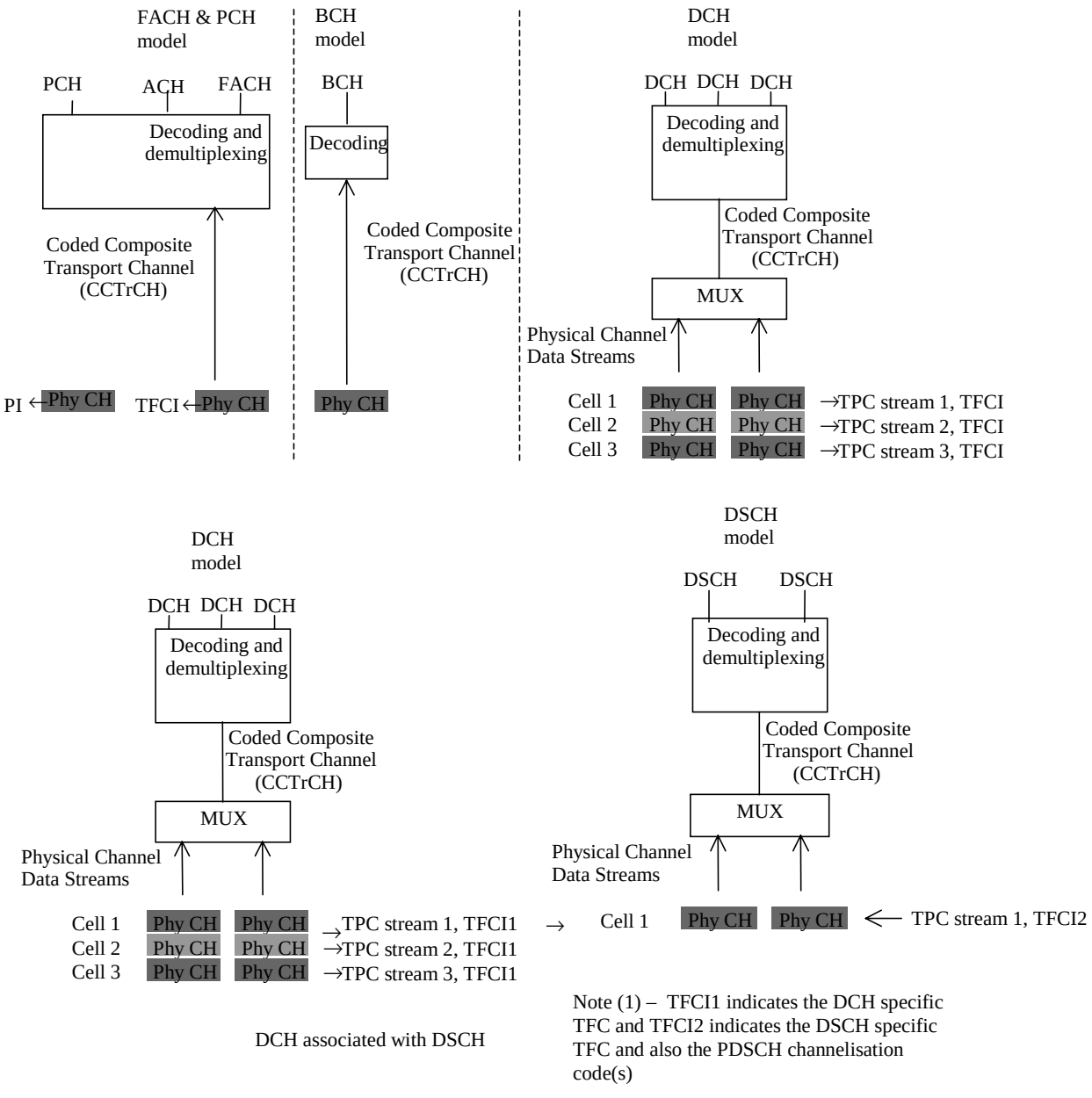
The CPCH, which is another common type transport channel, has a physical layer model as shown in figure2. There is always a single CPCH transport channel mapped to a PCPCH physical channel which implies a one-to-one correspondence between a CPCH TFI and the TFCI conveyed on PCPCH. There can only be one CPCH TrCH and no other TrCH in a CPCH CCTrCH. A CPCH transport channel belongs to a CPCH set which is identified by the application of a common, CPCH set-specific scrambling code for access preamble and collision detection, and multiple PCPCH physical channels. Each PCPCH shall employ a subset of the Transport Format Combinations implied by the Transport Format Set of the CPCH set. A UE can request access to CPCH transport channels of a CPCH set, which is assigned when the service is configured for CPCH transmission.

In FDD in case of a configured HS-DSCH one physical channel (HS-DPCCH) is configured for quality indication and HARQ status information. In TDD in case of a configured HS-DSCH a shared physical channel (HS-SICH) is configured for feedback indication and HARQ status information.

6.2 Downlink models

Figure 3 and figure 4 show the model of the UE's physical layer for the downlink in FDD and TDD mode, respectively.

Note that there is a different model for each transport channel type.



Note (1) – TFCI1 indicates the DCH specific TFC and TFCI2 indicates the DSCH specific TFC and also the PDSCH channelisation code(s)

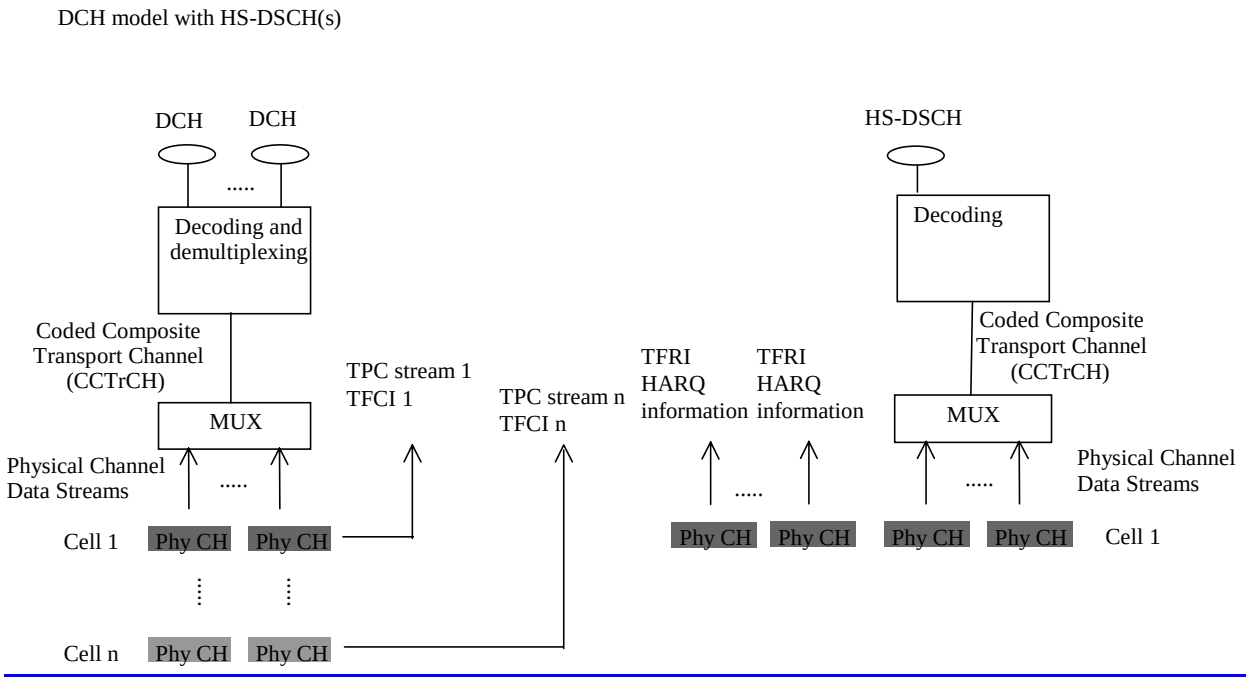
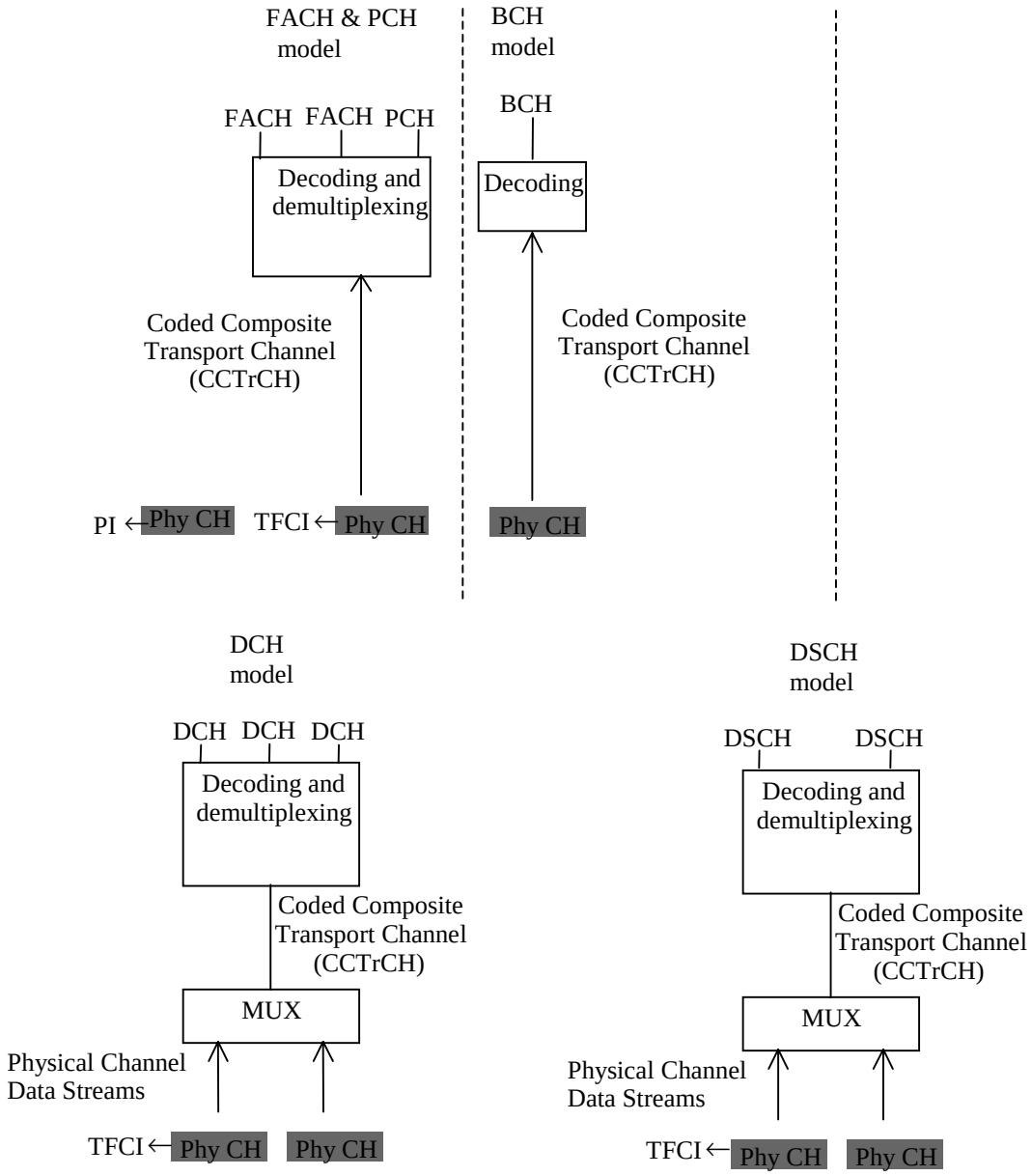


Figure 3: Model of the UE's physical layer - downlink FDD mode


FACH & PCH model
BCH model
FACH FACH PCH
Decoding and demultiplexing
BCH
Decoding
Coded Composite Transport Channel (CCTrCH)
Coded Composite Transport Channel (CCTrCH)
PI ← Phy CH
TFCI ← Phy CH
Phy CH
DCH model
DSCH model
DCH DCH DCH
Decoding and demultiplexing
Coded Composite Transport Channel (CCTrCH)
MUX
Physical Channel Data Streams
TFCI ← Phy CH Phy CH
DSCH DSCH
Decoding and demultiplexing
Coded Composite Transport Channel (CCTrCH)
MUX
Physical Channel Data Streams
TFCI ← Phy CH Phy CH

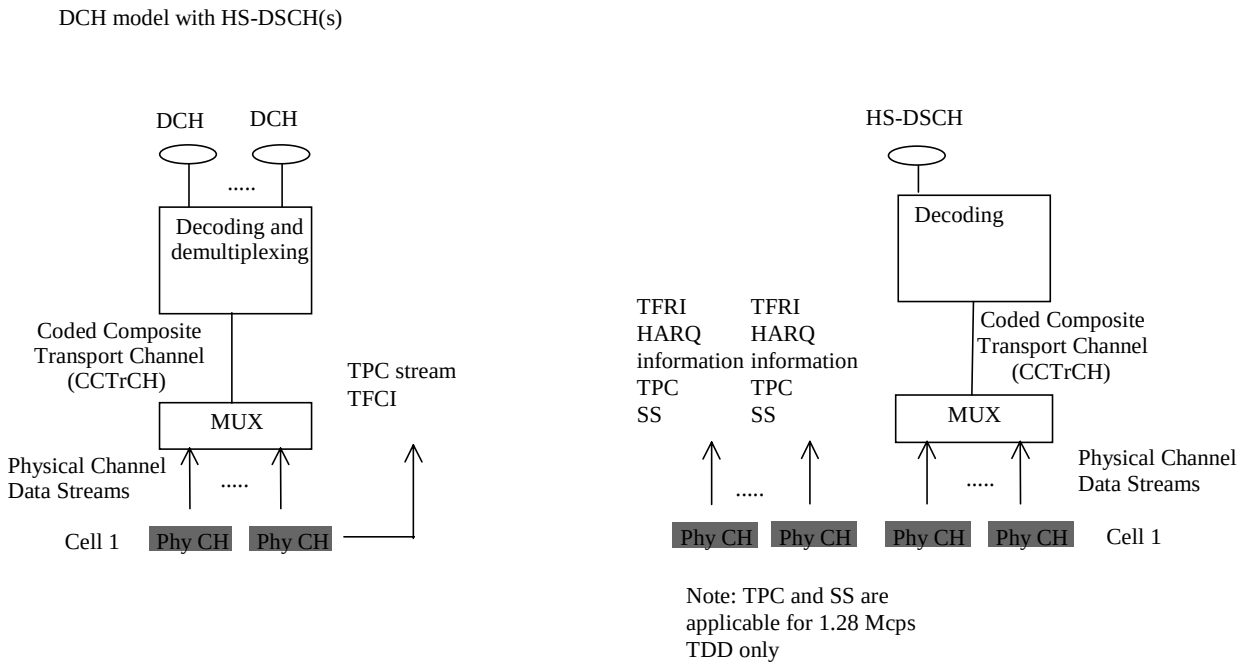


Figure 4: Model of the UE's physical layer – downlink TDD mode

For the DCH case, the mapping between DCHs and physical channel data streams works in the same way as for the uplink. Note however, that the number of DCHs, the coding and multiplexing etc. may be different in uplink and downlink.

In the FDD mode, the differences are mainly due to the soft and softer handover. Further, the pilot, TPC bits and TFCI are time multiplexed onto the same physical channel(s) as the DCHs. Further, the definition of physical channel data stream is somewhat different from the uplink. In TDD mode the TFCI is time multiplexed onto the same physical channel(s) as the DCHs. The exact locations and coding of the TFCI are signalled by higher layers.

Note that it is logically one and the same physical data stream in the active set of cells, even though physically there is one stream for each cell. The same processing and multiplexing is done in each cell. The only difference between the cells is the actual codes, and these codes correspond to the same spreading factor.

The physical channels carrying the same physical channel data stream are combined in the UE receiver, excluding the pilot, and in some cases the TPC bits. TPC bits received on certain physical channels may be combined provided that UTRAN has informed the UE that the TPC information on these channels is identical.

A PCH and one or several FACH can be encoded and multiplexed together forming a CCTrCH. Similarly as in the DCH model there is one TFCI for each CCTrCH for indication of the transport formats used on each PCH and FACH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto a separate physical channel. The BCH is always mapped onto one physical channel without any multiplexing with other transport channels, and there can only be one BCH TrCH and no other TrCH in a BCH CCTrCH.

For each HS-DSCH TTI, each HS-SCCH carries HS-DSCH-related downlink signalling for one UE. The following information is carried on the HS-SCCH:

- Transport Format and Resource Indicator (TFRI);
- Hybrid-ARQ-related Information (HARQ information).

10.1 Generic names of primitives between layers 1 and 2

The primitives between layer 1 and layer 2 are shown in table 7.

Table 7: Primitives between layer 1 and 2

Generic Name	Parameter			
	REQ	**IND**	**RESP**	**CNF**
PHY-Access	Transport Format subset (1), ASC selected for Transport Block Set to be transmitted (5)	Not Defined	Not Defined	access information (1)
PHY-Data	TFI, Transport Block Set, CFN_{CELL}, TTI within CFN, (6), Paging Indicators (2), ASC selected for that Transport Block Set (3), HS-DSCH information (6)	TFI, Transport Block Set, CRC check result, TD (4), HARQ process (6)	Not Defined	Not Defined
PHY-CPCH_Status	Transport Format subset (1)	Not Defined	Not Defined	Transport Format subset (1)
PHY-Status	Not Defined, HARQ status	Event value, Feedback information (6)	Not Defined	Not Defined
NOTE (1): FDD only. NOTE (2): PCH only NOTE (3): 3.84 Mcps TDD RACH only NOTE (4): optional, TDD only NOTE (5): FDD and 1.28 Mcps TDD RACH only NOTE (6): HS-DSCH only				

10.1.3 PHY-Data-REQ

The PHY-Data primitives are used to request SDUs used for communications passed to and from the physical layer. One PHY-Data primitive is submitted every Transmission Time Interval for each Transport Channel.

Parameters:

- TFI;
- Transport Block Set;
- CFN_{CELL};
- TTI within CFN (HS-DSCH only)
- Page Indicators (PIs) (PCH only);
- HS-DSCH information (HS-DSCH information);
- ASC selected for that Transport Block Set (3.84 Mcps TDD RACH only).

Annex A (normative): Description of Transport Formats

The following table describes the characterisation of a Transport Format.

Table A.1: Characterisation of Transport Format

		Attribute values	BCH	PCH	FACH	RACH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	246	1 to 5000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	246	1 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20 ms	10ms for FDD, 20ms for TDD	10, 20 ms, 40 and 80 ms	10 ms and 20 ms for FDD, 10 ms for 3.84 Mcps TDD 5ms, 10ms and 20ms for 1.28 Mcps TDD
	Type of channel coding	No Coding (TDD only) Turbo coding Convolutional coding	Convolutional coding	Convolutional coding	No coding (TDD only) Turbo coding Convolutional coding	Convolutional coding
	Code rates	1/2, 1/3	1/2 for FDD and 3.84 Mcps TDD 1/3 for 1.28 Mcps TDD	1/2 for FDD and 3.84 Mcps TDD 1/2, 1/3 for 1.28 Mcps TDD	1/2, 1/3	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity	0 to 5 000 1 bit granularity
	Transport Block Set Size	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity	0 to 200 000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	No coding (TDD only) Turbo coding Convolutional coding	No coding (TDD only) Turbo coding Convolutional coding	No coding (TDD only) Turbo coding Convolutional coding	No coding (TDD only) Turbo coding Convolutional coding	No coding (TDD only) Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0,5 to 4				

		HS-DSCH
Dynamic part	Transport Block Size	1 to 200 000 8 bit granularity
	Transport Block Set Size	1 to 200 000 8 bit granularity
	Modulation scheme	QPSK, 16 QAM
	Redundancy version/Constellation	1 to 8
Static part	Transmission Time Interval	2ms for FDD 5 ms for 1.28 Mcps TDD 10 ms for 3.84 Mcps TDD
	Type of channel coding	Turbo coding
	Code rates	1/3
	CRC size	24

NOTE 1: The maximum size of the Transport Block has been chosen so as to avoid any need for segmentation in the physical layer into sub-blocks (segmentation should be avoided in the physical layer).

NOTE 2: Code rate is fixed to 1/3 in case of Turbo coding.

NOTE 3: All channels using the same resources as the BCH (i.e. the same timeslot and code, e.g. in a multiframe pattern) have to use different Transport Formats than the BCH to allow the identification of the BCH channel by physical layer parameters. Due to the differing parameters, decoding of other transport channels than BCH will result in an erroneous CRC.

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea, 13-17 May 2002

Tdoc R2-021408

CR-Form-v5

CHANGE REQUEST

⌘ **25.306** **CR** **040** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Corrections in HSDPA UE capabilities
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	May 09, 2002
Category:	⌘	**F**
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)

Reason for change:	⌘	From LS R1-020684, R2-020865: "The category definition is rather messy and makes people confuse the reason of the order of the category. The category with inter-TTI=2 has only one choices of HARQ buffer size. The inter-TTI=2 have a character of simple implementation and efficient hardware resource when UE is designed with front receiver and turbo decoder. In the other hand, the category with inter-TTI=1 and 3 has three choices of HARQ buffer."
Summary of change:	⌘	**From LS R1-020684, R2-020865:** " - The order is sorted in ascending order of the bit rate and the complexity. – Two different values of HARQ buffer for each code and inter-TTI processing combinations. – The soft buffer value of inter-TTI is update to align other categories in case of inter-TTI is two. – More categories are not necessary from FDD physical layer point of view in this release was agreed. Therefore the note was removed." **Nokia:** - Based on the agreement in RAN2#28 the minimum L2 buffer sizes are defined for FDD physical layer categories.
Consequences if not approved:	⌘	- The category table kept rather untidy.

Clauses affected:	⌘	4.5.1, 5.1, 5.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.5.1 Transport channel parameters in downlink

Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant

NOTE 1: "Being received" refers to all bits in the active TFC within the TFCS over all simultaneous transport channels received by the UE. "Arbitrary time instant" means that the time instant corresponding to the highest sum of number of bits is relevant. This note also applies to similar parameter definitions below.

This parameter is defined as:

$$\Sigma_i(N_i)$$

where N_i is defined as the number of bits in transport block #i, and the sum is over all transport blocks being received at an arbitrary time instant. All transport blocks that are to be simultaneously received by the UE on DCH, FACH, PCH and DSCH transport channels are included in the parameter.

NOTE 2: A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* * *Transport Block size* over all simultaneous transport channels is larger than what the UE capability indicates.

This UE capability also limits the maximum number of bits before de-rate-matching as follows: The maximum number of bits before de-rate matching being received at an arbitrary time instant (DPCH, PDSCH, S-CCPCH) shall be less or equal to 6.6 times the Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant.

Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant.

This parameter is defined similar to the parameter above, but the sum includes only transport blocks that are to be convolutionally coded.

Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant.

This parameter is defined similar to the parameter above, but the sum includes only transport blocks that are to be turbo coded.

Maximum number of simultaneous transport channels

This is defined as the maximum number of downlink Transport Channels that the UE is capable to process simultaneously, not taking into account the rate of each Transport Channel.

NOTE: The number of simultaneous transport channels affects how the total memory space and processing capacity can be shared among the transport channels. A UE does not need to support more simultaneous transport channels than the UE capability allows for.

Maximum number of simultaneous CCTrCH

This is defined as the maximum number of downlink CCTrCH that the UE is capable to process simultaneously. CCTrCH should be interpreted as consisting of DCH, FACH or DSCH.

Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval

All transport blocks that are to be simultaneously received by the UE on DCH, FACH, PCH and DSCH transport channels are included in the parameter.

NOTE: Relates to processing requirements for CRC in downlink. A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* is larger than what the UE capability indicates. In the case of several CCTrCHs, the combination of the TFCs within the respective TFCSs for simultaneous TTIs at an arbitrary time instant shall not exceed this parameter.

Maximum number of TFC

Defines the maximum number of transport format combinations the UE can store, where all transport format combinations for all downlink transport format combination sets are counted. Different channelisation code mapping shall be counted as separate TFC in case of DSCH.

Maximum number of TF

The maximum total number of downlink transport formats the UE can store, where all transport formats for all downlink transport channels are counted.

Support for turbo decoding

Defines whether turbo decoding is supported or not.

~~Maximum number of HS-DSCH transport channel bits received within a HS-DSCH TTI~~Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI

Defines maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI ~~the maximum number of HS-DSCH transport channel bits~~ the UE is capable of receiving within a HS-DSCH TTI.

5.1 Value ranges

Table 5.1: UE radio access capability parameter value ranges

		UE radio access capability parameter	Value range
PDCP parameters		Support for RFC 2507	Yes/No
		Support for RFC 3095	Yes/No
		Support for loss-less SRNS relocation	Yes/No
		Maximum header compression context space	512, 1024, 2048, 4096, 8192 bytes
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 500, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
PHY parameters	Transport channel parameters in downlink	Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo decoding	Yes/No
	Transport channel parameters in uplink	Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840

		UE radio access capability parameter	Value range
		Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	2, 4, 8, 16, 32
		Maximum number of simultaneous CCTrCH of DCH type (TDD only)	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks transmitted within TTIs that start at the same time	2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo encoding	Yes/No
	FDD Physical channel parameters in downlink	Maximum number of DPCH/PDSCH codes to be simultaneously received	1, 2, 3, 4, 5, 6, 7, 8
		Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH)	600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800
		Support for SF 512	Yes/No
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Simultaneous reception of SCCPCH and DPCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Maximum number of simultaneous S-CCPCH radio links	1 NOTE: Only the value 1 is part of this release of the specification
		Support of dedicated pilots for channel estimation	Yes/No
	FDD Physical channel parameters in uplink	Maximum number of DPDCH bits transmitted per 10 ms	600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 48000, 57600
		Support of PCPCH	Yes/No
	TDD 3.84 Mcps physical channel parameters in downlink	Maximum number of timeslots per frame	1..14
		Maximum number of physical channels per frame	1, 2, 3..224
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
	TDD 3.84 Mcps physical channel parameters in uplink	Maximum Number of timeslots per frame	1..14
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of PUSCH	Yes/No
	TDD 1.28 Mcps physical channel parameters in downlink	Maximum number of timeslots per subframe	1..6
		Maximum number of physical channels per subframe	1, 2, 3, …, 96
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
		Support 8PSK	Yes/No
	TDD 1.28 Mcps physical channel parameters in uplink	Maximum number of timeslots per subframe	1..6

		UE radio access capability parameter	Value range
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of 8PSK	Yes/No
		Support of PUSCH	Yes/No
RF parameters	FDD RF parameters	UE power class	3, 4 NOTE: Only power classes 3 and 4 are part of this release of the specification
		Tx/Rx frequency separation	190 MHz 174.8 MHz to 205.2 MHz 134.8 MHz to 245.2 MHz
RF parameters	TDD 3.84 Mcps RF parameters	UE power class	2, 3 NOTE: Only power classes 2 and 3 are part of this release of the specification
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
	TDD 1.28 Mcps RF parameters	UE power class	2, 3
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
Multi-mode related parameters		Support of UTRA FDD	Yes/No
		Support of UTRA TDD 3.84 Mcps	Yes/No
		Support of UTRA TDD 1.28 Mcps	Yes/No
Multi-RAT related parameters		Support of GSM	Yes/No (per GSM frequency band)
		Support of multi-carrier	Yes/No
UE positioning related parameters		Standalone location method(s) supported	Yes/No
		Network assisted GPS support	Network based / UE based / Both/ None
		GPS reference time capable	Yes/No
		Support for IPDL	Yes/No
		Support for OTDOA UE based method	Yes/No
		Support for Rx-Tx time difference type 2 measurement	Yes/No
		Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states	Yes/No
Measurement related capabilities		Need for downlink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
		Need for uplink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
General capabilities		Access Stratum release indicator	R99, REL-4

Table 5.1a: FDD HS-DSCH physical layer categories

~~HS-DSCH category~~	~~Maximum number of HS-DSCH codes received~~	~~Minimum inter-TTI interval~~	~~Maximum number of HS-DSCH transport-channel bits received within an HS-DSCH TTI~~	~~Total number of soft channel bits~~
~~Category 1~~	~~15~~	~~1~~	~~20456~~	~~172800~~
~~Category 2~~	~~10~~	~~1~~	~~14600~~	~~115200~~
~~Category 3~~	~~5~~	~~1~~	~~7300~~	~~57600~~
~~Category 4~~	~~5~~	~~2~~	~~7300~~	~~28000~~
~~Category 5~~	~~5~~	~~3~~	~~7300~~	~~19200~~
~~Category 6~~	~~10~~	~~1~~	~~14600~~	~~153600~~
~~Category 7~~	~~5~~	~~1~~	~~7300~~	~~96000~~
~~Category 8~~	~~5~~	~~1~~	~~7300~~	~~76800~~
~~Category 9~~	~~5~~	~~3~~	~~7300~~	~~48000~~
~~Category 10~~	~~5~~	~~3~~	~~7300~~	~~38400~~
~~Category 11~~	~~15~~	~~1~~	~~[28800]~~	~~172800~~

HS-DSCH category	Maximum number of HS-DSCH codes received	Minimum inter-TTI interval	Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI	Total number of soft channel bits
Category 1	5	3	7300	19200
Category 2	5	3	7300	28800
Category 3	5	2	7300	28800
Category 4	5	2	7300	38400
Category 5	5	1	7300	57600
Category 6	5	1	7300	67200
Category 7	10	1	14600	115200
Category 8	10	1	14600	134400
Category 9	15	1	20432	172800
Category 10	15	1	28776	172800

~~NOTE: More categories may be added at a later stage.~~

Table 5.1b: RLC and MAC-hs parameters for FDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of AM RLC entities	Minimum total RLC AM and MAC-hs buffer size
Category 1	6	50
Category 2	6	50
Category 3	6	50
Category 4	6	50
Category 5	6	50
Category 6	6	50
Category 7	8	100
Category 8	8	100
Category 9	8	150
Category 10	8	150

Table 5.1c~~b~~: 1.28 Mcps TDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of HS-DSCH codes per timeslot	Maximum number of HS-DSCH timeslots per TTI	Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI	Total number of soft channel bits	Support of SF=1 for HS-PDSCH
Category 1	8	5	7040	28160	No
Category 2	8	5	7040	56320	No
Category 3	8	5	7040	84480	No
Category 4	8	5	14080	56320	Yes
Category 5	8	5	14080	112640	Yes
Category 6	12	5	10228	40912	No
Category 7	12	5	10228	81824	No
Category 8	12	5	10228	122736	No
Category 9	12	5	14080	56320	Yes
Category 10	12	5	14080	112640	Yes
Category 11	16	5	14080	56320	Yes
Category 12	16	5	14080	112640	Yes
Category 13	16	5	14080	168960	Yes

5.2.2 Combinations of UE Radio Access Parameters for DL

Table 5.2.2.1: UE radio access capability parameter combinations, DL parameters

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640	3840	3840	6400	10240	20480
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	NA	3840	3840	6400	10240	20480(1) 10240(2) NOTE 5
Maximum number of simultaneous transport channels	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	16 NOTE 4
Maximum number of simultaneous CCTrCH (FDD)	1 NOTE 3	2/1 NOTE 2 NOTE 3	2/1 NOTE 2 NOTE 3	2 NOTE 3	2 NOTE 3	2 NOTE 3
Maximum number of simultaneous CCTrCH (TDD)	2 NOTE 3	3 NOTE 3	3 NOTE 3	3 NOTE 3	4 NOTE 3	4 NOTE 3
Maximum total number of transport blocks received within TTIs that end at the same time	8	8	16	32	64	96
Maximum number of TFC	32	48	96	128	256	1024
Maximum number of TF	32	64	64	64	128	256
Support for turbo decoding	No	Yes	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)						
Maximum number of DPCH/PDSCH codes to be simultaneously received	1	2/1 NOTE 2	2/1 NOTE 2	3	3	3
Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH).	1200	3600/2400 NOTE2	7200/4800 NOTE2	19200	28800	57600
Support for SF 512 for DPCH NOTE 6	No	No	No	No	No	No
Support of PDSCH	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes	Yes	Yes
Support of HS-PDSCH	No	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7
Maximum number of simultaneous S-CCPCH radio links	1	1	1	1	1	1
Support of dedicated pilots for channel estimation	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Physical channel parameters (TDD 3.84 Mcps)						
Maximum number of timeslots per frame	1	2	4	5	10	12
Maximum number of physical channels per frame	8	9	14	28	64	136
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1/16 NOTE 1
Support of PDSCH	Yes/No NOTE 1	Yes	Yes	Yes	Yes	Yes
Maximum number of physical channels per timeslot	8	9	9	9	9	13
Physical channel parameters (TDD 1.28 Mcps)						
Maximum number of timeslots per subframe	1	2	3	4	6	6
Maximum number of physical	8	12	18	43	77	77

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
channels per subframe						
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1
Support of PDSCH	Yes/no NOTE 1	Yes	Yes	Yes	Yes	Yes
Maximum number of physical channels per timeslot	8	11	14	14	14	14
Support of 8PSK	No	No	No	No	No	Yes

NOTE 1: Options represent different combinations that should be supported with conformance tests.

NOTE 2: Options depend on the support of PDSCH. The highest value is required if PDSCH is supported.

NOTE 3: The given number does not contain the BCH CCTrCH of the current cell nor of the neighbour cells.

NOTE 4: The given number does not contain the BCH of the neighbour cell.

NOTE 5: (1) For FDD and 3.84 Mcps TDD (2) For 1.28 Mcps TDD.

NOTE 6: This UE capability does not relate to the support of CPCH in the uplink for which SF 512 is needed

NOTE 7: When HS-DSCH is configured the UE shall simultaneously support the UE capability values defined in the 64 kbps reference class. However, simultaneous support of PDSCH and HS-PDSCH is not required.

The reference combinations for HS-DSCH capabilities are shown in tables 5.2.2.2 and 5.2.2.3. These tables are subject to further discussions in TSG-RAN WG1 and TSG-RAN WG2.

Table 5.2.2.2: FDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.2 Mbps class	3.6 Mbps class	7 Mbps class	10 Mbps class
RLC and MAC-hs parameters				
Total RLC AM and MAC-hs buffer size (kbytes)	50	50~~[100]~~	100~~[200]~~	150~~[300]~~
Maximum number of AM RLC entities	6	6	8	8
PHY parameters				
FDD HS-DSCH category	Category 1~~5~~	Category 5~~3~~	Category 7~~2~~	Category 9~~1~~

Table 5.2.2.3: 1.28 Mcps TDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.4 Mbps class	2.0 Mbps class	2.8 Mbps class
RLC and MAC-HS parameters			
Total RLC AM and MAC-hs buffer size (kbytes)	50	50	100
Maximum number of AM RLC entities	6	6	6
PHY parameters			
1.28 Mcps TDD HS-DSCH Category	Category 1	Category 6	Category 11

TSG-RAN Working Group 2 Meeting #29 ***R2-021409***
Gyeongju, Korea, 13- 17 May 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.306** **CR** **041** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	HSDPA TDD UE Capabilities
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	17 MAY 2002
Category:	⌘	**F**
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)

Reason for change:	⌘	Correction of HSDPA UE Capabilities for 1.28Mcps TDD. Addition of HSDPA UE Capabilities for 3.84Mcps TDD.
Summary of change:	⌘	HSDPA UE Capabilities are corrected to allow a code limitation to be signalled for 1.28Mcps TDD. HSDPA UE Capabilities are added for 3.84Mcps TDD.
Consequences if not approved:	⌘	TDD UE would not be able to correctly signal HSDPA UE capabilities to UTRAN. Isolated impact statement: Only essential corrections are introduced. Since current specification is incomplete and contains errors, no working implementation can exist for the current specification.

Clauses affected:	⌘	4.5.5.1, 4.5.5.2, 5.1, 5.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.5.5 TDD physical channel parameters in downlink

4.5.5.1 3.84 Mcps TDD physical channel parameters in downlink

Maximum number of timeslots per frame

Defines the maximum number of timeslots per frame that the UE can receive.

Maximum number of physical channels per frame

This parameter defines how many physical channels can be received during one frame. The distribution of the received physical channels on the received timeslots can be arbitrary.

Minimum SF

Defines the minimum SF supported by the UE.

Support of PDSCH

Defines whether PDSCH is supported or not.

Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

Maximum number of physical channels per timeslot

This parameter defines how many physical channels can be received within one timeslot.

Maximum number of HS-DSCH codes per timeslot

This is the maximum number of channelisation codes that can be used for the HS-DSCH in a given downlink timeslot. Where the parameter "Maximum number of physical channels per timeslot" is larger than "Maximum number of HS-DSCH codes per timeslot", this indicates that the UE is able to receive HS-SCCH or associated DPCH transmissions in the same timeslot as HS-PDSCHs, even if the maximum HS-DSCH code allocation for that slot is being used.

Maximum number of HS-DSCH timeslots per TTI

This is the maximum number of timeslots in a given 10 ms frame that can be used for HS-DSCH transmissions.

Support of SF=1 for HS-PDSCH

Defines whether SF=1 for HS-PDSCH is supported or not.

Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI

Defines maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI the UE is capable of receiving within a HS-DSCH TTI.

Total number of soft channel bits

Defines the maximum number of soft channel bits over all HARQ processes.

4.5.5.2 1.28 Mcps TDD physical channel parameters in downlink

Maximum number of timeslots per subframe

Defines the maximum number of timeslots per subframe that the UE can receive.

Maximum number of physical channels per subframe

This parameter defines how many physical channels can be received during one subframe. The distribution of the received physical channels on the received timeslots can be arbitrary.

Minimum SF

Defines the minimum SF supported by the UE.

Support of PDSCH

Defines whether PDSCH is supported or not.

Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

Maximum number of physical channels per timeslot

This parameter defines how many physical channels can be received within one timeslot.

Support of 8PSK

Defines whether 8PSK modulation is supported or not.

Maximum number of HS-DSCH codes per timeslot

This is the maximum number of channelisation codes that can be used for the HS-DSCH in a given downlink timeslot. Where the parameter "Maximum number of physical channels per timeslot" is larger than "Maximum number of HS-DSCH codes per timeslot", this indicates that the UE is able to receive HS-SCCH or associated DPCH transmissions in the same timeslot as HS-PDSCHs, even if the maximum HS-DSCH code allocation for that slot is being used.

Maximum number of HS-DSCH timeslots per TTI

This is the maximum number of timeslots in a given 5 ms subframe that can be used for HS-DSCH transmissions.

Support of SF=1 for HS-PDSCH

Defines whether SF=1 for HS-PDSCH is supported or not.

Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI

Defines maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI the UE is capable of receiving within a HS-DSCH TTI.

Total number of soft channel bits

Defines the maximum number of soft channel bits over all HARQ processes.

5 Possible UE radio access capability parameter settings

5.1 Value ranges

Table 5.1: UE radio access capability parameter value ranges

		UE radio access capability parameter	Value range
PDCP parameters		Support for RFC 2507	Yes/No
		Support for RFC 3095	Yes/No
		Support for loss-less SRNS relocation	Yes/No
		Maximum header compression context space	512, 1024, 2048, 4096, 8192 bytes
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 500, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
PHY parameters	Transport channel parameters in downlink	Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo decoding	Yes/No
	Transport channel parameters in uplink	Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	2, 4, 8, 16, 32
		Maximum number of simultaneous CCTrCH of DCH type (TDD only)	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks transmitted within TTIs that start at the same time	2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo encoding	Yes/No

		UE radio access capability parameter	Value range
	FDD Physical channel parameters in downlink	Maximum number of DPCH/PDSCH codes to be simultaneously received	1, 2, 3, 4, 5, 6, 7, 8
		Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH)	600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800
		Support for SF 512	Yes/No
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Simultaneous reception of SCCPCH and DPCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Maximum number of simultaneous S-CCPCH radio links	1 NOTE: Only the value 1 is part of this release of the specification
		Support of dedicated pilots for channel estimation	Yes/No
	FDD Physical channel parameters in uplink	Maximum number of DPDCH bits transmitted per 10 ms	600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 48000, 57600
		Support of PCPCH	Yes/No
	TDD 3.84 Mcps physical channel parameters in downlink	Maximum number of timeslots per frame	1..14
		Maximum number of physical channels per frame	1, 2, 3..224
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
	TDD 3.84 Mcps physical channel parameters in uplink	Maximum Number of timeslots per frame	1..14
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of PUSCH	Yes/No
	TDD 1.28 Mcps physical channel parameters in downlink	Maximum number of timeslots per subframe	1..6
		Maximum number of physical channels per subframe	1, 2, 3, …, 96
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
		Support 8PSK	Yes/No
	TDD 1.28 Mcps physical channel parameters in uplink	Maximum number of timeslots per subframe	1..6
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of 8PSK	Yes/No
		Support of PUSCH	Yes/No
RF parameters	FDD RF parameters	UE power class	3, 4 NOTE: Only power classes 3 and 4 are part of this release of the specification
		Tx/Rx frequency separation	190 MHz 174.8 MHz to 205.2 MHz 134.8 MHz to 245.2 MHz

		UE radio access capability parameter	Value range
RF parameters	TDD 3.84 Mcps RF parameters	UE power class	2, 3 NOTE: Only power classes 2 and 3 are part of this release of the specification
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
	TDD 1.28 Mcps RF parameters	UE power class	2, 3
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
Multi-mode related parameters		Support of UTRA FDD	Yes/No
		Support of UTRA TDD 3.84 Mcps	Yes/No
		Support of UTRA TDD 1.28 Mcps	Yes/No
Multi-RAT related parameters		Support of GSM	Yes/No (per GSM frequency band)
		Support of multi-carrier	Yes/No
UE positioning related parameters		Standalone location method(s) supported	Yes/No
		Network assisted GPS support	Network based / UE based / Both/ None
		GPS reference time capable	Yes/No
		Support for IPDL	Yes/No
		Support for OTDOA UE based method	Yes/No
		Support for Rx-Tx time difference type 2 measurement	Yes/No
		Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states	Yes/No
Measurement related capabilities		Need for downlink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
		Need for uplink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
General capabilities		Access Stratum release indicator	R99, REL-4

Table 5.1a: FDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of HS-DSCH codes received	Minimum inter-TTI interval	Maximum number of HS-DSCH transport-channel bits received within an HS-DSCH TTI	Total number of soft channel bits
Category 1	15	1	20456	172800
Category 2	10	1	14600	115200
Category 3	5	1	7300	57600
Category 4	5	2	7300	28000
Category 5	5	3	7300	19200
Category 6	10	1	14600	153600
Category 7	5	1	7300	96000
Category 8	5	1	7300	76800
Category 9	5	3	7300	48000
Category 10	5	3	7300	38400
Category 11	15	1	[28800]	172800

NOTE: More categories may be added at a later stage.

Table 5.1b: 1.28 Mcps TDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of HS-DSCH codes per timeslot	Maximum number of HS-DSCH timeslots per TTI	Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI	Total number of soft channel bits	Support of SF=1 for HS-PDSCH
~~Category 1~~	~~8~~	~~5~~	~~7040~~	~~28160~~	~~No~~
~~Category 2~~	~~8~~	~~5~~	~~7040~~	~~56320~~	~~No~~
~~Category 3~~	~~8~~	~~5~~	~~7040~~	~~84480~~	~~No~~
~~Category 4~~	~~8~~	~~5~~	~~14080~~	~~56320~~	~~Yes~~

HS-DSCH category	Maximum number of HS-DSCH codes per timeslot	Maximum number of HS-DSCH timeslots per TTI	Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI	Total number of soft channel bits	Support of SF=1 for HS-PDSCH
~~Category 5~~	~~8~~	~~5~~	~~14080~~	~~112640~~	~~Yes~~
~~Category 6~~	~~12~~	~~5~~	~~10228~~	~~40912~~	~~No~~
~~Category 7~~	~~12~~	~~5~~	~~10228~~	~~81824~~	~~No~~
~~Category 8~~	~~12~~	~~5~~	~~10228~~	~~122736~~	~~No~~
~~Category 9~~	~~12~~	~~5~~	~~14080~~	~~56320~~	~~Yes~~
~~Category 10~~	~~12~~	~~5~~	~~14080~~	~~112640~~	~~Yes~~
~~Category 11~~	~~16~~	~~5~~	~~14080~~	~~56320~~	~~Yes~~
~~Category 12~~	~~16~~	~~5~~	~~14080~~	~~112640~~	~~Yes~~
~~Category 13~~	~~16~~	~~5~~	~~14080~~	~~168960~~	~~Yes~~
Category 1	12	5	7016	28160	Yes
Category 2	12	5	7016	56320	Yes
Category 3	12	5	7016	84480	Yes
Category 4	16	5	7016	28160	Yes
Category 5	16	5	7016	56320	Yes
Category 6	16	5	7016	84480	Yes
Category 7	12	5	10204	40912	Yes
Category 8	12	5	10204	81824	Yes
Category 9	12	5	10204	122736	Yes
Category 10	16	5	10204	40912	Yes
Category 11	16	5	10204	81824	Yes
Category 12	16	5	10204	122736	Yes
Category 13	16	5	14056	56320	Yes
Category 14	16	5	14056	112640	Yes
Category 15	16	5	14056	168960	Yes

Table 5.1c: RLC and MAC-hs parameters for 1.28 Mcps TDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of AM RLC entities	Minimum total RLC AM and MAC-hs buffer size
Category 1	6	[50]
Category 2	6	[50]
Category 3	6	[50]
Category 4	6	[50]
Category 5	6	[50]
Category 6	6	[50]
Category 7	6	[50]
Category 8	6	[50]
Category 9	6	[50]
Category 10	6	[50]
Category 11	6	[50]
Category 12	6	[50]
Category 13	6	[100]
Category 14	6	[100]
Category 15	6	[100]

Table 5.1d: 3.84 Mcps TDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of HS-DSCH codes per timeslot	Maximum number of HS-DSCH timeslots per TTI	Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI	Total number of soft channel bits	Support of SF=1 for HS-PDSCH
Category 1	16	2	12000	70656	Yes
Category 2	16	12	12000	70656	Yes

HS-DSCH category	Maximum number of HS-DSCH codes per timeslot	Maximum number of HS-DSCH timeslots per TTI	Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI	Total number of soft channel bits	Support of SF=1 for HS-PDSCH
Category 3	16	4	24000	141312	Yes
Category 4	16	12	24000	141312	Yes
Category 5	16	6	36000	211968	Yes
Category 6	16	12	36000	211968	Yes
Category 7	16	12	53000	282624	Yes
Category 8	16	12	73000	353280	Yes
Category 9	16	12	102000	423936	Yes

Table 5.1e: RLC and MAC-hs parameters for 3.84 Mcps TDD HS-DSCH physical layer categories

HS-DSCH category	Maximum number of AM RLC entities	Minimum total RLC AM and MAC-hs buffer size
Category 1	6	[50]
Category 2	6	[50]
Category 3	6	[100]
Category 4	6	[100]
Category 5	6	[150]
Category 6	6	[150]
Category 7	6	[200]
Category 8	8	[250]
Category 9	8	[350]

5.2.2 Combinations of UE Radio Access Parameters for DL

Table 5.2.2.1: UE radio access capability parameter combinations, DL parameters

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640	3840	3840	6400	10240	20480
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	NA	3840	3840	6400	10240	20480(1) 10240(2) NOTE 5
Maximum number of simultaneous transport channels	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	16 NOTE 4
Maximum number of simultaneous CCTrCH (FDD)	1 NOTE 3	2/1 NOTE 2 NOTE 3	2/1 NOTE 2 NOTE 3	2 NOTE 3	2 NOTE 3	2 NOTE 3
Maximum number of simultaneous CCTrCH (TDD)	2 NOTE 3	3 NOTE 3	3 NOTE 3	3 NOTE 3	4 NOTE 3	4 NOTE 3
Maximum total number of transport blocks received within TTIs that end at the same time	8	8	16	32	64	96
Maximum number of TFC	32	48	96	128	256	1024
Maximum number of TF	32	64	64	64	128	256
Support for turbo decoding	No	Yes	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)						
Maximum number of DPCH/PDSCH codes to be simultaneously received	1	2/1 NOTE 2	2/1 NOTE 2	3	3	3
Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH).	1200	3600/2400 NOTE2	7200/4800 NOTE2	19200	28800	57600
Support for SF 512 for DPCH NOTE 6	No	No	No	No	No	No
Support of PDSCH	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes	Yes	Yes
Support of HS-PDSCH	No	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7
Maximum number of simultaneous S-CCPCH radio links	1	1	1	1	1	1
Support of dedicated pilots for channel estimation	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Physical channel parameters (TDD 3.84 Mcps)						
Maximum number of timeslots per frame	1	2	4	5	10	12
Maximum number of physical channels per frame	8	9	14	28	64	136
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1/16 NOTE 1
Support of PDSCH	Yes/No NOTE 1	Yes	Yes	Yes	Yes	Yes
Support of HS-PDSCH	No	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7
Maximum number of physical channels per timeslot	8	9	9	9	9	13
Physical channel parameters (TDD 1.28 Mcps)						

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Maximum number of timeslots per subframe	1	2	3	4	6	6
Maximum number of physical channels per subframe	8	12	18	43	77	77
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1
Support of PDSCH	Yes/Nno NOTE 1	Yes	Yes	Yes	Yes	Yes
Support of HS-PDSCH	No	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7
Maximum number of physical channels per timeslot	8	11	14	14	14	14
Support of 8PSK	No	No	No	No	No	Yes

NOTE 1: Options represent different combinations that should be supported with conformance tests.

NOTE 2: Options depend on the support of PDSCH. The highest value is required if PDSCH is supported.

NOTE 3: The given number does not contain the BCH CCTrCH of the current cell nor of the neighbour cells.

NOTE 4: The given number does not contain the BCH of the neighbour cell.

NOTE 5: (1) For FDD and 3.84 Mcps TDD (2) For 1.28 Mcps TDD.

NOTE 6: This UE capability does not relate to the support of CPCH in the uplink for which SF 512 is needed

NOTE 7: When HS-DSCH is configured the UE shall simultaneously support the UE capability values defined in the 64 kbps reference class. However, simultaneous support of PDSCH and HS-PDSCH is not required.

The reference combinations for HS-DSCH capabilities are shown in tables 5.2.2.2, 5.2.2.3 and 5.2.2.43. These tables are subject to further discussions in TSG-RAN WG1 and TSG-RAN WG2.

Table 5.2.2.2: FDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.2 Mbps class	3.6 Mbps class	7 Mbps class	10 Mbps class
RLC and MAC-hs parameters				
Total RLC AM and MAC-hs buffer size (kbytes)	50	[100]	[200]	[300]
Maximum number of AM RLC entities	6	6	8	8
PHY parameters				
FDD HS-DSCH category	Category 5	Category 3	Category 2	Category 1

Table 5.2.2.3: 1.28 Mcps TDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.4 Mbps class	2.0 Mbps class	2.8 Mbps class
RLC and MAC-HS parameters			
Total RLC AM and MAC-hs buffer size (kbytes)	[50]	[50]	[100]
Maximum number of AM RLC entities	6	6	6
PHY parameters			
1.28 Mcps TDD HS-DSCH Category	Category 1	Category 67	Category 1113

Table 5.2.2.4: 3.84 Mcps TDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.2 Mbps class	2.4 Mbps class	3.6 Mbps class	7.3 Mbps class	10.2 Mbps class
RLC and MAC-hs parameters					

Reference combination	1.2 Mbps class	2.4 Mbps class	3.6 Mbps class	7.3 Mbps class	10.2 Mbps class
Total RLC AM and MAC-hs buffer size (kbytes)	[50]	[100]	[150]	[250]	[350]
Maximum number of AM RLC entities	6	6	6	8	8
PHY parameters					
3.84Mcps TDD HS-DSCH category	Category 1	Category 3	Category 5	Category 8	Category 9

3GPP TSG-RAN WG2 Meeting #29
Gyeongju , Korea, 13 - 17 May 2002

Tdoc R2-021458

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.306** **CR** **045** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	DPCH capabilities with simultaneous HSDPA configuration
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	8.5.2002
Category:	⌘	**B**
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)

Reason for change:	⌘	The specification is unclear regarding UE capabilities in case HS-DSCH is configured in an UE
Summary of change:	⌘	A table is added that contains parameters that are supposed to replace the signalled parameters in case HS-DSCH is configured simultaneously
Consequences if not approved:	⌘	The specification is ambigous regarding UE capabilities and the flexibility is very limited

Clauses affected:	⌘	4.11 (new), 5.1, 5.2.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.11 DL capabilities with simultaneous HS-DSCH

DL capability with simultaneous HS-DSCH configuration

Defines the modification of reception capabilities in downlink in terms of DPCH in case an HS-DSCH is configured simultaneously. The parameter values in table Table 5.2.2.1 replace the signalled values in case an HS-DSCH is configured simultaneously depending on the setting of the parameter DL DPCH capability with simultaneous HS-DSCH configuration. Other parameters are valid irrespective whether HS-DSCH is configured simultaneously or not.

DL DPCH capability with simultaneous HS-DSCH configuration	**32 kbps**	**64 kbps**	**128 kbps**	**384 kbps**
Transport channel parameters				
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640	3840	3840	6400
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	NA	3840	3840	6400
Maximum number of simultaneous transport channels	8	8	8	8
Maximum number of simultaneous CCTrCH (FDD)	1	1	1	1
Maximum number of simultaneous CCTrCH (TDD)	2	3	3	3
Maximum total number of transport blocks received within TTIs that end at the same time	8	8	16	32
Maximum number of TFC	32	48	96	128
Maximum number of TF	32	64	64	64
Support for turbo decoding	No	Yes	Yes	Yes
Physical channel parameters (FDD)				
Maximum number of DPCH/PDSCH codes to be simultaneously received	1	1	1	3
Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH).	1200	2400	4800	19200
Support of PDSCH	No	No	No	No
Physical channel parameters (TDD 3.84 Mcps)				
Maximum number of timeslots per frame	1	2	4	5
Maximum number of physical channels per frame	8	9	14	28
Support of PDSCH	No	No	No	No
Maximum number of physical channels per timeslot	8	9	9	9
Physical channel parameters (TDD 1.28 Mcps)				
Maximum number of timeslots per subframe	1	2	3	4
Maximum number of physical channels per subframe	8	12	18	43
Support of PDSCH	No	No	No	No
Maximum number of physical channels per timeslot	8	11	14	14

5 Possible UE radio access capability parameter settings

5.1 Value ranges

Table 5.1: UE radio access capability parameter value ranges

		UE radio access capability parameter	Value range
PDCP parameters		Support for RFC 2507	Yes/No
		Support for RFC 3095	Yes/No
		Support for loss-less SRNS relocation	Yes/No
		Maximum header compression context space	512, 1024, 2048, 4096, 8192 bytes
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 500, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
PHY parameters	Transport channel parameters in downlink	Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo decoding	Yes/No
	Transport channel parameters in uplink	Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	2, 4, 8, 16, 32
		Maximum number of simultaneous CCTrCH of DCH type (TDD only)	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks transmitted within TTIs that start at the same time	2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo encoding	Yes/No

		UE radio access capability parameter	Value range
	FDD Physical channel parameters in downlink	Maximum number of DPCH/PDSCH codes to be simultaneously received	1, 2, 3, 4, 5, 6, 7, 8
		Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH)	600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800
		Support for SF 512	Yes/No
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Simultaneous reception of SCCPCH and DPCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Maximum number of simultaneous S-CCPCH radio links	1 NOTE: Only the value 1 is part of this release of the specification
		Support of dedicated pilots for channel estimation	Yes/No
	FDD Physical channel parameters in uplink	Maximum number of DPDCH bits transmitted per 10 ms	600, 1200, 2400, 4800, 9600, 19200, 28800, 38400, 48000, 57600
		Support of PCPCH	Yes/No
	TDD 3.84 Mcps physical channel parameters in downlink	Maximum number of timeslots per frame	1..14
		Maximum number of physical channels per frame	1, 2, 3..224
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
	TDD 3.84 Mcps physical channel parameters in uplink	Maximum Number of timeslots per frame	1..14
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of PUSCH	Yes/No
	TDD 1.28 Mcps physical channel parameters in downlink	Maximum number of timeslots per subframe	1..6
		Maximum number of physical channels per subframe	1, 2, 3, …, 96
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Maximum number of physical channels per timeslot	1..16
		Support 8PSK	Yes/No
	TDD 1.28 Mcps physical channel parameters in uplink	Maximum number of timeslots per subframe	1..6
		Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of 8PSK	Yes/No
		Support of PUSCH	Yes/No
RF parameters	FDD RF parameters	UE power class	3, 4 NOTE: Only power classes 3 and 4 are part of this release of the specification
		Tx/Rx frequency separation	190 MHz 174.8 MHz to 205.2 MHz 134.8 MHz to 245.2 MHz

		UE radio access capability parameter	Value range
RF parameters	TDD 3.84 Mcps RF parameters	UE power class	2, 3 NOTE: Only power classes 2 and 3 are part of this release of the specification
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
	TDD 1.28 Mcps RF parameters	UE power class	2, 3
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
Multi-mode related parameters		Support of UTRA FDD	Yes/No
		Support of UTRA TDD 3.84 Mcps	Yes/No
		Support of UTRA TDD 1.28 Mcps	Yes/No
Multi-RAT related parameters		Support of GSM	Yes/No (per GSM frequency band)
		Support of multi-carrier	Yes/No
UE positioning related parameters		Standalone location method(s) supported	Yes/No
		Network assisted GPS support	Network based / UE based / Both/ None
		GPS reference time capable	Yes/No
		Support for IPDL	Yes/No
		Support for OTDOA UE based method	Yes/No
		Support for Rx-Tx time difference type 2 measurement	Yes/No
		Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states	Yes/No
Measurement related capabilities		Need for downlink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
		Need for uplink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
General capabilities		Access Stratum release indicator	R99, REL-4
DL capabilities with simultaneous HS-DSCH		DL capability with simultaneous HS-DSCH configuration	32kbps, 64kbps, 128kbps, 384kbps

5.2.2 Combinations of UE Radio Access Parameters for DL

Table 5.2.2.1: UE radio access capability parameter combinations, DL parameters

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640	3840	3840	6400	10240	20480
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	NA	3840	3840	6400	10240	20480(1) 10240(2) NOTE 5
Maximum number of simultaneous transport channels	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	8 NOTE 4	16 NOTE 4
Maximum number of simultaneous CCTrCH (FDD)	1 NOTE 3	2/1 NOTE 2 NOTE 3	2/1 NOTE 2 NOTE 3	2 NOTE 3	2 NOTE 3	2 NOTE 3
Maximum number of simultaneous CCTrCH (TDD)	2 NOTE 3	3 NOTE 3	3 NOTE 3	3 NOTE 3	4 NOTE 3	4 NOTE 3
Maximum total number of transport blocks received within TTIs that end at the same time	8	8	16	32	64	96
Maximum number of TFC	32	48	96	128	256	1024
Maximum number of TF	32	64	64	64	128	256
Support for turbo decoding	No	Yes	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)						
Maximum number of DPCH/PDSCH codes to be simultaneously received	1	2/1 NOTE 2	2/1 NOTE 2	3	3	3
Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH).	1200	3600/2400 NOTE2	7200/4800 NOTE2	19200	28800	57600
Support for SF 512 for DPCH NOTE 6	No	No	No	No	No	No
Support of PDSCH	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes	Yes	Yes
Support of HS-PDSCH	No	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7	Yes/No NOTE 1 NOTE 7
Maximum number of simultaneous S-CCPCH radio links	1	1	1	1	1	1
Support of dedicated pilots for channel estimation	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Physical channel parameters (TDD 3.84 Mcps)						
Maximum number of timeslots per frame	1	2	4	5	10	12
Maximum number of physical channels per frame	8	9	14	28	64	136
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1/16 NOTE 1
Support of PDSCH	Yes/No NOTE 1	Yes	Yes	Yes	Yes	Yes
Maximum number of physical channels per timeslot	8	9	9	9	9	13
Physical channel parameters (TDD 1.28 Mcps)						
Maximum number of timeslots per subframe	1	2	3	4	6	6
Maximum number of physical	8	12	18	43	77	77

Reference combination of UE Radio Access capability parameters in DL	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
channels per subframe						
Minimum SF	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1
Support of PDSCH	Yes/no NOTE 1	Yes	Yes	Yes	Yes	Yes
Maximum number of physical channels per timeslot	8	11	14	14	14	14
Support of 8PSK	No	No	No	No	No	Yes

NOTE 1: Options represent different combinations that should be supported with conformance tests.

NOTE 2: Options depend on the support of PDSCH. The highest value is required if PDSCH is supported.

NOTE 3: The given number does not contain the BCH CCTrCH of the current cell nor of the neighbour cells.

NOTE 4: The given number does not contain the BCH of the neighbour cell.

NOTE 5: (1) For FDD and 3.84 Mcps TDD (2) For 1.28 Mcps TDD.

NOTE 6: This UE capability does not relate to the support of CPCH in the uplink for which SF 512 is needed

~~NOTE 7: When HS-DSCH is configured the UE shall simultaneously support the UE capability values defined in the 64 kbps reference class. However, simultaneous support of PDSCH and HS-PDSCH is not required.~~

The reference combinations for HS-DSCH capabilities are shown in tables 5.2.2.2 and 5.2.2.3. These tables are subject to further discussions in TSG-RAN WG1 and TSG-RAN WG2.

Table 5.2.2.2: FDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.2 Mbps class	3.6 Mbps class	7 Mbps class	10 Mbps class
RLC and MAC-hs parameters				
Total RLC AM and MAC-hs buffer size (kbytes)	50	[100]	[200]	[300]
Maximum number of AM RLC entities	6	6	8	8
PHY parameters				
FDD HS-DSCH category	Category 5	Category 3	Category 2	Category 1

Table 5.2.2.3: 1.28 Mcps TDD UE radio access capability parameter combinations, DL HS-DSCH parameters

Reference combination	1.4 Mbps class	2.0 Mbps class	2.8 Mbps class
RLC and MAC-HS parameters			
Total RLC AM and MAC-hs buffer size (kbytes)	50	50	100
Maximum number of AM RLC entities	6	6	6
PHY parameters			
1.28 Mcps TDD HS-DSCH Category	Category 1	Category 6	Category 11

3GPP TSG-RAN WG2 meeting #29
Gyeongju, Korea, 13th-17th of May 2002

Tdoc R2-021461

CR-Form-v4

CHANGE REQUEST

⌘ **25.321** **CR** **121** ⌘ ev **-** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	HSDPA related MAC corrections
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	2002-05-06
Category:	⌘	**F**
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)*

Reason for change: ⌘ When HSDPA was included in 25.321 at WG2 #27, some errors where made.

1) The figure 9.1.4.1 describing the MAC HS-DSCH PDU format from the agreed CR R2-020559 where not implemented in 25.321 v 5.0.0 due to erroneous revision marks in the original CR.

2) The Figure 4.2.4.2.1 showing the MAC-d details in UTRAN currently shows the functionality in the UE.

Summary of change:

1) Figure 9.1.4.1 updated according to R2-020559

2) Figure 4.2.4.2.1 updated to reflect UTRAN functionality

Consequences if not approved: ⌘ Erroneous specification

Clauses affected: ⌘ 4.2.4.2, 9.1.4

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

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Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.2.4.2 MAC-d entity – UTRAN Side

Figure 4.2.4.2.1 shows the UTRAN side MAC-d entity.

The following functionality is covered:

- Transport Channel type switching:
  - Transport Channel type switching is performed by this entity, based on decision taken by RRC; this is related to a change of radio resources. If requested by RRC, MAC shall switch the mapping of one designated logical channel between common and dedicated transport channels.
- C/T MUX box;
  - the function includes the C/T field when multiplexing of several dedicated logical channels onto one transport channel is used.
- Priority setting;
  - This function is responsible for priority setting on data received from DCCH / DTCH;
- Ciphering;
  - Ciphering for transparent mode data to be ciphered is performed in MAC-d. Details about ciphering can be found in [10].
- Deciphering;
  - Deciphering for ciphered transparent mode data is performed in MAC-d. Details about ciphering can be found in [10].
- DL Scheduling/Priority handling;
  - in the downlink, scheduling and priority handling of transport channels is performed within the allowed transport format combinations of the TFCS assigned by the RRC.
- Flow Control;
  - a flow control function exists toward MAC-c/sh to limit buffering between MAC-d and MAC-c/sh entities. This function is intended to limit layer 2 signalling latency and reduce discarded and retransmitted data as a result of FACH or DSCH congestion. For the Iur interface this is specified in [11]. A flow control function also exists towards MAC-hs in case of configuration without MAC-c/sh, see subclause 4.2.4.2.

A MAC-d entity using common channels other than the high speed downlink shared channel is connected to a MAC-c/sh entity that handles the scheduling of the common channels to which the UE is assigned and DL (FACH) priority identification to MAC-c/sh;

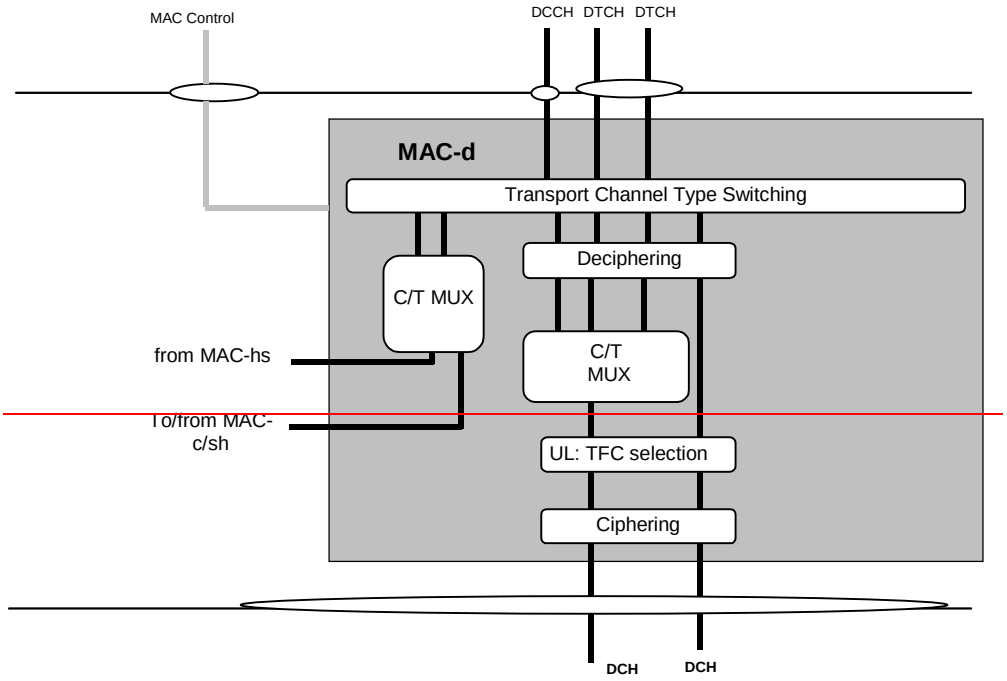
A MAC-d entity using downlink shared channel is connected to a MAC-c/sh entity that handles the shared channels to which the UE is assigned and indicates the level of priority of each PDU to MAC-c/sh;

A MAC-d entity using the high speed downlink shared channel may be connected to a MAC-c/sh entity that in turn is connected to the MAC-hs entity in the Node B (configuration with MAC-c/sh); alternately, a MAC-d entity using the high speed downlink shared channel may be connected to the MAC-hs entity in the Node B in case of configuration without MAC-c/sh.

A MAC-d entity is responsible for mapping dedicated logical channels onto the available dedicated transport channels or routing the data received on a DCCH or DTCH to MAC-c/sh or to MAC-hs.

One dedicated logical channel can be mapped simultaneously on DCH and DSCH. Different scheduling mechanisms apply for DCH and DSCH. One dedicated logical channel can be mapped simultaneously on DCH and HS-DSCH.

There is one MAC-d entity in the UTRAN for each UE that has one or more dedicated logical channels to or from the UTRAN.



Note 1: For DCH , DSCH and HS-DSCH, different scheduling mechanism apply
Note 2: Ciphering is performed in MAC-d only for transparent RLC mode

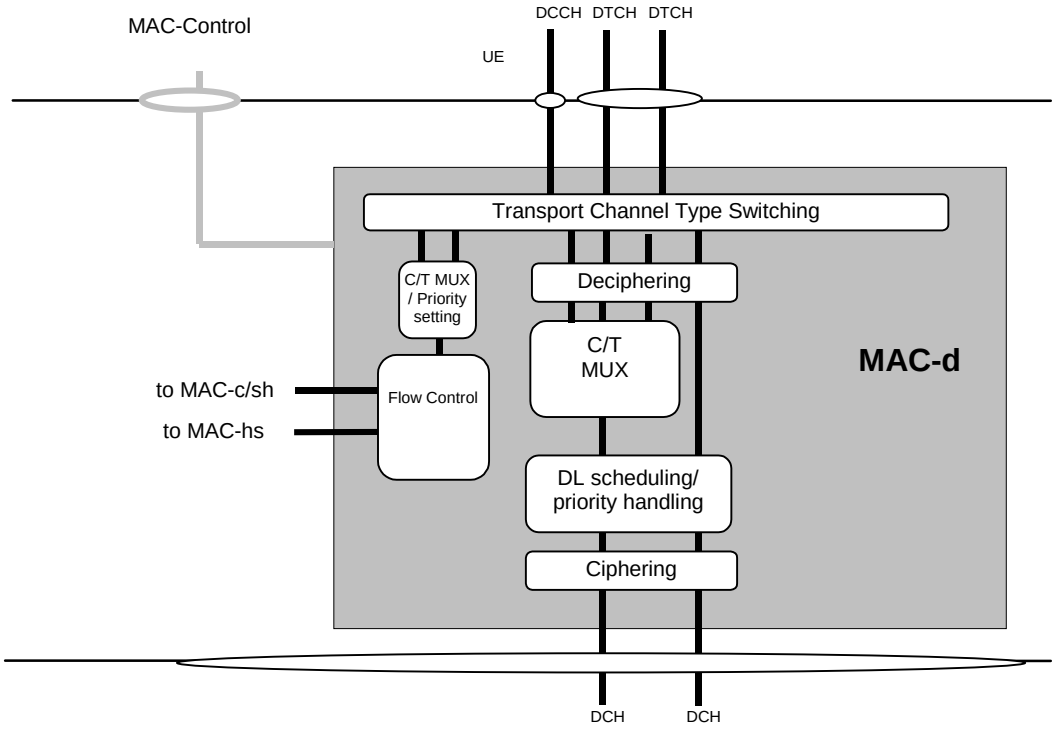


Figure 4.2.4.2.1: UTRAN side MAC architecture / MAC-d details

9.1.4 MAC PDU (HS-DSCH)

In case of HS-DSCH a MAC PDU consists of one MAC-hs header and one or more MAC-hs SDUs where each MAC-hs SDU equals a MAC-d PDU. A maximum of one MAC-hs PDU can be transmitted in a TTI per UE. The MAC-hs header is of variable size. The MAC-hs SDUs in one TTI belongs to the same reordering queue.

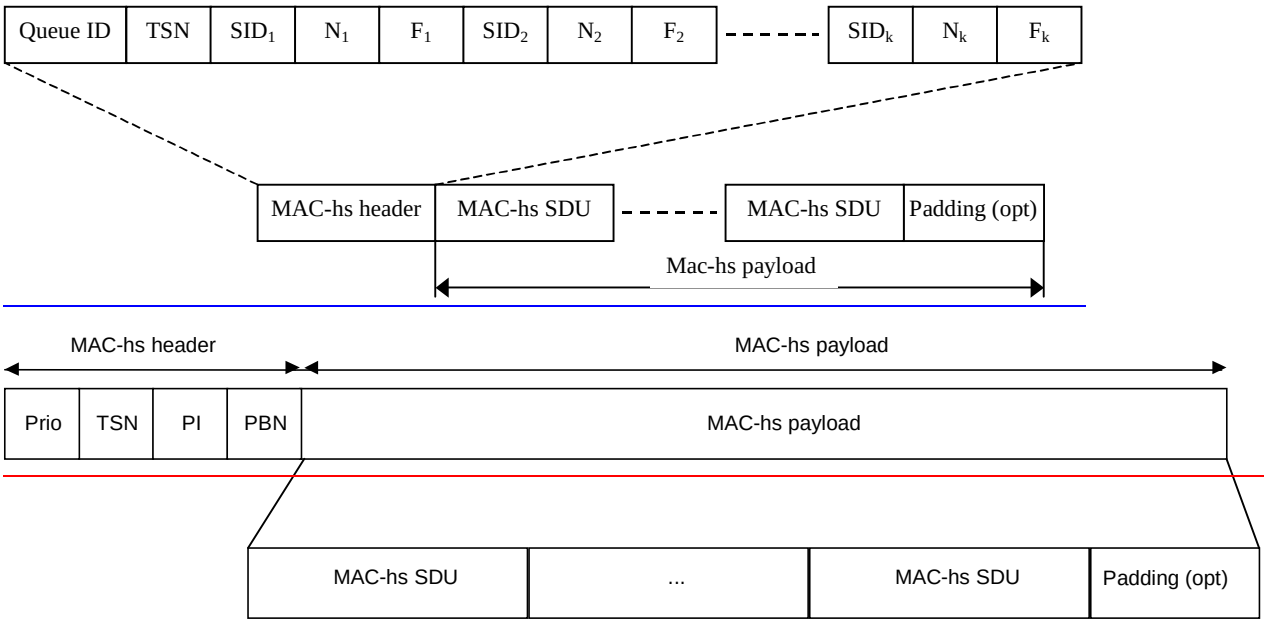


Figure 9.1.4.1: MAC-hs PDU

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea 13th-17th May 2002

Tdoc R2-021462

CR-Form-v5

CHANGE REQUEST

⌘ **25.321** **CR** **122** ⌘ **rev** ⌘ Current version: **5.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Description for MAC-hs reset
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	05. May 02
Category:	⌘	**F**
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)

Reason for change:	⌘	Missing functional description for MAC-hs reset
Summary of change:	⌘	Introduction of a functional description for MAC-hs reset
Consequences if not approved:	⌘	The specification is ambiguous regarding the MAC-hs reset function

Clauses affected:	⌘	8.3.2, 11.6.2.3.1, 11.6.2.5 (new)
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.3 Primitives between MAC and RRC

8.3.1 Primitives

The primitives between MAC and RRC are shown in table 8.3.1.1.

Table 8.3.1.1: Primitives between MAC sub-layer and RRC

Generic Name	Parameter			
	Request	Indication	Response	Confirm
CMAC-CONFIG	UE information elements, RB information elements, TrCH information elements, RACH transmission control elements, Ciphering elements, CPCH transmission control elements			
CMAC-MEASUREMENT	Measurement information elements	Measurement result		
CMAC-STATUS		Status info		

CMAC-CONFIG-Req:

- CMAC-CONFIG-Req is used to request for setup, release and configuration of a logical channel, e.g. RNTI allocation, switching the connection between logical channels and transport channels, TFCS update or scheduling priority of logical channel.

CMAC-MEASUREMENT-Req/Ind:

- CMAC-MEASUREMENT-Req is used by RRC to request MAC to perform measurements, e.g. traffic volume measurements;
- CMAC-MEASUREMENT-Ind is used to notify RRC of the measurement result.

CMAC-STATUS-Ind:

- CMAC-STATUS-Ind primitive notifies RRC of status information.

8.3.2 Parameters

See [7] for a detailed description of the UE, RB and TrCH information elements.

a) UE information elements
S-RNTI
SRNC identity
C-RNTI
Activation time

b) RB information elements
RB multiplexing info (Transport channel identity, Logical channel identity, MAC logical channel priority)

c) TrCH information elements
Transport Format Combination Set
MAC-hs reset indicator
Re-ordering release timer (T1)

d) Measurement information elements
Mode (Periodical, Event Trigger)
Reporting Quantity identifiers
Time interval to take an average or a variance (applicable when Average or Variance is Reporting Quantity)
Reporting Interval (applicable when mode is Periodical)
Upper and Lower Thresholds, TH_U and TH_L (applicable when mode is Event Trigger)

e) Measurement result
Mode
Reporting Quantity
Event ID, 4a or 4b (applicable when mode is Event Trigger)

f) Status info
when set to value ""transmission unsuccessful"" this parameter indicates to RRC that transmission of a TM RLC PDU failed (due to e.g. Maximum number of preamble ramping cycles reached for RACH in FDD), when set to value "transmission successful" this parameter indicates to RRC that the requested TM RLC PDU(s) has been submitted for transmission by the physical layer.

g) RACH transmission control elements
Set of ASC parameters (identifier for PRACH partitions, persistence values)
Maximum number of preamble ramping cycles (FDD) or synchronisation attempts (1.28Mcps TDD) M_{max}
Minimum and maximum number of time units between two preamble ramping cycles, N_{BO1min} and N_{BO1max} (FDD only)
ASC for RRC CONNECTION REQUEST message

h) Ciphering elements
Ciphering mode
Ciphering key
Ciphering sequence number

i) CPCH transmission control elements
CPCH persistency value, P for each Transport Format
Maximum number of preamble ramping cycles $N_{\_access\_fails}$
NF_max (Maximum number of frames for CPCH transmission for each Transport Format)
N_EOT (Number of EOT for release of CPCH transmission)
Backoff control timer parameters
Transport Format Set
Initial Priority Delays
Channel Assignment Active indication

11.6.2.3 Reordering entity

11.6.2.3.1 Definitions

In the functions described in this section the following variable definitions apply:

- Next_expected_TSN:
The next_expected_TSN is the Transmission sequence number (TSN) following the TSN of the last in-sequence MAC-hs PDU received. It shall be updated upon the receipt of the MAC-hs PDU with TSN equal to Next_expected_TSN. The initial value of Next_expected_TSN =0.

- Transmitter window (TRANSMIT_WINDOW):
The transmitter window defines which MAC-hs PDUs that the transmitter can retransmit without causing an ambiguity of the TSN in the receiver. The size of the transmitter window equals TRANSMIT_WINDOW and the maximum value of TRANSMIT_WINDOW is 32. The initial transmitter window equals [0..31]. The configuration of TRANSMIT_WINDOW by higher layers is FFS.

- Receiver window (RECEIVE_WINDOW):
The receiver window defines which MAC-hs PDUs that can be received in the receiver without causing an

advancement of the receiver window according to the procedure below. The size of the receiver window equals RECEIVE_WINDOW and the maximum value of RECEIVE_WINDOW is 32. The initial receiver window equals [0..31]. The configuration of RECEIVE_WINDOW by higher layers is FFS.

The Re-ordering release timer T1 controls the stall avoidance in the UE reordering buffer. The value of T1 is configured by upper layers.

If no timer T1 is active:

- the timer T1 shall be started when a MAC-hs PDU with TSN=SN is correctly received but can not be delivered to the disassembly function due to that the MAC-hs PDU with TSN equal to Next_expected_TSN is missing.

If a timer T1 is already active:

- no additional timer shall be started, i.e. only one timer T1 may be active at a given time.

The timer T1 shall be stopped if:

- the MAC-hs PDU for which the timer was started can be delivered to the disassembly function before the timer expires.

When the timer T1expires:

- all correctly received MAC-hs PDUs up to and including SN-1 shall be delivered to the disassembly function and be removed from the reordering buffer;

- all correctly received MAC-hs PDUs up to the first missing MAC-hs PDU shall be delivered to the disassembly function.

When the timer T1 is stopped or expires, and there still exist some received MAC-hs PDUs that can not be delivered to higher layer:

- timer T1 is started for the MAC-hs PDU with highest TSN among those MAC-hs PDUs that can not be delivered.

Transmitter operation:

After the transmitter has transmitted a MAC-hs PDU with TSN=SN, any MAC-hs PDU with TSN ≤ SN – TRANSMIT_WINDOW should not be retransmitted to avoid sequence number ambiguity in the receiver. A MAC-hs PDU that has been aborted by the transmitter after being transmitted one or more times, should not be retransmitted after it has been aborted.

Receiver operation:

- If the soft buffers in all the HARQ processes are empty (i.e. no data in the buffers exists that will be soft combined with later received data):

  - all correctly received MAC-hs PDUs shall be delivered to the disassembly function and be removed from the reordering buffer; and

  - these MAC-hs PDUs shall be considered as being received in the following procedure.

- MAC-hs PDUs that have been discarded by the timer based mechanism shall be considered as being received in the following procedure.

When a MAC-hs PDU with TSN = SN is received:

- If SN is within the receiver window and this MAC-hs PDU has not previously been received:

  - the MAC-hs PDU is placed in the reordering buffer at the place indicated by the TSN.

- If SN is within the receiver window, and this MAC-hs PDU has been previously received:

  - the MAC-hs PDU shall be discarded.

- If SN is outside the receiver window:

- the received MAC-hs PDU shall be placed above the highest received TSN in the reordering buffer, at the position indicated by SN;
- the receiver window shall be advanced so that SN forms the upper edge of the receiver window;
- any MAC-hs PDUs with TSN ≤ SN – RECEIVE_WINDOW shall be removed from the reordering buffer and be delivered to the disassembly entity.

- All received MAC-hs PDUs with consecutive TSNs from next_expected_TSN up to the first not received MAC-hs PDU are delivered to the disassembly entity. The TSN of this first not received MAC-hs PDU becomes the next_expected_TSN.

11.6.2.5 MAC-hs Reset

If a reset of the MAC-hs entity is requested by upper layers, the UE shall:

- flush soft buffer for all configured HARQ processes;
- stop all active re-ordering release timer (T1) and set all timer T1 to their initial value;
- start TSN with value 0 for the next transmission on every configured HARQ process;
- initialize the values for transmit window (TRANSMIT_WINDOW), receive window (RECEIVE_WINDOW) and the next expected TSN (Next_expected_TSN=0);
- disassemble all MAC-hs PDUs in the re-ordering buffer and deliver all MAC-d PDUs to the MAC-d entity;
- flush the re-ordering buffer.

3GPP TSG-RAN WG2 Meeting #29
GyeongJu, Korea, May 13th-17th, 2002

Tdoc R2-021459

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.331** **CR** **1499** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	HS-DSCH related corrections
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	2002-05-07
Category:	⌘	**F**
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)

Reason for change: ⌘

Activation time:
It is currently not clear in the specification which 2 ms subframe boundary that should be chosen by the UE as activation time for the HS-DSCH related reconfigurations,

Handling of the HS-DSCH physical channel configuration when leaving CELL_DCH:
Clarification is necessary what is expected by the UE at cases of radio link failure and transition from CELL_DCH. The UE shall delete any H-RNTI and stop receiving any HS-SCCHs.

H-RNTI and Measurement feedback info:
The expected use of these IEs related to the HS-DSCH reception procedures in the physical layer can not be derived from just the names of these IEs. A clarification is necessary, refering to the appropriate physical layer procedures.

Start of the HS-DSCH reception procedures:
It is currently unclear when HS-DSCH reception is started. Before the UE can start HS-DSCH reception, several IEs should have been signalled (not necessarily in the same message).

Summary of change: ⌘

Activation time:
It is clarified which HS-SCCH boundary to use for "HS-DSCH related reconfigurations". In case of a simultaneous DCH and HS-DSCH reconfiguration, the same 10 ms frame boundary T should be used for both the DCHs and the HS-DSCH to make sure the configuration is consistent at all times. And for the HS-DSCH related reconfiguration, the UE should chose the 2 ms subframe boundary immediately before the first 2 ms subframe, that entirely falls within the 10 ms frame next after T.

	Handling of the HS-DSCH physical channel configuration when leaving CELL_DCH: In the reconfiguration procedure, the text for actions when leaving CELL_DCH is moved to one place (in the same way as for the DSCH-RNTI – this is editorial). For radio link failure, statements are added that clarifies that the UE shalll stop the HS-DSCH reception and clear the HS-PDSCH configuration including the the H-RNTI. **H-RNTI and Measurement feedback info**: In the actions for these IEs, physical layer specification terminology is referred to to remove any uncertainty about the use of these IEs. **Start of the HS-DSCH reception procedures**: It is stated that the UE shall store the IEs "HS-SCCH Info" and "Measurement Feedback Info". When the IE receives the IE "Downlink HS-PDSCH information", the existence of a stored fully valid HS-DSCH configuration is checked by the UE and then reception can start. This means that start and stop of HS-DSCH reception can be triggered by using the IE "Downlink HS-PDSCH information", without having to send the full configuration each time reception is to be started. A new variable "HS_DSCH_RECEPTION" has been added, which is set to TRUE when HS-DSCH reception is ongoing.
Consequences if not approved: ⌘	

Clauses affected:	⌘	8.2.2.3, 8.5.6, 8.6.3.1, 8.6.3.1b, 8.6.6.32, 8.6.6.33, 8.6.6.34, 13.4.8o, 13.4.8oo (new)		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2.2.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE or TRANSPORT CHANNEL RECONFIGURATION or PHYSICAL CHANNEL RECONFIGURATION message by the UE

The UE shall be able to receive any of the following messages:

- RADIO BEARER SETUP message; or
- RADIO BEARER RECONFIGURATION message; or
- RADIO BEARER RELEASE message; or
- TRANSPORT CHANNEL RECONFIGURATION message; or
- PHYSICAL CHANNEL RECONFIGURATION message;

and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency.

If the UE receives:

- a RADIO BEARER SETUP message; or
- a RADIO BEARER RECONFIGURATION message; or
- a RADIO BEARER RELEASE message; or
- a TRANSPORT CHANNEL RECONFIGURATION message; or
- a PHYSICAL CHANNEL RECONFIGURATION message:

it shall:

1> set the variable ORDERED_RECONFIGURATION to TRUE;

1> perform the physical layer synchronisation procedure as specified in [29];

1> act upon all received information elements as specified in subclause 8.6, unless specified in the following and perform the actions below.

The UE may:

1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

The UE may first release the physical channel configuration used at reception of the reconfiguration message. The UE shall then:

1> in FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included and if the DCH has only one link in its active set:

2> act upon the IE "PDSCH code mapping" as specified in subclause 8.6; and

2> infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted.

1> enter a state according to subclause 8.6.3.3.

In case the UE receives a RADIO BEARER RECONFIGURATION message including the IE "RB information to reconfigure" that only includes the IE "RB identity", the UE shall:

1> handle the message as if IE "RB information to reconfigure" was absent.

NOTE: The RADIO BEARER RECONFIGURATION message always includes the IE "RB information to reconfigure". UTRAN has to include it even if it does not require the reconfiguration of any RB.

If after state transition the UE enters CELL_DCH state, the UE shall, after the state transition:

1> remove any C-RNTI from MAC;

1> clear the variable C_RNTI.

If after state transition the UE leaves CELL_DCH state, the UE shall, after the state transition:

1> stop any HS-DSCH reception procedures according to the stored HS-PDSCH configuration.

1> clear any stored HS-PDSCH configuration;

1> remove any H-RNTI stored;

1> clear the variable H_RNTI;

1> set the variable HS_DSCH_RECEPTION to FALSE;

In FDD, if after state transition the UE leaves CELL_DCH state, the UE shall, after the state transition:

1> remove any DSCH-RNTI from MAC;

1> clear the variable DSCH_RNTI.

If the UE was in CELL_DCH state upon reception of the reconfiguration message and remains in CELL_DCH state, the UE shall:

1> if the IE "Uplink DPCH Info" is absent, not change its current UL Physical channel configuration;

1> if the IE "Downlink information for each radio link" is absent, not change its current DL Physical channel configuration;

1> if "DPCH frame offset" is included for one or more RLs in the active set:

2> use its value to determine the beginning of the DPCH frame in accordance with the following:

3> if the received IE "DPCH frame offset" is across the value range border compared to the DPCH frame offset currently used by the UE:

4> consider it to be a request to adjust the timing with 256 chips across the frame border (e.g. if the UE receives value 0 while the value currently used is 38144 consider this as a request to adjust the timing with +256 chips).

3> if after taking into account value range borders, the received IE "DPCH frame offset" corresponds to a request to adjust the timing with a step exceeding 256 chips:

4> set the variable INVALID_CONFIGURATION to FALSE.

3> and the procedure ends.

2> adjust the radio link timing accordingly.

If after state transition the UE enters CELL_FACH state, the UE shall, after the state transition:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency.

1> if the IE "Frequency info" is not included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4].

1> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):

2> initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";

2> when the cell update procedure completed successfully:

3> if the UE is in CELL_PCH or URA_PCH state:

4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";

4> proceed as below.

1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;

1> select PRACH according to subclause 8.5.17;

1> select Secondary CCPCH according to subclause 8.5.19;

1> use the transport format set given in system information;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> ignore that IE and stop using DRX.

~~1> remove any H_RNTI stored;~~

~~1> clear the variable H_RNTI;~~

1> if the contents of the variable C_RNTI is empty:

2> perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";

2> when the cell update procedure completed successfully:

3> if the UE is in CELL_PCH or URA_PCH state:

4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";

4> proceed as below.

If the UE was in CELL_FACH state upon reception of the reconfiguration message and remains in CELL_FACH state, the UE shall:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency;

2> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or

the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):

3> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";

3> when the cell update procedure completed successfully:

4> proceed as below.

The UE shall transmit a response message as specified in subclause 8.2.2.4, setting the information elements as specified below. The UE shall:

1> if the received reconfiguration message included the IE "Downlink counter synchronisation info"; or

1> if the received reconfiguration message is a RADIO BEARER RECONFIGURATION and the IE "New U-RNTI" is included:

2> re-establish RB2;

2> set the new uplink and downlink HFN of RB2 to MAX(uplink HFN of RB2, downlink HFN of RB2);

2> increment by one the downlink and uplink HFN values for RB2;

2> calculate the START value according to subclause 8.5.9;

2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".

1> if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":

2> if the variable START_VALUE_TO_TRANSMIT is set:

3> include and set the IE "START" to the value of that variable.

2> if the variable START_VALUE_TO_TRANSMIT is not set and the IE "New U-RNTI" is included:

3> calculate the START value according to subclause 8.5.9;

3> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".

2> if the received reconfiguration message caused a change in the RLC size for any RB using RLC-AM:

3> calculate the START value according to subclause 8.5.9;

3> include the calculated START values for the CN domain associated with the corresponding RB identity in the IE "START list" in the IE "Uplink counter synchronisation info".

1> if the received reconfiguration message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":

2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".

1> if the received reconfiguration message contained the IE "Ciphering mode info":

2> include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.

1> if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" in IE "Ciphering mode info":

2> if prior to this procedure there exist no transparent mode RLC radio bearers:

3> if, at the conclusion of this procedure, the UE will be in CELL_DCH state; and

3> if, at the conclusion of this procedure, at least one transparent mode RLC radio bearer exists:

4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.

2> if prior to this procedure there exists at least one transparent mode RLC radio bearer:

3> if, at the conclusion of this procedure, no transparent mode RLC radio bearers exist:

4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.

1> set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and

1> clear that entry;

1> if the variable PDCP_SN_INFO is not empty:

2> include the IE "RB with PDCP information list" and set it to the value of the variable PDCP_SN_INFO.

1> in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):

2> set the IE "Uplink Timing Advance" according to subclause 8.6.6.26.

1> if the IE "Integrity protection mode info" was present in the received reconfiguration message:

2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.

If after state transition the UE enters CELL_PCH or URA_PCH state, the UE shall, after the state transition and transmission of the response message:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency.

1> if the IE "Frequency info" is not included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4].

1> prohibit periodical status transmission in RLC;

1> remove any C-RNTI from MAC;

1> clear the variable C_RNTI;

~~1> remove any H-RNTI stored;~~

~~1> clear the variable H_RNTI;~~

1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;

1> select Secondary CCPCH according to subclause 8.5.19;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2.

1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:

2> set the variable INVALID_CONFIGURATION to TRUE.

1> if the UE enters CELL_PCH state from CELL_DCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):

2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";

2> when the cell update procedure completed successfully:

3> the procedure ends.

1> if the UE enters CELL_PCH state from CELL_FACH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:

2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";

2> when the cell update procedure is successfully completed:

3> the procedure ends.

1> if the UE enters URA_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:

2> initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";

2> when the URA update procedure is successfully completed:

3> the procedure ends.

8.5.6 Radio link failure criteria and actions upon radio link failure

In CELL_DCH State, after receiving N313 consecutive "out of sync" indications from layer 1 for the established DPCCH physical channel in FDD, and the DPCH associated with mapped DCCHs in TDD, the UE shall:

1> start timer T313;

1> upon receiving N315 successive "in sync" indications from layer 1 and upon change of UE state:

2> stop and reset timer T313.

1> if T313 expires:

2> consider it as a "Radio link failure".

Periods in time where neither "in sync" nor "out of sync" is reported by layer 1 do not affect the evaluation of the number of consecutive (resp. successive) "in sync" or "out of sync" indications.

When a radio link failure occurs, the UE shall:

1> clear the dedicated physical channel configuration;

1> stop any HS-DSCH reception procedures according to the stored HS-PDSCH configuration;

1> clear any stored HS-PDSCH configuration;

1> remove any H-RNTI stored;

1> clear the variable H_RNTI;

1> set the variable HS_DSCH_RECEPTION to FALSE;

1> perform actions as specified for the ongoing procedure;

1> if no procedure is ongoing or no actions are specified for the ongoing procedure:

2> perform a cell update procedure according to subclause 8.3.1 using the cause "radio link failure".

8.6.3.1 Activation time

If the UE receives a message in which presence is needed for the IE "Activation time", and the value is other than the default value "Now", the UE shall:

1> if the frame boundary immediately before the frame with the CFN (Connection Frame Number) value indicated by the IE "Activation Time" is at the TTI boundary common to all the transport channels that are multiplexed onto the same CCTrCh including any transport channel which is added, reconfigured or has been removed:

2> select that frame boundary as the activation time T.

1> else:

2> select the next TTI boundary, which is common to all the transport channels that are multiplexed onto the same CCTrCh including any transport channel which is added, reconfigured or has been removed, after the frame with the CFN (Connection Frame Number) value indicated by the IE "Activation Time", as the activation time T.

1> at the activation time T:

2> for a physical channel reconfiguration <u>other than an HS-DSCH related reconfiguration,</u> caused by the received message:

3> release the physical channel configuration, which was present before T;

3> initiate the establishment of the physical channel configuration as specified for the physical channel information elements in the received message as specified elsewhere.

<u>2> for an HS-DSCH related reconfiguration caused by the received message:</u>

<u>3> select the HS-SCCH subframe boundary immediately before the first HS-SCCH subframe, which entirely falls within the 10 ms frame next after T;</u>

<u>3> at that HS-SCCH subframe boundary, start using the new HS-DSCH configuration in the received message, replacing any old HS-DSCH configuration.</u>

2> for actions, other than a physical channel reconfiguration, caused by the received message:

3> perform the actions for the information elements in the received message as specified elsewhere.

<u>NOTE: An “HS-DSCH related reconfiguration” includes, in particular, reconfigurations that need to be time-aligned with the 2ms subframe of the HS-SCCH, HS-PDSCH and/or HS-DPCCH. For example, start and stop of HS-SCCH reception and serving HS-DSCH cell change.</u>

If the UE receives a message in which presence is needed for the IE "Activation time", and the value is the default value "Now", the UE shall:

1> choose an activation time T as soon as possible after the reception of the message, respecting the performance requirements in subclause 13.5;

1> at the activation time T:

2> perform the actions for the information elements in the received message as specified elsewhere.

~~If the UE receives a message that includes the configuration or reconfiguration of an HS-DSCH transport channel, the IE "Activation time" indicates the frame boundary at which the UE shall:~~

~~1> start or stop monitoring the assigned HS-SCCH(s) according to the new configuration received in this message.~~

8.6.3.1b H-RNTI

If the IE "New H-RNTI" is included, the UE shall:

1> if the IE "Downlink HS-PDSCH Information" is also included and the UE would enter CELL_DCH state according to subclause 8.6.3.3 applied on the received message:

~~1~~2> store the value in the variable H_RNTI;~~.~~

When the variable HS_DSCH_RECEPTION is set to TRUE the UE shall:

1> use the value of the variable H_RNTI as UE identity in the HS-SCCH reception procedure in the physical layer.

8.6.6.32 Downlink HS-PDSCH Information

If the IE "Downlink HS-PDSCH Information" is included and the UE would enter CELL_DCH state according to subclause 8.6.3.3 applied on the received message, the UE shall:

1> if the IE "New H-RNTI" is included:

2> perform the actions as specified in subclause 8.6.3.1b.

1> if the IE "HS-SCCH Info" is included:

2> act as specified in subclause 8.6.6.33.

1> if the IE "Measurement Feedback Info" is included:

2> act as specified in subclause 8.6.6.34.

1> if, as a result of the received message, the variable H_RNTI is set and the UE has a stored IE "HS-SCCH Info" and a stored IE "Measurement Feedback Info":

2> set the variable HS_DSCH_RECEPTION to TRUE;

2> start HS-DSCH reception procedures according to the stored HS-PDSCH configuration:

3> as stated in 8.6.3.1b for the IE "H-RNTI";

3> in 8.6.6.33 for the IE "HS-SCCH Info";

3> in 8.6.6.34 for the IE "Measurement Feedback Info".

If the IE "Downlink HS-PDSCH Information" is not included, the UE shall:

1> set the variable HS_DSCH_RECEPTION to FALSE;

1> stop HS-DSCH reception procedures according to the stored HS-PDSCH configuration.

8.6.6.33 HS-SCCH Info

If the IE "HS-SCCH Info" is included, the UE shall:

1> store the received configuration.

When the variable HS_DSCH_RECEPTION is set to TRUE the UE shall:

1> in the case of FDD:

2> receive the HS-SCCH(s) according to the IE "HS-SCCH channelisation code" on the serving HS-DSCH radio link.

1> in the case of TDD:

2> receive the HS-SCCH(s) according to the IEs "Timeslot" and "Channelisation Code" on the serving HS-DSCH radio link;

2> receive the HS-SICH according to the IEs "Timeslot" and "Channelisation Code" on the serving HS-DSCH radio link.

8.6.6.34 Measurement Feedback Info

If the IE "Measurement Feedback Info" is included, the UE shall:

1> store the received configuration.

When the variable HS_DSCH_RECEPTION is set to TRUE the UE shall:

1> use the information for the channel quality indication (CQI) procedure in the physical layer on the serving HS-DSCH radio link.

13.4.8o H_RNTI

This variable stores the assigned H-RNTI for this UE when in CELL-DCH state and a HS-DSCH transport channel has been allocated.

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
H-RNTI	OP		H-RNTI 10.3.3.14a	Cleared when entering UTRA RRC connected mode when not otherwise stated in the procedure. Cleared when leaving UTRA RRC connected mode.	REL-5

13.4.8oo HS_DSCH_RECEPTION

This variable indicates whether HS-DSCH reception procedures are ongoing.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
HS-DSCH reception	MP		Boolean	TRUE: HS-DSCH reception is ongoing. Set to FALSE when entering UTRA RRC connected mode when not otherwise stated in the procedure. Set to FALSE when leaving UTRA RRC connected mode.

13.4.8a INCOMPATIBLE_SECURITY_RECONFIGURATION

This variable indicates whether an incompatible simultaneous reconfiguration of a security function has been received.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Incompatible security reconfiguration	MP		Boolean	TRUE: An incompatible simultaneous security reconfiguration has been detected. Set to FALSE when entering UTRA RRC connected mode. Set to FALSE when leaving UTRA RRC connected mode.

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea, 13th – 17th May 2002

Tdoc R2-021460

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.331** **CR** **1500** ⌘ **rev** **-** ⌘ Current version: **5.0.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Removal of BLER threshold from IE "Measurement Feedback Info"
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	HSDPA-L23
Date:	⌘	13th- May 2002
Category:	⌘	**F**
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)

Reason for change:	⌘	Following RAN1 decision, the BLER threshold is no longer needed to be signalled since it has a fixed value.
Summary of change:	⌘	It is proposed to be removed from the IE "Measurement Feedback Info". Alignment on the naming used in RAN1 and RAN3 is also proposed, e.g. "SQI" name is added and parameter's name "off" is replaced with"I"
Consequences if not approved:	⌘	misalignement between RAN1 and RAN2 specifications

Clauses affected:	⌘	10.3.6.40a, 11.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.3.6.40a Measurement Feedback Info

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
~~BLER threshold~~	~~MP~~		~~FFS~~		~~REL-5~~
CHOICE *mode*	MP				REL-5
>FDD					REL-5
>>POhsdsch	MP		Integer (-x..0) FFS	Default Power offset between HS-PDSCH and P-CPICH/S-CPICH. In dB.	REL-5
>>CQI Feedback cycle, k	MP		Integer ([0, 1, 5, 10, 20, 40, 80])	Multiples of 2 ms intervals. Value 10 corresponds to 20 ms.	REL-5
>>CQI Feedback offset, l~~off~~	MP		Integer (1..5)	Exact definition is FFS	REL-5
>TDD				(no data)	REL-5

11.3 Information element definitions

```
...

-- **************************************************
--
--     PHYSICAL CHANNEL INFORMATION ELEMENTS (10.3.6)
--
-- **************************************************



...


Measurement-Feedback-Info ::=       SEQUENCE {
--  bler-threshold
    modeSpecificInfo                CHOICE {
        fdd                             SEQUENCE {
--          pohsdsch                        Po-hsdsch
--          feedback-cycle                  Feedback-cycle
--          feedback-offset                 Feedback-offset
        },
        tdd                             NULL
    }
}
```