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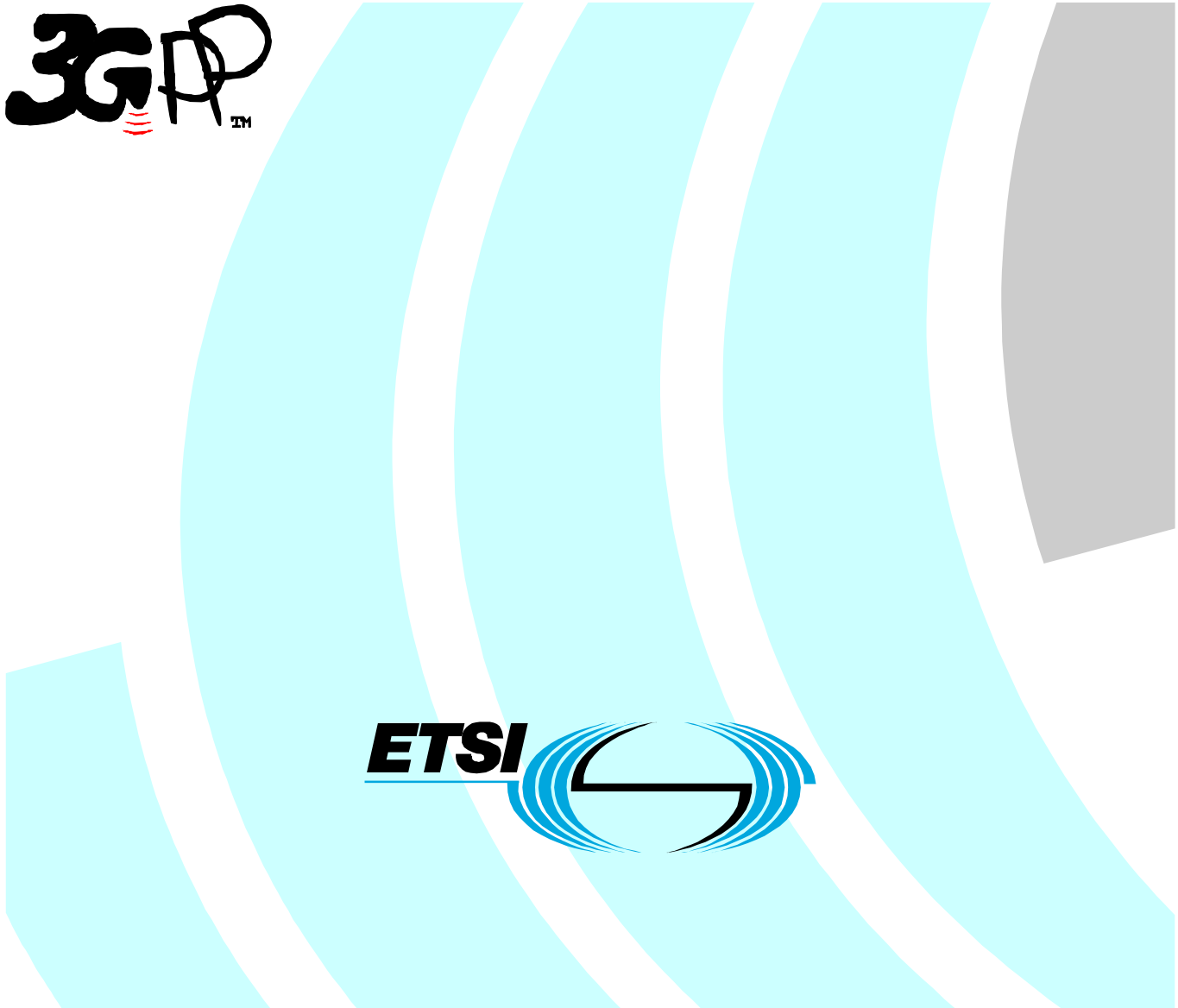
Technical Specification

Universal Mobile Telecommunications System (UMTS);
UE Radio Access capabilities definition
(3GPP TS 25.306 version 6.5.0 Release 6)



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Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp .

Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document identifies the parameters of the access stratum part of the UE radio access capabilities. Furthermore, some reference configurations of these values are defined. The intention is that these configurations will be used for test specifications.

2 References

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

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

[1] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".

[2] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".

[3] 3GPP TS 34.123-2: "User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".

[4] 3GPP TS 25.101 "UE Radio Transmission and Reception (FDD)".

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

[6] 3GPP TS 25.215 "Physical layer; Measurements (FDD)".

[7] RFC 2507: "IP Header Compression".

[8] RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles".

[9] 3GPP TS 25.321 "Medium Access Control (MAC) protocol specification".

[10] 3GPP TS 25.322 "Radio Link Control (RLC) protocol specification".

[11] 3GPP TS 25.211 "Physical channels and mapping of transport channels onto physical channels (FDD)".

[12] 3GPP TS 25.331 "Radio Resource Control (RRC); Protocol Specification".

3 Void

4 UE radio access capability parameters

In the following the UE radio capability parameters are defined. When using the RRC configuration parameters, UTRAN needs to respect the UE capabilities. Only parameters for which there is a need to set different values for different UEs are considered as UE capability parameters. Therefore, the capabilities that are the same for all UEs, including baseline capabilities, are not listed here.

UTRAN needs to respect the UE capabilities when configuring the RBs. Actions in the UE when capabilities are in conflict with a UTRAN request are specified in RRC.

4.1 PDCP parameters

Support for RFC 2507

This parameter defines whether the UE supports header compression according to RFC 2507 as defined in [1] or not.

Support for RFC 3095

This parameter defines whether the UE supports header compression according to RFC 3095 as defined in [1] or not. Except for a CS only UE, the UE shall support header compression according to RFC 3095 as defined in [1].

Support for RFC 3095 context relocation

This parameter defines whether the UE supports RFC 3095 context relocation as defined in [1] or not.

Support for loss-less SRNS relocation

Defines whether the UE supports loss-less SRNS relocation as defined in [1] or not.

Support for lossless DL RLC PDU size change

Defines whether the UE supports lossless DL RLC PDU size change as defined in [1] or not.

Maximum header compression context space

This parameter is only applicable if the UE supports header compression according to RFC 2507. It is defined as the maximum header compression context size supported by the UE for all RFC 2507 protocol entities for all RBs. UTRAN controls that the UE capability can be fulfilled through the following parameters:

1. MAX_HEADER;
2. TCP_SPACE;
3. NON_TCP_SPACE;

The context space for a single RFC 2507 protocol entity calculates from:

(2 * (TCP_SPACE + 1 + NON_ TCP_SPACE + 1) * MAX_HEADER).

The following criterion must be fulfilled in the configuration:

Maximum header compression context space ≥ sum of context spaces for all RFC 2507 protocol entities for all RBs.

Maximum number of ROHC context sessions

This parameter is only applicable if the UE supports header compression according to RFC3095. It is defined as the maximum number of header compression context sessions supported by the UE.

Support for Reverse Decompression

This parameter determines whether reverse decompression is supported or not and the maximum number of packets that can be reverse decompressed by the decompressor in the UE.

4.2 Void

4.3 RLC and MAC-hs parameters

Total RLC AM and MAC-hs buffer size

When HS-DSCH is not configured this is defined as the maximum total buffer size across all RLC AM entities supported by the UE. When HS-DSCH is configured this is defined as the maximum total buffer size across all MAC-hs reordering entities and all RLC AM entities supported by the UE. The memory signalled in this capability is dynamically shared by RLC AM entities and MAC-hs reordering entities at any time.

In order to evaluate memory consumption in the UE, it shall be assumed that:

- a stored AMD PDU of N octets requires a memory equal to N octets;
- a stored MAC-hs PDU of N bits requires a memory equal to (N – 10) bits.

The UE shall only consider itself in a memory shortage situation as defined in [9] [10] when the amount of stored AM RLC PDUs and MAC-hs PDUs exceeds its capability.

Maximum number of AM entities

This is defined as the maximum number of RLC AM entities supported by the UE.

Maximum RLC AM Window Size

This is defined as the maximum transmission and receiving window size of RLC AM entities supported by the UE.

Support for RLC SDU alignment

Defines whether the UE is able to support the intention to align the start of RLC SDU's to the start of RLC PDU's.

It is FFS whether this UE capability needs to be defined in more detail, and if so how.

4.4 Void

4.5 PHY parameters

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

Defines the 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.

4.5.2 Transport channel parameters in uplink

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

NOTE 1: "Being transmitted" refers to all bits in the active TFC within the TFCS over all simultaneous transport channels transmitted 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 transmitted at an arbitrary time instant.

NOTE 2: This parameter is related to memory requirements for uplink data received from MAC before it can be transmitted over the radio interface. As shown in Figure 4.1 the worst case occurs for the maximum TTI. 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.

Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted 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 transmitted 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 uplink transport channels that the UE is capable to process simultaneously, not taking into account the rate of each transport channel.

NOTE: 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.

Maximum number of simultaneous CCTrCH

This parameter is applicable for TDD only. For FDD there is always only one CCTrCH at a time. The parameter is defined as the maximum number of uplink CCTrCH that the UE is capable to process simultaneously.

Maximum total number of transport blocks transmitted within TTIs that start at the same time

Defines the maximum number of transport blocks that the UE is capable to transmit within TTIs that start at the same time. An example is shown in figure 4.1.

NOTE: Relates to processing requirements for CRC in uplink.

Maximum number of TFC

Defines the maximum number of transport format combinations the UE can store, where all transport format combinations for all uplink transport format combination sets are counted.

Maximum number of TF

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

Support for turbo encoding

Defines whether turbo encoding is supported or not.

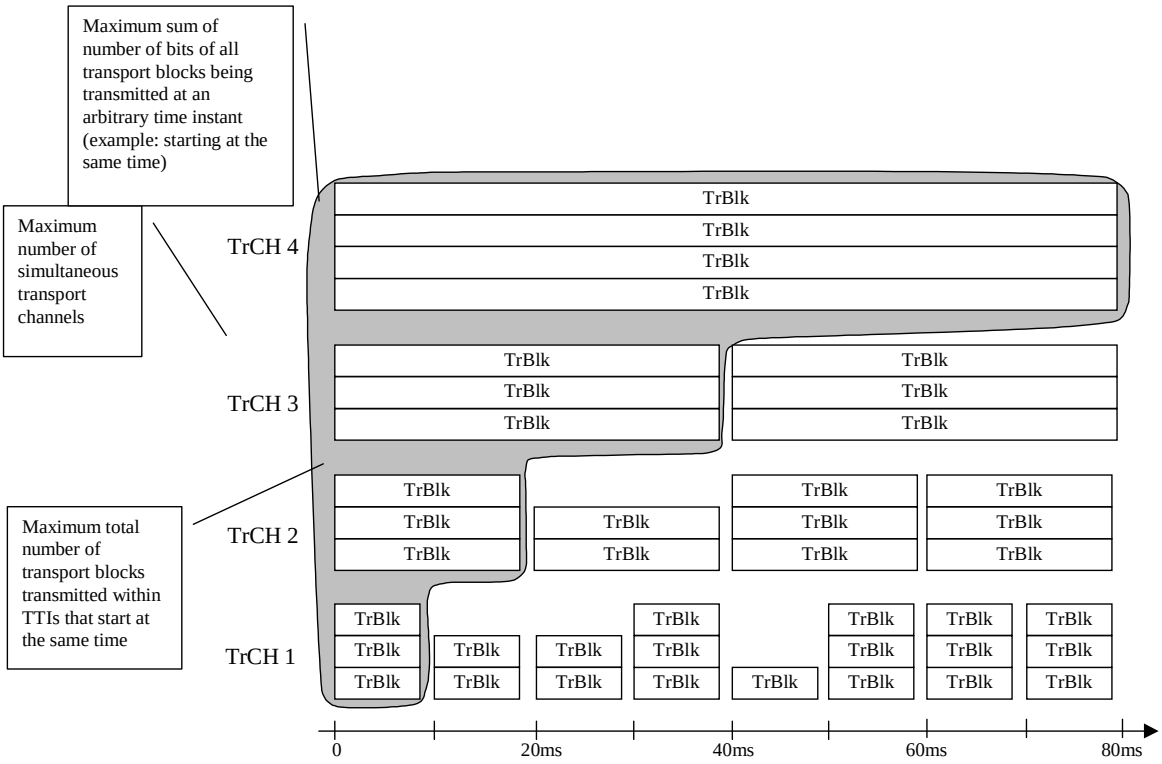

Figure 4.1: UE transport channel processing limitations in uplink

4.5.3 FDD Physical channel parameters in downlink

Maximum number of DPCH codes to be simultaneously received

Defines the number of codes the UE is capable of receiving in parallel. For DPCH in soft/softer handover, each DPCH is only calculated once in this capability. The capability does not include codes used for S-CCPCH.

Maximum number of physical channel bits received in any 10 ms interval (DPCH, S-CCPCH)

Defines the number of physical channel bits the UE is capable of receiving. For DPCH in soft/softer handover, each DPCH is only calculated once in this capability.

The number of DPCH channel bits indicates the capability of the UE when operating in non-compressed mode.

The parameter also indicates the capability of the UE to support compressed mode by spreading factor reduction as follows. The UE shall:

- for parameter values up to and including 9600 bits:
  - support compressed mode by spreading factor reduction when operating at any value up to the reported capability.
- for parameter values greater than 9600 bits:
  - support compressed mode by spreading factor reduction when operating at any value up to the greater of:

- half the reported capability; or
- 9600bits.

NOTE: Compressed mode by spreading factor reduction is not applicable when operating at spreading factor 4.

Support for SF 512 and 80 ms TTI for DPCH

Defines whether the UE supports spreading factor 512 and 80 ms TTI in downlink DPCH or not.

Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

Simultaneous reception of SCCPCH and DPCH

Defines whether the UE supports simultaneous reception of SCCPCH and DPCH or not.

NOTE: Simultaneous reception of SCCPCH and DPCH, i.e. simultaneous reception of FACH and DCH is required for e.g. DRAC procedure

Maximum number of HS-DSCH codes received

Defines the maximum number of HS-DSCH codes the UE is capable of receiving.

Total number of soft channel bits in HS-DSCH

Defines the maximum number of soft channel bits over all HARQ processes. When explicit signalling is used, UTRAN configures Process Memory Size for each HARQ process so that the following criterion must be fulfilled in the configuration:

Total number of soft channel bits in HS-DSCH ≥ sum of Process Memory Size of all the HARQ processes.

Minimum inter-TTI interval in HS-DSCH

Defines the distance from the beginning of a TTI to the beginning of the next TTI that can be assigned to the UE.

4.5.4 FDD physical channel parameters in uplink

Maximum number of DPDCH bits per 10 ms

Defines the maximum number of the DPDCH bits the UE is capable to transmit per 10 ms.

If the reported capability is lower than 9600, the number of DPDCH channel bits indicates the capability of the UE when operating in non-compressed mode; if the reported capability is equal to or greater than 9600 it indicates the maximum capability of the UE considering both compressed and non compressed mode operation.

NOTE 1: This capability combines the 'Max number of DPDCH' and 'Minimum SF' capabilities into one capability. Note that no flexibility is lost due to this, as multiple DPDCH is only used for SF = 4, i.e. when the number of DPDCH bits exceed a certain value.

NOTE 2: Compressed mode by spreading factor reduction is not applicable when operating at spreading factor 4.

Support of E-DPDCH

Defines whether the UE supports E-DPDCH or not.

Maximum number of E-DCH codes transmitted

Defines the maximum number of E-DCH codes and spreading factors the UE is capable of transmitting. The UE can support 1, 2 or 4 E-DPDCHs using either SF=2 or/and SF=4.

Support of 2ms TTI for E-DCH

Defines whether the UE supports 2ms TTI or not.

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.

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 an 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.

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 an HS-DSCH TTI.

Total number of soft channel bits

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

4.5.6 TDD physical channel parameters in uplink

4.5.6.1 3.84 Mcps TDD physical channel parameters in uplink

Maximum Number of timeslots per frame

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

Maximum number of physical channels per timeslot

Defines the maximum number physical channels transmitted in parallel during one timeslot.

Minimum SF

Defines the minimum SF supported by the UE.

Support of PUSCH

Defines whether PUSCH is supported or not.

4.5.6.2 1.28 Mcps TDD physical channel parameters in uplink

Maximum Number of timeslots per subframe

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

Maximum number of physical channels per timeslot

Defines the maximum number of physical channels transmitted in parallel during one timeslot.

Minimum SF

Defines the minimum SF supported by the UE.

Support of PUSCH

Defines whether PUSCH is supported or not.

Support of 8PSK

Defines whether 8PSK modulation is supported or not.

4.5.7 RF parameters

UE power class

Indicates the UE power class as defined in [4] for FDD and [5] for TDD.

Radio frequency bands

This parameter is only applicable for TDD. It defines the uplink and downlink frequency bands supported by the UE as defined in [5].

Tx/Rx frequency separation

This parameter is only applicable for FDD and only if the UE is operating in frequency band a as defined in [4]. It defines the uplink/downlink frequency separations supported by the UE.

4.6 Multi-mode related parameters

Support of UTRA FDD

Defines whether UTRA FDD is supported.

There is no explicit configuration parameter.

Support of UTRA TDD 3.84 Mcps

Defines whether UTRA TDD 3.84 Mcps is supported.

There is no explicit configuration parameter.

Support of UTRA TDD 1.28 Mcps

Defines whether UTRA TDD 1.28 Mcps is supported.

There is no explicit configuration parameter.

4.7 Multi-RAT related parameters

Support of GSM

Defines whether GSM is supported or not. There is a separate parameter for each GSM frequency band.

Support of multi-carrier

Defines whether multi-carrier is supported or not.

Support of UTRAN to GERAN NACC

Defines whether UTRAN to GERAN NACC is supported or not.

4.7a Security parameters

Ciphering algorithm capability

This capability defines the ciphering algorithms supported by the UE. In this version of the protocol, the UE shall support UEA0 and UEA1.

Integrity protection algorithm capability

This capability defines the integrity protection algorithms supported by the UE. In this version of the protocol, the UE shall support UIA1.

4.8 UE positioning related parameters

Standalone location method(s) supported

Defines if a UE can measure its location by some means unrelated to UTRAN (e.g. if the UE has access to a standalone GPS receiver).

OTDOA UE based method supported

Defines if a UE supports the OTDOA UE based schemes.

Network Assisted GPS support

Defines if a UE supports either of the two types of assisted GPS schemes, namely "Network based", "UE based", "Both", or "none".

GPS reference time capable

Defines if a UE has the capability to measure GPS reference time as defined in [6].

Support for IPDL

Defines if a UE has the capability to use IPDL to enhance its "SFN-SFN observed time difference –type 2" measurement.

Support for Rx-Tx time difference type 2

Defines if a UE has the capability to perform the Rx-Tx time difference type 2 measurement.

Support for UE Positioning assisted GPS measurement validity in CELL_PCH and URA_PCH RRC states

Defines if UE Positioning measurements using the assisted GPS method are valid in CELL_PCH and URA_PCH RRC states.

Support for SFN-SFN observed time difference type 2 measurement

Defines if the UE has the capability to perform the SFN-SFN observed time difference type 2 measurement.

4.9 Measurement related capabilities

Need for downlink compressed mode

Defines whether the UE needs compressed mode in the downlink in order to perform inter-frequency or inter-RAT measurements. There are separate parameters for measurements on each UTRA mode, on each RAT, and in each frequency band.

Need for uplink compressed mode

Defines whether the UE needs compressed mode in the uplink in order to perform inter-frequency or inter-RAT measurements. There are separate parameters for measurements on each UTRA mode, on each RAT, and in each frequency band.

4.10 General capabilities

Access stratum release indicator

This is defined as the release of the UTRA layer 1, 2, and 3 specifications that is applicable for the UE e.g. R'99, Rel-4.

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 4.11-1 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.

Table 4.11-1: DL capabilities with simultaneous HS-DSCH

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

DL DPCH capability with simultaneous HS-DSCH configuration	32 kbps	64 kbps	128 kbps	384 kbps
Physical channel parameters (FDD)				
Maximum number of DPCH codes to be simultaneously received	1	1	1	3
Maximum number of physical channel bits received in any 10 ms interval (DPCH, S-CCPCH).	1200	2400	4800	19200
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

4.12 UL capabilities with simultaneous E-DCH

UL capability with simultaneous E-DCH configuration

Defines the modification of transmission capabilities in uplink in terms of DPCH in case an E-DCH is configured simultaneously. The parameter values in table 4.12-1 replace the signalled values in case an E-DCH is configured simultaneously depending on the setting of the parameter UL DPCH capability with simultaneous E-DCH configuration. Other parameters are valid irrespective whether E-DCH is configured simultaneously or not.

Table 4.12-1: UL capabilities with simultaneous E-DCH

UL DPCH capability with simultaneous E-DCH configuration	64 kbps
Transport channel parameters	
Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	3840
Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640
Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	3840
Maximum number of simultaneous transport channels	8
Maximum total number of transport blocks transmitted within TTIs that end at the same time	8
Maximum number of TFC	32
Maximum number of TF	32
Support for turbo encoding	Yes
Physical channel parameters (FDD)	
Maximum number of DPDCH bits transmitted per 10 ms	2400
Support of PCPCH	Yes/No

4.13 UE minimum capabilities with MBMS

For FDD, the minimum UE capability for MBMS reception consists of 2 separate and independent parts ("MBMS capability part A" and "MBMS capability part B").

MBMS capability part A parameters defined in Table 4.13-1 are the same as the 64kbps UE reference class for DL described in subclause 5.2 and provides capability to enable reception of the logical channels other than the MTCHs when MBMS PTM is received simultaneously.

Table 4.13-1: MBMS capability part A (FDD)

Capability for reception of DL DPCH or S-CCPCH carrying logical channels other than MTCH during MTCH reception	**64 kbps Class**
Transport channel parameters	**Value**
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	3840
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	3840
Maximum number of simultaneous transport channels	8
Maximum number of simultaneous CCTrCH (FDD)	1
Maximum total number of transport blocks received within TTIs that end at the same time	8
Maximum number of TFC	48
Maximum number of TF	64
Support for turbo decoding	Yes
Physical channel parameters (FDD)	
Number of DPCH or S-CCPCH codes (Note 1)	1
Maximum number of physical channel bits received in any 10 ms interval (DPCH or S-CCPCH).	2400
Support of PDSCH	No

NOTE: Capability for reception of DPCH is applicable only if UE supports MBMS PTM reception in CELL_DCH state.MBMS capability part B enables reception of the S-CCPCHs onto which MTCH and MSCH can be multiplexed. MBMS capability part B supports selection combining and soft combining of S-CCPCHs on different cells but not simultaneously.

MBMS capability part B is defined in the following Table 4.13-2. The exhaustive lists of supported configurations (slot formats, TTI and combining parameters) for capability part B is given in Tables 4.13-3.

Table 4.13-2: MBMS capability part B (FDD)

Combination of UE Radio Access capability parameters in DL for all S-CCPCHs that carry at least MTCH	
Transport channel parameters	**Value**
Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	21504
Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	21504
Maximum number of transport channels for the configuration	12
Maximum total number of transport blocks received within TTIs that end at the same time	32
Maximum number of TFC per S-CCPCH	32
Maximum number of TF	64
Support for turbo decoding	Yes
Number of CRC bits	16
Support for slot formats that do not contain TFCI	No
Supported slot formats and TTI combinations	See table 4.13-3
Physical channel parameters	
Maximum number of S-CCPCH codes	3

Table 4.13-3: Supported slot formats and TTI combinations for MBMS capability part B (FDD)

S-CCPCH slot format (see [11])	TTI (ms)	Maximum Number of S-CCPCH for Selection combining (Note 1)	Maximum Number of S-CCPCH for Soft Combining (Note 1)	Maximum Number of Simultaneous Transport Channels per S-CCPCH
14 (SF=8)	40	2	None	1
14 (SF=8)	40	None	3	1
12 (SF=16)	40	3	None	1
12 (SF=16)	80	2	None	1
12 (SF=16)	80	None	3	1
10 (SF=32)	80	3	None	4
10(SF=32)	80	None	3	1
8 (SF=64)	80	3	None	4
8 (SF=64)	80	None	3	1
6 (SF=128)	80	3	None	4
6 (SF=128)	80	None	3	1
2 (SF=256)	80	3	None	4
2 (SF=256)	80	None	3	1

NOTE: 'None' indicates that selection combining or soft combining is not used. UE is required to receive one S-CCPCH carrying MTCH/MSCH per cell.

Since MBMS capability part A and B are independent, the maximum number of S-CCPCH codes that the UE is required to receive is 4.

MBMS Capability part B may be used to receive MCCH in the following cases:

- When the UE is in CELL_FACH state, and the MCCH is on a different S-CCPCH than the S-CCPCH that the UE is required to monitor by subclause 8.5.19 of [12]. In case MBMS PTM reception is ongoing, the UE may soft or selectively combine 1 less S-CCPCH than shown in table 4.13-3 while receiving the S-CCPCH carrying the MCCH.
- When the UE is in CELL_DCH, if the UE supports MBMS PTM reception in CELL_DCH.

Table 4.13-3a applies when UE does support MBMS PTM reception in CELL_DCH, while Table 4.13-3b applies when UE does not support MBMS PTM reception in CELL_DCH.

Table 4.13-3a: Alternate supported slot formats and TTI for MBMS capability part B (FDD)

S-CCPCH slot format (see [11])	TTI (ms)	Maximum Number of Simultaneous Transport Channels
10 (SF=32)	20,10	4
8 (SF=64)	20,10	4
6 (SF=128)	20,10	4
2 (SF=256)	20,10	4

Table 4.13-3b: Alternate supported slot formats and TTI for MBMS capability part B (FDD)

S-CCPCH slot format (see [11])	TTI (ms)	Maximum Number of Simultaneous Transport Channels
8 (SF=64)	10	1
6 (SF=128)	10	1
2 (SF=256)	10	1

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 RFC 3095 context relocation	Yes/No
		Support for loss-less SRNS relocation	Yes/No
		Support for loss-less DL RLC PDU size change	Yes/No
		Maximum header compression context space	1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072 bytes
		Maximum number of ROHC context sessions	2, 4, 8, 12, 16, 24, 32, 48, 64, 128, 256, 512, 1024, 16384
		Support for Reverse Decompression	Not supported, 1..65535
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 200, 300, 400, 500, 750, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
		Maximum RLC AM window size	2047, 4095
		Support for RLC-SDU alignment	Yes/No
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

		UE radio access capability parameter	Value range
		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 DPCHcodes 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, S-CCPCH)	600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800
		Support for SF 512 and 80 ms TTI for DPCH	Yes/No
		Support of HS-PDSCH	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 E-DPDCH	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
		Support of UTRAN to GERAN Network Assisted Cell Change	Yes/No
Security parameters		Support of ciphering algorithm UEA0	Yes
		Support of ciphering algorithm UEA1	Yes
		Support of integrity protection algorithm UIA1	Yes
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 assisted GPS measurement validity in CELL_PCH and URA_PCH RRC states	Yes
		Support for SFN-SFN observed time difference type 2 measurement	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, REL-5
DL capabilities with simultaneous HS-DSCH		DL capability with simultaneous HS-DSCH configuration	32 kbps, 64 kbps, 128 kbps, 384 kbps
UL capabilities with simultaneous E-DCH		UL capabilities with simultaneous E-DCH	64 kbps

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 bits of an HS-DSCH transport block received within an HS-DSCH TTI	Total number of soft channel bits
Category 1	5	3	7298	19200
Category 2	5	3	7298	28800
Category 3	5	2	7298	28800
Category 4	5	2	7298	38400
Category 5	5	1	7298	57600
Category 6	5	1	7298	67200
Category 7	10	1	14411	115200
Category 8	10	1	14411	134400
Category 9	15	1	20251	172800
Category 10	15	1	27952	172800
Category 11	5	2	3630	14400

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 12	5	1	3630	28800

UEs of Categories 11 and 12 support QPSK only.

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 [kBytes]
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
Category 11	6	50
Category 12	6	50

Table 5.1c: 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
Category 1	12	5	7016	28160
Category 2	12	5	7016	56320
Category 3	12	5	7016	84480
Category 4	16	5	7016	28160
Category 5	16	5	7016	56320
Category 6	16	5	7016	84480
Category 7	12	5	10204	40912
Category 8	12	5	10204	81824
Category 9	12	5	10204	122736
Category 10	16	5	10204	40912
Category 11	16	5	10204	81824
Category 12	16	5	10204	122736
Category 13	16	5	14056	56320
Category 14	16	5	14056	112640
Category 15	16	5	14056	168960

Table 5.1d: 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 [kBytes]
Category 1	6	50
Category 2	6	50
Category 3	6	50
Category 4	6	50
Category 5	6	50

HS-DSCH category	Maximum number of AM RLC entities	Minimum total RLC AM and MAC-hs buffer size [kBytes]
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 5.1e: 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
Category 1	16	2	12000	52992
Category 2	16	12	12000	52992
Category 3	16	4	24000	105984
Category 4	16	12	24000	105984
Category 5	16	6	36000	158976
Category 6	16	12	36000	158976
Category 7	16	12	53000	211968
Category 8	16	12	73000	264960
Category 9	16	12	102000	317952

Table 5.1f: 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 [kBytes]
Category 1	6	50
Category 2	6	50
Category 3	6	50
Category 4	6	50
Category 5	6	100
Category 6	6	100
Category 7	6	150
Category 8	8	150
Category 9	8	200

Table 5.1g: FDD E-DCH physical layer categories

E-DCH category	Maximum number of E-DCH codes transmitted	Minimum spreading factor	Support for 10 and 2 ms TTI EDCH	Maximum number of bits of an E-DCH transport block transmitted within a 10 ms E-DCH TTI	Maximum number of bits of an E-DCH transport block transmitted within a 2 ms E-DCH TTI
Category 1	1	SF4	10 ms TTI only	7296	-
Category 2	2	SF4	10 ms and 2 ms TTI	14592	2919
Category 3	2	SF4	10 ms TTI only	14592	-

E-DCH category	Maximum number of E-DCH codes transmitted	Minimum spreading factor	Support for 10 and 2 ms TTI EDCH	Maximum number of bits of an E-DCH transport block transmitted within a 10 ms E-DCH TTI	Maximum number of bits of an E-DCH transport block transmitted within a 2 ms E-DCH TTI
Category 4	2	SF2	10 ms and 2 ms TTI	20000	5837
Category 5	2	SF2	10 ms TTI only	20000	-
Category 6	4	SF2	10 ms and 2 ms TTI	20000	11520
NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4					

Table 5.1h: Total RLC and MAC-hs parameters for FDD HS-DSCH and E-DCH physical layer categories

These values reflect the total buffer sizes of HSDPA and E-DCH categories for simultaneous HSDPA/E-DCH operation.
It is FFS whether some resources need to be reserved for the Transmission buffer.

HS-DSCH category / E-DCH category	Categories 1 to 4 [kBytes]	Categories 5 and 6 [kBytes]	Categories 7 and 8 [kBytes]	Category 9 [kBytes]	Category 10 [kBytes]	Category 11 and 12 [kBytes]	Maximum number of AM RLC entities
Category 1	100	100	200	300	FFS	FFS	6
Categories 2 and 3	100	150	200	300	FFS	FFS	6
Category 5	100	150	200	300	FFS	FFS	6
Category 4	-	150	300	300	FFS	FFS	6
Category 6	-	200	300	400	FFS	FFS	6

5.2 Reference UE radio access capability combinations

Based on required UE radio access capabilities to support reference RABs as defined in [2], this clause lists reference UE Radio Access capability combinations. Subclause 5.2.1 defines reference combinations of UE radio access capability parameters common for UL and DL. Subclauses 5.2.2 and 5.2.3 define reference combinations of UE radio access capability parameters that are separate for DL and UL respectively. A reference combination for common UL and DL parameters, one combination for UL parameters and one combination for DL parameters together relate to a UE with a certain implementation complexity, that allows support for one or several combined reference RABs. Combinations for UL and DL can be chosen independently. The bit rate supported by the selected combination of common UL and DL parameters needs to be at least as high as the maximum out of the supported bit rates of the selected combination of DL parameters and the selected combination of UL parameters. Different combinations have different levels of implementation complexity.

For defined reference RABs, it is possible to require a UE to meet a certain reference UE radio access capability combination. Each UE needs to have capabilities complying with a given reference radio access capability combination. Each individual radio access capability parameter as defined in subclause 5.1 shall be signalled.

The reference combination numbers shall not be used in the signalling of UE radio access capabilities between the UE and UTRAN. Reference UE radio access capability combinations provide default configurations that should be used as a basis for conformance testing against reference RABs.

The UE shall support at least the UE radio access capability parameter values as specified for the 12kbps UE reference class for both UL and DL.

Allowed values of UE capability parameters are limited by the defined range and granularity of values in subclause 5.1. Values might change depending on further definition of reference RABs for testing.

5.2.1 Combinations of common UE Radio Access Parameters for UL and DL

NOTE: Measurement-related capabilities are not included in the combinations. These capabilities are independent from the supported RABs.

Table 5.2.1.1: UE radio access capability parameter combinations, parameters common for UL and DL

Reference combination of UE Radio Access capability parameters common for UL and DL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
PDCP parameters							
Support for RFC 2507	No	No	No/Yes NOTE 1	No/Yes NOTE 1	No/Yes NOTE 1	No/Yes NOTE 1	No/Yes NOTE 1
Support for RFC 3095	No/Yes NOTE 1	Yes	Yes	Yes	Yes	Yes	Yes
Support for RFC 3095 context relocation	No/Yes NOTE 1						
Support for loss-less SRNS relocation	No/Yes NOTE 1						
Maximum header compression context space	Not applicable for conformance testing						
Maximum number of ROHC context sessions	Not applicable for conformance testing						
Support for Reverse decompression	No/Yes NOTE 1						
RLC parameters							
Total RLC AM buffer size (kbytes)	10	10	10	50	50	100	500
Maximum number of AM entities	4	4	4	5	6	8	8
Maximum RLC AM window size	2047/4095 NOTE 1	2047/4095 NOTE 1	2047/4095 NOTE 1	2047/4095 NOTE 1	2047/4095 NOTE 1	2047/4095 NOTE 1	2047/4095 NOTE 1
Multi-mode related parameters							
Support of UTRA FDD	Yes/No NOTE 1						
Support of UTRA TDD 3.84 Mcps	Yes/No NOTE 1						
Support of UTRA TDD 1.28 Mcps	Yes/No NOTE 1						
Multi-RAT related parameters							
Support of GSM	Yes/No NOTE 1						
Support of multi-carrier	Yes/No NOTE 1						
Support of UTRAN to GERAN Network Assisted Cell Change	Yes/No						
Security parameters							
Support of ciphering algorithm UEA0	Yes						
Support of ciphering algorithm UEA1	Yes						
Support of integrity protection algorithm UIA1	Yes						
UE positioning related parameters							
Standalone location method(s) supported	Yes/No NOTE 1						
Network assisted GPS support	Network based / UE based / Both/ None NOTE 1						
GPS reference time capable	Yes/No NOTE 1						
Support for IPDL	Yes/No NOTE 1						
Support for OTDOA UE based method	Yes/No NOTE 1						
Support for Rx-Tx time difference type 2 measurement	Yes/No NOTE 1						

Reference combination of UE Radio Access capability parameters common for UL and DL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Support for UE Positioning assisted GPS measurement validity in CELL_PCH and URA_PCH RRC states	Yes						
Support for SFN-SFN observed time difference type 2 measurement	Yes/No NOTE 1						
RF parameters for FDD							
UE power class	3 / 4 NOTE 1						
Tx/Rx frequency separation	190 MHz						
RF parameters for TDD 3.84 Mcps							
Radio frequency bands	A / b / c / a+b / a+c / b+c / a+b+c NOTE 1						
UE power class	2 / 3 NOTE 1						
RF parameters for TDD 1.28 Mcps							
Radio frequency bands	A / b / c / a+b / a+c / b+c/ a+b+c NOTE 1						
UE power class	2 / 3 NOTE 1						

NOTE 1: Options represent different combinations that should be supported with Conformance Tests.

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	12 kbps class	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 (FDD) 1280(TDD)	1280	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	640
Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	NA (FDD) 1280(TDD)	1280	3840	3840	6400	10240	20480(1) 10240(2) NOTE 5
Maximum number of simultaneous transport channels	4	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	1 NOTE 3	1 NOTE 3	1 NOTE 3	1 NOTE 3	1 NOTE 3	1 NOTE 3
Maximum number of simultaneous CCTrCH (TDD)	1 NOTE 3	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	4	8	8	16	32	64	96
Maximum number of TFC	16	32	48	96	128	256	1024
Maximum number of TF	32	32	64	64	64	128	256
Support for turbo decoding	No (FDD) Yes (TDD)	Yes	Yes	Yes	Yes	Yes	Yes
Support for loss-less DL RLC PDU size change	No	No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Physical channel parameters (FDD)							
Maximum number of DPCH codes to be simultaneously received	1	1	1	1	3	3	3

Reference combination of UE Radio Access capability parameters in DL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class	2048 kbps class
Maximum number of physical channel bits received in any 10 ms interval (DPCH, S-CCPCH).	1200	1200	2400	4800	19200	28800	57600
Support for SF 512 and 80 ms TTI for DPCH NOTE 6	No	No	No	No	No	No	No
Support of HS-PDSCH	No	No	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	1	2	4	5	10	12
Maximum number of physical channels per frame	5	8	9	14	28	64	136
Minimum SF	16	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1/16 NOTE 1
Support of PDSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes	Yes
Support of HS-PDSCH	No	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Maximum number of physical channels per timeslot	5	8	9	9	9	9	13
Physical channel parameters (TDD 1.28 Mcps)							
Maximum number of timeslots per subframe	1	1	2	3	4	6	6
Maximum number of physical channels per subframe	5	8	12	18	43	77	77
Minimum SF	16	16	16	16	1/16 NOTE 1	1/16 NOTE 1	1
Support of PDSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes	Yes
Support of HS-PDSCH	No	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Maximum number of physical channels per timeslot	5	8	11	14	14	14	14
Support of 8PSK	No	No	No	No	No	No	Yes

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

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.

The reference combinations for HS-DSCH capabilities are shown in tables 5.2.2.2, 5.2.2.3 and 5.2.2.4. 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
FDD HS-DSCH category	Category 1	Category 5	Category 7	Category 9

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
1.28 Mcps TDD HS-DSCH Category	Category 1	Category 7	Category 13

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
3.84Mcps TDD HS-DSCH category	Category 1	Category 3	Category 5	Category 8	Category 9

The reference combinations for E-DCH capabilities are shown in table 5.2.2.5. This table is subject to further discussions in TSG-RAN WG1 and TSG-RAN WG2.

Table 5.2.2.5: FDD UE radio access capability parameter combinations, UL E-DCH parameters

Reference combination	0.7296 Mbps class	1.4592 Mbps class	2 Mbps class	2.9185 Mbps class	5.76 Mbps class
FDD E-DCH category	Category 1	Categories 2 and 3	Category 5	Category 4	Category 6

5.2.3 Combinations of UE Radio Access Parameters for UL

Table 5.2.3.1: UE radio access capability parameter combinations, UL parameters

Reference combination of UE Radio Access capability parameters in UL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640	640(FDD) 1280 (TDD)	3840	3840	6400	10240
Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	NA	NA(FDD) 1280 (TDD)	3840	3840	6400	10240
Maximum number of simultaneous transport channels	4	4	8	8	8	8
Maximum number of simultaneous CCTrCH(TDD only)	1 NOTE 3	1 NOTE 3	2 NOTE 3	2 NOTE 3	2 NOTE 3	2 NOTE 3
Maximum total number of transport blocks transmitted within TTIs that start at the same time	4	4	8	8	16	32
Maximum number of TFC	16	16	32	48	64	128
Maximum number of TF	32	32	32	32	32	64
Support for turbo encoding	No	No (FDD) Yes (TDD)	Yes	Yes	Yes	Yes
Support for RLC-SDU alignment	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Physical channel parameters (FDD)						
Maximum number of DPDCH bits transmitted per 10 ms	600	1200	2400	4800	9600	19200
Support of E-DPDCH	No	No	Yes/No	Yes/No	Yes/No	Yes/No
Physical channel parameters (TDD 3.84 Mcps)						
Maximum Number of timeslots per frame	1	1	2	3	7	9
Maximum number of physical channels per timeslot	1	1	1	1	1	2
Minimum SF	8	4	2	2	2	2
Support of PUSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes
Physical channel parameters (TDD 1.28 Mcps)						
Maximum Number of timeslots per	1	1	2	3	5	5

Reference combination of UE Radio Access capability parameters in UL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class
subframe						
Maximum number of physical channels per timeslot	1	1	1	1	1	2
Minimum SF	8	4	2	2	2	2
Support of PUSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes
Support of 8PSK	No	No	No	No	No	No

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

NOTE 3: This number does not contain the RACH CCTrCH.

Annex A (informative): Change history

Change history TR 25.926							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
03/2000	RP-07	RP-000052	-	-	Approved at TSG-RAN #7 and placed under Change Control	-	3.0.0
06/2000	RP-08	RP-000229	003	4	Updated Ad Hoc changes	3.0.0	3.1.0
	RP-08	RP-000229	008		CPCH note to the parameter definitions	3.0.0	3.1.0
09/2000	RP-09	RP-000368	010	1	TDD DL Physical Channel Capability per Timeslot	3.1.0	3.2.0
	RP-09	RP-000368	012		Change to UE Capability definition	3.1.0	3.2.0
	RP-09	RP-000368	013		Physical parameter changes	3.1.0	3.2.0
12/2000	RP-10	RP-000578	014		Removal of example RABs	3.2.0	25.306 3.0.0
	RP-10	RP-000578	015	2	Correction on parameter "Maximum total number of transport blocks…"	3.2.0	25.306 3.0.0
	RP-10	RP-000578	016		Change to UE multi-RAT capability	3.2.0	25.306 3.0.0
	RP-10	RP-000578	017		Change from TR 25.926 to TS 25.306	3.2.0	25.306 3.0.0

Change history TS 25.306							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
03/2001	RP-11	RP-010024	001		Downlink rate matching limitation	3.0.0	3.1.0
	RP-11	RP-010024	005		Miscellaneous corrections and editorial clean-up	3.0.0	3.1.0
	RP-11	RP-010024	007		Maximum number of AM entity	3.0.0	3.1.0
	RP-11	RP-010024	008	1	Clarification of maximum number of TF	3.0.0	3.1.0
	RP-11	RP-010024	010	1	Removal of the RLC PU concept	3.0.0	3.1.0
	RP-11	RP-010039	003	1	1.28 Mcps TDD	3.1.0	4.0.0
	RP-11	RP-010043	006	1	DSCH related updates for UE capabilities for the UE Radio Access Capability parameter combinations	3.1.0	4.0.0
	RP-11	RP-010039	011	1	Addition of ROHC	3.1.0	4.0.0
06/2001	RP-12	RP-010307	013		Clarification on the number of CCTrCHs to be received simultaneously by the UE	4.0.0	4.1.0
	RP-12	RP-010321	009	6	Modified UE Capability for CPCH	4.0.0	4.1.0
09/2001	RP-13	RP-010540	017		Maximum number of simultaneous transport channels	4.1.0	4.2.0
	RP-13	RP-010540	019		Clarification of FDD physical channel parameters	4.1.0	4.2.0
	RP-13	RP-010540	021		Support of dedicated pilots for channel estimation	4.1.0	4.2.0
	RP-13	RP-010540	023		Correction of UE capabilities regarding Rx-Tx time difference type 2 measurements	4.1.0	4.2.0
12/2001	RP-14	RP-010758	026		Correction on UL parameter "Maximum number of DPDCH bits per 10 ms"	4.2.0	4.3.0
03/2002	RP-15	RP-020228	035		Clarification on ICS version within UE radio access capabilities	4.3.0	4.4.0
	RP-15	RP-020242	037	1	Clarification of Maximum number of TFC in the TFCS	4.3.0	4.4.0
	RP-15	RP-020237	039		Support of UP measurement reporting in CELL_PCH/URA_PCH	4.3.0	4.4.0
	RP-15	RP-020094	029	2	HSDPA UE capabilities	4.4.0	5.0.0
06/2002	RP-16	RP-020325	044		Security Capabilities	5.0.0	5.1.0
	RP-16	RP-020439	040	1	Corrections in HSDPA UE capabilities	5.0.0	5.1.0
	RP-16	RP-020341	041		HSDPA TDD UE capabilities	5.0.0	5.1.0
	RP-16	RP-020341	045		DPCH capabilities with simultaneous HSDPA configuration	5.0.0	5.1.0
	RP-16	RP-020345	046		RFC 3095 context relocation	5.0.0	5.1.0
	RP-17	RP-020555	047		Introduction of HS-PDSCH capability definition and QPSK-only UE categories	5.1.0	5.2.0
	RP-17	RP-020555	048		Mandatory Support of dedicated pilots for channel estimation	5.1.0	5.2.0
12/2002	RP-18	RP-020717	054	1	UE capability for RLC window size	5.2.0	5.3.0
	RP-18	RP-020857	051		UE capability for RFC3095 operation	5.2.0	5.3.0
	RP-18	RP-020733	049	3	HSDPA L2 buffer sizes	5.2.0	5.3.0
	RP-18	RP-020733	056		Correction to Access Stratum release indicator	5.2.0	5.3.0
	RP-18	RP-020733	057		Dedicated pilot bits for HS-DSCH	5.2.0	5.3.0
03/2003	RP-19	RP-030113	061		Network Assisted Cell Change from UTRAN to GERAN	5.3.0	5.4.0
	RP-19	RP-030113	062		Modification to the number of soft channel bits required for HS-DSCH (TDD)	5.3.0	5.4.0
06/2003	RP-20	RP-030291	067		Extension of 32 kbps UE capability class	5.4.0	5.5.0
	RP-20	RP-030301	068		Correction of maximum transport block sizes for UE categories	5.4.0	5.5.0
	RP-20	RP-030301	069		SF1 corrections for TDD	5.4.0	5.5.0

Change history TS 25.306							
09/2003	RP-21	RP-030493	072		Addition of memory unit in UE Radio Access Capabilities tables	5.5.0	5.6.0
	RP-21	RP-030482	075		Correction of Maximum hc context space capability	5.5.0	5.6.0
	RP-21	RP-030482	078		UE positioning support in the UE	5.5.0	5.6.0
12/2003	RP-22	RP-030623	082		Removal of reference combinations for HS-DSCH capabilities	5.6.0	5.7.0
	RP-22	RP-030614	085		Definition of minimum UE capability class	5.6.0	5.7.0
	RP-22	RP-030614	088		TDD Radio Access Parameters for UL 32kbs class UE's	5.6.0	5.7.0
	RP-22	RP-030623	089		Correction to HSDPA capability	5.6.0	5.7.0
	RP-22	-	-		Upgrade to Release 6 - no technical change	5.7.0	6.0.0
03/2004	RP-23	RP-040102	093		Simultaneous Reception of S-CCPCH and HS-DSCH	6.0.0	6.1.0
	RP-23	RP-040102	095		Correction to memory check in the UE	6.0.0	6.1.0
06/2004	RP-24	RP-040223	096		Correction to memory handling in the UE	6.1.0	6.2.0
12/2004	RP-26	RP-040479	098		Alignment of MaxHcContextSpace	6.2.0	6.3.0
03/2005	RP-27	RP-050065	101		Support of DSCH	6.3.0	6.4.0
	RP-27	RP-050067	103		Lossless DL RLC PDU size change	6.3.0	6.4.0
	RP-27	RP-050154	104	2	Inclusion of UE capabilities for Enhanced Uplink	6.3.0	6.4.0
	RP-27	RP-050083	105		Support of ROHC mandatory	6.3.0	6.4.0
04/2005					Inclusion of RP-27 change history in this table.	6.4.0	6.4.1
06/2005	RP-28	RP-050314	0107		Introduction of MBMS capability Part A and B	6.4.1	6.5.0
	RP-28	RP-050305	0109		Feature Clean Up: Removal of 80 ms TTI for DCH for all other cases but when the UE supports SF512	6.4.1	6.5.0
	RP-28	RP-050308	0111		Feature Clean-up: Removal of DSCH (FDD)	6.4.1	6.5.0
	RP-28	RP-050309	0113		Feature Clean Up: Removal of CPCH	6.4.1	6.5.0
	RP-28	RP-050310	0115		Feature Clean Up: Removal of dedicated pilot as sole phase reference	6.4.1	6.5.0
	RP-28	RP-050311	0117		Feature Clean Up: Removal of DRAC	6.4.1	6.5.0
	RP-28	RP-050327	0118		E-DCH L2 Buffer sizes	6.4.1	6.5.0
	RP-28	RP-050317	0119		RLC LI Optimization for VoiP	6.4.1	6.5.0

History

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