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## **Universal Mobile Telecommunications System (UMTS); UE Radio Access capabilities (3GPP TS 25.306 version 10.7.0 Release 10)**



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## Foreword

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# Foreword

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## 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.

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## 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".
- [13] 3GPP TS 25.308 "High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2".
- [14] 3GPP TS 25.221 "Physical channels and mapping of transport channels onto physical channels (TDD)".
- [15] RFC 4815: "RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095".

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## 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 robust header compression according to [8] and [15], as defined in [1] or not. 'IMS capable UEs supporting voice' shall support ROHC profiles 0x0000, 0x0001, 0x0002 and be able to compress and decompress headers of PDCP SDUs at a PDCP SDU rate corresponding to supported IMS voice codecs.

#### Support for RFC 3095 context relocation

This parameter defines whether the UE supports ROHC, [8] and [15], 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  $\geq$  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 [8] and [15]. 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.

#### Support for CS voice over HSPA

Defines whether the UE is able to route CS voice (AMR and AMR WB) data over HS-DSCH and E-DCH transport channels. If the UE supports CS voice over HS-DSCH and E-DCH, then the UE shall also support HS-PDSCH and E-DPDCH in CELL\_DCH and DPCCH Discontinuous Transmission and MAC-ehs.

## 4.2 Void

## 4.3 RLC, MAC-hs, MAC-ehs and MAC-i/is 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 of MAC-ehs

Defines whether the UE supports reception of MAC-ehs operation. If the UE supports MAC-ehs operation then the UE shall also support HS-PDSCH in CELL\_DCH, flexible RLC AM PDU size in downlink, octet aligned transport block table, using special value of HE field to indicate end of an SDU for RLC AM and the possibility that different HS-SCCHs can be used in contiguous TTIs.

#### Support of Two Logical Channels

Defines whether the UE supports an AM RLC entity configuration with two logical channels.

#### Support of MAC-i/is

Defines whether the UE supports MAC-i/is operation. If the UE supports MAC-i/is operation then the UE shall also support MAC-ehs operation, E-DPDCH in CELL\_DCH and flexible RLC AM PDU size in uplink.

## 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:

$$\sum_i(N_i)$$

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:

$$\sum_i(N_i)$$

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.

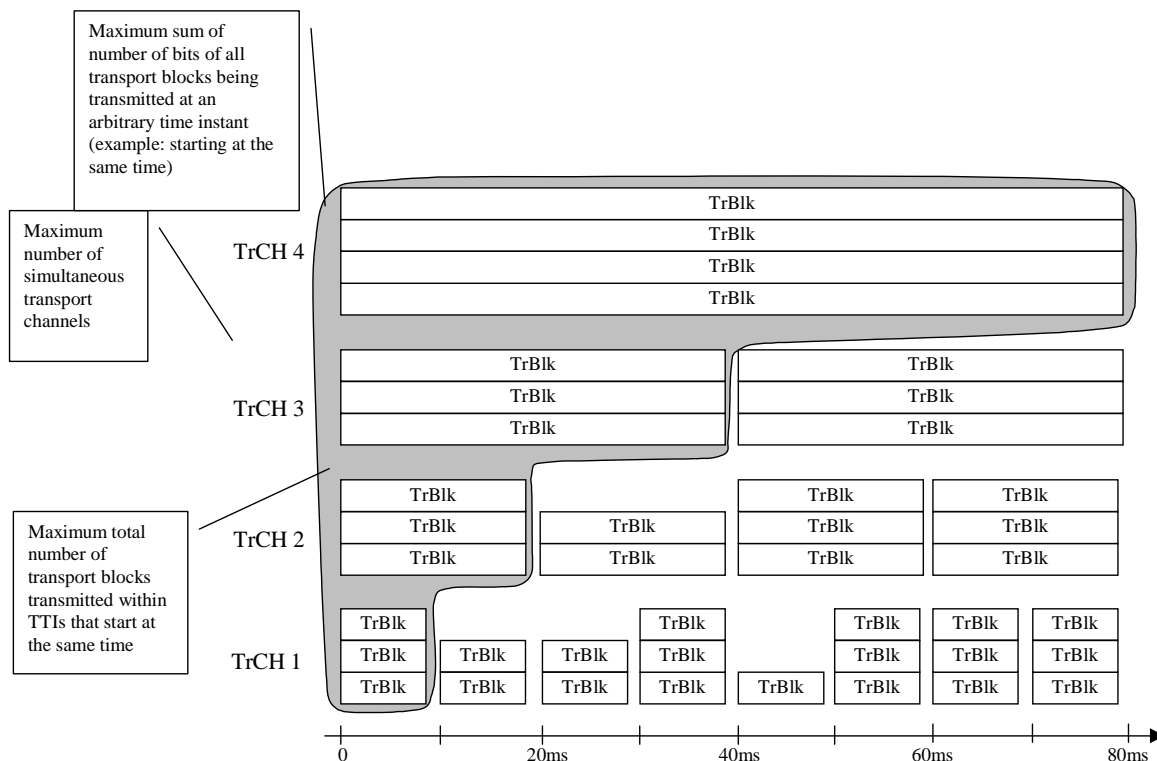


Figure 4.1: UE transport channel processing limitations in uplink

### 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 in CELL\_DCH state or not. If the UE supports HS-PDSCH in CELL\_DCH state then the UE shall support also F-DPCH.

Support of HS-SCCHless HS-DSCH

Defines whether the UE supports HS-PDSCH reception in CELL\_DCH without prior reception of HS-SCCH. If the UE supports HS-SCCHless HS-DSCH then the UE shall support HS-PDSCH in CELL\_DCH and E-DPDCH.

Support of HS-PDSCH in CELL\_FACH

Defines whether the UE supports HS-PDSCH in CELL\_FACH state or not. If the UE supports HS-PDSCH in CELL\_FACH then the UE shall support also HS-PDSCH in CELL\_DCH and MAC-ehs.

Support of HS-PDSCH in CELL\_PCH and URA\_PCH

Defines whether the UE supports HS-PDSCH in CELL\_PCH and URA\_PCH states or not. If the UE supports HS-PDSCH in CELL\_PCH then the UE shall support also HS-PDSCH in CELL\_FACH.

Support of Enhanced F-DPCH

Defines whether the UE supports enhanced F-DPCH operation. If the UE supports Enhanced F-DPCH then the UE shall also support HS-PDSCH in CELL\_DCH and E-DPDCH.

#### Maximum number of HS-DSCH codes received

Defines the maximum number of HS-DSCH codes the UE is capable of receiving. When the UE supports either MIMO or dual cell operation, this parameter defines the maximum number of HS-DSCH codes that the UE is capable of receiving per transport block.

#### 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  $\geq$  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.

#### Support of Target Cell Pre-Configuration

Defines if the UE supports simultaneous HS-DSCH reception from serving cell and decoding of an HS-SCCH sent from another cell in the active set. If the UE supports Target Cell Pre-Configuration then the UE shall also support Enhanced F-DPCH.

#### Support of HS-DSCH DRX operation

Defines whether the UE supports HS-DSCH DRX operation in CELL\_FACH state as defined in [13]. If the UE supports HS-DSCH DRX operation in CELL\_FACH state then the UE shall also support HS-PDSCH in CELL\_FACH.

#### Support for Two DRX schemes in URA\_PCH and CELL\_PCH

Defines whether UE supports Two DRX schemes in URA\_PCH and CELL\_PCH.

#### Support of TX Diversity on DL Control Channels by MIMO Capable UE when MIMO operation is active

Defines whether the UE supports TX diversity on DL Control Channels (HS-SCCH, F-DPCH, E-AGCH, E-HICH, E-RGCH) when MIMO is active, P-CPICH is configured on antenna 1, and S-CPICH on antenna 2.

#### Support for cell-specific Tx diversity configuration for dual-cell operation

Defines whether the UE supports cell specific Tx diversity configuration when configured for dual-cell operation.

#### Support of MIMO only with single-stream restriction

Defines whether the UE supports MIMO only with restriction to single stream operation. UE supporting this capability shall belong to any HS-DSCH physical layer category not supporting MIMO or the UE shall belong to category 17 or 18. If the UE supports MIMO only with single-stream restriction, the UE shall also support MAC-ehs.

#### Support of dual band operation

Defines whether the UE supports dual cell operation in the band combinations indicated in the Radio Access Capability Band Combination List [12]. If the UE supports dual band operation, the UE shall also support dual cell operation on adjacent frequencies.

#### Support for dual cell with MIMO operation in different bands

Defines whether the UE supports dual cell with MIMO operation in different bands. If the UE supports dual cell with MIMO operation in different bands, the UE shall also support dual band operation.

## 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 in CELL\_DCH or not.

### Maximum number of E-DCH codes transmitted per transport block

Defines the maximum number of E-DCH codes and spreading factors the UE is capable of transmitting per transport block. 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.

### Support of DPCCH Discontinuous Transmission

Defines whether the UE supports DPCCH Discontinuous Transmission in CELL\_DCH. If the UE supports DPCCH Discontinuous Transmission then the UE shall also support

- HS-PDSCH in CELL\_DCH
- E-DPDCH in CELL-DCH
- Uplink DRX with E-DCH start time restriction in CELL-DCH as defined in [13]
- The configuration of the Downlink DRX as defined in [13].

### Support of Slot Format #4

Defines whether the UE supports slot format #4.

### Support for E-DPDCH power interpolation formula

Defines whether the UE supports E-DPDCH power interpolation formula when 16QAM is not configured.

### Support for E-DPCCH power boosting

Defines whether the UE supports E-DPCCH power boosting.

### Support of common E-DCH

Defines whether the UE supports E-DCH enhanced random access in CELL\_FACH state and Idle mode. If the UE supports common E-DCH then the UE shall also support

- MAC-i/is
- FDD E-DCH physical layer category 2, 4, 6 or 7
- Enhanced F-DPCH

- HS-PDSCH in CELL\_FACH

## 4.5.5 TDD physical channel parameters in downlink

### 4.5.5.1 3.84 Mcps TDD and 7.68 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.

### Support of HS-PDSCH in CELL\_FACH

Defines whether the UE supports HS-PDSCH in CELL\_FACH, CELL\_PCH and URA\_PCH state or not. If the UE supports HS-PDSCH in CELL\_FACH, CELL\_PCH and URA\_PCH state then the UE shall also support:

- o MAC-ehs,
- o HS-PDSCH in CELL\_DCH,
- o HS-PDSCH physical layer category at least 9,
- o HS-DSCH DRX operation in CELL\_FACH,
- o E-DCH in CELL\_FACH.

### 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.



Maximum number of the total HS-DSCH timeslots on the all assigned carriers per TTI (Multi-frequency HS-DSCH operation mode only)

This is the maximum number of the total timeslots of all the carriers in a given 5 ms subframe that can be used for HS-DSCH transmissions. This is used by the UE which has the multi-carrier capability.

NOTE: If it is not specified explicitly, these parameters in this section are defined for single frequency operation mode.

UE specific capability Information LCR TDD

Defines the maximum number of frequencies supported in the multi-carrier HS-DSCH transmission.

Support of SPS

Defines whether semi-persistent scheduling is supported or not on downlink and uplink.

Support of HS-SCCH/E-AGCH Discontinuous Reception

Defines whether the UE supports HS-SCCH and E-AGCH Discontinuous Reception in CELL\_DCH and CELL\_FACH state.

Support of SF Mode For HS-PDSCH dual stream

Defines which SF is supported in dual HS-PDSCH stream operation for a 1.28Mcps TDD MIMO capable UE.

Support of Enhanced TS0

Defines whether the UE supports DPCH, HS-PDSCH, HS-SCCH, E-AGCH and E-HICH reception in timeslot 0 on the secondary carriers.

## 4.5.6 TDD physical channel parameters in uplink

### 4.5.6.1 3.84 Mcps TDD and 7.68 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.

Support of E-PUCH

Defines whether the UE supports E-PUCH or not.

Maximum number of physical channel bits on E-PUCH that can be transmitted in a 10ms TTI

Defines the maximum number of physical channel bits,  $N_{data}$ , that the UE is capable of transmitting on E-PUCH in a 10ms TTI.

Maximum number of bits of an E-DCH transport block that can be transmitted within a 10ms E-DCH TTI

Defines the maximum number of bits of an E-DCH transport block that the UE is capable of transmitting within a 10ms E-DCH TTI.

#### 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.

Support of E-PUCH

Defines whether the UE supports E-PUCH or not.

Support of E-DCH in CELL\_FACH

Defines whether the UE supports E-DCH transmission in CELL\_FACH state and Idle mode. If the UE supports E-DCH in CELL\_FACH then the UE shall also support:

- o MAC-i/is,
- o E-DCH in CELL\_DCH,
- o E-DCH physical layer category 3, 4, 5, or 6,
- o HS-PDSCH in CELL\_FACH.

Maximum number of physical channel bits on E-PUCH that can be transmitted in a 5ms TTI

Defines the maximum number of physical channel bits,  $N_{data}$ , that the UE is capable of transmitting on E-PUCH in a 5ms TTI.

Maximum number of bits of an E-DCH transport block that can be transmitted within a 5ms E-DCH TTI

Defines the maximum number of bits of an E-DCH transport block that the UE is capable of transmitting within a 5ms E-DCH TTI.

## 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

Defines the uplink and downlink frequency bands supported by the UE as defined in [4] for FDD and [5] for TDD.

UEs that support band XIX shall also support band VI.

### Tx/Rx frequency separation

This parameter is only applicable for FDD. It defines the uplink/downlink frequency separations supported by the UE. The value range depends on the radio frequency band the UE supports, as defined in [4].

## 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 7.68 Mcps

Defines whether UTRA TDD 7.68 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.

#### Support of Handover to GAN

Defines whether CS Handover to GAN is supported or not.

#### Support of Inter-RAT PS Handover

Defines whether Inter-RAT PS Handover to GERAN is supported or not.

#### Support of PS Handover to GAN

Defines whether PS Handover to GAN is supported or not.

#### Support of E-UTRA FDD

Defines whether E-UTRA FDD is supported or not. There is a separate parameter for each E-UTRA frequency band. If the UE supports E-UTRA FDD, it shall also support absolute priority based cell re-selection to GERAN if GERAN is supported by the UE.

#### Support of Inter-RAT PS Handover to E-UTRA FDD

Defines whether Inter-RAT PS Handover to E-UTRA FDD is supported or not.

#### Support of E-UTRA TDD

Defines whether E-UTRA TDD is supported or not. There is a separate parameter for each E-UTRA frequency band. If the UE supports E-UTRA TDD, it shall also support absolute priority based cell re-selection to GERAN if GERAN is supported by the UE.

#### Support of Inter-RAT PS Handover to E-UTRA TDD

Defines whether Inter-RAT PS Handover to E-UTRA TDD 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, UEA1 and UEA2.

#### 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 and UIA2.

## 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).

#### UE based OTDOA 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".

### Network Assisted GANSS support List

Defines if a UE supports assisted GANSS schemes. The GANSS gathers Galileo and Additional Navigation Satellite Systems. It defines which GANSS(s) is/are supported, and for each supported GANSS it further defines:

- the GANSS mode supported (namely "Network based", "UE based", "Both", or "none");
- the GANSS signals supported;
- the capability to perform GANSS timing of cell frames measurement;
- the capability to perform GANSS carrier phase measurement;
- the capability to support non-native assistance data choices.

### Support for GPS timing of cell frames measurement

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 measurement

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 (FDD only)

### 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.

### Support for absolute priority based cell re-selection in UTRAN

Defines whether absolute priority based cell re-selection in UTRAN is supported or not. If the UE supports absolute priority based cell re-selection in UTRAN, it shall also support absolute priority based cell re-selection to GERAN if GERAN is supported by the UE.

#### Adjacent Frequency measurements without compressed mode

Defines whether the UE needs compressed mode to perform measurements on an adjacent frequency, i.e. a frequency whose center is within 5MHz of the center of the currently used frequency and belongs to the same frequency band as that of the currently used frequency.

#### Inter-band Frequency measurements without compressed mode

Defines whether the UE needs compressed mode to perform measurements on an inter-band frequency, i.e. a frequency belonging to a frequency band in the band combinations as reported in the IE "Radio Access Capability Band Combination List" but not belonging to the same frequency band as that of the currently used frequency.

#### Support for System Information Block type 11bis

Defines whether the UE supports System Information Block type 11bis.

#### Enhanced inter-frequency measurements without compressed mode

Defines whether the UE needs compressed mode to perform measurements on two additional frequencies other than the frequency associated with the serving HS-DSCH cell, where each frequency belongs either to the frequency band of the currently used frequency or to a frequency band in the band combinations as reported in the IE "Radio Access Capability Band Combination List". The two additional frequencies to be measured without compressed mode together with currently used frequency cannot belong to more than two frequency bands.

#### Frequency specific compressed mode

For the dual band operation, defines whether the UE can apply compressed mode only to the frequencies associated with the secondary serving HS-DSCH cells, which are in the frequency band other than the serving HS-DSCH cell.

#### Extended measurements ID support

Defines whether the UE supports extended measurement identity range 17 to 32.

#### Inter-frequency detected set measurements

Defines whether the UE supports measurements of inter-frequency detected set cells.

## 4.9a Measurement related capabilities (TDD only)

#### Need for idle interval

Defines whether the UE needs idle interval in order to perform E-UTRAN measurements. There are separate parameters for measurements 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.

#### Device type

Defines whether UE benefits from NW-based battery consumption optimisation or not.

## 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**

| <b>DL DPCH capability with simultaneous HS-DSCH configuration</b>   | <b>32 kbps</b> | <b>64 kbps</b> | <b>128 kbps</b> | <b>384 kbps</b> |
|---|----------------|----------------|-----------------|-----------------|
| <b>Transport channel parameters</b>   |                |                |                 |                 |
| 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 CTrCH (FDD)  | 1              | 1              | 1               | 1               |
| Maximum number of simultaneous CTrCH (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             |
| <b>Physical channel parameters (FDD)</b>  |                |                |                 |                 |
| 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           |
| <b>Physical channel parameters (TDD 3.84 Mcps)</b>  |                |                |                 |                 |
| 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               |
| <b>Physical channel parameters (TDD 7.68 Mcps)</b>  |                |                |                 |                 |
| 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               |
| <b>Physical channel parameters (TDD 1.28 Mcps)</b>  |                |                |                 |                 |
| 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**

| <b>UL DPCH capability with simultaneous E-DCH configuration</b>  | <b>64 kbps</b> |
|--|----------------|
| <b>Transport channel parameters</b>  |                |
| 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            |
| <b>Physical channel parameters (FDD)</b>   |                |
| Maximum number of DPDCH bits transmitted per 10 ms   | 2400           |
| <b>Physical channel parameters (3.84Mcps TDD)</b>  |                |
| Maximum number of timeslots per frame  | 2              |
| Maximum number of physical channels per timeslot   | 1              |
| Minimum SF   | 2              |
| <b>Physical channel parameters (7.68Mcps TDD)</b>  |                |
| Maximum number of timeslots per frame  | 2              |
| Maximum number of physical channels per timeslot   | 1              |
| Minimum SF   | 4              |
| <b>Physical channel parameters (1.28Mcps TDD)</b>  |                |
| Maximum number of timeslots per frame  | 2              |
| Maximum number of physical channels per timeslot   | 1              |
| Minimum SF   | 2              |

### 4.13 UE minimum capabilities for reception of MBMS not provided in MBSFN mode

For FDD, the minimum UE capability for MBMS reception for MBMS services that are not provided in MBSFN mode consists of two 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 logical channels other than MTCHs and MSCH when MBMS PTM is received simultaneously.



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

| <b>Capability for reception of DL DPCH or S-CCPCH carrying logical channels other than MTCH during MTCH reception</b>   | <b>64 kbps Class</b> |
|---|----------------------|
| <b>Transport channel parameters</b>   |                      |
| 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                  |
| <b>Physical channel parameters (FDD)</b>  |                      |
| 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                 |

NOTE: Capability for reception of DPCH is applicable only if UE supports MBMS PTM reception in CELL\_DCH state for reception of MBMS services that are not provided in MBSFN mode.

MBMS capability part B for reception of MBMS services that are not provided in MBSFN mode is defined in the following Table 4.13-2. MBMS capability part B enables reception of the S-CCPCHs onto which at least MTCH is multiplexed. MBMS capability part B supports selection combining and soft combining of S-CCPCHs on different cells. The UE is not required to support simultaneous selection combining and soft combining.

The exhaustive lists of supported configurations (slot formats, TTI and combining parameters) for capability part B is given in Table 4.13-3. Only FACH can be mapped on the S-CCPCHs listed in table 4.13-3. In addition to MTCH, the MSCH, BCCH, CCCH, DCCH and DTCH can be multiplexed onto the S-CCPCHs listed in table 4.13-3. The FACH TTI restrictions in table 4.13-3 only apply to FACHs carrying MTCH or MSCH.

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

| <b>Combination of UE Radio Access capability parameters in DL for all S-CCPCHs that carry at least MTCH</b>             |       |
|---|-------|
| <b>Transport channel parameters</b>   |       |
| 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   |

| Combination of UE Radio Access capability parameters in DL for all S-CCPCHs that carry at least MTCH          |                  |
|---|------------------|
| 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-CCPCHs simultaneously received per cell for S-CCPCH Selection Combining or Soft Combining | 1                |
| Maximum number of cells for S-CCPCH Selection Combining or Soft Combining                                     | See table 4.13-3 |

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

| S-CCPCH slot format (see [11]) | FACH TTI (ms) for FACHs carrying MTCH or MSCH | Maximum Number of cells for S-CCPCH Selection Combining (Note 1) | Maximum Number of cells for S-CCPCH 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 either selection combining or soft combining is not required for the respective combination.

Since MBMS capability part A and B are independent, the maximum total number of S-CCPCHs, including the S-CCPCH that the UE is required to monitor by subclause 8.5.19 of [12], 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].
- When the UE is in CELL\_DCH, if the UE supports MBMS PTM reception in CELL\_DCH.

Furthermore, in case MBMS PTM reception is ongoing, the UE may soft or selectively combine one less cell than shown in table 4.13-3 while receiving the S-CCPCH carrying the MCCH.

Further restrictions on the supported configurations of the S-CCPCH carrying the MCCH apply. The exhaustive lists of supported slot formats, TTI size, and maximum number of configured transport channels that can be received, depend on the capability of the UE to support 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. In addition to MCCH, the BCCH, PCCH, CCCH, DCCH and DTCH can be multiplexed onto the S-CCPCHs listed in tables 4.13-3a and 4.13-3b. The FACH TTI restrictions in tables 4.13-3a and 4.13-3b only apply to FACH carrying MCCH.

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

| S-CCPCH slot format (see [11]) | FACH TTI (ms) for FACH carrying MCCH | Maximum Number of Configured 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   |

NOTE: One of the transport channels could be PCH.

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

| S-CCPCH slot format (see [11]) | FACH TTI (ms) for FACH carrying MCCH | Maximum Number of Configured Transport Channels |
|--------------------------------|--------------------------------------|---|
| 8 (SF=64)                      | 10                                   | 1   |
| 6 (SF=128)                     | 10                                   | 1   |
| 2 (SF=256)                     | 20, 10                               | 1   |

For FDD, the UE only supports reception of the MCCH, MTCH and MSCH on S-CCPCHs configured with flexible position.

For 3.84 Mcps TDD, a UE which supports the minimum capabilities defined in Table 4.13-4 should be capable of supporting transport channel combining of up to three radio links.

**Table 4.13-4: MBMS Capabilities (3.84 Mcps TDD)**

| Combination of UE Radio Access capability parameters in DL for MBMS   |       |
|---|-------|
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)                       | 10752 |
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH) | 640   |
| Maximum number of bits of all turbo coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)                  | 10752 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCH which carries MTCH (and MCCH/MSCH)                         | 31856 |
| Maximum number of physical channel bits received in any 10ms interval   | 13248 |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)   | 16    |
| Maximum number of physical channels per timeslot  | 16    |

|   |     |
|---|-----|
| Maximum number of synchronised radio links per frame which carry MTCH (and MCCH/MSCH) | 3   |
| Support for turbo decoding  | Yes |

NOTE: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH

For 7.68 Mcps TDD, a UE which supports the minimum capabilities defined in Table 4.13-4a should be capable of supporting transport channel combining of up to three radio links.

**Table 4.13-4a: MBMS Capabilities (7.68 Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS</b>  |       |
|---|-------|
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)                       | 21504 |
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH) | 1280  |
| Maximum number of bits of all turbo coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)                  | 21504 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCH which carries MTCH (and MCCH/MSCH)                         | 63712 |
| Maximum number of physical channel bits received in any 10ms interval   | 26496 |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)   | 16    |
| Maximum number of physical channels per timeslot  | 16    |
| Maximum number of synchronised radio links per frame which carry MTCH (and MCCH/MSCH)   | 3     |
| Support for turbo decoding  | Yes   |

NOTE: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH.

For 1.28 Mcps TDD, a UE which supports the minimum capabilities defined in Table 4.13-5 should be capable of supporting transport channel combining of up to three radio links.

**Table 4.13-5: DL Capabilities with simultaneous MBMS (1.28Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS</b>  |       |
|---|-------|
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH) | 10752 |

|   |       |
|---|-------|
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH) | 640   |
| Maximum number of bits of all turbo coded transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)                  | 10752 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCH which carries MTCH (and MCCH/MSCH)                         | 23920 |
| Maximum number of physical channel bits received in any 5ms interval  | 4224  |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)   | 16    |
| Maximum number of physical channels per timeslot  | 16    |
| Maximum number of synchronised radio links received per frame which carry MTCH (and MCCH/MSCH)  | 3     |
| Support for turbo decoding  | Yes   |

NOTE: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH

#### 4.13a UE minimum capabilities for reception of MBMS provided in MBSFN mode

For FDD, the minimum UE capability for reception of MBMS on cells that are operating in MBSFN mode consists of two separate and independent parts ("MBMS capability part C" and "MBMS capability part D").

For FDD MBSFN capability part C parameters defined in Table 4.13a-1 are the same as the 64kbps UE reference class for DL described in subclause 5.2 and provides capability to enable reception of MCCH when MBMS PTM is received simultaneously, and is applicable when a cell is operating in MBSFN mode.

**Table 4.13a-1: MBSFN capability part C (FDD)**

| <b>Capability for reception of S-CCPCH carrying logical channels other than MTCH during MTCH reception in MBSFN Mode</b> |              |
|--|--------------|
| <b>Transport channel parameters</b>  | <b>Value</b> |
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant                        | 1280         |
| 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            | 1280         |
| Maximum number of simultaneous transport channels  | 1            |
| 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  | 32           |
| Maximum number of TF   | 32           |
| Support for turbo decoding   | Yes          |
| <b>Physical channel parameters (FDD)</b>   |              |
| Number of S-CCPCH codes  | 1            |
| Maximum number of physical channel bits received in any 10 ms interval (S-CCPCH).  | 1200         |

For FDD, MBSFNcapability part D for cells that do operate in MBSFN mode is defined in Table 4.13a-2 for the reception of MTCH and MSCH on a S-CCPCH. This allows the UE to receive at least one service sent on a S-CCPCH of a cell operating in MBSFN mode.

The exhaustive lists of supported configurations (slot formats and TTI) for capability part D is given in Table 4.13a-3. Only FACH can be mapped on the S-CCPCHs listed in table 4.13a-2.

**Table 4.13a-2: MBSFN capability part D (FDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>                               |                         |
|--|-------------------------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCHs carrying MTCH (and MSCH) | 81920 / 40960<br>Note 1 |
| 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                    | 81920 / 40960<br>Note 1 |
| Maximum number of transport channels for the configuration   | 8                       |
| Maximum total number of transport blocks received within TTIs that end at the same time  | 128                     |
| Maximum number of TFC per S-CCPCH  | 128                     |
| 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        |
| Maximum Number of Simultaneous Transport Channels per S-CCPCH  | 2<br>(Note 2)           |

NOTE 1: 81920 is only applicable for combinations in table 4.13a-3 where scheduling is restricted by a value bigger than 1 of MBMS minimum inter-TTI interval.

NOTE 2: Only one MTCH at a time and in addition possibly MSCH

**Table 4.13a-3: Supported slot formats and FACH TTI combinations for MBSFN capability part D (FDD)**

| S-CCPCH slot format<br>(see [11]) | FACH TTI<br>(ms) | MBMS<br>minimum<br>inter-TTI<br>interval |
|-----------------------------------|------------------|--|
| 23 (SF=8, 16QAM)                  | 80               | 2  |
| 23 (SF=8, 16QAM)                  | 40               | 1  |
| 22 (SF=16, 16QAM)                 | 80               | 1  |
| 21 (SF=32, 16QAM)                 | 80               | 1  |
| 20 (SF=64, 16QAM)                 | 80               | 1  |
| 19 (SF=128, 16QAM)                | 80               | 1  |
| 18 (SF=256, 16QAM)                | 80               | 1  |
| 16 (SF=4, QPSK)                   | 80               | 2  |
| 14 (SF=8, QPSK)                   | 80               | 1  |
| 12 (SF=16, QPSK)                  | 80               | 1  |
| 10 (SF=32, QPSK)                  | 80               | 1  |
| 8 (SF=64, QPSK)                   | 80               | 1  |
| 6 (SF=128, QPSK)                  | 80               | 1  |
| 4 (SF=128, QPSK)                  | 80               | 1  |
| 2 (SF=256, QPSK)                  | 80               | 1  |
| 0 (SF=256, QPSK)                  | 80               | 1  |

The MBMS minimum inter-TTI interval for MBSFN reception defines the minimum distance from the beginning of a TTI in which a given transport channel is scheduled to the beginning of the next TTI which corresponds to the earliest TTI in which the same transport channel is allowed to be scheduled according to table 4.13a-3.

For 3.84 Mcps TDD, a MBSFN (MBMS over a Single Frequency Network) capable UE should support the minimum capabilities defined in Table 4.13a-4

**Table 4.13a-4: MBSFN Capabilities (3.84 Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>                                       |       |
|--|-------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCHs carrying MTCH (and MCCH/MSCH)    | 43603 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCHs which carry MTCH (and MCCH/MSCH) | 69696 |
| Maximum number of physical channel bits received in any 10ms interval  | 8712  |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)  | 4     |
| Maximum total number of transport blocks received within TTIs that end at the same time  | 130   |
| Maximum number of TFC per S-CCPCH carrying MTCH (and MCCH / MSCH)  | 32    |
| Maximum number of physical channels per timeslot   | 16    |
| Maximum number of physical channels per frame  | 33    |
| Maximum number of timeslots per frame  | 3     |

NOTE 3: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH. Only turbo coding is supported.

For 7.68 Mcps TDD, a MBSFN (MBMS over a Single Frequency Network) capable UE should support the minimum capabilities defined in Table 4.13a-5.

**Table 4.13a-5: MBSFN Capabilities (7.68 Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>                                       |        |
|--|--------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCHs carrying MTCH (and MCCH/MSCH)    | 84572  |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCHs which carry MTCH (and MCCH/MSCH) | 137280 |
| Maximum number of physical channel bits received in any 10ms interval  | 17160  |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)  | 4      |
| Maximum total number of transport blocks received within TTIs that end at the same time  | 130    |
| Maximum number of TFC per S-CCPCH carrying MTCH (and MCCH / MSCH)  | 32     |
| Maximum number of physical channels per timeslot   | 32     |
| Maximum number of physical channels per frame  | 65     |
| Maximum number of timeslots per frame  | 3      |

NOTE 4: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH. Only turbo coding is supported.

For 1.28 Mcps TDD, a MBSFN (MBMS over a Single Frequency Network) capable for mixed-carrier UE should support the minimum capabilities defined in Table 4.13a-6

**Table 4.13a-6: MBSFN Capabilities for Mixed-carrier (1.28 Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>  |       |
|---|-------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)      | 16448 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCH which carries MTCH (and MCCH/MSCH) | 23232 |
| Maximum number of physical channel bits received in any 10ms interval   | 5808  |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)   | 1     |
| Maximum total number of transport blocks received within TTIs that end at the same time   | 49    |
| Maximum number of TFC per S-CCPCH carrying MTCH (and MCCH / MSCH)   | 32    |
| Maximum number of physical channels per timeslot  | 16    |
| Maximum number of physical channels per frame   | 17    |
| Maximum number of timeslots per frame   | 2     |



NOTE: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH.

For 1.28 Mcps TDD, a MBSFN (MBMS over a Single Frequency Network) capable for dedicated-carrier UE should support the minimum capabilities defined in Table 4.13a-7

**Table 4.13a-7: MBSFN Capabilities for Dedicated-carrier (1.28 Mcps TDD)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>  |       |
|---|-------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCH carrying MTCH (and MCCH/MSCH)      | 16448 |
| Maximum number of bits before de-rate matching being received at an arbitrary time instant for S-CCPCH which carries MTCH (and MCCH/MSCH) | 25224 |
| Maximum number of physical channel bits received in any 10ms interval   | 6306  |
| Maximum number of simultaneous transport channels per S-CCPCH carrying MTCH (and MCCH/MSCH)   | 1     |
| Maximum total number of transport blocks received within TTIs that end at the same time   | 49    |
| Maximum number of TFC per S-CCPCH carrying MTCH (and MCCH / MSCH)   | 32    |
| Maximum number of physical channels per timeslot  | 16    |
| Maximum number of physical channels per frame   | 35    |
| Maximum number of timeslots per frame   | 3     |

NOTE: In the above table, the S-CCPCH refers to the CCTrCH carrying FACH.

For MBSFN Integrated Mobile Broadcast (3.84 Mcps TDD IMB), the minimum UE capability for reception of MBMS on cells that are operating in MBSFN mode consists of two separate and independent parts ("MBMS capability part E" and "MBMS capability part F").

For 3.84 Mcps TDD MBSFN IMB, capability part E parameters defined in Table 4.13a-8 enable reception of MCCH on S-CCPCH frame type 1 when MBMS PTM is received simultaneously, and is applicable when a cell is operating in MBSFN mode.

**Table 4.13a-8: MBSFN capability part E (3.84 Mcps TDD MBSFN IMB)**

| <b>Capability for reception of S-CCPCH frame type 1 carrying logical channels other than MTCH during MTCH reception in MBSFN Mode</b> |              |
|---|--------------|
| <b>Transport channel parameters</b>   | <b>Value</b> |
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant                                     | 1280         |
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant               | 1280         |
| Maximum number of simultaneous transport channels   | 1            |
| Maximum number of simultaneous CCTrCH   | 1            |
| Maximum total number of transport blocks received within TTIs that end at the same time   | 8            |
| Maximum number of TFC   | 32           |
| Maximum number of TF  | 32           |
| Support for turbo decoding  | No           |
| <b>Physical channel parameters</b>  |              |
| Number of S-CCPCH frame type 1 codes  | 1            |
| Maximum number of physical channel bits received in any 10 ms interval (S-CCPCH frame type 1).  | 270          |

For 3.84 Mcps TDD MBSFN IMB, capability part F for cells that do operate in MBSFN mode is defined in Table 4.13a-9 for the reception of an MTCH (and MSCH) on S-CCPCH frame type 2. This allows the UE to receive at least one service sent on S-CCPCHs frame type 2 of a cell operating in MBSFN mode.

**Table 4.13a-9: MBSFN capability part F (3.84 Mcps TDD MBSFN IMB)**

| <b>Combination of UE Radio Access capability parameters in DL for MBMS reception in MBSFN Mode</b>  |            |
|---|------------|
| Maximum number of bits of all transport blocks being received at an arbitrary time instant for S-CCPCHs frame type 2 carrying MTCH (and MSCH) | 40960      |
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant                       | 0          |
| Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant                                 | 40960      |
| Maximum number of transport channels for the configuration  | 8          |
| Maximum total number of transport blocks received within TTIs that end at the same time   | 128        |
| Maximum number of TFC per S-CCPCH frame type 2  | 32         |
| Maximum number of TF  | 32         |
| Support for turbo decoding  | Yes        |
| Number of CRC bits  | 16         |
| Support for CCTrCH that do not contain TFCI   | No         |
| Maximum Number of Simultaneous Transport Channels per S-CCPCH type 2  | 2 (Note 5) |
| <b>Physical channel parameters</b>  |            |
| Maximum number of S-CCPCH frame type 2 codes using QPSK modulation  | 10         |
| Maximum number of S-CCPCH frame type 2 codes using 16-QAM modulation  | 5          |
| Maximum number of physical channel bits received in any 10 ms interval (S-CCPCH frame type 2).  | 8640       |

NOTE 5: Only one MTCH at a time and in addition possibly MSCH

For 3.84 Mcps TDD MBSFN IMB, the permitted FACH TTI values for the supported configurations of the S-CCPCH carrying the MCCH are given by capability part G. For 3.84 Mcps TDD MBSFN IMB, capability part G is defined in Table 4.13a-10 for the reception of an MCCH on S-CCPCH frame type 1.

**Table 4.13a-10: Slot formats and FACH TTI for MBSFN capability part G (3.84 Mcps TDD MBSFN IMB)**

| S-CCPCH slot format (see [14]) | FACH TTI (ms) for FACH carrying MCCH | Maximum Number of Configured Transport Channels |
|--------------------------------|--------------------------------------|---|
| 0 (SF=256, QPSK)               | 80,40,20,10                          | 1   |
| 1 (SF=256, QPSK)               | 80,40,20,10                          | 1   |

## 4.14 Home Node B Inbound Mobility Related Parameters

### 4.14.1 CSG Proximity Indication Parameters

Support of intra-frequency proximity indication

Defines whether the UE supports proximity indication for intra-frequency cells whose CSG Identities are in the UE's CSG Whitelist.

Support of inter-frequency proximity indication

Defines whether the UE supports proximity indication for inter-frequency cells whose CSG Identities are in the UE's CSG Whitelist.

Support of E-UTRA proximity indication

Defines whether the UE supports proximity indication for E-UTRAN cells whose CSG IDs are in the UE's CSG Whitelist.

### 4.14.2 Neighbour Cell SI Acquisition Parameters

Support of intra-frequency SI acquisition for HO

Defines whether the UE supports, upon configuration of "Intra-frequency SI Acquisition", acquisition of relevant information from a neighbouring intra-frequency cell by reading the SI of the neighbouring cell and reporting the acquired information to the network.

Support of inter-frequency SI acquisition for HO

Defines whether the UE supports, upon configuration of "Inter-frequency SI Acquisition", acquisition of relevant information from a neighbouring inter-frequency cell by reading the SI of the neighbouring cell using autonomous gaps and reporting the acquired information to the network.

Support of E-UTRA SI acquisition for HO

Defines whether the UE supports, upon configuration of "E-UTRA SI Acquisition", acquisition of relevant information from a neighbouring E-UTRA cell by reading the SI of the neighbouring cell using autonomous gaps and reporting the acquired information to the network.

## 4.15 UE based network performance measurements parameters

Support of logged measurements in Idle mode and PCH States

Defines whether the UE supports logged measurements upon request from the network in Idle mode, URA\_PCH and CELL\_PCH states. A UE that supports logged measurements in Idle mode, Cell\_PCH and URA\_PCH states shall also support a minimum of 64 kB of memory for log storage.

## Support of UTRAN ANR

Defines whether the UE supports measurement and logging in Idle mode, CELL\_PCH and URA\_PCH states for Automatic Neighbour Relation (ANR) in UTRAN.

## 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   |
| Support for CS voice over HSPA               |  | Yes/No  |   |
| RLC, MAC-hs, MAC-ehs and MAC-i/is parameters | Total RLC AM, MAC-hs and MAC-ehs buffer size |   | 2, 10, 50, 100, 150, 200, 300, 400, 500, 750, 1000, 1150, 1250, 1800, 2000, 2300, 2550 kBytes |
|  | Maximum number of AM entities                |   | 3, 4, 5, 6, 8, 16, 30   |
|  | Maximum RLC AM window size                   |   | 2047, 4095  |
|  | Support for MAC-ehs                          |   | Yes/No  |
|  | Support for two logical channels             |   | Yes/No  |
| Support of MAC-i/is                          |  | 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, 204640     |
|  |  | 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, 204640     |
|  |  | 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, 204640     |
|  |  | 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              | 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   |
|---|--------|--|---|
| uplink                                      |        | 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 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 in CELL_DCH  | Yes/No  |
|   |        | Support of HS-SCCHless HS-DSCH   | Yes/No  |
|   |        | Support of HS-PDSCH in CELL_FACH   | Yes/No  |
|   |        | Support of HS-PDSCH in CELL_PCH and URA_PCH  | Yes/No  |
|   |        | Support of Enhanced F-DPCH   | Yes/No  |
|   |        | Support of Target Cell Pre-Configuration   | Yes/No  |
|   |        | Support of HS-DSCH DRX operation   | Yes/No  |
|   |        | Support for Two DRX schemes in URA_PCH and CELL_PCH  | Yes/No  |
|   |        | Support of TX Diversity on DL Control Channels by MIMO Capable UE when MIMO operation is active                            | Yes/No  |
|   |        | Support for cell-specific Tx diversity configuration for dual-cell operation   | Yes/No  |
|   |        | Support of MIMO only with single-stream restriction  | Yes/No  |
|   |        | Support for dual cell with MIMO operation in different bands   | Yes/No  |
|   |        | Support of dual band operation (Radio Access Capability Band Combination List)   | 1..16   |
|   |        | >Band Combination  | 1..256  |
|   |        | >Supported Carrier Combination List  |   |
|   |        | >>Carrier Combination (1,2)  | Yes/No  |
|   |        | >>Carrier Combination (2,1)  | Yes/No  |
| >>Carrier Combination (1,3)                 | Yes/No |  |   |
| >>Carrier Combination (3,1)                 | Yes/No |  |   |
| >>Carrier Combination (2,2)                 | Yes/No |  |   |

|   |  | UE radio access capability parameter               | Value range  |
|---|--|--|--|
|   | 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   |
|   |  | Support of Discontinuous Transmission in CELL_DCH  | Yes/No   |
|   |  | Support of Slot Format #4                          | Yes/No   |
|   |  | Support for E-DPCCH power interpolation formula    | Yes/No   |
|   |  | Support for E-DPCCH power boosting                 | Yes/No   |
|   |  | Support of common E-DCH                            | 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   |
|   |  | Support of E-PUCH                                  | Yes/No   |
|   | TDD 7.68 Mcps physical channel parameters in downlink<br>TDD 7.68 Mcps physical channel parameters in downlink | Maximum number of timeslots per frame              | 1..14  |
|   |  | Maximum number of physical channels per frame      | 1, 2, 3..448   |
|   |  | Minimum SF   | 32, 1  |
|   |  | Support of PDSCH                                   | Yes/No   |
|   |  | Support of HS-PDSCH                                | Yes/No   |
|   |  | Maximum number of physical channels per timeslot   | 1..32  |
|   | TDD 7.68 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   | 32, 16, 8, 4, 2, 1   |
| Support of PUSCH                                      |  | Yes/No   |  |
| Support of E-PUCH                                     |  | 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   |  |

|               |   | UE radio access capability parameter              | Value range   |
|---------------|---|---|---|
|               |   | UE specific capability Information LCR TDD        | Enumerated (NF, TriRxUniTx, TriRxTriTx, HexRxUniTx, HexRxTriTx, HexRxHexTx, TwoRxUniTxContiguous, TwoRxTwoTxContiguous, TwoRxUniTxDiscontiguous, TwoRxTwoTxDiscontiguous)<br>NOTE: If three frequencies are supported, the three frequencies shall be configured within 5 MHz; if six frequencies are supported, the six frequencies shall be configured within 10MHz; TwoRxUniTxContiguous and TwoRxTwoTxContiguous mean that the UE is only capable of supporting two adjacent carriers; TwoRxUniTxDiscontiguous and TwoRxTwoTxDiscontiguous mean that the UE is capable of supporting two non-adjacent carriers; if two non-adjacent carriers are supported, the two carriers can be in the same band or in two different bands. |
|               |   | Support of HS-PDSCH in CELL_FACH                  | Yes/No  |
|               |   | Support of SPS                                    | Yes/No  |
|               |   | Support of HS-SCCH/E-AGCH Discontinuous Reception | Yes/No  |
|               |   | Support of SF Mode For HS-PDSCH dual stream       | Yes/No  |
|               |   | Support of Enhanced TSO                           | 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  |
|               |   | Support of E-PUSCH                                | Yes/No  |
|               |   | Support of E-DCH in CELL_FACH                     | Yes/No  |
| RF parameters | FDD RF parameters                                   | UE power class                                    | 3, 4<br>NOTE: Only power classes 3 and 4 are part of this release of the specification  |
|               |   | Radio frequency bands                             | The radio frequency bands defined in [4].<br>UEs that support band XIX shall also support band VI   |
|               |   | Tx/Rx frequency separation                        | Defined in [4] for the respective supported radio frequency band  |

|                                   |                             | UE radio access capability parameter  | Value range  |
|-----------------------------------|-----------------------------|---|--|
| RF parameters                     | TDD 3.84 Mcps RF parameters | UE power class  | 2, 3<br>NOTE: Only power classes 2 and 3 are part of this release of the specification |
|                                   |                             | Radio frequency bands   | The radio frequency bands defined in [5]   |
|                                   | TDD 1.28 Mcps RF parameters | UE power class  | 2, 3   |
|                                   |                             | Radio frequency bands   | The radio frequency bands defined in [5]   |
| 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   |
|                                   |                             | Support of Handover to GAN  | Yes/No   |
|                                   |                             | Support of Inter-RAT PS Handover  | Yes/No   |
|                                   |                             | Support of PS Handover to GAN   | Yes/No   |
|                                   |                             | Support of E-UTRA FDD   | Yes/No (per E-UTRA frequency band)   |
|                                   |                             | Support of Inter-RAT PS Handover to E-UTRA FDD  | Yes/No   |
|                                   |                             | Support of E-UTRA TDD   | Yes/No (per E-UTRA frequency band)   |
|                                   |                             | Support of Inter-RAT PS Handover to E-UTRA TDD  | Yes/No   |
| Security parameters               |                             | Support of ciphering algorithm UEA0   | Yes  |
|                                   |                             | Support of ciphering algorithm UEA1   | Yes  |
|                                   |                             | Support of ciphering algorithm UEA2   | Yes  |
|                                   |                             | Support of integrity protection algorithm UIA1  | Yes  |
|                                   |                             | Support of integrity protection algorithm UIA2  | Yes  |
| UE positioning related parameters |                             | Standalone location method(s) supported   | Yes/No   |
|                                   |                             | UE based OTDOA supported  | Yes/No   |
|                                   |                             | Network assisted GPS support  | Network based / UE based / Both / None   |
|                                   |                             | Network Assisted GANSS support List:  | per GANSS  |
|                                   |                             | >GANSS ID   | Galileo / SBAS / Modernized GPS / QZSS / GLONASS                                       |
|                                   |                             | >SBAS IDs   | WAAS / EGNOS / MSAS / GAGAN  |
|                                   |                             | >GANSS mode   | Network based / UE based / Both / None   |
|                                   |                             | >GANSS Signal ID  | 0..7   |
|                                   |                             | >GANSS Signal IDs   | Yes/No (per GANSS signal)  |
|                                   |                             | >Support for GANSS timing of cell frames measurement  | Yes/No   |
|                                   |                             | >Support for GANSS Carrier-Phase Measurement  | Yes/No   |
|                                   |                             | >Support for non-native assistance choices  | Yes/No   |
|                                   |                             | Support for GPS timing of cell frames measurement   | Yes/No   |
|                                   |                             | Support for IPDL  | 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   |



|  |  | UE radio access capability parameter                           | Value range   |
|--|--|--|---|
| 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)  |
|  |  | Support for absolute priority based cell re-selection in UTRAN | Yes/No  |
|  |  | Support for System Information Block type 11bis                | Yes   |
|  |  | Adjacent Frequency measurements without compressed mode        | Yes/No  |
|  |  | Inter-band Frequency measurements without compressed mode      | Yes/No  |
|  |  | Enhanced inter-frequency measurements without compressed mode  | Yes/No  |
|  |  | Extended measurements ID support                               | Yes/No  |
|  |  | Frequency specific compressed mode                             | Yes/No  |
|  |  | Inter-frequency detected set measurements                      | Yes/No  |
| General capabilities                                 |  | Access Stratum release indicator                               | R99, REL-4, REL-5, REL-6, REL-7, REL-8, REL-9, REL-10   |
|  |  | Device type  | Benefits from NW-based battery consumption optimisation / Does not benefit from NW-based battery consumption optimisation |
| 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   |
| UE based network performance measurements parameters |  | Support of logged measurements in Idle mode and PCH States     | Yes/No  |
|  |  | Support of UTRAN ANR   | Yes/No  |
| Home Node B Inbound Mobility Related Parameters      | CSG Proximity Indication capabilities      | Support of intra-frequency proximity indication                | Yes/No  |
|  |  | Support of inter-frequency proximity indication                | Yes/No  |
|  |  | Support of E-UTRA proximity indication                         | Yes/No  |
|  | Neighbour Cell SI Acquisition capabilities | Support of intra-frequency SI acquisition for HO               | Yes/No  |
|  |  | Support of inter-frequency SI acquisition for HO               | Yes/No  |
|  |  | Support of E-UTRA SI acquisition for HO                        | Yes/No  |

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<br>NOTE 1 | Total number of soft channel bits | Total Number of serving/secondary serving HS-DSC H cells | Total Number of serving/secondary serving HS-DSCH cells in which MIMO can be configured | Supported modulations without MIMO operation or aggregated cell operation | Supported modulations with MIMO operation and without aggregated cell operation | Supported modulations without MIMO operation with aggregated cell operation | Supported modulations with MIMO operation and aggregated cell operation            |                    |
|-----------------------|--|----------------------------|---|-----------------------------------|--|---|---|---|---|--|--------------------|
| Category 1            | 5  | 3                          | 7298  | 19200                             | 1  | 0   | QPSK, 16QAM   | Not applicable (MIMO not supported)   | Not applicable (aggregated carriers operation not supported)                | Not applicable (simultaneous aggregated carriers and MIMO operation not supported) |                    |
| Category 2            | 5  | 3                          | 7298  | 28800                             | 1  | 0   |   |   |   |  |                    |
| Category 3            | 5  | 2                          | 7298  | 28800                             | 1  | 0   |   |   |   |  |                    |
| Category 4            | 5  | 2                          | 7298  | 38400                             | 1  | 0   |   |   |   |  |                    |
| Category 5            | 5  | 1                          | 7298  | 57600                             | 1  | 0   |   |   |   |  |                    |
| Category 6            | 5  | 1                          | 7298  | 67200                             | 1  | 0   |   |   |   |  |                    |
| Category 7            | 10                                       | 1                          | 14411   | 115200                            | 1  | 0   |   |   |   |  |                    |
| Category 8            | 10                                       | 1                          | 14411   | 134400                            | 1  | 0   |   |   |   |  |                    |
| Category 9            | 15                                       | 1                          | 20251   | 172800                            | 1  | 0   |   |   |   |  |                    |
| Category 10           | 15                                       | 1                          | 27952   | 172800                            | 1  | 0   |   |   |   |  |                    |
| Category 11           | 5  | 2                          | 3630  | 14400                             | 1  | 0   |   |   |   |  | QPSK               |
| Category 12           | 5  | 1                          | 3630  | 28800                             | 1  | 0   |   |   |   |  | QPSK, 16QAM, 64QAM |
| Category 13           | 15                                       | 1                          | 35280   | 259200                            | 1  | 0   |   |   |   |  |                    |
| Category 14           | 15                                       | 1                          | 42192   | 259200                            | 1  | 0   |   |   |   |  |                    |
| Category 15           | 15                                       | 1                          | 23370   | 345600                            | 1  | 1   | QPSK, 16QAM   |   |   |  |                    |
| Category 16           | 15                                       | 1                          | 27952   | 345600                            | 1  | 1   | QPSK, 16QAM   |   |   |  |                    |
| Category 17<br>NOTE 2 | 15                                       | 1                          | 35280   | 259200                            | 1  | 0   | QPSK, 16QAM, 64QAM  | -   |   |  |                    |
|                       |  |                            | 23370   | 345600                            | 1  | 1   | -   | QPSK, 16QAM   |   |  |                    |
| Category 18<br>NOTE 3 | 15                                       | 1                          | 42192   | 259200                            | 1  | 0   | QPSK, 16QAM, 64QAM  | -   |   |  |                    |
|                       |  |                            | 27952   | 345600                            | 1  | 1   | -   | QPSK, 16QAM   |   |  |                    |
| Category 19           | 15                                       | 1                          | 35280   | 518400                            | 1  | 1   | QPSK, 16QAM, 64QAM  |   |   |  |                    |
| Category 20           | 15                                       | 1                          | 42192   | 518400                            | 1  | 1   | QPSK, 16QAM, 64QAM  |   |   |  |                    |
| Category 21           | 15                                       | 1                          | 23370   | 345600                            | 2  | 0   | -   | -   | QPSK, 16QAM   |  |                    |
| Category 22           | 15                                       | 1                          | 27952   | 345600                            | 2  | 0   |   |   |   |  |                    |
| Category 23           | 15                                       | 1                          | 35280   | 518400                            | 2  | 0   |   |   |   |  |                    |
| Category 24           | 15                                       | 1                          | 42192   | 518400                            | 2  | 0   | -   | -   | QPSK, 16QAM, 64QAM  |  |                    |
| Category 25           | 15                                       | 1                          | 23370   | 691200                            | 2  | 2   |   |   |   |  |                    |
| Category 26           | 15                                       | 1                          | 27952   | 691200                            | 2  | 2   |   |   |   |  |                    |
| Category 27           | 15                                       | 1                          | 35280   | 1036800                           | 2  | 2   | -   | -   | -   |  |                    |
| Category 28           | 15                                       | 1                          | 42192   | 1036800                           | 2  | 2   |   |   |   |  |                    |
| Category 29           | 15                                       | 1                          | 42192   | 777600                            | 3  | 0   | -   | -   | QPSK, 16QAM, 64QAM  | -  |                    |
| Category 30           | 15                                       | 1                          | 42192   | 1555200                           | 3  | 3   | -   | -   | QPSK, 16QAM, 64QAM  | QPSK, 16QAM, 64QAM   |                    |
| Category 31           | 15                                       | 1                          | 42192   | 1036800                           | 4  | 0   | -   | -   | QPSK, 16QAM, 64QAM  | -  |                    |

| 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<br>NOTE 1 | Total number of soft channel bits | Total Number of serving/secondary serving HS-DSCH cells | Total Number of serving/secondary serving HS-DSCH cells in which MIMO can be configured | Supported modulations without MIMO operation or aggregated cell operation | Supported modulations with MIMO operation and without aggregated cell operation | Supported modulations without MIMO operation with aggregated cell operation | Supported modulations with MIMO operation and aggregated cell operation |
|------------------|--|----------------------------|---|-----------------------------------|---|---|---|---|---|---|
| Category 32      | 15                                       | 1                          | 42192   | 2073600                           | 4   | 4   | -   | -   | QPSK, 16QAM, 64QAM  | QPSK, 16QAM, 64QAM  |

For any category, in addition to the requirements in Table 5.1a, an HS-SCCH less capable UE shall allocate 24960 raw channel bits for HS-SCCH less operation in order to buffer the last 13 subframes and 13599 soft channel bits to receive 3 parallel HARQ processes.

UE Categories 1 to 4 and Category 11 do not support HS-DSCH reception in CELL\_FACH, CELL\_PCH or URA\_PCH states.

UEs of Category 13 are only required to support code rates up to 0.823 when 64QAM is used, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation in [9]. For other modulation formats, this restriction does not apply.

UEs of Category 15 are only required to support code rates up to 0.823 for 16QAM when two transport blocks are received in the same TTI, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation in [9]. For other modulation formats or when a single transport block is received, this restriction does not apply.

UEs of Category 19 are only required to support code rates up to 0.823 when 64QAM is used when two transport blocks are received in the same TTI, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation in [9]. For other modulation formats or when a single transport block is received, this restriction does not apply.

UEs of Category 21 are only required to support code rates up to 0.823 when 16QAM is used, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation in [9]. For other modulation formats, this restriction does not apply.

UEs of Category 23 are only required to support code rates up to 0.823 when 64QAM is used, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation in [9]. For other modulation formats, this restriction does not apply.

UEs of category 25 are only required to support code rates up to 0.823 for 16QAM for one cell when two transport blocks are received in the same TTI on that cell, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation. For other modulation formats or when a single transport block is received in a cell, this restriction does not apply on that cell.

UEs of category 27 are only required to support code rates up to 0.823 for 64QAM for one cell when two transport blocks are received in the same TTI on that cell, which is represented by a limitation in the maximum value of  $K_i$  in the transport block calculation. For other modulation formats or when a single transport block is received in a cell, this restriction does not apply on that cell.

A UE that supports categories greater or equal to category 13, also supports E-DPDCH.

A UE that supports categories greater or equal to category 13, also supports MAC-e-hs.

NOTE 1: Depending on the HS-DSCH configuration, the indicated maximum number of bits of an HS-DSCH transport block does not have to correspond exactly to an entry in the transport block size table to be applied [9].

NOTE 2: A UE of category 17 supports the physical capabilities of categories 13 and 15, but not simultaneously. The first row of category 17 in table 5.1a specifies the capabilities when MIMO is not configured and the capabilities of category 13 apply, the second row specifies the capabilities when MIMO is configured and the capabilities of category 15 apply.

NOTE 3: A UE of category 18 supports the physical capabilities of categories 14 and 16, but not simultaneously. The first row of category 18 in table 5.1a specifies the capabilities when MIMO is not configured and the capabilities of category 14 apply, the second row specifies the capabilities when MIMO is configured and the capabilities of category 16 apply.

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

| HS-DSCH category | Maximum number of AM RLC entities | Minimum total RLC AM and MAC-hs/MAC-ehs 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   |
| Category 13      | 8                                 | 300  |
| Category 14      | 8                                 | 300  |
| Category 15      | 8                                 | 400  |
| Category 16      | 8                                 | 400  |
| Category 17      | 8                                 | 400  |
| Category 18      | 8                                 | 400  |
| Category 19      | 8                                 | 600  |
| Category 20      | 8                                 | 600  |
| Category 21      | 8                                 | 400  |
| Category 22      | 8                                 | 400  |
| Category 23      | 8                                 | 600  |
| Category 24      | 8                                 | 600  |
| Category 25      | 8                                 | 1200   |
| Category 26      | 8                                 | 1200   |
| Category 27      | 8                                 | 1700   |
| Category 28      | 8                                 | 1700   |
| Category 29      | 8                                 | 1000   |
| Category 30      | 8                                 | 1800   |
| Category 31      | 8                                 | 1250   |
| Category 32      | 8                                 | 2300   |

**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 | Supported modulations without MIMO operation | Supported modulations simultaneously with MIMO operation |
|------------------|--|---|---|-----------------------------------|--|--|
| Category 1       | 16   | 2   | 2788  | 11264                             | QPSK   | Not applicable (MIMO not)                                |
| Category 2       | 16   | 2   | 2788  | 22528                             |  |  |
| Category 3       | 16   | 2   | 2788  | 33792                             |  |  |
| Category 4       | 16   | 2   | 5600  | 22528                             |  |  |

| 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 | Supported modulations without MIMO operation | Supported modulations simultaneously with MIMO operation |
|-----------------------|--|---|---|-----------------------------------|--|--|
| Category 5            | 16   | 2   | 5600  | 45056                             | M  | supported)   |
| Category 6            | 16   | 2   | 5600  | 67584                             |  |  |
| Category 7            | 16   | 3   | 8416  | 33792                             |  |  |
| Category 8            | 16   | 3   | 8416  | 67584                             |  |  |
| Category 9            | 16   | 3   | 8416  | 101376                            |  |  |
| Category 10           | 16   | 4   | 11226   | 45056                             |  |  |
| Category 11           | 16   | 4   | 11226   | 90112                             |  |  |
| Category 12           | 16   | 4   | 11226   | 135168                            |  |  |
| Category 13           | 16   | 5   | 14043   | 56320                             |  |  |
| Category 14           | 16   | 5   | 14043   | 112640                            |  |  |
| Category 15           | 16   | 5   | 14043   | 168960                            |  |  |
| Category 16           | 16   | 3   | 12636   | 50688                             | QPSK, 16QAM, 64QAM                           | Not applicable (MIMO not supported)                      |
| Category 17           | 16   | 3   | 12636   | 101376                            |  |  |
| Category 18           | 16   | 3   | 12636   | 152064                            |  |  |
| Category 19           | 16   | 4   | 16856   | 67584                             |  |  |
| Category 20           | 16   | 4   | 16856   | 135168                            |  |  |
| Category 21           | 16   | 4   | 16856   | 202752                            |  |  |
| Category 22           | 16   | 5   | 21076   | 84480                             |  |  |
| Category 23           | 16   | 5   | 21076   | 168960                            |  |  |
| Category 24           | 16   | 5   | 21076   | 253440                            |  |  |
| Category 25<br>NOTE 1 | 16   | 3   | 12636   | 152064                            | QPSK, 16QAM, 64QAM                           | --   |
|                       |  |   | 8416  | 202752                            | --   | QPSK, 16QAM  |
| Category 26<br>NOTE 2 | 16   | 4   | 16856   | 202752                            | QPSK, 16QAM, 64QAM                           | --   |
|                       |  |   | 11226   | 270336                            | --   | QPSK, 16QAM  |
| Category 27<br>NOTE 3 | 16   | 5   | 21076   | 253440                            | QPSK, 16QAM, 64QAM                           | --   |
|                       |  |   | 14043   | 337920                            | --   | QPSK, 16QAM  |
| Category 28           | 16   | 3   | 12636   | 304128                            | QPSK, 16QAM, 64QAM                           | QPSK, 16QAM, 64QAM                                       |
| Category 29           | 16   | 4   | 16856   | 405504                            |  |  |
| Category 30           | 16   | 5   | 21076   | 506880                            |  |  |

A UE in CELL\_FACH, CELL\_PCH or URA\_PCH state with HS-DSCH reception shall support the HS-DSCH physical layer category 9 and may support the total number of soft channel bits larger than that of the category 9 in table 5.1c. When HS-DSCH reception in CELL\_FACH, CELL\_PCH or URA\_PCH state is configured, the octet aligned table of transport block size for the HS-DSCH physical layer category 9 shall be used (see [9]).

NOTE 1: A UE of category 25 supports the physical capabilities of categories 18. The first row of category 25 in table 5.1c specifies the capabilities when MIMO is not configured and the capabilities of category 18 apply. The second row of category 25 in table 5.1c specifies the capabilities when MIMO is configured.

NOTE 2: A UE of category 26 supports the physical capabilities of categories 21. The first row of category 26 in table 5.1c specifies the capabilities when MIMO is not configured and the capabilities of category 21 apply. The second row of category 26 in table 5.1c specifies the capabilities when MIMO is configured.

NOTE 3: A UE of category 27 supports the physical capabilities of categories 24. The first row of category 27 in table 5.1c specifies the capabilities when MIMO is not configured and the capabilities of category 24 apply. The second row of category 27 in table 5.1c specifies the capabilities when MIMO is configured.

**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   |
| 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  |
| Category 16      | 6                                 | 100  |
| Category 17      | 6                                 | 100  |
| Category 18      | 6                                 | 100  |
| Category 19      | 6                                 | 100  |
| Category 20      | 6                                 | 100  |
| Category 21      | 6                                 | 100  |
| Category 22      | 6                                 | 100  |
| Category 23      | 6                                 | 100  |
| Category 24      | 6                                 | 100  |
| Category 25      | 6                                 | 150  |
| Category 26      | 6                                 | 200  |
| Category 27      | 6                                 | 300  |
| Category 28      | 6                                 | 300  |
| Category 29      | 6                                 | 300  |
| Category 30      | 6                                 | 300  |

**Table 5.1d-a: 1.28 Mcps TDD HS-DSCH physical layer categories (Multi-frequency HS-DSCH operation mode only)**

| HS-DSCH category | Maximum number of the total HS-DSCH timeslots on the all assigned carriers 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       | 30   | 84258   | 1013760                           |
| Category 2       | 30   | 84258   | 675840                            |
| Category 3       | 30   | 84258   | 337920                            |
| Category 4       | 24   | 67356   | 811008                            |
| Category 5       | 24   | 67356   | 540672                            |
| Category 6       | 24   | 67356   | 270336                            |
| Category 7       | 18   | 50496   | 608256                            |
| Category 8       | 18   | 50496   | 405504                            |
| Category 9       | 18   | 50496   | 202752                            |
| Category 10      | 15   | 42129   | 506880                            |
| Category 11      | 15   | 42129   | 337920                            |
| Category 12      | 15   | 42129   | 168960                            |
| Category 13      | 12   | 33678   | 405504                            |
| Category 14      | 12   | 33678   | 270336                            |
| Category 15      | 12   | 33678   | 135168                            |

| HS-DSCH category | Maximum number of the total HS-DSCH timeslots on the all assigned carriers 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 16      | 9  | 25248   | 304128                            |
| Category 17      | 9  | 25248   | 202752                            |
| Category 18      | 9  | 25248   | 101376                            |
| Category 19      | 30   | 126456  | 1520640                           |
| Category 20      | 30   | 126456  | 1013760                           |
| Category 21      | 30   | 126456  | 506880                            |
| Category 22      | 24   | 101136  | 1216512                           |
| Category 23      | 24   | 101136  | 811008                            |
| Category 24      | 24   | 101136  | 405504                            |
| Category 25      | 18   | 75816   | 912384                            |
| Category 26      | 18   | 75816   | 608256                            |
| Category 27      | 18   | 75816   | 304128                            |
| Category 28      | 15   | 63228   | 760320                            |
| Category 29      | 15   | 63228   | 506880                            |
| Category 30      | 15   | 63228   | 253440                            |
| Category 31      | 12   | 50568   | 608256                            |
| Category 32      | 12   | 50568   | 405504                            |
| Category 33      | 12   | 50568   | 202752                            |
| Category 34      | 9  | 37908   | 456192                            |
| Category 35      | 9  | 37908   | 304128                            |
| Category 36      | 9  | 37908   | 152064                            |
| Category 37      | 8  | 33712   | 405504                            |
| Category 38      | 8  | 33712   | 270336                            |
| Category 39      | 8  | 22452   | 270336                            |
| Category 40      | 8  | 22452   | 180224                            |
| Category 41      | 6  | 25272   | 304128                            |
| Category 42      | 6  | 25272   | 202752                            |
| Category 43      | 6  | 16832   | 202752                            |
| Category 44      | 6  | 16832   | 135168                            |

NOTE: UEs of Categories 1 to 18, 39, 40, 43 and 44 support QPSK and 16QAM. UEs of Categories 19 to 38, 41, and 42 support QPSK, 16QAM and 64QAM.

**Table 5.1d-b: RLC and MAC-hs parameters for 1.28 Mcps TDD HS-DSCH physical layer categories (Multi-frequency HS-DSCH operation mode only)**

| HS-DSCH category | Maximum number of AM RLC entities | Minimum total RLC AM and MAC-hs buffer size [kBytes] |
|------------------|-----------------------------------|--|
| Category 1       | 6                                 | 500  |
| Category 2       | 6                                 | 500  |
| Category 3       | 6                                 | 500  |
| Category 4       | 6                                 | 400  |
| Category 5       | 6                                 | 400  |
| Category 6       | 6                                 | 400  |
| Category 7       | 6                                 | 300  |
| Category 8       | 6                                 | 300  |
| Category 9       | 6                                 | 250  |
| Category 10      | 6                                 | 250  |
| Category 11      | 6                                 | 250  |
| Category 12      | 6                                 | 200  |
| Category 13      | 6                                 | 200  |
| Category 14      | 6                                 | 200  |
| Category 15      | 6                                 | 200  |
| Category 16      | 6                                 | 150  |
| Category 17      | 6                                 | 150  |
| Category 18      | 6                                 | 150  |
| Category 19      | 6                                 | 1000   |

| HS-DSCH category | Maximum number of AM RLC entities | Minimum total RLC AM and MAC-hs buffer size [kBytes] |
|------------------|-----------------------------------|--|
| Category 20      | 6                                 | 1000   |
| Category 21      | 6                                 | 1000   |
| Category 22      | 6                                 | 900  |
| Category 23      | 6                                 | 900  |
| Category 24      | 6                                 | 900  |
| Category 25      | 6                                 | 800  |
| Category 26      | 6                                 | 800  |
| Category 27      | 6                                 | 800  |
| Category 28      | 6                                 | 700  |
| Category 29      | 6                                 | 700  |
| Category 30      | 6                                 | 700  |
| Category 31      | 6                                 | 600  |
| Category 32      | 6                                 | 600  |
| Category 33      | 6                                 | 600  |
| Category 34      | 6                                 | 550  |
| Category 35      | 6                                 | 550  |
| Category 36      | 6                                 | 550  |
| Category 37      | 6                                 | 250  |
| Category 38      | 6                                 | 250  |
| Category 39      | 6                                 | 200  |
| Category 40      | 6                                 | 200  |
| Category 41      | 6                                 | 200  |
| Category 42      | 6                                 | 200  |
| Category 43      | 6                                 | 150  |
| Category 44      | 6                                 | 150  |

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 5.1f-a: 7.68 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       | 32   | 1   | 12000   | 52992                             |
| Category 2       | 32   | 12  | 12000   | 52992                             |
| Category 3       | 32   | 2   | 24000   | 105984                            |
| Category 4       | 32   | 12  | 24000   | 105984                            |
| Category 5       | 32   | 3   | 36000   | 158976                            |
| Category 6       | 32   | 12  | 36000   | 158976                            |
| Category 7       | 32   | 4   | 53000   | 211968                            |
| Category 8       | 32   | 12  | 53000   | 211968                            |
| Category 9       | 32   | 5   | 73000   | 264960                            |
| Category 10      | 32   | 12  | 73000   | 264960                            |
| Category 11      | 32   | 8   | 106000  | 423936                            |
| Category 12      | 32   | 12  | 106000  | 423936                            |
| Category 13      | 32   | 12  | 204000  | 635904                            |

Table 5.1f-b: RLC and MAC-hs parameters for 7.68 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       | 6                                 | 150  |
| Category 9       | 8                                 | 150  |
| Category 10      | 8                                 | 150  |
| Category 11      | 8                                 | 200  |
| Category 12      | 8                                 | 200  |
| Category 13      | 8                                 | 400  |

Table 5.1g: FDD E-DCH physical layer categories

| E-DCH category | Maximum number of E-DCH codes transmitted per transport block | 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                   | 7110  | -  |
| Category 2     | 2   | SF4                      | 10 ms and 2 ms TTI               | 14484   | 2798   |
| Category 3     | 2   | SF4                      | 10 ms TTI only                   | 14484   | -  |
| Category 4     | 2   | SF2                      | 10 ms and 2 ms TTI               | 20000   | 5772   |
| Category 5     | 2   | SF2                      | 10 ms TTI only                   | 20000   | -  |
| Category 6     | 4   | SF2                      | 10 ms and 2 ms TTI               | 20000   | 11484  |
| Category 7     | 4   | SF2                      | 10ms and 2 ms TTI                | 20000   | 22996  |

| E-DCH category   | Maximum number of E-DCH codes transmitted per transport block | 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 8   | 4   | SF2                      | 2 ms TTI                         | -   | 11484  |
| Category 9   | 4   | SF2                      | 2 ms TTI                         | -   | 22996  |
| NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4 |   |                          |                                  |   |  |

UEs of Categories 1 to 6 support QPSK only.

UEs of Category 7 supports QPSK (2 ms TTI, 10 ms TTI) and 16QAM (2 ms TTI).

UEs of Category 8 support only QPSK in Dual Cell E-DCH operation.

UEs of Category 9 support QPSK and 16QAM in Dual Cell E-DCH operation.

UEs of Category 8 and 9 support MAC-i/is.

**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 HS-DSCH and E-DCH categories for simultaneous HS-DSCH/E-DCH operation.

| 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 [kBytes] | Category 12 [kBytes] |
|-----------------------------------|----------------------------|-----------------------------|-----------------------------|---------------------|----------------------|----------------------|----------------------|
| Category 1                        | 100                        | 100                         | 200                         | 300                 | 300                  | 50                   | 50                   |
| Categories 2 and 3                | 100                        | 150                         | 200                         | 300                 | 300                  | 50                   | 100                  |
| Category 5                        | 100                        | 150                         | 200                         | 300                 | 300                  | 100                  | 100                  |
| Category 4                        | -                          | 150                         | 300                         | 300                 | 400                  | 100                  | 100                  |
| Category 6                        | -                          | 200                         | 300                         | 400                 | 400                  | 150                  | 150                  |
| Category 7                        | -                          | 300                         | 300                         | 400                 | 500                  | 200                  | 200                  |
| Category 8                        | -                          | -                           | -                           | -                   | -                    | -                    | -                    |
| Category 9                        | -                          | -                           | -                           | -                   | -                    | -                    | -                    |

| HS-DSCH category \ E-DCH category | Categories 13 and 14 [kBytes] | Categories 15 and 16 [kBytes] | Categories 17 and 18 [kBytes] | Categories 19 and 20 [kBytes] | Categories 21 and 22 [kBytes] | Categories 23 and 24 [kBytes] |
|-----------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Category 1                        | -                             | -                             | -                             | -                             | -                             | -                             |
| Categories 2 and 3                | -                             | -                             | -                             | -                             | -                             | -                             |
| Category 5                        | 400                           | -                             | -                             | -                             | -                             | -                             |
| Category 4                        | 400                           | 400                           | 400                           | -                             | 400                           | -                             |
| Category 6                        | 400                           | 500                           | 500                           | 750                           | 500                           | 750                           |
| Category 7                        | 500                           | 500                           | 500                           | 750                           | 500                           | 750                           |
| Category 8                        | -                             | -                             | -                             | -                             | 500                           | 750                           |
| Category 9                        | -                             | -                             | -                             | -                             | 750                           | 750                           |

| HS-DSCH category \ E-DCH category | Categories 25 and 26 [kBytes] | Categories 27 and 28 [kBytes] |
|-----------------------------------|-------------------------------|-------------------------------|
| Category 1                        | -                             | -                             |
| Categories 2 and 3                | -                             | -                             |
| Category 5                        | -                             | -                             |
| Category 4                        | 750                           | -                             |
| Category 6                        | 750                           | 1150                          |

| HS-DSCH category \ E-DCH category | Categories 25 and 26 [kBytes] | Categories 27 and 28 [kBytes] |
|-----------------------------------|-------------------------------|-------------------------------|
| Category 7                        | 1000                          | 1150                          |
| Category 8                        | 1000                          | 1150                          |
| Category 9                        | 1000                          | 1250                          |

| HS-DSCH category \ E-DCH category | Category 29 [kBytes] | Category 30 [kBytes] | Category 31 [kBytes] | Category 32 [kBytes] |
|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Category 6                        | 1000                 | 1800                 | 1150                 | 2300                 |
| Category 7                        | 1000                 | 1800                 | 1150                 | 2300                 |
| Category 8                        | 1000                 | 1800                 | 1150                 | 2300                 |
| Category 9                        | 1000                 | 1800                 | 1250                 | 2300                 |

NOTE: Maximum number of AM RLC entities for simultaneous HS-DSCH/E-DCH operation is defined in Table 5.1b.

**Table 5.1i: 3.84Mcps TDD E-DCH physical layer categories**

| E-DCH category | maximum number of physical channel bits on E-UCH that can be transmitted in a 10ms TTI | Maximum number of bits of an E-DCH transport block that can be transmitted within a 10ms E-DCH TTI |
|----------------|--|--|
| Category 1     | 17360  | 12146  |
| Category 2     | 34752  | 24161  |
| Category 3     | 52416  | 36782  |
| Category 4     | 69536  | 53896  |
| Category 5     | 104864   | 92014  |

NOTE: A UE of any 3.84Mcps TDD category can transmit E-DCH on up to (and including) 12 timeslots at spreading factors between 1 and 16 subject to the capabilities in table 5.1i.

**Table 5.1j - Total RLC and MAC-hs parameters for 3.84Mcps TDD HS-DSCH and E-DCH physical layer categories**

These values reflect the total buffer sizes of HS-DSCH and E-DCH categories for simultaneous HS-DSCH/E-DCH operation.

| HS-DSCH category \ E-DCH category | Categories 1 / 2 [Kbytes] | Categories 3 / 4 [Kbytes] | Categories 5 / 6 [Kbytes] | Category 7 [Kbytes] | Category 8 [Kbytes] | Category 9 [Kbytes] |
|-----------------------------------|---------------------------|---------------------------|---------------------------|---------------------|---------------------|---------------------|
| Category 1                        | 100                       | 100                       | 150                       | 200                 | 300                 | 400                 |
| Category 2                        | 100                       | 150                       | 200                       | 300                 | 300                 | 400                 |
| Category 3                        | 150                       | 150                       | 200                       | 300                 | 300                 | 400                 |
| Category 4                        | 150                       | 200                       | 300                       | 300                 | 300                 | 400                 |
| Category 5                        | 300                       | 300                       | 300                       | 300                 | 300                 | 400                 |

NOTE: Maximum number of AM RLC entities for simultaneous HS-DSCH/E-DCH operation is defined in Table 5.1f.

Table 5.1k: 7.68Mcps TDD E-DCH physical layer categories

| E-DCH category | maximum number of physical channel bits on E-UCH that can be transmitted in a 10ms TTI | Maximum number of bits of an E-DCH transport block that can be transmitted within a 10ms E-DCH TTI |
|----------------|--|--|
| Category 1     | 17360  | 12347  |
| Category 2     | 34752  | 24830  |
| Category 3     | 52416  | 36782  |
| Category 4     | 69536  | 54488  |
| Category 5     | 87200  | 73967  |
| Category 6     | 139104   | 104891   |
| Category 7     | 209760   | 177130   |

NOTE: A UE of any 7.68Mcps TDD category can transmit E-DCH on up to (and including) 12 timeslots at spreading factors between 1 and 32 subject to the capabilities in table 5.1k.

Table 5.1l: Total RLC and MAC-hs parameters for 7.68Mcps TDD HS-DSCH and E-DCH physical layer categories

These values reflect the total buffer sizes of HS-DSCH and E-DCH categories for simultaneous HS-DSCH/E-DCH operation.

| HS-DSCH category | Categories 1 / 2 [Kbytes] | Categories 3 / 4 [Kbytes] | Categories 5 / 6 [Kbytes] | Categories 7 / 8 [Kbytes] | Categories 9 / 10 [Kbytes] | Categories 11 / 12 [Kbytes] | Category 13 [Kbytes] |
|------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------------------------|----------------------|
| E-DCH category   |                           |                           |                           |                           |                            |                             |                      |
| Category 1       | 100                       | 100                       | 150                       | 200                       | 300                        | 400                         | 700                  |
| Category 2       | 100                       | 150                       | 200                       | 300                       | 300                        | 400                         | 700                  |
| Category 3       | 150                       | 150                       | 200                       | 300                       | 300                        | 400                         | 700                  |
| Category 4       | 150                       | 200                       | 300                       | 300                       | 400                        | 500                         | 700                  |
| Category 5       | 200                       | 300                       | 300                       | 300                       | 400                        | 500                         | 700                  |
| Category 6       | 300                       | 300                       | 400                       | 400                       | 500                        | 700                         | 700                  |
| Category 7       | 400                       | 400                       | 500                       | 500                       | 500                        | 700                         | 700                  |

NOTE: Maximum number of AM RLC entities for simultaneous HS-DSCH/E-DCH operation is defined in Table 5.1f-b.

Table 5.1m: 1.28 Mcps TDD E-DCH physical layer categories

| E-DCH category | Maximum number of E – DCH timeslots per TTI | Maximum number of E – DCH transport channel bits that can be received within an E-DCH TTI |
|----------------|---|---|
| Category 1     | 2 (Note 1, 3)                               | 2754  |
| Category 2     | 3 (Note 1, 3)                               | 4162  |
| Category 3     | 2 (Note 2, 3)                               | 5532  |
| Category 4     | 3 (Note 2, 3)                               | 8348  |
| Category 5     | 4 (Note 2, 3)                               | 11160   |
| Category 6     | 5 (Note 2, 3)                               | 11160   |

A UE in CELL\_FACH state with E-DCH transmission shall support the E-DCH physical layer category 3 in table 5.1m. When E-DCH transmission in CELL\_FACH state is configured, the formula to calculate the Transport Block Size shall be used according to the E-DCH physical layer category 3 (see [9]).

NOTE 1: Category 1 and category 2 UEs support QPSK only.

NOTE 2: Category 3, 4, 5 and 6 UEs support QPSK and 16QAM.

NOTE 3: All category UEs support up to 2 physical channels per timeslot unless 16QAM is adopted.

**Table 5.1m-a: 1.28 Mcps TDD multi-carrier E-DCH physical layer categories**

| E-DCH category | Maximum number of E – DCH timeslots per TTI |
|----------------|---|
| Category 1     | 4   |
| Category 2     | 6   |
| Category 3     | 9   |
| Category 4     | 12  |
| Category 5     | 15  |
| Category 6     | 18  |
| Category 7     | 24  |
| Category 8     | 30  |

The maximum number of E-DCH transport channel bits for multi-carrier E-DCH transmission equals to the sum of maximum number of E-DCH transport channel bits on each carrier which is determined by the UE's single carrier categories as specified in Table 5.1m. For instance, if the UE reports multi-carrier category 2 and single carrier category 4 with 2 uplink carriers, the maximum number of E-DCH transport channel bits is  $8348 * 2 = 16696$ .

NOTE: All categories UEs support QPSK and 16QAM.

**Table 5.1n: Total RLC and MAC-hs parameters for 1.28 Mcps TDD HS-DSCH and E-DCH physical layer categories**

These values reflect the total buffer sizes of HS-DSCH and E-DCH categories for simultaneous HS-DSCH/E-DCH operation.

| HS-DSCH category | Categories 1/2/3 [Kbytes] | Categories 4/5/6 [Kbytes] | Categories 7/8/9 [Kbytes] | Category 10/11/12 [Kbytes] | Category 13/14/15 [Kbytes] |
|------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| Category 1       | 100                       | 100                       | 150                       | 200                        | 300                        |
| Category 2       | 100                       | 150                       | 200                       | 300                        | 300                        |
| Category 3       | 150                       | 150                       | 200                       | 300                        | 300                        |
| Category 4       | 150                       | 150                       | 200                       | 300                        | 300                        |
| Category 5       | 150                       | 200                       | 300                       | 300                        | 400                        |
| Category 6       | 200                       | 300                       | 300                       | 300                        | 400                        |

| HS-DSCH category | Categories 16/17/18 [Kbytes] | Categories 19/20/21 [Kbytes] | Categories 22/23/24 [Kbytes] | Category 25 [Kbytes] | Category 26 [Kbytes] |
|------------------|------------------------------|------------------------------|------------------------------|----------------------|----------------------|
| Category 1       | 150                          | 150                          | 200                          | 200                  | 200                  |
| Category 2       | 150                          | 200                          | 200                          | 200                  | 200                  |
| Category 3       | 150                          | 200                          | 300                          | 200                  | 200                  |
| Category 4       | 200                          | 200                          | 300                          | 200                  | 300                  |
| Category 5       | 200                          | 200                          | 300                          | 200                  | 300                  |
| Category 6       | 200                          | 200                          | 300                          | 200                  | 300                  |

| HS-DSCH category | Categories 27/28/29 [Kbytes] | Category 30 [Kbytes] |
|------------------|------------------------------|----------------------|
| Category 1       | 300                          | 300                  |
| Category 2       | 300                          | 300                  |
| Category 3       | 300                          | 400                  |
| Category 4       | 300                          | 400                  |
| Category 5       | 300                          | 400                  |
| Category 6       | 300                          | 400                  |

**Table 5.1n-a: Total RLC and MAC-hs parameters for 1.28 Mcps TDD HS-DSCH and E-DCH physical layer categories (Multi-frequency HS-DSCH operation mode only)**

These values reflect the total buffer sizes of HS-DSCH and E-DCH categories for simultaneous HS-DSCH/E-DCH operation.

| HS-DSCH category | Categories 1/2/3 [Kbytes] | Categories 4/5/6 [Kbytes] | Categories 7/8/9 [Kbytes] | Category 10/11/12 [Kbytes] | Category 13/14/15 [Kbytes] | Category 16/17/18 [Kbytes] |
|------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|----------------------------|
| Category 1       | 500                       | 400                       | 300                       | 250                        | 200                        | 150                        |
| Category 2       | 500                       | 400                       | 300                       | 250                        | 200                        | 150                        |
| Category 3       | 500                       | 400                       | 300                       | 250                        | 200                        | 150                        |
| Category 4       | 500                       | 400                       | 300                       | 300                        | 200                        | 150                        |
| Category 5       | 600                       | 400                       | 300                       | 300                        | 250                        | 200                        |
| Category 6       | 600                       | 500                       | 400                       | 300                        | 250                        | 200                        |

| HS-DSCH category | Categories 19/20/21 [Kbytes] | Categories 22/23/24 [Kbytes] | Categories 25/26/27 [Kbytes] | Category 28/29/30 [Kbytes] | Category 31/32/33 [Kbytes] | Category 34/35/36 [Kbytes] |
|------------------|------------------------------|------------------------------|------------------------------|----------------------------|----------------------------|----------------------------|
| Category 1       | 750                          | 600                          | 500                          | 400                        | 300                        | 300                        |
| Category 2       | 750                          | 600                          | 500                          | 400                        | 300                        | 300                        |
| Category 3       | 750                          | 600                          | 500                          | 400                        | 400                        | 300                        |
| Category 4       | 750                          | 600                          | 500                          | 400                        | 400                        | 300                        |
| Category 5       | 750                          | 600                          | 500                          | 400                        | 400                        | 300                        |
| Category 6       | 750                          | 600                          | 500                          | 400                        | 400                        | 300                        |

| HS-DSCH category | Category 37/38 [Kbytes] | Category 39/40/43/44 [Kbytes] | Category 41/42 [Kbytes] |
|------------------|-------------------------|-------------------------------|-------------------------|
| Category 1       | 300                     | 200                           | 200                     |
| Category 2       | 300                     | 200                           | 200                     |
| Category 3       | 300                     | 300                           | 200                     |
| Category 4       | 300                     | 300                           | 200                     |

**Table 5.1n-b: Total RLC and MAC-hs/MAC-ehs parameters for 1.28 Mcps TDD HS-DSCH and E-DCH physical layer categories (Multi-frequency E-DCH and HS-DSCH operation mode only)**

These values reflect the total buffer sizes of HS-DSCH and E-DCH categories for simultaneous multi-frequency HS-DSCH/E-DCH operation.

| HS-DSCH category | Categories 1/2/3 [Kbytes] | Categories 4/5/6 [Kbytes] | Categories 7/8/9 [Kbytes] | Category 10/11/12 [Kbytes] | Category 13/14/15 [Kbytes] | Category 16/17/18 [Kbytes] |
|------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|----------------------------|
| Category 1       | 1500                      | 1150                      | 1000                      | 500                        | 400                        | 300                        |
| Category 2       | 1500                      | 1150                      | 1000                      | 500                        | 400                        | 300                        |
| Category 3       | 1500                      | 1150                      | 1000                      | 500<br>(Note)              | 400<br>(Note)              | 300<br>(Note)              |

|            |      |      |      |               |               |               |
|------------|------|------|------|---------------|---------------|---------------|
| Category 4 | 1500 | 1150 | 1000 | 500<br>(Note) | 400<br>(Note) | 400<br>(Note) |
| Category 5 | 1500 | 1150 | 1000 | 500<br>(Note) | 400<br>(Note) | 400<br>(Note) |
| Category 6 | 1500 | 1150 | 1000 | -             | -             | -             |
| Category 7 | 1500 | 1150 | 1000 | -             | -             | -             |
| Category 8 | 1500 | 1150 | 1000 | -             | -             | -             |

| HS-DSCH category | Categories<br>19/20/21<br>[Kbytes] | Categories<br>22/23/24<br>[Kbytes] | Categories<br>25/26/27<br>[Kbytes] | Category<br>28/29/30<br>[Kbytes] | Category<br>31/32/33<br>[Kbytes] | Category<br>34/35/36<br>[Kbytes] |
|------------------|------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Category 1       | 2300                               | 1800                               | 1150                               | 750                              | 500                              | 400                              |
| Category 2       | 2300                               | 1800                               | 1150                               | 750                              | 500                              | 400                              |
| Category 3       | 2300                               | 1800                               | 1250                               | 750<br>(Note)                    | 750<br>(Note)                    | 400<br>(Note)                    |
| Category 4       | 2300                               | 1800                               | 1250                               | 750<br>(Note)                    | 750<br>(Note)                    | 500<br>(Note)                    |
| Category 5       | 2300                               | 1800                               | 1250                               | 750<br>(Note)                    | 750<br>(Note)                    | 500<br>(Note)                    |
| Category 6       | 2300                               | 1800                               | 1250                               | -                                | -                                | -                                |
| Category 7       | 2300                               | 1800                               | 1500                               | -                                | -                                | -                                |
| Category 8       | 2300                               | 1800                               | 1500                               | -                                | -                                | -                                |

| HS-DSCH category | Categories<br>37/38/<br>[Kbytes] | Categories<br>39/40/43/44<br>[Kbytes] | Categories<br>41/42<br>[Kbytes] |
|------------------|----------------------------------|---------------------------------------|---------------------------------|
| Category 1       | 400                              | 300                                   | 250                             |
| Category 2       | 400                              | 300                                   | 250                             |

NOTE: Total RLC and MAC-hs/MAC-ehs parameters for E-DCH category 3, 4, 5 and HS-DSCH category form 10 to 18, 28 to 36 apply only for the UEs support smaller or equal to 3 carrier reception and transmission.

## 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     |
|---|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| <b>PDCP parameters</b>  |  |                     |                     |                     |                     |                     |                     |
| Support for RFC 2507  | No                                     | No                  | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    |
| Support for RFC 3095  | No/Yes<br>NOTE 1                       | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    | No/Yes<br>NOTE 1    |
| Support for RFC 3095 context relocation   | No/Yes<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support for loss-less SRNS relocation   | No/Yes<br>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<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| <b>RLC parameters</b>   |  |                     |                     |                     |                     |                     |                     |
| 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<br>NOTE 1                    | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 | 2047/4095<br>NOTE 1 |
| <b>Multi-mode related parameters</b>  |  |                     |                     |                     |                     |                     |                     |
| Support of UTRA FDD   | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support of UTRA TDD 3.84 Mcps   | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support of UTRA TDD 1.28 Mcps   | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| <b>Multi-RAT related parameters</b>   |  |                     |                     |                     |                     |                     |                     |
| Support of GSM  | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support of multi-carrier  | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support of UTRAN to GERAN Network Assisted Cell Change                              | Yes/No                                 |                     |                     |                     |                     |                     |                     |
| Support of E-UTRA FDD   | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| Support of E-UTRA TDD   | Yes/No<br>NOTE 1                       |                     |                     |                     |                     |                     |                     |
| <b>Security parameters</b>  |  |                     |                     |                     |                     |                     |                     |
| Support of ciphering algorithm UEA0   | Yes                                    |                     |                     |                     |                     |                     |                     |
| Support of ciphering algorithm UEA1   | Yes                                    |                     |                     |                     |                     |                     |                     |
| Support of ciphering algorithm UEA2   | Yes                                    |                     |                     |                     |                     |                     |                     |
| Support of integrity protection algorithm UIA1                                      | Yes                                    |                     |                     |                     |                     |                     |                     |
| Support of integrity protection algorithm UIA2                                      | Yes                                    |                     |                     |                     |                     |                     |                     |
| <b>UE positioning related parameters</b>  |  |                     |                     |                     |                     |                     |                     |



| 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 |
|---|--|---------------|---------------|----------------|----------------|----------------|-----------------|
| Standalone location method(s) supported   | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| UE based OTDOA supported  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| Network assisted GPS support  | Network based / UE based / Both/ None<br>NOTE 1                  |               |               |                |                |                |                 |
| Network Assisted GANSS support List   | Per supported GANSS<br>NOTE 1                                    |               |               |                |                |                |                 |
| >GANSS ID   | Galileo / SBAS / Modernized GPS / QZSS / GLONASS<br>NOTE 1       |               |               |                |                |                |                 |
| >SBAS IDs   | WAAS / EGNOS / MSAS / GAGAN<br>NOTE 1                            |               |               |                |                |                |                 |
| >GANSS mode   | Network based / UE based / Both/ None<br>NOTE 1                  |               |               |                |                |                |                 |
| >GANSS Signal ID  | 0..7<br>NOTE 1   |               |               |                |                |                |                 |
| >GANSS Signal IDs   | Yes/No (per GANSS signal)<br>NOTE 1                              |               |               |                |                |                |                 |
| >Support for GANSS timing of cell frames measurement  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| >Support for GANSS Carrier-Phase Measurement  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| >Support for non-native assistance choices  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| Support for GPS timing of cell frames measurement   | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| Support for IPDL  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| Support for Rx-Tx time difference type 2 measurement  | Yes/No<br>NOTE 1   |               |               |                |                |                |                 |
| 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<br>NOTE 1   |               |               |                |                |                |                 |
| <b>RF parameters for FDD</b>  |  |               |               |                |                |                |                 |
| Radio frequency bands   | The radio frequency bands defined in [4]                         |               |               |                |                |                |                 |
| UE power class  | 3 / 4<br>NOTE 1  |               |               |                |                |                |                 |
| Tx/Rx frequency separation  | Defined in [4] for the respective supported radio frequency band |               |               |                |                |                |                 |
| <b>RF parameters for TDD 3.84 Mcps</b>  |  |               |               |                |                |                |                 |
| Radio frequency bands   | A / b / c / a+b / a+c / b+c / a+b+c<br>NOTE 1                    |               |               |                |                |                |                 |
| UE power class  | 2 / 3<br>NOTE 1  |               |               |                |                |                |                 |
| <b>RF parameters for TDD 7.68 Mcps</b>  |  |               |               |                |                |                |                 |
| Radio frequency bands   | A / b / c / a+b / a+c / b+c / a+b+c<br>NOTE 1                    |               |               |                |                |                |                 |
| UE power class  | 2 / 3<br>NOTE 1  |               |               |                |                |                |                 |
| <b>RF parameters for TDD 1.28 Mcps</b>  |  |               |               |                |                |                |                 |
| Radio frequency bands   | A / b / c / a+b / a+c / b+c / a+b+c<br>NOTE 1                    |               |               |                |                |                |                 |
| UE power class  | 2 / 3<br>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                |
|---|------------------------|------------------|------------------|------------------|------------------|------------------|--------------------------------|
| <b>Transport channel parameters</b>   |                        |                  |                  |                  |                  |                  |                                |
| Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant                       | 640 (FDD)<br>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)<br>1280(TDD)  | 1280             | 3840             | 3840             | 6400             | 10240            | 20480(1)<br>10240(2)<br>NOTE 5 |
| Maximum number of simultaneous transport channels   | 4                      | 8<br>NOTE 4      | 8<br>NOTE 4      | 8<br>NOTE 4      | 8<br>NOTE 4      | 8<br>NOTE 4      | 16<br>NOTE 4                   |
| Maximum number of simultaneous CCTrCH (FDD)   | 1                      | 1<br>NOTE 3      | 1<br>NOTE 3      | 1<br>NOTE 3      | 1<br>NOTE 3      | 1<br>NOTE 3      | 1<br>NOTE 3                    |
| Maximum number of simultaneous CCTrCH (TDD)   | 1<br>NOTE 3            | 2<br>NOTE 3      | 3<br>NOTE 3      | 3<br>NOTE 3      | 3<br>NOTE 3      | 4<br>NOTE 3      | 4<br>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)<br>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                         |
| <b>Physical channel parameters (FDD)</b>  |                        |                  |                  |                  |                  |                  |                                |
| Maximum number of DPCH codes to be simultaneously received  | 1                      | 1                | 1                | 1                | 3                | 3                | 3                              |
| 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   | No                     | No               | No               | No               | No               | No               | No                             |
| Support of HS-PDSCH   | No                     | No               | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1               |
| <b>Physical channel parameters (TDD 3.84 Mcps)</b>  |                        |                  |                  |                  |                  |                  |                                |
| 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<br>NOTE 1   | 1/16<br>NOTE 1   | 1/16<br>NOTE 1                 |
| Support of PDSCH  | No                     | Yes/No<br>NOTE 1 | Yes              | Yes              | Yes              | Yes              | Yes                            |
| Support of HS-PDSCH   | No                     | No               | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1               |
| Maximum number of physical channels per timeslot  | 5                      | 8                | 9                | 9                | 9                | 9                | 13                             |
| <b>Physical channel parameters (TDD 7.68 Mcps)</b>  |                        |                  |                  |                  |                  |                  |                                |
| Maximum number of timeslots per frame   | 1                      | 1                | 2                | 4                | 5                | 10               | 12                             |
| Maximum number of physical  | 5                      | 8                | 9                | 14               | 28               | 64               | 136                            |

| 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  |
|--|---------------|------------------|------------------|------------------|------------------|------------------|------------------|
| channels per frame   |               |                  |                  |                  |                  |                  |                  |
| Minimum SF   | 32            | 32               | 32               | 32               | 1/32<br>NOTE 1   | 1/32<br>NOTE 1   | 1/32<br>NOTE 1   |
| Support of PDSCH   | No            | Yes/No<br>NOTE 1 | Yes              | Yes              | Yes              | Yes              | Yes              |
| Support of HS-PDSCH  | No            | No               | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 |
| Maximum number of physical channels per timeslot                     | 5             | 8                | 9                | 9                | 9                | 9                | 13               |
| <b>Physical channel parameters (TDD 1.28 Mcps)</b>                   |               |                  |                  |                  |                  |                  |                  |
| 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<br>NOTE 1   | 1/16<br>NOTE 1   | 1                |
| Support of PDSCH   | No            | Yes/No<br>NOTE 1 | Yes              | Yes              | Yes              | Yes              | Yes              |
| Support of HS-PDSCH  | No            | No               | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>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 3.84/7.68 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.

**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          | 0.5 Mbps class | 1.1 Mbps class | 1.6 Mbps class | 2.2 Mbps class | 2.8 Mbps class |
|--------------------------------|----------------|----------------|----------------|----------------|----------------|
| 1.28 Mcps TDD HS-DSCH Category | Category 1     | Category 4     | Category 7     | Category 10    | Category 13    |

**Table 5.2.2.3-a: 1.28 Mcps TDD UE radio access capability parameter combinations, DL HS-DSCH parameters (Multi-frequency HS-DSCH operation mode only)**

| Reference combination          | 14 Mbps class | 11.2 Mbps class | 8.4 Mbps class | 7.0 Mbps class | 5.6 Mbps class | 4.2 Mbps class |
|--------------------------------|---------------|-----------------|----------------|----------------|----------------|----------------|
| 1.28 Mcps TDD HS-DSCH Category | Category 1    | Category 4      | Category 7     | Category 10    | Category 13    | Category 10    |

**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      |

**Table 5.2.2.4a: 7.68 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 | 10.6 Mbps class |
|-------------------------------|----------------|----------------|----------------|----------------|-----------------|
| 7.68Mcps TDD HS-DSCH category | Category 1     | Category 3     | Category 5     | Category 9     | Category 11     |

The reference combinations for E-DCH capabilities are shown in tables 5.2.2.5, 5.2.2.6 and 5.2.2.7.

**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      |

**Table 5.2.2.6: 3.84Mcps TDD UE radio access capability parameter combinations, UL E-DCH parameters**

| Reference combination       | 1.2 Mbps class | 2.4 Mbps class | 3.6 Mbps class | 5.3 Mbps class | 9.2 Mbps class |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| 3.84Mcps TDD E-DCH category | Category 1     | Category 2     | Category 3     | Category 4     | Category 6     |

**Table 5.2.2.7: 7.68Mcps TDD UE radio access capability parameter combinations, UL E-DCH parameters**

| Reference combination       | 1.2 Mbps class | 2.4 Mbps class | 3.6 Mbps class | 5.3 Mbps class | 10.6 Mbps class |
|-----------------------------|----------------|----------------|----------------|----------------|-----------------|
| 7.68Mcps TDD E-DCH category | Category 1     | Category 2     | Category 3     | Category 4     | Category 6      |

**Table 5.2.2.8: 1.28Mcps TDD UE radio access capability parameter combinations, UL E-DCH parameters**

| Reference combination       | 0.5 Mbps class | 0.8 Mbps class | 1.1 Mbps class | 1.6 Mbps class | 2.2 Mbps class   |
|-----------------------------|----------------|----------------|----------------|----------------|------------------|
| 1.28Mcps TDD E-DCH category | Category 1     | Category 2     | Category 3     | Category 4     | Category 5 and 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 |
|--|---------------|------------------------|---------------|----------------|----------------|----------------|
| <b>Transport channel parameters</b>  |               |                        |               |                |                |                |
| Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant                       | 640           | 640(FDD)<br>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   | NA            | NA(FDD)                | 3840          | 3840           | 6400           | 10240          |

| 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 |
|--|---------------|-----------------------|---------------|----------------|----------------|----------------|
| turbo coded transport blocks being transmitted at an arbitrary time instant                  |               | 1280 (TDD)            |               |                |                |                |
| Maximum number of simultaneous transport channels  | 4             | 4                     | 8             | 8              | 8              | 8              |
| Maximum number of simultaneous CCTrCH(TDD only)  | 1<br>NOTE 3   | 1<br>NOTE 3           | 2<br>NOTE 3   | 2<br>NOTE 3    | 2<br>NOTE 3    | 2<br>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)<br>Yes (TDD) | Yes           | Yes            | Yes            | Yes            |
| <b>Physical channel parameters (FDD)</b>   |               |                       |               |                |                |                |
| 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         |
| <b>Physical channel parameters (TDD 3.84 Mcps)</b>   |               |                       |               |                |                |                |
| 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<br>NOTE 1      | Yes           | Yes            | Yes            | Yes            |
| Support of E-PUCH  | No            | Yes/No                | Yes           | Yes            | Yes            | Yes            |
| <b>Physical channel parameters (TDD 7.68 Mcps)</b>   |               |                       |               |                |                |                |
| 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   | 16            | 8                     | 4             | 4              | 4              | 4              |
| Support of PUSCH   | No            | Yes/No<br>NOTE 1      | Yes           | Yes            | Yes            | Yes            |
| Support of E-PUCH  | No            | Yes/No                | Yes           | Yes            | Yes            | Yes            |
| <b>Physical channel parameters (TDD 1.28 Mcps)</b>   |               |                       |               |                |                |                |
| Maximum Number of timeslots per subframe   | 1             | 1                     | 2             | 3              | 5              | 5              |
| Maximum number of physical channels per timeslot   | 1             | 2/1<br>NOTE 1         | 2             | 2              | 2              | 2              |
| Minimum SF   | 8             | 4                     | 2             | 2              | 2              | 2              |
| Support of PUSCH   | No            | Yes/No<br>NOTE 1      | Yes           | Yes            | Yes            | Yes            |
| Support of 8PSK  | No            | No                    | No            | No             | No             | No             |
| Support of E-PUCH  | No            | Yes/No                | Yes           | Yes            | Yes            | Yes            |

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<br>3.0.0 |
|                          | RP-10 | RP-000578 | 015 | 2   | Correction on parameter "Maximum total number of transport blocks..." | 3.2.0 | 25.306<br>3.0.0 |
|                          | RP-10 | RP-000578 | 016 |     | Change to UE multi-RAT capability                                     | 3.2.0 | 25.306<br>3.0.0 |
|                          | RP-10 | RP-000578 | 017 |     | Change from TR 25.926 to TS 25.306                                    | 3.2.0 | 25.306<br>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 |
| 09/2005                  | RP-29 | RP-050480 | 0120 |   | Removal RLC-SDU alignment capability  | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050480 | 0121 |   | Feature Clean Up: Removal of DRAC   | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050480 | 0122 |   | Adding the UE capability for FDD Radio frequency bands  | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050475 | 0123 |   | F-DPCH support for HS-DSCH supporting Ues   | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050468 | 0124 |   | Introduction of MBMS capability for TDD   | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050468 | 0125 |   | Correction of UE capability for MBMS  | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050470 | 0126 |   | Correction on table 5.1g (FDD E-DCH physical layer categories)                                    | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050470 | 0127 |   | E-DCH L2 Buffer sizes   | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050469 | 0128 |   | Removal of fixed position for S-CCPCHs carrying MBMS channels                                     | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-50461  | 0130 |   | Correction of TB size and soft channel bits number for 1.28 Mcps TDD                              | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050484 | 0131 |   | Introduction of battery-limited device indication in UE capability                                | 6.5.0 | 6.6.0 |
|                          | RP-29 | RP-050480 | 0132 |   | Introduction of REL-6 Access Stratum release indicator  | 6.5.0 | 6.6.0 |
| 12/2005                  | RP-30 | RP-050796 | 0133 |   | Tx/Rx frequency separation capability (FDD)   | 6.6.0 | 6.7.0 |
|                          | RP-30 | RP-050784 | 0134 |   | Feature cleanup and other leftovers   | 6.6.0 | 6.7.0 |
|                          | RP-30 | RP-050790 | 0135 | 1 | E-DCH L2 Buffer sizes   | 6.6.0 | 6.7.0 |
|                          | RP-30 | RP-050861 | 0136 | 1 | Introduction of Support of Handover to GAN  | 6.6.0 | 6.7.0 |
| 03/2006                  | RP-31 | RP-060090 | 0138 |   | Correction to number of RLC AM instances for HS   | 6.7.0 | 6.8.0 |
|                          | RP-31 | RP-060093 | 0141 | 1 | Inter-RAT PS Handover capability  | 6.7.0 | 6.8.0 |
|                          | RP-31 | RP-060098 | 0139 |   | 7.68 Mcps TDD Option (Release 7)  | 6.8.0 | 7.0.0 |
|                          | RP-31 | RP-060099 | 0140 |   | Introduction of REL-7 access stratum release indicator  | 6.8.0 | 7.0.0 |
| 09/2006                  | RP-33 | RP-060614 | 0144 |   | Introduction of SIB 11bis   | 7.0.0 | 7.1.0 |
|                          | RP-33 | RP-060586 | 0145 |   | Introduction of 3.84 Mcps and 7.68 McpsTDD E-DCH  | 7.0.0 | 7.1.0 |
| 12/2006                  | RP-34 | RP-060713 | 0146 | 1 | Introduction of the new security algorithms UEA2 and UIA2   | 7.1.0 | 7.2.0 |
| 03/2007                  | RP-35 | RP-070151 | 0147 |   | TTI values for MCCH RB configuration  | 7.2.0 | 7.3.0 |
|                          | RP-35 | RP-070150 | 0150 |   | Correction of the HS-DSCH physical layer categories of 1.28Mcps TDD                               | 7.2.0 | 7.3.0 |
|                          | RP-35 | RP-070157 | 0152 |   | Introduction of 1.28 Mcps TDD E-DCH   | 7.2.0 | 7.3.0 |
|                          | RP-35 | RP-070161 | 0153 | 2 | Introducing MIMO in UE Capability specification   | 7.2.0 | 7.3.0 |
|                          | RP-35 | RP-070163 | 0155 |   | Introduction of 64QAM downlink in 25.306  | 7.2.0 | 7.3.0 |
| 06/2007                  | RP-36 | RP-070402 | 0151 | 2 | Introducing 16QAM uplink support  | 7.3.0 | 7.4.0 |
|                          | RP-36 | RP-070395 | 0156 |   | Introduction of GAN PS handover   | 7.3.0 | 7.4.0 |
|                          | RP-36 | RP-070406 | 0158 |   | Support of RFC 3095 (ROHC) Compression  | 7.3.0 | 7.4.0 |
|                          | RP-36 | RP-070400 | 0159 |   | MBMS FDD and TDD Physical Layer Improvements  | 7.3.0 | 7.4.0 |
|                          | RP-36 | RP-070398 | 0160 |   | GANSS support to UE capabilities  | 7.3.0 | 7.4.0 |
|                          | RP-36 | RP-070403 | 0161 |   | UE capabilities for HS-DSCH reception in CELL_PCH, URA_PCH and CELL_FACH states                   | 7.3.0 | 7.4.0 |
| 09/2007                  | RP-37 | RP-070670 | 0163 | 1 | Introduction of HS-DSCH category for combined MIMO and DL64QAM                                    | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070670 | 0164 |   | Code rate limitation for UE HSDPA Categories 13 and 15  | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070625 | 0166 |   | MBMS UE Capability for mapping MTCH/MSCH to legacy S-CCPCH  | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070670 | 0167 |   | HSPA+ L2 Buffering  | 7.4.0 | 7.5.0 |

| Change history TS 25.306 |       |           |      |   |   |       |       |
|--------------------------|-------|-----------|------|---|---|-------|-------|
|                          | RP-37 | RP-070634 | 0168 | 1 | UE capabilities for Rel-7, with 'improved L2' optional  | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070627 | 0171 | 2 | Specification of HS-SCCH less memory requirement  | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070650 | 0173 |   | Introduction of the Multi-Carrier HS-DSCH physical layer categories for 1.28Mcps TDD  | 7.4.0 | 7.5.0 |
|                          | RP-37 | RP-070764 | 0174 |   | For the creation of RRC Rel-8   | 7.4.0 | 8.0.0 |
| 12/2007                  | RP-38 | RP-070900 | 0176 | 1 | Correction to memory requirement for HS-SCCH less operation   | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070903 | 0178 |   | Introduction of an additional UE category for 1.28Mcps TDD E-DCH  | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070901 | 0180 |   | Clarification on MIMO and 64QAM UE categories   | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070902 | 0182 |   | More improvement on dedicated carrier for 1.28 Mcps TDD MBMS  | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070900 | 0184 |   | UE capability for E-DCH transmission time restriction and UE DRX in CPC   | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070905 | 0186 |   | Correction to Control Information transmission with two logical channels  | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070910 | 0187 |   | Introduction of CS voice over HSPA  | 8.0.0 | 8.1.0 |
|                          | RP-38 | RP-070907 | 0188 |   | Introduction of HS-DSCH category for combined MIMO and DL64QAM  | 8.0.0 | 8.1.0 |
| 03/2008                  | RP-39 | RP-080185 | 0190 | - | Clarification of uplink multicode capability for 1.28Mcps TDD   | 8.1.0 | 8.2.0 |
|                          | RP-39 | RP-080188 | 0192 | - | Code rate limitations for HS-DSCH UE cat 13 and 15  | 8.1.0 | 8.2.0 |
| 05/2008                  | RP-40 | RP-080417 | 0193 | 1 | Introduction of 64QAM in UE capability specification for LCR TDD  | 8.2.0 | 8.3.0 |
| 09/2008                  | RP-41 | RP-080682 | 0195 | - | Ki restriction for UE HS-DSCH categories 13 and 15  | 8.3.0 | 8.4.0 |
|                          | RP-41 | RP-080694 | 0196 | 1 | Introduction of E-UTRA support  | 8.3.0 | 8.4.0 |
| 12/2008                  | RP-42 | RP-081024 | 0200 | - | Introduction of additional UE categories for 1.28Mcps TDD 64QAM DL  | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081022 | 0201 | 2 | Introduction of support of "Enhanced Uplink for CELL_FACH State in FDD" and "Improved L2 for uplink"  | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081030 | 0202 | 2 | Addition of UE categories for dual cell HSDPA   | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081029 | 0203 | - | UE positioning capabilities for support of additional navigation satellite systems  | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081102 | 0206 | 1 | 25.306 CR Introduction of UE Measurement Capability on frequency adjacent to intra-frequency  | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081033 | 0207 | - | Introduction of optional features in Release 8  | 8.4.0 | 8.5.0 |
|                          | RP-42 | RP-081127 | 0208 | 2 | Support for 3.84 Mcps MBSFN IMB operation   | 8.4.0 | 8.5.0 |
| 03/2009                  | RP-43 | RP-090114 | 0213 | - | Correction of RF parameters in 25.306   | 8.5.0 | 8.6.0 |
|                          | RP-43 | RP-090147 | 0214 | - | 25.306 CR on Introduction of CPC for 1.28Mcps TDD   | 8.5.0 | 8.6.0 |
|                          | RP-43 | RP-090151 | 0216 | - | Value range for UE Measurement Capability on a frequency adjacent to intra-frequency  | 8.5.0 | 8.6.0 |
|                          | RP-43 | RP-090144 | 0218 | - | Update to UE capability for IMB MCCH reception  | 8.5.0 | 8.6.0 |
|                          | RP-43 | RP-090149 | 0219 | - | Introduction of MIMO for 1.28Mcps TDD   | 8.5.0 | 8.6.0 |
| 06/2009                  | RP-44 | RP-090506 | 0220 | 1 | Add description about the parameter of Need for Idle Interval   | 8.6.0 | 8.7.0 |
|                          | RP-44 | RP-090519 | 0223 | - | Clarification for the code rate restriction for Cat19   | 8.6.0 | 8.7.0 |
| 09/2009                  | RP-45 | RP-090908 | 0228 | 1 | E-DCH TTI restriction for 16QAM   | 8.7.0 | 8.8.0 |
|                          | RP-45 | RP-090902 | 0232 | - | Making features "Using special value of HE field to indicate end of an SDU for RLC AM" optional, "Removing the constraint that the same HS-SCCH should be used in contiguous TTIs" and octet aligned HS-DSCH transport block table optional for non-64QAM UEs | 8.7.0 | 8.8.0 |
|                          | RP-45 | RP-090910 | 0233 | 1 | Clarification on UE category of enhanced CELL_FACH for 1.28Mcps TDD   | 8.7.0 | 8.8.0 |
|                          | RP-45 | RP-090901 | 0246 | - | Enhancing the Category Handling in UMTS   | 8.7.0 | 8.8.0 |
| 09/2009                  | RP-45 | RP-090921 | 0224 | 1 | Introduction of Band XIX  | 8.8.0 | 9.0.0 |
|                          | RP-45 | RP-090925 | 0230 | - | Introduction of TxAA extension for non-MIMO UEs   | 8.8.0 | 9.0.0 |
|                          | RP-45 | RP-090924 | 0231 | - | Introduction of Dual Cell operation with MIMO   | 8.8.0 | 9.0.0 |
| 12/2009                  | RP-46 | RP-091315 | 0248 | 1 | Making features "Absolute priority reselection to GERAN", "Absolute priority reselection to UTRA inter-frequency" optional (Option1)  | 9.0.0 | 9.1.0 |
|                          | RP-46 | RP-091338 | 0249 | 1 | L2 buffer sizes for DC-MIMO and E-DCH category combinations   | 9.0.0 | 9.1.0 |
|                          | RP-46 | RP-091336 | 0250 | - | Email discussion outcome for [67b#17] UMTS: DC-HSUPA in 25.306  | 9.0.0 | 9.1.0 |
|                          | RP-46 | RP-091339 | 0252 | - | RAN1 RAN2 alignment on TxAA   | 9.0.0 | 9.1.0 |
|                          | RP-46 | RP-091347 | 0253 | 2 | Introduction of TS0 capability for 1.28Mcps TDD   | 9.0.0 | 9.1.0 |
|                          | RP-46 | RP-091259 | 0255 | - | Support for carrier-specific STTD configuration for DC-HSDPA  | 9.0.0 | 9.1.0 |
| 03/2010                  | RP-47 | RP-100298 | 0256 | - | Clarification of code rates limitation for category 25/27   | 9.1.0 | 9.2.0 |
|                          | RP-47 | RP-100306 | 0258 | - | Release 9 UE Capability: UTRA Home Node B Inbound Mobility related features   | 9.1.0 | 9.2.0 |
|                          | RP-47 | RP-100299 | 0264 | - | UE cat17/18 and signalling of Single Stream MiMo capability   | 9.1.0 | 9.2.0 |
|                          | RP-47 | RP-100297 | 0265 | 1 | dual band capability  | 9.1.0 | 9.2.0 |
|                          | RP-47 | RP-100282 | 0266 | - | Bounds to RoHC requirements for UEs supporting IMS  | 9.1.0 | 9.2.0 |
| 06/2010                  | RP-48 | RP-100547 | 0267 | 1 | Corrections to Inter-band measurement capability  | 9.2.0 | 9.3.0 |
|                          | RP-48 | RP-100549 | 0268 | - | Support MAC-ehs in Single Stream MIMO case  | 9.2.0 | 9.3.0 |
| 09/2010                  | RP-49 | RP-100846 | 0272 | - | Clarification on the code rate restriction in HS-DSCH UE Categories 19  | 9.3.0 | 9.4.0 |



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|--------------------------|-------|-----------|------|---|--|--------|--------|
|                          | RP-49 | RP-100857 | 0273 | - | Clarification on the code rate restriction in HS-DSCH UE Categories 25 and 27                                  | 9.3.0  | 9.4.0  |
|                          | RP-49 | -         | -    | - | v10.0.0 created based on v9.4.0  | 9.4.0  | 10.0.0 |
|                          | RP-49 | RP-100863 | 0275 | 1 | Introduction of 4C-HSDPA categories  | 9.3.0  | 10.0.0 |
| 12/2010                  | RP-50 | RP-101366 | 0278 | 1 | Correction for value range of total RLC AM, MAC-hs and MAC-ehs buffer size                                     | 10.0.0 | 10.1.0 |
|                          | RP-50 | RP-101211 | 0279 | - | Correction for value range of total RLC AM, MAC-hs and MAC-ehs buffer size                                     | 10.0.0 | 10.1.0 |
|                          | RP-50 | RP-101213 | 0280 | 1 | Introduction of REL-10 access stratum release indicator  | 10.0.0 | 10.1.0 |
|                          | RP-50 | RP-101212 | 0282 | 1 | Introduction of REL-9 access stratum release indicator   | 10.0.0 | 10.1.0 |
|                          | RP-50 | RP-101366 | 0283 | - | Corrections on 25.306 for 4C-HSDPA   | 10.0.0 | 10.1.0 |
|                          | RP-50 | RP-101365 | 0284 | - | introduction of MC-HSUPA for 1.28Mcps TDD  | 10.0.0 | 10.1.0 |
| 03/2011                  | RP-51 | RP-110268 | 0287 | - | Correction of buffer sizes for 64QAM+MIMO, DC-HSDPA categories   | 10.1.0 | 10.2.0 |
|                          | RP-51 | RP-110279 | 0289 | - | Extend the carrier capability for Multi-Carrier HSDPA for 1.28Mcps TDD   | 10.1.0 | 10.2.0 |
|                          | RP-51 | RP-110264 | 0293 | - | Clarification to the carrier capability in Multi-Carrier HSDPA for 1.28Mcps TDD                                | 10.1.0 | 10.2.0 |
|                          | RP-51 | RP-110282 | 0295 | - | Counter proposal to R2-110749 on UE capabilities for MDT   | 10.1.0 | 10.2.0 |
|                          | RP-51 | RP-110332 | 0297 | 1 | Combination of DB-HSDPA and MIMO   | 10.1.0 | 10.2.0 |
| 06/2011                  | RP-52 | RP-110825 | 0298 | 1 | Removing RoHC discrepancy  | 10.2.0 | 10.3.0 |
|                          | RP-52 | RP-110829 | 0301 | 2 | Addition of the missing Total RLC and MAC-hs parameters in UE HS-DSCH categories for 1.28Mcps TDD              | 10.2.0 | 10.3.0 |
|                          | RP-52 | RP-110838 | 0302 | 1 | Addition of the missing Total RLC and MAC-hs parameters in UE dual-carrier HS-DSCH categories for 1.28Mcps TDD | 10.2.0 | 10.3.0 |
|                          | RP-52 | RP-110838 | 0303 | - | Correction to UE capability Support of MIMO with dual cell dual band operation                                 | 10.2.0 | 10.3.0 |
|                          | RP-52 | RP-110829 | 0306 | 1 | Correction to HS-DSCH physical layer categories for 1.28 Mcps TDD  | 10.2.0 | 10.3.0 |
|                          | RP-52 | RP-110672 | 0317 | - | Introduction of measurement ID extension   | 10.2.0 | 10.3.0 |
| 09/2011                  | RP-53 | RP-111285 | 0321 | 2 | Introduction of optional Rel-10 features   | 10.3.0 | 10.4.0 |
|                          | RP-53 | RP-111282 | 0329 | - | Clarification on DCHSUPA dependence on MAC-i/is  | 10.3.0 | 10.4.0 |
|                          | RP-53 | RP-111278 | 0331 | 1 | Correction to UE capability parameters for handover to CSG cell  | 10.3.0 | 10.4.0 |
| 12/2011                  | RP-54 | RP-111715 | 0332 | - | Correction of capability table   | 10.4.0 | 10.5.0 |
|                          | RP-54 | RP-111715 | 0333 | 2 | Addition of the missing value ranges for 1.28Mbps TDD capabilities   | 10.4.0 | 10.5.0 |
|                          | RP-54 | RP-111715 | 0336 | - | Introduction of the frequency specific compressed mode   | 10.4.0 | 10.5.0 |
| 03/2012                  | RP-55 | RP-120327 | 0342 | - | Add up several missing optional capabilities   | 10.5.0 | 10.6.0 |
|                          | RP-55 | RP-120327 | 0351 | 1 | Additional value for Total RLC AM Buffer Size value range  | 10.5.0 | 10.6.0 |
| 06/2012                  | RP-56 | RP-120855 | 0356 | 1 | Correction to definition of enhanced inter-frequency measurements without CM                                   | 10.6.0 | 10.7.0 |
|                          | RP-56 | RP-120815 | 0358 | 2 | Extend the carrier capability for two-carrier HSDPA for 1.28Mcps TDD   | 10.6.0 | 10.7.0 |

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## History

| <b>Document history</b> |              |             |
|-------------------------|--------------|-------------|
| V10.2.0                 | April 2011   | Publication |
| V10.3.0                 | July 2011    | Publication |
| V10.4.0                 | October 2011 | Publication |
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| V10.7.0                 | July 2012    | Publication |