

# ETSI TS 125 306 V5.2.0 (2002-09)

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*Technical Specification*

## **Universal Mobile Telecommunications System (UMTS); UE Radio Access capabilities definition (3GPP TS 25.306 version 5.2.0 Release 5)**

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**Reference**

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650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

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Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
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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.
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- 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".

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## 3 Void

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## 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 need 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 PDCCP parameters

### Support for RFC 2507

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

### Support for RFC 3095

This parameter defines whether the UE supports header compression according to RFC 3095 as defined in [1] or not.

### Support for RFC 3095 context relocation

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

### Support for loss-less SRNS relocation

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

### 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.

## 4.2 Void

## 4.3 RLC and MAC-hs parameters

### Total RLC AM and MAC-hs buffer size

When HS-DSCH is not configured this is defined as the maximum total buffer size across all RLC AM entities supported by the UE. When HS-DSCH is configured this is defined as the maximum total buffer size across all MAC-hs reordering entities and all RLC AM entities supported by the UE. UTRAN controls that the UE capability can be fulfilled through the following parameters:

1. The number of RLC AM entities configured (no explicit RRC parameter);
2. UL PDU size;
3. DL PDU size;
4. Transmission window size (in number of PDUs);
5. Receiving window size (in number of PDUs);
6. MAC-hs reordering buffer size.

The following criterion must be fulfilled in the configuration at all times:

$$\begin{aligned}
& \#RLC\_AM\_entities \\
& \sum_{i=1}^{Transmission\_window\_size_i} \cdot (UL\_AMD\_PDU\_size_i - AMD\_Header\_size) + \\
& \#RLC\_AM\_entities \\
& \sum_{i=1}^{Receiving\_window\_size_i} \cdot (DL\_AMD\_PDU\_size_i - AMD\_Header\_size) + \\
& \#MAC-hs\_reordering\_entities \\
& \sum_{j=1}^{MAC-hs\_reordering\_entity\_buffer\_size_j} \\
& \leq Total\_buffer\_size
\end{aligned}$$

where  $i$  is the RLC "entity number".

Maximum number of AM entities

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

## 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.

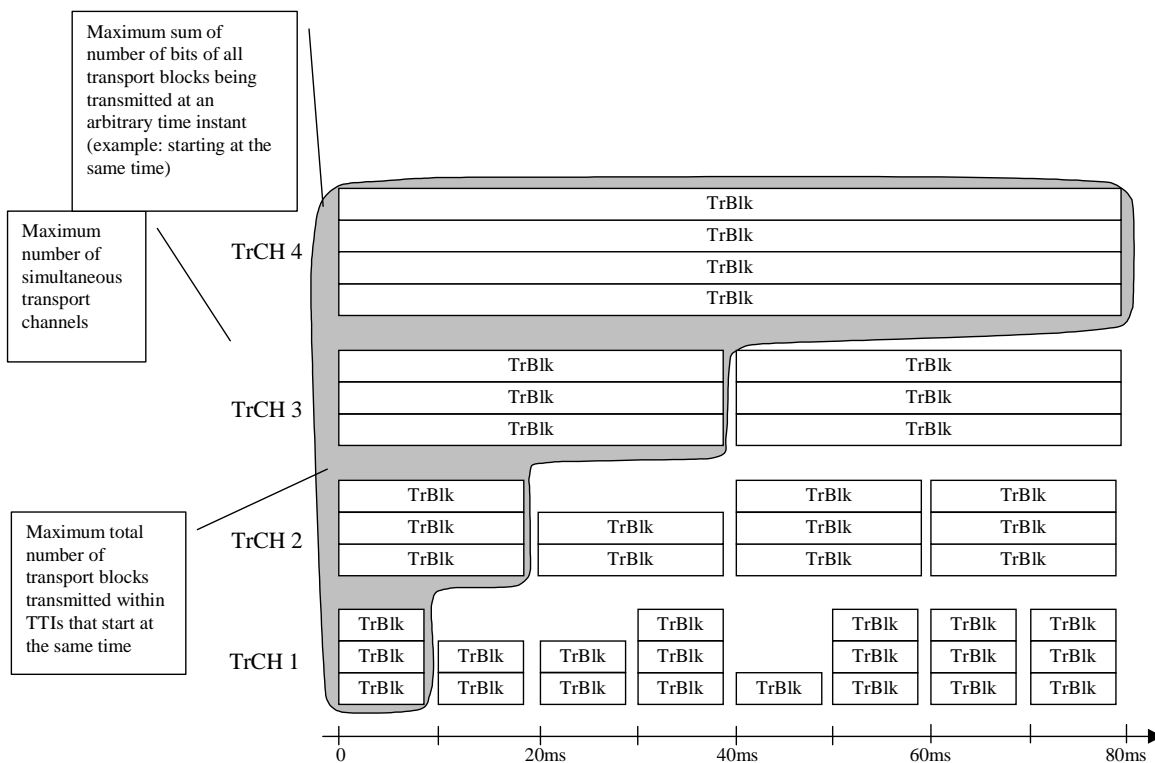


Figure 4.1: UE transport channel processing limitations in uplink

### 4.5.3 FDD Physical channel parameters in downlink

Maximum number of DPCH/PDSCH 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, PDSCH, 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

Defines whether the UE supports spreading factor 512 in downlink or not.

#### Support of PDSCH

Defines whether the UE supports PDSCH or not.

#### Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

#### Simultaneous reception of SCCPCH and DPCH

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

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

#### Simultaneous reception of SCCPCH, DPCH and PDSCH

Defines whether the UE supports simultaneous reception of SCCPCH, DPCH and PDSCH or not. The PDSCH part of this capability is only relevant if the UE supports PDSCH, as covered by the capability "Support of PDSCH".

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

#### Maximum number of simultaneous S-CCPCH radio links

Defines the maximum number of radio links on which the UE is capable of receiving S-CCPCH simultaneously.

#### Support of dedicated pilots for channel estimation

Defines whether the UE supports dedicated pilots for channel estimation or not.

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

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

#### Total number of soft channel bits in HS-DSCH

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

#### Minimum inter-TTI interval in HS-DSCH

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

### 4.5.4 FDD physical channel parameters in uplink

#### Maximum number of DPDCH bits per 10 ms

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

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

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

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

## Support of PCPCH

Defines whether the UE supports PCPCH or not.

NOTE: When CPCH is supported, then simultaneous DPCCH & SCCPCH reception is needed.

## 4.5.5 TDD physical channel parameters in downlink

### 4.5.5.1 3.84 Mcps TDD physical channel parameters in downlink

#### Maximum number of timeslots per frame

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

#### Maximum number of physical channels per frame

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

#### Minimum SF

Defines the minimum SF supported by the UE.

#### Support of PDSCH

Defines whether PDSCH is supported or not.

#### Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

#### Maximum number of physical channels per timeslot

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

#### Maximum number of HS-DSCH codes per timeslot

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

#### Maximum number of HS-DSCH timeslots per TTI

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

#### Support of SF=1 for HS-PDSCH

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

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

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

#### Total number of soft channel bits

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

#### 4.5.5.2 1.28 Mcps TDD physical channel parameters in downlink

##### Maximum number of timeslots per subframe

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

##### Maximum number of physical channels per subframe

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

##### Minimum SF

Defines the minimum SF supported by the UE.

##### Support of PDSCH

Defines whether PDSCH is supported or not.

##### Support of HS-PDSCH

Defines whether the UE supports HS-PDSCH or not.

##### Maximum number of physical channels per timeslot

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

##### Support of 8PSK

Defines whether 8PSK modulation is supported or not.

##### Maximum number of HS-DSCH codes per timeslot

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

##### Maximum number of HS-DSCH timeslots per TTI

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

##### Support of SF=1 for HS-PDSCH

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

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

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

##### Total number of soft channel bits

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

## 4.5.6 TDD physical channel parameters in uplink

### 4.5.6.1 3.84 Mcps TDD physical channel parameters in uplink

#### Maximum Number of timeslots per frame

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

#### Maximum number of physical channels per timeslot

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

#### Minimum SF

Defines the minimum SF supported by the UE.

#### Support of PUSCH

Defines whether PUSCH is supported or not.

### 4.5.6.2 1.28 Mcps TDD physical channel parameters in uplink

#### Maximum Number of timeslots per subframe

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

#### Maximum number of physical channels per timeslot

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

#### Minimum SF

Defines the minimum SF supported by the UE.

#### Support of PUSCH

Defines whether PUSCH is supported or not.

#### Support of 8PSK

Defines whether 8PSK modulation is supported or not.

## 4.5.7 RF parameters

#### UE power class

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

#### Radio frequency bands

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

#### Tx/Rx frequency separation

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

## 4.6 Multi-mode related parameters

### Support of UTRA FDD

Defines whether UTRA FDD is supported.

There is no explicit configuration parameter.

### Support of UTRA TDD 3.84 Mcps

Defines whether UTRA TDD 3.84 Mcps is supported.

There is no explicit configuration parameter.

### Support of UTRA TDD 1.28 Mcps

Defines whether UTRA TDD 1.28 Mcps is supported.

There is no explicit configuration parameter.

## 4.7 Multi-RAT related parameters

### Support of GSM

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

### Support of multi-carrier

Defines whether multi-carrier is supported or not.

## 4.7a Security parameters

### Ciphering algorithm capability

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

### Integrity protection algorithm capability

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

## 4.8 UE positioning related parameters

### Standalone location method(s) supported

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

### OTDOA UE based method supported

Defines if a UE supports the OTDOA UE based schemes.

### Network Assisted GPS support

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



#### GPS reference time capable

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

#### Support for IPDL

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

#### Support for Rx-Tx time difference type 2

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

#### Support for UE Positioning measurement validity in CELL\_PCH and URA\_PCH RRC states

Defines if the UE Positioning measurement are valid in CELL\_PCH and URA\_PCH RRC states.

## 4.9 Measurement related capabilities

#### Need for downlink compressed mode

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

#### Need for uplink compressed mode

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

## 4.10 General capabilities

#### Access stratum release indicator

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

## 4.11 DL capabilities with simultaneous HS-DSCH

#### DL capability with simultaneous HS-DSCH configuration

Defines the modification of reception capabilities in downlink in terms of DPCH in case an HS-DSCH is configured simultaneously. The parameter values in table 4.11-1 replace the signalled values in case an HS-DSCH is configured simultaneously depending on the setting of the parameter DL DPCH capability with simultaneous HS-DSCH configuration. Other parameters are valid irrespective whether HS-DSCH is configured simultaneously or not.

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

| DL DPCH capability with simultaneous HS-DSCH configuration  | 32 kbps | 64 kbps | 128 kbps | 384 kbps |
|---|---------|---------|----------|----------|
| <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     |

| DL DPCH capability with simultaneous HS-DSCH configuration                                     | 32 kbps | 64 kbps | 128 kbps | 384 kbps |
|--|---------|---------|----------|----------|
| Maximum number of simultaneous transport channels  | 8       | 8       | 8        | 8        |
| Maximum number of simultaneous CCTrCH (FDD)  | 1       | 1       | 1        | 1        |
| Maximum number of simultaneous CCTrCH (TDD)  | 2       | 3       | 3        | 3        |
| Maximum total number of transport blocks received within TTIs that end at the same time        | 8       | 8       | 16       | 32       |
| Maximum number of TFC  | 32      | 48      | 96       | 128      |
| Maximum number of TF   | 32      | 64      | 64       | 64       |
| Support for turbo decoding   | No      | Yes     | Yes      | Yes      |
| <b>Physical channel parameters (FDD)</b>   |         |         |          |          |
| Maximum number of DPCH/PDSCH codes to be simultaneously received                               | 1       | 1       | 1        | 3        |
| Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH). | 1200    | 2400    | 4800     | 19200    |
| Support of PDSCH   | No      | No      | No       | No       |
| <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 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       |

## 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  |
|                           |  | Maximum header compression context space  | 512, 1024, 2048, 4096, 8192 bytes   |
| RLC and MAC-hs parameters |  | Total RLC AM and MAC-hs buffer size   | 2, 10, 50, 100, 150, 500, 1000 kBytes   |
|                           |  | Maximum number of AM entities   | 3, 4, 5, 6, 8, 16, 30   |
| PHY parameters            | Transport channel parameters in downlink | Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant                       | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840 |
|                           |  | Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840 |
|                           |  | Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant           | 640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840 |
|                           |  | Maximum number of simultaneous transport channels   | 4, 8, 16, 32  |
|                           |  | Maximum number of simultaneous CCTrCH   | 1, 2, 3, 4, 5, 6, 7, 8  |

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

|   |   | UE radio access capability parameter   | Value range  |
|---|---|--|--|
|   | 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  |
|   | TDD 1.28 Mcps physical channel parameters in uplink   | Support 8PSK   | Yes/No   |
|   |   | Maximum number of timeslots per subframe   | 1..6   |
|   |   | Maximum number of physical channels per timeslot                                   | 1, 2   |
|   |   | Minimum SF   | 16, 8, 4, 2, 1   |
| RF parameters                             | FDD RF parameters                                     | Support of 8PSK  | Yes/No   |
|   |   | Support of PUSCH   | Yes/No   |
| RF parameters                             | TDD 3.84 Mcps RF parameters                           | UE power class   | 3, 4<br>NOTE: Only power classes 3 and 4 are part of this release of the specification |
|   |   | Tx/Rx frequency separation   | 190 MHz<br>174.8 MHz to 205.2 MHz<br>134.8 MHz to 245.2 MHz                            |
| RF parameters                             | TDD 1.28 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  | a), b), c), a+b), a+c), b+c), a+b+c)   |
|   | TDD 3.84 Mcps RF parameters                           | Radio frequency bands  | a), b), c), a+b), a+c), b+c), a+b+c)   |
| Multi-mode related parameters             |   | Support of UTRA FDD  | Yes/No   |
|   |   | Support of UTRA TDD 3.84 Mcps  | Yes/No   |
|   |   | Support of UTRA TDD 1.28 Mcps  | Yes/No   |
| Multi-RAT related parameters              |   | Support of GSM   | Yes/No (per GSM frequency band)  |
|   |   | Support of multi-carrier   | Yes/No   |
| Security parameters                       |   | Support of ciphering algorithm UEA0  | Yes  |
|   |   | Support of ciphering algorithm UEA1  | Yes  |
|   |   | Support of integrity protection algorithm UIA1                                     | Yes  |
| UE positioning related parameters         |   | Standalone location method(s) supported  | Yes/No   |
|   |   | Network assisted GPS support   | Network based / UE based / Both / None   |
|   |   | GPS reference time capable   | Yes/No   |
|   |   | Support for IPDL   | Yes/No   |
|   |   | Support for OTDOA UE based method  | Yes/No   |
|   |   | Support for Rx-Tx time difference type 2 measurement                               | Yes/No   |
| Measurement related capabilities          |   | Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states | Yes/No   |
|   |   | Need for downlink compressed mode  | Yes/No (per frequency band, UTRA mode and RAT)   |
|   |   | Need for uplink compressed mode  | Yes/No (per frequency band, UTRA mode and RAT)   |
| General capabilities                      |   | Access Stratum release indicator   | R99, REL-4   |
| DL capabilities with simultaneous HS-DSCH |   | DL capability with simultaneous HS-DSCH configuration                              | 32 kbps, 64 kbps, 128 kbps, 384 kbps   |

Table 5.1a: FDD HS-DSCH physical layer categories

| HS-DSCH category | Maximum number of HS-DSCH codes received | Minimum inter-TTI interval | Maximum number of bits of an HS-DSCH transport block received within an HS-DSCH TTI | Total number of soft channel bits |
|------------------|--|----------------------------|---|-----------------------------------|
| Category 1       | 5  | 3                          | 7300  | 19200                             |
| Category 2       | 5  | 3                          | 7300  | 28800                             |
| Category 3       | 5  | 2                          | 7300  | 28800                             |
| Category 4       | 5  | 2                          | 7300  | 38400                             |
| Category 5       | 5  | 1                          | 7300  | 57600                             |
| Category 6       | 5  | 1                          | 7300  | 67200                             |
| Category 7       | 10                                       | 1                          | 14600   | 115200                            |
| Category 8       | 10                                       | 1                          | 14600   | 134400                            |
| Category 9       | 15                                       | 1                          | 20432   | 172800                            |
| Category 10      | 15                                       | 1                          | 28776   | 172800                            |
| Category 11      | 5  | 2                          | 3650  | 14400                             |
| Category 12      | 5  | 1                          | 3650  | 28800                             |

UEs of Categories 11 and 12 support QPSK only.

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

| HS-DSCH category | Maximum number of AM RLC entities | Minimum total RLC AM and MAC-hs buffer size |
|------------------|-----------------------------------|---|
| Category 1       | 6                                 | 50  |
| Category 2       | 6                                 | 50  |
| Category 3       | 6                                 | 50  |
| Category 4       | 6                                 | 50  |
| Category 5       | 6                                 | [50]  |
| Category 6       | 6                                 | [50]  |
| Category 7       | 8                                 | [100]                                       |
| Category 8       | 8                                 | [100]                                       |
| Category 9       | 8                                 | [150]                                       |
| Category 10      | 8                                 | [150]                                       |
| Category 11      | [6]                               | [50]  |
| Category 12      | [6]                               | [50]  |

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

| HS-DSCH category | Maximum number of HS-DSCH codes per timeslot | Maximum number of HS-DSCH timeslots per TTI | Maximum number of HS-DSCH transport channel bits that can be received within an HS-DSCH TTI | Total number of soft channel bits | Support of SF=1 for HS-PDSCH |
|------------------|--|---|---|-----------------------------------|------------------------------|
| Category 1       | 12   | 5   | 7016  | 28160                             | Yes                          |
| Category 2       | 12   | 5   | 7016  | 56320                             | Yes                          |
| Category 3       | 12   | 5   | 7016  | 84480                             | Yes                          |
| Category 4       | 16   | 5   | 7016  | 28160                             | Yes                          |
| Category 5       | 16   | 5   | 7016  | 56320                             | Yes                          |
| Category 6       | 16   | 5   | 7016  | 84480                             | Yes                          |
| Category 7       | 12   | 5   | 10204   | 40912                             | Yes                          |
| Category 8       | 12   | 5   | 10204   | 81824                             | Yes                          |
| Category 9       | 12   | 5   | 10204   | 122736                            | Yes                          |
| Category 10      | 16   | 5   | 10204   | 40912                             | Yes                          |
| Category 11      | 16   | 5   | 10204   | 81824                             | Yes                          |
| Category 12      | 16   | 5   | 10204   | 122736                            | Yes                          |
| Category 13      | 16   | 5   | 14056   | 56320                             | Yes                          |
| Category 14      | 16   | 5   | 14056   | 112640                            | Yes                          |
| Category 15      | 16   | 5   | 14056   | 168960                            | Yes                          |

**Table 5.1d: 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 |
|------------------|-----------------------------------|---|
| Category 1       | 6                                 | [50]  |
| Category 2       | 6                                 | [50]  |
| Category 3       | 6                                 | [50]  |
| Category 4       | 6                                 | [50]  |
| Category 5       | 6                                 | [50]  |
| Category 6       | 6                                 | [50]  |
| Category 7       | 6                                 | [50]  |
| Category 8       | 6                                 | [50]  |
| Category 9       | 6                                 | [50]  |
| Category 10      | 6                                 | [50]  |
| Category 11      | 6                                 | [50]  |
| Category 12      | 6                                 | [50]  |
| Category 13      | 6                                 | [100]                                       |
| Category 14      | 6                                 | [100]                                       |
| Category 15      | 6                                 | [100]                                       |

**Table 5.1e: 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 | Support of SF=1 for HS-PDSCH |
|------------------|--|---|---|-----------------------------------|------------------------------|
| Category 1       | 16   | 2   | 12000   | 70656                             | Yes                          |
| Category 2       | 16   | 12  | 12000   | 70656                             | Yes                          |
| Category 3       | 16   | 4   | 24000   | 141312                            | Yes                          |
| Category 4       | 16   | 12  | 24000   | 141312                            | Yes                          |
| Category 5       | 16   | 6   | 36000   | 211968                            | Yes                          |
| Category 6       | 16   | 12  | 36000   | 211968                            | Yes                          |
| Category 7       | 16   | 12  | 53000   | 282624                            | Yes                          |
| Category 8       | 16   | 12  | 73000   | 353280                            | Yes                          |
| Category 9       | 16   | 12  | 102000  | 423936                            | Yes                          |

**Table 5.1f: 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 |
|------------------|-----------------------------------|---|
| Category 1       | 6                                 | [50]  |
| Category 2       | 6                                 | [50]  |
| Category 3       | 6                                 | [100]                                       |
| Category 4       | 6                                 | [100]                                       |
| Category 5       | 6                                 | [150]                                       |
| Category 6       | 6                                 | [150]                                       |
| Category 7       | 6                                 | [200]                                       |
| Category 8       | 8                                 | [250]                                       |
| Category 9       | 8                                 | [350]                                       |

## 5.2 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.

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 | 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/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 |
| 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 |                  |                  |                  |                  |                  |
| <b>RLC parameters</b>   |  |                  |                  |                  |                  |                  |
| Total RLC AM buffer size (kbytes)   | 10                                     | 10               | 50               | 50               | 100              | 500              |
| Maximum number of AM entities   | 4                                      | 4                | 5                | 6                | 8                | 8                |
| <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                       |                  |                  |                  |                  |                  |
| <b>Security parameters</b>  |  |                  |                  |                  |                  |                  |
| Support of ciphering algorithm UEA0   | Yes                                    |                  |                  |                  |                  |                  |
| Support of ciphering algorithm UEA1   | Yes                                    |                  |                  |                  |                  |                  |
| Support of integrity protection algorithm UIA1                                      | Yes                                    |                  |                  |                  |                  |                  |
| <b>UE positioning related parameters</b>  |  |                  |                  |                  |                  |                  |
| Standalone location method(s) supported   | Yes/No<br>NOTE 1                       |                  |                  |                  |                  |                  |

| Reference combination of UE Radio Access capability parameters common for UL and DL | 32 kbps class                                   | 64 kbps class | 128 kbps class | 384 kbps class | 768 kbps class | 2048 kbps class |
|---|---|---------------|----------------|----------------|----------------|-----------------|
| Network assisted GPS support  | Network based / UE based / Both/ None<br>NOTE 1 |               |                |                |                |                 |
| GPS reference time capable  | Yes/No<br>NOTE 1                                |               |                |                |                |                 |
| Support for IPDL  | Yes/No<br>NOTE 1                                |               |                |                |                |                 |
| Support for OTDOA UE based method   | Yes/No<br>NOTE 1                                |               |                |                |                |                 |
| Support for Rx-Tx time difference type 2 measurement                                | Yes/No<br>NOTE 1                                |               |                |                |                |                 |
| Support for UE Positioning measurement validity in CELL_PCH and URA_PCH RRC states  | Yes/No<br>NOTE 1                                |               |                |                |                |                 |
| <b>RF parameters for FDD</b>  |   |               |                |                |                |                 |
| UE power class  | 3 / 4<br>NOTE 1                                 |               |                |                |                |                 |
| Tx/Rx frequency separation  | 190 MHz   |               |                |                |                |                 |
| <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 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  | 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           | 3840                    | 3840                    | 6400           | 10240          | 20480                          |
| Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant | 640           | 640                     | 640                     | 640            | 640            | 640                            |
| Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant           | NA            | 3840                    | 3840                    | 6400           | 10240          | 20480(1)<br>10240(2)<br>NOTE 5 |
| Maximum number of simultaneous transport channels   | 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<br>NOTE 3   | 2/1<br>NOTE 2<br>NOTE 3 | 2/1<br>NOTE 2<br>NOTE 3 | 2<br>NOTE 3    | 2<br>NOTE 3    | 2<br>NOTE 3                    |
| Maximum number of simultaneous CCTrCH (TDD)   | 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                                 | 8             | 8                       | 16                      | 32             | 64             | 96                             |
| Maximum number of TFC   | 32            | 48                      | 96                      | 128            | 256            | 1024                           |
| Maximum number of TF  | 32            | 64                      | 64                      | 64             | 128            | 256                            |
| Support for turbo decoding  | No            | Yes                     | Yes                     | Yes            | Yes            | Yes                            |



| Reference combination of UE Radio Access capability parameters in DL                           | 32 kbps class           | 64 kbps class           | 128 kbps class          | 384 kbps class          | 768 kbps class          | 2048 kbps class         |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <b>Physical channel parameters (FDD)</b>   |                         |                         |                         |                         |                         |                         |
| Maximum number of DPCH/PDSCH codes to be simultaneously received                               | 1                       | 2/1<br>NOTE 2           | 2/1<br>NOTE 2           | 3                       | 3                       | 3                       |
| Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH). | 1200                    | 3600/2400<br>NOTE2      | 7200/4800<br>NOTE2      | 19200                   | 28800                   | 57600                   |
| Support for SF 512 for DPCH<br>NOTE 6  | No                      | No                      | No                      | No                      | No                      | No                      |
| Support of PDSCH   | No                      | Yes/No<br>NOTE 1        | Yes/No<br>NOTE 1        | Yes                     | Yes                     | Yes                     |
| Support of HS-PDSCH  | 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 simultaneous S-CCPCH radio links   | 1                       | 1                       | 1                       | 1                       | 1                       | 1                       |
| Support of dedicated pilots for channel estimation   | Yes<br>NOTE 1<br>NOTE 7 | Yes<br>NOTE 1<br>NOTE 7 | Yes<br>NOTE 1<br>NOTE 7 | Yes<br>NOTE 1<br>NOTE 7 | Yes<br>NOTE 1<br>NOTE 7 | Yes<br>NOTE 1<br>NOTE 7 |
| <b>Physical channel parameters (TDD 3.84 Mcps)</b>   |                         |                         |                         |                         |                         |                         |
| Maximum number of timeslots per frame  | 1                       | 2                       | 4                       | 5                       | 10                      | 12                      |
| Maximum number of physical channels per frame  | 8                       | 9                       | 14                      | 28                      | 64                      | 136                     |
| Minimum SF   | 16                      | 16                      | 16                      | 1/16<br>NOTE 1          | 1/16<br>NOTE 1          | 1/16<br>NOTE 1          |
| Support of PDSCH   | Yes/No<br>NOTE 1        | Yes                     | Yes                     | Yes                     | Yes                     | Yes                     |
| Support of HS-PDSCH  | 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   | 8                       | 9                       | 9                       | 9                       | 9                       | 13                      |
| <b>Physical channel parameters (TDD 1.28 Mcps)</b>   |                         |                         |                         |                         |                         |                         |
| Maximum number of timeslots per subframe   | 1                       | 2                       | 3                       | 4                       | 6                       | 6                       |
| Maximum number of physical channels per subframe   | 8                       | 12                      | 18                      | 43                      | 77                      | 77                      |
| Minimum SF   | 16                      | 16                      | 16                      | 1/16<br>NOTE 1          | 1/16<br>NOTE 1          | 1                       |
| Support of PDSCH   | Yes/No<br>NOTE 1        | Yes                     | Yes                     | Yes                     | Yes                     | Yes                     |
| Support of HS-PDSCH  | 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   | 8                       | 11                      | 14                      | 14                      | 14                      | 14                      |
| Support of 8PSK  | No                      | No                      | No                      | No                      | No                      | Yes                     |

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

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

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

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

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

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

NOTE 7: A UE conforming to this release of the specification shall set the support of channel estimation based on dedicated pilot bits to TRUE.

The reference combinations for HS-DSCH capabilities are shown in tables 5.2.2.2, 5.2.2.3 and 5.2.2.4. These tables are subject to further discussions in TSG-RAN WG1 and TSG-RAN WG2.

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

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

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

| Reference combination                        | 1.4 Mbps class | 2.0 Mbps class | 2.8 Mbps class |
|--|----------------|----------------|----------------|
| <b>RLC and MAC-HS parameters</b>             |                |                |                |
| Total RLC AM and MAC-hs buffer size (kbytes) | [50]           | [50]           | [100]          |
| Maximum number of AM RLC entities            | 6              | 6              | 6              |
| <b>PHY parameters</b>                        |                |                |                |
| 1.28 Mcps TDD HS-DSCH Category               | Category 1     | Category 7     | Category 13    |

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

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

### 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   | 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           | 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            |
| Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant           | NA            | 3840          | 3840           | 6400           | 10240          |
| Maximum number of simultaneous transport channels  | 4             | 8             | 8              | 8              | 8              |
| Maximum number of simultaneous CCTrCH(TDD only)  | 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             | 8             | 8              | 16             | 32             |
| Maximum number of TFC  | 16            | 32            | 48             | 64             | 128            |

| Reference combination of UE Radio Access capability parameters in UL | 32 kbps class    | 64 kbps class    | 128 kbps class   | 384 kbps class   | 768 kbps class   |
|--|------------------|------------------|------------------|------------------|------------------|
| Maximum number of TF   | 32               | 32               | 32               | 32               | 64               |
| Support for turbo encoding   | No               | Yes              | Yes              | Yes              | Yes              |
| <b>Physical channel parameters (FDD)</b>                             |                  |                  |                  |                  |                  |
| Maximum number of DPDCH bits transmitted per 10 ms                   | 1200             | 2400             | 4800             | 9600             | 19200            |
| Simultaneous reception of SCCPCH and DPCH<br>NOTE 2                  | No               | No               | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 | Yes/No<br>NOTE 1 |
| Simultaneous reception of SCCPCH, DPCH and PDSCH<br>NOTE 2           | No               | No               | No               | No               | No               |
| Support of PCPCH<br>NOTE 4   | 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                | 2                | 3                | 7                | 9                |
| Maximum number of physical channels per timeslot                     | 1                | 1                | 1                | 1                | 2                |
| Minimum SF   | 8                | 2                | 2                | 2                | 2                |
| Support of PUSCH   | Yes/No<br>NOTE 1 | Yes              | Yes              | Yes              | Yes              |
| <b>Physical channel parameters (TDD 1.28 Mcps)</b>                   |                  |                  |                  |                  |                  |
| Maximum Number of timeslots per subframe                             | 1                | 2                | 3                | 5                | 5                |
| Maximum number of physical channels per timeslot                     | 1                | 1                | 1                | 1                | 2                |
| Minimum SF   | 4                | 2                | 2                | 2                | 2                |
| Support of PUSCH   | Yes/No<br>NOTE 1 | Yes              | Yes              | Yes              | Yes              |
| Support of 8PSK  | No               | No               | No               | No               | No               |

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

NOTE 2: The downlink parameters 'Simultaneous reception of SCCPCH and DPCH' and 'Simultaneous reception of SCCPCH, DPCH and PDSCH' are included in the combinations for uplink as their requirements relate to the uplink data rate. Simultaneous reception of SCCPCH and DPCH is required for the DRAC procedure that is intended for controlling uplink transmissions. In this release of the specification, this is limited to 1 SCCPCH.

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

NOTE 4: Support of PCPCH means that the UE supports PCPCH access for both the CA not active case and for the CA active case.

## 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 |

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# History

| <b>Document history</b> |                |             |
|-------------------------|----------------|-------------|
| V5.0.0                  | March 2002     | Publication |
| V5.1.0                  | June 2002      | Publication |
| V5.2.0                  | September 2002 | Publication |
|                         |                |             |
|                         |                |             |