

**TSG-RAN Meeting #11
Palm Springs, CA, USA, 13 - 16 March 2001**

RP-010024

Title: Agreed CRs (Release '99) to TS 25.306

Source: TSG-RAN WG2

Agenda item: 5.2.3

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-010523	agreed	25.306	001		R99	Downlink rate matching limitation	F	3.0.0	3.1.0
R2-010372	agreed	25.306	005		R99	Miscellaneous corrections and editorial clean-up	F	3.0.0	3.1.0
R2-010432	agreed	25.306	007		R99	Maximum number of AM entity	F	3.0.0	3.1.0
R2-010649	agreed	25.306	008	1	R99	Clarification of maximum number of TF	F	3.0.0	3.1.0
R2-010689	agreed	25.306	010	1	R99	Removal of the RLC PU concept	F	3.0.0	3.1.0

CHANGE REQUEST

⌘ **25.306 CR 001** ⌘ rev **-** ⌘ Current version: **3.0.0** ⌘

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

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

Title:	⌘ Downlink rate matching limitation		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘	Date:	⌘ 2001-02-19
Category:	⌘ F	Release:	⌘ R99
	<i>Use one of the following categories:</i> F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Limit the memory requirements in the UE.
Summary of change:	⌘ Introduces a limitation on the memory required before de-ratematching.
Consequences if not approved:	⌘ This would result in unnecessary high memory requirements for the UE.

Clauses affected:	⌘ 4.5.1		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
Other comments:	⌘		

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.5.1 Transport channel parameters in downlink

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

NOTE: "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.

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-ratematching 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.

CHANGE REQUEST

⌘ **25.306 CR 005** ⌘ rev **-** ⌘ Current version: **3.0.0** ⌘

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

Title:	⌘ Miscellaneous corrections and editorial clean-up		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘	Date:	⌘ 2001-02-14
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Some text (remaining from TR 25.926) is not "specification type of text" and needs to be updated. Some capabilities defined in TS 25.331 and TS 25.323 were missing. Preparation for the transfer to Rel 4.
Summary of change:	⌘ Removed or updated non-specification type of text e.g. explanations of how certain capabilities affect implementation. PDCP capabilities updated to be in line with TS 25.323 and TS 25.331. Added the parameter "ICS version" (in line with TS 25.331). Expressions like "not supported in R99 " changed to "not supported in this release of the specification" or similar. Empty chapters and sub-sections removed
Consequences if not approved:	⌘ Incomplete definitions of some UE capability parameters. Not aligned with TS 25.323 and TS 25.331

Clauses affected:	⌘ 2, 3, 4, 4.1, 4.2, 4.3, 4.4, 4.5.1, 4.5.2, 4.5.3, 4.5.4, 4.5.7, 4.6, 4.7, 4.8, 4.x (new), 5.1, 5.2.1, 5.2.3, 6
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
Other comments:	⌘

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- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Foreword

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

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

Version x.y.z

where:

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

1 Scope

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

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) protocol".
- [2] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".
- [3] [3GPP TS 34.123-2: "UE Conformance Specification, Part 2 – ICS"](#)
- [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 \(FDD\)"](#)

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

UE	—	User Equipment
UMTS	—	Universal Mobile Telecommunication System
UTRAN	—	UMTS Terrestrial Radio Access Network

4 UE radio access capability parameters

In the following the UE radio capability parameters are defined. ~~In addition the relevant RRC configuration parameters are shown when applicable.~~ 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 ~~is responsible for the need to~~ respect ~~of~~ 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

~~Header compression algorithm supported~~

~~Defines whether header compression algorithms will be supported by the UE. If it will be supported it will be the RFC 2507 as specified in 3GPP TS 25.323.~~

Support for RFC2507

This parameter defines whether the UE supports header compression according to RFC2507 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 RFC2507. It is defined as the maximum header compression context size supported by the UE.

4.2 VoidBMC parameters

~~No UE radio access capability parameters identified.~~

4.3 RLC parameters

~~NOTE: — It is FFS whether some of the RLC functions should be considered as UE capabilities.~~

Total RLC AM buffer size

~~This is defined as the maximum total buffer size across all RLC AM entities supported by the UE. The total buffer size across all RLC AM entities puts requirements on memory.~~

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 PU size;
3. Transmission window size (#PUs);
4. Receiving window size, ~~(FFS whether this is configurable).~~

The following criterion must be fulfilled in the configuration:

$$\sum_{i=1}^{\#RLC_AM_entities} Transmission_window_size \bullet UL_PU_size + \sum_{i=1}^{\#RLC_AM_entities} Receiving_window_size \bullet DL_PU_size \leq Total_RLC_buffer_size$$

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. The number of AM entities affect the main part of the total processing and memory capacity to be shared between different RLC machines.~~

4.4 VoidMAC parameters

~~No capability parameters identified.~~

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: "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.

~~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.~~

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 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 ~~should be possible~~ the UE is capable to process simultaneously, not taking into account the rate of each Transport Channel.

~~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.~~

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 CCTrCH of any type, i.e. 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.

~~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.~~

~~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 in the TFCS

~~Defines the maximum number of transport format combinations in a downlink transport format combination set the UE can store.~~

~~The maximum number of TFC in a TFCS sets the size of the TFCI to TFCS mapping table to be handled by the UE.~~

Maximum number of TF

The maximum total number of downlink transport formats the UE can store.

Support for turbo decoding

Defines whether turbo decoding is supported or not.

~~The UTRAN configuration parameter is *Type of channel coding* which is part of the Transport format set (TFS) of each transport channel.~~

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: "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.

~~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.~~

NOTE: 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.

~~The number of simultaneous transport channels affects how the total memory space and processing capacity can be shared among the transport channels.~~

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.

~~UTRAN shall not set up more simultaneous transport channels than the UE capability allows for.~~

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.

~~Relates to processing requirements for CRC in uplink.~~

NOTE: Relates to processing requirements for CRC in uplink.

~~A UE does not need to support the TFC within the TFCS for which the sum of *Number of Transport Blocks* is larger than what the UE capability allows for.~~

Maximum number of TFC in the TFCS

Defines the maximum number of transport format combinations in an uplink transport format combination set the UE can store. The maximum number of TFC in a TFCS sets the size of the TFCI to TFCS mapping table to be handled by the UE.

Maximum number of TF

The maximum total number of uplink transport formats the UE can store.

Support for turbo encoding

Defines whether turbo encoding is supported or not.

The UTRAN configuration parameter is *Type of channel coding* which is part of the Transport format set (TFS) of each transport channel.

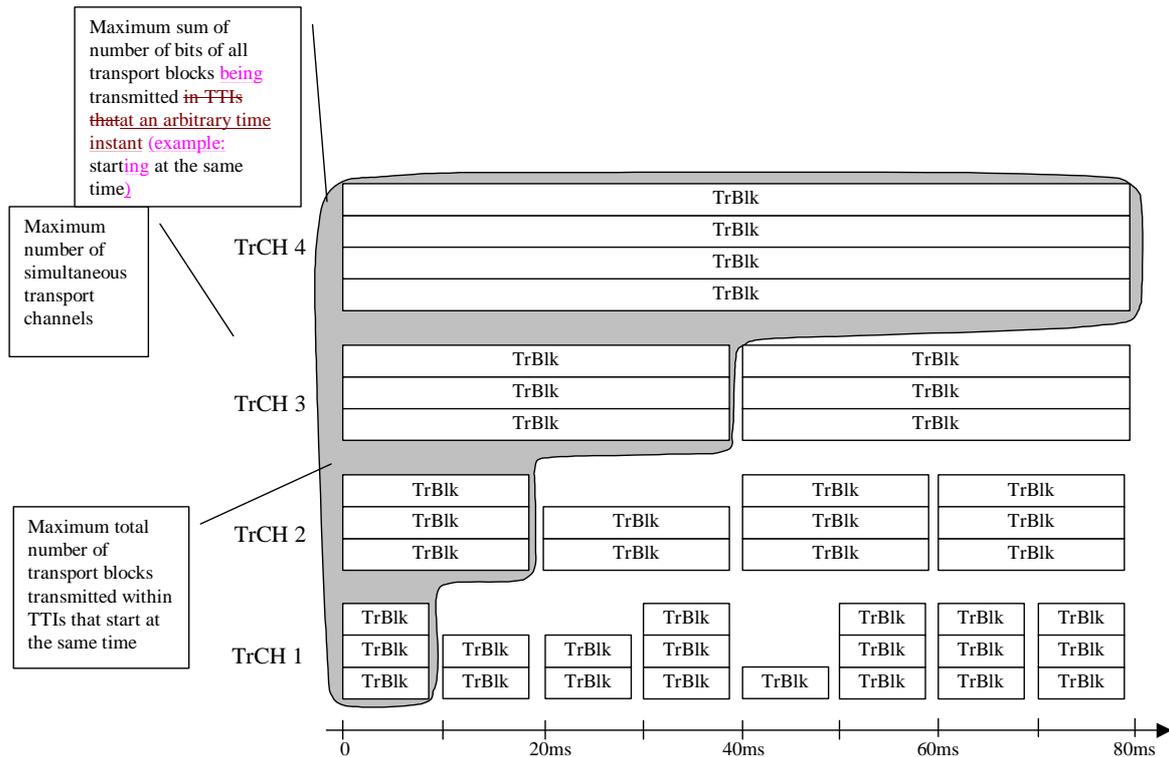


Figure 4.1: UE transport channel processing limitations in uplink

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

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 for normal, un-compressed mode.

The parameter also indicates the capability of the UE to support compressed mode by spreading factor reduction. For parameter values up to and including 9600 bits, the UE shall also be able to support compressed mode by SF reduction when operating in normal mode, at any value up to the reported capability. For parameter values greater than 9600 bits, the UE shall be able to support compressed mode by spreading factor reduction when operating, in normal mode, at any value up to half the reported capability or 9600bits, whichever is greater.

Support for SF 512

Defines whether the UE supports Sspreading factor 512 in downlink or not. should not be mandatory for all UEs.

The corresponding configuration parameter is *Spreading factor* which is part of *Downlink DPCH info*.

Support of PDSCH

Defines whether the UE supports PDSCH or not. Support of PDSCH is only required for some RAB realizations, and is therefore a UE capability.

The corresponding configuration parameter is *Downlink transport channel type*, which is part of *RB mapping info*.

Simultaneous reception of SCCPCH and DPCH

Simultaneous reception of SCCPCH and DPCH, i.e. simultaneous reception of FACH and DCH is required for e.g. DRAC procedure, but it should not be mandatory for all UEs (e.g. speech only UEs).

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

There is no specific configuration parameter.

Simultaneous reception of SCCPCH, DPCH and PDSCH

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, but it should not be mandatory for all UEs (e.g. speech only UEs). The PDSCH part of this capability is only relevant if the UE supports PDSCH, as covered by the capability "Support of 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.

There is no specific configuration parameter.

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.

4.5.4 FDD physical channel parameters in uplink

Maximum number of DPDCH bits per 10 ms

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.

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

The number of DPDCH channel bits indicates the capability for normal, un-compressed mode. The UE shall also be able to support compressed mode by SF reduction when operating at this value.

NOTE: 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.

Support of PCPCH

Defines whether the UE supports PCPCH or not.

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

~~Support of PCPCH is only required for some RAB realizations, and is therefore a UE capability.~~

~~There is no specific configuration parameter.~~

4.5.5 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.

Maximum number of physical channels per timeslot

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

4.5.6 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.

4.5.7 RF parameters

UE power class

~~Indicates the UE power class as defined in [4] for FDD and [5] for TDD. The value is fixed per UE and is not related to any configuration parameter.~~

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].~~

~~Configuration parameters are *UTRA RF Channel numbers* for uplink and downlink, which are part of *Frequency info*.~~

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.~~

~~Configuration parameters are UTRA RF Channel numbers for uplink and downlink, which are part of Frequency info.~~

Chip rate capability

~~This parameter is only applicable for TDD. It defines the chip rates supported by the UE.~~

~~Corresponding configuration parameter is chip rate, which is part of Frequency info.~~

4.6 Multi-mode related parameters

Support of UTRA FDD/TDD

Defines whether UTRA FDD and/or TDD are 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.

~~There is no explicit configuration parameter.~~

Support of multi-carrier

Defines whether multi-carrier is supported or not.

~~There is no explicit configuration parameter.~~

4.8 LCS-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 [25.215\[6\]](#).

Support for IPDL

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

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.x General capabilities

ICS version

This is defined as the release version of the Implementation Conformance Statement (ICS) proforma specification [3] that is applicable for the UE.

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 RFC2507 Header compression algorithm supported	Yes/No
		Support for loss-less SRNS relocation	Yes/No
		Maximum header compression context space	512, 1024, 2048, 4096, 8192 bytes
RLC parameters		Total RLC AM buffer size	2,10,50,100,150,500,1000 kBytes
		Maximum number of AM entities	3,4,5,6,8,16,32
PHY parameters	Transport channel parameters in downlink	Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC in the TFCS	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
	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 in the TFCS		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
		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

		UE radio access capability parameter	Value range
		Support for SF 512	Yes/No
		Support of PDSCH	Yes/No
		Simultaneous reception of SCCPCH and DPCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Maximum number of simultaneous S-CCPCH radio links	1 NOTE: Only the value 1 is part of R99this release of the specification
	FDD Physical channel parameters in uplink	Maximum number of DPDCH bits transmitted per 10 ms	600, 1200, 2400, 4800, 960, 19200, 28800, 38400, 48000, 57600
		Support of PCPCH	Yes/No
	TDD 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
	TDD physical channel parameters in uplink	Maximum number of physical channels per timeslot	1..16
		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	
RF parameters	FDD RF parameters	UE power class (25.101 subclause 6.2.1)	3, 4 NOTE: Only power classes 3 and 4 are part of R99this release of the specification
		Tx/Rx frequency separation (25.101 subclause 5.3)- NOTE: Not applicable if UE is not operating in frequency band a	190 MHz 174.8-205.2 MHz 134.8-245.2 MHz
RF parameters	TDD RF parameters	UE power class (25.102)	2,3 NOTE: Only power classes 2 and 3 are part of R99this release of the specification
		Radio frequency bands (25.102)	a), b), c), a+b), a+c), a+b+c)
		Chip rate capability (25.102)	3.84,1.28
Multi-mode related parameters		Support of UTRA FDD/TDD	FDD, TDD, FDD+TDD
Multi-RAT related parameters		Support of GSM	Yes/No (per GSM frequency band)
		Support of multi-carrier	Yes/No
LCS-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
Measurement related capabilities		Need for downlink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
		Need for uplink compressed mode	Yes/No (per frequency band, UTRA mode and RAT)
General capabilities		ICS version	R99

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. Subclause 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: ~~It is FFS whether m~~Measurement-related capabilities ~~need to be 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	32kbps class	64kbps class	128kbps class	384kbps class	768kbps class	2048kbps class
PDCP parameters						
Support for RFC2507 Header compression algorithm supported	No	No/Yes NOTE 1				
Support for loss-less SRNS relocation	No/Yes NOTE 1					
Maximum header compression context space	Not applicable for conformance testing					
RLC parameters						
Total RLC AM buffer size (kbytes)	10	10	50	50	100	500
Maximum number of AM entities	4	4	5	6	8	8
Multi-mode related parameters						
Support of UTRA FDD/TDD	FDD / FDD+TDD / TDD NOTE 1					
Multi-RAT related parameters						
Support of GSM	Yes/No NOTE 1					
Support of multi-carrier	Yes/No NOTE 1					
LCSUE positioning related parameters						
Standalone location method(s) supported	Yes/No NOTE 1					
Network assisted GPS support	Network based / UE based / Both/ None NOTE 1					
GPS reference time capable	Yes/No NOTE 1					
Support for IPDL	Yes/No NOTE 1					
Support for OTDOA UE based method	Yes/No NOTE 1					
RF parameters for FDD						
UE power class	3 / 4 NOTE 1					
Tx/Rx frequency separation	190 MHz					
RF parameters for TDD						
Radio frequency bands	A / b / c / a+b / a+c / b+c / a+b+c NOTE 1					
Chip rate capability	1.28 / 3.84 Mchip/sec NOTE 1					
UE power class	2 / 3 NOTE 1					

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

5.2.2 Combinations of UE Radio Access Parameters for DL

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

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

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.

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	32kbps class	64kbps class	128kbps class	384kbps class	768kbps class
Transport channel parameters					
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	2	2	2	2
Maximum total number of transport blocks transmitted within TTIs that start at the same time	4	8	8	16	32
Maximum number of TFC in the TFCS	16	32	48	64	128
Maximum number of TF	32	32	32	32	64
Support for turbo encoding	No	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)					
Maximum number of DPDCH bits transmitted per 10 ms	1200	2400	4800	9600	19200
Simultaneous reception of SCCPCH and DPCH NOTE 2	No	No	Yes/No NOTE 1	Yes/No NOTE 1	Yes/No NOTE 1
Simultaneous reception of SCCPCH, DPCH and PDSCH NOTE 2	No	No	No	No	No
Support of PCPCH	No	No	No	No	No
Physical channel parameters (TDD)					
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 NOTE 1	Yes	Yes	Yes	Yes

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 [release 99](#) [this release of the specification](#), this is limited to 1 SCCPCH.

6 Mandatory UE radio access capabilities

NOTE: In this section features and requirements that are mandatory for UEs (capabilities that do not need to be signalled) will be listed for information. The normative descriptions are part of the respective specifications.

Annex A (informative): Change history

Change history TR 25.926							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
03/00	RP-07	RP-000052	-	-	Approved at TSG-RAN #7 and placed under Change Control	-	3.0.0
06/00	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
09/00	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
12/00	RP-10	RP-000578	014		Removal of example RABs	3.2.0	25.306 3.0.0
	RP-10	RP-000578	015	2	Correction on parameter "Maximum total number of transport blocks..."	3.2.0	25.306 3.0.0
	RP-10	RP-000578	016		Change to UE multi-RAT capability	3.2.0	25.306 3.0.0
	RP-10	RP-000578	017		Change from TR 25.926 to TS 25.306	3.2.0	25.306 3.0.0

Change history TS 25.306							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New

CHANGE REQUEST

⌘ **25.306 CR 007** ⌘ rev **-** ⌘ Current version: **3.0.0** ⌘

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

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

Title:	⌘ Maximum number of AM entity		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘	Date:	⌘ February 19, 2001
Category:	⌘ F	Release:	⌘ R99
	<i>Use <u>one</u> of the following categories:</i> F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Maximum number of AM entities is currently defined as 32. There can be 32 RBs, but two of them are already reserved (RB1 for UM DCCH, RB5 for TM DCCH.) Therefore, the absolute maximum number of AM entities is 30.		
Summary of change:	⌘ The maximum value of "Maximum number of AM entity" is reduced to 30.		
Consequences if not approved:	⌘ UE may end up having unnecessary resource.		

Clauses affected:	⌘ 5.1		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
Other comments:	⌘		

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- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.1 Value ranges

Table 5.1: UE radio access capability parameter value ranges

		UE radio access capability parameter	Value range
PDCP parameters		Header compression algorithm supported	Yes/No
RLC parameters		Total RLC AM buffer size	2,10,50,100,150,500,1000 kBytes
		Maximum number of AM entities	3,4,5,6,8,16,30,32
PHY parameters	Transport channel parameters in downlink	Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC in the TFCS	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 in the TFCS	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	
Simultaneous reception of SCCPCH and DPCH		Yes/No	
Simultaneous reception of SCCPCH, DPCH and PDSCH		Yes/No	

		UE radio access capability parameter	Value range	
	FDD Physical channel parameters in uplink	Maximum number of simultaneous S-CCPCH radio links	1 NOTE: Only the value 1 is part of R99	
		Maximum number of DPDCH bits transmitted per 10 ms	600, 1200, 2400, 4800, 960, 19200, 28800, 38400, 48000, 57600	
	Support of PCPCH		Yes/No	
		TDD physical channel parameters in downlink	Maximum number of timeslots per frame	1..14
	TDD physical channel parameters in downlink	Maximum number of physical channels per frame	1,2,3,..,224	
		Minimum SF	16, 1	
		Support of PDSCH	Yes/No	
		Maximum number of physical channels per timeslot	1..16	
	TDD 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	
	RF parameters	FDD RF parameters	UE power class (25.101 subclause 6.2.1)	3, 4 NOTE: Only power classes 3 and 4 are part of R99
			Tx/Rx frequency separation (25.101 subclause 5.3) . NOTE: Not applicable if UE is not operating in frequency band a	190 MHz 174.8-205.2 MHz 134.8-245.2 MHz
RF parameters	TDD RF parameters	UE power class (25.102)	2,3 NOTE: Only power classes 2 and 3 are part of R99	
		Radio frequency bands (25.102)	a), b), c), a+b), a+c), a+b+c)	
		Chip rate capability (25.102)	3.84,1.28	
Multi-mode related parameters		Support of UTRA FDD/TDD	FDD, TDD, FDD+TDD	
Multi-RAT related parameters		Support of GSM	Yes/No (per GSM frequency band)	
		Support of multi-carrier	Yes/No	
LCS 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	
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)	

CHANGE REQUEST

⌘ **25.306 CR 008** ⌘ rev **r1** ⌘ Current version: **3.0.0** ⌘

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

Title:	⌘ Clarification of maximum number of TF		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘	Date:	⌘ 19-02-01
Category:	⌘ F	Release:	⌘ R99
	<i>Use <u>one</u> of the following categories:</i> F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The maximum number of TF is not clearly defined.
Summary of change:	⌘ It is clarified that for this parameter all transport formats for all transport channels are counted.
Consequences if not approved:	⌘ It is not clear whether several identical TFs count as one in total or one each.

Clauses affected:	⌘ 4.5.1, 4.5.2		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
Other comments:	⌘		

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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: "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.

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 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 Transport Channels that should be possible to process simultaneously, not taking into account the rate of each Transport Channel.

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

CcTrCH should be interpreted as CcTrCH of any type, i.e. 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.

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 in the TFCS

The maximum number of TFC in a TFCS sets the size of the TFCI to TFCS mapping table to be handled by the UE.

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.

The UTRAN configuration parameter is *Type of channel coding* which is part of the Transport format set (TFS) of each transport channel.

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: "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.

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

The number of simultaneous transport channels affects how the total memory space and processing capacity can be shared among the transport channels.

UTRAN shall not set up more simultaneous transport channels than the UE capability allows for.

Maximum number of simultaneous CCTrCH

TDD only. For FDD there is always only one CCTrCH at a time.

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

Relates to processing requirements for CRC in uplink.

A UE does not need to support the TFC within the TFCS for which the sum of *Number of Transport Blocks* is larger than what the UE capability allows for.

Maximum number of TFC in the TFCS

The maximum number of TFC in a TFCS sets the size of the TFCI to TFCS mapping table to be handled by the UE.

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.

The UTRAN configuration parameter is *Type of channel coding* which is part of the Transport format set (TFS) of each transport channel.

3GPP TSG-RAN WG2 Meeting #19
Sophia Antipolis, France, 19 February 2001

R2-010689

CR-Form-v3
<h2 style="margin: 0;">CHANGE REQUEST</h2> <p style="margin: 10px 0;">⌘ 25.306 CR 010 ⌘ rev r1 ⌘ Current version: 3.0.0 ⌘</p>

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

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

Title:	⌘ Removal of the RLC PU concept	Date:	⌘ 19-02-01
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘	Release:	⌘ R99
Category:	⌘ F		
<p><i>Use <u>one</u> of the following categories:</i></p> <p>F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p><i>Use <u>one</u> of the following releases:</i></p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>	

Reason for change:	⌘ In RAN2#19 it was decided to eliminate the PU concept from RLC. Therefore all references to PUs have to be replaced by references to PDUs.
Summary of change:	⌘ - PU has been replaced by PDU in the text - UL_PU_size and DL_PU_size have been replaced by (UL_PDU_size – 2 octets) and (DL_PDU_size – 2 octets) in the formula. - FFS in the receiving window size has been deleted
Consequences if not approved:	⌘ This specification is inconsistent with other RAN2 specs.

Clauses affected:	⌘ 4.3
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> <input type="checkbox"/> O&M Specifications ⌘ <input type="checkbox"/>
Other comments:	⌘ <u>Changes incorporated in r2-010349 (CR 004) have been incorporated.</u>

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

4 UE radio access capability parameters

In the following the UE radio capability parameters are defined. In addition the relevant RRC configuration parameters are shown when applicable. 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 is responsible for the respect of 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

Header compression algorithm supported

Defines whether header compression algorithms will be supported by the UE. If it will be supported it will be the RFC 2507 as specified in 3GPP TS 25.323.

4.2 BMC parameters

No UE radio access capability parameters identified.

4.3 RLC parameters

NOTE: It is FFS whether some of the RLC functions should be considered as UE capabilities.

Total RLC AM buffer size

The total buffer size across all RLC AM entities puts requirements on memory.

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. ~~2.~~ UL PDU size;
3. DL PDU size;
3. Transmission window size (in number of PDUs);
4. Receiving window size (in number of PDUs) (FFS whether this is configurable).

The following criterion must be fulfilled in the configuration:

$$\frac{\sum_{i=1}^{\#RLC_AM_entities} Transmission_window_size \cdot UL_PDU_size + \sum_{i=1}^{\#RLC_AM_entities} Receiving_window_size \cdot DL_PDU_size}{\leq Total_RLC_buffer_size}$$

$$\frac{\sum_{i=1}^{\#RLC_AM_entities} Transmission_window_size \cdot (UL_PDU_size - 2\ octets) + \sum_{i=1}^{\#RLC_AM_entities} Receiving_window_size \cdot (DL_PDU_size - 2\ octets)}{\leq Total_RLC_buffer_size}$$

$$\begin{aligned}
 & \#RLC_AM_entities \\
 & \sum_{i=1}^{Transmission_window_size} (UL_AMD_PDU_size - AMD_Header_size) + \\
 & \#RLC_AM_entities \\
 & \sum_{i=1}^{Receiving_window_size} (DL_AMD_PDU_size - AMD_Header_size) \\
 & \leq Total_RLC_buffer_size
 \end{aligned}$$

where i is the RLC "entity number".

Maximum number of AM entities

The number of AM entities affect the main part of the total processing and memory capacity to be shared between different RLC machines.