# TSG-RAN Meeting #23 Phoenix, 10-12 March 2004

Title: CRs on 25.306 Rel-5 (and linked CRs from later releases)

Source: TSG-RAN WG2

Agenda item: 7.3.5

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.306	92	-	Rel-5	Simultaneous Reception of S-CCPCH and HS-DSCH	F	5.7.0	5.8.0	R2-040641	HSDPA-L23
25.306	93	-	Rel-6	Simultaneous Reception of S-CCPCH and HS-DSCH	A	6.0.0	6.1.0	R2-040642	HSDPA-L23
25.306	94	-	Rel-5	Correction to memory check in UE	F	5.7.0	5.8.0	R2-040654	HSDPA-L23
25.306	95	-	Rel-6	Correction to memory check in UE	А	6.0.0	6.1.0	R2-040655	HSDPA-L23

%       25.306       CR       92       % rev       -       %       Current version:       5.7.0       %         For HELP on using this form, see bottom of this page or look at the pop-up text over the % symbols.       Proposed change affects:       UICC apps%       ME X Radio Access Network X Core Network         Title:       %       Simultaneous Reception of S-CCPCH and HS-DSCH         Source:       %       RAN WG2         Work item code: %       HSDPA-L23       Date: %       05/01/2004         Category:       %       F       Release: %       Rel-5         Use one of the following categories:       F (correction)       2       (GSM Phase)         D       (addition of feature)       R97       (Release 1996)       2         D       C (functional modification)       R99       (Release 1997)       2       (GSM Phase)         D       (addition of feature)       R97       (Release 1997)       2       (GSM Phase)       2       (GSM Phase)       2       (Release 1996)       2       (Release 1997)       2       (GSM Phase)       2       (Release 1997)       2       (Rel				CR-Form-v7					
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#### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <u>http://www.3gpp.org/specs/CR.htm</u>. 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.
- 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 <a href="http://ftp.3gpp.org/specs/">http://ftp.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

## 4.5.3 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.

Simultaneous reception of SCCPCH, DPCH and HS-PDSCH

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

NOTE: Simultaneous reception of SCCPCH, DPCH and HS-PDSCH, i.e. simultaneous reception of FACH, DCH and HS-PDSCH is required for e.g. simultaneous use of HS-PDSCH 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.

Support of dedicated pilots for channel estimation of HS-DSCH

Defines whether the UE supports dedicated pilots for channel estimation of HS-PDSCH and HS-SCCH 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. When explicit signalling is used, UTRAN configures Process Memory Size for each HARQ process so that the following criterion must be fulfilled in the configuration:

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

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

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

# 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
		Maximum number of ROHC context sessions	2, 4, 8, 12, 16, 24, 32, 48, 64, 128, 256, 512, 1024, 16384
		Support for Reverse Decompression	Not supported, 165535
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 200, 300, 400, 500, 750, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
		Maximum RLC AM window size	2047, 4095
PHY parameters	Transport channel parameters in	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
	downlink	Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo decoding	Yes/No
	Transport channel parameters in	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
	uplink	Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	2, 4, 8, 16, 32
		Maximum number of simultaneous CCTrCH of DCH type (TDD only)	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks transmitted within TTIs that start at the same time	2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024

		UE radio access capability parameter	Value range
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo encoding	Yes/No
	FDD Physical	Maximum number of DPCH/PDSCH	1, 2, 3, 4, 5, 6, 7, 8
	channel	codes to be simultaneously received	1, 2, 0, 1, 0, 0, 1, 0
	parameters in	Maximum number of physical channel	600, 1200, 2400, 3600, 4800, 7200,
	downlink	bits received in any 10 ms interval	9600, 14400, 19200, 28800, 38400,
	Gommin	(DPCH, PDSCH, S-CCPCH)	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	Yes/No
		and DPCH	
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and HS-PDSCH	Yes/No
		Maximum number of simultaneous S-	1
		CCPCH radio links	NOTE: Only the value 1 is part or this release of the specification
		Support of dedicated pilots for channel estimation	Yes
		Support of dedicated pilots for channel estimation of HS-DSCH	Yes/No
	FDD Physical	Maximum number of DPDCH bits	600, 1200, 2400, 4800, 9600, 19200
	channel	transmitted per 10 ms	28800, 38400, 48000, 57600
	parameters in uplink	Support of PCPCH	Yes/No
	TDD 3.84 Mcps physical channel	Maximum number of timeslots per frame	114
	parameters in	Maximum number of physical	1, 2, 3224
	downlink	channels per frame	
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Maximum number of physical channels per timeslot	116
	TDD 3.84 Mcps physical channel	Maximum Number of timeslots per frame	114
	parameters in	Maximum number of physical	1, 2
	uplink	channels per timeslot	1, 2
	apiint	Minimum SF	16, 8, 4, 2, 1
		Support of PUSCH	Yes/No
	TDD 1.28 Mcps physical channel	Maximum number of timeslots per subframe	16
	parameters in downlink	Maximum number of physical channels per subframe	1, 2, 3,, 96
	GOWTHINK		40.4
		Minimum SF	16, 1 Vac (Na
		Support of PDSCH	Yes/No
		Support of HS-PDSCH Maximum number of physical	Yes/No 116
		channels per timeslot	
	TOD	Support 8PSK	Yes/No
	TDD 1.28 Mcps physical channel	Maximum number of timeslots per subframe	16
	parameters in uplink	Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of 8PSK	Yes/No
		Support of PUSCH	Yes/No
RF parameters	FDD RF parameters	UE power class	3, 4 NOTE: Only power classes 3 and 4 are part of this release of the specification

		UE radio access capability parameter	Value range
		Tx/Rx frequency separation	190 Mhz 174.8 MHz to 205.2 MHz 134.8 MHz to 245.2 MHz
RF parameters	TDD 3.84 Mcps RF parameters	UE power class	2, 3 NOTE: Only power classes 2 and 3 are part of this release of the specification
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
	TDD 1.28 Mcps	UE power class	2, 3
	RF parameters	Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
Multi-mode related	d 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)
	parametere	Support of multi-carrier	Yes/No
		Support of UTRAN to GERAN	Yes/No
		Network Assisted Cell Change	
Security paramete	ers	Support of ciphering algorithm UEA0	Yes
		Support of ciphering algorithm UEA1	Yes
		Support of integrity protection algorithm UIA1	Yes
UE positioning rela	ated parameters	Standalone location method(s) supported	Yes/No
		Network assisted GPS support	Network based / UE based / Both/ None
		GPS reference time capable	Yes/No
		Support for IPDL	Yes/No
		Support for OTDOA UE based method	Yes/No
		Support for Rx-Tx time difference type 2 measurement	Yes/No
		Support for UE Positioning assisted GPS measurement validity in CELL_PCH and URA_PCH RRC states	Yes
		Support for SFN-SFN observed time difference type 2 measurement	Yes/No
Measurement rela	ted 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 capabilitie		Access Stratum release indicator	R99, REL-4, REL-5
	h simultaneous HS-	DL capability with simultaneous HS- DSCH configuration	32 kbps, 64 kbps, 128 kbps, 384 kbps

# 5.2.3 Combinations of UE Radio Access Parameters for UL

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

Reference combination of UE Radio Access capability parameters in UL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640	640(FDD) 1280 (TDD)	3840	3840	6400	10240
Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being	NA	NA(FDD) 1280 (TDD)	3840	3840	6400	10240

Reference combination of UE Radio	12 kbps	32 kbps	64 kbps	128 kbps	384 kbps	768 kbps
Access capability parameters in UL	class	class	class	class	class	class
transmitted at an arbitrary time instant						
Maximum number of simultaneous	4	4	8	8	8	8
transport channels						
Maximum number of simultaneous	1	1	2	2	2	2
CCTrCH(TDD only)	NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
Maximum total number of transport	4	4	8	8	16	32
blocks transmitted within TTIs that start at						
the same time						
Maximum number of TFC	16	16	32	48	64	128
Maximum number of TF	32	32	32	32	32	64
Support for turbo encoding	No	No (FDD)	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)		Yes (TDD)				
Maximum number of DPDCH bits	600	1200	2400	4800	9600	19200
transmitted per 10 ms			2400			
Simultaneous reception of SCCPCH and	No	No	No	Yes/No	Yes/No	Yes/No
DPCH				NOTE 1	NOTE 1	NOTE 1
NOTE 2						
Simultaneous reception of SCCPCH,	No	No	No	No	No	No
DPCH and PDSCH						
NOTE 2						
Simultaneous reception of SCCPCH, DPCH and HS-PDSCH NOTE 2	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
Support of PCPCH	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
NOTE 4	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1
Physical channel parameters (TDD 3.84 Mcps)						
Maximum Number of timeslots per frame	1	1	2	3	7	9
Maximum number of physical channels	1	1	1	1	1	2
per timeslot						
Minimum SF	8	4	2	2	2	2
Support of PUSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes
Physical channel parameters (TDD 1.28 Mcps)						
Maximum Number of timeslots per subframe	1	1	2	3	5	5
Maximum number of physical channels per timeslot	1	1	1	1	1	2
Minimum SF	8	4	2	2	2	2
Support of PUSCH	o No	4 Yes/No	Yes	Yes	Yes	Yes
		NOTE 1				
Support of 8PSK	No	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.

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Consequences if not approved:	#       The UE can not indicate whether it supports the CCPCH, DPCH and HS-PDSCH which is needed								
Clauses affected: Other specs affected: Other comments:	<ul> <li># 4.5.3, 5.1, 5.2.3</li> <li># X Other core specifications # 25.331</li> <li>X Test specifications O&amp;M Specifications</li> <li>#</li> </ul>								

#### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <u>http://www.3gpp.org/specs/CR.htm</u>. 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.
- 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 <a href="http://ftp.3gpp.org/specs/">http://ftp.3gpp.org/specs/</a> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

## 4.5.3 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.

Simultaneous reception of SCCPCH, DPCH and HS-PDSCH

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

NOTE: Simultaneous reception of SCCPCH, DPCH and HS-PDSCH, i.e. simultaneous reception of FACH, DCH and HS-PDSCH is required for e.g. simultaneous use of HS-PDSCH 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.

Support of dedicated pilots for channel estimation of HS-DSCH

Defines whether the UE supports dedicated pilots for channel estimation of HS-PDSCH and HS-SCCH 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. When explicit signalling is used, UTRAN configures Process Memory Size for each HARQ process so that the following criterion must be fulfilled in the configuration:

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

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

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

# 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
		Maximum number of ROHC context sessions	2, 4, 8, 12, 16, 24, 32, 48, 64, 128, 256, 512, 1024, 16384
		Support for Reverse Decompression	Not supported, 165535
RLC and MAC-hs parameters		Total RLC AM and MAC-hs buffer size	2, 10, 50, 100, 150, 200, 300, 400, 500, 750, 1000 kBytes
		Maximum number of AM entities	3, 4, 5, 6, 8, 16, 30
		Maximum RLC AM window size	2047, 4095
PHY parameters	Transport channel parameters in	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
	downlink	Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	4, 8, 16, 32
		Maximum number of simultaneous CCTrCH	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval	4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	16, 32, 48, 64, 96, 128, 256, 512, 1024
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo decoding	Yes/No
	Transport channel parameters in	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
	uplink	Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum sum of number of bits of all turbo coded transport blocks being transmitted at an arbitrary time instant	640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840
		Maximum number of simultaneous transport channels	2, 4, 8, 16, 32
		Maximum number of simultaneous CCTrCH of DCH type (TDD only)	1, 2, 3, 4, 5, 6, 7, 8
		Maximum total number of transport blocks transmitted within TTIs that start at the same time	2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512
		Maximum number of TFC	4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024

		UE radio access capability parameter	Value range
		Maximum number of TF	32, 64, 128, 256, 512, 1024
		Support for turbo encoding	Yes/No
	FDD Physical	Maximum number of DPCH/PDSCH	1, 2, 3, 4, 5, 6, 7, 8
	channel	codes to be simultaneously received	1, 2, 0, 1, 0, 0, 1, 0
	parameters in	Maximum number of physical channel	600, 1200, 2400, 3600, 4800, 7200,
	downlink	bits received in any 10 ms interval	9600, 14400, 19200, 28800, 38400,
	Gommin	(DPCH, PDSCH, S-CCPCH)	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	Yes/No
		and DPCH	
		Simultaneous reception of SCCPCH, DPCH and PDSCH	Yes/No
		Simultaneous reception of SCCPCH, DPCH and HS-PDSCH	Yes/No
		Maximum number of simultaneous S-	1
		CCPCH radio links	NOTE: Only the value 1 is part or this release of the specification
		Support of dedicated pilots for channel estimation	Yes
		Support of dedicated pilots for channel estimation of HS-DSCH	Yes/No
	FDD Physical	Maximum number of DPDCH bits	600, 1200, 2400, 4800, 9600, 19200
	channel	transmitted per 10 ms	28800, 38400, 48000, 57600
	parameters in uplink	Support of PCPCH	Yes/No
	TDD 3.84 Mcps physical channel	Maximum number of timeslots per frame	114
	parameters in	Maximum number of physical	1, 2, 3224
	downlink	channels per frame	
		Minimum SF	16, 1
		Support of PDSCH	Yes/No
		Support of HS-PDSCH	Yes/No
		Maximum number of physical channels per timeslot	116
	TDD 3.84 Mcps physical channel	Maximum Number of timeslots per frame	114
	parameters in	Maximum number of physical	1, 2
	uplink	channels per timeslot	1, 2
	apiint	Minimum SF	16, 8, 4, 2, 1
		Support of PUSCH	Yes/No
	TDD 1.28 Mcps physical channel	Maximum number of timeslots per subframe	16
	parameters in downlink	Maximum number of physical channels per subframe	1, 2, 3,, 96
	GOWTHINK		40.4
		Minimum SF	16, 1 Vac (Na
		Support of PDSCH	Yes/No
		Support of HS-PDSCH Maximum number of physical	Yes/No 116
		channels per timeslot	
	TOD	Support 8PSK	Yes/No
	TDD 1.28 Mcps physical channel	Maximum number of timeslots per subframe	16
	parameters in uplink	Maximum number of physical channels per timeslot	1, 2
		Minimum SF	16, 8, 4, 2, 1
		Support of 8PSK	Yes/No
		Support of PUSCH	Yes/No
RF parameters	FDD RF parameters	UE power class	3, 4 NOTE: Only power classes 3 and 4 are part of this release of the specification

		UE radio access capability parameter	Value range
		Tx/Rx frequency separation	190 Mhz 174.8 MHz to 205.2 MHz 134.8 MHz to 245.2 MHz
RF parameters	TDD 3.84 Mcps RF parameters	UE power class	2, 3 NOTE: Only power classes 2 and 3 are part of this release of the specification
		Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
	TDD 1.28 Mcps	UE power class	2, 3
	RF parameters	Radio frequency bands	a), b), c), a+b), a+c), b+c), a+b+c)
Multi-mode related	d 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)
	parametere	Support of multi-carrier	Yes/No
		Support of UTRAN to GERAN	Yes/No
		Network Assisted Cell Change	
Security paramete	ers	Support of ciphering algorithm UEA0	Yes
		Support of ciphering algorithm UEA1	Yes
		Support of integrity protection algorithm UIA1	Yes
UE positioning rela	ated parameters	Standalone location method(s) supported	Yes/No
		Network assisted GPS support	Network based / UE based / Both/ None
		GPS reference time capable	Yes/No
		Support for IPDL	Yes/No
		Support for OTDOA UE based method	Yes/No
		Support for Rx-Tx time difference type 2 measurement	Yes/No
		Support for UE Positioning assisted GPS measurement validity in CELL_PCH and URA_PCH RRC states	Yes
		Support for SFN-SFN observed time difference type 2 measurement	Yes/No
Measurement rela	ted 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 capabilitie		Access Stratum release indicator	R99, REL-4, REL-5
	h simultaneous HS-	DL capability with simultaneous HS- DSCH configuration	32 kbps, 64 kbps, 128 kbps, 384 kbps

# 5.2.3 Combinations of UE Radio Access Parameters for UL

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

Reference combination of UE Radio Access capability parameters in UL	12 kbps class	32 kbps class	64 kbps class	128 kbps class	384 kbps class	768 kbps class
Transport channel parameters						
Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant	640	640(FDD) 1280 (TDD)	3840	3840	6400	10240
Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant	640	640	640	640	640	640
Maximum sum of number of bits of all turbo coded transport blocks being	NA	NA(FDD) 1280 (TDD)	3840	3840	6400	10240

Reference combination of UE Radio	12 kbps	32 kbps	64 kbps	128 kbps	384 kbps	768 kbps
Access capability parameters in UL	class	class	class	class	class	class
transmitted at an arbitrary time instant						
Maximum number of simultaneous	4	4	8	8	8	8
transport channels						
Maximum number of simultaneous	1	1	2	2	2	2
CCTrCH(TDD only)	NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3	NOTE 3
Maximum total number of transport	4	4	8	8	16	32
blocks transmitted within TTIs that start at						
the same time						
Maximum number of TFC	16	16	32	48	64	128
Maximum number of TF	32	32	32	32	32	64
Support for turbo encoding	No	No (FDD)	Yes	Yes	Yes	Yes
Physical channel parameters (FDD)		Yes (TDD)				
Maximum number of DPDCH bits	600	1200	2400	4800	9600	19200
transmitted per 10 ms			2400			
Simultaneous reception of SCCPCH and	No	No	No	Yes/No	Yes/No	Yes/No
DPCH				NOTE 1	NOTE 1	NOTE 1
NOTE 2						
Simultaneous reception of SCCPCH,	No	No	No	No	No	No
DPCH and PDSCH						
NOTE 2						
Simultaneous reception of SCCPCH, DPCH and HS-PDSCH NOTE 2	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
Support of PCPCH	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
NOTE 4	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1	NOTE 1
Physical channel parameters (TDD 3.84 Mcps)						
Maximum Number of timeslots per frame	1	1	2	3	7	9
Maximum number of physical channels	1	1	1	1	1	2
per timeslot						
Minimum SF	8	4	2	2	2	2
Support of PUSCH	No	Yes/No NOTE 1	Yes	Yes	Yes	Yes
Physical channel parameters (TDD 1.28 Mcps)						
Maximum Number of timeslots per subframe	1	1	2	3	5	5
Maximum number of physical channels per timeslot	1	1	1	1	1	2
Minimum SF	8	4	2	2	2	2
Support of PUSCH	o No	4 Yes/No	Yes	Yes	Yes	Yes
		NOTE 1				
Support of 8PSK	No	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.

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Reason for change: ೫	When a "MAC-hs Reordering Buffer Size" IE lower than currently configured is
	signalled to the Node B, the exact point of time when corresponding re-ordering
	buffer size reduction is completed in the UE is not known by UTRAN. As a
	consequence, reconfigurations engaged towards the UE may fail.
	It is therefore clarified that MAC-hs re-ordering buffer size shall not be part of the "memory check" performed by the UE. Note that in case memory overload occurs in the UE, mechanisms described in TS 25.321 §11.6.2.3.2 will apply.
Summary of change: ೫	The sum over all re-ordering buffers size is removed from the condition stated in §4.3.
Consequences if 🛛 🕱	Reconfigurations engaged towards the UE may fail, in the worst case leading to
not approved:	dropped calls.

Clauses affected:	ж 2, 4.3
Other specs affected:	YN%XAOther core specificationsXTest specificationsXO&M Specifications
Other comments:	¥

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- [1] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) specification".
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- [6] 3GPP TS 25.215 "Physical layer; Measurements (FDD)".
- [7] RFC 2507: "IP Header Compression".
- [8] RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles".
- [9] 3GPP TS 25.321 "Medium Access Control (MAC) protocol specification".
- [10] 3GPP TS 25.322 "Radio Link Control (RLC) protocol specification".

# 4.3 RLC and MAC-hs parameters

Total RLC AM and MAC-hs buffer size

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

#RLC \_ AM \_ e n tities Σ Transm is s i o n\_window \_ size<sub>i</sub>  $(UL\_AMD \_ PDU\_$ ٠ size <sub>i</sub> \_ AMD \_ Header \_ size ) + i=1#RLC\_ AM \_ entities Σ Receiving \_ window \_ size; ٠ (DL\_AMD \_ PDU\_ size ;  $AMD \_ Header \_ size) +$ \_ i=1#MAC-hs\_reordering\_entities Σ MAC - hs \_ reordering \_ entity \_ buffer \_ size j=1 $\leq$ Total \_ buffer \_ size #RLC \_ AM\_ e n tities Σ Transm is s i o n\_window \_ size; ٠  $(UL\_AMD \_ PDU\_$ size ; AMD \_ Header \_ size ) + i=1#RLC\_ AM \_ entities Σ size <sub>i</sub> - AMD \_ Header \_ size) + •  $(DL\_AMD \_ PDU\_$ Receiving window \_ size i i=1 $\leq$ Total \_ buffer \_ size

where *i* is the RLC "entity number" and *j* is the MAC hs reordering "entity number".

In order to evaluate memory consumption in the UE, it shall be assumed that a stored MAC-hs PDU of N bits requires a memory equal to (N - 10) bits.

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

#### Maximum number of AM entities

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

#### Maximum RLC AM Window Size

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

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Clauses affected:	¥ 2, 4.3
Other specs affected:	Y       N         X       Other core specifications       #         X       Test specifications       #         X       O&M Specifications       #
Other comments:	X

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