TSG-RAN Meeting #6 *TSGRP#6(99)775*
Nice, France, 13 – 15 December 1999

Title: **Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.102**

Source: **TSG-RAN WG4**

Agenda item: **5.4.3**

TSG_DOC	SPEC	CR	REV	3G_P	SUBJECT	CAT	VERS_CUR	VERS_NEW
R4-99694	25.102	001		R99	Corrections to 25.102 version 3.0.0	F	3.0.0	3.1.0
R4-99773	25.102	003		R99	Receiver spurious emissions for UE TDD	C	3.0.0	3.1.0
R4-99866	25.102	005		R99	Change of propagation conditions recommendations	C	3.0.0	3.1.0
R4-99897	25.102	007		R99	Corrections to 25.102 v.3.0.0	F	3.0.0	3.1.0
R4-99957	25.102	010		R99	TDD uplink power control requirements	C	3.0.0	3.1.0
R4-99960	25.102	011		R99	Update of ITU Region 2 Specific Specifications and proposed universal channel numbering	C	3.0.0	3.1.0
R4-99A04	25.102	013		R99	UE power classes	F	3.0.0	3.1.0
R4-99A12	25.102	014		R99	Update of UE RF capabilities	F	3.0.0	3.1.0

3GPP TSG RAN WG4 Meeting #8
Sophia Antipolis, France, 26-29 October 1999

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25.102	CR	001	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#6	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]
(at least one should be marked with an X)

Source: TSG RAN WG4 **Date:** 29.10.99

Subject: Corrections to 25.102 v.3.0.0

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: 25.102 version 3.0.0 includes some minor mistakes that need to be corrected.

Clauses affected:

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: Based on 3GPP WG4 Tdoc (99) 694

3.3 Abbreviations

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

ACIR	Adjacent Channel Interference Ratio
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH
$\frac{DPCH\_Ec}{I_{or}}$	The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the ~~forward link~~downlink at the BS antenna connector
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Rate
I_{or}	The total transmit power spectral density of the ~~Forward link~~downlink at the BS antenna connector
$\hat{I}_{or}$	The received power spectral density of the ~~Forward link~~downlink as measured at the UE antenna connector
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
UTRA	UMTS Terrestrial Radio Access

6.2 Transmit power

6.2.1 User Equipment maximum output power

The following Power Classes define the maximum output power;

Table 6.1: UE power classes

Power Class	Maximum output power	Tolerance
1	+30 dBm	+1dB /-3dB
2	+24 dBm	+1dB /-3dB
3	+21 dBm	+2dB /-2dB]
4	+10 dBm	+4dB /-4dB

Note

1. The maximum output power refers to the measure of power when averaged over the useful part of the transmit timeslot at the maximum power control setting.
2. For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.
3. The tolerance of the maximum power is below the prescribed value even for the multi-code transmission mode.
~~3.~~4. Power class 4 is envisaged for licensed exempt operation.
~~4.~~5. For UE using directive antennas for transmission, a class dependent limit will be placed on the maximum EIRP (Equivalent Isotropic Radiated Power)..

7.2 Diversity characteristics

A suitable receiver structure using coherent reception in both channel impulse response estimation, and code tracking procedures is assumed. Three forms of diversity are considered to be available in UTRA/TDD:

Table 6, Diversity characteristics for UTRA/TDD.

Table 7.1 : Diversity characteristics for UTRA/~~FDD~~TDD

Time diversity	Channel coding and interleaving in both up link and down link
Multi-path diversity	Rake receiver or other suitable receiver structure with maximum combining. Additional processing elements can increase the delay-spread performance due to increased capture of signal energy.
Antenna diversity	Antenna diversity with maximum ratio combing in the base station and optionally in the mobile stations. Possibility for downlink transmit diversity in the base station.

7.3 Reference sensitivity level

The reference sensitivity is the minimum receiver input power measured at the antenna port at which the BIT Error Rate BER does not exceed a specific value.

7.3.1 Minimum Requirements

Table 7.2 : Reference sensitivity level

Data rate	UE reference sensitivity level (dBm)	FER/BER
12.2 kbps	-105 dBm	BER shall not exceed 0.001

7.4 Maximum input level

This is defined as the maximum receiver input power at the UE antenna port which does not degrade the specified BER performance.

7.4.1 Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in Table 7.3.

Table 7.3: Maximum input level

Parameter	Level	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/3.84 MHz

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Sophia Antipolis, France, 26-29 October 1999

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25.102	CR	003	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN #6	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: Siemens AG **Date:** 29/10/99

Subject: Receiver spurious emissions for UE TDD

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Determination of the values for the receiver spurious emissions for UE TDD under consideration of the impact for the UE FDD receiver.

Clauses affected: 7.9, 7.9.1

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: Based on 3GPP WG4 Tdoc (99) 621

7.8.1 Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.8.

Table 7.8: Receive intermodulation characteristics

Parameter	Level	Unit
Wanted Signal Level	<REFSENS> + 3 dB	dBm/3.84 MHz
I_{ouw1}	-46	dBm
I_{ouw2}	-46	dBm/3.84 MHz
Fuw1 (CW)	10	MHz
Fuw2 (Modulated)	20	MHz

7.9 Spurious emissions

The Spurious Emissions Power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

7.9.1 Minimum Requirement

The spurious emission shall be:

1. Less than ~~[~~-60dBm/ 3.84MHz~~]~~ at the mobile station antenna connector, for frequencies within the~~ UE receive band~~ UTRA/TDD band and the UTRA/FDD UE receive band.

2. Less than ~~[~~-57dBm/100kHz~~]~~ at the mobile station antenna connector, for frequencies band from 9kHz to 1GHz.

3. Less than ~~[~~-47dBm/100kHz~~]~~ at the mobile station antenna connector, for frequencies band from 1GHz to 12.75GHz.

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25.102	CR	005	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#6	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: InterDigital **Date:** 7.12.99

Subject: Change of propagation conditions

Work item:

Category: *(only one category Shall be marked With an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Adapt test requirements to better match ITU recommendations

Clauses affected: Annex B

Other specs Affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: Based on 3GPP WG4 Tdoc R4-99675 as modified by WG4.

Annex B (normative): Propagation conditions

B.2 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

B.2 Multi-path fading propagation conditions

Table B2 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table B2: Propagation Conditions for Multi path Fading Environments

Case 1, speed 3km/h		**Case 2, speed 3 km/h**		**Case 3, 120 km/h**	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0
976	-10	976	0	260	-3
		12000~~20000~~	0	521	-6
				781	-9

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25.102	CR	007	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG RAN WG4 **Date:**

Subject: Corrections to 25.102 v.3.0.0

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: 25.102 version 3.0.0 includes some empty sections / test cases that are either covered by other specifications in WG4 or by given test cases in this test specification. It is proposed to delete those redundant sections.

Clauses affected: 8.2.2, 8.4, 8.5

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: Based on 3GPP WG4 Tdoc (99)

8. Performance requirement

8.1 General

The performance requirements for the UE in this section are specified for the measurement channels specified in Annex A and the propagation condition specified in Annex B.

Table 8.1: Summary of UE performance targets

Test Chs.	Information Data Rate	Static	Multi-path Case 1	Multi-path Case 2	Multi-path Case 3
		Performance metric			
DCH	12.2 kbps				
	64 kbps				
	144 kbps				
	384 kbps				
	2048 kbps				
BCH					

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Rate (BLER). The BLER is specified for each individual data rate of the DCH.

8.2.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.2.

Table 8.2: Performance requirements in AWGN channel.

Measurement channel		
12.2 kbps		
64 kbps		
144 kbps		
384 kbps		
2048 kbps		

~~8.2.2 Demodulation of BCH~~

~~8.2.2.1 Minimum requirement~~

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

The performance requirement of DCH is determined by the maximum Block Error Rate (BLER). The BLER is specified for each individual data rate of the DCH.

8.3.1.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.3.

Table 8.3: Performance requirements in multipath Case 1 channel.

Measurement channel		
12.2 kbps		
64 kbps		
144 kbps		
384 kbps		
2048 kbps		

8.3.2 Multipath fading Case 2

The performance requirement of DCH is determined by the maximum Block Error Rate (BLER). The BLER is specified for each individual data rate of the DCH.

8.3.2.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.4.

Table 8.4: Performance requirements in multipath Case 2 channel.

Measurement channel		
12.2 kbps		
64 kbps		
144 kbps		
384 kbps		

8.3.3 Multipath fading Case 3

The performance requirement of DCH is determined by the maximum Block Error Rate (BLER). The BLER is specified for each individual data rate of the DCH.

8.3.3.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.5.

Table 8.5: Performance requirements in multipath Case 3 channel.

Measurement channel			
12.2 kbps			
64 kbps			
144 kbps			
384 kbps			

~~8.4 Demodulation of BCH in multipath fading conditions~~

~~8.4.1 Multipath fading Case 1~~

~~8.4.1.1 Minimum requirement~~

8.5 Rx synchronisation characterisitics

8.5.1 Synchronization Performance

8.5.1.1 Search of other Cells

Search of other cells test is used to check whether the UE correctly searches and measures other BS(s) during the specified operation.

8.5.1.1.1 Minimum requirements

TBD

8.5.2 Inter-Frequency Handover.

The UE has to have the ability to make an Inter-frequency handover. This type of handover can happen within a BS or between two BS(s). Currently [ARIB Vol. 3] does not define requirements for Inter-frequency handover. <This item is ffs>

8.5.2.1 Minimum Requirements

TBD

8.6 Timing requirements

8.6.1 Synchronization

The timing of the UE is determined during specified operation.

8.6.1.1 Minimum Requirements

TBD

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Bath, UK, December 1999

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25.102	CR	010	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#6	for approval	X	Strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*

USIM		ME	X	UTRAN / Radio	X	Core Network	

Source: InterDigital **Date:** 7.12.99

Subject: TDD uplink power control requirements

Work item:

Category: *(only one category Shall be marked With an X)*

			Release:	
F	Correction		Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature	X	Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change: Adapt test requirements to match recent changes in layer 1 procedures

Clauses affected: 6.4

Other specs Affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

6.4 Output power dynamics

Power control is used to limit the interference level.

6.4.1 ~~Open loop~~Uplink power control

Uplink~~Open loop~~ power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signaling and parameter α as defined in TS 25.224. ~~to a specified value. For the TDD mode the reciprocity of the channel allows accurate estimation of the required open loop transmit power.~~

6.4.1.1 Initial Accuracy

The UE ~~open loop~~ power control initial accuracy error shall be less than +/-9dB under normal conditions and +/- 12dB under extreme conditions.

6.4.1.2 Differential accuracy, controlled input

The power control differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET} when the parameter α=0. The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The error shall not exceed the values in table x.1

Table x.1: Transmitter power step tolerance as a result of control power step

$\Delta SIR_{TARGET\ [dB]}$	Transmitter power step tolerance [dB]
$\Delta SIR_{TARGET} \leq 1$	± 0.5
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	± 1.5
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (1)

(1) Value is given for normal conditions. For extreme conditions value is ±12

6.4.1.3 Differential accuracy, measured input

The power control differential accuracy, measured input, is defined as the error in UE transmitter power step change as a result of a step change in path loss L_{PCCPCH}.

The error shall not exceed the sum of the following two errors:

- The power control error, controlled input error as defined in table x.1,
- and the errors in the PCCPCH RSCP measurement as defined in TS 25.123.

The conditions for the test are as in table x.2.

Table x.2 Conditions for TDD uplink power control requirements

Condition	Value
$\frac{PCCPCH\_E_c}{I_{or}}$	0 dB
$\hat{I}_{or}$ in the lower power of the two states	-60 dBm/3.84 MHz
Parameter α	1

6.4.2 Inner loop power control

Inner loop power control is the ability of the UE transmitter to adjust its output power in accordance to the TPC symbols received in the downlink.

6.4.3 Power control steps

The power control step is the step change in the UL transmitter output power in response to a TPC message. A set of power control steps is defined.

6.4.3.1 Minimum Requirements

The mobile station transmitter shall have the capability of setting power with a step of 1, 2 and 3dB. tolerance of the transmitter output power and the greatest average rate of change in mean power due to the power control step shall be within the range shown in Table 6.3.

Table 6.3: Power control step size tolerance

Step size	Tolerance	Range of average rate of change in mean power per 10 steps	
		minimum	maximum
1dB	+/- 0.5dB	+/- 8dB	+/- 12dB
2dB	+/- 1dB	+/- 16dB	+/- 24dB
3dB	+/- 1.5dB	+/- 24dB	+/- 36dB

6.4.4 Power control cycles per second

The maximum and minimum rate of change for the UL transmitter power control step.

6.4.4.1 Minimum Requirement

The rate of change for the UL transmitter power control step is a s follows: 100 – 800 Hz.

~~The minimum rate of 100 Hz is to ensure that every frame is power controlled. The maximum rate may differ for open and closed loop power control due to the used frame configuration.~~

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Bath, Avon, UK, Dec 7 – Dec 10, 1999

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25.102	CR	011	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-RAN#6	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: BellSouth Cellular Corp **Date:** 1999-12-08

Subject: Update of ITU Region 2 Specific Specifications and proposed universal channel numbering.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature	X		Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Updates region 2 specific specifications and proposed universal channel numbering.

Clauses affected: 5.2, 5.4.3, 7.6.1

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

5.2 Frequency bands

UTRA/TDD is designed to operate in the following bands;

a) 1900 – 1920 MHz: Uplink and downlink transmission
2010 – 2025 MHz Uplink and downlink transmission

b)* 1850 – 1910 MHz: Uplink and downlink transmission
1930 – 1990 MHz: Uplink and downlink transmission

~~Note: Appropriate adjustment is required for the parameters in the specified band~~

c)* 1910 – 1930 MHz: Uplink and downlink transmission
~~Note: Appropriate adjustment is required for the parameters in the specified band~~

* Used in ITU Region 2

Additional allocations in ITU region 2 are FFS.

Deployment in existing or other frequency bands is not precluded.

The co-existence of TDD and FDD in the same bands is still under study in WG4.

5.4 Channel arrangement

5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

5.4.2 Channel raster

The channel raster is 200 kHz, which means that the carrier frequency must be a multiple of 200 kHz.

5.4.3 Channel number

The carrier frequency is designated by the UTRA absolute radio frequency channel number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

~~Lower IMT 2000 band:~~

$N_t = 5 * (F - $ ~~1885.2~~MHz) ~~1885.2~~ 0.0 MHz $\leq F \leq$ 3276.6 MHz ~~2024.8~~ where F is the carrier frequency in MHz

7.6 Blocking characteristics

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

7.6.1 Minimum Requirement

The BER shall not exceed 0.001 for the parameters specified in table 7.5 and table 7.6. For table 13 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

Table 7.5: In-band blocking

Parameter	Offset	Offset	Unit
Wanted Signal Level	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3.84 MHz
Unwanted Signal Level (modulated)	-56	-44	dBm/3.84 MHz
Blocking offset	10<|f-fo|<15	|f-fo|≥15	MHz

Table 7.6: Out of band blocking

Parameter	Band 1	Band 2	Band 3	Unit
Wanted Signal Level	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/3.84 MHz
Unwanted Signal Level (CW)	-44	-30	-15	dBm
Blocking offset	1840 <f <1885 1935 <f <1995 2040 <f <2095	1815 <f <1840 2095 <f <2120	1< f <1815 2120< f <12750	MHz
Blocking offset	1790 < f < 1835 2005 < f < 2060	1765 < f < 1790 2060 < f < 2085	1 < f < 1765 2085 < f < 12750	MHz

Note: 1. On frequency regions 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz (as defined in sub-clause 5.2(a), the appropriate in-band blocking or adjacent channel selectivity in section 7.5.1 shall be applied.

2. On frequency regions 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in section 7.5.1 shall be applied.

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25.102	CR	013	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	RAN#6	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]
(at least one should be marked with an X)

Source: TSG RAN WG4 **Date:**

Subject: UE power classes

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: UE power class that are not fully specified are deleted. Requirements for 24dBm UE power class 2

Clauses affected: 6.2.1, 6.6.2.2, 6.7, 7.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

6 Transmitter characteristics

6.1 General

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of this specification. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in section 6 are defined using the UL reference measurement channel (12.2 kbps) specified in Annex A.2.1.

6.2 Transmit power

6.2.1 User Equipment maximum output power

The following Power Classes define the maximum output power;

Table 6.1: UE power classes

Power Class	Maximum output power	Tolerance
1	~~+30 dBm~~	~~+1dB / 3dB~~
2	+24 dBm	+1dB /-3dB
3	+21 dBm	+2dB /-2dB
~~4~~	~~+10 dBm~~	~~+4dB / 4dB~~

Note

1. The maximum output power refers to the measure of power when averaged over the useful part of the transmit timeslot at the maximum power control setting.
2. For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission. The error of the maximum average power is below the prescribed value even at the multi-code transmission mode <new text is required to clarify this sentence>
3. ~~Power class 4 is envisaged for licensed exempt operation~~.
4. For UE using directive antennas for transmission, a class dependent limit will be placed on the maximum EIRP (Equivalent Isotropic Radiated Power)..

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receive filter in the adjacent channels(s). Both the transmitted power and the received power are measured with a filter response that has a Root-Raised Cosine (RRC) filter response with roll-off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

6.6.2.2.1 Minimum requirement

The ACLR shall be better than the value specified in Table 6.5.

Table 6.5 :UE ACLR

Power Class	UE channel	ACLR limit
2, 3	± 5 MHz	-33 dB or –50 dBm which ever is higher
2, 3	± 10 MHz	-43 dB or –50 dBm which ever is higher

Note

1. The ACLR due to switching transients shall not exceed the limits in the above table.

6.7 Transmit intermodulation

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

6.7.1 Minimum requirement

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or BS receive band as an unwanted interfering signal. The UE intermodulation attenuation is defined by the ratio of the output power of the wanted signal to the output power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. Both the wanted signal power and the intermodulation product power are measured with a filter response that is root-raised cosine (RRC) with roll-off α=0.22 and with a bandwidth equal to the chip rate.
The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in the Table below.

Table 6.7 : Transmit Intermodulation

Interference Signal Frequency Offset	5MHz	10MHz
Interference Signal Level	-40 dBc	
Minimum Requirement	-31dBc	-41dBc

~~Note: This requirement is applicable to the 21 dBm power class 3 UE and the 24 dBm power class 2 UE.~~

Table 7.3: Maximum input level

Parameter	Level	Unit
$\frac{DPCH\_Ec}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/3.84 MHz

7.5 Adjacent Channel Selectivity (ACS)

Adjacent Channel Selectivity is a measure of a receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

7.5.1 Minimum Requirement

The ACS shall be better than the value indicated in Table 7.x for the test parameters specified in Table 7.y where the BER shall not exceed 0.001

Table 7.x: Adjacent Channel Selectivity

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.y: Test parameters for Adjacent Channel Selectivity

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/3.84 MHz	-91
I_{oac}	dBm/3.84 MHz	-52
F_{uw} (modulated)	MHz	+5 or -5

~~The BER shall not exceed 0.001 for the parameters specified in Table 7.4.~~

~~**Table 7.4: Adjacent Channel Selectivity**~~

~~Power Class~~	~~ACS~~	~~Units~~
~~3~~	~~[33]~~	~~dB~~

~~**Parameter**~~	~~**Level**~~	~~**Unit**~~
~~Data rate~~	~~12.2~~	~~kbps~~
~~Wanted signal~~	~~[ ]~~	~~dBm~~
~~Interfering signal~~	~~[ ]~~	~~dBm~~
~~Fuw (Modulated)~~	~~5~~	~~MHz~~

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25.102	CR	014	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: SIEMENS AG **Date:** 08-12-99

Subject: Update of UE RF capabilities

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: UE RF capabilities need to be updated based on the latest specifications and to align UE Radio Access capabilities defined in RAN WG2.

Clauses affected: Annex Es

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

ANNEX E (INFORMATIVE): Terminal Capabilities (TDD)

This section provides the UE capabilities related to 25.102.

Notes:

This section shall be aligned with TR25.926, UE Radio Access Capabilities regarding TDD RF parameters. These RF UE Radio Access capabilities represent options in the UE, that require signalling to the network.

Table F.1 provides the list of UE radio access capability parameters and possible values for 25.102

Table F.1: RF UE Radio Access Capabilities	**UE radio access capability parameter**	**Value range**
TDD RF parameters	UE power class (25.102 section 6.2.1)	2, 3
	Radio frequency bands (25.102 section 5.2)	a) lower band, a) upper band, a), b), c)

~~This section is based on the LS sent to TSG T2 on baseline terminal capabilities which has been updated to take into account changes in UE radio requirement specifications TS 25.102.~~

~~E.1 Baseline Implementation Capabilities~~

~~Capability TDD~~	~~Section~~	~~UE*~~	~~Comments~~
~~Chiprate 3.84 Mcps~~	~~5.1~~	~~M~~	
~~Frequency bands – 1900-1920 MHz – 2010-2025 MHz – Other spectrum~~	~~5.2~~	 ~~M~~ ~~M~~ ~~O~~	 ~~Declared 1900-1920 MHz~~ ~~Declared 2010-2025 MHz~~ ~~As Declared~~
~~Carrier raster~~	~~5.4~~	~~M~~	
~~UE maximum output power~~	~~6.2.1~~	~~M~~	~~At least one power class~~

~~(* M = mandatory, O = optional)~~

~~E.2 Service Implementation Capabilities~~

~~For further study.~~