TSG-RAN Meeting #6
Nice, France, 13 – 15 December 1999

Title: Agreed CRs of category "B" (New features) to TS 25.105

Source: TSG-RAN WG4

Agenda item: 5.4.3

TSG_DOC	SPEC	CR	RE	3G_P	SUBJECT	CAT	VERS_CU	VERS_NE
R4-99887	25.105	009		R99	Transmit Template	B	3.0.0	3.1.0
R4-99891	25.105	010		R99	Performance Requirements	B	3.0.0	3.1.0
R4-99A01	25.105	018		R99	BS TDD Spurious Emission Requirements for co-Existence UTRA-FDD/	B	3.0.0	3.1.0

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25.105	CR	**009**	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*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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 ☐   UTRAN / Radio **X**   Core Network ☐
(at least one should be marked with an X)

Source:	Siemens AG		**Date:**	7/12/99

Subject:	Transmit Template

Work item:	

Category:

	F	Correction			**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release				Release 96	
(only one category	B	Addition of feature		X		Release 97	
shall be marked	C	Functional modification of feature				Release 98	
with an X)	D	Editorial modification				Release 99	X
						Release 00	

Reason for change:	Inclusion of transmit ON/OFF template to avoid leakage of power into adjacent timeslots.

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:	

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

The transmit OFF power state is when the BS does not transmit. This parameter is defined as maximum output transmit power within the channel bandwidth when the transmitter is OFF.

6.5.1.1 Minimum Requirement

The requirement of transmitOFF power shall be better than –33dBm measured with a filter that has a Root Raised Cosine (RRC) filter responcse with a roll off $\alpha=0.22$ and a bandwidth equal to the chip rate.

6.5.2 Transmit ON/OFF Time mask

The time mask transmit ON/OFF defines the ramping time allowed for the BS between transmit OFF power and transmit ON power.

6.5.2.1 Minimum Requirement

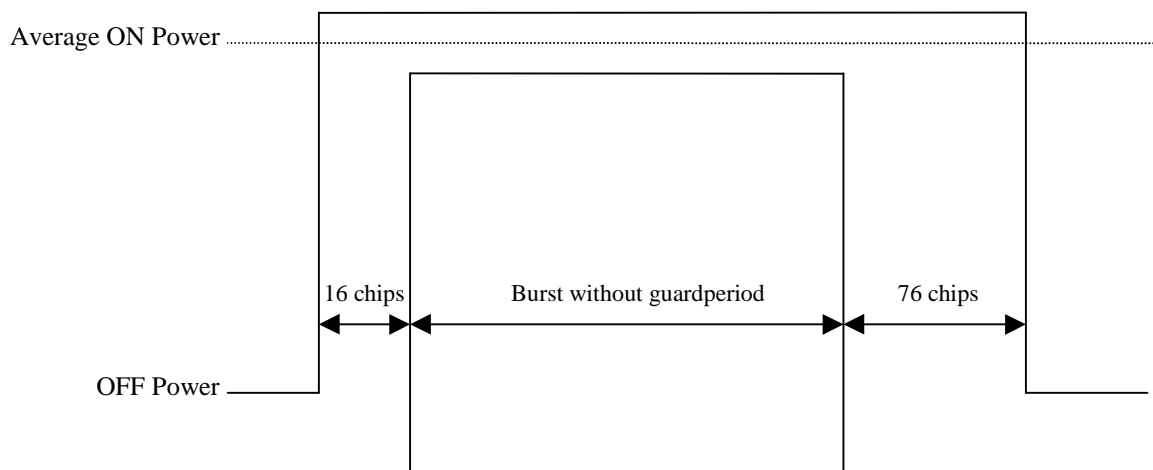The transmit power level versus time should meet the mask specified in figure 1.

Figure 1: Transmit ON/OFF template

3GPP TSG-RAN Meeting #9
Bath, UK, 07-10 Dec 1999

CHANGE REQUEST

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25.105	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*
list expected approval meeting # here ↑   for information ☐   non-strategic ☐ *use only)*

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 ☐   UTRAN / Radio **X**   Core Network ☐
(at least one should be marked with an X)

Source: Siemens AG   **Date:** 07/12/99

Subject: Performance Requirements

Work item:

Category: F Correction   ☐   **Release:**   Phase 2   ☐
            A Corresponds to a correction in an earlier release   ☐   Release 96   ☐
(only one category B Addition of feature   **X**   Release 97   ☐
shall be marked   C Functional modification of feature   ☐   Release 98   ☐
with an X)   D Editorial modification   ☐   Release 99   **X**
                                                                                      Release 00   ☐

Reason for change: Based on simulations performance requirements are specified.

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:

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
BER	Bit Error Rate
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
$DPCH_o$	A mechanism used to simulate an individual intracell interferer in the cell with one code and a spreading factor of 16
$\dfrac{DPCH_o\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the $DPCH_o$ to the total transmit power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Rate
I_{oc}	The power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
$\hat{I}_{or}$	The received power spectral density of all users in the cell in one timeslot as measured at the BS 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

8 Performance requirement

8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

The requirements only apply to a base station with dual receiver antenna diversity. The required $\hat{I}_{or}/I_{oc}$ ~~E_b/N_0~~ shall be applied separately at each antenna port.

Table 8.1: Summary of Base Station performance targets

Physical channel	Measurement channel	Static	Multi-path Case 1	Multi-path Case 2	Multi-path Case 3
		Performance metric			
DCH	12.2 kbps	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}	BLER<10^{-2}
	64 kbps	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}, 10^{-3}
	144 kbps	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}, 10^{-3}
	384 kbps	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}	BLER< 10^{-1}, 10^{-2}, 10^{-3}
	~~2048 kbps~~				-
RACH					

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) allowed when the receiver input signal is at a specified $\hat{I}_{or}/I_{oc}$ ~~E_b/N_0~~ limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.2.1.1 Minimum requirement

For the parameters specified in Table 8.2 ~~T~~the BLER should not exceed the ~~limit for the E_b/N_0~~ piece-wise linear BLER curve specified in Table 8.3~~2~~.

Table 8.2: Parameters in static propagation conditions

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of DPCH$_o$		6	4	0	0
$\dfrac{DPCH_o\_E_c}{I_{or}}$	dB	-9	-9.5	0	0
I	dBm/3.84 MHz	-60			

Information Data Rate	kbps	12.2	64	144	384

Table 8.32: Performance requirements in AWGN channel.

Test Number ~~Measurement channel~~	$\dfrac{\hat{I}_{or}}{I_{oc}}$ **[dB]** ~~Required E_b/N_0~~	**BLER**~~Required E_b/N_0~~
1~~12.2 kbps~~	-1.9	10^{-2}
2~~64 kbps~~	-0.3	10^{-1}
	0.0	10^{-2}
3~~144 kbps~~	0.0	10^{-1}
	0.2	10^{-2}
4~~384 kbps~~	-0.5	10^{-1}
	-0.3	10^{-2}
~~2048 kbps~~		

8.2.2   Demodulation of RACH

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 in multipath fading Case 1 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified $\underline{\hat{I}_{or}/I_{oc}}$ ~~E_b/N_0~~ limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.1.1   Minimum requirement

For the parameters specified in Table 8.4 ~~T~~the BLER should not exceed the ~~limit for the E_b/N_0~~ piece-wise linear BLER curve specified in Table 8.53.

Table 8.4: Parameters in multipath Case 1 channel

Parameters	**Unit**	**Test 1**	**Test 2**	**Test 3**	**Test 4**
Number of DPCH$_o$		6	4	0	0
$-\dfrac{DPCH_o\_E_c}{I_{or}}$	dB	-9	-9.5	0	0
I	dBm/3.84 MHz	-60			
Information Data Rate	kbps	12.2	64	144	384

Table 8.53: Performance requirements in multipath Case 1 channel.

Test Number ~~Measurement channel~~	$\dfrac{\hat{I}_{or}}{I_{oc}}$ **[dB]** ~~Required E_b/N_0~~	**BLER** ~~Required E_b/N_0~~
1~~12.2 kbps~~	6.3	10^{-2}
2~~64 kbps~~	5.5	10^{-1}
	9.4	10^{-2}
3~~144 kbps~~	5.6	10^{-1}
	9.4	10^{-2}
4~~384 kbps~~	5.5	10^{-1}
	8.7	10^{-2}
~~2048 kbps~~		

8.3.2   Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified $\hat{I}_{or}/I_{oc}$ ~~E_b/N_0~~ limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.2.1   Minimum requirement

For the parameters specified in Table 8.6 ~~T~~the BLER should not exceed the ~~limit for the E_b/N_0~~ piece-wise linear BLER curve specified in Table 8.74.

Table 8.6: Parameters in multipath Case 2 channel

Parameters	**Unit**	**Test 1**	**Test 2**	**Test 3**	**Test 4**
Number of DPCH$_o$		2	0	0	0
$\dfrac{DPCH_o \_ E_c}{I_{or}}$	dB	-6	0	0	0
I	dBm/3.84 MHz	-60			
Information Data Rate	kbps	12.2	64	144	384

Table 8.74: Performance requirements in multipath Case 2 channel.

Test Number~~Measurement channel~~	$\dfrac{\hat{I}_{or}}{I_{oc}}$ [dB]~~Required E_b/N_0 BLER < 10^{-1}~~	**BLER** ~~Required E_b/N_0 BLER < 10^{-2}~~
1~~12.2 kbps~~	0.1~~n.a.~~	10^{-2}
2~~64 kbps~~	0.4	10^{-1}
	2.8	10^{-2}

3144 kbps	3.6	10^{-1}
	6.0	10^{-2}
4384 kbps	3.0	10^{-1}
	5.4	10^{-2}

8.3.3   Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified $\hat{I}_{or}/I_{oc}$ E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.3.1   Minimum requirement

For the parameters specified in Table 8.8 Tthe BLER should not exceed the limit for the E_b/N_0 piece-wise linear BLER curve specified in Table 8.95.

Table 8.6: Parameters in multipath Case 3 channel

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
Number of $DPCH_o$		2	0	0	0
$\dfrac{DPCH_o\_E_c}{I_{or}}$	dB	-6	0	0	0
I	dBm/3.84 MHz	-60			
Information Data Rate	kbps	12.2	64	144	384

Table 8.85: Performance requirements in multipath Case 3 channel.

Test NumberMeasurement channel	$\dfrac{\hat{I}_{or}}{I_{oc}}$ [dB]Required E_b/N_0	BLER Required E_b/N_0	Required E_b/N_0
112.2 kbps	-0.6n.a.	10^{-2}	
264 kbps	0.7	10^{-1}	
	2.4	10^{-2}	
	3.8	10^{-3}	
3144 kbps	3.9	10^{-1}	
	5.9	10^{-2}	
	7.3	10^{-3}	
4384 kbps	2.8	10^{-1}	
	4.2	10^{-2}	
	4.8	10^{-3}	

CHANGE REQUEST

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	25.105	CR	**018**		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*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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

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

Source:	Siemens AG	**Date:**	9/12/99

Subject:	BS TDD Spurious Emission Requirements for Co-Existence UTRA-FDD/ UTRA-TDD

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	**X**		Release 97	
	C	Functional modification of feature			Release 98	
	D	Editorial modification			Release 99	**X**
					Release 00	

Reason for change:	Necessity of defining spurious emission requirements in TDD for the receive frequency band of FDD.

Clauses affected:	6.6.3

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) 840

6.6.3.4 Co-existence with UTRA-FDD

6.6.3.4.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.

6.6.3.4.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.9: BS Spurious emissions limits for BS in geographic coverage area of UTRA-FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-32 dBm	1 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	

6.6.3.4.2 Co-located base stations

This requirement may be applied for the protection of UTRA-TDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.

6.6.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.10: BS Spurious emissions limits for BS co-located with UTRA-FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-86 dBm	1 MHz	
2110 – 2170 MHz	-52 dBm,	1 MHz	