TSG-RAN Meeting #7 *TSGRP#7(00)0022*

Madrid, Spain, 13 – 15 March 2000

Title: **Agreed CRs to TS 25.141**

Source: **TSG-RAN WG4**

Agenda item: **6.2.3**

Spec	CR	Rev	Phas	Subject	Cat	Current	New	WG4 doc
25.141	001		R99	Clarification of Receiver Dynamic Range requirement	F	3.0.0	3.1.0	R4-000030
25.141	002		R99	Editorial changes	D	3.0.0	3.1.0	R4-000062
25.141	003		R99	Occupied bandwidth measurement	F	3.0.0	3.1.0	R4-000067
25.141	004		R99	Clarification of "random" in relation to injected bit errors	F	3.0.0	3.1.0	R4-000070
25.141	005		R99	Test Models for transmitter	B	3.0.0	3.1.0	R4-000080
25.141	006	1	R99	Regional requirements in TS 25.104	D	3.0.0	3.1.0	R4-000299
25.141	007		R99	Blocking test	F	3.0.0	3.1.0	R4-000095
25.141	008		R99	ACLR measurement	F	3.0.0	3.1.0	R4-000093
25.141	009		R99	Peak code domain error measurement	F	3.0.0	3.1.0	R4-000094
25.141	010		R99	Test point & set of specifications for use of external RF devices	F	3.0.0	3.1.0	R4-000137
25.141	011		R99	CR for Performance requirement in TS 25.141	F	3.0.0	3.1.0	R4-000295
25.141	012		R99	Spectrum emission mask	F	3.0.0	3.1.0	R4-000127
25.141	013		R99	BS configurations	B	3.0.0	3.1.0	R4-000246
25.141	014		R99	Test models	F	3.0.0	3.1.0	R4-000244
25.141	015		R99	Update to Downlink Test Models	F	3.0.0	3.1.0	R4-000180
25.141	016		R99	Remove revision marks in annex A	D	3.0.0	3.1.0	R4-000150
25.141	017		R99	Format and interpretation of tests	D	3.0.0	3.1.0	R4-000236
25.141	018		R99	Modifications for system set-up's TS25.141v3.0.0	F	3.0.0	3.1.0	R4-000187
25.141	019		R99	Intermodulation test	F	3.0.0	3.1.0	R4-000128
25.141	020		R99	Modifications for test models	C	3.0.0	3.1.0	R4-000184
25.141	021		R99	Receiver diversity	C	3.0.0	3.1.0	R4-000188
25.141	023		R99	Spectrum emission mask	F	3.0.0	3.1.0	R4-000256
25.141	024		R99	Rx spurious emissions measurement bandwidth	F	3.0.0	3.1.0	R4-000130
25.141	025		R99	Modification to the handling of measurement equipment uncertainty	F	3.0.0	3.1.0	R4-000291
25.141	026		R99	Test models	F	3.0.0	3.1.0	R4-000323

3G CHANGE REQUEST

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25.141 **CR** **001** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

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

Source: RAN WG4 **Date:** 00-01-13

Subject: Clarification of Receiver Dynamic Range requirement

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: In version 3.0.0, the Receiver Dynamic Range requirement is unclear. The proposed correction specifies that the power of the interference shall be -73 dBm measured in 3.84 MHz.
The text <REFSENS> +30 dB is replaced with -91 dBm

Clauses affected: 7.3

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G 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:

7.3 Dynamic range

7.3.1 Definition and applicability

Receiver dynamic range is the receiver ability to handle a rise of interference in the reception frequency channel. The receiver shall fulfil a specified BER requirement for a specified sensitivity degradation of the wanted signal in the presence of an interfering AWGN signal in the same reception frequency channel.

Minimum bandwidth of AWGN interferer shall be 1.5 times chip rate - 5.76 MHz for a chip rate of 3.84 MHz.

7.3.2 Conformance requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.2~~xx~~.

Table 7.2 : Dynamic range

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	~~<REFSENS> + 30 dB~~-91	dBm
Interfering AWGN signal	-73	dBm/3.84 MHz

7.3.3 Test purpose

The purpose of this test is to verify that the BS meet the dynamic range requirement as specified in TS25.104, clause 7.3.

7.3.4 Method of test

7.3.4.1 Initial conditions

1) Connect the test equipment as shown in Annex B.

2) Terminate the RX port that is not tested.

7.3.4.2 Procedure

1) Adjust the signal generator for the wanted signal to ~~<REFSENS> + 30 dB~~91~~2~~ dBm

2) Adjust the AWGN generator level to –73 dBm/3.84 MHz and set the frequency to the same frequency as the tested channel.

3) Measure the BER for the tested service and verify that it is below the specified level

4) Repeat the measurement for the other RX port

CHANGE REQUEST

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25.141	CR	002	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#7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 1/14/00

Subject: Editorial changesfor TS25.141v3.0.0

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			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change: Test Models are defined in section 6.1 globally so as to other parts in section 6 can ref these models. Annex D shall be removed since it is redundant after all. All related descriptions in section 6which refers to these test models should be also corrected. Typos in section 6.2.2.5, 6.3.2, 6.4.4.3,6.,6.5.2, 7.3.2 and Table 6.17 should be corrected.

Clauses affected: 6.1, 6.2, 6.2.1, 6.2.2,6.3,6.4, 6.5.1, 6.5.2, 6.5.3, 6.6, 6.7 and Annex D

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:

6.1 General

All tests in this Clause shall be conducted on Base Station fitted with a full complement of Transceivers for the configuration unless otherwise stated. Transmission power shall be at the maximum output power unless otherwise stated. Measurements shall be made at the BS Tx antenna connector, unless otherwise stated.Power levels are expressed in dBm.

6.1.1 Test Models

The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test. The mean overall output power to be transmitted, is specified with each test.

6.1.1.1 Test Model 1

This model shall be used for tests on.

- spectrum emission mask
- ACLR
- spurious emissions
- transmit intermodulation
- modulation accuracy

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random DPCH~~T~~$_{offsets}$ are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" relates to the mean output power on the TX antenna interface under test.

Table 6.1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	~~T~~DPCH$_{offset}$
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	16/32/64	76.8 in total	See Table 6.2	See Table 6.2	See Table 6.2

Table 6.2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	2	-10.4	-13.0	-15.6
11	0	-11.1	-13.3	-15.7
17	2	-12.0	-13.9	-16.1
23	1	-14.2	-14.9	-16.8
31	6	-11.4	-16.8	-18.0
38	1	-13.0	-14.1	-20.0

47	7	-16.5	-15.6	-15.9
55	6	-15.6	-18.0	-16.5
62	1	-12.5	-16.2	-17.4
69	9	-15.3	-19.4	-19.0
78	1	-13.7	-17.1	-21.7
85	0	-17.6	-14.6	-20.3
94	0	-18.8	-16.5	-16.3
102	0	-16.9	-20.3	-17.2
113	5	-15.0	-20.6	-18.6
119	2	-9.4	-23.6	-20.8
7	3		-19.8	-18.5
13	4		-17.6	-20.5
20	2		-13.7	-17.9
27	5		-14.4	-19.7
35	9		-15.9	-24.3
41	1		-18.8	-24.0
51	7		-18.2	-22.4
58	2		-16.7	-21.0
64	5		-21.5	-18.2
74	5		-19.1	-20.2
82	8		-18.6	-16.7
88	1		-15.8	-17.7
97	9		-18.4	-19.4
108	4		-15.4	-23.0
117	9		-17.4	-22.1
125	3		-12.4	-20.5
4	6			-17.0
9	5			-18.3
12	2			-20.4
14	7			-17.3
19	8			-18.8
22	4			-21.3
26	4			-19.3
28	3			-22.6
34	5			-21.6
36	8			-19.5
40	0			-23.8
44	0			-22.8
49	2			-21.4
53	7			-19.1
56	1			-21.9
61	8			-20.7
63	2			-17.6
66	3			-19.2
71	6			-22.2
76	9			-21.2
80	3			-18.7
84	2			-21.1
87	5			-18.9
91	0			-21.5
95	9			-19.8
99	2			-25.0
105	9			-25.0
110	3			-24.8
116	3			-23.5
118	6			-21.8
122	2			-20.1
126	8			-15.3

6.1.1.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	7	7 x 10.97	7 x -9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

6.1.1.3 Test Model 3

This model shall be used for tests on,

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=256)	16/32	76.8 in total	See Table 6.5	See Table 6.5	See Table 6.5

As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2
83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2
96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2

125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

6.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

NEXT MODIFIED SECTION

6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter. The physical channels for the following test(s) shall be setup according to the test model specified in 6.~~2.~~1.1.~~.~~

6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1.1 Test Conditions and measurement method

1. Connect the power measuring equipment to the base station RF output port.

2. Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model2 in 6.1.1.2~~stated bellow~~.

3. Measure the mean power at the RF output port over a certain slots.

~~The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test. The mean overall output power to be transmitted, is specified with each test.~~

~~6.2.1.1.1 Test Model 1~~

~~This model shall be used for tests on,~~

~~□spectrum emission mask~~

~~□ACLR~~

~~□spurious emissions~~

~~□transmit intermodulation~~

~~□modulation accuracy~~

~~**Table 6.1. Test Model 1 Active Channels**~~

~~Type~~	~~Number of Channels~~	~~Fraction of Power (%)~~	~~Fraction of Power (dB)~~	~~Channelisation Code~~	~~T_{offset}~~
~~PCCPCH+SCH~~	~~1~~	~~10~~	~~-10~~	~~1~~	
~~Primary CPICH~~	~~1~~	~~10~~	~~-10~~	~~0~~	
~~PICH~~	~~1~~	~~3.2~~	~~-15~~	~~16~~	
~~DPCH (SF=128)~~	~~16/32/64~~	~~76.8 in total~~	~~See Table 6.2~~	~~See Table 6.2~~	~~See Table 6.2~~

~~Table 6.2: DPCH Spreading Code, Toffset and Power for Test Model 1~~

~~Code~~	~~Toffset~~	~~Code Power (dB) (16 codes)~~	~~Code Power (dB) (32 codes)~~	~~Code Power (dB) (64 codes)~~
~~2~~	~~2~~	~~-10.4~~	~~-13.0~~	~~-15.6~~
~~11~~	~~0~~	~~-11.1~~	~~-13.3~~	~~-15.7~~
~~17~~	~~2~~	~~-12.0~~	~~-13.9~~	~~-16.1~~
~~23~~	~~1~~	~~-14.2~~	~~-14.9~~	~~-16.8~~
~~31~~	~~6~~	~~-11.4~~	~~-16.8~~	~~-18.0~~
~~38~~	~~1~~	~~-13.0~~	~~-14.1~~	~~-20.0~~
~~47~~	~~7~~	~~-16.5~~	~~-15.6~~	~~-15.9~~
~~55~~	~~6~~	~~-15.6~~	~~-18.0~~	~~-16.5~~
~~62~~	~~1~~	~~-12.5~~	~~-16.2~~	~~-17.4~~
~~69~~	~~9~~	~~-15.3~~	~~-19.4~~	~~-19.0~~
~~78~~	~~1~~	~~-13.7~~	~~-17.1~~	~~-21.7~~
~~85~~	~~0~~	~~-17.6~~	~~-14.6~~	~~-20.3~~
~~94~~	~~0~~	~~-18.8~~	~~-16.5~~	~~-16.3~~
~~102~~	~~0~~	~~-16.9~~	~~-20.3~~	~~-17.2~~
~~113~~	~~5~~	~~-15.0~~	~~-20.6~~	~~-18.6~~
~~119~~	~~2~~	~~-9.4~~	~~-23.6~~	~~-20.8~~
~~7~~	~~3~~		~~-19.8~~	~~-18.5~~
~~13~~	~~4~~		~~-17.6~~	~~-20.5~~
~~20~~	~~2~~		~~-13.7~~	~~-17.9~~
~~27~~	~~5~~		~~-14.4~~	~~-19.7~~
~~35~~	~~9~~		~~-15.9~~	~~-24.3~~
~~41~~	~~1~~		~~-18.8~~	~~-24.0~~
~~51~~	~~7~~		~~-18.2~~	~~-22.4~~
~~58~~	~~2~~		~~-16.7~~	~~-21.0~~
~~64~~	~~5~~		~~-21.5~~	~~-18.2~~
~~74~~	~~5~~		~~-19.1~~	~~-20.2~~
~~82~~	~~8~~		~~-18.6~~	~~-16.7~~
~~88~~	~~1~~		~~-15.8~~	~~-17.7~~
~~97~~	~~9~~		~~-18.4~~	~~-19.4~~
~~108~~	~~4~~		~~-15.4~~	~~-23.0~~
~~117~~	~~9~~		~~-17.4~~	~~-22.1~~
~~125~~	~~3~~		~~-12.4~~	~~-20.5~~
~~4~~	~~6~~			~~-17.0~~
~~9~~	~~5~~			~~-18.3~~
~~12~~	~~2~~			~~-20.4~~
~~14~~	~~7~~			~~-17.3~~
~~19~~	~~8~~			~~-18.8~~
~~22~~	~~4~~			~~-21.3~~
~~26~~	~~4~~			~~-19.3~~
~~28~~	~~3~~			~~-22.6~~
~~34~~	~~5~~			~~-21.6~~
~~36~~	~~8~~			~~-19.5~~
~~40~~	~~0~~			~~-23.8~~
~~44~~	~~0~~			~~-22.8~~
~~49~~	~~2~~			~~-21.4~~
~~53~~	~~7~~			~~-19.1~~
~~56~~	~~1~~			~~-21.9~~
~~61~~	~~8~~			~~-20.7~~
~~63~~	~~2~~			~~-17.6~~
~~66~~	~~3~~			~~-19.2~~
~~71~~	~~6~~			~~-22.2~~
~~76~~	~~9~~			~~-21.2~~
~~80~~	~~3~~			~~-18.7~~
~~84~~	~~2~~			~~-21.1~~
~~87~~	~~5~~			~~-18.9~~

91	0
95	9
99	2
105	9
110	3
116	3
118	6
122	2
126	8

-21.5
-19.8
-25.0
-25.0
-24.8
-23.5
-21.8
-20.1
-15.3

6.2.1.1.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	7	7 x 10.97	7 x -9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

6.2.1.1.3 Test Model 3

This model shall be used for tests on,

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=256)	16/32	76.8 in total	See Table 6.5	See Table 6.5	See Table 6.5

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2
83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2

96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2
125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

6.2.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

6.2.2. CPICH power accuracy

6.2.2.4.1 Initial conditions

Establish applicable temperature and supply voltage, as specified in chapter 4.4.

Connect BS to code domain analyser as shown in Annex B.

Disable inner loop power control

Setup BS transmission at maximum total power as specified by the supplier. Channel setup shall be according to 6.~~2~~.1.1.2.

6.2.2.4.2 Procedure

With the Code Domain Analyser measure the power in the PCCPCH and PCPICH.

Repeat the measurement for all other applicable temperatures and supply voltages.

6.2.2.5 Test requirement

The measured CPICH power shall be within ±2.1dB of the ordered ~~absolut~~absolute value.

NEXT MODIFIED SECTION

6.3 Frequency stability

6.3.2 Minimum requirement

The modulated carrier frequency of the BS shall be accurate to within ± 0.05 ppm~~PPM~~ for RF frequency generation.

NEXT MODIFIED SECTION

6.4 Output power dynamics

Power control is used to limit the interference level. The BS transmitter uses a quality-based power control on the downlink. The physical channels for the following test(s) shall be setup according to 6.~~2~~.1.1.2.

6.4.4 Total power dynamic range

6.4.4.3 Test purpose

To verify that the total power dynamic range as specified in TS25.104 clause 6.4.3.1 The test is to ensure that the total output power can be reduced while still transmitting a single code. This is to ensure that the interference to neighbouring cells is reduced.

<Editor's note: The rationale of the requirement should be clarified. >

NEXT MODIFIED SECTION

6.5 Output RF spectrum emissions

The physical channels for the following test(s) shall be setup according to 6.~~2~~.1.1.1.

6.5.1 Occupied bandwidth

6.5.1.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

(1) Connect the Measurement device to the BS antenna connector.

(2) Start transmission on a single carrier according to test model defined in 6.~~2~~.1.1.1.

6.5.2 Out of band emission

6.5.2.2.1 Test conditions and measurement method

1. Connect measurement receiver to the base station RF output port, using an attenuator or directional coupler if necessary.

2. The receiver characteristics shall be:

Measurement filter bandwidth : Defined in section 6.5.2.2.
Sufficient averaging time to ensure 0.2dB error at 95% confidence
Detection mode : True RMS

3. Set the base station to transmit a signal modulated in accordance with 6.~~2~~.1.1.1 (Model 1).
Total power at the RF output port shall be the nominal power as specified by the manufacturer.

4. Measure the power level at the carrier frequency.

6.5.3 Spurious emissions

6.5.3.3 Test case

The BS shall be configured with transmitters active at their maximum output power for all transmission modes foreseen by the manufacturer's specification.

Set the base station to transmit a signal as stated in 6.~~2~~.1.1.1. Total power at the RF Output port shall be the nominal power as specified by the manufacturer.

The transmitter antenna connector shall be connected to a measurement receiver with the same characteristic impedance, using an attenuator or directional coupler if necessary.

The detecting device shall be configured with a measurement bandwidth as stated in the tables

NEXT MODIFIED SECTION

6.5.3.4 Conformance Requirements

~~Chapters 6.6.3.4-6.6.3.9.1 as they are in 25.141 v.2.0.4~~

6.5.3.~~5~~1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation [4] , are applied.

6.5.3.5.1.1 Minimum Requirement

The power of any spurious emission shall be attenuated by at least the minimum requirement:

Table 6.16 BS Mandatory spurious emissions limits, Category A

Band	Minimum attenuation requirement	Measurement Bandwidth	Note
9kHz – 150kHz	43 + 10logP (dB)	1 kHz	Bandwidth as in ITU SM.329-7, s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU SM.329-7, s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU SM.329-7, s4.1
1GHz – 12.75GHz		1 MHz	Upper frequency as in ITU SM.329-7, s2.6

P = Mean power (W) where P < 500W

6.5.3.~~6~~2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation [4] , are applied.

6.5.3.~~6~~2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.17 BS Mandatory spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-7, s4.1
1GHz ↔ Fc1 – 60 MHz or 2100 MHz *Whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, s4.1
Fc1 – 60 MHz or 2100 MHz	-25 dBm	1 MHz	Specification more

whichever is the higher ↔ Fc1 – 50 MHz or 2100 MHz *whichever is the higher*			stringent than ITU-R SM.329-7, s4.1
Fc1 – 50 MHz or 2100 MHz *whichever is the higher* ↔ Fc2 + 50 MHz or 2180 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, s4.1
Fc2 + 50 MHz or 2180 MHz *whichever is the lower* ↔ Fc2 + 60 MHz or 2180 MHz *Whichever is the lower*	-25-13 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, s4.1
Fc2 + 60 MHz or 2180 MHz *Whichever is the lower* ↔ 12.75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, s4.1. Upper frequency as in ITU-R SM.329-7, s2.6

Fc1 : Center frequency of first carrier frequency used.

Fc2 : Center frequency of last carrier frequency used.

6.5.3.47.3 Protection of the BS receiver

This requirement may be applied in order to prevent the receiver of the BS being desensitised by emissions from the BS transmitter which are coupled between the antennas of the BS.

[This requirement assumes the scenario described in [2]. For different scenarios, the manufacturer may declare a different requirement.

This requirement is not applicable to antenna ports which are used for both transmission and reception (e.g. which have an internal duplexer).

NOTE: In this case, the measurement of Reference Sensitivity will directly show any desensitisation of the receiver.

6.5.3.47.31.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.18 BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980MHz For operation in Frequency Bands defined in sub-clause 3.4.1(a)	-96 dBm	100 kHz	
1850-1910 MHz For operation in Frequency Bands defined in sub-clause 3.4.1(b)	-96 dBm	100kHz	

6.5.3.48.4 Co-existence with GSM 900

6.5.3.48.41.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

[This requirement assumes the scenario described in [2].] For different scenarios, the manufacturer may declare a different requirement.

6.5.3.48.41.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.19 BS Spurious emissions limits for BS in geographic coverage area of GSM 900

Band	Maximum Level	Measurement Bandwidth	Note
921 – 960 MHz	-47 dBm	100 kHz	

6.5.3.84.4.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BS receivers when GSM 900 BS and UTRA BS are co-located.

6.5.3.4.8.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.20 BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
876-915 MHz	–98dBm	100 kHz	

6.5.3.4.95 Co-existence with DCS 1800

6.5.3.49.5.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

[This requirement assumes the scenario described in [2].] For different scenarios, the manufacturer may declare a different requirement.

6.5.3.49.5.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.21 BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880 MHz	-57 dBm	100 kHz	

6.5.3.~~9~~.5.2 Co-located basestations

This requirement may be applied for the protection of DCS 1800 BS receivers when DCS 1800 BS and UTRA BS are co-located.

6.5.3.~~9~~.5.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.22 BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum Level	Measurement Bandwidth	Note
1710-1785 MHz	-98dBm	100 kHz	

6.5.3.~~10~~.6Co-existence with PHS

This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.

6.5.3.~~10~~.6.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.23 BS Spurious emissions limits for BS in geographic coverage area of PHS

Band	Maximum Level	Measurement Bandwidth	Note
1893.5 – 1919.60 MHz	-41 dBm	300 kHz	

6.5.3.~~11~~.7Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 3.4.1(a) and 1930-1990 MHz, as defined in sub-clause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.

6.5.3.~~11~~.7.1 Minimum requirement

The power of any spurious emission shall not exceed:

Table 6.24: BS spurious emissions limits for protection of adjacent band services

Band (f)	Maximum Level	Measurement Bandwidth	Note
2100-2105 MHz For operation in frequency bands as defined in sub-clause 3.4.1(a)	-30 + 3.4 · (f - 2100 MHz) dBm	1 MHz	
2175-2180 MHz For operation in frequency	-30 + 3.4 · (2180 MHz - f) dBm	1 MHz	

bands as defined in sub-clause 3.4.1(a)			
1920-1925 MHz For operation in frequency bands as defined in sub-clause 3.4.1(b)	-30 + 3.4 · (f – 1930 MHz) dBm	1 MHz	
1995-2000 MHz For operation in frequency bands as defined in sub-clause 3.4.1(b)	-30 +3.4 · (2000 MHz – f) dBm	1 MHz	

6.5.3.4~~12~~.8Co-existence with UTRA-TDD

6.5.3.4~~12~~.8.1 Operation in the same geographic area

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

6.5.3.4~~12~~.8.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.25: BS Spurious emissions limits for BS in geographic coverage area of UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1900 – 1920 MHz	-52 dBm	1 MHz	
2010 – 2025 MHz	-52 dBm	1 MHz	

6.5.3.4~~12~~.8.2 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.

6.5.3.4.~~12~~.8.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 6.26: BS Spurious emissions limits for BS co-located with UTRA-TDD

Band	Maximum Level	Measurement Bandwidth	Note
1900 – 1920 MHz	–86 dBm	1 MHz	
2010 – 2025 MHz	–86 dBm	1 MHz	

NEXT MODIFIED SECTION

6.6 Transmit intermodulation

6.6.2 Conformance requirement

The transmit intermodulation level shall not exceed the out of band emission or the spurious emission requirements of clause 6.5~~6~~.2 and 6.5~~6~~.3 ~~in TS 25.141~~.

6.6.4 Method of test

6.6.4 1 Initial conditions

1) Test set up in accordance to Appendix B.

6.6.4.2 Procedures

1) Generate the wanted signal in accordance to test model 1, clause 6.~~2.~~1.1.1 at specified maximum BS output power.
2) Generate the interference signal with frequency offset of 5 MHz relative to the wanted signal in accordance to test model 2, clause 6.~~2.~~1.1.2.
3) Adjust ATT1 so the level of the WCDMA modulated interference signal at BS is 30 dB below the wanted signal.
4) Perform the out of band emission test as specified in clause 6.5.2.
5) Perform the spurious emission test as specified in clause 6.5.3.
6) Verify that the emission level does not exceed the required level with the exception of interference signal frequencies.
7) Repeat the test for interference frequency off set of -5 MHz.
8) Repeat the test for interference frequency off set of +/- 10 MHz and +/-15 MHz.

NEXT MODIFIED SECTION

6.7 Transmit modulation

6.7.1 Modulation Accuracy

The modulation accuracy is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot) . The requirement is valid over the total power dynamic range as specifed in 6.4.3. The physical channels for the following test(s) shall be setup according to 6.~~2.~~1.1.1.

6.7.2 Peak code Domain error

The code domain error is computed by projecting the error vector power onto the code domain at the maximum spreading factor. The error vector for each power code is defined as the ratio to the mean power of the reference waveform expressed in dB. The peak code domain error is defined as the maximum value for the code domain error. The measurement interval is one power control group (timeslot). The physical channels for the following test shall be setup according to 6.~~2.~~1.1.3.

NEXT MODIFIED SECTION

7.3 Dynamic range

7.3.2 Conformance requirement

The BER shall not exceed 0.001 for the parameters specified in Table 7.2~~xx~~.

Table 7.2 : Dynamic range

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	<REFSENS> + 30 dB	dBm
Interfering AWGN signal	-73	dBm

NEXT MODIFIED SECTION

~~Annex D (Informative): Downlink test model~~

~~D.1 Test Model 1~~

~~This model shall be used for tests on,~~

~~□spectrum emission mask~~

~~□ACLR~~

~~□spurious emissions~~

~~□transmit intermodulation~~

~~□modulation accuracy~~

~~For the above set of measurements it is appropriate for the test signal to have high PAR. This is achieved by including 64 DPCH at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random $T_{offsets}$ (simulating a realistic traffic scenario).~~

~~Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.~~

~~"Fraction of power" relates to the mean output power on the TX antenna interface under test.~~

~~*Table 1: Test Model 1 Active Channels*~~

~~Type~~	~~Number of Channels~~	~~Fraction of Power (%)~~	~~Fraction of Power (dB)~~	~~Channelisation Code~~	~~T_{offset}~~
~~PCCPCH+SCH~~	~~1~~	~~10~~	~~-10~~	~~1~~	
~~Primary CPICH~~	~~1~~	~~10~~	~~-10~~	~~0~~	
~~PICH~~	~~1~~	~~3.2~~	~~-15~~	~~16~~	
~~DPCH~~	~~16/32/64~~	~~76.8 in total~~	~~See Table 2~~	~~See Table 2~~	~~See Table 2~~

(SF=128)					

The power levels in Table 2 were based on the results from network simulations. Lists containing 16, 32 and 64 power levels were constructed to have approximately the same power distribution of the simulation results. These powers were then randomly assigned to the chosen codes. A set of 64 codes was chosen with a random but even distribution across the codespace. Subsets of the set of 64 were chosen for the 32 and 16 code cases. $T_{offsets}$ were chosen at random.

Table 2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	2	-10.4	-13.0	-15.6
11	0	-11.1	-13.3	-15.7
17	2	-12.0	-13.9	-16.1
23	1	-14.2	-14.9	-16.8
31	6	-11.4	-16.8	-18.0
38	1	-13.0	-14.1	-20.0
47	7	-16.5	-15.6	-15.9
55	6	-15.6	-18.0	-16.5
62	1	-12.5	-16.2	-17.4
69	9	-15.3	-19.4	-19.0
78	1	-13.7	-17.1	-21.7
85	0	-17.6	-14.6	-20.3
94	0	-18.8	-16.5	-16.3
102	0	-16.9	-20.3	-17.2
113	5	-15.0	-20.6	-18.6
119	2	-9.4	-23.6	-20.8
7	3		-19.8	-18.5
13	4		-17.6	-20.5
20	2		-13.7	-17.9
27	5		-14.4	-19.7
35	9		-15.9	-24.3
41	1		-18.8	-24.0
51	7		-18.2	-22.4
58	2		-16.7	-21.0
64	5		-21.5	-18.2
74	5		-19.1	-20.2
82	8		-18.6	-16.7
88	1		-15.8	-17.7
97	9		-18.4	-19.4
108	4		-15.4	-23.0
117	9		-17.4	-22.1
125	3		-12.4	-20.5
4	6			-17.0
9	5			-18.3
12	2			-20.4
14	7			-17.3
19	8			-18.8
22	4			-21.3
26	4			-19.3
28	3			-22.6
34	5			-21.6
36	8			-19.5
40	0			-23.8
44	0			-22.8
49	2			-21.4
53	7			-19.1
56	1			-21.9

61	8	-20.7
63	2	-17.6
66	3	-19.2
71	6	-22.2
76	9	-21.2
80	3	-18.7
84	2	-21.1
87	5	-18.9
91	0	-21.5
95	9	-19.8
99	2	-25.0
105	9	-25.0
110	3	-24.8
116	3	-23.5
118	6	-21.8
122	2	-20.1
126	8	-15.3

D.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

A 10 code channel model is chosen because when testing total power dynamic range P_{max} -18 dB level (RF power) this is the maximum number of channels which we can get down to the required output power level without going under the P_{max} -28 dB level in the code domain base (when we assume that all code channels use same power).

This configuration is also suitable for power control test as we can test P_{max} -3 dB level (for one code channel in the code domain) by reducing power of the other code channels to P_{max} -13 dB.

Table 3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	7	7 x 10.97	7 x 9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

D.3 Test Model 3

This model shall be used for tests on,

- peak code domain error.

The structure of this test model is chosen assuming that error power in the inactive codes will be primarily due to the following effects,

- random noise - which will cause an even growth of error power in all codes.
- non-linearity - which will cause code intermodulation (error growth in codes which are the bitwise product of active codes)
- phase jitter - which can cause "tails" of error growth in codes adjacent to active codes.

By putting all the DPCH in the upper half of the codespace, all the error due to code intermodulation lands in the bottom half of the code space, whereas that due to noise lands evenly across the whole space, and any "tails" due to, e.g. phase jitter will be visible on the few codes in the lower half of the code space (particularly PICH which is positioned in the lower half of the code space with this in mind). The intention is to make possible a qualitative assessment of the reason for a poor PCDE result by inspecting the code domain display.

Table 4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=256)	16/32	76.8 in total	See Table 5	See Table 5	See Table 5

The channelisation codes and T_{offset} are randomly assigned. As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2
83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2
96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2
125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

D.4 DPCH Structure of the Downlink Test Models

It is proposed that for the above test models the following structure is adopted for the DPCH.

It is proposed that the DPDCH and DPCCH have the same power level.

It is proposed that the timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 1 below.

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	NData 2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

It is proposed that the test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 2 below.

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

It is proposed that the TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

It is proposed that the aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

D.4 References

[1]Ericsson, " Downlink test model for 25.141", 3GPP RAN WG4 Tdoc (99) 704.

[2][1] Hewlett Packard, "Downlink Modulation Quality Measurement", SMG2 UMTS L1-EG Tdoc 622/98.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	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:	TSG RAN #7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-01-14

Subject: Occupied Bandwidth Measurement

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: Current measurement definition and test method are non-standard.

Clauses affected: 6.5.1

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:

6.5.1 Occupied bandwidth

6.5.1.1 Definition and applicability

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean transmitted power.

The value of β/2 should be taken as 0,5%.

~~Occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency.~~

6.5.1.2 Conformance requirements

The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The reference for this requirement is TS 25.104 subclause 6.6.1.

6.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also Recommendation ITU-R SM.328-9 [7]. The test purpose is to verify that the emission of the BS does not occupy an excessive bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

6.5.1.4 Method of test

6.5.1.4.1 Initial conditions

(1) Connect the Measurement device to the BS antenna connector.

(2) Start transmission on a single carrier according to test model defined in 6.2.1.1.1.

6.5.1.4.2 Procedure

~~(1)Measure the power of the transmitted signal with a measurement filter of bandwidth 30 kHz or less. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be (7,5 – 0,015) MHz below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be (7,5 – 0,015) MHz above the assigned channel frequency of the transmitted signal.. The measured power shall be recorded for each step.~~

~~(2)Determine the total transmitted power by accumulating the recorded power measurements results of all steps.~~

~~(3)Determine the transmitted power within the assigned channel bandwidth by accumulating the recorded power measurements results of all steps with center frequencies from (2,5 – 0,015) MHz below the assigned channel frequency up to (2,5 – 0,015) MHz above the assigned channel frequency.~~

~~(4)Calculate the ratio~~

~~total transmitted power acc. to (2) / transmitted power within the assigned channel bandwidth acc. to (3).~~

1. Measure the spectrum of the transmitted signal across a span of 10 MHz, based on an occupied bandwidth requirement of 5 MHz. The selected resolution bandwidth (RBW) filter of the analyzer shall be 30 kHz or less. The spectrum shall be measured at 400 or more points across the measurement span.

Note that the detection mode of the spectrum analyzer will not have any effect on the result if the statistical properties of the out-of-OBW power are the same as those of the inside-OBW power. Both are expected to have the Rayleigh distribution of the amplitude of Gaussian noise. In any case where the statistics are not the same, though, the detection mode must be power responding. There are at least two ways to be power responding. The spectrum analyzer can be set to "sample" detection, with its video bandwidth setting at least three times its RBW setting. Or the analyzer may be set to respond to the average of the power (root-mean-square of the voltage) across the measurement cell.

2. Compute the total of the power, P0, (in power units, not decibel units) of all the measurement cells in the measurement span. Compute P1, the power outside the occupied bandwidth on each side. P1 is half of the total power outside the bandwidth. P1 is half of (100% - (occupied percentage)) of P0. For the occupied percentage of 99%, P1 is 0.005 times P0.

3. Determine the lowest frequency, f1, for which the sum of all power in the measurement cells from the beginning of the span to f1 exceeds P1.

4. Determine the highest frequency, f2, for which the sum of all power in the measurement cells from the end of the span to f2 exceeds P1.

5. Compute the occupied bandwidth as f2 - f1.

6.5.1.5 Test requirements

The ~~ratio~~ bandwidth calculated in step (5~~4~~) of subclause 6.5.1.4.2 shall be ~~0,99 or greater~~less than 5 MHz.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	004	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 #7	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		UTRAN / Radio	X	Core Network	

Source: RAN WG4 **Date:** 2000-01-14

Subject: Clarification of "random" in relation to injected bit errors

Work item:

Category: *(only one category shall be marked with an X)*				**Release:**		
	F	Correction	X		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: True randomness is unnecessary and difficult to implement.

Clauses affected: 7.8.1, 8.6.1

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:

7.8 Verification of the internal BER calculation

7.8.1 Definition and applicability

Base Station System with internal BER calculation can synchronize it's receiver to known pseudo-random data sequence and calculates bit error ratio from the received data. This test is performed only if Base Station System has this kind of feature. All data rate's which are used in RX conformance testing shall be used in verification test. This test is performed by feeding measurement signal with known BER to the input of the receiver. Locations of the errorneus bits shall be randomly distributed within a frame. Erroneus bits shall be inserted to the data bit stream as shown in Fig. 7.1.

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in Section 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the errorneus blocks shall be randomly distributed within a frame. Erroneus blocks shall be inserted into the UL signal as shown in Fig. 8.1.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	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#7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 1/14/00

Subject: Test Models for transmtter

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	X
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: Test Models for transmitter testingdefines code powers as nominal values. Tolerance for these values should be defined.

Clauses affected: 6.2.1.1.1, 6.2.1.1.3

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:

6.2.1.1.1 Test Model 1

Table 6.2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	2	-10.4	-13.0	-15.6
11	0	-11.1	-13.3	-15.7
17	2	-12.0	-13.9	-16.1
23	1	-14.2	-14.9	-16.8
31	6	-11.4	-16.8	-18.0
38	1	-13.0	-14.1	-20.0
47	7	-16.5	-15.6	-15.9
55	6	-15.6	-18.0	-16.5
62	1	-12.5	-16.2	-17.4
69	9	-15.3	-19.4	-19.0
78	1	-13.7	-17.1	-21.7
85	0	-17.6	-14.6	-20.3
94	0	-18.8	-16.5	-16.3
102	0	-16.9	-20.3	-17.2
113	5	-15.0	-20.6	-18.6
119	2	-9.4	-23.6	-20.8
7	3		-19.8	-18.5
13	4		-17.6	-20.5
20	2		-13.7	-17.9
27	5		-14.4	-19.7
35	9		-15.9	-24.3
41	1		-18.8	-24.0
51	7		-18.2	-22.4
58	2		-16.7	-21.0
64	5		-21.5	-18.2
74	5		-19.1	-20.2
82	8		-18.6	-16.7
88	1		-15.8	-17.7
97	9		-18.4	-19.4
108	4		-15.4	-23.0
117	9		-17.4	-22.1
125	3		-12.4	-20.5
4	6			-17.0
9	5			-18.3
12	2			-20.4
14	7			-17.3
19	8			-18.8
22	4			-21.3
26	4			-19.3
28	3			-22.6
34	5			-21.6
36	8			-19.5
40	0			-23.8
44	0			-22.8
49	2			-21.4
53	7			-19.1
56	1			-21.9
61	8			-20.7
63	2			-17.6
66	3			-19.2
71	6			-22.2
76	9			-21.2
80	3			-18.7

84	2	-21.1
87	5	-18.9
91	0	-21.5
95	9	-19.8
99	2	-25.0
105	9	-25.0
110	3	-24.8
116	3	-23.5
118	6	-21.8
122	2	-20.1
126	8	-15.3

Note: The figures for code power are nominal and have tolerance of ±1 dB.

6.2.1.1.3 Test Model 3

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2
83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2
96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2
125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

Note: The figures for code power are nominal and have tolerance of ±1 dB.

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	006 r1	Current Version:	3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X]
for information [ ]

(only one box should be marked with an X)

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

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

Source: RAN WG4 **Date:** 2000-03-02

Subject: Regional requirements in TS 25.141

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: Several requirements inTS 25.104 will be applied regionally, since they depend on regional regulatory requirements or on co-existence with systems that are deployed regionally. The proposed text for the “General” section clarifies this.
A regional requirement is also added for Cause .

Clauses affected: 4, 4.7, 6.2.1.2

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	CR 25.104-xxx attached
Other 2G 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:

4. General test conditions and declarations

The requirements of this clause apply to all tests in this TS, when applicable.

Many of the tests in this TS measure a parameter relative to a value which is not fully specified in the UTRA specifications. For these tests, the conformance requirement is determined relative to a nominal value specified by the manufacturer.

Certain functions of a BS are optional in the UTRA specifications. Some requirements for the BS may be regional as listed in Section 4.7.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

4.7 Regional requirements

Some requirements in TS 25.141 may only apply in certain regions. Table 4.4 lists all requirements that may be applied differently in different regions.

Table 4.4: List of regional requirements.

Clause number	Requirement	Comments
3.4.1	Frequency bands	Some bands may be applied regionally.
3.4.2	Tx-Rx Frequency Separation	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.
6.2.1.2	Base station output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in Clause 4.4.1.
6.5.2.1	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.5.3.5	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.5.3.6	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-7 [1], are applied.
6.5.3.8.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.5.3.8.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.5.3.9.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.5.3.9.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.5.3.10	Co-existence with PHS	This requirement may be applied for the protection of PHS in geographic areas in which both PHS and UTRA are deployed.
6.5.3.11	Co-.existence with services in adjacent frequency bands	This requirement may be applied for the protection in bands adjacent to 2110-2170 MHz, as defined in sub-clause 5.2(a) and 1930-1990 MHz, as defined in sub-clause 5.2(b) in geographic areas in which both an adjacent band service and UTRA are

		deployed.
6.5.3.12.1	Co-existence with UTRA TDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.5.3.12.2	Co-existence with UTRA TDD – 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.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in Clause 5.2 that are supported by the BS.

6.2.1.2 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2 dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +2.5 dB and –2.5 dB of the manufacturer's rated power.

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in Clause 4.4.1.

3G CHANGE REQUEST

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25.141 CR 007 Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

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

Source: RAN WG4 **Date:** 00-01-21

Subject: CR on Blocking test

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: Previous test unclear and contains references to non existing tests.
The text <REFSENS> +30 dB is replaced with -91 dBm

Clauses affected: 7.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G 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:

7.5 Blocking characteristics

7.5.1 Definition and applicability

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~~, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit.~~ The blocking performance shall apply at all frequencies as specified in ~~the~~ table ~~below~~ 7.4, ~~using a 1MHz step size. Test conditions and measurement method~~

The requirements in this subclause shall apply to base stations intended for general-purpose applications.

7.5.2 Conformance requirements

~~(1) Connect the BS to a mobile station simulator and a Signal generator.~~

~~(2) Disable Transmitter power control (TPC) function.~~

~~(3) Adjust the mobile station simulator to a level 6dB above the specified required reference sensitivity level.~~

~~(4) Adjust the Signal generator level to the appropriate level for the BS under test.~~

~~(5)The signal generator shall now be swept over the specified frequency band with a defined increment.~~

~~(6)The BS shall satisfy the $1x10^{-3}$ BER requirement for all signal generator frequencies above.~~

~~NOTE: The test procedure as defined in steps (5) and (6) requests to carry out more than [10000] BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.~~

~~<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >~~

~~7.5.1 Minimum requirement~~

~~The static reference performance as specified in clause 7.2.2 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.~~

The BER shall not exceed 0.001 for the parameters specified in table 7.4

Table 7.4 (a) Blocking characteristics for operation in frequency bands in sub-clause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1920 – 1980 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –115 dBm	10 MHz	WCDMA signal with one code
1900 – 1920 MHz 1980 – 2000 MHz	-40 dBm	~~<REFSENS> + 6 dB~~ –115 dBm	10 MHz	WCDMA signal with one code
1 MHz -1900 MHz,	-15 dBm	~~<REFSENS> + 6 dB~~ –115 dBm	—	CW carrier

and 2000 MHz – 12750 MHz		–115 dBm		

Table 7.4(b) : Blocking performance requirement for operation in frequency bands in sub-clause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1850 – 1910 MHz	- 40 dBm	~~<REFSENS> + 6dB~~ -115 dBm	10 MHz	WCDMA signal with one code
1830 – 1850 MHz 1910 – 1930 MHz	-40 dBm	~~<REFSENS> + 6dB~~ -115 dBm	10 MHz	WCDMA signal with one code
1 MHz – 1830 MHz 1930 MHz – 12750 MHz	-15 dBm	~~<REFSENS> + 6dB~~ -115 dBm	—	CW carrier

7.5.3 Test purpose

The test stresses the ability of the BS receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity.

7.5.4 Method of test

7.5.4.1 Initial conditions

(1) Connect WCDMA signal generator at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.

(2) Terminate any other Rx port not under test.

(3) Transmitt a signal from the WCDMA signal generator to the BS. The characteristics of the signal shall be set according to the UL reference measurement channel (12.2 kbit/s) specified in Annex A.2.1. The level of the WCDMA signal measured at the BS antenna connector shall be set to the level specified in subclause 7.5.2.

7.5.4.2 Procedure

(1) Set the signal generator to produce an interfering signal at a frequency offset Fuw from the assigned channel frequency of the wanted signal which is given by

$$Fuw = \pm (n \times 1 \text{ MHz}),$$

where n shall be increased in integer steps from n = 10 up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12.75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 7.5.2.1. The type of the interfering signal is either equivalent to a continuous WCDMA signal with one code of chip frequency 3.84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off $\alpha = 0.22$, or a CW signal; see table 7.5.2.1.

(2) Measure the BER of the wanted signal at the BS receiver.

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

(3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (2).

<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >

7.5.5 Test requirements

In all measurements made according to subclause 7.5.4.2, the BER shall not exceed 0.001.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	008	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 #7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-01-19

Subject: ACLR measurement

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: To define ACLR measurement more exactly

Clauses affected: 6.5.2.2.

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:

2.7 ≤ Δf < 3.5 MHz	P - 53 - 15·(Δf - 2.7) dBm	30 kHz [1]
3.5 ≤ Δf < 7.5 MHz	P - 52 dBm	1 MHz [2]
7.5 ≤ Δf ≤ Δf_{max} MHz	P - 56 dBm	1 MHz [2]

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	-22 dBm	30 kHz [1]
2.7 ≤ Δf < 3.5 MHz	-22 - 15·(Δf - 2.7) dBm	30 kHz [1]
3.5 ≤ Δf < 7.5 MHz	-21 dBm	1 MHz [2]
7.5 ≤ Δf ≤ Δf_{max} MHz	-25 dBm	1 MHz [2]

Notes:
1. The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz.
2. The first and last measurement positions with a 1 MHz filter are 4 MHz and (Δf_{max} – 500 kHz)

6.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

6.5.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receiver filter in the adjacent channel(s). Both the transmitted power and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate. The requirements shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

~~6.5.2.2.1 Test conditions and measurements method~~

6.5.2.2.2 Conformance requirement

Table 6.15 BS ACLR

BS channel offset below the first or above the last carrier frequency used	ACLR limit
5 MHz	45 dB
10 MHz	50 dB

6.5.2.2.3 Test purpose

To verify that the adjacent channel leakage power ratio requirement shall be met as specified in clause 6.5.2.2.2.

6.5.2.2.4 Method of test

6.5.2.2.4.1 Initial conditions

1) Connect measurement device ~~receiver~~ to the base station RF output port as shown in Annex B~~, using an attenuator or directional coupler if necessary.~~
2) The measurement device ~~receiver~~ characteristics shall be:
   Measurement filterbandwidth : Defined in section 6.5.2.2.

Sufficient averaging time to ensure 0.2dB error at 95% confidence
Detection mode : True RMS voltage or true average power.

3) Set the base station to transmit a signal modulated in accordance with 6.1.1.1 Test model 1 ~~6.2.1.1.1 (Model 1)~~. Total power at the RF output port shall be the maximum output ~~nominal~~ power as specified by the manufacturer.

4) Set carrier frequency within the frequency band supported by BS. Minimum carrier spacing shall be 5 MHz and maximum carrier spacing shall be specified by manufacturer.

~~4. Measure the power level at the carrier frequency.~~

6.5.2.2.4.2 Procedure

1) Measure Adjacent channel leakage power ratio for 5 MHz and 10 MHz offsets both side of channel frequency. In multiple carrier case only offset frequencies below the lowest and above the highest carrier frequency used shall be measured.

2) All RF channel configurations supported by BS shall be verified.

6.5.2.2.5 Test requirement

Adjacent channel leakage power ratio requirement shall be met as specified in clause 6.5.2.2.2.

~~**6.5.2.2.2 Minimum requirement**~~

~~**Table 6.15** BS ACLR~~

~~BS channel offset below the first or above the last carrier frequency used~~	~~ACLR limit~~
~~5 MHz~~	~~45 dB~~
~~10 MHz~~	~~50 dB~~

~~Note: In order to ensure that switching transients due to the slotted mode do not degrade the ACLR value the reference measurements conditions are an item for further study.~~

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	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:	TSG RAN #7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-01-19

Subject: Peak code domain error measurement

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 offeature	
D	Editorial modification	

Release:

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

Reason for change: To define peak code domain error measurement more exactly

Clauses affected: 6.7.2.

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:

6.7.2 Peak code domain error

6.7.2.1 Definition and applicability

The code domain error is computed by projecting the error vector power onto the code domain at the maximum spreading factor. The error vector for each power code is defined as the ratio to the mean power of the reference waveform expressed in dB. The peak code domain error is defined as the maximum value for the code domain error. The measurement interval is one power control group (timeslot). ~~The physical channels for the following test shall be setup according to 6.2.1.1.3.~~

~~6.7.2.1 Minimum requirement~~

6.7.2.2 Conformance requirement

The peak code domain error shall not exceed ~~[~~ -33 ~~]~~ dB

6.7.2.3 Test purpose

To verify that the peak code domain error requirement shall met as specified in clause 6.7.2.2 .

6.7.2.4 Method of test

6.7.2.4.1 Initial conditions

1) Connect the measurement equipment to the BS antenna connector as shown in Annex B.

2) Channel configuration defined in clause 6.1.1.3 Test model 3 shall be used.

3) Set BS frequency

4) Start BS transmission

6.7.2.4.2 Procedure

1) Set power as defined in clause 6.1.1.3 Test model 3 for each code channel.

2) Measure Peak code domain error

6.7.2.5 Test requirement

Peak code domain error requirement shall met requirement as specified in clause 6.7.2.2

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141 **CR** **010** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 for approval [X] *(only one box should*
list TSG meeting no. here ↑ for information [ ] *be marked with an X)*

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/3GCRFxx.rtf

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

Source: RAN WG4 **Date:** 00-02-29

Subject: Clarification on the testpoint and the set of specifications to be considered in case of us of RF devices external to the BS.

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The purpose of that contribution is to clarify the test point to be considered for t compliance tests when RF apparatuses outsideof the BS are used (*i.e. a masthead power amplifier or a low noise amplifier external to the BS cabinet*).

Clauses affected: 6.1 & 7.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G 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

6.1 General

~~All tests in this Clauseshall be conducted on Base Station fitted with a fullcomplement of Transceivers for the configuration unless otherwise stated. Transmission power shall be at the maximum output power unless otherwise stated. Measurements shall be made at the BS Tx antenna connector, unless otherwise stated~~

Unless otherwise stated, all tests in this clause shall be performed at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a TX amplifier, a diplexer, a filter or the combination of such devices is used, the tests according to clauses 4.6.2 and/or 4.6.4, depending on the device added, shall be performed to ensure that the requirements are met at test port B.

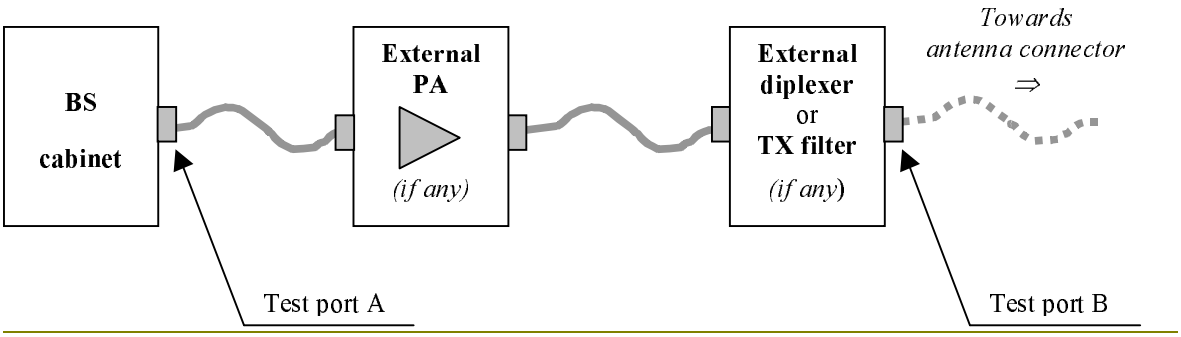

Figure 1: Transmitter test ports

Power levels are expressed in dBm.

7 Receiver characteristics

7.1 General

~~All tests unless otherwise stated in this subclause shall be conducted on Base Station Systems fitted with a full complement of Transceivers for the configuration. Measurements shall include any RX multicoupler.~~

~~□~~Unless otherwise stated, all tests in this clause shall be performed at the BS antenna connector (test port A) with a full complement of transceivers for the configuration in normal operating conditions. If any external apparatus such as a RX amplifier, a diplexer, a filter or the combination of such devices is used, the tests according to clauses 4.6.2 and/or 4.6.4, depending on the device added, shall be performed to ensure that the requirements are met at test port B.

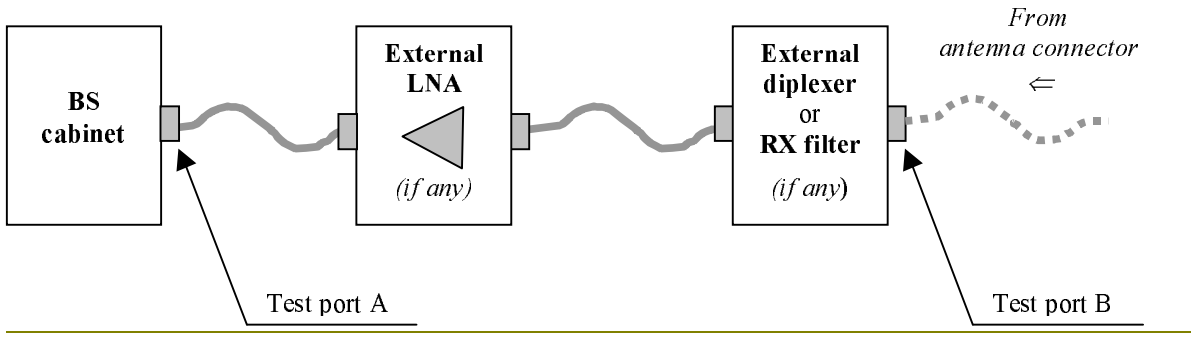

Figure 2: Receiver test ports

The tests in Section 7 assume that the receiver is not equipped with diversity. For receivers with diversity, unless otherwise stated, tests shall be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s). The tests and requirements are otherwise unchanged.
In all the relevant subclauses in this clause all Bit Error Ratio (BER), Residual BER (RBER) and Block Error Ratio (BLER) measurements shall be carried out according to the general rules for statistical testing in annex A.
If external BER measurement is not used then the internal BER calculation shall be used instead. When internal BER calculation is used, the requirements of the verification test according to 7.8 shall be met in advance.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	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: RAN #7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-24

Subject: CR for Performance requirement in TS 25.141

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 offeature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The tests for performance are lacking in the current specification. Furthermore the channel models are included as an annex

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:

8 Performance requirement

8.1 General

All Bit Error Ratio (BER) and Block Error ratio (BLER) measurements shall be carried out according to the general rules for statistical testing defined in ITU-T O.153 [5].

If external BLER measurement is not used then the internal BLER calculation shall be used instead. When internal BLER calculation is used, the requirements of the verification test according to 8.6 shall be met in advance.

Performance requirements are specified for a number of test environments and multi-path channel classes.

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 E_b/N_0 shall be applied separately at each antenna port.

~~<Editor's note: The following sections are taken from correspondent sections in TS25.104. Only requirements are specified at the moment. Test method to be specified. >~~

8.2 Demodulation in static propagation conditions

8.2.1 ~~8.2.1~~ Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications

8.2.1.~~1~~2 ~~Minimum~~ Conformance requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.1.

Table 8.1: Performance requirements in AWGN channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	5.1 dB
64 kbps	1.5 dB	1.7 dB
144 kbps	0.8 dB	0.9 dB
384 kbps	0.9 dB	1.0 dB

The reference for this requirement is TS 25.104 subcaluse 8.2.1.1

8.2.1.3 Test purpose

The test shall verify the receiver's ability to receive the test signal under static propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.2.1.4.1 Initial conditions

(1) Connect the BS tester generating the wanted signal and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.2.1.4.2 Procedure

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) Adjust the equipment so that required E_b/N_O specified in table 8.1 is achieved.

(4) For each of the data rates in table 8.1 applicable for the base station, measure the BLER

8.2.1.5 Test requirements

The BLER measured according to subclause 8.2.1.4.2 shall not exceed the limits specified in table 8.1

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 ~~8.3.1~~ Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications

8.3.1.~~1~~2 ~~Minimum~~ Conformance 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 multipath Case 1 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	11.9 dB
64 kbps	6.2 dB	9.2 dB
144 kbps	5.4 dB	8.4 dB
384 kbps	5.8 dB	8.8 dB

The reference for this requirement is TS 25.104 subclause 8.3.1.1

8.3.1.3 Test Purpose

The test shall verify the receiver's ability to receive the test signal under slow multipath fading propagation conditions with a BLER not exceeding a specified limit.

8.3.1.4 Method of test

8.3.1.4.2 Initial conditions

(1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.3.1.4.2 Procedure

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex X

(4) Adjust the equipment so that required E_b/N_O specified in table 8.2 is achieved.

(5) For each of the data rates in table 8.2 applicable for the base station, measure the BLER

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the limits specified in table 8.2

8.3.2 ~~8.3.2~~ Multipath fading Case 2

8.3.2.1 Definition and applicability

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 E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications

8.3.2.~~1~~2 ~~Minimum~~ Conformance 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 2 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	9.0 dB
64 kbps	4.3 dB	6.4 dB
144 kbps	3.7 dB	5.6 dB
384 kbps	4.1 dB	6.1 dB

The reference for this requirement is TS 25.104 subcaluse 8.3.2.1

8.3.1.3 Test Purpose

The test shall verify the receivers ability to receive the test signal under slow fading propagation conditions with a BLER not exceeding a specified limit.

8.2.1.4 Method of test

8.3.1.4.1 Initial conditions

(1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.3.1.4.2 Procedure

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex X

(4) Adjust the equipment so that required E_b/N_O specified in table 8.3 is achieved.

(5) For each of the data rates in table 8.3 applicable for the base station, measure the BLER

8.3.1.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the limits specified in table 8.3

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications

8.3.3.21 ~~Minimum~~ Conformance 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 3 channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}	Required E_b/N_0 BLER < 10^{-3}
12.2 kbps	n.a	6.7 dB	7.5 dB
64 kbps	2.7 dB	3.2 dB	3.4 dB
144 kbps	2.2 dB	2.5 dB	2.8 dB
384 kbps	2.6 dB	3.0 dB	3.5 dB

The reference for this requirement is TS 25.104 subcaluse 8.3.3.1

8.3.3.3 Test Purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

(1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.3.3.4.2 Procedure

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex X

(4) Adjust the equipment so that required E_b/N_O specified in table 8.4 is achieved.

(5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER

8.3.3.5 Test requirements

The BLER measured according to subclause 8.3.3.4.2 shall not exceed the limits specified in table 8.4

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general-purpose applications

8.4.21 ~~Minimum~~ Conformance 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 moving channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	
64 kbps		
~~144 kbps~~		
~~384 kbps~~		

The reference for this requirement is TS 25.104 subcaluse 8.4.1

8.4.3 Test Purpose

The test shall verify the receiver's ability to receive and track the test signal with a BLER not exceeding the specified limit.

8.4.3.1 Method of test

8.4.3.1.1 Initial conditions

(1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.4.3.1.2 Procedur

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex X

(4) Adjust the equipment so that required E_b/N_O specified in table 8.4 is achieved.

(5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER

8.4.2.4 Test requirements

The BLER measured according to subclause 8.4.2.3.2 shall not exceed the limits specified in table 8.5

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to base stations intended for general purpose applications

8.5.~~1~~2 ~~Minimum~~ Conformance requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.6.

Table 8.6: Performance requirements in birth/death channel.

Measurement channel	Required E_b/N_0 BLER < 10^{-1}	Required E_b/N_0 BLER < 10^{-2}
12.2 kbps	n.a.	
64 kbps		
~~144 kbps~~		
~~384 kbps~~		

The reference for this requirement is TS 25.104 subclause 8.5.1

8.5.2.1 Test Purpose

The test shall verify the receiver's ability to receive the test signal that has a large time dispersion with a BLER not exceeding the specified limit.

8.5.2.2 Method of test

8.5.2.2.1 Initial conditions

(1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in Annex X

8.5.2.2.2 Procedure

(1) Adjust the AWGN generator to –89 dBm/3.84 MHz

(2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex X

(4) Adjust the equipment so that required E_b/N_O specified in table 8.4 is achieved.

(5) For each of the data rates in table 8.4 applicable for the base station, measure the BLER

8.5.2.3 Test requirements

The BLER measured according to subclause 8.5.2.2.2 shall not exceed the limits specified in table 8.6

8.6 Verification of the internal BLER calculation

8.6.1 Definition and applicability

Base Station System with internal BLER calculates block error rate from the CRC blocks of the received. This test is performed only if Base Station System has this kind of feature. All data rates which are used in Section 8 Performance requirement testing shall be used in verification testing. This test is performed by feeding measurement signal with known BLER to the input of the receiver. Locations of the errorneus blocks shall be random. Erroneus blocks shall be inserted into the UL signal as shown in Fig. 8.1.

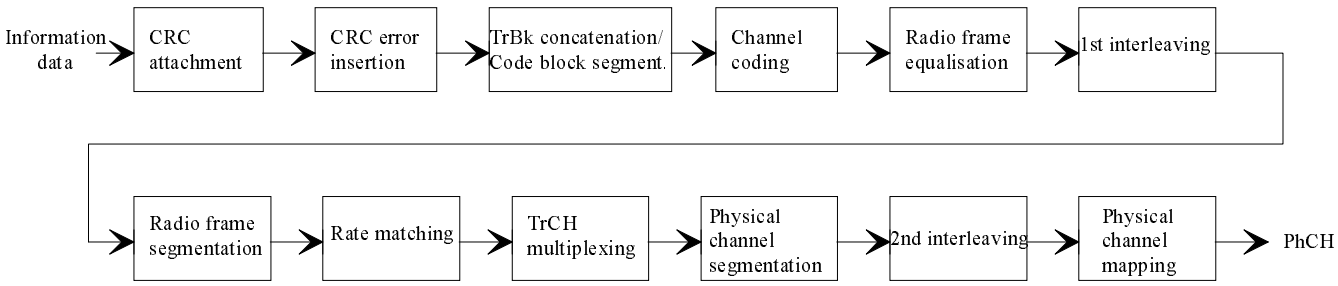

Figure 8.1 BLER insertion to the output data

8.6.2 Conformance requirement

BLER indicated by the Base Station System shall be within ±[10%] of the BLER generated by the RF signal source. Measurement shall be repeated for each signal rate as specified in Table 8.7.

Table 8.7

Transport channel combination	Data rate	BLER

DPCH	12.2 kbps	BLER 0.01
DPCH	64 kbps	BLER 0.01
DPCH	144 kbps	BLER 0.01
DPCH	384 kbps	BLER 0.01
DPCH	2048 kbps	BLER 0.01

Note: 10 times larger BLER generator is used to get a good confidence.

8.6.3 Test purpose

To verify that the internal BLER calculation accuracy shall met requirements for conformance testing.

8.6.4 Method of test

8.6.4.1 Initial conditions

(1) Connect the BS tester generating the wanted signal to both BS antenna connectors for diversity reception via a combining network as shown in Annex B~~Connect BS RX antenna connector to the RF signal source or UE simulator as shown in Annex B~~

(2) ~~Set correct signal source parameters as specified in Table 8.6.2.~~

Table 8.8

Parameter	Level/status	Unit
UL signal level	Ref.sens + 10 dB	dBm/3.84 MHz
Data sequence	PN9	

8.6.4.2 ~~8.6.4.2~~ Procedure

(1) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in Annex A.

(2) The BLER insertion to the wanted signal shall be configured according to the corresponding data rate in table 8.7

(3) Adjust the BS tester so that the required UL signal level specified in table 8.8 is achieved.

For each of the data rates in table 8.6 applicable for the base station, measure the BLER at least over 50000 blocks.

~~(1)Measure the BLER of received signal from RF signal source or UE simulator to BS antenna connector~~

~~(2)BLER calculation shall be done at least over 50000 blocks~~

~~(3)~~(1) ~~Repeat test for all required data rates~~

8.6.5 Test requirement

BLER indicated by the Base Station System shall be within requirement as specified in clause 8.6.2.

B.2.6 Receiver spurious emission

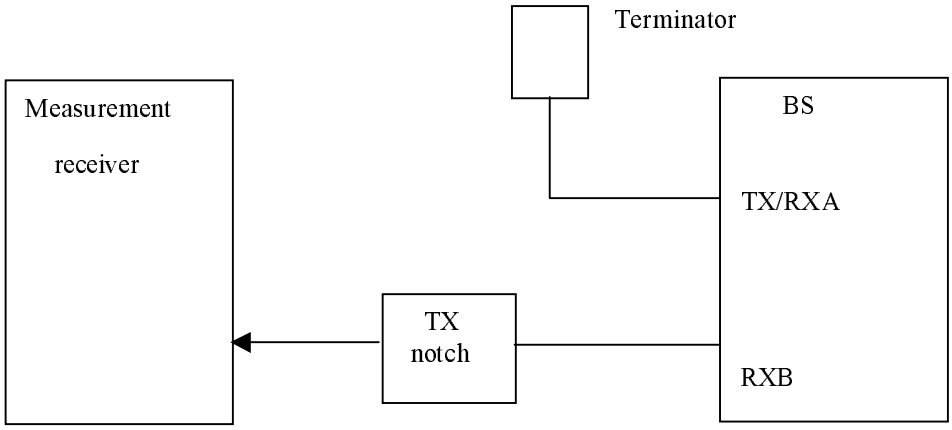

Fig. B.15 Measuring system Setup for Receiver spurious emission

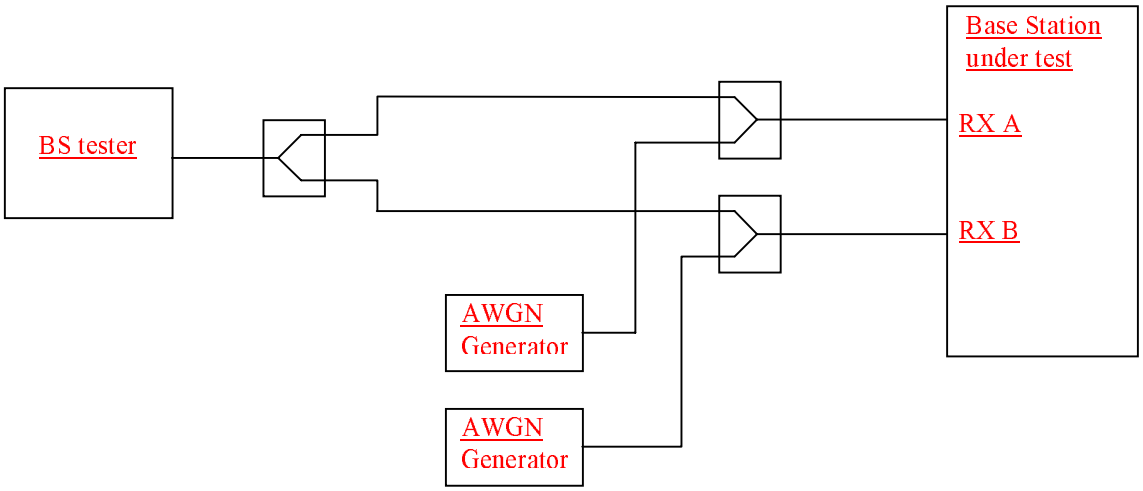

Fig. B.16 Functional Setup for Demodulation in static conditions

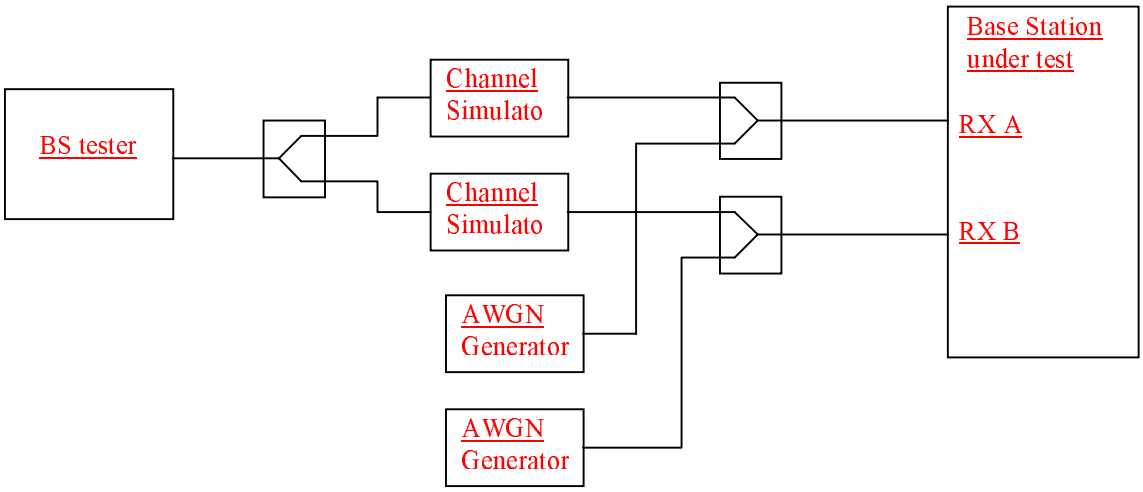

Fig. B.17 Functional Setup for Demodulation of DCH in multipath fading conditions

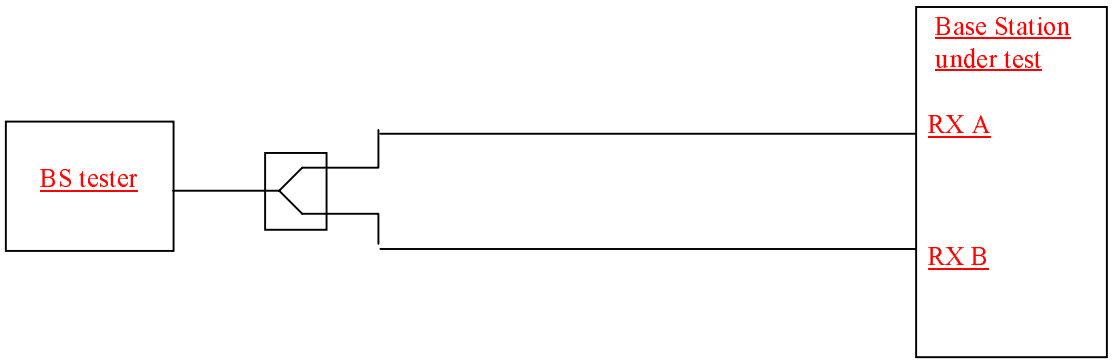

Fig. B.18 Functional Setup for Verification of the internal BLER calculation

Annex X (normative): Propagation conditions

Static propagation condition

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

X.2 Multi-path fading propagation conditions

TableX.1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

TableX.1: 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
		20000	0	521	-6
				781	-9

X.3 Moving propagation conditions

The dynamic propagation conditions for the test of the baseband performance are non fading channel models with two taps. The moving propagation condition has two tap, one static, Path0, and one moving, Path1. The time difference between the two paths is according Equation (X.1). The taps have equal strengths and equal phases.

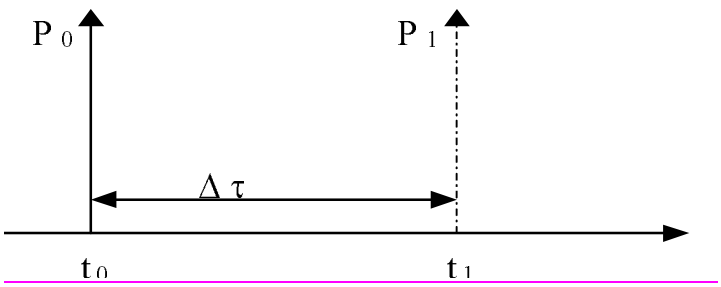

Figure X1: The moving propagation conditions

$$\Delta\tau = \left(1 + \frac{A}{2}\left(1 + \sin(\Delta\omega \cdot t)\right)\right)$$

μs Equation X.1

The parameters in the equation are shown in.

A	5 μs
Δω	$40*10^{-3}$ s^{-1}

X.4 Birth-Death propagation conditions

The dynamic propagation conditions for the test of the baseband performance is a non fading propagation channel with two taps. The moving propagation condition has two taps, Path1 and Path2 which alternate between 'birth' and 'death'. The positions the paths appear are randomly selected with an equal probability rate and is shown in Figure X2.

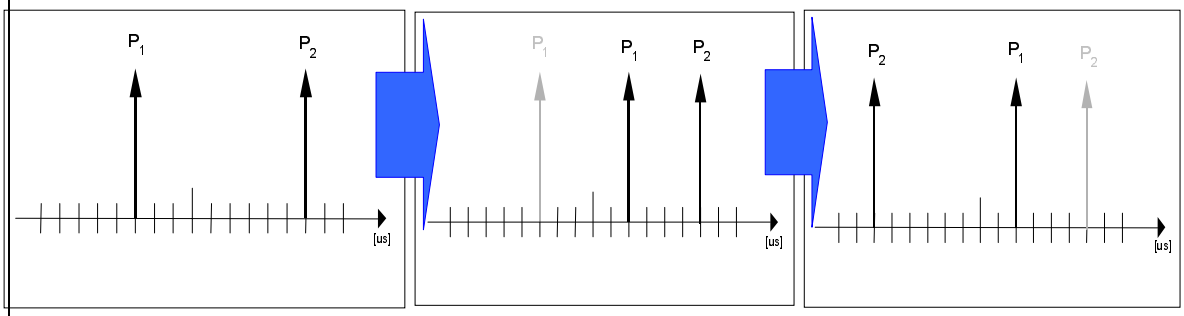

Figure X2: Birth death propagation sequence

Note

1. Two paths, Path1 and Path2 are randomly selected ~~between -5μs and + 5μs~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs. The paths have equal strengths and equal phases.
2. After 191 ms, Path1 vanishes and reappears immediately at a new location randomly selected ~~between -5μs and + 5μs from~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs but excludes the point Path2.
3. After an additional 191 ms, Path2 vanishes and reappears immediately at a new location randomly selected ~~between -5μs and + 5μs~~ from the group [-5, -4, -3, -2, -1, 0 ,1, 2, 3, 4, 5] μs but excludes the point Path1.
4. The sequence in 2) and 3) is repeated.

CHANGE REQUEST

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25.141	CR	012	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 #7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-24

Subject: Spectrum emission mask

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: Test of spectrum emission mask is lacking in specification.

Clauses affected: 6.5.2.1

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:

6.5.2.1 Spectrum emission mask

6.5.2.1.1 Definition and applicability~~Test conditions and measurement method~~

~~<Editor's note: Test conditions to be specified. >~~

The spectrum emission mask defined below may be mandatory in certain regions. In other regions this mask may not be applied. For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification.

6.5.2.1.2 ~~Minimum requirement~~Conformance requirement

~~<Editor's note: The text below is just cut and pasted from 25.104 to keep coincidence. Better description may be applied. >~~

~~The mask defined in Table 6.11 toTable 6.14below may be mandatory in certain regions. In other regions this mask may not be applied.~~

~~For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification.~~ Emissions shall not exceed the maximum level specified by the mask in the frequency range with offset Δf from 2.5 MHz to Δf_{max} from the carrier frequency. The maximum offset Δf_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 3.4.1, whichever is the greatest.

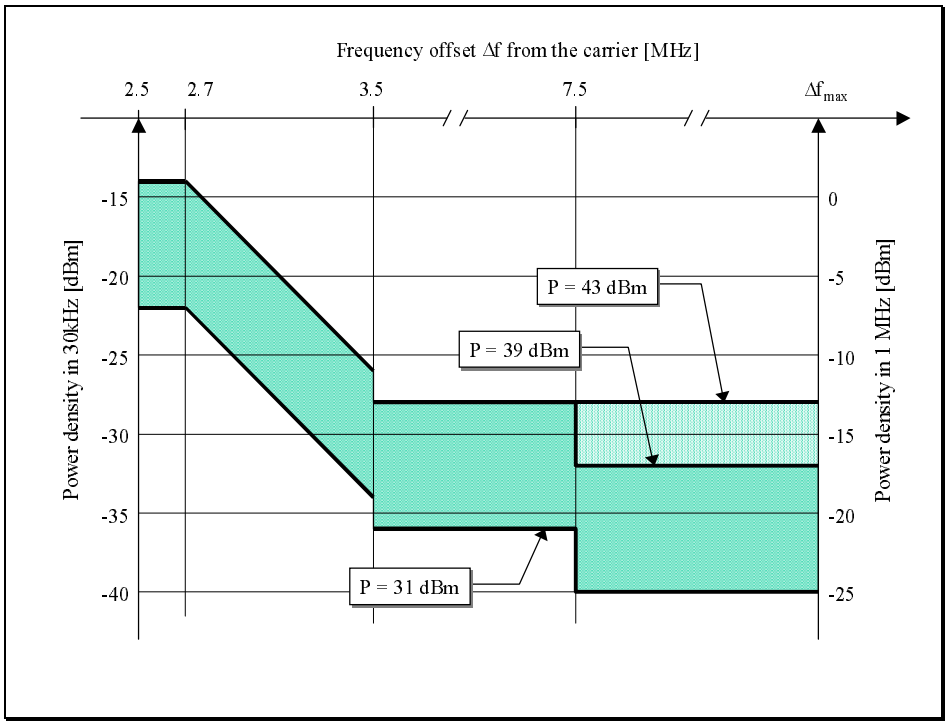

Fig. 6.1

Table 6.11: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
2.5 ≤ Δf < 2.7 MHz	-14 dBm	30 kHz

$2.7 \le \Delta f < 3.5$ MHz	- 14 - 15·(Δf - 2.7) dBm	30 kHz
$3.5 \le \Delta f \le \Delta f_{max}$ MHz	-13 dBm	1 MHz

Table6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
$2.5 \le \Delta f < 2.7$ MHz	-14 dBm	30 kHz
$2.7 \le \Delta f < 3.5$ MHz	-14 - 15·(Δf - 2.7) dBm	30 kHz
$3.5 \le \Delta f < 7.5$ MHz	-13 dBm	1 MHz
$7.5 \le \Delta f \le \Delta f_{max}$ MHz	P - 56 dBm	1 MHz

Table 6.13: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
$2.5 \le \Delta f < 2.7$ MHz	P - 53 dBm	30 kHz
$2.7 \le \Delta f < 3.5$ MHz	P - 53 - 15·(Δf - 2.7) dBm	30 kHz
$3.5 \le \Delta f < 7.5$ MHz	P - 52 dBm	1 MHz
$7.5 \le \Delta f \le \Delta f_{max}$ MHz	P - 56 dBm	1 MHz

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

Frequency offset Δf	Maximum level	Measurement bandwidth
$2.5 \le \Delta f < 2.7$ MHz	-22 dBm	30 kHz
$2.7 \le \Delta f < 3.5$ MHz	-22 - 15·(Δf - 2.7) dBm	30 kHz
$3.5 \le \Delta f < 7.5$ MHz	-21 dBm	1 MHz
$7.5 \le \Delta f \le \Delta f_{max}$ MHz	-25 dBm	1 MHz

~~Notes:~~

~~1.The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz.~~

~~2.The first and last measurement positions with a 1 MHz filter are 4 MHz and (Δf_{max} – 500 kHz)~~

6.5.2.1.3 Test purpose

The purpose of this test is to verify that the BS meet the spectrum emission requirements as specified in TS25.104, clause 6.6.2.1.

6.5.2.1.4 Method of test

6.5.2.1.4.1 Initial conditions

1) Set up the equipment as shown in Annex A.

2) The first and last measurement positions with a 30 kHz filter shall be 2.515 MHz and 3.485 MHz

3) The first and last measurement positions with a 1 MHz filter shall be 4 MHz and (Δf_{max} – 500 kHz)

4) Detection mode: True RMS

6.5.2.1.5 Procedures

1) Set the BS to transmit a signal in accordance to test model 1, clause 6.2.1.1.1 at by the manufacturer specified maximum output power.
2) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6.5.2.1.6 Test requirements

In all measurements, the requirements according to sub-clause 6.5.2.1.2 shall be fulfilled.

CHANGE REQUEST

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25.141	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#7 *List expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-24

Subject: BS configurations

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: Table 4.3 needs description on BS configuration for each receiver/transmitter tests.

Clauses affected: 4.6.4

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:

4.6.4 Ancillary RF amplifiers

<Table from GSM11.21 will be here. Note on passive elements should be here.>

Ancillary RF amplifier: a piece of equipment, which when connected by RF coaxial cables to the BS, has the primary function to provide amplification between the transmit and/or receive antenna connector of a BS and an antenna without requiring any control signal to fulfil its amplifying function.

The requirements of this TS shall be met with the ancillary RF amplifier fitted. At tests according to clause 6 and 7 for TX and RX respectively, the ancillary amplifier is connected to the BS by a connecting network (including any cable(s), attenuator(s), etc.) with applicable loss to make sure the appropriate operating conditions of the ancillary amplifier and the BS. The applicable connecting network loss range is declared by the manufacturer. Other characteristics and the temperature dependence of the attenuation of the connecting network are neglected. The actual attenuation value of the connecting network is chosen for each test as one of the applicable extreme values. The lowest value is used unless otherwise stated.

Sufficient tests should be repeated with the ancillary amplifier fitted and, if it is optional, without the ancillary RF amplifier to verify that the BS meets the requirements of this TS in both cases.

When testing, the following tests should be repeated with the optional ancillary amplifier fitted according to the table below, where x denotes that the test is applicable:

Table 4.3

	Subclause	TX amplifier only	RX amplifier only	TX/RX amplifiers combined (Note)
Receiver Tests	7.2		X	X
	7.5		X	X
	7.6		x	X
	7.7		x	
Transmitter Tests	6.2	x		X
	6.5.1	X		X
	6.5.2.2	X		x
	6.5.3	x		X
	6.6	x		X

~~<Editor's note: To be filled in. >~~

NOTE: Combining can be by duplex filters or any other network. The amplifiers can either be in RX or TX branch or in both. Either one of these amplifiers could be a passive network.

In test according to subclause ~~[~~6.2~~]~~ and ~~[~~7.2~~]~~ highest applicable attenuation value is applied.

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141 **CR** **014** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf*

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

Source: RAN WG4 **Date:** 00-02-29

Subject: Test models

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The current definitions of the test models are incomplete. Values for missing parameters are proposed in this CR.

Clauses affected: 6.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G 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:

6.1 General

All tests in this Clause shall be conducted on Base Station fitted with a full complement of Transceivers for the configuration unless otherwise stated. Transmission power shall be at the maximum output power unless otherwise stated. Measurements shall be made at the BS Tx antenna connector, unless otherwise stated.Power levels are expressed in dBm.

6.1.1 Test Models

The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test. The mean overall output power to be transmitted, is specified with each test.

6.1.1.1 Test Model 1

This model shall be used for tests on.

- spectrum emission mask
- ACLR
- spurious emissions
- transmit intermodulation
- modulation accuracy

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets~~T~~$_{offsets}$, are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" relates to the mean output power on the TX antenna interface under test.

Table 6.1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	Timing offset (x256T$_{chip}$)~~T~~ ~~offset~~
PCCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	3.2	-15	16	120
DPCH (SF=128)	16/32/64	76.8 in total	See Table 6.2	See Table 6.2	See Table 6.2

Table 6.2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	86~~——2~~	-10.4	-13.0	-15.6
11	134 ~~0~~	-11.1	-13.3	-15.7
17	52~~——2~~	-12.0	-13.9	-16.1

23	45——1	-14.2	-14.9	-16.8
31	143——6	-11.4	-16.8	-18.0
38	112——1	-13.0	-14.1	-20.0
47	59——7	-16.5	-15.6	-15.9
55	23——6	-15.6	-18.0	-16.5
62	1——1	-12.5	-16.2	-17.4
69	88——9	-15.3	-19.4	-19.0
78	30——1	-13.7	-17.1	-21.7
85	18——0	-17.6	-14.6	-20.3
94	30——0	-18.8	-16.5	-16.3
102	61——0	-16.9	-20.3	-17.2
113	128——5	-15.0	-20.6	-18.6
119	143——2	-9.4	-23.6	-20.8
7	83——3		-19.8	-18.5
13	25——4		-17.6	-20.5
20	103——2		-13.7	-17.9
27	97——5		-14.4	-19.7
35	56——9		-15.9	-24.3
41	104——1		-18.8	-24.0
51	51——7		-18.2	-22.4
58	26——2		-16.7	-21.0
64	137——5		-21.5	-18.2
74	65——5		-19.1	-20.2
82	37——8		-18.6	-16.7
88	125——1		-15.8	-17.7
97	149——9		-18.4	-19.4
108	123——4		-15.4	-23.0
117	83——9		-17.4	-22.1
125	5——3		-12.4	-20.5
4	91——6			-17.0
9	7——5			-18.3
12	32——2			-20.4
14	21——7			-17.3
19	29——8			-18.8
22	59——4			-21.3
26	22——4			-19.3
28	138——3			-22.6
34	31——5			-21.6
36	17——8			-19.5
40	9——0			-23.8
44	69——0			-22.8
49	49——2			-21.4
53	20——7			-19.1
56	57——1			-21.9
61	121——8			-20.7
63	127——2			-17.6
66	114			-19.2

	3	
71	100 6	-22.2
76	76——9	-21.2
80	141 3	-18.7
84	82——2	-21.1
87	64——5	-18.9
91	149 0	-21.5
95	87——9	-19.8
99	98——2	-25.0
105	46——9	-25.0
110	37——3	-24.8
116	87——3	-23.5
118	149 6	-21.8
122	85——2	-20.1
126	69——8	-15.3

6.1.1.2 Test Model 2

This model shall be used for tests on.

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	Timing offset ($x256T_{chip}$)T offset
PCCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	3.2	-15	16	120
DPCH (SF=128)	7	7 x 10.97	7 x -9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

6.1.1.3 Test Model 3

This model shall be used for tests on.

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	Timing offset ($x256T_{chip}$)T offset
PCCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	3.2	-15	16	120
DPCH (SF=256)	16/32	76.8 in total	See Table 6.5	See Table 6.5	See Table 6.5

As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	862	-13.2	-16.2
69	1340	-13.2	-16.2
74	522	-13.2	-16.2
78	451	-13.2	-16.2
83	1436	-13.2	-16.2
89	1121	-13.2	-16.2
93	597	-13.2	-16.2
96	236	-13.2	-16.2
100	11	-13.2	-16.2
105	889	-13.2	-16.2
109	301	-13.2	-16.2
111	180	-13.2	-16.2
115	300	-13.2	-16.2
118	610	-13.2	-16.2
122	1285	-13.2	-16.2
125	1432	-13.2	-16.2
67	833		-16.2
71	254		-16.2
76	1032		-16.2
81	975		-16.2
86	569		-16.2
90	1041		-16.2
95	517		-16.2
98	262		-16.2
103	1375		-16.2
108	655		-16.2
110	378		-16.2
112	1251		-16.2
117	1499		-16.2
119	1234		-16.2
123	839		-16.2
126	53		-16.2

6.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

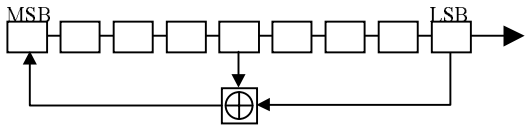
The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame: the first bit is the LSB of the channelisation code.



6.1.1.5 Common channel Structure of the Downlink Test Models

6.1.1.5.1 P-CCPCH

The aggregate 15 x 18 = 270 P-CCPCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. Channelisation code of the P-CCPCH is used as the seed for the PN sequence at the start of each frame.

6.1.1.5.2 PICH

PICH carries 18 Paging Indicators (PI) equals to [1 0 1 1 0 0 0 1 0 1 1 0 0 0 1 0 1 0]. This defines the 288 first symbols (= ± 1 ± j) of the PICH. No power is transmitted for the 12 remaining unused symbols (=0).

6.1.1.5.3 Primary scrambling code and SCH

Primary scrambling code is 0. The secondary SCH is then defined by the SSC sequence of scrambling group 1. In their active part, primary and secondary SCH are set at equal power, The sequence of SSC for secondary SCHThis defines the primary and secondary SCH (group 1). In their active part, primary and secondary SCH share equally the power level defined for “PCCPCH+SCH”.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	015	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 #7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-02-29

Subject: Update to Downlink Test Models

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: Current PN generator non-standard and ambiguously defined. Scrambling code undefined.

Clauses affected: 6.2.1.1.4, 6.2.1.1.5

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:

6.2.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	NPilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial ~~$x^9 + x^4 + 1$~~ $x^9 + x^5 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

The sequence ~~may~~shall be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The generator shall~~may~~ be seeded so that the sequence begins with the 7 bit channelisation code starting from the LSB, and followed by 2 consecutive ONEs.

- Number of shift register stages 9
- Length of pseudo-random sequence $2^9 - 1 = 511$ bits
- Longest sequence of zeros 8 (non-inverted signal)

6.2.1.1.5 Scrambling Code Defaults for Downlink Test Models

The scrambling code should be 0.

Where multiple repetitions of the Test Model signals are being used to simulate a multi-carrier signal, the scrambling code for the central carrier should be 0, carriers added at successively lower frequencies should use codes 2, 4, ... and carriers added at successively higher frequencies should use codes 1, 3, ...

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	016	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#7 *List expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2/21/00

Subject: Remove revision marks in Annex-A

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	
D	Editorial modification	X

Release:

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

Reason for change: Some of the charts in Annex A still have revision marks though they should be cleaned up.

Clauses affected: Annex-A

Other specs Affected:

Other 3G core specifications		→ List of CRs: None
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: CR still has change bars to indicate where they are.

Annex A (Normative): Measurement channels

A.1 Summary of UL reference measurement channels

The parameters for the UL reference measurement channels are specified in Table A.1 and the channel coding is detailed in figure A.1 through A.5 respectively. Note that for all cases, one DPCCH shall be attached to DPDCH(s).

Table A.1: Reference measuremet channels for UL DCH

Parameter		DCH for DTCH / DCH for DCCH					Unit
DPDCH	Information bit rate	12.2/2.4	64/2.4	144/2.4	384/2.4	2048/2.4	kbps
	Physical channel	60/15	240/15	480/15	960/15	960/15	kbps
	Spreading factor	64	16	8	4	4	
	Repetition rate	22/22	19/19	8/9	-18/-18	-1/-1	%
	Interleaving	20	40	40	40	80	ms
	Number of DPDCHs	1	1	1	1	6	
DPCCH	Dedicated pilot	6					bit/slot
	Power control	2					bit/slot
	TFCI	2					bit/slot
	Spreading factor	256					
Power ratio of DPCCH/DPDCH		-2.69	-5.46	-9.54	-9.54	-9.54	dB
Amplitude ratio of DPCCH/DPDCH		0.7333	0.5333	0.3333	0.3333	0.3333	

A.2 UL reference measurement channel for 12.2 kbps

The parameters for the UL reference measurement channel for 12.2 kbps are specified in Table A.2 and the channel coding is detailed in Figure A.2.

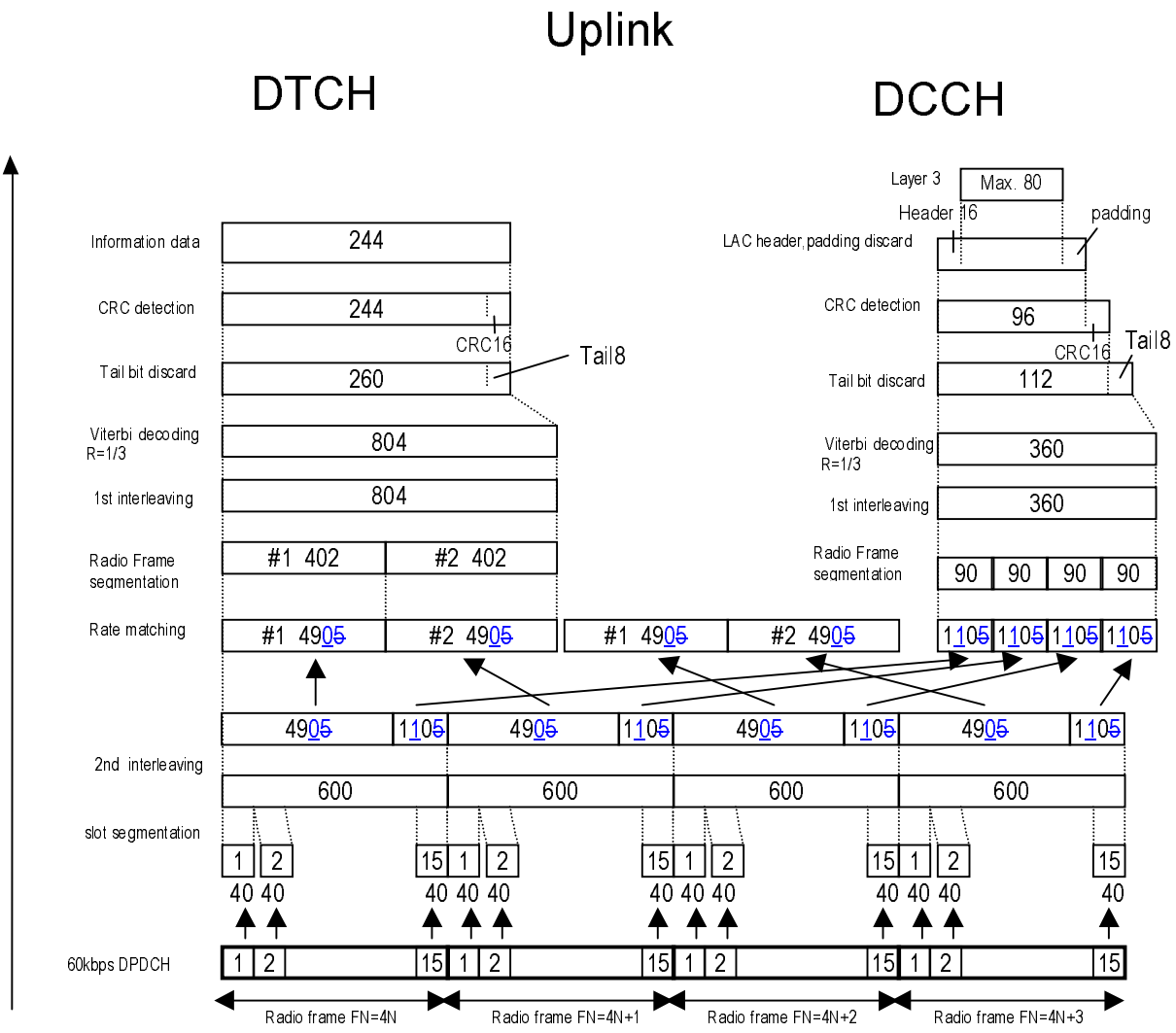


Table A.2: UL reference measurement channel (12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPCH	60	kbps
Power control	Off	
TFCI	On	
Repetition	22	%

A.3 UL reference measurement channel for 64 kbps

The parameters for the UL reference measurement channel for 64 kbps are specified in Table A.3 and the channel coding is detailed in Figure A.3.

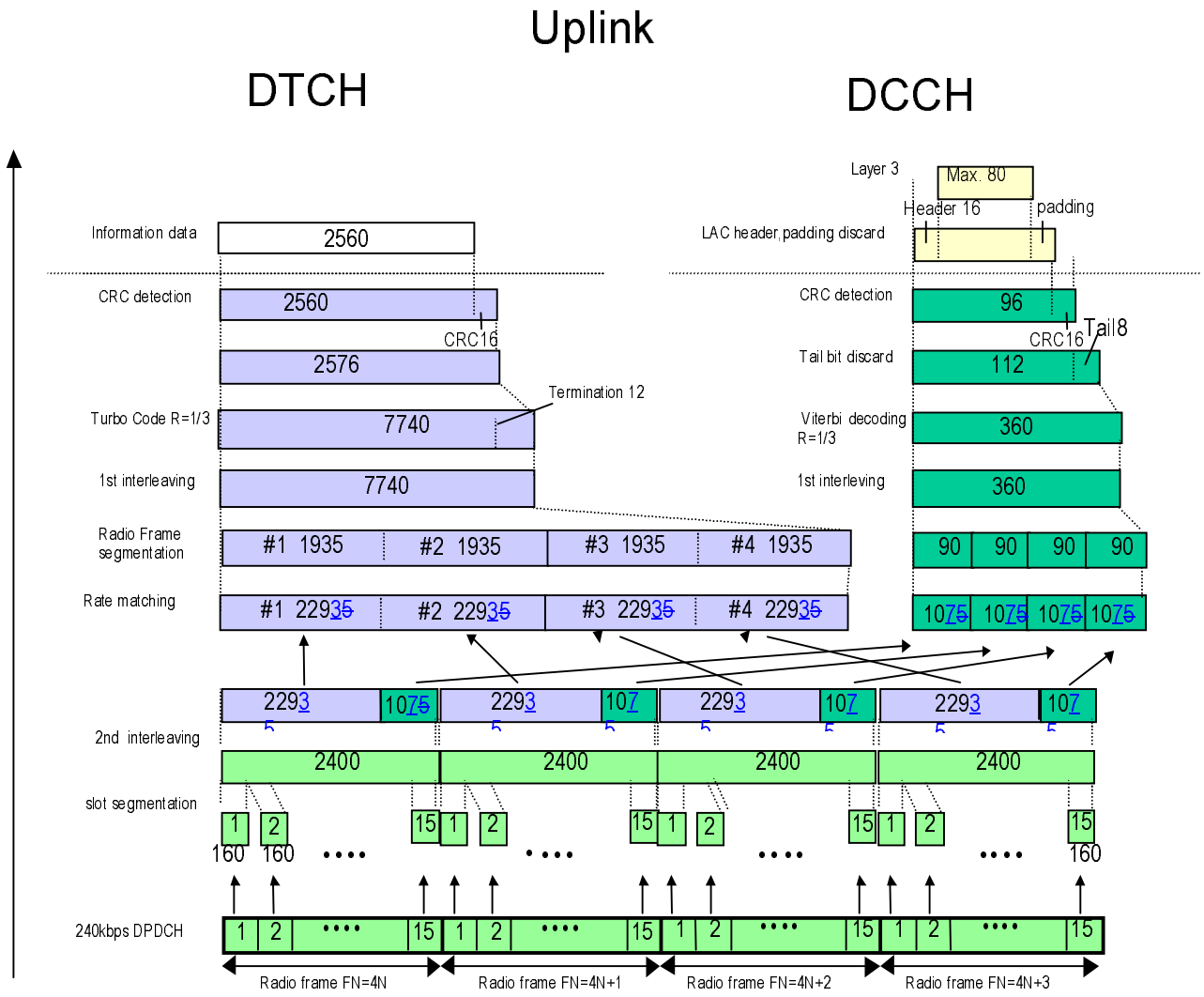


Table A.3: UL reference measurement channel (64kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPCH	240	kbps
Power control	Off	
TFCI	On	
Repetition	19	%

A.4 UL reference measurement channel for 144 kbps

The parameters for the UL reference measurement channel for 144 kbps are specified in Table A.4 and the channel coding is detailed in Figure A.4.

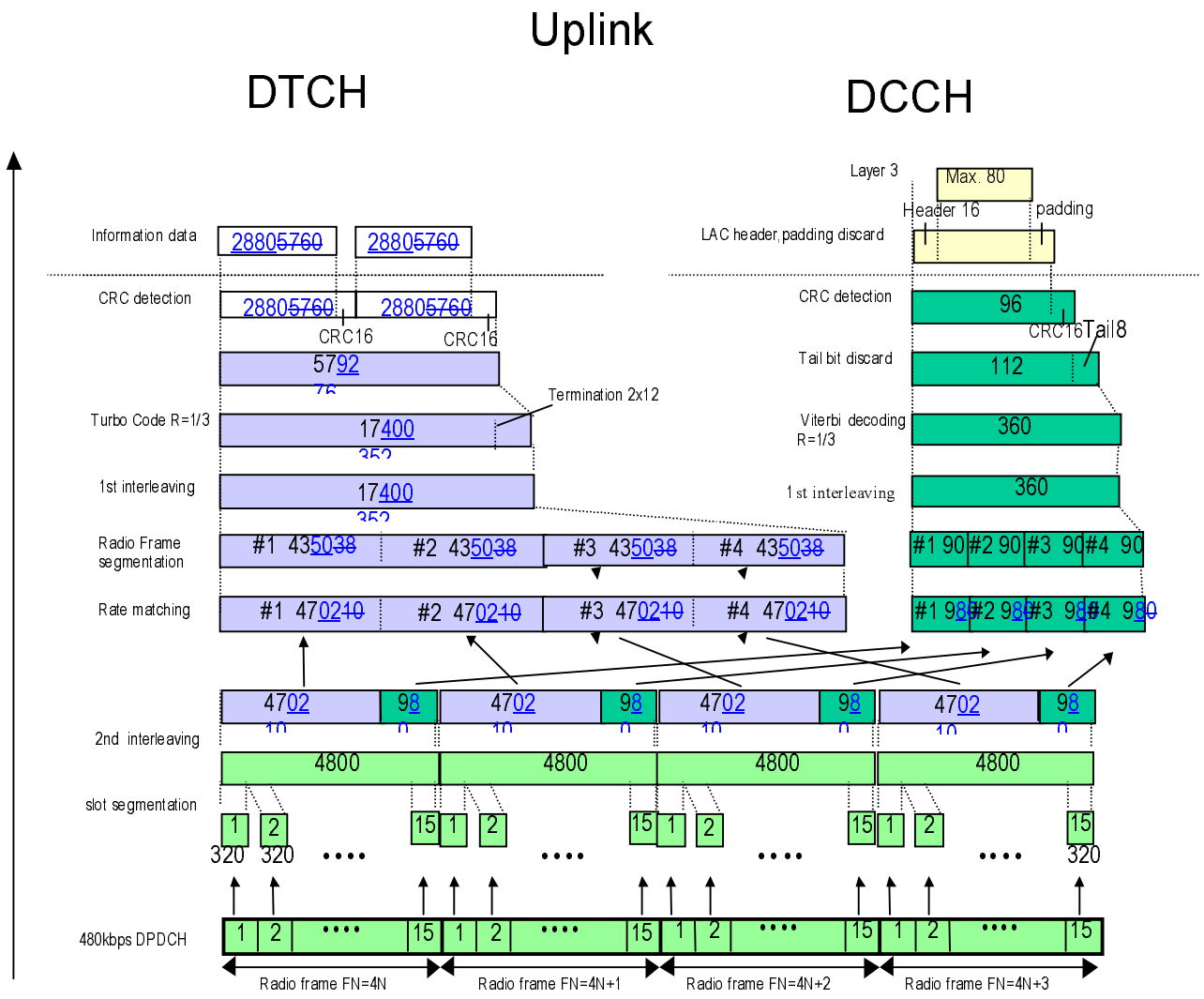


Table A.4: UL reference measurement channel (144kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPCH	480	kbps
Power control	Off	
TFCI	On	
Repetition	8	%

A.5 UL reference measurement channel for 384 kbps

The parameters for the UL reference measurement channel for 384 kbps are specified in Table A.5 and the channel coding is detailed in Figure A.5.

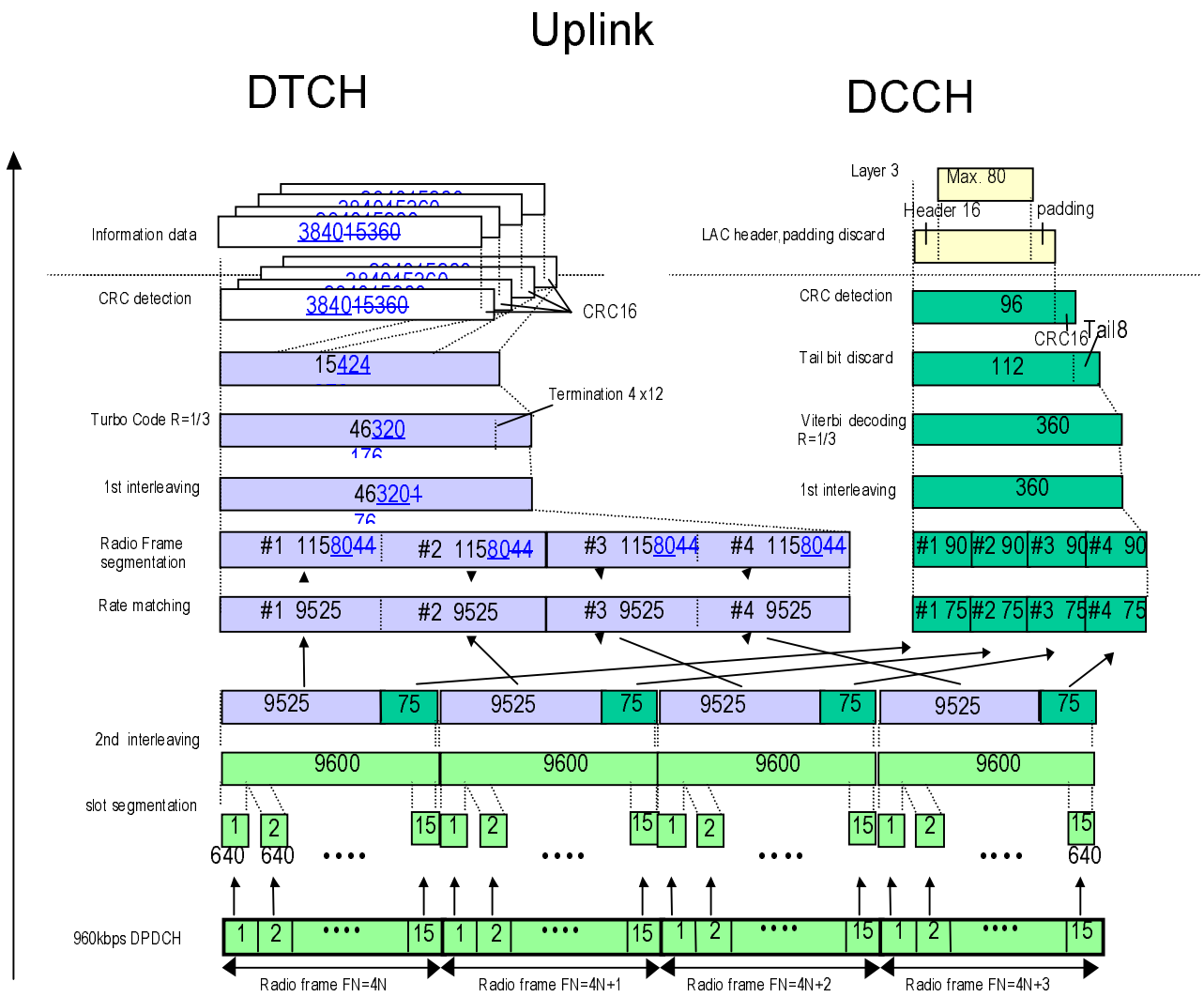


Table A.5: UL reference measurement channel (384kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPCH	960	kbps
Power control	Off	
TFCI	On	
Puncturing	18	%

A.6 UL reference measurement channel for 2048 kbps

The parameters for the UL reference measurement channel for 2048 kbps are specified in Table A.6 and the channel coding is detailed in Figure A.6.

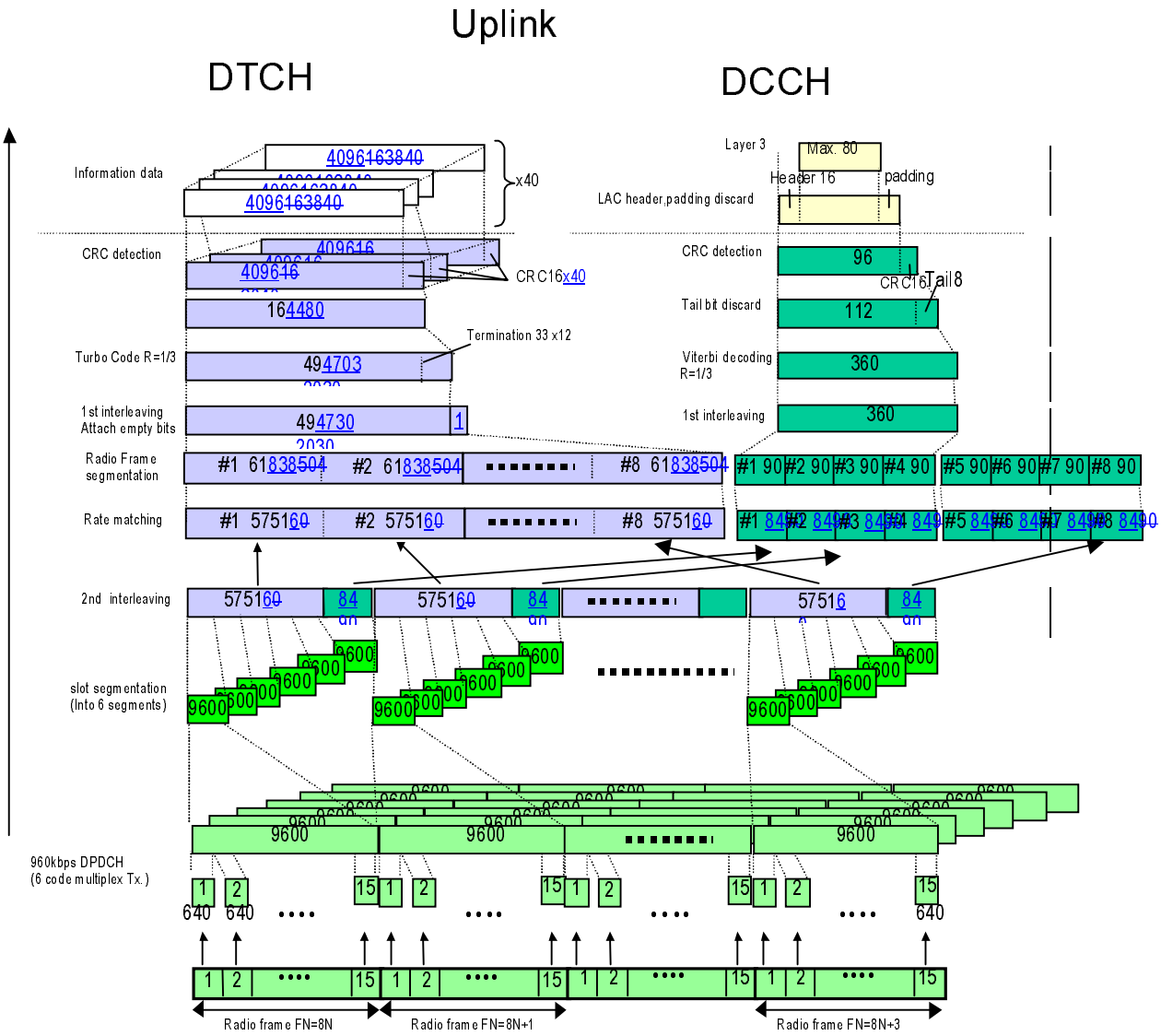


Table A.6: UL reference measurement channel (2048kbps)

Parameter	Level	Unit
Information bit rate	2048	kbps
DPCH	960	kbps
Power control	Off	
TFCI	On	
Puncturing	1	%

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	017	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#7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2/28/00

Subject: Format and interpretation of tests

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	
D	Editorial modification	X

Release:

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

Reason for change: Definition of "Format and interpretation of tests" described in chapter 5 shall be revised to keep in align with specification body.

Clauses affected: 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: Texts are taken from R4-99368.

5 Format and interpretation of tests

Each test in the following clauses has a standard format:

X Title

All tests are applicable to all equipment within the scope of this specification, unless otherwise stated.

X.1 Definition and applicability ~~Test conditions and measurement method~~

This subclause gives the general definition of the parameter under consideration and specifies whether the test is applicable to all equipment or only to a certain subset. ~~This sub-clause describes the steps necessary to perform the test.~~

X.2 **Conformance requirements** ~~Minimum requirement~~

This subclause describes the requirement under test has to fulfil to ensure compliance with the relevant specification.~~which shall be met for the specified tests.~~

In addition, this subclause contains the reference to the subclause to the 3GPP reference (or core) specification from which the conformance requirements are derived.

X.3 Test purpose

This subclause defines the purpose of the test.

X.4 Method of test

X.4.1 Initial conditions

This subclause defines the initial conditions for each test, including the basic measurement setup.

X.4.2 Procedure

This subclause describes the steps necessary to perform the test and provides further details of the test definition like point of access (e.g. antenna port), domain (e.g. frequency-span), range, weighting (e.g. bandwidth), and algorithms (e.g. averaging).

X.5 Test requirements

This subclause defines the pass/fail criteria for the equipment under test.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	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#7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Modifications for system set-up's TS25.141v3.0.0

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: Some correction to system set-up's

Clauses affected: Annex B (informative), test set-up referencies in test case.

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 B (Informative): Measurement system set-up

Example of measurement system set-ups are attached below as an informative annex.

B.1 Transmitter

B.1.1 Maximum output power, total power dynamic range

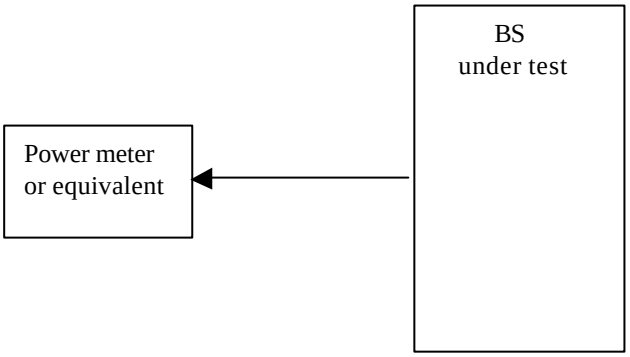


Fig.B.5 Measuring system Setup for maximum output power, total power dynamic range

B.1.2 CPICH power accuracy and Peak code domain error

Fig.B.2 Measuring system Setup for CPICH power accuracy and peak code domain error measurements

B.1.3 Power control steps and power control dynamic range

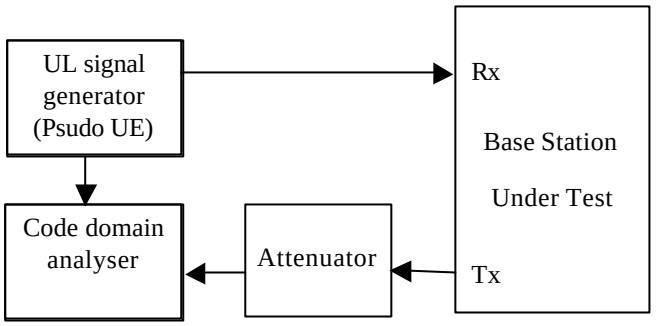


Fig. B.3 Measuring system Setup for power control steps and power control dynamic range measurements

B.1.4 Out of band emission

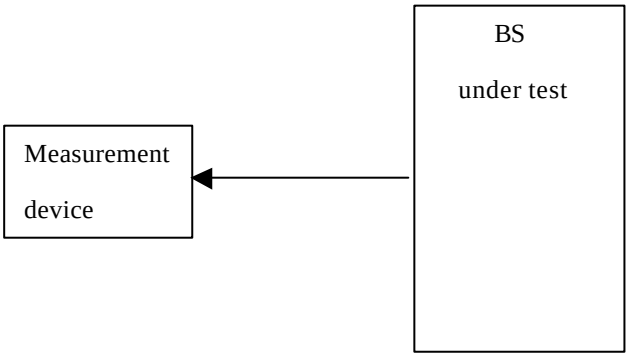


Fig.B.4 Measuring system Setup for Out of band emission measurements

B.1.5 Transmit intermodulation

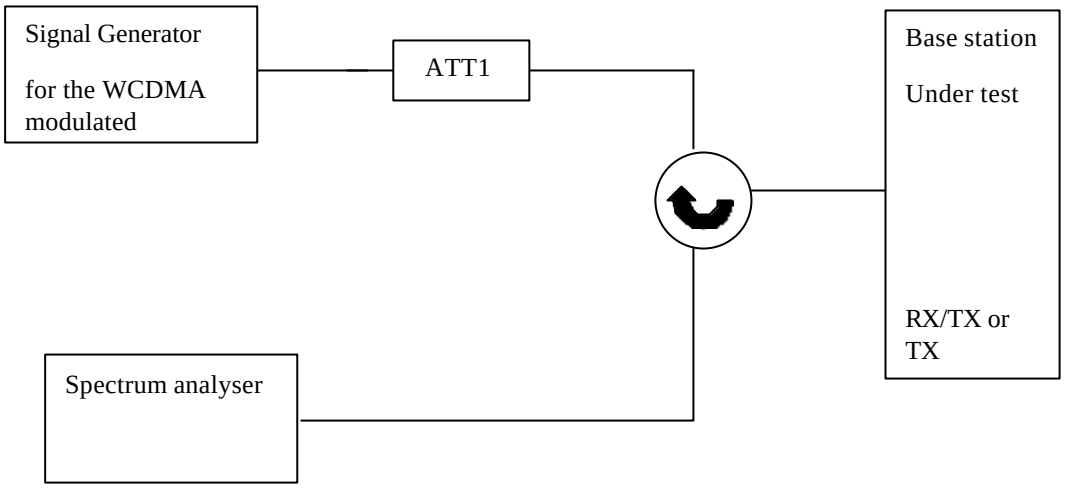


Fig.B.5Measuring system Setup for Base Station Transmit Intermodulation Testes

B.1.6 EVM measurement

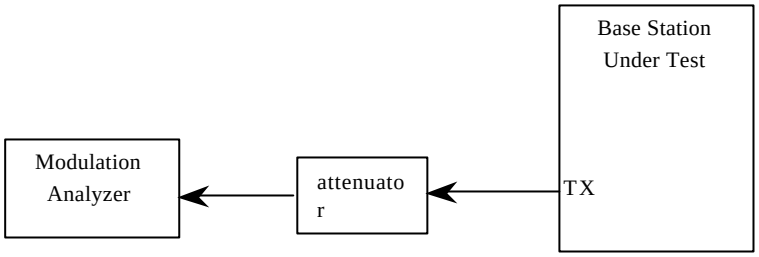


Fig. B.6 Measuring system Setup for EVM test .

B.2 Receiver

B.2.1 Reference sensitivity level

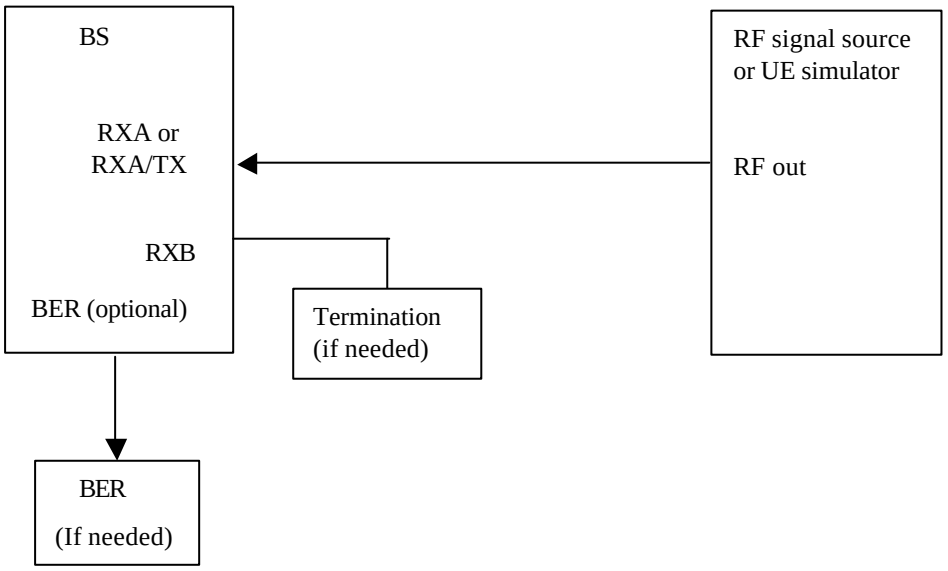


Fig. B.8 Measuring system Setup for Base Station Reference sensitivity level Testes

B.2.2 Dynamic range

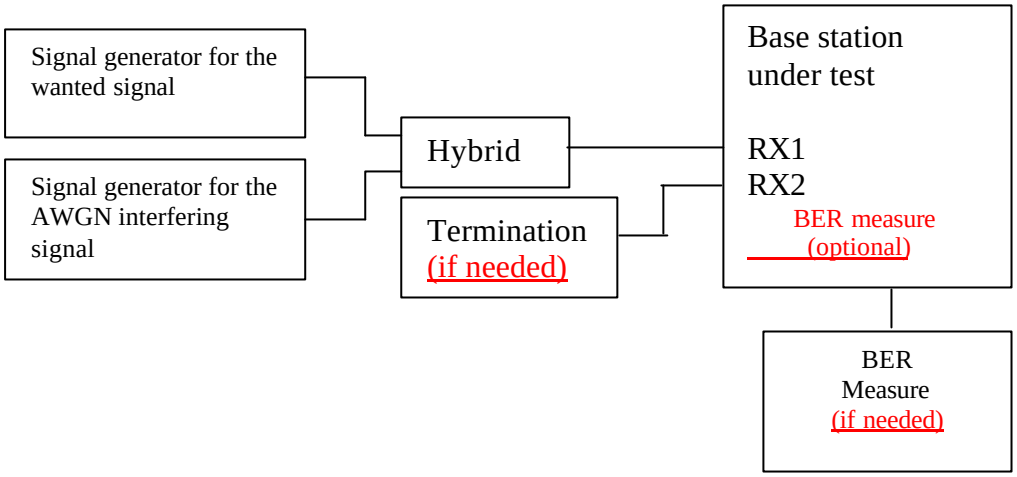


Fig. B.11 Measuring system Setup for Dynamic range

B.2.3 Adjacent Channel Selectivity (ACS)

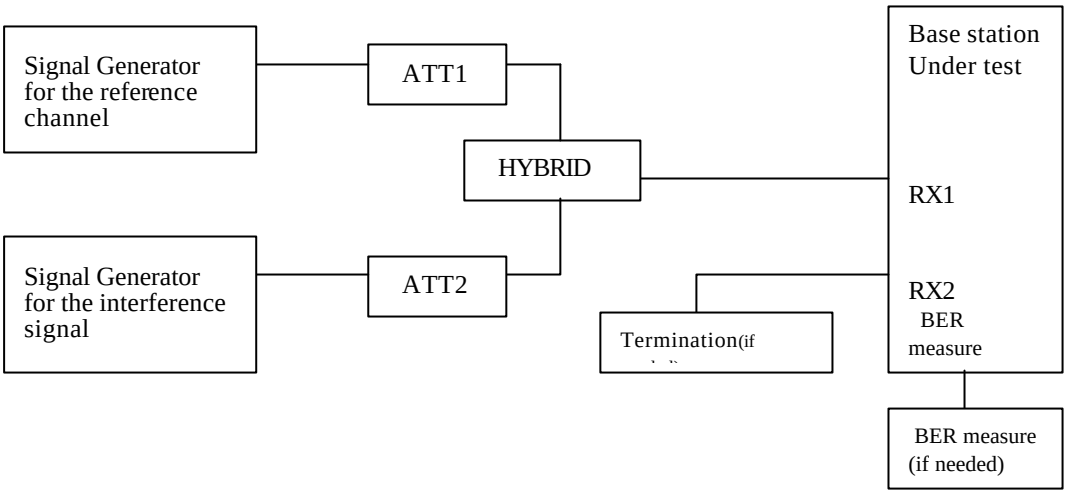


Fig. B.12 Measuring system Setup for Adjacent channel selectivity

B.2.4 Blocking characteristics

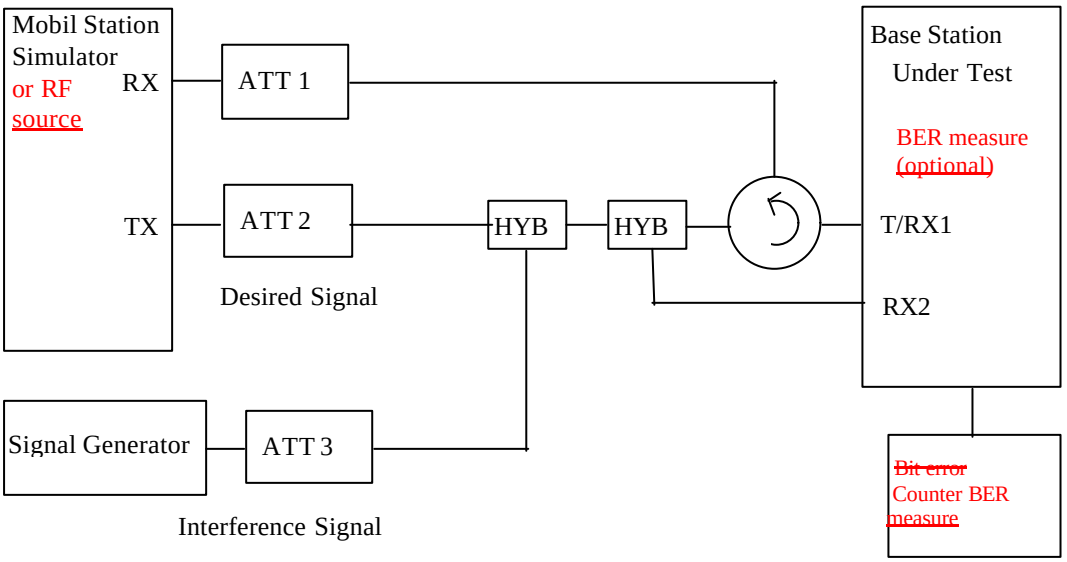


Fig. B.13 Measuring system Setup for Blocking characteristics

B.2.5 Intermodulation characteristics

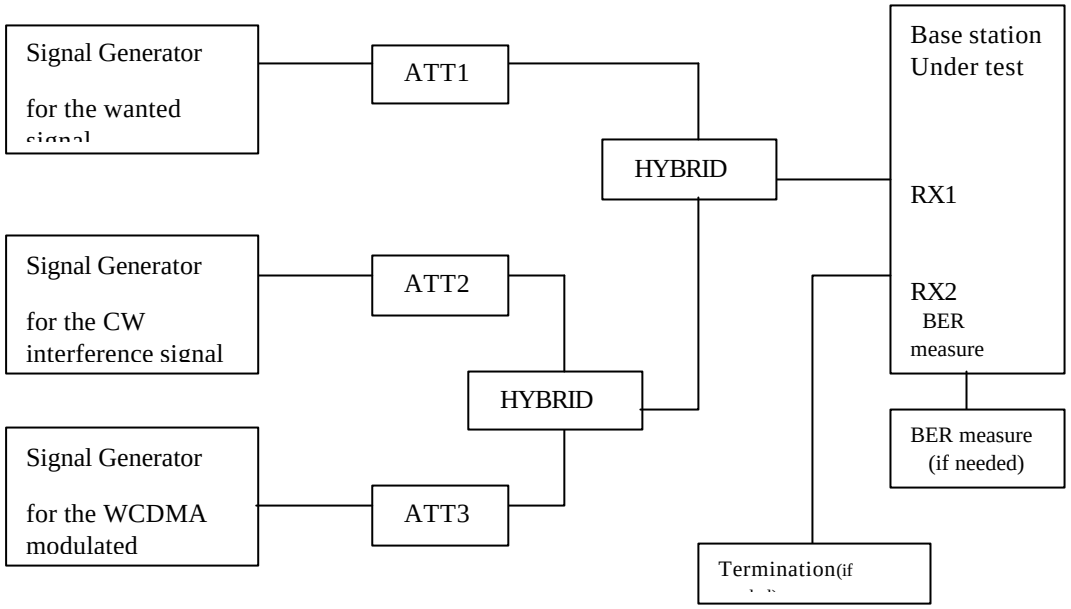


Fig. B.14 Measuring system Setup for intermodulation characteristics

B.2.6 Receiver spurious emission

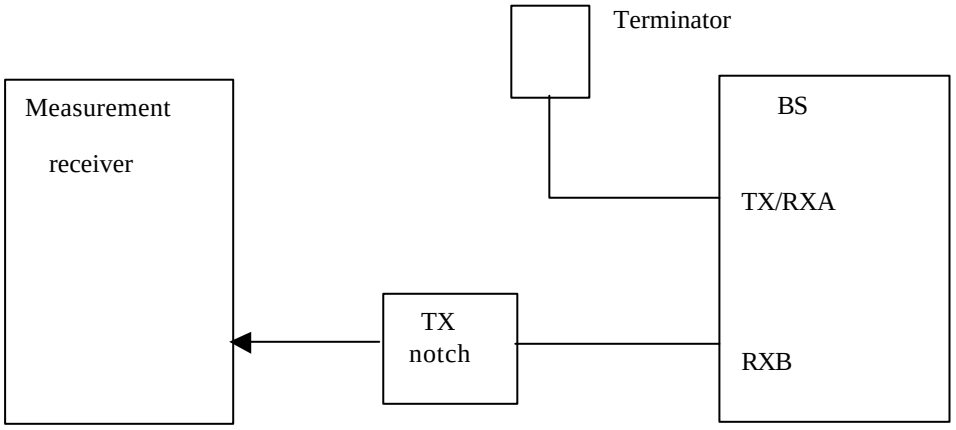


Fig. B.15 Measuring system Setup for Receiver spurious emission

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	019	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 #7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-24

Subject: CR for intermodulaiton test in TS 25.141

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: Corrects the value for the wanted signal, as a consequence of a change in the references sensitivity level. Adds a heading Test requirement to align the structure of the tests.

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:

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.2 Conformance requirement

The intermodulation performance should be met when the following signals are applied to the receiver.

Table 7.5: Interferer signals for intermodulation performance requirement

Type of Signal	Offset	Signal level
Wanted signal	-	~~-116~~ 115 dBm ~~<Note: Ref sens + 6dB >~~
CW signal	10 MHz	-48 dBm
WCDMA signal with one code	20 MHz	-48 dBm

The BER for wanted signal shall not exceed 0.001 for the parameters specified above.

7.6.3 Test purpose

The purpose of this test is to verify that the BS meet the intermodulation characteristics requirements as specified in TS25.104, clause 7.6.

7.6.4 Method of test

7.6.4.1 Initial conditions

1) Set up the equipment as shown in Annex B.

2) Terminate the RX port that is not tested.

7.6.4.2 Procedures

1) Generate the wanted signal (reference signal) and adjust ATT1 to set the signal level to the BS under test to the specified ~~–116~~ 115 dBm.
2) Adjust the signal generators to the frequency offset of +10 MHz (CW tone) and +20 MHz (WCDMA modulated) from the frequency of the wanted signal if possible.
3) Adjust the ATT2 and ATT3 to obtain the specified level of interference signal at the BS input.
4) Measure the BER and control that the measured value does not exceed the specified value.
5) Repeat the test for interference signal frequency offset of –10 MHz and -20 MHz for CW and WCDMA modulated respectively.
6) Repeat the whole test for the port which was terminated

7.6.5 Test requirements

The BER for wanted signal shall not exceed 0.001

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	020	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#7 *List expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Modifications for test models TS25.141v3.0.0

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: Power setting is changed to be as level setting. New test model introduced for EVM measurement and amount of DPCH channels is reduced to 3 in test model 2.

Clauses affected: 6.7

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:

6.1 General

All tests in this Clause shall be conducted on Base Station fitted with a full complement of Transceivers for the configuration unless otherwise stated. Transmission power shall be at the maximum output power unless otherwise stated. Measurements shall be made at the BS Tx antenna connector, unless otherwise stated. Power levels are expressed in dBm.

6.1.1 Test Models

The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test. ~~The mean overall output power to be transmitted, is specified with each test.~~

A code "level setting" of -X dB is the setting that according to the base station manufacturer will result in a code power of nominally X dB below the maximum output power. The relative accuracy of the level settings shall conform to clause 6.4.2.

6.1.1.1 Test Model 1

This model shall be used for tests on.

- spectrum emission mask
- ACLR
- spurious emissions
- transmit intermodulation
- ~~modulation accuracy~~
- Base station maximum output power

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random $T_{offsets}$ are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" ~~relates~~ is relative to the ~~mean~~ maximum output power on the TX antenna interface under test.

Table 6.1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting ~~Fraction of Power~~ (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	16/32/64	76.8 in total	See Table 6.2	See Table 6.2	See Table 6.2

Table 6.2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)

2	2	-10 -10.4	-13 -13.0	-16 -15.6
11	0	-12 -11.1	-13 -13.3	-16 -15.7
17	2	-12 -12.0	-14 -13.9	-16 -16.1
23	1	-14 -14.2	-15 -14.9	-17 -16.8
31	6	-11 -11.4	-17 -16.8	-18 -18.0
38	1	-13 -13.0	-14 -14.1	-20 -20.0
47	7	-17 -16.5	-16 -15.6	-16 -15.9
55	6	-16 -15.6	-18 -18.0	-17 -16.5
62	1	-13 -12.5	-16 -16.2	-16 -17.4
69	9	-15 -15.3	-19 -19.4	-19 -19.0
78	1	-14 -13.7	-17 -17.1	-22 -21.7
85	0	-18 -17.6	-15 -14.6	-20 -20.3
94	0	-19 -18.8	-17 -16.5	-16 -16.3
102	0	-17 -16.9	-22 -20.3	-17 -17.2
113	5	-15 -15.0	-20 -20.6	-19 -18.6
119	2	-9 -9.4	-24 -23.6	-21 -20.8
7	3		-20 -19.8	-19 -18.5
13	4		-18 -17.6	-21 -20.5
20	2		-14 -13.7	-18 -17.9
27	5		-14 -14.4	-20 -19.7
35	9		-16 -15.9	-24 -24.3
41	1		-19 -18.8	-24 -24.0
51	7		-18 -18.2	-22 -22.4
58	2		-17 -16.7	-21 -21.0
64	5		-22 -21.5	-18 -18.2
74	5		-19 -19.1	-20 -20.2
82	8		-19 -18.6	-17 -16.7
88	1		-16 -15.8	-18 -17.7
97	9		-18 -18.4	-19 -19.4
108	4		-15 -15.4	-23 -23.0
117	9		-17 -17.4	-22 -22.1
125	3		-12 -12.4	-21 -20.5
4	6			-17 -17.0
9	5			-18 -18.3
12	2			-20 -20.4
14	7			-17 -17.3
19	8			-19 -18.8
22	4			-21 -21.3
26	4			-19 -19.3
28	3			-23 -22.6
34	5			-22 -21.6
36	8			-19 -19.5
40	0			-24 -23.8
44	0			-23 -22.8
49	2			-22 -21.4
53	7			-19 -19.1
56	1			-22 -21.9
61	8			-21 -20.7
63	2			-18 -17.6
66	3			-19 -19.2
71	6			-22 -22.2
76	9			-21 -21.2
80	3			-19 -18.7

84	2	-21 ~~-21.1~~
87	5	-19 ~~-18.9~~
91	0	-21 ~~-21.5~~
95	9	-20 ~~-19.8~~
99	2	-25 ~~-25.0~~
105	9	-25 ~~-25.0~~
110	3	-25 ~~-24.8~~
116	3	-24 ~~-23.5~~
118	6	-22 ~~-21.8~~
122	2	-20 ~~-20.1~~
126	8	-15 ~~-15.3~~

6.1.1.2 Test Model 2

This model shall be used for tests on.

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting ~~Fraction of Power~~ (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	10 ~~3.2~~	-10 ~~-15~~	16	
DPCH (SF=128)	~~73~~	2 x 10,1x 50 ~~7 x 10.97~~	2 x –10, 1x –3 ~~7 x 9.6~~	24,~~40,56,~~ 72, ~~88,104,~~ 120	1,~~3.5,~~ 7, ~~6.4,~~ 2

6.1.1.3 Test Model 3

This model shall be used for tests on.

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%) 16/32	Level setting 16/32 ~~Fraction of Power~~ (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	12.6/7.9 ~~10~~	-9 / -11 ~~-10~~	1	
Primary CPICH	1	12.6/7.9 ~~10~~	-9 / -11 ~~-10~~	0	
PICH	1	10/3.2~~3.2~~	-10 / -15 ~~-15~~	16	
DPCH (SF=256)	16/32	63.7/80.4 in total~~76.8 in total~~	See Table 6.5	See Table 6.5	See Table 6.5

As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-14~~-13.2~~	-16~~-16.2~~
69	0	-14~~-13.2~~	-16~~-16.2~~
74	2	-14~~-13.2~~	-16~~-16.2~~
78	1	-14~~-13.2~~	-16~~-16.2~~
83	6	-14~~-13.2~~	-16~~-16.2~~
89	1	-14~~-13.2~~	-16~~-16.2~~
93	7	-14~~-13.2~~	-16~~-16.2~~
96	6	-14~~-13.2~~	-16~~-16.2~~
100	1	-14~~-13.2~~	-16~~-16.2~~
105	9	-14~~-13.2~~	-16~~-16.2~~
109	1	-14~~-13.2~~	-16~~-16.2~~
111	0	-14~~-13.2~~	-16~~-16.2~~
115	0	-14~~-13.2~~	-16~~-16.2~~
118	0	-14~~-13.2~~	-16~~-16.2~~
122	5	-14~~-13.2~~	-16~~-16.2~~
125	2	-14~~-13.2~~	-16~~-16.2~~
67	3		-16~~-16.2~~
71	4		-16~~-16.2~~
76	2		-16~~-16.2~~
81	5		-16~~-16.2~~
86	9		-16~~-16.2~~
90	1		-16~~-16.2~~
95	7		-16~~-16.2~~
98	2		-16~~-16.2~~
103	5		-16~~-16.2~~
108	5		-16~~-16.2~~
110	8		-16~~-16.2~~
112	1		-16~~-16.2~~
117	9		-16~~-16.2~~
119	4		-16~~-16.2~~
123	9		-16~~-16.2~~
126	3		-16~~-16.2~~

6.2.1.1.4 Test Model 4

This model shall be used for tests on.

- EVM measurement

Table 6.6. Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	50 to 1.6	-3 to -18	1	

6.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.~~6~~7 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.~~7~~8 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	021	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#7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:**

Subject: Correction for receiver diversity in TS25.141v3.0.0

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: The reason for this CR is to correct chapter 4.6.1 Receiver diversity and make instruction for Rx diversity uniform through specification.

Clauses affected: 4.6.1, 7.3, 7.4, 7.5, 7.6

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:

4.6 BS Configurations

4.6.1 Receiver diversity

~~i)~~ For the tests in clause 7 of this TS, the specified test signals shall ~~may~~ be applied to one receiver antenna connector, with the remaining receivers are disabled or their antenna connectors being terminated with 50 ohms

~~or~~

~~ii) For the tests in clause 7 of this TS, the specified test signals may be simultaneously applied to each of the receiver antenna connectors~~.

4.6.2 Duplexers

The requirements of this TS shall be met with a duplexer fitted, if a duplexer is supplied as part of the BS. If the duplexer is supplied as an option by the manufacturer, sufficient tests should be repeated with and without the duplexer fitted to verify that the BS meets the requirements of this TS in both cases.

The following tests should be performed with the duplexer fitted, and without it fitted if this is an option:

1) Subclause 6.2.1 Base station maximum output power, for the highest static power step only, if this is measured at the antenna connector.

2) Subclause 6.5, Output RF spectrum emissions; outside the BS transmit band.

3) Subclause 6.5.3.7, Protection of the BS receiver.

4) Subclause 6.6, Transmit intermedulation; for the testing of conformance, the carrier frequencies should be selected to minimize intermodulation products from the transmitters falling in receive channels.

The remaining tests may be performed with or without the duplexer fitted.

NOTE 1: When performing receiver tests with a duplexer fitted, it is important to ensure that the output from the transmitters does not affect the test apparatus. This can be achieved using a combination of attenuators, isolators and filters.

NOTE 2: When duplexers are used, intermodulation products will be generated, not only in the duplexer but also in the antenna system. The intermodulation products generated in the antenna system are not controlled by 3GPP specifications, and may degrade during operation (e.g. due to moisture ingress). Therefore, to ensure continued satisfactory operation of a BS, an operator will normally select ARFCNs to minimize intermodulation products falling on receive channels. For testing of complete conformance, an operator may specify the ARFCNs to be used.

4.6.3 Power supply options

If the BS is supplied with a number of different power supply configurations, it may not be necessary to test RF parameters for each of the power supply options, provided that it can be demonstrated that the range of conditions over which the equipment is tested is at least as great as the range of conditions due to any of the power supply configurations.

This applies particularly if a BS contains a DC rail which can be supplied either externally or from an internal mains power supply. In this case, the conditions of extreme power supply for the mains power supply options can be tested by testing only the external DC supply option. The range of DC input voltages for the test should be sufficient to verify the performance with any of the power supplies, over its range of operating conditions within the BS, including variation of mains input voltage, temperature and output current.

7.3.3 Test purpose

The purpose of this test is to verify that the BS meet the dynamic range requirement as specified in TS25.104, clause 7.3.

7.3.4 Method of test

7.3.4.1 Initial conditions

1) Connect the test equipment as shown in Annex B.

2) ~~Terminate the RX port that is not tested.~~

7.3.4.2 Procedure

1) Adjust the signal generator for the wanted signal to [–92 dBm]

2) [Adjust the AWGN generator level to –73 dBm and set the frequency to the same frequency as the tested channel.]

3) Measure the BER for the tested service and verify that it is below the specified level

4) Repeat the measurement for the other RX port

7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The interference signal be detuned by F_{uw} MHz and modulated by a pseudo random binary sequence uncorrelated to the wanted signal.

7.4.1 Test conditions and measurement method

1. Set up the equipment as shown in Annex B.

2. ~~Terminate the RX port, which is not tested.~~

3. Generate the reference channel and adjust the ATT1 to set the input level to the base station under test to the specified –115 dBm.

4. Set up the interference signal at the adjacent channel frequency and adjust the ATT2 to obtain the specified level of interference signal at the base station input. Note that the interference signal shall have an ACLR of at least 63 dB in order to eliminate the impact of interference signal adjacent channel leakage power on the ACS measurement. The interference signal shall be wide band CDMA signal of single code.

5. Measure the BER and control that the measured value does not exceed the specified value (BER< 0.001).

6. Repeat the test for the port, which was terminated.

7.4.2 Minimum requirement

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

Table 7.3 *Adjacent channel selectivity*

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	-115	dBm
Interfering signal	-52	dBm
Fuw (Modulated)	+ /- 5	MHz

7.5 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; without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies as specified in the table below, using a 1MHz step size. Test conditions and measurement method

(1) Connect the BS to a mobile station simulator and a Signal generator.

(2) Disable Transmitter power control (TPC) function.

(3) Adjust the mobile station simulator to a level 6dB above the specified required reference sensitivity level.

(4) Adjust the Signal generator level to the appropriate level for the BS under test.

(5) The signal generator shall now be swept over the specified frequency band with a defined increment.

(6) The BS shall satisfy the $1x10^{-3}$ BER requirement for all signal generator frequencies above.

NOTE: The test procedure as defined in steps (5) and (6) requests to carry out more than [10000] BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

<Editor's note: The above NOTE is taken from proposal for TDD specification (R4-99789). Precise parameters for this 2-phase measurement shall be specified. >

7.5.1 Minimum requirement

The static reference performance as specified in clause 7.2.2 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Table 7.4 (a) Blocking characteristics for operation in frequency bands in sub-clause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal

Interfering Signal	Signal Level		Interfering Signal	
1920 – 1980 MHz	-40 dBm	<REFSENS> + 6 dB	10 MHz	WCDMA signal with one code
1900 – 1920 MHz 1980 – 2000 MHz	-40 dBm	<REFSENS> + 6 dB	10 MHz	WCDMA signal with one code
1 MHz -1900 MHz, and 2000 MHz – 12750 MHz	-15 dBm	<REFSENS> + 6 dB	—	CW carrier

Table 7.4(b) : Blocking performance requirement for operation in frequency bands in sub-clause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1850 – 1910 MHz	- 40 dBm	<REFSENS> + 6dB	10 MHz	WCDMA signal with one code
1830 – 1850 MHz 1910 – 1930 MHz	-40 dBm	<REFSENS> + 6dB	10 MHz	WCDMA signal with one code
1 MHz – 1830 MHz 1930 MHz – 12750 MHz	-15 dBm	<REFSENS> + 6dB	—	CW carrier

7.6 Intermodulation characteristics

7.6.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

7.6.2 Conformance requirement

The intermodulation performance should be met when the following signals are applied to the receiver.

Table 7.5: Interferer signals for intermodulation performance requirement

Type of Signal	Offset	Signal level
Wanted signal	-	-116 dBm <Note: Ref sens + 6dB >

CW signal	10 MHz	-48 dBm
WCDMA signal with one code	20 MHz	-48 dBm

The BER for wanted signal shall not exceed 0.001 for the parameters specified above.

7.6.3 Test purpose

The purpose of this test is to verify that the BS meet the intermodulation characteristics requirements as specified in TS25.104, clause 7.6.

7.6.4 Method of test

7.6.4.1 Initial conditions

1) Set up the equipment as shown in Annex B.

2) ~~Terminate the RX port that is not tested.~~

7.6.4.2 Procedures

1) Generate the wanted signal (reference signal) and adjust ATT1 to set the signal level to the BS under test to the specified –116 dBm.
2) Adjust the signal generators to the frequency offset of +10 MHz (CW tone) and +20 MHz (WCDMA modulated) from the frequency of the wanted signal if possible.
3) Adjust the ATT2 and ATT3 to obtain the specified level of interference signal at the BS input.
4) Measure the BER and control that the measured value does not exceed the specified value.
5) Repeat the test for interference signal frequency offset of –10 MHz and -20 MHz for CW and WCDMA modulated respectively.
6) Repeat the whole test for the port which was terminated

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	023	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 #7	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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 00-02-27

Subject: CR for Spectrum emission mask in TS 25.141

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: The frequency ranges for measurement are currently only defined in a note. This is ambiguous, and is incorrect according to 3GPP drafting rules. At the same time, a number of editorial improvements are also made.

Clauses affected: 6.5.2, 6.5.2.1, 6.5.2.1.1, 6.5.2.1.2

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: This is a consequential change to the equivalent CR to TS 25.104. The column in tables 6.11 to 6.14 are removed, as these are no longer relevant to conformance testing. The diagram is removed since it relates to the first column; however, it may be considered useful to add a new diagram to provide clarification.

6.5.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the ~~[~~channel~~]~~ bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and adjacent channel power ratio for the transmitter.

6.5.2.1 Spectrum emission mask

NOTE: This subclause may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.1 Test conditions and measurement method

F_offset is the separation between the carrier frequency and the centre of the measuring filter.

<Editor's note: Test conditions to be specified. >

6.5.2.1.2 Minimum requirement

<Editor's note: The text below is just cut and pasted from 25.104 to keep coincidence. Better description may be applied. >

~~The mask defined in Table 6.11 toTable 6.14below may be mandatory in certain regions. In other regions this mask may not be applied.~~

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified ~~by the mask~~ in tables 6.11 to 6.14 in the frequency range of ~~with~~ f_offset ~~Δf~~ from 2.515 MHz to ~~Δ~~f_offset$_{max}$ from the carrier frequency, where:

- ~~-~~f_offset is the separation between the carrier frequency and the centre of the measurement filter.

~~. The maximum offset Δ-~~ f_offset$_{max}$ is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in section 3.4.1, whichever is the greate~~s~~rst.

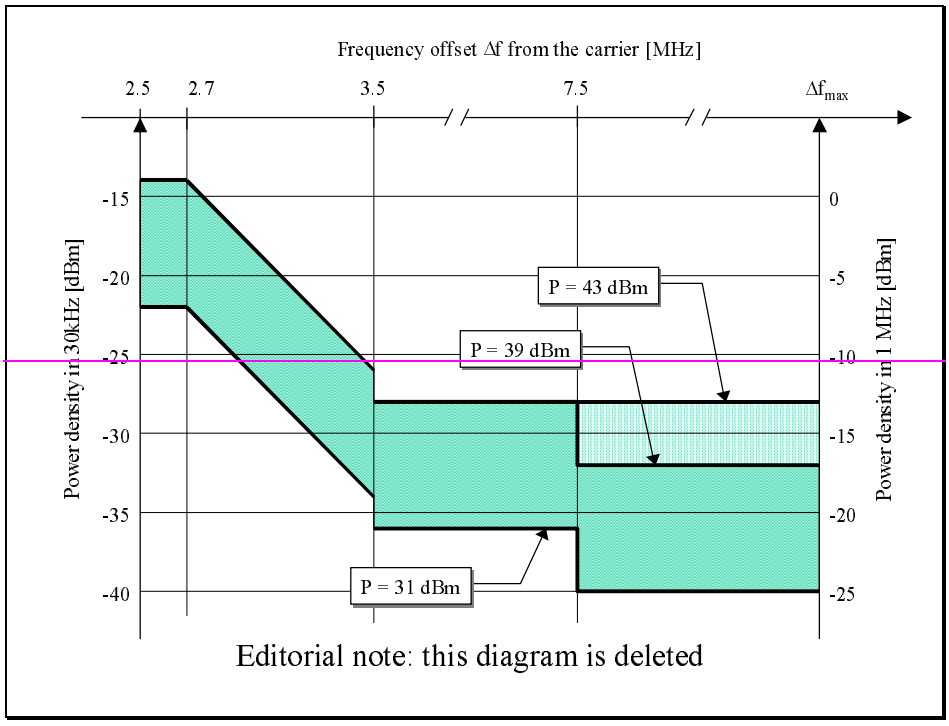


Fig. 6.1

Table 6.11: Spectrum emission mask values, BS maximum output power P ≥ 43 dBm

~~Frequency offset Δf~~	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
~~2.5 ≤ Δf < 2.7 MHz~~	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz [1]
~~2.7 ≤ Δf < 3.5 MHz~~	2.715MHz ≤ f_offset < 3.515MHz	- 14 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
~~3.5 ≤ Δf ≤ Δf$_{max}$ MHz~~	4.0MHz ≤ f_offset < f_offset$_{max}$	-13 dBm	1 MHz [2]

Table6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

~~Frequency offset Δf~~	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
~~2.5 ≤ Δf < 2.7 MHz~~	2.515MHz ≤ f_offset < 2.715MHz	-14 dBm	30 kHz [1]
~~2.7 ≤ Δf < 3.5 MHz~~	2.715MHz ≤ f_offset < 3.515MHz	-14 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz

	4.0MHz		
~~3.5 ≤ Δf < 7.5 MHz~~	4.0MHz ≤ f_offset < 7.5MHz	-13 dBm	1 MHz [2]
~~7.5 ≤ Δf ≤ Δf_{max} MHz~~	7.5MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz [2]

Table 6.13: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

~~Frequency offset Δf~~	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
~~2.5 ≤ Δf < 2.7 MHz~~	2.515MHz ≤ f_offset < 2.715MHz	P - 53 dBm	30 kHz [1]
~~2.7 ≤ Δf < 3.5 MHz~~	2.715MHz ≤ f_offset < 3.515MHz	P - 53 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
~~3.5 ≤ Δf < 7.5 MHz~~	4.0MHz ≤ f_offset < 7.5MHz	P - 52 dBm	1 MHz [2]
~~7.5 ≤ Δf ≤ Δf_{max} MHz~~	7.5MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz [2]

Table 6.14: Spectrum emission mask values, BS maximum output power P < 31 dBm

~~Frequency offset Δf~~	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
~~2.5 ≤ Δf < 2.7 MHz~~	2.515MHz ≤ f_offset < 2.715MHz	-22 dBm	30 kHz [1]
~~2.7 ≤ Δf < 3.5 MHz~~	2.715MHz ≤ f_offset < 3.515MHz	-22 - 15·(f_offset~~Δf~~ - 2.715) dBm	30 kHz [1]
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
~~3.5 ≤ Δf < 7.5 MHz~~	4.0MHz ≤ f_offset < 7.5MHz	-21 dBm	1 MHz [2]
~~7.5 ≤ Δf ≤ Δf_{max} MHz~~	7.5MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz [2]

~~Notes:~~

~~1.The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz.~~

~~2.The first and last measurement positions with a 1 MHz filter are 1 MHz and (Δf_{max} – 500 kHz)~~

3G CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141 **CR** **024** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑*

for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

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

Source: RAN WG4 **Date:** 2000-03-02

Subject: Rx spurious emissions measurement bandwidth

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The measurement bandwidth applied from 1 GHz to 12.75 GHz is changed to 1 MHz according to ITU-R SM.329-7.

Clauses affected: 7.7.2

Other specs affected:

Other 3G core specifications	X	→ List of CRs:	CR 25.104-xxx in this Tdoc 130
Other 2G 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:

7.7 Spurious Emissions

7.7.1 Definition and applicability

The spurious emission power is the power of the emissions generated or amplified in a receiver that appears at the BS antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For all BS with common RX and TX antenna port the transmitter spurious emission as specified in section 6.6.3 is valid.

7.7.2 Conformance requirements

The spurious emission shall be:

(a) Less than −78 dBm/3.84 MHz at the BS antenna connector, for frequencies within the BS receive band.

(b) Less than −57 dBm/100 kHz at the BS antenna connector, for frequencies band from 9 kHz to 1 GHz.

(c) Less than −47 dBm/~~100 kHz~~1 MHz at the BS antenna connector, for frequencies band from 1 GHz to 12.75 GHz with the exception of frequencies which are more than 12.5MHz under the first carrier frequency used or more than 12.5MHz above the last carrier frequency used.

~~<Editor's note: Tentative text. The text shall be revised according to the requirements in TS25.104.>~~

The reference for this requirement is TS 25.104[1] clause 7.~~8~~.1.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.141	CR	025	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 #7	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [X] Core Network [ ]

Source: RAN WG4 **Date:** 2000-03-03

Subject: Modification to the handling of measurement equipment uncertainty

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:

1 The current text in 25.141 has proved to mean different things to different people. This CR aims to adopt a position which is understood and can be agreed

2 Mismatch uncertainty is known not to be accounted for in the allowance for measurement uncertainty. This CR makes that assumption explicit, but does not rule an alternative approach in the future.

Clauses affected: 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: Corresponding change needed to 25.10?

4. General test conditions and declarations

The requirements of this clause apply to all tests in this TS, when applicable.

Many of the tests in this TS measure a parameter relative to a value which is not fully specified in the UTRA specifications. For these tests, the conformance requirement is determined relative to a nominal value specified by the manufacturer.

Certain functions of a BS are optional in the UTRA specifications.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

4.1 Acceptable uncertainty of measurement equipment

The maximum acceptable uncertainty of measurement equipment is specified separately for each test, where appropriate. The measurement equipment shall enable the stimulus signals in the test case to be adjusted to within the specified tolerance, and the conformance requirement to be measured with an uncertainty not exceeding the specified values. All tolerances and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

It should be noted that the stated uncertainties in section 4.1 apply to the test equipment only and do not include system effects due to mismatch between the DUT and the test equipment.

4.1.1 Test environments

Subclause 4.4, Test environments:

Pressure	± 5 kPa
Temperature	± 2 degrees
Relative Humidity	± 5 %
DC Voltage	± 1.0 %
AC Voltage	± 1.5 %
Vibration	10 %
Vibration frequency	0.1 Hz

The above values shall apply unless the test environment is controlled and the specification for the control of the test environment specifies the uncertainty for the parameter.

4.1.2 Transmitter

Subclause 6.2, Base station output power:

Base station maximum output power	±[0.5] dB

Subclause 6.3, Frequency stability:

Carrier frequency	±[10] Hz

Subclause 6.4.1, Inner loop power control in the downlink:

Transmitter power control step (relative 1 dB step) ±[0.3] dB

Transmitter average power control step (relative 10 * 1 dB steps) ±[0.5] dB

Note: Code domain power

Subclause 6.4.3, Power control dynamic range:

Maximum and minimum power ±[0.8] dB

Power control dynamic range (at 25 dB relative power) ±[0.5] dB

NOTE: Code domain power

Subclause 6.4.4, Total power dynamic range:

Total power ±[0.5] dB

Total power dynamic range (at 18 dB relative power) ±[0.3] dB

Subclause 6.2.2, CPICH power accuracy:

CPICH power ±[0.8] dB

NOTE: Code domain power

Subclause 6.5.1, Occupied bandwidth:

Occupied channel bandwidth ±[] kHz

Subclause 6.5.2.1, Spectrum emission mask:

Emission power:

Table 4-1 Uncertainty for Spectrum emission mask measurement

Frequency offset Δf		Uncertainty
$2.5 \leq \Delta f < 2.7$ MHz		±[1.5] dB
$2.7 \leq \Delta f < 3.5$ MHz		±[1.5] dB
$3.5 \leq \Delta f < 7.5$ MHz		±[1.5] dB
$7.5 \leq \Delta f \leq \Delta f_{max}$ MHz		±[1.5] dB

Subclause 6.5.2.2, Adjacent Channel Leakage power Ratio (ACLR):

ACLR ± 5 MHz (Relative carrier power) ±[0.8] dB

ACLR ± 10 MHz (Relative carrier power) ±[0.8] dB

Subclause 6.5.3.7, Protection of the BS receiver:

Emission power ±[1.5] dB

Subclause 6.5.3, Spurious emissions

Conformance requirement in BS and coexistence receive bands:

Emission power ±[2.0] dB

Conformance requirements outside BS and coexistence receive bands:

Emission power:

f ≤ 2.2 GHz	± 1.5 dB
2.2 GHz < f ≤ 4 GHz	± 2.0 dB
f > 4 GHz	±4.0 dB

Subclause 6.6, Transmit intermodulation:

Interference signal power relative the carrier power ± [1.0] dB

Intermodulation power ± [1.5] dB

Subclause 6.7.1, Modulation Accuracy:

Modulation accuracy (EVM) ± [2.5] % RMS

Subclause 6.7.2, Peak code Domain error:

Peak code domain error ±[] dB

4.1.3 Receiver

Subclause 7.2, Reference sensitivity level:

Test signal power ± [0.8] dB

Subclause 7.3, Dynamic range:

Test signal power ± [0.8] dB

AWGN signal power ± [1.0] dB

Subclause 7.4, Adjacent Channel Selectivity (ACS):

Test signal power ± [0.8] dB

Interfering signal power (Relative to the test signal) ± [0.8] dB

Subclause 7.5, Blocking characteristics:

Test signal power ± [0.8] dB

Interfering signal power:

f ≤ 2.2 GHz	± 0.7 dB
2.2 GHz < f ≤ 4 GHz	±1.5 dB
f > 4 GHz	±3.0 dB

Subclause 7.6, Intermodulation characteristics:

Test signal power	± [0.8] dB
Interfering signals power	± [0.7] dB

Subclause 7.7, Spurious emissions:

Emission power:

f ≤ 2.2 GHz	± 1.5 dB

2.2 GHz < f ≤ 4 GHz	± 2.0 dB
f > 4 GHz	±4.0 dB

4.1.4 Performance requirement

Subclause 8.2, Demodulation in static propagation condtion:

Test signal power	± [] dB
Eb/I0 (relative)	± [] dB

Subclause 8.3, Demodulation of DCH in multiplath fading conditons:

Test signal power	± [] dB
Eb/I0 (relative)	± [] dB

4.2 Interpretation of measurement results

Compliance with the requirement is determined by comparing the measured value (or derived value from the measured one) with the ~~specified~~ test limit. ~~, without making allowance for measurement uncertainty~~ The test limit shall be relaxed from the specified limit in the core requirement using the maximum allowed uncertainty for the test equipment as specified in section 4.1. ~~,~~

The actual measurement uncertainty of the test equipment for the measurement of each parameter shall be included in the test report.

The recorded value for the test equipment ~~measurement~~ uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in subclause 4.1 of this TS.

If the ~~measurement apparatus~~test equipment for a test is known to have a measurement uncertainty greater than that specified in subclause 4.1, it is still permitted to use this apparatus provided that an adjustment is made to the measured value as follows:

~~The adjustment is made by subtracting the modulus of the specified measurement uncertainty in subclause 4.1 from the measurement uncertainty of the apparatus. The measured value is then increased or decreased by the result of the subtraction, whichever is most unfavourable in relation to the limit.~~

The initial test limit is derived as above by relaxing the specified limit using the maximum allowed test equipment uncertainty as specified in 4.1. Any additional uncertainty in the test equipment over and above that specified in section 4.1 shall be used to tighten the test limit. This procedure will ensure that test equipment not compliant with 4.1does not increase the chance of passing a device under test where that device would otherwise have failed the test if test equipment compliant with section 4.1 had been used.

3G CHANGE REQUEST

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25.141 **CR** **026** Current Version: 3.0.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submision to TSG RAN #7 *list TSG meeting no. here ↑* for approval [X] for information [ ] *(only one box should be marked with an X)*

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

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

Source: RAN WG4 **Date:** 00-03-03

Subject: Test models

3G Work item:

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

F	Correction	X
A	Corresponds to a correction in a 2G specification	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Reason for change: The current definitions of the test models are incomplete. Values for missing parameters are proposed in this CR.

Clauses affected: 6.1, Annex D

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G 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:

6.1 General

All tests in this Clause shall be conducted on Base Station fitted with a full complement of Transceivers for the configuration unless otherwise stated. Transmission power shall be at the maximum output power unless otherwise stated. Measurements shall be made at the BS Tx antenna connector, unless otherwise stated.Power levels are expressed in dBm.

6.1.1 Test Models

The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test.

A code "level setting" of -X dB is the setting that according to the base station manufacturer will result in a code power of nominally X dB below the maximum output power. The relative accuracy of the level settings shall conform to clause 6.4.2.

6.1.1.1 Test Model 1

This model shall be used for tests on.

- spectrum emission mask
- ACLR
- spurious emissions
- transmit intermodulation
- Base station maximum output power

64 DPCHs at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets are defined so as to simulate a realistic traffic scenario which may have high PAR (Peak to Average Ratio).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" is relative to the maximum output power on the TX antenna interface under test.

Table 6.1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelisation Code	Timing offset ($x256T_{chip}$)
PCCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	3.2	-15	16	120
DPCH (SF=128)	16/32/64	76.8 in total	See Table 6.2	See Table 6.2	See Table 6.2

Table 6.2. DPCH Spreading Code, Timing offsets and level settings for Test Model 1

Code	Timing offset ($x256T_{chip}$)	Level settings (dB) (16 codes)	Level settings (dB) (32 codes)	Level settings (dB) (64 codes)
2	86	-10	-13	-16
11	134	-12	-13	-16
17	52	-12	-14	-16
23	45	-14	-15	-17
31	143	-11	-17	-18
38	112	-13	-14	-20
47	59	-17	-16	-16
55	23	-16	-18	-17
62	1	-13	-16	-16
69	88	-15	-19	-19
78	30	-14	-17	-22
85	18	-18	-15	-20
94	30	-19	-17	-16
102	61	-17	-22	-17
113	128	-15	-20	-19
119	143	-9	-24	-21
7	83		-20	-19
13	25		-18	-21
20	103		-14	-18
27	97		-14	-20
35	56		-16	-24
41	104		-19	-24
51	51		-18	-22
58	26		-17	-21
64	137		-22	-18
74	65		-19	-20
82	37		-19	-17
88	125		-16	-18
97	149		-18	-19
108	123		-15	-23
117	83		-17	-22
125	5		-12	-21
4	91			-17
9	7			-18
12	32			-20
14	21			-17
19	29			-19
22	59			-21
26	22			-19
28	138			-23
34	31			-22
36	17			-19
40	9			-24
44	69			-23
49	49			-22
53	20			-19
56	57			-22

61	121	-21
63	127	-18
66	114	-19
71	100	-22
76	76	-21
80	141	-19
84	82	-21
87	64	-19
91	149	-21
95	87	-20
99	98	-25
105	46	-25
110	37	-25
116	87	-24
118	149	-22
122	85	-20
126	69	-15

Note: The figures for code power are nominal and have tolerance of ±1 dB.

6.1.1.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelisation Code	Timing offset ($x256T_{chip}$)
PCCPCH+SCH	1	10	-10	1	0
Primary CPICH	1	10	-10	0	0
PICH	1	10	-10	16	120
DPCH (SF=128)	3	2 x 10,1x 50	2 x –10, 1x –3	24, 72, 120	1, 7, 2

6.1.1.3 Test Model 3

This model shall be used for tests on,

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%) 16/32	Level settings (dB) 16/32	Channelisation Code	Timing offset ($x256T_{chip}$)
PCCPCH+SCH	1	12.6/7.9	-9 / -11	1	0
Primary CPICH	1	12.6/7.9	-9 / -11	0	0
PICH	1	10/3.2	-10 / -15	16	120
DPCH (SF=256)	16/32	63.7/80.4 in total	See Table 6.5	See Table 6.5	See Table 6.5

As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Level settings (dB) (16 codes)	Level settings dB) (32 codes)
64	86	-14	-16
69	134	-14	-16
74	52	-14	-16
78	45	-14	-16
83	143	-14	-16
89	112	-14	-16
93	59	-14	-16
96	23	-14	-16
100	1	-14	-16
105	88	-14	-16
109	30	-14	-16
111	18	-14	-16
115	30	-14	-16
118	61	-14	-16
122	128	-14	-16
125	143	-14	-16
67	83		-16
71	25		-16
76	103		-16
81	97		-16
86	56		-16
90	104		-16
95	51		-16
98	26		-16
103	137		-16
108	65		-16
110	37		-16
112	125		-16
117	149		-16
119	123		-16
123	83		-16
126	5		-16

Note: The figures for code power are nominal and have tolerance of ±1 dB.

6.2.1.1.4 Test Model 4

This model shall be used for tests on.

- EVM measurement

Table 6.6. Test Model 4 Active Channels

Type	Number of Channels	Fraction of Power (%)	Level setting (dB)	Channelisation Code	Timing offset

PCCPCH+SCH	1	50 to 1.6	-3 to -18	1	

6.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	Npilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

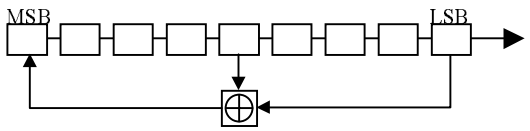
Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame, according to its timing offset.

The sequence shall be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The generator shall be seeded so that the sequence begins with the 7 bit channelisation code starting from the LSB, and followed by 2 consecutive ONEs.



6.1.1.5 Common channel Structure of the Downlink Test Models

6.1.1.5.1 P-CCPCH

The aggregate 15 x 18 = 270 P-CCPCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. Channelisation code of the P-CCPCH is used as the seed for the PN sequence at the start of each frame.

6.1.1.5.2 PICH

PICH carries 18 Paging Indicators (PI) equals to [1 0 1 1 0 0 0 1 0 1 1 0 0 0 1 0 1 0]. This defines the 288 first symbols (= ± 1 ± j) of the PICH. No power is transmitted for the 12 remaining unused symbols (=0).

6.1.1.5.3 Primary scrambling code and SCH

The scrambling code should be 0.

Where multiple repetitions of the Test Model signals are being used to simulate a multi-carrier signal, the scrambling code for the central carrier should be 0, carriers added at successively lower frequencies should use codes 2, 4, ... and carriers added at successively higher frequencies should use codes 1, 3, ...

The scrambling code defines the SSC sequence of the secondary SCH. In their active part, primary and secondary SCH share equally the power level defined for "PCCPCH+SCH".

6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturer has declared to be available at the antenna connector.

6.2.1.1 Test Conditions and measurement method

1. Connect the power measuring equipment to the base station RF output port.

2. Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model1 in 6.1.1.1~~as stated bellow.~~

3. Measure the mean power at the RF output port over a certain slots.

The setup of physical channels for transmitter tests shall be according to one of the test models below. A reference to the applicable table is made with each test. The mean overall output power to be transmitted, is specified with each test.

~~6.2.1.1.1 Test Model 1~~

~~This model shall be used for tests on,~~

~~□spectrum emission mask~~

~~□ACLR~~

~~□spurious emissions~~

- transmit intermodulation
- modulation accuracy

Table 6.1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	16/32/64	76.8 in total	See Table 6.2	See Table 6.2	See Table 6.2

Table 6.2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	2	-10.4	-13.0	-15.6
11	0	-11.1	-13.3	-15.7
17	2	-12.0	-13.9	-16.1
23	1	-14.2	-14.9	-16.8
31	6	-11.4	-16.8	-18.0
38	1	-13.0	-14.1	-20.0
47	7	-16.5	-15.6	-15.9
55	6	-15.6	-18.0	-16.5
62	1	-12.5	-16.2	-17.4
69	9	-15.3	-19.4	-19.0
78	1	-13.7	-17.1	-21.7
85	0	-17.6	-14.6	-20.3
94	0	-18.8	-16.5	-16.3
102	0	-16.9	-20.3	-17.2
113	5	-15.0	-20.6	-18.6
119	2	-9.4	-23.6	-20.8
7	3		-19.8	-18.5
13	4		-17.6	-20.5
20	2		-13.7	-17.9
27	5		-14.4	-19.7
35	9		-15.9	-24.3
41	1		-18.8	-24.0
51	7		-18.2	-22.4
58	2		-16.7	-21.0
64	5		-21.5	-18.2
74	5		-19.1	-20.2
82	8		-18.6	-16.7
88	1		-15.8	-17.7
97	9		-18.4	-19.4
108	4		-15.4	-23.0
117	9		-17.4	-22.1
125	3		-12.4	-20.5
4	6			-17.0
9	5			-18.3
12	2			-20.4
14	7			-17.3
19	8			-18.8

22	4	-21.3
26	4	-19.3
28	3	-22.6
34	5	-21.6
36	8	-19.5
40	0	-23.8
44	0	-22.8
49	2	-21.4
53	7	-19.1
56	1	-21.9
61	8	-20.7
63	2	-17.6
66	3	-19.2
71	6	-22.2
76	9	-21.2
80	3	-18.7
84	2	-21.1
87	5	-18.9
91	0	-21.5
95	9	-19.8
99	2	-25.0
105	9	-25.0
110	3	-24.8
116	3	-23.5
118	6	-21.8
122	2	-20.1
126	8	-15.3

6.2.1.1.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

Table 6.3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	7	7 x 10.97	7 x -9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

6.2.1.1.3 Test Model 3

This model shall be used for tests on,

- peak code domain error

Table 6.4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	

PICH	1	3.2	15	16	
DPCH (SF=256)	16/32	76.8 in total	See Table 6.5	See Table 6.5	See Table 6.5

Table 6.5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2
83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2
96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2
125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

6.2.1.1.4 DPCH Structure of the Downlink Test Models

For the above test models the following structure is adopted for the DPCH. The DPDCH and DPCCH have the same power level. The timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 6.6 below.

Table 6.6 DPCH structure of the downlink test models

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	Ndata2	NTFCI	NTPC	NPilot
10	60	30	128	450	150	600	40	6	24	0	2	8

The test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 6.7 below.

Table 6.7 Frame structure of DPCH

	N_{pilot} = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

The TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

The aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

6.2.1.2 Minimum requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and –2dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +2.5 and –2.5 of the manufacturer's rated power.

Annex D (Informative): Downlink test model

D.1 Test Model 1

This model shall be used for tests on,

- spectrum emission mask
- ACLR
- spurious emissions
- transmit intermodulation
- modulation accuracy

For the above set of measurements it is appropriate for the test signal to have high PAR. This is achieved by including 64 DPCH at 30 ksps (SF=128) distributed randomly across the code space, at random power levels and random $T_{offsets}$ (simulating a realistic traffic scenario).

Considering that not every base station implementation will support 64 DPCH, variants of this test model containing 32 and 16 DPCH are also specified. The conformance test shall be performed using the largest of these three options that can be supported by the equipment under test.

"Fraction of power" relates to the mean output power on the TX antenna interface under test.

Table 1. Test Model 1 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	16/32/64	76.8 in total	See Table 2	See Table 2	See Table 2

The power levels in Table 2 were based on the results from network simulations. Lists containing 16, 32 and 64 power levels were constructed to have approximately the same power distribution of the simulation results. These powers were then randomly assigned to the chosen codes. A set of 64 codes was chosen with a random but even distribution across the codespace. Subsets of the set of 64 were chosen for the 32 and 16 code cases. $T_{offsets}$ were chosen at random.

Table 2. DPCH Spreading Code, Toffset and Power for Test Model 1

Code	Toffset	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)	Code Power (dB) (64 codes)
2	2	-10.4	-13.0	-15.6
11	0	-11.1	-13.3	-15.7
17	2	-12.0	-13.9	-16.1
23	1	-14.2	-14.9	-16.8
31	6	-11.4	-16.8	-18.0
38	1	-13.0	-14.1	-20.0
47	7	-16.5	-15.6	-15.9
55	6	-15.6	-18.0	-16.5
62	1	-12.5	-16.2	-17.4
69	9	-15.3	-19.4	-19.0
78	1	-13.7	-17.1	-21.7
85	0	-17.6	-14.6	-20.3
94	0	-18.8	-16.5	-16.3

102	0	-16.9	-20.3	-17.2
113	5	-15.0	-20.6	-18.6
119	2	-9.4	-23.6	-20.8
7	3		-19.8	-18.5
13	4		-17.6	-20.5
20	2		-13.7	-17.9
27	5		-14.4	-19.7
35	9		-15.9	-24.3
41	1		-18.8	-24.0
51	7		-18.2	-22.4
58	2		-16.7	-21.0
64	5		-21.5	-18.2
74	5		-19.1	-20.2
82	8		-18.6	-16.7
88	1		-15.8	-17.7
97	9		-18.4	-19.4
108	4		-15.4	-23.0
117	9		-17.4	-22.1
125	3		-12.4	-20.5
4	6			-17.0
9	5			-18.3
12	2			-20.4
14	7			-17.3
19	8			-18.8
22	4			-21.3
26	4			-19.3
28	3			-22.6
34	5			-21.6
36	8			-19.5
40	0			-23.8
44	0			-22.8
49	2			-21.4
53	7			-19.1
56	1			-21.9
61	8			-20.7
63	2			-17.6
66	3			-19.2
71	6			-22.2
76	9			-21.2
80	3			-18.7
84	2			-21.1
87	5			-18.9
91	0			-21.5
95	9			-19.8
99	2			-25.0
105	9			-25.0
110	3			-24.8
116	3			-23.5
118	6			-21.8
122	2			-20.1
126	8			-15.3

D.2 Test Model 2

This model shall be used for tests on,

- output power dynamics

A 10 code channel model is chosen because when testing total power dynamic range P_{max} -18 dB level (RF power) this is the maximum number of channels which we can get down to the required output power level without going under the P_{max} -28 dB level in the code domain base (when we assume that all code channels use same power).

This configuration is also suitable for power control test as we can test P_{max} -3 dB level (for one code channel in the code domain) by reducing power of the other code channels to P_{max} -13 dB.

Table 3. Test Model 2 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=128)	7	7 x 10.97	7 x -9.6	24,40,56,72, 88,104,120	1,3,5,7, 6,4,2

D.3 Test Model 3

This model shall be used for tests on,

peak code domain error.

The structure of this test model is chosen assuming that error power in the inactive codes will be primarily due to the following effects,

- random noise - which will cause an even growth of error power in all codes.
- non-linearity - which will cause code intermodulation (error growth in codes which are the bitwise product of active codes)
- phase jitter - which can cause "tails" of error growth in codes adjacent to active codes.

By putting all the DPCH in the upper half of the codespace, all the error due to code intermodulation lands in the bottom half of the code space, whereas that due to noise lands evenly across the whole space, and any "tails" due to, e.g. phase jitter will be visible on the few codes in the lower half of the code space (particularly PICH which is positioned in the lower half of the code space with this in mind). The intention is to make possible a qualitative assessment of the reason for a poor PCDE result by inspecting the code domain display.

Table 4. Test Model 3 Active Channels

Type	Number of Channels	Fraction of Power (%)	Fraction of Power (dB)	Channelisation Code	T_{offset}
PCCPCH+SCH	1	10	-10	1	
Primary CPICH	1	10	-10	0	
PICH	1	3.2	-15	16	
DPCH (SF=256)	16/32	76.8 in total	See Table 5	See Table 5	See Table 5

The channelisation codes and $T_{offsets}$ are randomly assigned. As with Test Model 1, not every base station implementation will support 32 DPCH, a variant of this test model containing 16 DPCH are also specified. The conformance test shall be performed using the larger of these two options that can be supported by the equipment under test.

Table 5. DPCH Spreading Code, Toffset and Power for Test Model 3

Code	T_{offset}	Code Power (dB) (16 codes)	Code Power (dB) (32 codes)
64	2	-13.2	-16.2
69	0	-13.2	-16.2
74	2	-13.2	-16.2
78	1	-13.2	-16.2

83	6	-13.2	-16.2
89	1	-13.2	-16.2
93	7	-13.2	-16.2
96	6	-13.2	-16.2
100	1	-13.2	-16.2
105	9	-13.2	-16.2
109	1	-13.2	-16.2
111	0	-13.2	-16.2
115	0	-13.2	-16.2
118	0	-13.2	-16.2
122	5	-13.2	-16.2
125	2	-13.2	-16.2
67	3		-16.2
71	4		-16.2
76	2		-16.2
81	5		-16.2
86	9		-16.2
90	1		-16.2
95	7		-16.2
98	2		-16.2
103	5		-16.2
108	5		-16.2
110	8		-16.2
112	1		-16.2
117	9		-16.2
119	4		-16.2
123	9		-16.2
126	3		-16.2

D.4 DPCH Structure of the Downlink Test Models

It is proposed that for the above test models the following structure is adopted for the DPCH.

It is proposed that the DPDCH and DPCCH have the same power level.

It is proposed that the timeslot structure should be as described by 25.211-300 section 5.3.2 Table 11-slot format 10 that is reproduced in Table 1 below.

Slot Format #I	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Frame			Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot		
				DPDCH	DPCCH	TOT		NData 1	NData 2	NTFCI	NTPC	NPilot
10	60	30	128	450	150	600	40	6	24	0	2	8

It is proposed that the test DPCH has frame structure so that the pilot bits are defined over 15 timeslots according to the relevant columns of 25.211-300 section 5.3.2 Table 12, which are reproduced in Table 2 below.

	Npilot = 8			
Symbol #	0	1	2	3
Slot #0	11	11	11	10
1	11	00	11	10
2	11	01	11	01
3	11	00	11	00
4	11	10	11	01
5	11	11	11	10
6	11	11	11	00
7	11	10	11	00
8	11	01	11	10
9	11	11	11	11
10	11	01	11	01
11	11	10	11	11
12	11	10	11	00
13	11	00	11	11
14	11	00	11	11

It is proposed that the TPC bits alternate 00 / 11 starting with 00 in timeslot 0.

It is proposed that the aggregate 15 x 30 = 450 DPDCH bits per frame are filled with a PN9 sequence generated using the primitive trinomial $x^9 + x^4 + 1$. To ensure non-correlation of the PN9 sequences, each DPDCH shall use its channelisation code as the seed for the PN sequence at the start of each frame.

D.4 References

[1]Ericsson, " Downlink test model for 25.141", 3GPP RAN WG4 Tdoc (99) 704.

[2][1] Hewlett Packard, "Downlink Modulation Quality Measurement", SMG2 UMTS L1-EG Tdoc 622/98.