TSG-RAN Meeting #10 ***RP-000592***
Bangkok, Thailand, 6 - 8 December 2000

Title: Agreed CRs to TS 25.141 [1]

Source: TSG RAN WG4

Agenda Item:5.4.3

Tdoc Num	TS	CR number	Title	Type	Status	Cur Ver	New Ver
R4-000818	25.141	51	Clarifications for EVM and PCDE measurement with respect to inclusion of the SCH	F	agreed	3.3.0	3.4.0
R4-000821	25.141	52	Clarifications for EVM definition	F	agreed	3.3.0	3.4.0
R4-000989	25.141	53	Corrections of values, references and structures of test cases	F	agreed	3.3.0	3.4.0
R4-000833	25.141	54	Total power dynamic range in 25.141	F	agreed	3.3.0	3.4.0
R4-000840	25.141	55	Editorial corrections on TS25.141, sections for test conditions	F	agreed	3.3.0	3.4.0
R4-000964	25.141	56	Editorial correction to uplink reference channel for 2048kbps.	F	agreed	3.3.0	3.4.0

3GPP TSG RAN WG4 Meeting #14 **R4-000818**

Sophia, France 13th - 17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **51** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

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

Title:	⌘	Clarifications for EVM and PCDE measurement with respect to inclusion of the SCH
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 10.11.2000
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The presence of the non-orthogonal SCH degrades measurement accuracy
Summary of change:	⌘	The EVM and PCDE measurements are defined to exclude the SCH period
Consequences if not approved:	⌘	EVM measurement accuracy will be compromised, PCDE measurements will have a noise floor just below the Node B specification.

Clauses affected:	⌘	6.7.1, 6.7.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot). Due to difficulties estimating the power of the non-orthogonal SCH, the period of the SCH ~~(the first 10% of the slot)~~ is excluded.

6.7.1.2 Conformance Requirement

The Error Vector Magnitude shall be less than 17.5%

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 Method of Test

Refer to annex B for a functional block diagram of the test set-up.

1) Connect the base station RF output port to the measurement equipment.

2) Set the base station to transmit a signal according to 6.2.1.3.1 (test model 4) on the main path only. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

3) Trigger the test equipment from the system time reference signal from the base station.

<Editor's note: Precise definition of "Triggering signal" shall be needed.>

4. Measure the Error Vector Magnitude as defined in annex E.
5. If the base station supports STTD or TxAA, repeat steps 1 through 4 with the diversity path (antenna connector 2) enabled instead of the main path

6.7.1.5 Test Requirement

The Error Vector Magnitude measured in 6.7.2.4 step 4 shall meet the limit specified in 6.7.2.2

6.7.2 Peak Code Domain Error

6.7.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting the error vector (as defined in 6.7.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. The measurement interval is one power control group (timeslot).). Due to the non-orthogonal SCH mapping to all the OVSF codes, the period of the SCH (the first 10% of the slot) is excluded.

3GPP TSG RAN WG4 Meeting #14 **R4-000821**

Sophia, France 13th - 17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **52** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

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

Title:	⌘	Clarifications for EVM definition
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 10.11.2000
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The current EVM definition does not explicitly state that the signal should be analysed using the active channels
Summary of change:	⌘	The word “active” is inserted into Annex E
Consequences if not approved:	⌘	If the wrong spreading factor is used in the analysis, the tets signal will be over optimised and the result returned will be too low.

Clauses affected:	⌘	Annex C.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Identical CR to 25.142

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

Annex E (normative):
Global In-Channel TX-Test

E.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process. The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the accuracy limits.

E.2 Definition of the process

E.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal ~~should~~ shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only one code and one spreading factor. All signals are represented as equivalent (generally complex) baseband signals.

E.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored at one sample per chip at the Inter-Symbol-Interference free instants.
The following form represents the physical signal in the entire measurement interval:

one vector **Z**, containing N = ns x sf + ma complex samples;

with
ns: number of symbols in the measurement interval;
sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)
ma: number of midamble chips (only in TDD)

E.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications.
It is filtered by the same matched filter, mentioned in E.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:

one vector **R**, containing N = ns x sf + ma complex samples;

ns: number of symbols in the measurement interval;
sf: number of chips per symbol. (see Note: Symbol length)
ma: number of midamble chips (only in TDD)

3GPP TSG RAN WG4 Meeting #14 **R4-000989**

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CR-Form-v3

CHANGE REQUEST

⌘ **25.141 CR 53** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

Title:	⌘	Corrections of values, references and structures of test cases
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2000-11-08
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:	*Use one of the following releases:*	
F *(essential correction)*	*2*	*(GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96*	*(Release 1996)*
B *(Addition of feature),*	*R97*	*(Release 1997)*
C *(Functional modification of feature)*	*R98*	*(Release 1998)*
D *(Editorial modification)*	*R99*	*(Release 1999)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*REL-4*	*(Release 4)*
	REL-5	*(Release 5)*

Reason for change:	⌘	CR corrects values, references and structure of tests
Summary of change:	⌘	In TS 25.141 a number of inconistencies with the core specification exists, for requirements such as spurios emission. Some requirements are lacking, even though they exist in TS25.104. Several test cases are not written according to the prescribed format. There are also several cases of incorrect references.
Consequences if not approved:	⌘	TS25.141 would be incosistent with the core requirement TS25.104, and within the document there would be different structures of test cases with errounous references.

Clauses affected:	⌘	Chapters 4,6,7,8 and Annex A		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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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 the present document shall be met with the ancillary RF amplifier fitted. At tests according to clauses 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 the present document 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

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 subclauses 6.2 and 7.2 highest applicable attenuation value is applied.

4.6.5 BS using antenna arrays

A BS may be configured with a multiple antenna port connection for some or all of its transceivers or with an antenna array related to one cell (not one array per transceiver). This subclause applies to a BS which meets at least one of the following conditions:

- the transmitter output signals from one or more transceiver appear at more than one antenna port; or
- there is more than one receiver antenna port for a transceiver or per cell and an input signal is required at more than one port for the correct operation of the receiver (NOTE: diverstity reception does not meet this requirement) thus the outputs from the transmitters aswell as the inputs to the receivers are directly connected to several antennas (known as „aircombining"); or
- transmitters and receivers are connected via duplexers to more than one antenna.

If a BS is used, in normal operation, in conjunction with an antenna system which contains filters or active elements which are necessary to meet the UTRA requirements, the conformance tests may be performed on a system comprising the BS together with these elements, supplied separately for the purposes of testing. In this case, it must be

demonstrated that the performance of the configuration under test is representative of the system in normal operation, and the conformance assessment is only applicable when the BS is used with the antenna system.

For conformance testing of such a BS, the following procedure may be used.

4.6.5.1 Receiver tests

For each test, the test signals applied to the receiver antenna connectors shall be such that the sum of the powers of the signals applied equals the power of the test signal(s) specified in the test.

An example of a suitable test configuration is shown in figure 4.1.

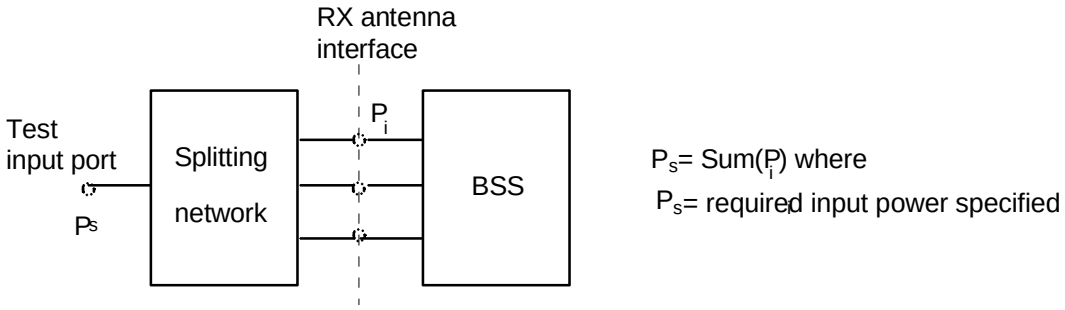

Figure 4.1: Receiver test set-up

For spurious emissions from the receiver antenna connector, the test may be performed separately for each receiver antenna connector.

4.6.5.2 Transmitter tests

For each test, the test signals applied to the transmitter antenna connectors **(P_i)** shall be such that the sum of the powers of the signals applied equals the power of the test signal(s) **(P_s)** specified in the test. This may be assessed by separately measuring the signals emitted by each antenna connector and summing the results, or by combining the signals and performing a single measurement. The characteristics (e.g. amplitude and phase) of the combining network should be such that the power of the combined signal is maximised.

An example of a suitable test configuration is shown in figure 4.2.

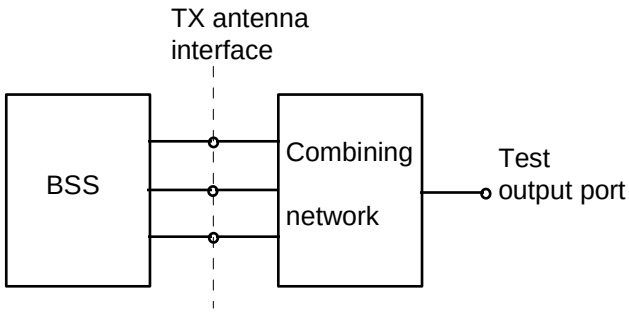

Figure 4.2: Transmitter test set-up

For Intermodulation attenuation, the test may be performed separately for each transmitter antenna connector.

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

Subclause 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 subclause ~~5.2~~3.4.1 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 subclause 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 subclause ~~5.2~~3.4.1(a) and 1930-1990 MHz, as defined in subclause ~~5.2~~3.4.1(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 subclause ~~5.2~~3.4.1 that are supported by the BS.

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.

Rated output power, PRAT, 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 Base station maximum output power

6.2.1.1 Definition and applicability

Maximum output power, Pmax, of the base station is the mean power level per carrier measured at the antenna connector in specified reference condition.

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 subclause 4.4.1.

6.2.1.2 Conformance requirement

In normal conditions, the Base station maximum output power shall remain within +2 dB and -2 dB of the manufacturer's rated output 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 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 subclause 4.4.1.~~

The reference for this requirement is in TS 25.104 [1] subclause 6.2.1

6.2.1.3 Test purpose

The test purpose is to verify the accuracy of the maximum output power across the frequency range and under normal and extreme conditions for all transmitters in the BS.

6.2.1.4~~3~~ Method of test

6.2.1.4~~3~~.1 Initial conditions

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

6.2.1.4~~3~~.2 Procedure

1. Set the base station to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model1 in subclause 6.1.1.1.
2. Measure the mean power at the RF output port over a certain slots.

6.2.1.5~~4~~ Test requirements

Maximum output power requirement shall be met as specified in subclause 6.2.1.2.

6.2.2 CPICH power accuracy

6.2.2.1 Definition and applicability

CPICH power accuracy is defined as the maximum deviation between the ordered channel power and the power in that channel measured at the TX antenna interface. The requirement is applicable for all BS types.

6.2.2.2 Conformance Requirement

~~See subclause 6.2.2.5.~~ The measured CPICH power shall be within ±2.1dB of the ordered absolute value. The reference for this requirement is in TS 25.104 [1] subclause 6.4.4

6.2.2.3 Test purpose

The purpose of the test is to verify, that the BS under test delivers CPICH power within margins, thereby allowing reliable cell planning and operation.

6.2.2.4 Method of test

6.2.2.4.1 Initial conditions

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

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

Disable inner loop power control.

Set-up BS transmission at maximum total power as specified by the supplier. Channel set-up shall be according to subclause 6.1.1.2.

6.2.2.4.2 Procedure

Measure the power in the PCCPCH and PCPICH according to annex E.

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 absolute value.~~meet the requirements as specified in 6.2.2.2

6.3 Frequency error

6.3.1 Definition and applicability

Frequency error is the measure of the difference between the actual ~~BTS~~BS transmit frequency and the assigned frequency. The same source shall be used for RF frequency and data clock generation.

It is not possible to verify by testing that the data clock is derived from the same frequency source as used for RF generation. This may be confirmed by a manufacturers declaration

6.3.2 Conformance requirement

The Frequency Error shall be within ± 0.05 PPM.

The reference for this requirement is in TS 25.104 [1] subclause 6.3

6.3.3 Test purpose

To verify that the Frecuency Error is within the limit specified in 6.3.2

6.3.4 Method of test

6.3.4.1. Initial Conditions

1) Connect the base station RF output port to the test equipment. Refer to annex B.1.2 for a functional block diagram of the test set-up.

2) Set the base station to transmit a signal modulated with PCCPCH. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

6.3.4.2. Procedure

Measure the Frequency Error according to annex E.

6.3.5 Test requirement

The Frequency Error shall meet the limit specified in 6.3.2

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 set-up according to subclause 6.1.1.2.

6.4.1 Inner loop power control

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

6.4.2 Power control steps

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.1 Definition and applicability

Inner loop power control in the downlink is the ability of the BS transmitter to adjust the transmitter output power of a code channel in accordance with the corresponding TPC symbols received in the uplink.

The power control step is the required step change in the DL transmitter output power of a code channel in response to the corresponding power control command. The combined output power change is the required total change in the DL transmitter output power of a code channel in response to multiple consecutive power control commands corresponding to that code channel.

6.4.2.2 Conformance requirement

The BS transmitter shall have the capability of setting the inner loop output power with a step sizes of 1 dB mandatory and 0,5 dB optional.

(a) The tolerance of the power control step due to inner loop power control shall be within the range shown in table 6.9.

(b) The tolerance of the combined output power change due to inner loop power control shall be within the range shown in table 6.10a.

Table 6.9: Transmitter power control step tolerance

Power control commands in the down link	Transmitter power control step tolerance			
	1 dB step size		0,5 dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+0,5 dB	+1,5 dB	+0,25 dB	+0,75 dB
Down(TPC command "0")	-0,5 dB	-1,5 dB	-0,25 dB	-0,75 dB

Table 6.10a: Transmitter combined output power tolerance

Power control commands in the down link	Transmitter combined output power change tolerance after 10 consecutive equal commands (up or down)			
	1 dB step size		0.5dB step size	
	Lower	Upper	Lower	Upper
Up(TPC command "1")	+8 dB	+12 dB	+4 dB	+6 dB
Down(TPC command "0")	-8 dB	-12 dB	-4 dB	-6 dB

The reference for this requirement is TS 25.104 [1] subclause 6.4.1.1.1

6.4.2.3 Test purpose

To verify those requirements for the power control step size and response are met as specified in subclause 6.4.2.2.

6.4.2.4 Method of test

6.4.2.4.1 Initial conditions

(1) Connect the suitable measurement equipment to the BS antenna connector as shown in annex B.

(2) Start BS transmission with channel configuration as specified in table 6.3 Test model 2.

(3) Establish downlink power control with parameters as specified in table 6.10b.

Table 6.10b

Parameter	Level/status	Unit
UL signal level	Ref.sens + 10 dB	dBm/3,84 MHz
Data sequence	PN9	

6.4.2.4.2 Procedure

1) Set and send alternating TPC bits from the UE simulator or UL signal generator.

2) Measure mean power level of the code under the test each time TPC command is transmitted. All steps within power control dynamic range declared by manufacturer shall be measured. Use the code power measurement method defined in annex E.

3) Measure the 10 highest and the 10 lowest power step levels within the power control dynamic range declared by manufacturer by sending 10 consecutive equal commands as described table 6.10a.

4) Check that average step size tolerance requirement shall be met.

6.4.2.5 Test requirement

(a) BS shall fulfil step size requirement for all power control steps declared by manufacture as specified in subclause 6.4.2.2.

(b) For all measured Up/Down cycles, the difference of transmission power between before and after 10 equal commands (Up and Down), derived in step (3), shall not exceed the prescribed range in subclause 6.4.2.2.

6.4.3 Power control dynamic range

6.4.3.1 Definition and applicability

The power control dynamic range is difference between the maximum and the minimum transmit output power of a code channel for a specified reference condition. Transmit modulation shall be maintained within whole dynamic range as specified in TS 25.104 subclause 6.8.

6.4.3.2 Conformance requirement

Down link (DL) power control dynamic range:

- maximum power: BS maximum output power -3 dB or greater;
- minimum power: BS maximum output power -28 dB or less.

The reference for this requirement is TS 25.104 [1] subclause 6.4.2.1.

6.4.3.3 Test purpose

To verify that the minimum power control dynamic range is met as specified in subclause 6.4.3.2.

6.4.3.4 Method of test

6.4.3.4.1 Initial conditions

1) Connect the measurement equipment to the BS antenna connector as shown in annex B.
2) Channel configuration defined in table 6.3 Test model 2 shall be used.
3) Set BS frequency.
4) Star BS transmission.

6.4.3.4.2 Procedure

Pmax shall be defined as described in subclause 6.2.1 Base station maximum output power.

1) Set power of the DPCH under test to the Pmax-3 dB level. Power levels for other code channels shall be adjusted as necessary.
2) Measure mean power level of the code channel under test. Use the code power measurement method defined in annex E.
3) Set power of the DPCH under test to the minimum value by means determined by the manufacturer. Power levels for other code channels shall remain unchanged.
4) Measure mean power level of the code channel under test.

6.4.3.5 Test requirement

Power control dynamic range requirement shall be met as specified in subclause 6.4.3.2.

6.4.4 Total power dynamic range

6.4.4.1 Definition and applicability

The total power dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition.

6.4.4.2 Conformance requirement

The down link (DL) total power dynamic range shall be 18 dB or greater. The reference for this requirement is TS 25.104 [1] subclause 6.4.3.1.

6.4.4.3 Test purpose

To verify that the total power dynamic range as specified in TS 25.104 subclause 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.>~~

6.4.4.4 Method of test

6.4.4.4.1 Initial requirement

1) Connect the measurement equipment to the BS antenna connector as shown in annex B.
2) Channel configuration defined in table 6.3 Test model 2 [but without traffic channel] shall be used.

~~<Editor's note: The conditions should be clarified.>~~

3) Set BS frequency.
4) Start BS transmission.

6.4.4.4.2 Procedure

1) Pmax shall be defined as described in subclause 6.2.1 Base station maximum output power.
2) Set the power level of the code channels such that BS output power level is 18 dB lower than BS maximum output power. All code channels shall use same power level.
3) Measure the mean transmission power level

6.4.4.5 Test requirement

BS shall achieve total power dynamic range as specified in subclause 6.4.~~3~~4.2.

6.5 Output RF spectrum emissions

The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.1.

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 $\beta/2$ of the total mean transmitted power.

The value of $\beta/2$ should be taken as 0,5%.

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 Recommendation 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 subclause 6.1.1.1.

6.5.1.4.2 Procedure

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: 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 bandwidth calculated in step (5) of subclause 6.5.1.4.2 shall be less than 5 MHz.

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 Definitions and applicability

The mask defined in Tables 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

6.5.2.1.2 Conformance requirements

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 in tables 6.11 to 6.14 for the appropriate BS maximum output power, in the frequency range from Δf =2.5 MHz to f_offset_{max} from the carrier frequency, where:m

- Δf is the separation between the carrier frequency and the nominal –3dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12.5 MHz or the offset to the UMTS Tx band edge as defined in subclause 3.4.1, whichever is the greater.

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

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

Frequency offset of measurement filter – 3dB point, 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
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	- 14 – 15·(f_offset- 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	1 MHz
7.5 ≤ Δf MHz	8.0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 6.12: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, 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
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-14 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-26 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-13 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

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

Frequency offset of measurement filter – 3dB point,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
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	P – 53 – 15·(f_offset – 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	P - 65 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	P - 52 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

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

Frequency offset of measurement filter – 3dB point, 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
2.7 ≤ Δf < 3.5 MHz	2.715MHz ≤ f_offset < 3.515MHz	-22 – 15·(f_offset - 2.715) dBm	30 kHz
	3.515MHz ≤ f_offset < 4.0MHz	-34 dBm	30 kHz
3.5 ≤ Δf < 7.5 MHz	4.0 MHz ≤ f_offset < 8.0MHz	-21 dBm	1 MHz
7.5 ≤ Δf MHz	8.0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

The reference for this requirement is in TS 25.104 [1] subclause 6.6.2.1

6.5.2.1.3 Test purpose

This test measures the emissions of the BS, close to the assigned channel bandwidth of the wanted signal, while the transmitter is in operation. ~~The purpose of this test is to verify that the BS meet the spectrum emission requirements as specified in TS 25.104, subclause 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) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4.0 MHz shall use a 30 kHz measurement bandwidth.

3) Measurements with an offset from the carrier centre frequency between 4.0 MHz and (Δf_{max} – 500 kHz).shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements

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, subclause 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 subclause 6.5.2.1.2 shall be fulfilled.

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.

6.5.2.2.2 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

The reference for this requirement is in TS 25.104 [1] subclause 6.5.2.2

6.5.2.2.3 Test purpose

To verify that the adjacent channel leakage power ratio requirement shall be met as specified in subclause 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 to the base station RF output port as shown in annex B.

2) The measurement device characteristics shall be:

   - measurement filter bandwidth: defined in subclause 6.5.2.2.1;

   - 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. Total power at the RF output port shall be the maximum output 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.

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 subclause 6.5.2.2.2.

6.5.3 Spurious emissions

6.5.3.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions. This is measured at the base station RF output port.

The requirement applies at frequencies within the specified frequency ranges, which are more than 12.5 MHz under the first carrier frequency used or more than 12.5 MHz above the last carrier frequency used.

The requirements of either subclause 6.5.3.4.1 or subclause 6.5.3.4.2 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.

Unless otherwise stated, all requirements are measured as mean power (RMS).

6.5.3.2 Test purpose

This test measures conducted spurious emission from the BS transmitter antenna connector, while the transmitter is in operation.

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 subclause 6.1.1.1. 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.

6.5.3.4 Conformance Requirements

6.5.3.4.1 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.

6.5.3.4.1.1 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	Maximum level	Measurement Bandwidth	Note
9 kHz to 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz to 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz to 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz to 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-7, subclause 2.6

6.5.3.4.2 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.

6.5.3.4.2.1 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
9 kHz ↔ 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
150 kHz ↔ 30 MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
30 MHz ↔ 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
1 GHz ↔ Fc1 – 60 MHz or 2 100 MHz *Whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1
Fc1 – 60 MHz or 2 100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2 100 MHz whichever is the higher	-25 dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
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, subclause 4.1
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2 180 MHz Whichever is the lower	-25 ~~-13~~ dBm	1 MHz	Specification more stringent than ITU-R SM.329-7, subclause 4.1
Fc2 + 60 MHz or 2 180 MHz *Whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-7, subclause 4.1. Upper frequency as in ITU-R SM.329-7, subclause 2.6
Fc1: Center frequency of first carrier frequency used. Fc2: Center frequency of last carrier frequency used.			

6.5.3.4.3 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 desensitization of the receiver.

6.5.3.4.3.1 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
1 920 MHz to 1 980 MHz For operation in Frequency Bands defined in subclause 3.4.1(a)	-96 dBm	100 kHz	
1 850 MHz to 1 910 MHz For operation in Frequency Bands defined in subclause 3.4.1(b)	-96 dBm	100kHz	

6.5.3.4.4 Co-existence with GSM 900

6.5.3.4.4.1 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.

6.5.3.4.4.1.1 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 MHz to 960 MHz	-~~47~~ 57 dBm	100 kHz	

6.5.3.4.4.2 Co-located base stations

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

6.5.3.4.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed.

Table 6.20: BS Spurious emissions limits for protection of the ~~BS~~ BTS receiver

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

6.5.3.4.5 Co-existence with DCS 1800

6.5.3.4.5.1 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.

6.5.3.4.5.1.1 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
1 805 MHz to 1 880 MHz	-~~57~~ 47 dBm	100 kHz	

6.5.3.4.5.2 Co-located basestations

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

6.5.3.4.5.2.1 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
1 710 MHz to 1 785 MHz	-98 dBm	100 kHz	

6.5.3.4.6 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.

6.5.3.4.6.1 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
1 893,5 MHz to 1 919,60 MHz	-41 dBm	300 kHz	

6.5.3.4.7 Co-existence with services in adjacent frequency bands

This requirement may be applied for the protection in bands adjacent to 2 110 MHz to 2 170 MHz, as defined in subclause 3.4.1(a) and 1 930 MHz to 1 990 MHz, as defined in subclause 3.4.1(b) in geographic areas in which both an adjacent band service and UTRA are deployed.

6.5.3.4.7.1 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
2 100 MHz to 2 105 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (f - 2 100 MHz) dBm	1 MHz	
2 175 MHz to 2 180 MHz For operation in frequency bands as defined in subclause 3.4.1(a)	-30 + 3,4 (2 180 MHz - f) dBm	1 MHz	
1 920 MHz to 1 925 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 + 3,4 (f – ~~1 930~~ 1920 MHz) dBm	1 MHz	
1 995 MHz to 2 000 MHz For operation in frequency bands as defined in subclause 3.4.1(b)	-30 +3,4 (2 000 MHz – f) dBm	1 MHz	

6.5.3.4.8 Co-existence with UTRA-TDD

6.5.3.4.8.1 Operation in the same geographic area

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

6.5.3.4.8.1.1 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
1 900 MHz to 1 920 MHz	-52 dBm	1 MHz	
2 010 MHz to 2 025 MHz	-52 dBm	1 MHz	

6.5.3.4.8.2 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.

6.5.3.4.8.2.1 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
1 900 MHz to 1 920 MHz	–86 dBm	1 MHz	
2 010 MHz to 2 025 MHz	–86 dBm	1 MHz	

6.6 Transmit intermodulation

6.6.1 Definition and applicability

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

The transmit intermodulation level is the power of the intermodulation products when a WCDMA modulated interference signal is injected into an antenna connector at a level of 30 dB lower than that of the wanted signal. The frequency of the interference signal shall be 5 MHz, 10 MHz and 15 MHz offset below the first or above the last carrier frequency used.

The requirements are applicable for single carrier BS.

~~< Editor's note: Multi Carier case to be specified. >~~

6.6.2 Conformance requirement

The transmit intermodulation level shall not exceed the out of band emission or the spurious emission requirements of subclauses 6.5.2 and 6.5.3.

The reference for this requirement is in TS 25.104 [1] subclause 6.7

6.6.3 Test purpose

The test purpose is to verify the ability of the BS transmitter to restrict the generation of intermodulation products in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna to below specified levels.~~The purpose of this test is to verify that the BS meet the transmit intermodulation requirements as specified in TS 25.104, subclause 6.7.~~

6.6.4 Method of test

6.6.4.1 Initial conditions

1) Test set-up in accordance to annex B.

6.6.4.2 Procedures

1) Generate the wanted signal in accordance to test model 1, subclause 6.1.1.1 at specified maximum BS output power.
2) Generate the interference signal (WCDMA signal as specified in the table 6.1 and 6.2 (Test model 1)) with frequency offset of 5 MHz relative to the wanted signal in accordance to test model 2, subclause 6.1.1.2.
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 subclause 6.5.2.
5) Perform the spurious emission test as specified in subclause 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.

6.7 Transmit modulation

6.7.1 Error Vector Magnitude

6.7.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E. This difference is called the error vector. The

EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot).

6.7.1.2 Conformance Requirement

The Error Vector Magnitude shall be less than 17.5%.

The reference for this requirement is in TS 25.104 [1] subclause 6.8.2

6.7.1.3 Test Purpose

To verify that the Error Vector Magnitude is within the limit specified in 6.7.1.2

6.7.1.4 Method of Test

Refer to annex B for a functional block diagram of the test set-up.

1) Connect the base station RF output port to the measurement equipment.

2) Set the base station to transmit a signal according to 6.2.1.3.1 (test model 4) on the main path only. Total power at the RF output port shall be Pmax-3dB and Pmax-18dB.

3) Trigger the test equipment from the system time reference signal from the base station.

<Editor's note: Precise definition of "Triggering signal" shall be needed.>

4. Measure the Error Vector Magnitude as defined in annex E.

5. If the base station supports STTD or TxAA, repeat steps 1 through 4 with the diversity path (antenna connector 2) enabled instead of the main path

6.7.1.5 Test Requirement

The Error Vector Magnitude measured in 6.7.2.4 step 4 shall meet the limit specified in 6.7.2.2

6.7.2 Peak Code Domain Error

6.7.2.1 Definition and applicability

The Peak Code Domain Error is computed by projecting the error vector (as defined in 6.7.1) onto the code domain at a specific spreading factor. The Code Domain Error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The Peak Code Domain Error is defined as the maximum value for the Code Domain Error for all codes. The measurement interval is one power control group (timeslot).

6.7.2.2 Conformance requirement

The peak code domain error shall not exceed -33 dB at spreading factor 256.

The reference for this requirement is in TS 25.104 [1] subclause 6.8.3

6.7.2.3 Test Purpose

It is the purpose of this test to discover and limit inter-code cross-talk.

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. For non-transmit diversity modes, connect the antenna connector as shown in Figure B.2. If STTD or TxAA is supported by the BS, connect both antenna connectors as shown in Figure B.6.

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

<Suggested Editor's Note: Changes to Test model 3 for TD tests are ffs>

3) Set BS frequency.

4) Start BS transmission

6.7.2.4.2 Procedure

1) Measure Peak code domain error according to annex E.

6.7.2.5 Test requirement

Peak code domain error shall meet the requirement as specified in subclause 6.7.2.2.

7 Receiver characteristics

7.1 General

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 subclauses 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.

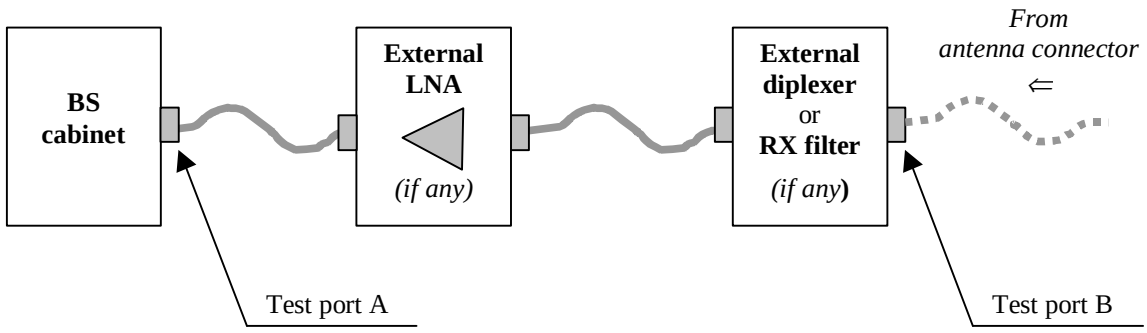

Figure 7.1: Receiver test ports

The tests in clause 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.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

7.2 Reference sensitivity level

7.2.1 Definition and applicability

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the BER does not exceed the specific value indicated in subclause 7.2.2. This test is performed without interfering signal with power applied to the BS antenna connector according to annex B. In the case duplex operation is supported, the measurement configuration principle is indicated for one duplex branch also in Annex B. In case of internal BER calculation is used example of test connection is as shown in figure B.7 The reference point for signal power is at the input of receiver (antenna connector).

7.2.2 Conformance requirement

The BER shall not exceed 0,001 for the parameters specified in table 7.1. ~~The reference for this requirement is in TS 25.104 [1] subclause 7.3.1.~~

Table 7.1: BS reference sensitivity levels

Data rate	BS reference sensitivity level (dBm)	FER/BER
12,2 kbps	-121 dBm	BER shall not exceed 0,001
NOTE: Should only be specified for a measurement channel.		

The reference for this requirement is in TS 25.104 [1] subclause 7.2

7.2.3 Test purpose

To ~~verify~~ verify the minimum receiver input power of a single code at which the BER does not exceed the specified limit.~~that the BS shall meet receiver sensitivity requirement as specified TS 25.104 [1] subclause 7.3.1.~~

7.2.4 Method of testing

7.2.4.1 Initial conditions

1) Connect BS to be tested to RF signal source.
2) Set frequency.
3) Start transmit 12,2kbps DPCH with reference measurement channel defined in annex A to the BS under test (PN-9 data sequence or longer).
4) Disable TPC function.

7.2.4.2 Procedure

1) Calculate BER from at least 30000 received data bits.
2) Set test signal power level transmitted for corresponding data rate as specified in table 7.1.
3) Measure BER.

7.2.5 Test requirement

Requirements for RX reference sensitivity specified in subclause 7.2.2 shall be fulfilled.

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.

Table 7.2: Dynamic range

Parameter	Level	Unit
Data rate	12,2	kbps
Wanted signal	-91	dBm
Interfering AWGN signal	-73	dBm/3.84 MHz

The reference for this requirement is in TS 25.104 [1] subclause 7.3

7.3.3 Test purpose

The test purpose is to verify the ability of the BS to receive a single-code test signal of maximum with a BER not exceeding a specified limit.~~The purpose of this test is to verify that the BS meet the dynamic range requirement as specified in TS 25.104, subclause 7.3.~~

7.3.4 Method of test

7.3.4.1 Initial conditions

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

7.3.4.2 Procedure

1) Adjust the signal generator for the wanted signal to -91 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.

Repeat the measurement for the other RX port.

7.3.5 Test requirements

Dynamic range requirement shall be met as specified in subclause 7.3.2

7.4 Adjacent Channel Selectivity (ACS)

7.4.1 Definition and applicability

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.

7.4.2 Conformance 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

The interference signal shall be wide band CDMA signal of single code.

The reference for this requirement is in TS 25.104 [1] subclause 7.4

7.4.3 Test purpose

The test purpose is to verify the ability of the BS receiver filter to suppress interfering signals in the channels adjacent to the wanted channel.~~The purpose of this test is to verify that the BS meet the dynamic range requirement as specified in TS 25.104, subclause 7.4.~~

7.4.4 Method of test

7.4.4.1 Initial conditions

1) Set-up the equipment as shown in annex B.

7.4.4.2 Procedure

1) Generate the reference channel and adjust the ATT1 to set the input level to the base station under test to the specified -115 dBm.

2) 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.~~

3) Measure the BER and control that the measured value does not exceed the specified value (BER < 0,001).

4) Repeat the test for the port, which was terminated.

7.4.5 Test requirements

Adjacent channel selectivity requirement shall be met as specified in subclause 7.4.2

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 adjacent channels. The blocking performance shall apply at all frequencies as specified in table 7.4.

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

7.5.2 Conformance requirements

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 subclause 3.4.1(a)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 920 MHz to 1 980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 900 MHz to 1 920 MHz 1 980 MHz to 2 000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 900 MHz and 2 000 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

Table 7.4(b): Blocking performance requirement for operation in frequency bands in subclause 3.4.1(b)

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1 850 MHz to 1 910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 830 MHz to 1 850 MHz 1 910 MHz to 1 930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal with one code
1 MHz to 1 830 MHz 1 930 MHz to 12 750 MHz	-15 dBm	-115 dBm	-	CW carrier

The reference for these requirements is in TS 25.104 [1] subclause 7.5

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) Transmit 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 subclause 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:

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

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~~7.4. 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 α = 0,22, or a CW signal; see table ~~7.5.2.1~~7.4.

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 10 000 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.

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	-	-115 dBm
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 in table 7.5.

The reference for this requirement is in TS 25.104 [1] subclause 7.6

7.6.3 Test purpose

The test purpose is to verify the ability of the BS receiver to inhibit the generation of intermodulation products in its non-linear elements caused by the presence of two high-level interfering signals at frequencies with a specific

relationship to the frequency of the wanted signal.~~The purpose of this test is to verify that the BS meet the intermodulation characteristics requirements as specified in TS 25.104, subclause 7.6.~~

7.6.4 Method of test

7.6.4.1 Initial conditions

1) Set-up the equipment as shown in annex B.

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 -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.

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 subclause 6.6.3 is valid.

7.7.2 Conformance requirements

The power of any spurious emission shall not exceed:

Table 7.7: Spurious emission minimum requirement

Band	Maximum level	Measurement Bandwidth	Note
1900 – 1980 MHz and 2010 – 2025 MHz	-78 dBm	3.84 MHz	
9 kHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 12.75 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12.5 MHz below the first carrier frequency and 12.5 MHz above the last carrier frequency used by the BS.

The reference for this requirement is in TS 25.104 [1] subclause 7.7

7.7.3 Test purpose

The test purpose is to verify the ability of the BS to limit the interference caused by receiver spurious emissions to other systems.~~To verify that the BS spurious emission meets the specifications described in subclause 7.7.2.~~

7.7.4 Method of test

7.7.4.1 Initial conditions

1) Connect a measurement receiver to the BS antenna connector as shown in annex B.

2) Enable the BS receiver.

3) Start BS transmission with channel configuration as specified in the table 6.1 and 6.2 (Test model 1).

7.7.4.2 Procedure

1) Set measurement equipment parameters as specified in table 7.6.

2) Measure the spurious emissions over each frequency range described in subclause 7.7.2.

3) Repeat test using diversity antenna connector if available.

Table 7.6

Measurement Band width	3.84 MHz (Root raised cosine,0.22) / 100 kHz (note)
Sweep frequency range	9 kHz to 12.75GHz
Detection	True RMS
NOTE: As defined in subclause 7.7.2.	

7.7.5 Test requirements

The all measured spurious emissions, derived in step (2), shall be within requirement limits as specified in subclause 7.7.2.

7.8 Verification of the internal BER calculation

7.8.1 Definition and applicability

Base Station System with internal BER calculation can synchronise 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 erroneous bits shall be randomly distributed within a frame. Erroneous bits shall be inserted to the data bit stream as shown in figure 7.1.

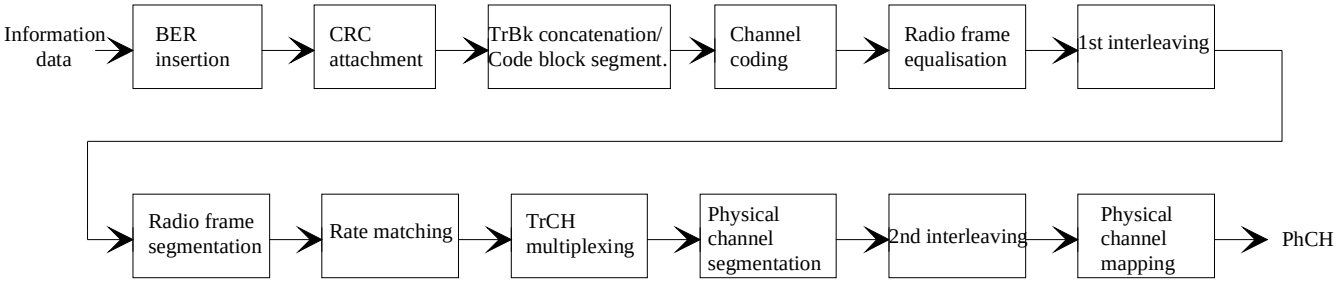

Figure 7.1: BER insertion into the information data

7.8.2 Conformance requirement

BER indicated by the Base Station System shall be within ±[10%] of the BER generated by the RF signal source. Measurement shall be repeated for each measurement signal specified in table 7.7.

Table 7.7

Transport channel combination	Data rate	BER
DPCH	12,2 kbps	BER 0,01
TBD	TBD	TBD
…	…	…
NOTE: 10 times larger BER generator is used to get a good confidence.		

7.8.3 Test purpose

To verify that the internal BER calculation accuracy shall meet requirements for conformance testing.

7.8.4 Method of test

7.8.4.1 Initial conditions

1) 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 7.8.

Table 7.8

Parameter	Level/status	Unit
UL signal level	Ref.sens +10 dB	dBm/3,84 MHz
Data sequence	PN9 or longer	

7.8.4.2 Procedure

1) Measure the BER of received signal from RF signal source or UE simulator to BS antenna connector.

2) BER calculation shall be done at least over 50 000 bits.

3) Repeat test for all required data rates.

7.8.5 Test requirement

BER indicated by the Base Station System shall be within requirement as specified in subclause 7.8.2.

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 Recommendation 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.

In tests performed with signal generators a synchronization signal may be provided, from the base station to the signal generator, to enable correct timing of the wanted signal.

8.2 Demodulation in static propagation conditions

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.

8.2.1.2 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 data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required 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 ~~subcalusesubclause~~ 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 B.

8.2.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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_0 specified in table 8.1 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.1 is found in table 8.2

Table 8.2: Wanted signal levels in AWGN channels.

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-103.9 dBm
64 kbps	-100.3 dBm	-100.1 dBm
144 kbps	-97.5 dBm	-97.4 dBm
384 kbps	-93.1 dBm	-93 dBm

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 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.

8.3.1.2 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 1 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required 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

8.3.1.4.1 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 B.

8.3.1.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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 D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.3 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.3 is found in table 8.4

Table 8.4: Wanted signal levels in multipath Case 1 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-97,1 dBm
64 kbps	-95.6 dBm	-92.6 dBm
144 kbps	-92.9 dBm	-89.9 dBm
384 kbps	-88.2 dBm	-85.2 dBm

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 8.23.

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.

8.3.2.2 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 multipath Case 2 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required 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 subclause 8.3.2.1.

8.3.2.3 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 a specified limit.

8.2.2.4 Method of test

8.3.2.4.1 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 B.

8.3.2.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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 D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.5 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.5 is found in table 8.6.

Table 8.6: Wanted signal levels in multipath Case 2 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-100 dBm
64 kbps	-97.5 dBm	-95.4 dBm
144 kbps	-94.6 dBm	-92.7 dBm
384 kbps	-89.9 dBm	-87.9 dBm

5) For each of the data rates in table 8.5 applicable for the base station, measure the BLER.

8.3.2.5 Test requirements

The BLER measured according to subclause 8.3.1.4.2 shall not exceed the limits specified in table 8.5.

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.

8.3.3.2 Conformance requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.7.

Table 8.7: Performance requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	6.7 dB	7.5 dB
64 kbps	2.9~~7~~ dB	3.3~~2~~ dB	3.6~~4~~ dB
144 kbps	2.3~~2~~ dB	2.7~~5~~ dB	3.1~~2.8~~ dB
384 kbps	2.7~~2.6~~ dB	3.1~~0~~ dB	3.7~~5~~ dB

The reference for this requirement is TS 25.104 ~~subcalusesubclause~~ 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 B.

8.3.3.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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

4) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

5) Adjust the equipment so that required E_b/N_0 specified in table 8.7~~8.4~~ is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.7 is found in table 8.8.

Table 8.8: Performance requirements in multipath Case 3 channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}	Wanted signal level for required BLER < 10^{-3}
12.2 kbps	n.a	-102.3 dBm	-101.5 dBm
64 kbps	-98.9~~99.1~~ dBm	-98.5~~98.6~~ dBm	-98.2~~98.4~~ dBm
144 kbps	-~~96.1~~ 96.0dBm	-~~95.8~~95.6 dBm	-~~95.5~~95.2 dBm
384 kbps	-~~91.4~~91.3 dBm	-~~91.0~~90.9 dBm	-~~90.5~~90.3 dBm

6) For each of the data rates in table 8.7 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 8.7.

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.

8.4.2 Conformance requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.9.

Table 8.9: Performance requirements in moving channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	5.7 dB
64 kbps	2.1 dB	2.2 dB

The reference for this requirement is TS 25.104 ~~subcalusesubclause~~ 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 D.

8.4.3.1.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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 D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.94 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: $-84+10*\text{Log10}(R_b/3.84*10^6)+E_b/N_0$ [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.9 is found in table 8.10

Table 8.10: Wanted signal levels in moving channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-103.3 dBm
64 kbps	-99.7 dBm	-99.6 dBm

5) For each of the data rates in table 8.9 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 8.9.

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.

8.5.2 Conformance requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.11.

Table 8.11: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}
12.2 kbps	n.a.	7.7 dB
64 kbps	4.1 dB	4.2 dB

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 to find new multi path components 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 B.

8.5.2.2.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

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 D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.11~~8~~.4 is achieved. To achieve the specified E_b/N_O, the wanted signal level at the BS input should be adjusted to: -84+10*Log10(R_b /3.84*10^6)+E_b/N_0 [dBm]. The wanted signal levels at the BS input for the specified E_b/N_0 levels in table 8.11 is found in table 8.12

Table 8.12: Performance requirements in birth/death channel

Measurement channel data rate (R_b)	Wanted signal level for required BLER < 10^{-1}	Wanted signal level for required BLER < 10^{-2}
12.2 kbps	n.a.	-101.3 dBm
64 kbps	-97.7 dBm	-97.6 dBm

5) For each of the data rates in table 8.11 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 8.11.

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 clause 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 erroneous blocks shall be randomly distributed within a frame. Erroneous bits shall be inserted into the UL signal as shown in figure 8.1.

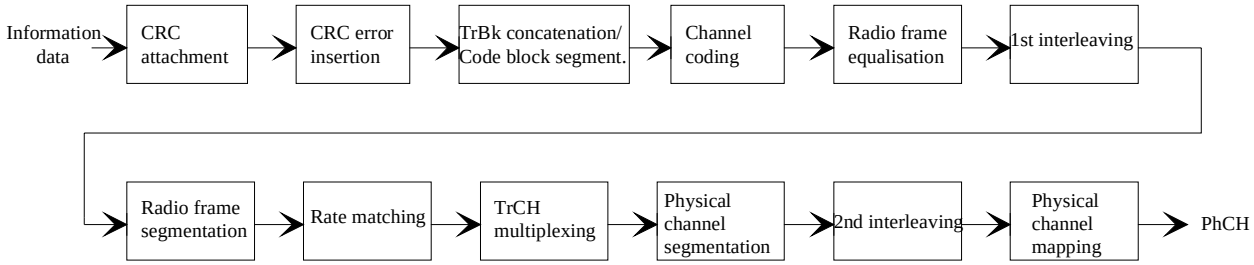

Figure 8.1: BLER insertion to the output data

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 8.13.

Table 8.13

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

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.

Table 8.14

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

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 8.14 is achieved.

For each of the data rates in table 8.13 applicable for the base station, measure the BLER at least over 50 000 blocks.

8.6.5 Test requirement

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

8.7 Site Selection Diversity Transmission (SSDT) Mode

8.7.1 Definition and applicability

Site Selection Diversity Transmission (SSDT) mode is an optional feature of BS and is a macro diversity method in soft handover mode. In SSDT mode, the UE selects one of the cells from its active set to be "primary", all other active cells are classed as "non-primary". The non-primary cells switch off the DCH transmission. The primary cell ID code is delivered to active cells using uplink FBI field of DPCCH.

The requirements and this test apply only to Base Station which has a function of SSDT mode.

8.7.1.1 Conformance requirements

According to the conditions specified in Table 8.15, the downlink DPDCH and DPCCH are properly transmitted or stopped.

Table 8.15: Parameters for SSDT mode test

Parameter	Unit	Test 1	Test 2	Test 3	Test 4
Cell ID of BS under test	-	A	A	A	A
SSDT Quality threshold, $Q_{th,}$ set in BS	dB	-5			
Uplink: $\frac{DPCH\_E_c}{I_o}$	dB	Q_{th} + 10	Q_{th} + 10	Q_{th} - 3	Q_{th} - 3
Cell ID transmitted by UE	-	A	B	A	B
Transmission Of downlink DPCCH	-	Yes	Yes	Yes	yes
Transmission Of downlink DPDCH	-	Yes	No	Yes	yes

The reference for this requirement is in TS 25.104 clause 8.6.

8.7.1.2 Test purpose

To verify that downlink transmission reaction of BS to Layer 1 feedback signalling messages from UE.

8.7.1.3 Method of test

8.7.1.3.1 Initial conditions

1. Connect a UE simulator and an AWGN noise source to the BS antenna connector as shown in Figure B.13.
2. Set up a call according to the Generic call setup procedure using parameters as specified in Table 8.~~6-1~~15. SSDT Quality threshold Q_{th} should be set to the value specified by the manufacturer.
3. Activate SSDT function.

8.7.1.3.2 Procedure

1. Check downlink DCH, properly transmitted on or off, according to Table 8.~~6-1~~15 under conditions of Test1 through Test4 with 3 types of Cell ID sets, “long”, ”medium” and “short”, respectively.

8.7.1.3.3 Test Requirements

Downlink DCH of the BS under test shall be transmitted or stopped properly according to the conditions specified in Table 8.15~~9~~

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~~ 2 through A.6~~5~~ respectively.

NOTE: 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	03333	

3GPP TSG RAN WG4 Meeting #14 R4-000833

Sophia, France 13th - 17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **25.141 CR 54** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

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

Title:	⌘	Total power dynamic range in 25.141
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 13.11.2000
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Test for EVM covers existing test for total power dynamic range.
Summary of change:	⌘	Total power dynamic range and EVM tests are coupled.
Consequences if not approved:	⌘	An unnecessary test is included in conformance testing.

Clauses affected:	⌘	6.4.4.3, 6.4.4.4, 6.4.4.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

3GPP TS 25.141 V3.3.0 (2000-10)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Radio Access Networks;
Base station conformance testing (FDD)
(Release 1999)

6.4.4 Total power dynamic range

6.4.4.1 Definition and applicability

The total power dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition.

6.4.4.2 Conformance requirement

The down link (DL) total power dynamic range shall be 18 dB or greater. The reference for this requirement is TS 25.104 [1] subclause 6.4.3.1.

6.4.4.3 Test purpose

To verify that the total power dynamic range is met as specified in TS 25.104 subclause 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.>~~

6.4.4.4 Method of test

Requirement is tested together with Error Vector Magnitude test, as described in subclause 6.7.1.

~~6.4.4.4.1 Initial requirement~~

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

~~2) Channel configuration defined in table 6.3 Test model 2 [but without traffic channel] shall be used.~~

~~<Editor's note: The conditions should be clarified.>~~

~~3) Set BS frequency.~~

~~4) Start BS transmission.~~

~~6.4.4.4.2 Procedure~~

~~1) Pmax shall be defined as described in subclause 6.2.1 Base station maximum output power.~~

~~2) Set the power level of the code channels such that BS output power level is 18 dB lower than BS maximum output power. All code channels shall use same power level.~~

~~3) Measure the mean transmission power level~~

6.4.4.5 Test requirement

BS shall achieve total power dynamic range as specified in subclause ~~6.4.3.2.~~6.4.4.2.

6.5 Output RF spectrum emissions

The physical channels for the following test(s) shall be set-up according to subclause 6.1.1.1.

3GPP TSG RAN WG4 Meeting #14 **R4-000840**

Sophia, France 13th - 17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **55** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

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

Title:	⌘	Editorial corrections on TS25.141, sections for test conditions
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 2000-11-8
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Although measurement uncertainties are being discussed in 3GPP, some figures in 4.1 and 4.2, do not have [ ] with them. For time being, they will be replaced by certain figures agreed on without [ ]. Until then, to avoid misunderstanding nor confusion, "[ ]" should be put on them.
Summary of change:	⌘	Put "[ ]" for all figures in sections for test conditions (sec.4.1 and 4.2).
Consequences if not approved:	⌘	

Clauses affected:	⌘	4.1, 4.2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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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 1: 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 2: 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 3: 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**
$2,5 \le \Delta f < 2,7$ MHz		±[1,5] dB
$2,7 \le \Delta f < 3,5$ MHz		±[1,5] dB
$3,5 \le \Delta f < 7,5$ MHz		±[1,5] dB
$7,5 \le \Delta f \le \Delta f_{max}$ 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 Test tolerances

The following values may be increased only on a test by test basis. The test tolerances should not be increased to take account of commonly known test system errors (such as mismatch, cable loss, etc.)

4.2.1 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 1: 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 2: 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 3: 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 ±[0] dB.
- conformance requirements outside BS and coexistence receive bands:
  - emission power:

    $f \leq 2.2$ GHz ±[0] dB;

    2.2 GHz < $f \leq 4$ GHz ±[0] dB;

    $f > 4$ GHz ±[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.

4.2.2 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.

4.2.3 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.

3GPP TSG RAN WG4 Meeting #14 **R4-000964**

Sophia, France 13th - 17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **25.141** **CR** **56** ⌘ rev **-** ⌘ Current version: **3.3.0** ⌘

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

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

Title:	⌘	Editorial correction to uplink reference channel for 2048kbps.
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 13 November 00
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Correction of minor editorial error
Summary of change:	⌘	Correction of one number in uplink model definition for 2048kbps.
Consequences if not approved:	⌘	Uplink model definition will not be completely clear.

Clauses affected:	⌘	Figure A.6		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.104 v3.4.0
Other comments:	⌘			

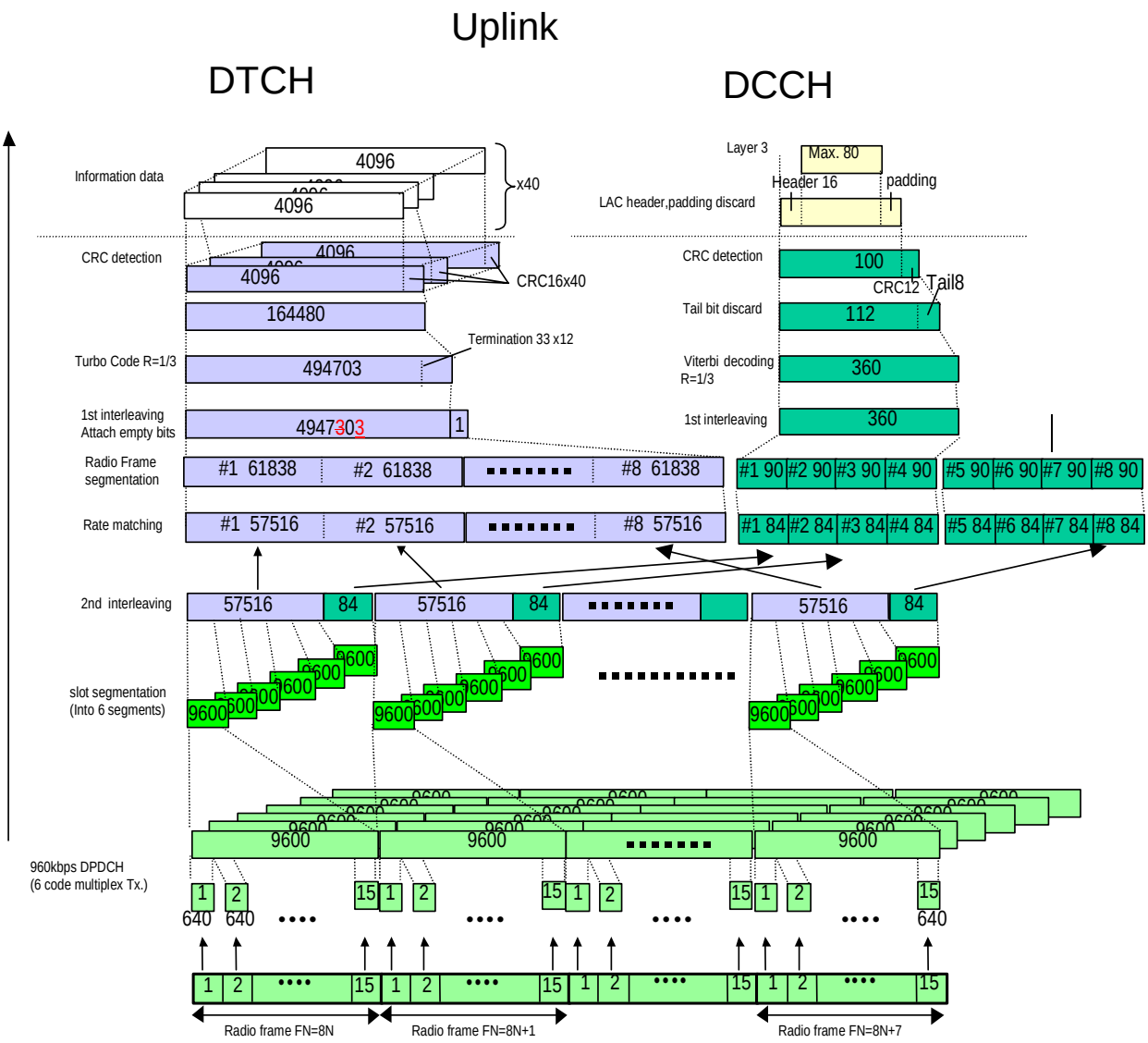

Figure A.6

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

Parameter	Level	Unit
Information bit rate	2 048	kbps
DPCH	960	kbps
Power control	Off	
TFCI	On	
Puncturing	1	%