TSG-T1/RF SWG meeting #4 **TSGT1R#4(99)034**
Stockholm, Sweden, May 14th 1999

Agenda Item: 6.3

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Title: iTS-T1.003 (V0.1.1): Measurement Procedure (FDD)

Document for: Approval

This document was updated from Tdoc T1-99040 (TS XX.XX V1.0.0), and the new document numbering was introduced referring to Tdoc T1R#4(99)033.

According to the agreement in the last T1 meeting, the construction of each test is changed as follows: (items number (2), (3), (4.1) were added and titles of (1), (4), (5) were changed)
(1) Definition and applicability
(2) Conformance requirements
(3) Test purpose
(4) Method of test
(4.1) Initial conditions
(4.2) Procedure
(5) Test requirements

But most of these contents are not completed because of the lack of information. Most of "Method of test" and " Test requirements" were not changed or still TBD.

For the Logical Test Interface, the former loopback test functions specified by TS XX.XX was replaced by the new special conformance testing functions (iTS-T1.001). Each test procedure needs more investigations.

"Performance requirements" is left as it was because of less contribution. The future work shoul be conformed to the progress of investigations in TSG-RAN WG4.

"Requirement of Test Euipment" is left as TBD.

Lastly, the contents for "Foreword" and some words for "Terms and abbreviations" were added.

iTS ~~XX.XX~~-T1.003 V~~1.0.0~~0.1.1 (~~1999-04~~1999-05)

3rd Generation Partnership Project (3GPP)
Technical Specification Group (TSG) Terminal
Measurement Procedure (FDD)

3GPP

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Contents

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Foreword

*[TBD]*This Technical Specification has been produced by the 3rd Generation Partnership Project, Technical Specification Group Terminal, Working Group 1 / RF sub-working-group (3GPP TSG-T WG1/RF).

The contents of this TS may be subject to continuing work within the 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

m indicates [major version number]

x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

y the third digit is incremented when editorial only changes have been incorporated into the specification.

Introduction

[TBD]

1 Scope

This present document specifies the measurement procedures for the conformance test of the mobile station that contain transmitting characteristics, receiving characteristics and *performance requirements* in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 3GPP S4.01AS25.101v1.0.0 "UTRA (UE) FDD;UE Radio transmission and reception (FDD)"

[2] 3GPP S4.03S25.103v0.1.0 "RF Parameters in Support of Radio Resource Management(RRM)"

[3] 3GPP iTS-T1.001v?.?.? "Logical Test Interface (FDD) Special conformance testing functions"

3 Terms and abbreviations

For the purpose of the present document, the following terms and abbreviations apply.

AFC	Automatic Frequency Control
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
ATT	Attenuator
AWGN	Additive White Gaussian Noise
BER	Bit Error Rate
BS	Base Station
CDMA	Code-Domain Multiple Access
Chip Rate	Chip rate of W-CDMA system, equals to 4.096 M chips per second.
CPCH	Common Physical Channel.
CPCH _ E_c	Average energy per PN chip for CPCH.
CRC	Cyclic Redundancy Code

CW	Continuous Wave (unmodulated signal)
$Data\_E_c$	Average energy per PN chip for the DATA fields in the DPCH.
$Data\frac{E_c}{I_o}$	The ratio of the received energy per PN chip for the DATA fields of the DPCH to the total received power spectral density at the mobile station antenna connector.
$\frac{Data\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the DATA fields of the DPCH to the total transmit power spectral density.
DL	DownLink (= forward link)
DPCH	Dedicated Physical Channel
$DPCH\_E_c$	Average energy per PN chip for DPCH.
$\frac{DPCH\_E_c}{I_{or}}$	The ratio of the received energy per PN chip of the DPCH to the total received power spectral density at the mobile station antenna connector.
DTCH	Dedicated Traffic Channel, which is mapped into Dedicated Physical Channel. DTCH contains the user data.
DTX	Discontinuous Transmission
E_b	Average energy per information bit for the Perch Channel, DPCH CPCH, PCH, and for FACH at the mobile station antenna connector.
$\frac{E_b}{N_t}$	The ratio of combined received energy per information bit to the effective noise power spectral density for the Perch Channel, DPCH CPCH, PCH, and for the FACH at the mobile station antenna connector. Following items are calculated as overhead: pilot, TPC, RI, CRC, tail, repetition, convolution coding and Turbo coding.
E_c	Average energy per PN chip.
$\frac{E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for different fields or physical channels to the total transmit power spectral density.
EIRP	Effective Isotropic Radiated Power
EVM	Error Vector Magnitude
FACH	Forward Access Channel
FDD	Frequency Division Duplexing
FER	Frame Error Rate
Fuw	*Frequency offset of unwanted channel ??*
HYB	Hybrid
Information Data Rate	Rate of the user information, which must be transmitted over the Air Interface. For example, output rate of the voice codec.

I_o	The total received power spectral density, including signal and interference, as measured at the mobile station antenna connector.
I_{oac}	The power spectral density of the adjacent frequency channel as measured at the mobile station antenna connector.
I_{oc}	The power spectral density of a band limited white noise source (simulating interference from other cells) as measured at the mobile station antenna connector.
I_{or}	The total transmit power spectral density of the Forward link at the base station antenna connector.
$\hat{I}_{or}$	The received power spectral density of the Forward link as measured at the mobile station antenna connector.
MER	Message Error Rate
MS	Mobile Station
N_t	The effective noise power spectral density at the mobile station antenna connector.
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a Forward link.
$OCNS\_E_c$	Average energy per PN chip for the OCNS.
$\frac{OCNS\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the OCNS to the total transmit power spectral density.
PCH	Paging Channel
$Perch\ \frac{E_c}{I_o}$	The ratio of the received Perch Channel energy per chip to the total received power spectral density at the mobile station antenna connector.
$\frac{Perch\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the Perch Channel to the total transmit power spectral density.
$Pilot\_E_c$	Average energy per PN chip for the Pilot field in the DPCH.
$Pilot\ \frac{E_c}{I_o}$	The ratio of the received energy per PN chip for the Pilot field of the DPCH to the total received power spectral density at the mobile station antenna connector.
$\frac{Pilot\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the Pilot field of the DPCH to the total transmit power spectral density.
PN	Pseudo-random Noise
RI_E_c	Average energy per PN chip for the Rate Information field in the DPCH.
$RI\ \frac{E_c}{I_o}$	The ratio of the received energy per PN chip for the Rate Information field of the DPCH to the total received power spectral density at the mobile station antenna connector.

$\frac{RI\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the Rate Information field of the DPCH to the total transmit power spectral density.
RRM	Radio Resource Management
RSCP	Received Signal Code Power
RX	Receiver
SIR	Signal to Interference Ratio
TPC	Transmit Power Control
TPC_E_c	Average energy per PN chip for the Transmission Power Control field in the DPCH.
$TPC\frac{E_c}{I_o}$	The ratio of the received energy per PN chip for the Transmission Power Control field of the DPCH to the total received power spectral density at the mobile station antenna connector.
$\frac{TPC\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the Transmission Power Control field of the DPCH to the total transmit power spectral density.
TX	Transmitter
UE	User Equipment
UL	UpLink (= reverse link)
UTRA	UMTS Terrestrial Radio Access

<Editor's Note> Radio Frequency Bands specification will be inserted here..

4 Transmitter Characteristics

4.1 General

Transmitting performance test of the mobile station is implemented during communicating with the base station or the simulator via air interface. The procedure is used normal call protocol until the mobile station is communicating on traffic channel basically. On the traffic channel, the mobile station provides special function for testing that is called Logical Test Interface and the mobile station is tested using this function. (Refer to TS xx.xxiTS-T1.001 Logical Test Interface)

Transmitting or receiving bit/symbol rate for test channel is shown in Table 4.1.

Table 4.1 Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	Forward DPCH symbol rate	Reverse DPCH bit rate	Remarks
Speech	12.2kbps	32ksps	64kbps	Standard Test
Circuit Switched Data	TBD	TBD	TBD	
Packet Switched Data	[16kbps]	32ksps	64kbps	Standard Test
	TBD	TBD	TBD	

4.2 Maximum Output Power

4.2.1 Definition and applicability

*[TBD]*The following Power Classes define the maximum output power;

Table 4.2.1 MS Power Classes

Power Class	Maximum output power	Tolerance
1	+33 dBm	± [2] dB
2	+27 dBm	± [2] dB
3	+24 dBm	± [2] dB
4	+21 dBm	± 2 dB

The maximum output power refers to the measure power when averaged over the transmit slot at the maximum power control setting.

For MS using directive antennas for transmission, a class dependent limit will be placed on the maximum Effective Isotropic Radiated Power (EIRP).

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.2.2 Conformance requirements

The tolerance of the MS maximum output power shall be below the prescribed value even for the multi-code transmission mode.

4.2.3 Test purpose

To verify the tolerance of the MS maximum output power does not exceed the prescribed value in Table 4.2.1.

4.2.4 Method of ~~measurement~~ test

4.2.4.1 Initial conditions

A call is set up according to the Generic call setup procedure.

4.2.4.2 Procedure

(1) Connect the base station or simulator to the mobile station antenna connector as shown in Figure 4.2.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.2.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Set and send continuously TPC bits as '11' to the mobile station.

(4) Measure the output power of the mobile station by Tester. The output power shall be averaged over the transmit one timeslot.

~~<Editor's Note> The measurement period is related with measurement tolerance and should be defined in conformance testing. It would be deleted after being approved in RAN4.~~

Table 4.2.2 Test parameters for Maximum Output Power

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

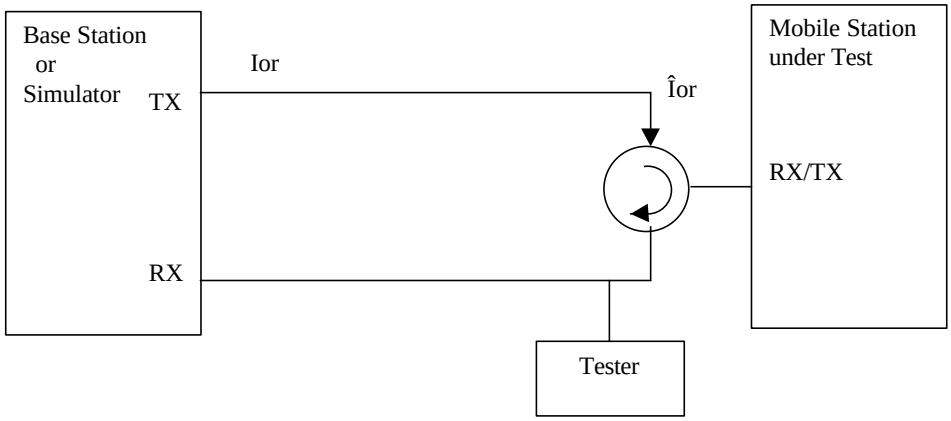

Figure 4.2 Maximum Output Power

4.2.5 Minimum Test Requirements

[TBD]

4.3 Frequency Stability

4.3.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.3 Frequency stability.~~

The frequency stability is the difference in modurated carrier frequency with AFC ON between the RF transmission from the MS and either:
- the RF transmission from the BS, or
- the nominal frequency for the UARFCN used.

These signals will have an apparent error due to BS frequency error and Doppler shift. In the later case, signals from the BS must be averaged over sufficient time that errors due to noise or interference are allowed for within the above ±0.1PPM figure.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.3.2 Conformance requirements

The MS carrier frequency shall be accurate to within ±0,1 ppm, or accurate to within ±0,1 ppm compared to signals received from the BS.

4.3.3 Test purpose

To verify that the MS carrier frequency error does not exceed ±0,1 ppm.

4.3.4 Method of ~~measurement~~ test

4.3.4.1 Initial conditions

A call is set up according to the Generic call setup procedure.

4.3.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.3.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.3. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Measure the frequency error delta f, at the mobile station antenna connector by Tester.
Since counter method leads an incorrect result, EVM method shall be used.

<Editor's Note> The details of this procedure should be defined.

Table 4.3 Test parameters for Frequency Stability

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-103]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	
AFC	ON	
Modulation	ON	

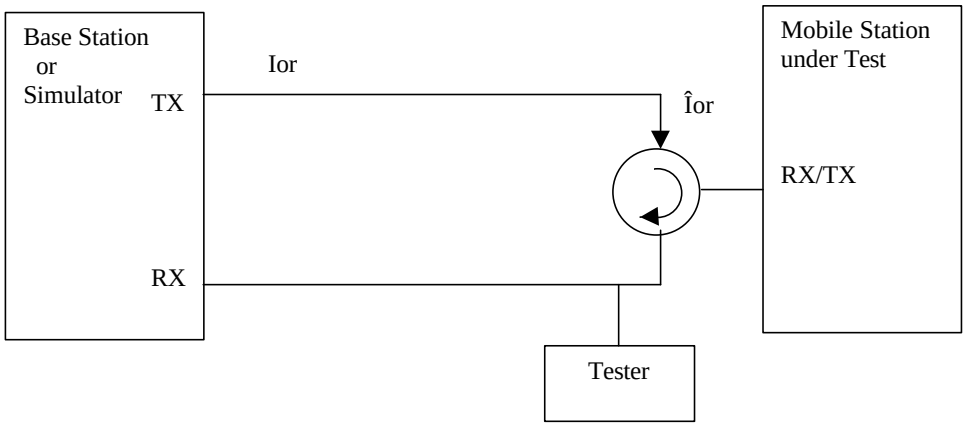

Figure 4.3 Frequency Stability

4.3.5 ~~Minimum~~Test Requirements

For all measured bursts, the frequency error, derived in step (3), shall be less than 10E-7.

4.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level

4.4.1 Open Loop Power Control in the Uplink

4.4.1.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.4.1 Open loop power control.~~

Open loop power control in the uplink is the ability of the MS transmitter to sets its output power to a specific value. This function is used for RACH transmission and based on the information from BS using BCCH and the downlink received signal power level of the perch channel. The information from BS includes transmission power of perch channel and uplink interference power level.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.4.1.2 Conformance requirements

The MS open loop power control tolerance is given in Table 4.4.2.1.

Table 4.4.1.1 Open loop power control tolerance

Normal conditions	± 9 dB
Extreme conditions	± 12 dB

4.4.1.3 Test purpose

To verify that the MS open loop power control tolerance does not exceed the described value shown in Table 4.4.2.1.

4.4.1.4 Method of ~~measurement~~ test

4.4.1.4.1 Initial conditions

[TBD]

4.4.1.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.4.1.2.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.4.1. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Adjust the TX output level of the simulator to obtain Îor at the mobile station antenna connector. Îor shall be selected out of the range that is shown in the table. [TBD]

(4) Measure the output power of the mobile station during 1 frame at the mobile station antenna connector by Tester.

(5) Repeat the above measurement several times. In this time, Îor shall be varied over the range. [TBD]

(6) RACH shall be used for this measurement.

Table 4.4.1.2 Test parameters for Open Loop Power Control

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[ ] to [ ]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Disabled	

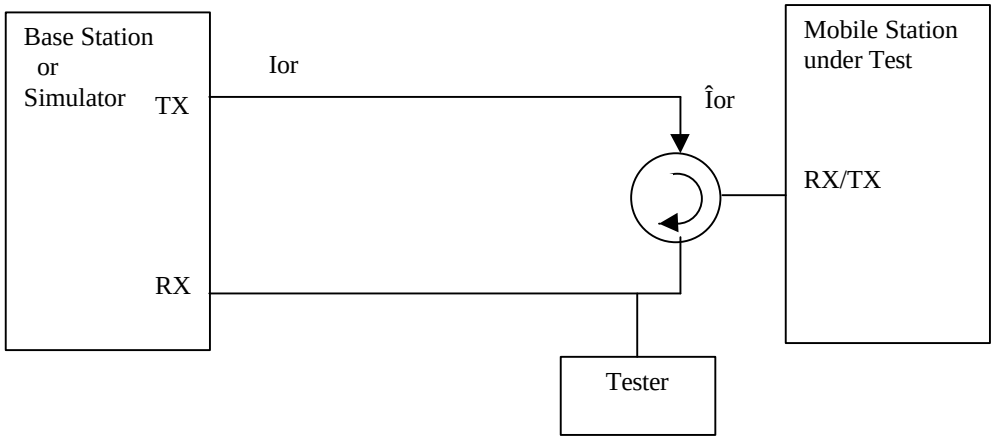

Figure 4.4.1 Open Loop Power Control

4.4.1.5 ~~Minimum~~Test Requirements

[TBD]

4.4.2 Closed Loop Power Control in the Uplink

4.4.2.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.4.2 Closed loop power control.~~

Closed loop power control in the uplink is the ability of the MS transmitter to adjust its output power in accordance with the TPC symbols received in the downlink.

The power control step is the minimum step change in the uplink- transmitter output power in response to a TPC message.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.4.2.2 Conformance requirements

The MS transmitter shall have the capability of setting the closed loop output power with a step size of 1 dB.

(a) The tolerance of the transmitter output power due to closed loop power control shall be within the range shown in Table 4.4.2.1.
(b) The average rate of change in mean power shall be greater than [8.0] dB per [10] slots and less than [12.0] dB per [10] slots
(c) Following the reception of a valid power control bit, the mean output power of the MS shall be within [0.3] dB of its final value in less than [62.5] us from the beginning of the next slot.

The maximum rate of change for the transmitter power control step is 1.6kHz (1/0.625msec).

Table 4.4.2.1 Transmitter power control tolerance

TPC Symbol in the forward-link	Transmitter power control tolerance	
	Lower	Upper
11	+[0.5]dB	+[1.5]dB
00	-[0.5]dB	-[1.5]dB

4.4.2.3 Test purpose

To verify that the MS closed loop power control tolerance and response is meet to the described value shown in clause 4.4.2.2.

~~4.4.2.2~~4.4.2.4 Method of ~~measurement~~ test

4.4.2.4.1 Initial conditions

[TBD]

4.4.2.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.4.2.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.4.2.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Set and send alternating TPC bits from the base station, followed by [10] consecutive ‘11’ s TPC bits, followed by [10] consecutive ‘00’ s TPC bits alternately.

(4) Measure the output power of the mobile station during every slot (0.625msec) at the mobile station antenna connector by Tester.

(5) Measure the transient time from the beginning of the next slot to the time when the output power shall be within the defined tolerance of its final value.

Table 4.4.2.2 Test parameters for Closed Loop Power Control

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

<Editor's Note> Test procedures for the conformance requirement (a) and (c) are not specified yet. Individual power control cycles test may be unnecessary because above procedure includes the cycle verification.

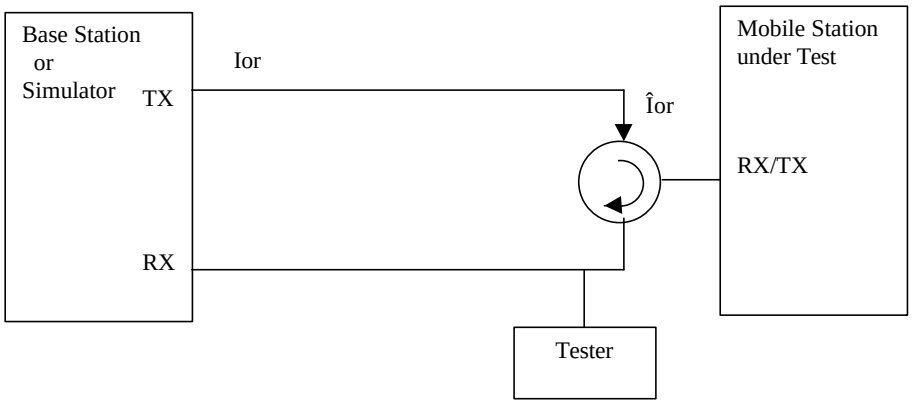

Figure 4.4.2 Closed Loop Power Control

4.4.2.34.4.2.5 MinimumTest Requirements

[TBD]

4.4.3 Minimum Output Power

4.4.3.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.4.4 Minimum transmit output power.~~

The minimum controlled output power of the MS is when the power control setting is set to a minimum value. This is when both the closed loop and open loop power control indicate a minimum transmit output power is required.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.4.3.2 Conformance requirements

The minimum transmit power shall be better than –44 dBm /4.096MHz

4.4.3.3 Test purpose

To verify that the MS minimum transmit power is below the described value shown in clause 4.4.3.2.

~~4.4.3.2~~4.4.3.4 Method of ~~measurement~~ test

4.4.3.4.1 Initial conditions

[TBD]

4.4.3.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.4.3.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.4.3. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Set and send continuously TPC bits as '00' to the mobile station.

(4) Measure the output power of the mobile station by Tester.

<Editor's Note> Both the closed loop and open loop power control indicate a minimum transmit output power is required. And the measurement period should be defined.

Table 4.4.3 Test parameters for Minimum Output Power

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

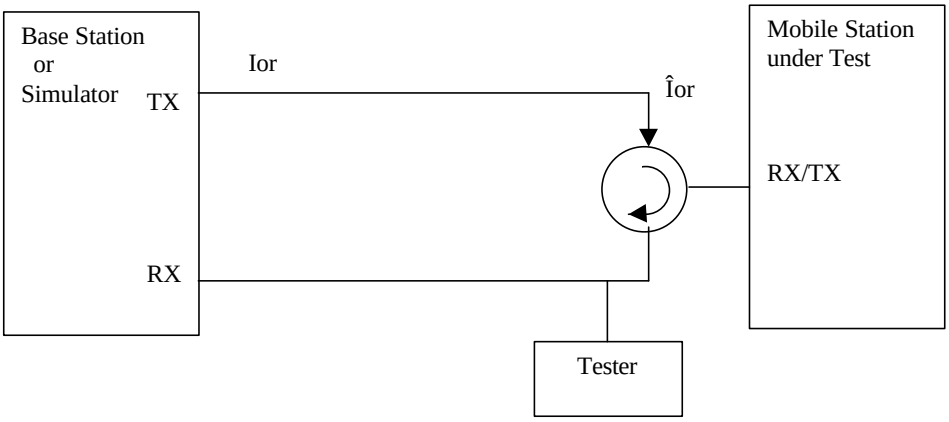

Figure 4.4.3 Minimum Output Power

4.4.3.34.4.3.5 MinimumTest Requirements

[TBD]

4.5 Transmit OFF Power

<Editor's Note> This title should be changed to "Transmit ON/OFF Power" and this clause should be separated into two sub-clauses: "Transmit OFF Power" and "Transmit ON/OFF Time mask".

4.5.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.5 Transmit OFF power.~~

The transmit OFF power state is when the MS does not transmit except during uplink DTX mode. This parameter is defined as the maximum output transmit power within the channel bandwidth when the transmitter is OFF.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.5.2 Conformance requirements

The requirement for the transmit OFF power shall be better than –50 dBm /4.096 MHz.

4.5.3 Test purpose

To verify that the MS transmit OFF power is below the described value shown in clause 4.5.2.

~~4.5.2~~4.5.4 Method of ~~measurement~~ test

4.5.4.1 Initial conditions

[TBD]

4.5.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown Figure 4.5.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.5. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Send release message to the mobile station to stop transmitting.

(4) Measure the leakage power within the transmission band from the mobile station by the Tester.

4.5 Test parameters for Transmit OFF Power

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

<Editor's Note> "Closed Power Control: Enabled" might be unnecessary in this measurement.

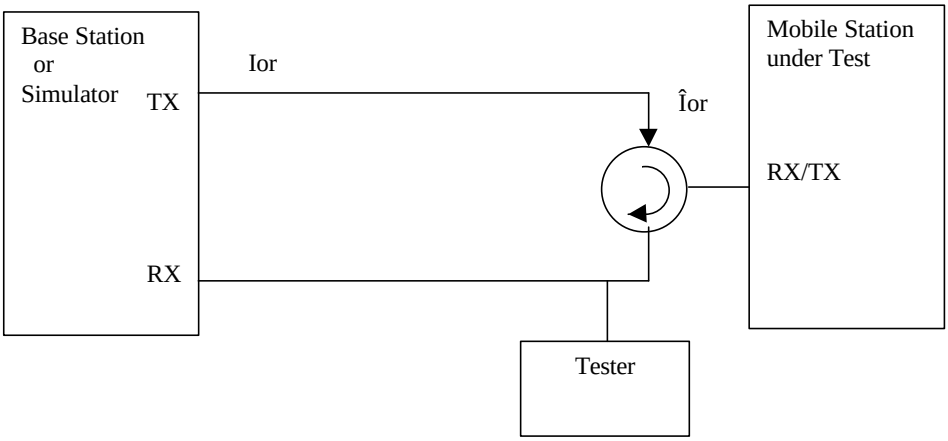

Figure 4.5 Transmit OFF Power

4.5.34.5.5 Minimum Test Requirements

[TBD]

<Editor's Note> The following is an example for "Transmit ON/OFF Time mask" sub-clause.

4.5.2 Transmit ON/OFF Time mask

4.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the MS between transmit OFF power and transmit ON power. Possible ON/OFF scenarios are RACH or uplink slotted mode

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.5.2.2 Conformance requirements

The transmit power levels versus time should meet the mask specified in Figure X

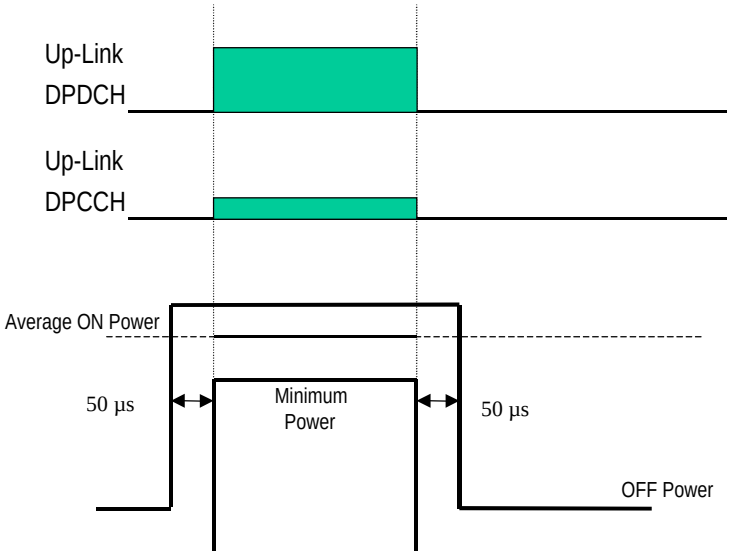

Figure X Transmit ON/OFF template

4.5.2.3 Test purpose

To verify that the MS transmit ON/OFF power levels versus time meets the described mask shown in Figure X.

4.5.2.4 Method of test

4.5.2.4.1 Initial conditions

[TBD]

4.5.2.4.2 Procedure

[TBD]

4.5.2.5 Test Requirements

[TBD]

4.6 DTX

4.6.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.6 DTX.~~

DTX is used to minimize the interference between MS(s) by reducing the MS transmit power when voice, user or control information is not present. Under DTX control, the DTX requirements is defined in terms of the transmitting power ratio and timing as follows:

(a) Both DPDCH and DPCCH transmission is ON in the up link.
(b) In case of no information after (a), DPDCH transmission is OFF
(c) In case synchronism is out of range after section (b), DPCCH transmission is OFF in up link.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.6.2 Conformance requirements

The transmitting power ratio and the timing should be in the range indicated in Figure 4.6.1.

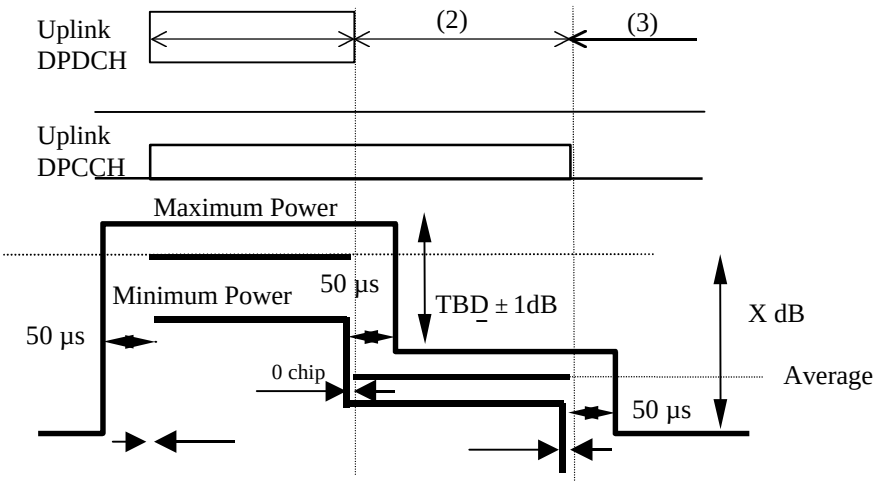

Figure 4.6.1 DTX template

4.6.3 Test purpose

To verify that the MS transmitting power ratio and the timing are in the range indicated in Figure 4.6.1.

~~4.6.2~~4.6.4 Method of ~~measurement~~ test

4.6.4.1 Initial conditions

[TBD]

4.6.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.6.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.6. Then start the loopback test. The detail of the loopback test shall be in accordance with TS xx.xxiTS-T1.001 Logical Test Interface.

(3) Measure the average output power at the antenna connector of the mobile station by Tester in three cases, both DPDCH and DPCCH are ON, only DPCCH is ON and both channels are OFF.

Table 4.6 Test parameters for DTX

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate (PTCH)	[32]	ksps
Reverse Channel bit rate (PTCH)	[64]	kbps
User bit rate	[16]	kbps
Closed Power Control	Enabled	

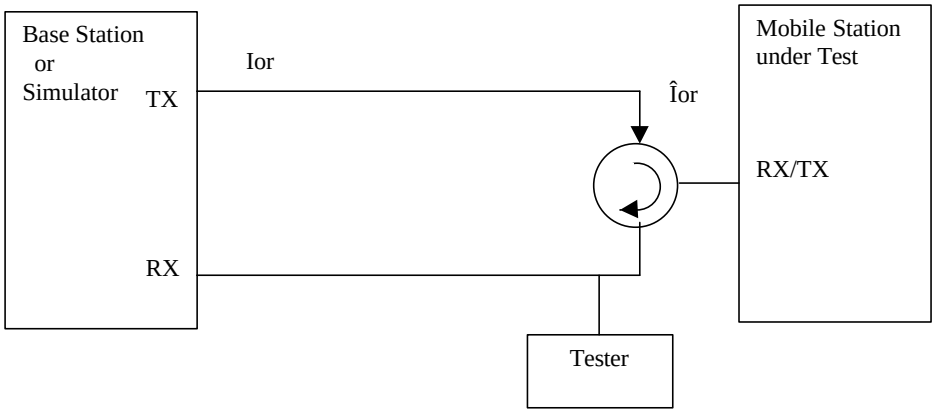

Figure 4.6 DTX

4.6.34.6.5 Minimum Test Requirements

[TBD]

4.7 Occupied Bandwidth

4.7.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.6.1 Occupied bandwidth.~~

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

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.7.2 Conformance requirements

The occupied channel bandwidth is less than 5 MHz based on a chip rate of 4.096 Mcps.

4.7.3 Test purpose

To verify that the MS occupied channel bandwidth is less than 5 MHz based on a chip rate of 4.096 Mcps.

~~4.7.2~~4.7.4 Method of ~~measurement~~ test

4.7.4.1 Initial conditions

[TBD]

4.7.4.2 Procedure

[TBD]

~~4.7.3~~4.7.5 ~~Minimum~~ Test Requirements

[TBD]

4.8 Adjacent Channel Leakage Power Ratio (ACPRACLR)

<Editor's Note> The abbreviation "ACLR" is currentry used for the substitution of "ACPR".

4.8.1 Leakage Power due to Modulation

4.8.1.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 6.6.2.2 Adjacent channel power ratio (ACPR).

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 with a filter response that is [normally rectangular] with a noise power bandwidth equal to the chip rate.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.8.1.2 Conformance requirements

Table 4.8.1 MS ACLR due to modulation

MS channel	ACLR limit
± First adjacent channel	[35] dB
± Second adjacent channel	[45] dB

Note
1) The possibility is being considered of dynamically relaxing the ACLR requirements for Mobile Station(s) under conditions when this would not lead to significant interference (with respect to other system scenario or UMTS operators). This would be carried out under network control, primarily to facilitate reduction in MS power consumption.
2) The ACLR value is FFS based on system scenario and implementation issues.

4.8.1.3 Test purpose

To verify that the MS ACLR due to modulation is less than described value shown in Table 4.8.1.

4.8.1.24.8.1.4 Method of measurement test

4.8.1.4.1 Initial conditions

[TBD]

4.8.1.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.8.1. Connect a spectrum analyzer (or other suitable test equipment) to the mobile station antenna connector.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.8.1. Then start the loopback test. The detail of the loopback test shall be in accordance with TS xx.xxiTS-T1.001 Logical Test Interface.

(3) Set and send continuously TPC bits as '11' to the mobile station until the mobile station output power shall be maximum level.

(4) Measure the power within the bandwidth of current carrier.

(5) Measure the power fallen in the bandwidth of the adjacent channel and the next adjacent channel.

(6) Calculate the ratio of the power between the values measured in '(4)'and '(5)'.

Table 4.8.1 2 Test parameters for Leakage Power due to Modulation

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

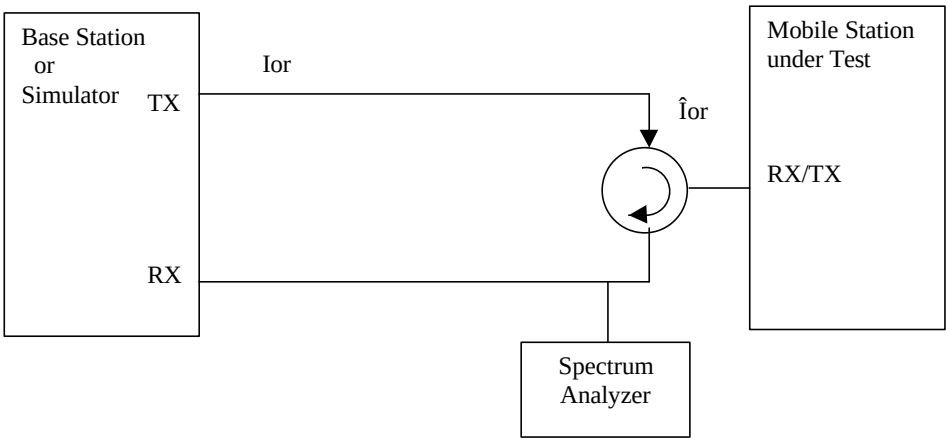

Figure 4.8.1 Leakage Power due to Modulation

4.8.1.34.8.1.5 Minimum Test Requirements

[TBD]

4.8.2 Leakage Power due to Switching

4.8.2.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.6.2.2 Adjacent channel power ratio (ACPR).~~

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.8.2.2 Conformance requirements

Table 4.8.3 MS ACLR due to switching

MS channel	ACLR limit
± First adjacent channel	[35] dB
± Second adjacent channel	[45] dB

Note
1) The ACLR due to switching transients shall not exceed the limits in table 6. To ensure that switching transients due to slotted or DTX mode does not degrade the ACLR value the reference measurement conditions are FFS
2) The possibility is being considered of dynamically relaxing the ACLR requirements for Mobile Station(s) under conditions when this would not lead to significant interference (with respect to other system scenario or UMTS operators). This would be carried out under network control, primarily to facilitate reduction in MS power consumption.
3) The ACLR value is FFS based on system scenario and implementation issues.

4.8.2.3 Test purpose

To verify that the MS ACLR due to switching is less than described value shown in Table 4.8.3.

~~4.8.2.2~~4.8.2.4 Method of ~~measurement~~ test

4.8.2.4.1 Initial conditions

[TBD]

4.8.2.4.2 Procedure

[TBD]

~~4.8.2.3~~4.8.2.5 ~~Minimum~~ Test Requirements

[TBD]

4.9 Spurious Emissions

4.9.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.6.3 Spurious emissions.~~

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.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.9.2 Conformance requirements

Table 4.9.1a Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
9kHz ≤ f < 150kHz	1 kHz	-36dBm
150kHz ≤ f < 30MHz	10 kHz	-36dBm
30MHz ≤ f < 1000 MHz	100kHz	-36dBm
1GHz ≤ f < 11GHz	1MHz	-30dBm

Table 4.9.1b Spurious emissions regional requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
1893.5 MHz < f < 1910 MHz	300 kHz	-40dBm

4.9.3 Test purpose

To verify that the MS spurious emissions are less than described value shown in Table 4.9.1a and Table 4.9.1b.

~~4.9.2~~4.9.4 Method of ~~measurement~~ test

4.9.4.1 Initial conditions

[TBD]

4.9.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.9. Connect a spectrum analyzer (or other suitable test equipment) to the mobile station antenna connector.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.9.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Set and send continuously TPC bits as '11' to the mobile station until the mobile station output power shall be maximum level.

(4) Sweep the spectrum analyzer over a frequency range and measure the average power of spurious emission.

Table 4.9.2 Test parameters for Spurious Emissions

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

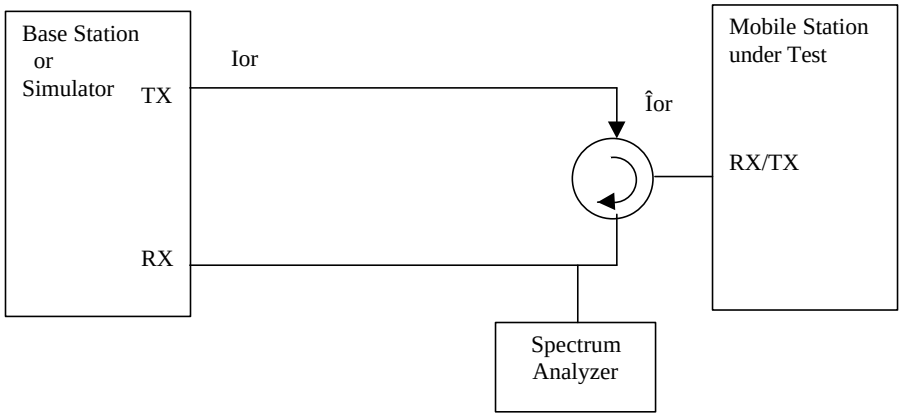

Figure 4.9 Spurious Emissions

4.9.34.9.5 Minimum Test Requirements

[TBD]

4.10 Transmit Intermodulation

4.10.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.7 Transmit intermodulation.~~

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

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.10.2 Conformance requirements

Mobile Station(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the MS, or BS receive band as an unwanted interfering signal. The MS intermodulation attenuation is defined by the ratio of the output power of the wanted signal to the output power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. The requirement of transmitting intermodulation for a carrier spacing of 5 MHz is prescribed in Table 4.10.1.

Table 4.10.1 Transmit Intermodulation

Interference Signal Frequency Offset	5MHz	10MHz
Interference CW Signal Level	-40dBc	
Minimum Requirement	-35dBc	-45dBc

4.10.3 Test purpose

To verify that the MS transmit intermodulation is less than described value shown in Table 4.10.1.

~~4.10.2~~4.10.4 Method of ~~measurement~~ test

4.10.4.1 Initial conditions

[TBD]

4.10.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.10.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.10. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Set and send continuously TPC bits as '11' to the mobile station until the mobile station output power shall be maximum level.

(4) Measure the average output power of the mobile station by spectrum analyzer.

(5) Set the frequency of the CW generator to the offset 1 or offset 2 as shown in the table.

(6) Check around the frequency of the carrier and [3rd] IM, then measure the average power of transmitting intermodulation.

(7) Repeat the measurement with another tone offset.

Table 4.10 Test parameters for Transmit Intermodulation

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	
Tone Power	-40	dBc
Tone Offset 1 from Transmitting Carrier	5	MHz
Tone Offset 2 from Transmitting Carrier	10	MHz

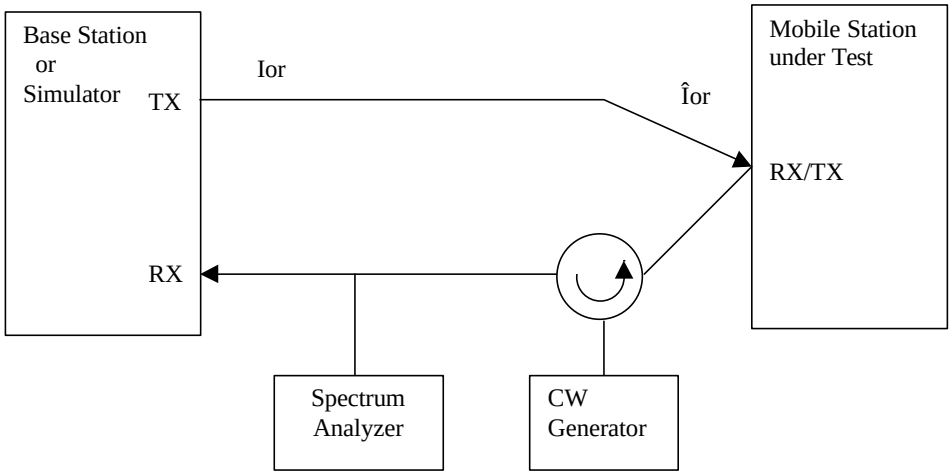

Figure 4.10 Transmit Intermodulation

4.10.34.10.5 Minimum Test Requirements

[TBD]

4.11 Modulation Accuracy

<Editor's Note> This clause should be separated into two sub-clauses: "Error Vector" and "Peak code Domain error".

4.11.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 6.8 Modulation Accuracy.~~

The modulation accuracy is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot)

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.11.2 Conformance requirements

The modulation accuracy shall not exceed [17.5] % based on the test parameters detailed in Table 4.11.1.

Table 4.11.1 Modulation accuracy

Parameter	Level	Unit
Output power	[MS maximum power]	dBm
DPCCH/DPDCH	[-6 (*)]	dB
DPDCH physical channel	[64]	kbps
User bit rate	[12.2]	kbps
Power control	off	

Note
1) Measurement channel is based on mapping of a 12.2 kbps voice channel
2) * Power ratio will need to be defined in RAN WG1

4.11.3 Test purpose

To verify that the MS modulation accuracy is less than [17.5]% based on the test parameters shown in Table 4.11.1.

~~4.11.2~~4.11.4 Method of ~~measurement~~ test

4.11.4.1 Initial conditions

[TBD]

4.11.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 4.11.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 4.11. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Measure the waveform quality factor ρ, and EVM (Error vector magnitude), at the mobile station antenna connector by Tester.

Table 4.11.2 Test parameters for Modulation Accuracy

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Closed Power Control	Enabled	

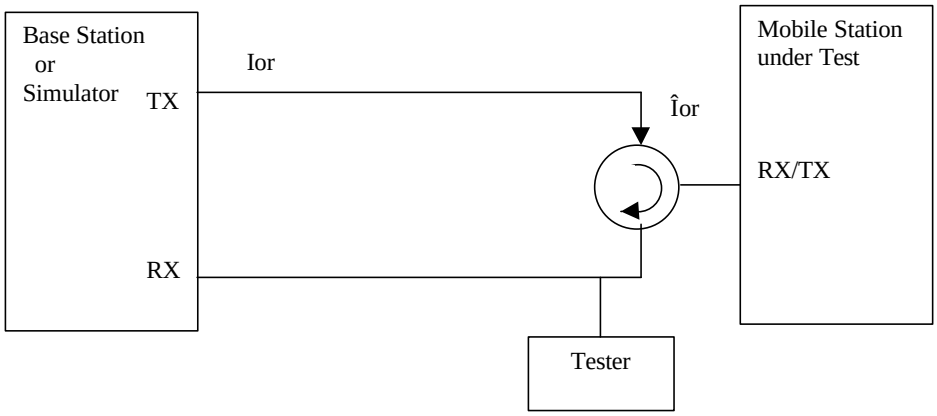

Figure 4.11 Modulation Accuracy

4.11.34.11.5 Minimum Test Requirements

[TBD]

<Editor's Note> The following is an example for "Peak code Domain error" sub-clause.

4.11.2 Peak code Domain error

4.11.2.1 Definition and applicability

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

The requirement for peak code domain error is only applicable for multi-code transmission.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

4.11.2.2 Conformance requirements

The peak code domain error shall not exceed [ ] dB.

4.11.2.3 Test purpose

To verify that the MS peak code domain error is less than [] dB.

4.5.2.4 Method of test

4.5.2.4.1 Initial conditions

[TBD]

4.5.2.4.2 Procedure

[TBD]

4.5.2.5 Test Requirements

[TBD]

5 Receiver Characteristics

5.1 General

Receiving performance test of the mobile station is implemented during communicating with the base station or the simulator via air interface. The procedure is used normal call protocol until the mobile station is communicating on traffic channel basically. On the traffic channel, the mobile station provides special function for testing that is called Logical Test Interface and the mobile station is tested using this function. (Refer to TS xx.xxiTS-T1.001 Logical Test Interface)

Transmitting or receiving bit/symbol rate for test channel is shown in Table 5.1.

Table 5.1 Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	Forward DPCH symbol rate	Reverse DPCH bit rate	Remarks
Speech	12.2kbps	32ksps	64kbps	Standard Test
Circuit Switched Data	TBD	TBD	TBD	
Packet Switched Data	[16kbps]	32ksps	64kbps	Standard Test
	TBD	TBD	TBD	

5.2 Static Reference Sensitivity Level

5.2.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.3 Static reference sensitivity level.~~

The static reference sensitivity is the minimum receiver input power measured at the antenna port at which the Bit Error Rate (BER) does not exceed a specific value

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.2.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 5.2.1.

Table 5.2.1 Test parameters for static reference sensitivity

Parameter	Level	Unit
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7 (*)]	dB
$\hat{I}_{or}$	[-110]	dBm/4.096 MHz
User bit rate	[12.2]	kbps
Channel symbol rate	[32]	ksps
Rate information	On	

Note
1) Measurement channel is based on mapping of a 12.2 kbps voice channel

5.2.3 Test purpose

To verify that the MS BER is less than 0.001 for the parameters specified in Table 5.2.1.

~~5.2.2~~5.2.4 Method of ~~measurement~~ test

5.2.4.1 Initial conditions

[TBD]

5.2.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown Figure 5.2.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.2.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.2.2 Test parameters for Static Reference Sensitivity Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-110]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	

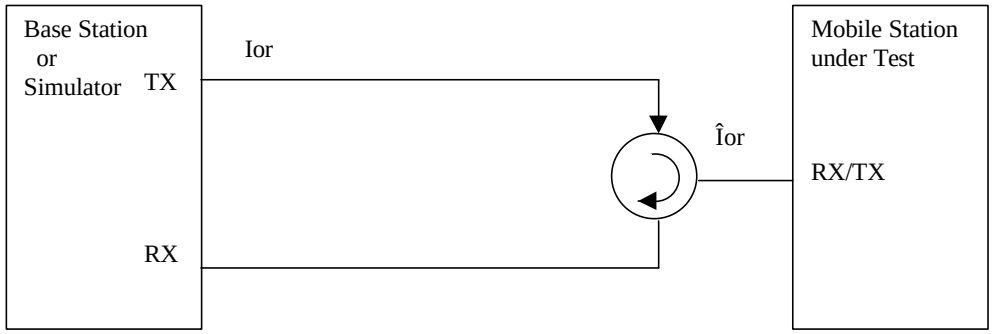

Figure 5.2 Static Reference Sensitivity Level

5.2.35.2.5 Minimum Test Requirements

[TBD]

5.3 Maximum Input Level

5.3.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.4 Maximum input level.~~

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

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.3.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 5.3.1.

Table 5.3.1 Maximum input power

Parameter	Level	Unit
User bit rate	[12.2]	kbps
Channel symbol rate	[32]	ksps
$\frac{Perch\_Ec}{I_{or}}$	[-10]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-19]	dB
$\frac{OCNS\_Ec}{I_{or}}$	[-0.52]	dB
$\hat{I}_{or}$	[-25]	dBm/4.096MHz
Rate Information	on	

Note
1) Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. <Change OCNS definition>
2) Measurement channel is based on mapping of a 12.2 kbps voice channel

5.3.3 Test purpose

To verify that the MS BER is less than 0.001 for the parameters specified in Table 5.3.1.

~~5.3.2~~5.3.4 Method of ~~measurement~~ test

5.3.4.1 Initial conditions

[TBD]

5.3.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown Figure 5.3

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.3.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.3.2 Test parameters for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-25]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-10]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-19]	dB
$\frac{OCNS\_Ec}{I_{or}}$	[-0.52]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	

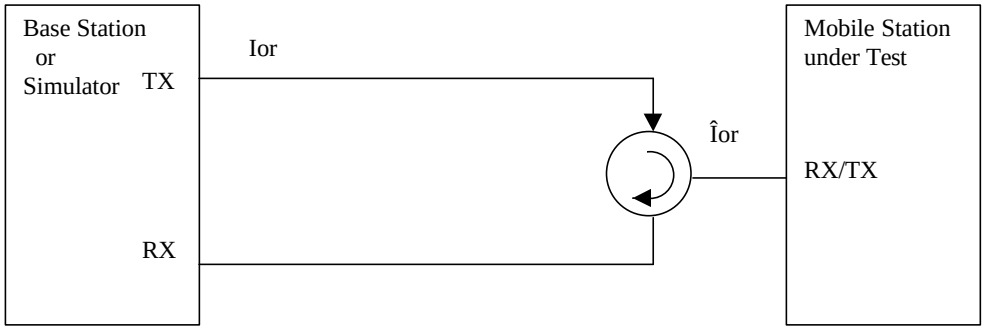

Figure 5.3 Maximum Input Level

5.3.35.3.5 Minimum Test Requirements

[TBD]

5.4 Adjacent Channel Selectivity (ACS)

5.4.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.5 Adjacent channel selectivity.~~

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its 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 receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.4.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in table 5.4.1.

Table 5.4.1 Adjacent Channel Selectivity

Parameter	Level	Unit
User bit rate	[12.2]	kbps
Channel symbol rate	[32]	ksps
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
I_{oac}	[-52]	dBm/4.096MHz
Fuw	[5]	MHz

Note
1) Measurement channel is based on mapping of a 12.2 kbps voice channel

<Editor's Note> The modulation and spreading of the adjacent channel signal is not clear.

5.4.3 Test purpose

To verify that the MS BER is less than 0.001 for the parameters specified in Table 5.4.1.

~~5.4.2~~5.4.4 Method of ~~measurement~~ test

5.4.4.1 Initial conditions

[TBD]

5.4.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown in Figure 5.4

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.4.2. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.4.2 Test parameters for Adjacent Channel Selectivity

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-93]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	
I_{oac} (Interference Signal)	[-52]	dBm/4.096MHz

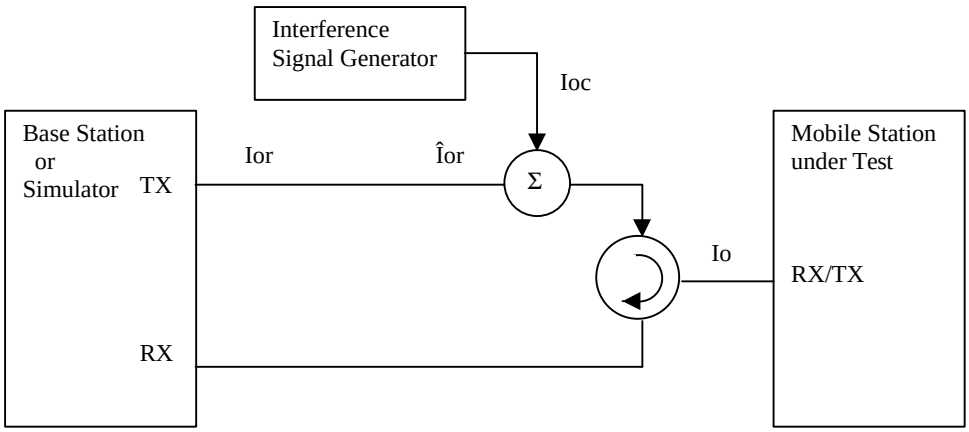

Figure 5.4 Adjacent Channel Selectivity

5.4.35.4.5 Minimum Test Requirements

[TBD]

5.5 Blocking Characteristics

5.5.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.6 Blocking characteristics.~~

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.5.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 5.5.1 and Table 5.5.2.

Table 5.5.1 In-band blocking

Parameter	Level	Unit
User bit rate	[12.2]	Kbps
Channel symbol rate	[32]	Ksps
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7 (*)]	dB
$\hat{I}_{or}$	[-107]	dBm/4.096MHz
$I_{blocking}$ modulated	[-44]	dBm/4.096MHz
Blocking offset	[>15]	MHz
Rate Information	On	

Table 5.5.2 Out of band blocking

Parameter	Band 1	Band 2	Unit
User bit rate	[12.2]	[12.2]	Kbps
Channel symbol rate	[32]	[32]	Ksps
$\frac{Perch\_Ec}{I_{or}}$	[-1]	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7 (*)]	[-7 (*)]	dB
$\hat{I}_{or}$	[-107]	[-107]	dBm/4.096MHz
$I_{blocking}$ tone	[-30]	[-15]	dBm
Blocking offset	[2025<f<2050] [2230<f<2255]	[f<2025 f>2255]	MHz
Rate Information	On	On	

5.5.3 Test purpose

To verify that the MS BER is less than 0.001 for the parameters specified in Table 5.5.1 and Table 5.5.2.

5.5.25.5.4 Method of measurement test

5.5.4.1 Initial conditions

[TBD]

5.5.4.2 Procedure

(1) Connect the base station and an interference CW tone generator or an interference signal generator to the mobile station as shown Figure 5.5.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.5.13. Then start the loopback test. The detail of the loopback test shall be in accordance with TS xx.xxiTS-T1.001 Logical Test Interface.

(3) Set the parameters of the CW generator or the interference signal generator as shown in Table 5.5.24.

(4) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.5.1 3 Test parameters for Blocking Characteristics

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-107]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	

Table 5.5.2 4 Parameters of Blocking Signal

	In-Band	Out of Band 1	Out of Band 2	
Parameter	Level	Level	Level	Unit
$I_{blocking}$ modulated	[-44]	—	—	dBm/4.096MHz
$I_{blocking}$ tone	—	[-30]	[-15]	dBm
Blocking Offset $_{modulated}$	[>15]	—	—	MHz
Tone Scanning Range	—	[2025<f<2070 2210<f<2255]	[f<2025 f>2255]	MHz

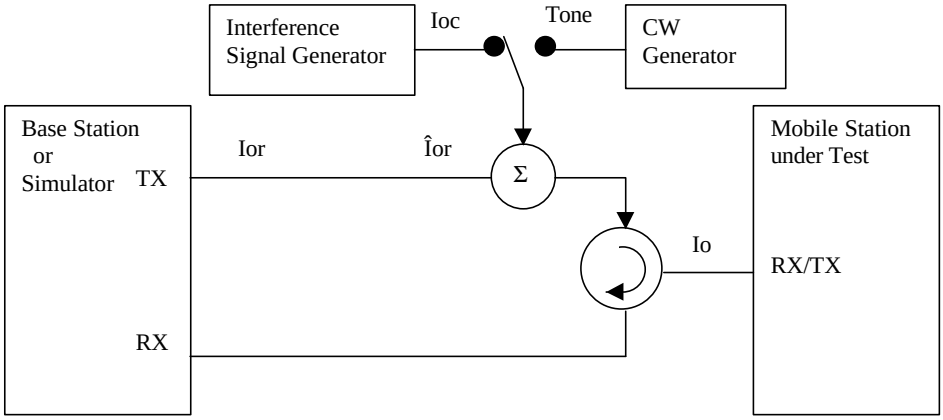

Figure 5.5 Blocking Characteristics

5.5.35.5.5 Minimum Test Requirements

[TBD]

5.6 Spurious Response

5.6.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.7 Spurious response.~~

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the blocking limit is not met. <Only applies to out of band text required>

The static reference performance as specified in clause [ ] should be met when the following signals are applied to the receiver;

1. A wanted signal at the assigned channel frequency, 3 dB above the static reference level.
2. A CW interfering signal below a level of [ ] dBm.
3. The number of allowed spurious responses is an item for further study.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.6.2 Conformance requirements

[TBD]

5.6.3 Test purpose

[TBD]

~~5.6.2~~5.6.4 Method of ~~measurement~~ test

5.6.4.1 Initial conditions

[TBD]

5.6.4.2 Procedure

~~(5)~~(1) Connect the base station and an interference CW generator to the mobile station as shown Figure 5.6.

~~(6)~~(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.6.1. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

~~(7)~~(3) Set the parameter of the CW generator as shown in Table 5.6.2.

~~(8)~~(4) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.6.1 Test parameters for Spurious Response

Parameter	Level / Status	Unit
$\hat{I}_{or}$	3dB above the static reference level	
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	

Table 5.6.2 Parameter of Spurious Signal

Parameter	Level	Unit
Tone Power	[ ]	dBm
Tone Offset	[ ]	MHz

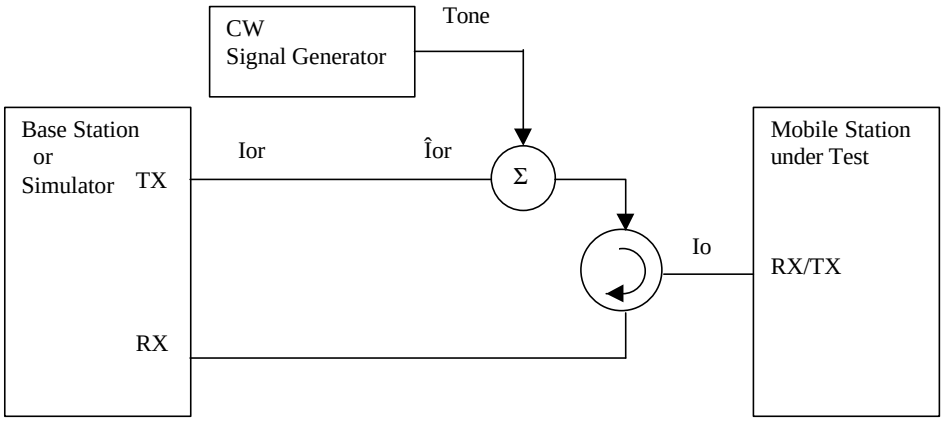

Figure 5.6 Spurious Response

5.6.35.6.5 Minimum Test Requirements

[TBD]

5.7 Intermodulation Characteristics

5.7.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.8 Intermodulation characteristics.~~

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.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.7.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 5.7.1.

Table 5.7.1 Receive intermodulation characteristics

Parameter	Level	Unit
User bit rate	[12.2]	kbps
Channel symbol rate	[32]	ksps
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7 (*)]	dB
$\hat{I}_{or}$	[-107]	dBm/4.096MHz
I_{ouw1}	[-46]	dBm
I_{ouw2}	[-46]	dBm/4.096MHz
Fuw1 (CW)	[10]	MHz
Fuw2 (Modulated)	[20]	MHz
Rate Information	[On]	

Note
1) Measurement channel is based on mapping of a 12.2 kbps voice channel

5.7.3 Test purpose

To verify that the MS BER is less than 0.001 for the parameters specified in Table 5.7.1.

~~5.7.2~~5.7.4 Method of ~~measurement~~ test

5.7.4.1 Initial conditions

[TBD]

5.7.4.2 Procedure

(1) Connect the base station, an interference CW generator and an interference signal generator to the mobile station as shown in Figure 5.7.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.7.2. Then start the loopback test. The detail of the loopback test shall be in accordance with TS xx.xxiTS-T1.001 Logical Test Interface.

(3) Measure the BER or FER of DTCH received from the mobile station at the base station or the simulator.

Table 5.7.2 Test parameters for Intermodulation Characteristics

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-107]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	[On]	
Tone Power	[-46]	dBm
Tone Offset from Receiving Carrier	[10]	MHz
I_{oc} (Interference Signal)	[-46]	dBm/4.096MHz
I_{oc} Offset from Receiving Carrier	[20]	MHz

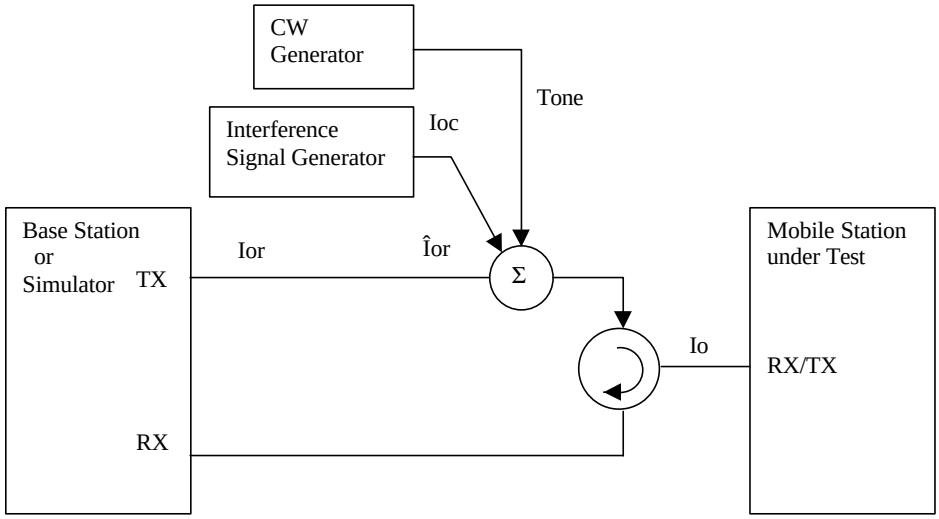

Figure 5.7 Intermodulation Characteristics

5.7.35.7.5 Minimum Test Requirements

[TBD]

5.8 Spurious Emissions

5.8.1 Definition and applicability

~~The definition of this measure shall refer 3GPP S4.01A, Section 7.9 Spurious emissions.~~

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the MS antenna connector.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

<Editor's Note> Spurious emission is not clearly defined. (What conditions, operation mode, etc.)

5.8.2 Conformance requirements

The spurious emission shall be:
(a) Less than -60dBm/4.096 MHz at the MS antenna connector, for frequencies within the MS receive band.
(b) Less than -57dBm/100 kHz at the MS antenna connector, for frequencies band from 9kHz to 1GHz.
(c) Less than -47dBm/100 kHz at the MS antenna connector, for frequencies band from 1GHz to 12.75 GHz.

5.8.3 Test purpose

To verify that the MS spurious emission meets the specifications described in clause 5.8.2.

~~5.8.2~~5.8.4 Method of ~~measurement~~ test

5.8.4.1 Initial conditions

[TBD]

5.8.4.2 Procedure

(1) Connect a spectrum analyzer (or other suitable test equipment) to the mobile station antenna connector as shown in Fig. 5.8.

(2) Enable the mobile station receiver and set Cell Search Mode on a Perch Channel. Since there is no forward link signal, the mobile station should not pass the Cell Search mode.

(3) Sweep the spectrum analyzer over a frequency range from the lowest intermediate frequency or lowest oscillator frequency used in the receiver or 1 MHz, whichever is lowest to at least 3 times the carrier frequency.

Figure 5.8 Spurious Emissions

5.8.35.8.5 Minimum Test Requirements

[TBD]

5.9 RSCP Detection Range and Accuracy

<Editor's Note> This specification ~~shall~~ may be defined by RAN4 in future.~~.~~???

5.9.1 Definition and applicability

[TBD]

5.9.2 Conformance requirements

[TBD]

5.9.3 Test purpose

[TBD]

~~5.9.2~~5.9.4 Method of ~~measurement~~ test

5.9.4.1 Initial conditions

[TBD]

5.9.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown Figure 5.9.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.9. Then start the loopback test. The detail of the loopback test shall be in accordance with ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(3) Select $\hat{I}_{or}$ out of the range that is shown in the table.

(4) Send the request message to the mobile station in order to get receiving RSCP value of the mobile station and then mobile station informs the RSCP value. Refer to ~~TS xx.xx~~iTS-T1.001 Logical Test Interface.

(5) Repeat the above measurement several times. In this time, $\hat{I}_{or}$ shall be varied over the range. [TBD]

Table 5.9 Test parameters for RSCP Detection Range and Accuracy

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-111 to –41]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-1]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-7]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	

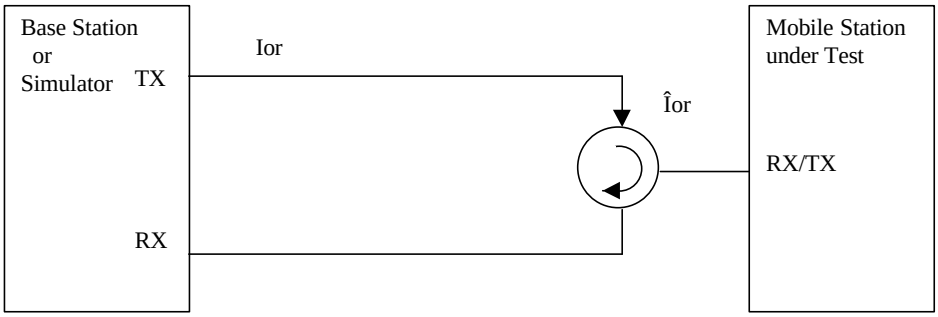

Figure 5.9 RSCP Detection Range and Accuracy

5.9.35.9.5 Minimum Test Requirements

[TBD]

5.10 SIR Measurement Range and Accuracy

<Editor's Note> This specification shall be defined by RAN4 in future.
This test item is specified as "Closed loop power control in the downlink" in the refered document S25.101.

5.10.1 Definition and applicability

[TBD]
SIR measurement is the ability of the MS receiver to estimate the received SIR, compare it with the SIR target and transmit the TPC symbols in accordance to the results of this comparison.

The requirements and this test apply to all types of UTRA for the Mobile Station (MS).

5.10.2 Conformance requirements

(a) The accuracy for the SIR measurements shall be within the range shown in Table 5.10.1.
(b) The range of the SIR measurement of the received signal in the downlink shall be better than shown in Table 5.10.1.

Table 5.10.1 SIR Measurement Range and Accuracy

SIR measurement accuracy	[ ] dB
SIR measurement range	[ ] dB

<Editor's Note> A time constant for SIR is specified in the refered document S25.101 as follows:
"The transmitted TPC symbols must respond to a change in the received SIR within the time period [0.625] ms".

5.10.3 Test purpose

To verify that the MS SIR measurement range and accuracy meets the specifications described in Table 5.10.1.

5.10.25.10.4 Method of measurement test

5.10.4.1 Initial conditions

[TBD]

5.10.4.2 Procedure

(1) Connect the base station to the mobile station antenna connector as shown Figure 5.10.

(2) Enter the mobile station into loopback test mode and set the test parameters as specified in Table 5.10.2. Then start the loopback test. The detail of the loopback test shall be in accordance with TS xx.xxiTS-T1.001 Logical Test Interface.

(3) Select Ioc out of the range that is shown in the table. [TBD]

(4) Send the request message to the mobile station in order to get receiving SIR value of the mobile station and then mobile station informs the SIR value. Refer to TS xx.xxiTS-T1.001 Logical Test Interface.

(5) Repeat the above measurement several times. In this time, Ioc shall be varied over the range. [TBD]

Table 5.10.2 Test parameters for SIR Measurement Range and Accuracy

Parameter	Level / Status	Unit
$\hat{I}_{or}$	[-69]	dBm/4.096MHz
$\frac{Perch\_Ec}{I_{or}}$	[-7]	dB
$\frac{DPCH\_Ec}{I_{or}}$	[-1]	dB
Forward Channel symbol rate	[32]	ksps
Reverse Channel bit rate	[64]	kbps
User bit rate	[12.2]	kbps
Rate information	On	
I_{oc}	[ ] to [ ]	dBm/4.096MHz

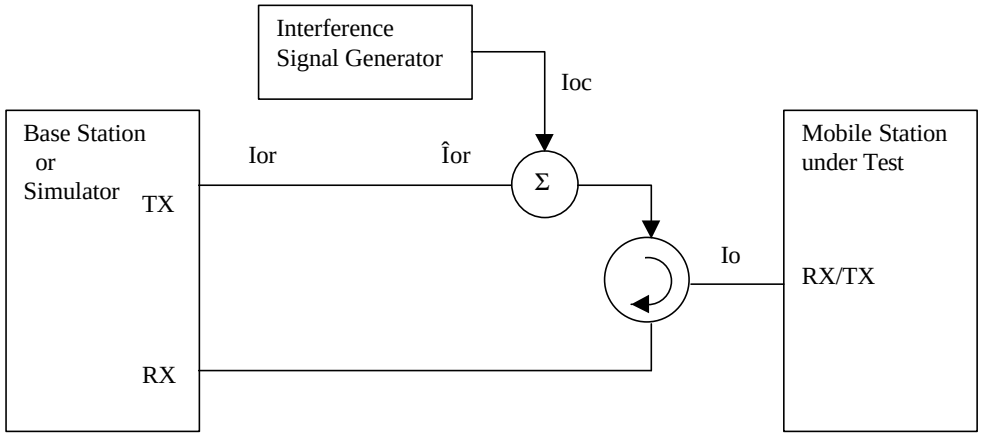

Figure 5.10 SIR Measurement Range and Accuracy

5.10.5 MinimumTest Requirements

[TBD]

6 Performance requirements

<Editor's Note> This section is far from being completed.

6.1 General

6.1.1 Test Environments

Mobile Station is measured in different environments i.e., static, indoor, and outdoor to indoor and pedestrian, and vehicular environments. Each of these environments is modeled by typical channel models that are defined in Section 6.1.2.

Mobile Station shall be able to receive different channels transmitted from BS for it. These channels may have different bit rates and different BER/FER requirements. Table 6.1.1-1 describes shortly test environments.

Table 6.1.1-1 Test Environments for MS Performance Specifications

Test Services	***Static***	***Indoor Office 3 km/h***	***Outdoor to Indoor and Pedestrian 3 km/h***	***Vehicular 120 km/h***
	Information Data Rate, Performance metric	*Information Data Rate, Performance metric*	*Information Data Rate, Performance metric*	*Information Data Rate, Performance metric*
Paging Message	*128 kbps MER <10^{-2}*	-	-	-
FACH Message	*128 kbps MER <10^{-2}*	-	-	-
Speech	*12.2 kbps BER <10^{-3}*	*12.2 kbps BER <10^{-3}*	*12.2 kbps BER <10^{-3}*	*12.2 kbps BER <10^{-3}*
Circuit Switched Data	*64, 384, 2048 kbps, BER < 10^{-6}*	*64, 384 kbps BER < 10^{-6}*	*64, 384 kbps BER < 10^{-6}*	*64, 384 kbps BER < 10^{-6}*
Packet Switched Data	*TBD*	*TBD*	*TBD*	*TBD*

6.1.2 Channel Models

The channel model for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multipaths exist.

Modified ITU channel models[1] are used for the performance measurements in multipath fading channels. The channel models for indoor, indoor to outdoor and pedestrian, and for vehicular environments are depicted in Table 6.1.2-1

[1] These channel models are the same that were used in simulations and evaluations of the system presented in "Japan's Proposal for Candidate Radio Transmission Technology on IMT-2000, W-CDMA, June 1998"

Table 6.1.2-1 Channel Models for Non-Static Environments

Indoor		*Indoor to Outdoor and Pedestrian*		*Vehicular*	
Relative Delay [ns]	***Average Power [dB]***	***Relative Delay [ns]***	***Average Power [dB]***	***Relative Delay [ns]***	***Average Power [dB]***
0	*0.0*	*0*	*0.0*	*0*	*0.0*
244	*-9.6*	*244*	*-12.5*	*244*	*-2.4*
488	*-33.5*	*488*	*-24.7*	*488*	*-6.5*
				732	*-9.4*
				976	*-12.7*
				1220	*-13.3*
				1708	*-15.4*
				1952	*-25.4*

6.1.3 CDMA Equations

The equations listed below describe the relationship between various parameters under different conditions.

6.1.3.1 BS Transmission Power

Transmit power of the Base Station is normalized to 1 and can be presented as

$$\frac{Perch\_E_c}{I_{or}} + \frac{Pilot\_E_c}{I_{or}} + \frac{TPC\_E_c}{I_{or}} + \frac{RI\_E_c}{I_{or}} + \frac{DATA\_E_c}{I_{or}} + \frac{CPCH\_E_c}{I_{or}} + \frac{OCNS\_E_c}{I_{or}} = 1.$$

Dedicated Physical Channel consists of four different fields. Therefore, it can be shown that

$$\frac{DPCH\_E_c}{I_{or}} = \frac{Pilot\_E_c}{I_{or}} + \frac{TPC\_E_c}{I_{or}} + \frac{RI\_E_c}{I_{or}} + \frac{DATA\_E_c}{I_{or}}.$$

Hence, transmit power of Base Station can be presented also as

$$\frac{Perch\_E_c}{I_{or}} + \frac{DPCH\_E_c}{I_{or}} + \frac{CPCH\_E_c}{I_{or}} + \frac{OCNS\_E_c}{I_{or}} = 1.$$

6.1.3.2 Received Signal Strength for Mobile Station Not in Handoff (Static Channel)

For Perch channel we get

$$Perch\ \frac{E_c}{I_o} = \frac{\frac{Perch\_E_c}{I_{or}}}{\frac{I_{oc}}{\hat{I}_{or}} + 1}$$

and for a Dedicated Physical Channel

$$DPCH\ \frac{E_c}{I_o} = \frac{\frac{DPCH\_E_c}{I_{or}}}{\frac{I_{oc}}{\hat{I}_{or}} + 1}.$$

For the Common Physical Channel we get

$$CPCH\ \frac{E_c}{I_o} = \frac{\frac{CPCH\_E_c}{I_{or}}}{\frac{I_{oc}}{\hat{I}_{or}} + 1}.$$

E_b/N_t *for the Perch channel is given as*

$$Perch\ \frac{E_b}{N_t} = \frac{\frac{Perch\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate}}{\frac{I_{oc}}{\hat{I}_{or}}}.$$

The same for Dedicated Traffic Channels is given as

$$DTCH\ \frac{E_b}{N_t} = \frac{\frac{DPCH\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate}}{\frac{I_{oc}}{\hat{I}_{or}}},$$

Similar equations can be derived for the Paging Channel and for the Forward Access Channel. For the Paging Channel we get

$$PCH\ \frac{E_b}{N_t} = \frac{\frac{CPCH\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Paging\ Data\ Rate}}{\frac{I_{oc}}{\hat{I}_{or}}},$$

and the same for FACH is given as

$$FACH\ \frac{E_b}{N_t} = \frac{\frac{CPCH\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Control\ Data\ Rate}}{\frac{I_{oc}}{\hat{I}_{or}}}.$$

6.1.3.3 Received Signal Strength for Mobile Station Not in Handoff (Non-Static Channel)

Let us assume that the sum of the channel tap powers is equal to one in multipath channel with L taps, i.e.,

$$\sum_{i=1}^{L} {a_i}^2 = 1,$$

where a_i *represent the complex channel coefficient of the tap i. When assuming that a receiver combines all the multipaths* E_b/N_t *for Perch channel is given as*

$$Perch\ \frac{E_b}{N_t} = \frac{Perch\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate} \times \sum_{i=1}^{L} \frac{{a_i}^2}{\frac{I_{oc}}{\hat{I}_{or}} + \left(1 - {a_i}^2\right)}.$$

As an example E_b/N_t *for Perch channel in Indoor channel is*

$$Perch\ \frac{E_b}{N_t} = \frac{Perch\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate} \times \left(\frac{0.900824}{\frac{I_{oc}}{\hat{I}_{or}} + 0.099176} + \frac{0.098773}{\frac{I_{oc}}{\hat{I}_{or}} + 0.901227} + \frac{0.000402}{\frac{I_{oc}}{\hat{I}_{or}} + 0.999598} \right).$$

Using the same assumptions, E_b/N_t *for Dedicated Traffic Channels is given as*

$$DTCH\ \frac{E_b}{N_t} = \frac{DPCH\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate} \times \sum_{i=1}^{L} \frac{a_i^2}{\frac{I_{oc}}{\hat{I}_{or}} + \left(1 - a_i^2\right)}.$$

6.1.3.4 Received Signal Strength for Mobile Station in Two-Way Handover

When the received power from each cell is $\hat{I}_{or}$ *we get for each Perch Channel*

$$Perch\ \frac{E_c}{I_o} = \frac{\frac{Perch\_E_c}{I_{or}}}{\frac{I_{oc}}{\hat{I}_{or}} + 2}.$$

If the power received from cell 1 and cell 2 are $\hat{I}_{or1}$ *and* $\hat{I}_{or2}$ *, respectively, then*

$$Perch\ \frac{E_c}{I_o}(Cell\ 1) = \frac{\frac{Perch\_E_c}{I_{or1}}}{\frac{I_{oc}}{\hat{I}_{or1}} + \frac{\hat{I}_{or2}}{\hat{I}_{or1}} + 1}$$

and

$$Perch\ \frac{E_c}{I_o}(Cell\ 2) = \frac{\frac{Perch\_E_c}{I_{or2}}}{\frac{I_{oc}}{\hat{I}_{or2}} + \frac{\hat{I}_{or1}}{\hat{I}_{or2}} + 1}.$$

Similarly,

$$DTCH\ \frac{E_b}{N_t} = \frac{DPCH\_E_c}{I_{or}} \times \frac{Chip\ Rate}{Information\ Data\ Rate} \times \sum_{i=1}^{L} \frac{2a_i^2}{\frac{I_{oc}}{\hat{I}_{or}} + 1 + \left(1 - a_i^2\right)}$$

if the channel is non-static.

6.1.3.5 Measurement Configurations

In all measurements MS should transmit with maximum power while receiving signals from BS. Transmission Power Control is always disable during the measurements. Chip Rate is specified to be 4.096 MHz.

It as assumed that fields inside DPCH have the same energy per PN chip. Also, if the power of CPCH is not specified in

the test parameter table, it should be set to zero. The power of OCNS should be adjusted that the power ratios (Ec/Ior) of all specified forward channels add up to one.

Measurement configurations for different scenarios are shown in Figure 6.1.3.5-1, Figure 6.1.3.5-2 and Figure 6.1.3.5-3.

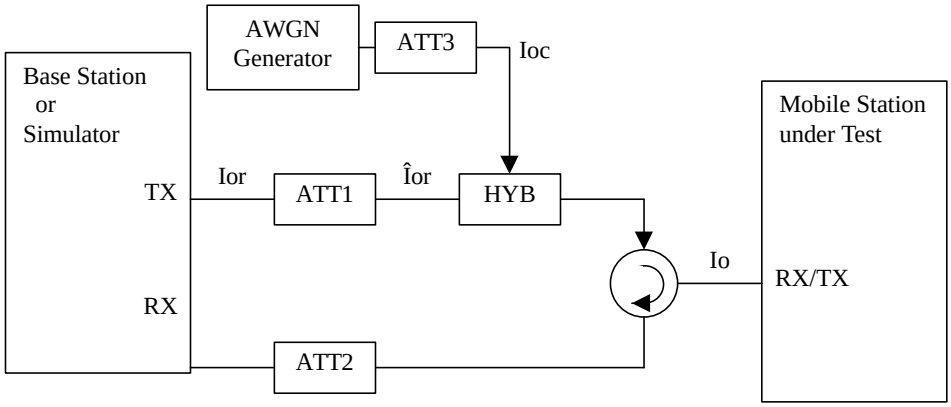

Figure 6.1.3.5-1. Measurement Configuration in Static Channel.

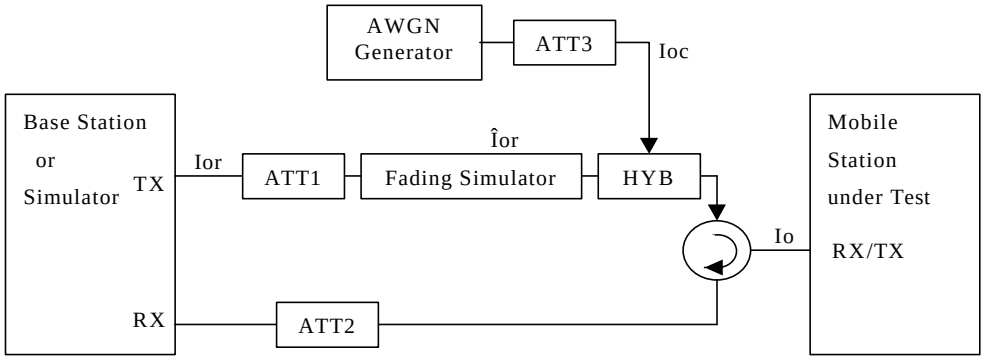

Figure 6.1.3.5-2. Measurement Configuration in Multipath Fading Channel.

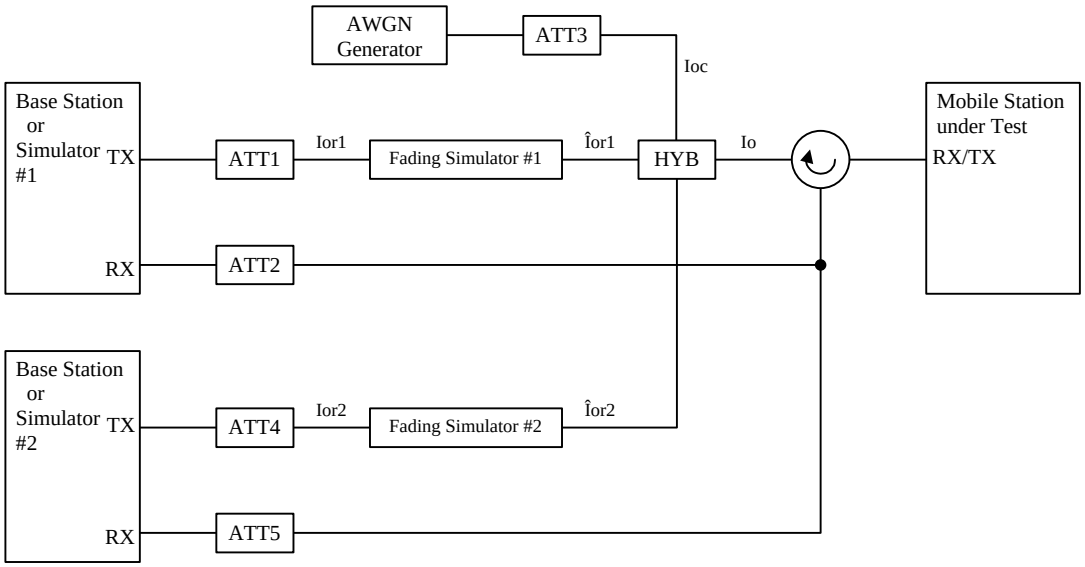

Figure 6.1.3.5-3. Measurement Configuration for Tests in Soft Handoff.

6.2 Demodulation in Static Channel

6.2.1 Demodulation of Paging Channel

6.2.1.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.2.1.1 Demodulation of Paging Channel.

6.2.1.2 Test Conditions and Measurement Method

1. *Connect the base station and an AWGN noise source to the mobile station antenna connector as shown in Figure 6.1.3.5-1.*
2. *Map the Paging Channel information into Common Physical Channel as specified in ARIB Volume 1.*
3. *Set the test parameters as specified in Table 6.2.1.2-1.*
4. *Send xx paging messages to Mobile Station.*
5. *Measure MER of received Paging messages.*

Table 6.2.1.2-1. Test Parameters for Paging Channel Reception in an AWGN Channel.

Parameter	***Unit***	***Value***
$\frac{Perch\_E_c}{I_{or}}$	*dB*	
$\frac{DPCH\_E_c}{I_{or}}$	*dB*	
$\frac{CPCH\_E_c}{I_{or}}$	*dB*	
$\hat{I}_{or}/I_{oc}$	*dB*	*-1*
I_{oc}	*dBm/4.096 MHz*	*-60*
Paging Data Rate	*??*	
PCH E_b/N_t	*dB*	

6.2.1.3 ~~Minimum~~ Test Requirements

6.2.2 Demodulation of Forward Access Channel

6.2.2.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.2.2.2 Demodulation of Forward Access Channel.

6.2.2.2 Test Conditions and Measurement Method

1. *Connect the base station and an AWGN noise source to the mobile station antenna connector as shown in Figure 6.1.3.5-1.*
2. *Map the Forward Access Channel information into Common Physical Channel as specified in ARIB Volume 1.*
3. *Set the test parameters as specified in Table 6.2.2.2-1.*
4. *Send xx FACH messages to Mobile Station.*
5. *Measure MER of received FACH messages*

Table 6.2.2.2-1. Test Parameters for Forward Access Channel Reception in an AWGN Channel.

Parameter	***Unit***	***Value***
$\frac{Perch\_E_c}{I_{or}}$	*dB*	
$\frac{DPCH\_E_c}{I_{or}}$	*dB*	
$\frac{CPCH\_E_c}{I_{or}}$	*dB*	
$\hat{I}_{or}/I_{oc}$	*dB*	*-1*
I_{oc}	*dBm/4.096 MHz*	*-60*
Control Data Rate	*??*	
FACH E_b/N_t	*dB*	

6.2.2.3 ~~Minimum~~ Test Requirements

6.2.3 Demodulation of Dedicated Traffic Channel

6.2.3.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.2.2.3 Demodulation of Dedicated Traffic Channel.

6.2.3.2 Test Conditions and Measurement Method

1. *Connect the base station and an AWGN noise source to the mobile station antenna connector as shown in Figure 6.1.3.5-1.*
2. *Set up the call.*
3. *Set the test parameters for test 1-8 as specified in Table 6.2.3.2-1 and Table 6.2.3.2-2.*
4. *Count, at the base station, the number of information bits transmitted and the number of correctly received information bits at the mobile station.*
5. *Measure BER of DTCH channel.*

Table 6.2.3.2-1. Test Parameters for Dedicated Traffic Channel Reception in an AWGN Channel.

Parameter	*Unit*	*Test 1*	*Test 2*	*Test 3*	*Test 4*
$\frac{Perch\_E_c}{I_{or}}$	*dB*				
$\frac{DPCH\_E_c}{I_{or}}$	*dB*				
$\hat{I}_{or}/I_{oc}$	*dB*	*-1*			
I_{oc}	*dBm/4.096 MHz*	*-60*			
Information Data Rate	*kbps*	*12.2*	*12.2*	*64*	*64*
Channel Symbol Rate	*ksps*	*32*	*32*	*128*	*128*
Rate Information	-	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*				

Table 6.2.3.2-2. Test Parameters for Dedicated Traffic Channel Reception in an AWGN Channel.

Parameter	*Unit*	*Test 5*	*Test 6*	*Test 7*	*Test 8*
$\frac{Perch\_E_c}{I_{or}}$	*dB*				
$\frac{DPCH\_E_c}{I_{or}}$	*dB*				
$\hat{I}_{or}/I_{oc}$	*dB*	*-1*			
I_{oc}	*dBm/4.096 MHz*	*-60*			
Information Data Rate	*kbps*	*384*	*384*	*2048*	*2046*
Channel Symbol Rate	*ksps*	*512*	*512*	*3*1024*[2]	*3*1024*
Rate Information	-	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*				

6.2.3.3 ~~Minimum~~ Test Requirements

[2] Multicode transmission with 3 different codes each having 1024 ksps channel symbol rate.

6.3 Demodulation of Dedicated Traffic Channel in Multipath Fading Channel

6.3.1 Single Link Performance

6.3.1.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.3.1 Single Link Performance.

6.3.1.2 Test Conditions and Measurement Method

1. *Connect the base station, multipath fading simulator and an AWGN noise source to the mobile station antenna connector as shown in Figure 6.1.3.5-2.*
2. *Set up the call.*
3. *Set the test parameters for test 1-20 as specified Table 6.3.1.2-1 to Table 6.3.1.2-4.*
4. *Count, at the base station, the number of information bits transmitted and the number of correctly received information bits at the mobile station.*
5. *Measure BER of DTCH channel.*

Table 6.3.1.2-1. Test Parameters for Dedicated Traffic Channel Reception in a Multipath Channel (Indoor Environment).

Parameter	*Unit*	*Test 1*	*Test 2*	*Test 3*	*Test 4*
$\frac{Perch\_E_c}{I_{or}}$	*dB*				
$\frac{DPCH\_E_c}{I_{or}}$	*dB*				
$\hat{I}_{or}/I_{oc}$	*dB*	*5?*			
I_{oc}	*dBm/4.096 MHz*	*-60*			
Information Data Rate	*kbps*	*12.2*	*12.2*	*64*	*64*
Channel Symbol Rate	*ksps*	*32*	*32*	*128*	*128*
Rate Information	-	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*				

Table 6.3.1.2-2. Test Parameters for Dedicated Traffic Channel Reception in a Multipath Channel (Indoor Environment).

Parameter	*Unit*	*Test 5*	*Test 6*	*Test 7*	*Test 8*
$\frac{Perch\_E_c}{I_{or}}$	*dB*				
$\frac{DPCH\_E_c}{I_{or}}$	*dB*				
$\hat{I}_{or}/I_{oc}$	*dB*	*5?*			
I_{oc}	*dBm/4.096 MHz*	*-60*			
Information Data Rate	*kbps*	*384*	*384*	*2048*	*2048*
Channel Symbol Rate	*ksps*	*512*	*512*	*3*1024*	*3*1024*
Rate Information	*-*	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*				

Table 6.3.1.2-3. Test Parameters for Dedicated Traffic Channel Reception in a Multipath Channel (Indoor to Outdoor and Pedestrian Environment).

Parameter	*Unit*	*Test 9*	*Test 10*	*Test 11*	*Test 12*	*Test 13*	*Test 14*
$\frac{Perch\_E_c}{I_{or}}$	*dB*						
$\frac{DPCH\_E_c}{I_{or}}$	*dB*						
$\hat{I}_{or}/I_{oc}$	*dB*	*5?*					
I_{oc}	*dBm/4.096 MHz*	*-60*					
Information Data Rate	*kbps*	*12.2*	*12.2*	*64*	*64*	*384*	*384*
Channel Symbol Rate	*ksps*	*32*	*32*	*128*	*128*	*512*	*512*
Rate Information	*-*	*off*	*on*	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*						

Table 6.3.1.2-4. Test Parameters for Dedicated Traffic Channel Reception in a Multipath Channel (Vehicular Environment).

Parameter	*Unit*	*Test 15*	*Test 16*	*Test 17*	*Test 18*	*Test 19*	*Test 20*
$\frac{Perch\_E_c}{I_{or}}$	*dB*						
$\frac{DPCH\_E_c}{I_{or}}$	*dB*						
$\hat{I}_{or}/I_{oc}$	*dB*	*5?*					
I_{oc}	*dBm/4.096 MHz*	*-60*					
Information Data Rate	*kbps*	*12.2*	*12.2*	*64*	*64*	*384*	*384*
Channel Symbol Rate	*ksps*	*32*	*32*	*128*	*128*	*512*	*512*
Rate Information	-	*off*	*on*	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*						

6.3.1.3 ~~Minimum~~ Test Requirements

6.3.2 Inter-Cell Soft Handover Performance

6.3.2.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.4 Inter-Cell Soft Handover Performance.

6.3.2.2 Test Conditions and Measurement Method

1. *Connect the base station, multipath fading simulator and an AWGN noise source to the mobile station antenna connector as shown in Figure 6.1.3.5-3.*
2. *Set up the call.*
3. *Set the test parameters for test 1-6 as specified in Table 6.3.2.2-1.*
4. *Count, at the base station, the number of information bits transmitted and the number of correctly received information bits at the mobile station.*
5. *Measure BER of DTCH channel.*

Table 6.3.2.2-1. Test Parameters for Dedicated Traffic Channel Reception in a Multipath Channel during a Soft Handoff (Vehicular Environment).

Parameter	***Unit***	***Test 1***	***Test 2***	***Test 3***	***Test 4***	***Test 5***	***Test 6***
$\frac{Perch\_E_c}{I_{or}}$	*dB*						
$\frac{DPCH\_E_c}{I_{or}}$	*dB*						
$\hat{I}_{or1}/I_{oc}$ *and* $\hat{I}_{or2}/I_{oc}$	*dB*	*5?*					
I_{oc}	*dBm/4.096 MHz*	*-60*					
Information Data Rate	*kbps*	*12.2*	*12.2*	*64*	*64*	*384*	*384*
Channel Symbol Rate	*ksps*	*32*	*32*	*128*	*128*	*512*	*512*
Rate Information	-	*off*	*on*	*off*	*on*	*off*	*on*
DTCH E_b/N_t	*dB*						

6.3.2.3 ~~Minimum~~ Test Requirements

6.4 Synchronization Performance

6.4.1 Search of other Cells

6.4.1.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.5.1.1 Search of other Cells.

6.4.1.2 Test Conditions and Measurement Method

Table 6.4.1.2-1. Test Parameters for the Search of other Cells.

Parameter	***Unit***	***Channel 1***		***Channel 2***	
		Time 1	***Time 2***	***Time 1***	***Time 2***
Perch $\frac{E_c}{I_{or}}$	*dB*				
$\hat{I}_{or}/I_{oc}$	*dB*				
I_{oc}	*dBm/4.096 MHz*	*-60*			
Perch $\frac{E_c}{I_o}$	*dB*				

1. *Setup the equipment as shown in Figure 6.1.3.5-3 (without fading channel blocks)*
2. *Set the test parameters as specified in Table 6.4.1.2-1.*
3. *Turn MS on.*
4. *TBD*

6.4.1.3 Minimum Test Requirements

6.4.2 Inter-Frequency Handover

6.4.2.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.5.2 Inter-Frequency Handover.

6.4.2.2 Test Conditions and Measurement Method

TBD

6.4.2.3 Minimum Test Requirements

6.5 Timing requirements

6.5.1 Synchronization

6.5.1.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.6.1 Synchronization.

6.5.1.2 Test Conditions and Measurement Method

The measuring configuration is shown in Figure 6.1.3.5-1.

6.5.1.3 ~~Minimum~~ Test Requirements

6.5.2 Channel Timing Dependencies

6.5.2.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.6.2 Channel Timing Dependencies.

6.5.2.2 Test Conditions and Measurement Method

TBD

6.5.2.3 ~~Minimum~~ Test Requirements

6.5.3 Reception Timing

6.5.3.1 Definition and applicability

The definition of this measure shall refer 3GPP S4.01A, Section 8.6.3 Reception Timing.

6.5.3.2 Test Conditions and Measurement Method

The measuring configuration is shown in Figure 6.1.3.5-1.

6.5.3.3 Minimum Test Requirements

7 Requirement of Test Equipment

[TBD]

Annex <yy> (normative):
Title of normative annex

yy.1 First clause of this normative annex

<Text>

yy.1.1 First subclause of this normative annex

<Text>

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

- <Publication>: "<Title>".

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version	date (yyyy-mm-dd)	comments
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