TSG RAN Meeting #16 **RP-020280**
Marco Island, FL, USA, 4 - 7 June 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.102**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020690	25.102	3.10.0	3.11.0	95		F	R99	Correction of power terms and definitions	TEI
R4-020691	25.102	4.4.0	4.5.0	96		A	Rel-4	Correction of power terms and definitions	TEI
R4-020692	25.102	5.0.1	5.1.0	97		A	Rel-5	Correction of power terms and definitions	TEI
R4-021002	25.102	3.10.0	3.11.0	100	1	F	R99	Correction of DL power control test for testability	TEI
R4-021003	25.102	4.4.0	4.5.0	112	1	A	Rel-4	Correction of DL power control test for testability	TEI
R4-021004	25.102	5.0.1	5.1.0	113	1	A	Rel-5	Correction of DL power control test for testability	TEI
R4-020836	25.102	3.10.0	3.11.0	102		F	R99	Addition of Test Case 4 to support 1G intra-frequency fading test case	TEI
R4-020898	25.102	4.4.0	4.5.0	116		A	Rel-4	Addition of Test Case 4 to support 1G intra-frequency fading test case	TEI
R4-020899	25.102	5.0.1	5.1.0	117		A	Rel-5	Addition of Test Case 4 to support 1G intra-frequency fading test case	TEI
R4-020963	25.102	3.10.0	3.11.0	103	1	F	R99	Control and monitoring function of UE requirement	TEI
R4-020964	25.102	4.4.0	4.5.0	104	1	A	Rel-4	Control and monitoring function of UE requirement	TEI
R4-020965	25.102	5.0.1	5.1.0	105	1	A	Rel-5	Control and monitoring function of UE requirement	TEI

3GPP TSG RAN WG4 Meeting #23 **R4-021002**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **100** ⌘ ev **1** ⌘ Current version: **3.10.0** ⌘

*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 ☐ Core Network ☐

Title:	⌘	Correction of DL power control test for testability.
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(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:	⌘	DL power control test requires the BLER performance to be met 90% of the time. This requires that the BLER must be measured numerous times to meet this requirement, this greatly increases test time. The estimated test time for a single BLER evaluation is estimated to be 600 s. For the required 90% of the time evaluation to be completed it is estimated that 100 measurement are required which will required an estimated test time of 16 hr 40 min. which is impractical. In addition specifying the BLER performance in this manner is inconsistent with the methods used in 25.101 for DL PC testing. Note is missing from table 8.12.
Summary of change:	⌘	Remove the requirement that the BLER only be met 90% of the time, this is effectively a tightening of the requirement and will align the requirement with the DL PC testing in 25.101. Add missing note to table 8.12.
Consequences if not approved:	⌘	DL power control testing will require excessive test time and therefore will not be practical. The requirement will be inconsistent with the equivalent requirement as stated in 25.101. Note will be missing. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections made only correct test requirements to provide improved testability.

Clauses affected:	⌘	8.5

Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR112r1 cat. A to 25.102 v4.4.0, CR113r1 cat. A to 25.102 v5.0.1		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

8.5 Power control in downlink

Power control in the downlink is the ability of the UE receiver to converge to the required link quality set by the network while using minimum downlink power.

8.5.1 Minimum requirements

For the parameters specified in Table 8.12 the average downlink $\hat{I}_{or}/I_{oc}$ shall be below the specified value in Table 8.13 more than 90% of the time. BLER shall be as shown in Table 8.13 ~~more than 90% of the time~~. Downlink power control is ON during the test.

Table 8.12: Test parameters for downlink power control

Parameter	Unit	Test 1
$\frac{DPCH\_E_c}{I_{or}}$	~~DB~~dB	0
I_{oc}	dBm/3.84 MHz	-60
Information Data Rate	Kbps	12.2
Target quality value on DTCH	BLER	0.01
Propagation condition		Case 1
DL Power Control step size, Δ_{TPC}	~~DB~~dB	1
Maximum_DL_power *	~~DB~~dB	0
Minimum_DL_power *	~~DB~~dB	-27
*Note: Refer to TS 25.224 for description and definition		

Table 8.13: Requirements for downlink power control

Parameter	Unit	Test 1
$\hat{I}_{or}/I_{oc}$	~~DB~~dB	8.0
Measured quality on DTCH	BLER	0.01±30%

3GPP TSG RAN WG4 Meeting #23 **R4-020836**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **102** ⌘ ev ⌘ Current version: **3.10.0** ⌘

*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:	⌘	Addition of Test Case 4 to support 1G intra-frequency fading test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
- ***F*** *(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:	⌘	Introduced 1G intra-frequency fading test case in TS25.123 requires this test case to support its requirements.
Summary of change:	⌘	Add test case 4 and associated note to table B.1
Consequences if not approved:	⌘	Appropriate test case will not be available for the 1G intra-frequency fading test case in TS25.123. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections support fading test case in TS25.123.
Clauses affected:	⌘	B.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Supports 1G intra-frequency fading test case in Tdoc R4-020838 Equivalent CRs in other Releases: CR117 cat. A to 25.102 v4.4.0, CR116 cat. A to 25.102 v4.4.0

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

B.2 Multi-path fading propagation conditions

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

Table B.1: Propagation Conditions for Multi path Fading Environments

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h		CASE 4, 50 km/h *	
Relative Delay [ns]	Average Power [dB]	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
976	-10	976	0	260	-3	976	-10
		12000	0	521	-6		
				781	-9		

*NOTE: Case 4 is only used in TS25.123.

3GPP TSG RAN WG4 Meeting #23 **R4-020963**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **103** ⌘ ev **1** ⌘ Current version: **3.10.0** ⌘

*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:	⌘	UE control and monitoring functions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(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:	⌘	A general requirement is missing that prevents the UE from transmitting when no acceptable cell can be found. This is requested by 3GPP PCG.
Summary of change:	⌘	General requirement on control and monitoring functions added
Consequences if not approved:	⌘	3GPP PCG demand will not be reflected. Isolated impact statement: Addition of a requirement that was missing in the specification.

Clauses affected:	⌘	4.3 (new), 4.3.1(new)		
Other specs Affected:	⌘	☐ Other core specifications **X** Test specifications ☐ O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR104r1 cat. A to 25.102 v4.4.0, CR105r1 cat. A to 25.102 v5.0.1		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

4.3 Control and monitoring functions

This requirement verifies that the control and monitoring functions of the UE prevent it from transmitting if no acceptable cell can be found by the UE.

4.3.1 Minimum requirement

The power of the UE, as measured -with a thermal detector, shall not exceed -30dBm if no acceptable cell can be found by the UE.

3GPP TSG RAN WG4 Meeting #23 **R4-020964**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **104** ⌘ ev **1** ⌘ Current version: **4.4.0** ⌘

*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 ☐ Core Network ☐

Title:	⌘	UE control and monitoring functions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(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:	⌘	A general requirement is missing that prevents the UE from transmitting when no acceptable cell can be found. This is requested by 3GPP PCG.
Summary of change:	⌘	General requirement on control and monitoring functions added
Consequences if not approved:	⌘	3GPP PCG demand will not be reflected. Isolated impact statement: Addition of a requirement that was missing in the specification.

Clauses affected:	⌘	4.3 (new), 4.3.1(new)		
Other specs Affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR103r1 cat. F to 25.102 v3.10.0, CR105r1 cat. A to 25.102 v5.0.1		

How to create CRs using this form:

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

4.3 Control and monitoring functions

This requirement verifies that the control and monitoring functions of the UE prevent it from transmitting if no acceptable cell can be found by the UE.

4.3.1 Minimum requirement

The power of the UE, as measured -with a thermal detector, shall not exceed -30dBm if no acceptable cell can be found by the UE.

3GPP TSG RAN WG4 Meeting #23 **R4-020965**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **105** ⌘ ev **1** ⌘ Current version: **5.0.1** ⌘

*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:	⌘	UE control and monitoring functions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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:	⌘	A general requirement is missing that prevents the UE from transmitting when no acceptable cell can be found. This is requested by 3GPP PCG.
Summary of change:	⌘	General requirement on control and monitoring functions added
Consequences if not approved:	⌘	3GPP PCG demand will not be reflected. Isolated impact statement: Addition of a requirement that was missing in the specification.

Clauses affected:	⌘	4.3 (new), 4.3.1(new)		
Other specs Affected:	⌘	☐ Other core specifications **X** Test specifications ☐ O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR103r1 cat. F to 25.102 v3.10.0, CR104r1 cat. A to 25.102 v4.4.0		

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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.

4.3 Control and monitoring functions

This requirement verifies that the control and monitoring functions of the UE prevent it from transmitting if no acceptable cell can be found by the UE.

4.3.1 Minimum requirement

The power of the UE, as measured -with a thermal detector, shall not exceed -30dBm if no acceptable cell can be found by the UE.

3GPP TSG RAN WG4 Meeting #23 **R4-021003**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **112** ⌘ ev **1** ⌘ Current version: **4.4.0** ⌘

*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 ☐ Core Network ☐

Title:	⌘	Correction of DL power control test for testability.
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(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:	⌘	DL power control test requires the BLER performance to be met 90% of the time. This requires that the BLER must be measured numerous times to meet this requirement, this greatly increases test time. The estimated test time for a single BLER evaluation is estimated to be 600 s. For the required 90% of the time evaluation to be completed it is estimated that 100 measurement are required which will required an estimated test time of 16 hr 40 min. which is impractical. In addition specifying the BLER performance in this manner is inconsistent with the methods used in 25.101 for DL PC testing. Note is missing from table 8.12.
Summary of change:	⌘	Remove the requirement that the BLER only be met 90% of the time, this is effectively a tightening of the requirement and will align the requirement with the DL PC testing in 25.101. Add missing note to table 8.12.
Consequences if not approved:	⌘	DL power control testing will require excessive test time and therefore will not be practical. The requirement will be inconsistent with the equivalent requirement as stated in 25.101. Note will be missing. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections made only correct test requirements to provide improved testability.

Clauses affected:	⌘	8.5.1.1

Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR100r1 cat. F to 25.102 v3.10.0, CR113r1 cat. A to 25.102 v5.0.1		

How to create CRs using this form:
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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.

8.5.1 Power control in downlink, constant BLER target

8.5.1.1 Minimum requirements 3.84 Mcps TDD option

For the parameters specified in Table 8.12 the average downlink $\hat{I}_{or}/I_{oc}$ shall be below the specified value in Table 8.13 more than 90% of the time. BLER shall be as shown in Table 8.13 ~~more than 90% of the time.~~. Downlink power control is ON during the test.

Table 8.12: Test parameters for downlink power control – constant BLER Target (3.84 Mcps TDD option)

Parameter	Unit	Test 1
$\frac{DPCH\_E_c}{I_{or}}$	dB	0
I_{OC}	dBm/3.84 MHz	-60
Information Data Rate	kbps	12.2
Target quality value on DTCH	BLER	0.01
Propagation condition		Case 1
DL Power Control step size, Δ_{TPC}	dB	1
Maximum_DL_power *	dB	0
Minimum_DL_power *	dB	-27
*Note: Refer to TS 25.224 for description and definition		

Table 8.13: Requirements for downlink power control – constant BLER Target (3.84 Mcps TDD option)

Parameter	Unit	Test 1
$\hat{I}_{or}/I_{oc}$	dB	8.0
Measured quality on DTCH	BLER	0.01±30%

3GPP TSG RAN WG4 Meeting #23 **R4-021004**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **113** ⌘ ev **1** ⌘ Current version: **5.0.1** ⌘

*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 ☐ Core Network ☐

Title:	⌘	Correction of DL power control test for testability.
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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:	⌘	DL power control test requires the BLER performance to be met 90% of the time. This requires that the BLER must be measured numerous times to meet this requirement, this greatly increases test time. The estimated test time for a single BLER evaluation is estimated to be 600 s. For the required 90% of the time evaluation to be completed it is estimated that 100 measurement are required which will required an estimated test time of 16 hr 40 min. which is impractical. In addition specifying the BLER performance in this manner is inconsistent with the methods used in 25.101 for DL PC testing. Note is missing from table 8.12.
Summary of change:	⌘	Remove the requirement that the BLER only be met 90% of the time, this is effectively a tightening of the requirement and will align the requirement with the DL PC testing in 25.101. Add missing note to table 8.12.
Consequences if not approved:	⌘	DL power control testing will require excessive test time and therefore will not be practical. The requirement will be inconsistent with the equivalent requirement as stated in 25.101. Note will be missing. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections made only correct test requirements to provide improved testability.

Clauses affected:	⌘	8.5.1.1

Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘	Equivalent CRs in other Releases: CR100r1 cat. F to 25.102 v3.10.0, CR112r1 cat. A to 25.102 v4.4.0		

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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.

8.5.1 Power control in downlink, constant BLER target

8.5.1.1 Minimum requirements 3.84 Mcps TDD option

For the parameters specified in Table 8.12 the average downlink $\hat{I}_{or}/I_{oc}$ shall be below the specified value in Table 8.13 more than 90% of the time. BLER shall be as shown in Table 8.13 ~~more than 90% of the time.~~. Downlink power control is ON during the test.

Table 8.12: Test parameters for downlink power control – constant BLER Target (3.84 Mcps TDD option)

Parameter	Unit	Test 1
$\frac{DPCH\_E_c}{I_{or}}$	dB	0
I_{OC}	dBm/3.84 MHz	-60
Information Data Rate	kbps	12.2
Target quality value on DTCH	BLER	0.01
Propagation condition		Case 1
DL Power Control step size, Δ_{TPC}	dB	1
Maximum_DL_power *	dB	0
Minimum_DL_power *	dB	-27
*Note: Refer to TS 25.224 for description and definition		

Table 8.13: Requirements for downlink power control – constant BLER Target (3.84 Mcps TDD option)

Parameter	Unit	Test 1
$\hat{I}_{or}/I_{oc}$	dB	8.0
Measured quality on DTCH	BLER	0.01±30%

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CHANGE REQUEST

⌘ **25.102** **CR** **116** ⌘ ev ⌘ Current version: **4.4.0** ⌘

*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:	⌘	Addition of Test Case 4 to support 1G intra-frequency fading test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
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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:	⌘	Introduced 1G intra-frequency fading test case in TS25.123 requires this test case to support its requirements.
Summary of change:	⌘	Add test case 4 and associated note to table B.1
Consequences if not approved:	⌘	Appropriate test case will not be available for the 1G intra-frequency fading test case in TS25.123. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections support fading test case in TS25.123.
Clauses affected:	⌘	B.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Supports 1G intra-frequency fading test case in Tdoc R4-020902 Equivalent CRs in other Releases: CR102 cat. F to 25.102 v3.10.0, CR117 cat. A to 25.102 v4.4.0

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B.2 Multi-path fading propagation conditions

B.2.1 3.84 Mcps TDD Option

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

Table B.1: Propagation Conditions for Multi path Fading Environments

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, 120 km/h		CASE 4, 50 km/h *	
Relative Delay [ns]	Average Power [dB]	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
976	-10	976	0	260	-3	976	-10
		12000	0	521	-6		
				781	-9		

*NOTE: Case 4 is only used in TS25.123.

3GPP TSG RAN WG4 Meeting #23 **R4-020899**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.102** **CR** **117** ⌘ ev ⌘ Current version: **5.0.1** ⌘

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

Title:	⌘	Addition of Test Case 4 to support 1G intra-frequency fading test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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C *(functional modification of feature)*
D *(editorial modification)*
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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:	⌘	Introduced 1G intra-frequency fading test case in TS25.123 requires this test case to support its requirements.
Summary of change:	⌘	Add test case 4 and associated note to table B.1
Consequences if not approved:	⌘	Appropriate test case will not be available for the 1G intra-frequency fading test case in TS25.123. Isolated impact analysis: The corrections made in this CR will not affect previous implementations or functionality, or system performance. The corrections support fading test case in TS25.123.
Clauses affected:	⌘	B.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Supports 1G intra-frequency fading test case in Tdoc R4-020905 Equivalent CRs in other Releases: CR102 cat. F to 25.102 v3.10.0, CR116 cat. A to 25.102 v4.4.0

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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.

B.2 Multi-path fading propagation conditions

B.2.1 3.84 Mcps TDD Option

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

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Relative Delay [ns]	Average Power [dB]	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
976	-10	976	0	260	-3	976	-10
		12000	0	521	-6		
				781	-9		

*NOTE: Case 4 is only used in TS25.123.

3GPP TSG RAN WG4 Meeting #23 **R4-020690**

Gyeongju, Korea 13th -17th May, 2002

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CHANGE REQUEST

⌘ **25.102** **CR** **95** ⌘ ev **-** ⌘ Current version: **3.10.0** ⌘

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

Title:	⌘	Correction of power terms and definitions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Reason for change: ⌘ The existing requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.

Summary of change: ⌘ 3.1 Definitions - Clarification of power spectral density added. For maximum output power, replaced the term “broadband” by defining the bandwidth as being at least (1+ α) times the chip rate over a period of at least one timeslot excluding the guard period. This definition allows the use of a broadband (thermal) power meter.
Definition of mean power (consistent with ITU radio regulation S1.156) added which includes a minimum bandwidth requirement of (1+ α) times the chip rate. This ensures all the signal power is captured and does not unnecessarily restrict the choice of measurement method.
Average power definition becomes the RRC filtered mean power definition.
Received Signal Code Power and Interference Signal Code Power defined as RRC filtered mean power

3.3. Abbreviations – definition of I_{oc}, I_{or} and $\hat{I}_{or}$ corrected.

6.2.1 UE maximum output power – Replacement of “broadband” by “at least (1+ α) times the chip rate”. Added measurement period of “a transmit timeslot excluding the guard period”.

6.4.1 Uplink power control – defined as RRC filtered mean power

6.4.1.2 Power control steps – unit [dB] added to ΔSIR_{TARGET}

6.4.2.1 Minimum output power – defined as mean power

6.5.1 Transmit OFF power - average power replaced by RRC filtered mean

		power 6.6.2 Out of band emission editorial correction on ACLR. 6.6.2.1 Spectrum emission mask reference power defined as RRC filtered mean power. Added clarification about noise bandwidth of the integrated method. 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as RRC filtered mean power 7.3 Reference sensitivity level - defined as mean power, Requirement corrected 7.4 Maximum input level – defined as received mean power 7.5 Adjacent Channel Selectivity (ACS) - interfering signal defined as mean power. 7.6 Blocking characteristics - interfering signal defined as mean power, table restructured, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.7 Spurious response: Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.8 Intermodulation characteristics - Wanted and interfering signals defined as mean power, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB), ± signs added to interfering frequencies to match existing test Annex B: Average power replaced by relative mean power
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect UE implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3.1, 3.3, 6.2.1, 6.4.1, 6.4.1.2, 6.4.2.1, 6.5.1, 6.5.1.1, 6.6.2, 6.6.2.1, 6.6.2.1.1, 6.6.2.2, 6.7.1, 7.3, 7.4, 7.5.1, 7.6.1, 7.7.1, 7.8.1, Annex B.2		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR96 cat. A to 25.102 v4.4.0, CR97 cat. A to 25.102 v5.0.1		

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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.

3.1 Definitions

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

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and $\hat{I}$or). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.
It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

~~**Average power:** The thermal power as measured through a root raised cosine filter with roll-off α=0.22 and a bandwidth equal to the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.~~

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual ~~broadband~~ power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period.

Mean Power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

RRC Filtered Mean Power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class. The period of measurement shall be a transmit timeslot excluding the guard period.

Received Signal Code Power (RSCP): Given only signal power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading and combining.

Interference Signal Code Power (ISCP): Given only interference power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading to the code and combining. Equivalent to the RSCP value but now only interference is received instead of signal

NOTE 1: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in section 6.8.1.

--- next changed section ---

3.3 Abbreviations

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

ACIR	Adjacent Channel Interference Ratio
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH

$\frac{DPCH\_Ec}{I_{or}}$ The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector

$\frac{\Sigma\ DPCH\_Ec}{I_{or}}$ The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector

EIRP Effective Isotropic Radiated Power

FDD Frequency Division Duplexing

FER Frame Error Ratio

Fuw Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.

Ioc The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.

Ior The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the BS antenna connector

$\hat{I}_{or}$ The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector

PPM Parts Per Million

RSSI Received Signal Strength Indicator

SCTD Space Code Transmit Diversity

SIR Signal to Interference ratio

TDD Time Division Duplexing

TPC Transmit Power Control

UE User Equipment

UL Up link (reverse link)

UTRA UMTS Terrestrial Radio Access

--- next changed section ---

6.2.1 User Equipment maximum output power

The following Power Classes define the nominal maximum output power. The nominal power defined is the ~~broadband~~ transmit power of the UE~~;~~ , i.e. the power in a bandwidth of at least (1+α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period.

Table 6.1: UE power classes

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

NOTES:

1) For multi-code operation the nominal maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.

2) The tolerance allowed for the nominal maximum power applies even at the multi-code transmission mode

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

--- next changed section ---

6.4.1 Uplink power control

Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signalling and path loss weighting parameter α as defined in TS 25.331. The output power is defined as the ~~average~~ RRC filtered mean power of the transmit timeslot~~, and is measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α = 0.22 and a bandwidth equal to the chip rate~~.

6.4.1.1 Initial Accuracy

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

6.4.1.2 Differential accuracy, controlled input

The power control differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET} when the path loss weighting parameter α=0. The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The power control error resulting from a change in I_{BTS} or DPCH Constant Value shall not exceed the values defined in Table 6.3.

Table 6.3: Transmitter power step tolerance as a result of control power step

ΔSIR_{TARGET} [dB]	**Transmitter power step tolerance [dB]**
$\Delta SIR_{TARGET} \leq 1$	± 0.5
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	± 1.5
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (1)
(1) Value is given for normal conditions. For extreme conditions value is ±12	

6.4.1.3 Differential accuracy, measured input

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

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

- The power control error, resulting from a change in the path loss (ΔL_{PCCPCH}), the same tolerances as defined in table 6.3 shall apply,
- and the errors in the PCCPCH RSCP measurement as defined in TS 25.123.

6.4.2 Minimum output power

The minimum controlled output power of the UE is when the power is set to a minimum value.

6.4.2.1 Minimum requirement

The minimum output power is defined as the mean power in one time slot excluding the guard period. The minimum output power shall be less than −44 dBm~~ measured with a filter that has a root-raised-cosine (RRC) filter response with a roll-off factor α = 0.22 and a bandwidth equal to the chip rate~~.

--- next changed section ---

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

Transmit OFF power is defined as the ~~average~~ RRC filtered mean power measured over one chip when the transmitter is off. The transmit OFF power state is when the UE does not transmit.

6.5.1.1 Minimum Requirement

The requirement for transmit OFF power shall be less than −65 dBm ~~measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll-off α=0.22 and a bandwidth equal to the chip rate~~.

--- next changed section ---

6.6.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel 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 leakage power ratio (ACLR).

6.6.2.1 Spectrum emission mask

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz from ~~a~~ the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier ~~output power in measured in a 3.84 MHz bandwidth~~.

6.6.2.1.1 Minimum Requirement

The power of any UE emission shall not exceed the levels specified in table 6.5.

Table 6.5: Spectrum Emission Mask Requirement

Δf* in MHz	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz **
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz ***
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz ***
8.5 - 12.5	-49 dBc	1 MHz ***
*	Δf is the separation between the carrier frequency and the centre of the measuring filter.	
**	The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz.	
***	The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.	
The lower limit shall be –50dBm/3.84 MHz or the minimum requirement presented in this table which ever is the higher.		

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both cases the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off α = 0.22 and a bandwidth equal to the chip rate.~~

6.6.2.2.1 Minimum requirement

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in Table 6.6.

Table 6.6: UE ACLR

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 5 MHz	33 dB
2, 3	UE channel ± 10 MHz	43 dB

NOTES:

1) The requirement shall still be met in the presence of switching transients.

2) The ACLR requirements reflect what can be achieved with present state of the art technology.

3) Requirement on the UE shall be reconsidered when the state of the art technology progresses.

--- next changed 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.

6.7.1 Minimum requirement

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

The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in Table 6.8.

Table 6.8: Transmit Intermodulation

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

--- next changed section ---

7.3 Reference sensitivity level

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the UE antenna port at which the BIT Error Ratio BER ~~does~~ shall not exceed a specific value.

7.3.1 Minimum Requirements

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

Table 7.2: Test parameters for reference sensitivity

Parameter	Level	Unit
$\frac{\Sigma \text{DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/3.84 MHz

7.4 Maximum input level

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

7.4.1 Minimum Requirements

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

Table 7.3: Maximum input level

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

7.5 Adjacent Channel Selectivity (ACS)

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

7.5.1 Minimum Requirement

The ACS shall be better than the value indicated in Table 7.4 for the test parameters specified in Table 7.5 where the BER shall not exceed 0.001

Table 7.4: Adjacent Channel Selectivity

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.5: Test parameters for Adjacent Channel Selectivity

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

7.6 Blocking characteristics

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

7.6.1 Minimum Requirement

The BER shall not exceed 0.001 for the parameters specified in table 7.6 and table 7.7. For table 7.7 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

Table 7.6: In-band blocking

~~Parameter~~	~~Offset~~	~~Offset~~	~~Unit~~
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	~~0~~	~~0~~	~~dB~~
~~$\hat{I}_{or}$~~	~~<REFSENS> + 3 dB~~	~~<REFSENS> + 3 dB~~	~~dBm/3.84 MHz~~
~~I_{ouw} (modulated)~~	~~-56~~	~~-44~~	~~dBm/3.84 MHz~~
~~F_{uw} (offset)~~	~~±10 or -10~~	~~±15 or -15~~	~~MHz~~

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/3.84 MHz
$\frac{I_{ouw}\text{ mean power}}{\text{(modulated)}}$	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)	dBm

Table 7.7: Out of band blocking

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ -102	~~<REFSENS> + 3 dB~~ -102	~~<REFSENS> + 3 dB~~ -102	dBm/3.84 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in subclause 5.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
Note 1. For operation referenced in 5.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
Note 2. For operation referenced in 5.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
Note 3. For operation referenced in 5.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				

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.

7.7.1 Minimum Requirement

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

Table 7.8: Spurious Response

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ -102	dBm/3.84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

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.

7.8.1 Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.9.

Table 7.9: Receive intermodulation characteristics

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ -102	dBm/3.84 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm~~/3.84 MHz~~
F_{uw1} (CW)	±10	MHz
F_{uw2} (~~M~~modulated)	±20	MHz

--- next changed section ---

Annex B (normative): Propagation conditions

B.1 Static propagation condition

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

B.2 Multi-path fading propagation conditions

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

Table B.1: Propagation Conditions for Multi path Fading Environments

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

3GPP TSG RAN WG4 Meeting #23 **R4-020691**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **96** ⌘ ev **-** ⌘ Current version: **4.4.0** ⌘

*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:	⌘	Correction of power terms and definitions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
- ***F*** *(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 existing requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.

Summary of change: ⌘ 3.1 Definitions - Clarification of power spectral density added. For maximum output power, replaced the term “broadband” by defining the bandwidth as being at least (1+ α) times the chip rate over a period of at least one timeslot excluding the guard period. This definition allows the use of a broadband (thermal) power meter.
Definition of mean power (consistent with ITU radio regulation S1.156) added which includes a minimum bandwidth requirement of (1+ α) times the chip rate. This ensures all the signal power is captured and does not unnecessarily restrict the choice of measurement method.
Average power definition becomes the RRC filtered mean power definition.
Received Signal Code Power and Interference Signal Code Power defined as RRC filtered mean power

3.3. Abbreviations – definition of I_{oc}, I_{or} and $\hat{I}_{or}$ corrected.

6.2.1 UE maximum output power – Replacement of “broadband” by “at least (1+ α) times the chip rate”. Added measurement period of “a transmit timeslot excluding the guard period”.

6.4.1 Uplink power control – defined as RRC filtered mean power

6.4.1.1.2 Power control steps – unit [dB] added to ΔSIR_{TARGET}

6.4.2.1.1 Minimum output power – defined as mean power

6.5.1 Transmit OFF power - average power replaced by RRC filtered mean

		power 6.6.2 Out of band emission editorial correction on ACLR. 6.6.2.1.1 Spectrum emission mask reference power defined as RRC filtered mean power. Added clarification about noise bandwidth of the integrated method. 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as RRC filtered mean power 7.3 Reference sensitivity level - defined as mean power, Requirement corrected 7.4 Maximum input level – defined as received mean power 7.5 Adjacent Channel Selectivity (ACS) - interfering signal defined as mean power. 7.6 Blocking characteristics - interfering signal defined as mean power, table restructured, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.7 Spurious response: Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.8 Intermodulation characteristics - Wanted and interfering signals defined as mean power, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB), ± signs added to interfering frequencies to match existing test Annex B: Average power replaced by relative mean power
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect UE implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3.1, 3.3, 6.2.1, 6.4.1, 6.4.1.1.2, 6.4.2.1.1, 6.5.1, 6.5.1.1, 6.6.2, 6.6.2.1.1, 6.6.2.1.1.1, 6.6.2.2, 6.6.2.2.1.1, 6.7.1, 7.3, 7.4, 7.5.1.1, 7.6.1.1, 7.7.1.1, 7.8.1.1, Annex B.2.1		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR95 cat. F to 25.102 v3.10.0, CR97 cat. A to 25.102 v5.0.1		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz (3.84 Mcps TDD option) or X dBm/1.28 MHz (1.28 Mcps TDD option) can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz (3.84 Mcps TDD option) or Y dBm/1.28 MHz (1.28 Mcps TDD option) can be expressed as a signal power of Y dBm.

~~**Average power**: The thermal power as measured through a root raised cosine filter with roll-off α=0.22 and a bandwidth equal to the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.~~

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual ~~broadband~~ power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period.

Mean Power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

RRC Filtered Mean Power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class. The period of measurement shall be a transmit timeslot excluding the guard period.

Received Signal Code Power (RSCP): Given only signal power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading and combining.

Interference Signal Code Power (ISCP): Given only interference power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading to the code and combining. Equivalent to the RSCP value but now only interference is received instead of signal

NOTE 1: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in section 6.8.1.

--- next changed section ---

3.3 Abbreviations

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

ACIR Adjacent Channel Interference Ratio

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH
$\frac{DPCH\_Ec}{I_{or}}$	The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector
$\frac{\Sigma\ DPCH\_Ec}{I_{or}}$	The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Ratio
Fuw	Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.
Ioc	The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.
Ior	The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the BS antenna connector
$\hat{I}_{or}$	The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SCTD	Space Code Transmit Diversity
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
UTRA	UMTS Terrestrial Radio Access

--- next changed section ---

6.2.1 User Equipment maximum output power

The following Power Classes define the nominal maximum output power. The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least (1+α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period..

Table 6.1: UE power classes

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

NOTE:

1) For multi-code operation the nominal maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.

2) The tolerance allowed for the nominal maximum power applies even at the multi code transmission mode.

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

--- next changed section ---

6.4.1 Power control

6.4.1.1 3.84 Mcps option

Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signalling and path loss weighting parameter α as defined in TS 25.331. The output power is defined as the ~~average~~ RRC filtered mean power of the transmit timeslot~~, and is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0.22 and a bandwidth equal to the chip rate~~.

6.4.1.1.1 Initial Accuracy

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

6.4.1.1.2 Differential accuracy, controlled input

The power control differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET} when the path loss weighting parameter α=0. The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The power control error resulting from a change in I_{BTS} or DPCH Constant Value shall not exceed the values defined in Table 6.3.

Table 6.3: Transmitter power step tolerance as a result of control power step

ΔSIR_{TARGET} [dB]	**Transmitter power step tolerance [dB]**
$\Delta SIR_{TARGET} \leq 1$	± 0.5
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	± 1.5
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (1)
Note (1) Value is given for normal conditions. For extreme conditions value is ±12	

6.4.1.1.3 Differential accuracy, measured input

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

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

- The power control error, resulting from a change in the path loss (ΔL_{PCCPCH}), the same tolerances as defined in table 6.3 shall apply,
- and the errors in the PCCPCH RSCP measurement as defined in TS 25.123.

6.4.1.2 1.28 Mcps TDD Option

6.4.1.2.1 Open loop power control

Open loop power control is the ability of the UE transmitter to sets its output power to a specific value. The open loop power control tolerance is given in Table 6.3A

6.4.1.2.1.1 Minimum requirement

The UE open loop power is defined as the average power in a timeslot or ON power duration, whichever is available, and they are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 6.3A: Open loop power control

Normal conditions	± 9 dB
Extreme conditions	± 12 dB

6.4.1.2.2 Closed loop power control

Closed loop power control in the Uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

6.4.1.2.2.1 Power control steps

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, arrived at the UE.

6.4.1.2.2.1.1 Minimum requirement

The UE transmitter shall have the capability of changing the output power with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be arrived.

a) The transmitter output power step due to closed loop power control shall be within the range shown in Table 6.3B.

b) The transmitter average output power step due to closed loop power control shall be within the range shown in Table 6.3C. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

The closed loop power is defined as the relative power differences between averaged power of original (reference) timeslot and averaged power of the target timeslot without transient duration. They are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 6.3B: Transmitter power control range

TPC_ cmd	Transmitter power control range					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+0.5 dB	+1.5 dB	+1 dB	+3 dB	+1.5 dB	+4.5 dB
Down	-0.5 dB	-1.5 dB	-1 dB	-3 dB	-1.5 dB	-4.5 dB

Table 6.3C: Transmitter average power control range

TPC_ cmd group	Transmitter power control range after 10 equal TPC_ cmd groups					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+8 dB	+12 dB	+16 dB	+24 dB	+24 dB	+36 dB
Down	-8 dB	-12 dB	-16 dB	-24 dB	-24 dB	-36 dB

6.4.2 Minimum output power

The minimum controlled output power of the UE is when the power is set to a minimum value.

6.4.2.1 Minimum requirement

6.4.2.1.1 3.84 Mcps TDD Option

The minimum output power is defined as the mean power in one time slot excluding the guard period. The minimum output power shall be less than –44 dBm ~~measured with a filter that has a root-raised cosine (RRC) filter response with a roll-off-factor $\alpha = 0.22$ and a bandwidth equal to the chip rate~~.

6.4.2.1.2 1.28 Mcps TDD Option

The minimum output power shall be less than–49 dBm measured with a filter that has a root-raised cosine (RRC) filter response with a roll-off-factor $\alpha = 0.22$ and a bandwidth equal to the chip rate.

--- next changed section ---

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

Transmit OFF power is defined as the ~~average~~ RRC filtered mean power measured over one chip when the transmitter is off. The transmit OFF power state is when the UE does not transmit.

6.5.1.1 Minimum Requirement

The requirement for transmit OFF power shall be less than −65 dBm ~~measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α=0.22 and a bandwidth equal to the chip rate~~.

--- next changed section ---

6.6.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel 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 leakage power ratio (ACLR).

6.6.2.1 Spectrum emission mask

6.6.2.1.1 3.84 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5MHz from ~~a~~ the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier ~~output power in measured in a 3.84 MHz bandwidth~~.

6.6.2.1.1.1 Minimum Requirement

The power of any UE emission shall not exceed the levels specified in table 6.5.

Table 6.5: Spectrum Emission Mask Requirement (3.84 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz **
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz ***
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz ***
8.5 - 12.5	-49 dBc	1 MHz ***
*	Δf is the separation between the carrier frequency and the centre of the measuring filter.	
**	The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz	
***	The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.	
The lower limit shall be –50dBm/3.84 MHz or the minimum requirement presented in this table which ever is the higher.		

6.6.2.1.2 1.28 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 0.8 and 4.0MHz from a carrier frequency. The out of channel emission is specified relative to the UE output power in measured in a 1.28 MHz bandwidth.

6.6.2.1.2.1 Minimum Requirement

The power of any UE emission shall not exceed the levels specified in table 6.5A

Table 6.5A: Spectrum Emission Mask Requirement (1.28 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
0.8	-35 dBc	30 kHz **
0.8-1.8	$\left\{-35-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz **
1.8-2.4	$\left\{-49-25\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz **
2.4 – 4.0	-49 dBc	1MHz ***
*	Δf is the separation between the carrier frequency and the centre of the measuring filter.	
**	The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.	
***	The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth.	
The lower limit shall be –55dBm/1.28 MHz or the minimum requirement presented in this table which ever is the higher.		

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both cases the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off $\alpha = 0.22$ and a bandwidth equal to the chip rate.~~

6.6.2.2.1 Minimum requirement

6.6.2.2.1.1 3.84 Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in Table 6.6.

Table 6.6:UE ACLR (3.84 Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 5 MHz	33 dB
2, 3	UE channel ± 10 MHz	43 dB

NOTE:

1) The requirement shall still be met in the presence of switching transients.

2) The ACLR requirements reflect what can be achieved with present state of the art technology.

3) Requirement on the UE shall be reconsidered when the state of the art technology progresses.

6.6.2.2.1.2 1.28 Mcps TDD Option

If the adjacent channel power is greater than –55dBm/1.28MHz then the ACLR shall be higher than the value specified in Table 6.6A.

Table 6.6A: UE ACLR (1.28 Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 1.6 MHz	33 dB
2, 3	UE channel ± 3.2 MHz	43 dB

NOTE:

1) The requirement shall still be met in the presence of switching transients.

2) The ACLR requirements reflect what can be achieved with present state of the art technology.

3) Requirement on the UE shall be reconsidered when the state of the art technology progresses.

--- next changed 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.

6.7.1 Minimum requirement

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or BS receive band as an unwanted interfering signal. The UE intermodulation attenuation is defined by the

ratio of the ~~output~~ RRC filtered mean power of the wanted signal to the ~~output~~ RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. ~~Both the wanted signal power and the intermodulation product power are measured with a filter response that is root raised cosine (RRC) with roll-off α=0.22 and with a bandwidth equal to the chip rate.~~

6.7.1.1 3.84 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in Table 6.8.

Table 6.8: Transmit Intermodulation (3.84 Mcps TDD Option)

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

6.7.1.2 1.28 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 1.6 MHz is prescribed in Table 6.8A.

Table 6.8A: Transmit Intermodulation (1.28 Mcps TDD Option)

Interference signal frequency offset	1.6MHz	3.2MHz
Interference signal level	-40dBc	
Minimum requirement of intermodulation products	-31 dBc	-41 dBc

--- next changed section ---

7.3 Reference sensitivity level

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the UE antenna port at which the BIT Error Ratio BER ~~does~~ shall not exceed a specific value.

7.3.1 Minimum Requirements

7.3.1.1 3.84 Mcps TDD Option

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

Table 7.2: Test parameters for reference sensitivity (3.84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma \text{DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/3.84 MHz

7.3.1.2 1.28 Mcps TDD Option

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

Table 7.2A: Test parameters for reference sensitivity (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-108	dBm/1.28 MHz

7.4 Maximum input level

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

7.4.1 Minimum Requirements

7.4.1.1 3.84 Mcps TDD Option

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

Table 7.3: Maximum input level (3.84 Mcps TDD Option)

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

7.4.1.2 1.28 Mcps TDD Option

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

Table 7.3A: Maximum input level (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/1.28 MHz

7.5 Adjacent Channel Selectivity (ACS)

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

7.5.1 Minimum Requirement

7.5.1.1 3.84 Mcps TDD Option

The ACS shall be better than the value indicated in Table 7.4 for the test parameters specified in Table 7.5 where the BER shall not exceed 0.001

Table 7.4: Adjacent Channel Selectivity (3.84 Mcps TDD Option)

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.5: Test parameters for Adjacent Channel Selectivity (3.84 Mcps TDD Option)

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

7.5.1.2 1.28 Mcps TDD Option

The ACS shall be better than the value indicated in table 7.4A for the test parameters specified in table 7.5A where the BER shall not exceed 0.001

Table7.4A: Adjacent Channel Selectivity (1.28 Mcps TDD Option)

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.5A: Test parameters for Adjacent Channel Selectivity (1.28 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/1.28MHz	-91
I_{oac}	dBm/1.28 MHz	-54
F_{uw} offset	MHz	+1.6 or –1.6

7.6 Blocking characteristics

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

7.6.1 Minimum Requirement

7.6.1.1 3.84 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.6 and table 7.7. For table 7.7 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

Table 7.6: In-band blocking (3.84 Mcps TDD Option)

~~Parameter~~	~~Offset~~	~~Offset~~	~~Unit~~
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	~~0~~	~~0~~	~~dB~~
~~$\hat{I}_{or}$~~	~~<REFSENS> + 3 dB~~	~~<REFSENS> + 3 dB~~	~~dBm/3.84 MHz~~
~~I_{ouw} (modulated)~~	~~-56~~	~~-44~~	~~dBm/3.84 MHz~~
~~F_{uw} (offset)~~	~~±10 or –10~~	~~±15 or -15~~	~~MHz~~

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/3.84 MHz
$\frac{I_{ouw}\text{ mean power}}{\text{(modulated)}}$	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)	dBm

Table 7.7: Out of band blocking (3.84 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	~~<REFSENS> + 3 dB~~ –102	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in subclause 5.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
1. For operation referenced in 5.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
2. For operation referenced in 5.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
3. For operation referenced in 5.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				

7.6.1.2 1.28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.6A and table 7.7A.

Table 7.6A: In-band blocking (1.28 Mcps TDD Option)

Parameter	Offset	Offset	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (modulated)	-61	-49	dBm/1.28 MHz
F_{uw} (offset)	+3.2 or –3.2	+4.8 or –4.8	MHz

Table 7.7A: Out of band blocking (1.28 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in subclause 5.2(a)	1840 <f <1895.2 1924.8 <f <2005.2 2029.8 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(b)	1790 < f < 1845.2 1994.8 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(c)	1850 < f < 1905.2 1934.8 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
1. For operation referenced in 5.2(a), from 1895.2 <f< 1900 MHz, 1920 <f< 1924.8 MHz, 2005.2 <f< 2010 MHz and 2025<f< 2029.8 MHz , the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2shall be applied.				
2. For operation referenced in 5.2(b), from 1845.2 < f < 1850 MHz and 1990< f < 1994.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.				
3. For operation referenced in 5.2(c), from 1905.2 < f < 1910 MHz and 1930< f < 1934.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.				

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.

7.7.1 Minimum Requirement

7.7.1.1 3.84 Mcps TDD Option

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

Table 7.8: Spurious Response (3.84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

7.7.1.2 1.28 Mcps TDD Option

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

Table 7.8A: Spurious Response (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

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.

7.8.1 Minimum Requirements

7.8.1.1 3.84 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.9.

Table 7.9: Receive intermodulation characteristics

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm~~/3.84 MHz~~
F_{uw1} (CW)	±10	MHz
F_{uw2} (~~M~~modulated)	±20	MHz

7.8.1.2 1.28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.9A

Table 7.9A: Receive intermodulation characteristics (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	dBm/1.28 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} (modulated)	-46	dBm/1.28 MHz
F_{uw1} (CW)	3.2	MHz
F_{uw2} (Modulated)	6.4	MHz

--- next changed section ---

Annex B (normative): Propagation conditions

B.1 Static propagation condition

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

B.2 Multi-path fading propagation conditions

B.2.1 3.84 Mcps TDD Option

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table B1: Propagation Conditions for Multi path Fading Environments

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

B.2.2 1.28 Mcps TDD Option

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

Table B2: Propagation Conditions for Multi-Path Fading Environments

Case 1, speed 3km/h		Case 2, speed 3km/h		Case 3, speed 120km/h	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0
2928	-10	2928	0	781	-3
		12000	0	1563	-6
				2344	-9

3GPP TSG RAN WG4 Meeting #23 **R4-020692**

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CR-Form-v4

CHANGE REQUEST

⌘ **25.102** **CR** **97** ⌘ ev **-** ⌘ Current version: **5.0.1** ⌘

*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:	⌘	Correction of power terms and definitions
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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 existing requirements relating to power are incomplete, inconsistent and ambiguous. The proposed changes remove the possibility of misinterpreting the specification.

Summary of change: ⌘ 3.1 Definitions - Clarification of power spectral density added. For maximum output power, replaced the term “broadband” by defining the bandwidth as being at least (1+ α) times the chip rate over a period of at least one timeslot excluding the guard period. This definition allows the use of a broadband (thermal) power meter.
Definition of mean power (consistent with ITU radio regulation S1.156) added which includes a minimum bandwidth requirement of (1+ α) times the chip rate. This ensures all the signal power is captured and does not unnecessarily restrict the choice of measurement method.
Average power definition becomes the RRC filtered mean power definition.
Received Signal Code Power and Interference Signal Code Power defined as RRC filtered mean power

3.3. Abbreviations – definition of I_{oc}, I_{or} and $\hat{I}_{or}$ corrected.

6.2.1 UE maximum output power – Replacement of “broadband” by “at least (1+ α) times the chip rate”. Added measurement period of “a transmit timeslot excluding the guard period”.

6.4.1 Uplink power control – defined as RRC filtered mean power

6.4.1.1.2 Power control steps – unit [dB] added to ΔSIR_{TARGET}

6.4.2.1.1 Minimum output power – defined as mean power

6.5.1 Transmit OFF power - average power replaced by RRC filtered mean

		power 6.6.2 Out of band emission editorial correction on ACLR. 6.6.2.1.1 Spectrum emission mask reference power defined as RRC filtered mean power. Added clarification about noise bandwidth of the integrated method. 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR) – changed to RRC filtered mean power terminology 6.7 Transmit intermodulation - subject and interferer signals defined as RRC filtered mean power 7.3 Reference sensitivity level - defined as mean power, Requirement corrected 7.4 Maximum input level – defined as received mean power 7.5 Adjacent Channel Selectivity (ACS) - interfering signal defined as mean power. 7.6 Blocking characteristics - interfering signal defined as mean power, table restructured, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.7 Spurious response: Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB) 7.8 Intermodulation characteristics - Wanted and interfering signals defined as mean power, Îor given as –102 dBm/3.84 MHz (according formula: REFSENS + 3 dB : -105dBm/3.84 MHz+3 dB), ± signs added to interfering frequencies to match existing test Annex B: Average power replaced by relative mean power
Consequences if not approved:	⌘	Existing power specifications are incomplete, inconsistent and ambiguous which will lead to different interpretation of power quantities (e.g. ACLR, Interferer levels etc.). This will lead to inconsistent performance measurement results. Isolated impact statement: Correction of requirements. Correct interpretation of the existing specification will not affect UE implementations or system performance. However, incorrect interpretation may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3.1, 3.3, 6.2.1, 6.4.1, 6.4.1.1.2, 6.4.2.1.1, 6.5.1, 6.5.1.1, 6.6.2, 6.6.2.1.1, 6.6.2.1.1.1, 6.6.2.2, 6.6.2.2.1.1, 6.7.1, 7.3, 7.4, 7.5.1.1, 7.6.1.1, 7.7.1.1, 7.8.1.1, Annex B.2.1		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	34.122
Other comments:	⌘	Equivalent CRs in other Releases: CR95 cat. F to 25.102 v3.10.0, CR96 cat. A to 25.102 v4.4.0		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and Îor). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz (3.84 Mcps TDD option) or X dBm/1.28 MHz (1.28 Mcps TDD option) can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz (3.84 Mcps TDD option) or Y dBm/1.28 MHz (1.28 Mcps TDD option) can be expressed as a signal power of Y dBm.

~~**Average power**: The thermal power as measured through a root raised cosine filter with roll-off α=0.22 and a bandwidth equal to the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.~~

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual ~~broadband~~ power as would be measured assuming no measurement error) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period.

Mean Power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

RRC Filtered Mean Power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class. The period of measurement shall be a transmit timeslot excluding the guard period.

Received Signal Code Power (RSCP): Given only signal power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading and combining.

Interference Signal Code Power (ISCP): Given only interference power is received, the ~~average~~ RRC filtered mean power of the received signal after despreading to the code and combining. Equivalent to the RSCP value but now only interference is received instead of signal

NOTE 1: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in section 6.8.1.

--- next changed section ---

3.3 Abbreviations

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

ACIR Adjacent Channel Interference Ratio

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH
$\frac{DPCH\_Ec}{I_{or}}$	The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector
$\frac{\Sigma\ DPCH\_Ec}{I_{or}}$	The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Ratio
Fuw	Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.
Ioc	The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.
Ior	The total transmit power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal at the BS antenna connector
$\hat{I}_{or}$	The received power spectral density (integrated in a bandwidth of (1+α) times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SCTD	Space Code Transmit Diversity
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
UTRA	UMTS Terrestrial Radio Access

--- next changed section ---

6.2.1 User Equipment maximum output power

The following Power Classes define the nominal maximum output power. The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least (1+α) times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period..

Table 6.1: UE power classes

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

NOTE:

1) For multi-code operation the nominal maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.

2) The tolerance allowed for the nominal maximum power applies even at the multi code transmission mode.

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

--- next changed section ---

6.4.1 Power control

6.4.1.1 3.84 Mcps option

Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signalling and path loss weighting parameter α as defined in TS 25.331. The output power is defined as the ~~average~~ RRC filtered mean power of the transmit timeslot~~, and is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll-off α = 0.22 and a bandwidth equal to the chip rate~~.

6.4.1.1.1 Initial Accuracy

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

6.4.1.1.2 Differential accuracy, controlled input

The power control differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET} when the path loss weighting parameter α=0. The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The power control error resulting from a change in I_{BTS} or DPCH Constant Value shall not exceed the values defined in Table 6.3.

Table 6.3: Transmitter power step tolerance as a result of control power step

ΔSIR_{TARGET} [dB]	**Transmitter power step tolerance [dB]**
$\Delta SIR_{TARGET} \leq 1$	± 0.5
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	± 1.5
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (1)
Note (1) Value is given for normal conditions. For extreme conditions value is ±12	

6.4.1.1.3 Differential accuracy, measured input

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

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

- The power control error, resulting from a change in the path loss (ΔL_{PCCPCH}), the same tolerances as defined in table 6.3 shall apply,
- and the errors in the PCCPCH RSCP measurement as defined in TS 25.123.

6.4.1.2 1.28 Mcps TDD Option

6.4.1.2.1 Open loop power control

Open loop power control is the ability of the UE transmitter to sets its output power to a specific value. The open loop power control tolerance is given in Table 6.3A

6.4.1.2.1.1 Minimum requirement

The UE open loop power is defined as the average power in a timeslot or ON power duration, whichever is available, and they are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 6.3A: Open loop power control

Normal conditions	± 9 dB
Extreme conditions	± 12 dB

6.4.1.2.2 Closed loop power control

Closed loop power control in the Uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

6.4.1.2.2.1 Power control steps

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, arrived at the UE.

6.4.1.2.2.1.1 Minimum requirement

The UE transmitter shall have the capability of changing the output power with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be arrived.

a) The transmitter output power step due to closed loop power control shall be within the range shown in Table 6.3B.

b) The transmitter average output power step due to closed loop power control shall be within the range shown in Table 6.3C. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

The closed loop power is defined as the relative power differences between averaged power of original (reference) timeslot and averaged power of the target timeslot without transient duration. They are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 6.3B: Transmitter power control range

TPC_ cmd	Transmitter power control range					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+0.5 dB	+1.5 dB	+1 dB	+3 dB	+1.5 dB	+4.5 dB
Down	-0.5 dB	-1.5 dB	-1 dB	-3 dB	-1.5 dB	-4.5 dB

Table 6.3C: Transmitter average power control range

TPC_ cmd group	Transmitter power control range after 10 equal TPC_ cmd groups					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
Up	+8 dB	+12 dB	+16 dB	+24 dB	+24 dB	+36 dB
Down	-8 dB	-12 dB	-16 dB	-24 dB	-24 dB	-36 dB

6.4.2 Minimum output power

The minimum controlled output power of the UE is when the power is set to a minimum value.

6.4.2.1 Minimum requirement

6.4.2.1.1 3.84 Mcps TDD Option

The minimum output power is defined as the mean power in one time slot excluding the guard period. The minimum output power shall be less than –44 dBm ~~measured with a filter that has a root-raised cosine (RRC) filter response with a roll-off factor $\alpha = 0.22$ and a bandwidth equal to the chip rate~~.

6.4.2.1.2 1.28 Mcps TDD Option

The minimum output power shall be less than–49 dBm measured with a filter that has a root-raised cosine (RRC) filter response with a roll-off-factor $\alpha = 0.22$ and a bandwidth equal to the chip rate.

--- next changed section ---

6.5 Transmit ON/OFF power

6.5.1 Transmit OFF power

Transmit OFF power is defined as the ~~average~~ RRC filtered mean power measured over one chip when the transmitter is off. The transmit OFF power state is when the UE does not transmit.

6.5.1.1 Minimum Requirement

The requirement for transmit OFF power shall be less than −65 dBm ~~measured with a filter that has a Root Raised Cosine (RRC) filter response with a roll off α=0.22 and a bandwidth equal to the chip rate~~.

--- next changed section ---

6.6.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel 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 leakage power ratio (ACLR).

6.6.2.1 Spectrum emission mask

6.6.2.1.1 3.84 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5MHz from ~~a~~ the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier ~~output power in measured in a 3.84 MHz bandwidth~~.

6.6.2.1.1.1 Minimum Requirement

The power of any UE emission shall not exceed the levels specified in table 6.5.

Table 6.5: Spectrum Emission Mask Requirement (3.84 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	30 kHz **
3.5 - 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	1 MHz ***
7.5 - 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	1 MHz ***
8.5 - 12.5	-49 dBc	1 MHz ***
*	Δf is the separation between the carrier frequency and the centre of the measuring filter.	
**	The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz	
***	The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.	
The lower limit shall be –50dBm/3.84 MHz or the minimum requirement presented in this table which ever is the higher.		

6.6.2.1.2 1.28 Mcps TDD Option

The spectrum emission mask of the UE applies to frequencies, which are between 0.8 and 4.0MHz from a carrier frequency. The out of channel emission is specified relative to the UE output power in measured in a 1.28 MHz bandwidth.

6.6.2.1.2.1 Minimum Requirement

The power of any UE emission shall not exceed the levels specified in table 6.5A

Table 6.5A: Spectrum Emission Mask Requirement (1.28 Mcps TDD Option)

Δf* in MHz	Minimum requirement	Measurement bandwidth
0.8	-35 dBc	30 kHz **
0.8-1.8	$\left\{-35-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz **
1.8-2.4	$\left\{-49-25\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz **
2.4 – 4.0	-49 dBc	1MHz ***
*	Δf is the separation between the carrier frequency and the centre of the measuring filter.	
**	The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.	
***	The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9MHz and 3.5MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth.	
The lower limit shall be –55dBm/1.28 MHz or the minimum requirement presented in this table which ever is the higher.		

6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the ~~average~~ RRC filtered mean power centered on the assigned channel frequency to the ~~average~~ RRC filtered mean power centered on an adjacent channel frequency. ~~In both cases the power is measured with a filter that has a Root Raised Cosine (RRC) filter response with roll-off $\alpha = 0.22$ and a bandwidth equal to the chip rate.~~

6.6.2.2.1 Minimum requirement

6.6.2.2.1.1 3.84 Mcps TDD Option

If the adjacent channel RRC filtered mean power is greater than –50dBm then the ACLR shall be higher than the value specified in Table 6.6.

Table 6.6:UE ACLR (3.84 Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 5 MHz	33 dB
2, 3	UE channel ± 10 MHz	43 dB

NOTE:

1) The requirement shall still be met in the presence of switching transients.

2) The ACLR requirements reflect what can be achieved with present state of the art technology.

3) Requirement on the UE shall be reconsidered when the state of the art technology progresses.

6.6.2.2.1.2 1.28 Mcps TDD Option

If the adjacent channel power is greater than –55dBm/1.28MHz then the ACLR shall be higher than the value specified in Table 6.6A.

Table 6.6A: UE ACLR (1.28 Mcps TDD Option)

Power Class	adjacent channel	ACLR limit
2, 3	UE channel ± 1.6 MHz	33 dB
2, 3	UE channel ± 3.2 MHz	43 dB

NOTE:

1) The requirement shall still be met in the presence of switching transients.

2) The ACLR requirements reflect what can be achieved with present state of the art technology.

3) Requirement on the UE shall be reconsidered when the state of the art technology progresses.

--- next changed 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.

6.7.1 Minimum requirement

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or BS receive band as an unwanted interfering signal. The UE intermodulation attenuation is defined by the

ratio of the ~~output~~ RRC filtered mean power of the wanted signal to the ~~output~~ RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. ~~Both the wanted signal power and the intermodulation product power are measured with a filter response that is root raised cosine (RRC) with roll-off α=0.22 and with a bandwidth equal to the chip rate.~~

6.7.1.1 3.84 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in Table 6.8.

Table 6.8: Transmit Intermodulation (3.84 Mcps TDD Option)

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

6.7.1.2 1.28 Mcps TDD Option

The requirement of transmitting intermodulation for carrier spacing 1.6 MHz is prescribed in Table 6.8A.

Table 6.8A: Transmit Intermodulation (1.28 Mcps TDD Option)

Interference signal frequency offset	1.6MHz	3.2MHz
Interference signal level	-40dBc	
Minimum requirement of intermodulation products	-31 dBc	-41 dBc

--- next changed section ---

7.3 Reference sensitivity level

The reference sensitivity level is the minimum ~~receiver input~~ mean power ~~measured~~ received at the UE antenna port at which the BIT Error Ratio BER ~~does~~ shall not exceed a specific value.

7.3.1 Minimum Requirements

7.3.1.1 3.84 Mcps TDD Option

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

Table 7.2: Test parameters for reference sensitivity (3.84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma \text{DPCH\_Ec}}{\text{I}_{or}}$	0	dB
$\hat{\text{I}}_{or}$	-105	dBm/3.84 MHz

7.3.1.2 1.28 Mcps TDD Option

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

Table 7.2A: Test parameters for reference sensitivity (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	-108	dBm/1.28 MHz

7.4 Maximum input level

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

7.4.1 Minimum Requirements

7.4.1.1 3.84 Mcps TDD Option

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

Table 7.3: Maximum input level (3.84 Mcps TDD Option)

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

7.4.1.2 1.28 Mcps TDD Option

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

Table 7.3A: Maximum input level (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	-7	dB
$\hat{I}_{or}$	-25	dBm/1.28 MHz

7.5 Adjacent Channel Selectivity (ACS)

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

7.5.1 Minimum Requirement

7.5.1.1 3.84 Mcps TDD Option

The ACS shall be better than the value indicated in Table 7.4 for the test parameters specified in Table 7.5 where the BER shall not exceed 0.001

Table 7.4: Adjacent Channel Selectivity (3.84 Mcps TDD Option)

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.5: Test parameters for Adjacent Channel Selectivity (3.84 Mcps TDD Option)

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

7.5.1.2 1.28 Mcps TDD Option

The ACS shall be better than the value indicated in table 7.4A for the test parameters specified in table 7.5A where the BER shall not exceed 0.001

Table7.4A: Adjacent Channel Selectivity (1.28 Mcps TDD Option)

Power Class	Unit	ACS
2	dB	33
3	dB	33

Table 7.5A: Test parameters for Adjacent Channel Selectivity (1.28 Mcps TDD Option)

Parameter	Unit	Level
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	0
$\hat{I}_{or}$	dBm/1.28MHz	-91
I_{oac}	dBm/1.28 MHz	-54
F_{uw} offset	MHz	+1.6 or –1.6

7.6 Blocking characteristics

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

7.6.1 Minimum Requirement

7.6.1.1 3.84 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.6 and table 7.7. For table 7.7 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size.

Table 7.6: In-band blocking (3.84 Mcps TDD Option)

~~Parameter~~	~~Offset~~	~~Offset~~	~~Unit~~
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	~~0~~	~~0~~	~~dB~~
~~$\hat{I}_{or}$~~	~~<REFSENS> + 3 dB~~	~~<REFSENS> + 3 dB~~	~~dBm/3.84 MHz~~
~~I_{ouw} (modulated)~~	~~-56~~	~~-44~~	~~dBm/3.84 MHz~~
~~F_{uw} (offset)~~	~~±10 or –10~~	~~±15 or -15~~	~~MHz~~

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/3.84 MHz
$\frac{I_{ouw}\text{ mean power}}{\text{(modulated)}}$	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)	dBm

Table 7.7: Out of band blocking (3.84 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	~~<REFSENS> + 3 dB~~ –102	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as definded in subclause 5.2(a)	1840 <f <1885 1935 <f <1995 2040 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as definded in subclause 5.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
1. For operation referenced in 5.2(a), from 1885 <f< 1900 MHz, 1920 <f< 1935 MHz, 1995 <f< 2010 MHz and 2025<f< 2040 MHz , the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
2. For operation referenced in 5.2(b), from 1835 < f < 1850 MHz and 1990< f < 2005 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				
3. For operation referenced in 5.2(c), from 1895 < f < 1910 MHz and 1930< f < 1945 MHz, the appropriate in-band blocking in table 7.6 or adjacent channel selectivity in section 7.5.1 shall be applied.				

7.6.1.2 1.28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.6A and table 7.7A.

Table 7.6A: In-band blocking (1.28 Mcps TDD Option)

Parameter	Offset	Offset	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (modulated)	-61	-49	dBm/1.28 MHz
F_{uw} (offset)	+3.2 or –3.2	+4.8 or –4.8	MHz

Table 7.7A: Out of band blocking (1.28 Mcps TDD Option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in subclause 5.2(a)	1840 <f <1895.2 1924.8 <f <2005.2 2029.8 <f <2085	1815 <f <1840 2085 <f <2110	1< f <1815 2110< f <12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(b)	1790 < f < 1845.2 1994.8 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 5.2(c)	1850 < f < 1905.2 1934.8 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz
1. For operation referenced in 5.2(a), from 1895.2 <f< 1900 MHz, 1920 <f< 1924.8 MHz, 2005.2 <f< 2010 MHz and 2025<f< 2029.8 MHz , the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2shall be applied.				
2. For operation referenced in 5.2(b), from 1845.2 < f < 1850 MHz and 1990< f < 1994.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.				
3. For operation referenced in 5.2(c), from 1905.2 < f < 1910 MHz and 1930< f < 1934.8 MHz, the appropriate in-band blocking in table 7.6A or adjacent channel selectivity in section 7.5.1.2 shall be applied.				

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.

7.7.1 Minimum Requirement

7.7.1.1 3.84 Mcps TDD Option

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

Table 7.8: Spurious Response (3.84 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

7.7.1.2 1.28 Mcps TDD Option

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

Table 7.8A: Spurious Response (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	dBm/1.28 MHz
I_{ouw} (CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz

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.

7.8.1 Minimum Requirements

7.8.1.1 3.84 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.9.

Table 7.9: Receive intermodulation characteristics

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	~~<REFSENS> + 3 dB~~ –102	dBm/3.84 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm~~/3.84 MHz~~
F_{uw1} (CW)	±10	MHz
F_{uw2} (~~M~~modulated)	±20	MHz

7.8.1.2 1.28 Mcps TDD Option

The BER shall not exceed 0.001 for the parameters specified in table 7.9A

Table 7.9A: Receive intermodulation characteristics (1.28 Mcps TDD Option)

Parameter	Level	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	dB
$\hat{I}_{or}$	<REFSENS> + 3 dB	dBm/1.28 MHz
$I_{ouw1\ (CW)}$	-46	dBm
I_{ouw2} (modulated)	-46	dBm/1.28 MHz
F_{uw1} (CW)	3.2	MHz
F_{uw2} (Modulated)	6.4	MHz

--- next changed section ---

Annex B (normative): Propagation conditions

B.1 Static propagation condition

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

B.2 Multi-path fading propagation conditions

B.2.1 3.84 Mcps TDD Option

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table B1: Propagation Conditions for Multi path Fading Environments

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

B.2.2 1.28 Mcps TDD Option

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

Table B2: Propagation Conditions for Multi-Path Fading Environments

Case 1, speed 3km/h		Case 2, speed 3km/h		Case 3, speed 120km/h	
Relative Delay [ns]	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**	**Relative Delay [ns]**	**Average Power [dB]**
0	0	0	0	0	0
2928	-10	2928	0	781	-3
		12000	0	1563	-6
				2344	-9