TSG RAN Meeting #18 **RP-020790**
New Orleans, US, 3 - 6 December, 2002

Title **CRs (Rel-4 and Rel-5 Category A) to TS 25.143**
Source **TSG RAN WG4**
Agenda Item **7.4.4**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021678	25.143	013	1	F	Rel-4	4.5.0	New test environment: Extreme power supply for output power test	RInImp-REP
R4-021679	25.143	014	1	A	Rel-5	5.2.0	New test environment: Extreme power supply for output power test	RInImp-REP
R4-021680	25.143	015	1	F	Rel-4	4.5.0	Addition of Repeater configuration	RInImp-REP
R4-021681	25.143	016	1	A	Rel-5	5.2.0	Addition of Repeater configuration	RInImp-REP
R4-021516	25.143	017		F	Rel-4	4.5.0	Definition of the power to select the right table for the spectrum emission mask requirement.	RInImp-REP
R4-021517	25.143	018		A	Rel-5	5.2.0	Definition of the power to select the right table for the spectrum emission mask requirement.	RInImp-REP
R4-021527	25.143	023		F	Rel-4	4.5.0	Spurious emission: correction of the procedure	RInImp-REP
R4-021528	25.143	024		A	Rel-5	5.2.0	Spurious emission: correction of the procedure	RInImp-REP
R4-021685	25.143	028		F	Rel-4	4.5.0	EVM Test: Change from Test Model 4 to Test Model 1	RInImp-REP
R4-021520	25.143	020		A	Rel-5	5.2.0	EVM Test: Change from Test Model 4 to Test Model 1	RInImp-REP

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021678**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **013** ⌘ **rev** **1** ⌘ Current version: **4.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Extreme power supply conditions
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
Category:	⌘	**F**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Test for extreme powersupply conditions are missing.
Summary of change:	⌘	Extreme powersupply conditions are introduced and applied to the maximum output power tests. Correction of reference to tabels for maximum outputpower.
Consequences if not approved:	⌘	Maximum output power may vary under extreme powersupply conditions.

Clauses affected:	⌘	5.4.4, 6.1.2, 6.1.5

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR014r1 cat. A to 25.143 v5.2.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

5.4.4. Power supply

When extreme power supply conditions are specified for a test, the test shall be performed at the standard upper and lower limits of operating voltage defined by manufacturer's declaration for the equipment under test.

Upper voltage limit:

The equipment shall be supplied with a voltage equal to the upper limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60 068-2-1 [8] Test Ab/Ad and IEC 60 068-2-2 [9] Test Bb/Bd: Dry Heat.

Lower voltage limit:

The equipment shall be supplied with a voltage equal to the lower limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60 068-2-1 [8] Test Ab/Ad and IEC 60 068-2-2 [9] Test Bb/Bd: Dry Heat.

======== next changed section =========

6 Output power

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

6.1 Maximum output power

6.1.1 Definition and applicability

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

6.1.2 Minimum Requirements

In normal conditions as specified in section 5.4.1, the Repeater maximum output power shall remain within limits specified in Table 6.1 relative to the manufacturer's rated output power.

Table 6.1: Repeater output power; normal conditions

Rated output power	Limit
P ≥ 43 dBm	+2 dB and -2 dB
39 ≤ P < 43 dBm	+2 dB and -2 dB
31 ≤ P < 39 dBm	+2 dB and -2 dB
P < 31 dBm	+3 dB and -3 dB

In extreme conditions as specified in section 5.4.2 and 5.4.4, the Repeater maximum output power shall remain within limits specified in Table 6.2 relative to the manufacturer's rated output power.

Table 6.2: Repeater output power; extreme conditions

Rated output power	Limit
P ≥ 43 dBm	+2,5 dB and -2,5 dB
39 ≤ P < 43 dBm	+2,5 dB and -2,5 dB
31 ≤ P < 39 dBm	+2,5 dB and -2,5 dB
P < 31 dBm	+4 dB and -4 dB

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.4.1.

6.1.3 Test purpose

To verify that the Repeater maximum output power is within the limit specified in 6.1.2.

6.1.4 Method of test

6.1.4.1 Initial conditions

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

2) Connect the signal generator equipment to the Repeater input port.

3) Connect the power measuring equipment to the Repeater output port.

6.1.4.2 Procedure

1) Set the signal generator to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 in TS 25.141.

2) Adjust the input power to the Repeater to create the maximum nominal Repeater output power at maximum gain.

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

4) Increase the power with 10 dB compare to the level obtained in step 2.

5) Measure the mean power at the RF output port over a certain slot.

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in subclause 5.4.4

NOTE: Tests under extreme power supply also test extreme temperature.

6.1.5 Test Requirements

In normal conditions as specified in section 5.4.1, the Repeater maximum output power shall remain within limits specified in Table ~~6.1~~6.3 relative to the manufacturer's rated output power.

Table 6.3: Repeater output power; normal conditions

Rated output power	Limit
P ≥ 43 dBm	+2,7 dB and –2,7 dB
39 ≤ P < 43 dBm	+2,7 dB and –2,7 dB
31 ≤ P < 39 dBm	+2,7 dB and –2,7 dB
P < 31 dBm	+3,7 dB and –3,7 dB

In extreme conditions as specified in section 5.4.2 and 5.4.4~~, for one UARFCN only~~, the Repeater maximum output power shall remain within limits specified in Table ~~6.2~~6.4 relative to the manufacturer's rated output power.

~~NOTE: Tests under extreme power supply also test extreme temperature.~~

Table 6.4: Repeater output power; extreme conditions

Rated output power	Limit
P ≥ 43 dBm	+3,2 dB and –3,2 dB
39 ≤ P < 43 dBm	+3,2 dB and –3,2 dB
31 ≤ P < 39 dBm	+3,2 dB and –3,2 dB
P < 31 dBm	+4,7 dB and –4,7 dB

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.4.1.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non zero. The Test Tolerance for this test is defined in subclause 5.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex B.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021679**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **014** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Extreme power supply conditions
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Test for extreme powersupply conditions are missing.
Summary of change:	⌘	Extreme powersupply conditions are introduced and applied to the maximum output power tests. Correction of reference to tabels for maximum outputpower.
Consequences if not approved:	⌘	Maximum output power may vary under extreme powersupply conditions.

Clauses affected:	⌘	5.4.4, 6.1.2, 6.1.5

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR013r1 cat. F to 25.143 v4.5.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

5.4.4. Power supply

When extreme power supply conditions are specified for a test, the test shall be performed at the standard upper and lower limits of operating voltage defined by manufacturer's declaration for the equipment under test.

Upper voltage limit:

The equipment shall be supplied with a voltage equal to the upper limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60 068-2-1 [8] Test Ab/Ad and IEC 60 068-2-2 [9] Test Bb/Bd: Dry Heat.

Lower voltage limit:

The equipment shall be supplied with a voltage equal to the lower limit declared by the manufacturer (as measured at the input terminals to the equipment). The tests shall be carried out at the steady state minimum and maximum temperature limits declared by the manufacturer for the equipment, to the methods described in IEC 60 068-2-1 [8] Test Ab/Ad and IEC 60 068-2-2 [9] Test Bb/Bd: Dry Heat.

======== next changed section =========

6 Output power

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

6.1 Maximum output power

6.1.1 Definition and applicability

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

6.1.2 Minimum Requirements

In normal conditions as specified in section 5.4.1, the Repeater maximum output power shall remain within limits specified in Table 6.1 relative to the manufacturer's rated output power.

Table 6.1: Repeater output power; normal conditions

Rated output power	Limit
P ≥ 43 dBm	+2 dB and -2 dB
39 ≤ P < 43 dBm	+2 dB and -2 dB
31 ≤ P < 39 dBm	+2 dB and -2 dB
P < 31 dBm	+3 dB and -3 dB

In extreme conditions as specified in section 5.4.2 and 5.4.4, the Repeater maximum output power shall remain within limits specified in Table 6.2 relative to the manufacturer's rated output power.

Table 6.2: Repeater output power; extreme conditions

Rated output power	Limit
P ≥ 43 dBm	+2,5 dB and -2,5 dB
39 ≤ P < 43 dBm	+2,5 dB and -2,5 dB
31 ≤ P < 39 dBm	+2,5 dB and -2,5 dB
P < 31 dBm	+4 dB and -4 dB

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.4.1.

6.1.3 Test purpose

To verify that the Repeater maximum output power is within the limit specified in 6.1.2.

6.1.4 Method of test

6.1.4.1 Initial conditions

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

2) Connect the signal generator equipment to the Repeater input port.

3) Connect the power measuring equipment to the Repeater output port.

6.1.4.2 Procedure

1) Set the signal generator to transmit a signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 in TS 25.141.

2) Adjust the input power to the Repeater to create the maximum nominal Repeater output power at maximum gain.

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

4) Increase the power with 10 dB compare to the level obtained in step 2.

5) Measure the mean power at the RF output port over a certain slot.

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in subclause 5.4.4

NOTE: Tests under extreme power supply also test extreme temperature.

6.1.5 Test Requirements

In normal conditions as specified in section 5.4.1, the Repeater maximum output power shall remain within limits specified in Table ~~6.1~~6.3 relative to the manufacturer's rated output power.

Table 6.3: Repeater output power; normal conditions

Rated output power	Limit
P ≥ 43 dBm	+2,7 dB and –2,7 dB
39 ≤ P < 43 dBm	+2,7 dB and –2,7 dB
31 ≤ P < 39 dBm	+2,7 dB and –2,7 dB
P < 31 dBm	+3,7 dB and –3,7 dB

In extreme conditions as specified in section 5.4.2 and 5.4.4~~, for one UARFCN only~~, the Repeater maximum output power shall remain within limits specified in Table ~~6.2~~6.4 relative to the manufacturer's rated output power.

~~NOTE: Tests under extreme power supply also test extreme temperature.~~

Table 6.4: Repeater output power; extreme conditions

Rated output power	Limit
P ≥ 43 dBm	+3,2 dB and –3,2 dB
39 ≤ P < 43 dBm	+3,2 dB and –3,2 dB
31 ≤ P < 39 dBm	+3,2 dB and –3,2 dB
P < 31 dBm	+4,7 dB and –4,7 dB

In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.4.1.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non zero. The Test Tolerance for this test is defined in subclause 5.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex B.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021680**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **015** ⌘ **rev** **1** ⌘ Current version: **4.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Addition of Repeater configuration
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
Category:	⌘	**F**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Clarification on Repeater configurations requested by regulators.
Summary of change:	⌘	Power supply options and Repeater combinations as Repeater configurations are introduced.
Consequences if not approved:	⌘	Clarification on Repeater configurations is missing.

Clauses affected:	⌘	5.9

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments:	⌘	Equivalent CRs in other Releases: CR016r1 cat. A to 25.143 v5.2.0

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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.

5.9 Repeater configurations

5.9.1 Power supply options

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

5.9.2 Combining of Repeaters

If the repeater is intended for combination with additional apparatus connected to a repeater port and this combination is supplied as a system, the combination of repeater together with the additional apparatus ~~must~~shall also fulfil the repeater requirements. E.g. if the repeater is intended for combination such that multiple repeaters amplify the same signals into the same ports the combination ~~must~~shall also fulfil the repeater requirements.

An example of such a configuration is shown in figure 5.1

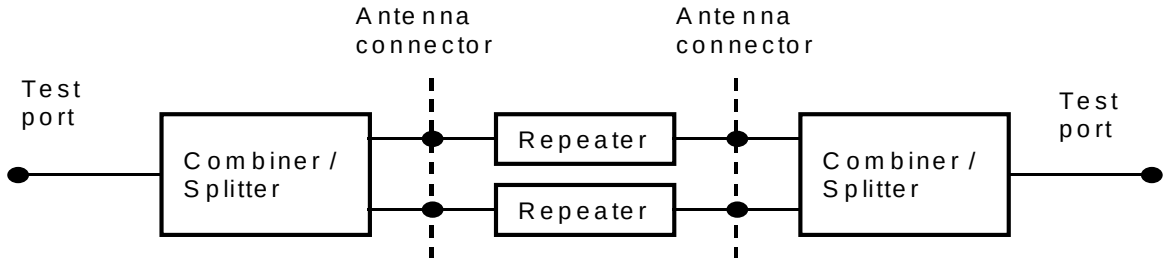

Figure 5.6: Example of repeater configuration

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021681**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **016** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Addition of Repeater configuration
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Clarification on Repeater configurations requested by regulators.
Summary of change:	⌘	Power supply options and Repeater combinations as Repeater configurations are introduced.
Consequences if not approved:	⌘	Clarification on Repeater configurations is missing.

Clauses affected:	⌘	5.9

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘ Equivalent CRs in other Releases: CR015r1 cat. F to 25.143 v4.5.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

5.9 Repeater configurations

5.9.1 Power supply options

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

5.9.2 Combining of Repeaters

If the repeater is intended for combination with additional apparatus connected to a repeater port and this combination is supplied as a system, the combination of repeater together with the additional apparatus ~~must~~shall also fulfil the repeater requirements. E.g. if the repeater is intended for combination such that multiple repeaters amplify the same signals into the same ports the combination ~~must~~shall also fulfil the repeater requirements.

An example of such a configuration is shown in figure 5.1

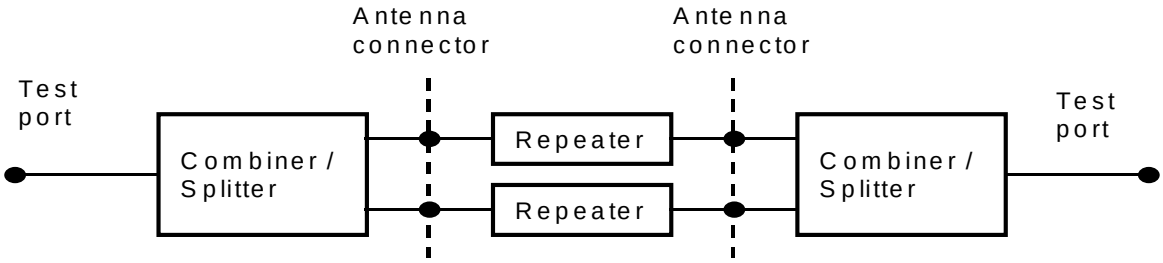

Figure 5.6: Example of repeater configuration

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021516**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **017** ⌘ **rev** ⌘ Current version: **4.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Definition of the power to select the right table for the spectrum emission mask requirement.
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
Category:	⌘	**F**
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)
Rel-6 (Release 6)

Reason for change:	⌘	It was unclear, what power was ment to select the table for the spectrum emission mask requirement.
Summary of change:	⌘	A explanation is added to clearify what power is ment to select the table for the spectrum emission mask requirement. Explanation for number of carrier to be used and procedure improved.
Consequences if not approved:	⌘	It is unclear for the person, approving a repeater which power is ment to select the table for the spectrum emission mask requirement and the nuber of carrier used for this test. It might happen that a repeater with higher emission might get approved.
Clauses affected:	⌘	3.1, 9.1.1

	Y	N		
Other specs Affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR018 cat. A to 25.143 v5.2.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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 terms and definitions apply:

Donor coupling loss: is the coupling loss between the repeater and the donor base station.

down-link: signal path where base station transmits and mobile receives

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

operating band: the Repeater can have one or several operating bands. The operating band is the frequency range that the Repeater operates in with operational configuration. This frequency range can correspond to one or several consecutive nominal 5 MHz channels. If they are not consecutive each subset of channels shall be considered as an individual operating band.

Repeater: a device that receives, amplifies and transmits the radiated or conducted RF carrier both in the down-link direction (from the base station to the mobile area) and in the up-link direction (from the mobile to the base station).

up-link: signal path where mobile transmits and base station receives.

==== next changed section ====

9.1.1 Spectrum emission mask

9.1.1.1 Definitions and applicability

The masks defined in Table 9.1, Table 9.2, Table 9.3, and Table 9.4 below may be mandatory in certain regions. In other regions this mask may not be applied.

9.1.1.2 Minimum Requirements

For regions where this clause applies, the requirement shall be met by a repeater's RF-signal output at maximum gain with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel. In normal conditions as specified in section 5.4.1 emissions shall not exceed the maximum level specified in Table 9.1, Table 9.2, Table 9.3, and Table 9.4 for the appropriate Repeater maximum output power, in the frequency range from Δf = 2,5 MHz to Δf_{max} from the 5 MHz channel, where:

- Δf is the separation between the centre frequency of first or last 5 MHz channel used in the operating band and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the centre frequency of first or last 5 MHz channel in the operating band and the centre of the measuring filter.
- f_offset_{max} is either 12,5 MHz or the offset to the UTRA band edge at both up- and down-link as defined in section 4.1, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measurement filter.

If the operating band corresponds to ~~three~~ two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

To select the table of the maximum level for the spectrum emission mask test, use the maximum output power as defined in subclause 3.1 Definition. If one channel is used for the spectrum emission mask test use this power for the selection. If two channels are used for the spectrum emission mask test use the power of one of these.

Table 9.1: Spectrum emission mask values, maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	-14 – 15·(f_offset- 2,715) dBm	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 ≤ Δf MHz	8,0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 9.2: Spectrum emission mask values, maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	-14 – 15·(f_offset - 2,715) dBm	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 ≤ Δf MHz	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

Table 9.3: Spectrum emission mask values, maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	P - 53 dBm	30 kHz
2,7 ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	P – 53 – 15·(f_offset – 2,715) dBm	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	P - 65 dBm	30 kHz
3,5 ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	P - 52 dBm	1 MHz
7,5 ≤ Δf MHz	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dBm	1 MHz

Table 9.4: Spectrum emission mask values, maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-22 dBm	30 kHz
2,7 ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	-22 – 15·(f_offset - 2,715) dBm	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-34 dBm	30 kHz
3,5 ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-21 dBm	1 MHz
7,5 ≤ Δf MHz	8,0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

9.1.1.3 Test purpose

The purpose of this test is to verify that the Repeater meet the spectrum emission requirements as specified in TS 25.106.

9.1.1.4 Method of test

9.1.1.4.1 Initial conditions

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

2) Connect a signal generator to the input port of the Repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4,0 MHz shall use a 30 kHz measurement bandwidth.

4) Measurements with an offset from the carrier centre frequency between 4,0 MHz and (Δfmax – 500 kHz) shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements.

5) Detection mode: True RMS.

9.1.1.4.2 Procedures

1) Set the Repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 25.141 subclause 6.2.1.1.1, at level(s) which produce the manufacturer specified maximum output power at maximum gain.

3) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

4) Increase the power with 10 dB compare to the level obtained in step 2.

5) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6) If the operating band corresponds to two or more consecutive nominal 5 MHz channels, repeat step 1) to 5) with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

7) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

~~6)~~8) Repeat the test for the opposite path of the Repeater.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021517**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **018** ⌘ **rev** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Definition of the power to select the right table for the spectrum emission mask requirement.
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	It was unclear, what power was ment to select the table for the spectrum emission mask requirement.
Summary of change:	⌘	A explanation is added to clearify what power is ment to select the table for the spectrum emission mask requirement. Explanation for number of carrier to be used and procedure improved.
Consequences if not approved:	⌘	It is unclear for the person, approving a repeater which power is ment to select the table for the spectrum emission mask requirement and the nuber of carrier used for this test. It might happen that a repeater with higher emission might get approved.

Clauses affected:	⌘	3.1, 9.1.1

	Y	N		
Other specs Affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	Equivalent CRs in other Releases: CR017 cat. F to 25.143 v4.5.0

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Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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 terms and definitions apply:

Donor coupling loss: is the coupling loss between the repeater and the donor base station.

down-link: signal path where base station transmits and mobile receives

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

operating band: the Repeater can have one or several operating bands. The operating band is the frequency range that the Repeater operates in with operational configuration. This frequency range can correspond to one or several consecutive nominal 5 MHz channels. If they are not consecutive each subset of channels shall be considered as an individual operating band.

Repeater: a device that receives, amplifies and transmits the radiated or conducted RF carrier both in the down-link direction (from the base station to the mobile area) and in the up-link direction (from the mobile to the base station).

up-link: signal path where mobile transmits and base station receives.

==== next changed section ====

9.1.1 Spectrum emission mask

9.1.1.1 Definitions and applicability

The masks defined in Table 9.1, Table 9.2, Table 9.3, and Table 9.4 below may be mandatory in certain regions. In other regions this mask may not be applied.

9.1.1.2 Minimum Requirements

For regions where this clause applies, the requirement shall be met by a repeater's RF-signal output at maximum gain with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel. In normal conditions as specified in section 5.4.1 emissions shall not exceed the maximum level specified in Table 9.1, Table 9.2, Table 9.3, and Table 9.4 for the appropriate Repeater maximum output power, in the frequency range from Δf = 2,5 MHz to Δf_{max} from the 5 MHz channel, where:

- Δf is the separation between the centre frequency of first or last 5 MHz channel used in the operating band and the nominal –3 dB point of the measuring filter closest to the carrier frequency.
- f_offset is the separation between the centre frequency of first or last 5 MHz channel in the operating band and the centre of the measuring filter.
- f_offset_{max} is either 12,5 MHz or the offset to the UTRA band edge at both up- and down-link as defined in section 4.1, whichever is the greater.
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measurement filter.

If the operating band corresponds to ~~three~~ two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

To select the table of the maximum level for the spectrum emission mask test, use the maximum output power as defined in subclause 3.1 Definition. If one channel is used for the spectrum emission mask test use this power for the selection. If two channels are used for the spectrum emission mask test use the power of one of these.

Table 9.1: Spectrum emission mask values, maximum output power P ≥ 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	$-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)$ dB	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0 MHz ≤ f_offset < f_offset_{max}	-13 dBm	1 MHz

Table 9.2: Spectrum emission mask values, maximum output power 39 ≤ P < 43 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-14 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	$-14\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)$ dB	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-26 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-13 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	1 MHz

Table 9.3: Spectrum emission mask values, maximum output power 31 ≤ P < 39 dBm

Frequency offset of measurement filter – 3dB point,Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	P - 53 dB	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	$\text{P} - 53\text{dB} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)$ dB	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	P - 65 dB	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	P - 52 dB	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0MHz ≤ f_offset < f_offset_{max}	P - 56 dB	1 MHz

Table 9.4: Spectrum emission mask values, maximum output power P < 31 dBm

Frequency offset of measurement filter – 3dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515MHz ≤ f_offset < 2,715MHz	-22 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715MHz ≤ f_offset < 3,515MHz	$-22\text{dBm} - 15 \cdot \left(\frac{\text{f\_offset}}{\text{MHz}} - 2{,}715 \right)\text{dB}$	30 kHz
	3,515MHz ≤ f_offset < 4,0MHz	-34 dBm	30 kHz
3,5 MHz ≤ Δf < 7,5 MHz	4,0 MHz ≤ f_offset < 8,0MHz	-21 dBm	1 MHz
7,5 MHz ≤ Δf ≤ f_{max}	8,0MHz ≤ f_offset < f_offset_{max}	-25 dBm	1 MHz

9.1.1.3 Test purpose

The purpose of this test is to verify that the Repeater meet the spectrum emission requirements as specified in TS 25.106.

9.1.1.4 Method of test

9.1.1.4.1 Initial conditions

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

2) Connect a signal generator to the input port of the Repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Measurements with an offset from the carrier centre frequency between 2,515 MHz and 4,0 MHz shall use a 30 kHz measurement bandwidth.

4) Measurements with an offset from the carrier centre frequency between 4,0 MHz and (Δfmax – 500 kHz) shall use a 1 MHz measurement bandwidth. The 1MHz measurement bandwidth may be calculated by integrating multiple 50 kHz or narrower filter measurements.

5) Detection mode: True RMS.

9.1.1.4.2 Procedures

1) Set the Repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 25.141 subclause 6.2.1.1.1, at level(s) which produce the manufacturer specified maximum output power at maximum gain.

3) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

4) Increase the power with 10 dB compare to the level obtained in step 2.

5) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

6) If the operating band corresponds to two or more consecutive nominal 5 MHz channels, repeat step 1) to 5) with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

7) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

~~6)~~8) Repeat the test for the opposite path of the Repeater.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021520**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **020** ⌘ **rev** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	EVM Test: Change from Test Model 4 to Test Model 1
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The base station specification TS25.141 has already being changed at RANwith the folowing reasons: The existing test for EVM uses Test Model 4, which is a simple signal with low peak to average ratio. This does not sufficiently stress the Repeater transmitter, which will likely have the worst EVM performance when the loading is high as with Test Model 1.
Summary of change:	⌘	The EVM test is modified to use Test Model 1 instead of Test Model 4.
Consequences if not approved:	⌘	A Repeater passing the existing test would not be an indication that it would operate correctly under full loading.

Clauses affected:	⌘	5.7, 10.1

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘ Equivalent CRs in other Releases: CR028 cat. F to 25.143 v4.5.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

5.7 Test Models

The set-up of physical channels for the Repeater tests shall be according to one of the test models described in TS 25.141 [11]. A reference to the applicable test model in TS 25.141 is made for each test in Table 5.5 by referring to the test model number as it appears in TS 25.141.

These test models shall be used in the tests of both the up-link and the down-link directions of the Repeater unless otherwise stated.

Table 5.5: List of the applicable test models

Test model number in TS 25.141	Requirement	Comments
Test Model 1	Repeater output power	
Test Model 1	Out of band emission	
Test Model 1	Spurious emission	
~~Test Model 4~~ Test Model 1	Error vector magnitude	
Test Model 3	Peak code domain error	

=== next changed section ===

10 Modulation accuracy

In this section the procedure for testing the modulation accuracy of Repeaters is defined. This test includes EVM and peak code domain error.

10.1 Error vector magnitude

In this section the procedure for testing the Error Vector Magnitude (EVM) of Repeaters is defined.

10.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E of TS25.141. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot).

10.1.2 Minimum Requirements

In normal conditions as specified in section 5.4.1 the Error Vector Magnitude shall not be worse than 17,5 % as defined in TS25.106.

10.1.3 Test purpose

To verify that the EVM is within the limit specified in 10.1.2 after the signal passed through the Repeater..

10.1.4 Method of test

10.1.4.1 Initial conditions

Set-up the equipment as shown in annex A.

The test is based upon the test for the base station. ~~Test model 4~~Test model 1 as described in TS25.141 is used for the definition of the signal to test on. A signal generator providing the required signals is connected to the input of the Repeater. The Repeater is set to operate at full gain. The signal level is adjusted to the equivalent level to obtain the nominal output power as declared by the manufacturer. A signal analyser connected to the output is used to measure the EVM value.

10.1.4.2 Procedure

The test has to be performed in the uplink and the downlink path of the Repeater. The EVM has to be measured according to Annex E of TS25.141

10.1.4.3 Stimulus EVM effect

The stimulus signal generator EVM will RSS with the tested repeater EVM. The target for the recorded value is adjusted accordingly in the test requirements.

10.1.5 Test requirements

In normal conditions as specified in section 5.4.1, the Error Vector Magnitude, as defined in TS25.106, shall not exceed 18,2%.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021527**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **023** ⌘ **rev** ⌘ Current version: **4.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spurios emission: Correction of the test procedure
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
Category:	⌘	**F**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	It was unclear what power was ment to select the table for the spectrum emission mask requirement.
Summary of change:	⌘	A explanation is added to clearify what power is ment to select the table for the spectrum emission mask requirement.
Consequences if not approved:	⌘	It is unclear for the person, performing the type approval which power is ment to select the table for the spectrum emission mask requirement. So it can happen that a repeater with higher emission will get approved.

Clauses affected:	⌘	9.2.2, 9.2.4

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR024 cat. A to 25.143 v5.2.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

9.2 Spurious emissions

9.2.1 Definition and applicability

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

The requirements of either subclause 9.2.2.1 or subclause 9.2.2.2 shall apply whatever the type of Repeater considered (one or several operating bands). It applies for all configurations foreseen by the manufacturer's specification.

Either requirement applies at frequencies within the specified frequency ranges that are more than 12,5 MHz below the centre frequency of the first 5 MHz channel or more than 12,5 MHz above the centre frequency of the last 5 MHz channel in the operating band.

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

9.2.2 Minimum Requirements

In normal conditions as specified in section 5.4.1 the following requirements shall be met.

9.2.2.1 Spurious emission (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.9.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The ~~measurements~~ requirement shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to ~~three~~two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

Table 9.9: Up-link and down-link: General spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9kHz – 150kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
1GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8 [4], s2.6

9.2.2.2 Spurious emission (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated power output per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.10 and Table 9.11 for the down- and up-link, respectively.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The ~~measurements~~ requirement shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to ~~three~~ two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

Table 9.10: Down-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8 [4], s4.1
Fc1 – 60 MHz or 2100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2100 MHz whichever is the higher	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8 [4], s4.1
Fc1 – 50 MHz or 2100 MHz whichever is the higher ↔ Fc2 + 50 MHz or 2180 MHz whichever is the lower	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8 [4], s4.1
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2180 MHz whichever is the lower	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8 [4], s4.1
Fc2 + 60 MHz or 2180 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1. Upper frequency as in ITU-R SM.329-8 [4], s2.6

==== next changed section ====

9.2.4 Method of test

9.2.4.1 Initial conditions

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

2) Connect a signal generator to the input port of the Repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Detection mode: True RMS.

9.2.4.2 Procedures

1) Set the Repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 25.141 subclause 6.2.1.1.1, at level(s) which produce the manufacturer specified maximum output power at maximum gain.

~~4)~~3) The detecting device shall be configured with a measurement bandwidth as stated in the tables.

~~3)~~4) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

5) Increase the input power with 10 dB compare to the level obtained in step 2.

6) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

7) If the operating band corresponds to two or more consecutive nominal 5 MHz channels, repeat step 1) to 6) with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

8) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

9.2.5 Test requirements

In all measurements, the requirements according to subclause 9.2.2 shall be fulfilled.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021528**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **024** ⌘ **rev** ⌘ Current version: **5.2.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spurios emission: Correction of the test procedure
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	It was unclear what power was ment to select the table for the spectrum emission mask requirement.
Summary of change:	⌘	A explanation is added to clearify what power is ment to select the table for the spectrum emission mask requirement.
Consequences if not approved:	⌘	It is unclear for the person, performing the type approval which power is ment to select the table for the spectrum emission mask requirement. So it can happen that a repeater with higher emission will get approved.

Clauses affected:	⌘	9.2.2, 9.2.4

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR023 cat. F to 25.143 v4.5.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

9.2 Spurious emissions

9.2.1 Definition and applicability

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

The requirements of either subclause 9.2.2.1 or subclause 9.2.2.2 shall apply whatever the type of Repeater considered (one or several operating bands). It applies for all configurations foreseen by the manufacturer's specification.

Either requirement applies at frequencies within the specified frequency ranges that are more than 12,5 MHz below the centre frequency of the first 5 MHz channel or more than 12,5 MHz above the centre frequency of the last 5 MHz channel in the operating band.

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

9.2.2 Minimum Requirements

In normal conditions as specified in section 5.4.1 the following requirements shall be met.

9.2.2.1 Spurious emission (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated output power per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.9.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The ~~measurements~~ requirement shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to ~~three~~ two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

Table 9.9: Up-link and down-link: General spurious emissions limits, Category A

Band	Maximum level	Measurement Bandwidth	Note
9kHz – 150kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
1GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329 [4], s2.5 table 1

9.2.2.2 Spurious emission (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329 [4], are applied.

At maximum Repeater gain, with WCDMA signals in the operating band of the Repeater, at levels that produce the maximum rated power output per channel, the power of any spurious emission shall not exceed the limits specified in Table 9.10 and Table 9.11 for the down- and up-link, respectively.

When the power in all channels is increased by 10 dB the requirements shall still be met.

The ~~measurements~~ requirement shall apply both with or without an input signal applied.

NOTE 1: If the operating band corresponds to ~~three~~ two or more consecutive nominal 5 MHz channels, the requirement shall be met with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

Table 9.10: Down-link: General spurious emissions limits, Category B

Band	Maximum Level	Measurement Bandwidth	Note
9kHz ↔ 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
150kHz ↔ 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
30MHz ↔ 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329 [4], s4.1
1GHz ↔ Fc1 - 60 MHz or 2100 MHz whichever is the higher	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329 [4], s4.1
Fc1 – 60 MHz or 2100 MHz whichever is the higher ↔ Fc1 – 50 MHz or 2100 MHz whichever is the higher	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329 [4], s4.3 and Annex 7
Fc1 – 50 MHz or 2100 MHz whichever is the higher ↔ Fc2 + 50 MHz or 2180 MHz whichever is the lower	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329 [4], s4.3 and Annex 7
Fc2 + 50 MHz or 2180 MHz whichever is the lower ↔ Fc2 + 60 MHz or 2180 MHz whichever is the lower	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329 [4], s4.3 and Annex 7
Fc2 + 60 MHz or 2180 MHz whichever is the lower ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.32 [4], s4.1. Upper frequency as in ITU-R SM.329 [4], s2.5 table 1

==== next changed section ====

9.2.4 Method of test

9.2.4.1 Initial conditions

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

2) Connect a signal generator to the input port of the Repeater for tests of repeaters with an operating band corresponding to one 5 MHz channel. If the operating band corresponds to two or more 5 MHz carriers, two signal generators with a combining circuit or one signal generator with the ability to generate several WCDMA carriers is connected to the input.

3) Detection mode: True RMS.

9.2.4.2 Procedures

1) Set the Repeater to maximum gain.

2) Set the signal generator(s) to generate signal(s) in accordance to test model 1, TS 25.141 subclause 6.2.1.1.1, at level(s) which produce the manufacturer specified maximum output power at maximum gain.

~~4)~~3) The detecting device shall be configured with a measurement bandwidth as stated in the tables.

~~3)~~4) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

5) Increase the input power with 10 dB compare to the level obtained in step 2.

6) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

7) If the operating band corresponds to two or more consecutive nominal 5 MHz channels, repeat step 1) to 6) with any combination of two WCDMA modulated signals of equal power in the repeaters operating band.

8) Measure the emission at the specified frequencies with specified measurement bandwidth and note that the measured value does not exceed the specified value.

9.2.5 Test requirements

In all measurements, the requirements according to subclause 9.2.2 shall be fulfilled.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021685**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.143** **CR** **028** ⌘ **rev** ⌘ Current version: **4.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	EVM Test: Change from Test Model 4 to Test Model 1
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-REP
Date:	⌘	26/11/2002
Category:	⌘	**F**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The base station specification TS25.141 has already being changed at RANwith the following reasons: The existing test for EVM uses Test Model 4, which is a simple signal with low peak to average ratio. This does not sufficiently stress the Repeater transmitter, which will likely have the worst EVM performance when the loading is high as with Test Model 1.
Summary of change:	⌘	The EVM test is modified to use Test Model 1 instead of Test Model 4.
Consequences if not approved:	⌘	A Repeater passing the existing test would not be an indication that it would operate correctly under full loading.

Clauses affected:	⌘	5.7, 10.1			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR020 cat. A to 25.143 v5.2.0			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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.

5.7 Test Models

The set-up of physical channels for the Repeater tests shall be according to one of the test models described in TS 25.141 [11]. A reference to the applicable test model in TS 25.141 is made for each test in Table 5.5 by referring to the test model number as it appears in TS 25.141.

These test models shall be used in the tests of both the up-link and the down-link directions of the Repeater unless otherwise stated.

Table 5.5: List of the applicable test models

Test model number in TS 25.141	Requirement	Comments
Test Model 1	Repeater output power	
Test Model 1	Out of band emission	
Test Model 1	Spurious emission	
~~Test Model 4~~ Test Model 1	Error vector magnitude	
Test Model 3	Peak code domain error	

=== next changed section ===

10 Modulation accuracy

In this section the procedure for testing the modulation accuracy of Repeaters is defined. This test includes EVM and peak code domain error.

10.1 Error vector magnitude

In this section the procedure for testing the Error Vector Magnitude (EVM) of Repeaters is defined.

10.1.1 Definition and applicability

The Error Vector Magnitude is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. The modification is done according to annex E of TS25.141. This difference is called the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the modified mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot).

10.1.2 Minimum Requirements

In normal conditions as specified in section 5.4.1 the Error Vector Magnitude shall not be worse than 17,5 % as defined in TS25.106.

10.1.3 Test purpose

To verify that the EVM is within the limit specified in 10.1.2 after the signal passed through the Repeater..

10.1.4 Method of test

10.1.4.1 Initial conditions

Set-up the equipment as shown in annex A.

The test is based upon the test for the base station. ~~Test model 4~~Test model 1 as described in TS25.141 is used for the definition of the signal to test on. A signal generator providing the required signals is connected to the input of the Repeater. The Repeater is set to operate at full gain. The signal level is adjusted to the equivalent level to obtain the nominal output power as declared by the manufacturer. A signal analyser connected to the output is used to measure the EVM value.

10.1.4.2 Procedure

The test has to be performed in the uplink and the downlink path of the Repeater. The EVM has to be measured according to Annex E of TS25.141

10.1.4.3 Stimulus EVM effect

The stimulus signal generator EVM will RSS with the tested repeater EVM. The target for the recorded value is adjusted accordingly in the test requirements.

10.1.5 Test requirements

In normal conditions as specified in section 5.4.1, the Error Vector Magnitude, as defined in TS25.106, shall not exceed 18,2%.