

**TSG RAN Meeting #20**  
**Hämeenlinna, Finland, 3 - 6 June, 2003**

**RP-030212**

**Title** CRs (Rel-4 and Rel-5 Category A) to TS 25.143 on "Removal of square brackets in test uncertainty of output intermodulation"  
**Source** TSG RAN WG4  
**Agenda Item** 7.4.4

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020436	25.143	033		F	Rel-4	4.7.0	Removal of square brackets in the test uncertainty section regarding output intermodulation	RInImp-REP
R4-020437	25.143	034		A	Rel-5	5.4.0	Removal of square brackets in the test uncertainty section regarding output intermodulation	RInImp-REP

Paris, France 19 - 23 May, 2003

CR-Form-v7

**CHANGE REQUEST**

⌘ **25.143 CR 033** ⌘ rev ⌘ Current version: **4.7.0** ⌘

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

<b>Title:</b>	⌘ Removal of square brackets in the test uncertainty section regarding output intermodulation		
<b>Source:</b>	⌘ RAN WG4		
<b>Work item code:</b>	⌘ RInImp-REP <span style="float: right;"><b>Date:</b> ⌘ 27/05/2003</span>		
<b>Category:</b>	⌘ <b>F</b> <span style="float: right;"><b>Release:</b> ⌘ Rel-4</span>		
	<table border="0"> <tr> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (addition of feature),</p> <p><b>C</b> (functional modification of feature)</p> <p><b>D</b> (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <a href="http://www.3gpp.org/Specs/tr21/900">TR 21.900</a>.</p> </td> <td style="vertical-align: top; padding-left: 20px;"> <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> </td> </tr> </table>	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (addition of feature),</p> <p><b>C</b> (functional modification of feature)</p> <p><b>D</b> (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <a href="http://www.3gpp.org/Specs/tr21/900">TR 21.900</a>.</p>	<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p>
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<b>Reason for change:</b>	⌘ Approved measurement uncertainty limits are necessary for effective verification of specification conformance.
<b>Summary of change:</b>	⌘ Removal of square brackets regarding measurement uncertainty of output intermodulation measurements.
<b>Consequences if not approved:</b>	⌘ Conformance to specification cannot be demonstrated.

<b>Clauses affected:</b>	⌘ 5.1, 5.2 and Annex B.								
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Y	N								
<input type="checkbox"/>	<input type="checkbox"/>								
<input type="checkbox"/>	<input type="checkbox"/>								
<input type="checkbox"/>	<input type="checkbox"/>								
<b>Other comments:</b>	⌘ Equivalent CRs in other Releases: CR034 cat. A to 25.143 v5.4.0								

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/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.
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### 5.1.2 Measurements of Repeater

**Table 5.1: Maximum Test System Uncertainty**

Subclause	Maximum Test System Uncertainty	Range over which Test System Uncertainty applies
6.1 Maximum output power	±0,7 dB	
7 Frequency error	±12 Hz	Measurement results of ± 500 Hz
8 Out of band gain	±0,5 dB Calibration of test set-up shall be made without D.U.T. in order to achieve the accuracy	
9.1 Spectrum emission mask	±1,5 dB  Due to carrier leakage for measurements specified in a 1MHz bandwidth close to the carrier (4 MHz to 8 MHz), integration of the measurement using several narrower bandwidth measurements may be necessary in order to achieve the above accuracy.  The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS25.141	
9.2 Spurious emissions	In UTRA and coexistence receive bands: for results > -60 dBm ±2,0 dB for results < -60 dBm ±3,0 dB Outside above range: emission power f ≤ 2,2 GHz ±1,5 dB; 2,2 GHz < f ≤ 4 GHz ±2,0 dB; f > 4 GHz ±4,0 dB.  The interference from the signal generator ACLR shall be minimum 10 dB below that of a Base Station according to TS25.141	
10.1 Error vector magnitude	± 2,5 % (single code applied)  (±2,5 % measurement error for single code).  5,0 % EVM in the stimulus signal (single code) will shift the EVM maximum value 0,7% to 18,2%. (RSS repeater EVM and Stimulus EVM.)	Measurement results from 12,5% to 22,5% at signal power = P_max – 3dB to P_max – 18 dB
10.2 Peak code domain error	±1,1dB  Formula: RSS measurement error and impedance mismatch error  (using ±1,0 dB measurement error and ±0,5 dB impedance mismatch error (stimulus side) assuming 14 dB return loss)	Measurement results from – 36 dB to – 30 dB, at signal power = P_max – 3 dB to P_max – 18 dB
11 Input intermodulation Characteristics	±1,2 dB  Formula: RSS CW1 level error, 2 x CW2 level error, and measurement error (using all errors = ±0,5 dB)	
12 Output Intermodulation	±2,1 dB Spectrum emission  Formula: RSS 2x Interference signal level error and Spectrum emission measurement level error. (1 dB interference signal level error is assumed.)  Due to carrier leakage for measurements specified in a 1MHz bandwidth close to the carrier (4 MHz to 8 MHz), integration of the measurement using several narrower bandwidth measurements may be necessary in order to achieve the above accuracy.  The interference from the signal generator ACLR	

	<p>shall be minimum 10 dB below that of a Base Station</p> <p>For spurious emission:</p> <p>In UTRA and coexistence receive bands:                  {for results &gt; -60 dBm ±2,0 dB}                  {for results &lt; -60 dBm ±3,0 dB}</p> <p>Outside above range:                  emission power                  {f ≤ 2,2 GHz ±1,5 dB;}                  {2,2 GHz &lt; f ≤ 4 GHz ±2,0 dB;}                  {f &gt; 4 GHz ±4,0 dB.}</p> <p>The interference signal must have a spurious emission level at least {10 dB} below the spurious levels required in 9.2.</p>	
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## 5.2 Repeater test tolerances (informative)

The Test Tolerances defined in this subclause have been used to relax the Minimum Requirements in this specification to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.)

**Table 5.2: Test Tolerance**

Subclause	Test Tolerance	Notes
6.1 Maximum output power	0,7 dB	
9.1 Spectrum emission mask	1,5 dB	
9.2 Spurious emissions	0 dB	
7 Frequency error	12 Hz	
10.1 Error vector magnitude	0 %	Target value is shifted due to stimulus EVM
10.2 Peak code domain error	1,1 dB	
8 Out of band gain	0,5dB	
11 Input intermodulation Characteristics	1,2dB	
12 Output intermodulation	{1,5 dB} for spectrum emission {0 dB} for spurious emission	

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## Annex B (informative): Derivation of Test Requirements

The Test Requirements in this specification have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in subclause 5.2. When the Test Tolerance is zero, the Test Requirement

will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table B.1.

**Table B.1: Derivation of Test Requirements**

Clause number	Title	Minimum Requirement in TS 25.106	Test Tolerance (TT)	Test Requirement in TS 25.143
6.1	Maximum output power	In normal conditions Table 6.1	0,7 dB	Formula: Upper limit + TT Lower limit - TT  In normal conditions refer to Table 6.3
		In extreme conditions Tabel 6.2		In extreme conditions refer to Table 6.4
9.1	Spectrum emission mask	Tables 9.1, 9.2, 9.3 and 9.4: "Maximum level" = X dB	1,5 dB	Formula: Maximum level + TT  Refer to tables 9.5, 9.6, 9.7 and 9.8
7	Frequency stability	7.1 minimum requirement	12 Hz	Formula: Relative error + TT  Refer to 7.5 Test requirements
8	Out of Band Gain	Table 8.1: Out of band gain limits	0,5 dB	Formula: Maximum level + TT  Refer to table 8.2
9.2	Spurious emissions	Tables 9.5, to 9.15	0 dB	
10.1	Error Vector Magnitude	10.1.1 Minimum requirement	0 %	Formula: RSS Stimulus EVM and Repeater EVM to get target EVM  Refer to 10.1.5 Test requirements
10.2	Peak code domain error	10.2.1 Minimum requirement	1,1 dB	Formula: Maximum error + TT  Refer to 10.2.5 Test requirements
11	Input intermodulation	11.5 Minimum requirements, and Tables 11.1 and 11.2	1,2 dB	Maximum in-band power increase + TT  Refer to 11.5 Test requirements.
12	Output intermodulation	12.1 Minimum requirements	{1,5 dB} for spectrum emission mask.  {0 dB} for spurious emissions	Maximum level + TT  Refer to tables 9.5 to 9.19

# CHANGE REQUEST

⌘ **25.143 CR 034** ⌘ rev ⌘ Current version: **5.4.0** ⌘

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