RP-020861

Title CRs (Rel-4 and Rel-5 Category A) to TS 25.106 & TS 25.143 on "EVM test:

change requirement for the use of HSDPA"

Source TSG RAN WG4

Agenda Item 7.4.4

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021677	25.106	019		F	Rel-4	4.3.0	EVM Test: Change requirement for the use of HSDPA.	RInImp-REP, HSDPA-RF
R4-021518	25.106	010		Α	Rel-5	5.2.0	EVM Test: Change requirement for the use of HSDPA.	RInImp-REP, HSDPA-RF
R4-021682	25.143	027		F	Rel-4	4.5.0	EVM Test: Change requirement for the use of HSDPA.	RInImp-REP, HSDPA-RF
R4-021519	25.143	019		Α	Rel-5	5.2.0	EVM Test: Change requirement for the use of HSDPA.	RInImp-REP, HSDPA-RF

3GPP TSG RAN WG4 (Radio) Meeting #25 Secaucus, NJ, USA 11 - 15 November, 2002

R4-021518

			(CHAN	IGE	REQ	UE	ST				CR-Form-v
*	25	106	CR	010	S	⊭ rev		ж	Current vers	sion:	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	affec	ts: U	ICC a	pps#		ME	Rad	lio Ac	ccess Netwo	rk X	Core N	etwork
Title:	€ EV	M Test:	Chan	ge of the	e requir	ement f	for the	use	of HSDPA			
Source:	€ RA	N WG4										
Work item code:	€ RIn	Imp-RI	EP, HS	SDPA-RE	=				Date: ℜ	26/	11/2002	
Category:	Deta	F (corre A (corre B (addi C (fund D (edite iled exp	ection) espond ition of tional i orial mal	wing cated to a confeature), modification of the ER 21.900	rrection on of fea n) above c	ature)		lease	Release: ₩ Use <u>one</u> of 2 e) R96 R97 R98 R99 Rel-4 Rel-5 Rel-6	the for (GSN (Relea (Relea (Relea (Relea (Relea (Relea	-)
Reason for chang	je: ૠ	wheth	er the		ation is	used w			ce the Repea			
Summary of chan	ge:₩	The F		ter EVM	require	ement is	tighte	end to	the value o	f ope	ration wit	h
Consequences if not approved:	ж		QAM o						sary for a sat ed in HSDPA			
Clauses affected:	ж	10.1.	1									
Other specs	¥	Y N	Other	core spe	ecificat	ions	¥					

How to create CRs using this form:

 \mathfrak{R}

affected:

Other comments:

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:

Test specifications

O&M Specifications

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

Equivalent CRs in other Releases: CR019 cat. F to 25.106 v4.3.0

TS25.143

- 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.

10.1 Error Vector Magnitude

The modulation accuracy is defined by the Error Vector Magnitude (EVM), which is a measure of the difference between the theoretical waveform and a modified version of the measured waveform. This difference is called the error vector. The measured waveform is modified by first passing it through a matched root raised cosine filter with bandwidth 3.84 MHz and roll-off α =0.22. The waveform is then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as root of the ratio of the mean error vector power to the mean reference signal power expressed as a %.

The measurement interval is one power control group (timeslot). The repeater shall operate with an ideal WCDMA signal in the operating band of the repeater at a level, which produce the maximum rated output power per channel, as specified by the manufacturer.

10.1.1 Minimum requirement

The Error Vector Magnitude shall not be worse than 17,5 % 12,5%.

10.2 Peak code domain error

The peak code domain error is computed by projecting the power of the error vector (as defined in subclause 10.1) onto the code domain at a specified spreading factor. The code domain error for every code in the domain is defined as the ratio of the mean power of the projection onto that code, to the mean power of the composite reference waveform. This ratio is expressed in dB. The peak code domain error is defined as the maximum value for the code domain error for all codes. The measurement interval is one power control group (timeslot).

10.2.1 Minimum requirement

The peak code domain error shall not exceed -35 dB at spreading factor 256.

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R4-021677

	C	HANGE	REQ	JEST			CK-I OIIII-VI	
ж 2	5.106 CR	019	жrev	ж	Current versi	on: 4.3.0	¥	
For <u>HELP</u> on using	For <u>HELP</u> on using this form, see bottom of this page or look at the pop-up text over the ℜ symbols.							
Proposed change affe	ects: UICC a	ops#	ME	Radio Ac	cess Networl	k X Core Ne	etwork	
Title: 第 E	VM Test: Chan	ge of the requ	irement fo	r the use	of HSDPA			
Source:	AN WG4							
Work item code: R	InImp-REP, HS	DPA-RF			Date: ♯	26/11/2002		
De	re <u>one</u> of the follo F (correction) A (correspond B (addition of	ls to a correction feature), nodification of fe odification) ns of the above	n in an eari eature)		2) R96 R97 R98 R99 Rel-4 Rel-5	Rel-4 the following religions (GSM Phase 2) (Release 1996) (Release 1997) (Release 1998) (Release 1999) (Release 4) (Release 5) (Release 6)		
Reason for change:	whether the	of HSDPA for base station i eds to be char	s used wi					
Summary of change:	The Repeat	er EVM requir	ement is	ightend to	the value of	operation with	า	
Consequences if not approved:		ity signal wave lemodulation v						
Clauses affected:	₩ 10.1.1							

How to create CRs using this form:

Other specs

Other comments:

affected:

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:

Other core specifications

Test specifications

O&M Specifications

1) Fill out the above form. The symbols above marked \$\mathbb{x}\$ contain pop-up help information about the field that they are closest to.

Equivalent CRs in other Releases: CR010 cat. A to 25.106 v5.2.0

TS25.143

- 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.

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10.2.1 Minimum requirement

The peak code domain error shall not exceed -35 dB at spreading factor 256.

Tdoc # R4-021519

	CHANG	E DEOLIECT		CR-Form-v7
	CHANG	E REQUEST		
# TS2	5.143 CR 19	# rev - [#]	Current version: 5.2.0	¥
For <u>HELP</u> on using	g this form, see bottom of t	his page or look at the	e pop-up text over the % sym	nbols.
Proposed change affe	ects: UICC apps#	ME Radio Ad	ccess Network X Core Ne	twork
Title: # E	VM Test: Change of the re	quirement for the use	of HSDPA	
	·	quirement for the dec	011100171	
Source: # R	RAN WG4			
Work item code: ₩ R	RinImp-REP, HSDPA-RF		<i>Date:</i> ₩ 04/11/2002	
Reason for change: Summary of change: Consequences if	Se one of the following categor F (correction) A (corresponds to a correct B (addition of feature), C (functional modification of D (editorial modification) etailed explanations of the about found in 3GPP TR 21.900. Introduction of HSDPA whether the base static for EVM needs to be character. The Repeater EVM req HSDPA. Higher quality signal was	tion in an earlier release of feature) ve categories can for base station. Hence on is used with HSDPA nanged. quirement is tightend to aveform that is necess	Release: # Rel-5 Use one of the following rele 2 (GSM Phase 2) e) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) The the Repeater does not know the sary for a satisfactory performed in HSDPA operation of a light of the same and the sary for a satisfactory performed in HSDPA operation of a light of the same and the sary for a satisfactory performed in HSDPA operation of a light of the same and the sary for a satisfactory performed in HSDPA operation of a light of the same and	ow ement mance
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Clauses affected:	3 10.1.2, 10.1.5			
Other specs affected:	Y N X Other core specif X Test specification X O&M Specificatio	is end	5.106	
Other comments:	₩			

How to create CRs using this form:

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- downloaded from the 3GPP server under $\underline{\text{ftp://ftp.3gpp.org/specs/}}$ 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.

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 47,5 %-12,5% 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 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% 13,2%.

3GPP TSG RAN WG4 (Radio) Meeting #25 Secaucus, NJ, USA 11 - 15 November, 2002

R4-021682

	CHANGE REQUEST							
*	25.143	CR <mark>027</mark>	жrev	ж	Current version:	4.5.0	¥	
For H	For HELP on using this form, see bottom of this page or look at the pop-up text over the % symbols.							

*	25.143 CR 027	ж rev	urrent version: 4.5.0 [#]
For HELP on u	sing this form, see bottom of this	s page or look at the p	op-up text over the 🕷 symbols.
Proposed change a	affects: UICC appsЖ	ME Radio Acce	ess Network X Core Network
Title: 第	EVM Test: Change of the requ	irement for the use of	HSDPA
Source: #	RAN WG4		
Work item code: ₩	RInImp-REP, HSDPA-RF		Date: 第 26/11/2002
Category:	F Use one of the following categories F (correction) A (corresponds to a correction B (addition of feature), C (functional modification of find the determination of the determination of the above be found in 3GPP TR 21.900.	s: n in an earlier release) feature)	Release: # Rel-4 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		is used with HSDPA o	the Repeater does not know or not the Repeater requirement
Summary of chang	The Repeater EVM require HSDPA.	rement is tightend to t	he value of operation with
Consequences if not approved:			ry for a satisfactory performance in HSDPA operation of a base
Clauses affected:	ж <u>10.1.2, 10.1.5</u>		
Other specs affected:	Y N X Other core specifications		06
Other comments:	*		

How to create CRs using this form:

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10.1.2 Minimum Requirements

In normal conditions as specified in section 5.4.1 the Error Vector Magnitude shall not be worse than 47,5 %-12,5% 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

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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 $\frac{18,2\%}{13,2\%}$.