

Test Site:
FCC Test Site No.: 96997
IC OATS No.: IC3475A-1



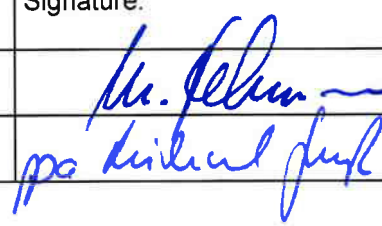
ECL-TAL Test Report No.: 09-171

Equipment under test: ION-M17P/17P/17P
FCC ID: XS5 - M17P17P17P

Type of test: FCC 47 CFR Part 27 Subpart C
Miscellaneous Wireless Communication Services

Measurement Procedures: ANSI C63.4 (2009) & TIA-603

Test result: Passed

Date of issue:	07.12.09			Signature:
Issue-No.:	04	Author:	M. Lehmann Test engineer	
Date of delivery:	29.09.09	Checked:	M. Grytz Operational manager	
Test dates:	29.09. – 13.11.09			
Pages:	39			



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General:

The purpose of this report is to show compliance to the FCC regulations for unlicensed devices operating under section 2 and 27 of the Code of Federal Regulations title 47.

This report informs about the results of the EMC tests, it only refers to the equipment under test. No part of this report may be reproduced in any form, without written permission.

The tests have been performed at two locations. The approvals described in sections 5 to 7 of the report have been witnessed by Mario Lehmann. The radiated spurious emissions have been performed at the ECL (FCC Test Site No.: 96997)



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1 Test Results Summary

Name of Test	FCC Para. No.	FCC Method	FCC Spec.	Result
RF Power Output	27.50(d)	2.1046	1640 Watts	Complies
Occupied Bandwidth		2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	27.53(h)	2.1051	-13dBm	Complies
Field Strength of Spurious Emissions	27.53(m)	2.1053	-13dBm E.I.R.P	Complies
Frequency Stability	27.54	2.1055	Must stay in band	NA

Frequency stability is not applicable because the device uses a common oscillator to up convert and down convert the RF signal. The EUT does not contain modulation circuitry, or frequency generation, therefore the test was not performed.

2 Equipment under test (E.U.T.)

2.1 Description

Kind of equipment	ION M17P/17P/17P Repeater	
Andrew Ident. Number	Id.No. 7563307	
Serial no.(SN)	13	
Revision	00	
Software version and ID	V 3.16.1.3	Id.No.7162793
Type of modulation and Designator	CDMA (F9W)	<input checked="" type="checkbox"/>
	W-CDMA (F9W)	<input checked="" type="checkbox"/>
Frequency Translation	F1-F1	<input checked="" type="checkbox"/>
	F1-F2	<input type="checkbox"/>
	N/A	<input type="checkbox"/>
Band Selection	Software	<input type="checkbox"/>
	Duplexer	<input type="checkbox"/>
	Fullband	<input checked="" type="checkbox"/>

2.1.1 Downlink

Pass band	2110 MHz – 2155 MHz
Maximum rated output power per path	43,8 dBm = 24 W
Calculated maximum rated composite output power / Remote Unit	48,57 dBm = 72 W
Gain	10 dB @ Pout BTS of 33dBm

2.1.2 Uplink

Pass band	1710 MHz – 1755 MHz
Gain	n.a.

Note: The EUT does not transmit over the air in the uplink direction.

2.1.3 Description of EUT

Andrew ION-M17P/17P/17P is a multi-operator remote unit with various extension units. It is used in conjunction with a master unit in the ION optical distribution system.

The ION-M17P/17P/17P consists of three equal 17P paths (Sector 1, 2, 3), with the intended use of simultaneous transmission.

2.1.4 System diagrams

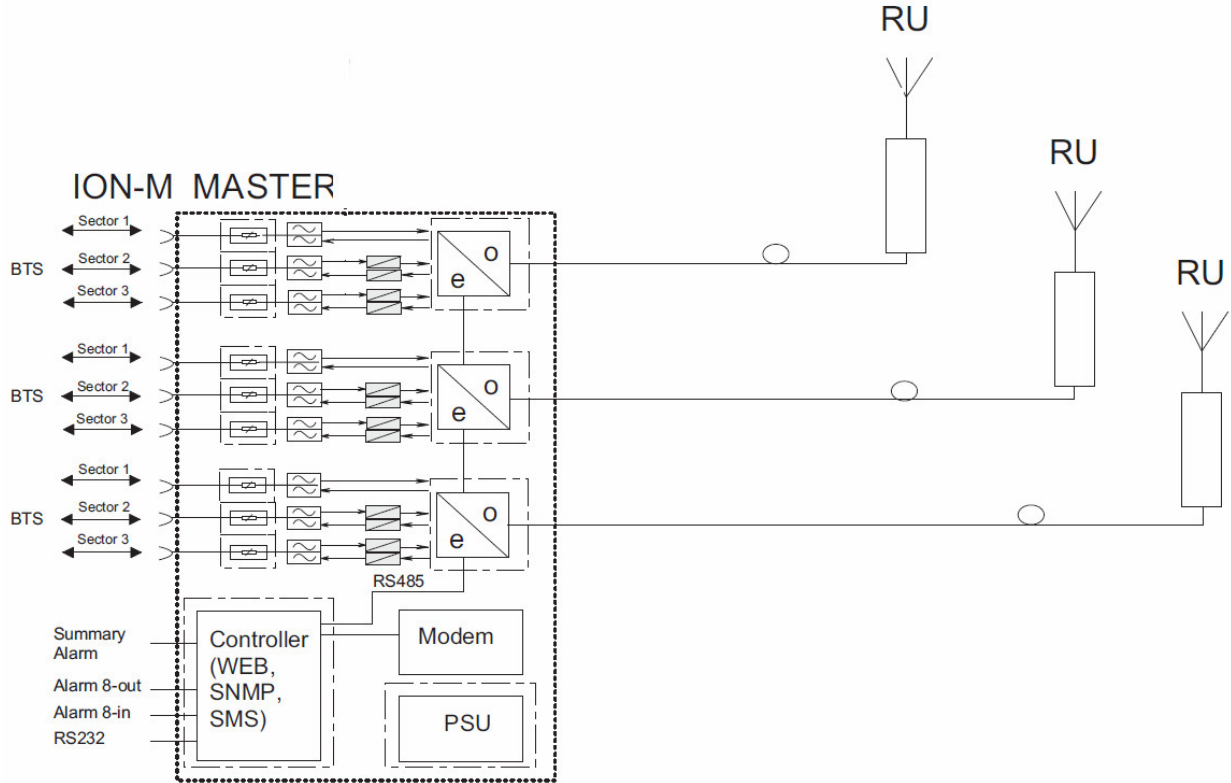
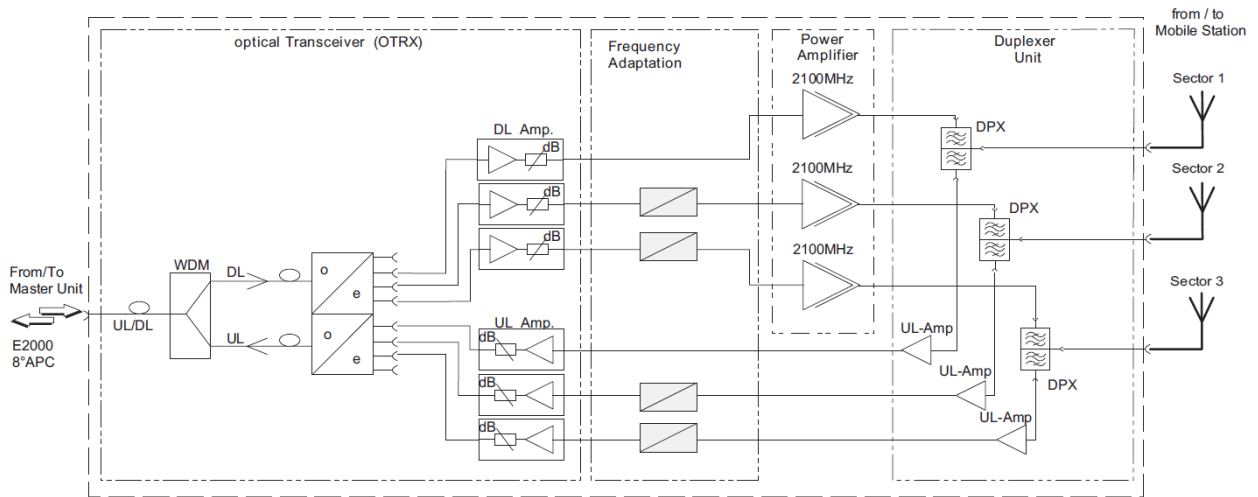


figure 2.1.4-#1 System diagram: ION optical distribution system



ION-M17P/17P/17P Remote Unit Design Principle

figure 2.1.4-#2 System diagram: EUT is Remote Unit

2.1.5 Block diagram of measurement reference points

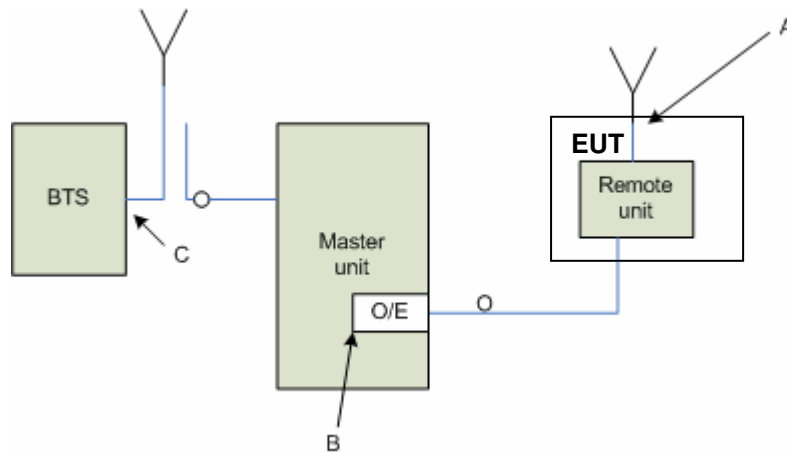


figure 2.1.5-#1 Block diagram of measurement reference points

Remote Unit is EUT

O/E Optcal/Electrical converter

SRMU SubRackMaster Unit

Reference point A, Remote Unit DL output, UL input

Reference point B, SRMU UL output, DL input

Reference point C, BTS DL output, UL input

3 Andrew test site at Buchdorf (witnessed by M. Lehmann)

3.1 Test environment

All tests were performed under the following environmental conditions:

Condition	Minimum value	Maximum value
Barometric pressure	86 kPa	106 kPa
Temperature	15 °C	30 °C
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	

3.2 Test equipment

ANDREW Inv. No.	Test equipment	Type	Manufacturer	Serial No.	Calibration
8917	Network Analyzer	ZVCE8	R&S	827712/009	01/10
8845	Spectrum Analyzer	FSP13	R&S	100387	04/10
8736	Spectrum Analyzer	FSIQ26	R&S	100290	04/10
8848	Signal Generator	E4438C	Agilent	MY45092504	04/10
8775	Signal Generator	SMIQ03B	R&S	102040	03/10
8671	Power Meter	E4418B	Agilent	GB39513094	06/10
8672	Power Sensor	E9300H	Agilent	US41090179	06/10
7280	Power Attenuator	769-30	Narda	9395	CIU
7130	Power Amplifier	3-Band Amp	Andrew	---	CIU
7119	Divider	2way	Mikom	3512	CIU
7323	Circulator	E10-1FFF	AEROTEK	25357	CIU
7315	Circulator	E10-1FFF	AEROTEK	25344	CIU
7363	RF-Cable	2,0m; N-N	Huber & Suhner	28439/4PEA	CIU
7295	RF-Cable	2,5m; N-N	Huber & Suhner	28964/4PEA	CIU
7299	RF-Cable	2,5m; N-N	Huber & Suhner	28964/4PEA	CIU
7364	RF-Cable	1,0m; SMA	Huber & Suhner	36309/4P	CIU
7365	RF-Cable	1,0m; SMA	Huber & Suhner	36292/4P	CIU
7366	RF-Cable	2,0m; SMA	Huber & Suhner	36183/4P	CIU
7367	RF-Cable	2,0m; SMA	Huber & Suhner	36158/4P	CIU
7373	RF-Cable	Multiflex141 0,6m	Andrew	---	CIU
7374	RF-Cable	Multiflex141 0,6m	Andrew	---	CIU

CIU = Calibrate in use

3.3 Input and output losses

All recorded power levels should be referenced to the input and output connectors of the repeater, unless explicitly stated otherwise.

The test equipment used in this test has to be calibrated, so that the functionality is also checked.

All cables, attenuators, splitter, isolator, circulator and combiner etc. must be measured before testing and used for compensation during testing.

4 Description of the HERBERG EMC test centre

4.1 Registrations



Registration No. (DATech): DAT-P-231/92-04



Registration No. (Krafftahrt-Bundesamt): KBA-P 00053-03



Registration No.: 96997



Registration No.
for radiated emission: IC 3475



Registration No.
for conducted emission on power supply lines: C-2169
for conducted emission on telecommunication ports: T-140
for radiated emission: R-2016



Registered within Verizons ITL program.

4.2 Measurement Uncertainty

The table below shows the measurement uncertainties for each measurement method. The expanded uncertainty was calculated with worst case values over the complete frequency area.

Measurement method	Frequency area impulse duration time	Description	expanded Uncertainty (95% or k=2)
Radiated emission (EN 55022; ANSI C63.4 etc.)	30 MHz - 1 GHz	Semi anechoic chamber	± 4,7 dB
	1 GHz - 18 GHz	Fully anechoic chamber	± 3,9 dB
Conducted emission (EN 55022; ANSI C63.4 etc.)	9 kHz - 150 kHz		± 4,0 dB
	150 kHz - 30 MHz		± 3,6 dB
Harmonics (EN 61000-3-2)	2 ... 40 x f _N ; f _N = 50 Hz	Voltage Current	± 1% ± 1%
Flicker (EN 61000-3-3)	f _N = 50 Hz	P _{st}	± 1,5%
ESD (EN 61000-4-2)	5/30ns	Rise time / half life Voltage amplitude	± 30% ± 10%
Radiated Immunity (EN 61000-4-3)	80 MHz - 2,7 GHz		± 42,7%
BURST (EN 61000-4-4)	5/50 ns	Rise time / half life Voltage amplitude	± 20% ± 4,1%
SURGE (EN 61000-4-5)	1,2/50 µs 8/20 µs	Voltage rise time / half life Current rise time / half life Charged voltage	± 30% / ±20% ± 20% / ±20% ± 4,1%
HF-Injection (EN 61000-4-6)	150 kHz - 80 MHz		± 9%
Voltage Dips, Interruptions (EN 61000-4-11)		Voltage level Time	± 1% ± 0,1%
Power induction	ITU-K.20	Frequency Amplitude	± 0,1Hz ± 1%

4.3 Climatic test conditions during measurements

Ambient temperature	10 - 40 °C
relative Humidity:	10 - 90 %

5 Test of RF Power Out: §27.50, §2.1046

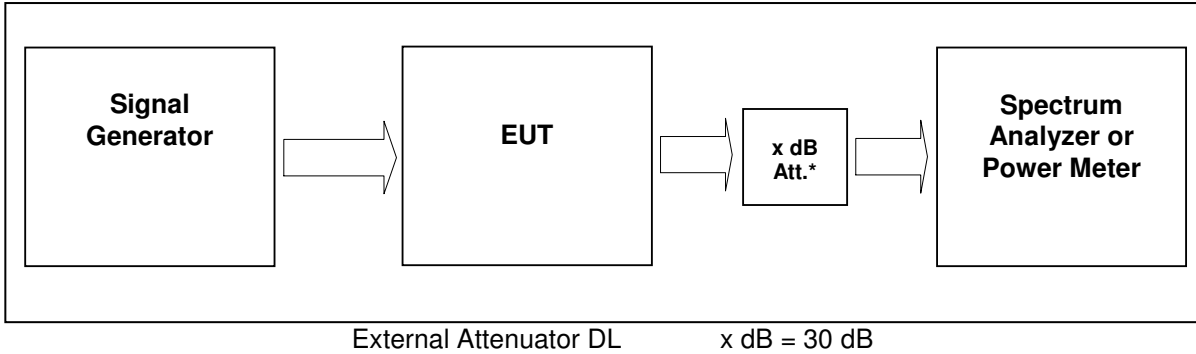


figure 4.3-#1 Test setup: Test of RF Power Out: §27.50, §2.1046

Measurement uncertainty	± 0,38 dB
Test equipment used	8848, 7323, 7366, 7130, 7367, 7299, 7280, 7363, 8845

5.1 Limit

Minimum standard:

Para. No.27.50(d)(2)(B)

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:

(2) The power of each fixed or base station transmitting in the 2110–2155 MHz band and situated in any geographic location other than that described in paragraph (d)(1) is limited to:

(B) an EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

5.2 Test method

§ 2.1046 Measurements required: RF power output.

(a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

(c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations

5.3 Test results

For peak power measurements: Detector peak max.

For composite power measurements: Detector RMS.

Test signal CDMA2000:

Signal waveform according to table 6.2-1 of standard specification 3GPP2 C.p0051-0 v1.0

16.February 2006 pilot, sync, paging, 37 traffics, which is equal to the table 6.5.2.1 of 3GPP2 C.S0010-C v2.0 24.February 2006.

Test signal WCDMA:

Signal waveform according to Test Model 1 clause 6.1.1.1 of standard specification 3GPP TS25.141

v8.8.0 (2009-09). Signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 64 DPCH.

According to ANSI C63.4 section 13.1 Table 5 for operating frequencies more then 10MHz: The test shall be performed at Bottom, Middle, Top frequencies.

5.3.1 Downlink

Modulation	Measured at		RBW VBW Span	Peak / Composite Power (dBm)	RF Power (W)	Plot -
CDMA	Bottom	2110,625 MHz	3MHz 10MHz 15MHz	43,5	22,4	4.3.1.1 #1
	Bottom	2110,625 MHz		52,5 peak	177,8 peak	#2
	Middle	2132,50 MHz		43,4	21,9	#3
	Middle	2132,50 MHz		52,6 peak	182,0 peak	#4
	Top	2154,375 MHz		43,1	20,4	#5
	Top	2154,375 MHz		52,5 peak	177,8 peak	#6
WCDMA	Bottom	2112,4 MHz	10MHz 10MHz 50MHz	43,5	22,4	4.3.1.2 #1
	Bottom	2112,4 MHz		52,8 peak	190,6 peak	#2
	Middle	2132,4 MHz		43,4	21,9	#3
	Middle	2132,4 MHz		53,0 peak	199,5 peak	#4
	Top	2152,6 MHz		43,3	21,4	#5
	Top	2152,6 MHz		52,9 peak	195,0 peak	#6
Maximum output power = 43,8 dBm = 24 W						
Limit Maximum output power = 1640 W / 1 MHz						

table 5.3.1-#1 Test of RF Power Out: §27.50, §2.1046 Test results Downlink

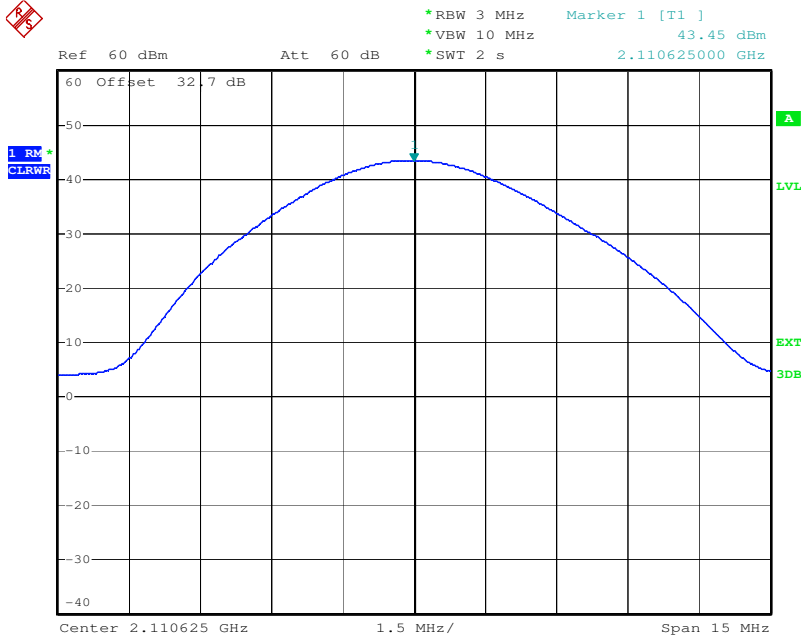
Modulation	Pin / dBm (Ref. point B)
CDMA	2,6
WCDMA	2,6

table 5.3.1-#2 Test of RF Power Out: §27.50, §2.1046 Test results Downlink Input power



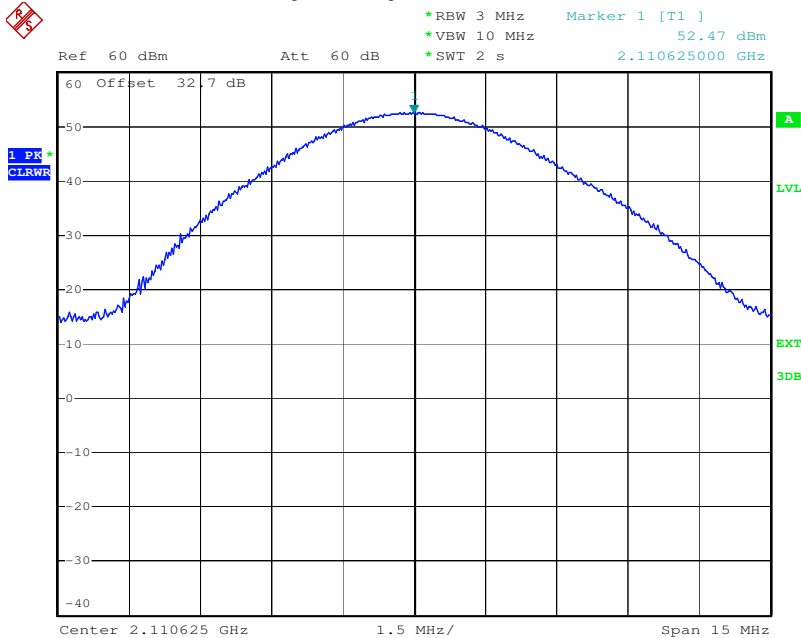
5.3.1.1 CDMA

RBW 3 MHz → Limit 66,92 dBm



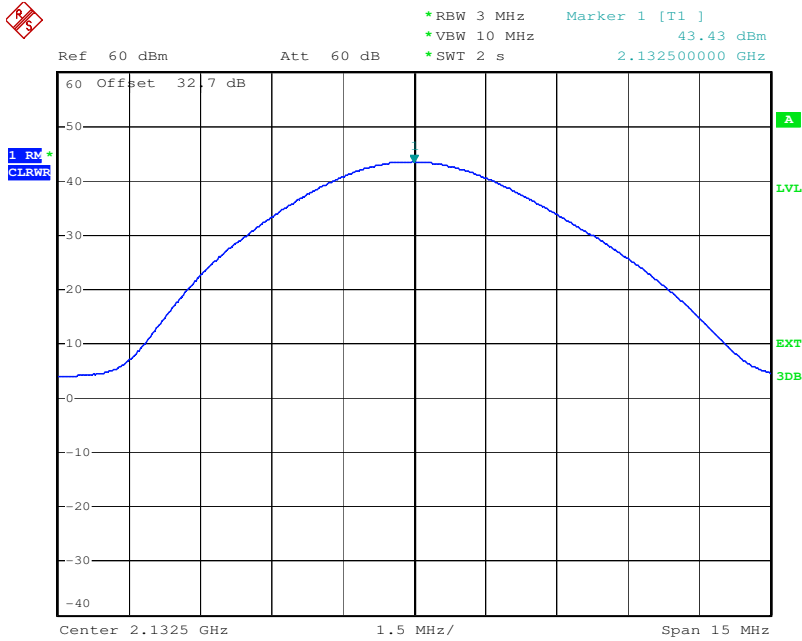
Date: 29.SEP.2009 12:20:49

plot 5.3.1.1-#1 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Bottom Composite



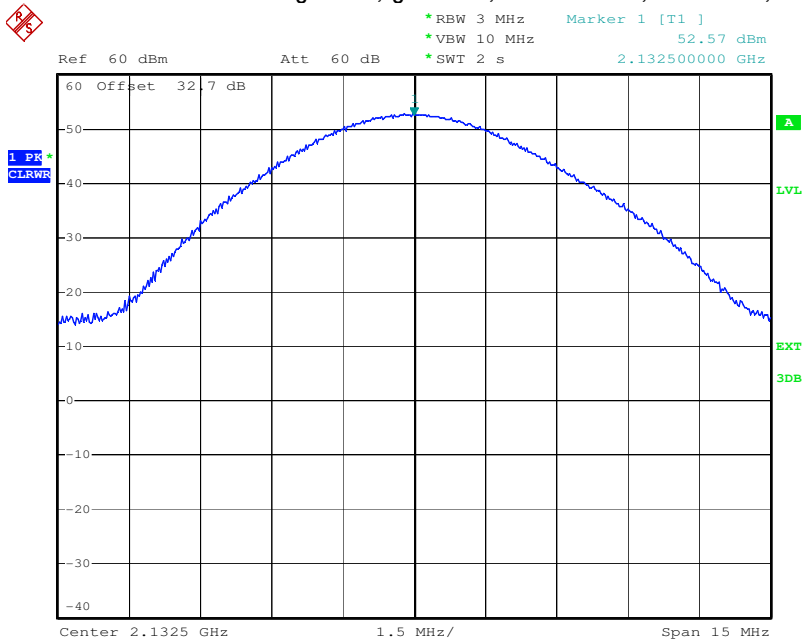
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plot 5.3.1.1-#2 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Bottom Peak



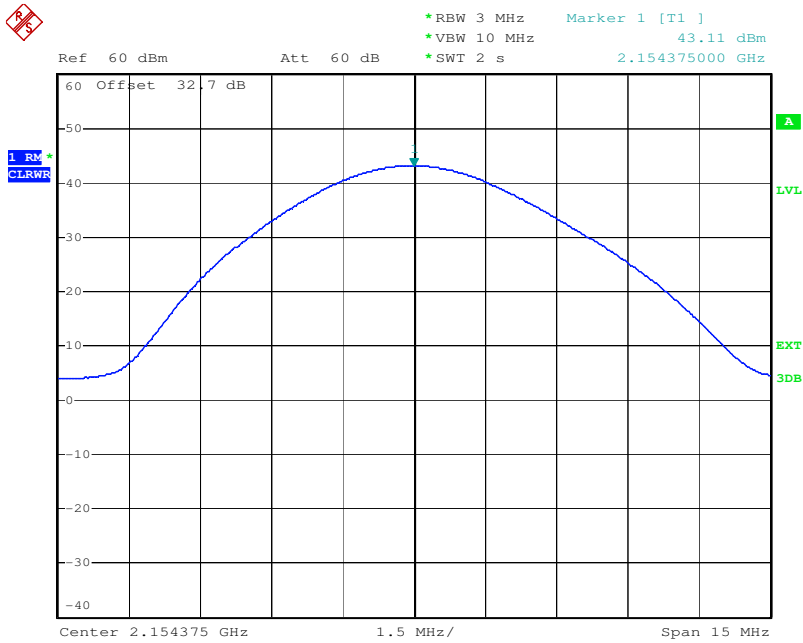
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plot 5.3.1.1-#3 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Middle Composite



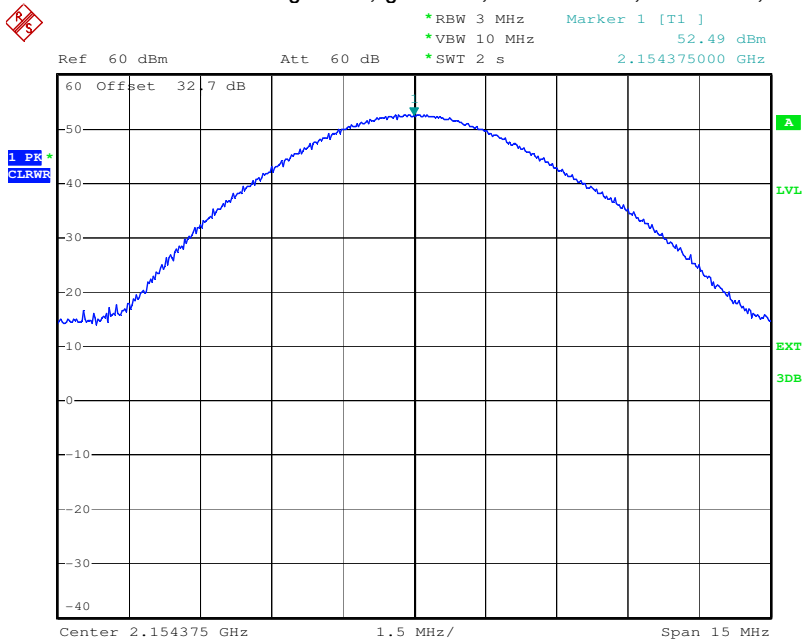
Date: 29.SEP.2009 12:21:59

plot 5.3.1.1-#4 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Middle Peak



Date: 29.SEP.2009 12:19:32

plot 5.3.1.1-#5 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Top Composite

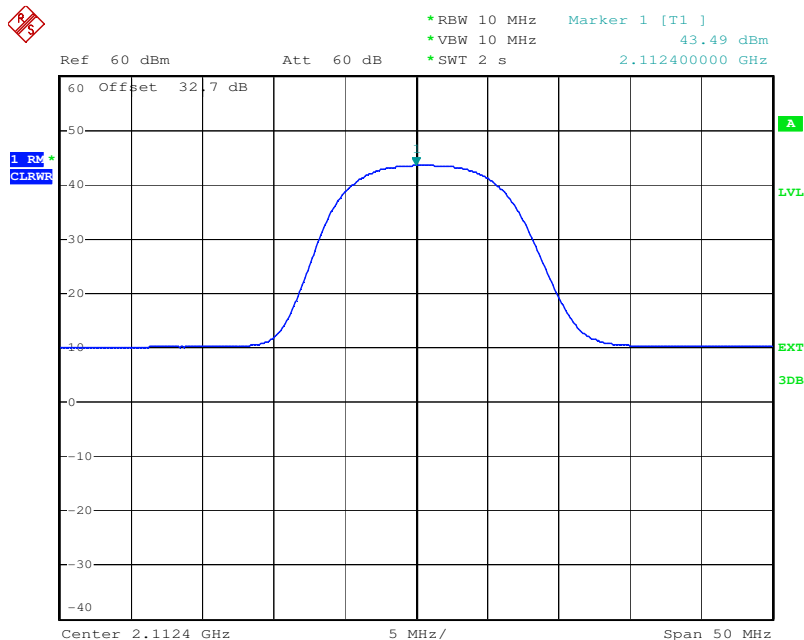


Date: 29.SEP.2009 12:19:52

plot 5.3.1.1-#6 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; CDMA Top Peak

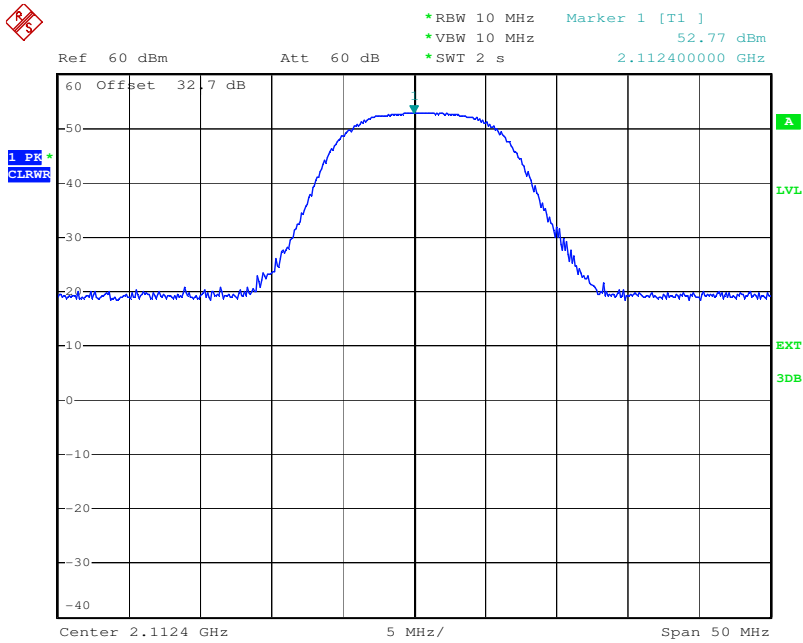
5.3.1.2 W-CDMA

RBW 10 MHz → Limit 72,15 dBm



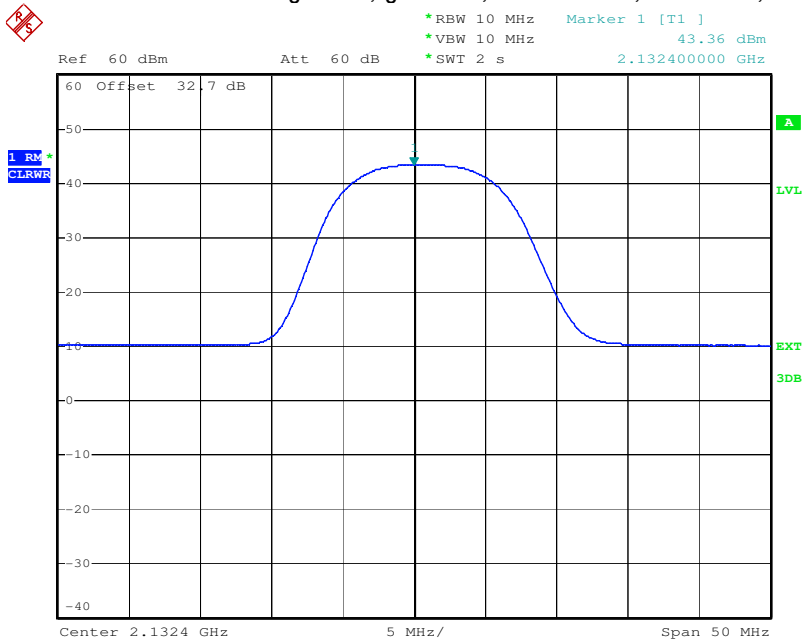
Date: 29.SEP.2009 12:15:48

plot 5.3.1.2-#1 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Bottom Composite



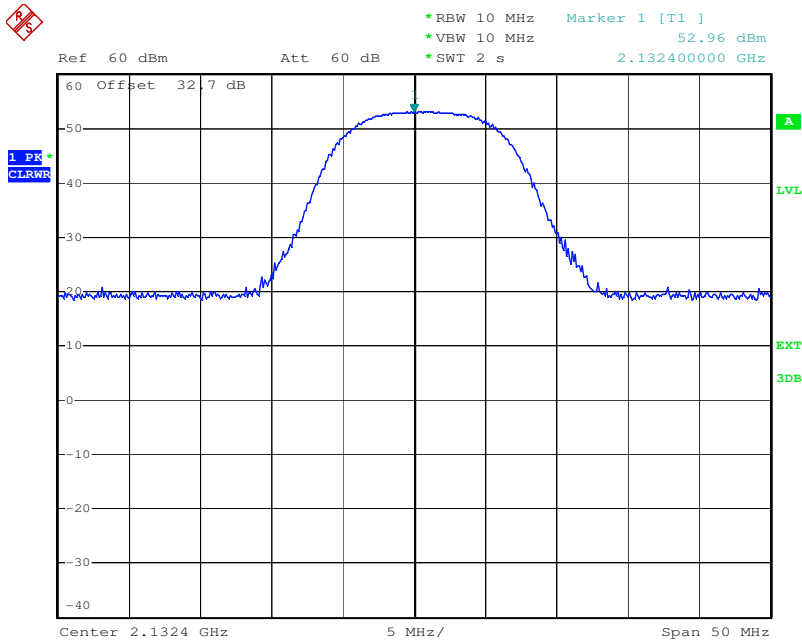
Date: 29.SEP.2009 12:15:31

plot 5.3.1.2-#2 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Bottom Peak



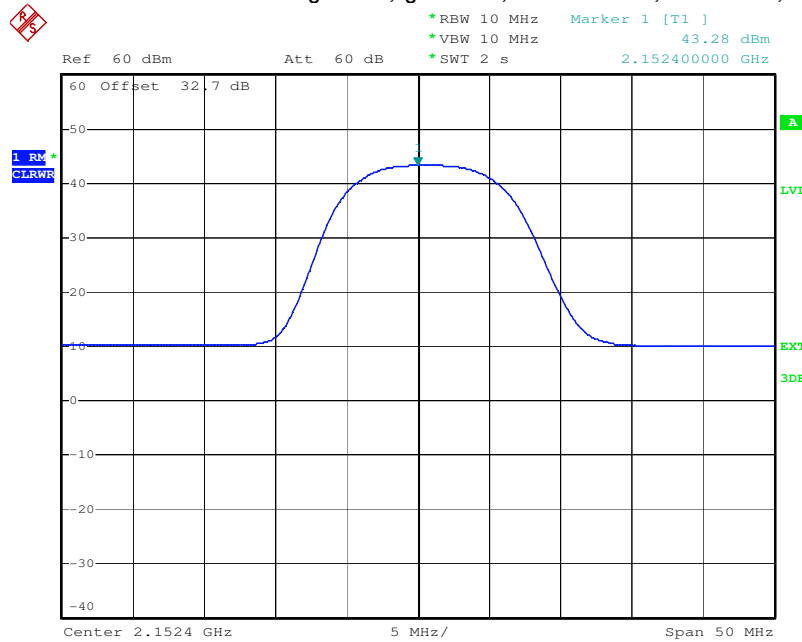
Date: 29.SEP.2009 12:16:15

plot 5.3.1.2-#3 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Middle Composite



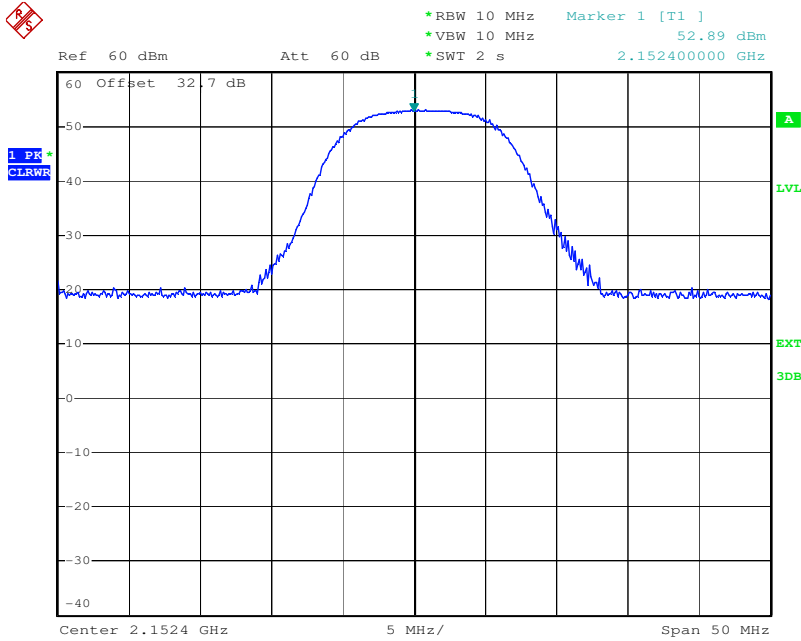
Date: 29.SEP.2009 12:14:44

plot 5.3.1.2-#4 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Middle Peak



Date: 29.SEP.2009 12:16:46

plot 5.3.1.2-#5 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Top Composite



Date: 29.SEP.2009 12:13:22

plot 5.3.1.2-#6 Test of RF Power Out: §27.50, §2.1046; Test results; Downlink; W-CDMA Top Peak

5.3.2 Uplink

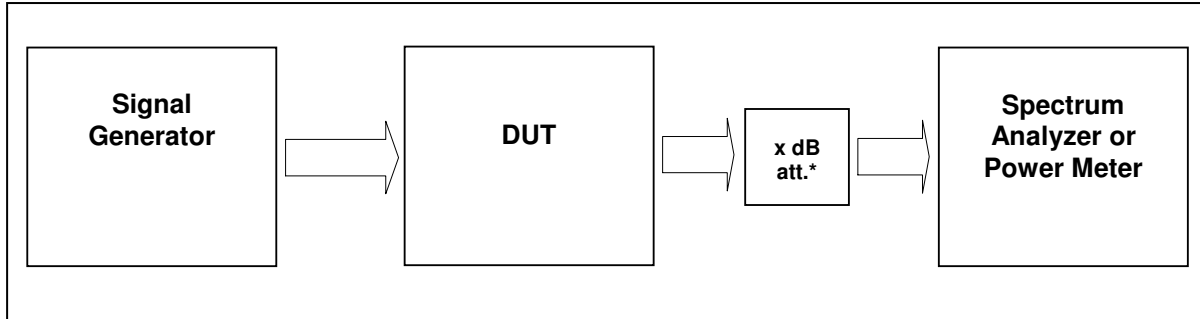
n.a.

Note: The EUT does not transmit over the air in the uplink direction.

5.4 Summary test result

Test result	complies, according the plots above
Tested by:	Michael Leinfelder
Date:	29.09.2009

6 Test of Occupied Bandwidth: §2.1049



External Attenuator DL x dB = 30 dB
figure 5.4-#1 Test setup: Test of Occupied Bandwidth: §2.1049

Measurement uncertainty	± 0,38 dB
Test equipment used	8848, 7323, 7366, 7130, 7367, 7299, 7280, 7363, 8845

6.1 Limit

The spectral shape of the output should look similar to input for all modulations.

6.2 Test method

Para. No.2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

6.3 Test results

For composite power measurements: Detector RMS.

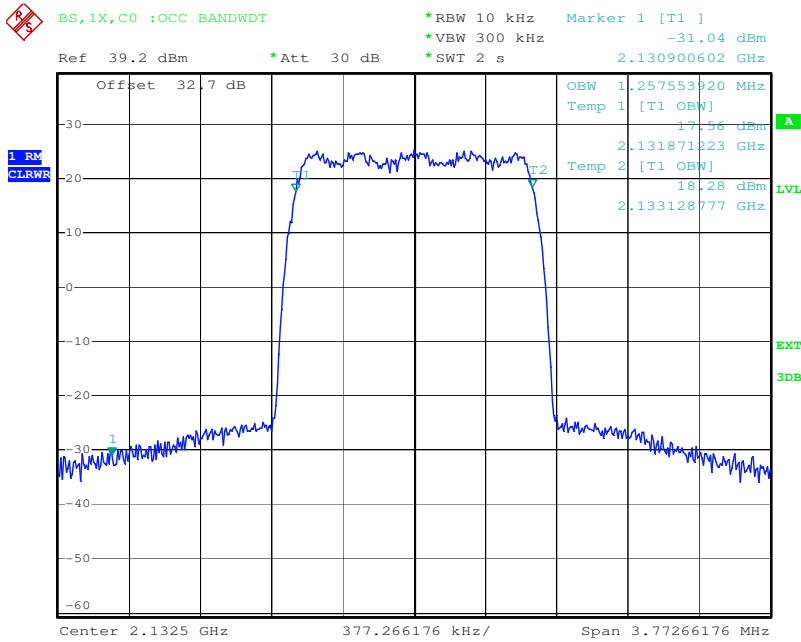
Modulation	Link	Measured at		RBW VBW Span	Occupied Bandwidth / MHz	Plot #
CDMA	Downlink	Middle	2132,5 MHz	10kHz 300kHz min. 3 MHz	1,258	6.3.1.1 #1, #2
WCDMA	Downlink	Middle	2132,4 MHz	30kHz 300kHz 10 MHz	4,18	6.3.1.2 #1, #2
CDMA	Uplink	n.a.				
WCDMA	Uplink	n.a.				

table 6.3-#1 Test of Occupied Bandwidth: §2.1049 Test results



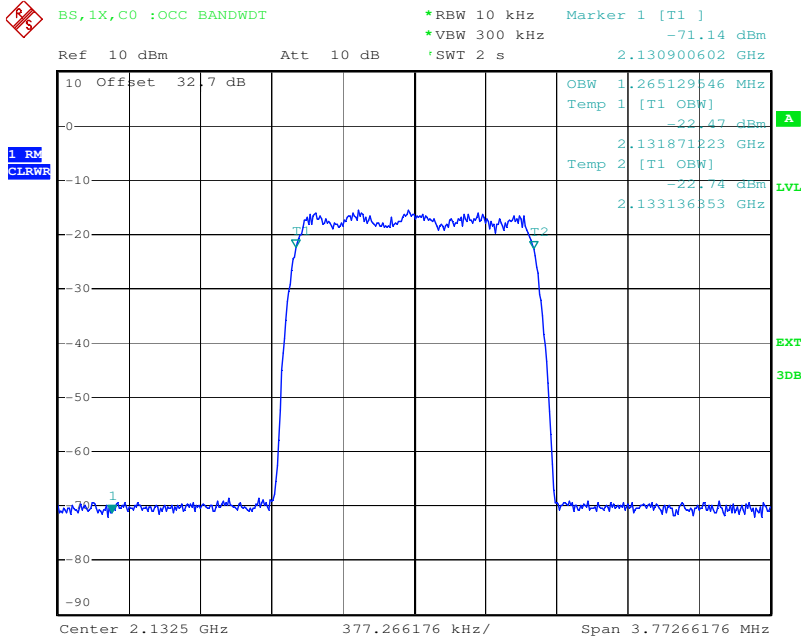
6.3.1 Downlink

6.3.1.1 CDMA



Date: 29.SEP.2009 13:36:20

plot 6.3.1.1-#1 Test of Occupied Bandwidth: §2.1049; Test results; Downlink; CDMA Output

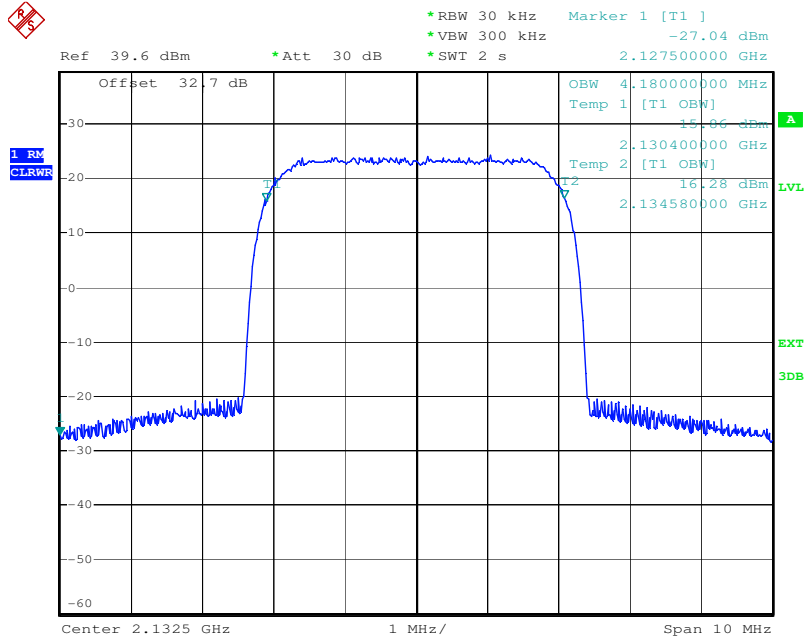


Date: 29.SEP.2009 13:37:40

plot 6.3.1.1-#2 Test of Occupied Bandwidth: §2.1049; Test results; Downlink; CDMA Input

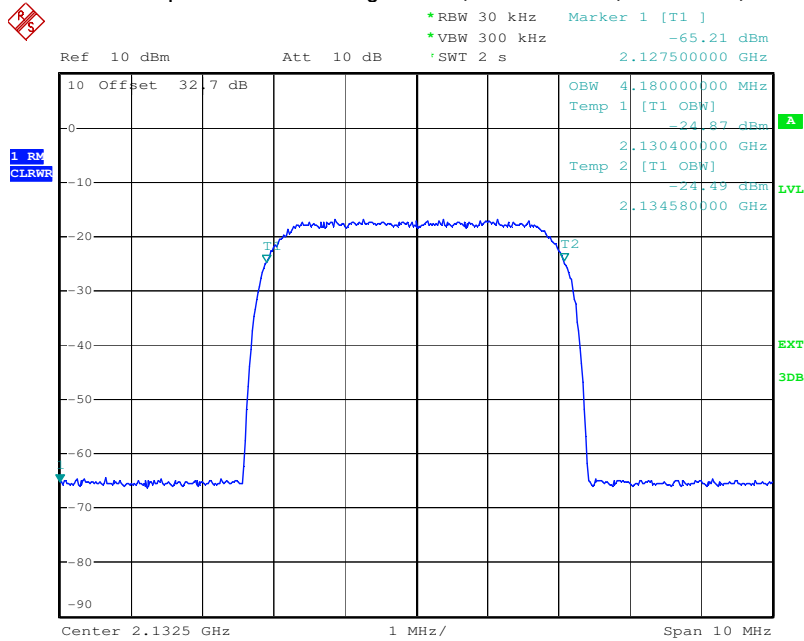


6.3.1.2 W-CDMA



Date: 29.SEP.2009 13:39:49

plot 6.3.1.2-#1 Test of Occupied Bandwidth: §2.1049; Test results; Downlink; W-CDMA Output



Date: 29.SEP.2009 13:40:45

plot 6.3.1.2-#2 Test of Occupied Bandwidth: §2.1049; Test results; Downlink; W-CDMA Input



6.3.2 Uplink

n.a.

Note: The EUT does not transmit over the air in the uplink direction.

6.4 Summary test result

Test result	complies, according the plots above
Tested by:	Michael Leinfelder
Date:	29.09.2009

7 Spurious Emissions at Antenna Terminals: §27.53, §2.1051

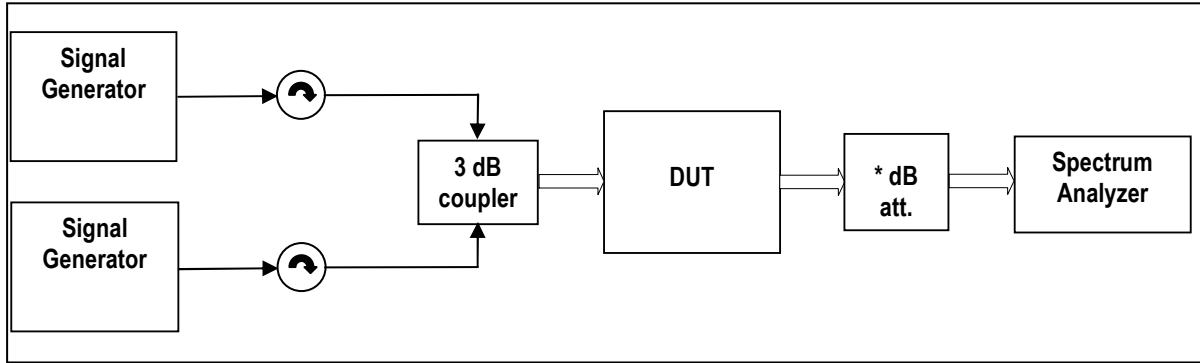


figure 6.4-#1 Test setup: Spurious Emissions at Antenna Terminals: §27.53, §2.1051

Measurement uncertainty	± 0,54 dB ± 1,2 dB ± 1,5 dB	9 kHz to 3 GHz 3 GHz to 7 GHz 7 GHz to 26 GHz
Test equipment used	8848, 8775, 7323, 7315, 7365, 7366, 7129, 7130, 7119, 7367, 7299, 7280, 7363, 8845, 8736	

7.1 Limit

Minimum standard:

Para. No.27.53(h)

(h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee’s frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee’s frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

7.2 Test method

Para. No 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

[39 FR 5919, Feb. 15, 1974. Redesignated and amended at 63 FR 36599, July 7, 1998]

7.3 Test results

<1MHz from Band Edge

Detector: RMS.

Modulation	Measured at Band Edge		RBW VBW Span	Max. level (dBm)	Plot -
CDMA	Lower Edge	2110,75 MHz	30kHz	-21,9	7.3.1.1 #1
	Upper Edge	2112,0 MHz 2153,0 MHz 2154,25 MHz	300kHz 6MHz	-19,9	#2
WCDMA	Lower Edge	2112,4 MHz	30kHz	-18,2	7.3.1.2 #1
	Upper Edge	2117,4 MHz 2147,6 MHz 2152,6 MHz	300kHz 15MHz	-17,9	#2

table 7.3-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051 Test results <1MHz from Band Edge

>1MHz from Band Edge

Detector: RMS.

Modulation	Measured at		Max. level (dBm)	Frequency range	Plot -
CDMA	Bottom	2111,25 MHz	-37,5	30MHz – 1GHz	7.3.1.3 #1
	Bottom	2112,5 MHz	-24,0	1GHz – 22GHz	#2
	Middle	2131,875 MHz	-37,5	30MHz – 1GHz	#3
	Middle	2133,125 MHz	-24,0	1GHz – 22GHz	#4
	Top	2153,125 MHz	-36,0	30MHz – 1GHz	#5
	Top	2154,375 MHz	-24,0	1GHz – 22GHz	#6
WCDMA	Bottom	2112,4 MHz	-36,0	30MHz – 1GHz	7.3.1.4 #1
	Bottom	2117,4 MHz	-23,9	1GHz – 22GHz	#2
	Middle	2127,4 MHz	-36,0	30MHz – 1GHz	#3
	Middle	2132,4 MHz	-24,0	1GHz – 22GHz	#4
	Top	2147,6 MHz	-36,0	30MHz – 1GHz	#5
	Top	2152,6 MHz	-23,9	1GHz – 22GHz	#6

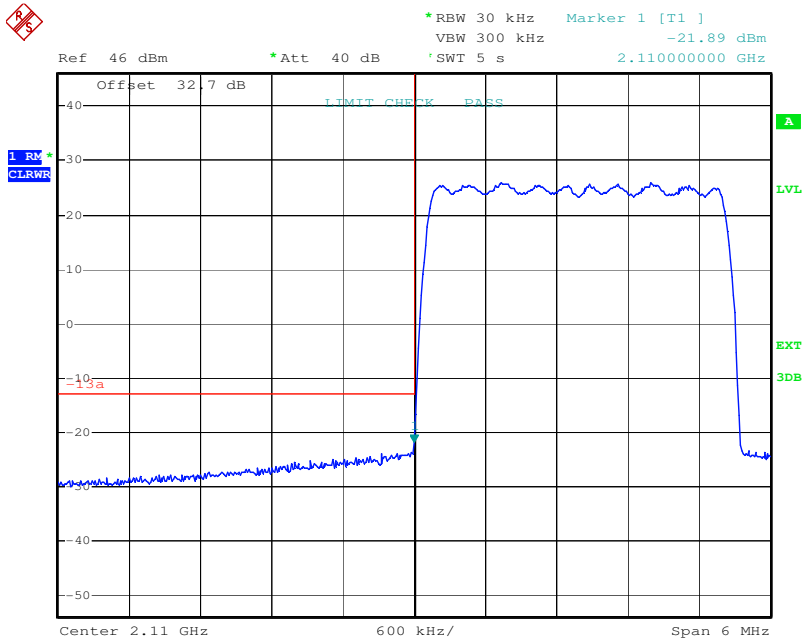
table 7.3-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051 Test results

Start	Stop	RBW	VBW
30MHz	1GHz	100kHz	300kHz
1GHz	22GHz	1MHz	3MHz

table 7.3-#3 Spurious Emissions at Antenna Terminals: §27.53, §2.1051 Test results RBW, VBW Table

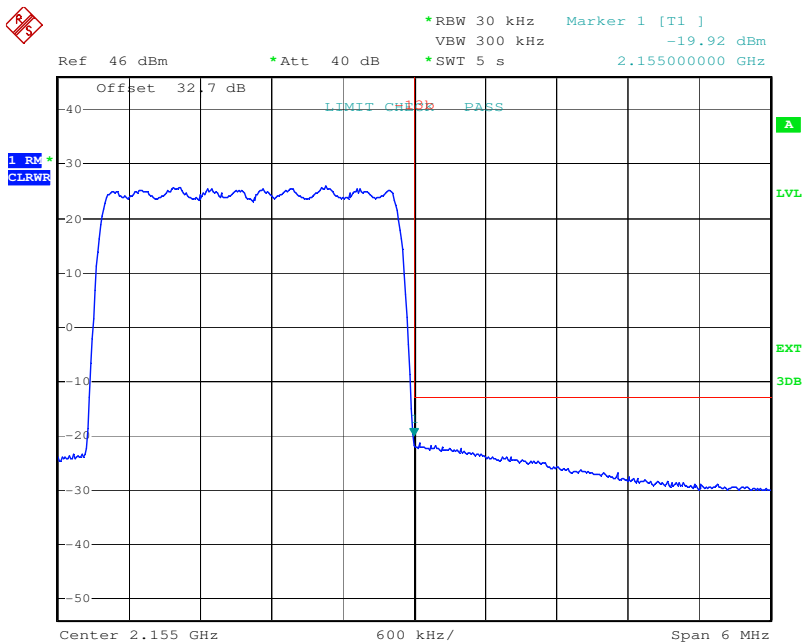
7.3.1 Downlink

7.3.1.1 CDMA < 1MHz to band edge



Date: 29.SEP.2009 17:01:58

plot 7.3.1.1-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA < 1MHz to band edge Lower Band Edge

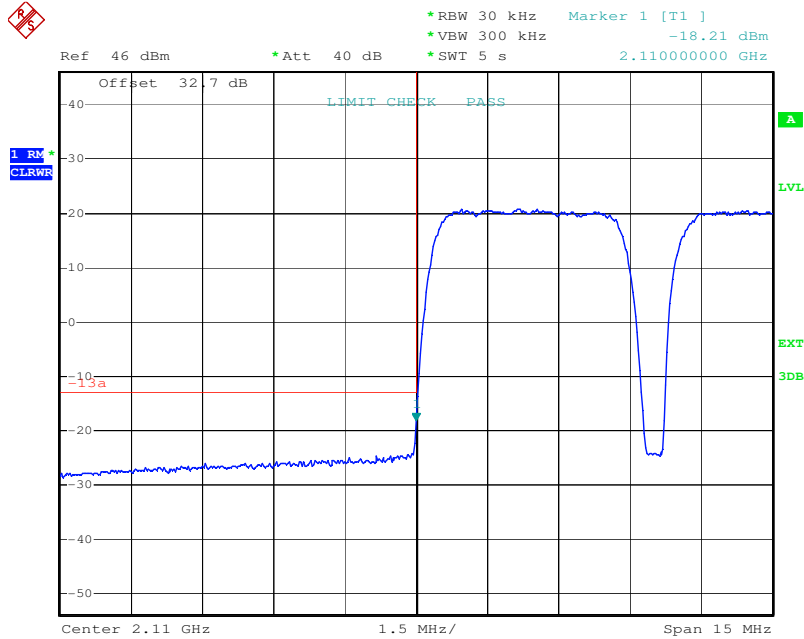


Date: 29.SEP.2009 17:06:25

plot 7.3.1.1-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA < 1MHz to band edge Upper Band Edge

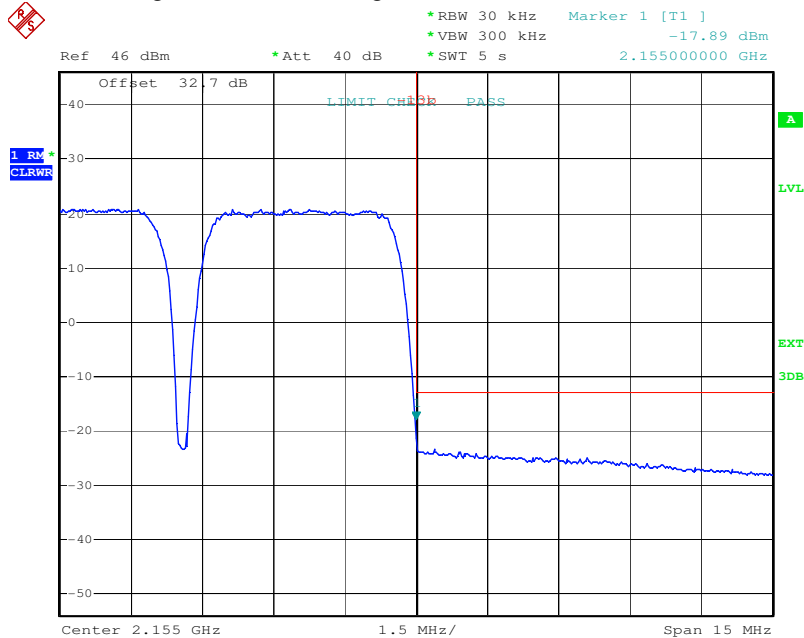


7.3.1.2 W-CDMA < 1MHz to band edge



Date: 29.SEP.2009 17:13:14

plot 7.3.1.2-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA < 1MHz to band edge Lower Band Edge

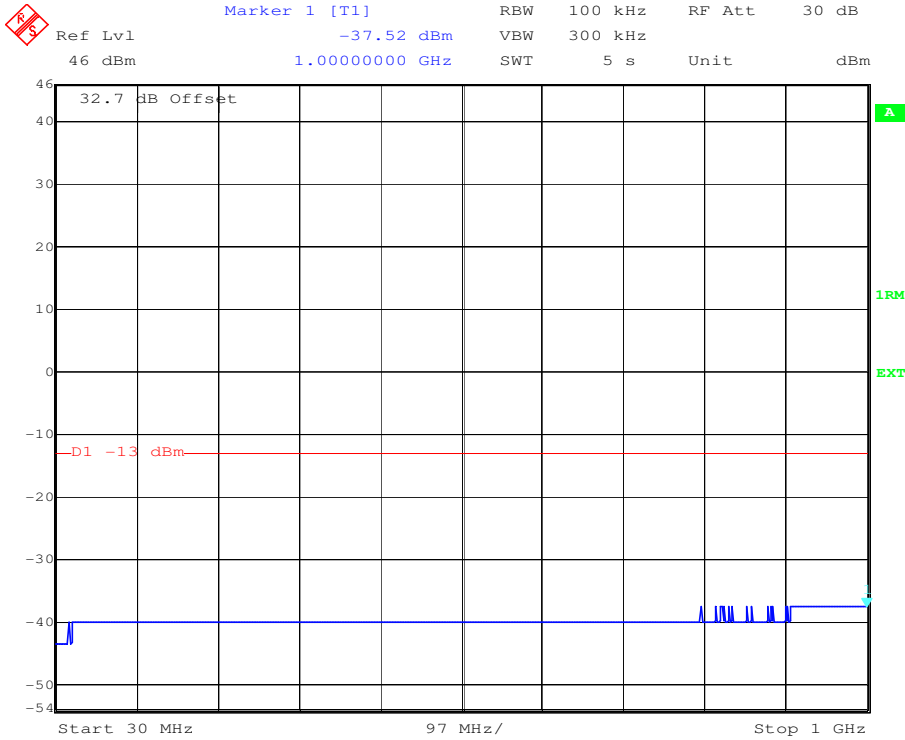


Date: 29.SEP.2009 17:17:28

plot 7.3.1.2-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA < 1MHz to band edge Upper Band Edge

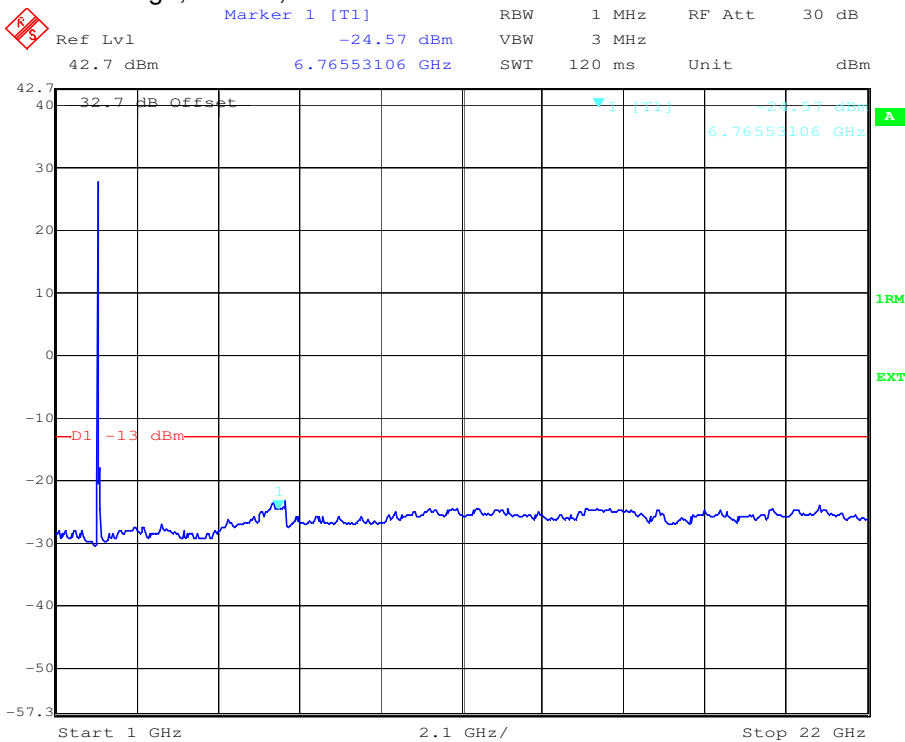


7.3.1.3 CDMA > 1MHz to band edge



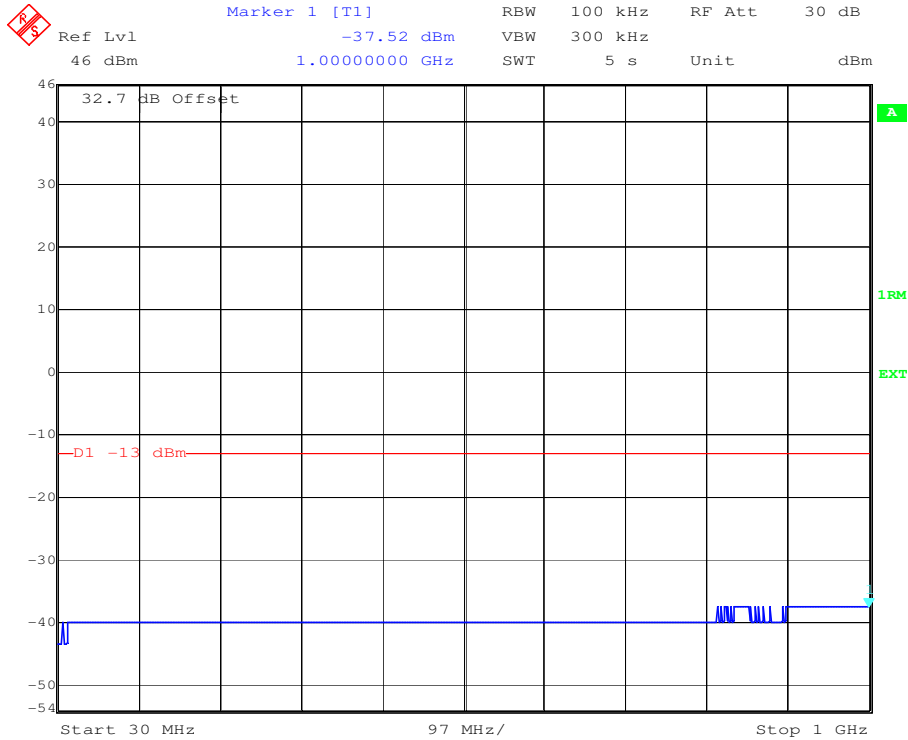
Date: 29.SEP.2009 16:16:13

plot 7.3.1.3-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA > 1MHz to band edge; Bottom; < 1 GHz



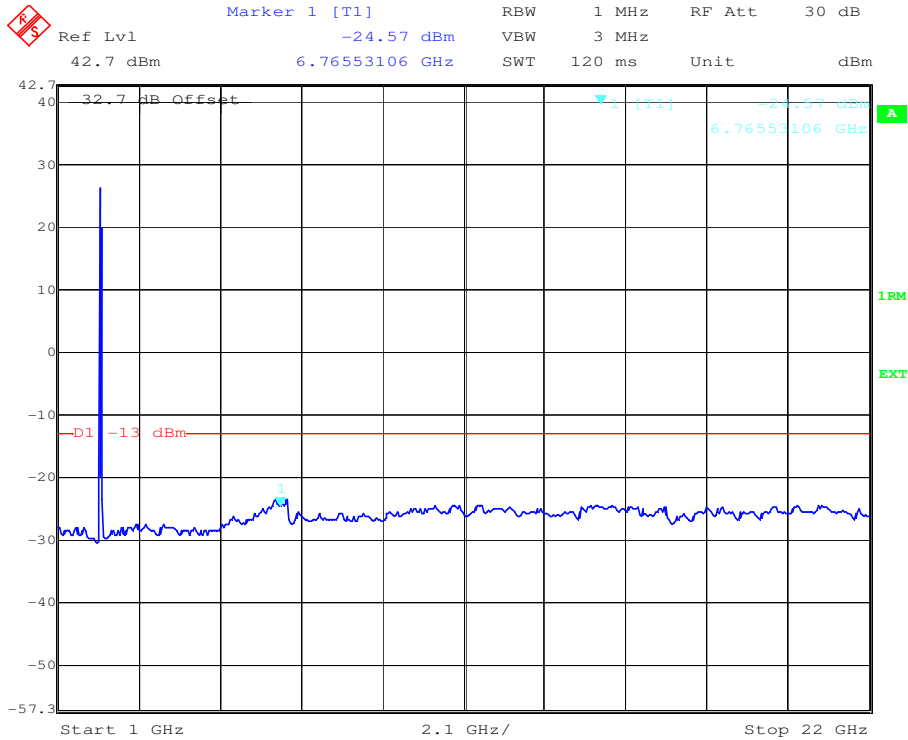
Date: 29.SEP.2009 17:35:04

plot 7.3.1.3-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA > 1MHz to band edge; Bottom; > 1 GHz



Date: 29.SEP.2009 16:17:13

plot 7.3.1.3-#3 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA > 1MHz to band edge; Middle; < 1GHz

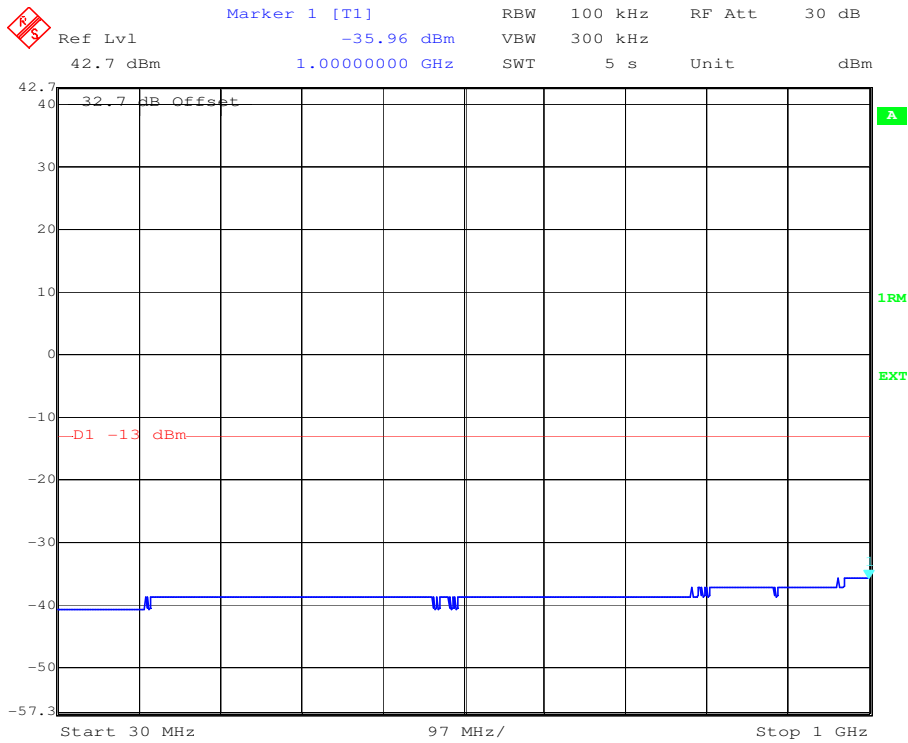


Date: 29.SEP.2009 17:35:32

plot 7.3.1.3-#4 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; CDMA > 1MHz to band edge; Middle; > 1 GHz

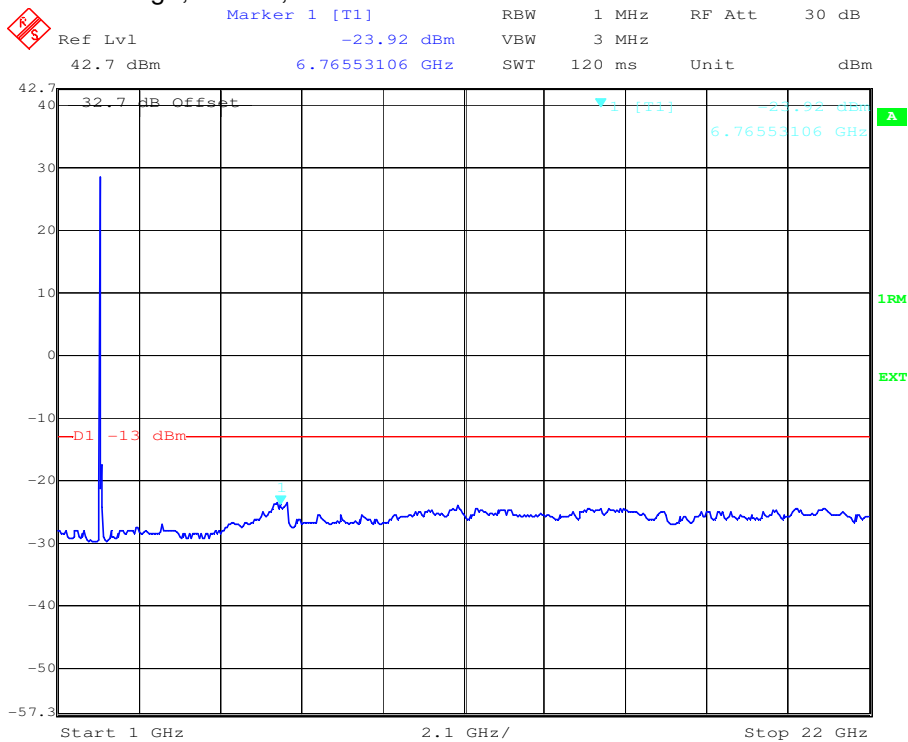


7.3.1.4 W-CDMA > 1MHz to band edge



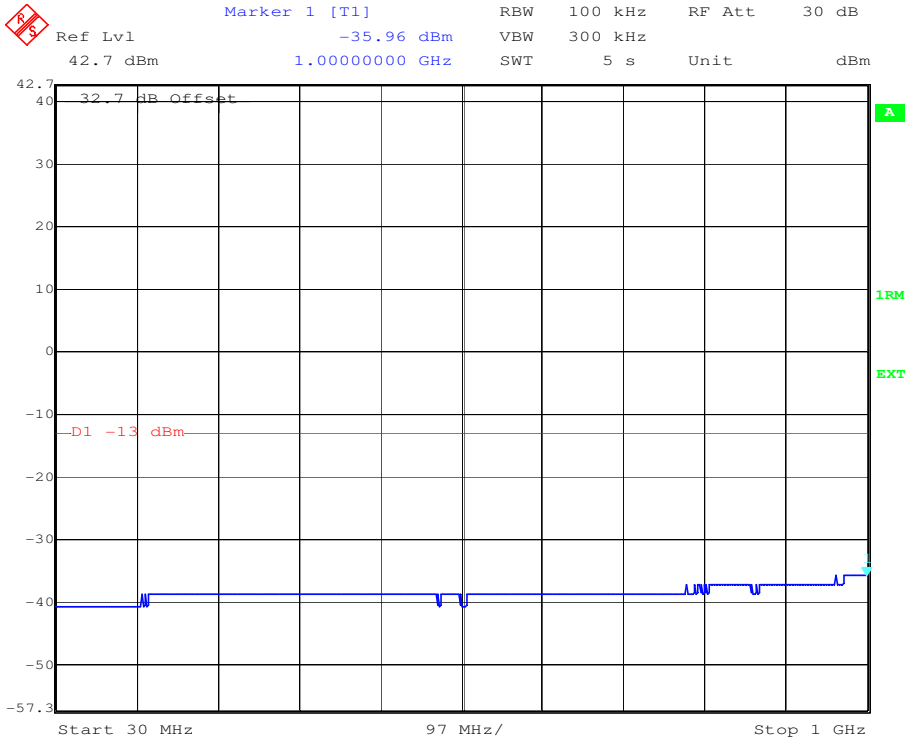
Date: 29.SEP.2009 16:28:56

plot 7.3.1.4-#1 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Bottom; < 1 GHz



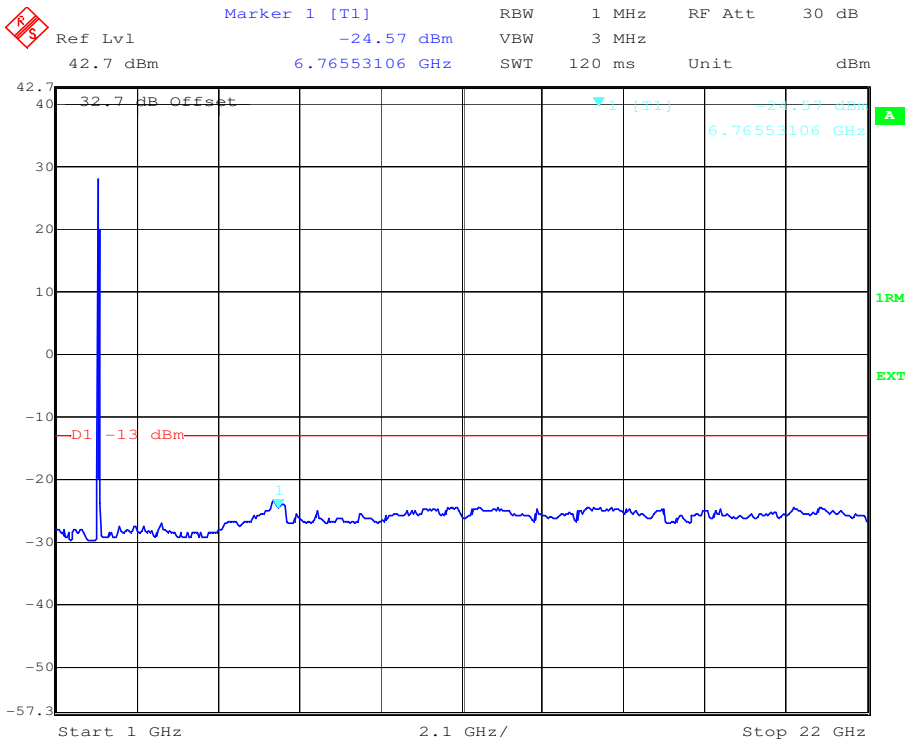
Date: 29.SEP.2009 17:33:20

plot 7.3.1.4-#2 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Bottom; > 1 GHz



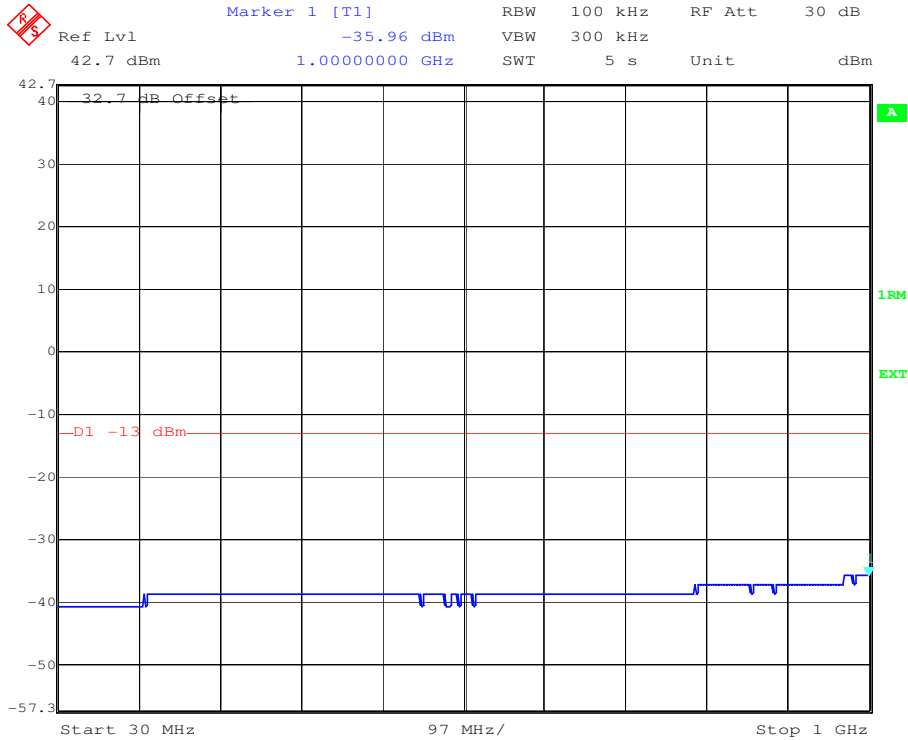
Date: 29.SEP.2009 16:27:14

plot 7.3.1.4-#3 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Middle; < 1 GHz



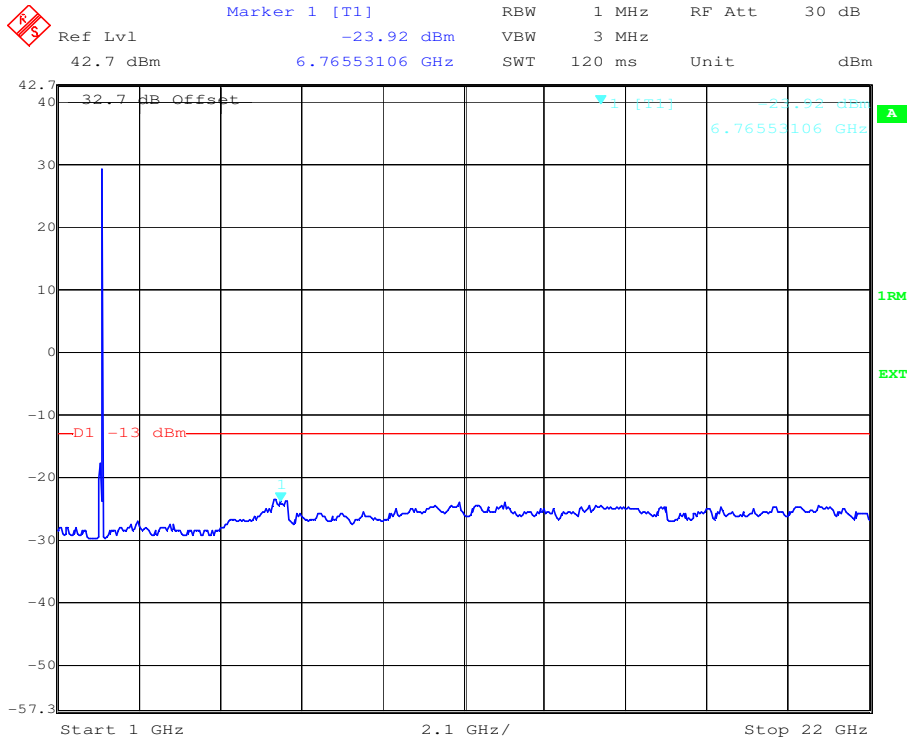
Date: 29.SEP.2009 17:32:50

plot 7.3.1.4-#4 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Middle; > 1 GHz



Date: 29.SEP.2009 16:28:16

plot 7.3.1.4-#5 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Top; < 1 GHz



Date: 29.SEP.2009 17:32:13

plot 7.3.1.4-#6 Spurious Emissions at Antenna Terminals: §27.53, §2.1051; Test results; Downlink; W-CDMA > 1MHz to band edge; Top; > 1 GHz



7.3.2 Uplink

n.a.

Note: The EUT does not transmit over the air in the uplink direction.

7.4 Summary test result

Test result	complies, according the plots above
Tested by:	Michael Leinfelder
Date:	29.09.2009

8 Radiated Spurious Emissions: §27.53, §2.1053 at the ECL

8.1 Limit

Minimum standard:

§27.53(h)

For operations in the 1710–1755 MHz / 2110-2155 MHz bands, the power of any emission outside a licensee’s frequency block shall be attenuated below the transmitter power (P) by at least:

$$43 + 10 \log_{10} (P) \text{ dB} = -13 \text{ dBm.}$$

§ 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

8.2 Test method

§ 2.1053 Measurements required: Field strength of spurious radiation .

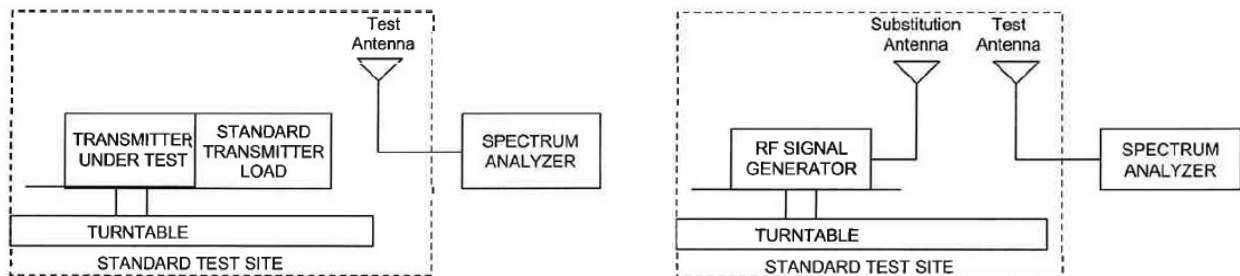
From KDB (AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET):

Radiated spurs (enclosure) – Use of CW signal (low, mid. and high freq.) is acceptable rather than all modulations.

The three physical antenna interfaces have been loaded with dummies with a maximum output power of **3 x 43,5 dBm** at the following frequencies:

- DL 1 → 2,110 GHz (Bottom)
- DL 2 → 2,1325 GHz (Middle)
- DL 3 → 2,155 GHz (Top)

The maximum RFI field strength was determined during the premeasurement by rotating the turntable (± 180 degrees) and varying the height of the receive antenna ($h = 1 \dots 4$ m) as like defined in ANSI C63.4 and TIA-603. The final measurement has been performed by the substitution method as described in ANSI/TIA-603-C-2004 under sec. 2.2.12. A Peak detector has been used.



Source: ANSI/TIA 603-C-2004

figure 8-#1 Test setup: Radiated Spurious Emissions: §27.53, §2.1053 at the ECL

8.3 Test Results

8.3.1 Spurious emission within the band 30 MHz to 22 GHz.

This clause specifies requirements for the measurement of radiated emission.

Frequency range	Distance: EUT <-> antenna	Limit	Test method	Measurement uncertainty
30 MHz - 1 GHz 1 GHz – 22 GHz	10 metres 3 metres	CFR 47 Part §27.53(h) -13 dBm	ANSI C63.4 and ANSI TIA-603-C-2004	Max. 1.64dB

Test equipment used:

designation	Type	manufacurer.	invent.-no.	cal.-date	next cal.- date	used
EMI test receiver	ESI40	Rohde & Schwarz	E1607	04.03.2009	04.03.2010	X
Antenna	CBL 6111	Chase	K1149	14.09.2009	14.09.2010	X
Antenna	CBL 6111	Chase	K1026	14.09.2009	14.09.2010	X
Antenna	HL025	R & S	K809	06.11.2008	06.11.2009	
Antenna	HL025	R & S	K1114	04.06.2009	04.06.2010	X
Antenna	STLP 9148-126	Schwarzbeck	K1759	30.09.2009	30.09.2010	X
Antenna	MWH-1826 / B	ARA Inc.	K1042	06.11.2008	06.11.2010	X
Pre amplifier	AM1431	Miteq	K1721	27.04.2009	27.04.2010	X
Pre amplifier	AFS4-00102000	Miteq	K817	11.11.2009	11.11.2010	X
Pre amplifier	JS43-1800-4000	Miteq	K1104	11.11.2009	11.11.2010	X
RF Cable	RG214	Frankonia	K1121 SET	23.01.2009	23.01.2010	X
RF Cable	Sucoflex 100	Suhner	K1742	09.04.2009	09.04.2010	X

8.3.2 Test data

There has been just one level detected at 4.31 GHz (second harmonic of 2.155 GHz) with a maximum level of -26.88 dBm e.r.p. at 30° TT-Position and 104 cm Antenna height.

The EUT passed the test with a margin of 13.88 dB to the limit.

13.11.2009
Leh



History

Revision	Modification	Date	Name
01.00	Initial release	17. Aug. 2009	R. Michanikl
02.00	Test done	29. Sept. 2009	M. Leinfelder
03.00	Test done	16. Nov. 2009	M. Lehmann
04.00	Change in Section 2.1.4.	07.12.2009	M. Lehmann

***** **End of test report** *****