

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



ECL-EMC Test Report No.: 10-091

Equipment under test: MR8018/1918/1918 (Path: 800 MHz)
FCC ID: XS5-MR801919
IC ID: 2237E- MR801919
Type-of-test: **FCC 47 CFR Part 90 Subpart S:2009**
Private Land Mobile Radio Services
IC RSS-131:2003
Zone Enhancers for the Land Mobile Service

Measurement Procedures: 47 CFR Parts 2:2009 (*Frequency Allocations and Radio Treaty Matters; General Rules and Regulations*),
90 (Private Land Mobile),
ANSI/TIA-603-C (2004), *Land Mobile FM or PM Communications Equipment Measurement and Performance Standards*
IC-GEN:2007 General Requirements and Information for the Certification of Radiocommunication Equipment

Test result: **Passed**

Date of issue:	22.04.10			Signature:
Issue-No.:	01	Author:	M. Lehmann Test engineer	<i>i.v. p. Lehmann</i>
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EMC Test Report No.:10-091

FCC ID: XS5- MR801919

IC ID: 2237E-MR801919



Manufacturer: ANDREW Wireless Systems GmbH
Industriering 10

D-86675 Buchdorf

Tel.: +49 (0)9099 69 0

Fax: +49 (0)9099 69 140

Test Location: TEMPTON Service Plus GmbH
European Compliance Laboratory (ECL)

Thurn-und Taxis-Straße 18

D-90411 Nürnberg

Tel.: +49 0911 59835 923

Fax: +49 0911 59835 90

General:

The purpose of this report is to show compliance to the FCC regulations for licensed devices operating under section 90 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.



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1 Test Results Summary

Name of Test	FCC Para. No.	FCC Method	FCC Spec.	Result
RF Power Output	90.635	2.1046	1000 Watts	Complies
Occupied Bandwidth	90.210	2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	90.210	2.1051	-13dBm	Complies
Field Strength of Spurious Emissions	90.543	2.1053	-13dBm	Complies
Frequency Stability	90.213	2.1055	1 ppm	NA

Name of Test	IC Para. No.	IC Method	Result
RF Power Output	RSS-131	RSS-GEN 4.8	Complies
Occupied Bandwidth	RSS-131	RSS-GEN 4.6.1	Complies
Spurious Emissions at Antenna Terminals	RSS-131	RSS-GEN 4.9	Complies
Field Strength of Spurious Emissions	RSS-131 6.4	RSS-GEN 4.9	Complies
Frequency Stability	RSS-131	RSS-GEN 4.7	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	MR8018/1918/1918 Repeater
Andrew Ident. Number	Id.No. 7613709
Serial no.(SN)	10
Revision	00
Software version and ID	V 2.1.0.3 Id.No.7612208-01
Type of modulation and Designator	CDMA (F9W) <input checked="" type="checkbox"/> W-CDMA (F9W) <input checked="" type="checkbox"/> GSM (GXW) <input checked="" type="checkbox"/> GSM-EDGE (G7W) <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 checked="" type="checkbox"/> Duplexer <input type="checkbox"/> Fullband <input type="checkbox"/>

2.1.1 Downlink

Pass band	851 MHz – 869 MHz
Max. composite output power based on one carrier (rated)	22,0 dBm = 158.5 mW
Gain max.	78dB

2.1.2 Uplink

Pass band	806 MHz – 824 MHz
Max. composite output power based on one carrier (rated)	22,0 dBm = 158.5 mW
Gain max.	78dB

2.1.3 Description of EUT

Andrew MR8018/1918/1918 is a minirepeater for indoor coverage in small areas.

This Test Report describes the approval of the 800 MHz Path (MR8018).

The MR8018/1918/1918 Repeater consists of one 800 MHz path and two 1900 MHz path, with the intended use of simultaneous transmission

2.1.4 System diagrams

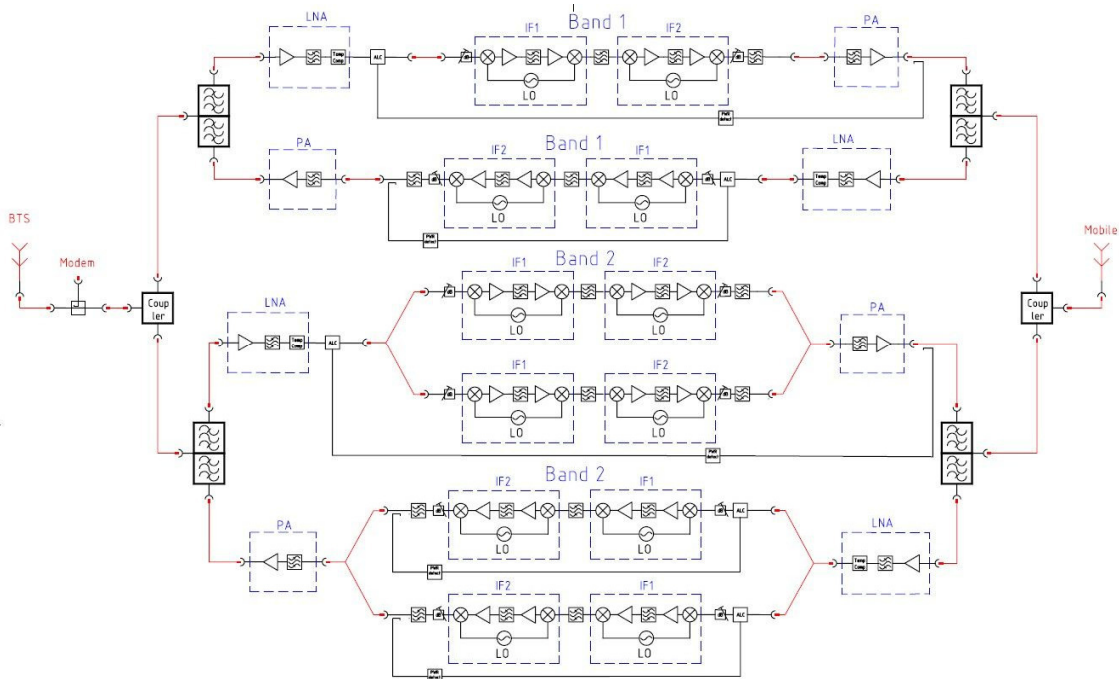


figure 2.1.4-#1 System diagrams: Minirepeater

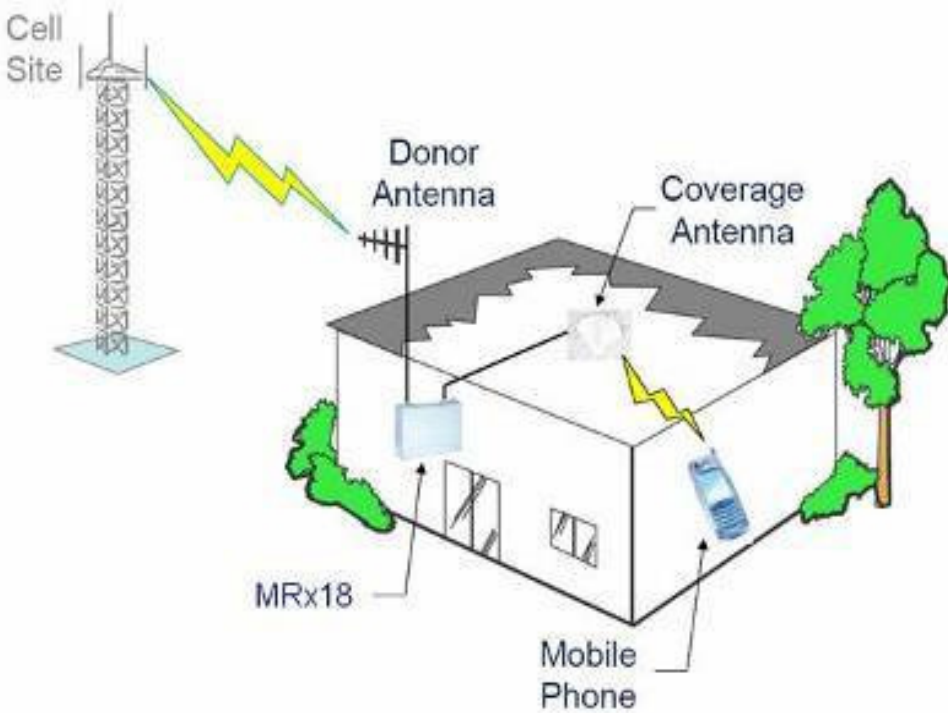


figure 2.1.4-#2 System diagrams: Application example

2.1.5 Block diagram of measurement reference points

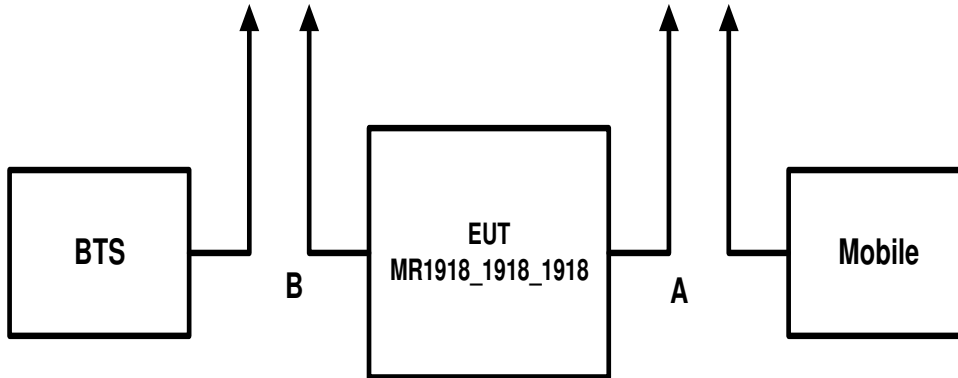


figure 2.1.5-#1 Block diagram of measurement reference points

Reference point A, Mobile: Repeater DL output, UL input
Reference point B, BTS: Repeater UL output, DL input

3 Test site (Andrew Buchdorf)

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
8893	Network Analyzer	ZVB8	R&S	100201	06/10
8961	Spectrum Analyzer	FSP13	R&S	100147	10/10
8736	Spectrum Analyzer	FSIQ26	R&S	100290	04/10
8984	Signal Generator	E4438C	Agilent	MY45094089	11/10
8972	Signal Generator	SMIQ03B	R&S	837747/023	07/10
8686	Power Meter	E4418B	Agilent	MY41293484	09/10
8687	Power Sensor	E9300H	Agilent	MY41090294	09/10
7370	Automatic Box	Basic Part	Andrew	--	01/10
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.

3.4 Measurement uncertainty

The extended measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor $k=2$. The true value is located in the corresponding interval with a probability of 95 %.

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4 Test site (Herberg)

FCC Test site: 96997
IC OATS: IC3475A-1

See relevant dates under section 8.

5 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN

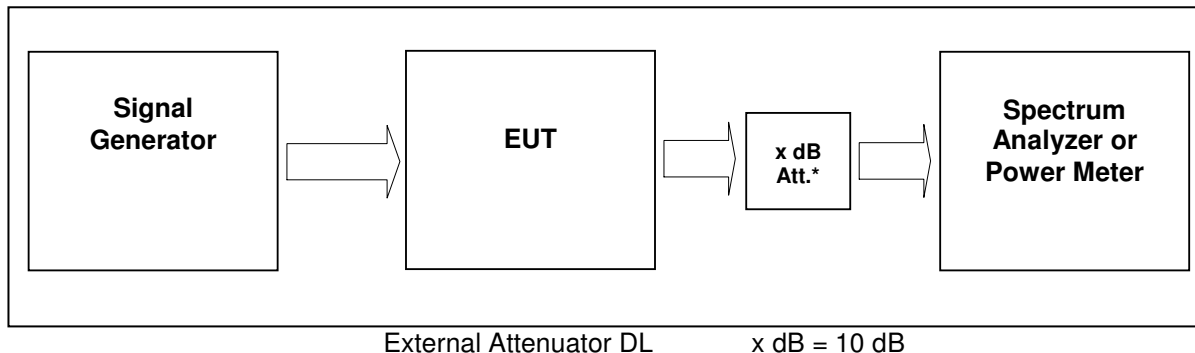


figure 3.4-#1 Test setup: RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN

Measurement uncertainty	± 0,38 dB
Test equipment used	8984,8686,8687,8961,7370

5.1 Limit

5.1.1 FCC CFR47

Minimum standard:

Para. No. 90.635 Limitations on power and antenna height.

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

5.2 Test method

5.2.1 FCC CFR47

§ 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

5.2.2 IC RSS-GEN

4.8 Transmitter Output Power

Transmitter output power measurements shall be carried out before the unwanted emissions test. The transmitter output power value, obtained from this test, serves as the reference level used to determine the unwanted emissions. For comparative purposes, the measurements of emission power and unwanted



emissions can be in peak or average provided the same parameter is used when measuring both. This information shall be included in the test report.

If the transmission is in bursts, the output power shall be averaged over any 100 millisecond period or, over the burst duration if the burst is shorter than 100 milliseconds, during which its value is at its maximum. The power shall only be averaged over the duration of actual transmission. No off times are to be included in the average.

If the RF output power is internally or externally adjustable or remotely controllable, set or control the power to the maximum rating of the range for which equipment certification is sought. If the spectrum analyzer selectivity or bandwidth is insufficient when measuring emission power, a resolution bandwidth, narrower than that specified, plus numerical integration, in terms of linear power to sum the transmitter output power, is permitted. The method used shall be described in the test report.

If the antenna is detachable, the transmitter output power may be measured at the antenna port using conducted measurement.

If the antenna is not detachable, field strength measurements shall be made using a calibrated open area test site.

The following formula may be used to convert field strength (FS) in volts/metre to transmitter output power (TP) in watts:

$$TP = (FS \times D)^2 / (30 \times G)$$

Where D is the distance in metres between the two antennas and G is the antenna numerical gain referenced to isotropic gain. (Note: In an open-area test measurement, the effect due to the metal ground plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.)

Measure and record the transmitter output power using a measurement bandwidth at least 3 times the emission bandwidth of the transmitter, or use power summation as described above.

5.3 Test results

Detector: RMS.

Test signal GSM:

Signal waveform with GMSK modulation in all time slots according to 3GPP TS45.004

Test signal GSM EDGE:

Signal waveform with 8-PSK modulation in all time slots according to 3GPP TS45.004

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 than 10MHz: The test shall be performed at Bottom, Middle, Top frequencies.



5.3.1 Downlink

Modulation	Measured at		RBW VBW Span	RF Power (dBm)	RF Power (W)	Plot -
CDMA	Bottom	851,625 MHz	3MHz	22.0	0.159	5.3.1.1 #1
	Middle	860,00 MHz	10MHz	22.0	0.159	#2
	Top	868,375 MH	15MHz	21.9	0.155	#3
WCDMA	Bottom	853,4 MHz	10MHz	18.0	0.063	5.3.1.2 #1
	Middle	860,0 MHz	10MHz	18.0	0.063	#2
	Top	866,6 MHz	50MHz	18.1	0.065	#3
GSM	Bottom	851,1 MHz	1MHz	21.8	0.151	5.3.1.3 #1
	Middle	860,0 MHz	3MHz	22.0	0.159	#2
	Top	868,9 MHz	10MHz	21.6	0.145	#3
GSM-EDGE	Bottom	851,1 MHz	1MHz	22.1	0.162	5.3.1.4 #1
	Middle	860,0 MHz	3MHz	22.1	0.162	#2
	Top	868,9 MHz	10MHz	22.2	0.166	#3
Maximum output power = 22 dBm -> 0.159 W						
Limit Maximum output power = 1000 W -> 60 dBm						

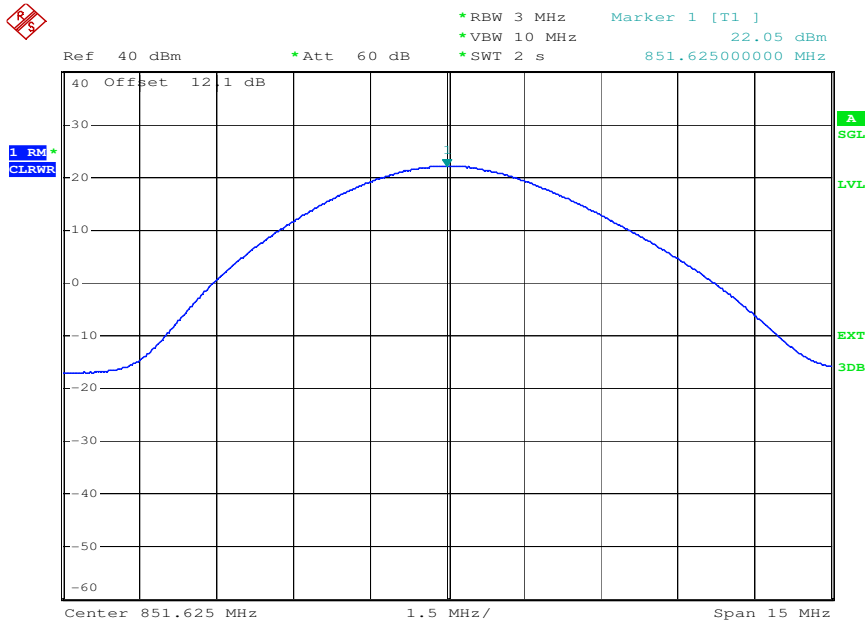
table 5.3.1-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN Test results Downlink

Modulation	Pin / dBm (Ref. point B)
CDMA GSM, GSM-EDGE	-56
WCDMA	-60

table 5.3.1-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN Test results Downlink Input power

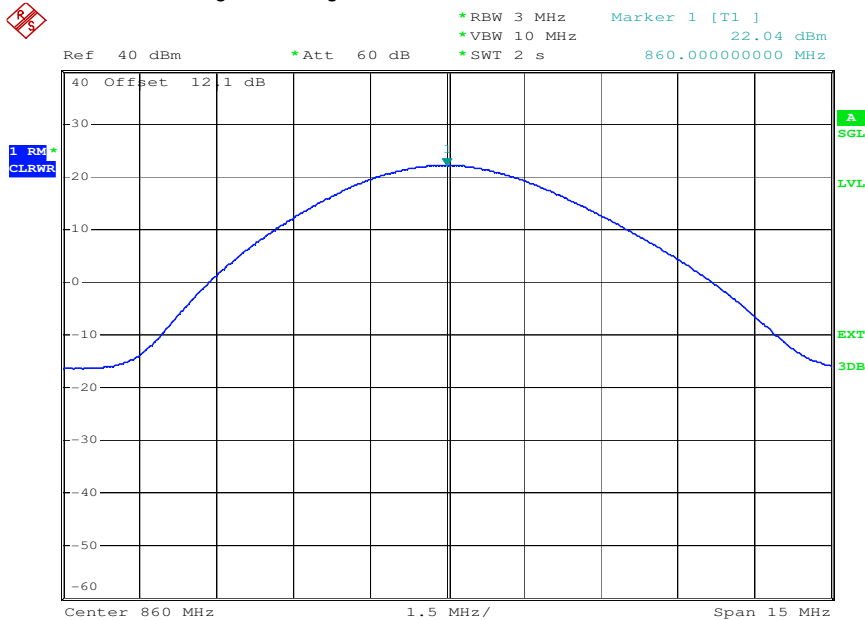


5.3.1.1 CDMA



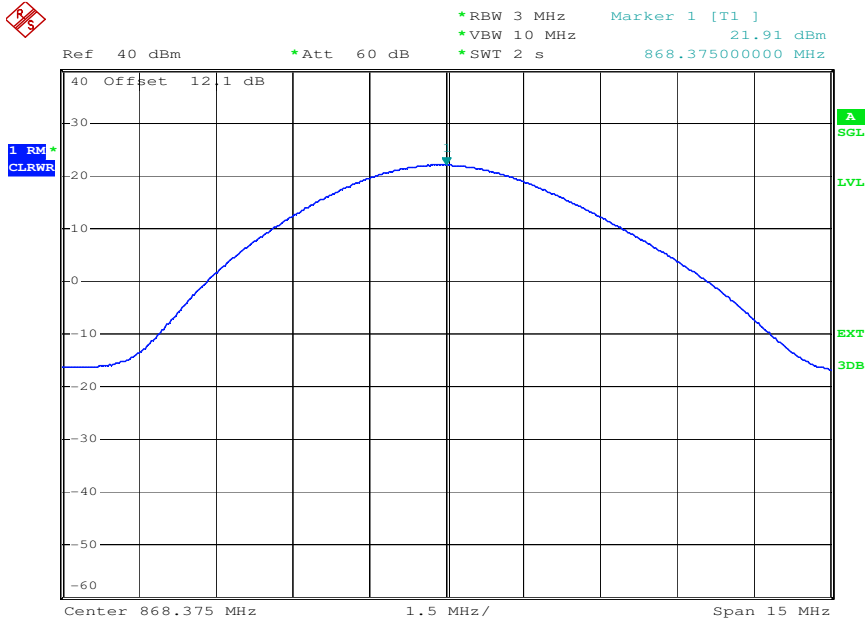
Date: 8.MAR.2010 10:09:53

plot 5.3.1.1-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; CDMA Bottom



Date: 8.MAR.2010 10:10:22

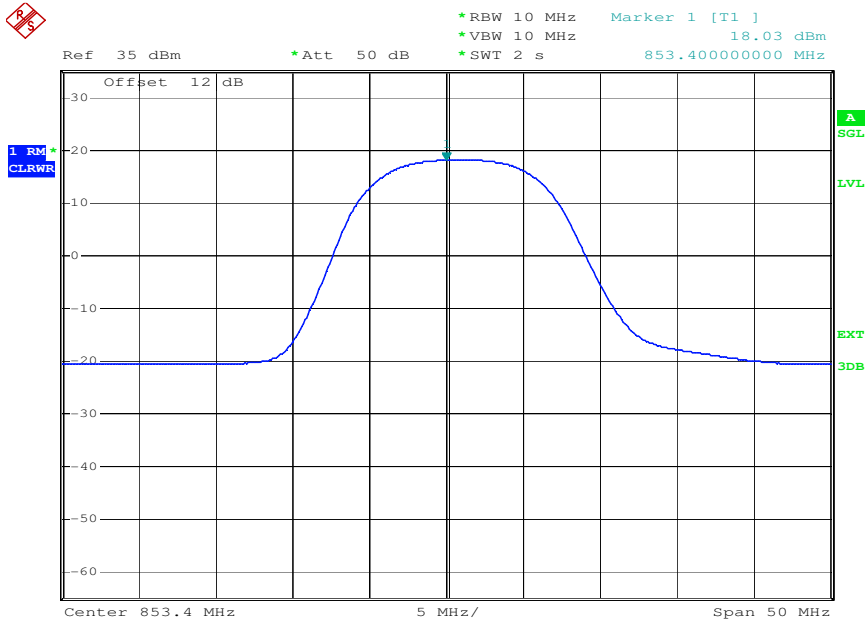
plot 5.3.1.1-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; CDMA Middle



Date: 8.MAR.2010 10:10:52

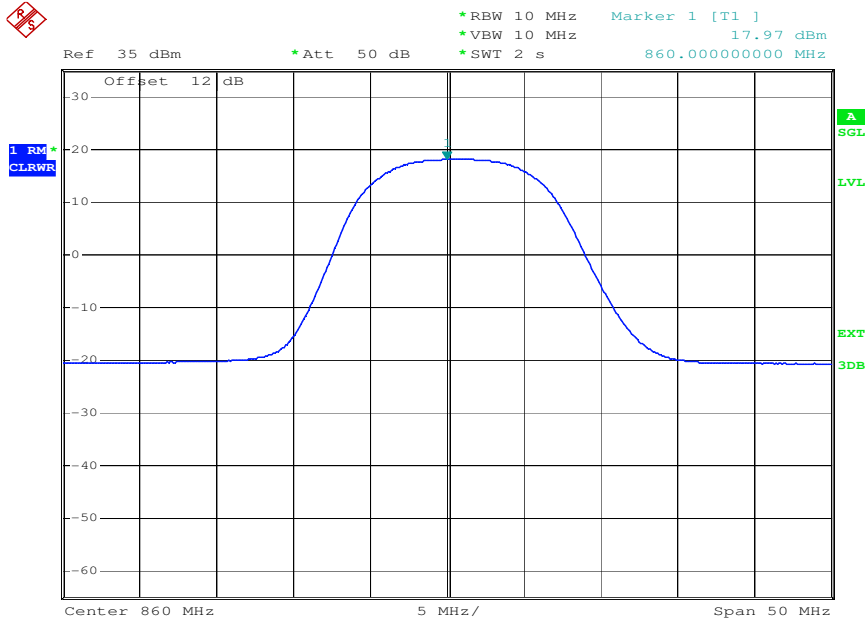
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5.3.1.2 W-CDMA



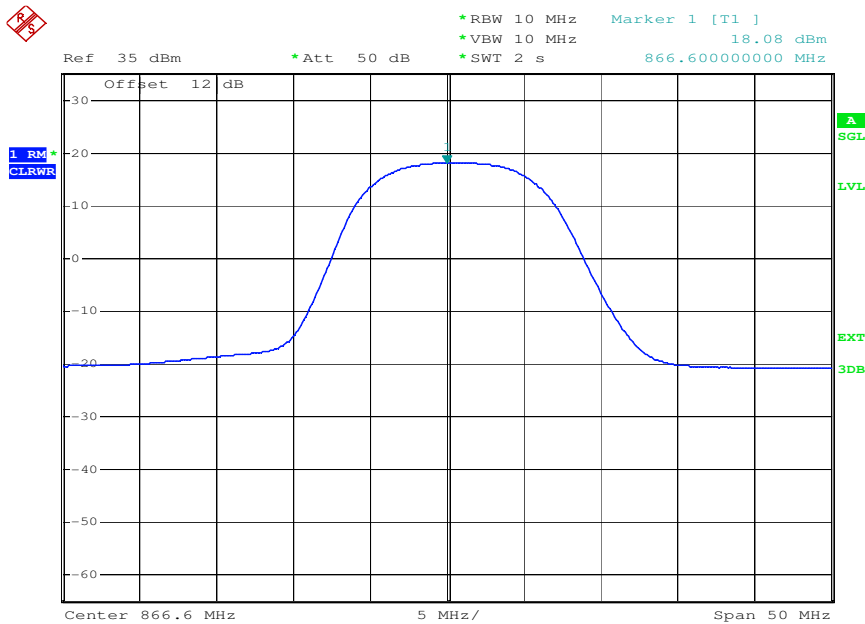
Date: 8.MAR.2010 11:38:02

plot 5.3.1.2-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA Bottom



Date: 8.MAR.2010 11:38:28

plot 5.3.1.2-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA Middle

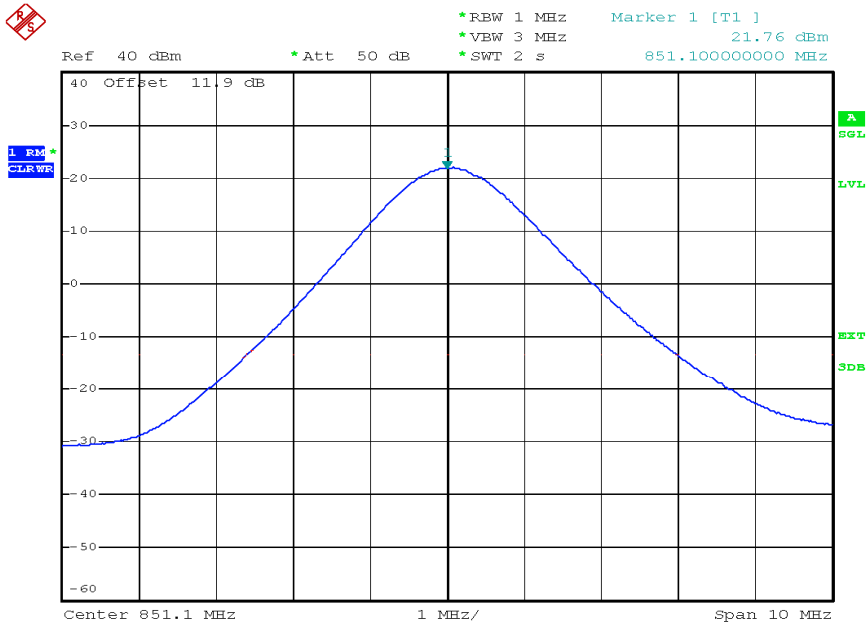


Date: 8.MAR.2010 11:38:54

plot 5.3.1.2-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA Top

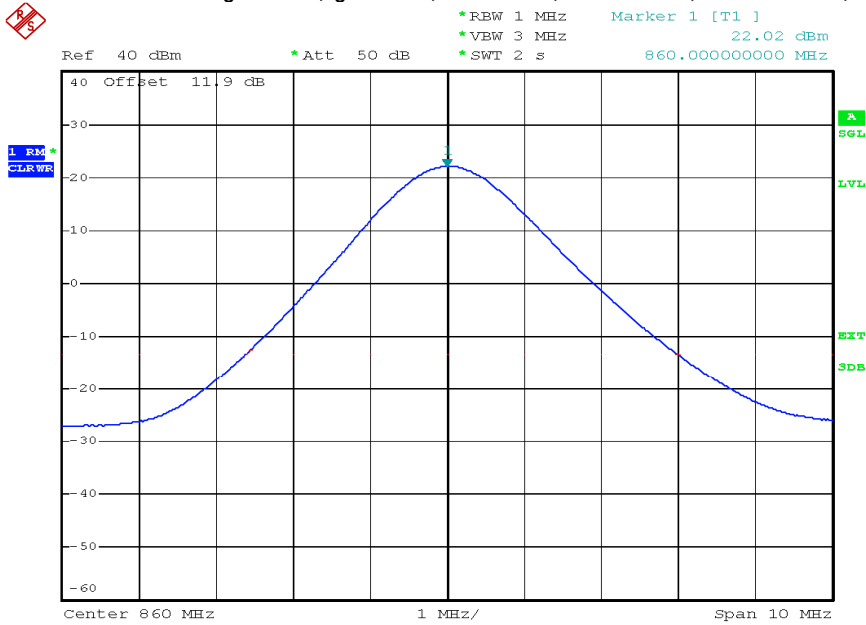


5.3.1.3 GSM



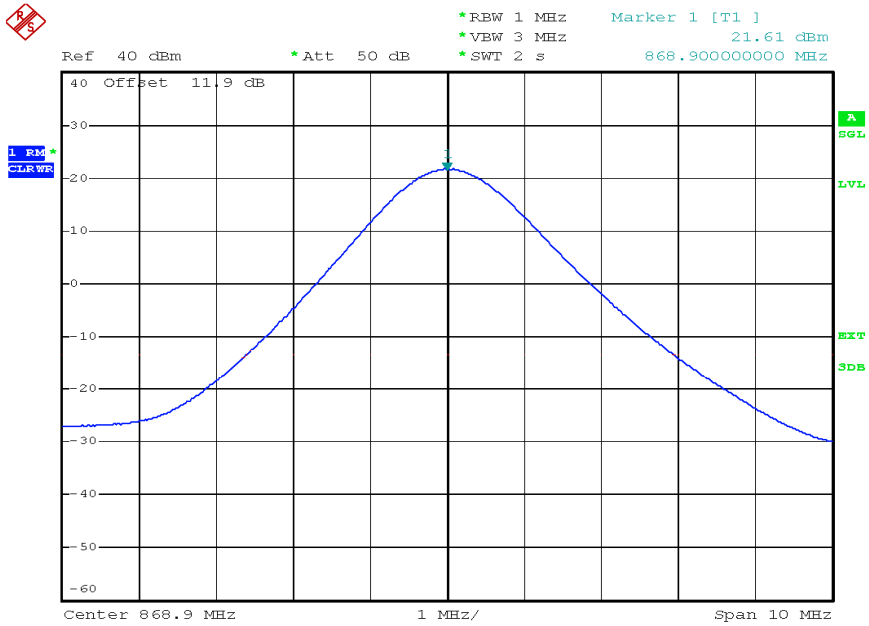
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plot 5.3.1.3-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; GSM Bottom



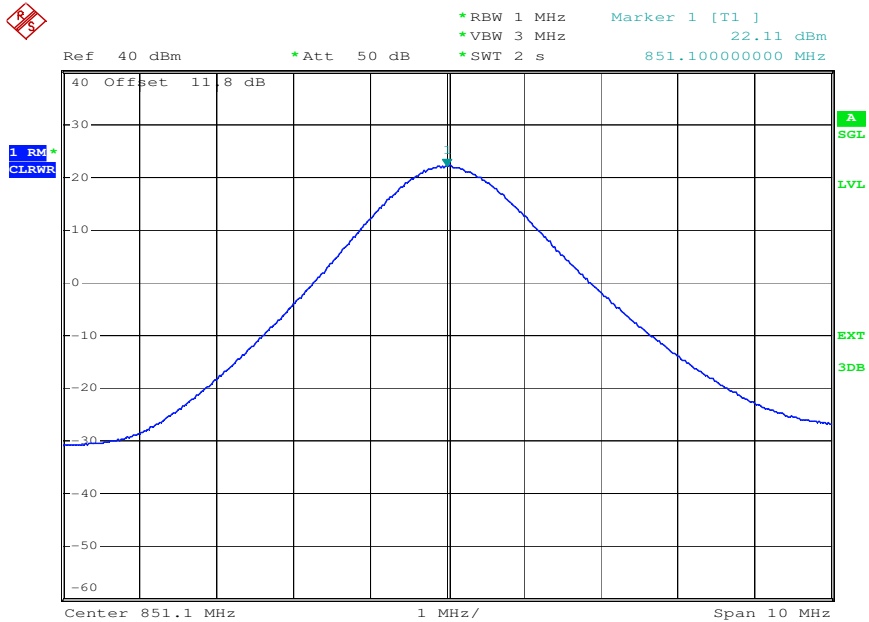
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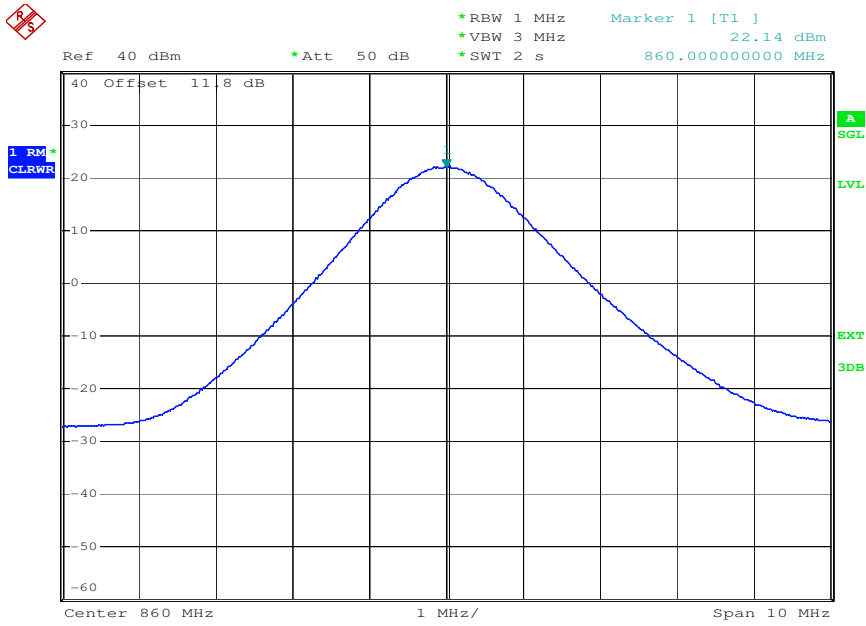
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5.3.1.4 GSM-EDGE



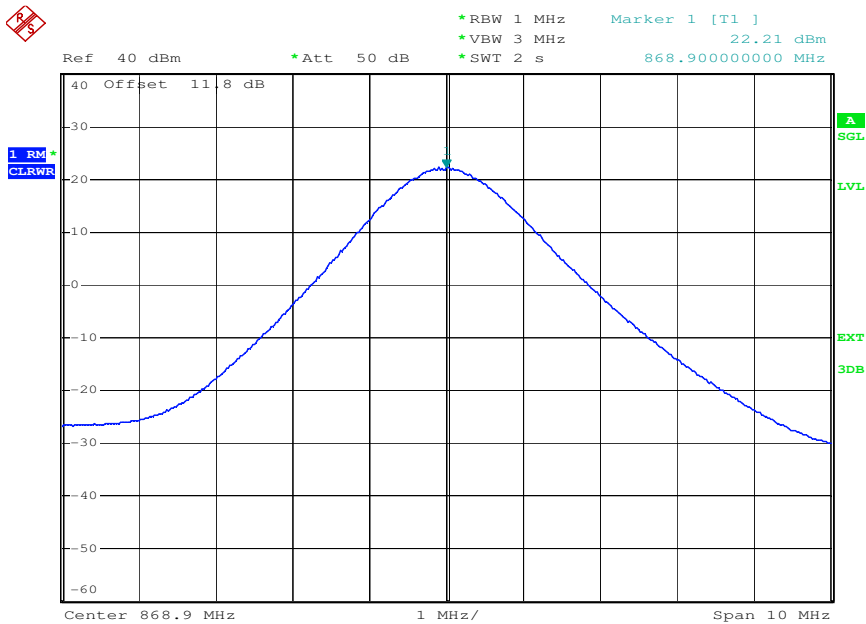
Date: 10.MAR.2010 18:48:10

plot 5.3.1.4-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE
Bottom



Date: 10.MAR.2010 18:48:36

plot 5.3.1.4-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE Middle



Date: 10.MAR.2010 18:49:02

plot 5.3.1.4-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE Top



5.3.2 Uplink

Modulation	Measured at		RBW VBW Span	RF Power (dBm)	RF Power (W)	Plot -
CDMA	Bottom	806,625 MHz	3MHz	22.0	0.159	5.3.2.1 #1
	Middle	815,00 MHz	10MHz	22.0	0.159	#2
	Top	823,375 MHz	15MHz	22.1	0.162	#3
WCDMA	Bottom	806,4 MHz	10MHz	17.9	0.062	5.3.2.2 #1
	Middle	815,0 MHz	10MHz	18.0	0.063	#2
	Top	821,6 MHz	50MHz	18.9	0.063	#3
GSM	Bottom	806,1 MHz	1MHz	22.0	0.159	5.3.2.3 #1
	Middle	815,0 MHz	3MHz	22.0	0.159	#2
	Top	823,9 MHz	10MHz	22.1	0.162	#3
GSM-EDGE	Bottom	806,1 MHz	1MHz	22.4	0.174	5.3.1.4 #1
	Middle	815,0 MHz	3MHz	22.1	0.162	#2
	Top	823,9 MHz	10MHz	22.1	0.162	#3
Maximum output power = 22 dBm -> 0.159 W						
Limit Maximum output power = 1000 W -> 60 dBm						

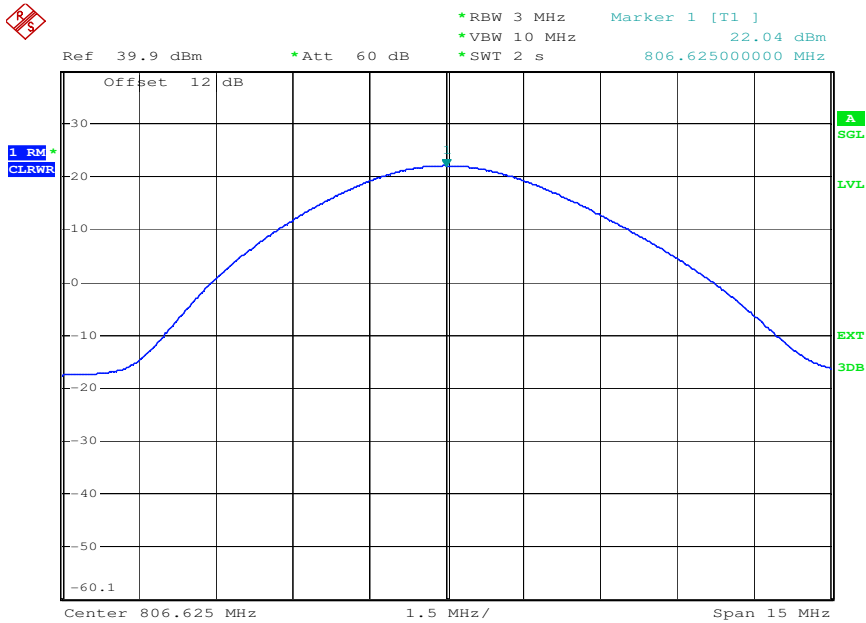
table 5.3.2-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN Test results Uplink

Modulation	Pin / dBm (Ref. point A)
CDMA GSM, GSM-EDGE	-56
WCDMA	-60

table 5.3.2-#4 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN Test results Uplink Input power

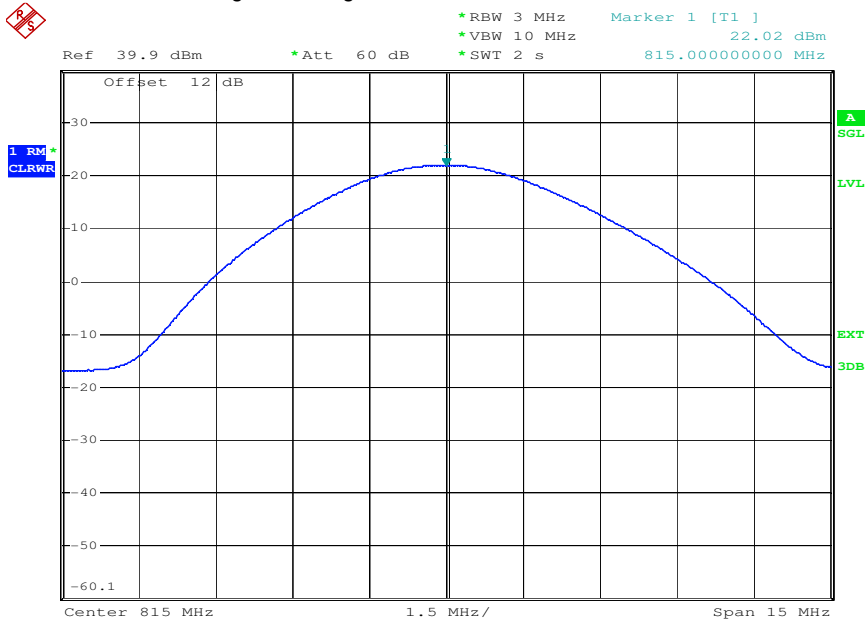


5.3.2.1 CDMA



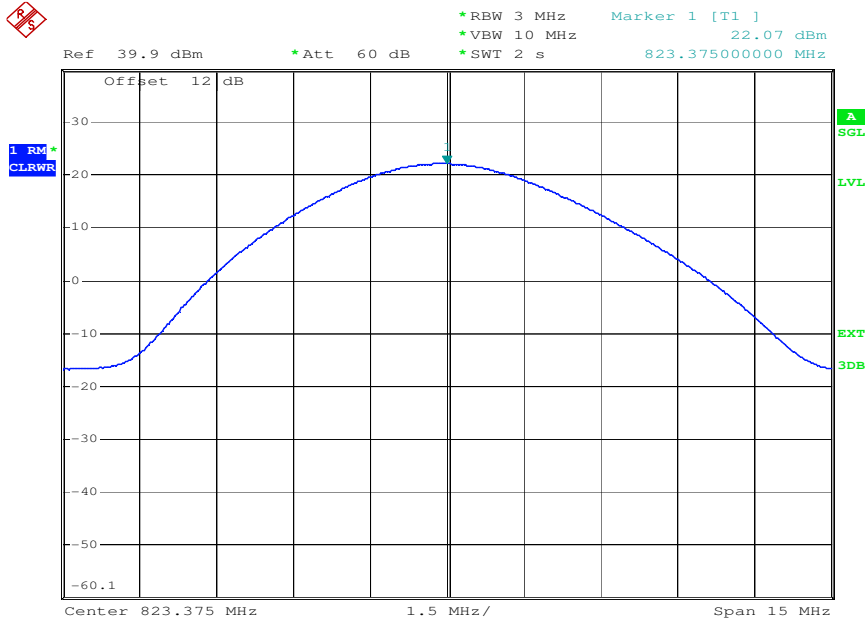
Date: 8.MAR.2010 10:11:21

plot 5.3.2.1-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; CDMA Bottom



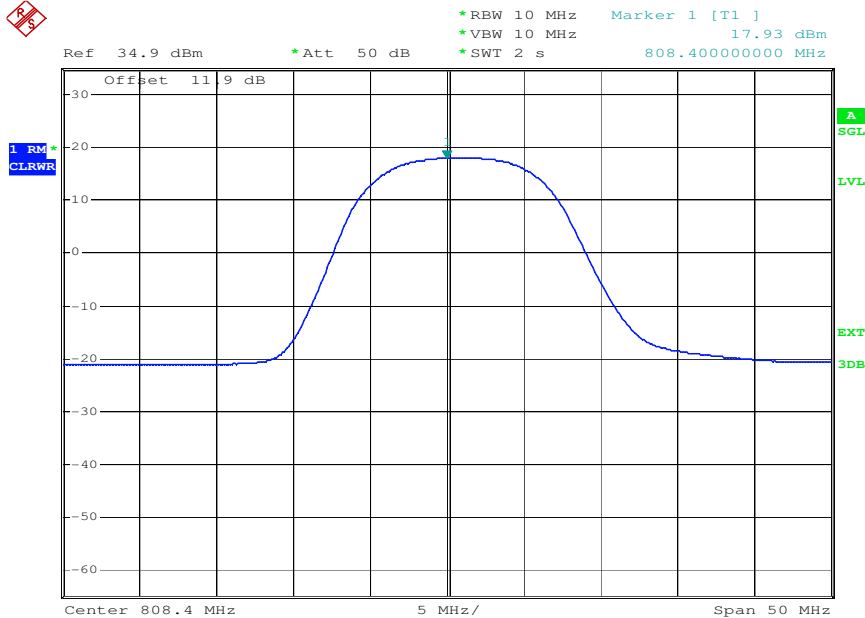
Date: 8.MAR.2010 10:11:50

plot 5.3.2.1-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; CDMA Middle



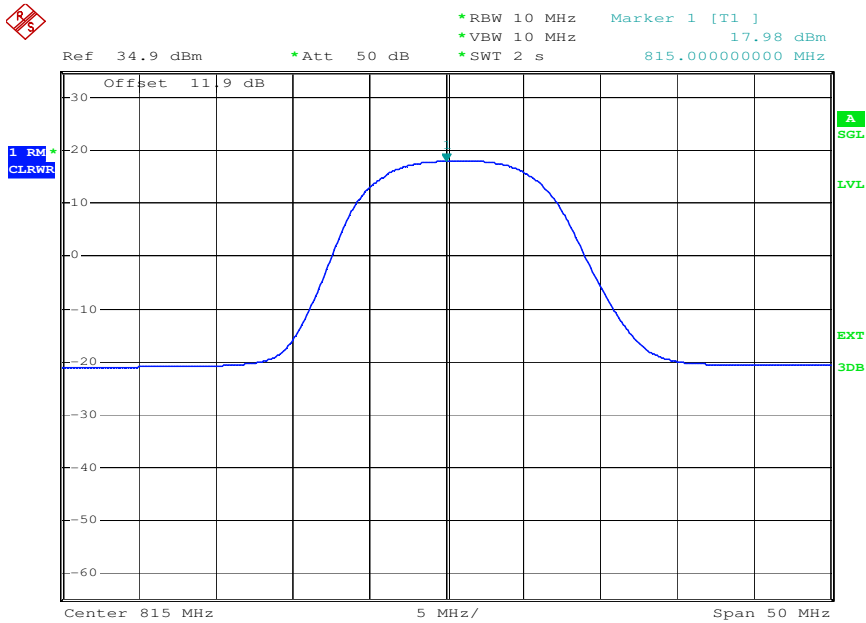
Date: 8.MAR.2010 10:12:19

plot 5.3.2.1-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; CDMA Top
5.3.2.2 W-CDMA



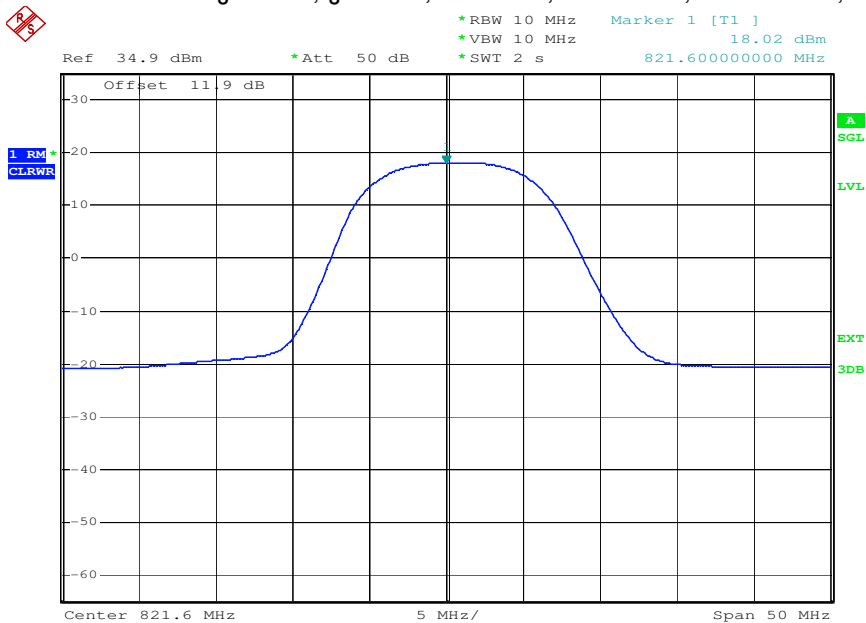
Date: 8.MAR.2010 11:39:20

plot 5.3.2.2-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA Bottom



Date: 8.MAR.2010 11:39:46

plot 5.3.2.2-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA Middle

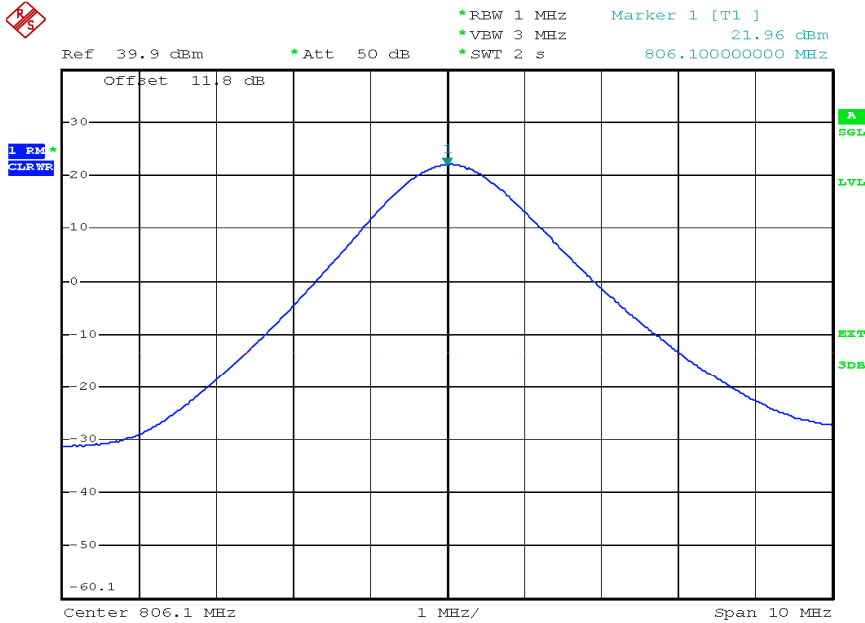


Date: 8.MAR.2010 11:40:12

plot 5.3.2.2-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA Top

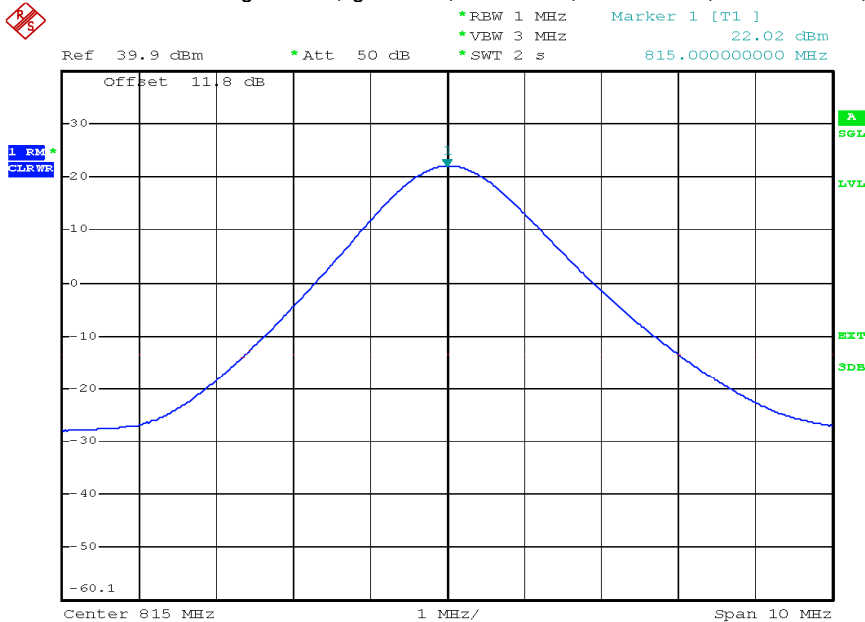


5.3.2.3 GSM



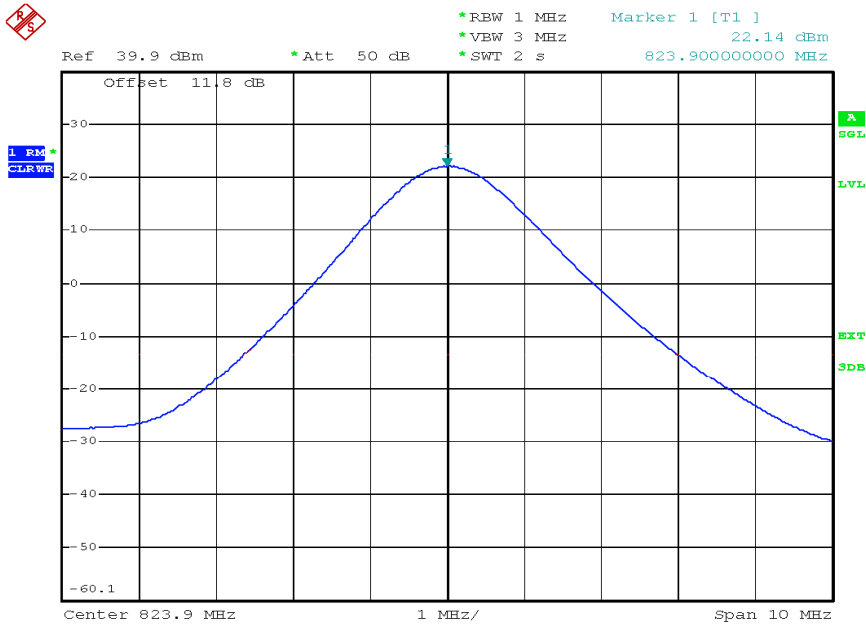
Date: 10.MAR.2010 17:05:02

plot 5.3.2.3-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM Bottom



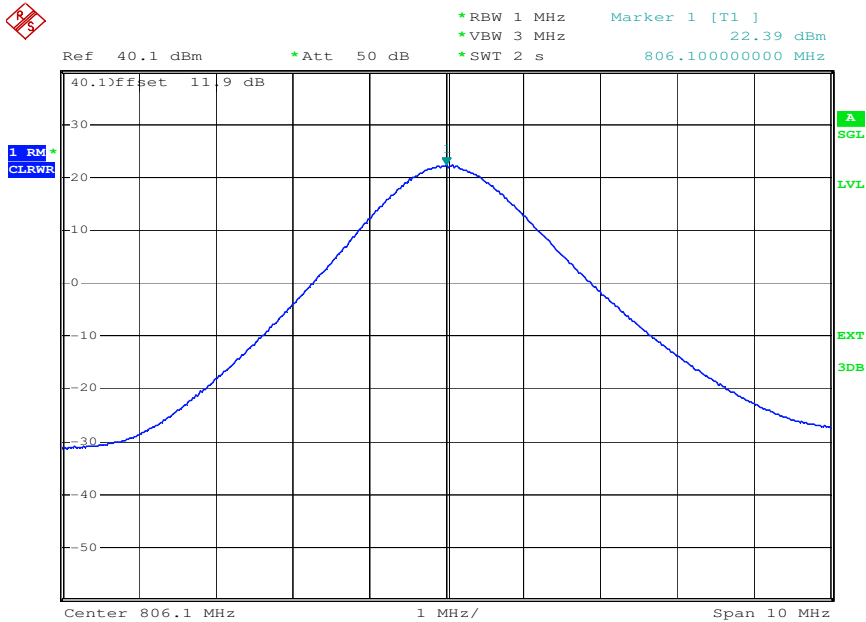
Date: 10.MAR.2010 17:05:28

plot 5.3.2.3-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM Middle



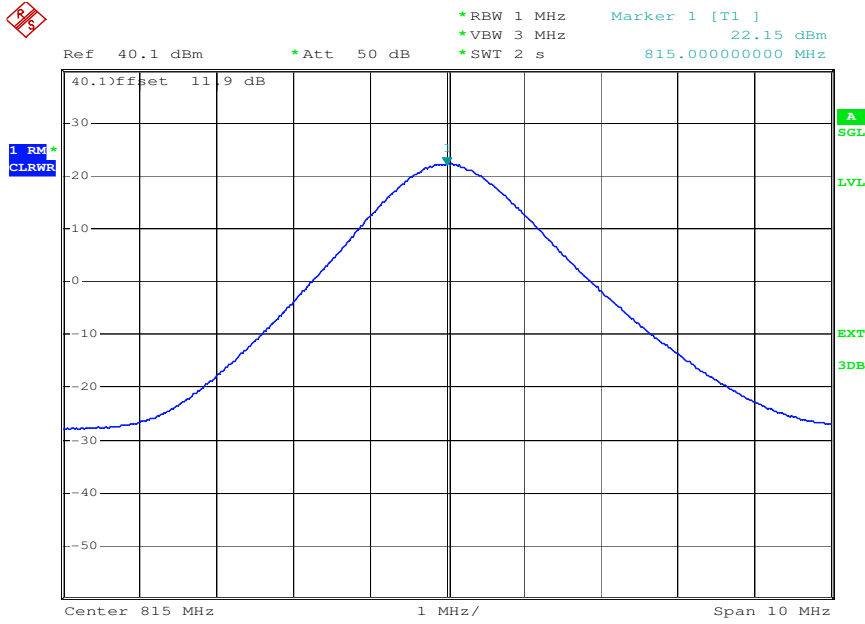
Date: 10.MAR.2010 17:05:54

plot 5.3.2.3-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM Top
5.3.2.4 GSM-EDGE



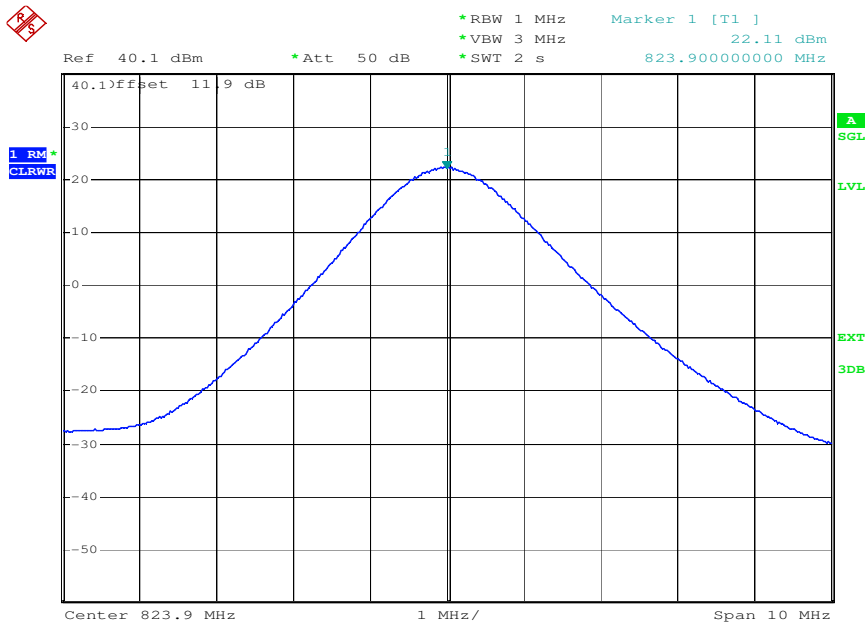
Date: 10.MAR.2010 18:49:28

plot 5.3.2.4-#1 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE
Bottom



Date: 10.MAR.2010 18:49:54

plot 5.3.2.4-#2 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE Middle



Date: 10.MAR.2010 18:50:20

plot 5.3.2.4-#3 RF Power Out: §90.635, §2.1046; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE Top

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FCC ID: XS5- MR801919

IC ID: 2237E-MR801919

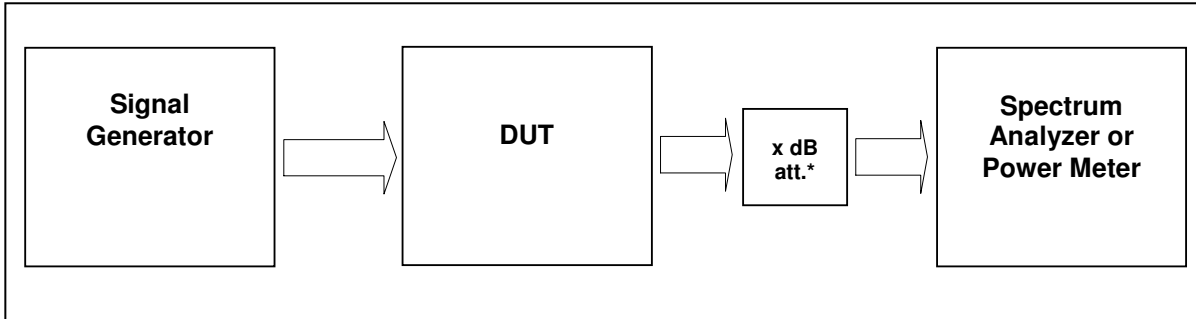


5.4 Summary test result

Test result	complies, according the plots above
Tested by:	Roland Macho
Date:	10.03.2010



6 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN



External Attenuator DL x dB = 10 dB
figure 5.4-#1 Test setup: Occupied Bandwidth: §90.210 §2.1049; RSS-GEN

Measurement uncertainty	± 0,38 dB
Test equipment used	8984,8686,8687,8961,7370

6.1 Limit

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

6.2 Test method

6.2.1 FCC CFR47

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:

6.2.2 IC RSS-GEN

4.6.1 Occupied Bandwidth

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recorded frequencies is the occupied bandwidth.

6.3 Test results

6.3.1 Downlink

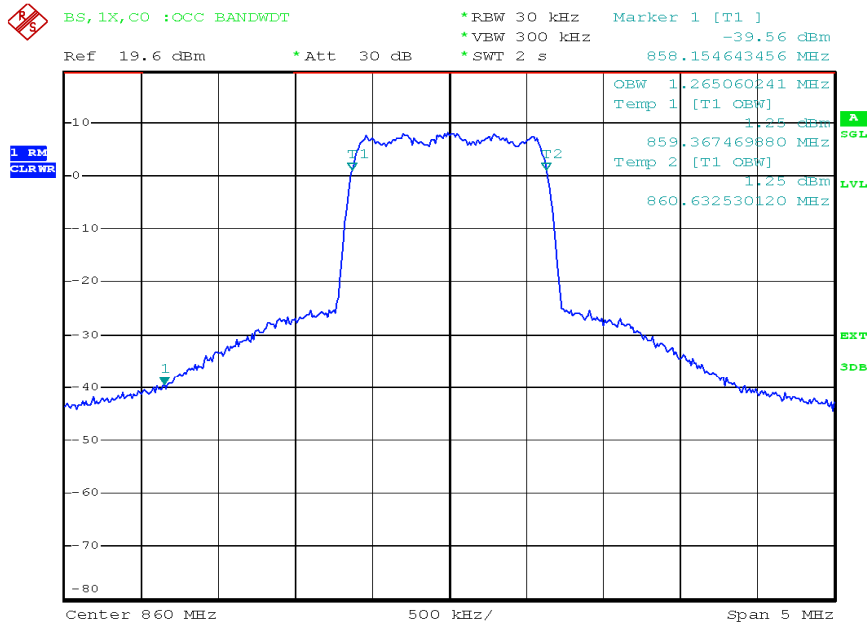
Detector: RMS.

Modulation	Measured at		RBW VBW Span	Occupied Bandwidth / MHz	Plot #
CDMA	Middle	860,0 MHz	30kHz 300kHz 5MHz	1.265	6.3.1.1 #1, #2
WCDMA	Middle	860,0 MHz	100kHz 1MHz 10MHz	4.177	6.3.1.2 #1, #2
GSM	Middle	860,0 MHz	3kHz 30kHz 1MHz	0.249	6.3.1.3 #1, #2
GSM-EDGE	Middle	860,0 MHz	3kHz 30kHz 1MHz	0.245	6.3.1.4 #1, #2

table 6.3-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN Test results Downlink

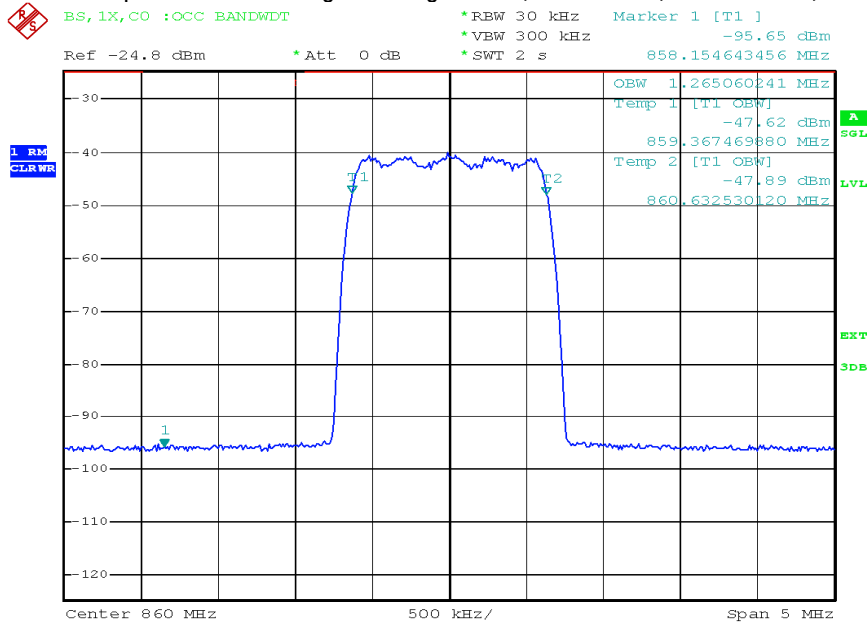


6.3.1.1 CDMA



Date: 11.MAR.2010 10:59:23

plot 6.3.1.1-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; CDMA Output

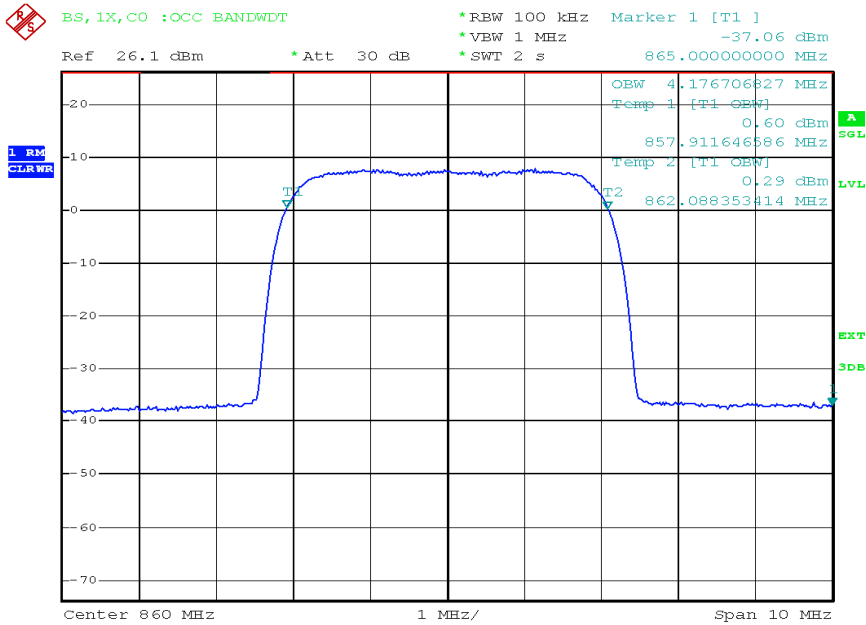


Date: 11.MAR.2010 11:00:57

plot 6.3.1.1-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; CDMA Input

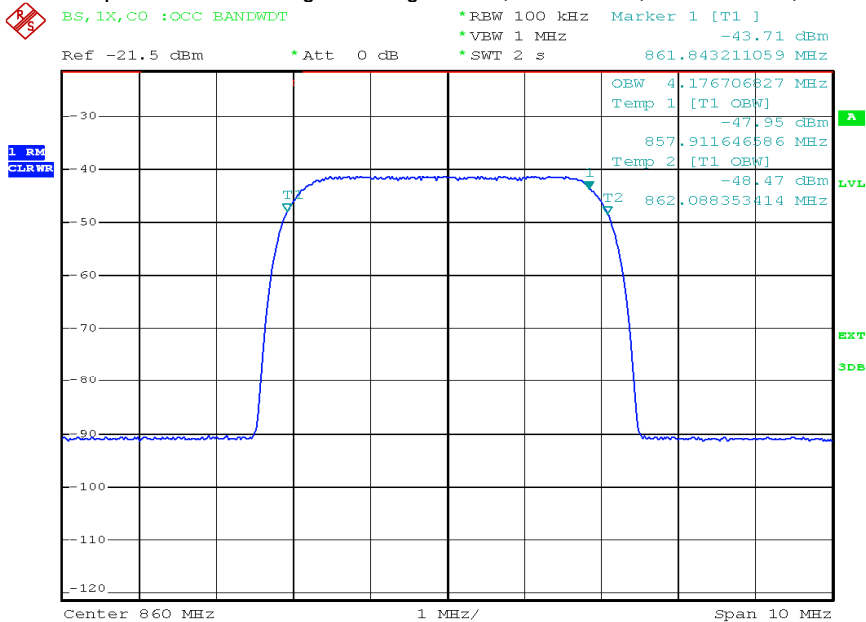


6.3.1.2 W-CDMA



Date: 11.MAR.2010 10:39:21

plot 6.3.1.2-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; W-CDMA Output

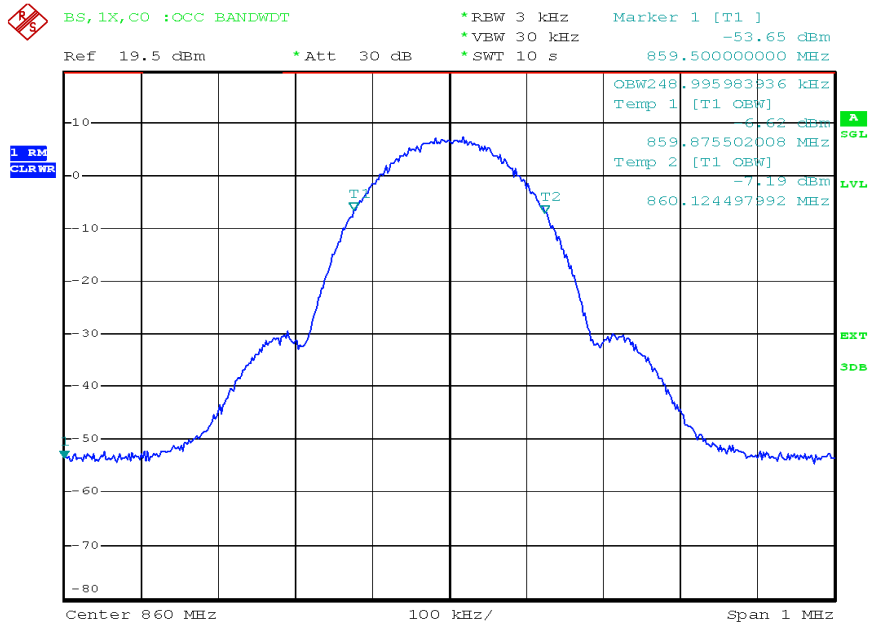


Date: 11.MAR.2010 10:41:05

plot 6.3.1.2-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; W-CDMA Input

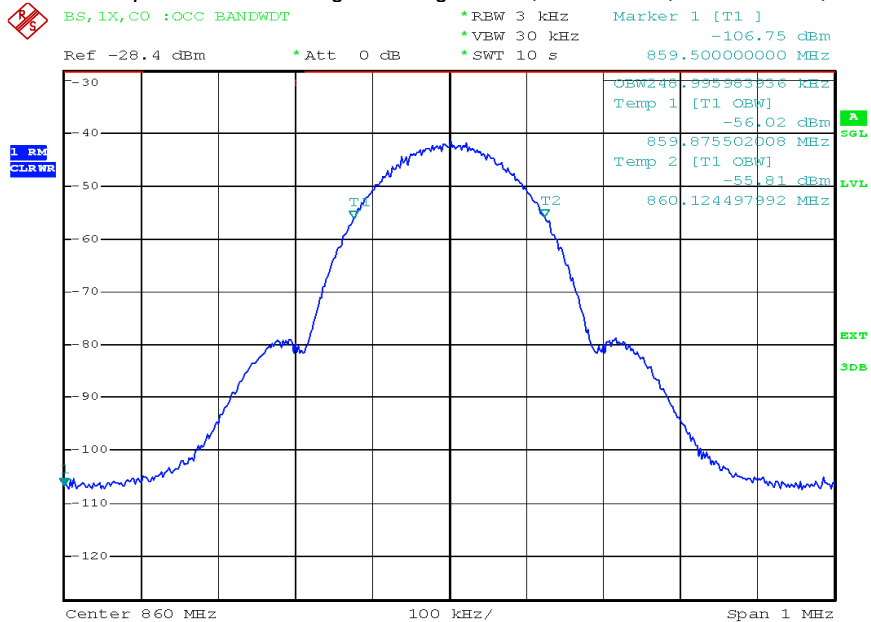


6.3.1.3 GSM



Date: 11.MAR.2010 11:12:04

plot 6.3.1.3-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; GSM Output

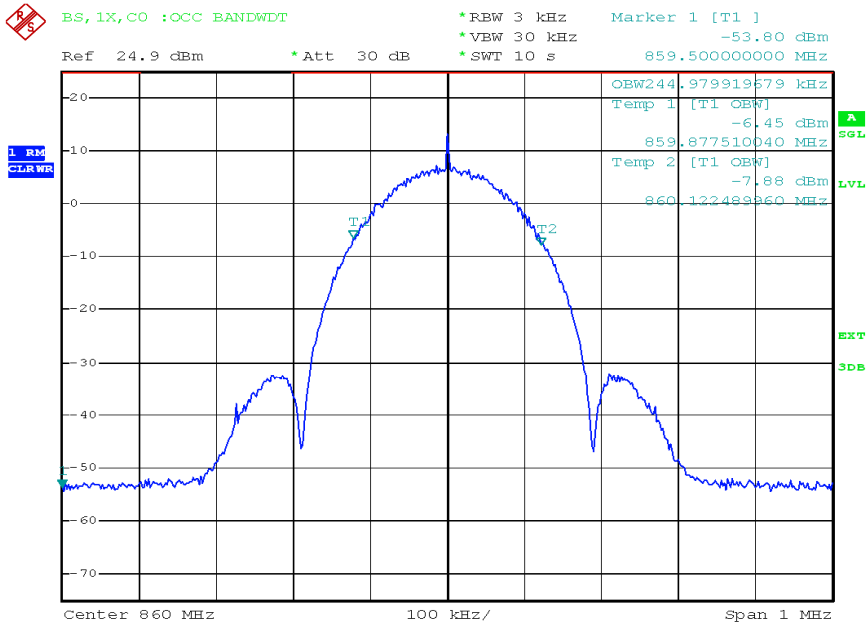


Date: 11.MAR.2010 11:15:38

plot 6.3.1.3-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; GSM Input

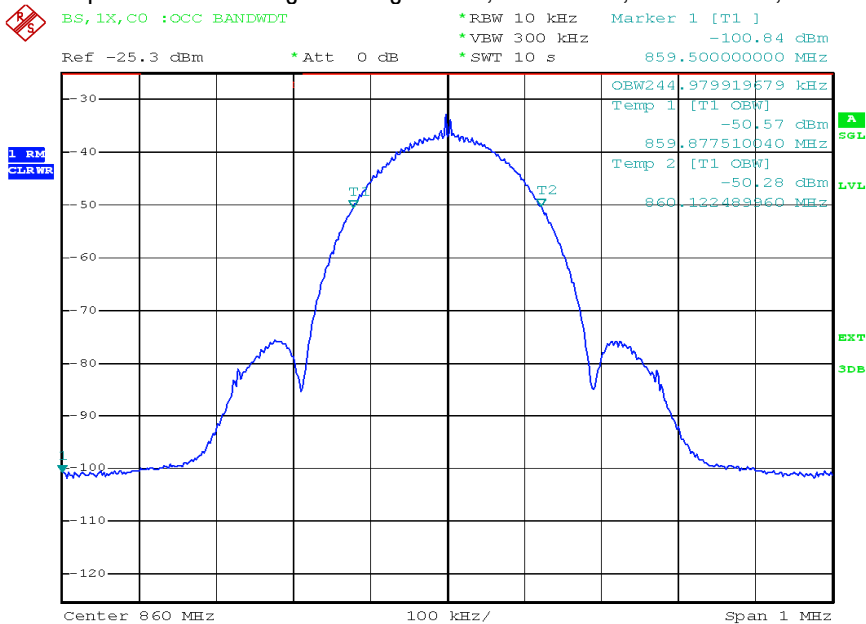


6.3.1.4 GSM-EDGE



Date: 11.MAR.2010 12:00:26

plot 6.3.1.4-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; GSM-EDGE Output



Date: 11.MAR.2010 12:02:08

plot 6.3.1.4-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Downlink; GSM-EDGE Input



6.3.2 Uplink

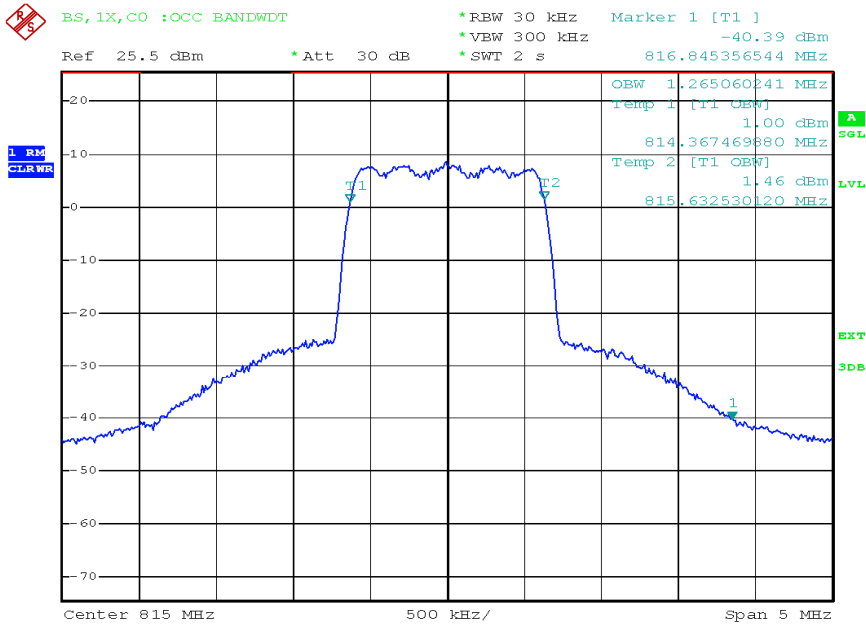
Detector: RMS.

Modulation	Measured at		RBW VBW Span	Occupied Bandwidth / MHz	Plot #
CDMA	Middle	815,0 MHz	30kHz 300kHz 5MHz	1.265	6.3.2.1 #1, #2
WCDMA	Middle	815,0 MHz	100kHz 1MHz 10MHz	4.177	6.3.2.2 #1, #2
GSM	Middle	815,0 MHz	3kHz 30kHz 1MHz	0.249	6.3.2.3 #1, #2
GSM-EDGE	Middle	815,0 MHz	3kHz 30kHz 1MHz	0.245	6.3.2.4 #1, #2

table 6.3-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN Test results Uplink

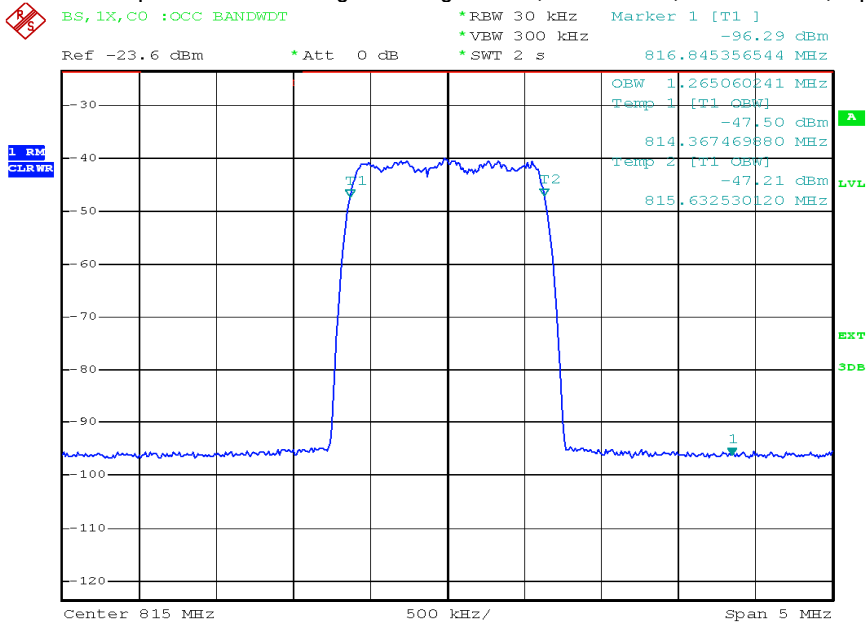


6.3.2.1 CDMA



Date: 11.MAR.2010 10:53:27

plot 6.3.2.1-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; CDMA Output

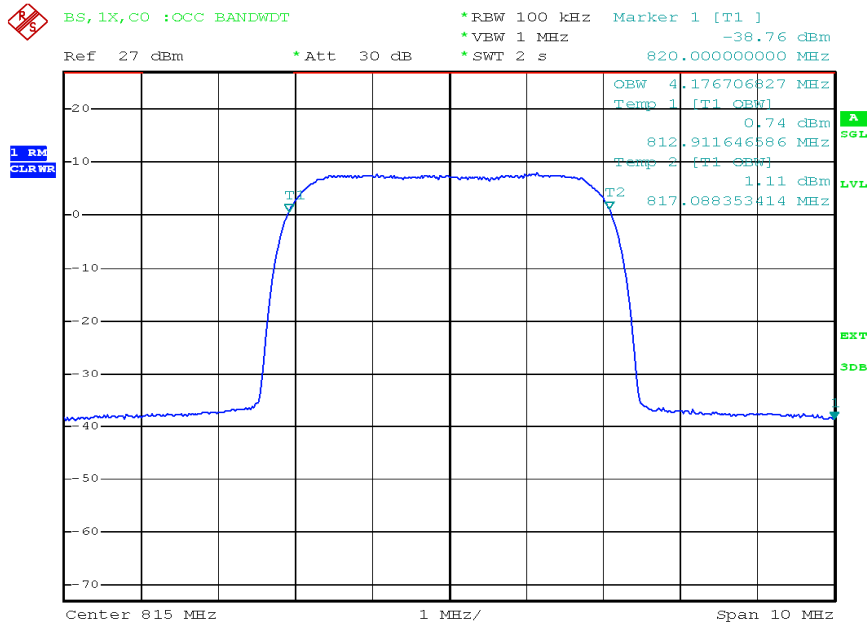


Date: 11.MAR.2010 10:55:48

plot 6.3.2.1-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; CDMA Input

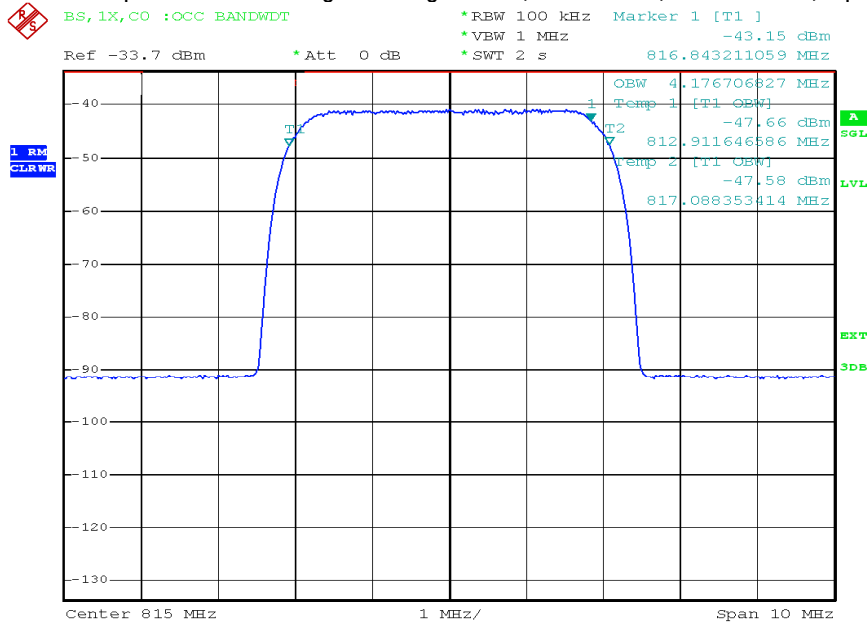


6.3.2.2 W-CDMA



Date: 11.MAR.2010 10:44:12

plot 6.3.2.2-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; W-CDMA Output

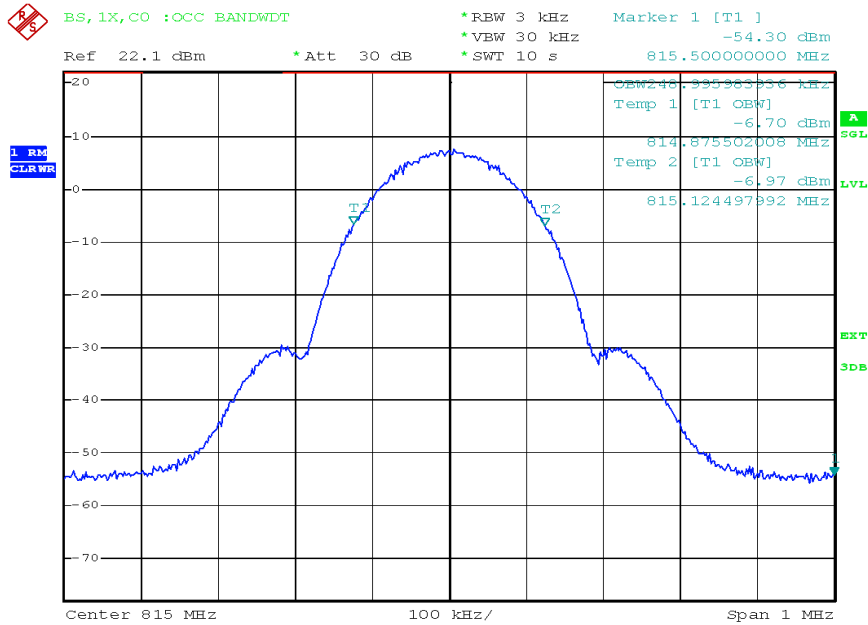


Date: 11.MAR.2010 10:46:05

plot 6.3.2.2-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; W-CDMA Input

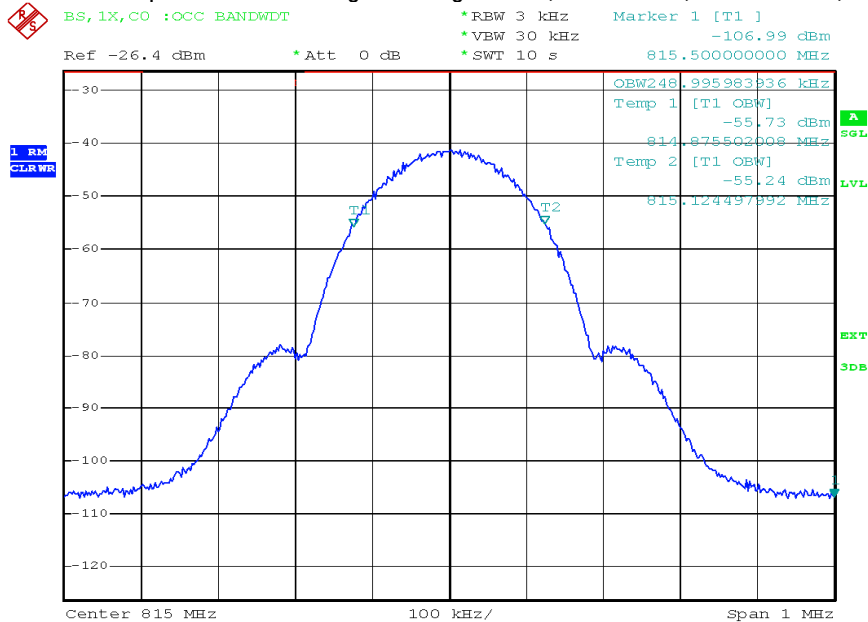


6.3.2.3 GSM



Date: 11.MAR.2010 11:19:23

plot 6.3.2.3-#1 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; GSM Output



Date: 11.MAR.2010 11:21:28

plot 6.3.2.3-#2 Occupied Bandwidth: §90.210 §2.1049; RSS-GEN; Test results; Uplink; GSM Input

EMC Test Report No.:10-091

FCC ID: XS5- MR801919

IC ID: 2237E-MR801919

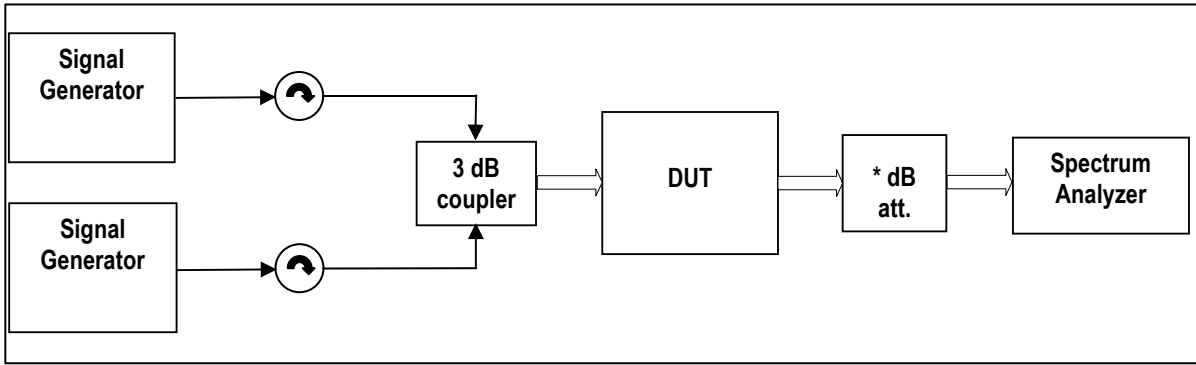


6.4 Summary test result

Test result	complies, according the plots above
Tested by:	Roland Macho
Date:	11.03.2010



7 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN



Multisignal-Generator used, External Attenuator DL x dB = 10 dB

figure 7-#1 Test setup: Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN

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	8984,8686,8687,8961,7370	

7.1 Limit

7.1.1 FCC CFR47

Minimum standard: §90.210, Table “Application Emission Mask”

Frequency Band (MHz)	Mask for equipment with Audio Low pass filter	Mask for Equipment without audio low pass filter
806–809/851–854	B	H
809–824/854–869 ³	B	G

³ Equipment used in this licensed to EA or non-EA systems shall comply with the emission mask provisions of § 90.691.

MASK	Spurious Limit
A,B,C,G,H,I	-13dBm

7.2 Test method

7.2.1 FCC CFR47

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]



7.2.2 IC RSS-GEN

4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. The same parameter, peak power or average power, used for the transmitter output power measurement shall be used for unwanted emission measurements.

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lower, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

Unless otherwise specified, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000 MHz and, an average detector with a minimum resolution bandwidth of 1 MHz for emissions above 1 GHz.

7.3 Test results

7.3.1 Downlink

<1MHz from Band Edge

Detector: RMS.

Modulation	Measured at Band Edge	Carriers	RBW VBW Span	Max. level (dBm)	Plot -
CDMA	Lower Edge Upper Edge	851,70 MHz	30kHz	-24,8	7.3.1.1 #1
		852,95 MHz 867,05 MHz 868,30 MHz	300kHz 6MHz	-24,7	#2
WCDMA	Lower Edge Upper Edge	852,4 MHz	100kHz	-35,2	7.3.1.2 #1
		857,4 MHz 861,6 MHz 866,6 MHz	300kHz 15MHz	-35,4	#2
GSM	Lower Edge Upper Edge	851,2 MHz	3kHz	-38,8	7.3.1.3 #1
		851,4 MHz 868,6 MHz 868,8 MHz	30kHz 2MHz	-40,4	#2
GSM-EDGE	Lower Edge Upper Edge	851,2 MHz	3kHz	-36,2	7.3.1.4 #1
		851,4 MHz 868,6 MHz 868,8 MHz	30kHz 2MHz	-41,2,9	#2

table 7.3-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN Test results
 Downlink <1MHz from Band Edge

>1MHz from Band Edge

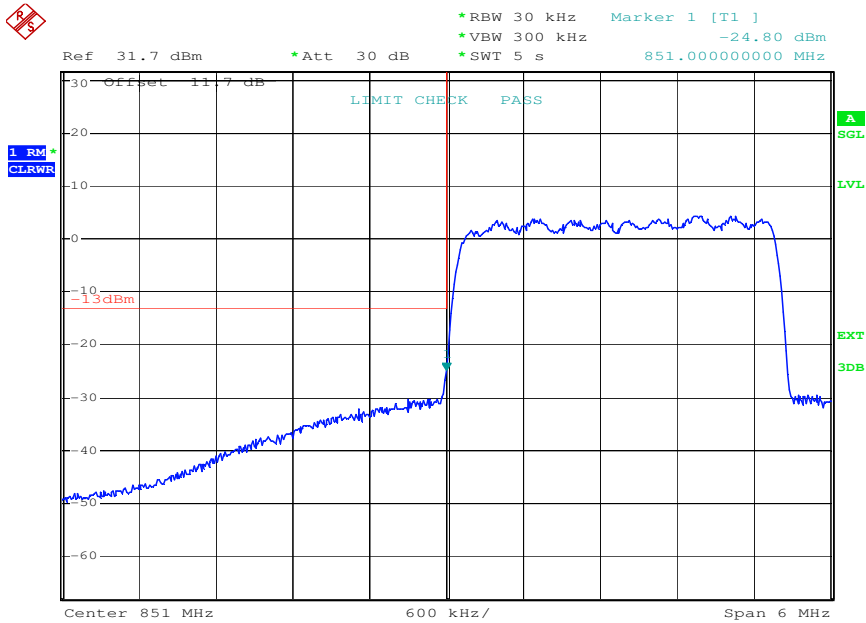
Detector: RMS.

Modulation	Link	Carrier at	Carrier	Max. level (dBm)	RBW VBW Frequency range	Plot -
CDMA	Downlink	Middle	860 MHz	-47,0	1MHz 3MHz 30MHz – 20GHz	7.3.1.5 #1
WCDMA	Downlink	Middle	860 MHz	-48,0	1MHz 3MHz 30MHz – 20GHz	7.3.1.6 #1
GSM	Downlink	Middle	860 MHz	-46,0	1MHz 3MHz 30MHz – 20GHz	7.3.1.7 #1
GSM-EDGE	Downlink	Middle	860 MHz	-47,0	1MHz 3MHz 30MHz – 20GHz	7.3.1.8 #1

table 7.3-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN Test results

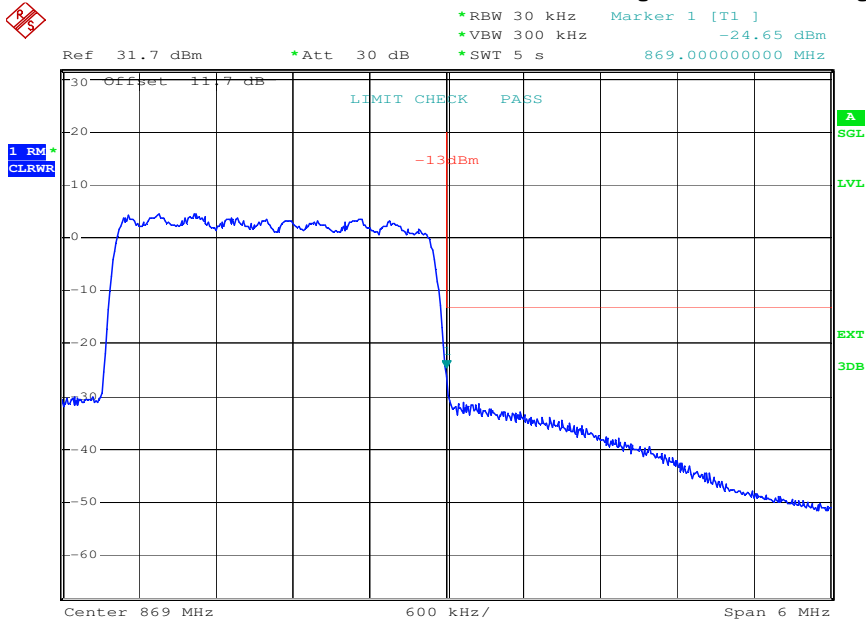


7.3.1.1 CDMA < 1MHz to band edge



Date: 10.MAR.2010 10:07:17

plot 7.3.1.1-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge Lower Band Edge

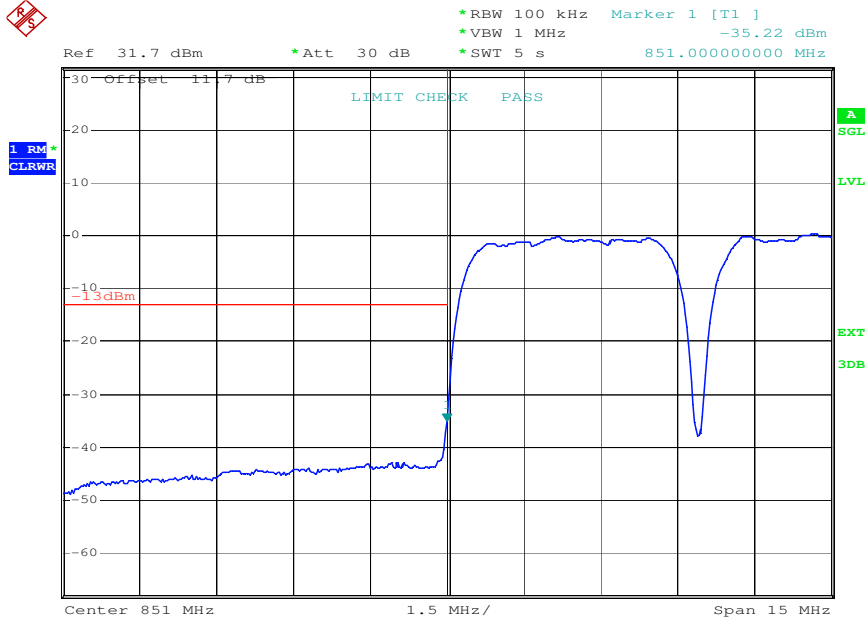


Date: 10.MAR.2010 10:07:45

plot 7.3.1.1-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA < 1MHz to band edge Upper Band Edge

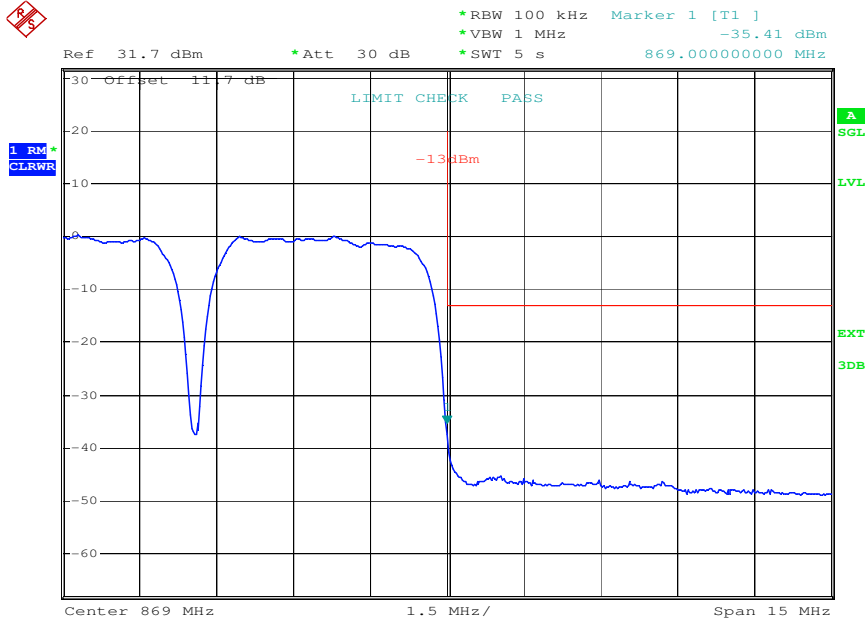


7.3.1.2 W-CDMA < 1MHz to band edge



Date: 9.MAR.2010 14:37:55

plot 7.3.1.2-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA < 1MHz to band edge Lower Band Edge

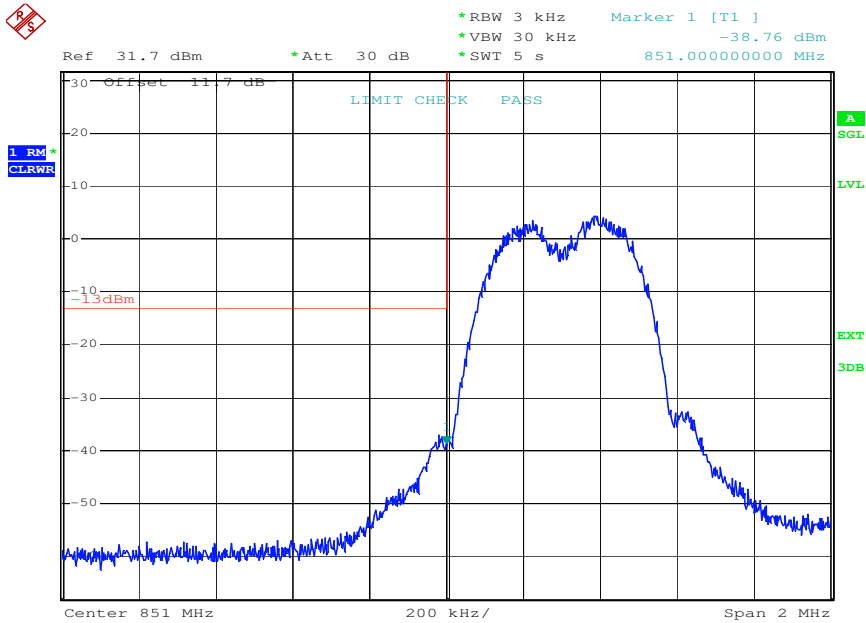


Date: 9.MAR.2010 14:38:23

plot 7.3.1.2-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA < 1MHz to band edge Upper Band Edge

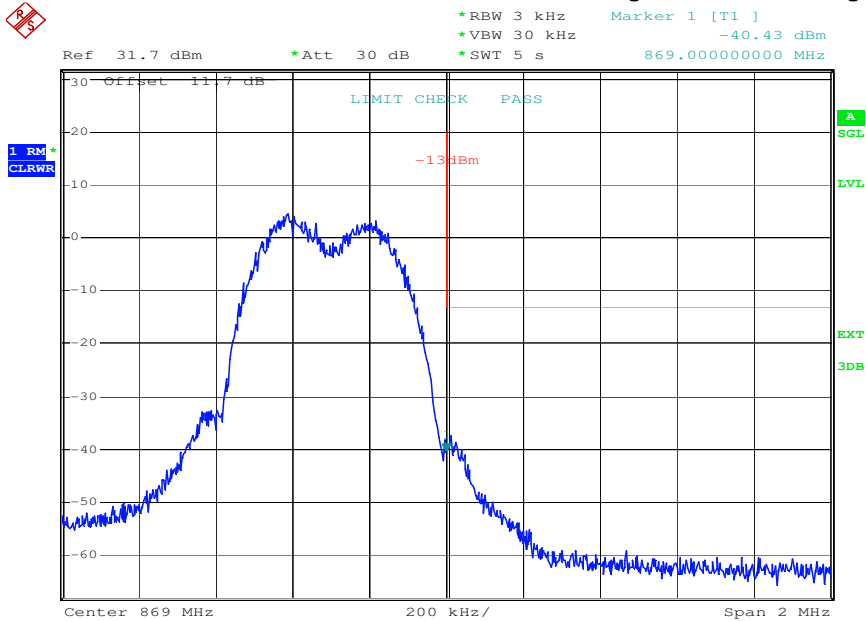


7.3.1.3 GSM < 1MHz to band edge



Date: 10.MAR.2010 10:55:00

plot 7.3.1.3-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM < 1MHz to band edge Lower Band Edge

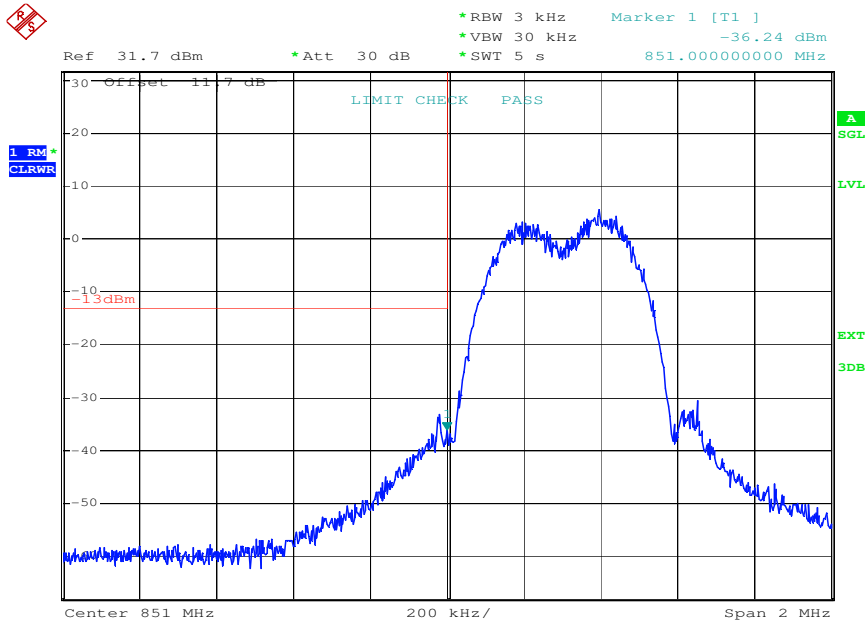


Date: 10.MAR.2010 10:55:28

plot 7.3.1.3-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM < 1MHz to band edge Upper Band Edge

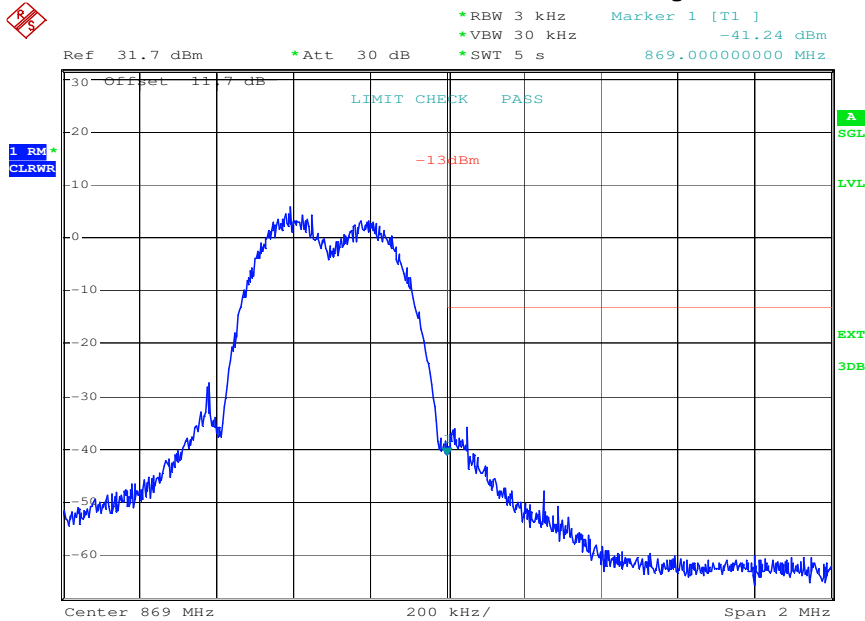


7.3.1.4 GSM-EDGE < 1MHz to band edge



Date: 10.MAR.2010 11:07:48

plot 7.3.1.4-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE < 1MHz to band edge Lower Band Edge

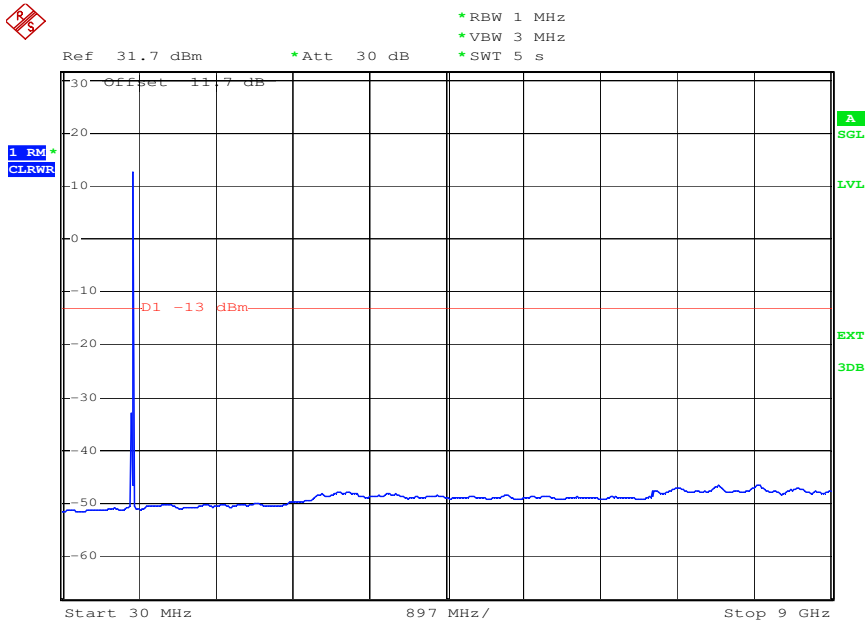


Date: 10.MAR.2010 11:08:16

plot 7.3.1.4-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE < 1MHz to band edge Upper Band Edge



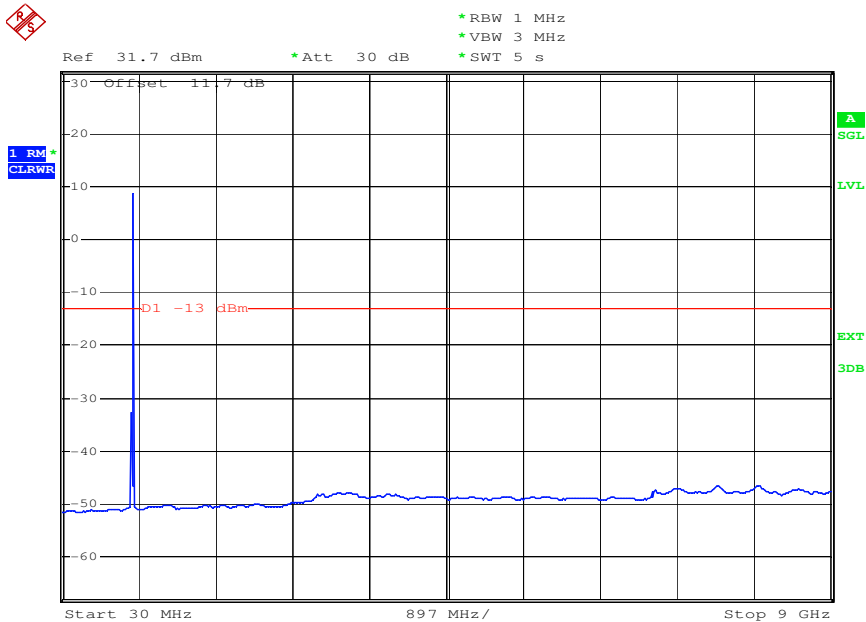
7.3.1.5 CDMA > 1MHz to band edge



Date: 10.MAR.2010 13:39:45

plot 7.3.1.5-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; CDMA > 1MHz to band edge;

7.3.1.6 W-CDMA > 1MHz to band edge

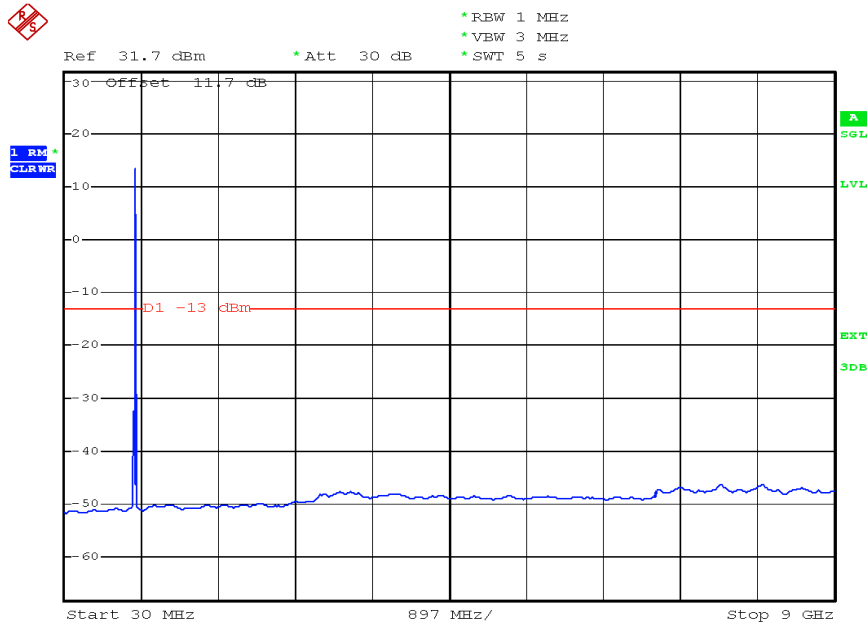


Date: 10.MAR.2010 13:15:44

plot 7.3.1.6-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; W-CDMA > 1MHz to band edge;



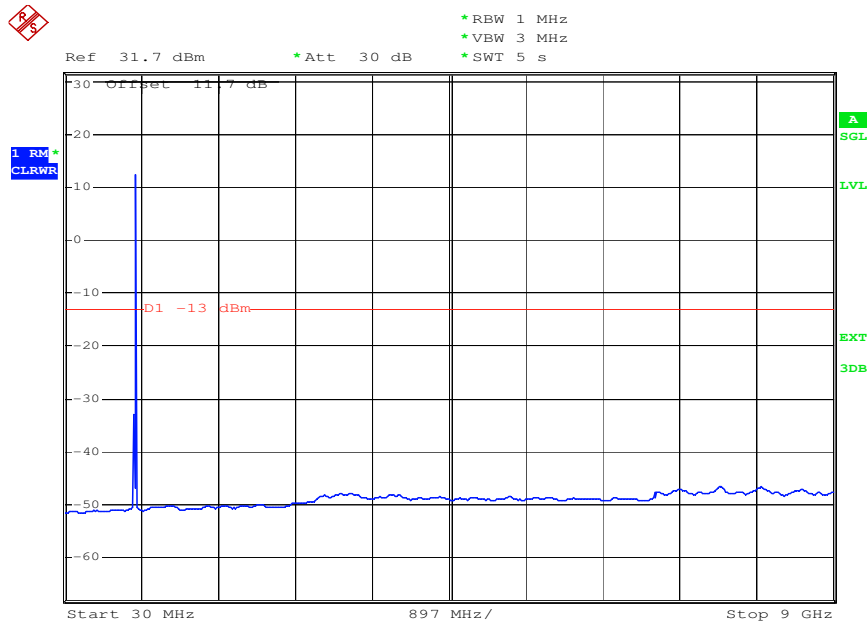
7.3.1.7 GSM > 1MHz to band edge



Date: 10.MAR.2010 16:46:11

plot 7.3.1.7-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM > 1MHz to band edge;

7.3.1.8 GSM-EDGE > 1MHz to band edge



Date: 10.MAR.2010 14:06:17

plot 7.3.1.8-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Downlink; GSM-EDGE > 1MHz to band edge;

7.3.2 Uplink

<1MHz from Band Edge

Detector: RMS.

Modulation	Measured at Band Edge	Carriers	RBW VBW Span	Max. level (dBm)	Plot -
CDMA	Lower Edge Upper Edge	806,70 MHz 807,95 MHz	30kHz 300kHz 6MHz	-22,8	7.3.2.1 #1
		822,05 MHz 823,30 MHz		-22,6	#2
WCDMA	Lower Edge Upper Edge	808,4 MHz 813,4 MHz	100kHz 300kHz 15MHz	-34,4	7.3.2.2 #1
		816,6 MHz 821,6 MHz		-35,1	#2
GSM	Lower Edge Upper Edge	806,2 MHz 806,4 MHz	3kHz 30kHz 2MHz	-37,1	7.3.2.3 #1
		823,6 MHz 823,8 MHz		-37,4	#2
GSM-EDGE	Lower Edge Upper Edge	806,2 MHz 806,4 MHz	3kHz 30kHz 2MHz	-37,5	7.3.2.4 #1
		823,6 MHz 823,8 MHz		-35,9	#2

table 7.3-#3 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN Test results
 Uplink <1MHz from Band Edge

>1MHz from Band Edge

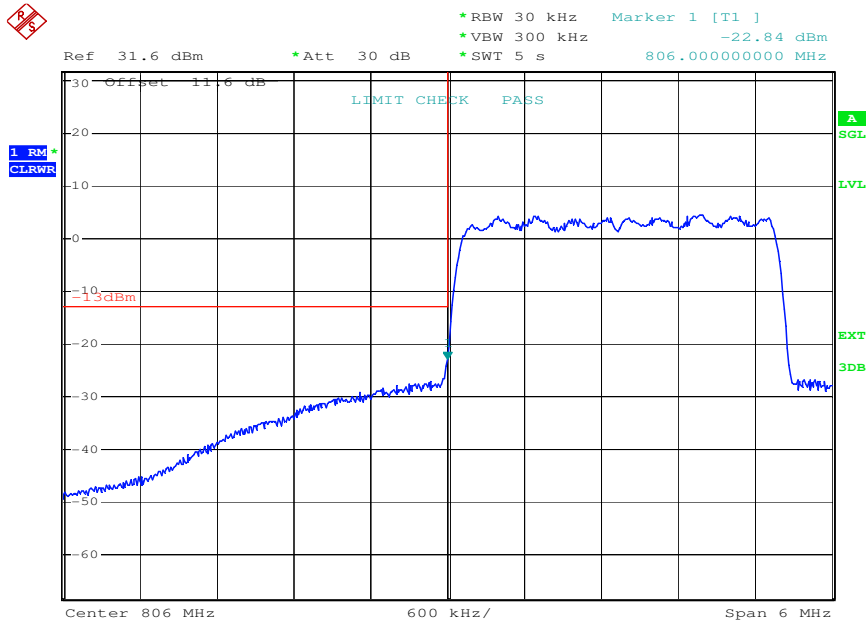
Detector: RMS.

Modulation	Carrier at	Carrier	Max. level (dBm)	RBW VBW Frequency range	Plot -
CDMA	Middle	815 MHz	-47,0	1MHz 3MHz 30MHz – 20GHz	7.3.2.5 #1
WCDMA	Middle	815 MHz	-46,5	1MHz 3MHz 30MHz – 20GHz	7.3.2.6 #1
GSM	Middle	815 MHz	-47,0	1MHz 3MHz 30MHz – 20GHz	7.3.2.7 #1
GSM-EDGE	Middle	815 MHz	-47,5	1MHz 3MHz 30MHz – 20GHz	7.3.2.8 #1

table 7.3-#4 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN Test results
 Uplink >1MHz from Band Edge

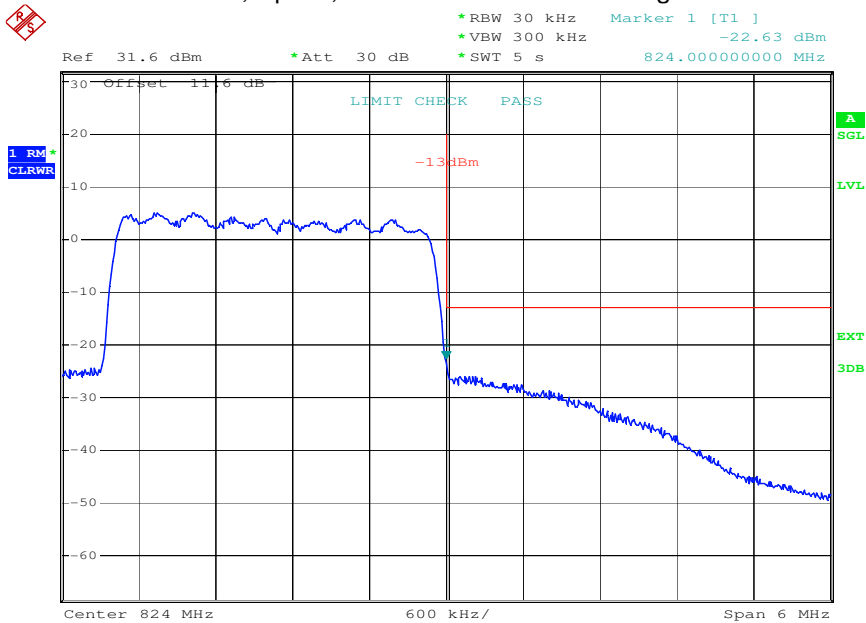


7.3.2.1 CDMA < 1MHz to band edge



Date: 10.MAR.2010 10:08:14

plot 7.3.2.1-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; CDMA < 1MHz to band edge Lower Band Edge

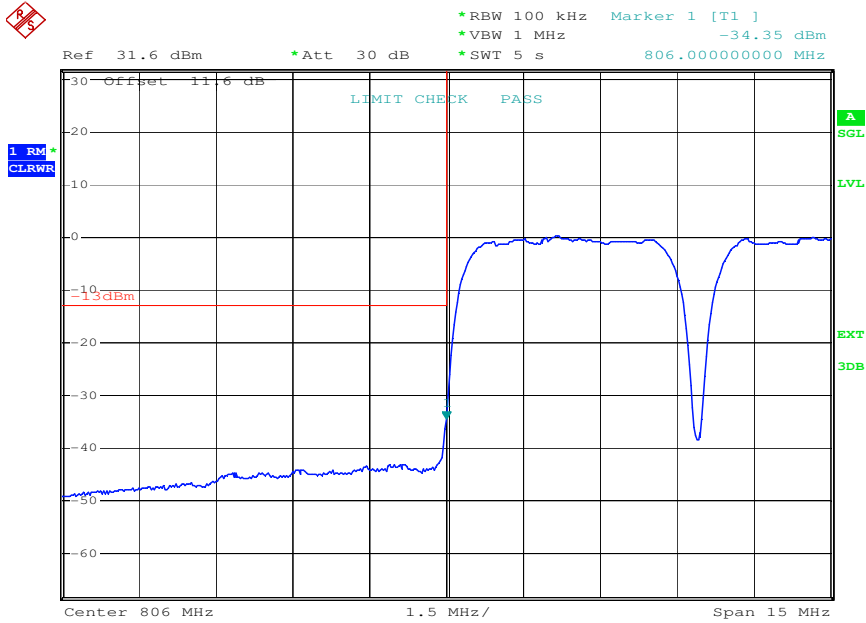


Date: 10.MAR.2010 10:08:41

plot 7.3.2.1-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; CDMA < 1MHz to band edge Upper Band Edge

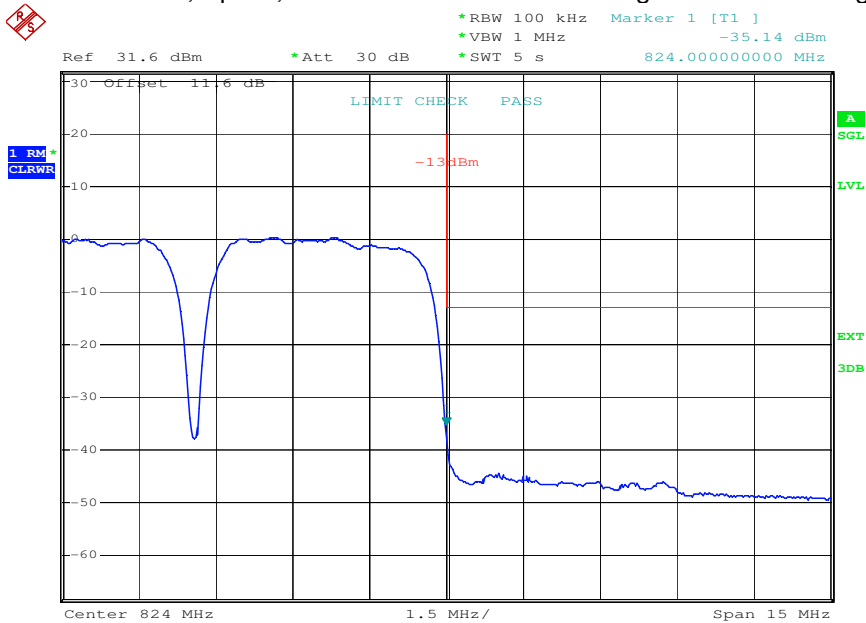


7.3.2.2 W-CDMA < 1MHz to band edge



Date: 9.MAR.2010 14:38:51

plot 7.3.2.2-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA < 1MHz to band edge Lower Band Edge

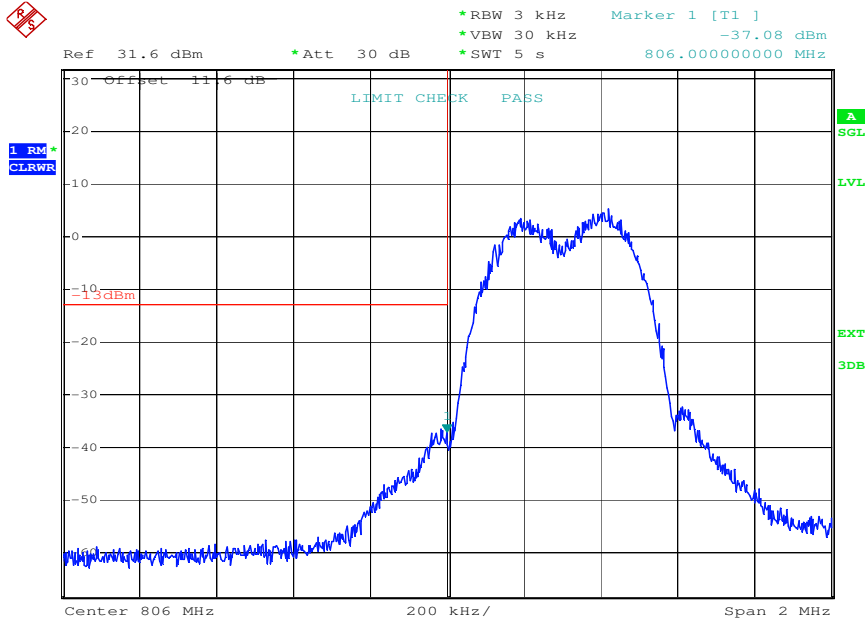


Date: 9.MAR.2010 14:39:19

plot 7.3.2.2-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA < 1MHz to band edge Upper Band Edge

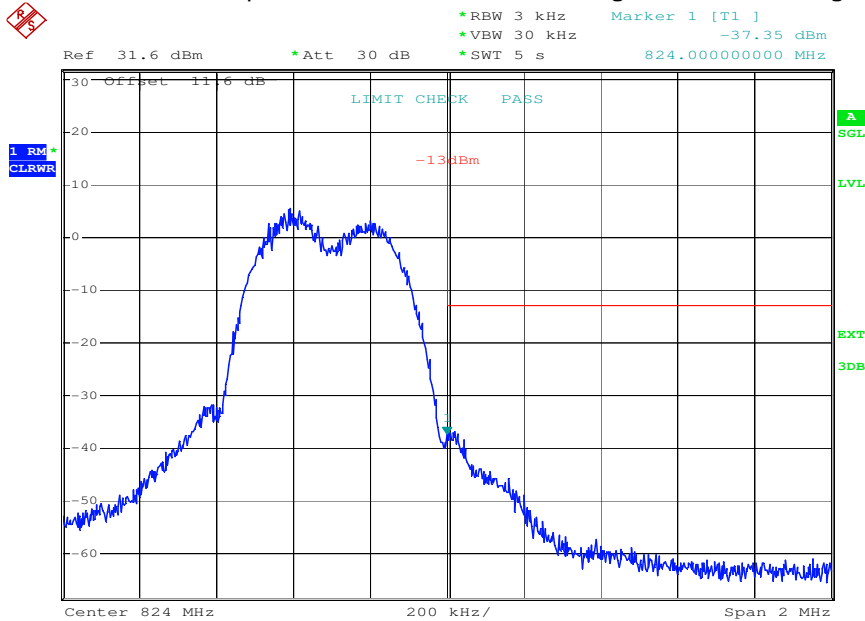


7.3.2.3 GSM < 1MHz to band edge



Date: 10.MAR.2010 10:55:56

plot 7.3.2.3-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM < 1MHz to band edge Lower Band Edge

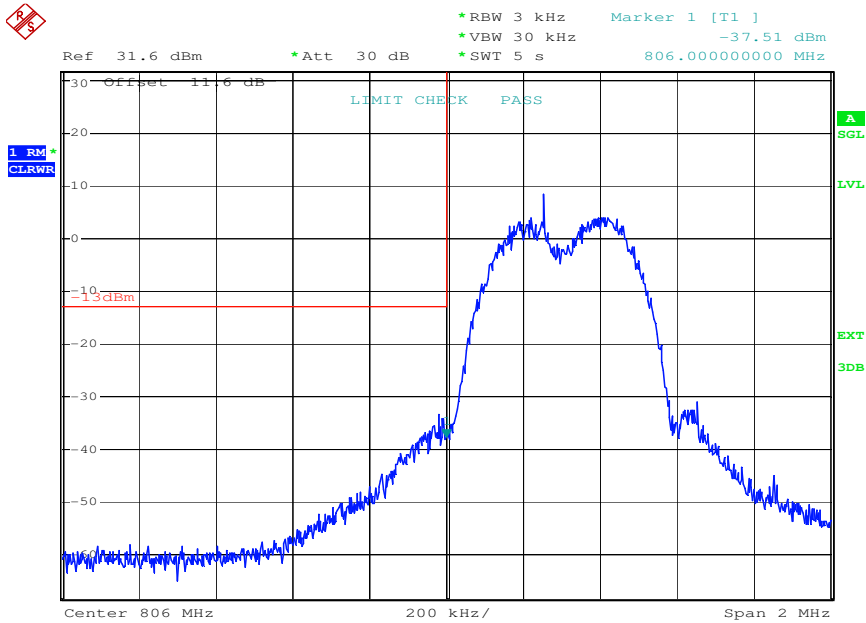


Date: 10.MAR.2010 10:56:23

plot 7.3.2.3-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM < 1MHz to band edge Upper Band Edge

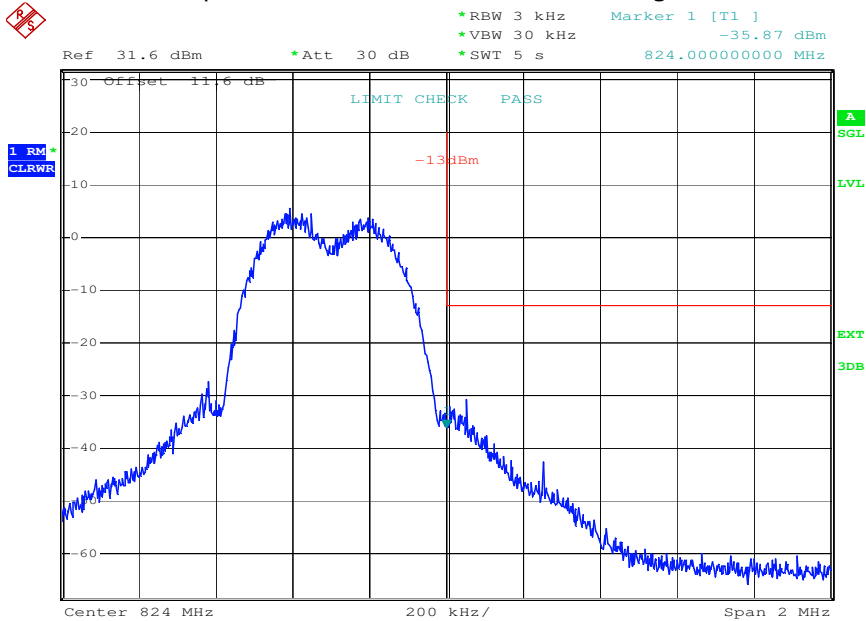


7.3.2.4 GSM-EDGE < 1MHz to band edge



Date: 10.MAR.2010 11:08:44

plot 7.3.2.4-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE < 1MHz to band edge Lower Band Edge

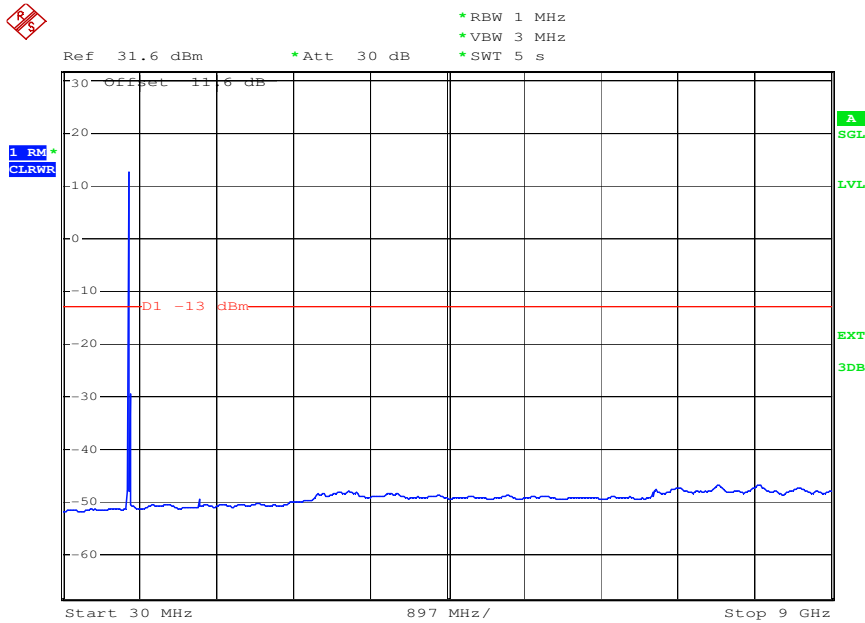


Date: 10.MAR.2010 11:09:12

plot 7.3.2.4-#2 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE < 1MHz to band edge Upper Band Edge



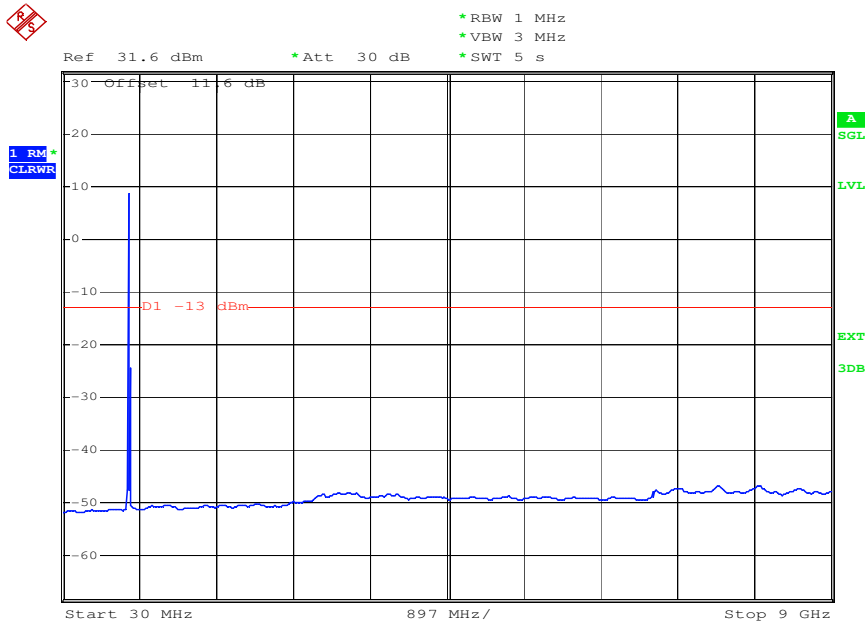
7.3.2.5 CDMA > 1MHz to band edge



Date: 10.MAR.2010 13:40:20

plot 7.3.2.5-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; CDMA > 1MHz to band edge;

7.3.2.6 W-CDMA > 1MHz to band edge

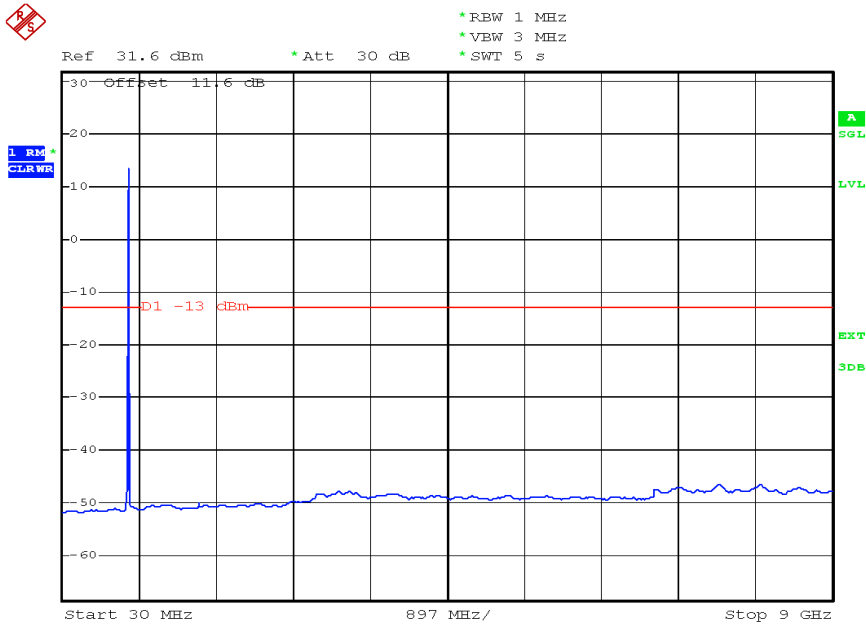


Date: 10.MAR.2010 13:16:19

plot 7.3.2.6-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; W-CDMA > 1MHz to band edge;



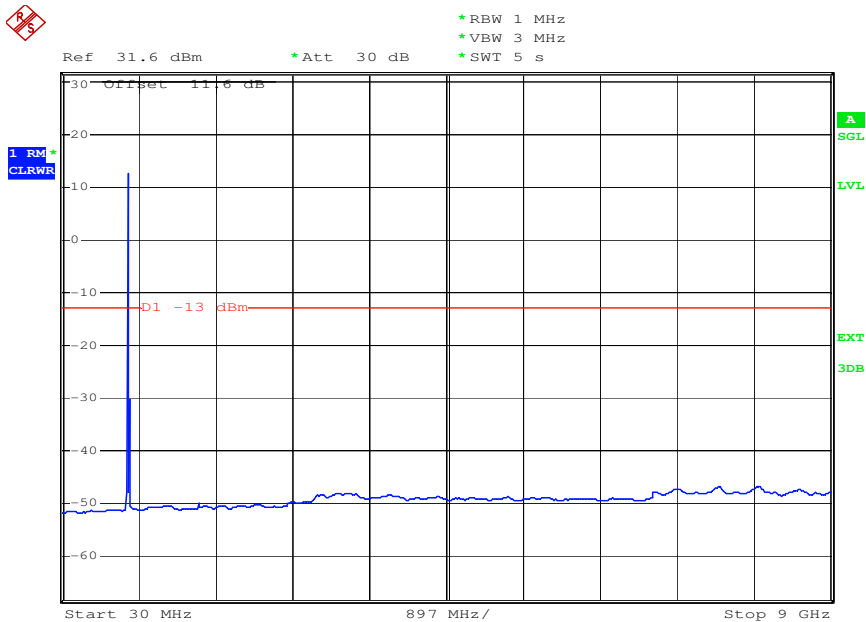
7.3.2.7 GSM > 1MHz to band edge



Date: 10.MAR.2010 16:46:47

plot 7.3.2.7-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM > 1MHz to band edge;

7.3.2.8 GSM-EDGE > 1MHz to band edge



Date: 10.MAR.2010 14:06:52

plot 7.3.2.8-#1 Spurious Emissions at Antenna Terminals: §90.210, §2.1051; RSS-131, RSS-GEN; Test results; Uplink; GSM-EDGE > 1MHz to band edge;

EMC Test Report No.:10-091

FCC ID: XS5- MR801919

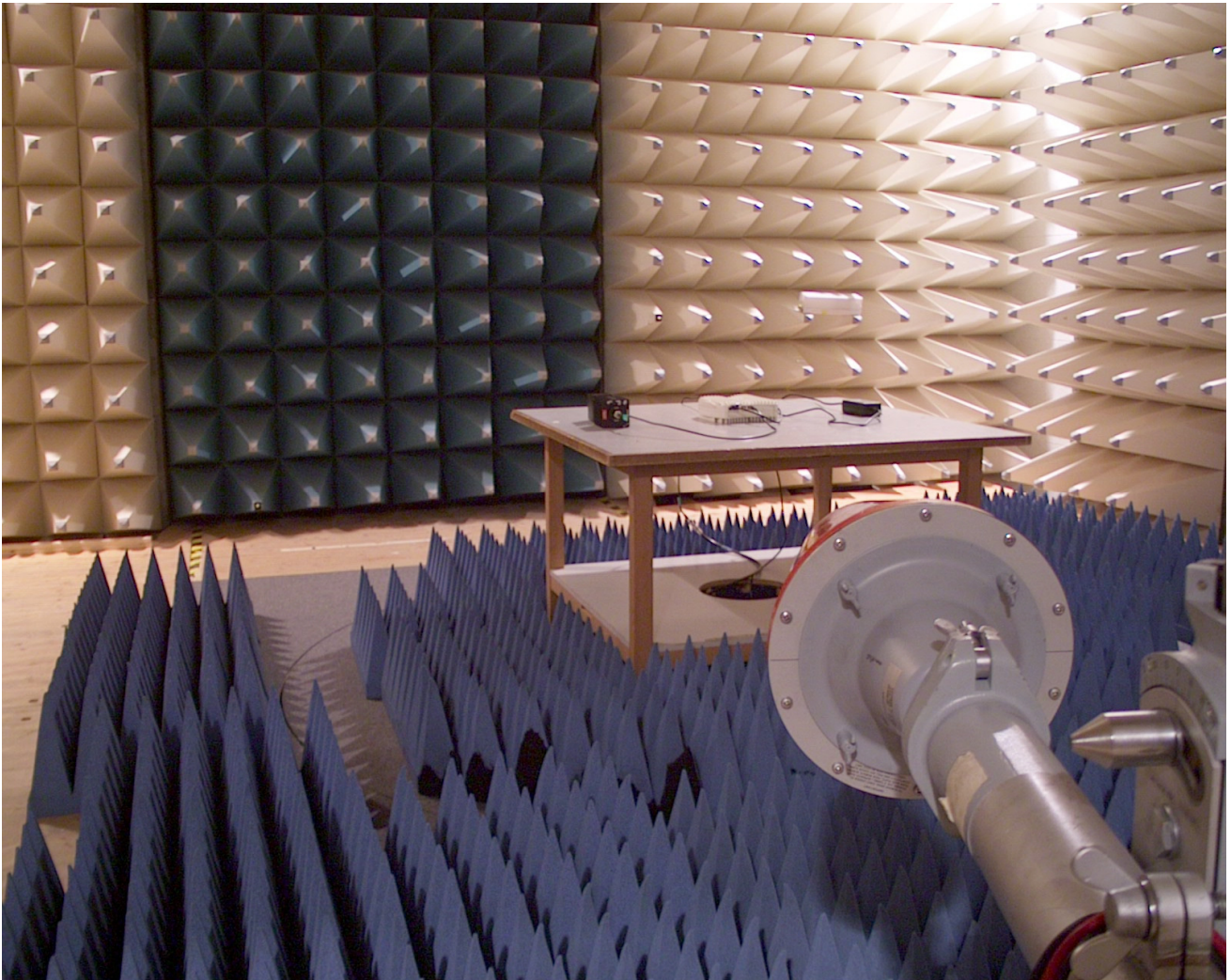
IC ID: 2237E-MR801919



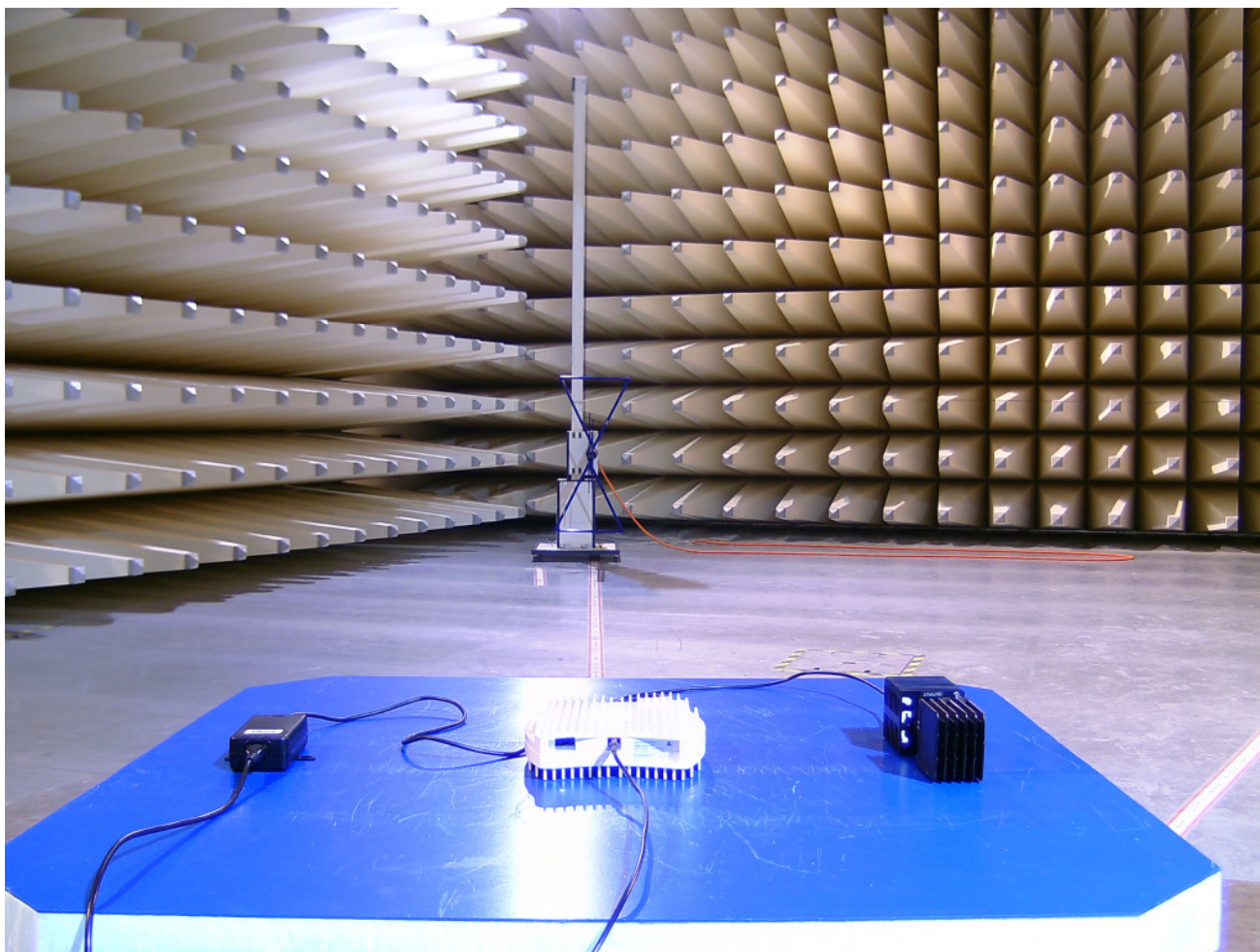
7.4 Summary test result

Test result	complies, according the plots above
Tested by:	Roland Macho
Date:	10.03.2010

8 Radiated Spurious Emissions: §90.543, §2.1053, RSS-131



picture 7.1: Test setup: Field Strength Emission >1 GHz @3m in the FAC



picture 7.2: Test setup: Field Strength Emission <1 GHz @10m in the SAC

This clause specifies requirements for the measurement of radiated emission.

Frequency range	Distance: EUT <-> antenna / location	Limit	Test method
30 MHz - 1 GHz	10 metres / SAC	FCC 47 CFR Part 90.543 IC RSS-131 sec. 6.4	TIA/EIA-603-C:2004
1 GHz – 9 GHz	3 metres / FAC	FCC 47 CFR Part 90.543 IC RSS-131 sec. 6.4	

Test equipment used:

Designation	Type	Manufacturer	Invent.-no.	Cal.-date	due Cal.- date	used
EMI test receiver	ESI40	Rohde & Schwarz	E1687	20.10.2009	20.10.2010	X
EMI test receiver	ESI40	Rohde & Schwarz	E1607	04.03.2009	04.03.2010	
Antenna	CBL 6111	Chase	K1149	14.09.2009	14.09.2010	X
Antenna	CBL 6111	Chase	K1026	14.09.2009	14.09.2010	
RF Cable		Frankonia	K1121 SET	28.12.2009	28.12.2010	X
Pre amplifier	AM1431	Miteq	K1721	27.04.2009	27.04.2010	X
Antenna	HL 025	R&S	K809	06.05.2009	06.05.2010	X
Antenna	MWH-1826 / B	ARA Inc.	K1042	06.04.2009	06.04.2010	
Antenna	MWH-2640 / B	ARA Inc.	K1043	06.04.2009	06.04.2010	
Preamplifier	AFS4-00102000	Miteq	K817	11.11.2009	11.11.2010	X
Preamplifier	AFS4-00102000	Miteq	K838	06.10.2009	06.10.2010	
Preamplifier	JS43-1800-4000	Miteq	K1104	26.08.2009	26.08.2010	
RF Cable	Sucoflex 100	Suhner	K1742	09.04.2009	09.04.2010	X

The Tile-Software Version 4 has been used to maximize radiated emission from the EUT in the frequency area up to 1 GHz. Above 1 GHz the REMI version 2.135 has been used for max search.

Test set-up:

Test location: SAC/FAC
 Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

Test Voltage: 115V / 60 Hz
 Type of EUT: Wall mounted

Measurement uncertainty:

Measurement uncertainty expanded (95% or K=2)	± 4,7 dB for ANSI C63.4 measurement ± 0,5 dB for TIA-603 measurement
--	---



8.1 Method of Measurement

Measurement procedure. TIA-603-C

The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic dipole (see Figure 7.2).

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 maximum RFI field strength was determined during the measurement 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. A measurement receiver has been used with a RBW 120 kHz up to 1 GHz and 1 MHz above 1 GHz. Steps with during pre measurement was half the RBW.

Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

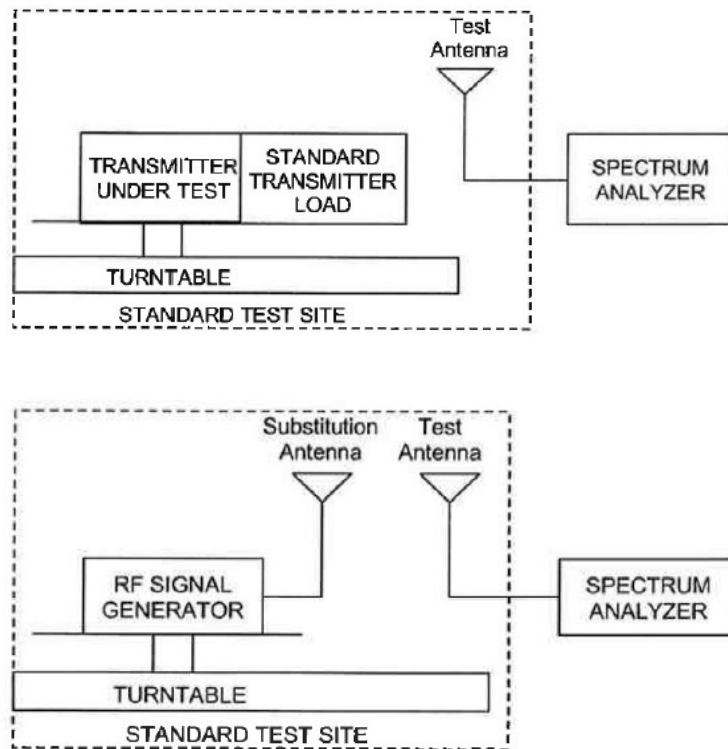


Figure #7.2 Substitution methods TIA/EIA-603-C



8.2 Limit

§90.210 Emission masks / RSS-GEN sec. 4.9; RSS-131 sec. 6.4

Frequency band (MHz)	Mask for equipment with Audio low pass filter	Mask for equipment without audio low pass filter
806–809/851–854	B	H
809–824/854–869	B	G

(g) *Emission Mask G.* For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(2) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

(h) *Emission Mask H.* For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(5) On any frequency removed from the center of the authorized bandwidth by more than 25 kHz: At least $43 + \log (P)$ dB.

The Emission limit is -13dBm

8.3 Climatic values in the lab

Temperature: 21 °
Relative Humidity: 46%
Air-pressure: 1002 hPa

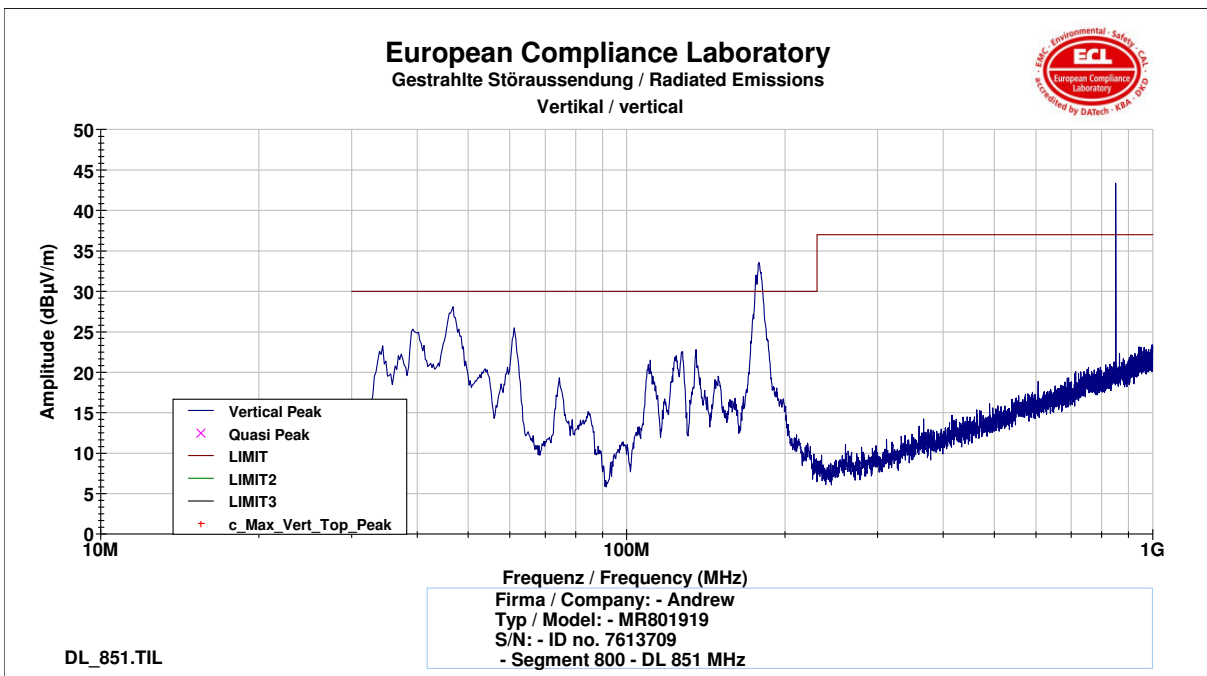
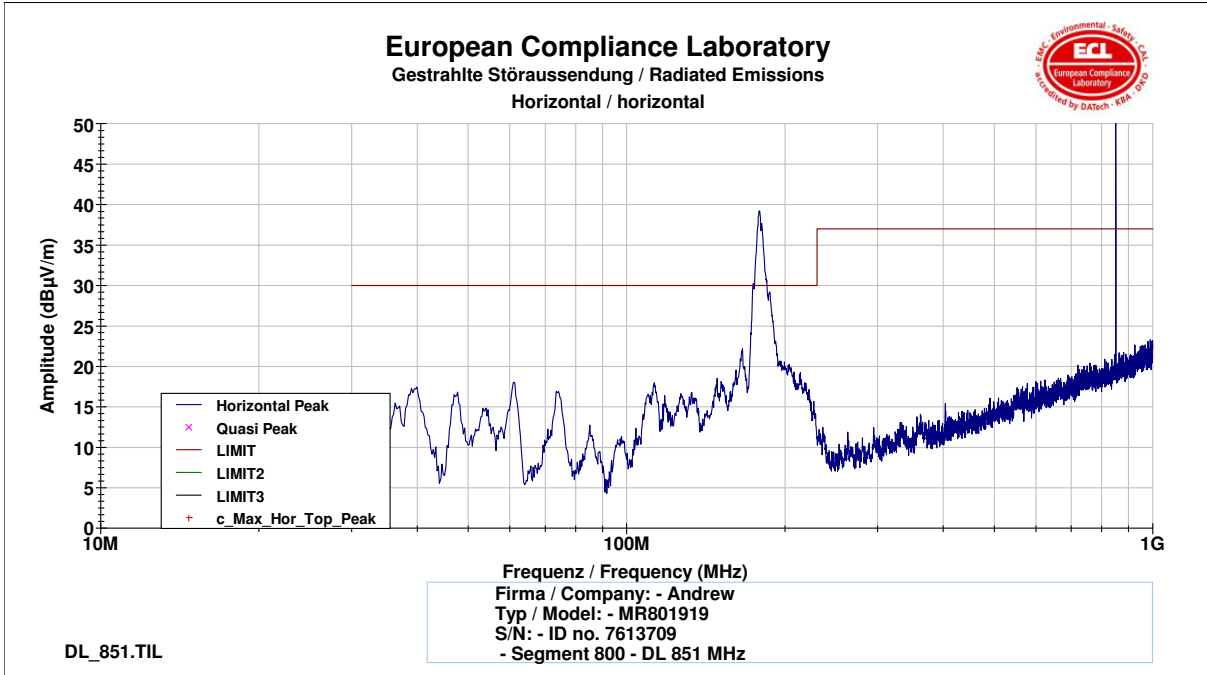


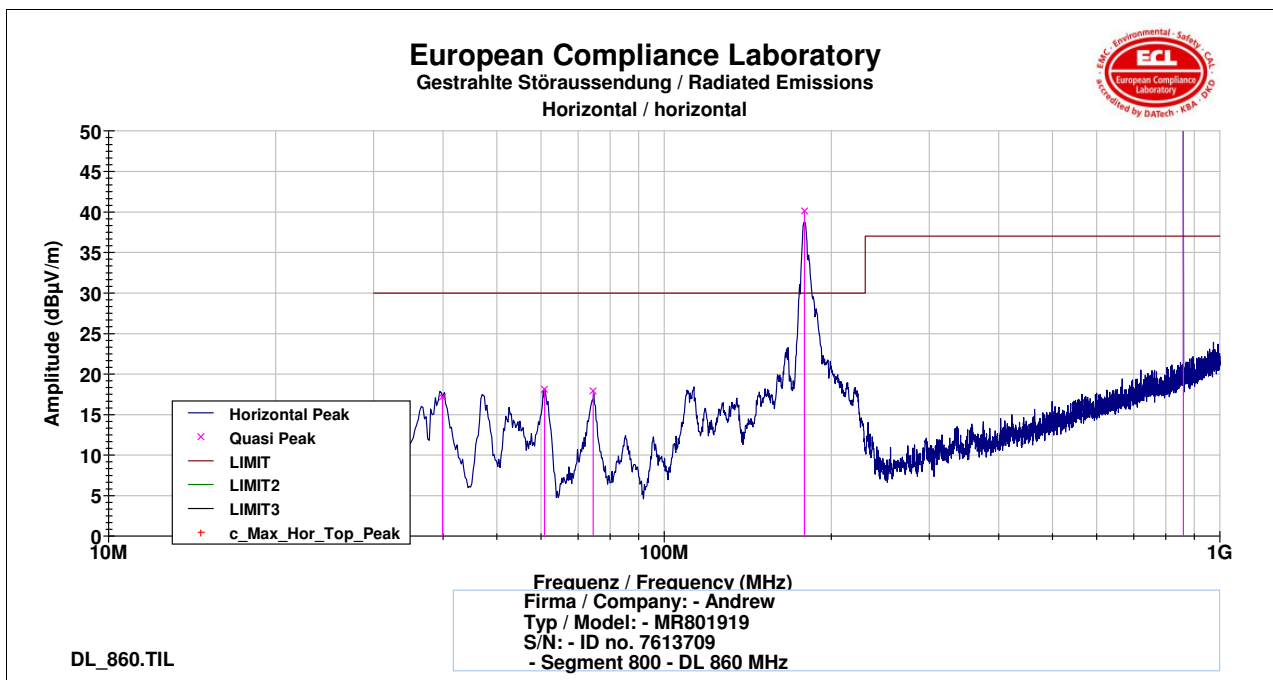
8.4 Test results

8.4.1 Premeasurements

8.4.1.1 30 MHz to 1 GHz Downlink (Bottom – Middle – Top)

Bottom:

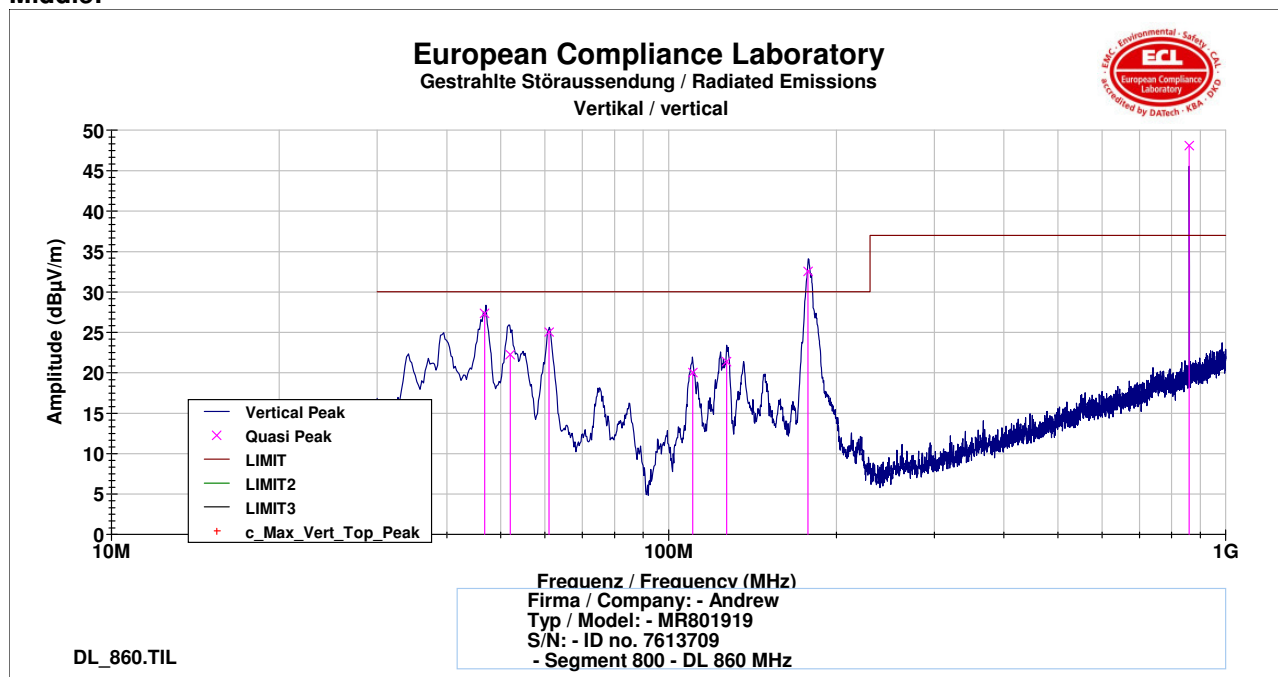




Frequency	Polarisation	Height	TT-Position	Cable Loss	Antenna Factor	Reading	Field Intensity	Limit	Margin
[MHz]	H/V	[cm]	[°]	(dB)	(dB/m)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
39.9054	H	398	-158	37.011	12.438	41.741	17.167	30.000	12.833
60.9162	H	398	157	36.715	4.355	50.487	18.128	30.000	11.872
74.4694	H	396	-69	36.588	7.015	47.497	17.924	30.000	12.076
178.893	H	397	85	35.832	9.150	66.789	40.108	30.000	-10.108
859.98	H	317	-52	32.517	22.780	66.335	56.598	37.000	-19.598



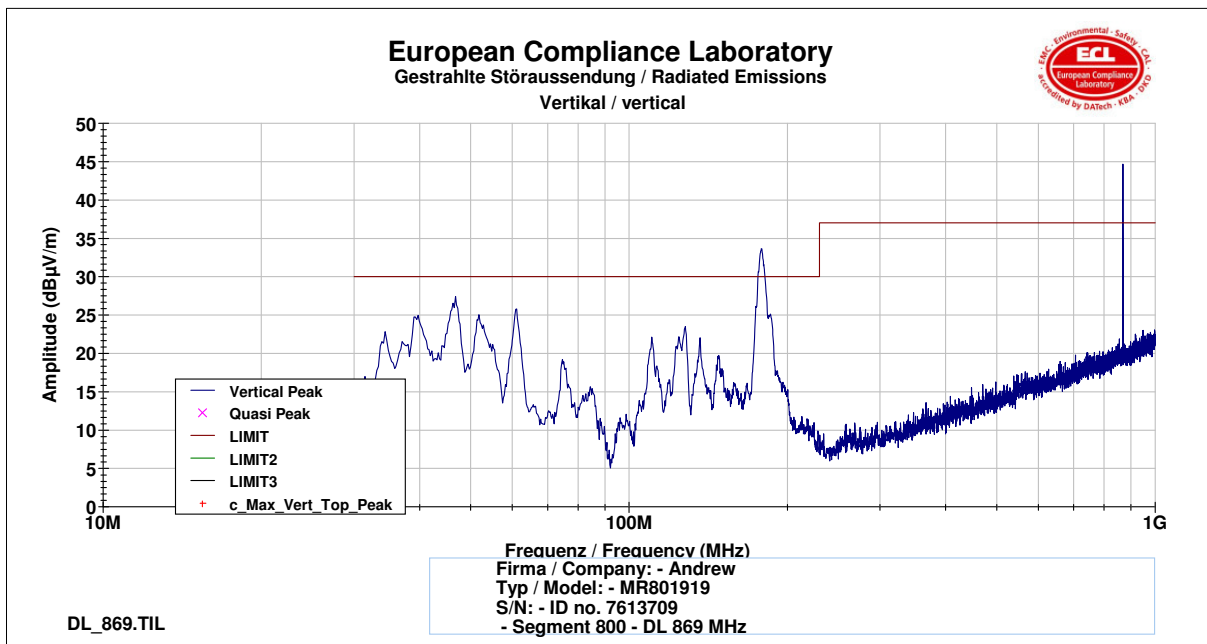
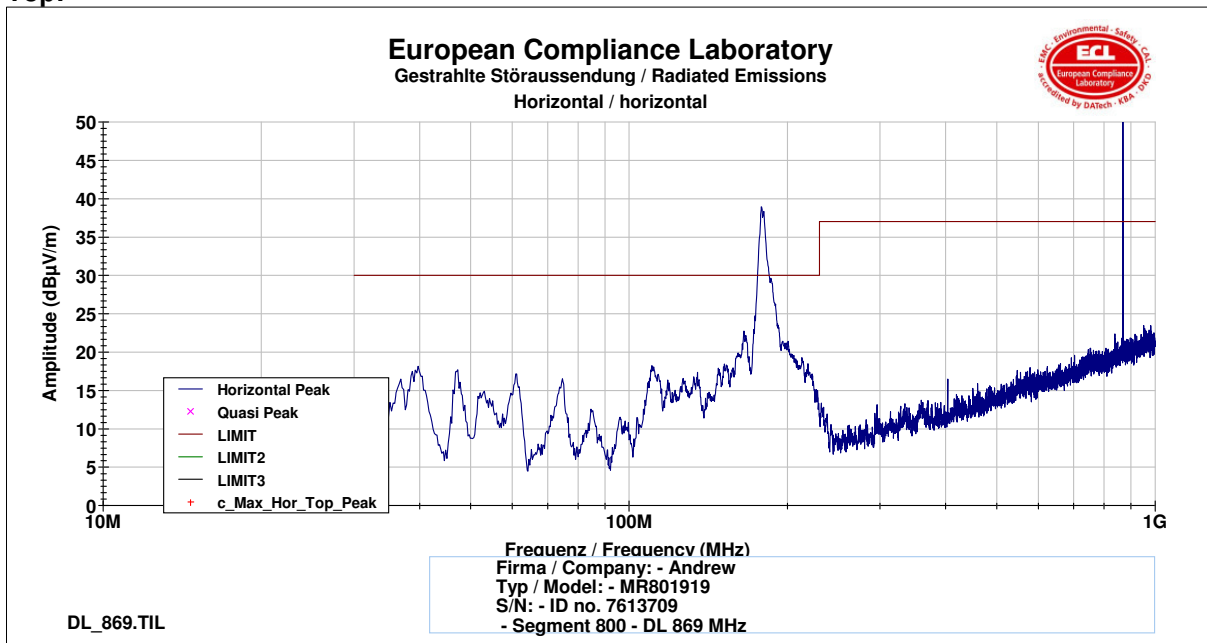
Middle:



Frequency	Polarisation	Height	TT-Position	Cable Loss	Antenna Factor	Reading	Field Intensity	Limit	Margin
[MHz]	H/V	[cm]	[°]	(dB)	(dB/m)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
46.769	V	107	52	36.914	9.674	54.579	27.340	30.000	2.660
51.9887	V	323	-31	36.840	7.637	51.460	22.257	30.000	7.743
61.0422	V	231	152	36.713	4.363	57.382	25.031	30.000	4.969
110.548	V	114	123	36.287	11.155	45.163	20.031	30.000	9.969
127.134	V	108	145	36.174	12.172	45.380	21.379	30.000	8.621
177.981	V	108	32	35.842	9.191	59.180	32.529	30.000	-2.529
859.98	V	228	-84	32.517	22.780	57.823	48.086	37.000	-11.086



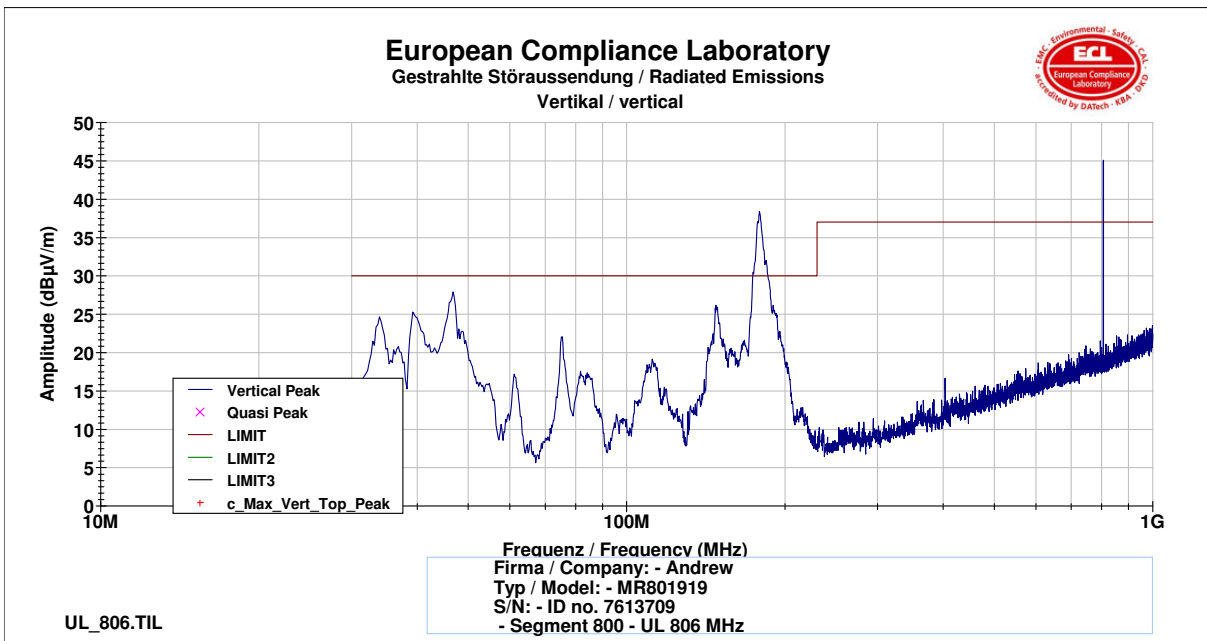
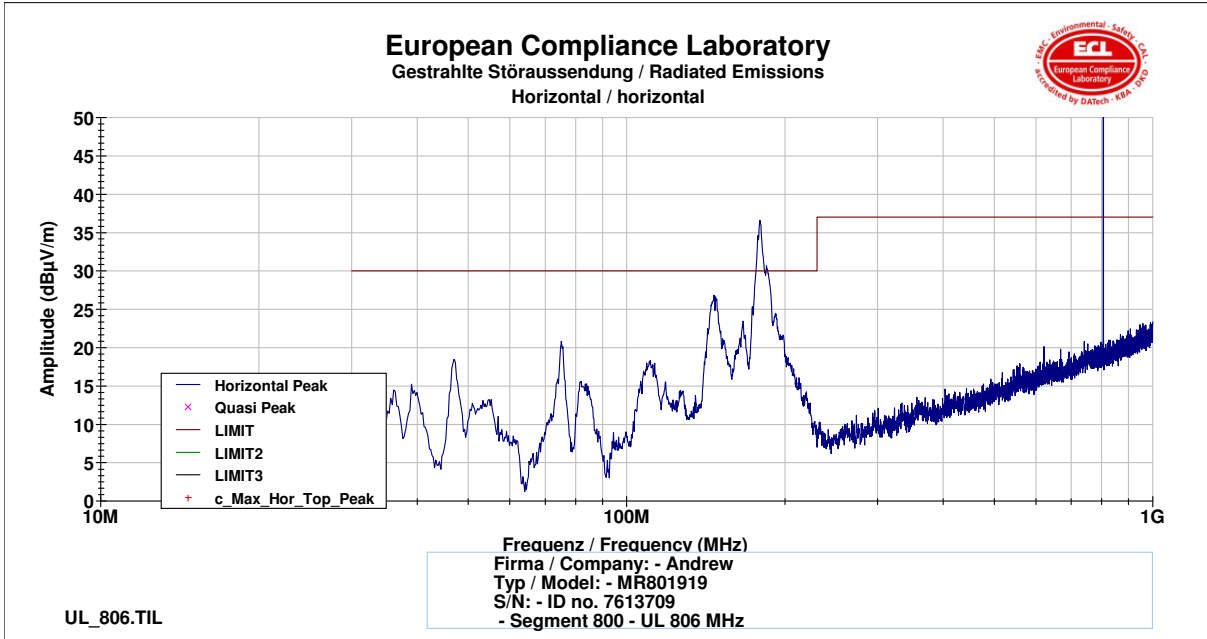
Top:





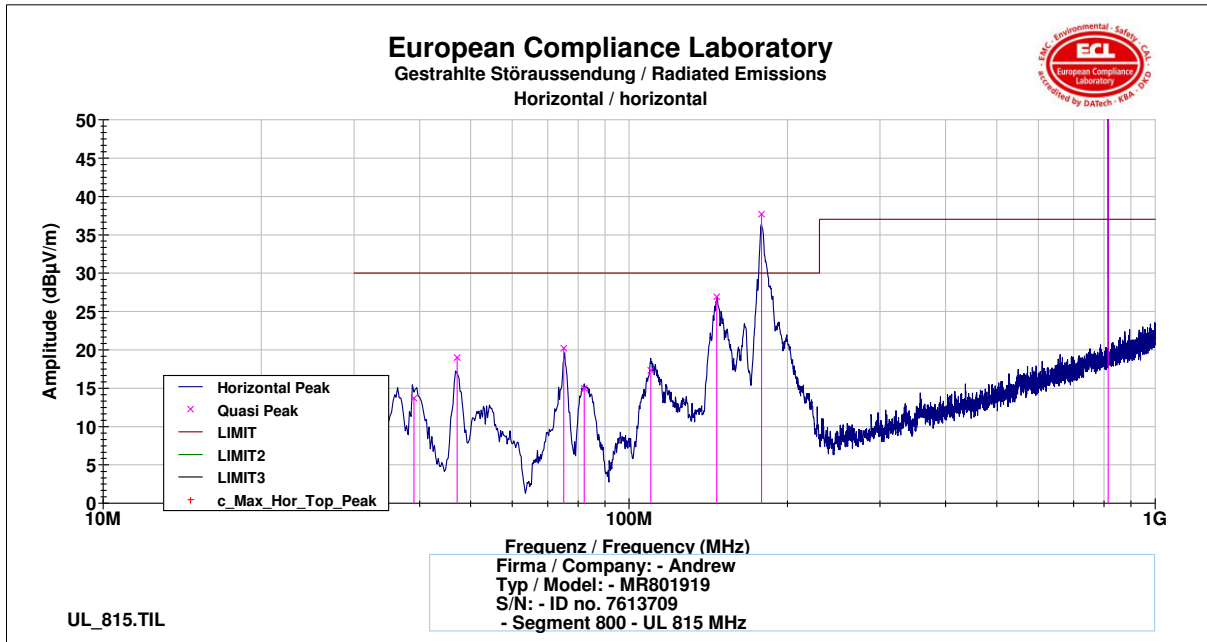
8.4.1.2 30 MHz to 1 GHz Uplink (Bottom – Middle – Top)

Bottom:

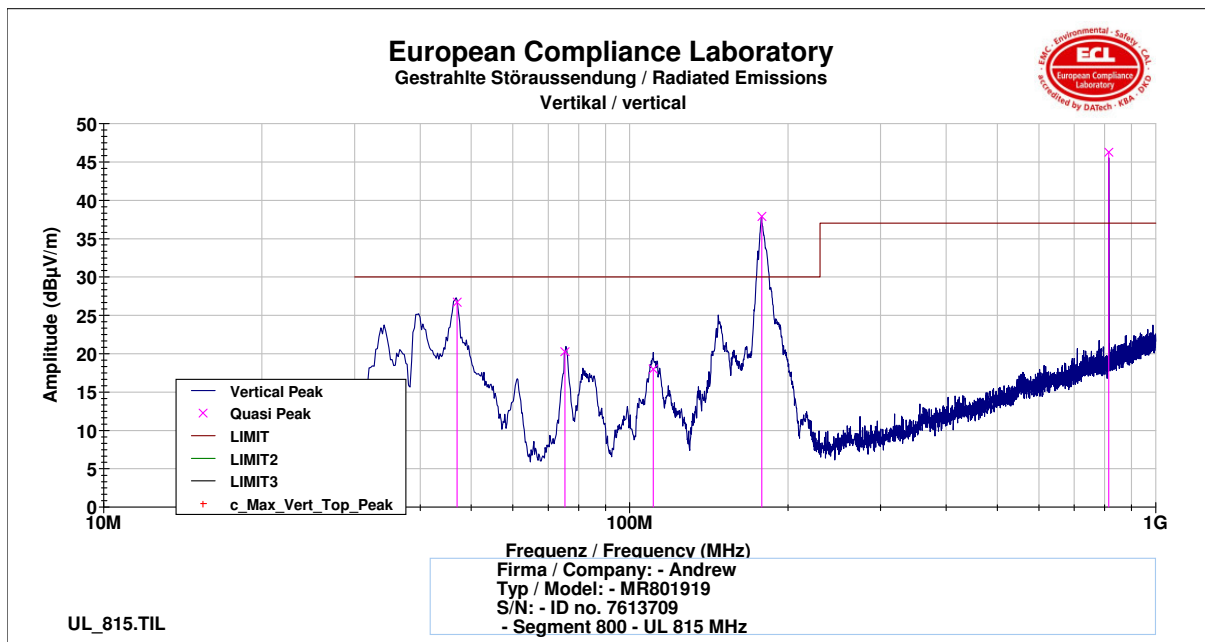




Middle:



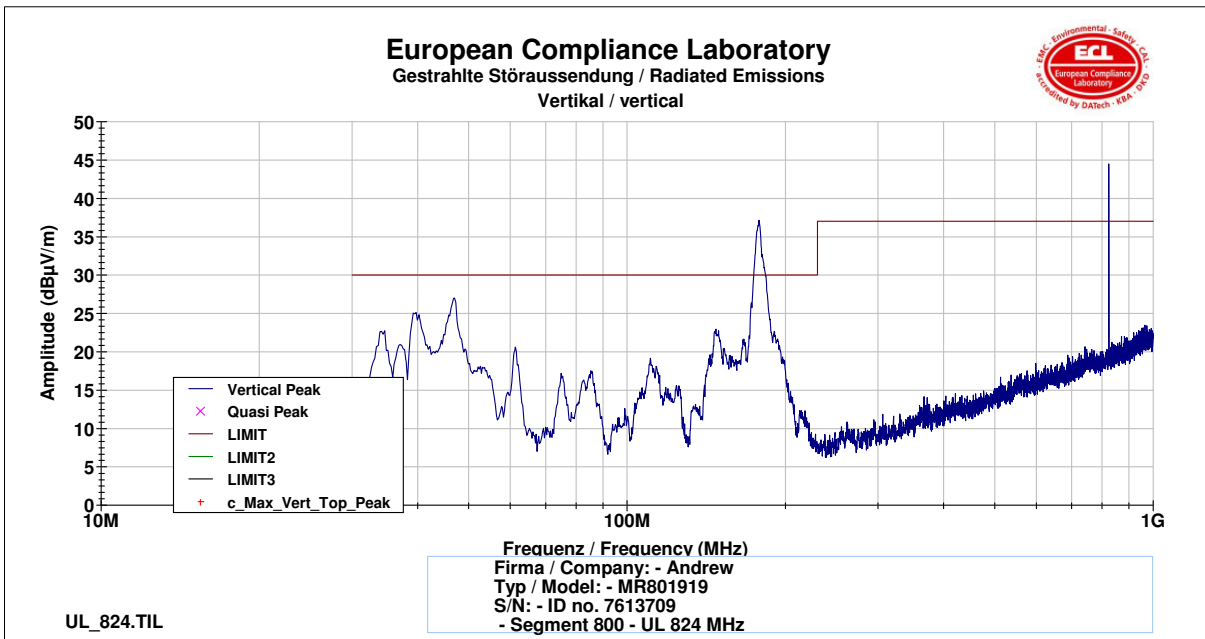
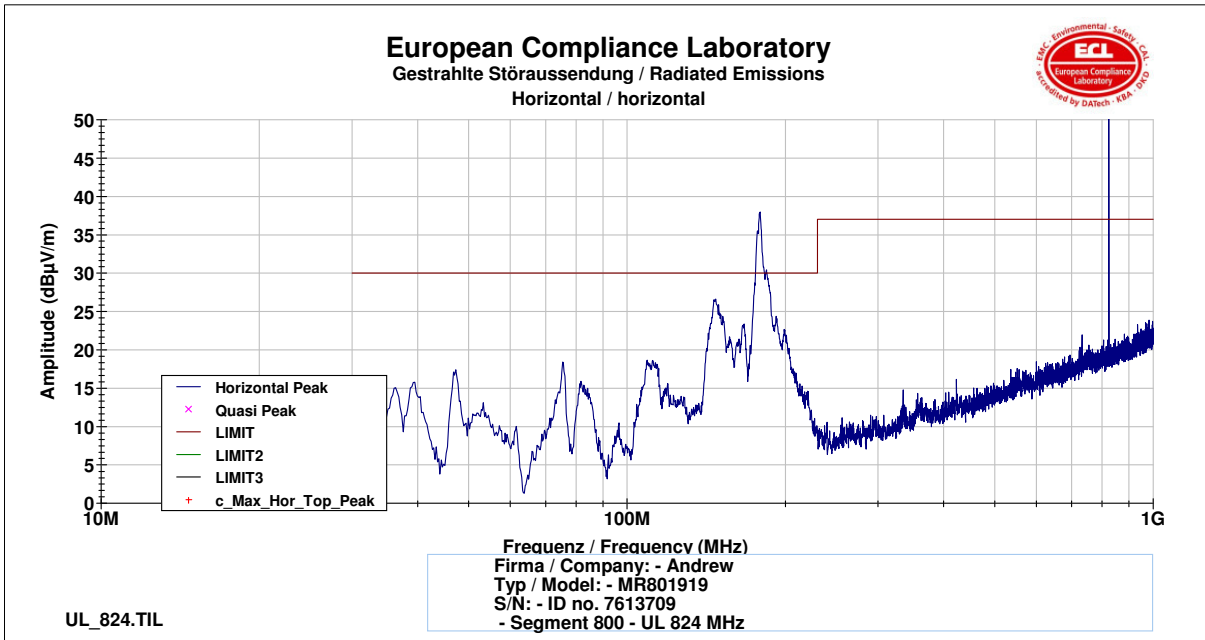
Frequency	Polarisation	Height	TT-Position	Cable Loss	Antenna Factor	Reading	Field Intensity	Limit	Margin
[MHz]	H/V	[cm]	[°]	(dB)	(dB/m)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
38.9875	H	396	54	37.027	12.805	37.916	13.694	30.000	16.306
47.129	H	396	20	36.909	9.506	46.395	18.993	30.000	11.007
75.1384	H	397	-52	36.582	7.121	49.646	20.185	30.000	9.815
82.122	H	396	-69	36.524	8.168	43.337	14.982	30.000	15.018
109.942	H	396	-121	36.293	11.095	42.531	17.334	30.000	12.666
146.816	H	379	-86	36.137	10.873	52.183	26.918	30.000	3.082
178.704	H	398	105	35.834	9.158	64.341	37.666	30.000	-7.666
814.968	H	125	-33	32.365	22.099	66.155	55.889	37.000	-18.889



Frequency	Polarisation	Height	TT-Position	Cable Loss	Antenna Factor	Reading	Field Intensity	Limit	Margin
[MHz]	H/V	[cm]	[°]	(dB)	(dB/m)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
47.006	V	103	17	36.910	9.564	54.052	26.705	30.000	3.295
75.3814	V	391	-35	36.579	7.157	49.672	20.250	30.000	9.750
110.854	V	154	69	36.284	11.185	43.091	17.992	30.000	12.008
178.461	V	101	122	35.836	9.169	64.553	37.885	30.000	-7.885
814.968	V	202	-92	32.365	22.099	56.526	46.259	37.000	-9.259



Top:





8.4.2 Final measurements

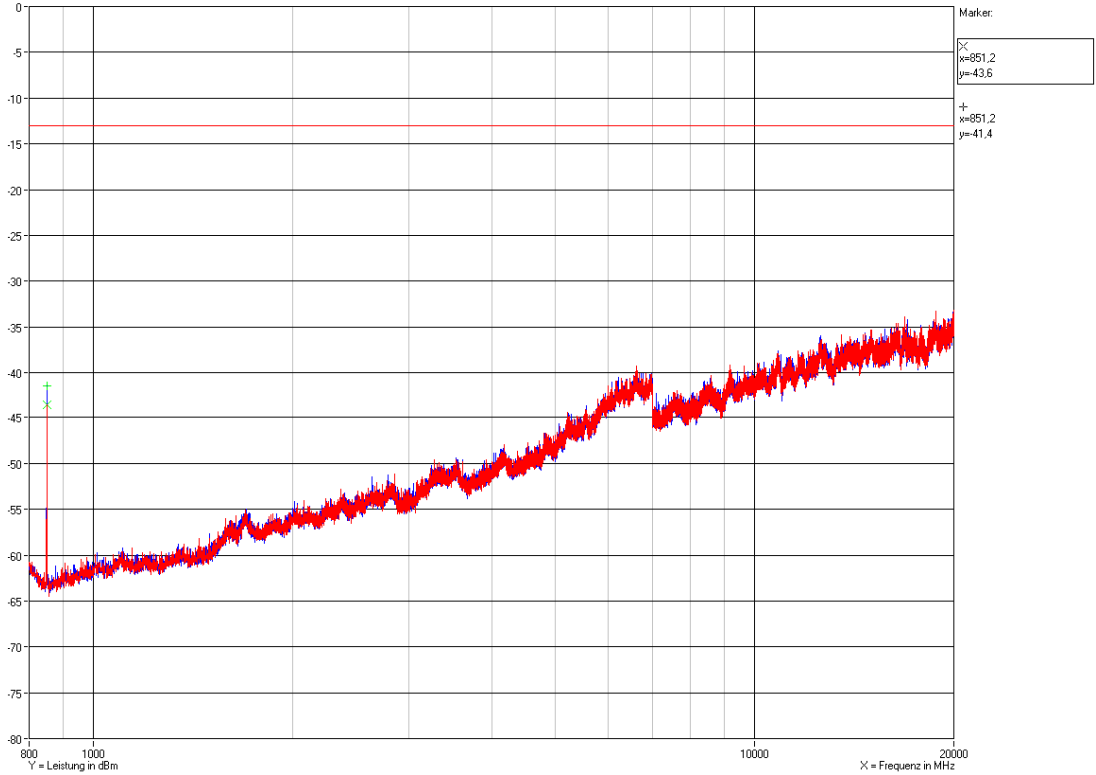
8.4.2.1 30 MHz to 1 GHz

DL/UL B/M/T	Frequency	Polarisation	Height	TT-Position	e.r.p.	Limit	Margin
	[MHz]	H/V	[cm]	[°]	dBm	dBm	dB
UL/M	75.1384	H	397	-52	-66.715	-13	53.715
UL/M	146.816	H	379	-86	-59.982	-13	46.982
DL/M	46.769	V	107	52	-59.56	-13	46.56
DL/M	51.9887	V	323	-31	-64.643	-13	51.643
DL/M	61.0422	V	231	152	-61.869	-13	48.869
DL/M	110.548	V	114	123	-66.869	-13	53.869
DL/M	127.134	V	108	145	-65.521	-13	52.521
DL/M	178.893	H	397	85	-46.792	-13	33.792



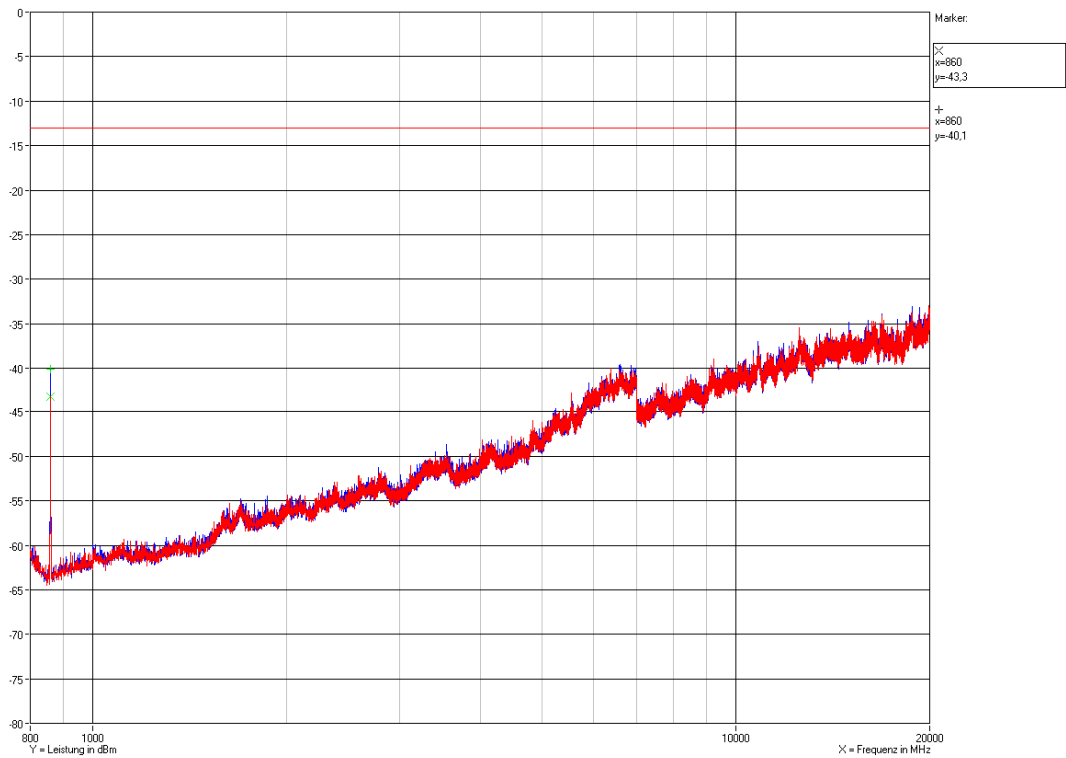
8.4.2.2 1 GHz to 9 GHz Downlink (Bottom – Middle – Top)

Bottom 851 MHz: horizontal/vertical

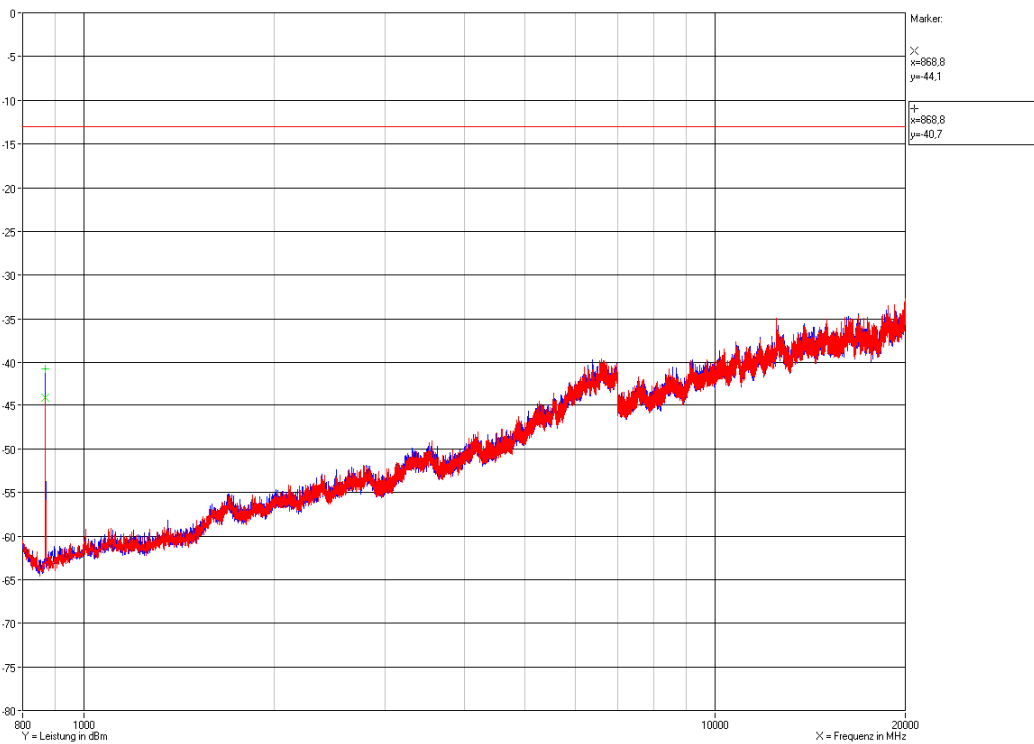




Middle 860 MHz: horizontal/vertical



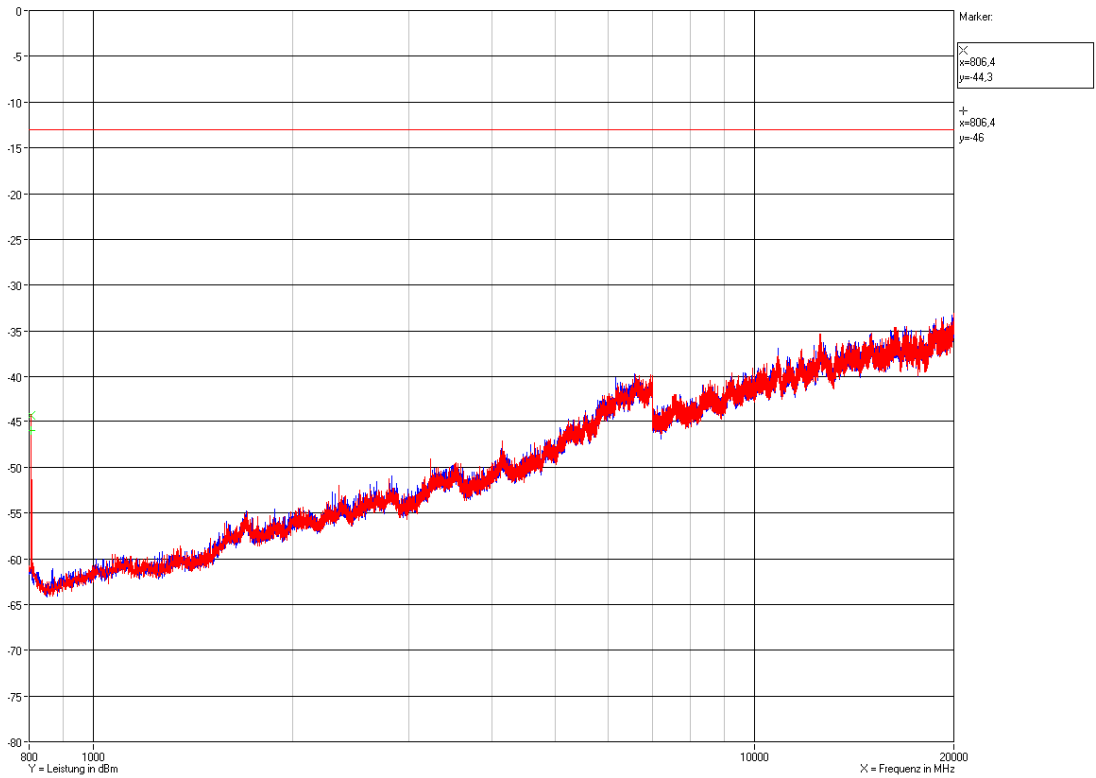
Top 869 MHz: horizontal/vertical





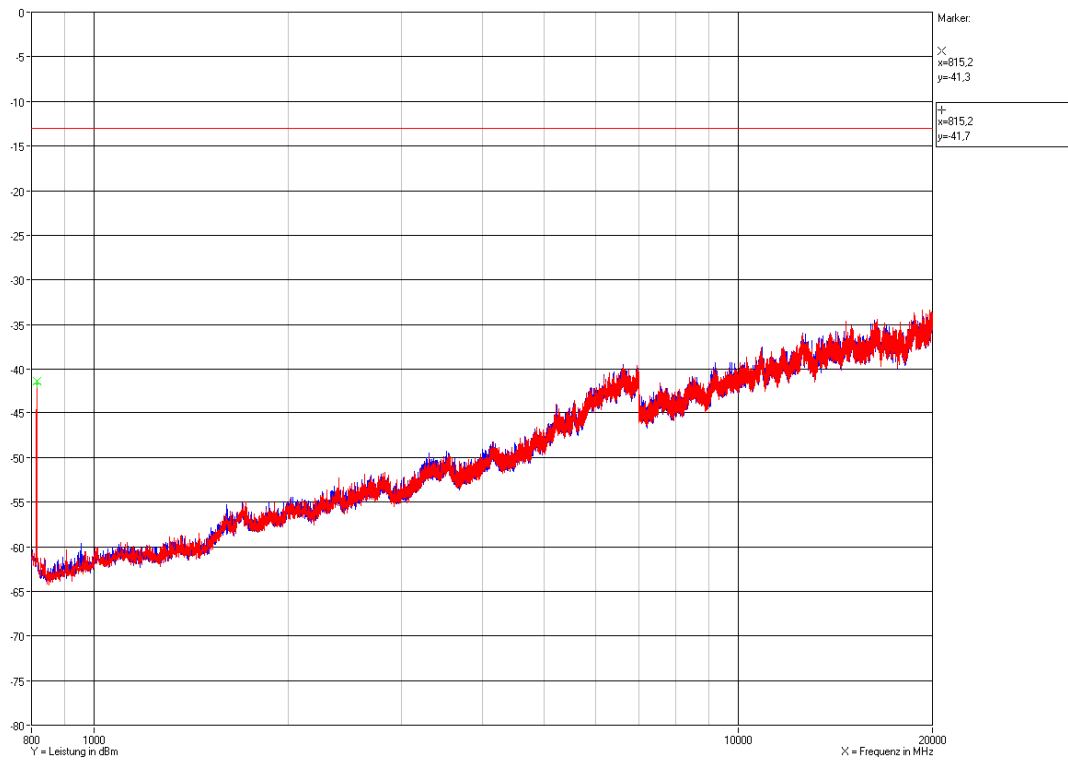
8.4.2.3 1 GHz to 9 GHz Uplink (Bottom – Middle – Top)

Bottom 806 MHz: horizontal/vertical

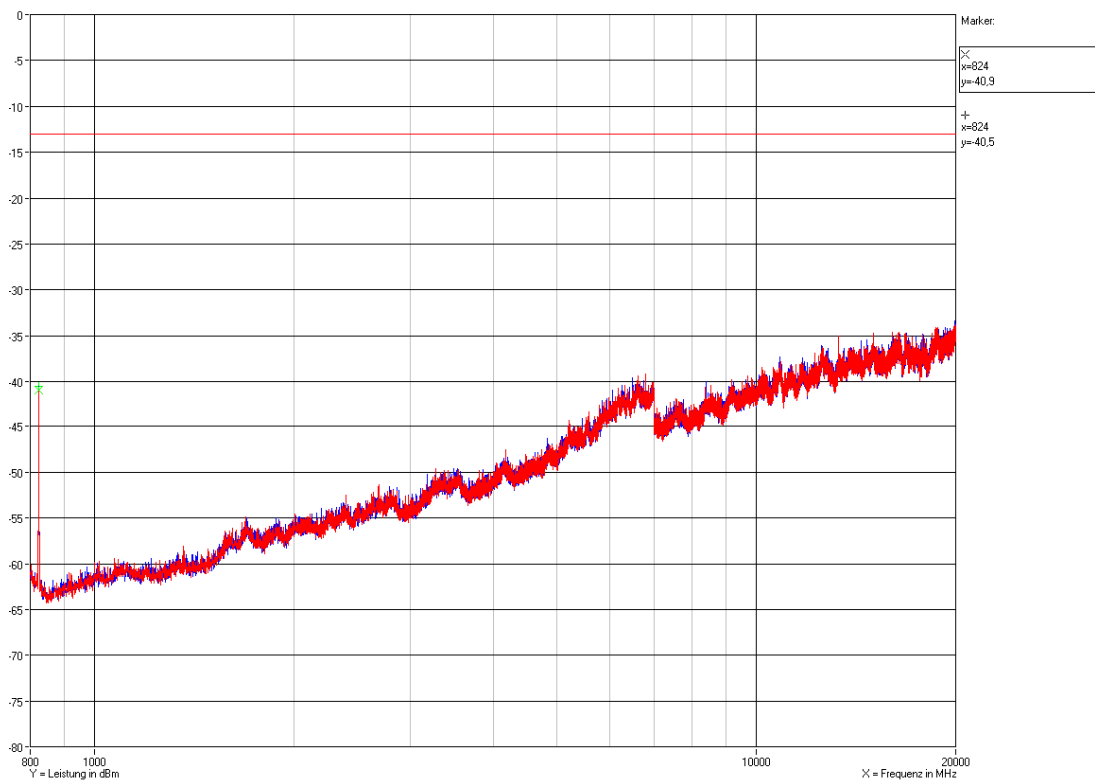




Middle 815 MHz: horizontal/vertical



Top 824 MHz: horizontal/vertical



There were detected no disturbances with a significant signal to noise ratio!



8.5 Summary test result

Test result	The spurious emission requirements have been met in all frequency bands.
Tested by:	Mario Lehmann
Date:	16.03.2010

9 History

Revision	Modification	Date	Name
V01.00	Initial Test Report	21.04.2010	M. Lehmann

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