



FCC RF Test Report

**Product Name: HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone
with Bluetooth; Apollo**

Model Number: HUAWEI U8867Z, U8867Z

**Report No: SYBH(Z-RF)010072012-2001
FCC ID: QISU8867Z**

Reliability Laboratory of Huawei Technologies Co., Ltd.

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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1 General Information

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 2:2011, Subpart J 47 CFR FCC Part 22:2011, Subpart H ANSI/TIA 603C:2004
1.2 Test Location	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
1.3 Test Environmental Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

2 Summary

Table 1 Summary of results

Test Case	FCC Part No.	Requirements	Result
Cellular Band			
Transmitter Output Power	2.1046 & 22.913	ERP not exceed 7 W	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 2.917	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/100 kHz, 30 MHz to 10 th harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 22.917	Below -13 dBm/100 kHz	Pass
Frequency Stability	2.1055 & 22.355	Maintained within the tolerances of ± 1.5 ppm	Pass

3 Product Description

3.1 Product Information

3.1.1 General Description

HUAWEI U8867Z, U8867Z subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band II and Band IV and Band V, but only Band V test data included in this report. The GSM/GPRS/EDGE frequency band includes GSM850 and PCS1900, but only GSM850 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.1.2 Board Information

Table 2 Board Information

HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; Apollo		
HUAWEI U8867Z, U8867Z		
Board and Module		
Equipment Designation / Description	Software	Hardware
MAINBOARD	U8867Z V100R001USAC189B824	HD2U8867ZM

3.1.3 Adapter Technical Data

AC/DCAdapter Model	HW-050100U1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100E1W
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AC/DCAdapter Model	HW-050100Z1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V \equiv 1A
Rated Power	5W

3.1.4 Battery Technical Data

Name	Qty.	Manufacture	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	Battery Model: HB5N1HA Rated capacity: 1650mAh Nominal Voltage: \equiv +3.7V Charging Voltage: \equiv +4.2V

4 Test Description

4.1 Supported Frequency Range

Characteristics	Description
Downlink	869 to 894 MHz
Uplink	824 to 849 MHz

4.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	GSM UMTS
TX Output Power (per Antenna Port)	GSM system: 33dBm UMTS system: 24dBm
Channel Spacing(s) / Bandwidth(s)	GSM system: 200 kHz UMTS system: 5 MHz
Designation of Emissions	GSM system: 246KGXW (GMSK modulation), 242KG7W (8PSK modulation) UMTS system: 4M15F9W

4.3 Antenna Gain

Antenna Gain(dBi)	1.7
Antenna Gain(dBd)	-0.45

5 General Test Conditions / Configurations

5.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
TM1/TM2	TX	Channel 128	Channel 192	Channel 251
		824.2MHz	837.0MHz	848.8MHz
	RX	Channel 128	Channel 192	Channel 251
		869.2MHz	882.0MHz	893.8MHz
TM3/TM4/TM5	TX	Channel 4132	Channel 4182	Channel 4233
		826.4MHz	836.4MHz	846.6MHz
	RX	Channel 4357	Channel 4407	Channel 4458
		871.4MHz	881.4MHz	891.6MHz

5.2 Test Modes

Test Mode	Test Modes Description
TM1	GSM/GPRS, GMSK modulation
TM2	EDGE, 8PSK modulation
TM3	WCDMA, QPSK modulation
TM4	HSDPA, QPSK modulation
TM5	HSUPA, QPSK modulation

5.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.6V
	VN	3.7V
	VH	4.2V

NOTE: VL= lower extreme test voltage

VN= nominal voltage

VH= upper extreme test voltage

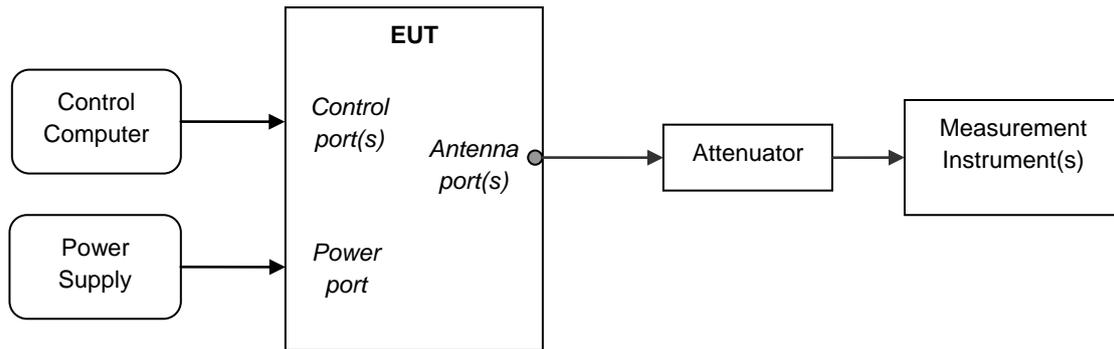
TN= normal temperature

5.4 Test Setup

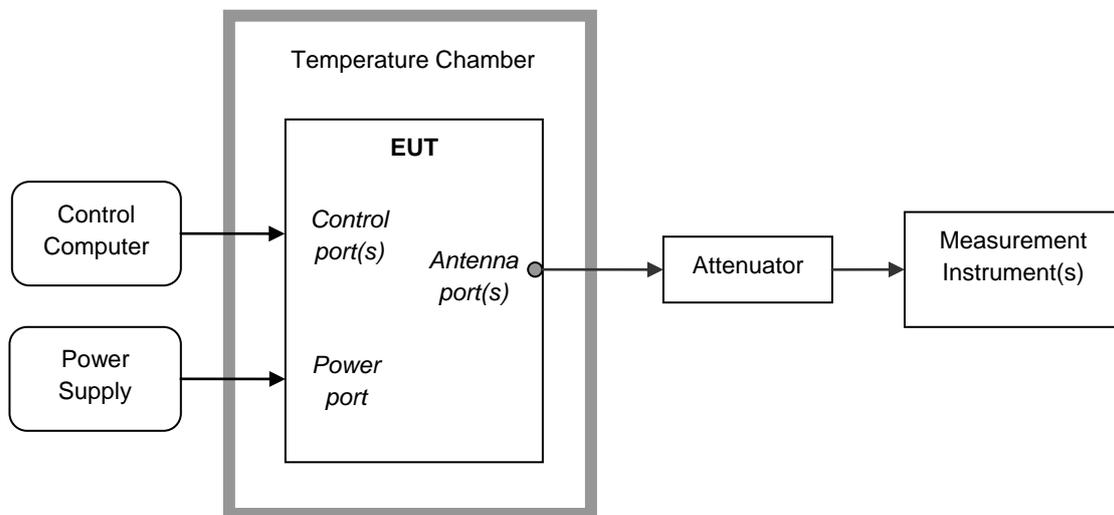
5.4.1 General Test Setup Configurations

Configuration	Description
Test Antenna Ports	Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT.
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

5.4.2 Test Setup 1



5.4.3 Test Setup 2



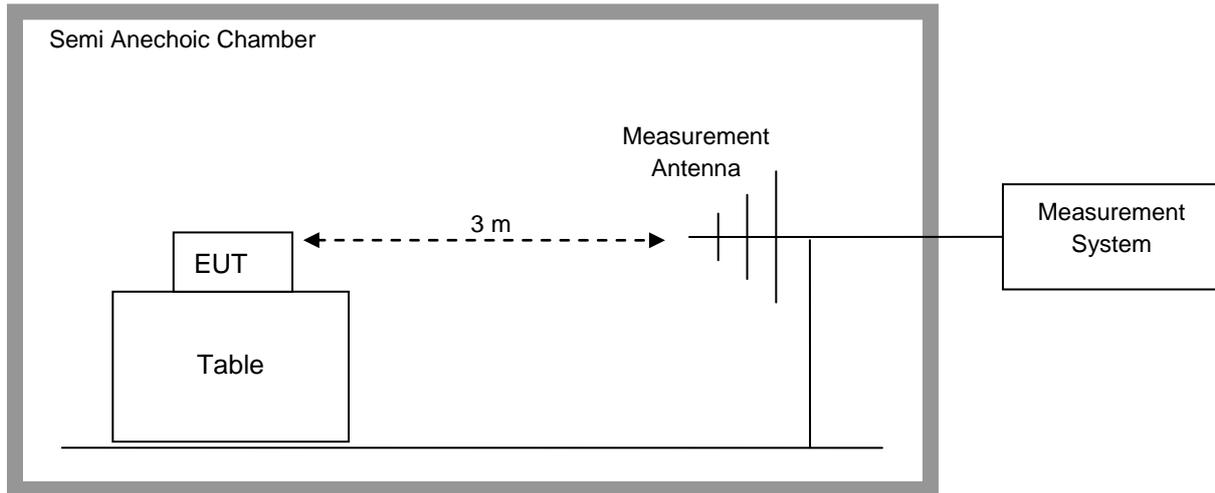
5.4.4 Test Setup 3

NOTE1: Effective radiated power (ERP) or Effective Isotropic radiated power (EIRP) refers to the EUT radiation power output, assuming all emissions are radiated from half-wave dipole antennas or horn antennas.

NOTE2: The EUT was set on insulator 80cm above the Ground Plane. The setup and test methods were according to ANSI-TIA-603C 2004. The measurements were carried through with a Rohde and Schwarz Test Receiver and control software.

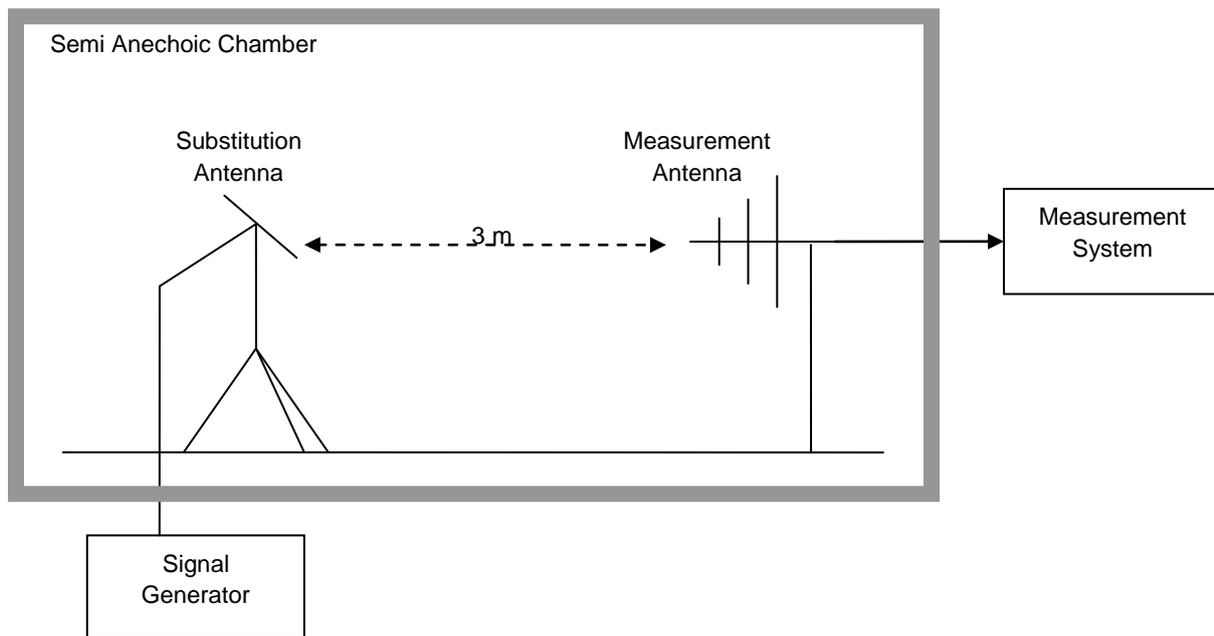
Step 1: Pre-test to find the Maximum ERP or EIRP

1. Connect the test system according to the following figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit at maximum power.
3. Set the center frequency of the signal analyzer or receiver to the EUT's operating frequency, the RBW is equal to the emission bandwidth of the signal. Set RMS detector for the test, and the span is equal to 2 times of emission bandwidth, the other settings should remain automatic. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°. The receiver antenna has two polarizations V and H. A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.
4. Changing EUT working frequency and measuring the RF power at channel T, M, B respectively.
Complete the test data.



Step 2: Substitution method to verify the maximum ERP or EIRP

1. Measurement setup is according to the following figure. EUT was substituted by antenna, and the polarization is identical with the test antenna; the signal generator was connected to the substitution antenna.
2. The radiated output power, measured by signal analyzer set, is the same as recorded in above item 5). Then this power level is matched by a signal from a calibrated signal generator which is substituted for EUT. The power supplied by the generator is then equal to the ERP or EIRP after corrected by the antenna gain and cable loss.



5.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1 & Test Setup 3
	Detector	RMS
	RF Channels (TX)	L, M, H
	Test Mode	TM1/TM2/TM3/TM4/TM5
Modulation Characteristics	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3
Occupied Bandwidth	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	L, M, H
	Test Mode	TM1/TM2/TM3
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	L, H
	Test Mode	TM1/TM2/TM3
Spurious Emission at Antenna Terminals	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	PK
	RF Channels (TX)	L, M, H
	Test Mode	TM1/TM2/TM3
Field Strength of Spurious Radiation	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 3
	Detector	PK
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3/TM4/TM5
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature.
	Test Setup	Test Setup 2
	RF Channels (TX)	M



Test Case	Test Conditions	
	Test Mode	TM1/TM2/TM3

6 Main Test Instruments

Table 3 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sept., 27, 2012
Universal Radio Communication Tester	R&S	CMU200	105822	Oct., 24, 2012
Wireless Communication Test set	Agilent	N4010A	MY49081592	Dec., 14, 2012
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug., 31, 2012
Spectrum Analyzer	Agilent	E4440A	MY49420179	Apr., 20, 2013
Signal Analyzer	R&S	FSQ31	200021	Sept., 27, 2012
Temperature Chamber	WEISS	WKL64	24600294	Jan., 03, 2013
Signal generator	Agilent	E8257D	MY49281095	Jul., 09, 2013
Vector Signal Generator	R&S	SMU200A	104162	Sept., 07, 2012
Test receiver	R&S	ESU26	100150	May., 24, 2013
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Dec., 13, 2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Dec., 13, 2012
Horn Antenna	R & S	HF906	100683	May., 16, 2013
Horn Antenna	R & S	HF906	100684	May., 16, 2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	Sep., 15, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	Sep., 15, 2012

7 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Photos of Test Setup	Appendix H

NOTE: There is no test data in Appendix H, only Photos of Test Setup for Field Strength of Spurious Radiation.

8 Measurement Uncertainty

For a 95% confidence level ($k=2$), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmitter Output Power	Power (dBm)	U =0.39 dB
Occupied Bandwidth	Magnitude (%)	U=0.2%
Band Edge Compliance	Disturbance Power (dBm)	U=2.0 dB
Conducted Spurious Emissions	Disturbance Power (dBm)	U=2.0 dB
Field Strength of Spurious Radiation	ERP (dBm)	U=4.6 dB (30 MHz – 1GHz) U=3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy (ppm)	U=0.21 ppm

-----The END-----



Appendix A

Transmitter Output Power According to FCC Part 2.1046 & Part 22.913



Conducted Power of Transmitter

Table 1 Measurement Results

		RF Output Power (Conducted)					
TEST CONDITIONS		Channel128(B)		Channel192(M)		Channel251(T)	
		824.2MHz		837.0MHz		848.8MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}	Measured	Limit	Measured	Limit	Measured	Limit	
TM1	32.64	38.50	32.83	38.50	32.53	38.50	
TM2	26.41	38.50	26.51	38.50	26.45	38.50	
TEST CONDITIONS		Channel4132(B)		Channel4182(M)		Channel4233(T)	
		826.4MHz		836.4MHz		846.6MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}	Measured	Limit	Measured	Limit	Measured	Limit	
TM3	23.39	38.50	23.11	38.50	23.15	38.50	
TM4	Case1	23.43	38.50	23.23	38.50	23.19	38.50
	Case2	23.22	38.50	23.19	38.50	23.16	38.50
	Case3	22.61	38.50	22.59	38.50	22.55	38.50
	Case4	22.65	38.50	22.67	38.50	22.59	38.50
TM5	Case1	22.95	38.50	23.14	38.50	23.15	38.50
	Case2	21.67	38.50	21.49	38.50	21.55	38.50
	Case3	22.87	38.50	23.08	38.50	22.05	38.50
	Case4	21.69	38.50	21.39	38.50	21.45	38.50
	Case5	22.83	38.50	23.04	38.50	23.03	38.50



Peak-to-Average Ratio

Table 2 Measurement Results

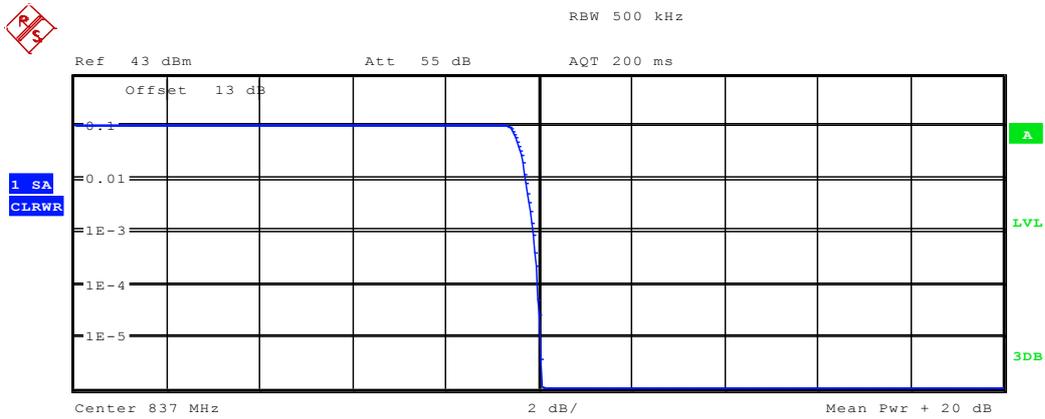
TEST CONDITIONS		Channel128(B)		Channel192(M)		Channel251(T)	
		824.2MHz		837.0MHz		848.8MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM1		9.60	13.0	9.90	13.0	9.30	13.0
TM2		12.68	13.0	12.85	13.0	12.78	13.0
TEST CONDITIONS		Channel4132(B)		Channel4182(M)		Channel4233(T)	
		826.4MHz		836.4MHz		846.6MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM3		3.1	13.0	3.3	13.0	3.2	13.0
TM4	Case1	2.94	13.0	2.98	13.0	2.91	13.0
	Case2	2.88	13.0	2.84	13.0	2.86	13.0
	Case3	2.89	13.0	2.81	13.0	2.85	13.0
	Case4	2.78	13.0	2.77	13.0	2.76	13.0
TM5	Case1	2.72	13.0	2.79	13.0	2.75	13.0
	Case2	2.67	13.0	2.64	13.0	2.63	13.0
	Case3	2.69	13.0	2.62	13.0	2.61	13.0
	Case4	2.59	13.0	2.57	13.0	2.55	13.0
	Case5	2.54	13.0	2.51	13.0	2.53	13.0



Test Plot of Peak-to-Average Ratio

Note: All relevant operation modes have been tested, and the worst case Plot is included in this report.

TM1



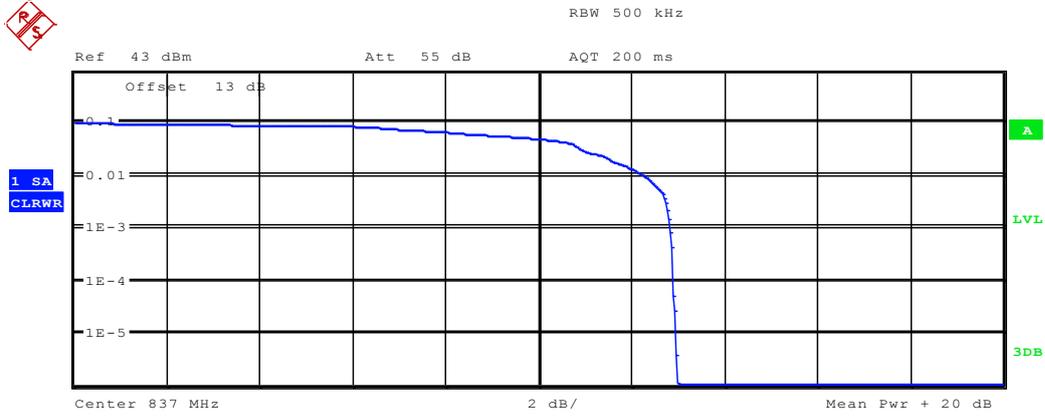
Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 424kHz

Trace 1	
Mean	22.80 dBm
Peak	32.86 dBm
Crest	10.05 dB
10 %	9.39 dB
1 %	9.74 dB
.1 %	9.90 dB
.01 %	10.00 dB

Date: 8.JUL.2012 15:14:55



TM2



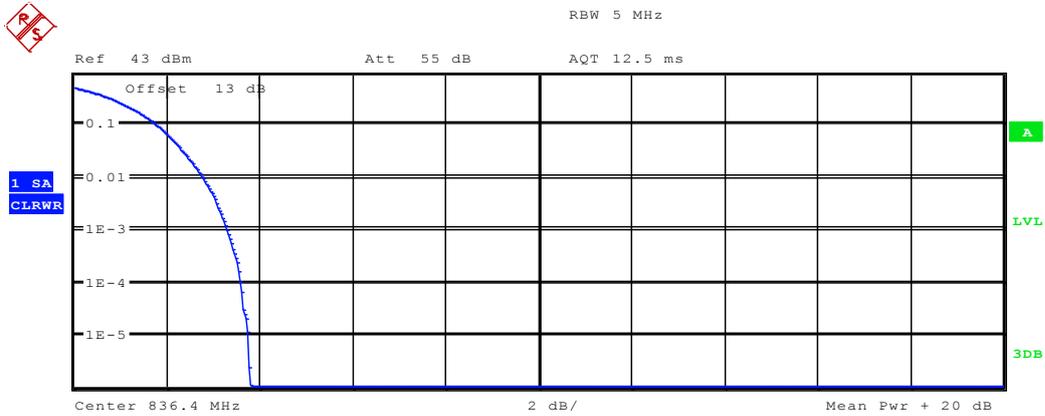
Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 424kHz

Trace 1	
Mean	16.43 dBm
Peak	29.40 dBm
Crest	12.97 dB
10 %	1.89 dB
1 %	12.28 dB
.1 %	12.85 dB
.01 %	12.92 dB

Date: 8.JUL.2012 15:19:21



TM3/TM4/TM5



Complementary Cumulative Distribution Function
 NOF samples: 100000, Usable BW: 7.1MHz

Trace 1	
Mean	23.15 dBm
Peak	26.93 dBm
Crest	3.78 dB
10 %	1.79 dB
1 %	2.76 dB
.1 %	3.30 dB
.01 %	3.59 dB

Date: 8.JUL.2012 15:33:21



Effective Radiated Power of Transmitter (ERP)

Table 3 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	FCC limit [dBm]	Result
TM1	824.2	32.19	Dipole Ant.	35.34	-2.75	0.6	31.99	38.5	Pass
TM1	837.0	32.38	Dipole Ant.	35.87	-2.87	0.6	32.4	38.5	Pass
TM1	848.8	32.08	Dipole Ant.	35.33	-2.85	0.6	31.88	38.5	Pass
TM2	824.2	25.96	Dipole Ant.	29.11	-2.75	0.6	25.76	38.5	Pass
TM2	837.0	26.06	Dipole Ant.	29.33	-2.87	0.6	25.86	38.5	Pass
TM2	848.8	26	Dipole Ant.	29.25	-2.85	0.6	25.8	38.5	Pass
TM3	826.4	22.94	Dipole Ant.	26.09	-2.75	0.6	22.74	38.5	Pass
TM3	836.4	22.66	Dipole Ant.	26.3	-2.87	0.6	22.83	38.5	Pass
TM3	846.6	22.7	Dipole Ant.	25.95	-2.85	0.6	22.5	38.5	Pass

Note: a, For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b, SGP=Signal Generator Level

-----The END-----



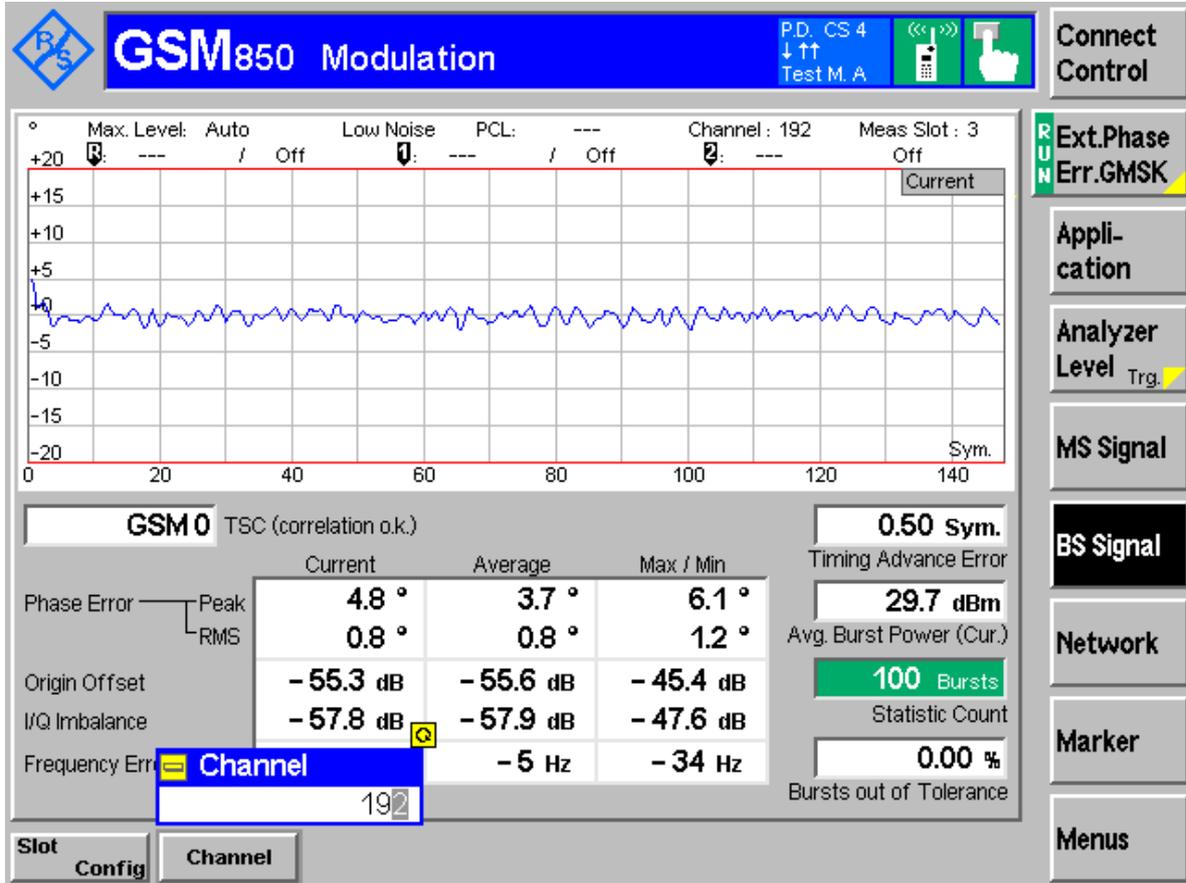
Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

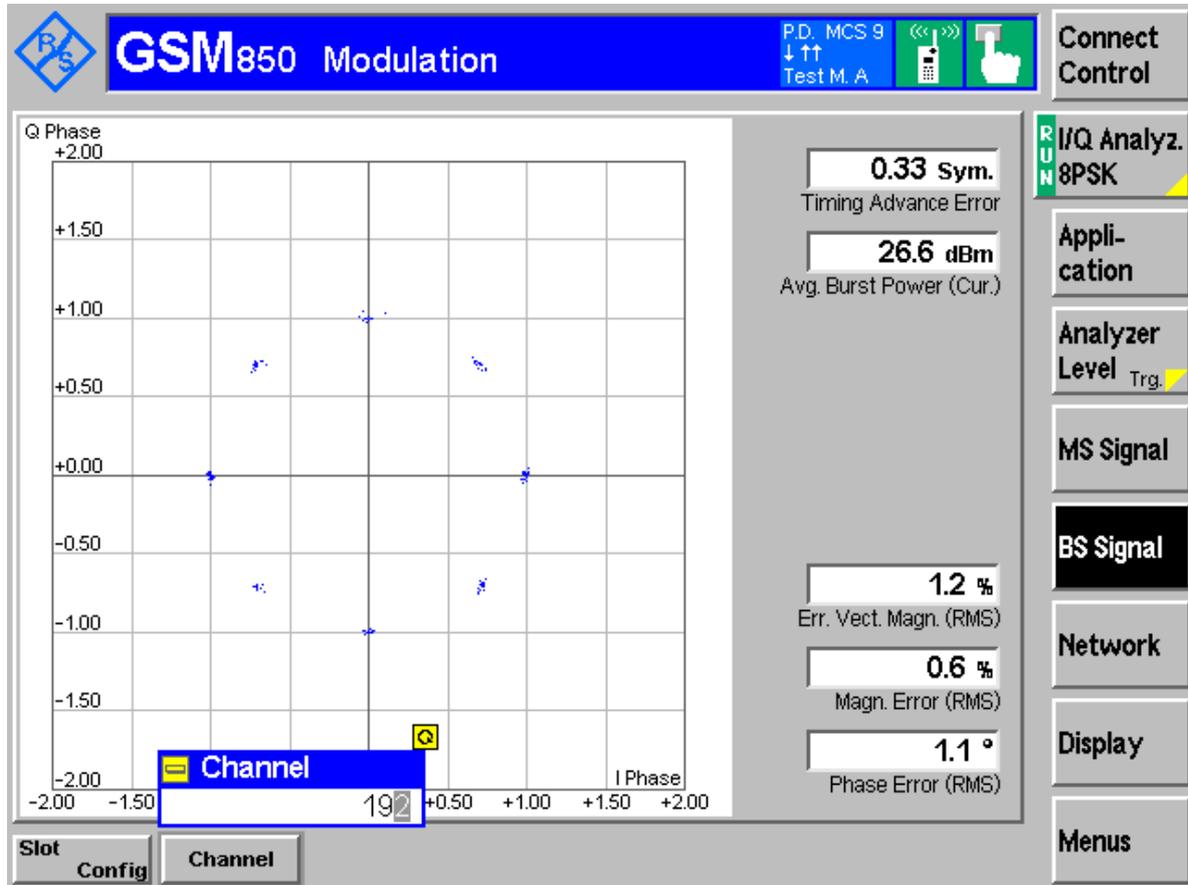


Channel 192 (TM1:GPRS/GSM)



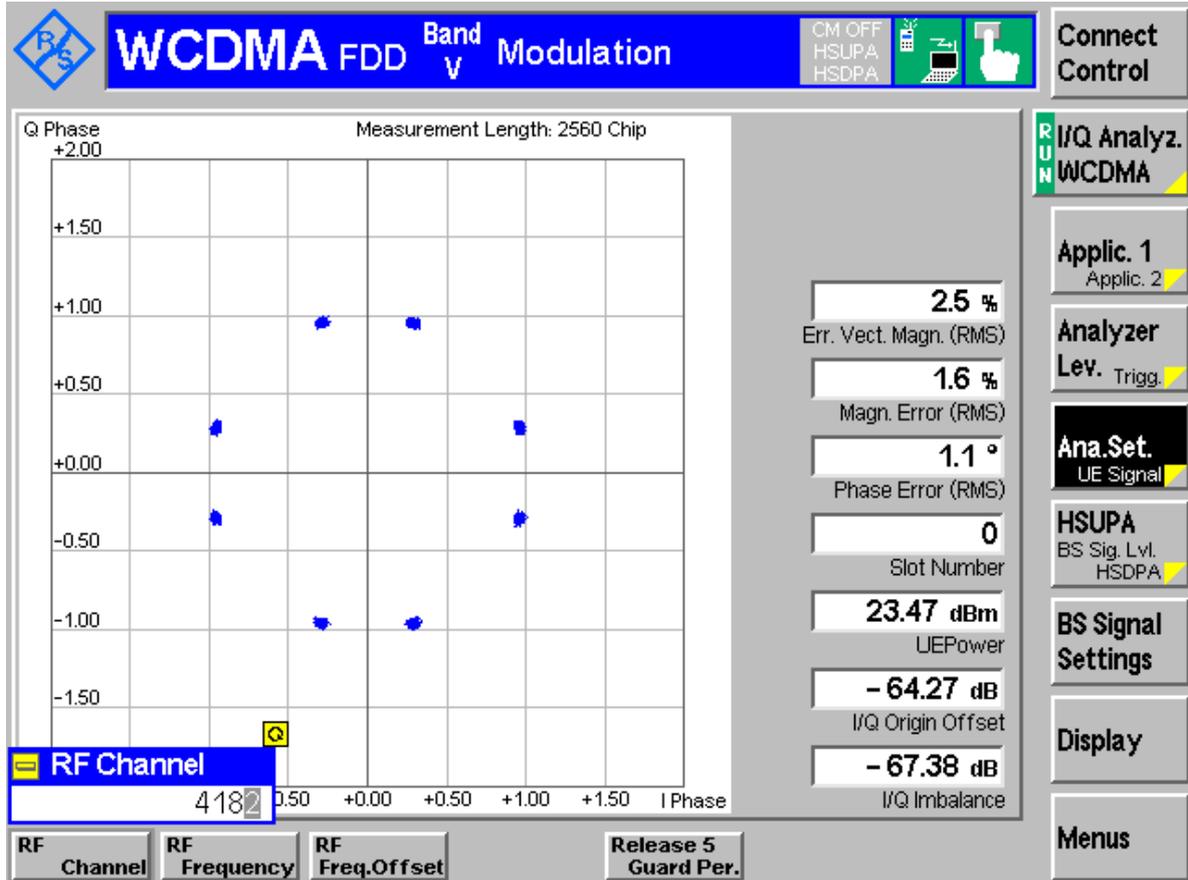


Channel 192 (TM2:EDGE)





Channel 4182 (TM3: WCDMA)



-----The END-----



Appendix C

Occupied Bandwidth According to FCC Part 2.1049 & Part 22 Subpart H



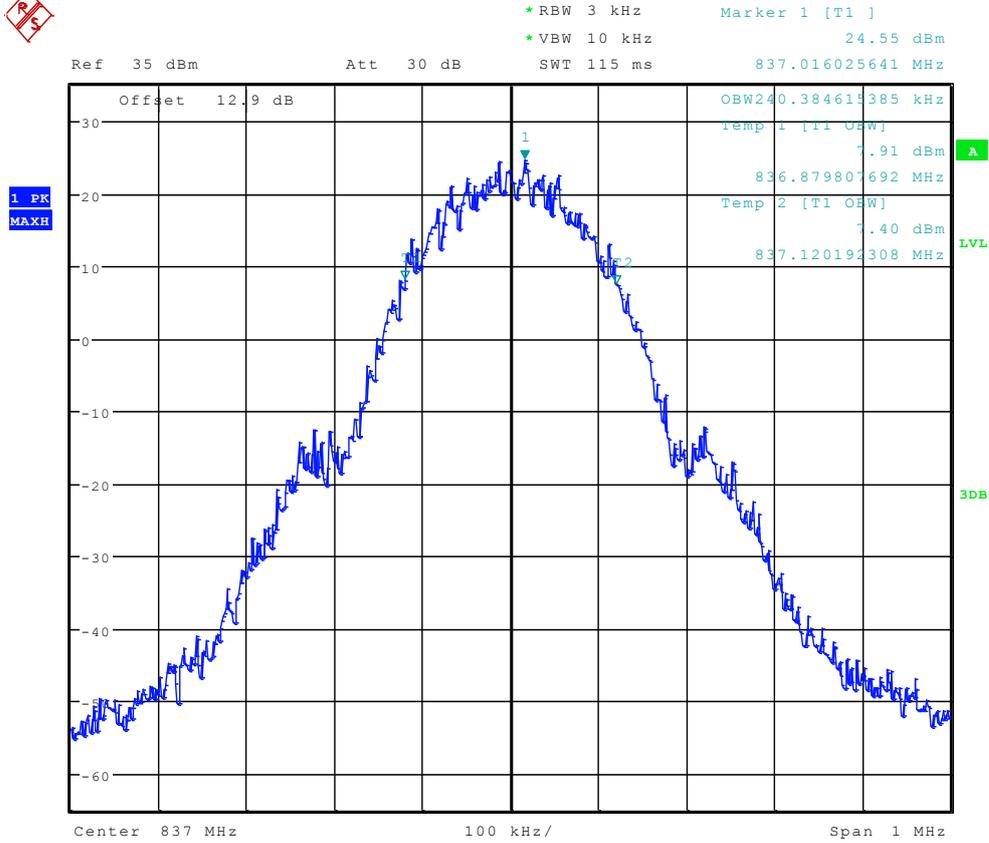
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	245.19	Pass
	192	240.38	Pass
	251	241.99	Pass
TM2	128	241.99	Pass
	192	240.38	Pass
	251	235.58	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.13	Pass
	4182	4.15	Pass
	4233	4.13	Pass



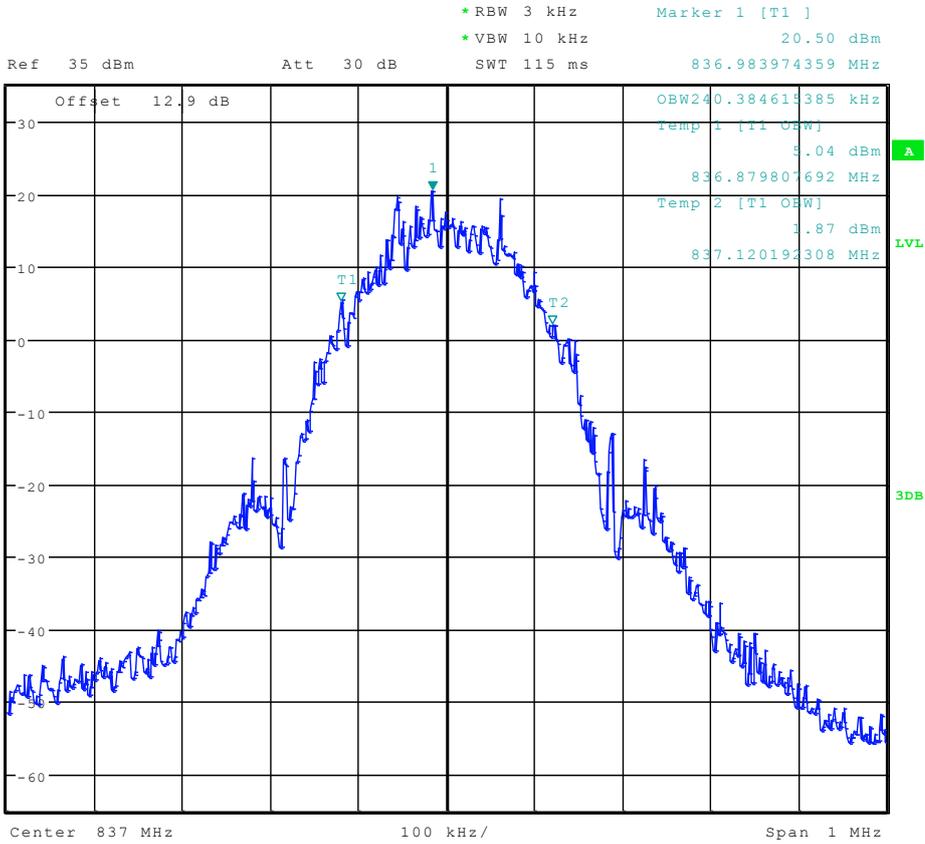
Channel 192 (TM1:GPRS/GSM)



Date: 8.JUL.2012 11:45:47



Channel 192 (TM2:EDGE)



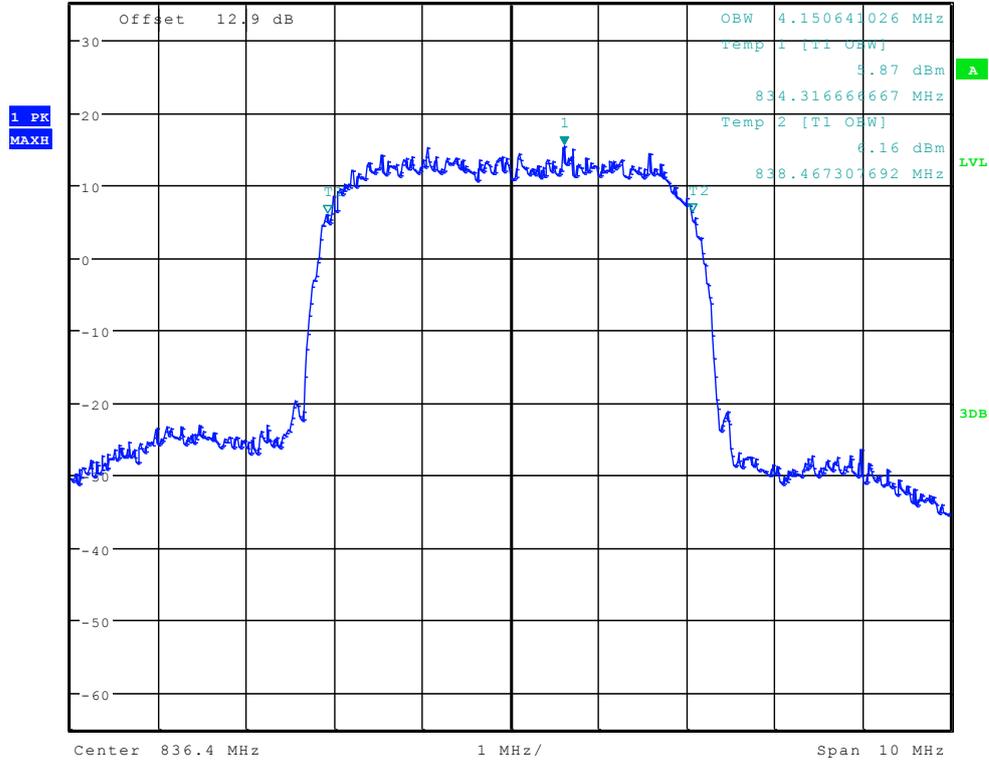
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Channel 4182 (TM3: WCDMA)



*RBW 50 kHz Marker 1 [T1]
 *VBW 500 kHz 15.26 dBm
 Ref 35 dBm Att 30 dB SWT 5 ms 837.008974359 MHz



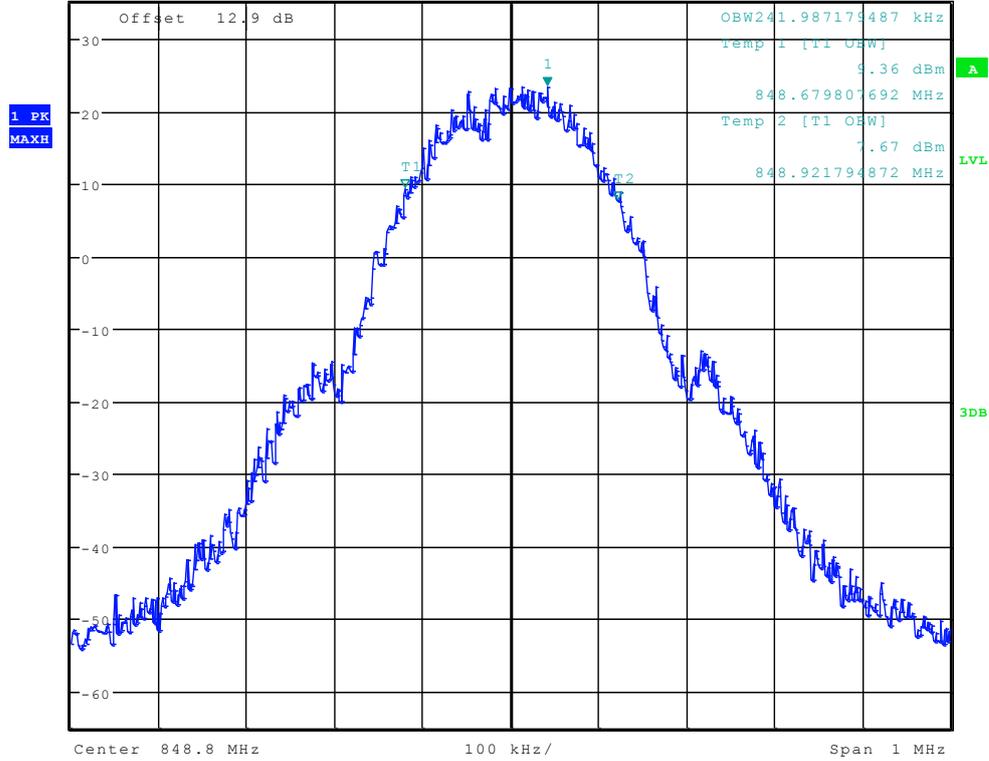
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Channel 251 (TM1:GPRS/GSM)



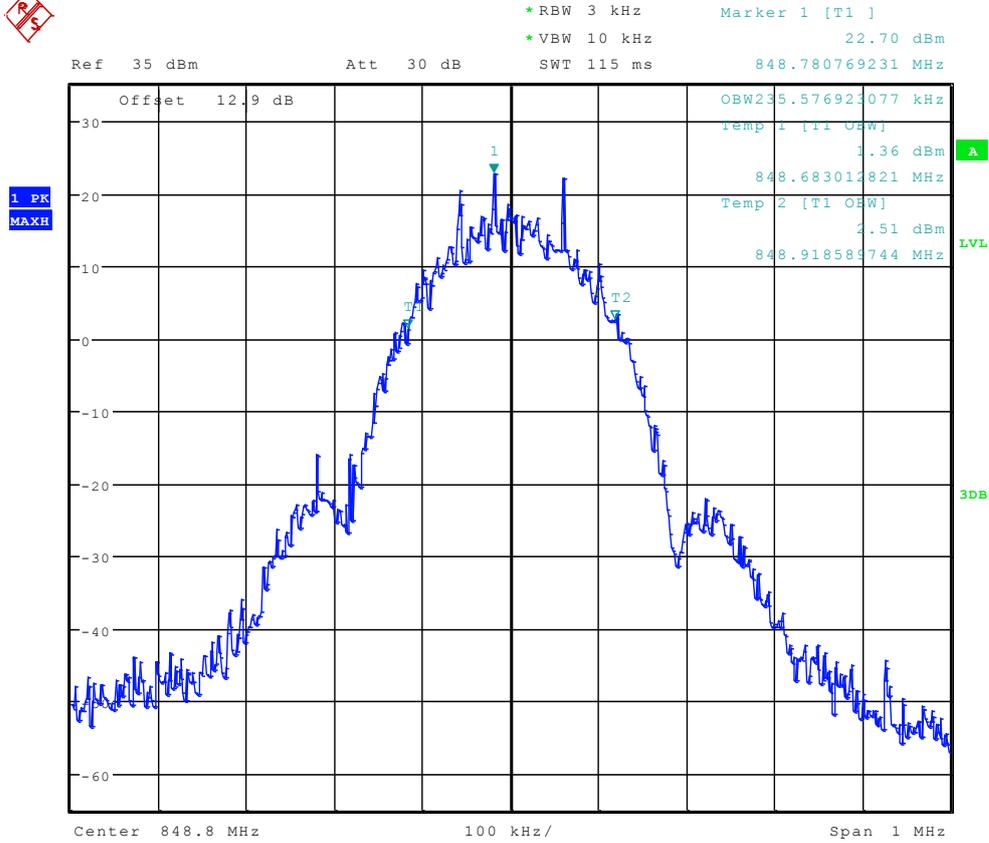
Ref 35 dBm Att 30 dB SWT 115 ms
 *RBW 3 kHz Marker 1 [T1] 23.29 dBm
 *VBW 10 kHz 848.841666667 MHz



Date: 8.JUL.2012 11:46:01



Channel 251 (TM2:EDGE)



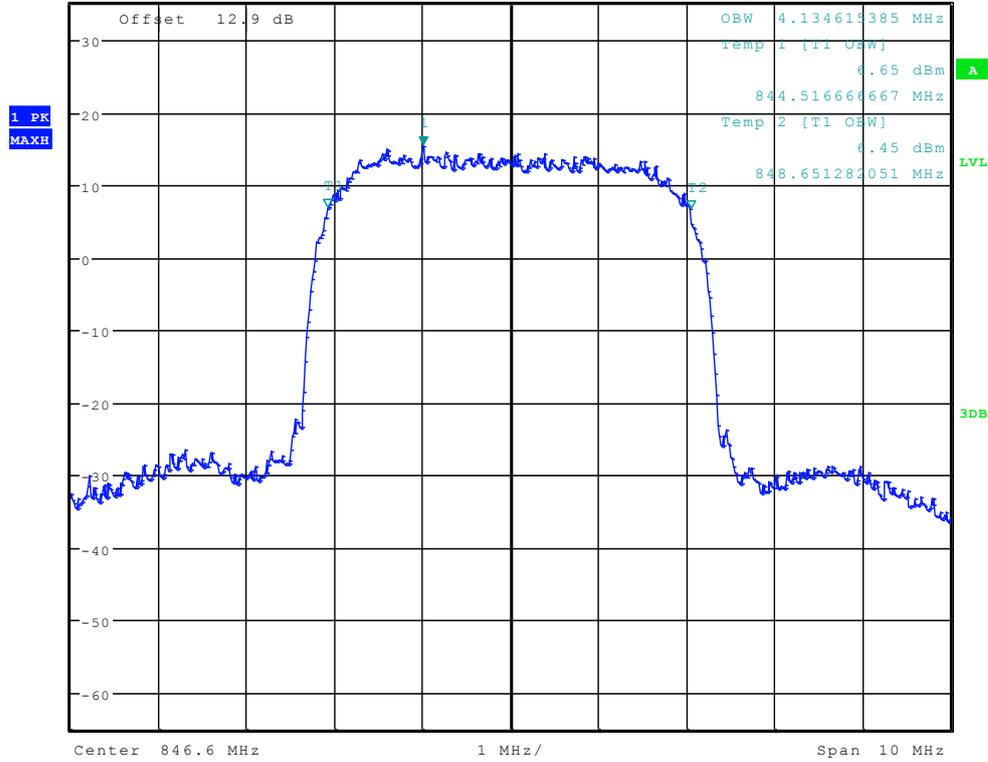
Date: 8.JUL.2012 11:54:54



Channel 4233 (TM3: WCDMA)



Ref 35 dBm Att 30 dB RBW 50 kHz VBW 500 kHz SWT 5 ms Marker 1 [T1] 15.40 dBm
 845.606410256 MHz



Date: 8.JUL.2012 12:01:15

-----END-----



Appendix D

Band Edges Compliance

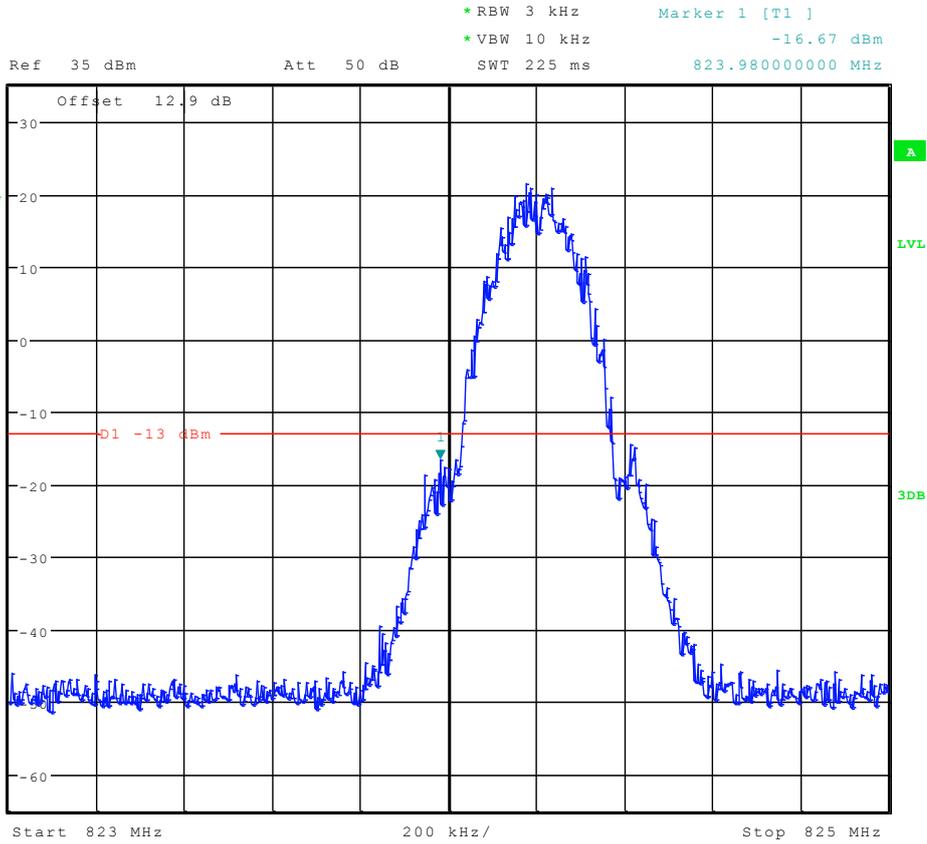
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

Left Edge

Channel 128



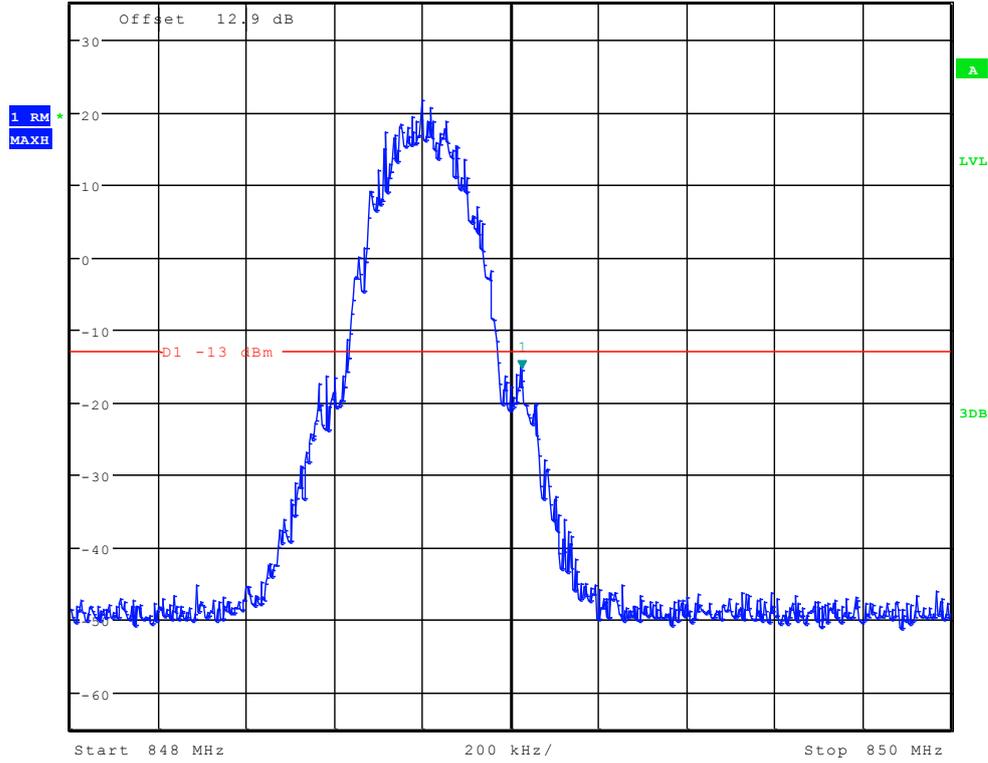
Date: 8.JUL.2012 11:49:50



Right Edge Channel 251



Ref 35 dBm Att 50 dB RBW 3 kHz Marker 1 [T1] -15.47 dBm
* VBW 10 kHz
SWT 225 ms 849.02500000 MHz



Date: 8.JUL.2012 11:50:03



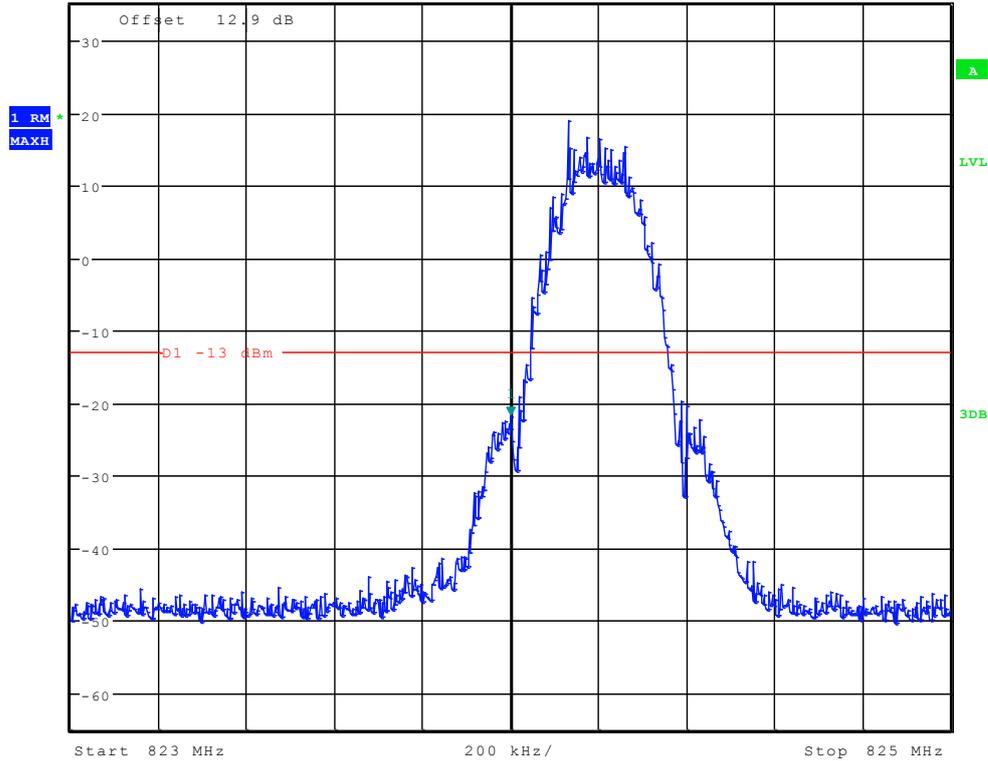
TM2:EDGE

Left Edge

Channel 128



Ref 35 dBm Att 50 dB SWT 225 ms
*RBW 3 kHz *VBW 10 kHz
Marker 1 [T1] -21.86 dBm
824.000000000 MHz



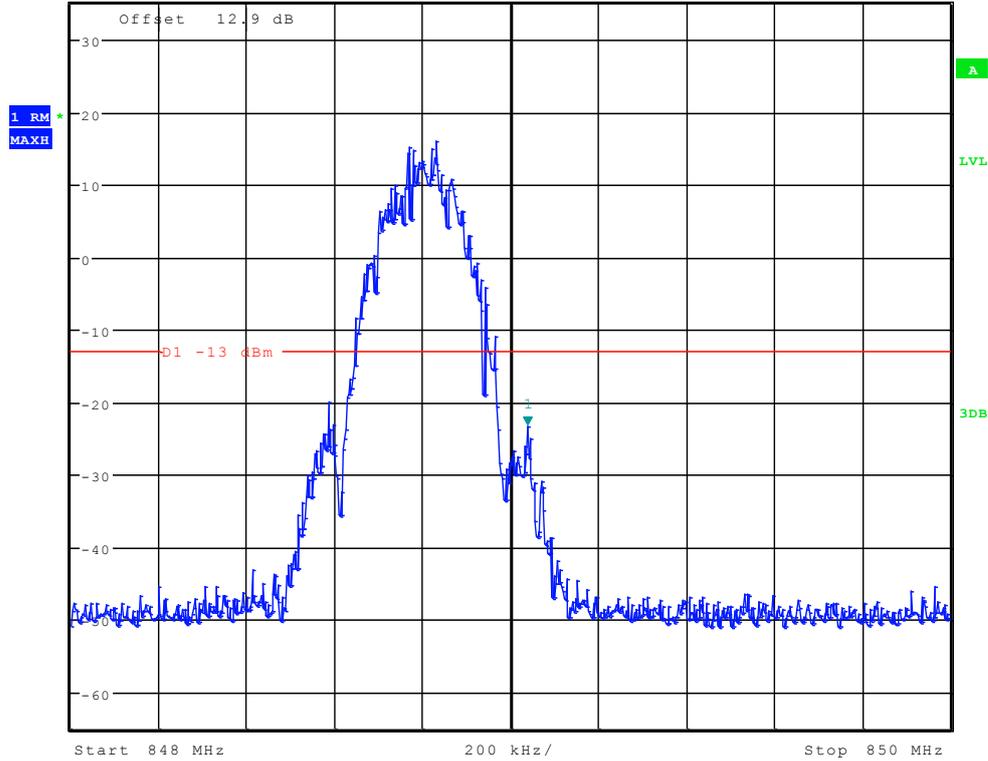
Date: 8.JUL.2012 11:58:51



Right Edge Channel 251



Ref 35 dBm Att 50 dB RBW 3 kHz Marker 1 [T1] -23.39 dBm
* VBW 10 kHz
SWT 225 ms 849.04000000 MHz



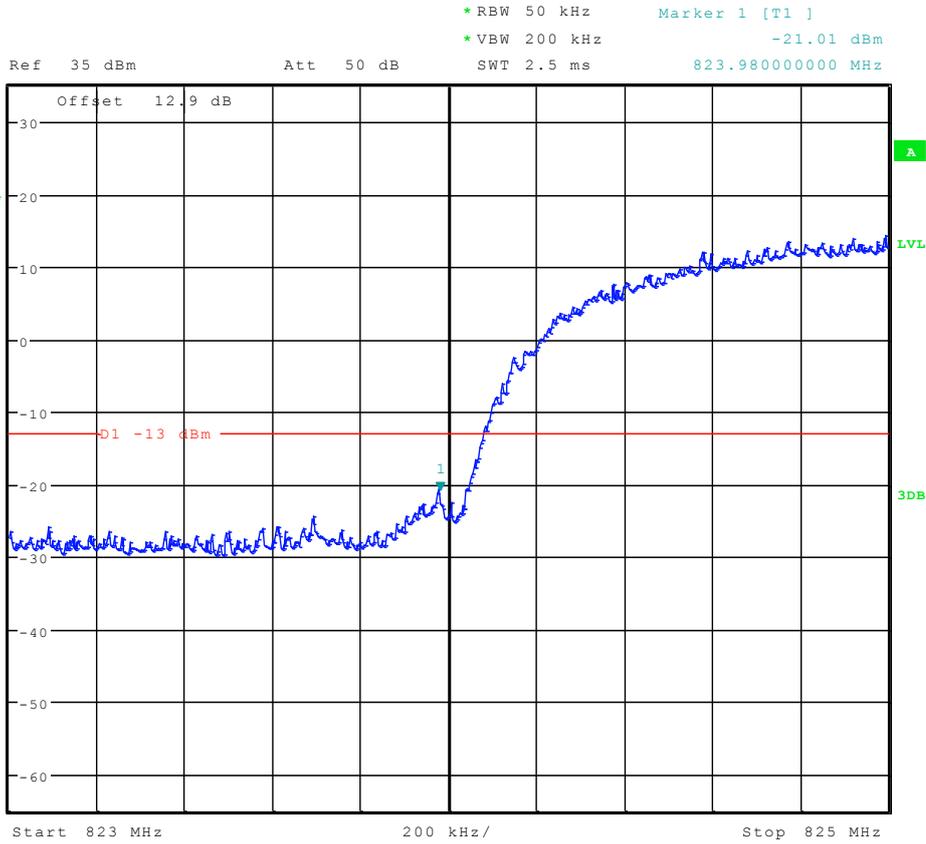
Date: 8.JUL.2012 11:59:04



TM3: WCDMA

Left Edge

Channel 4132



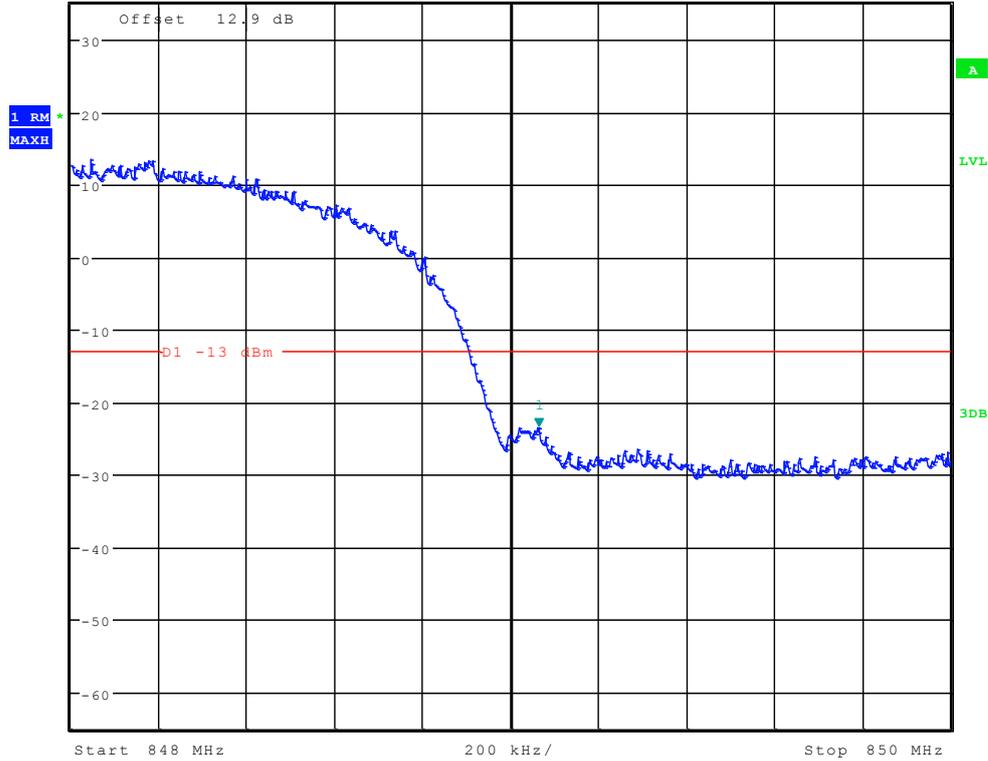
Date: 8.JUL.2012 12:04:24



Right Edge Channel 4233



*RBW 50 kHz Marker 1 [T1]
 *VBW 200 kHz -23.42 dBm
 Ref 35 dBm Att 50 dB SWT 2.5 ms 849.065000000 MHz



Date: 8.JUL.2012 12:04:37

-----END-----



Appendix E

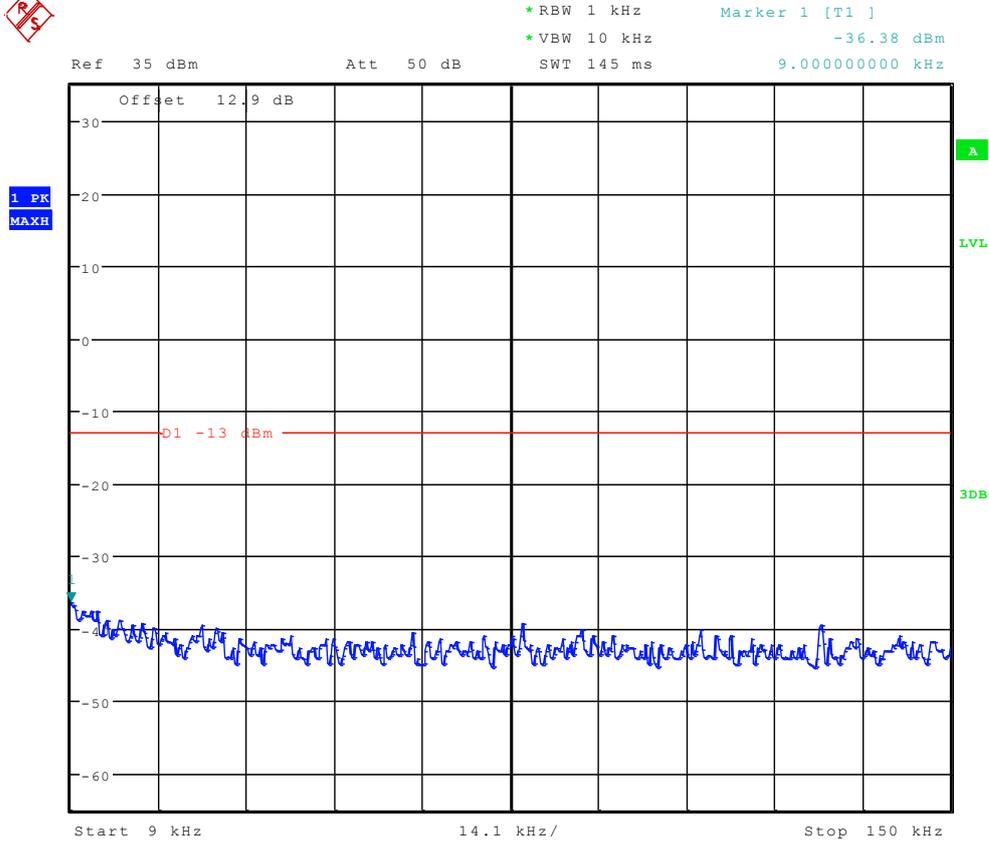
Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

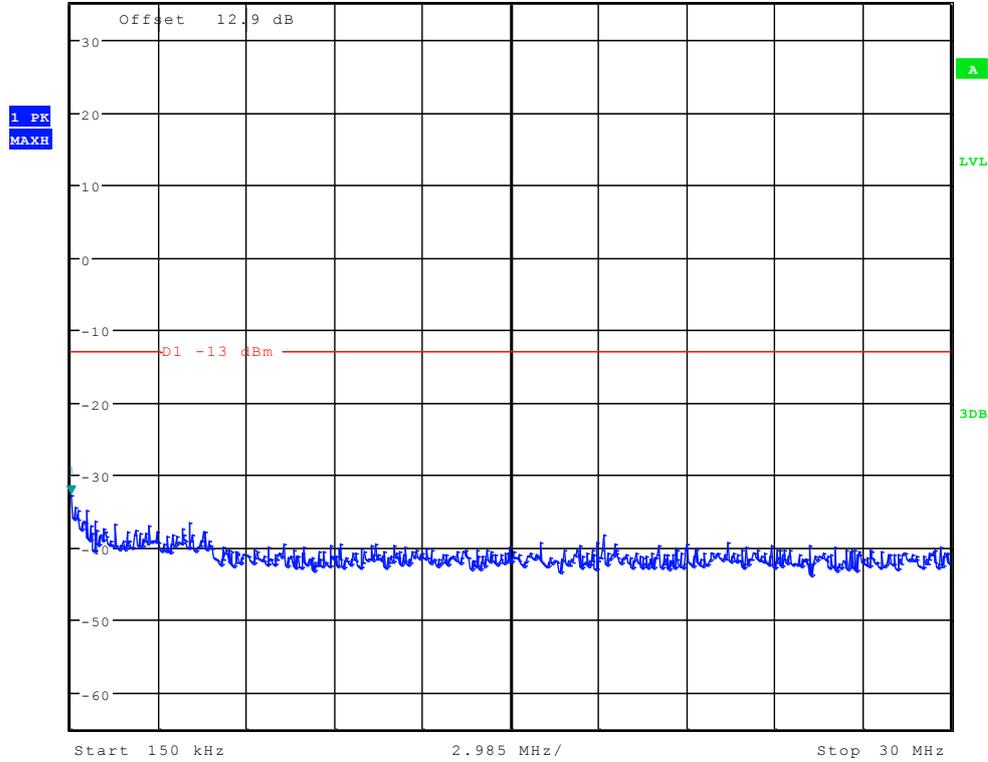
Channel 128



Date: 8.JUL.2012 11:46:15



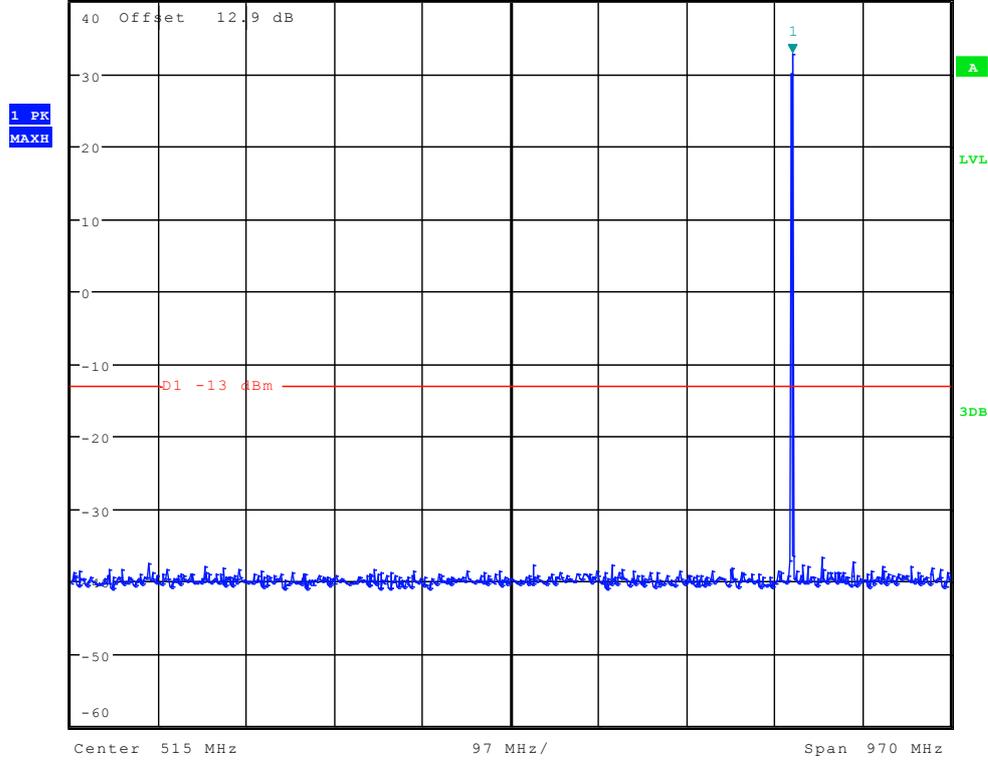
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -32.83 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 8.JUL.2012 11:46:59



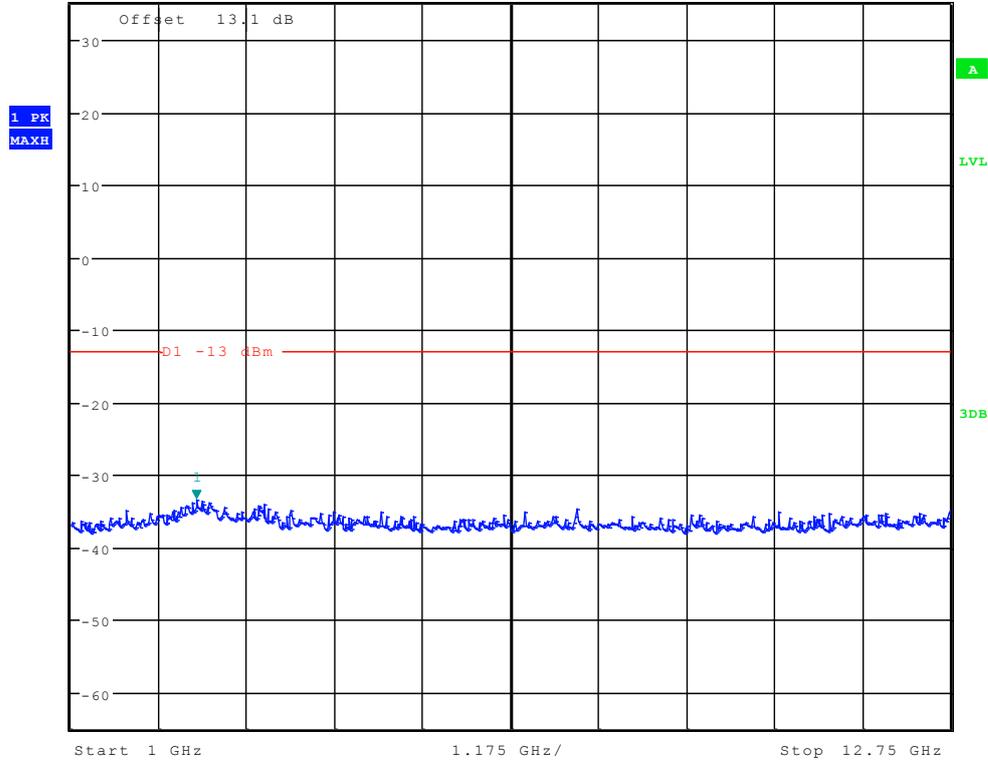
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 32.81 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 825.897435897 MHz



Date: 8.JUL.2012 11:48:22



Ref 35 dBm * Att 30 dB SWT 70 ms * RBW 1 MHz Marker 1 [T1] -33.46 dBm
* VBW 3 MHz 2.675881410 GHz



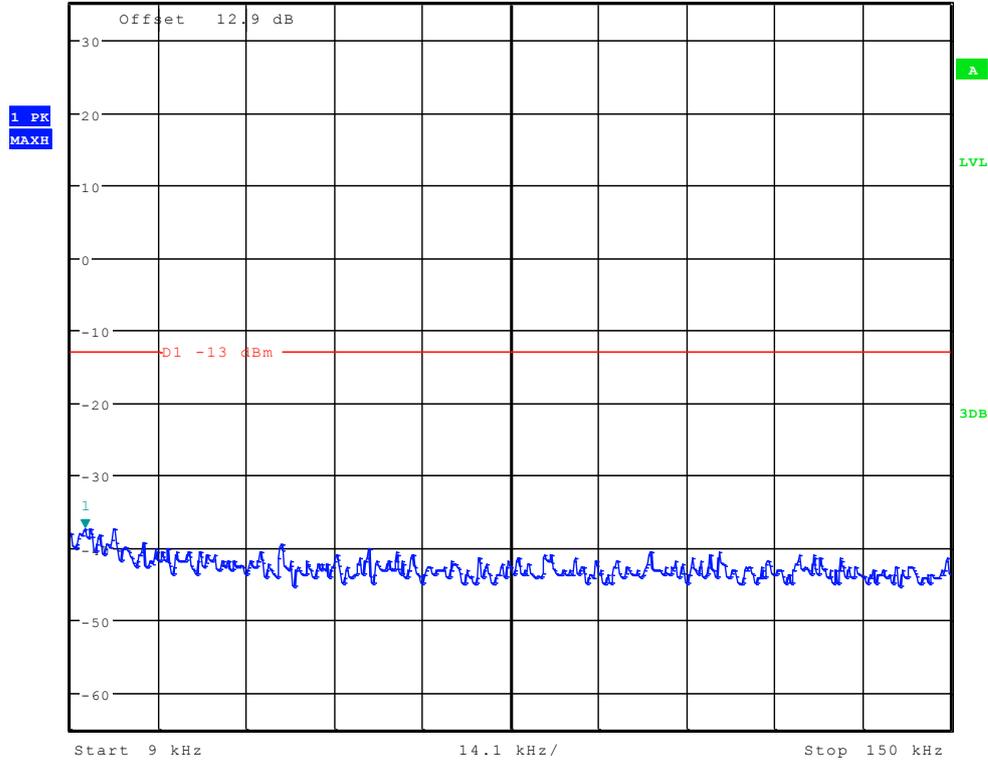
Date: 8.JUL.2012 11:49:06



Channel 192



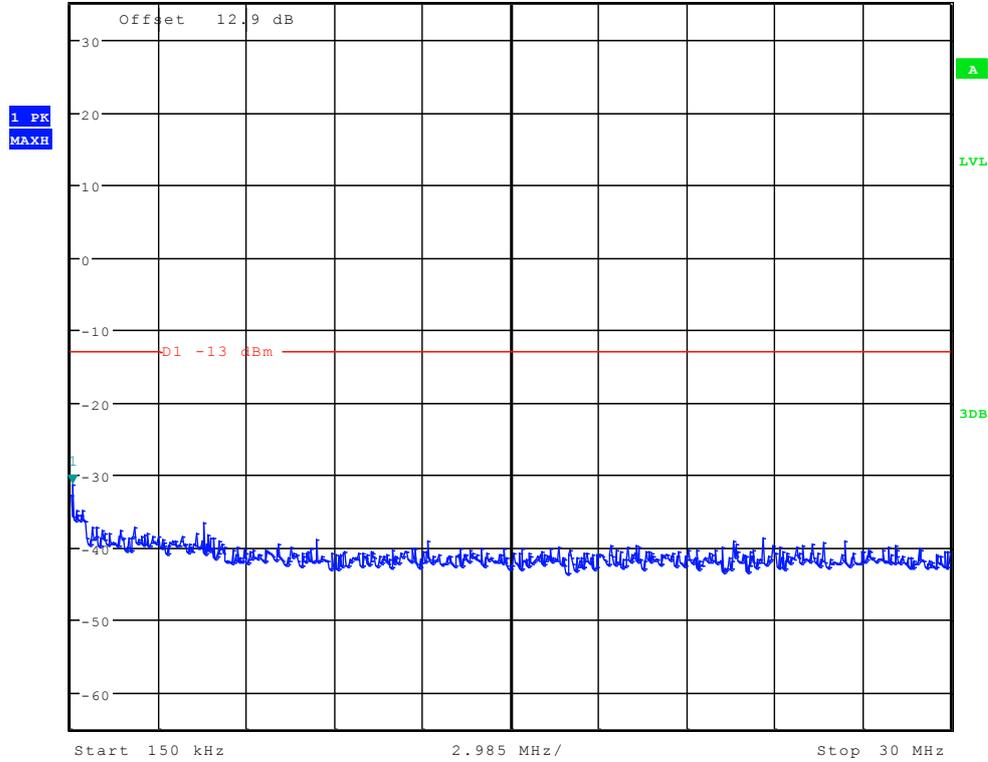
*RBW 1 kHz Marker 1 [T1]
 *VBW 10 kHz -37.39 dBm
 Ref 35 dBm Att 50 dB SWT 145 ms 11.259615385 kHz



Date: 8.JUL.2012 11:46:30



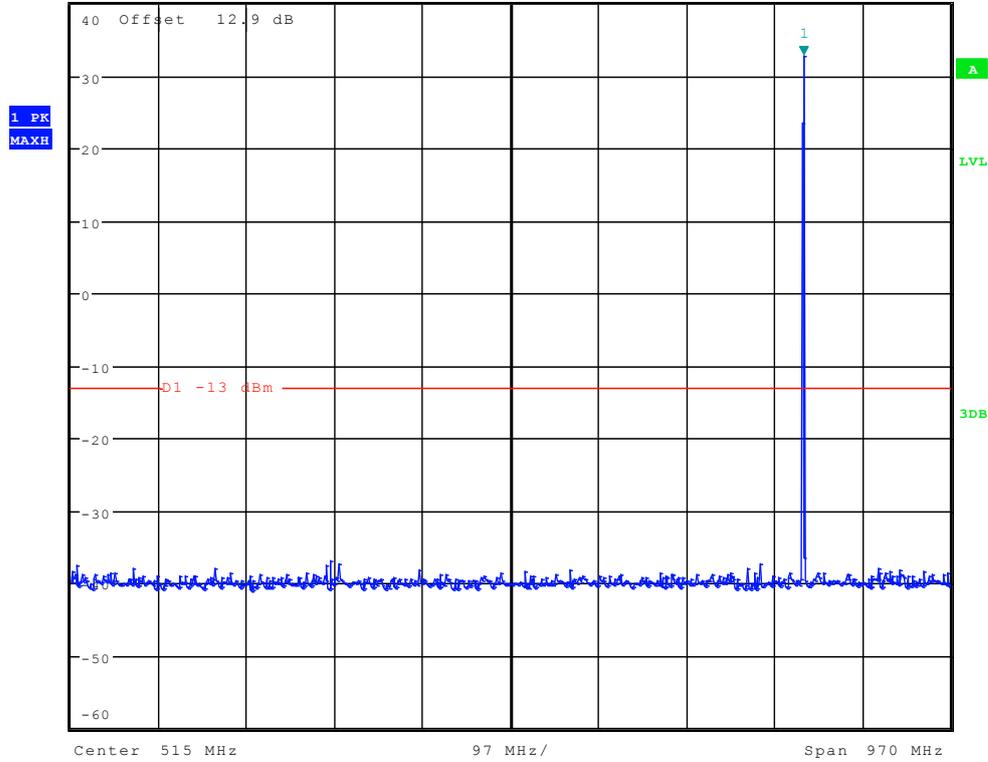
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -31.32 dBm
Ref 35 dBm Att 50 dB SWT 300 ms 197.836538462 kHz



Date: 8.JUL.2012 11:47:13



* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 32.78 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 838.333333333 MHz



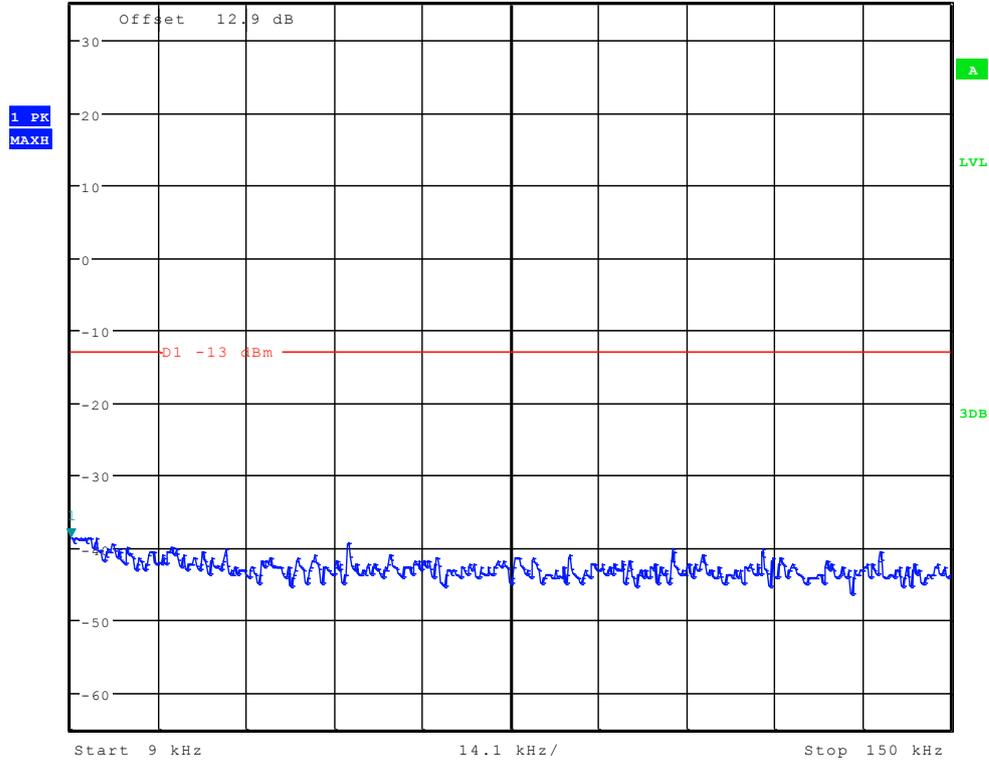
Date: 8.JUL.2012 11:48:37



Channel 251



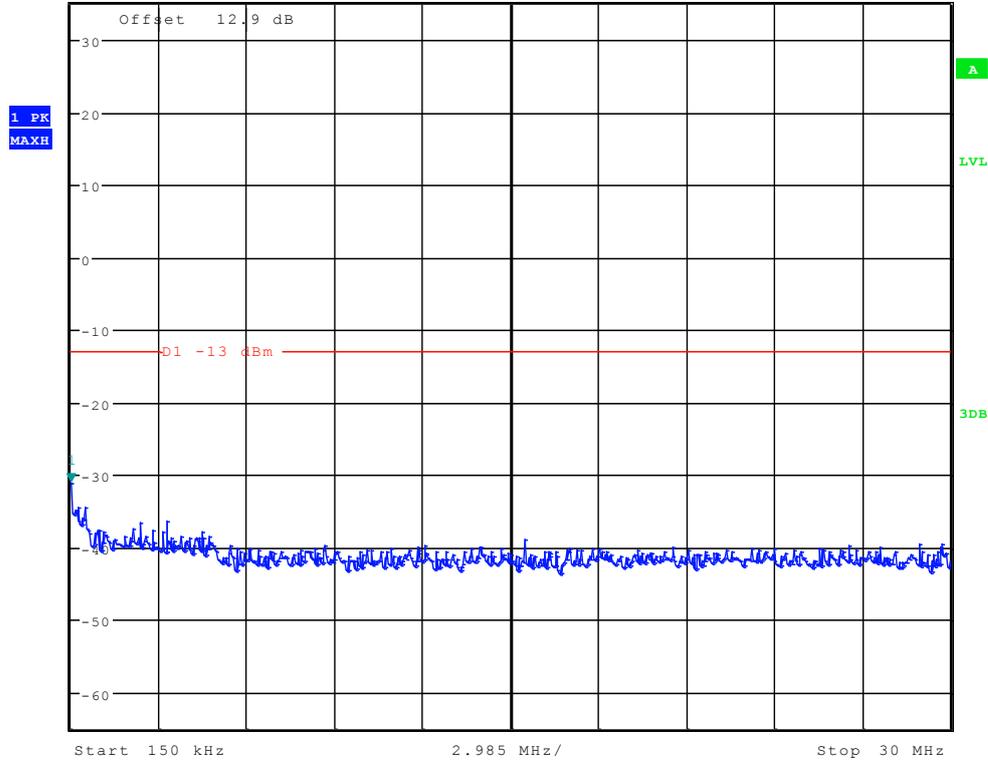
* RBW 1 kHz Marker 1 [T1]
 * VBW 10 kHz -38.54 dBm
 Ref 35 dBm Att 50 dB SWT 145 ms 9.000000000 kHz



Date: 8.JUL.2012 11:46:44



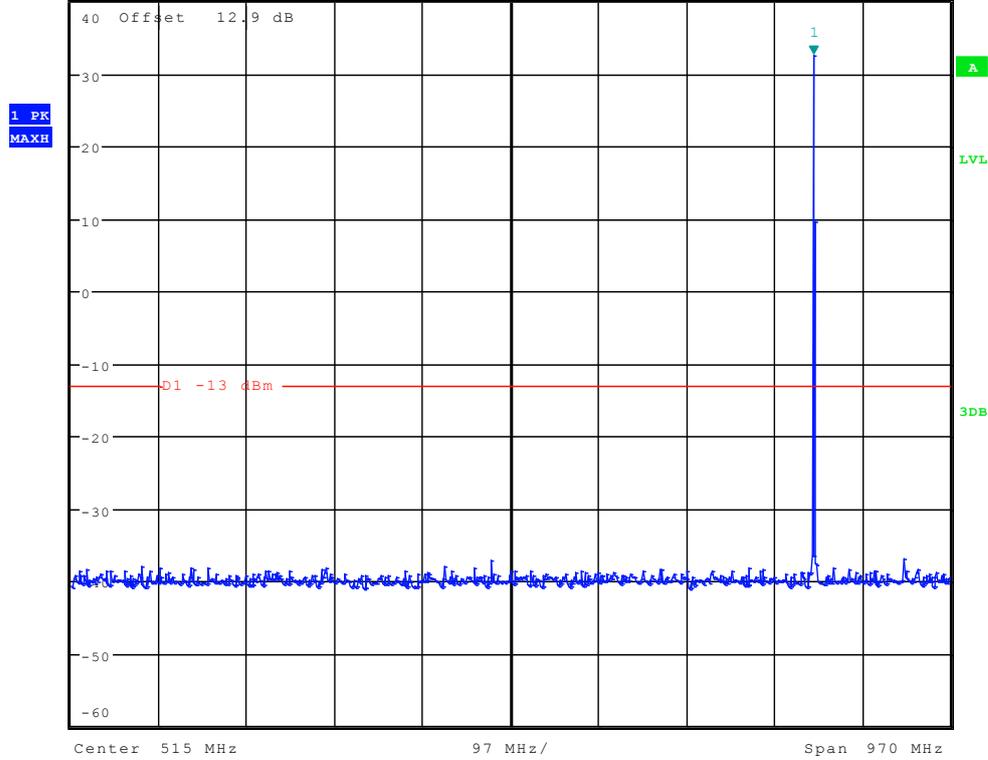
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -31.16 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 8.JUL.2012 11:47:28



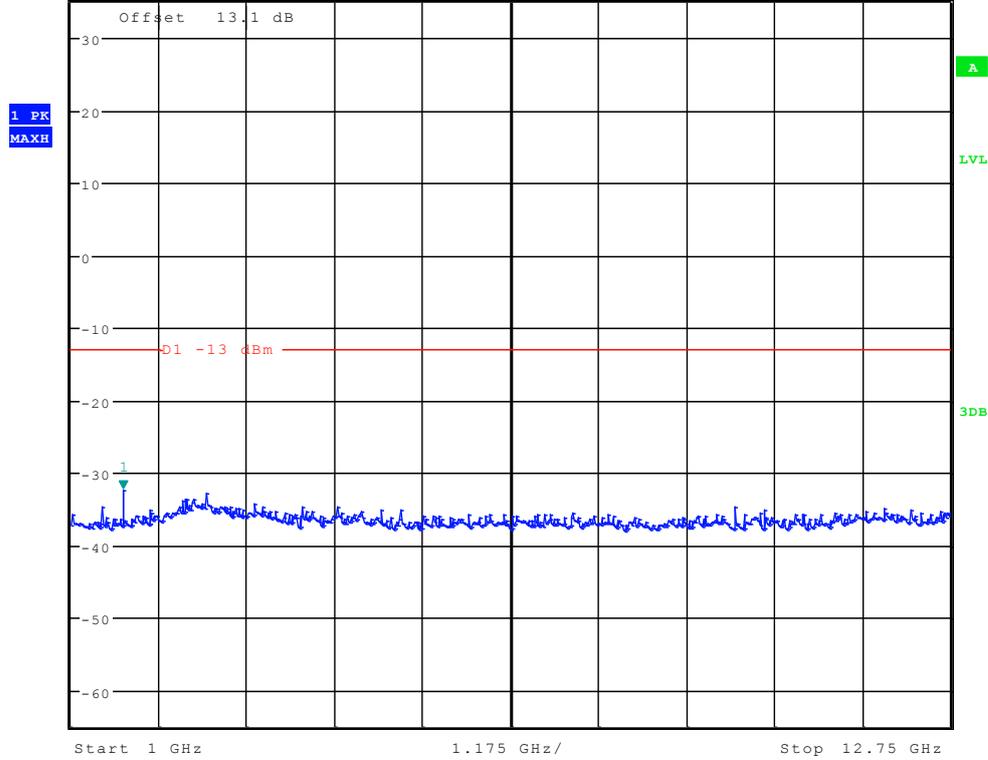
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 32.47 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 849.214743590 MHz



Date: 8.JUL.2012 11:48:51



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -32.35 dBm
 Ref 35 dBm * Att 30 dB SWT 70 ms 1.696714744 GHz



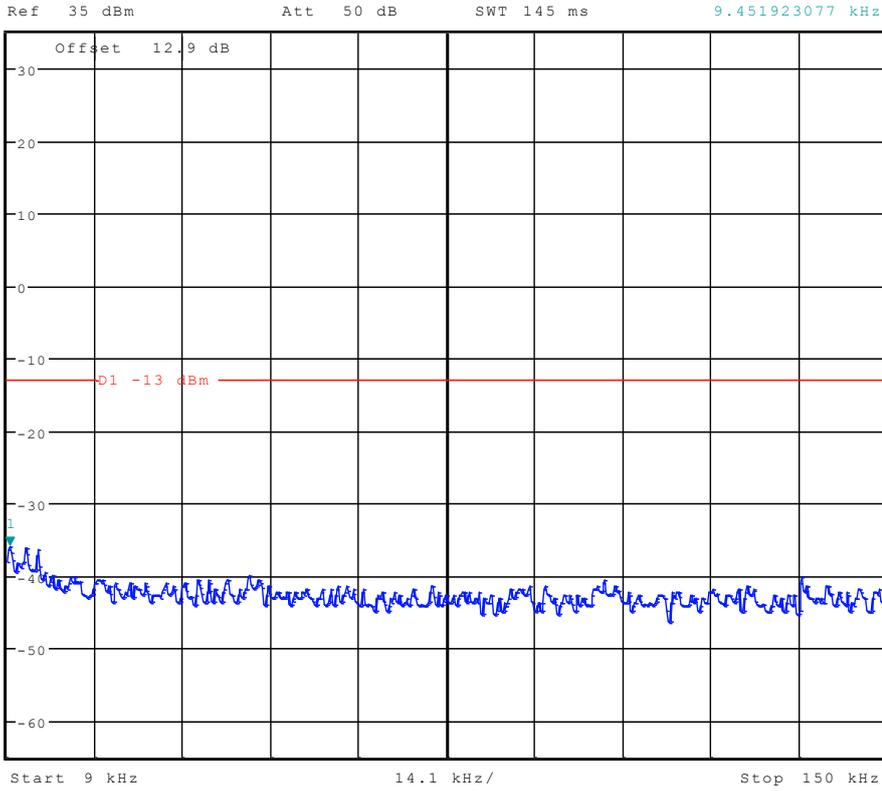
Date: 8.JUL.2012 11:49:35



TM2:EDGE Channel 128



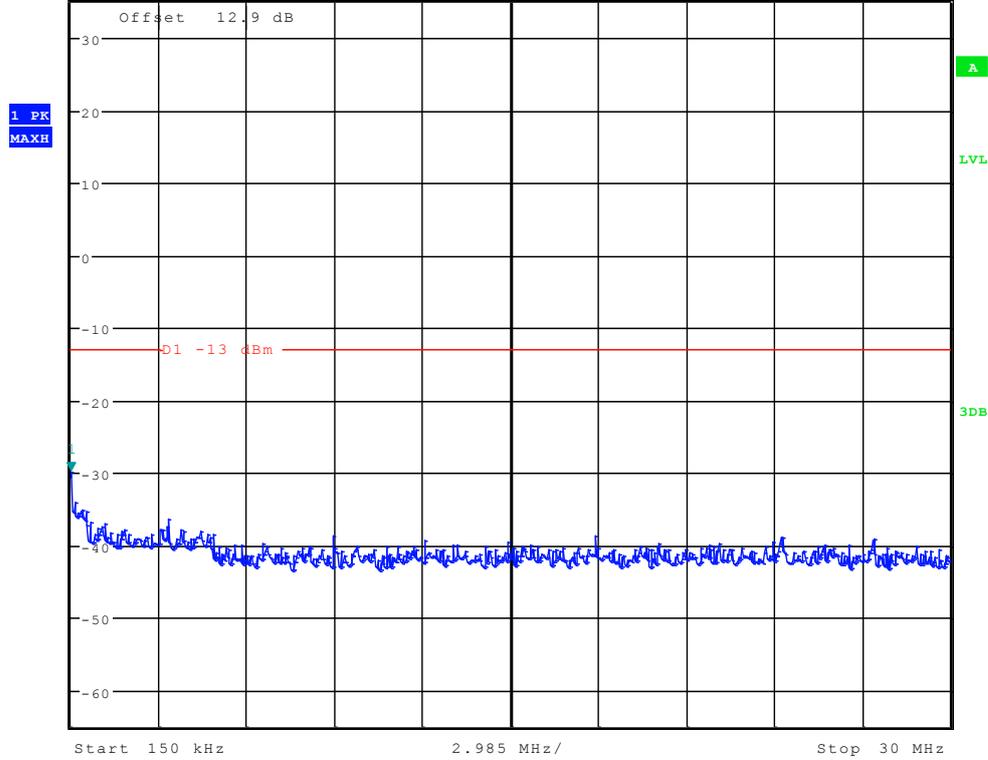
*RBW 1 kHz Marker 1 [T1]
 *VBW 10 kHz -35.92 dBm
 SWT 145 ms 9.451923077 kHz



Date: 8.JUL.2012 11:55:09



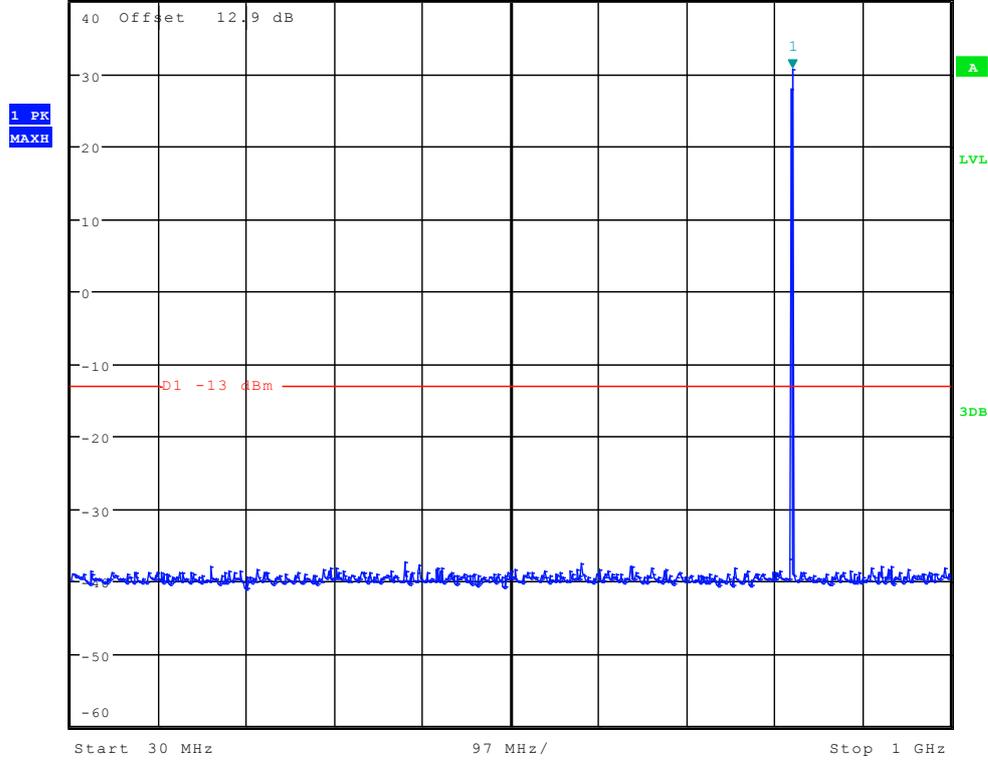
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -29.85 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 8.JUL.2012 11:55:53



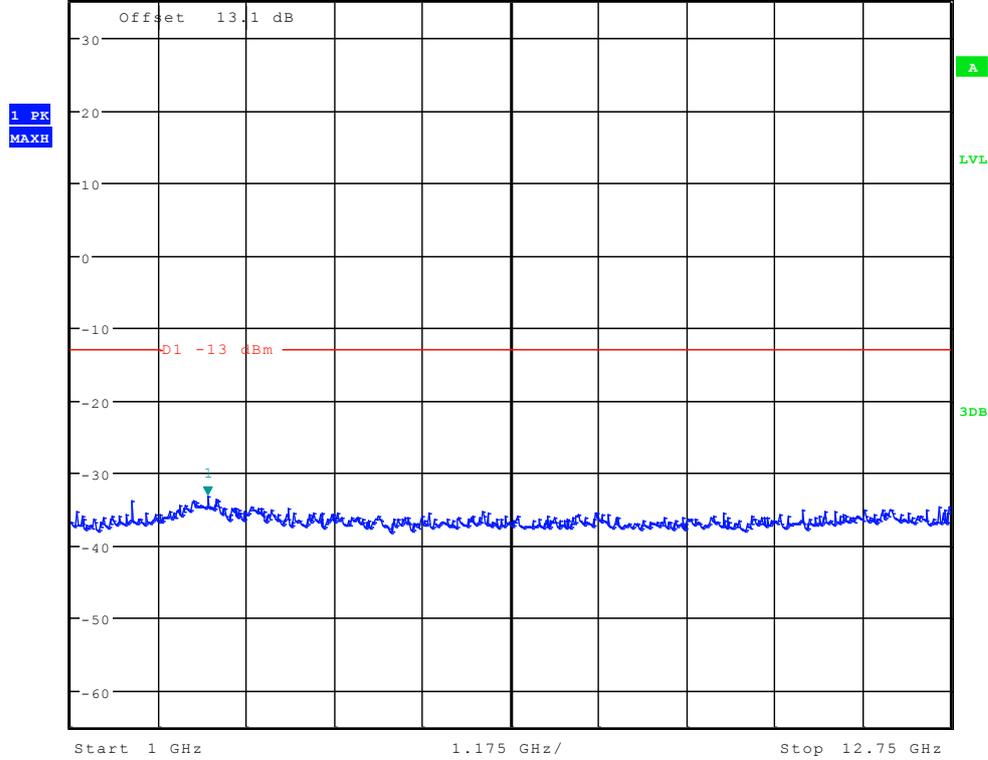
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 30.58 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 825.897435897 MHz



Date: 8.JUL.2012 11:57:05



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -33.11 dBm
 Ref 35 dBm * Att 30 dB SWT 70 ms 2.826522436 GHz



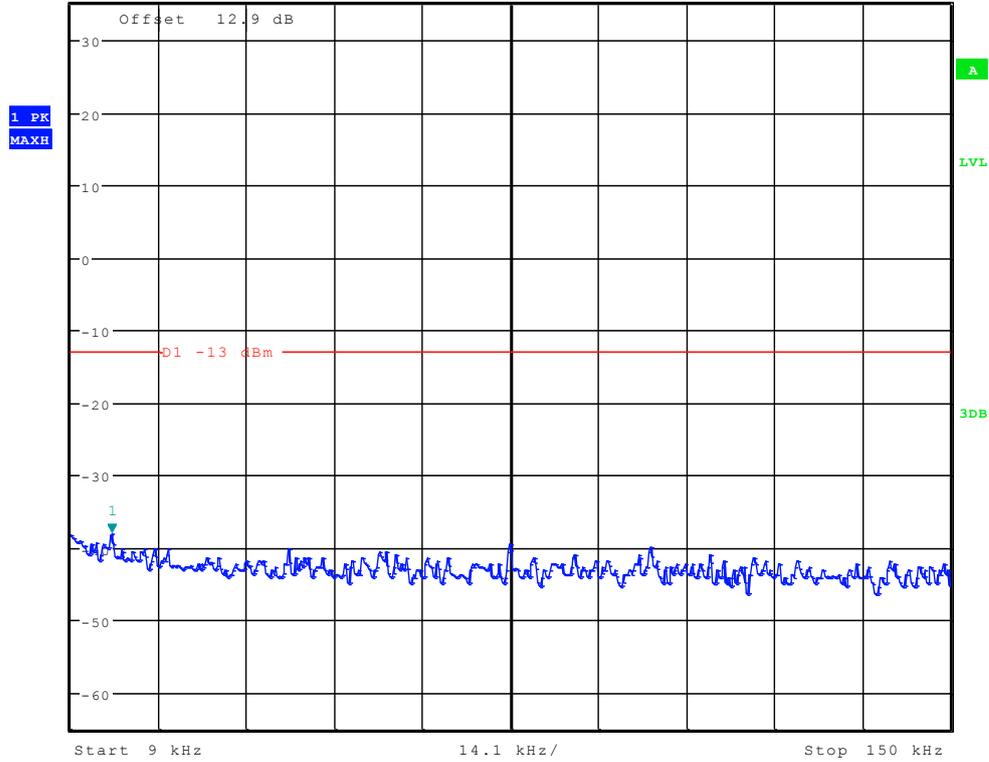
Date: 8.JUL.2012 11:57:49



Channel 192



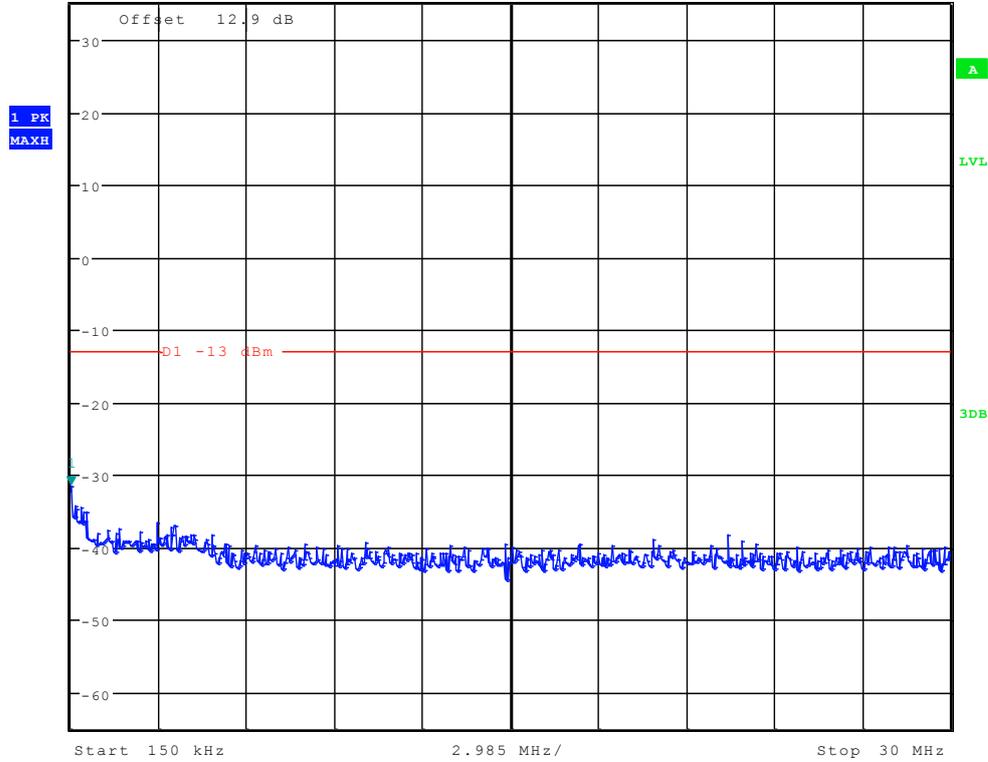
Ref 35 dBm Att 50 dB *RBW 1 kHz Marker 1 [T1] -37.95 dBm
*VBW 10 kHz SWT 145 ms 15.552884615 kHz



Date: 8.JUL.2012 11:55:24



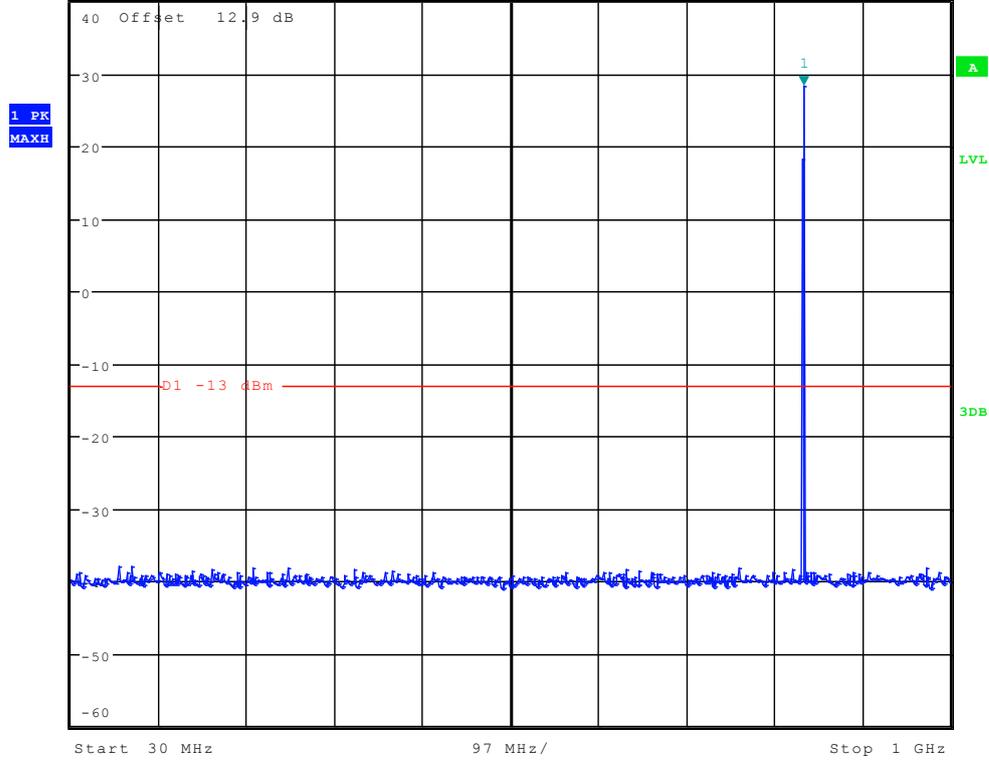
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -31.59 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.000000000 kHz



Date: 8.JUL.2012 11:56:07



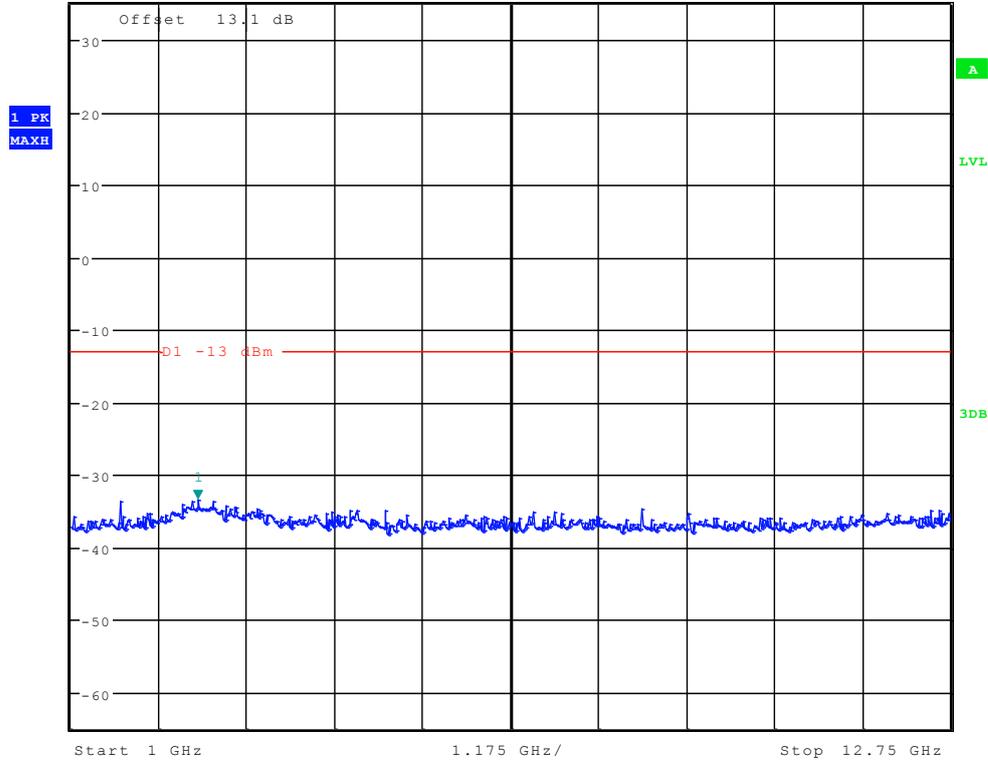
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 28.37 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 838.333333333 MHz



Date: 8.JUL.2012 11:57:19



*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -33.48 dBm
 Ref 35 dBm *Att 30 dB SWT 70 ms 2.694711538 GHz



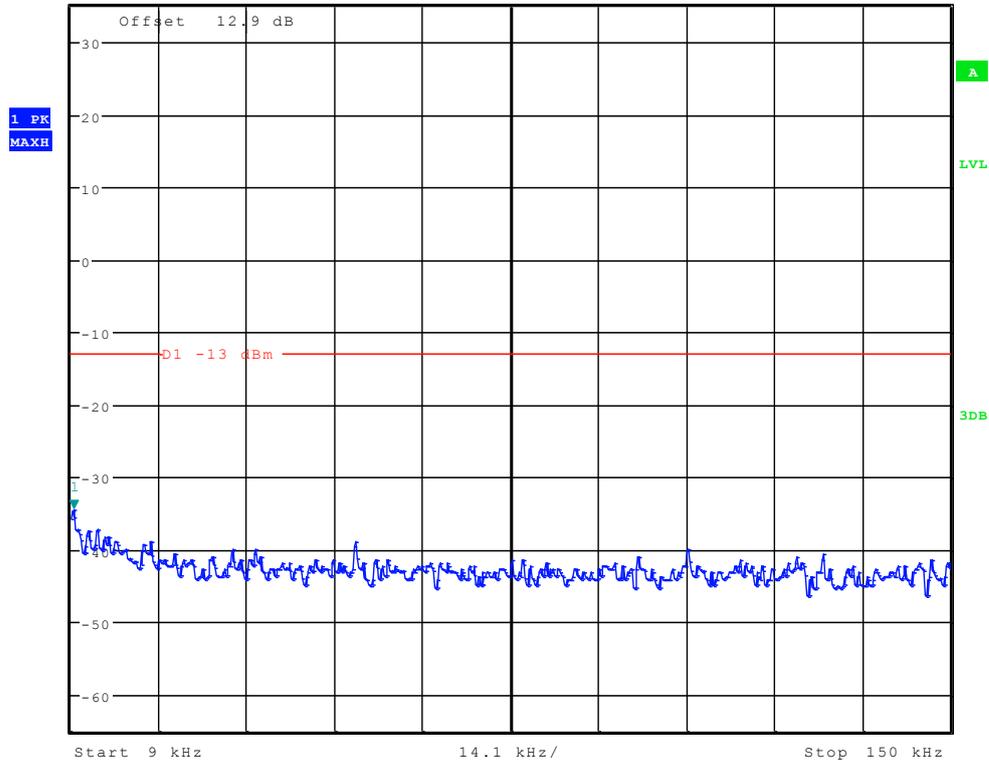
Date: 8.JUL.2012 11:58:03



Channel 251



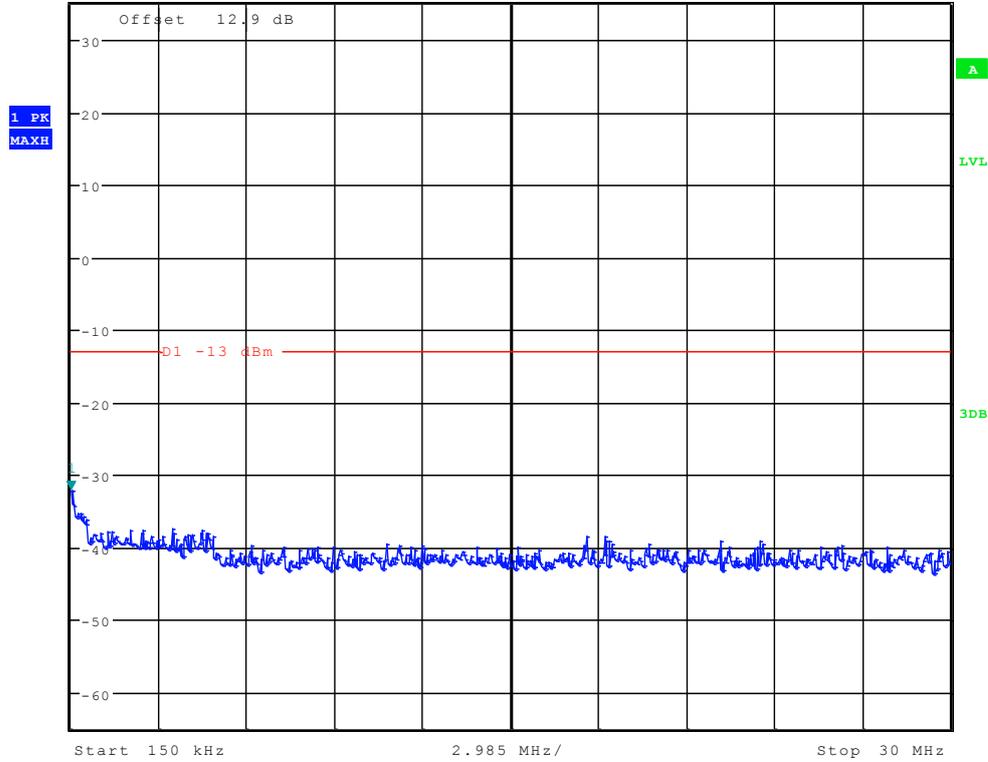
* RBW 1 kHz Marker 1 [T1]
* VBW 10 kHz -34.50 dBm
Ref 35 dBm Att 50 dB SWT 145 ms 9.451923077 kHz



Date: 8.JUL.2012 11:55:38



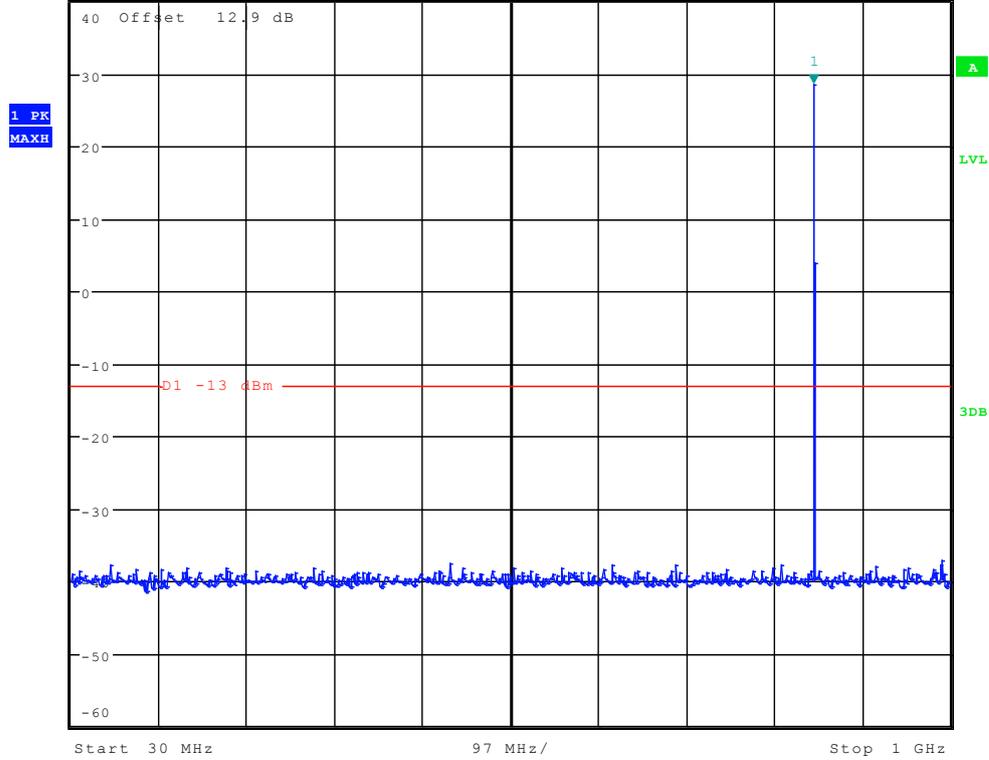
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -32.22 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.000000000 kHz



Date: 8.JUL.2012 11:56:22



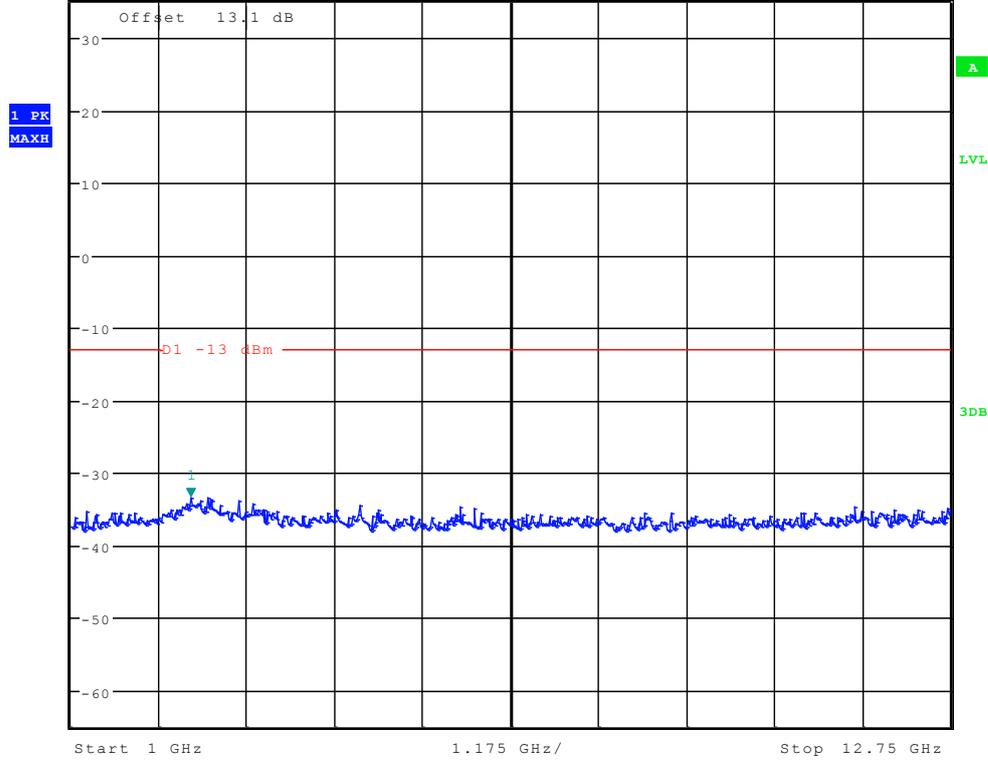
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 28.50 dBm
 Ref 40 dBm * Att 30 dB SWT 100 ms 849.214743590 MHz



Date: 8.JUL.2012 11:57:34



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -33.40 dBm
 Ref 35 dBm * Att 30 dB SWT 70 ms 2.600560897 GHz



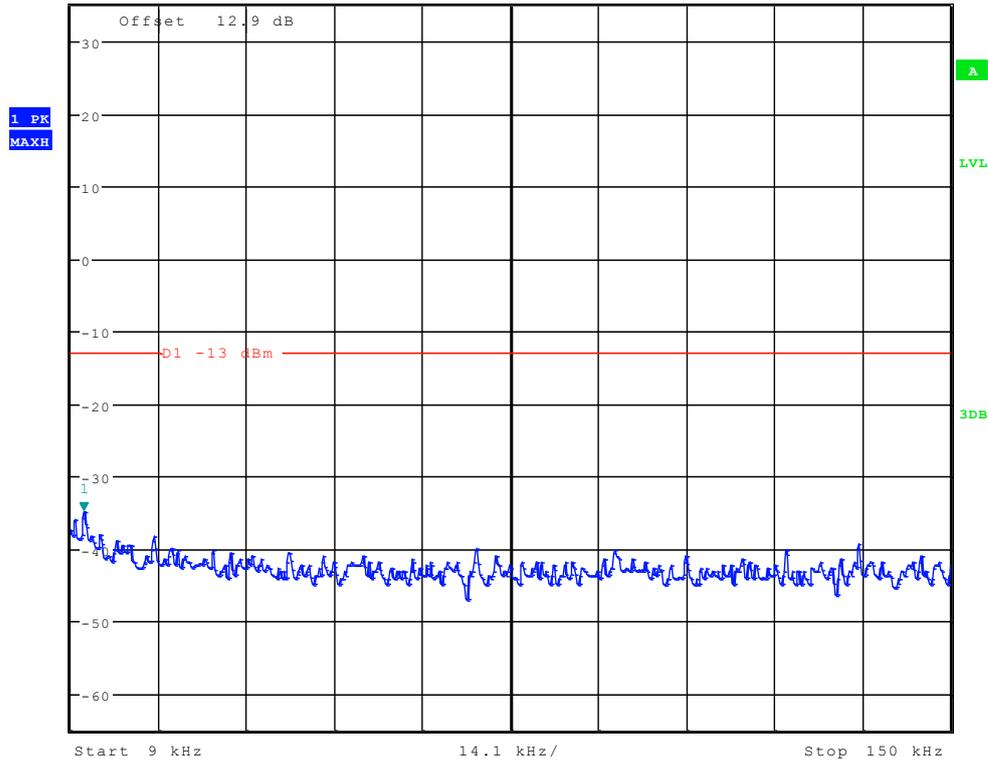
Date: 8.JUL.2012 11:58:17



TM3: WCDMA Channel 4132



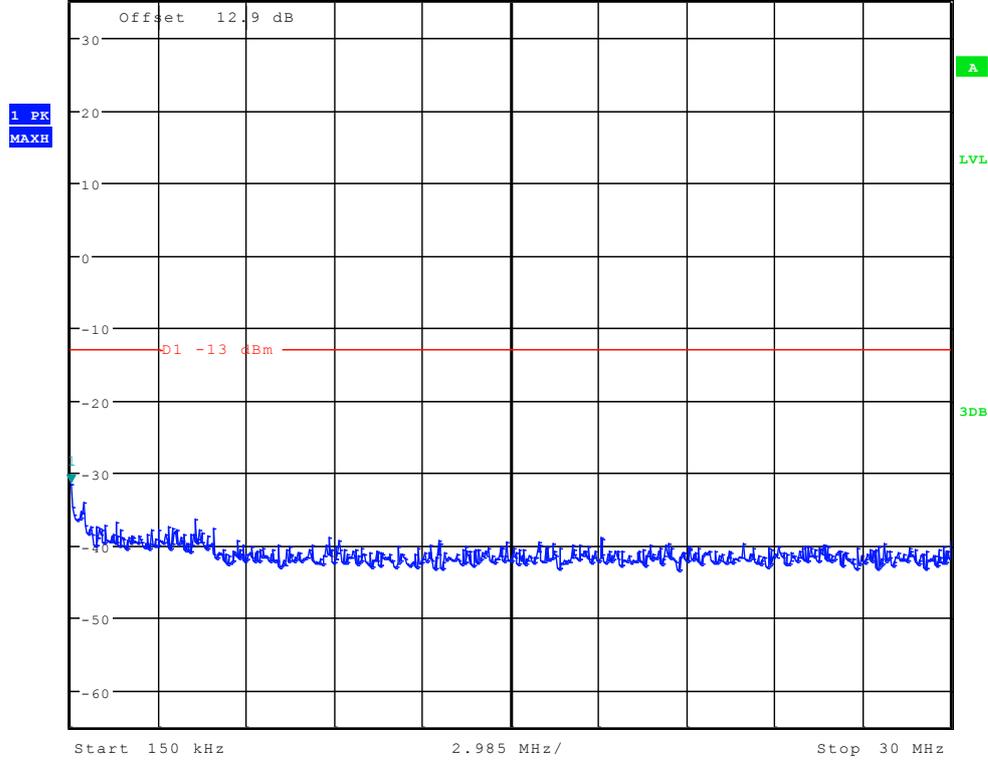
*RBW 1 kHz Marker 1 [T1]
 *VBW 10 kHz -34.89 dBm
 Ref 35 dBm Att 50 dB SWT 145 ms 11.033653846 kHz



Date: 8.JUL.2012 14:19:41



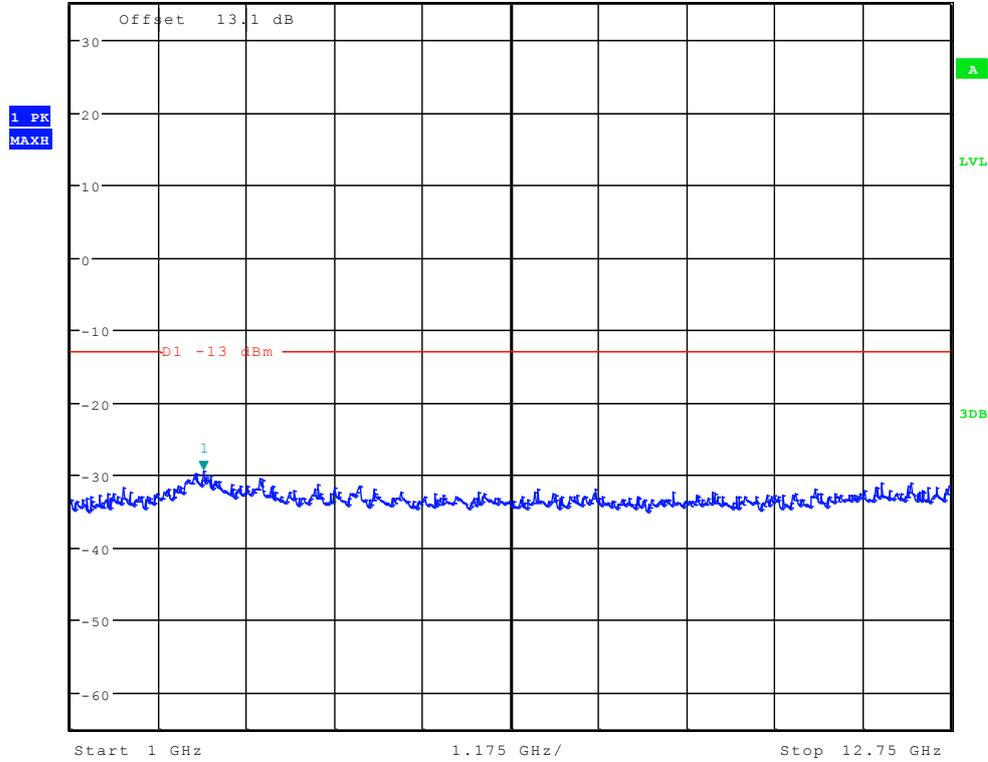
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -31.59 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 8.JUL.2012 14:20:24



*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -29.48 dBm
 Ref 35 dBm *Att 35 dB SWT 70 ms 2.770032051 GHz



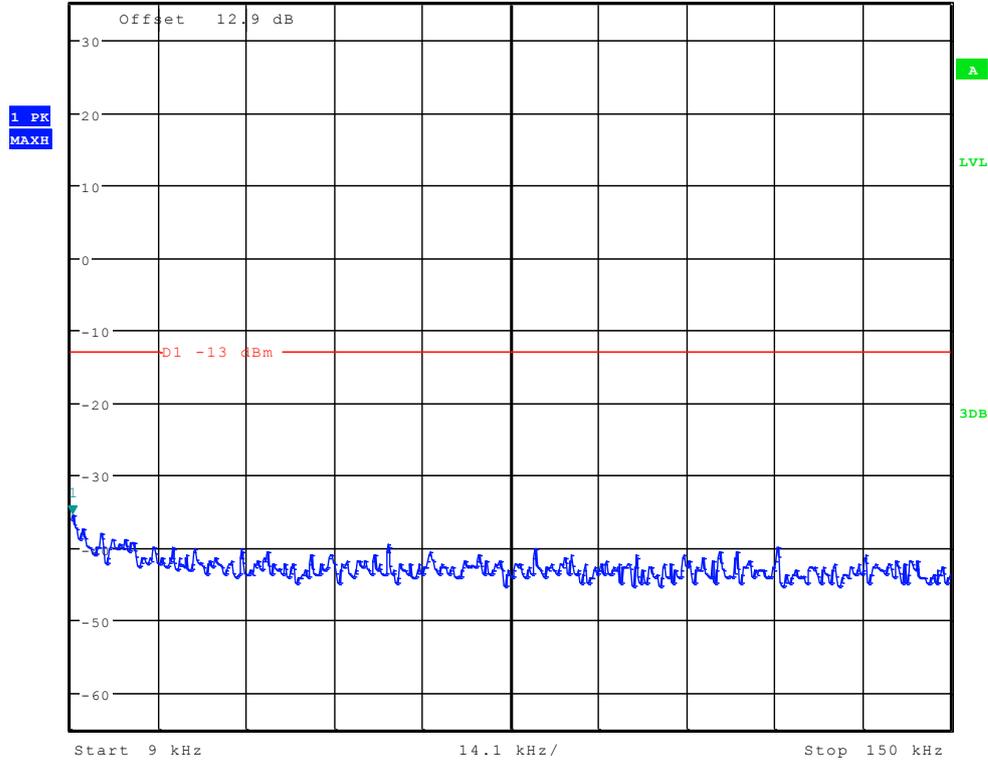
Date: 8.JUL.2012 14:22:13



Channel 4182



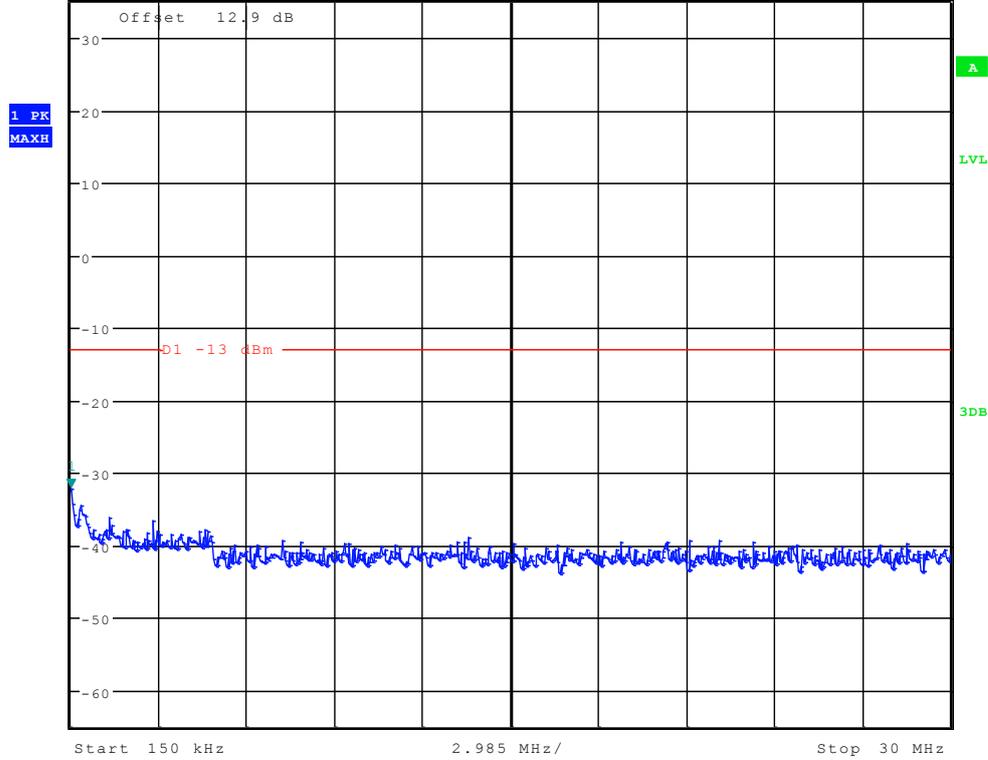
Ref 35 dBm Att 50 dB *RBW 1 kHz Marker 1 [T1] -35.48 dBm
 *VBW 10 kHz SWT 145 ms 9.225961538 kHz



Date: 8.JUL.2012 14:19:55



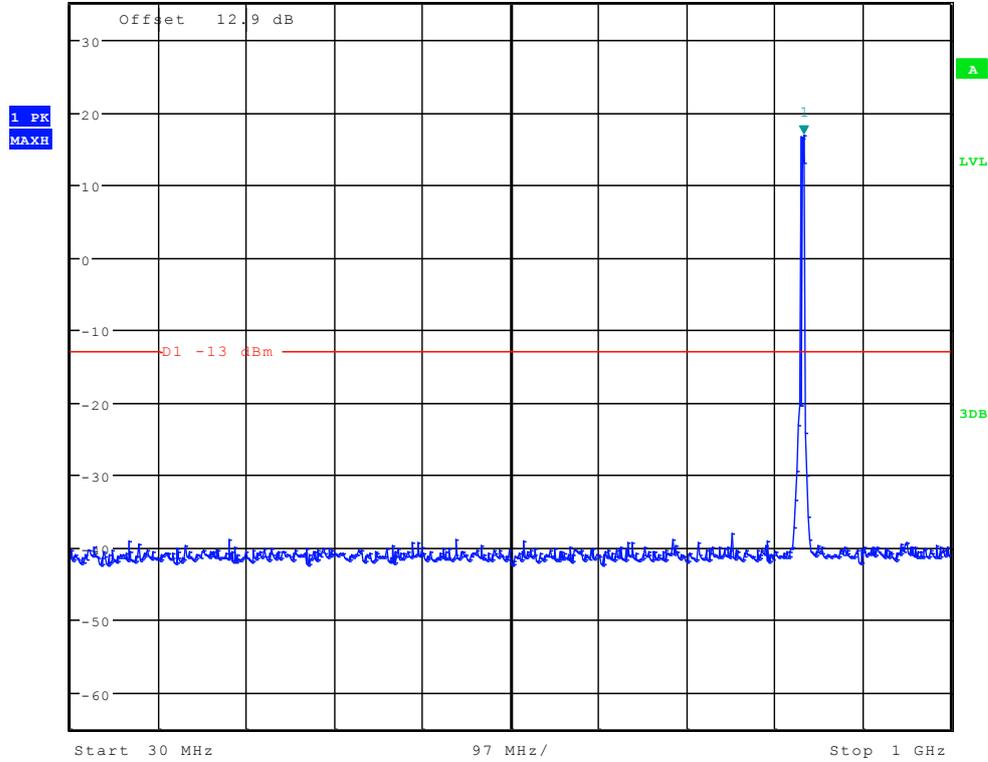
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -32.22 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.000000000 kHz



Date: 8.JUL.2012 14:20:39



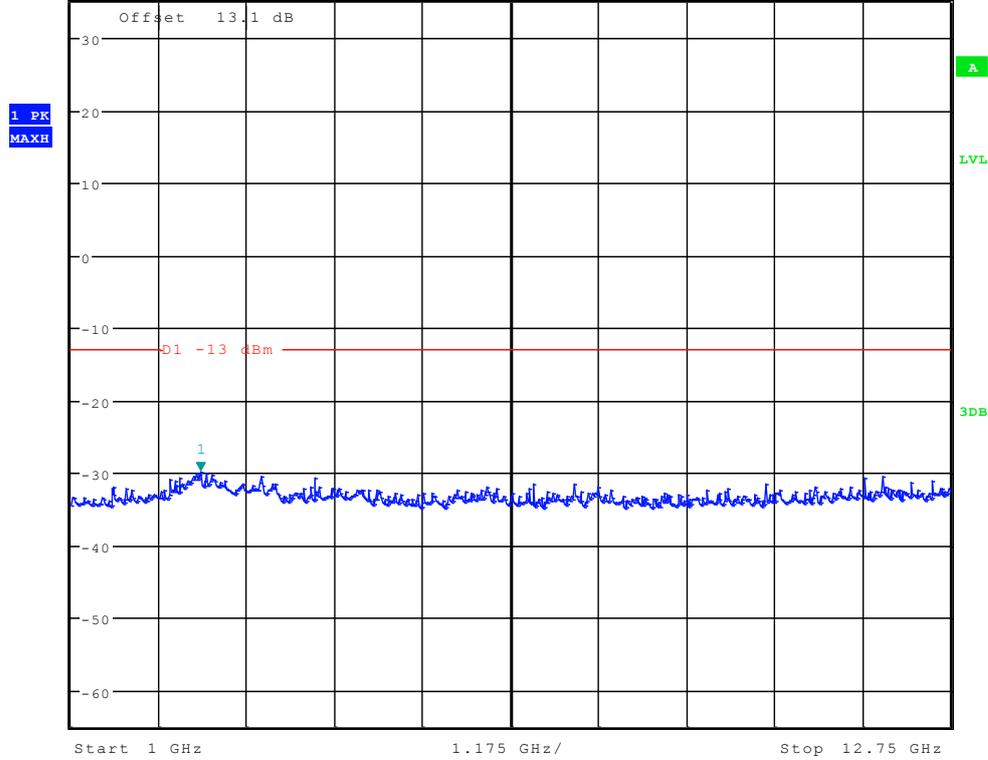
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 16.78 dBm
 Ref 35 dBm * Att 35 dB SWT 100 ms 838.333333333 MHz



Date: 8.JUL.2012 14:21:43



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -29.75 dBm
 Ref 35 dBm * Att 35 dB SWT 70 ms 2.732371795 GHz



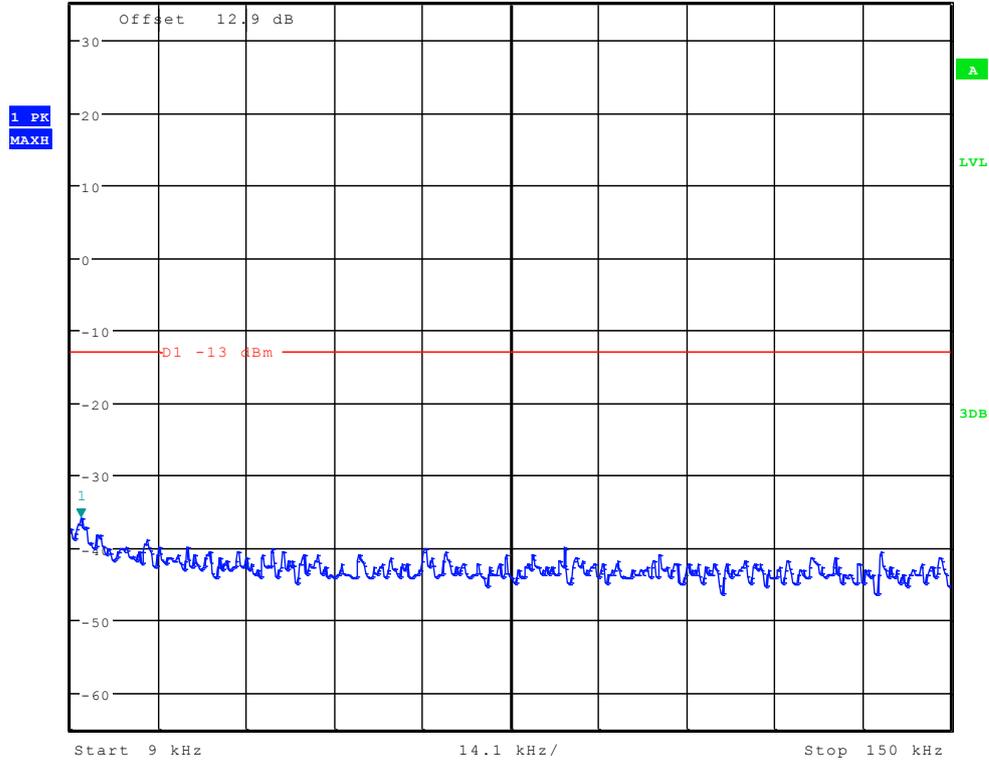
Date: 8.JUL.2012 14:22:27



Channel 4233



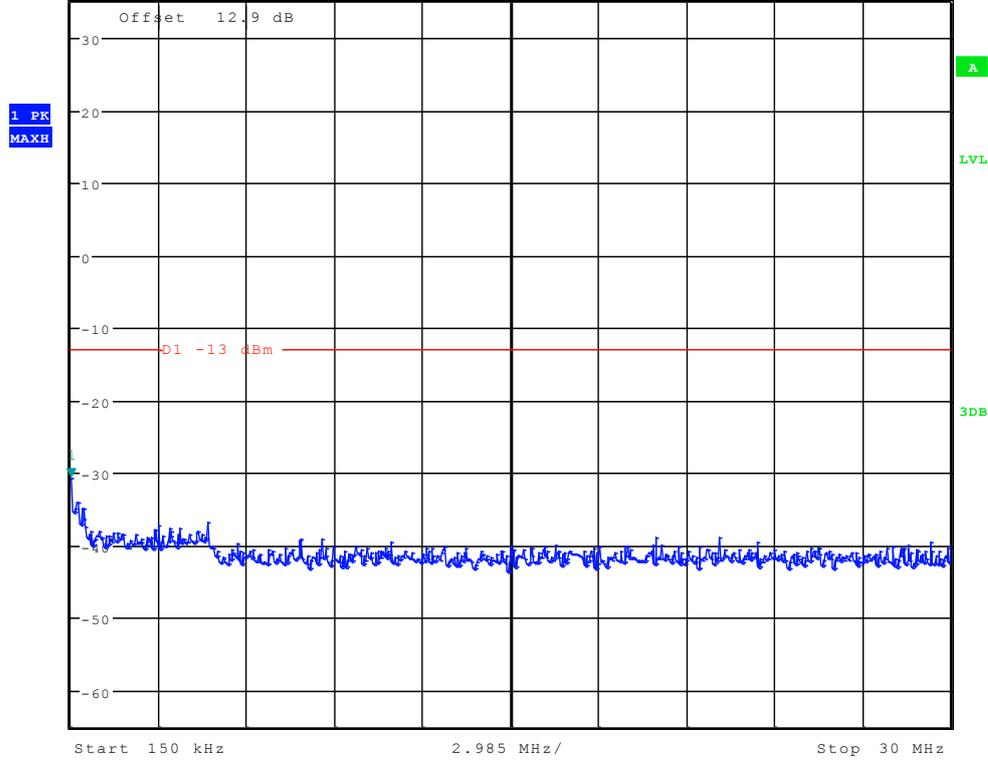
Ref 35 dBm Att 50 dB *RBW 1 kHz Marker 1 [T1] -35.92 dBm
 *VBW 10 kHz SWT 145 ms 10.581730769 kHz



Date: 8.JUL.2012 14:20:10



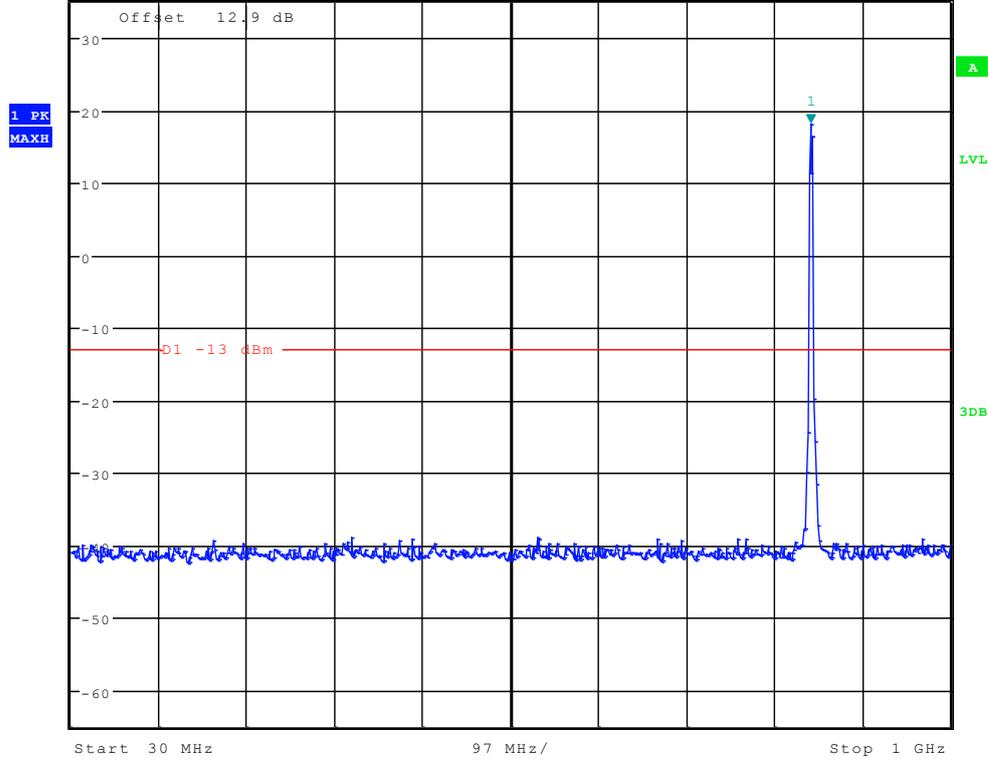
*RBW 10 kHz Marker 1 [T1]
 *VBW 30 kHz -30.75 dBm
 Ref 35 dBm Att 50 dB SWT 300 ms 150.00000000 kHz



Date: 8.JUL.2012 14:20:53



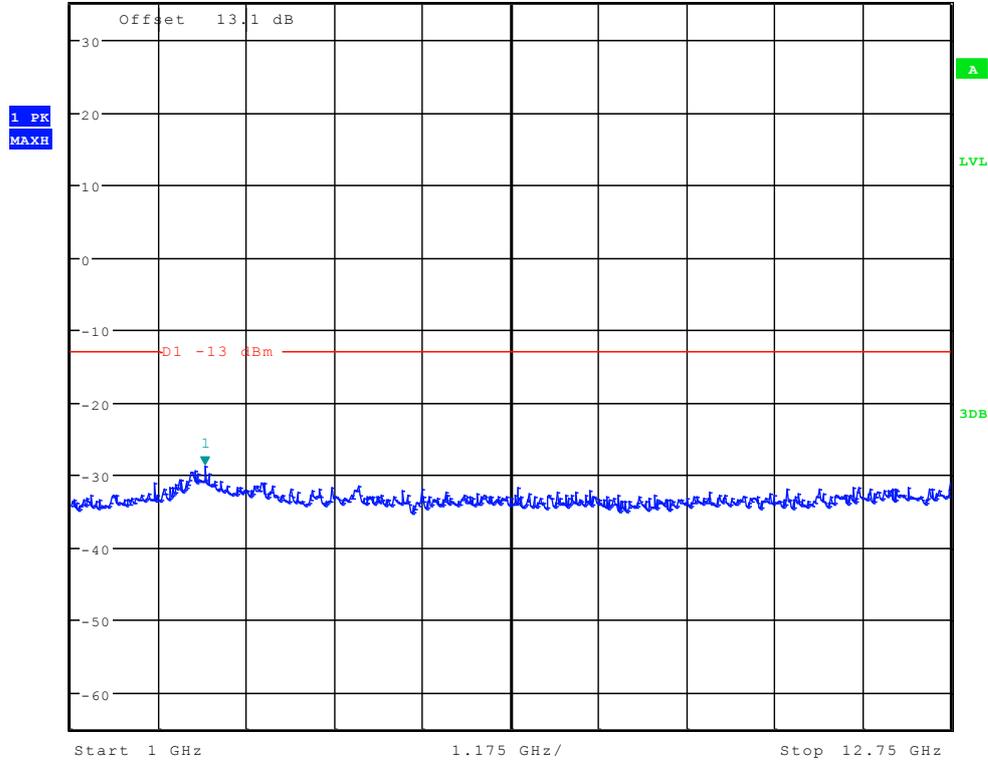
* RBW 100 kHz Marker 1 [T1]
 * VBW 300 kHz 18.18 dBm
 Ref 35 dBm * Att 35 dB SWT 100 ms 846.105769231 MHz



Date: 8.JUL.2012 14:21:58



* RBW 1 MHz Marker 1 [T1]
 * VBW 3 MHz -28.75 dBm
 Ref 35 dBm * Att 35 dB SWT 70 ms 2.788862179 GHz



Date: 8.JUL.2012 14:22:42

-----END-----



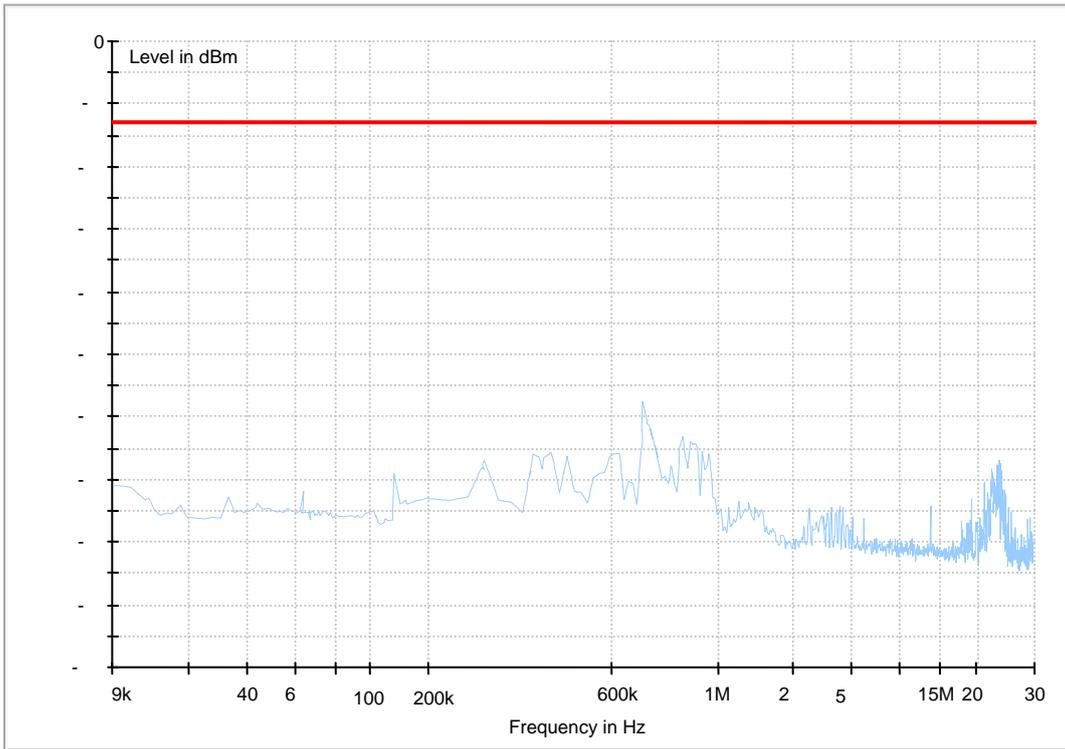
Appendix F

Radiated spurious emission

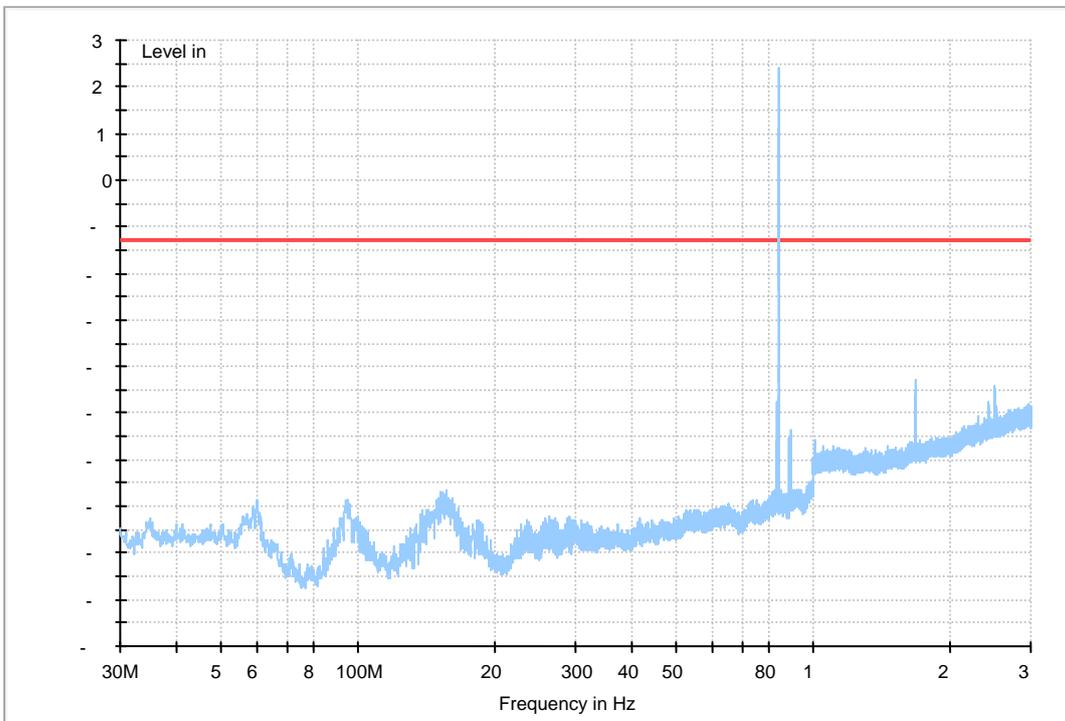
According to FCC Part 2.1053& Part 22.917

GSM850

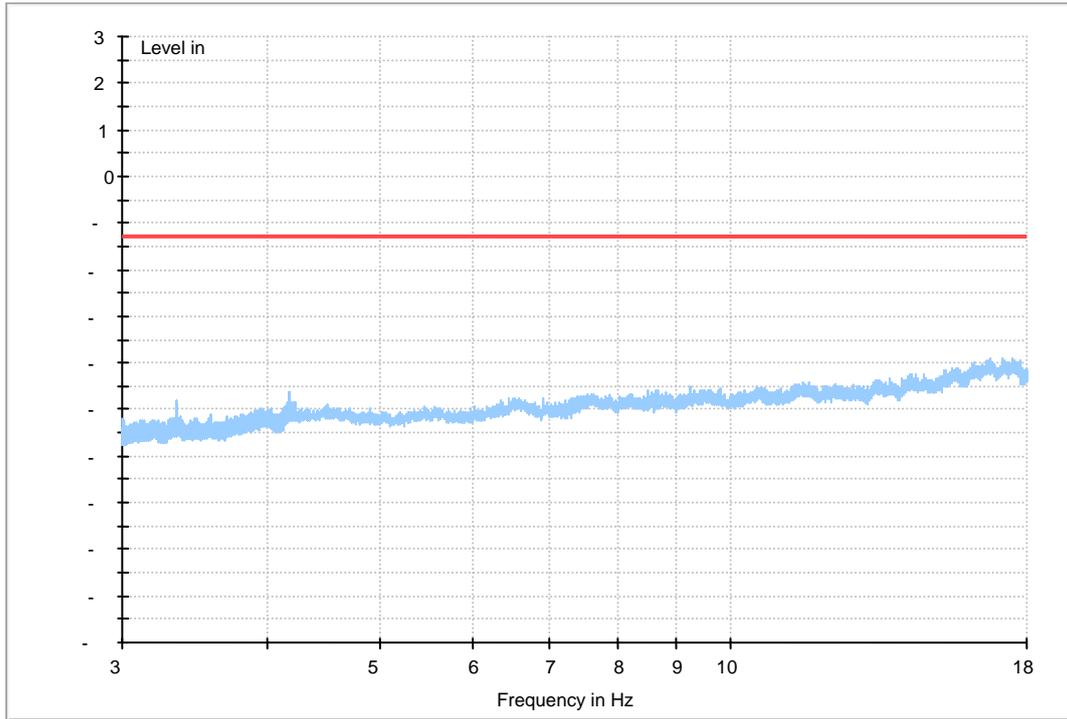
(9kHz~30MHz)



(30MHz~3GHz)

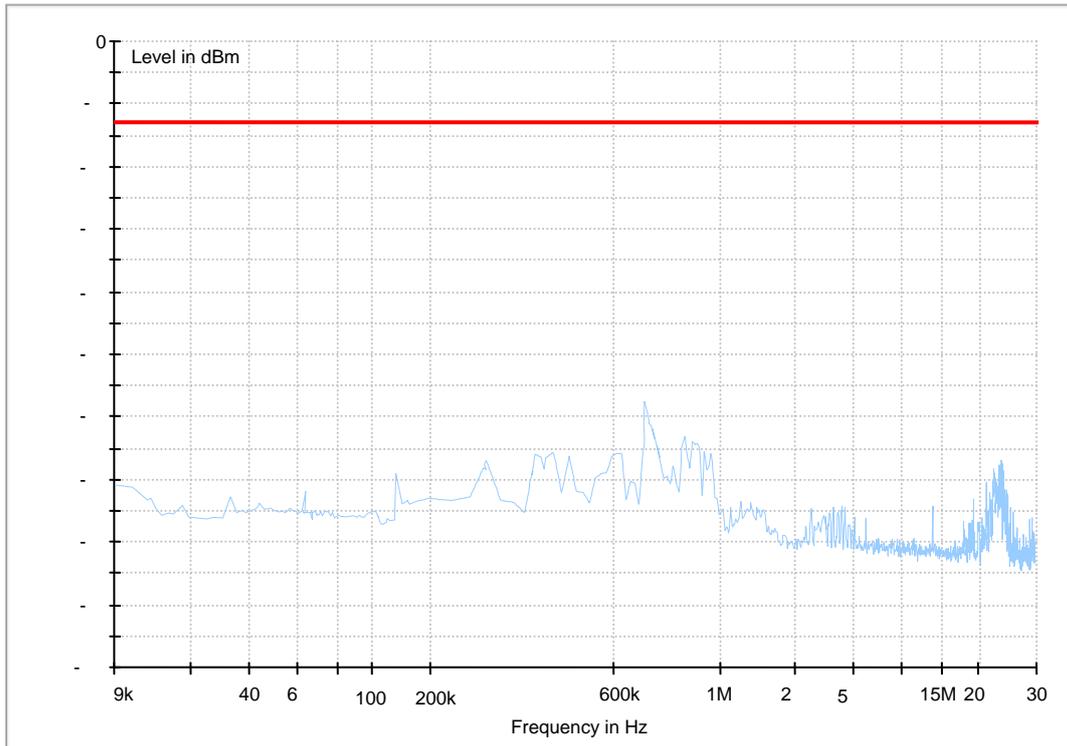


(3GHz~18GHz)

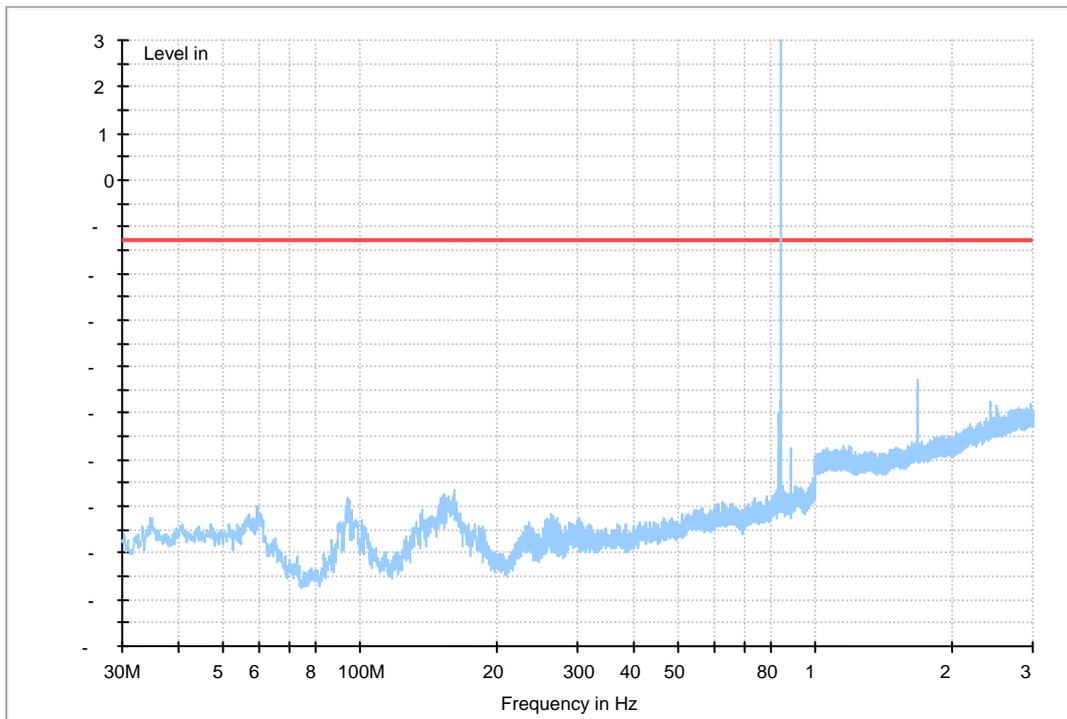


GPRS 850

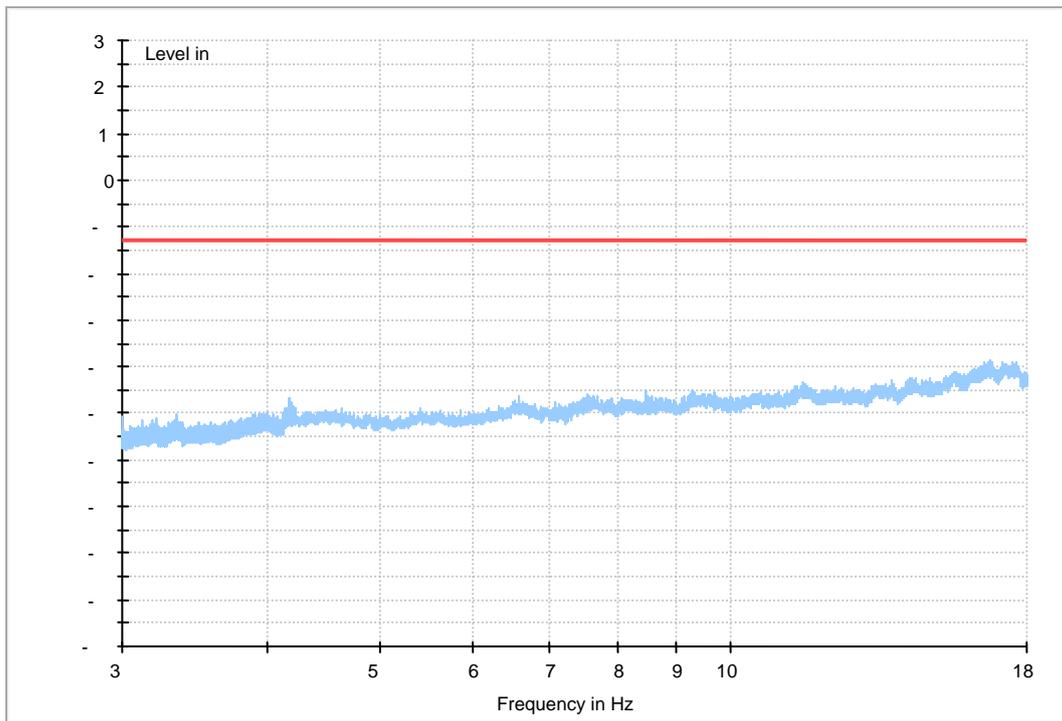
(9kHz~30MHz)



(30MHz~3GHz)

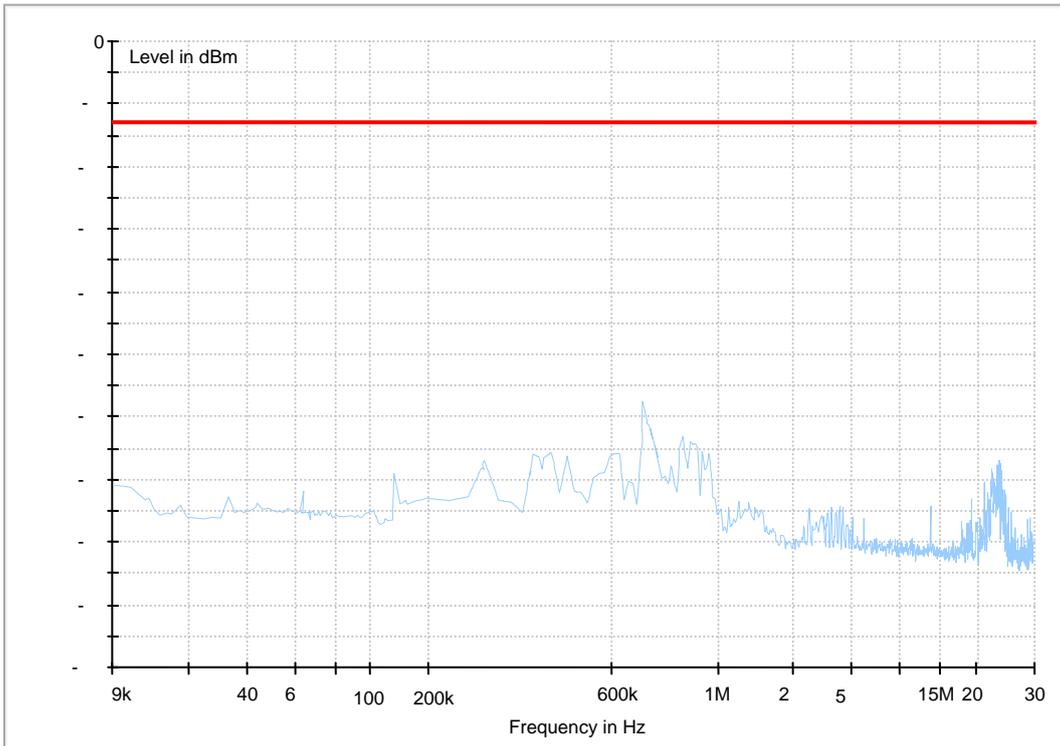


(3GHz~18GHz)

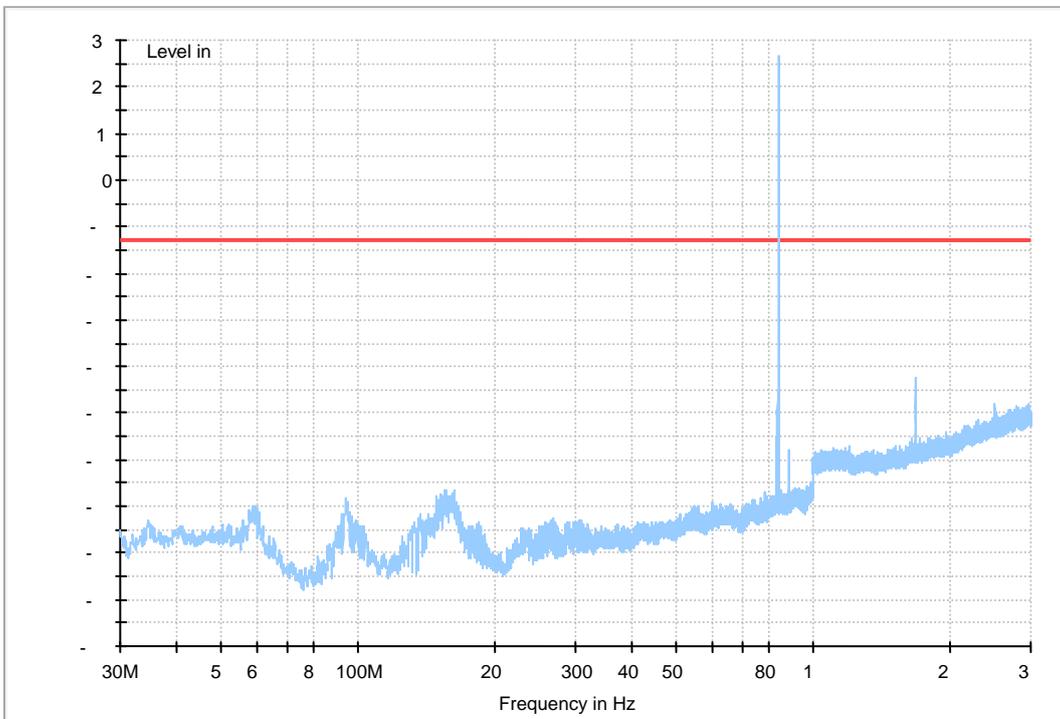


EDGE 850

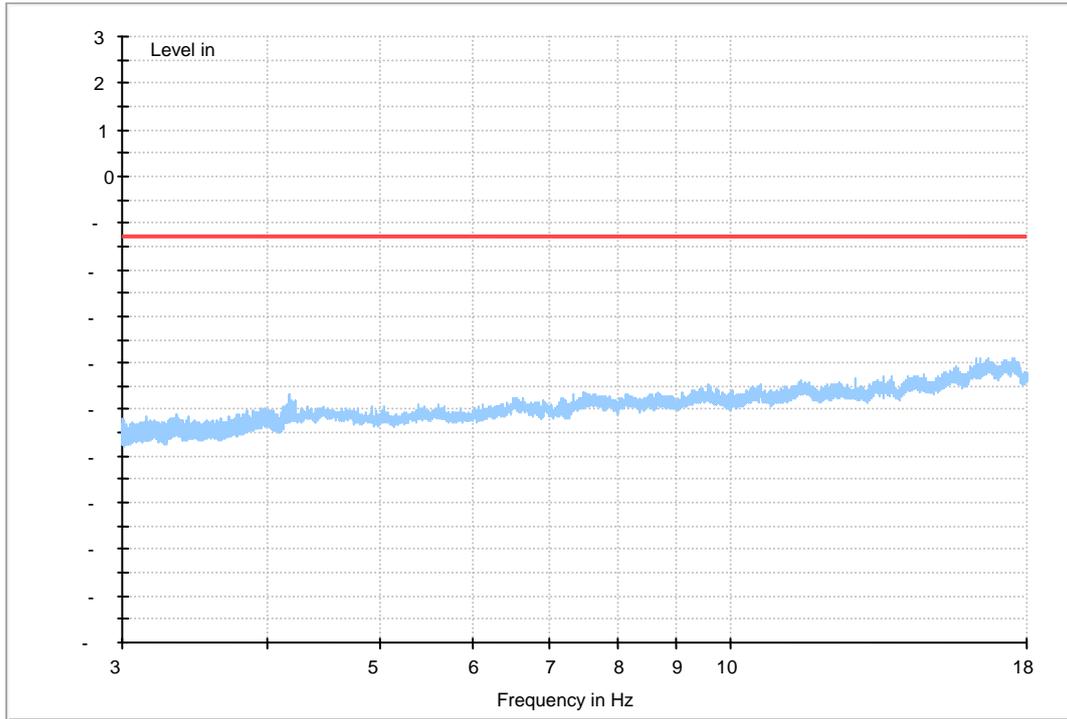
(9kHz~30MHz)



(30MHz~3GHz)

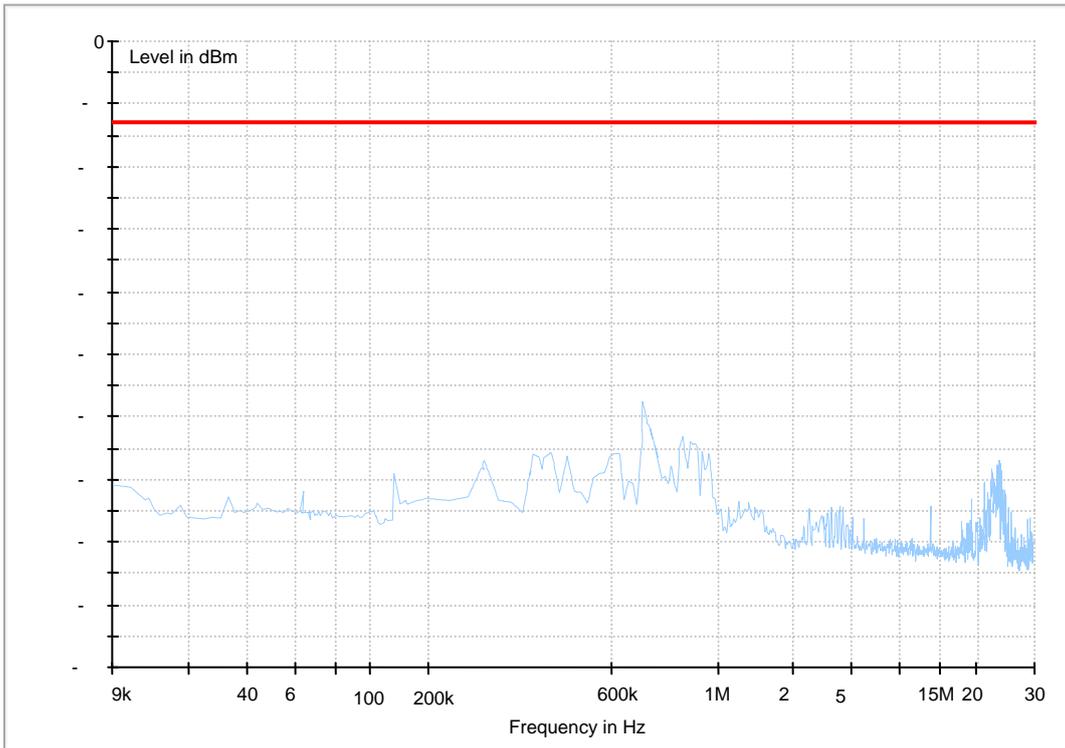


(3GHz~18GHz)

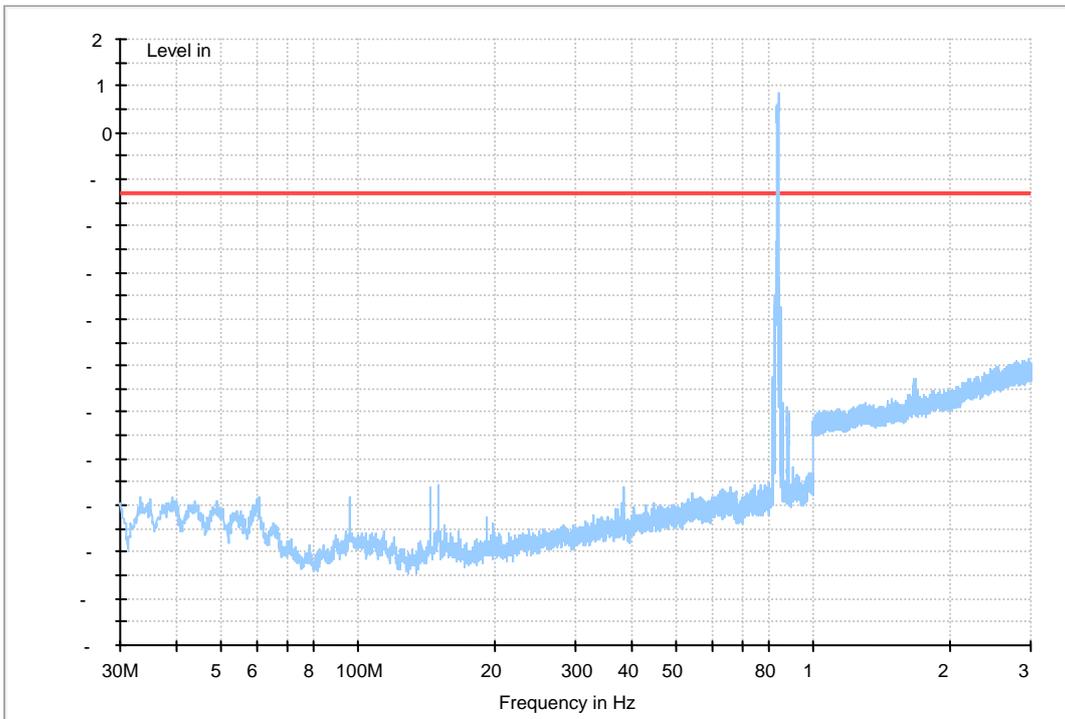


WCDMA Band V

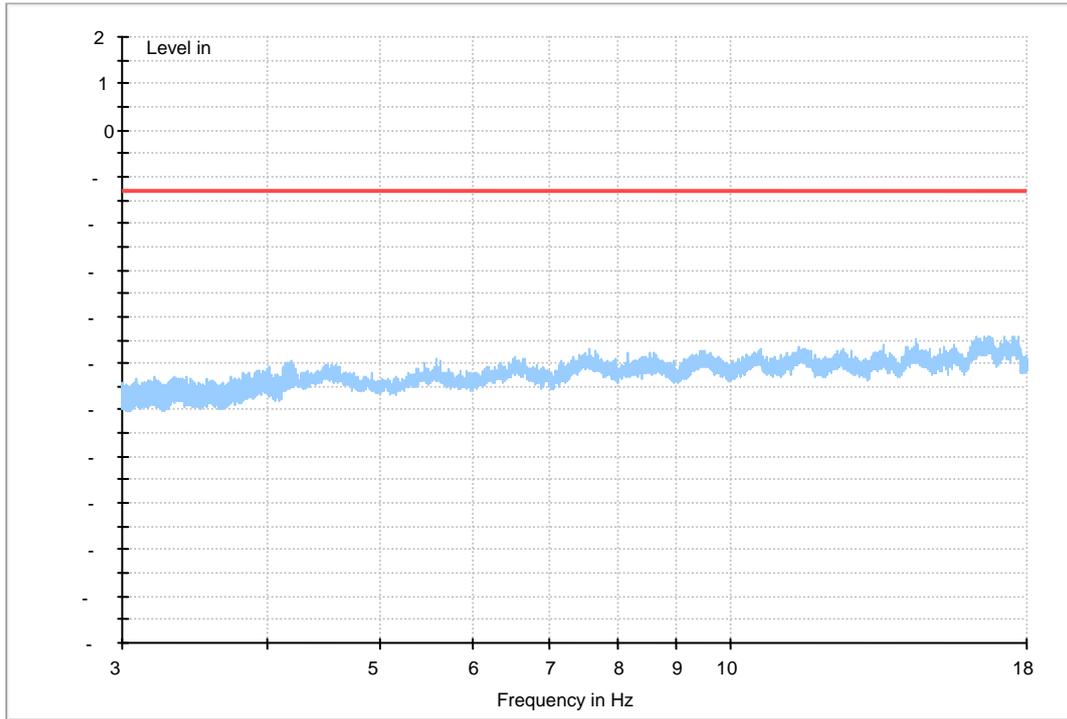
(9KHz~30MHz)



(30MHz~3GHz)

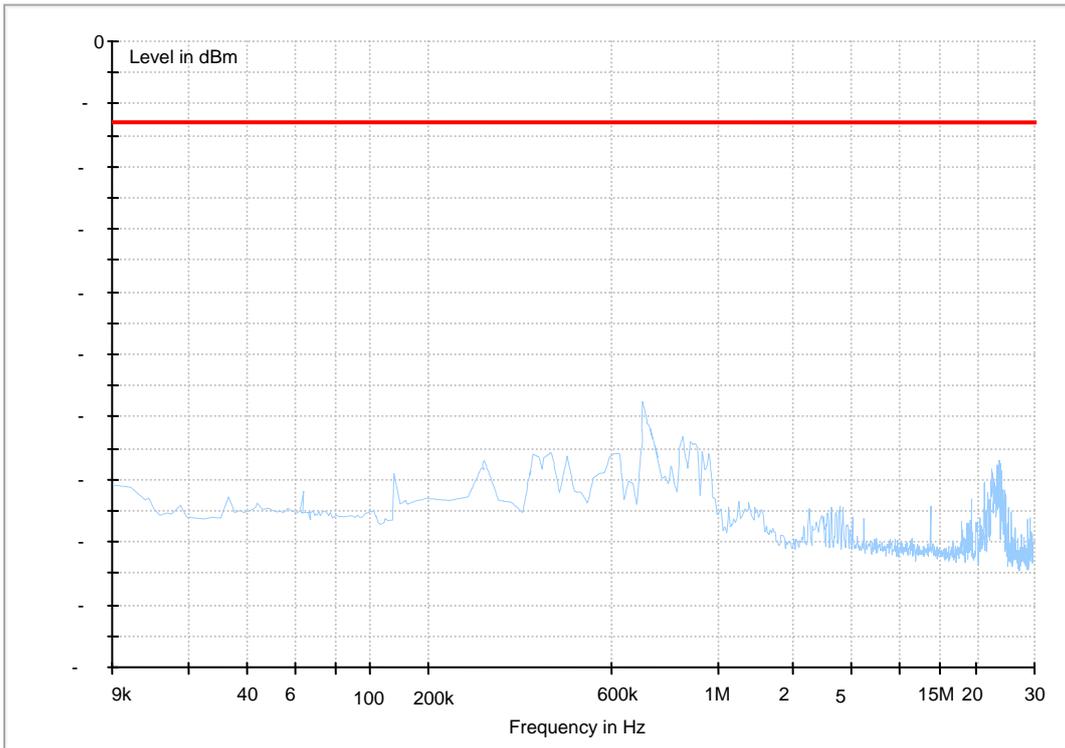


(3GHz~18GHz)

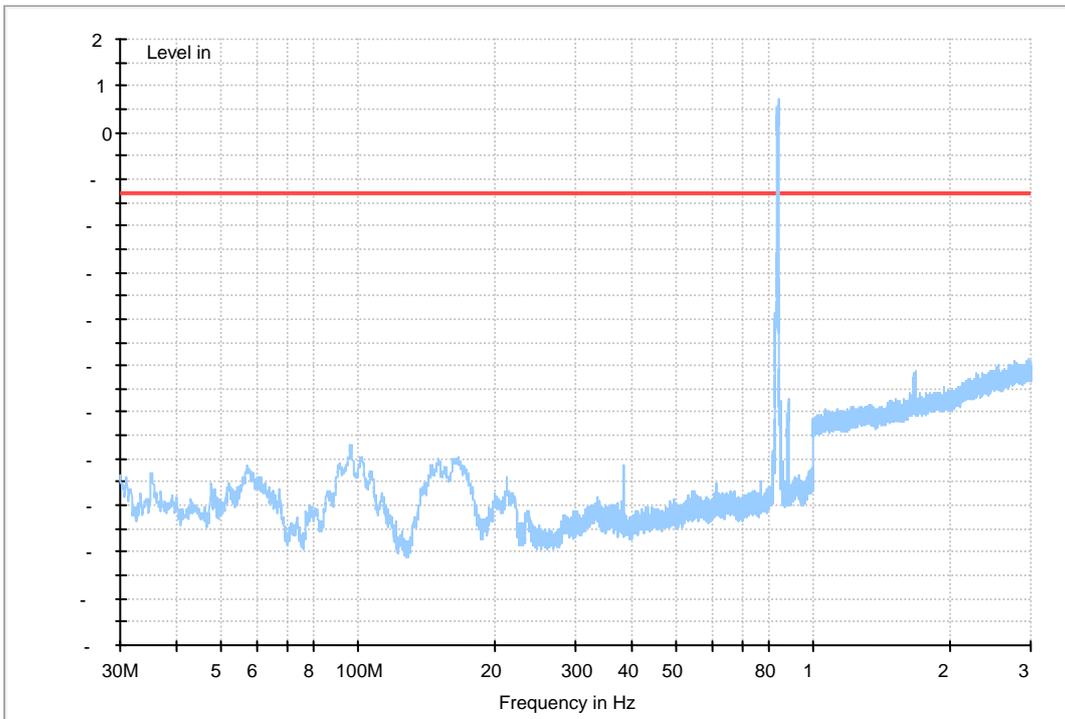


HSDPA Band V

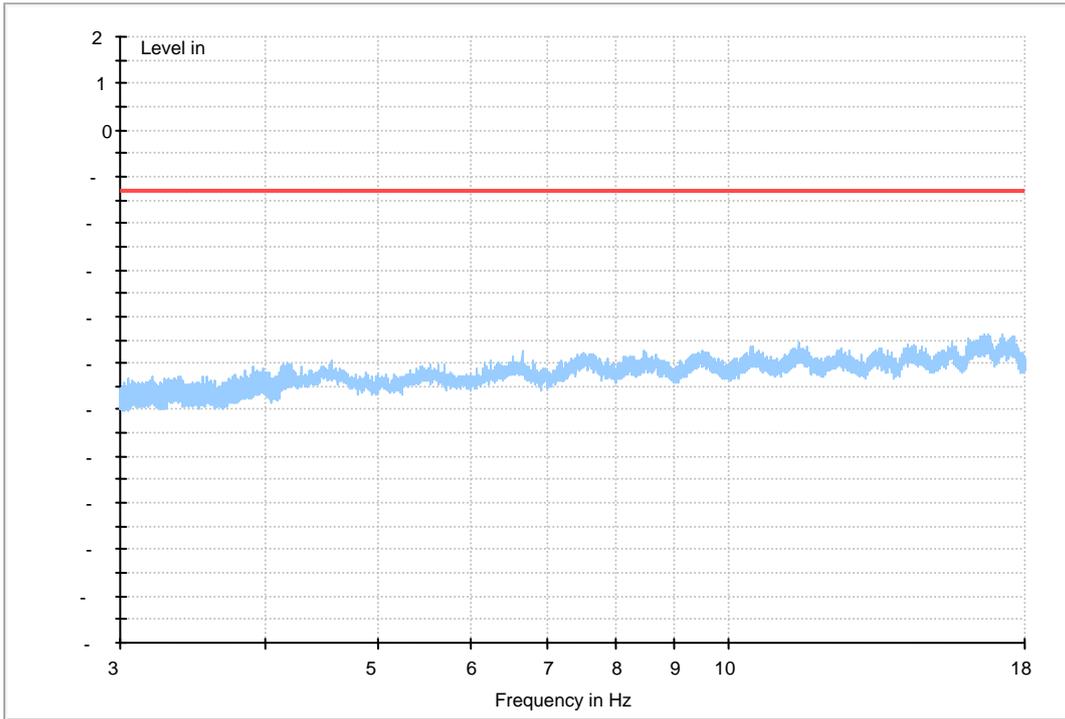
(9KHz~30MHz)



(30MHz~3GHz)

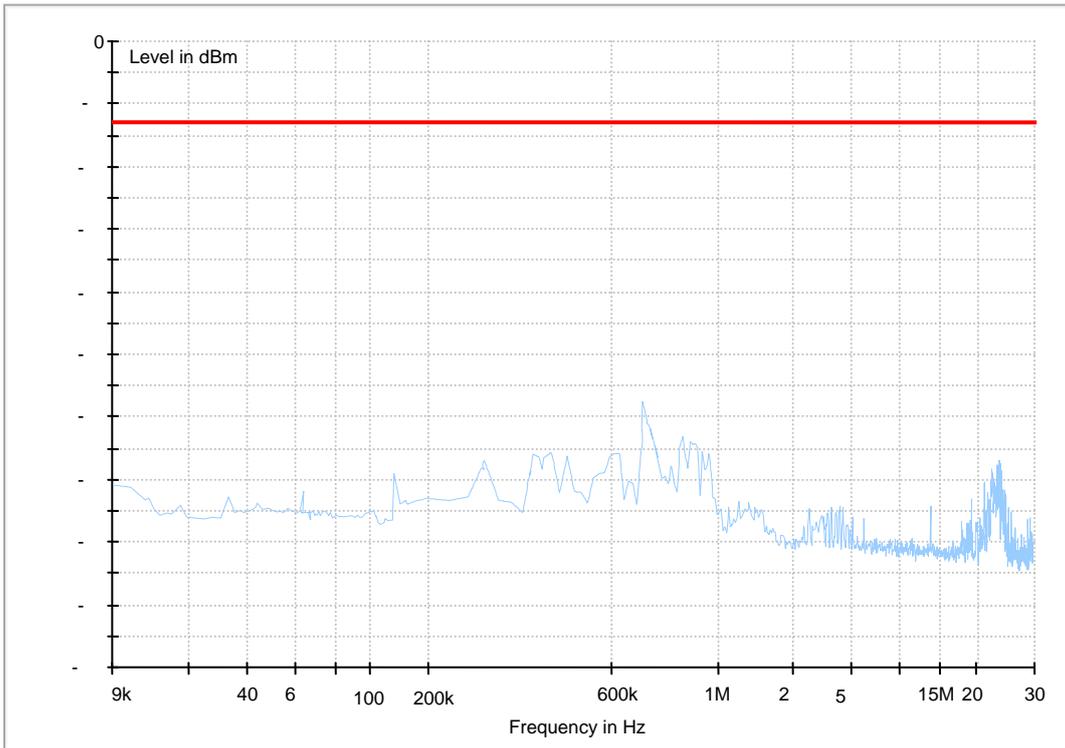


(3GHz~18GHz)

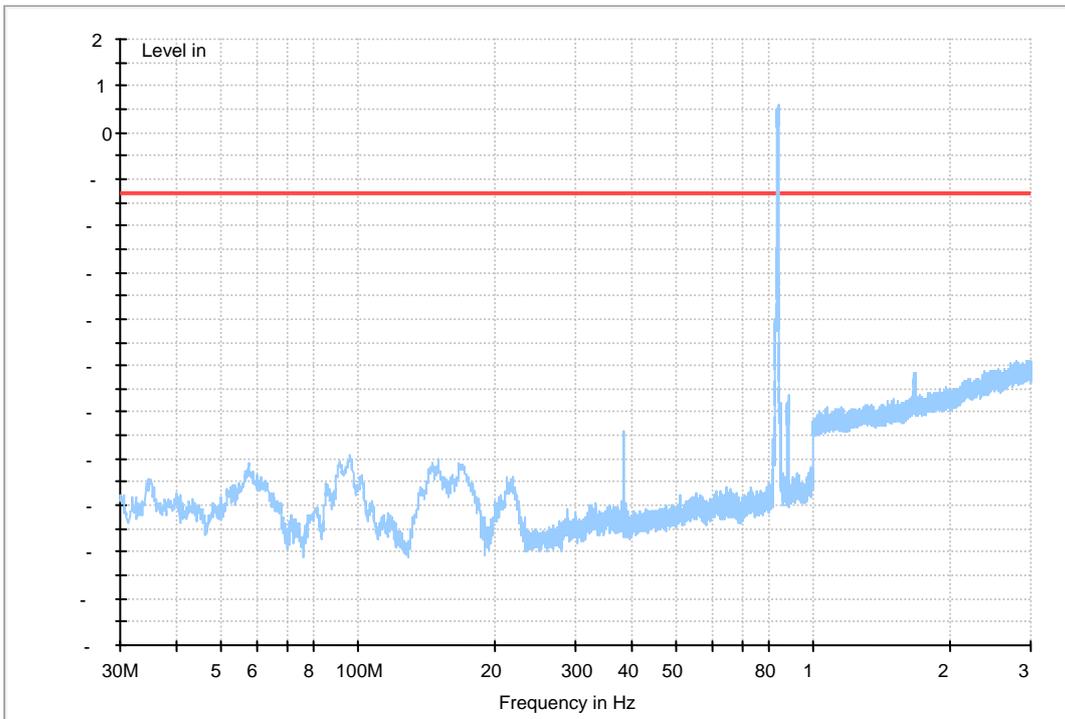


HSUPA Band V

(9KHz~30MHz)

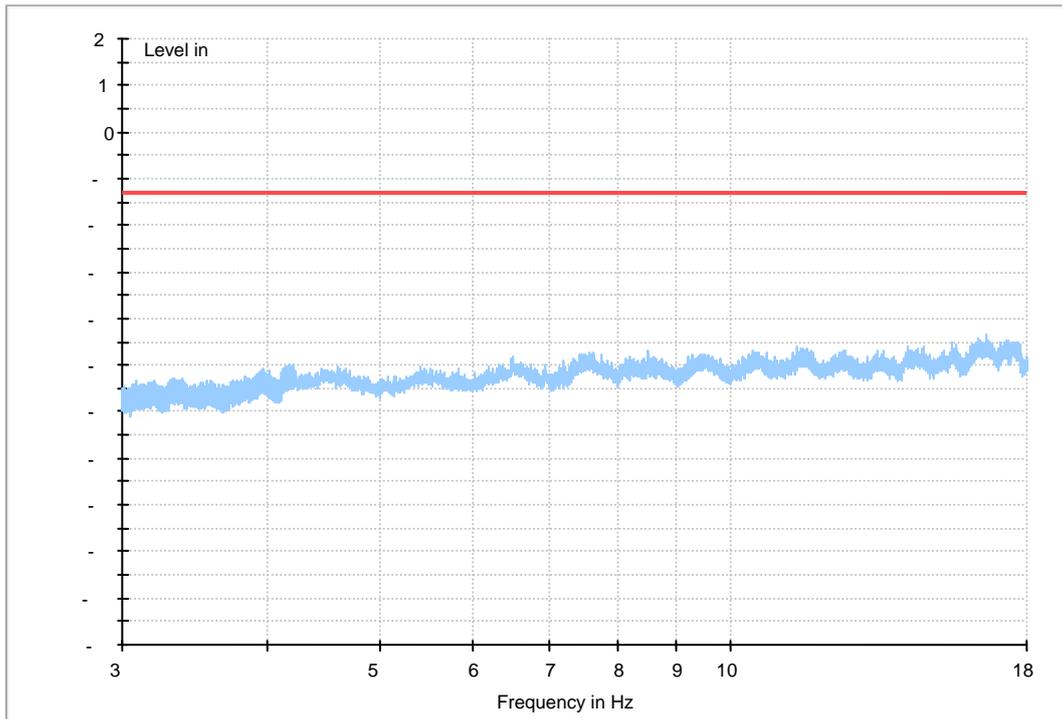


(30MHz~3GHz)





(3GHz~18GHz)





Appendix G

Frequency Stability According to FCC Part 2.1055 & Part 22.355



Frequency Error vs. Temperature:

Test Mode	RF Ch.	Volt.	Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	VN	-30 °C	-12	-0.0143	---	±2.5	Pass
			-20 °C	-7	-0.0084	---	±2.5	Pass
			-10 °C	23	0.02748	---	±2.5	Pass
			0 °C	21	0.02509	---	±2.5	Pass
			10 °C	-8	-0.0096	---	±2.5	Pass
			20 °C	-13	-0.0155	---	±2.5	Pass
			30 °C	18	0.02151	---	±2.5	Pass
			40 °C	20	0.02389	---	±2.5	Pass
			50 °C	19	0.0227	---	±2.5	Pass
TM 2	M	VN	-30 °C	17	0.02031	---	±2.5	Pass
			-20 °C	-12	-0.0143	---	±2.5	Pass
			-10 °C	16	0.01912	---	±2.5	Pass
			0 °C	21	0.02509	---	±2.5	Pass
			10 °C	-16	-0.0191	---	±2.5	Pass
			20 °C	-10	-0.0119	---	±2.5	Pass
			30 °C	-7	-0.0084	---	±2.5	Pass
			40 °C	21	0.02509	---	±2.5	Pass
			50 °C	24	0.02867	---	±2.5	Pass
TM 3	M	VN	-30 °C	16	0.01913	---	±2.5	Pass
			-20 °C	-5	-0.006	---	±2.5	Pass
			-10 °C	21	0.02511	---	±2.5	Pass
			0 °C	19	0.02272	---	±2.5	Pass
			10 °C	-11	-0.0132	---	±2.5	Pass
			20 °C	18	0.02152	---	±2.5	Pass
			30 °C	-8	-0.0096	---	±2.5	Pass
			40 °C	-12	-0.0143	---	±2.5	Pass
			50 °C	19	0.02272	---	±2.5	Pass



Frequency Error vs. Voltage:

Test Mode	RF Ch.	Temp.	Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Freq. vs. 20 °C [ppm]	Limit [ppm]	Verdict
TM 1	M	TN	VL	19	0.0227	---	±2.5	Pass
			VN	-13	-0.0155	---	±2.5	Pass
			VH	15	0.01792	---	±2.5	Pass
TM 2	M	TN	VL	22	0.02628	---	±2.5	Pass
			VN	-15	-0.0179	---	±2.5	Pass
			VH	24	0.02867	---	±2.5	Pass
TM 3	M	TN	VL	14	0.01674	---	±2.5	Pass
			VN	23	0.0275	---	±2.5	Pass
			VH	-11	-0.0132	---	±2.5	Pass

-----The END-----
