



# FCC RF Test Report

**Product Name: HSPA+/HSUPA/HSDPA/UMTS/GSM/GPRS/EDGE  
Mobile Phone with Bluetooth**

**Model Number: HUAWEI U9510E, U9510E**

**Report No: SYBH(Z-RF)005082012-2001  
FCC ID: QISU9510E**

**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

<b>1.1 Applied Standard</b>	
Applied Rules:	47 CFR FCC Part 2:2011, Subpart J 47 CFR FCC Part 22:2011, Subpart H ANSI/TIA 603C:2004
<b>1.2 Test Location</b>	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China
<b>1.3 Test Environmental Condition</b>	
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 Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 22.917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 22.917	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 <sup>th</sup> 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 $\pm 2.5$ ppm	Pass

### 3 Product Description

#### 3.1 Product Information

##### 3.1.1 General Description

HUAWEI U9510E, U9510E is subscriber equipment in the WCDMA/GSM system. The HSPA+/HSUPA/HSDPA/UMTS frequency band is Band I, Band II, Band IV, Band V and Band VIII. Band V can be used in this report. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850MHz band test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA+/HSUPA/HSDPA/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+/HSUPA/HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth		
HUAWEI U9510E, U9510E		
Board and Module		
Hardware Version	Software Version	Description
Ver.C	U9510EV100R001C00B104SP01	Main board of Mobile Phone

##### 3.1.3 Adapter Technical Data

AC/DCAdapter Model	HW-050100U3W
Manufacturer	HUIZHOU BYD ELECTRONIC CO.,. LTD.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W



### 3.1.4 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5Q1HV Rated capacity: 2600mAh Nominal Voltage: $\approx$ +3.75V Charging Voltage: $\approx$ +4.3V



## 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: 247KGXW (GMSK modulation), 252KG7W (8PSK modulation) UMTS system: 4M10F9W

### 4.3 Antenna Gain

Antenna Gain(dBi)	-1
Antenna Gain(dBd)	-3.15

### 4.4 Power Supply

Specification	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to EUT (DC power)	DC Voltage Nominal: $\approx$ 3.75 V DC Voltage Range: $\approx$ 3.5 V to 4.3 V
Input to EUT (AC power)	AC Voltage Nominal: ~ 120 V (50/60 Hz) AC Voltage Range: ~ 100 V to 240 V

## 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	3.5V
	VN	3.8V
	VH	4.3V

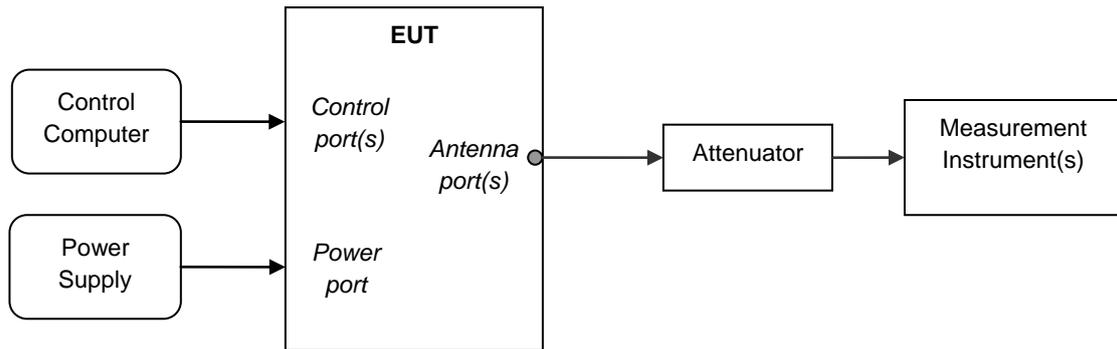
NOTE: VL= lower extreme test voltage  
 VN= nominal voltage  
 VH= upper extreme test voltage  
 TN= normal temperature

## 5.4 Test Setup

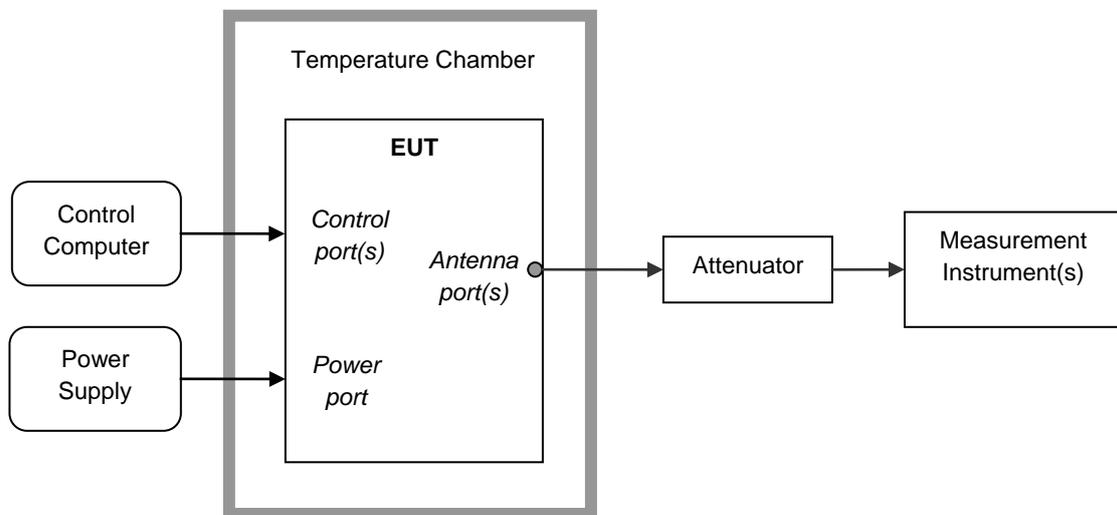
### 5.4.1 General Test Setup Configurations

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



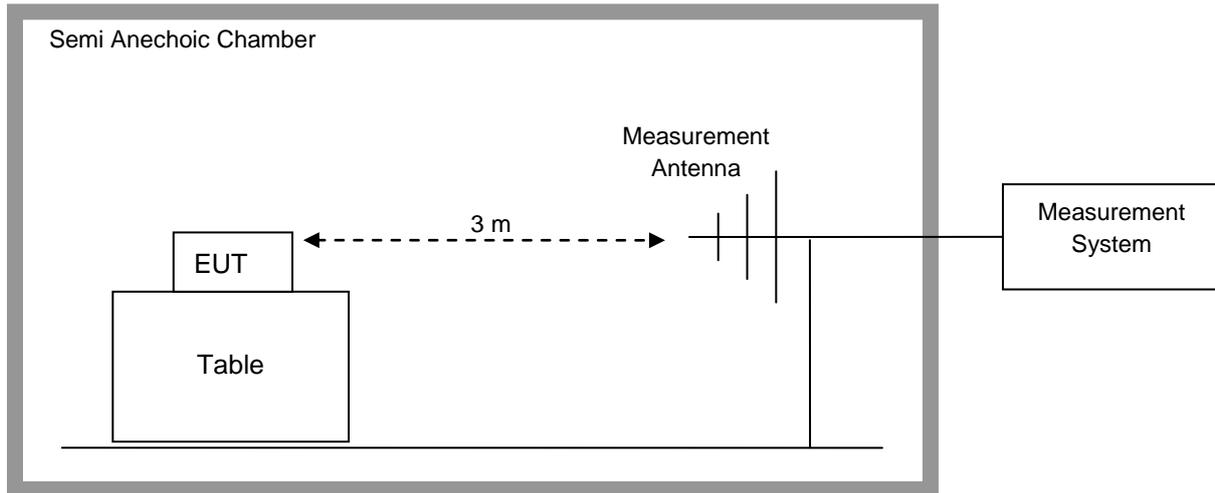
### 5.4.4 Test Setup 3

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.

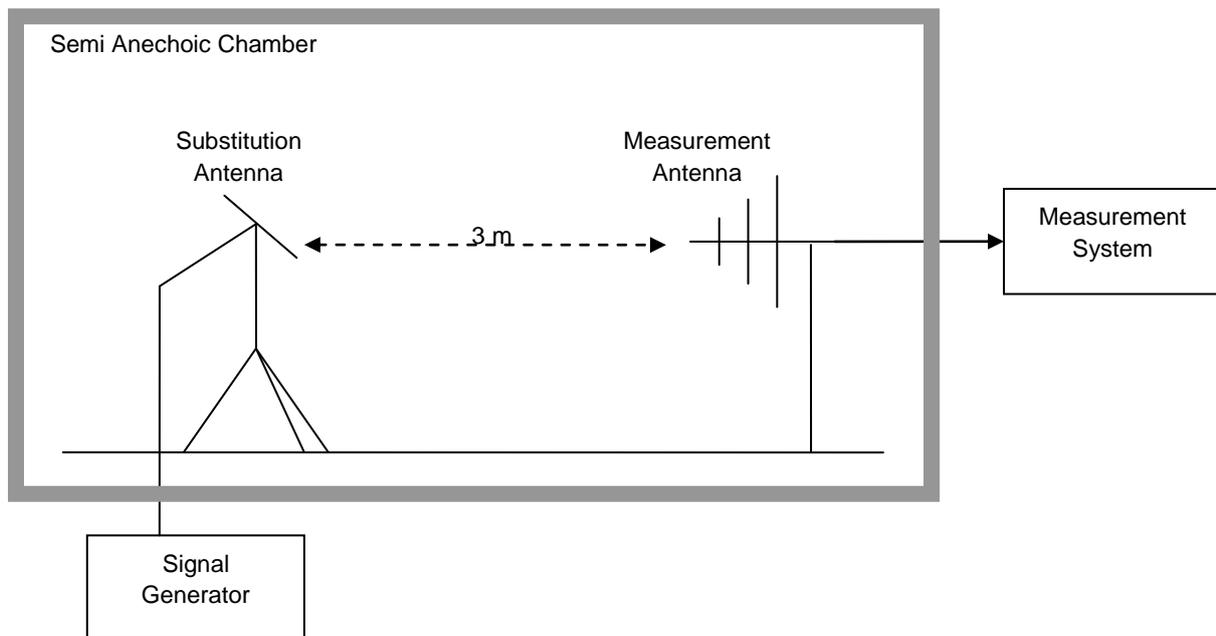
#### Step 1: Pre-test to find the Maximum ERP or EIRP

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. 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



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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	117341	Jan., 12,2013
Universal Radio Communication Tester	Agilent	E5515C	MY50260239	Aug., 31,2012
Spectrum Analyzer	Agilent	E4440A	MY49420179	Jul., 17,2013
Signal Analyzer	R&S	FSQ31	200021	Sept., 27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.,13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.,09,2013
Spectrum analyzer	R&S	FSU3	200474	Mar., 05, 2013
Spectrum analyzer	R&S	FSU43	100144	Mar., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	Apr., 05, 2013
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100391	Apr., 05, 2013
Trilog Broadband Antenna (30M~3GHz)	SCHWARZBECK	VULB 9163	9163-521	Jul., 07, 2013
Pyramidal Horn Antenna(26GHz-40GHz)	ETS-Lindgren	3160-10	00123940	Feb., 27, 2013
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	00125912	Feb., 27, 2013

## 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

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel128(L)		Channel192(M)		Channel251(H)	
		824.2MHz		837.0MHz		848.8MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM1		32.37	38.5	32.41	38.5	32.38	38.5
TM2		26.95	38.5	26.97	38.5	27.02	38.5
TEST CONDITIONS		Channel4132(L)		Channel4182(M)		Channel4233(H)	
		826.4MHz		836.4MHz		846.6MHz	
		dBm		dBm		dBm	
		$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit
TM3		23.71	38.5	23.66	38.5	23.69	38.5
TM4	Case1	23.43	38.5	23.31	38.5	23.42	38.5
	Case2	22.1	38.5	22.02	38.5	22.07	38.5
	Case3	21.75	38.5	21.67	38.5	21.68	38.5
	Case4	21.47	38.5	21.39	38.5	21.46	38.5
TM5	Case1	22.24	38.5	22.15	38.5	22.21	38.5
	Case2	19.91	38.5	19.82	38.5	19.89	38.5
	Case3	21.01	38.5	20.88	38.5	20.92	38.5
	Case4	20.45	38.5	20.34	38.5	20.42	38.5
	Case5	22.52	38.5	22.41	38.5	22.44	38.5



## Peak-to-Average Ratio

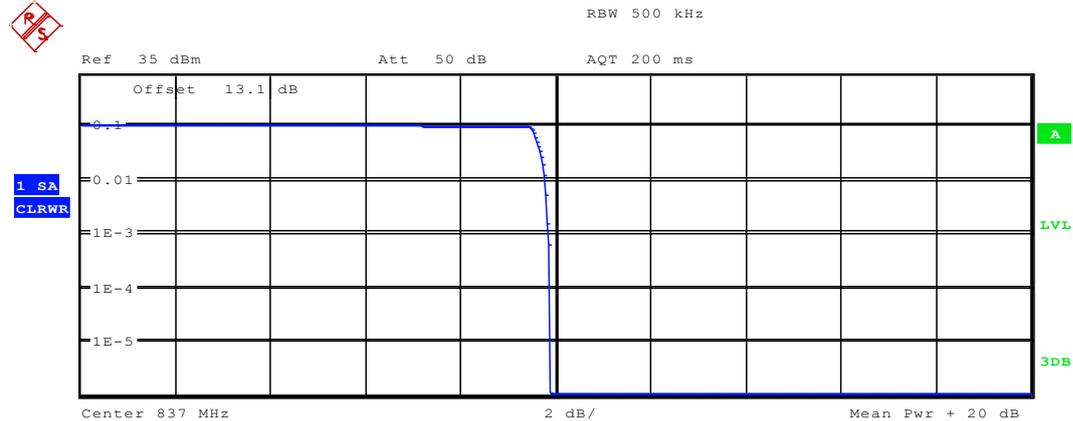
TEST CONDITIONS		Peak-to-Average Ratio					
		Channel128(L)		Channel192(M)		Channel251(H)	
		824.2MHz		837.0MHz		848.8MHz	
		dB		dB		dB	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM1		9.45	13	9.87	13	9.56	13
TM2		12.14	13	12.37	13	12.23	13
TEST CONDITIONS		Channel4132(L)		Channel4182(M)		Channel4233(H)	
		826.4MHz		836.4MHz		846.6MHz	
		dB		dB		dB	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM3		2.67	13	2.79	13	2.52	13
TM4	Case1	2.48	13	2.58	13	2.41	13
	Case2	2.43	13	2.47	13	2.29	13
	Case3	2.17	13	2.22	13	2.12	13
	Case4	2.01	13	2.13	13	2.06	13
TM5	Case1	2.29	13	2.31	13	2.38	13
	Case2	1.97	13	2.01	13	2.09	13
	Case3	2.31	13	2.20	13	2.33	13
	Case4	2.18	13	2.35	13	2.31	13
	Case5	2.34	13	2.41	13	2.44	13



## 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



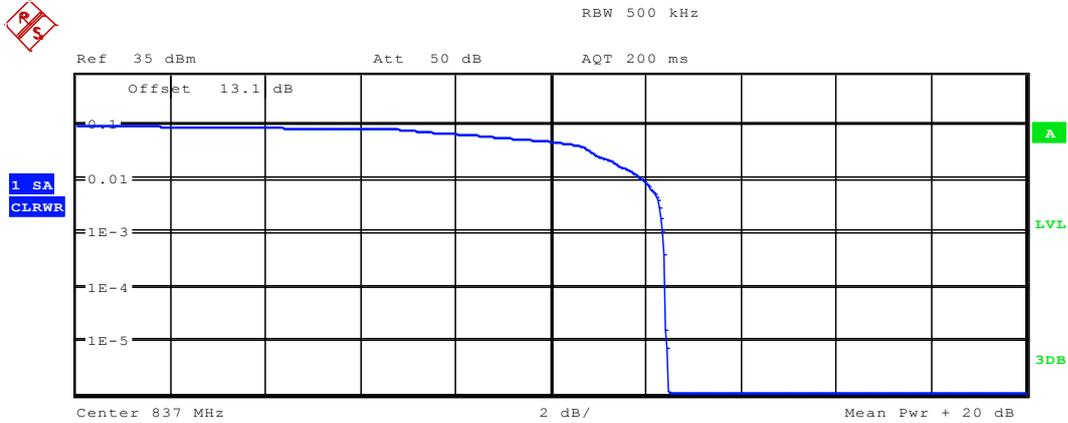
Complementary Cumulative Distribution Function  
NOF samples: 100000, Usable BW: 424kHz

Trace 1	
Mean	22.53 dBm
Peak	32.41 dBm
Crest	9.88 dB
10 %	9.46 dB
1 %	9.78 dB
.1 %	9.87 dB
.01 %	9.90 dB

Date: 2.AUG.2012 11:04:43



## TM2



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

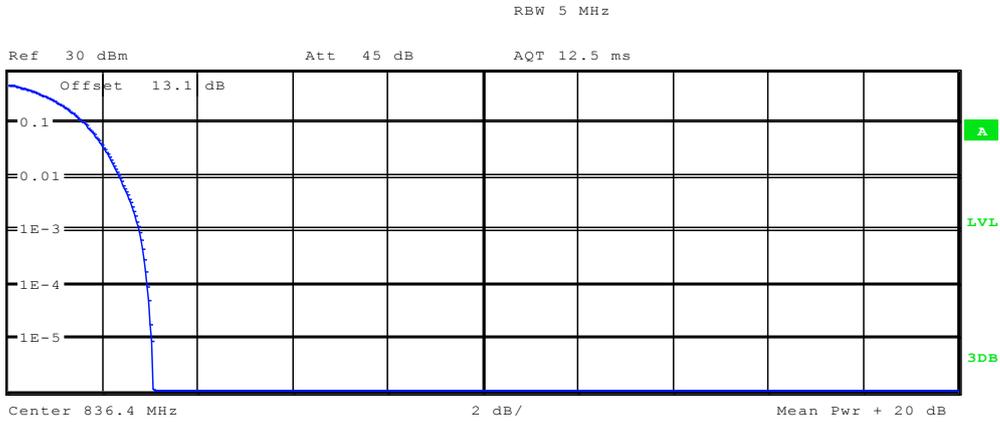
Trace 1

Mean	16.90	dBm
Peak	29.37	dBm
Crest	12.47	dB
10 %	3.01	dB
1 %	11.96	dB
.1 %	12.37	dB
.01 %	12.44	dB

Date: 2.AUG.2012 11:06:04



### TM3/TM4/TM5



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

Trace 1	
Mean	23.28 dBm
Peak	26.35 dBm
Crest	3.07 dB
10 %	1.63 dB
1 %	2.37 dB
.1 %	2.79 dB
.01 %	2.95 dB

Date: 2.AUG.2012 11:02:40



### Effective Radiated Power of Transmitter (ERP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (ERP)	FCC limit [dBm]	Result
							[dBm]		
TM1	824.2	29.22	Dipole Ant.	32.37	-2.75	0.6	29.02	38.5	Pass
TM1	837.0	29.26	Dipole Ant.	32.91	-2.87	0.6	29.44	38.5	Pass
TM1	848.8	29.23	Dipole Ant.	32.58	-2.85	0.6	29.13	38.5	Pass
TM2	824.2	23.80	Dipole Ant.	27.01	-2.75	0.6	23.66	38.5	Pass
TM2	837.0	23.82	Dipole Ant.	27.09	-2.87	0.6	23.62	38.5	Pass
TM2	848.8	23.87	Dipole Ant.	27.14	-2.85	0.6	23.69	38.5	Pass
TM3	826.4	20.56	Dipole Ant.	24.03	-2.75	0.6	20.68	38.5	Pass
TM3	836.4	20.51	Dipole Ant.	23.79	-2.87	0.6	20.32	38.5	Pass
TM3	846.6	20.54	Dipole Ant.	23.80	-2.85	0.6	20.35	38.5	Pass

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

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

b, SGP=Signal Generator Level

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



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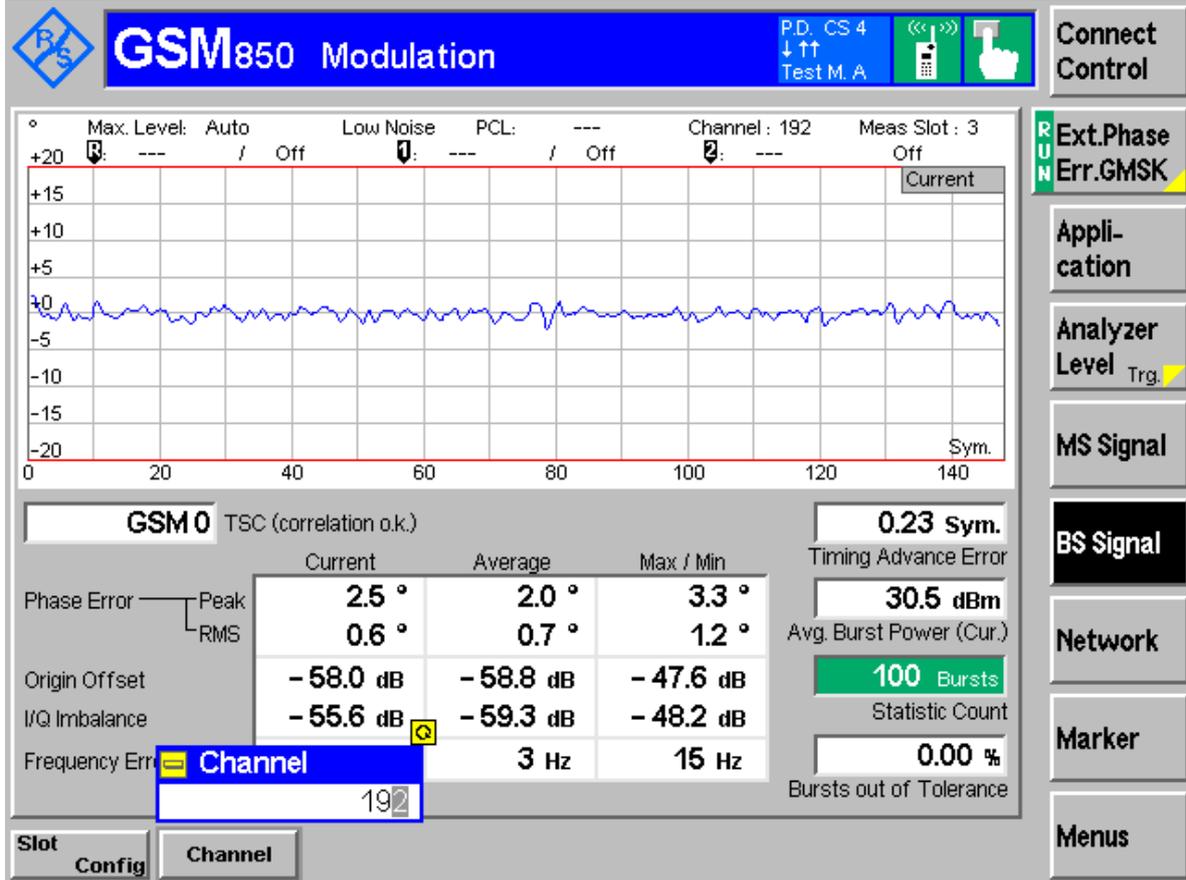
## **Appendix B**

# Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

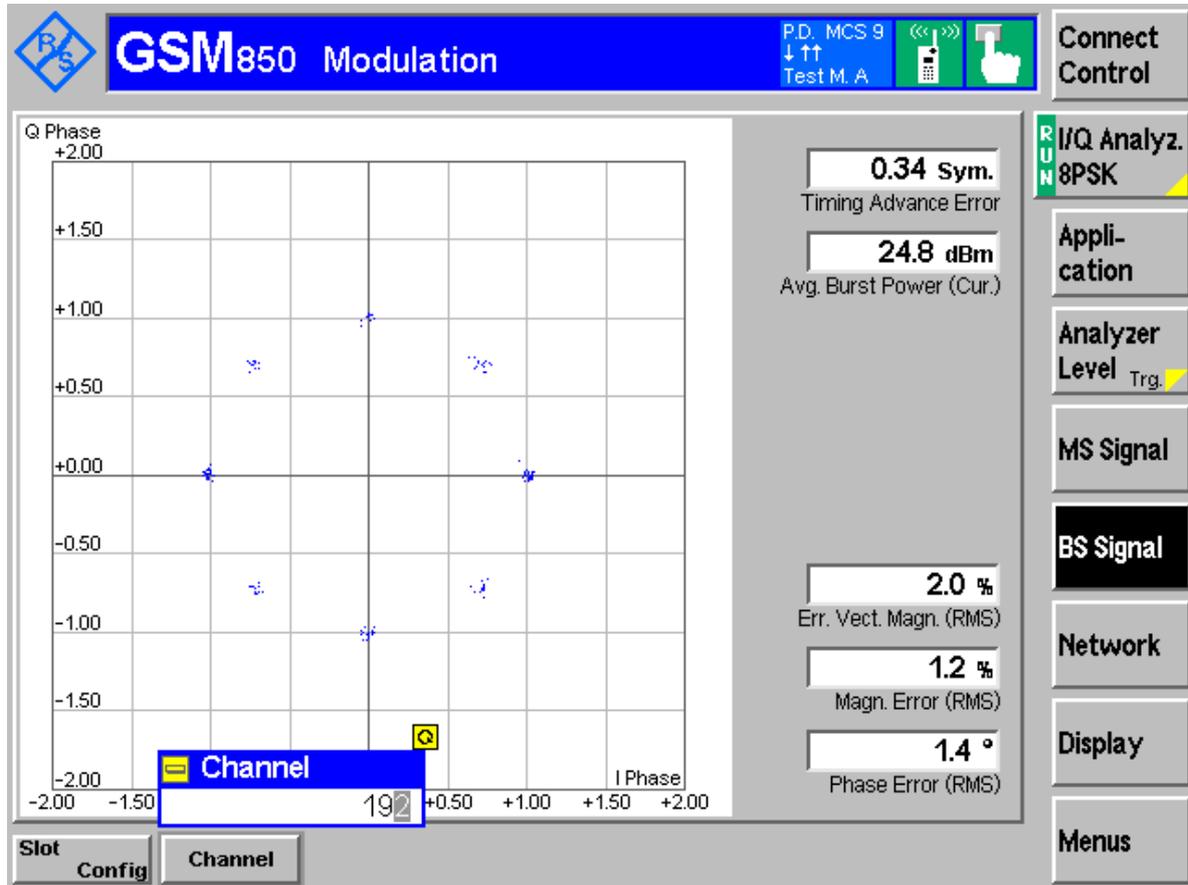


## Channel 192 (TM1:GPRS/GSM)



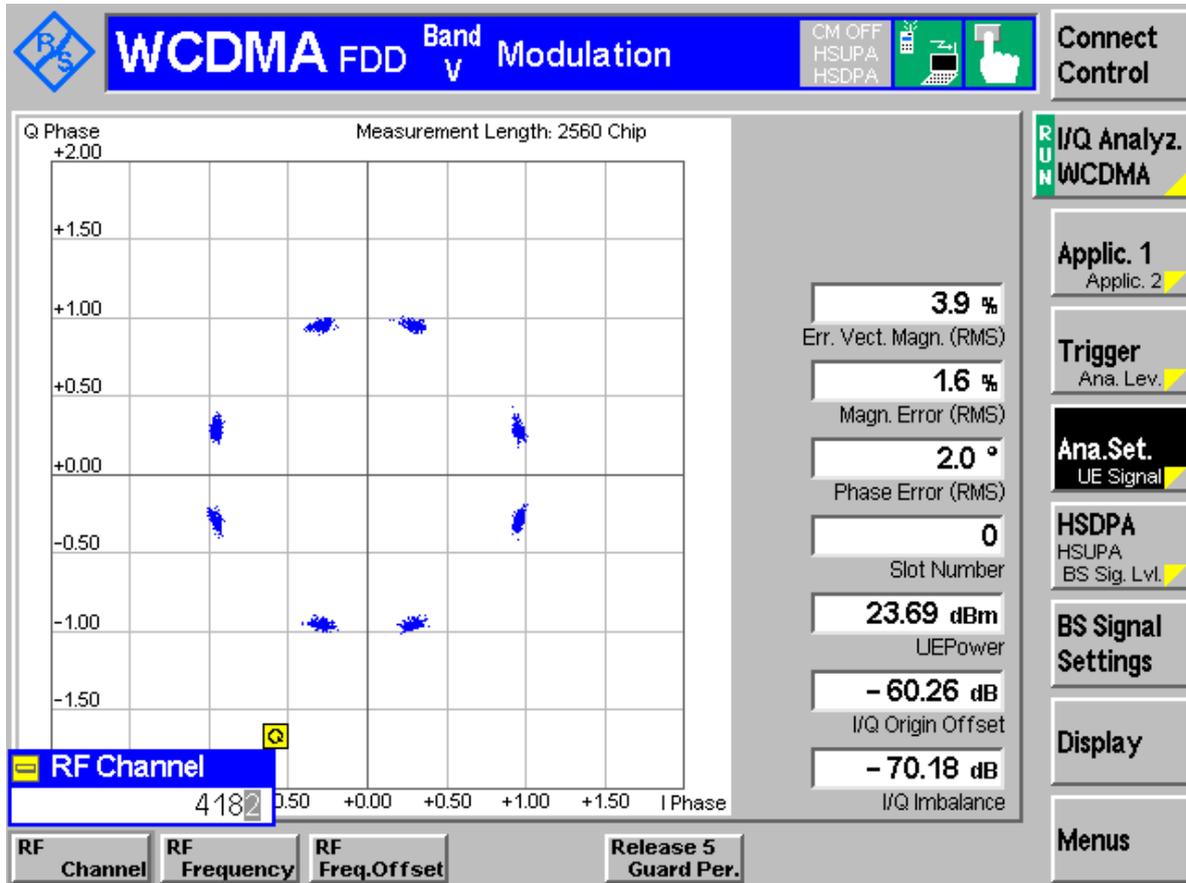


## Channel 192 (TM2:EDGE)





## Channel 4182 (TM3: WCDMA)



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



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# Appendix C

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



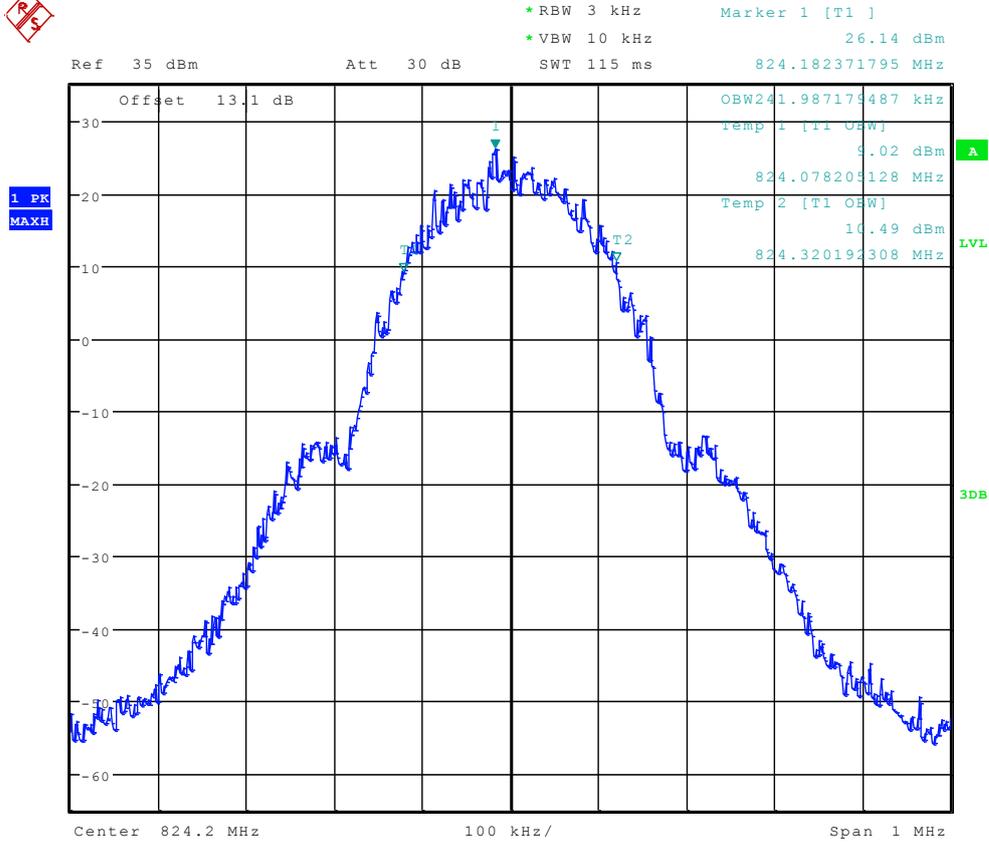
## Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	241.99	Pass
	192	241.99	Pass
	251	246.79	Pass
TM2	128	243.59	Pass
	192	251.60	Pass
	251	250.00	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.09	Pass
	4182	4.09	Pass
	4233	4.07	Pass



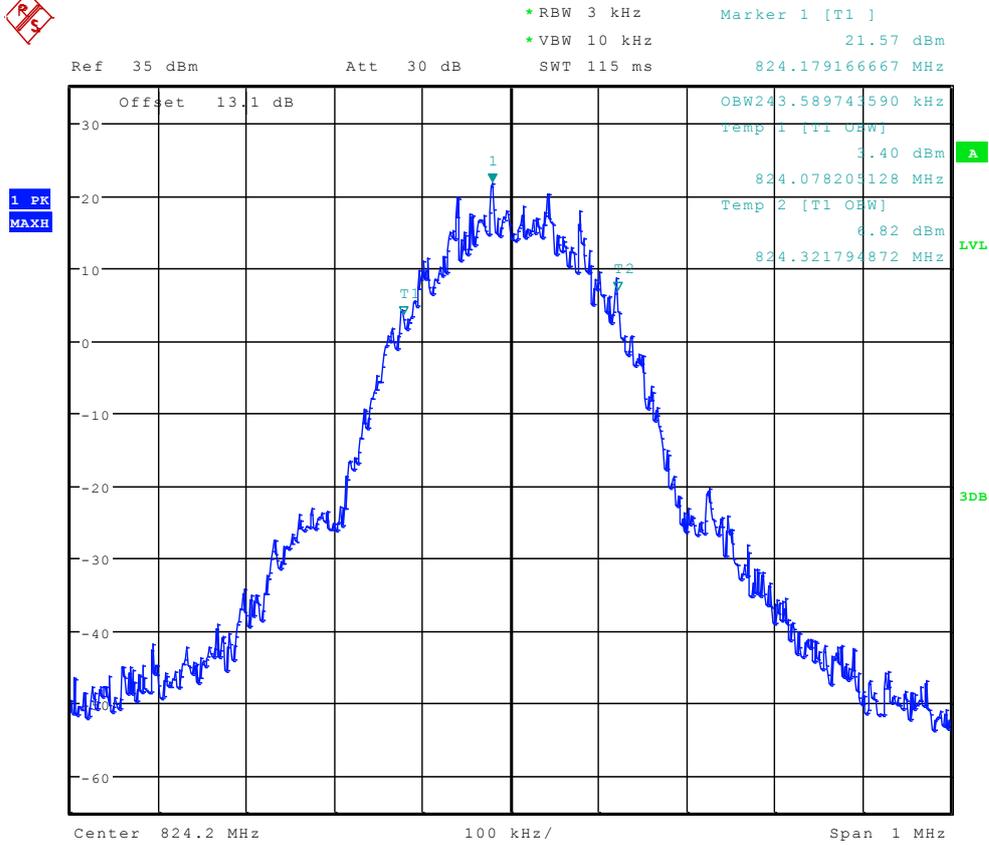
## Channel 128 (TM1:GPRS/GSM)



Date: 2.AUG.2012 09:26:35



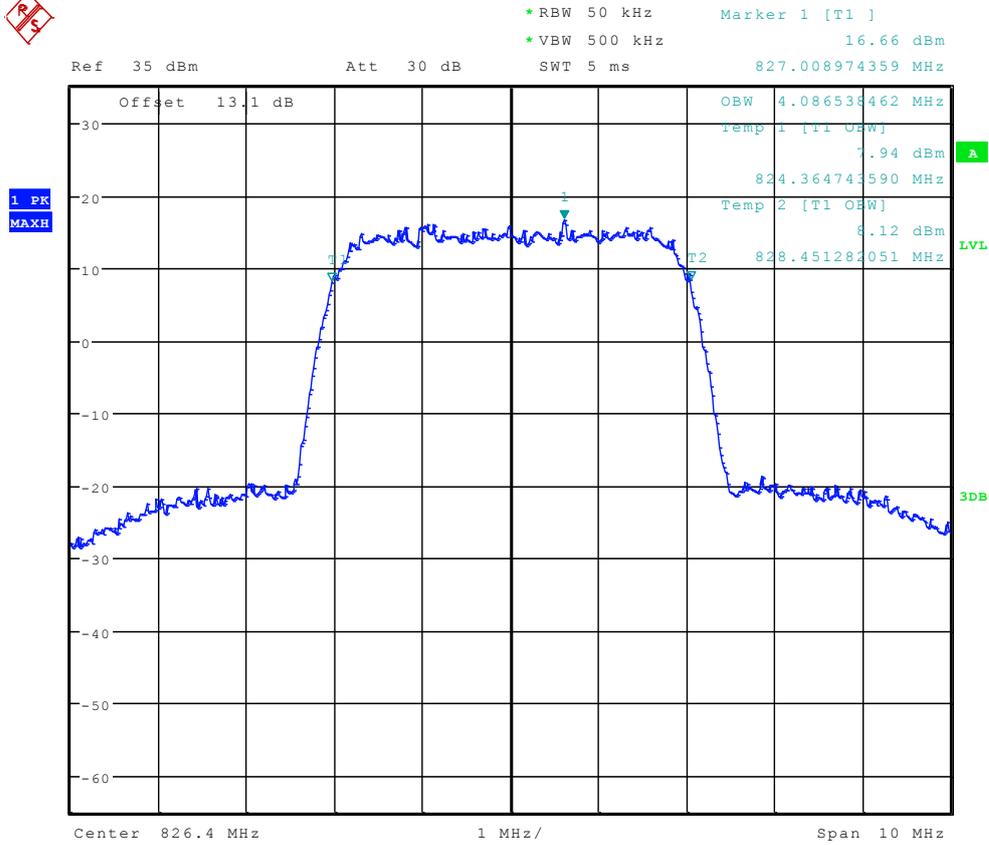
## Channel 128 (TM2:EDGE)



Date: 2.AUG.2012 09:49:14



## Channel 4132 (TM3: WCDMA)

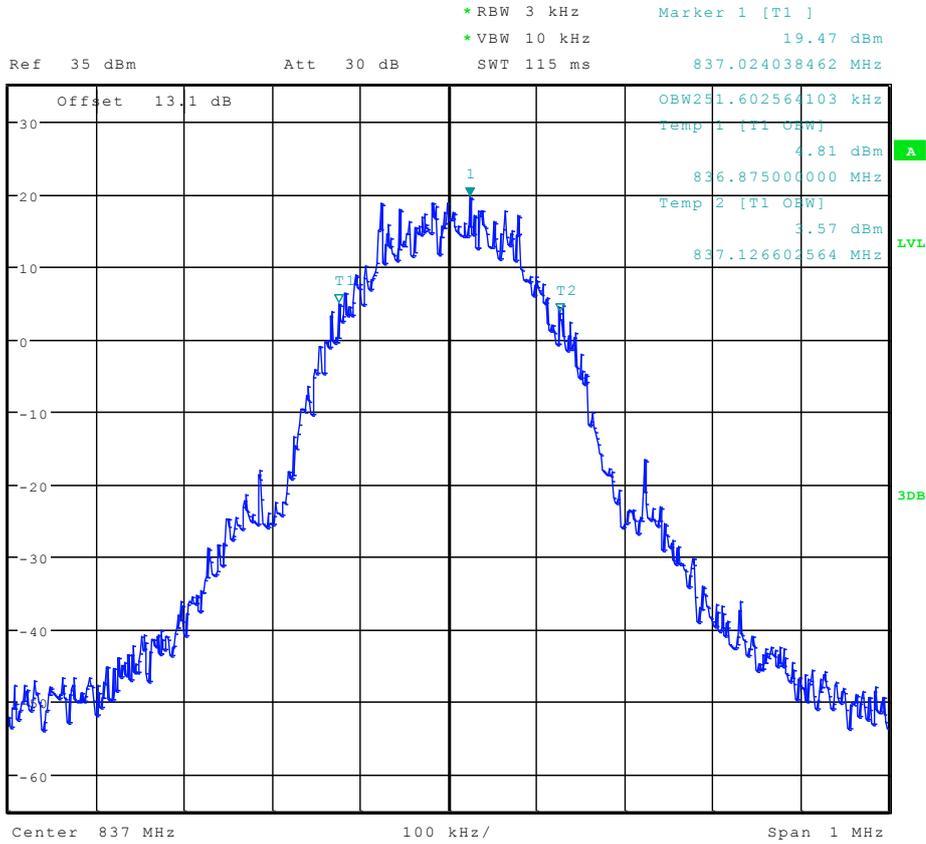


Date: 2.AUG.2012 10:08:02





### Channel 192 (TM2:EDGE)



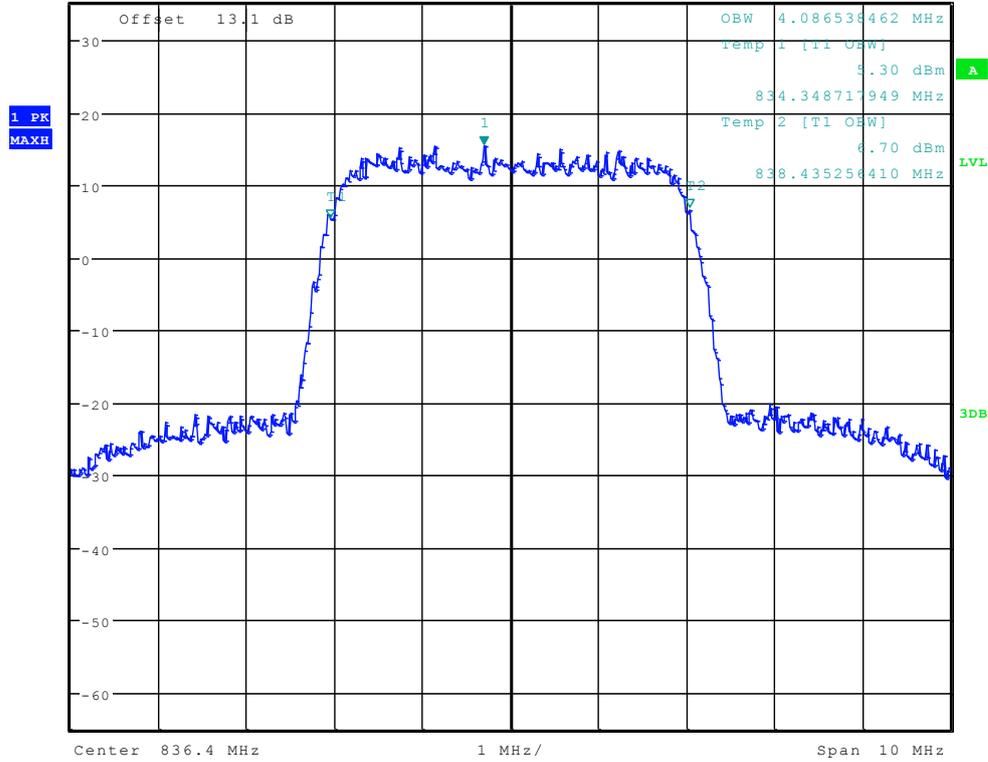
Date: 2.AUG.2012 09:49:28



## Channel 4182 (TM3: WCDMA)



Ref 35 dBm Att 30 dB RBW 50 kHz VBW 500 kHz SWT 5 ms Marker 1 [T1] 15.44 dBm 836.095512821 MHz



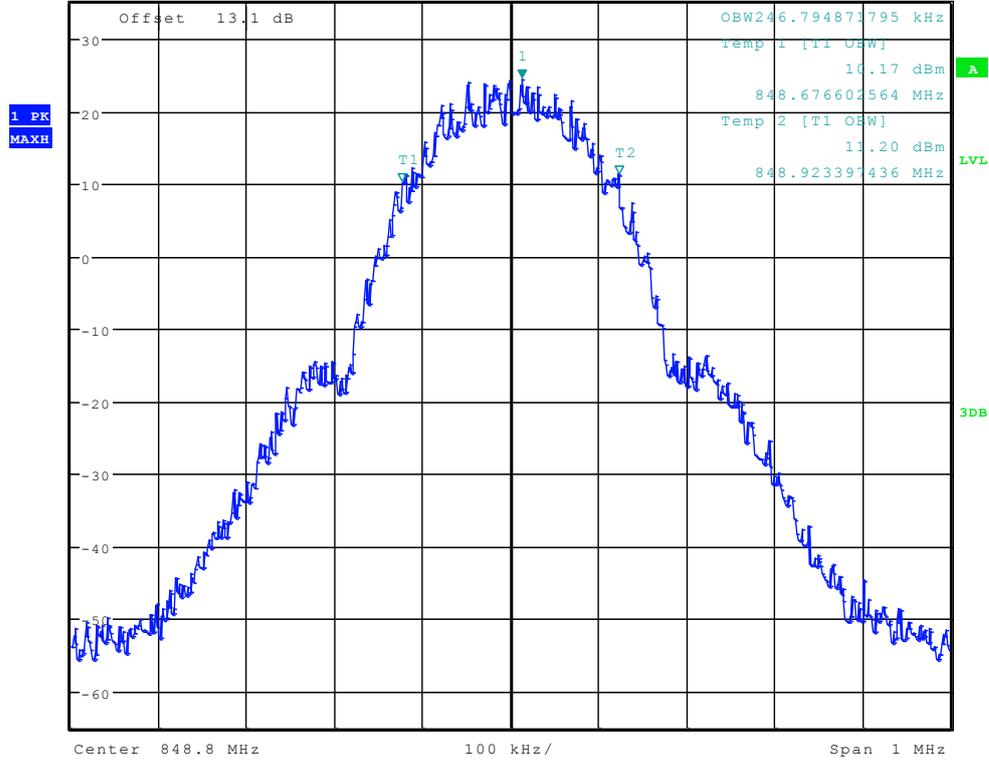
Date: 2.AUG.2012 10:08:16



### Channel 251 (TM1:GPRS/GSM)



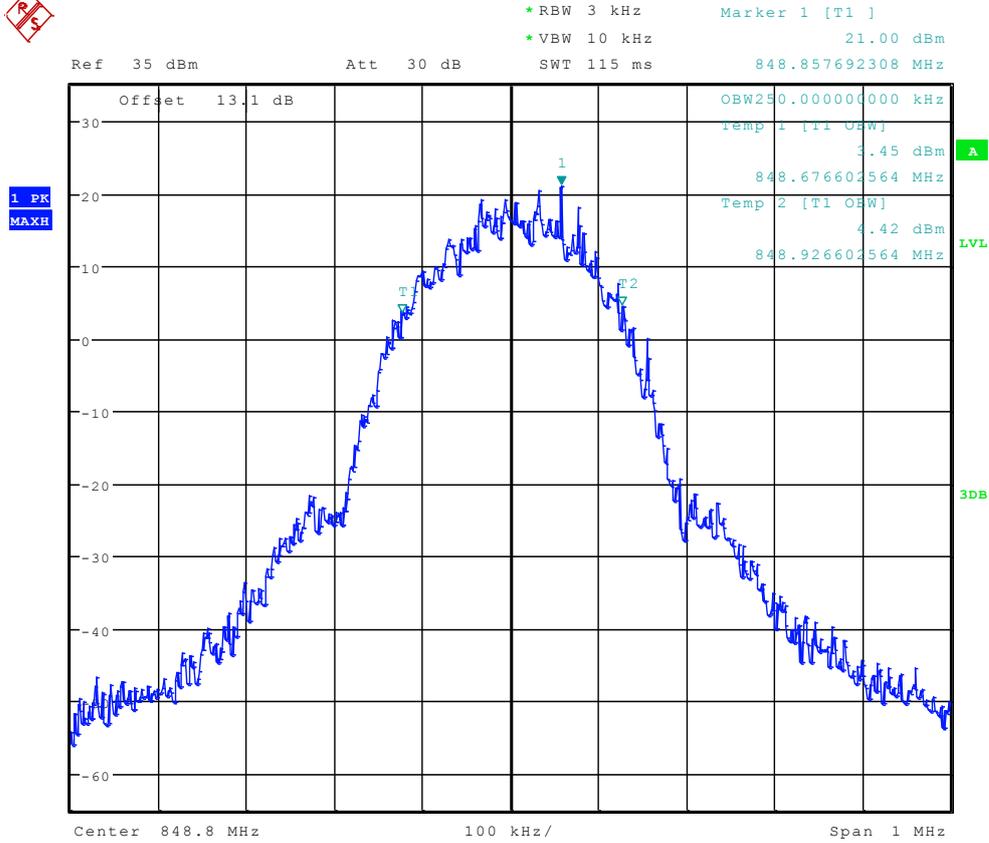
Ref 35 dBm Att 30 dB SWT 115 ms Marker 1 [T1] 24.47 dBm  
 \*RBW 3 kHz \*VBW 10 kHz 848.812820513 MHz



Date: 2.AUG.2012 09:27:04



## Channel 251 (TM2:EDGE)



Date: 2.AUG.2012 09:49:41





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# Appendix D

## Band Edges Compliance

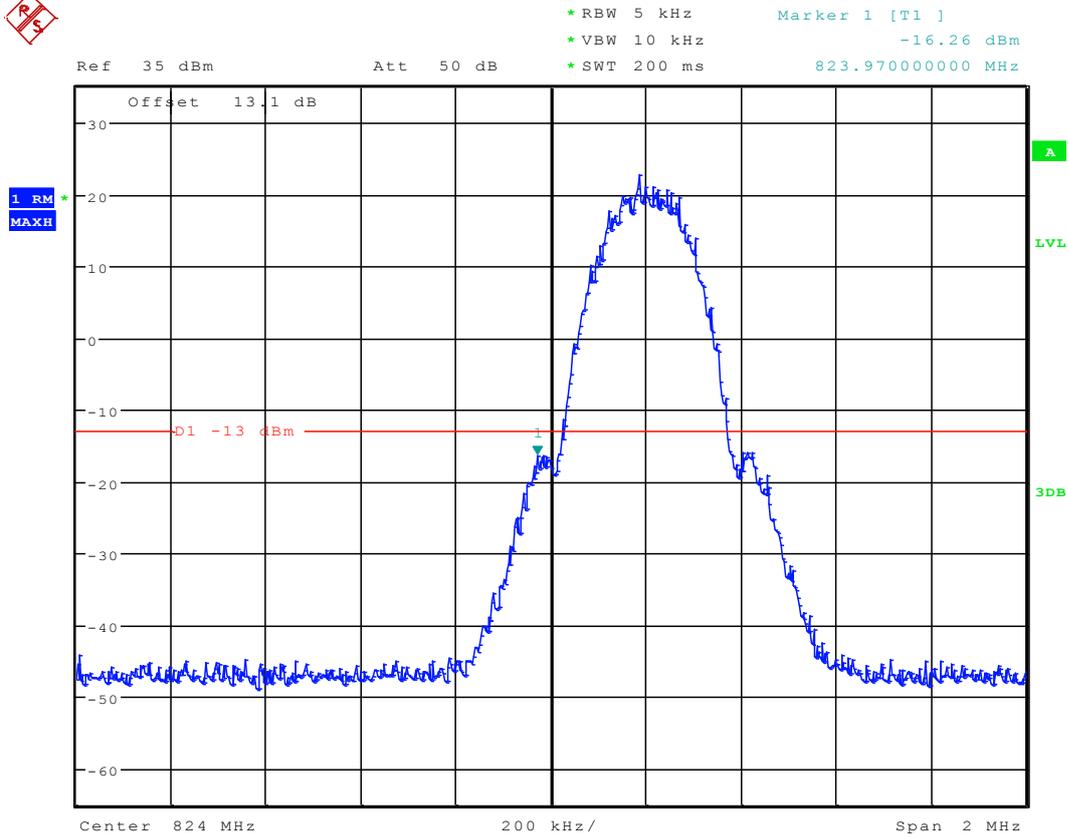
According to FCC Part 2.1051 & Part 22 Subpart H



# TM1:GPRS/GSM

## Left Edge

### Channel 128



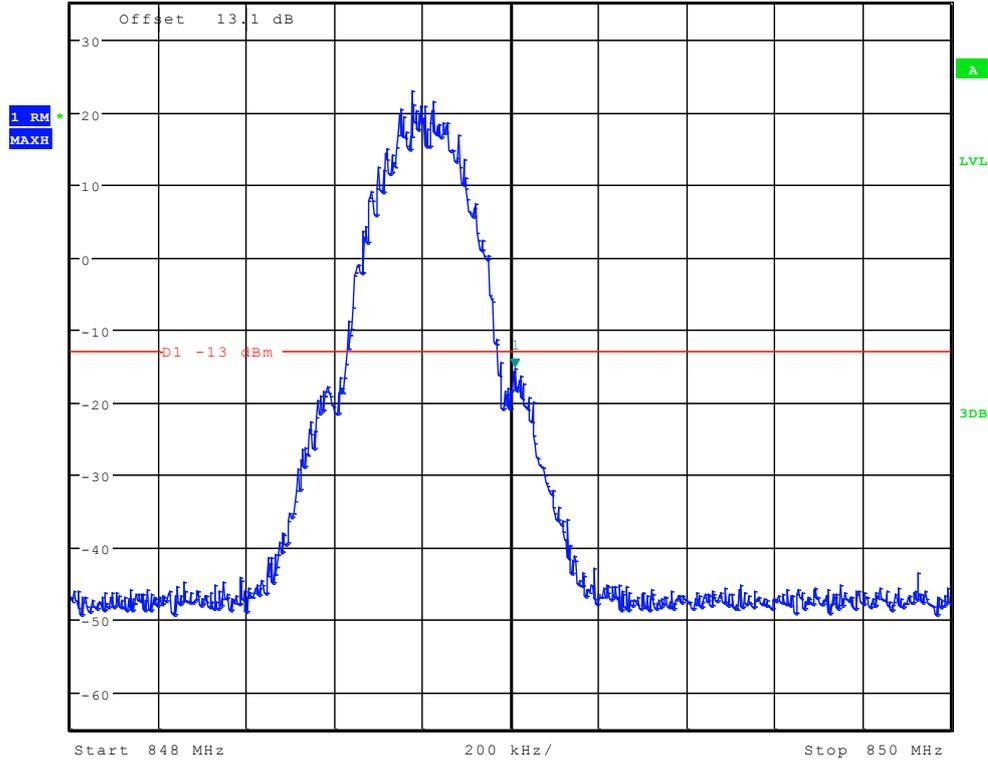
Date: 2.AUG.2012 09:36:36



## Right Edge Channel 251



Ref 35 dBm      Att 50 dB      \*RBW 5 kHz      Marker 1 [T1]      -15.40 dBm  
\*VBW 10 kHz      849.01000000 MHz  
\*SWT 200 ms



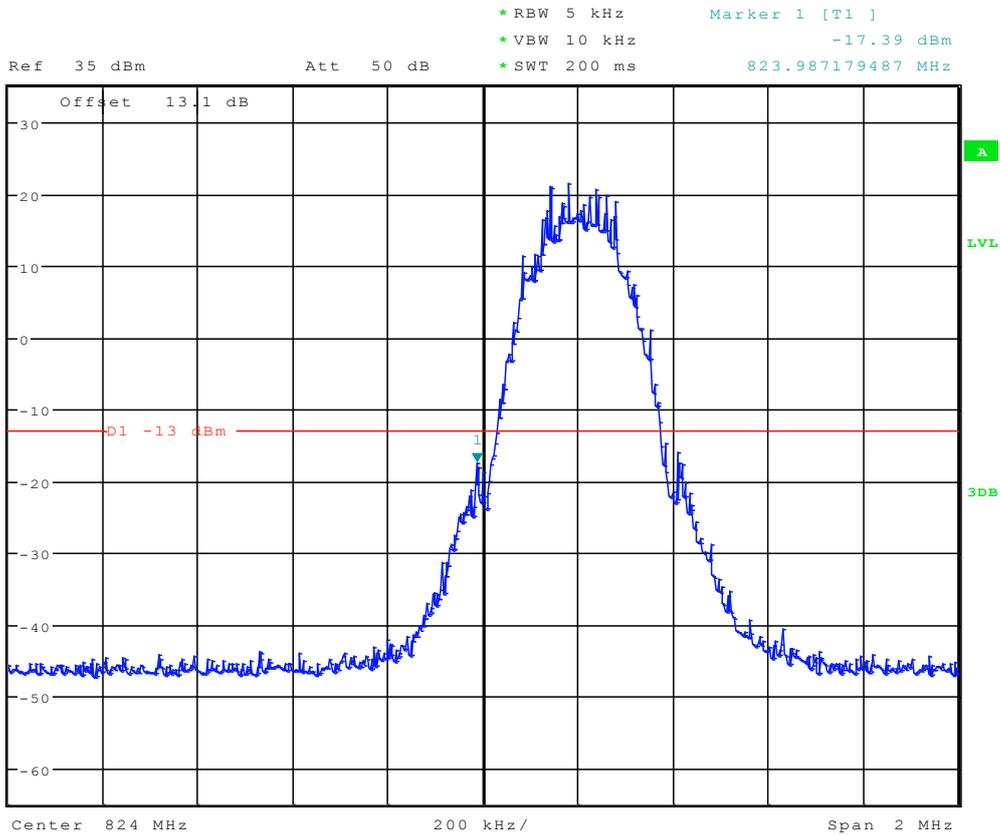
Date: 2.AUG.2012 09:41:26



# TM2:EDGE

## Left Edge

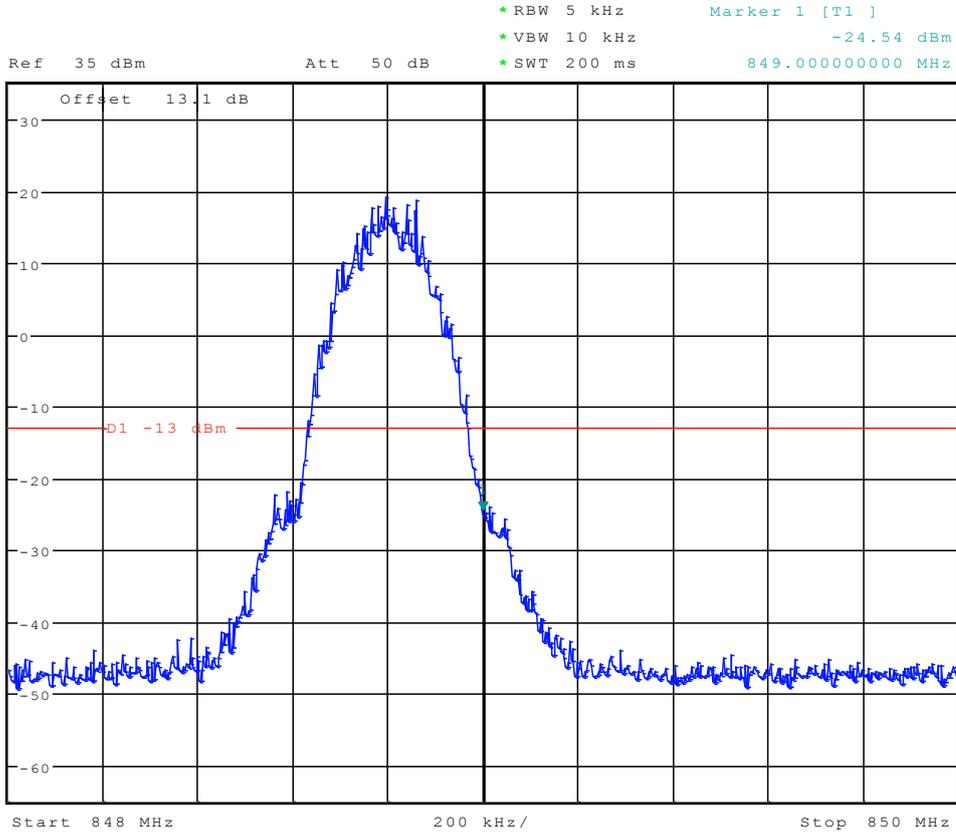
### Channel 128



Date: 2.AUG.2012 10:02:09



## Right Edge Channel 251



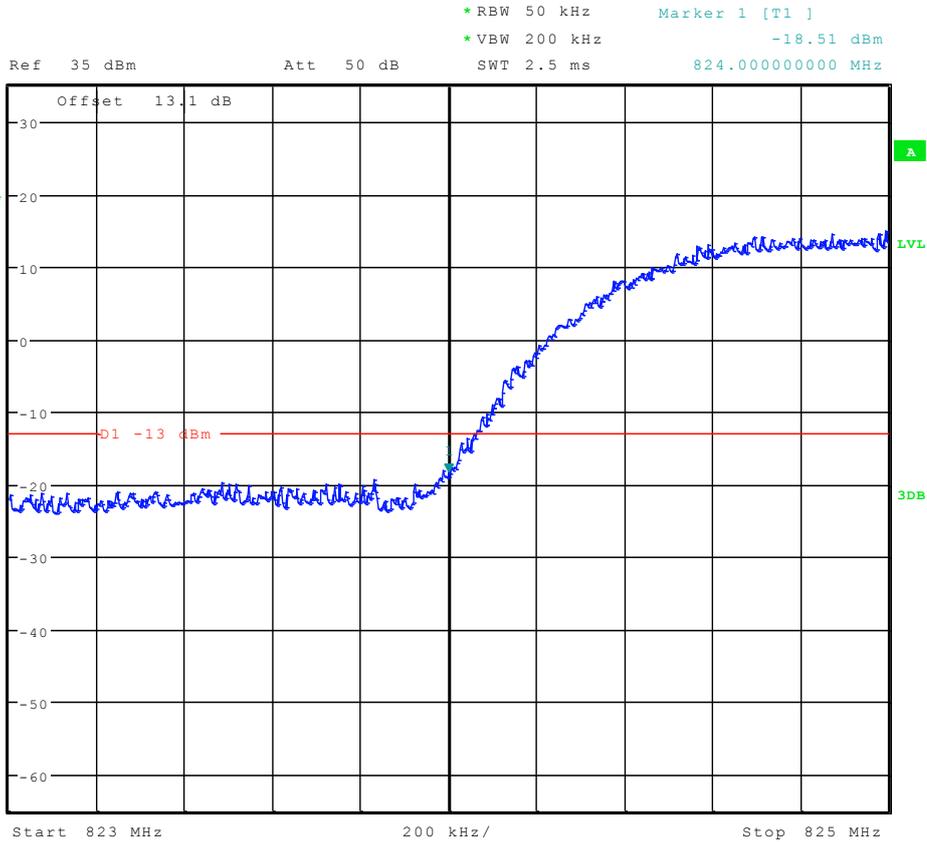
Date: 2.AUG.2012 09:53:39



# TM3: WCDMA

## Left Edge

### Channel 4132



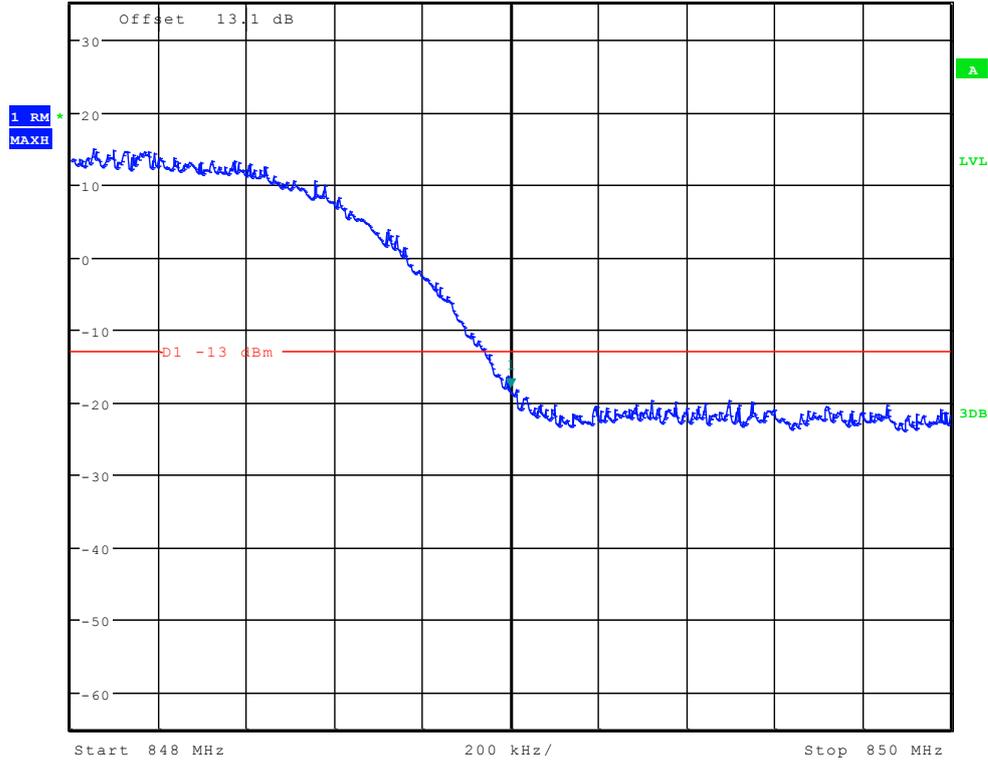
Date: 2.AUG.2012 10:08:46



## Right Edge Channel 4233



Ref 35 dBm      Att 50 dB      \*RBW 50 kHz      Marker 1 [T1]      -17.99 dBm  
 \*VBW 200 kHz      849.000000000 MHz  
 SWT 2.5 ms



Date: 2.AUG.2012 10:09:00

-----END-----



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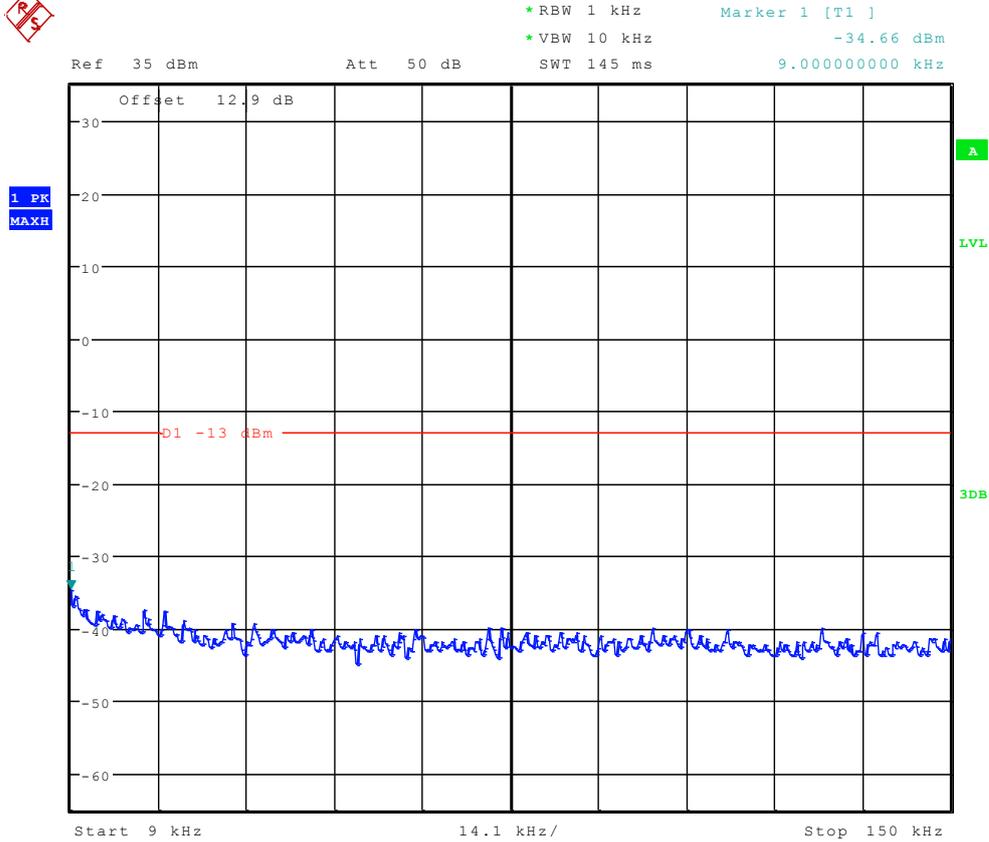
# Appendix E

## Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & Part 22 Subpart H



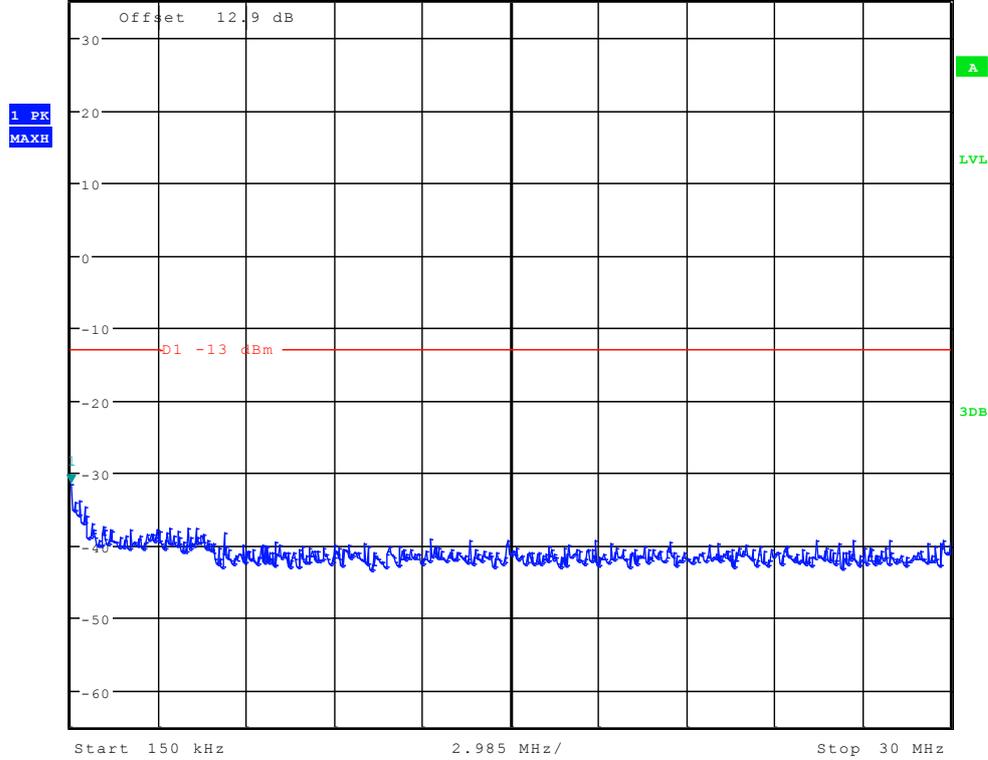
# TM1:GPRS/GSM Channel 128



Date: 2.AUG.2012 09:27:33



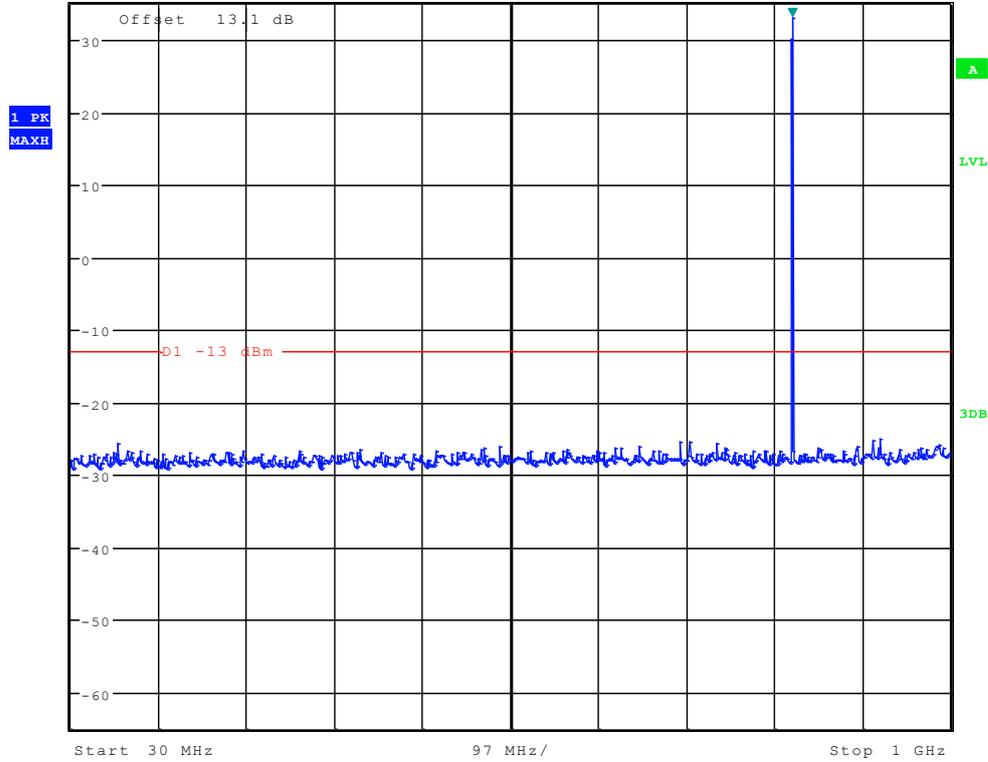
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -31.53 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 2.AUG.2012 09:28:17



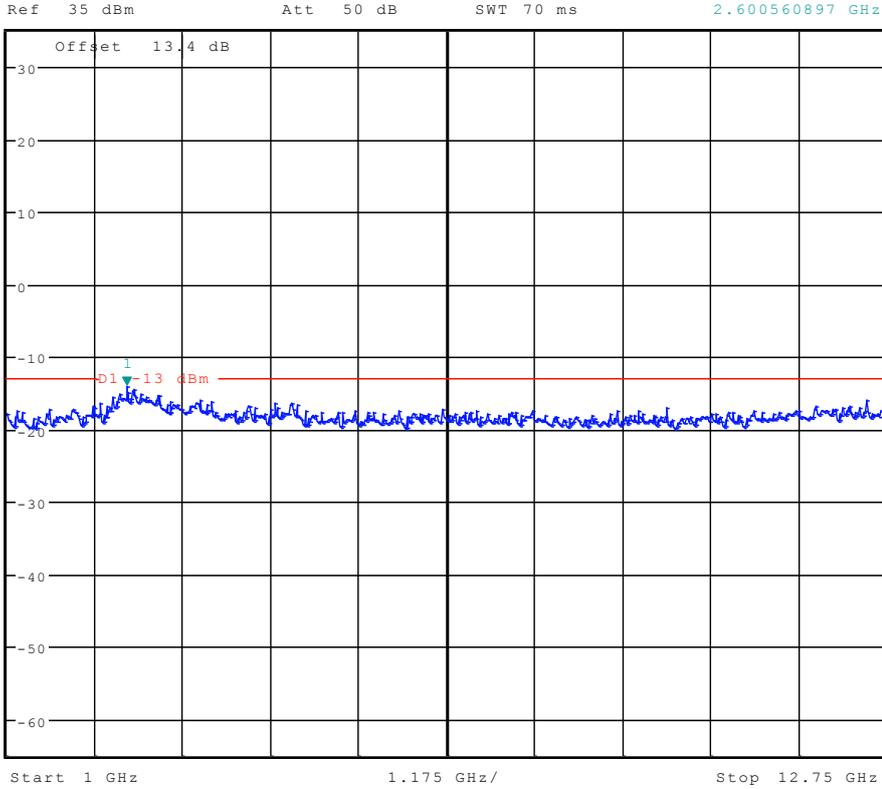
Ref 35 dBm Att 50 dB SWT 100 ms  
\*RBW 100 kHz \*VBW 300 kHz  
Marker 1 [T1] 33.01 dBm  
825.897435897 MHz



Date: 2.AUG.2012 09:29:01



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -13.97 dBm  
SWT 70 ms      2.600560897 GHz



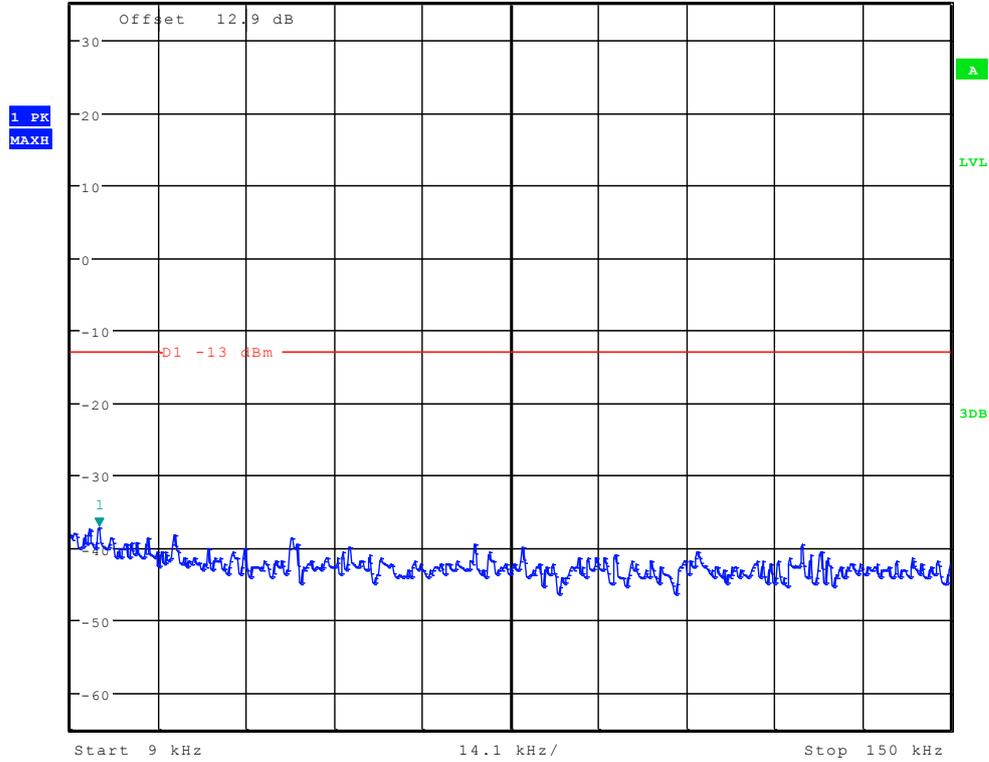
Date: 2.AUG.2012 09:29:44



## Channel 192



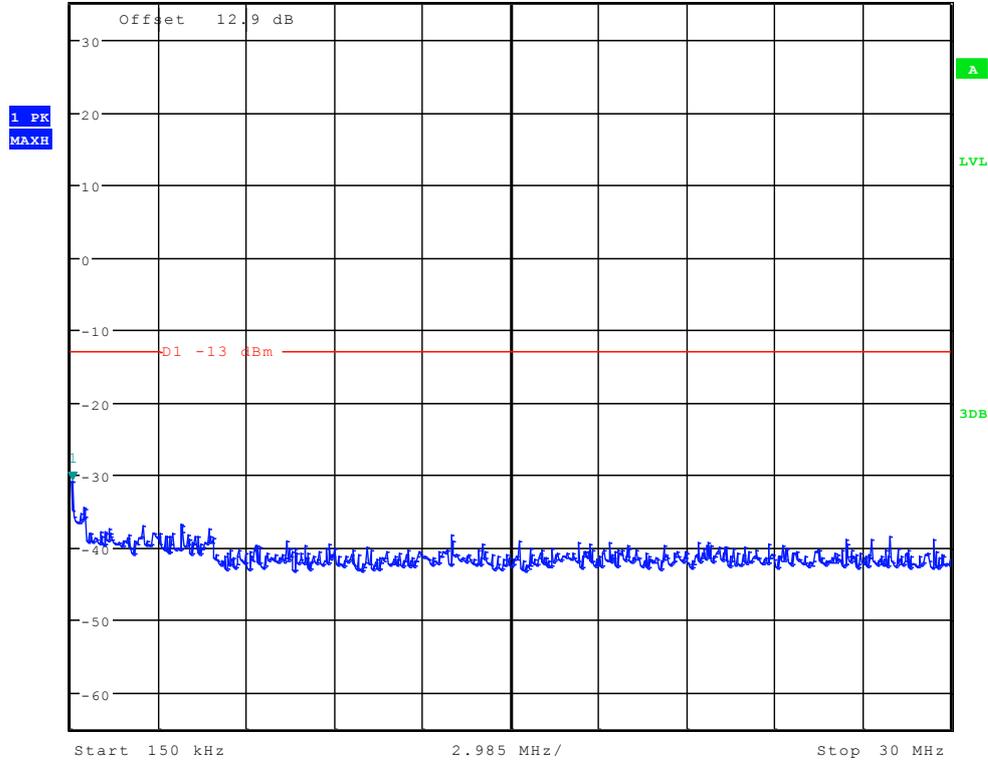
Ref 35 dBm      Att 50 dB      RBW 1 kHz      Marker 1 [T1]      -37.08 dBm  
VBW 10 kHz      SWT 145 ms      13.519230769 kHz



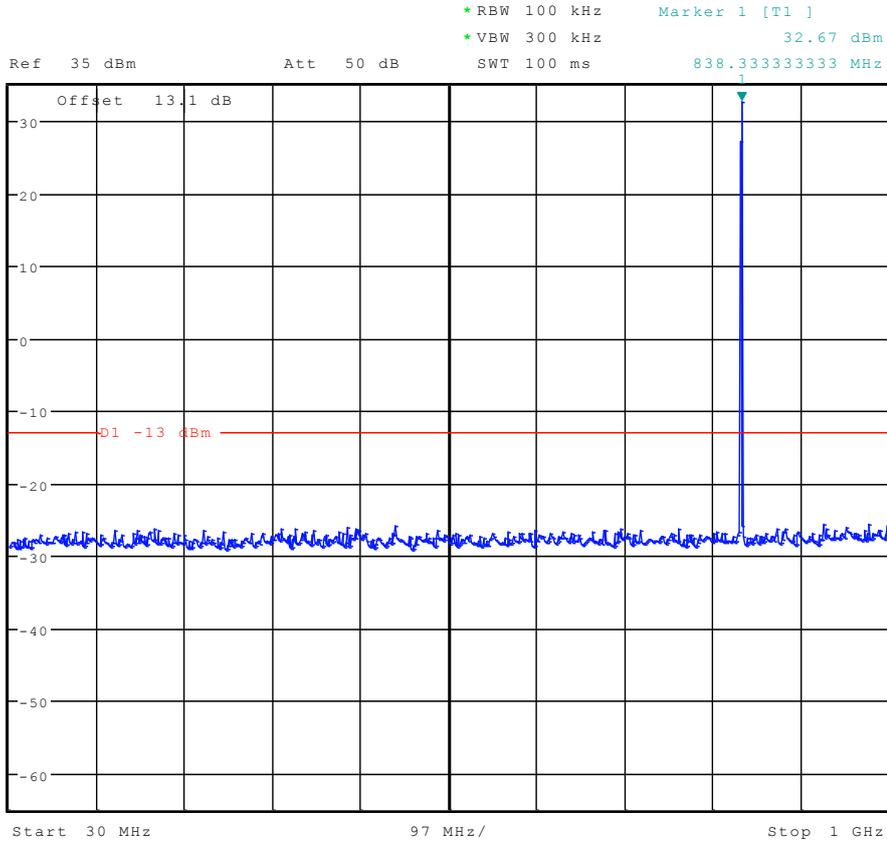
Date: 2.AUG.2012 09:27:48



\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -30.85 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



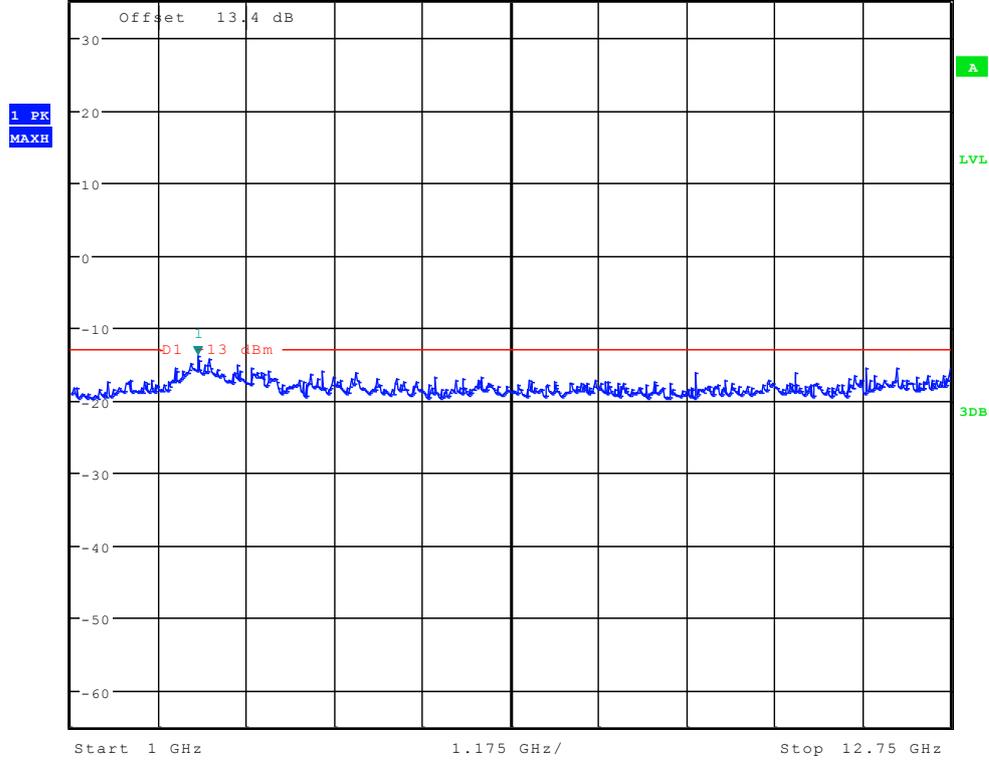
Date: 2.AUG.2012 09:28:31



Date: 2.AUG.2012 09:29:15



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -13.90 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.694711538 GHz



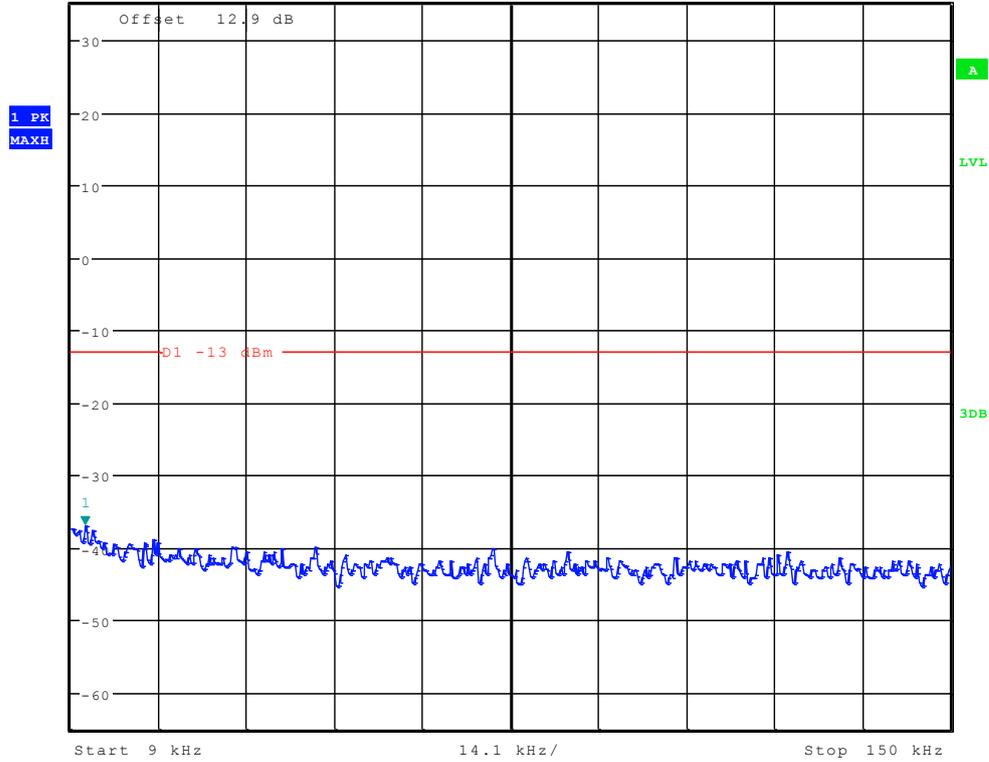
Date: 2.AUG.2012 09:29:59



## Channel 251



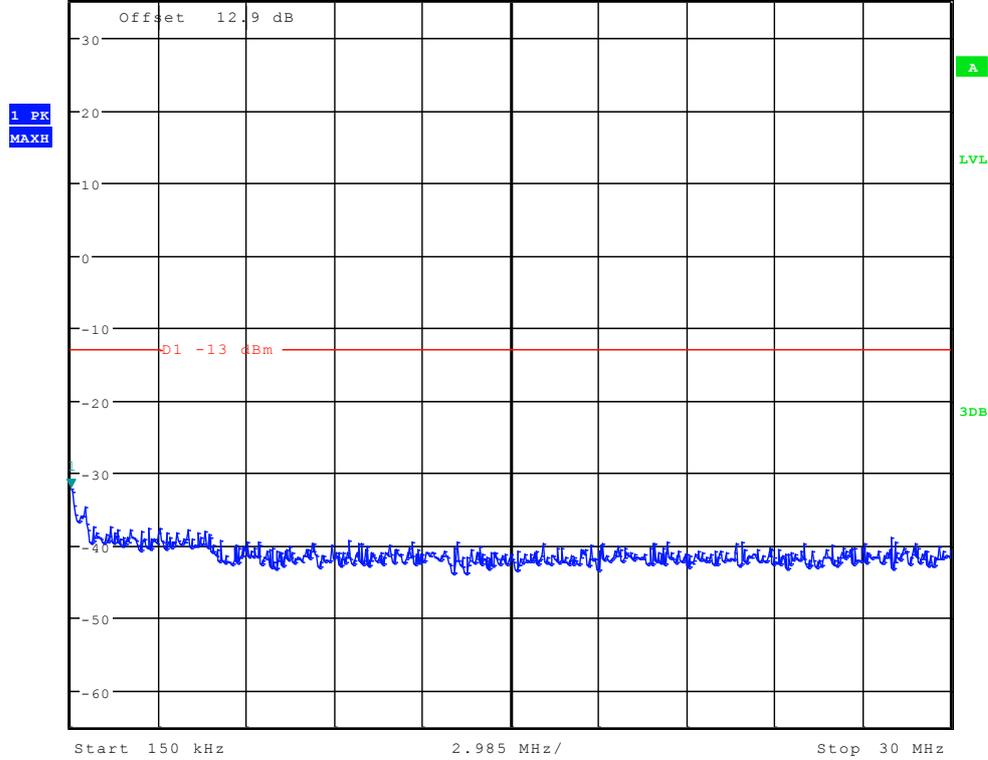
\* RBW 1 kHz      Marker 1 [T1 ]  
 \* VBW 10 kHz      -36.87 dBm  
 Ref 35 dBm      Att 50 dB      SWT 145 ms      11.259615385 kHz



Date: 2.AUG.2012 09:28:02



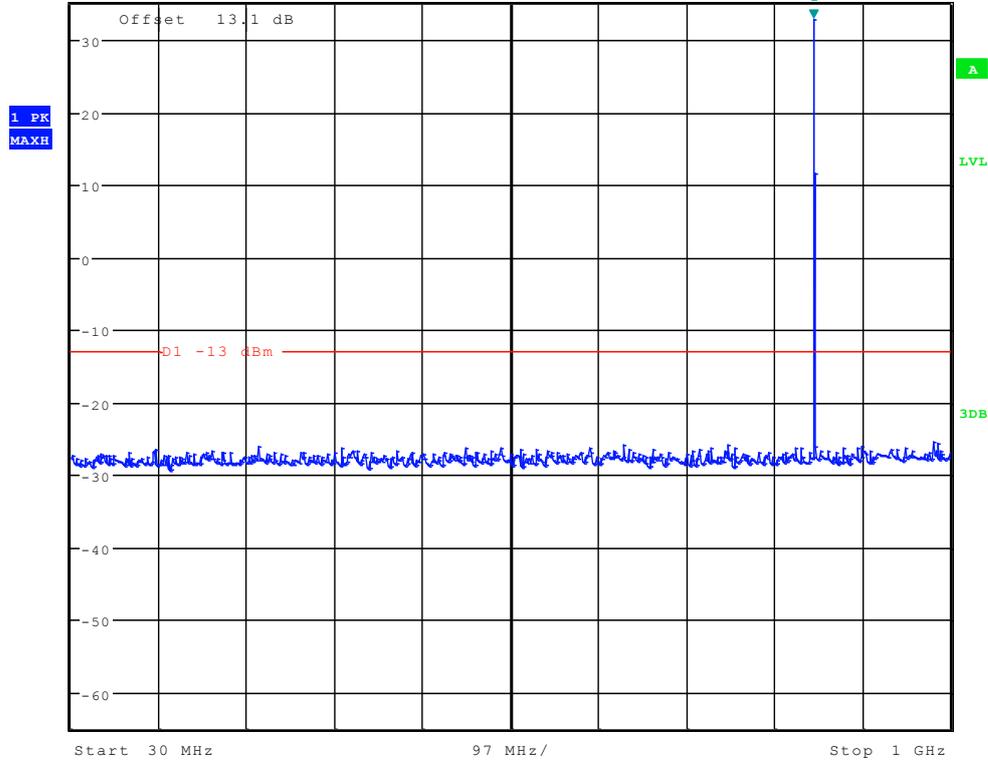
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -32.22 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      150.000000000 kHz



Date: 2.AUG.2012 09:28:46



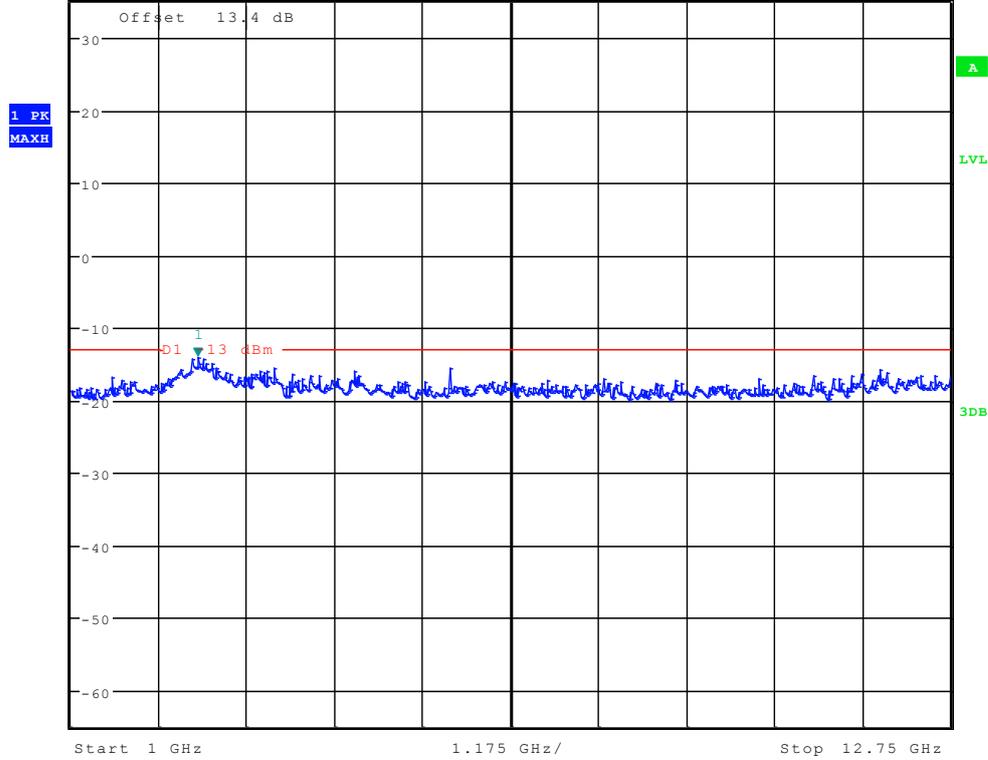
\*RBW 100 kHz      Marker 1 [T1 ]  
 \*VBW 300 kHz      32.89 dBm  
 Ref 35 dBm      Att 50 dB      SWT 100 ms      849.214743590 MHz



Date: 2.AUG.2012 09:29:29



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -14.15 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.694711538 GHz



Date: 2.AUG.2012 09:30:13

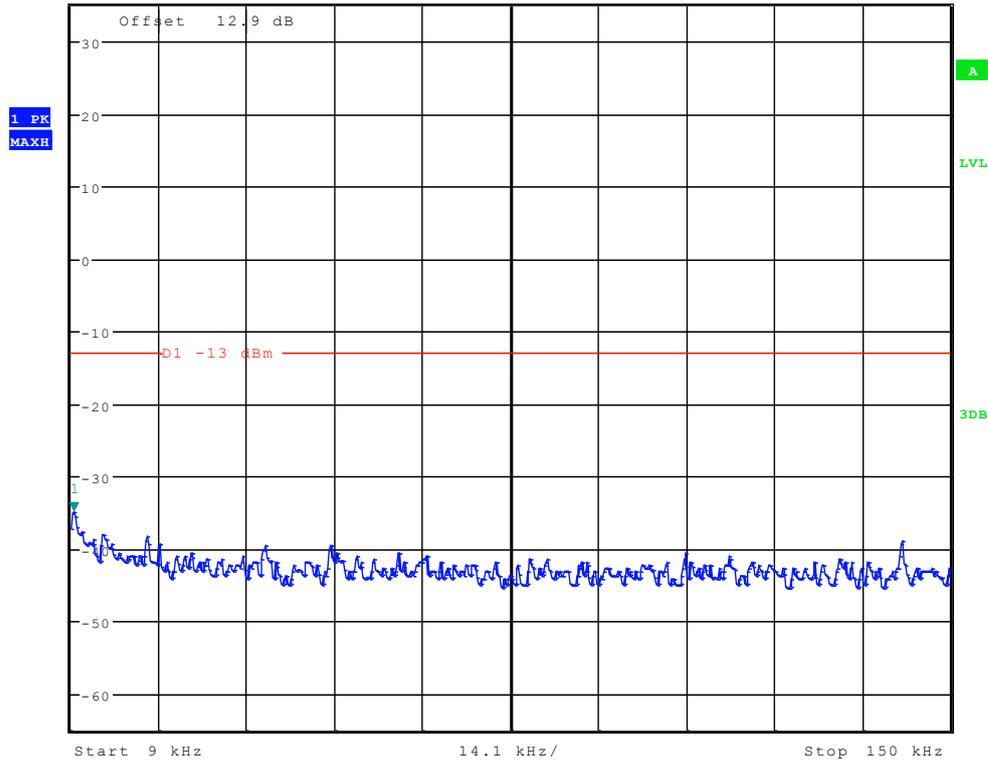


# TM2:EDGE

## Channel 128



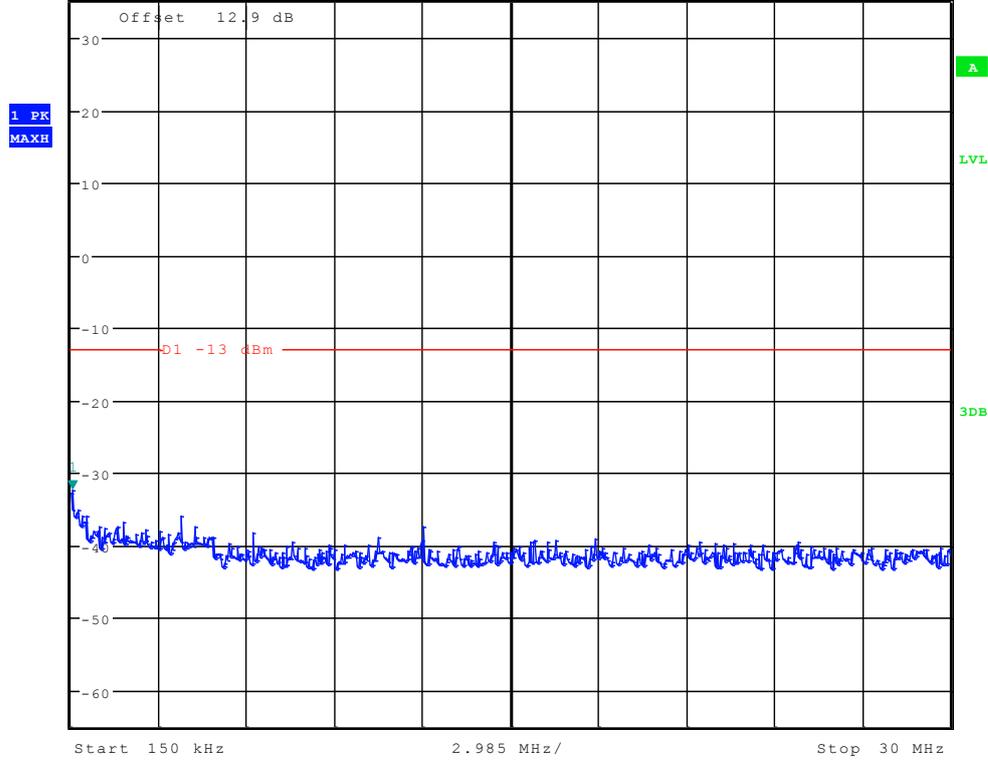
Ref 35 dBm Att 50 dB SWT 145 ms  
\*RBW 1 kHz \*VBW 10 kHz  
Marker 1 [T1] -34.89 dBm  
9.451923077 kHz



Date: 2.AUG.2012 09:50:01



\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -32.34 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz

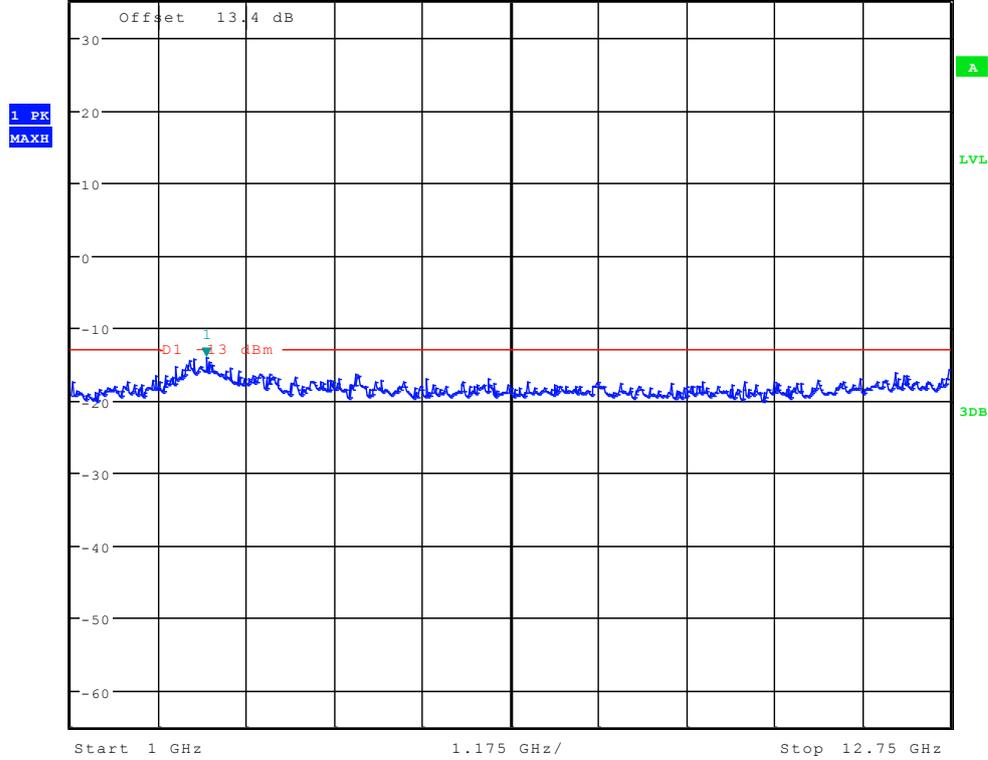


Date: 2.AUG.2012 09:50:45





\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -14.03 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.807692308 GHz



Date: 2.AUG.2012 09:52:12

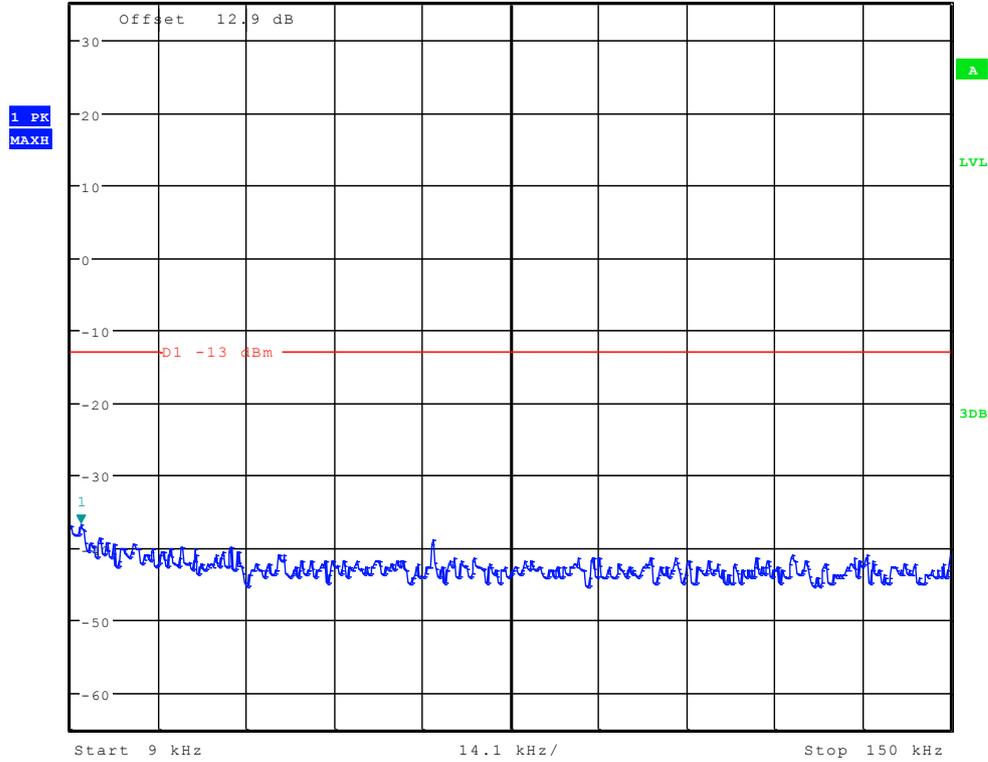


## Channel 192



\* RBW 1 kHz      Marker 1 [T1 ]  
\* VBW 10 kHz      -36.67 dBm  
SWT 145 ms      10.581730769 kHz

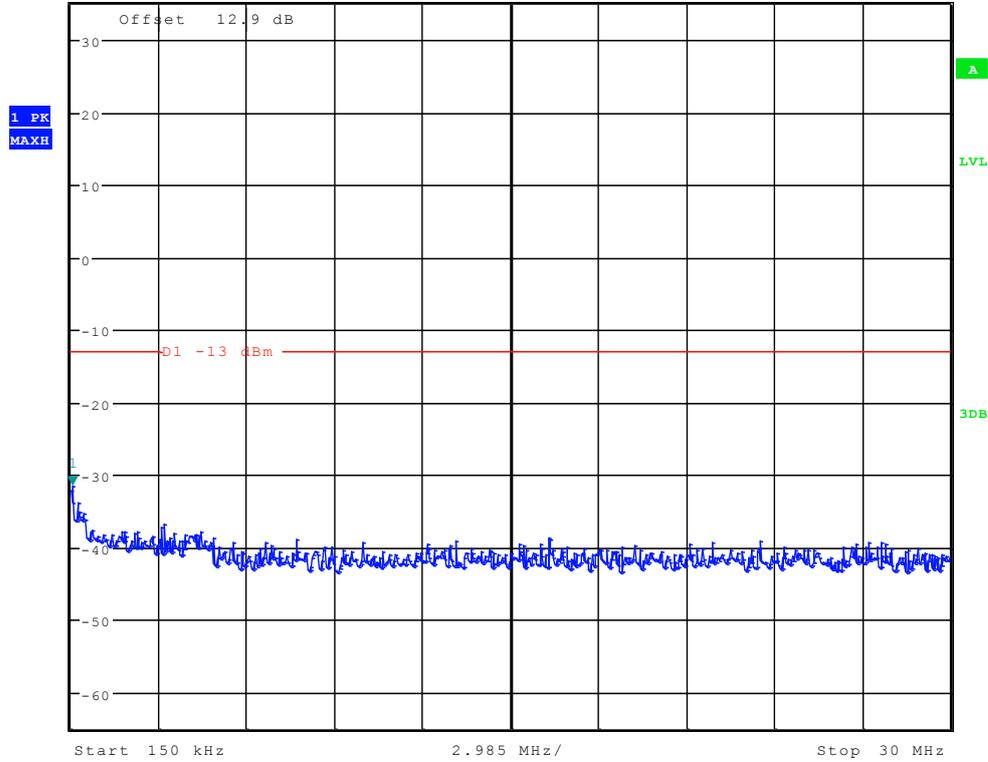
Ref 35 dBm      Att 50 dB



Date: 2.AUG.2012 09:50:16



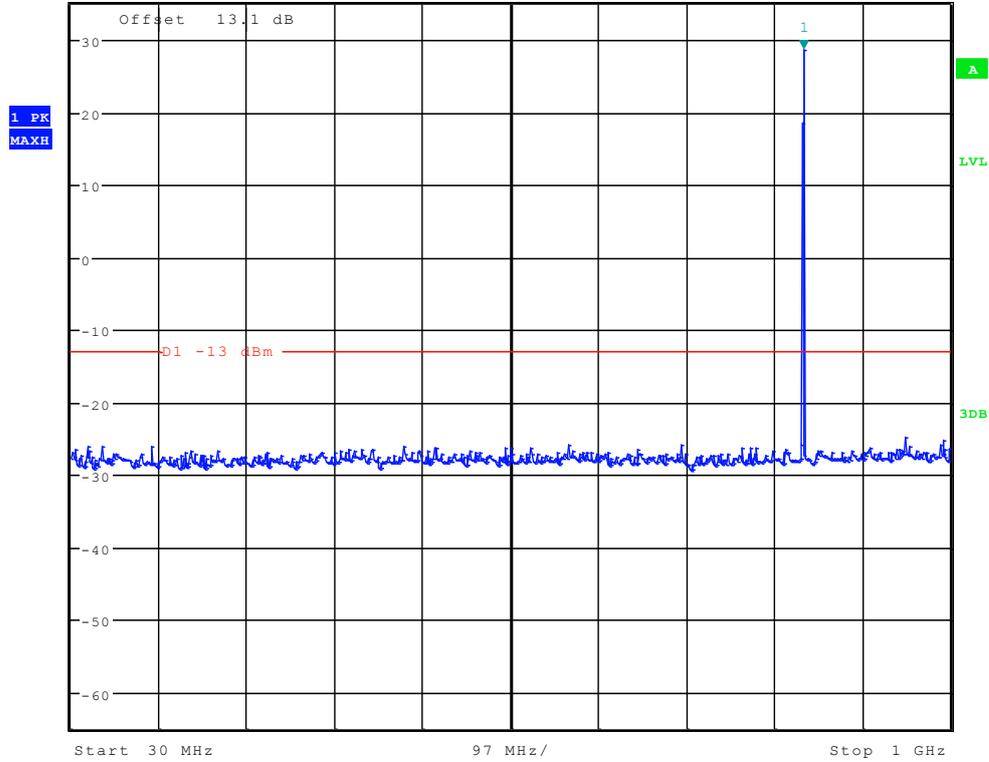
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.59 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 2.AUG.2012 09:50:59



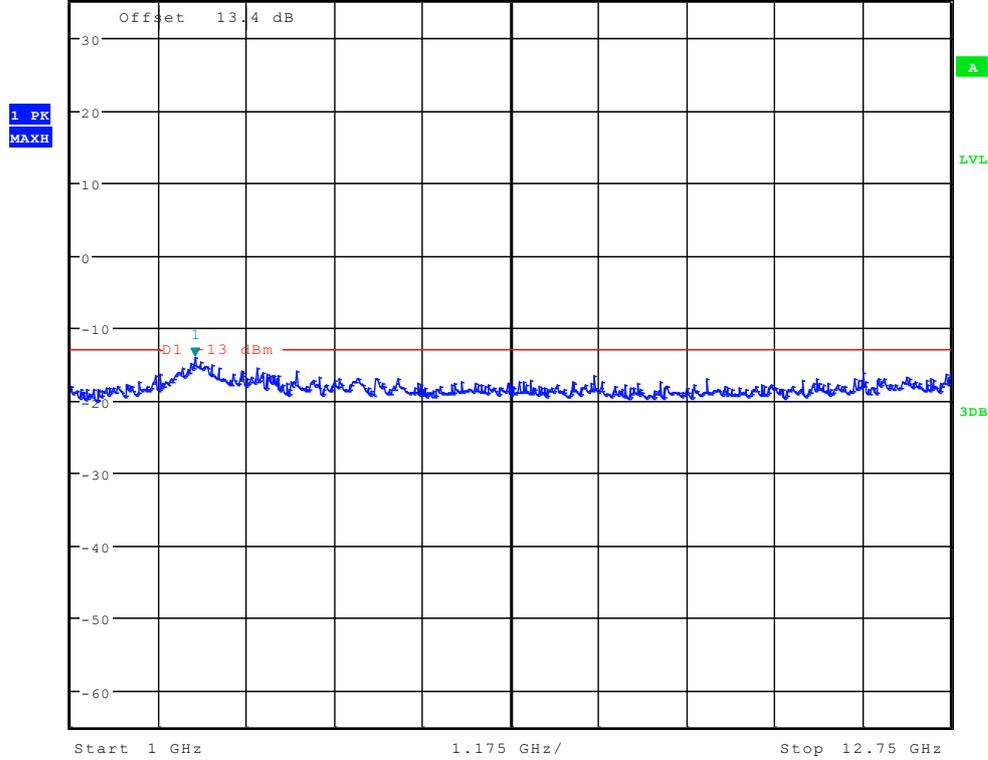
\*RBW 100 kHz      Marker 1 [T1 ]  
 \*VBW 300 kHz      28.66 dBm  
 Ref 35 dBm      Att 50 dB      SWT 100 ms      838.333333333 MHz



Date: 2.AUG.2012 09:51:43



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -14.03 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.657051282 GHz



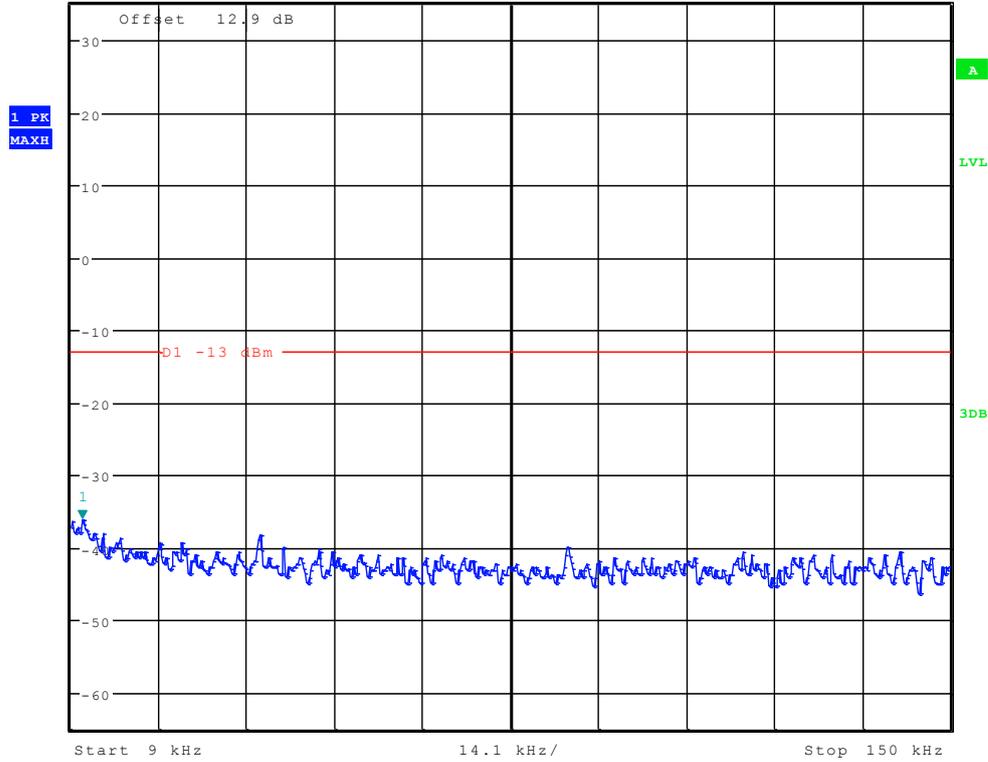
Date: 2.AUG.2012 09:52:27



## Channel 251



Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -36.19 dBm  
\*VBW 10 kHz      SWT 145 ms      10.807692308 kHz

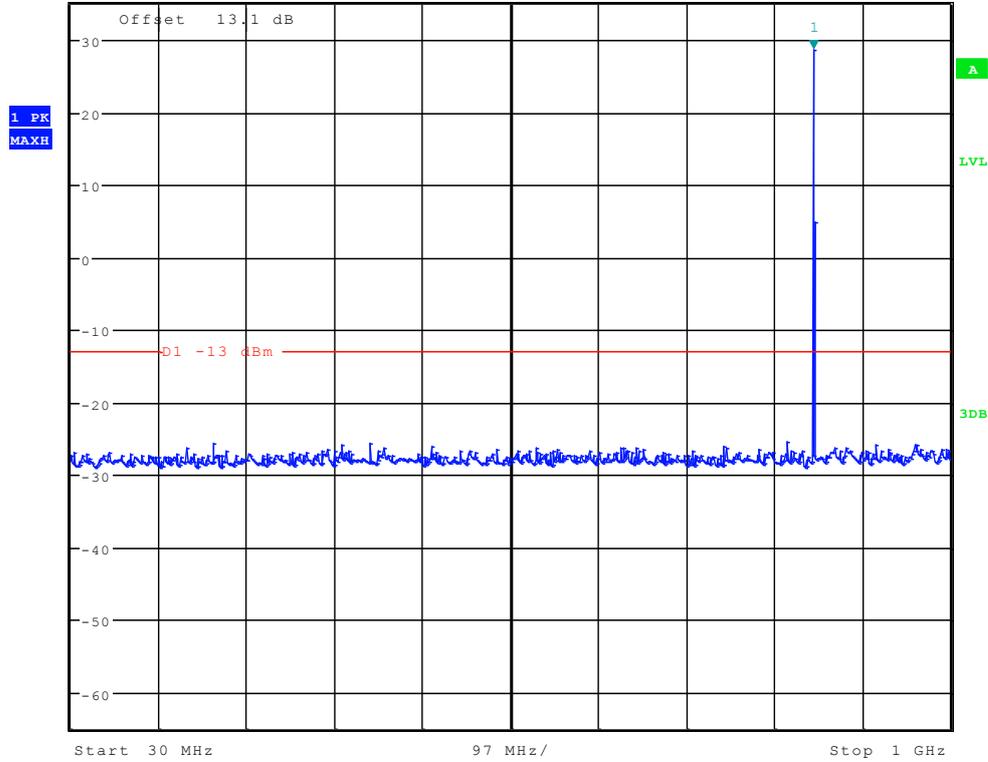


Date: 2.AUG.2012 09:50:30





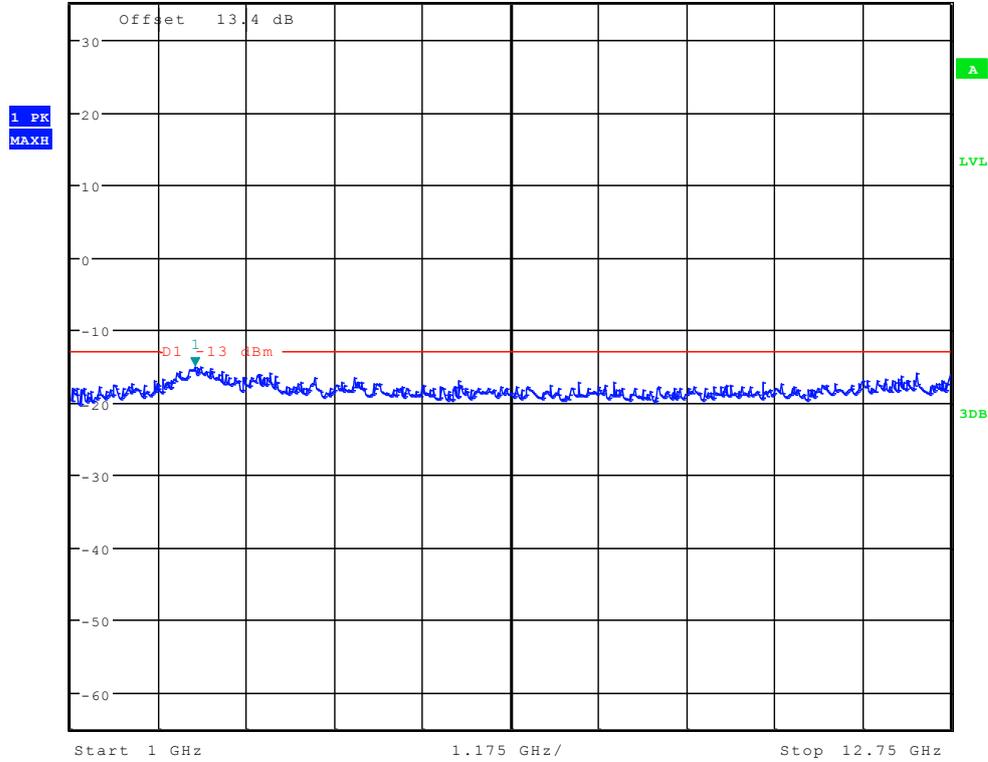
\*RBW 100 kHz      Marker 1 [T1 ]  
\*VBW 300 kHz      28.56 dBm  
Ref 35 dBm      Att 50 dB      SWT 100 ms      849.214743590 MHz



Date: 2.AUG.2012 09:51:57



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -15.07 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.657051282 GHz



Date: 2.AUG.2012 09:52:41

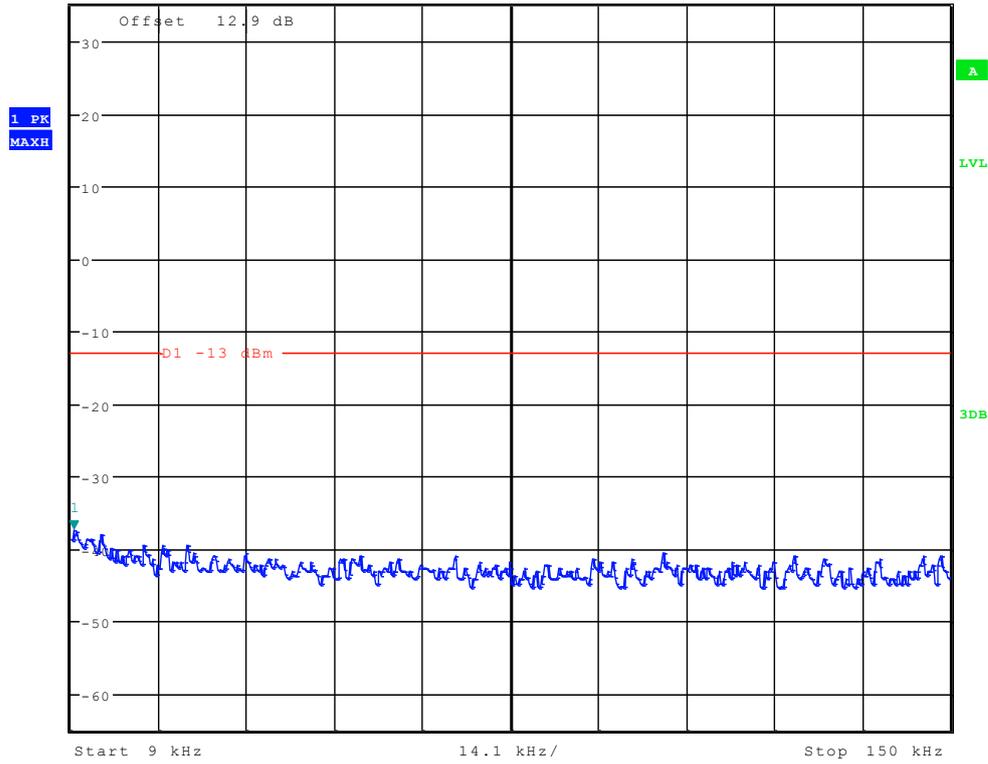


# TM3: WCDMA

## Channel 4132



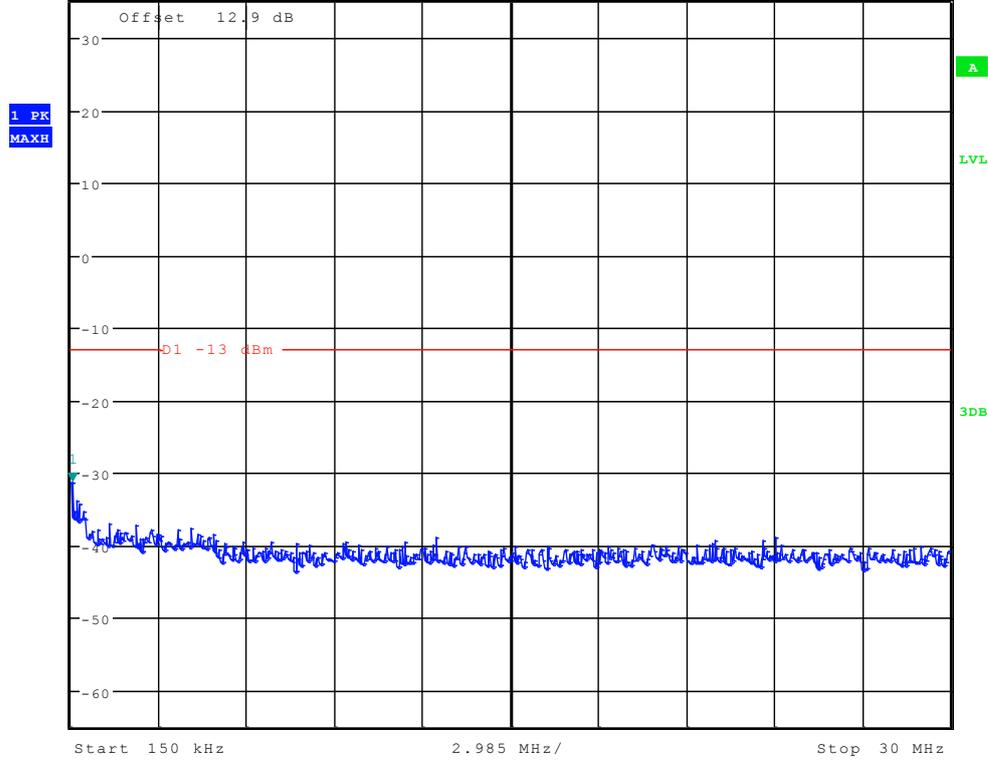
Ref 35 dBm Att 50 dB SWT 145 ms  
\*RBW 1 kHz Marker 1 [T1] -37.39 dBm  
\*VBW 10 kHz 9.451923077 kHz



Date: 2.AUG.2012 10:09:14



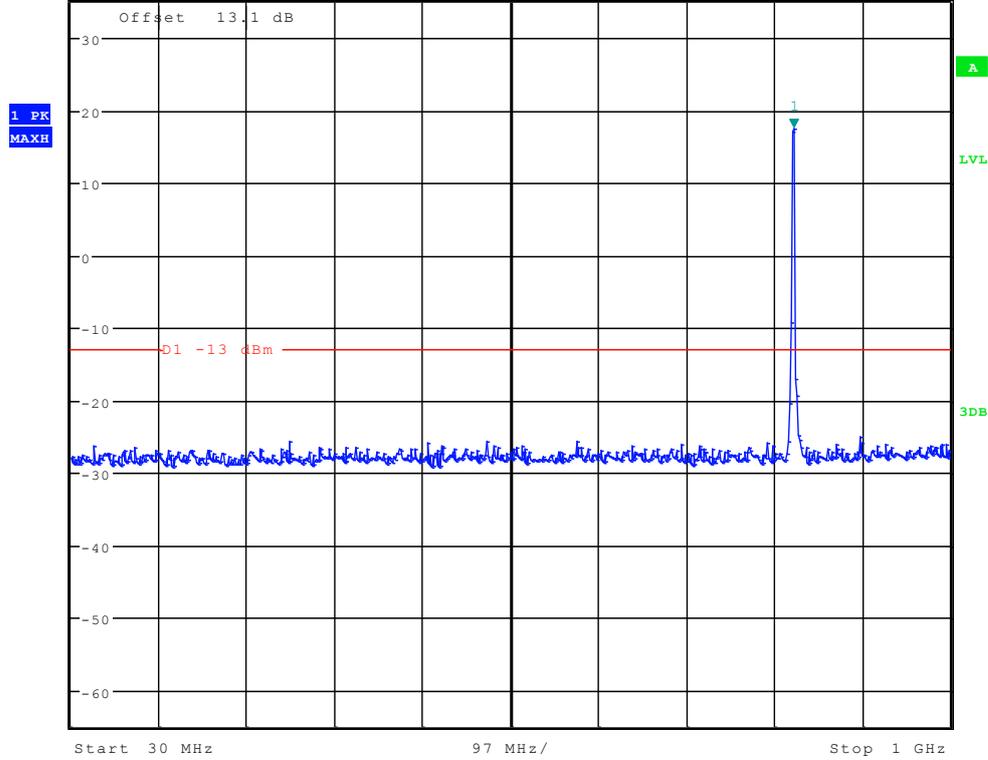
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.32 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 2.AUG.2012 10:09:58



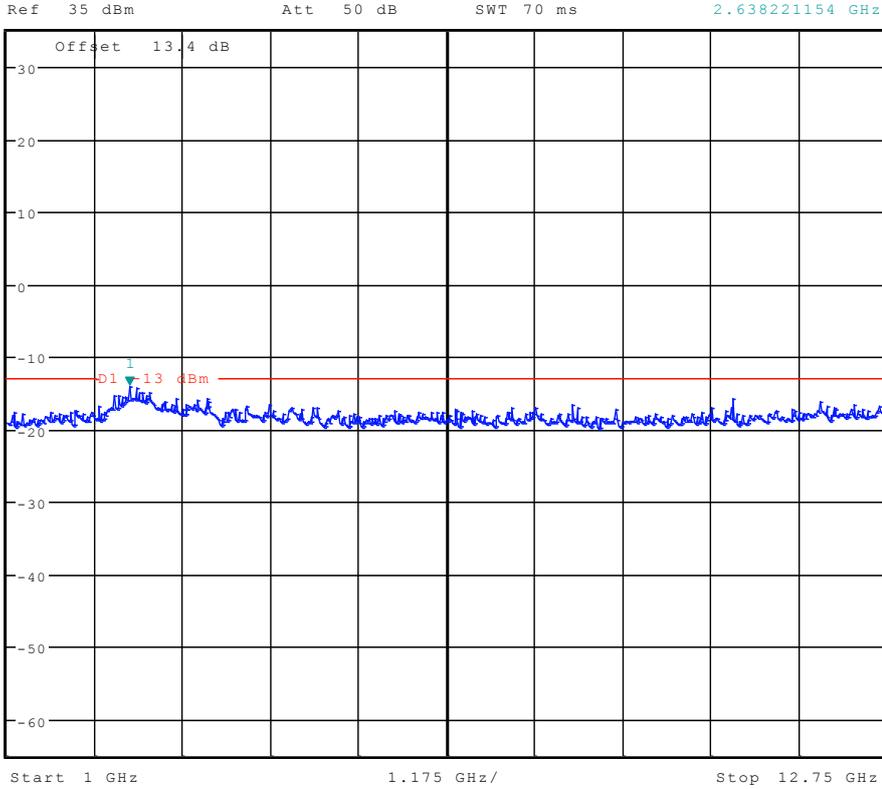
\*RBW 100 kHz      Marker 1 [T1 ]  
\*VBW 300 kHz      17.37 dBm  
Ref 35 dBm      Att 50 dB      SWT 100 ms      827.451923077 MHz



Date: 2.AUG.2012 10:10:41



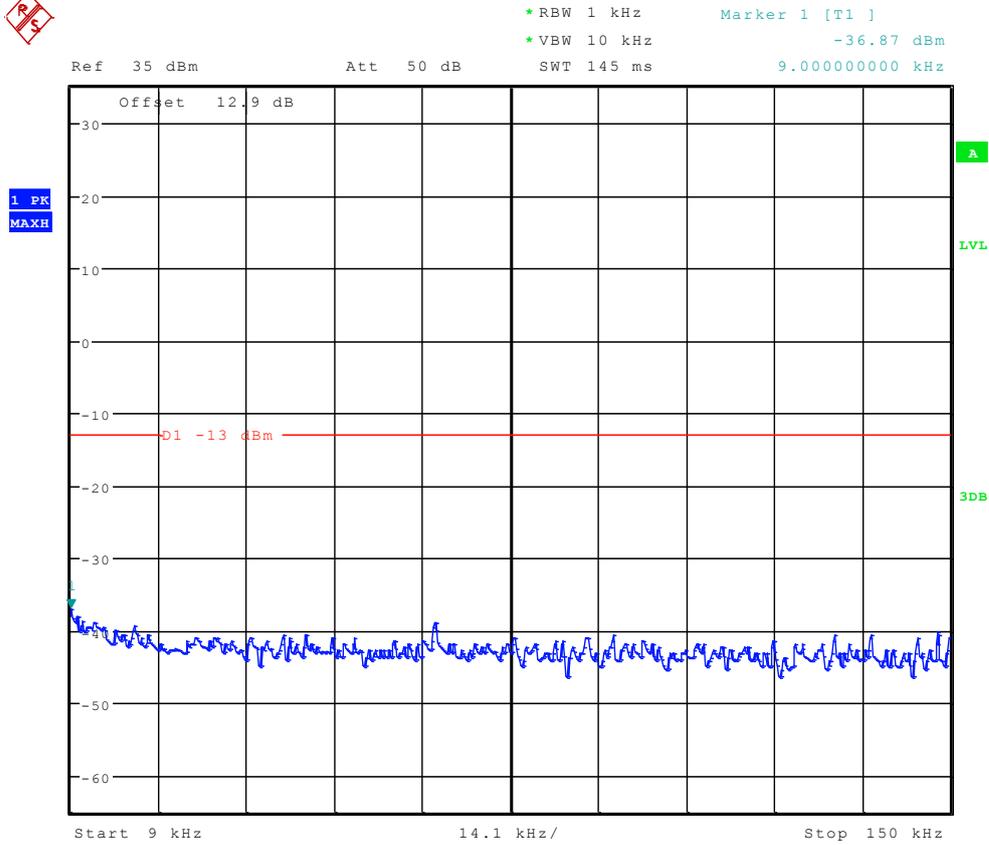
\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      -14.06 dBm  
SWT 70 ms      2.638221154 GHz



Date: 2.AUG.2012 10:11:25



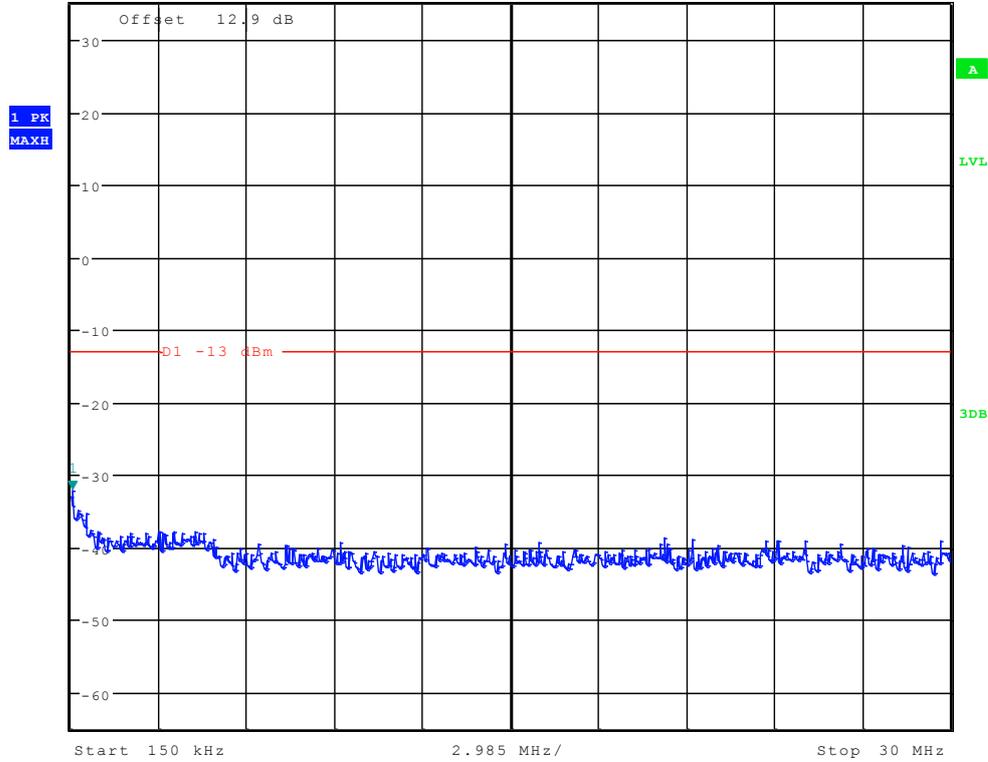
## Channel 4182



Date: 2.AUG.2012 10:09:29



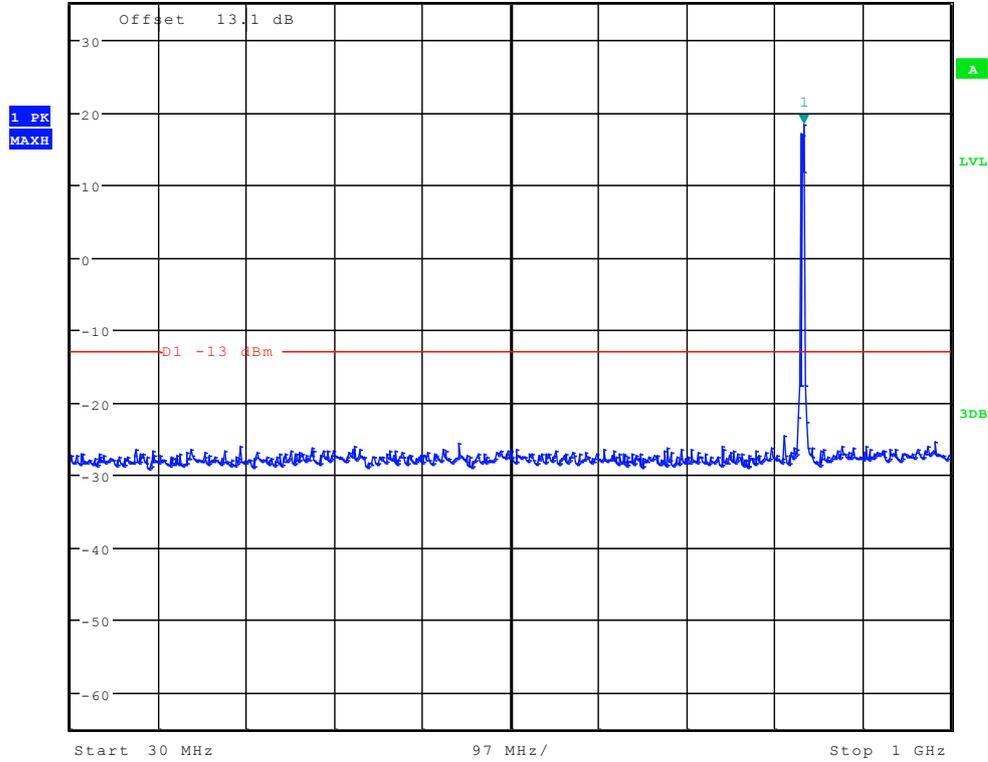
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -32.22 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 2.AUG.2012 10:10:12



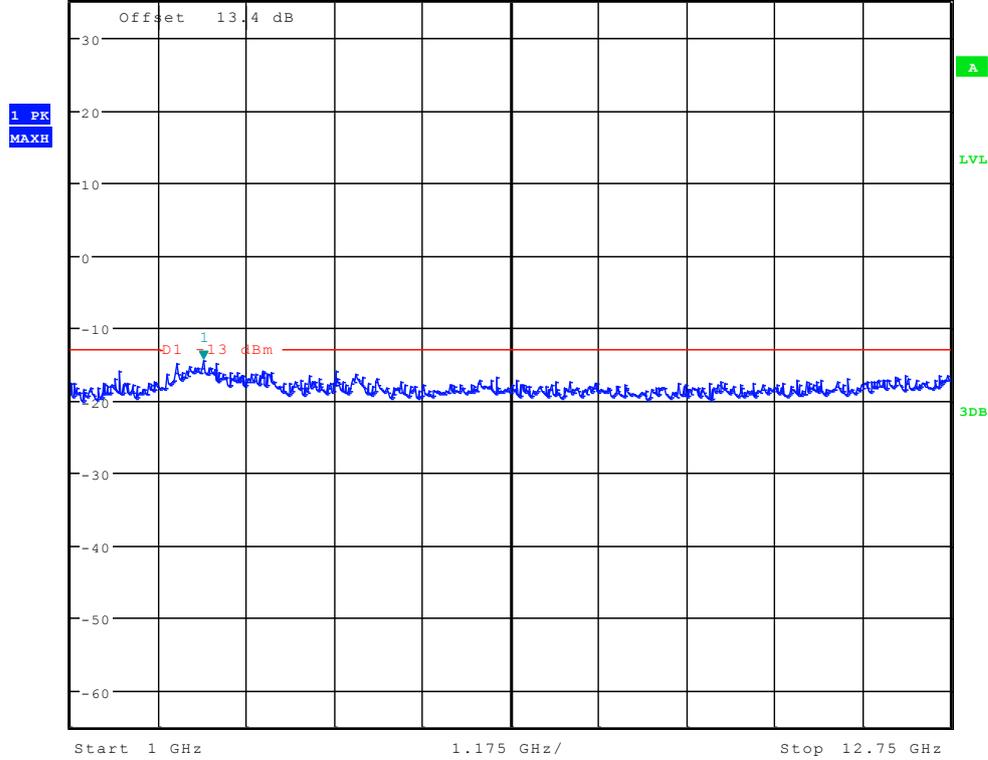
\*RBW 100 kHz      Marker 1 [T1 ]  
\*VBW 300 kHz      18.38 dBm  
Ref 35 dBm      Att 50 dB      SWT 100 ms      838.333333333 MHz



Date: 2.AUG.2012 10:10:56



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -14.56 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.770032051 GHz



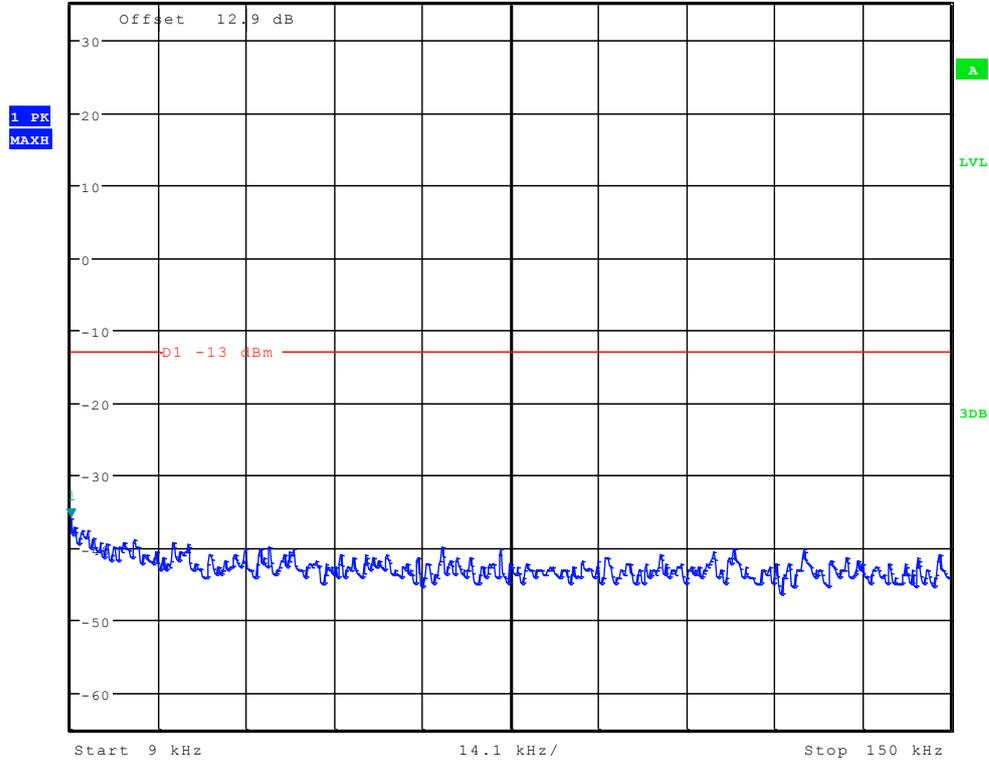
Date: 2.AUG.2012 10:11:40



### Channel 4233



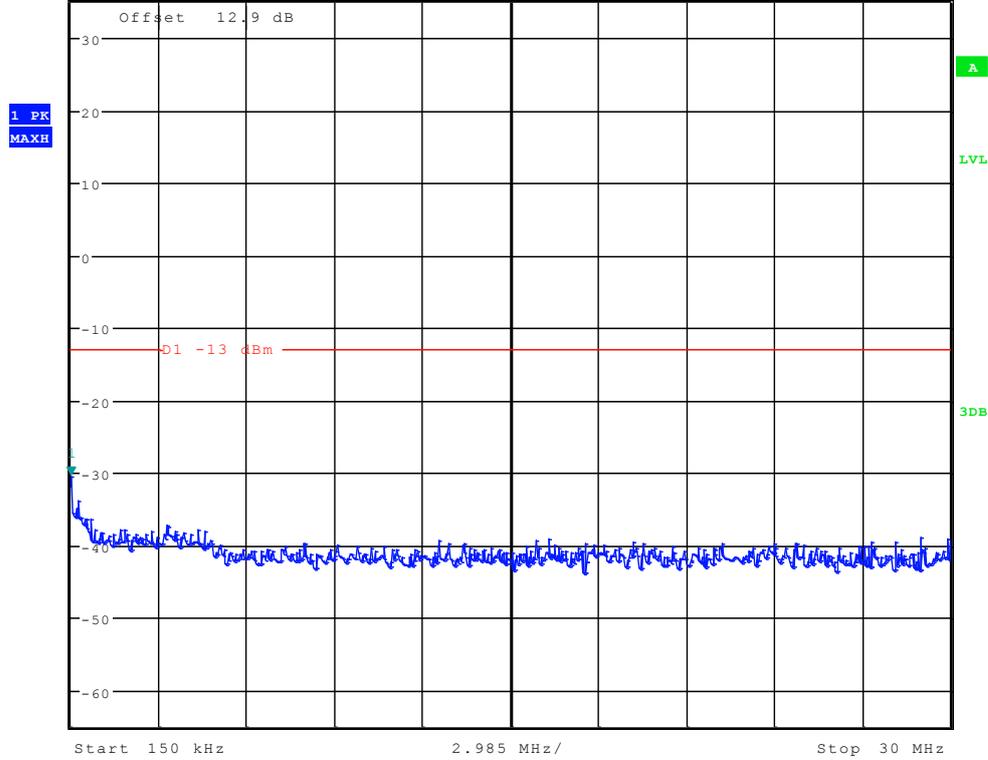
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -35.92 dBm  
\*VBW 10 kHz      SWT 145 ms      9.000000000 kHz



Date: 2.AUG.2012 10:09:43



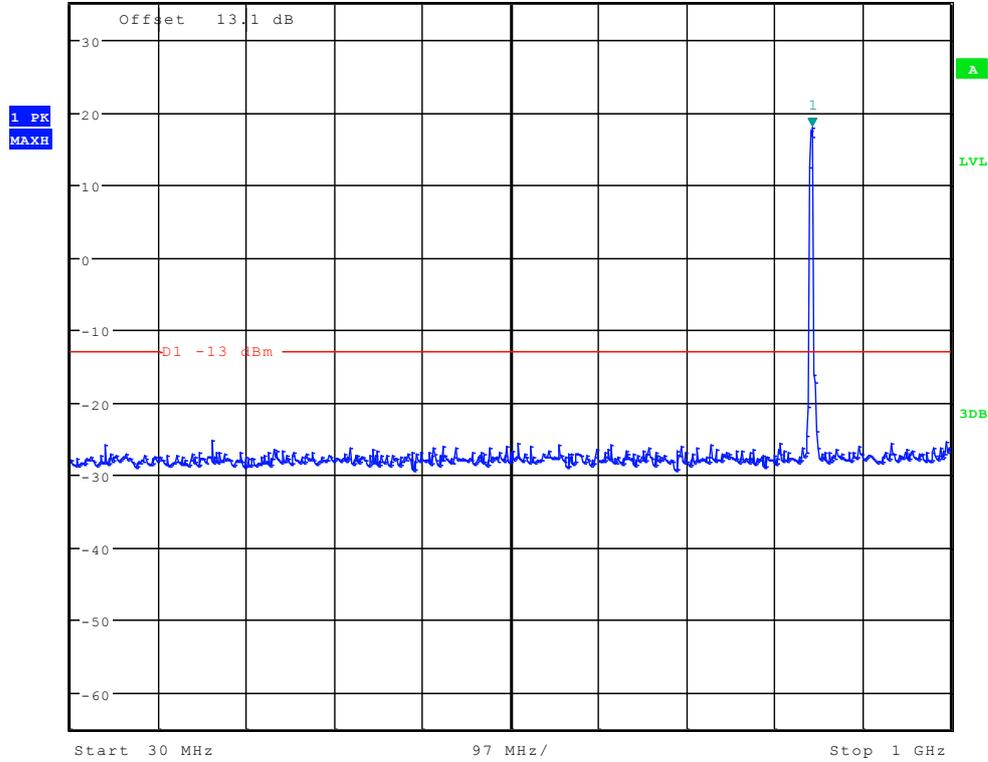
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -30.51 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 2.AUG.2012 10:10:26



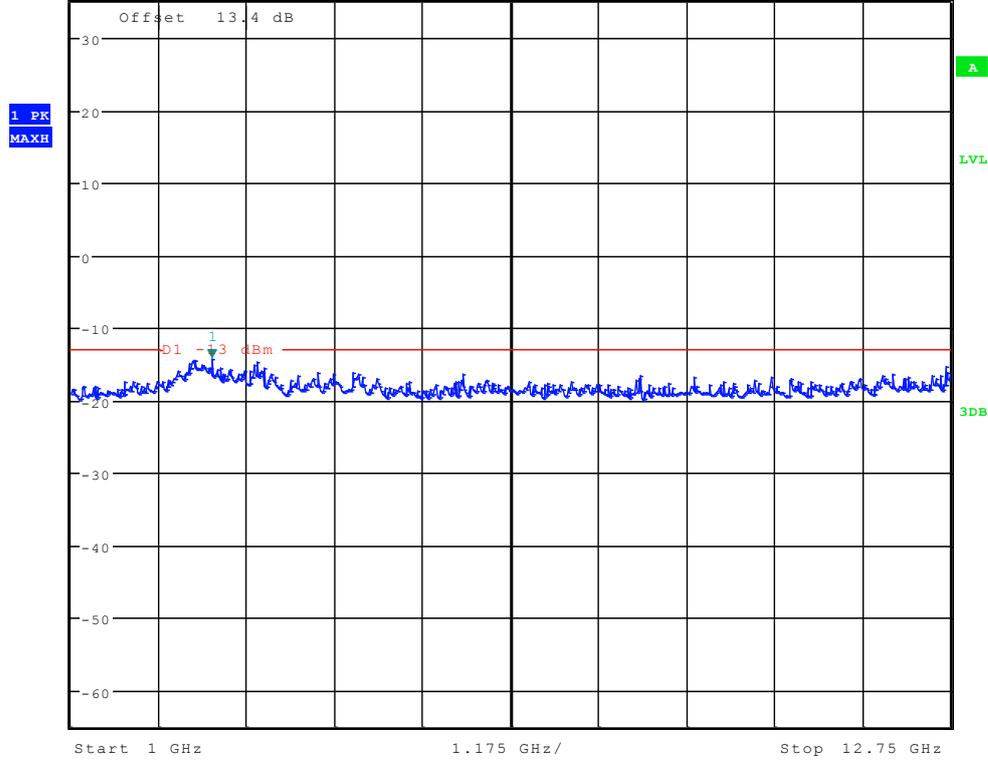
\*RBW 100 kHz      Marker 1 [T1 ]  
 \*VBW 300 kHz      17.85 dBm  
 Ref 35 dBm      Att 50 dB      SWT 100 ms      847.660256410 MHz



Date: 2.AUG.2012 10:11:10



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      -14.32 dBm  
 Ref 35 dBm      Att 50 dB      SWT 70 ms      2.883012821 GHz



Date: 2.AUG.2012 10:11:54

-----END-----



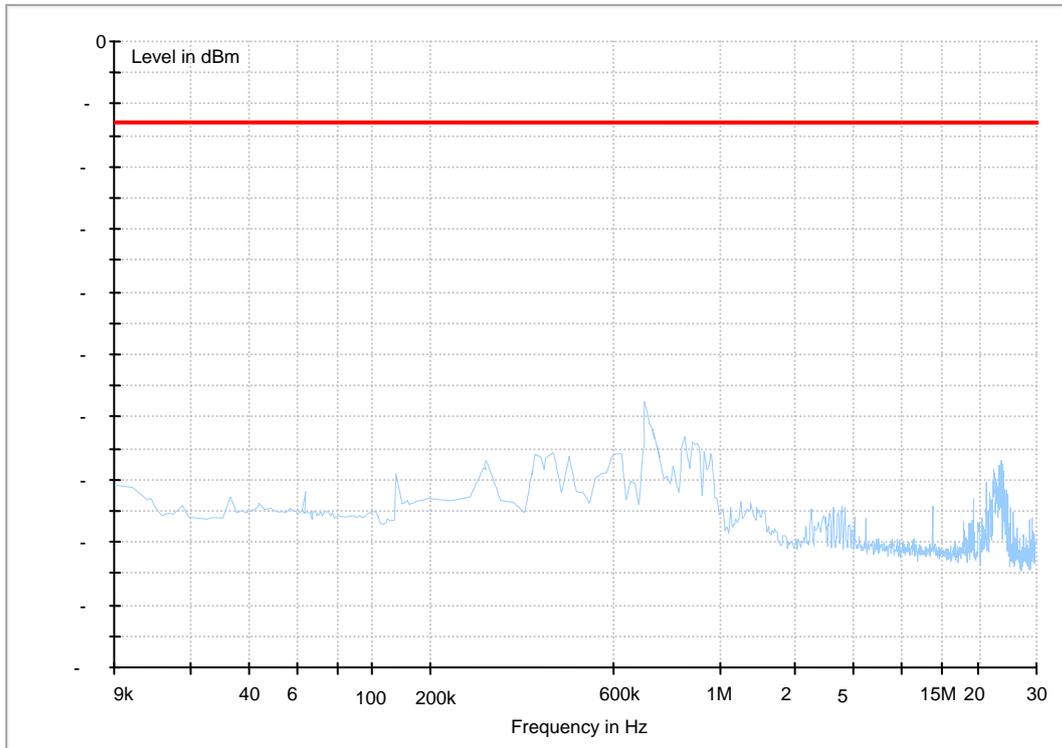
# **Appendix F**

## Radiated spurious emission

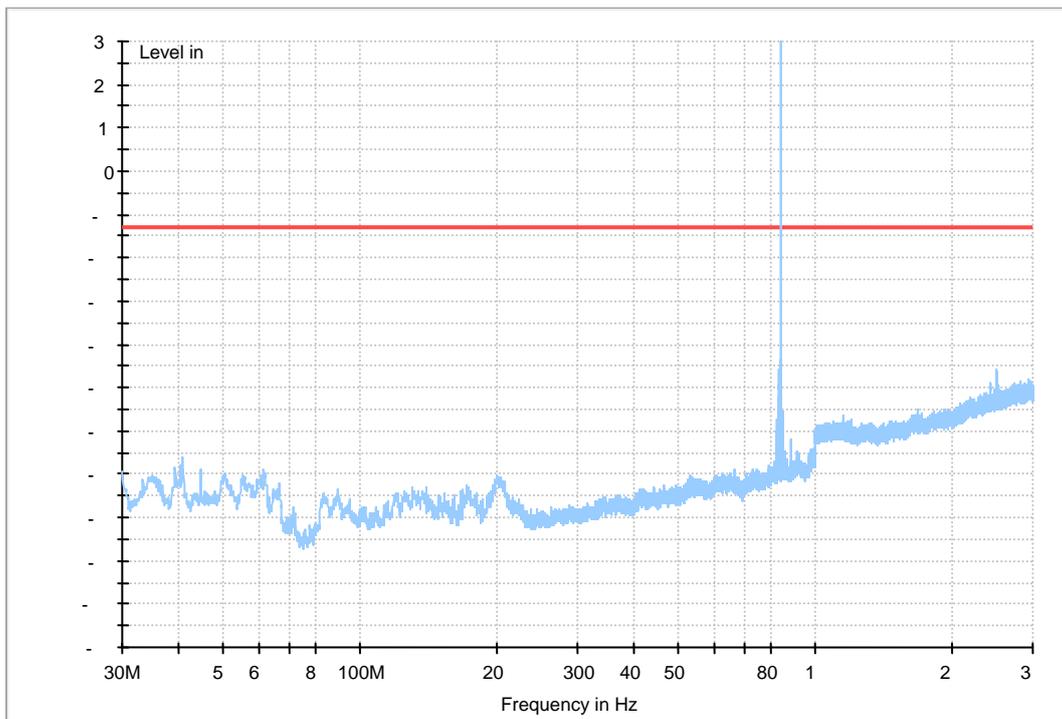
According to FCC Part 2.1053& Part 22.917

### GSM850

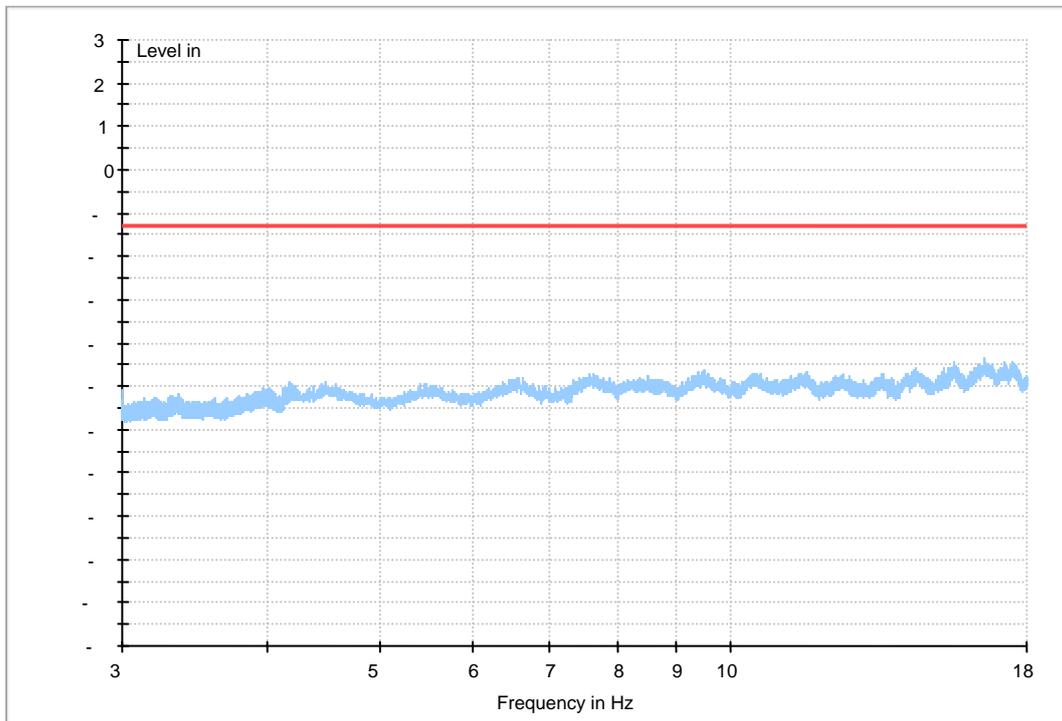
(9kHz~30MHz)



(30MHz~3GHz)

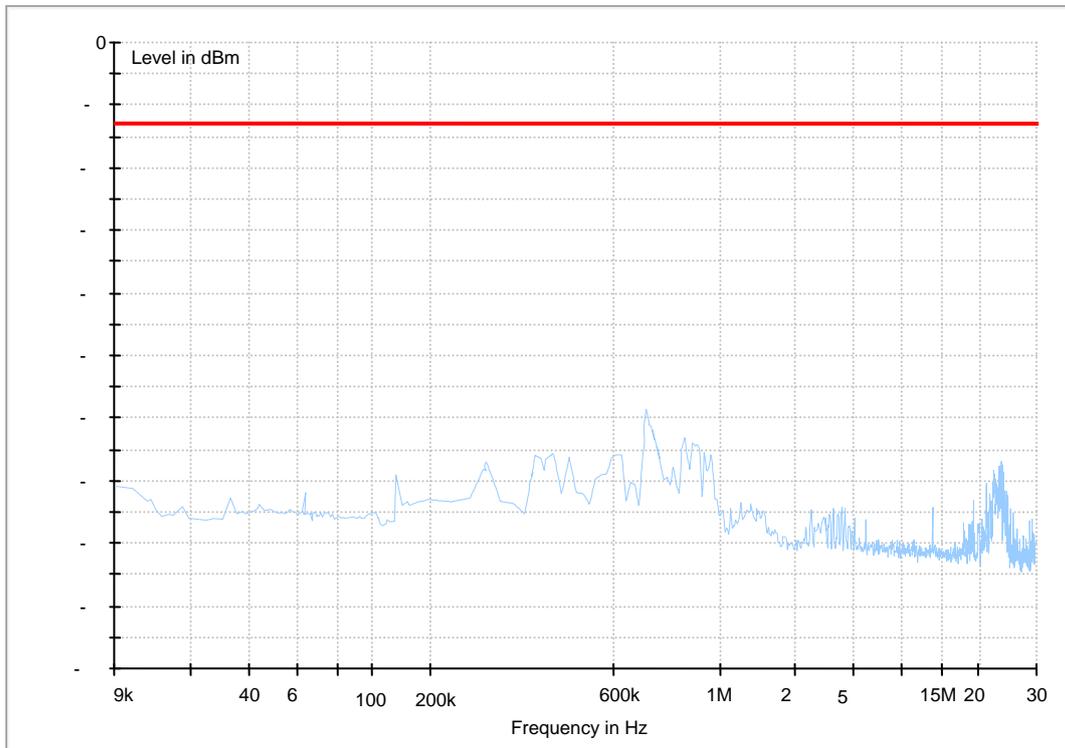


(3GHz~18GHz)

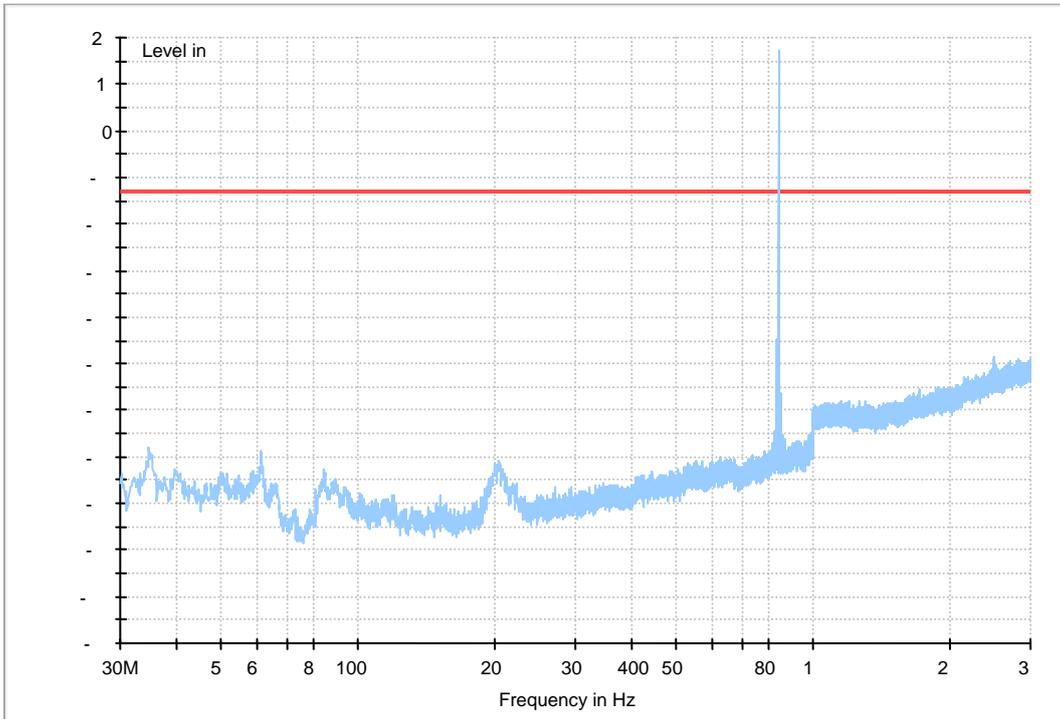


## GPRS 850

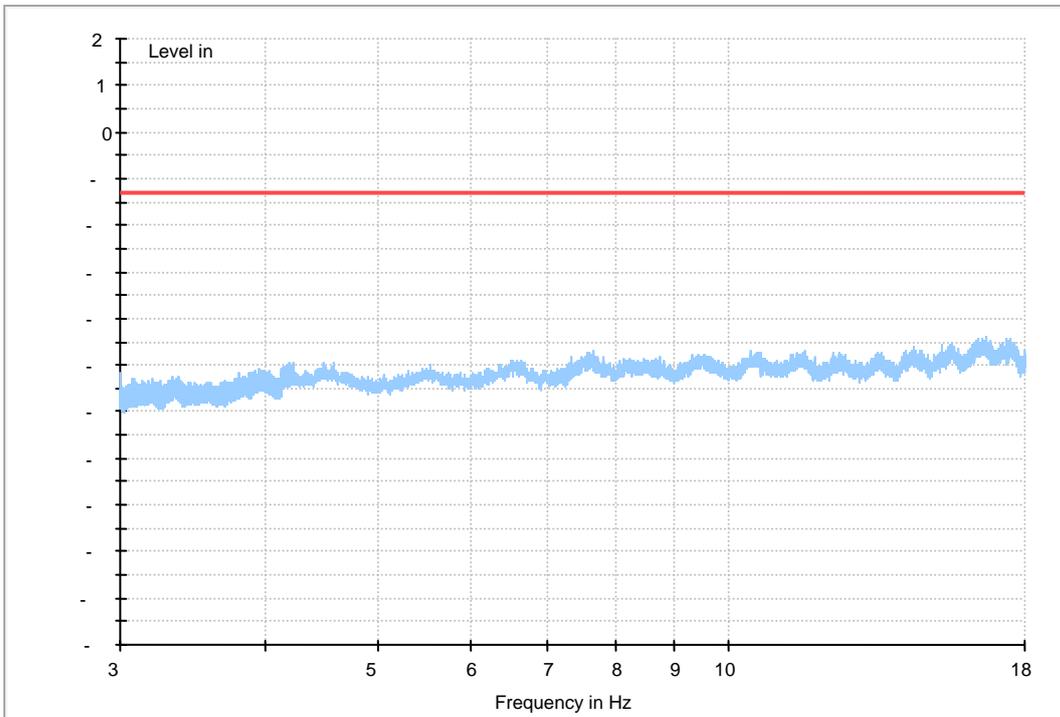
(9kHz~30MHz)



(30MHz~3GHz)

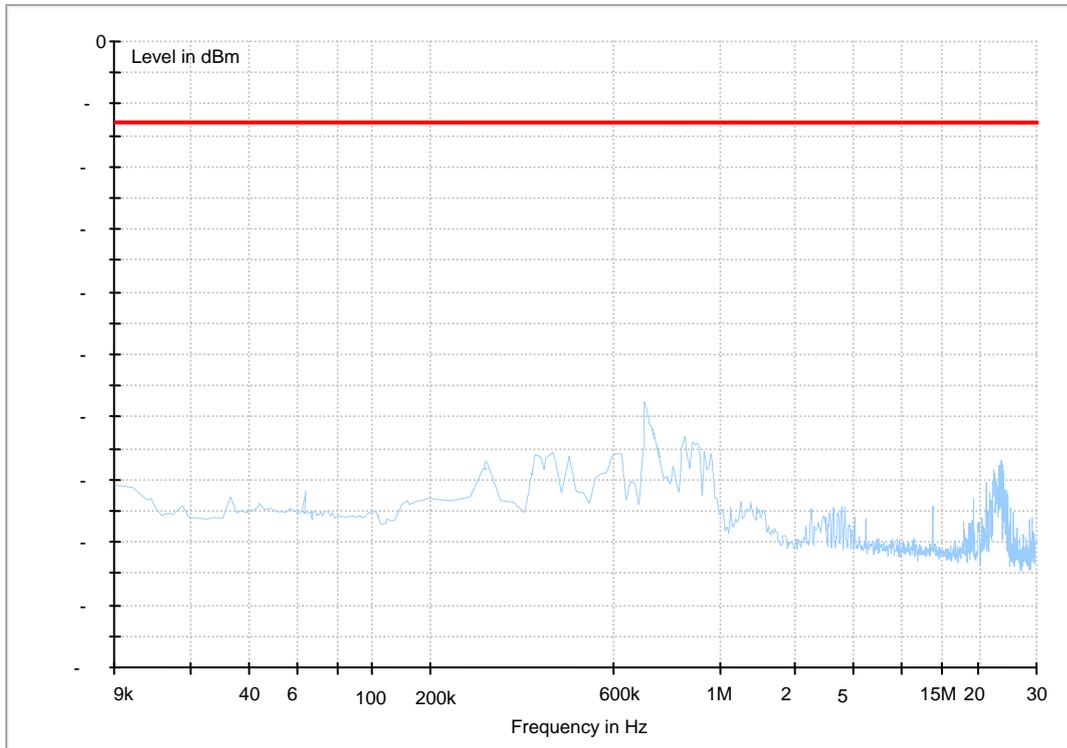


(3GHz~18GHz)

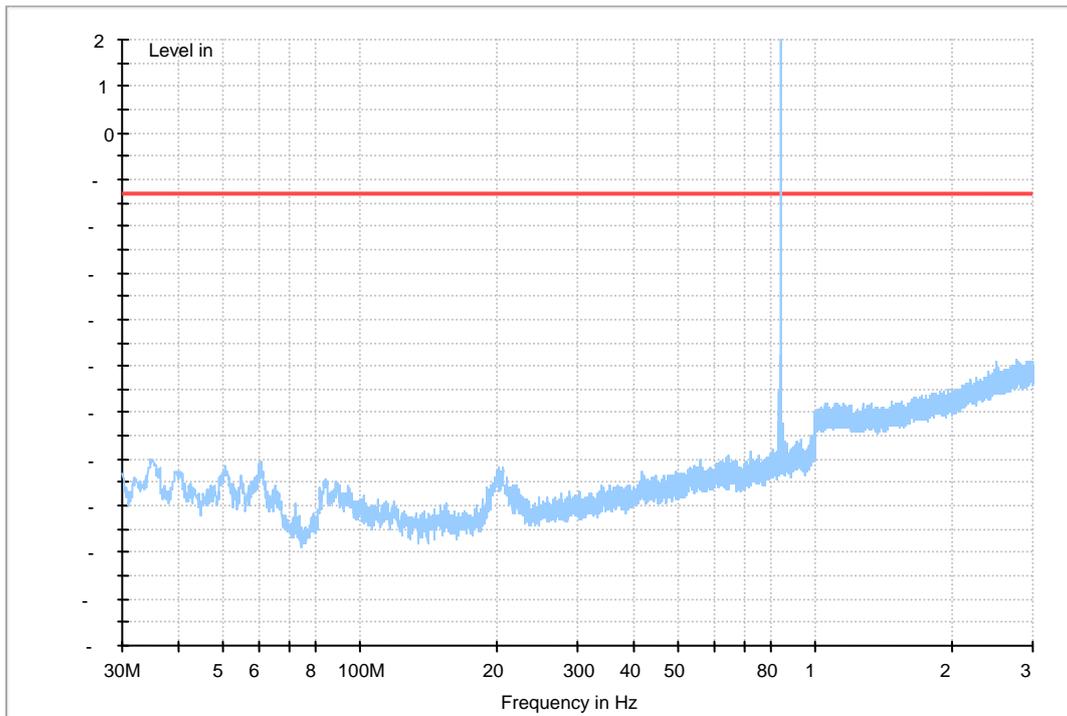


### EDGE 850

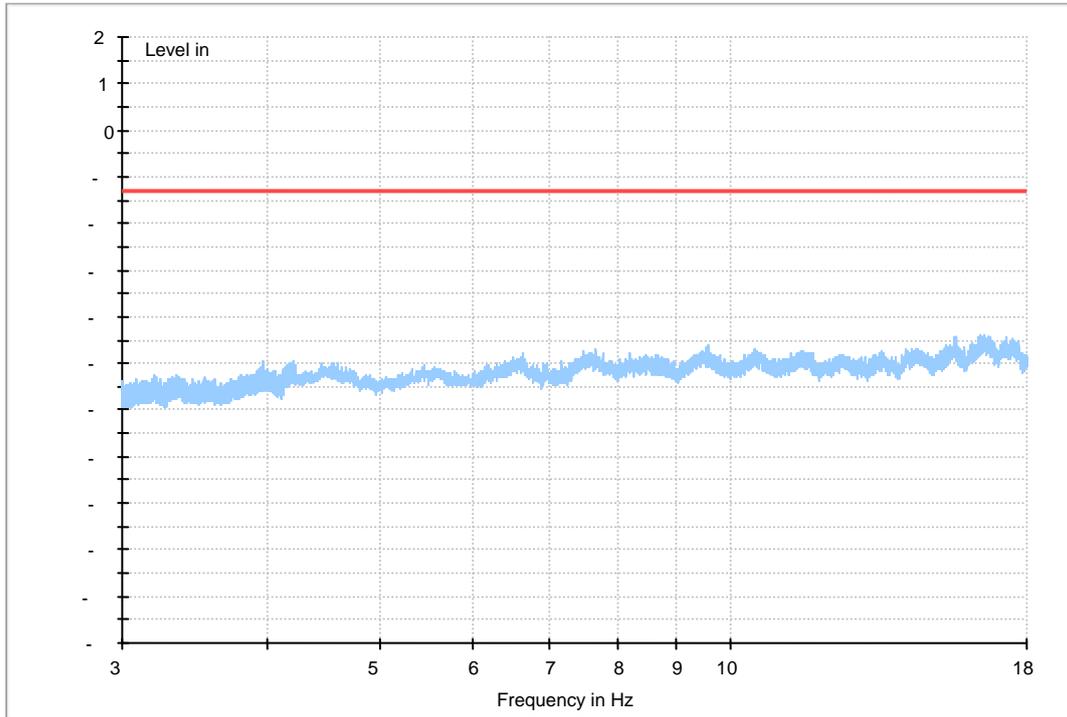
(9kHz~30MHz)



(30MHz~3GHz)

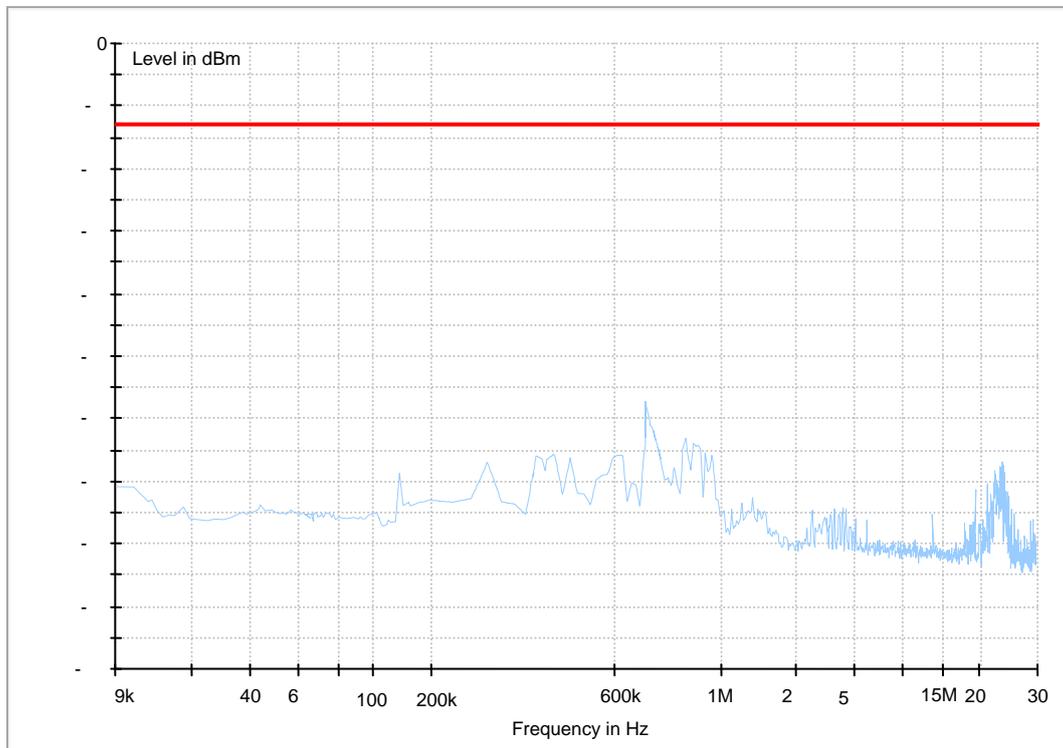


(3GHz~18GHz)

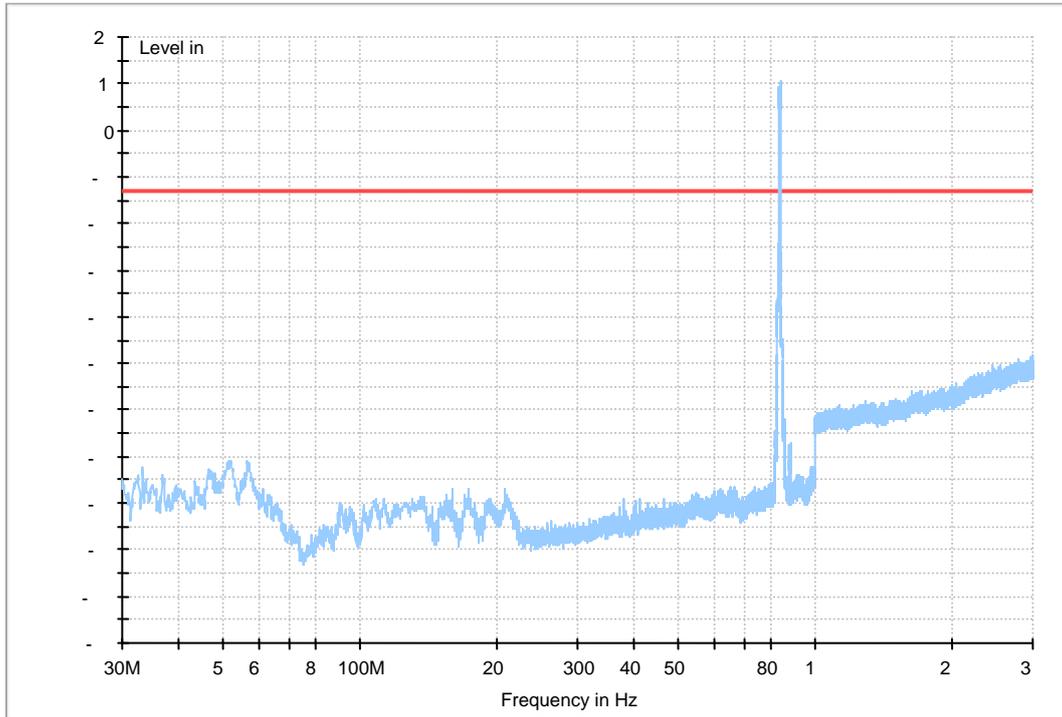


### WCDMA Band V

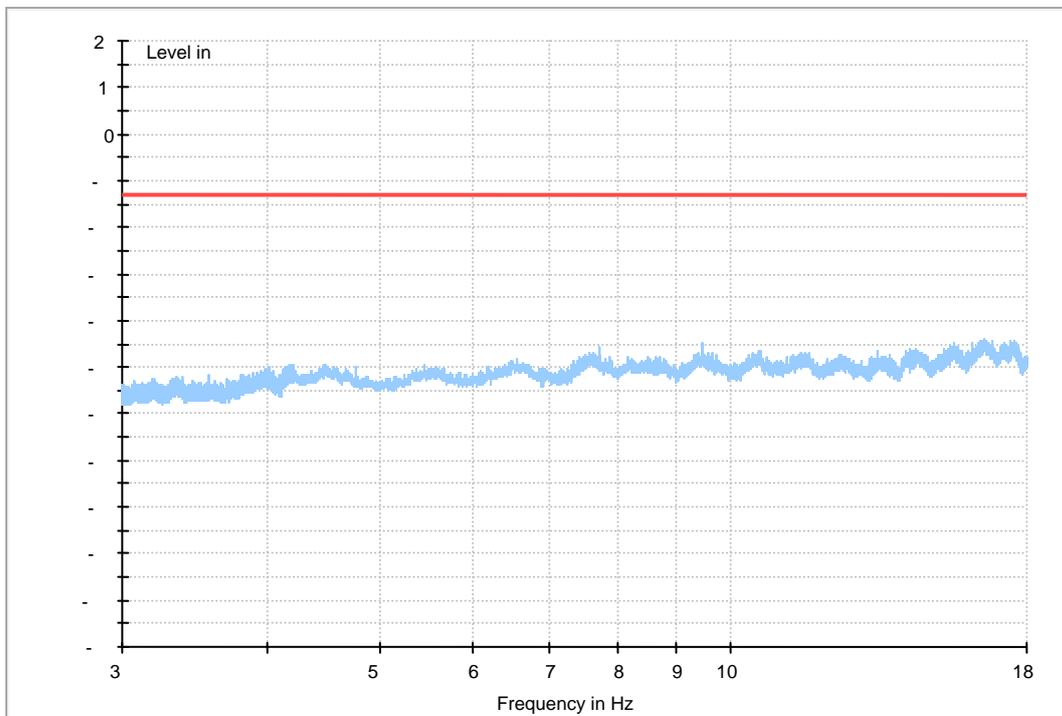
(9KHz~30MHz)



(30MHz~3GHz)

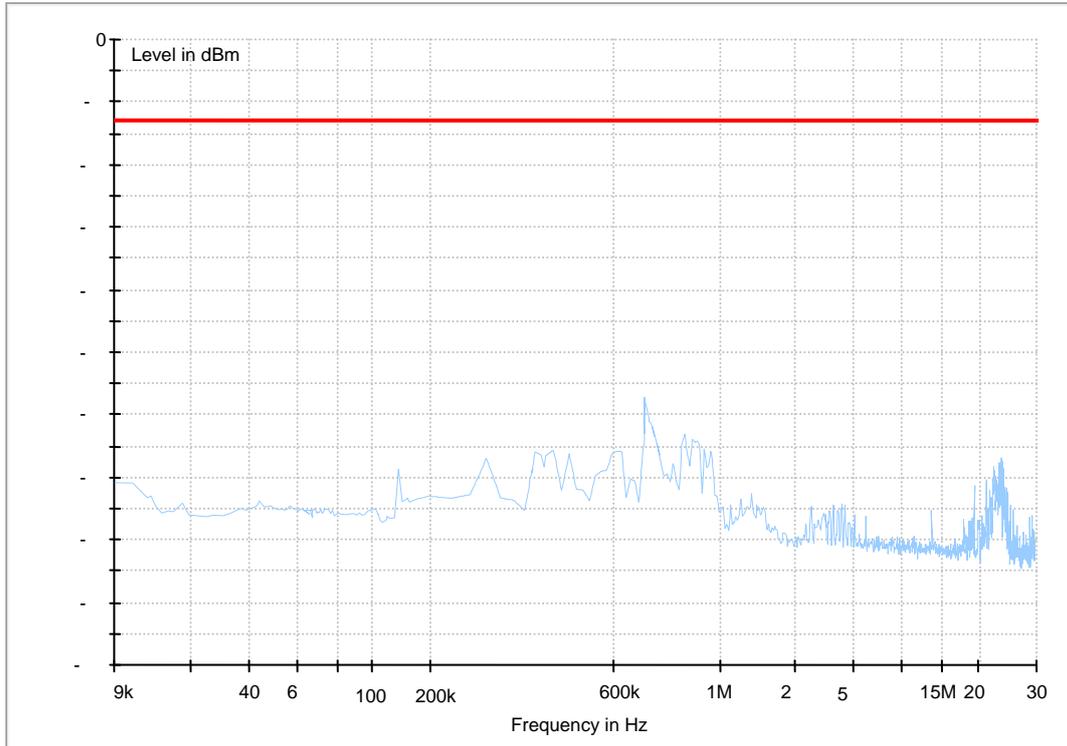


(3GHz~18GHz)

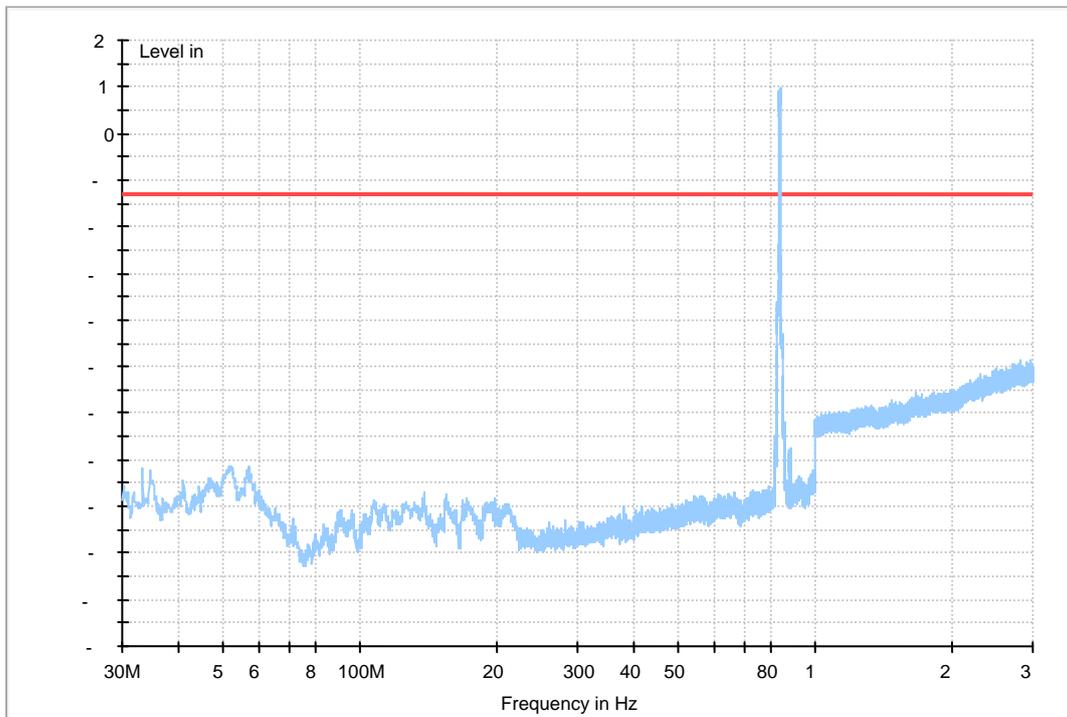


### HSDPA Band V

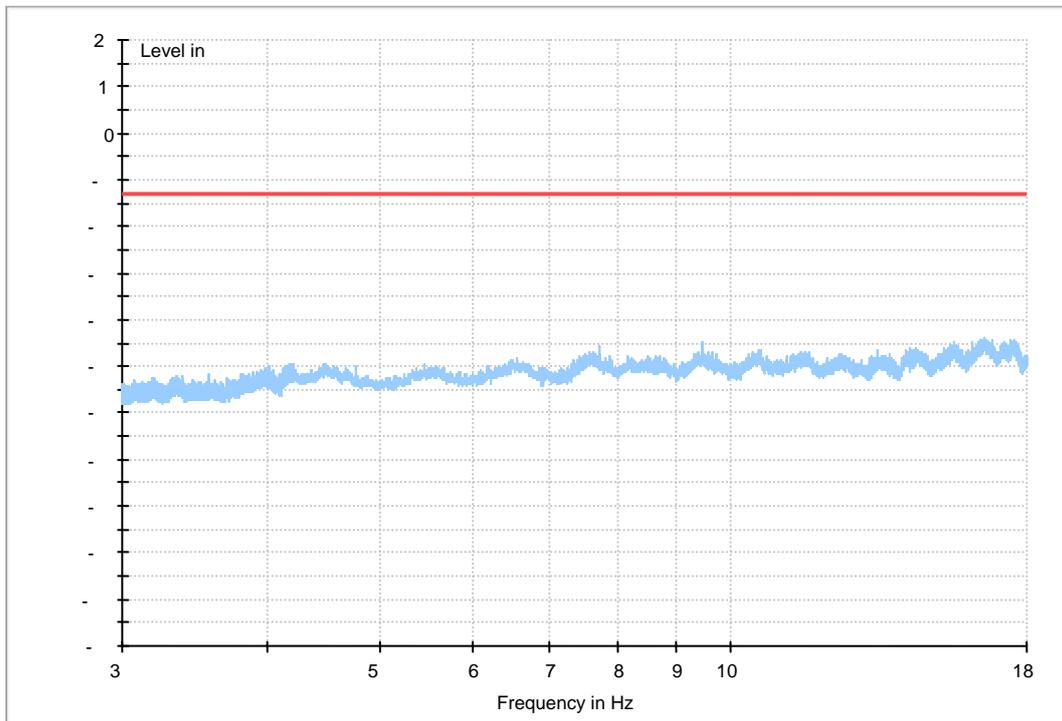
(9KHz~30MHz)



(30MHz~3GHz)

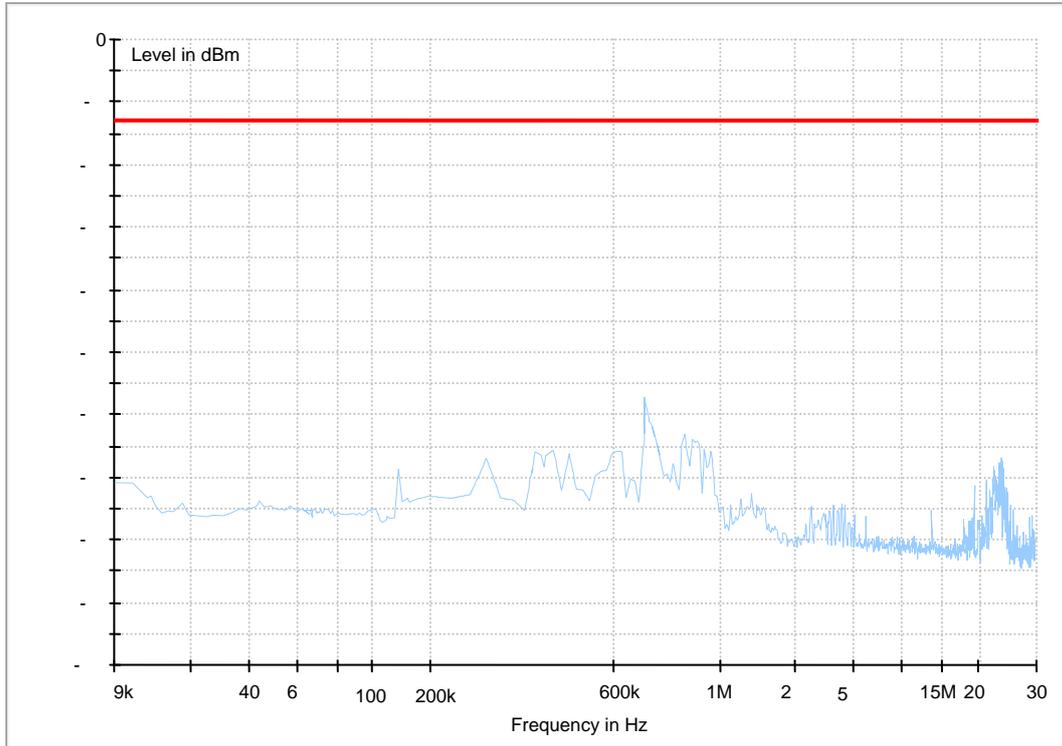


(3GHz~18GHz)

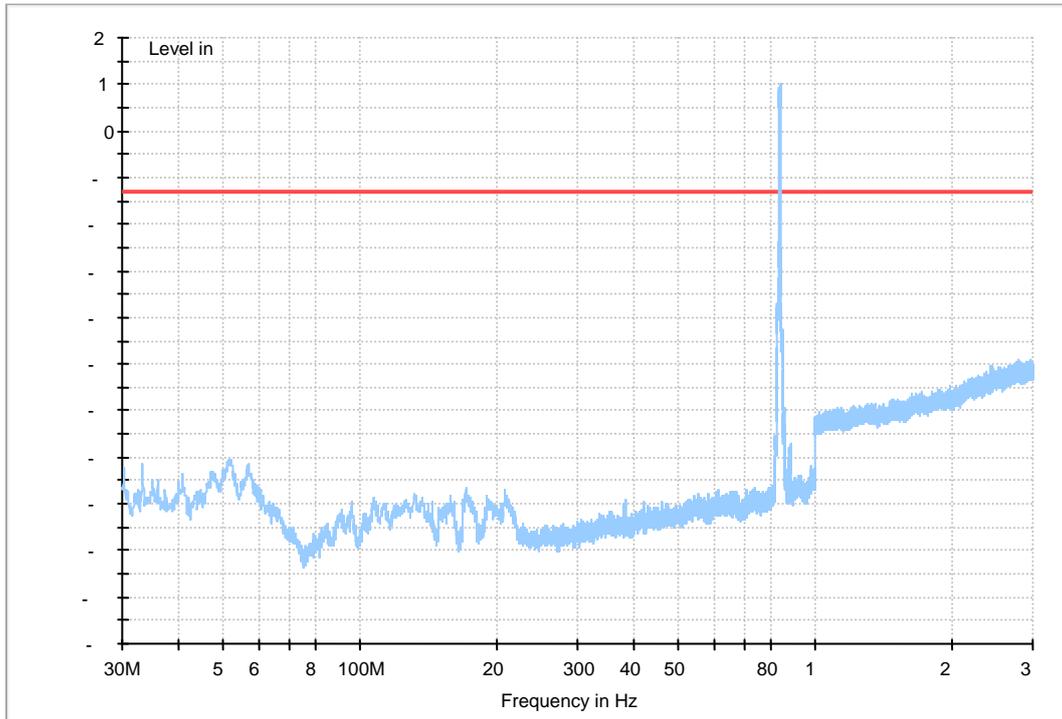


### HSUPA Band V

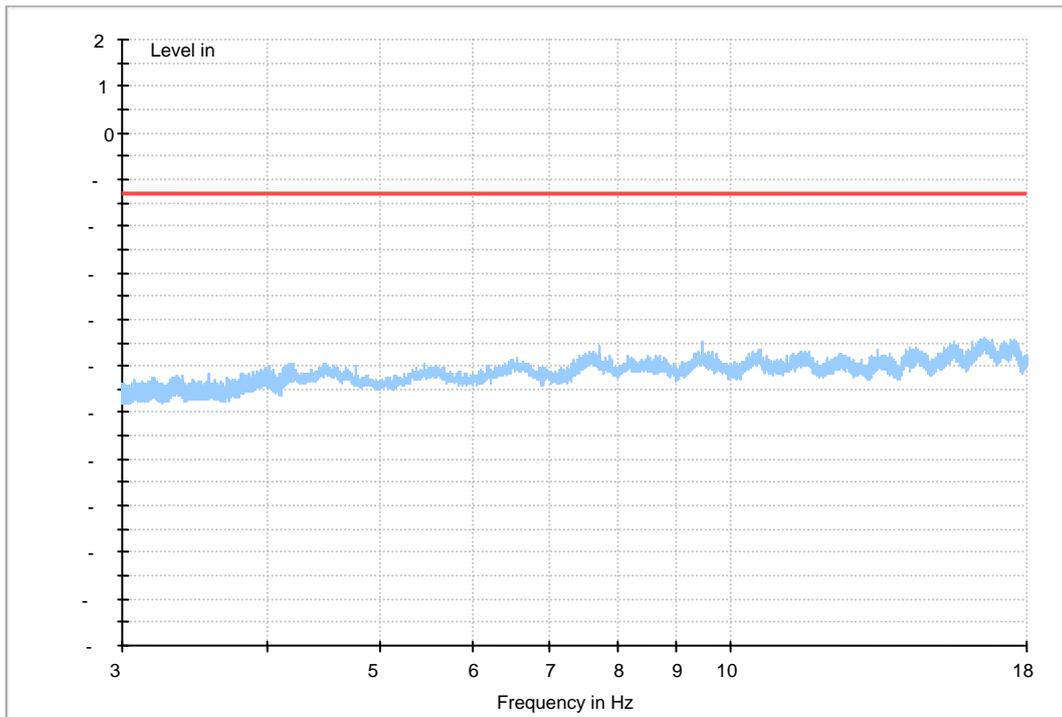
(9KHz~30MHz)



(30MHz~3GHz)



(3GHz~18GHz)



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



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# 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	-20	-0.02389	---	±2.5	Pass
			-20 °C	28	0.03345	---	±2.5	Pass
			-10 °C	-10	-0.01195	---	±2.5	Pass
			0 °C	-25	-0.02987	---	±2.5	Pass
			10 °C	-16	-0.01912	---	±2.5	Pass
			20 °C	-21	-0.02509	---	±2.5	Pass
			30 °C	-7	-0.00836	---	±2.5	Pass
			40 °C	-8	-0.00956	---	±2.5	Pass
			50 °C	24	0.02867	---	±2.5	Pass
TM 2	M	VN	-30 °C	18	0.02151	---	±2.5	Pass
			-20 °C	7	0.00836	---	±2.5	Pass
			-10 °C	14	0.01673	---	±2.5	Pass
			0 °C	-16	-0.01912	---	±2.5	Pass
			10 °C	15	0.01792	---	±2.5	Pass
			20 °C	29	0.03465	---	±2.5	Pass
			30 °C	20	0.02389	---	±2.5	Pass
			40 °C	-9	-0.01075	---	±2.5	Pass
			50 °C	-13	-0.01553	---	±2.5	Pass
TM 3	M	VN	-30 °C	15	0.01793	---	±2.5	Pass
			-20 °C	-14	-0.01674	---	±2.5	Pass
			-10 °C	27	0.03228	---	±2.5	Pass
			0 °C	-15	-0.01793	---	±2.5	Pass
			10 °C	-9	-0.01076	---	±2.5	Pass
			20 °C	13	0.01554	---	±2.5	Pass
			30 °C	-8	-0.00956	---	±2.5	Pass
			40 °C	29	0.03467	---	±2.5	Pass
			50 °C	21	0.02511	---	±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	-21	-0.02509	---	±2.5	Pass
			VN	17	0.02031	---	±2.5	Pass
			VH	-24	-0.02867	---	±2.5	Pass
TM 2	M	TN	VL	8	0.00956	---	±2.5	Pass
			VN	25	0.02987	---	±2.5	Pass
			VH	8	0.00956	---	±2.5	Pass
TM 3	M	TN	VL	-11	-0.01315	---	±2.5	Pass
			VN	13	0.01554	---	±2.5	Pass
			VH	-21	-0.02511	---	±2.5	Pass

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