



# FCC RF Test Report

**Product Name: HSPA/UMTS/GPRS/GSM/EDGE Mobile  
Phone with Bluetooth; Ascend G600**

**Model Number: HUAWEI U8950-51, U8950-51**

**Report No: SYBH(Z-RF)019082012-2007**

**FCC ID: QISU8950-51**

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## Notice

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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.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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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 24:2011, Subpart E ANSI/TIA 603C:2004
<b>1.2 Test Location</b>	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
<b>1.3 Test Environmental Condition</b>	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

## 2 Summary

### Summary of results

Test Case	FCC Part No.	Requirements	Result
PCS Band			
Transmitter Output Power	2.1046 & 24.232	Peak EIRP not exceed 2 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.104	Digital modulation	Pass
Occupied Bandwidth	2.104	(Not specified)	Pass
Band Edges Compliance	2.1051 & 24.238	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 24.238	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/1 MHz, 30 MHz to 10 <sup>th</sup> harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 24.238	Below -13 dBm/1 MHz	Pass
Frequency Stability	2.1055 & 24.235	Stay within the authorized frequency block	Pass

### 3 Product Description

#### 3.1 Product Information

##### 3.1.1 General Description

HUAWEI U8950-51, U8950-51 is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I and Band II and Band V. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only Band II and PCS1900 bands 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, NFC, 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.

NOTE:

1) : Model U8950-1 wasn't tested and all of U8950-1 test data was drawn from U8950N-1.

2):The difference of U8950N-1 and U8950-1:

1. The mobile phone U8950N-1 is a HSDPA/HSUPA/UMTS/GPRS/GSM/EDGE mobile phone with Bluetooth and NFC, which supports GSM850/900/1800/1900 and WCDMA900/2100

2. The mobile phone U8950-1 is a HSDPA/HSUPA/UMTS/GPRS/GSM/EDGE mobile phone with Bluetooth, which supports GSM850/900/1800/1900 and WCDMA900/2100

The difference between U8950N-1 and U8950-1 is showed in the following table.

	U8950N-1	U8950-1
GSM four bands	the same	the same
WCDMA bands	the same	the same
FLASH	the same	the same
Mainboard	the same	the same
Appearance	the same	the same
NFC	Have	Without
Bluetooth mode	the same	the same
WLAN mode	the same	the same
BT/ WLAN antenna	the same	the same
GSM/ WCDMA antenna	the same	the same
External camera	the same	the same
internal camera	the same	the same
Adapter	the same	the same

Battery	the same	the same
Chipset	the same	the same
Memory	the same	the same
Form factor	Bar type, Internal antenna	Bar type, Internal antenna
RF Parameter	The same RF Parameter in the same band	The same RF Parameter in the same band
BT RF Parameter	the same	the same
Dimension	the same	the same
Weight	the same	the same
Bluetooth	the same	the same
External camera	the same	the same
Main Frequency NV	The same NV in the same band	The same NV in the same band
BT conducted power	the same	the same
WIFI conducted power	the same	the same

### 3.1.2 Board Information

#### Board Information

HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; Ascend G600		
HUAWEI U8950-51, U8950-51		
Board and Module		
Equipment Designation / Description	Hardware Version	software status:
Main board of Mobile Phone	HD2U8950M	U8950-1V100R001C00B930

### 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
Manufacturer	Huawei Technologies Co., Ltd.



Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100B1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100A1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100U2W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

AC/DCAdapter Model	HW-050100E3W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

### 3.1.4 Battery Technical Data

Name	Qty.	Manufacture	Description
Rechargeable Li-ion	1	Huawei Technologies Co., Ltd.	Battery Model: HB5R1H Rated capacity: 1930mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

## 4 Test Description

### 4.1 Supported Frequency Range

Characteristics	Description
Downlink	1930 to 1990 MHz
Uplink	1850 to 1910 MHz

### 4.2 Transmitter / Receiver Characteristics

Characteristics	Description
System Type	GSM UMTS
TX Output Power (per Antenna Port)	GSM system: Power class 1 UMTS system: Power class 3
Channel Spacing(s) / Bandwidth(s)	GSM system: 200 kHz UMTS system: 5 MHz
Designation of Emissions	GSM system: 247KGXW (GMSK modulation), 248KG7W (8PSK modulation) UMTS system: 4M18F9W

### 4.3 Antenna Gain

Antenna Gain(dBi)	0.35
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## 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 512	Channel 661	Channel 810
		1850.2MHz	1880.0MHz	1909.8MHz
	RX	Channel 512	Channel 661	Channel 810
		1930.2 MHz	1960.0 MHz	1989.8 MHz
TM3/TM4/TM5	TX	Channel 9262	Channel9400	Channel9538
		1852.4MHz	1880.0MHz	1907.6MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz

### 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	3.7V
	VH	4.2V

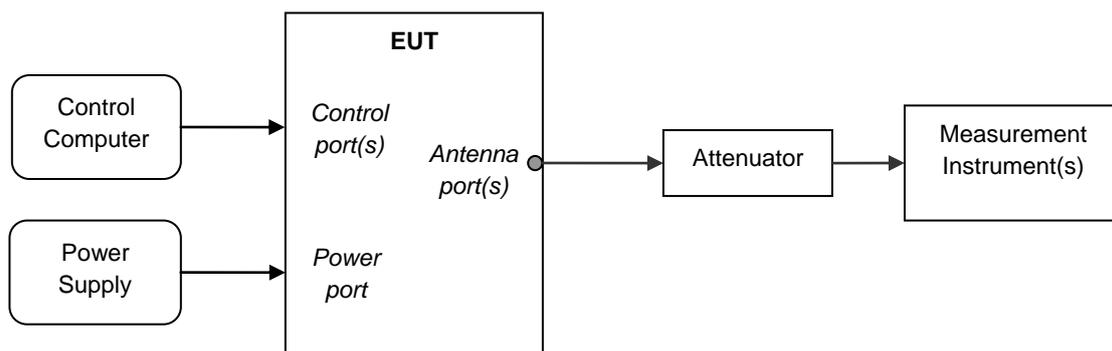
NOTE: VL= lower extreme test voltage  
 VN= nominal voltage  
 VH= upper extreme test voltage  
 TN= normal temperature

## 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.

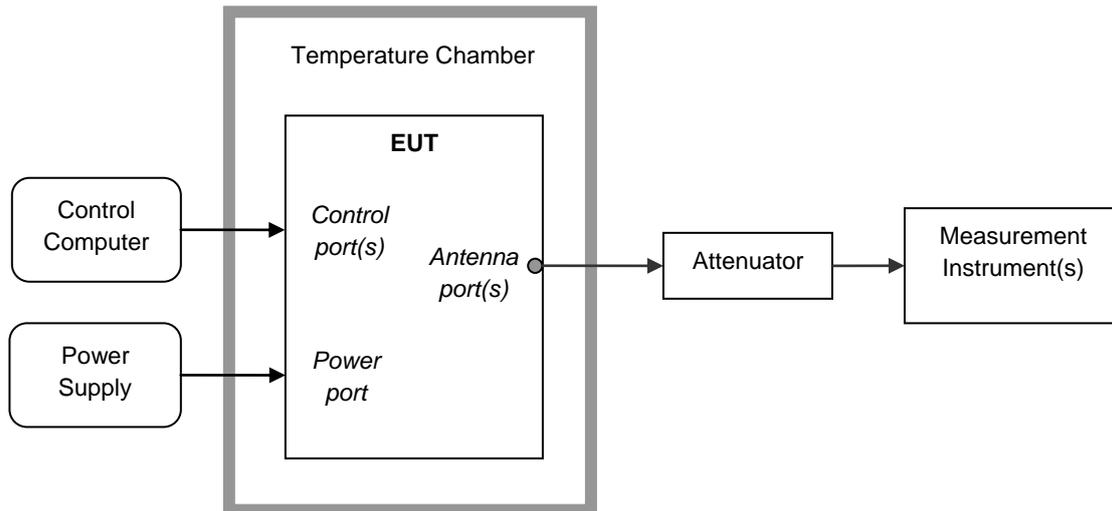
### 5.4.2 Test Setup 1



#### Note

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

### 5.4.3 Test Setup 2



#### 5.4.4 Test Setup 3

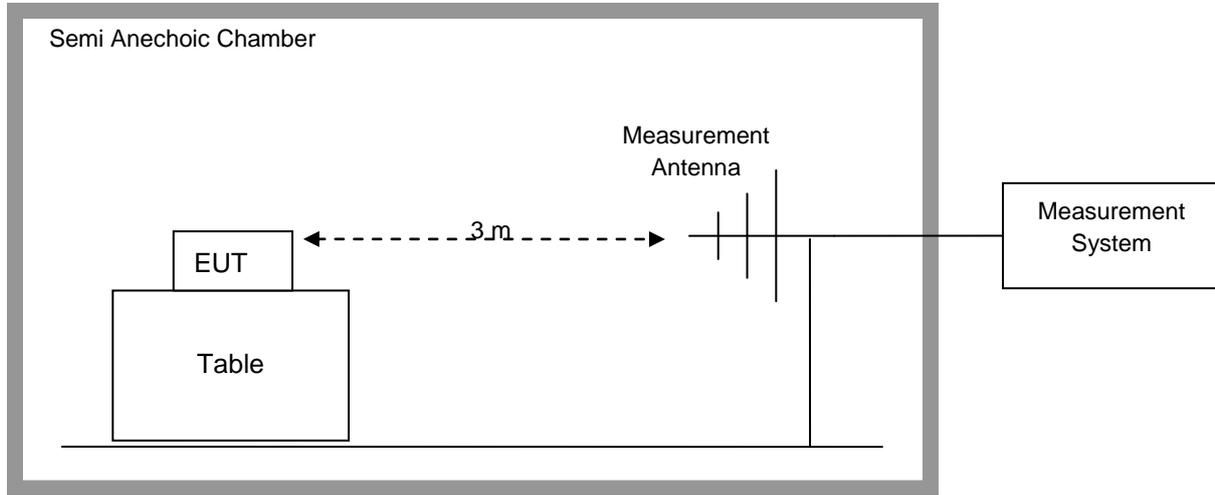
NOTE1: Effective radiated power (ERP) or Effective Isotropic radiated power (EIRP) refers to the EUT radiation power output, assuming all emissions are radiated from half-wave dipole antennas or horn antennas.

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

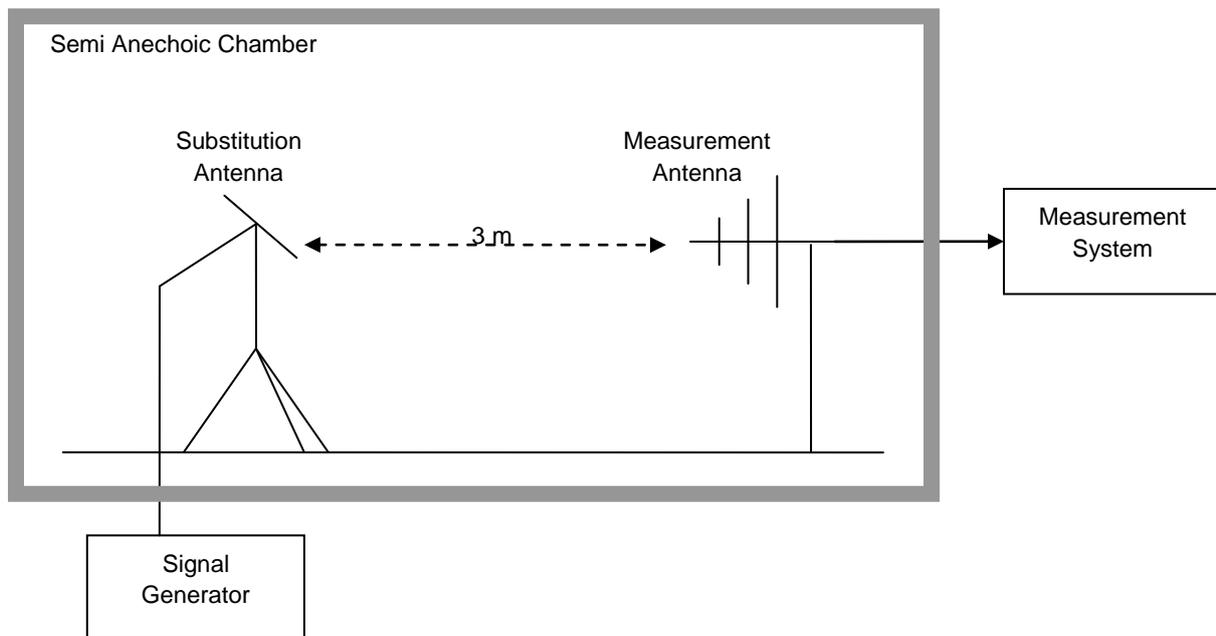
1. Connect the test system according to the following figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit 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 L, M, H 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/TM4TM5
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/TM4TM5
Frequency Stability	Test Configuration	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) VL, VH,VN Voltage at Ambient Temperature.
	Test Setup	Test Setup 2
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3



## 6 Main Test Instruments

### 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, 2013
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

Note: All the equipments are calibrated once a year.

## 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-----



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# Appendix A

## Transmitter Output Power According to FCC Part 2.1046 & Part 24.232



## Conducted Power of Transmitter

Table 1 Measurement Results

		RF Output Power (Conducted)					
TEST CONDITIONS		Channel512(B)		Channel661(M)		Channel810(T)	
		1850.2MHz		1880.0MHz		1909.8MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM1		29.81	33	29.73	33	29.42	33
TM2		26.45	33	26.42	33	26.09	33
TEST CONDITIONS		Channel9262(B)		Channel9400(M)		Channel9538(T)	
		1852.4MHz		1880.0MHz		1907.6MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM3		22.64	33	22.78	33	22.37	33
TM4	Case1	22.94	33	22.89	33	22.71	33
	Case2	22.73	33	22.69	33	22.89	33
	Case3	22.14	33	22.24	33	21.95	33
	Case4	22.05	33	22.16	33	21.98	33
TM5	Case1	22.36	33	22.39	33	22.06	33
	Case2	21.15	33	20.84	33	20.67	33
	Case3	21.49	33	21.27	33	21.03	33
	Case4	21.11	33	21.44	33	21.16	33
	Case5	22.21	33	22.39	33	21.84	33



## Peak-to-Average Ratio

TEST CONDITIONS	Peak-to-Average Ratio					
	Channel512(L)		Channel661(M)		Channel810(H)	
	1850.2MHz		1880.0MHz		1909.8MHz	
	dB		dB		dB	
$T_{nom} / V_{nom}$	Measured	Limit	Measured	Limit	Measured	Limit
TM1	0.1	13	0.2	13	0.1	13
TM2	3.2	13	3.2	13	3.1	13
TM3	3.91	13	3.79	13	3.71	13



## Effective Isotropic Radiated Power of Transmitter (EIRP)

Table 2 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
TM1	1850.2	30.16	Horn Ant.	26.46	4.5	1	29.96	33	Pass
TM1	1880.0	30.08	Horn Ant.	26.38	4.5	1	29.88	33	Pass
TM1	1909.8	29.77	Horn Ant.	25.77	4.8	1	29.57	33	Pass
TM2	1850.2	26.8	Horn Ant.	23.1	4.5	1	26.6	33	Pass
TM2	1880.0	26.77	Horn Ant.	23.07	4.5	1	26.57	33	Pass
TM2	1909.8	26.44	Horn Ant.	22.44	4.8	1	26.24	33	Pass
TM3	1852.4	22.99	Horn Ant.	19.29	4.5	1	22.79	33	Pass
TM3	1880.0	23.13	Horn Ant.	19.78	4.5	1	23.28	33	Pass
TM3	1907.6	22.72	Horn Ant.	18.72	4.8	1	22.52	33	Pass

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

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

b, SGP=Signal Generator Level

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



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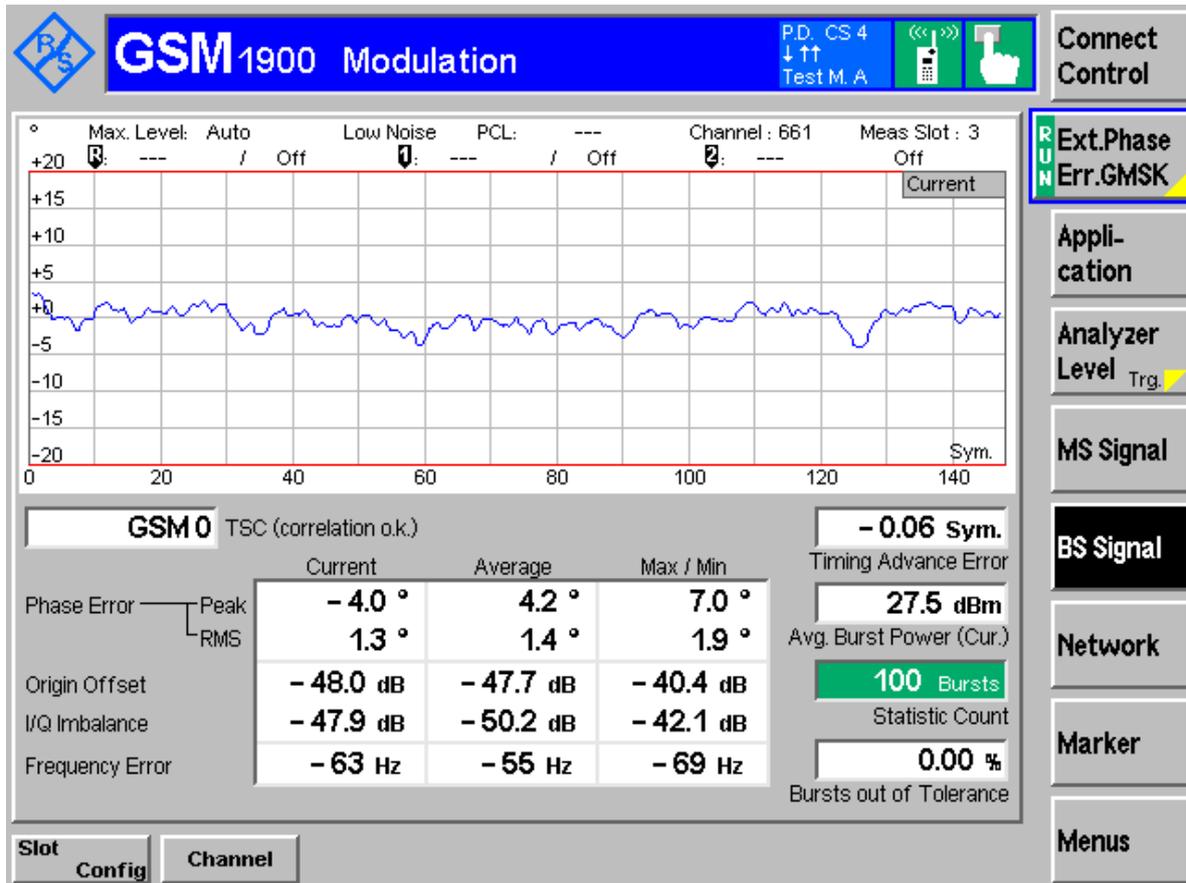
## Appendix B

# Modulation Characteristics

According to FCC Part 2.1047 & Part24 Subpart E

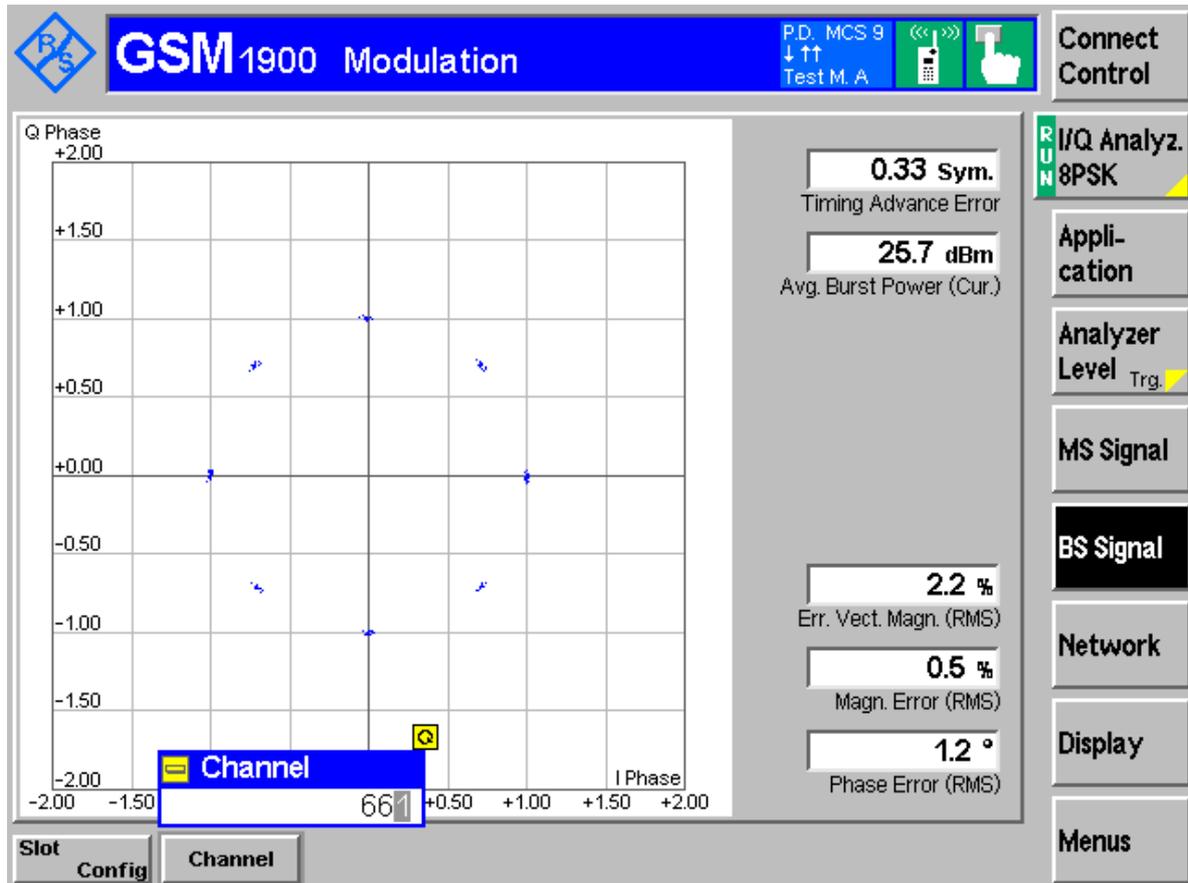


## TM1:GPRS/GSM Channel 661



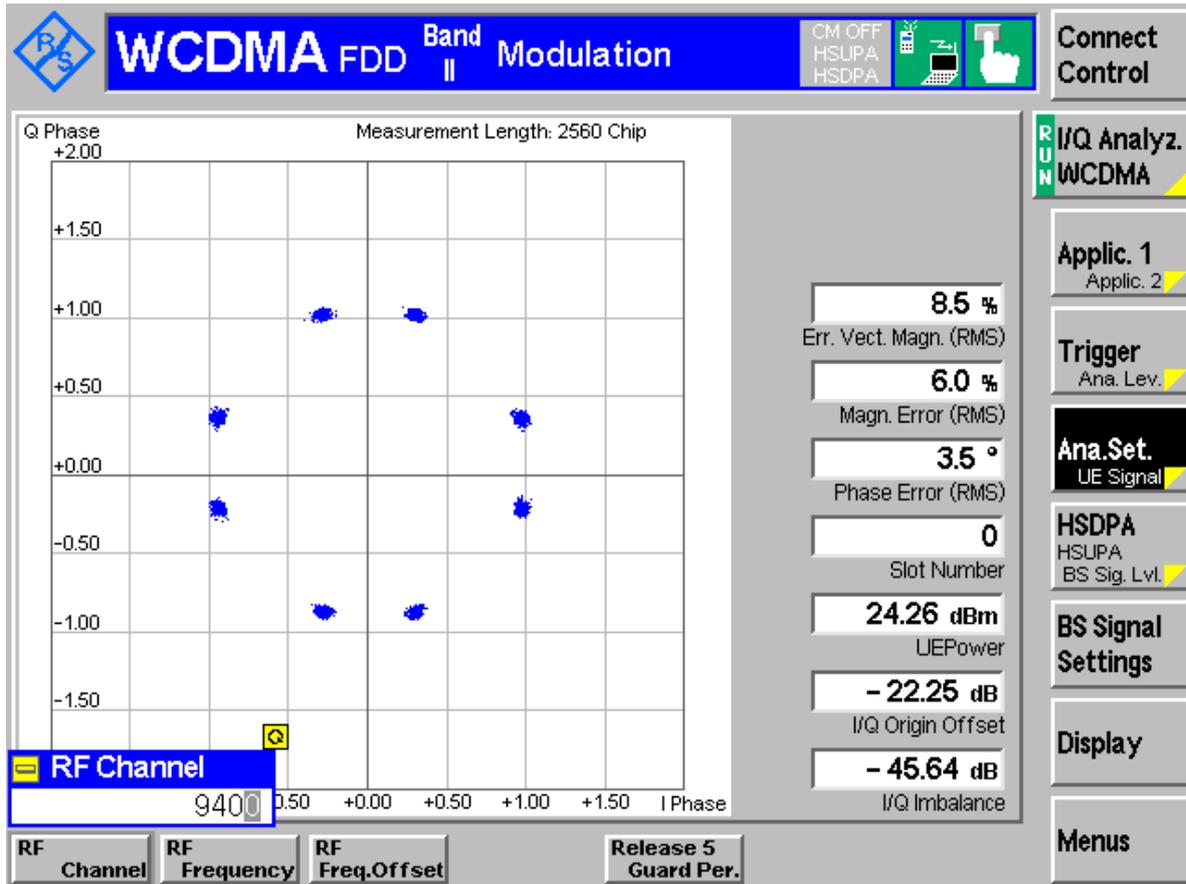


# TM2:EDGE Channel 661





## TM3: WCDMA Channel 9400



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# Appendix C

## Occupied Bandwidth According to FCC Part 2.1049 & Part24 Subpart E



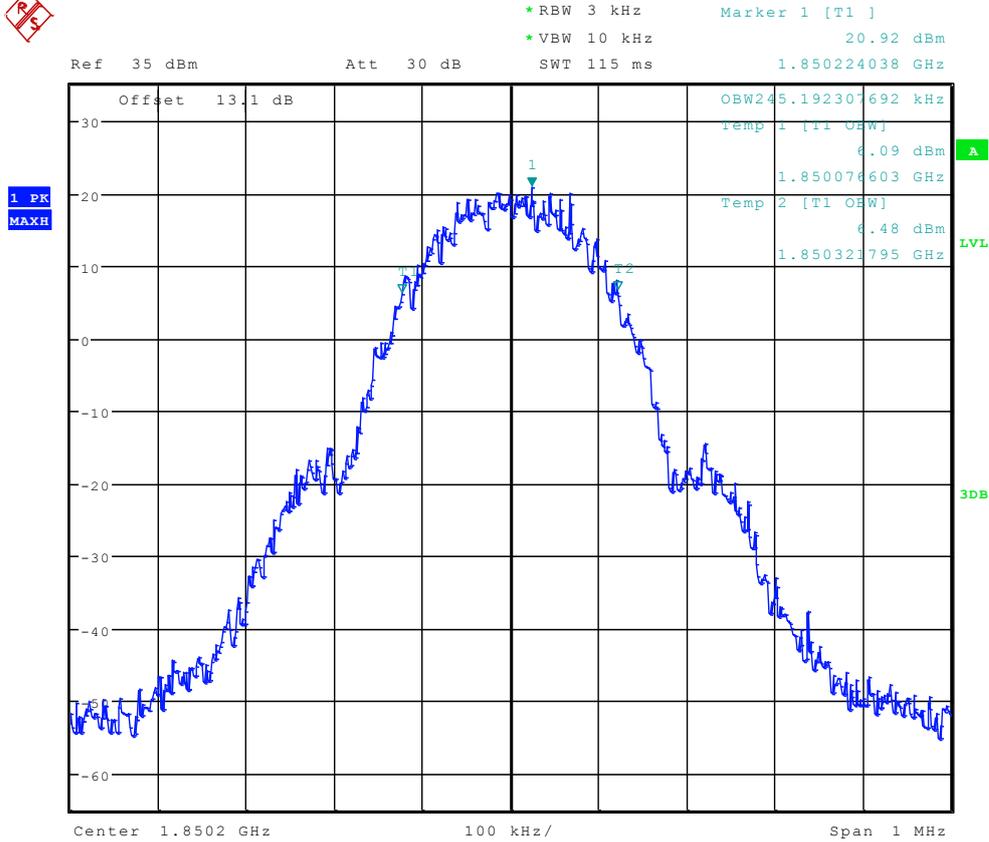
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	512	245.19	Pass
	661	246.79	Pass
	810	243.59	Pass
TM2	512	246.79	Pass
	661	248.40	Pass
	810	245.19	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	9262	4.18	Pass
	9400	4.18	Pass
	9538	4.18	Pass



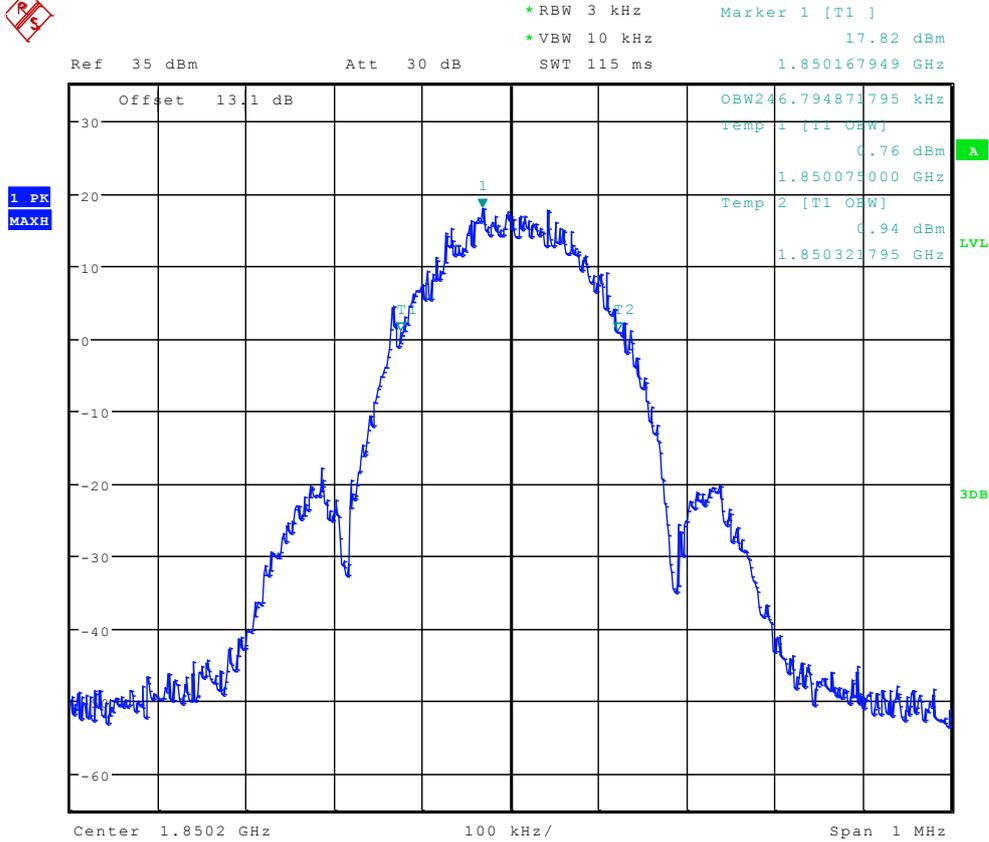
# TM1:GPRS/GSM Channel 512



Date: 15.AUG.2012 10:05:53



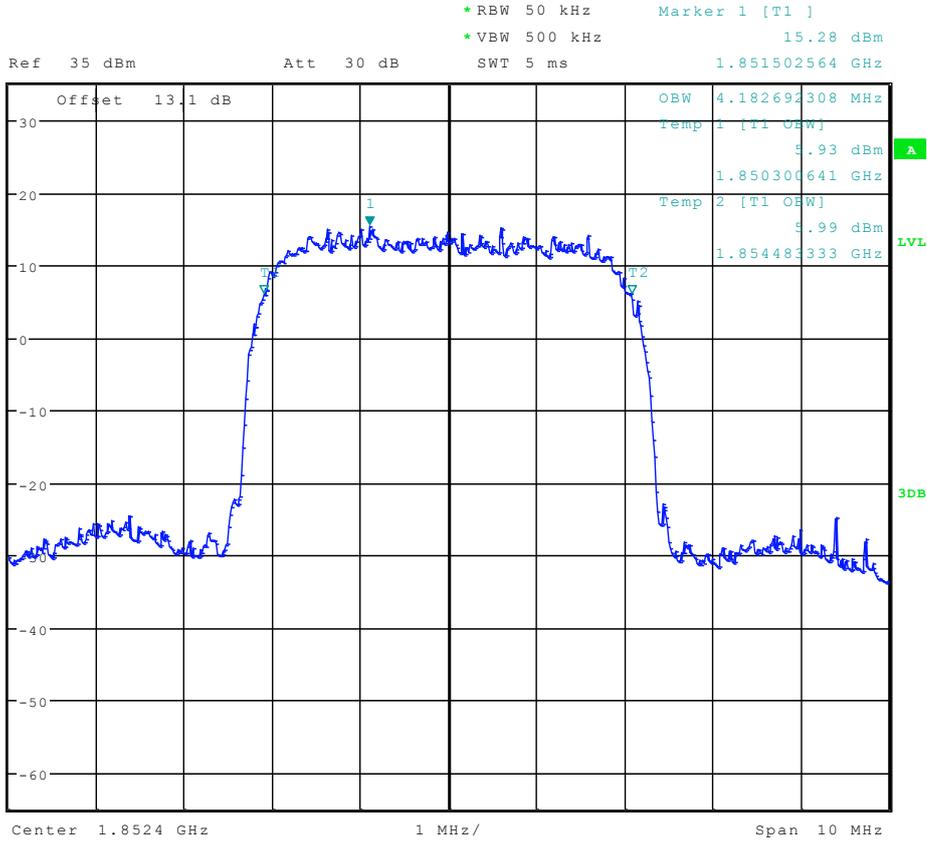
# TM2:EDGE Channel 512



Date: 15.AUG.2012 10:12:49



## TM3: WCDMA Channel 9262



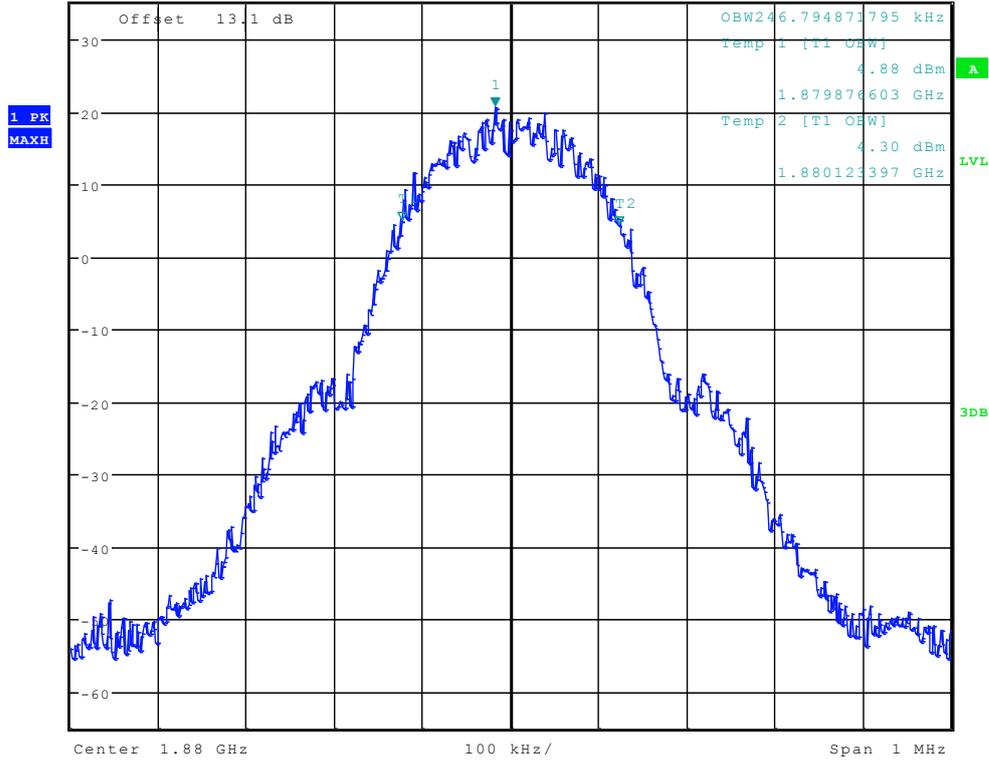
Date: 15.AUG.2012 10:19:02



# TM1:GPRS/GSM Channel 661



Ref 35 dBm Att 30 dB SWT 115 ms  
 \*RBW 3 kHz Marker 1 [T1] 20.55 dBm  
 \*VBW 10 kHz 1.87987603 GHz  
 1.879982372 GHz



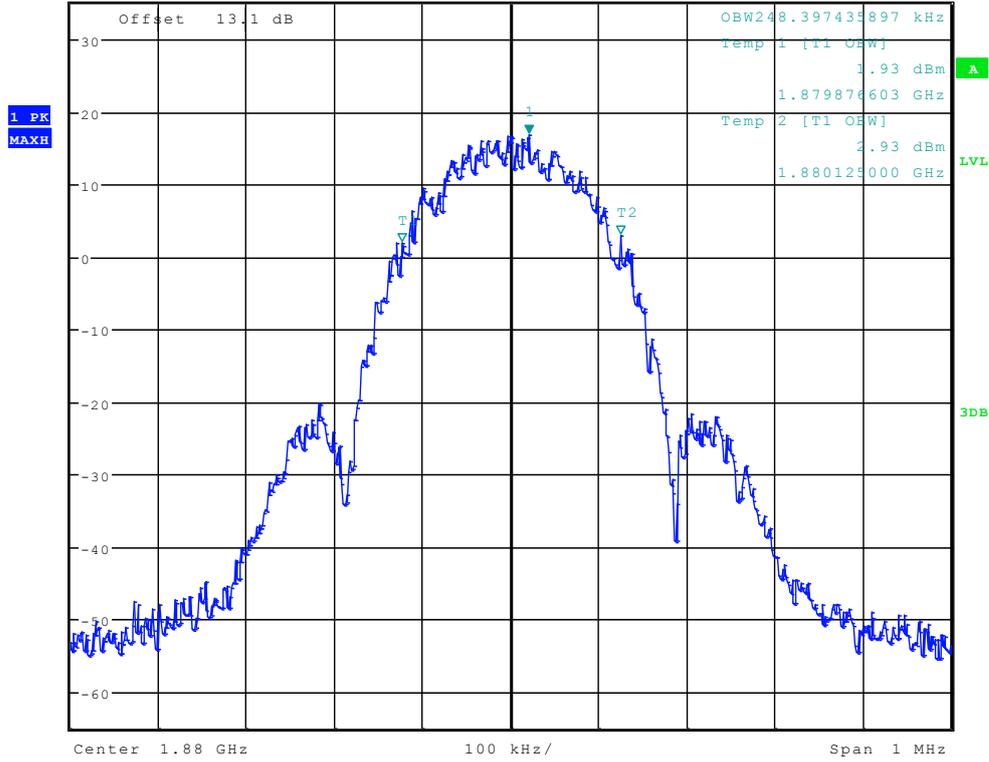
Date: 15.AUG.2012 10:06:07



# TM2:EDGE Channel 661



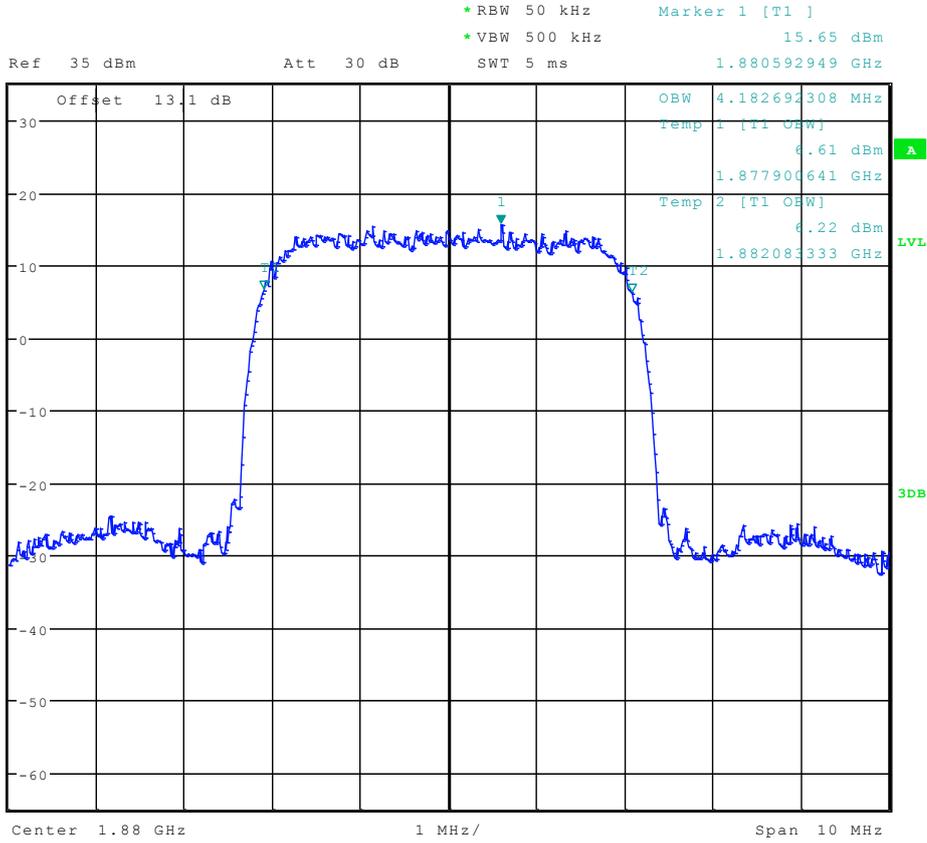
Ref 35 dBm      Att 30 dB      RBW 3 kHz      Marker 1 [T1]      16.81 dBm  
 \*VBW 10 kHz      1.880020833 GHz  
 SWT 115 ms



Date: 15.AUG.2012 10:13:02



## TM3: WCDMA Channel 9400



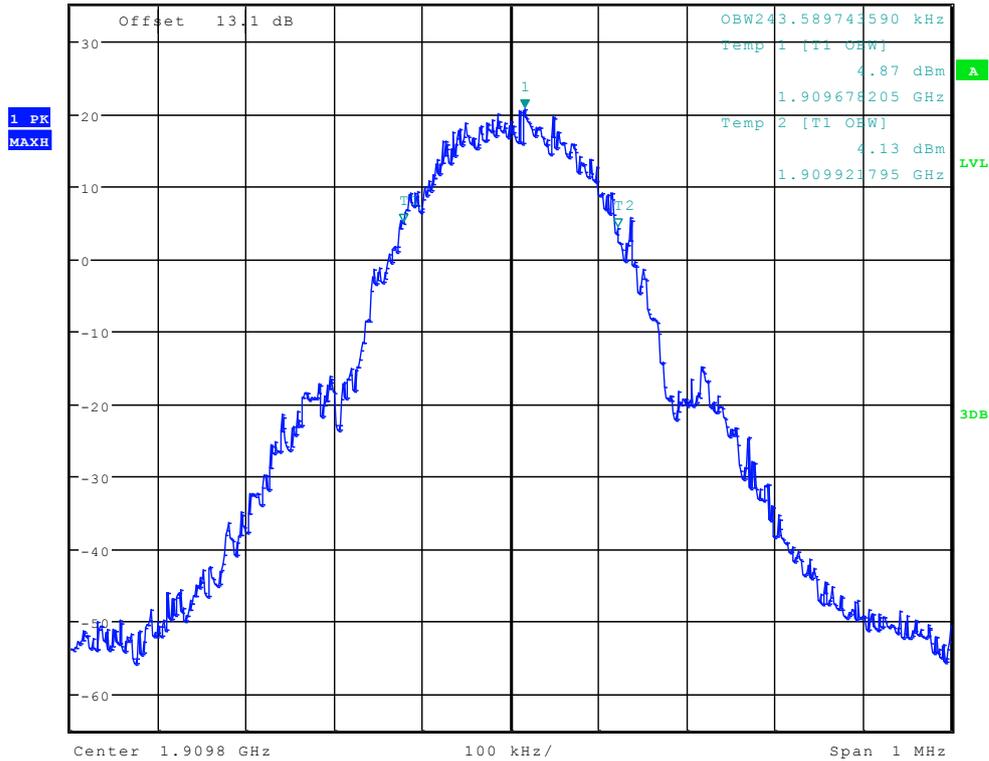
Date: 15.AUG.2012 10:19:16



# TM1:GPRS/GSM Channel 810



Ref 35 dBm Att 30 dB SWT 115 ms Marker 1 [T1 ]  
 \*RBW 3 kHz 20.61 dBm  
 \*VBW 10 kHz 1.909816026 GHz



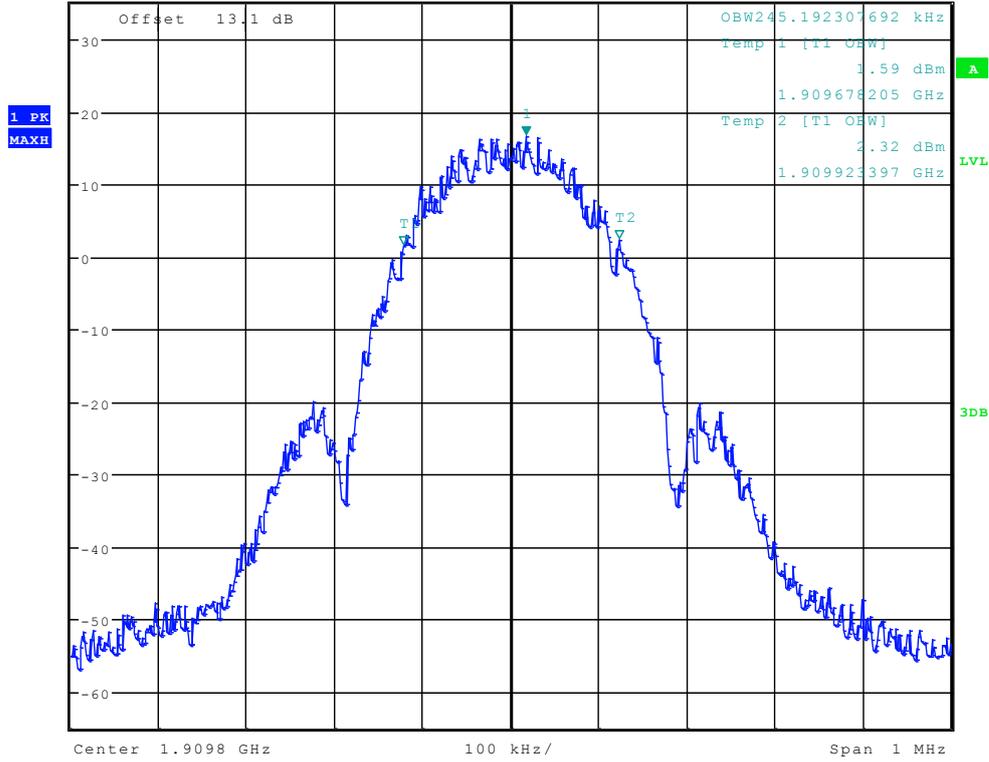
Date: 15.AUG.2012 10:06:22



# TM2:EDGE Channel 810



Ref 35 dBm Att 30 dB SWT 115 ms  
 \*RBW 3 kHz Marker 1 [T1] 16.66 dBm  
 \*VBW 10 kHz 1.909817628 GHz



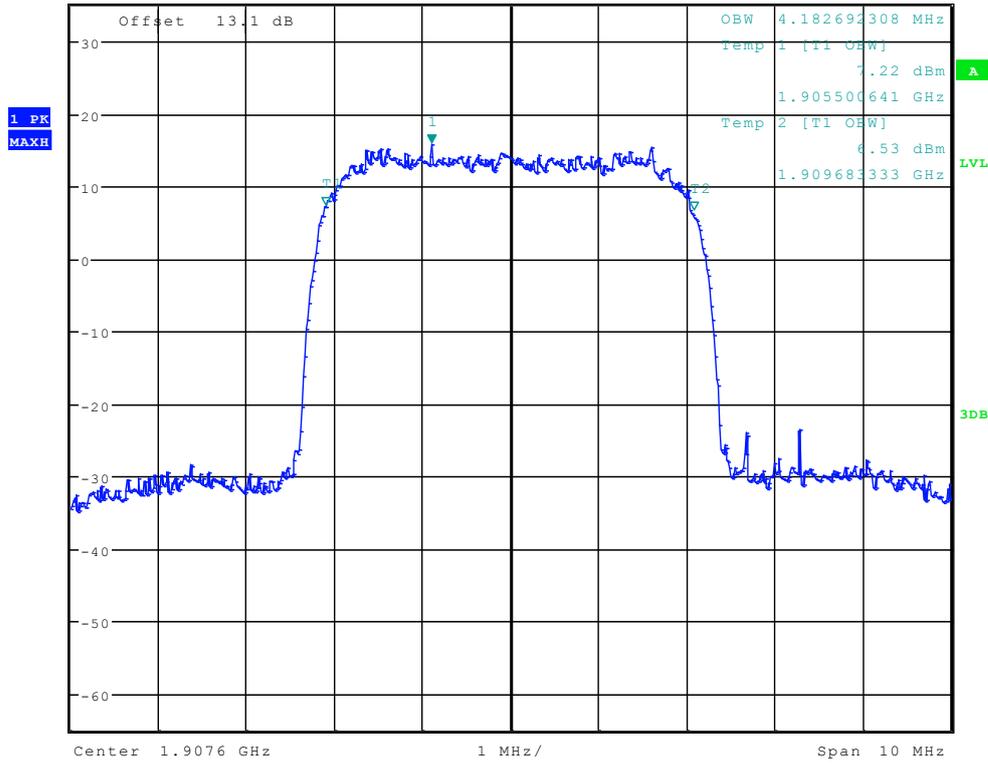
Date: 15.AUG.2012 10:13:16



# TM3: WCDMA Channel 9538



Ref 35 dBm      Att 30 dB      SWT 5 ms      Marker 1 [T1]      15.87 dBm  
 \*RBW 50 kHz      \*VBW 500 kHz      1.905500641 GHz  
 1.906702564 GHz



Date: 15.AUG.2012 10:19:30

-----END-----



# Appendix D

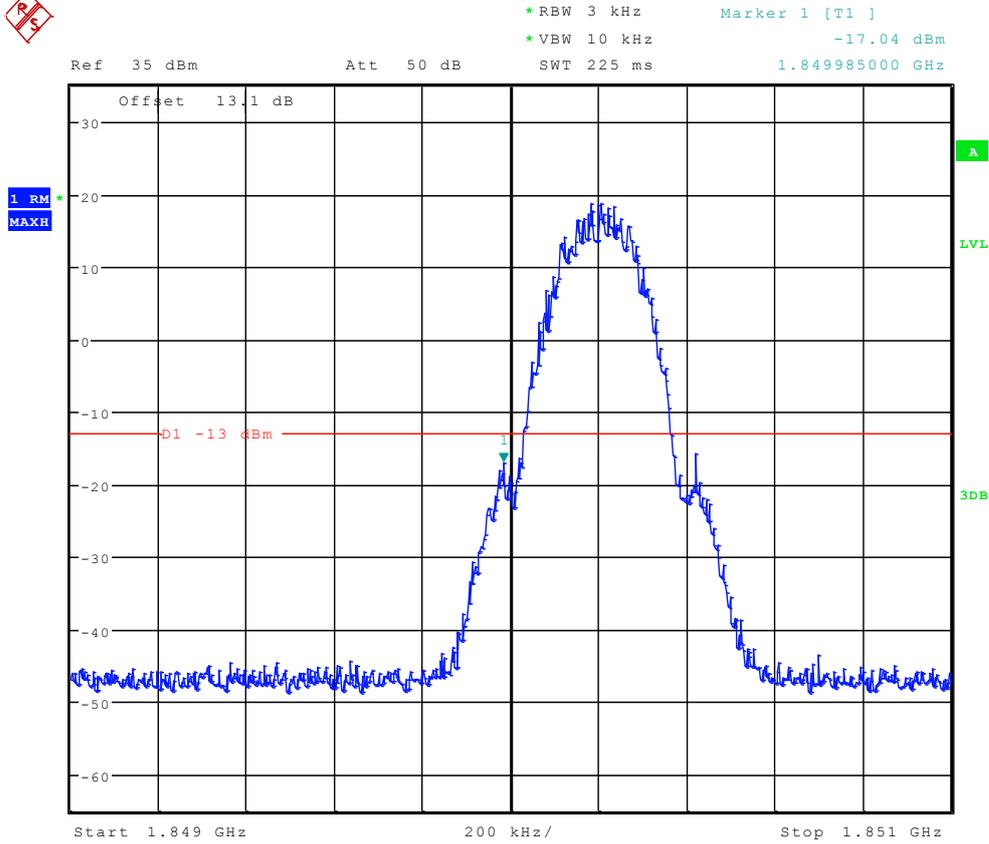
## Band Edges Compliance According to FCC Part 2.1051 & Part24 Subpart E



# TM1:GPRS/GSM

## Left Edge

### Channel 512



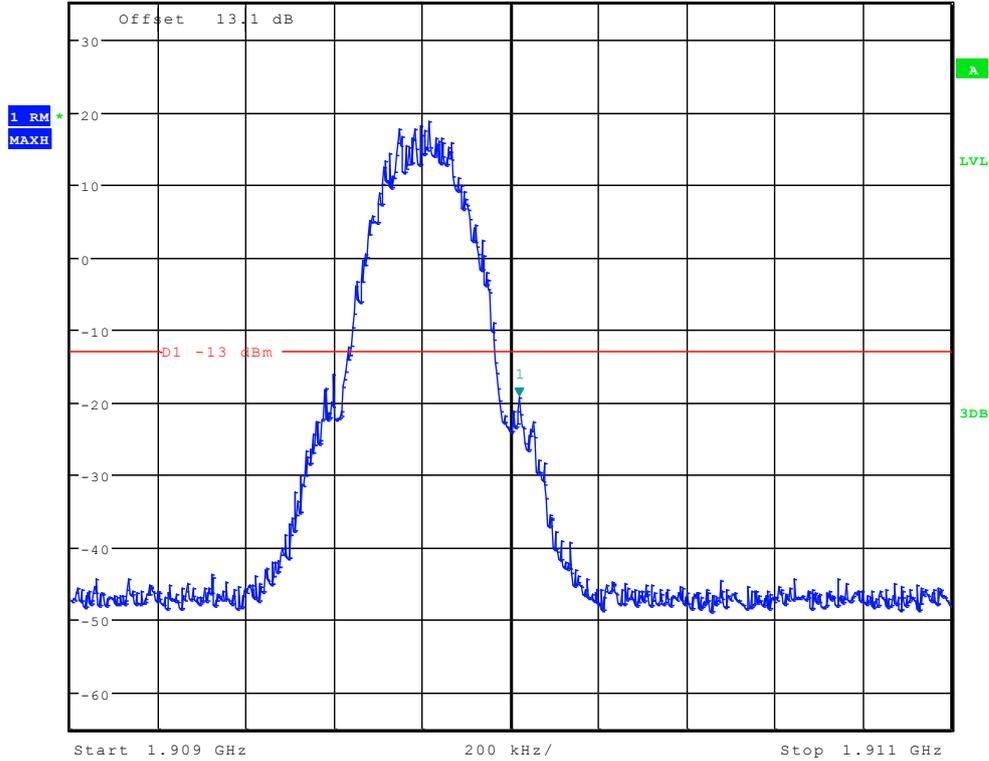
Date: 15.AUG.2012 10:10:33



## Right Edge Channel 810



Ref 35 dBm      Att 50 dB      RBW 3 kHz      Marker 1 [T1]      -19.26 dBm  
VBW 10 kHz      SWT 225 ms      1.910020000 GHz



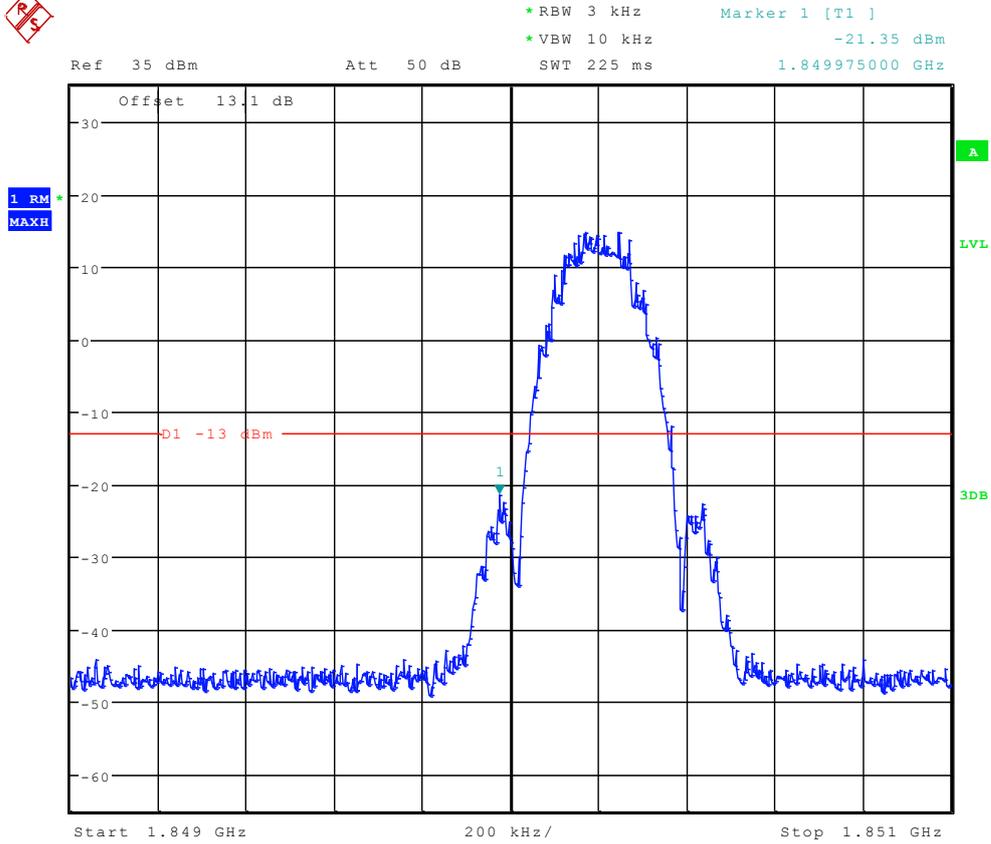
Date: 15.AUG.2012 10:10:58



# TM2:EDGE

## Left Edge

### Channel 512



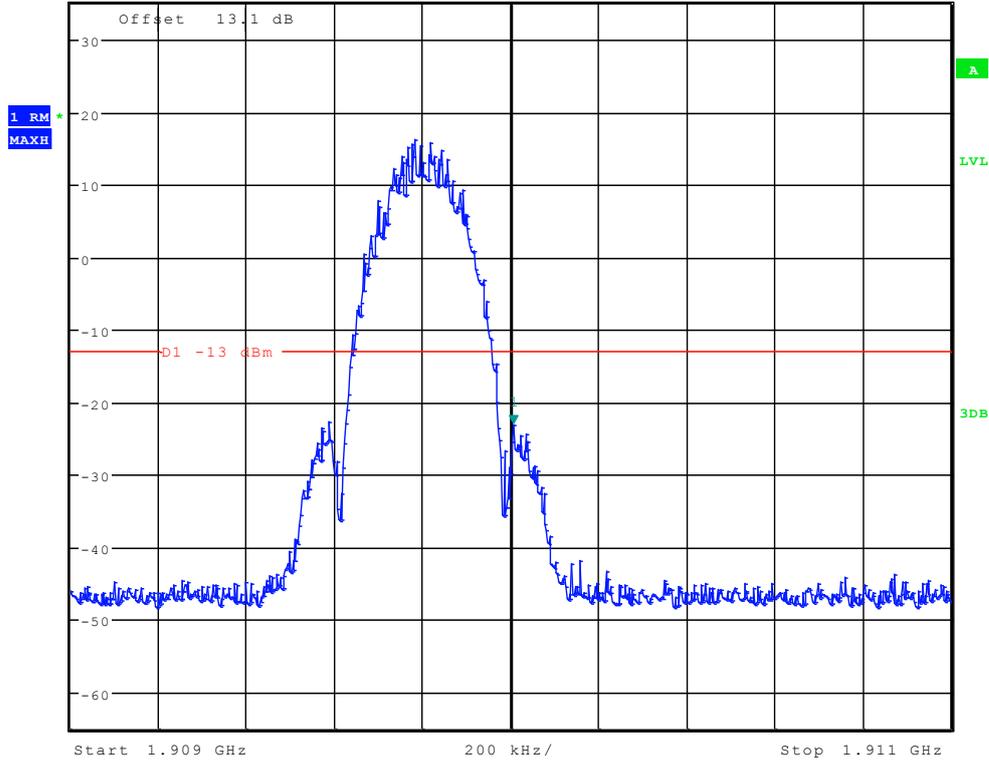
Date: 15.AUG.2012 10:16:19



## Right Edge Channel 810



\*RBW 3 kHz                      Marker 1 [T1 ]  
 \*VBW 10 kHz                     -23.18 dBm  
 Ref 35 dBm                      Att 50 dB                      SWT 225 ms                      1.910005000 GHz



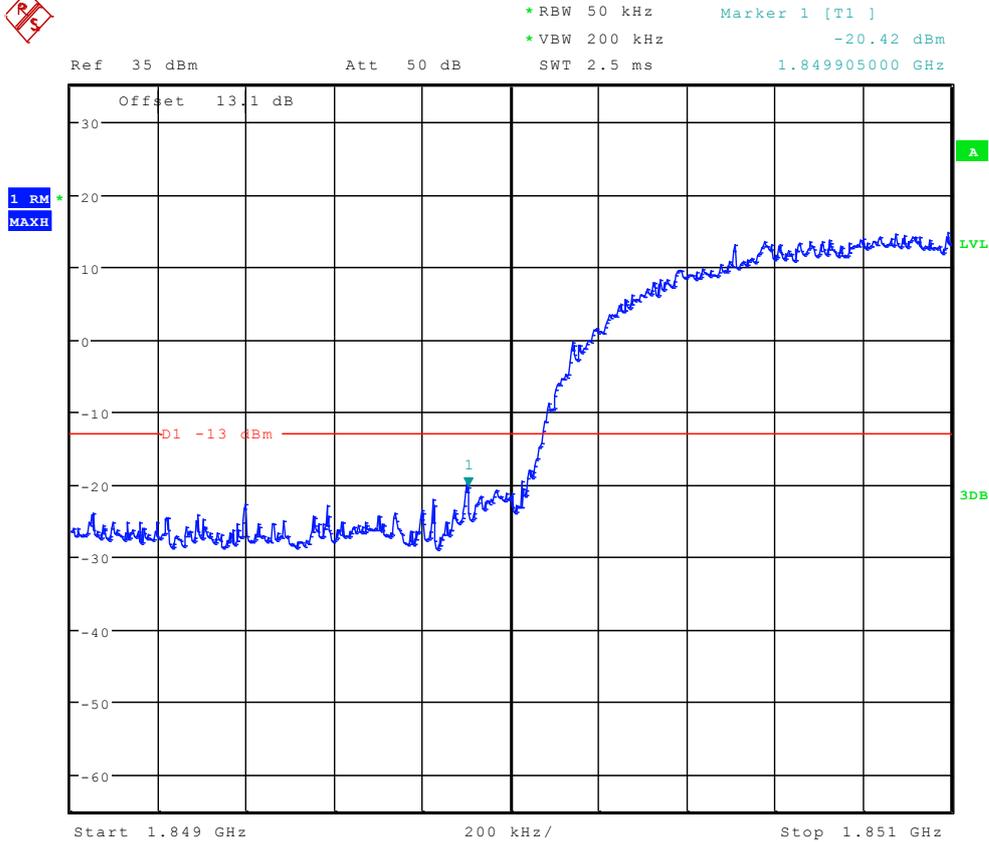
Date: 15.AUG.2012 10:16:56



# TM3: WCDMA

## Left Edge

### Channel 9262



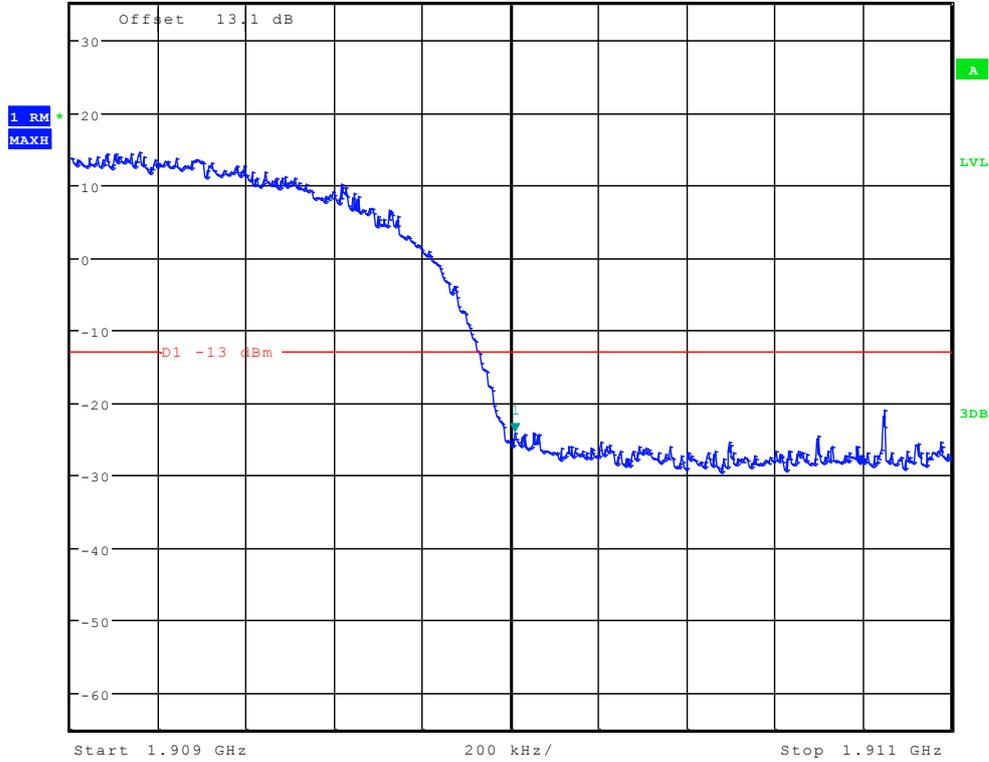
Date: 15.AUG.2012 10:22:21



## Right Edge Channel 9538



Ref 35 dBm      Att 50 dB      \* RBW 50 kHz      Marker 1 [T1]      -24.11 dBm  
 \* VBW 200 kHz      SWT 2.5 ms      1.910010000 GHz



Date: 15.AUG.2012 10:22:35

-----END-----



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# Appendix E

## Spurious Emission at Antenna Terminal

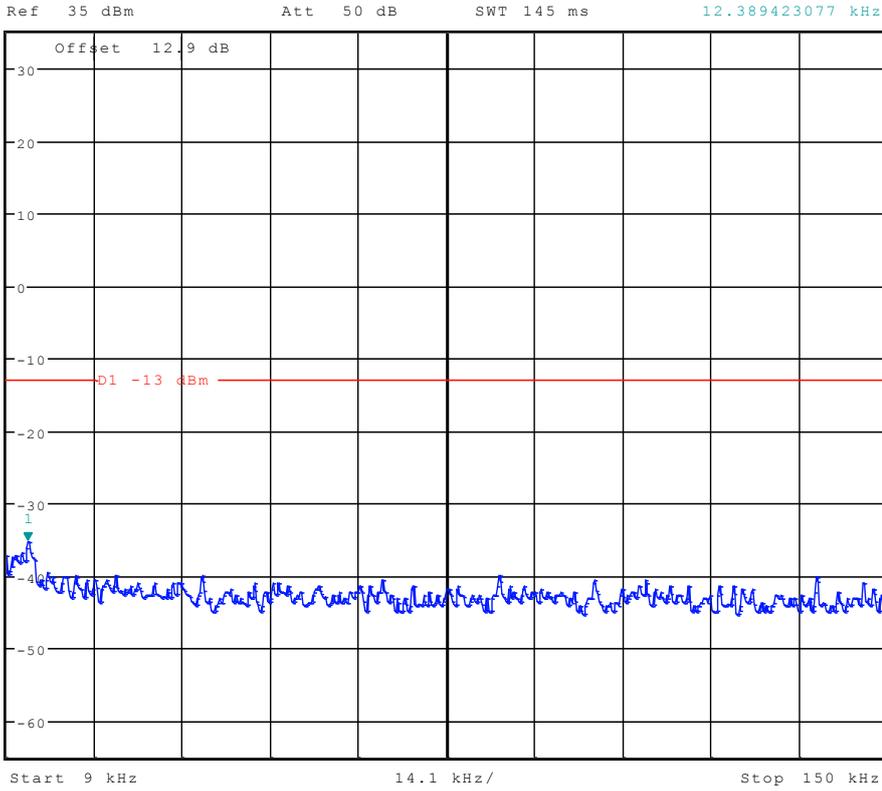
According to FCC Part 2.1051 & Part24 Subpart E



# TM1:GPRS/GSM Channel 512



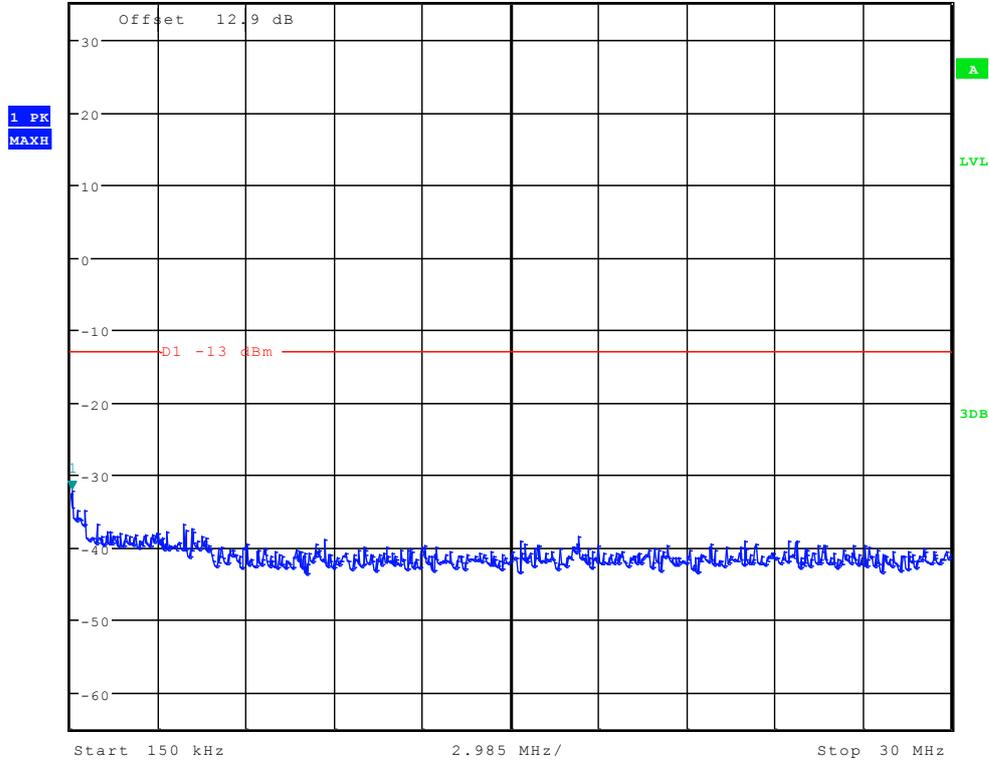
\*RBW 1 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      -35.31 dBm  
 SWT 145 ms      12.389423077 kHz



Date: 15.AUG.2012 10:06:36



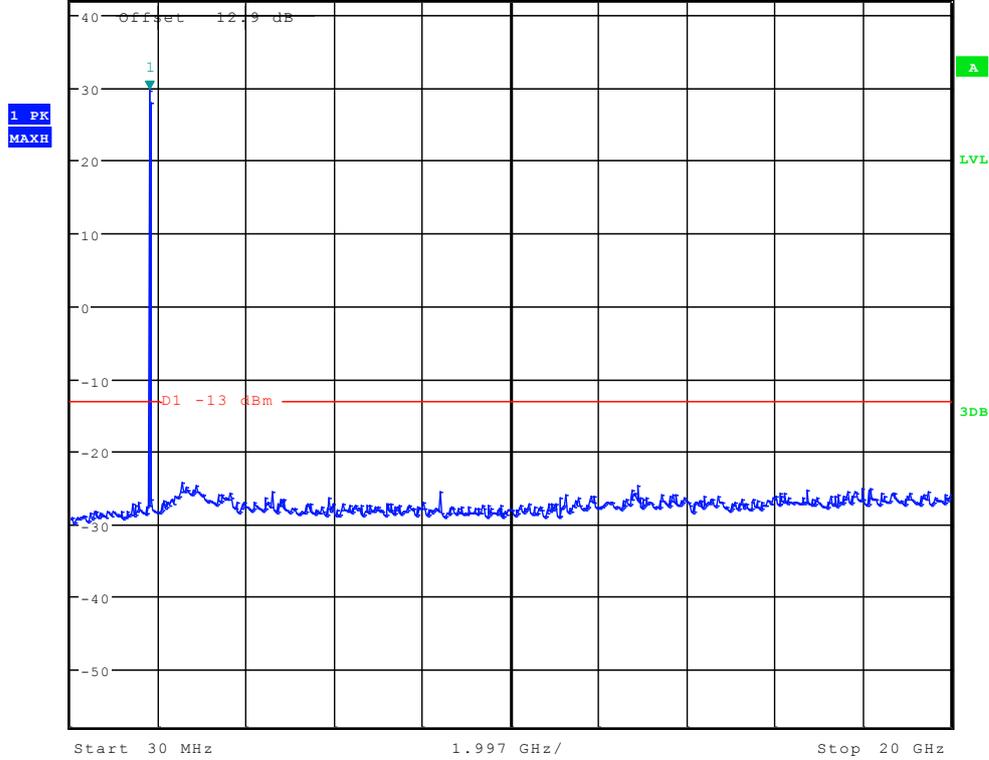
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -32.22 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 15.AUG.2012 10:07:20



Ref 42 dBm \* Att 40 dB SWT 115 ms  
\* RBW 1 MHz Marker 1 [T1] 29.70 dBm  
\* VBW 3 MHz 1.822179487 GHz



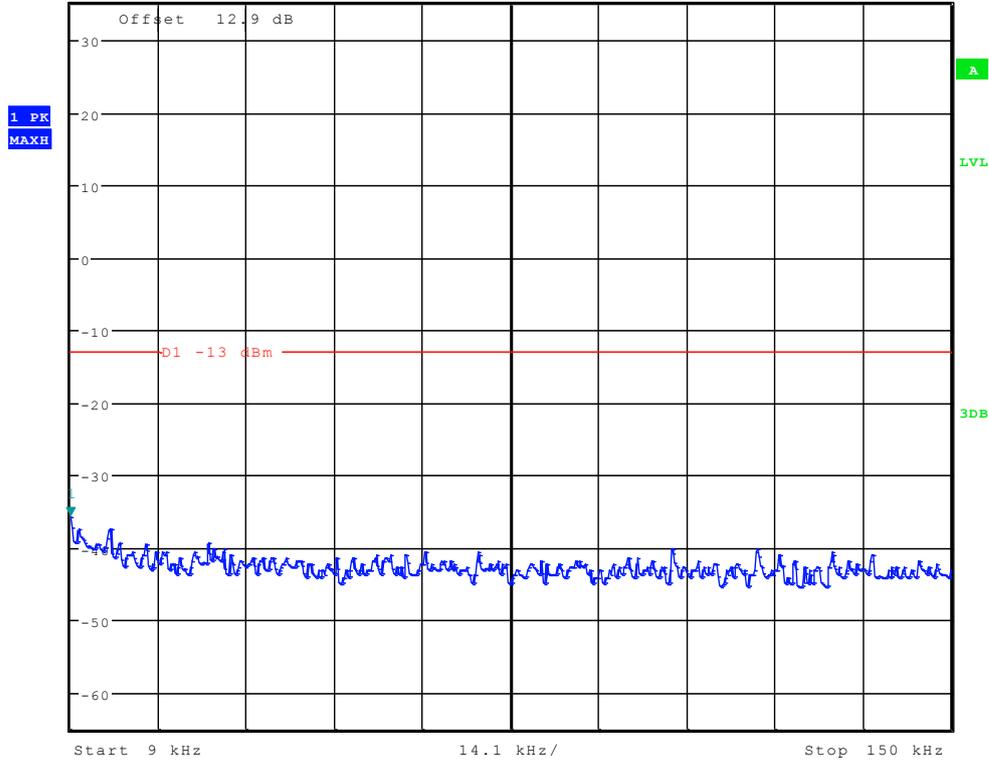
Date: 15.AUG.2012 10:09:37



## Channel 661



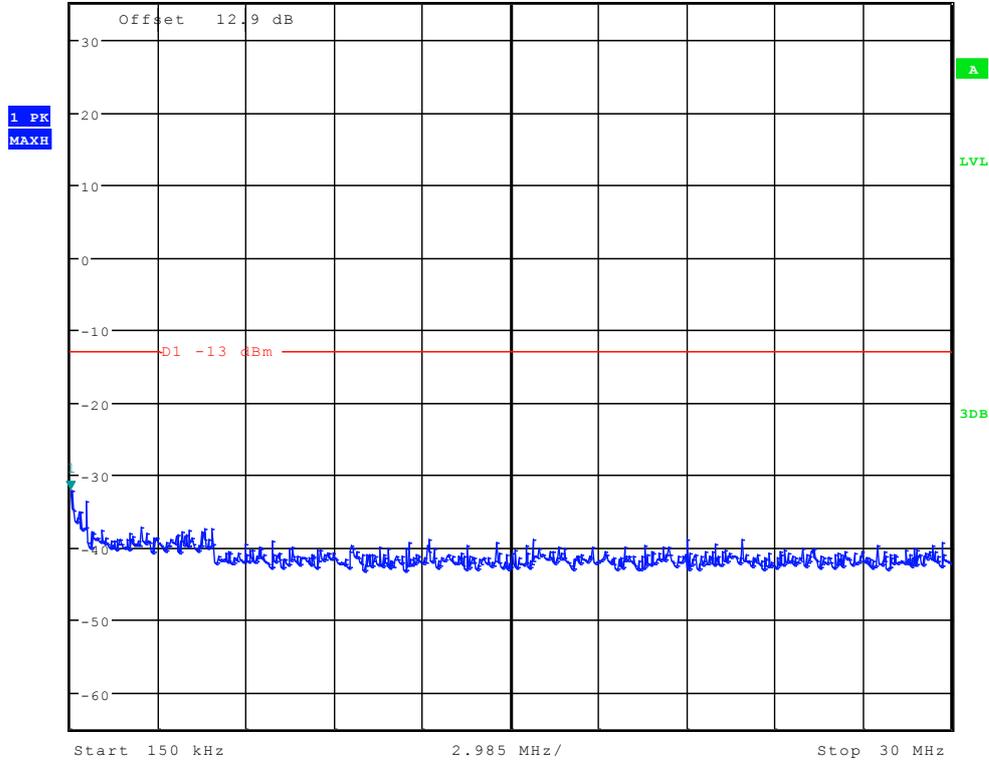
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -35.74 dBm  
 \*VBW 10 kHz      SWT 145 ms      9.000000000 kHz



Date: 15.AUG.2012 10:06:51



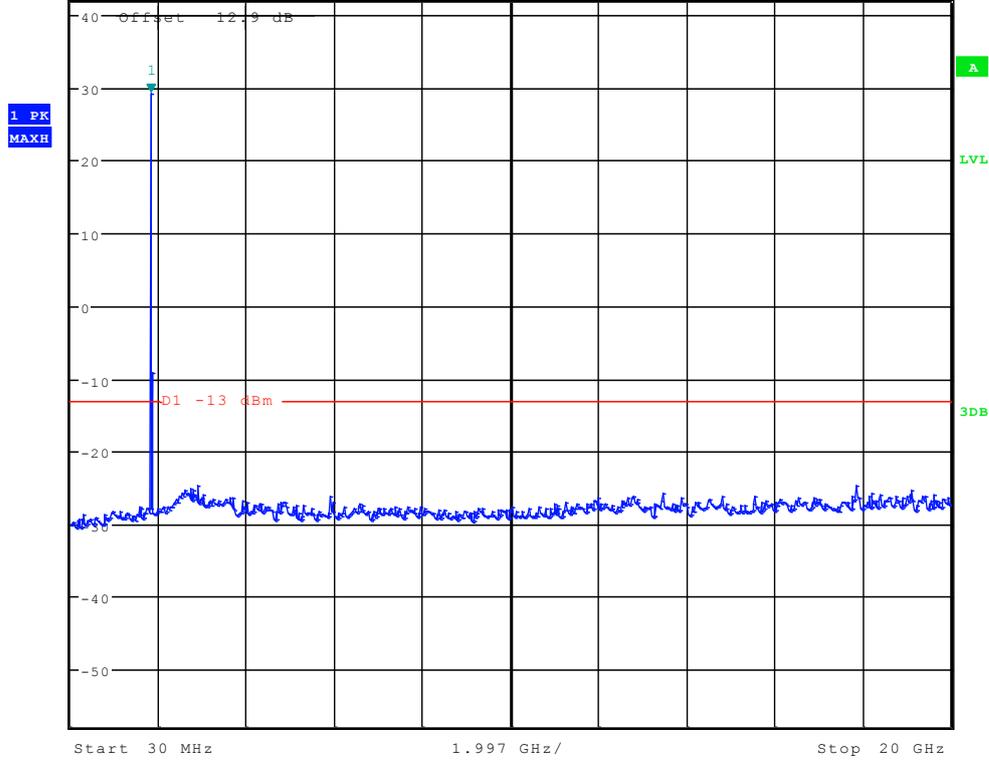
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -32.16 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 15.AUG.2012 10:07:34



Ref 42 dBm \* Att 40 dB SWT 115 ms \* RBW 1 MHz Marker 1 [T1 ]  
\* VBW 3 MHz 29.31 dBm  
1.854182692 GHz



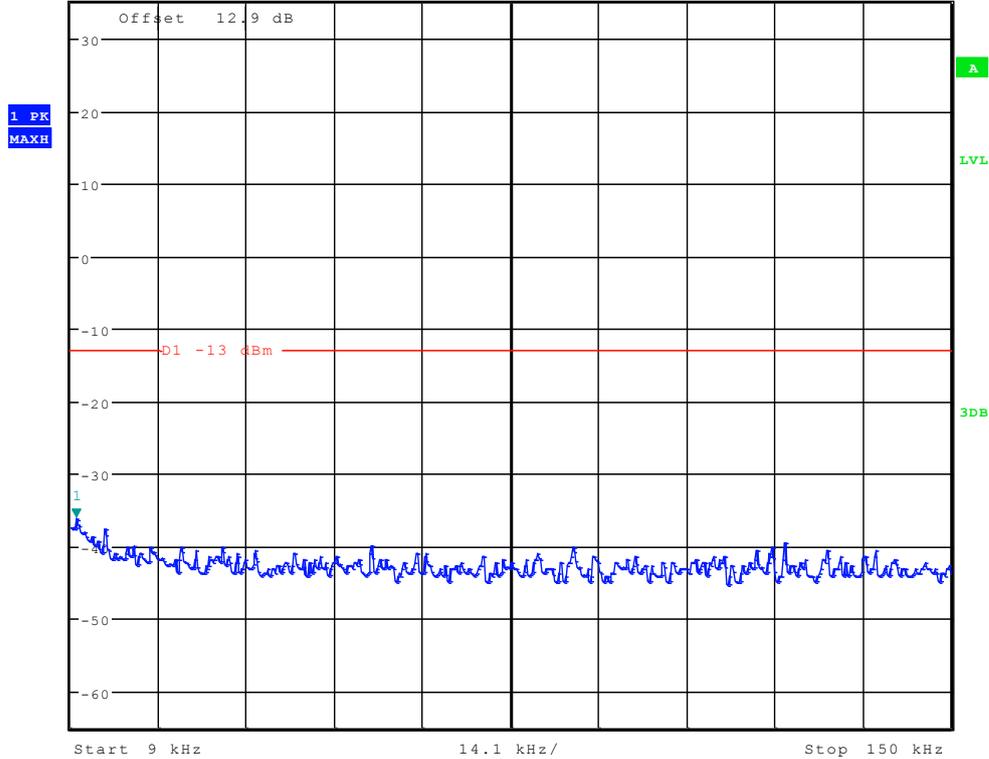
Date: 15.AUG.2012 10:09:51



# Channel 810



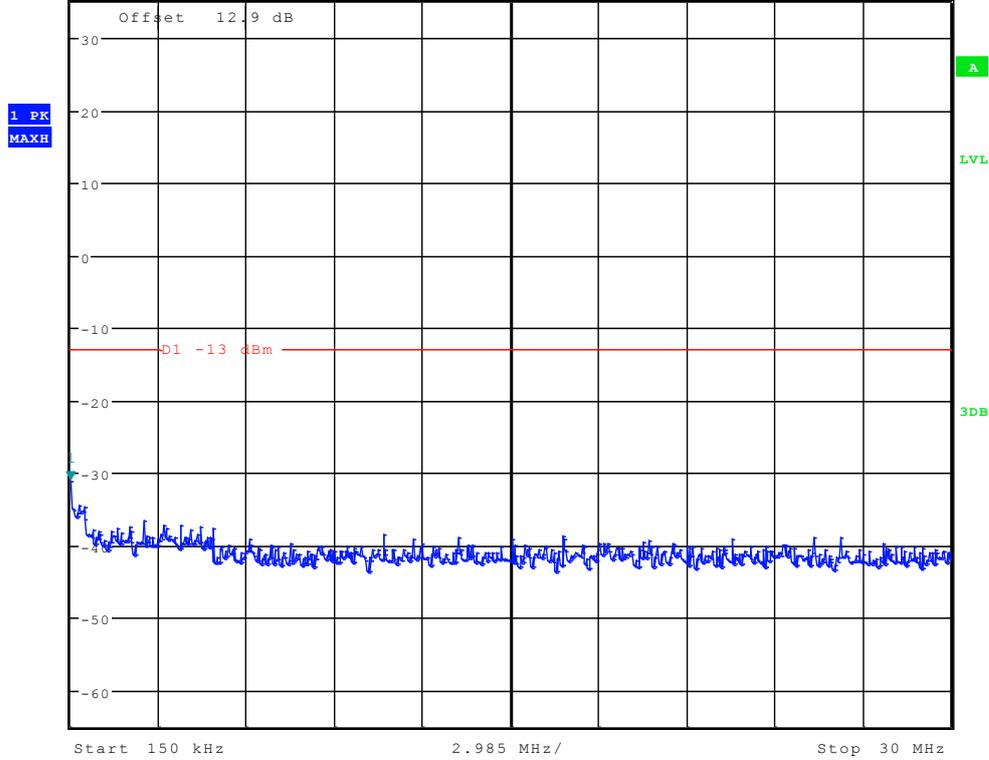
\*RBW 1 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      -36.19 dBm  
 Ref 35 dBm      Att 50 dB      SWT 145 ms      9.903846154 kHz



Date: 15.AUG.2012 10:07:05



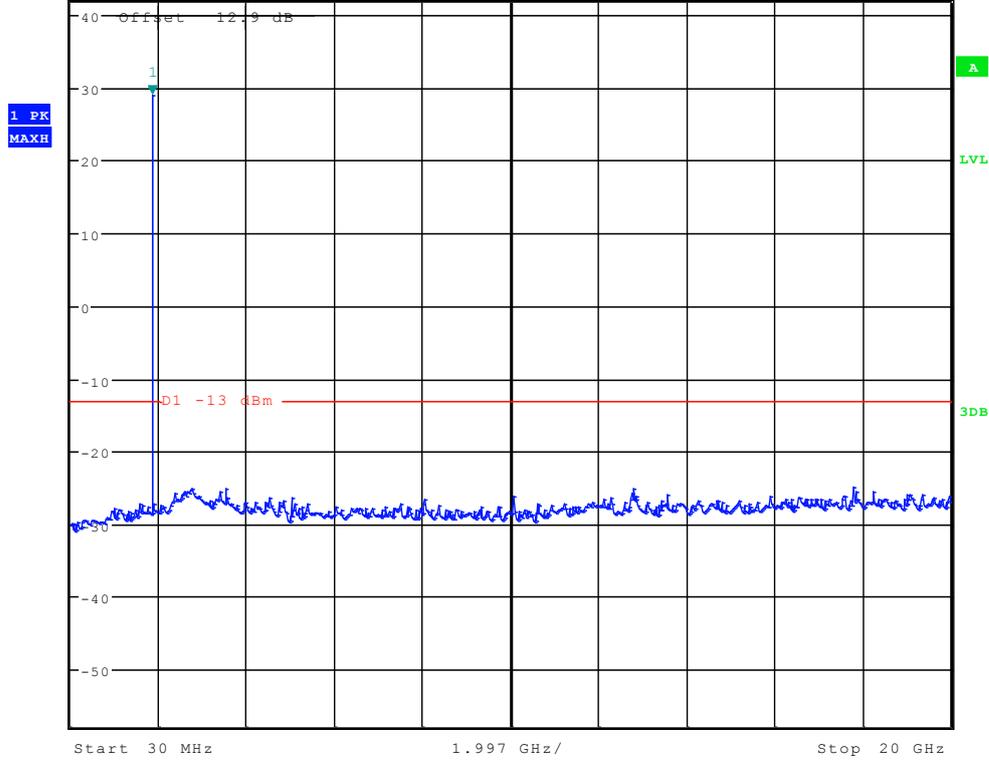
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -31.00 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 15.AUG.2012 10:07:49



Ref 42 dBm \* Att 40 dB SWT 115 ms \* RBW 1 MHz Marker 1 [T1] 29.15 dBm  
 \* VBW 3 MHz 1.886185897 GHz



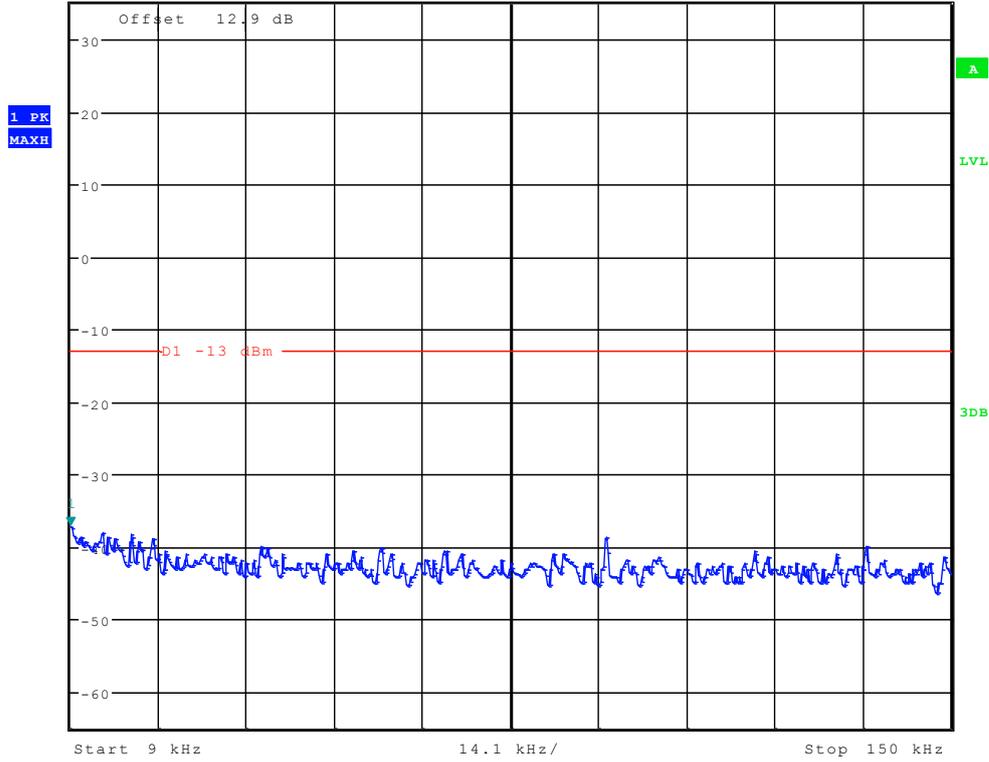
Date: 15.AUG.2012 10:10:05



# TM2:EDGE Channel 512



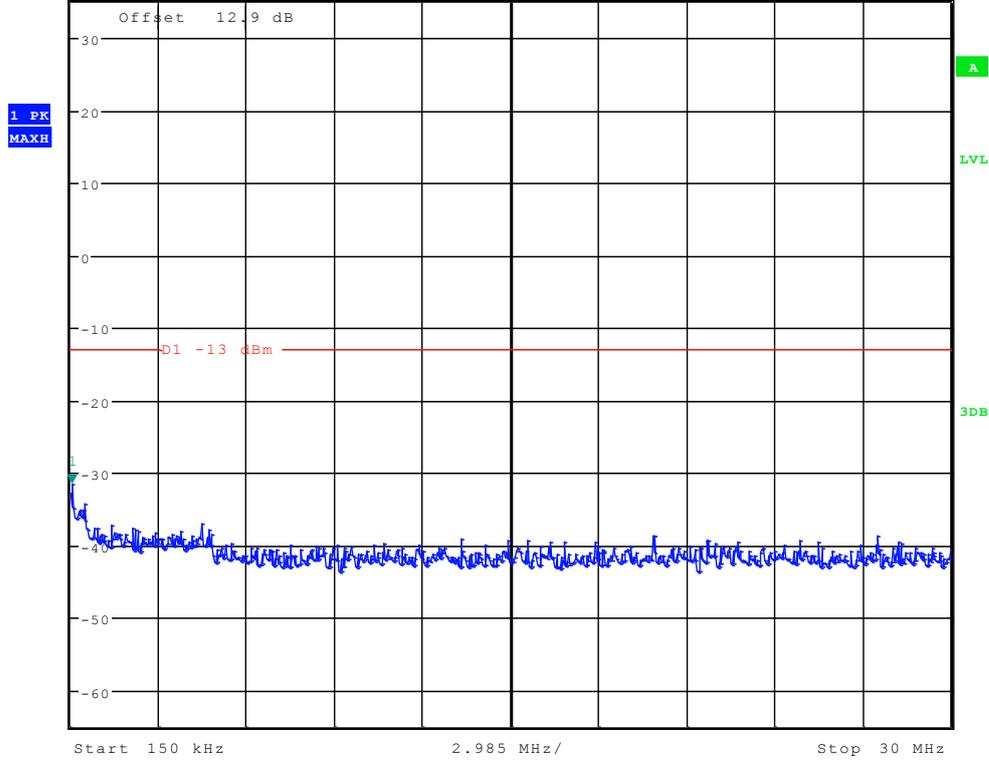
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -37.08 dBm  
 \*VBW 10 kHz      9.000000000 kHz  
 SWT 145 ms



Date: 15.AUG.2012 10:13:31



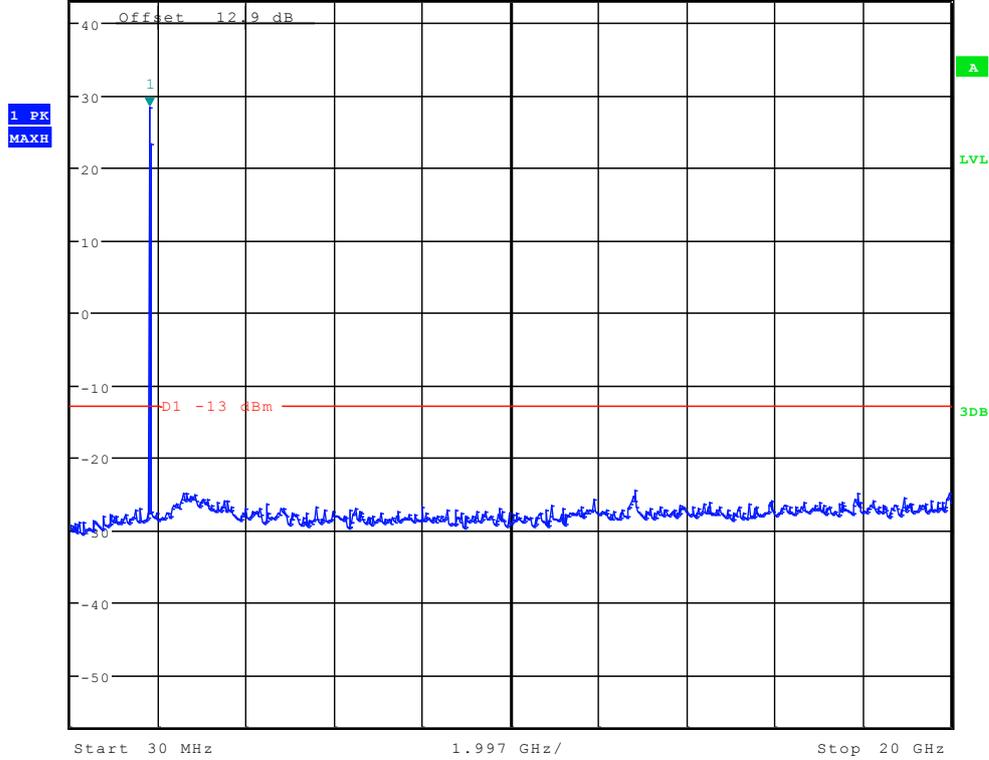
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -31.43 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 15.AUG.2012 10:14:14



Ref 42.9 dBm \* Att 40 dB SWT 115 ms \* RBW 1 MHz Marker 1 [T1] 28.25 dBm  
\* VBW 3 MHz



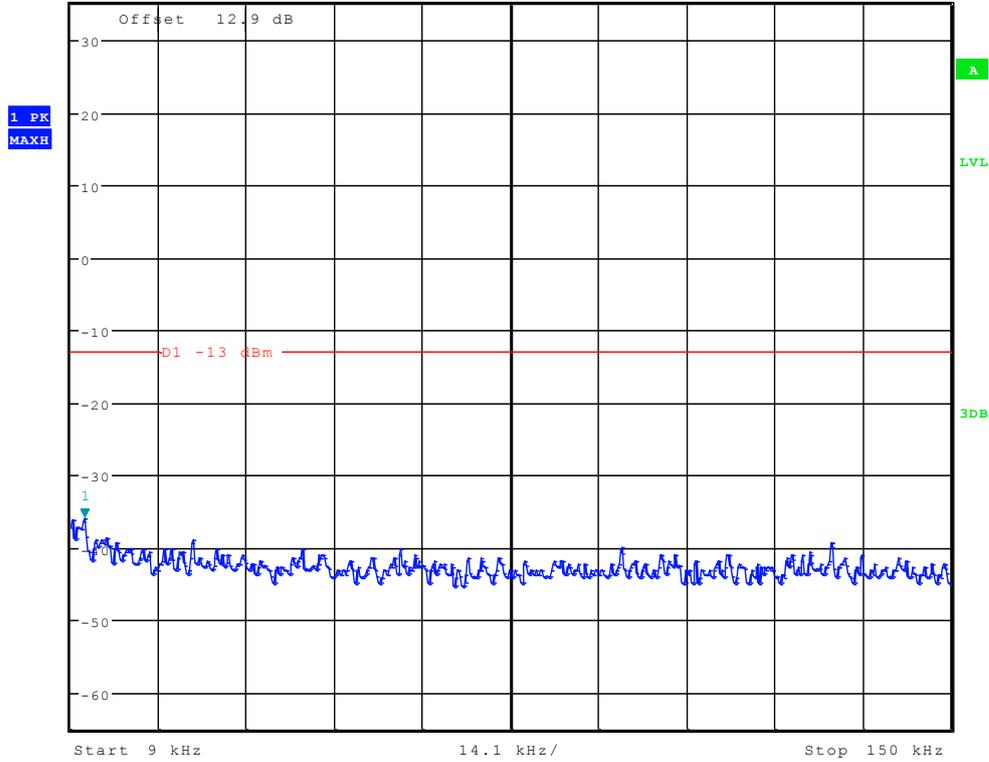
Date: 15.AUG.2012 10:15:16



## Channel 661



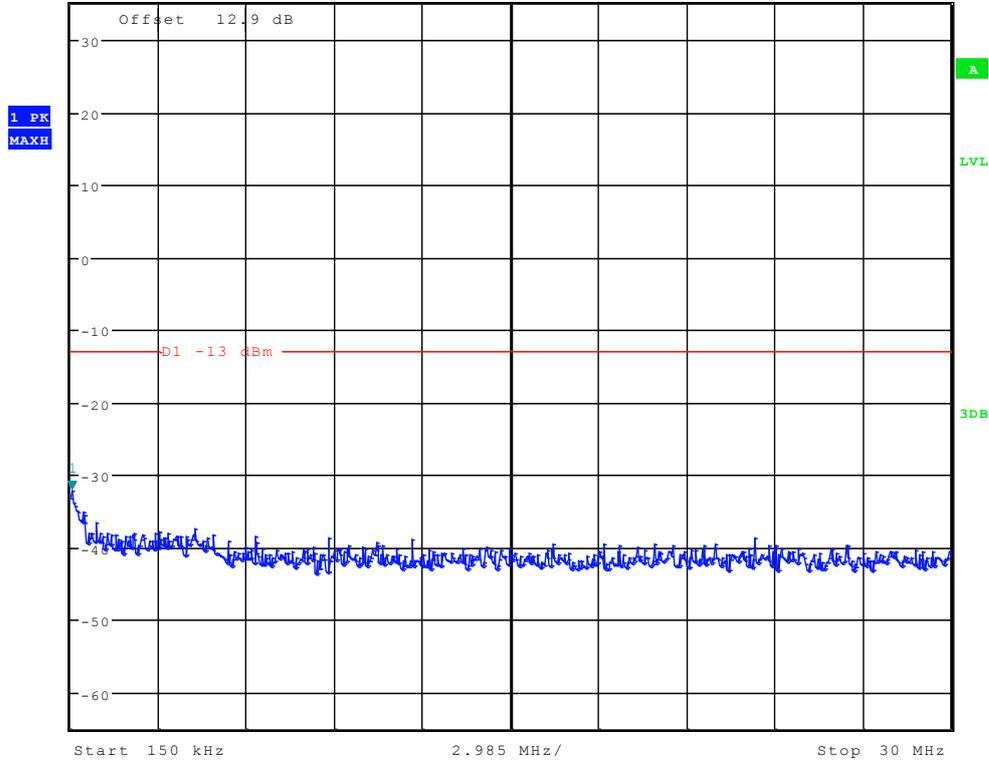
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -35.92 dBm  
\*VBW 10 kHz      SWT 145 ms      11.259615385 kHz



Date: 15.AUG.2012 10:13:45



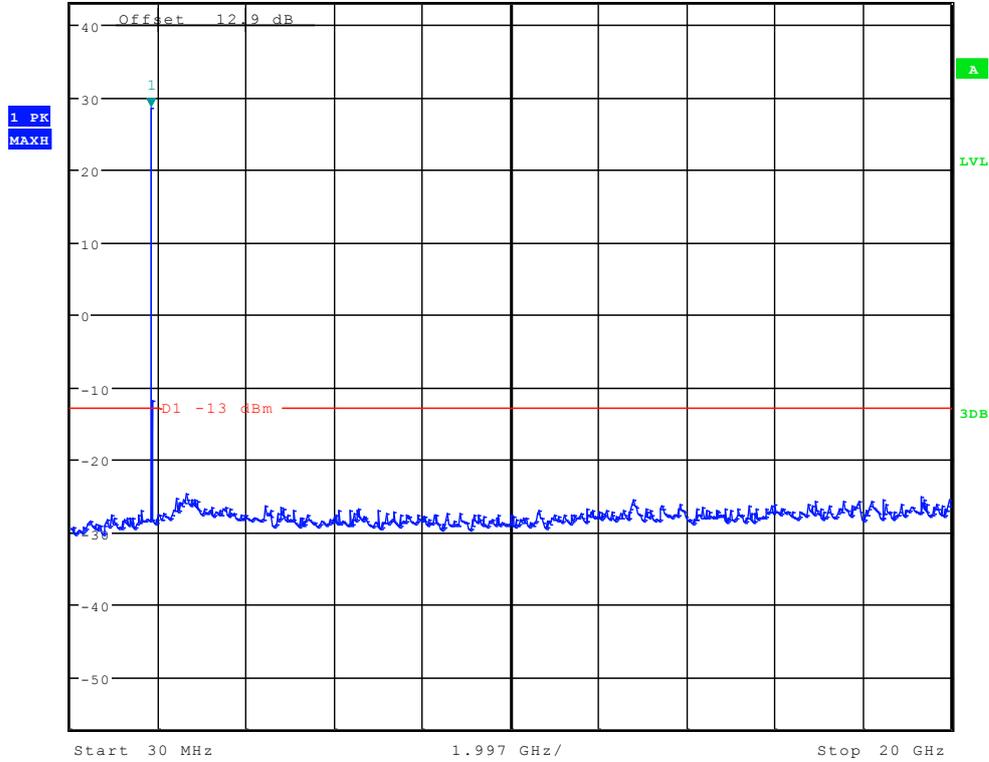
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -32.22 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 15.AUG.2012 10:14:29



\* RBW 1 MHz      Marker 1 [T1 ]  
 \* VBW 3 MHz      28.55 dBm  
 Ref 42.9 dBm      \* Att 40 dB      SWT 115 ms      1.854182692 GHz



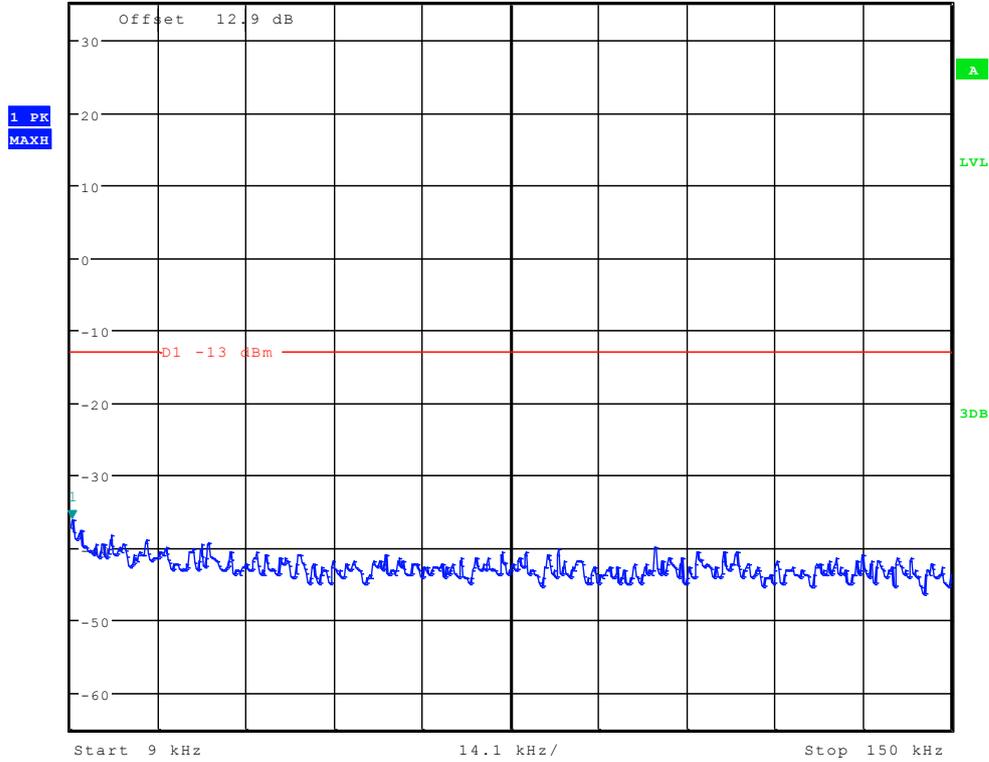
Date: 15.AUG.2012 10:15:30



## Channel 810



Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -36.19 dBm  
 \*VBW 10 kHz      SWT 145 ms      9.225961538 kHz

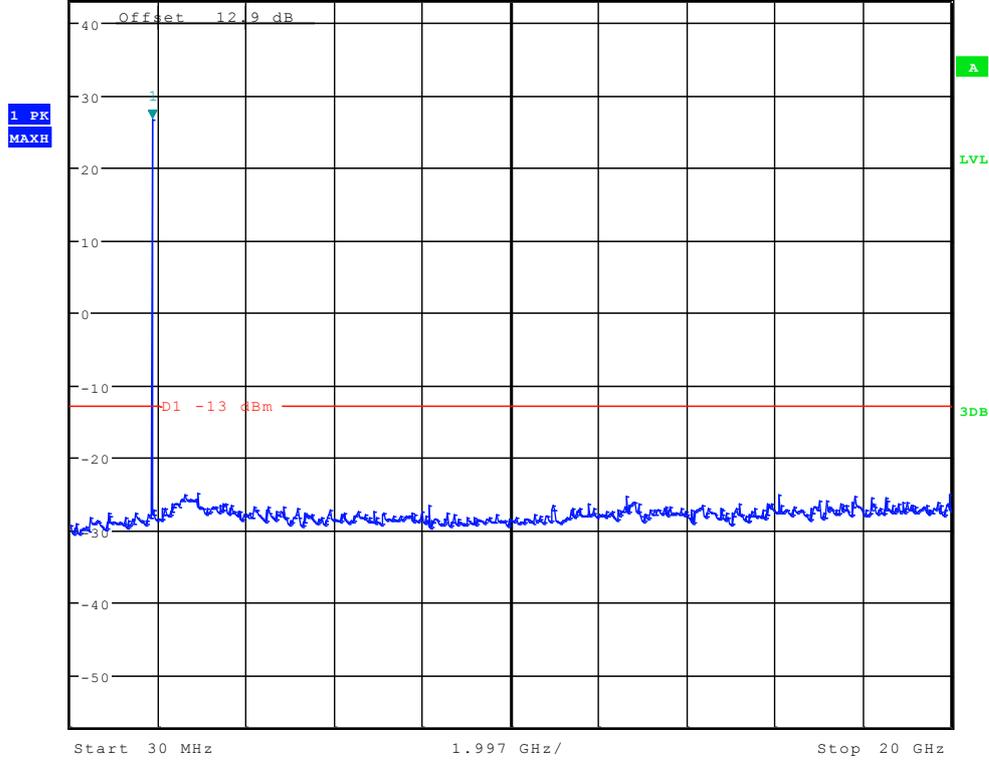


Date: 15.AUG.2012 10:14:00





Ref 42.9 dBm \* Att 40 dB SWT 115 ms \* RBW 1 MHz Marker 1 [T1] 26.66 dBm  
\* VBW 3 MHz 1.886185897 GHz



Date: 15.AUG.2012 10:15:45

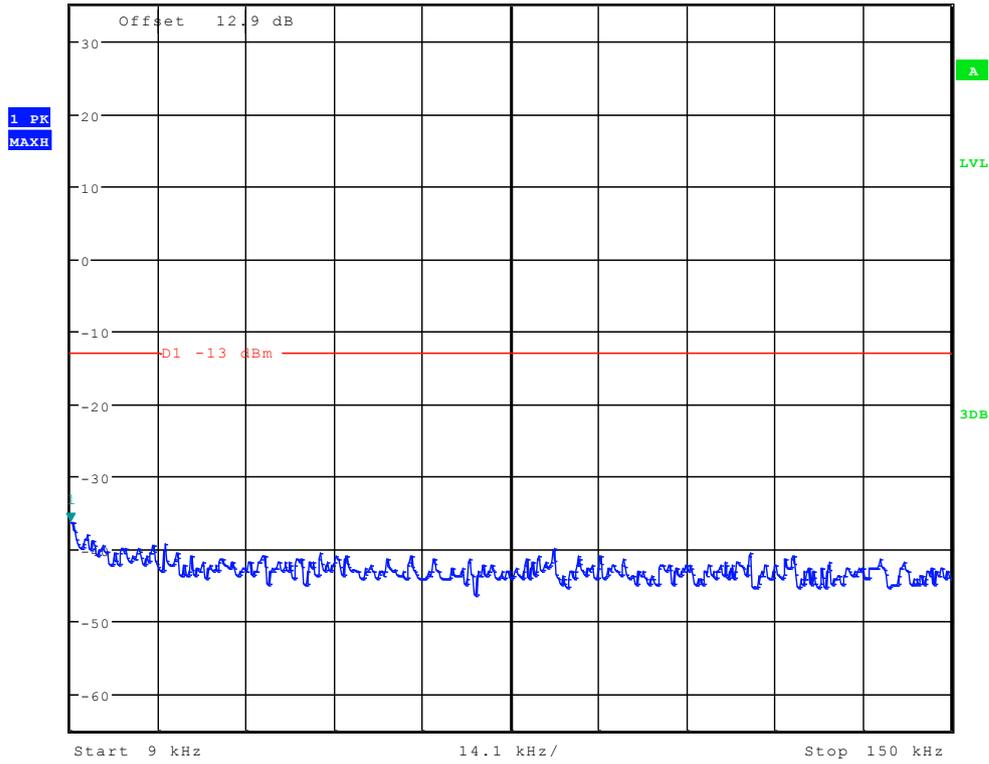


# TM3: WCDMA

## Channel 9262



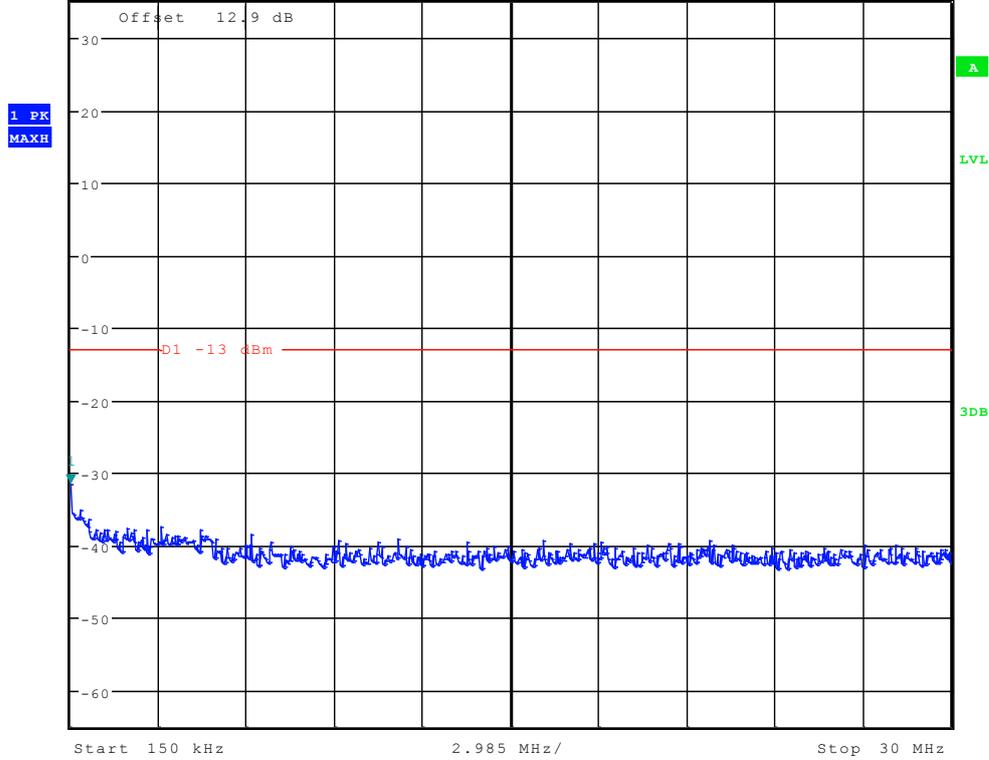
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -36.38 dBm  
\*VBW 10 kHz      9.000000000 kHz  
SWT 145 ms



Date: 15.AUG.2012 10:19:44



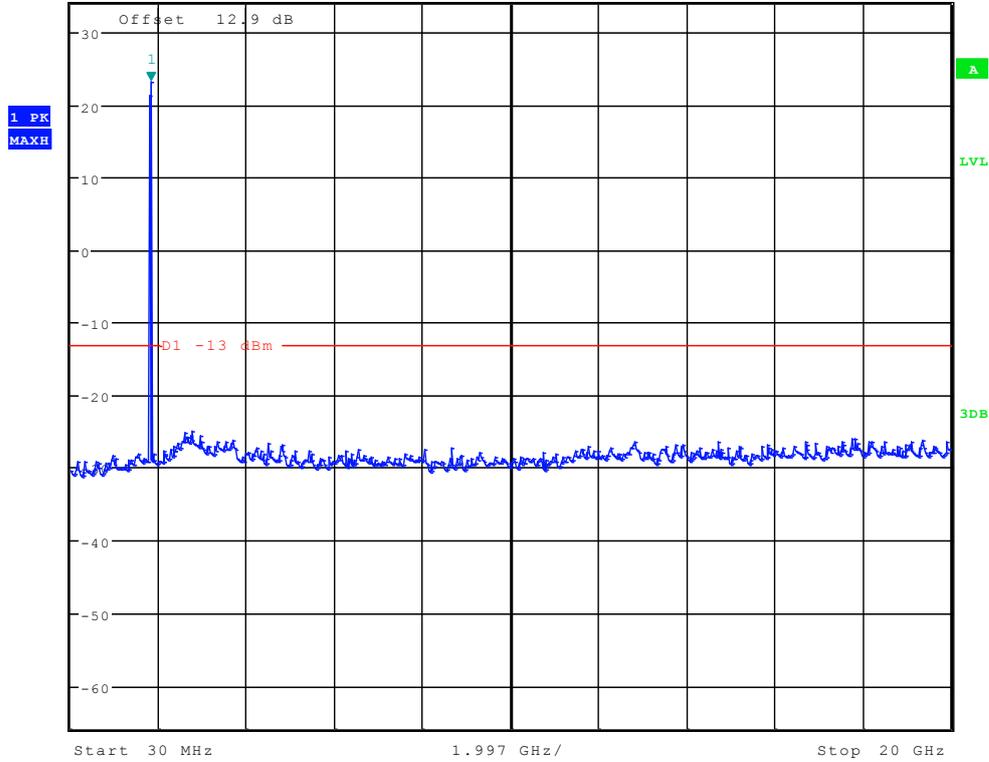
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -31.59 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 15.AUG.2012 10:20:28



Ref 34 dBm \* Att 40 dB SWT 115 ms \* RBW 1 MHz Marker 1 [T1] 23.28 dBm  
\* VBW 3 MHz 1.854182692 GHz



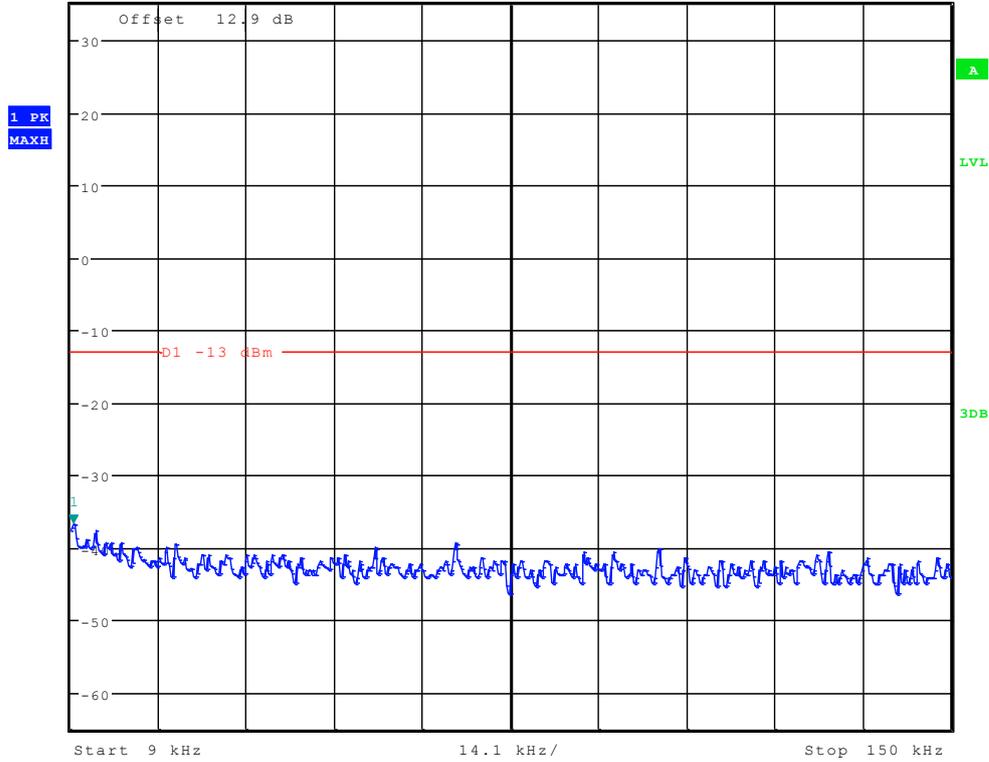
Date: 15.AUG.2012 10:21:37



## Channel 9400



Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -36.67 dBm  
 \*VBW 10 kHz      SWT 145 ms      9.451923077 kHz

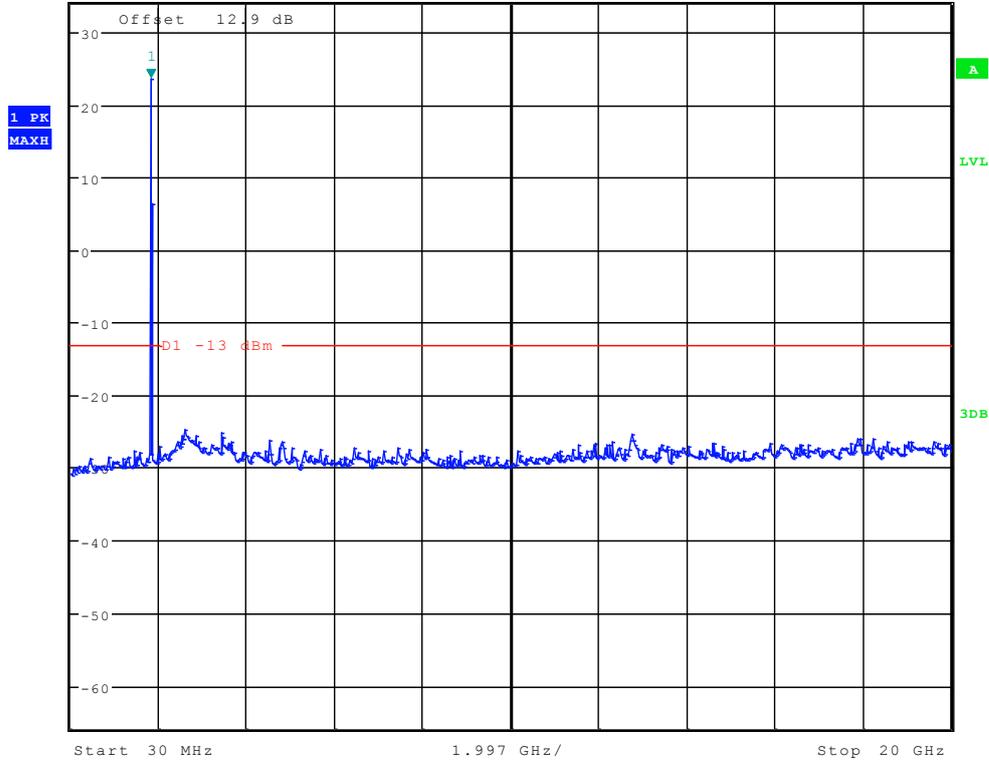


Date: 15.AUG.2012 10:19:59





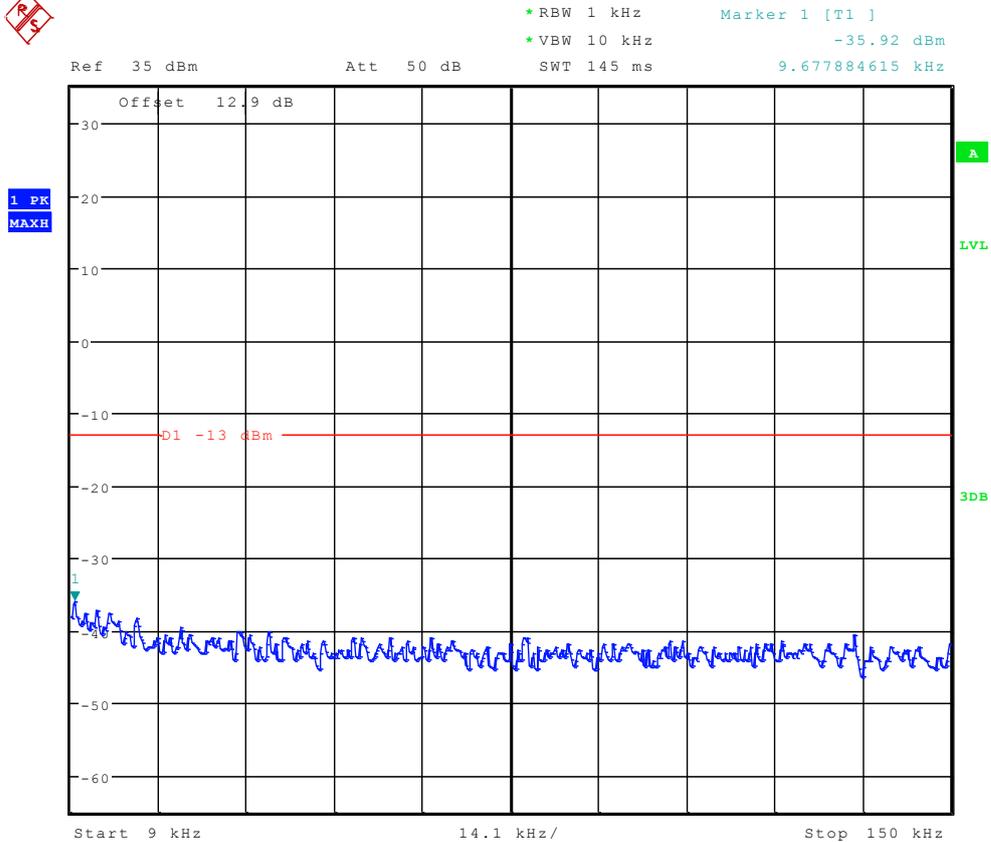
Ref 34 dBm      \* Att 40 dB      SWT 115 ms      Marker 1 [T1]      23.64 dBm  
 \* RBW 1 MHz      \* VBW 3 MHz      1.854182692 GHz



Date: 15.AUG.2012 10:21:52



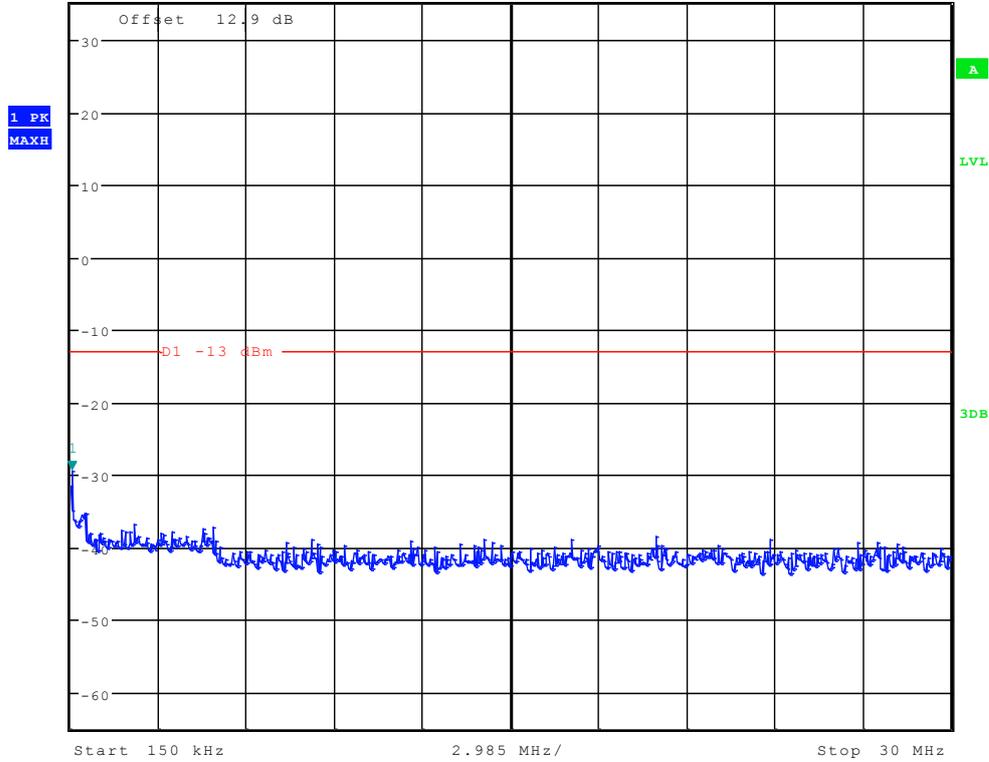
## Channel 9538



Date: 15.AUG.2012 10:20:13



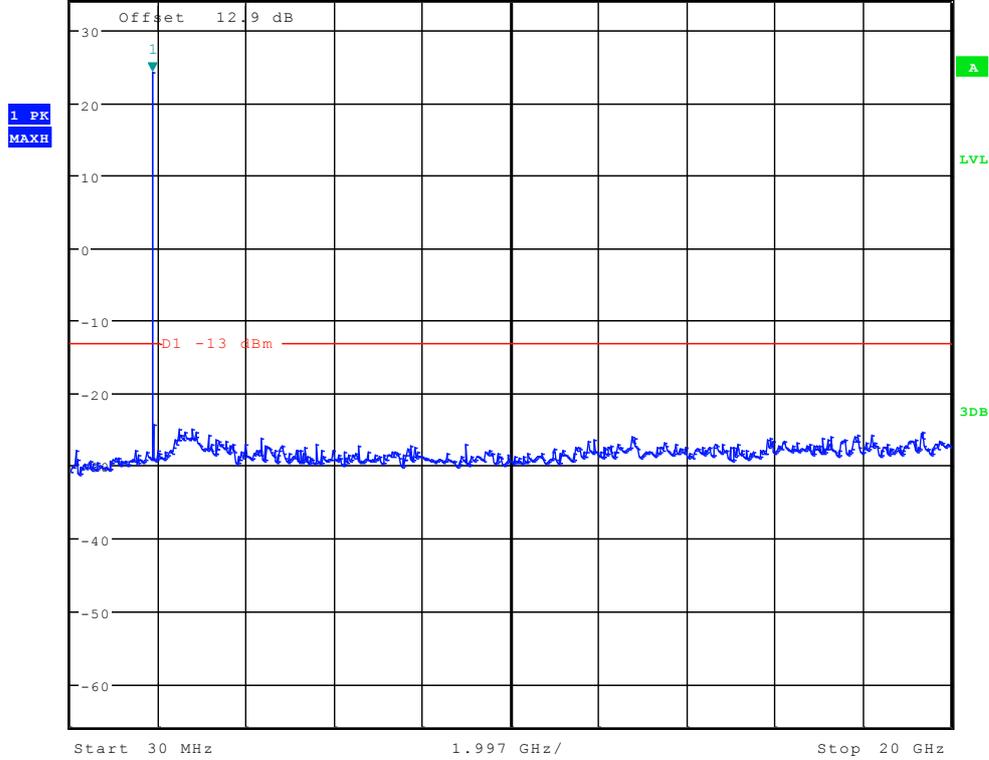
\*RBW 10 kHz      Marker 1 [T1 ]  
 \*VBW 30 kHz      -29.46 dBm  
 Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 15.AUG.2012 10:20:57



Ref 34 dBm      \* Att 40 dB      SWT 115 ms      Marker 1 [T1]      24.26 dBm  
 \* RBW 1 MHz      \* VBW 3 MHz      1.886185897 GHz



Date: 15.AUG.2012 10:22:07

-----END-----



# **Appendix F**

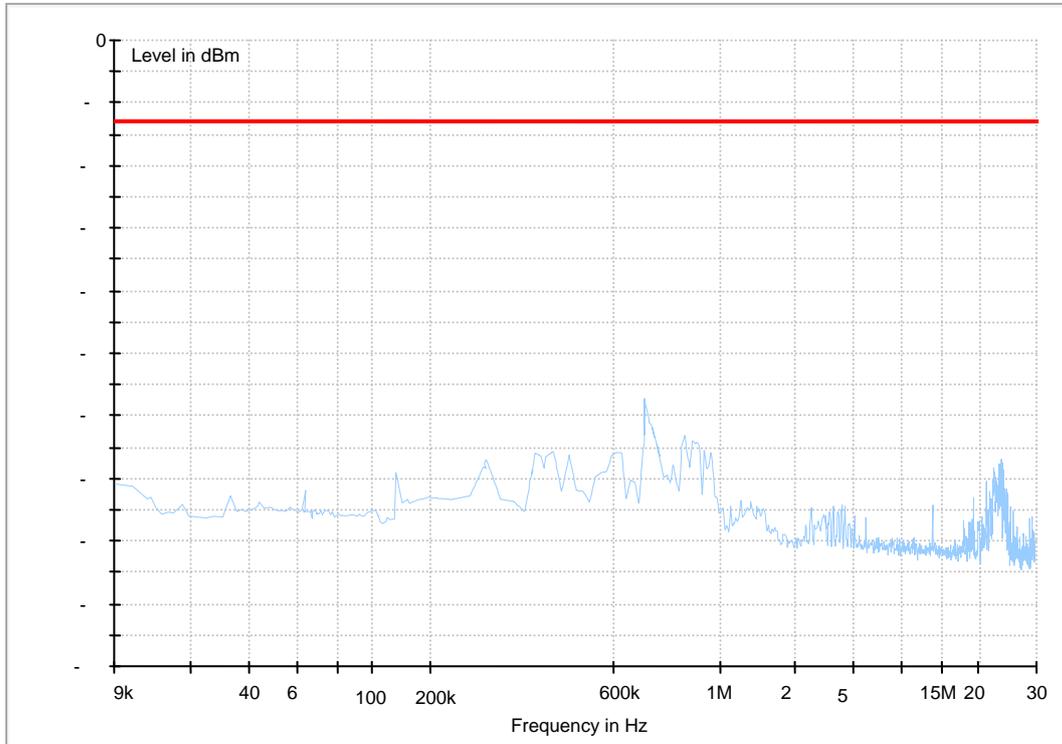
## Radiated spurious emission

According to FCC Part 2.1053& Part 24.238

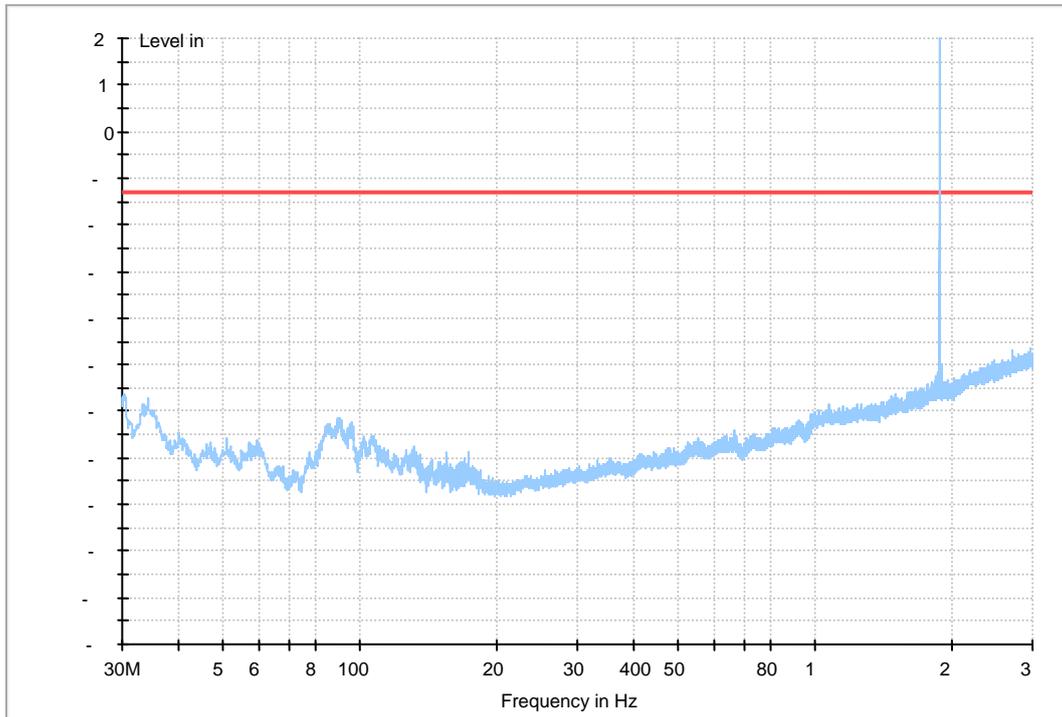
Note: 1. Simultaneous transmission was investigated and no new emissions were found.  
2. RBW  $\geq$  1MHz, VBW  $>$  3 x RBW.

## GSM 1900

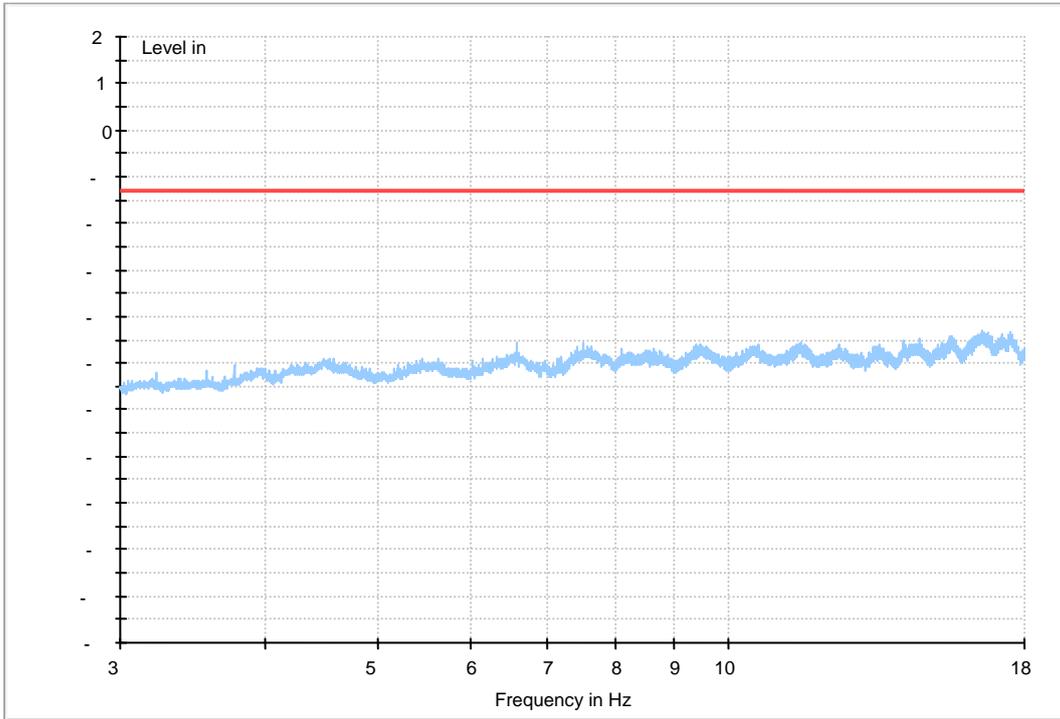
### (9 kHz-30MHz)



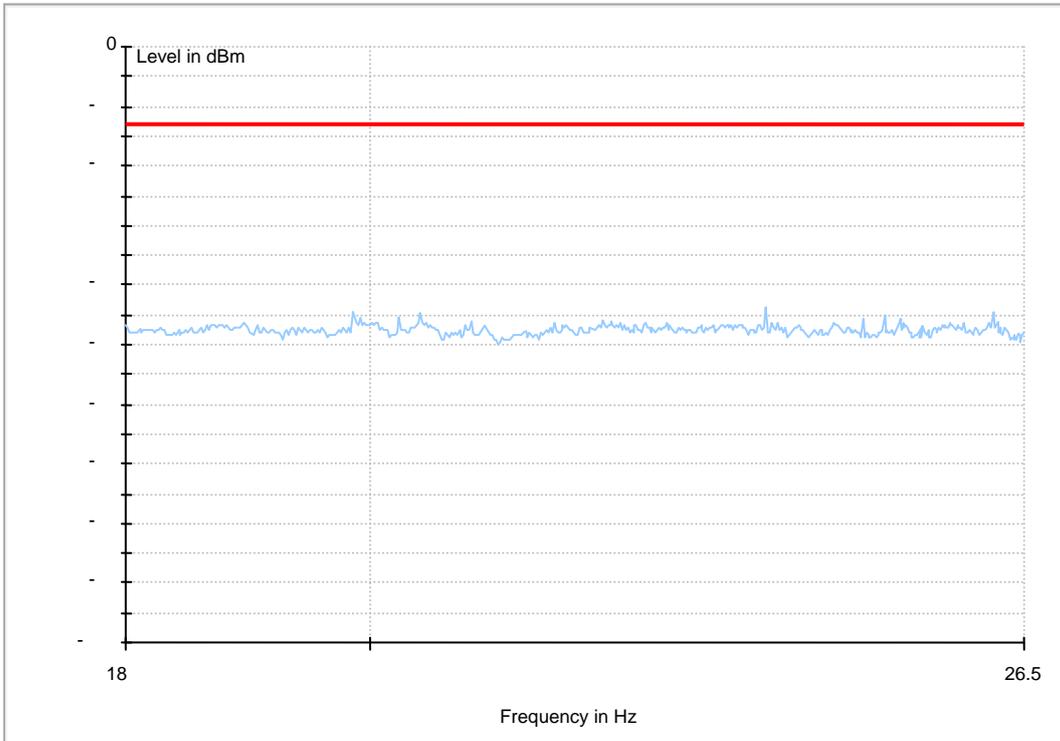
### (30MHz~3GHz)



**(3GHz~18GHz)**

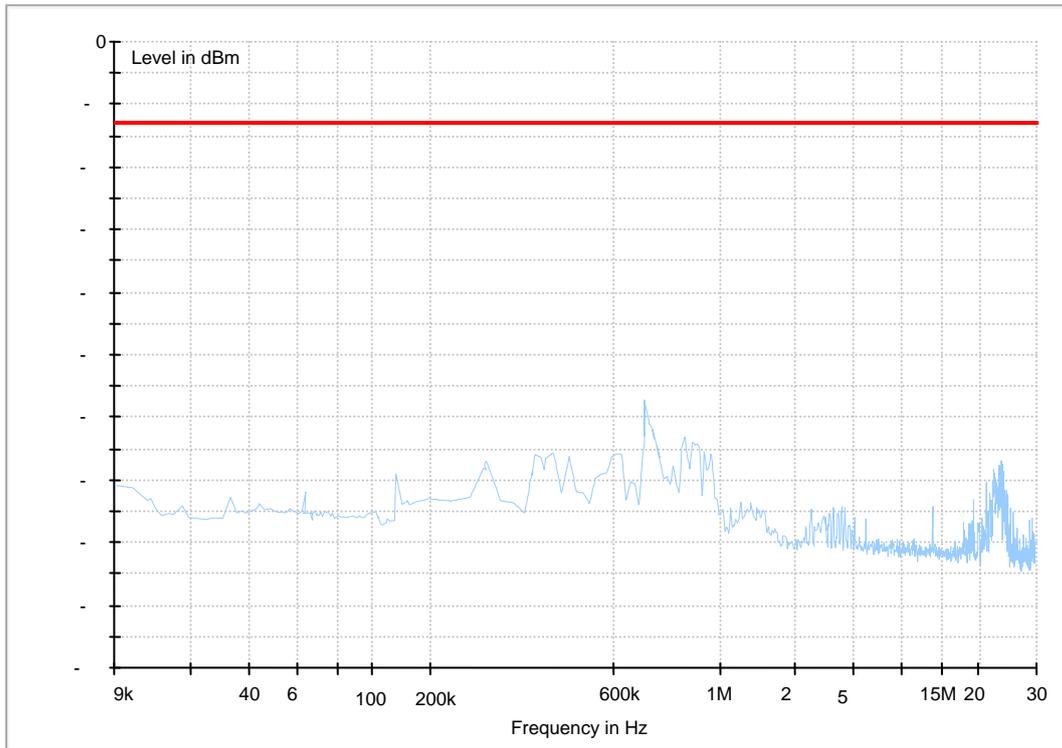


**(18GHz-26.5GHz)**

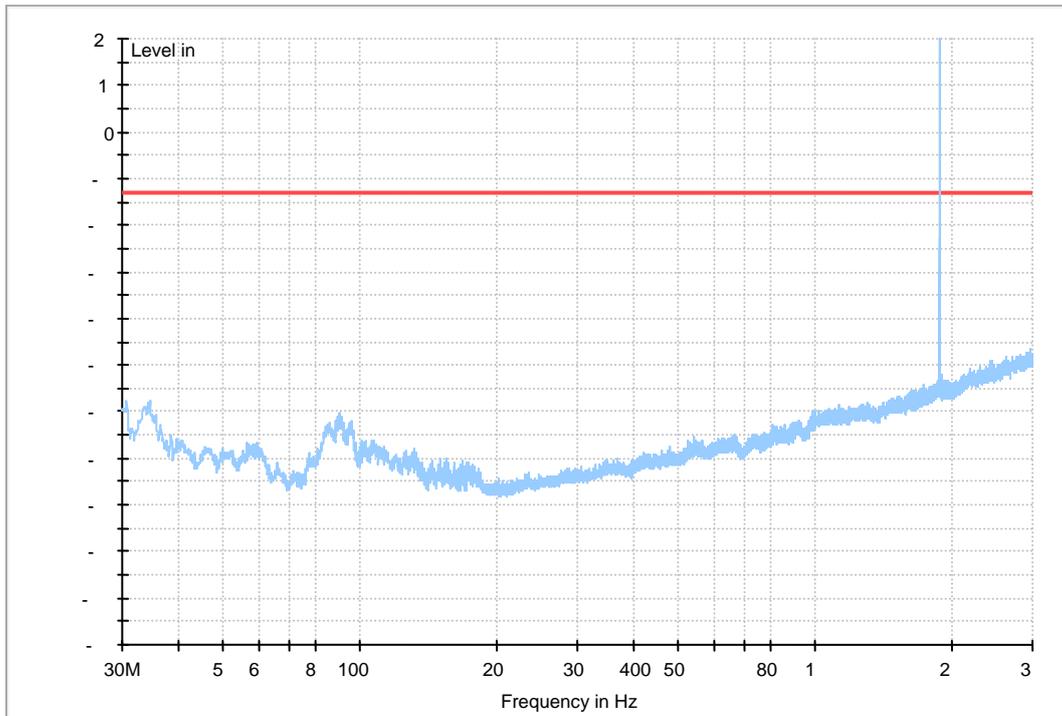


## GPRS 1900

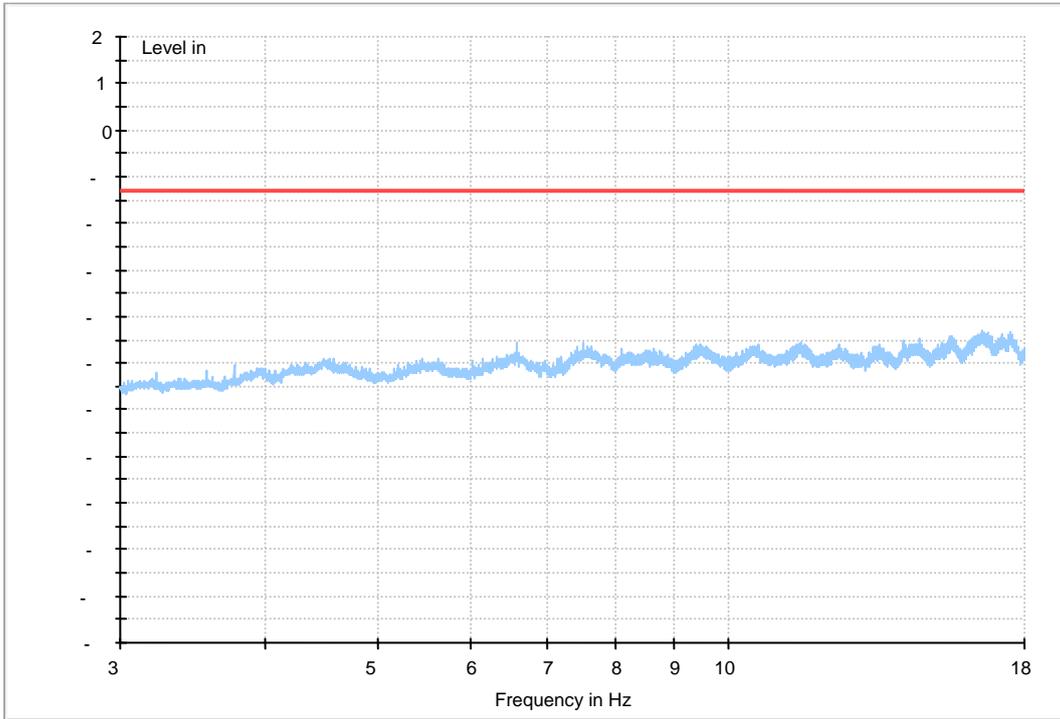
(9kHz-30MHz)



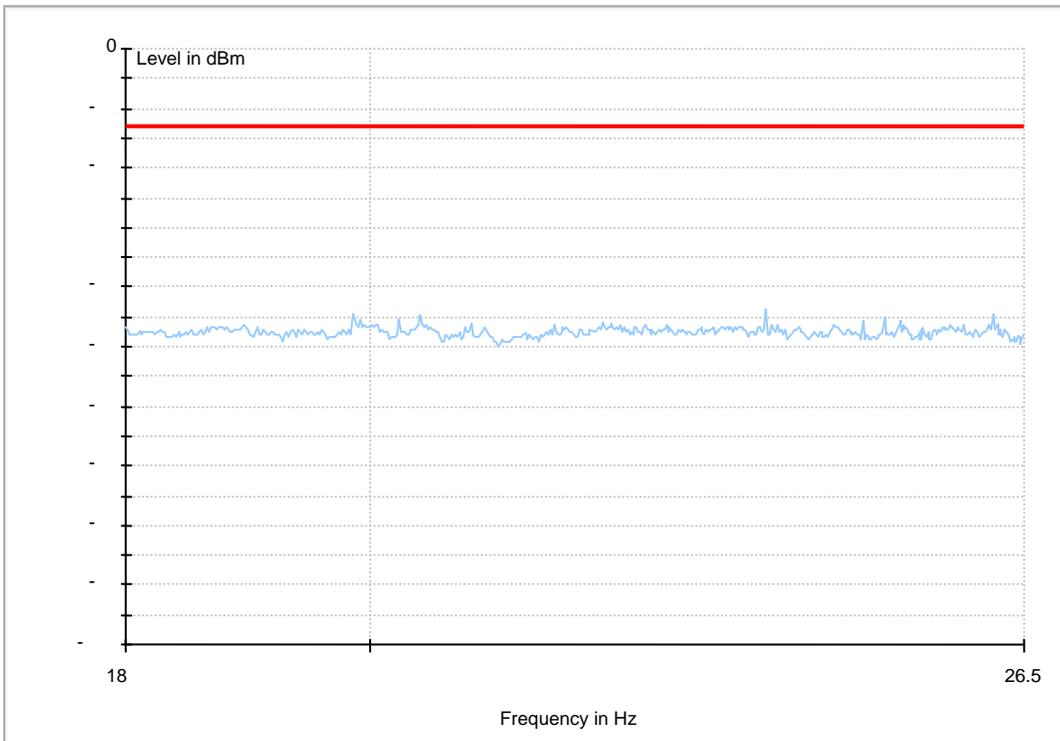
(30MHz~3GHz)



### (3GHz~18GHz)

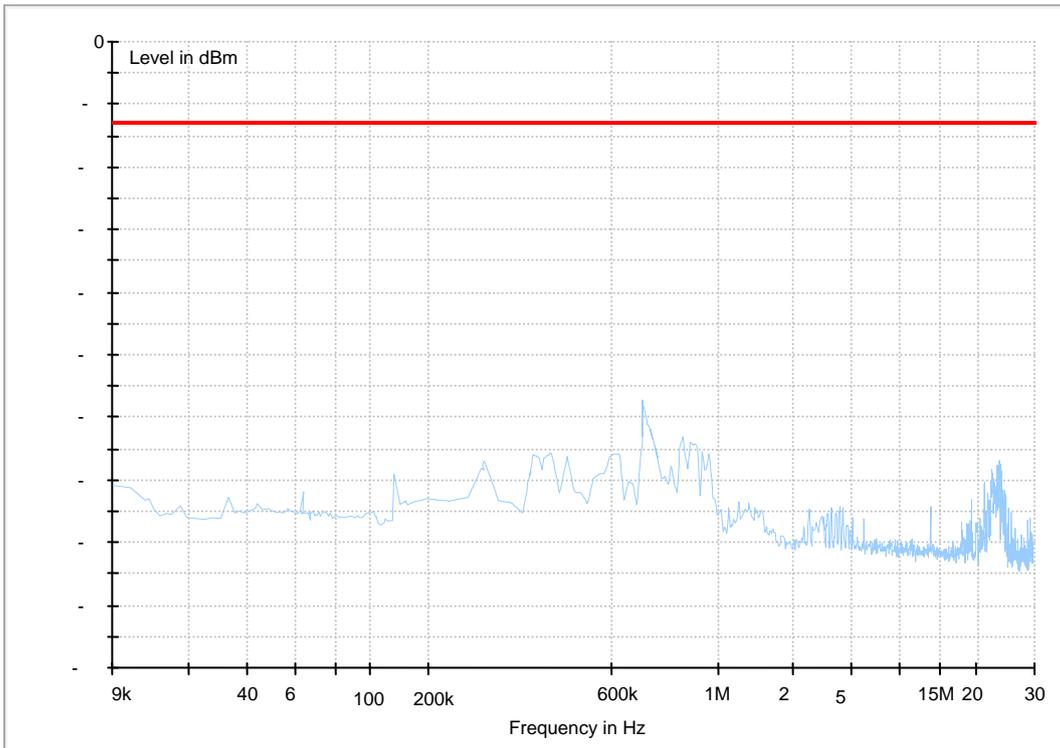


### (18GHz-26.5GHz)

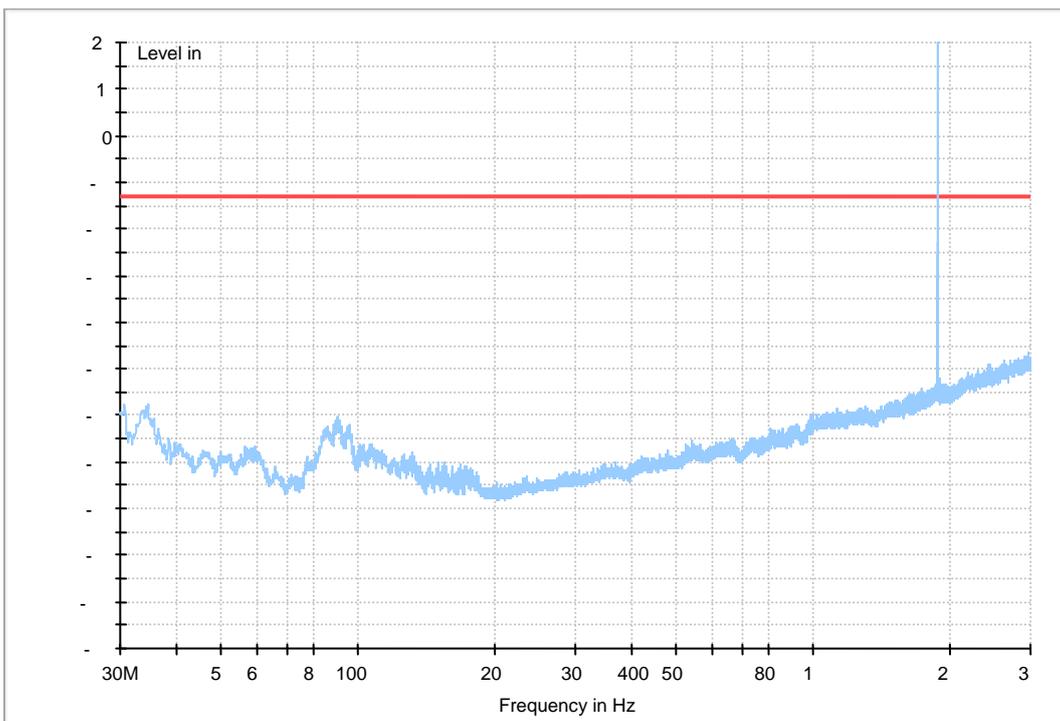


# EDGE 1900

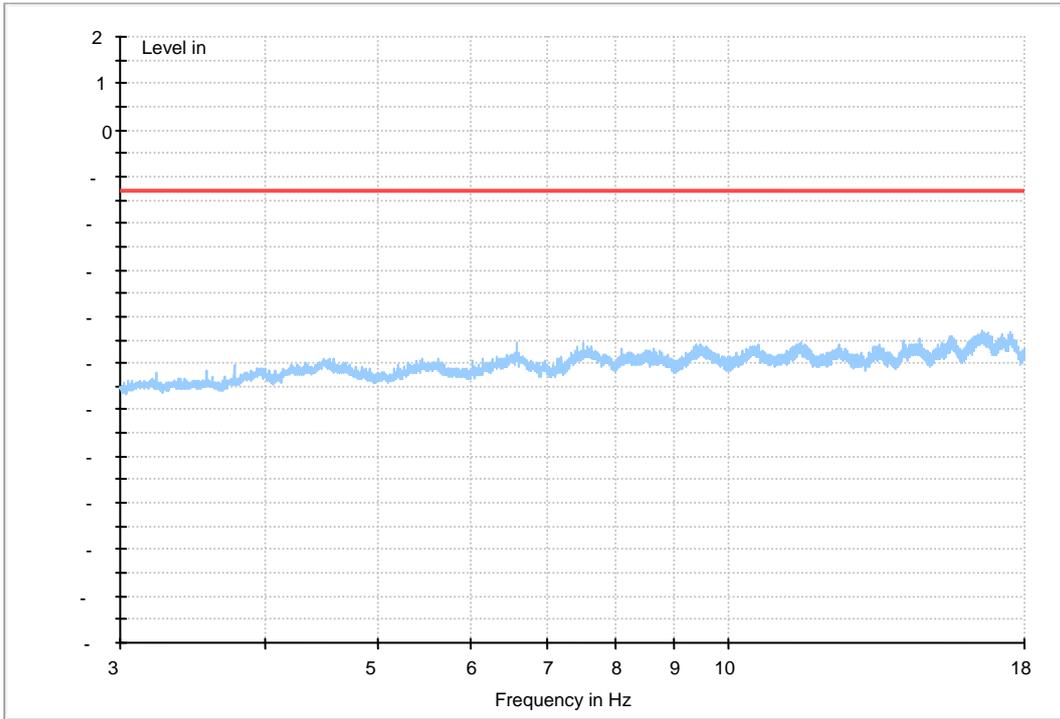
(9kHz-30MHz)



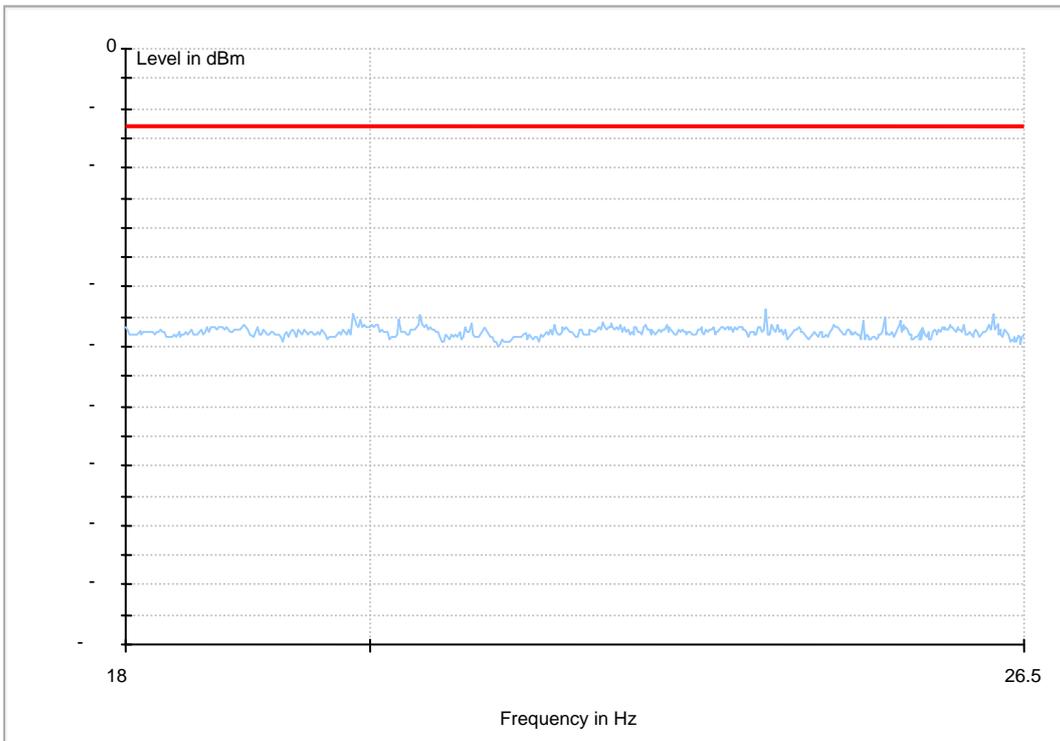
(30MHz~3GHz)



### (3GHz~18GHz)

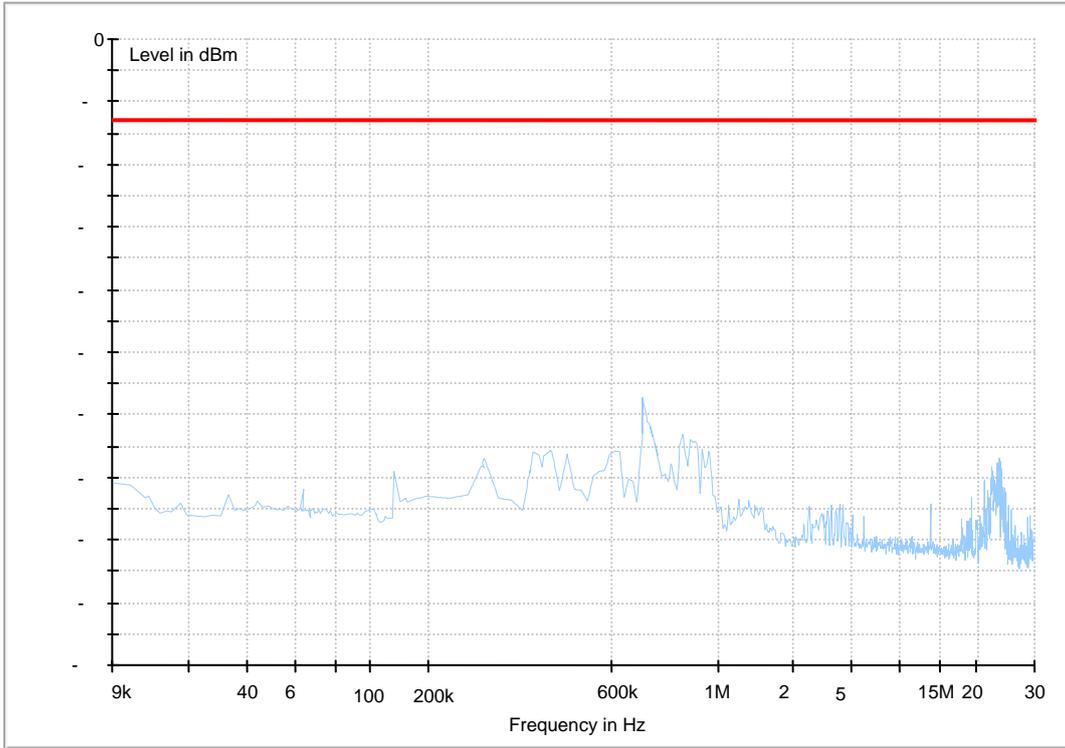


### (18GHz-26.5GHz)

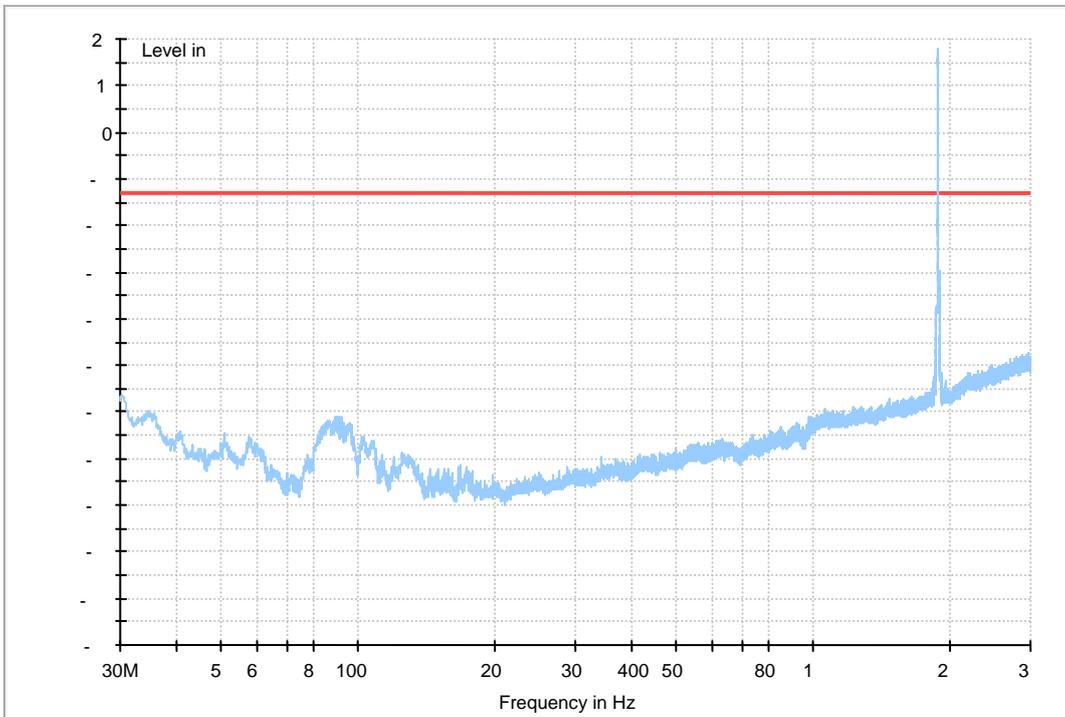


### WCDMA Band II

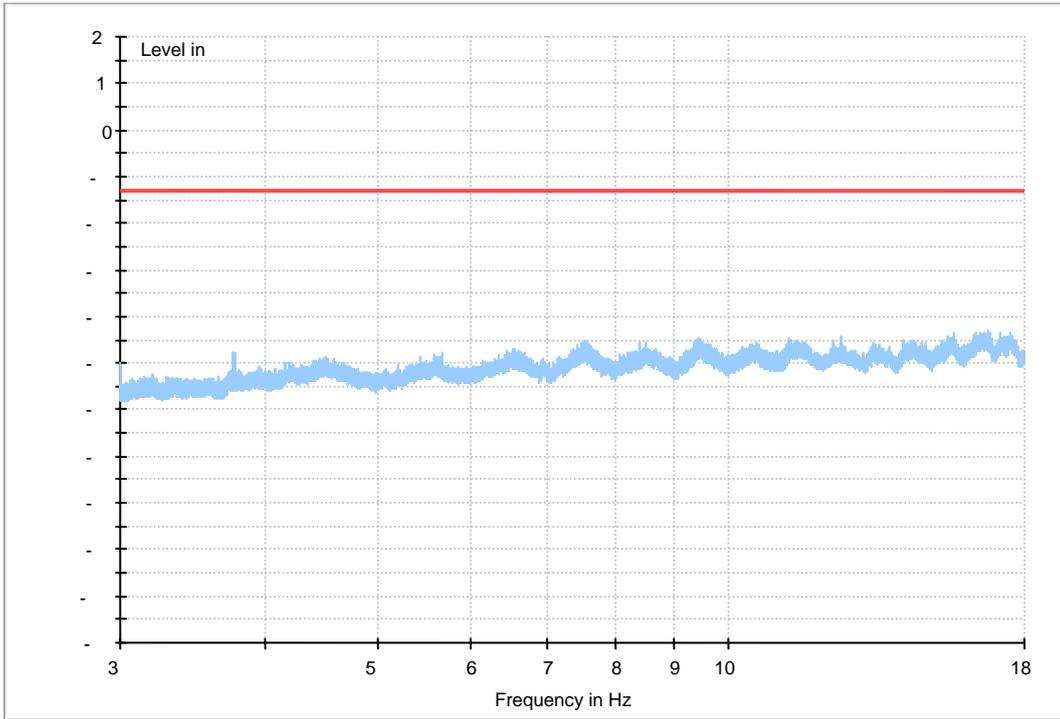
(9KHz~30MHz)



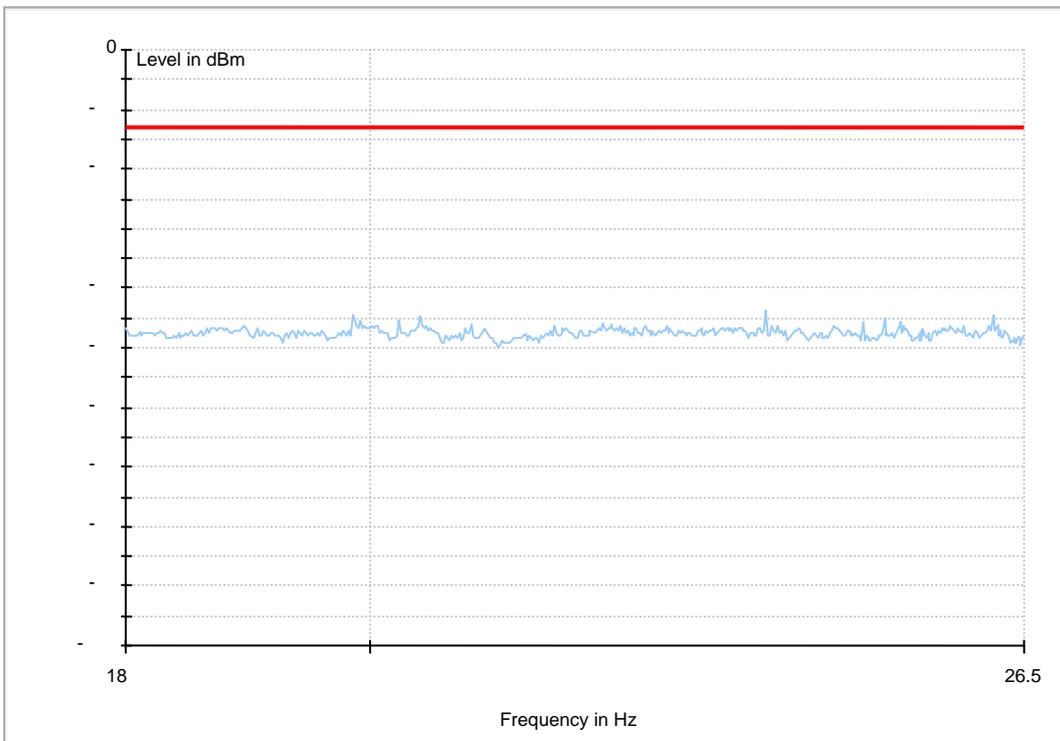
(30MHz~3GHz)



**(3GHz~18GHz)**

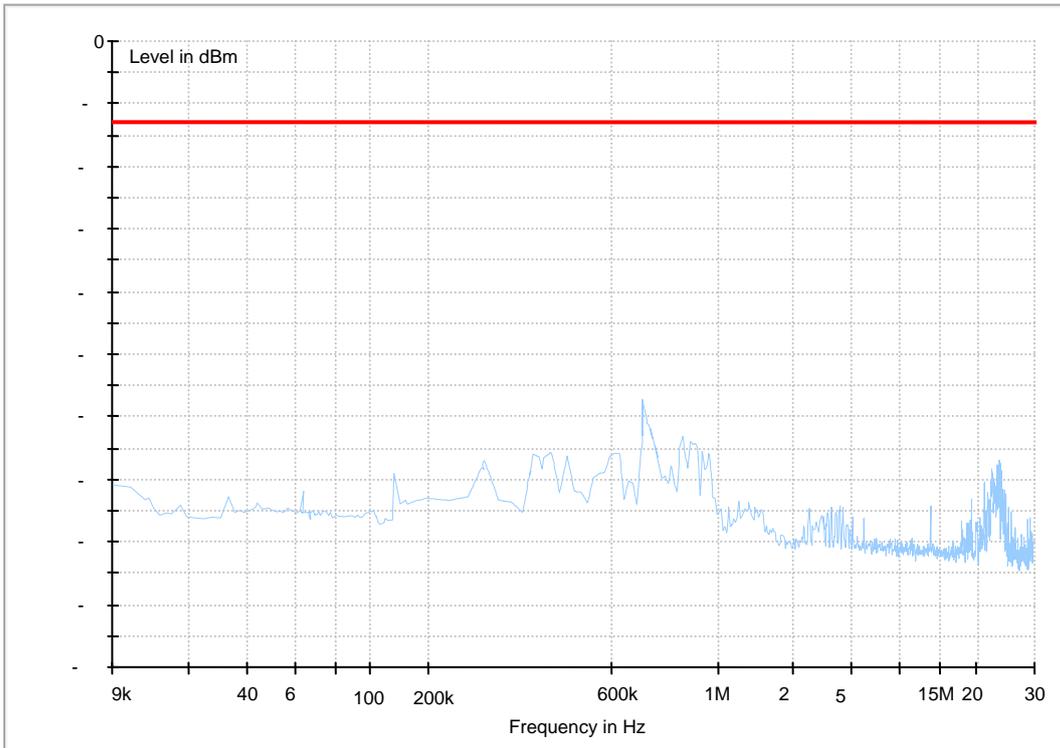


**(18GHz~26.5GHz)**

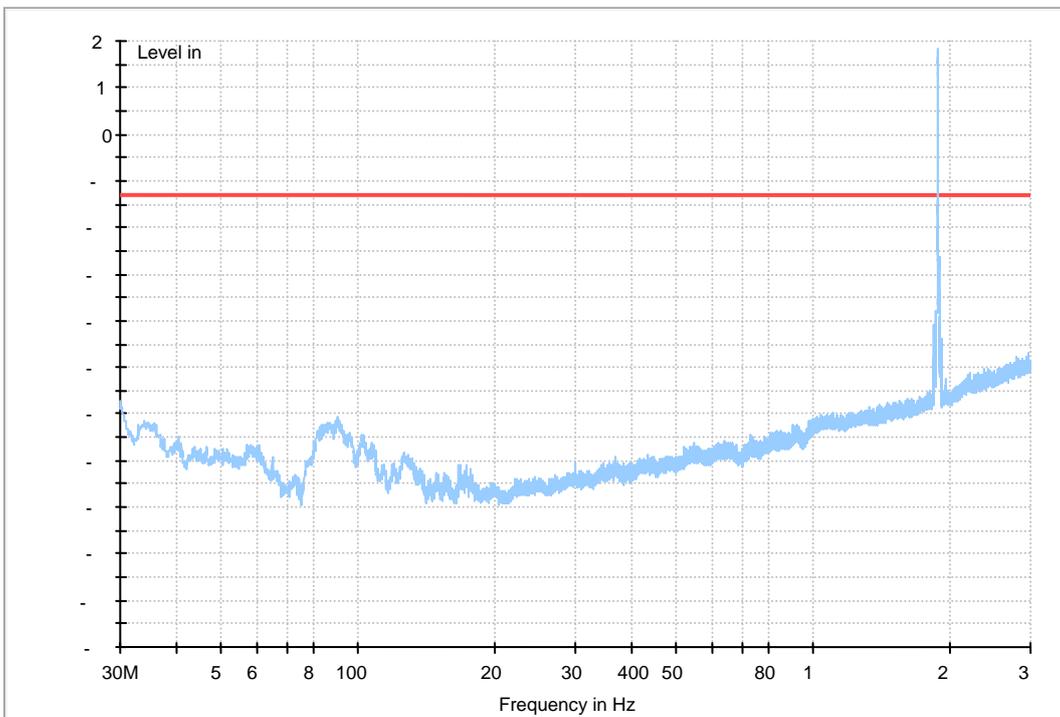


### HSDPA Band II

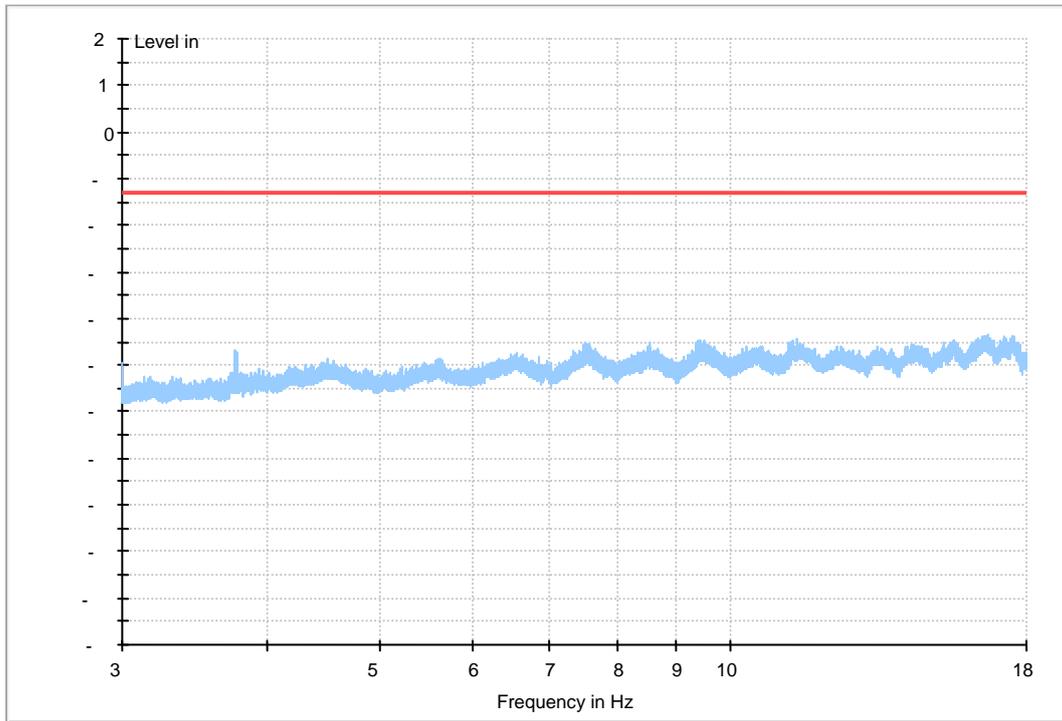
(9KHz~30MHz)



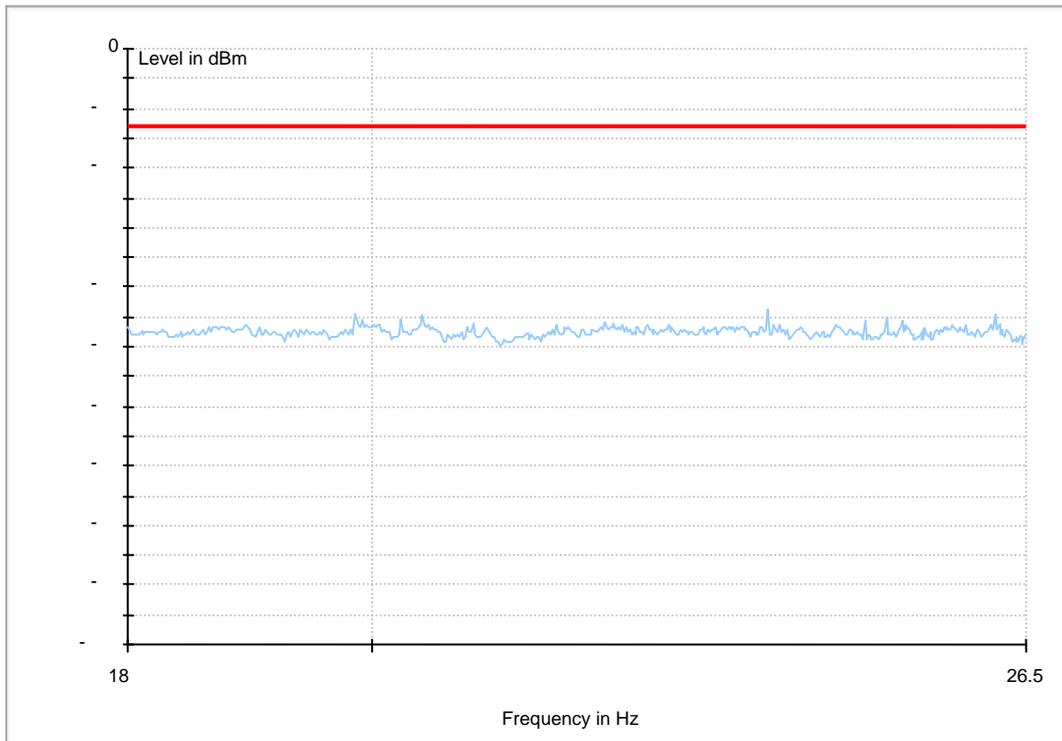
(30MHz ~3GHz)



**(3GHz~18GHz)**

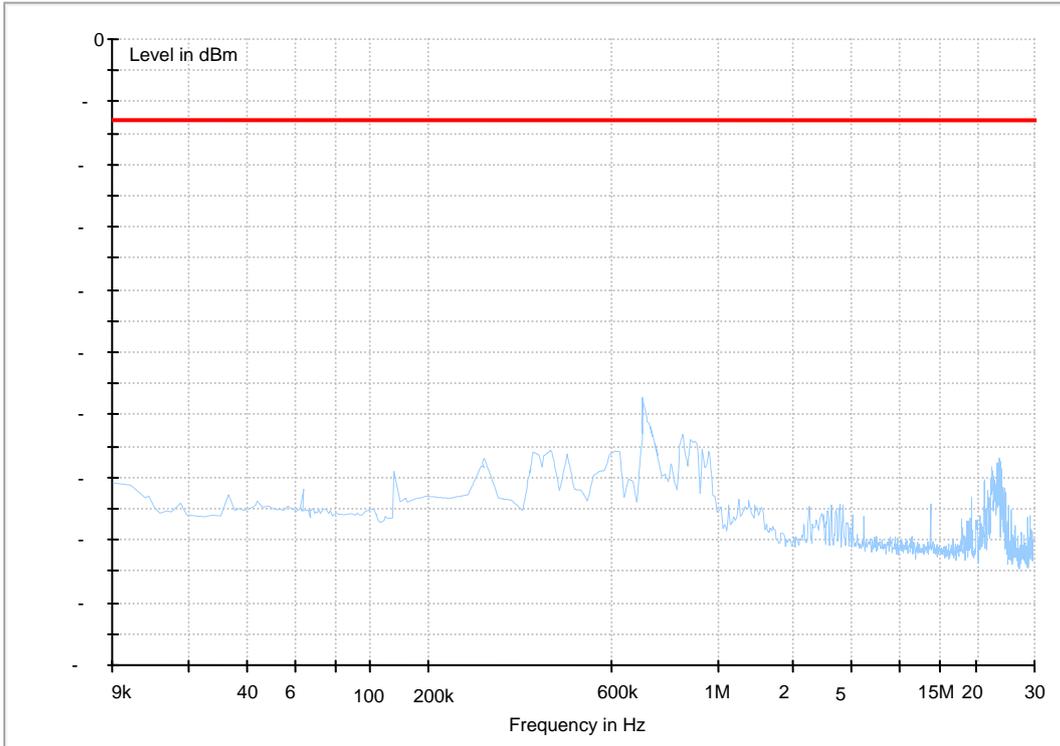


**(18GHz~26.5GHz)**

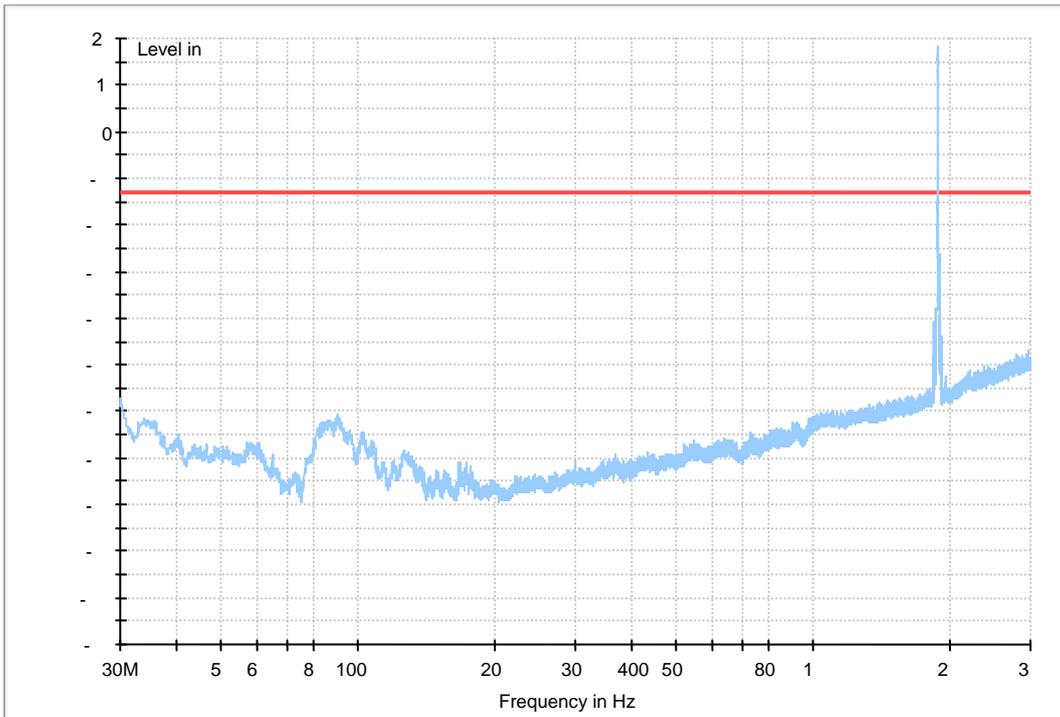


### HSUPA Band II

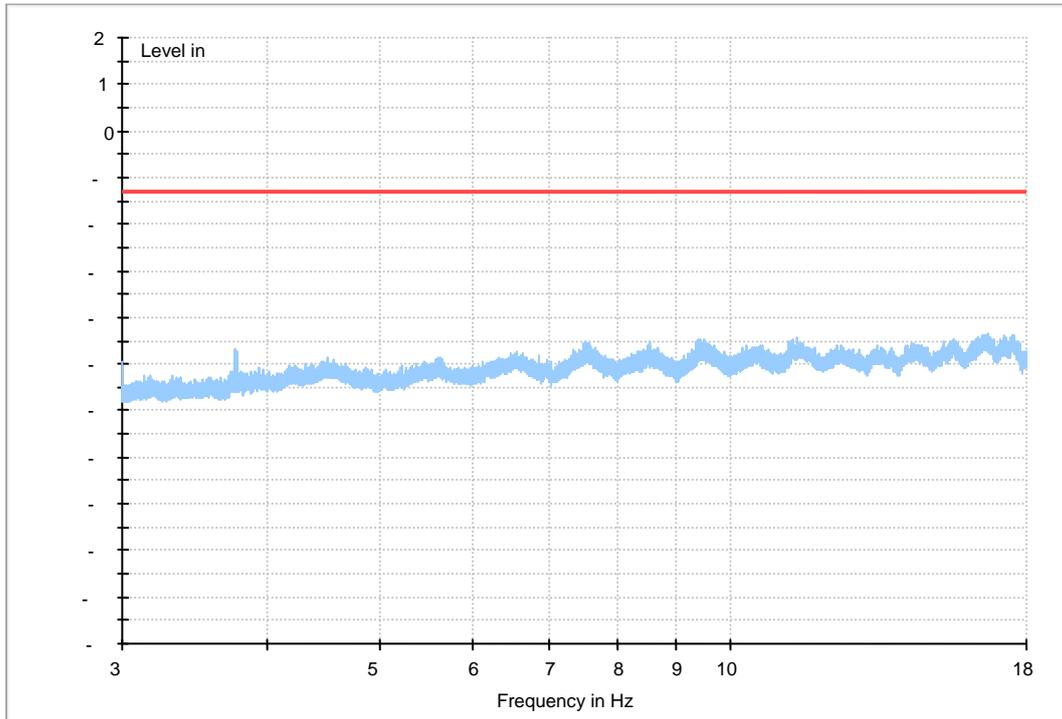
(9KHz~30MHz)



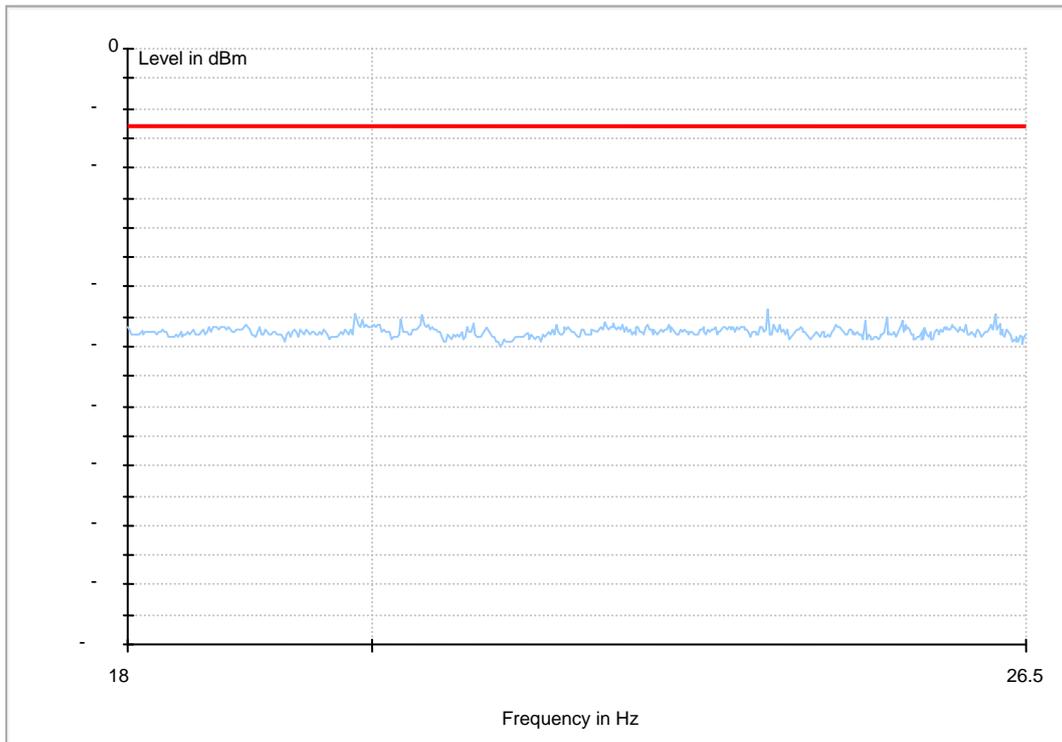
(30MHz~3GHz)



### (3GHz~18GHz)



### (18GHz~26.5GHz)





# Appendix G

## Frequency Stability According to FCC Part 2.1055& Part 24.235



## 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	-15	-0.00798	---	±2.5	Pass
			-20 °C	-24	-0.01277	---	±2.5	Pass
			-10 °C	7	0.00372	---	±2.5	Pass
			0 °C	-8	-0.00426	---	±2.5	Pass
			10 °C	-8	-0.00426	---	±2.5	Pass
			20 °C	15	0.00798	---	±2.5	Pass
			30 °C	27	0.01436	---	±2.5	Pass
			40 °C	11	0.00585	---	±2.5	Pass
			50 °C	-23	-0.01223	---	±2.5	Pass
TM 2	M	VN	-30 °C	-12	-0.00638	---	±2.5	Pass
			-20 °C	-8	-0.00426	---	±2.5	Pass
			-10 °C	24	0.01277	---	±2.5	Pass
			0 °C	-12	-0.00638	---	±2.5	Pass
			10 °C	-11	-0.00585	---	±2.5	Pass
			20 °C	-15	-0.00798	---	±2.5	Pass
			30 °C	17	0.00904	---	±2.5	Pass
			40 °C	-10	-0.00532	---	±2.5	Pass
			50 °C	16	0.00851	---	±2.5	Pass
TM 3	M	VN	-30 °C	25	0.01330	---	±2.5	Pass
			-20 °C	-24	-0.01277	---	±2.5	Pass
			-10 °C	22	0.01170	---	±2.5	Pass
			0 °C	-19	-0.01011	---	±2.5	Pass
			10 °C	-25	-0.01330	---	±2.5	Pass
			20 °C	-7	-0.00372	---	±2.5	Pass
			30 °C	-21	-0.01117	---	±2.5	Pass
			40 °C	13	0.00691	---	±2.5	Pass
			50 °C	-8	-0.00426	---	±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	25	0.01330	---	±2.5	Pass
			VN	7	0.00372	---	±2.5	Pass
			VH	-18	-0.00957	---	±2.5	Pass
TM 2	M	TN	VL	14	0.00745	---	±2.5	Pass
			VN	9	0.00479	---	±2.5	Pass
			VH	27	0.01436	---	±2.5	Pass
TM 3	M	TN	VL	27	0.01436	---	±2.5	Pass
			VN	-17	-0.00904	---	±2.5	Pass
			VH	26	0.01383	---	±2.5	Pass

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