



# FCC RF Test Report

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

**Model Number: U5120-53**

**Report No: SYBH(Z-RF)012062012-2002  
FCC ID: QISU5120-53**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R. China

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## Notice

1. The laboratory has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L0310.
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.
4. The test report is invalid if not marked with "exclusive stamp for the test report".
5. The test report is invalid if not marked with the stamps or the signatures of the persons responsible for performing, revising and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. If there is any dissidence for the test report, please file objection to the test centre within 15 days from the date of receiving the test report.
8. Normally, the test report is only responsible for the samples that have undergone the test.
9. Context of the test report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of the laboratory.



**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Huawei Base, Bantian, Longgang District, Shenzhen  
 518129, P.R. China  
**Date of Receipt Test Item:** Jun, 04, 2012  
**Start Date of Test:** Jun, 05, 2012  
**End Date of Test:** Jun, 15, 2012  
  
**Test Result:** Pass

Approved By Senior Engineer Jun,18,2012 Dai Linjun *Dai Linjun*  
 Date Name Signature

Reviewed By Jun,18,2012 Cousy Xu *Cousy XU*  
 Date Name Signature

Operator Jun,18,2012 Huang Qiuliang *Huang Qiuliang*  
 Date Name Signature

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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 24:2011, Subpart E  
ANSI/TIA 603C

## 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 Environment Condition

Ambient Temperature: 20 – 25 °C  
Ambient Relative Humidity: 45 – 55 %  
Atmospheric Pressure: 101 kPa

## 2 Test Summary

PCS Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 24.232	Peak EIRP not exceed 2 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(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 Production Information

#### 3.1.1 General Description

HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth U5120-53 is subscriber equipment in the WCDMA/GSM system. The UMTS frequency band includes Band II, and the test data included in this report. The GSM/GPRS/EDGE frequency band includes GSM850 & PCS1900, and the PCS1900 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, UMTS and GSM/GPRS/EDGE protocol processing, voice, MMS service, SMS, music player, camera, FM etc. 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

Table 1 Board Information

HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth		
U5120-53		
Board and Module		
Description	Software Version	Hardware Version
Main board of Mobile Phone	U5120C32B109	Ver.C

#### 3.1.3 Sub-Assembly

AC/DCAdapter Model	HS-050040U6(02130973)
Manufacturer	HUAWEI
Input Voltage	~ 100-240V 50/60Hz
Output Voltage	≡ 5.0 V 400mA
Rated Power	2W

#### 3.1.4 Battery Technical Data

Battery Model:	HB5D1(24021043)
Rated capacity:	800 mAh
Nominal Voltage:	≡ 3.7 V
Charging Voltage:	≡ 4.2 V

## 3.2 Test Description

### 3.2.1 Supported Frequency Range

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

### 3.2.2 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), 250KG7W (8PSK modulation) UMTS system: 4M17F9W

### 3.2.3 Antenna Gain

Antenna Gain(dBi):	-3.30
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### 3.2.4 Power Supply

	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to Adapter (DC power)	DC Voltage Nominal: $\pm$ +3.7V DC Voltage Range: $\pm$ +3.5 V to +4.2V

## 4 General Test Conditions / Configurations

### 4.1 RF Channels under Test

Test Mode	TX / RX	RF Channel		
		Bottom (B)	Middle (M)	Top (T)
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	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

### 4.2 Test Modes

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

### 4.3 Test Environments

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.5V
	VN	3.7V
	VH	4.2V

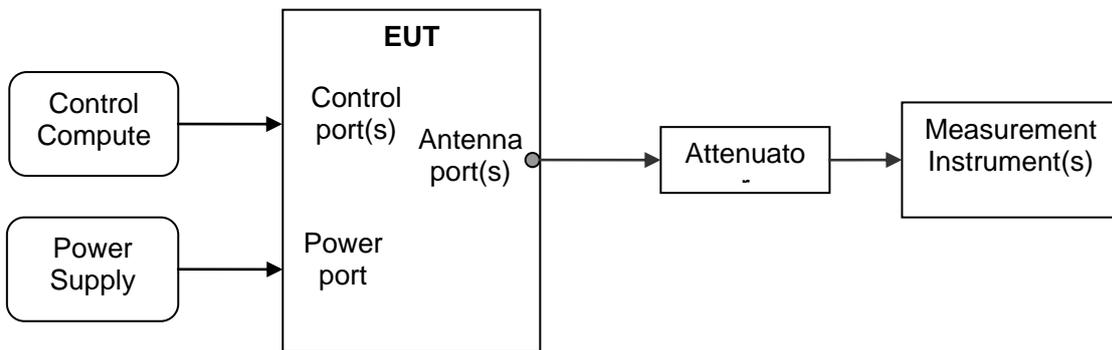
NOTE: VL= lower extreme test voltages  
 VN= nominal voltage  
 VH= upper extreme test voltage  
 TN= nominal temperature

## 4.4 Test Setups

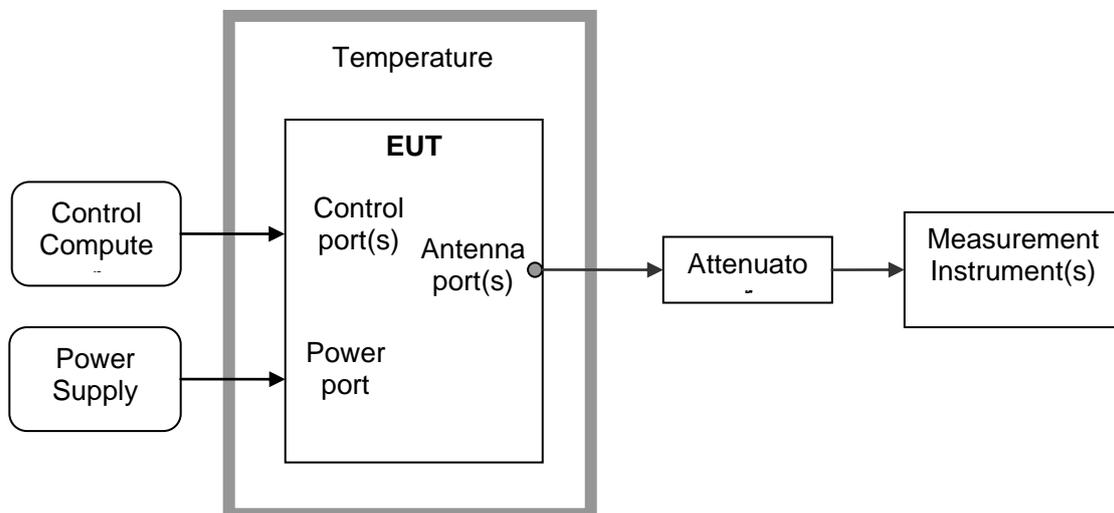
### 4.4.1 General Test Setup Configurations

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.

### 4.4.2 Test Setup 1



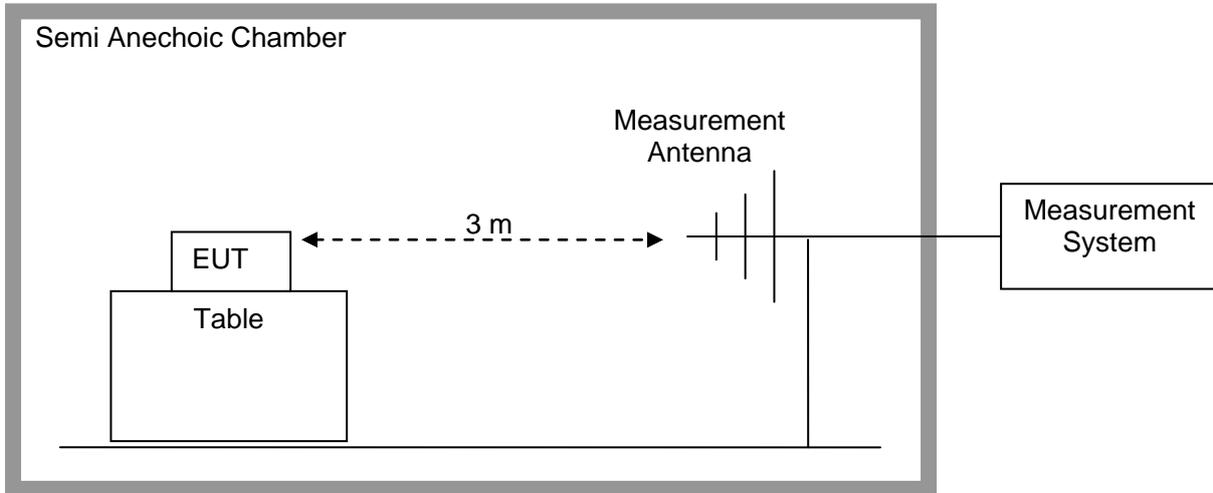
### 4.4.3 Test Setup 2



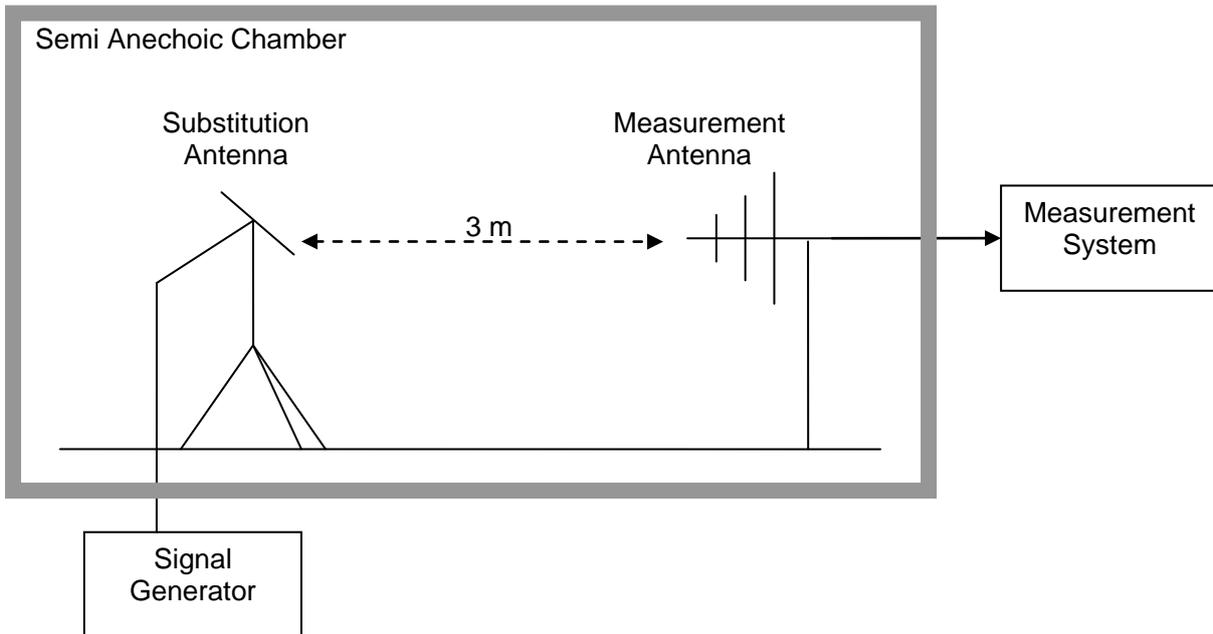
#### 4.4.4 Test Setup 3

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

##### Step 1: Pre-test



##### Step 2: Substitution method to verify the maximum EIRP



## 4.5 Test Conditions

Test Case	Test Conditions	
Transmitter Output Power	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1/ Setup 3
	Detector	RMS
	RF Channels (TX)	B, M, T
	Test Mode	TM1/TM2/TM3/TM4
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)	B, M, T
	Test Mode	TM1/TM2/TM3
Band Edges Compliance	Test Configuration	Ambient Temperature & Rated Voltage
	Test Setup	Test Setup 1
	Detector	RMS
	RF Channels (TX)	B, T
	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)	B, M, T
	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
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



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Test Case	Test Conditions	
	RF Channels (TX)	M
	Test Mode	TM1/TM2/TM3

## 5 Main Test Instruments

Table 2 Main Test Equipments

Equipment Description	Manufacturer	Model	Serial Number	Calibrated until
Power supply	KEITHLEY	2303	1288003	Sep.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	MY48250119	Jul.17,2012
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.09.2012
Test receiver	R&S	ESU26	100150	May.29.2013
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	919/1009	Jan.29.2013
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Jan.29.2013
Horn Antenna	R & S	HF906	100683	May.15, 2013
Horn Antenna	R & S	HF906	100684	Jul.01, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.15, 2013
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.15, 2013

## 6 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	Radiated spurious emission	Appendix F
7	Frequency Stability	Appendix G
8	Photos of Radiated Spurious Emissions	Appendix H

NOTE: The Appendix H only photos of Field Strength of Spurious Radiation, no test data.

## 7 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 & Part24.232



## Conducted Power of Transmitter

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel512(L)		Channel661(M)		Channel810(H)	
		1850.2MHz		1880.0MHz		1909.8MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM1		29.81	33	29.88	33	29.73	33
TM2		25.55	33	25.65	33	25.50	33
TEST CONDITIONS		Channel9262(L)		Channel9400(M)		Channel9538(H)	
		1852.4MHz		1880.0MHz		1907.6MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM3		22.22	33	22.03	33	22.12	33
TM4	Case1	22.21	33	22.07	33	22.12	33
	Case2	21.81	33	21.75	33	21.73	33
	Case3	20.95	33	20.78	33	20.81	33
	Case4	19.91	33	19.73	33	19.76	33



## Peak-to-Average Ratio

Table 1 Measurement Results

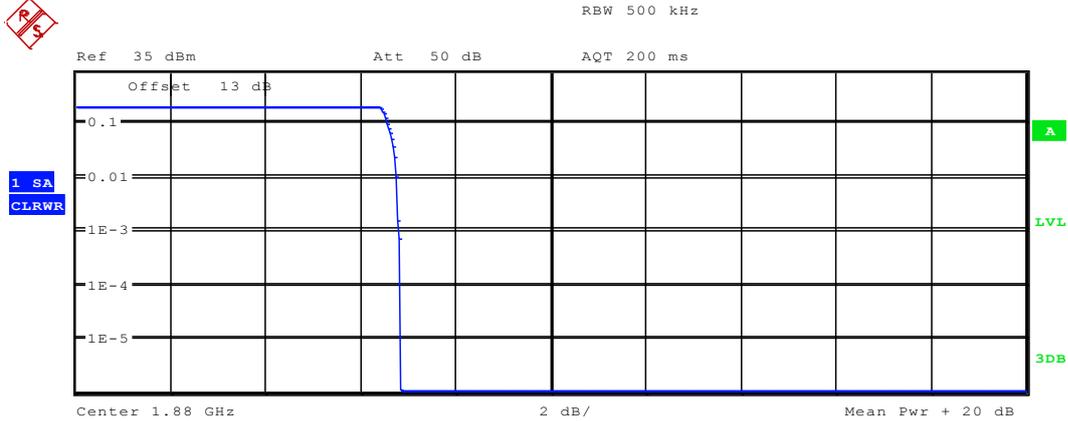
TEST CONDITIONS		Channel512(B)		Channel661(M)		Channel810(T)	
		1850.2MHz		1880.0MHz		1909.8MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM1		5.96	13.0	<b>6.83</b>	13.0	6.57	13.0
TM2		12.67	13.0	12.59	13.0	<b>12.76</b>	13.0
TEST CONDITIONS		Channel9262(B)		Channel9400(M)		Channel9538(T)	
		1852.4MHz		1880.0MHz		1907.6MHz	
		dBm		dBm		dBm	
$T_{nom} / V_{nom}$		Measured	Limit	Measured	Limit	Measured	Limit
TM3		3.12	13.0	<b>3.27</b>	13.0	3.24	13.0
TM4	Case1	3.13	13.0	3.11	13.0	2.79	13.0
	Case2	2.84	13.0	2.91	13.0	2.94	13.0
	Case3	2.72	13.0	2.83	13.0	2.92	13.0
	Case4	2.95	13.0	2.71	13.0	2.86	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



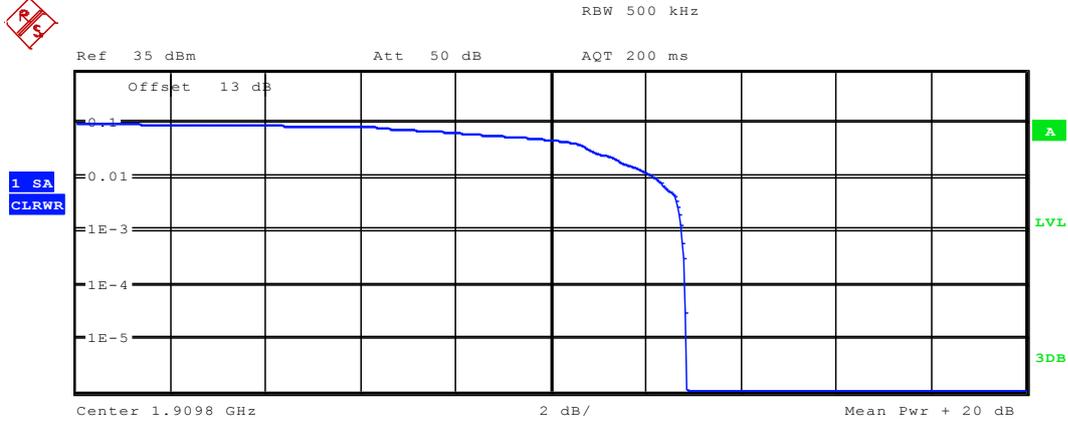
Complementary Cumulative Distribution Function  
NOF samples: 100000, Usable BW: 424kHz

Trace 1	
Mean	22.53 dBm
Peak	29.37 dBm
Crest	6.84 dB
10 %	6.57 dB
1 %	6.76 dB
.1 %	6.83 dB
.01 %	6.86 dB

Date: 14.JUN.2012 17:07:25



## TM2



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

Trace 1	
Mean	15.55 dBm
Peak	28.38 dBm
Crest	12.84 dB
10 %	2.60 dB
1 %	12.18 dB
.1 %	12.76 dB
.01 %	12.85 dB

Date: 14.JUN.2012 17:11:18

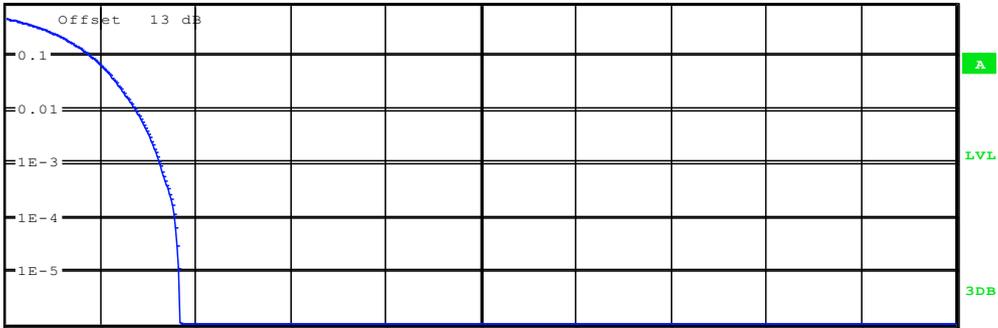


### TM3/TM4



RBW 5 MHz

Ref 35 dBm      Att 50 dB      AQT 12.5 ms



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

Trace 1	
Mean	21.40 dBm
Peak	25.07 dBm
Crest	3.67 dB
10 %	1.83 dB
1 %	2.76 dB
.1 %	3.27 dB
.01 %	3.56 dB

Date: 14.JUN.2012 17:23:37



### Effective Isotropic Radiated Power of Transmitter (EIRP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP)	FCC limit [dBm]	Result
							[dBm]		
TM1	1850.2	26.51	Horn Ant.	23.05	4.5	1	26.55	33	Pass
TM1	1880.0	26.58	Horn Ant.	23.04	4.5	1	26.54	33	Pass
TM1	1909.8	26.43	Horn Ant.	22.67	4.8	1	26.47	33	Pass
TM2	1850.2	22.25	Horn Ant.	18.72	4.5	1	22.22	33	Pass
TM2	1880.0	22.35	Horn Ant.	18.89	4.5	1	22.39	33	Pass
TM2	1909.8	22.20	Horn Ant.	18.43	4.8	1	22.23	33	Pass
TM3	1852.4	18.92	Horn Ant.	15.47	4.5	1	18.97	33	Pass
TM3	1880.0	18.73	Horn Ant.	15.27	4.5	1	18.77	33	Pass
TM3	1907.6	18.82	Horn Ant.	15.09	4.8	1	18.89	33	Pass

Note: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken 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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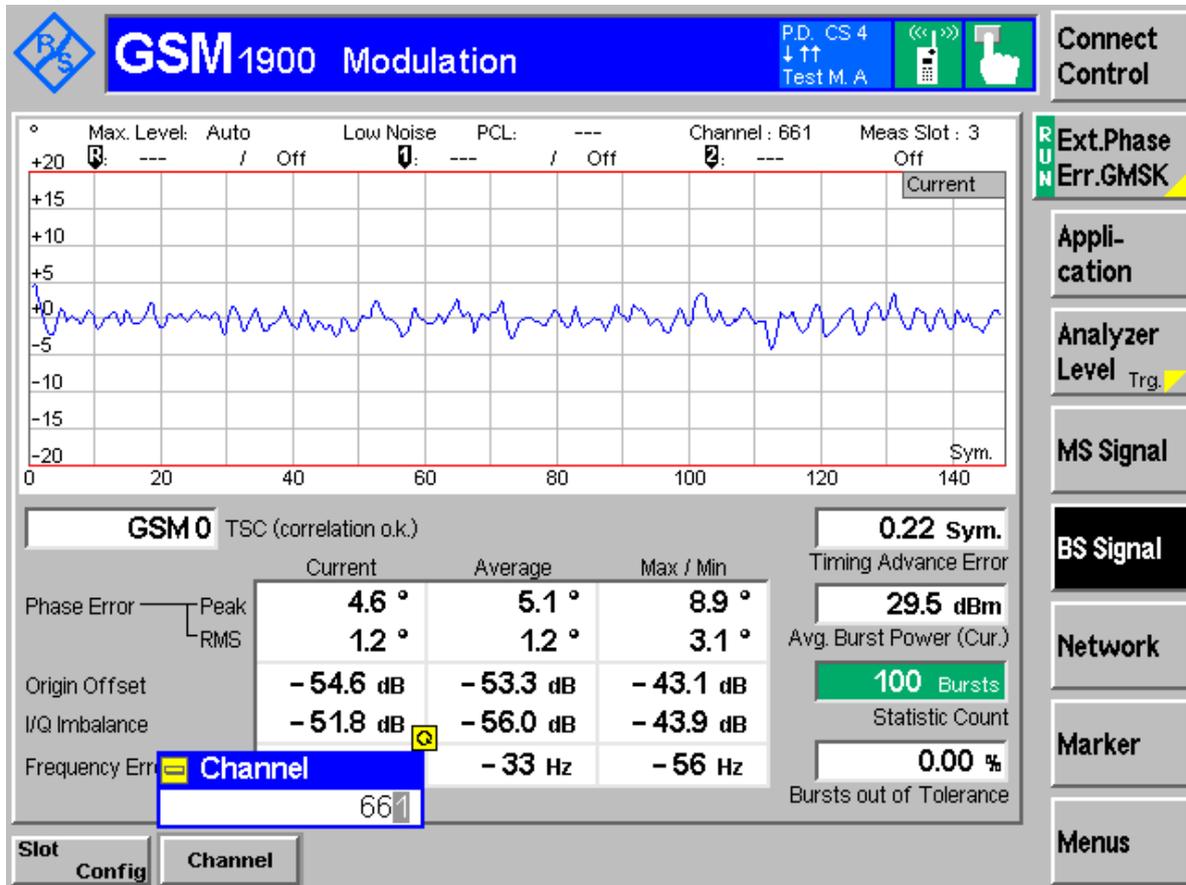
## **Appendix B**

# Modulation Characteristics

According to FCC Part 2.1047 & Part24 Subpart E

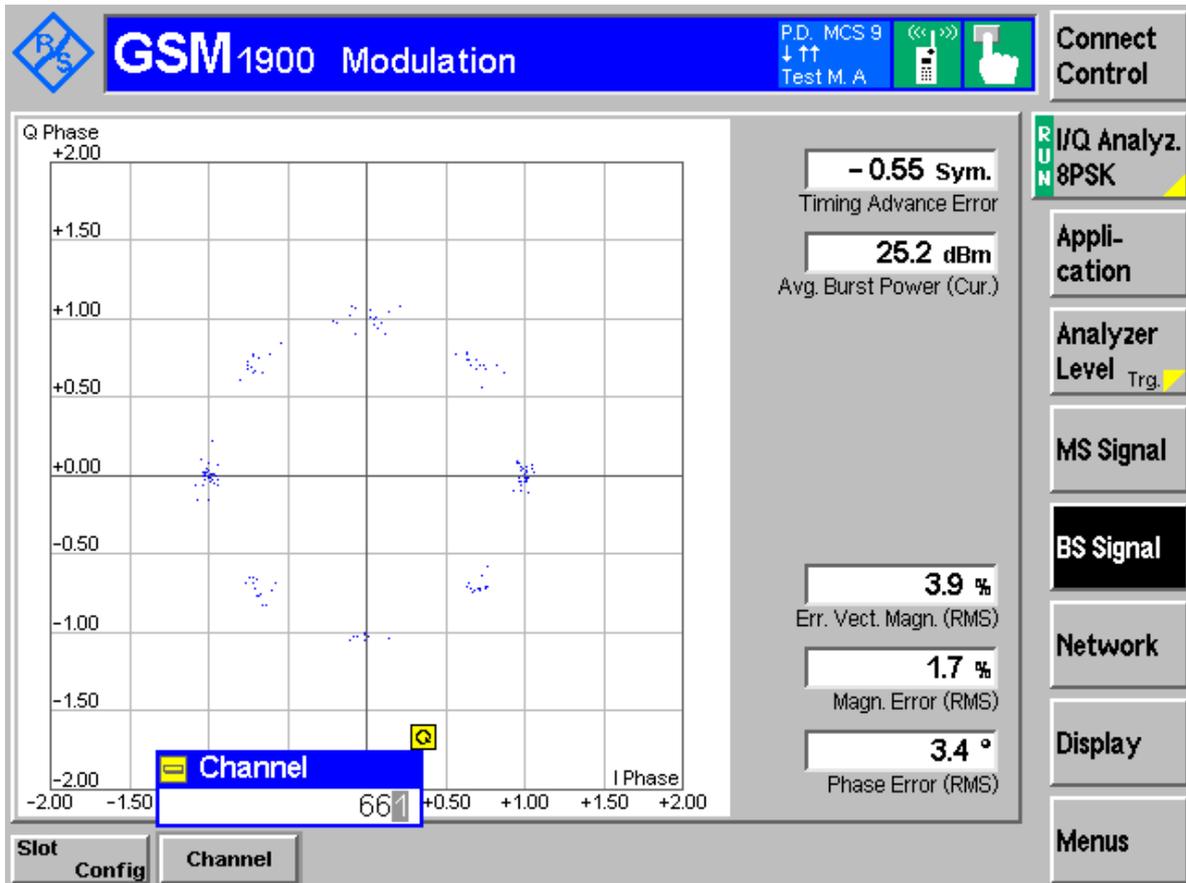


## TM1:GPRS/GSM Channel 661



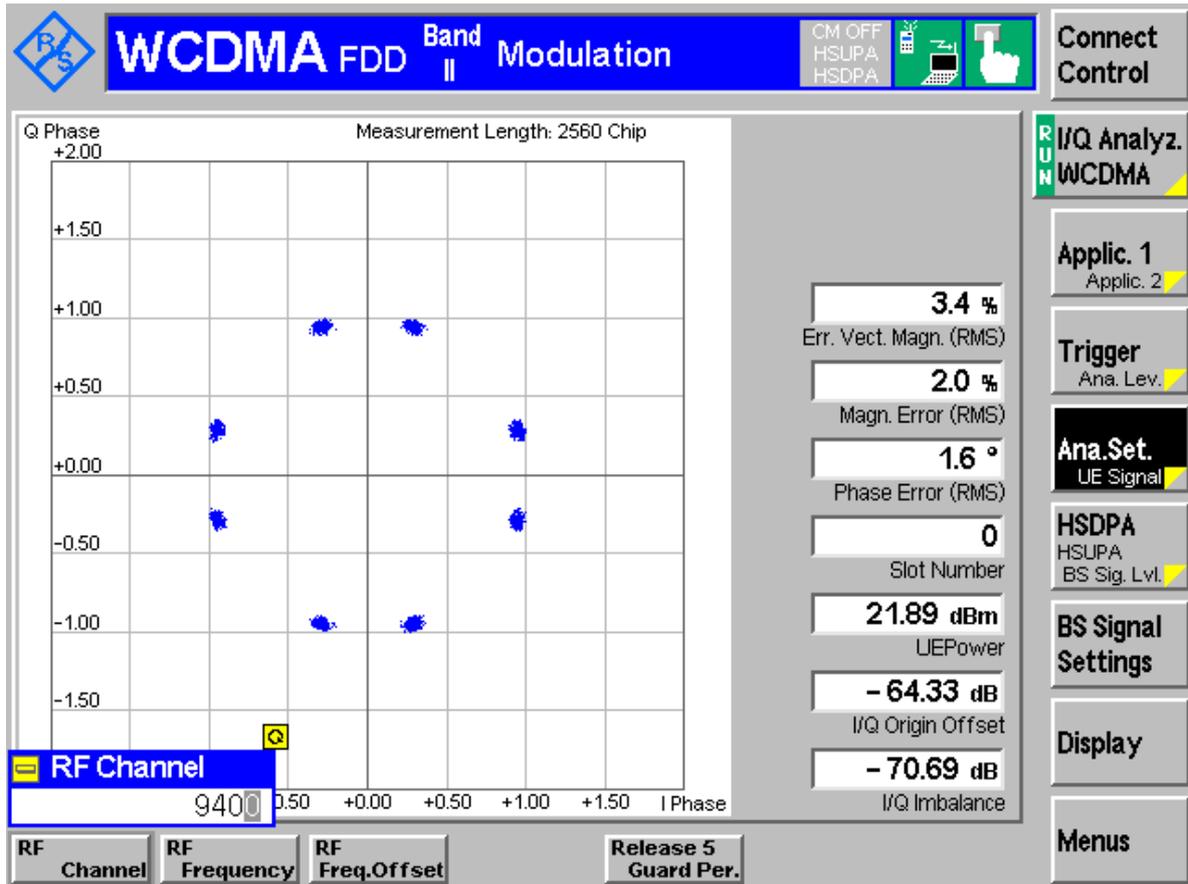


# TM2:EDGE Channel 661





## TM3: WCDMA Channel 9400



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# Appendix C

## Occupied Bandwidth According to FCC Part 2.1049 & Part 24 Subpart E



Table 1 Measurement Results

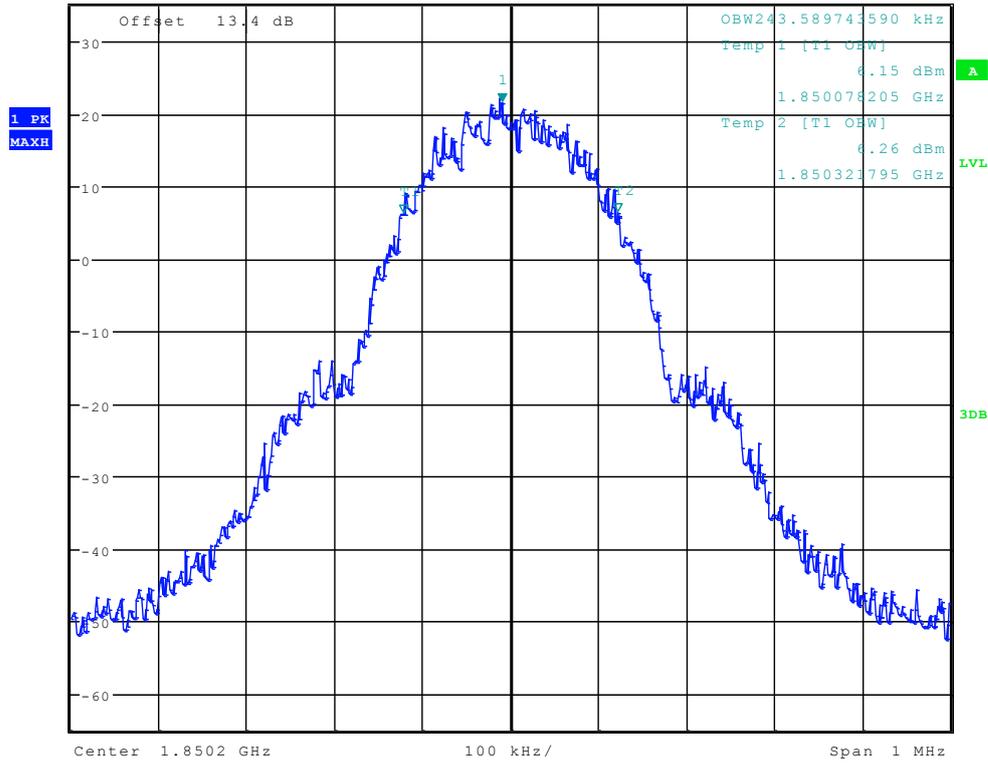
Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	512	243.59	Pass
	661	243.59	Pass
	810	246.79	Pass
TM2	512	250.00	Pass
	661	245.19	Pass
	810	246.79	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	9262	4.15	Pass
	9400	4.17	Pass
	9538	4.15	Pass



# TM1:GPRS/GSM Channel 512



Ref 35 dBm Att 30 dB SWT 115 ms  
 \*RBW 3 kHz Marker 1 [T1] 21.51 dBm  
 \*VBW 10 kHz 1.850190385 GHz



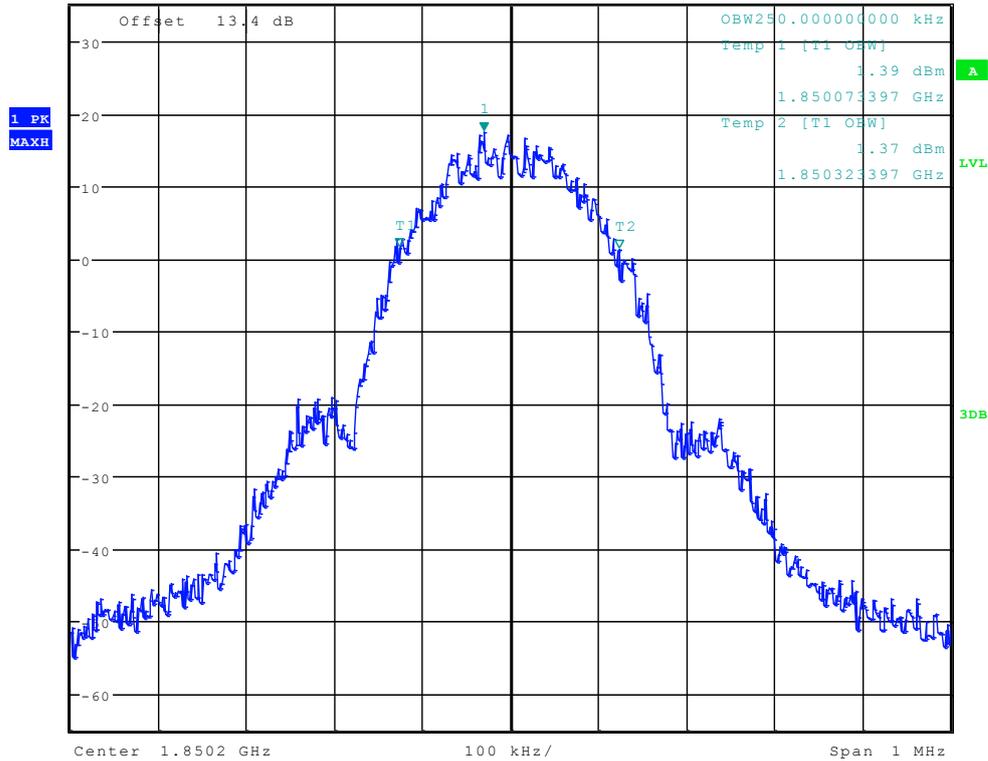
Date: 5.JUN.2012 15:37:36



# TM2:EDGE Channel 512



\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      17.45 dBm  
 Ref 35 dBm      Att 30 dB      SWT 115 ms      1.850169551 GHz



Date: 5.JUN.2012 15:43:45



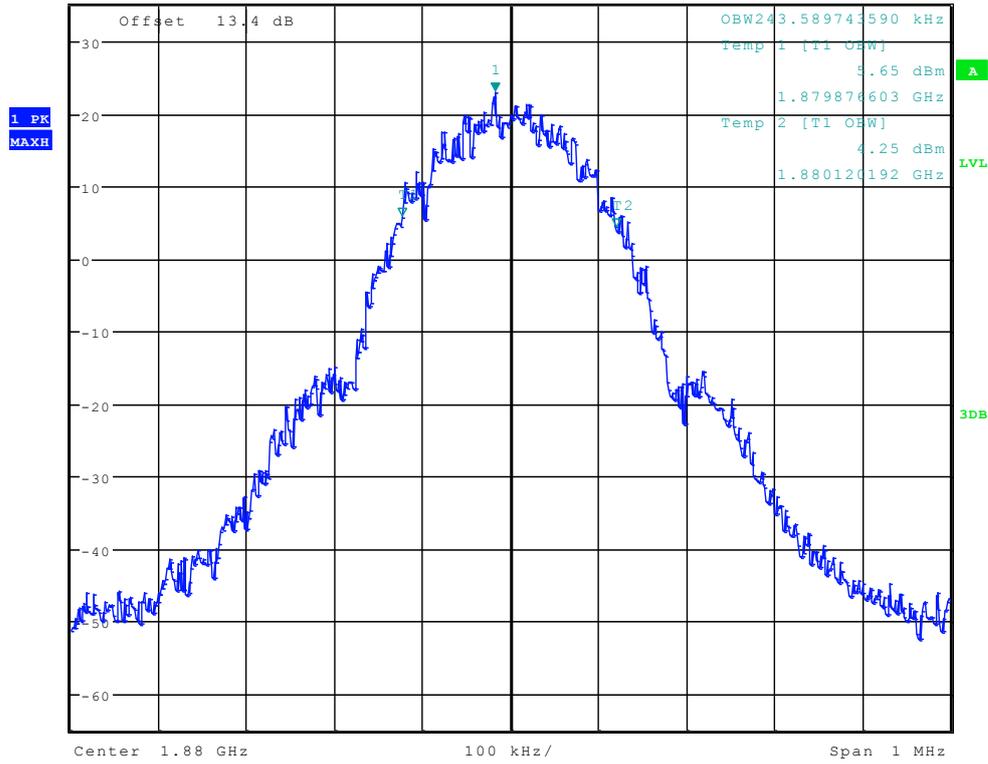


# TM1:GPRS/GSM Channel 661



Ref 35 dBm Att 30 dB SWT 115 ms

\*RBW 3 kHz Marker 1 [T1 ]  
\*VBW 10 kHz 22.94 dBm  
1.879982372 GHz



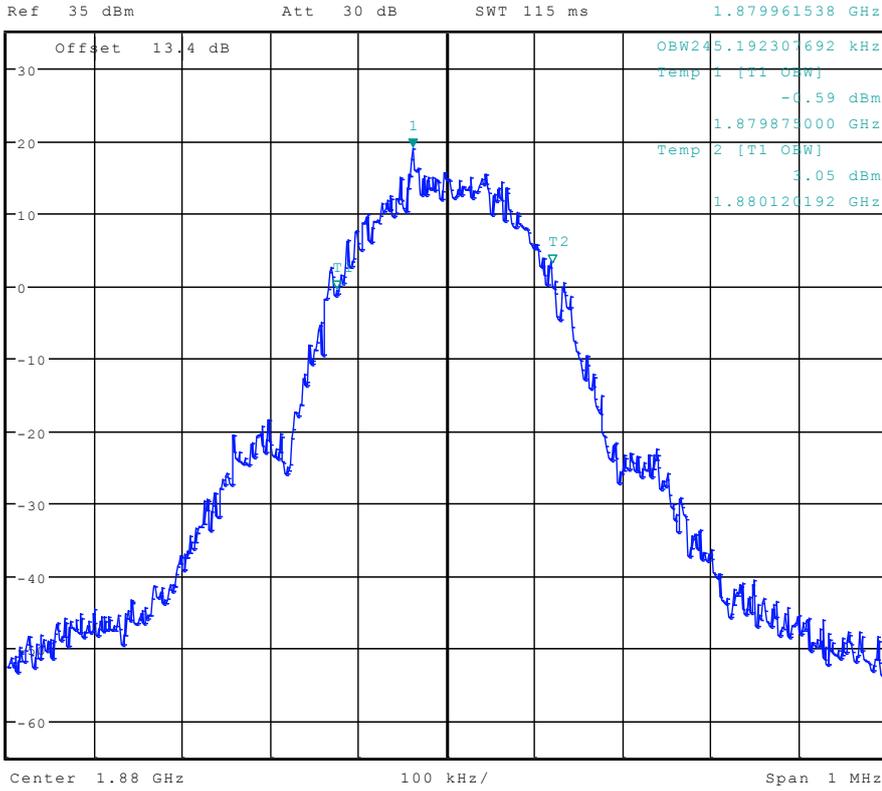
Date: 5.JUN.2012 15:37:49



# TM2:EDGE Channel 661



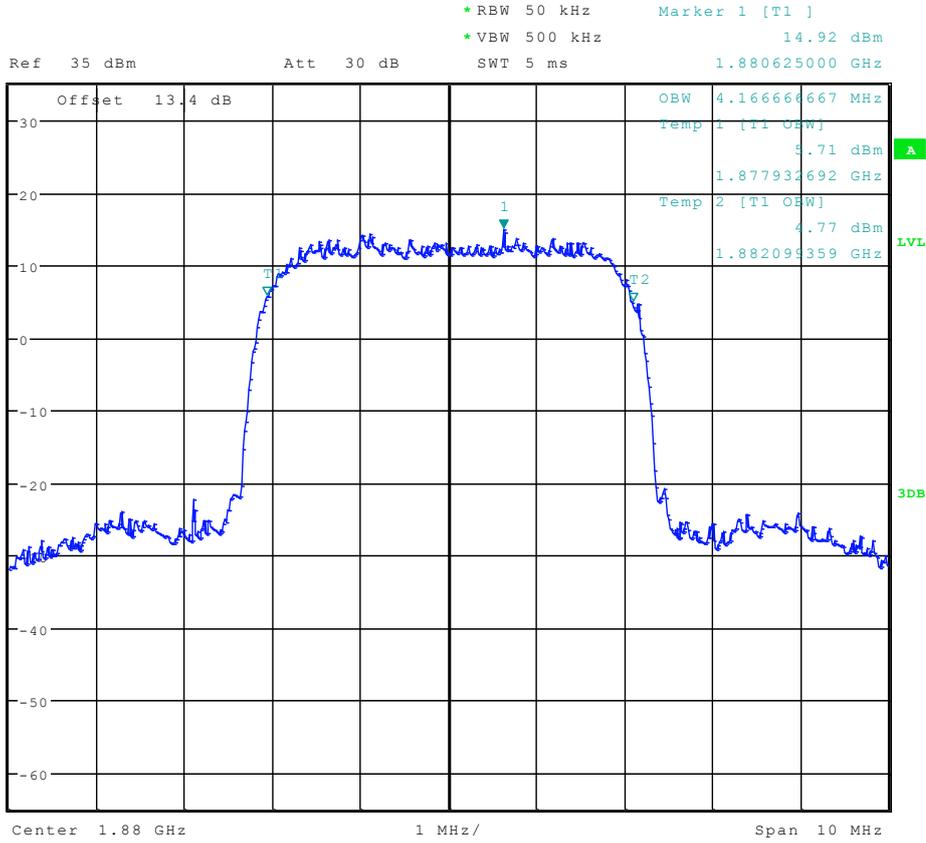
\*RBW 3 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      19.03 dBm  
SWT 115 ms      1.879961538 GHz



Date: 5.JUN.2012 15:43:59



## TM3: WCDMA Channel 9400



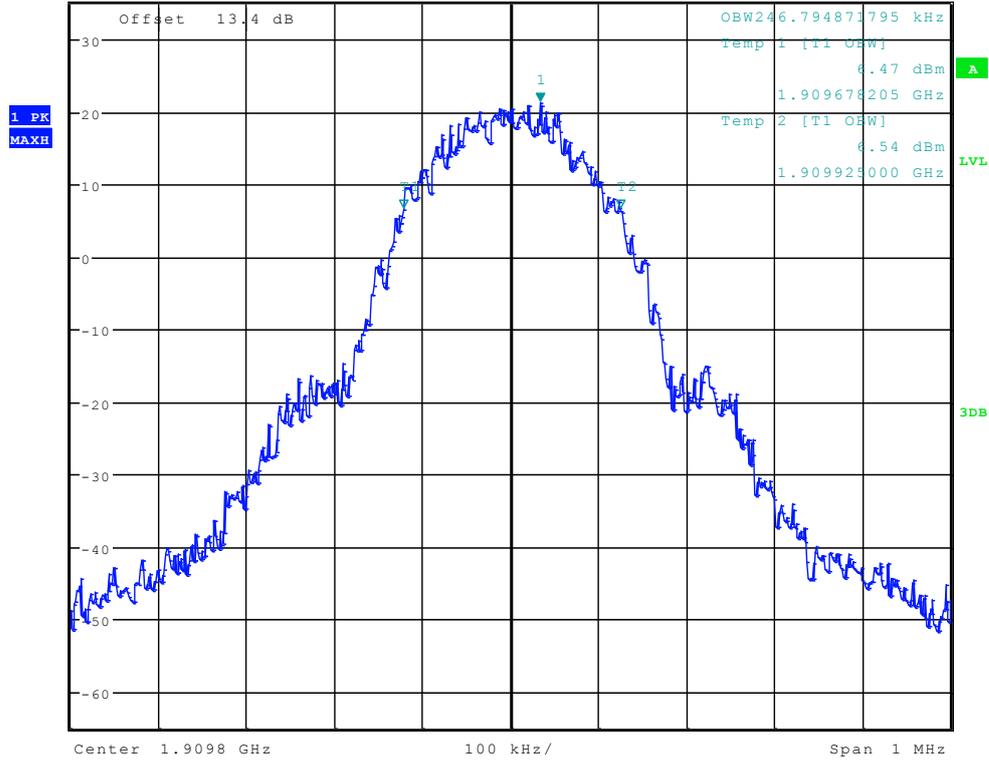
Date: 5.JUN.2012 15:28:45



# TM1:GPRS/GSM Channel 810



\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 10 kHz      21.21 dBm  
 Ref 35 dBm      Att 30 dB      SWT 115 ms      1.909833654 GHz



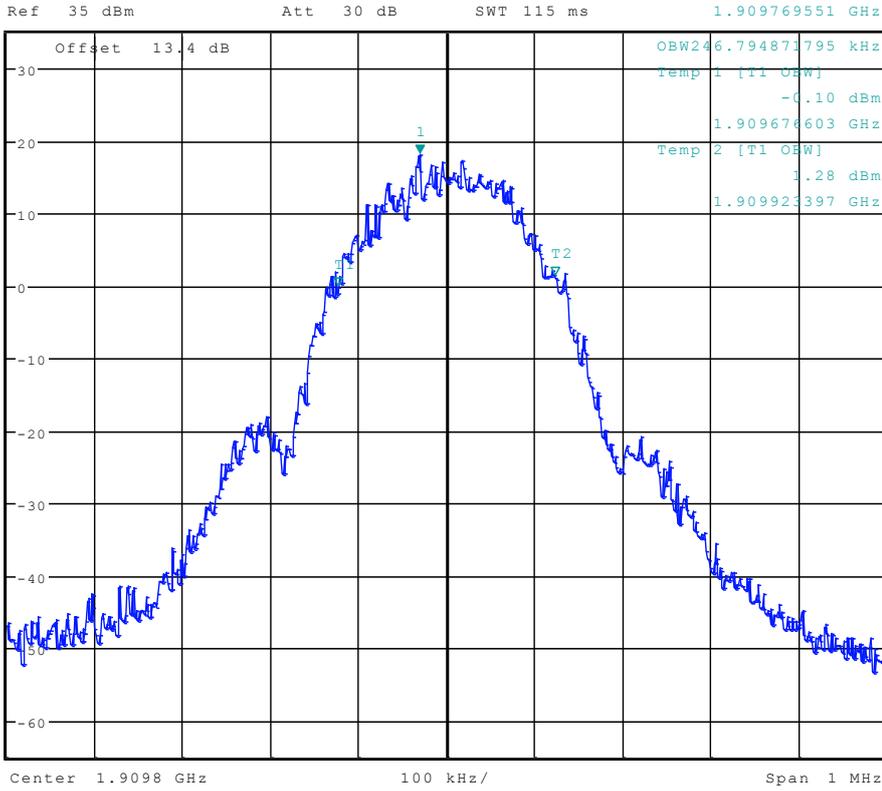
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# TM2:EDGE Channel 810



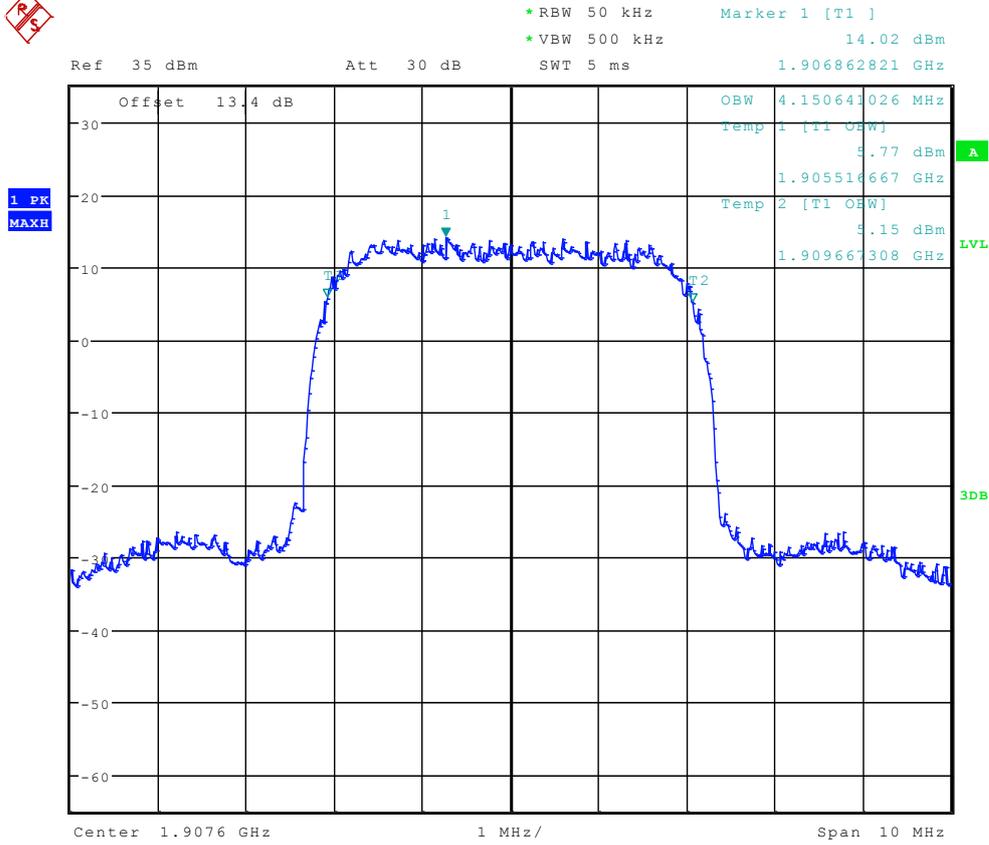
\*RBW 3 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      18.01 dBm  
SWT 115 ms      1.909769551 GHz



Date: 5.JUN.2012 15:44:13



## TM3: WCDMA Channel 9538



Date: 5.JUN.2012 15:28:58

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# Appendix D

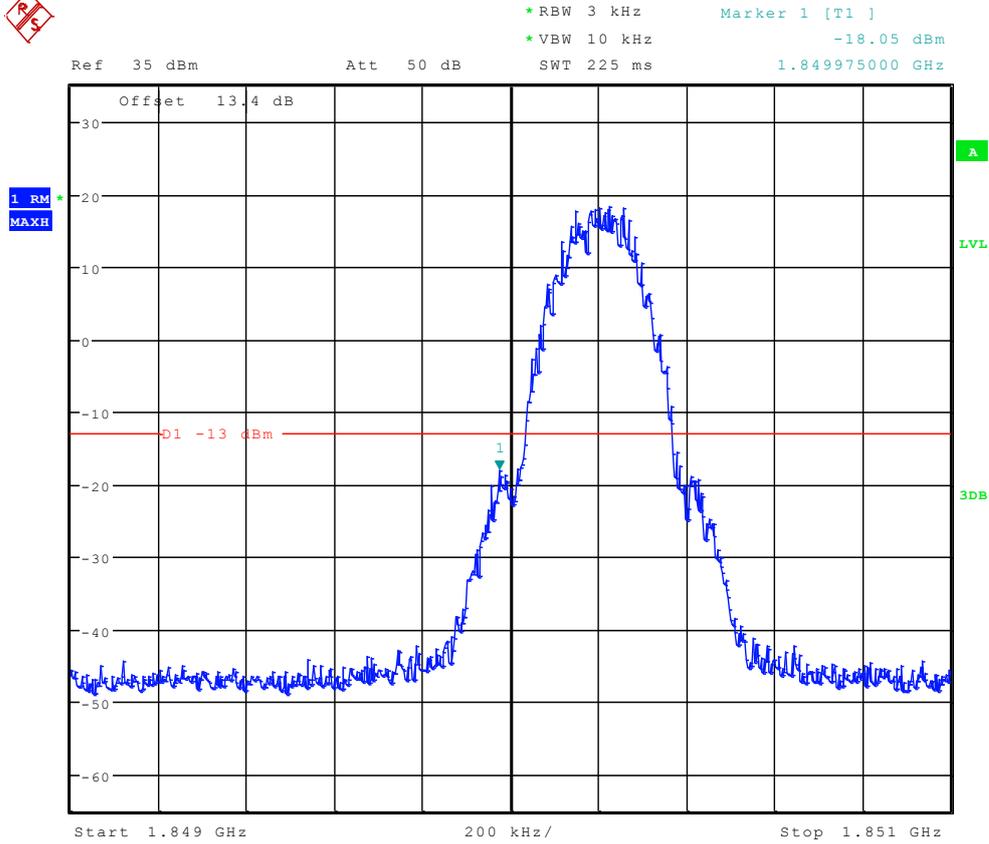
## Band Edges Compliance According to FCC Part 2.1051 & 24.238



# TM1:GPRS/GSM

## Left Edge

### Channel 512



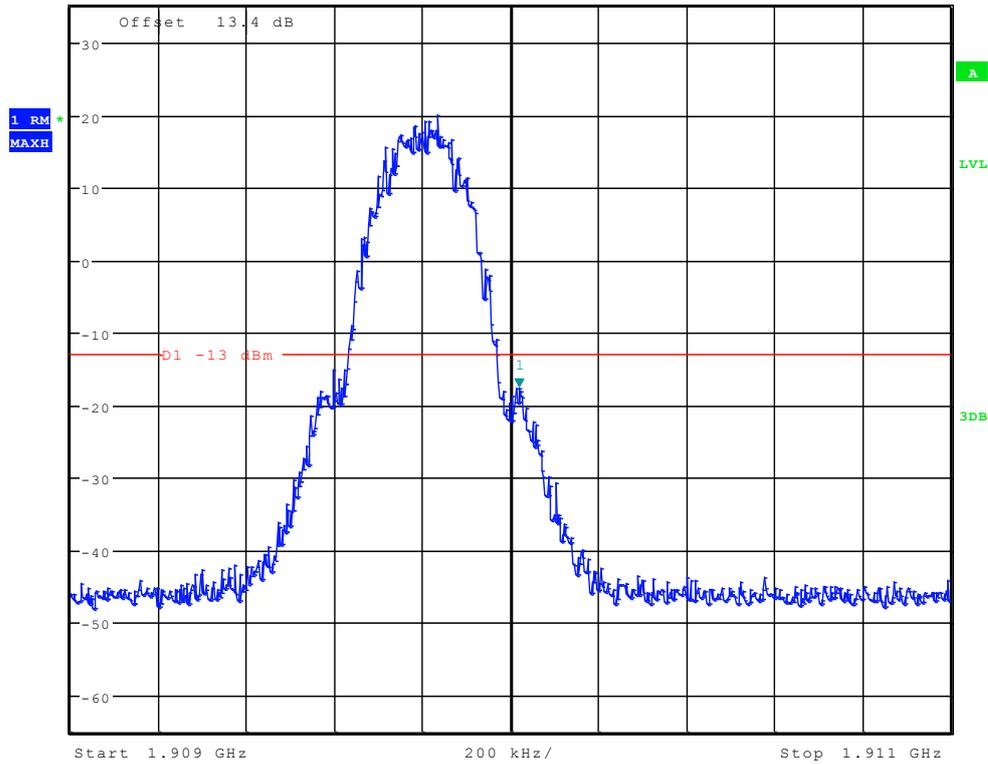
Date: 5.JUN.2012 15:40:35



## Right Edge Channel 810



Ref 35 dBm      Att 50 dB      RBW 3 kHz      Marker 1 [T1]      -17.64 dBm  
\* VBW 10 kHz      SWT 225 ms      1.910020000 GHz



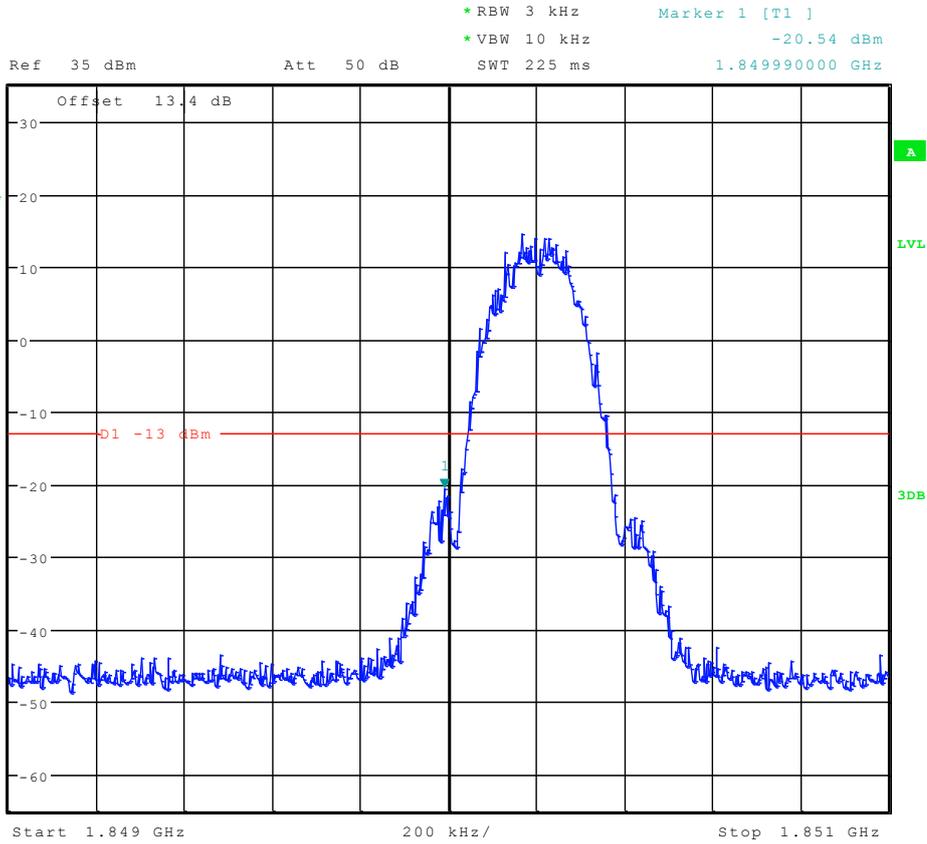
Date: 5.JUN.2012 15:41:14



# TM2:EDGE

## Left Edge

### Channel 512



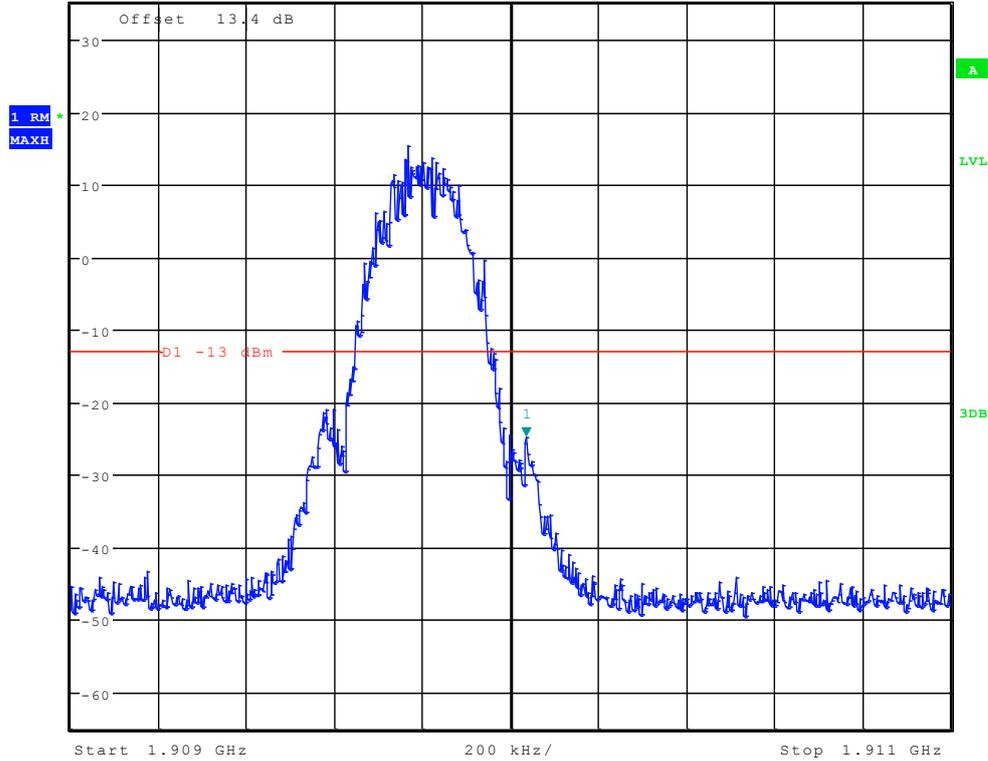
Date: 5.JUN.2012 15:47:10



## Right Edge Channel 810



Ref 35 dBm      Att 50 dB      RBW 3 kHz      Marker 1 [T1]      -24.76 dBm  
SWT 225 ms      1.910035000 GHz  
VBW 10 kHz



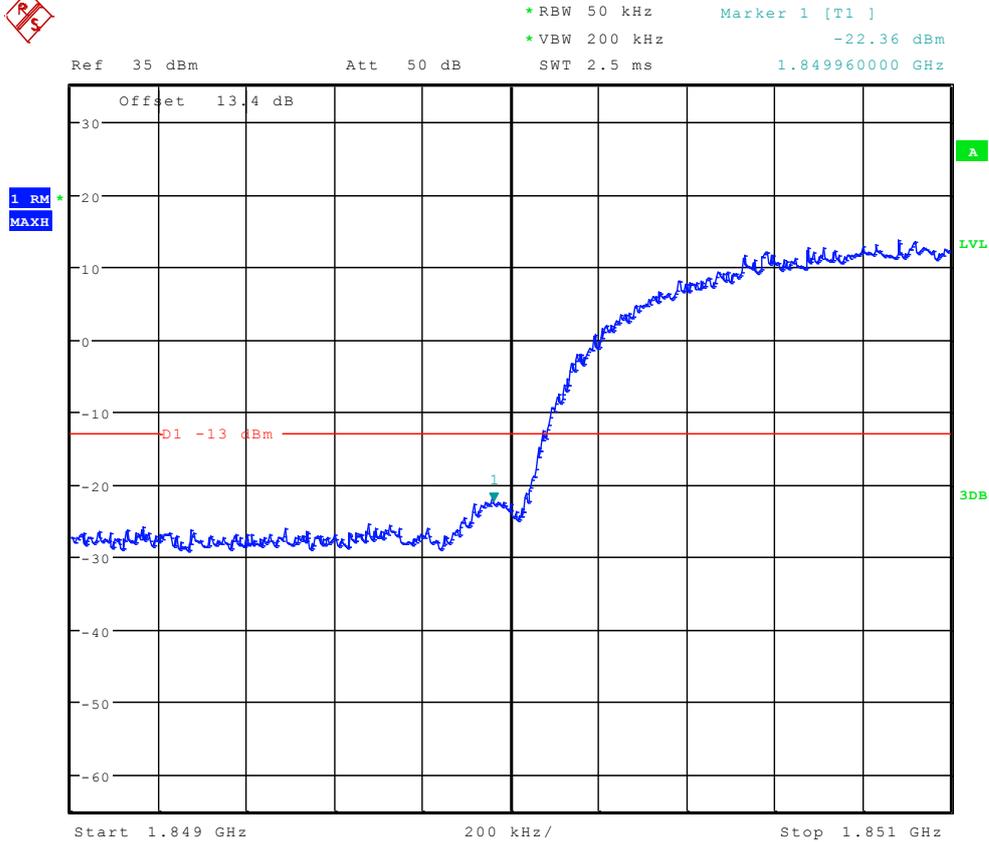
Date: 5.JUN.2012 15:47:23



# TM3: WCDMA

## Left Edge

### Channel 9262



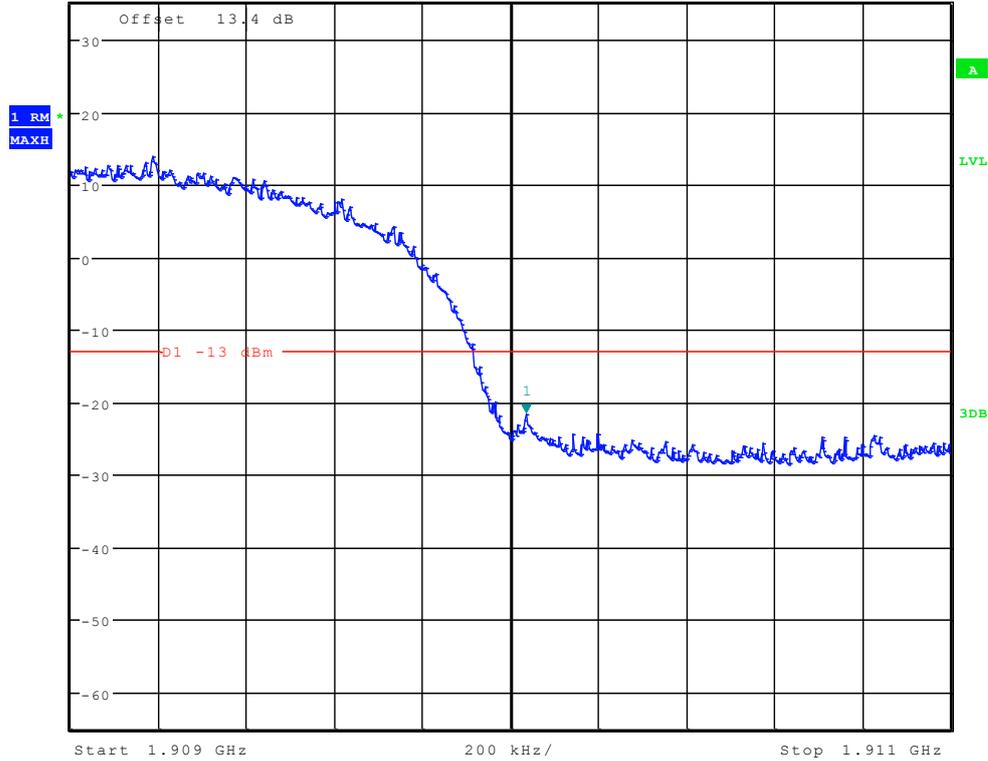
Date: 5.JUN.2012 15:31:24



## Right Edge Channel 9538



Ref 35 dBm Att 50 dB RBW 50 kHz Marker 1 [T1] -21.69 dBm  
\* VBW 200 kHz  
SWT 2.5 ms 1.910035000 GHz



Date: 5.JUN.2012 15:31:37

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



---

# Appendix E

## Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & 24.238

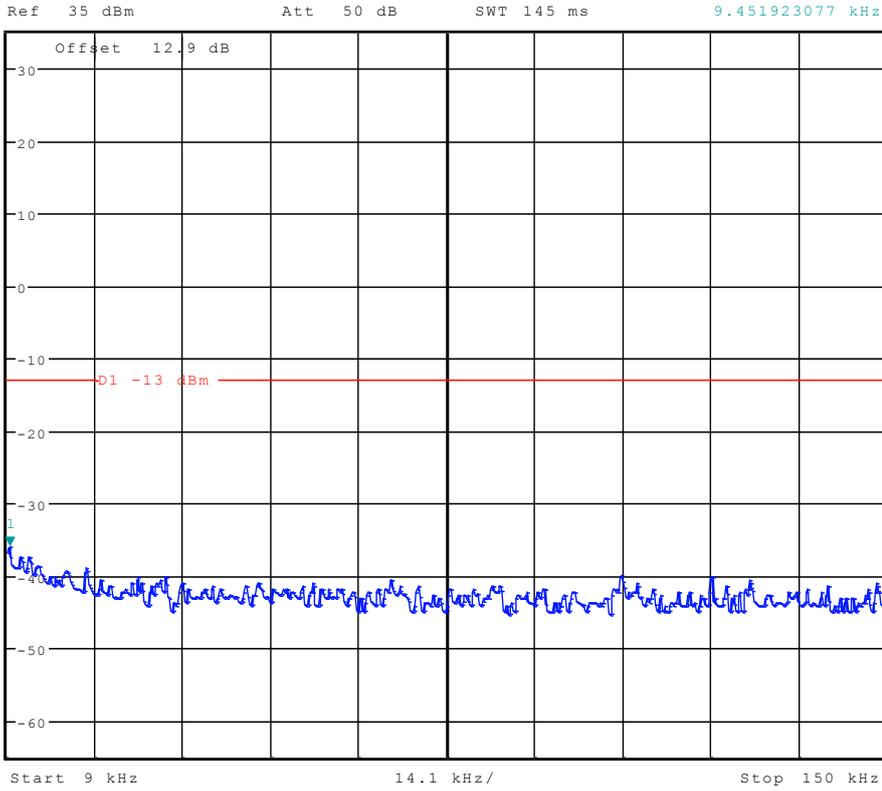


# TM1:GPRS/GSM

## Channel 512



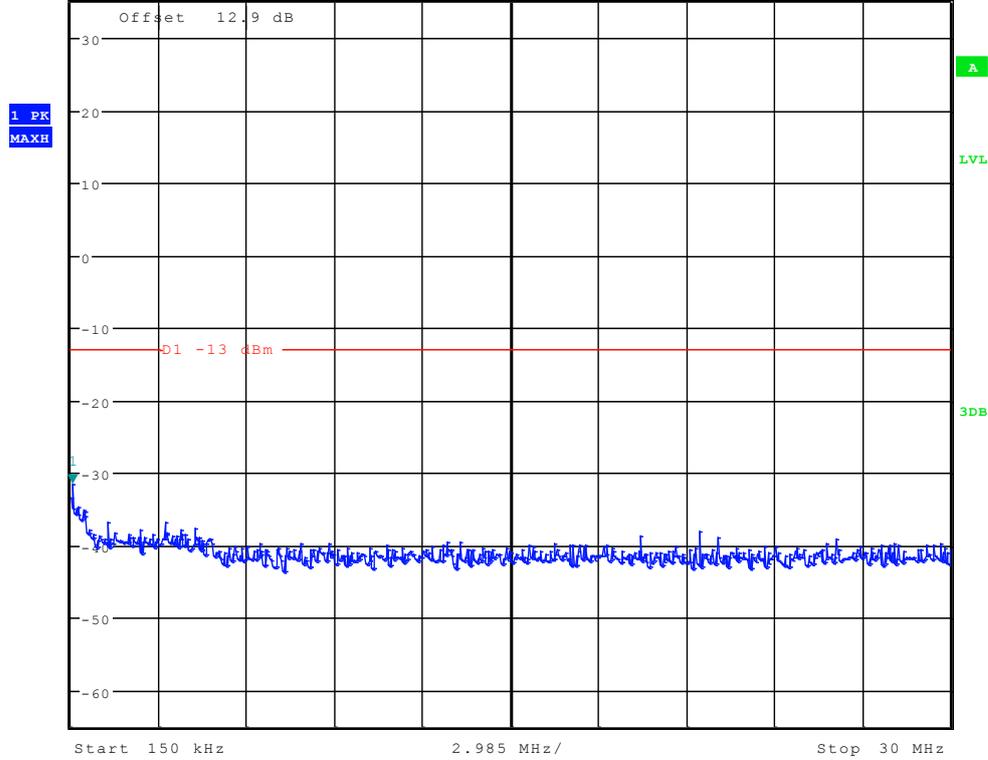
\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      -35.92 dBm  
SWT 145 ms      9.451923077 kHz



Date: 5.JUN.2012 15:38:18



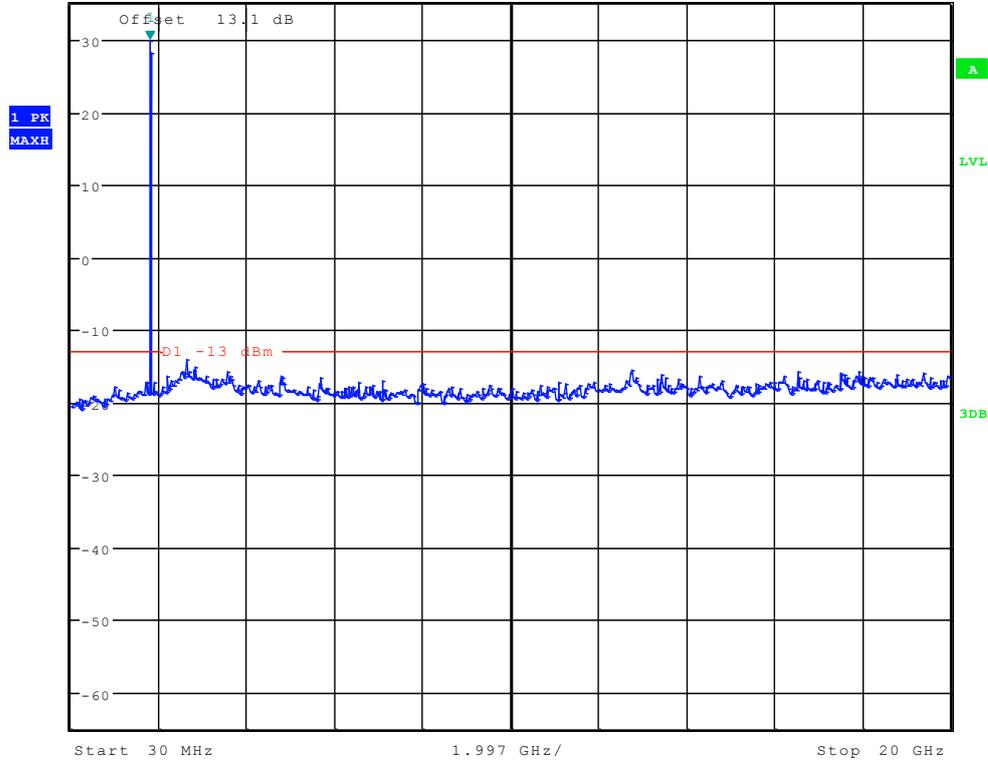
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.48 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 5.JUN.2012 15:39:01



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      29.92 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.822179487 GHz



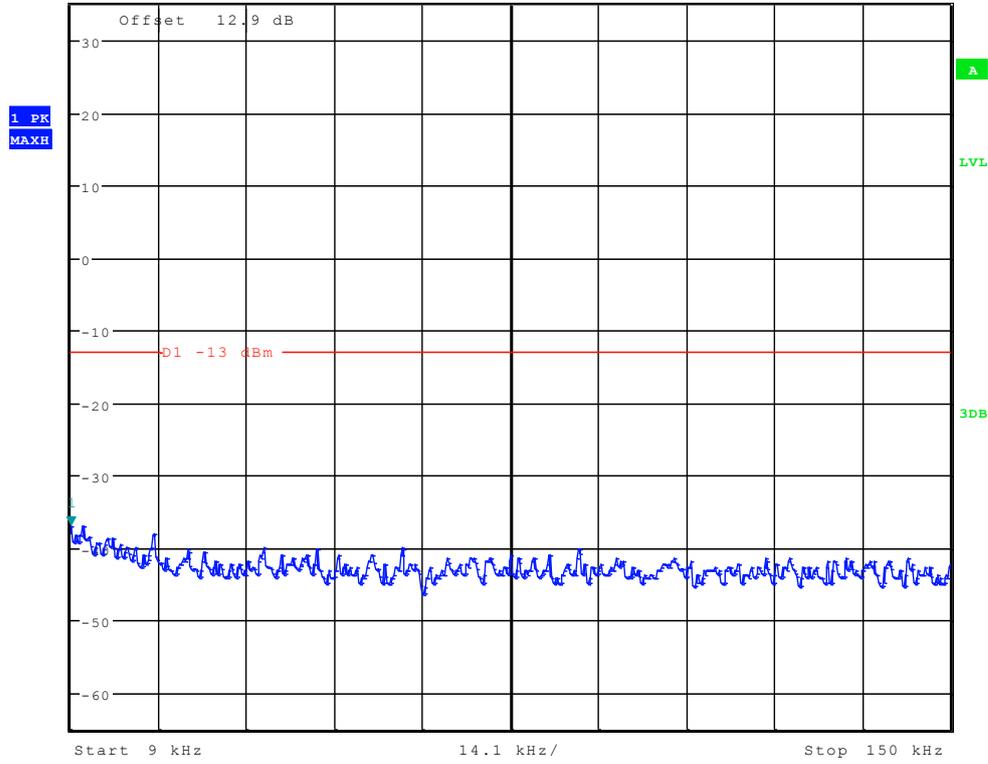
Date: 5.JUN.2012 15:39:45



## Channel 661



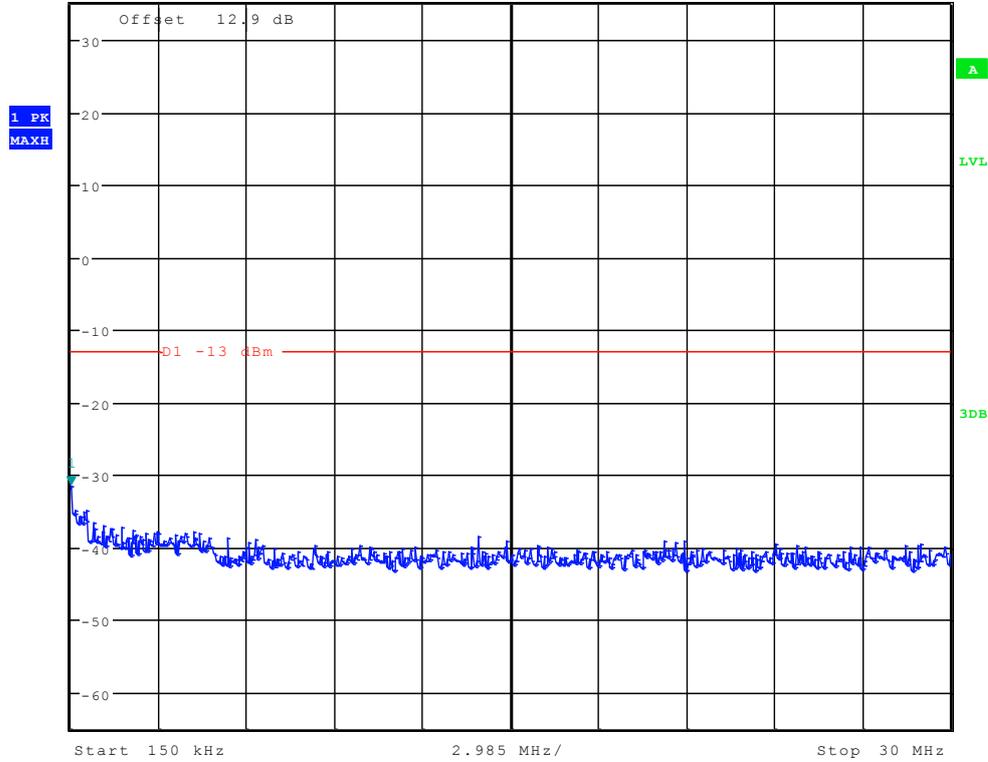
\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      -36.87 dBm  
Ref 35 dBm      Att 50 dB      SWT 145 ms      9.000000000 kHz



Date: 5.JUN.2012 15:38:32



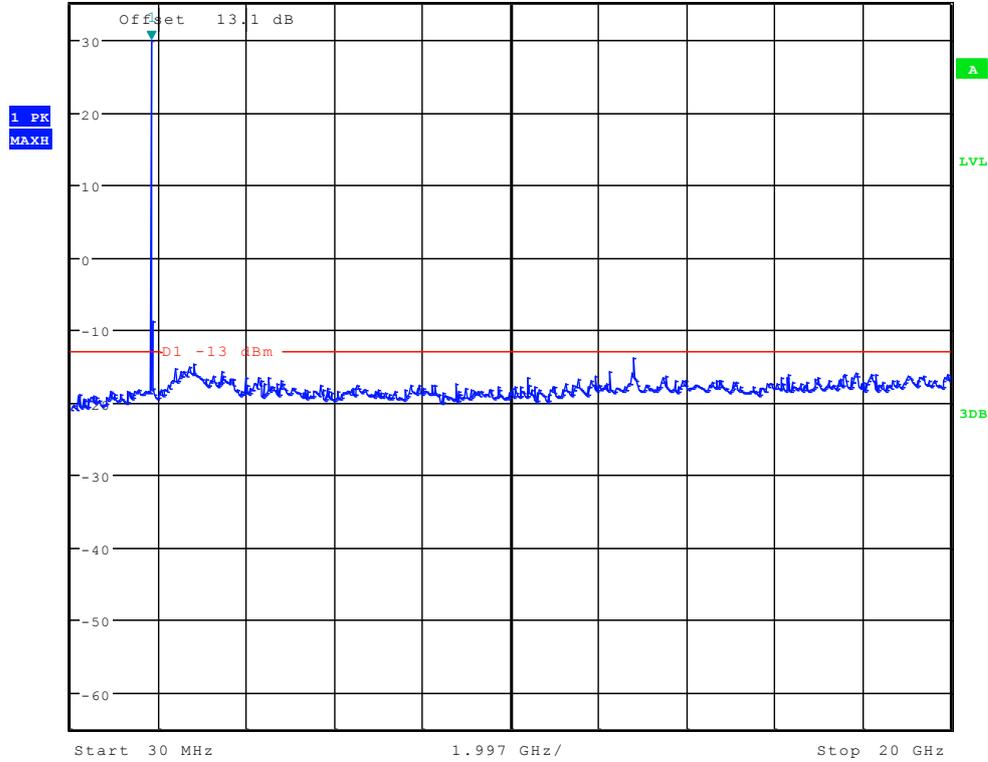
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.59 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 5.JUN.2012 15:39:16



\*RBW 1 MHz      Marker 1 [T1 ]  
 \*VBW 3 MHz      29.77 dBm  
 Ref 35 dBm      Att 50 dB      SWT 115 ms      1.854182692 GHz



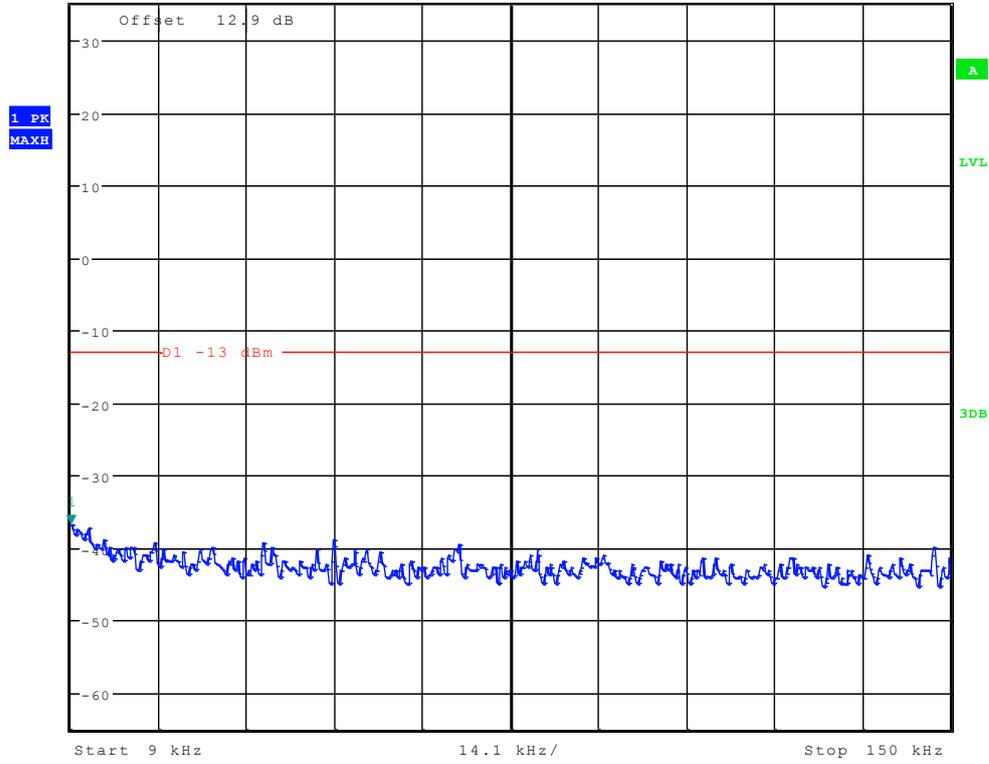
Date: 5.JUN.2012 15:39:59



## Channel 810



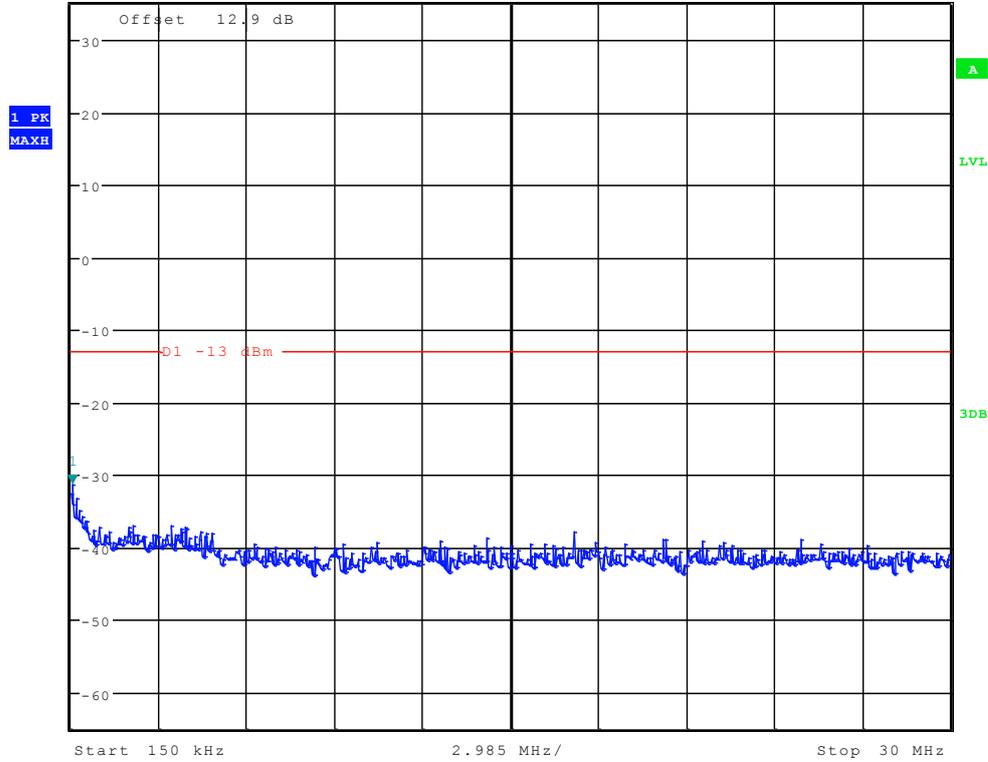
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      \*VBW 10 kHz      -36.67 dBm  
SWT 145 ms      9.000000000 kHz



Date: 5.JUN.2012 15:38:46



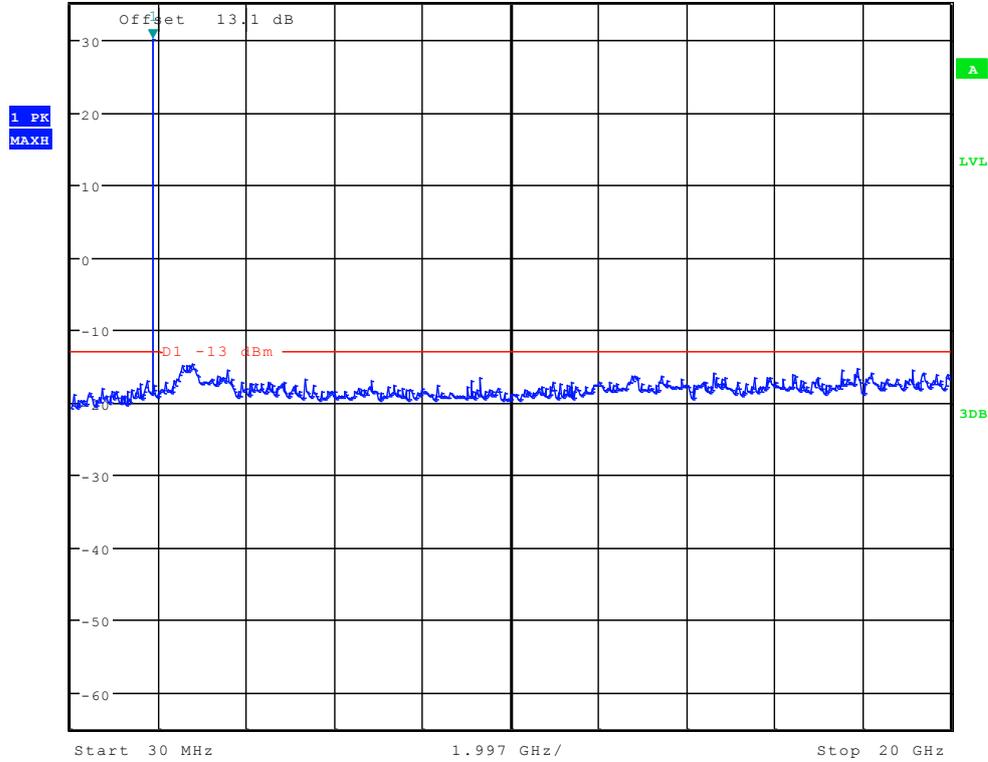
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.32 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 5.JUN.2012 15:39:30



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      30.01 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.886185897 GHz



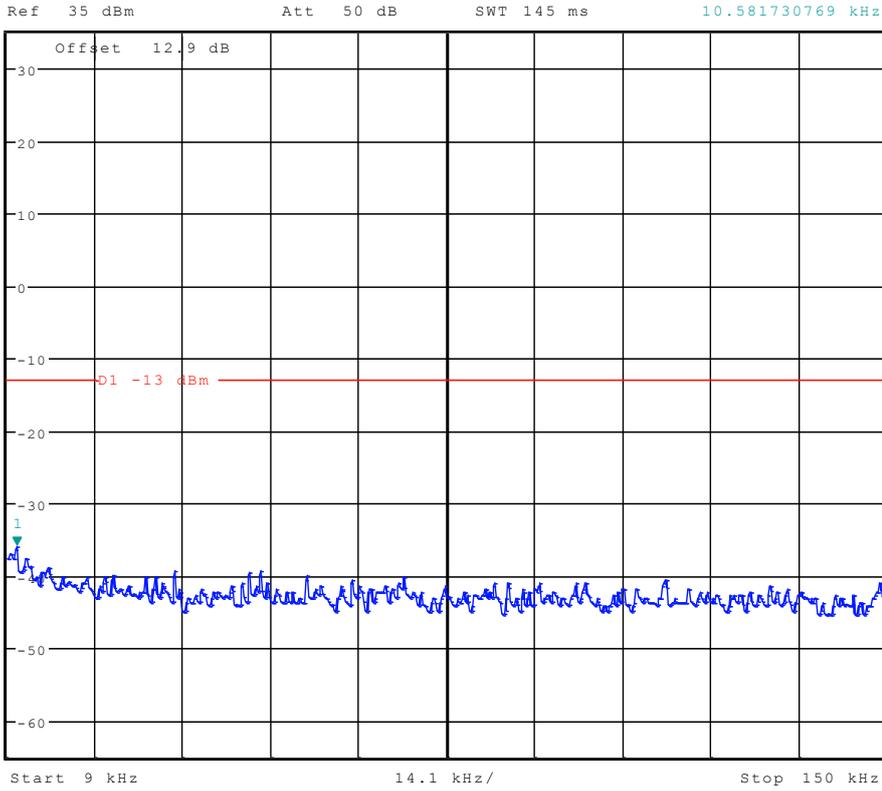
Date: 5.JUN.2012 15:40:14



# TM2:EDGE Channel 512



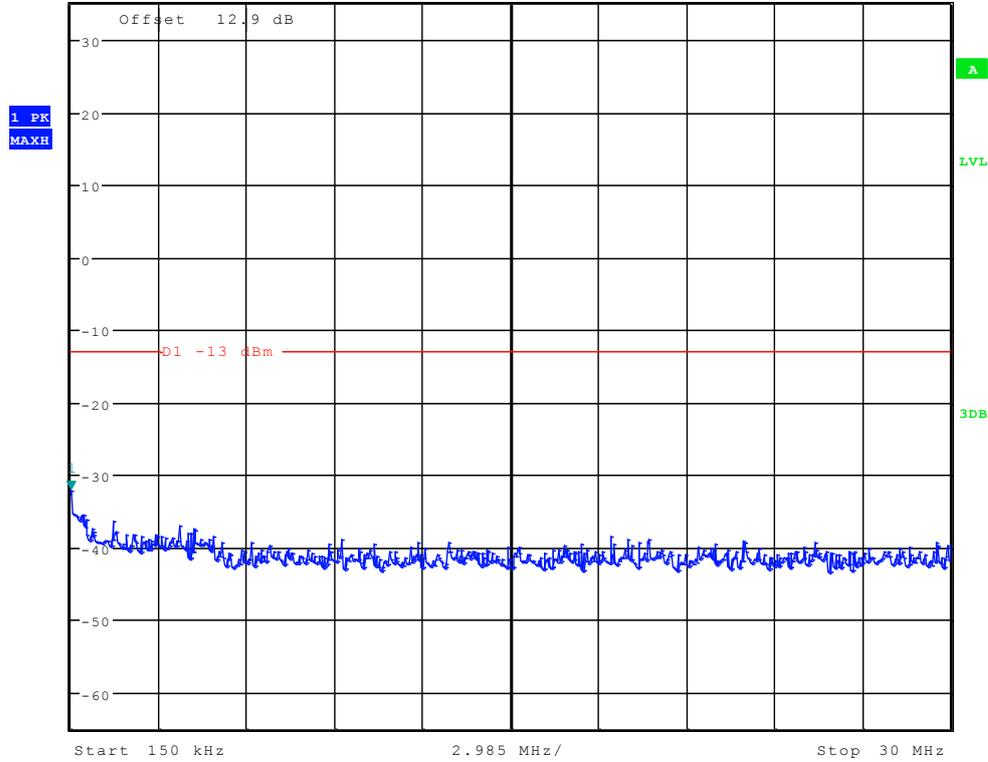
\*RBW 1 kHz      Marker 1 [T1 ]  
\*VBW 10 kHz      -35.92 dBm  
SWT 145 ms      10.581730769 kHz



Date: 5.JUN.2012 15:44:28



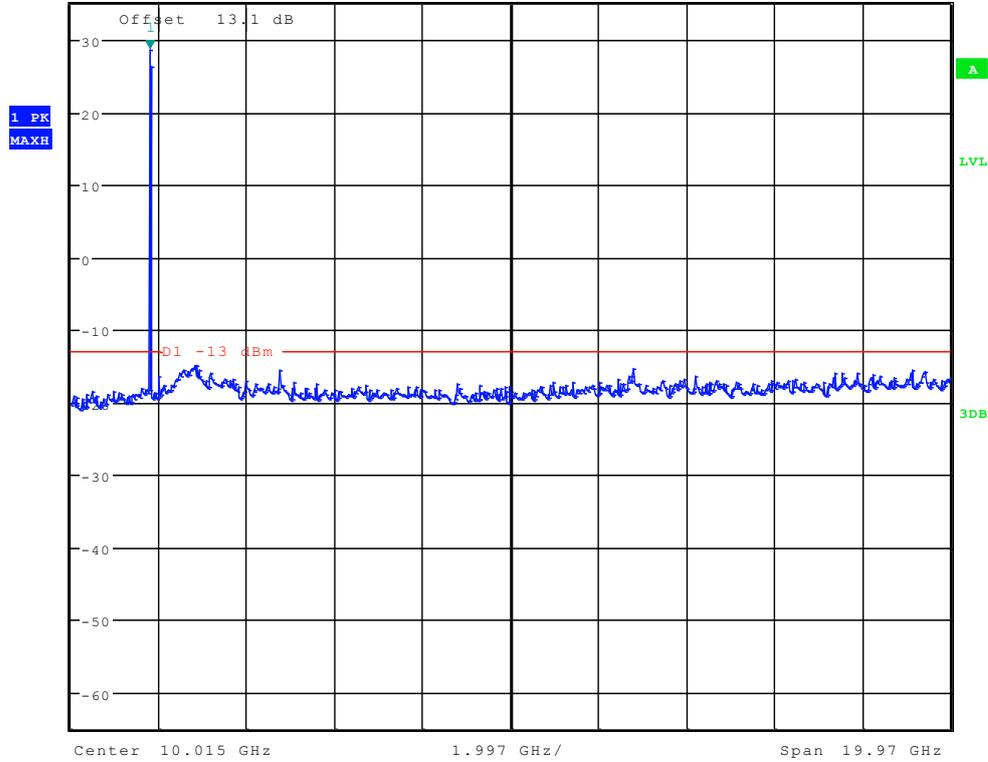
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -32.04 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 5.JUN.2012 15:45:11



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      28.59 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.822179487 GHz



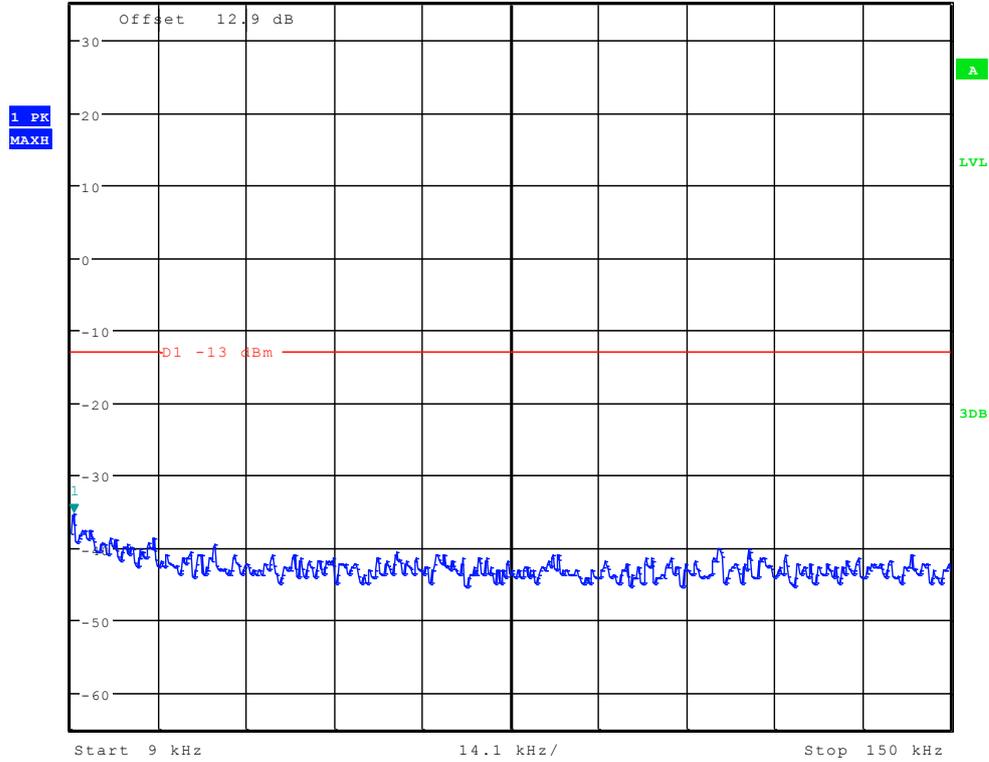
Date: 5.JUN.2012 15:46:12



## Channel 661



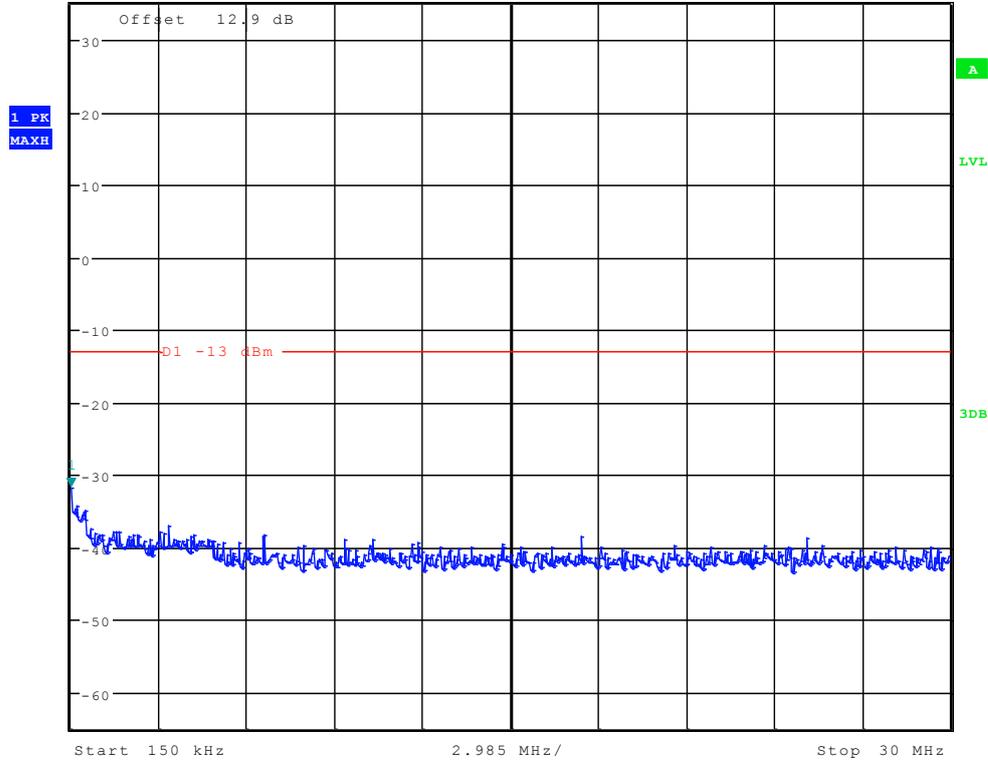
Ref 35 dBm      Att 50 dB      \*RBW 1 kHz      Marker 1 [T1]      -35.31 dBm  
 \*VBW 10 kHz      SWT 145 ms      9.451923077 kHz



Date: 5.JUN.2012 15:44:42



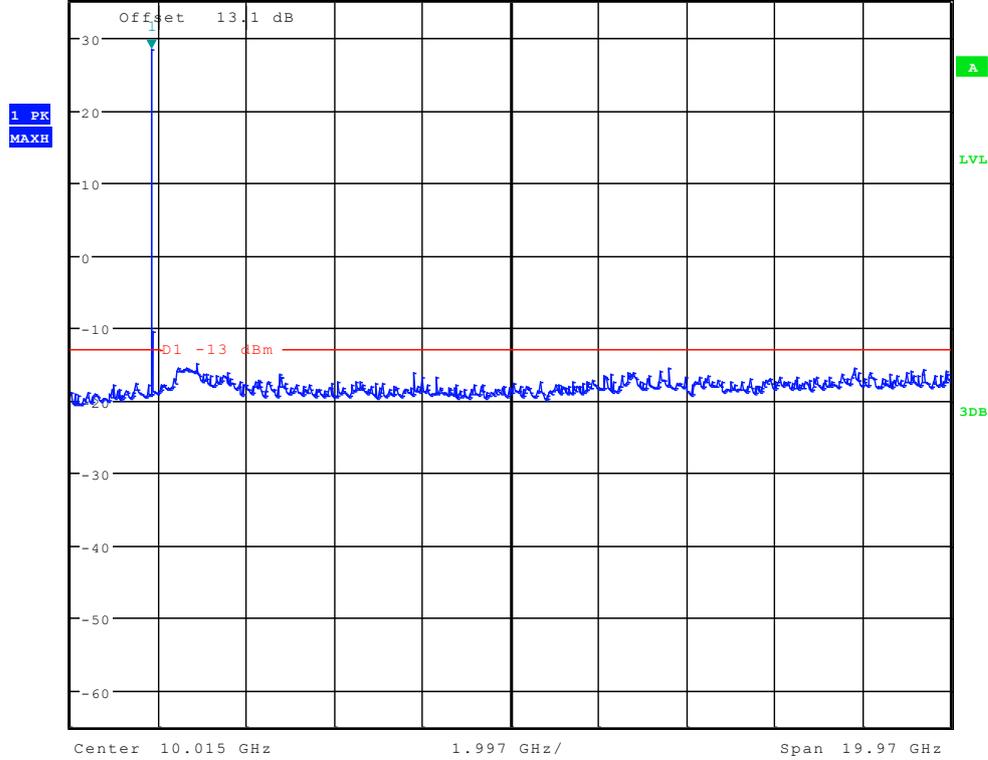
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -31.76 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      150.00000000 kHz



Date: 5.JUN.2012 15:45:26



\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      28.41 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.854182692 GHz



Date: 5.JUN.2012 15:46:27

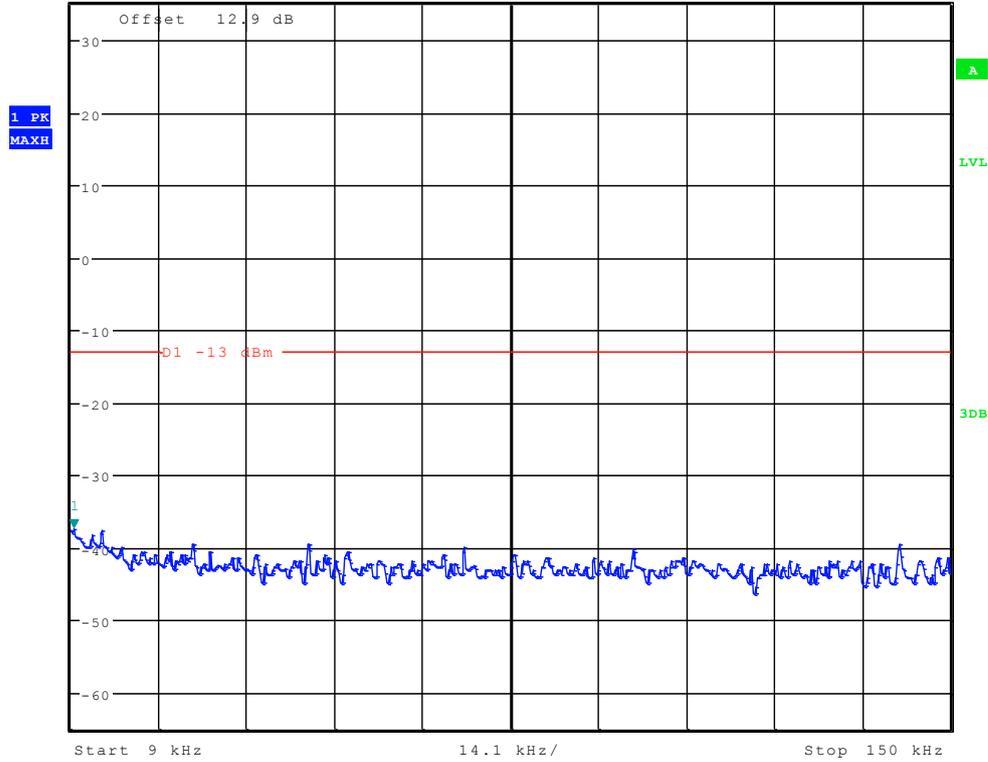


## Channel 810



\* RBW 1 kHz      Marker 1 [T1 ]  
\* VBW 10 kHz      -37.39 dBm  
SWT 145 ms      9.451923077 kHz

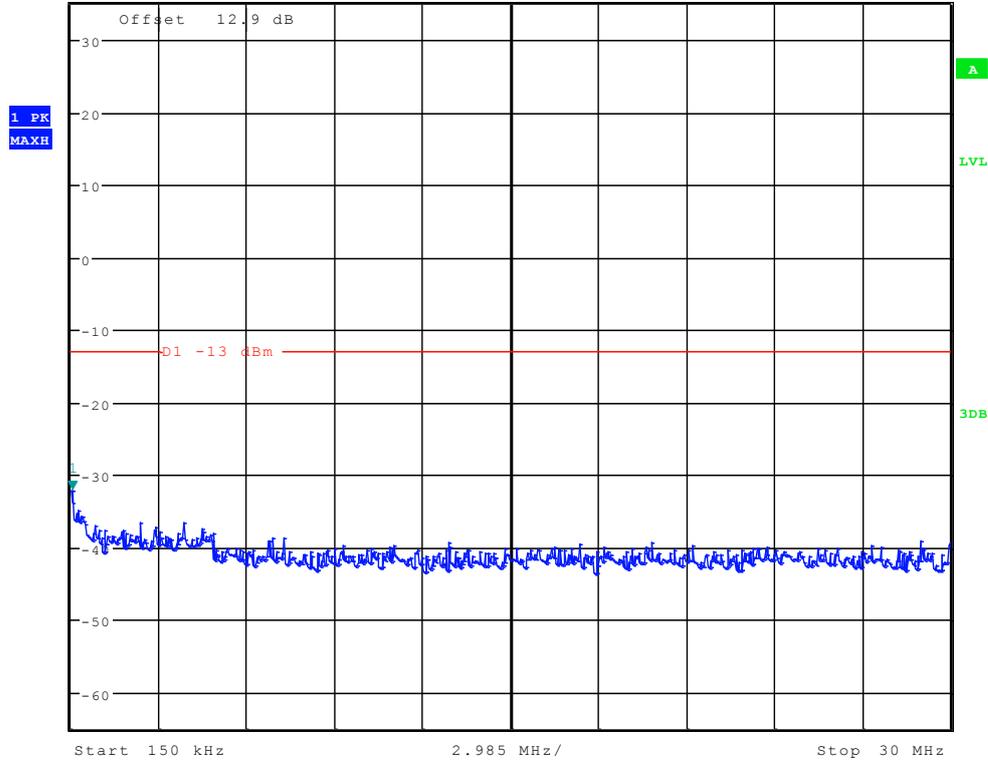
Ref 35 dBm      Att 50 dB



Date: 5.JUN.2012 15:44:56



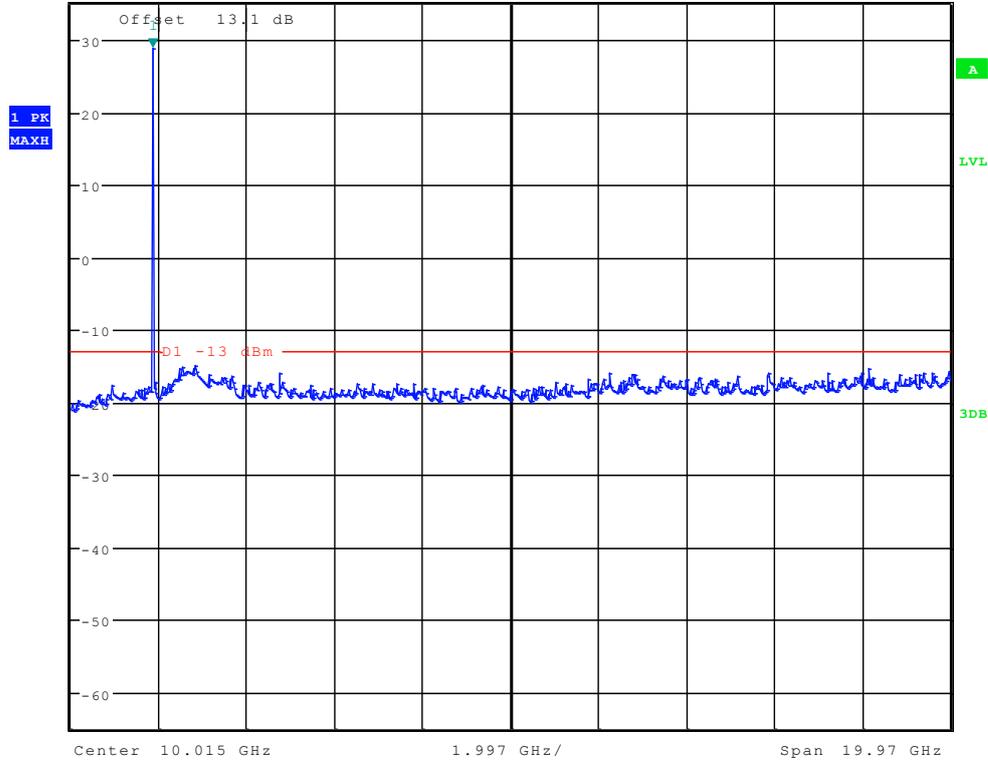
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -32.04 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 5.JUN.2012 15:45:40



Ref 35 dBm Att 50 dB SWT 115 ms Marker 1 [T1] 28.71 dBm  
\*RBW 1 MHz \*VBW 3 MHz 1.886185897 GHz

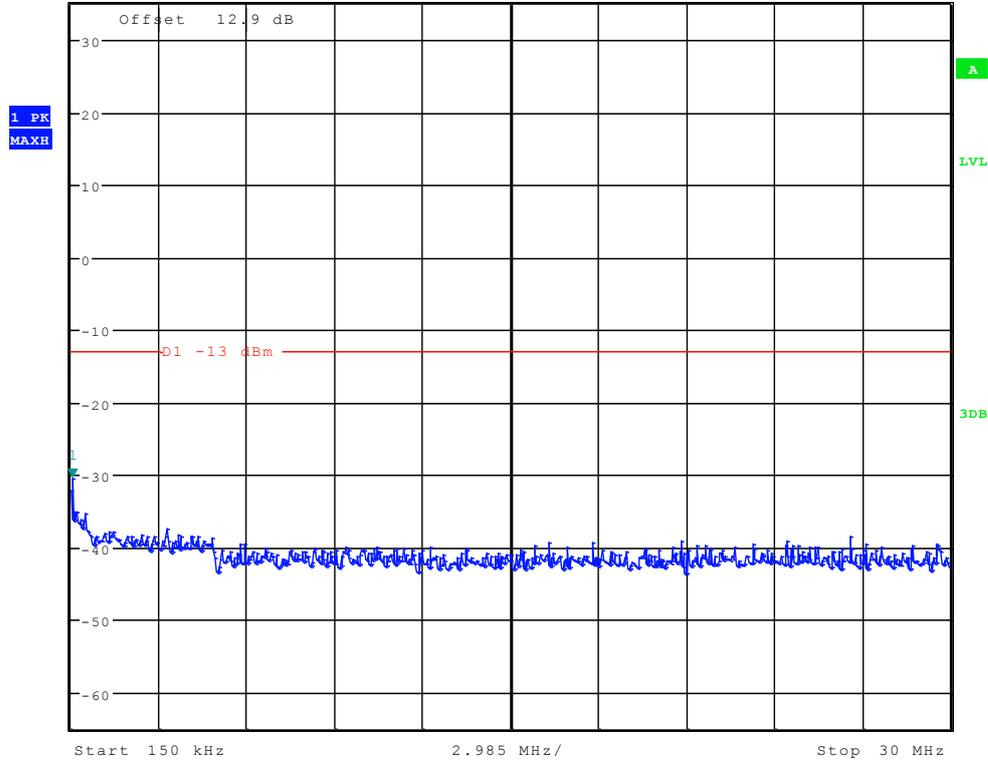


Date: 5.JUN.2012 15:46:41





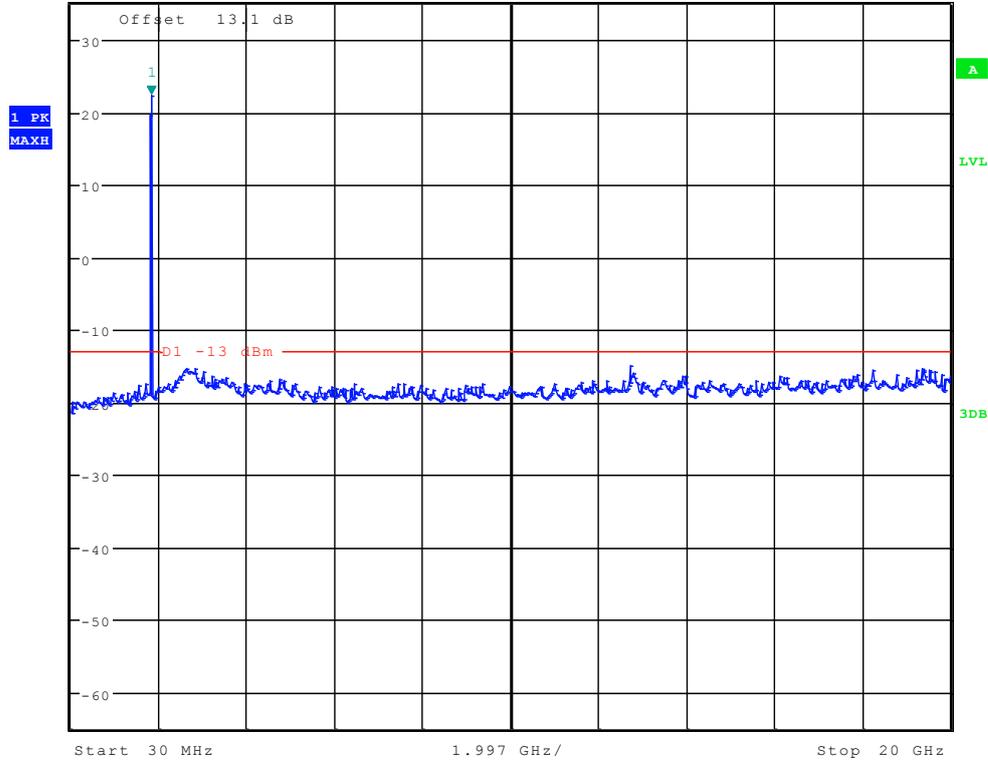
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -30.36 dBm  
Ref 35 dBm      Att 50 dB      SWT 300 ms      197.836538462 kHz



Date: 5.JUN.2012 15:29:57



Ref 35 dBm Att 50 dB SWT 115 ms  
\*RBW 1 MHz Marker 1 [T1] 22.27 dBm  
\*VBW 3 MHz 1.854182692 GHz



Date: 5.JUN.2012 15:30:40

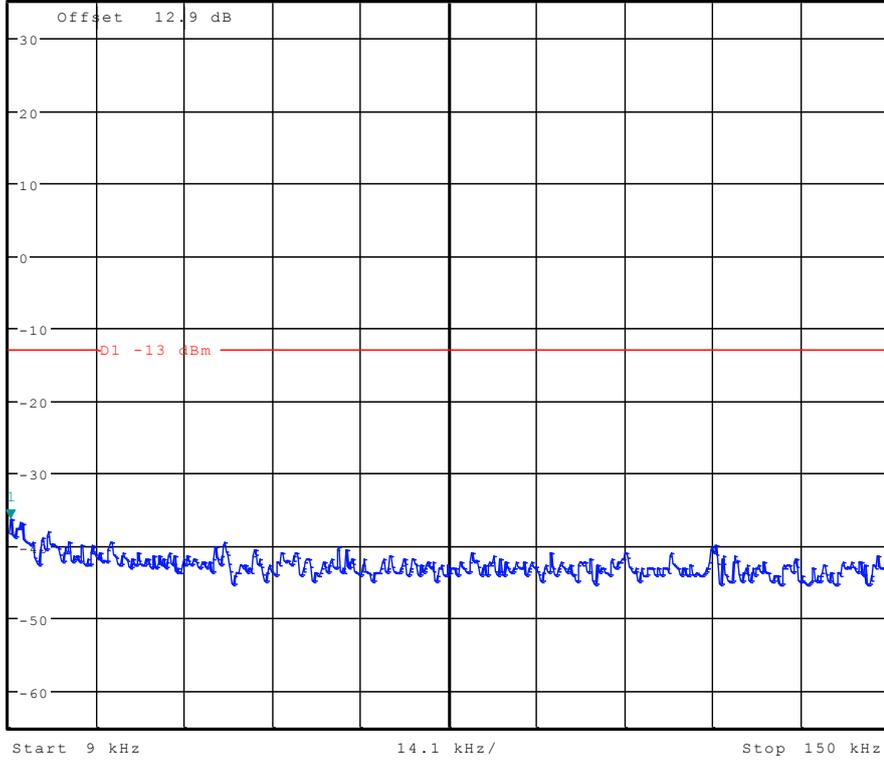


## Channel 9400



\* RBW 1 kHz      Marker 1 [T1 ]  
\* VBW 10 kHz      -36.38 dBm  
SWT 145 ms      9.225961538 kHz

Ref 35 dBm      Att 50 dB

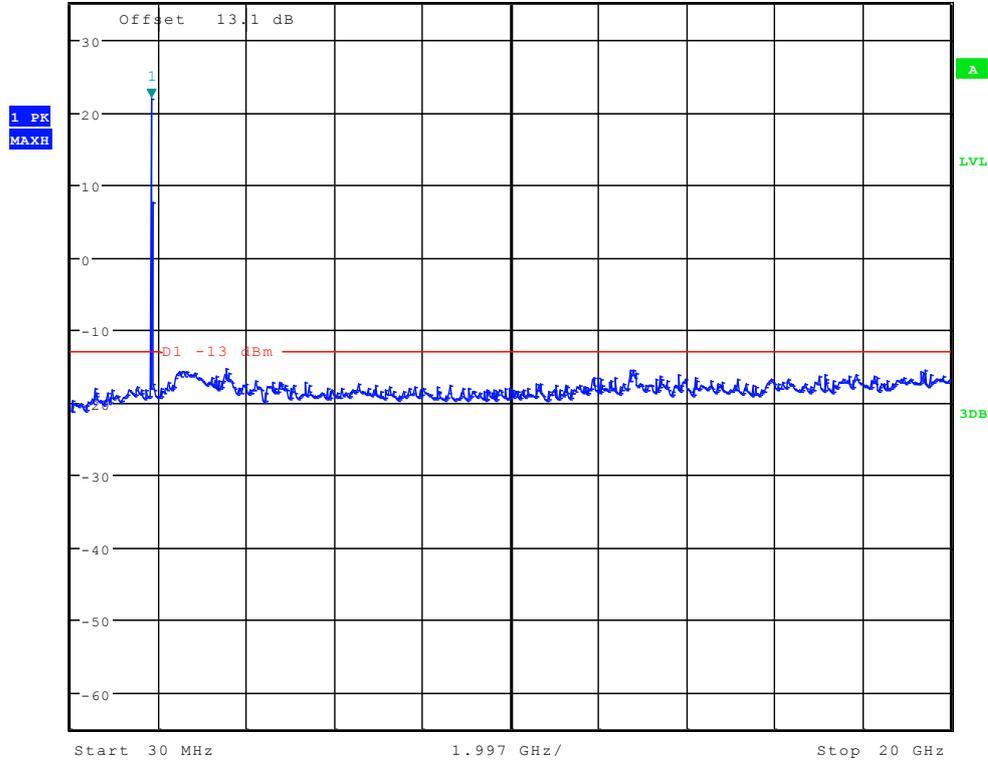


Date: 5.JUN.2012 15:29:28





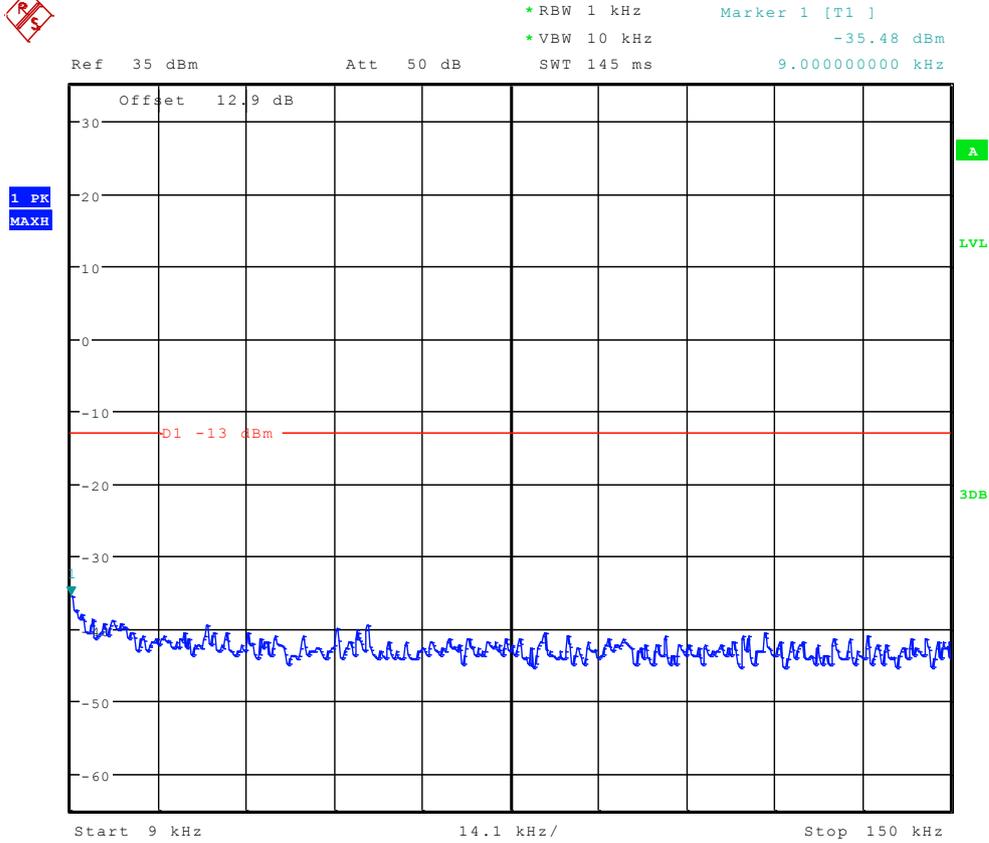
\*RBW 1 MHz      Marker 1 [T1 ]  
\*VBW 3 MHz      21.94 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.854182692 GHz



Date: 5.JUN.2012 15:30:55



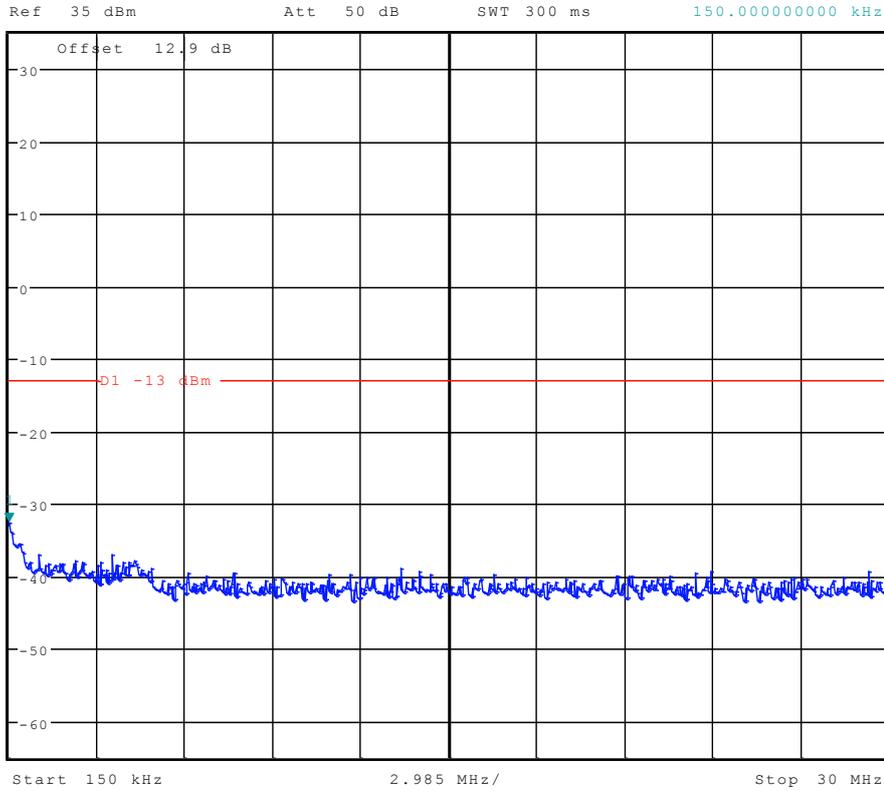
## Channel 9538



Date: 5.JUN.2012 15:29:42



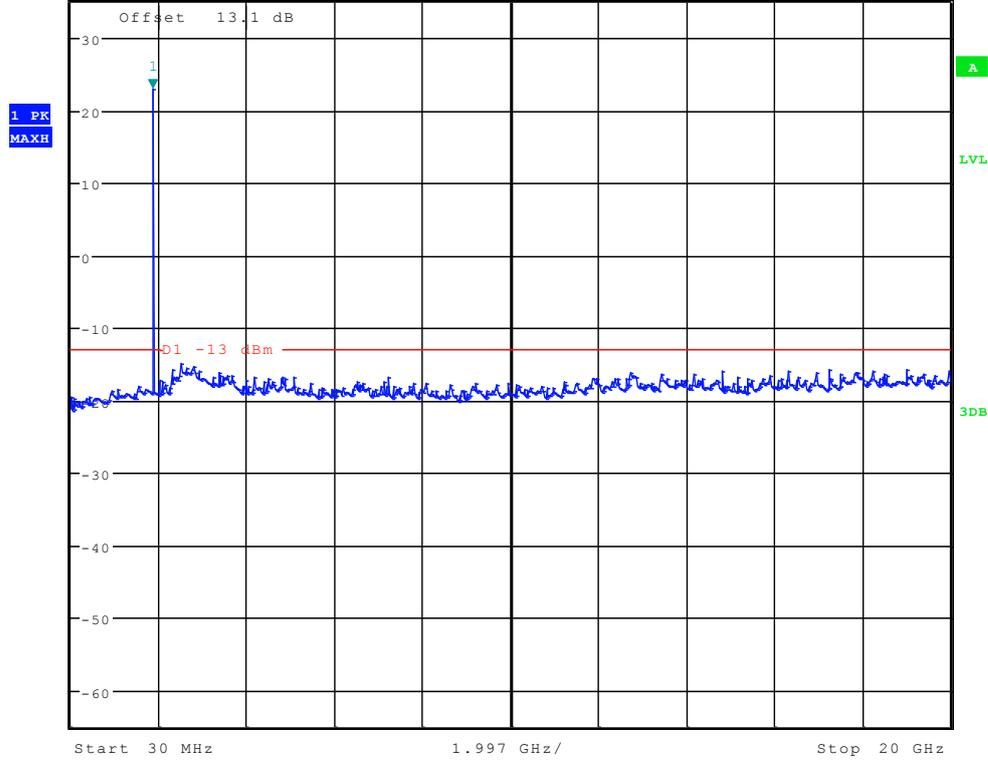
\*RBW 10 kHz      Marker 1 [T1 ]  
\*VBW 30 kHz      -32.52 dBm  
SWT 300 ms      150.00000000 kHz



Date: 5.JUN.2012 15:30:25



\* RBW 1 MHz      Marker 1 [T1 ]  
\* VBW 3 MHz      22.88 dBm  
Ref 35 dBm      Att 50 dB      SWT 115 ms      1.886185897 GHz



Date: 5.JUN.2012 15:31:09

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

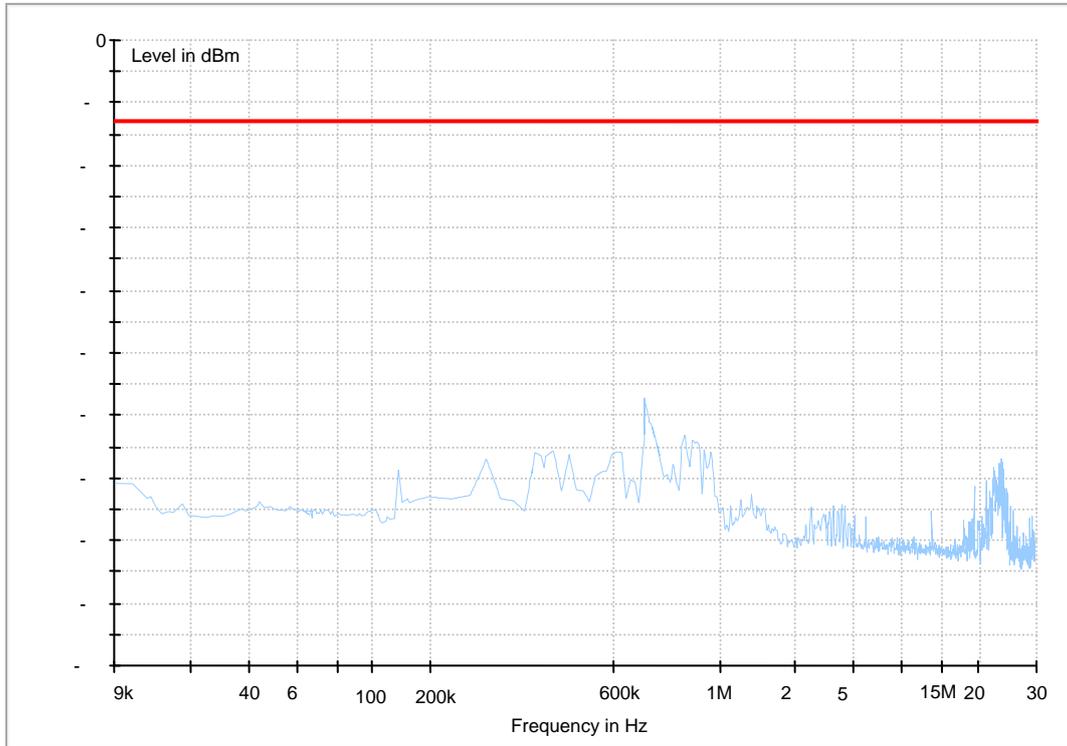


# **Appendix F**

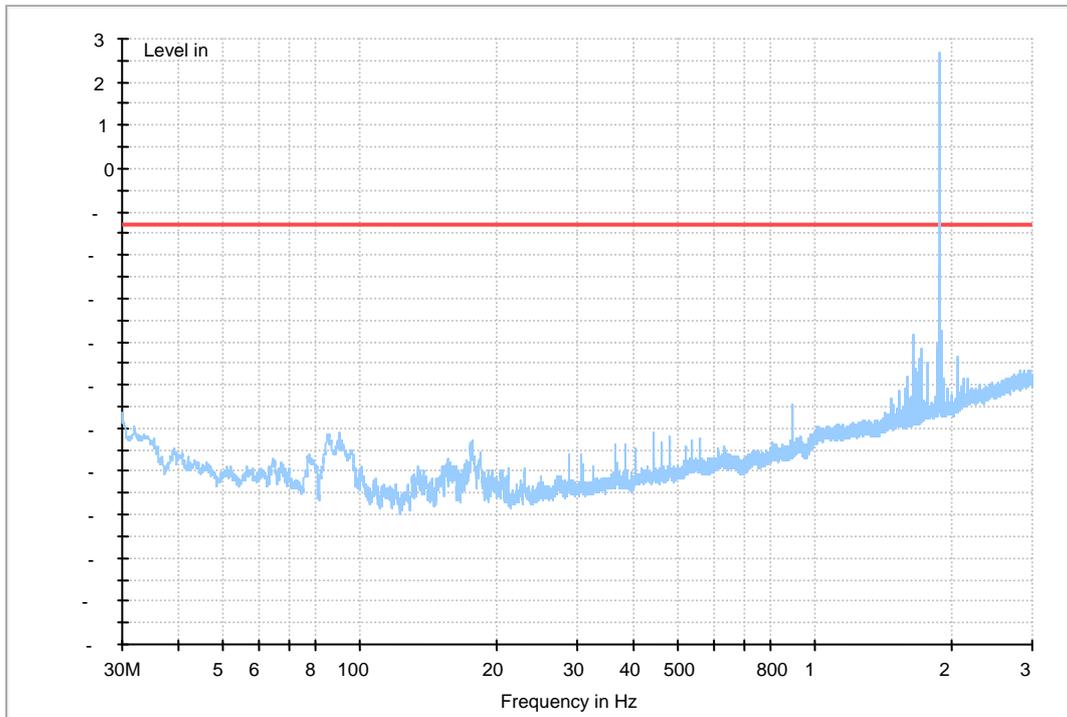
## Radiated spurious emission

# GSM 1900

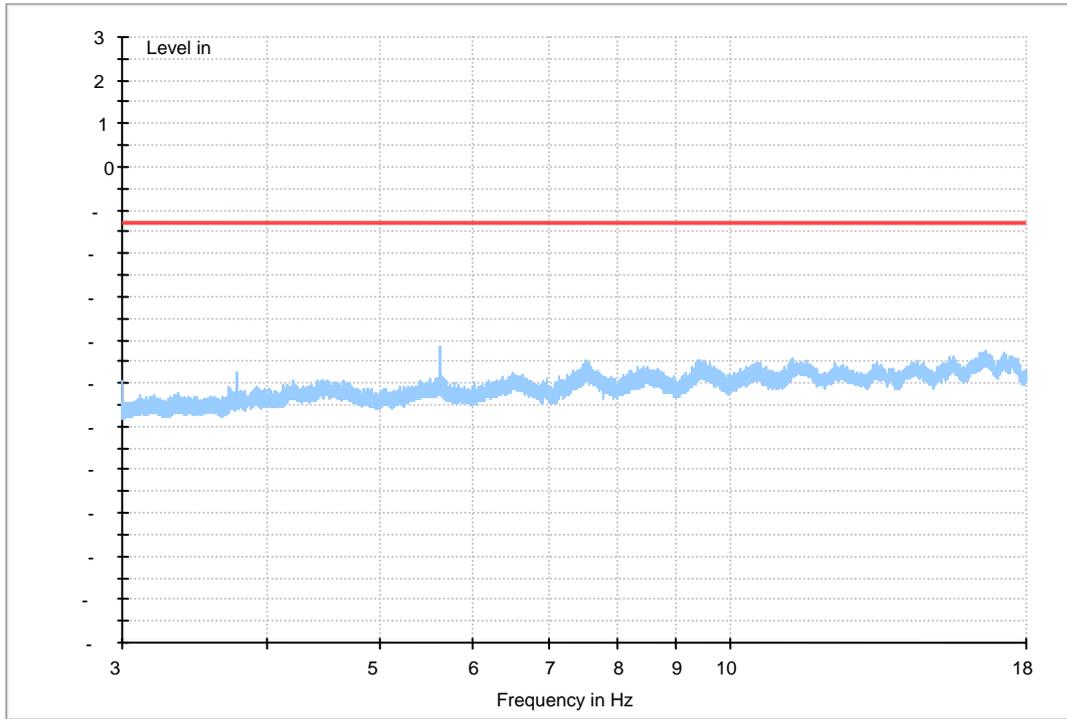
(9kHz-30MHz)



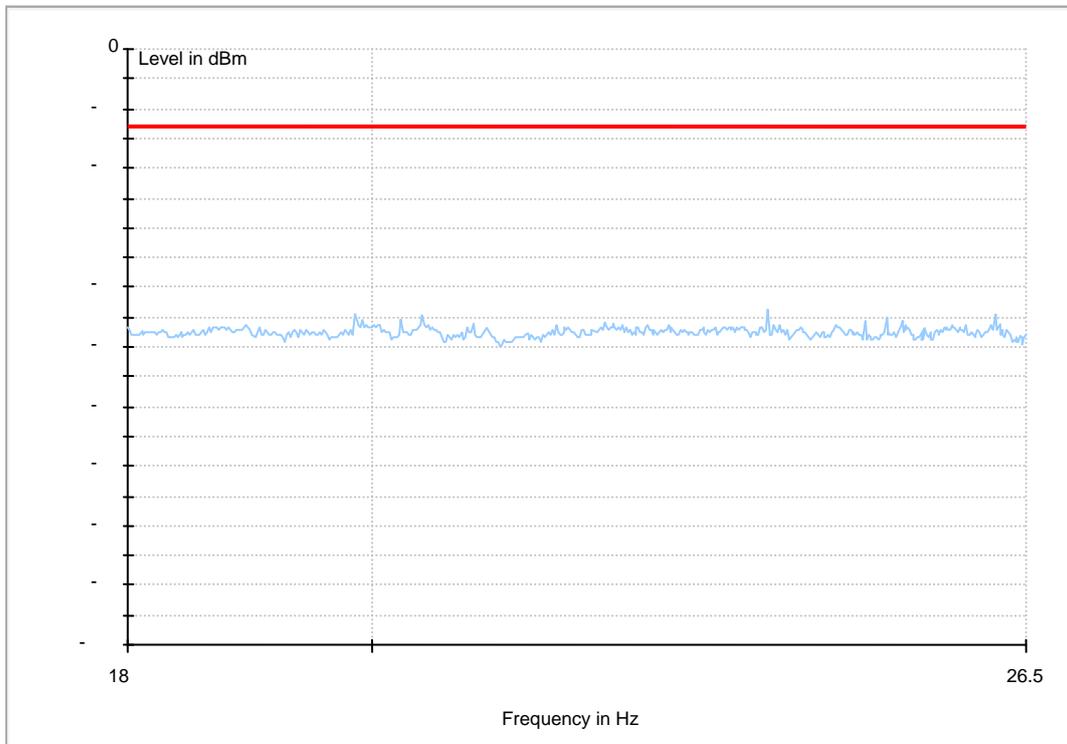
Traffic Mode (30MHz-3GHz)



### Traffic Mode (3GHz-18GHz)

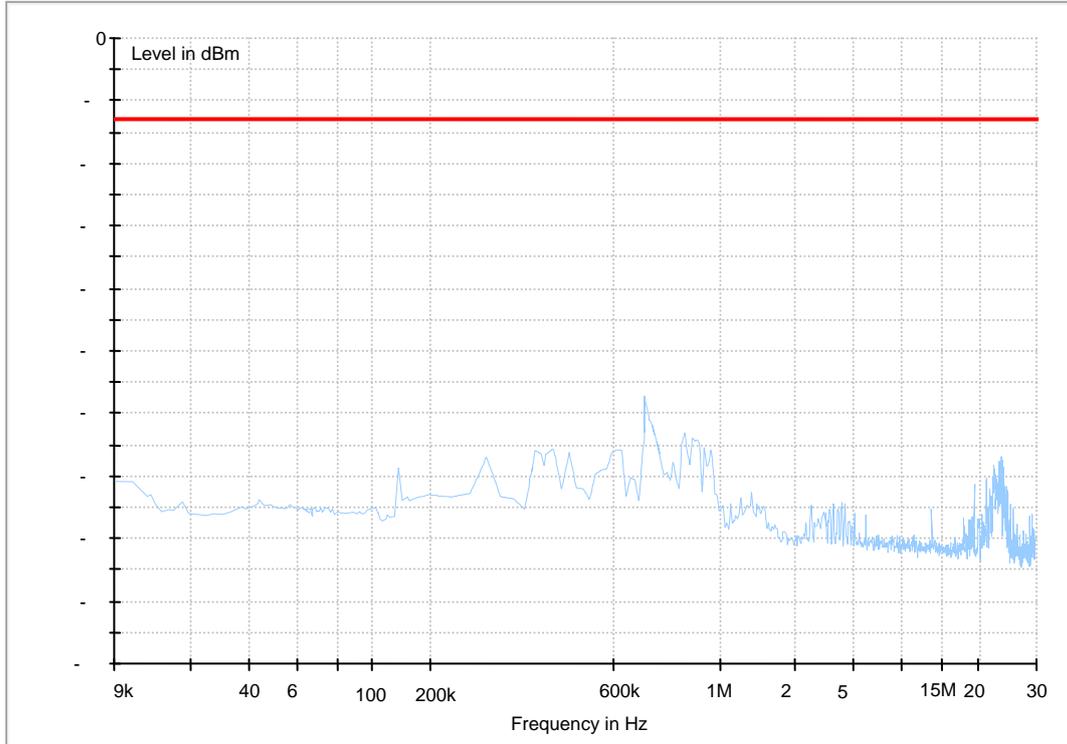


### (18GHz-26.5GHz)

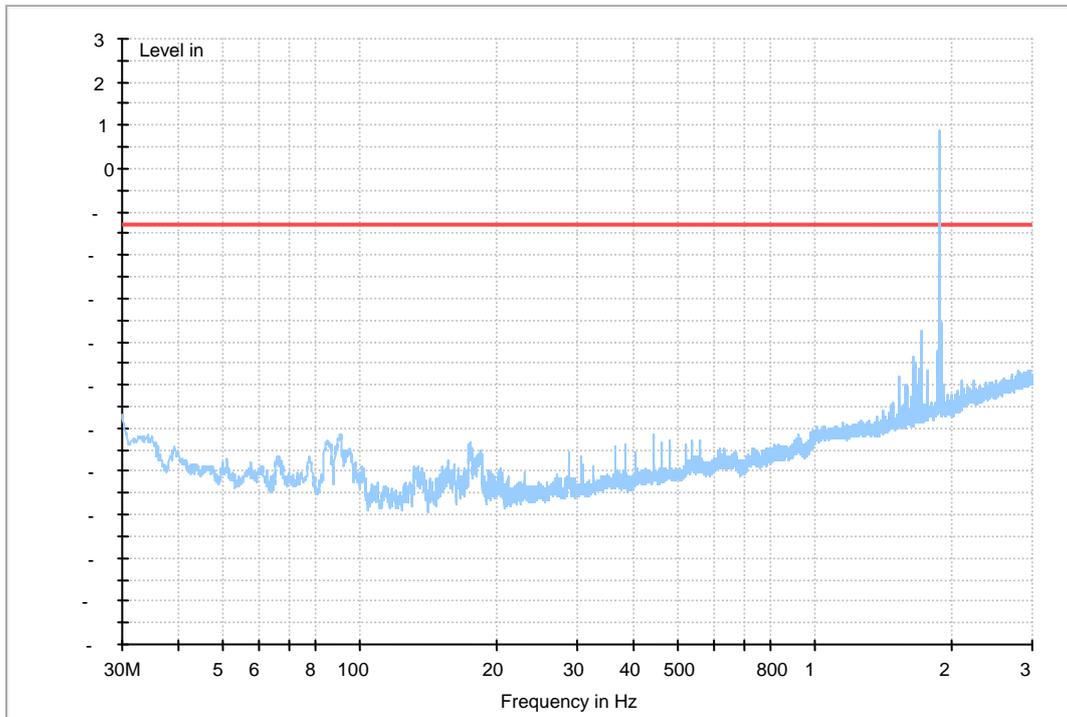


## GPRS 1900

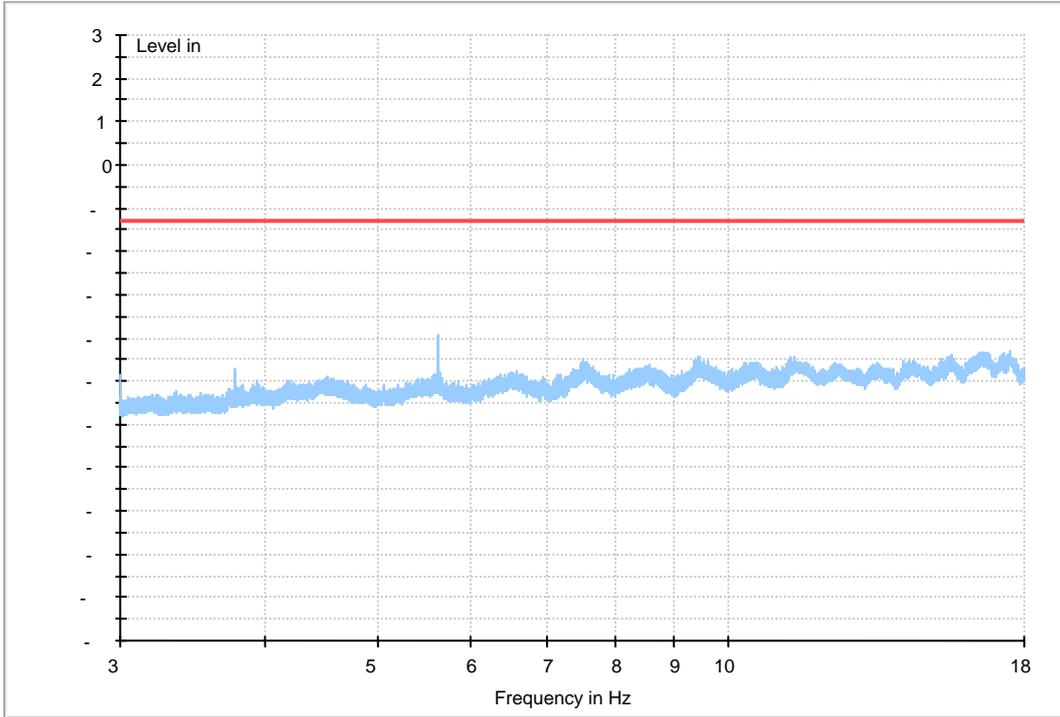
(9kHz-30MHz)



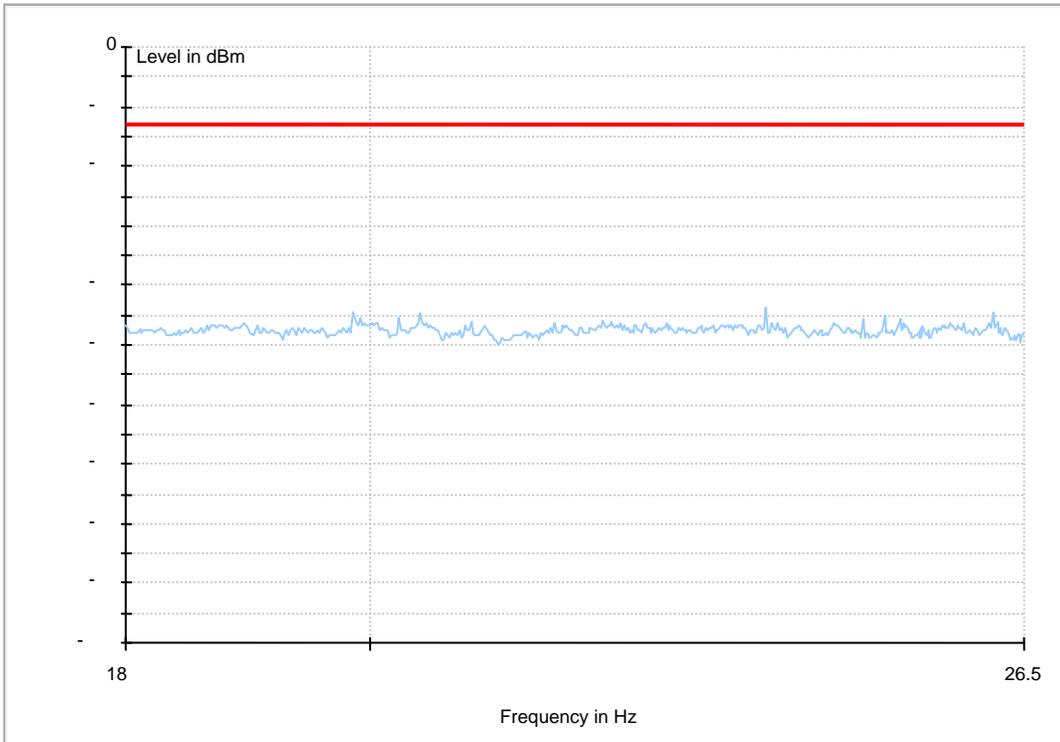
Traffic Mode (30MHz-3GHz)



### Traffic Mode (3GHz-18GHz)

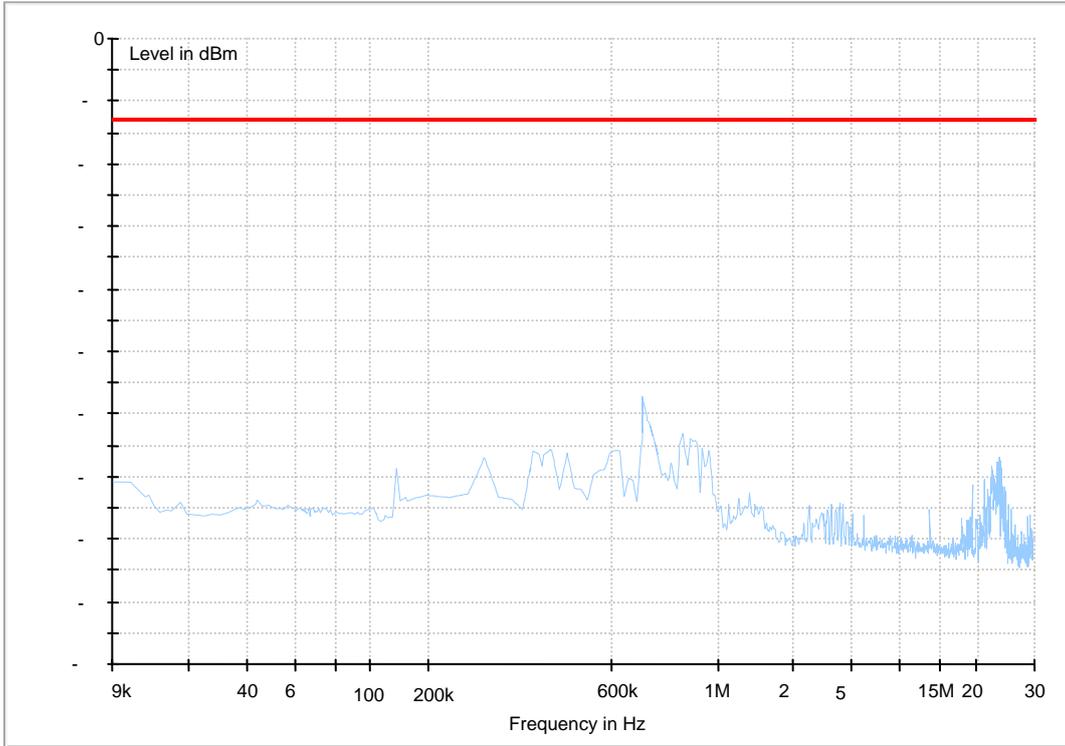


### (18GHz-26.5GHz)

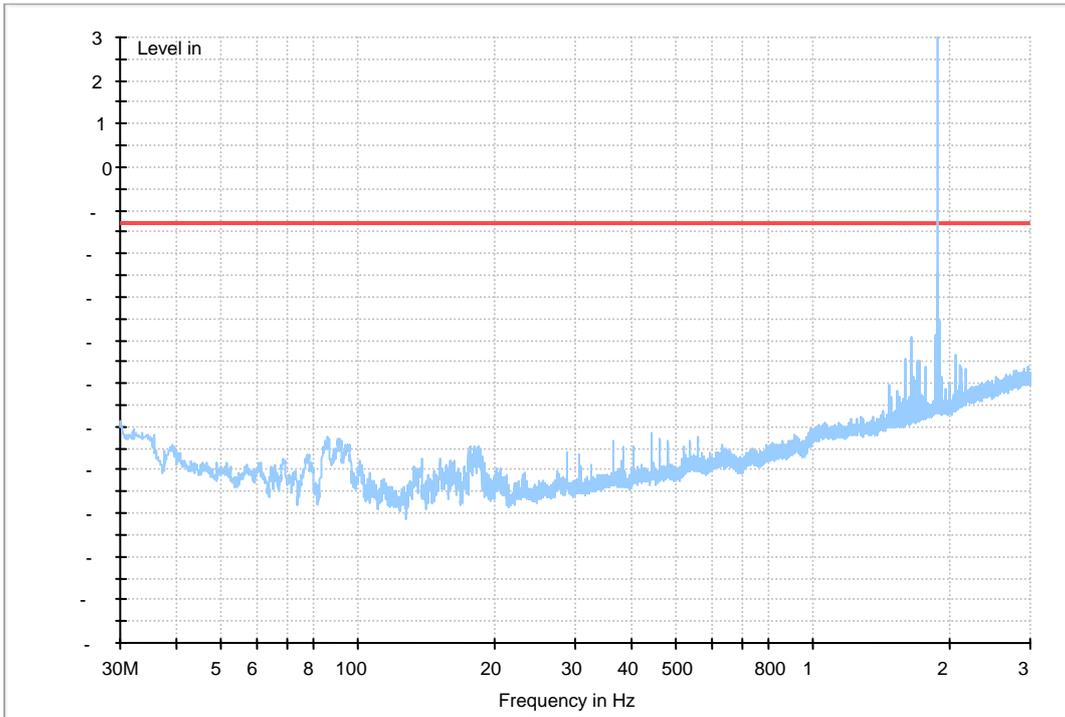


# EDGE 1900

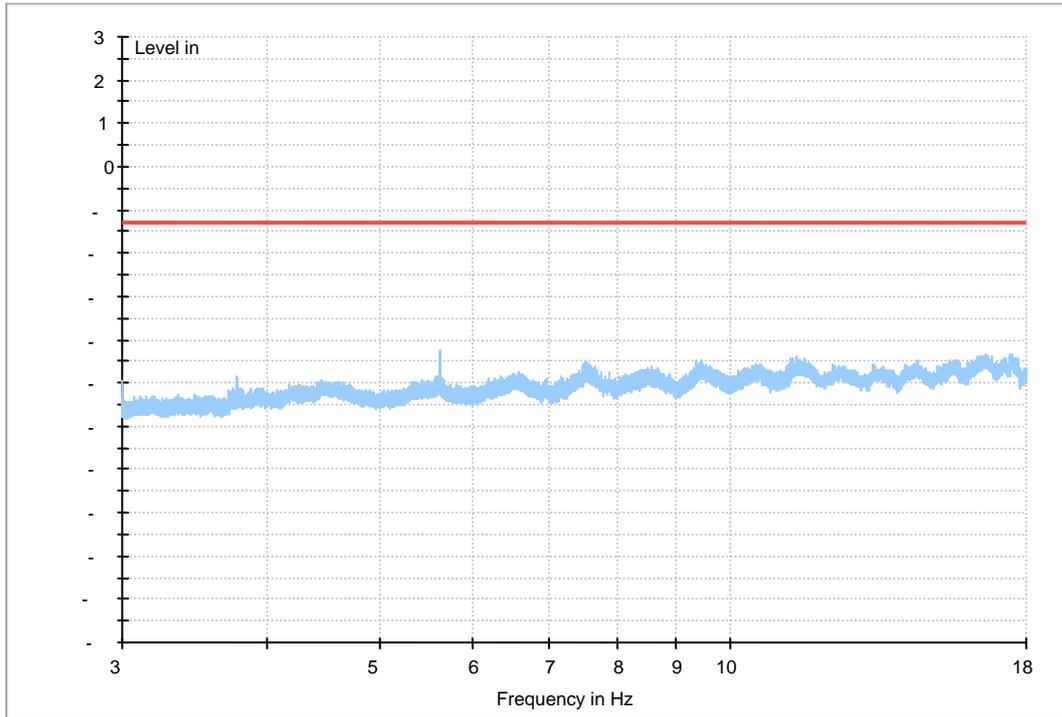
## (9kHz-30MHz)



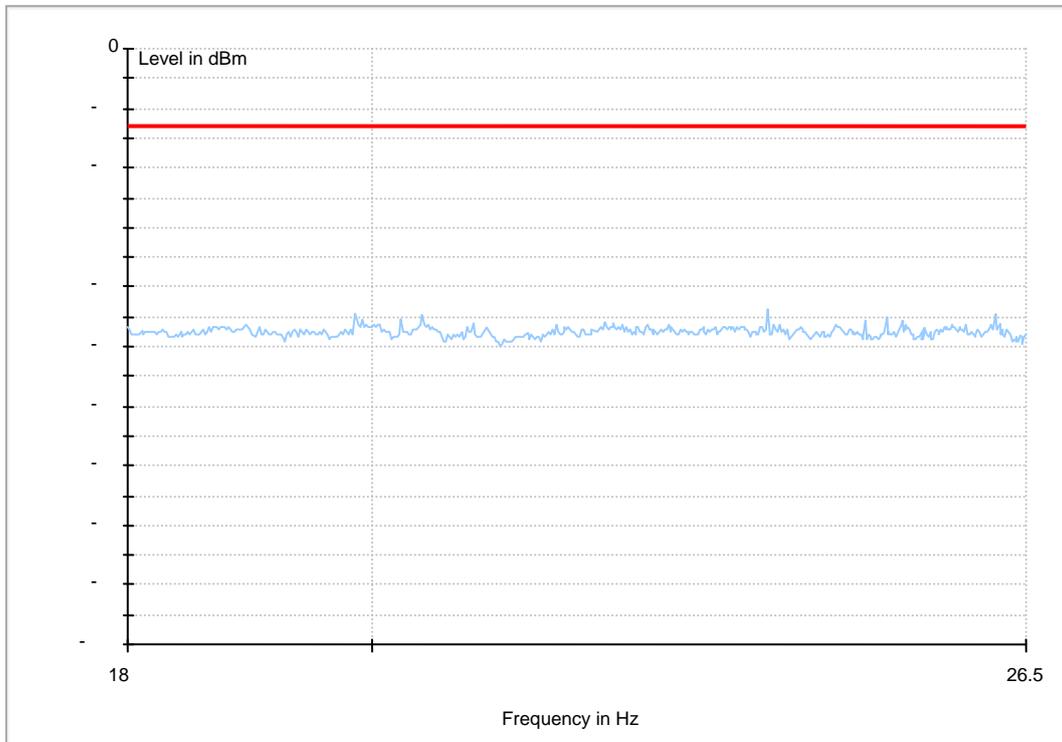
## Traffic Mode (30MHz-3GHz)



### Traffic Mode (3GHz-18GHz)

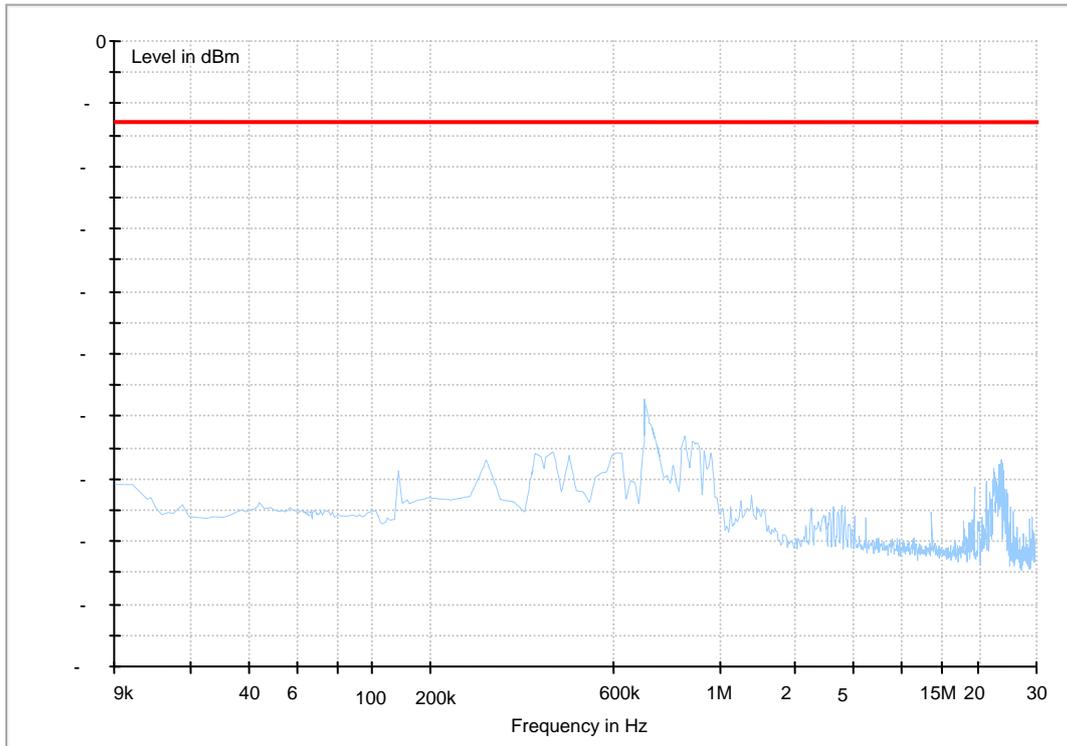


### (18GHz-26.5GHz)

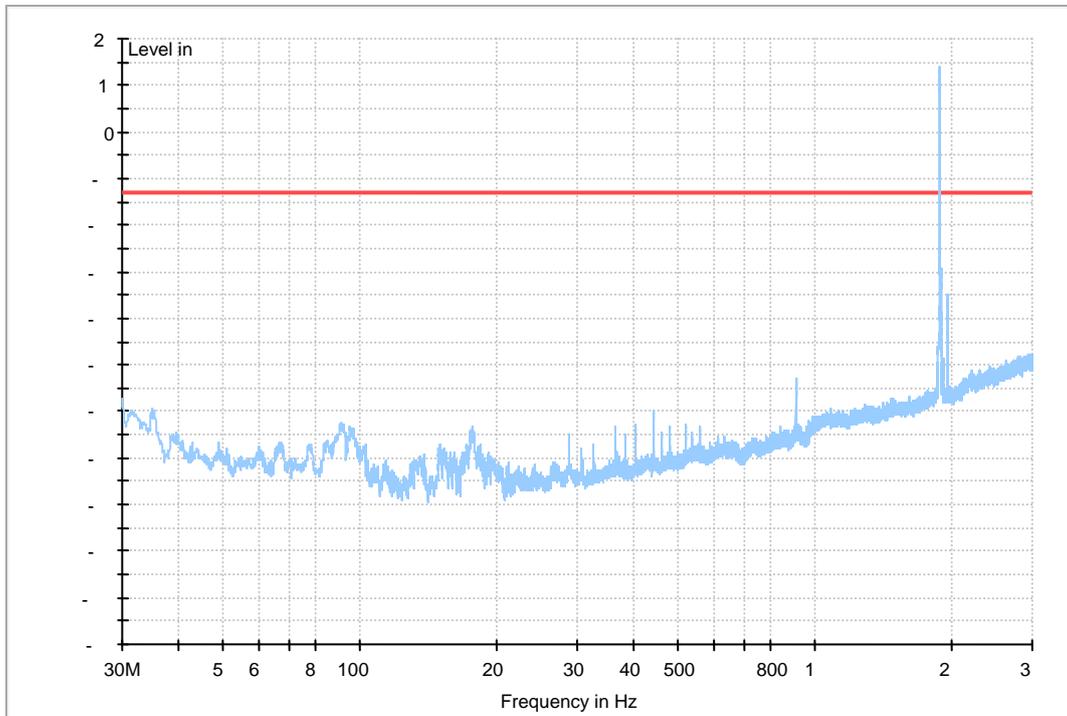


## WCDMA Band II

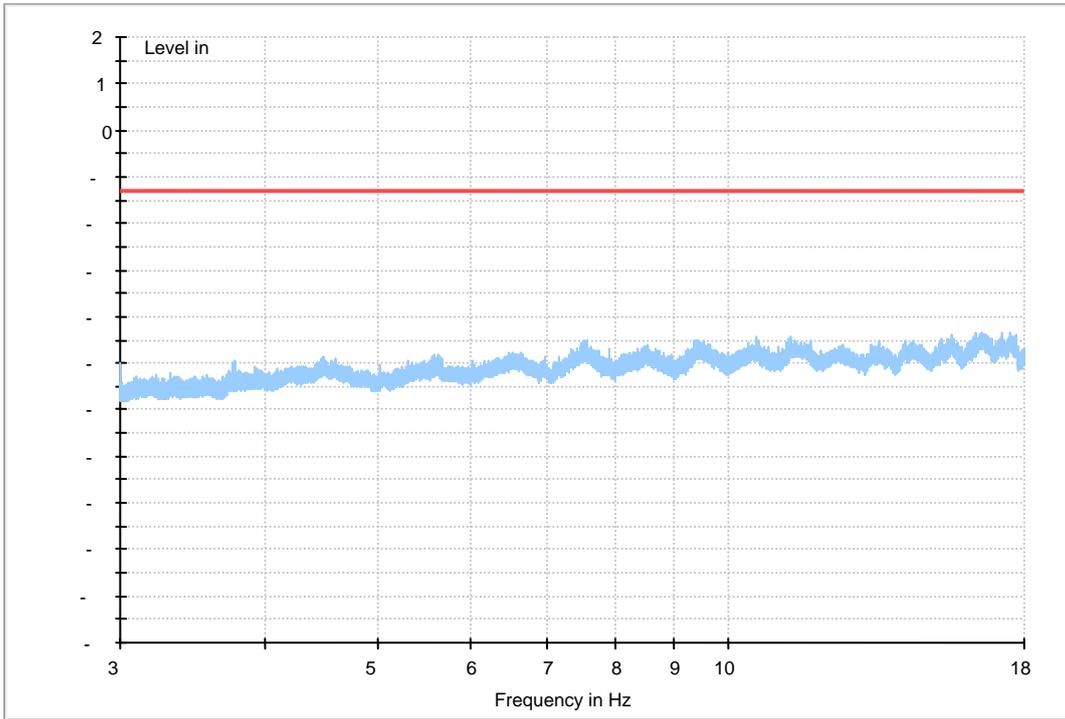
(9kHz-30MHz)



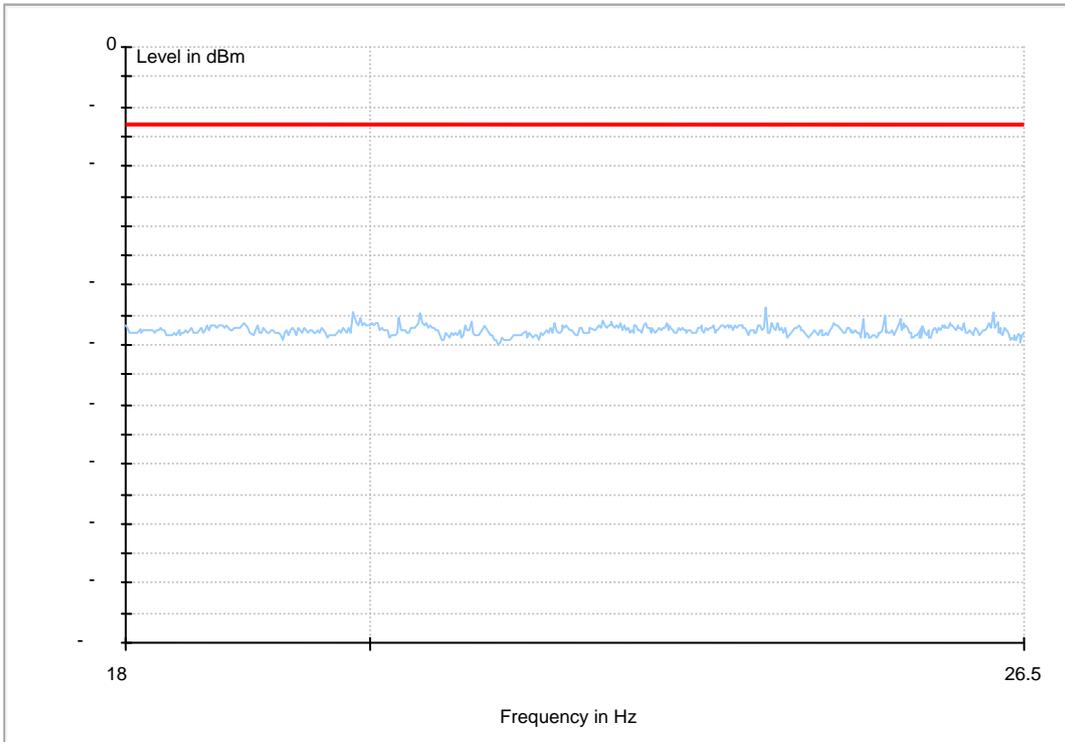
Traffic Mode (30MHz-3GHz)



### Traffic Mode (3GHz-18GHz)

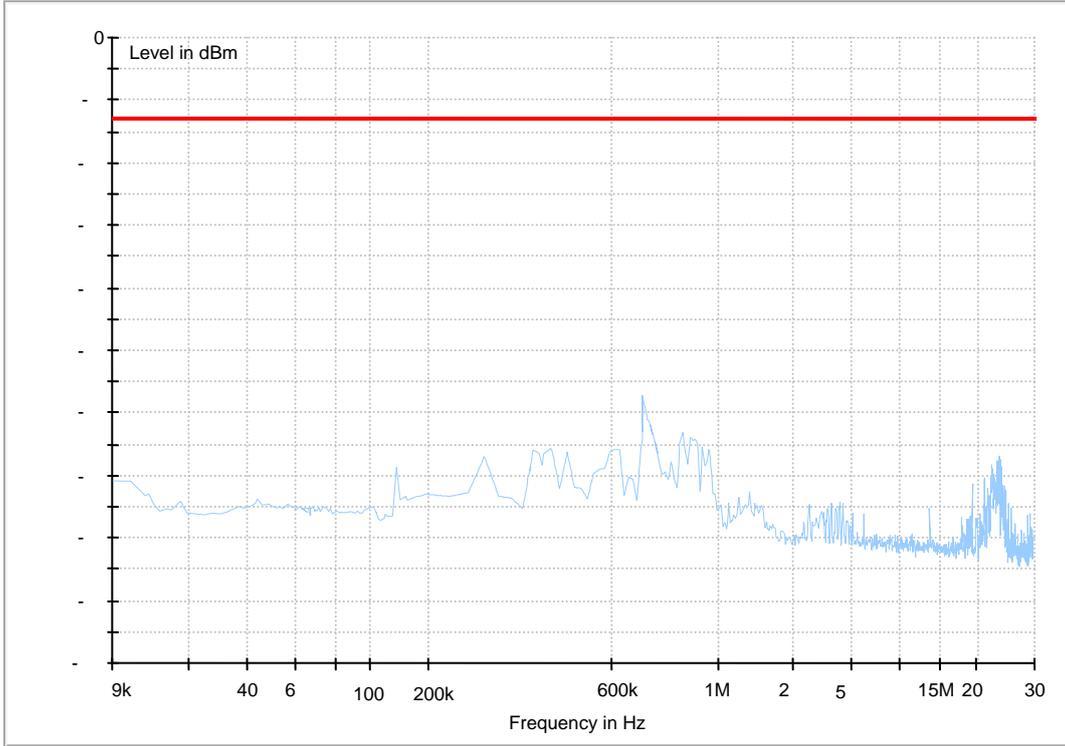


### (18GHz-26.5GHz)

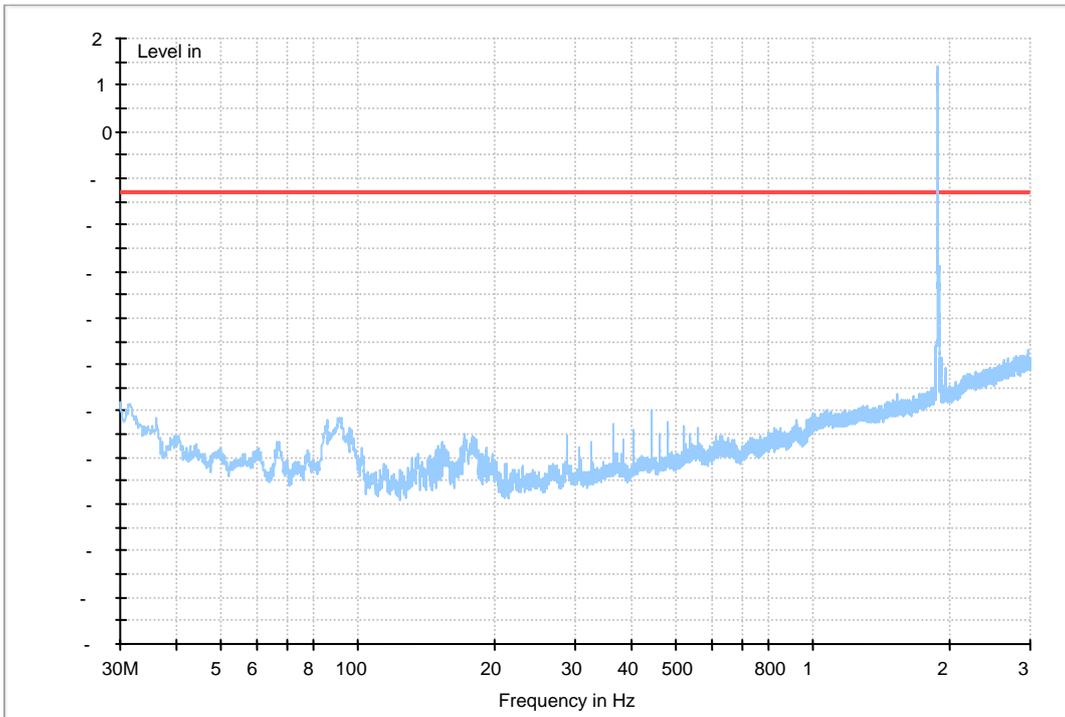


## HSDPA Band II

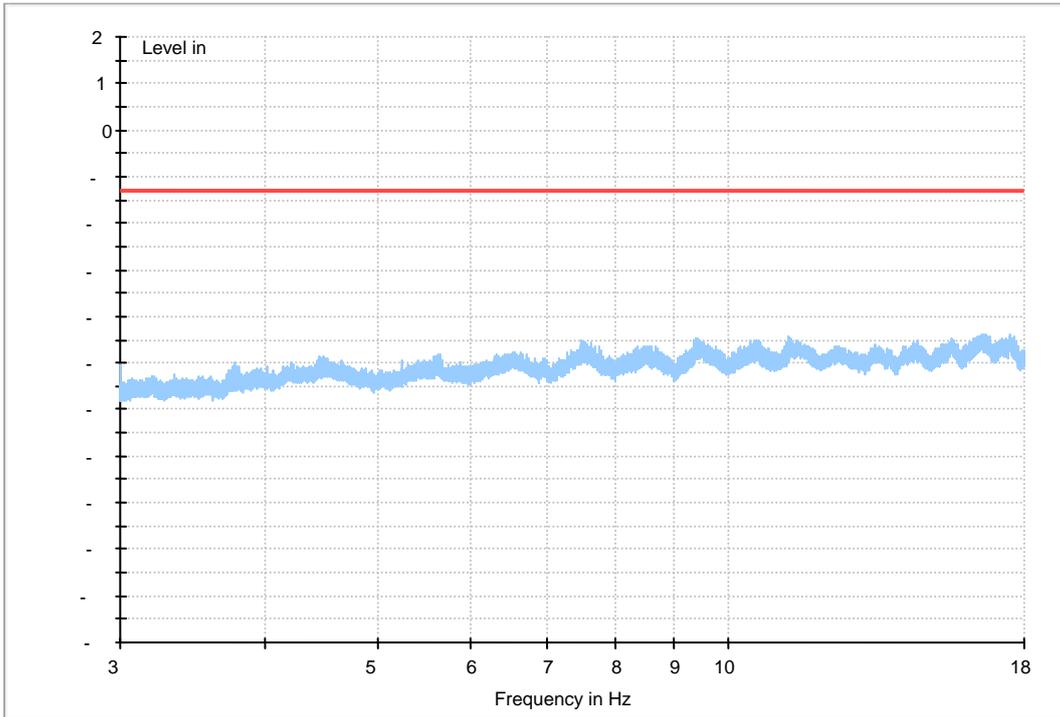
(9kHz-30MHz)



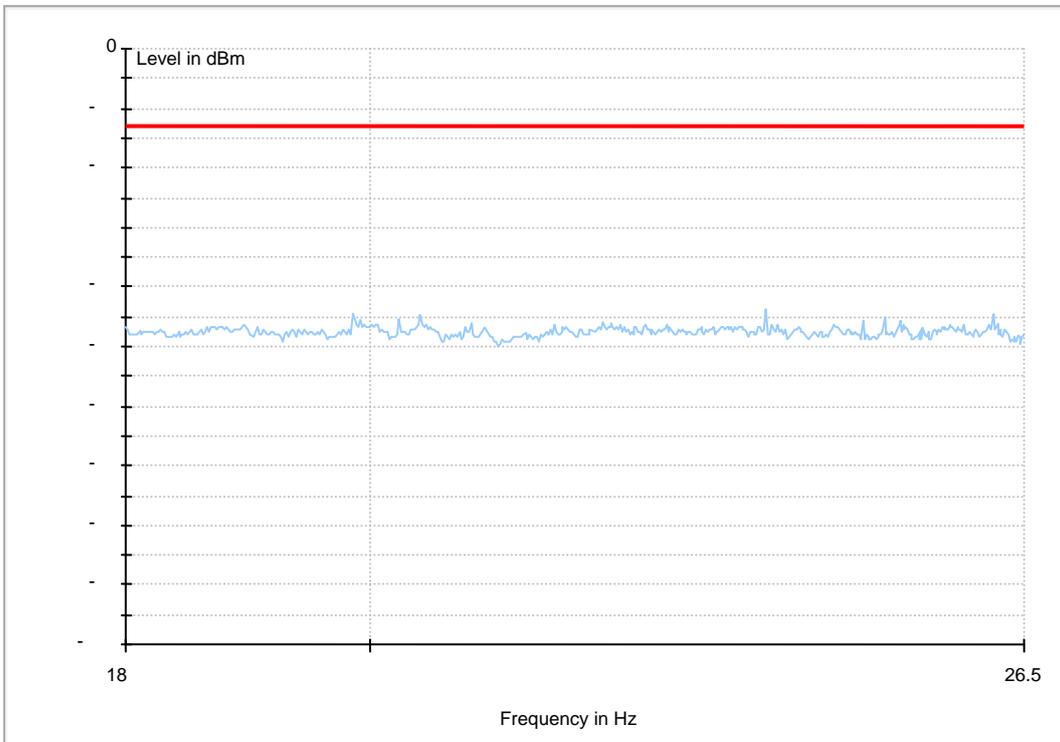
Traffic Mode (30MHz-3GHz)



### Traffic Mode (3GHz-18GHz)



### (18GHz-26.5GHz)



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



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# 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	-26	-0.01383	---	±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	-20	-0.01064	---	±2.5	Pass
			20 °C	15	0.00798	---	±2.5	Pass
			30 °C	-18	-0.00957	---	±2.5	Pass
			40 °C	13	0.00691	---	±2.5	Pass
			50 °C	-19	-0.01011	---	±2.5	Pass
TM 2	M	VN	-30 °C	-18	-0.00957	---	±2.5	Pass
			-20 °C	-16	-0.00851	---	±2.5	Pass
			-10 °C	23	0.01223	---	±2.5	Pass
			0 °C	-21	-0.01117	---	±2.5	Pass
			10 °C	-17	-0.00904	---	±2.5	Pass
			20 °C	-14	-0.00745	---	±2.5	Pass
			30 °C	18	0.00957	---	±2.5	Pass
			40 °C	-15	-0.00798	---	±2.5	Pass
			50 °C	-25	-0.01330	---	±2.5	Pass
TM 3	M	VN	-30 °C	-20	-0.01064	---	±2.5	Pass
			-20 °C	-19	-0.01011	---	±2.5	Pass
			-10 °C	-13	-0.00691	---	±2.5	Pass
			0 °C	13	0.00691	---	±2.5	Pass
			10 °C	-19	-0.01011	---	±2.5	Pass
			20 °C	24	0.01277	---	±2.5	Pass
			30 °C	-22	-0.01170	---	±2.5	Pass
			40 °C	22	0.01170	---	±2.5	Pass
			50 °C	25	0.01330	---	±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	-21	-0.01117	---	±2.5	Pass
			VH	16	0.00851	---	±2.5	Pass
TM 2	M	TN	VL	-16	-0.00851	---	±2.5	Pass
			VN	-23	-0.01223	---	±2.5	Pass
			VH	24	0.01277	---	±2.5	Pass
TM 3	M	TN	VL	-29	-0.01543	---	±2.5	Pass
			VN	26	0.01383	---	±2.5	Pass
			VH	28	0.01489	---	±2.5	Pass

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