



FCC RF Test Report

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

Model Number: HW-01E

**Report No: SYBH(Z-RF)011082012-2001
FCC ID:QISU9501L**

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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".
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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.
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1 General Information

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 2:2011, Subpart J 47 CFR FCC Part 22:2011, Subpart H ANSI/TIA 603C:2004
1.2 Test Location	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
1.3 Test Environmental Condition	
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
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 & 917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 2.917	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/100 kHz, 30 MHz to 10 th harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 22.917	Below -13 dBm/100 kHz	Pass
Frequency Stability	2.1055 & 22.355	Maintained within the tolerances of ± 2.5 ppm	Pass

3 Product Description

3.1 Product Information

3.1.1 General Description

HW-01E is subscriber equipment in the LTE/WCDMA/GSM system. The LTE frequency band is Band I, not included in this report. The HSUPA/HSDPA/UMTS frequency band is Band V, Band VI and Band XIX, But only Band V included in this report. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/WCDMA/GSM 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

Board Information

LTE/HSUPA/HSDPA/UMTS/GSM/GPRS/EDGE Mobile Phone with Bluetooth		
HW-01E		
Board and Module		
Equipment Designation / Description	Hardware Version	Software Version
MAINBOARD	U9501L_VB	U9501LV100R001C341B126

3.1.3 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB4T1HV Rated capacity: 1800mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V

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: Power class 4 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), 247KG7W (8PSK modulation) UMTS system: 4M18F9W

4.3 Antenna Gain

Antenna Gain(dBi)	1.2
Antenna Gain(dBd)	-0.95

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 3.8 V DC Voltage Range: \approx 3.5 V to 4.35 V
Input to EUT (AC power)	AC Voltage Nominal: \sim 120 V (50/60 Hz) AC Voltage Range: \sim 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	4.35V

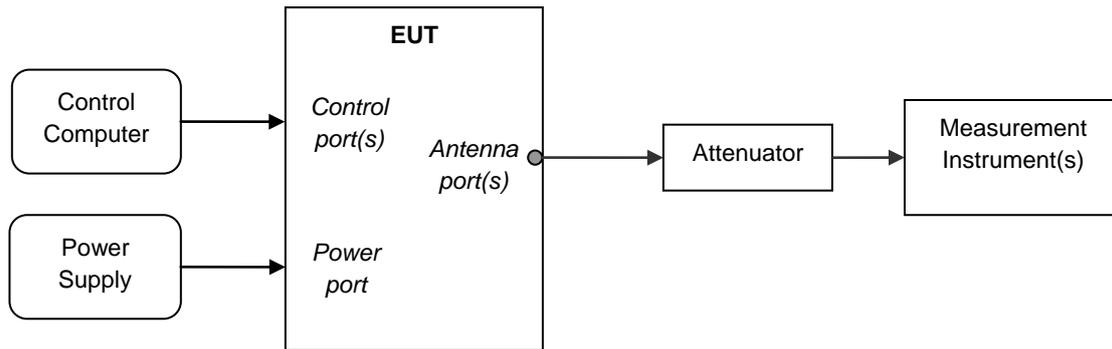
NOTE: VL= lower extreme test voltage
 VN= nominal voltage
 VH= upper extreme test voltage
 TN= normal temperature

5.4 Test Setup

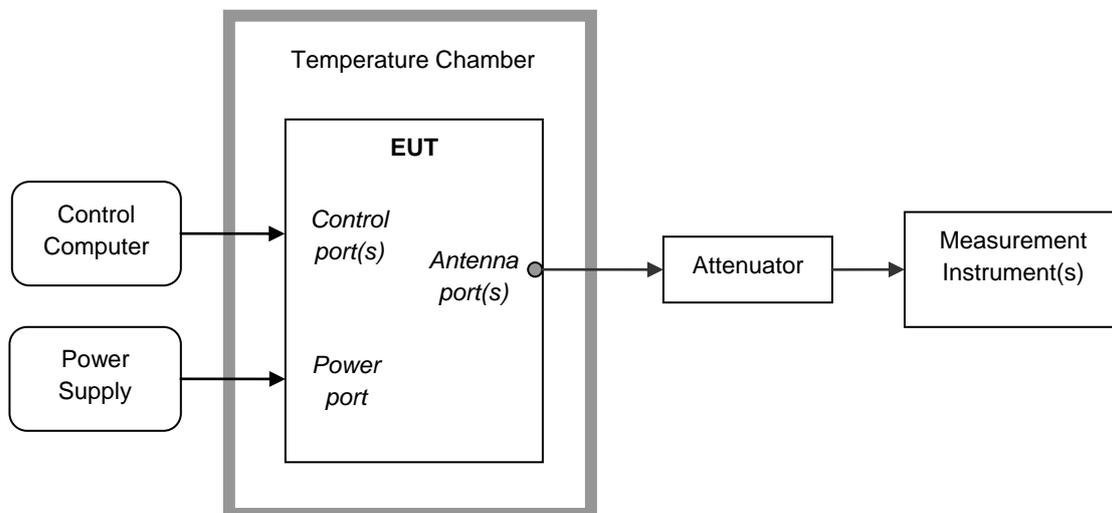
5.4.1 General Test Setup Configurations

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

5.4.2 Test Setup 1



5.4.3 Test Setup 2



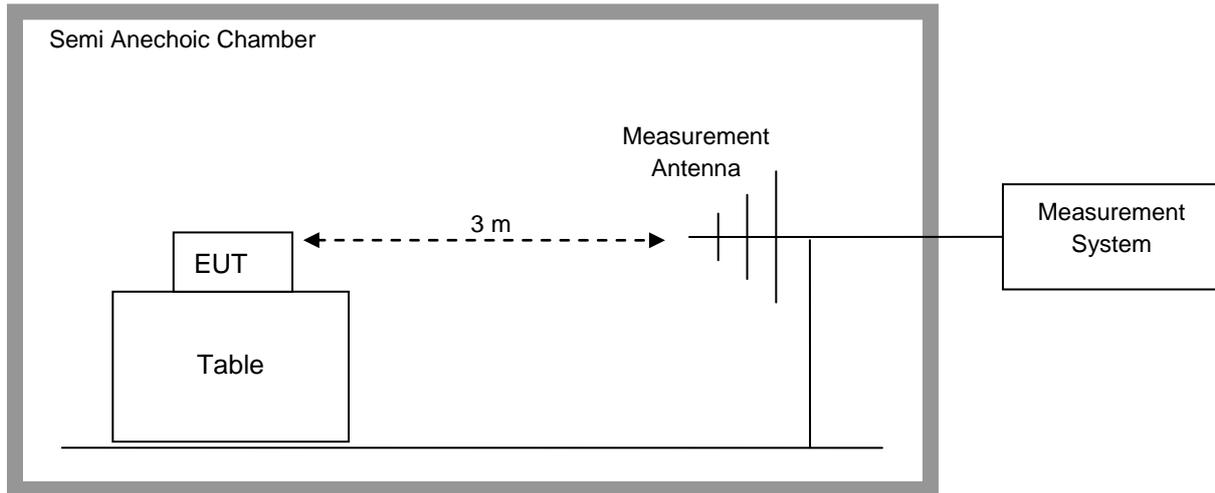
5.4.4 Test Setup 3

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

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

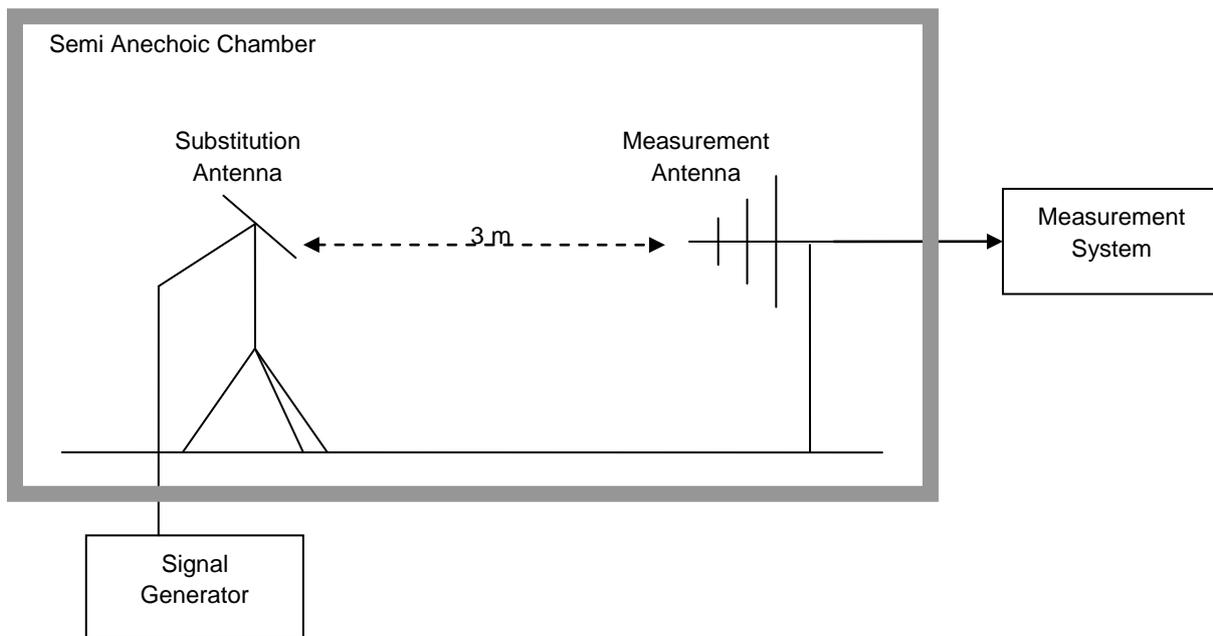
Step 1: Pre-test to find the Maximum ERP or EIRP

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



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

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



5.5 Test Conditions

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



Test Case	Test Conditions	
	Test Mode	TM1/TM2/TM3

6 Main Test Instruments

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

Note: All the equipments are calibrated once a year. When it's almost due, we will arrange calibration again before the calibration deadline.

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		33.97	38.5	33.95	38.5	33.98	38.5
TM2		27.17	38.5	27.05	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	Measured	Limit
TM3		23.62	38.5	23.66	38.5	24.61	38.5
TM4	Case1	22.65	38.5	22.61	38.5	23.59	38.5
	Case2	22.45	38.5	22.41	38.5	23.83	38.5
	Case3	22.04	38.5	21.78	38.5	23.07	38.5
	Case4	22.01	38.5	21.82	38.5	23.04	38.5
TM5	Case1	21.81	38.5	22.12	38.5	22.97	38.5
	Case2	19.51	38.5	19.42	38.5	19.88	38.5
	Case3	21.37	38.5	21.32	38.5	22.28	38.5
	Case4	21.58	38.5	21.37	38.5	22.64	38.5
	Case5	22.41	38.5	21.81	38.5	22.45	38.5



Effective Radiated Power of Transmitter (ERP)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP)	FCC limit [dBm]	Result
							[dBm]		
TM1	824.2	33.02	Dipole Ant.	36.53	-2.75	0.6	33.18	38.5	Pass
TM1	837.0	33.00	Dipole Ant.	36.54	-2.87	0.6	33.07	38.5	Pass
TM1	848.8	33.03	Dipole Ant.	36.28	-2.85	0.6	32.83	38.5	Pass
TM2	824.2	26.22	Dipole Ant.	29.37	-2.75	0.6	26.02	38.5	Pass
TM2	837.0	26.10	Dipole Ant.	29.37	-2.87	0.6	25.90	38.5	Pass
TM2	848.8	26.07	Dipole Ant.	29.60	-2.85	0.6	26.15	38.5	Pass
TM3	826.4	22.67	Dipole Ant.	25.82	-2.75	0.6	22.47	38.5	Pass
TM3	836.4	22.71	Dipole Ant.	26.26	-2.87	0.6	22.79	38.5	Pass
TM3	846.6	23.66	Dipole Ant.	26.91	-2.85	0.6	23.46	38.5	Pass

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

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

b, SGP=Signal Generator Level

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



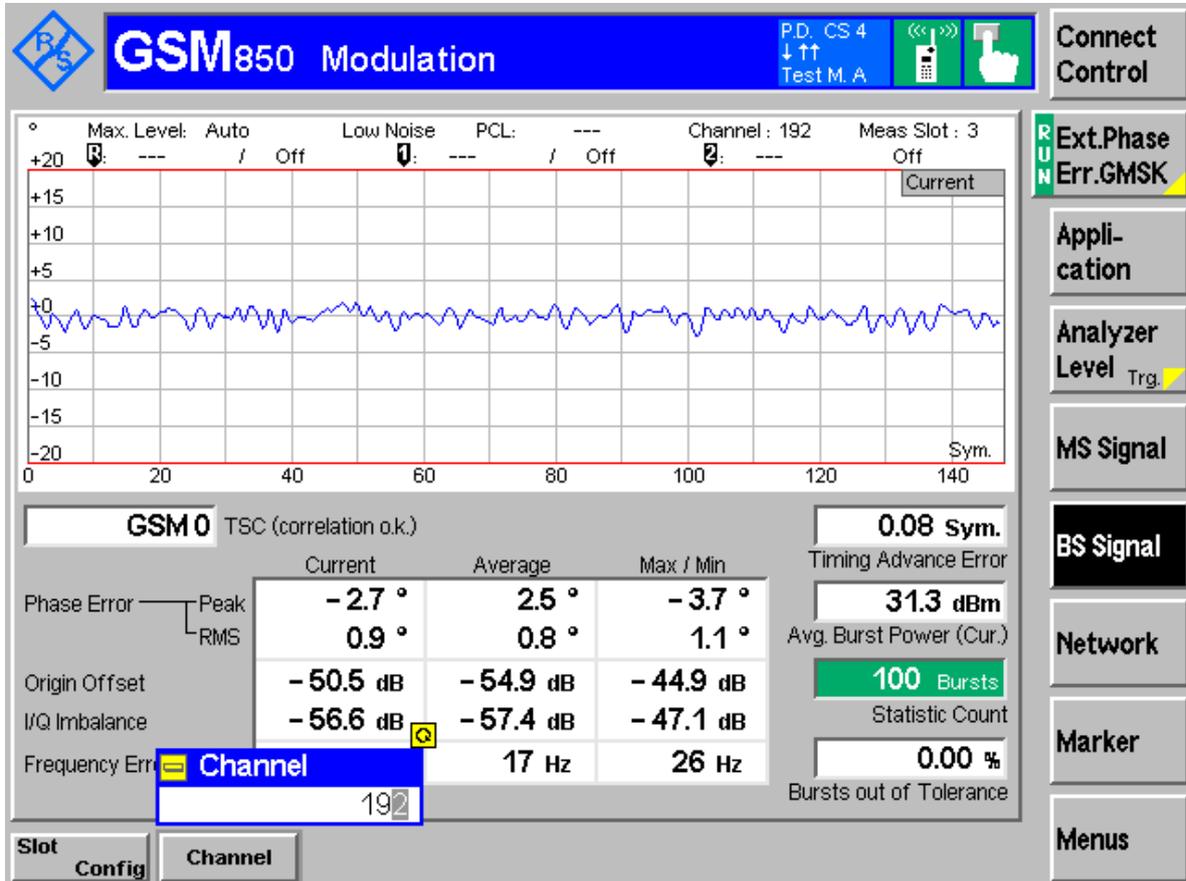
Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

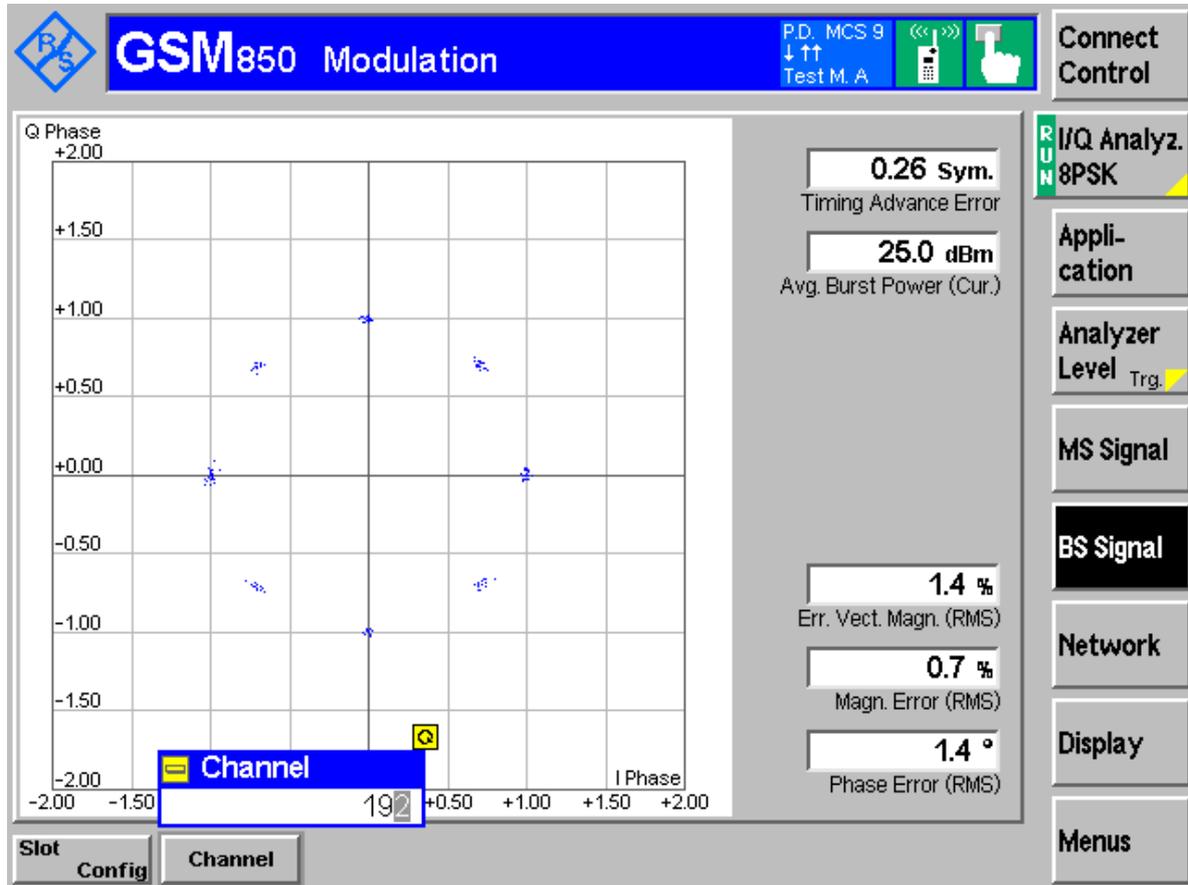


Channel 192 (TM1:GPRS/GSM)



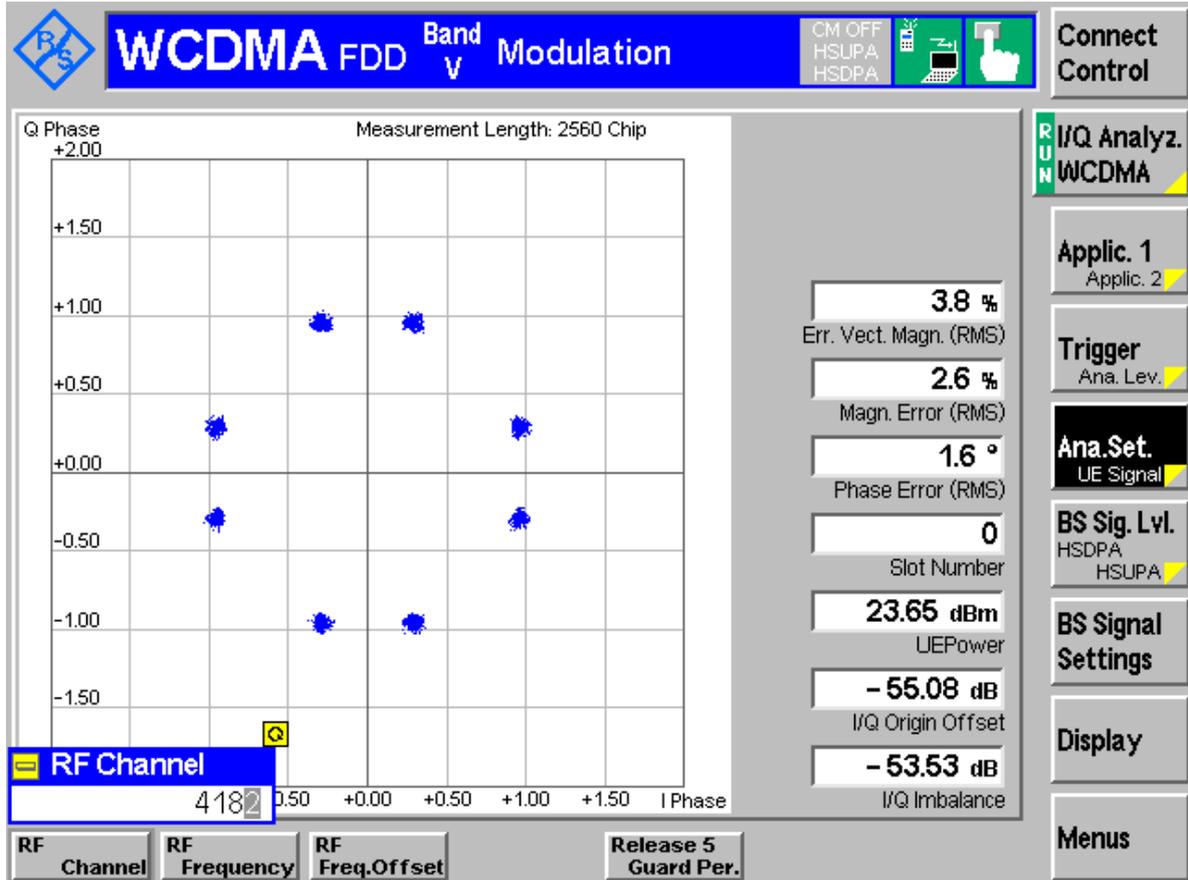


Channel 192 (TM2:EDGE)





Channel 4182 (TM3: WCDMA)



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



Appendix C

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



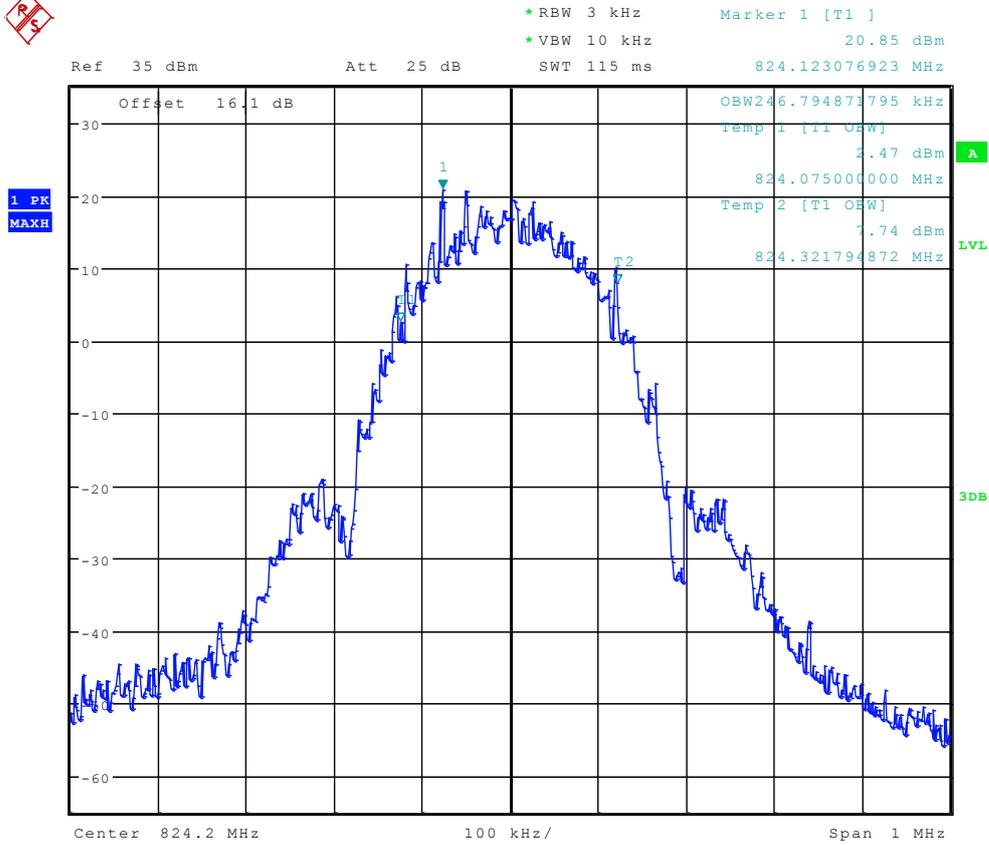
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	Verdict
TM1	128	243.59	Pass
	192	246.79	Pass
	251	243.59	Pass
TM2	128	246.79	Pass
	192	246.79	Pass
	251	243.59	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	Verdict
TM3	4132	4.15	Pass
	4182	4.17	Pass
	4233	4.17	Pass

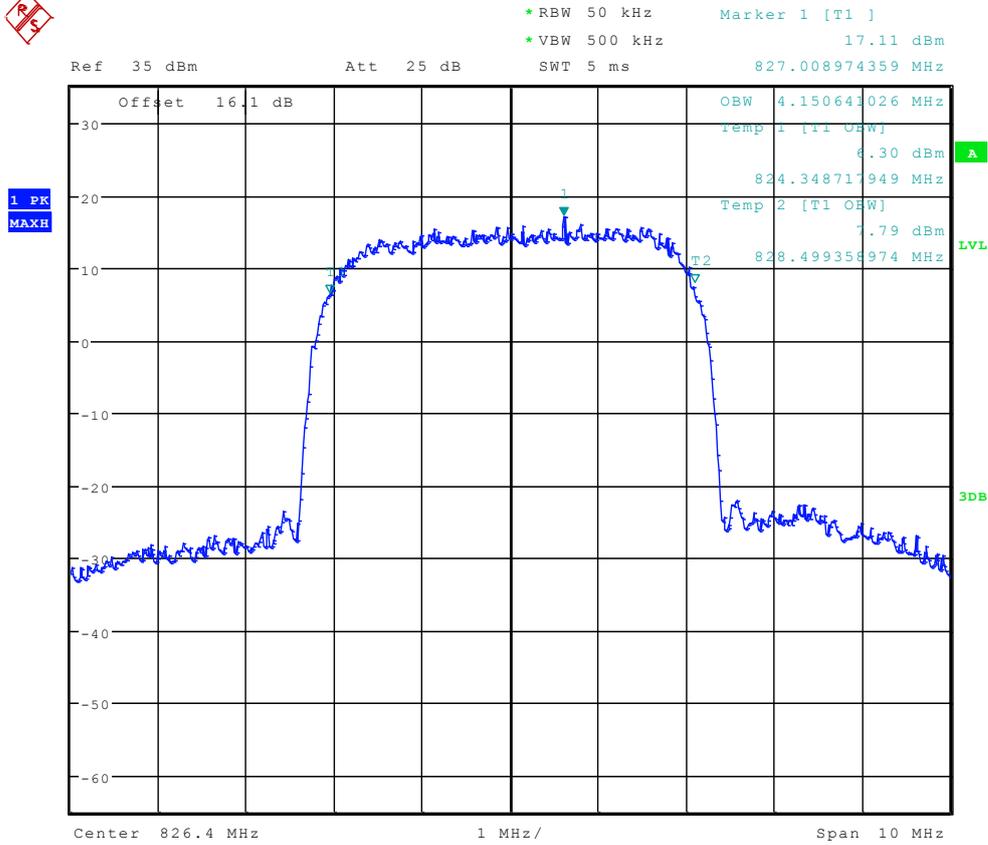


Channel 128 (TM2:EDGE)



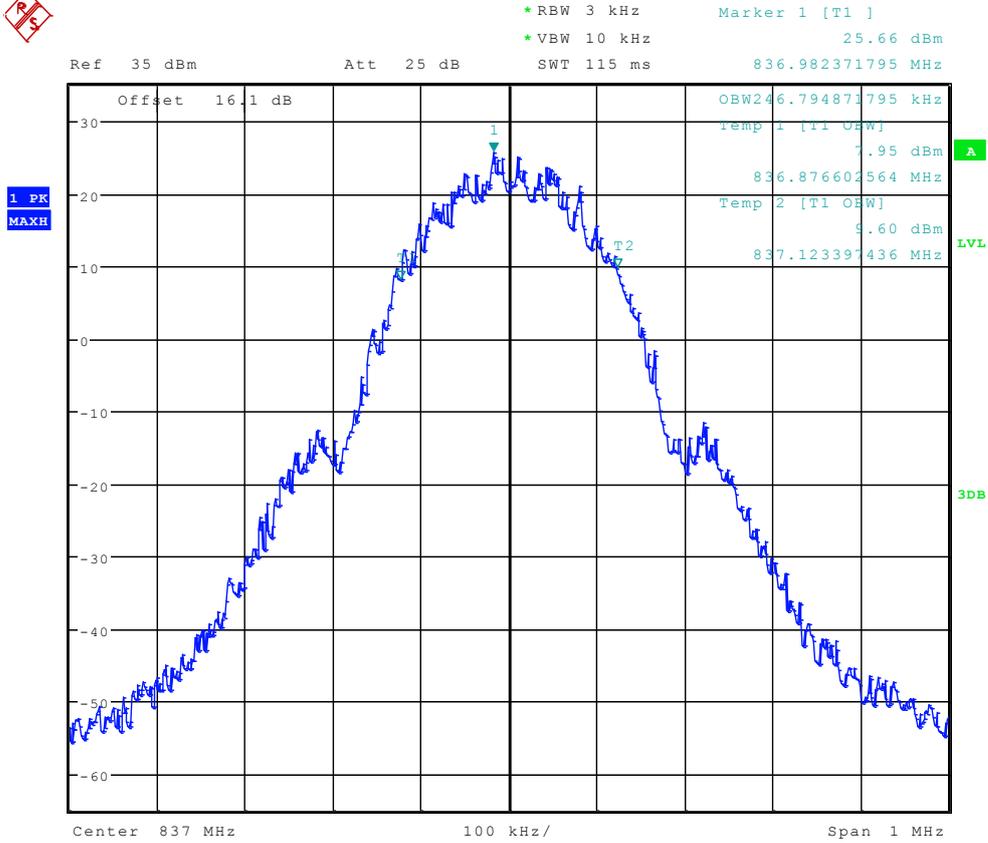


Channel 4132 (TM3: WCDMA)





Channel 192 (TM1:GPRS/GSM)

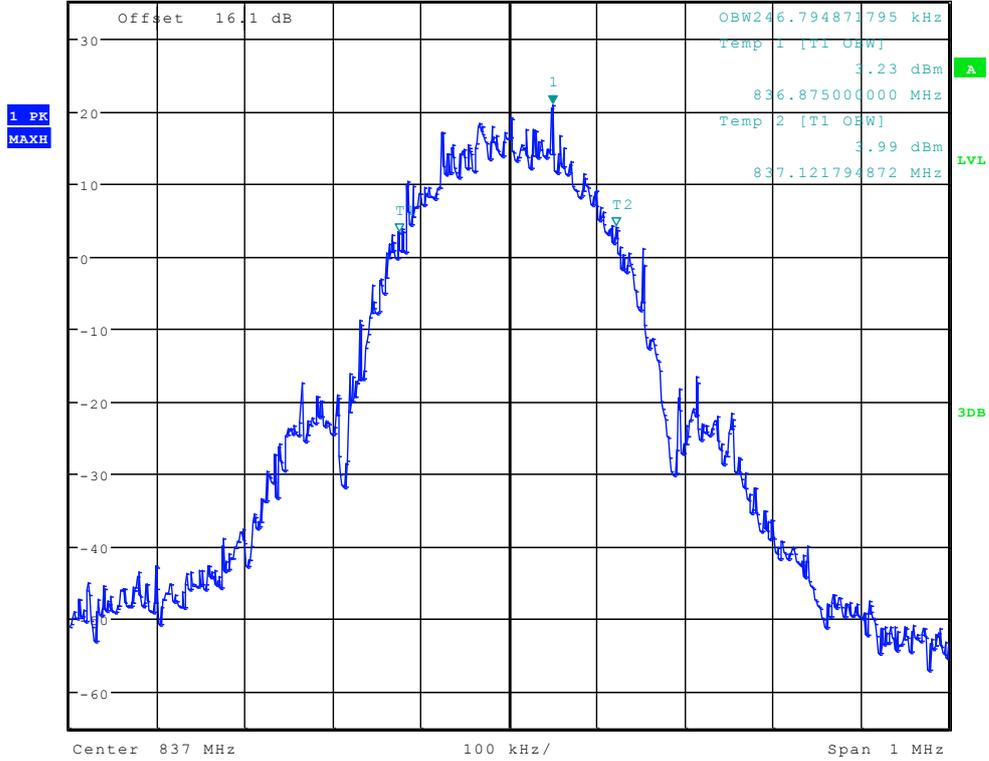




Channel 192 (TM2:EDGE)

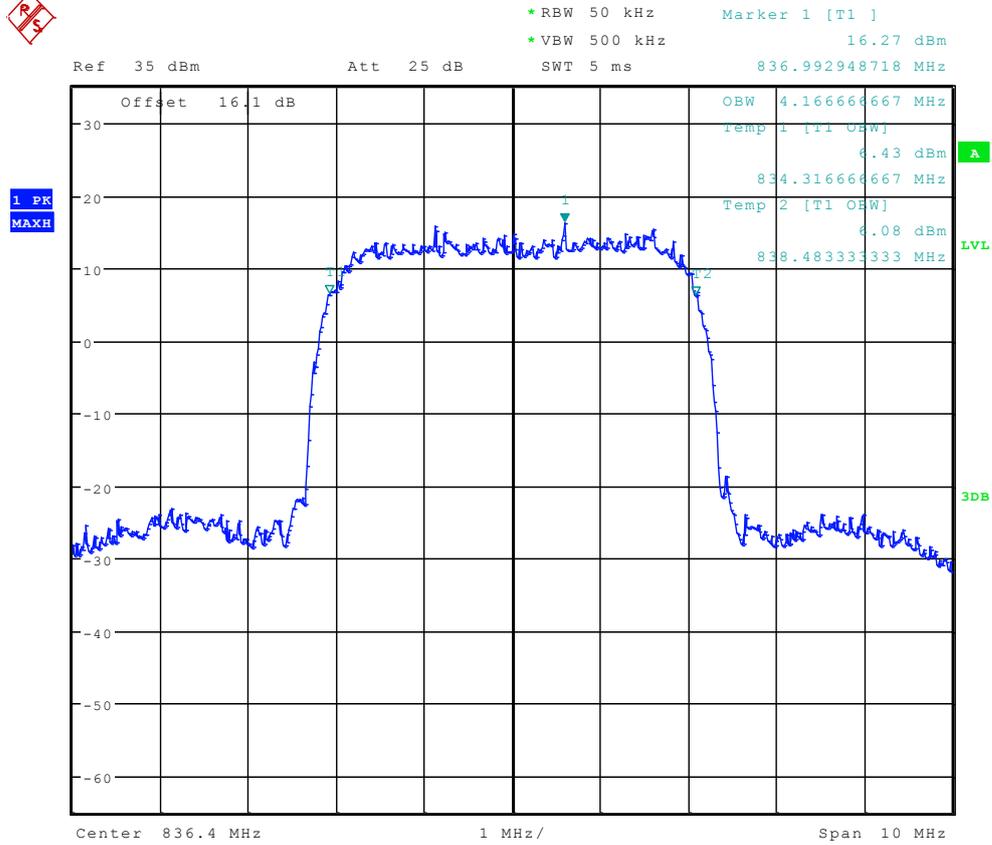


*RBW 3 kHz Marker 1 [T1]
*VBW 10 kHz 20.80 dBm
Ref 35 dBm Att 25 dB SWT 115 ms 837.049679487 MHz



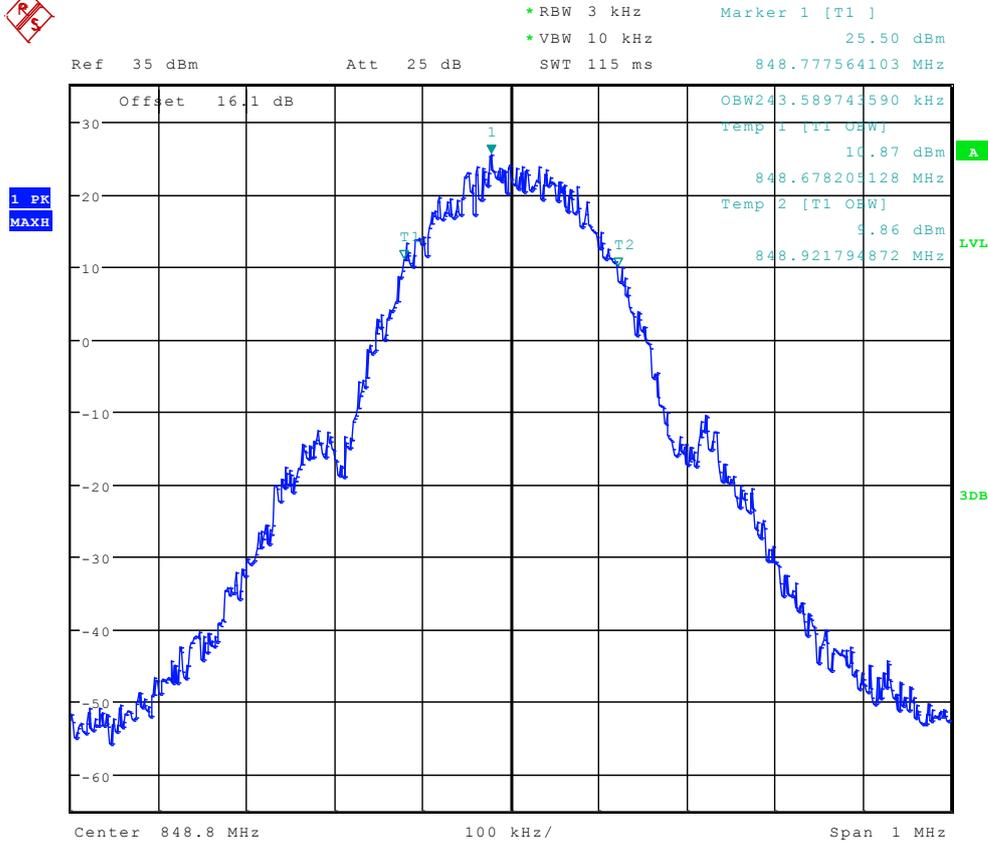


Channel 4182 (TM3: WCDMA)



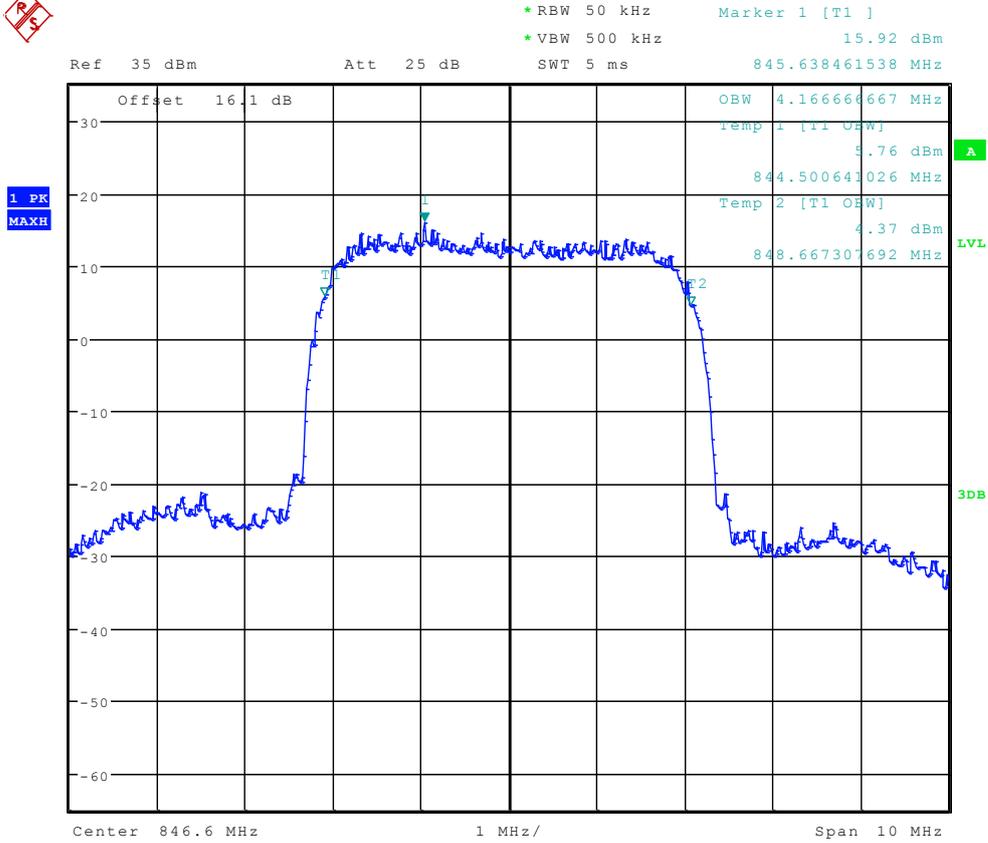


Channel 251 (TM1:GPRS/GSM)





Channel 4233 (TM3: WCDMA)



-----END-----



Appendix D

Band Edges Compliance

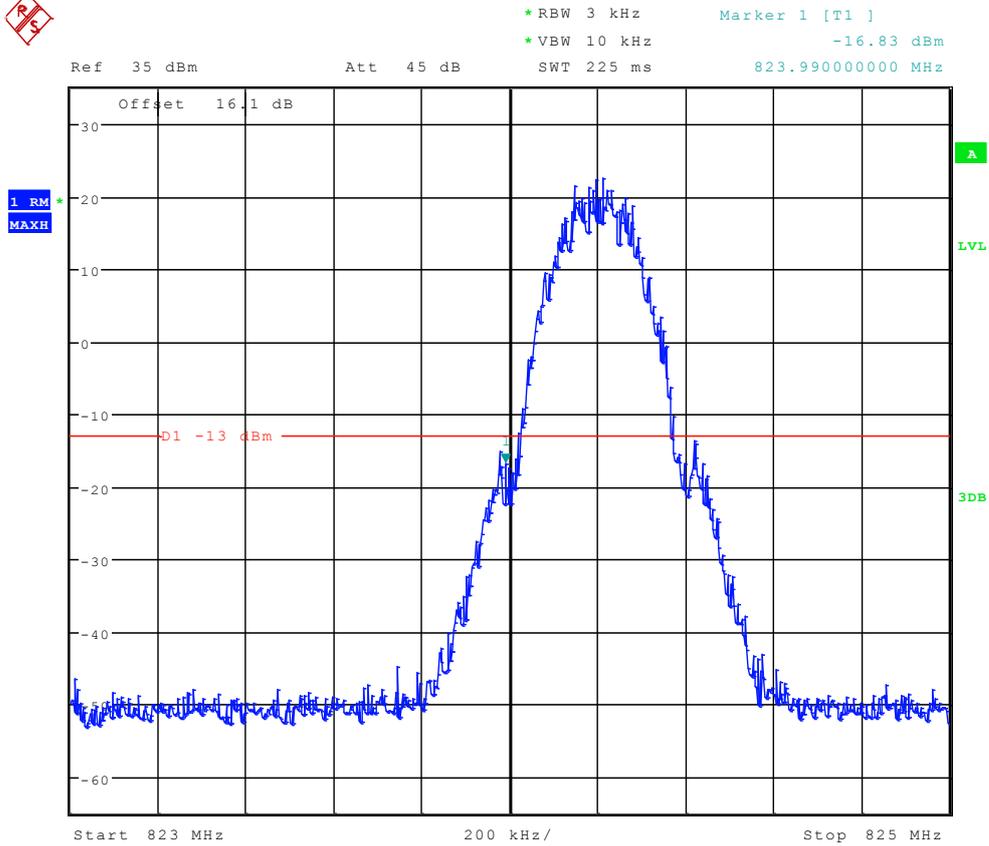
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM

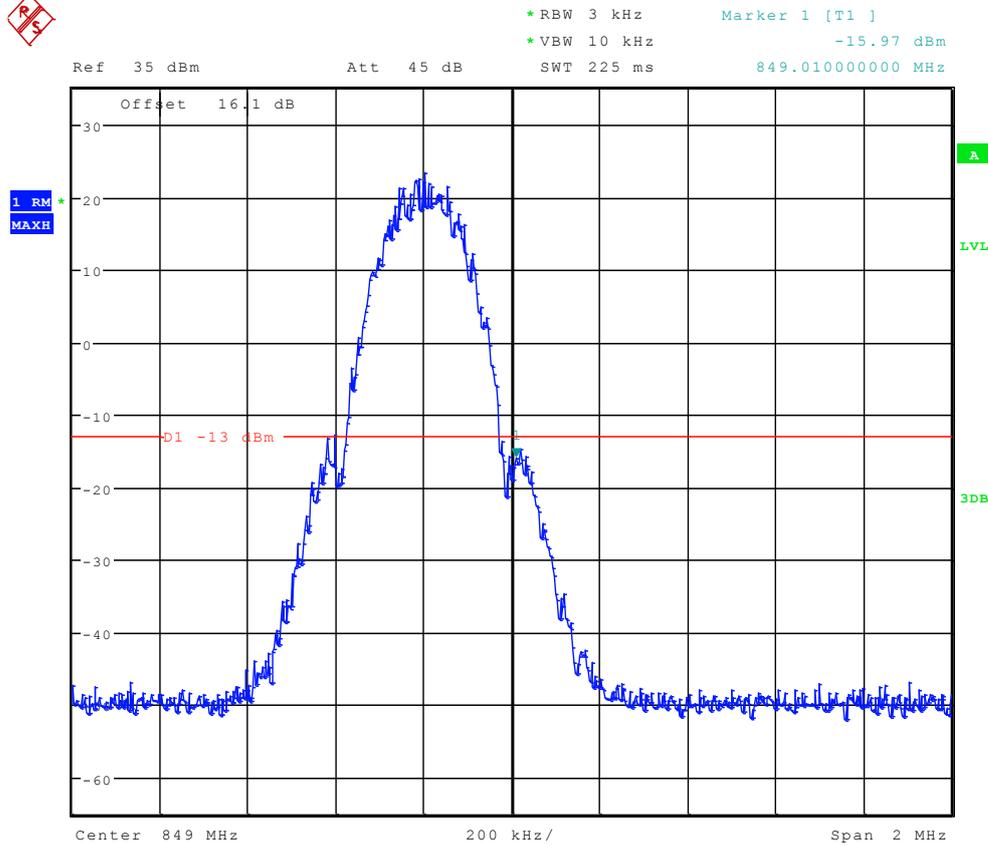
Left Edge

Channel 128





Right Edge Channel 251

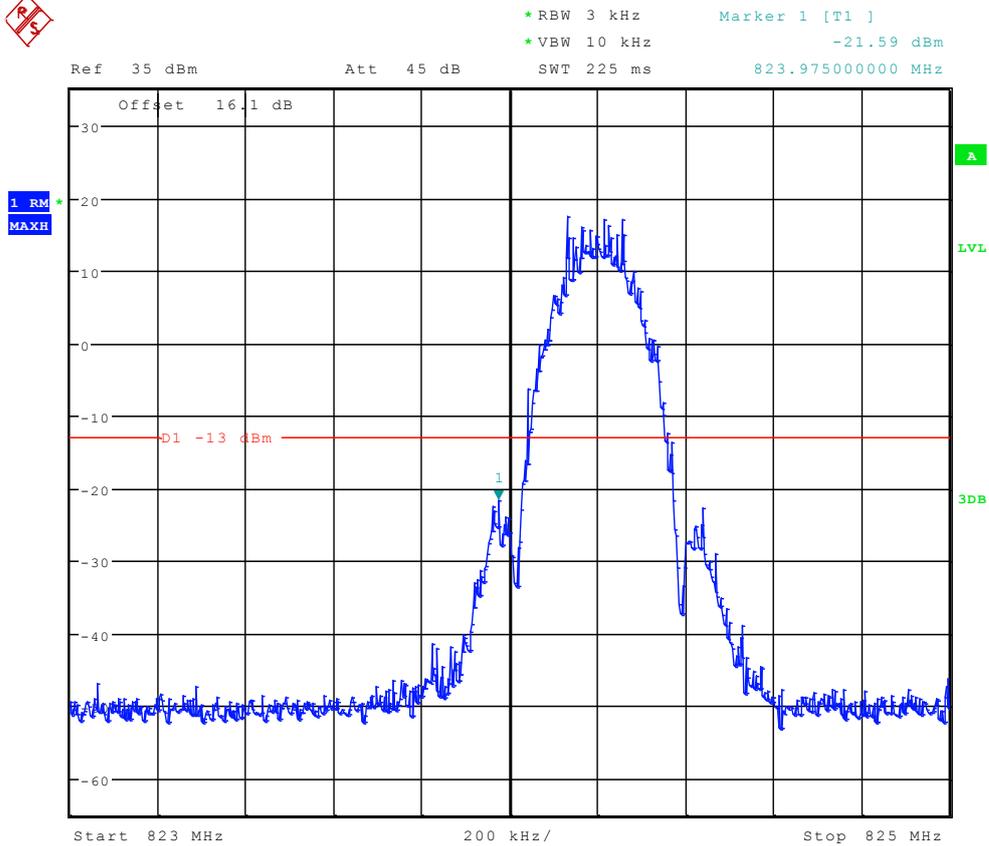




TM2:EDGE

Left Edge

Channel 128

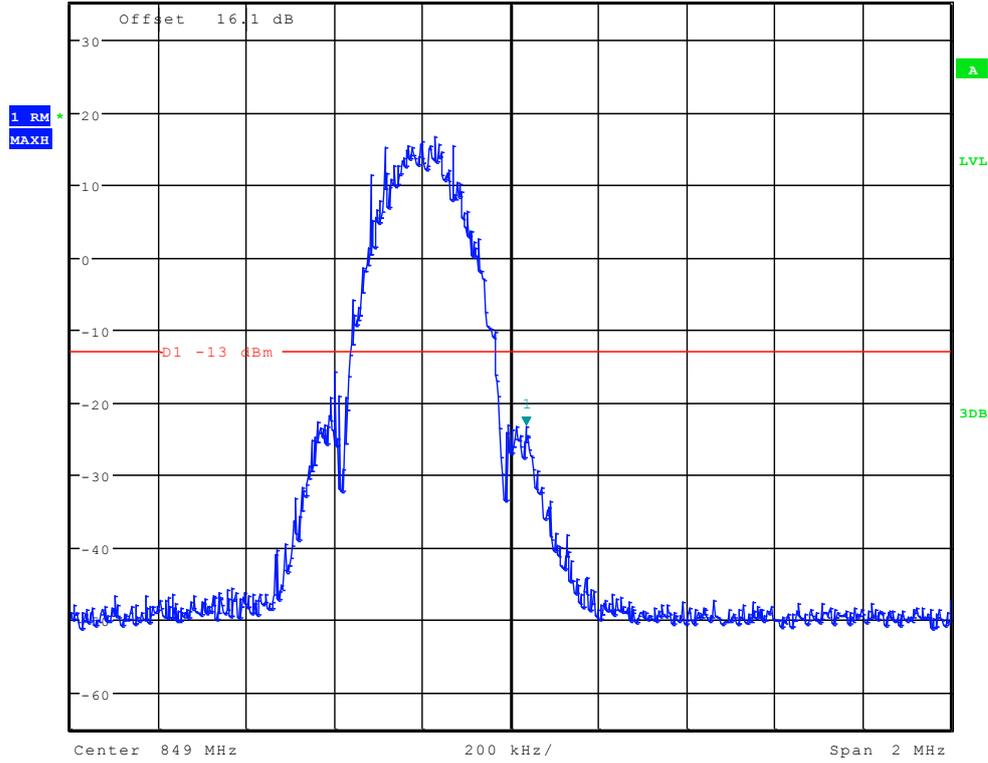




Right Edge Channel 251



Ref 35 dBm Att 45 dB SWT 225 ms 849.03500000 MHz
*RBW 3 kHz Marker 1 [T1] -23.29 dBm
*VBW 10 kHz

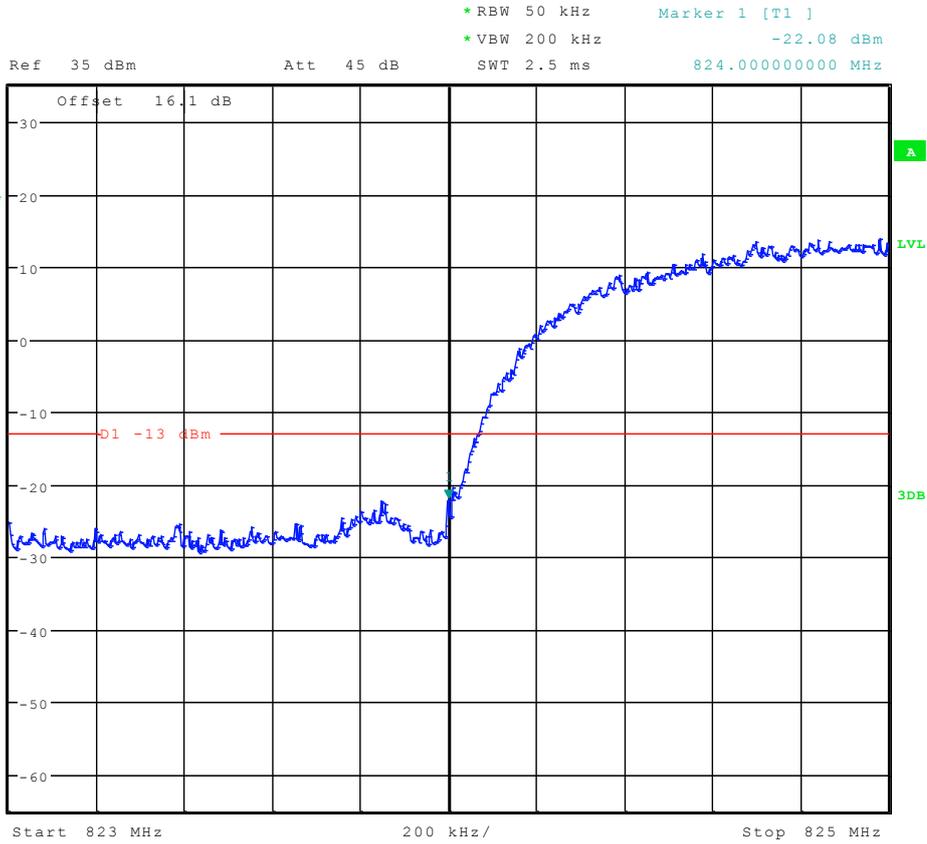




TM3: WCDMA

Left Edge

Channel 4132

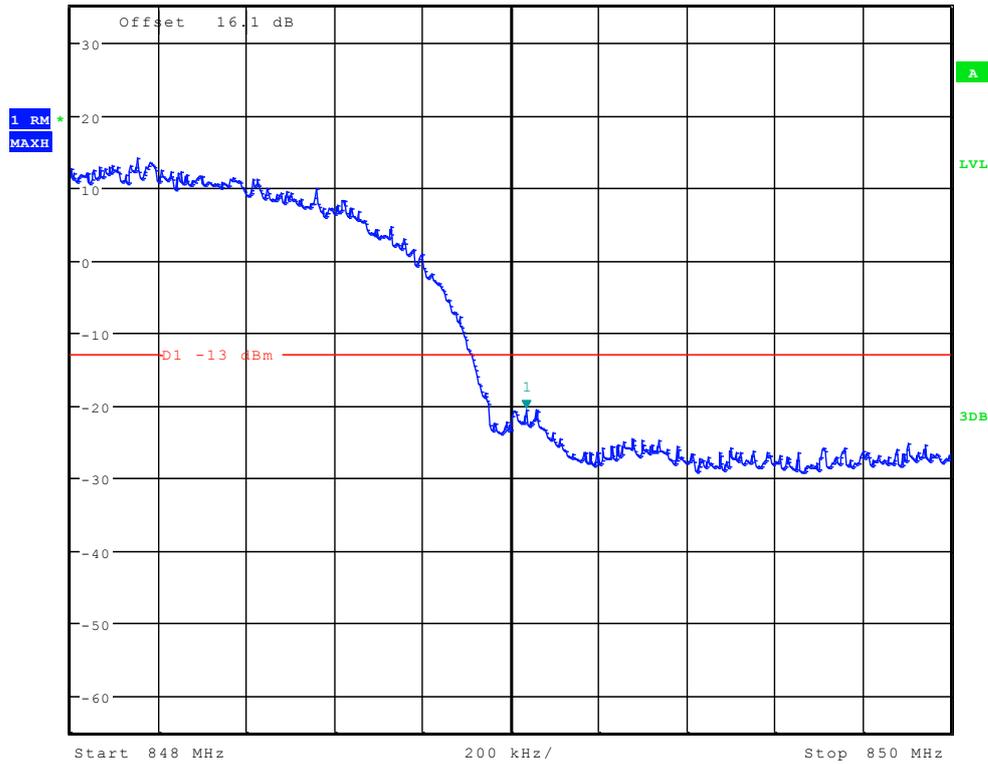




Right Edge Channel 4233



*RBW 50 kHz Marker 1 [T1]
 *VBW 200 kHz -20.49 dBm
 Ref 35 dBm Att 45 dB SWT 2.5 ms 849.035000000 MHz



-----END-----



Appendix E

Spurious Emission at Antenna Terminal

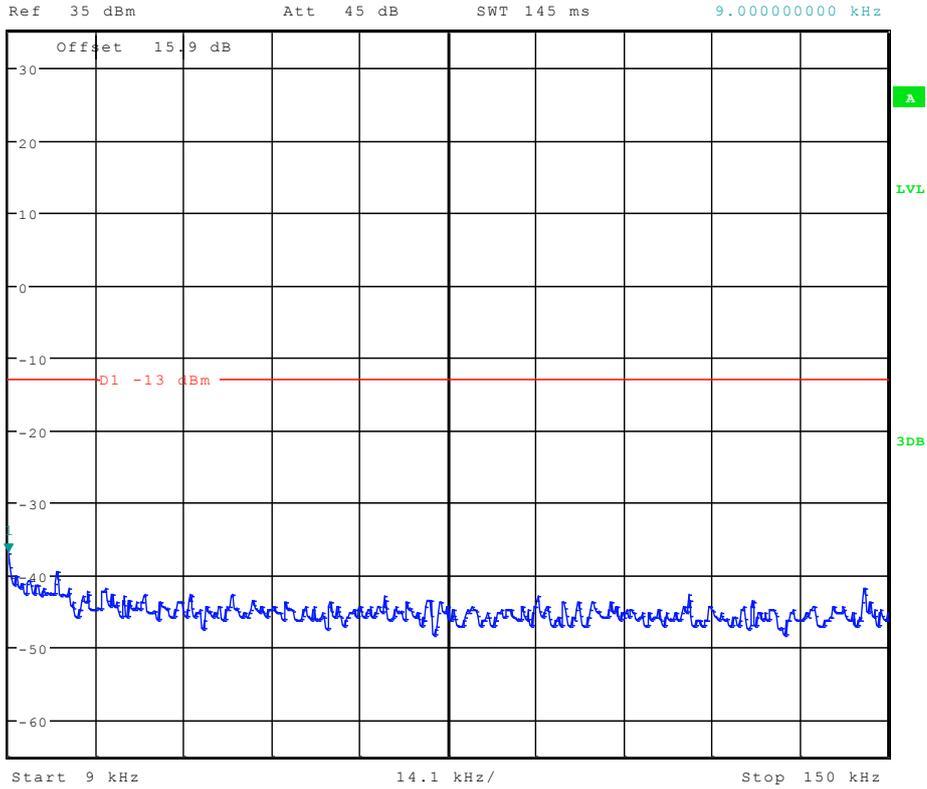
According to FCC Part 2.1051 & Part 22 Subpart H



TM1:GPRS/GSM Channel 128

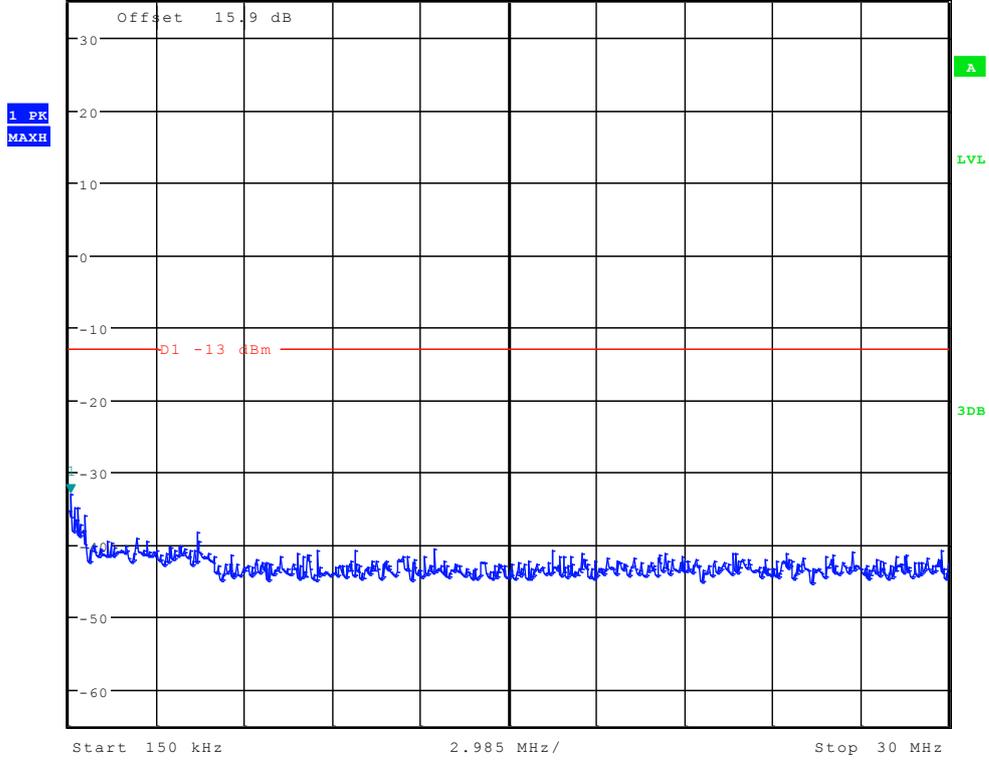


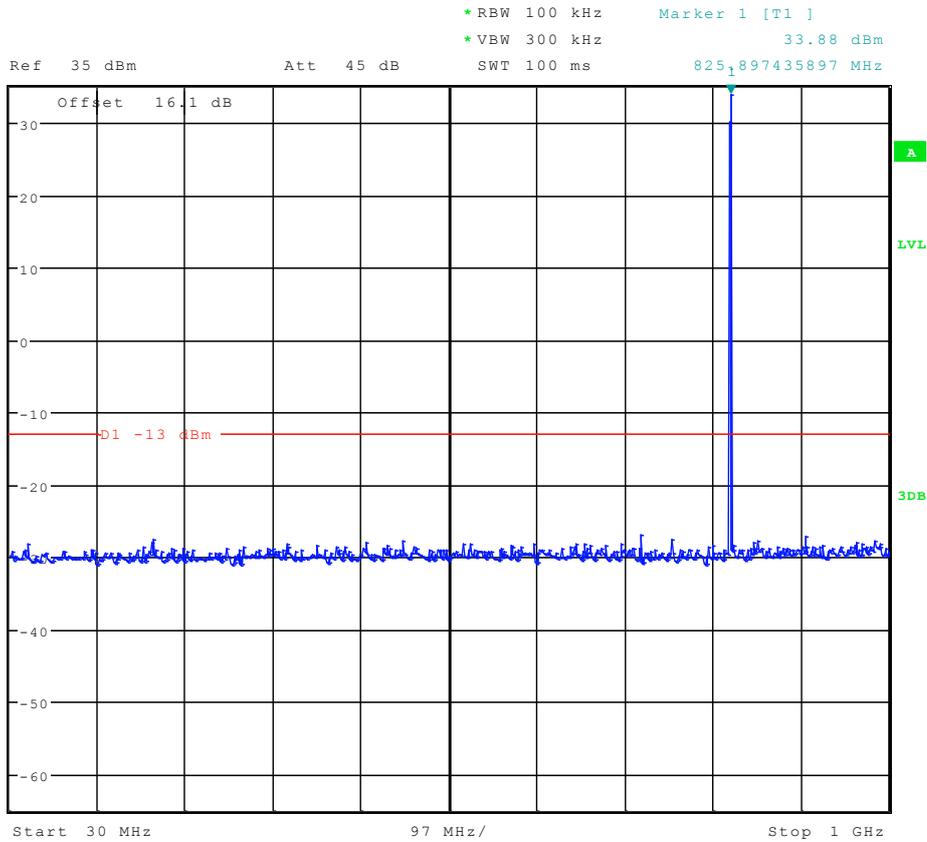
*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -36.89 dBm
SWT 145 ms 9.000000000 kHz





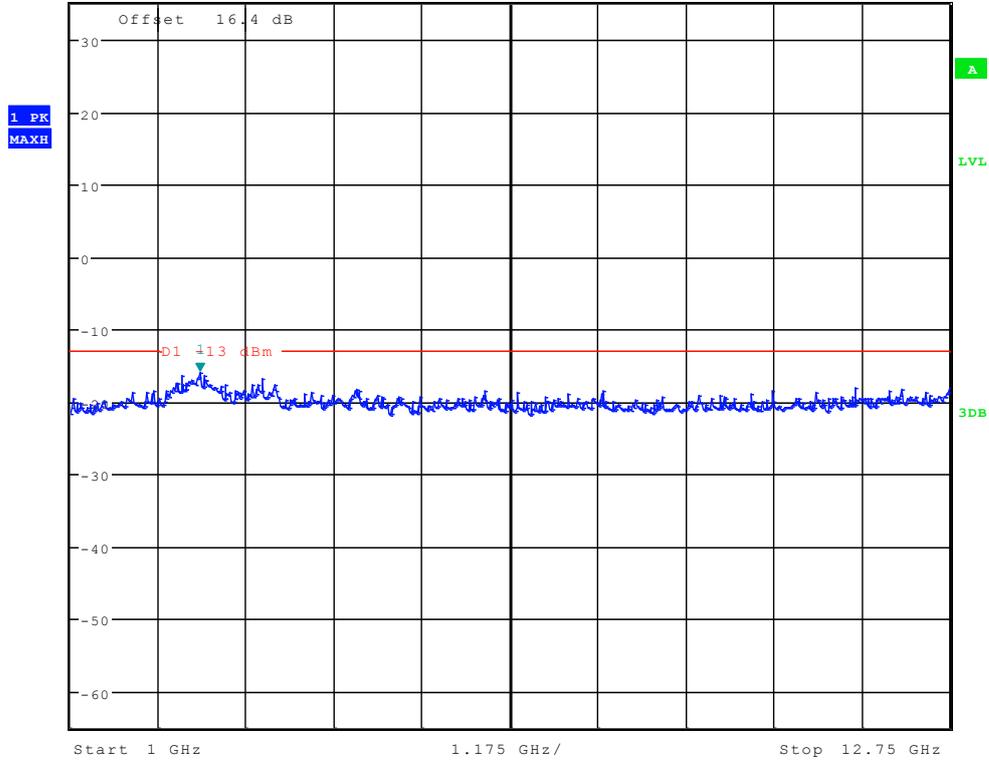
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -33.06 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 197.836538462 kHz





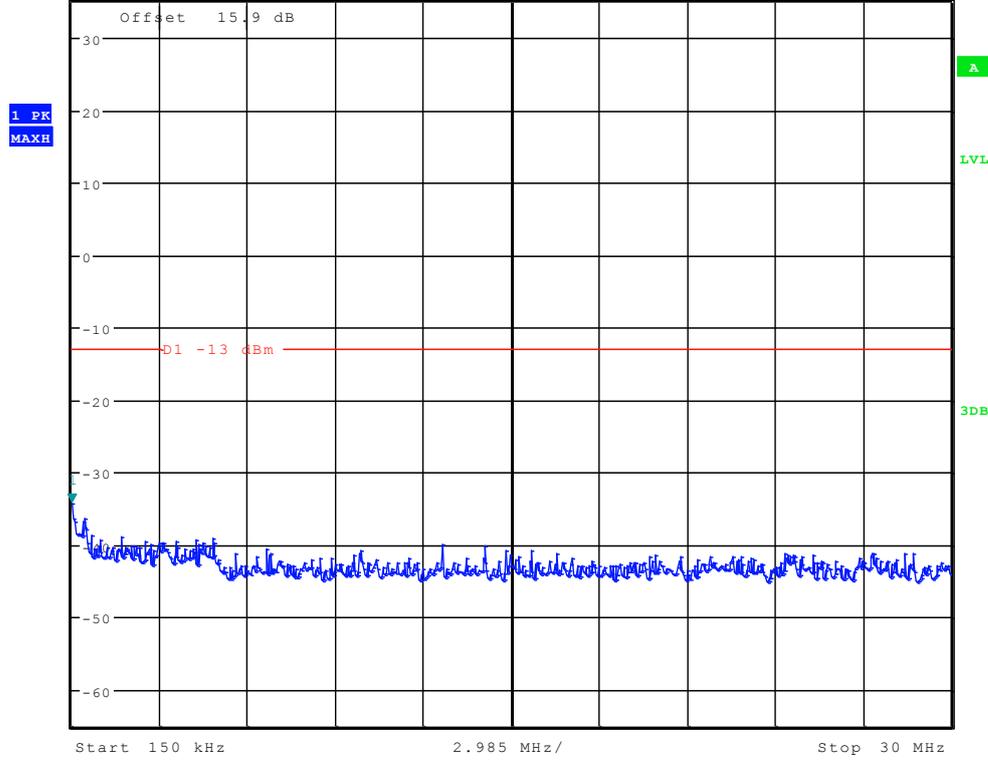


* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.03 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.732371795 GHz



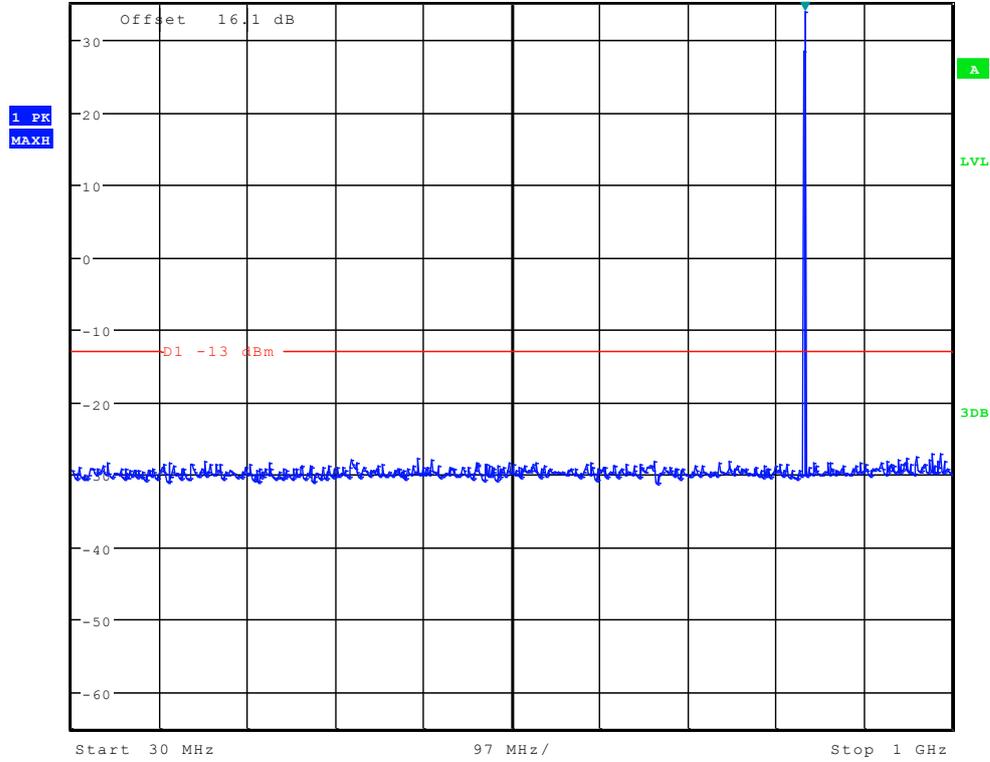


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -34.28 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 150.00000000 kHz



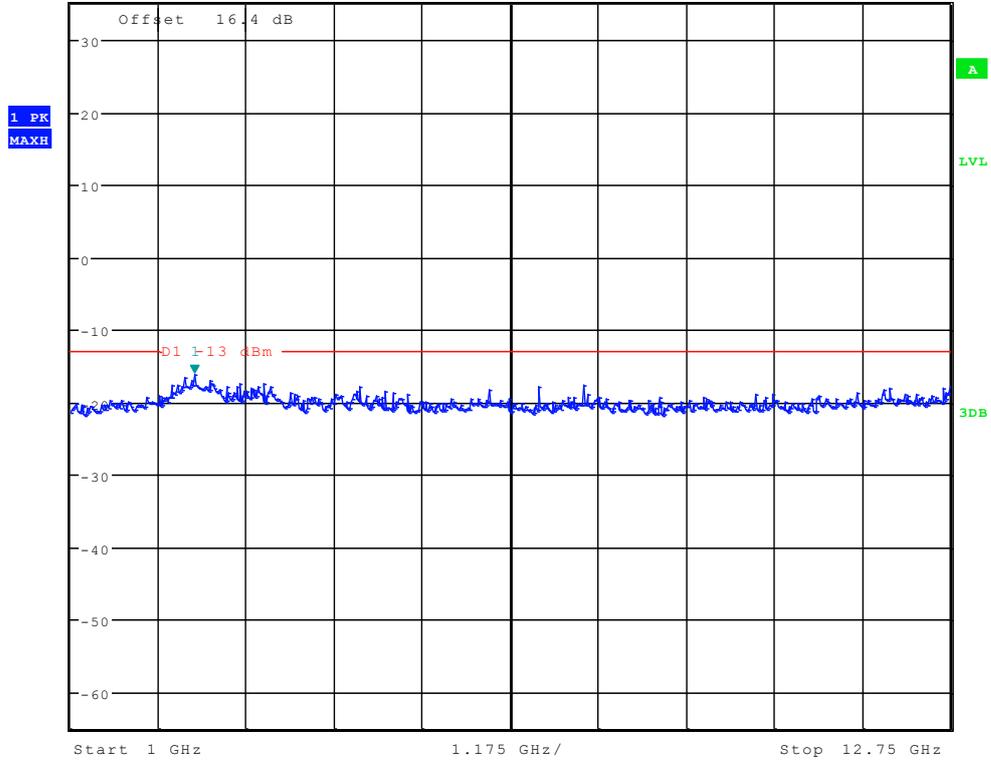


* RBW 100 kHz Marker 1 [T1]
* VBW 300 kHz 33.77 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 838.333333333 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.15 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.657051282 GHz



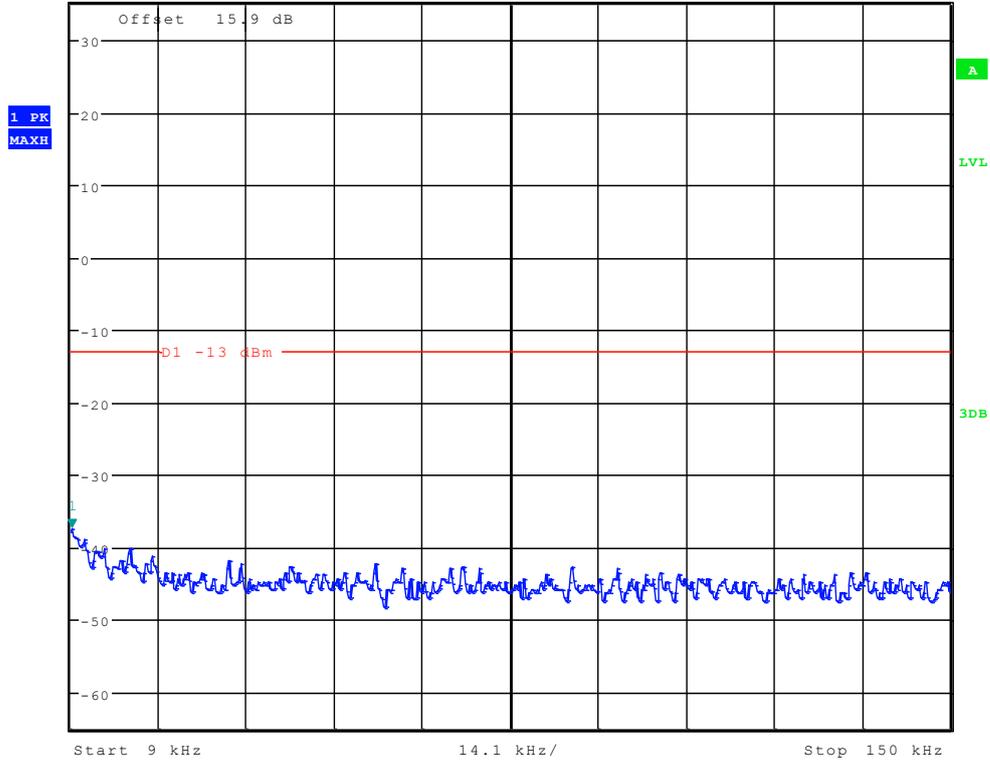


Channel 251



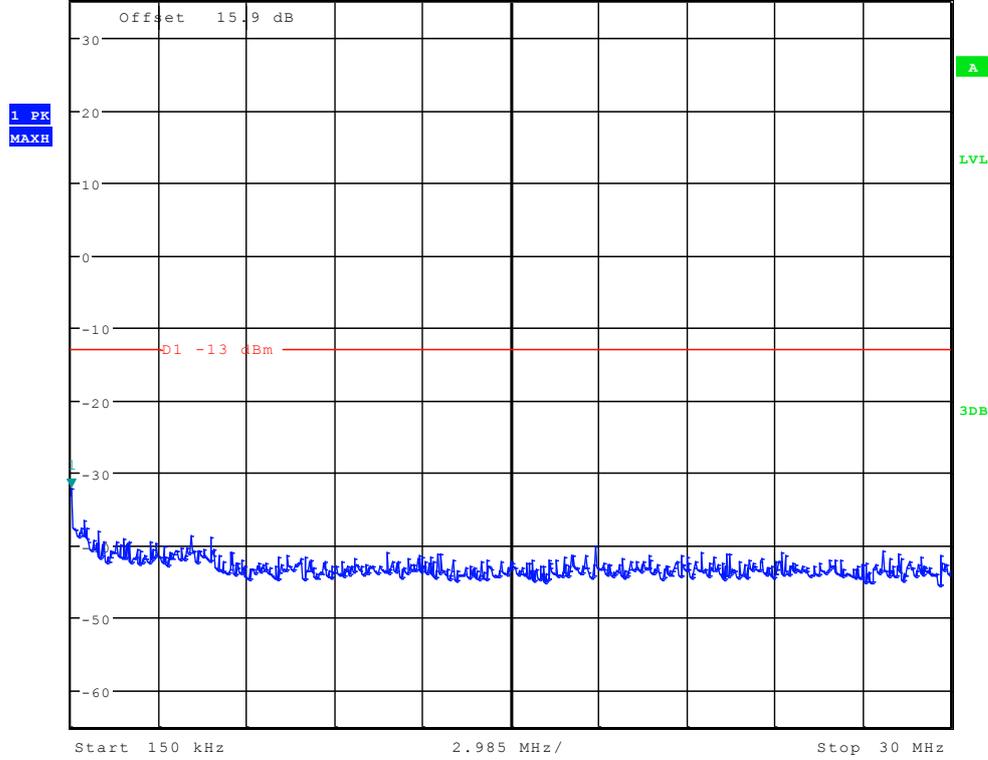
*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -37.48 dBm
SWT 145 ms 9.225961538 kHz

Ref 35 dBm Att 45 dB



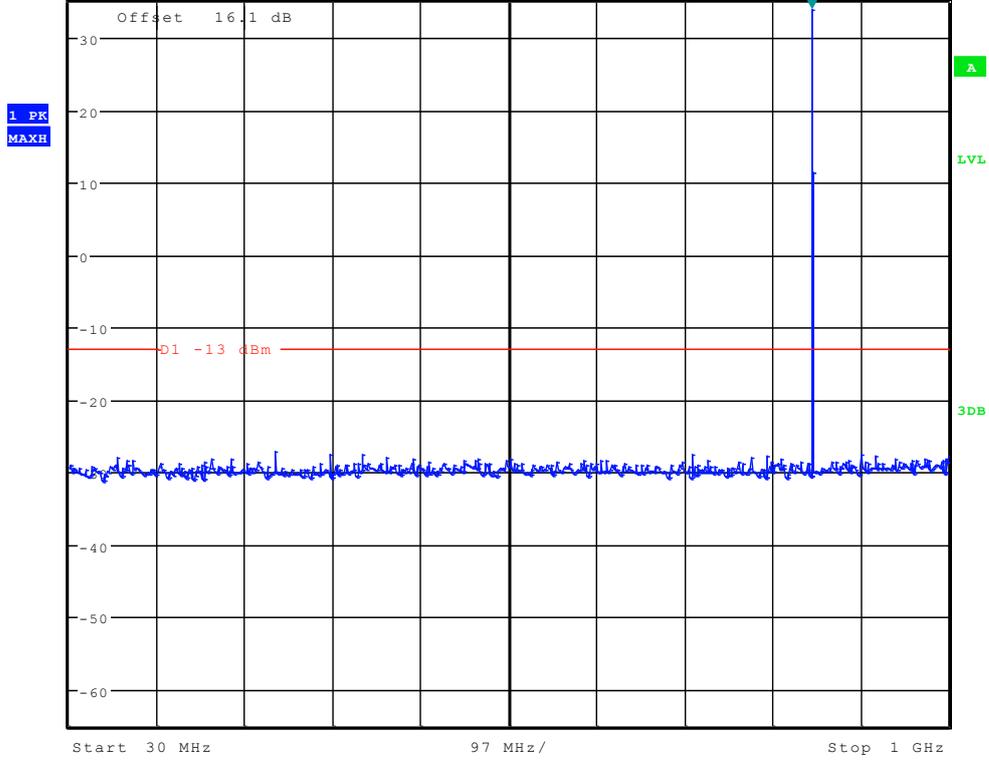


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -32.13 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 150.00000000 kHz



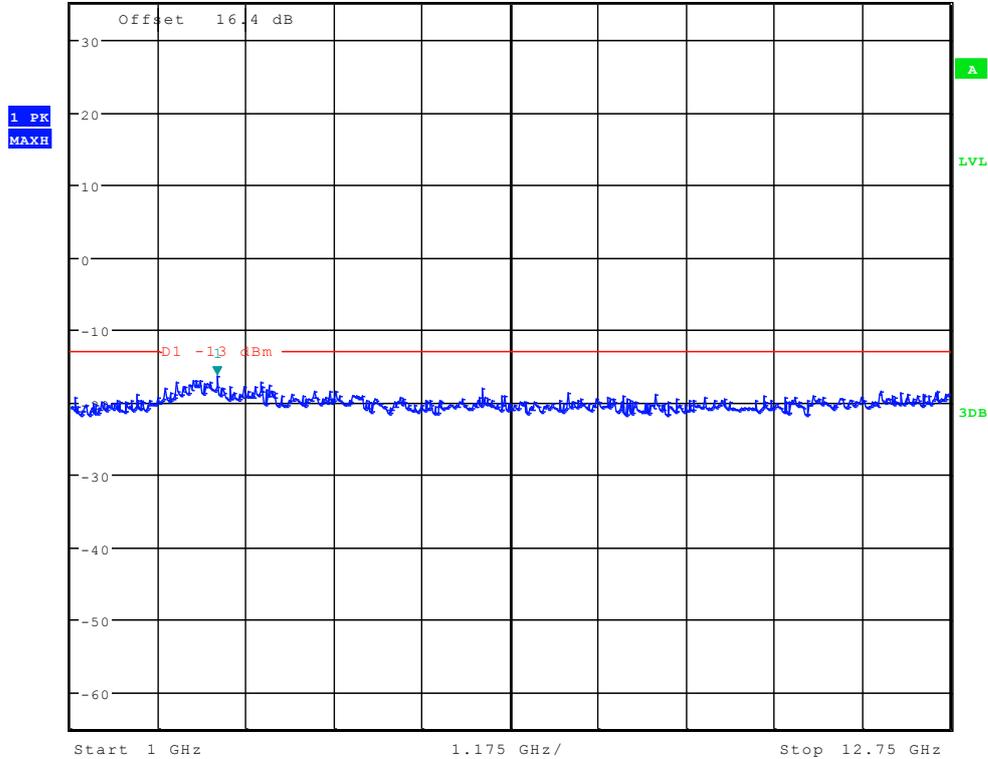


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 33.92 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 849.214743590 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.34 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.958333333 GHz



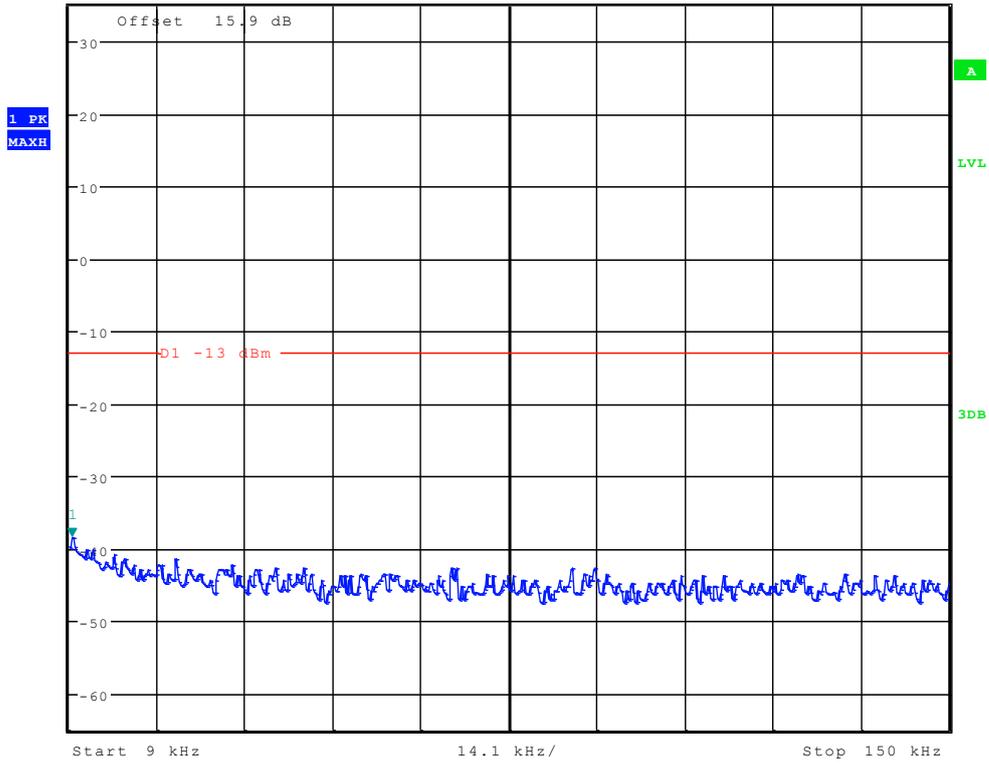


TM2:EDGE

Channel 128

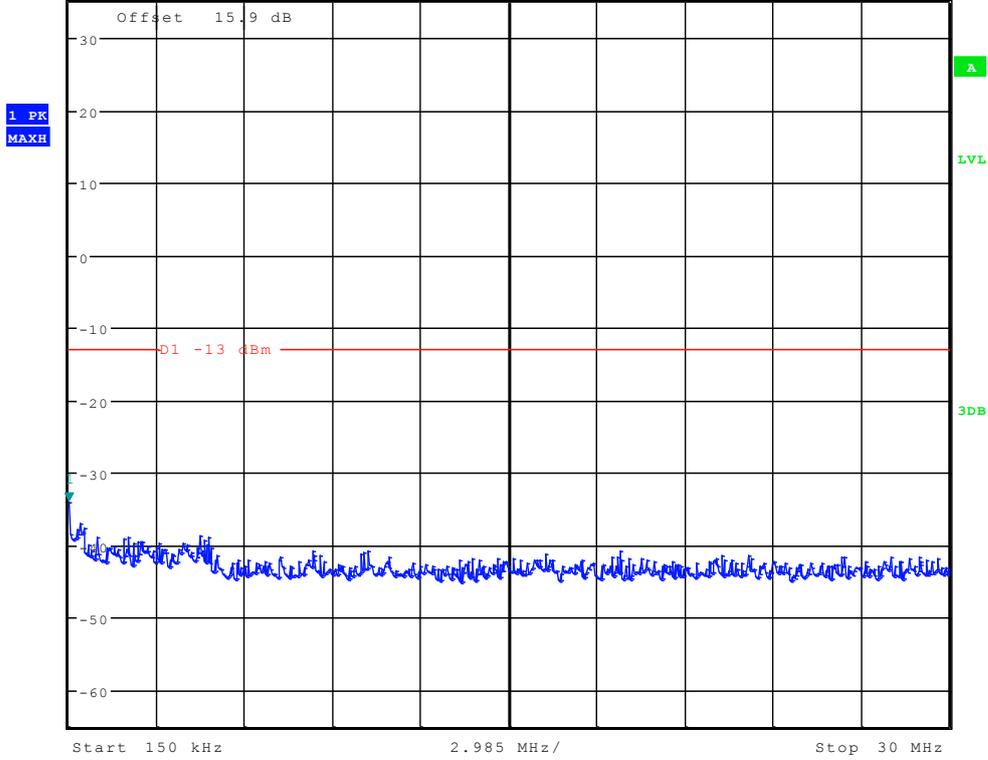


*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -38.38 dBm
Ref 35 dBm Att 45 dB SWT 145 ms 9.451923077 kHz



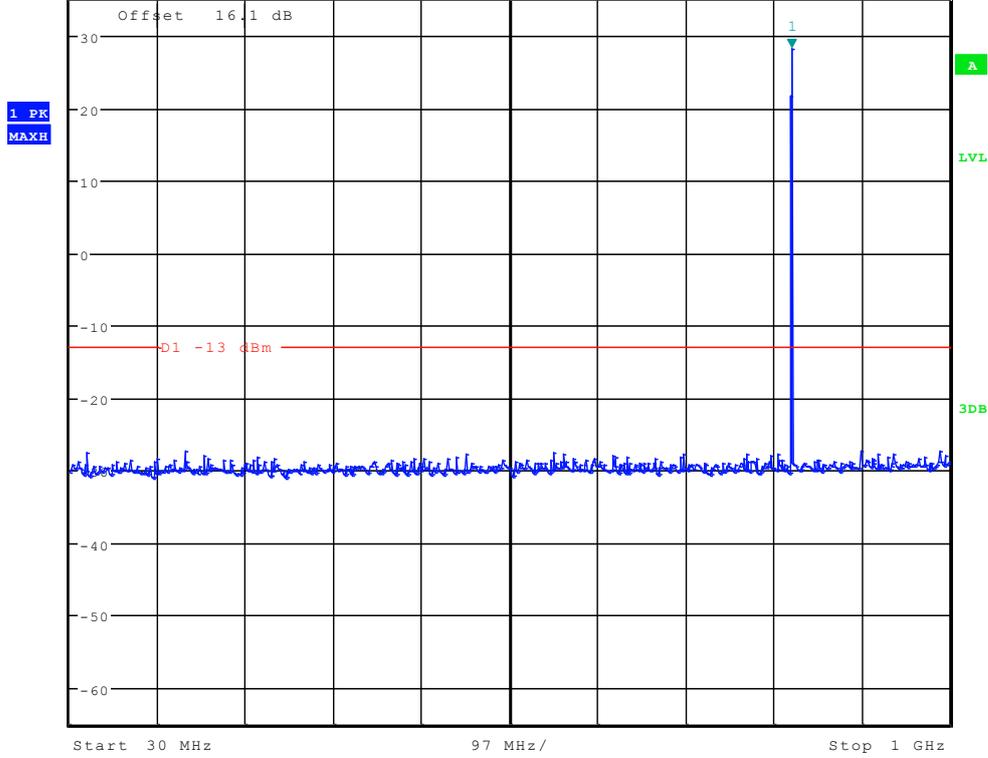


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -34.04 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 150.00000000 kHz



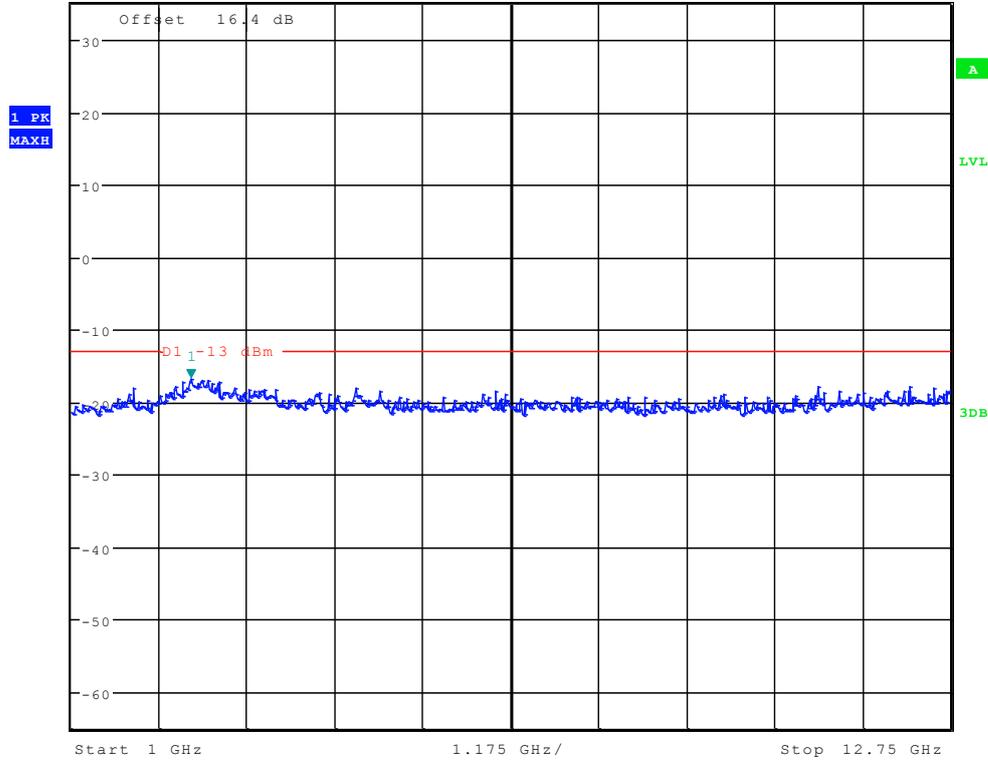


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 28.11 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 825.897435897 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.72 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.600560897 GHz

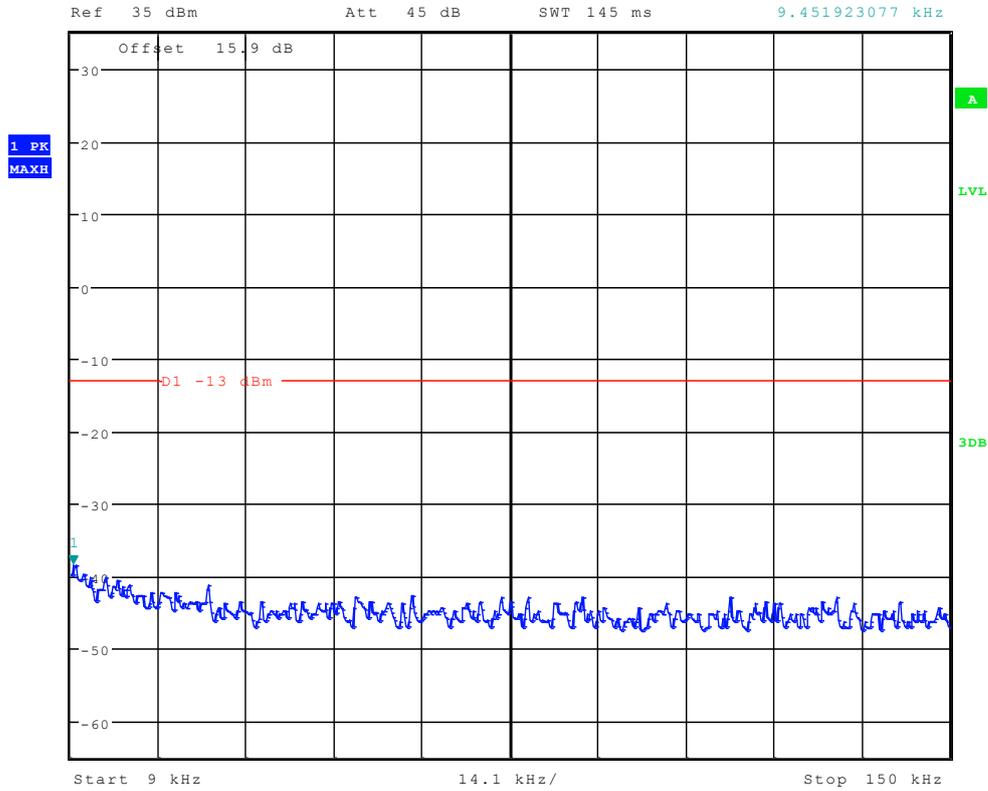




Channel 192



*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -38.38 dBm
SWT 145 ms 9.451923077 kHz

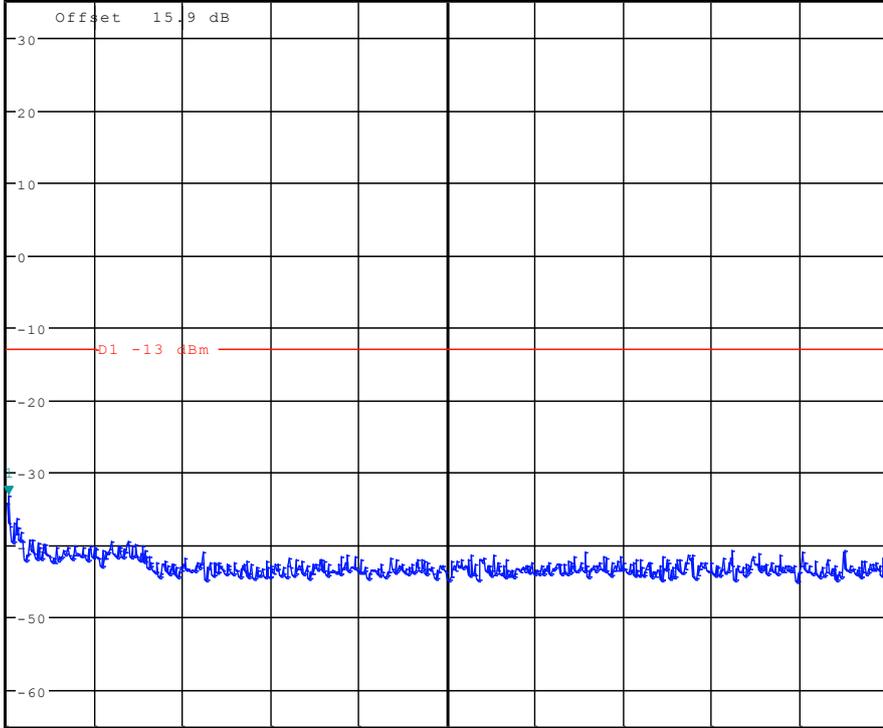




*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -33.11 dBm
SWT 300 ms 197.836538462 kHz

Ref 35 dBm

Att 45 dB



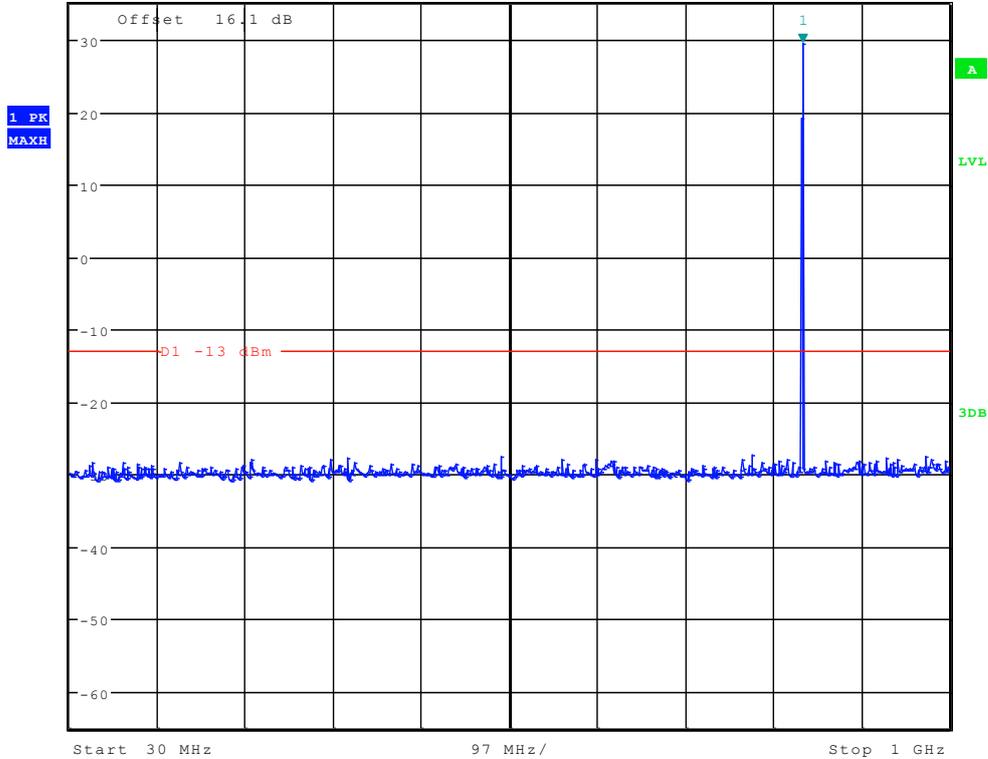
Start 150 kHz

2.985 MHz/

Stop 30 MHz

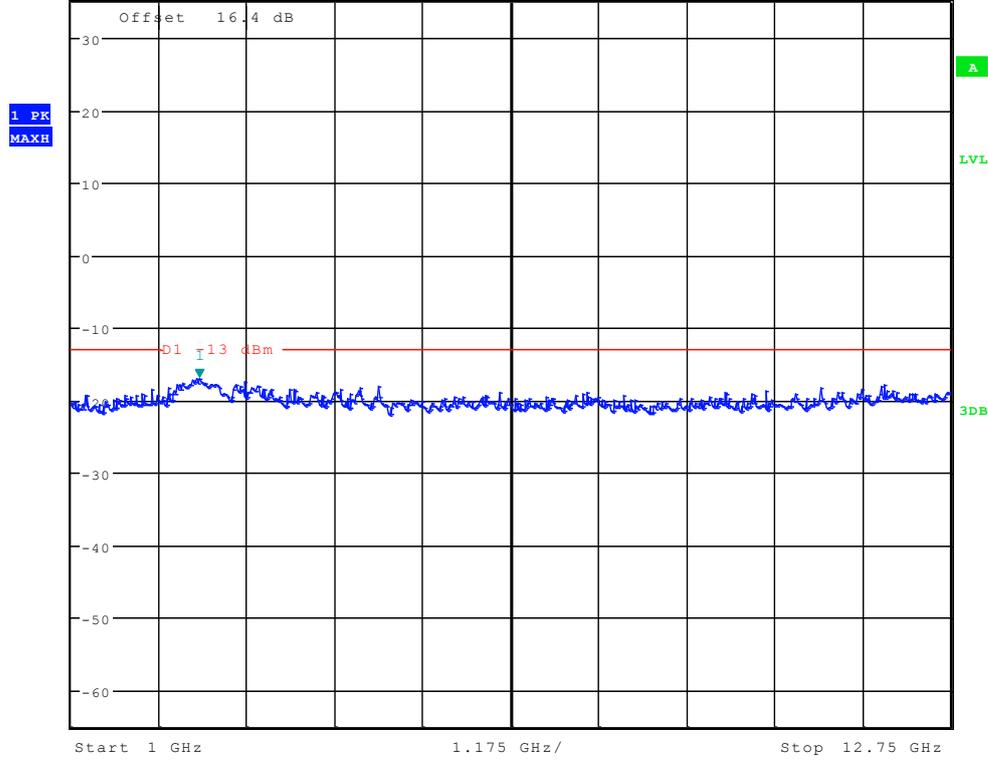


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 29.49 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 838.333333333 MHz





*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -16.94 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.713541667 GHz





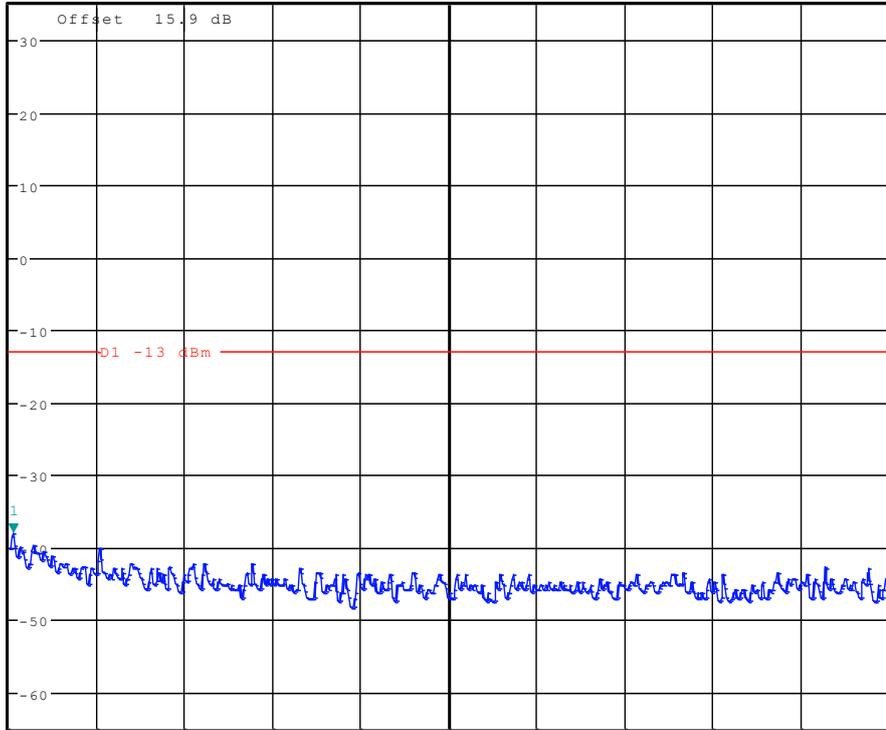
Channel 251



*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -37.92 dBm
SWT 145 ms 9.677884615 kHz

Ref 35 dBm Att 45 dB

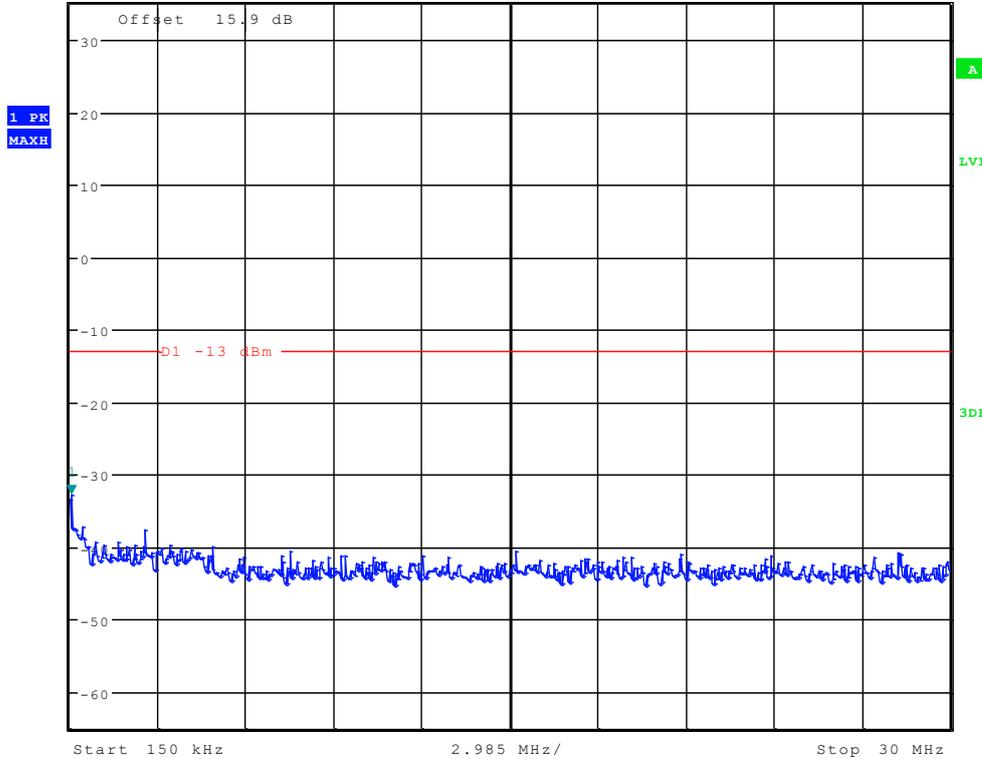
1 PK
MAXH



Start 9 kHz 14.1 kHz/ Stop 150 kHz

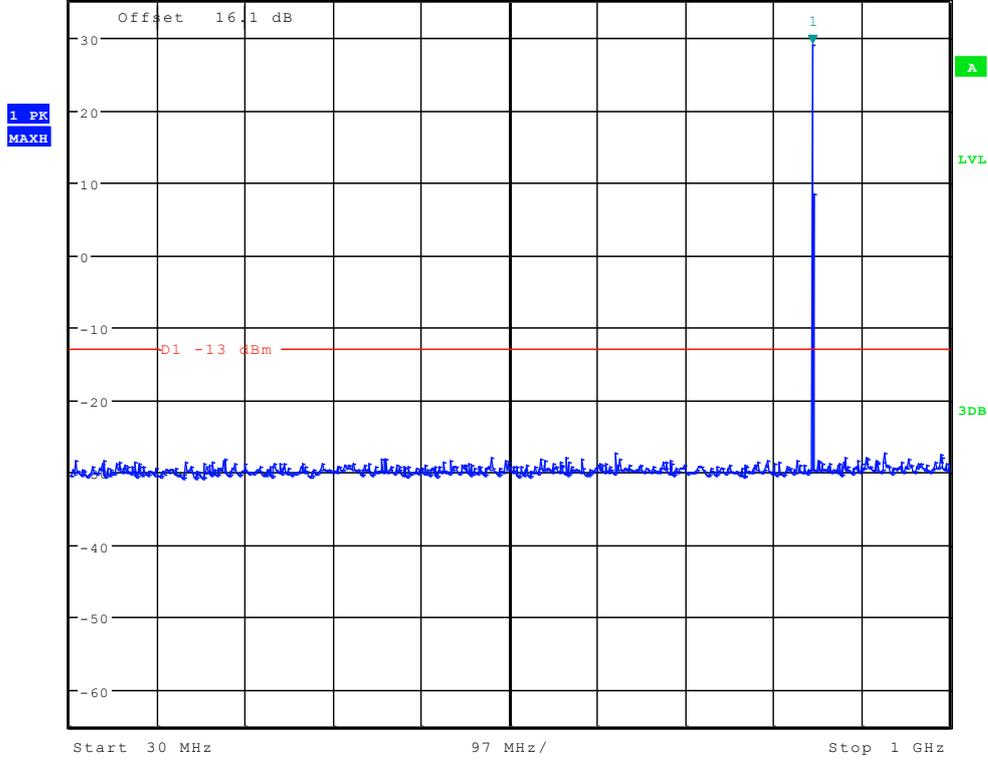


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -32.85 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 197.836538462 kHz



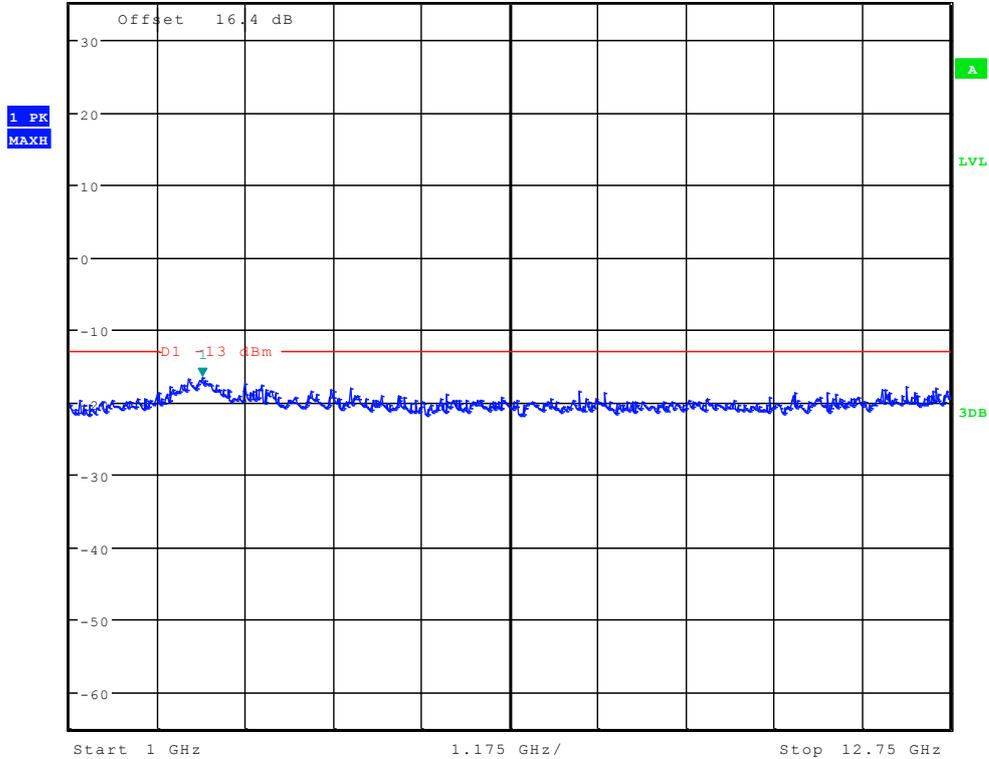


* RBW 100 kHz Marker 1 [T1]
* VBW 300 kHz 28.98 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 849.214743590 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.67 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.770032051 GHz



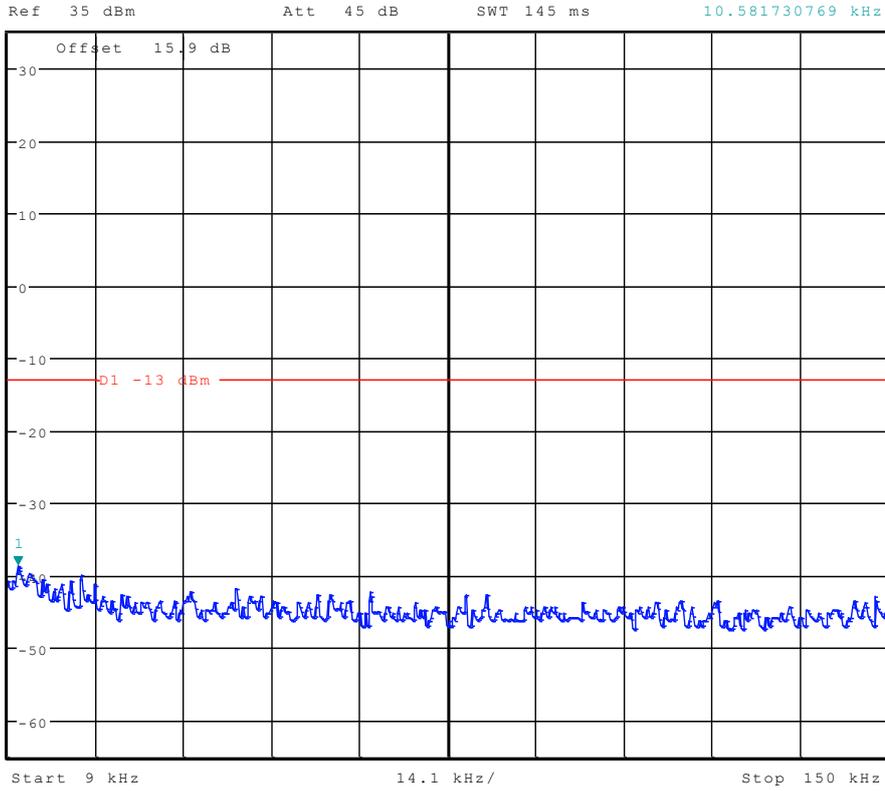


TM3: WCDMA

Channel 4132

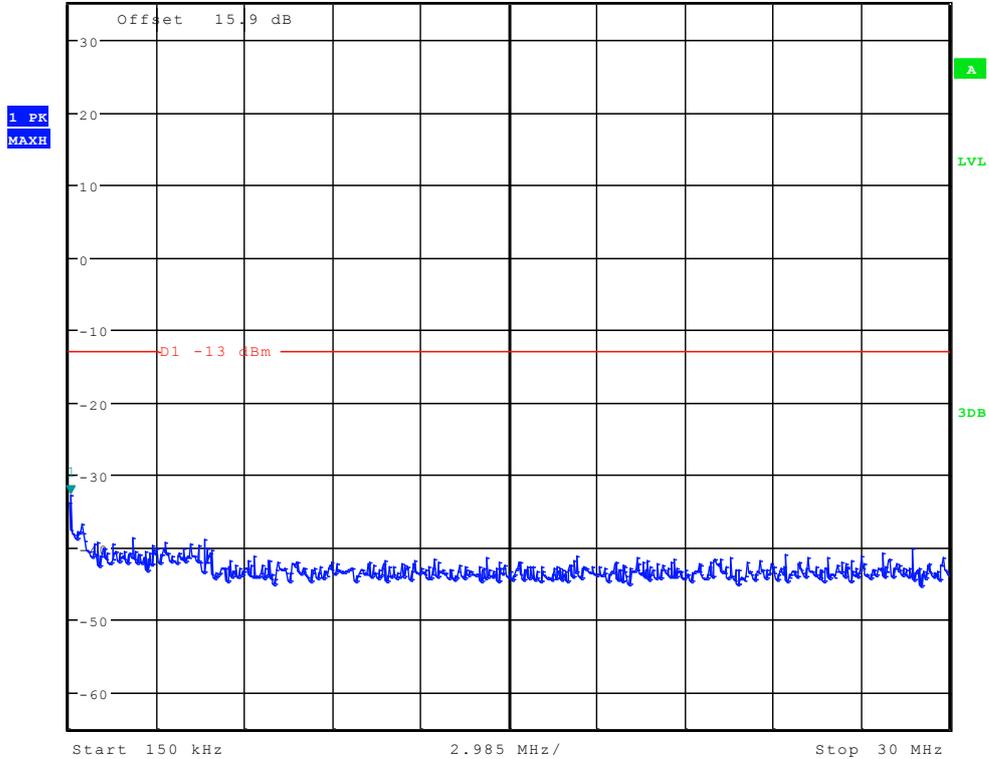


*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -38.67 dBm
SWT 145 ms 10.581730769 kHz



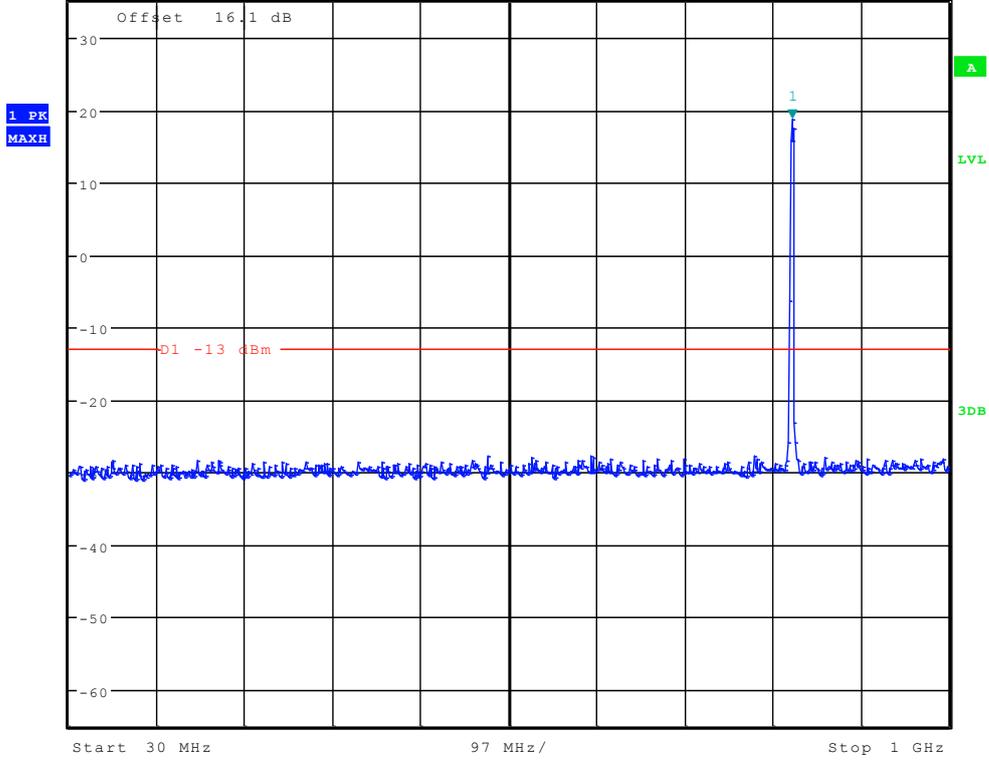


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -32.85 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 197.836538462 kHz





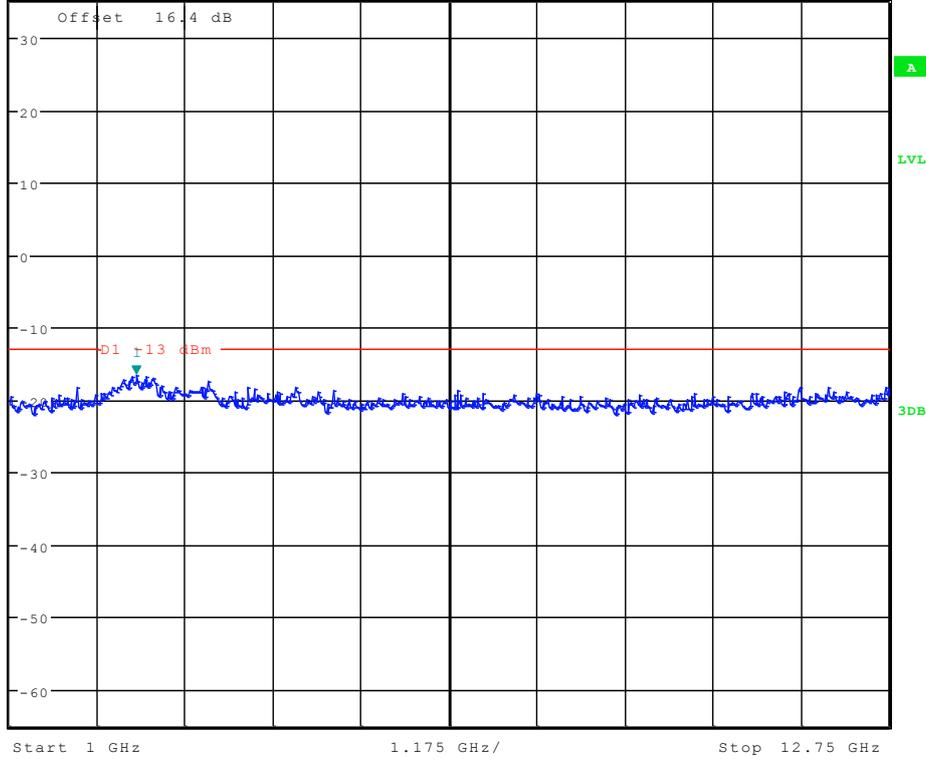
*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 18.82 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 827.451923077 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.66 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.694711538 GHz

1 PK
MAXH



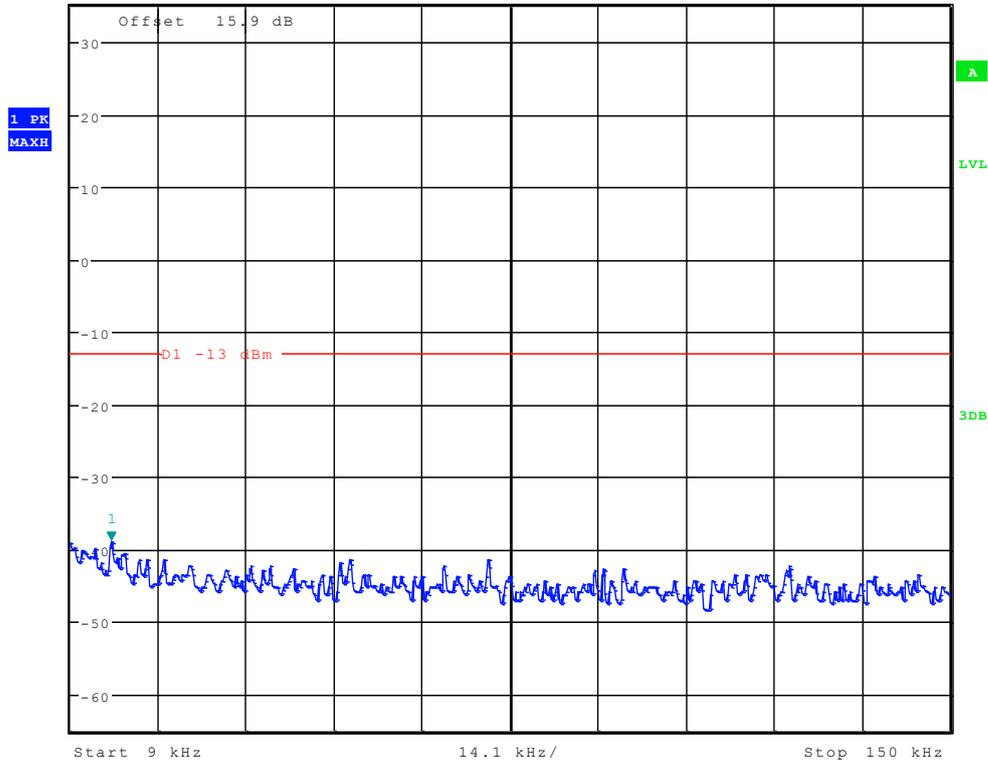


Channel 4182



* RBW 1 kHz
* VBW 10 kHz
Marker 1 [T1]
-38.87 dBm
15.552884615 kHz

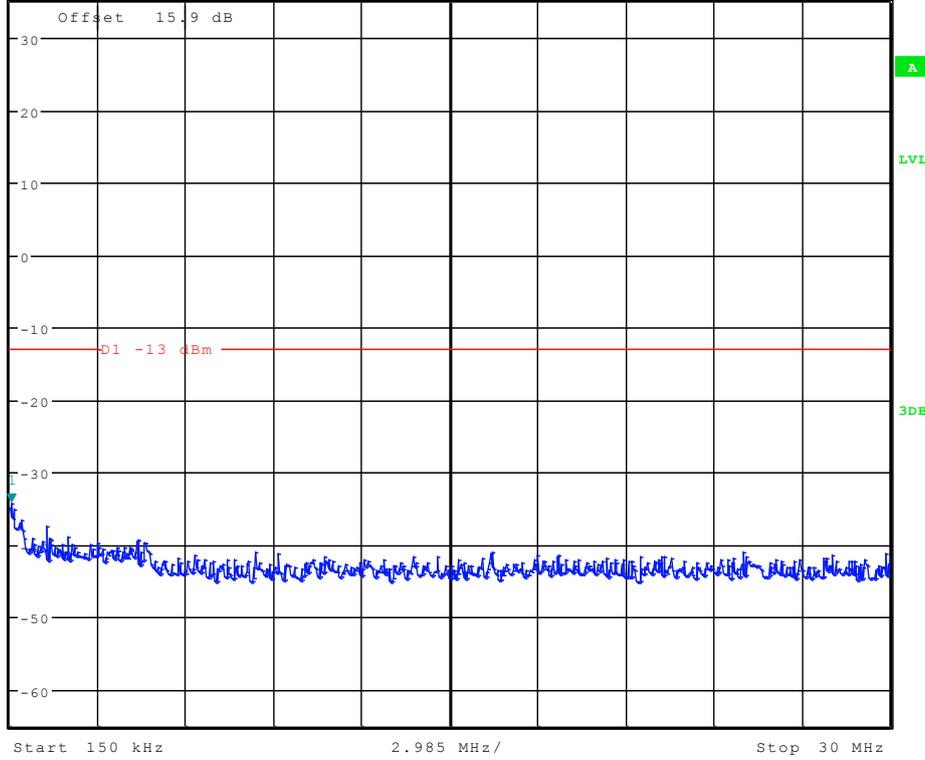
Ref 35 dBm Att 45 dB SWT 145 ms





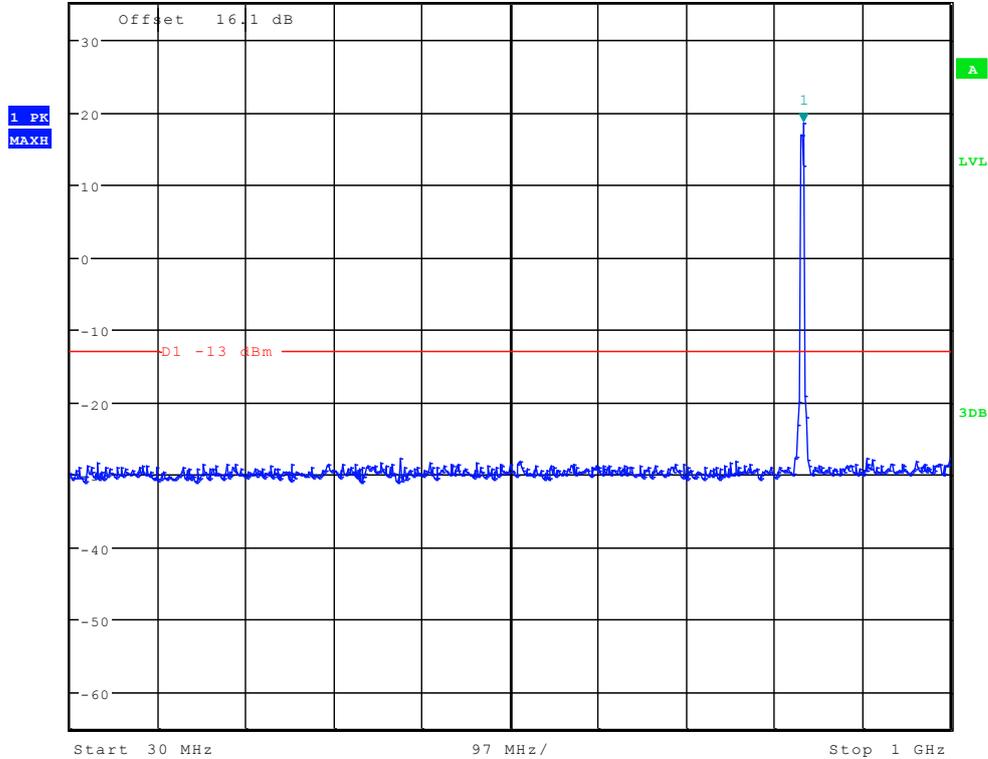
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -34.22 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 197.836538462 kHz

1 PK
MAXH



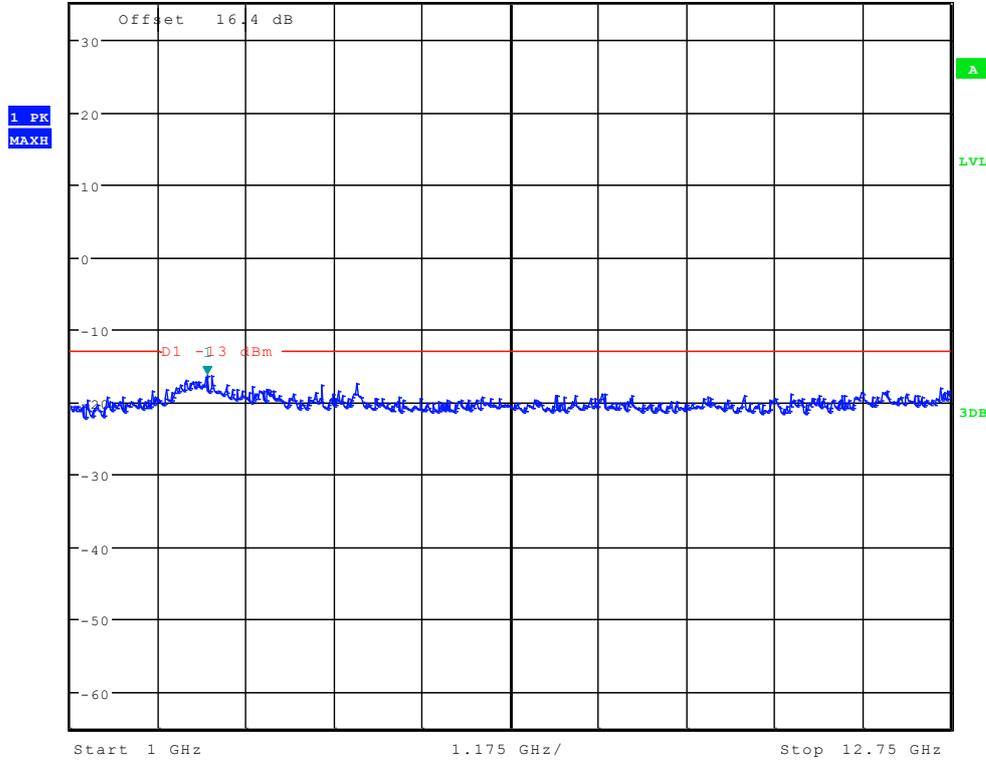


* RBW 100 kHz Marker 1 [T1]
* VBW 300 kHz 18.57 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 838.333333333 MHz





* RBW 1 MHz Marker 1 [T1]
* VBW 3 MHz -16.40 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.826522436 GHz





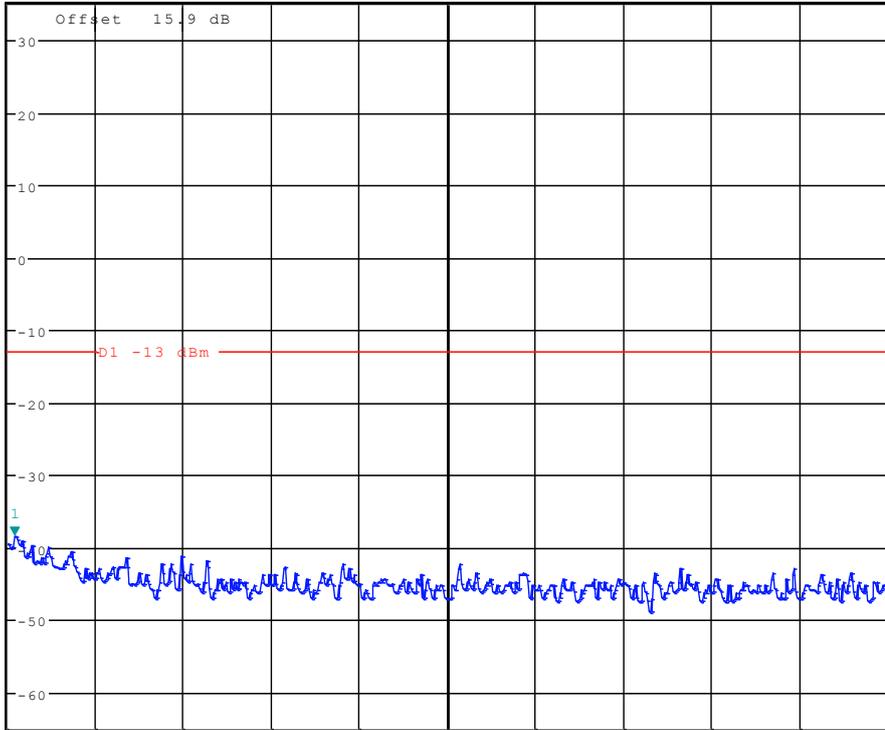
Channel 4233



*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -38.38 dBm
SWT 145 ms 10.129807692 kHz

Ref 35 dBm Att 45 dB

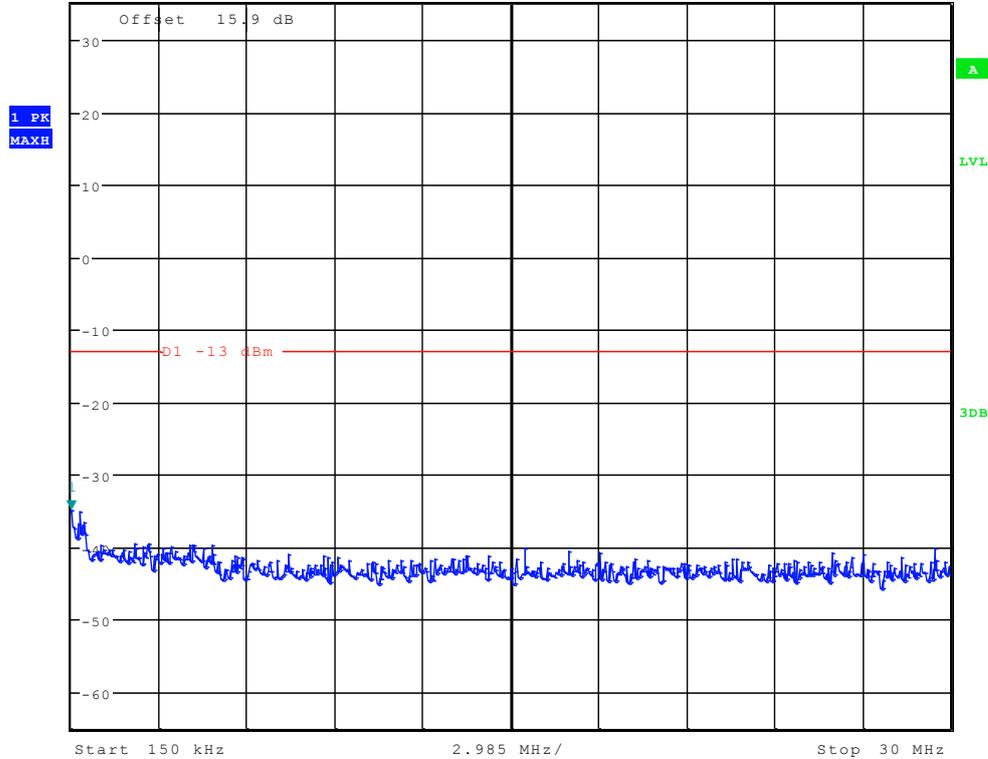
1 PK
MAXH



Start 9 kHz 14.1 kHz/ Stop 150 kHz

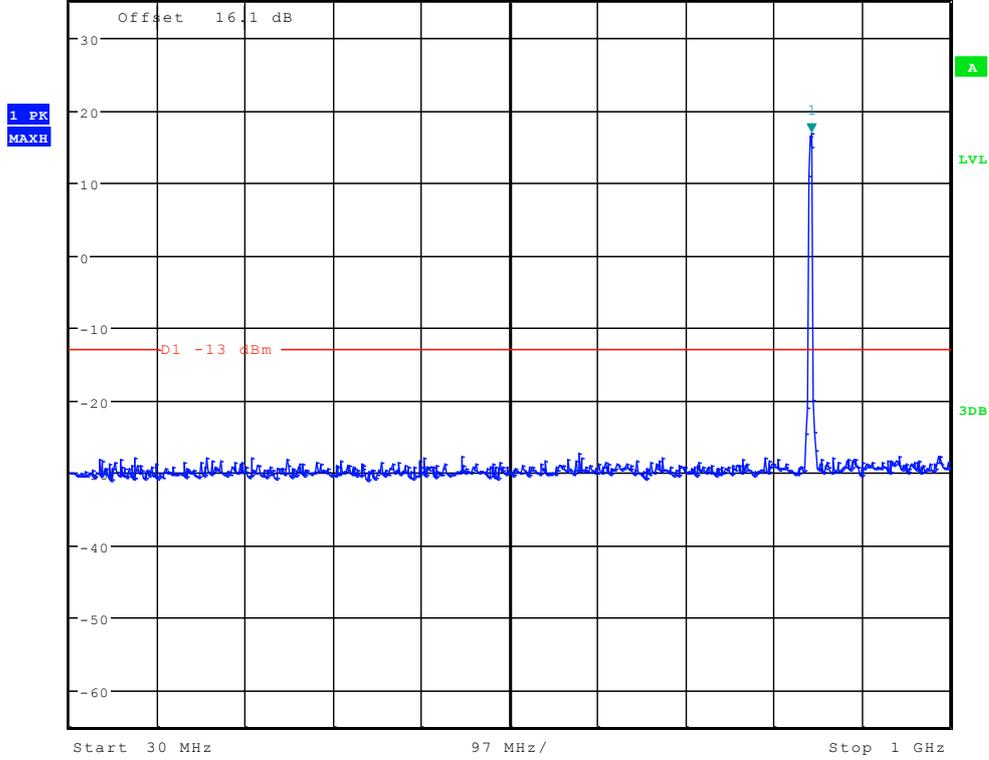


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -34.89 dBm
Ref 35 dBm Att 45 dB SWT 300 ms 150.00000000 kHz



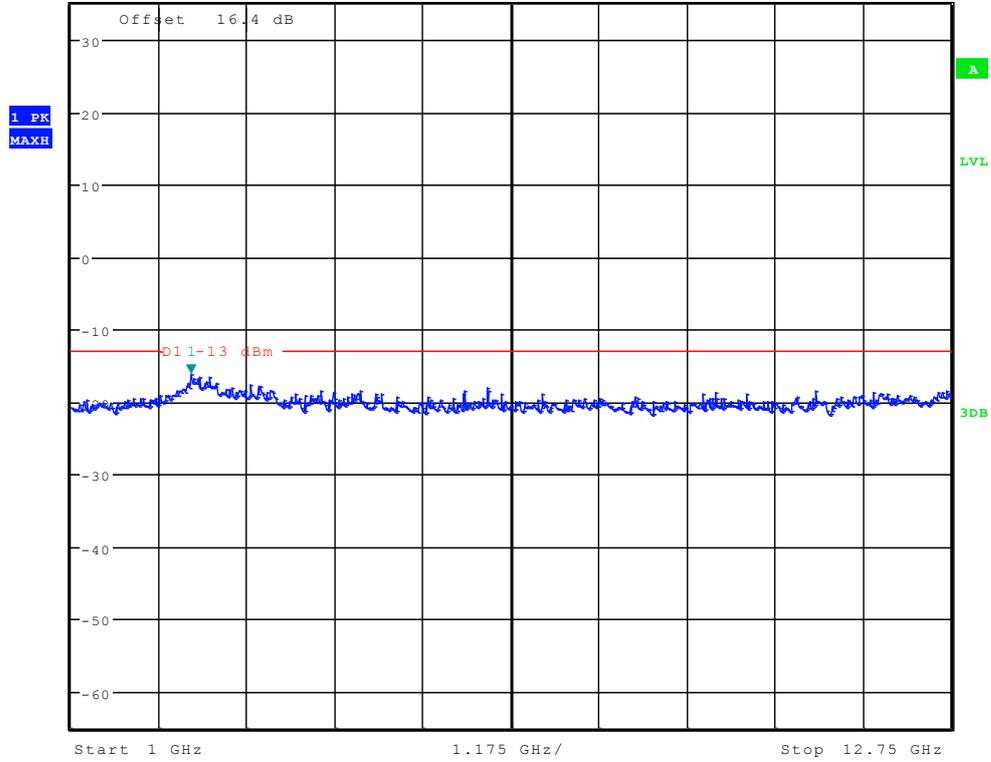


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 16.91 dBm
Ref 35 dBm Att 45 dB SWT 100 ms 847.660256410 MHz





*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -16.21 dBm
Ref 35 dBm Att 45 dB SWT 70 ms 2.600560897 GHz



-----END-----



Appendix F

Radiated spurious emission

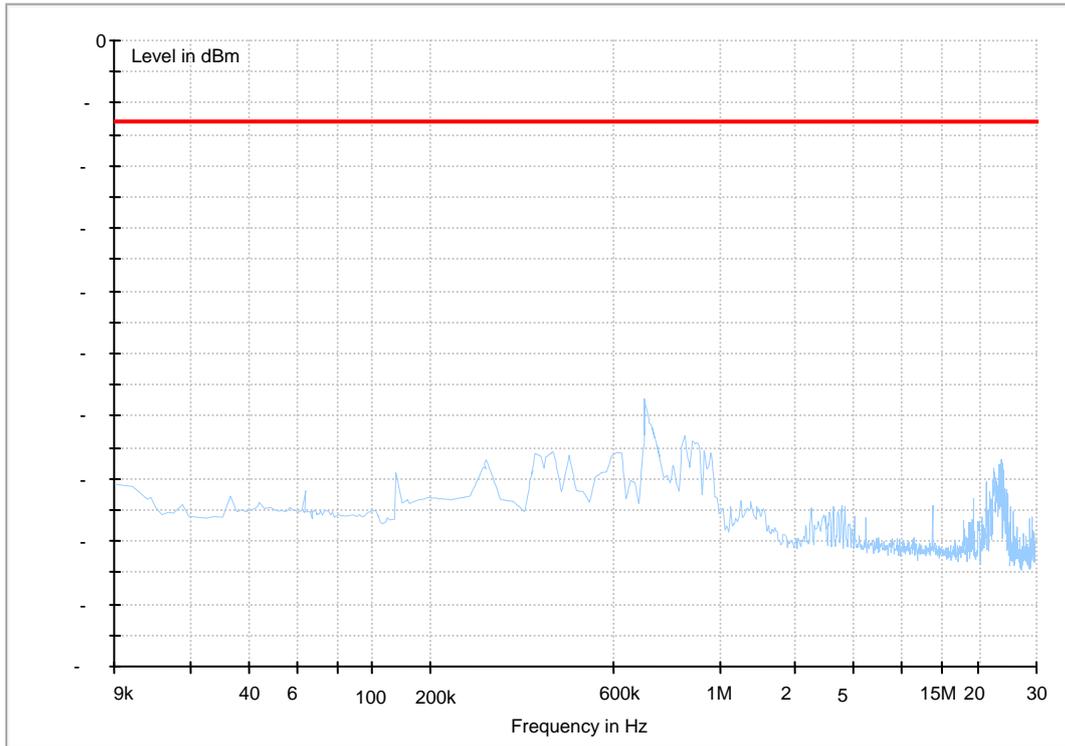
According to FCC Part 2.1053& Part 22.917



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

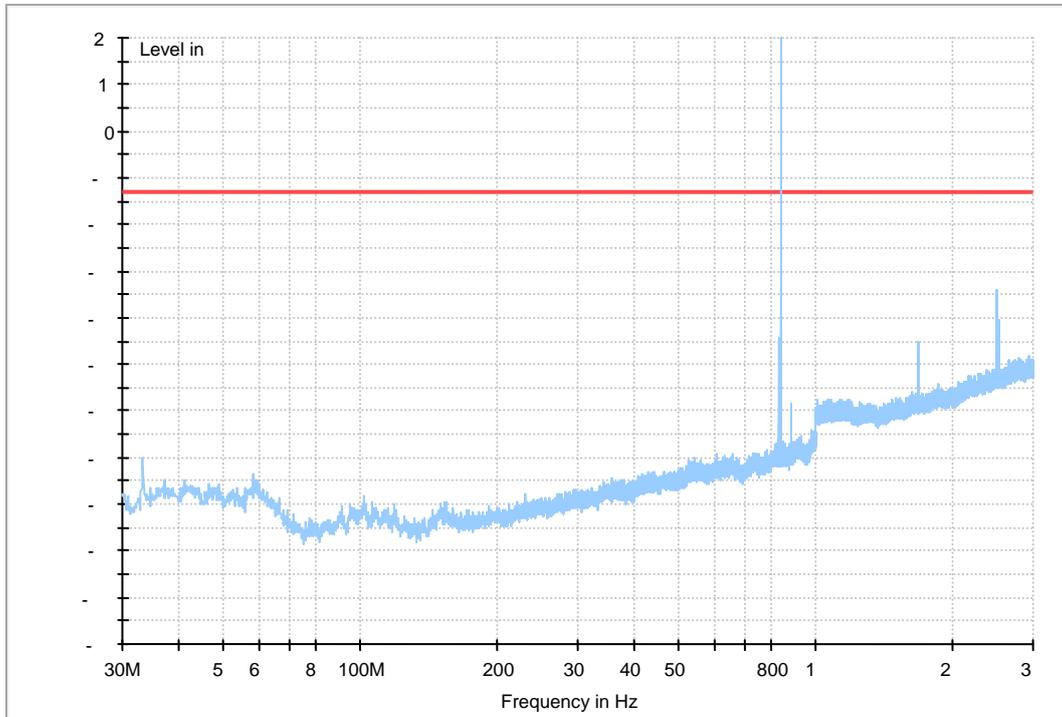
GSM 850

Traffic Mode (9kHz-30MHz)



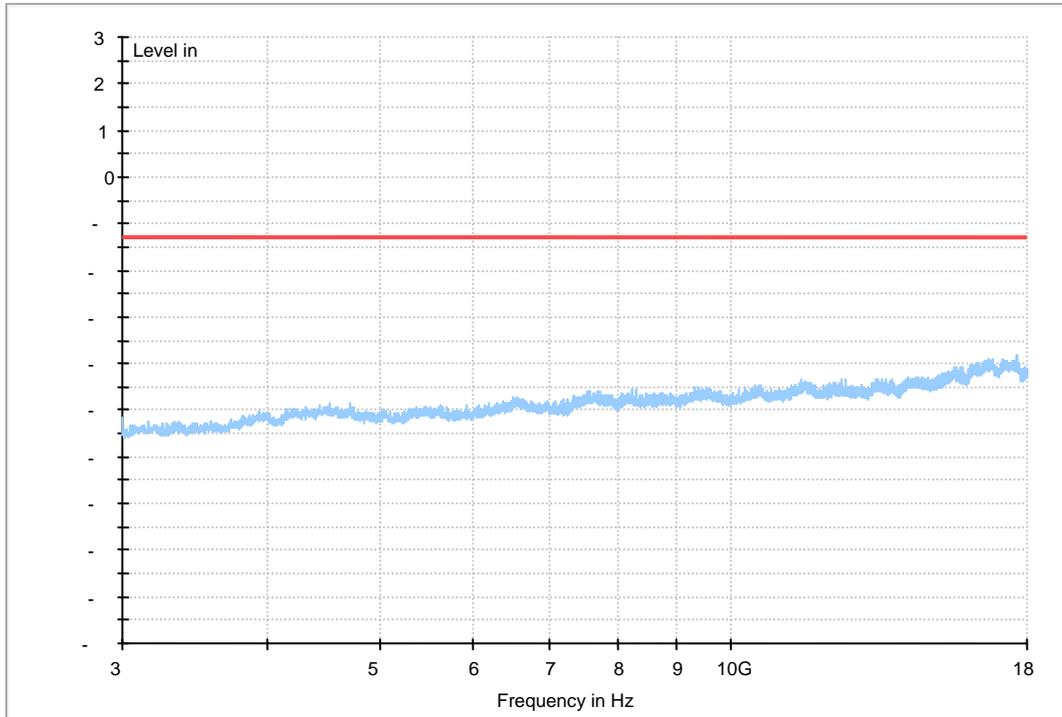


Traffic Mode (30MHz-3GHz)





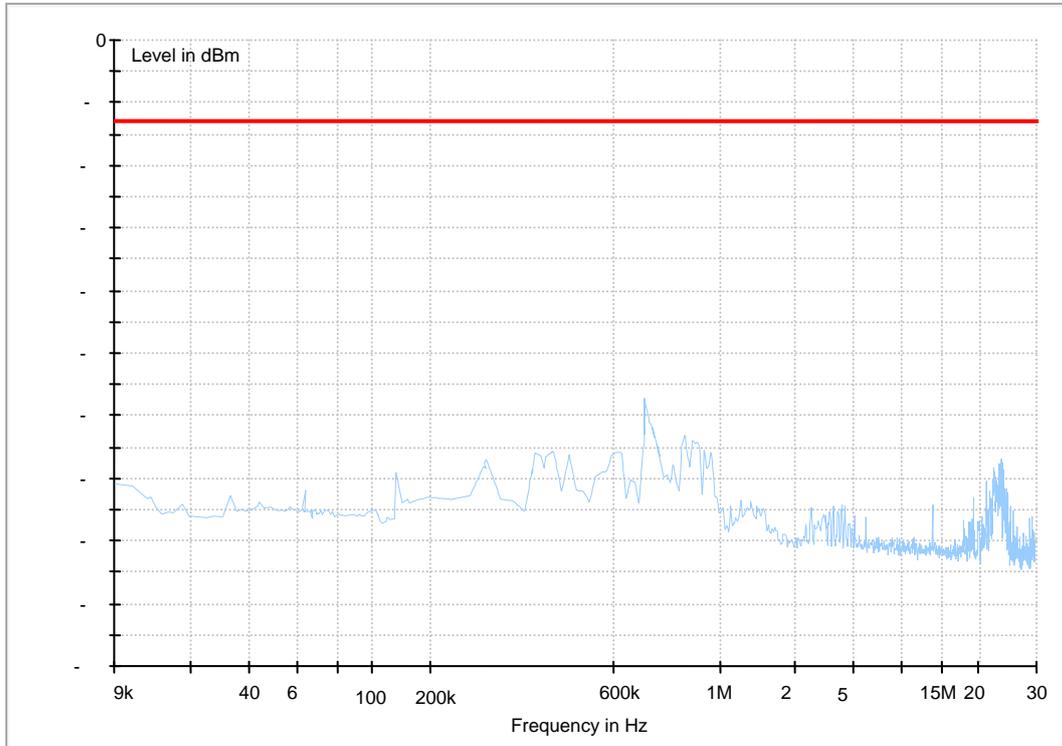
Traffic Mode (3GHz-18GHz)





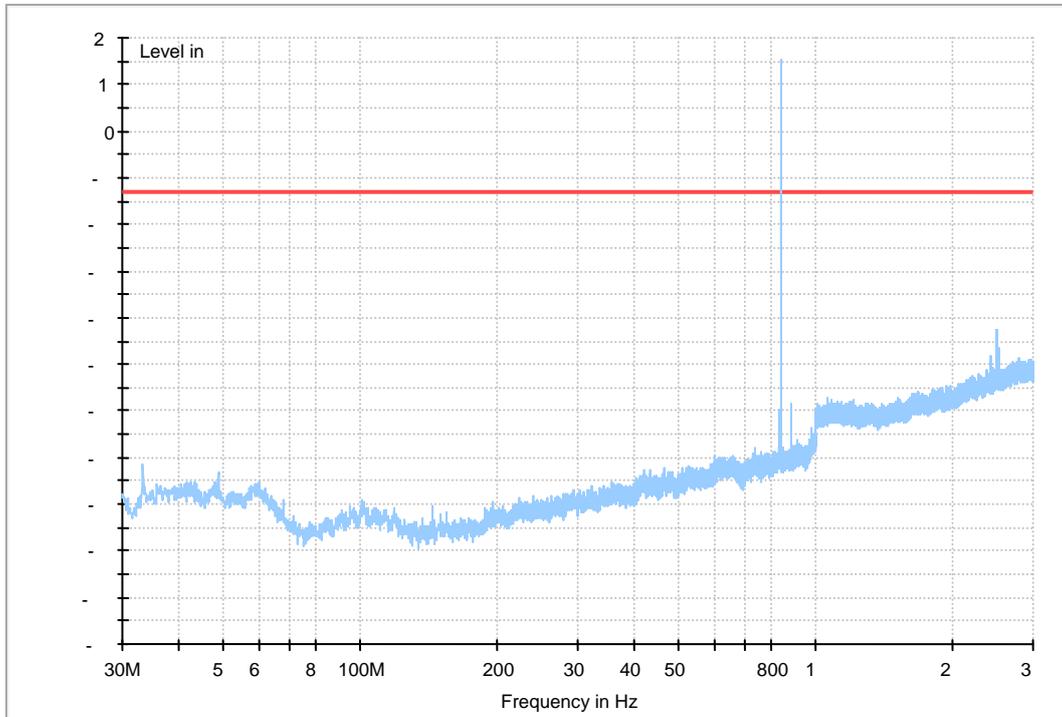
GPRS 850

Traffic Mode (9kHz-30MHz)



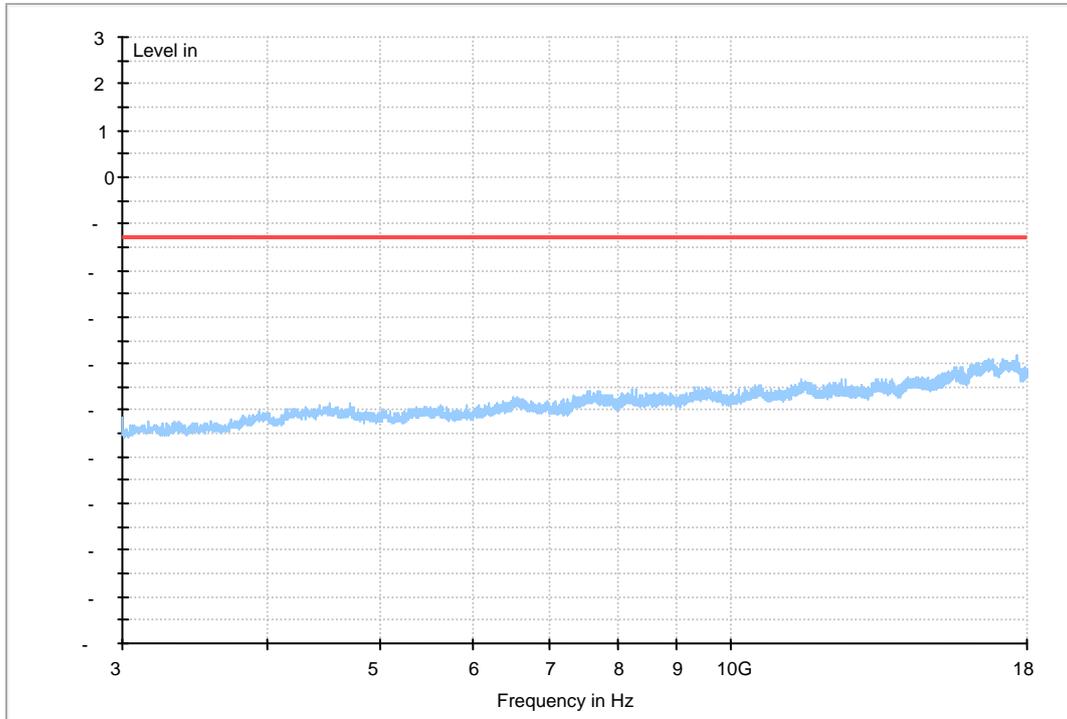


Traffic Mode (30MHz-3GHz)





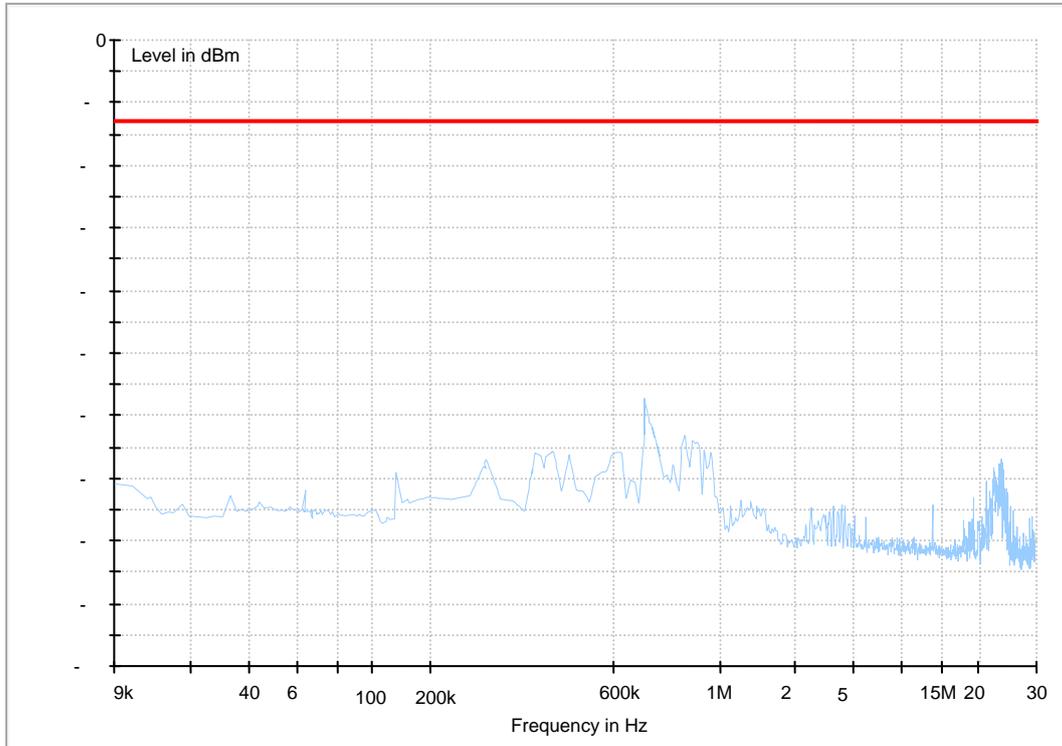
Traffic Mode (3GHz-18GHz)





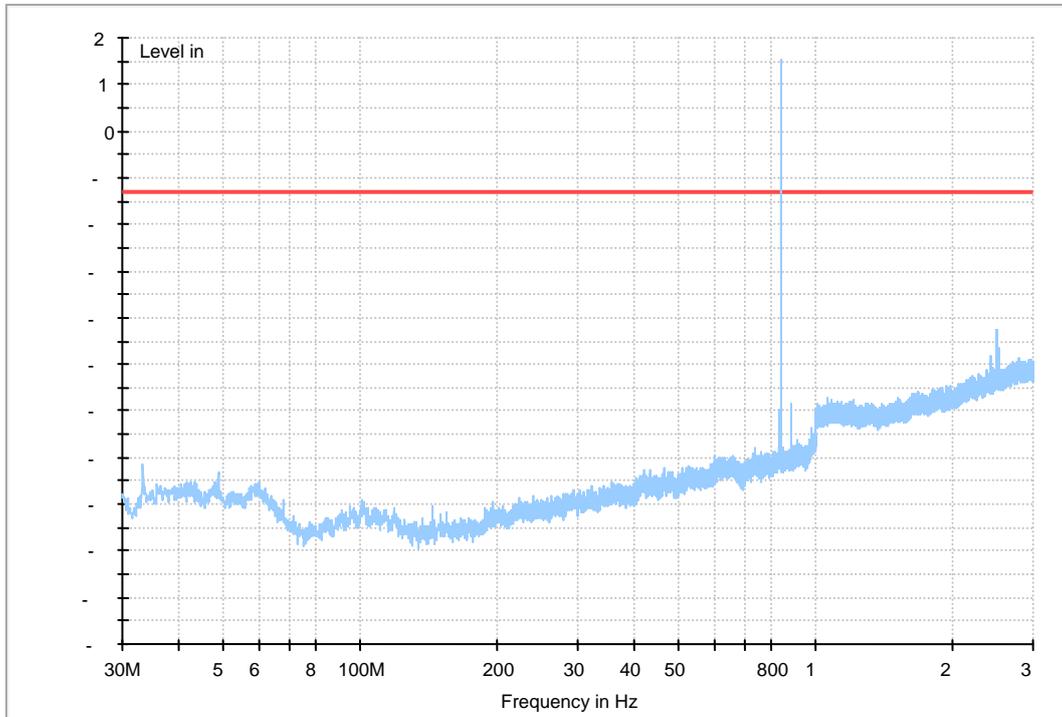
EDGE 850

Traffic Mode (9kHz-30MHz)



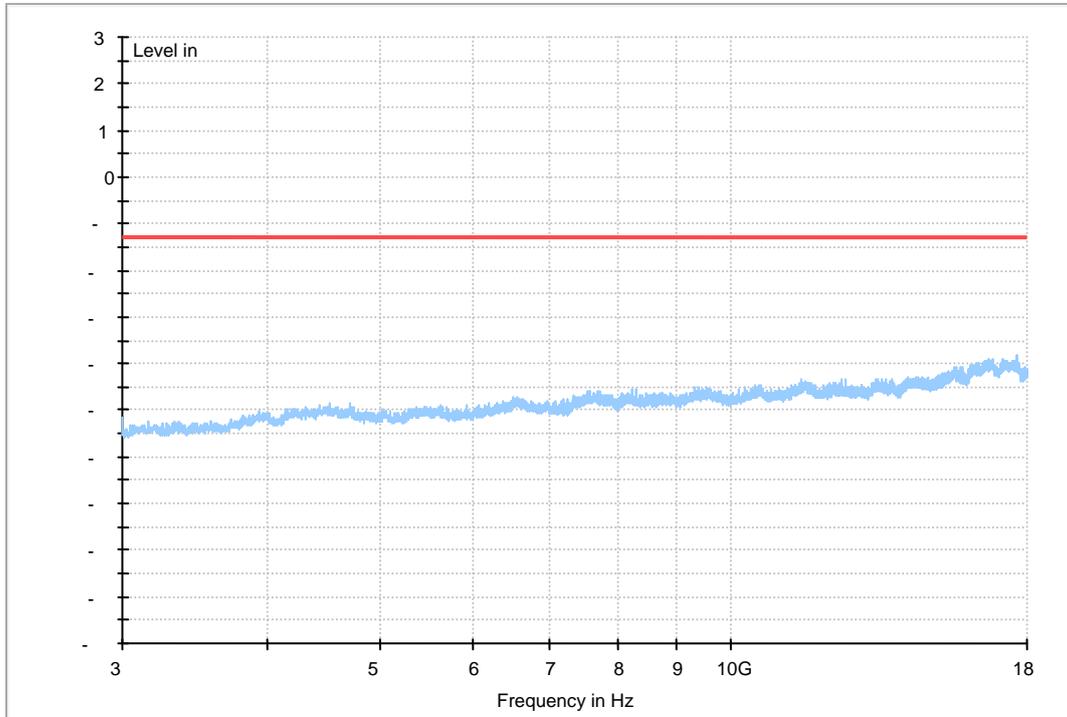


Traffic Mode (30MHz-3GHz)





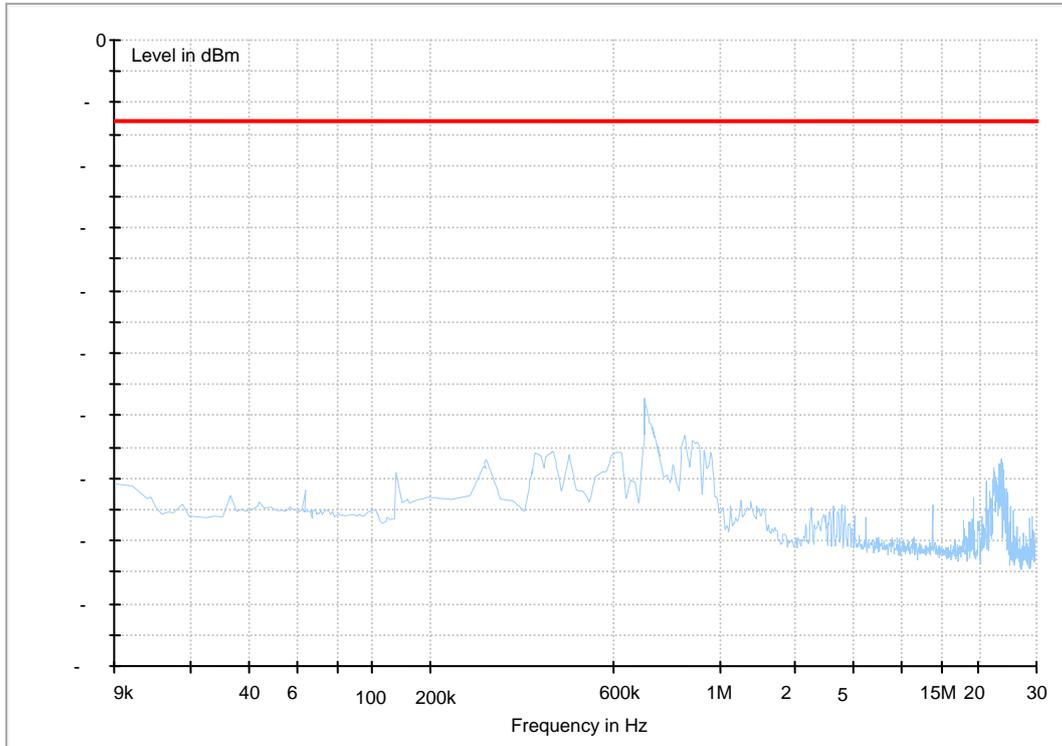
Traffic Mode (3GHz-18GHz)





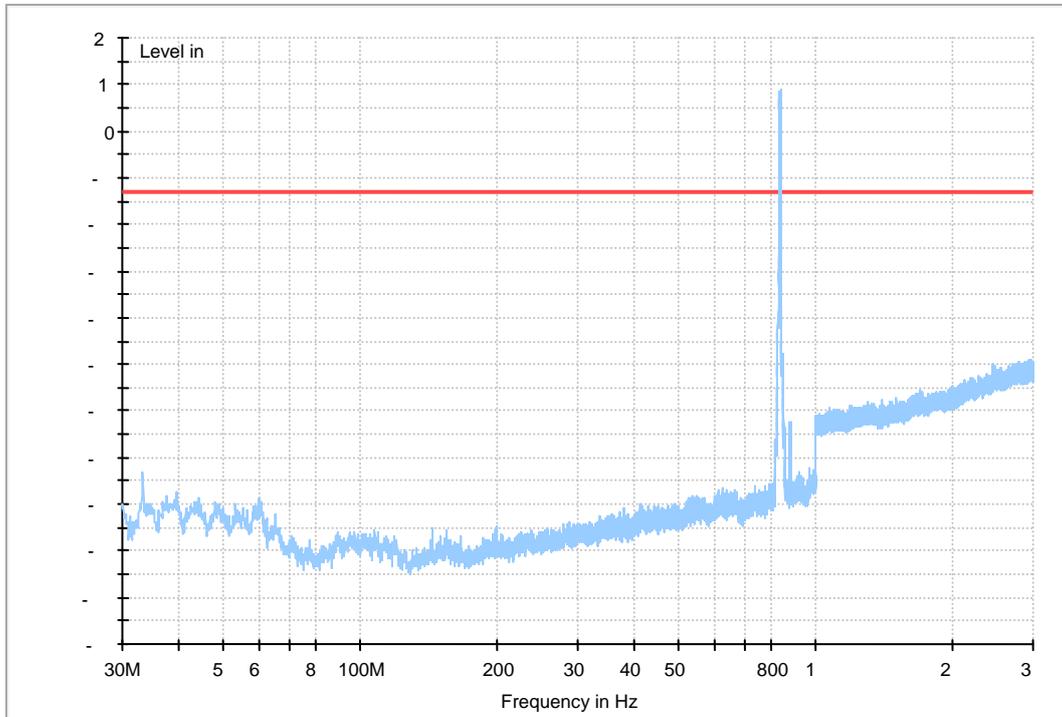
WCDMA Band V

Traffic Mode (9kHz-30MHz)



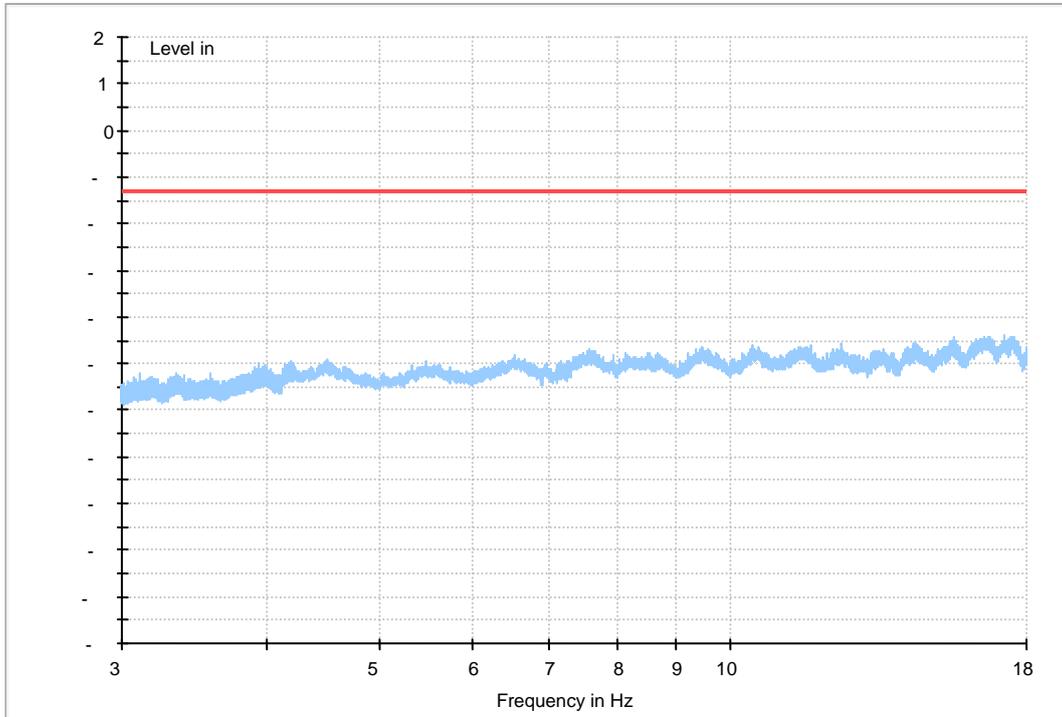


Traffic Mode (30MHz-3GHz)





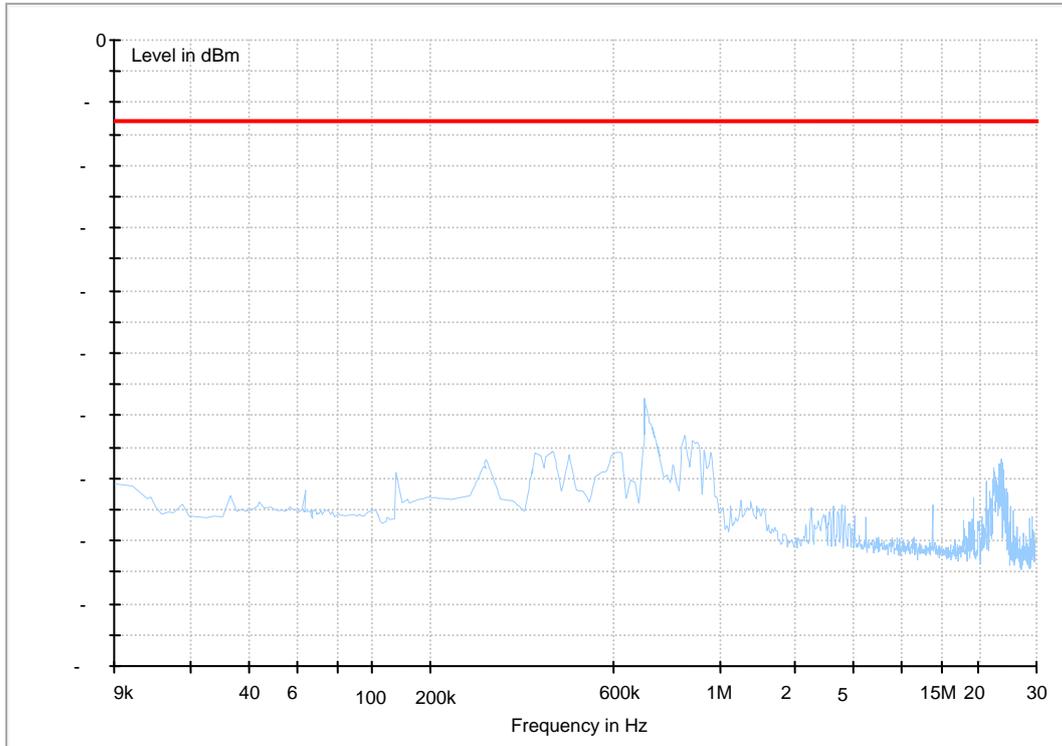
Traffic Mode (3GHz-18GHz)





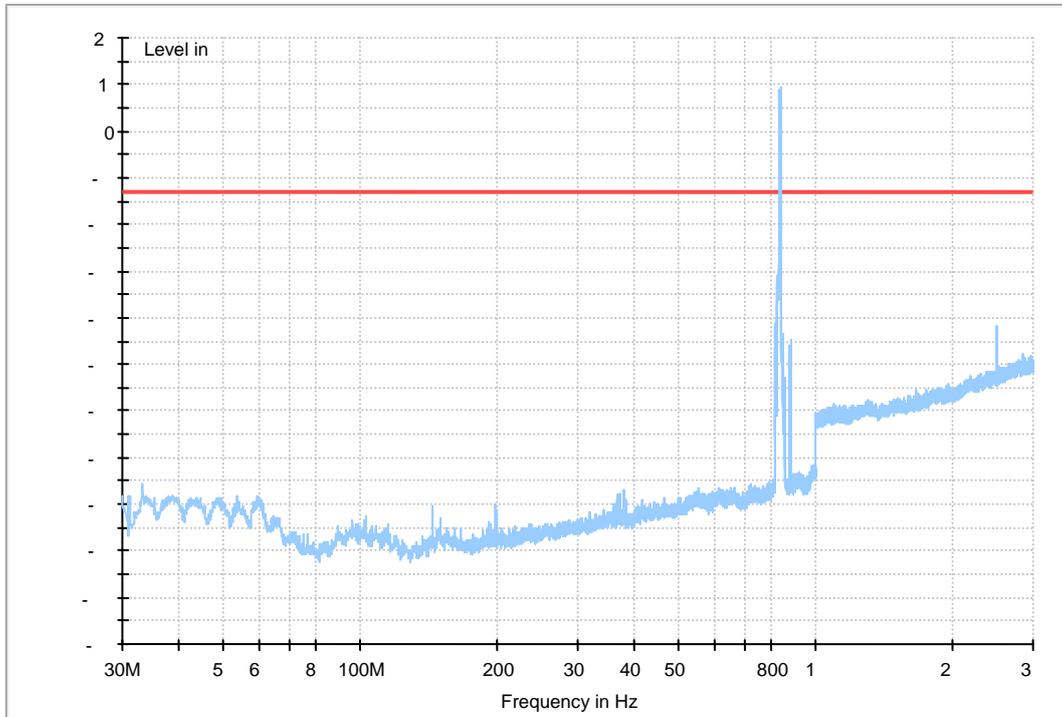
HSDPA Band V

Traffic Mode (9kHz-30MHz)



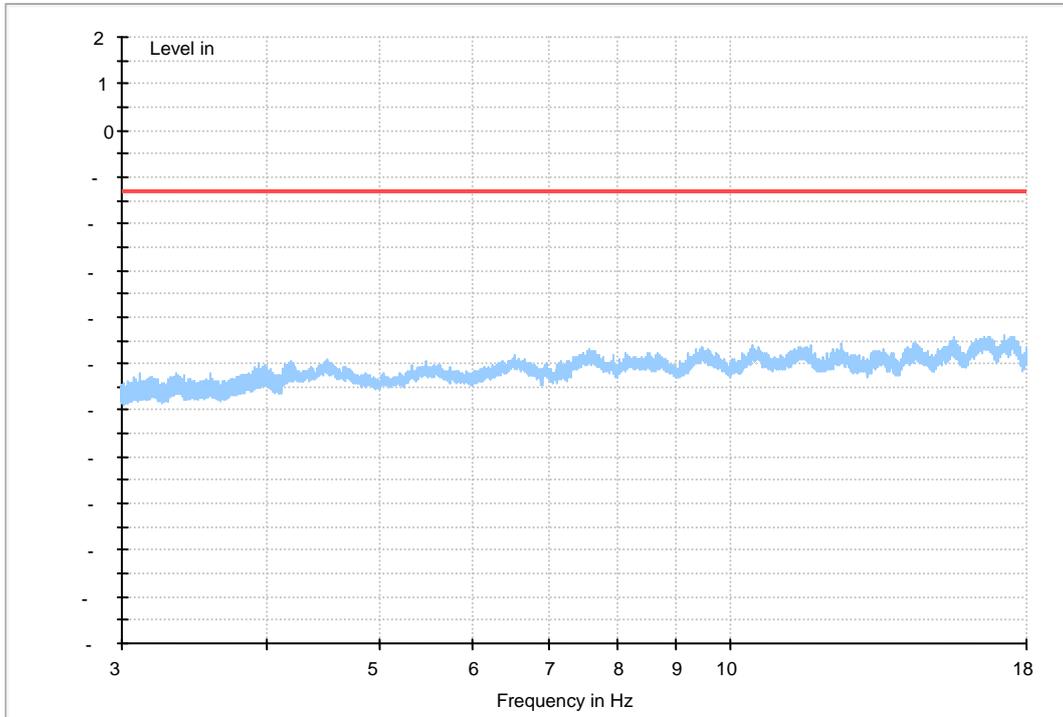


Traffic Mode (30MHz-3GHz)





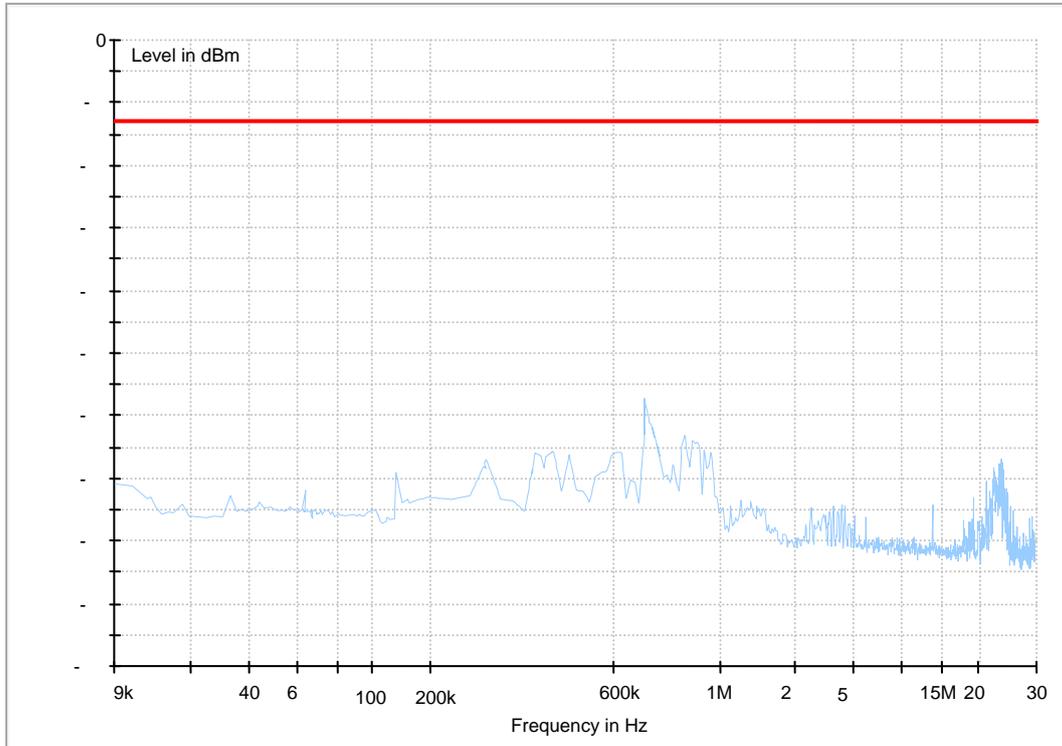
Traffic Mode (3GHz-18GHz)





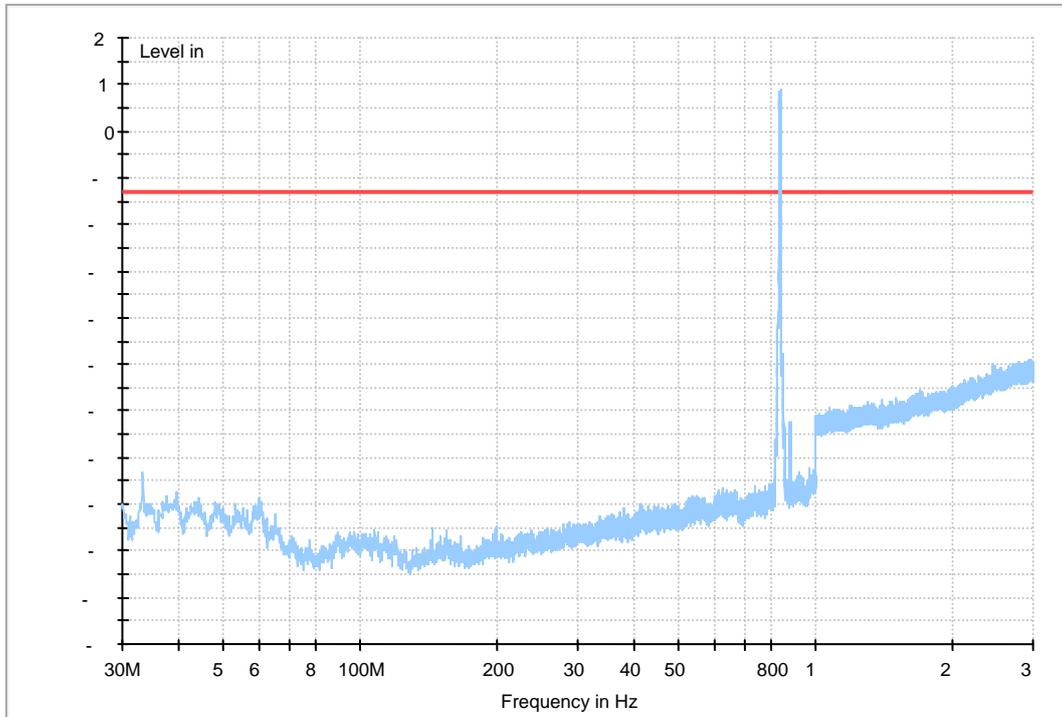
HSUPA Band V

Traffic Mode (9kHz-30MHz)



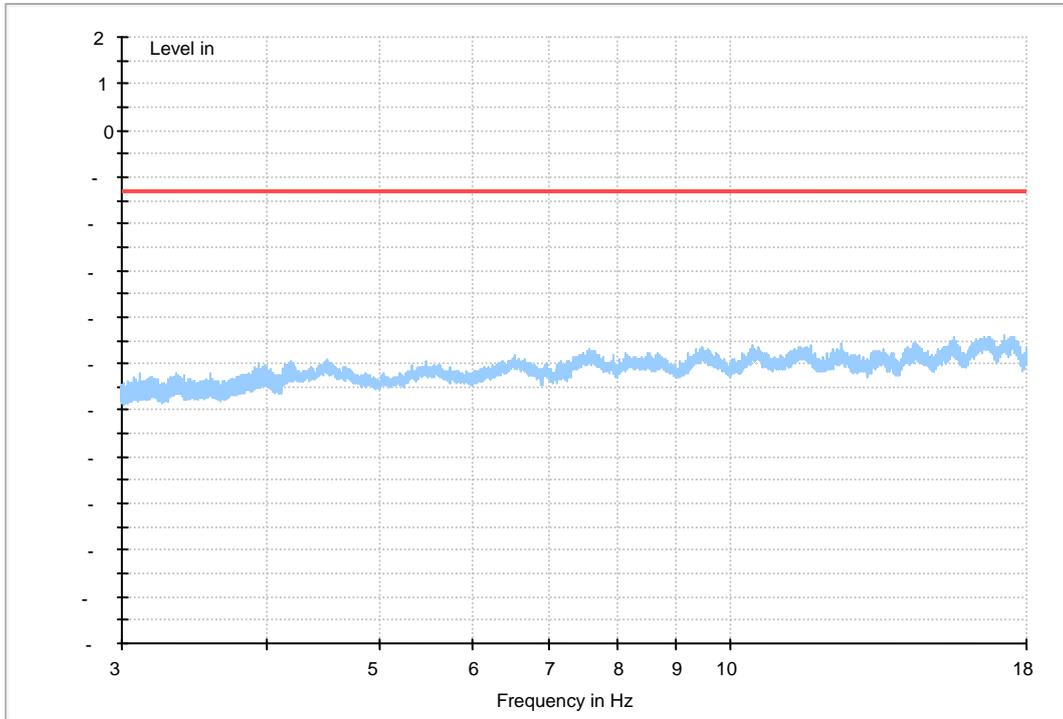


Traffic Mode (30MHz-3GHz)





Traffic Mode (3GHz-18GHz)



-----END-----



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	22	0.02628	---	±2.5	Pass
			-20 °C	10	0.01195	---	±2.5	Pass
			-10 °C	23	0.02748	---	±2.5	Pass
			0 °C	-24	-0.02867	---	±2.5	Pass
			10 °C	-16	-0.01912	---	±2.5	Pass
			20 °C	-7	-0.00836	---	±2.5	Pass
			30 °C	27	0.03226	---	±2.5	Pass
			40 °C	-14	-0.01673	---	±2.5	Pass
			50 °C	17	0.02031	---	±2.5	Pass
TM 2	M	VN	-30 °C	-12	-0.01434	---	±2.5	Pass
			-20 °C	-18	-0.02151	---	±2.5	Pass
			-10 °C	-22	-0.02628	---	±2.5	Pass
			0 °C	9	0.01075	---	±2.5	Pass
			10 °C	11	0.01314	---	±2.5	Pass
			20 °C	11	0.01314	---	±2.5	Pass
			30 °C	-14	-0.01673	---	±2.5	Pass
			40 °C	26	0.03106	---	±2.5	Pass
			50 °C	29	0.03465	---	±2.5	Pass
TM 3	M	VN	-30 °C	27	0.03228	---	±2.5	Pass
			-20 °C	-22	-0.02630	---	±2.5	Pass
			-10 °C	26	0.03109	---	±2.5	Pass
			0 °C	12	0.01435	---	±2.5	Pass
			10 °C	-9	-0.01076	---	±2.5	Pass
			20 °C	19	0.02272	---	±2.5	Pass
			30 °C	25	0.02989	---	±2.5	Pass
			40 °C	-16	-0.01913	---	±2.5	Pass
			50 °C	20	0.02391	---	±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	-11	-0.01314	---	±2.5	Pass
			VN	16	0.01912	---	±2.5	Pass
			VH	10	0.01195	---	±2.5	Pass
TM 2	M	TN	VL	24	0.02867	---	±2.5	Pass
			VN	-16	-0.01912	---	±2.5	Pass
			VH	-25	-0.02987	---	±2.5	Pass
TM 3	M	TN	VL	-11	-0.01315	---	±2.5	Pass
			VN	21	0.02511	---	±2.5	Pass
			VH	26	0.03109	---	±2.5	Pass

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