



FCC RF Test Report

**Product Name: T-Mobile myTouch;
HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth;
Ascend G 312**

Model Number: HUAWEI U8680, U8680

**Report No: SYBH(Z-RF)004022012-2001
FCC ID: QISU8680**

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.
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Applicant: Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen
 518129, P.R. China
Date of Receipt Test Item: Mar.03, 2012
Start Date of Test: Mar.05, 2012
End Date of Test: Mar.12, 2012

Test Result: Pass

Approved By Senior Engineer Mar.15, 2012 Dai Linjun *Dai Linjun*
 Date Name Signature

Reviewed By Mar.15, 2012 Cousy Xu *Cousy XU*
 Date Name Signature

Operator Mar.15, 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 2:2010, Subpart J
47 CFR FCC Part 22:2010, Subpart H
ANSI/TIA 603C 2004

1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.
Address: Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.
China

1.3 Test Environment Condition

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

2 Summary

Table 1 Summary of results

Cellular Band			
Test Case	FCC Part No.	Requirements	Result
Transmitter Output Power	2.1046 & 22.913	ERP not exceed 7 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 22.917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 22.917	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/100 kHz, 30 MHz to 10 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 Production Information

3.1.1 General Description

HUAWEI U8680, U8680 is subscriber equipment in the WCDMA/GSM system. The HSPA/UMTS frequency band is Band I, Band II, Band IV, and Band V, but only Band V band test data included in this report. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850 band test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port(to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.1.2 Board

Table 1 Board Information

T-Mobile myTouch; HSPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth; Ascend G 312		
HUAWEI U8680, U8680		
Hardware Version	Software Version	Serial Number
HD1U868M	U8680V100R001C85B815	C5Z01A11B1800946

3.1.3 Sub-Assembly

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

3.1.4 Battery Technical Data

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5N1H Rated capacity: 1500mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V

3.2 Test Description

3.2.1 Supported Frequency Range

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

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: 240KGXW (GMSK modulation), 244KG7W (8PSK modulation)) UMTS system: 4M13F9W

3.2.3 Antenna Gain

Antenna Gain(dBi):	-1.0
Antenna Gain(dBd):	-3.15

3.2.4 Power Supply

	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to Adapter (DC power)	DC Voltage Nominal: \equiv +3.7V DC Voltage Range: \equiv +3.6 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 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

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
TM5	HSUPA QPSK modulation

4.3 Test Environments

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

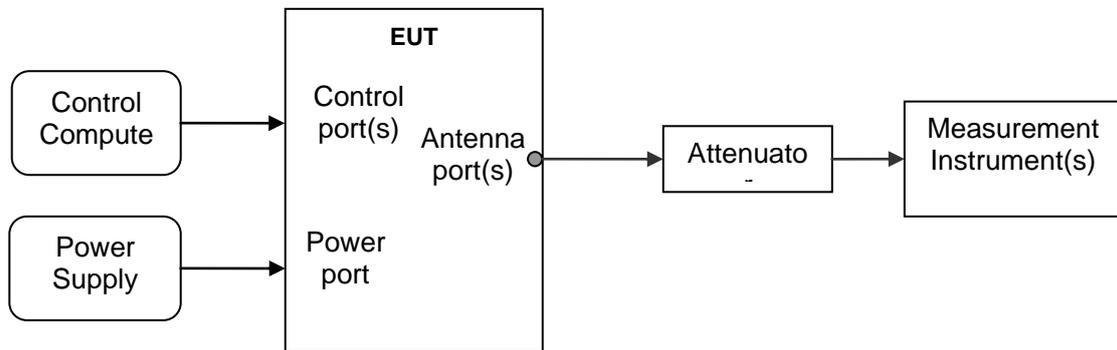
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= nominal temperature

4.4 Test Setups

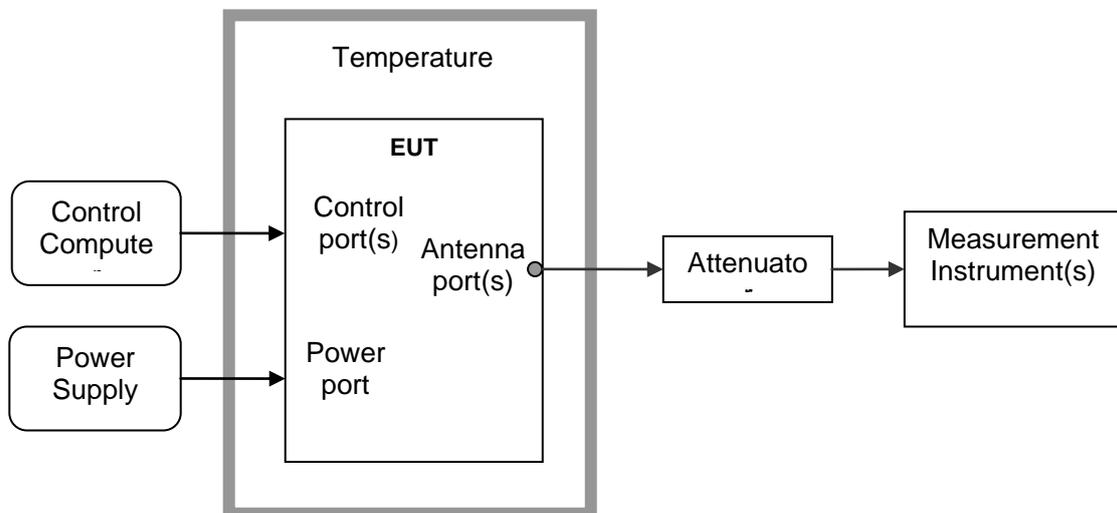
4.4.1 General Test Setup Configurations

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



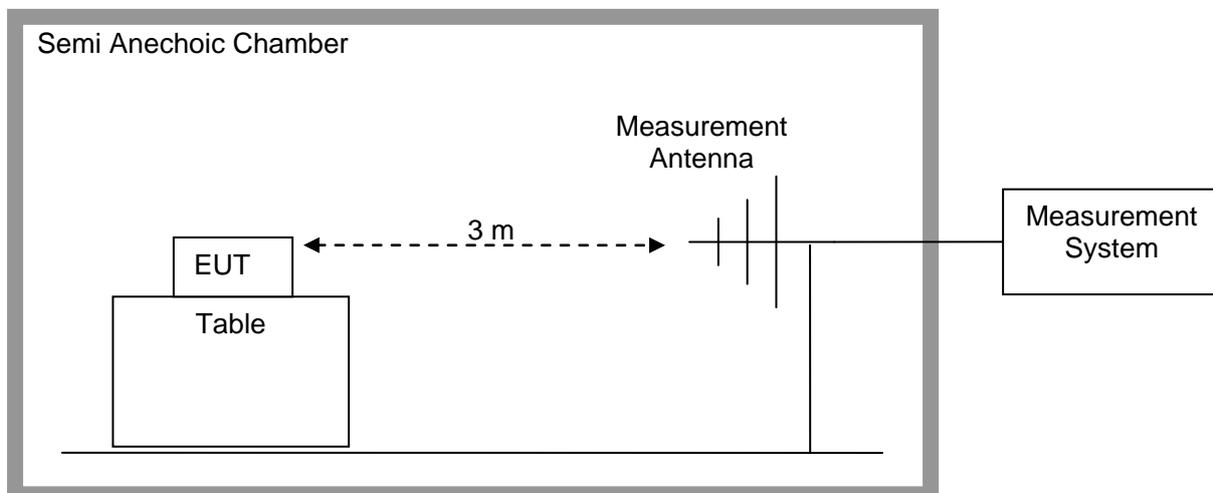
4.4.4 Test Setup 3

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

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

Step 1: Pre-test , find the Maximum ERP

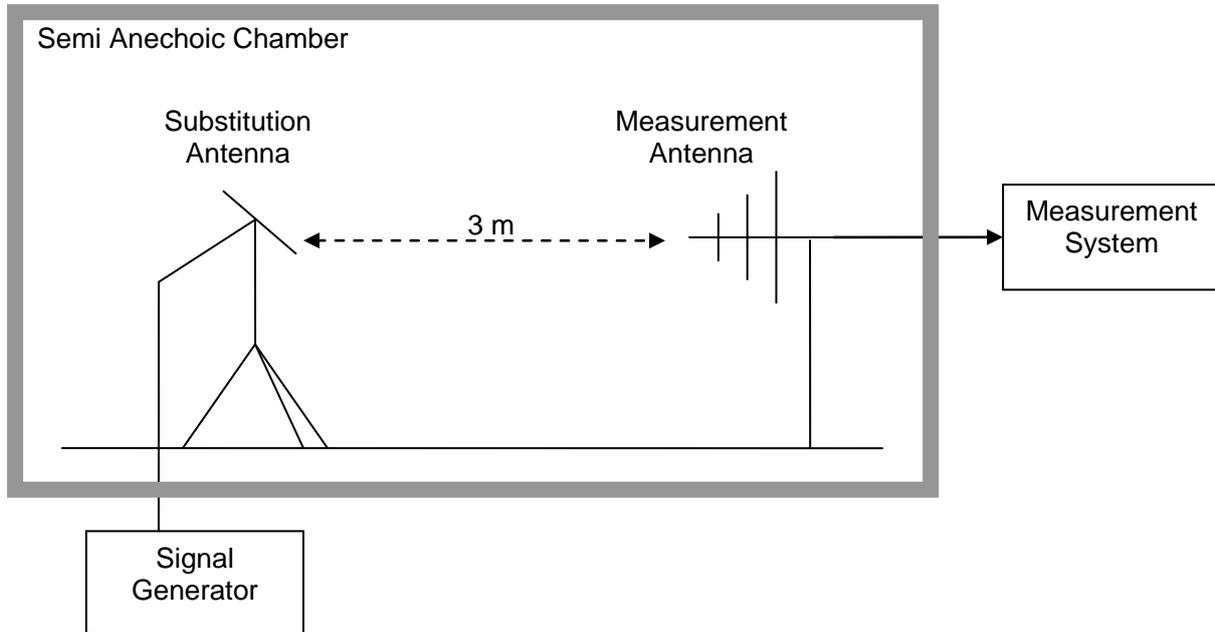
1. Connect the test system according to Figure. EUT is running for 30 minutes before test, and measurement instruments are warming-up for 30 minutes.
2. Set up communication link between Universal radio communication tester and EUT, set EUT working frequency, and control EUT to transmit at maximum power.
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 signal. RMS detector for the test, and the span is equal to 2 times of emission bandwidth, remain other settings to be auto. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive 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 nonmetallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z axes) 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

1. Measurement setup according to figure , EUT was substituted by antenna, and the polarization is

identical as the test antenna; the signal generator was connected to the substitution antenna.
2.The radiated output power, measured by signal analyzer set, is as 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 after corrected by the antenna gain and cable loss.



4.5 Test Conditions

Test Case		Test Conditions	
Transmitter Output Power	Conducted 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/TM5
	ERP	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/TM5
	Peak-to-Average Ratio	Test Configuration	Ambient Temperature & Rated Voltage
		Test Setup	Test Setup 1 & Setup 3
		RF Channels (TX)	B, M, T
		Test Mode	TM1/TM2/TM3/TM4/TM5
	Modulation Characteristics		Test Configuration
Test Setup			Test Setup 1
RF Channels (TX)			M
Test Mode			TM1/TM2/TM3
Bandwidth	99% 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
	Emission Bandwidth (if required)	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			Ambient Temperature & Rated Voltage
			Test Setup 1
		Emission Bandwidth (if required)	RMS
			B, T

Test Case	Test Conditions	
		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/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 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	MY49420179	Apr.20,2012
Signal Analyzer	R&S	FSQ31	200021	Sep.27,2012
Temperature Chamber	WEISS	WKL64	24600294	Feb.13,2013
Signal generator	Agilent	E8257D	MY49281095	Jul.9.2012
Test receiver	R&S	ESU26	100150	May.29.2012
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, 2012
Horn Antenna	R & S	HF906	100684	Jul.01, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-357	May.15, 2012
Broadband Antenna	Schwarzbeck	VULB 9163	9163-356	May.15, 2012

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	Field Strength of Spurious Radiation	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 & Part 22.913



Conducted Power of Transmitter

Table 1 Measurement Results

TEST CONDITIONS		RF Output Power (Conducted)					
		Channel128(B)		Channel192(M)		Channel251(T)	
		824.2MHz		837.0MHz		848.8MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}	Measured	Limit	Measured	Limit	Measured	Limit	
TM1	32.27	38.50	32.28	38.50	32.03	38.50	
TM2	26.44	38.50	26.54	38.50	26.38	38.50	
TEST CONDITIONS		Channel4132(B)		Channel4182(M)		Channel4233(T)	
		826.4MHz		836.4MHz		846.6MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}	Measured	Limit	Measured	Limit	Measured	Limit	
TM3	24.10	38.50	24.08	38.50	24.11	38.50	
TM4	Case1	24.02	38.50	24.09	38.50	24.05	38.50
	Case2	24.04	38.50	24.07	38.50	24.08	38.50
	Case3	23.48	38.50	23.50	38.50	23.51	38.50
	Case4	23.43	38.50	23.51	38.50	23.56	38.50
TM5	Case1	22.45	38.50	23.32	38.50	22.81	38.50
	Case2	21.25	38.50	21.83	38.50	22.08	38.50
	Case3	21.88	38.50	22.27	38.50	22.30	38.50
	Case4	22.29	38.50	22.80	38.50	22.13	38.50
	Case5	22.39	38.50	23.30	38.50	22.86	38.50



Peak-to-Average Ratio

Table 2 Measurement Results

TEST CONDITIONS		Channel128(B)		Channel192(M)		Channel251(T)	
		824.2MHz		837.0MHz		848.8MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM1		9.87	13.0	9.94	13.0	9.84	13.0
TM2		12.35	13.0	12.79	13.0	12.46	13.0
TEST CONDITIONS		Channel4132(B)		Channel4182(M)		Channel4233(T)	
		826.4MHz		836.4MHz		846.6MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM3		3.10	13.0	3.21	13.0	2.98	13.0
TM4	Case1	2.55	13.0	2.65	13.0	2.77	13.0
	Case2	2.6	13.0	2.65	13.0	2.75	13.0
	Case3	2.9	13.0	2.54	13.0	2.23	13.0
	Case4	2.62	13.0	2.88	13.0	2.35	13.0
TM5	Case1	3.15	13.0	2.65	13.0	2.54	13.0
	Case2	2.89	13.0	2.91	13.0	3.02	13.0
	Case3	2.56	13.0	2.26	13.0	2.11	13.0
	Case4	2.62	13.0	2.01	13.0	2.68	13.0
	Case5	2.98	13.0	2.12	13.0	2.87	13.0



NOTE:

For TM4:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
Case1	2/15	15/15	64	2/15	4/15	0.0	0.0
Case2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
Case3	15/15	8/15	64	15/8	30/15	1.5	0.5
Case4	15/15	4/15	64	15/4	30/15	1.5	0.5

For TM5:

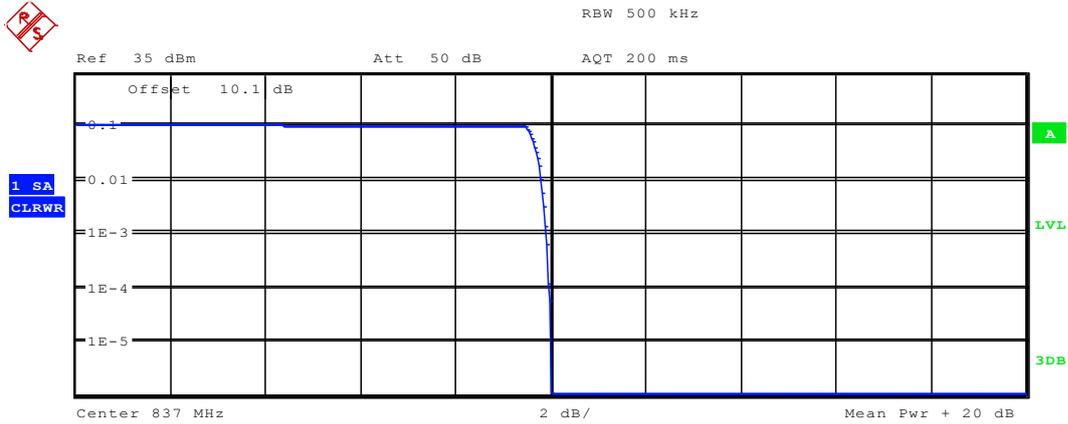
Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (Codes)	CM (dB)	MPR (dB)	AG Index)	E-TFCI
Case1	11/15	15/15	64	11/15)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
Case2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
Case3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
Case4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
Case5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67



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

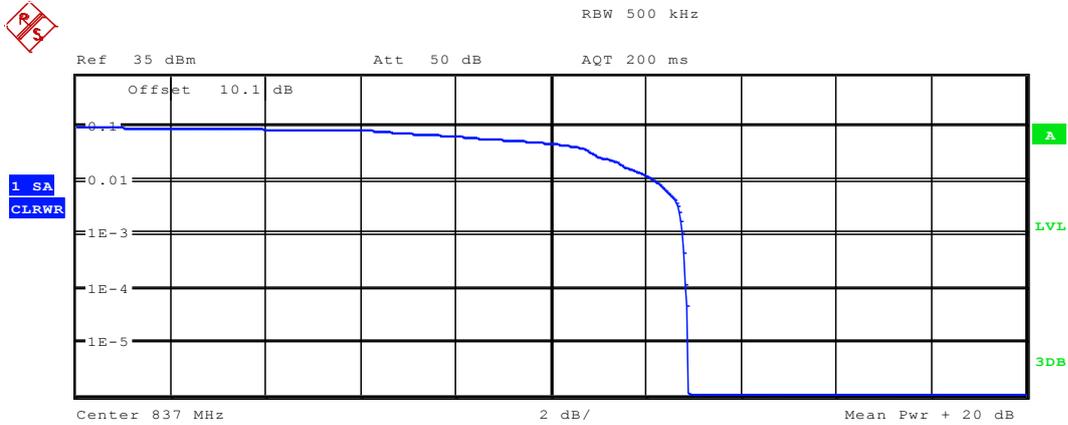


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 424kHz

	Trace 1
Mean	22.32 dBm
Peak	32.33 dBm
Crest	10.01 dB
10 %	9.49 dB
1 %	9.81 dB
.1 %	9.94 dB
.01 %	9.97 dB



TM2



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

Trace 1

Mean	16.34	dBm
Peak	29.23	dBm
Crest	12.89	dB

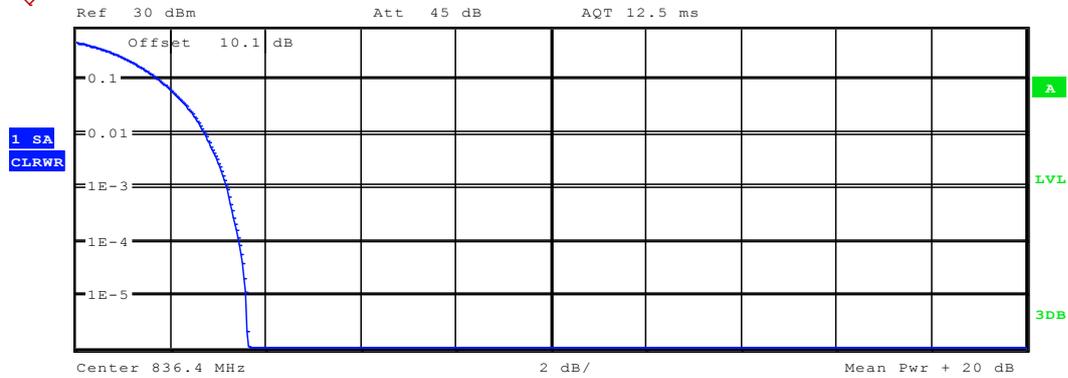
10 %	2.34	dB
1 %	12.21	dB
.1 %	12.79	dB
.01 %	12.85	dB



TM3/TM4/TM5



RBW 5 MHz



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

		Trace 1	
Mean		23.50	dBm
Peak		27.12	dBm
Crest		3.62	dB
10 %		1.76	dB
1 %		2.72	dB
.1 %		3.21	dB
.01 %		3.46	dB



Effective Radiated Power of Transmitter (ERP)

Table 3 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	FCC limit [dBm]	Result
TM1	824.2	29.14	Dipole Ant.	32.50	-2.75	0.6	29.15	38.5	Pass
TM1	837.0	29.22	Dipole Ant.	32.71	-2.87	0.6	29.24	38.5	Pass
TM1	848.8	28.90	Dipole Ant.	32.36	-2.85	0.6	28.91	38.5	Pass
TM2	824.2	23.29	Dipole Ant.	26.56	-2.75	0.6	23.21	38.5	Pass
TM2	837.0	23.39	Dipole Ant.	26.82	-2.87	0.6	23.35	38.5	Pass
TM2	848.8	23.23	Dipole Ant.	26.66	-2.85	0.6	23.21	38.5	Pass
TM3	826.4	20.95	Dipole Ant.	24.29	-2.75	0.6	20.94	38.5	Pass
TM3	836.4	20.93	Dipole Ant.	24.45	-2.87	0.6	20.98	38.5	Pass
TM3	846.6	20.96	Dipole Ant.	24.35	-2.85	0.6	20.90	38.5	Pass

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

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

b, SGP=Signal Generator Level

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



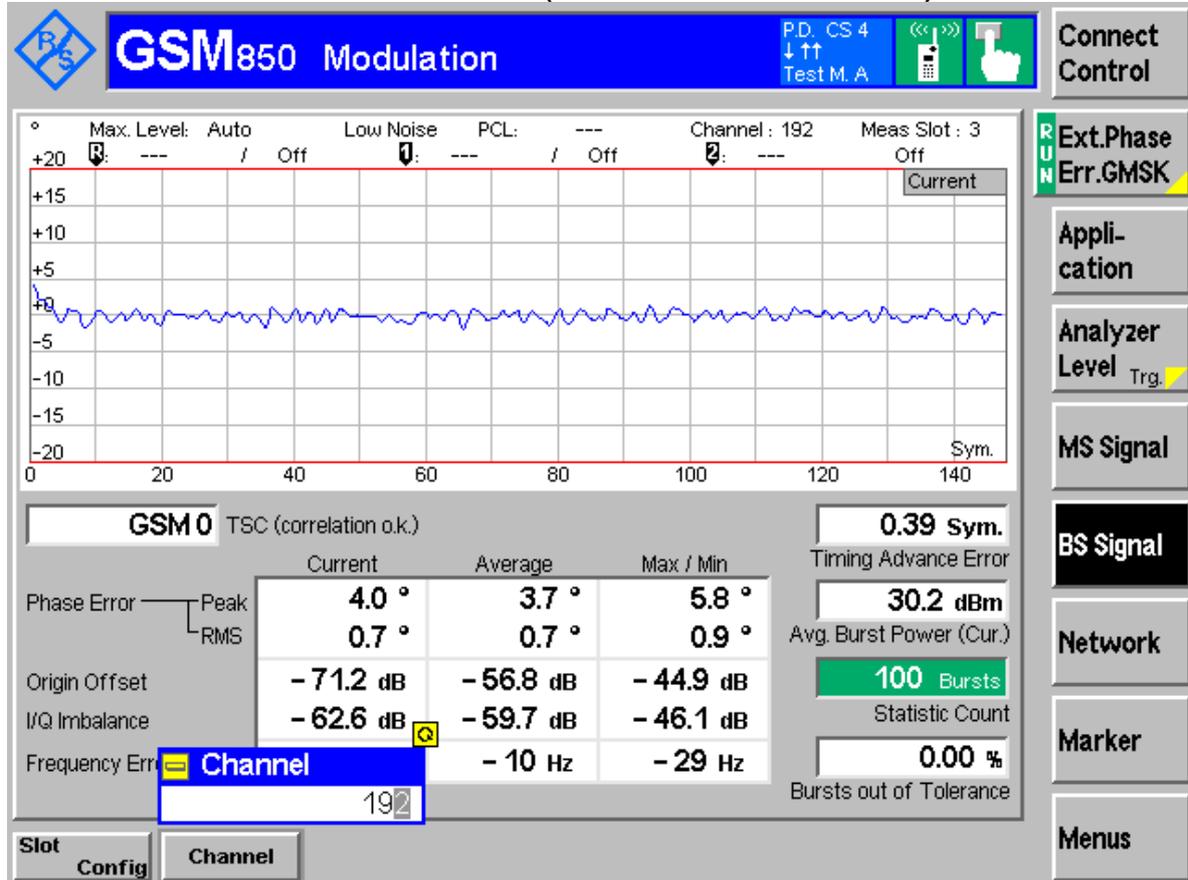
Appendix B

Modulation Characteristics

According to FCC Part 2.1047 & Part22 Subpart H

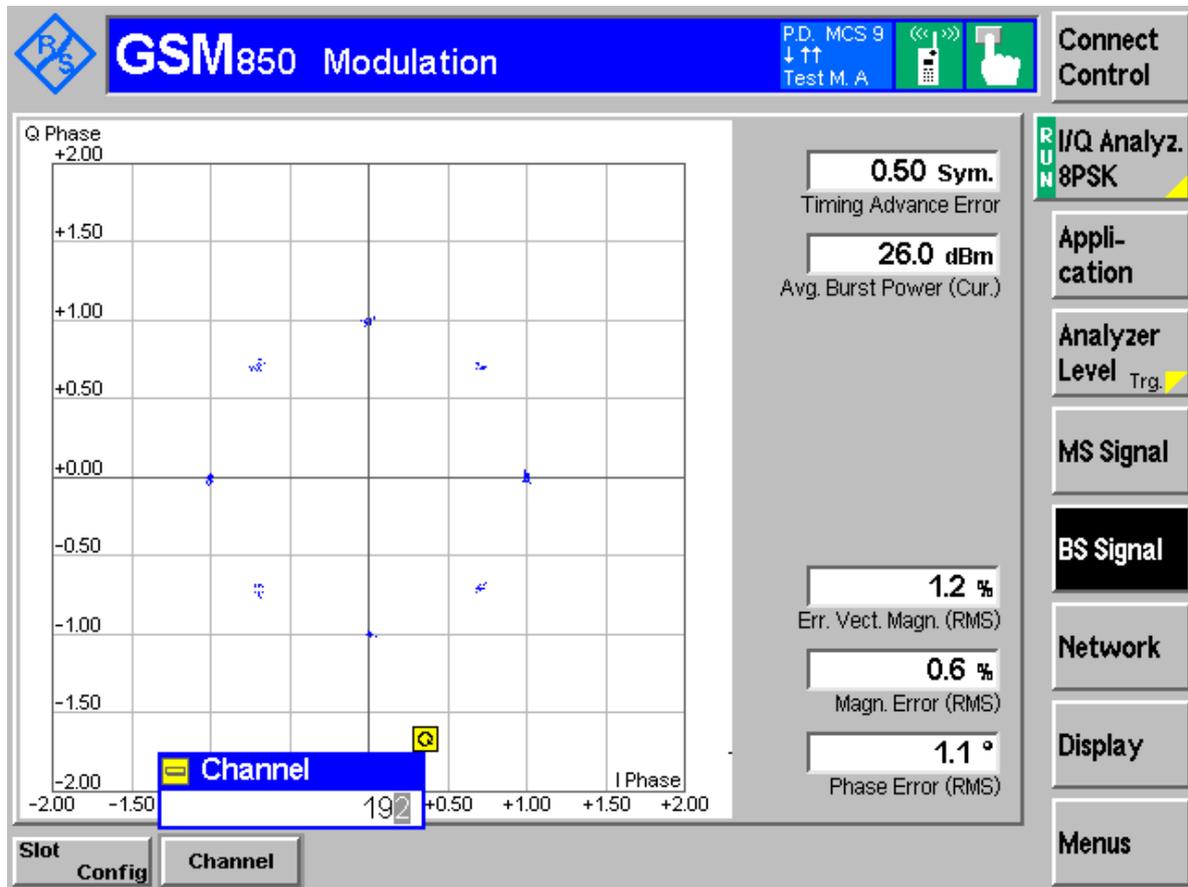


Channel 192(TM1:GPRS/GSM)



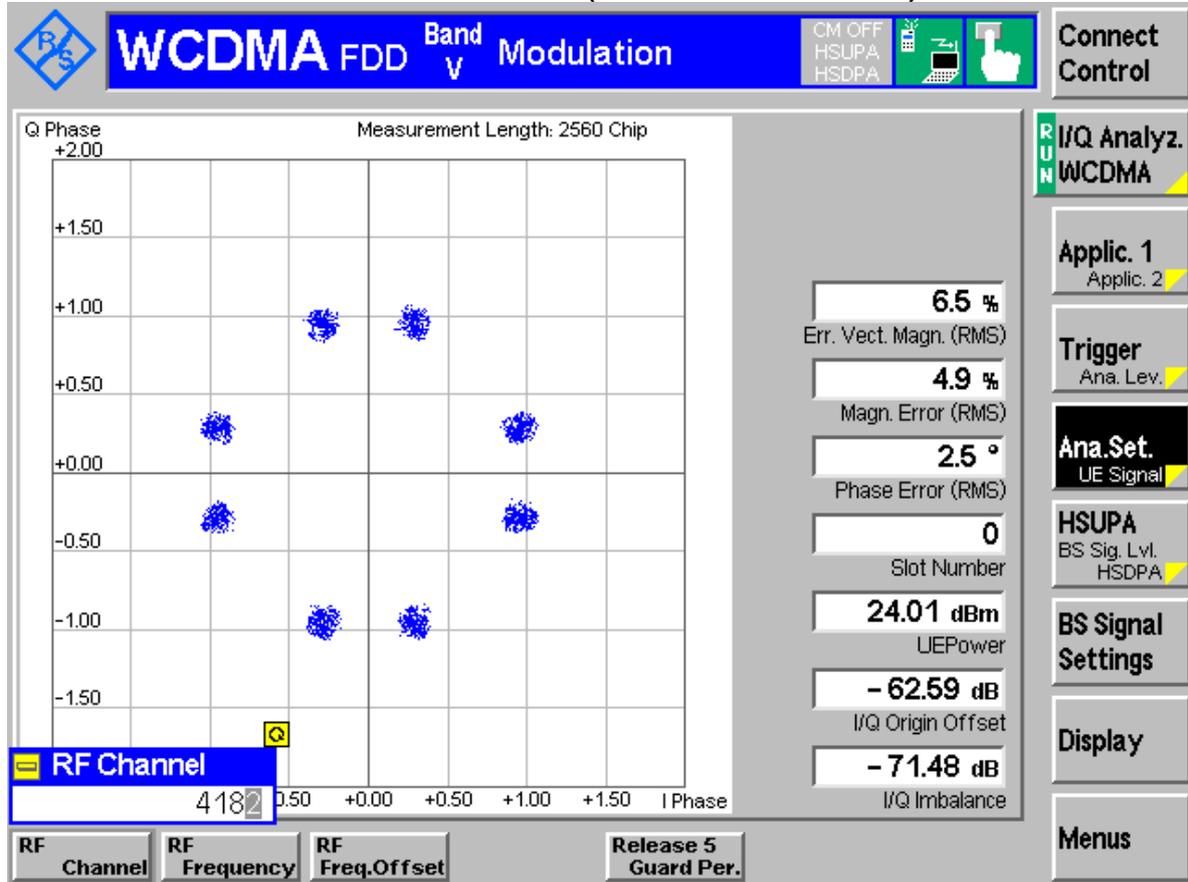


Channel 192(TM2:EDGE)





Channel 4182(TM3: WCDMA)



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



Appendix C

Occupied Bandwidth

According to FCC Part 2.1049 & Part 22 Subpart H



Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [kHz]	-26dB BW [kHz]	Verdict
TM1	128	239.8	319.3	Pass
	192	238.6	314.7	Pass
	251	238.9	318.7	Pass
TM2	128	238.1	311.0	Pass
	192	243.3	318.1	Pass
	251	239.7	308.6	Pass
Test Mode	RF Channel	Occupied Bandwidth [MHz]	-26dB BW [MHz]	Verdict
TM3	4132	4.12	4.64	Pass
	4182	4.13	4.64	Pass
	4233	4.12	4.63	Pass



Channel 128(TM1:GPRS/GSM)



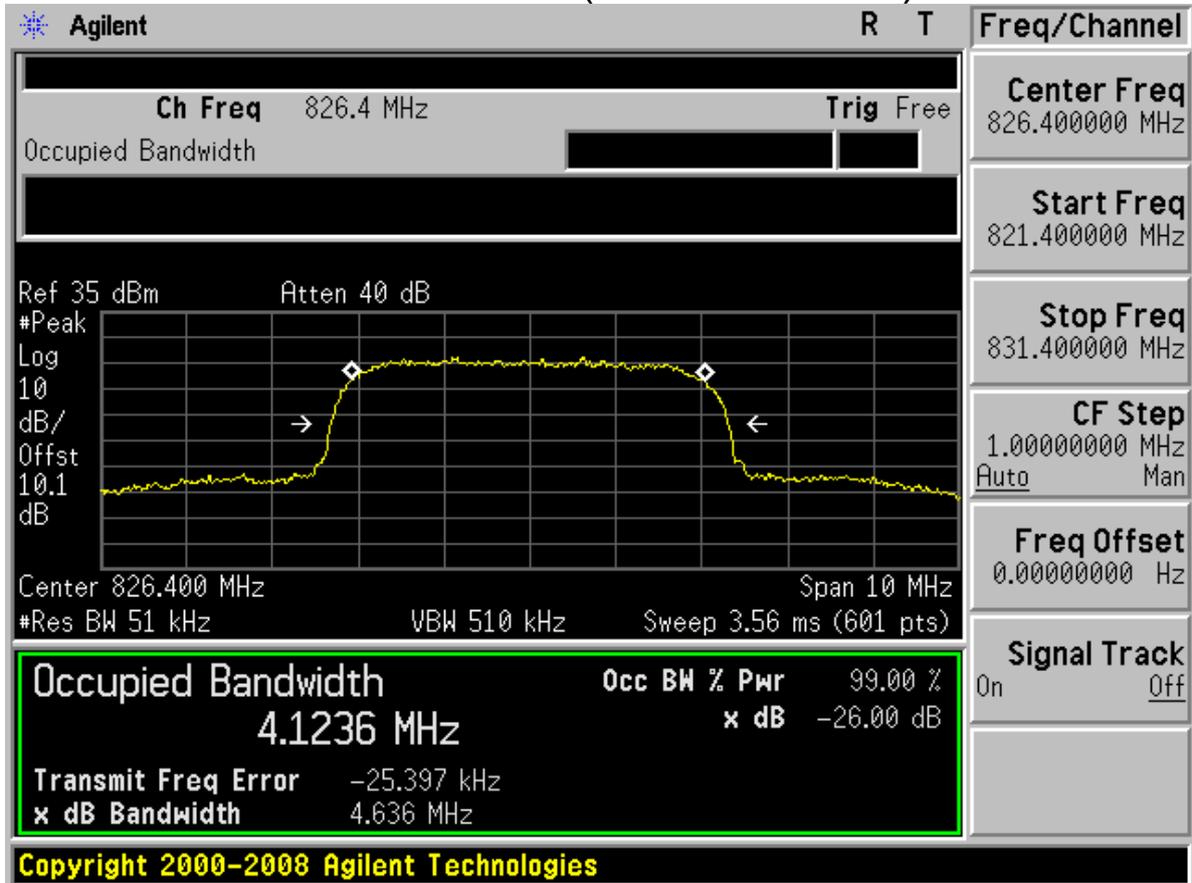


Channel 128(TM2:EDGE)



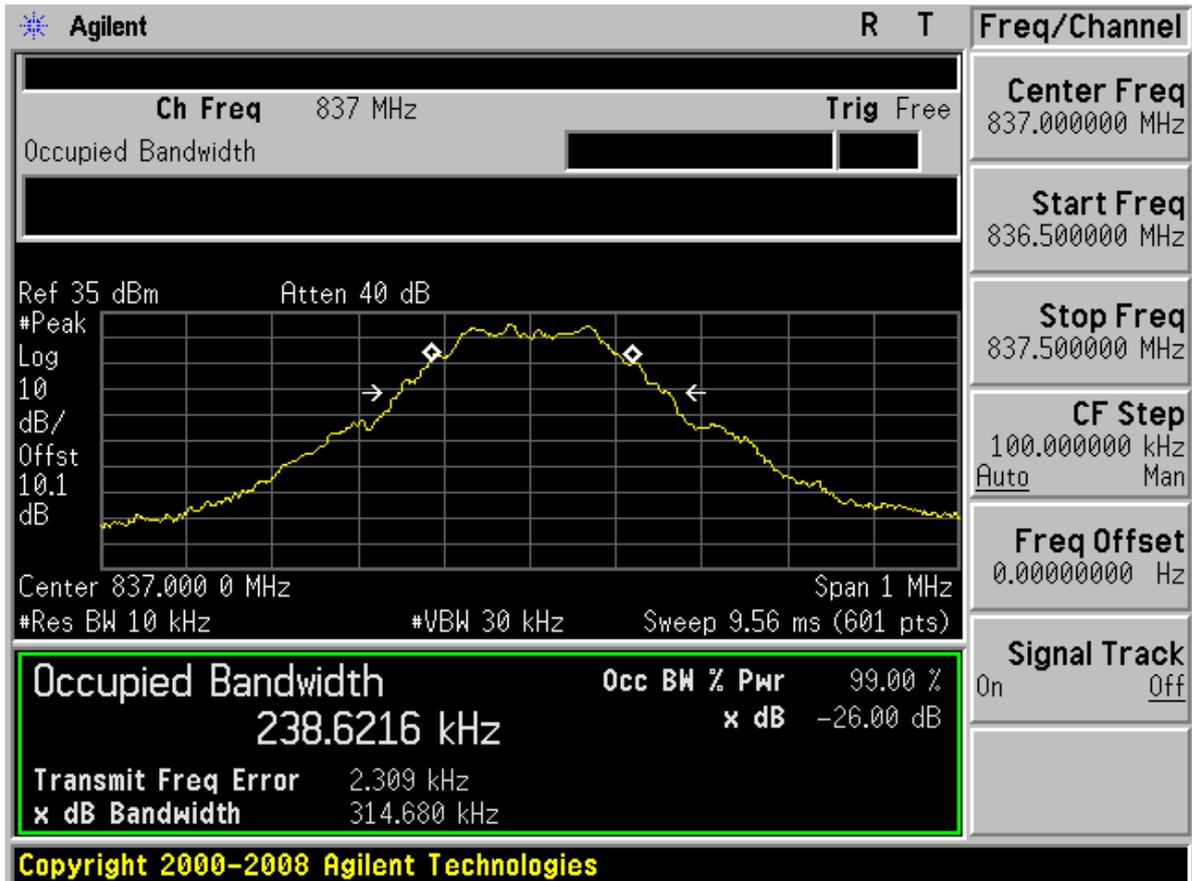


Channel 4132(TM3: WCDMA)





Channel 192(TM1:GPRS/GSM)



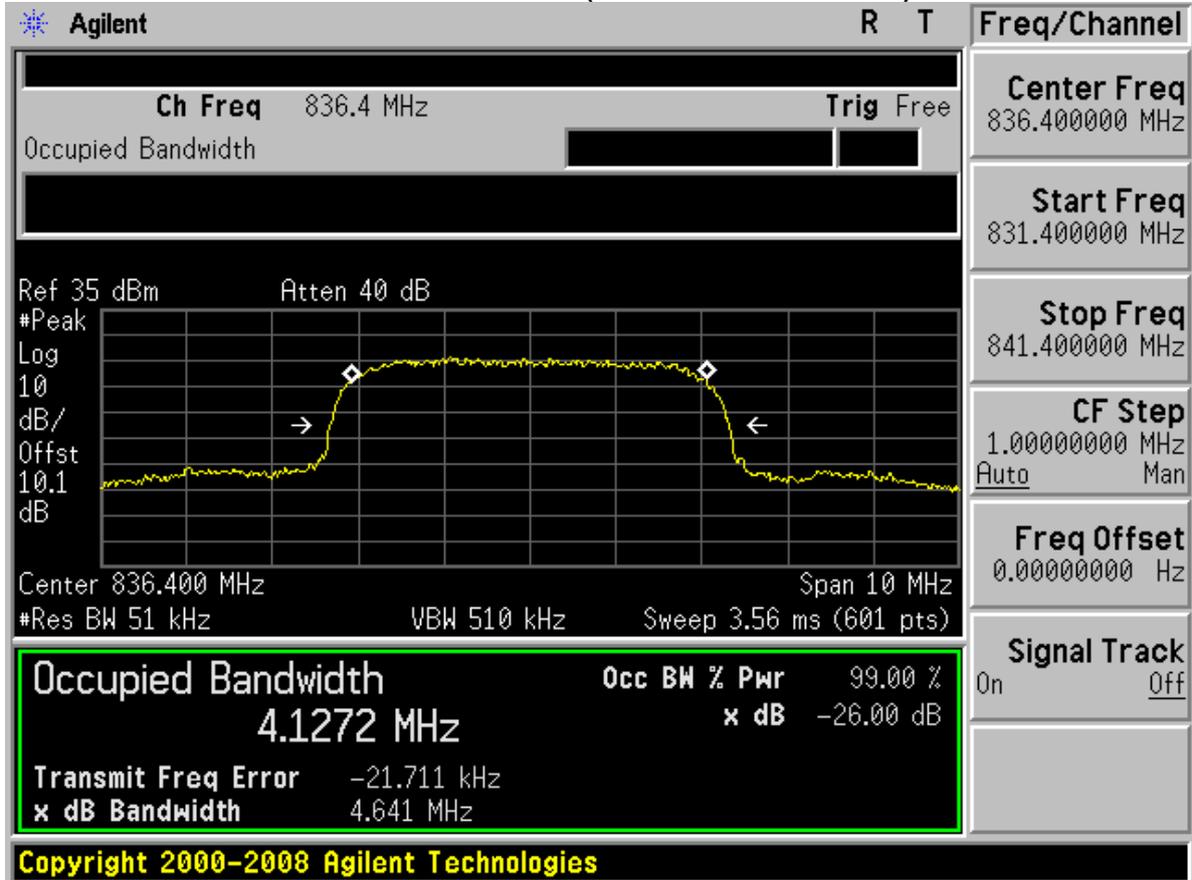


Channel 192(TM2:EDGE)





Channel 4182(TM3: WCDMA)





Channel 251(TM1:GPRS/GSM)



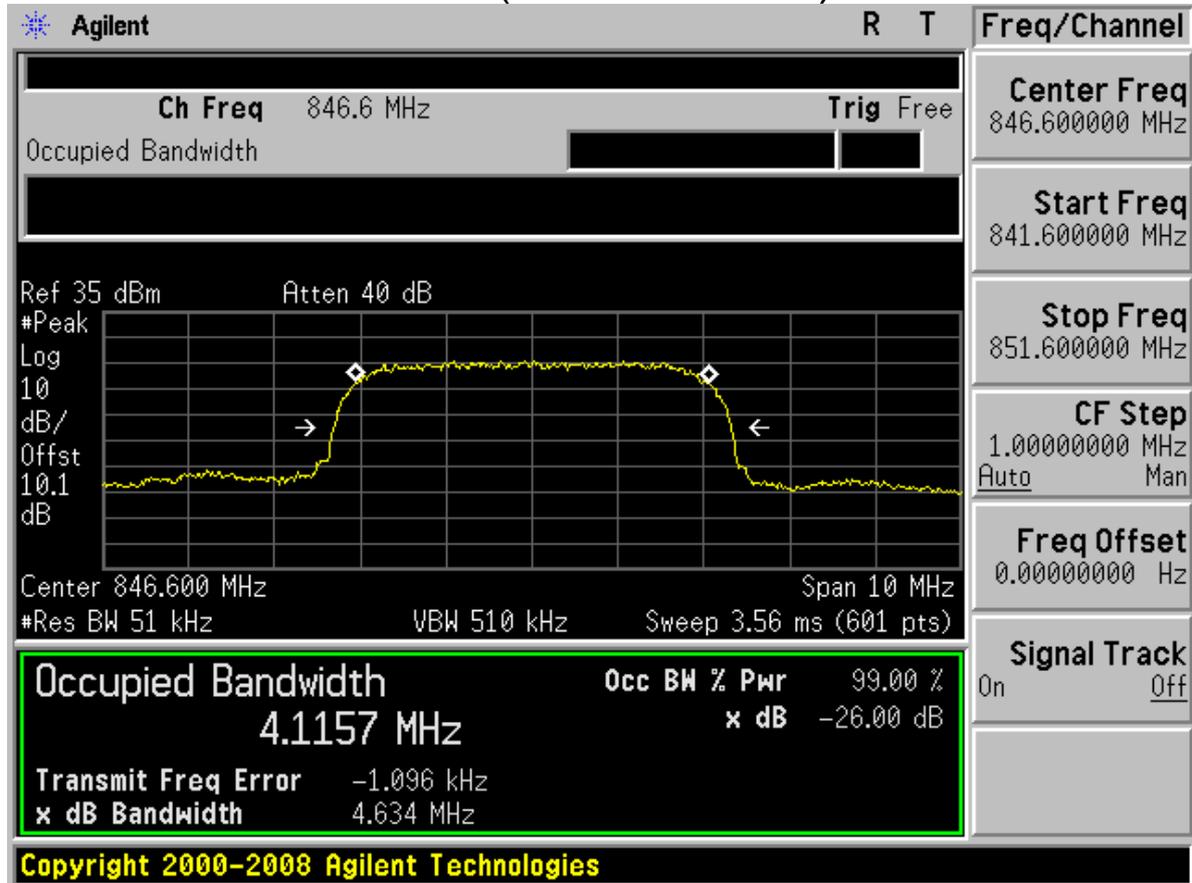


Channel 251(TM2:EDGE)





Channel 4233(TM3: WCDMA)



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



Appendix D

Band Edges Compliance

According to FCC Part 2.1051 & Part 22 Subpart H



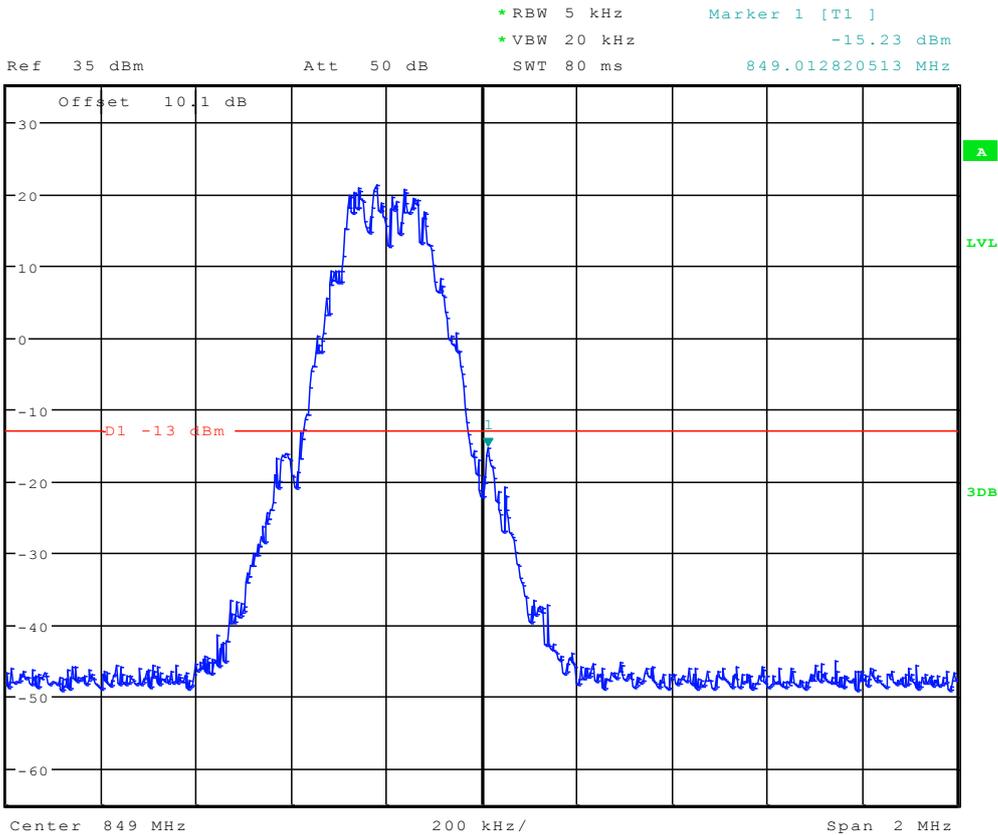
26dB Occupied Bandwidth

Note: All relevant operation modes have been tested, and the widest case data is included in this table.

Mode	-26dB BW [kHz]	RBW to Measure Band Edge [kHz]
TM1/TM2	319.3	≥ 3.19 , used 5
TM3	4640	≥ 46.4 used 50



Right Edge Channel 251

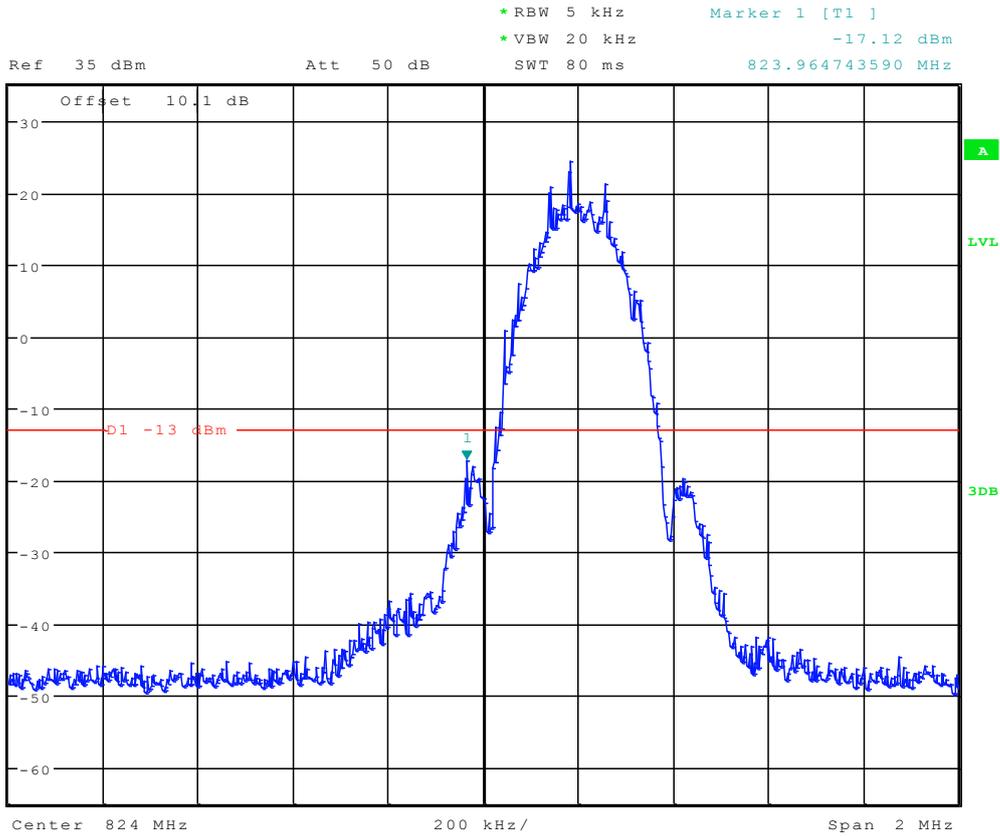




TM2:EDGE

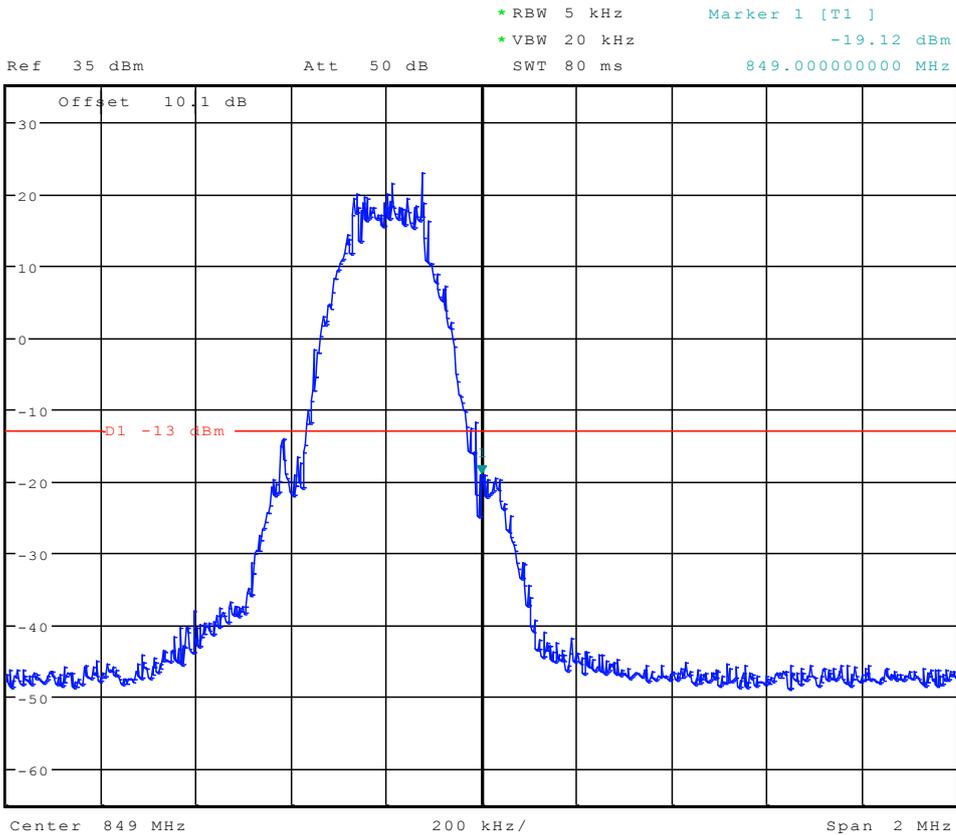
Left Edge

Channel 128





Right Edge Channel 251

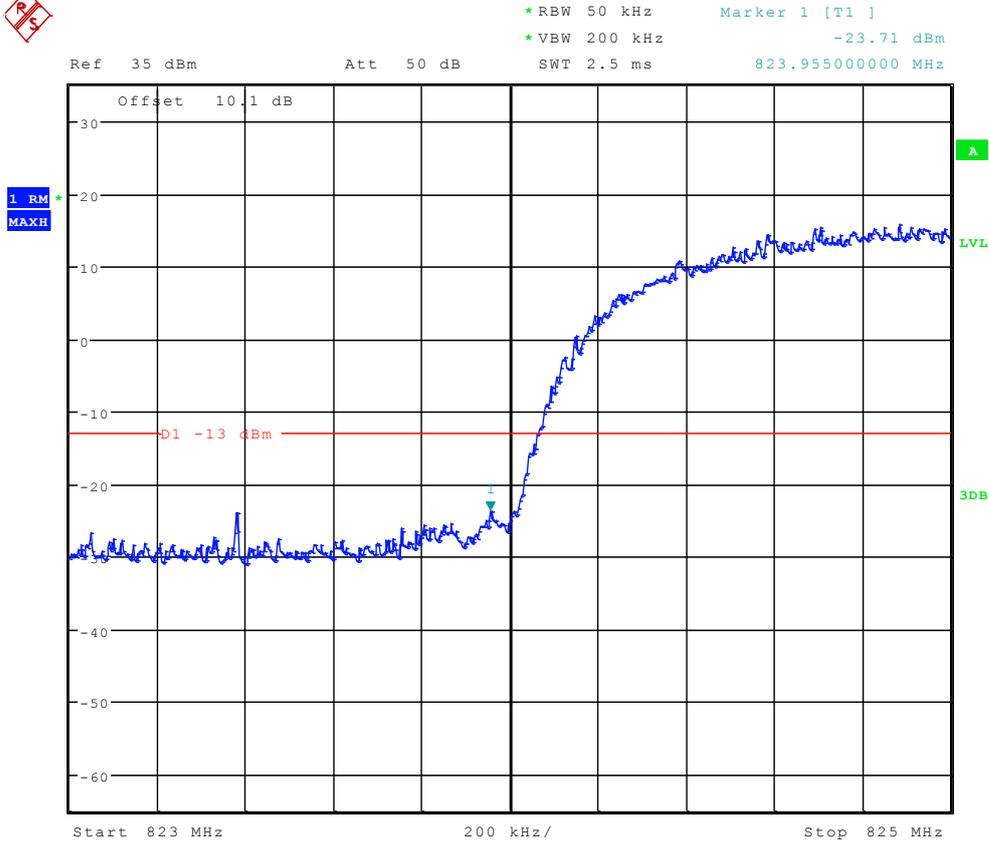




TM3: WCDMA

Left Edge

Channel 4132

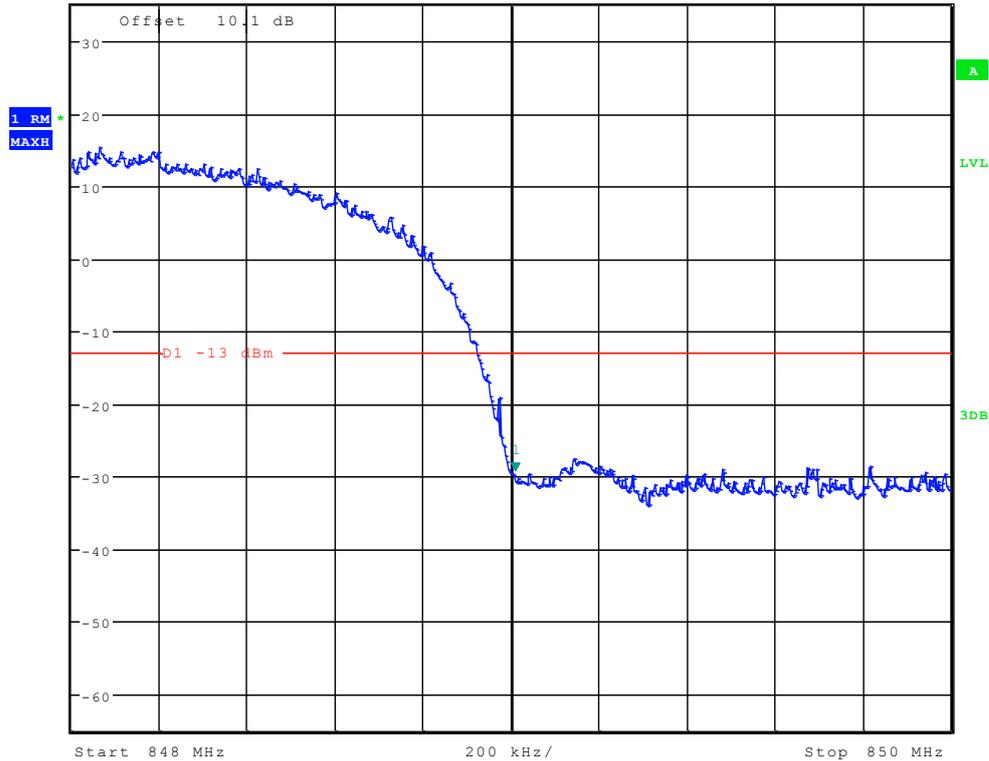




Right Edge Channel 4233



Ref 35 dBm Att 50 dB RBW 50 kHz Marker 1 [T1] -29.37 dBm
 VBW 200 kHz SWT 2.5 ms 849.01000000 MHz



The END



Appendix E

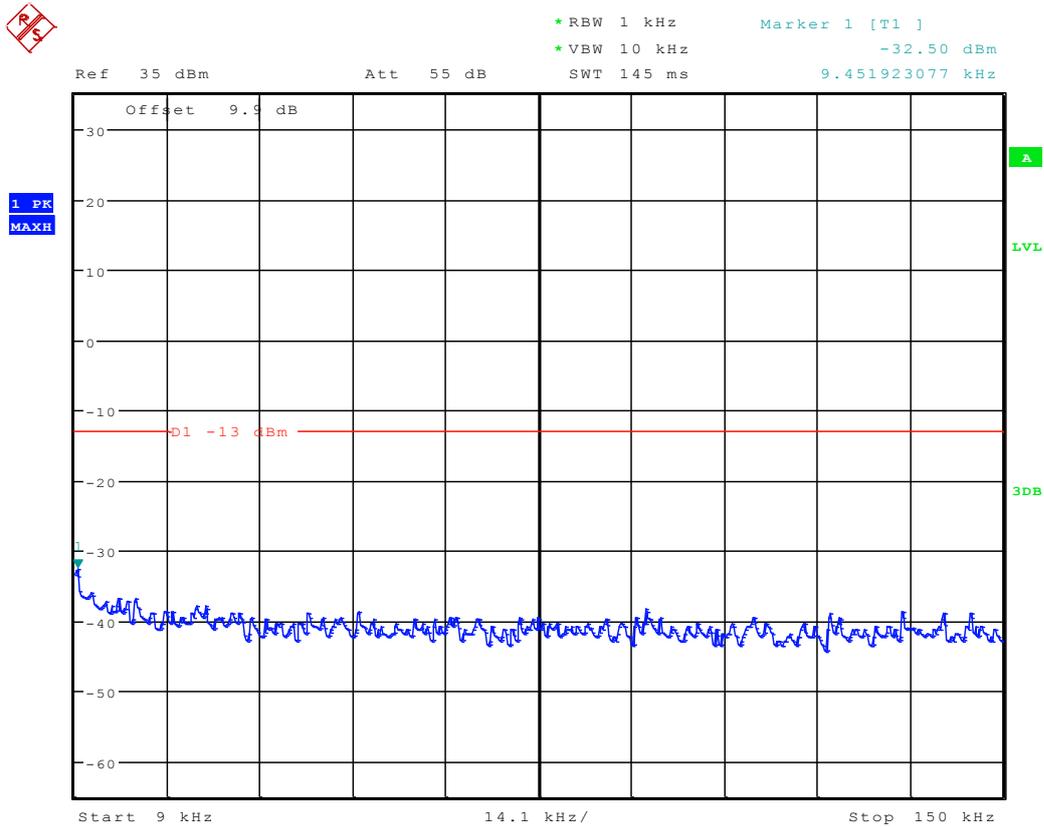
Spurious Emission at Antenna Terminal

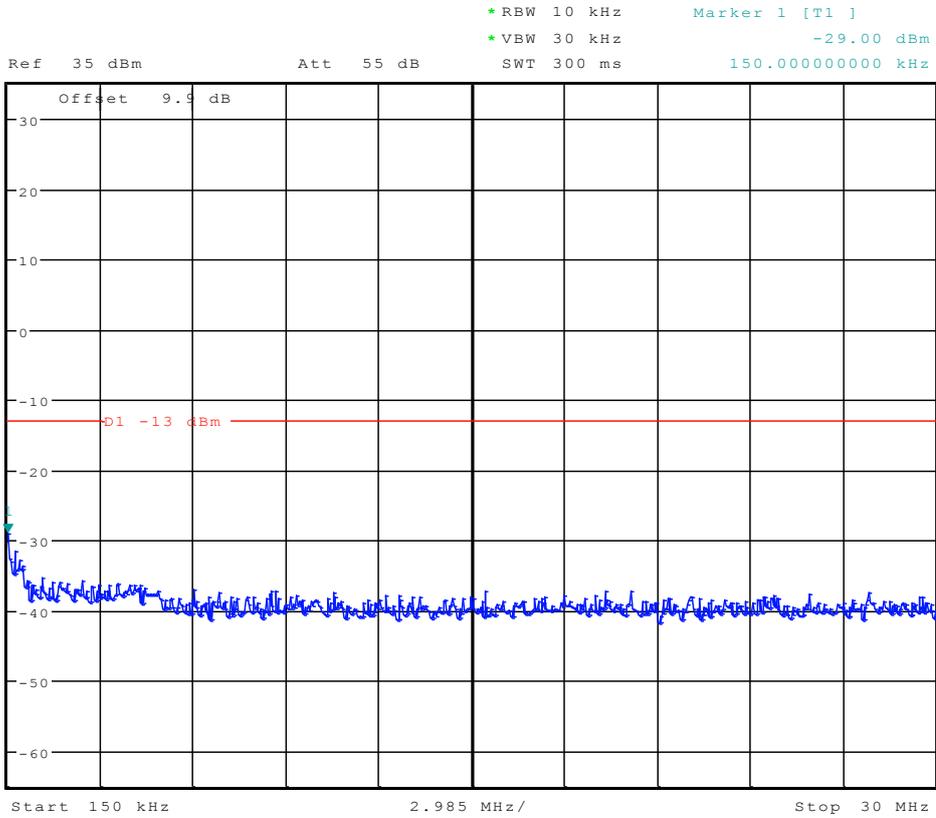
According to FCC Part 2.1051 & Part 22 Subpart H

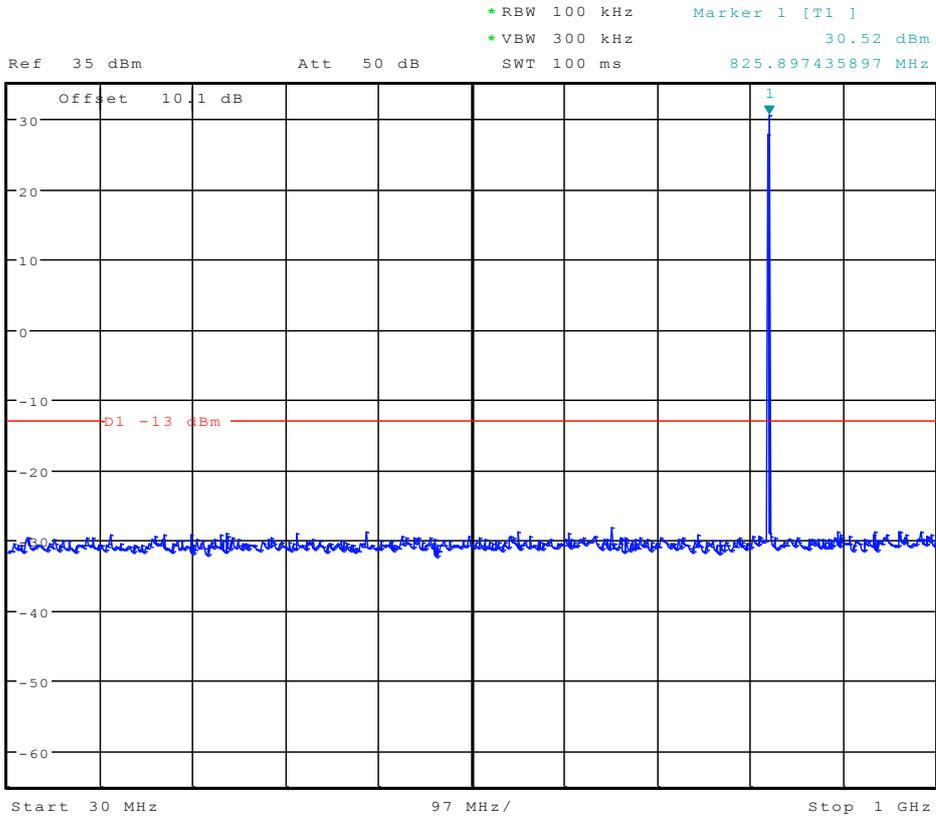


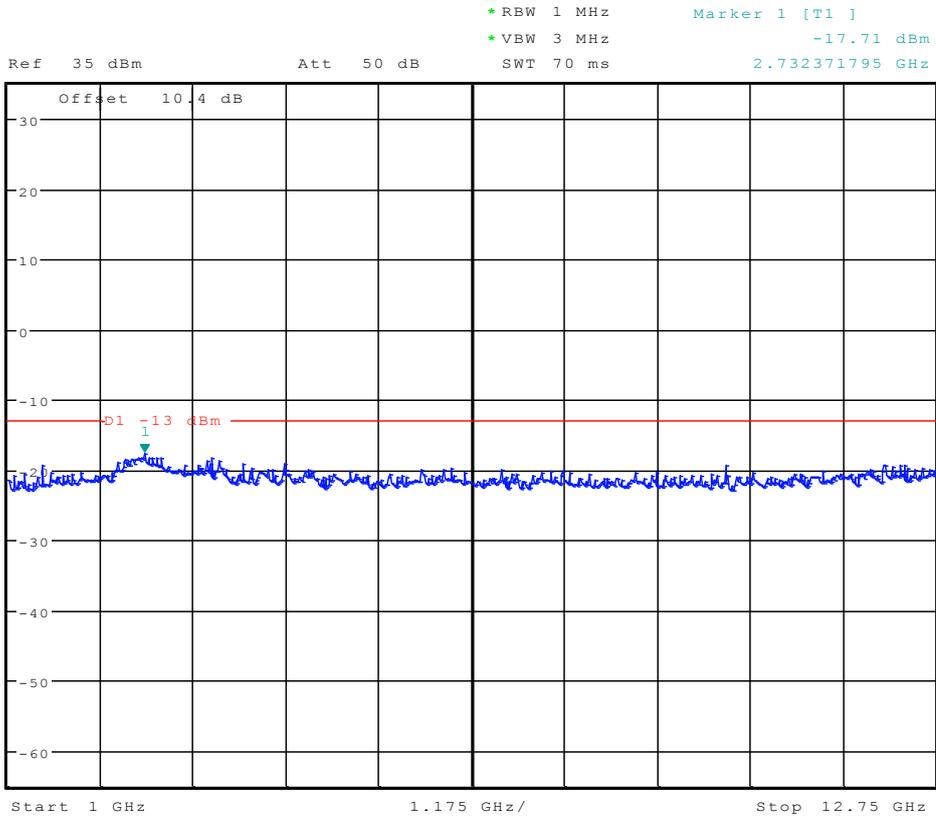
TM1: GPRS/GSM

Channel 128







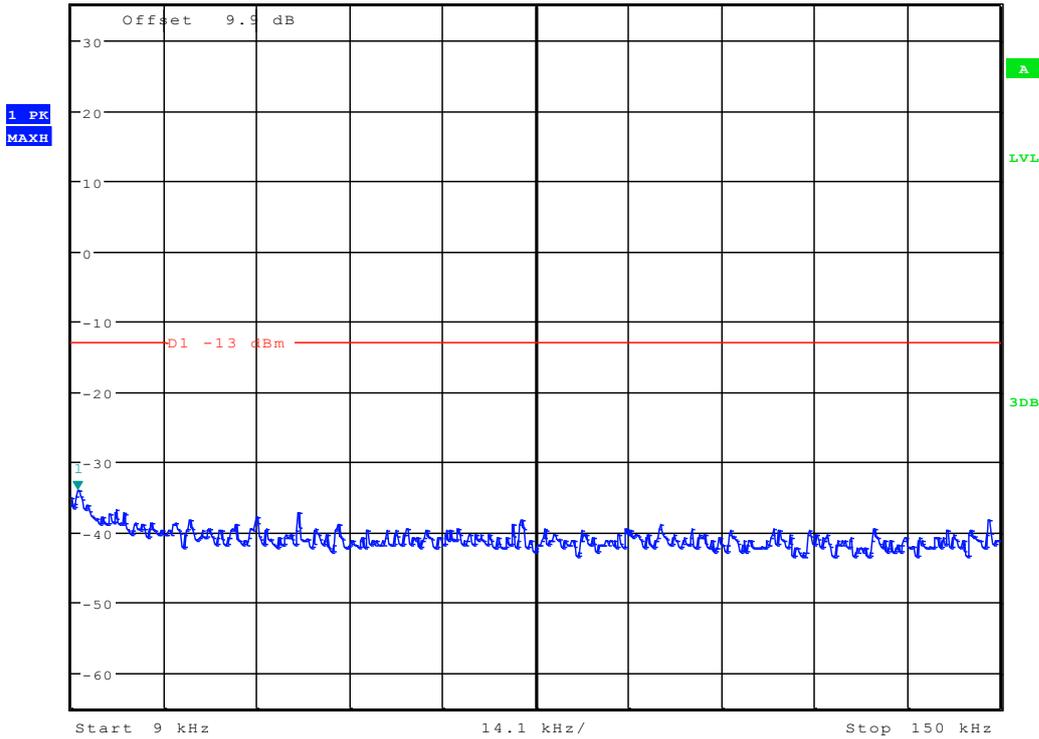


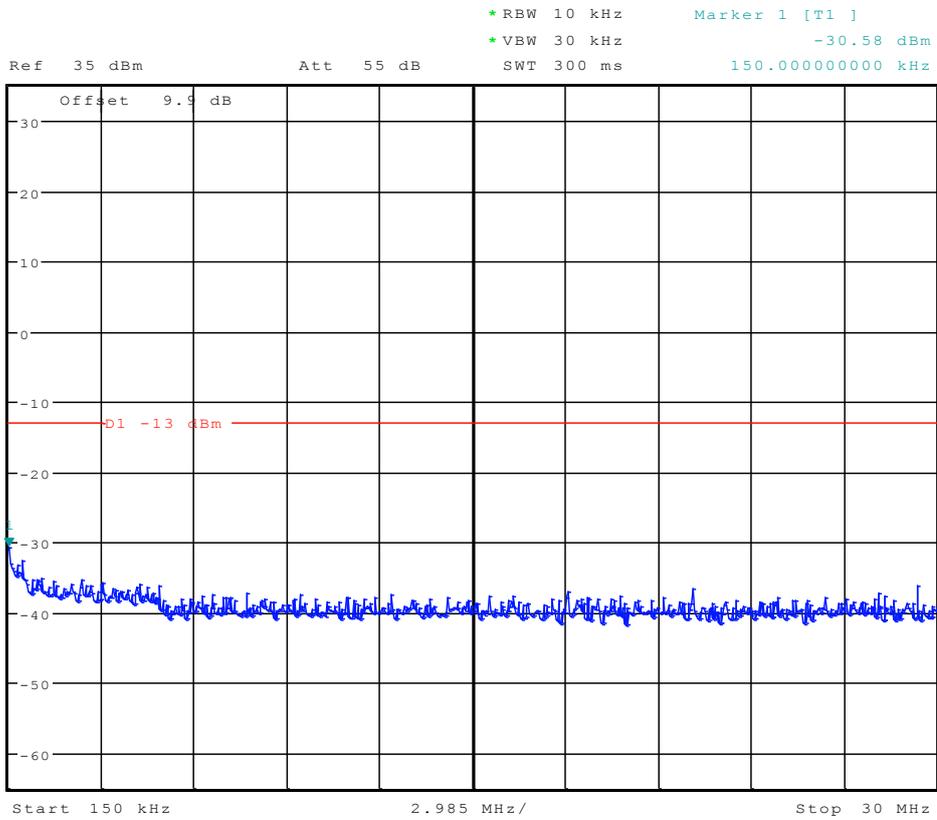


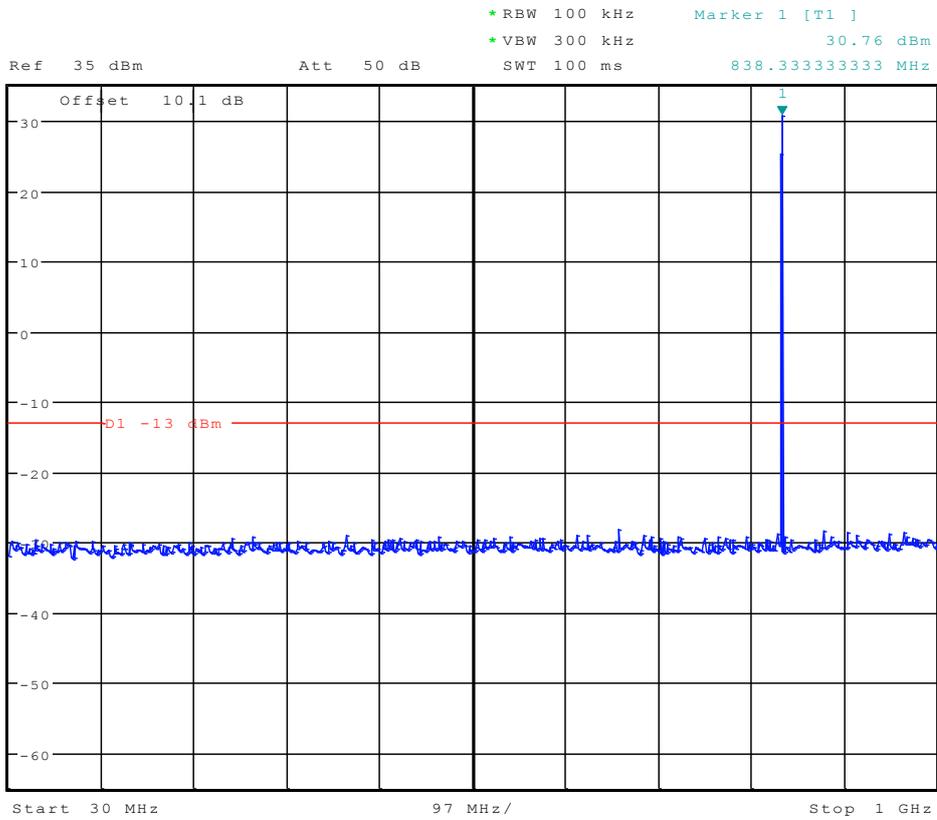
Channel 192



*RBW 1 kHz Marker 1 [T1]
*VBW 10 kHz -33.92 dBm
Ref 35 dBm Att 55 dB SWT 145 ms 9.903846154 kHz

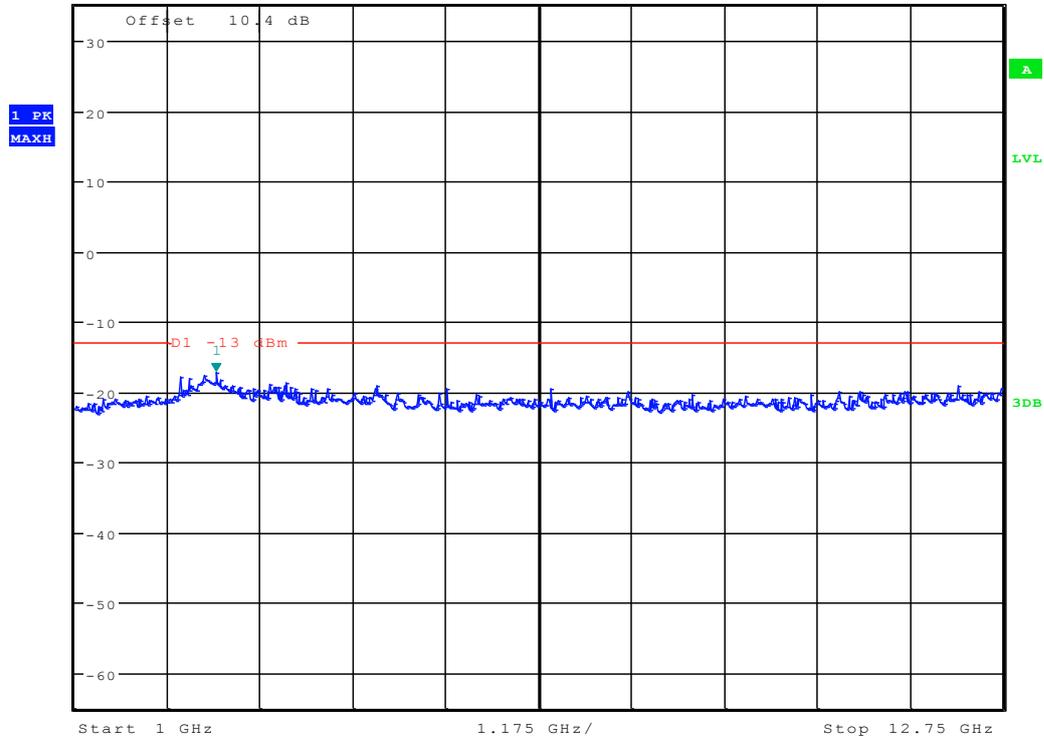








*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.28 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.788862179 GHz

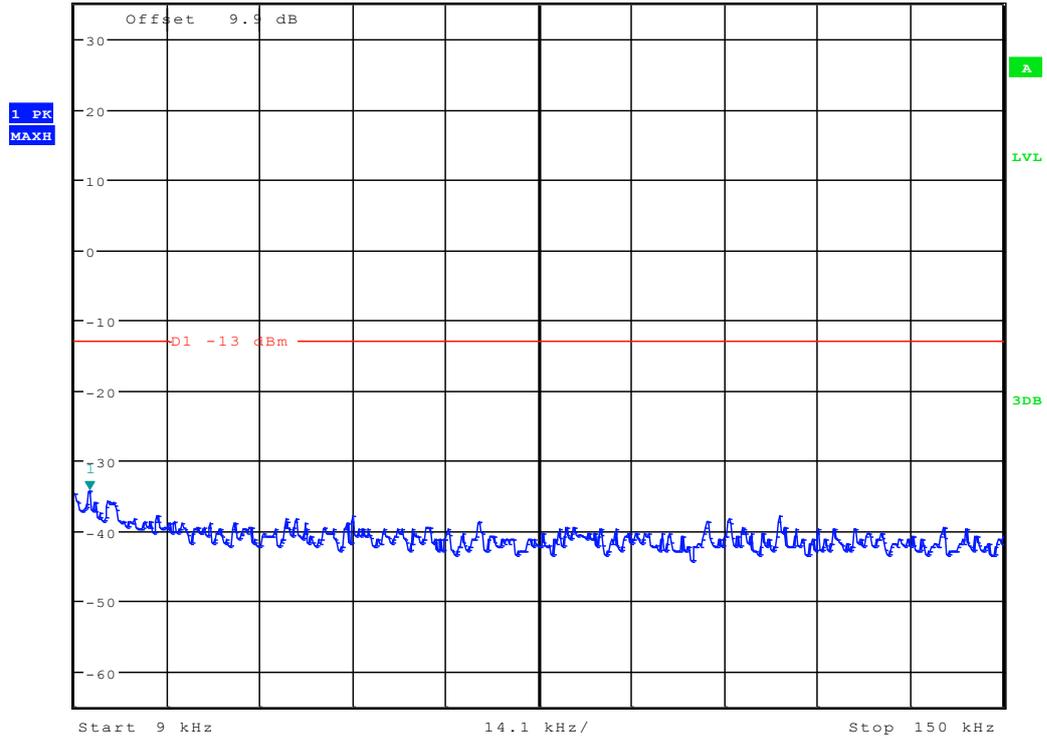




Channel 251

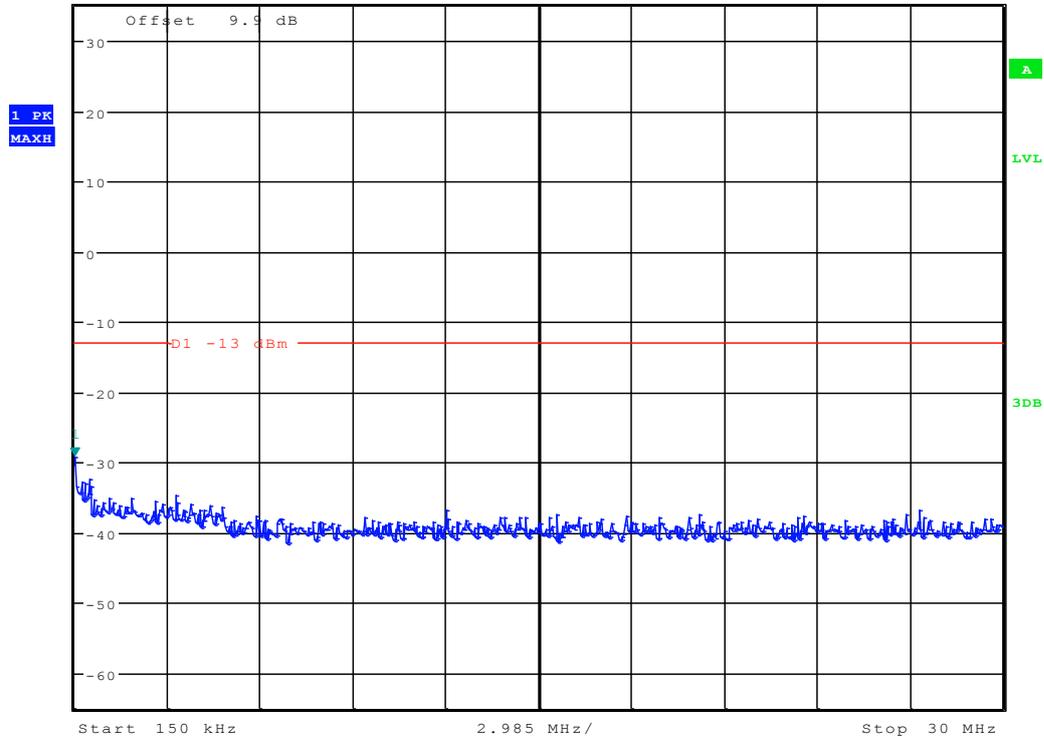


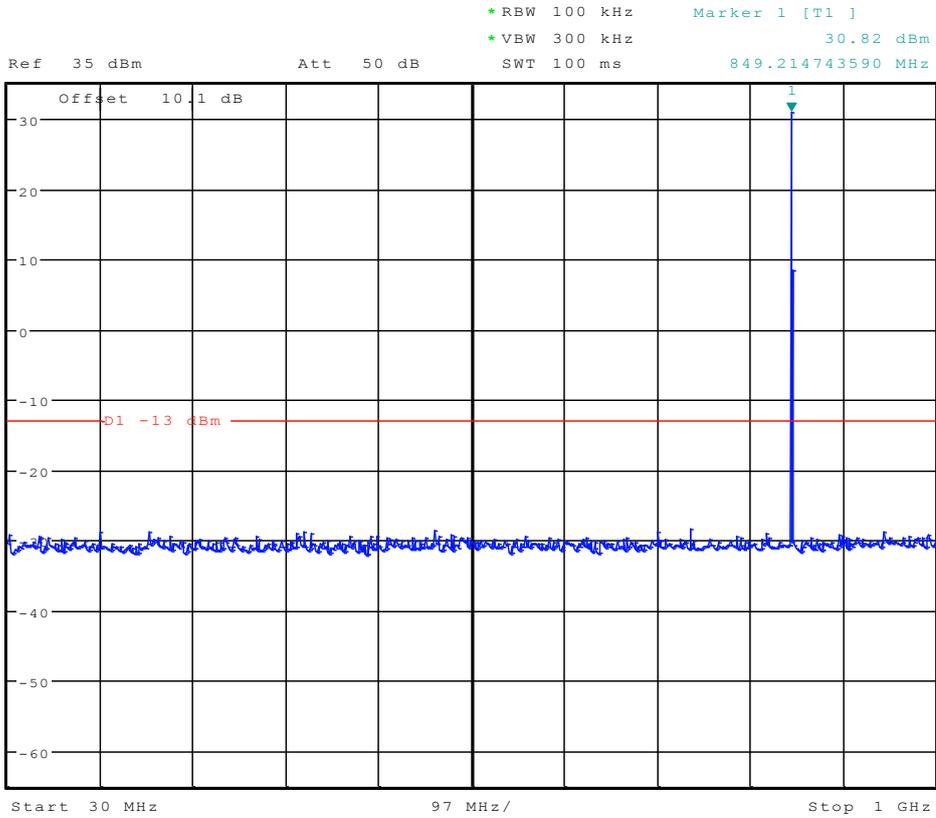
* RBW 1 kHz Marker 1 [T1]
 * VBW 10 kHz -34.19 dBm
 Ref 35 dBm Att 55 dB SWT 145 ms 11.259615385 kHz





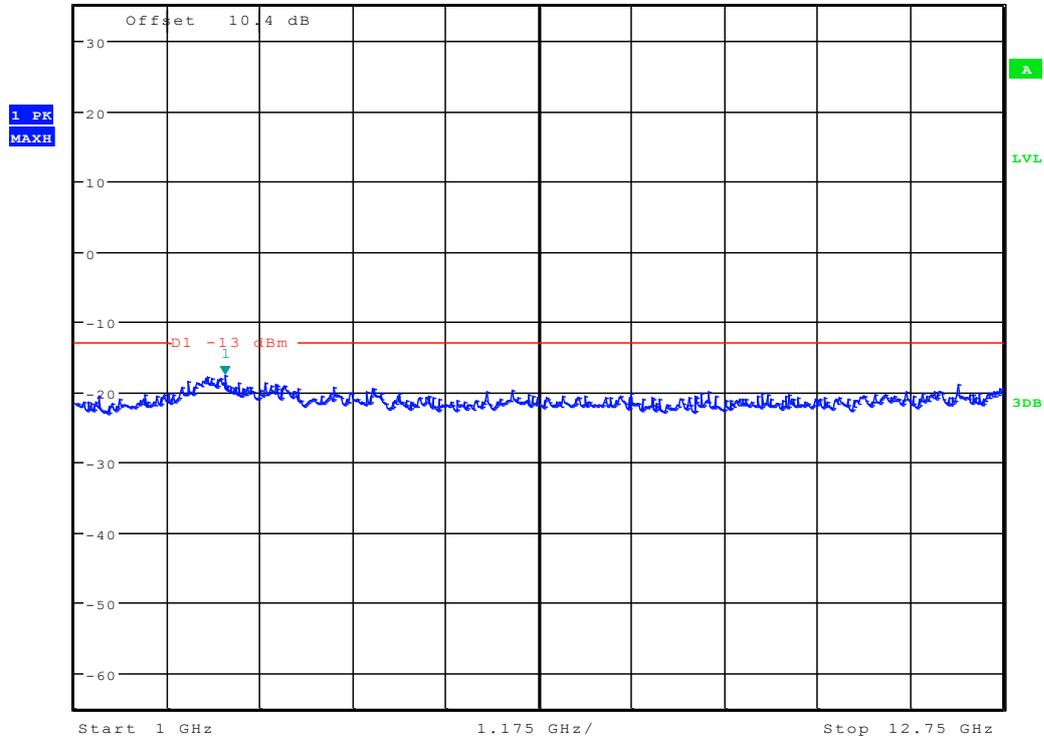
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -29.16 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 150.00000000 kHz





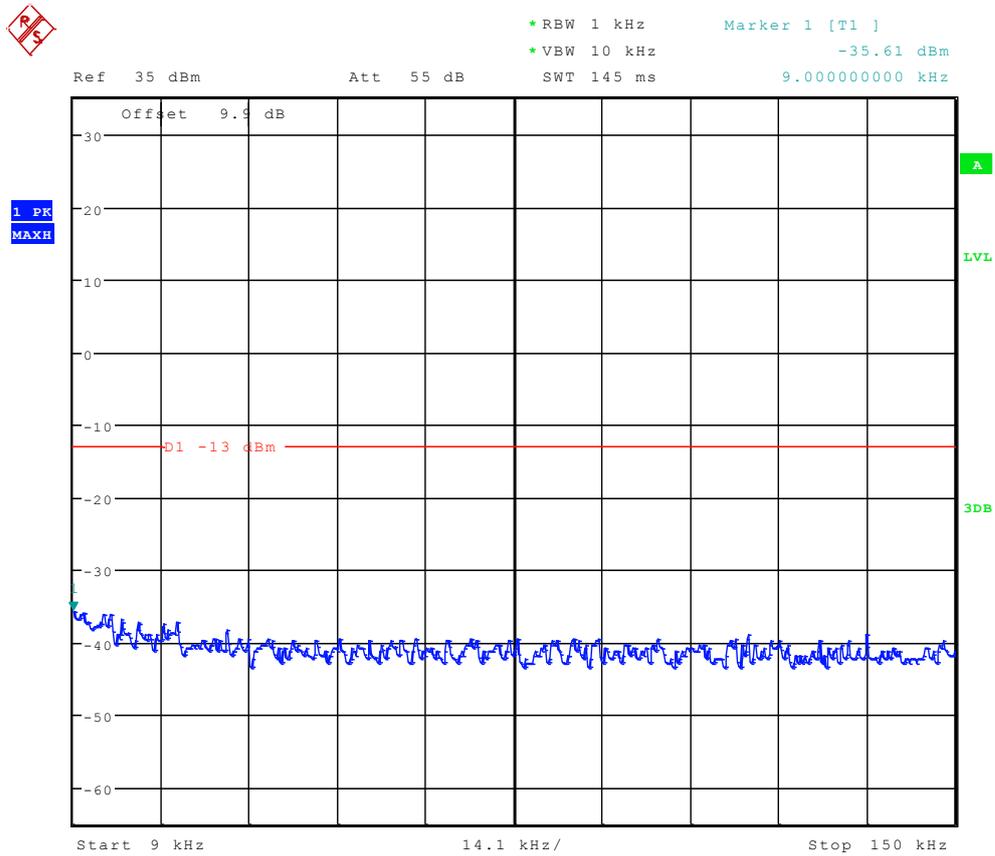


*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -17.66 dBm
 Ref 35 dBm Att 50 dB SWT 70 ms 2.901842949 GHz



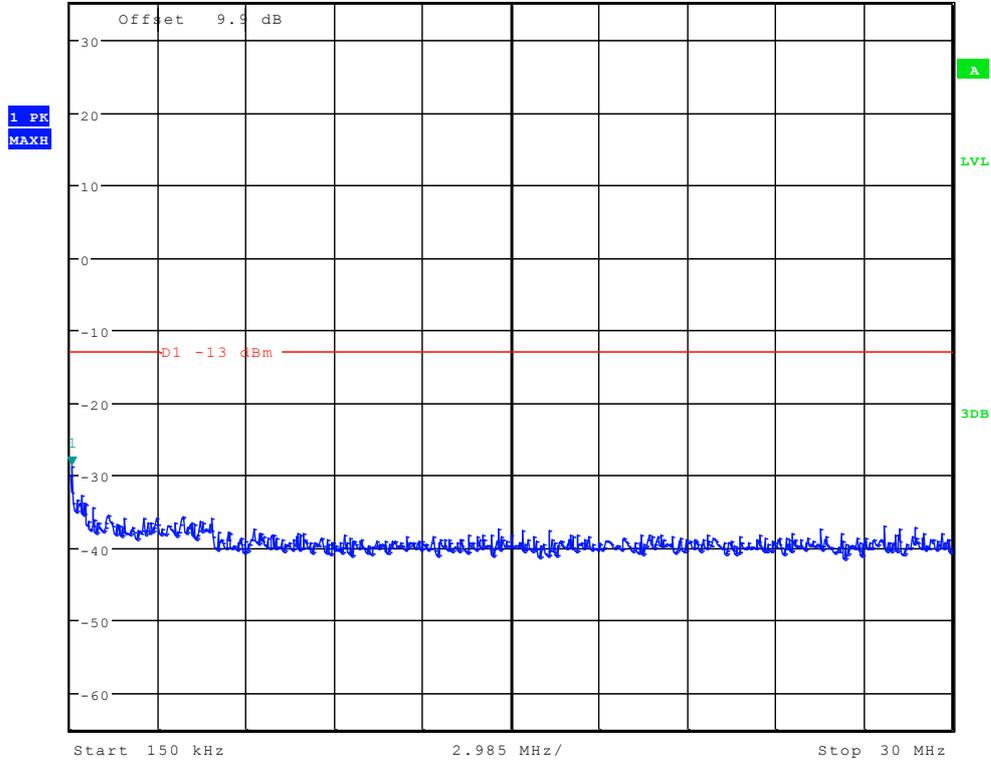


TM2: EDGE Channel 128



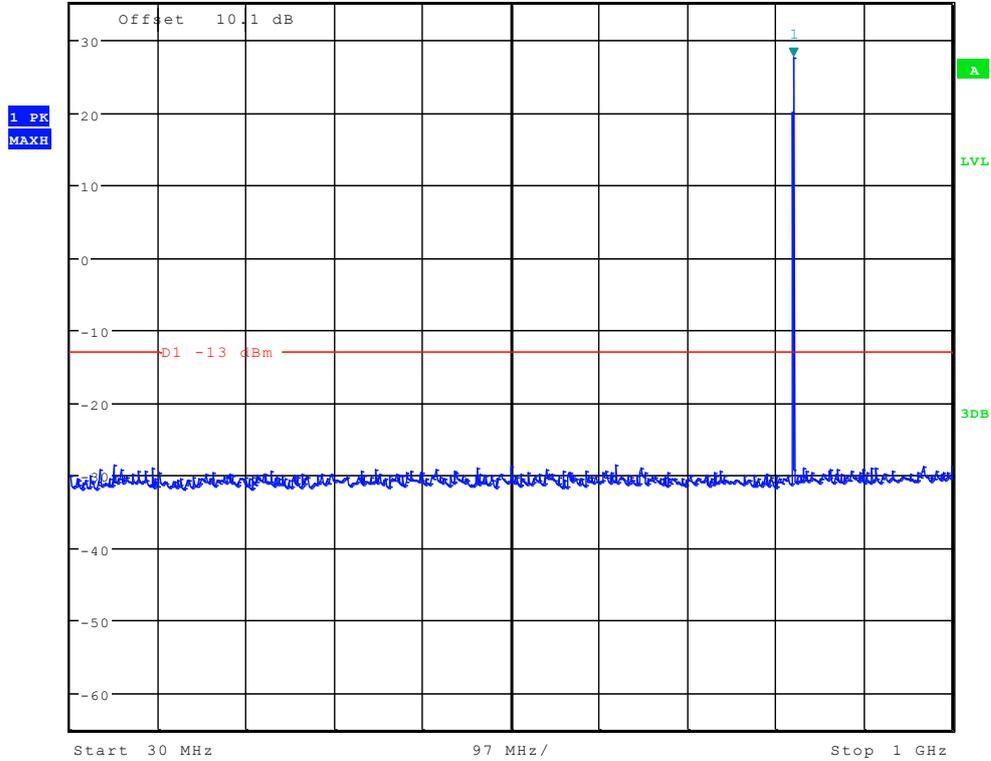


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -28.80 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



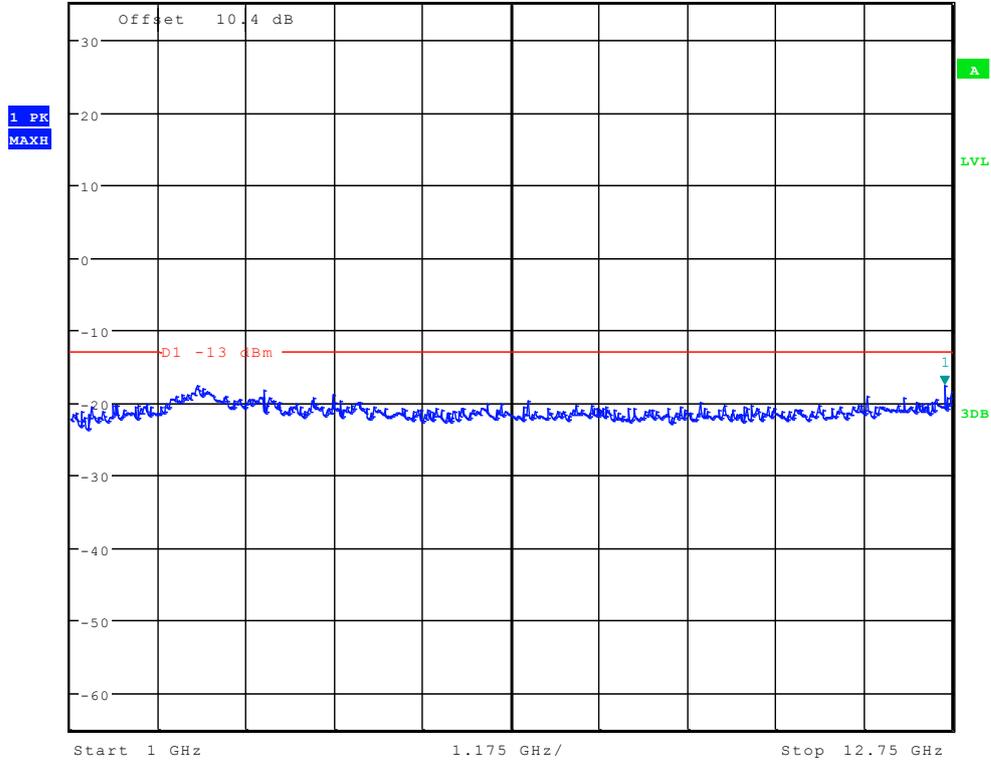


Ref 35 dBm Att 50 dB SWT 100 ms
*RBW 100 kHz Marker 1 [T1] 27.56 dBm
*VBW 300 kHz 825.897435897 MHz



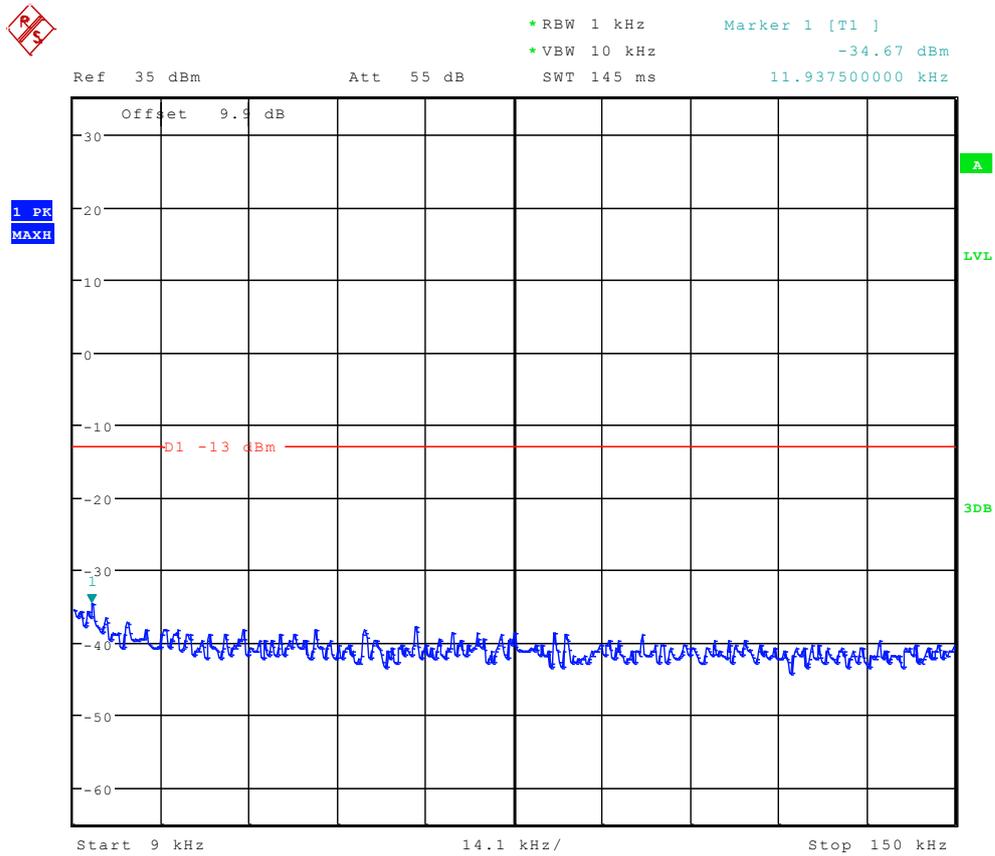


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.66 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 12.655849359 GHz



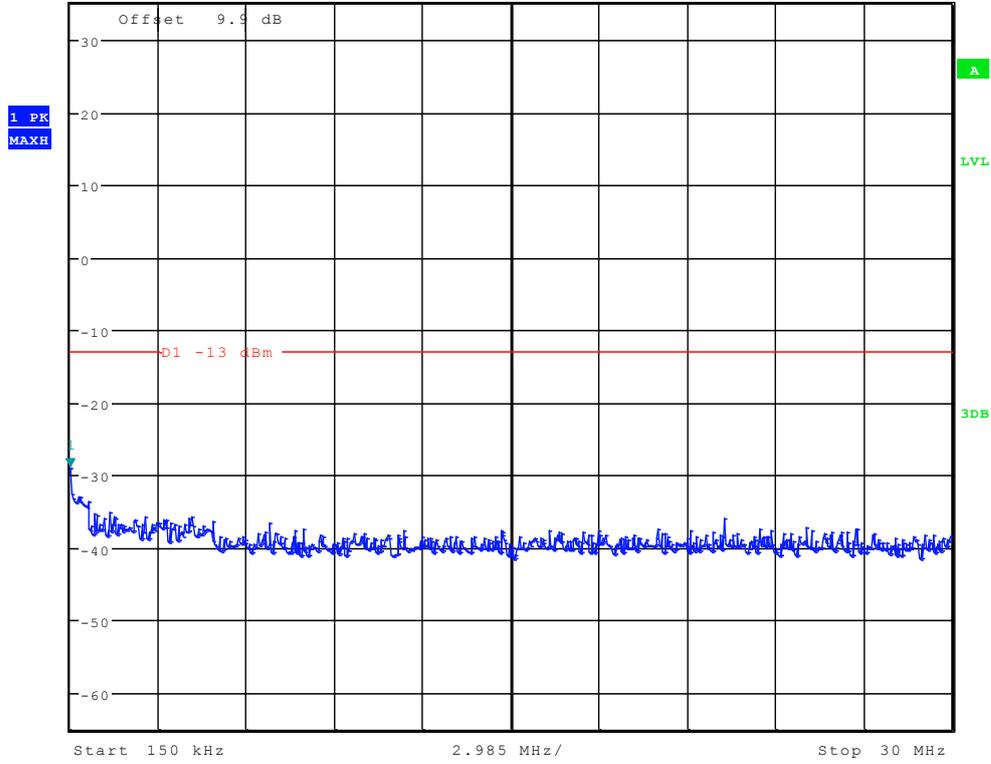


Channel 192



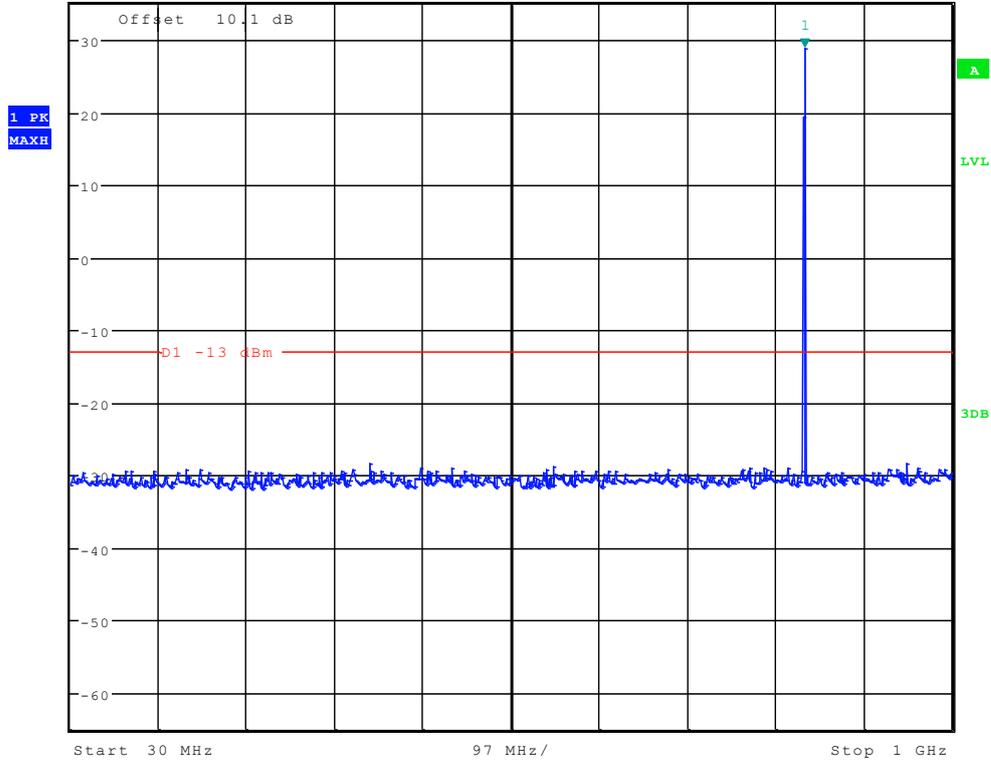


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -28.90 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 150.000000000 kHz



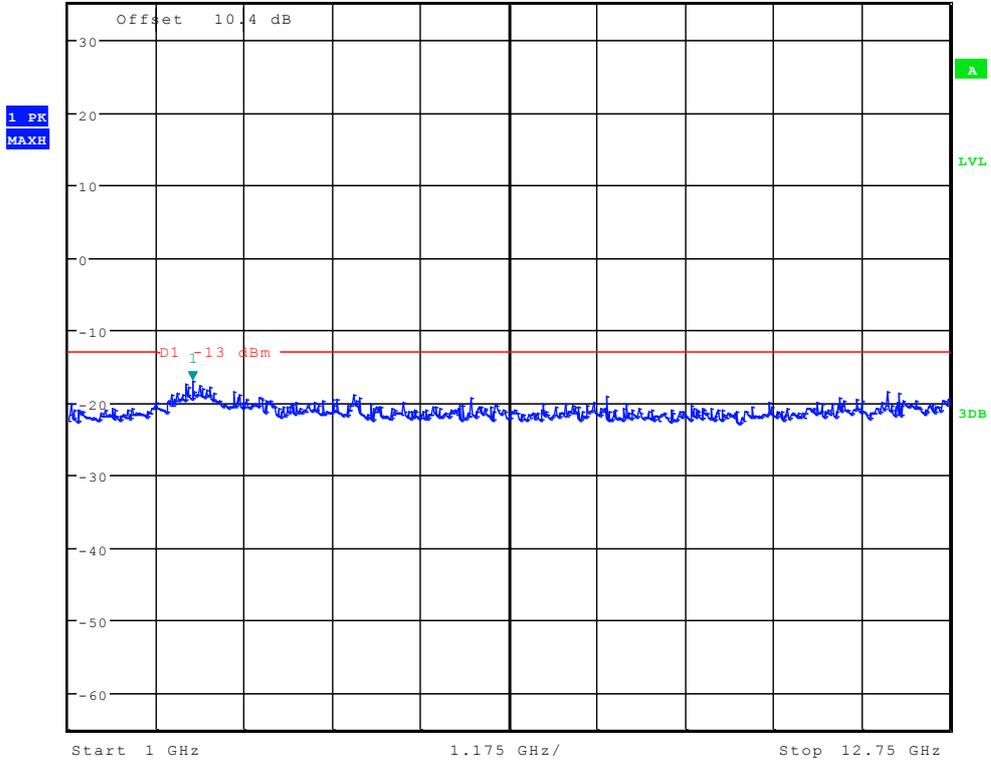


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 28.79 dBm
Ref 35 dBm Att 50 dB SWT 100 ms 838.333333333 MHz





*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -16.96 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.657051282 GHz

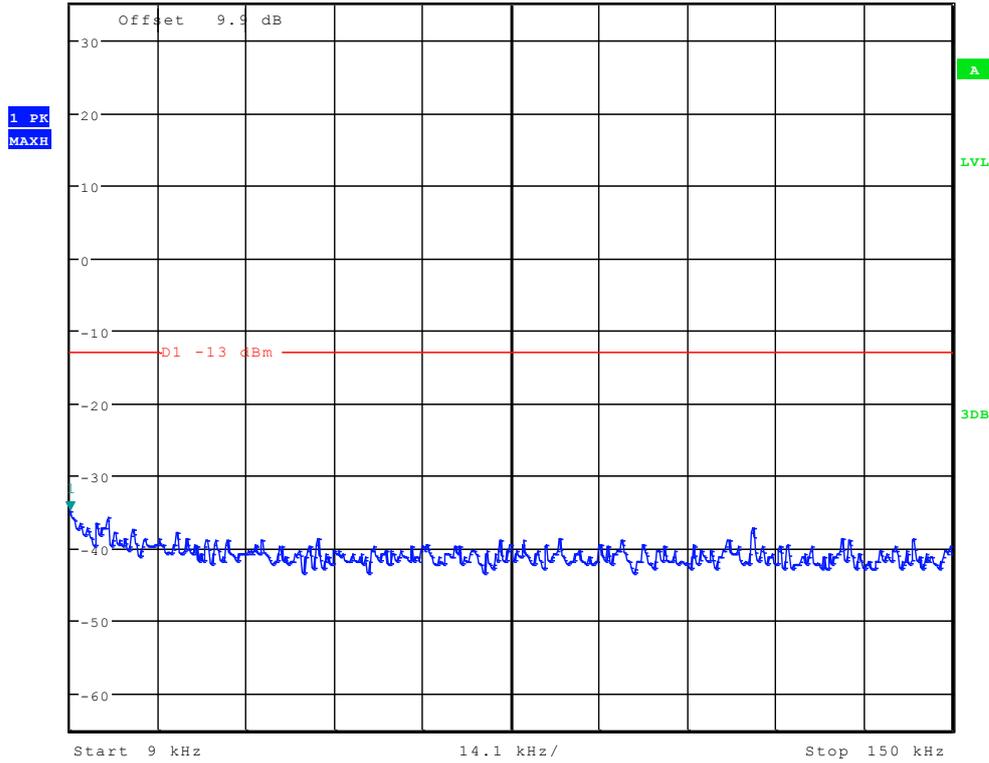




Channel 251

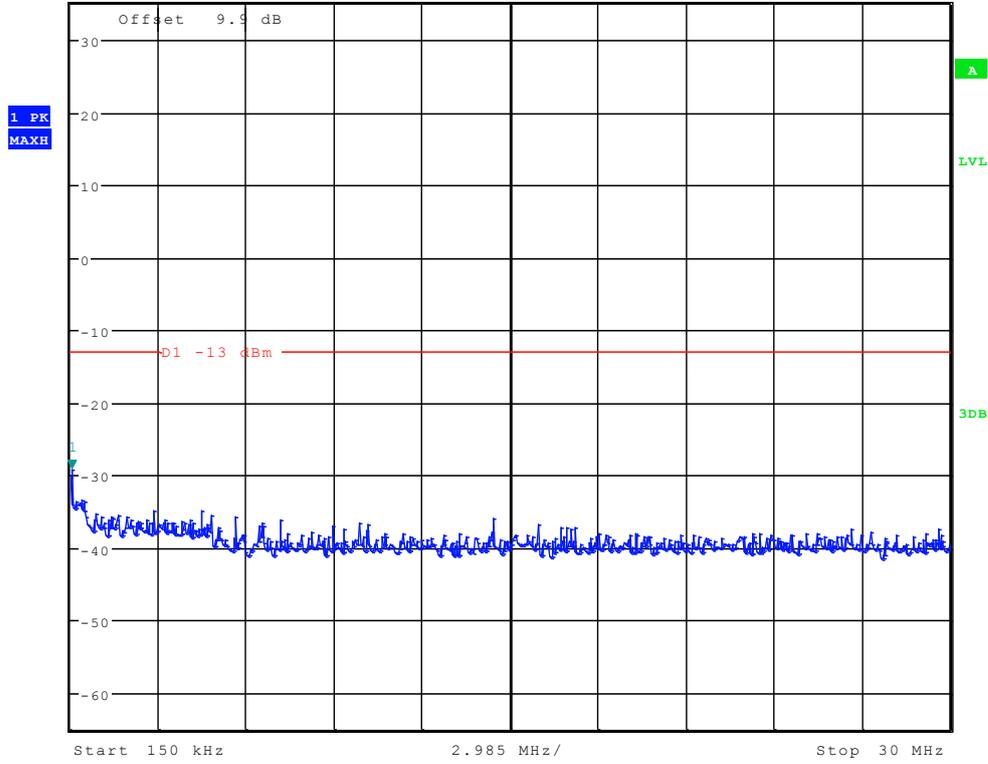


Ref 35 dBm Att 55 dB SWT 145 ms Marker 1 [T1] -34.87 dBm
*RBW 1 kHz *VBW 10 kHz 9.000000000 kHz



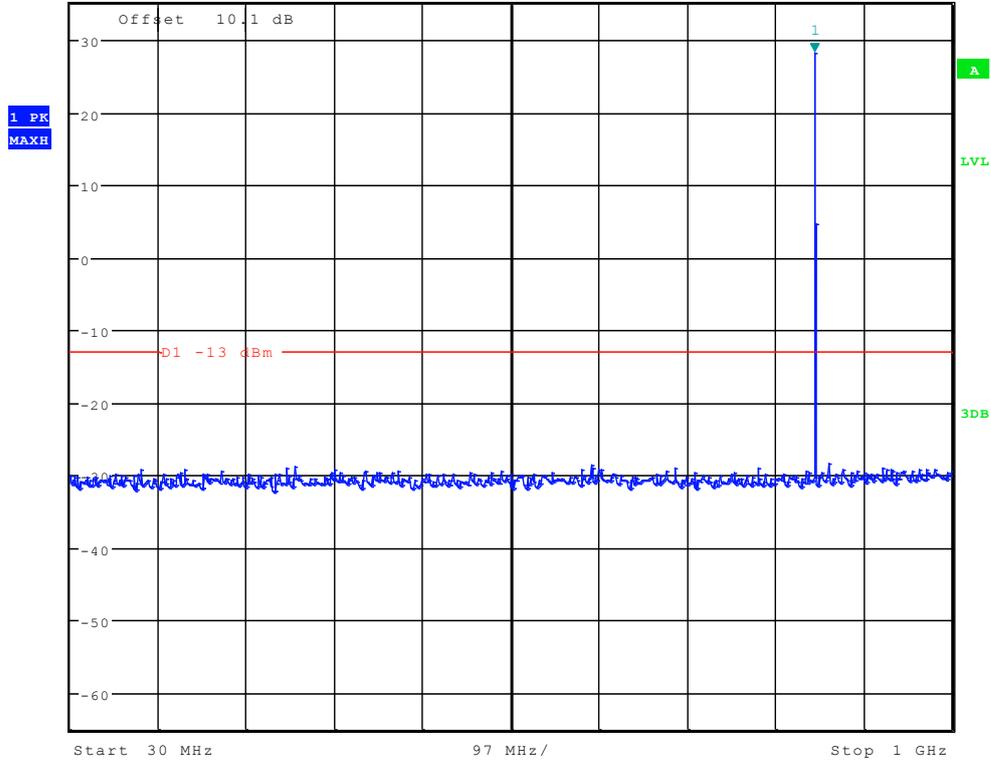


Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz
*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -29.11 dBm



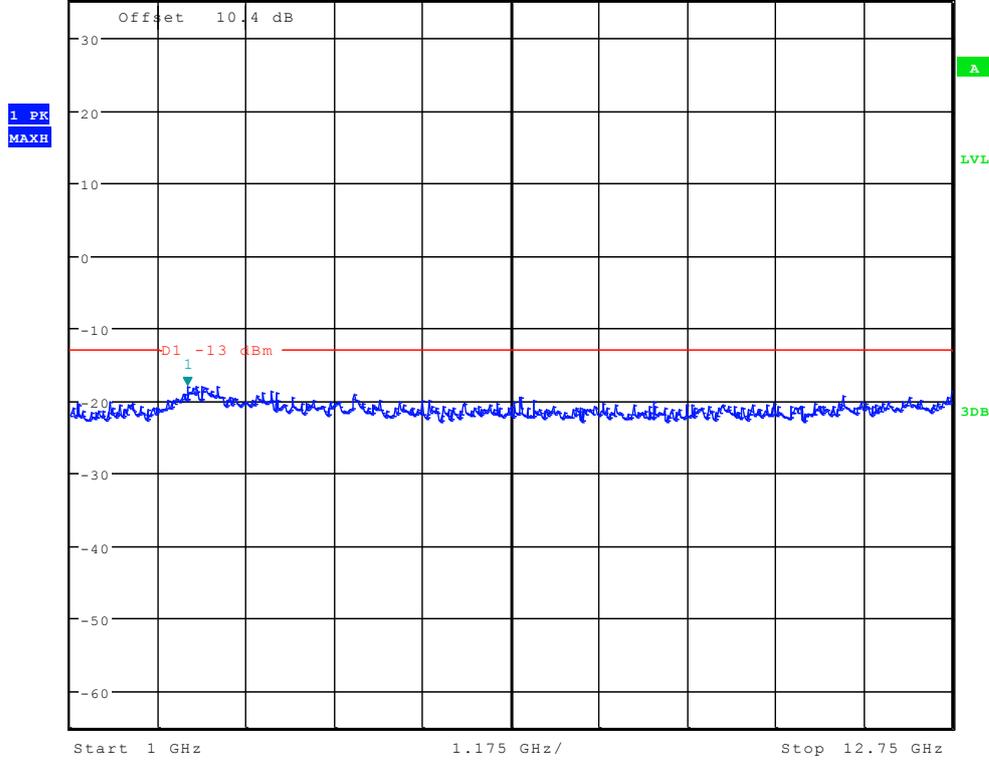


Ref 35 dBm Att 50 dB SWT 100 ms Marker 1 [T1] 28.11 dBm
849.214743590 MHz



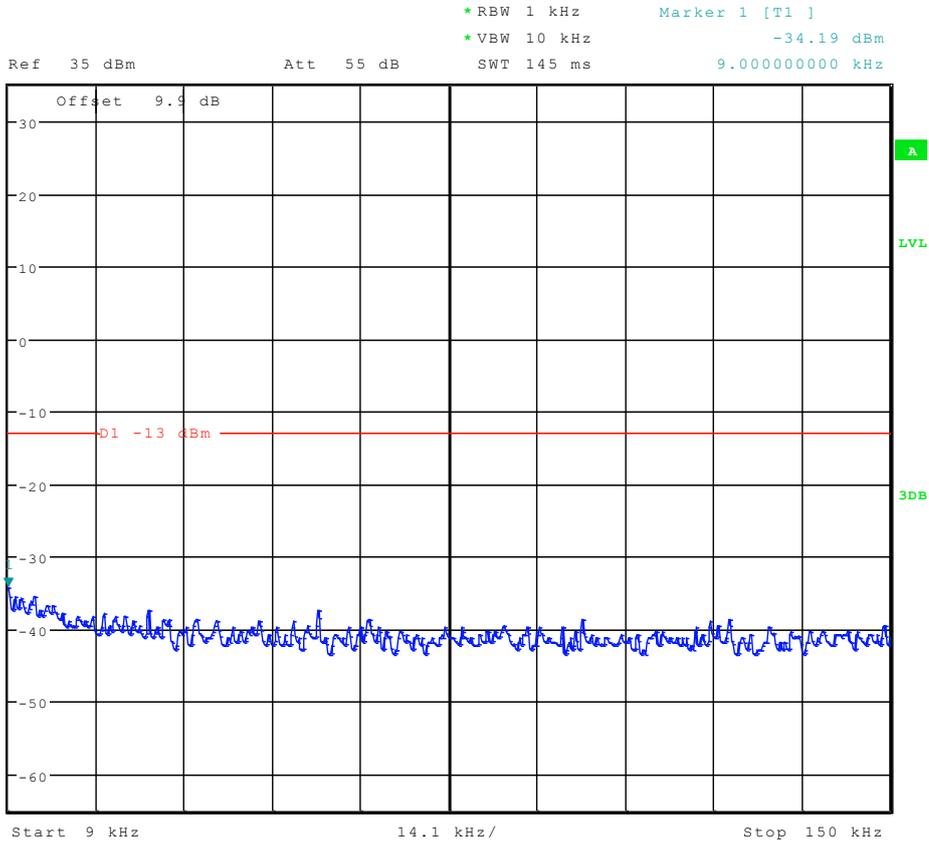


*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -17.98 dBm
 Ref 35 dBm Att 50 dB SWT 70 ms 2.562900641 GHz



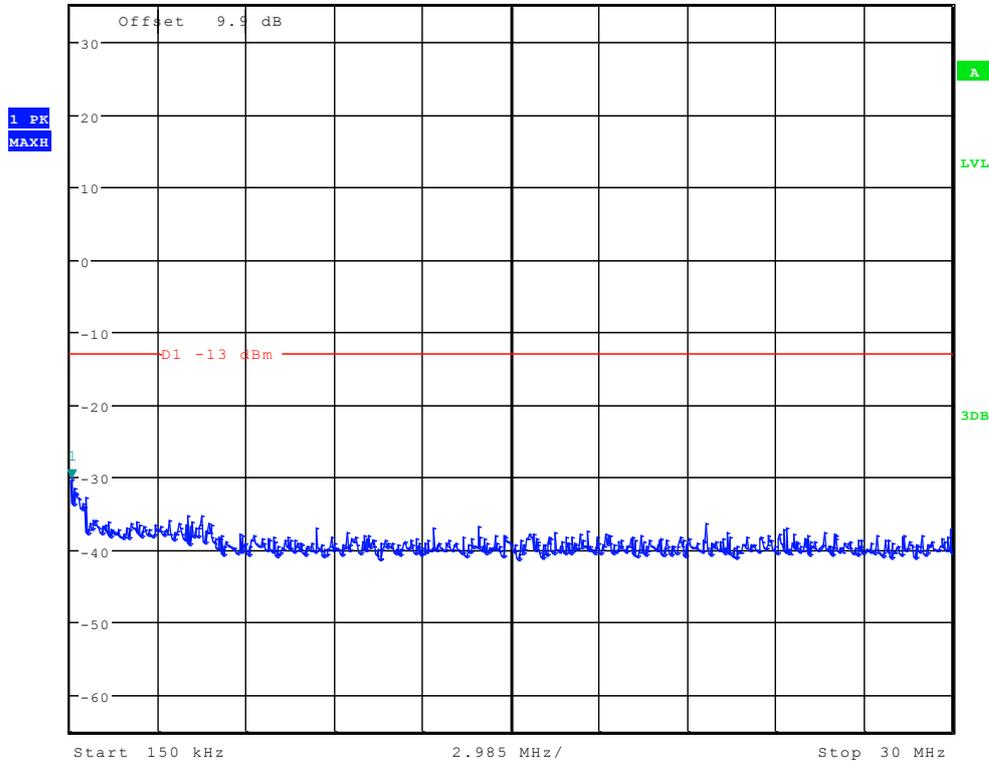


TM3: WCDMA Channel 4132



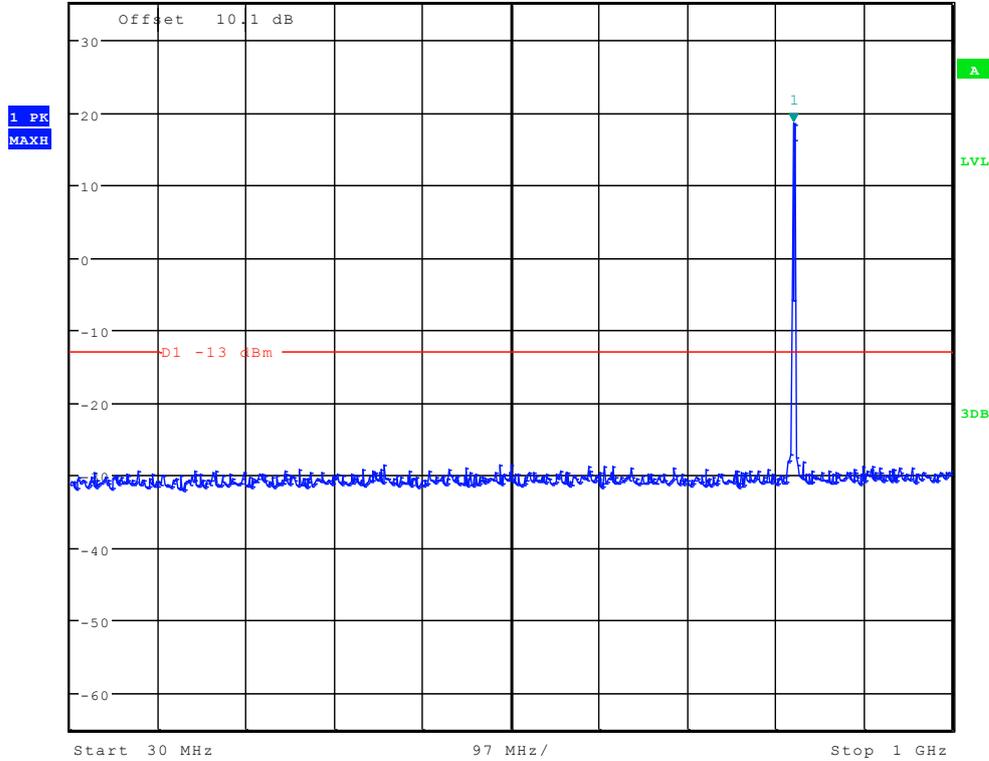


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -30.22 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



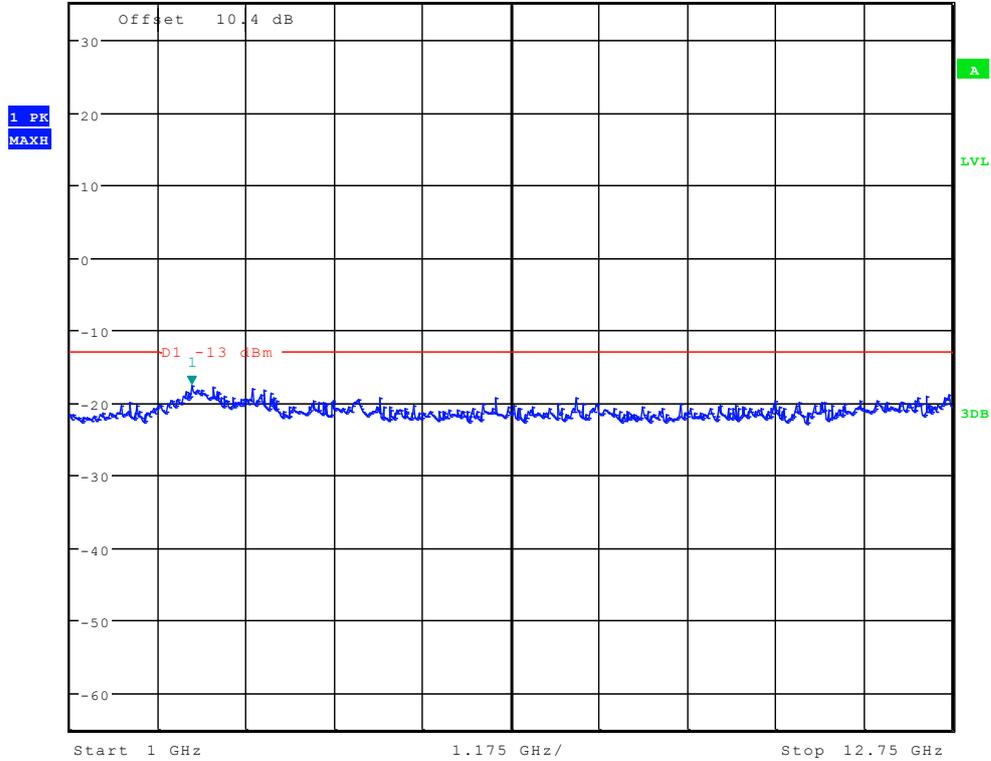


Ref 35 dBm Att 50 dB SWT 100 ms
*RBW 100 kHz Marker 1 [T1] 18.55 dBm
*VBW 300 kHz 825.897435897 MHz



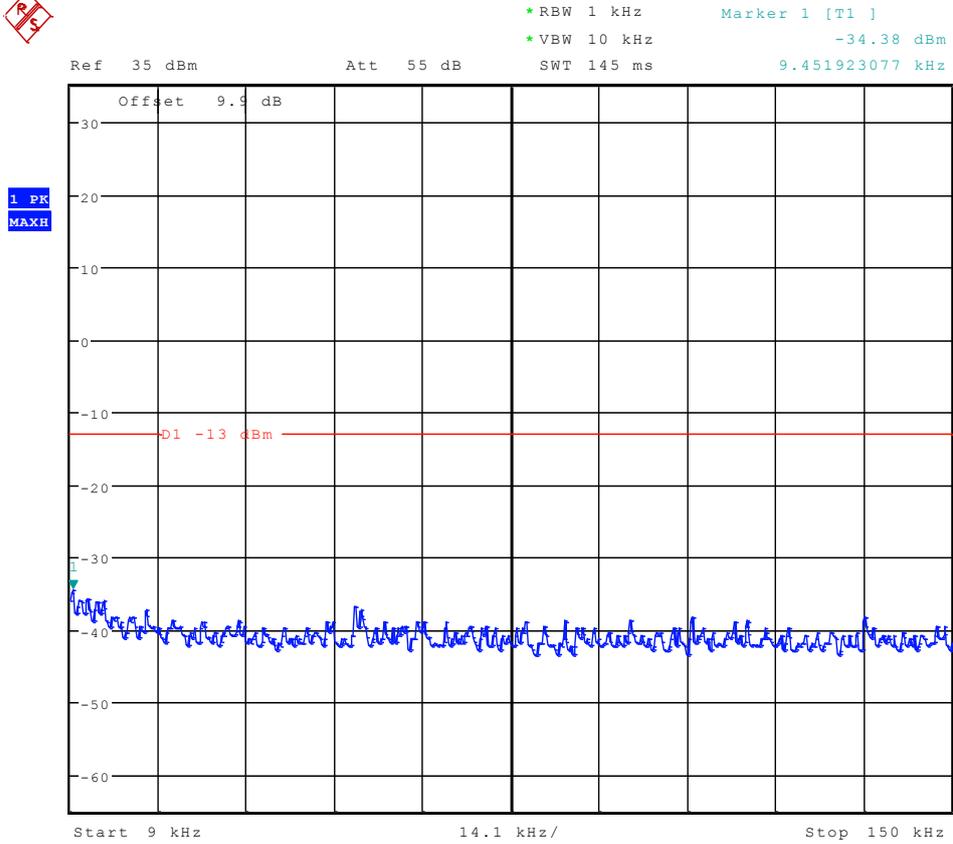


*RBW 1 MHz Marker 1 [T1]
 *VBW 3 MHz -17.58 dBm
 Ref 35 dBm Att 50 dB SWT 70 ms 2.619391026 GHz



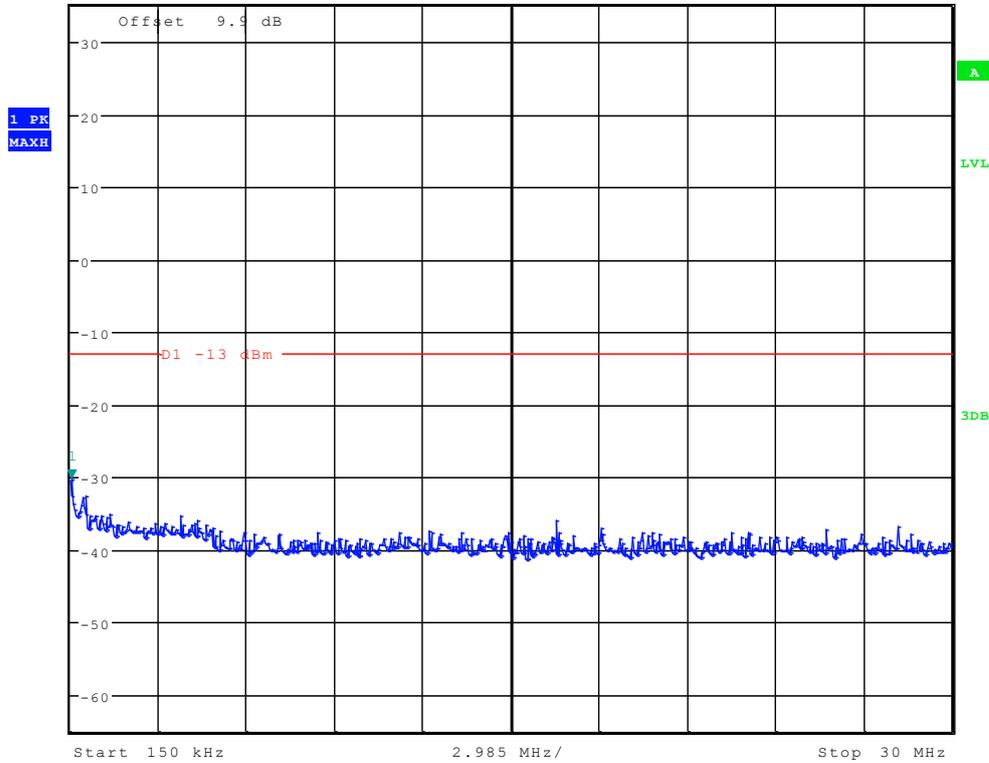


Channel 4182



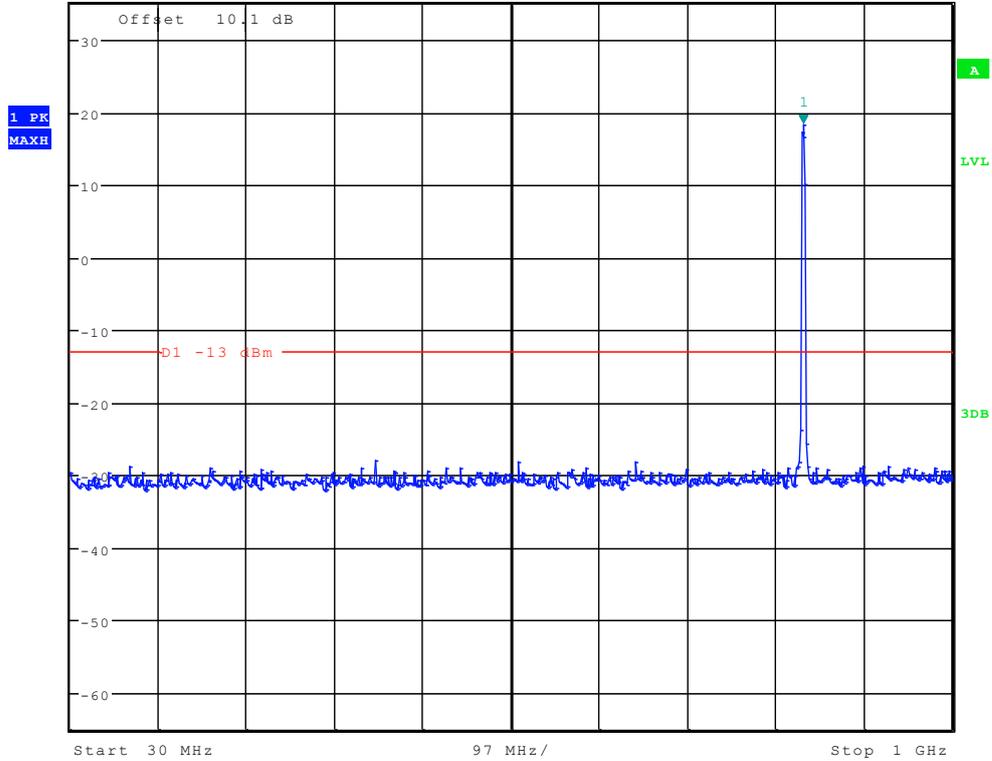


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -30.22 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



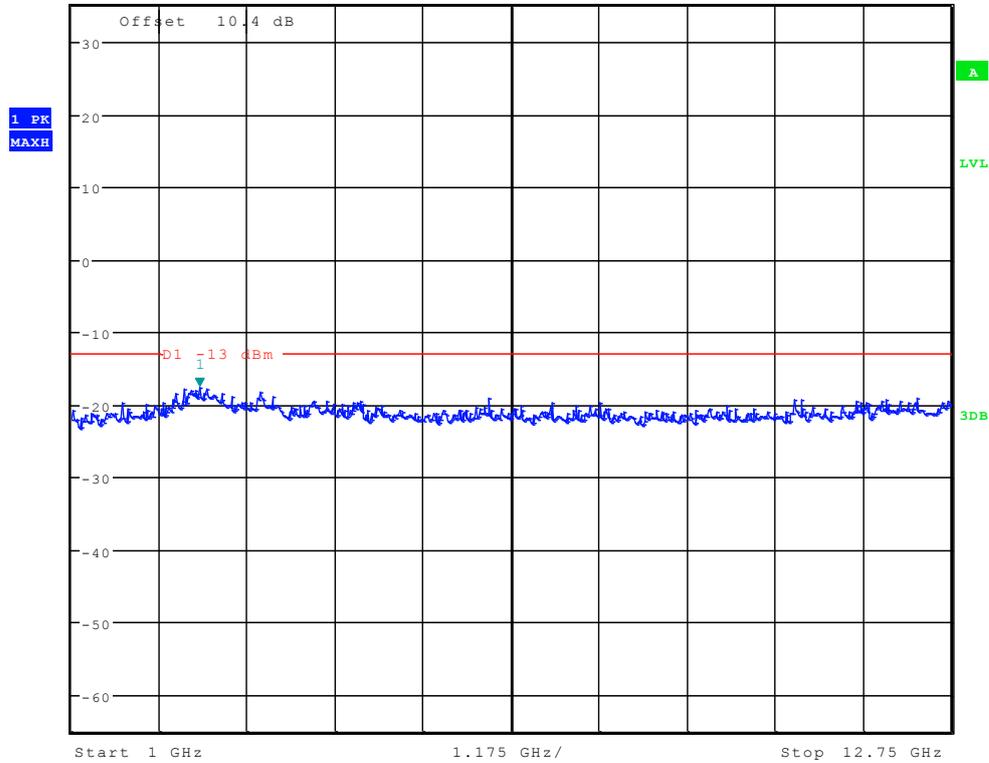


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 18.36 dBm
Ref 35 dBm Att 50 dB SWT 100 ms 836.778846154 MHz



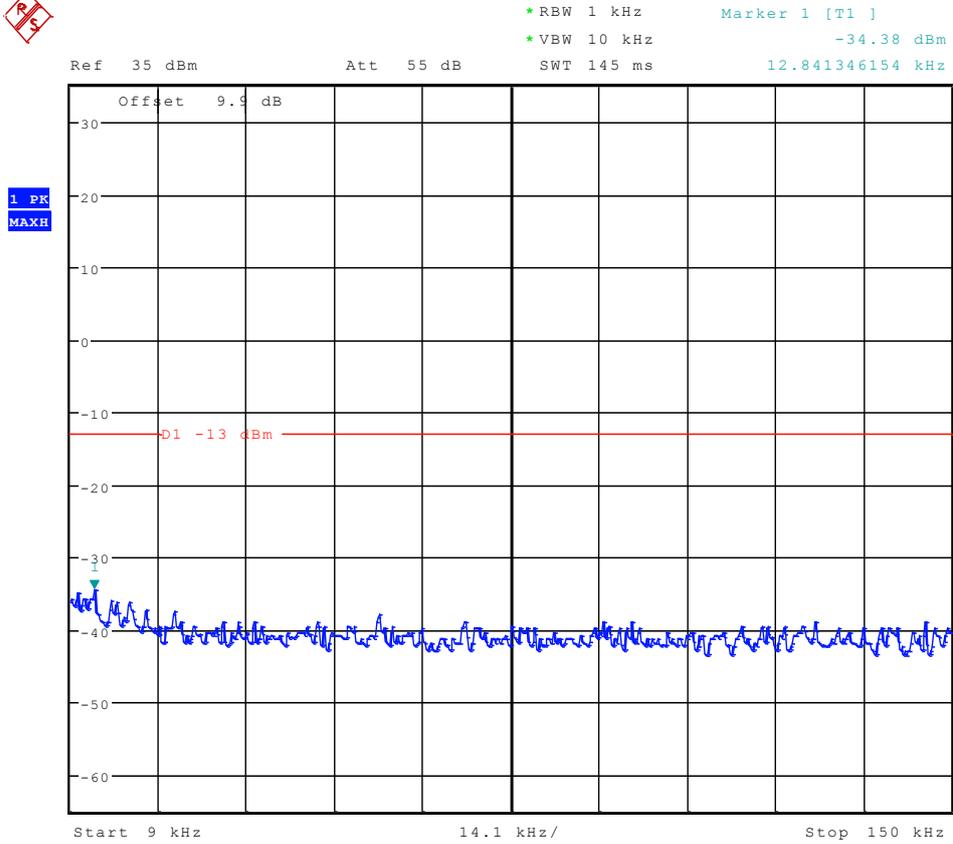


*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.68 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.713541667 GHz



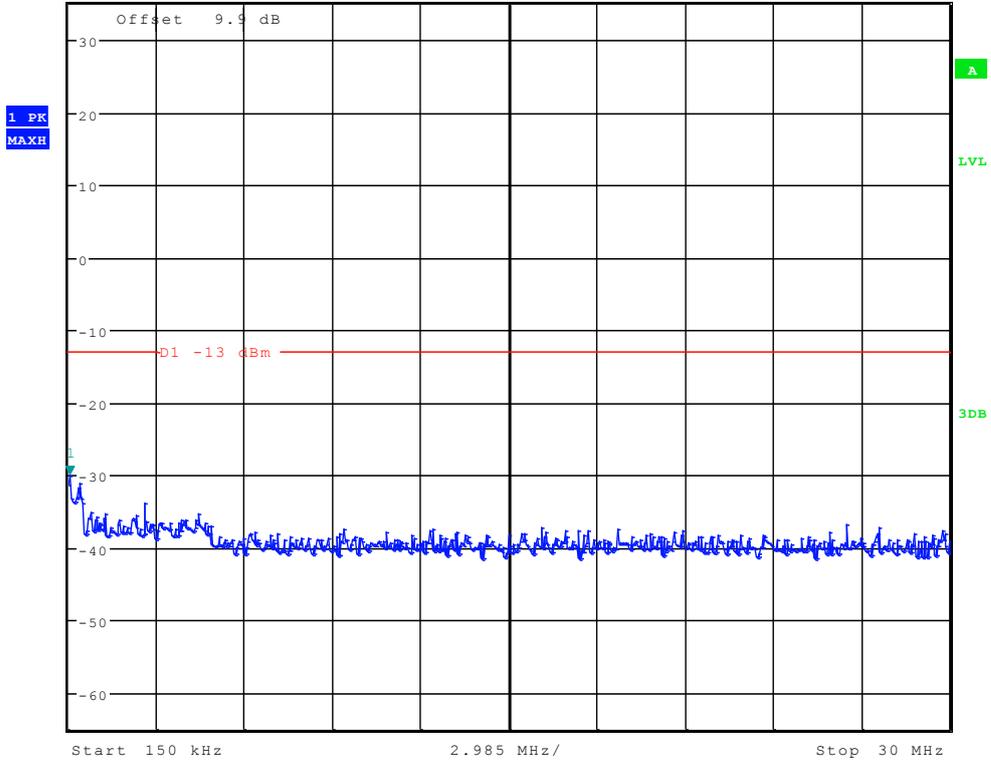


Channel 4233



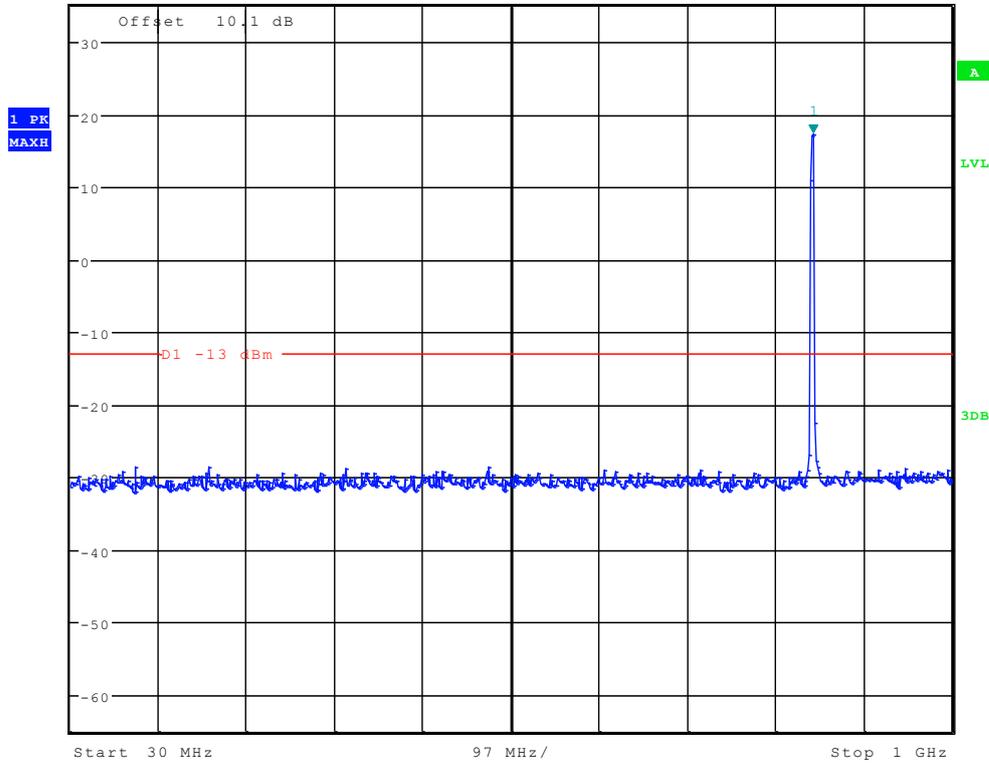


*RBW 10 kHz Marker 1 [T1]
*VBW 30 kHz -30.04 dBm
Ref 35 dBm Att 55 dB SWT 300 ms 197.836538462 kHz



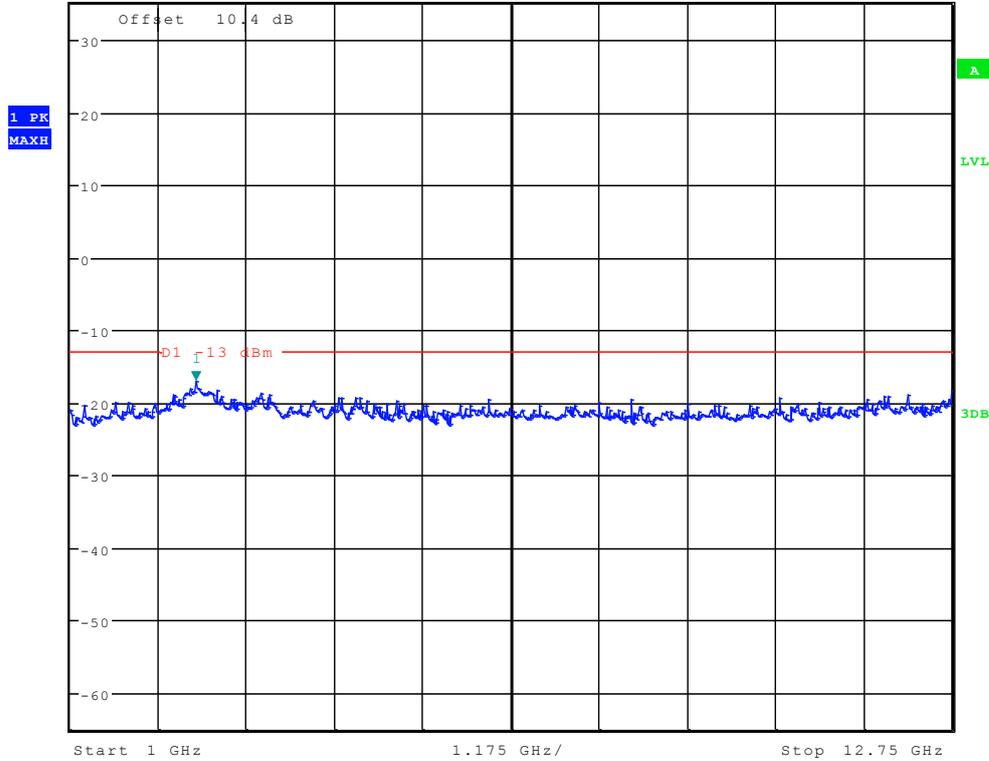


*RBW 100 kHz Marker 1 [T1]
*VBW 300 kHz 17.24 dBm
Ref 35 dBm Att 50 dB SWT 100 ms 847.660256410 MHz





*RBW 1 MHz Marker 1 [T1]
*VBW 3 MHz -17.10 dBm
Ref 35 dBm Att 50 dB SWT 70 ms 2.675881410 GHz



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



Appendix F

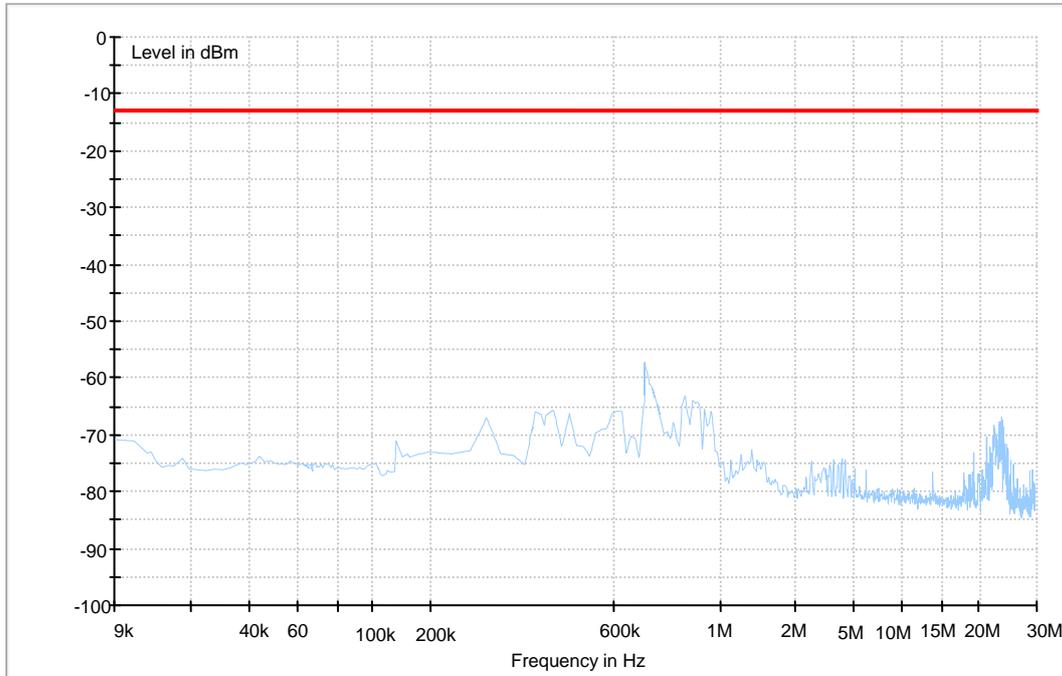
Field Strength of Spurious Emissions

According to FCC Part 2.1053 & Part22.917



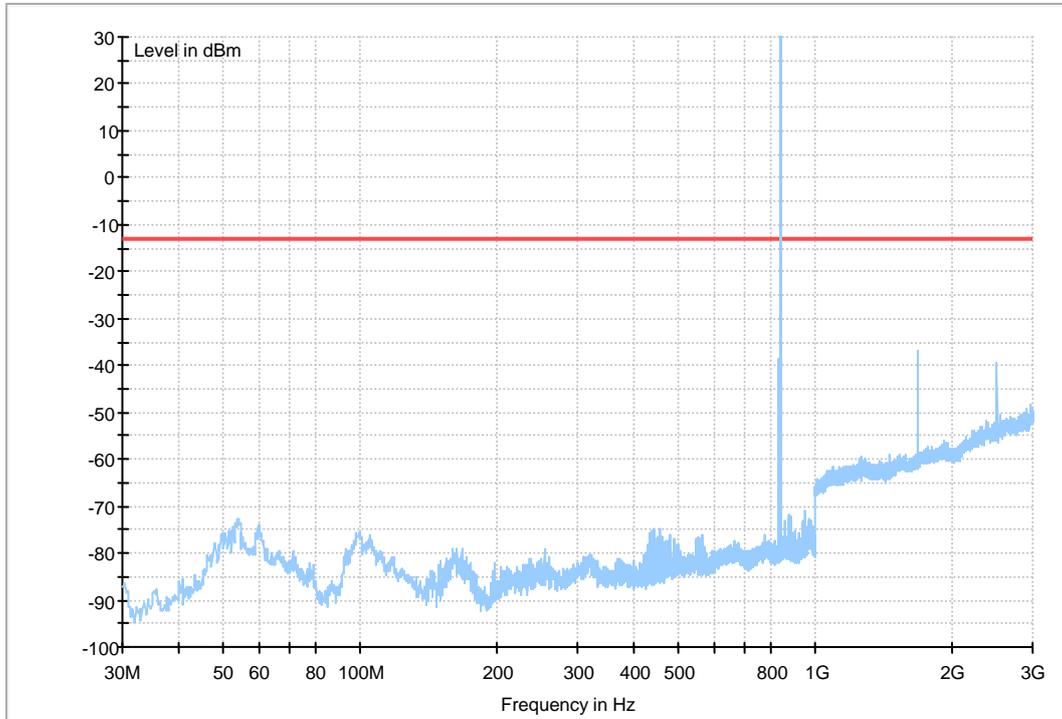
GSM 850

Traffic Mode (9kHz-30MHz)



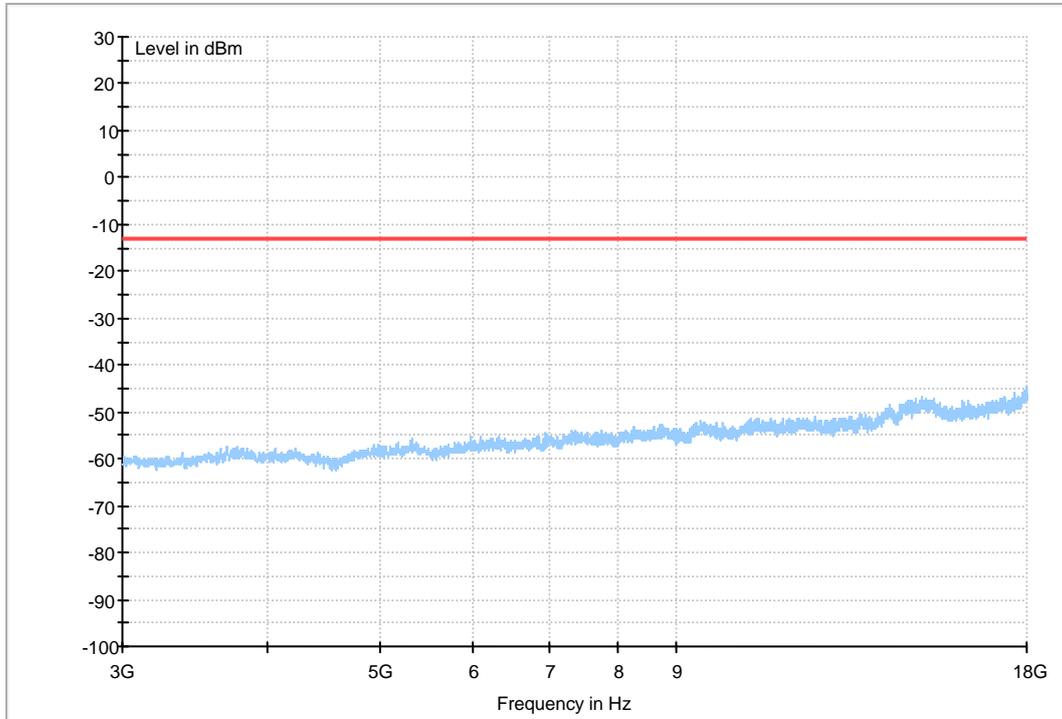


Traffic Mode (30MHz-3GHz)





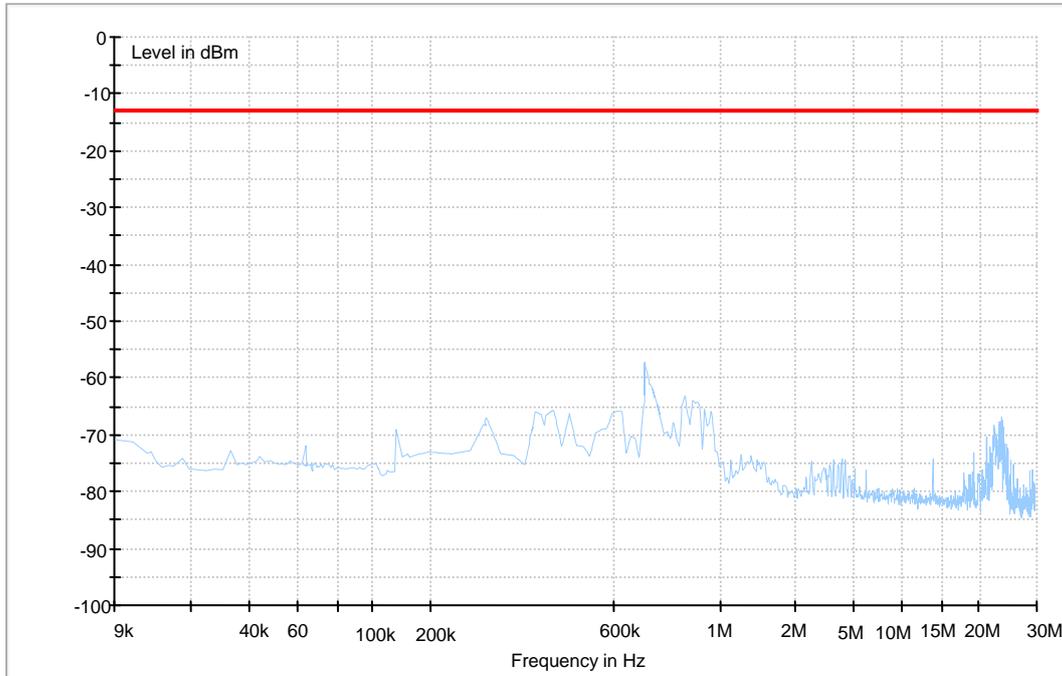
Traffic Mode (3GHz-18GHz)





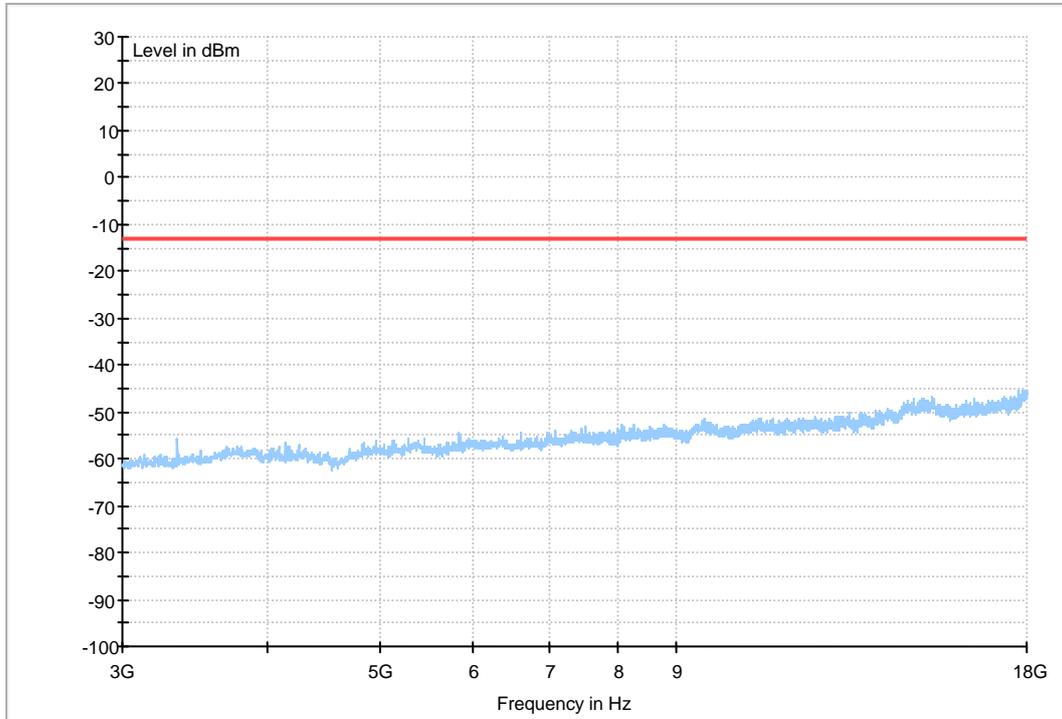
GPRS 850

Traffic Mode (9kHz-30MHz)





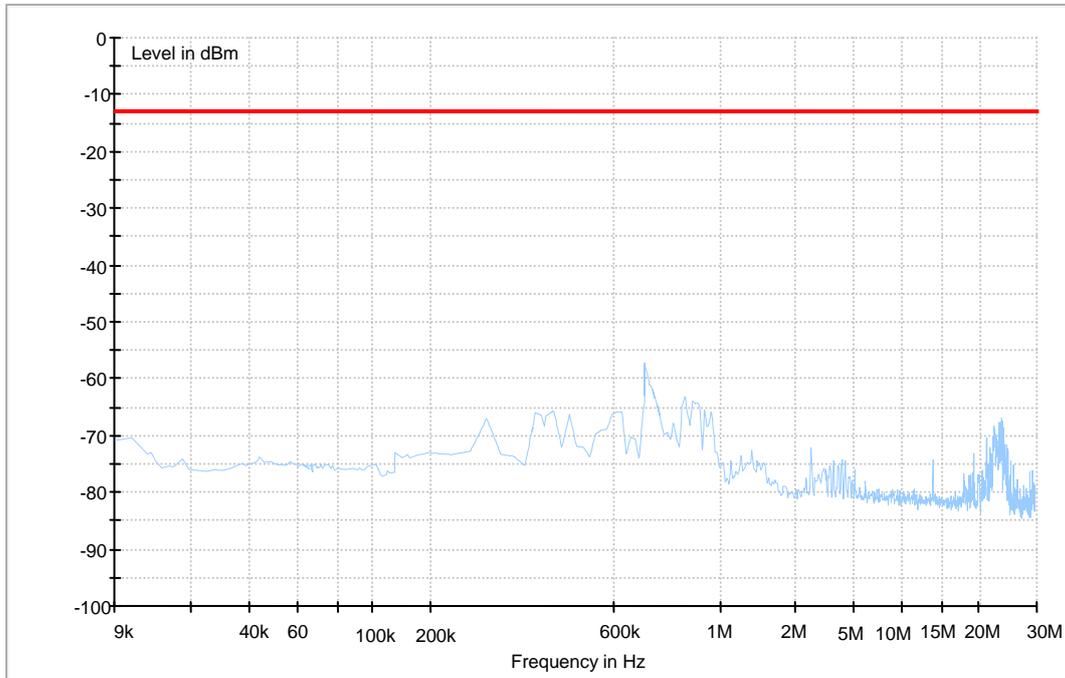
Traffic Mode (3GHz-18GHz)





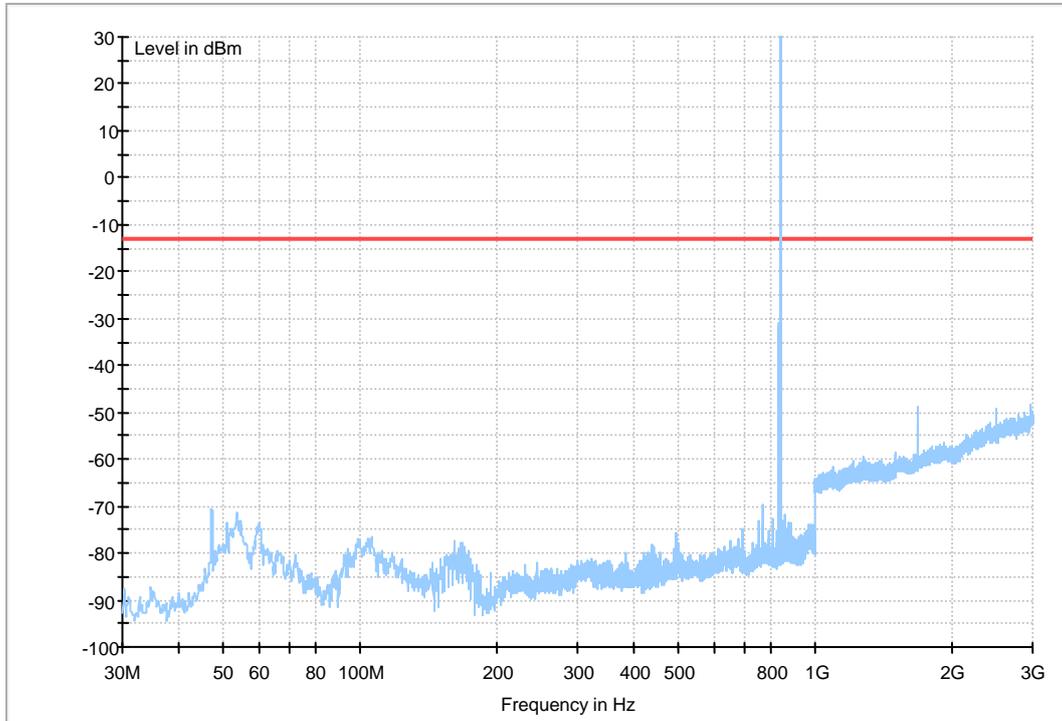
EDGE 850

Traffic Mode (9kHz-30MHz)



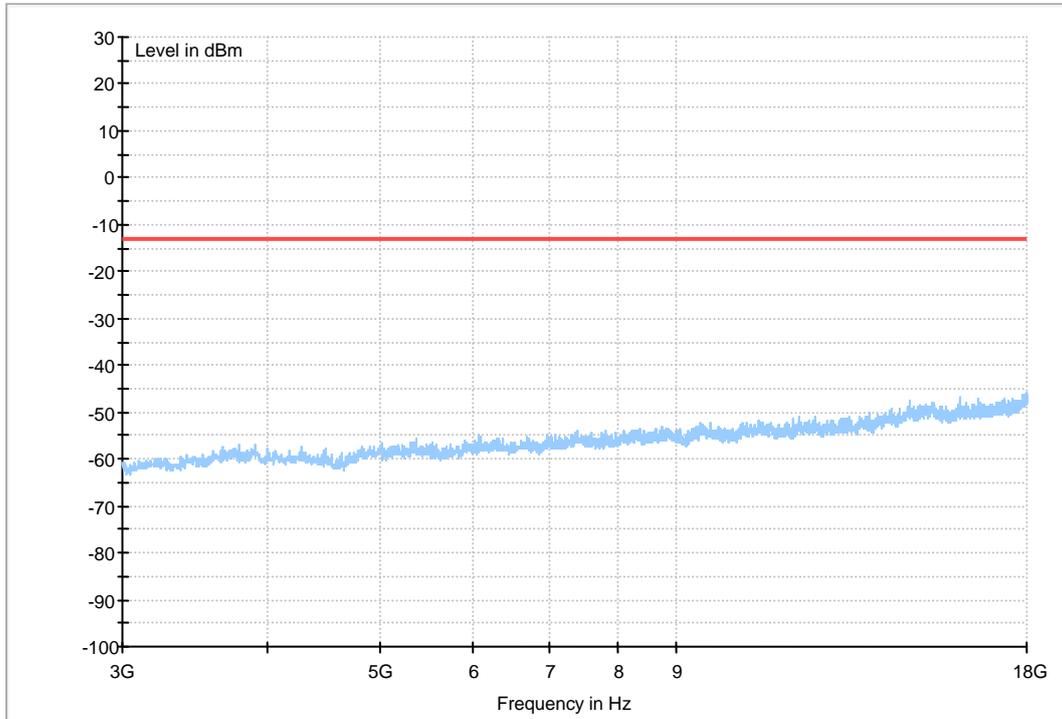


Traffic Mode (30MHz-3GHz)





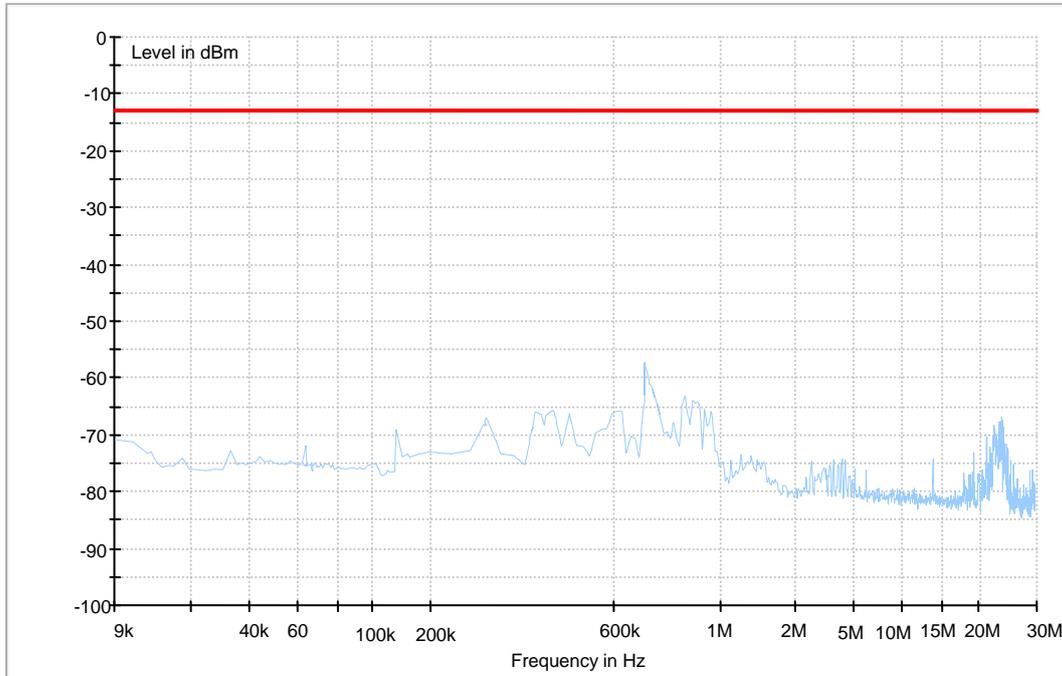
Traffic Mode (3GHz-18GHz)





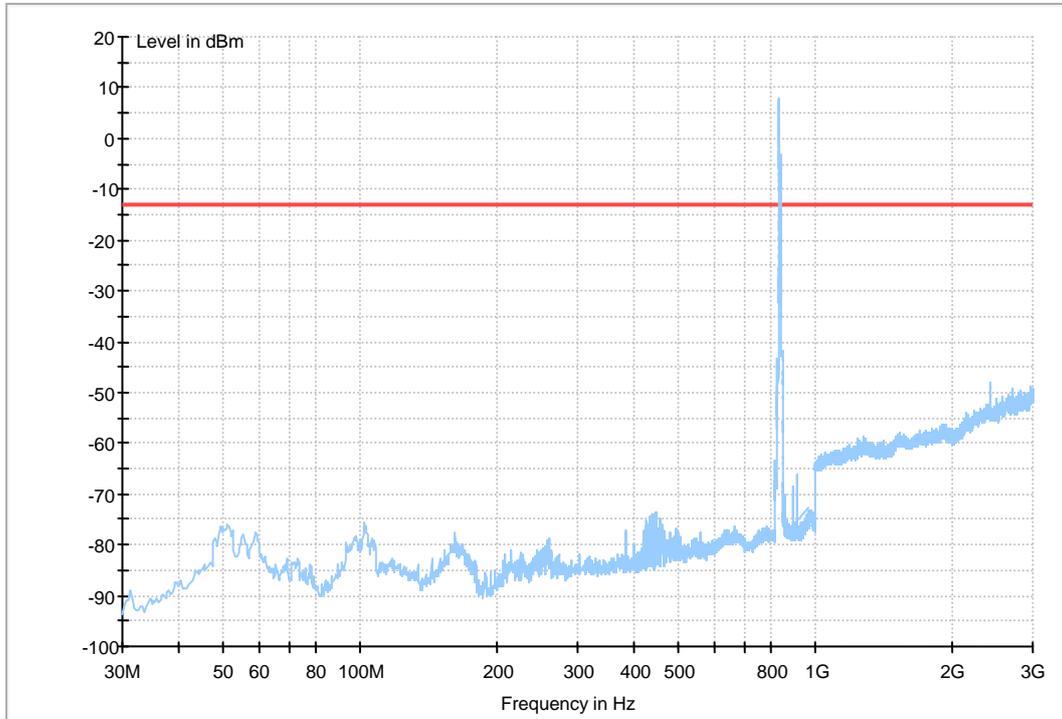
WCDMA 850

Traffic Mode (9kHz-30MHz)



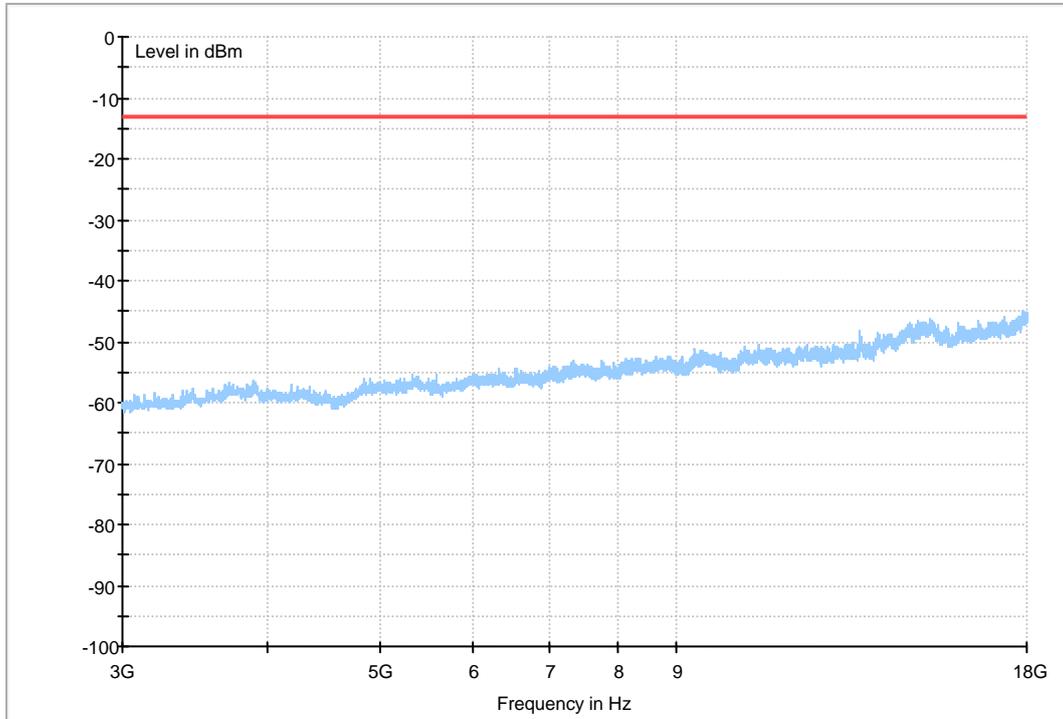


Traffic Mode (30MHz-3GHz)





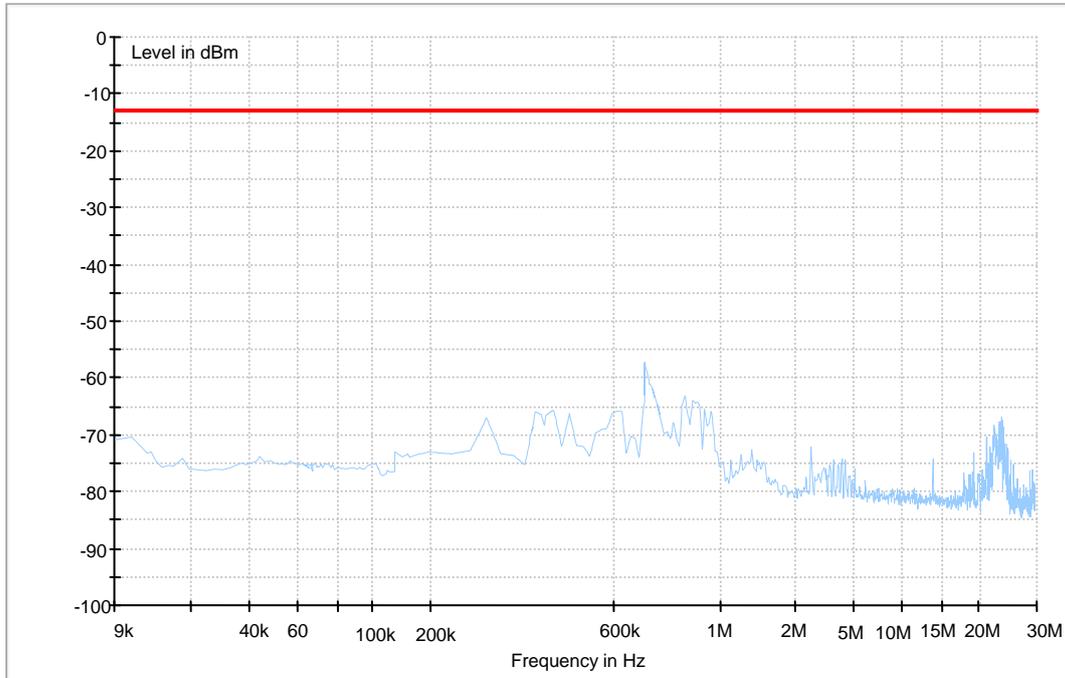
Traffic Mode (3GHz-18GHz)





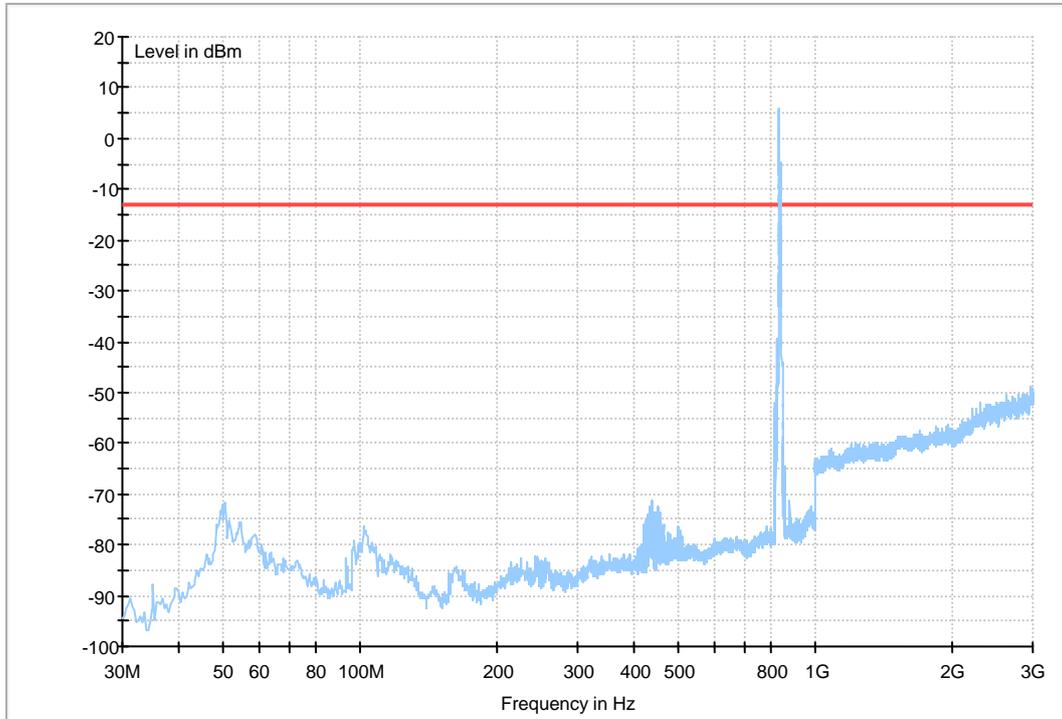
HSDPA 850

Traffic Mode (9kHz-30MHz)



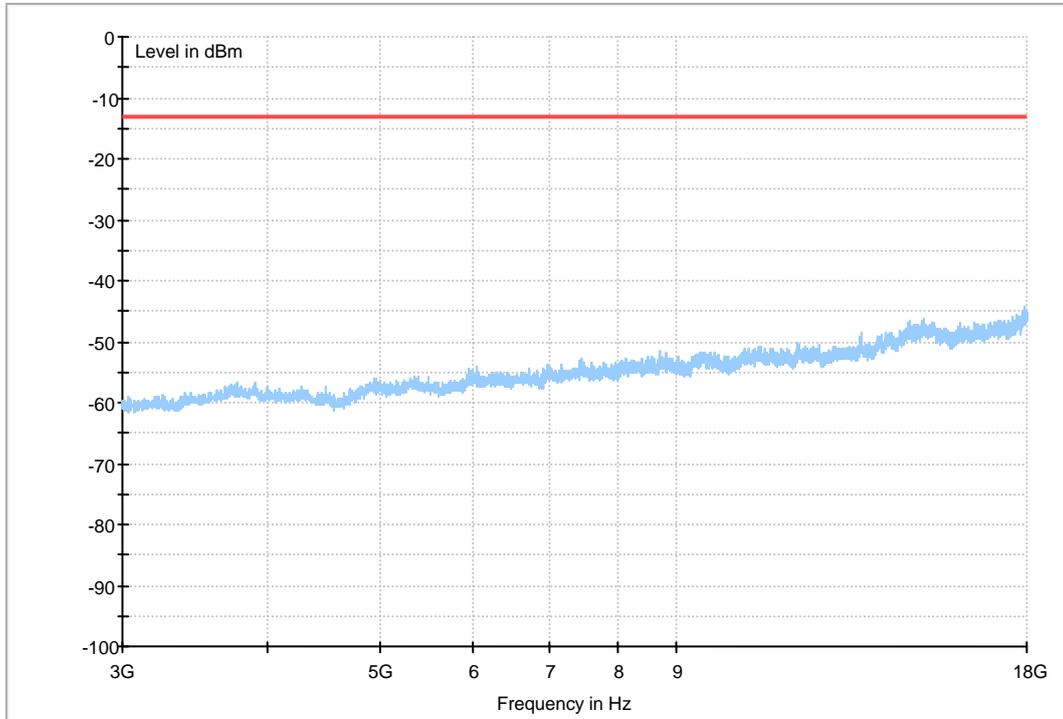


Traffic Mode (30MHz-3GHz)





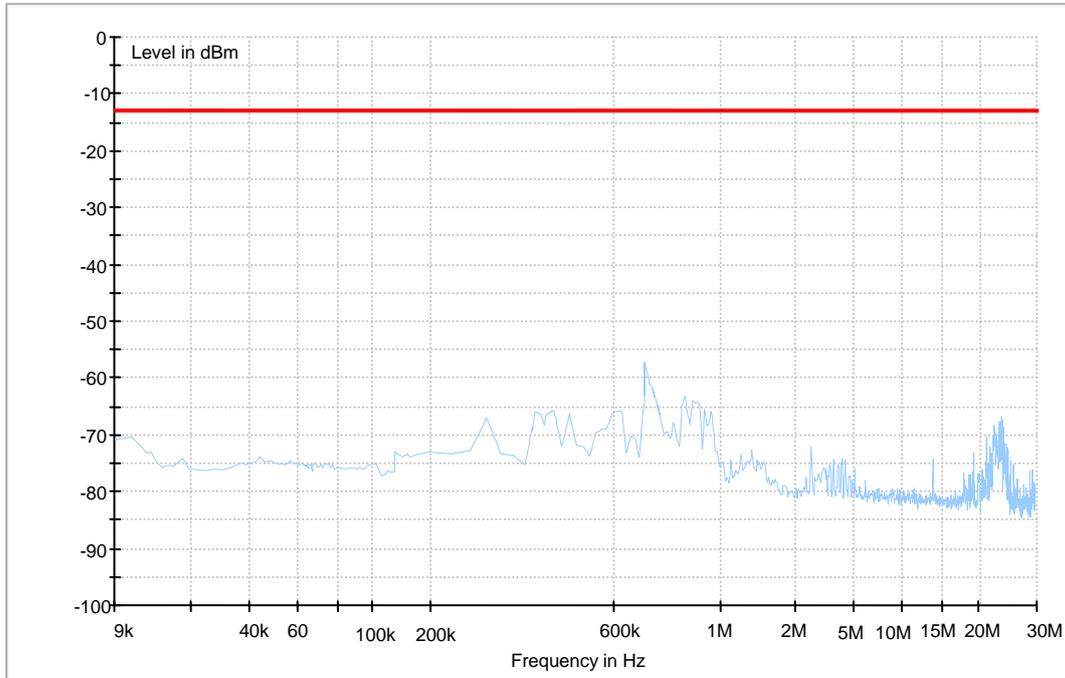
Traffic Mode (3GHz-18GHz)





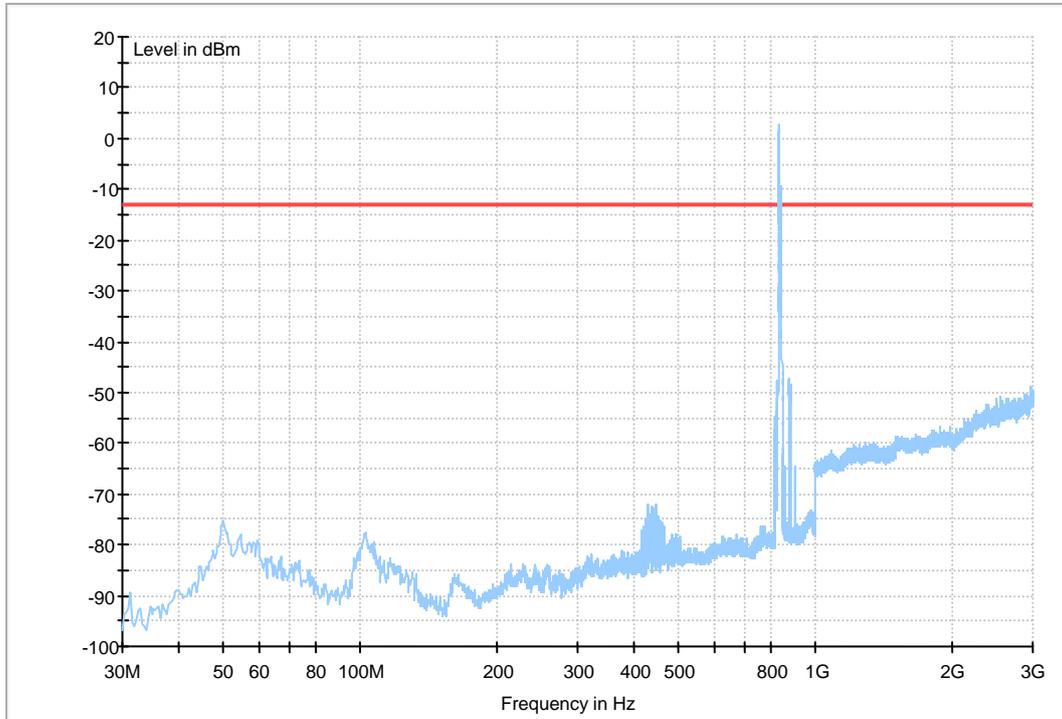
HSUPA 850

Traffic Mode (9kHz-30MHz)



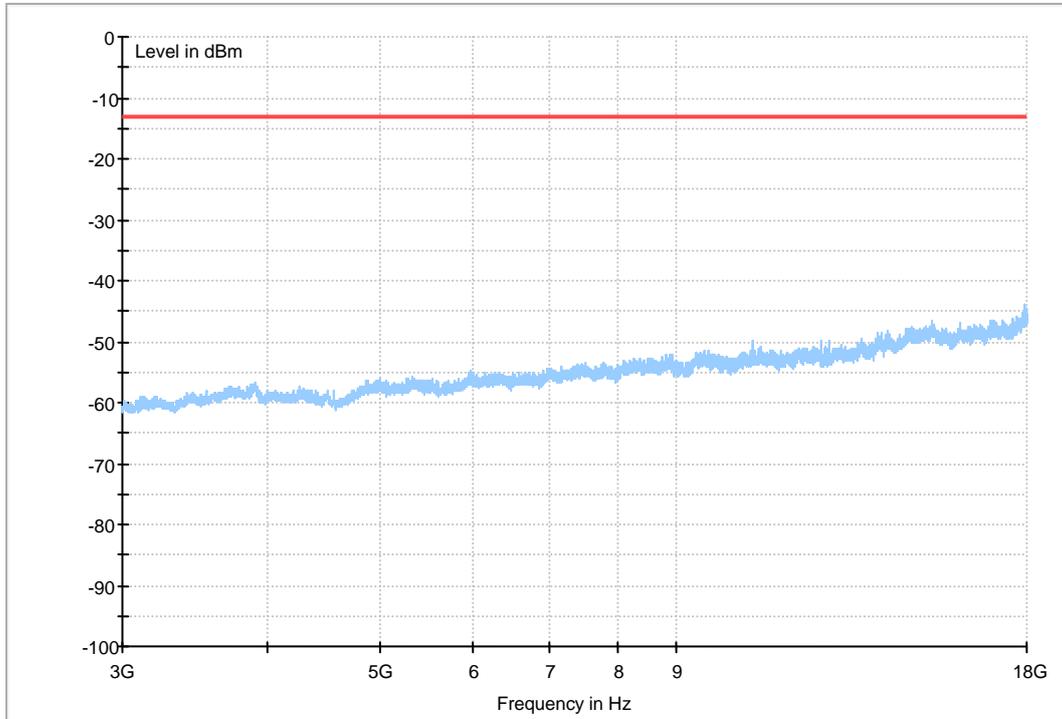


Traffic Mode (30MHz-3GHz)





Traffic Mode (3GHz-18GHz)



-----The 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	100%	-30 °C	15	0.0179	---	±2.5	Pass
			-20 °C	18	0.0215	---	±2.5	Pass
			-10 °C	-13	-0.0155	---	±2.5	Pass
			0 °C	11	0.0131	---	±2.5	Pass
			10 °C	20	0.0239	---	±2.5	Pass
			20 °C	-10	-0.0119	---	±2.5	Pass
			30 °C	-12	-0.0143	---	±2.5	Pass
			40 °C	13	0.0155	---	±2.5	Pass
TM 2	M	100%	50 °C	-15	-0.0179	---	±2.5	Pass
			-30 °C	13	0.0155	---	±2.5	Pass
			-20 °C	-10	-0.0119	---	±2.5	Pass
			-10 °C	17	0.0203	---	±2.5	Pass
			0 °C	21	0.0251	---	±2.5	Pass
			10 °C	14	0.0167	---	±2.5	Pass
			20 °C	16	0.0191	---	±2.5	Pass
			30 °C	-6	-0.0072	---	±2.5	Pass
TM 3	M	100%	40 °C	13	0.0155	---	±2.5	Pass
			50 °C	-9	-0.0108	---	±2.5	Pass
			-30 °C	-8	-0.0096	---	±2.5	Pass
			-20 °C	14	0.0167	---	±2.5	Pass
			-10 °C	-10	-0.0120	---	±2.5	Pass
			0 °C	15	0.0179	---	±2.5	Pass
			10 °C	-15	-0.0179	---	±2.5	Pass
			20 °C	-14	-0.0167	---	±2.5	Pass
			30 °C	-9	-0.0108	---	±2.5	Pass
			40 °C	16	0.0191	---	±2.5	Pass
			50 °C	-11	-0.0132	---	±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	20 °C	85 %	13	0.0155	---	±2.5	Pass
			100 %	-7	-0.0084	---	±2.5	Pass
			115 %	-11	-0.0131	---	±2.5	Pass
TM 2	M	20 °C	85 %	16	0.0191	---	±2.5	Pass
			100 %	-12	-0.0143	---	±2.5	Pass
			115 %	13	0.0155	---	±2.5	Pass
TM 3	M	20 °C	85 %	20	0.0239	---	±2.5	Pass
			100 %	-13	-0.0155	---	±2.5	Pass
			115 %	15	0.0179	---	±2.5	Pass

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