



FCC&IC RF Test Report

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

Model Number: HUAWEI U8651T, U8651T, U8651, Astro

Report No: SYBH(Z-RF)002022012-2003

FCC ID: QISU8651T

IC ID: 6369A-U8651T

Reliability Laboratory of Huawei Technologies Co., Ltd.

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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1 General Information

1.1 Applied Standard

Applied Rules:	47 CFR FCC Part 2:2010, Subpart J 47 CFR FCC Part 24:2010, Subpart E IC RSS-Gen Issue 3 IC RSS-133 Issue 3
measurement standard:	ANSI/TIA-603-C: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 Test Summary

Table 1 Summary of results

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 th 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

Table 2 Summary of results

Test Case	IC Standard No.	Requirements	Result
PCS Band			
Transmitter Output Power	RSS-Gen, §4.8; RSS-133, §6.4	EIRP not exceed 2 W Peak-to-average ratio not exceed 13 dB	Pass
Modulation Characteristics	RSS-133, §6.2	Digital modulation	Pass
Occupied Bandwidth	RSS-Gen, §4.6	(Not specified)	Pass
Band Edges Compliance	RSS-Gen, §4.9; RSS-133, §6.5	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	RSS-Gen, §4.9; RSS-133, §6.5	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 5 th harmonics	Pass
Field Strength of Spurious Radiation	RSS-Gen, §4.9; RSS-133, §6.5	Below -13 dBm/1 MHz	Pass
Frequency Stability	RSS-Gen, §4.7; RSS-133, §6.3	Maintained within the tolerances of ±1.0 ppm	Pass
Receiver Spurious Emissions (Conducted)	RSS-Gen, §4.10; RSS-Gen, §6; RSS-133, §6.6	Below 2 nW/4 kHz (-57 dBm/4 kHz), for 30 MHz - 1000 MHz Below 5 nW/MHz (-53 dBm/MHz), for above 1 GHz	Pass



3 Product Description

3.1 Production Information

3.1.1 General Description

HUAWEI U8651T, U8651T, U8651, Astro subscriber equipment in the WCDMA/GSM system. The HSDPA/UMTS frequency band is Band IV and Band II and Band V. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only WCDMA BAND II and PCS1900 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, HSDPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.1.2 Board

HSDPA/UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth		
HUAWEI U8651T, U8651T, U8651, Astro		
Board and Module		
Hardware Version	Software Version	Serial Number
HD4U865M	U8651V100R001USAC85B865SP01	G9E2A11191600138

3.1.3 Adapter

AC/DC Adapter Model	HW-050100U1W
Manufacturer	Huawei Technologies Co., Ltd.
Input Voltage	~100-240V 50/60Hz 0.2A
Output Voltage	5V  1A
Rated Power	5W

3.1.4 Battery

Name	Manufacture	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	Battery Model: HB5K1H Rated capacity: 1400mAh Nominal Voltage:  +3.7V Charging Voltage:  +4.2V



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: 30dBm UMTS system: 24dBm
Channel Spacing(s) / Bandwidth(s)	GSM system: 200 kHz UMTS system: 5 MHz
Designation of Emissions	GSM system: 245KGXW (GMSK modulation), 247KG7W (8PSK modulation) UMTS system: 4M19F9W

3.2.3 Antenna Gain

Antenna Gain(dBi):	0
Antenna Gain(dBd):	-2.15

3.2.4 Power Supply

	Description
Power Supply Type	Directly Connected to DC /AC Power Supply
Input to Adapter (DC power)	DC Voltage Nominal: $\approx$ +3.7V DC Voltage Range: $\approx$ +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 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 16QAM 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

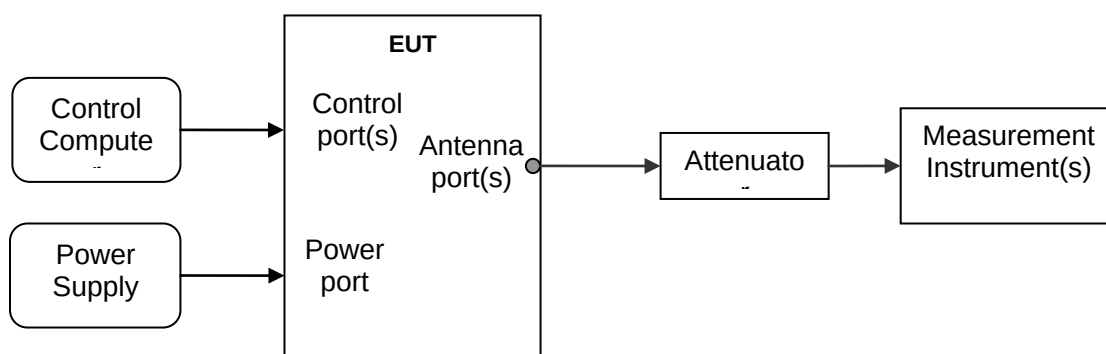
NOTE: VL= lower extreme test voltages
VN= nominal voltage
VH= upper extreme test voltage
TN= nominal temperature

4.4 Test Setups

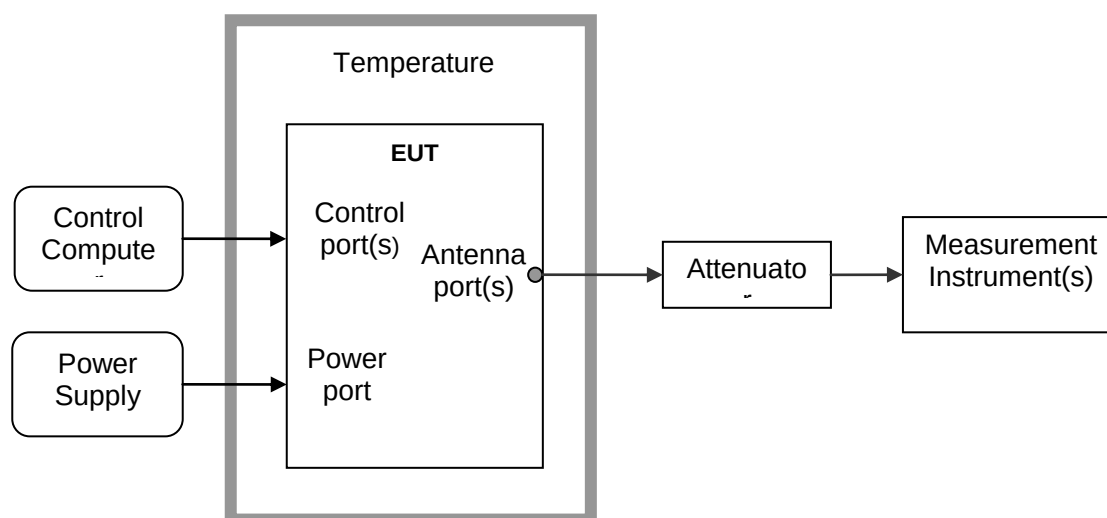
4.4.1 General Test Setup Configurations

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



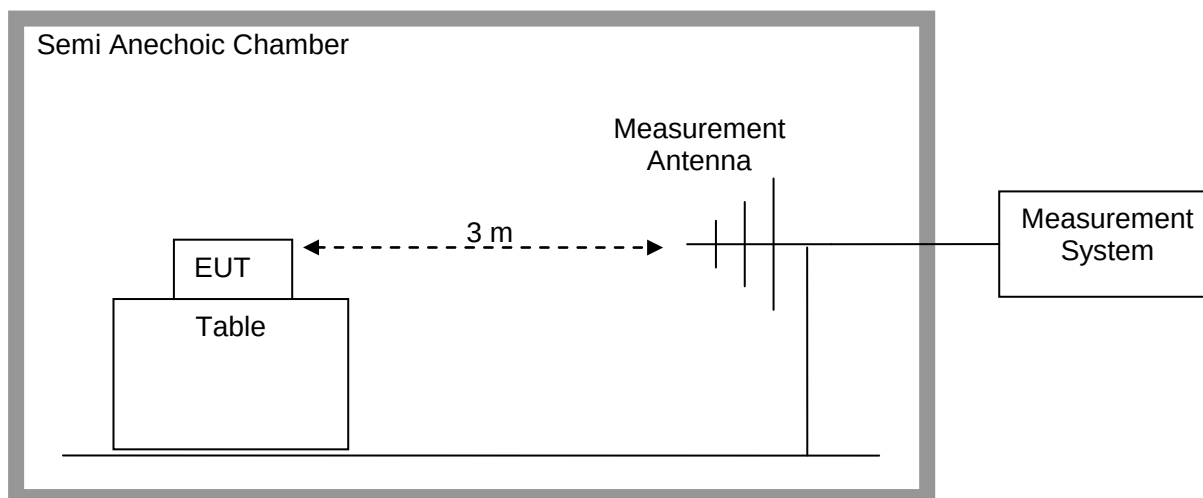
4.4.3 Test Setup 2



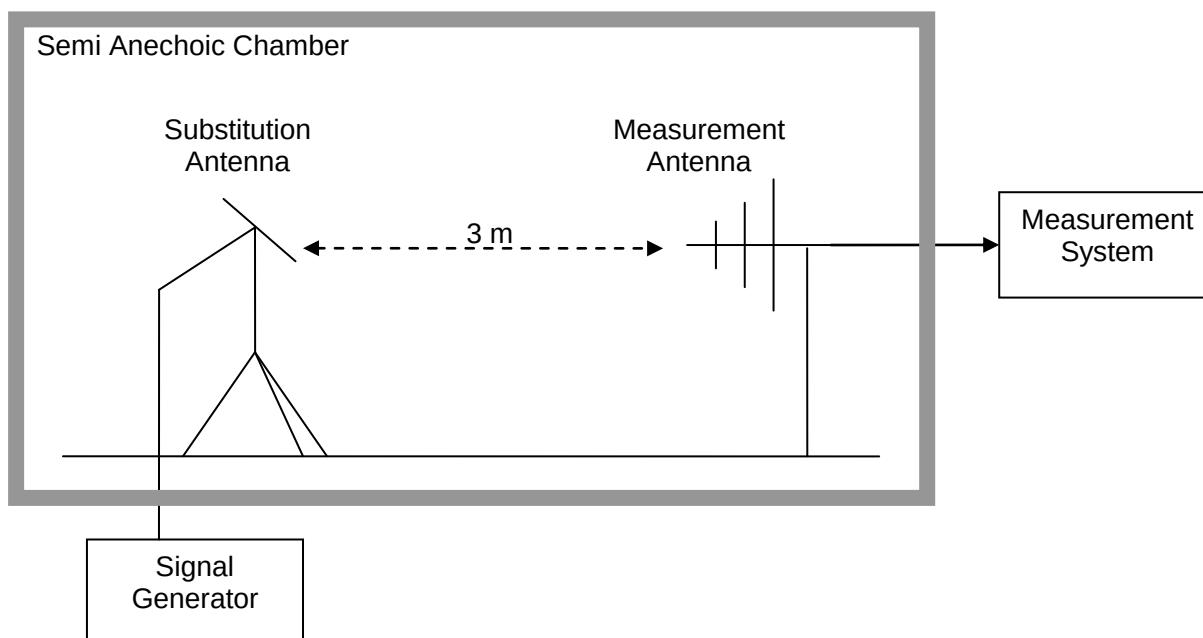
4.4.4 Test Setup 3

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/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)	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
	RF Channels (TX)	M



Test Case	Test Conditions	
	Test Mode	TM1/TM2/TM3

5 Main Test Instruments

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	Jan.03,2013
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.29.2012
Tunable Dipole	Schwarzbeck	D69250-UHAP/D69250-VHAP	979/917	Jan.29.2012
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	Receiver Spurious Emissions	Appendix H
9	Photos of Test setup	Appendix I

NOTE: The Appendix I only photos of Test setup, 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 24 Subpart E
& RSS-133



Conducted Power of Transmitter

Table 1 Measurement Results

TEST CONDITIONS		RF Output Power (Conducted)					
		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		30.02	33	29.79	33	29.69	33
TM2		26.53	33	26.30	33	26.19	33
TEST CONDITIONS		Channel9262(B)		Channel9400(M)		Channel9538(T)	
		1852.4MHz		1880.0MHz		1907.6MHz	
		dBm		dBm		dBm	
T_{nom} / V_{nom}		Measured	Limit	Measured	Limit	Measured	Limit
TM3		22.46	33	22.98	33	22.57	33
TM4	Case1	22.34	33	22.91	33	22.48	33
	Case2	22.06	33	22.65	33	22.24	33
	Case3	21.85	33	22.44	33	22.08	33
	Case4	21.49	33	21.98	33	22.11	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		9.56	13.0	9.87	13.0	9.59	13.0
TM2		9.72	13.0	9.94	13.0	9.55	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		3.01	13.0	3.14	13.0	2.91	13.0
TM4	Case1	2.78	13.0	2.87	13.0	2.94	13.0
	Case2	2.89	13.0	2.68	13.0	2.96	13.0
	Case3	2.94	13.0	2.68	13.0	2.91	13.0
	Case4	2.88	13.0	2.64	13.0	2.93	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

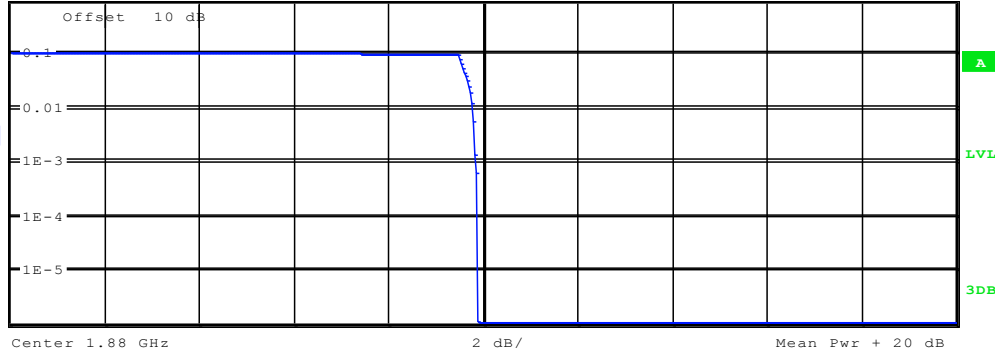


RBW 500 kHz

Ref 30 dBm

Att 45 dB

AQT 200 ms



Complementary Cumulative Distribution Function

NOF samples: 100000, Usable BW: 424kHz

Trace 1

Mean 12.59 dBm

Peak 22.47 dBm

Crest 9.88 dB

10 % 9.49 dB

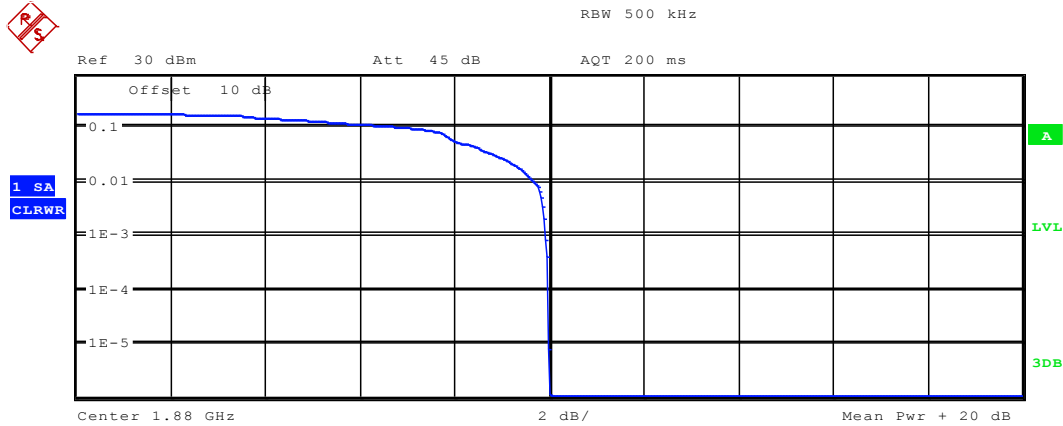
1 % 9.78 dB

.1 % 9.87 dB

.01 % 9.90 dB



TM2



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

Trace 1
Mean 11.85 dBm
Peak 21.83 dBm
Crest 9.98 dB

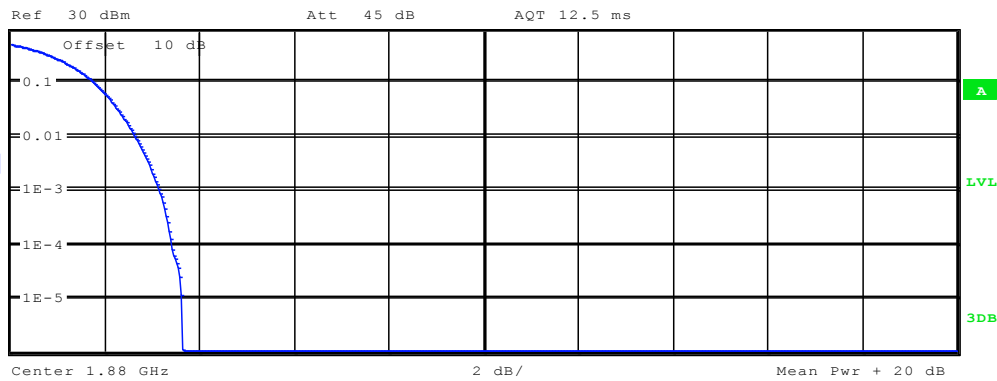
10 %	7.18 dB
1 %	9.68 dB
.1 %	9.94 dB
.01 %	10.00 dB



TM3/TM4



RBW 5 MHz



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

Trace 1
Mean 15.15 dBm
Peak 18.80 dBm
Crest 3.64 dB

10 %	1.76 dB
1 %	2.63 dB
.1 %	3.14 dB
.01 %	3.43 dB



Efficient Isotropic Radiated Power(EIRP)

Table 2 Substitution Results

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP)	FCC limit [dBm]	Result
				[dBm]			[dBm]		
TM1	1850.2	30.02	Horn Ant.	26.55	4.5	1	30.05	33	Pass
TM1	1880.0	29.79	Horn Ant.	26.25	4.5	1	29.75	33	Pass
TM1	1909.8	29.69	Horn Ant.	25.88	4.8	1	29.68	33	Pass
TM2	1850.2	26.53	Horn Ant.	23.05	4.5	1	26.55	33	Pass
TM2	1880.0	26.30	Horn Ant.	22.85	4.5	1	26.35	33	Pass
TM2	1909.8	26.19	Horn Ant.	22.38	4.8	1	26.18	33	Pass
TM3	1852.4	22.46	Horn Ant.	18.91	4.5	1	22.41	33	Pass
TM3	1880.0	22.98	Horn Ant.	19.45	4.5	1	22.95	33	Pass
TM3	1907.6	22.57	Horn Ant.	18.76	4.8	1	22.56	33	Pass

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

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

b, SGP=Signal Generator Level

The END



Appendix B

Modulation Characteristics

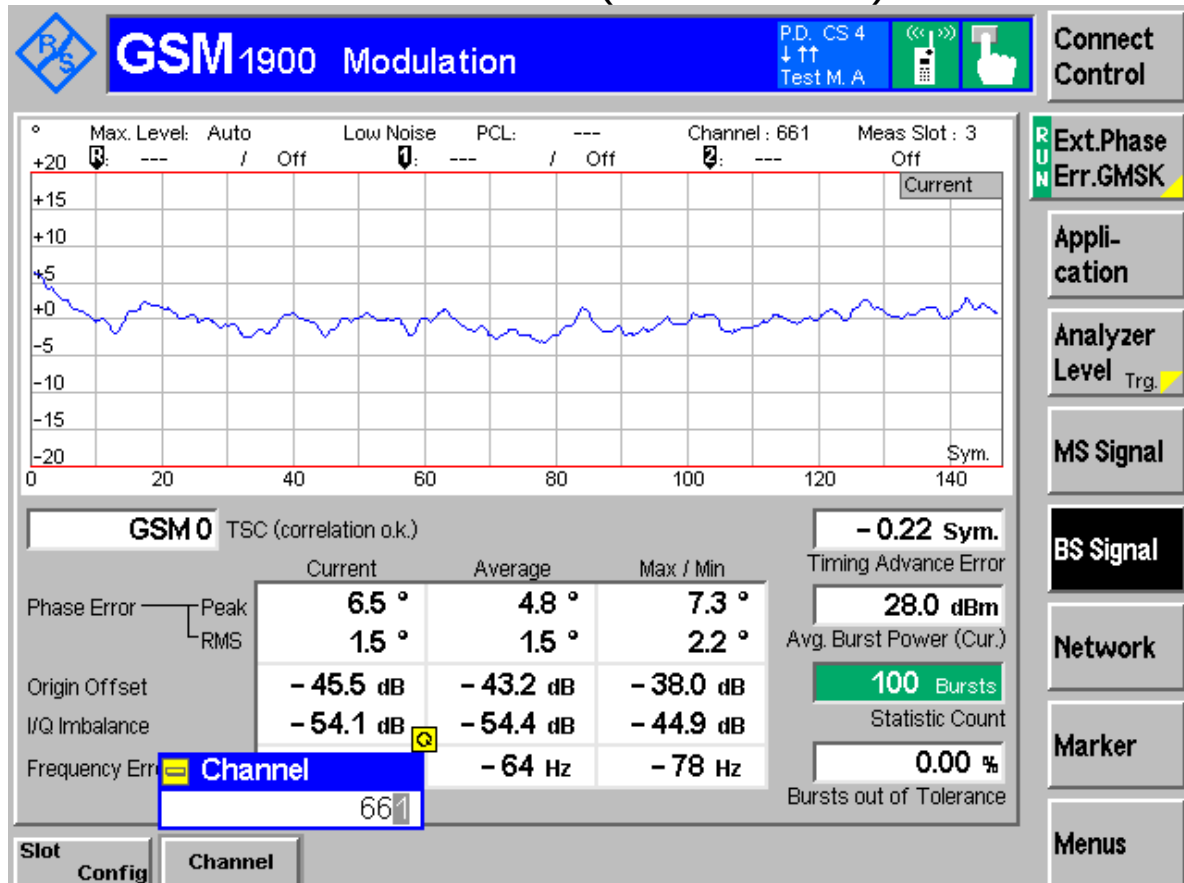
According to FCC Part 2.1047 & Part24 Subpart E
& RSS-133



1 Test Plot

1.1 Test Mode = TM 1

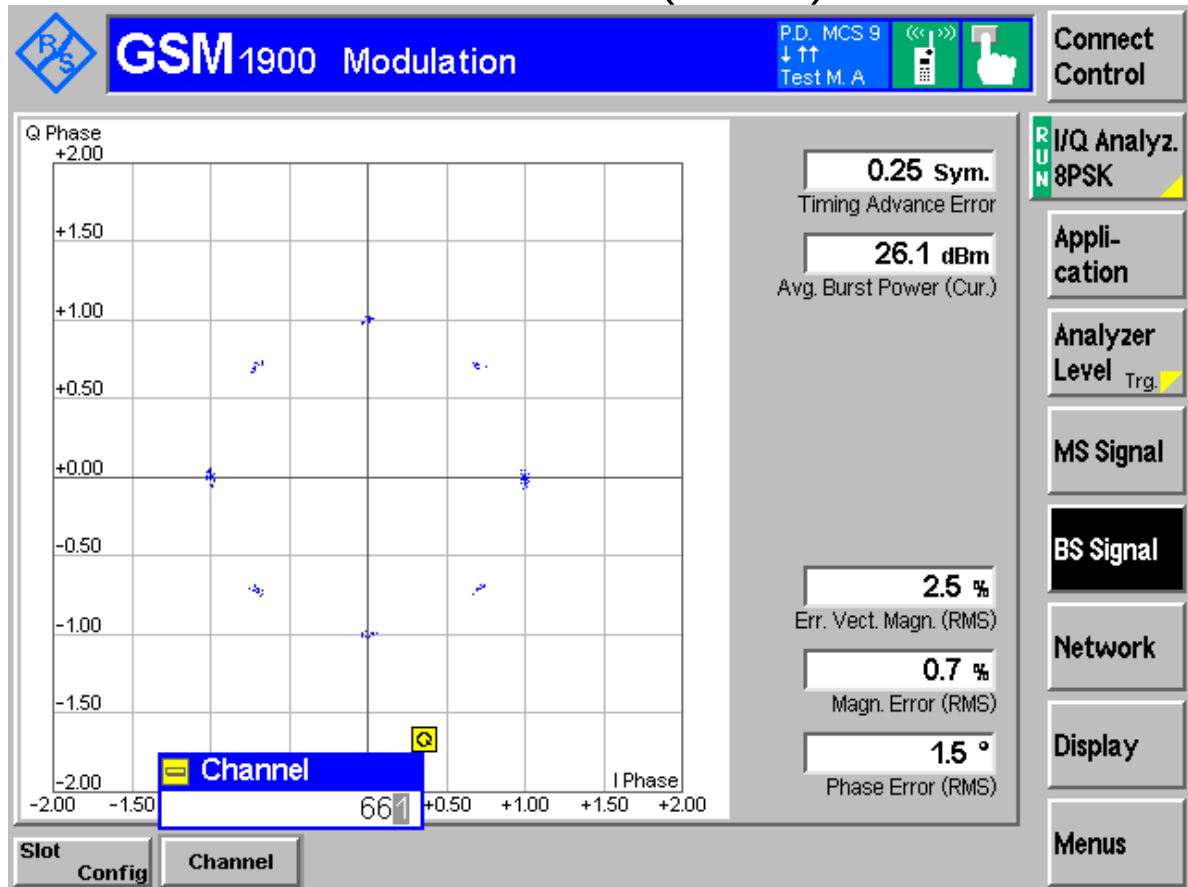
Channel 661 (GPRS/GSM)





1.2 Test Mode = TM 2

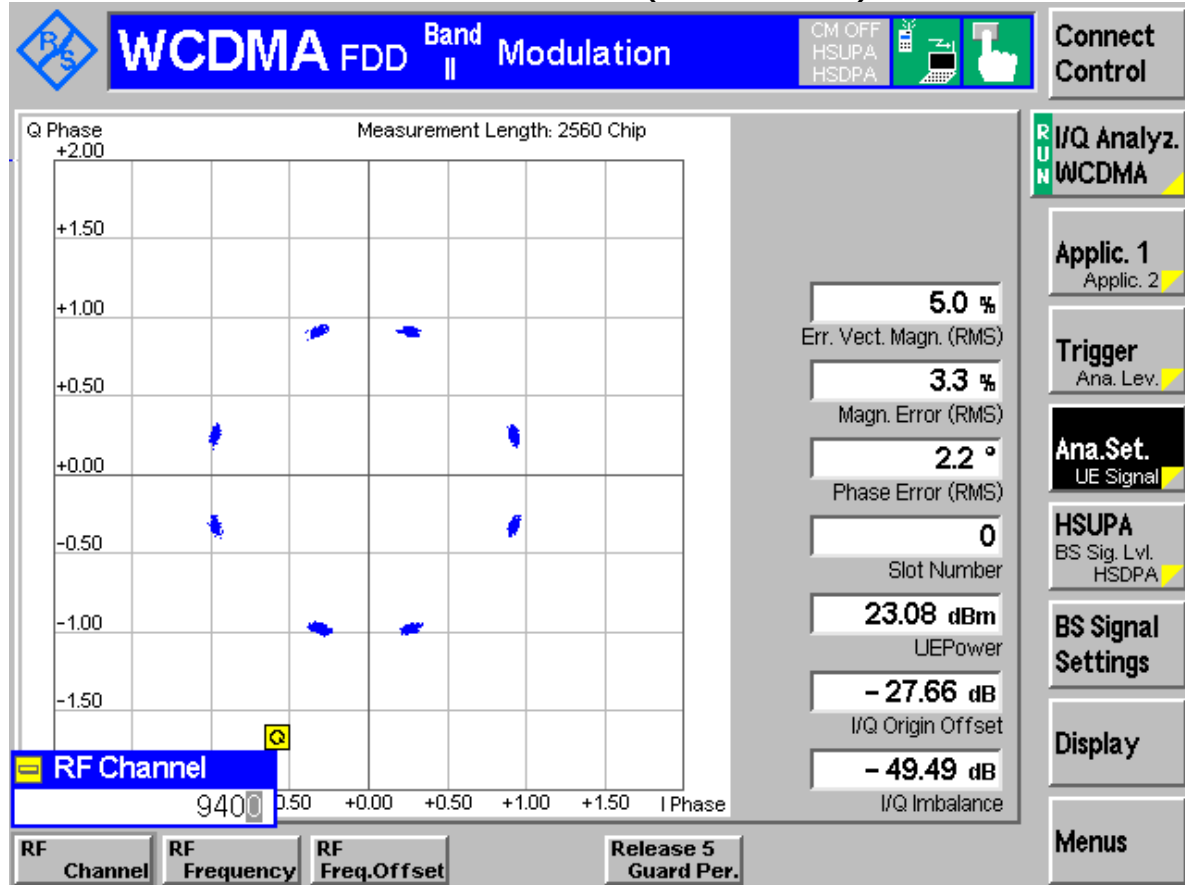
Channel 661 (EDGE)





1.3 Test Mode = TM 3

Channel 9400 (WCDMA)



The END



Appendix C

Occupied Bandwidth According to FCC Part 2.1049 & Part 24 Subpart E & RSS-133



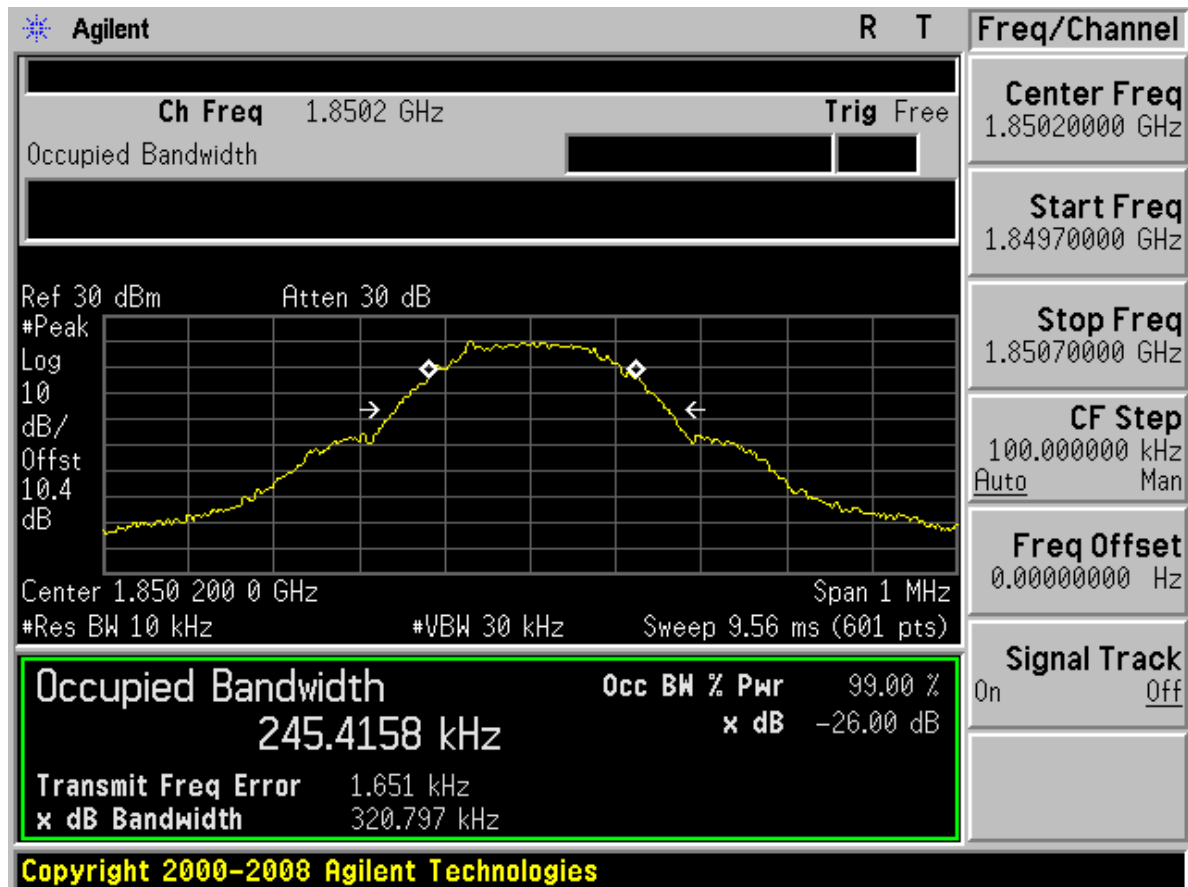
Result Table

Table 1 Measurement Results

Test Mode	RF Channel	Occupied Bandwidth [MHz]	-26dB BW [MHz]	Verdict
TM1	512	0.245	0.321	Pass
	661	0.241	0.315	Pass
	810	0.241	0.311	Pass
TM2	512	0.245	0.311	Pass
	661	0.247	0.306	Pass
	810	0.241	0.311	Pass
TM3	9262	4.176	4.654	Pass
	9400	4.163	4.652	Pass
	9538	4.187	4.664	Pass

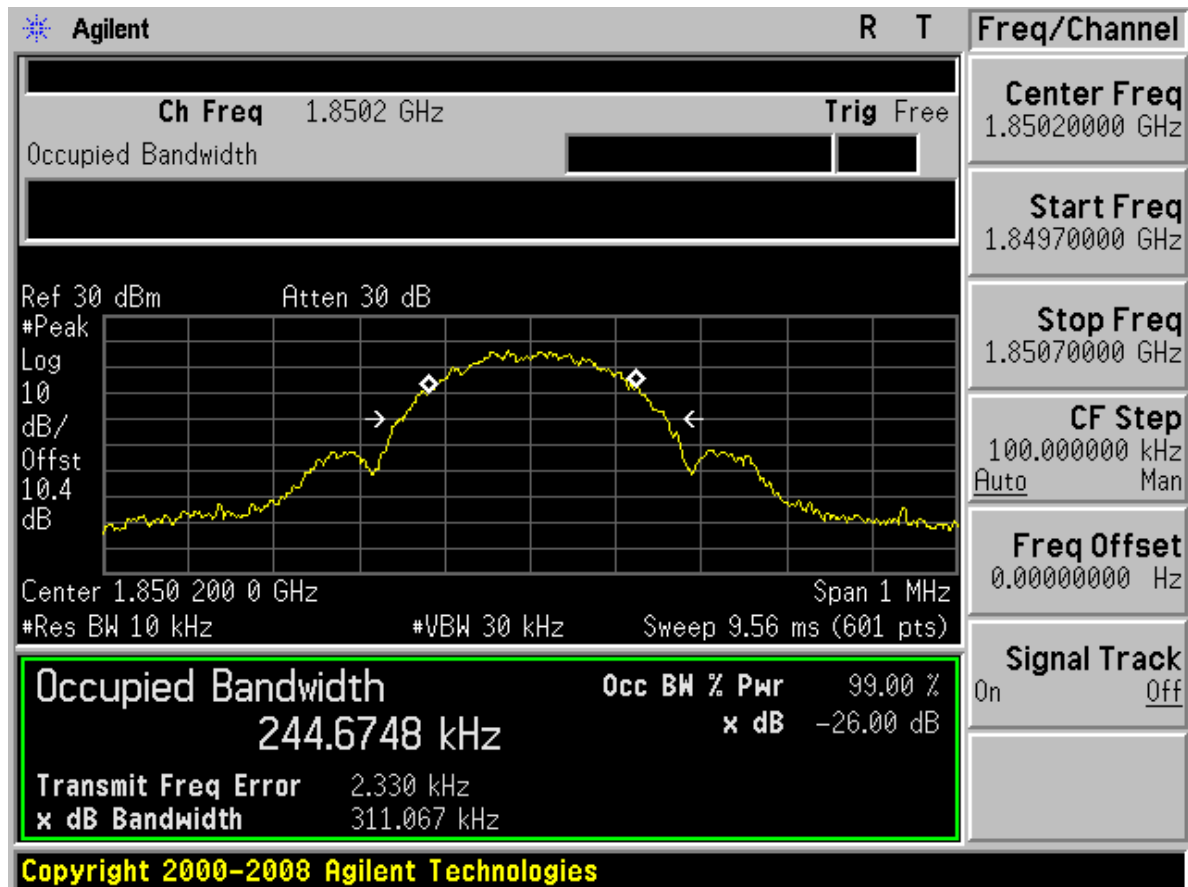


TM1:GPRS/GSM Channel 512



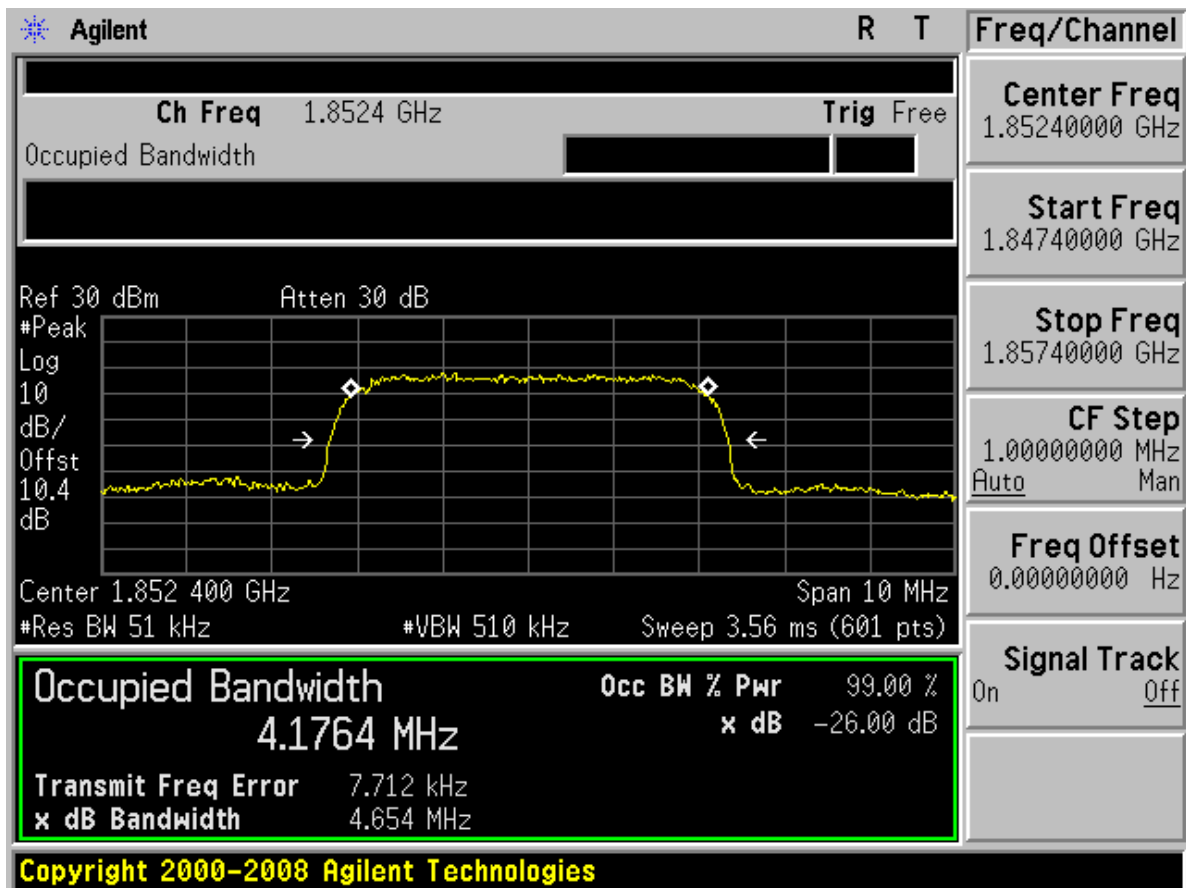


TM2:EDGE Channel 512



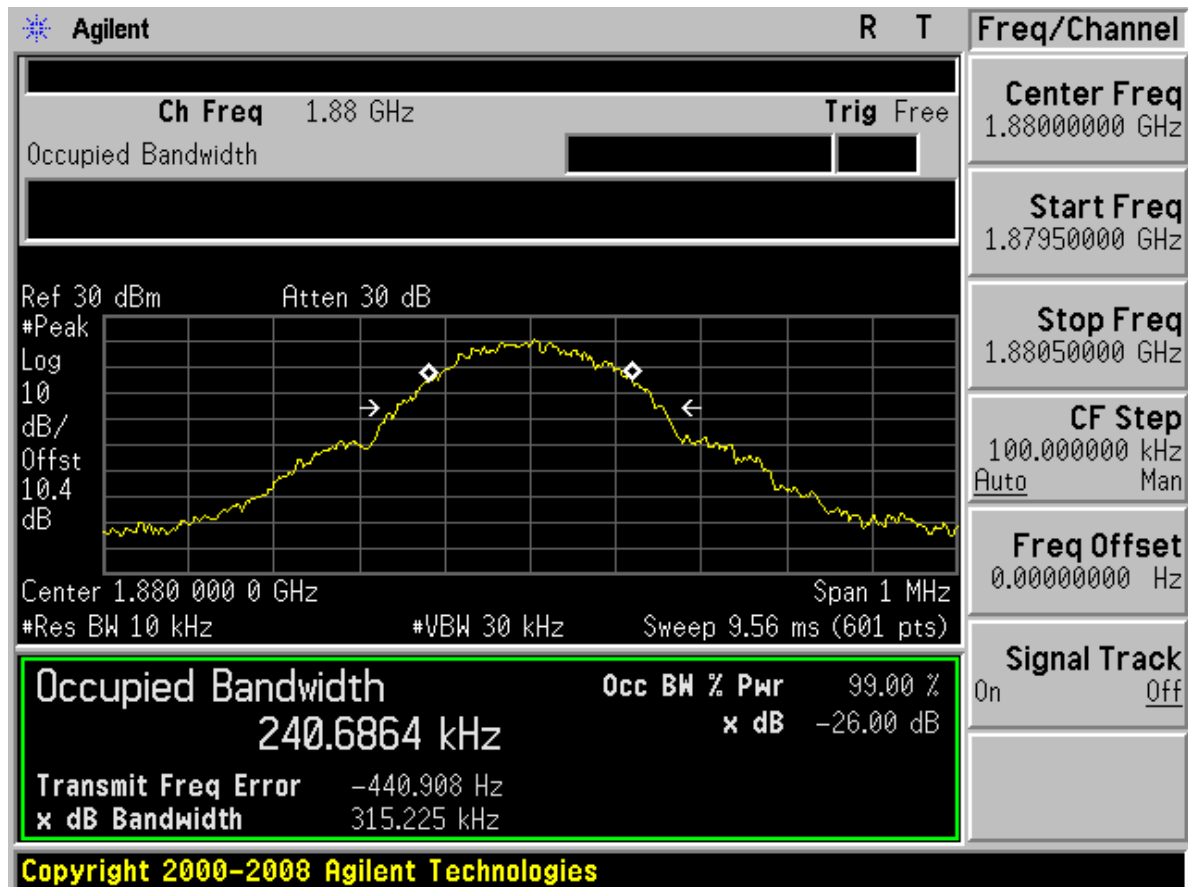


TM3: WCDMA Channel 9262



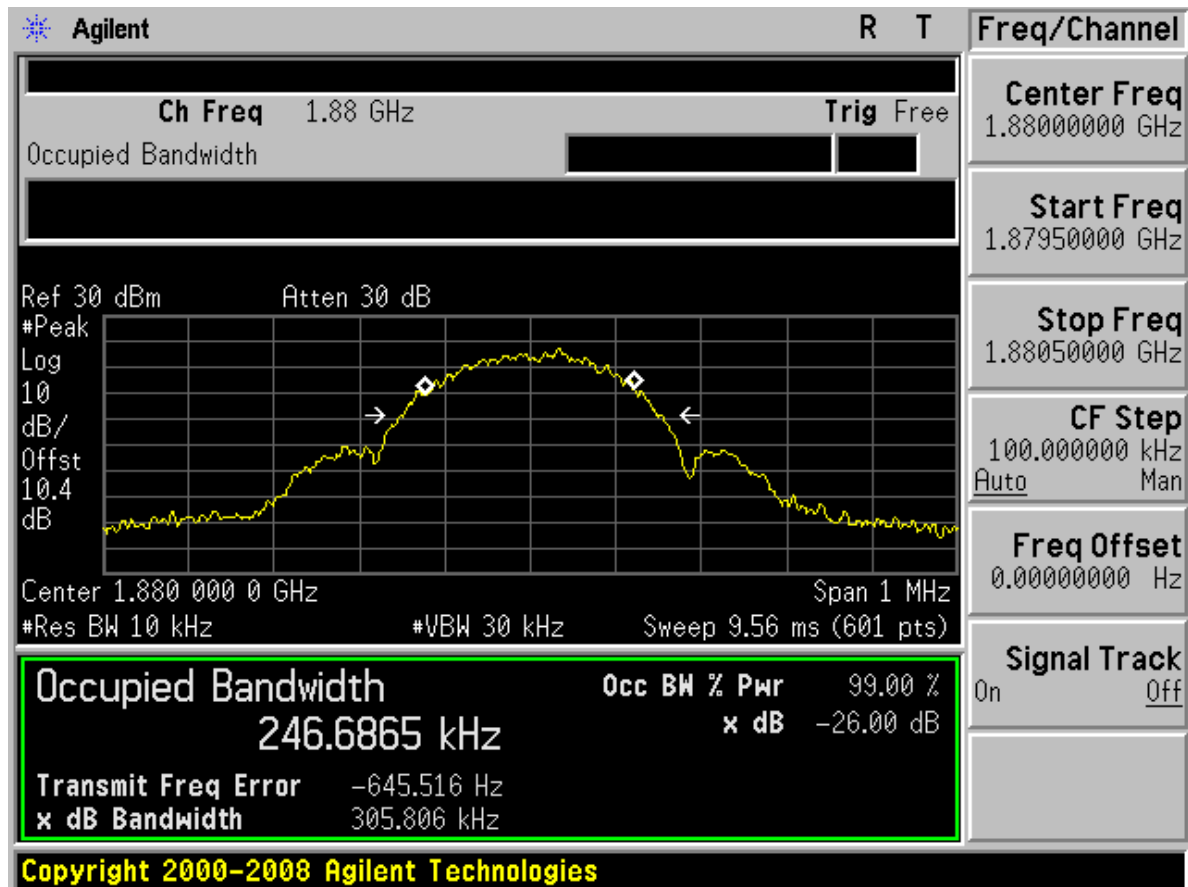


TM1:GPRS/GSM Channel 661



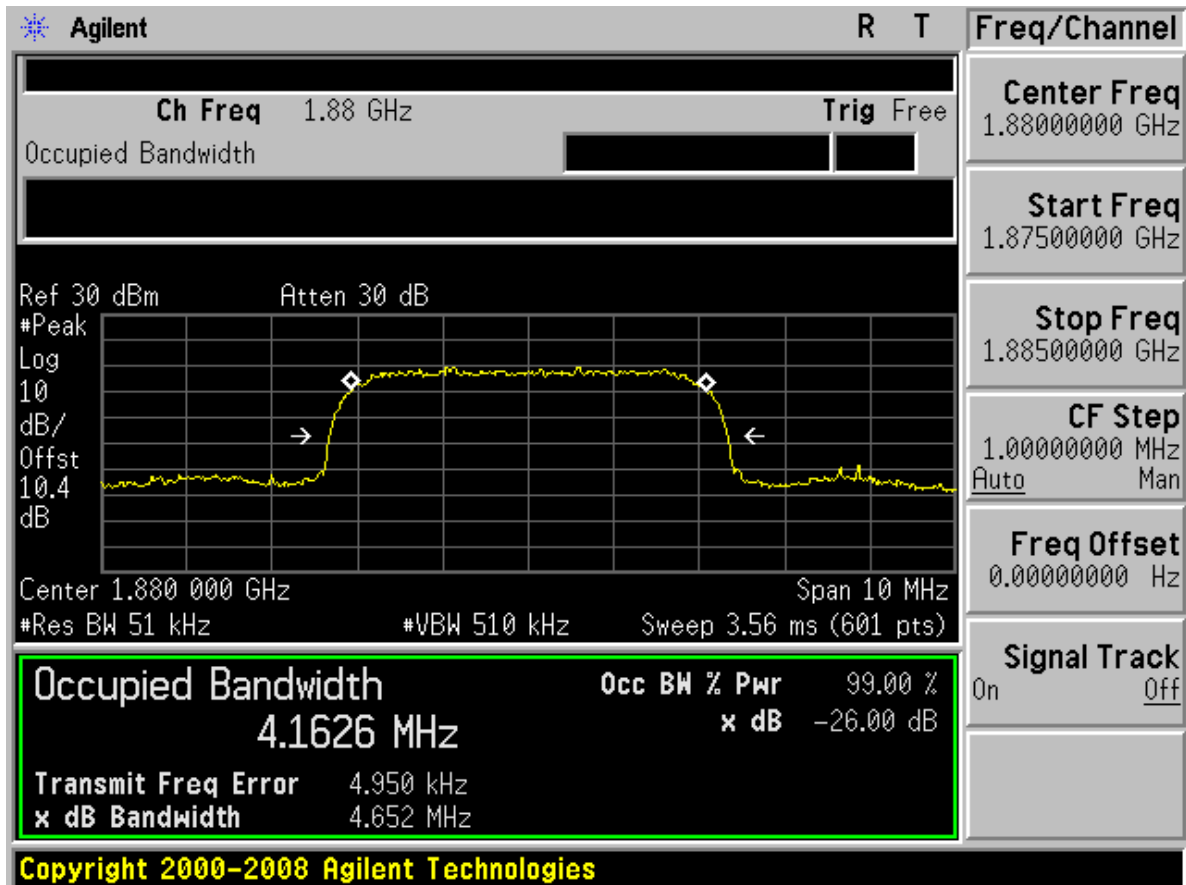


TM2:EDGE Channel 661



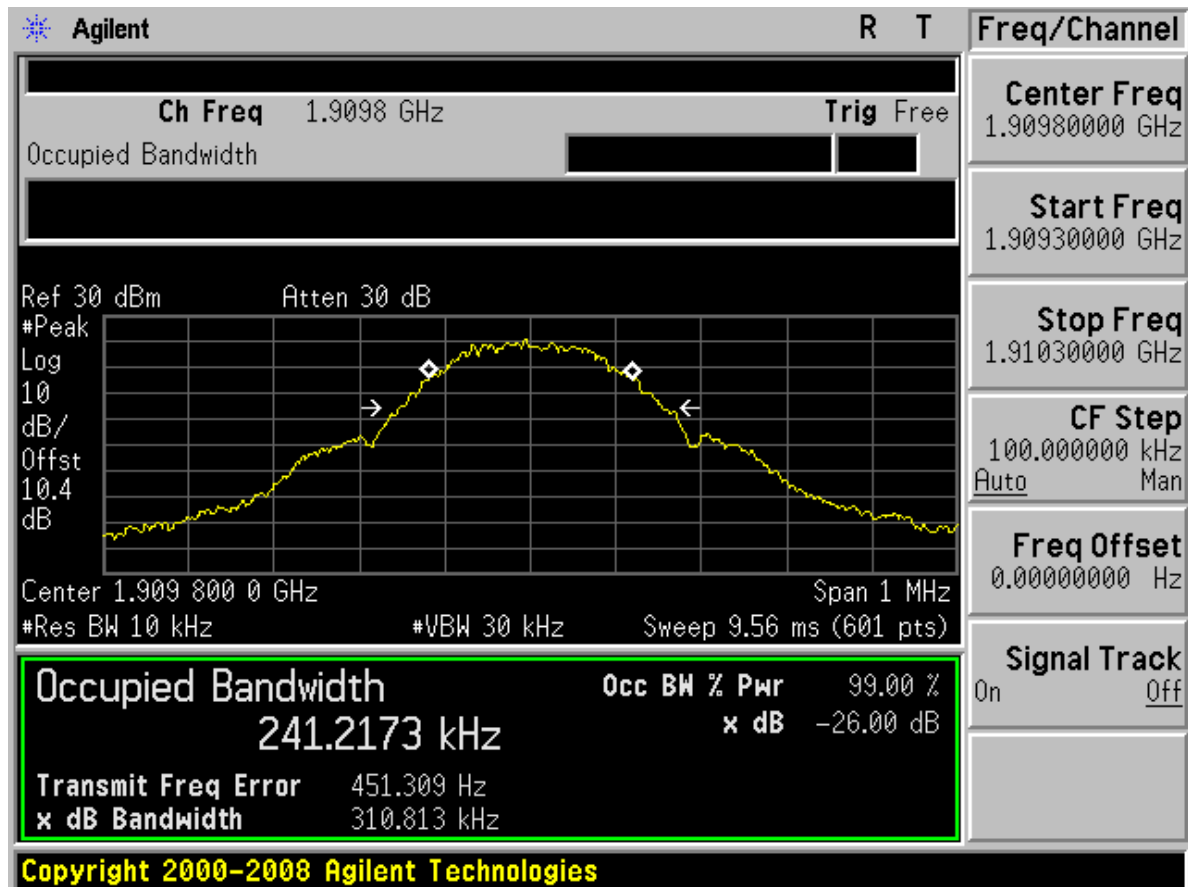
TM3: WCDMA

Channel 9400



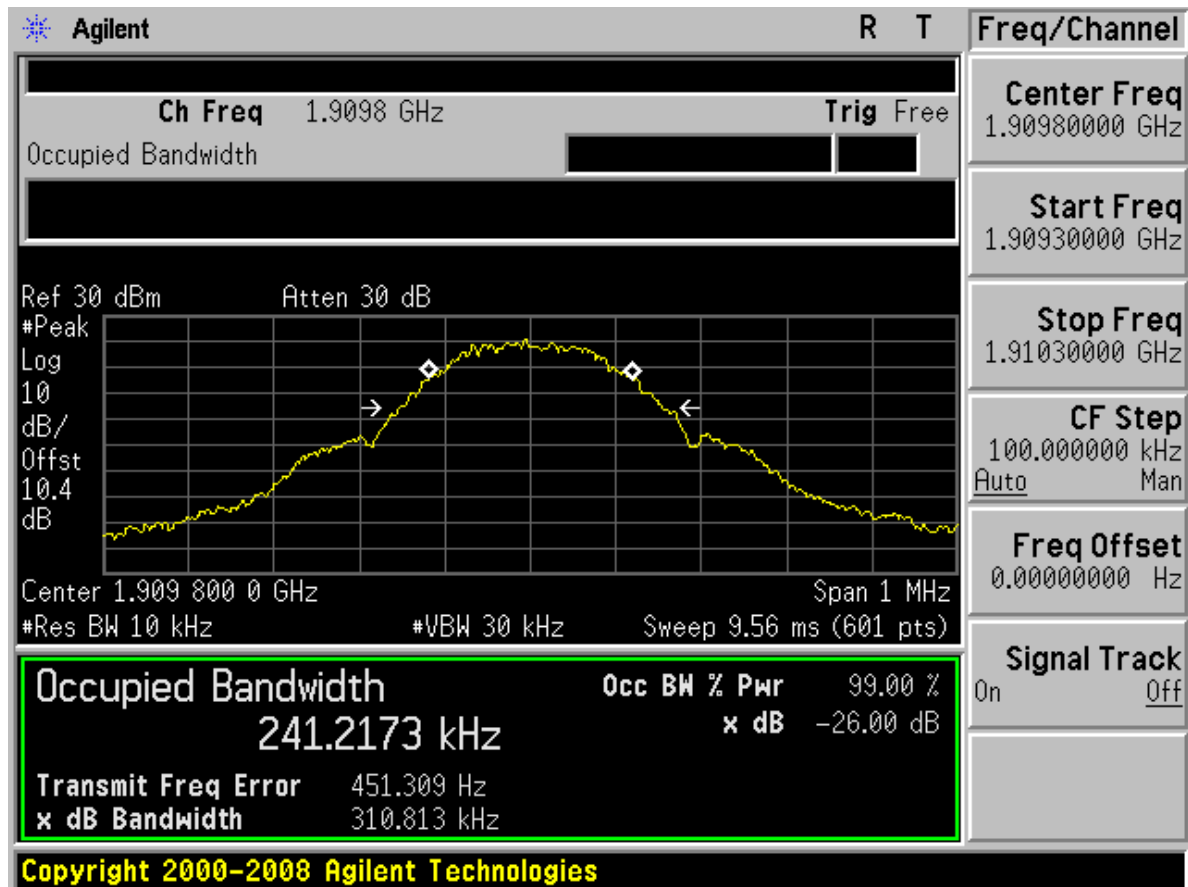


TM1:GPRS/GSM Channel 810



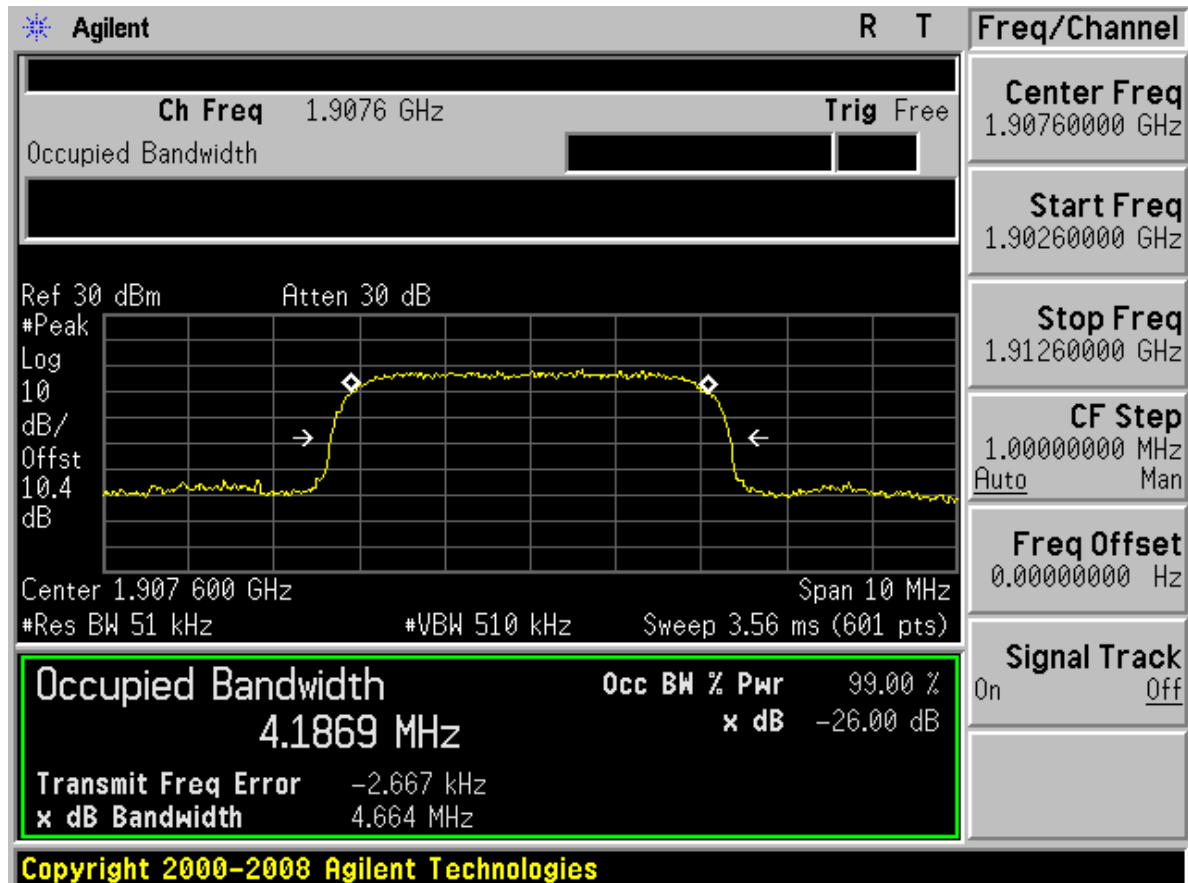


TM2:EDGE Channel 810





TM3: WCDMA Channel 9538



The END



Appendix D

Band Edges Compliance

According to FCC Part 2.1051 & 24.238
& RSS-133



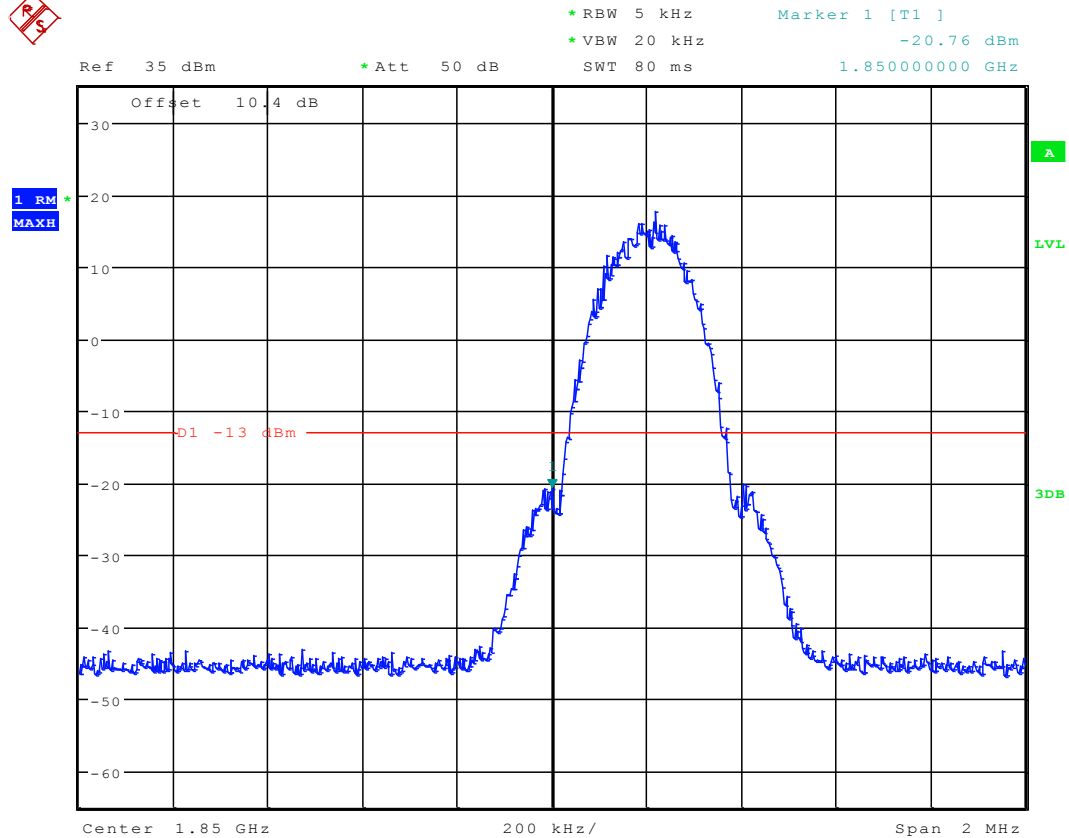
26dB Occupied Bandwidth

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

Mode	-26dB BW [MHz]	RBW to Measure Band Edge [kHz]
TM1/TM2	0.321	≥ 3.21 , used 5
TM3	4.664	≥ 46.64 used 50

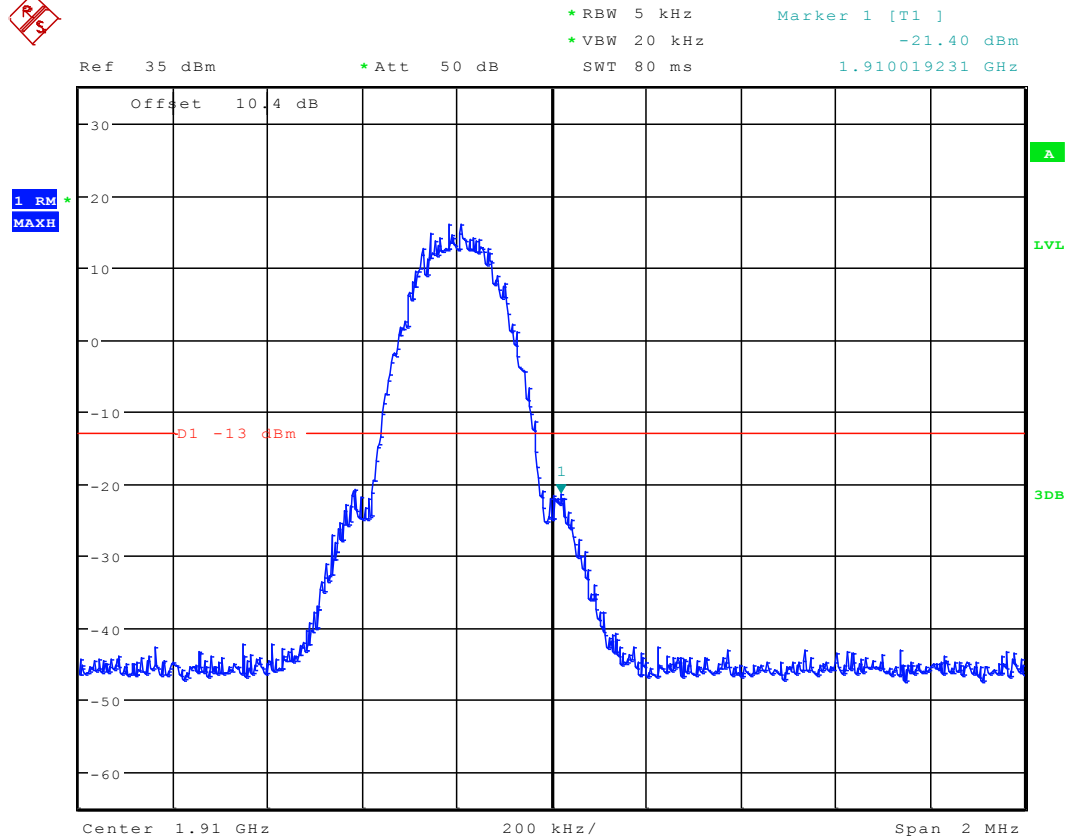


TM1:GPRS/GSM Left Edge Channel 512



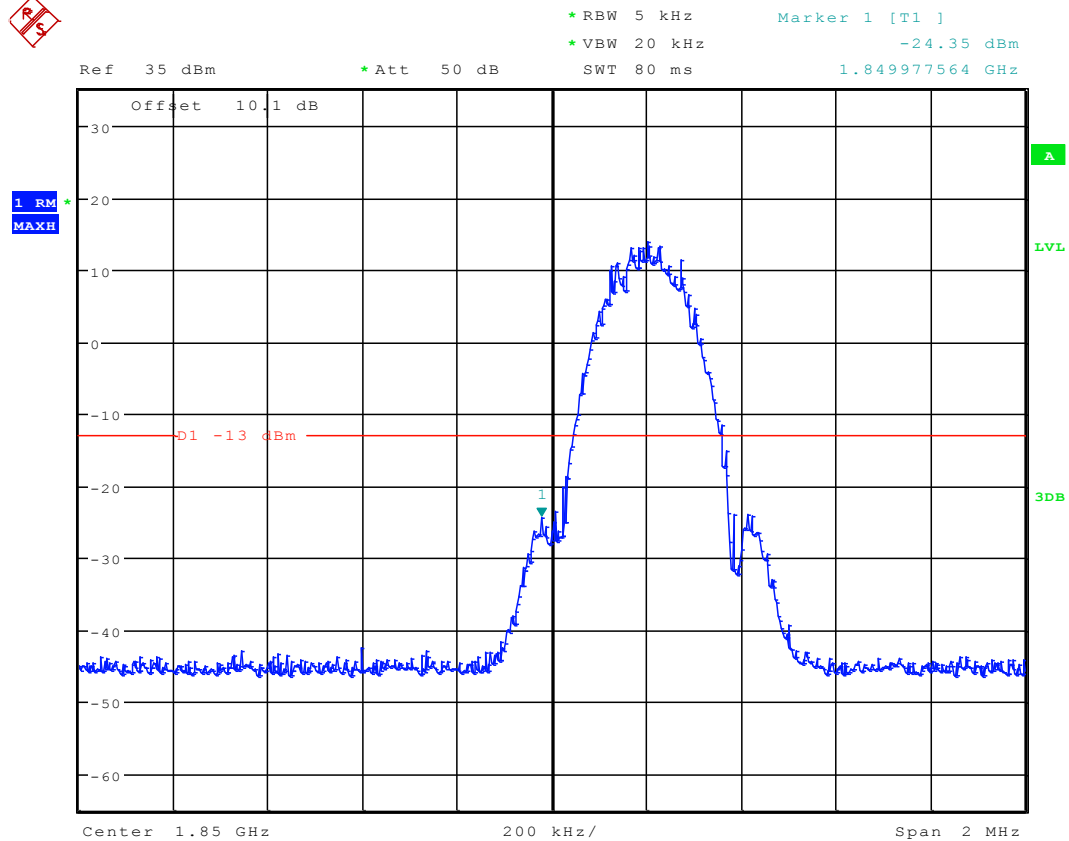


Right Edge Channel 810



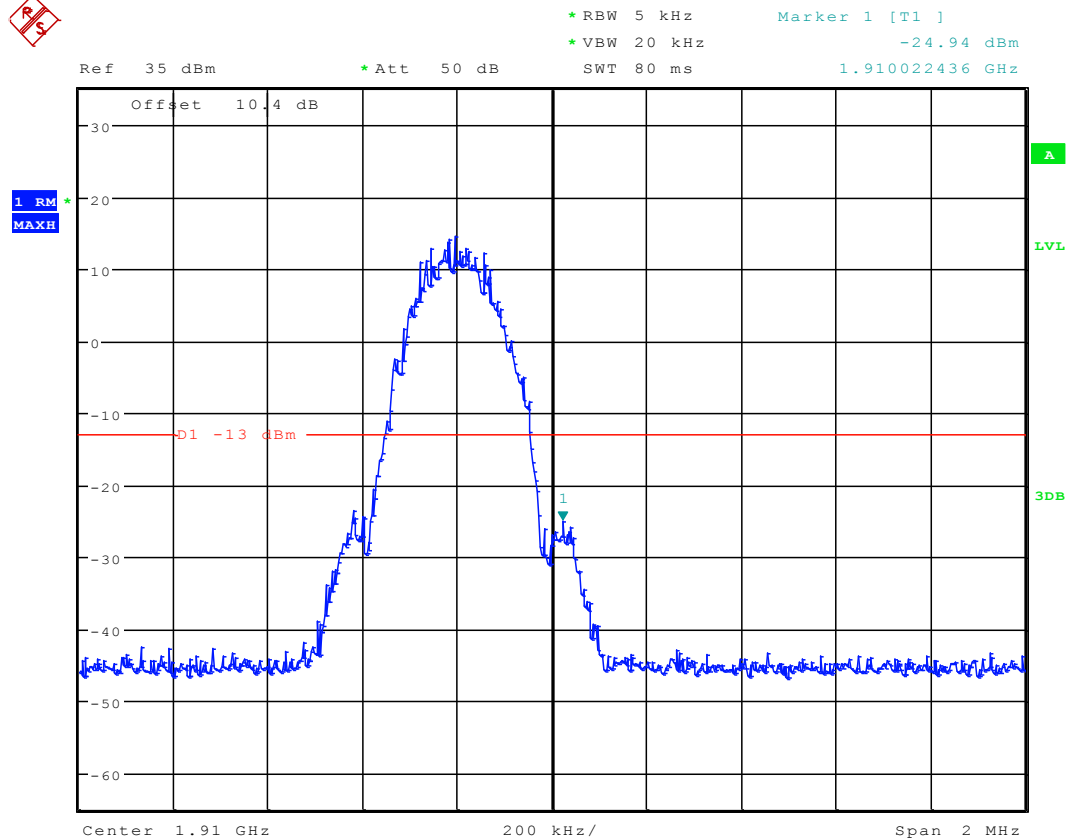


TM2:EDGE Left Edge Channel 512





Right Edge Channel 810

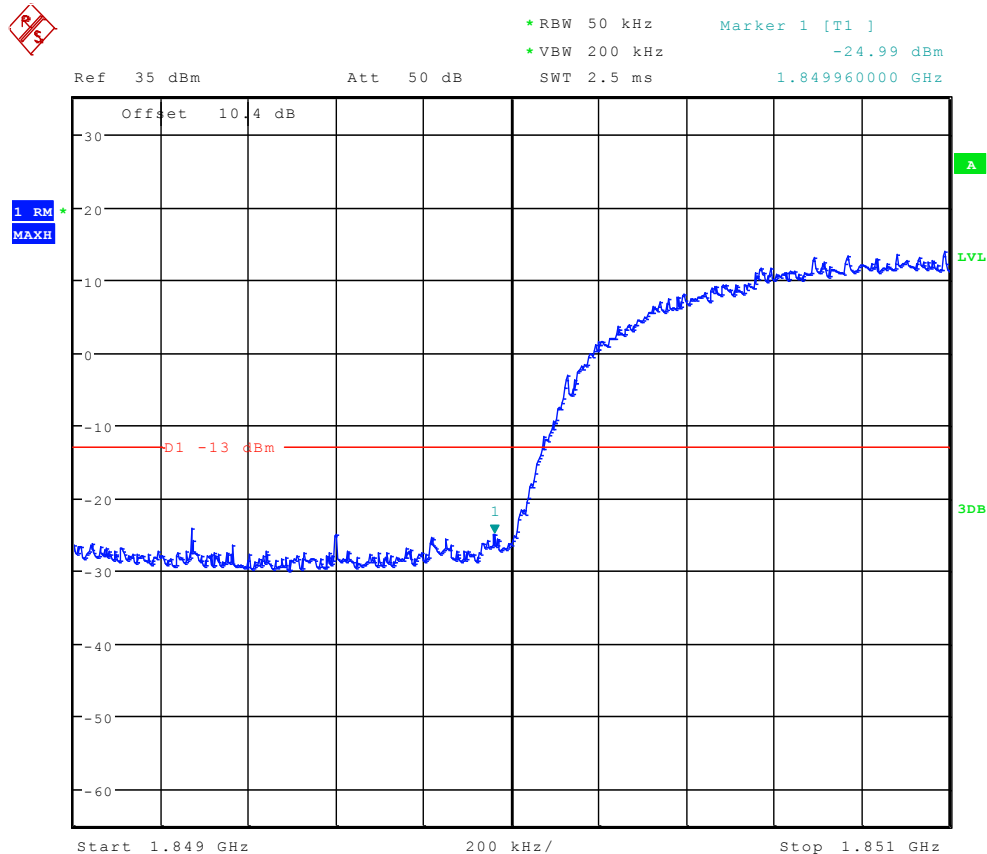




TM3: WCDMA

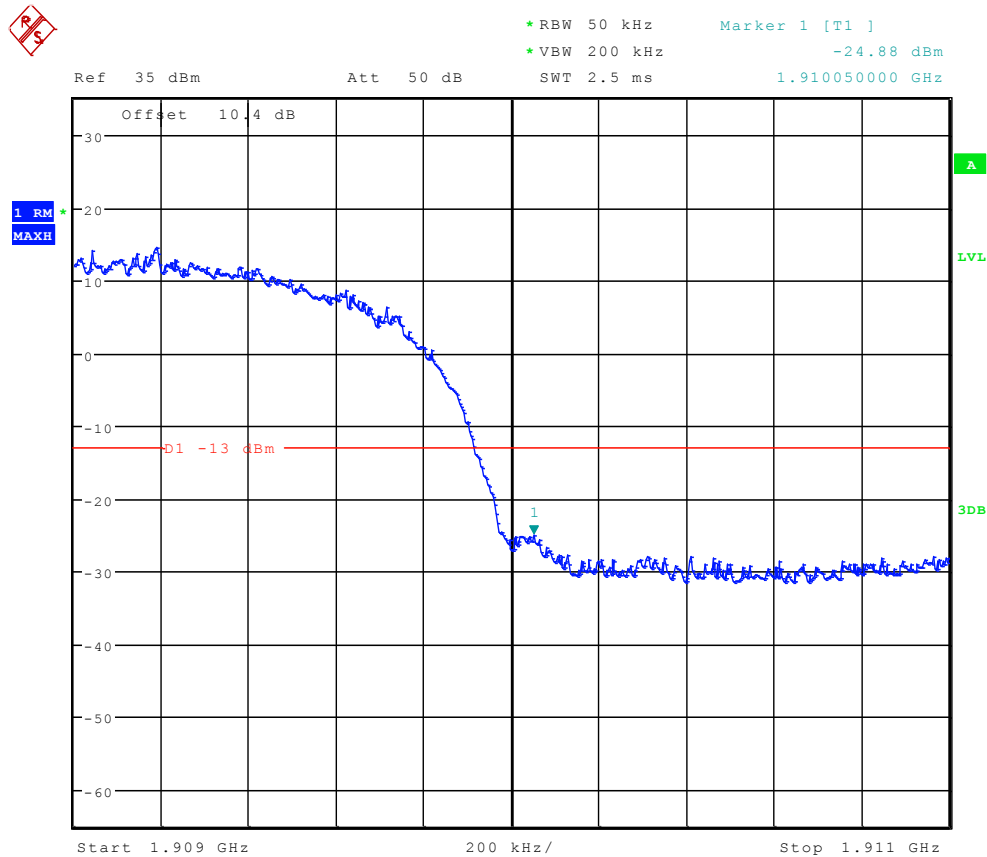
Left Edge

Channel 9262





Right Edge Channel 9538



The END



Appendix E

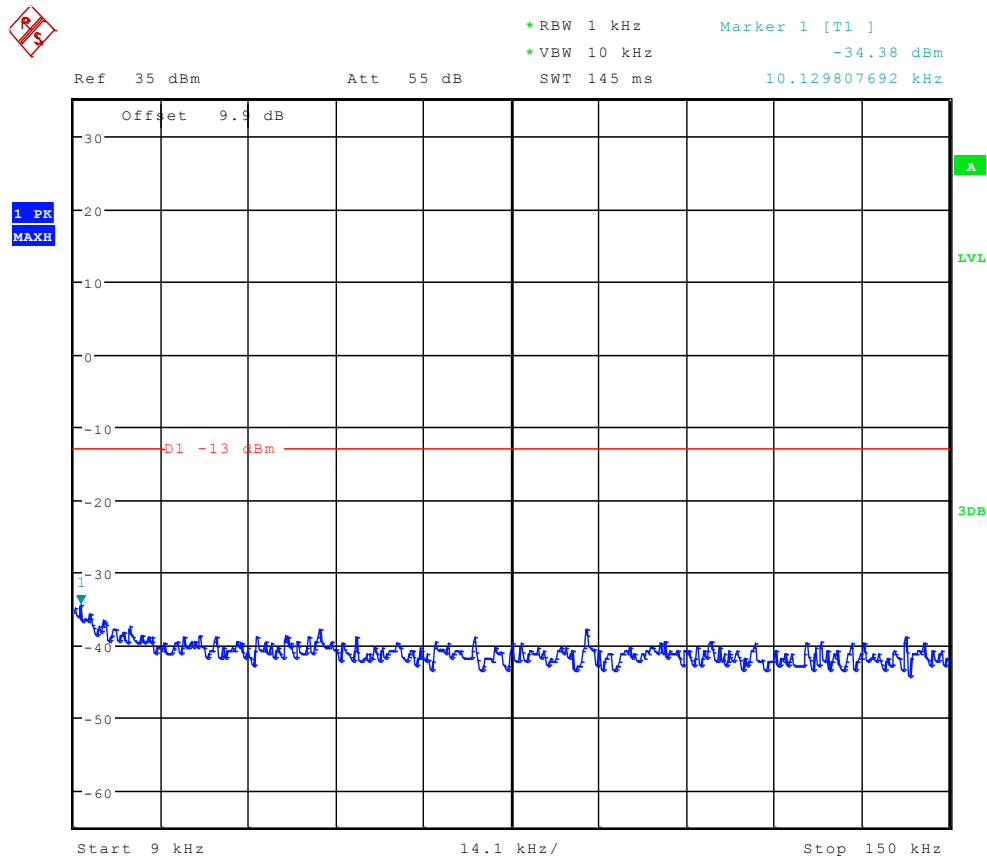
Spurious Emission at Antenna Terminal

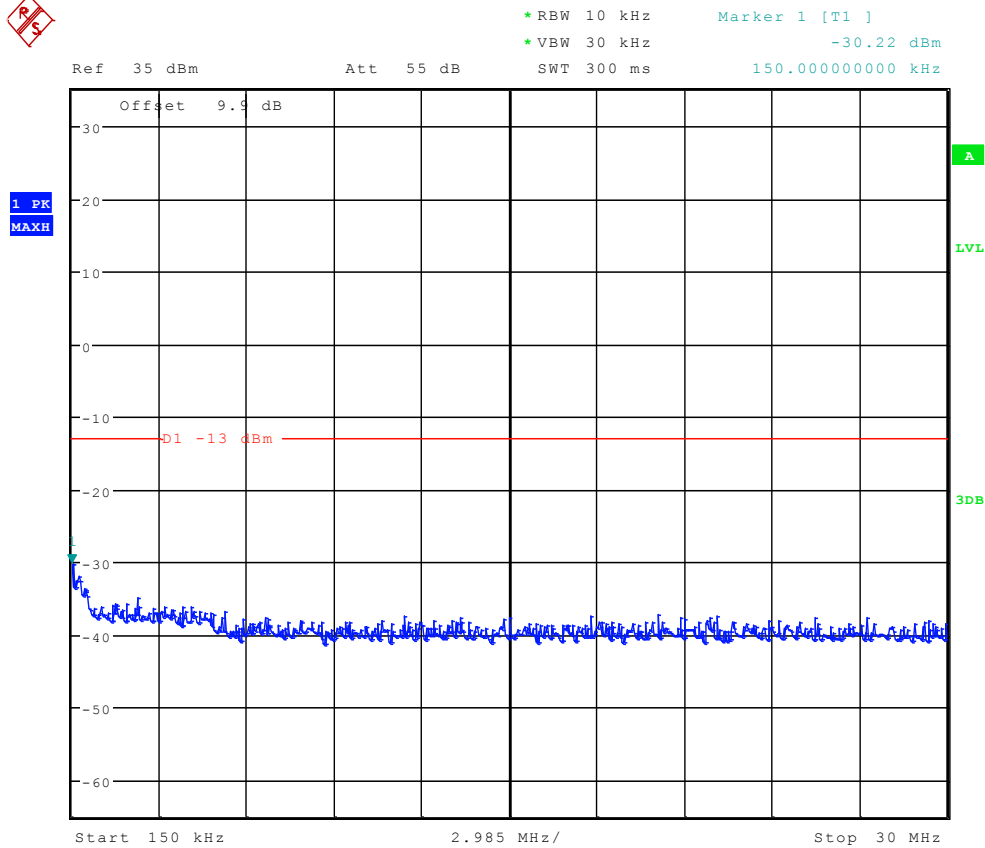
According to FCC Part 2.1051 & 24.238
& RSS-133

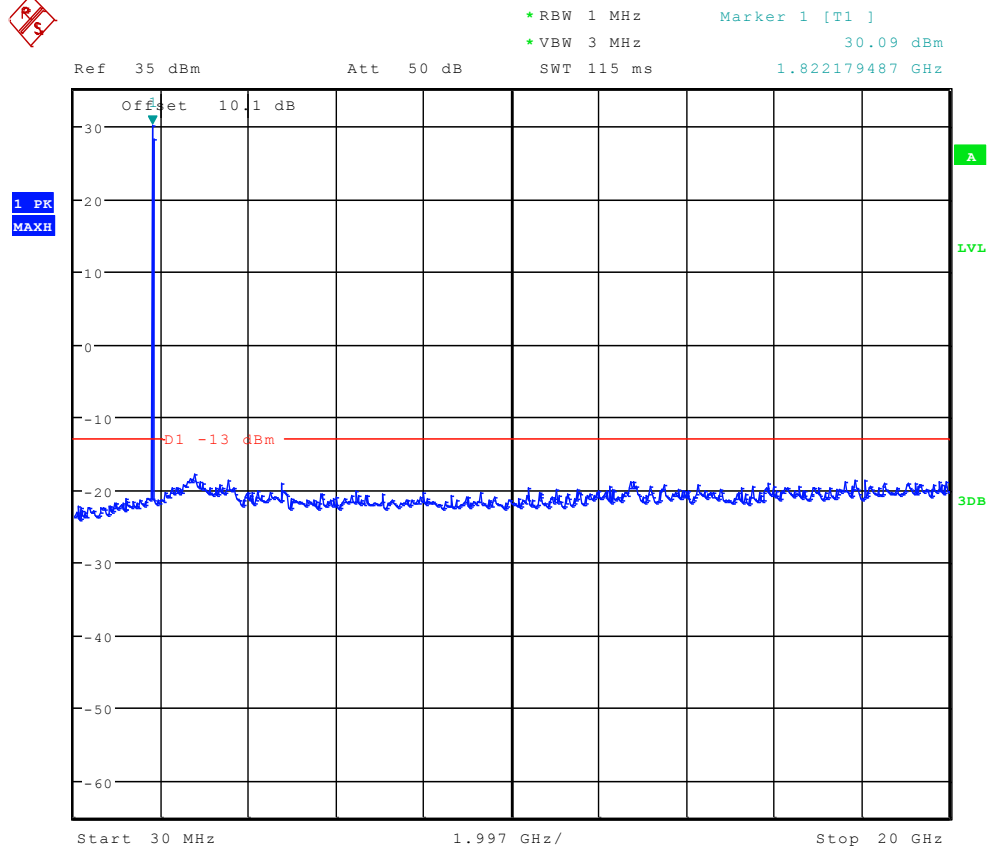


TM1:GPRS/GSM

Channel 512

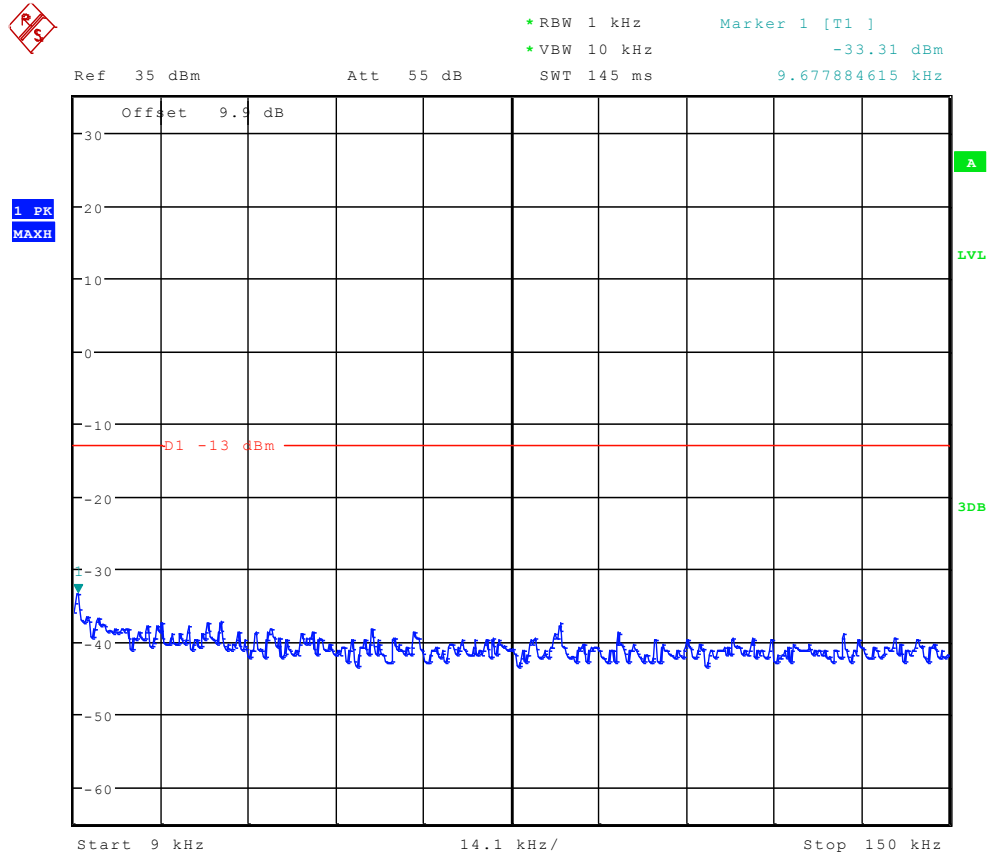


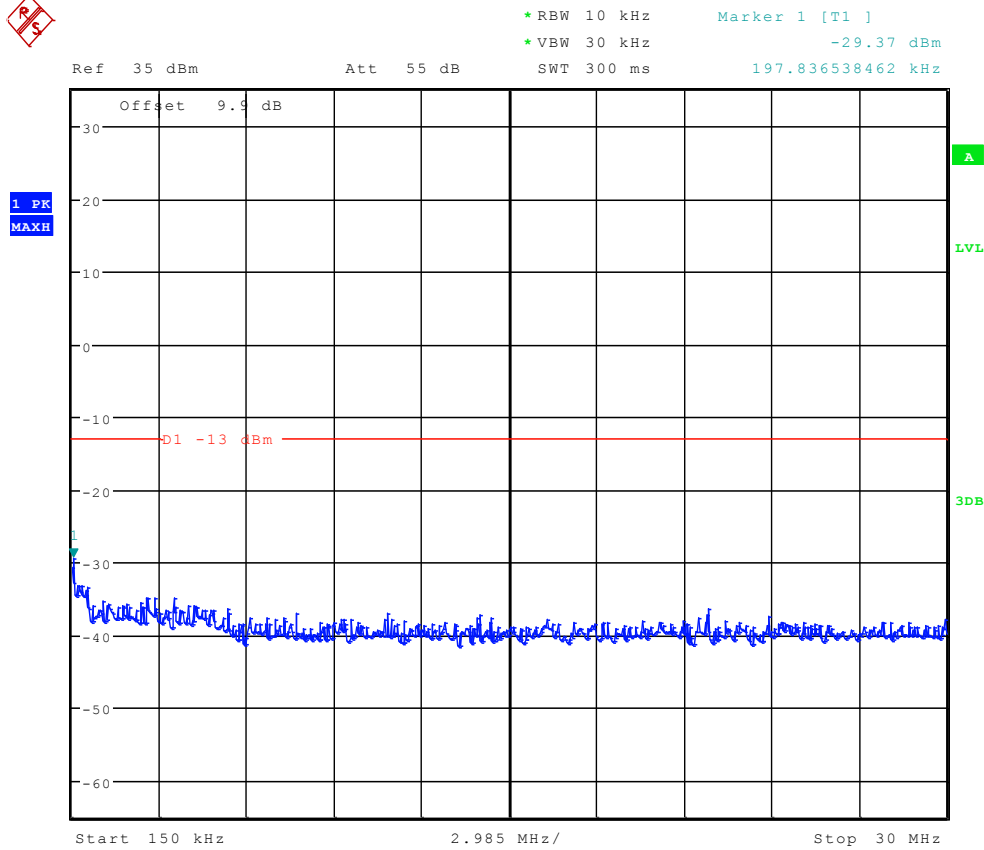


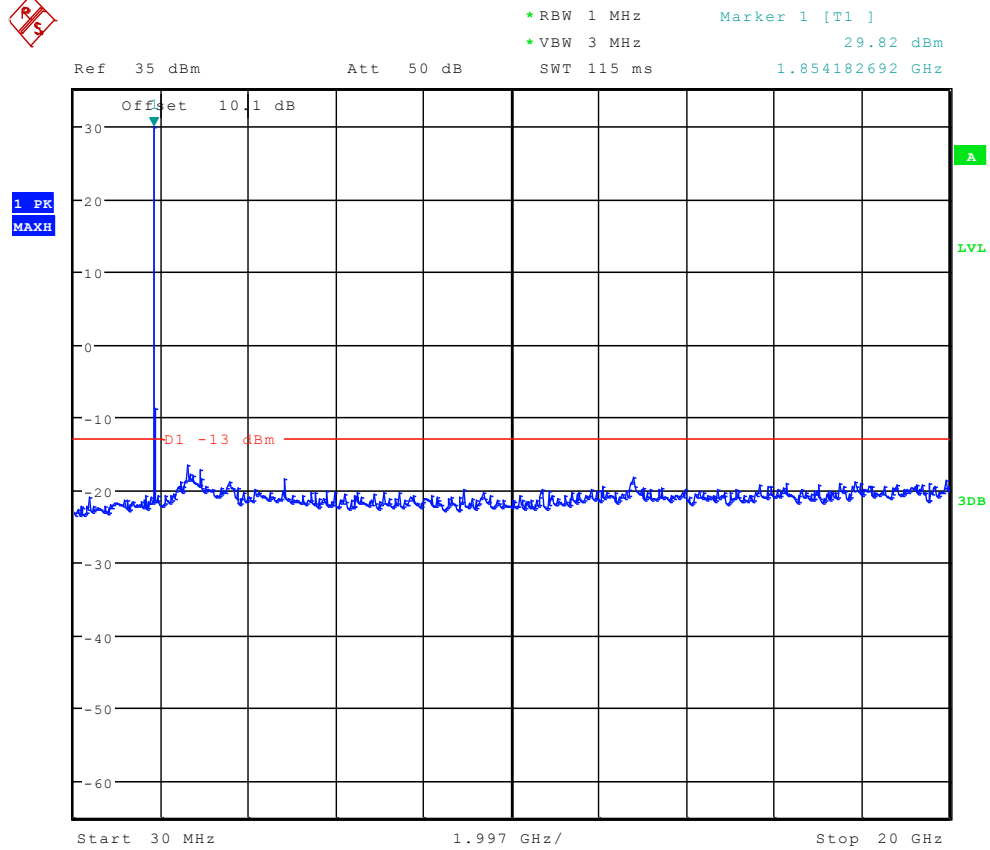




Channel 661

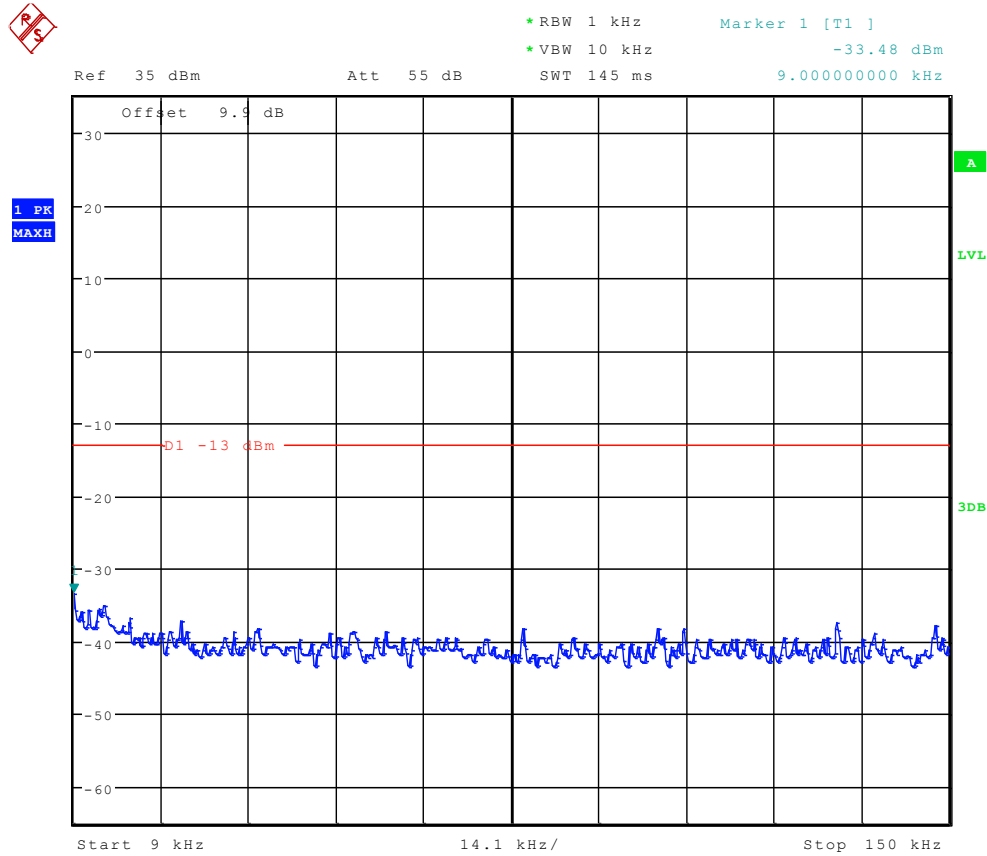


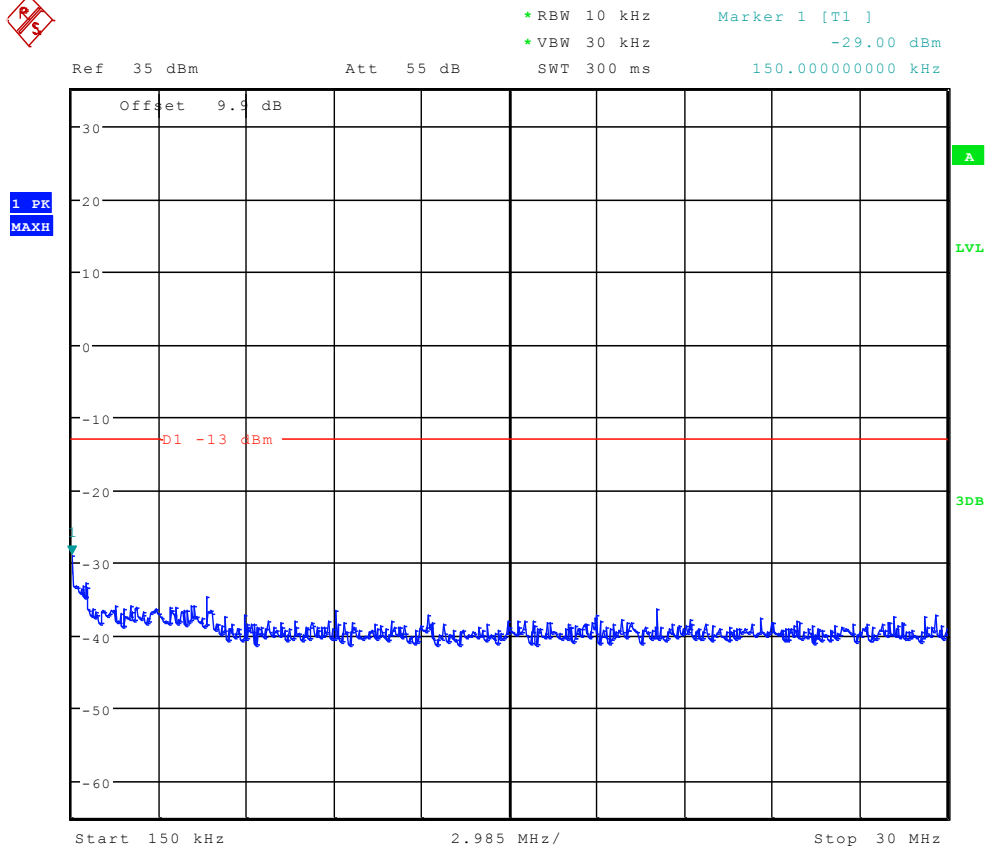


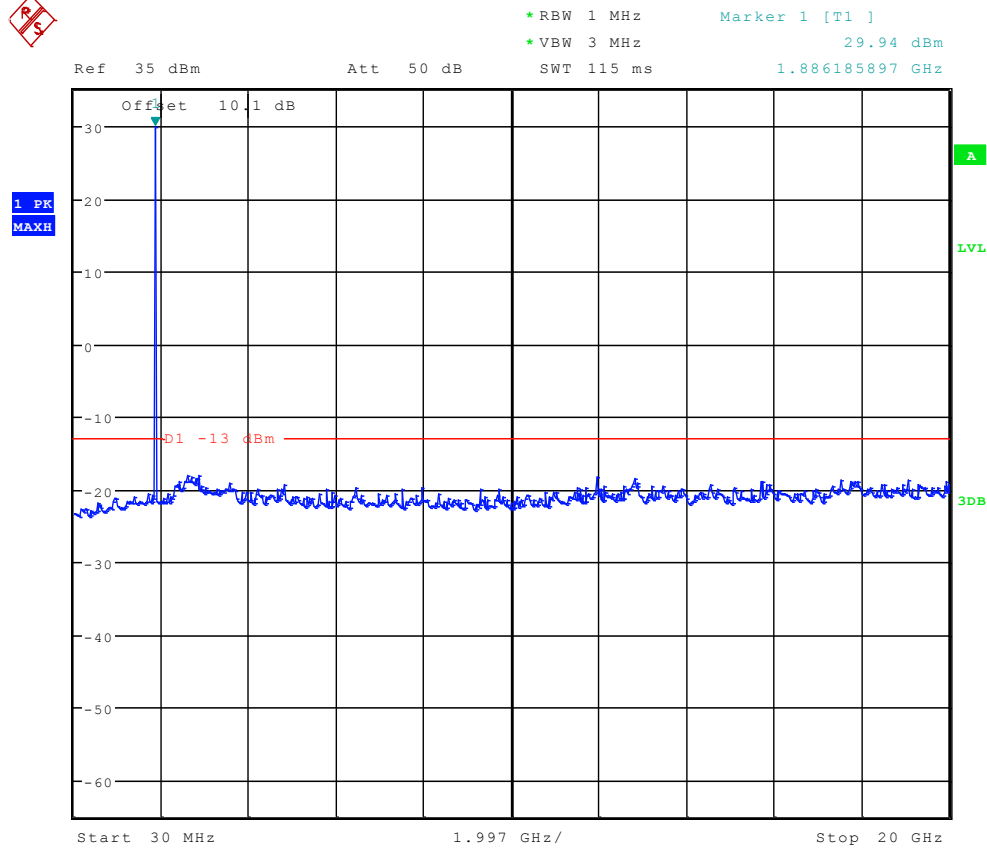




Channel 810

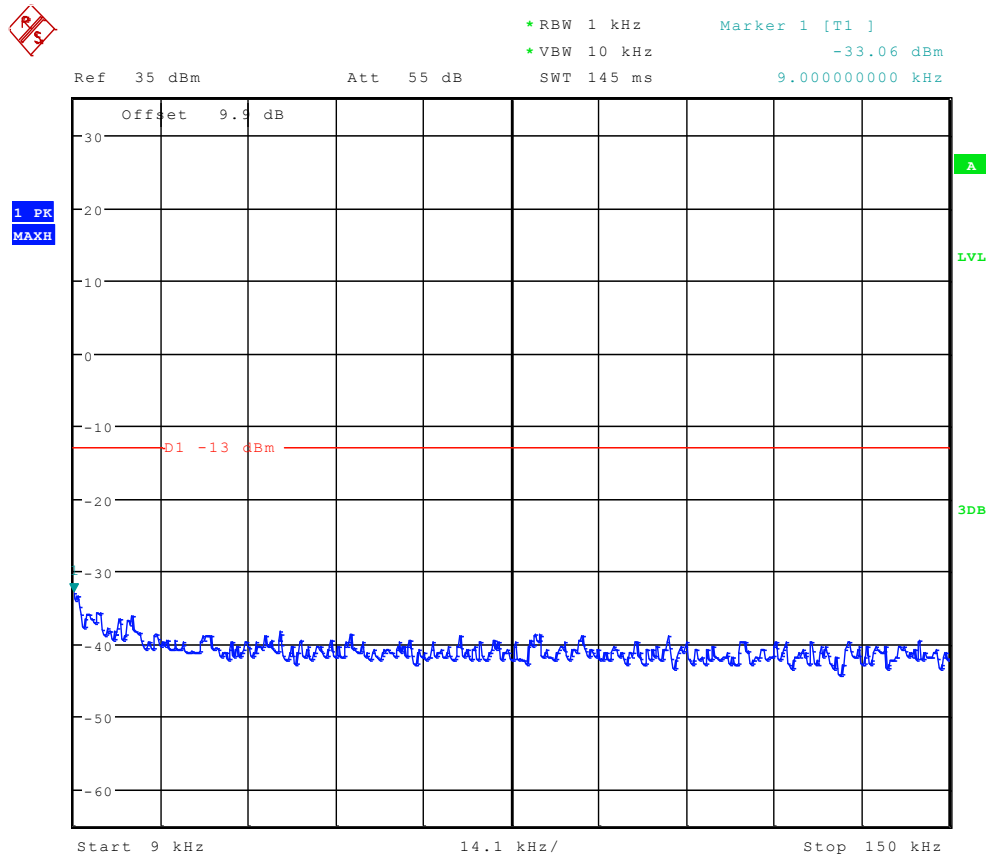


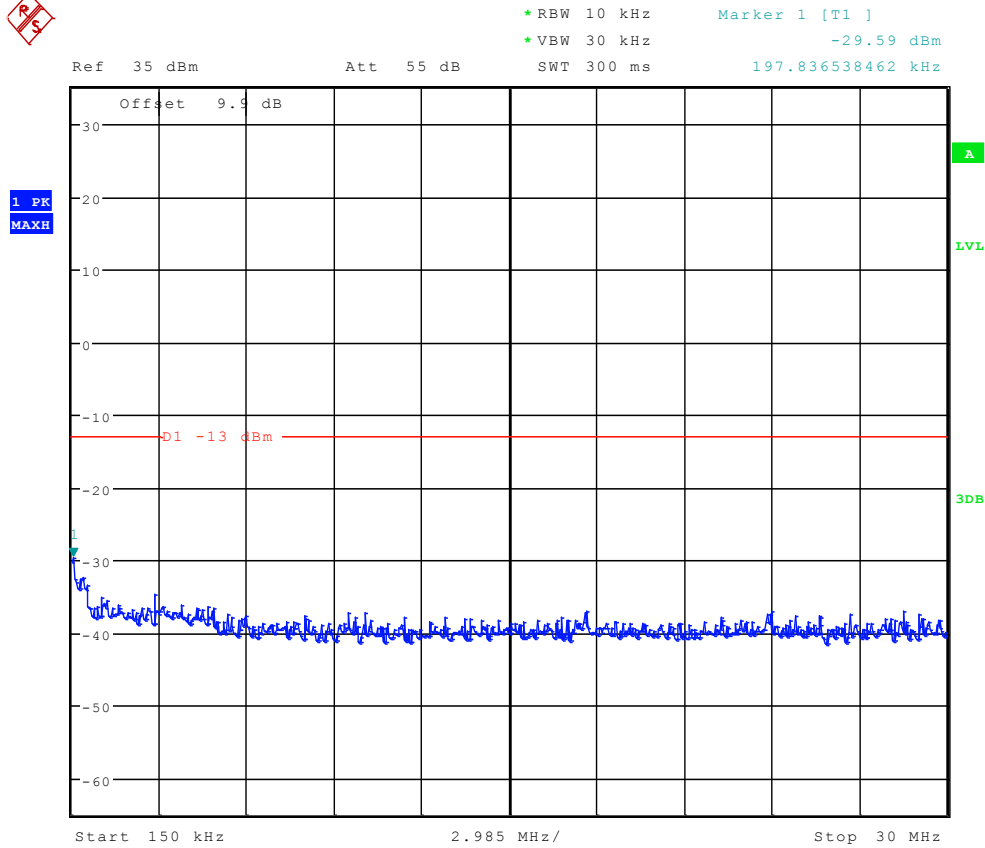


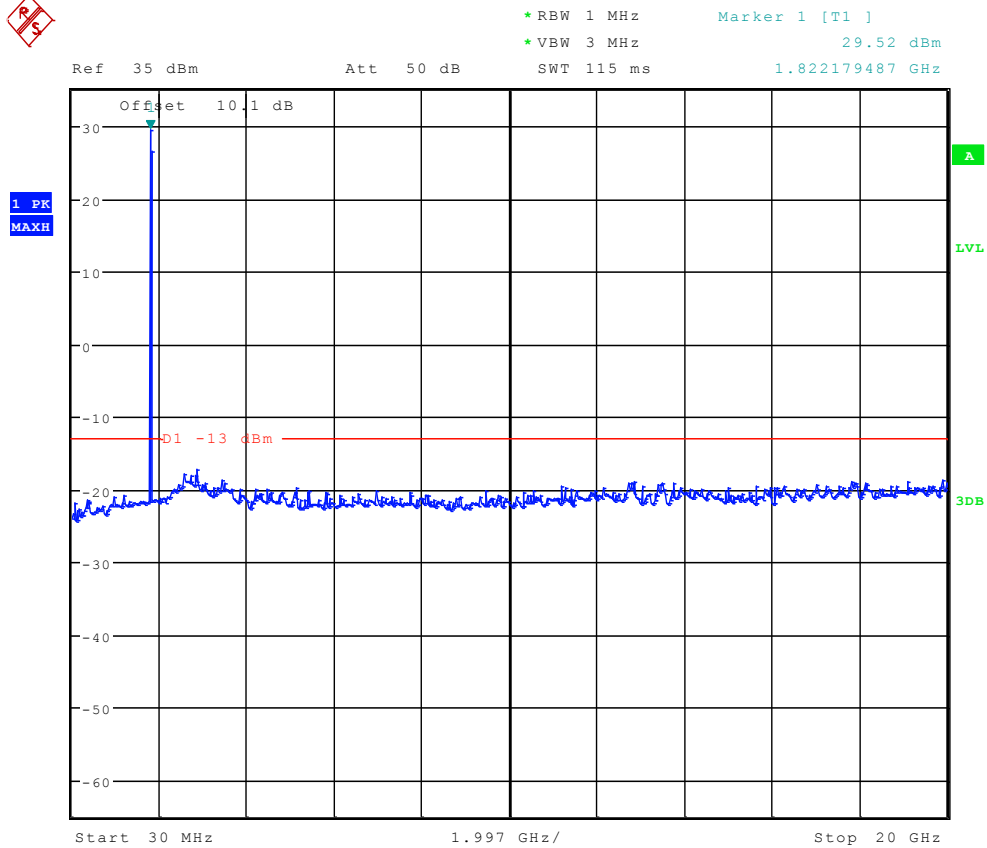




TM2:EDGE Channel 512

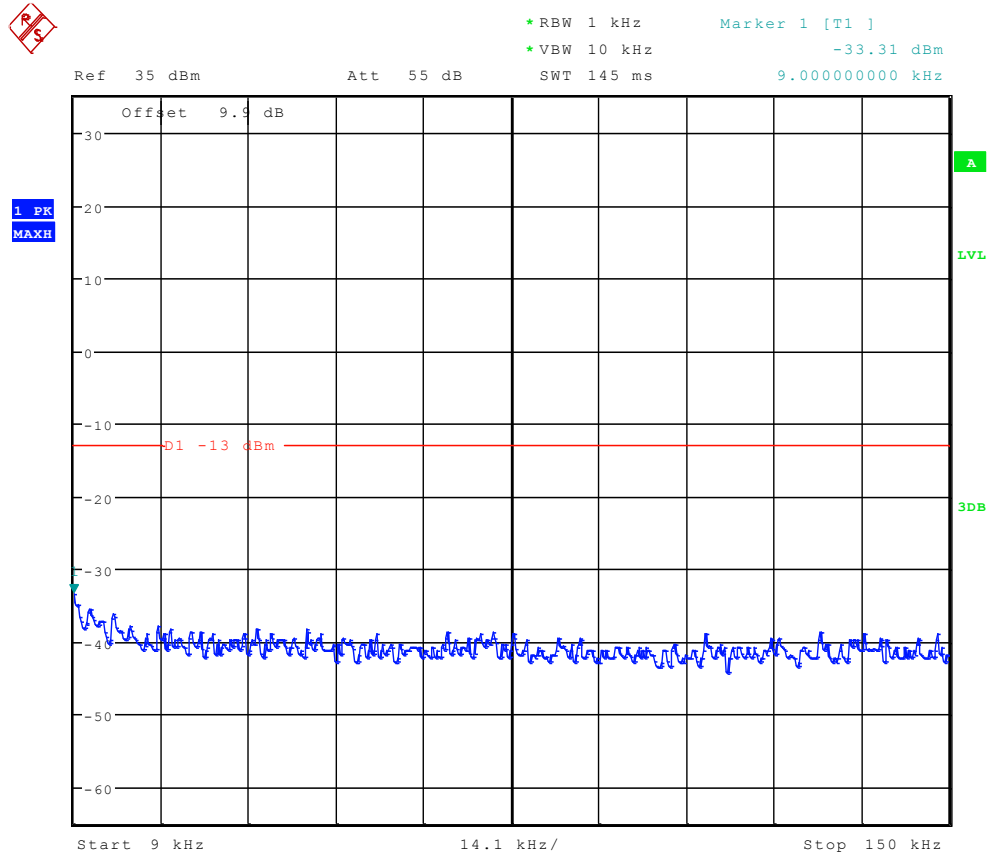


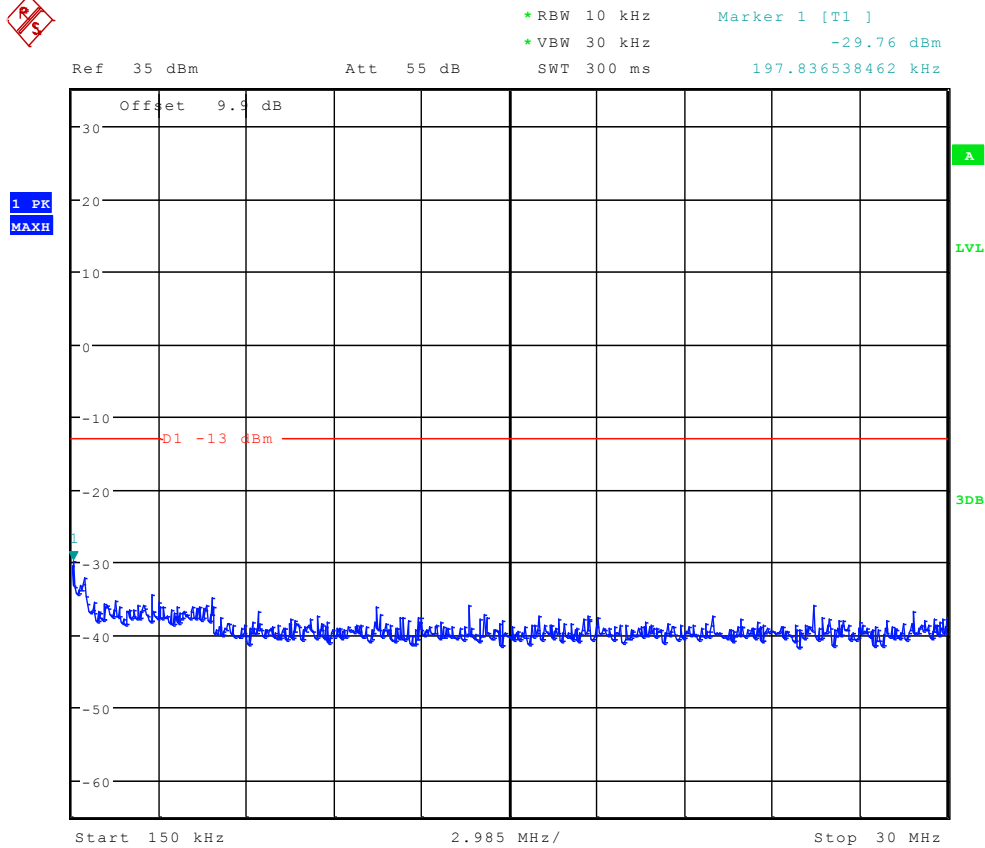


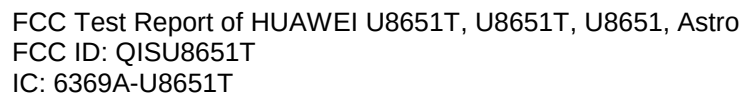




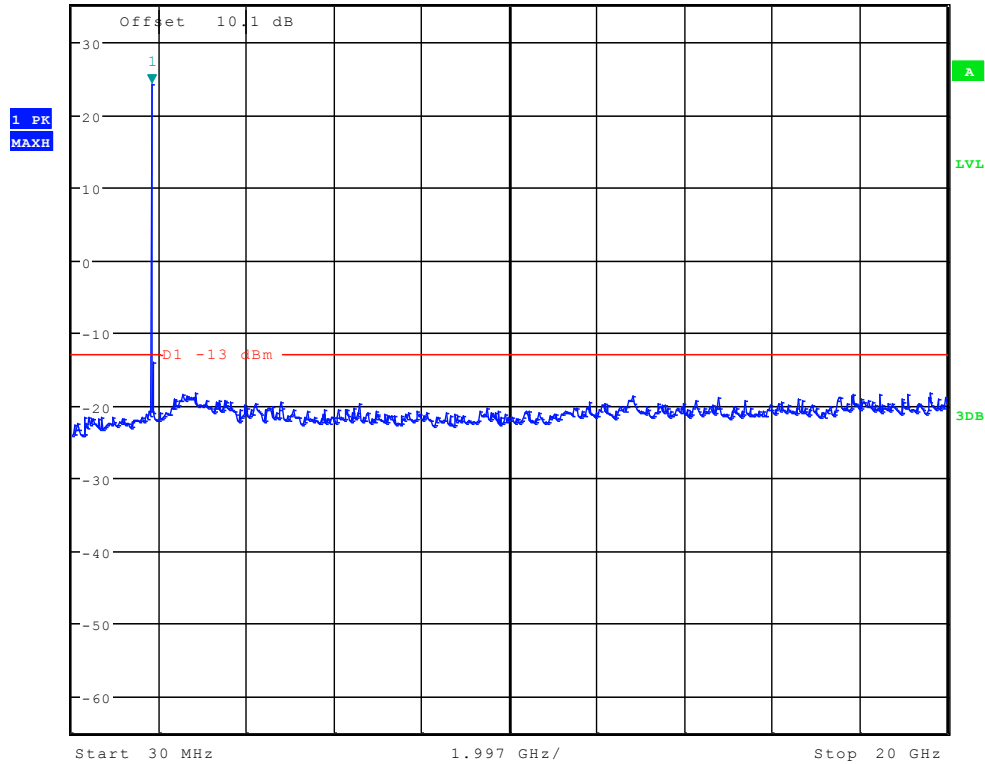
Channel 661





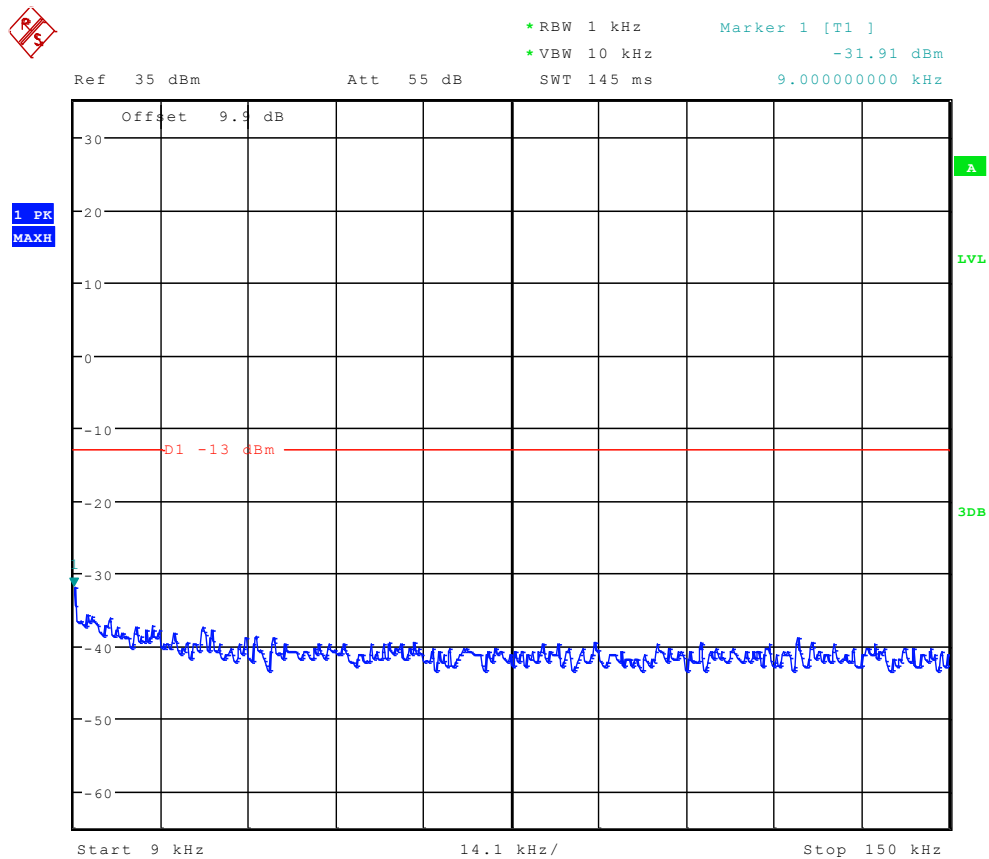


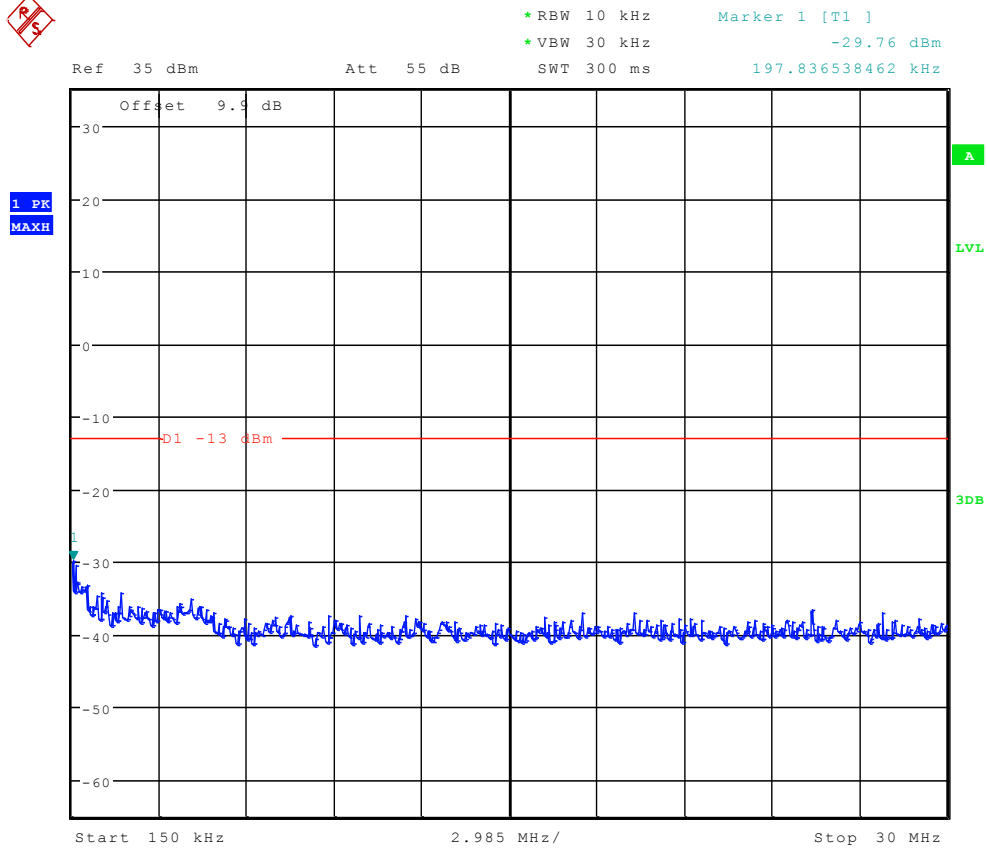
Ref	35 dBm	Att	50 dB	SWT	115 ms	1.854182692 GHz
-----	--------	-----	-------	-----	--------	-----------------

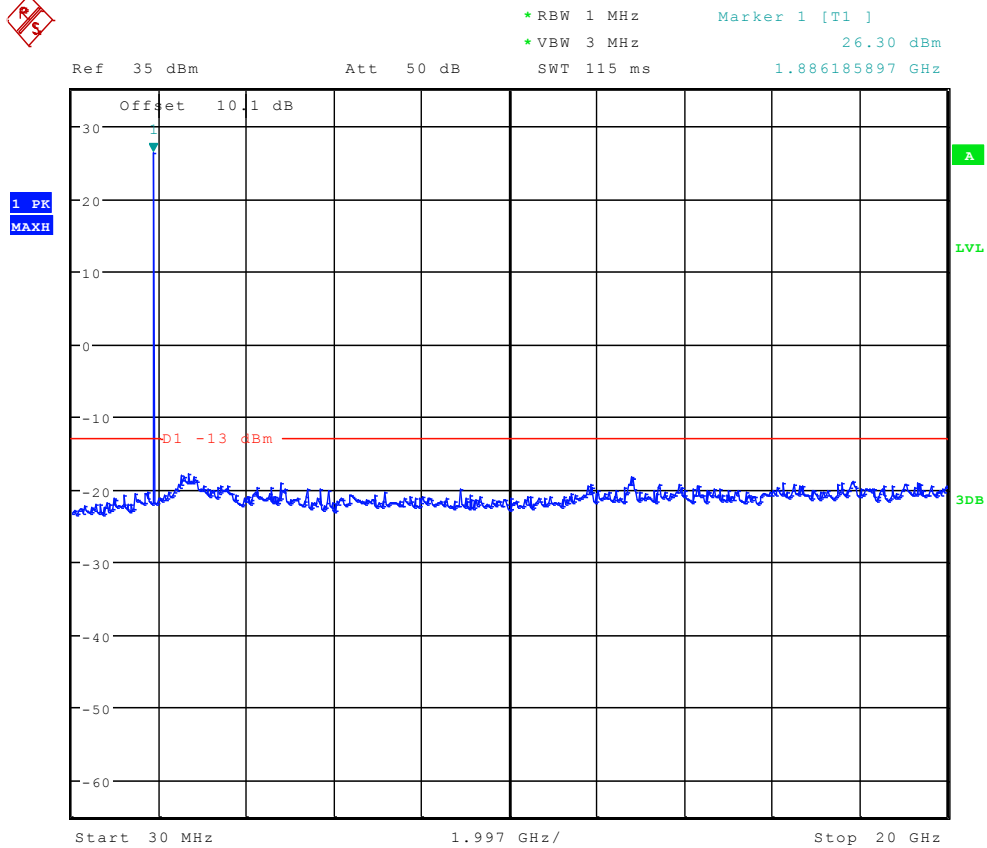




Channel 810



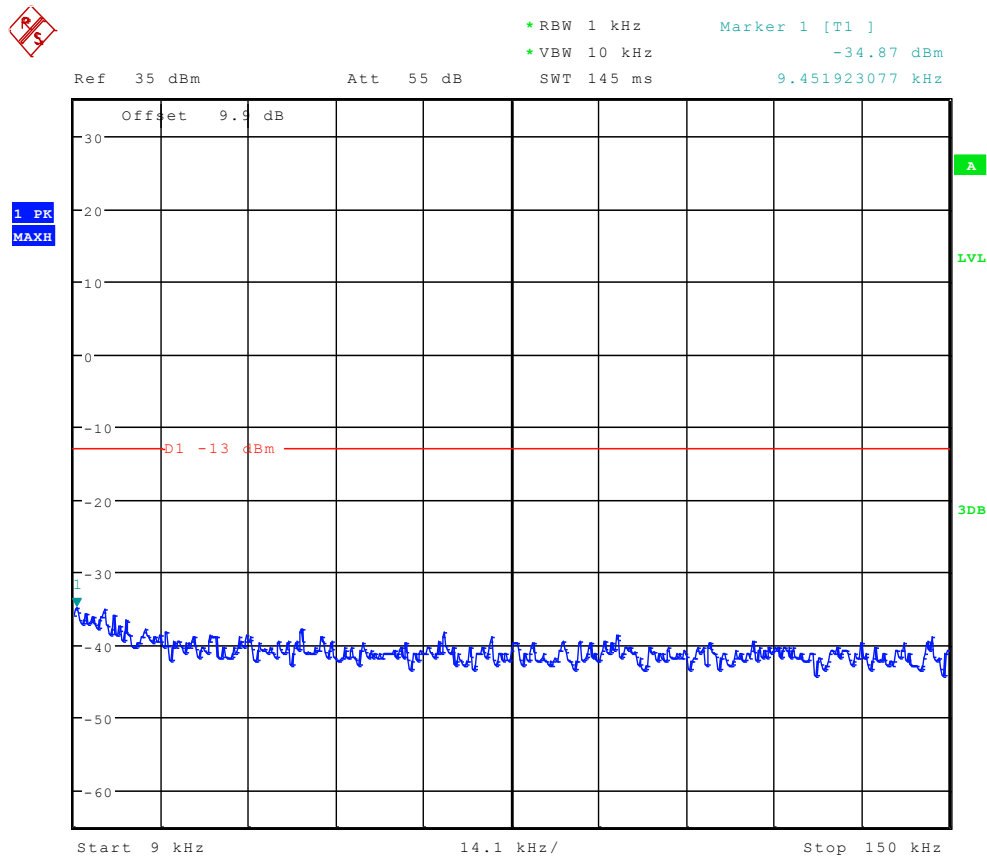


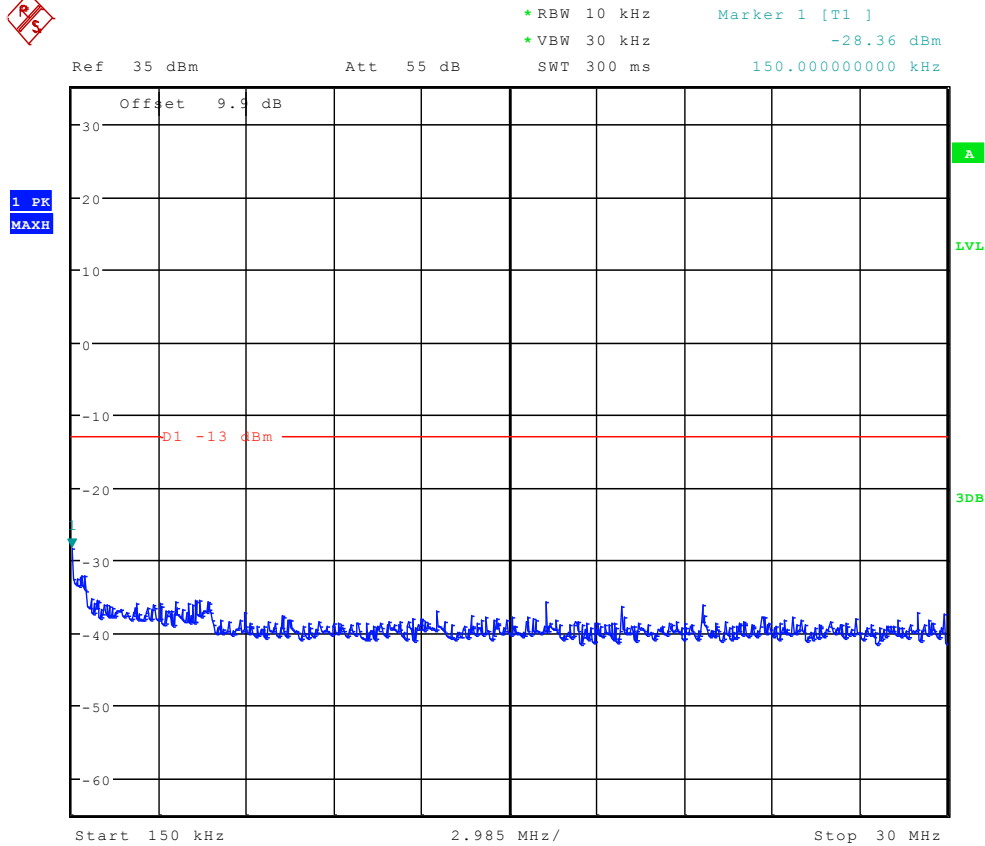


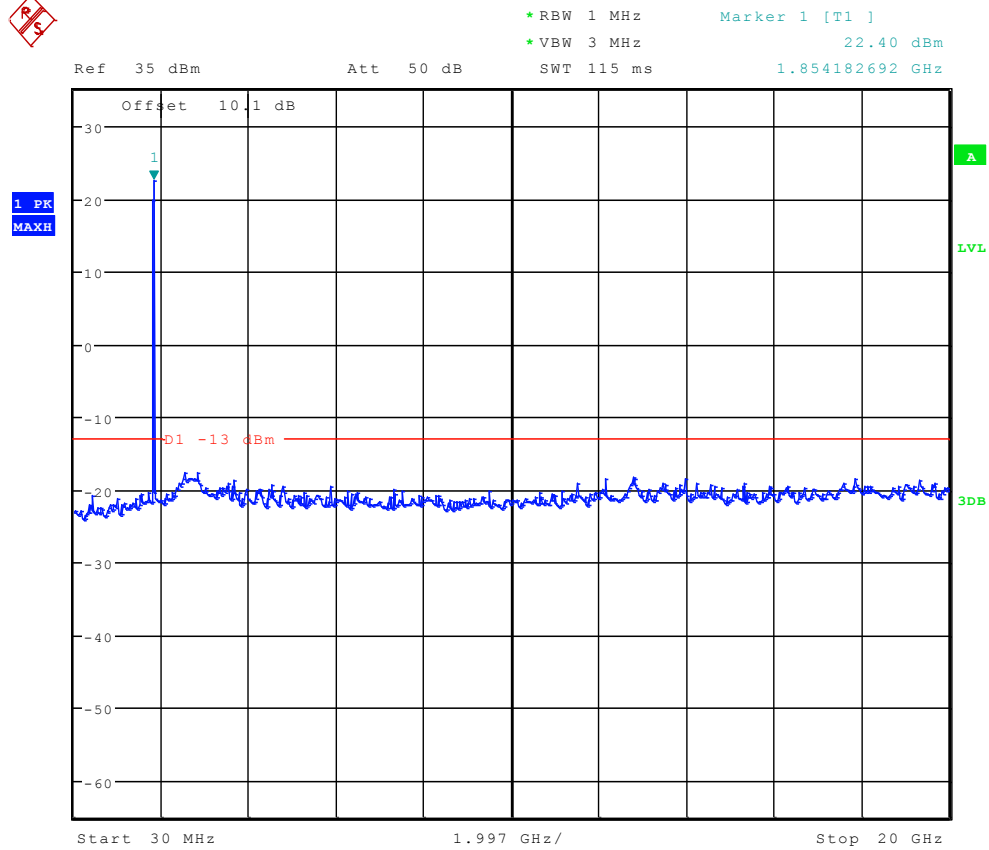


TM3: WCDMA

Channel 9262

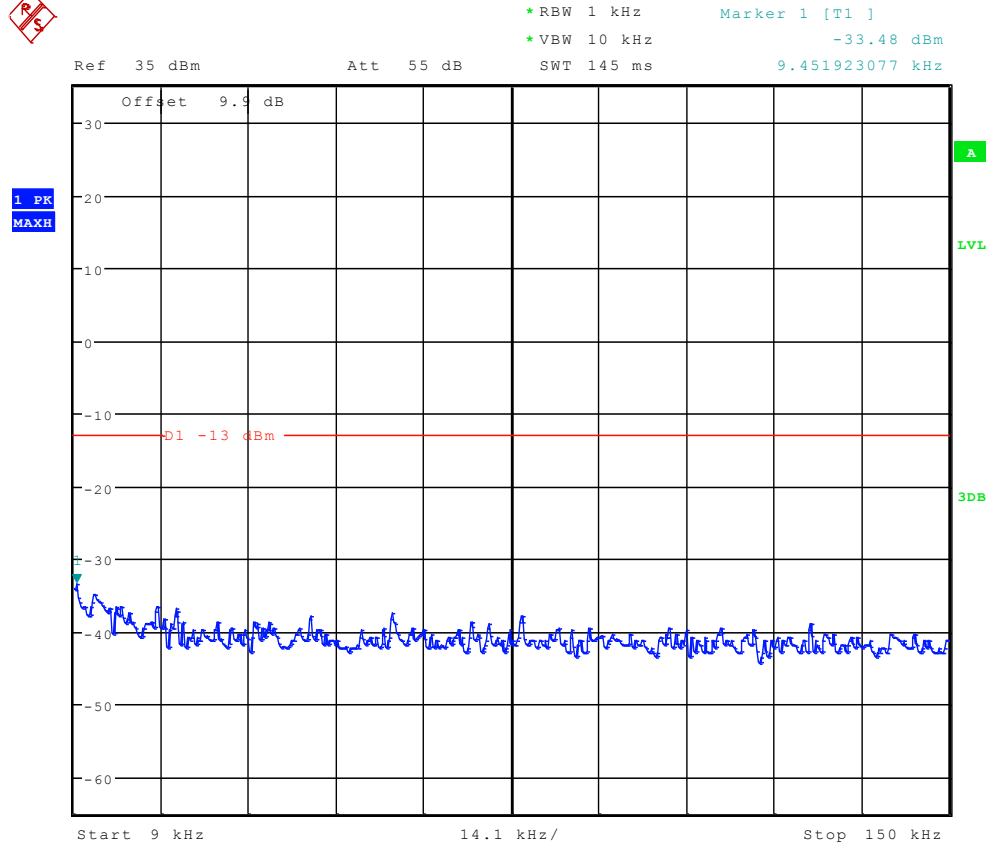


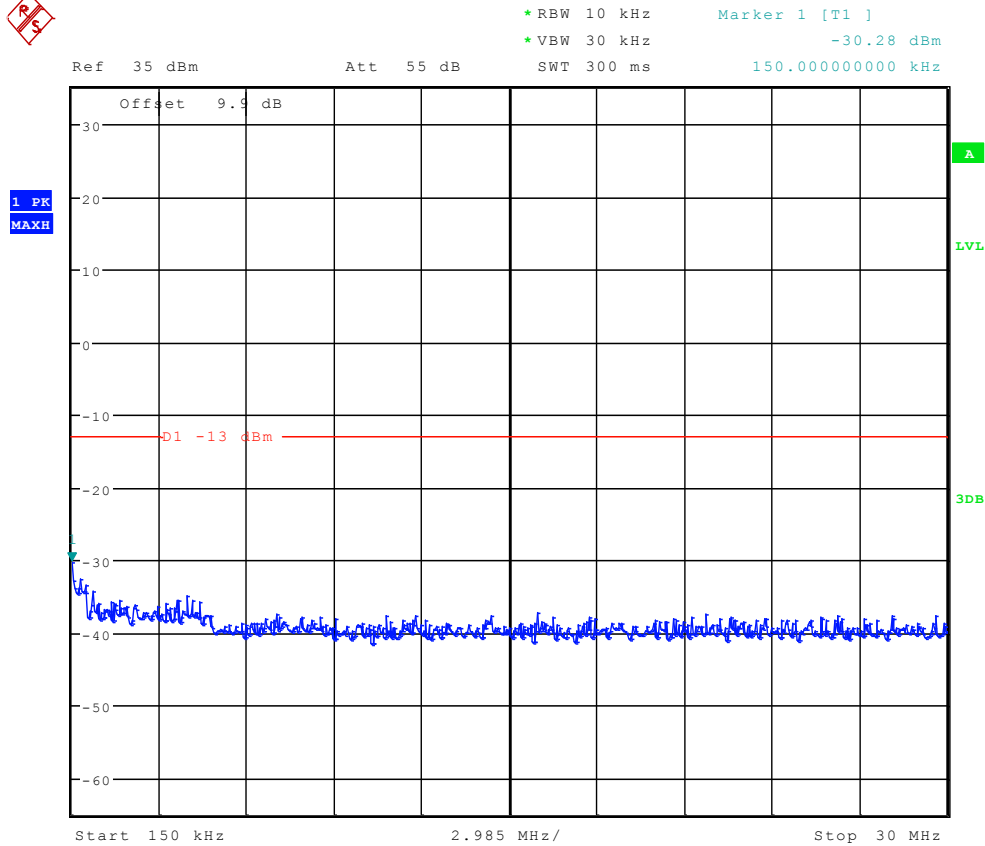


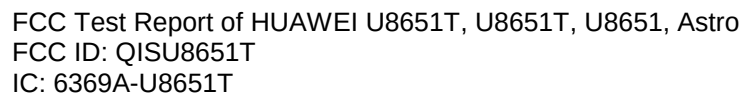




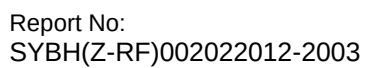
Channel 9400





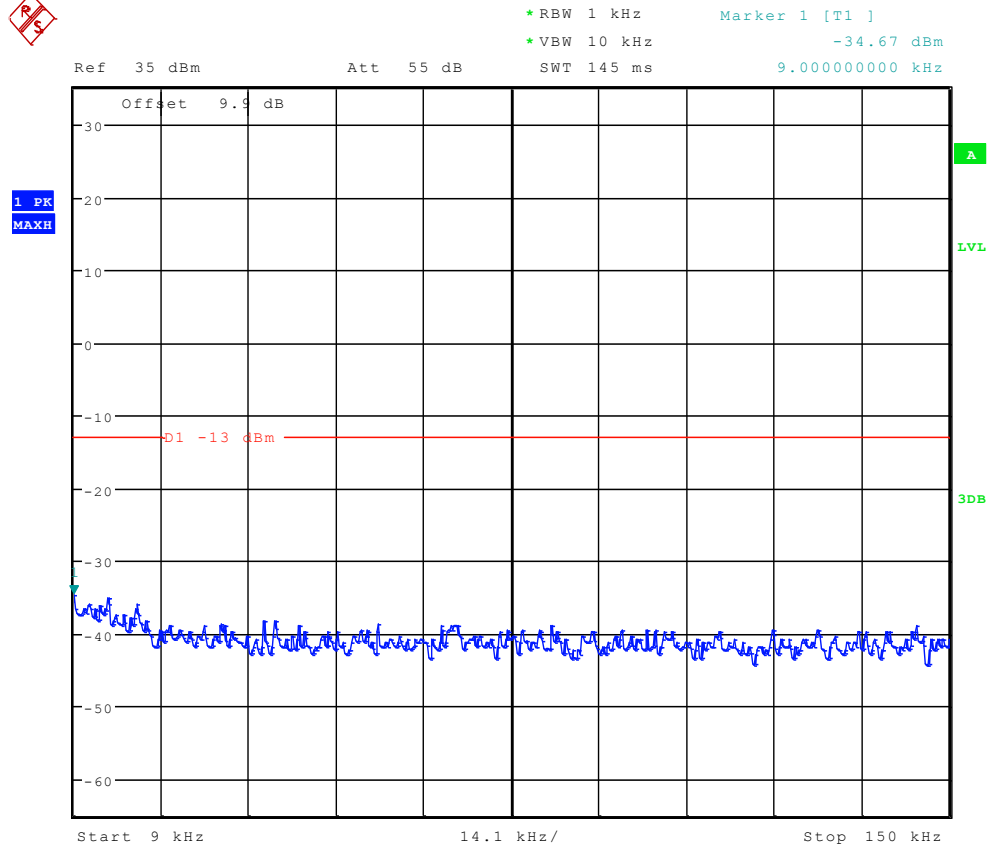


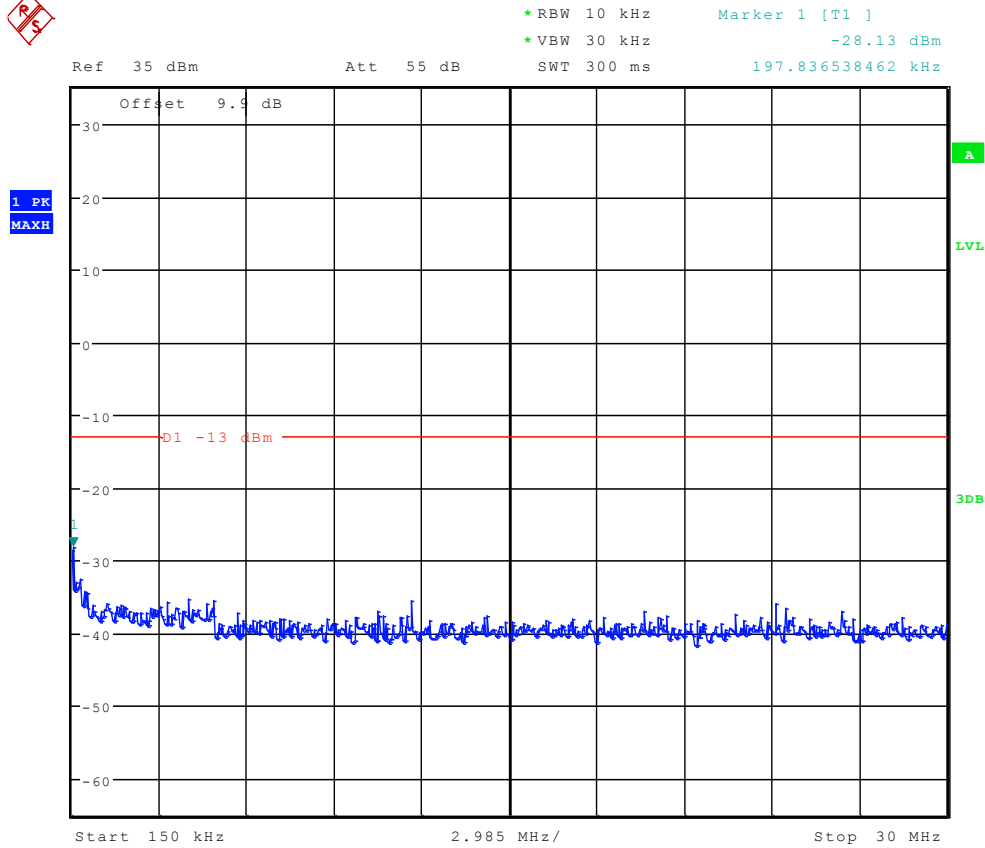
Ref	35 dBm	Att	50 dB	SWT	115 ms	1.854182692 GHz
-----	--------	-----	-------	-----	--------	-----------------

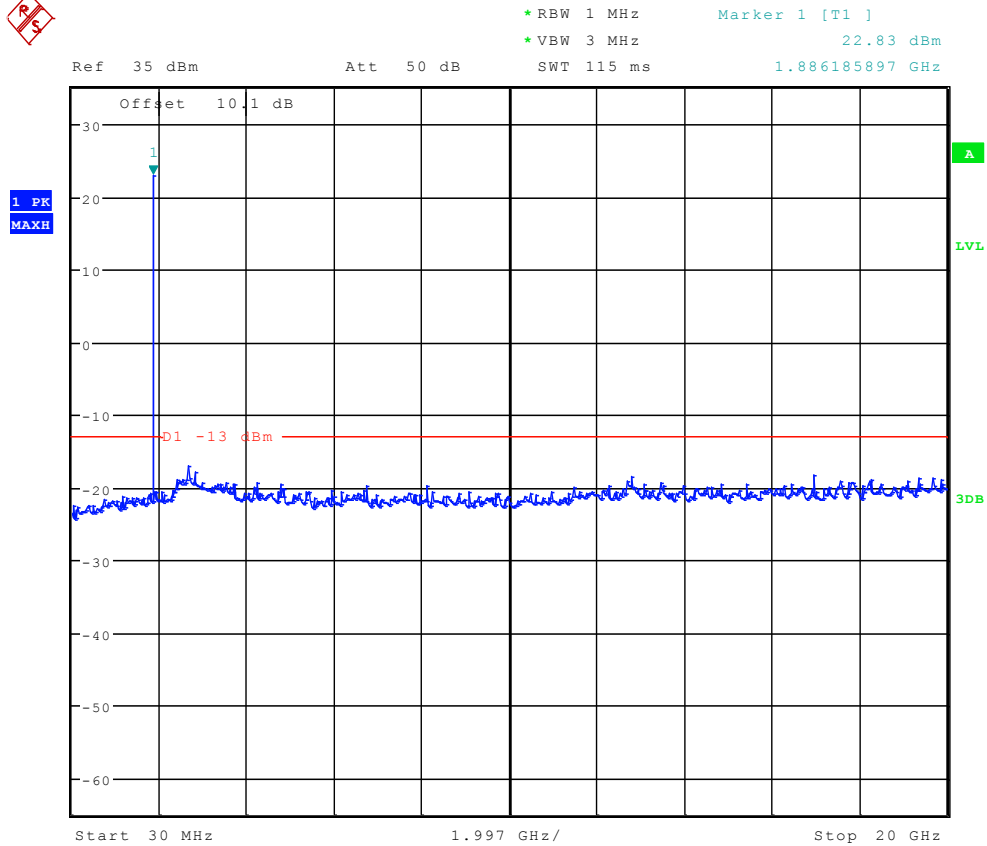




Channel 9538







The END



AppendixF

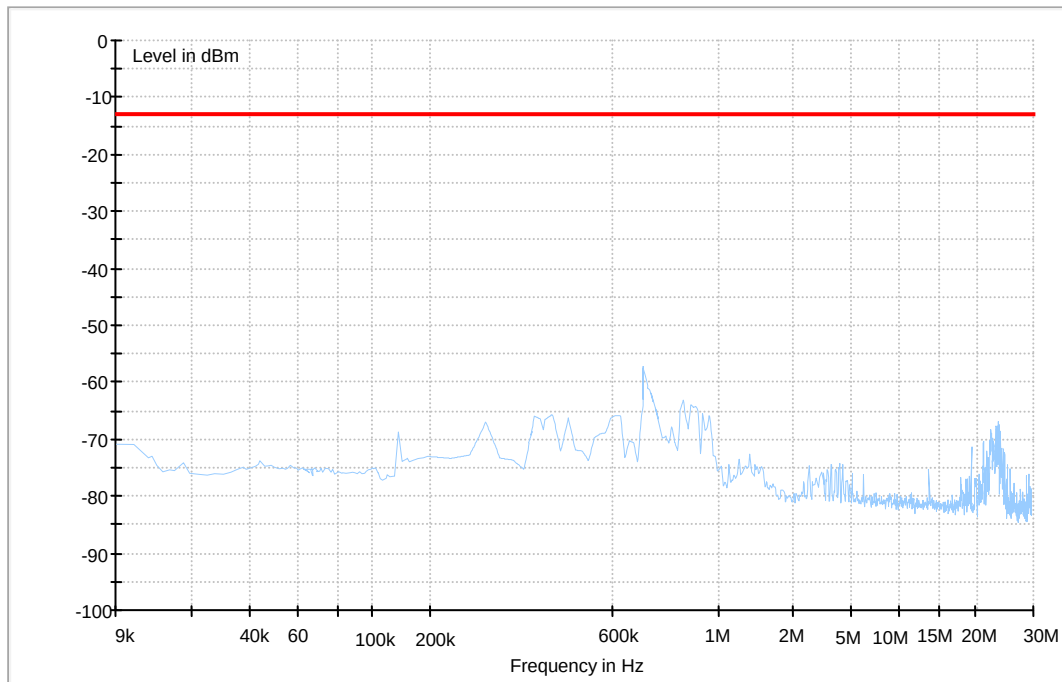
Field Strength of Spurious Emissions

According to FCC Part 2.1053 & Part24.238
& RSS-133



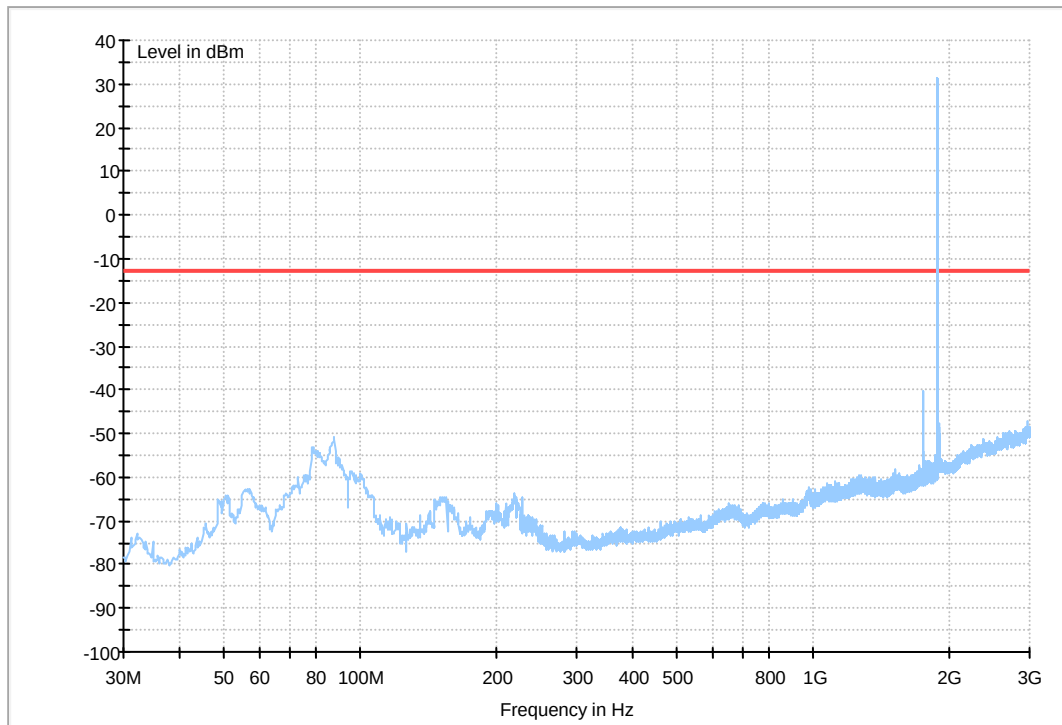
GSM 1900

Traffic Mode (9kHz-30MHz)



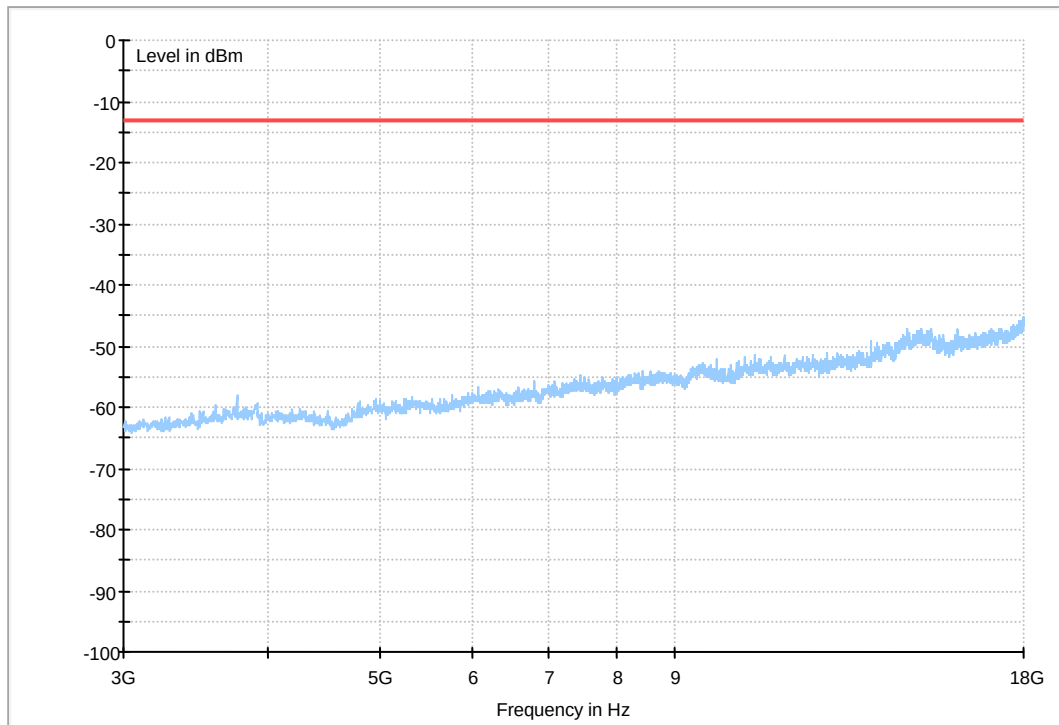


Traffic Mode (30MHz-3GHz)



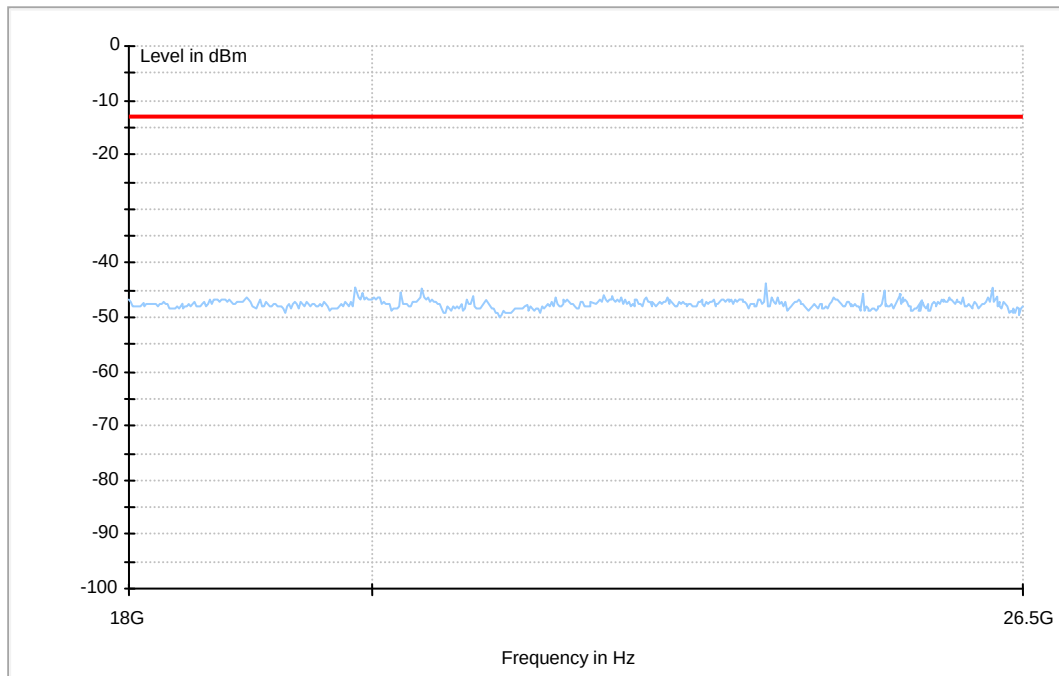


Traffic Mode (3GHz-18GHz)





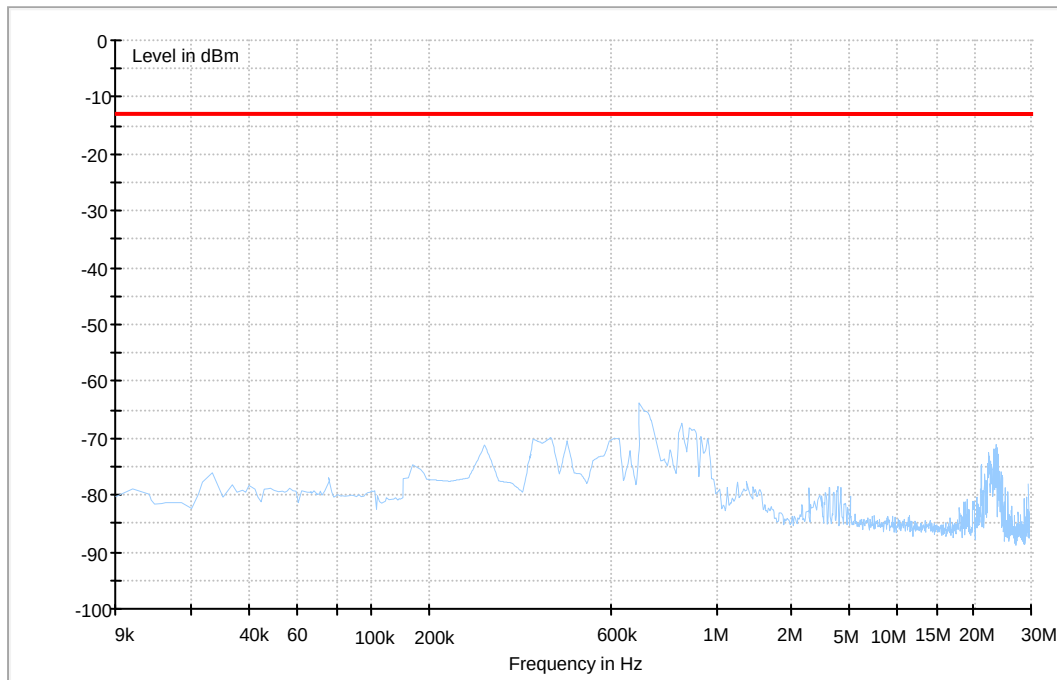
Traffic Mode (18GHz-26.5GHz)





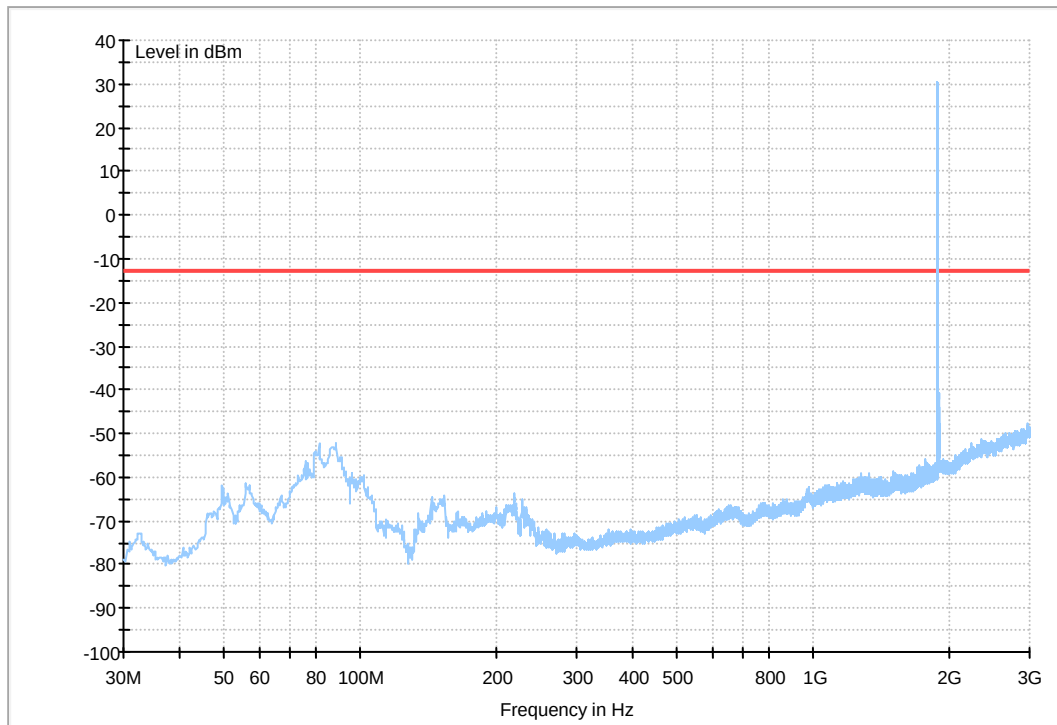
GPRS1900

Traffic Mode (9kHz-30MHz)



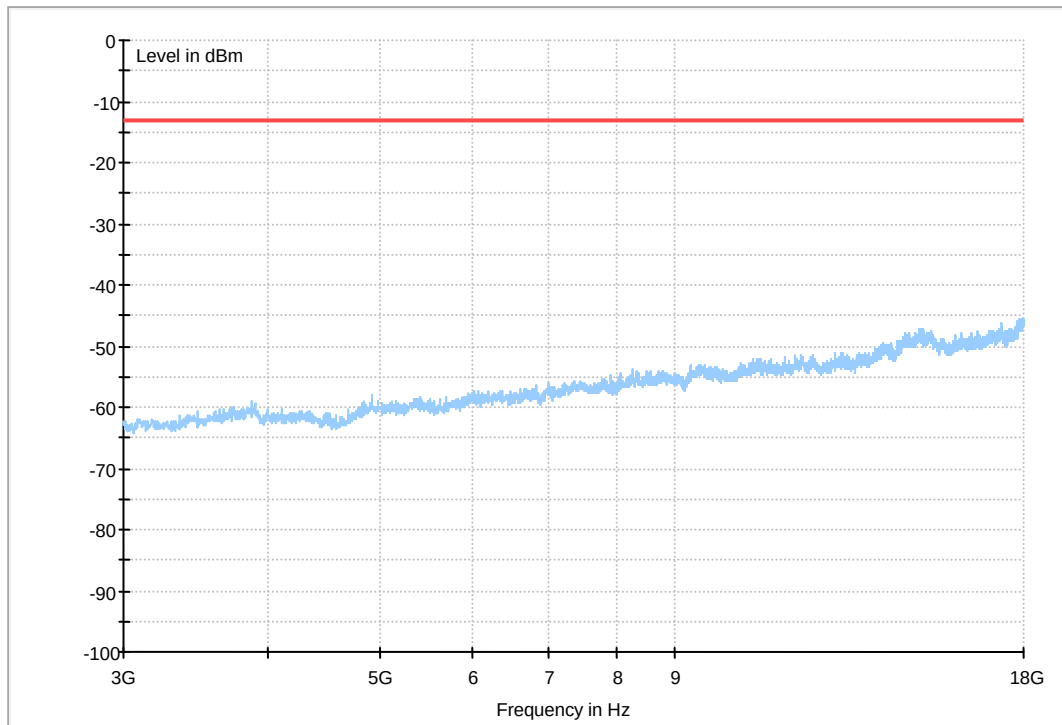


Traffic Mode (30MHz-3GHz)



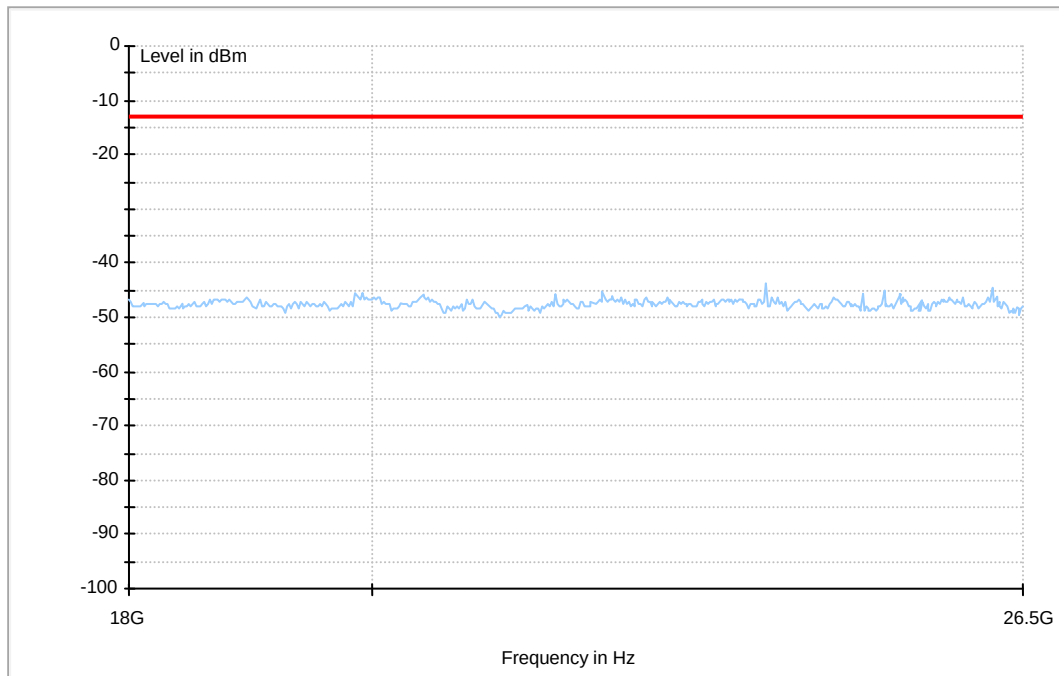


Traffic Mode (3GHz-18GHz)





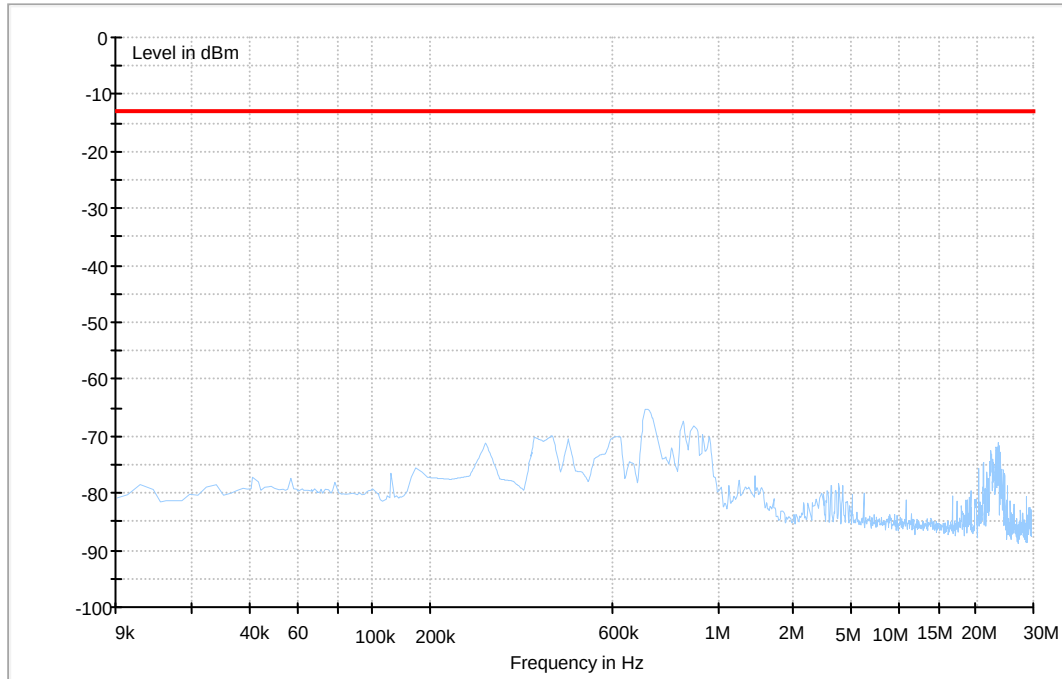
Traffic Mode (18GHz-26.5GHz)





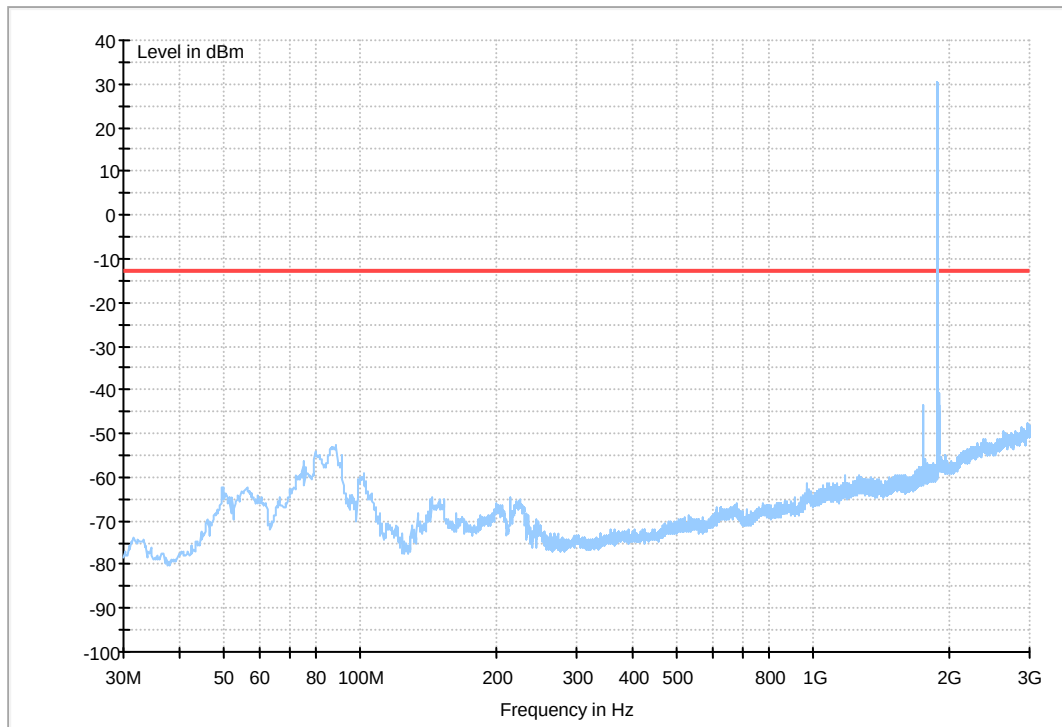
EDGE 1900

Traffic Mode (9kHz-30MHz)



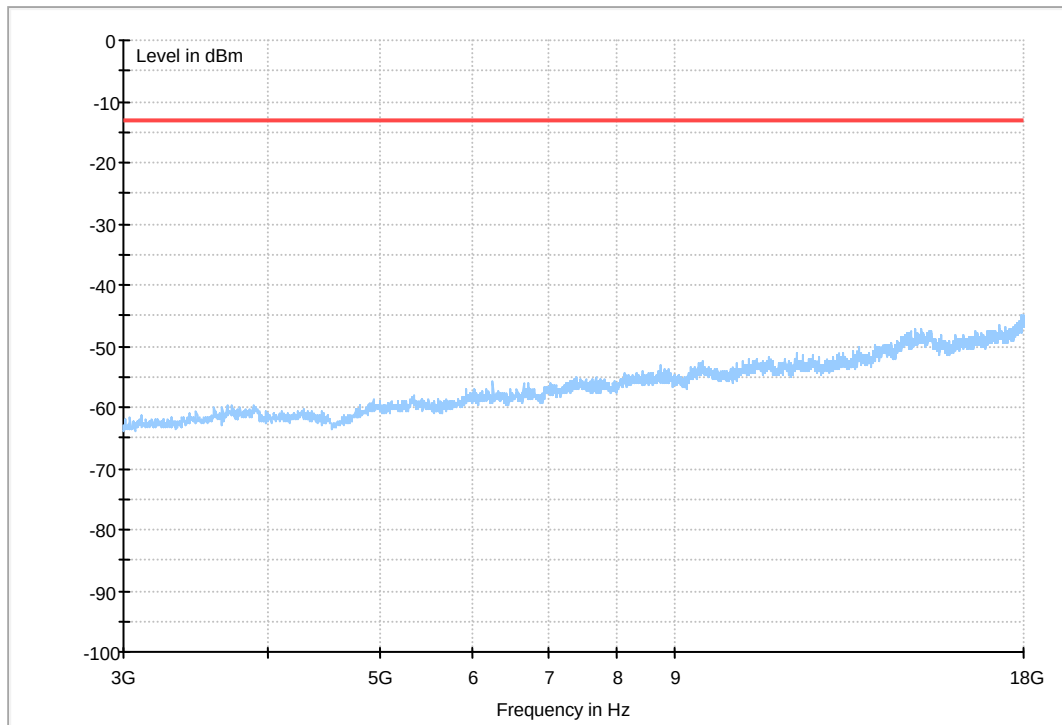


Traffic Mode (30MHz-3GHz)



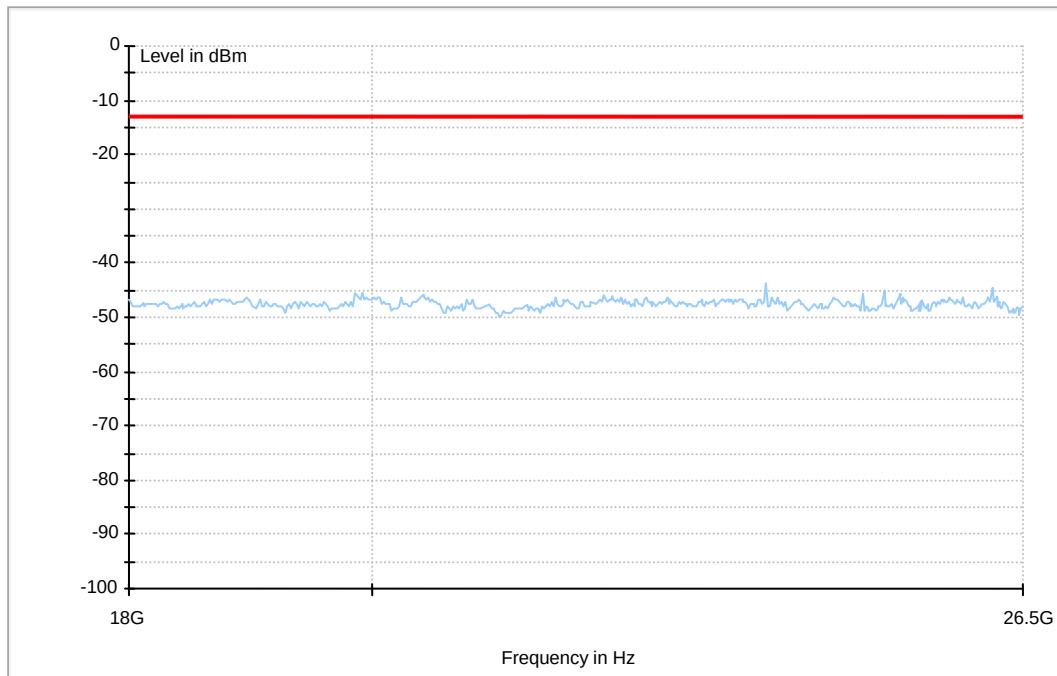


Traffic Mode (3GHz-18GHz)





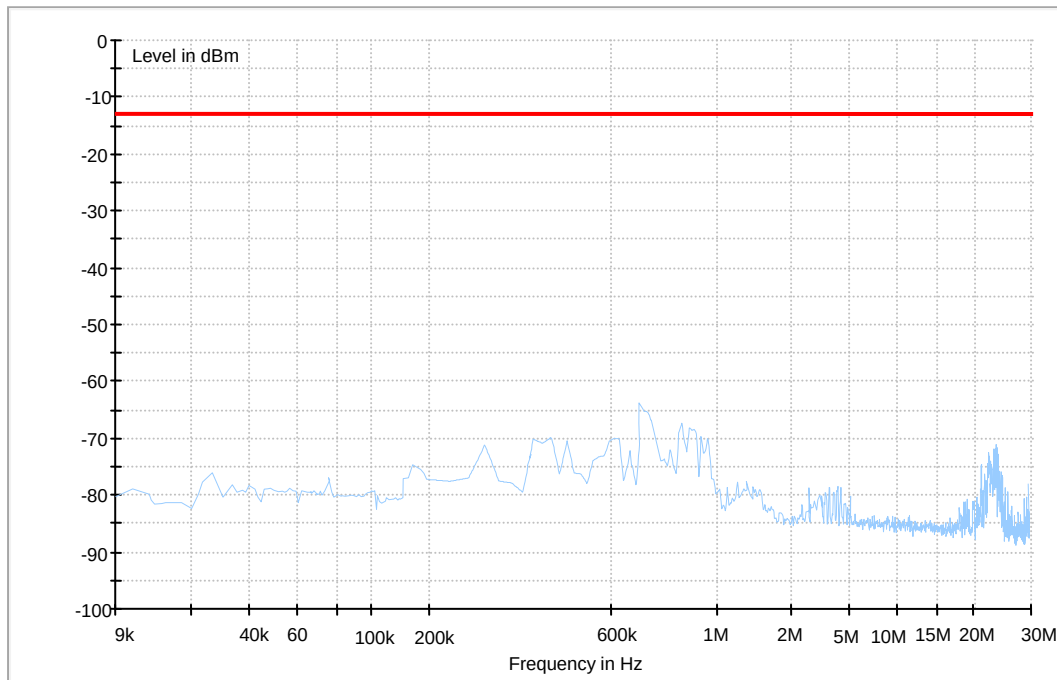
Traffic Mode (18GHz-26.5GHz)





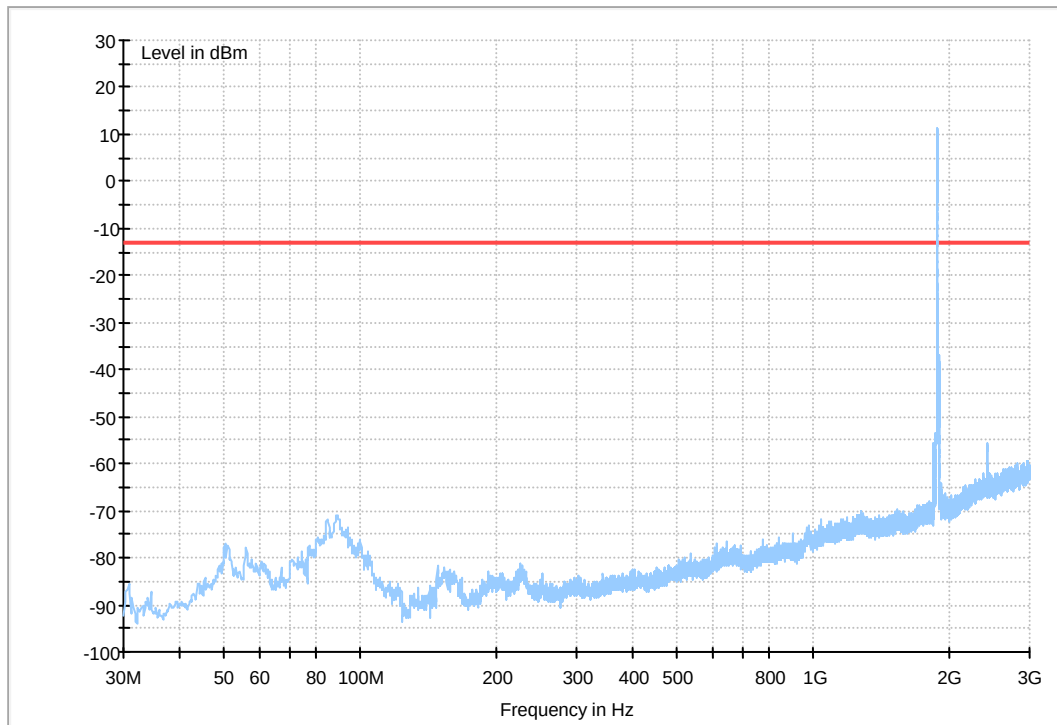
WCDMA1900

Traffic Mode (9kHz-30MHz)



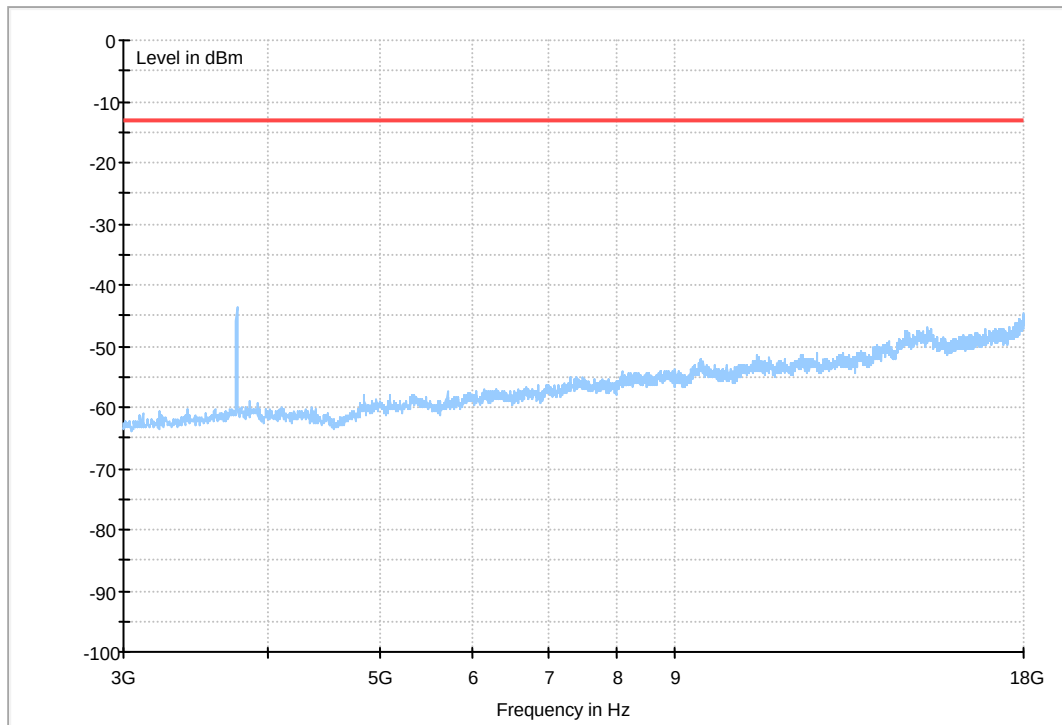


Traffic Mode (30MHz-3GHz)



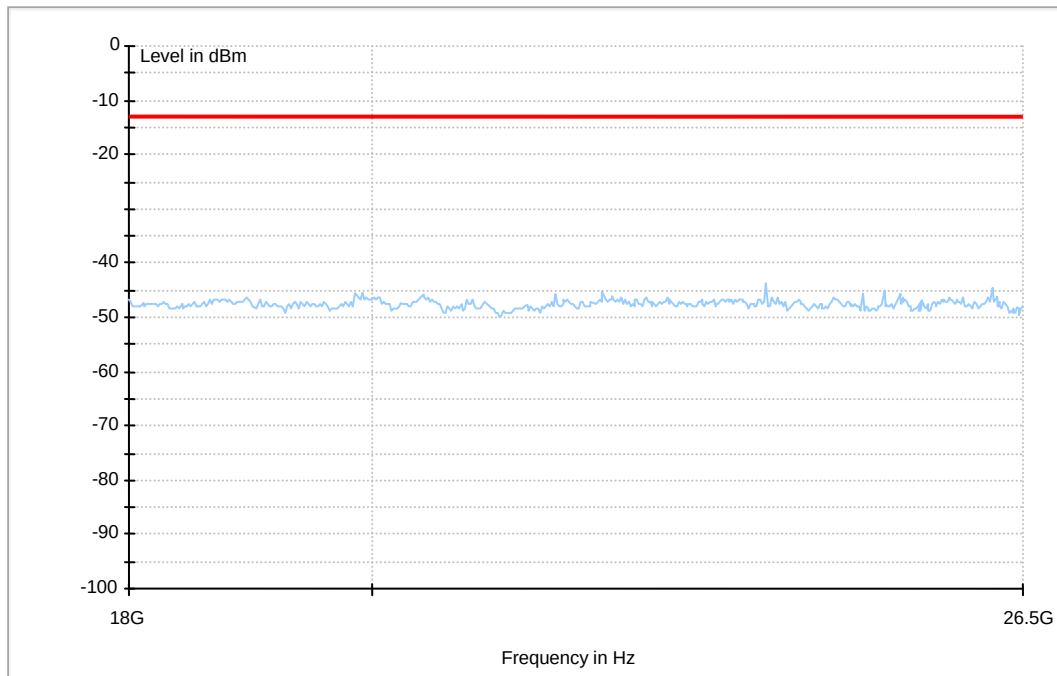


Traffic Mode (3GHz-18GHz)





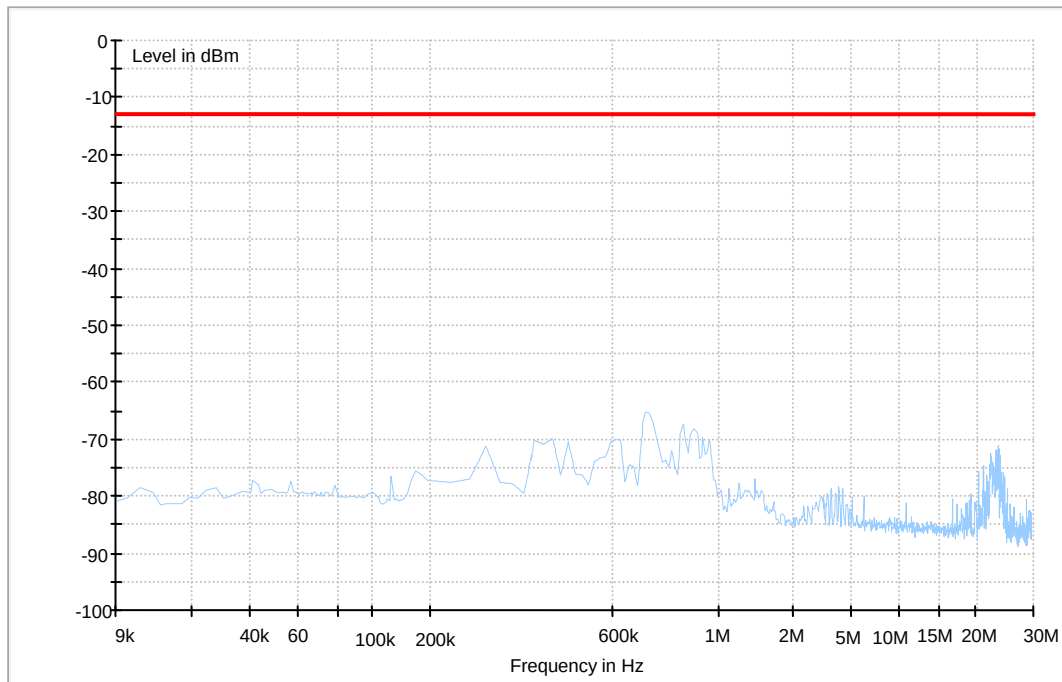
Traffic Mode (18GHz-26.5GHz)





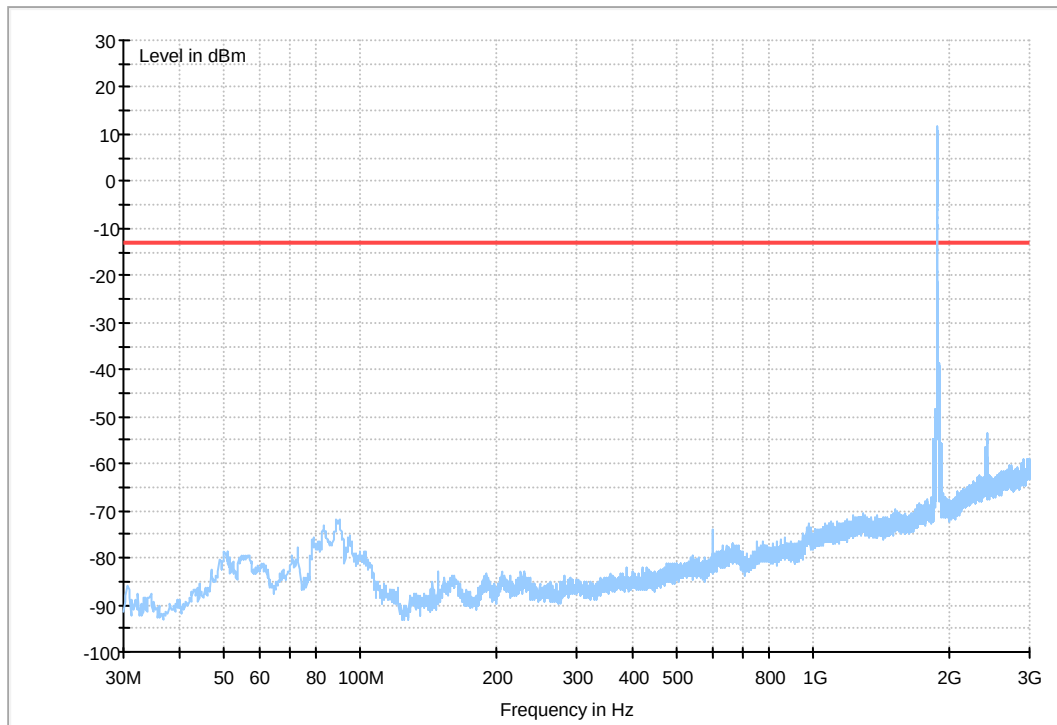
HSDPA 1900

Traffic Mode (9kHz-30MHz)



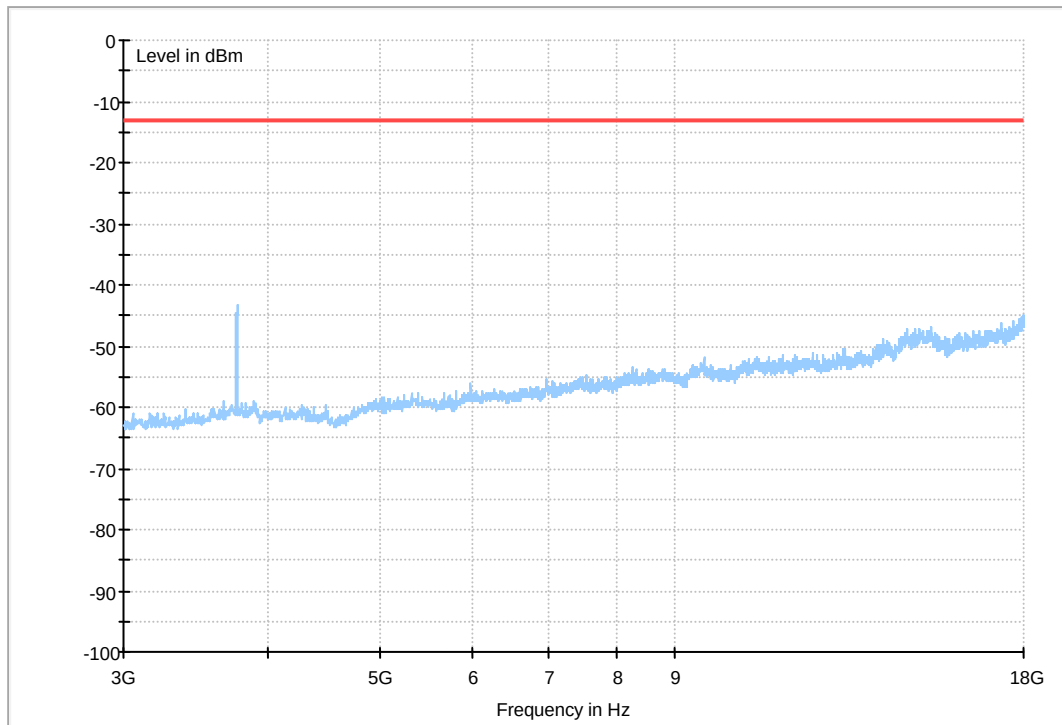


Traffic Mode (30MHz-3GHz)



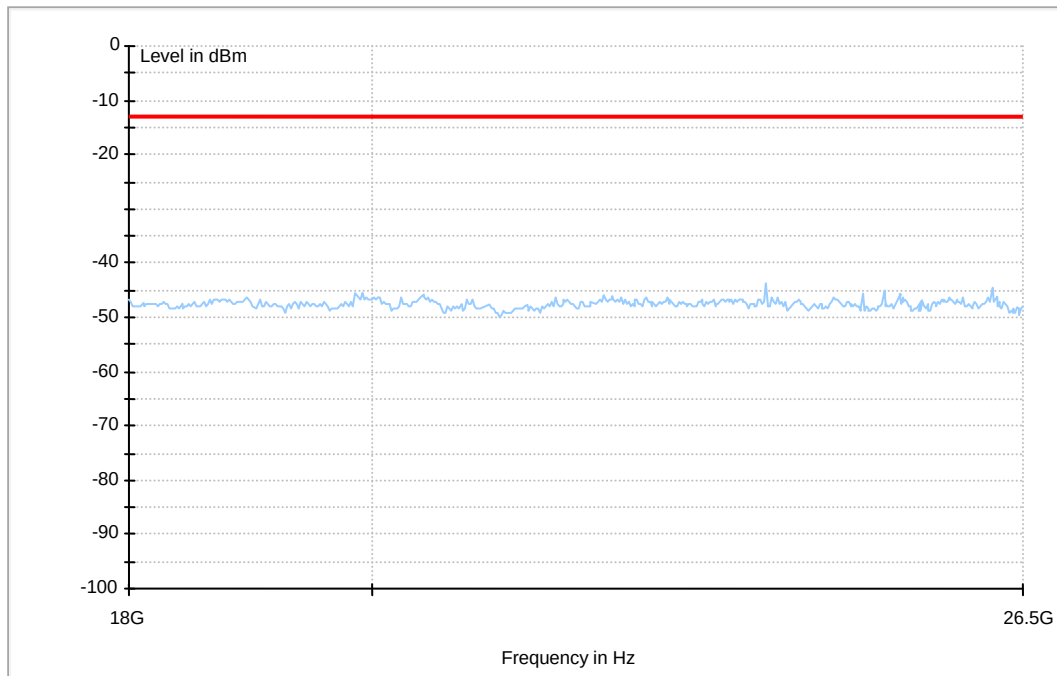


Traffic Mode (3GHz-18GHz)





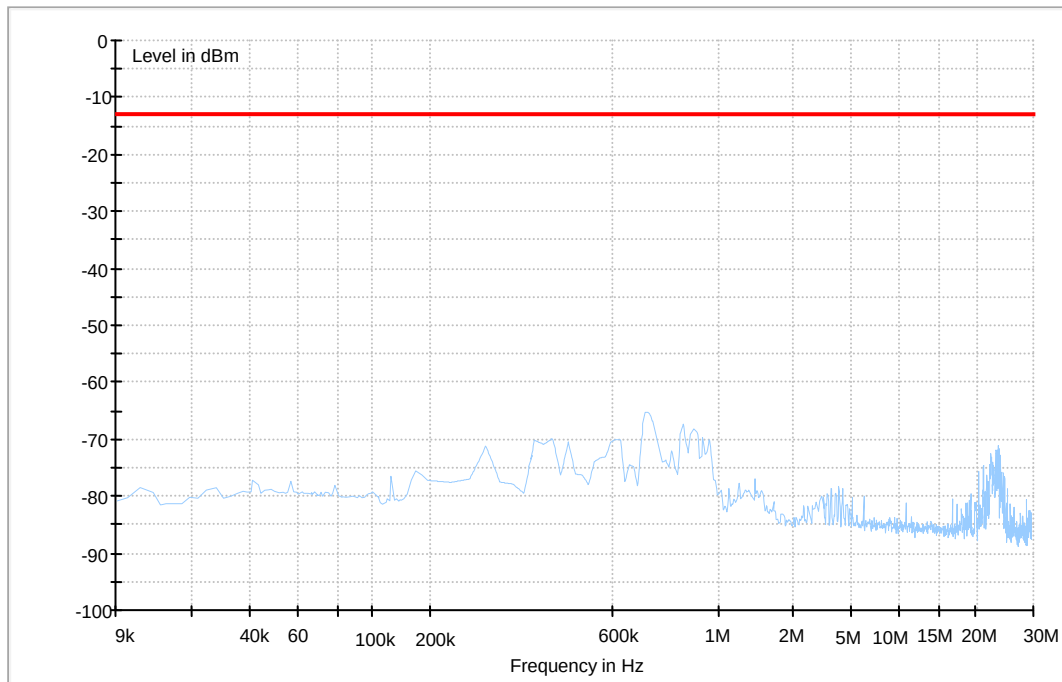
Traffic Mode (18GHz-26.5GHz)





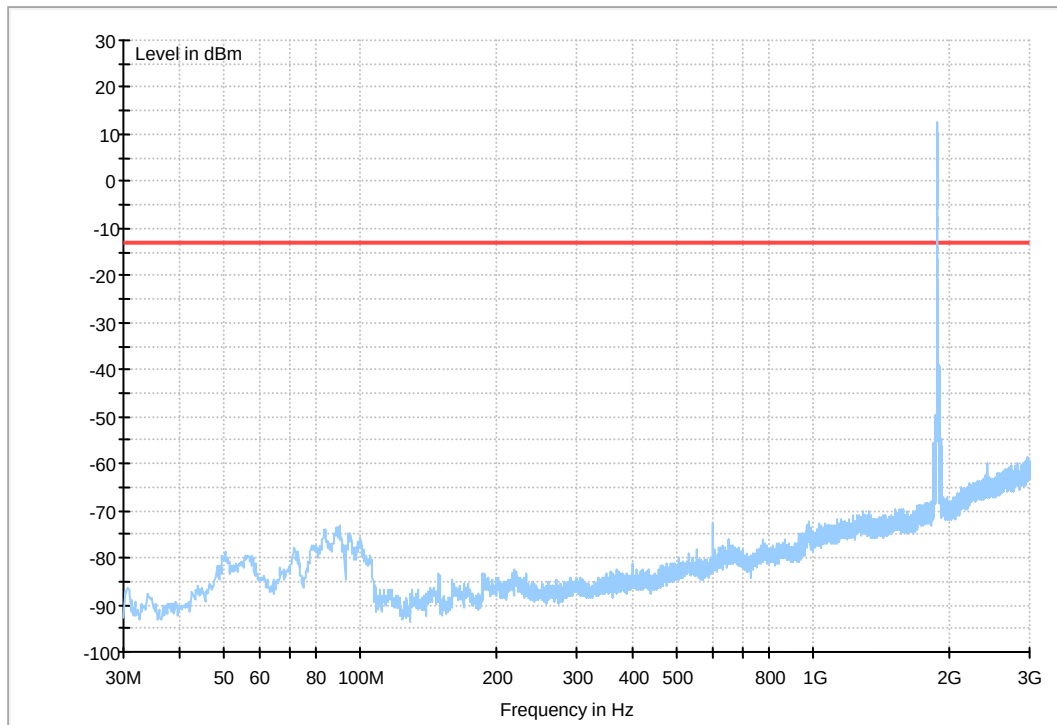
HSUPA 1900

Traffic Mode (9kHz-30MHz)



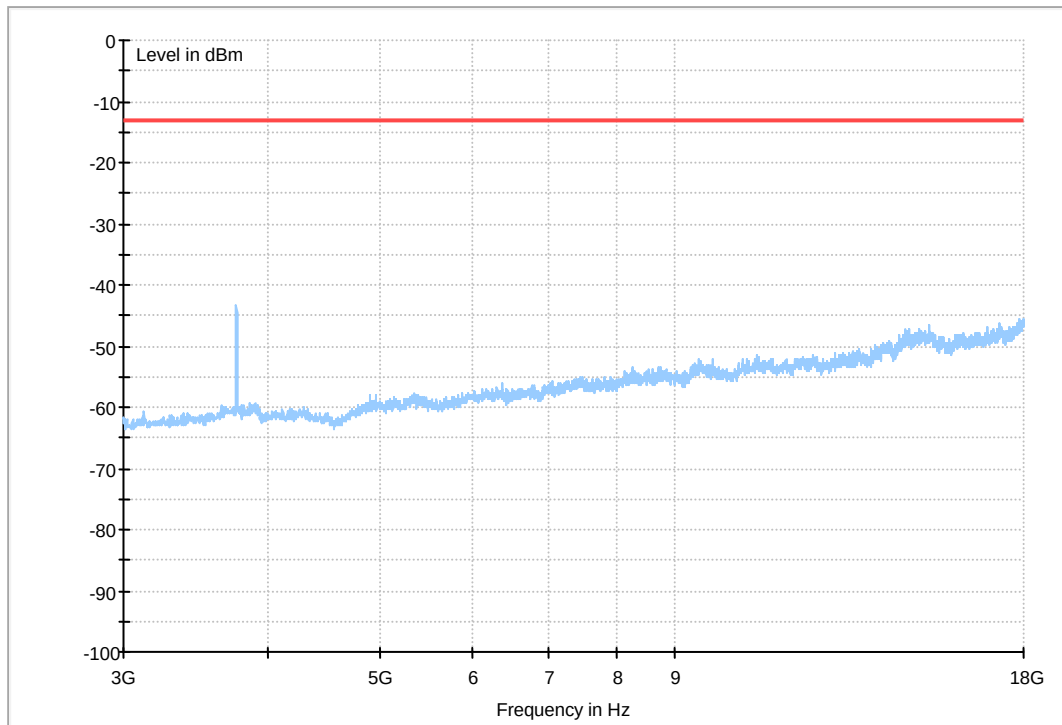


Traffic Mode (30MHz-3GHz)



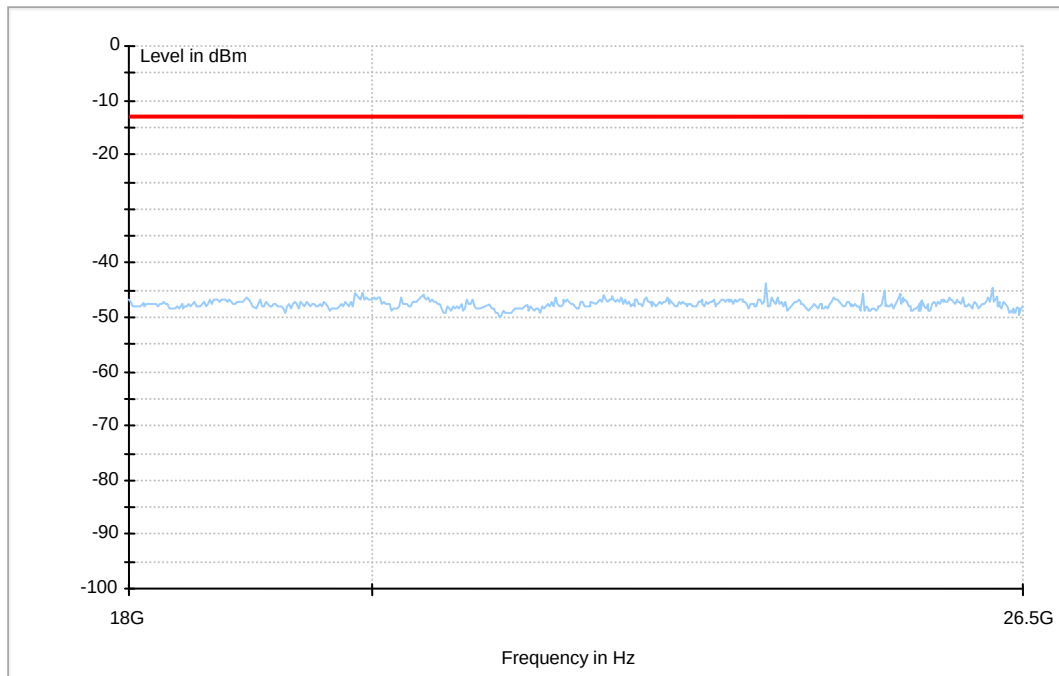


Traffic Mode (3GHz-18GHz)





Traffic Mode (18GHz-26.5GHz)



The END



Appendix G

Frequency Stability

According to FCC Part 2.1055& Part 24.235
& RSS-133



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	12	0.006383	---	±2.5	Pass
			-20 °C	17	0.009043	---	±2.5	Pass
			-10 °C	-14	-0.00745	---	±2.5	Pass
			0 °C	10	0.005319	---	±2.5	Pass
			10 °C	16	0.008511	---	±2.5	Pass
			20 °C	-13	-0.00691	---	±2.5	Pass
			30 °C	-15	-0.00798	---	±2.5	Pass
			40 °C	13	0.006915	---	±2.5	Pass
			50 °C	-15	-0.00798	---	±2.5	Pass
TM 2	M	100%	-30 °C	13	0.006915	---	±2.5	Pass
			-20 °C	-14	-0.00745	---	±2.5	Pass
			-10 °C	13	0.006915	---	±2.5	Pass
			0 °C	-15	-0.00798	---	±2.5	Pass
			10 °C	13	0.006915	---	±2.5	Pass
			20 °C	14	0.007447	---	±2.5	Pass
			30 °C	-9	-0.00479	---	±2.5	Pass
			40 °C	12	0.006383	---	±2.5	Pass
			50 °C	12	0.006383	---	±2.5	Pass
TM 3	M	100%	-30 °C	8	0.004255	---	±2.5	Pass
			-20 °C	12	0.006383	---	±2.5	Pass
			-10 °C	-12	-0.00638	---	±2.5	Pass
			0 °C	11	0.005851	---	±2.5	Pass
			10 °C	-19	-0.01011	---	±2.5	Pass
			20 °C	-18	-0.00957	---	±2.5	Pass
			30 °C	-11	-0.00585	---	±2.5	Pass
			40 °C	12	0.006383	---	±2.5	Pass
			50 °C	-15	-0.00798	---	±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 %	16	0.008511	---	±2.5	Pass
			100 %	15	0.007979	---	±2.5	Pass
			115 %	10	0.005319	---	±2.5	Pass
TM 2	M	20 °C	85 %	-12	-0.00638	---	±2.5	Pass
			100 %	-16	-0.00851	---	±2.5	Pass
			115 %	13	0.006915	---	±2.5	Pass
TM 3	M	20 °C	85 %	-18	-0.00957	---	±2.5	Pass
			100 %	15	0.007979	---	±2.5	Pass
			115 %	-15	-0.00798	---	±2.5	Pass

The END



Appendix H

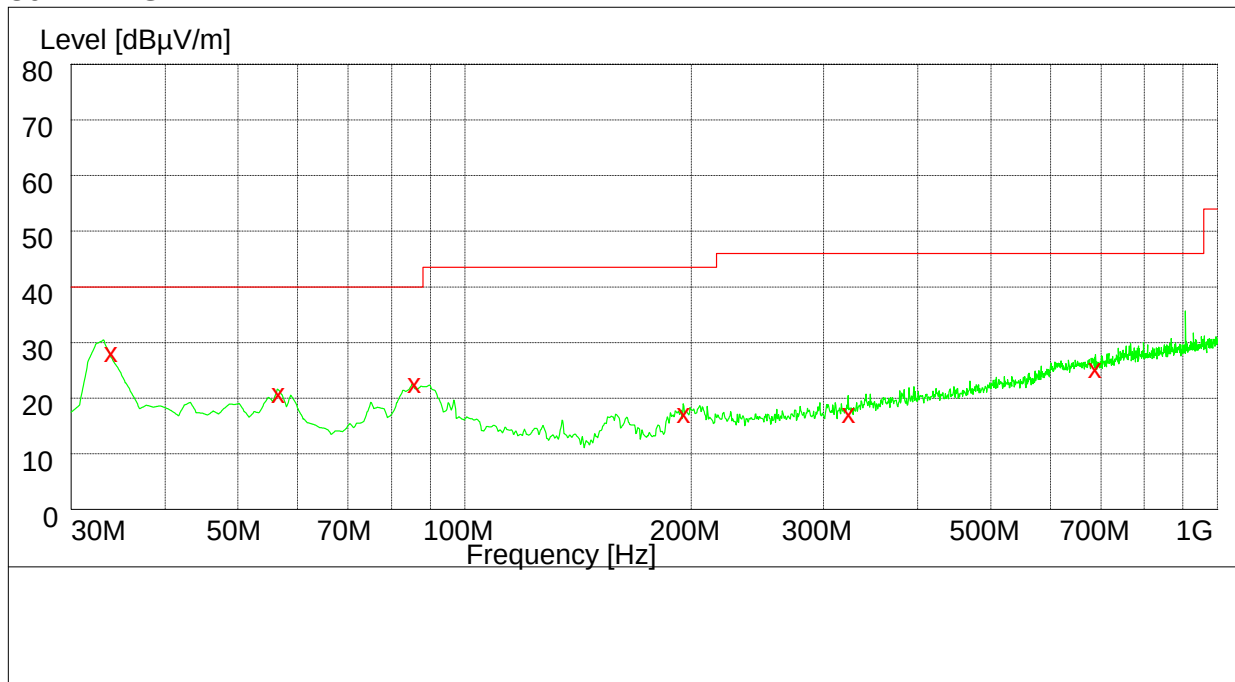
Receiver Spurious Emissions

According to RSS-133



This test was carried out in all the test modes, Here only the worst test result was shown.

30MHz-1GHz

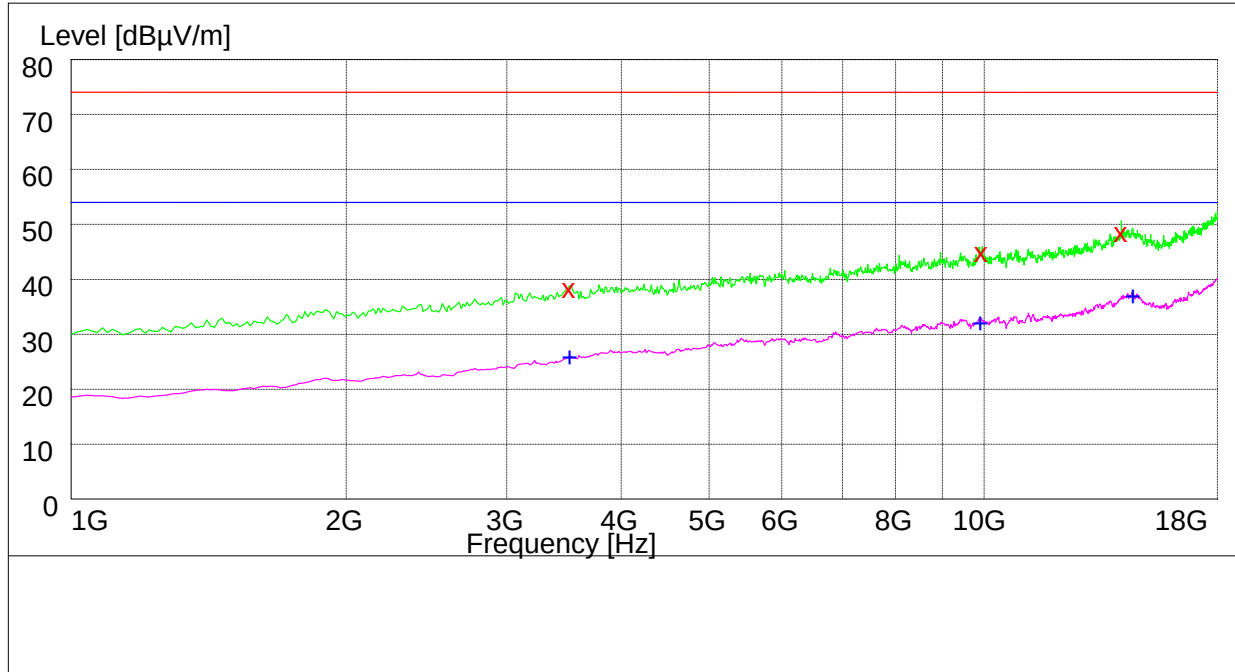


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV/m	Trans d dB	Limit dBμV/m	Margin dB	Heig ht cm	Azimet h deg	Polarisation
33.960000	25.40	14.8	40.0	14.6	101.0	29.00	VERTICAL
56.640000	18.10	14.1	40.0	21.9	100.0	271.00	VERTICAL
85.980000	19.90	11.2	40.0	20.1	149.0	100.00	VERTICAL
196.080000	14.50	12.3	43.5	29.0	100.0	200.00	VERTICAL
324.180000	14.40	15.7	46.0	31.6	104.0	209.00	HORIZONTAL
688.680000	22.50	22.0	46.0	23.5	104.0	298.00	HORIZONTAL



1GHz-18GHz



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Trans d dB	Limit dBμV/m	Margin dB	Heig ht cm	Azimet h deg	Polarisation
3515.000000	36.80	-6.0	74.0	37.2	149.0	356.00	HORIZONTAL
9942.500000	43.40	8.1	74.0	30.6	140.0	66.00	HORIZONTAL
14136.000000	47.00	13.5	74.0	27.0	109.0	38.00	VERTICAL

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV/m	Trans d dB	Limit dBμV/m	Margin dB	Heig ht cm	Azimet h deg	Polarisation
3514.500000	24.20	-6.0	54.0	29.8	100.0	237.00	HORIZONTAL
9883.000000	30.50	8.0	54.0	23.5	100.0	48.00	VERTICAL
14534.500000	35.30	14.5	54.0	18.7	137.0	241.00	HORIZONTAL

The END