47 CFR PART 22H & 24E

TEST REPORT

of

industrial HSUPA router

Brand Name:	Greentel
Model Name:	R211HHW-232, R201HHW-232
Report No.:	SZ10110001E02
FCC ID.:	Y2BR1H1

prepared for

Greentel Limited
11 Daling Rd, Longfeng, Huizhou, China, 516001

prepared by

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Change History		
Issue	Date	Reason for change
1.0	December 2, 2010	First edition

1. TEST CERTIFICATION

Equipment under Test:	industrial HSUPA router
Brand Name:	Greentel
Model Name:	R211HHW-232, R201HHW-232
FCC ID:	Y2BR1H1
Applicant:	Greentel Limited 11 Daling Rd, Longfeng, Huizhou, China, 516001
Manufacturer:	Greentel Limited 11 Daling Rd, Longfeng, Huizhou, China, 516001
Test Standards:	47 CFR Part 2 47 CFR Part 22 Subpart H 47 CFR Part 24 Subpart E
Test Date(s):	November 29, 2010 – December 3, 2010
Test Result:	PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Tu Lang Dated: 2010.12.3
Tu Lang

Reviewed by: Ni Yong Dated: 2010.12.03
Ni Yong

Approved by: Zeng dexin Dated: 2010.12.03
Zeng dexin

2. GENERAL INFORMATION

2.1 EUT Description

EUT Type ..... :	industrial HSUPA router
Model Name ..... :	R211HHW-232, R201HHW-232
Serial No. ..... :	(n.a, marked #1 by test site)
Hardware Version ..... :	MAIN_BOARD_V2.6, MiniPCIE V1.2
Software Version ..... :	1.3.2.r1984
Frequency Range ..... :	GSM 850MHz: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GSM 1900MHz: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz) WCDMA 850MHz Tx: 826.4- 846.6MHz (at intervals of 200kHz); Rx: 871.4 – 891.6MHz (at intervals of 200kHz) WCDMA 1900MHz Tx: 1852.4 – 1907.6MHz (at intervals of 200kHz); Rx: 1932.4 – 1987.6MHz (at intervals of 200kHz)
Modulation Type..... :	GPRS/GSM Mode with GMSK Modulation WCDMA Mode with QPSK Modulation HSDPA Mode with QPSK Modulation HSUPA Mode with 16QAM Modulation
Emission Designators ..... :	GSM:300KGXW, WCDMA:4M18F9W, HSPA: 4M20F9W
Ancillary Equipments ..... :	AC Adapter (Charger for Battery) Model Name: DSA-20D-12 2 120150 Brand Name: DEE VAN Serial No.: (n.a. marked #1 by test site) Rated Input: ~ 90-264V, 47- 63Hz, 0.5-0.7A Rated Output: ⎓ 12.0V, 1.25A Manufacturer: DEE VAN ENTERPRISE CO., LTD Manufacturer Address: NO.5, PAO-KAO RD, HSIN-TIEN, TAIPEI COUNTY, TAIWAN, R.O.C

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula F(n)=824.2+0.2*(n-128), 128<=n<=251; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

Note 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula F(n)=1850.2+0.2*(n-512), 512<=n<=810; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).

Note 3: The GPRS was tested under 4 uplink time slots mode.

Note 4: The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula F(n)=826.4+0.2*(n-4357), 4357<=n<=4458; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4357 (826.4MHz), 4400 (835MHz) and 4458 (846.6MHz).

Note 5: The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT can be represented with the formula F(n)=1852.4+0.2*(n-9662), 9662<=n<=9938; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9662 (1852.4MHz), 9800 (1880MHz) and 9938 (1907.6MHz).

Note 6: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-09 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-09 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-09 Edition)	Personal Communications Services

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result (WCDMA)	Result (GPRS)
1	2.1046	Conducted RF Output Power	PASS	PASS
2	2.1049	20dB Occupied Bandwidth	PASS	PASS
3	2.1055 22.355 24.235	Frequency Stability	PASS	PASS
4	2.1051 2.1057 22.917 24.238	Conducted Out of Band Emissions	PASS	PASS
5	2.1051 2.1057 22.917 24.238	Band Edge	PASS	PASS
6	22.913 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS	PASS
7	2.1053 2.1057 22.917 24.238	Radiated Out of Band Emissions	PASS	PASS

NOTE： Measurement method according to TIA/EIA-603.

2.3 Facilities and Accreditations

2.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

3. 47 CFR PART 2, PART 22H & 24E REQUIREMENTS

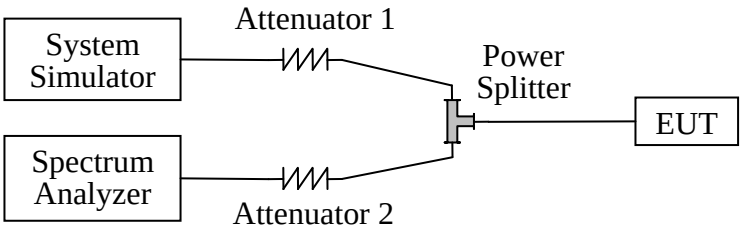
3.1. Conducted RF Output Power

3.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

3.1.2 Test Description

1. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2009.09	2year
Spectrum Analyzer	Agilent	E7405A	US44210471	2009.09	2year
Power Splitter	Weinschel	1506A	NW521	(n.a.)	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)	(n.a.)

3.1.3 Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 33dBm, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), the rated conducted RF output power is 30dBm.

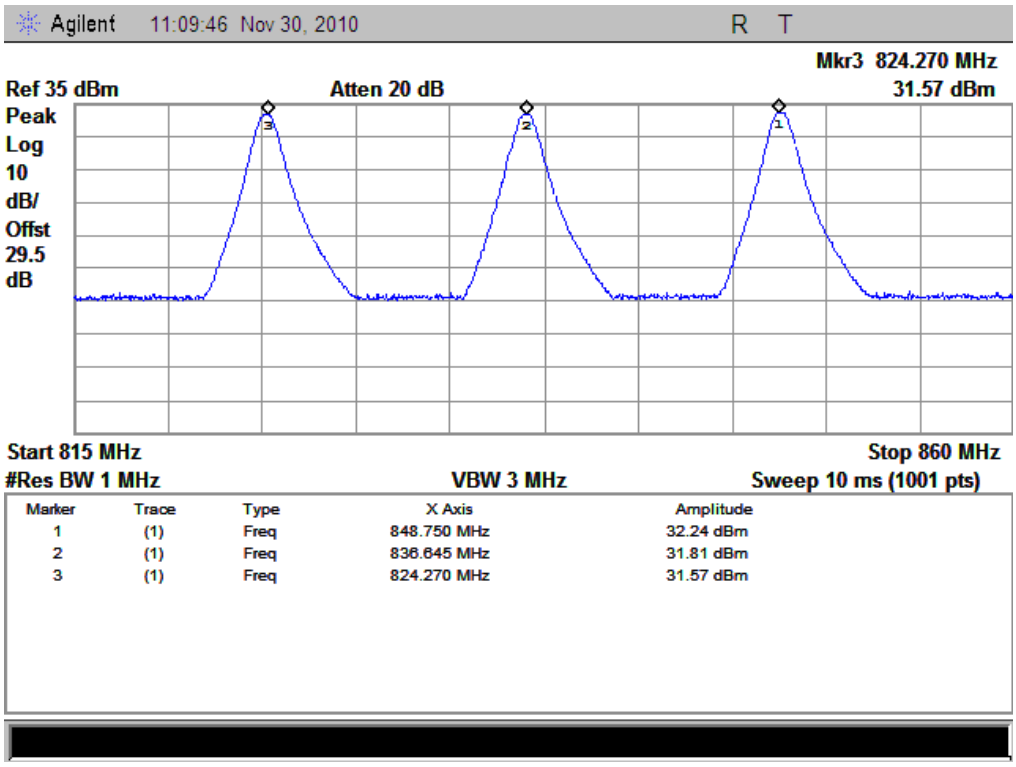
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Output Power		Limit	Verdict
			dBm	Refer to Plot	dBm	
GPRS 850MHz	128	824.2	32.24	Plot A	35	PASS
	190	836.6	31.81			PASS
	251	848.8	31.57			PASS
GPRS 1900MHz	512	1850.2	30.18	Plot B	32	PASS
	661	1880.0	29.89			PASS
	810	1909.8	29.65			PASS

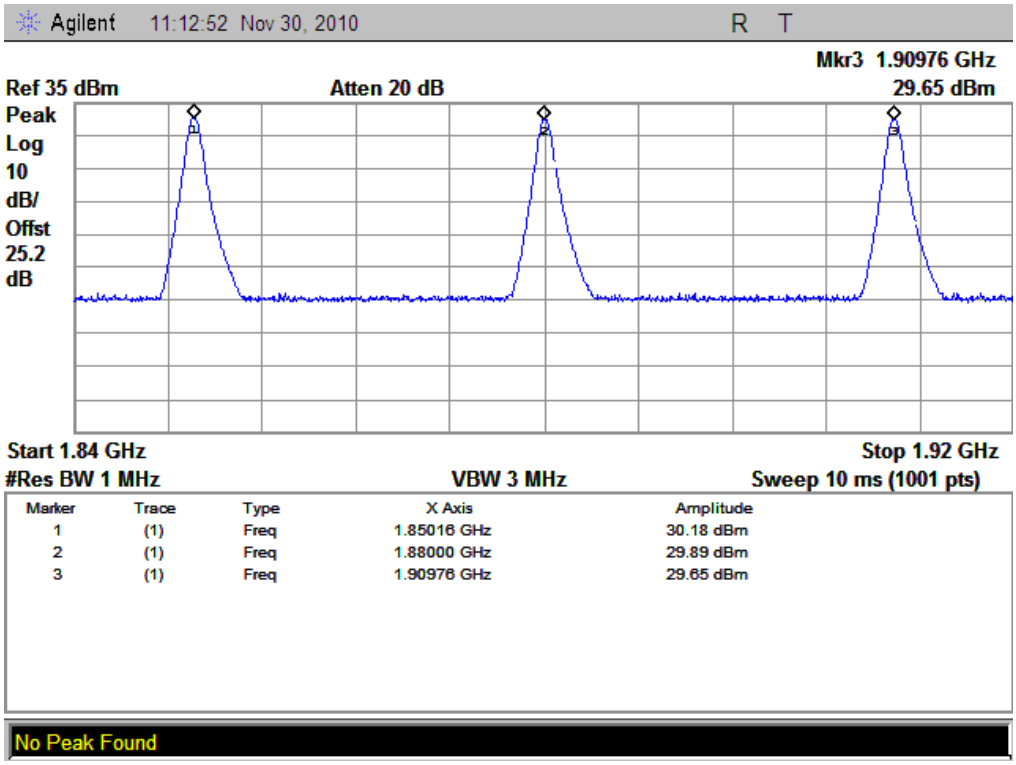
ltem	band	WCDMA 850			WCDMA 1900		
	ARFCN	4357	4400	4458	9662	9800	9938
	subtest	dBm			dBm		
5.2(WCDMA)	non	25.14	25.61	26.13	24.30	25.08	24.29
5.2AA(HSDPA)	1	25.15	25.84	26.10	24.32	24.43	24.28
	2	25.15	25.84	26.10	24.32	24.43	24.28
	3	24.65	25.34	25.60	23.82	23.93	23.78
	4	24.65	25.34	25.60	23.82	23.93	23.78
N5.2B(HSUPA)	1	25.30	25.82	26.10	24.45	24.62	24.53
	2	23.30	23.82	24.10	22.45	22.62	22.53
	3	24.30	24.82	25.10	23.45	23.62	23.53
	4	23.30	23.82	24.10	22.45	22.62	22.53
	5	25.30	25.82	26.10	24.45	24.62	24.53

Note: For the WCDMA, HSDPA and HSUPA test band, the measured output power was calculated by the reading of the Power Meter and calibration.

2. Test Plots:



(Plot A: GPRS 850MHz Channel = 128, 190, 251)



(Plot B: GPRS 1900MHz Channel = 512, 661, 810)

3.2 99% Occupied Bandwidth

3.2.1 Definition

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth,.

3.2.2 Test Description

See section 3.1.2 of this report.

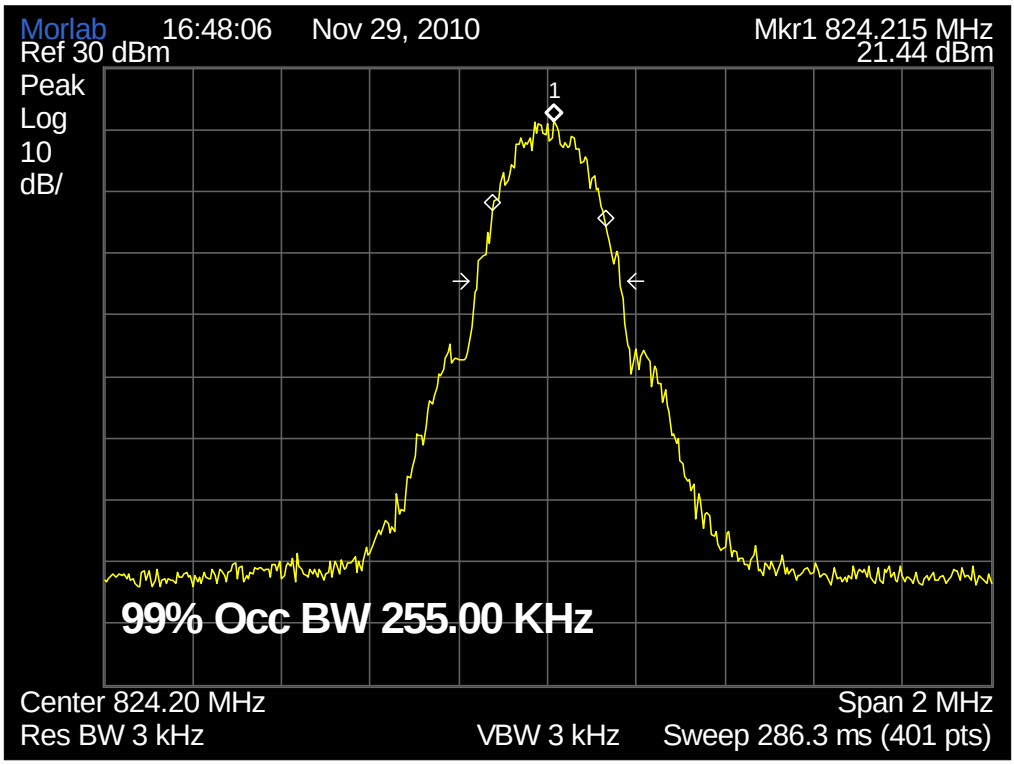
3.2.3 Test Verdict

Here the lowest, middle and highest channels are tested to record the 99% occupied bandwidth, it's about 255KHz for GSM, and 4.26MHz for WCDMA.

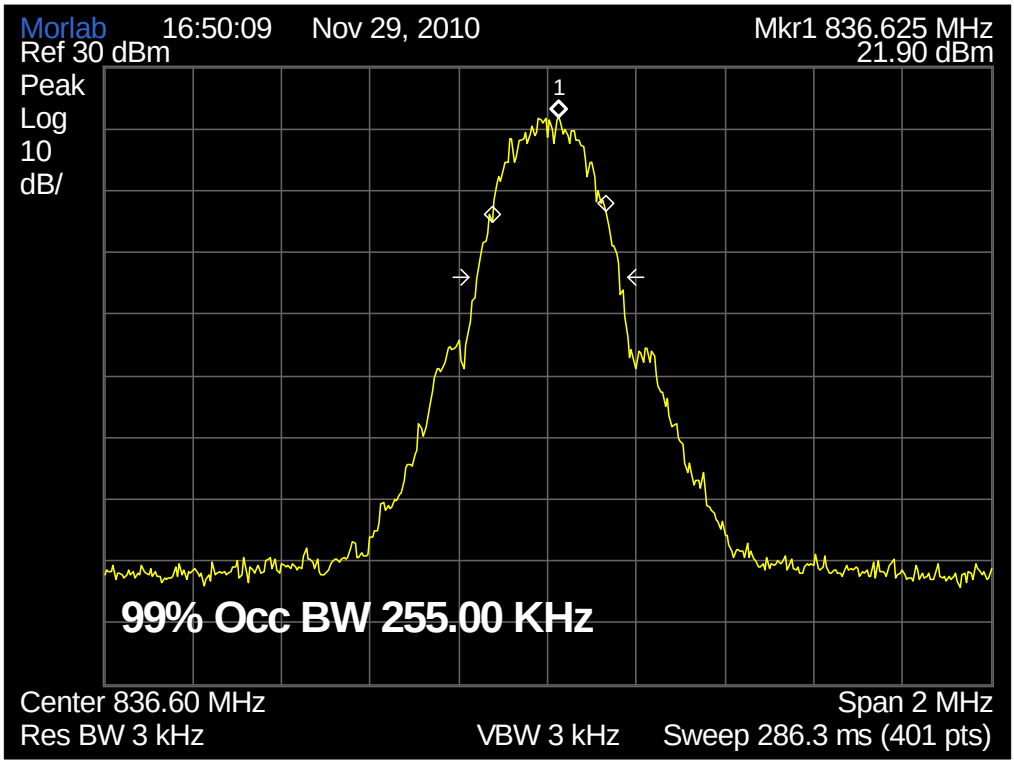
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured 99% Occupied Bandwidth (kHz)	Refer to Plot
GPRS 850MHz	128	824.2	255.0	Plot A
	190	836.6	255.0	Plot B
	251	848.8	255.0	Plot C
GPRS 1900MHz	512	1850.2	255.0	Plot D
	661	1880.0	255.0	Plot E
	810	1909.8	255.0	Plot F
WCDMA 850MHz	4400	835	4.22MHz	Plot G
WCDMA 1900MHz	9800	1880	4.22MHz	Plot H
HSDPA 850MHz	4400	835	4.26MHz	Plot I
HSDPA 1900MHz	9800	1880	4.24MHz	Plot J
HSUPA 850MHz	4400	835	4.24MHz	Plot K
HSUPA 1900MHz	9800	1880	4.22MHz	Plot L

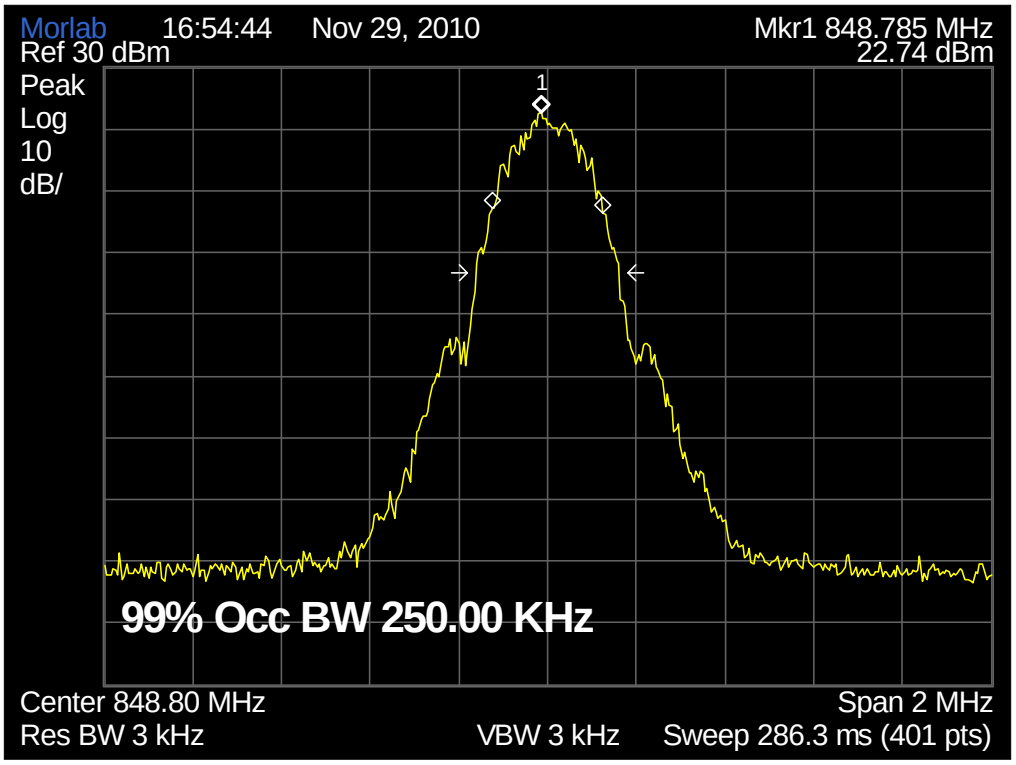
2. Test Plots:



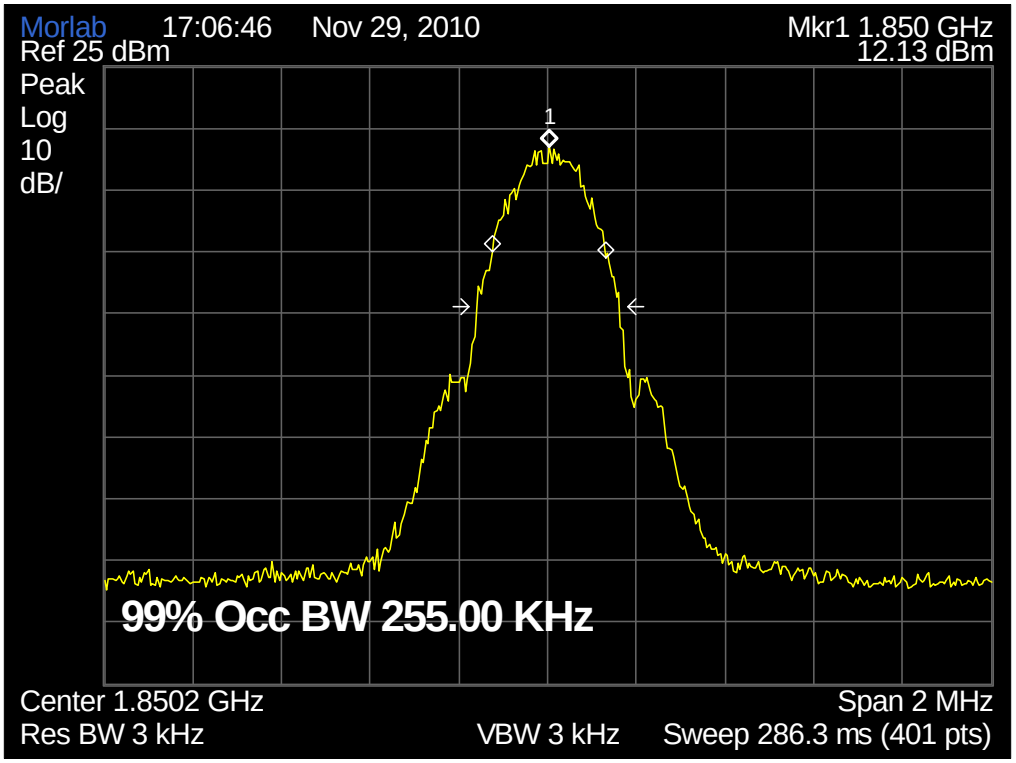
(Plot A: GPRS 850MHz Channel = 128)



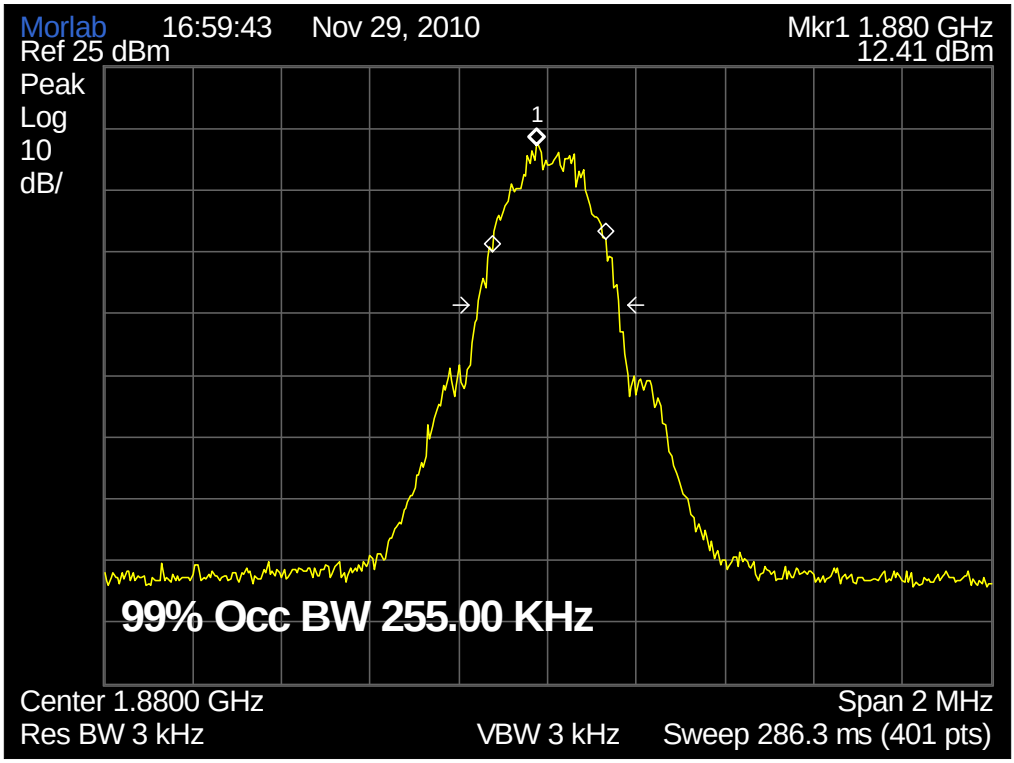
(Plot B: GPRS 850MHz Channel = 190)



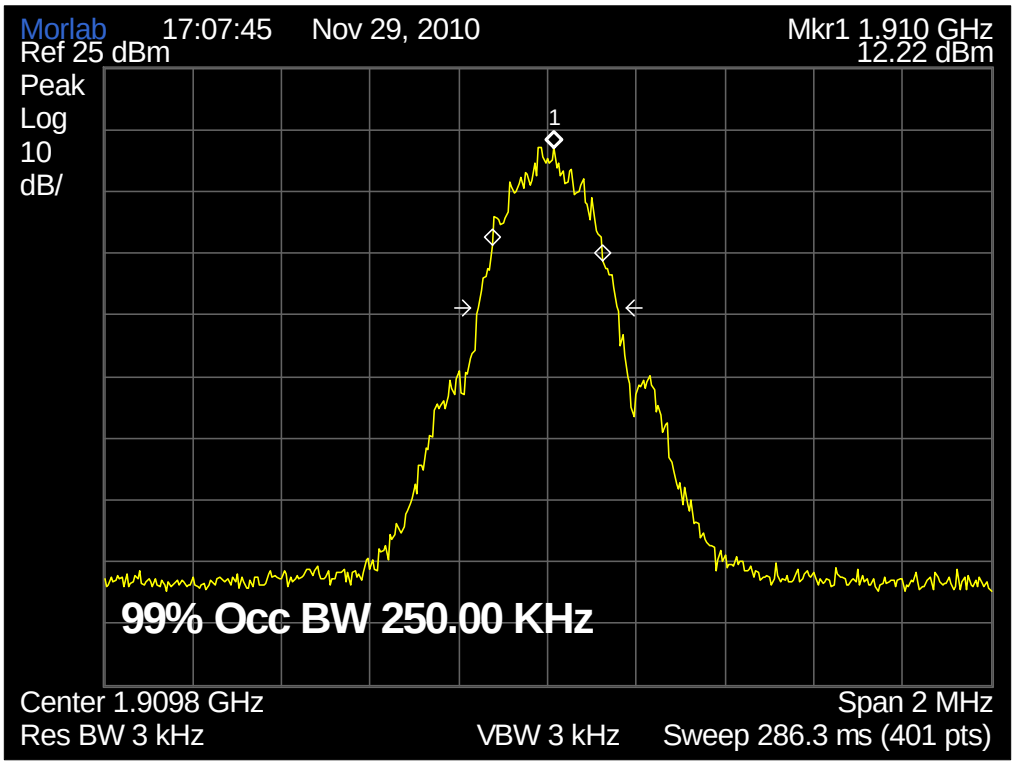
(Plot C: GPRS 850MHz Channel = 251)



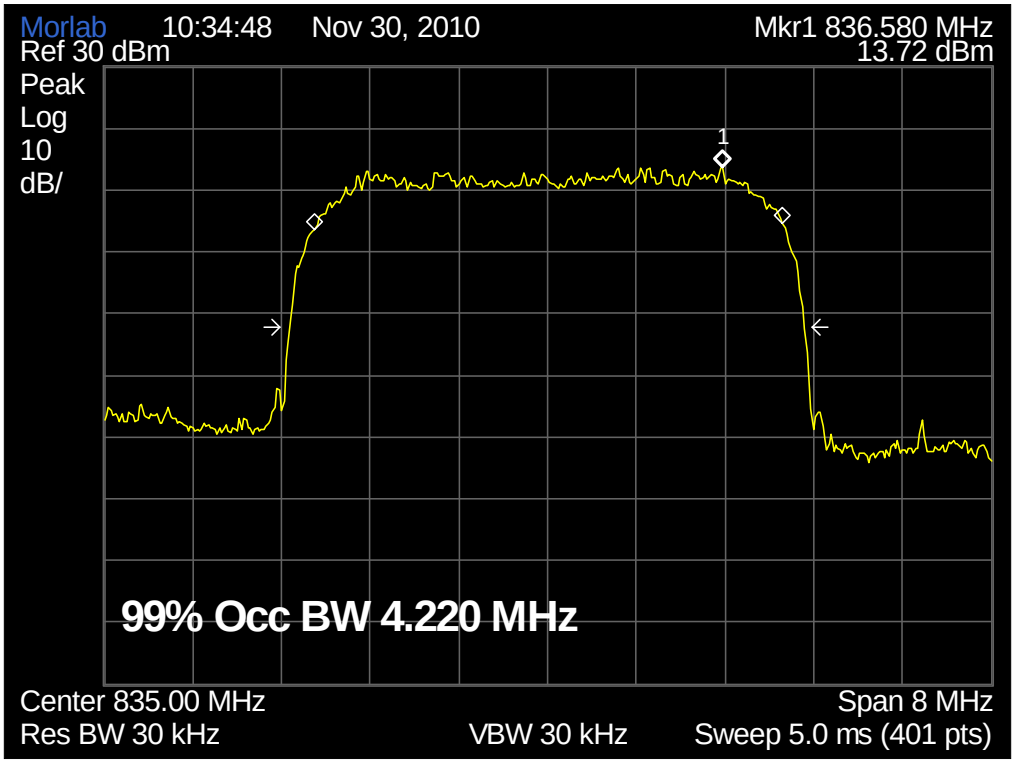
(Plot D: GPRS 1900MHz Channel = 512)



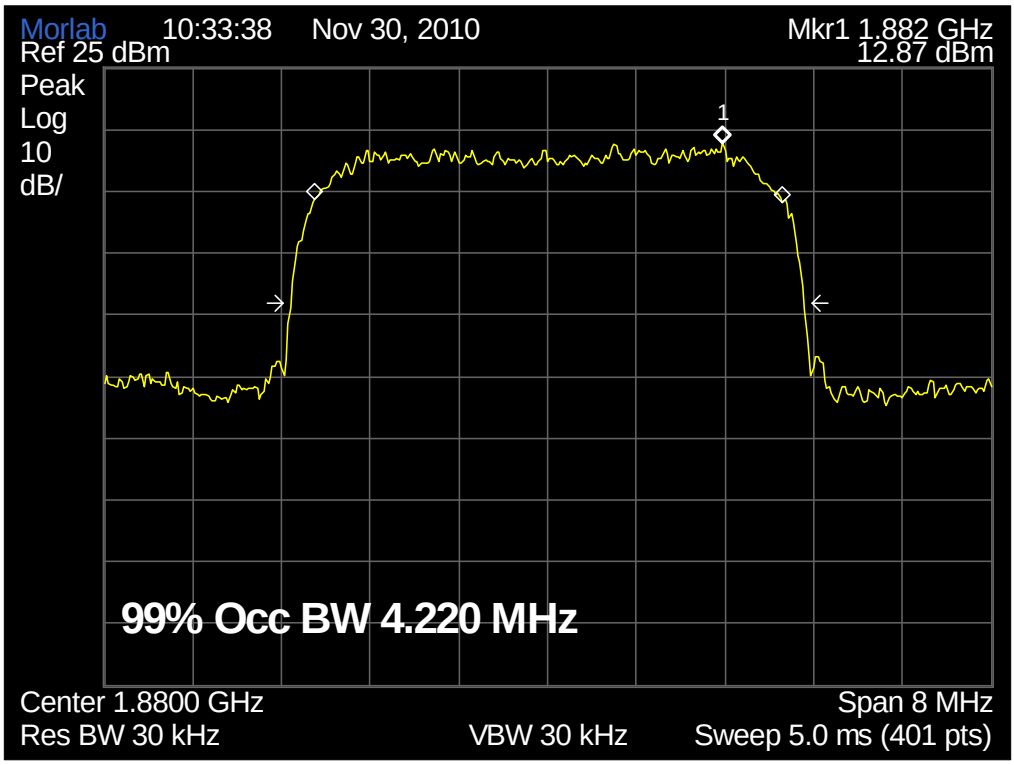
(Plot E: GPRS 1900MHz Channel = 661)



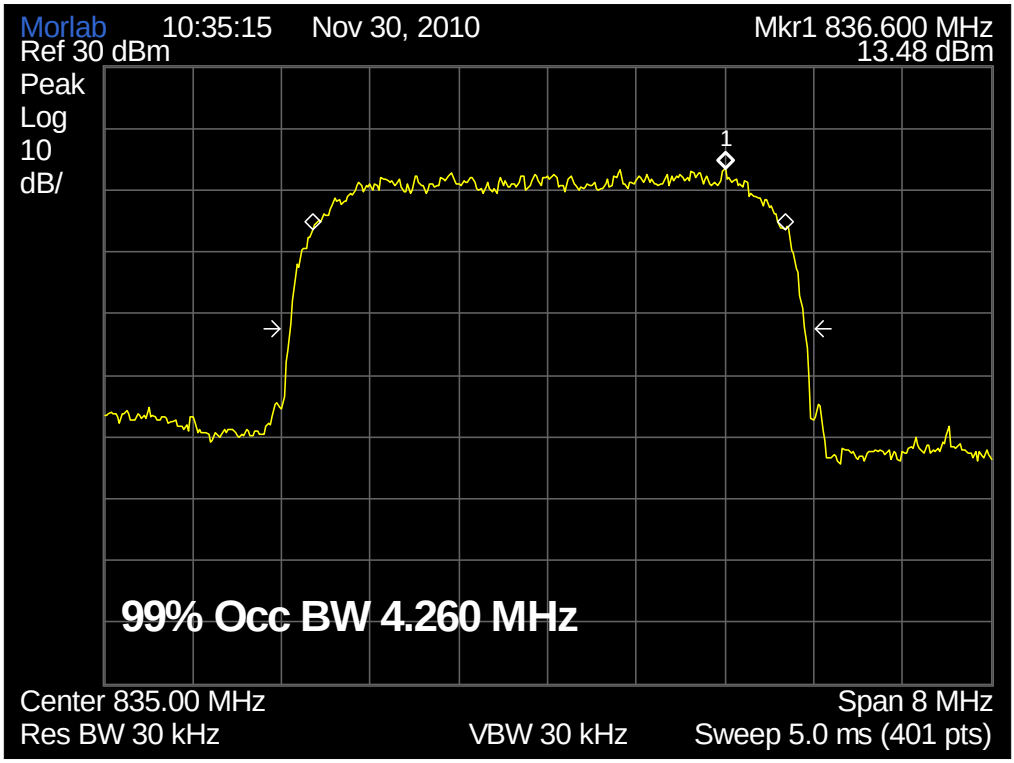
(Plot F: GPRS 1900MHz Channel = 810)



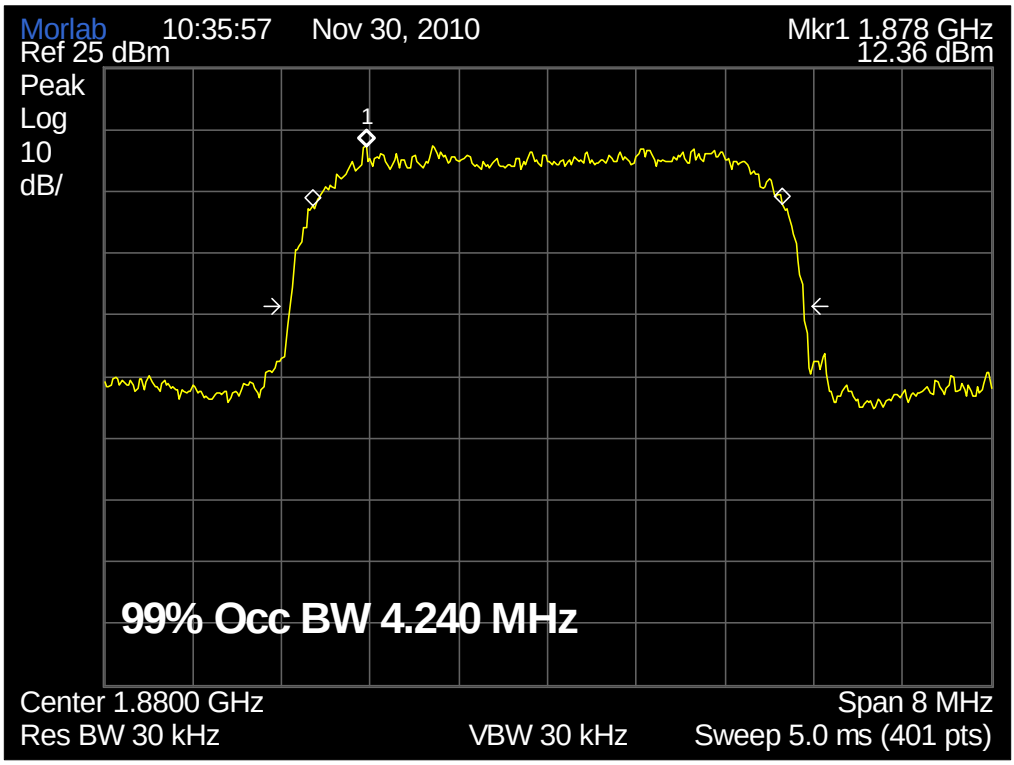
(Plot G: WCDMA 850MHz Channel = 4400)



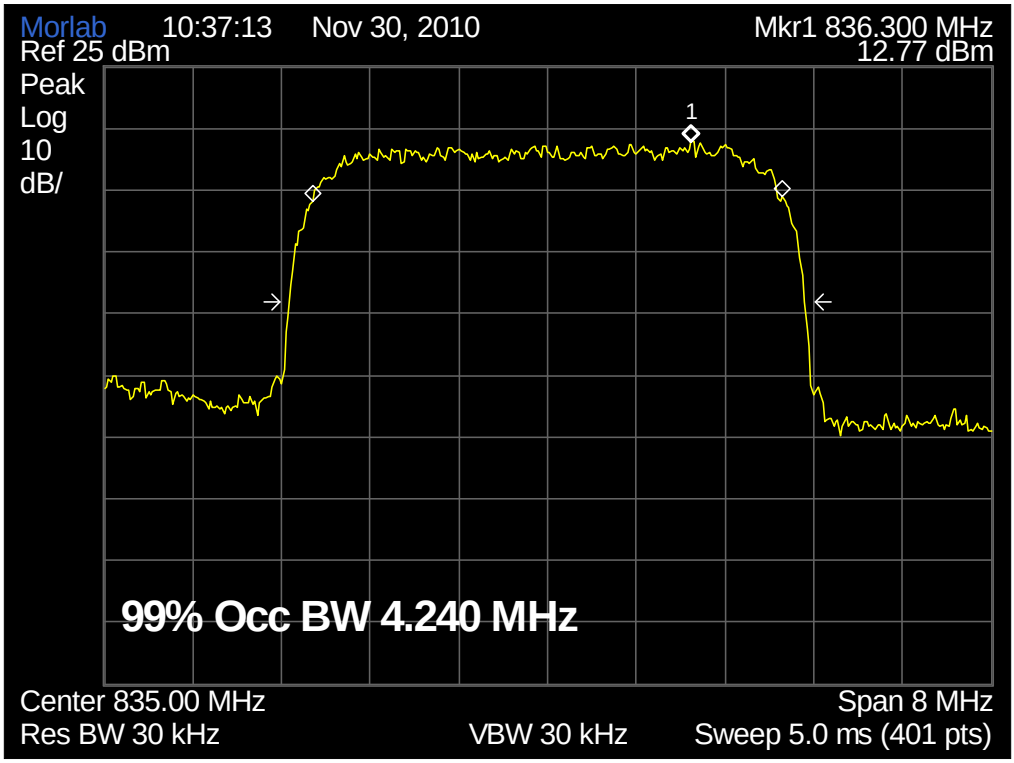
(Plot H: WCDMA 1900MHz Channel = 9800)



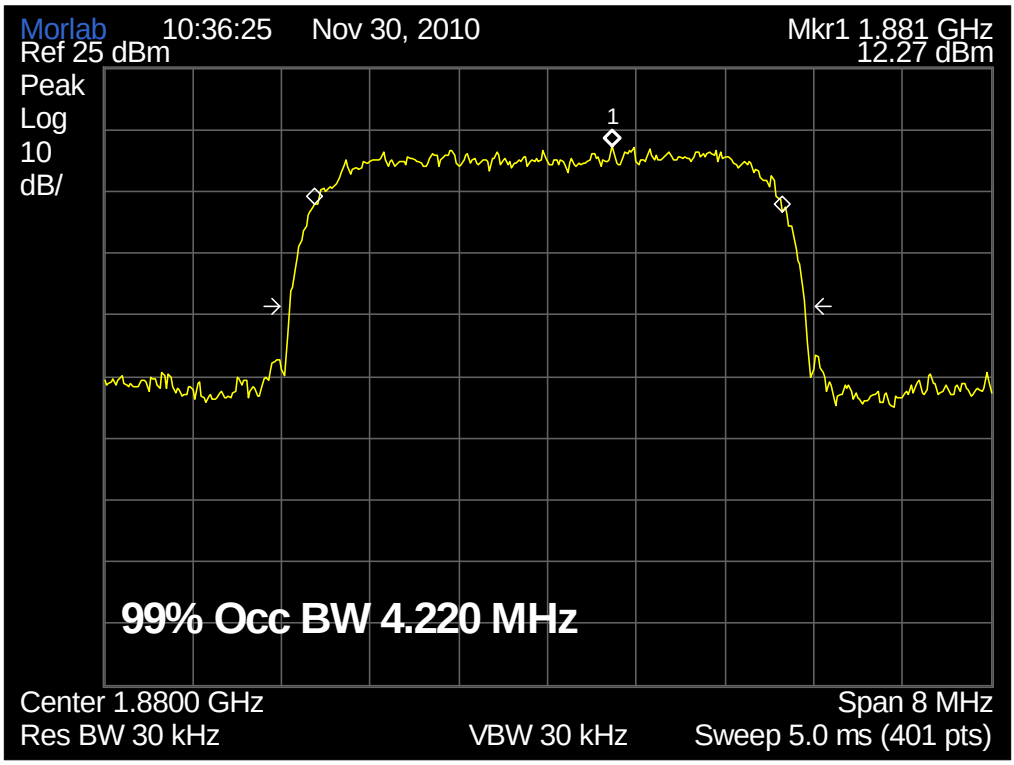
(Plot I: HSDPA 850MHz Channel = 4400)



(Plot J: HSDPA 1900MHz Channel = 9800)



(Plot K: HSUPA 850MHz Channel = 4400)



(Plot L: HSUPA 1900MHz Channel = 9800)

3.3 Frequency Stability

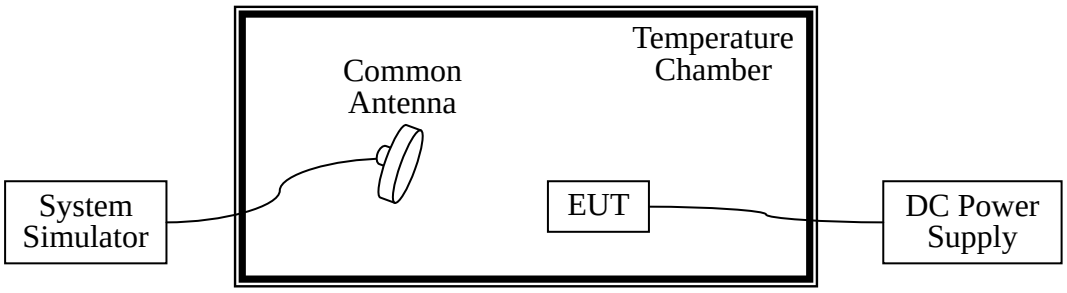
3.3.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

3.3.2 Test Description

1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2009.09	2year
DC Power Supply	Good Will	GPS-3030DD	EF920938	2009.09	2year
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2009.09	2year

3.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25°C. The frequency

deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 128 (824.2MHz)		Channel = 190 (836.6MHz)		Channel = 251 (848.8MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
GPRS 850MHz	3.7	-30	-7.22	±2060.5	-16.29	±2091.5	3.46	±2122	PASS
		-20	27.39		29.37		-0.67		
		-10	-11.01		-11.06		31.03		
		0	-20.13		35.04		-23.57		
		+10	-3.99		-12.26		26.49		
		+20	29.02		35.09		29.46		
		+30	-24.82		26.75		-24.07		
		+40	5.93		-11.08		-21.34		
		+50	-28.01		21.44		21.21		
	4.2	+25	33.05		-7.85		-24.03		
	3.6	+25	-12.92		25.32		11.08		

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
GPRS 1900MHz	3.7	-30	-26.11	±1850.2	25.06	±1880.0	-9.54	±1909.8	PASS
		-20	9.35		-25.06		28.17		
		-10	-25.21		24.03		-24.09		
		0	32.01		-23.11		23.41		
		+10	-29.31		9.85		-16.07		
		+20	26.52		27.01		29.16		
		+30	-8.99		26.09		-7.54		
		+40	27.92		-8.15		11.74		
		+50	-20.25		27.13		28.05		
	4.2	+25	6.98		24.37		-20.13		
	3.6	+25	17.39		24.26		33.70		

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4357 (826.4MHz)		Channel = 4400 (835MHz)		Channel = 4458 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
WCDMA 850MHz	3.7	-30	19.43	±826.4	19.62	±835	23.79	±2122	PASS
		-20	-25.46		-24.90		-25.36		
		-10	9.39		12.37		4.84		
		0	8.06		6.43		6.99		
		+10	-14.63		-14.57		-18.56		
		+20	-20.71		-22.04		-24.03		
		+30	-14.25		-13.19		-9.91		
		+40	25.08		21.80		21.29		
		+50	1.28		0.37		-0.29		
	4.2	+25	-16.32		-13.29		-18.37		
	3.6	+25	-7.80		-6.31		-3.66		

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 9662 (1852.4MHz)		Channel = 9800 (1880.0MHz)		Channel = 9938 (1907.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
WCDMA 1900MHz	3.7	-30	6.82	±1852.4	3.17	±1880.0	4.22	±1909.8	PASS
		-20	-10.68		-13.99		-7.26		
		-10	-0.09		3.13		-2.12		
		0	-25.07		-24.44		-23.88		
		+10	24.99		27.99		20.59		
		+20	-28.27		-25.40		-26.57		
		+30	-5.94		-4.63		-9.71		
		+40	-16.32		-13.10		-13.72		
		+50	-28.71		-29.22		-29.83		
	4.2	+25	-14.06		-12.51		-13.94		
	3.6	+25	-11.09		-7.25		-7.55		

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4357 (826.4MHz)		Channel = 4400 (835MHz)		Channel = 4458 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSDPA 850MHz	3.7	-30	18.26	±826.4	20.03	±835	22.59	±2122	PASS
		-20	-26.88		-24.27		-24.35		
		-10	9.93		13.32		5.59		
		0	9.38		5.71		8.34		
		+10	-14.74		-14.16		-19.66		
		+20	-20.68		-21.36		-24.77		

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4357 (826.4MHz)		Channel = 4400 (835MHz)		Channel = 4458 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
		+30	-15.42		-12.98		-9.97		
		+40	23.71		23.17		20.95		
		+50	0.69		0.56		0.32		
	4.2	+25	-17.43		-12.50		-17.48		
	3.6	+25	-8.51		-5.23		-4.34		
Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 9662 (1852.4MHz)		Channel = 9800 (1880.0MHz)		Channel = 9938 (1907.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSDPA 1900MHz	3.7	-30	7.91	±1852.4	2.56	±1880	4.52	±1909.8	PASS
		-20	-11.25		-12.86		-7.22		
		-10	-0.94		3.36		-2.96		
		0	-23.93		-24.81		-24.03		
		+10	26.33		28.29		20.43		
		+20	-29.66		-24.09		-25.90		
		+30	-6.59		-4.66		-9.55		
		+40	-17.76		-12.39		-13.14		
		+50	-29.63		-29.85		-30.88		
	4.2	+25	-13.46		-13.10		-14.39		
	3.6	+25	-10.66		-5.80		-7.56		
Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4357 (826.4MHz)		Channel = 4400 (835MHz)		Channel = 4458 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSUPA 850MHz	3.7	-30	9.49	±826.4	16.54	±835	21.65	±2122	PASS
		-20	-26.41		-2.93		-2.68		
		-10	19.05		16.21		-24.83		
		0	11.03		26.06		26.31		
		+10	-13.65		-18.33		-8.55		
		+20	-2.86		-21.43		-26.31		
		+30	-13.43		-27.19		-23.88		
		+40	5.76		1.86		13.44		
		+50	31.05		10.32		-20.01		
	4.2	+25	-7.44		-19.22		-15.07		
	3.6	+25	-17.04		-26.43		-23.61		
Band	Test Conditions		Frequency Deviation						Verdict

	Power (VDC)	Temperature (°C)	Channel = 9662 (1852.4MHz)		Channel = 9800 (1880.0MHz)		Channel = 9938 (1907.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSUPA 1900MHz	3.7	-30	16.33	±1852.4	23.31	±1880.0	14.27	±1909.8	PASS
		-20	-12.61		-1.99		-10.24		
		-10	-20.33		33.11		-22.07		
		0	-22.31		-14.42		-21.07		
		+10	20.91		27.92		18.53		
		+20	-2.77		-15.41		-20.53		
		+30	-15.07		-12.62		-19.43		
		+40	-15.66		-9.15		-10.22		
		+50	23.04		-27.21		-25.81		
	4.2	+25	-16.54		-17.88		-23.11		
	3.6	+25	31.01		-9.21		-17.08		

3.4 Conducted Out of Band Emissions

3.4.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

3.4.2 Test Description

See section 3.1.2 of this report.

3.4.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

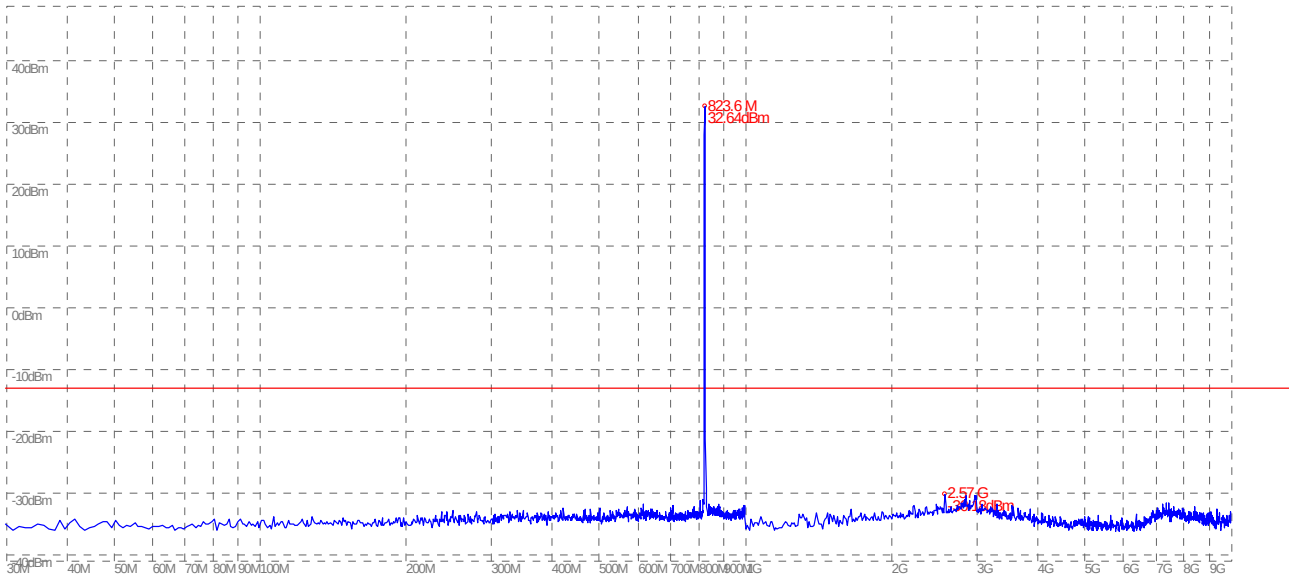
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GPRS 850MHz	128	824.2	-30.18	Plot A	-13	PASS
	190	836.6	-29.11	Plot B		PASS
	251	848.8	-29.91	Plot C		PASS
GPRS 1900MHz	512	1850.2	-36.10	Plot D	-13	PASS
	661	1880.0	-35.81	Plot E		PASS
	810	1909.8	-36.61	Plot F		PASS
WCDMA 850MHz	4357	826.4	-29.58	Plot G	-13	PASS
	4400	835	-29.69	Plot H		PASS
	4458	846.6	-30.33	Plot I		PASS
WCDMA 1900MHz	9662	1852.4	-35.59	Plot J	-13	PASS
	9800	1880	-35.21	Plot K		PASS
	9938	1907.6	-34.75	Plot L		PASS
HSDPA 850MHz	4357	826.4	-30.32	Plot M	-13	PASS
	4400	835	-29.90	Plot N		PASS
	4458	846.6	-30.17	Plot O		PASS
HSDPA 1900MHz	9662	1852.4	-27.02	Plot P	-13	PASS
	9800	1880	-36.41	Plot Q		PASS
	9938	1907.6	-36.16	Plot R		PASS
HSUPA	4357	826.4	-30.70	Plot S	-13	PASS

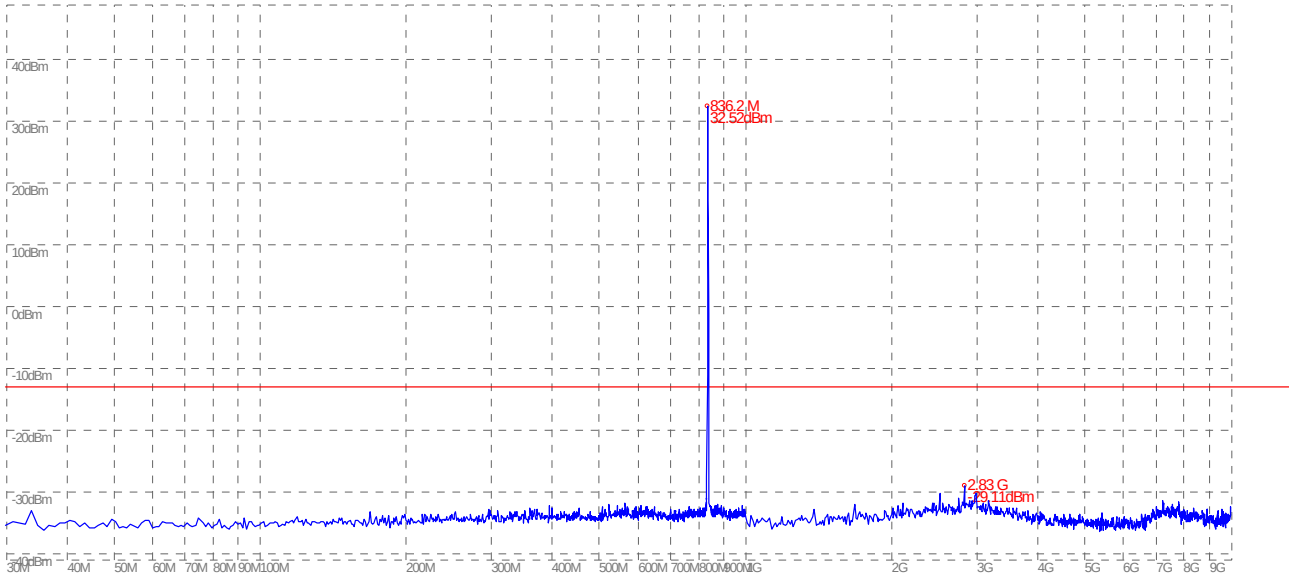
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
850MHz	4400	835	-30.80	Plot T		PASS
	4458	846.6	-30.67	Plot U		PASS
HSUPA 1900MHz	9662	1852.4	-35.74	Plot V	-13	PASS
	9800	1880	-34.10	Plot W		PASS
	9938	1907.6	-34.43	Plot X		PASS

2. Test Plots for the Whole Measurement Frequency Range:

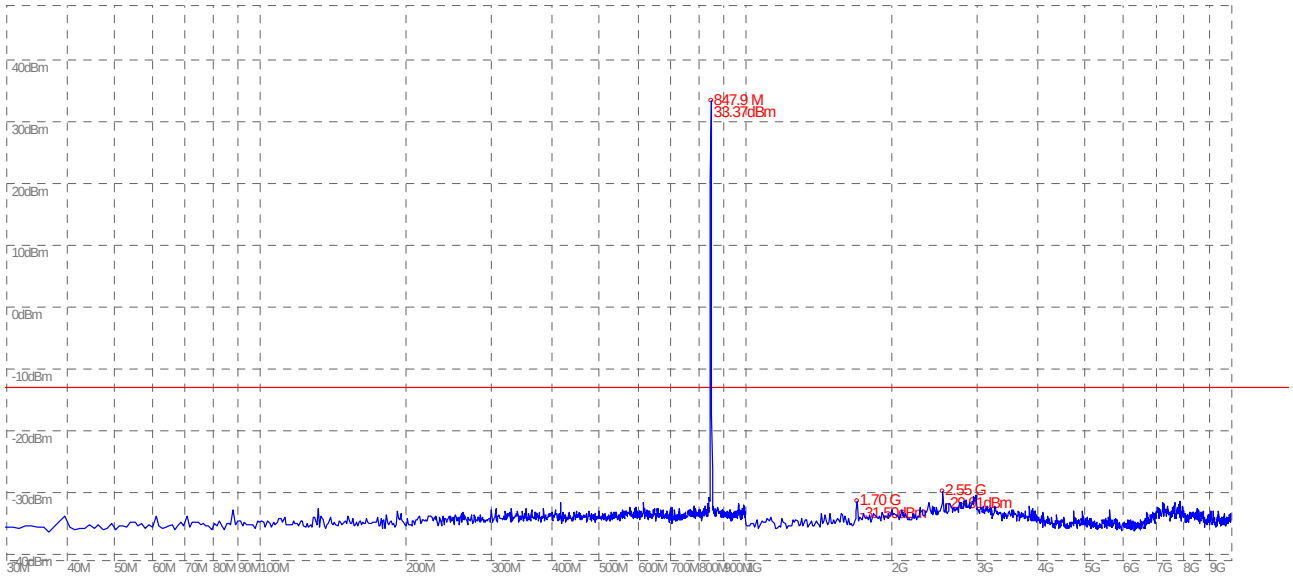
Note: the power of the EUT transmitting frequency should be ignored.



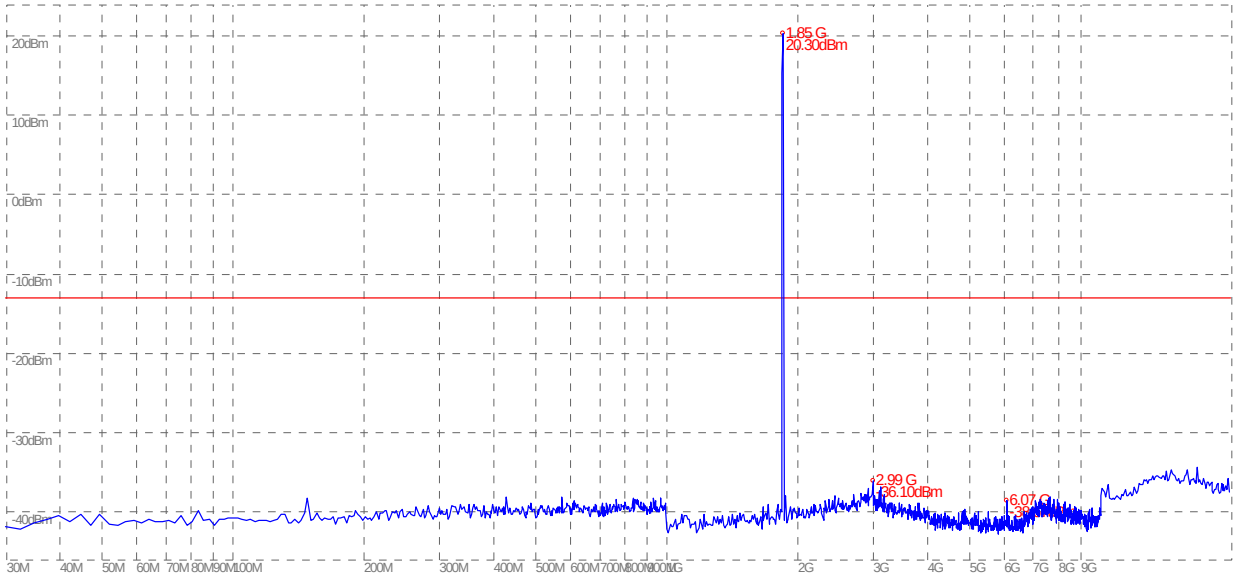
(Plot A: GPRS 850MHz Channel = 128, 30MHz to 10GHz)



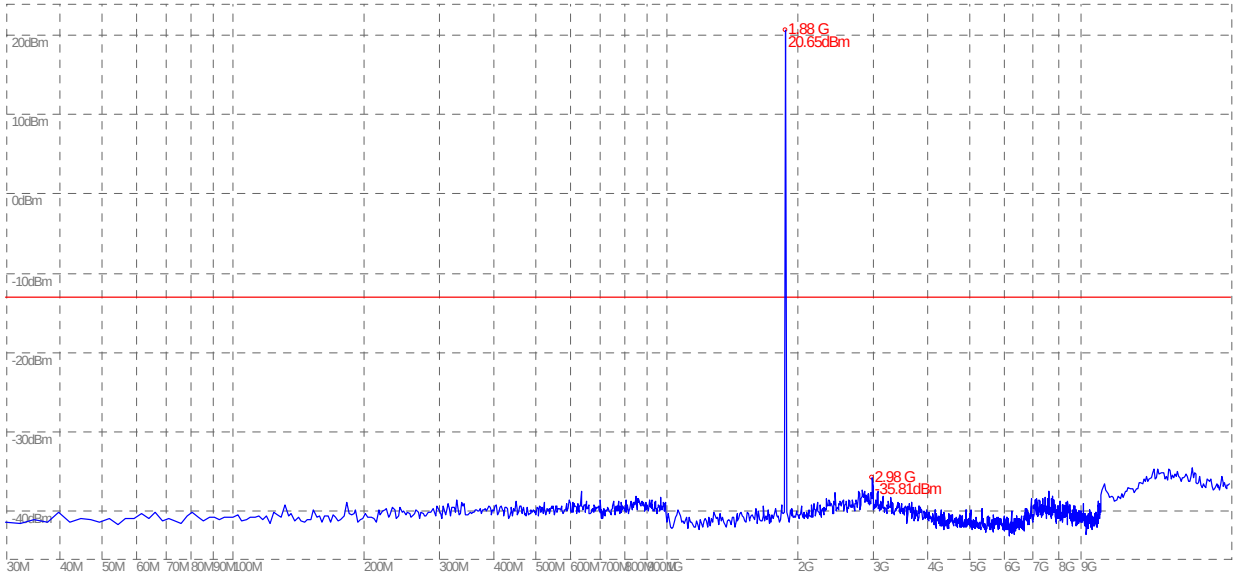
(Plot B: GPRS 850MHz Channel = 190, 30MHz to 10GHz)



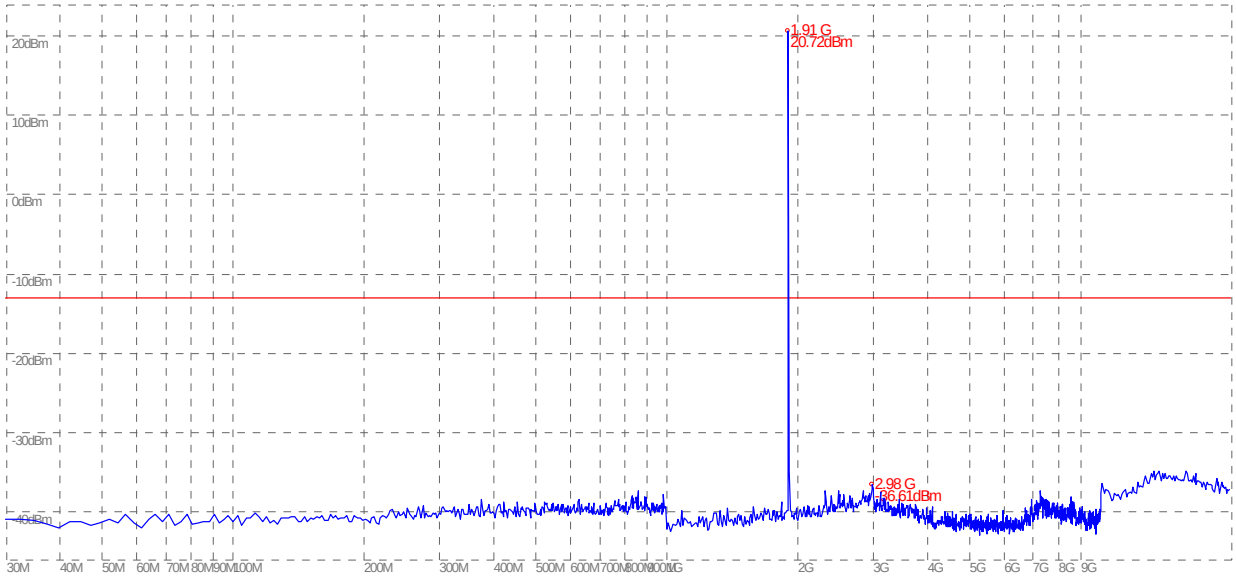
(Plot C: GPRS 850MHz Channel = 251, 30MHz to 10GHz)



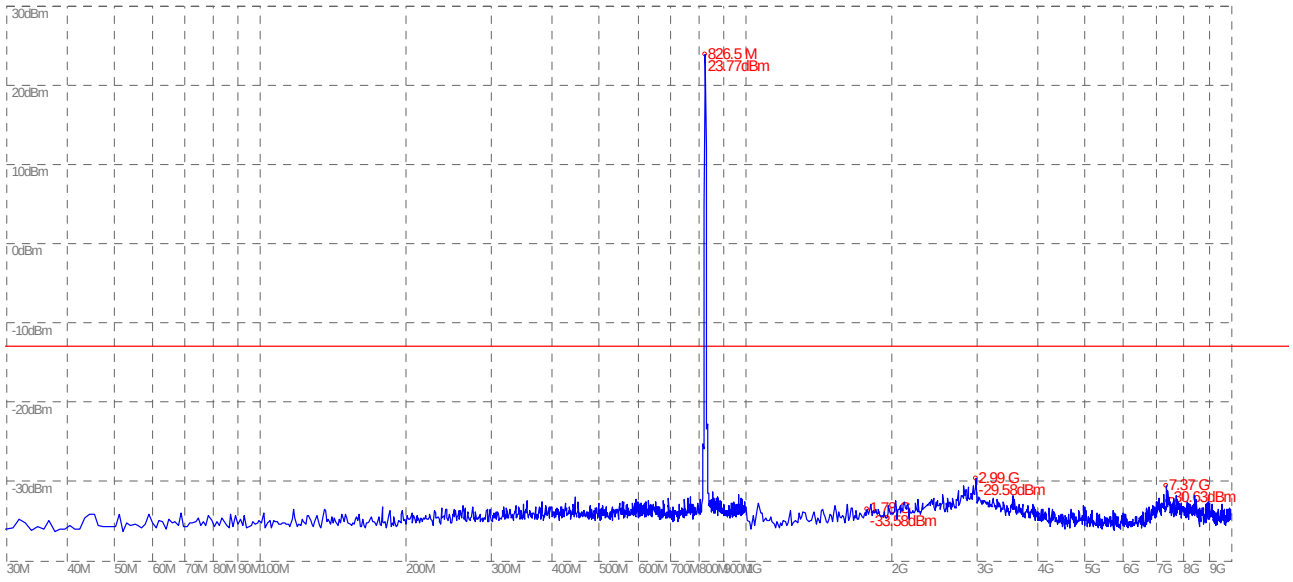
(Plot D: GPRS 1900MHz Channel = 512, 30MHz to 20GHz)



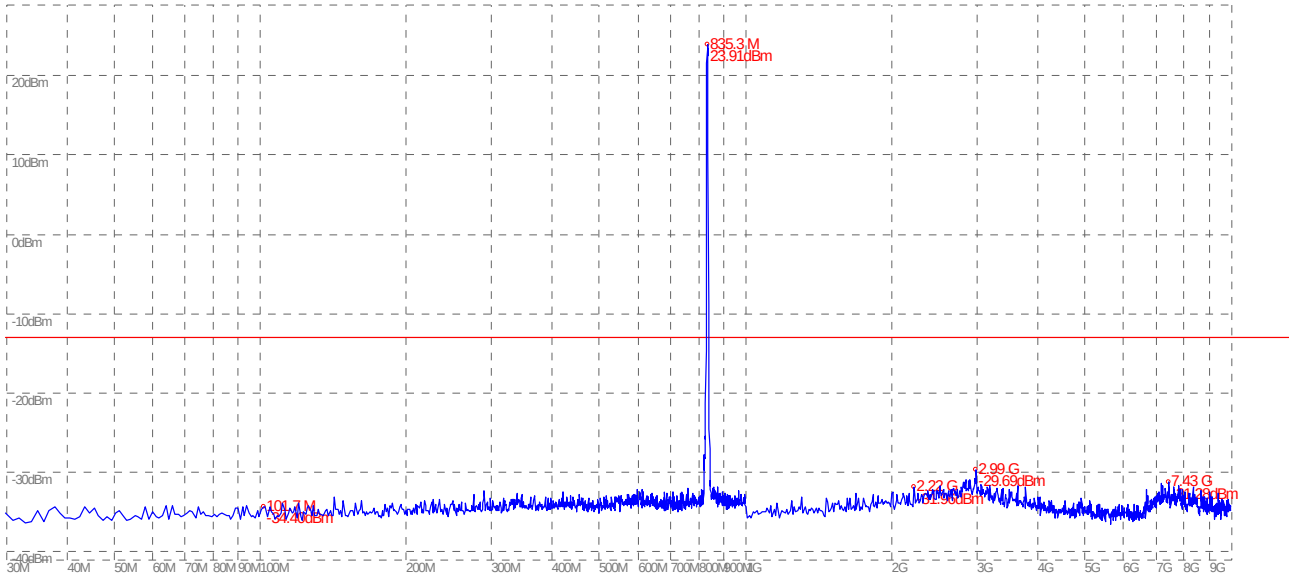
(Plot E: GPRS 1900MHz Channel = 661, 30MHz to 20GHz)



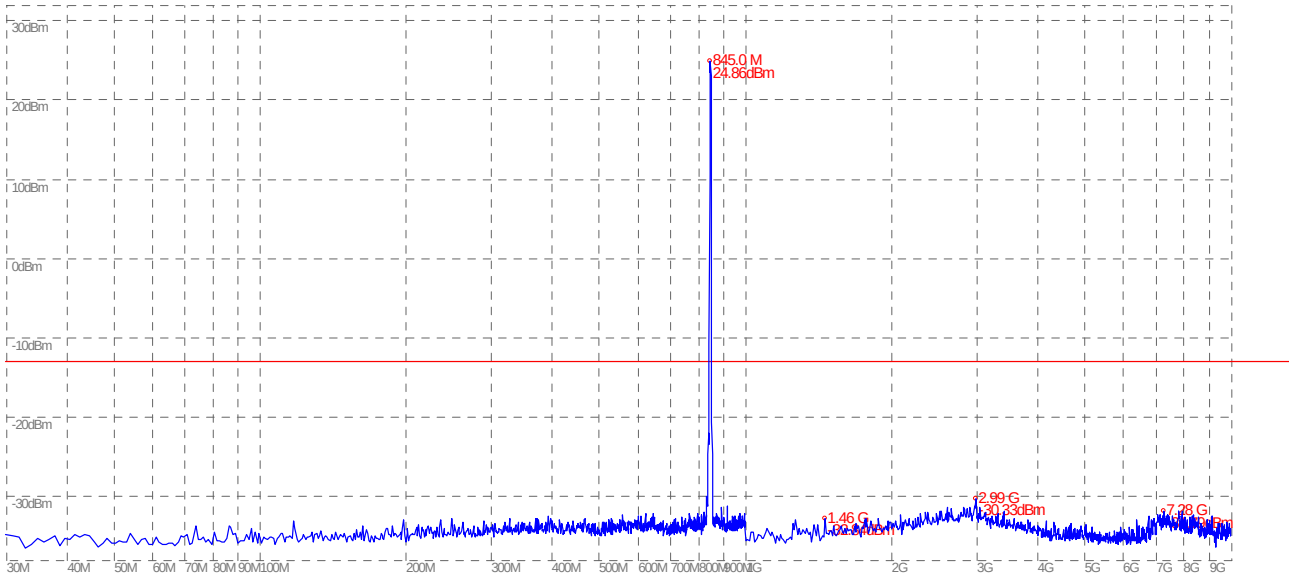
(Plot F: GPRS 1900MHz Channel = 810, 30MHz to 20GHz)



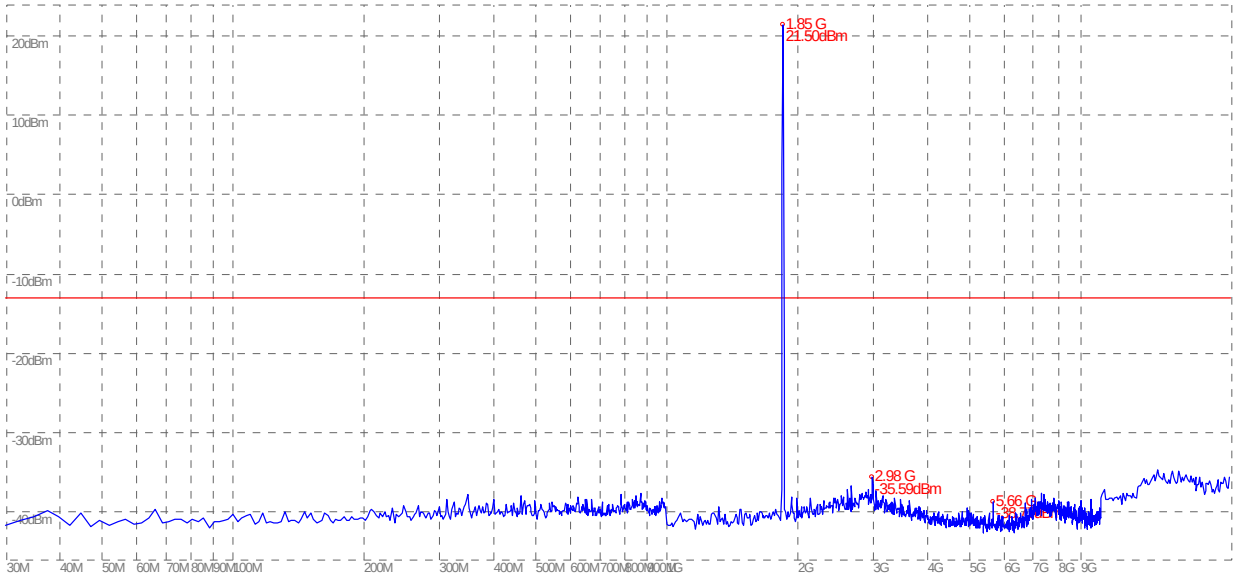
(Plot G: WCDMA850MHz Channel = 4357, 30MHz to 10GHz)



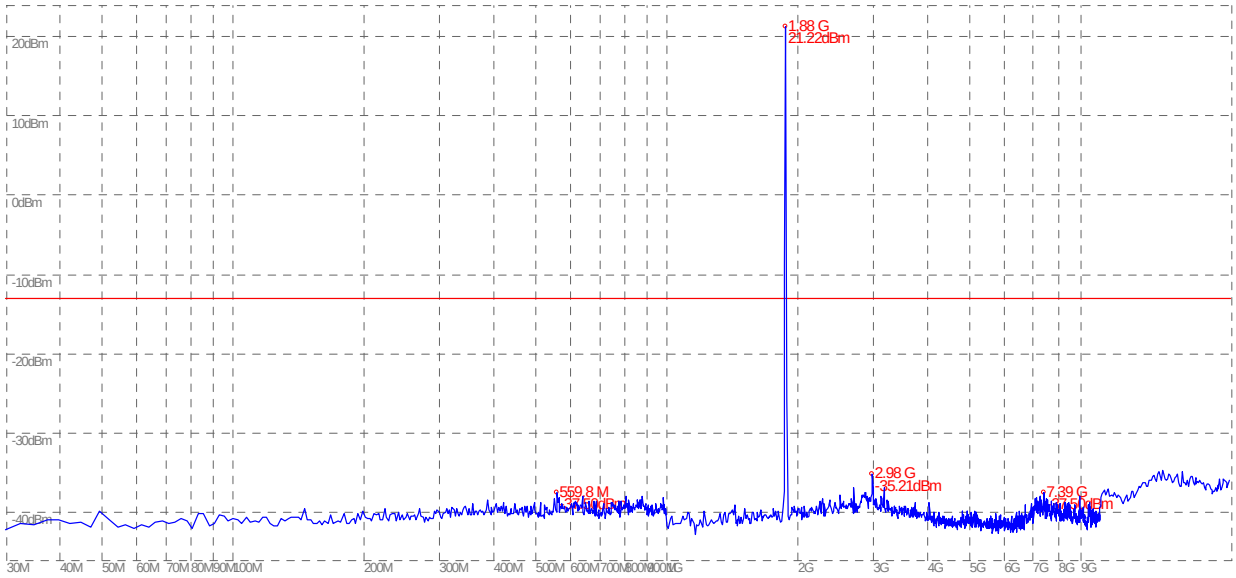
(Plot H: WCDMA 850MHz Channel = 4400, 30MHz to 10GHz)



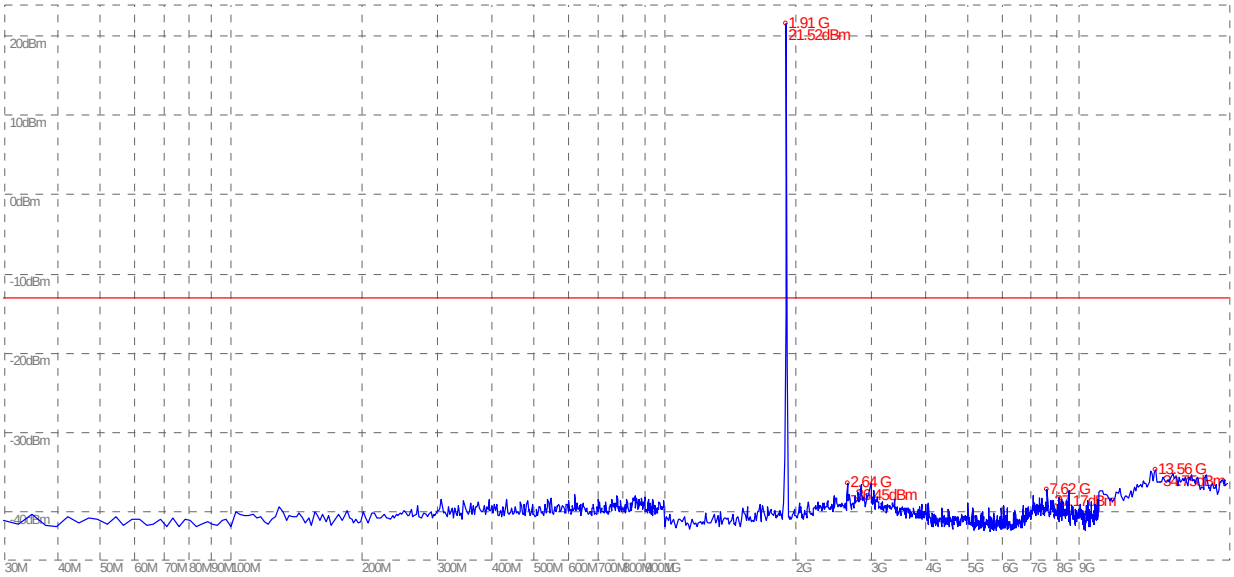
(Plot I: WCDMA 850MHz Channel = 4458, 30MHz to 10GHz)



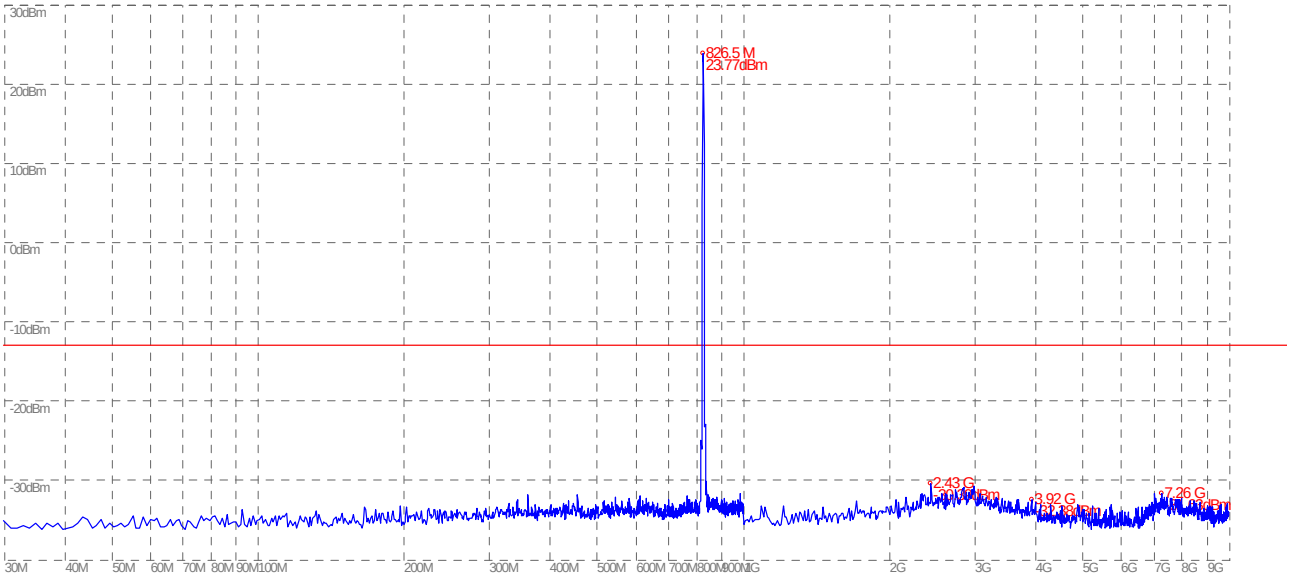
(Plot J: WCDMA 1900MHz Channel = 9662, 30MHz to 20GHz)



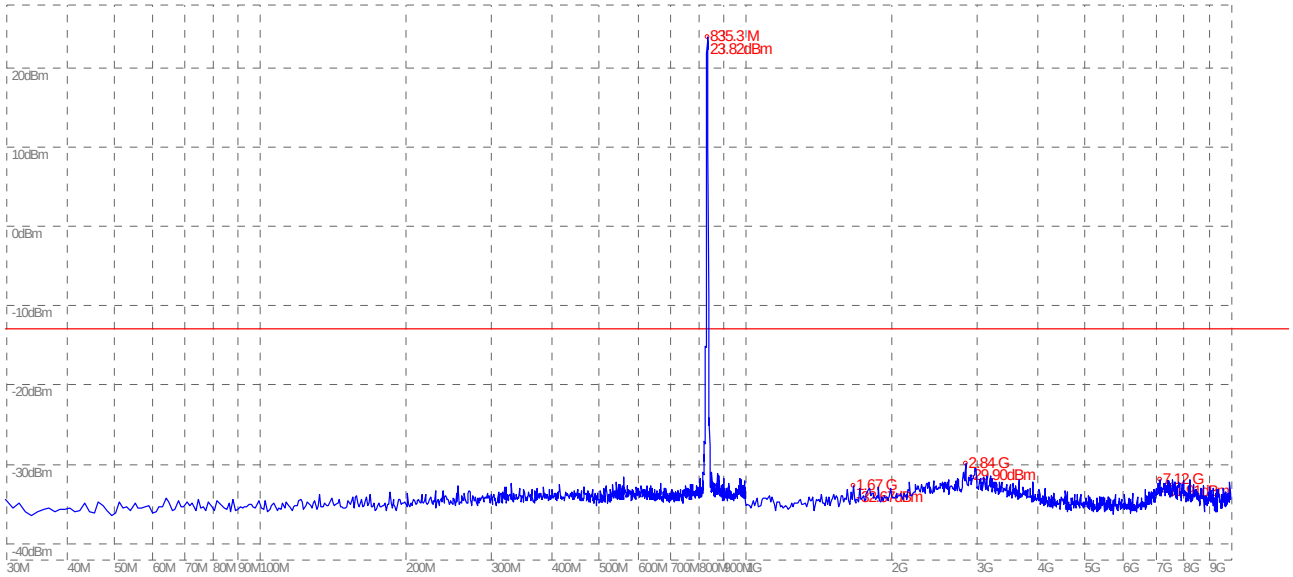
(Plot K: WCDMA 1900MHz Channel = 9800, 30MHz to 20GHz)



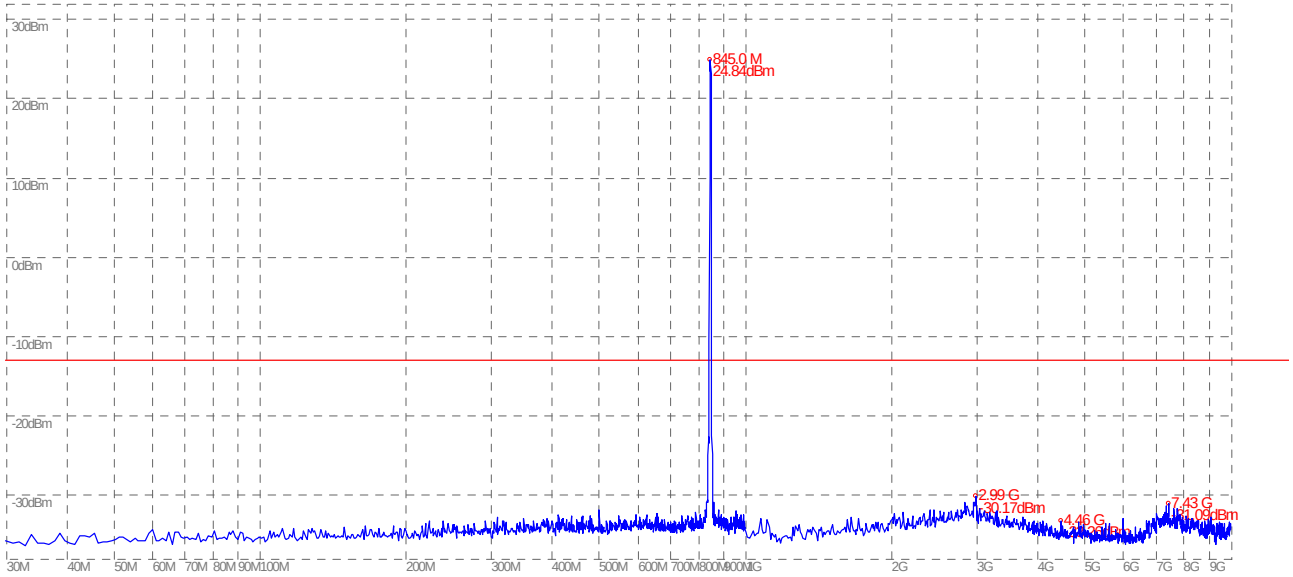
(Plot L: WCDMA 1900MHz Channel = 9938, 30MHz to 20GHz)



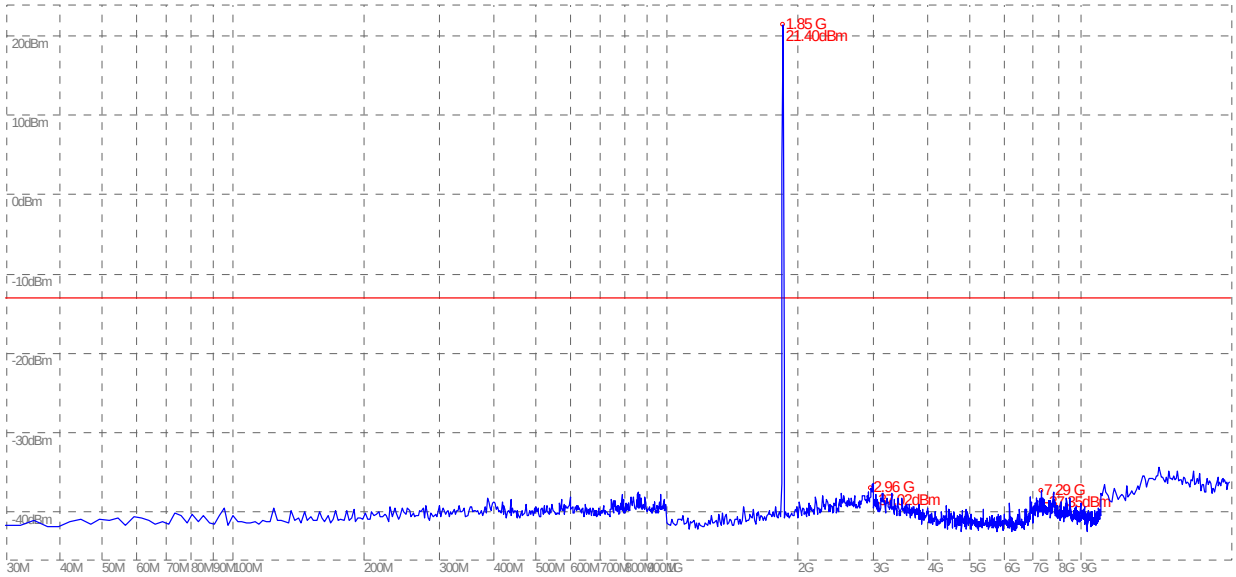
(Plot M: HSDPA 850MHz Channel = 4357, 30MHz to 10GHz)



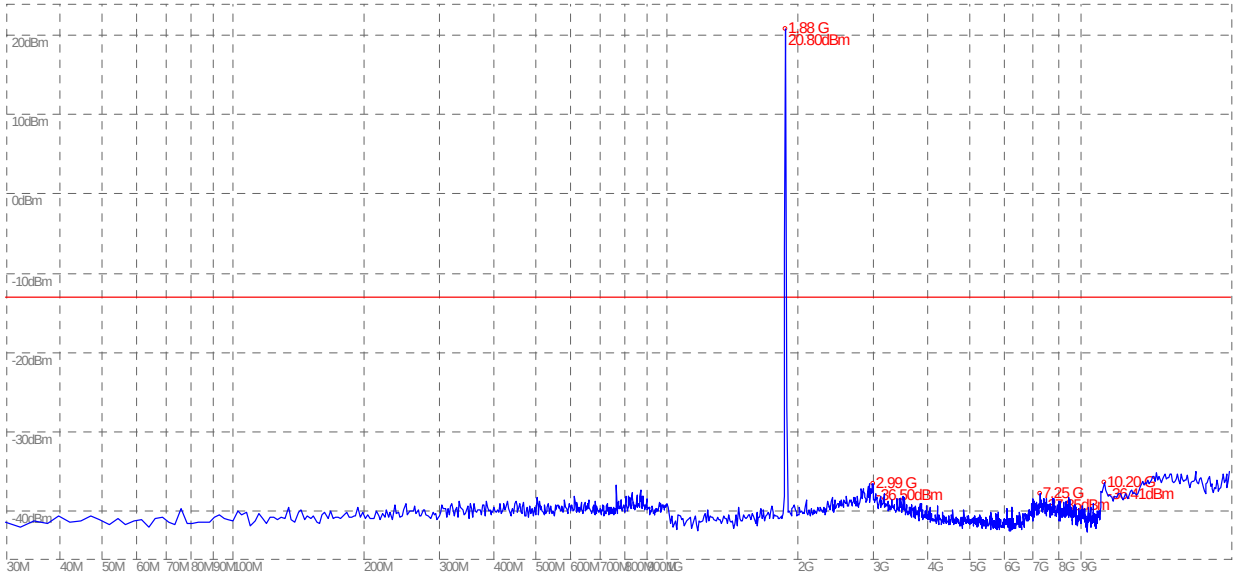
(Plot N: HSDPA 850MHz Channel = 4400, 30MHz to 10GHz)



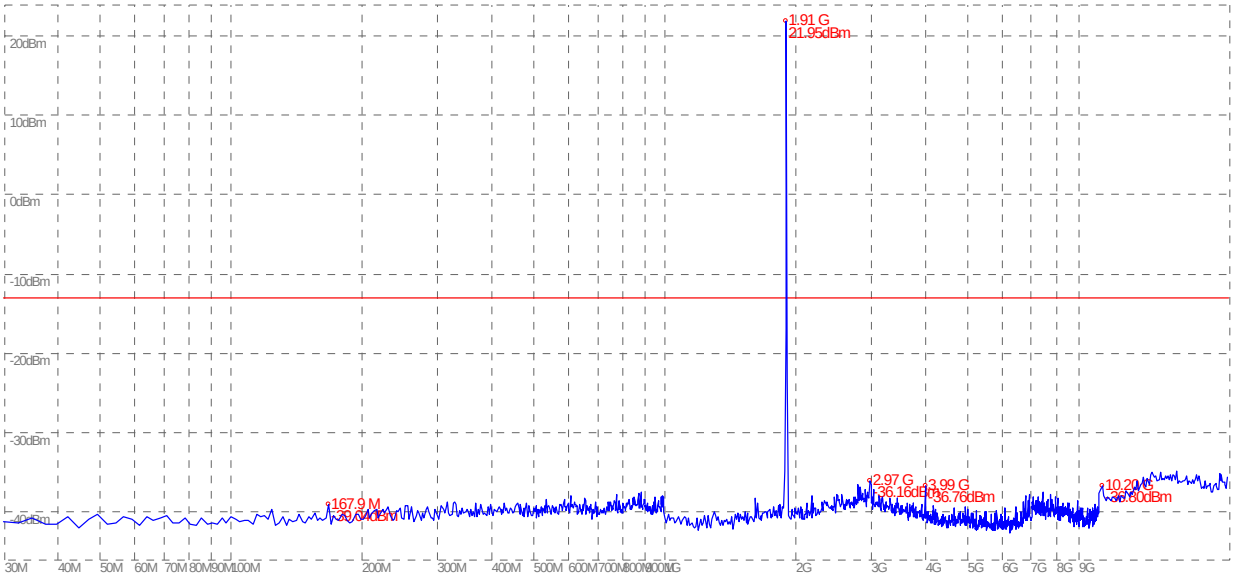
(Plot O: HSDPA 850MHz Channel = 4458, 30MHz to 10GHz)



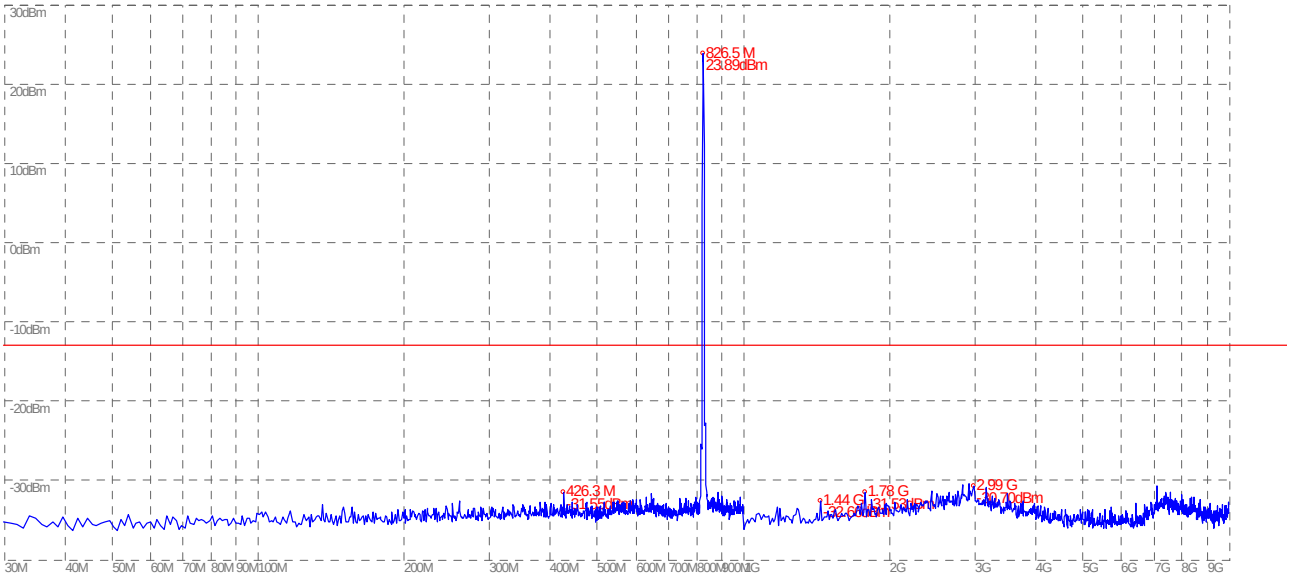
(Plot P: HSDPA 1900MHz Channel = 9662, 30MHz to 20GHz)



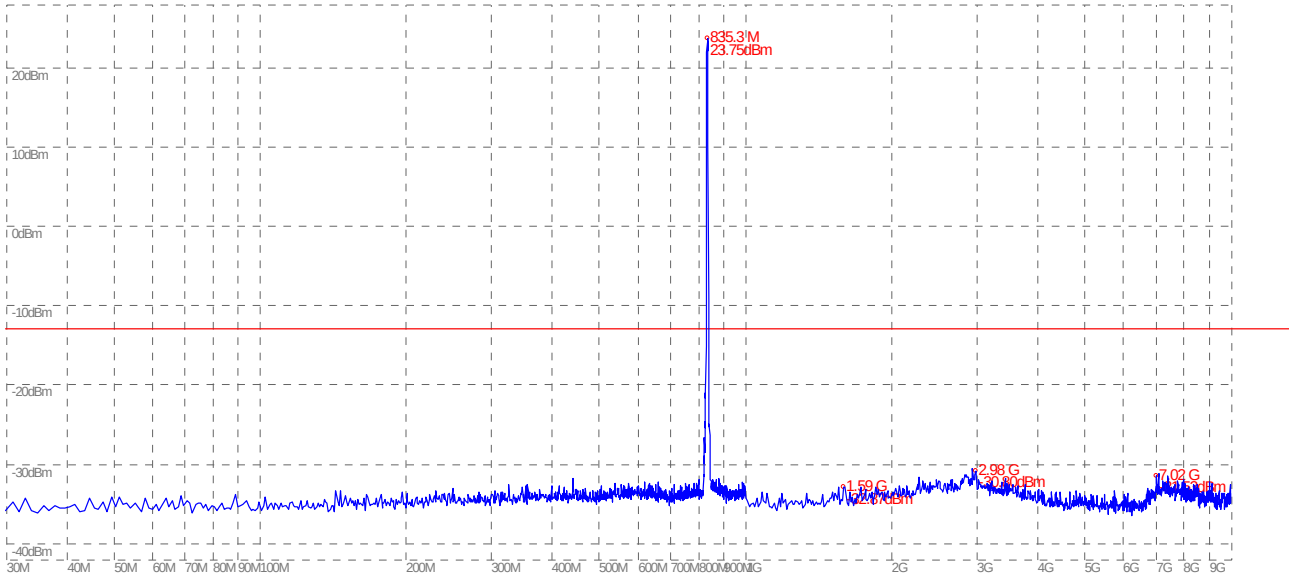
(Plot Q: HSDPA 1900MHz Channel = 9800, 30MHz to 20GHz)



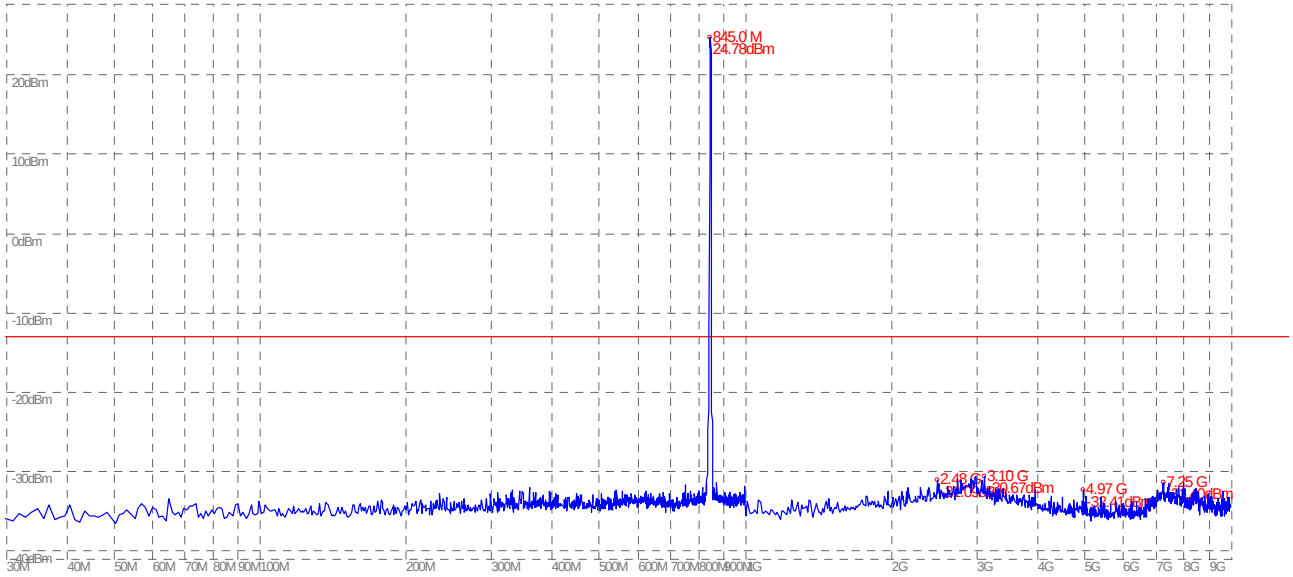
(Plot R: HSDPA 1900MHz Channel = 9938, 30MHz to 20GHz)



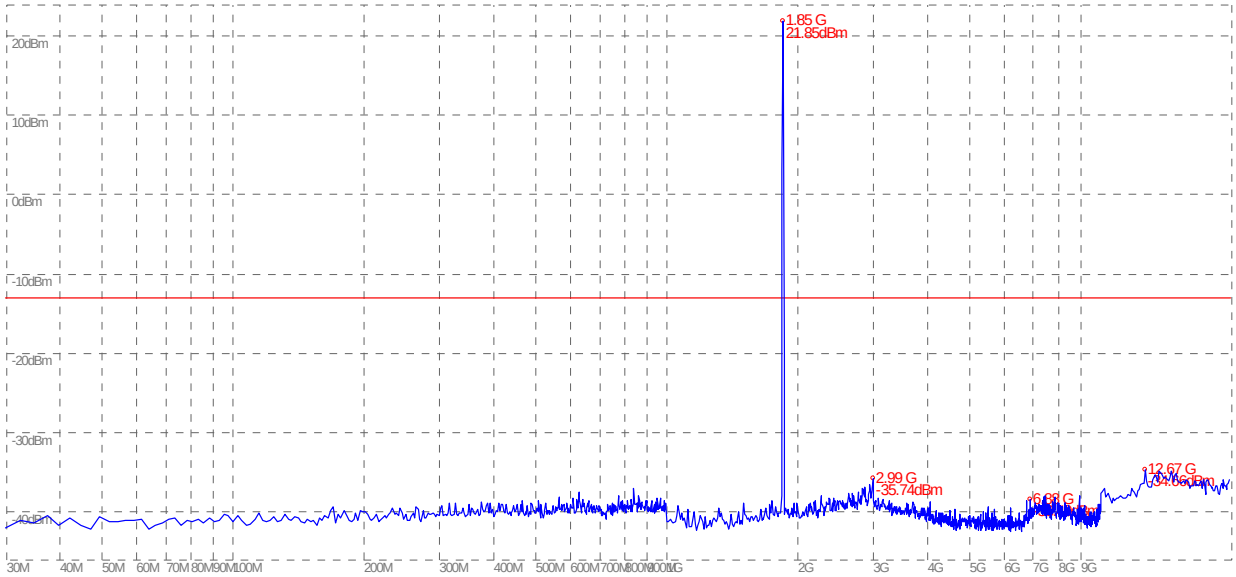
(Plot S: HSUPA 850MHz Channel = 4357, 30MHz to 10GHz)



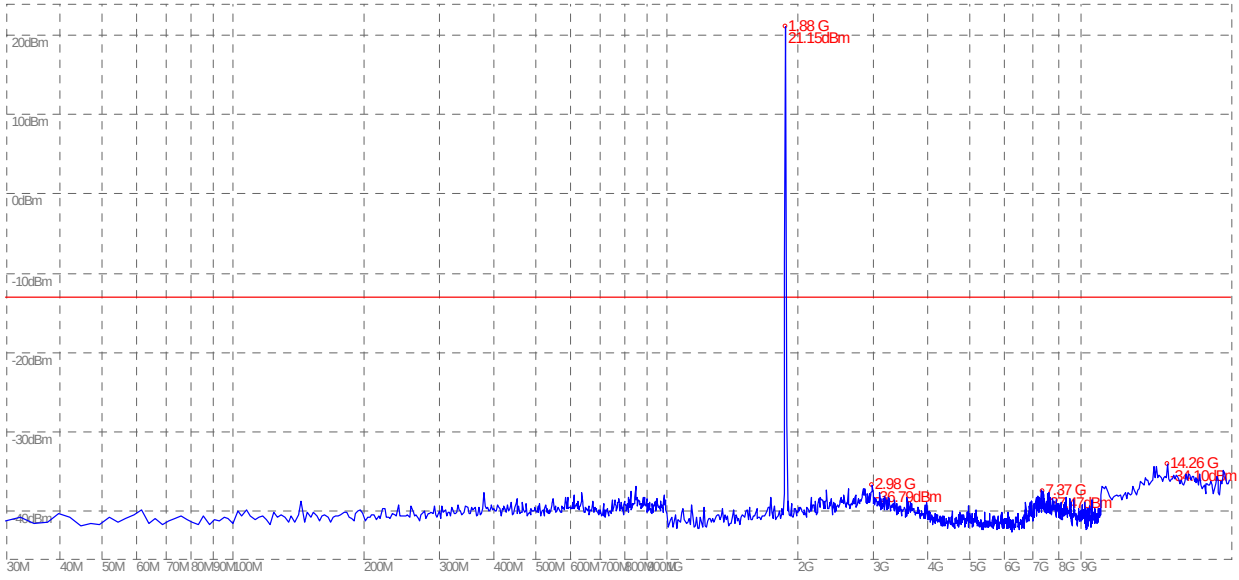
(Plot T: HSUPA 850MHz Channel = 4400, 30MHz to 10GHz)



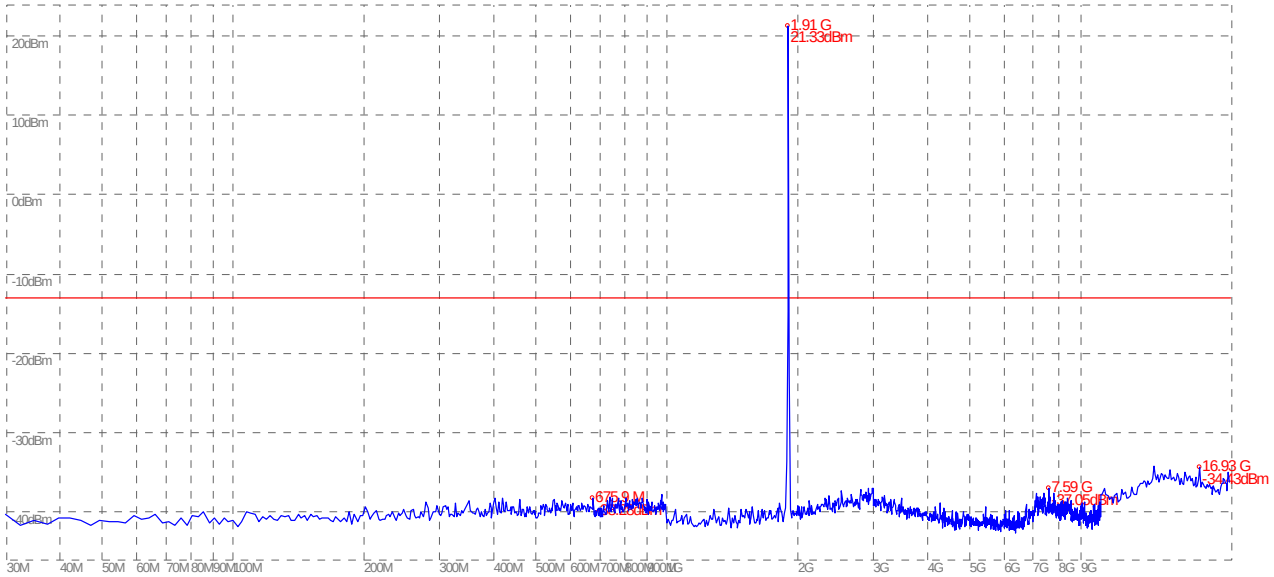
(Plot U: HSUPA 850MHz Channel = 4458, 30MHz to 10GHz)



(Plot V: HSUPA 1900MHz Channel = 9662, 30MHz to 20GHz)



(Plot W: HSUPA 1900MHz Channel = 9800, 30MHz to 20GHz)



(Plot X: HSUPA 1900MHz Channel = 9938, 30MHz to 20GHz)

3.5 Band Edge

3.5.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

3.5.2 Test Description

See section 3.1.2 of this report.

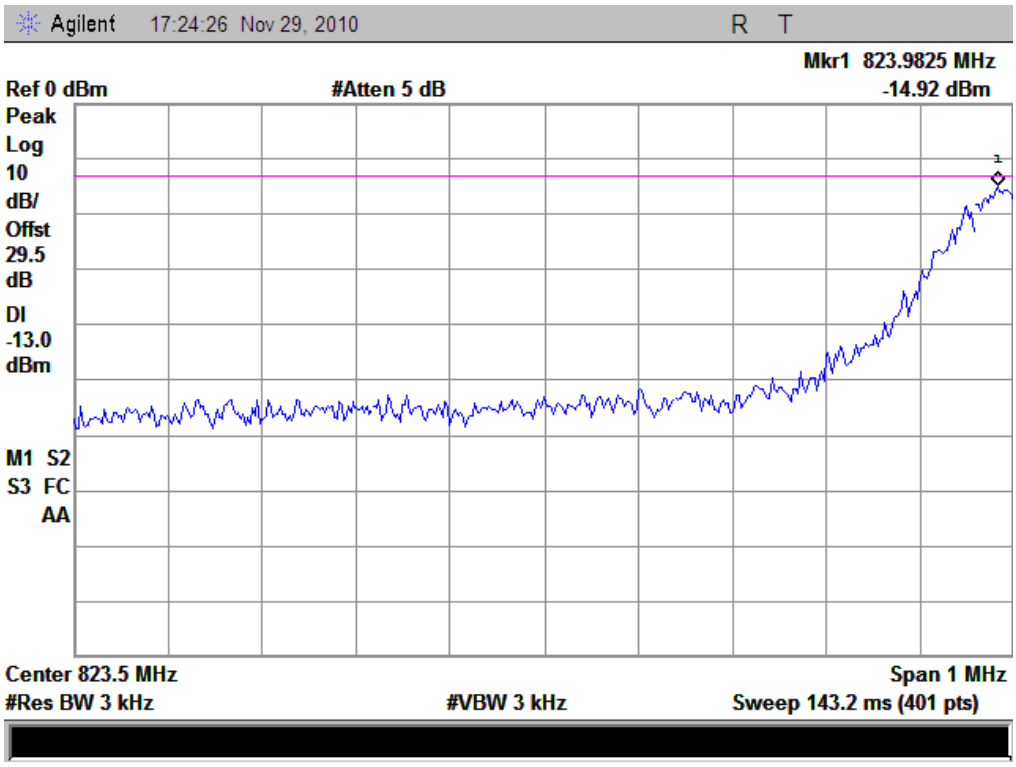
3.5.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions.

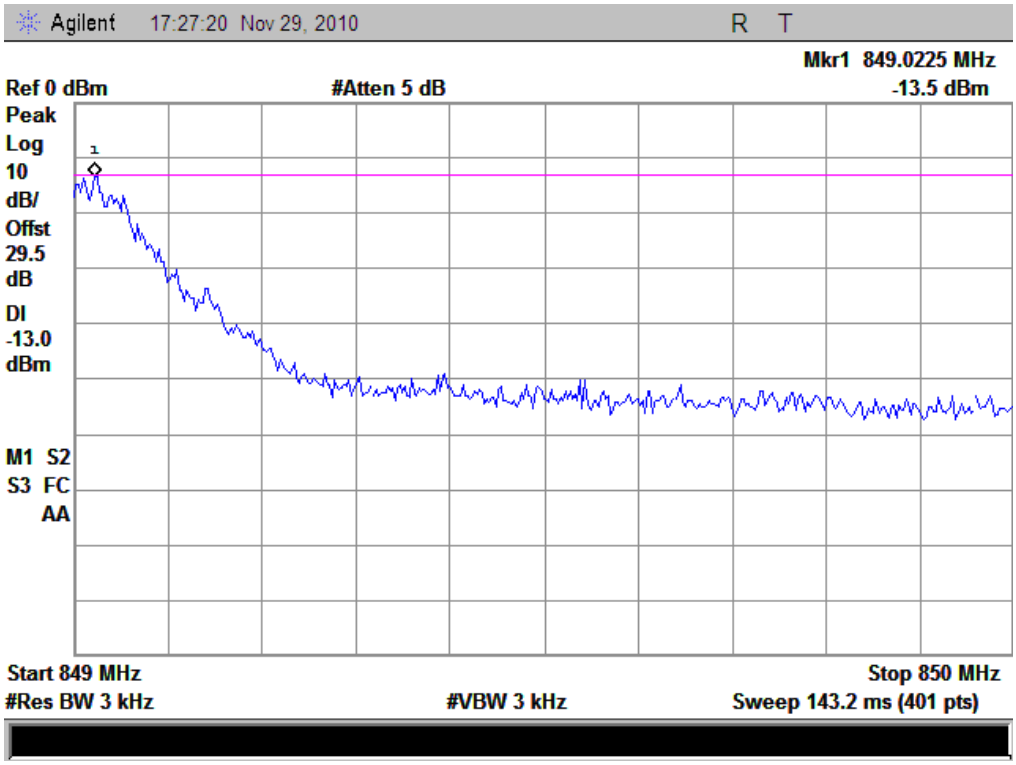
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GPRS 850MHz	128	824.2	-14.92	Plat A	-13	PASS
	251	848.8	-13.50	Plot B		PASS
GPRS 1900MHz	512	1850.2	-17.30	Plat C	-13	PASS
	810	1909.8	-19.98	Plot D		PASS
WCDMA 850MHz	4357	826.4	-30.46	Plat E	-13	PASS
	4458	846.6	-27.59	Plot F		PASS
WCDMA 1900MHz	9662	1852.4	-30.38	Plat G	-13	PASS
	9938	1907.6	-28.56	Plot H		PASS
HSDPA 850MHz	4357	826.4	-29.83	Plat I	-13	PASS
	4458	846.6	-29.01	Plot J		PASS
HSDPA1 900MHz	9662	1852.4	-29.53	Plat K	-13	PASS
	9938	1907.6	-28.52	Plot L		PASS
HSUPA 850MHz	4357	826.4	-30.26	Plat M	-13	PASS
	4458	846.6	-28.01	Plot N		PASS
HSUPA 1900MHz	9662	1852.4	-31.24	Plat O	-13	PASS
	9938	1907.6	-28.04	Plot P		PASS

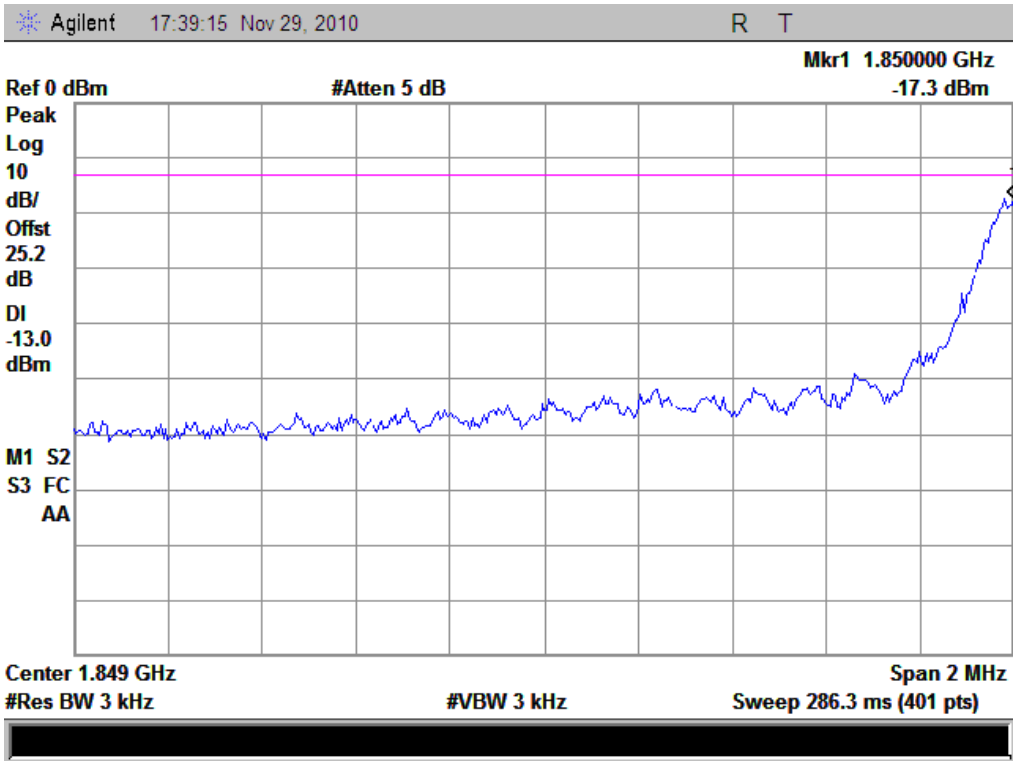
2. Test Plots:



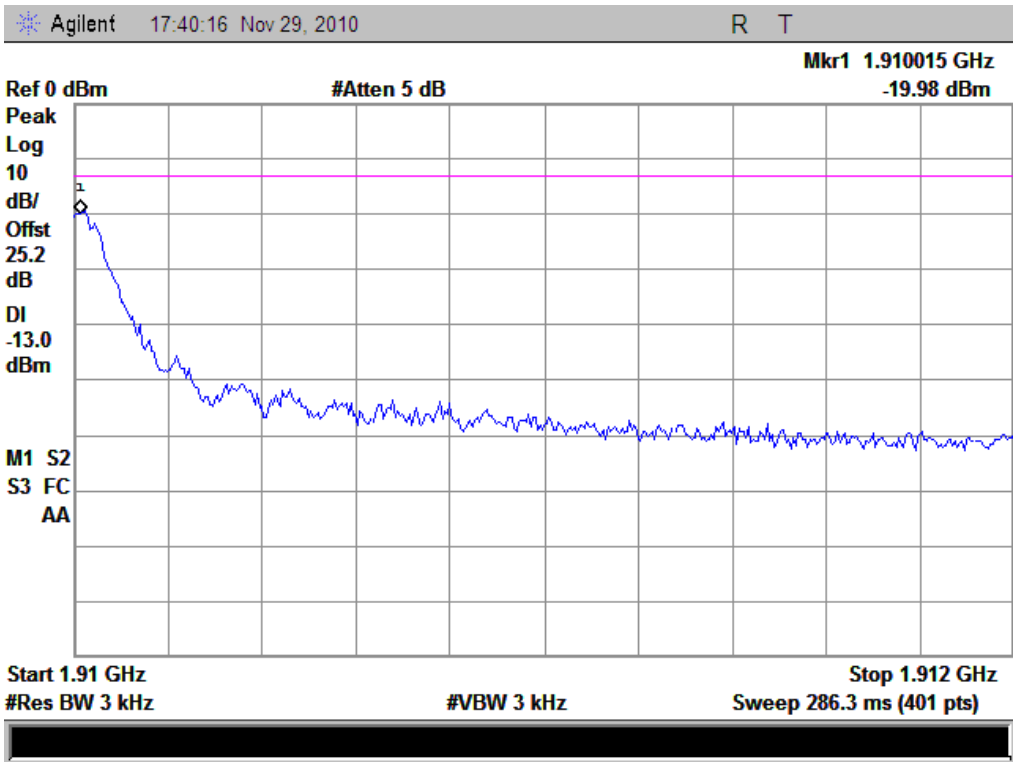
(Plot A: GPRS 850 Channel = 128)



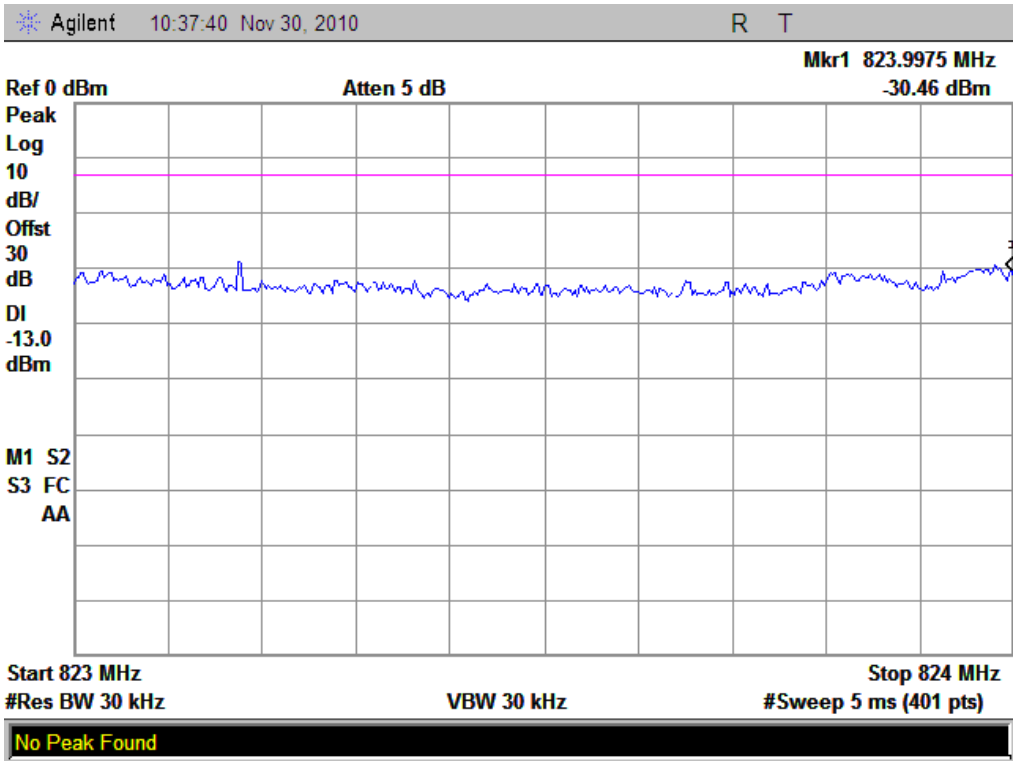
(Plot B: GPRS 850 Channel = 251)



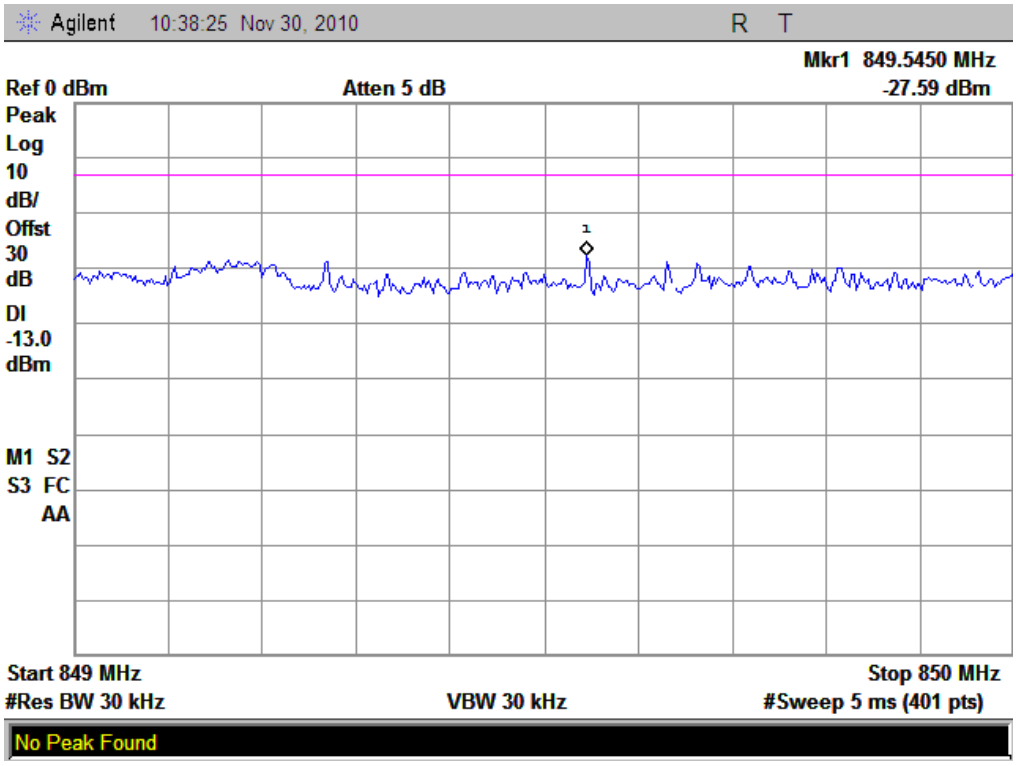
(Plot C: GPRS 1900 Channel = 512)



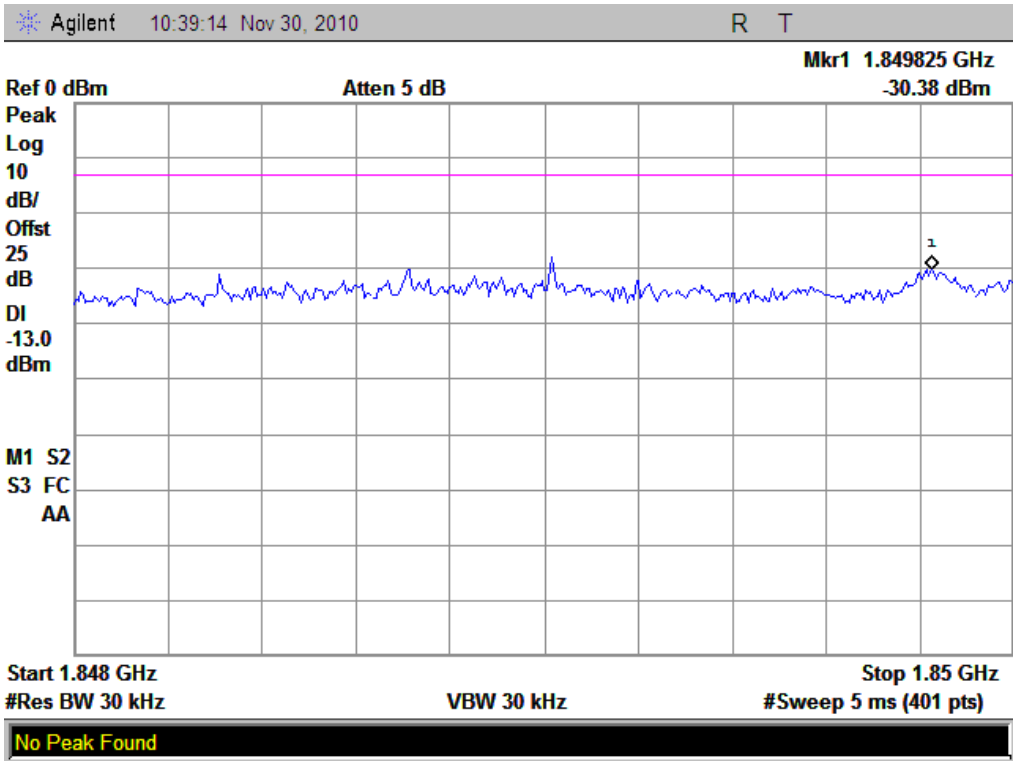
(Plot D: GPRS 1900 Channel = 810)



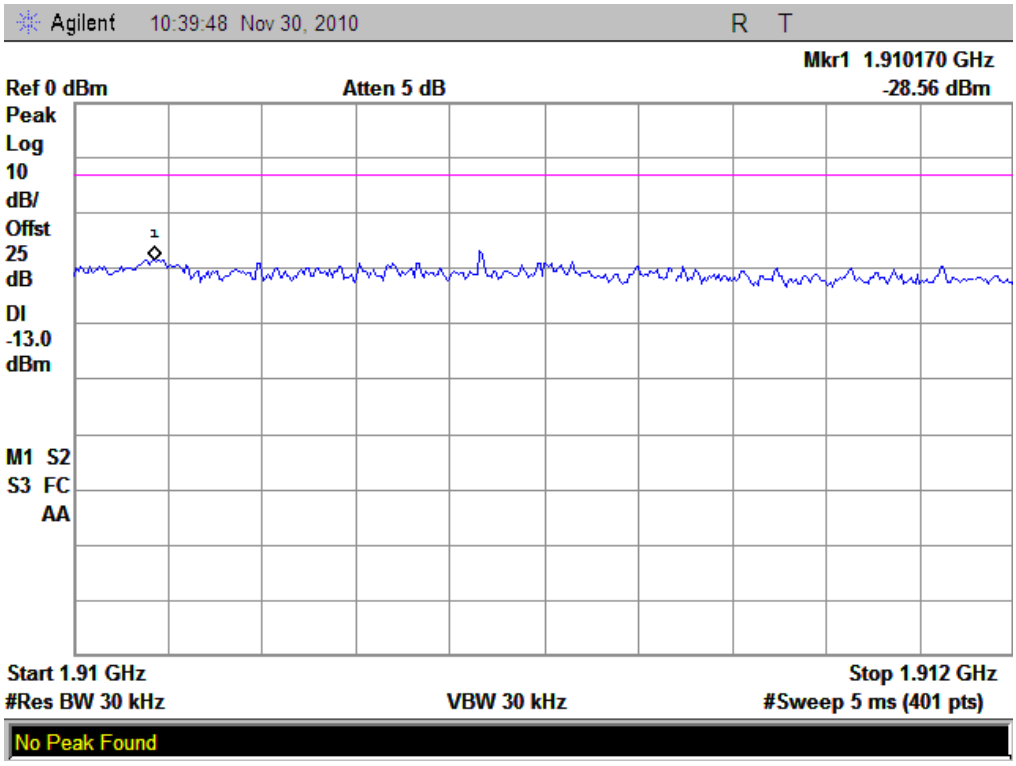
(Plot E: WCDMA 850 Channel = 4357)



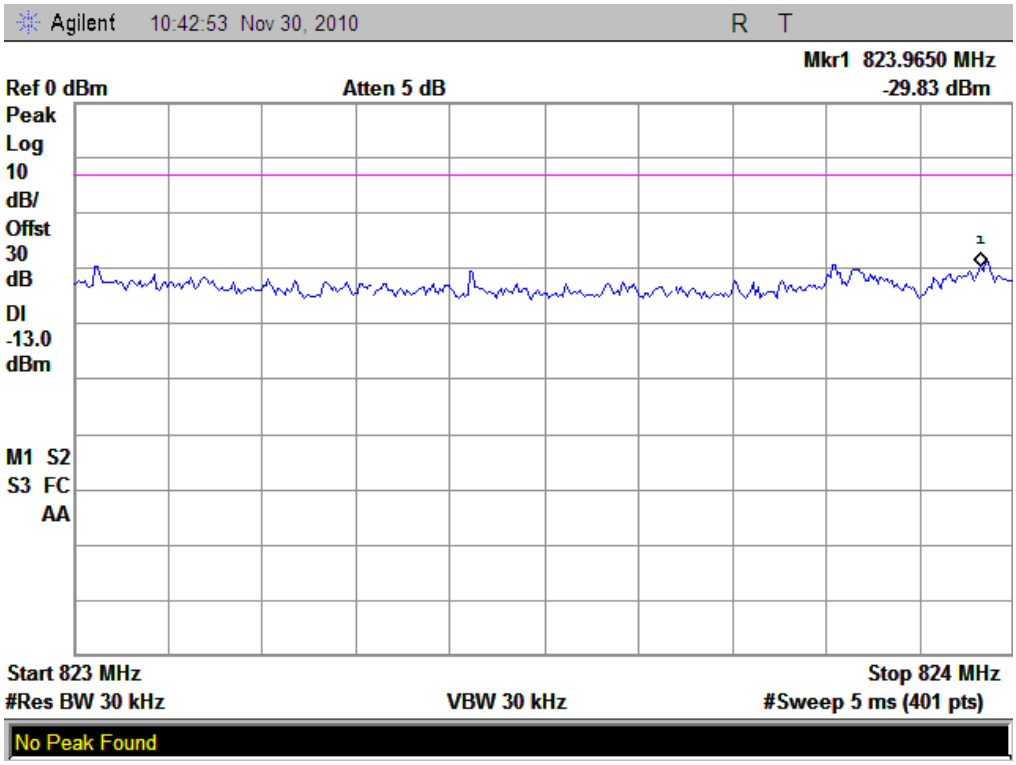
(Plot F: WCDMA 850 Channel = 4458)



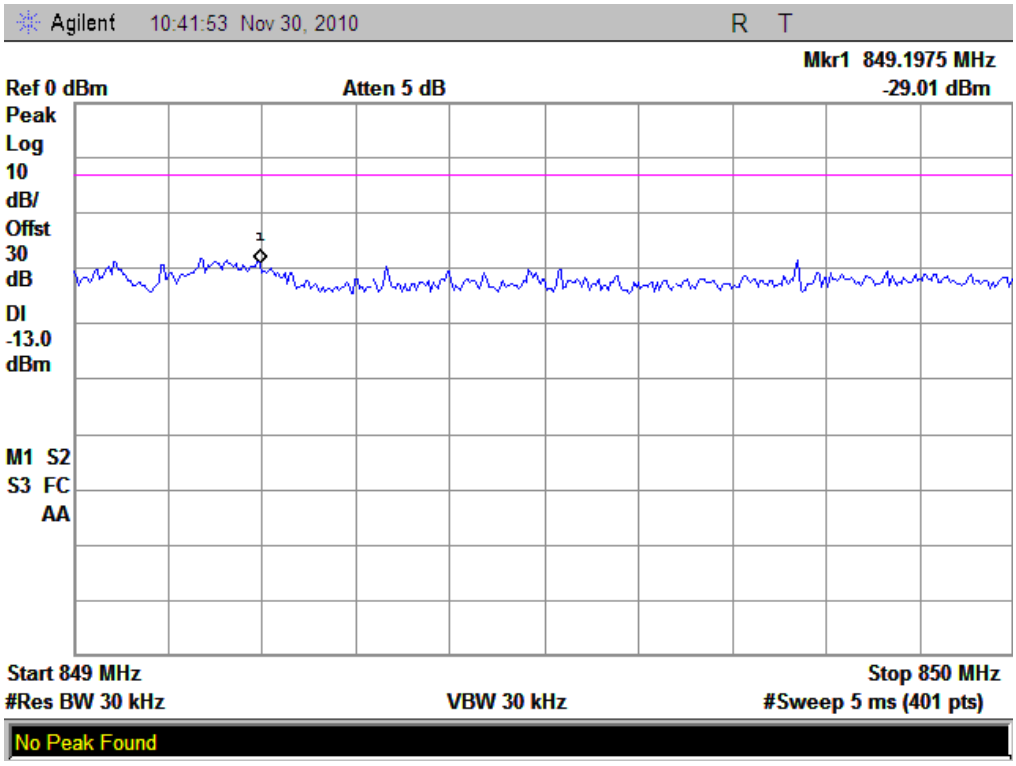
(Plot G: WCDMA 1900 Channel = 9662)



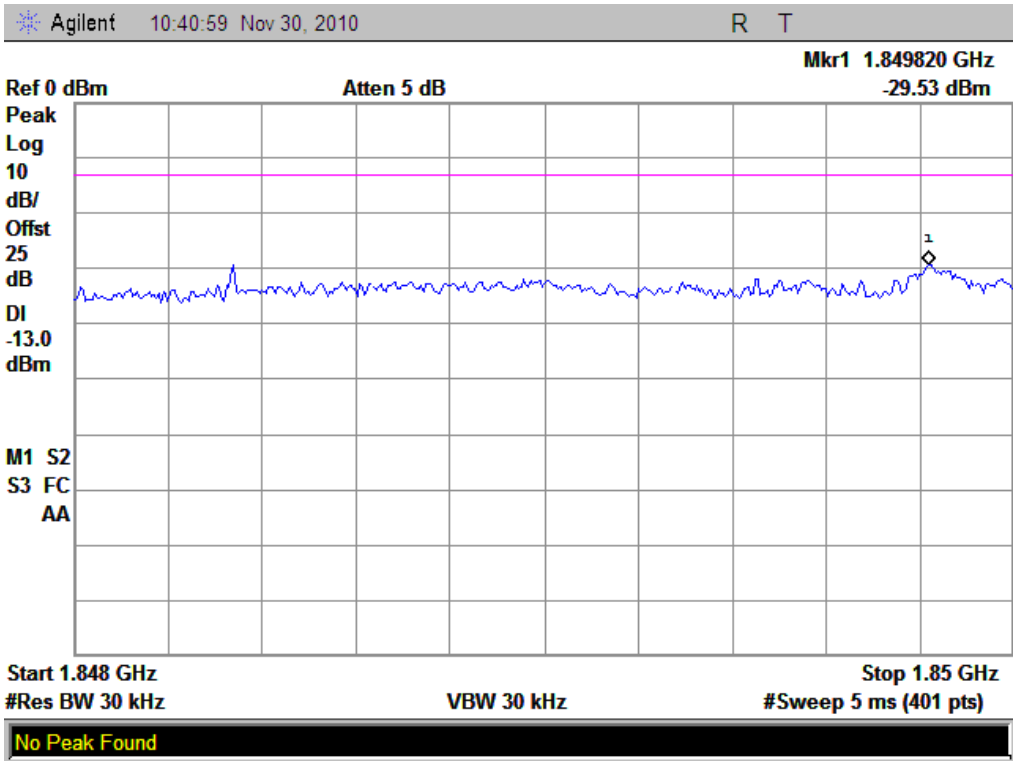
(Plot H: WCDMA 1900 Channel = 9938)



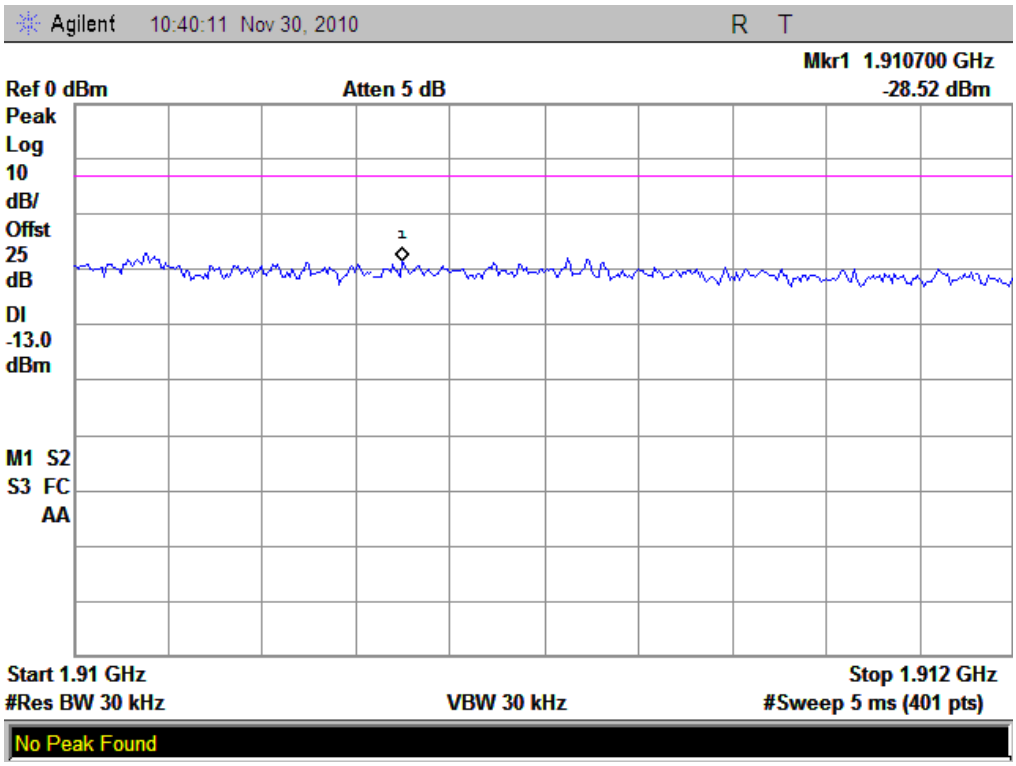
(Plot I: HSDPA 850 Channel = 4357)



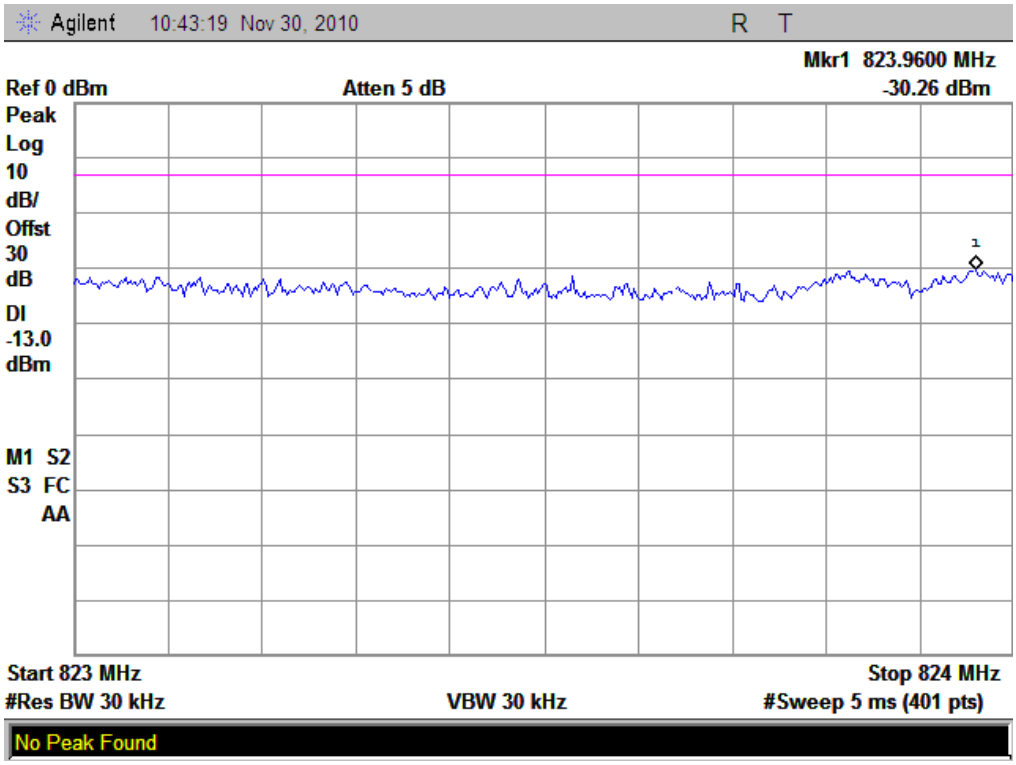
(Plot J: HSDPA 850 Channel = 4458)



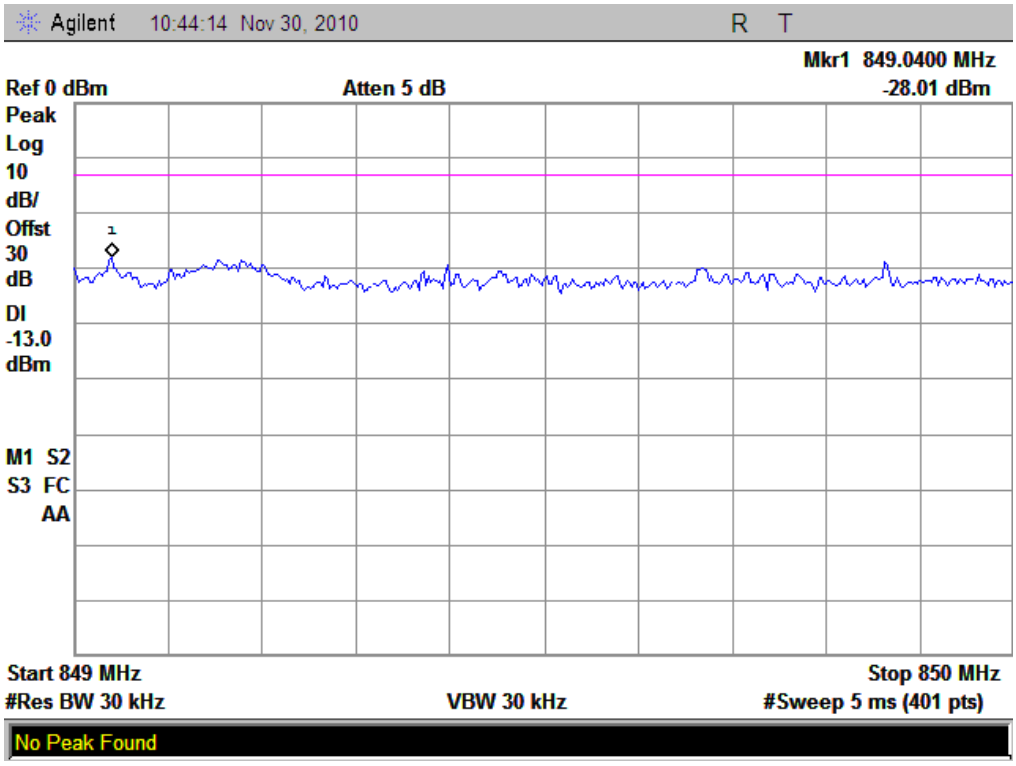
(Plot K: HSDPA1900 Channel = 9662)



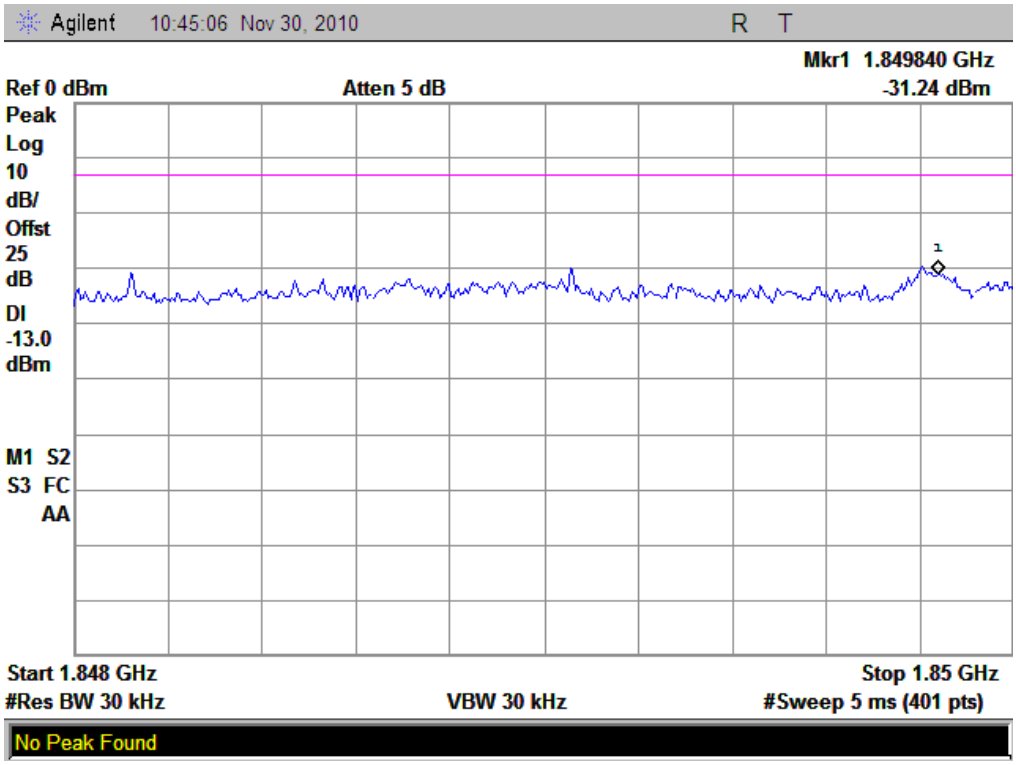
(Plot L: HSDPA 1900 Channel = 9938)



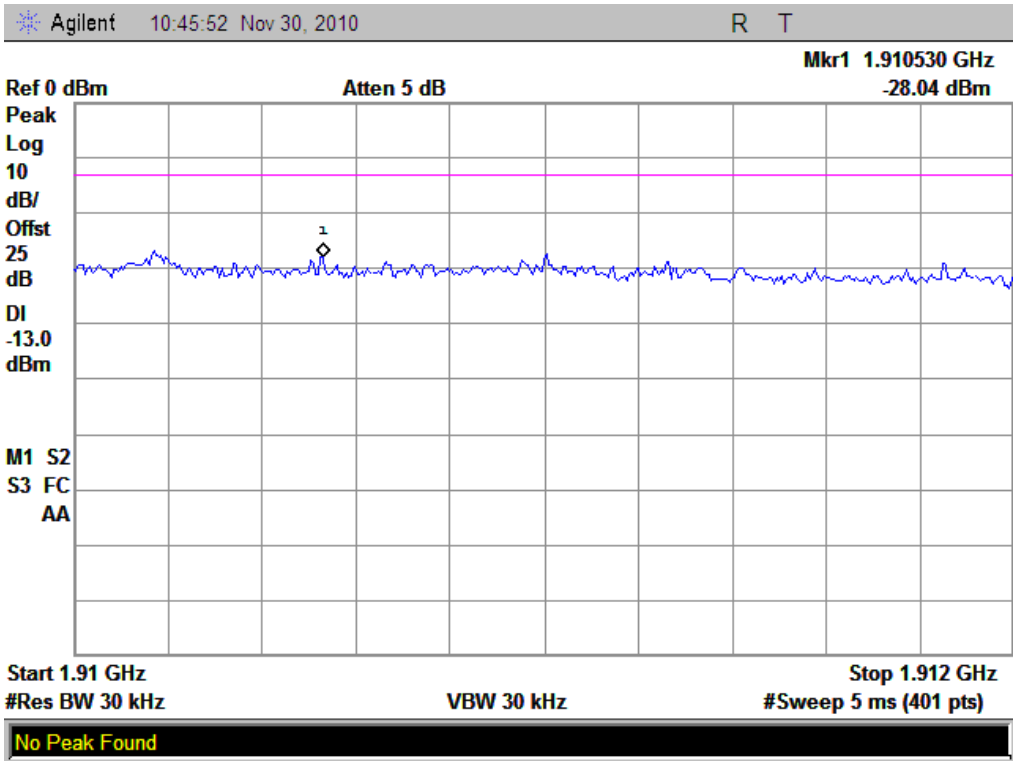
(Plot M: HSUPA 850 Channel = 4357)



(Plot N: HSUPA 850 Channel = 4458)



(Plot O: HSUPA 1900 Channel = 9662)



(Plot P: HSUPA 1900 Channel = 9938)

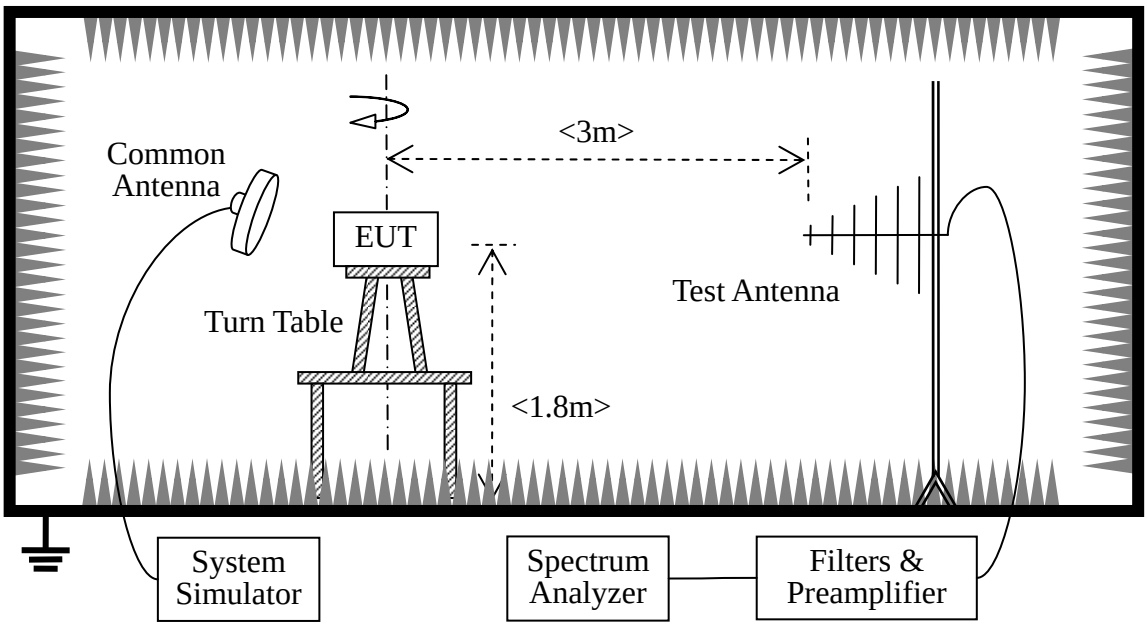
3.6 Transmitter Radiated Power (EIRP/ERP)

3.6.1 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2Watts e.i.r.p. peak power.

3.6.2 Test Description

1. Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded.

-Maximum RF output power: GPRS 850 32.24dBm, GPRS 1900 30.18dBm, Please refer to section 错误！未找到引用源。 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM850 2.1dBm, GSM 1900 0.2dBm

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2009.09	2year
Spectrum Analyzer	Agilent	E7405A	US44210471	2009.09	2year
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2009.09	2year
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2009.09	2year
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2009.09	2year

3.6.3 Test Result

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$

$A_{TOT} = L_{CABLES} + A_{SUBST}$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST\_TX\_ANT}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of A_{TOT}.

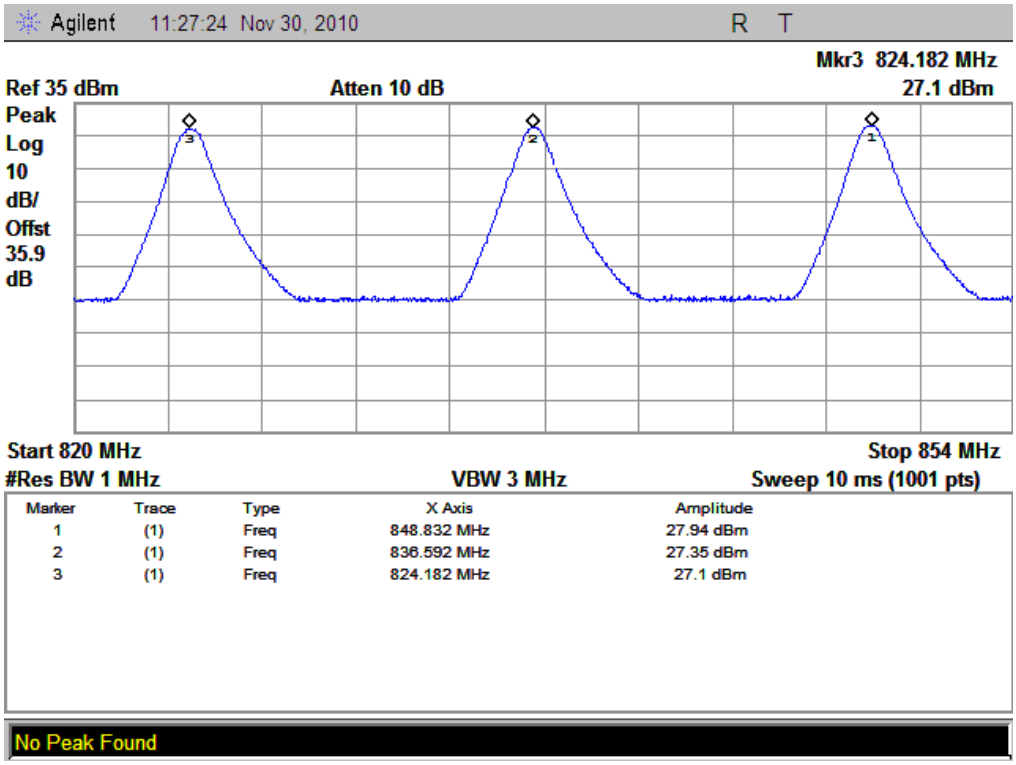
1. Test Verdict:

Band	Channel	Frequency (MHz)	PCL	Measured ERP/EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GPRS 850MHz	128	824.20	5	27.10	0.513	Plot A	38.45	7	PASS
	190	836.60	5	27.35	0.543	Plot B			PASS
	251	848.80	5	27.94	0.622	Plot C			PASS
GPRS 1900MHz	512	1850.2	0	20.25	0.106	Plot D	33	2	PASS
	661	1880.0	0	21.14	0.130	Plot E			PASS
	810	1909.8	0	19.99	0.100	Plot F			PASS

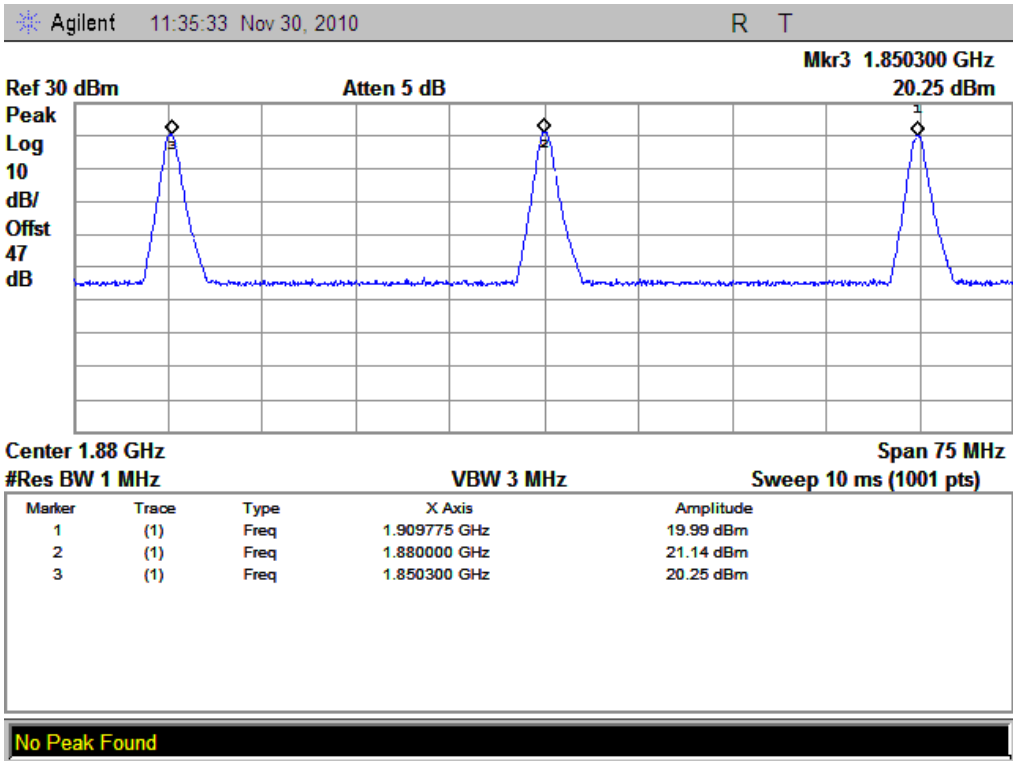
Band	Channel	Frequency (MHz)	Measured ERP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA 850MHz	4357	826.4	25.14	0.33	38.5	7	PASS
	4400	835	25.61	0.36			PASS
	4458	846.6	26.13	0.41			PASS
WCDMA 1900MHz	9662	1852.4	24.30	0.27	33	2	PASS
	9800	1880	25.08	0.32			PASS
	9938	1907.6	24.29	0.27			PASS
HSDPA 850MHz	4357	826.4	25.15	0.33	38.5	7	PASS
	4400	835	25.84	0.38			PASS
	4458	846.6	26.10	0.41			PASS
HSDPA 1900MHz	9662	1852.4	24.32	0.27	33	2	PASS
	9800	1880	24.43	0.28			PASS
	9938	1907.6	24.28	0.27			PASS
HSUPA 850MHz	4357	826.4	25.30	0.34	38.5	7	PASS
	4400	835	25.82	0.38			PASS
	4458	846.6	26.10	0.41			PASS
HSUPA 1900MHz	9662	1852.4	24.45	0.28	33	2	PASS
	9800	1880	24.62	0.29			PASS
	9938	1907.6	24.53	0.28			PASS

Note: For the WCDMA、HSUPA、HSDPA test band, The measured output power was calculated by the reading of the Power Meter and calibration

2. Test Plots:



(Plot A: GPRS 850MHz Channel = 128, 190, 251)



(Plot A: GPRS 1900MHz Channel = 512, 661, 810)

3.7 Radiated Out of Band Emissions

3.7.1 Requirement

According to FCC section 22.917(a) and section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

3.7.2 Test Description

See section 3.7.2 of this report.

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

3.7.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

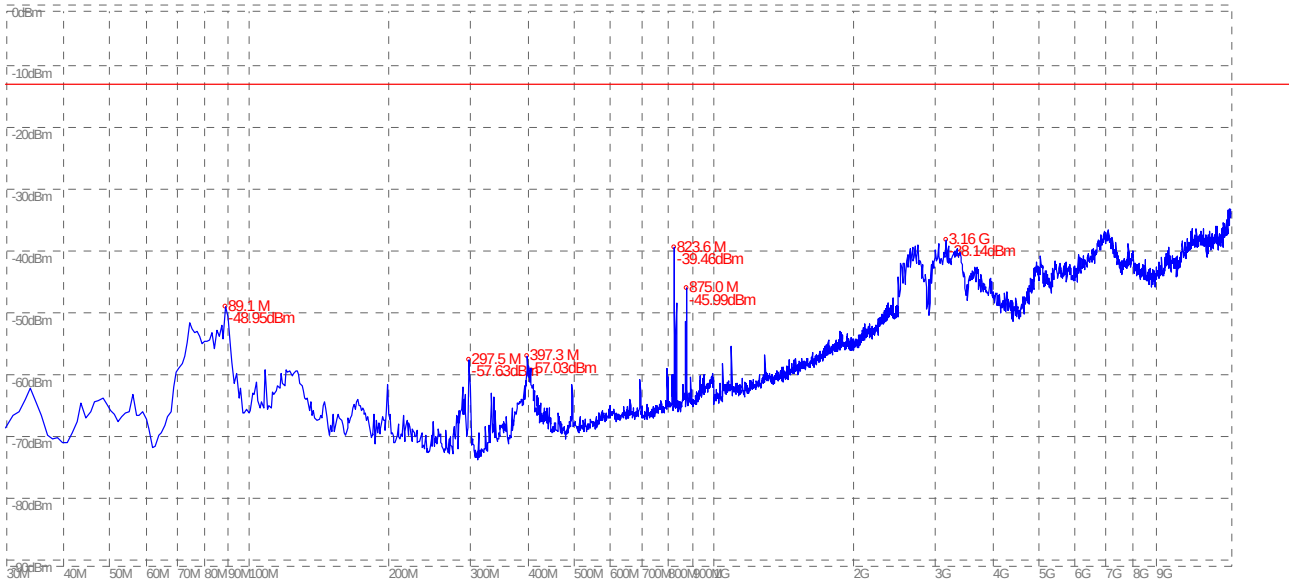
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
GPRS 850MHz	128	824.2	-28.14	< -33	Plot A.1/A.2	-13	PASS
	190	836.6	-39.04	< -33	Plot B.1/B.2		PASS
	251	848.8	-38.29	< -33	Plot C.1/C.2		PASS
GPRS 1900MHz	512	1850.2	< -33	< -33	Plot D.1/D.2	-13	PASS
	661	1880.0	< -33	< -33	Plot E.1/E.2		PASS
	810	1909.8	< -33	< -33	Plot F.1/F.2		PASS
WCDMA 850MHz	4357	826.4	-24.19	-56.65	Plot G.1/G.2	-13	PASS
	4400	835	-52.05	-51.15	Plot H.1/H.2		PASS
	4458	846.6	-47.70	-36.96	Plot I.1/I.2		PASS
WCDMA 1900MHz	9662	1852.4	< -33	< -33	Plot J.1/J.2	-13	PASS
	9800	1880	< -33	< -33	Plot K.1/K.2		PASS
	9938	1907.6	< -33	< -33	Plot L.1/L.2		PASS
HSDPA	4357	826.4	< -25	< -25	Plot M.1/M.2	-13	PASS

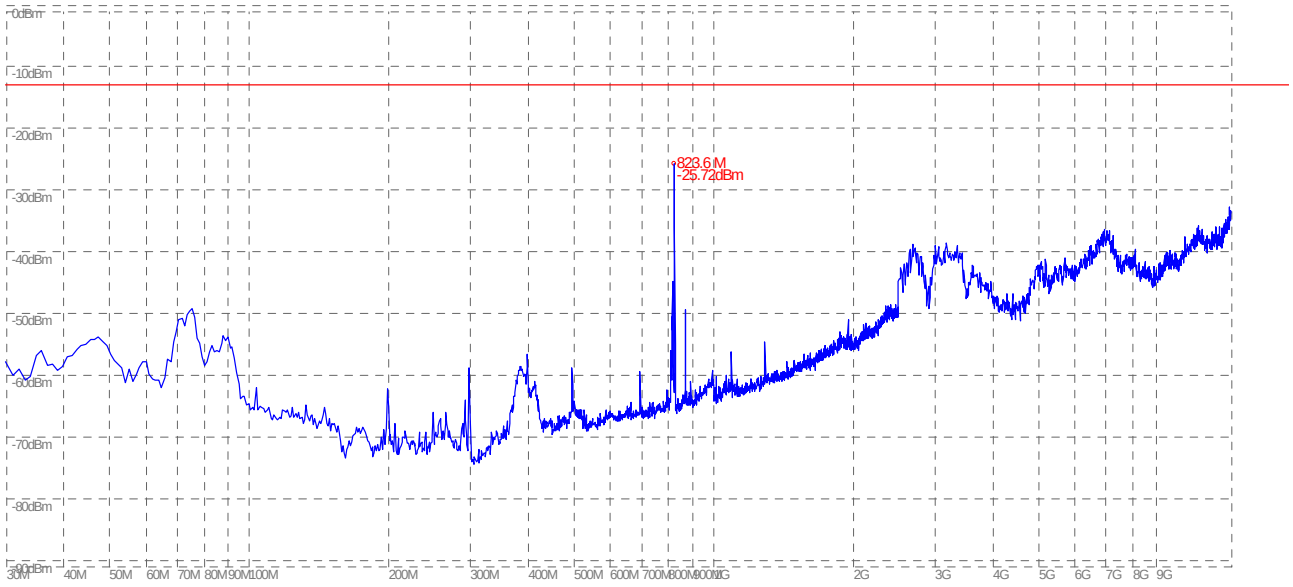
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
850MHz	4400	835	< -25	< -25	Plot N.1/N.2		PASS
	4458	846.6	< -25	< -25	Plot O.1/O.2		PASS
HSDPA 1900MHz	9662	1852.4	< -25	< -25	Plot P.1/P.2	-13	PASS
	9800	1880	< -25	< -25	Plot Q.1/Q.2		PASS
	9938	1907.6	< -25	< -25	Plot R.1/R.2		PASS
HSUPA 850MHz	4357	826.4	< -25	< -25	Plot S.1/S.2	-13	PASS
	4400	835	< -25	< -25	Plot T.1/T.2		PASS
	4458	846.6	< -25	< -25	Plot U.1/U.2		PASS
HSUPA 1900MHz	9662	1852.4	< -25	< -25	Plot V.1/V.2	-13	PASS
	9800	1880	< -25	< -25	Plot W.1/W.2		PASS
	9938	1907.6	< -25	< -25	Plot X.1/X.2		PASS

2. Test Plots for the Whole Measurement Frequency Range:

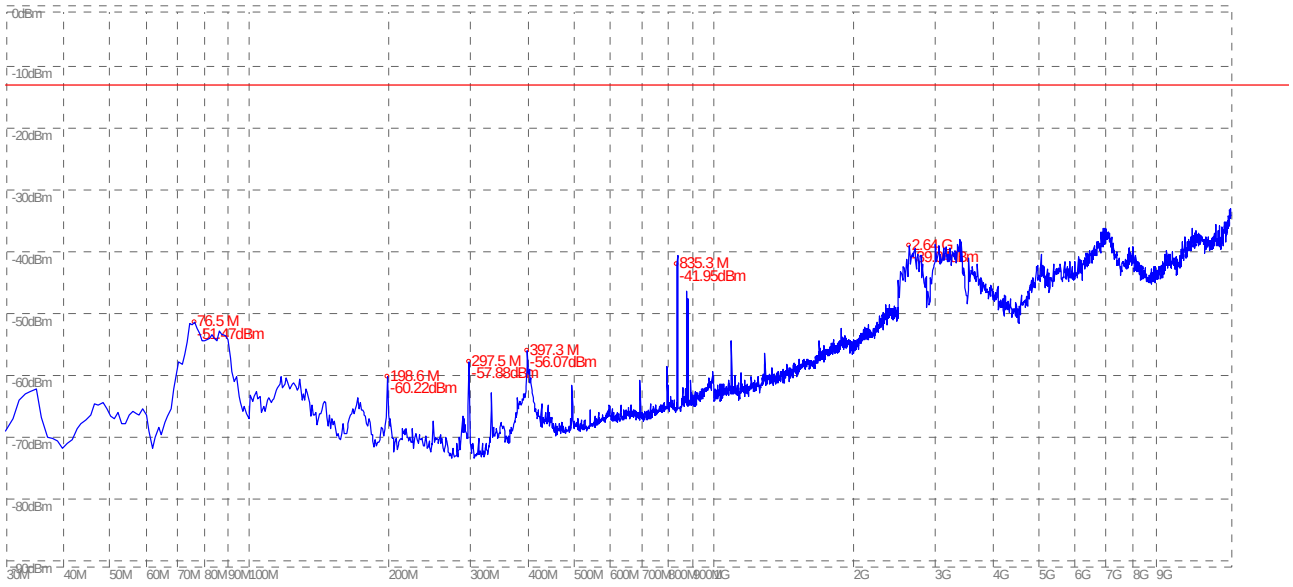
Note: the power of the EUT transmitting frequency should be ignored.



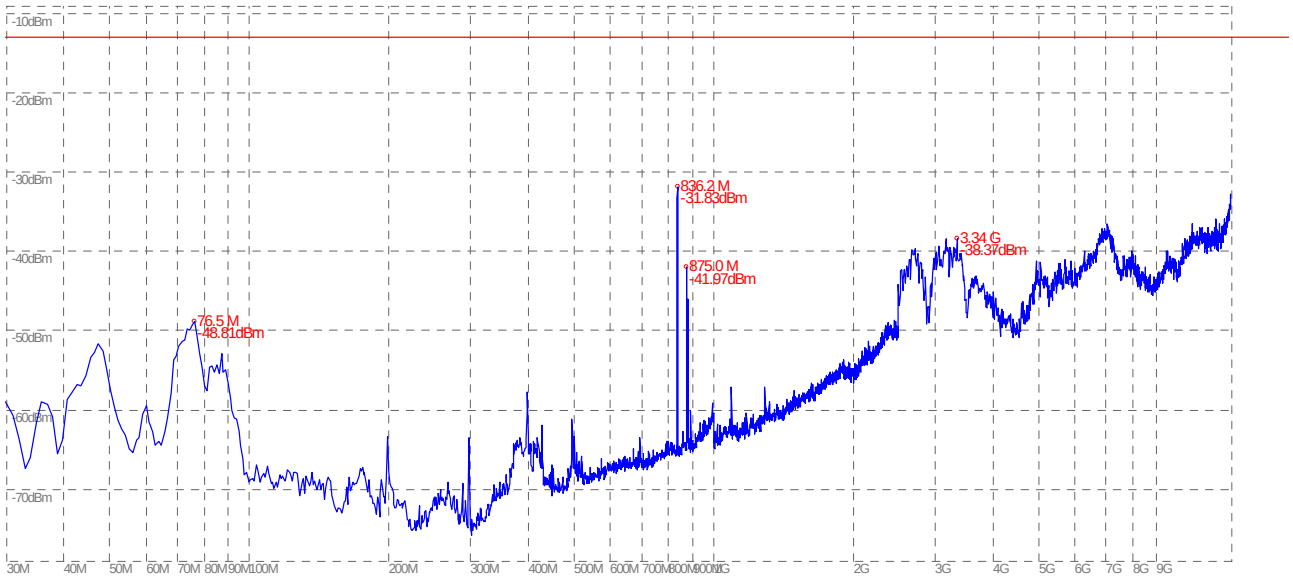
(Plot A.1: GPRS 850MHz Channel = 128, Test Antenna Horizontal)



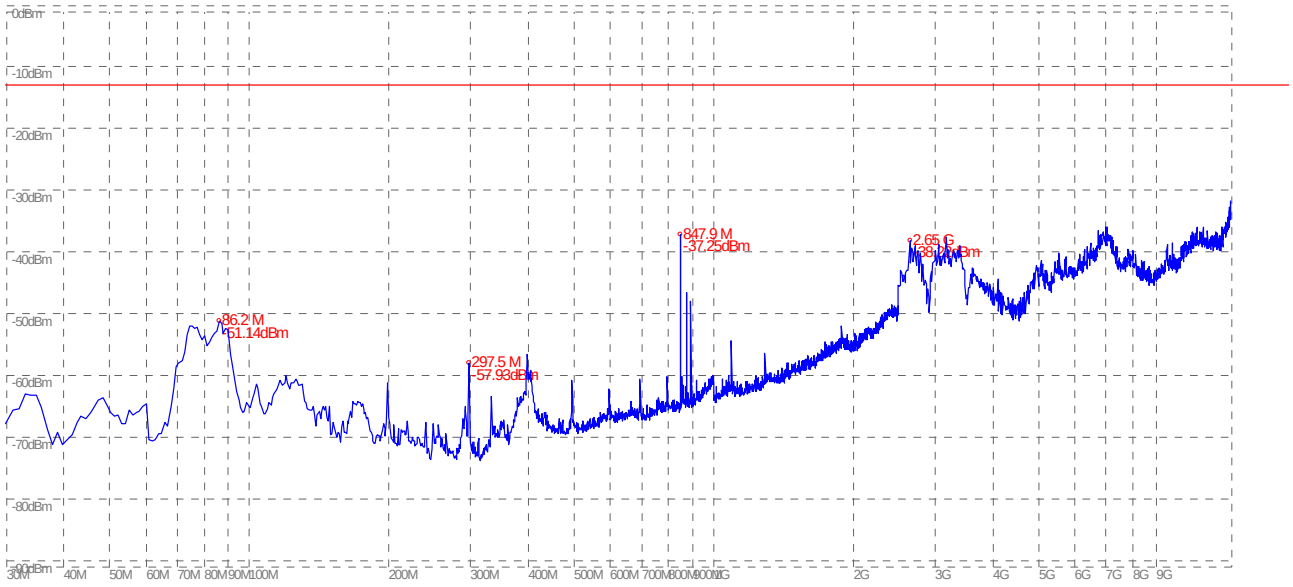
(Plot A.2: GPRS 850MHz Channel = 128, Test Antenna Vertical)



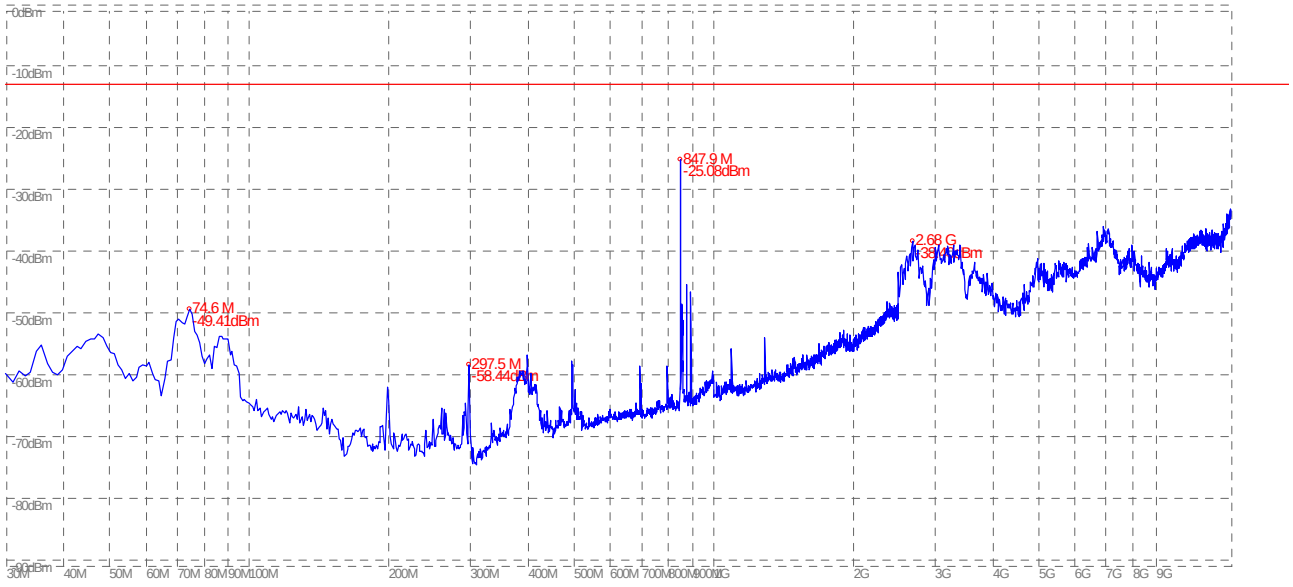
(Plot B.1: GPRS 850MHz Channel = 190, Test Antenna Horizontal)



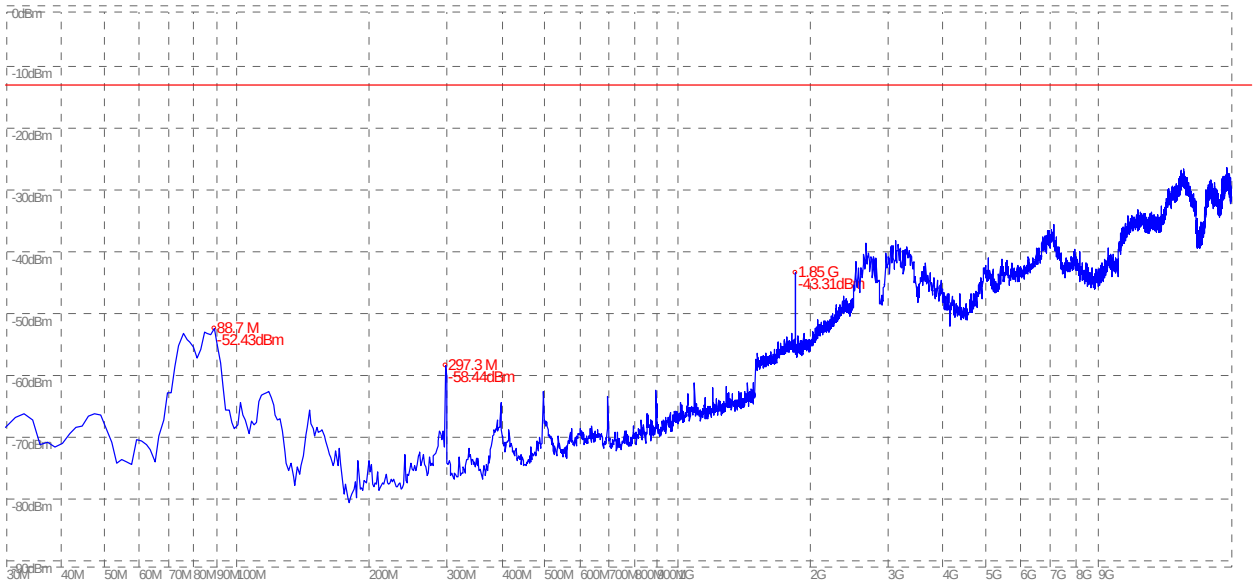
(Plot B.2: GPRS 850MHz Channel = 190, Test Antenna Vertical)



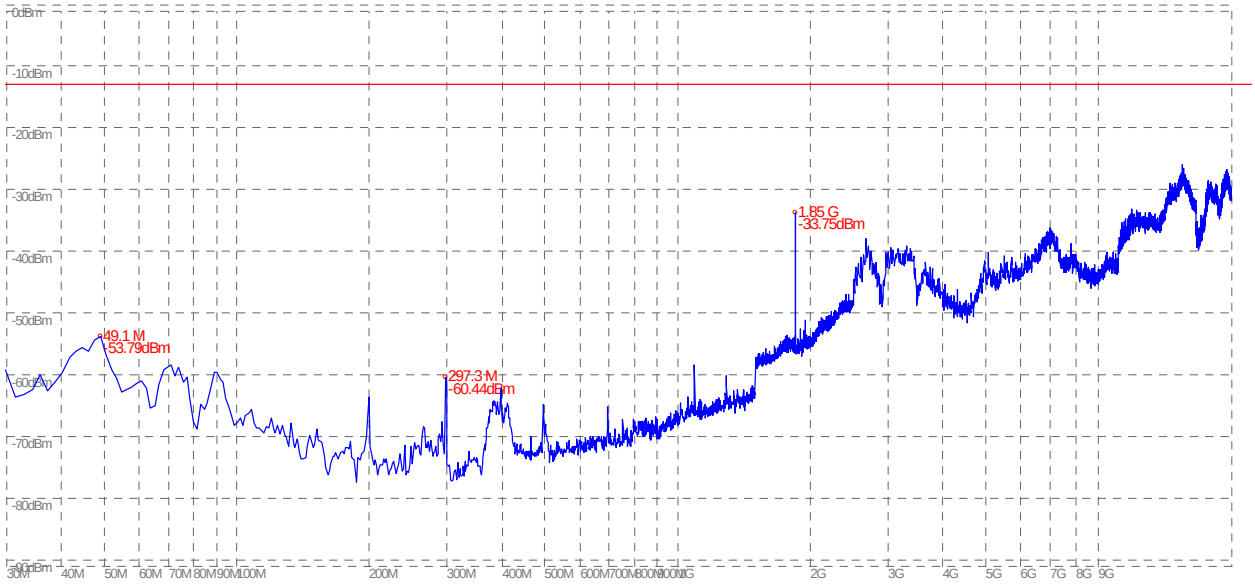
(Plot C.1: GPRS 850MHz Channel = 251, Test Antenna Horizontal)



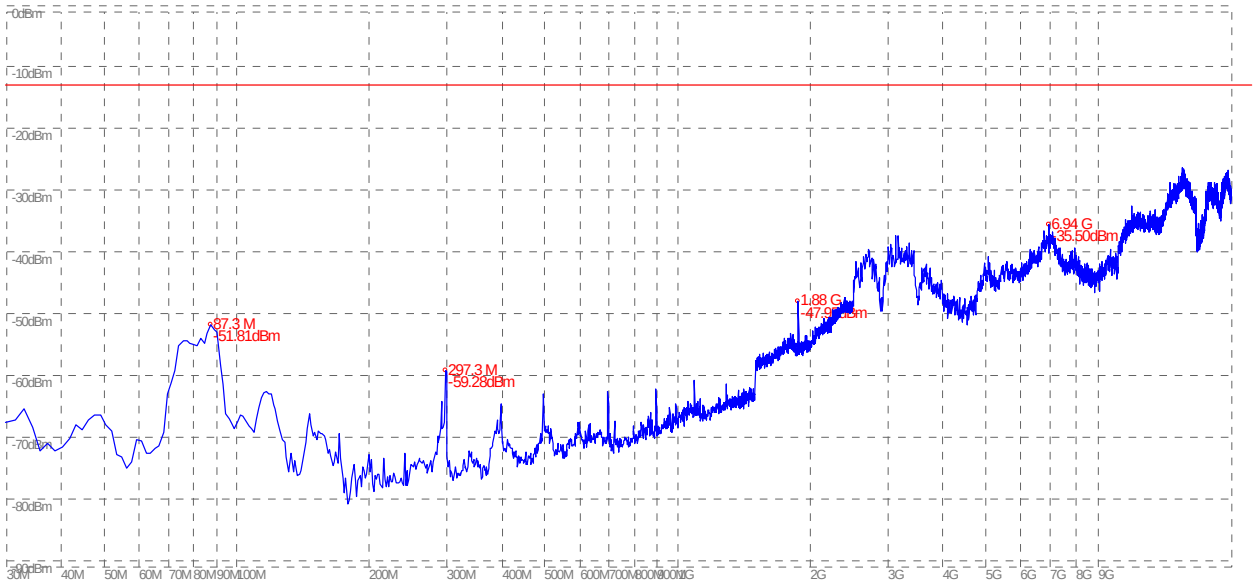
(Plot C.2: GPRS 850MHz Channel = 251, Test Antenna Vertical)



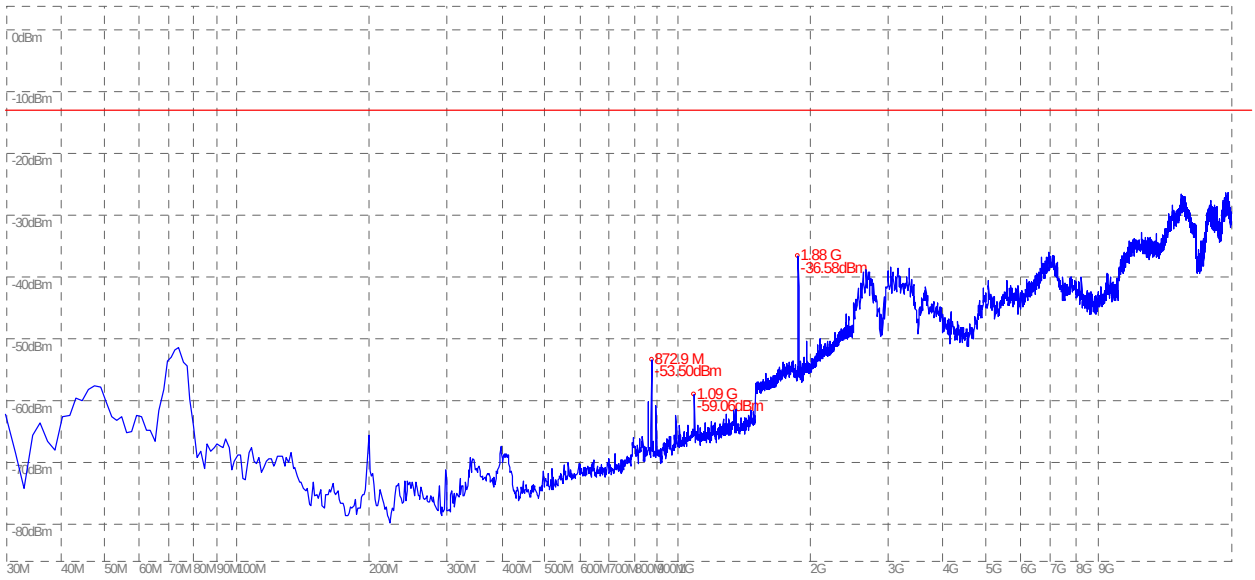
(Plot D.1: GPRS 1900MHz Channel = 512, Test Antenna Horizontal)



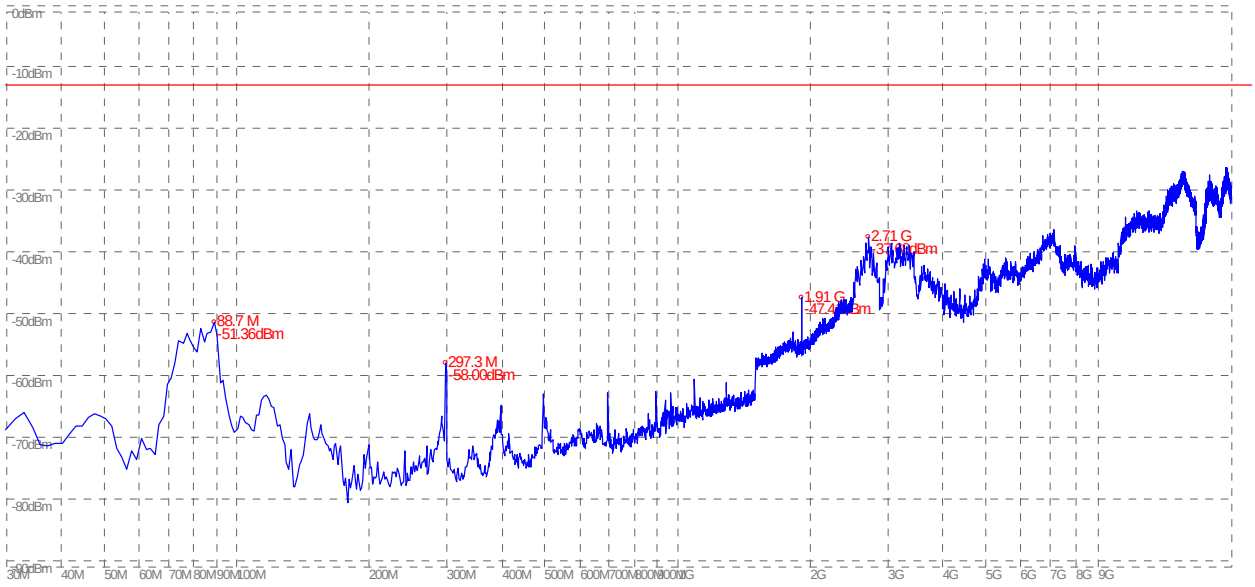
(Plot D.2: GPRS 1900MHz Channel = 512, Test Antenna Vertical)



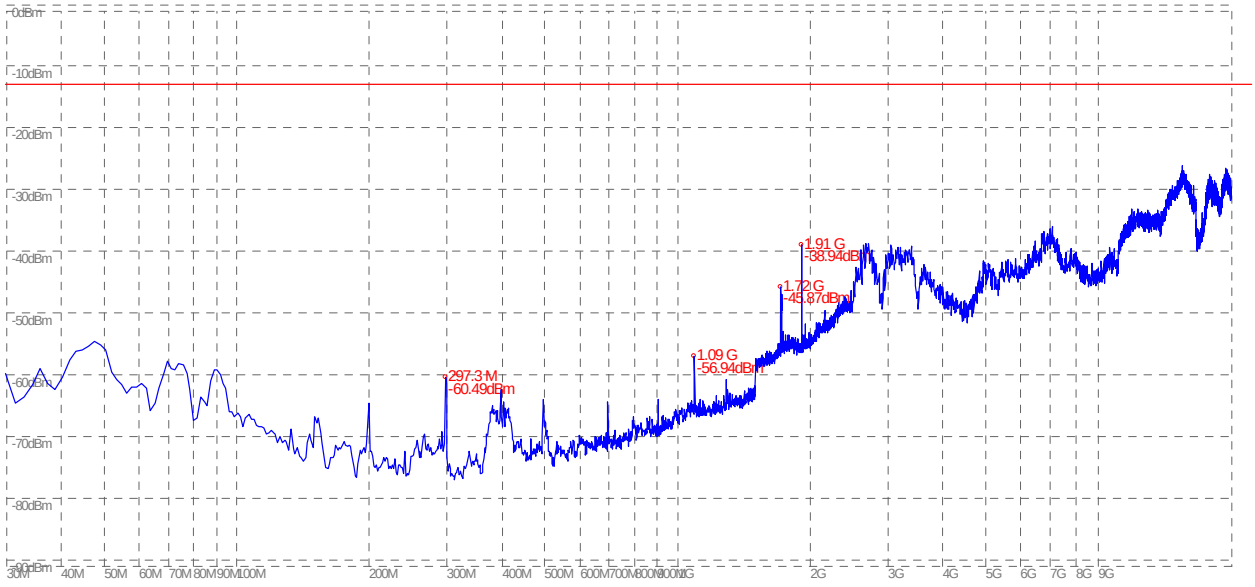
(Plot E.1: GPRS 1900MHz Channel = 661, Test Antenna Horizontal)



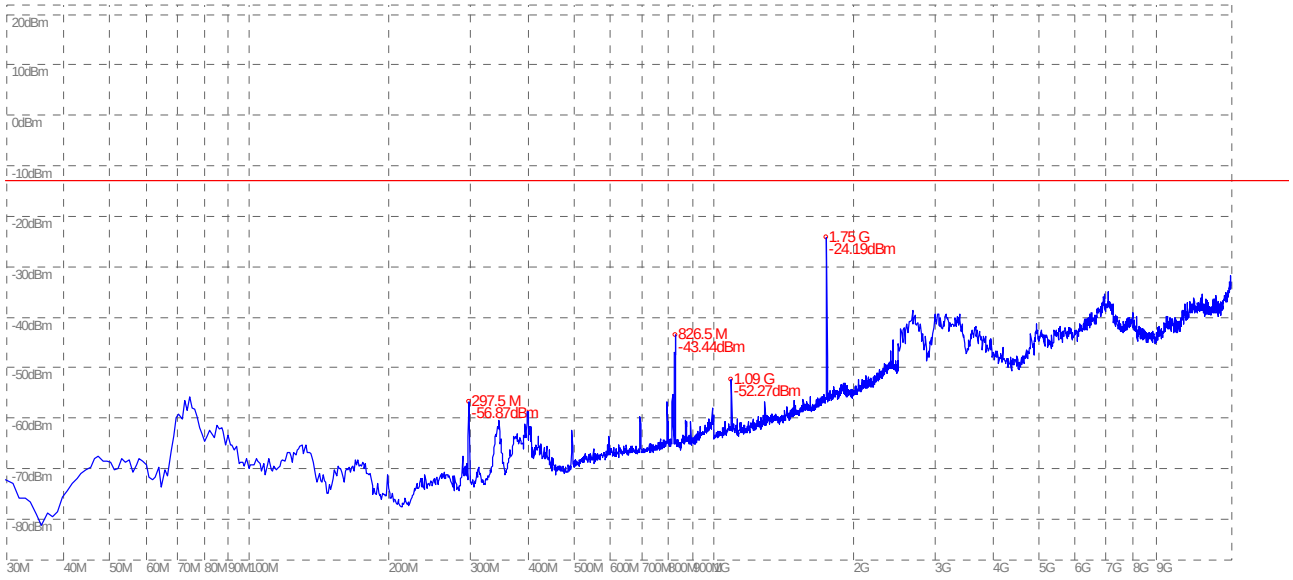
(Plot E.2: GPRS 1900MHz Channel = 661, Test Antenna Vertical)



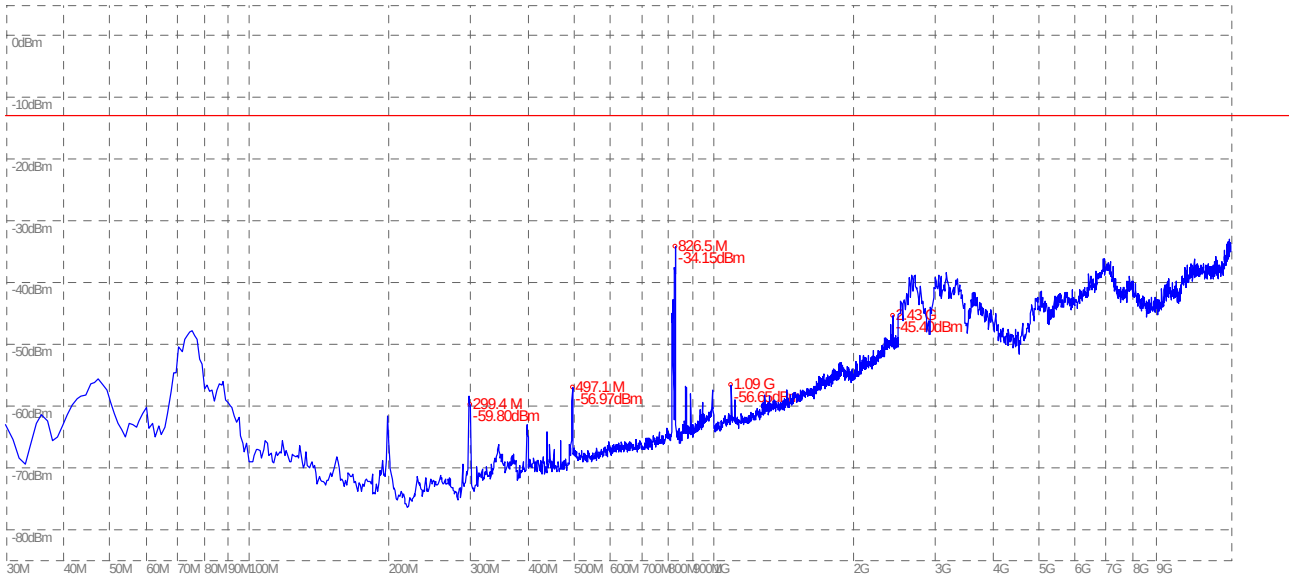
(Plot F.1: GPRS 1900MHz Channel = 810, Test Antenna Horizontal)



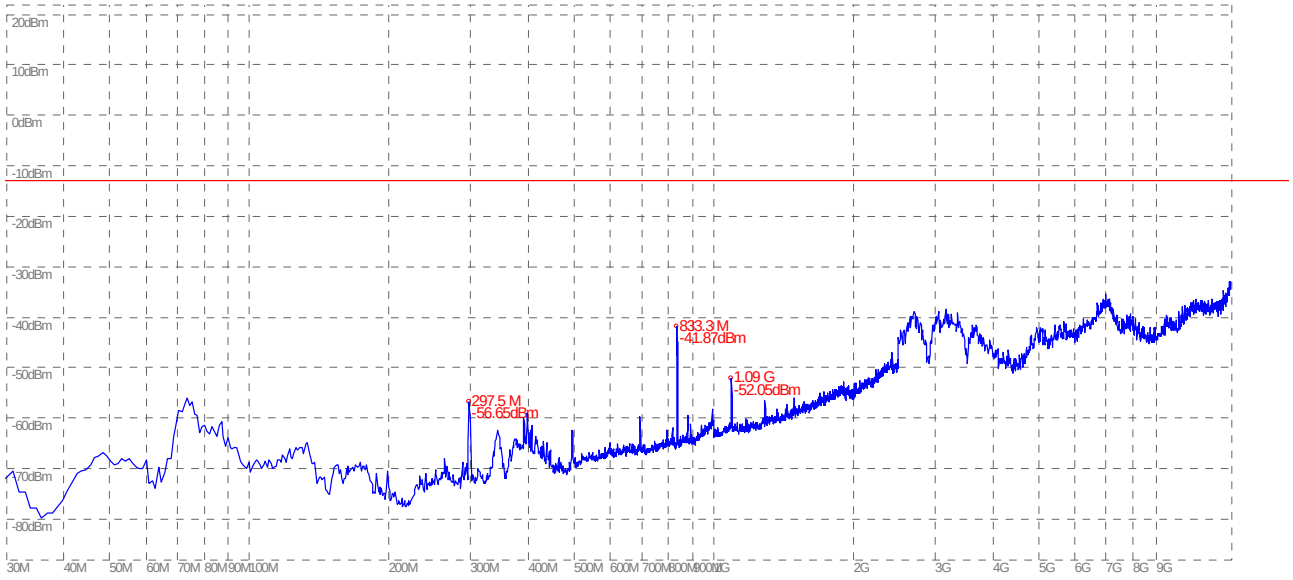
(Plot F.2: GPRS 1900MHz Channel = 810, Test Antenna Vertical)



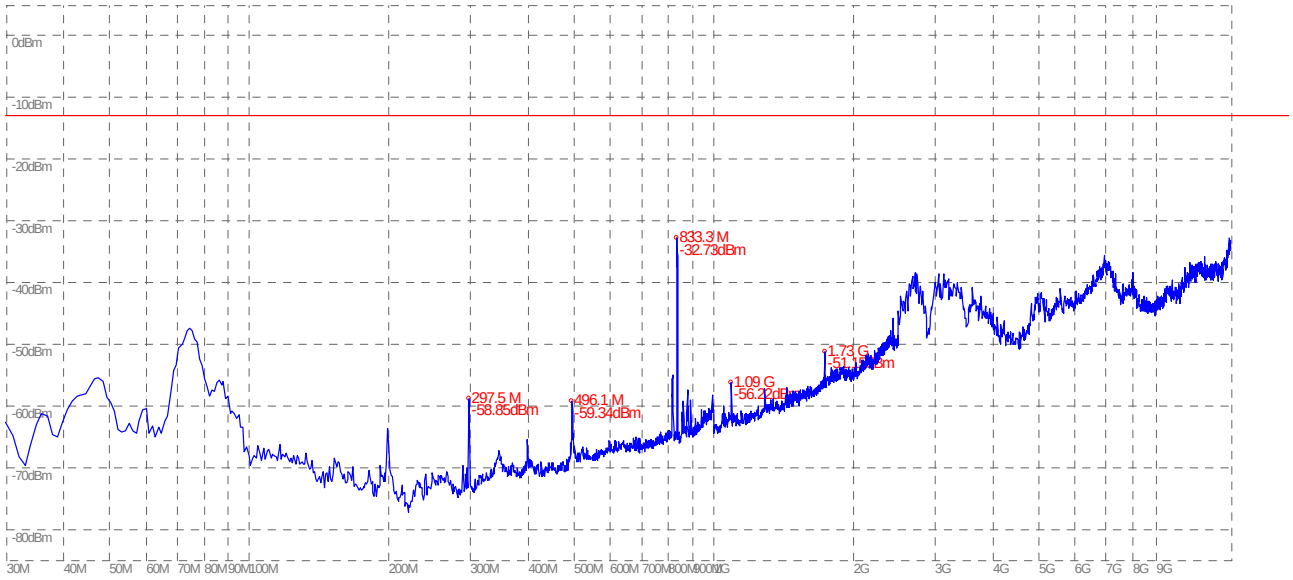
(Plot G.1: WCDMA 850MHz Channel = 4357, Test Antenna Horizontal)



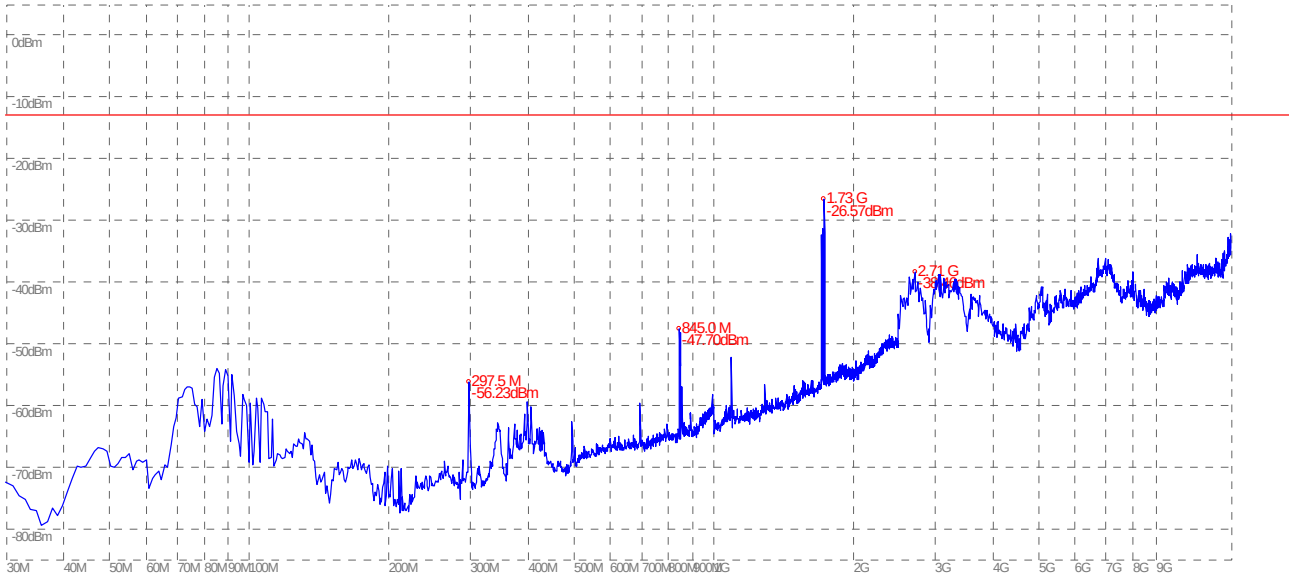
(Plot G.2: WCDMA 850MHz Channel = 4357, Test Antenna Vertical)



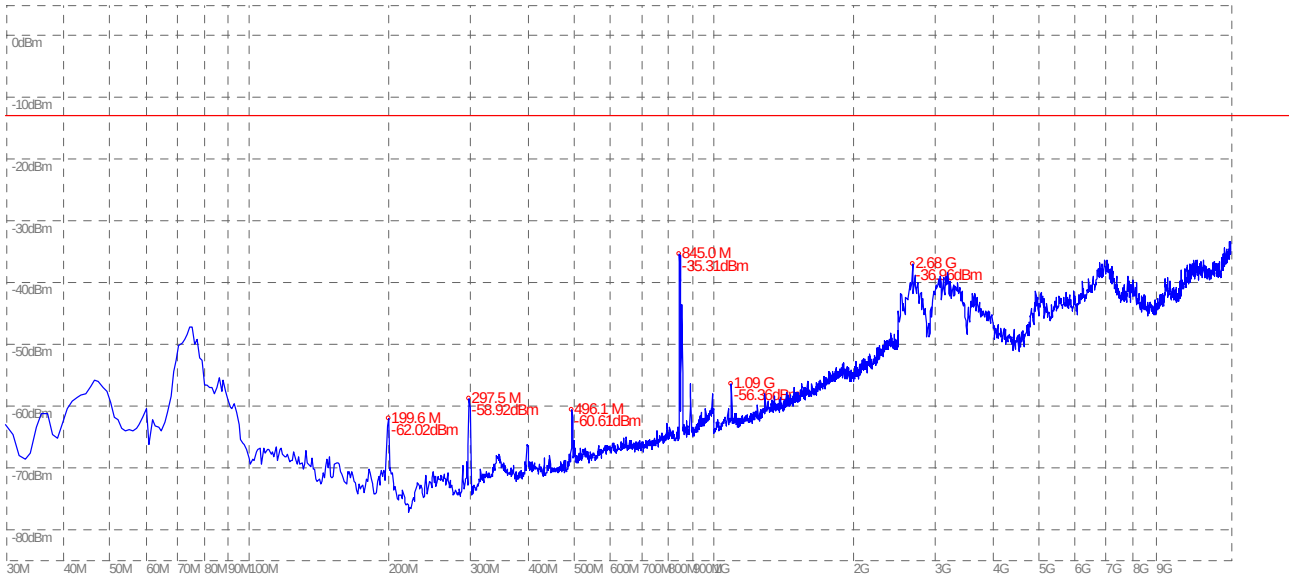
(Plot H.1: WCDMA 850MHz Channel = 4400, Test Antenna Horizontal)



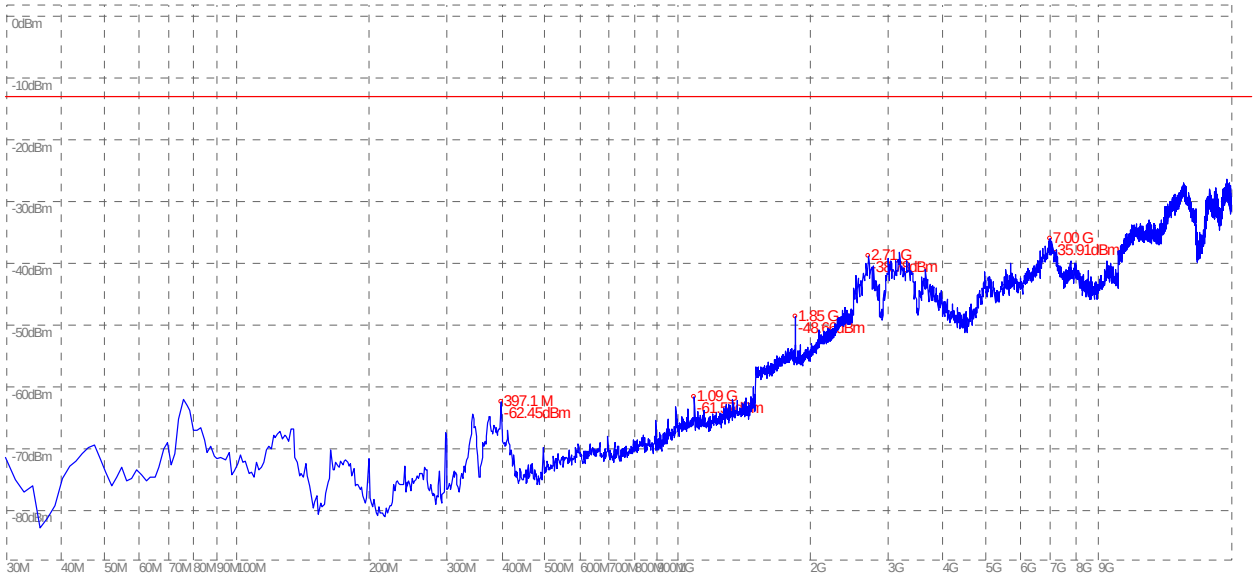
(Plot H.2: WCDMA 850MHz Channel = 4400, Test Antenna Vertical)



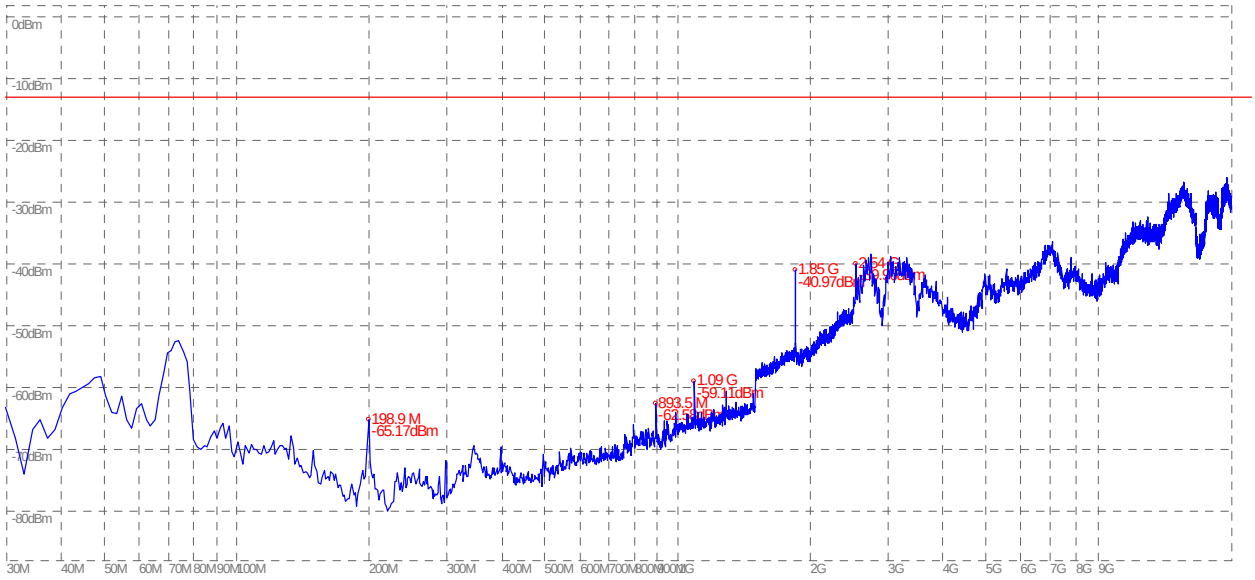
(Plot I.1: WCDMA 850MHz Channel = 4458, Test Antenna Horizontal)



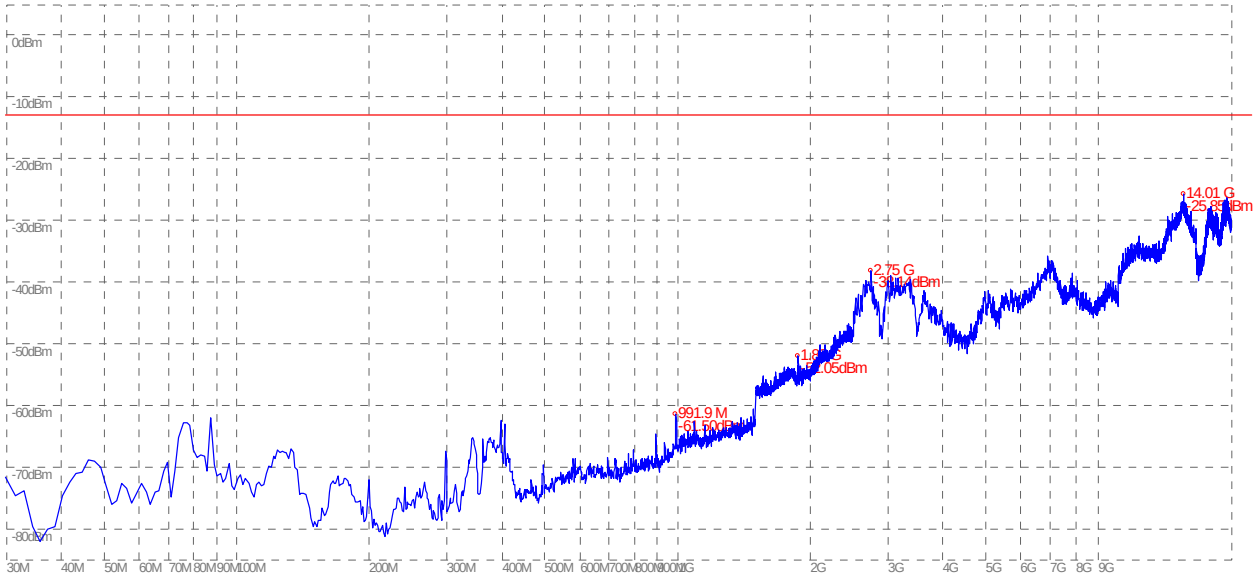
(Plot I.2: WCDMA 850MHz Channel = 4458, Test Antenna Vertical)



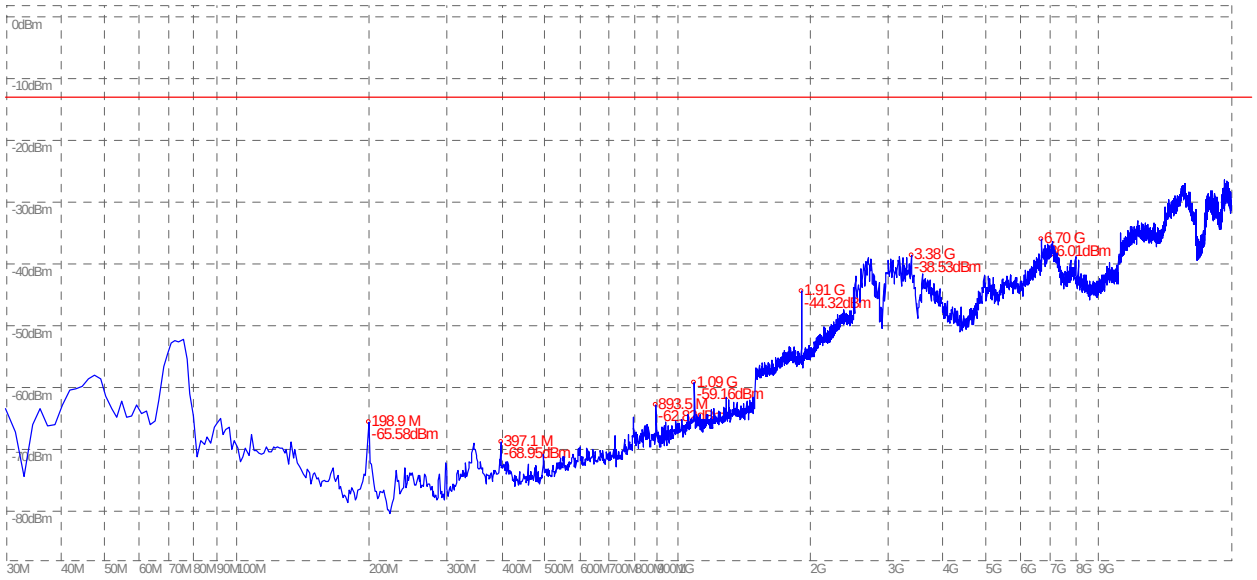
(Plot J.1: WCDMA 1900MHz Channel = 9662, Test Antenna Horizontal)



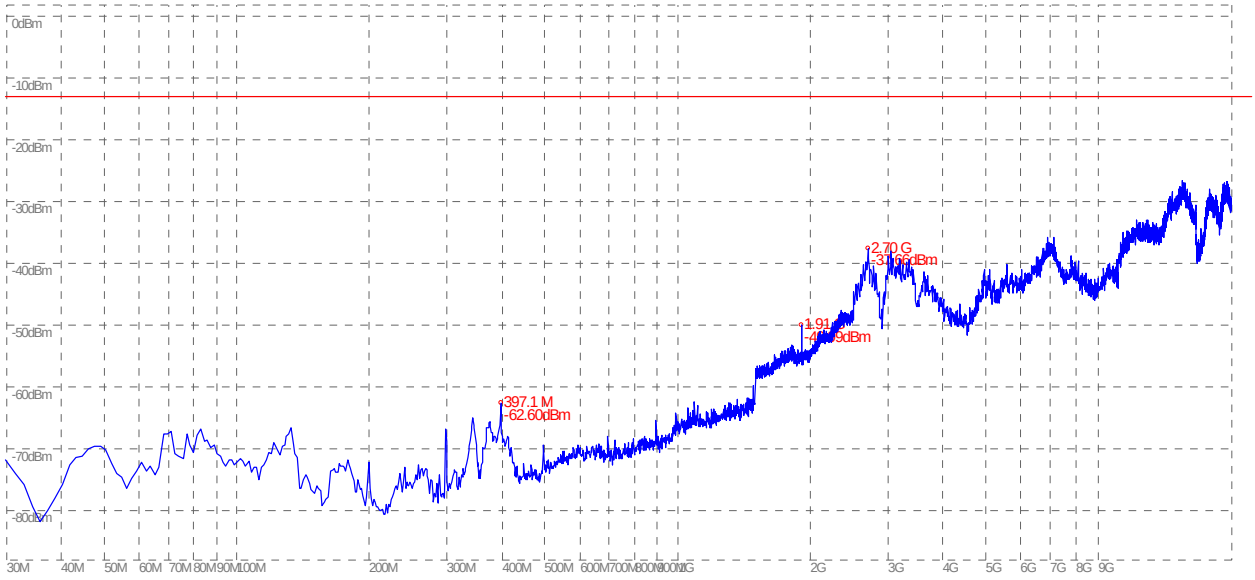
(Plot J.2: WCDMA 1900MHz Channel = 9662, Test Antenna Vertical)



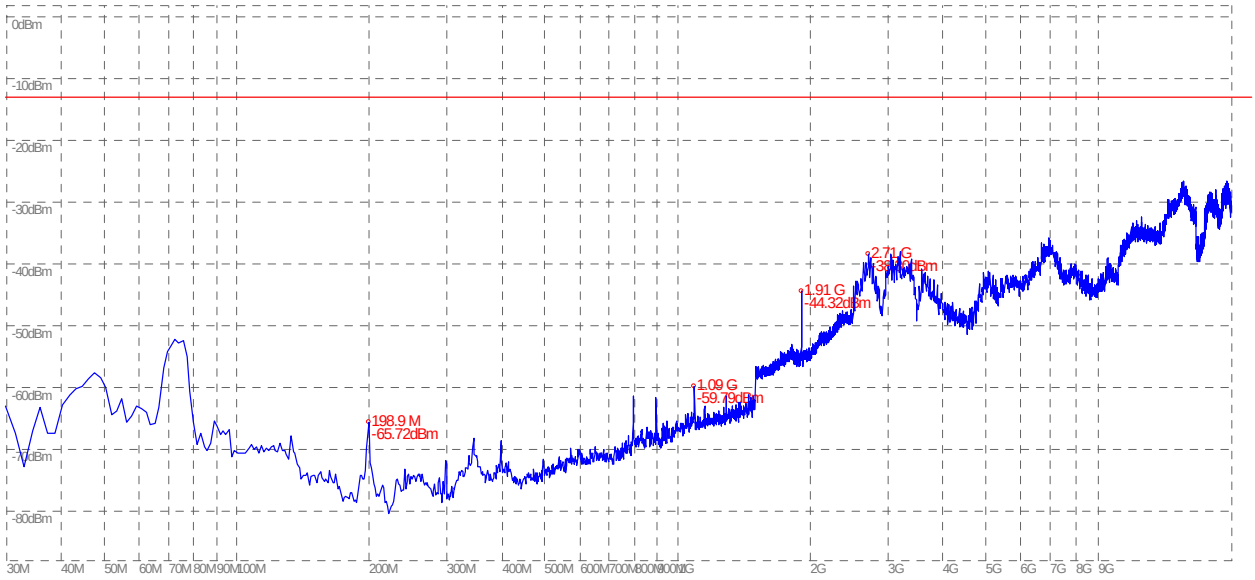
(Plot K.1: WCDMA 1900MHz Channel = 9800, Test Antenna Horizontal)



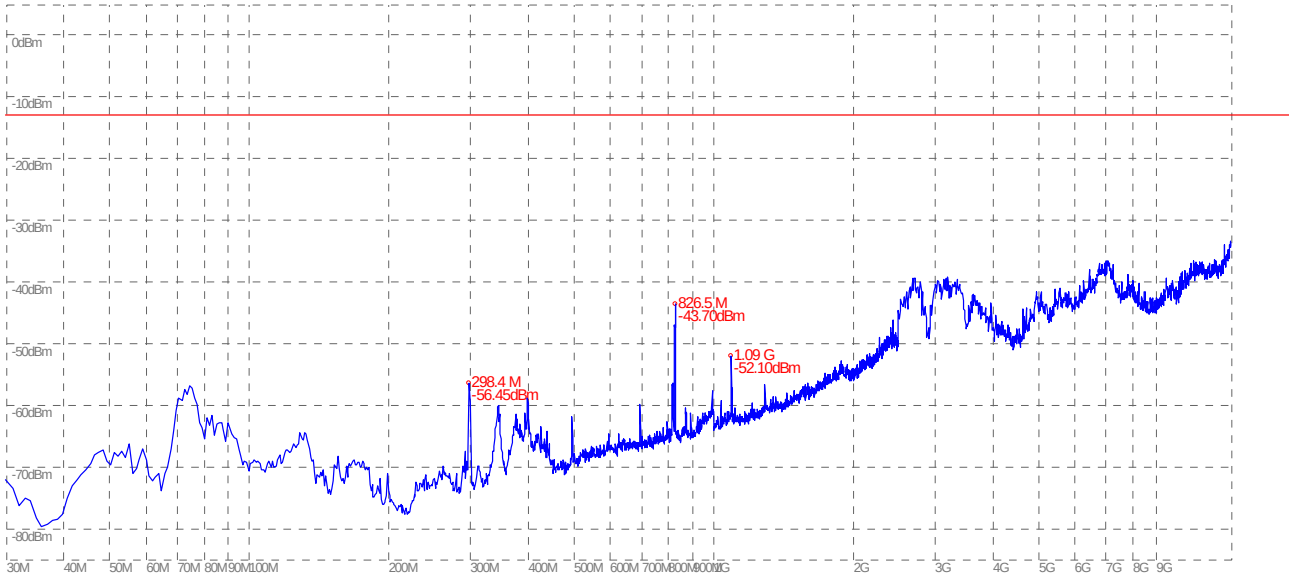
(Plot K.2: WCDMA 1900MHz Channel = 9800, Test Antenna Vertical)



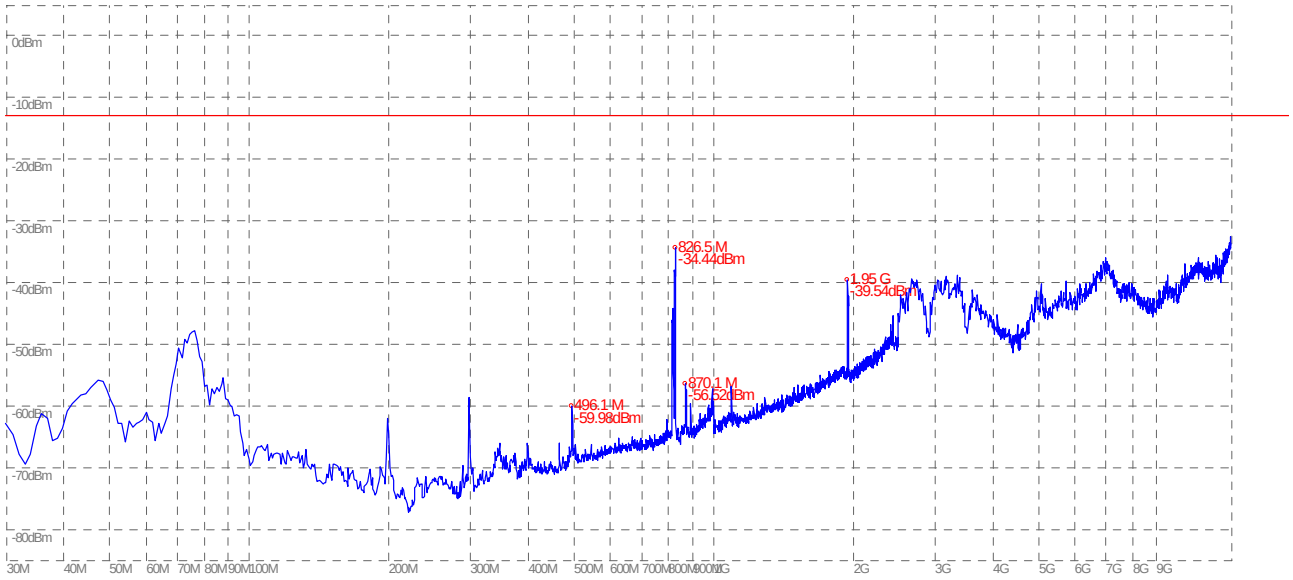
(Plot L.1: WCDMA 1900MHz Channel = 9938, Test Antenna Horizontal)



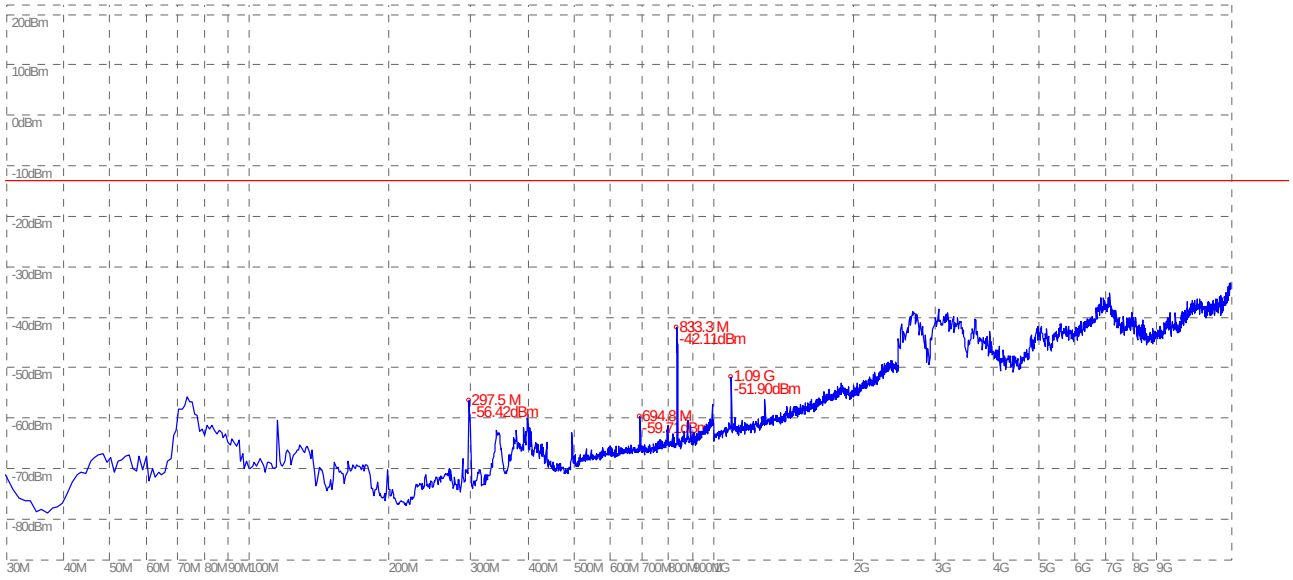
(Plot L.2: WCDMA 1900MHz Channel = 9938, Test Antenna Vertical)



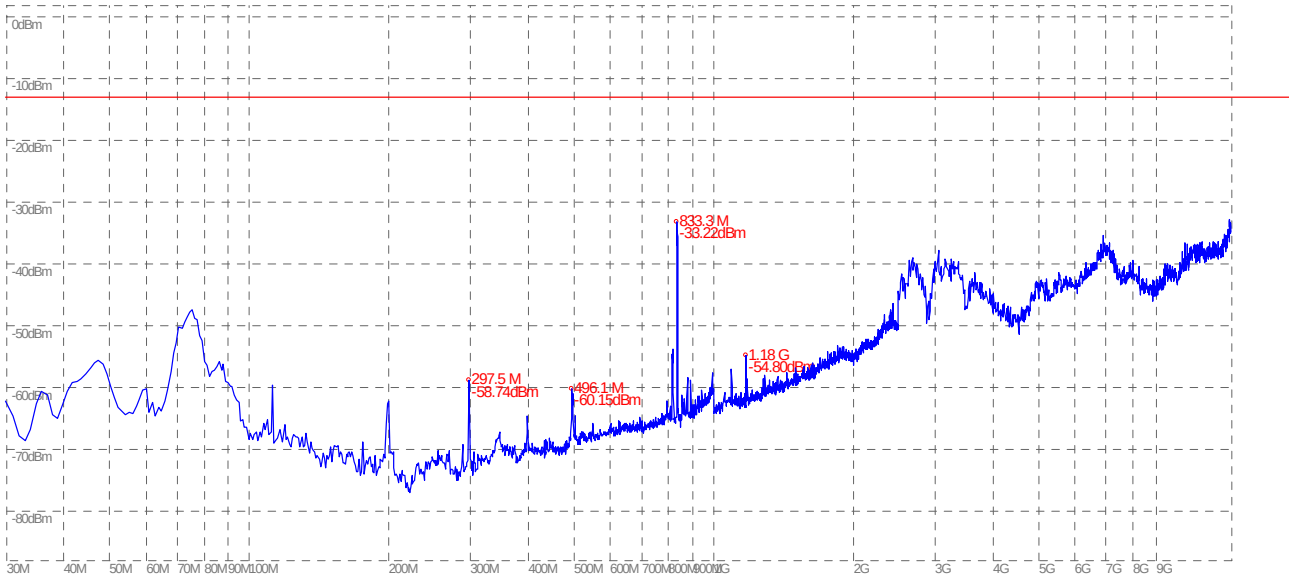
(Plot M.1: HSDPA 850MHz Channel = 4357, Test Antenna Horizontal)



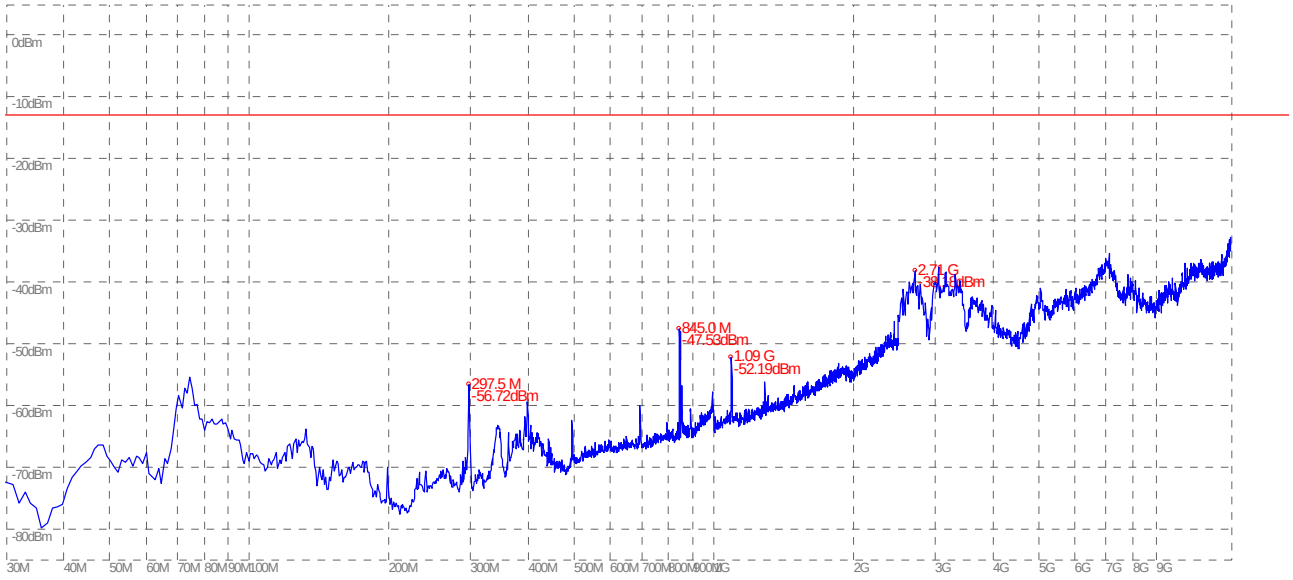
(Plot M.2: HSDPA 850MHz Channel = 4357, Test Antenna Vertical)



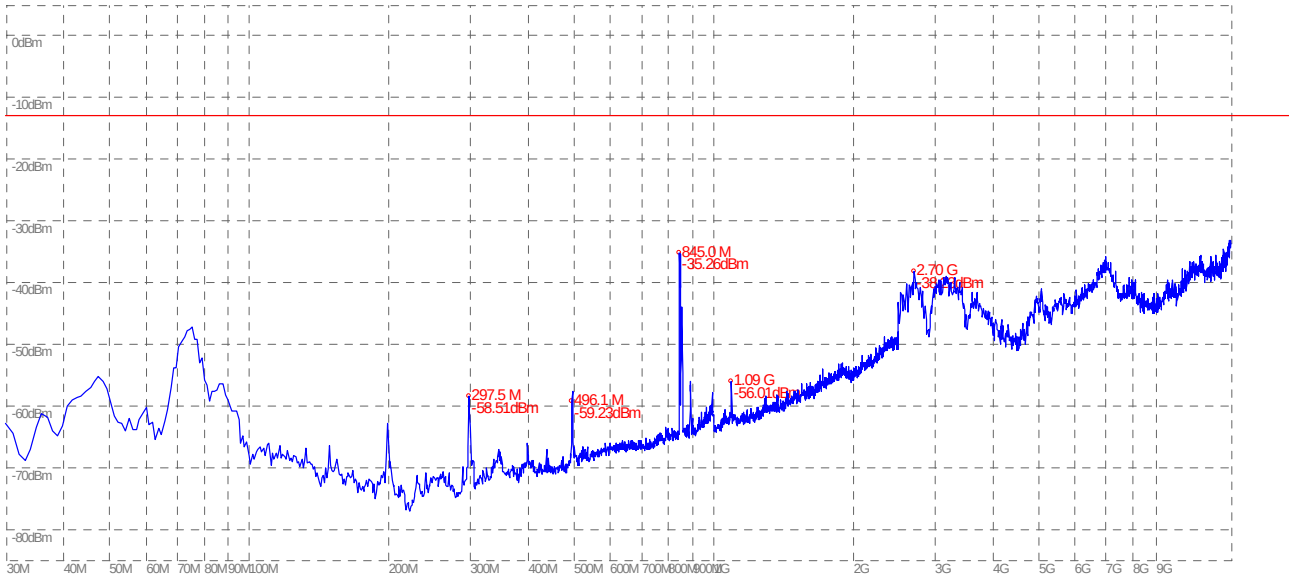
(Plot N.1: HSDPA 850MHz Channel = 4400, Test Antenna Horizontal)



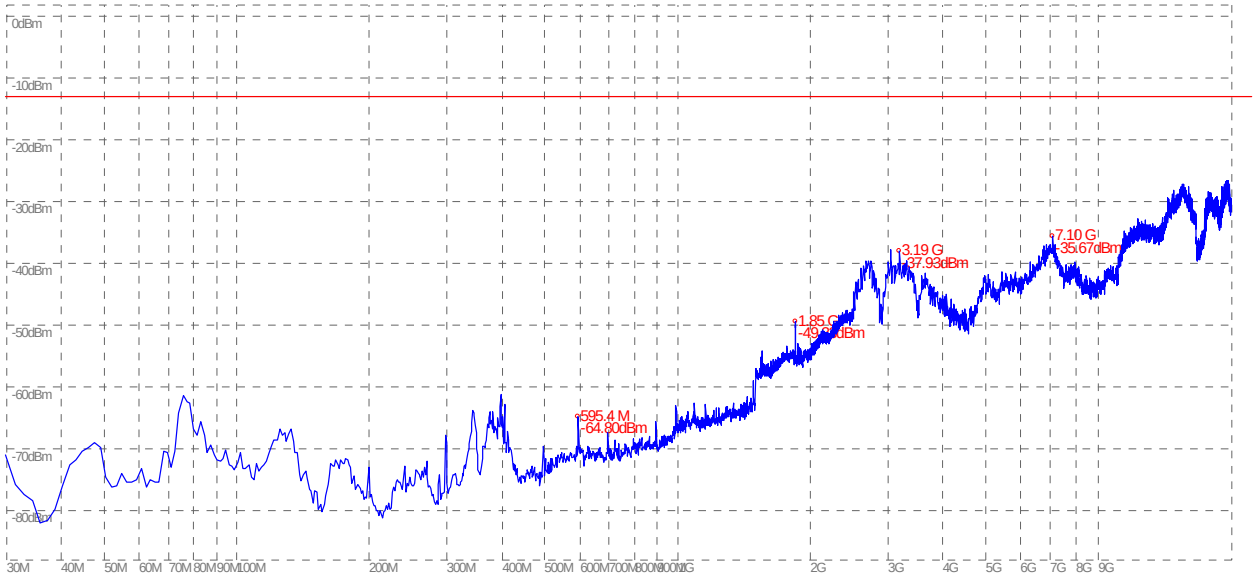
(Plot N.2: HSDPA 850MHz Channel = 4400, Test Antenna Vertical)



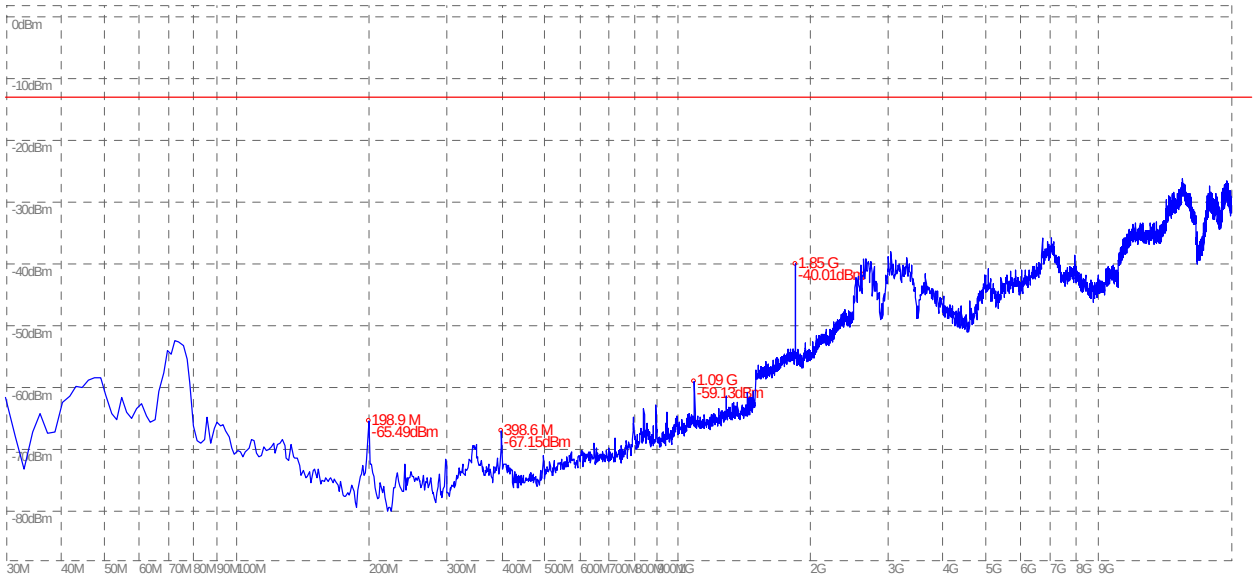
(Plot O.1: HSDPA 850MHz Channel = 4458, Test Antenna Horizontal)



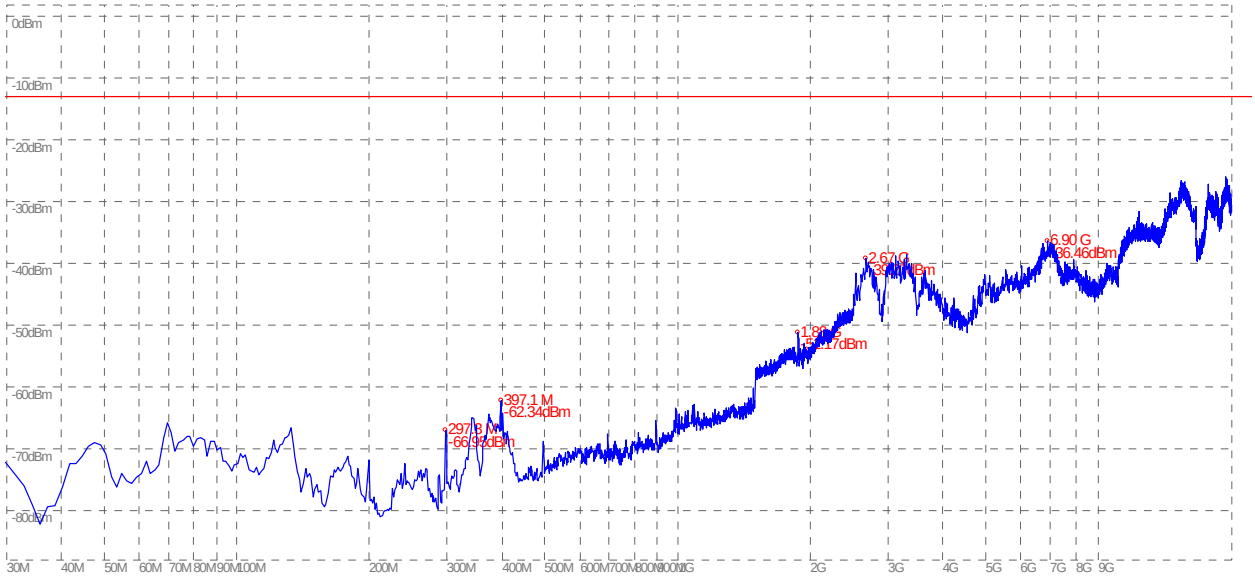
(Plot O.2: HSDPA 850MHz Channel = 4458, Test Antenna Vertical)



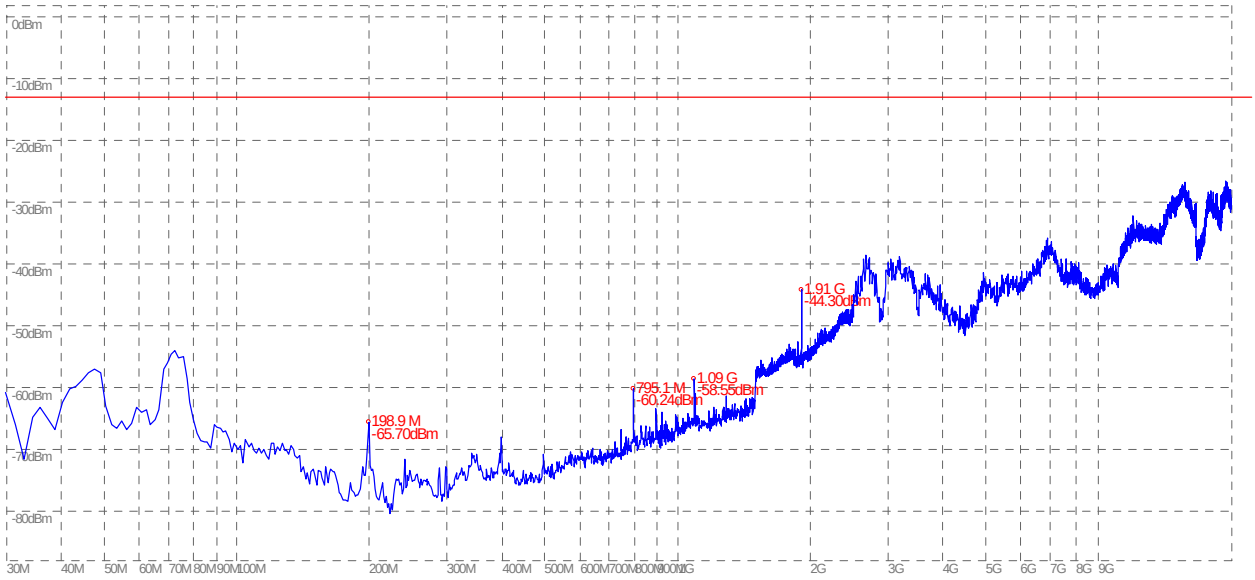
(Plot P.1: HSDPA 1900MHz Channel = 9662, Test Antenna Horizontal)



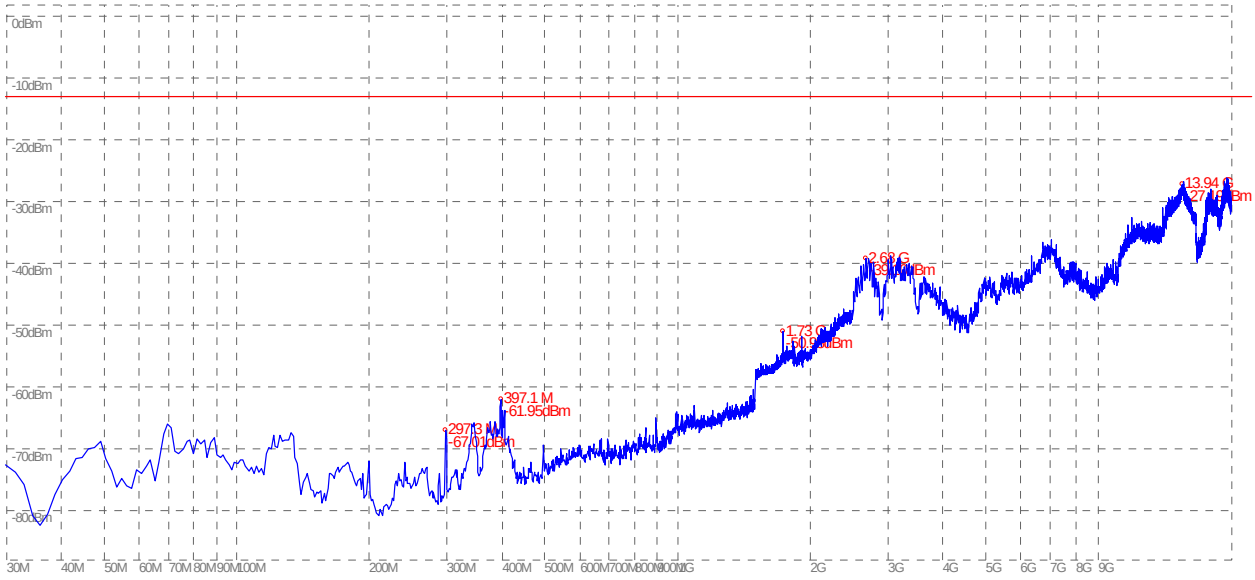
(Plot P.2: HSDPA 1900MHz Channel = 9662, Test Antenna Vertical)



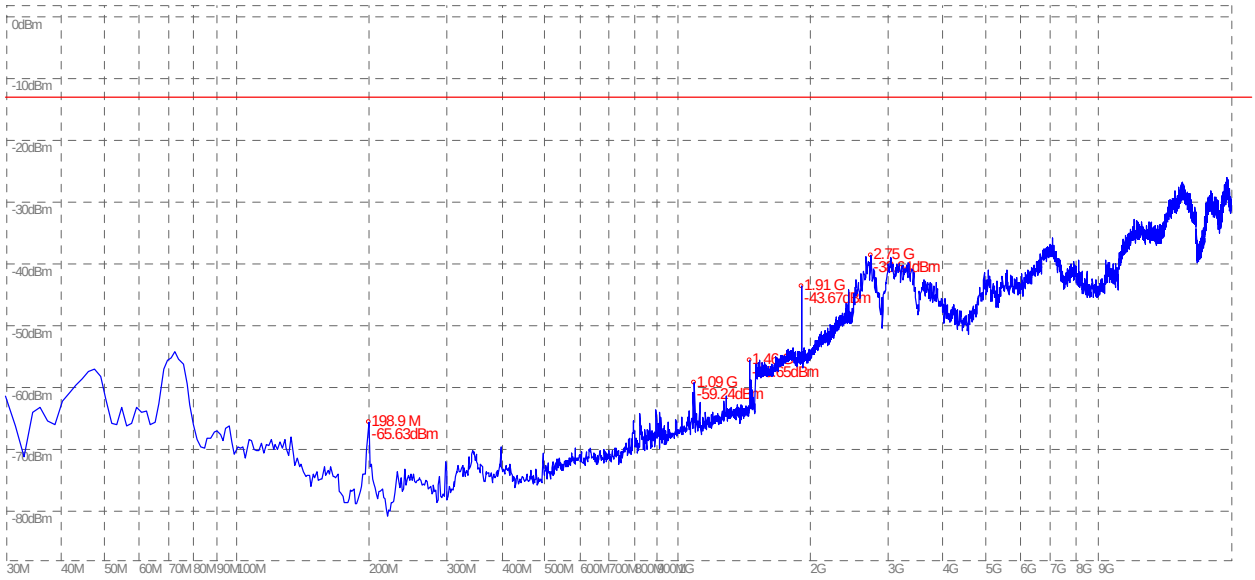
(Plot Q.1: HSDPA 1900MHz Channel = 9800, Test Antenna Horizontal)



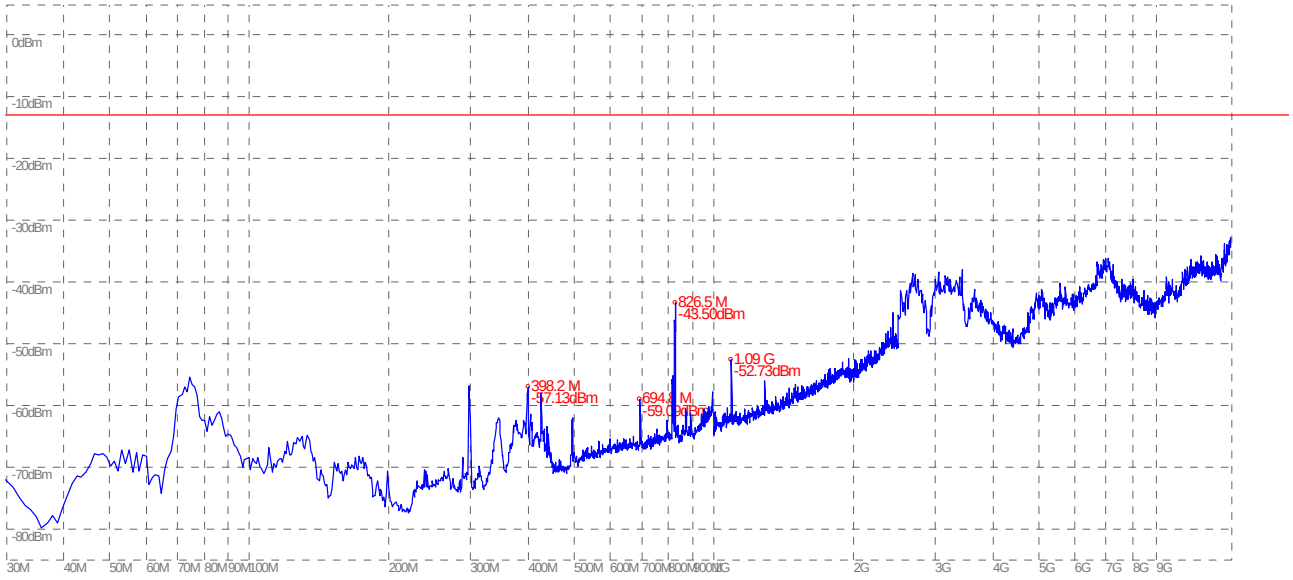
(Plot Q.2: HSDPA 1900MHz Channel = 9800, Test Antenna Vertical)



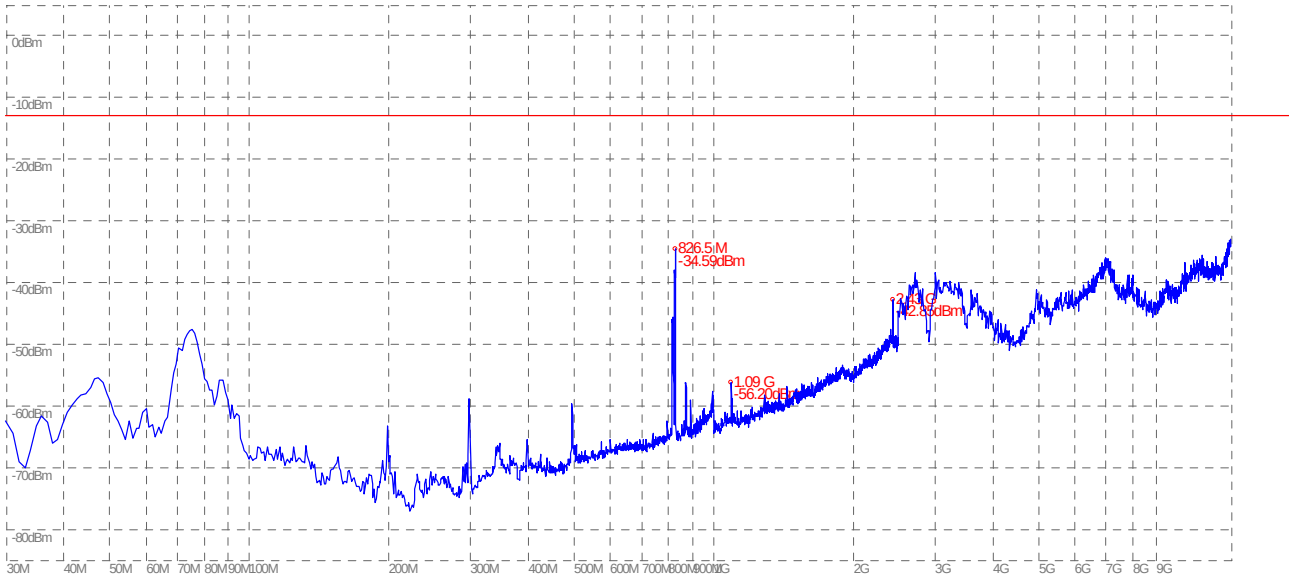
(Plot R.1: HSDPA 1900MHz Channel = 9938, Test Antenna Horizontal)



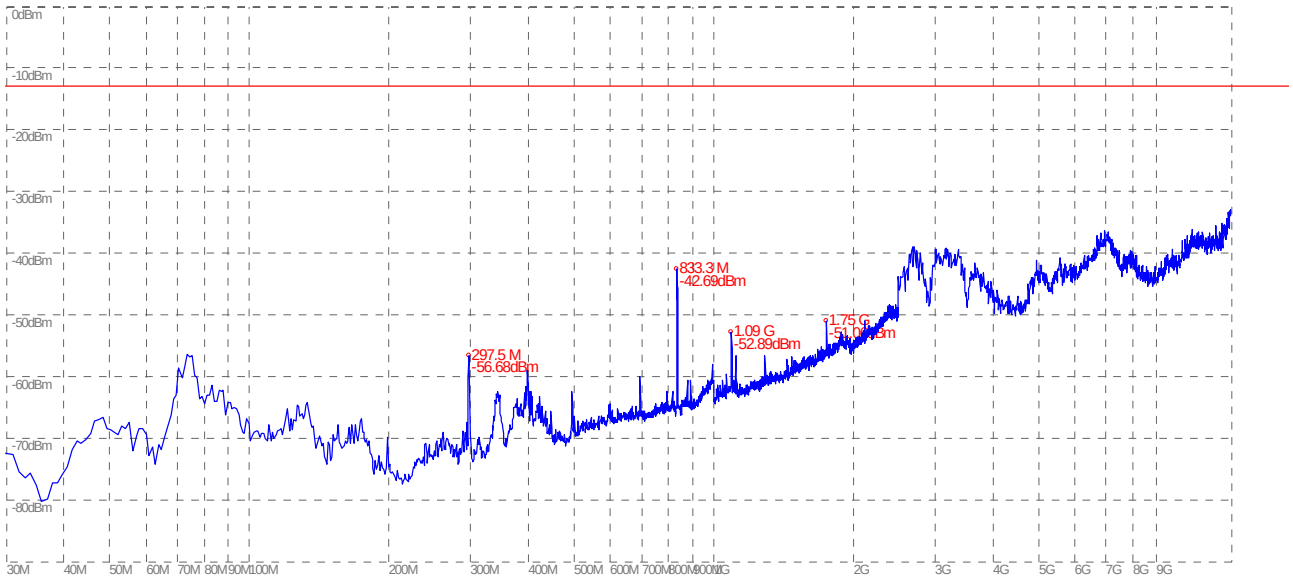
(Plot R.2: HSDPA 1900MHz Channel = 9938, Test Antenna Vertical)



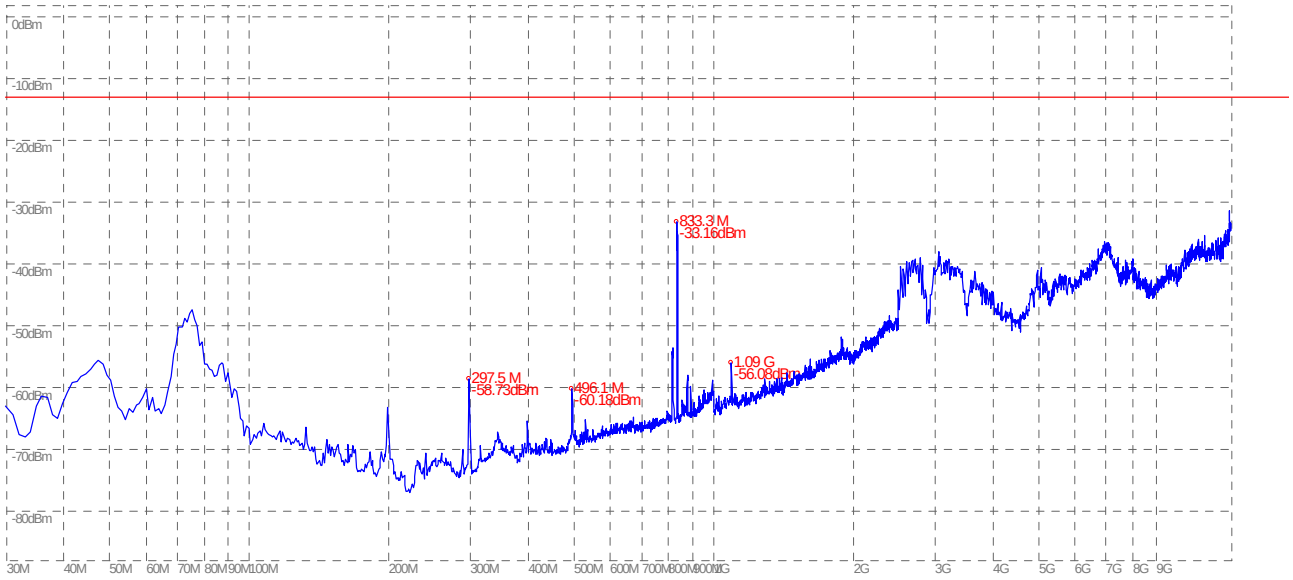
(Plot S.1: HSUPA 850MHz Channel = 4357, Test Antenna Horizontal)



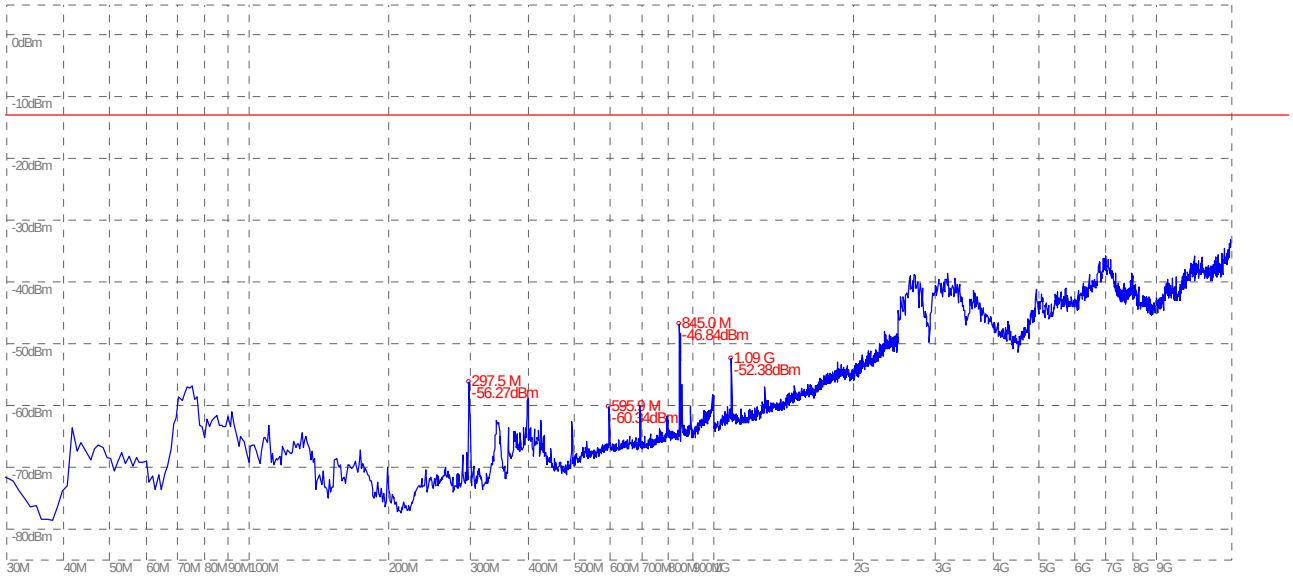
(Plot S.2: HSUPA 850MHz Channel = 4357, Test Antenna Vertical)



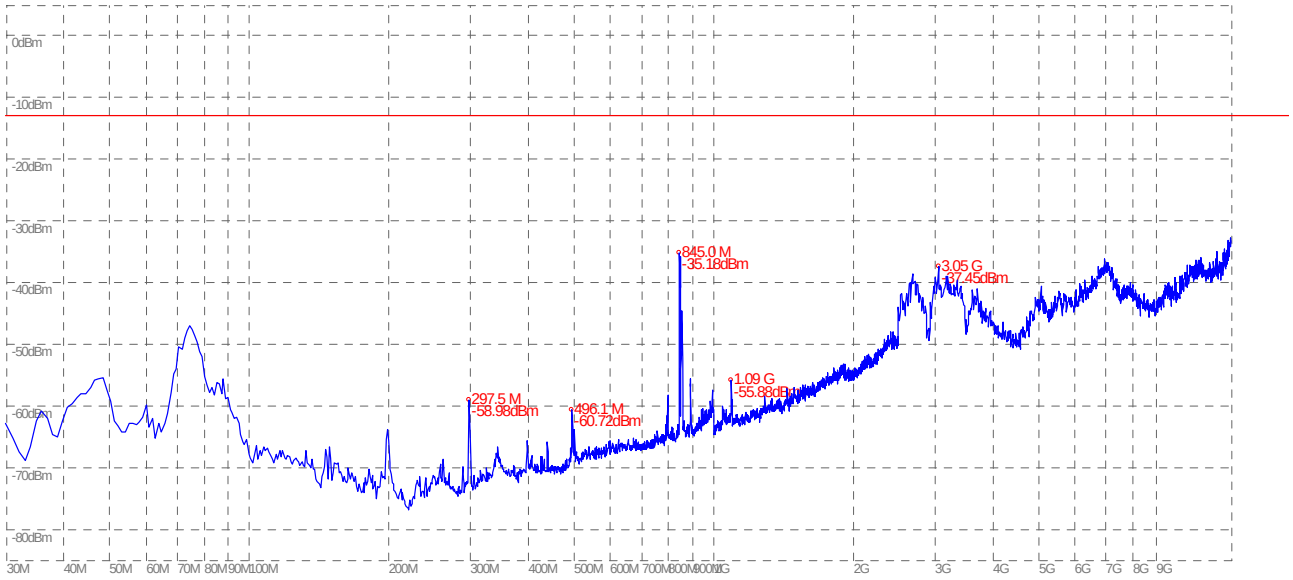
(Plot T.1: HSUPA 850MHz Channel = 4400, Test Antenna Horizontal)



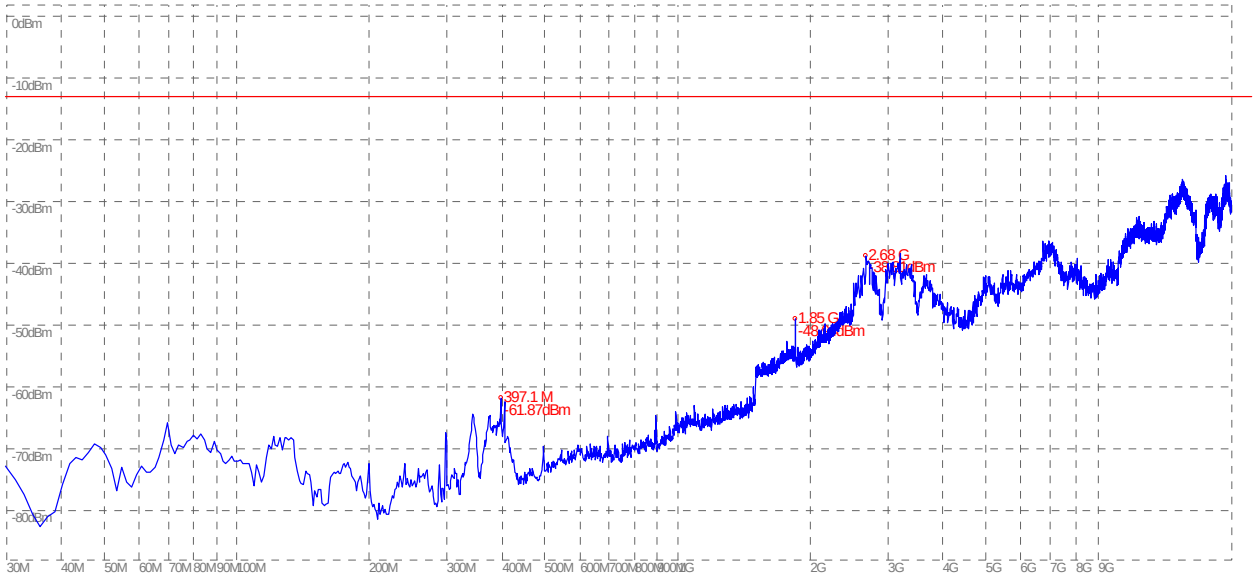
(Plot T.2: HSUPA 850MHz Channel = 4400, Test Antenna Vertical)



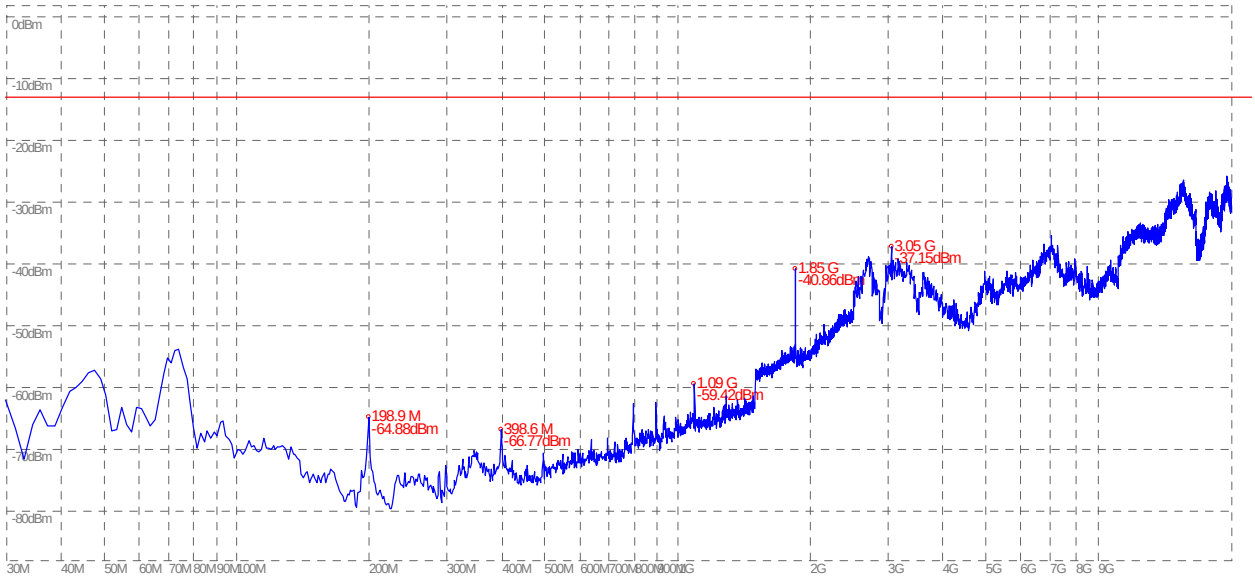
(Plot U.1: HSUPA 850MHz Channel = 4458, Test Antenna Horizontal)



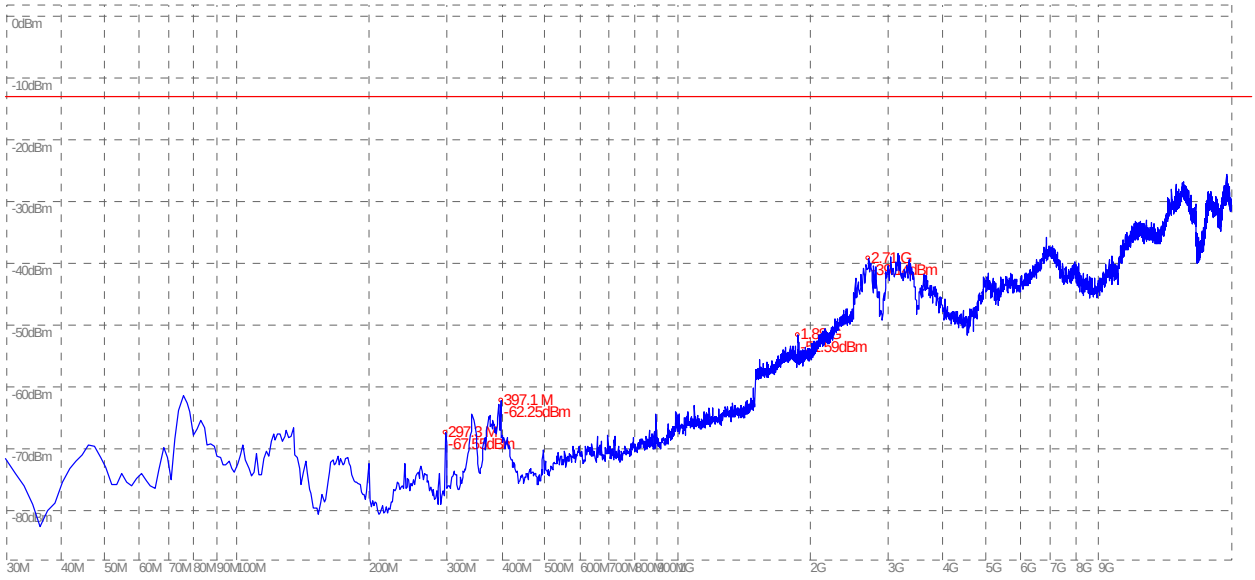
(Plot U.2: HSUPA 850MHz Channel = 4458, Test Antenna Vertical)



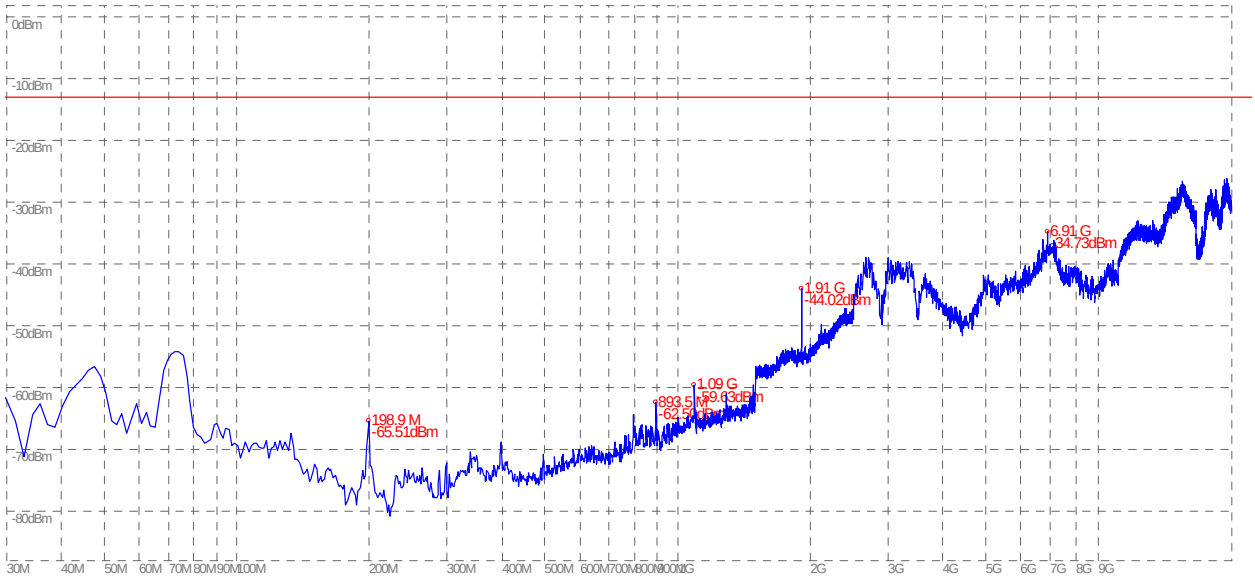
(Plot V.1: HSUPA 1900MHz Channel = 9662, Test Antenna Horizontal)



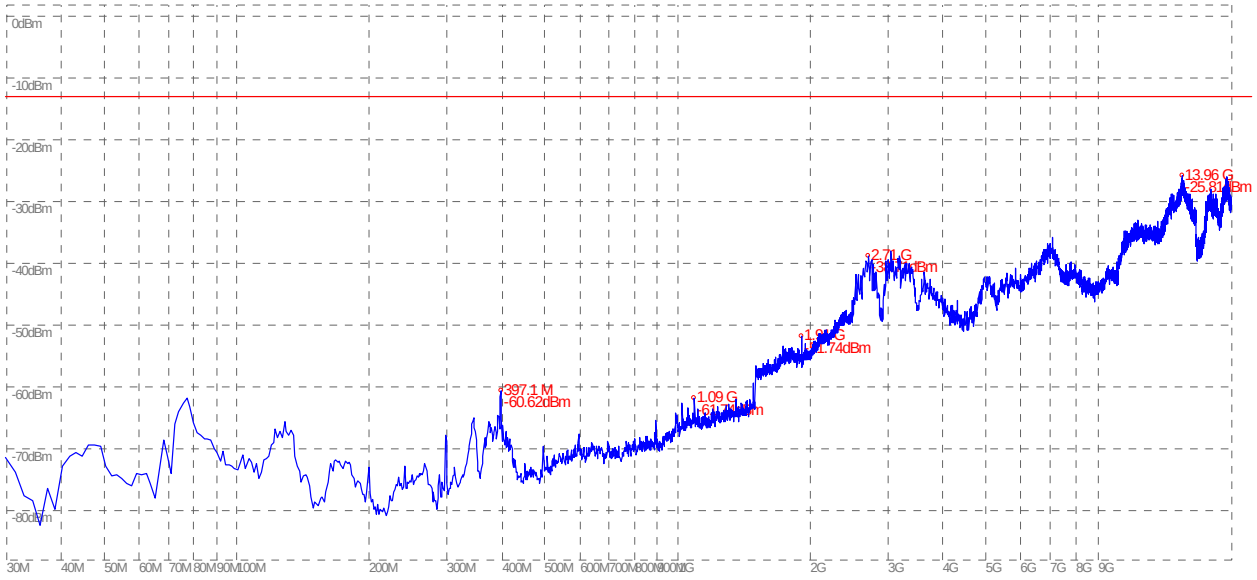
(Plot V.2: HSUPA 1900MHz Channel = 9662, Test Antenna Vertical)



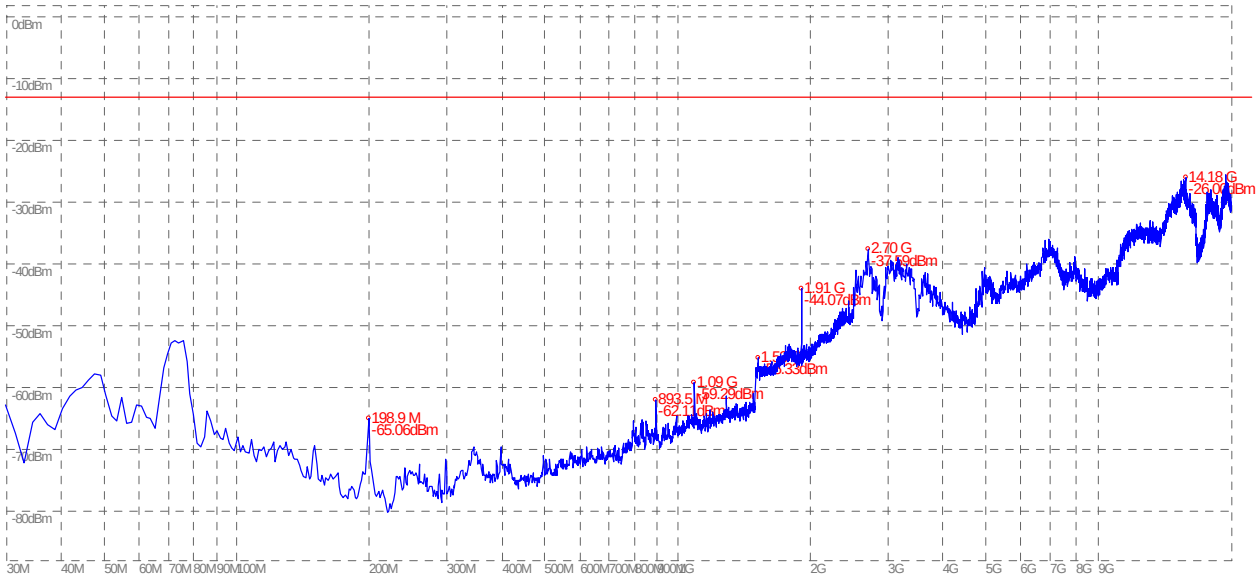
(Plot W.1: HSUPA 1900MHz Channel = 9800, Test Antenna Horizontal)



(Plot W.2: HSUPA 1900MHz Channel = 9800, Test Antenna Vertical)



(Plot X.1: HSUPA 1900MHz Channel = 9938, Test Antenna Horizontal)



(Plot X.2: HSUPA 1900MHz Channel = 9938, Test Antenna Vertical)

** END OF REPORT **