



Report No.: SZ11090185W01

FCC TEST REPORT

Issued to

REACH Tech (Xiamen) Co., Ltd

For

A58w

Model Name: A58w;
 Trade Name: CINCINNATI BELL HOLA
 Brand Name: CINCINNATI BELL
 FCC ID : Z5J-A58W
 Standard: 47 CFR Part 2
 47 CFR Part 22 Subpart H
 47 CFR Part 24 Subpart E
 47 CFR Part 27 Subpart L
 Test date: Sep 29, 2011 - Oct 17, 2011
 Issue date: Oct 21, 2011



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Date 2011.10.21

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Change History		
Issue	Date	Reason for change
1.0	Oct 21, 2011	First edition
2.0	Nov 30,2011	Corrected EIRP limit and WCDMA band emission of resolution bandwith.

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type: A58w
Serial No.....: (n.a, marked #1 by test site)
Hardware Version: E407mb_v2.0
Software Version: E407RWLite_SS_V0.1.0.22090
Applicant: REACH Tech (Xiamen) Co., Ltd.
RM.303,#18,Guanri Road, Software Park II, Xiamen,China
Manufacturer: REACH Tech (Xiamen) Co., Ltd.
RM.303,#18,Guanri Road, Software Park II, Xiamen, China
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 1700MHz:
Tx:1710MHz -1755MHz(at intervals of 200kHz);
Rx:2110MHz -2155MHz(at intervals of 200kHz)
Modulation Type.....: GPRS/GSM Mode with GMSK Modulation
EDGE Mode with 8PSK Modulation
WCDMA Mode with QPSK Modulation
Emission Designators: GSM:265KGXW, EGPRS:260KG7W
WCDMA:4M12F9W

Note 1: The EUT is a A58w in Cellular and PCS bands.

Note 2: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; 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 3: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula $F(n)=1850.2+0.2*(n-512)$, $512 \leq n \leq 810$; 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 4: The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; 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: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 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
4	47 CFR Part 27 (10-1-09 Edition)	Miscellaneous Wireless Communications Services

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

No.	Section	Description	Result
1	2.1046	Conducted RF Output Power	PASS
2	2.1049; 27.53	20dB Occupied Bandwidth	PASS
3	2.1055; 22.355 24.235; 27.54	Frequency Stability	PASS
4	2.1051; 2.1057 22.917; 24.238 27.53(h)	Conducted Out of Band Emissions	PASS
5	2.1051; 2.1057 22.917; 24.238 27.53	Band Edge	PASS
6	22.913; 24.232 27.50	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053; 2.1057 22.917; 24.238 27.53	Radiated Out of Band Emissions	PASS

NOTE: Measurement method according to TIA/EIA 603.C-2004

1.3 Facilities and Accreditations

1.3.1 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.

1.3.2 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

2. 47 CFR PART 2, PART 22H & 24E, 27L REQUIREMENTS

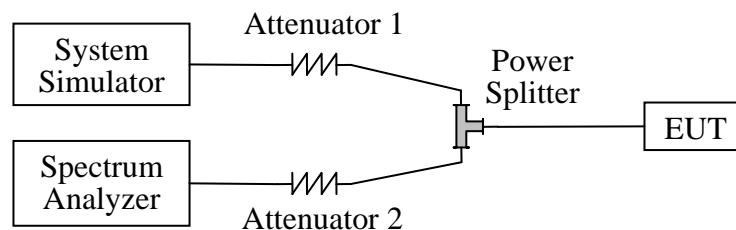
2.1 Conducted RF Output Power

2.1.1 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).

2.1.2 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
System Simulator	Agilent	E5515C	GB43130131	2011.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2011.05
Power Splitter	Weinschel	1506A	NW521	(n.a.)
Attenuator 1	Resnet	20dB	(n.a.)	(n.a.)
Attenuator 2	Resnet	3dB	(n.a.)	(n.a.)

2.1.3 Test Result

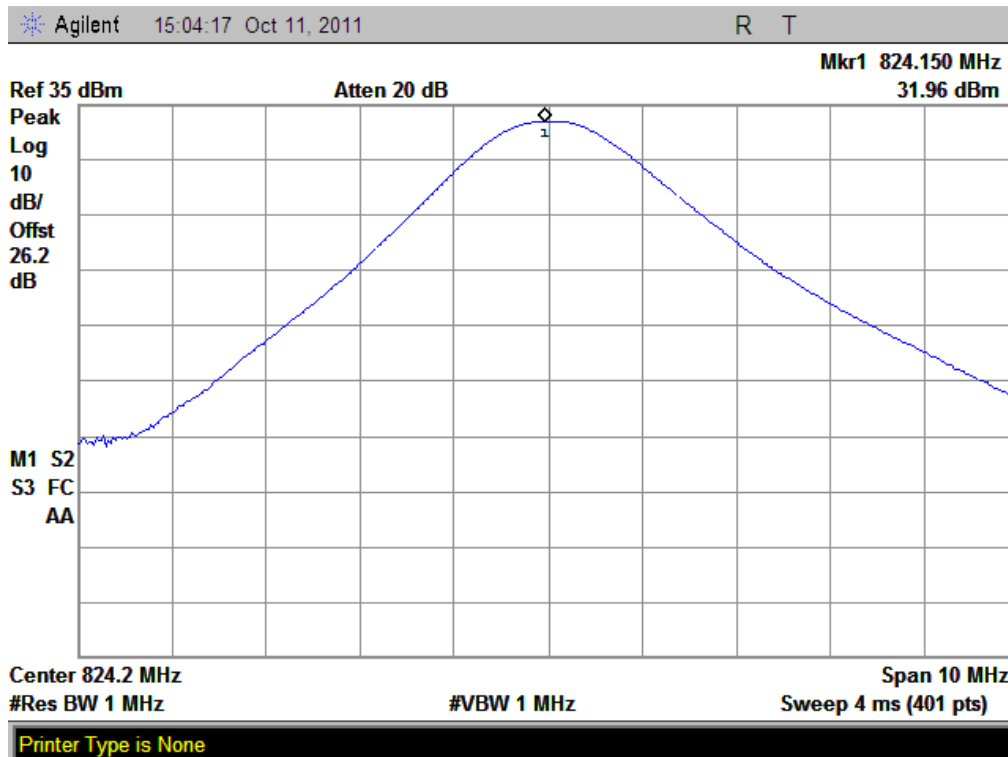
Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 35dBm, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), the rated conducted RF output power is 32dBm, and For the AWS 1700MHz operates at maximum output Power, the rated conducted RF output power is 30dBm.

1. Test Verdict:

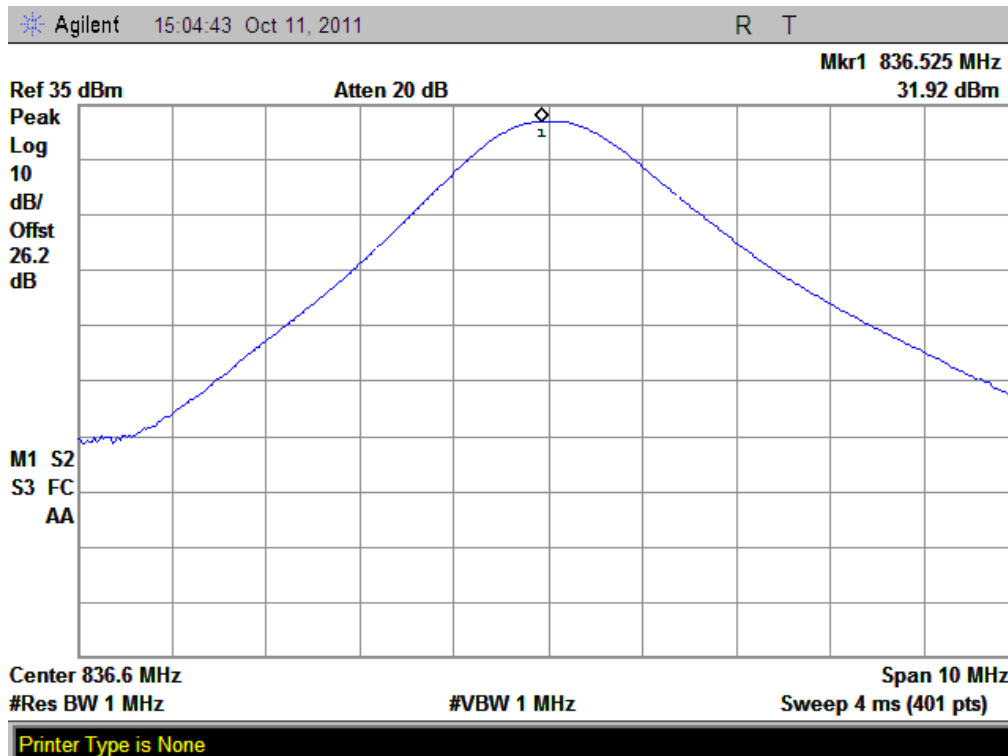
Band	Channel	Frequency (MHz)	Measured Output Power		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 850MHz	128	824.2	31.96	Plot A1 to A3	35	PASS
	190	836.6	31.92			PASS
	251	848.8	32.10			PASS
GSM 1900MHz	512	1850.2	27.49	Plot B1 to B3	32	PASS
	661	1880.0	29.23			PASS
	810	1909.8	28.86			PASS
GPRS 850MHz	128	824.2	32.04	Plot C1 to C3 4down link 1up link	35	PASS
	190	836.6	31.99			PASS
	251	848.8	32.20			PASS
GPRS 1900MHz	512	1850.2	27.60	Plot D1 to D3 4down link 1up link	32	PASS
	661	1880.0	29.29			PASS
	810	1909.8	28.98			PASS
EGPRS 850MHz	128	824.2	30.35	Plot E1 to E3 1down link 4up link	35	PASS
	190	836.6	30.14			PASS
	251	848.8	30.47			PASS
EGPRS 1900MHz	512	1850.2	26.18	Plot F1 to F3 1down link 4up link	32	PASS
	661	1880.0	27.07			PASS
	810	1909.8	27.35			PASS

Item	band	WCDMA 1700		
	ARFCN	1537	1637	1738
	subtest	dBm		
5.2(WCDMA)	non	22.44	22.78	22.22

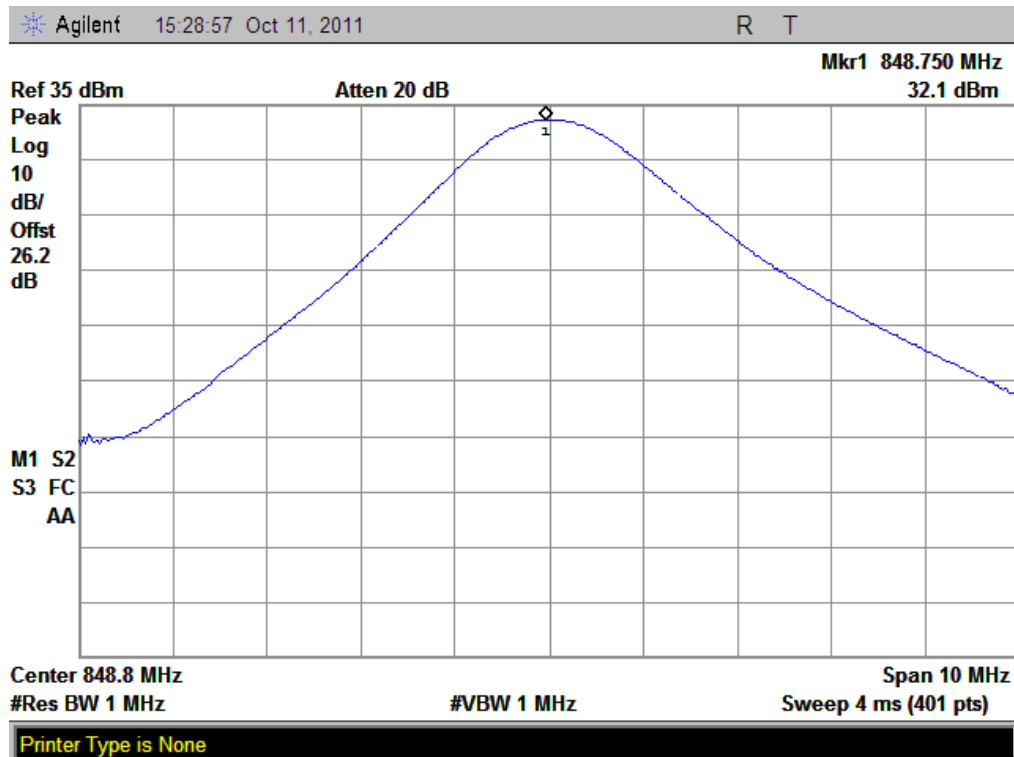
2. Test Plots:



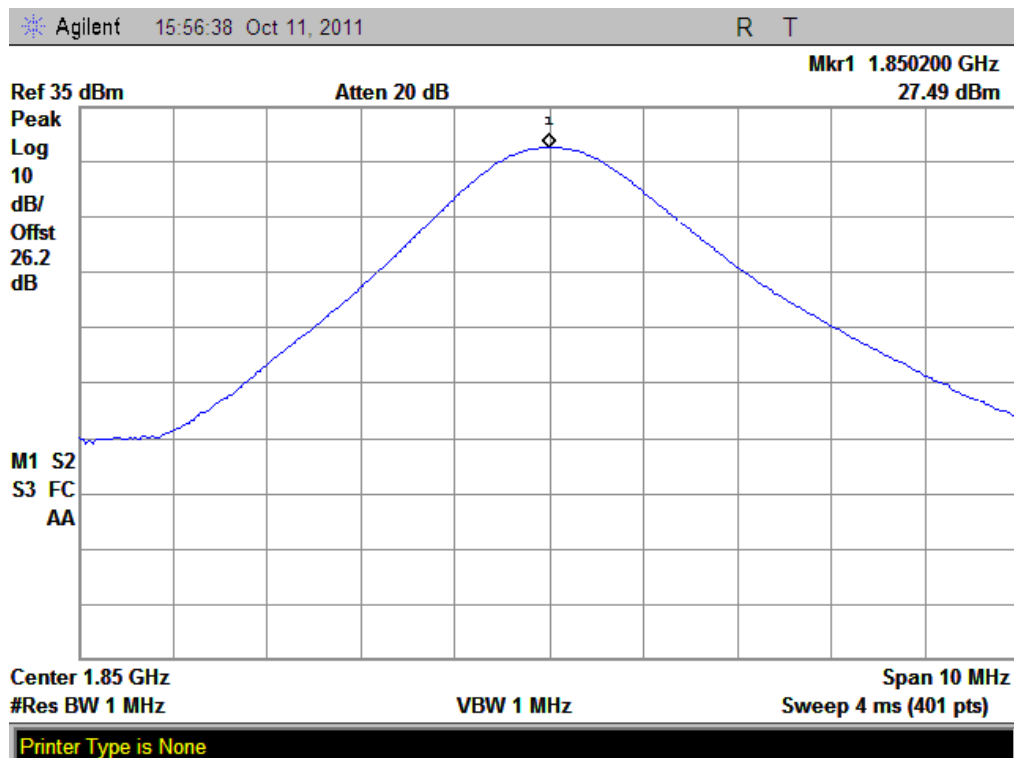
(Plot A1: GSM 850MHz Channel = 128)



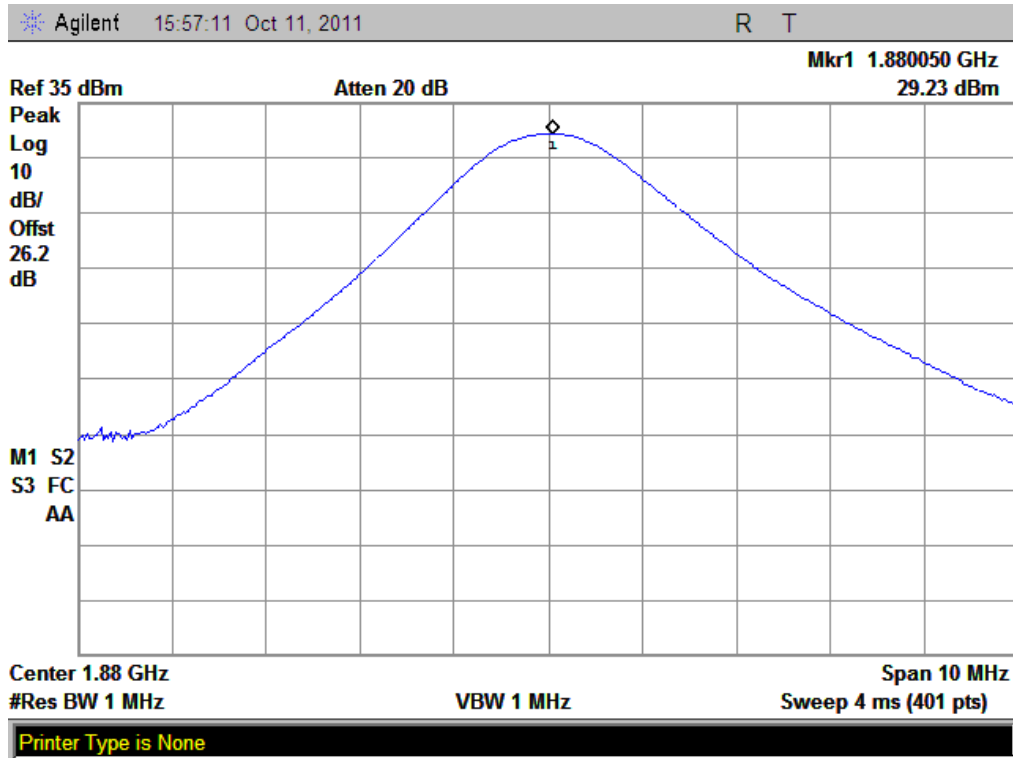
(Plot A2: GSM 850MHz Channel = 190)



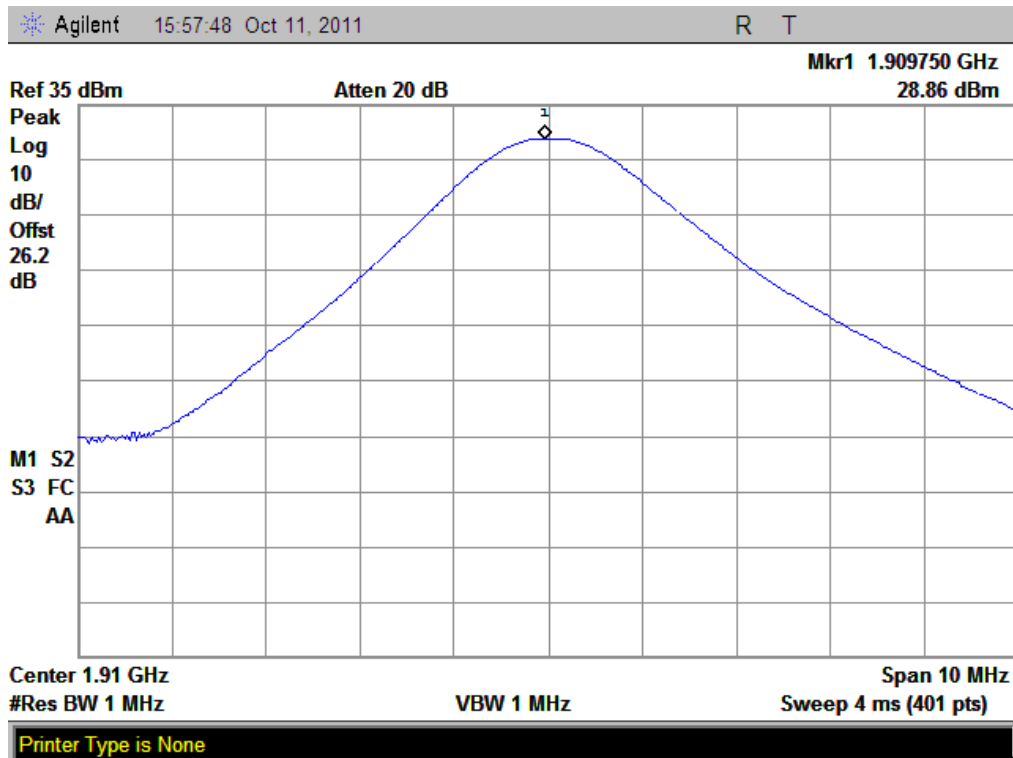
(Plot A3: GSM 850MHz Channel = 251)



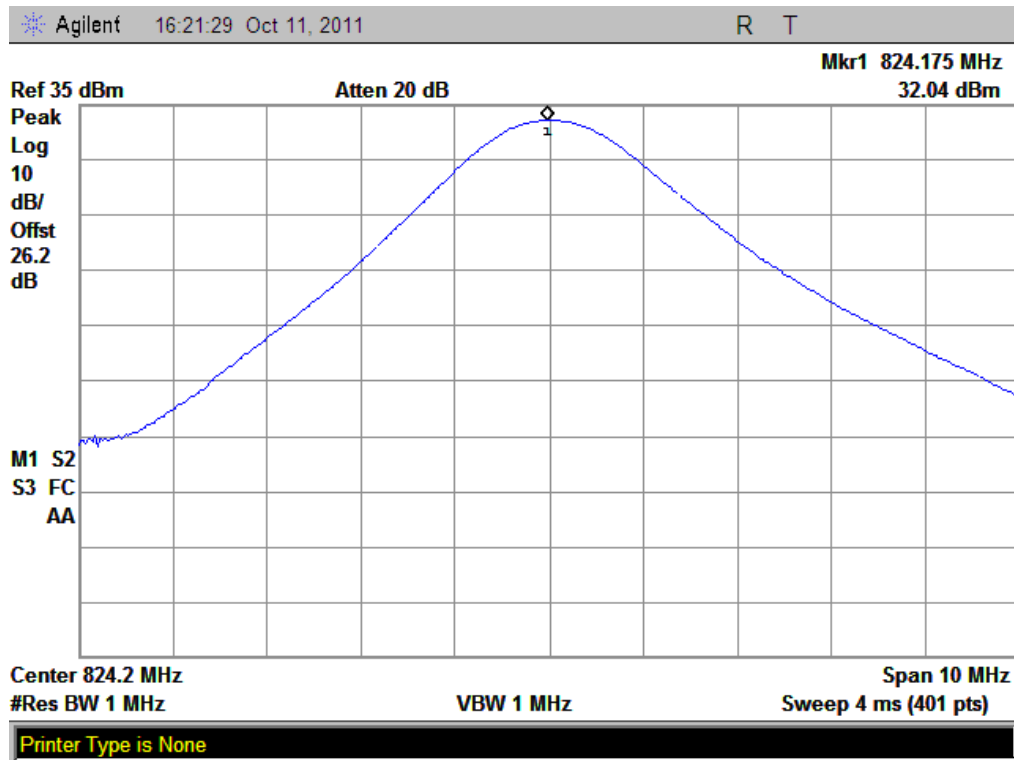
(Plot B1: GSM 1900MHz Channel = 512)



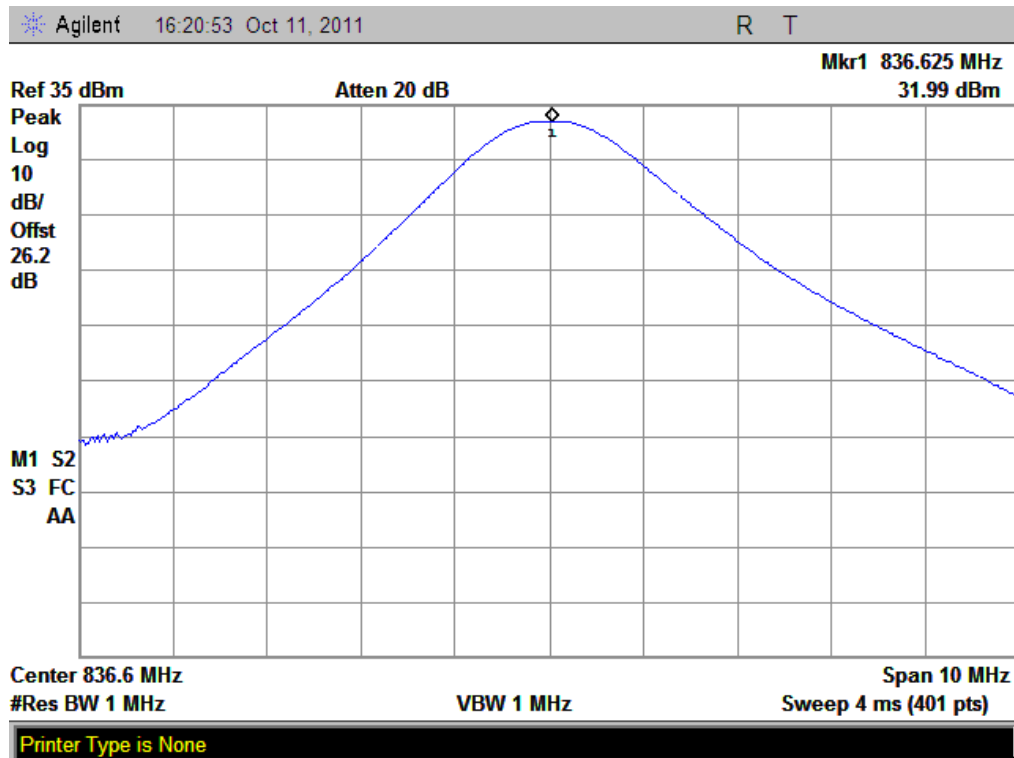
(Plot B2: GSM 1900MHz Channel = 661)



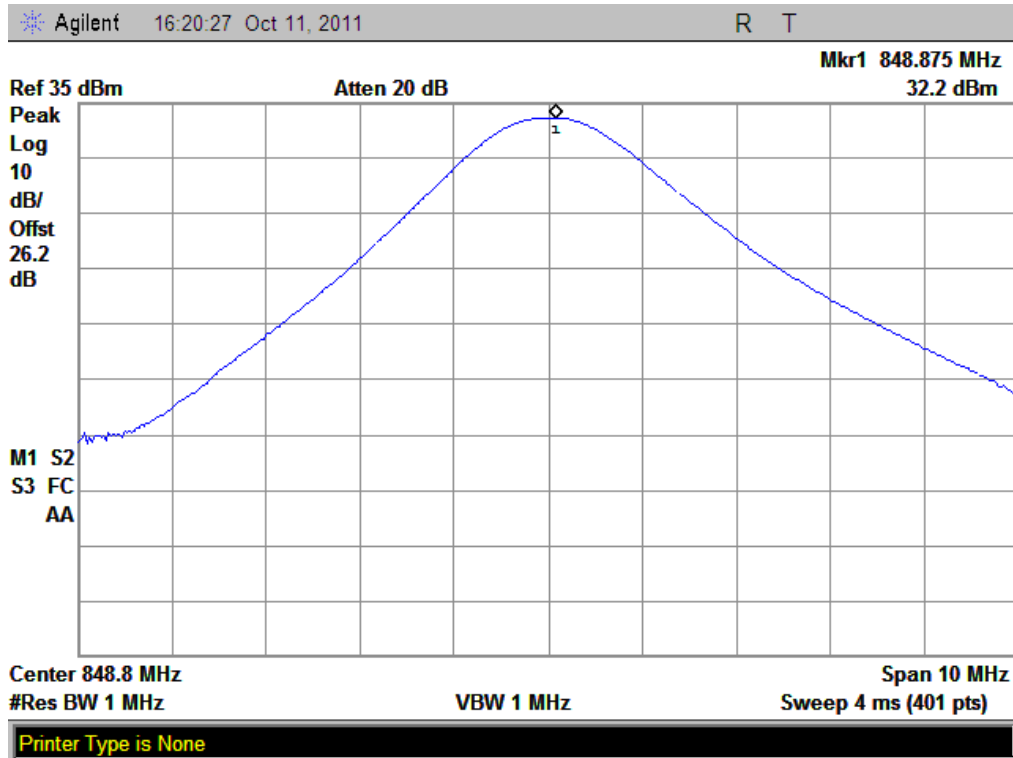
(Plot B3: GSM 1900MHz Channel = 810)



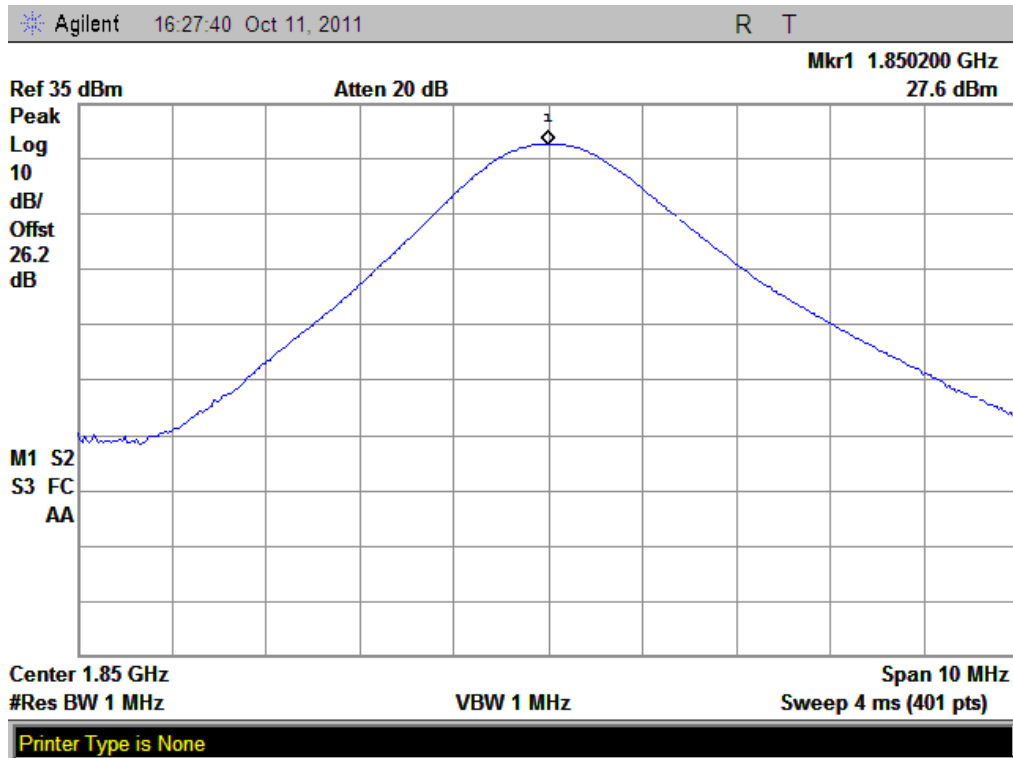
(Plot C1: GPRS 850MHz Channel = 128)



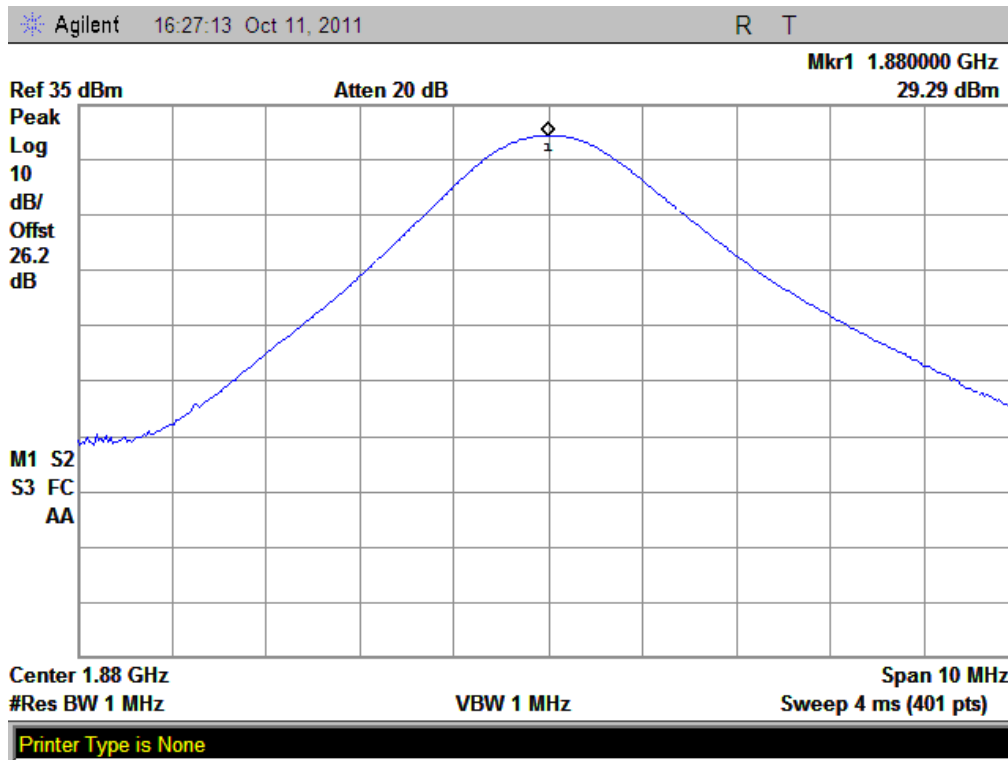
(Plot C2: GPRS 850MHz Channel = 190)



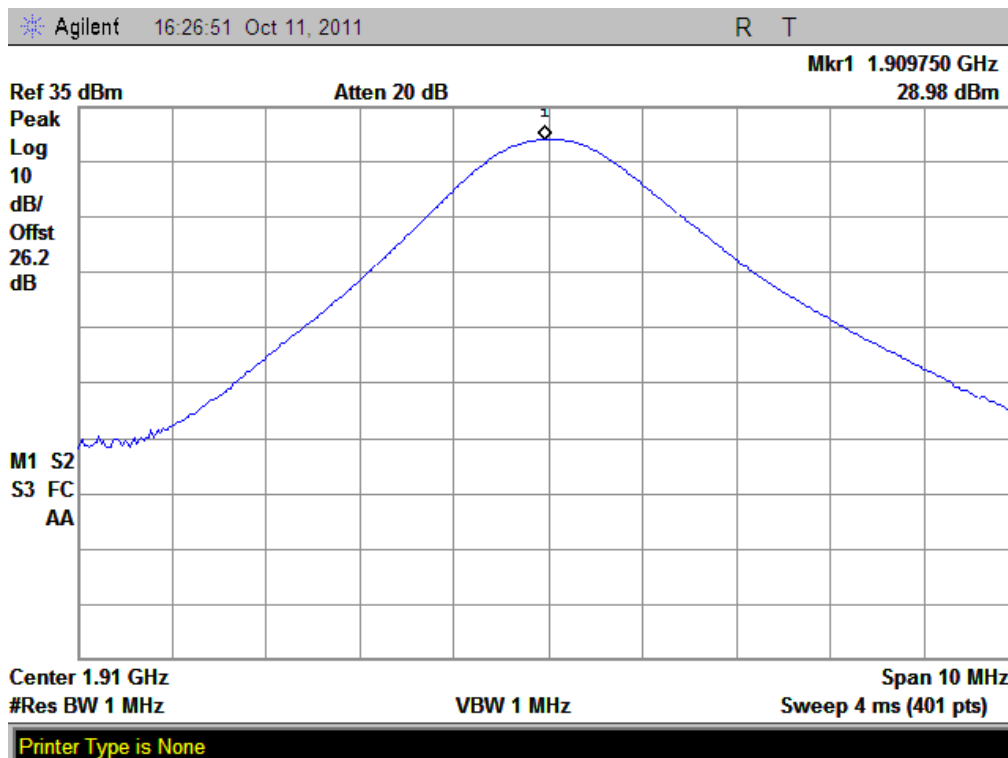
(Plot C3: GPRS 850MHz Channel = 251)



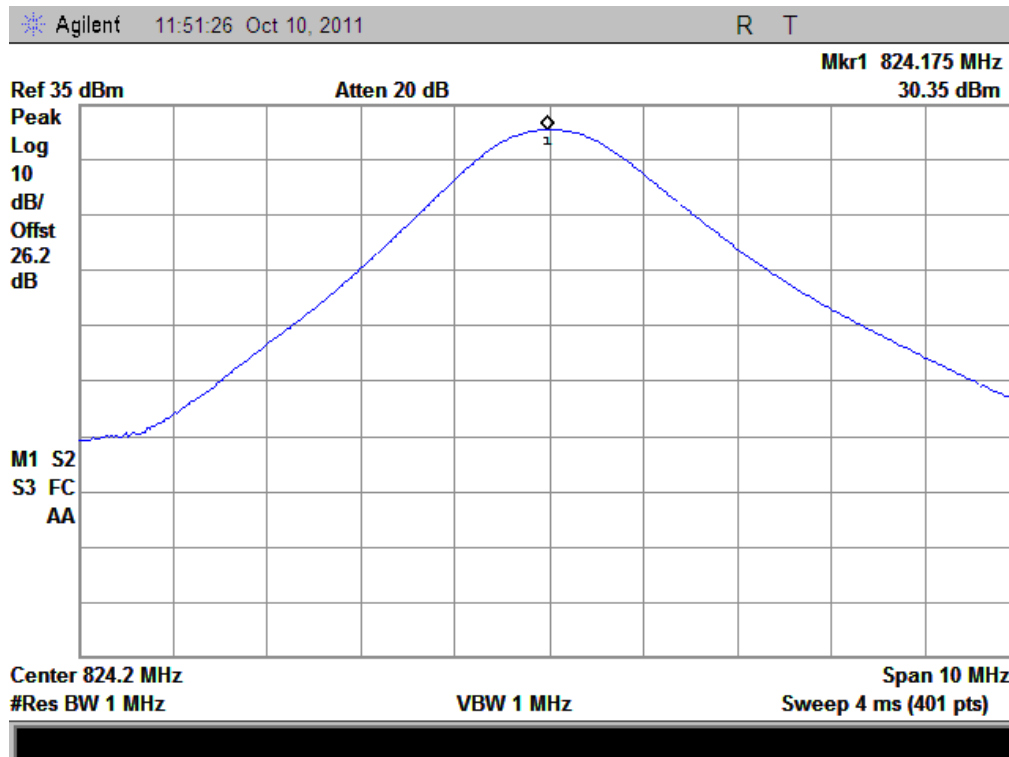
(Plot D1: GPRS 1900MHz Channel = 512)



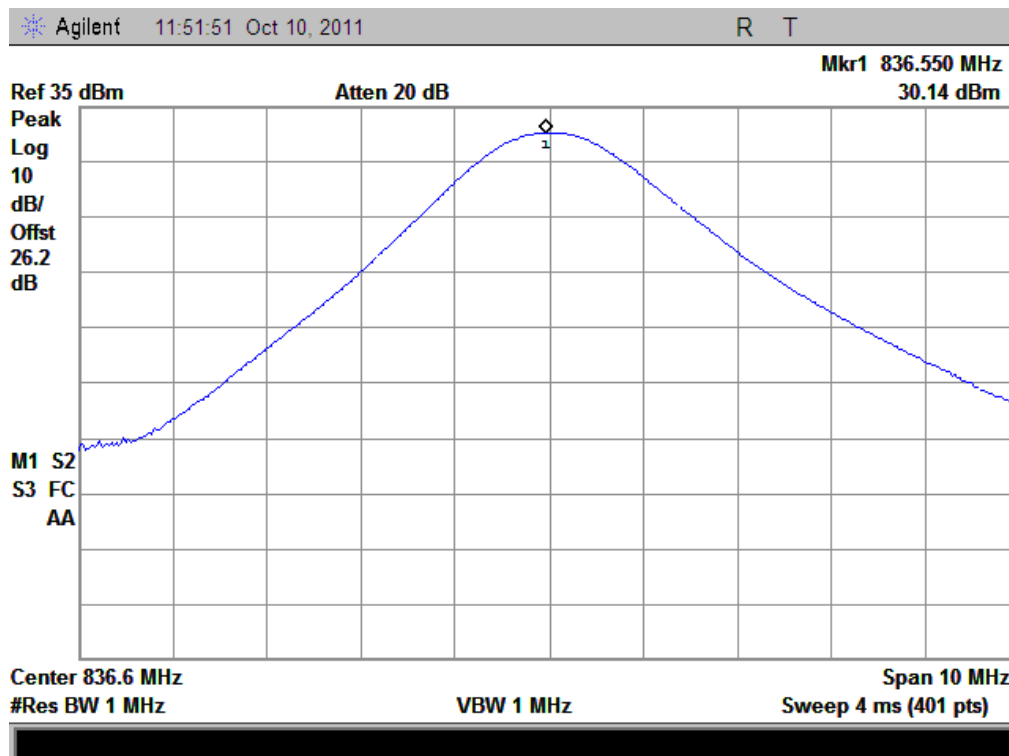
(Plot D2: GPRS 1900MHz Channel = 661)



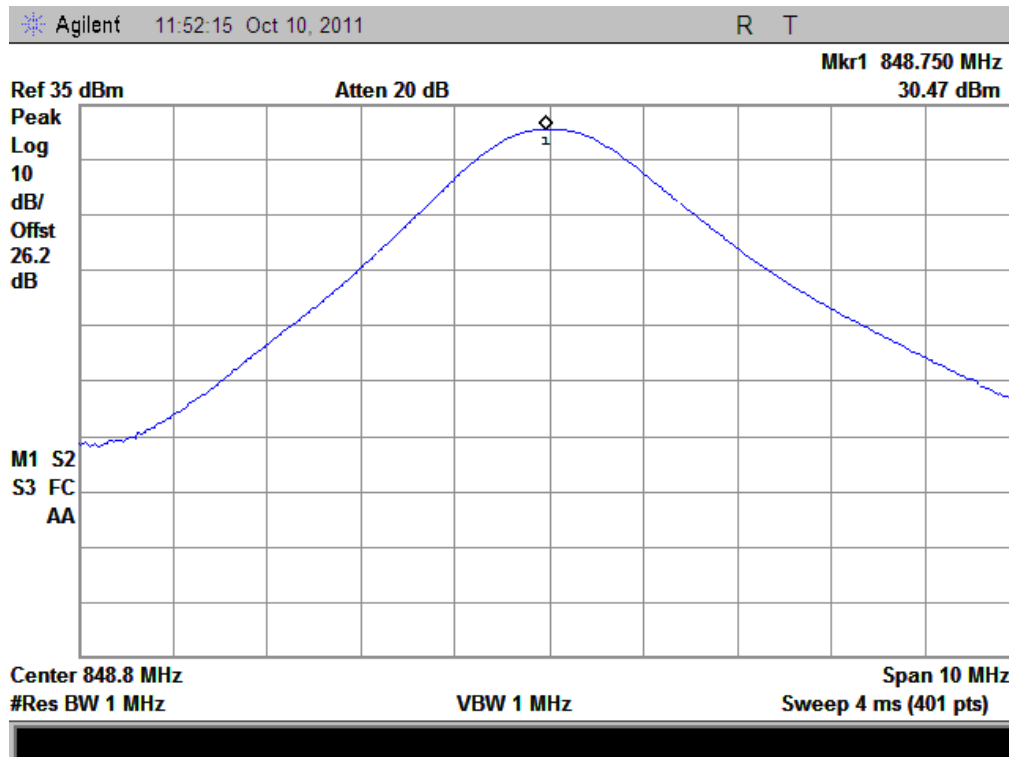
(Plot D3: GPRS 1900MHz Channel = 810)



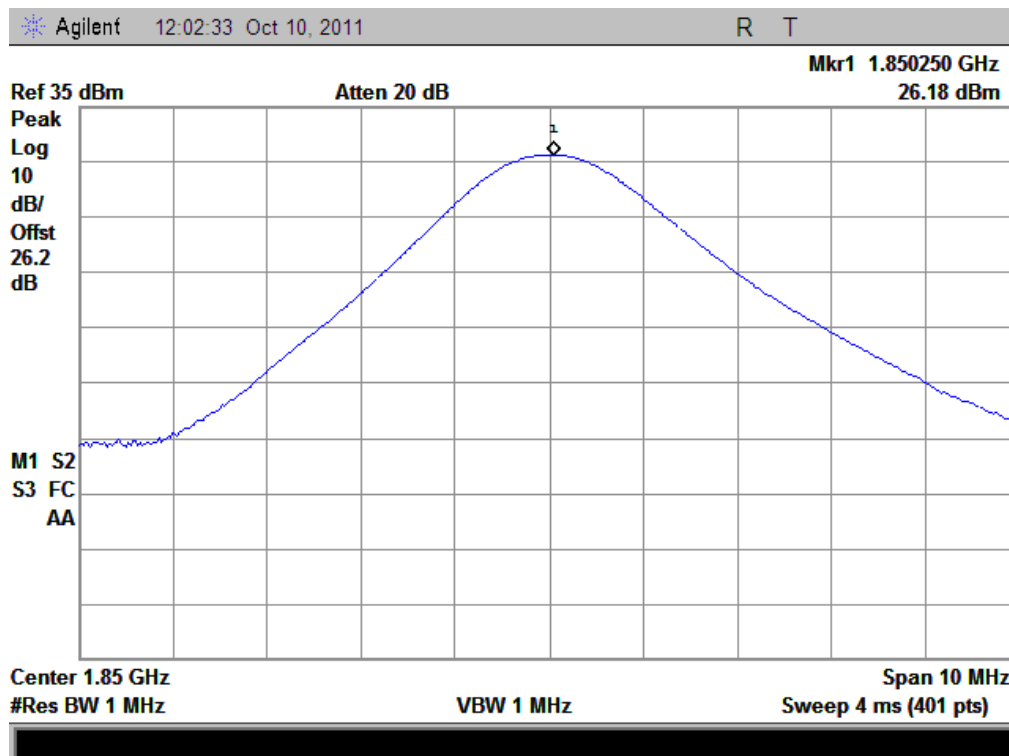
(Plot E 1: EGPRS 850MHz Channel = 128)



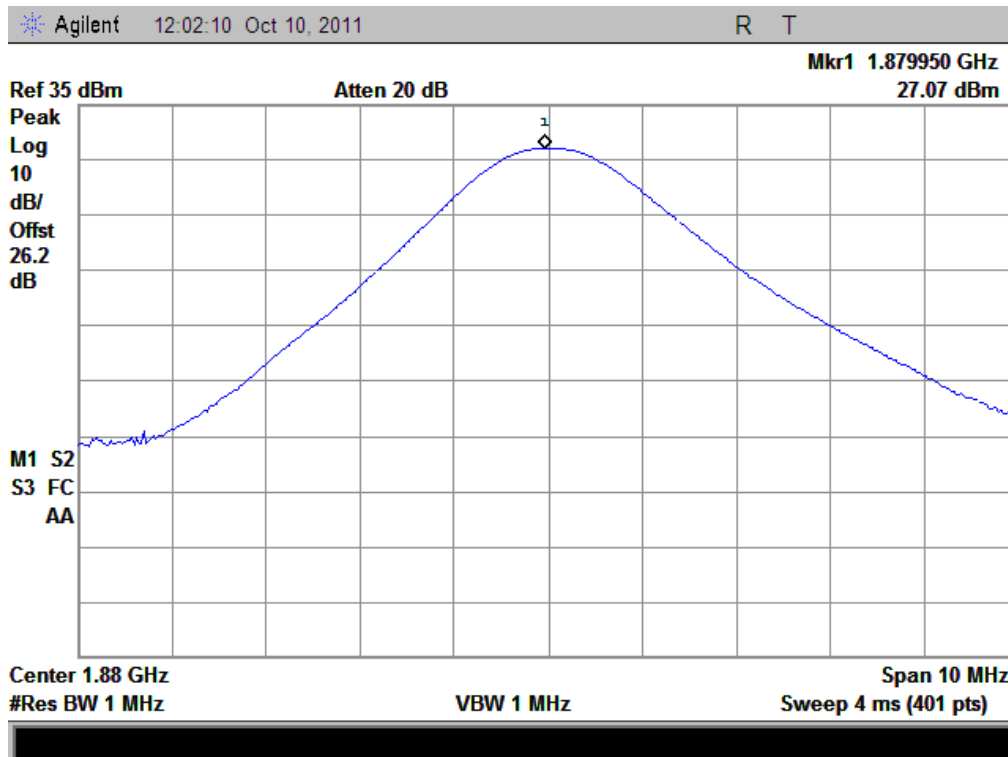
(Plot E 2: EGPRS 850MHz Channel = 190)



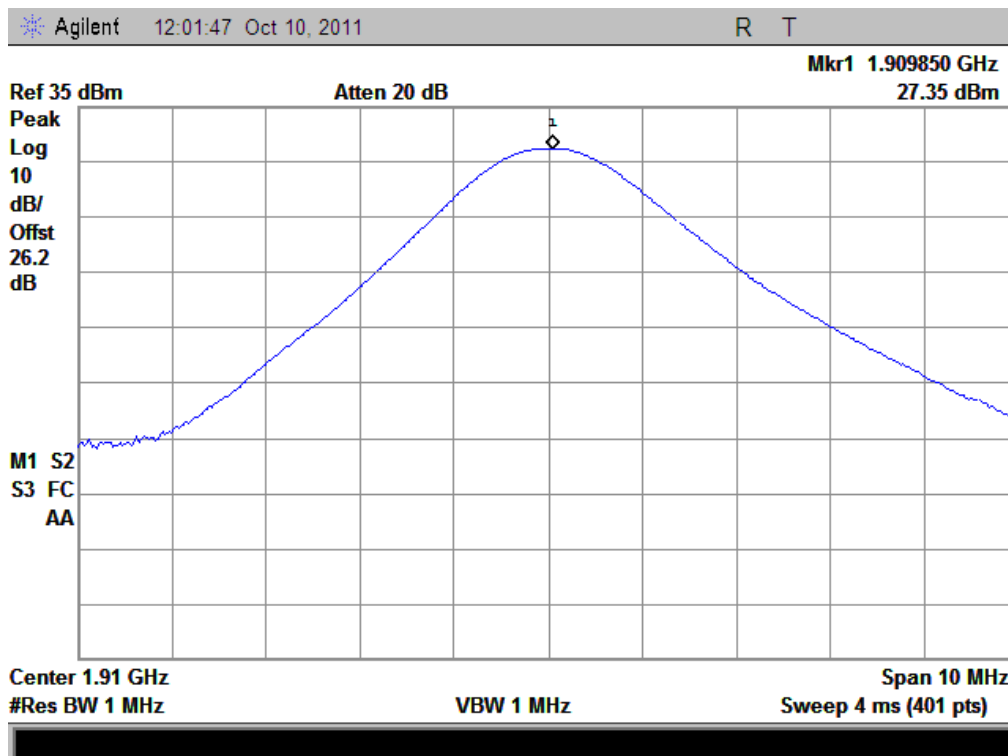
(Plot E 3: EGPRS 850MHz Channel = 251)



(Plot F 1: EGPRS 1900MHz Channel = 512)



(Plot F 2: EGPRS 1900MHz Channel = 661)



(Plot F 3: EGPRS 1900MHz Channel = 810)

99% Occupied Bandwidth

2.1.4 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,

2.1.5 Test Description

See section 2.1.2 of this report.

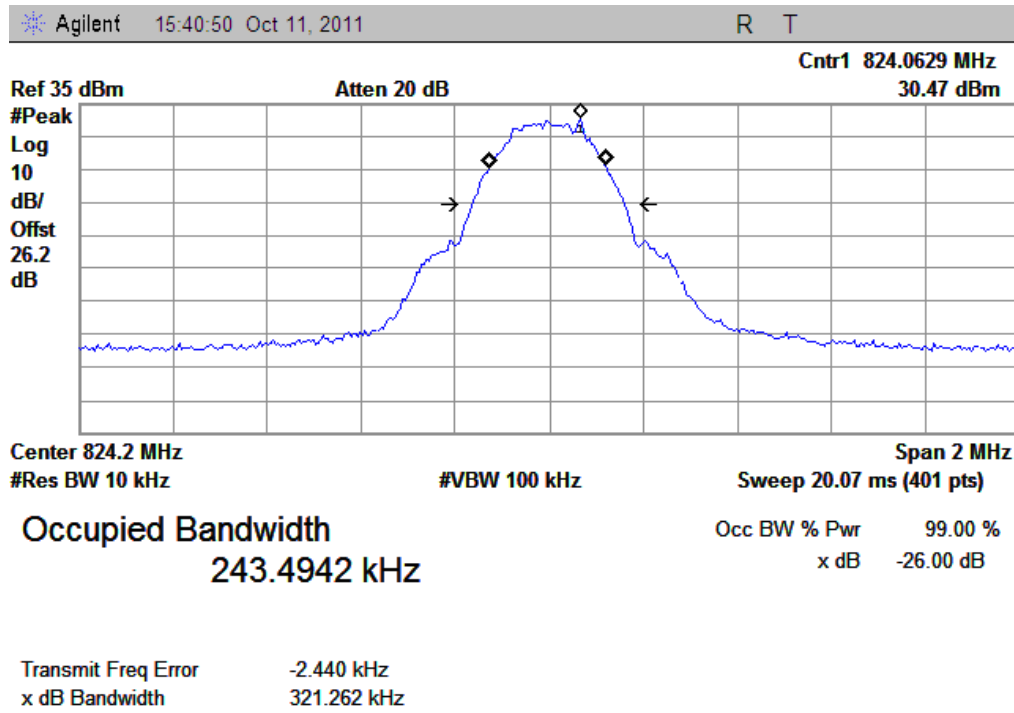
2.1.6 Test Verdict

Here the lowest, middle and highest channels are tested to record the 99% occupied bandwidth.

1. Test Verdict:

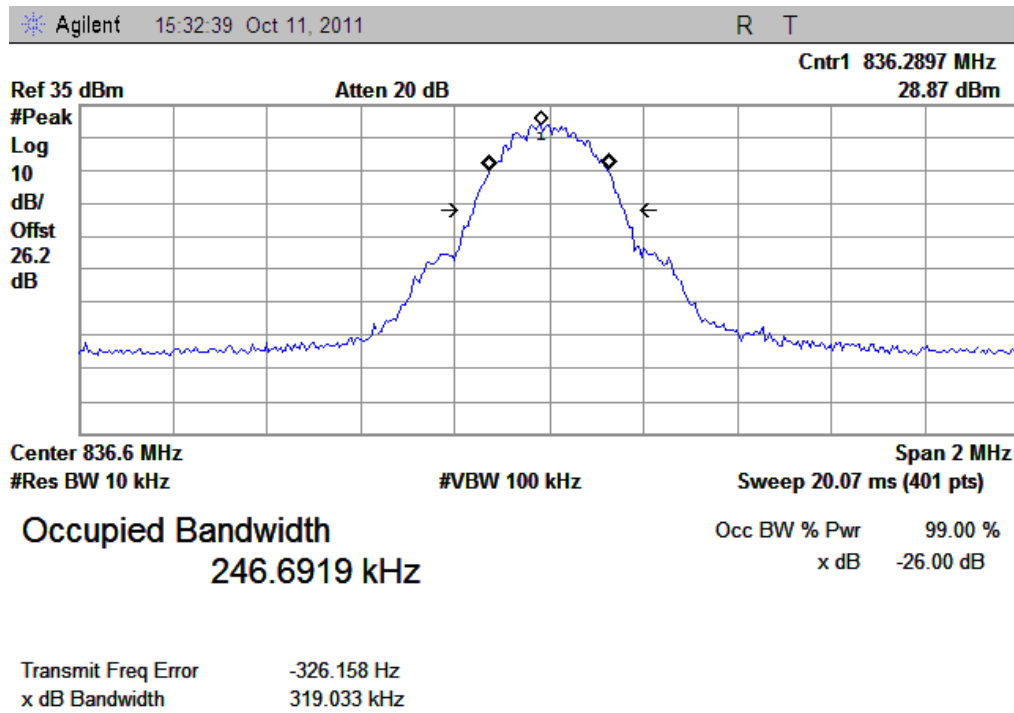
Band	Channel	Frequency (MHz)	Measured 99% Occupied Bandwidth	Refer to Plot
GSM 850MHz	128	824.2	243.4942K	Plot A
	190	836.6	246.6919K	Plot B
	251	848.8	242.7730K	Plot C
GSM 1900MHz	512	1850.2	243.3035K	Plot D
	661	1880.0	242.6190K	Plot E
	810	1909.8	244.9510K	Plot F
EDGE 850MHz	128	824.2	245.6045K	Plot G
	190	836.6	245.7807K	Plot H
	251	848.8	249.8369K	Plot I
EDGE 1900MHz	512	1850.2	245.0969K	Plot J
	661	1880.0	248.9513K	Plot K
	810	1909.8	249.3489K	Plot L
WCDMA 1700MHz	1637	1732.5	4.1241M	Plot M

2. Test Plots:



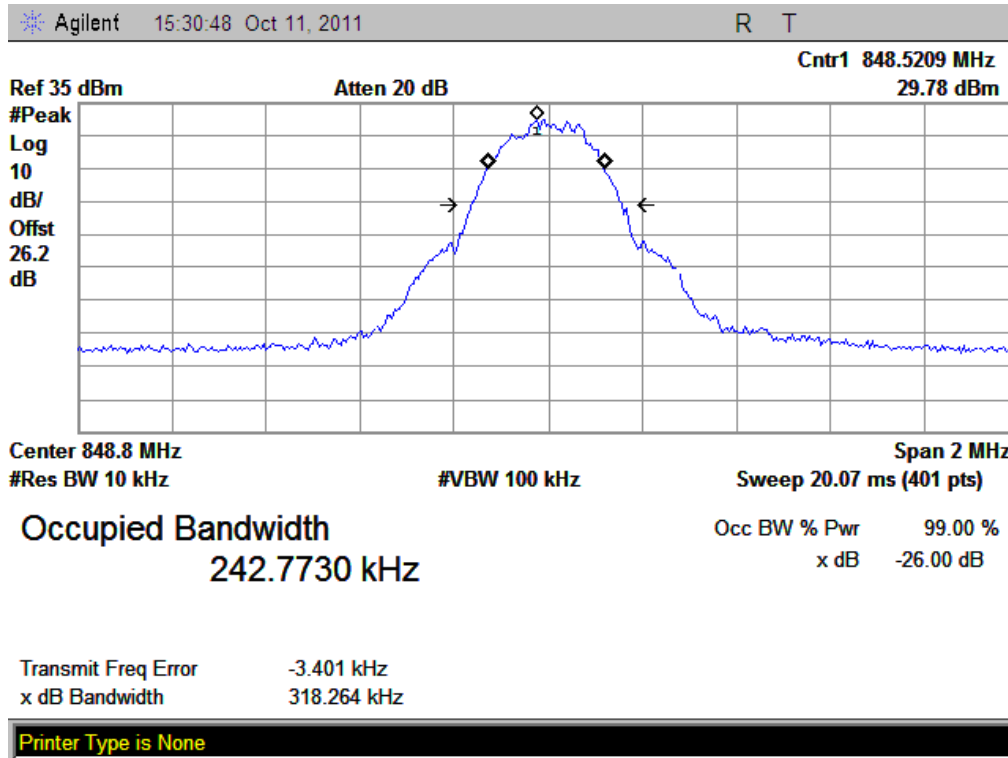
Printer Type is None

(Plot A: GSM 850MHz Channel = 128)

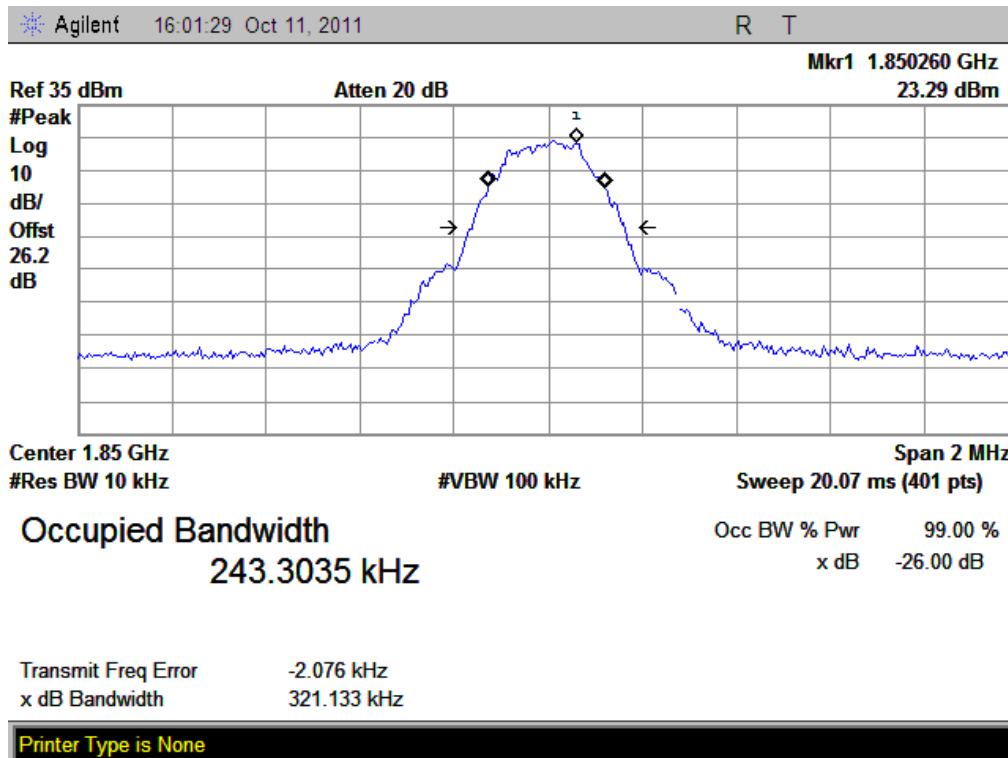


Printer Type is None

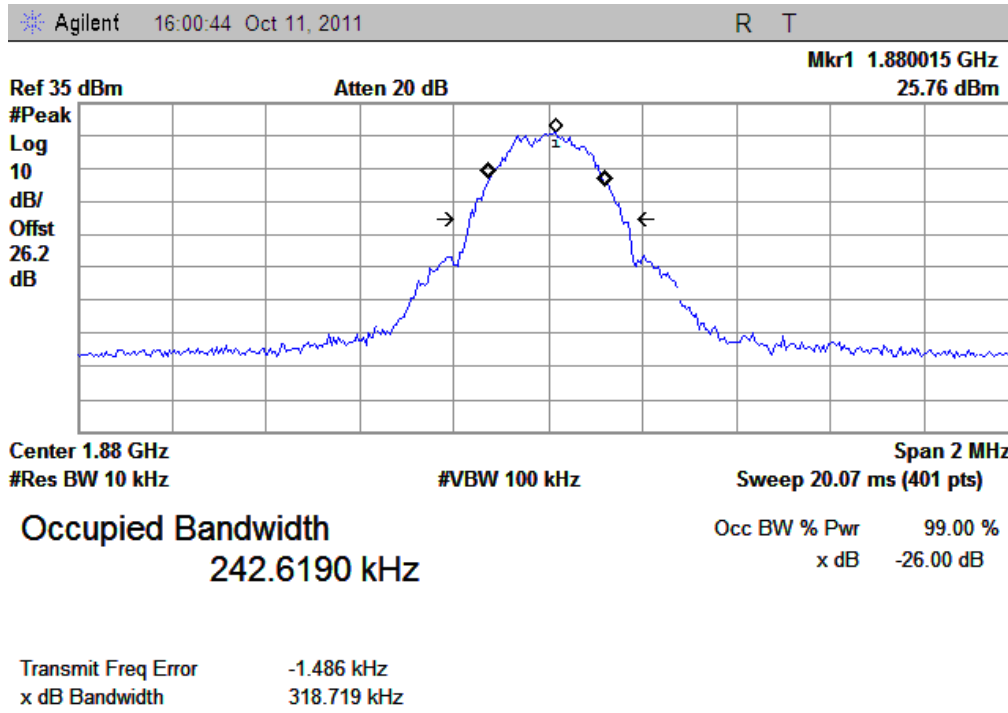
(Plot B: GSM 850MHz Channel = 190)



(Plot C: GSM 850MHz Channel = 251)

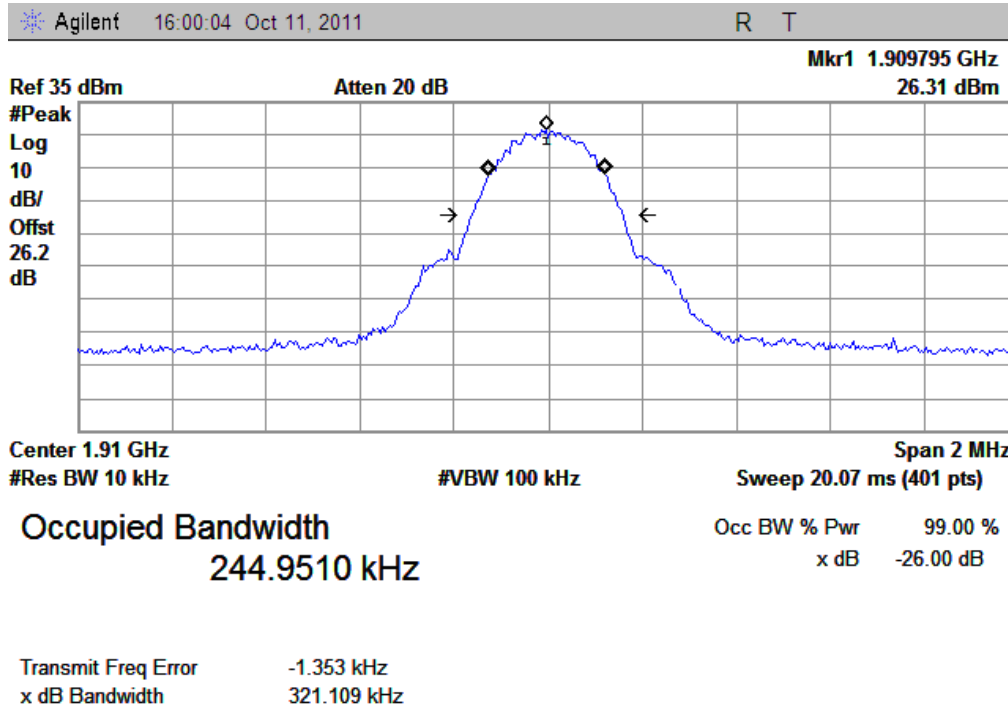


(Plot D: GSM 1900MHz Channel = 512)



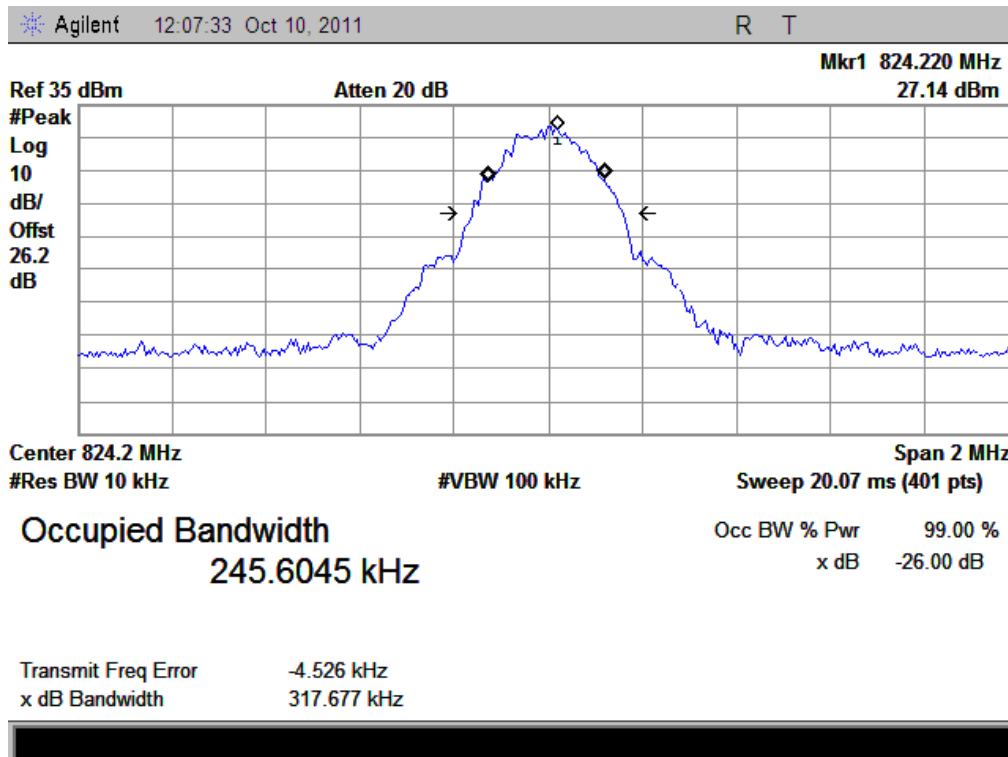
Printer Type is None

(Plot E: GSM 1900MHz Channel = 661)

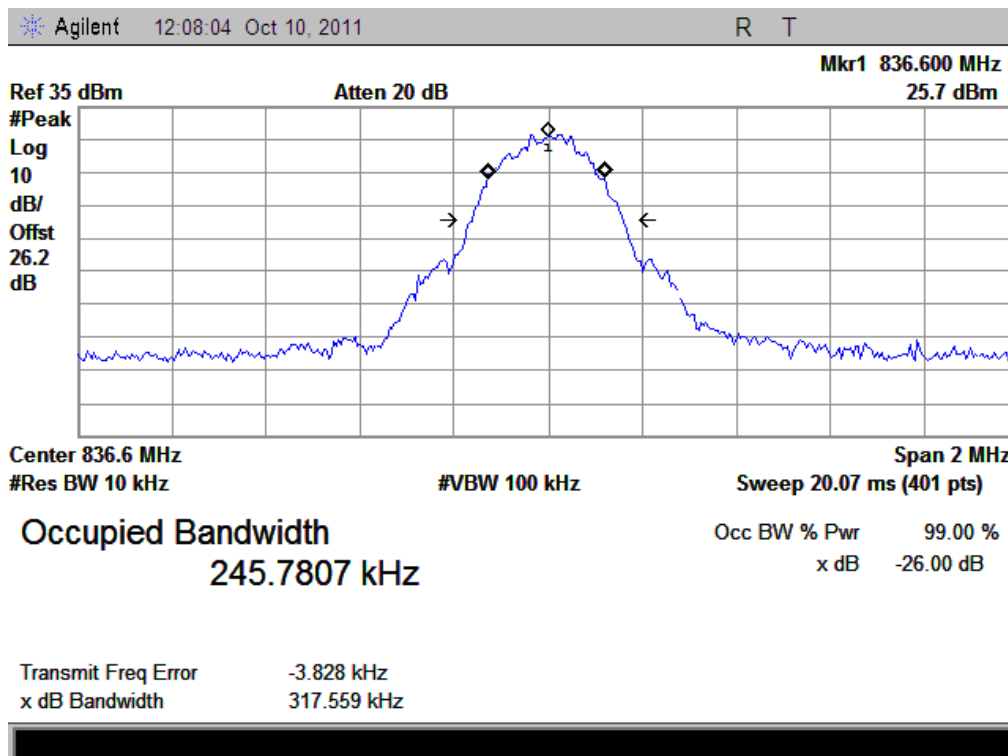


Printer Type is None

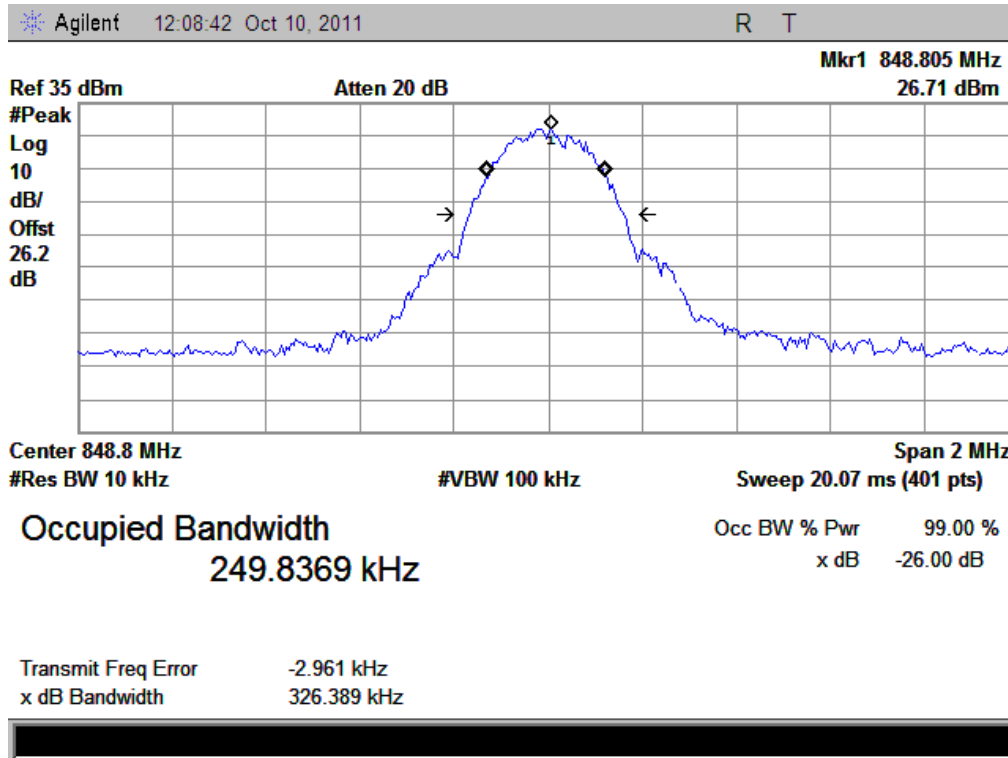
(Plot F: GSM 1900MHz Channel = 810)



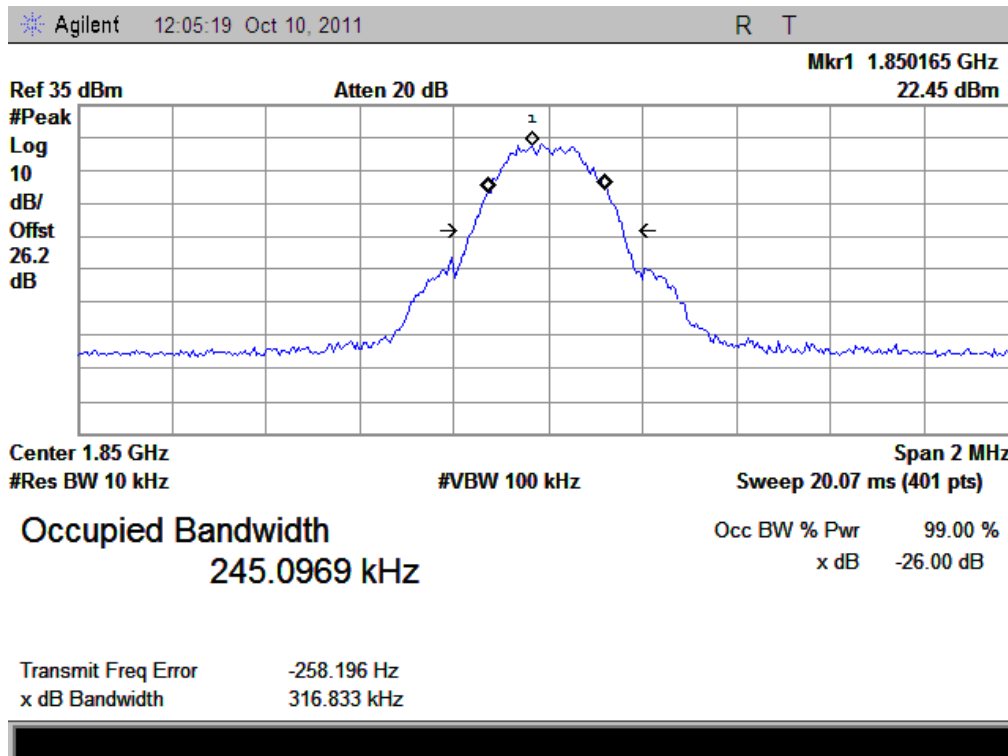
(Plot G: EDGE 850MHz Channel = 128)



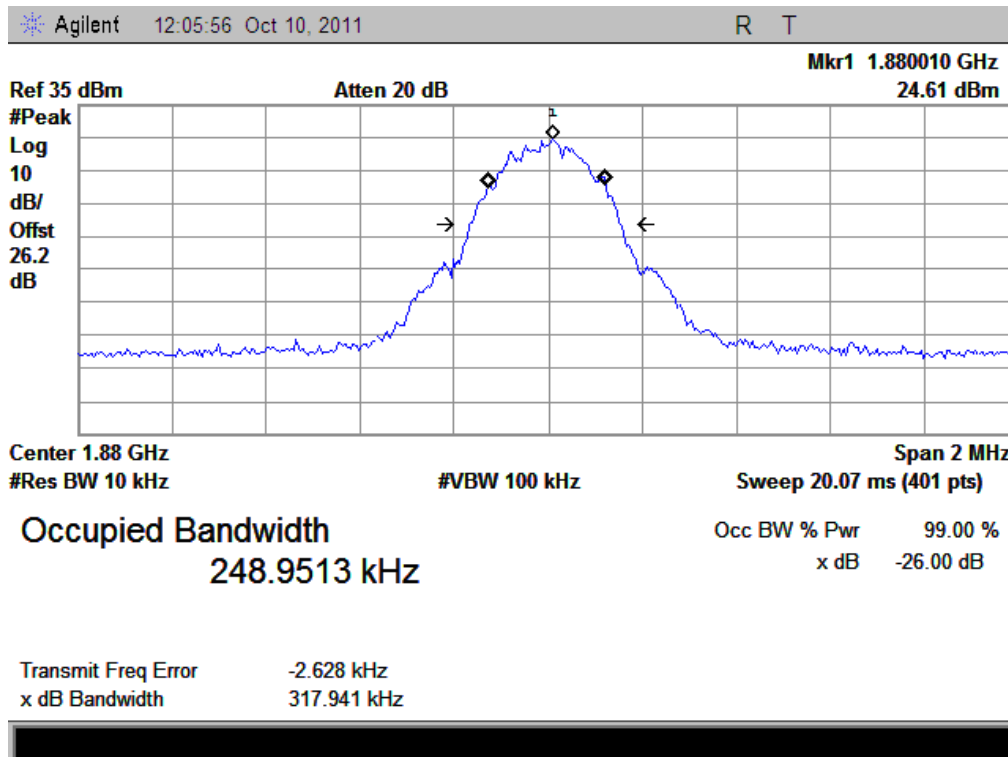
(Plot H: EDGE 850MHz Channel = 190)



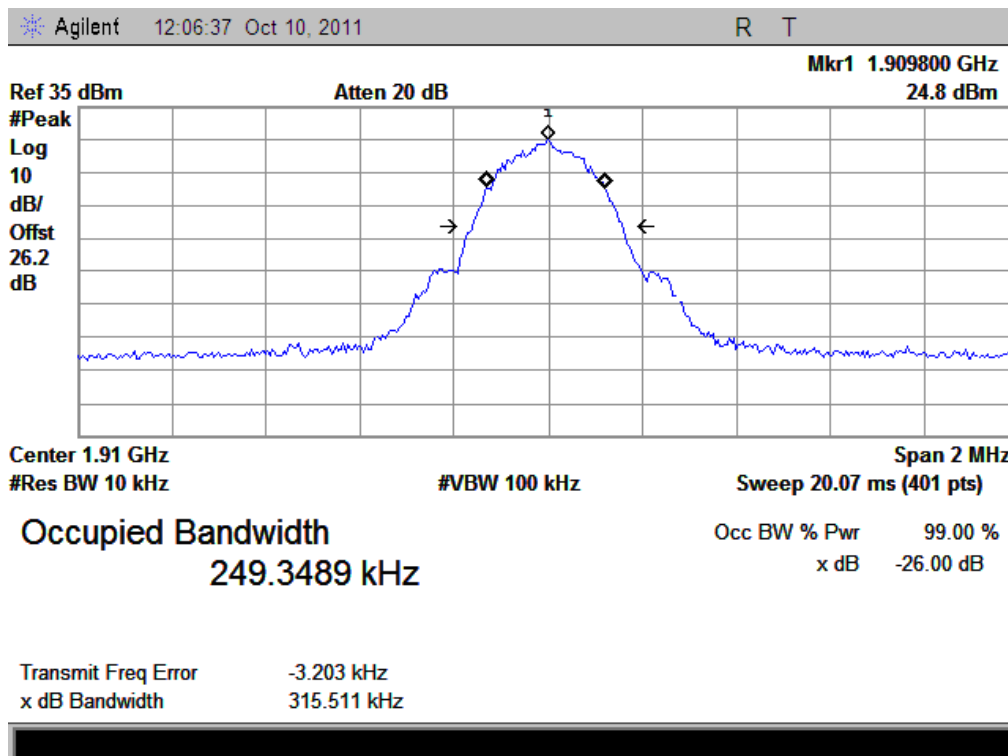
(Plot I: EDGE 850MHz Channel = 251)



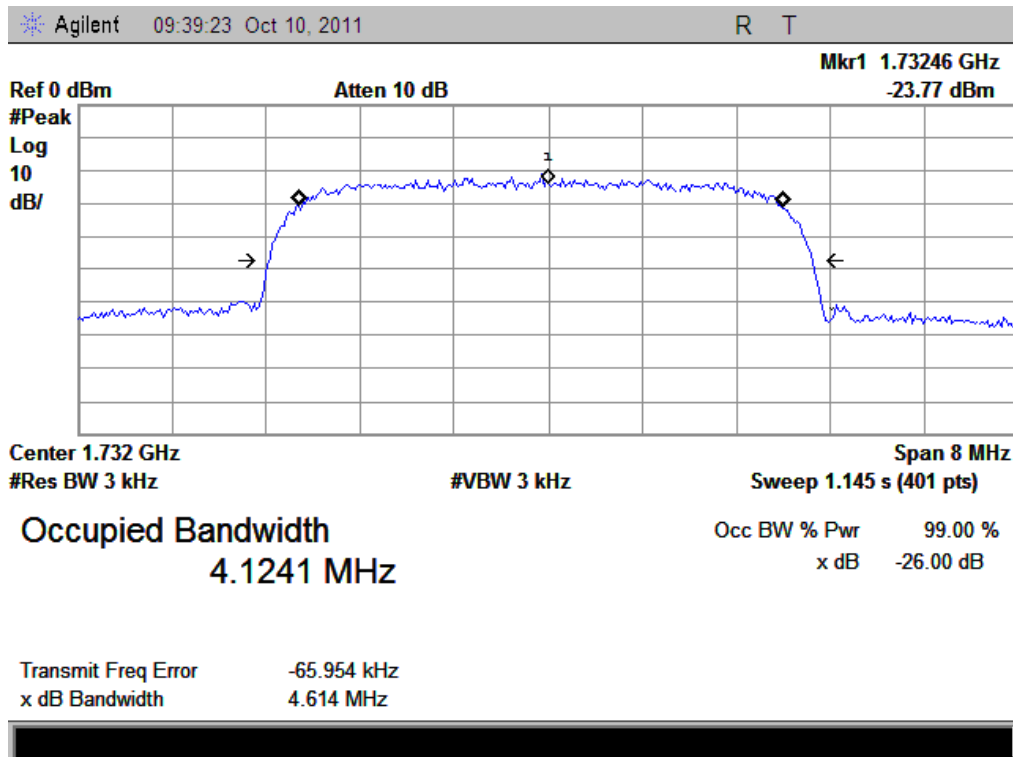
(Plot J: EDGE 1900MHz Channel = 512)



(Plot K: EDGE 1900MHz Channel = 661)



(Plot L: EDGE 1900MHz Channel = 810)



(Plot M: WCDMA 1700MHz Channel = 1637)

2.2 Frequency Stability

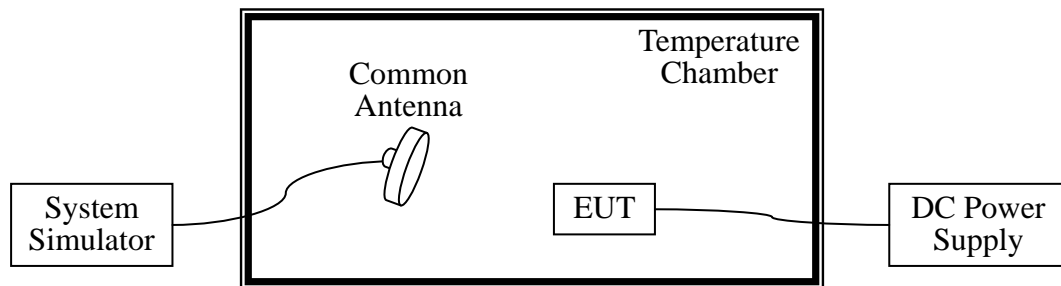
2.2.1 Requirement

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

- (a) The temperature is varied from -30°C to $+50^{\circ}\text{C}$ 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.

2.2.2 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
System Simulator	Agilent	E5515C	GB43130131	2011.05
DC Power Supply	Good Will	GPS-3030DD	EF920938	2011.05
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2011.05

2.2.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.4VDC, which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of GSM 850MHz band is $\pm 2.5\text{ppm}$, GSM 1900MHz is $\pm 1\text{ppm}$, and WCDMA

1700MHz band is ± 2.5 ppm

GSM 850MHz 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	
3.7	-30	-16.29	± 2060.5	-9.54	± 2091.5	15.06	± 2122	PASS
	-20	29.37		18.17		-25.16		
	-10	-11.06		-24.09		24.03		
	0	35.04		23.41		-23.21		
	+10	-22.26		-16.07		9.85		
	+20	35.09		29.16		27.01		
	+30	26.75		-17.54		26.09		
	+40	-11.08		11.74		-8.15		
+50	21.44	28.05	27.23					
4.2	+25	-7.85		-20.13		24.37		
3.4	+25	25.32		33.70		24.26		

GSM 1900MHz 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	
3.7	-30	-16.11	± 1850.2	26.75	± 1880.0	7.06	± 1909.8	PASS
	-20	9.35		-11.01		-21.13		
	-10	-25.42		11.54		17.01		
	0	-2.21		-4.85		3.20		
	+10	-19.01		13.32		-5.17		
	+20	26.52		5.09		14.51		
	+30	-18.49		23.04		20.79		
	+40	17.92		-10.26		-18.75		
+50	-10.25	21.09	17.43					
4.2	+25	26.98		-17.85		13.27		
3.4	+25	7.39		15.32		14.34		

EDGE 850MHz 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	
3.7	-30	8.8	±2060.5	12.0	±2091.5	13.1	±2122	PASS
	-20	0.7		-22.4		3.0		
	-10	-3.8		32.6		-8.8		
	0	-19.9		19.2		-23.2		
	+10	-3.4		-25.4		-6.3		
	+20	14.2		-34.6		19.9		
	+30	-27.2		13.6		-29.1		
	+40	-30.5		21.8		-27.4		
+50	12.3	4.2	15.0					
4.2	+25	25.8		24.8		28.1		
3.4	+25	-14.0		-4.2		-13.5		

EDGE 1900MHz 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	
3.7	-30	9.7	±1850.2	17.0	±1880.0	16.0	±1909.8	PASS
	-20	-21.2		6.2		-24.2		
	-10	29.7		-3.9		29.3		
	0	21.7		-23.7		23.9		
	+10	-21.7		-9.9		-23.4		
	+20	-29.1		15.5		-29.7		
	+30	9.8		-24.4		9.6		
	+40	22.4		-27.9		23.0		
+50	4.4	13.5	8.4					
4.2	+25	21.6		23.6		19.8		
3.4	+25	-3.6		-13.7		-6.3		



WCDMA 1700MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 1537 (826.4MHz)		Channel = 1637 (835MHz)		Channel = 1738 (846.6MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
3.7	-30	26.75	±826.4	-16.29	±835	13.32	±846.6	PASS
	-20	-11.01		29.37		5.09		
	-10	11.54		-11.06		23.04		
	0	-4.85		35.04		-10.26		
	+10	13.32		-22.26		13.32		
	+20	5.09		13.32		21.7		
	+30	5.09		3.0		23.04		
	+40	23.04		19.4		-10.26		
	+50	-10.26		6.8		21.09		
4.2	+25	13.32	13.1	-17.85				
3.4	+25	5.09	1.8	15.32				

2.3 Conducted Out of Band Emissions

2.3.1 Requirement

According to FCC section 2.1051, 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.

2.3.2 Test Description

See section 2.1.2 of this report.

2.3.3 Test Result

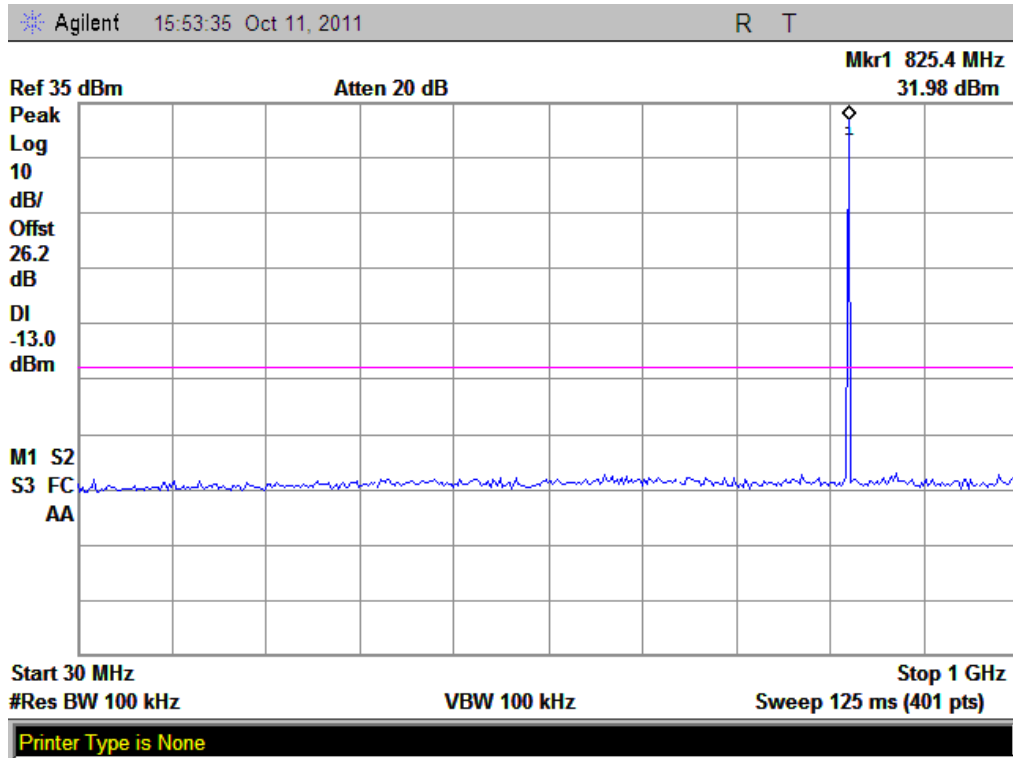
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Test Verdict:

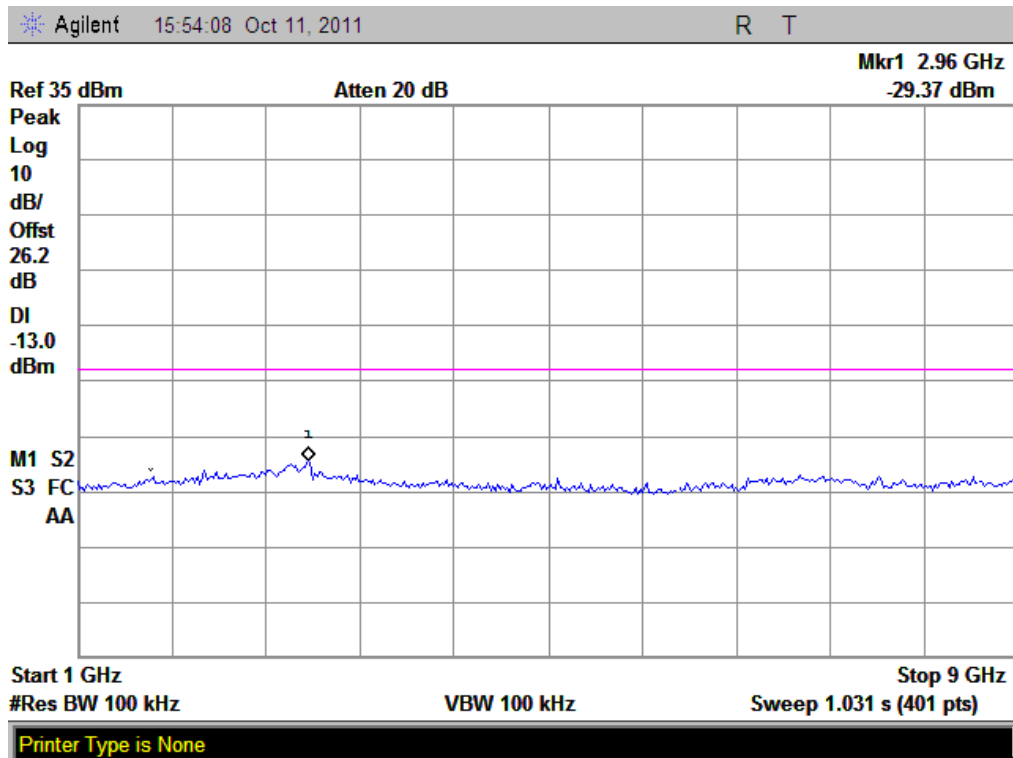
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-29.37	Plot A1toA1.1	-13	PASS
	190	836.6	-28.94	Plot A2toA2.1		PASS
	251	848.8	-28.95	Plot A3toA3.1		PASS
GSM 1900MHz	512	1850.2	-32.37	Plot B1toB1.1	-13	PASS
	661	1880.0	-32.38	Plot B2toB2.1		PASS
	810	1909.8	-31.51	Plot B3toB3.1		PASS
EDGE 850MHz	128	824.2	-29.51	Plot C1toC1.1	-13	PASS
	190	836.6	-28.68	Plot C2toC2.1		PASS
	251	848.8	-29.44	Plot C3toC3.1		PASS
EDGE 1900MHz	512	1850.2	-32.71	Plot D1toD1.1	-13	PASS
	661	1880.0	-32.57	Plot D2toD2.1		PASS
	810	1909.8	-32.13	Plot D3toD3.1		PASS
WCDMA 1700MHz	1312	1711.25	-36.68	Plot E1toE1.1	-13	PASS
	1450	1732.5	-36.95	Plot E2toE2.1		PASS
	1513	1753.75	-36.64	Plot E3toE3.1		PASS

2. Test Plots for the Whole Measurement Frequency Range:

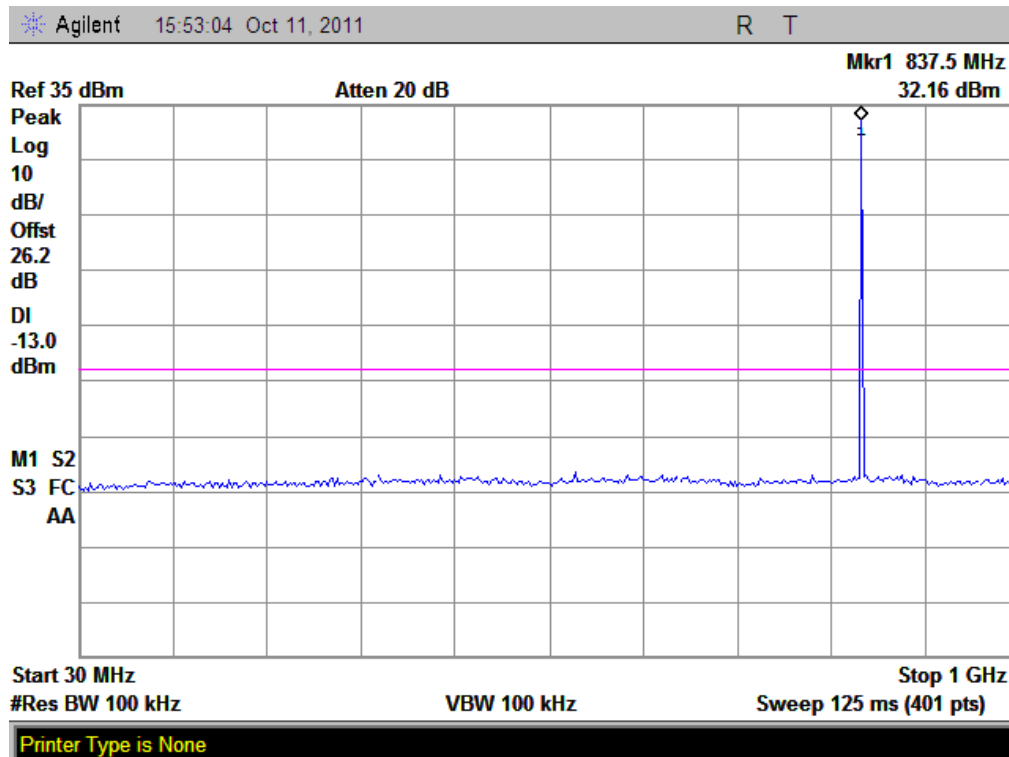
Note: the power of the EUT transmitting frequency should be ignored.



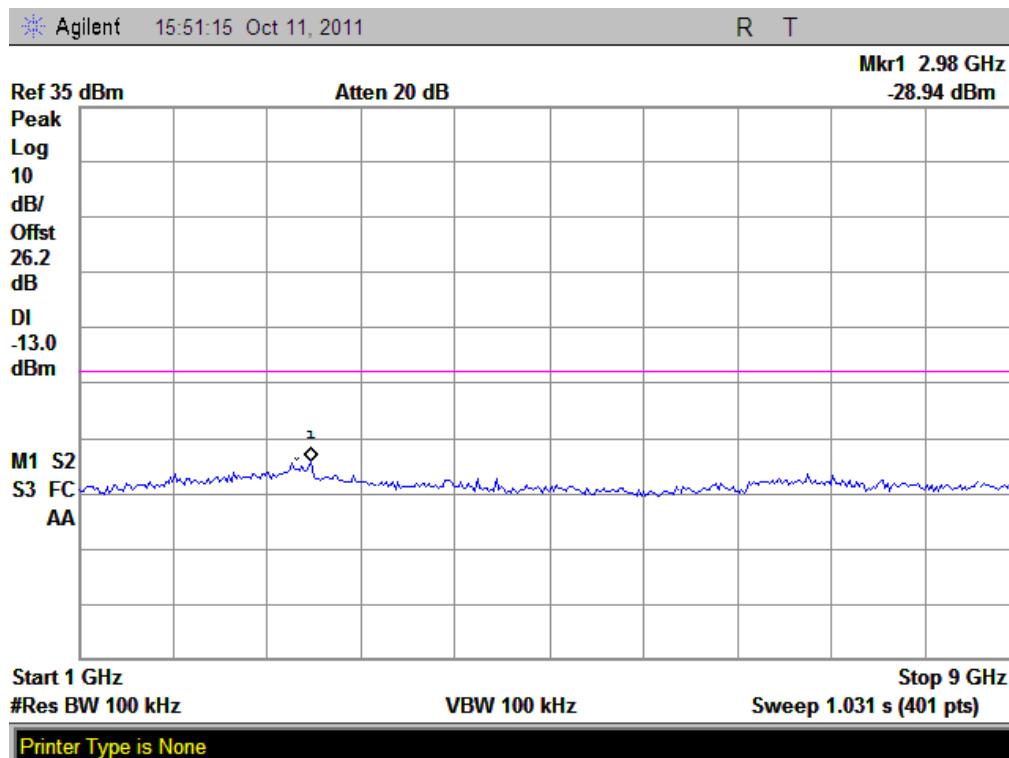
(Plot A1: GSM 850MHz Channel = 128, 30MHz to 1GHz)



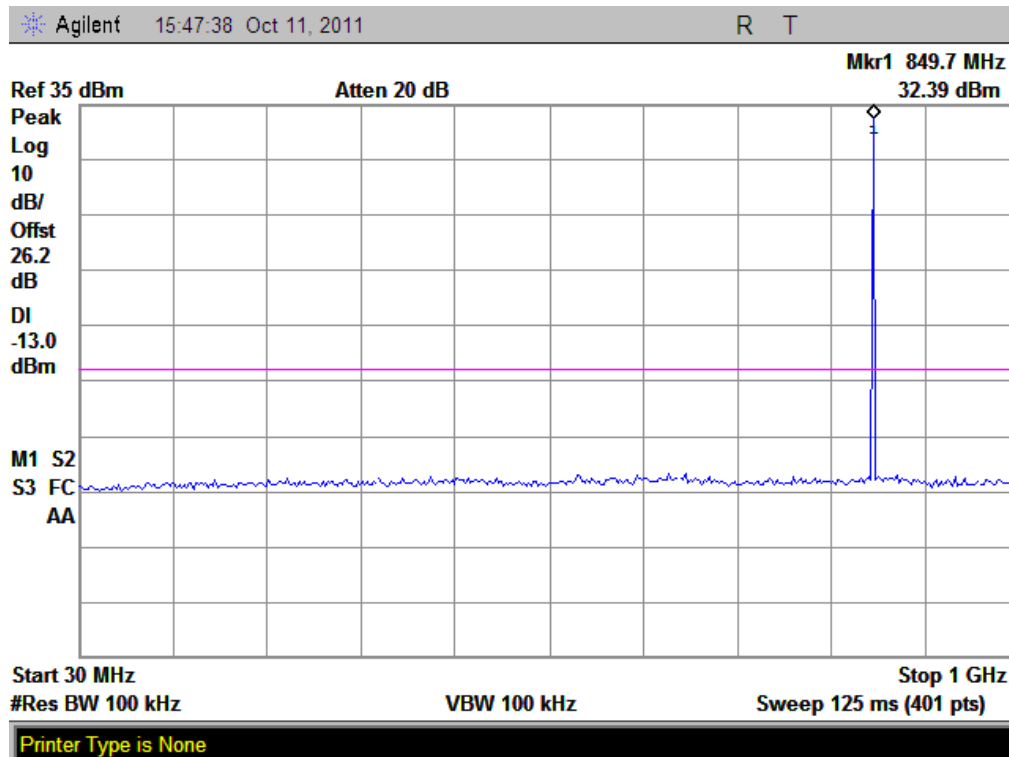
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



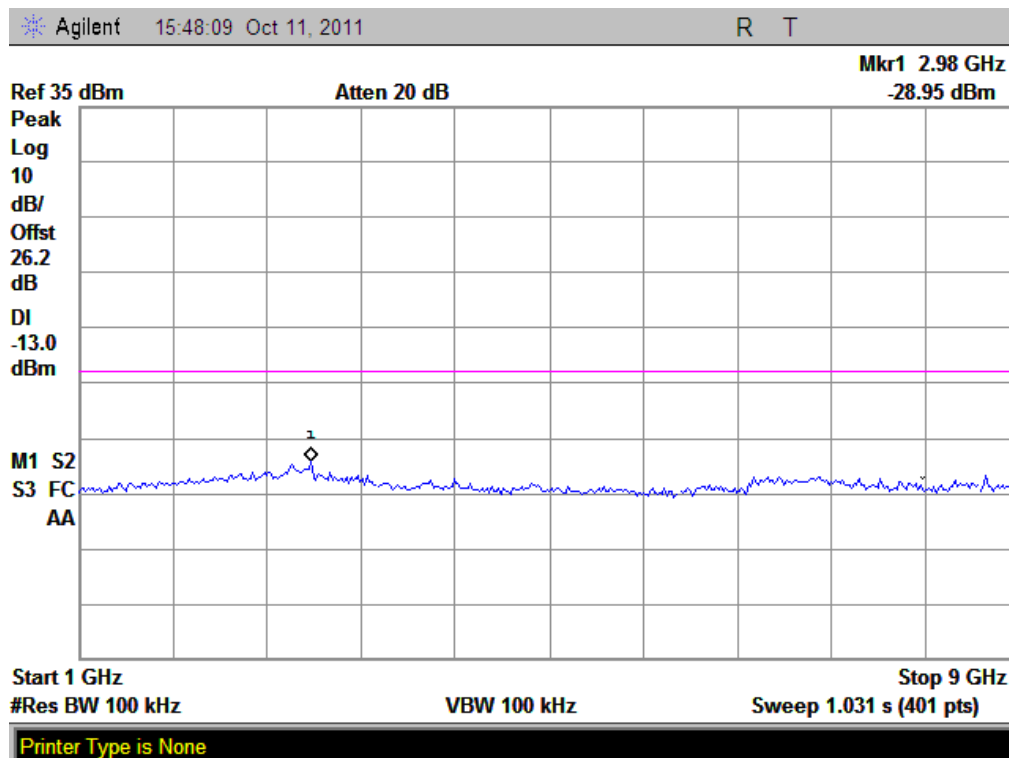
(Plot A2: GSM 850MHz Channel = 190, 30MHz to 1GHz)



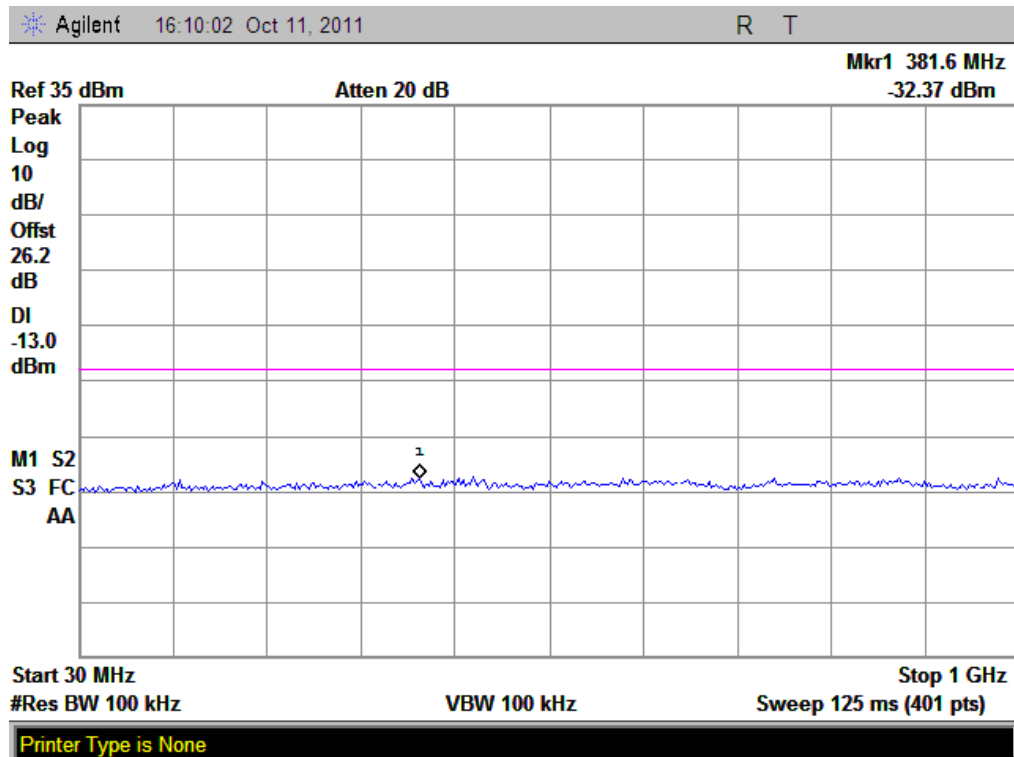
(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



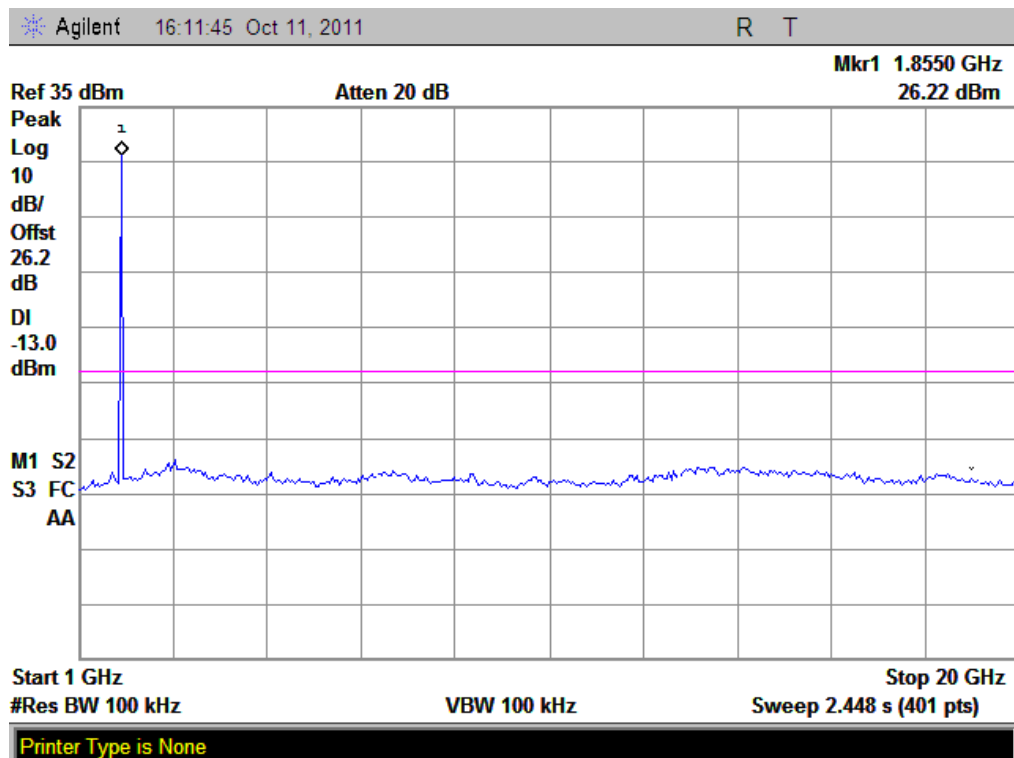
(Plot A3: GSM 850MHz Channel = 251, 30MHz to 1GHz)



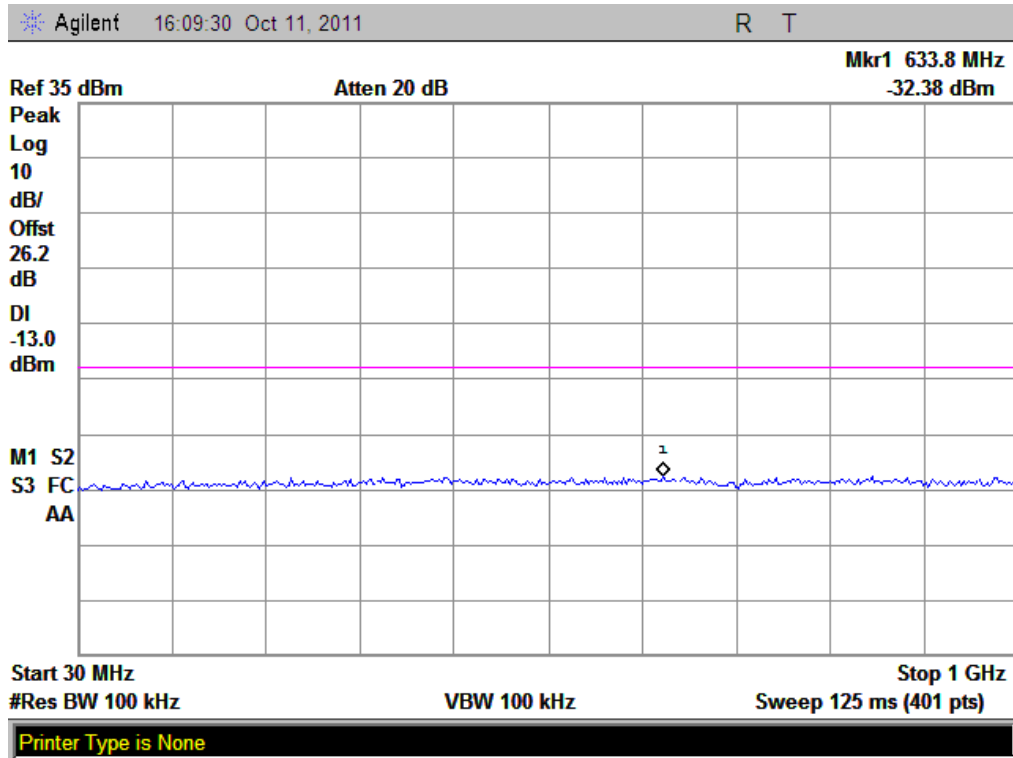
(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



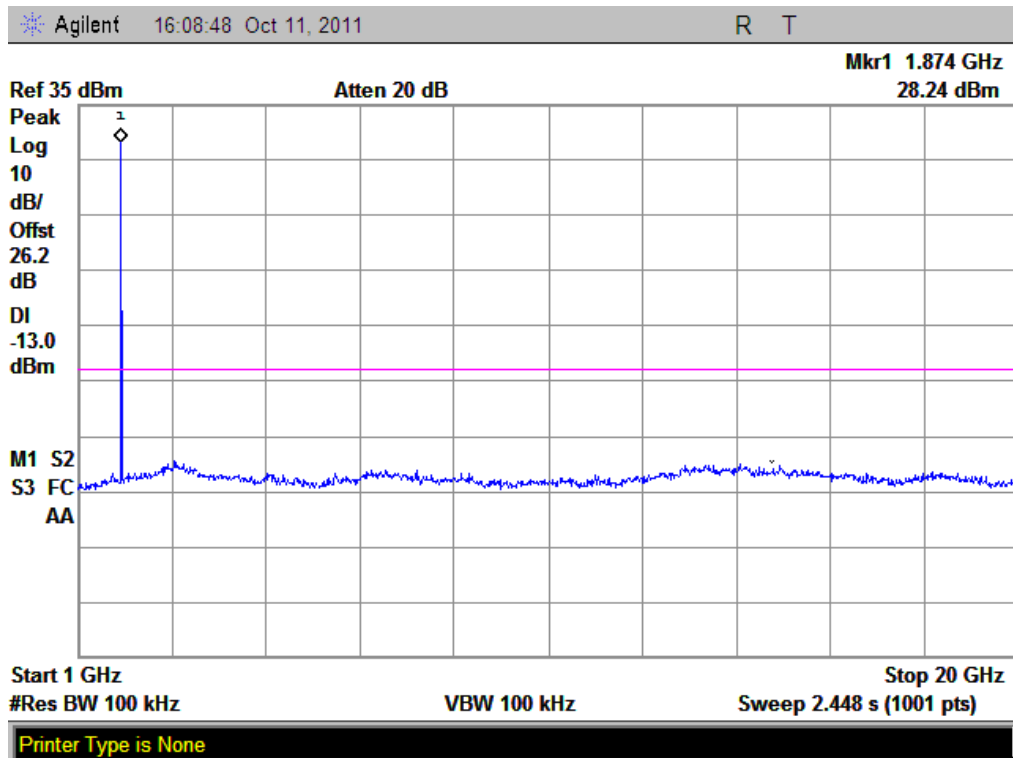
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



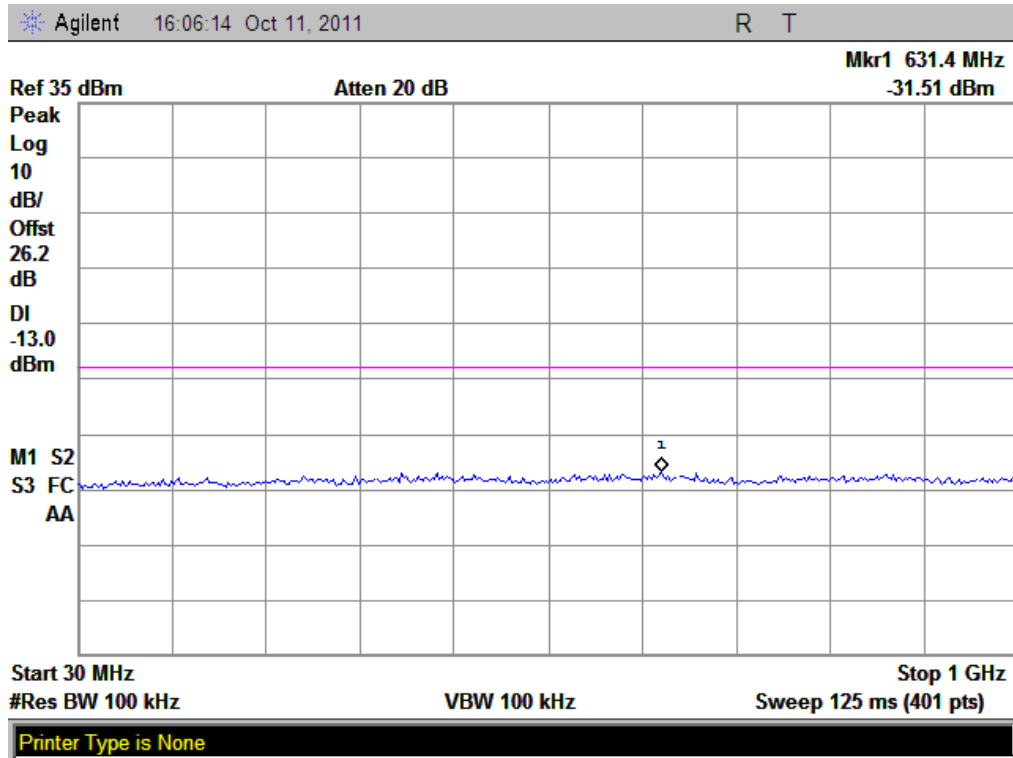
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



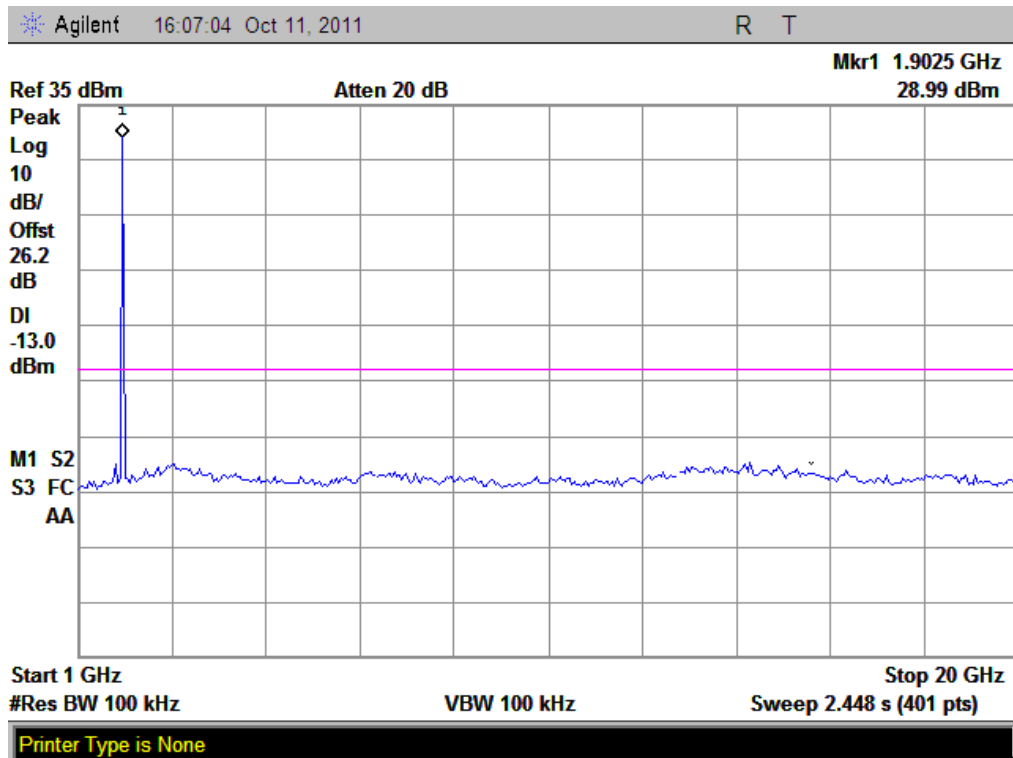
(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



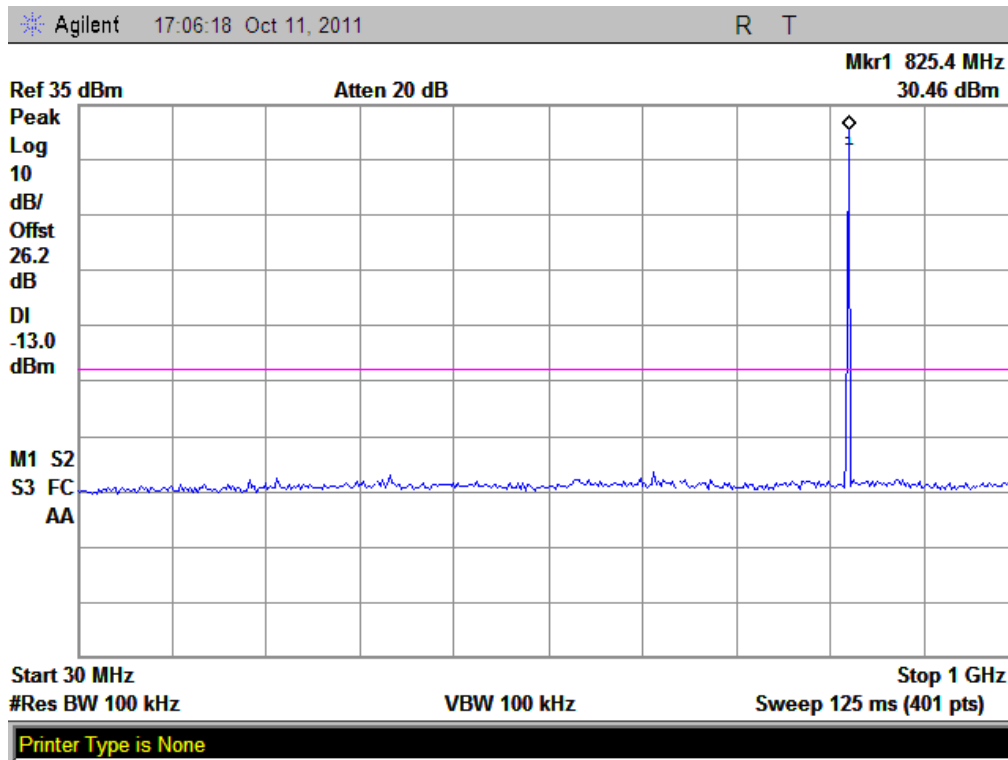
(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



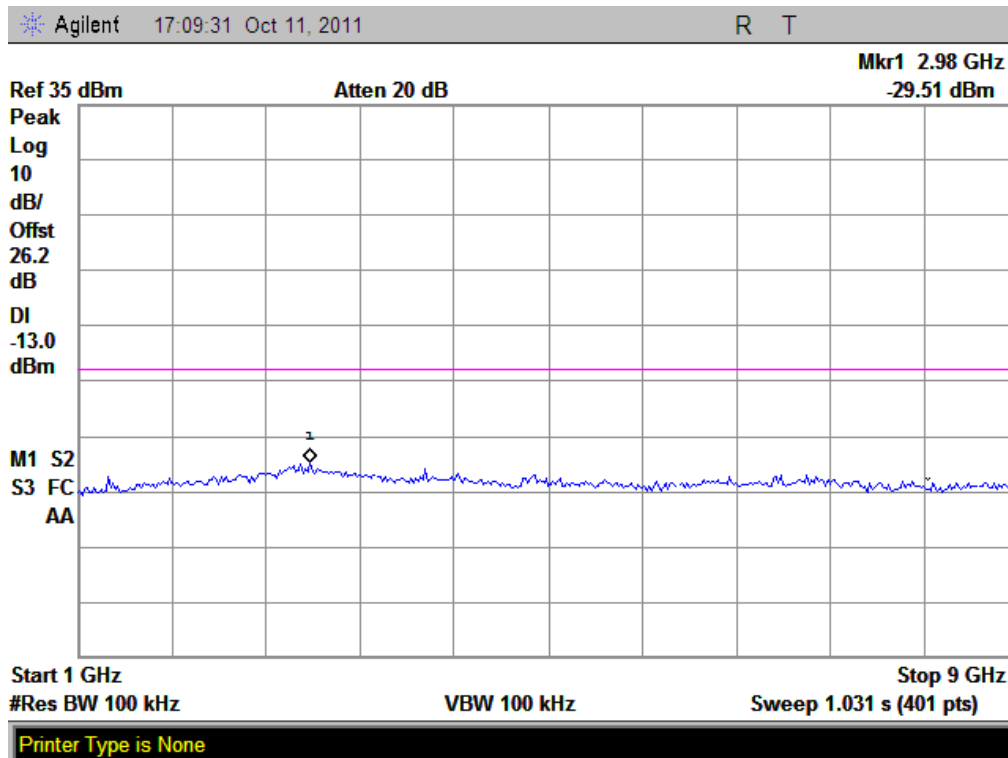
(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



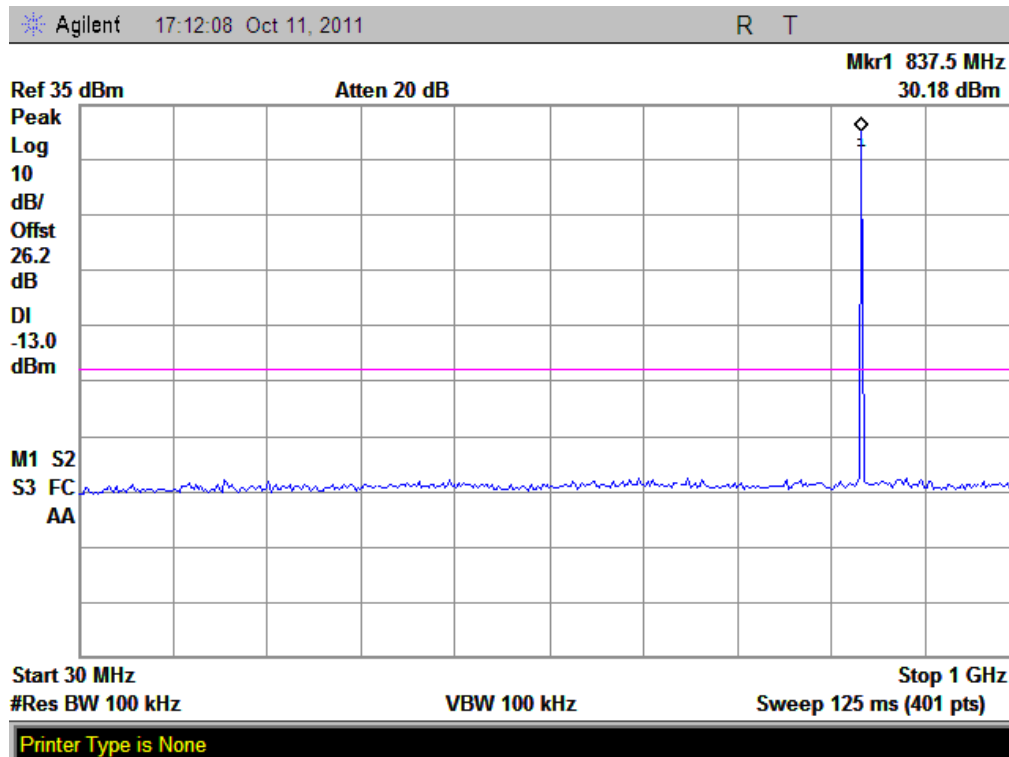
(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



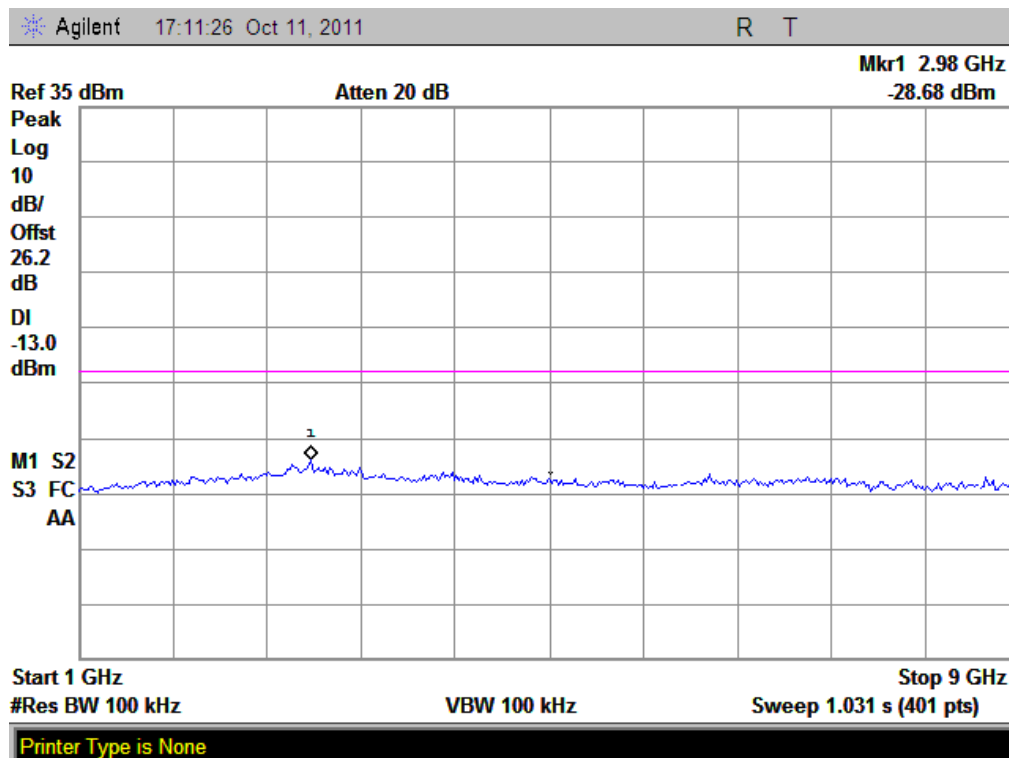
(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



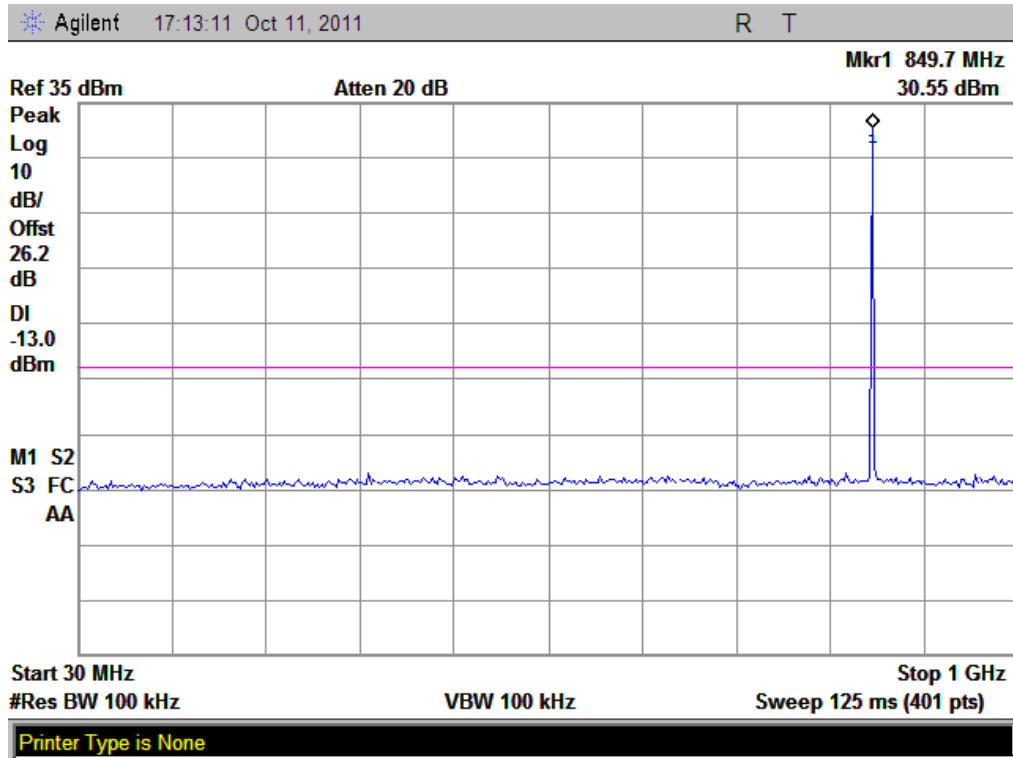
(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



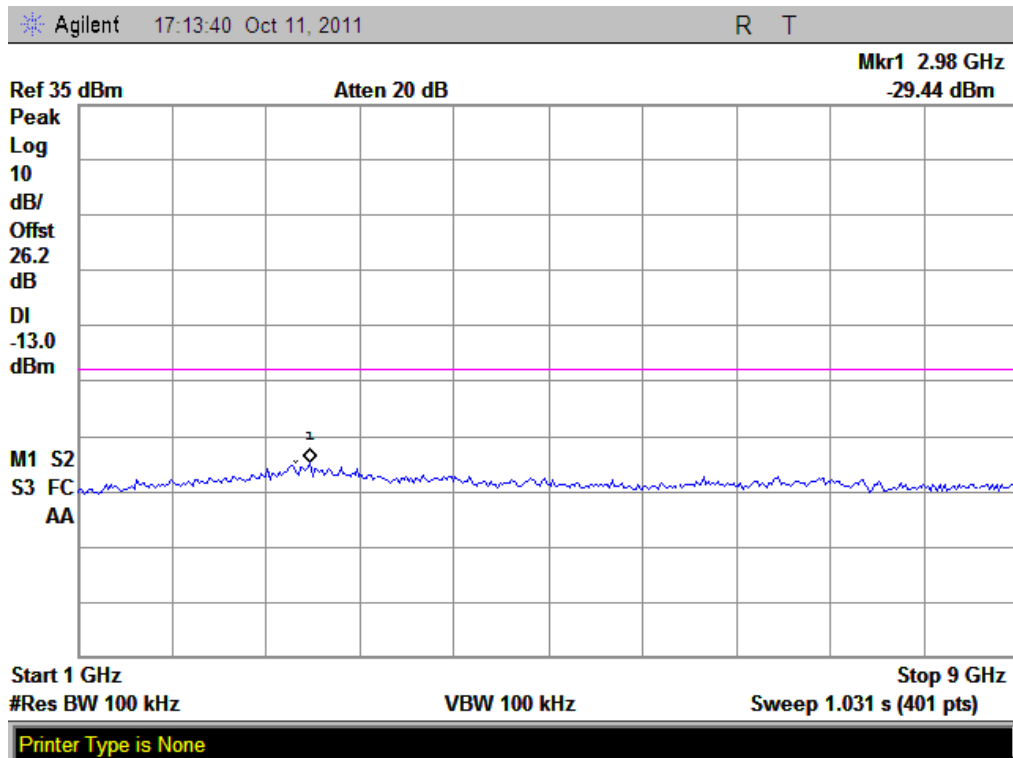
(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



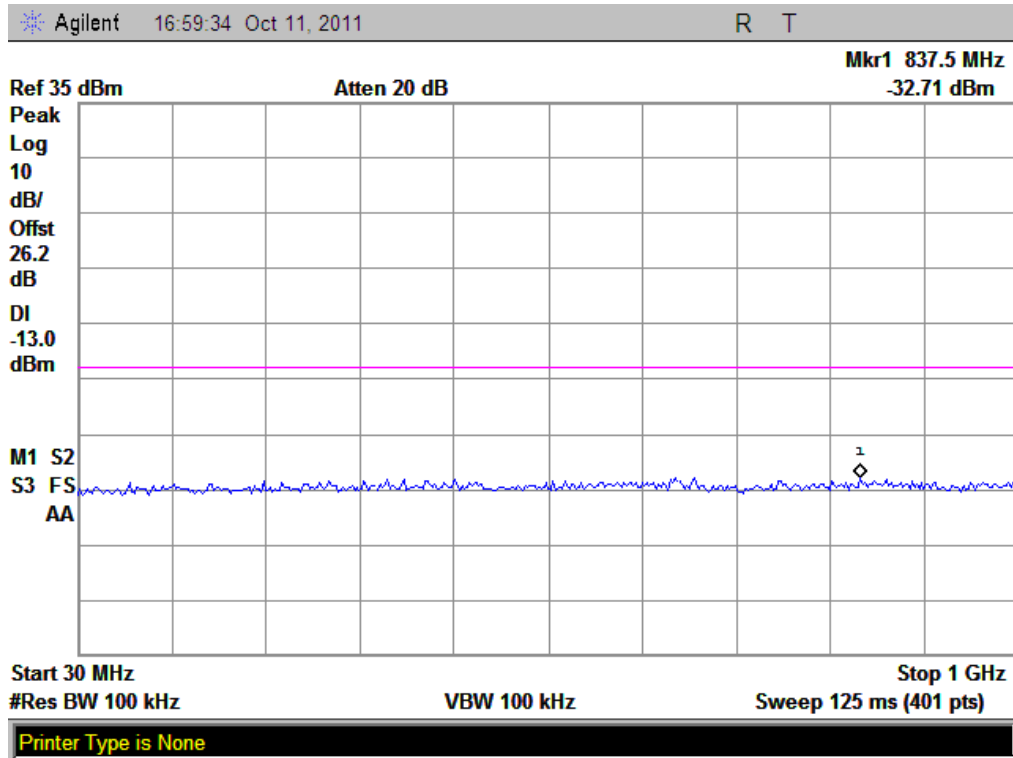
(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



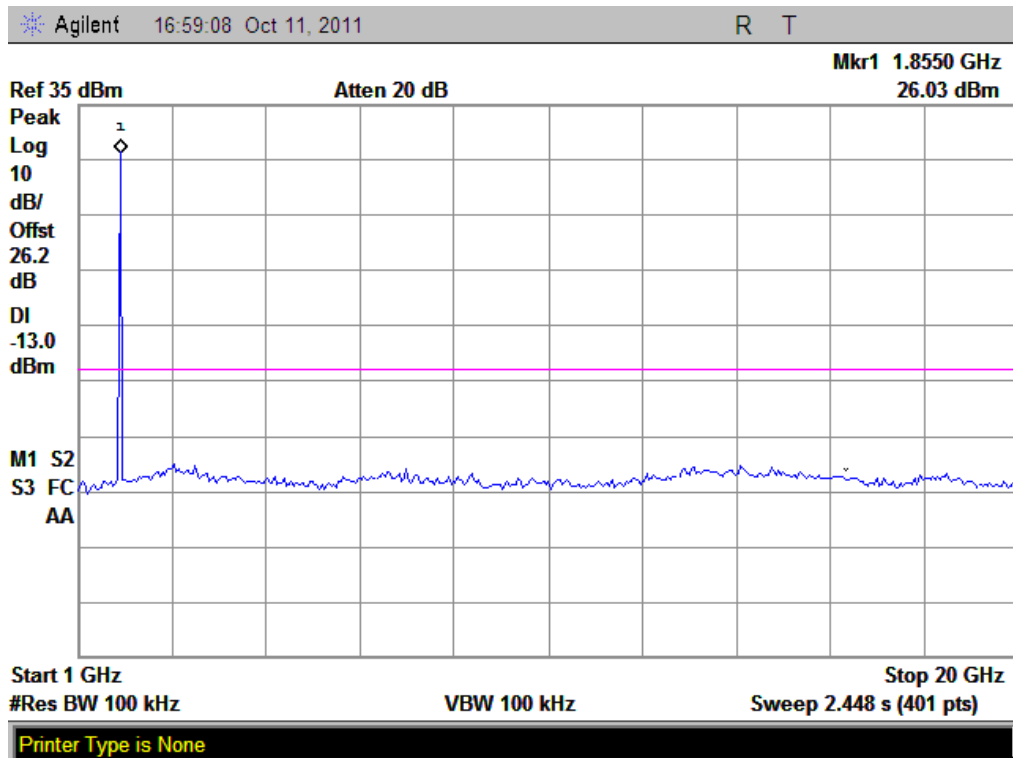
(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



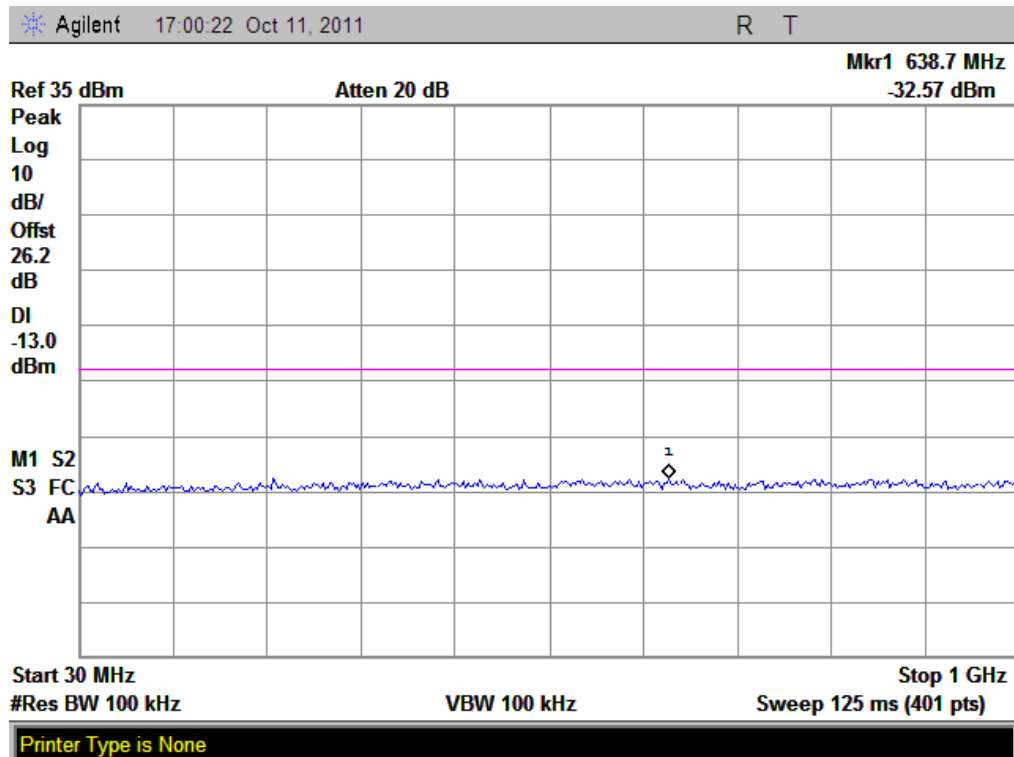
(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



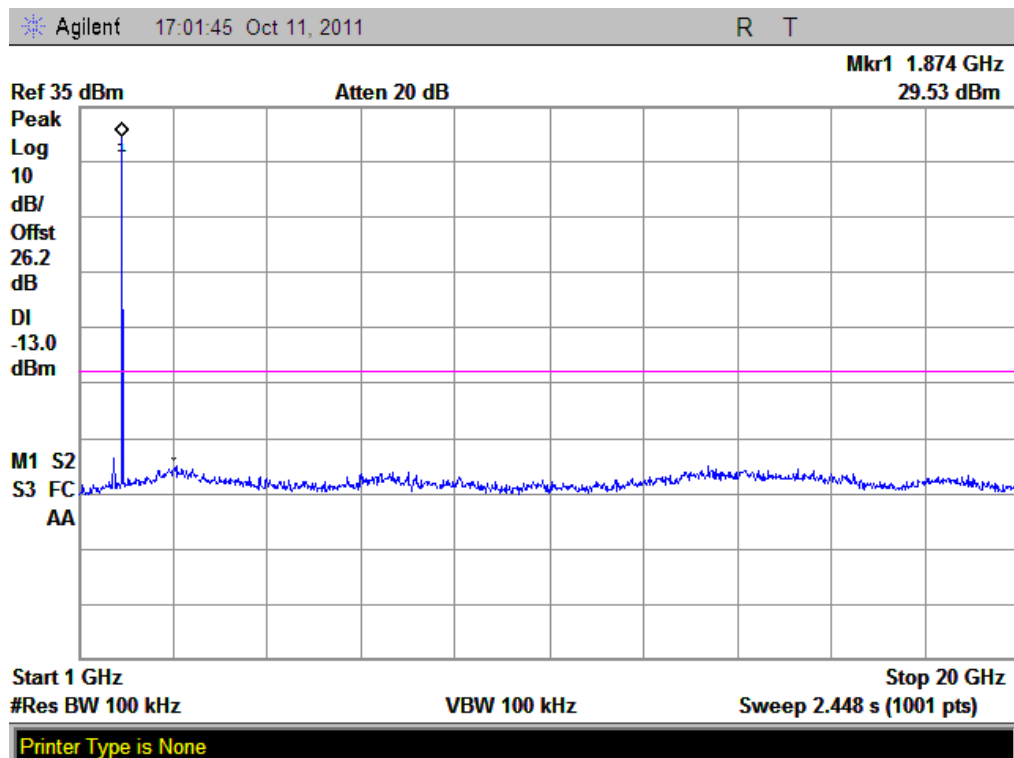
(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



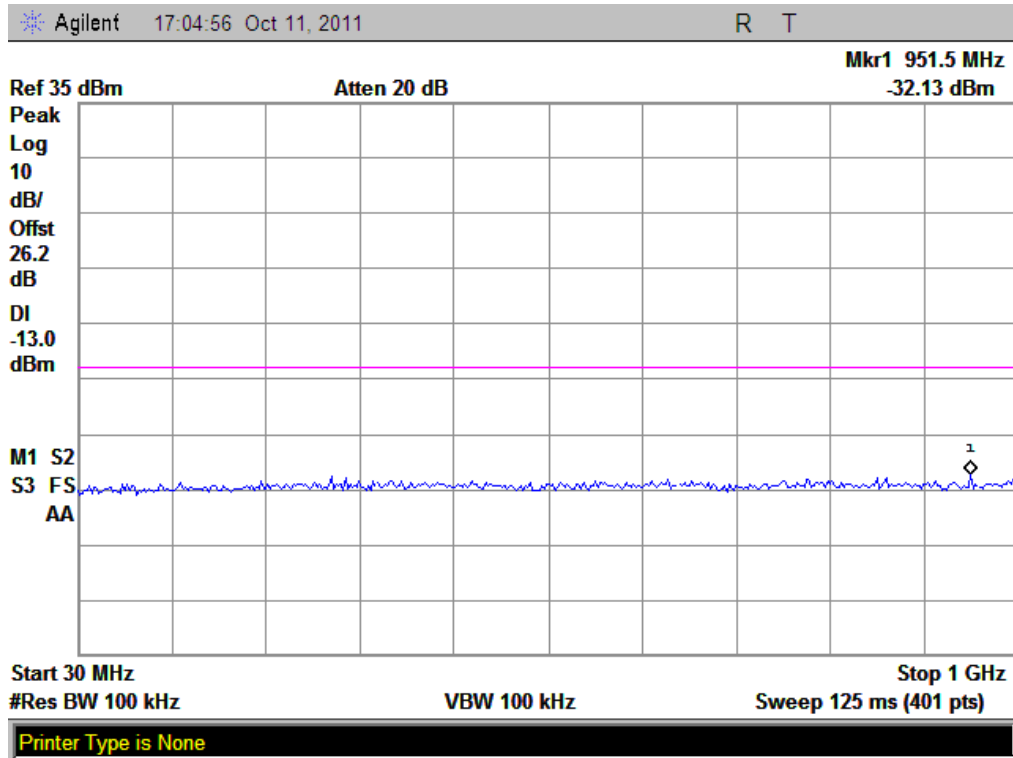
(Plot D1.1: EDGE 850MHz Channel = 512, 1GHz to 20GHz)



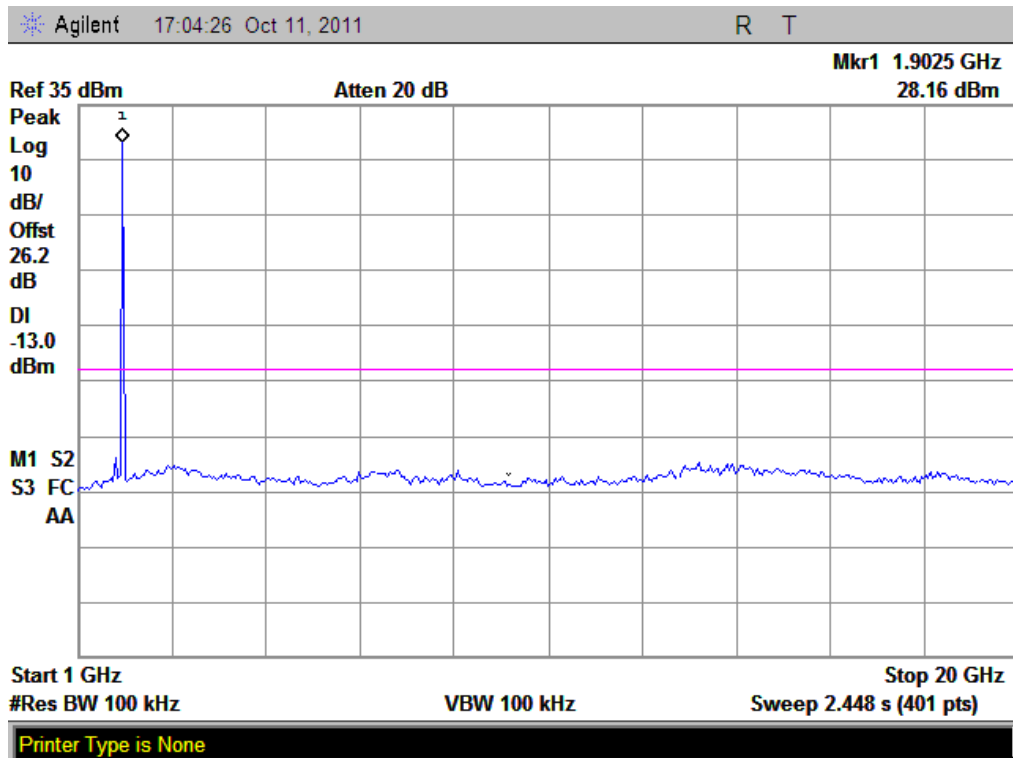
(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



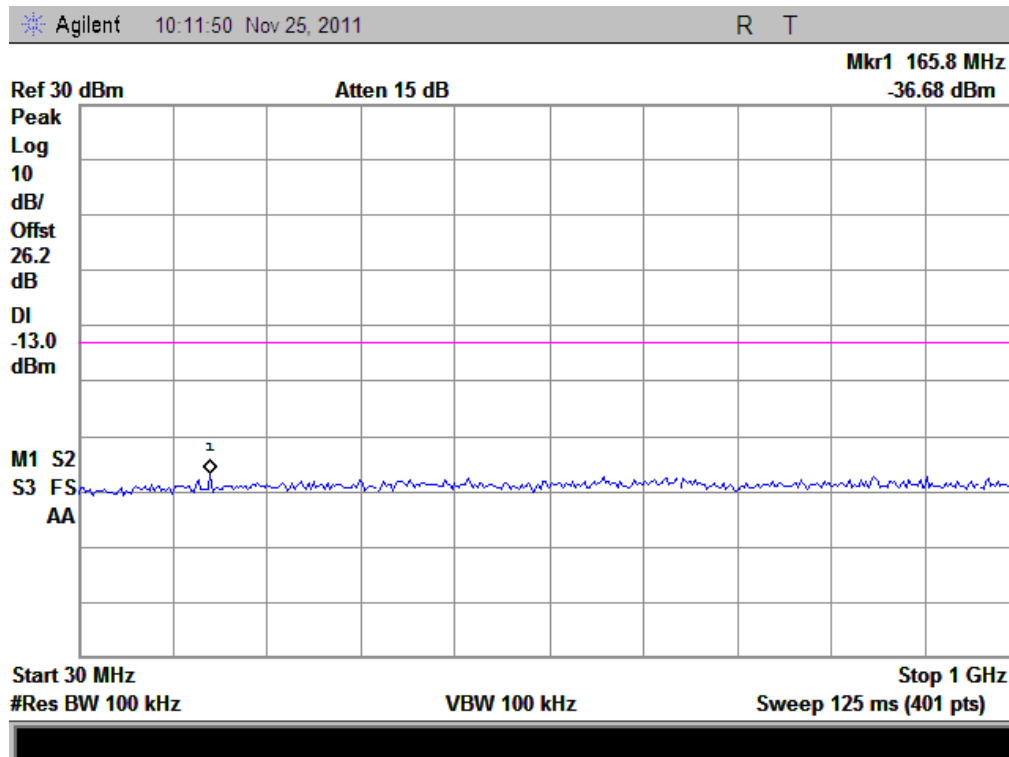
(Plot D2.1: EDGE 1900MHz Channel = 661, 1GHz to 20GHz)



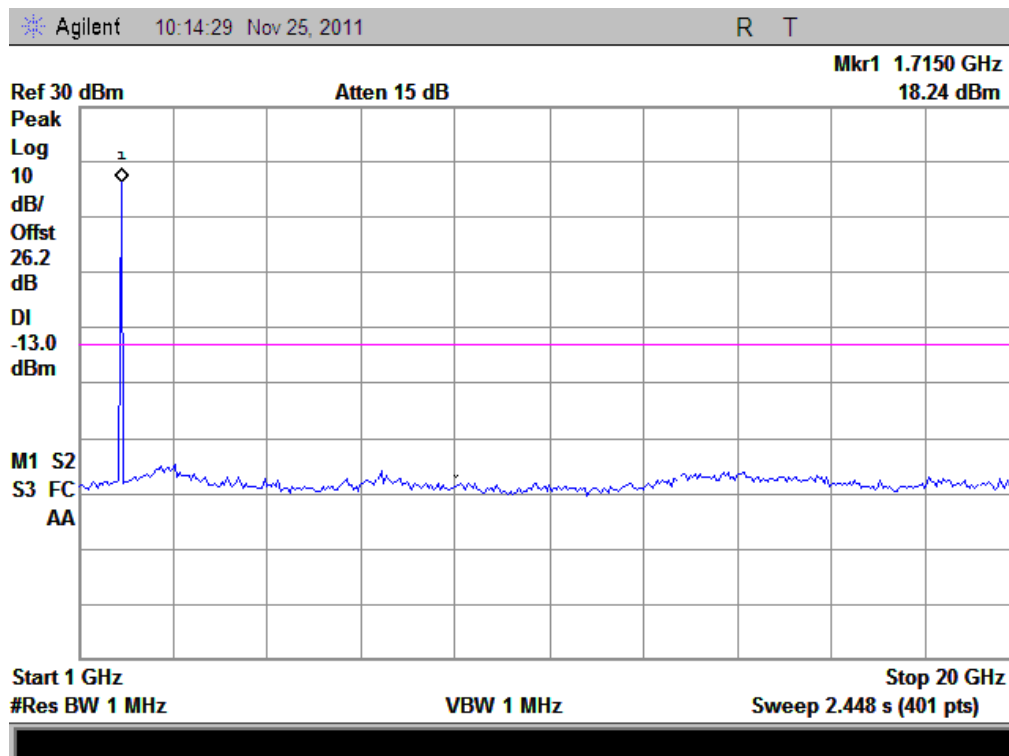
(Plot D3: EDGE 1900MHz Channel = 810, 30MHz to 1GHz)



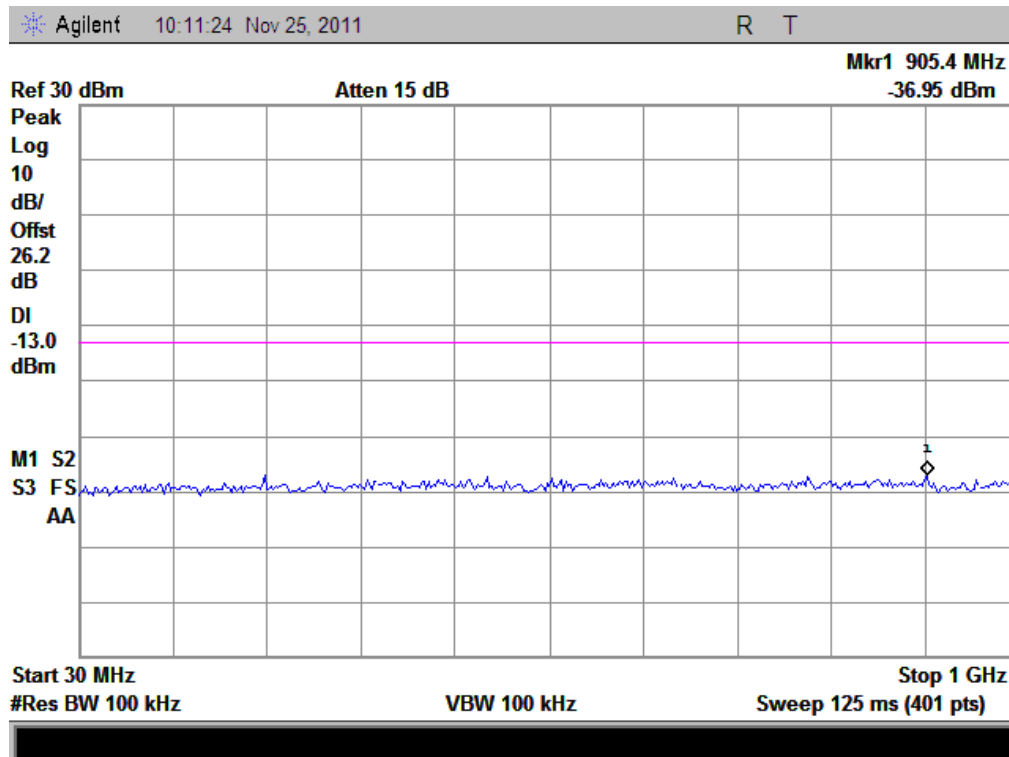
(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)



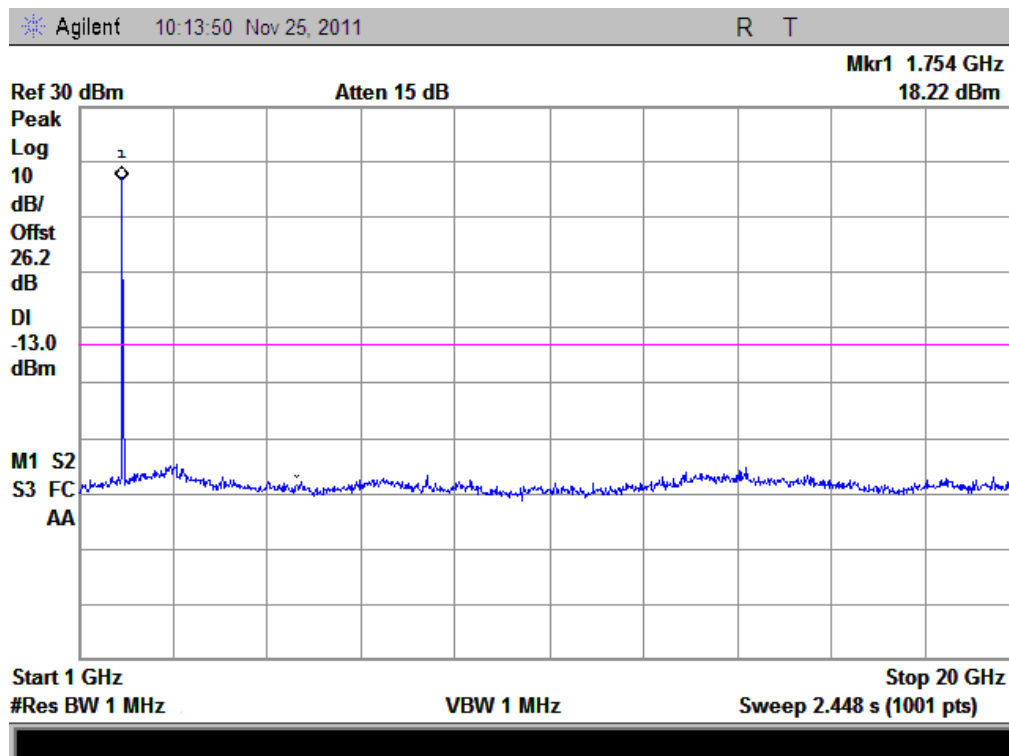
(Plot E1: WCDMA1700MHz Channel = 1312, 30MHz to 1GHz)



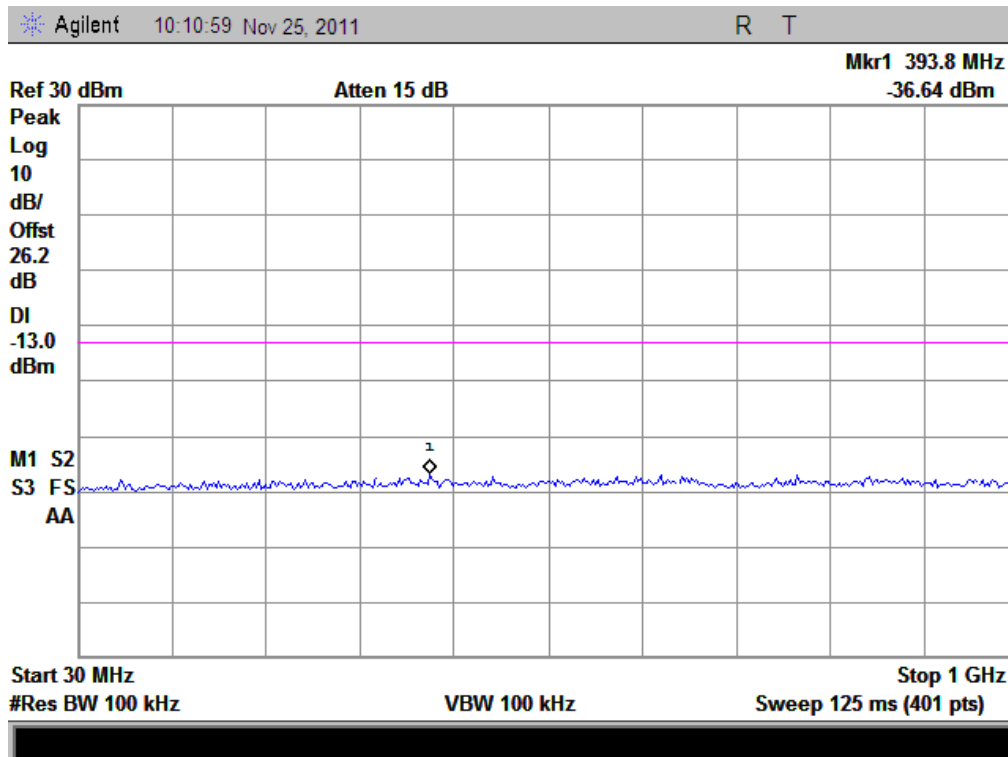
(Plot E1.1: WCDMA1700MHz Channel = 1312, 1GHz to 20GHz)



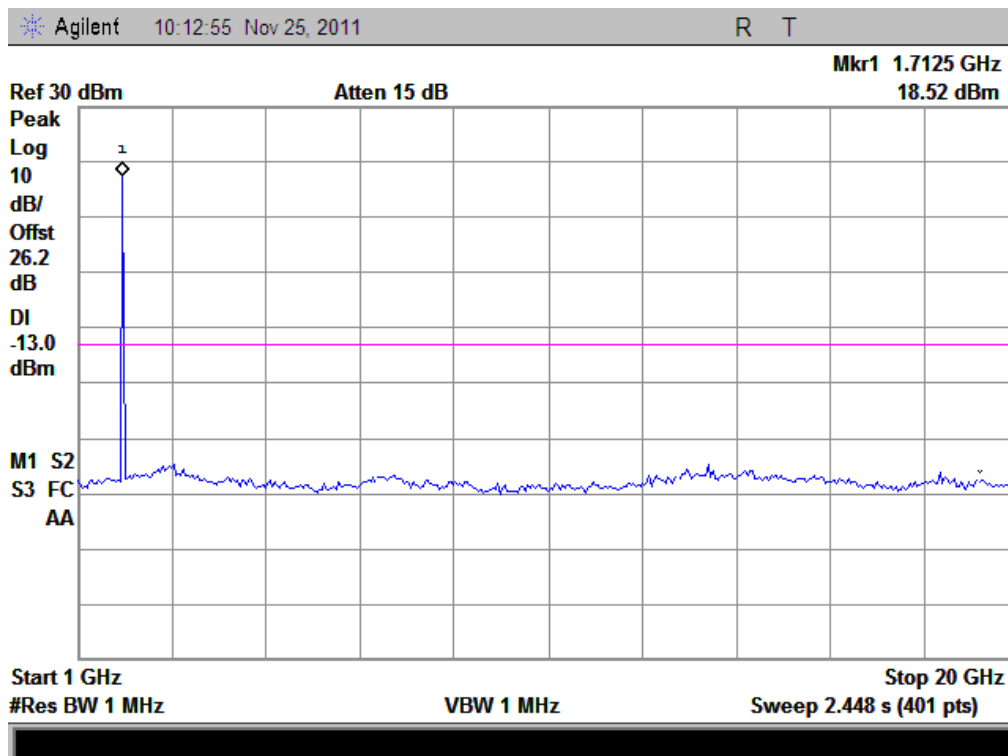
(Plot E2: WCDMA1700MHz Channel = 1450, 30MHz to 1GHz)



(Plot E2.1: WCDMA1700MHz Channel = 1450, 1GHz to 20GHz)



(Plot E3: WCDMA1700MHz Channel = 1513, 30MHz to 1GHz)



(Plot E3.1: WCDMA1700MHz Channel = 1513 1GHz to 20GHz)

2.4 Band Edge

2.4.1 Requirement

According to FCC section 2.1051, 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.

2.4.2 Test Description

See section 2.1.2 of this report.

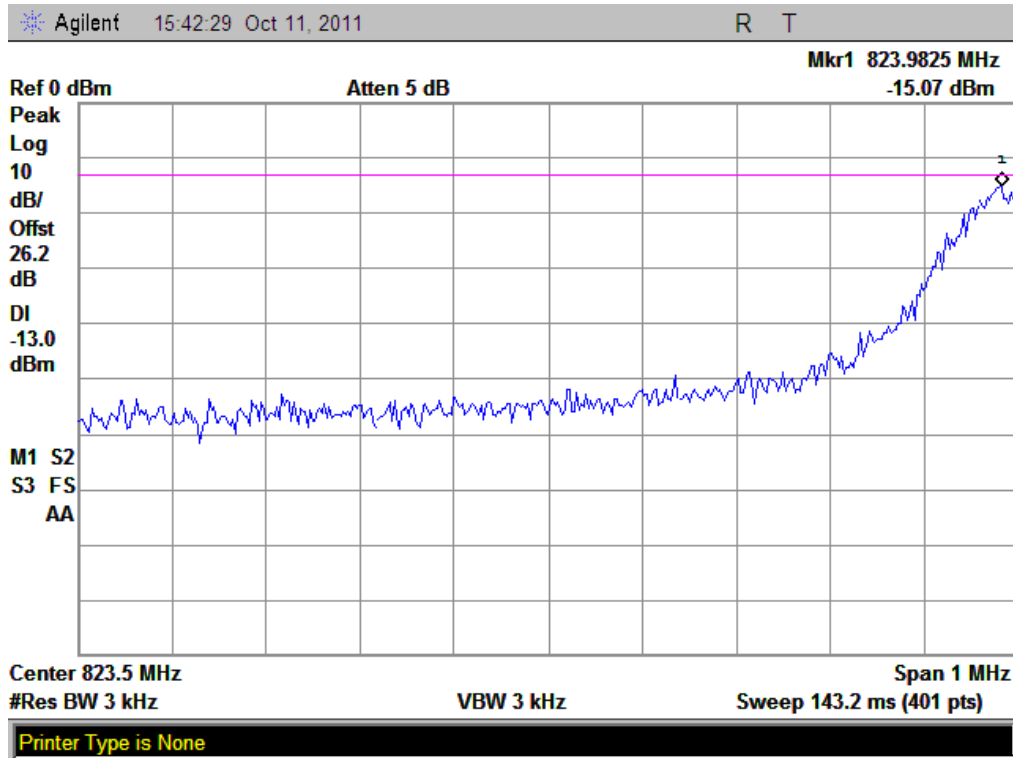
2.4.3 Test Result

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

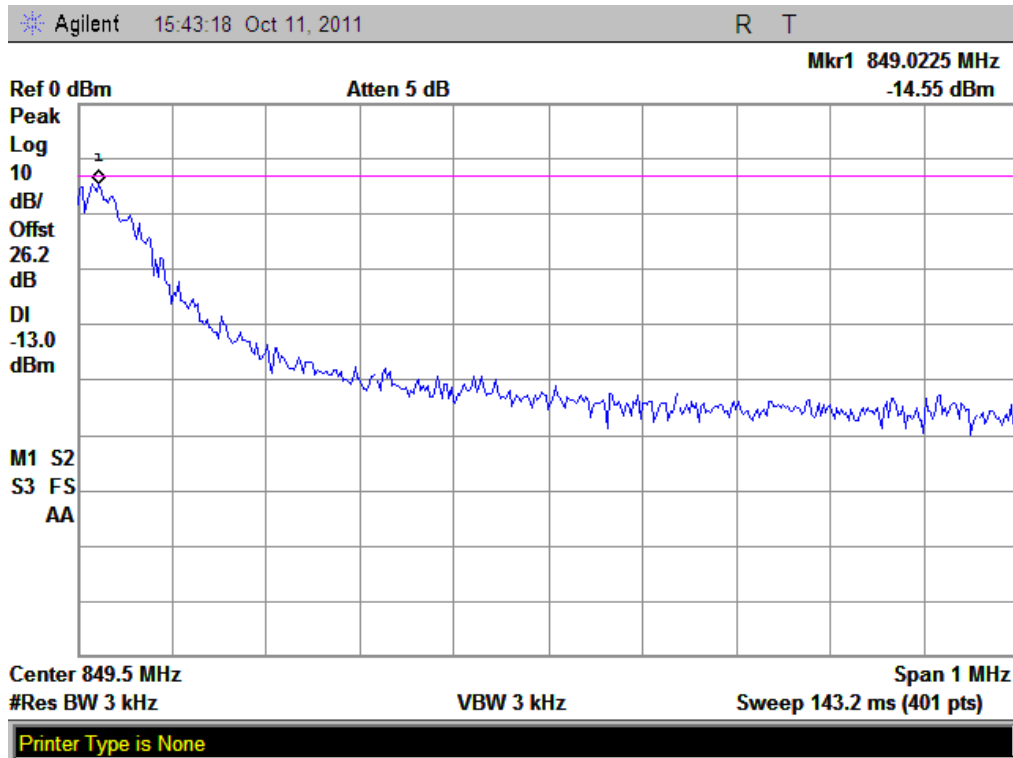
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-15.07	Plat A	-13	PASS
	251	848.8	-14.55	Plot B		PASS
GSM 1900MHz	512	1850.2	-19.50	Plat C	-13	PASS
	810	1909.8	-16.91	Plot D		PASS
EDGE 850MHz	128	824.2	-15.54	Plat E	-13	PASS
	251	848.8	-16.62	Plot F		PASS
EDGE 1900MHz	512	1850.2	-19.39	Plat G	-13	PASS
	810	1909.8	-19.93	Plot H		PASS
WCDMA 850MHz	1537	1711.25	-13.34	Plat I	-13	PASS
	1738	1753.75	-15.30	Plot J		PASS

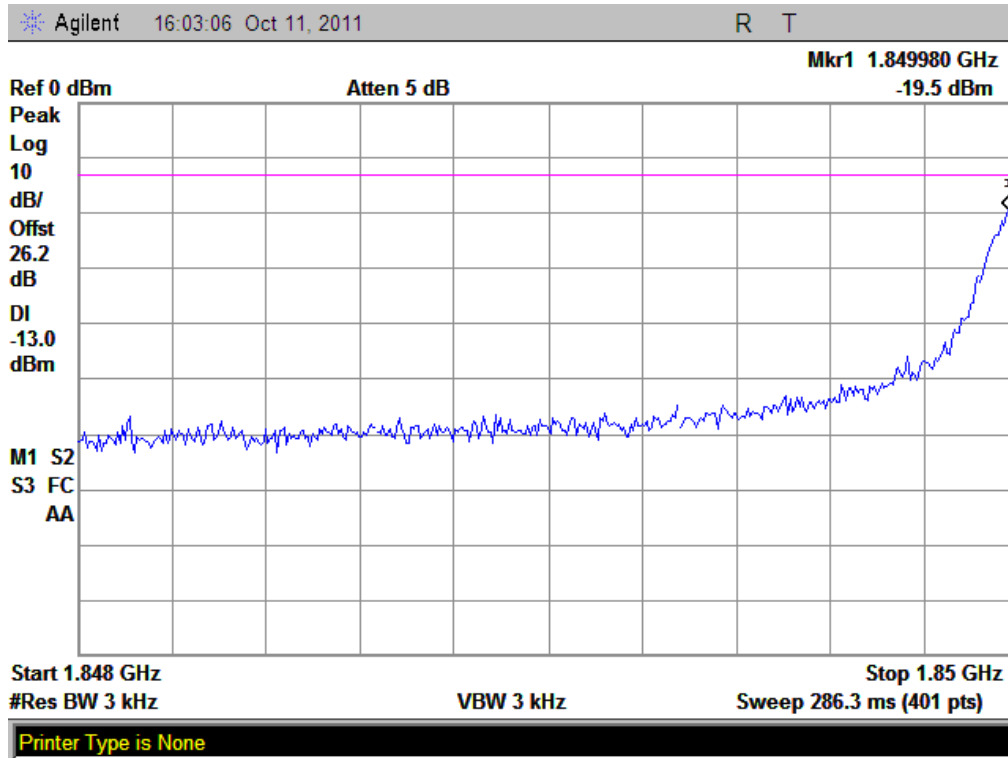
2. Test Plots:



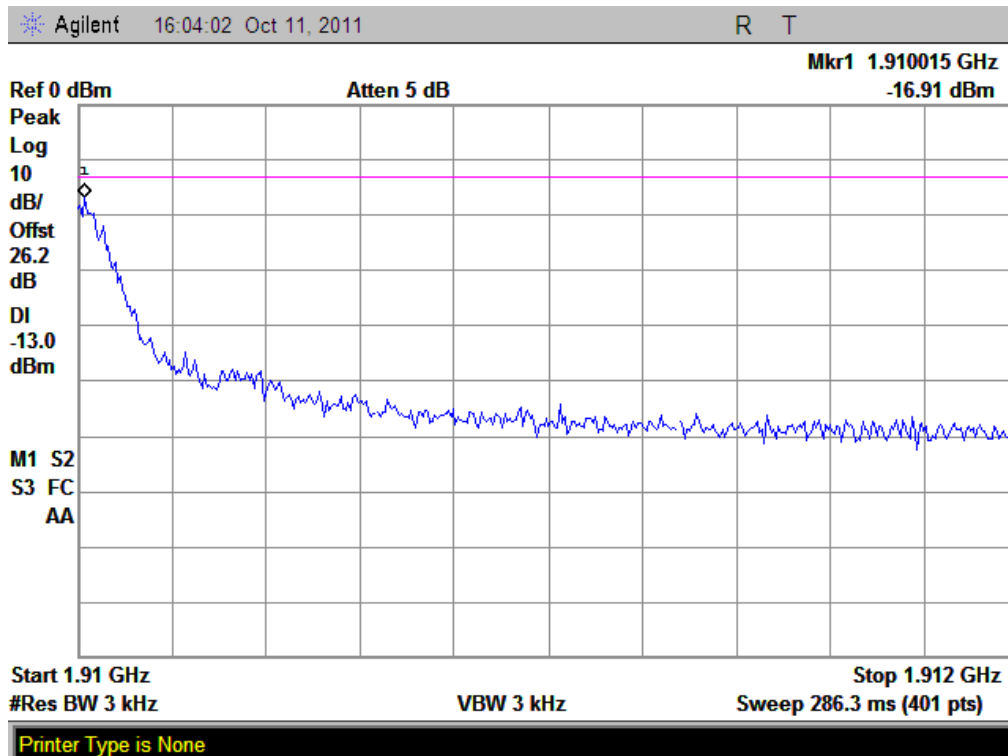
(Plot A: GSM 850 Channel = 128)



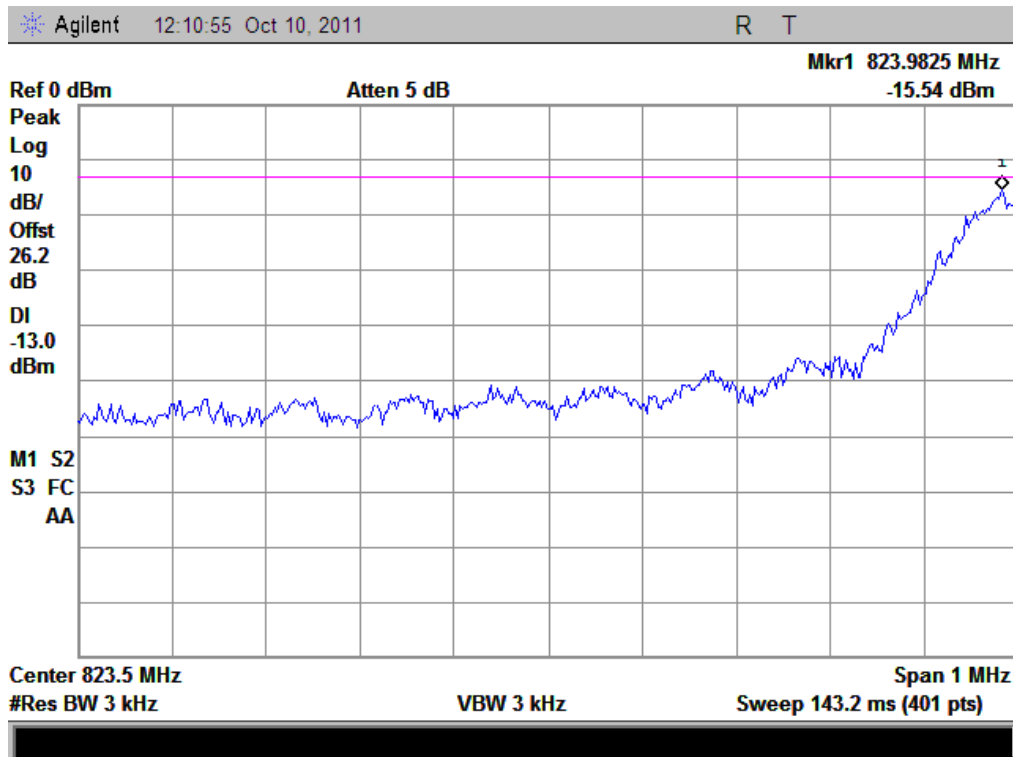
(Plot B: GSM 850 Channel = 251)



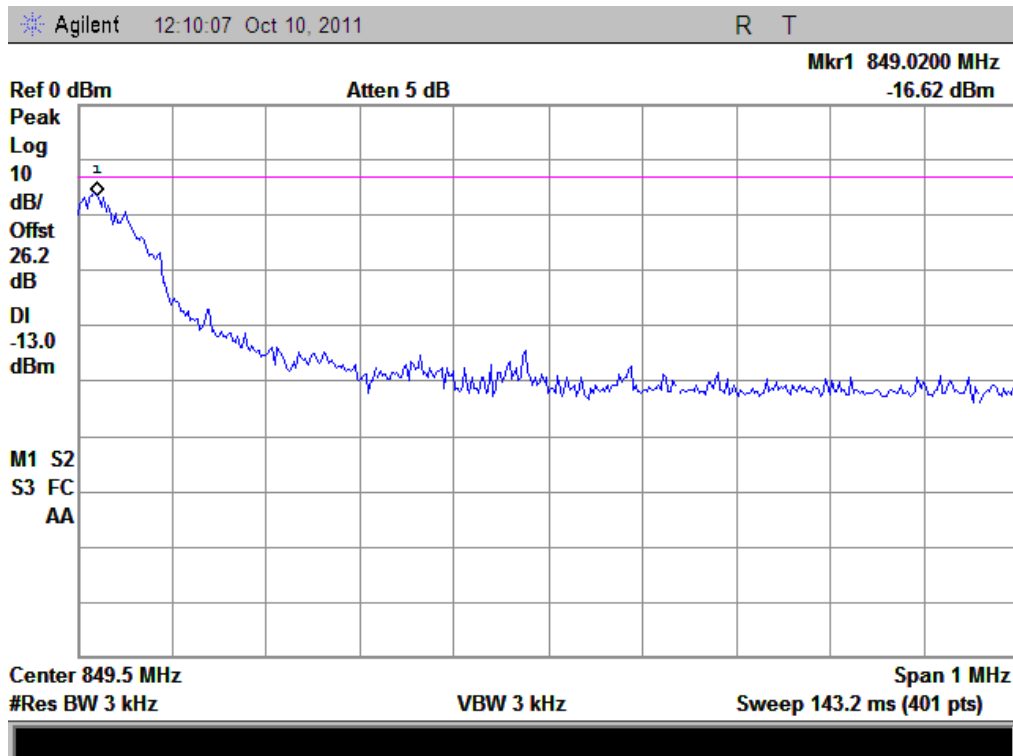
(Plot C: GSM 1900 Channel = 512)



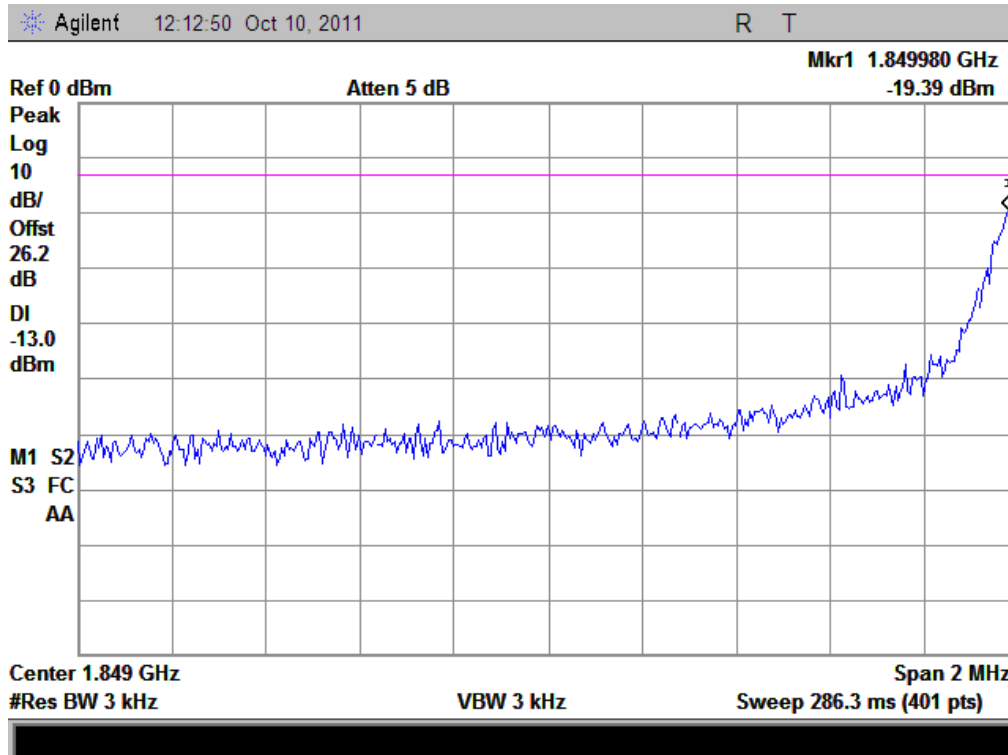
(Plot D: GSM 1900 Channel = 810)



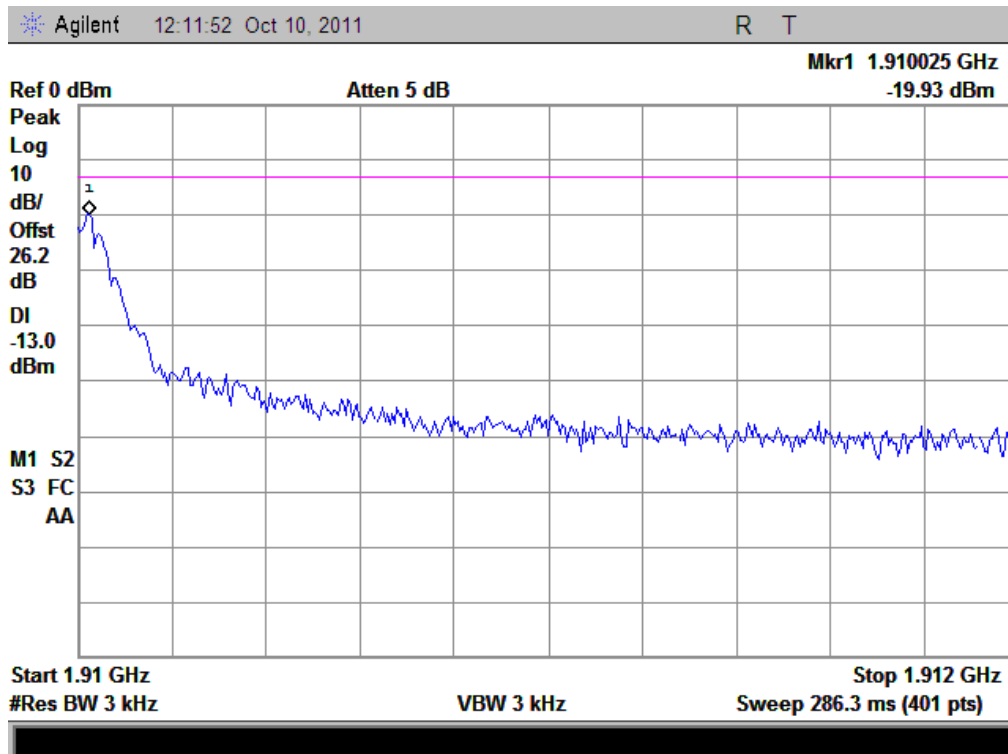
(Plot E: EDGE 850 Channel = 128)



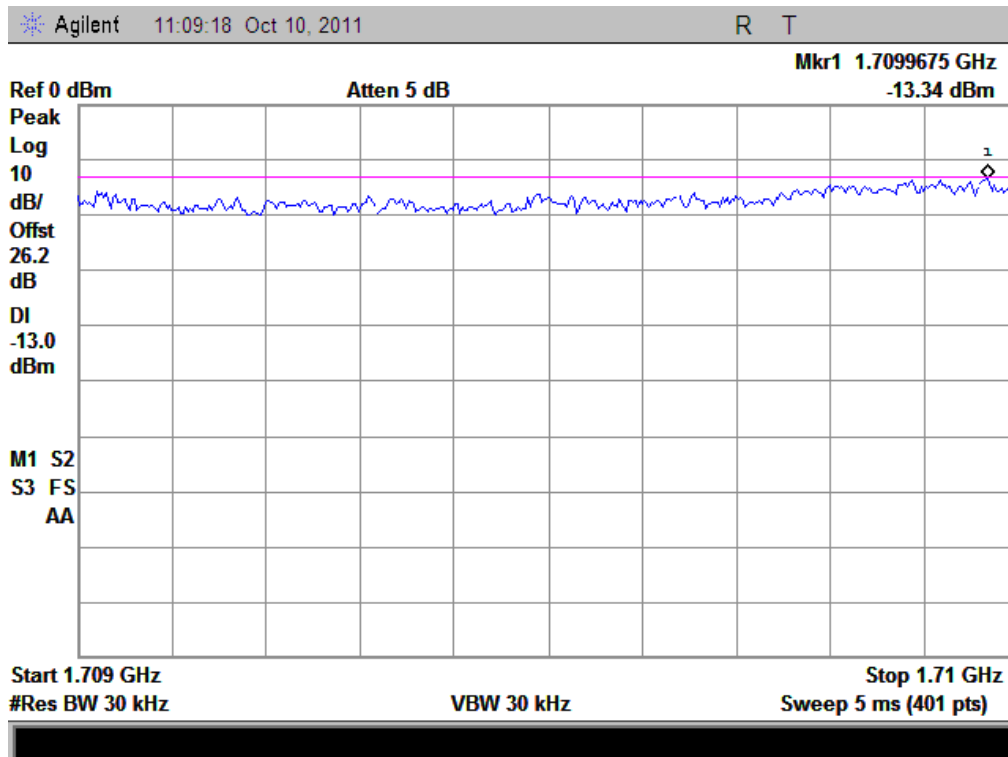
(Plot F: EDGE 850 Channel = 251)



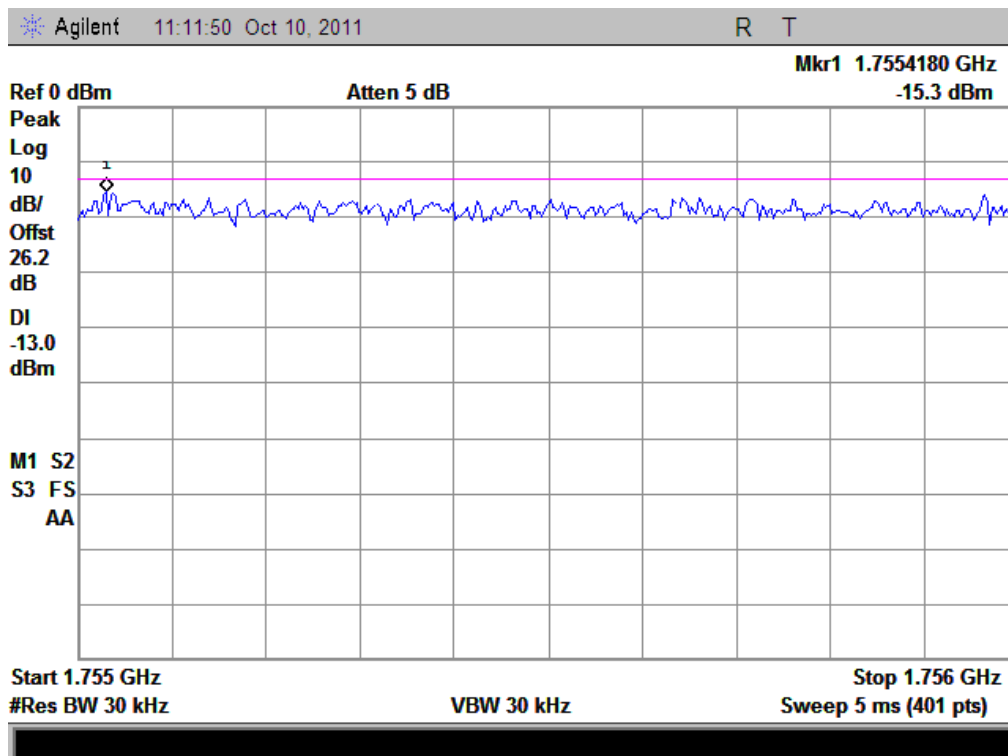
(Plot G: EDGE 1900 Channel = 512)



(Plot H: EDGE 1900 Channel = 810)



(Plot I: WCDMA 1700 Channel = 1450)



(Plot J: WCDMA 1700 Channel = 1513)

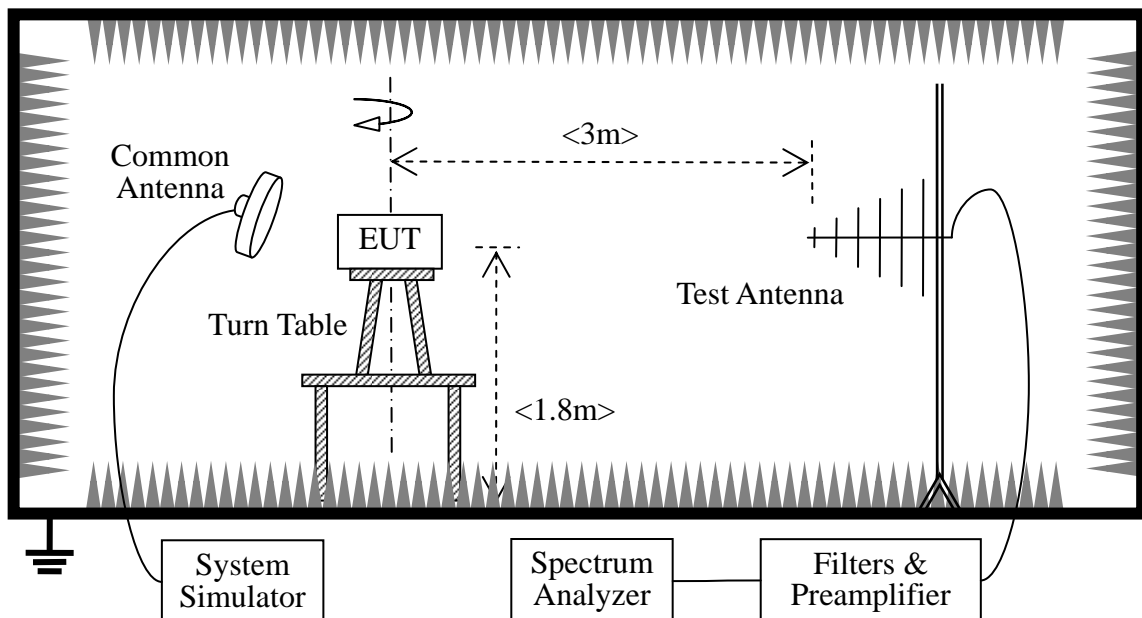
2.5 Transmitter Radiated Power (EIRP/ERP)

2.5.1 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 and broadband WCDMA mobile station is limited to 1Watts e.i.r.p. peak power in FCC section 27.50(d)(4)

2.5.2 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: GSM850 17.12dBm, GSM 1900 23.41dBm, AWS1700 23.19dBm
Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM850 3.0dBm, GSM 1900 0.1dBm, WCDMA 1700 -0.7dBm

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
System Simulator	Agilent	E5515C	GB43130131	2011.05
Spectrum Analyzer	Agilent	E7405A	US44210471	2011.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2011.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2011.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120C	9120C-384	2011.05

2.5.3 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:

$$A_{\text{SUBST}} = P_{\text{SUBST_TX}} - P_{\text{SUBST_RX}} - L_{\text{SUBST_CABLES}} + G_{\text{SUBST_TX_ANT}}$$

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

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

$P_{\text{SUBST_TX}}$ is signal generator level,

$P_{\text{SUBST_RX}}$ is receiver level,

$L_{\text{SUBST_CABLES}}$ is cable losses including TX cable,

$G_{\text{SUBST_TX_ANT}}$ is substitution antenna gain.

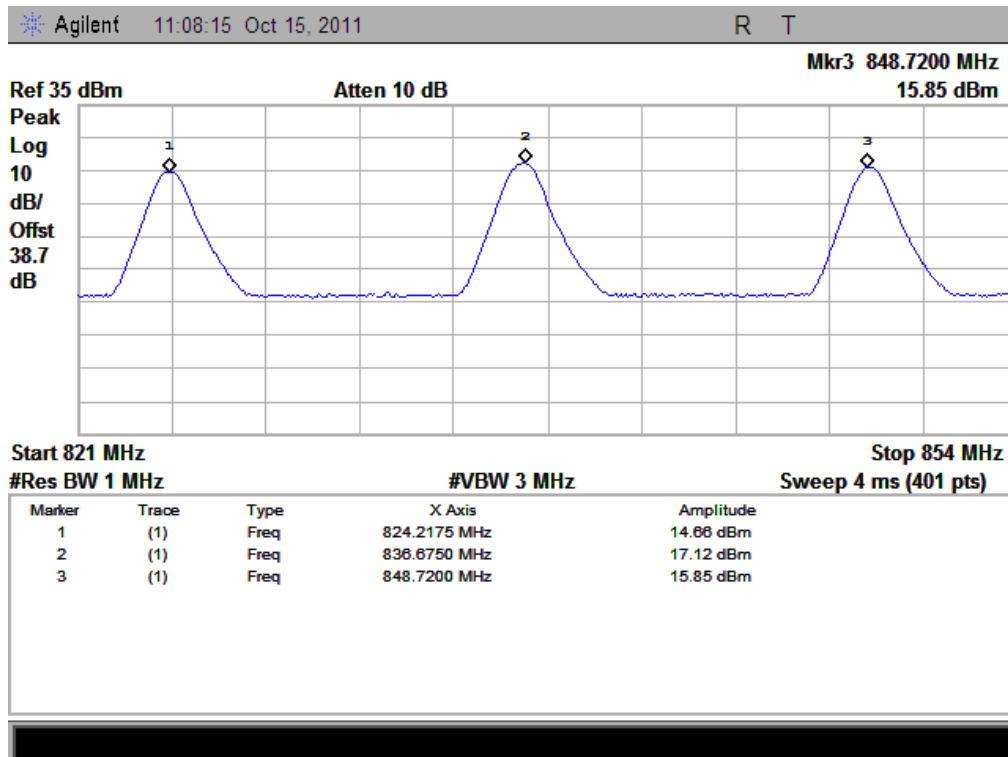
A_{TOT} is total correction factor including cable loss and substitution correction

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} .

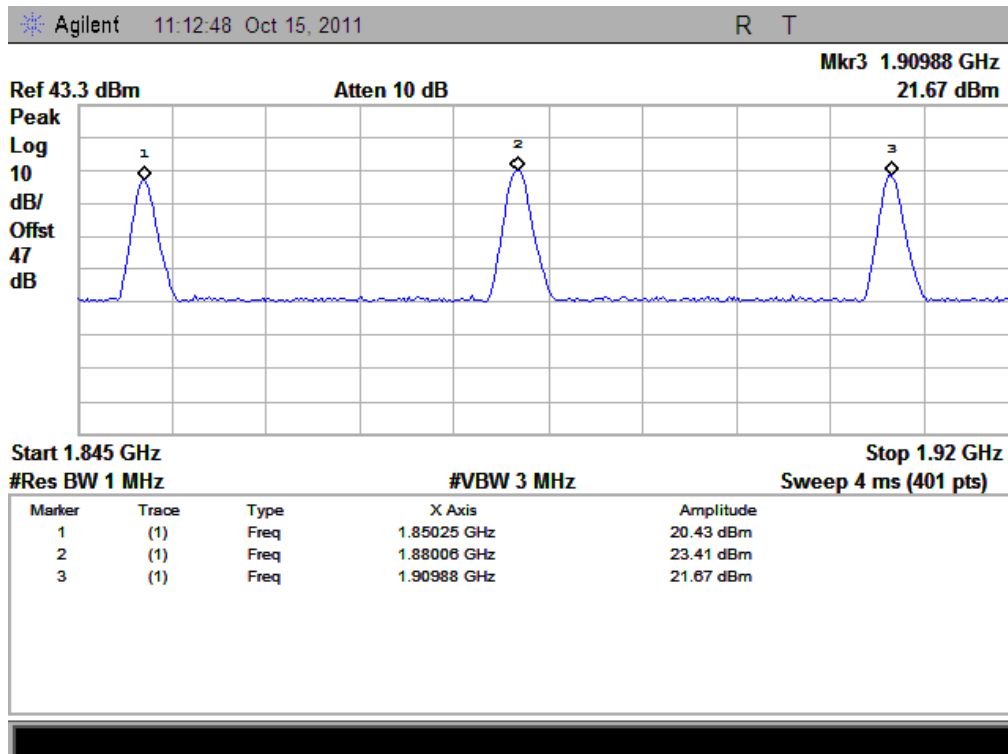
1. Test Verdict:

Band	Channel	Frequency (MHz)	PCL	Measured ERP/EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GSM 850MHz	128	824.20	5	14.66	0.0292	Plot A	38.45	7	PASS
	190	836.60	5	17.12	0.0515				PASS
	251	848.80	5	15.85	0.0385				PASS
GSM 1900MHz	512	1850.2	0	20.43	0.1104	Plot B	33	2	PASS
	661	1880.0	0	23.41	0.2193				PASS
	810	1909.8	0	21.67	0.1469				PASS
GPRS 850MHz	128	824.20	5	13.20	0.0209	Plot C	38.45	7	PASS
	190	836.60	5	19.75	0.0945	4down link			PASS
	251	848.80	5	17.65	0.0582	1up link			PASS
GPRS 1900MHz	512	1850.2	0	27.42	0.5521	Plot D	33	2	PASS
	661	1880.0	0	25.03	0.3184	4down link			PASS
	810	1909.8	0	20.67	0.1167	1up link			PASS
EGPRS 850MHz	128	824.20	5	20.56	0.1138	Plot E	38.45	7	PASS
	190	836.60	5	23.48	0.2228	4down link			PASS
	251	848.80	5	26.62	0.4592	1up link			PASS
EGPRS 1900MHz	512	1850.2	0	27.45	0.5559	Plot F	33	2	PASS
	661	1880.0	0	24.57	0.2864	4down link			PASS
	810	1909.8	0	21.67	0.1469	1up link			PASS
WCDMA 1700MHz	1312	1711.25	0	23.19	0.2084	Plot G	33	2	PASS
	1450	1732.5	0	23.04	0.2014				PASS
	1513	1753.75	0	19.57	0.0906				PASS

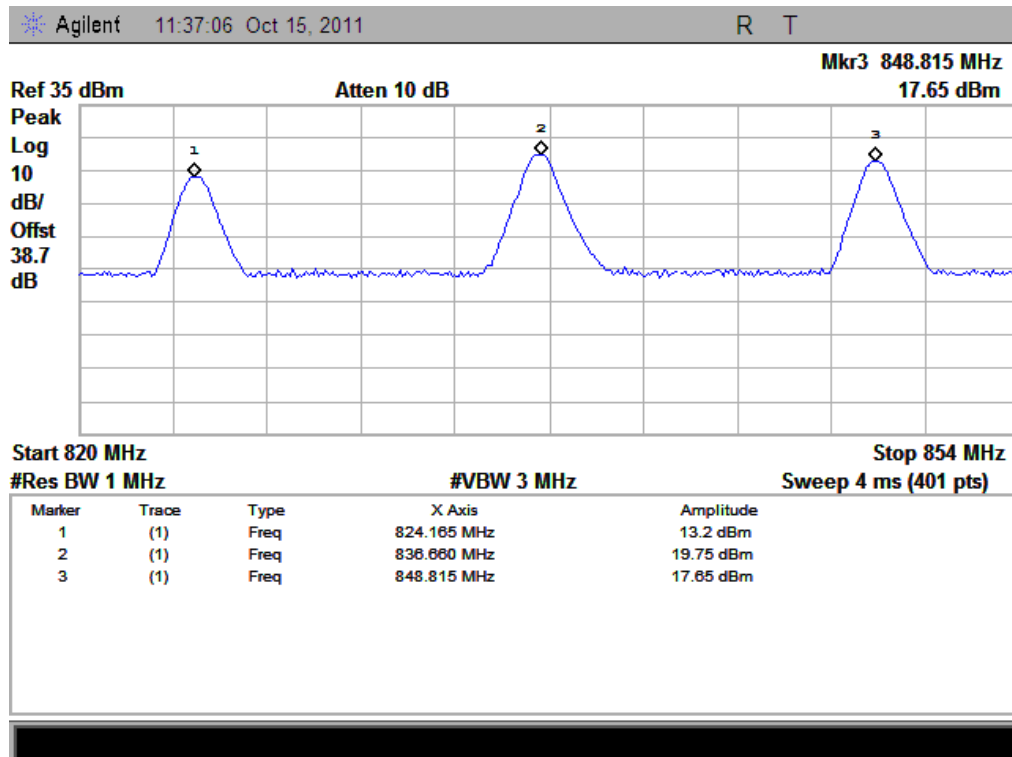
2. Test Plots:



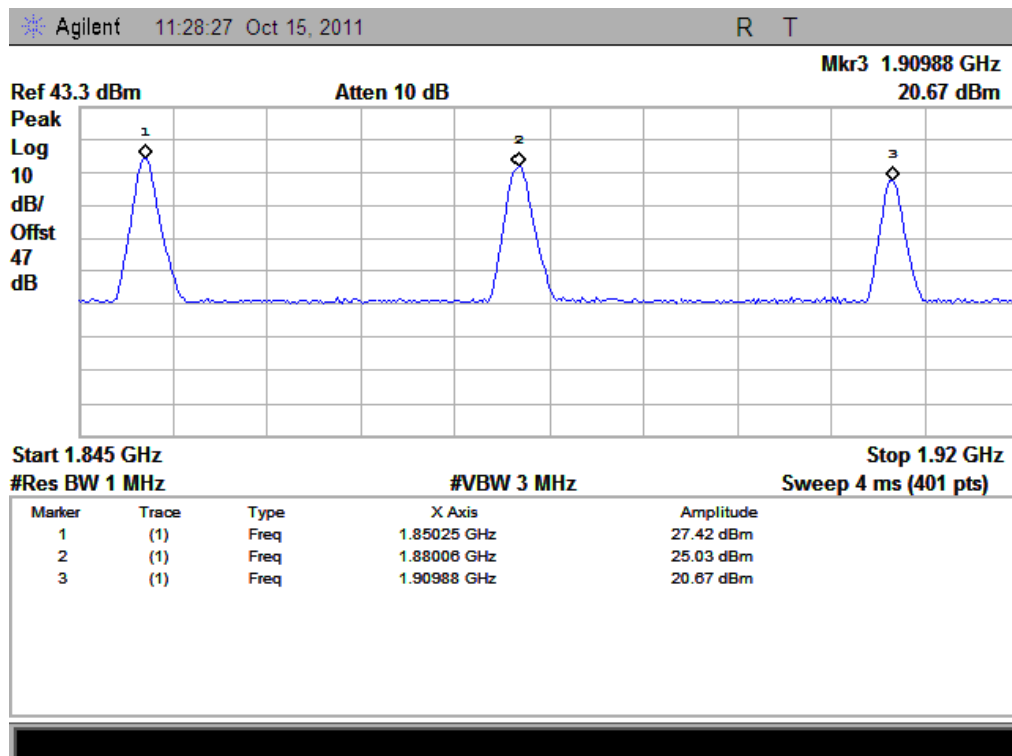
(Plot A: GSM 850MHz Channel = 128, 190, 251)



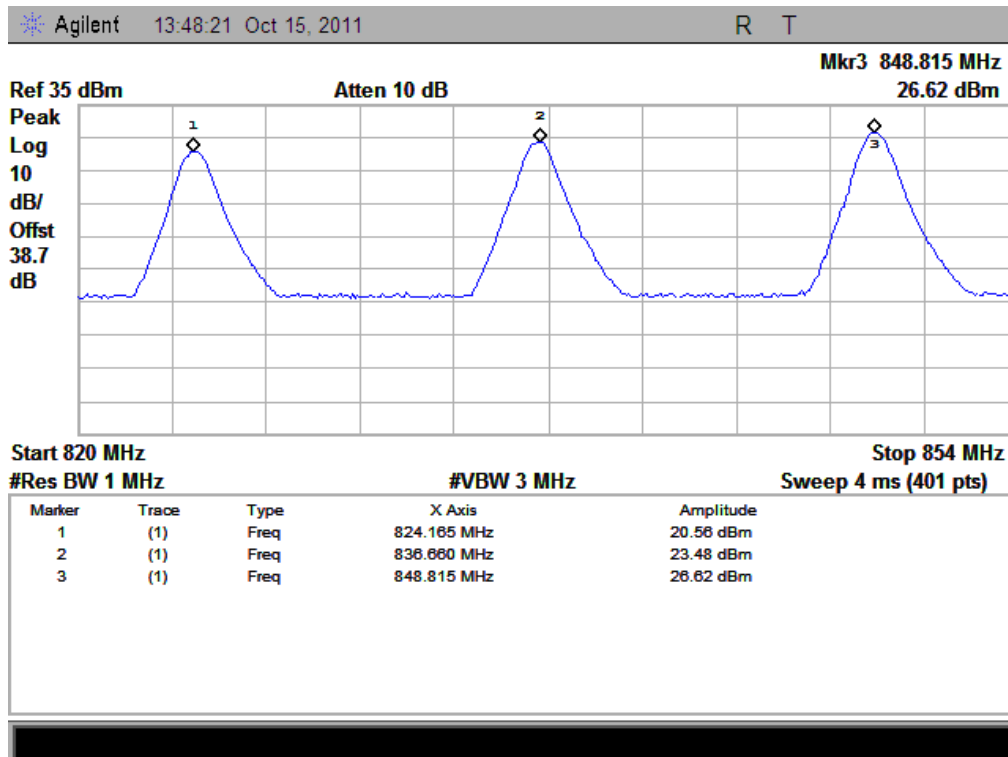
(Plot B: GSM 1900MHz Channel = 512, 661, 810)



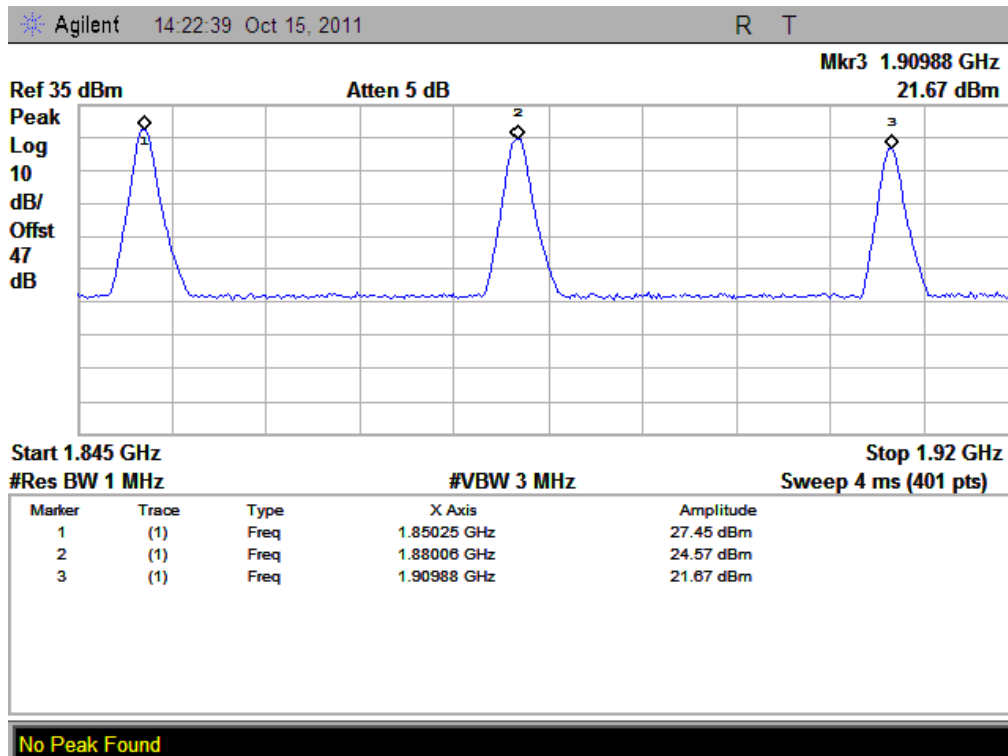
(Plot C: GPRS 850MHz Channel = 128, 190, 251)



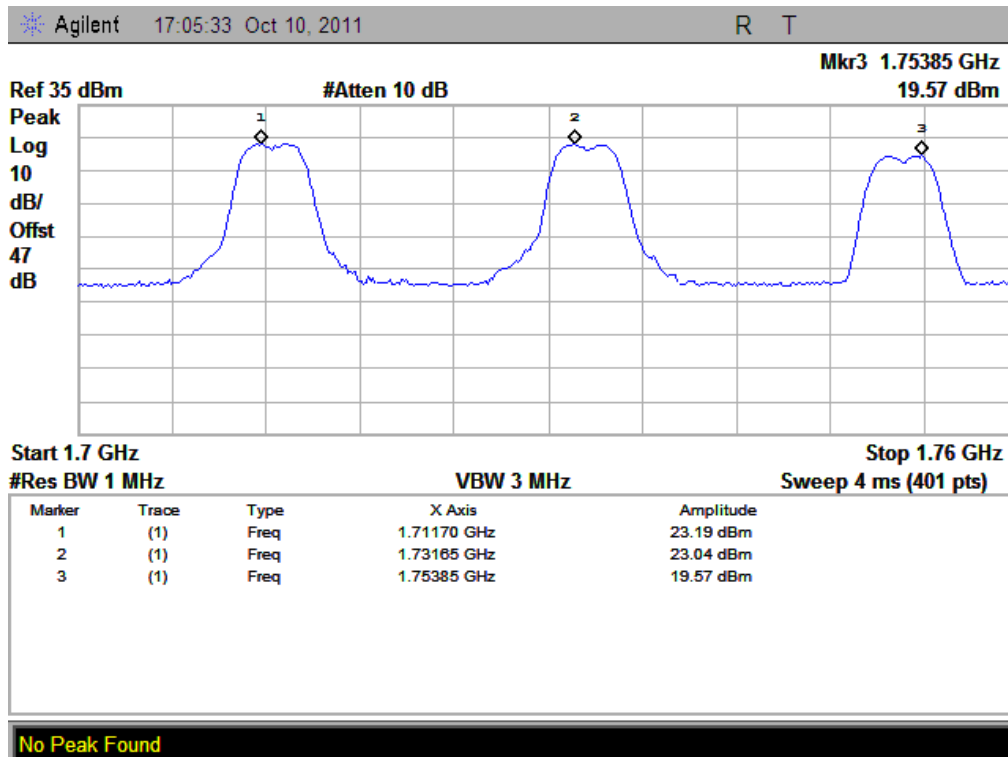
(Plot D: GPRS 1900MHz Channel = 512, 661, 810)



(Plot E: EDGE 850MHz Channel = 128, 190, 251)



(Plot F: EDGE 1900MHz Channel = 512, 661, 810)



(Plot G: WCDMA 1700MHz Channel = 1312, 1450, 1513)

2.6 Radiated Out of Band Emissions

2.6.1 Requirement

According to FCC section 2.1053, 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.

2.6.2 Test Description

See section 2.5.2 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.

2.6.3 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.

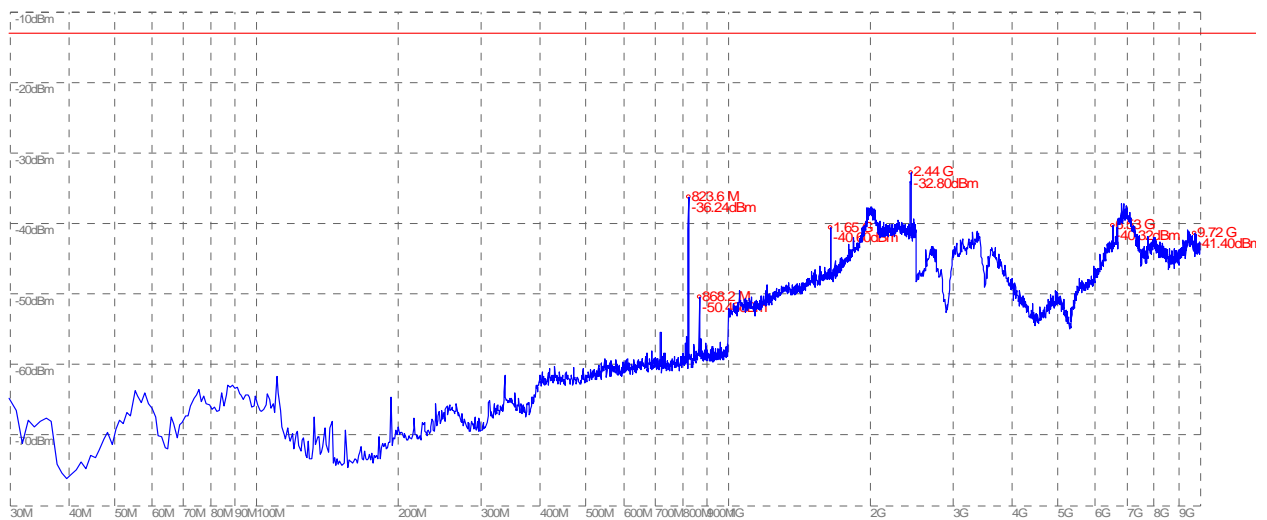
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
GSM 850MHz	128	824.2	< -25	< -25	Plot A.1/A.2	-13	PASS
	190	836.6	< -25	< -25	Plot A.3/A.4		PASS
	251	848.8	< -25	< -25	Plot A.5/A.6		PASS
GSM 1900MHz	512	1850.2	< -25	< -25	Plot B.1/B.2	-13	PASS
	661	1880.0	< -25	< -25	Plot B.3/B.4		PASS
	810	1909.8	< -25	< -25	Plot B.5/B.6		PASS
EDGE 850MHz	128	824.2	< -25	< -25	Plot C.1/C.2	-13	PASS
	190	836.6	< -25	< -25	Plot C.3/C.4		PASS
	251	848.8	< -25	< -25	Plot C.5/C.6		PASS
EDGE 1900MHz	512	1850.2	< -25	< -25	Plot D.1/D.2	-13	PASS
	661	1880.0	< -25	< -25	Plot D.3/D.4		PASS
	810	1909.8	< -25	< -25	Plot D.5/D.6		PASS
WCDMA	1537	1711.25	< -25	< -25	Plot E.1/E.2	-13	PASS

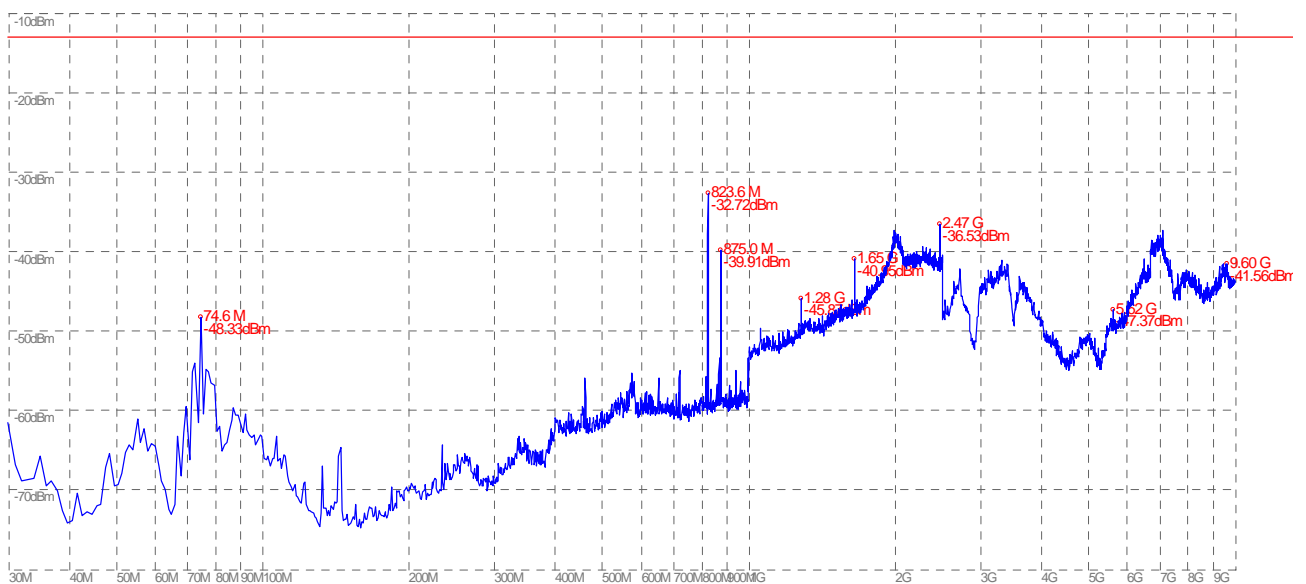
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
1700MHz	1637	1732.5	< -25	< -25	Plot E.3/E.4		PASS
	1738	1753.75	< -25	< -25	Plot E.5/E.6		PASS

2. Test Plots for the Whole Measurement Frequency Range:

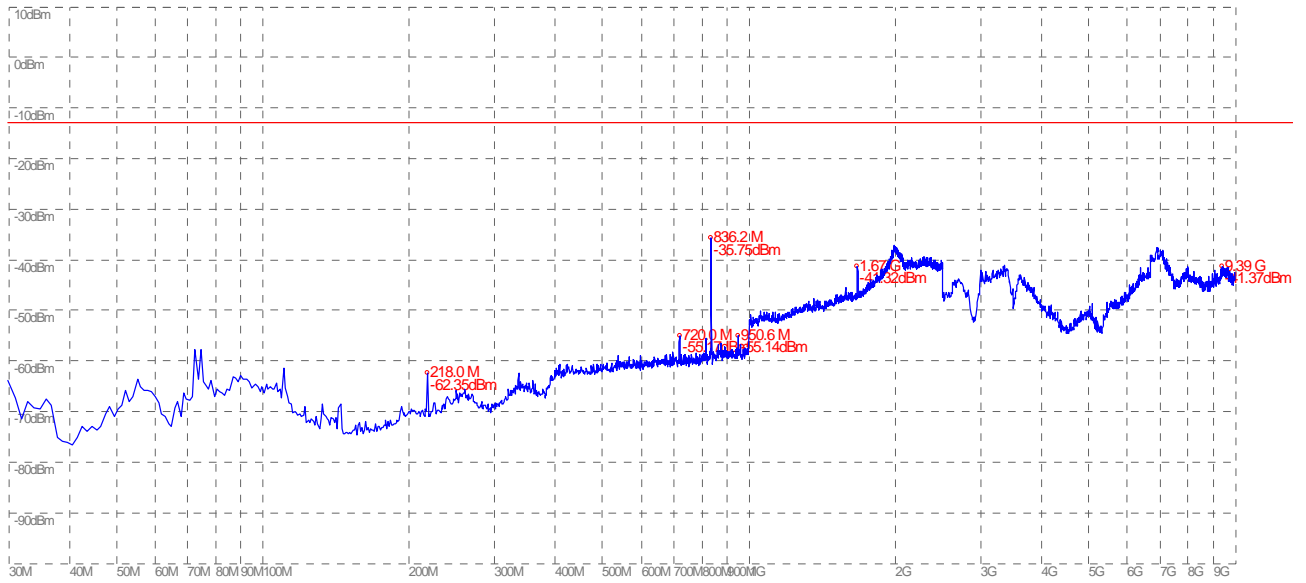
Note: the power of the EUT transmitting frequency should be ignored.



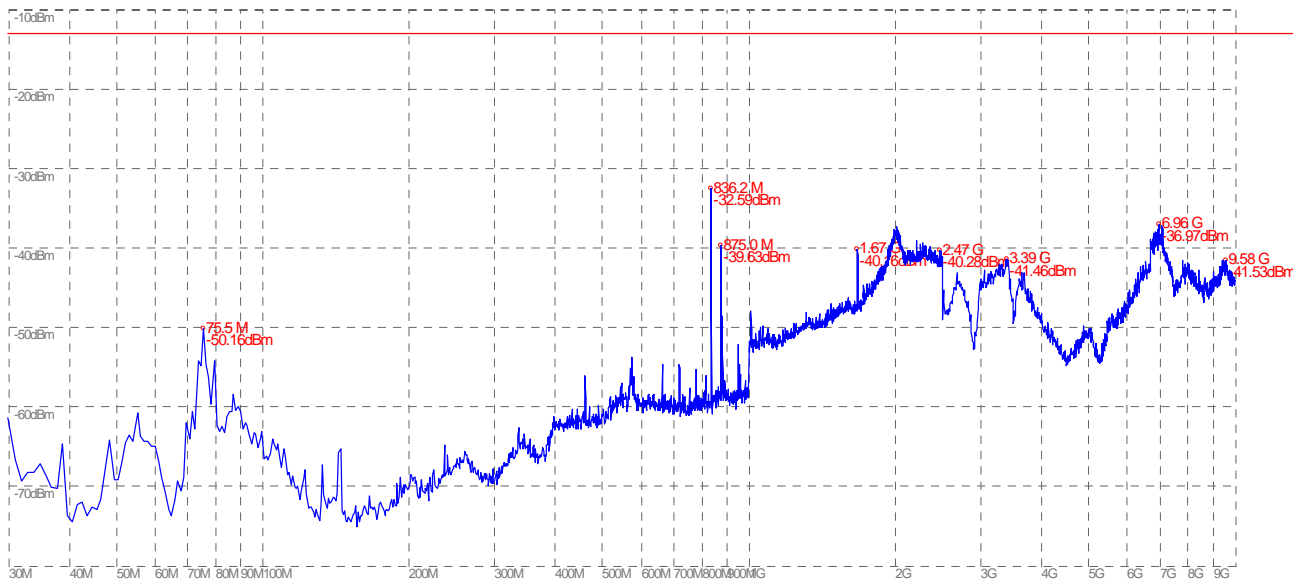
(Plot A.1: GSM 850MHz Channel = 128, Test Antenna Horizontal)



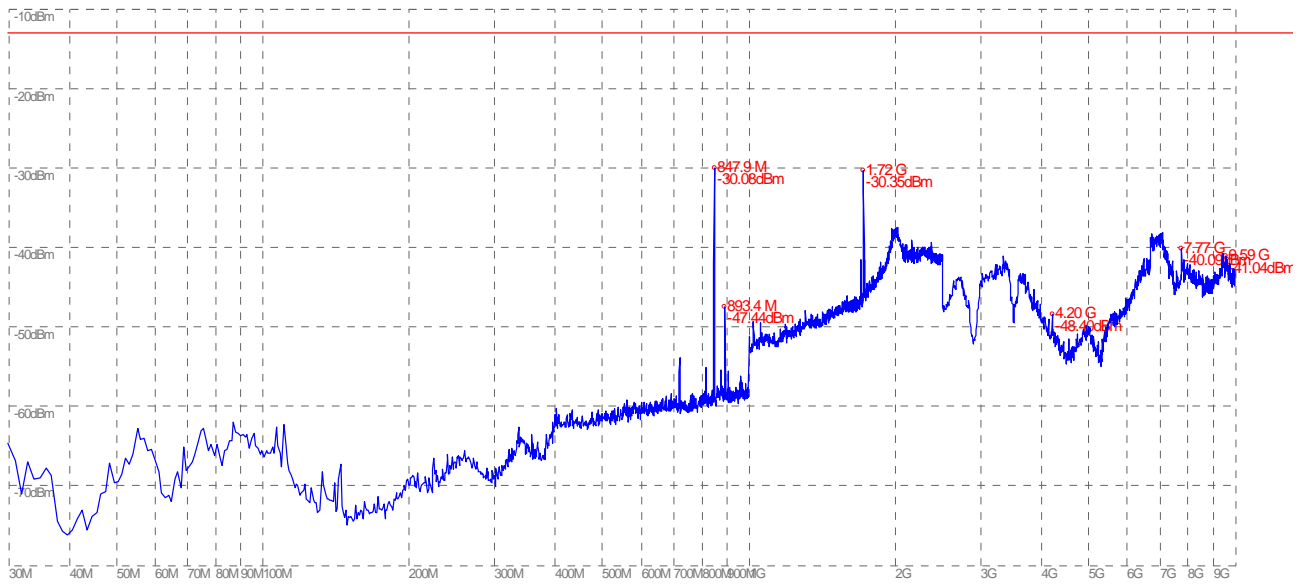
(Plot A.2: GSM 850MHz Channel = 128, Test Antenna Vertical)



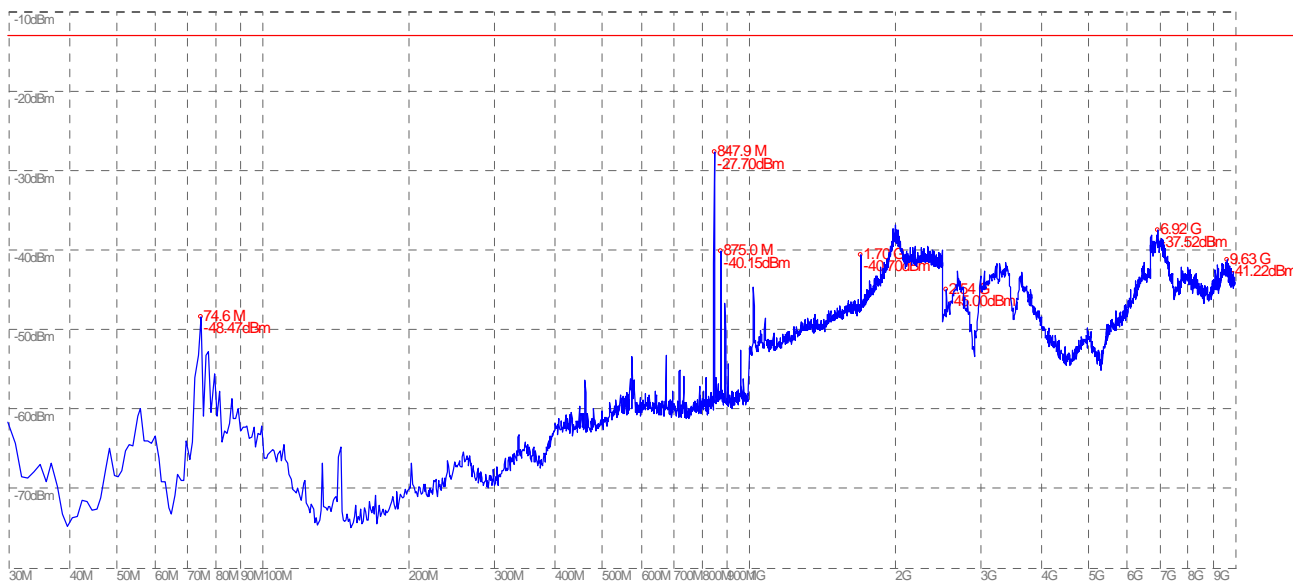
(Plot A.3: GSM 850MHz Channel = 190, Test Antenna Horizontal)



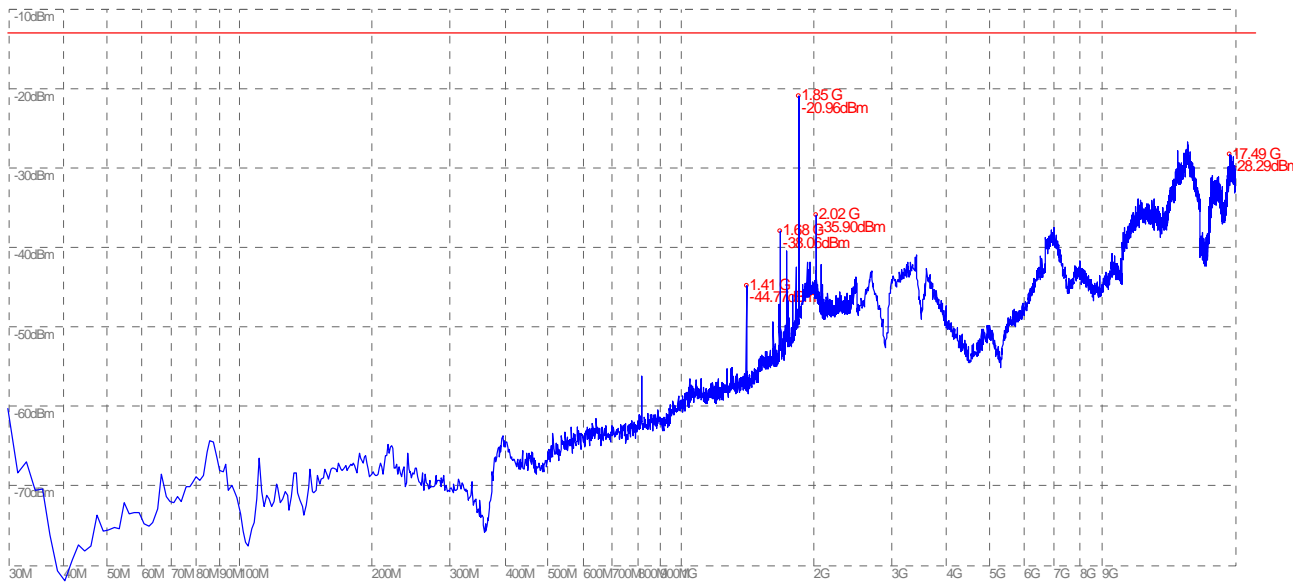
(Plot A.4: GSM 850MHz Channel = 190, Test Antenna Vertical)



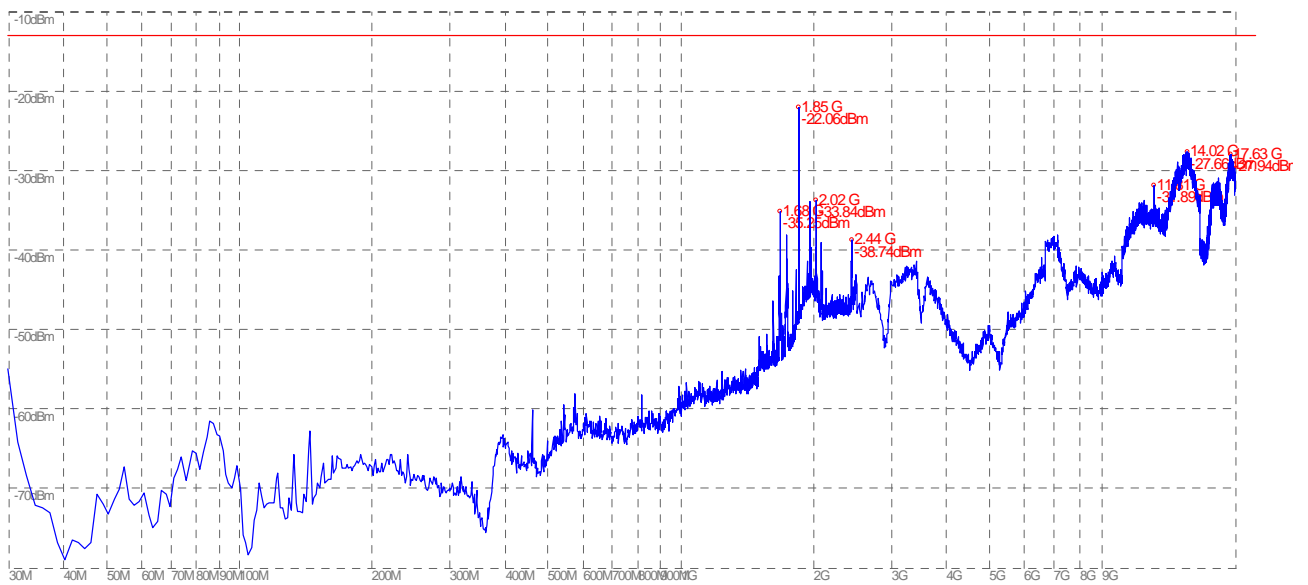
(Plot A.5: GSM 850MHz Channel = 251, Test Antenna Horizontal)



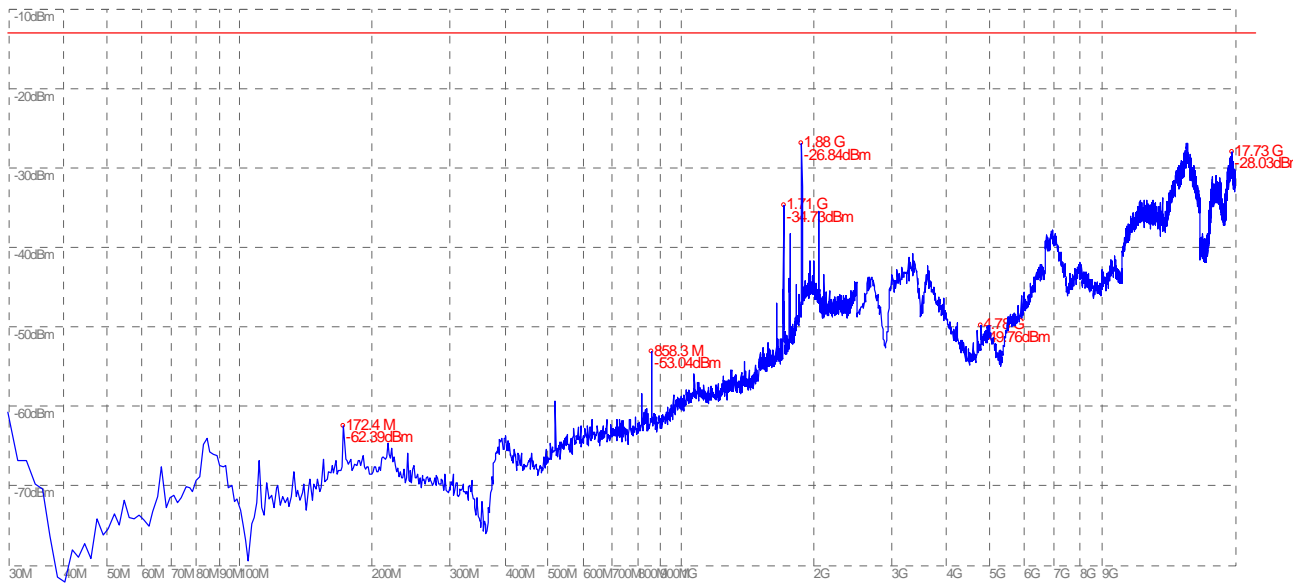
(Plot A.6: GSM 850MHz Channel = 251, Test Antenna Vertical)



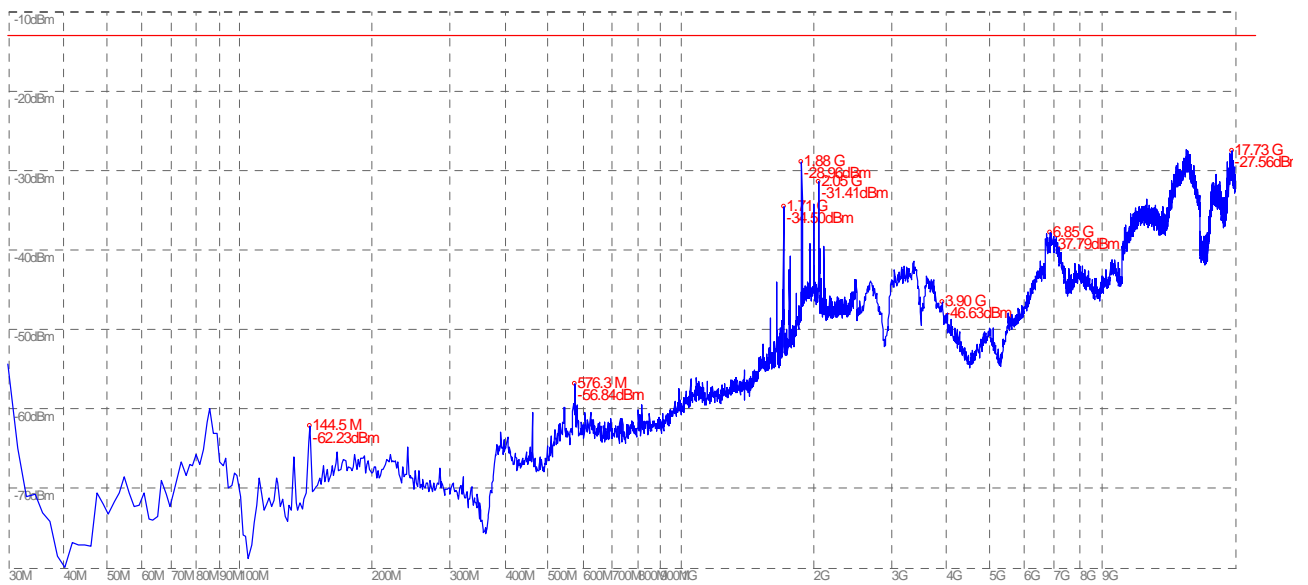
(Plot B.1: GSM 1900MHz Channel = 512, Test Antenna Horizontal)



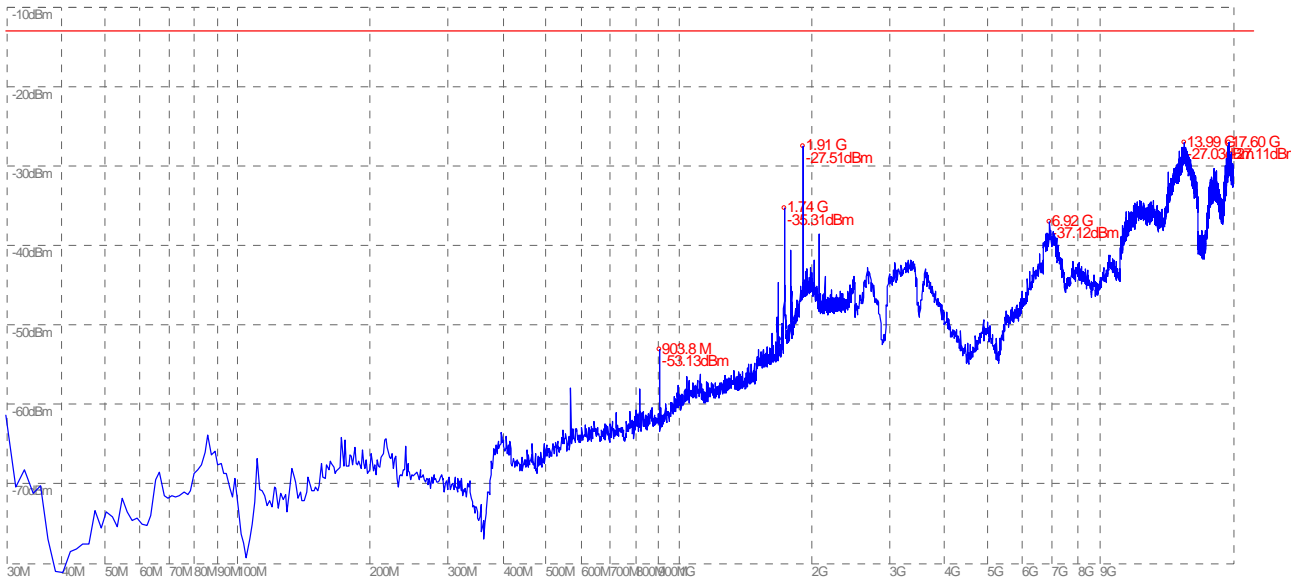
(Plot B.2: GSM 1900MHz Channel = 512, Test Antenna Vertical)



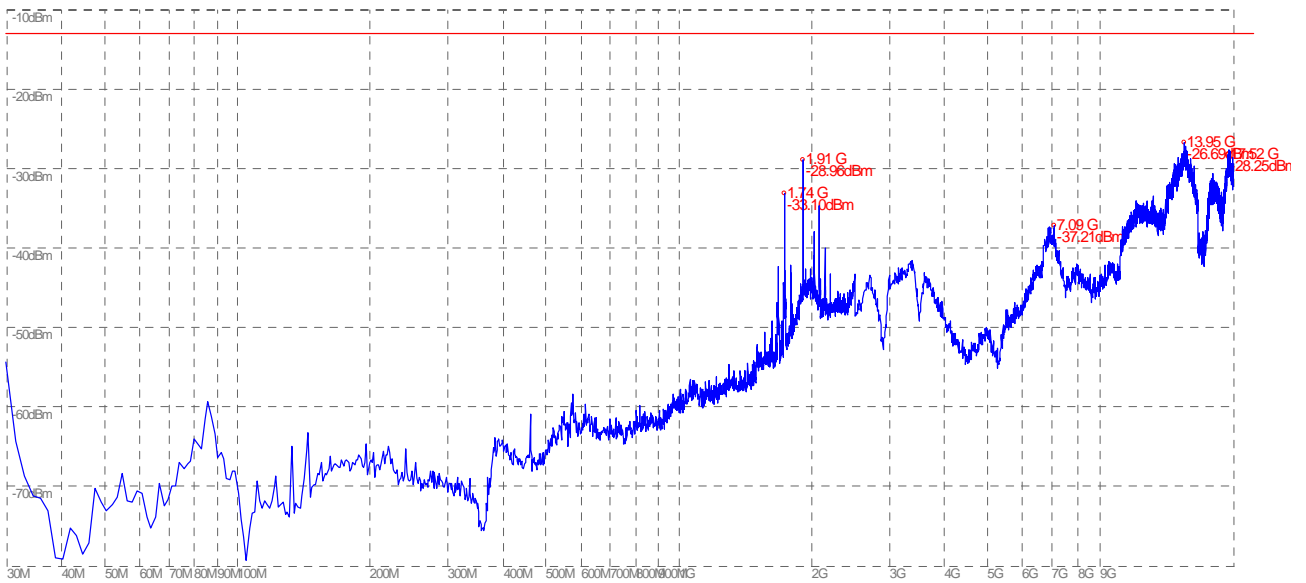
(Plot B.3: GSM 1900MHz Channel = 661, Test Antenna Horizontal)



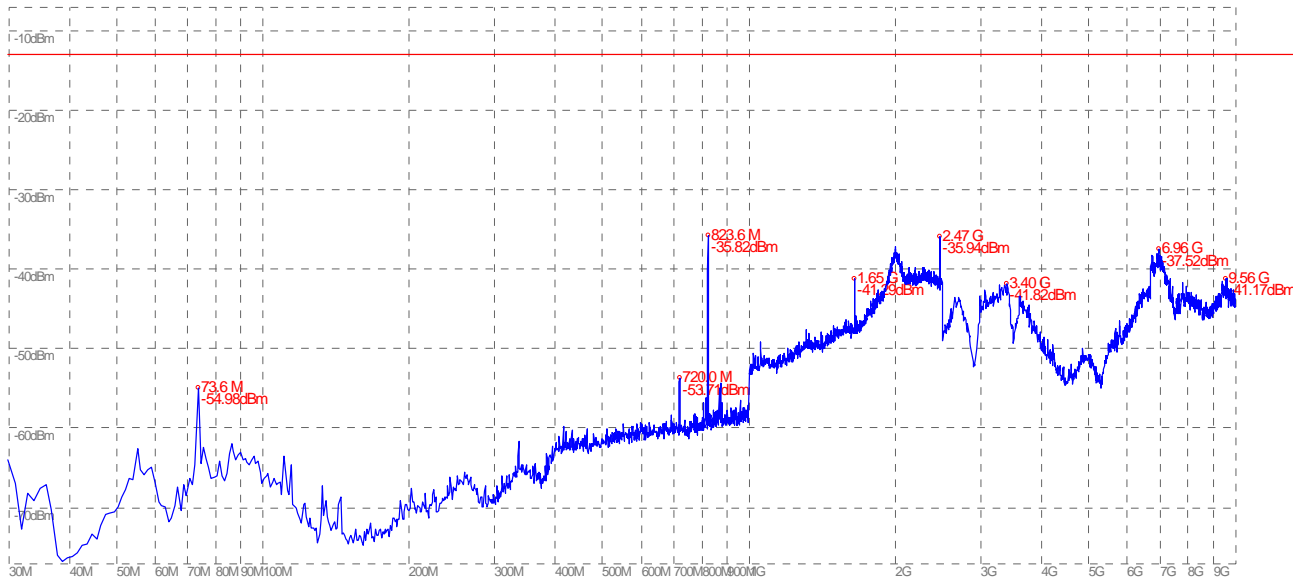
(Plot B.4: GSM 1900MHz Channel = 661, Test Antenna Vertical)



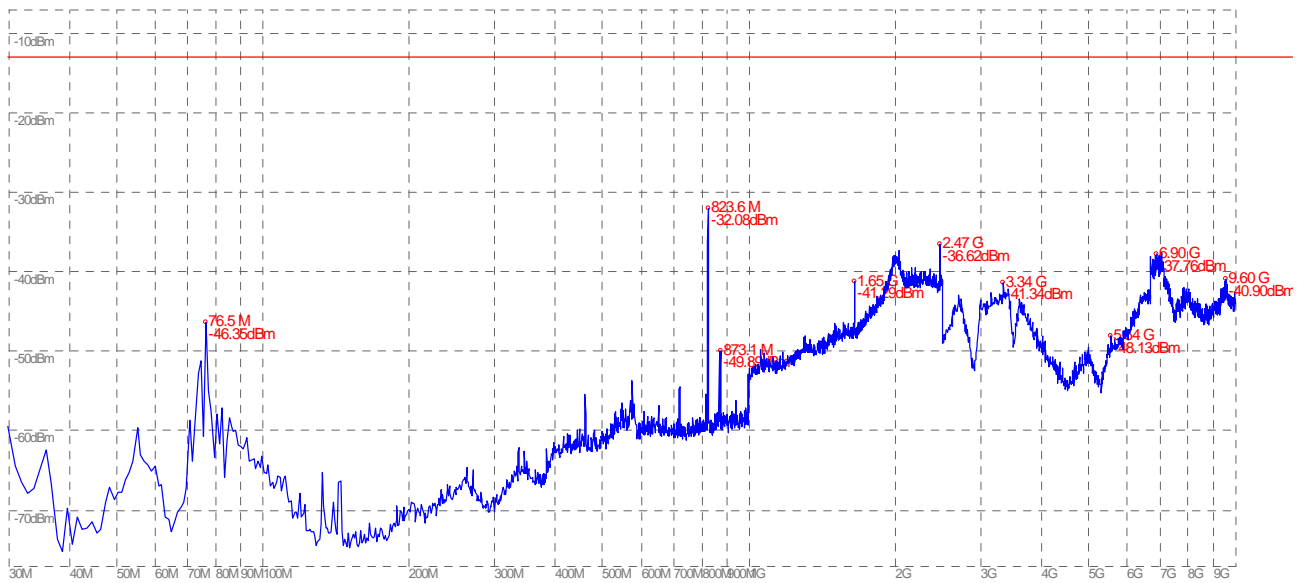
(Plot B.5: GSM 1900MHz Channel = 810, Test Antenna Horizontal)



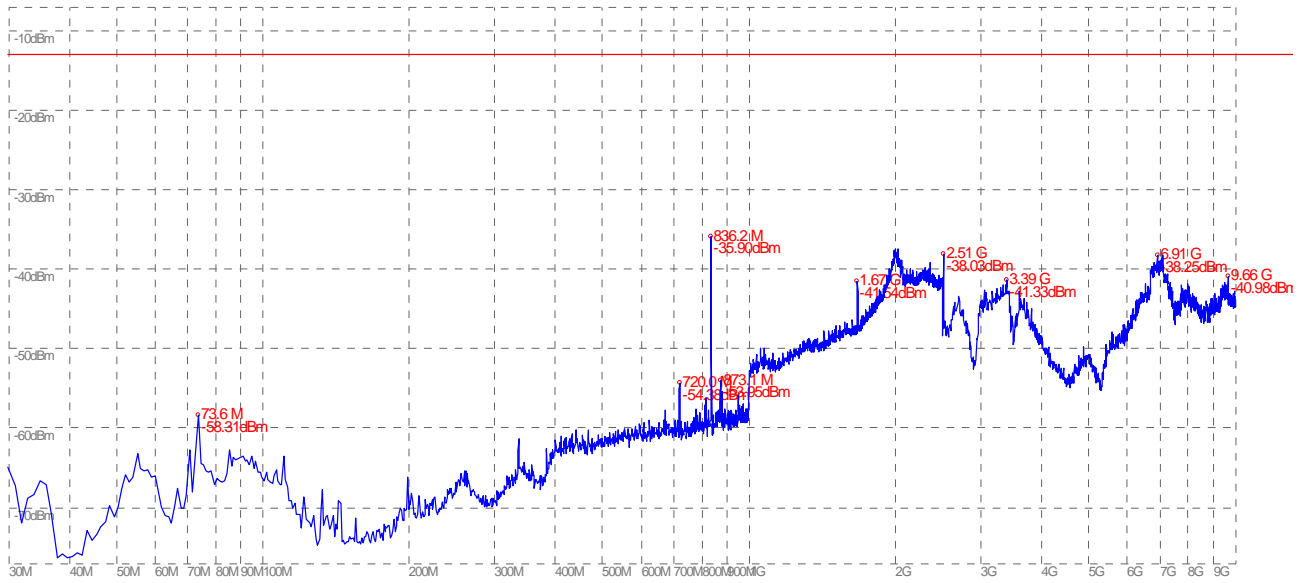
(Plot B.6: GSM 1900MHz Channel = 810, Test Antenna Vertical)



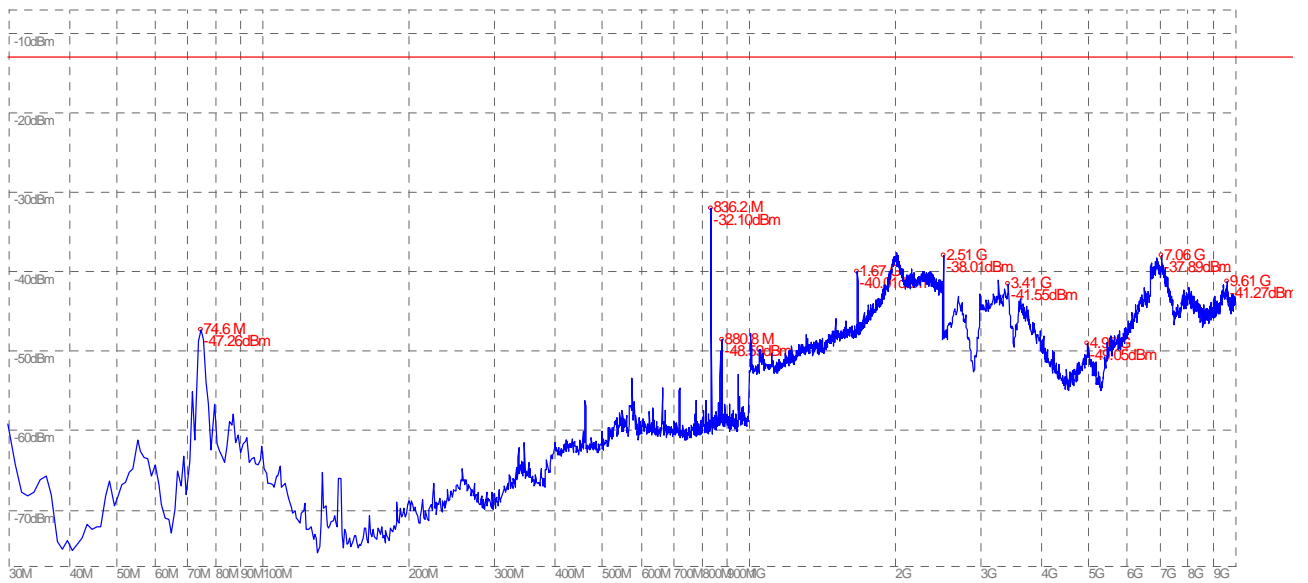
(Plot C.1: EGPRS 850MHz Channel = 128, Test Antenna Horizontal)



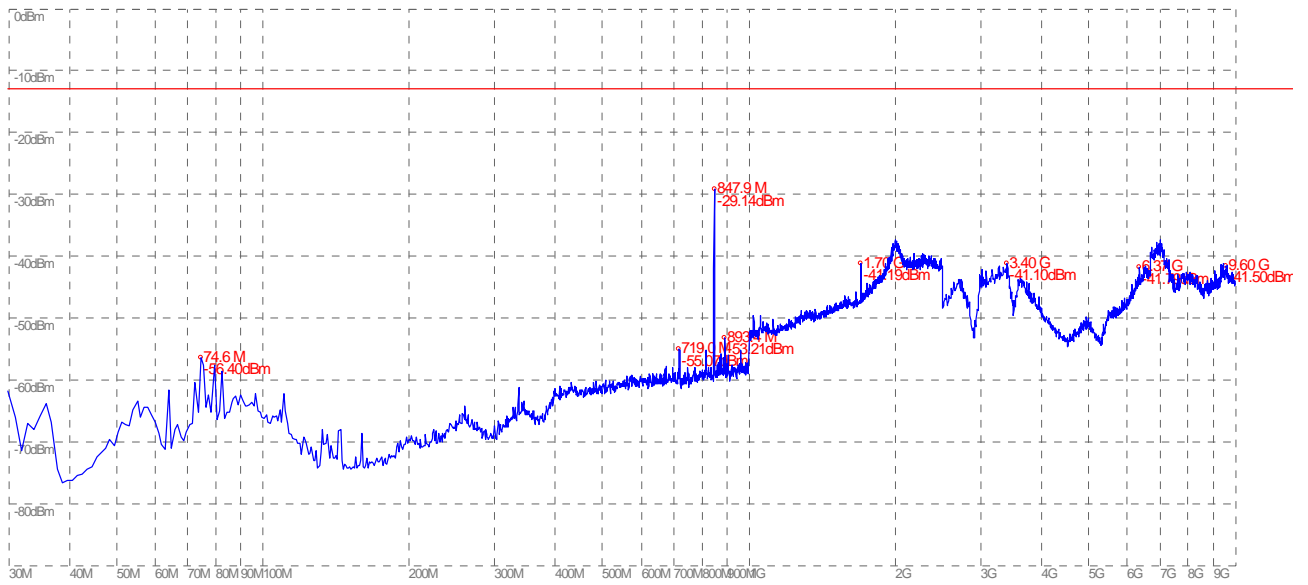
(Plot C.2: EGPRS 850MHz Channel = 128, Test Antenna Vertical)



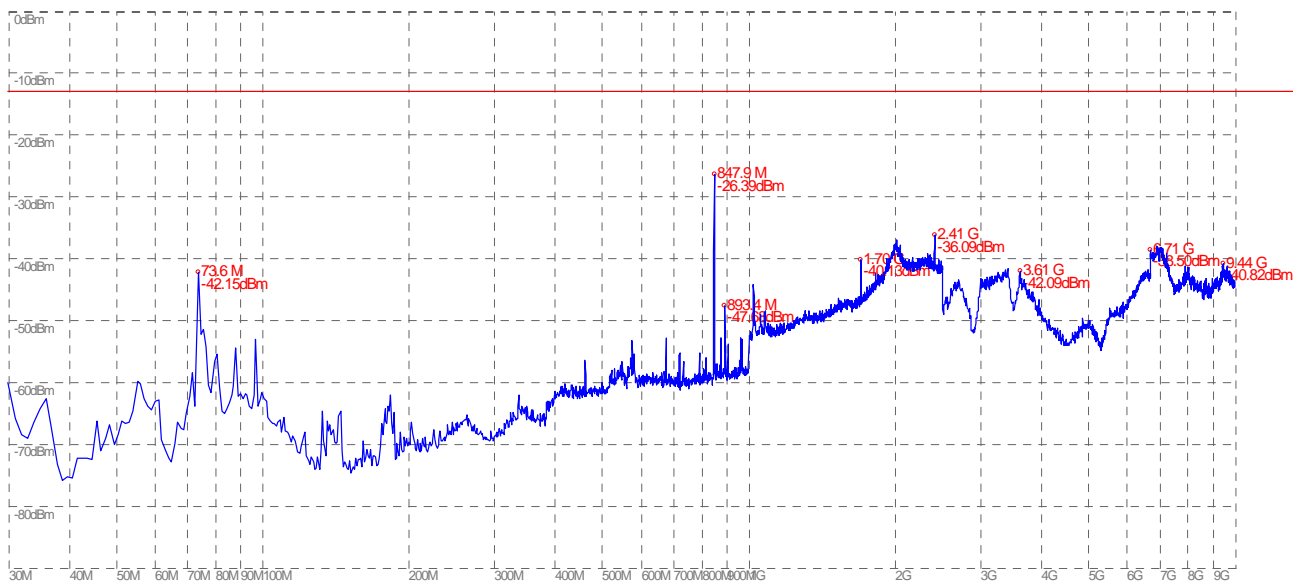
(Plot C.3: EGPRS 850MHz Channel = 190, Test Antenna Horizontal)



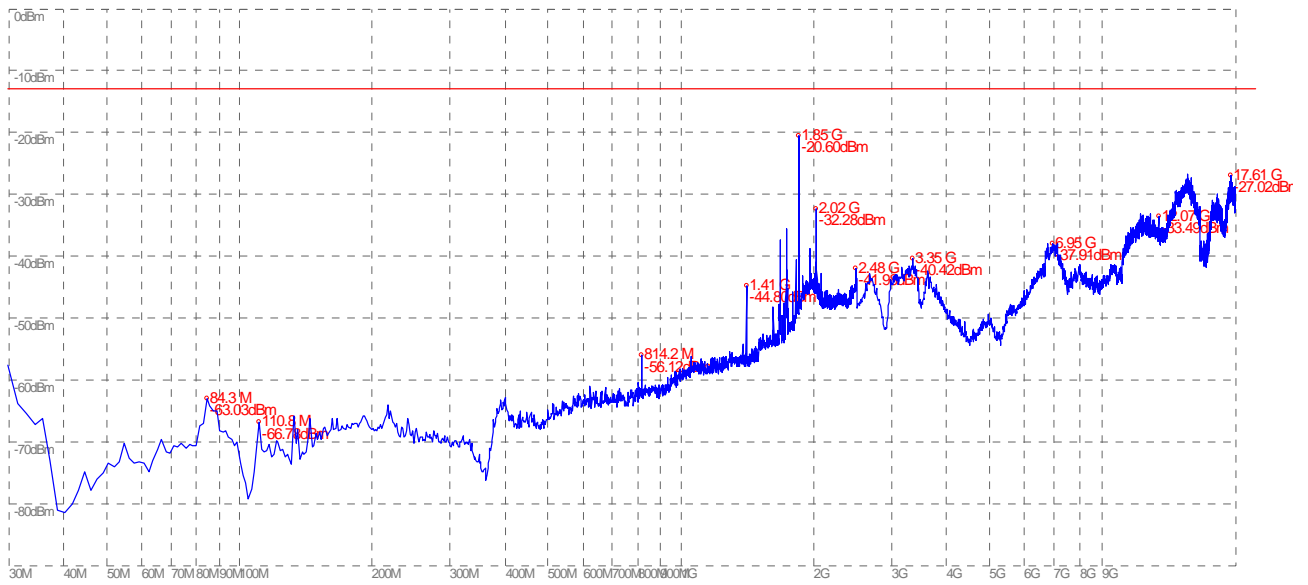
(Plot C.4: EGPRS 850MHz Channel = 190, Test Antenna Vertical)



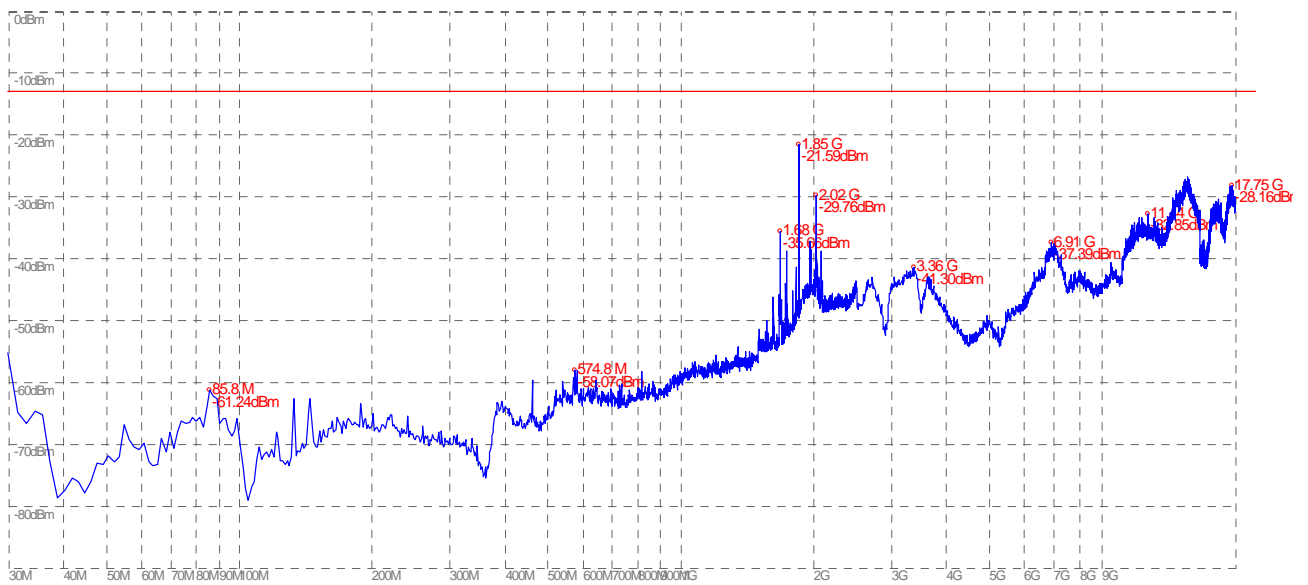
(Plot C.5: EGPRS 850MHz Channel = 251, Test Antenna Horizontal)



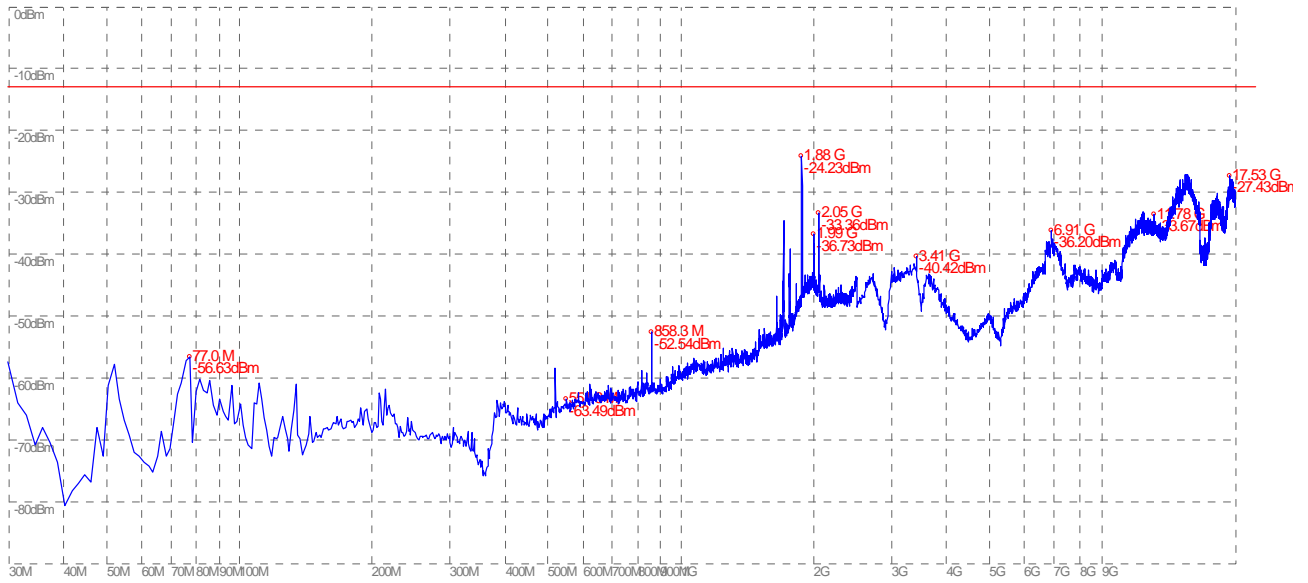
(Plot C.6: EGPRS 850MHz Channel = 251, Test Antenna Vertical)



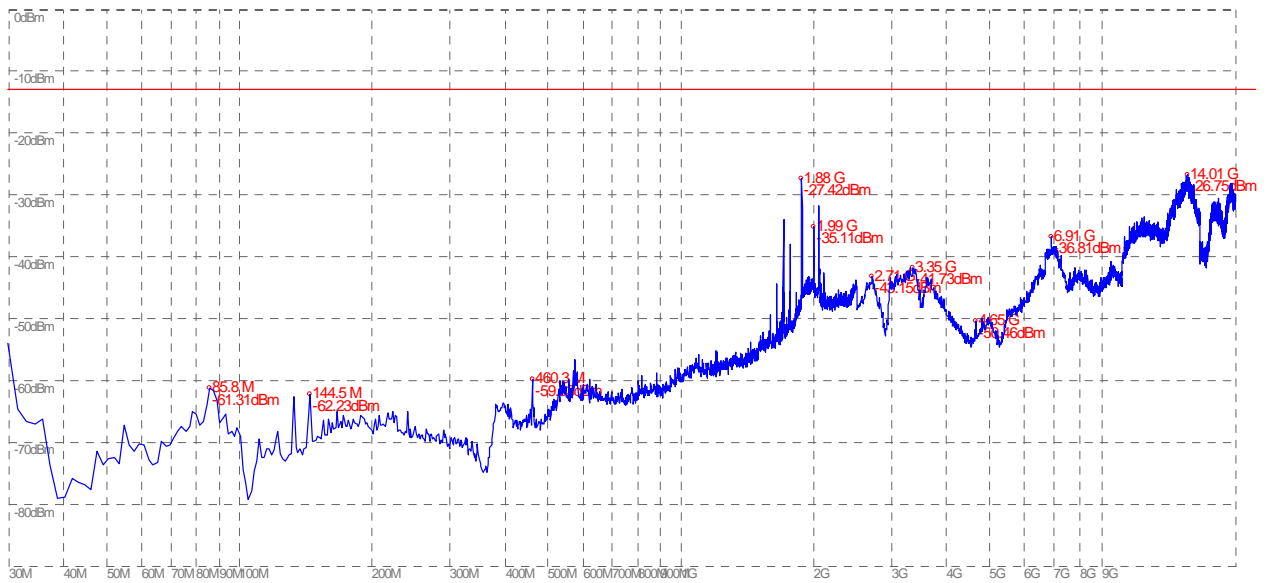
(Plot D.1: EGPRS 1900MHz Channel = 512, Test Antenna Horizontal)



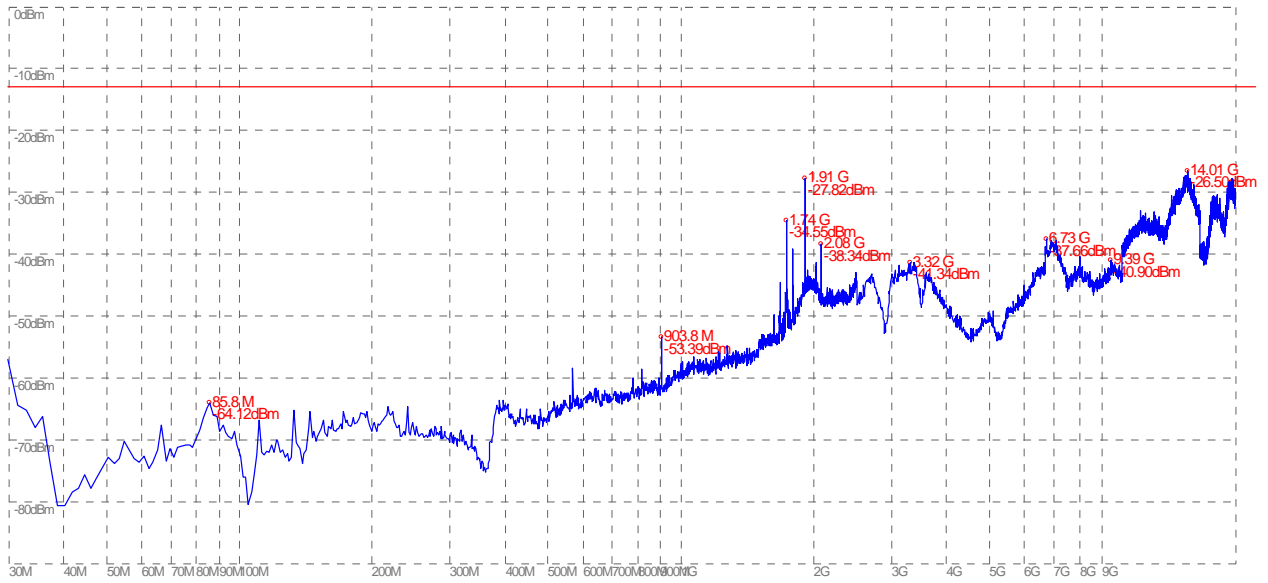
(Plot D.2: EGPRS 1900MHz Channel = 512, Test Antenna Vertical)



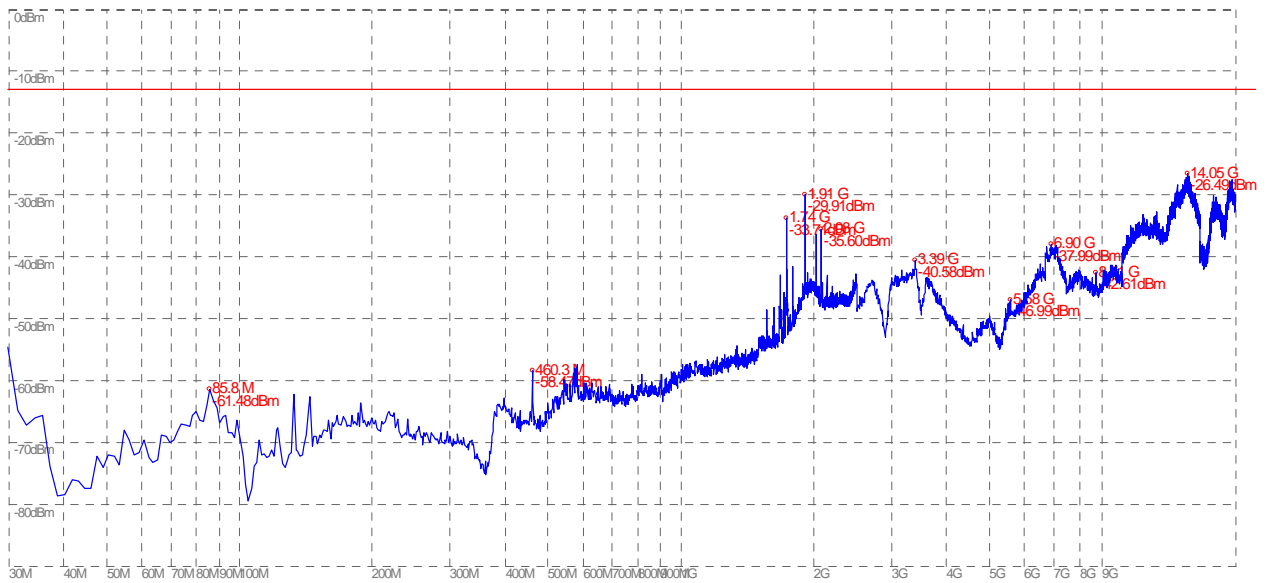
(Plot D.3: EGPRS 1900MHz Channel = 661, Test Antenna Horizontal)



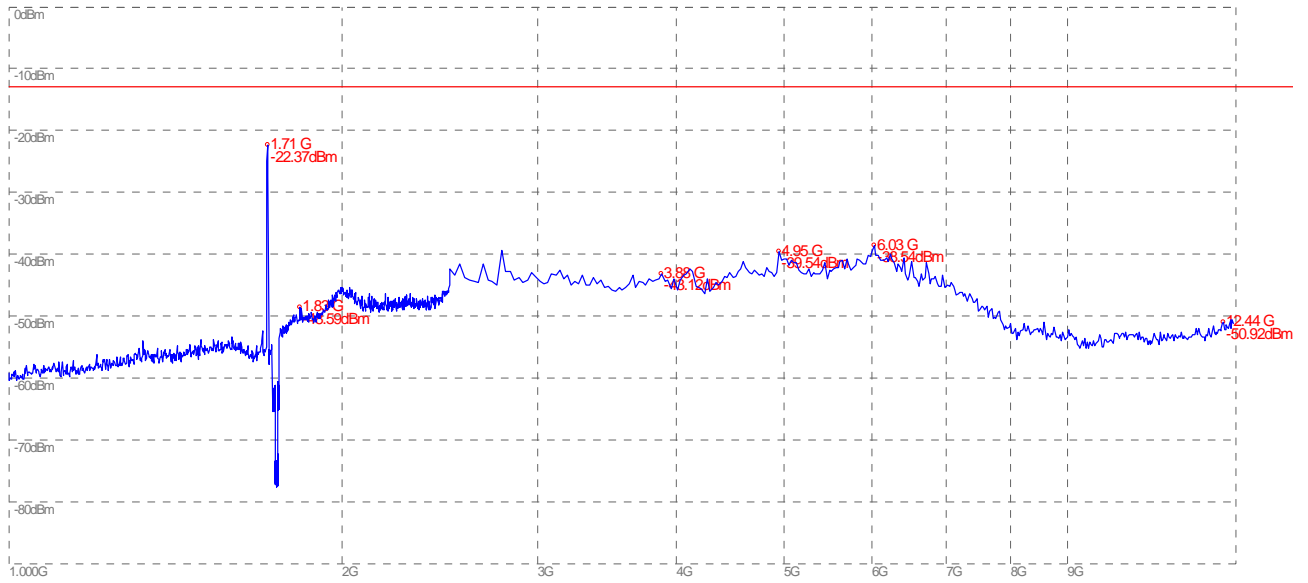
(Plot D.4: EGPRS 1900MHz Channel = 661, Test Antenna Vertical)



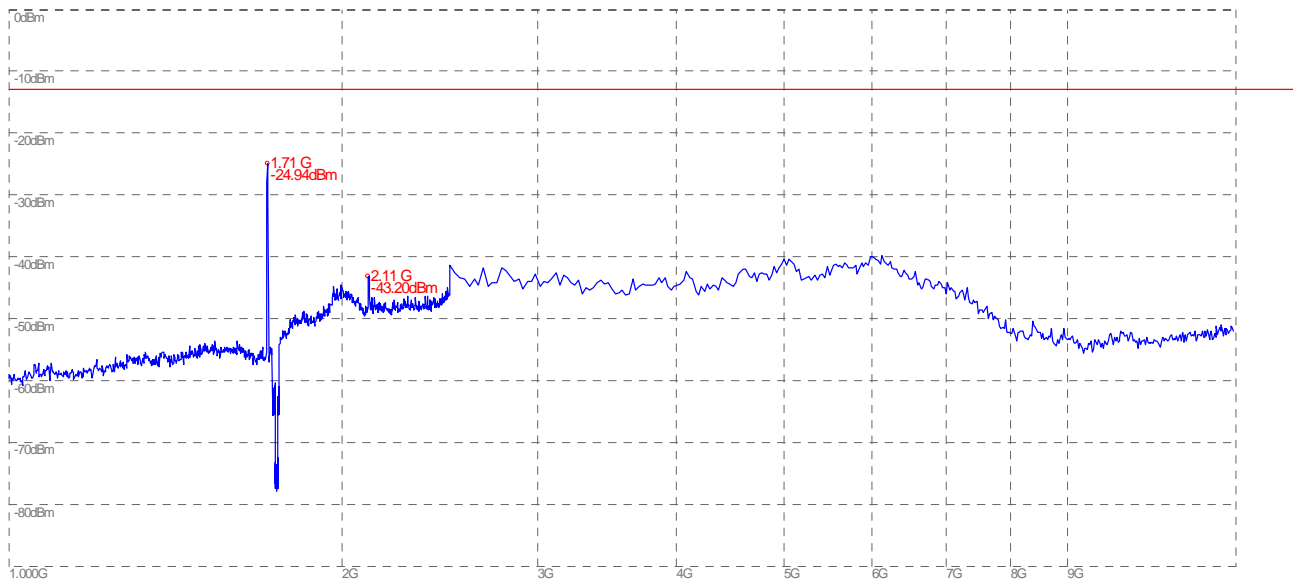
(Plot D.5: EGPRS 1900MHz Channel = 810, Test Antenna Horizontal)



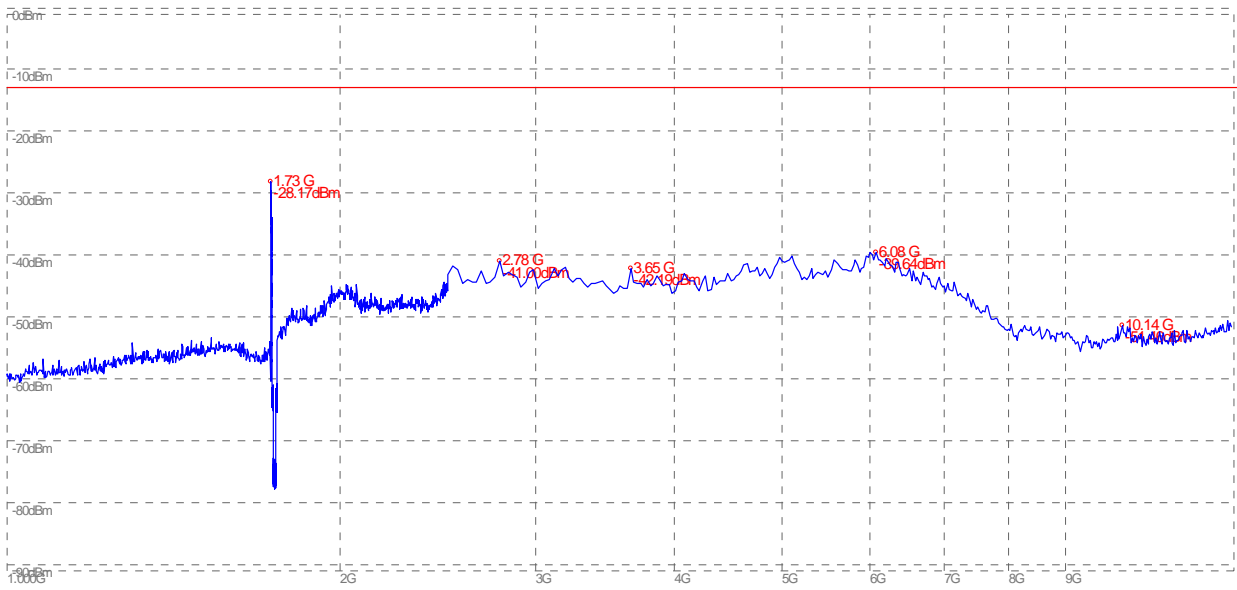
(Plot D.6: EGPRS 1900MHz Channel = 810, Test Antenna Vertical)



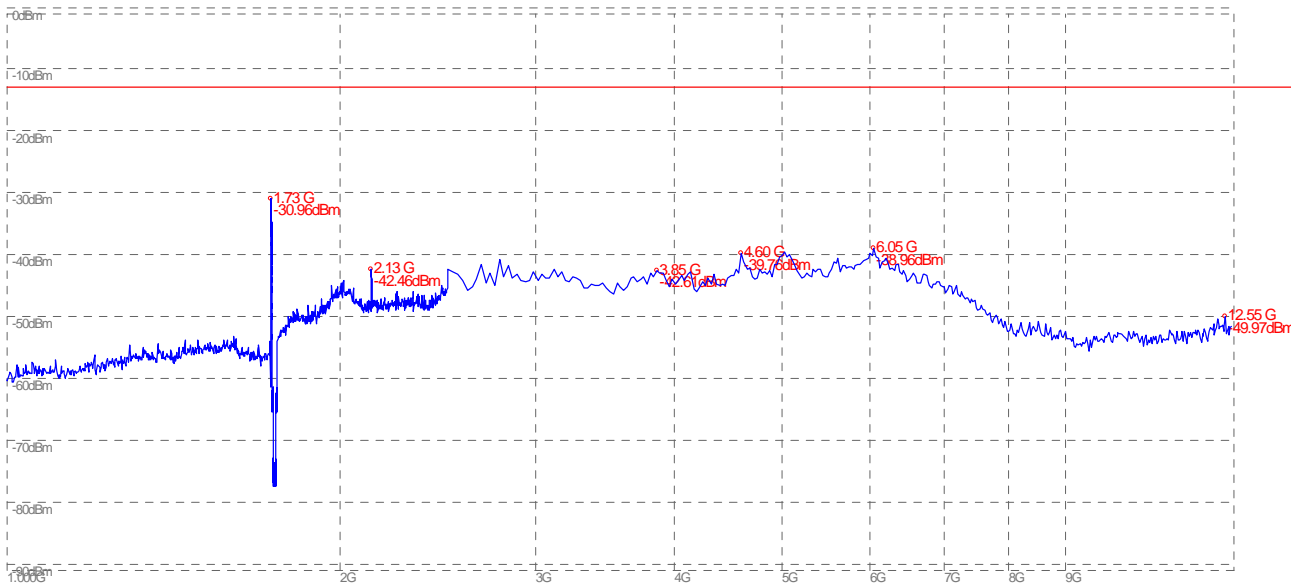
(Plot E.1: WCDMA 1700MHz Channel = 1537, Test Antenna Horizontal)



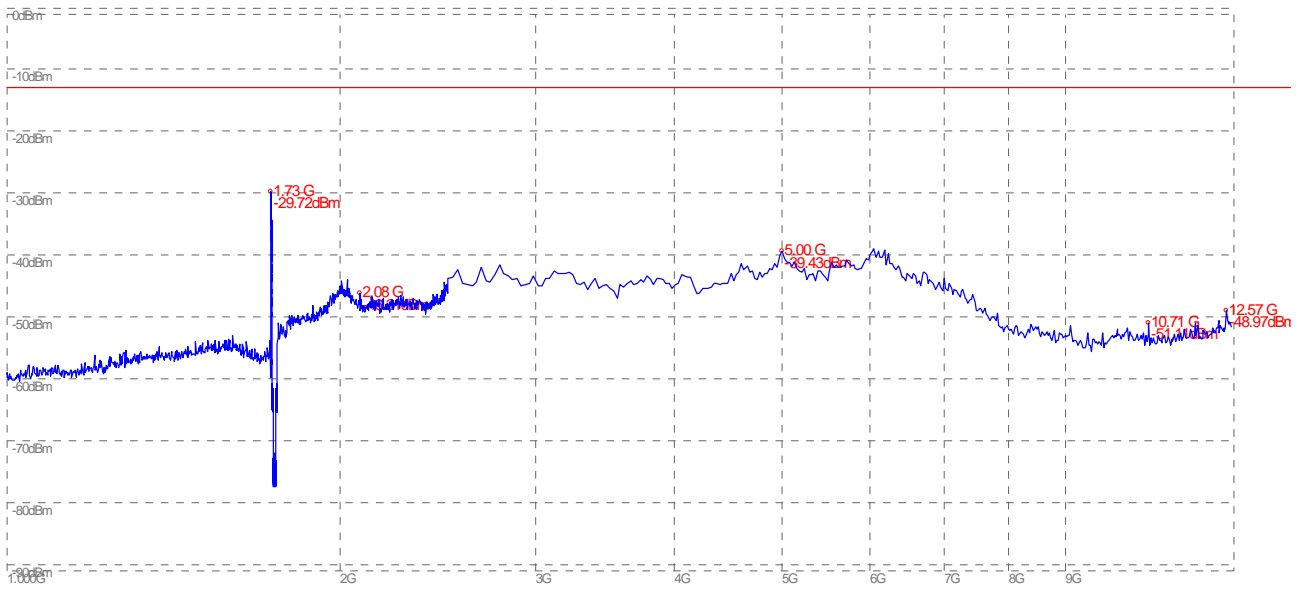
(Plot E.2: WCDMA 1700MHz Channel = 1537, Test Antenna Vertical)



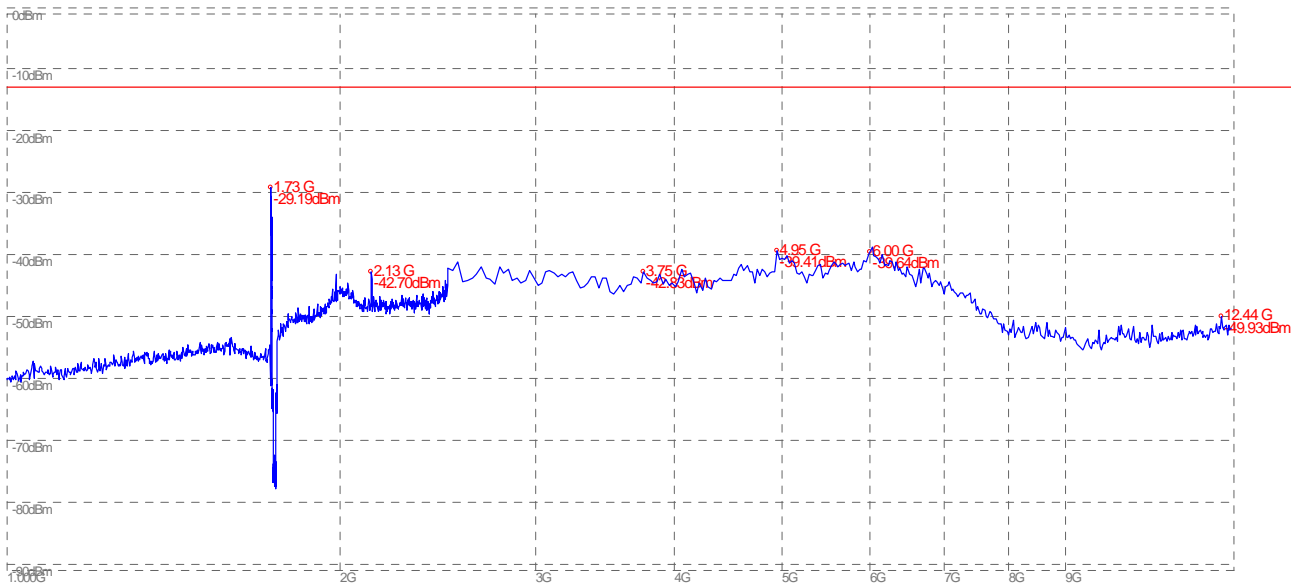
(Plot E.3: WCDMA 1700MHz Channel = 1637, Test Antenna Horizontal)



(Plot E.4: WCDMA 1700MHz Channel = 1637, Test Antenna Vertical)



(Plot E.5: WCDMA 1700MHz Channel = 1738, Test Antenna Horizontal)



(Plot E.6: WCDMA 1700MHz Channel = 1738, Test Antenna Vertical)

** END OF REPORT **