



Report No.:SZ11090107W01



FCC RF TEST REPORT

Issued to

3M Cogent, Inc

For

Mobile Ident IIIc

Model Name : Mi3c
 Trade Name : 3M
 Brand Name : N/A
 FCC ID : ZYFMI3C
 Standard : 47 CFR Part 2
 47 CFR Part 22 Subpart H
 47 CFR Part 24 Subpart E
 Test date : 2011-9-23 to 2011-11-29
 Issue date : 2011-12-2



Shenzhen MORLAB Communication Technology Co., Ltd.

Tested by Zhang Yan
 Zhang Yan
 Date 2011.12.2

Approved by Wu Xuewen
 Wu Xuewen
 Date 2011.12.02

Review by Peng Huarui
 Peng Huarui
 Date 2011.12.2



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Change History		
Issue	Date	Reason for change
1.0	Dec 2, 2011	First edition

1. General Information

1.1. EUT Description

EUT Type: Mobile Ident IIIc
Serial No.....: (n.a, marked #1 by test site)
Hardware Version.....: V5.1
Software Version: V2.1.6
Applicant: 3M Cogent, Inc
639N.Rosemead Blvd. Pasadena.CA 91170, USA
Manufacturer: 3M Cogent, Inc
Fiyta Hi-tech Building 1706, Gaoxinnanyi Avenue, Southern
District of Hi-tech Park, Nanshan District, Shenzhen, 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 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
EDGE Mode with 8PSK Modulation
WCDMA Mode with QPSK Modulation
HSDPA Mode with QPSK Modulation
HSUPA Mode with QPSK Modulation
Emission Designators.....: EGPRS:249KG7W
WCDMA:4M18F9W

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; 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 2: The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula $F(n)=1850.2+0.2*(n-512)$, $512 \leq n \leq 810$; 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 3: The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; 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 4: The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT can be represented with the formula $F(n)=1852.4+0.2*(n-9262)$, $9262 \leq n \leq 9538$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

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 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
1	2.1046	Conducted RF Output Power	PASS
2	2.1049	20dB Occupied Bandwidth	PASS
3	2.1055 22.355 24.235	Frequency Stability	PASS
4	2.1051 2.1057 22.917 24.238	Conducted Out of Band Emissions	PASS
5	2.1051 2.1057 22.917 24.238	Band Edge	PASS
6	22.913 24.232	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053 2.1057 22.917 24.238	Radiated Out of Band Emissions	PASS

Note: Measurement method according to ANSI/TIA-603-D 2010.

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 Requirements

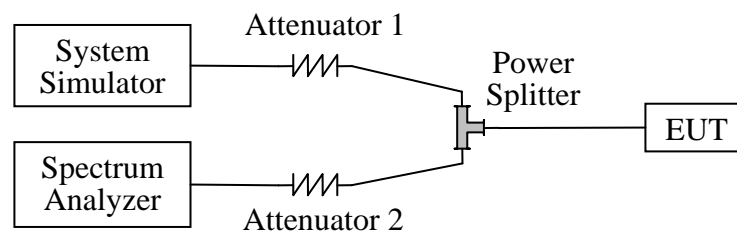
2.1. Conducted RF Output Power

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

A. 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.

B. 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

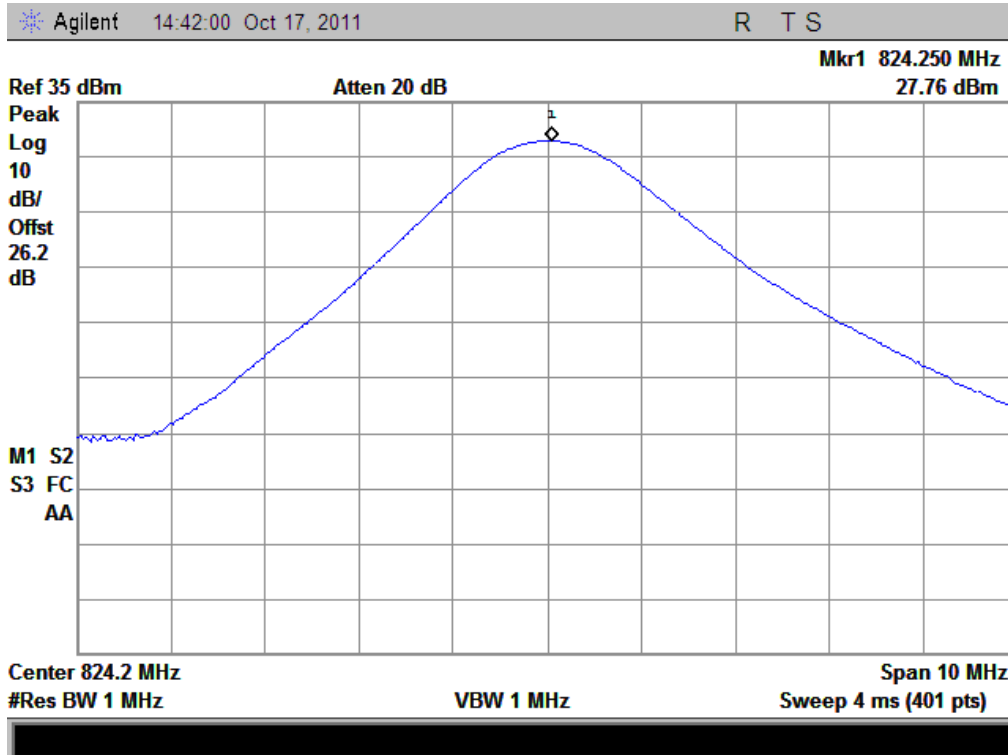
Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 33dBm, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), For the WDMA 850MHz operates at maximum output Power, the rated conducted RF output power is 25.7dBm, and For the WDMA 1900MHz operates at maximum output Power, the rated conducted RF output power is 33dBm, the rated conducted RF output power is 25.7dBm.

A. Test Verdict:

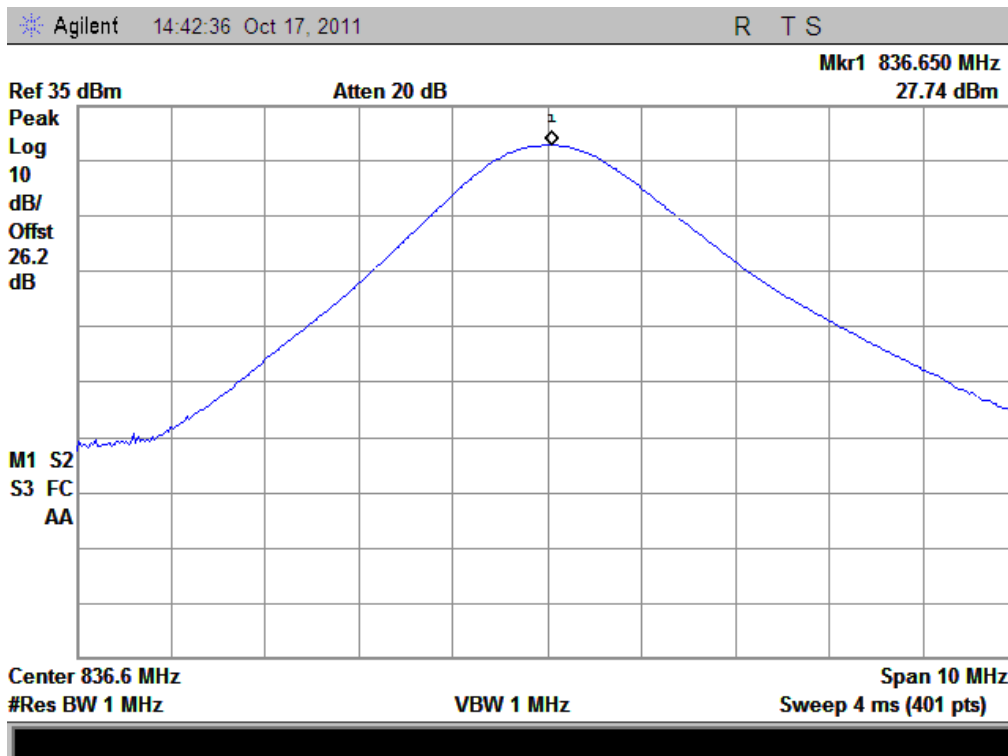
Band	Channel	Frequency (MHz)	Measured Output Power		Limit dBm	Verdict
			dBm	Refer to Plot		
GPRS 850MHz	128	824.2	27.76	Plot A1 to A3 ^{Note 1}	35	PASS
	190	836.6	27.74			PASS
	251	848.8	28.03			PASS
GPRS 1900MHz	512	1850.2	26.84	Plot B1 to B3 ^{Note 1}	32	PASS
	661	1880.0	26.25			PASS
	810	1909.8	25.61			PASS
EGPRS 850MHz	128	824.2	31.68	Plot C1 to C3 ^{Note 1}	35	PASS
	190	836.6	31.36			PASS
	251	848.8	30.57			PASS
EGPRS 1900MHz	512	1850.2	28.44	Plot D1 to D3 ^{Note 1}	32	PASS
	661	1880.0	29.33			PASS
	810	1909.8	29.81			PASS

Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4175	4233	9262	9400	9538
	subtest	dBm			dBm		
5.2(WCDMA)	non	22.89	22.69	22.79	23.06	23.01	23.19
HSDPA	1	22.81	22.61	22.71	23.05	22.97	23.09
	2	22.87	22.68	22.77	23.05	22.99	23.11
	3	22.32	22.13	22.21	22.52	22.51	22.65
	4	22.34	22.18	22.23	22.53	22.49	22.69
HSUPA	1	22.83	22.62	22.76	23.05	22.98	23.12
	2	20.79	20.61	20.66	21.08	20.88	21.15
	3	21.78	21.61	21.71	22.06	21.85	22.15
	4	20.79	20.59	20.75	21.06	20.88	21.13
	5	22.81	22.61	22.71	23.03	22.97	23.11

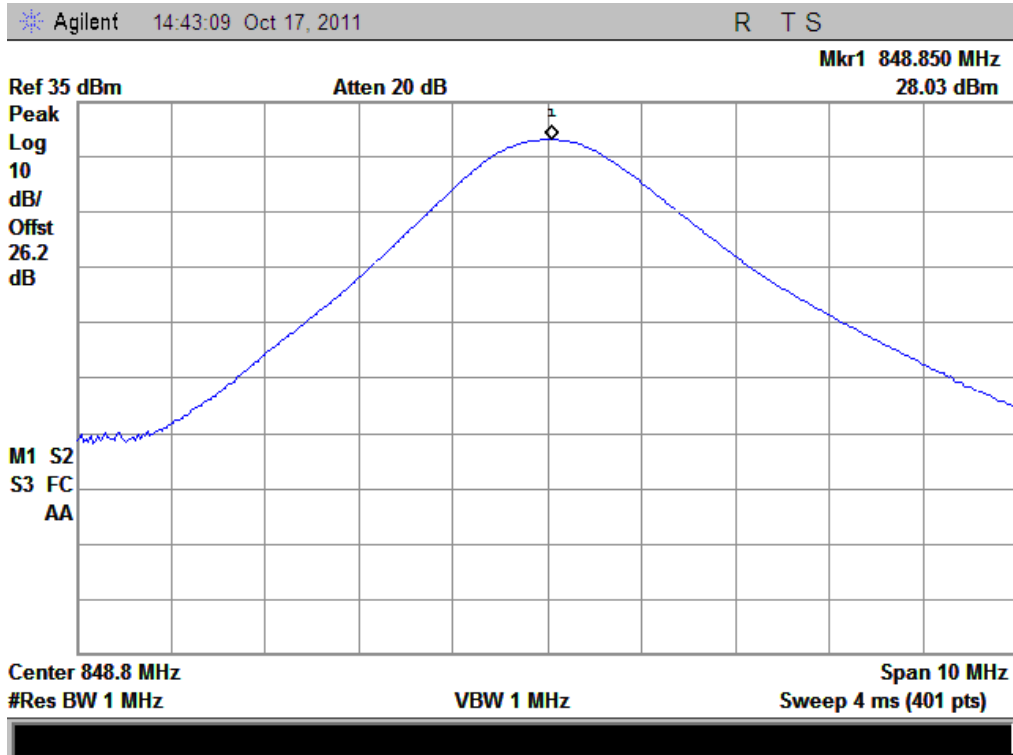
Note 1: For the GPRS model, all the slots were tested and just the worst data was record in this report.

B. Test Plots:


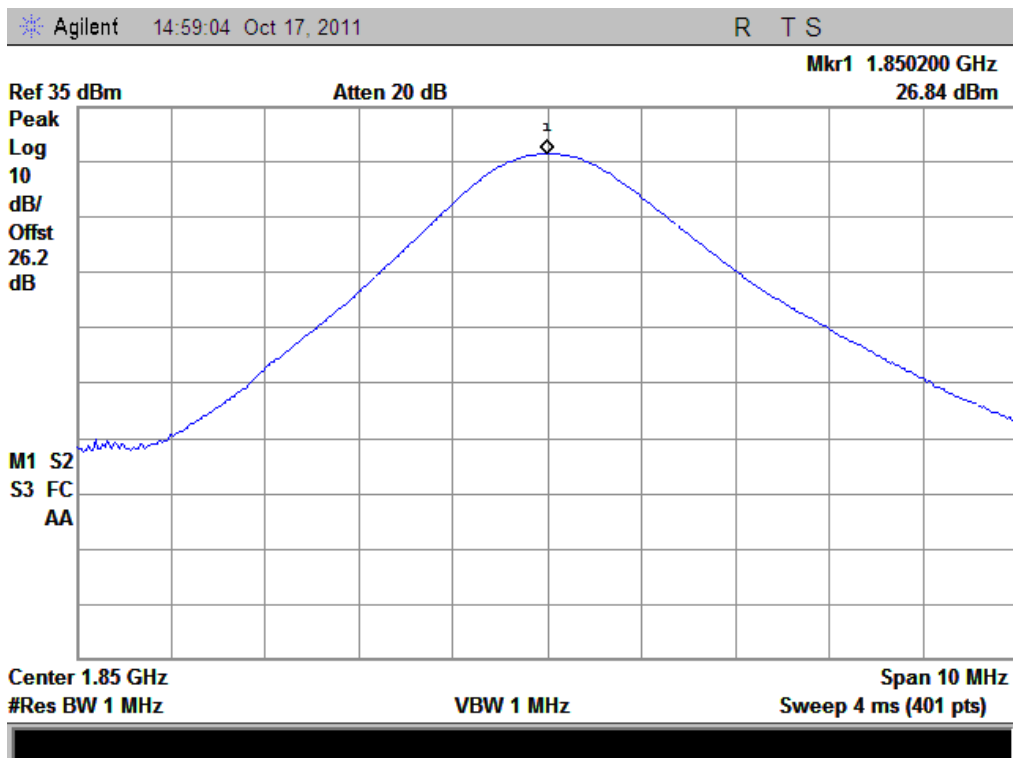
Plot A1: GPRS 850MHz Channel = 128



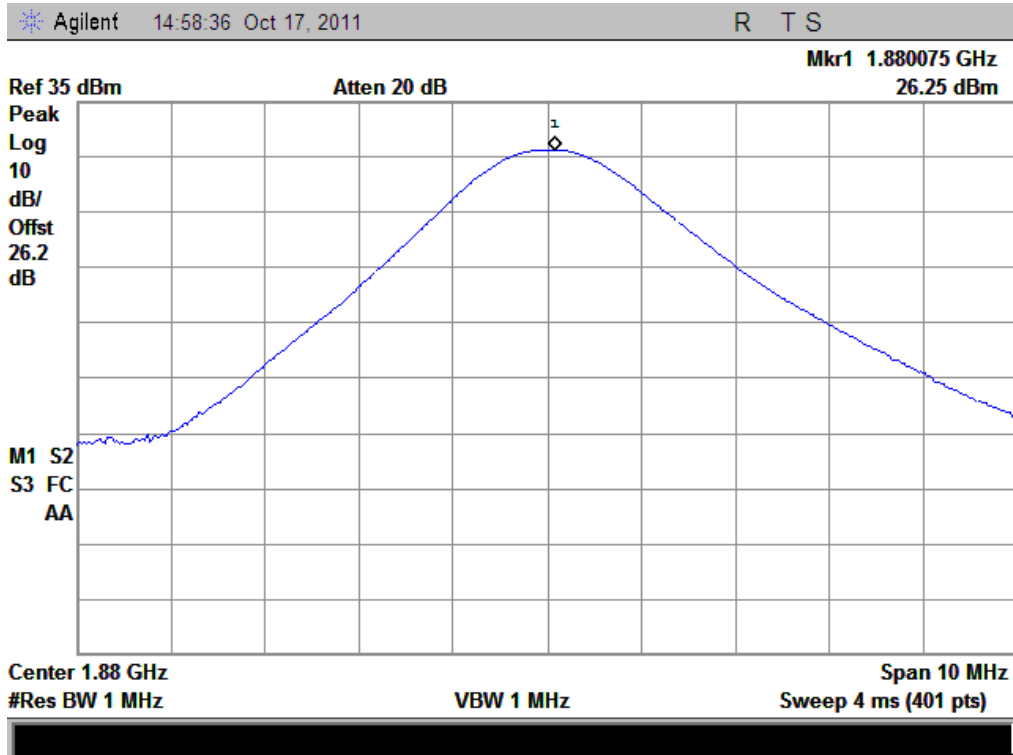
Plot A2: GPRS 850MHz Channel = 190



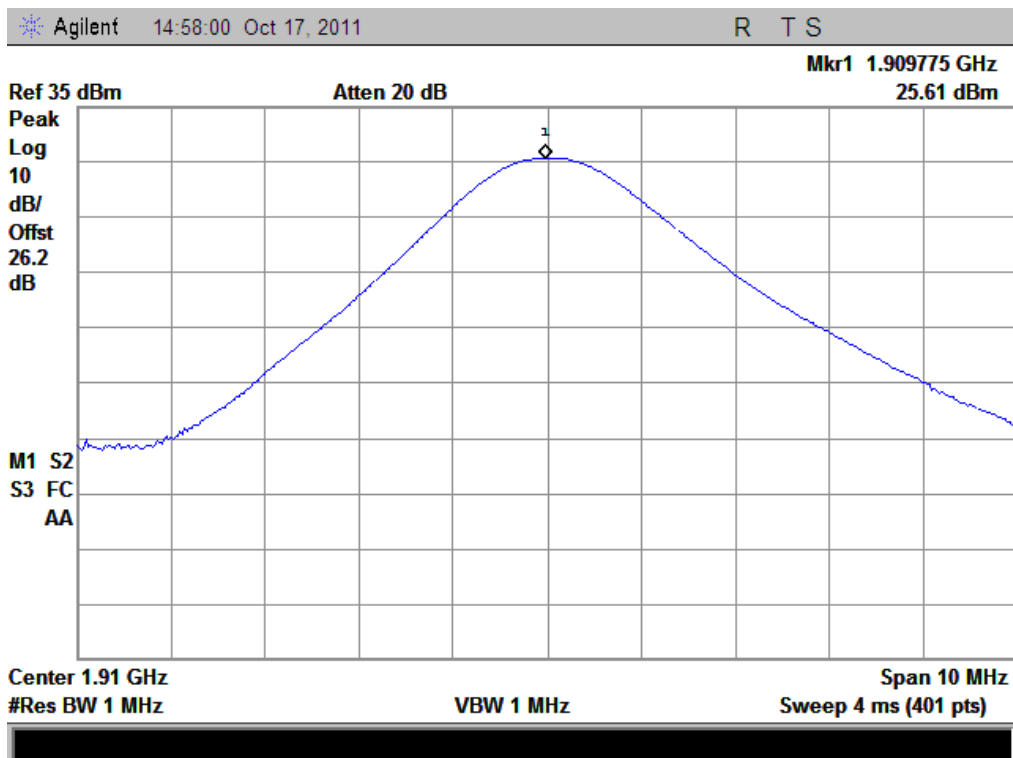
Plot A3: GPRS 850MHz Channel = 251



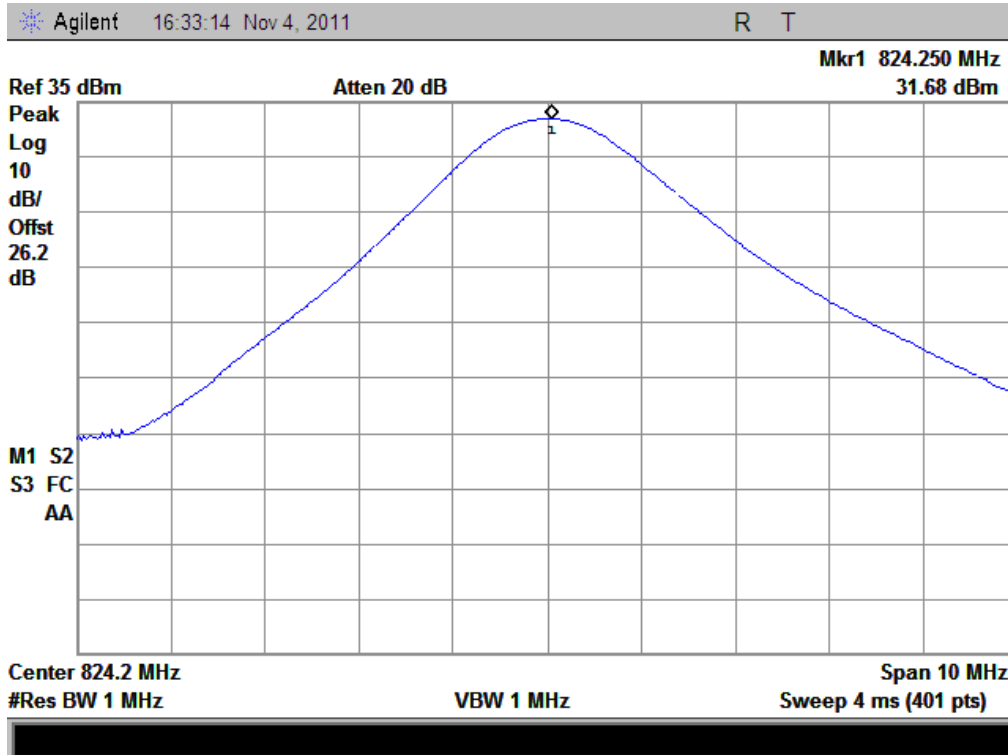
Plot B1: GPRS 1900MHz Channel = 512



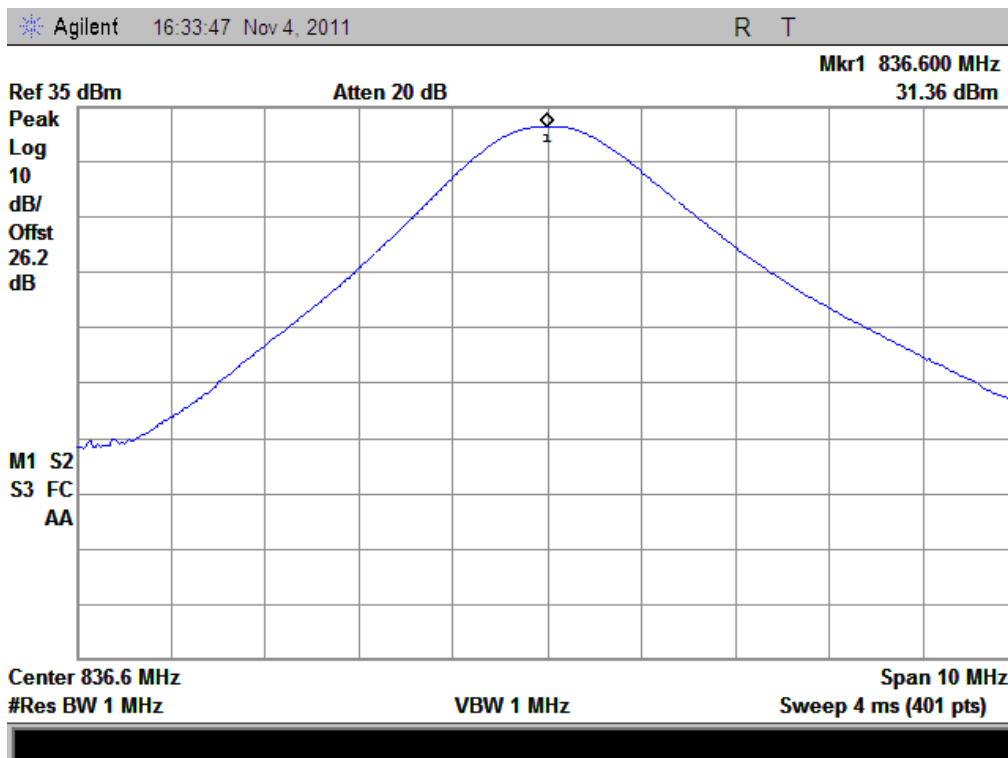
Plot B2: GPRS 1900MHz Channel = 661



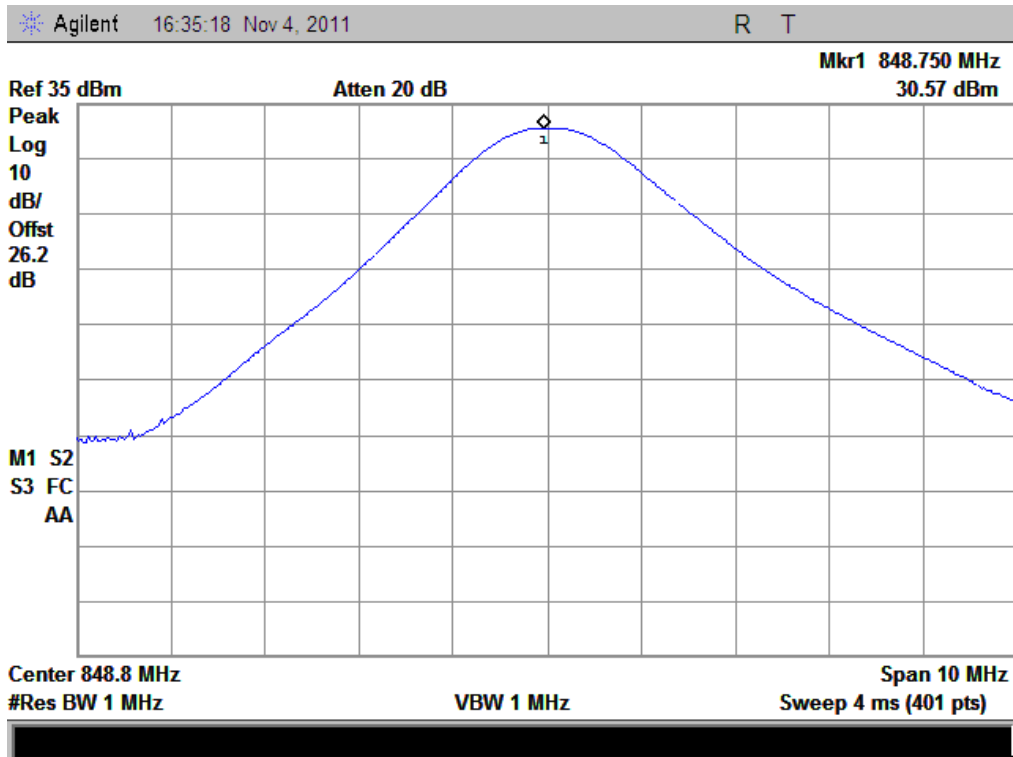
Plot B3: GPRS 1900MHz Channel = 810



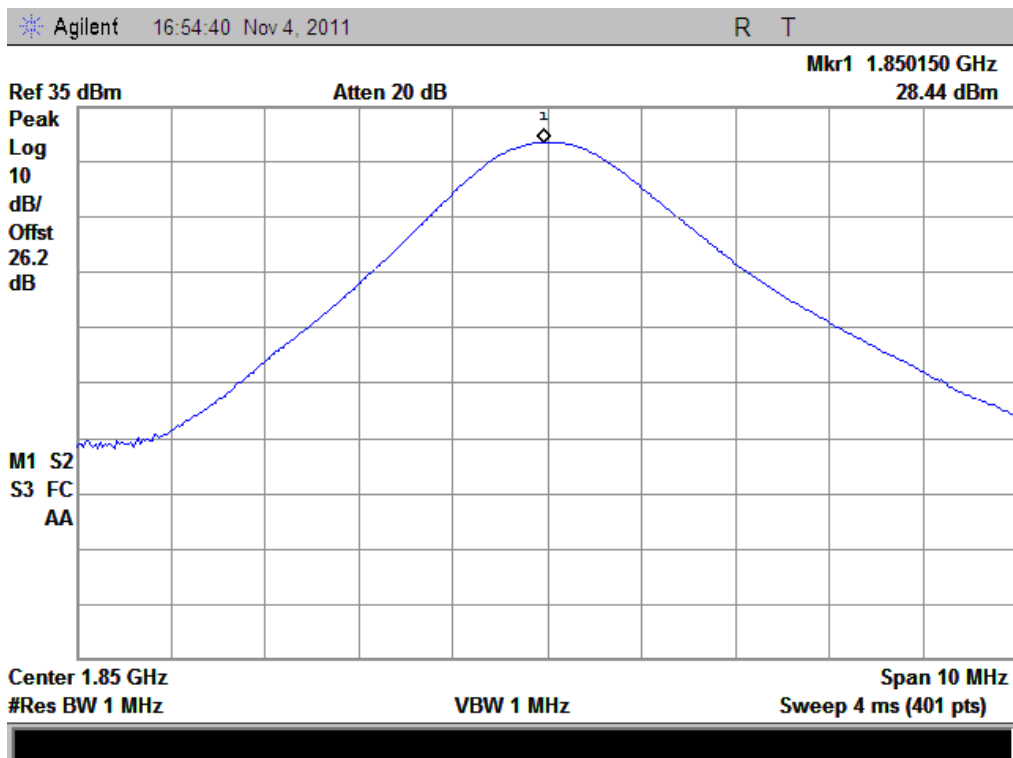
Plot C1: EGPRS 850MHz Channel = 128



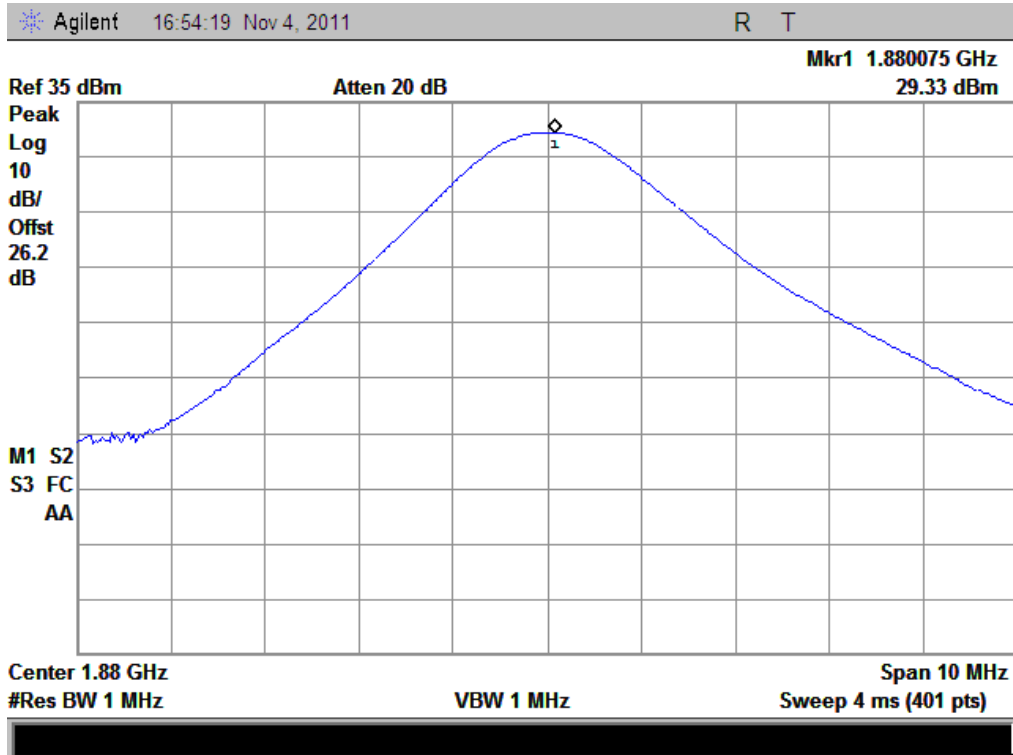
Plot C2: EGPRS 850MHz Channel = 190



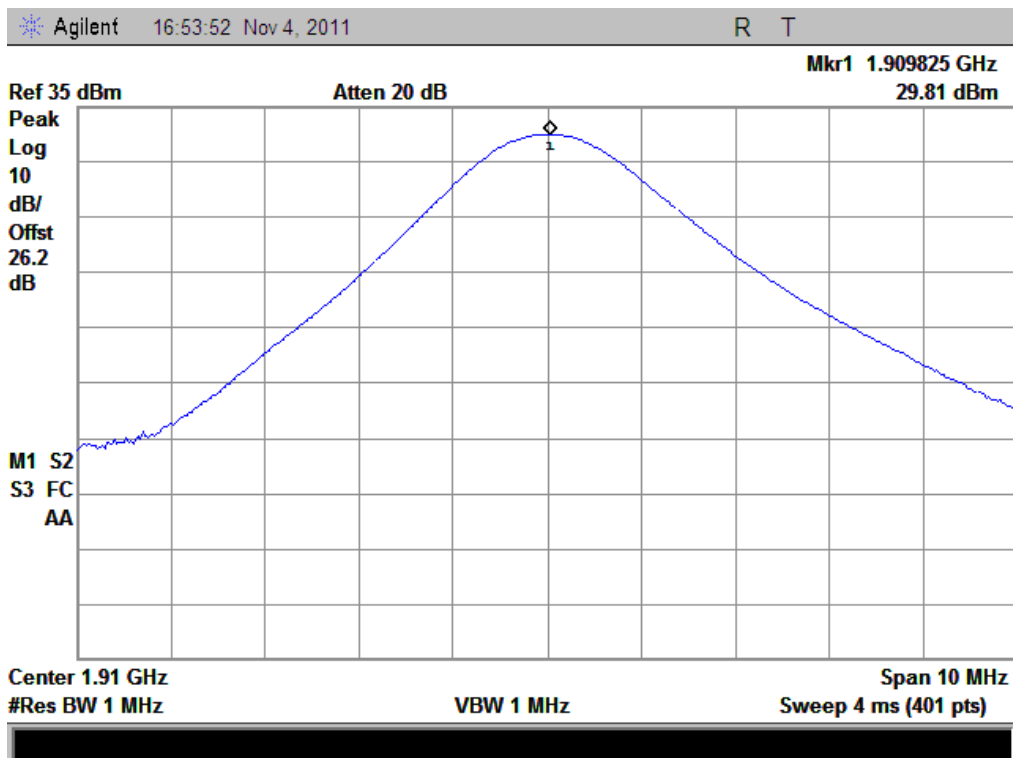
Plot C3: EGPRS850MHz Channel = 251



Plot D1: EGPRS 1900MHz Channel = 512



Plot D2: EGPRS1900MHz Channel = 661



Plot D3: EGPRS 1900MHz Channel = 810

2.2. 99% Occupied Bandwidth

2.2.1. 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.

2.2.2. Test Description

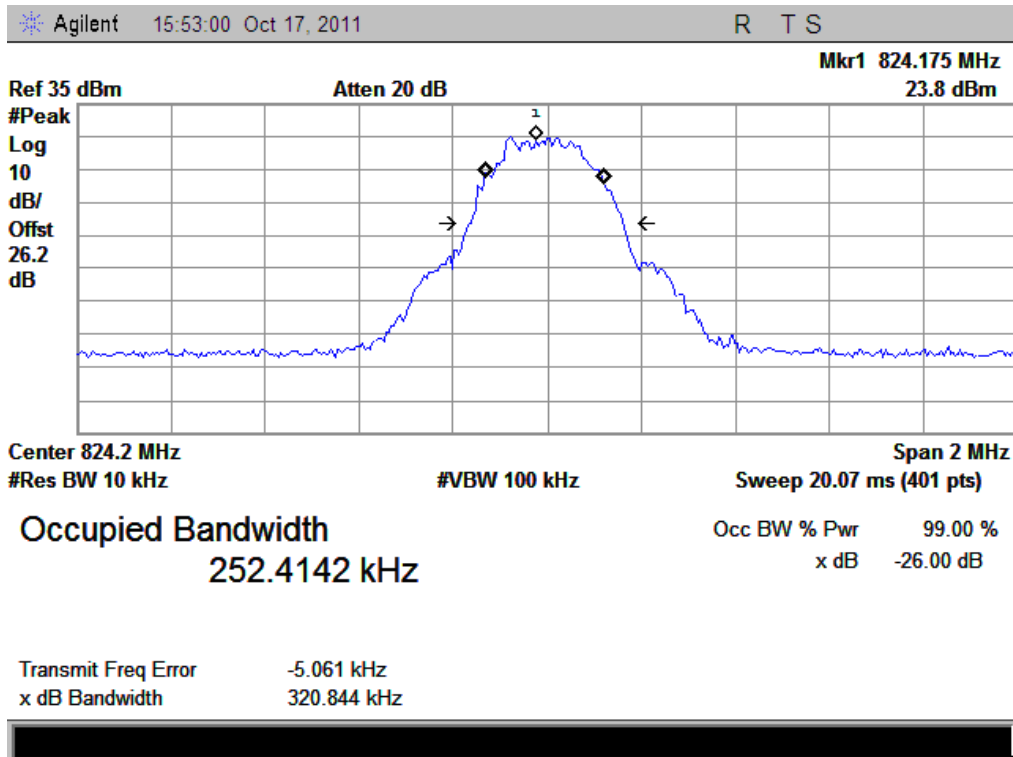
See section 2.1.2 of this report.

2.2.3. Test Verdict

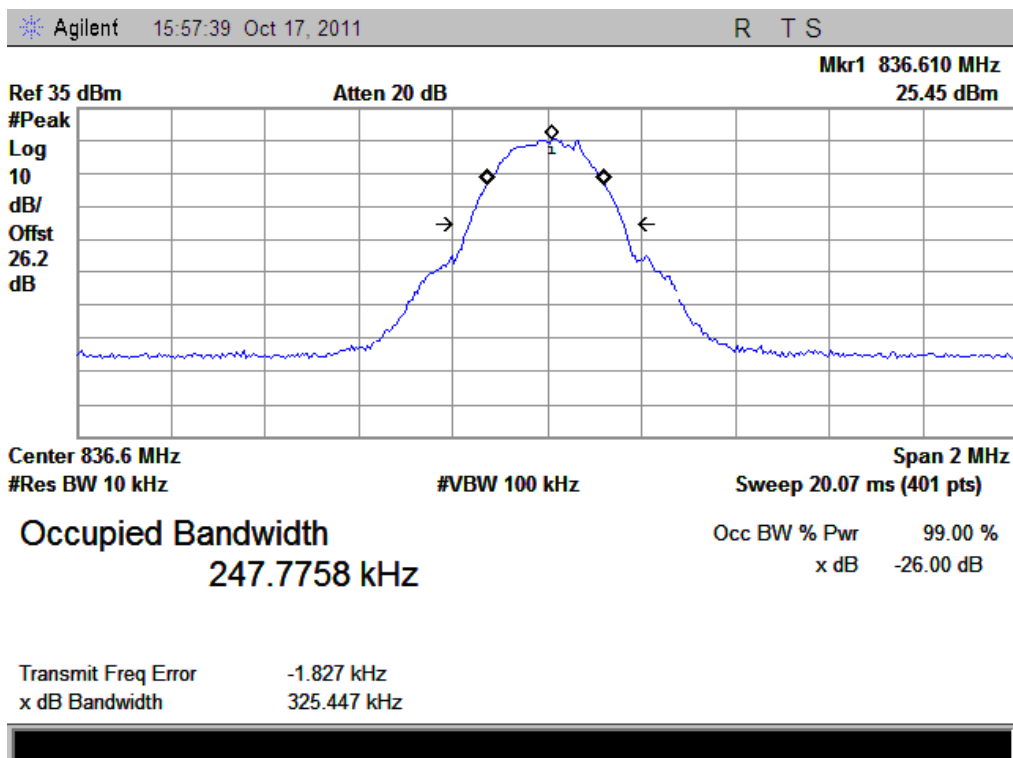
Here the lowest, middle and highest channels are tested to record the 99% occupied bandwidth

A. Test Verdict:

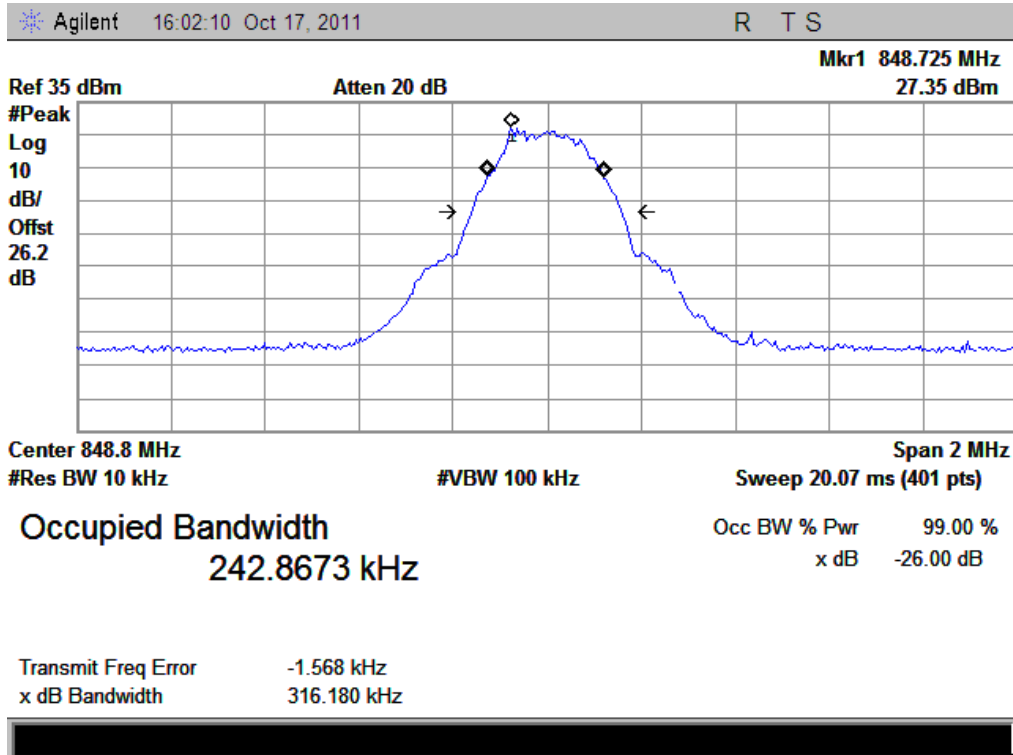
Band	Channel	Frequency (MHz)	Measured 99% Occupied Bandwidth (kHz)	Refer to Plot
EDGE 850MHz	128	824.2	252.4142 kHz	Plot A
	190	836.6	247.7758 kHz	Plot B
	251	848.8	242.8673 kHz	Plot C
EDGE 1900MHz	512	1850.2	242.2734 kHz	Plot D
	661	1880.0	248.7983 kHz	Plot E
	810	1909.8	246.9880 kHz	Plot F
WCDMA 850MHz	4175	835	4.1632MHz	Plot G
WCDMA 1900MHz	9400	1880	4.1587 MHz	Plot H
HSDPA 850MHz	4175	835	4.1678 MHz	Plot I
HSDPA 1900MHz	9400	1880	4.1751 MHz	Plot J
HSUPA 850MHz	4175	835	4.1788 MHz	Plot K
HSUPA 1900MHz	9400	1880	4.1735 MHz	Plot L

B. Test Plots:


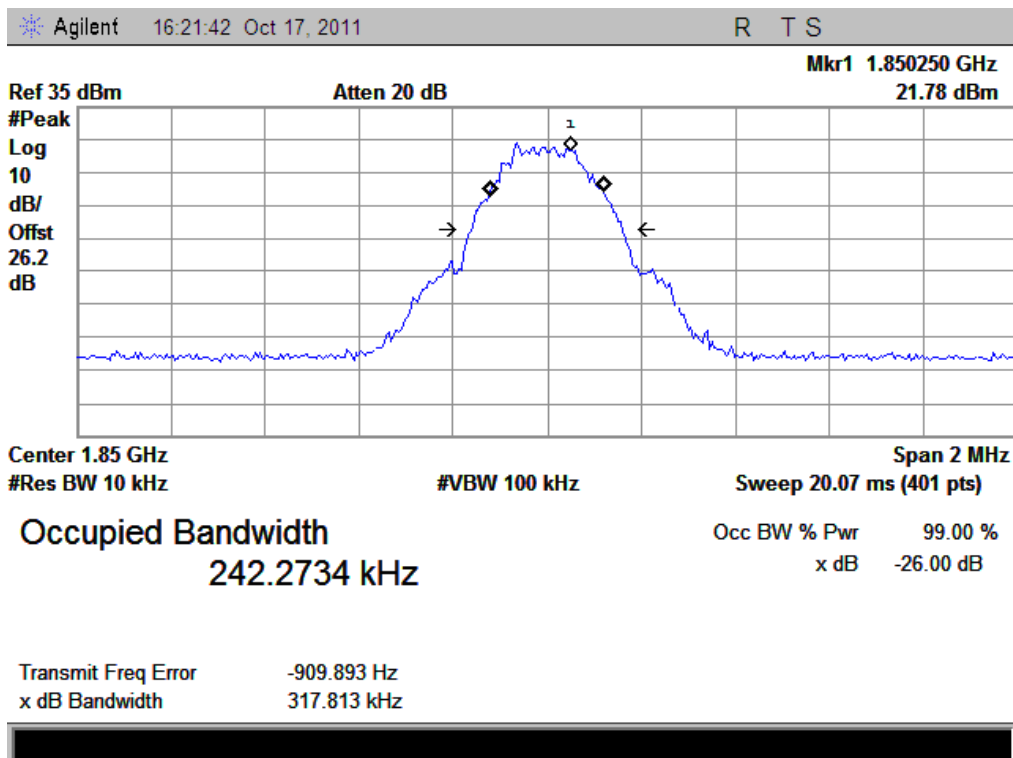
(Plot A: EGPRS 850MHz Channel = 128)



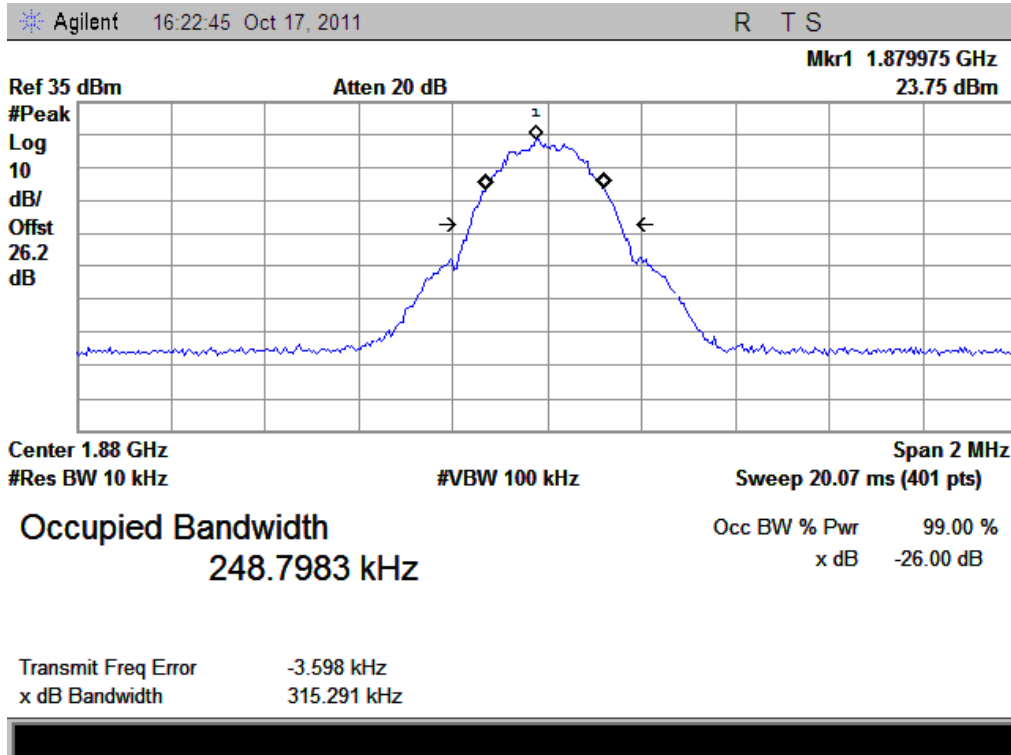
(Plot B: EGPRS 850MHz Channel = 190)



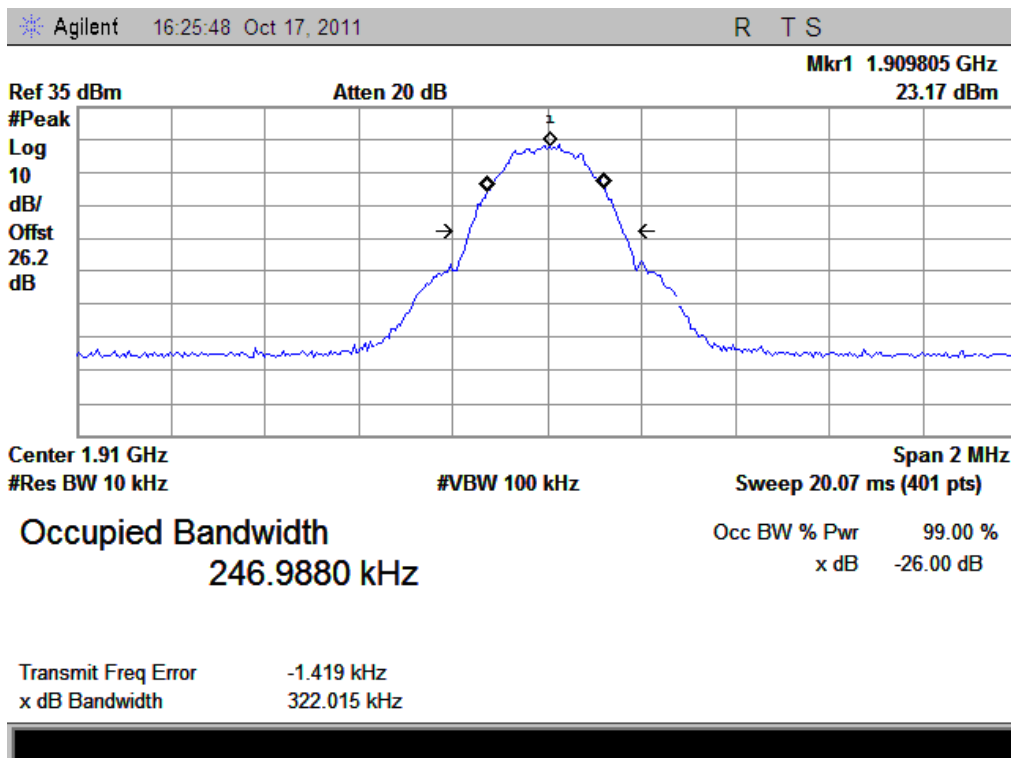
(Plot C: EGPRS 850MHz Channel = 251)



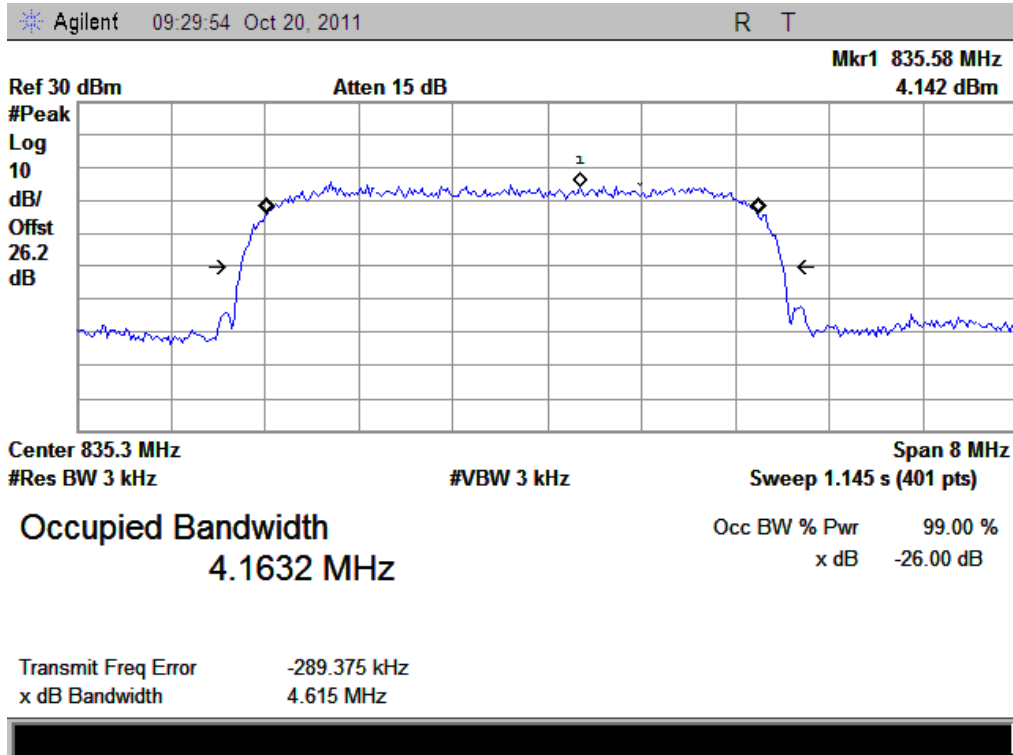
(Plot D: EGPRS 1900MHz Channel = 512)



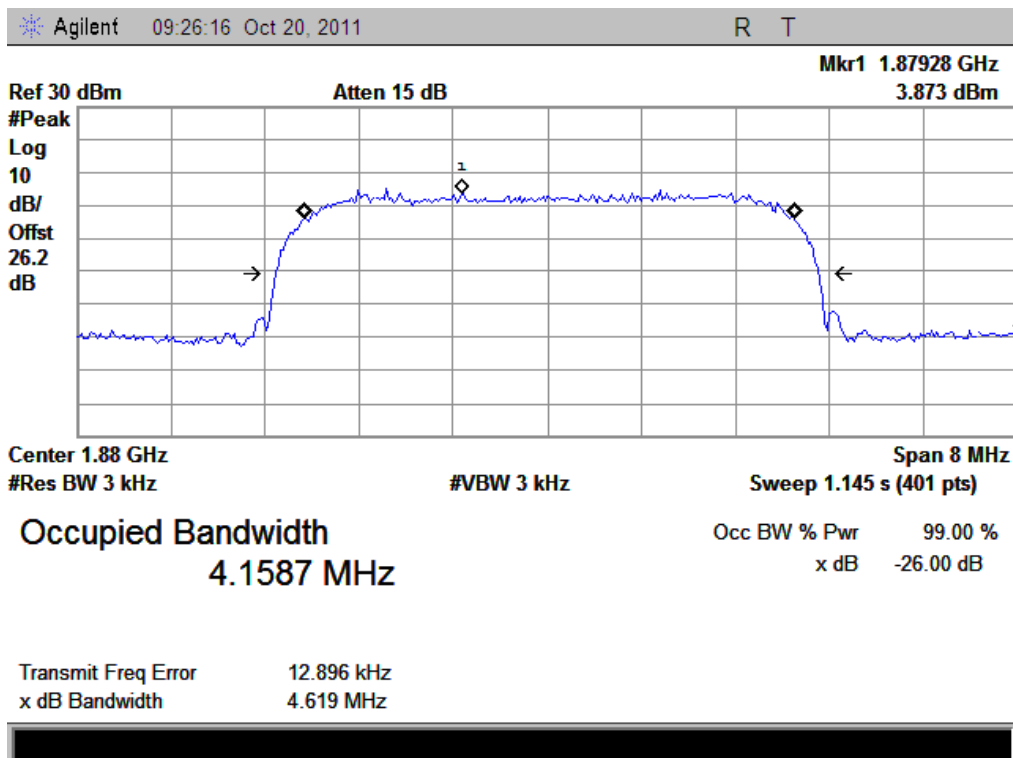
(Plot E: EGPRS 1900MHz Channel = 661)



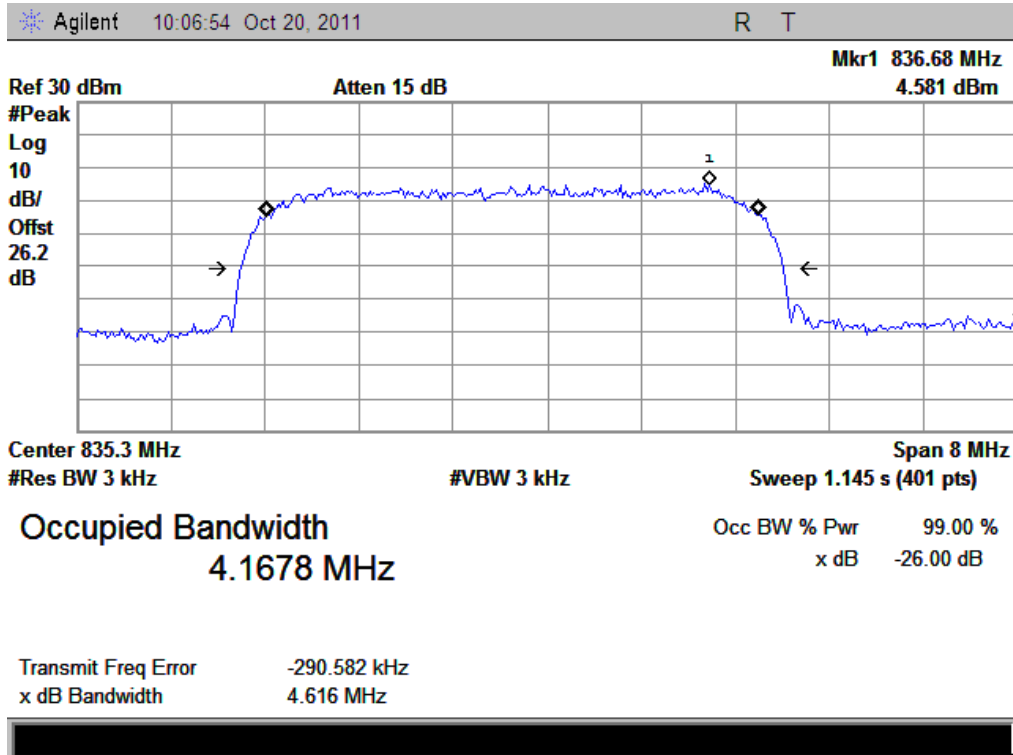
(Plot F: EGPRS 1900MHz Channel = 810)



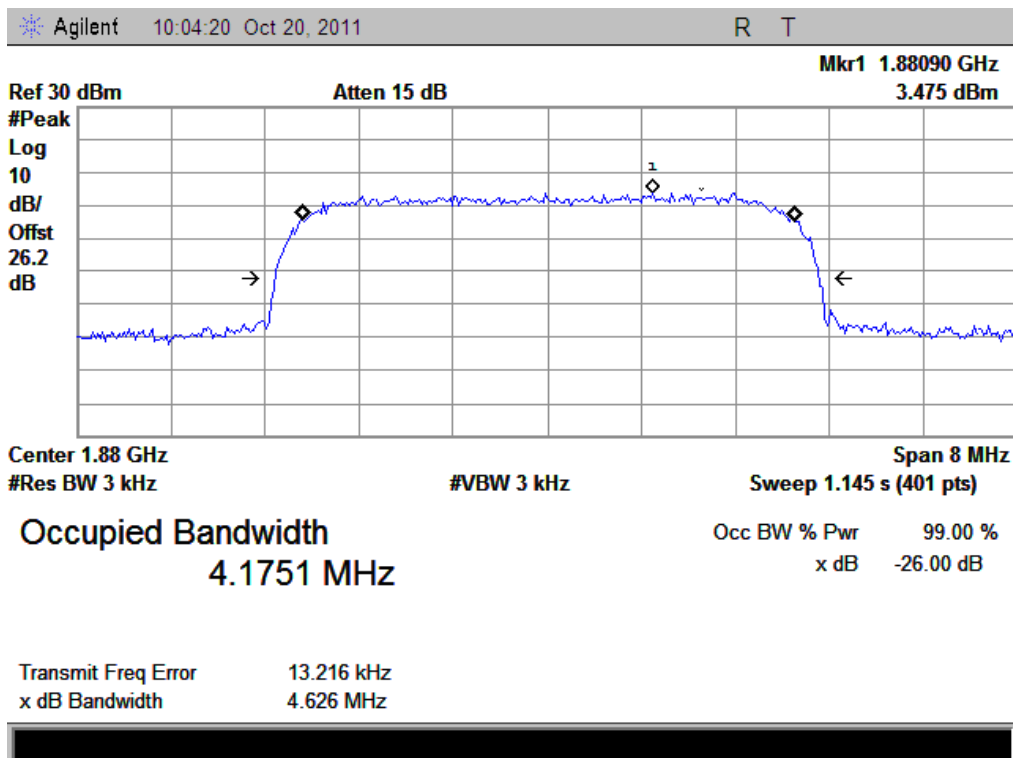
(Plot G: WCDMA 850MHz Channel = 4175)



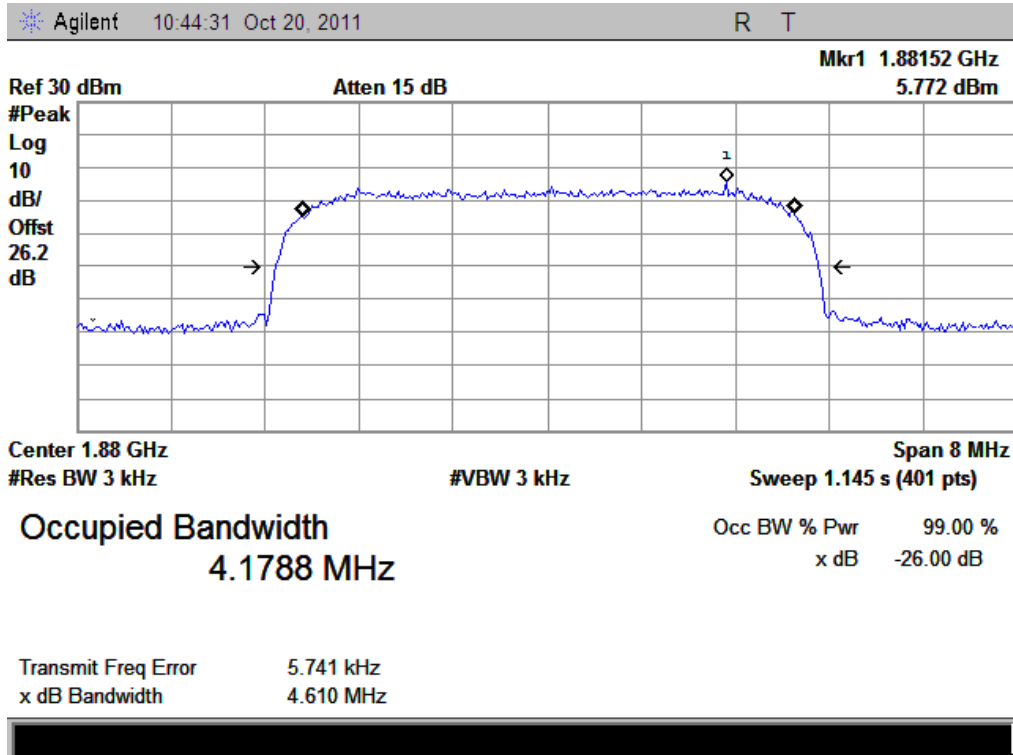
(Plot H: WCDMA 1900MHz Channel = 9400)



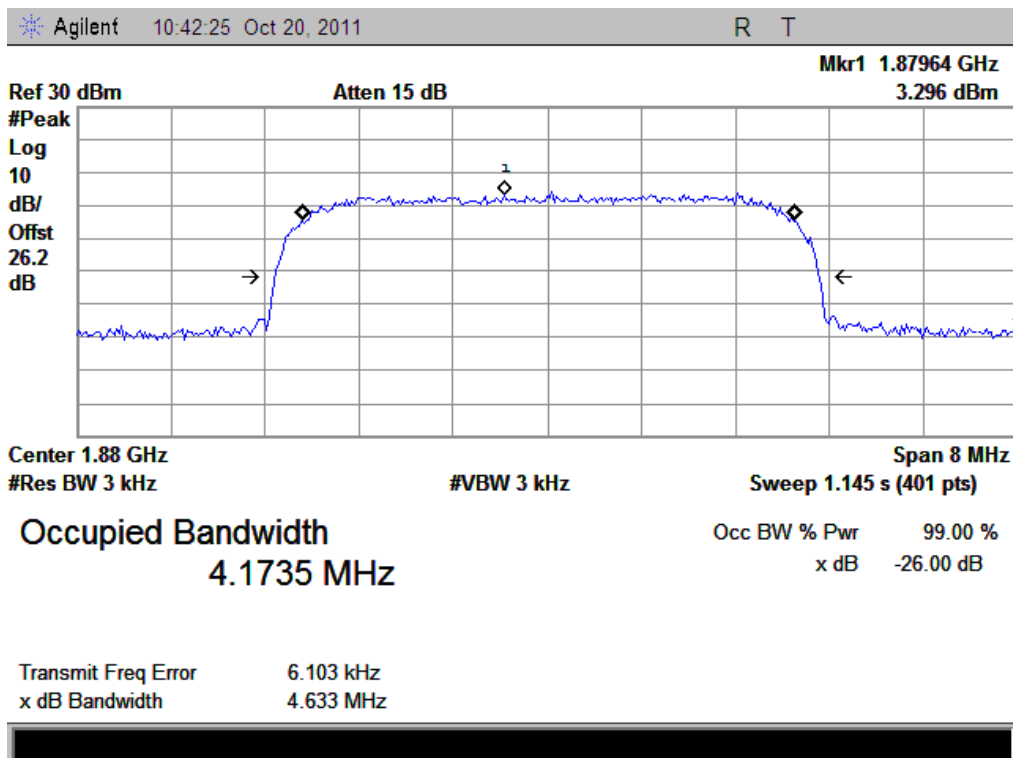
(Plot I: HSDPA 850 MHz Channel = 4175)



(Plot J: HSDPA 1900MHz Channel = 9400)



(Plot K: HSUPA 850MHz Channel = 4175)



(Plot L: HSUPA 1900MHz Channel = 9400)

2.3. Frequency Stability

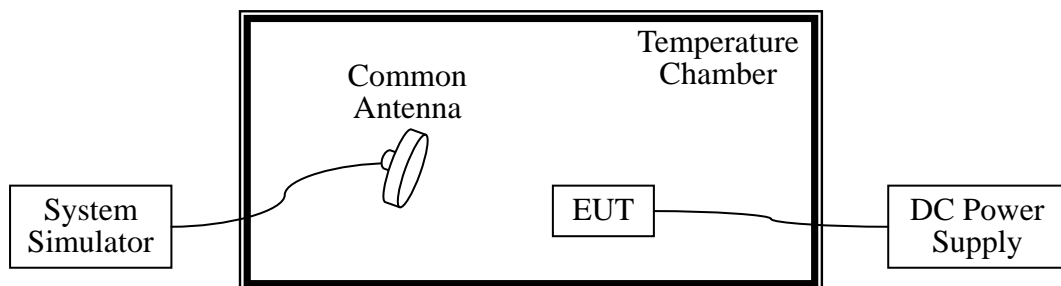
2.3.1. Requirement

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 $+50^{\circ}\text{C}$ 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.

2.3.2. Test Description

A. 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.

B. 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

2.3.3. Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of GSM 850MHz band is $\pm 2.5\text{ppm}$, and GSM 1900MHz is $\pm 1\text{ppm}$, WCDMA 850MHz band is $\pm 2.5\text{ppm}$, and WCDMA 1900MHz is $\pm 1\text{ppm}$

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	
EDGE 850 MHz	3.7	-30	27.12	±2060.5	27.82	±2091.5	25.74	±2122	
		-20	26.83		29.70		25.74		
		-10	23.28		28.12		31.14		
		0	25.11		21.06		25.17		
		+10	-23.13		13.07		25.47		
		+20	-10.39		-12.76		-7.61		
		+30	17.75		-2.05		6.09		
		+40	5.31		-33.77		15.49		
		+50	-12.19		5.39		10.19		
	4.2	+25	20.74	19.65	8.71				
3.6	+25	-27.28	-26.96	-25.27					
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	
EDGE 1900 MHz	3.7	-30	29.30	±1850.2	27.82	±1880.0	29.47	±1909.8	
		-20	29.22		29.45		29.30		
		-10	25.19		28.17		27.12		
		0	29.37		-3.20		11.82		
		+10	13.97		20.04		19.77		
		+20	22.42		-14.29		-22.73		
		+30	18.57		-27.62		-22.22		
		+40	-19.93		-17.97		22.21		
		+50	23.76		-18.23		-22.22		
	4.2	+25	-21.20	27.16	22.63				
3.6	+25	-19.17	-15.31	-15.15					

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4132 (826.4MHz)		Channel = 4175 (835 MHz)		Channel = 4233 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
WCDMA 850 MHz	3.7	-30	27.12	±2060.5	27.82	±2091.5	25.74	±2122	
		-20	26.83		29.70		25.74		
		-10	23.28		28.12		31.14		
		0	25.11		21.06		25.17		
		+10	-23.13		13.07		25.47		
		+20	-10.39		-12.76		-7.61		
		+30	17.75		-2.05		6.09		
		+40	5.31		-33.77		15.49		
	+50	-12.19	5.39	10.19					
	4.2	+25	20.74	19.65	8.71				
3.6	+25	-27.28	-26.96	-25.27					
WCDMA 1900 MHz	3.7	-30	29.30	±1850.2	27.82	±1880.0	29.47	±1909.8	
		-20	29.22		29.45		29.30		
	-10	25.19	28.17	27.12					
WCDMA 1900 MHz	3.7	0	29.37	±1850.2	-3.20	±1880.0	11.82	±1909.8	
		+10	13.97		20.04		19.77		
		+20	22.42		-14.29		-22.73		
		+30	18.57		-27.62		-22.22		
		+40	-19.93		-17.97		22.21		
		+50	23.76		-18.23		-22.22		
		4.2	+25		-21.20		27.16		22.63
		3.6	+25		-19.17		-15.31		-15.15

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4132 (826.4MHz)		Channel = 4175 (835 MHz)		Channel = 4233 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSDPA 850 MHz	3.7	-30	27.12	±2060.5	27.82	±2091.5	25.74	±2122	
		-20	26.83		29.70		25.74		
		-10	23.28		28.12		31.14		
		0	25.11		21.06		25.17		
		+10	-23.13		13.07		25.47		
		+20	-10.39		-12.76		-7.61		
		+30	17.75		-2.05		6.09		
		+40	5.31		-33.77		15.49		
	+50	-12.19	5.39	10.19					
	4.2	+25	20.74	19.65	8.71				
3.6	+25	-27.28	-26.96	-25.27					
Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 9262 (1852.4MHz)		Channel = 9400 (1880.0MHz)		Channel = 9538 (1907.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSDPA 1900 MHz	3.7	-30	29.30	±1850.2	27.82	±1880.0	29.47	±1909.8	
		-20	29.22		29.45		29.30		
		-10	25.19		28.17		27.12		
		0	29.37		-3.20		11.82		
		+10	13.97		20.04		19.77		
		+20	22.42		-14.29		-22.73		
		+30	18.57		-27.62		-22.22		
		+40	-19.93		-17.97		22.21		
	+50	23.76	-18.23	-22.22					
	4.2	+25	-21.20	27.16	22.63				
3.6	+25	-19.17	-15.31	-15.15					

Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 4132 (826.4MHz)		Channel = 4175 (835 MHz)		Channel = 4233 (846.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSUPA 850 MHz	3.7	-30	27.12	±2060.5	27.82	±2091.5	25.74	±2122	
		-20	26.83		29.70		25.74		
		-10	23.28		28.12		31.14		
		0	25.11		21.06		25.17		
		+10	-23.13		13.07		25.47		
		+20	-10.39		-12.76		-7.61		
		+30	17.75		-2.05		6.09		
		+40	5.31		-33.77		15.49		
		+50	-12.19		5.39		10.19		
	4.2	+25	20.74	19.65	8.71				
3.6	+25	-27.28	-26.96	-25.27					
Band	Test Conditions		Frequency Deviation						Verdict
	Power (VDC)	Temperature (°C)	Channel = 9262 (1852.4MHz)		Channel = 9400 (1880.0MHz)		Channel = 9538 (1907.6MHz)		
			Hz	Limits	Hz	Limits	Hz	Limits	
HSUPA 1900 MHz	3.7	-30	29.30	±1850.2	27.82	±1880.0	29.47	±1909.8	
		-20	29.22		29.45		29.30		
		-10	25.19		28.17		27.12		
		0	29.37		-3.20		11.82		
		+10	13.97		20.04		19.77		
		+20	22.42		-14.29		-22.73		
		+30	18.57		-27.62		-22.22		
		+40	-19.93		-17.97		22.21		
		+50	23.76		-18.23		-22.22		
	4.2	+25	-21.20	27.16	22.63				
3.6	+25	-19.17	-15.31	-15.15					

2.4. Conducted Out of Band Emissions

2.4.1. 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.

2.4.2. Test Description

See section 2.1.2 of this report.

2.4.3. Test Result

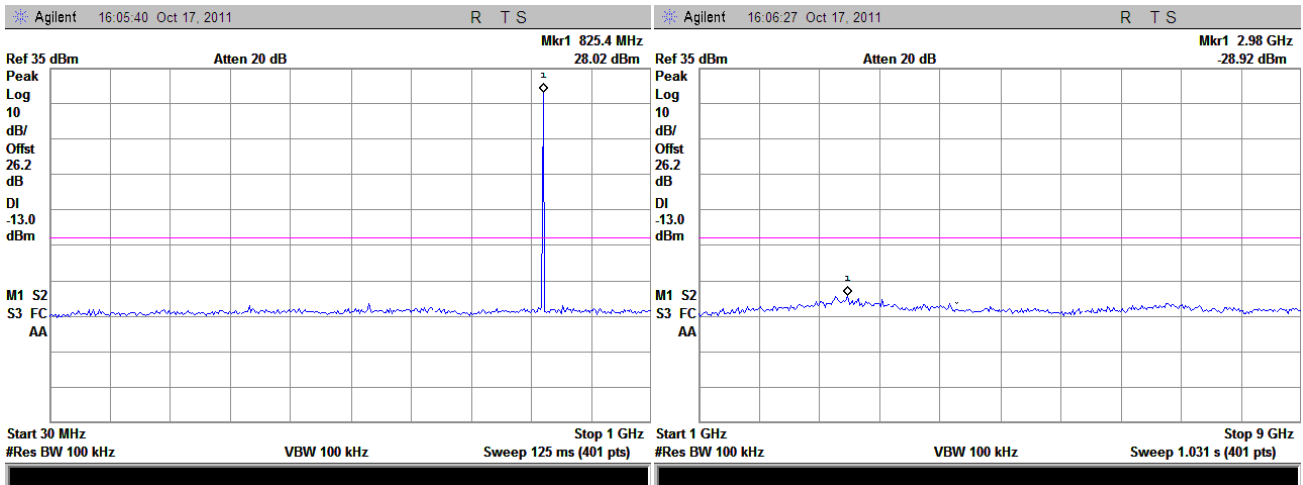
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Test Verdict:

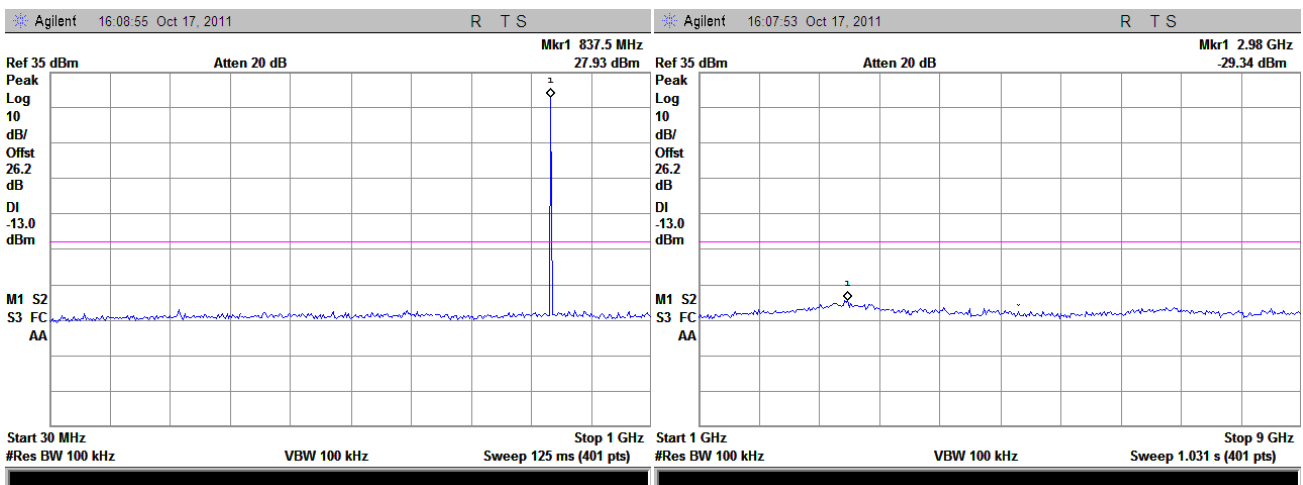
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
EDGE 850MHz	128	824.2	<-25	Plot A1toA1.1	-13	PASS
	190	836.6	<-25	Plot A2toA2.1		PASS
	251	848.8	<-25	Plot A3toA3.1		PASS
EDGE 1900MHz	512	1850.2	<-25	Plot B1toB1.1	-13	PASS
	661	1880.0	<-25	Plot B2toB2.1		PASS
	810	1909.8	<-25	Plot B3toB3.1		PASS
WCDMA 850MHz	4132	824.2	<-25	Plot C1toC1.1	-13	PASS
	4175	836.6	<-25	Plot C2toC2.1		PASS
	4233	848.8	<-25	Plot C3toC3.1		PASS
WCDMA 1900MHz	9262	1850.2	<-25	Plot D1toD1.1	-13	PASS
	9400	1880.0	<-25	Plot D2toD2.1		PASS
	9538	1909.8	<-25	Plot D3toD3.1		PASS
HSDPA 850MHz	4132	826.4	<-25	Plot E1toE1.1	-13	PASS
	4175	835	<-25	Plot E2toE2.1		PASS
	4233	846.6	<-25	Plot E3toE3.1		PASS
HSDPA 1900MHz	9262	1852.4	<-25	Plot F1toF1.1	-13	PASS
	9400	1880	<-25	Plot F2toF2.1		PASS
	9538	1907.6	<-25	Plot F3to3.1		PASS
HSUPA 850MHz	4132	826.4	<-25	Plot G1toG1.1	-13	PASS
	4175	835	<-25	Plot G2toG2.1		PASS
	4233	846.6	<-25	Plot G3toG3.1		PASS
HSUPA 1900MHz	9262	1852.4	<-25	Plot H1toH1.1	-13	PASS
	9400	1880	<-25	Plot H2toH2.1		PASS
	9538	1907.6	<-25	Plot H3toH3.1		PASS

Test Plots for the Whole Measurement Frequency Range:

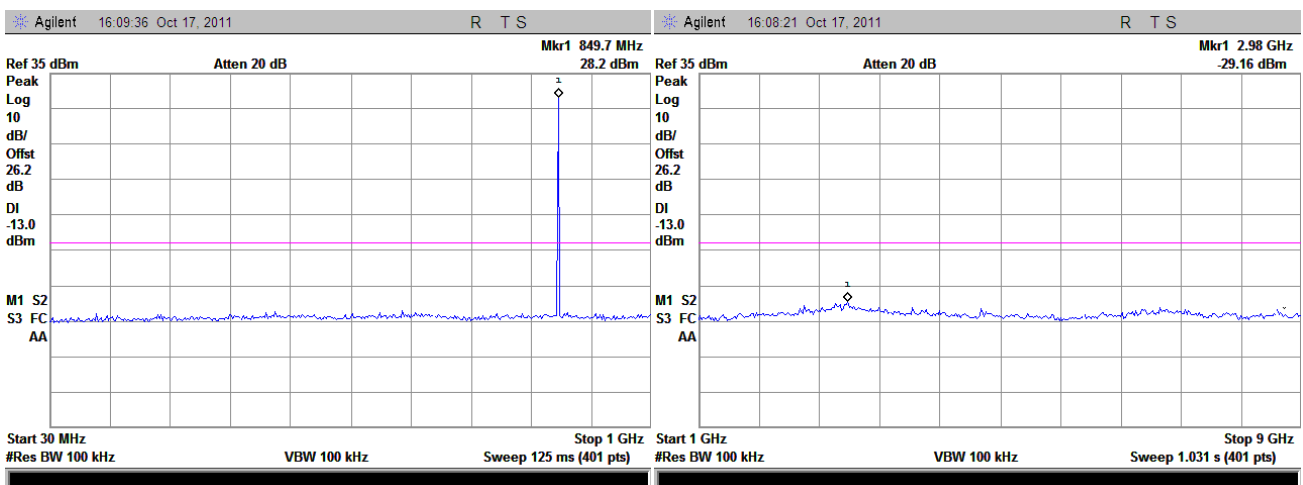
Note: the power of the EUT transmitting frequency should be ignored.



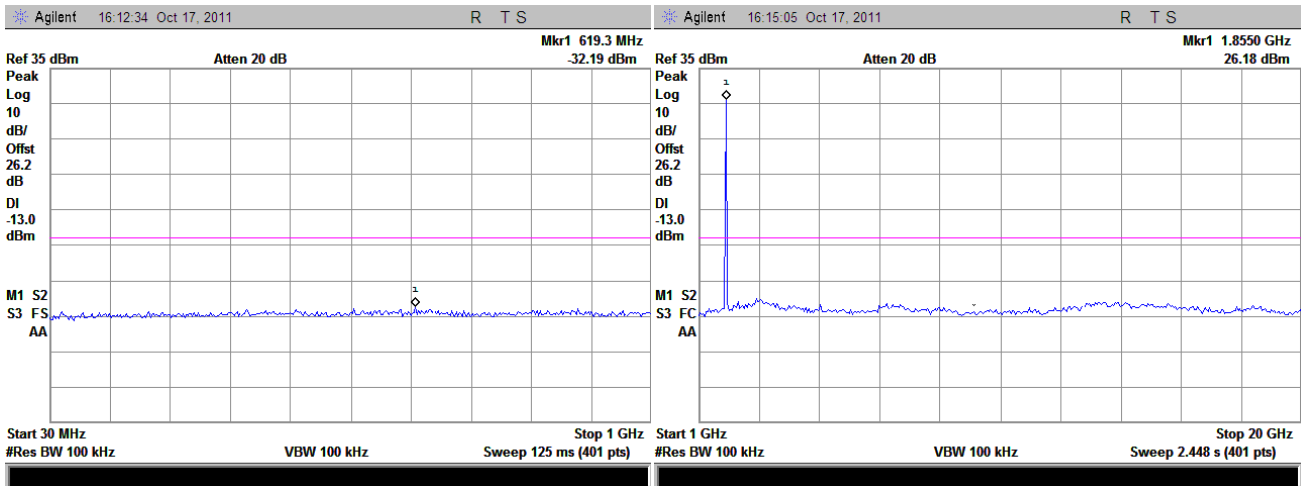
(Plot A1 to A1.1: EGPRS 850MHz Channel = 128,30MHz to 9GHz)



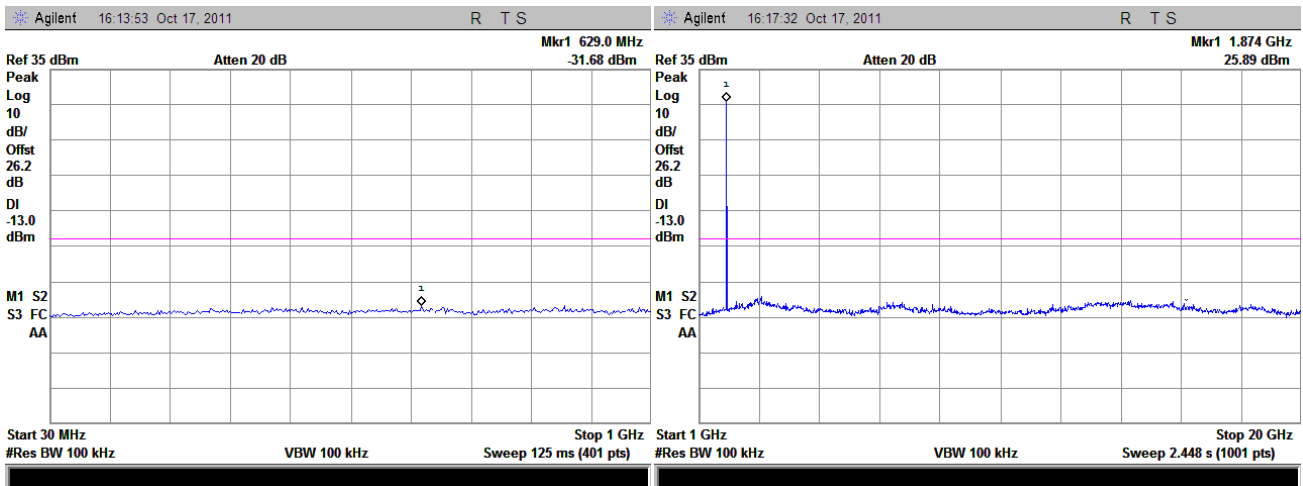
(Plot A2 to A2.1 : EGPRS 850MHz Channel = 190, 30 MHz to 9GHz)



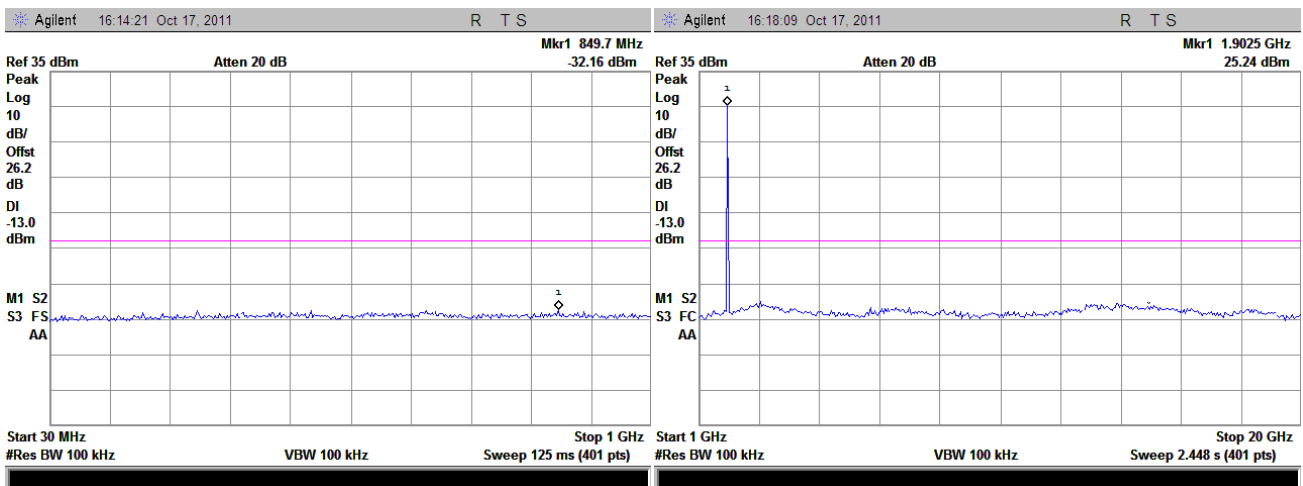
(Plot A3 to A3.1: EGPRS 850MHz Channel = 251, 30MHz to 9GHz)



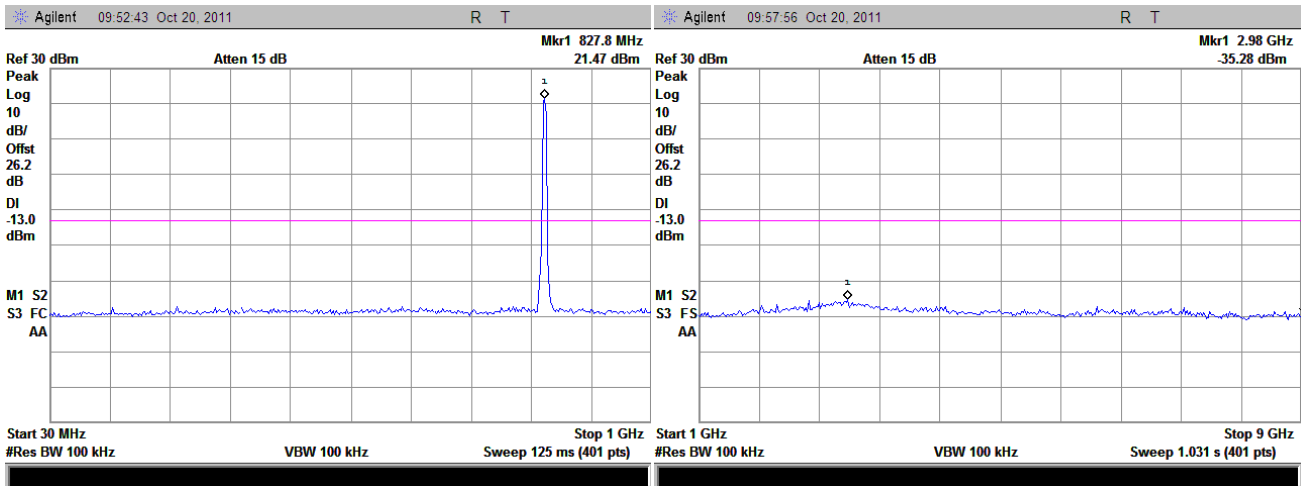
(Plot B1 to B1.1: EGPRS 1900MHz Channel = 512, 30 MHz to 20GHz)



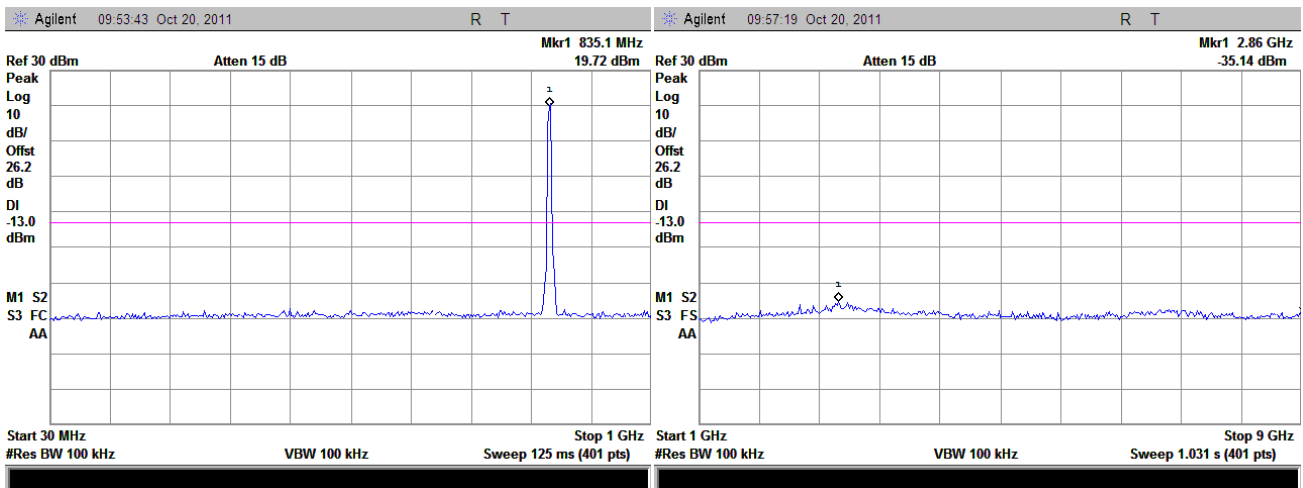
(Plot B2 to B2.1: EGPRS 1900MHz Channel = 661, 30 MHz to 20GHz)



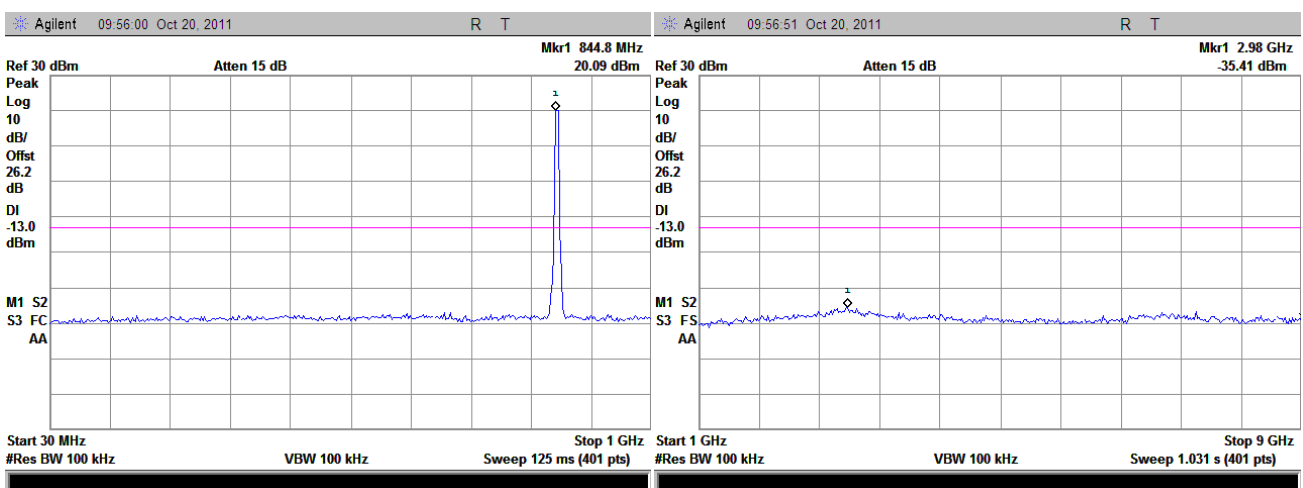
(Plot B3 to B3.1: EGPRS 1900MHz Channel = 810, 30 MHz to 20GHz)



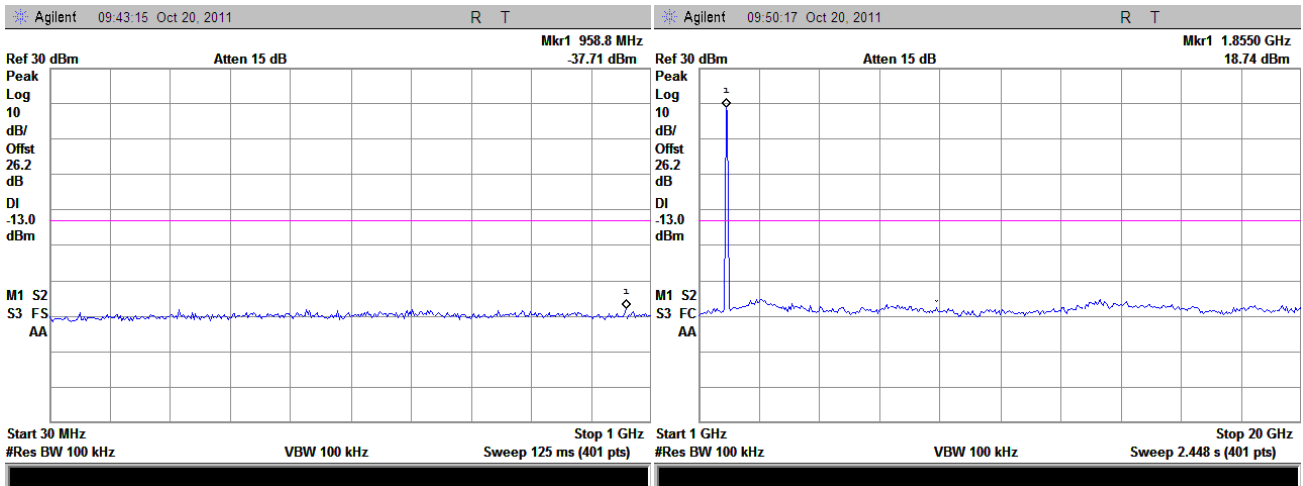
(Plot C1 to C1.1: (WCDMA 850MHz Channel =4132, 30MHz to 9GHz)



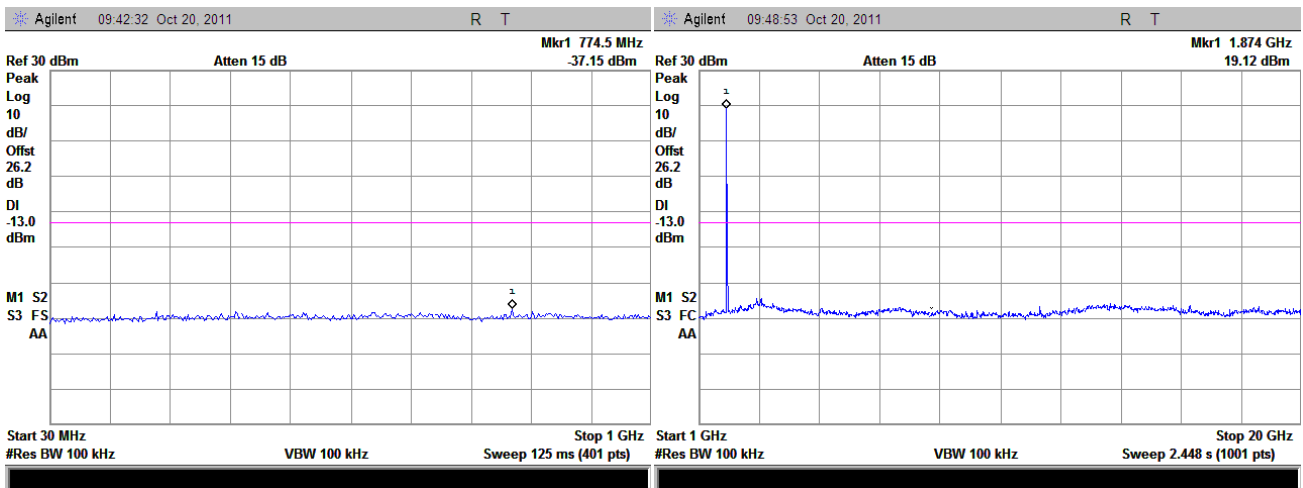
(Plot C2 to C2.1: WCDMA 850MHz Channel =4175, 30MHz to 9GHz)



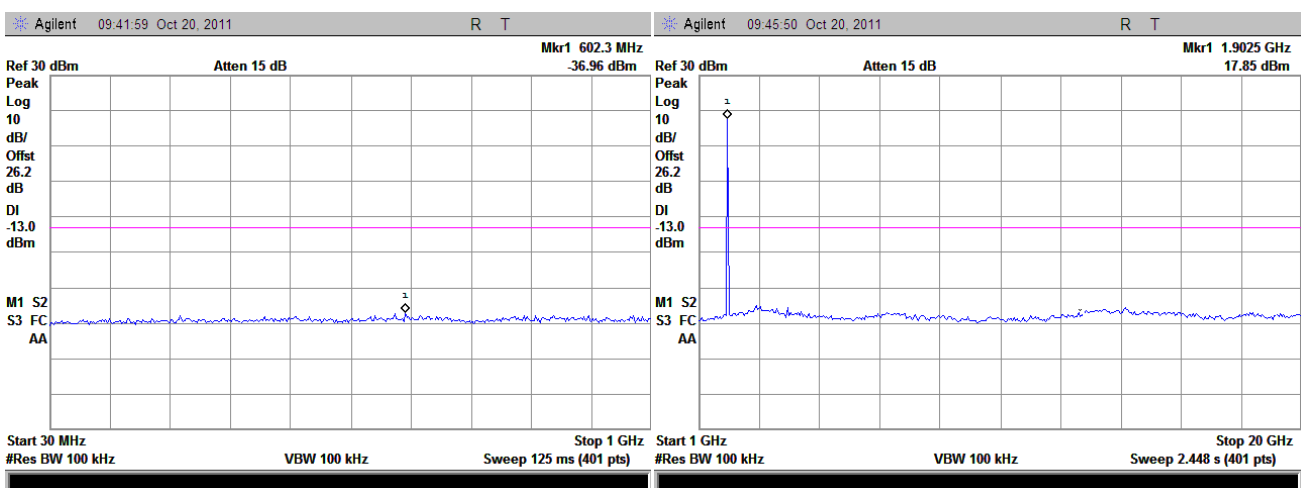
(Plot C3 to C3.1: WCDMA 850MHz Channel =4233, 30MHz to 9GHz)



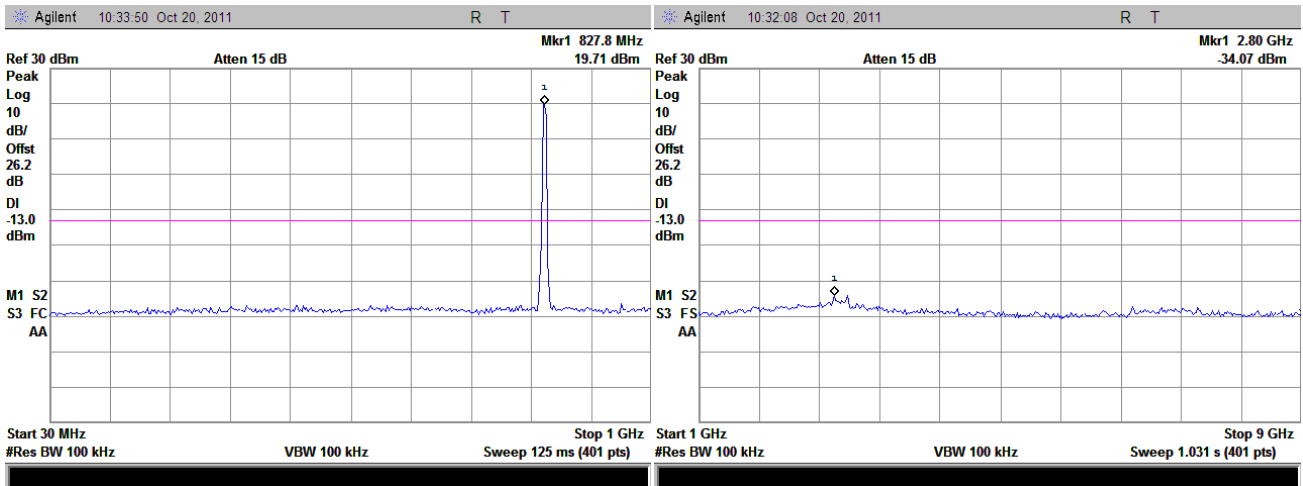
(Plot D1 to D1.1: WCDMA 1900MHz Channel =9262, 30MHz to 20GHz)



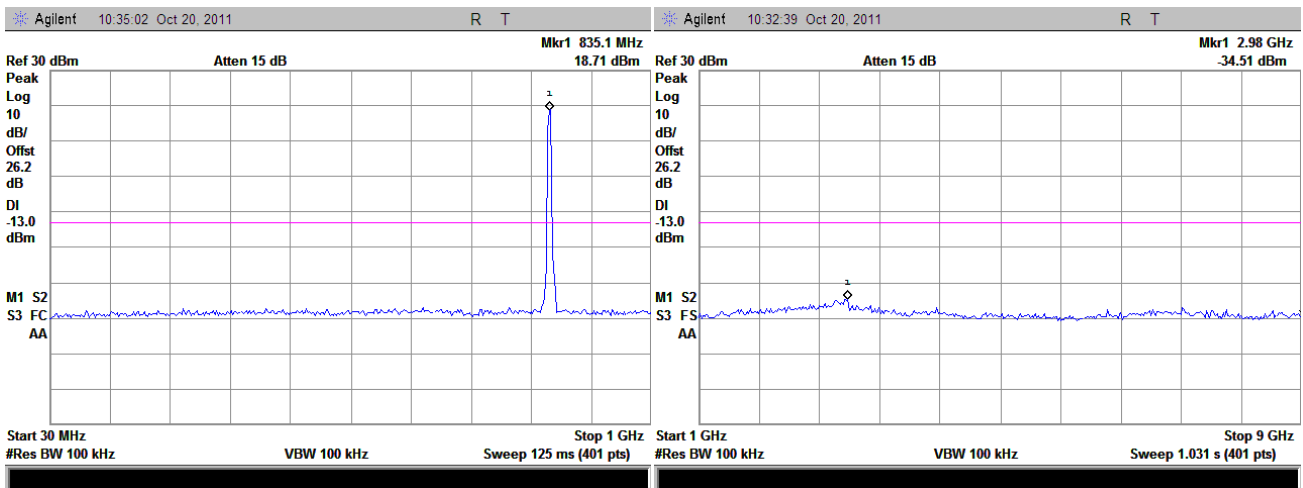
(Plot D2 to D2.1: WCDMA 1900MHz Channel =9400, 30MHz to 20GHz)



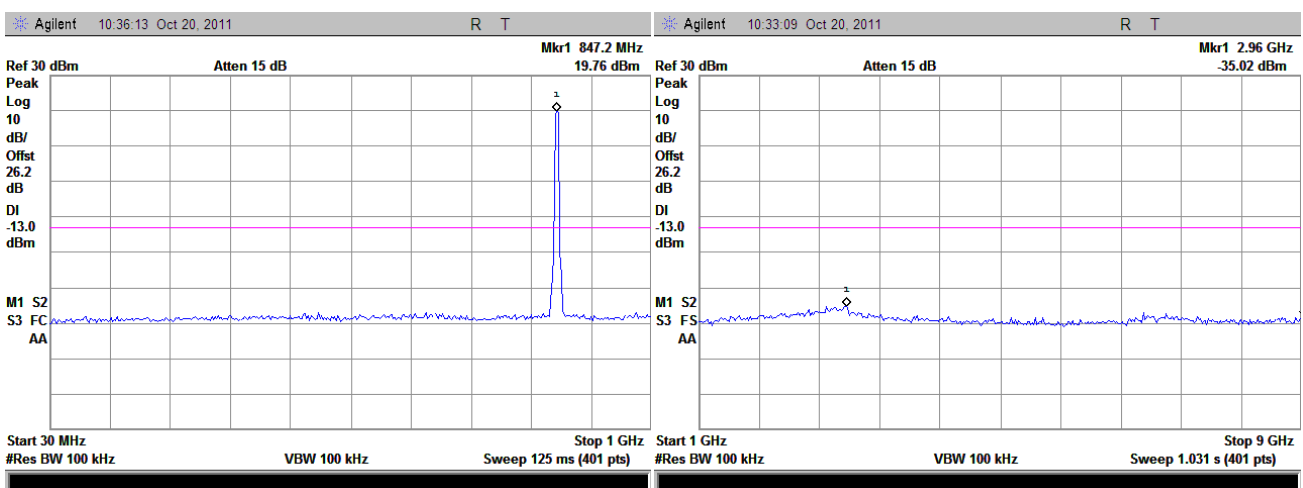
(Plot D3 to D3.1: WCDMA 1900MHz Channel =9538, 30MHz to 20GHz)



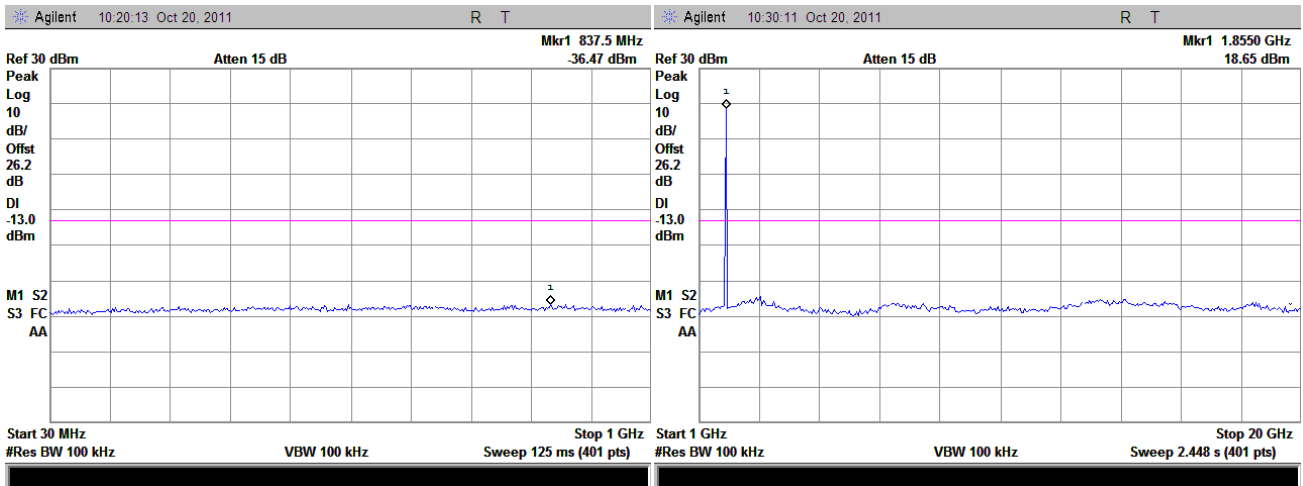
(Plot E1 to E1.1: HSDPA 850MHz Channel =4132, 30MHz to 9GHz)



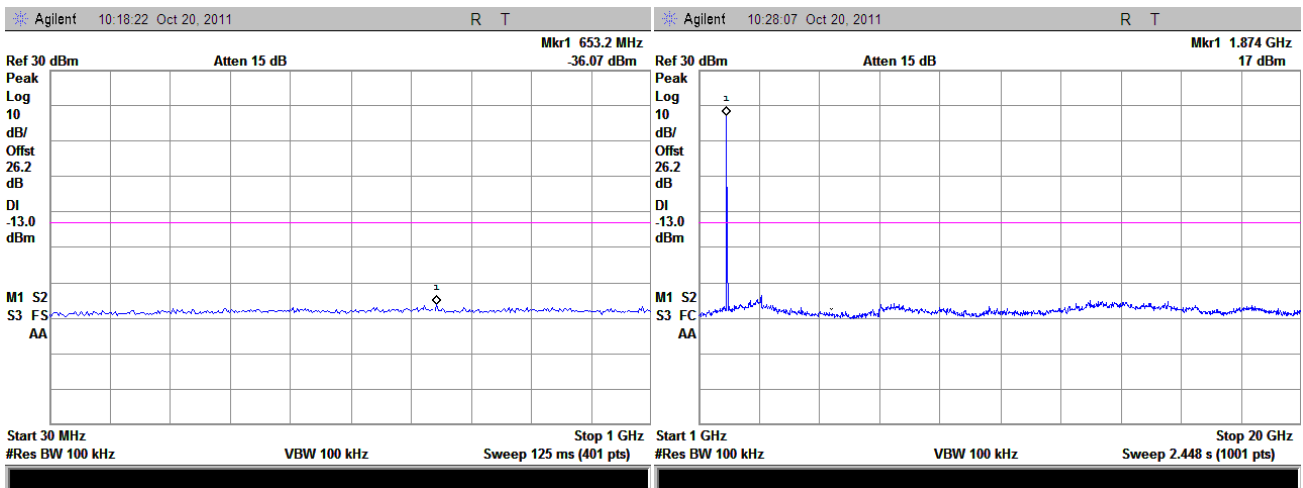
(Plot E2 to E2.1: HSDPA 850MHz Channel =4175, 30MHz to 9GHz)



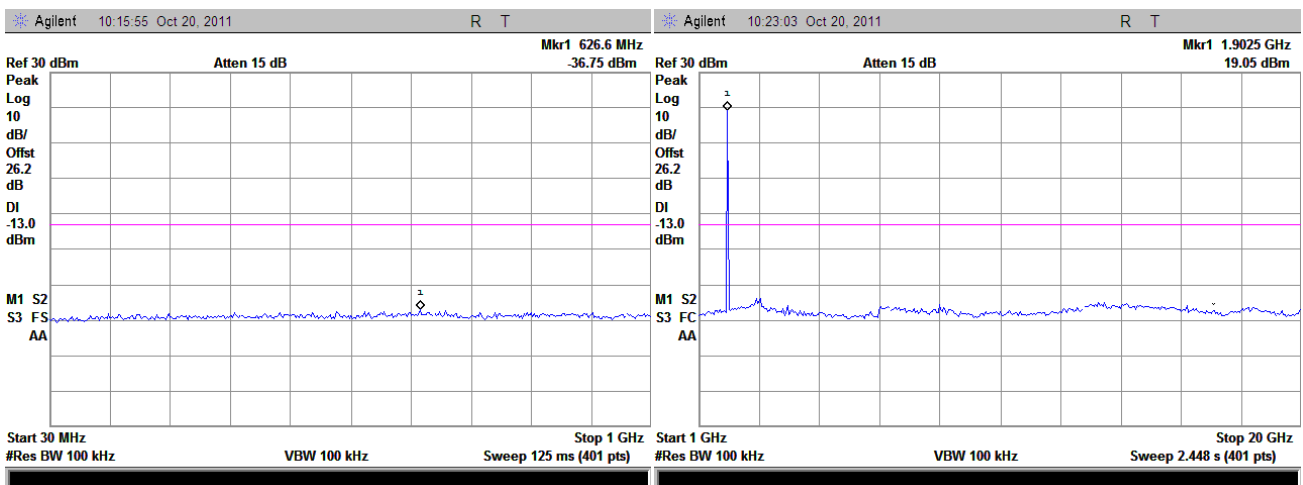
(Plot E3 to E3.1: HSDPA 850MHz Channel =4233, 30MHz to 9GHz)



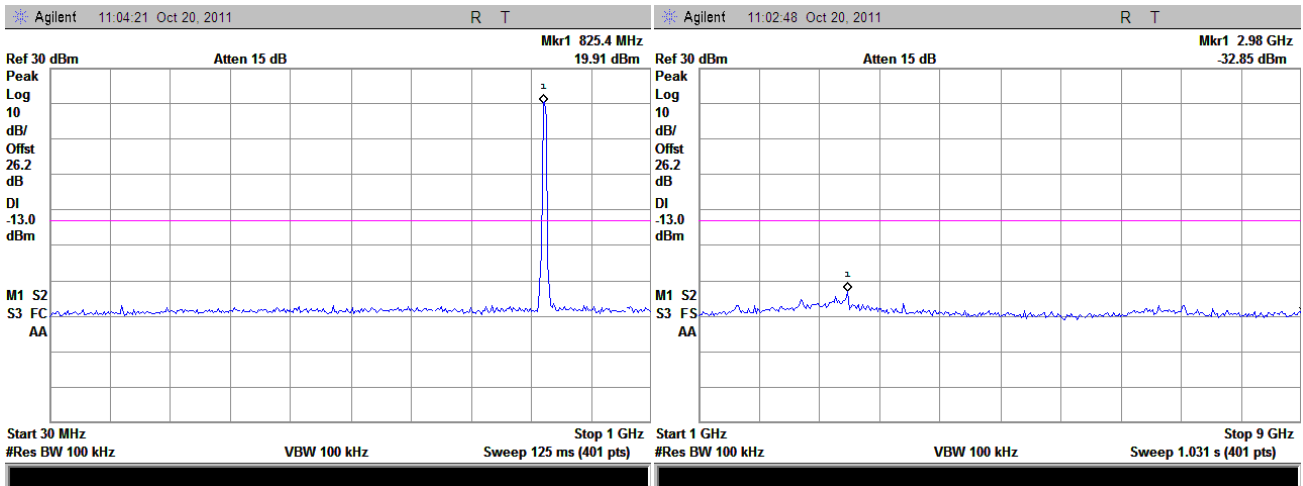
(Plot F1 to F1.1: HSDPA 1900MHz Channel =9262, 30MHz to 20GHz)



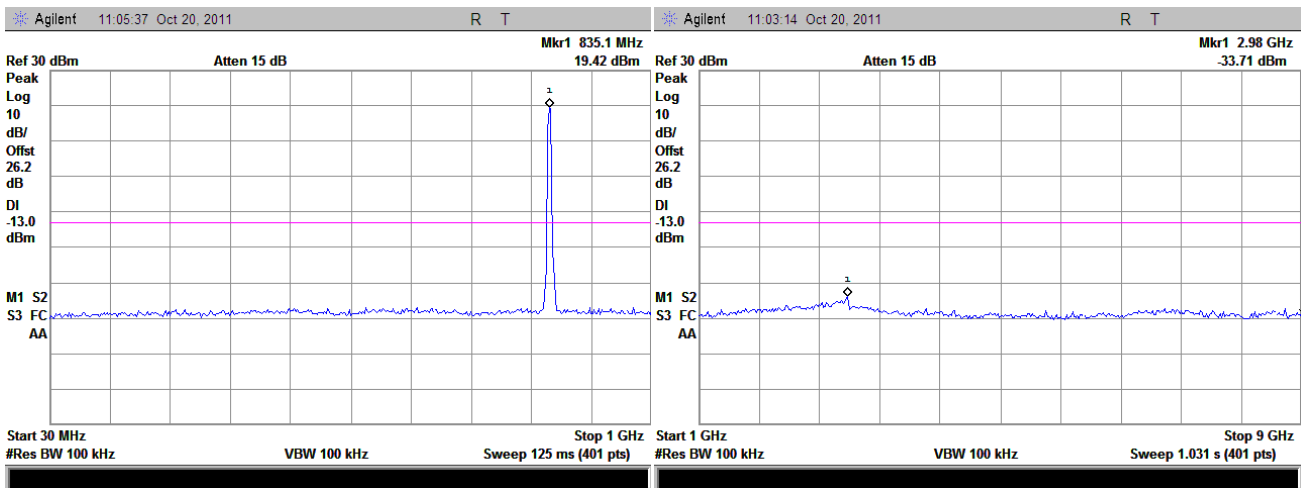
(Plot F2 to F2.1: HSDPA 1900MHz Channel =9400, 30MHz to 20GHz)



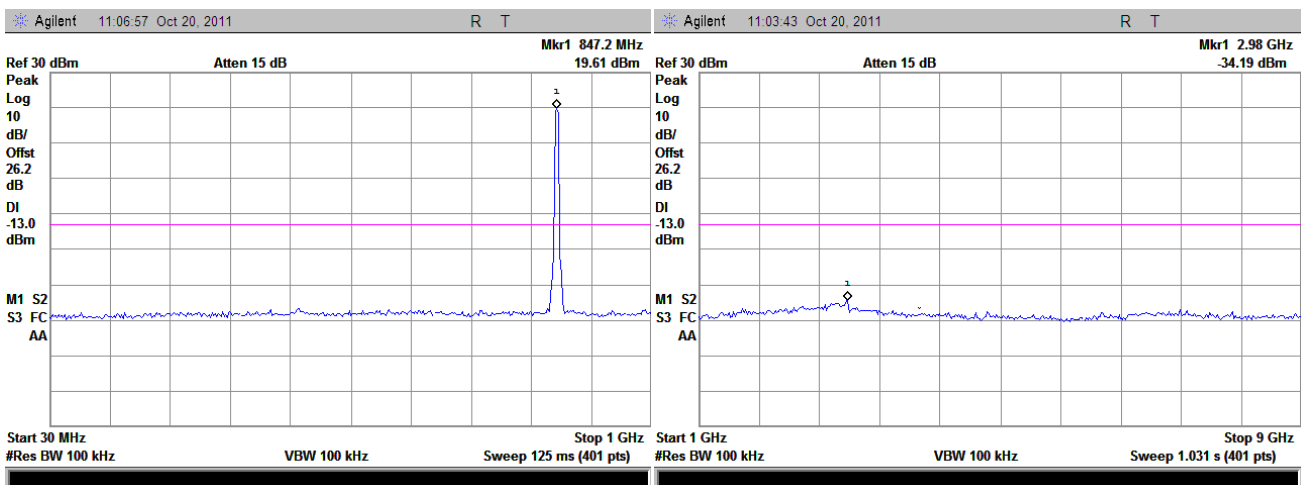
(Plot F3 to F3.1: HSDPA 1900MHz Channel =9538, 30MHz to 20GHz)



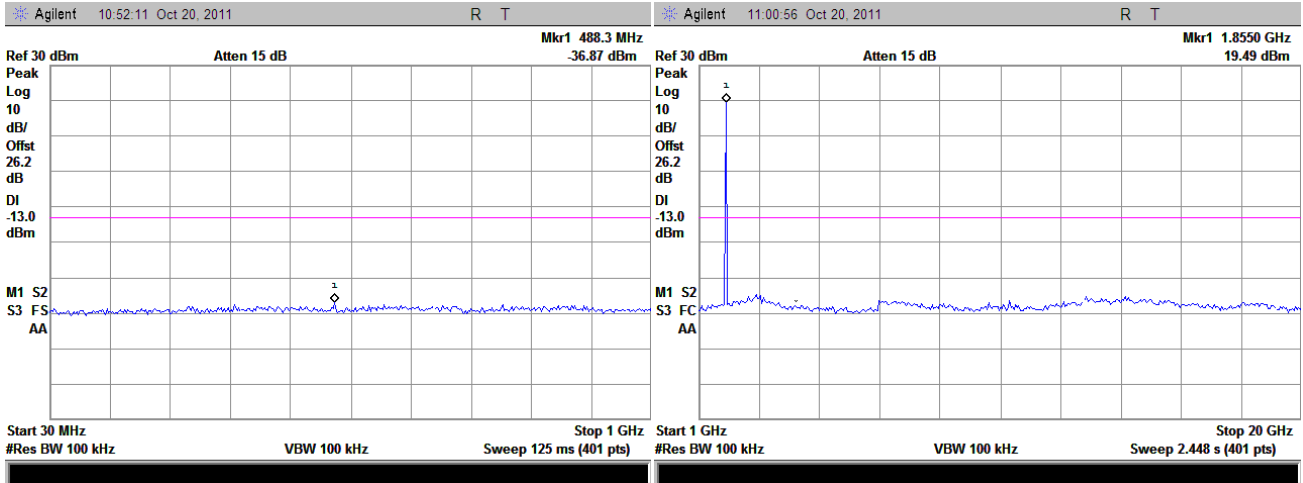
(Plot G1 to G1.1: HSUPA 850MHz Channel =4132, 30MHz to 9GHz)



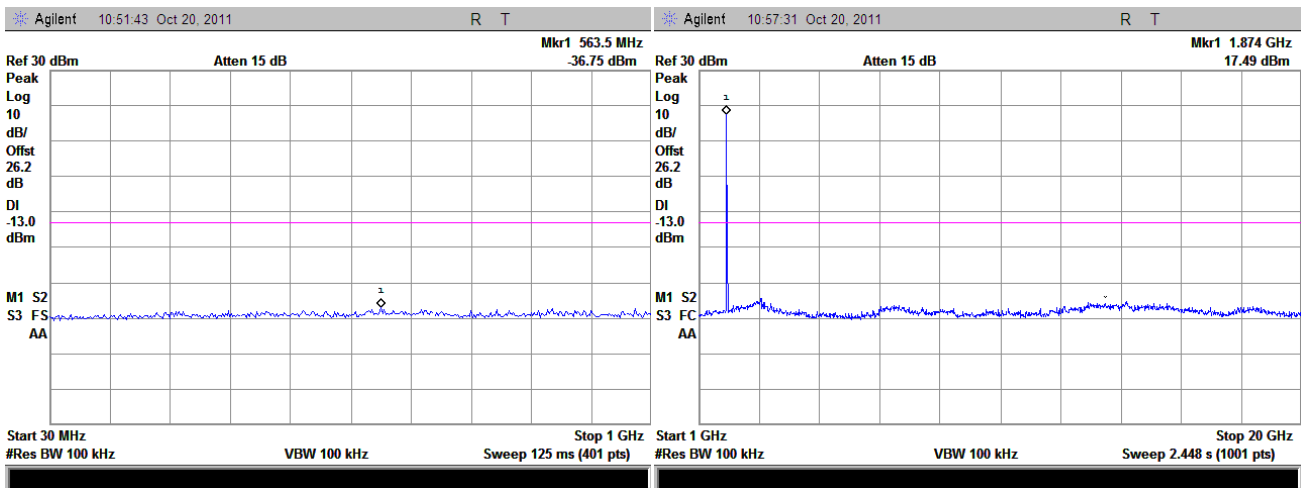
(Plot G2 to G2.1: HSUPA 850MHz Channel =4175, 30MHz to 9GHz)



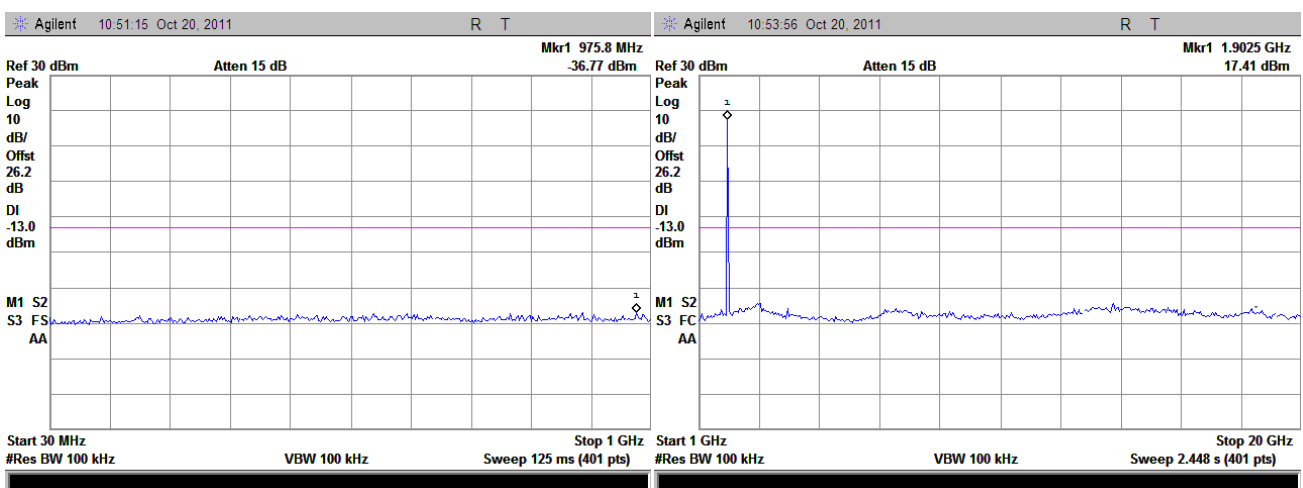
(Plot G3 to G3.1: HSUPA 850MHz Channel =4233, 30MHz to 9GHz)



(Plot H1 to H1.1: HSUPA 1900MHz Channel =9262, 30MHz to 20GHz)



(Plot H2 to H2.1: HSUPA 1900MHz Channel =9400, 30MHz to 20GHz)



(Plot H3 to H3.1: HSUPA 1900MHz Channel =9538, 30MHz to 20GHz)

2.5. Band Edge

2.5.1. 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.

2.5.2. Test Description

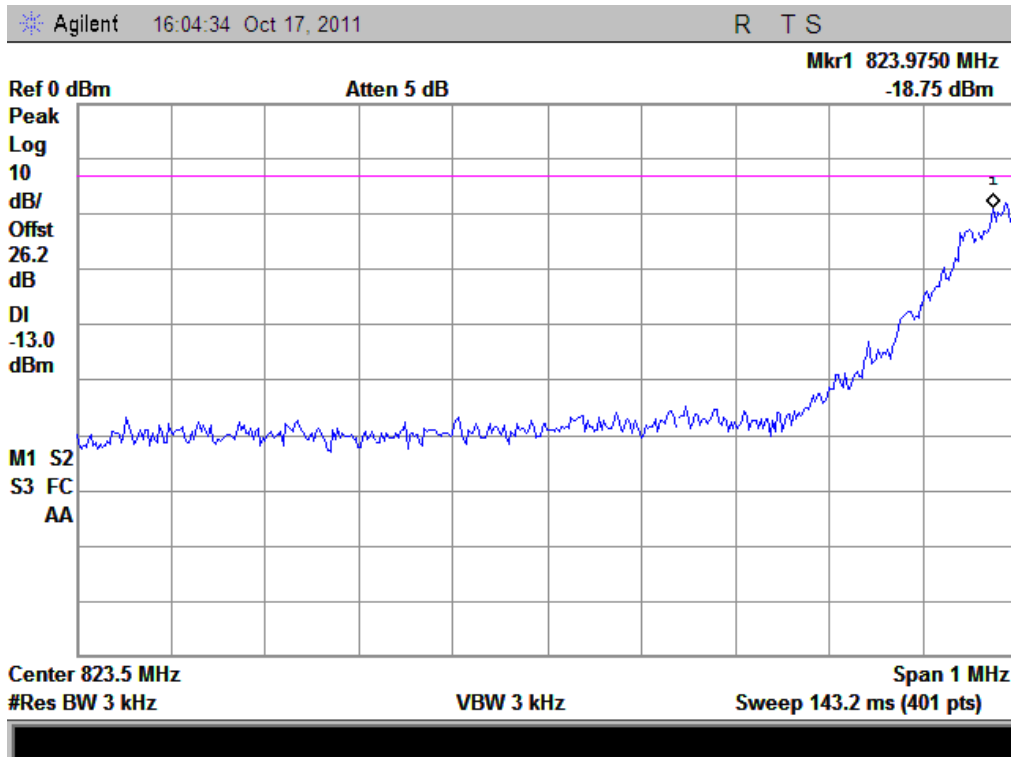
See section 2.1.2 of this report.

2.5.3. Test Result

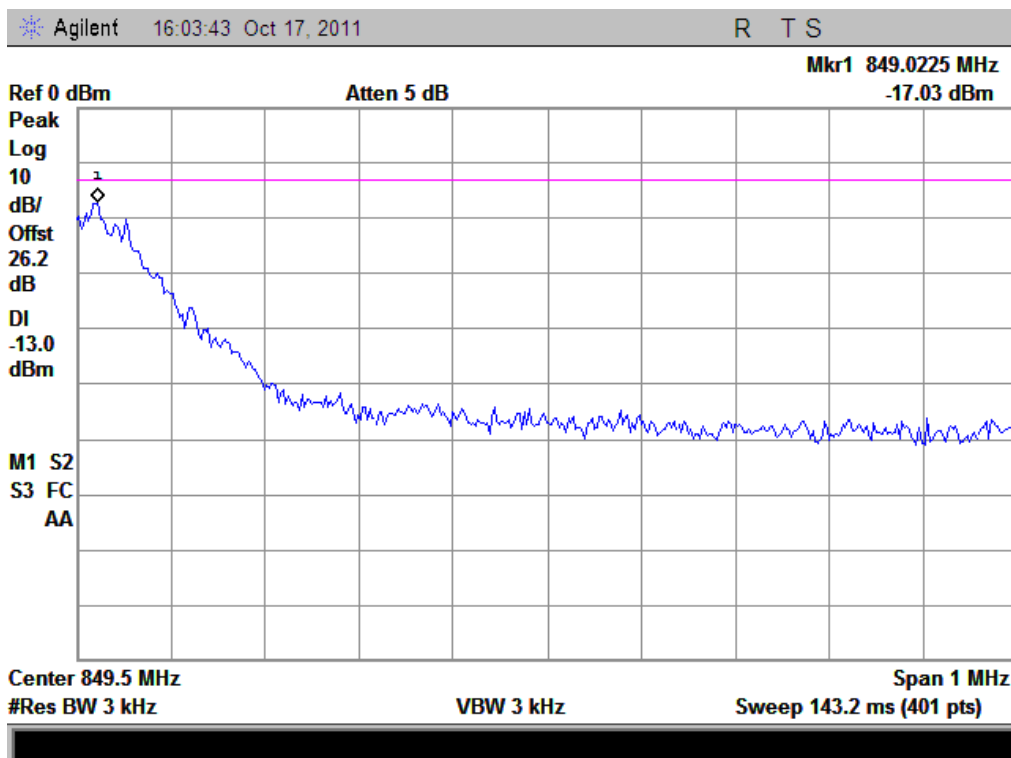
The lowest and highest channels are tested to verify the band edge emissions.

A. Test Verdict:

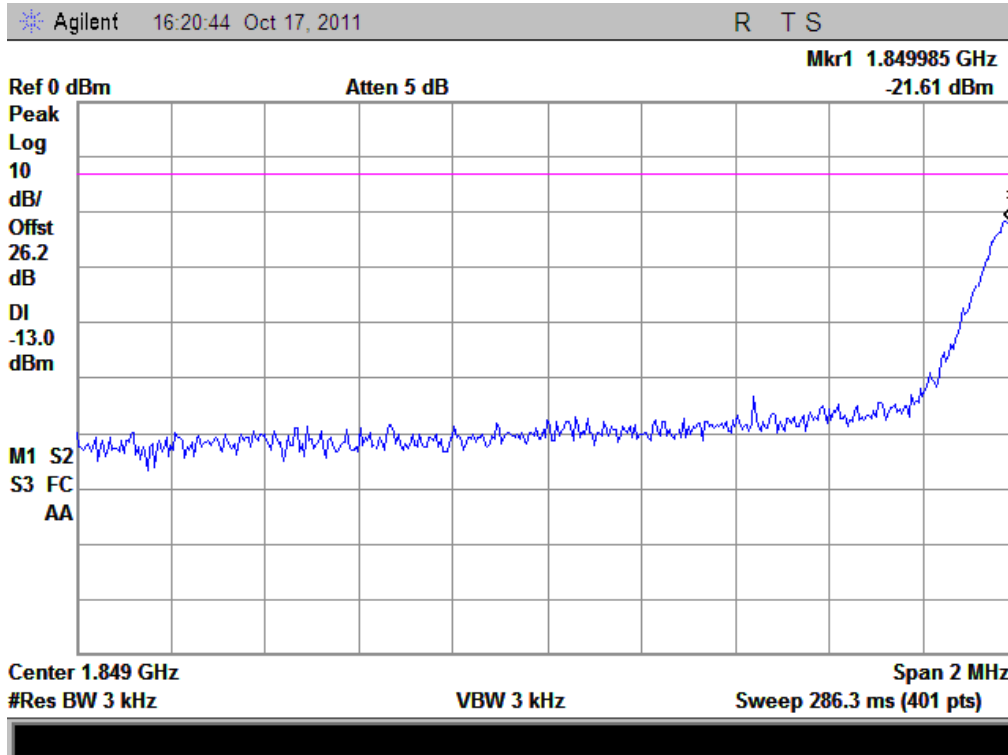
Band	Channel	Frequency (MHz)	Measured Max. Band Edge Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
EDGE 850MHz	128	824.2	-18.75	Plat A	-13	PASS
	251	848.8	-17.03	Plot B		PASS
EDGE 1900MHz	512	1850.2	-21.61	Plat C	-13	PASS
	810	1909.8	-17.92	Plot D		PASS
WCDMA 850MHz	4132	826.4	-21.92	Plat E	-13	PASS
	4233	846.6	-22.20	Plot F		PASS
WCDMA 1900MHz	9262	1852.4	-23.47	Plat G	-13	PASS
	9538	1907.6	-21.97	Plot H		PASS
HSDPA 850MHz	4132	826.4	-21.30	Plat I	-13	PASS
	4233	846.6	-22.82	Plot J		PASS
HSDPA 1900MHz	9262	1852.4	-24.80	Plat K	-13	PASS
	9538	1907.6	-24.66	Plot L		PASS
HSUPA 850MHz	4132	826.4	-19.57	Plat M	-13	PASS
	4233	846.6	-22.29	Plot N		PASS
HSUPA 1900MHz	9262	1852.4	-21.39	Plat O	-13	PASS
	9538	1907.6	-23.76	Plot P		PASS

B. Test Plots:


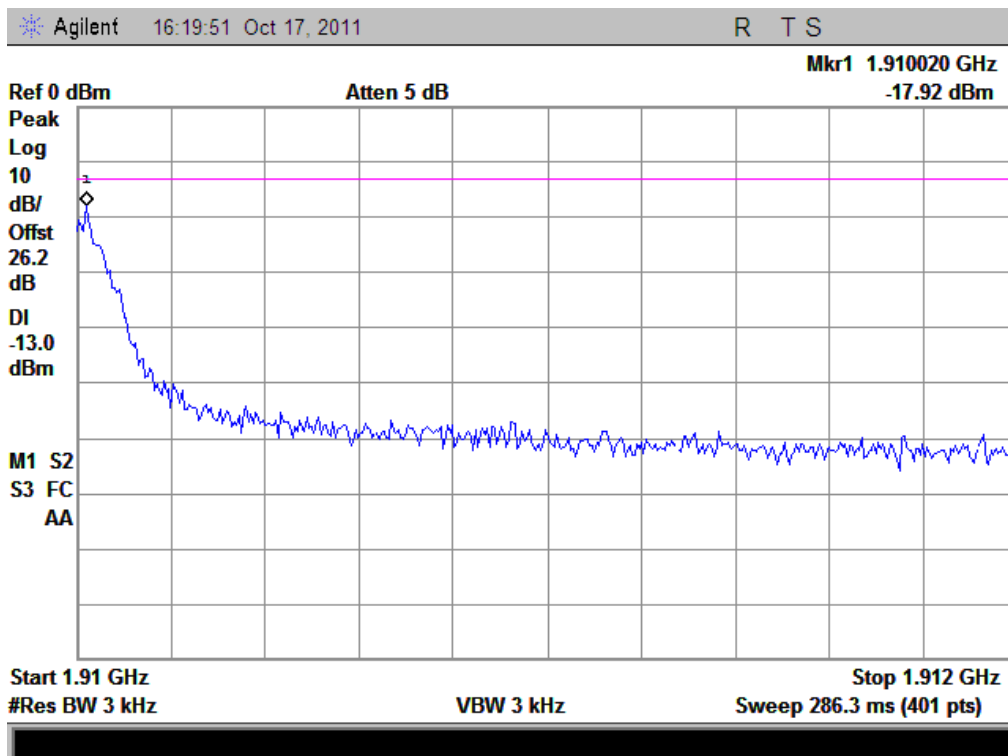
(Plot A: Channel = 128)



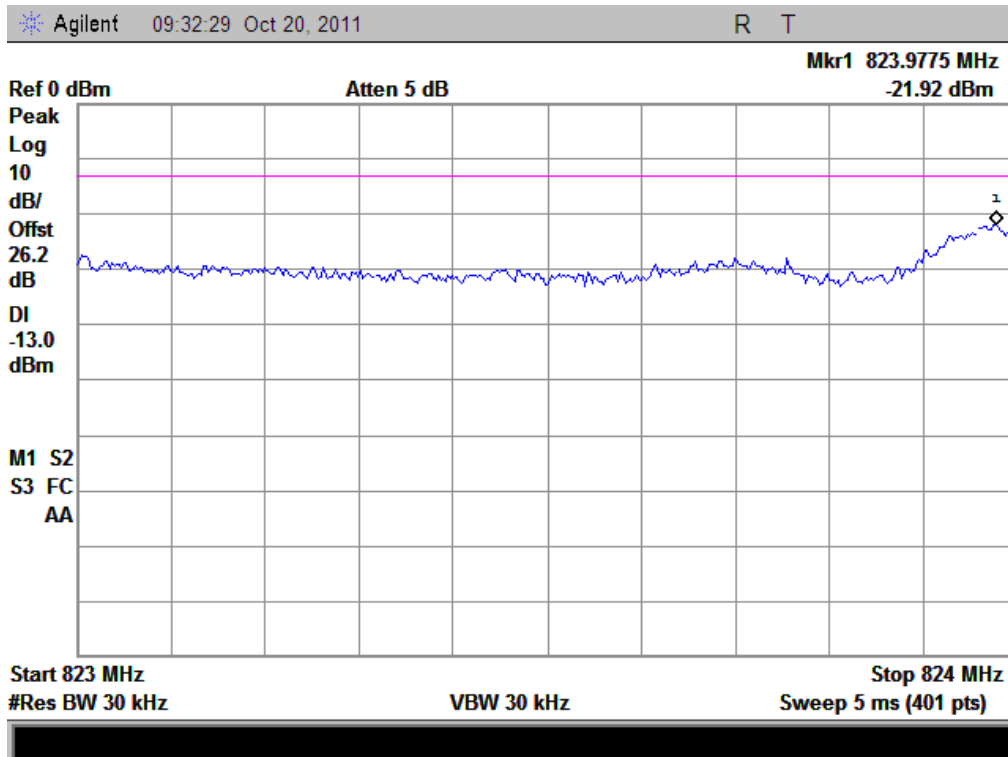
(Plot B: Channel = 251)



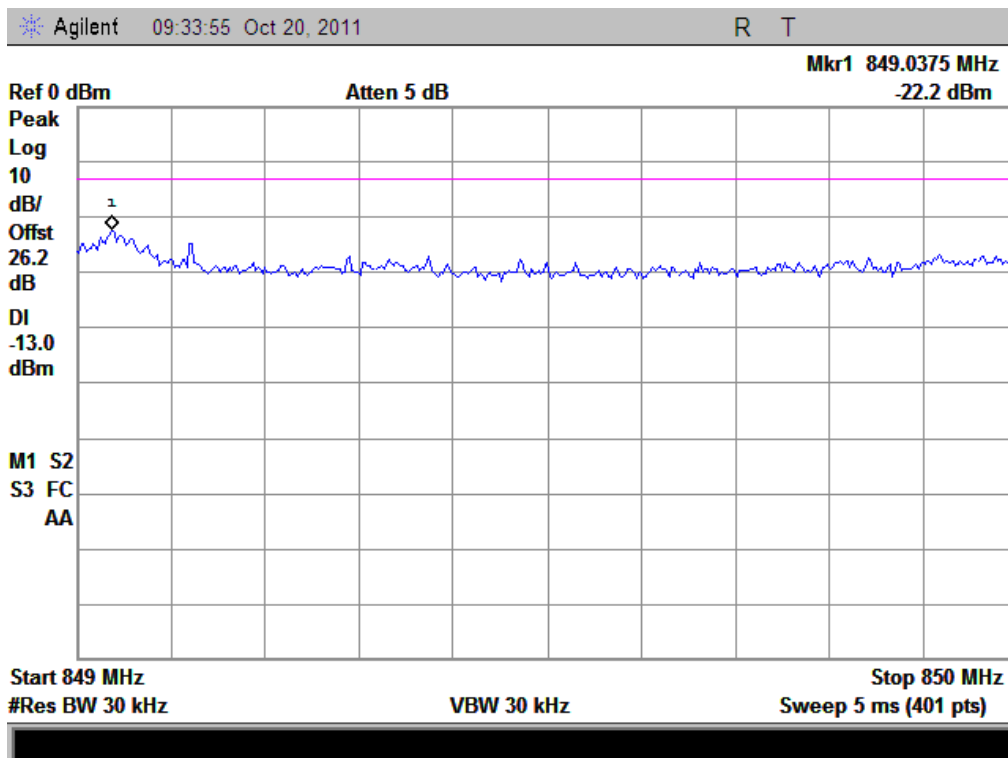
(Plot C: Channel = 512)



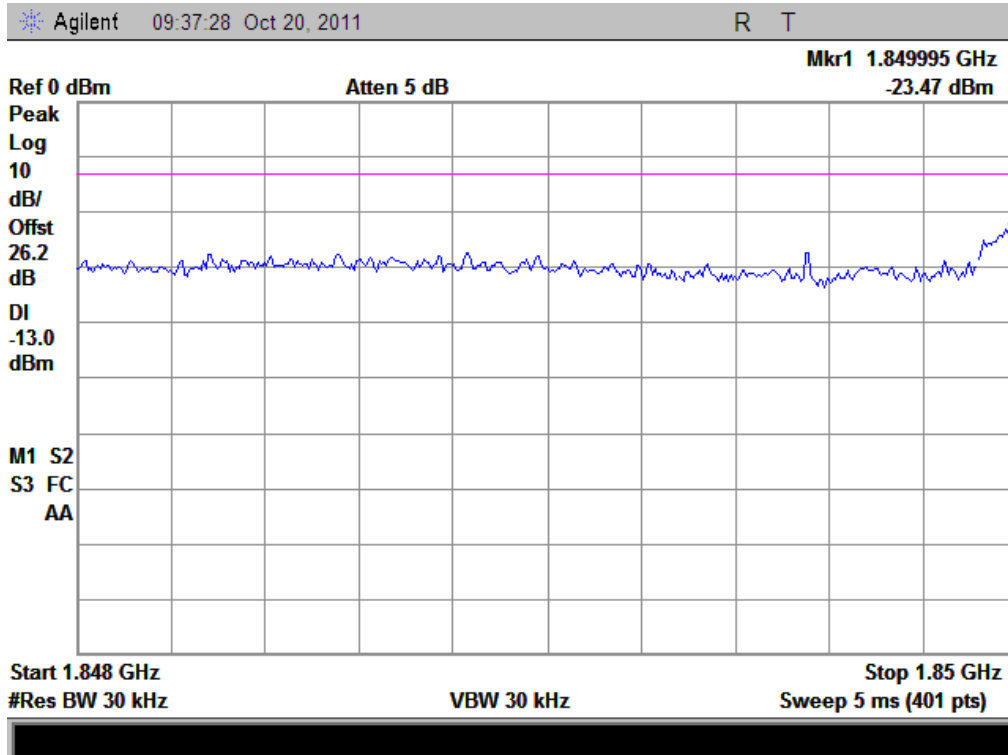
(Plot D: Channel = 810)



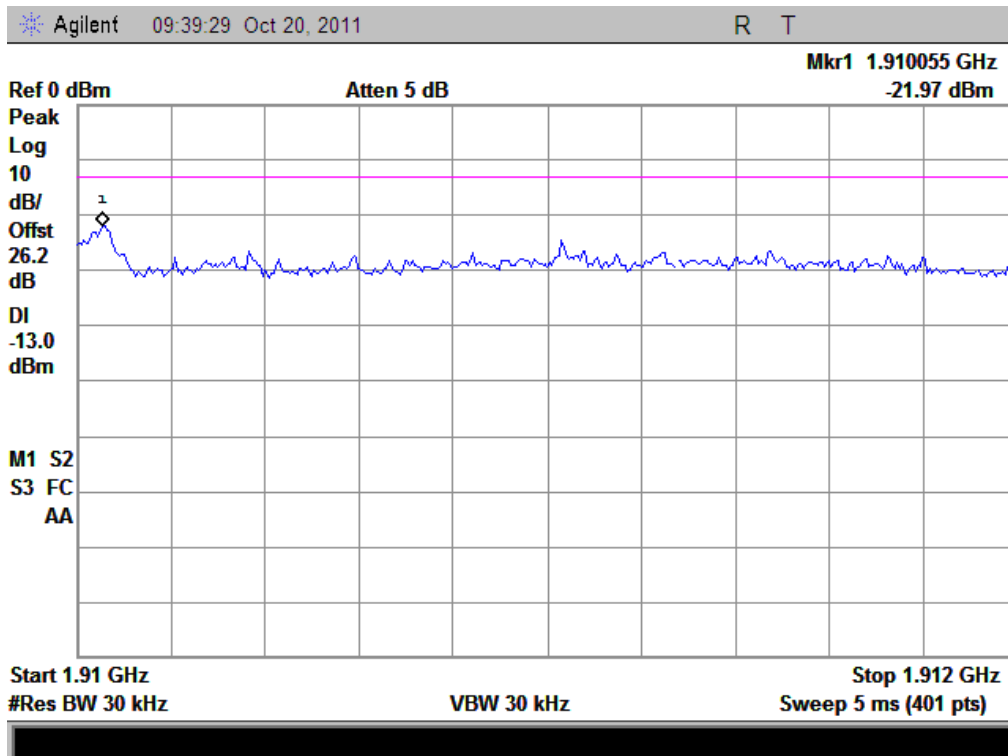
(Plot E: Channel = 4132)



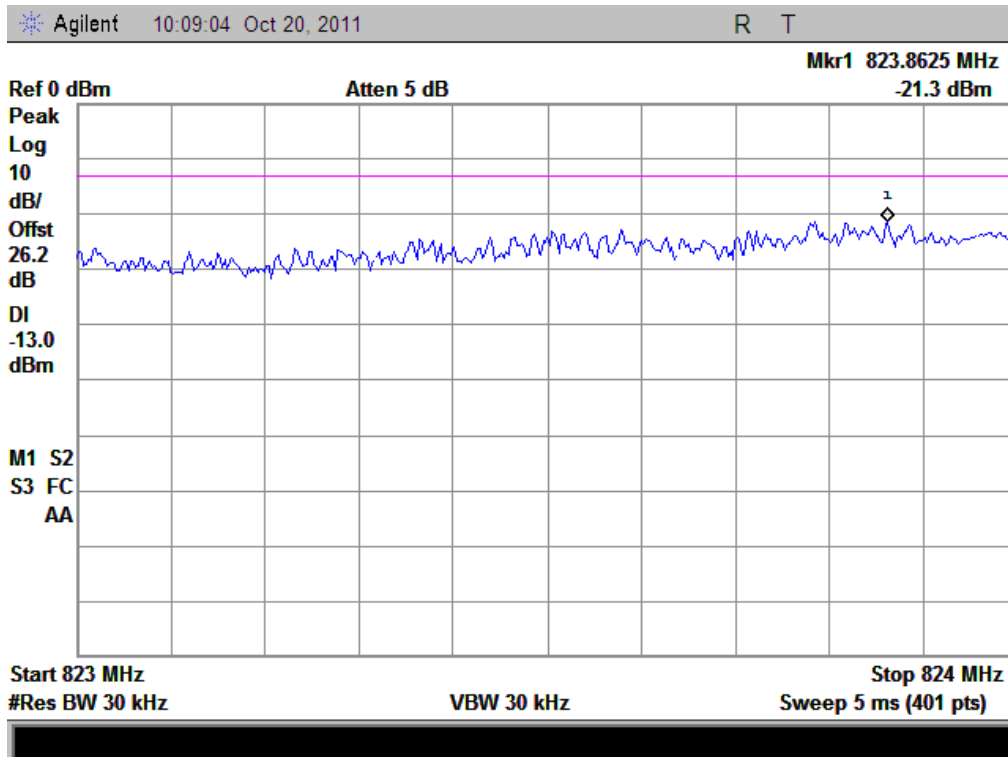
(Plot F: Channel = 4233)



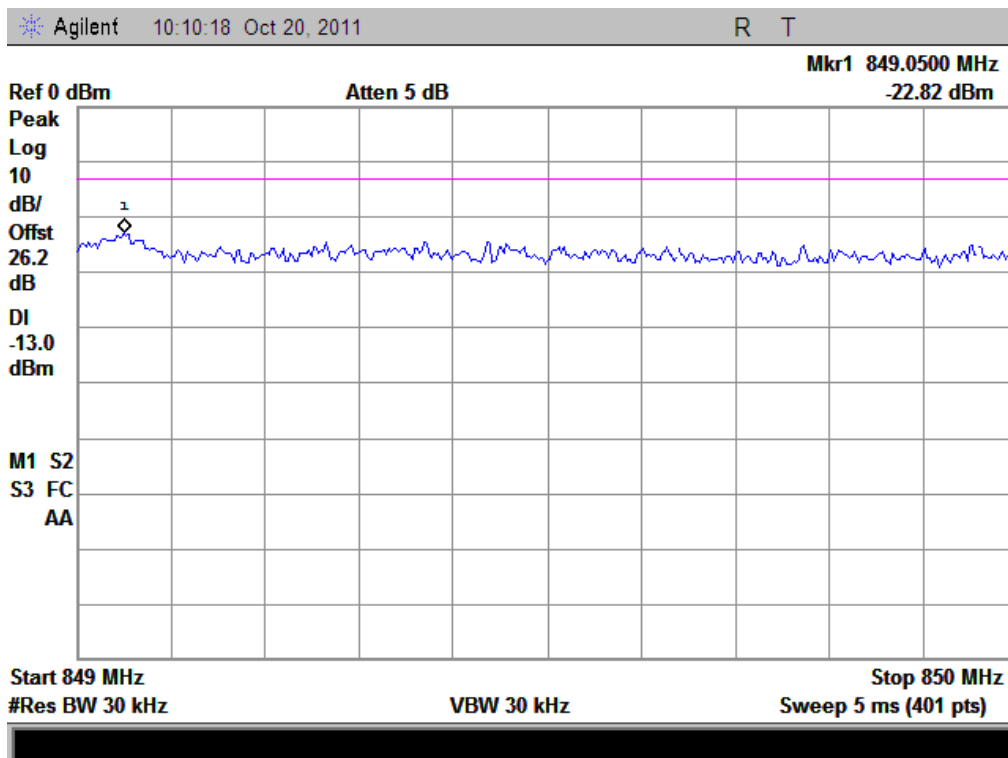
(Plot G: Channel = 9262)



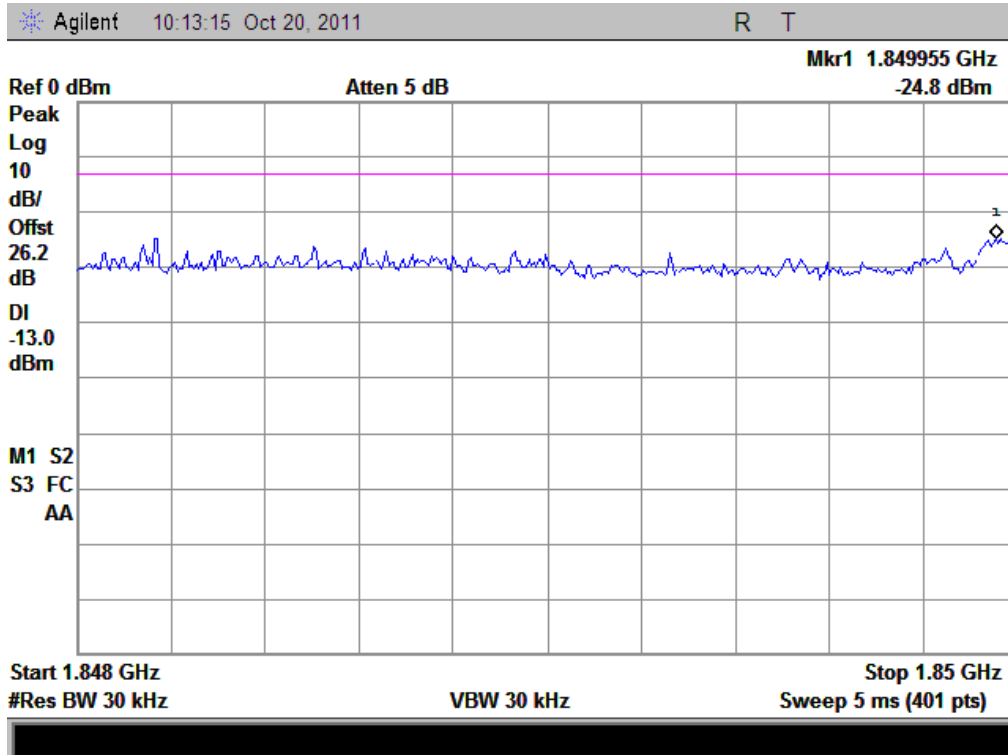
(Plot H: Channel = 9538)



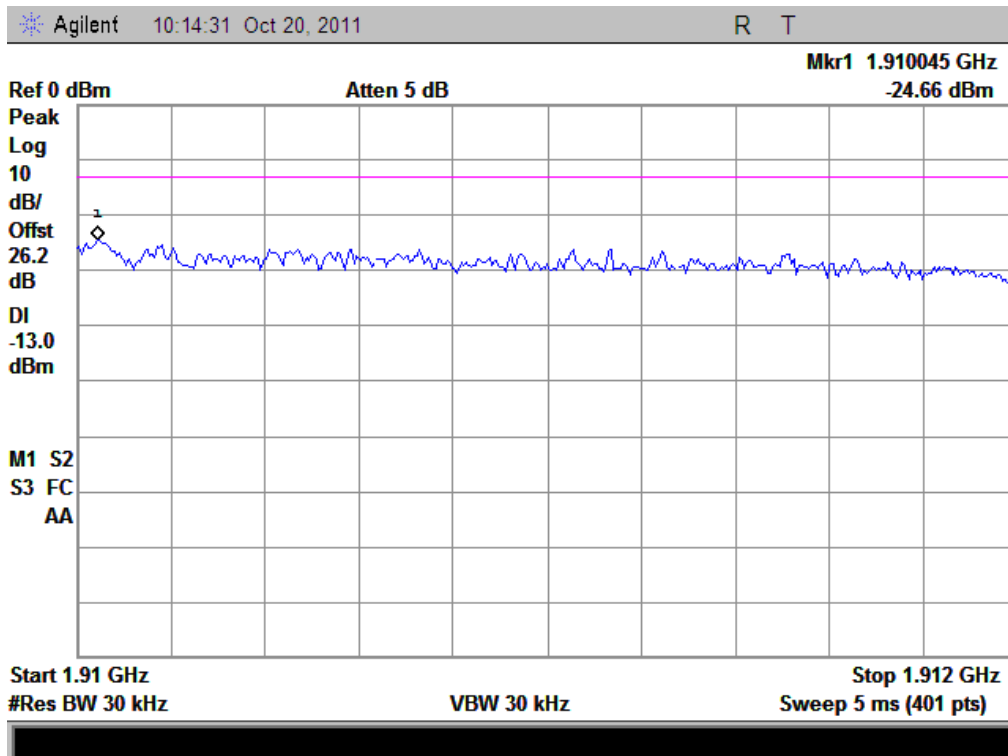
(Plot I: Channel = 4132)



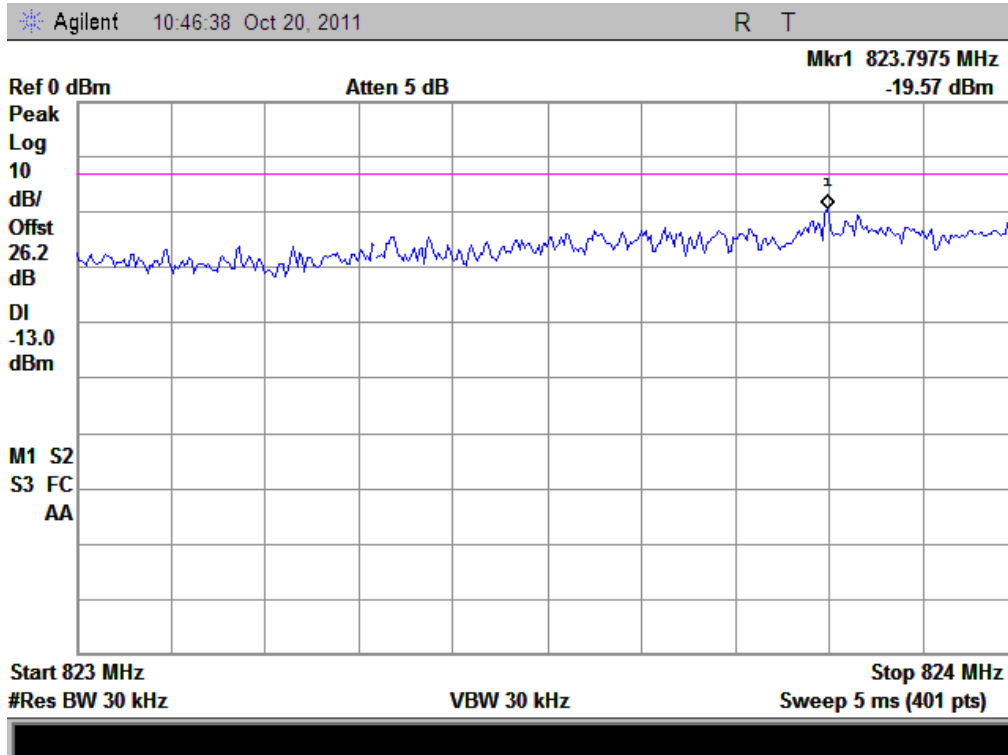
(Plot J: Channel = 4233)



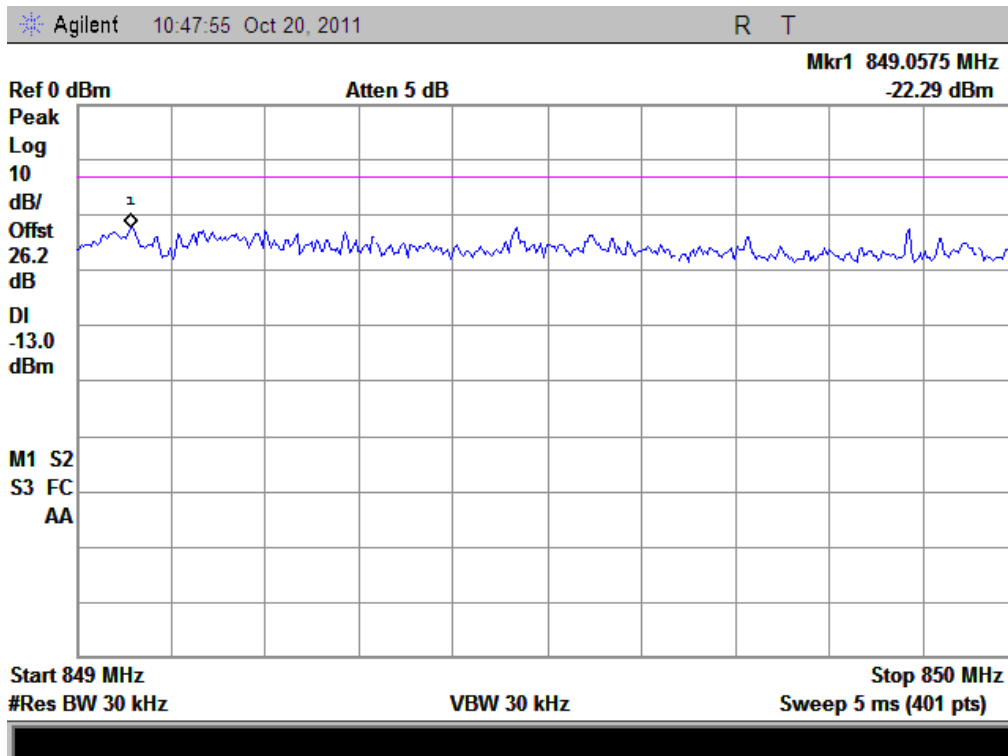
(Plot K: Channel = 9262)



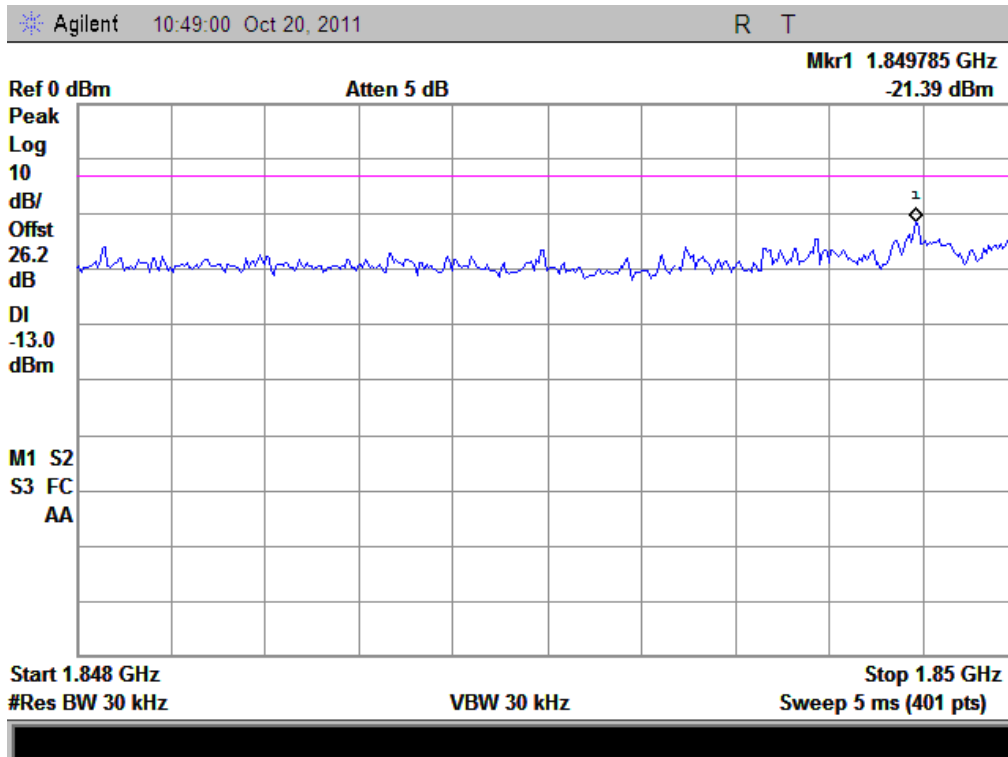
(Plot L: Channel = 9538)



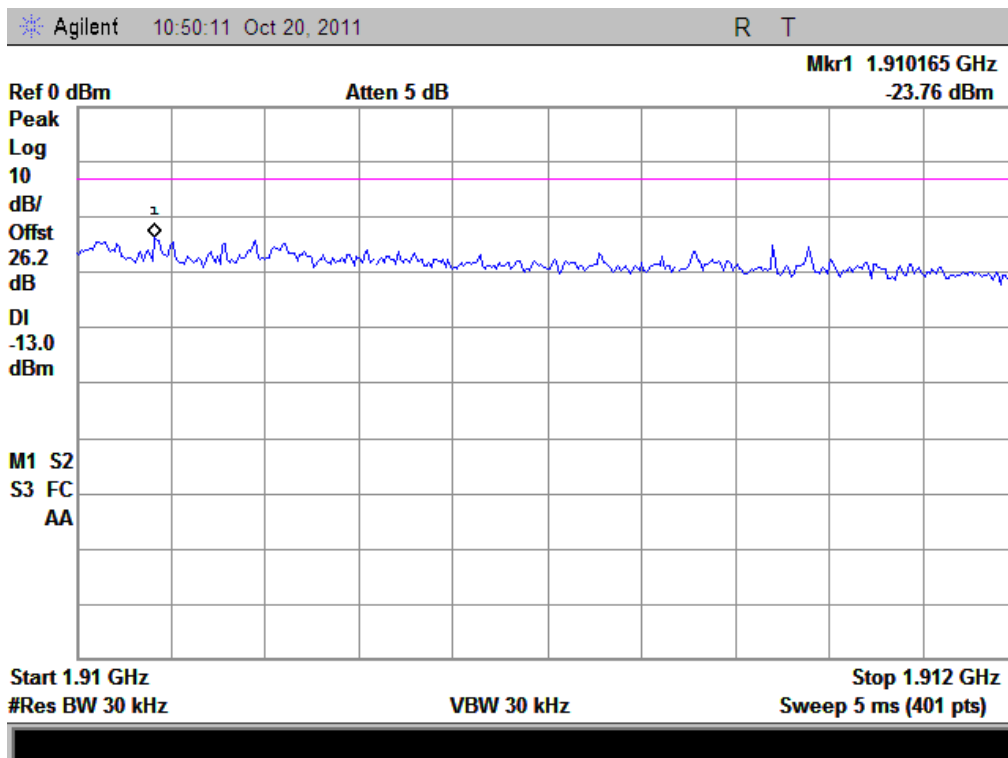
(Plot M: Channel = 4132)



(Plot N: Channel = 4233)



(Plot O: Channel = 9262)



(Plot P: Channel = 9538)

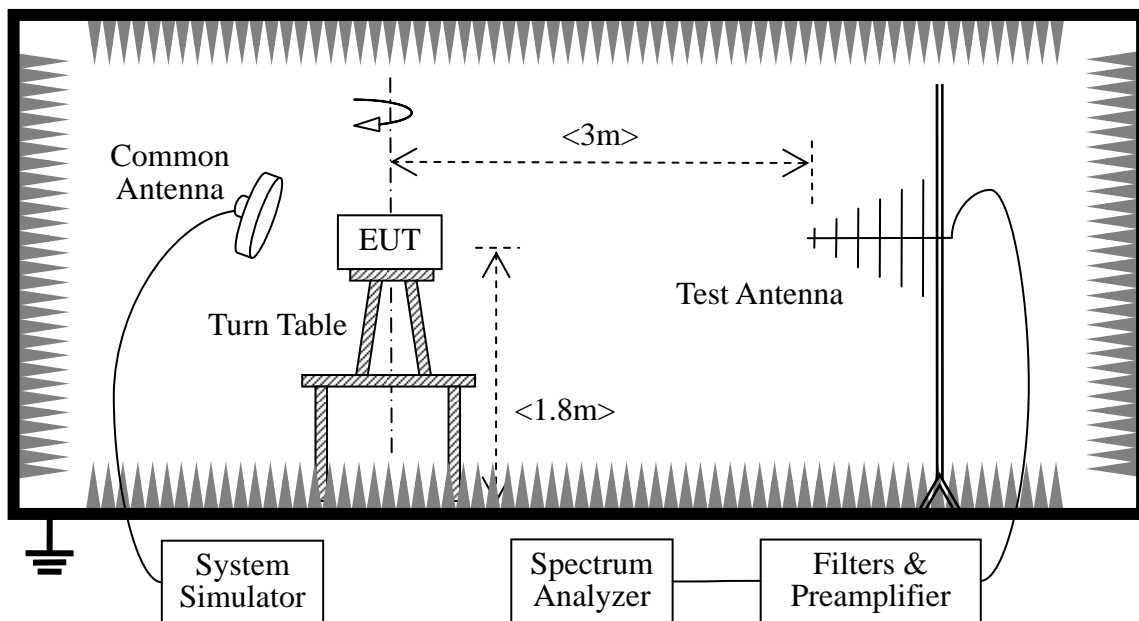
2.6. Transmitter Radiated Power (EIRP/ERP)

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

2.6.2. Test Description

A. 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 31.68dBm, GSM1900 29.81dBm, WCDMA850 22.89dBm, WCDMA1900 23.19dBm, Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM850 -4.2dBm, GSM 1900 -10.16dBm, WCDMA850 -2.5dBm, WCDMA1900dBm -5.2dBm.

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.

B. 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

2.6.3. 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:

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

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

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} .

A. Test Verdict:

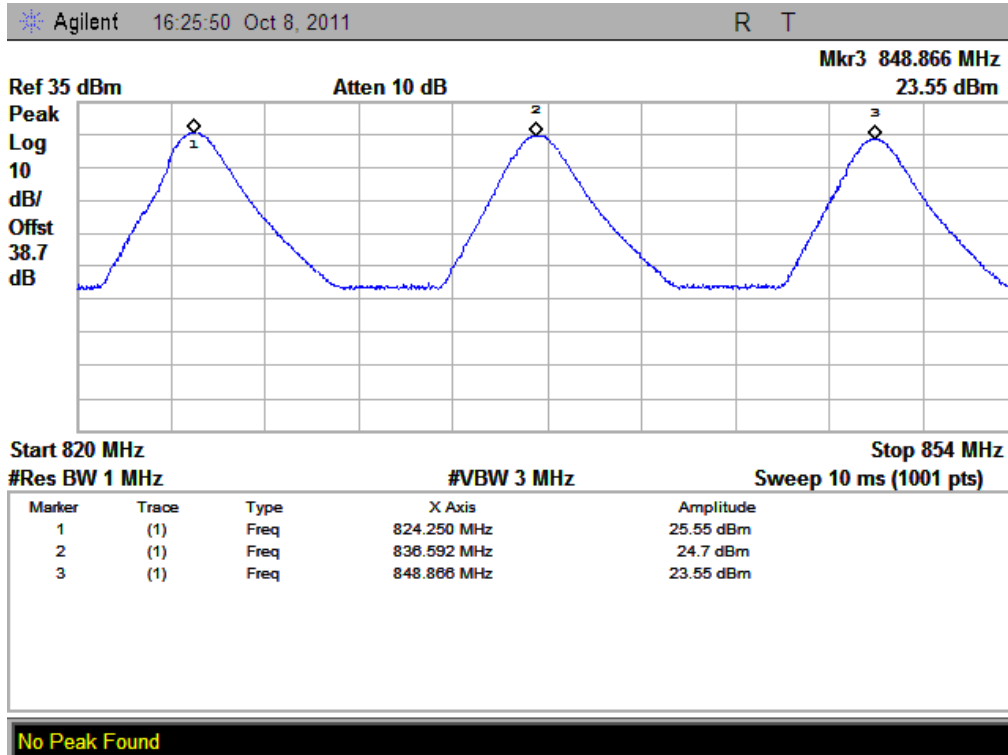
Band	Channel	Frequency (MHz)	PCL	Measured ERP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GPRS 850MHz	128	824.20	5	25.55	0.358922	Plot A ^{Note 1}	38.45	7	PASS
	190	836.60	5	24.70	0.295121				PASS
	251	848.80	5	23.55	0.226464				PASS
EDGE 850MHz	128	824.20	5	24.71	0.295801	Plot C ^{Note 1}	38.45	7	PASS
	190	836.60	5	25.20	0.331131				PASS
	251	848.80	5	23.26	0.211836				PASS

Band	Channel	Frequency (MHz)	PCL	Measured EIRP			Limit		Verdict
				dBm	W	Refer to Plot	dBm	W	
GPRS 1900MHz	512	1850.2	0	26.18	0.414954	Plot B ^{Note 1}	33	2	PASS
	661	1880.0	0	25.76	0.376704				PASS
	810	1909.8	0	25.21	0.331894				PASS
EDGE 1900MHz	512	1850.2	0	26.29	0.425598	Plot D ^{Note 1}	33	2	PASS
	661	1880.0	0	24.41	0.276058				PASS
	810	1909.8	0	20.88	0.122462				PASS

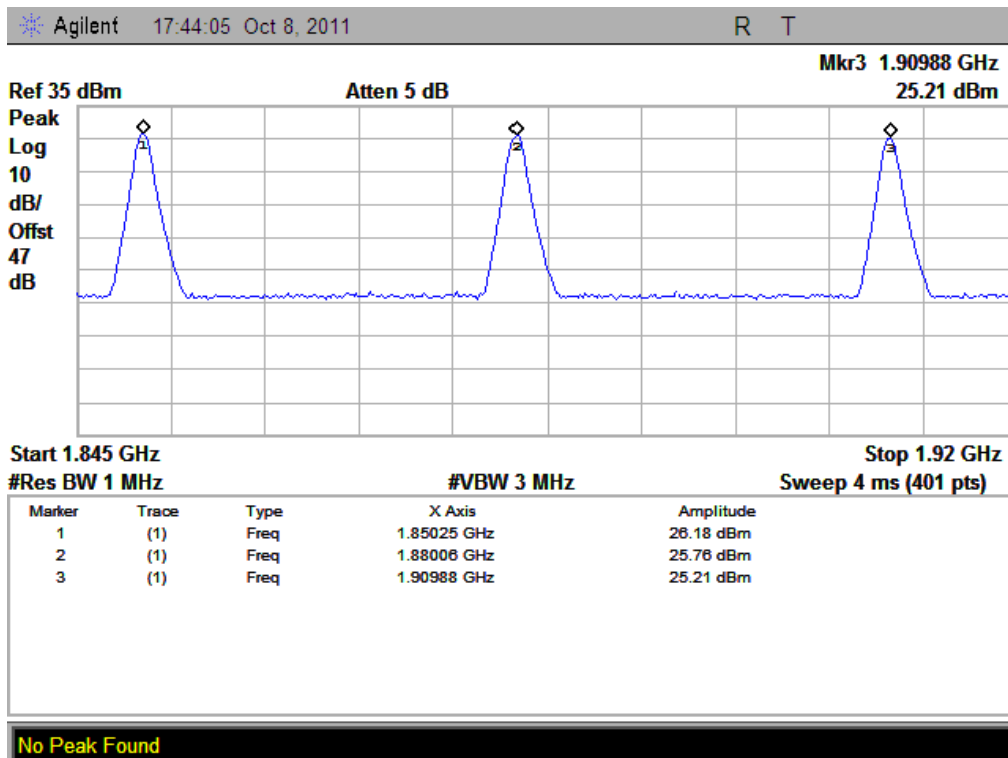
Band	Channel	Frequency (MHz)	Measured ERP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA 850MHz	4132	826.4	19.50	0.089125	38.5	7	PASS
	4175	835	20.85	0.121619			PASS
	4233	846.6	21.97	0.157398			PASS
HSDPA 850MHz	4132	826.4	19.79	0.095280	38.5	7	PASS
	4175	835	20.98	0.125314			PASS
	4233	846.6	21.40	0.138038			PASS
HSUPA 850MHz	4132	826.4	19.87	0.097051	38.5	7	PASS
	4175	835	21.14	0.130017			PASS
	4233	846.6	21.65	0.146218			PASS

Band	Channel	Frequency (MHz)	Measured EIRP		Limit		Verdict
			dBm	W	dBm	W	
WCDMA 1900MHz	9262	1852.4	23.71	0.234963	33	2	PASS
	9400	1880	24.90	0.309030			PASS
	9538	1907.6	23.27	0.212324			PASS
HSDPA 1900MHz	9262	1852.4	23.22	0.209894	33	2	PASS
	9400	1880	24.37	0.273527			PASS
	9538	1907.6	23.17	0.212324			PASS
HSUPA 1900MHz	9262	1852.4	23.49	0.223357	33	2	PASS
	9400	1880	24.58	0.287078			PASS
	9538	1907.6	23.19	0.208449			PASS

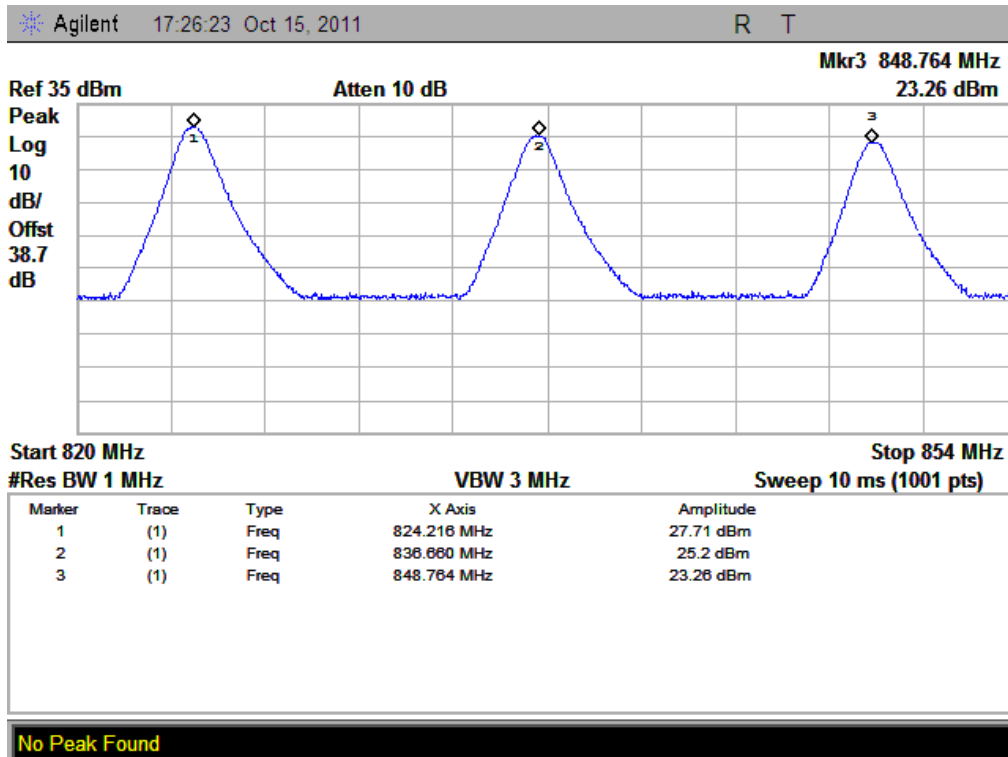
Note 1: For the GPRS model, all the slots were tested and just the worst data was record in this report

B. Test Plots:


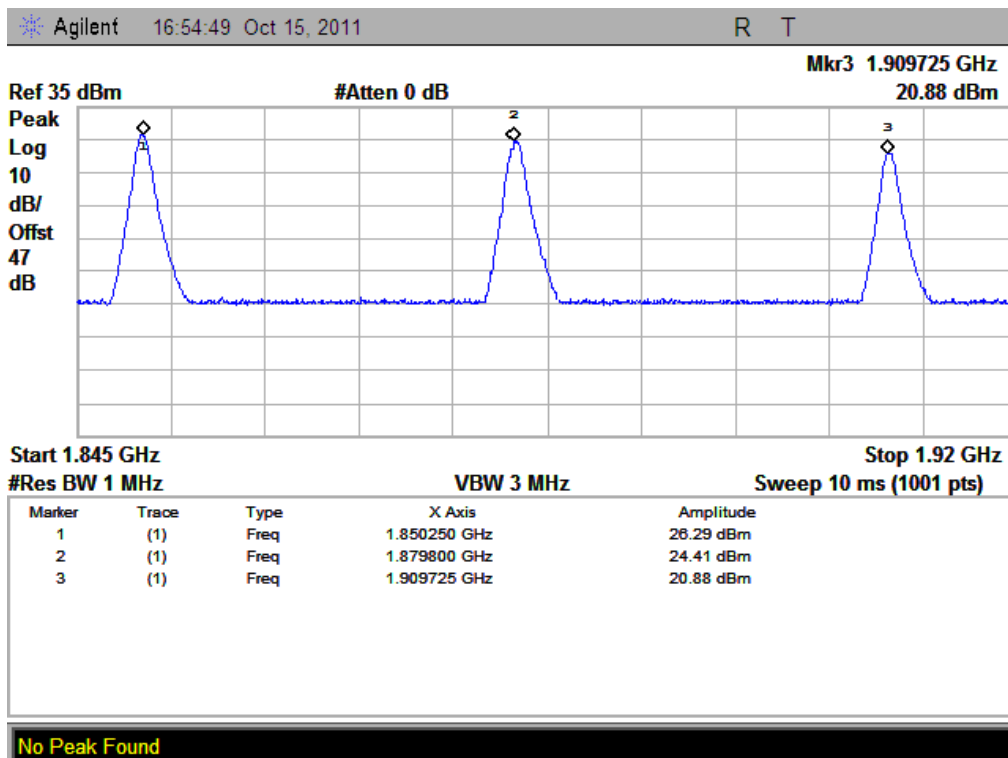
(Plot A: GPRS 850MHz Channel = 128,190,251)



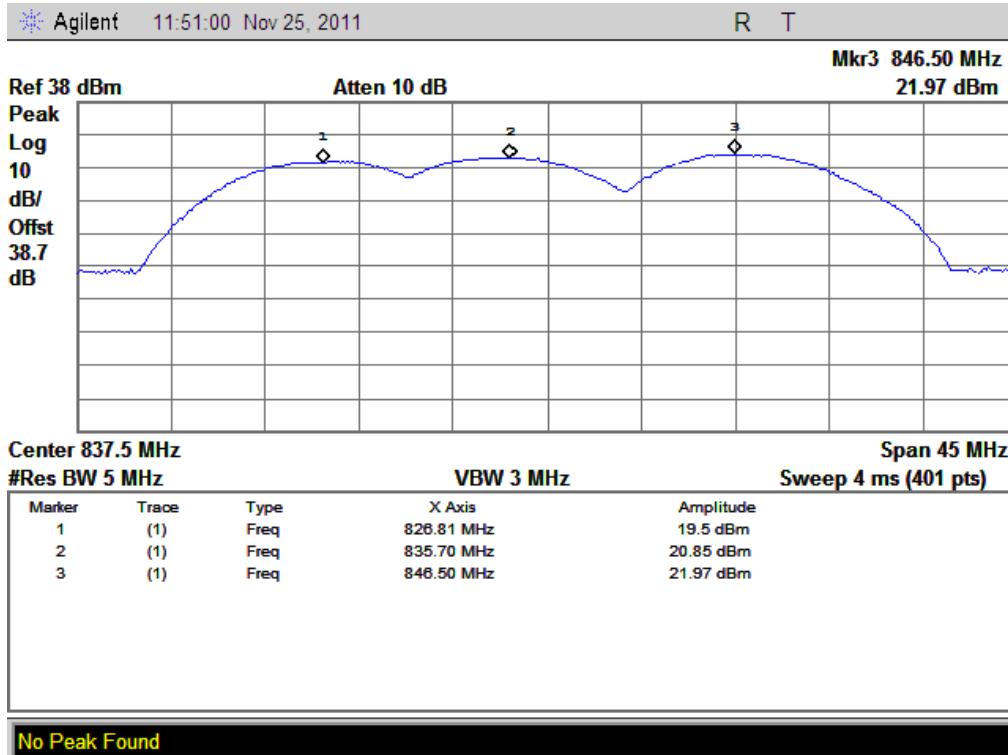
(Plot B: GPRS 1900MHz Channel = 512, 661, 810)



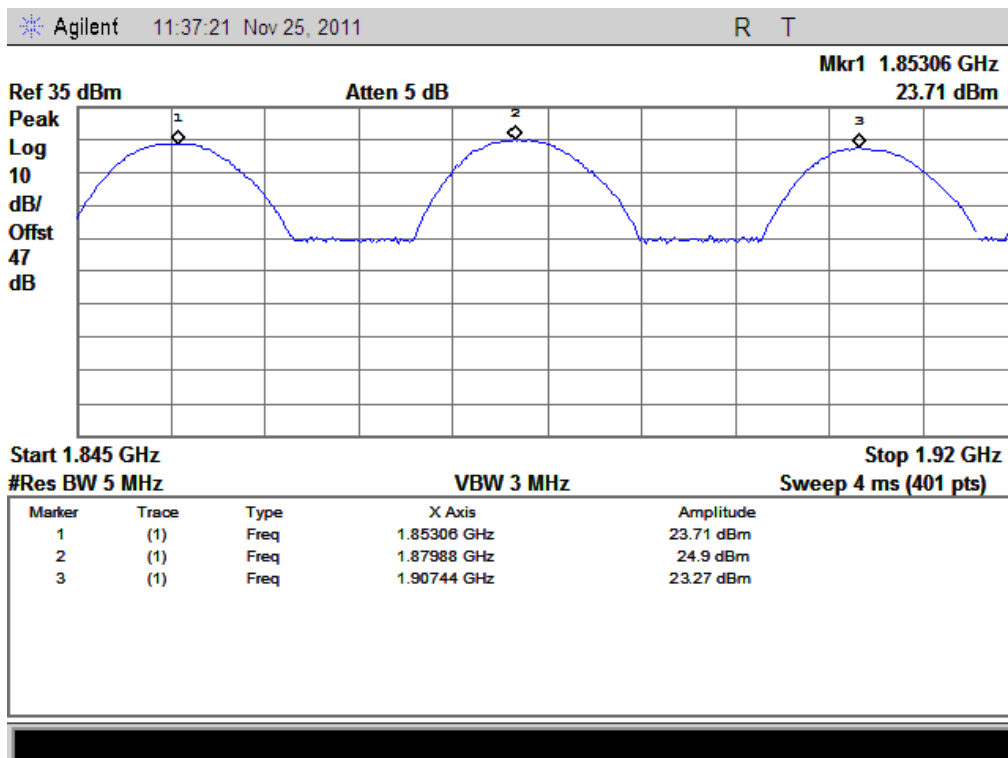
(Plot C: EGPRS 850MHz Channel = 128,190,251)



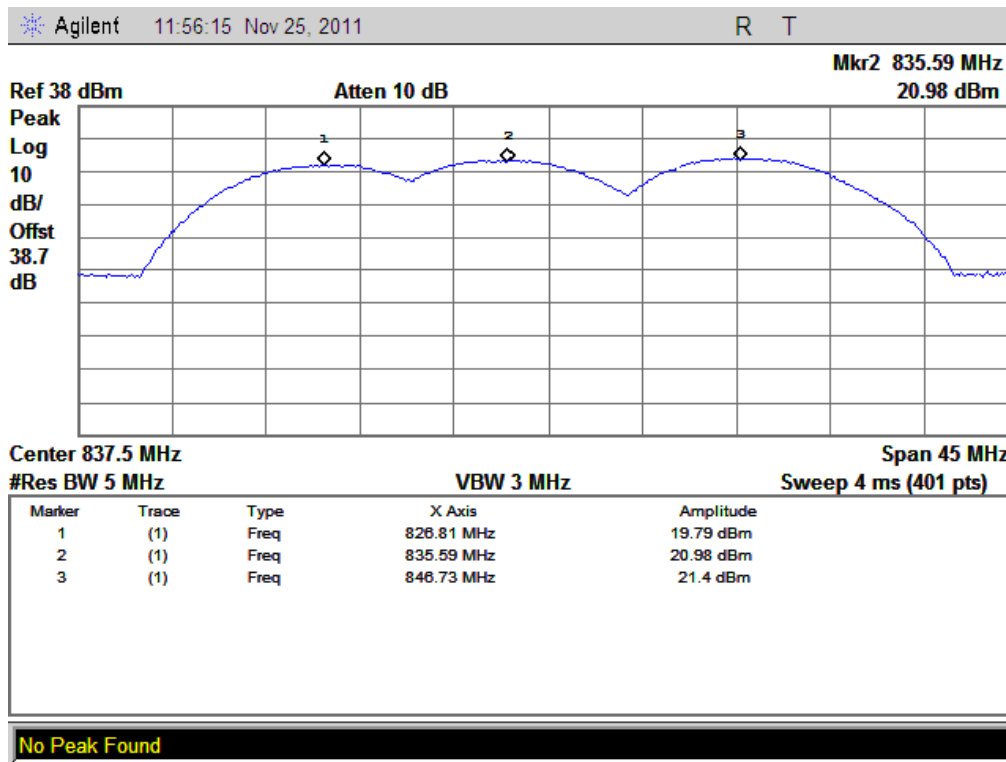
(Plot D: EGPRS 1900MHz Channel = 512, 661, 810)



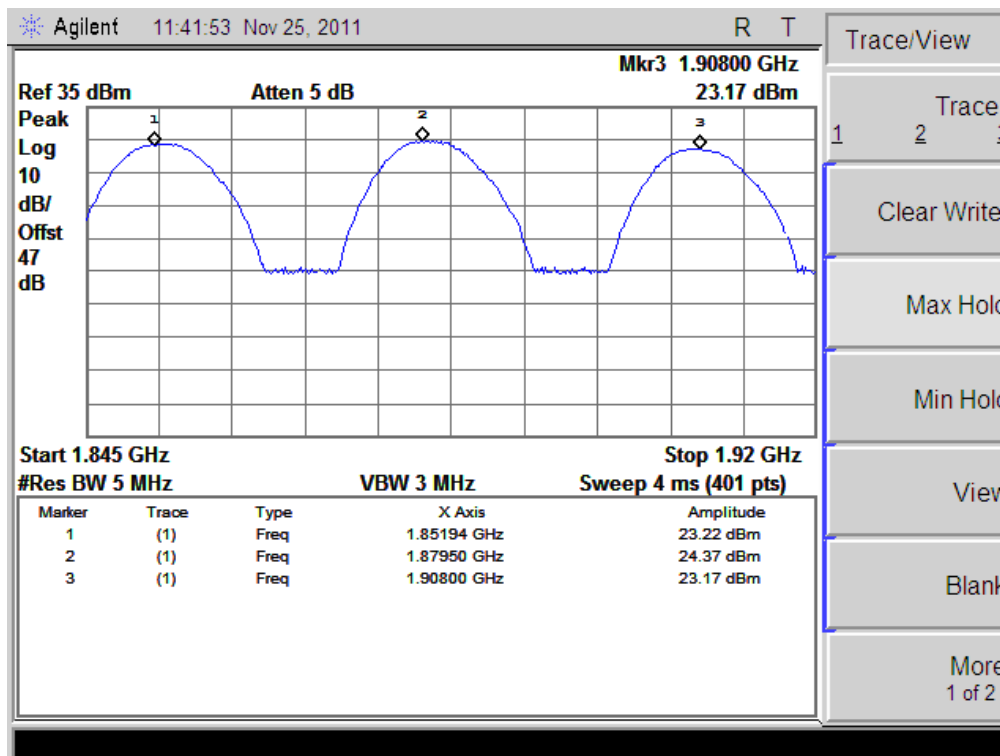
(Plot E: WCDMA 850MHz Channel = 4132, 4175, 4233)



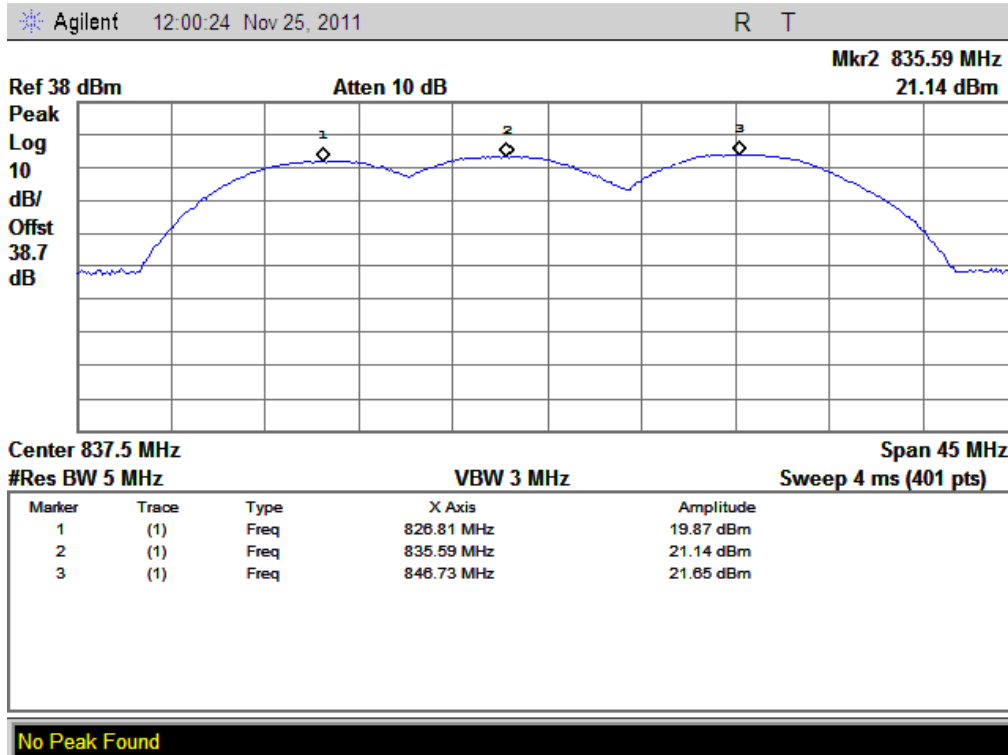
(Plot F: WCDMA 1900MHz Channel = 9262, 9400, 9538)



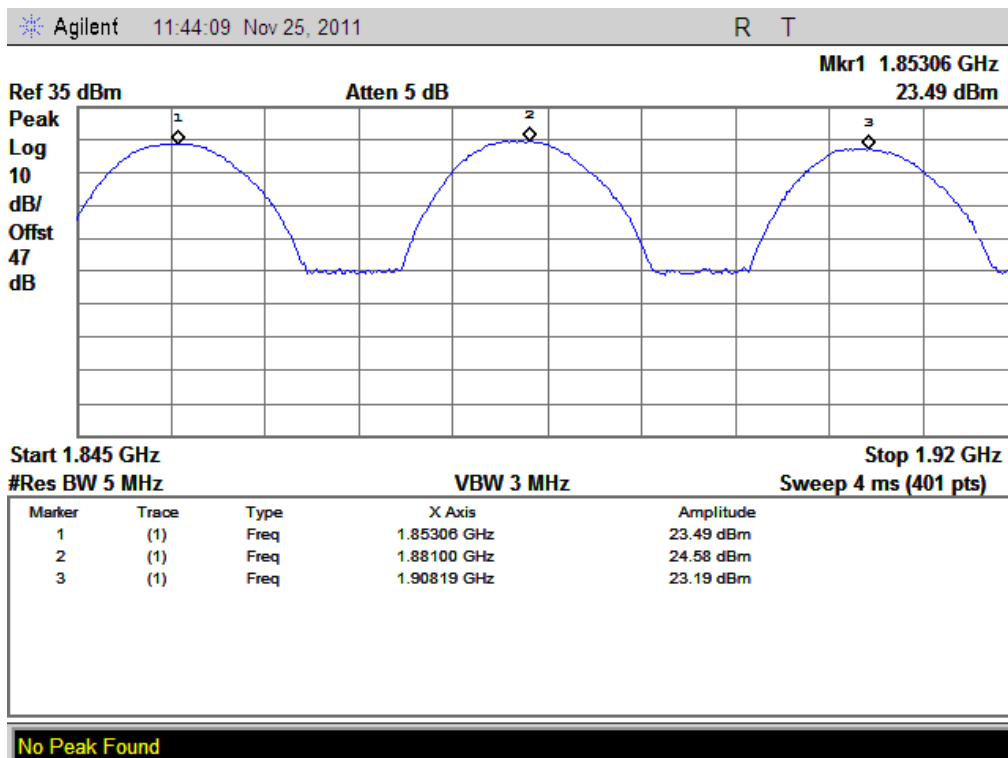
(Plot G: HSDPA 850MHz Channel = 4132, 4175, 4233)



(Plot H: HSDPA 1900MHz Channel = 9262, 9400, 9538)



(Plot I: HSUPA 850MHz Channel = 4132, 4175, 4233)



(Plot J: HSUPA 1900MHz Channel = 9262, 9400, 9538)

2.7. Radiated Out of Band Emissions

2.7.1. 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.

2.7.2. Test Description

See section 2.6.2 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.

2.7.3. 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.

A. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
EDGE 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
EDGE 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
WCDMA 850MHz	4132	824.2	< -25	< -25	Plot C.1/C.2	-13	PASS
	4175	836.6	< -25	< -25	Plot C.3/C.4		PASS
	4233	848.8	< -25	< -25	Plot C.5/C.6		PASS
WCDMA 1900MHz	9262	1850.2	< -25	< -25	Plot D.1/D.2	-13	PASS
	9400	1880.0	< -25	< -25	Plot D.3/D.4		PASS
	9538	1909.8	< -25	< -25	Plot D.5/D.6		PASS
HSDPA 850MHz	4132	826.4	< -25	< -25	Plot E.1/E.2	-13	PASS
	4175	835	< -25	< -25	Plot E.3/E.4		PASS
	4233	846.6	< -25	< -25	Plot E.5/E.6		PASS
HSDPA	9262	1852.4	< -25	< -25	Plot F.1/F.2	-13	PASS

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)		Refer to Plot	Limit (dBm)	Verdict
			Test Antenna Horizontal	Test Antenna Vertical			
1900MHz	9400	1880	< -25	< -25	Plot F.3/F.4		PASS
	9538	1907.6	< -25	< -25	Plot F.5/F.6		PASS
HSUPA 850MHz	4132	826.4	< -25	< -25	Plot G.1/G.2	-13	PASS
	4175	835	< -25	< -25	Plot G.3/G.4		PASS
	4233	846.6	< -25	< -25	Plot G.5/G.6		PASS
HSUPA 1900MHz	9262	1852.4	< -25	< -25	Plot H.1/H.2	-13	PASS
	9400	1880	< -25	< -25	Plot H.3/H.4		PASS
	9538	1907.6	< -25	< -25	Plot H.5/H.6		PASS

B. Test Plots for the Whole Measurement Frequency Range:

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



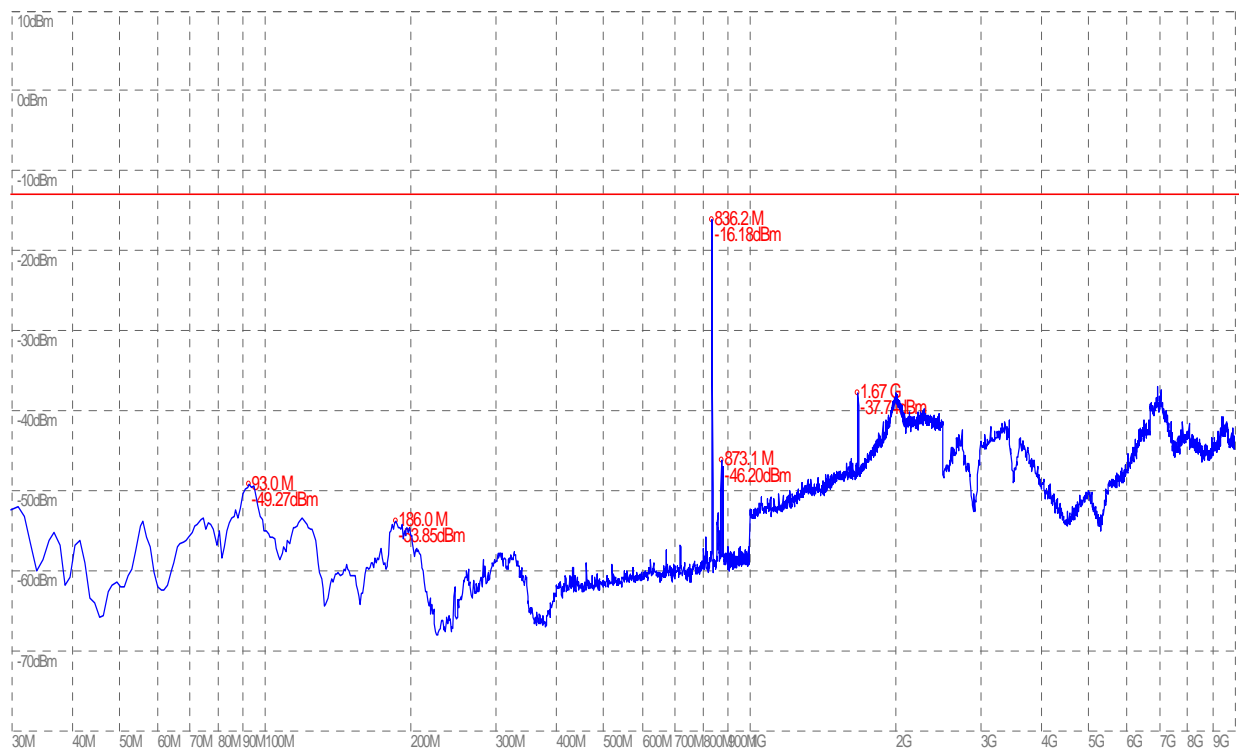
(Plot A.1: EGPRS 850MHz Channel = 128, Test Antenna Horizontal)



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



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



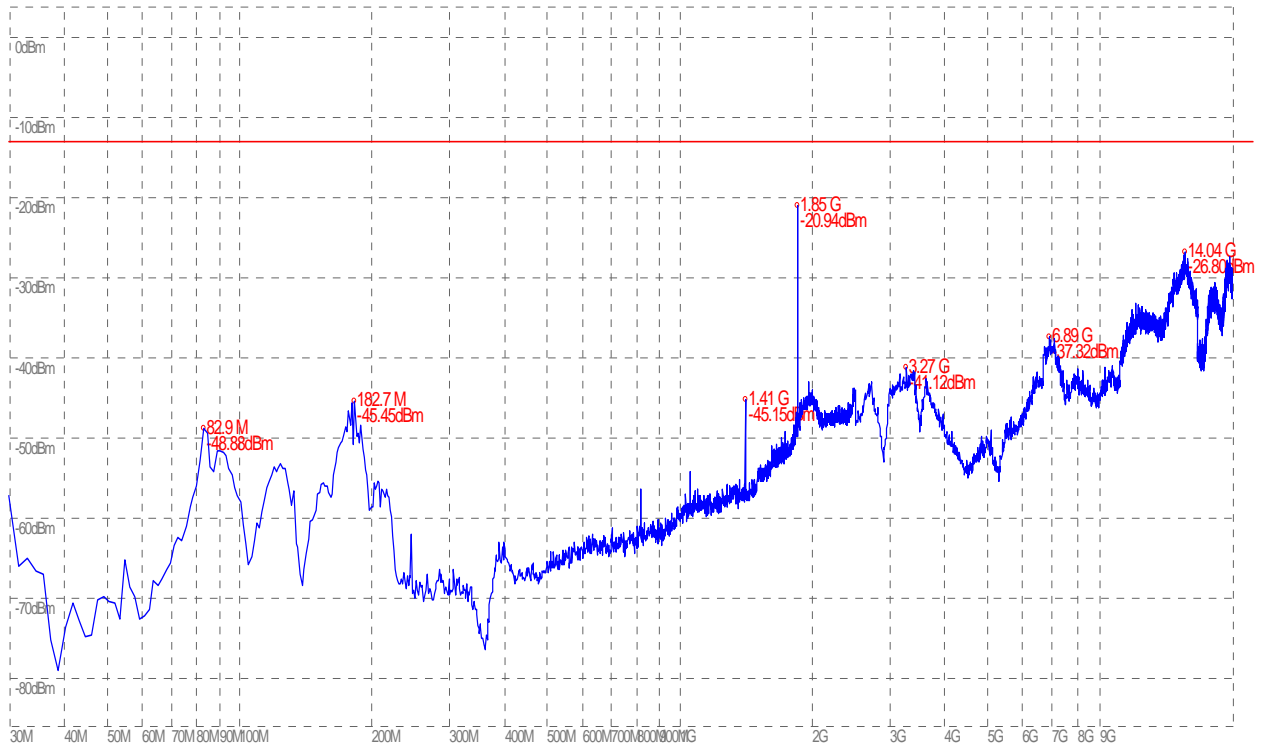
(Plot A.4: EGPRS 850MHz Channel = 190, Test Antenna Vertical)



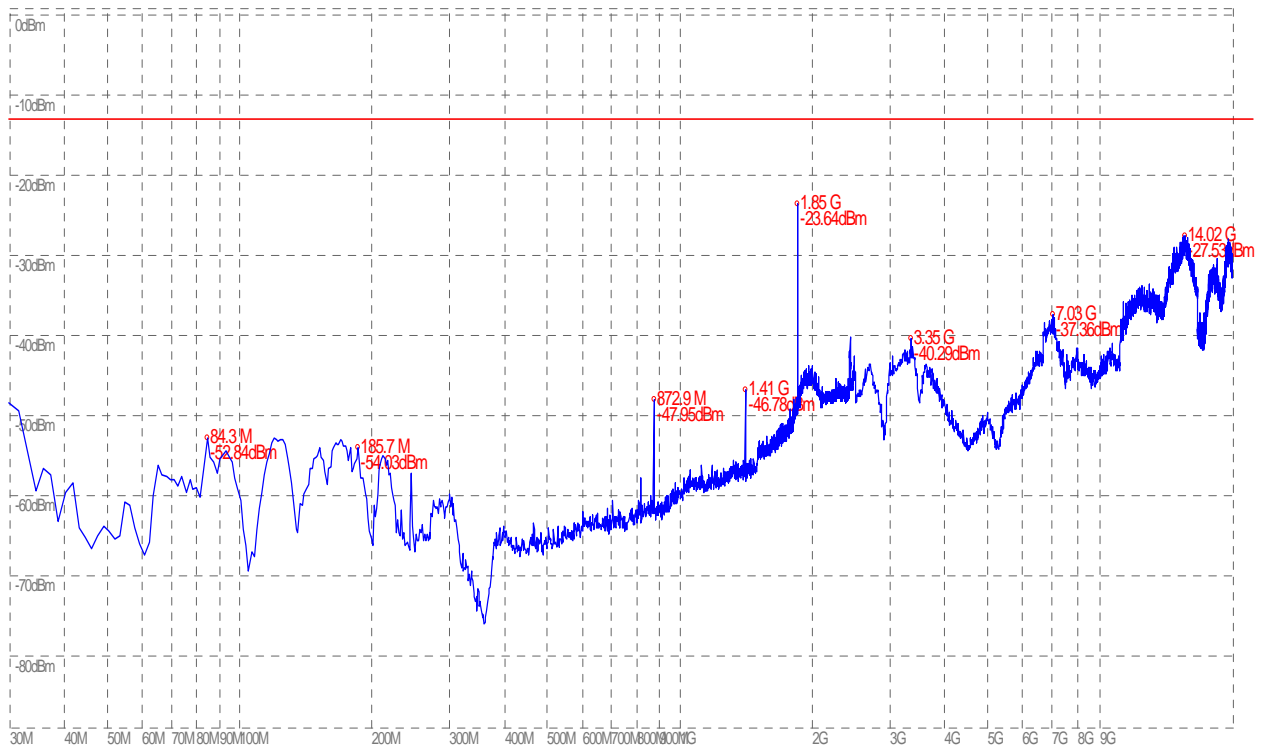
(Plot A.5: EGPRS 850MHz Channel = 251, Test Antenna Horizontal)



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



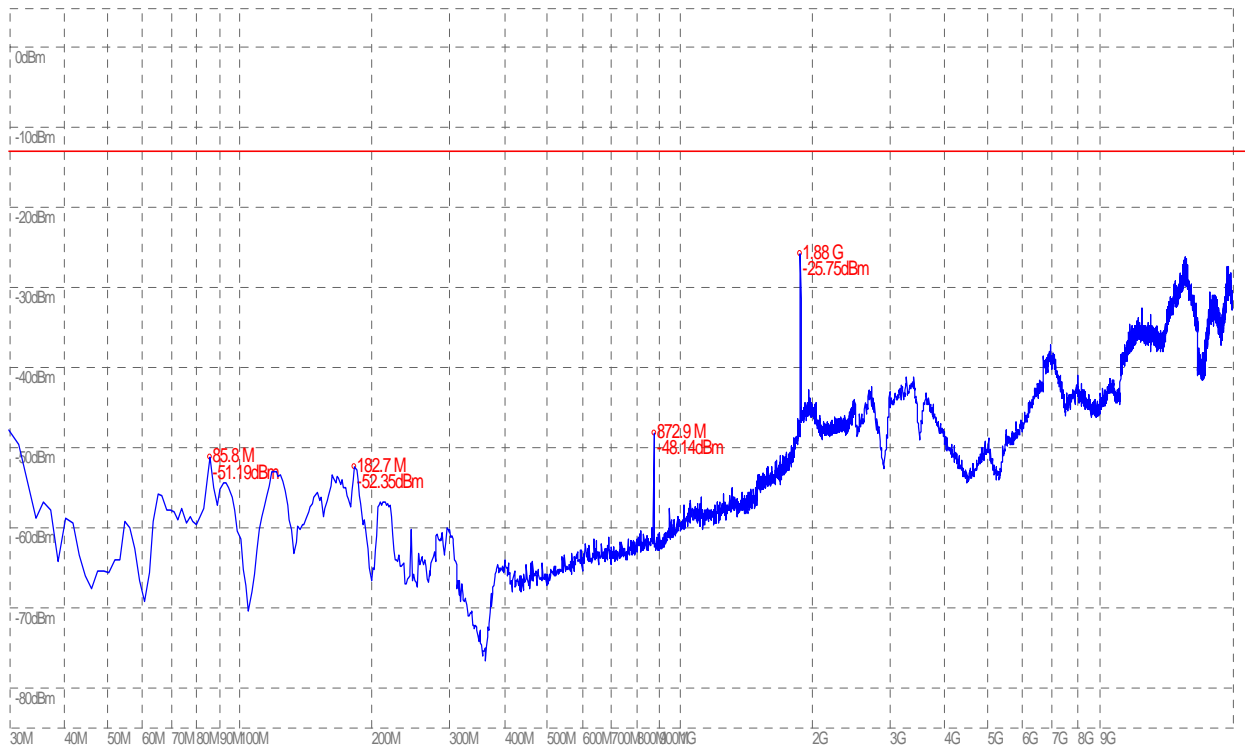
(Plot B.1: EGPRS 1900MHz Channel = 512, Test Antenna Horizontal)



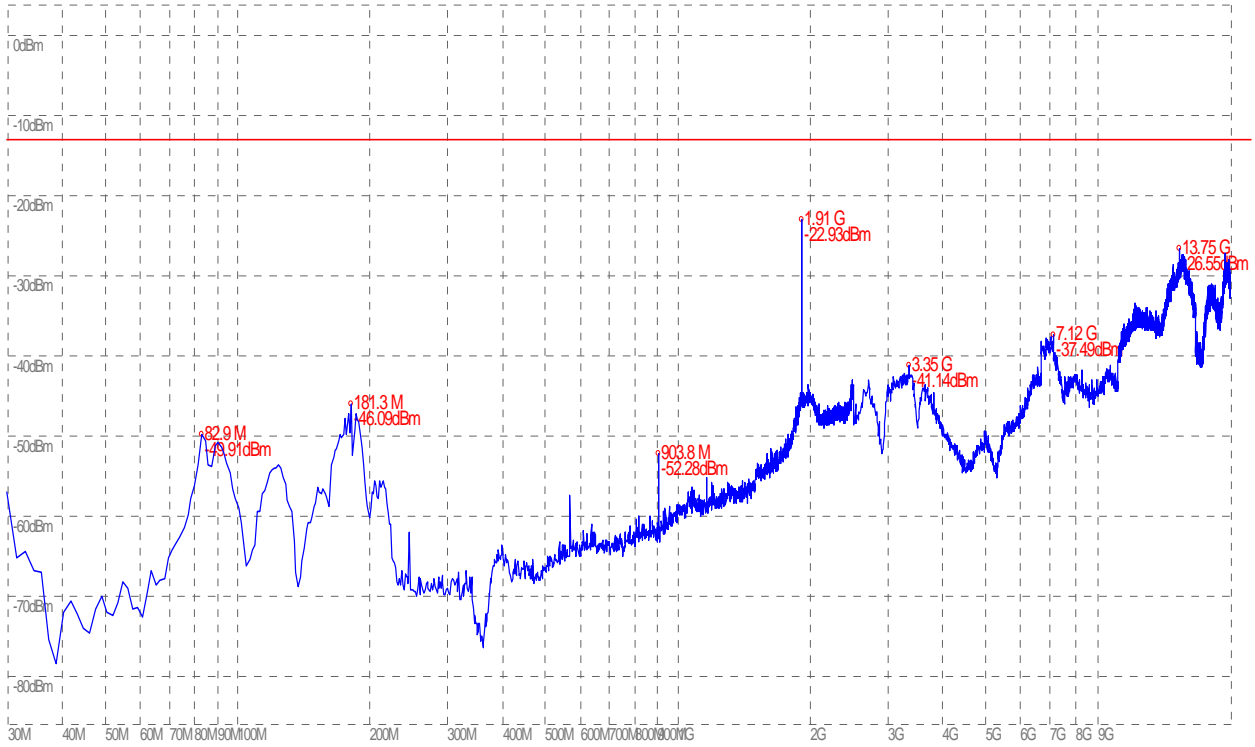
(Plot B.2: EGPRS 1900MHz Channel = 512, Test Antenna Vertical)



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



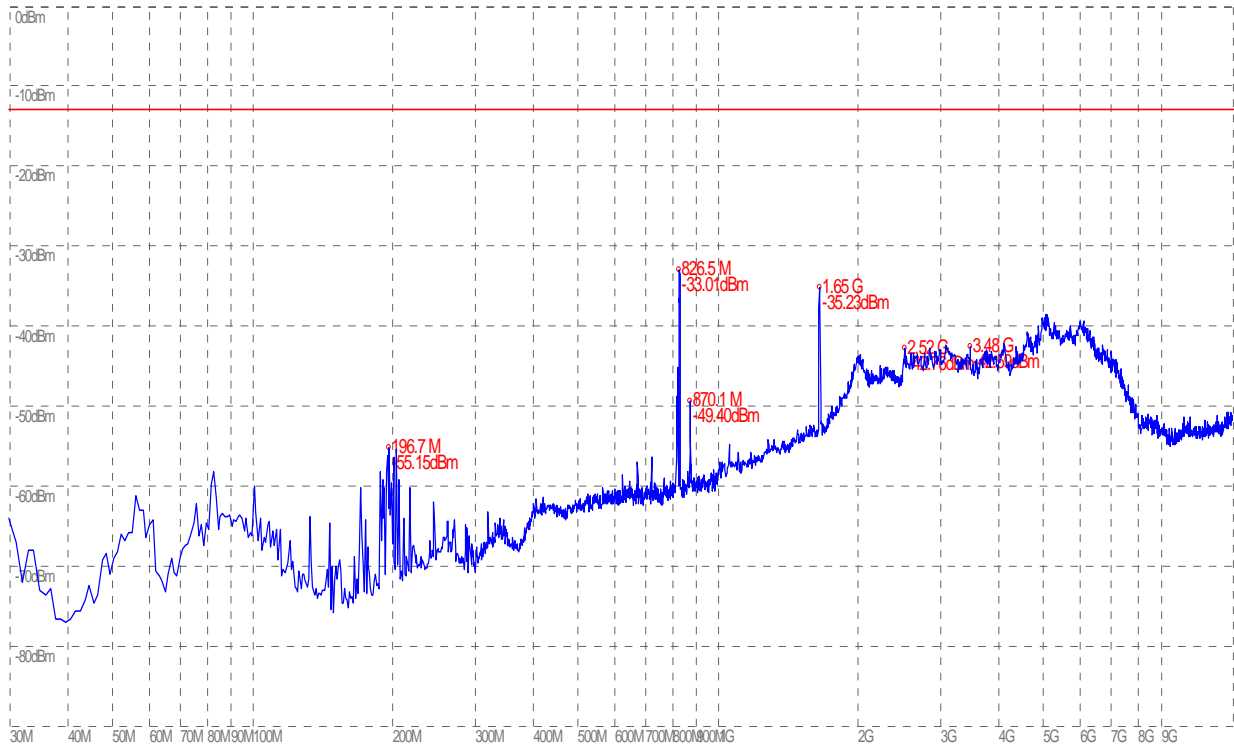
(Plot B.4: EGPRS 1900MHz Channel = 661, Test Antenna Vertical)



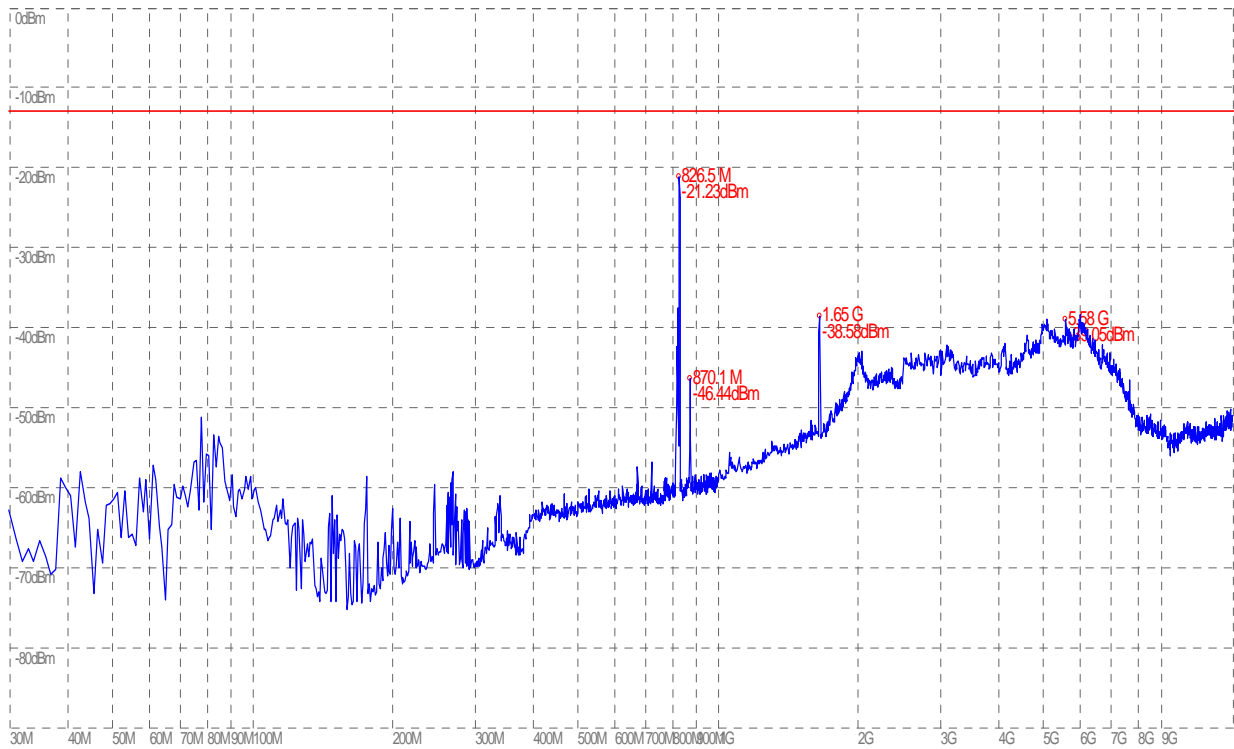
(Plot B 5 : EGPRS 1900MHz Channel = 810, Test Antenna Horizontal)



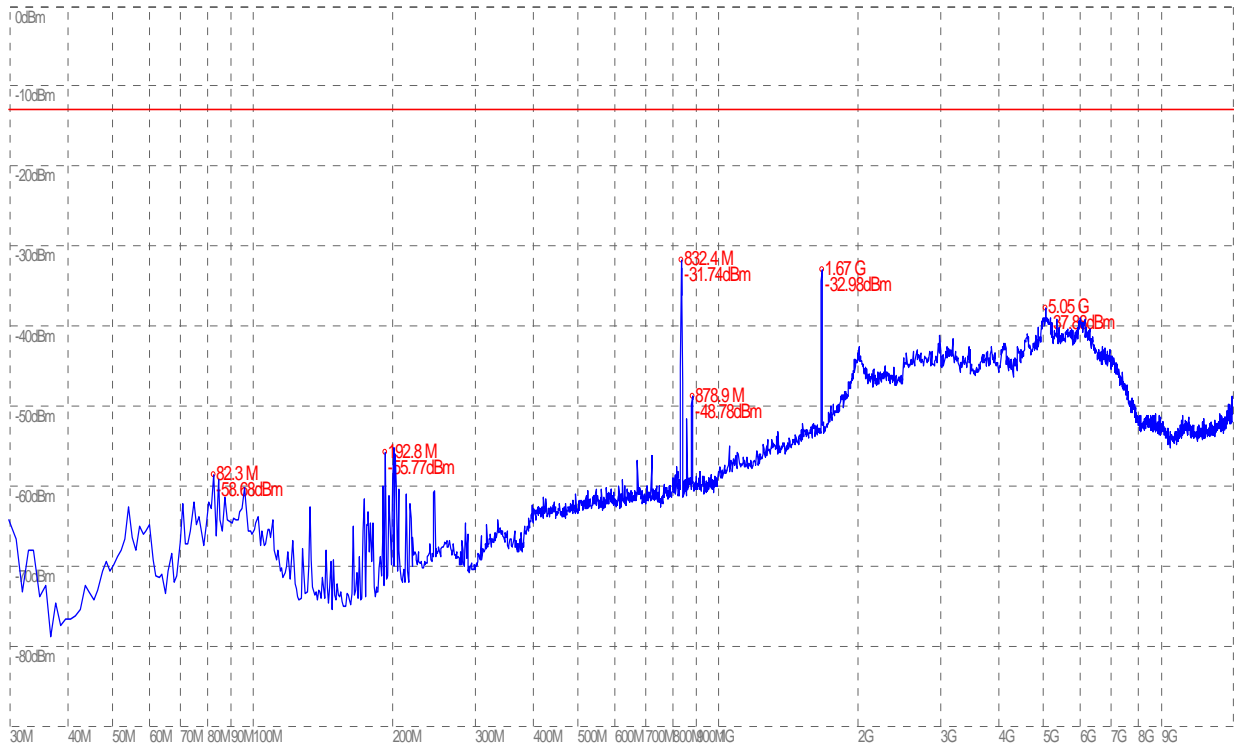
(Plot B 6: EGPRS 1900MHz Channel = 810, Test Antenna Vertical)



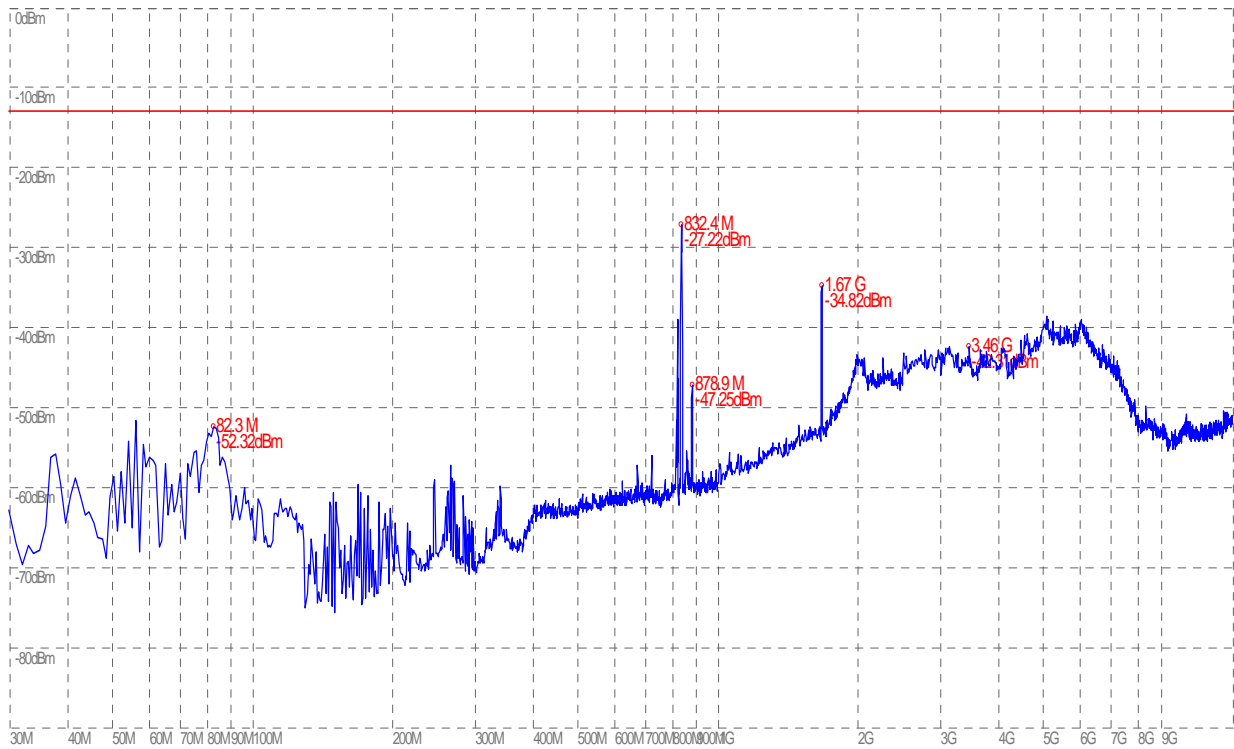
(Plot C.1: WCDMA 850MHz Channel = 4132, Test Antenna Horizontal)



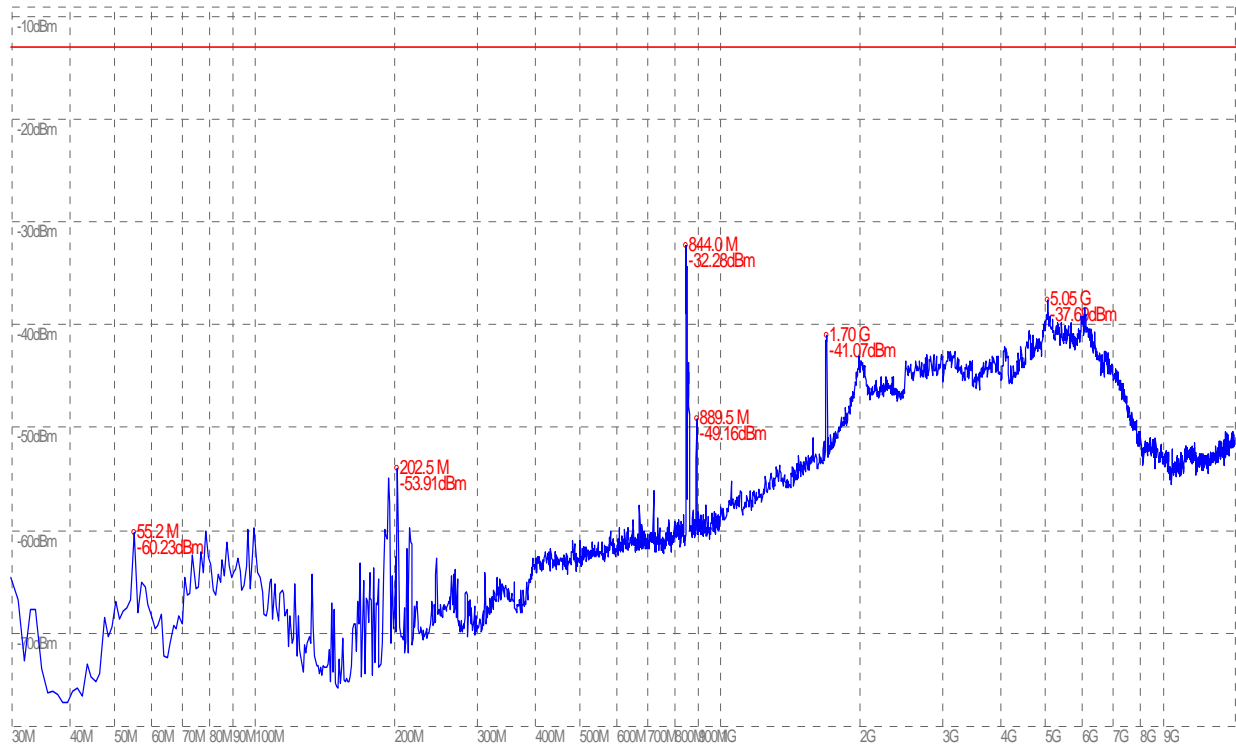
(Plot C.2: WCDMA 850MHz Channel = 4132, Test Antenna Vertical)



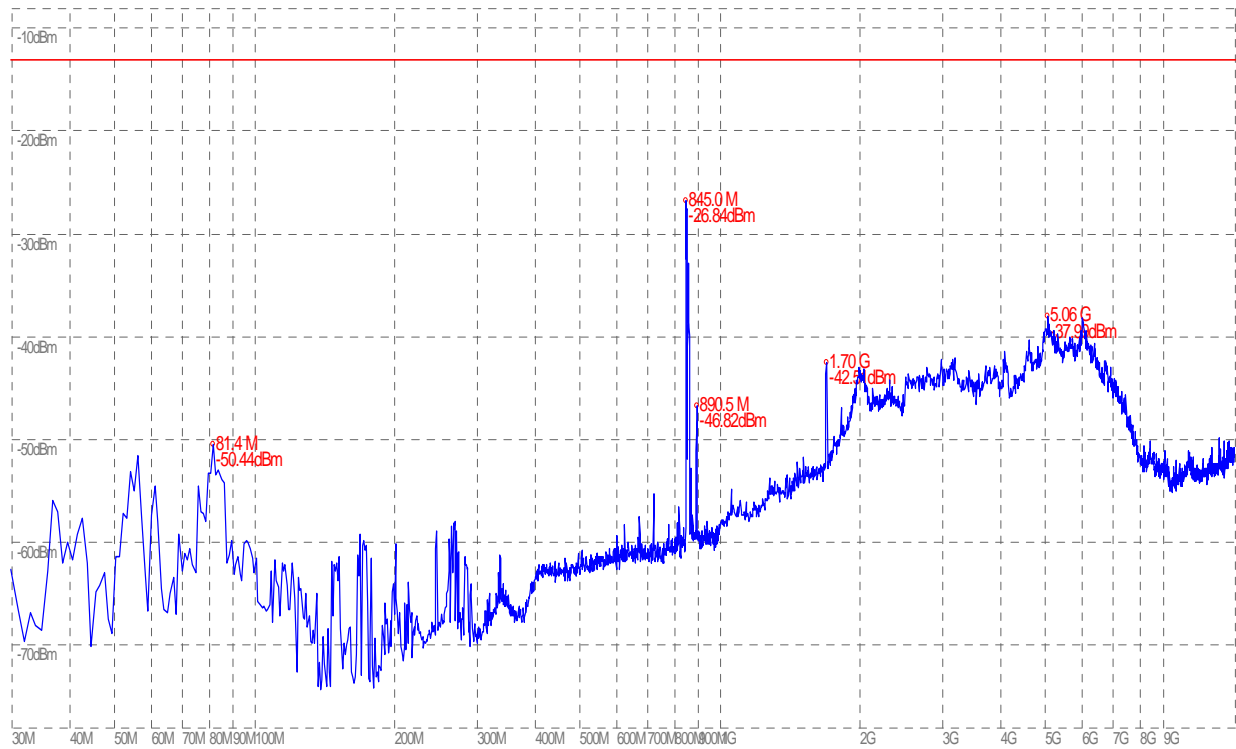
(Plot C.3: WCDMA 850MHz Channel = 4175, Test Antenna Horizontal)



(Plot C.4: WCDMA 850MHz Channel = 4175, Test Antenna Vertical)



(Plot C.5: WCDMA 850MHz Channel = 4233, Test Antenna Horizontal)



(Plot C.6: WCDMA 850MHz Channel = 4233, Test Antenna Vertical)



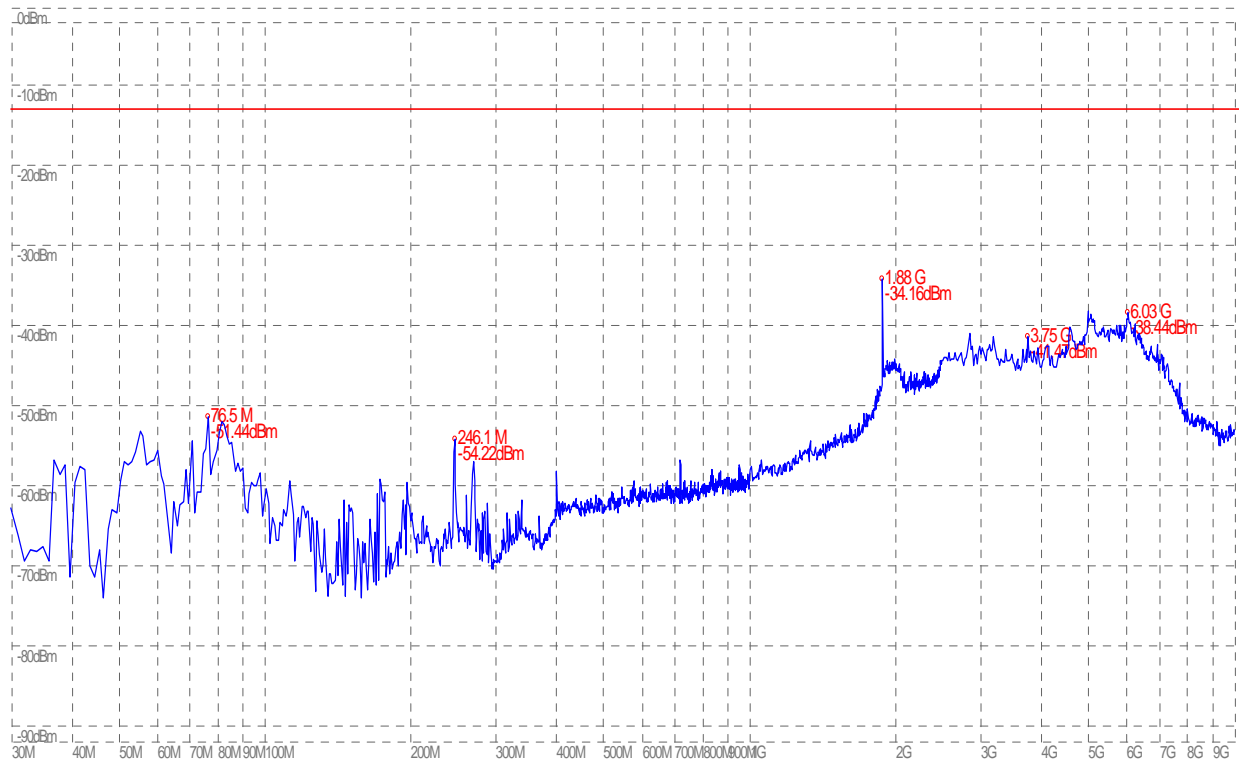
(Plot D.1: WCDMA 1900MHz Channel = 9262, Test Antenna Horizontal)



(Plot D.2: WCDMA 1900MHz Channel = 9262, Test Antenna Vertical)



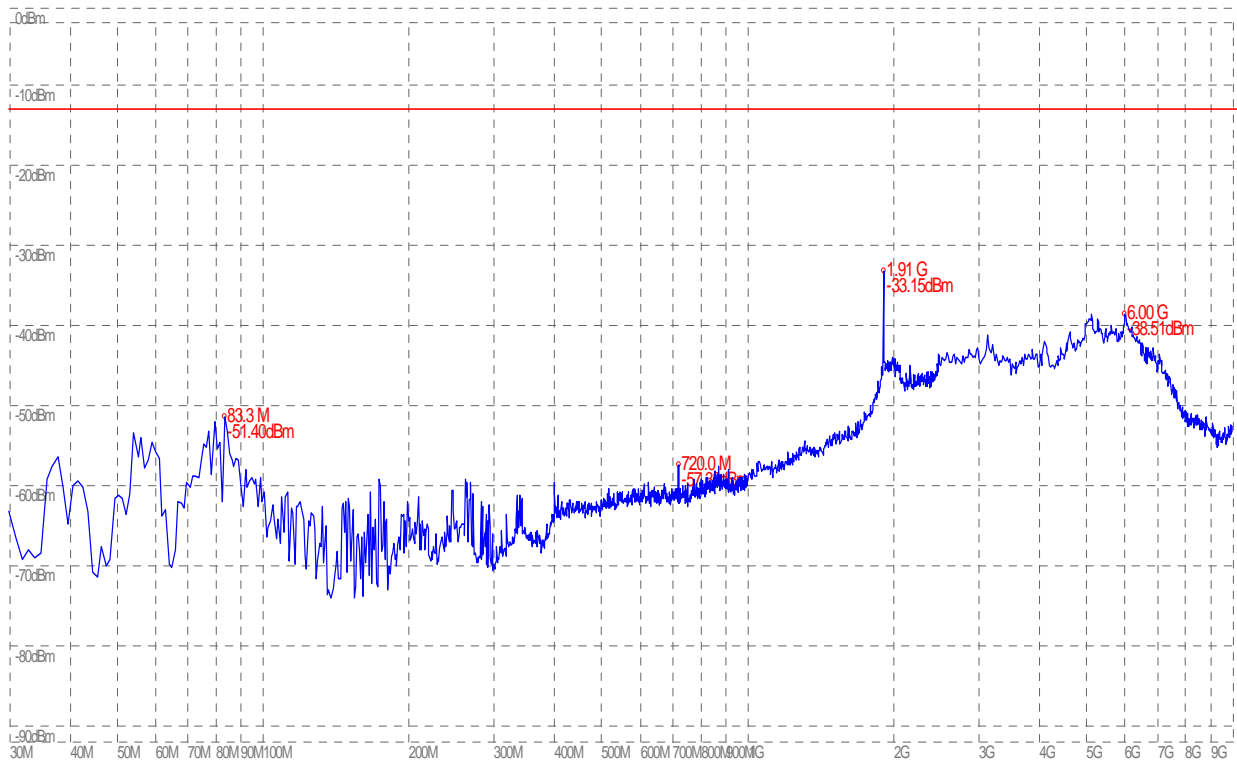
(Plot D.3: WCDMA 1900MHz Channel = 9400, Test Antenna Horizontal)



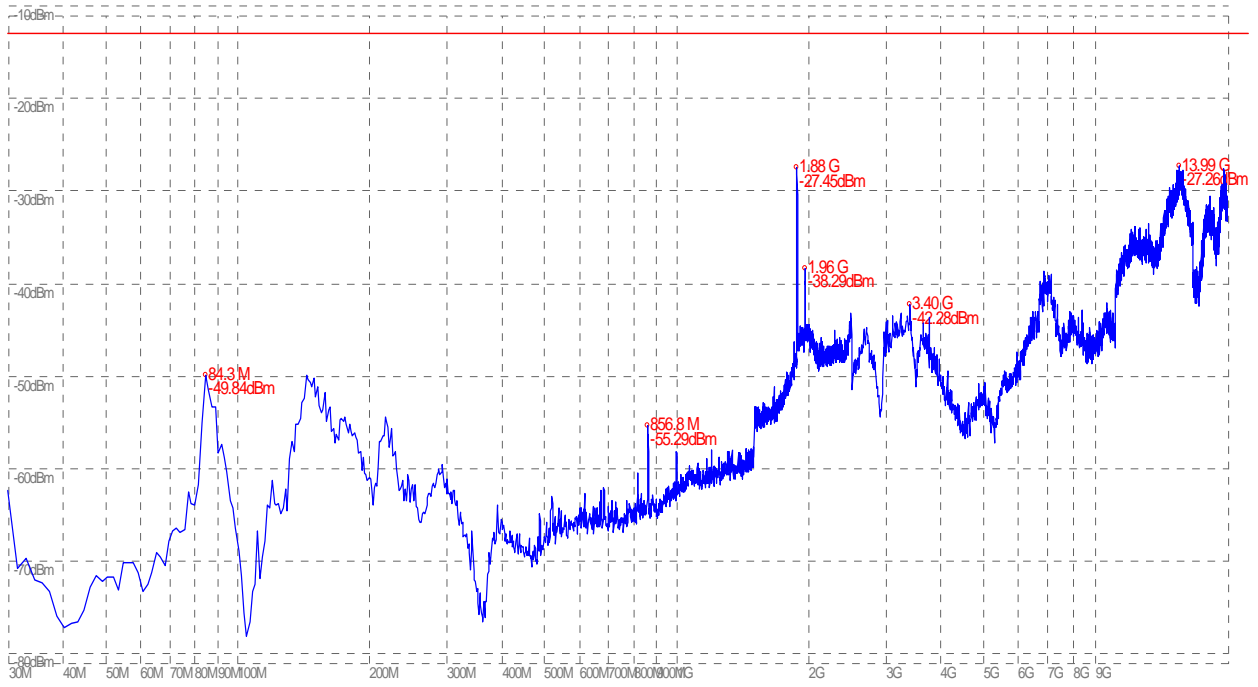
(Plot D.4: WCDMA 1900MHz Channel = 9400, Test Antenna Vertical)



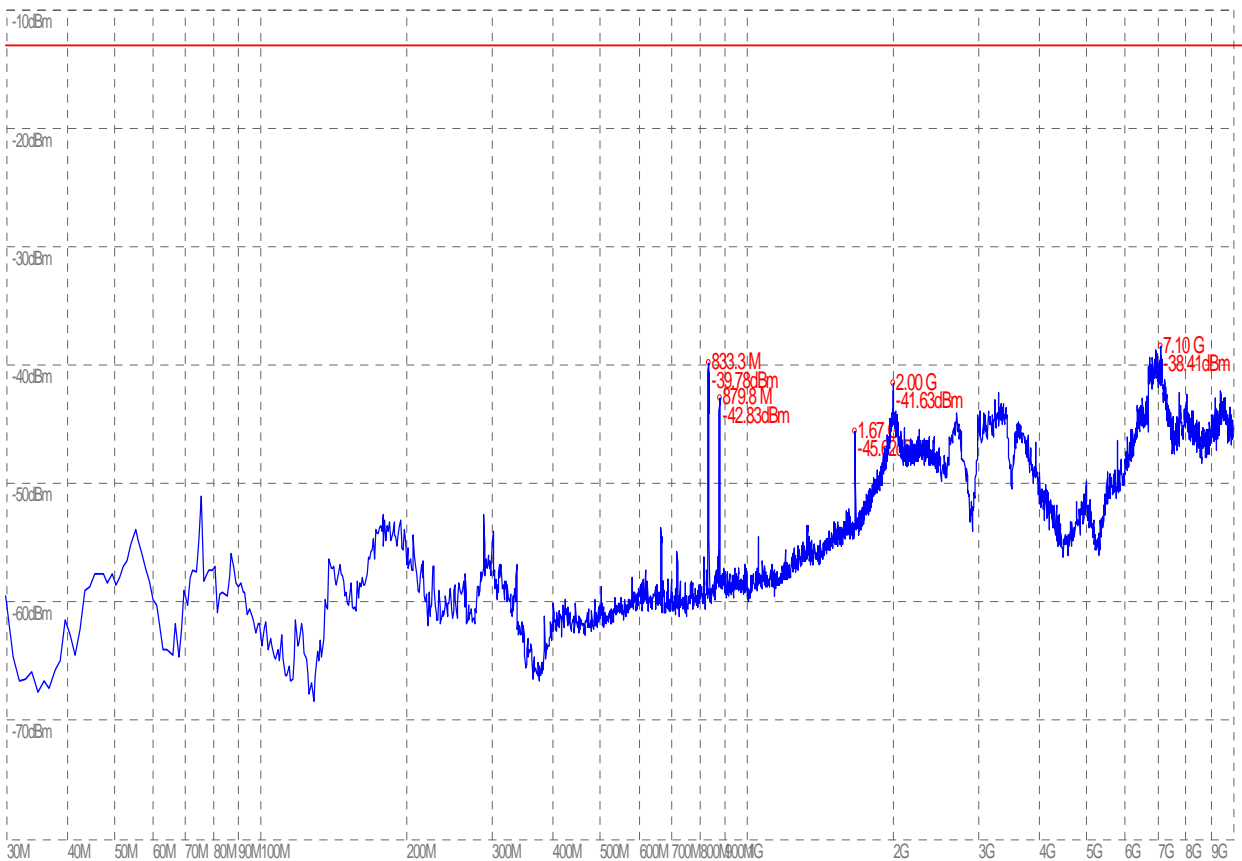
(Plot D.5: WCDMA 1900MHz Channel = 9538, Test Antenna Horizontal)



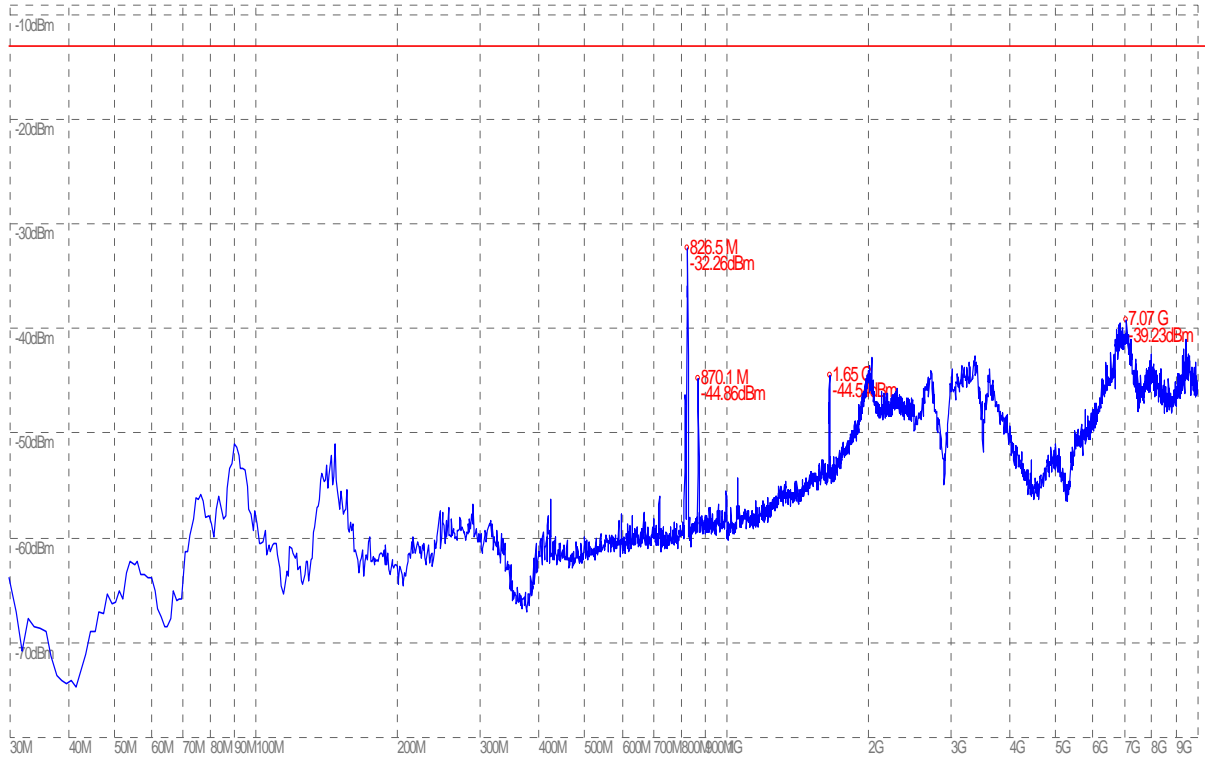
(Plot D.6: WCDMA 1900MHz Channel = 9538, Test Antenna Vertical)



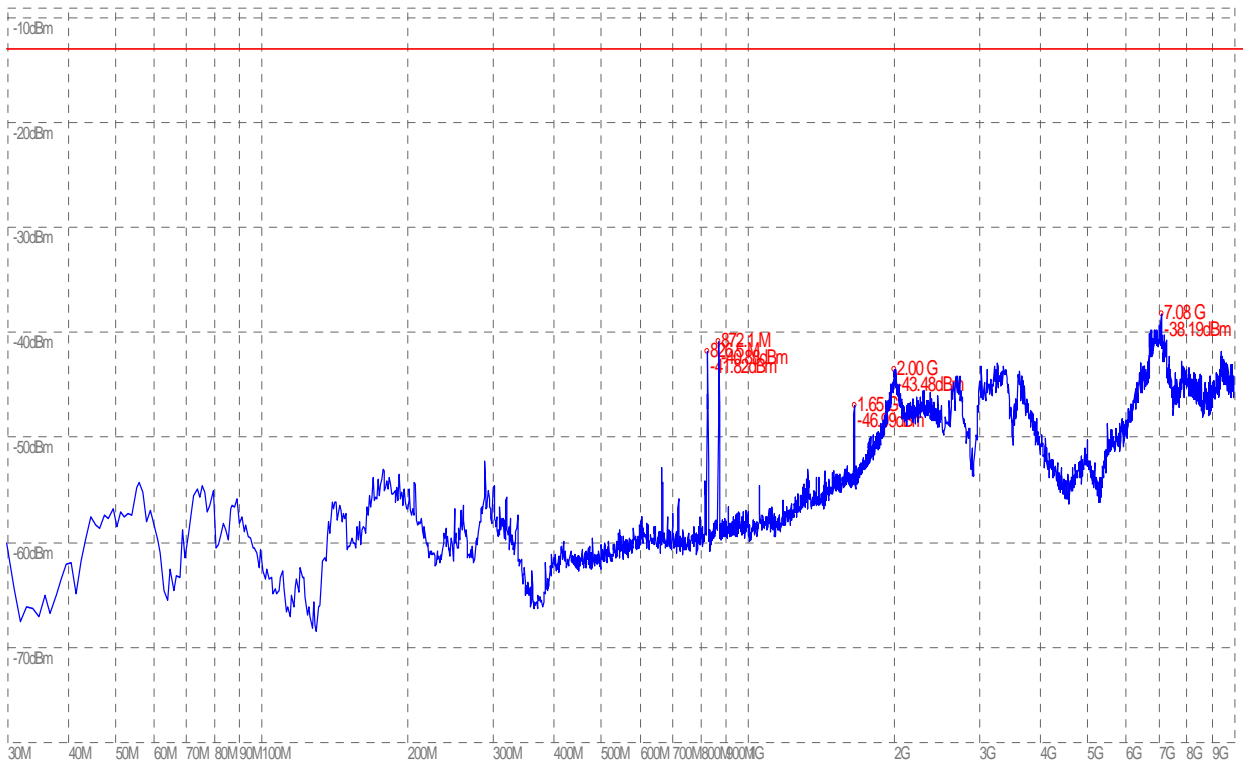
(Plot E.1: HSDPA 850MHz Channel = 4132 Test Antenna Horizontal)



(Plot E.2: HSDPA 850MHz Channel = 4132, Test Antenna Vertical)



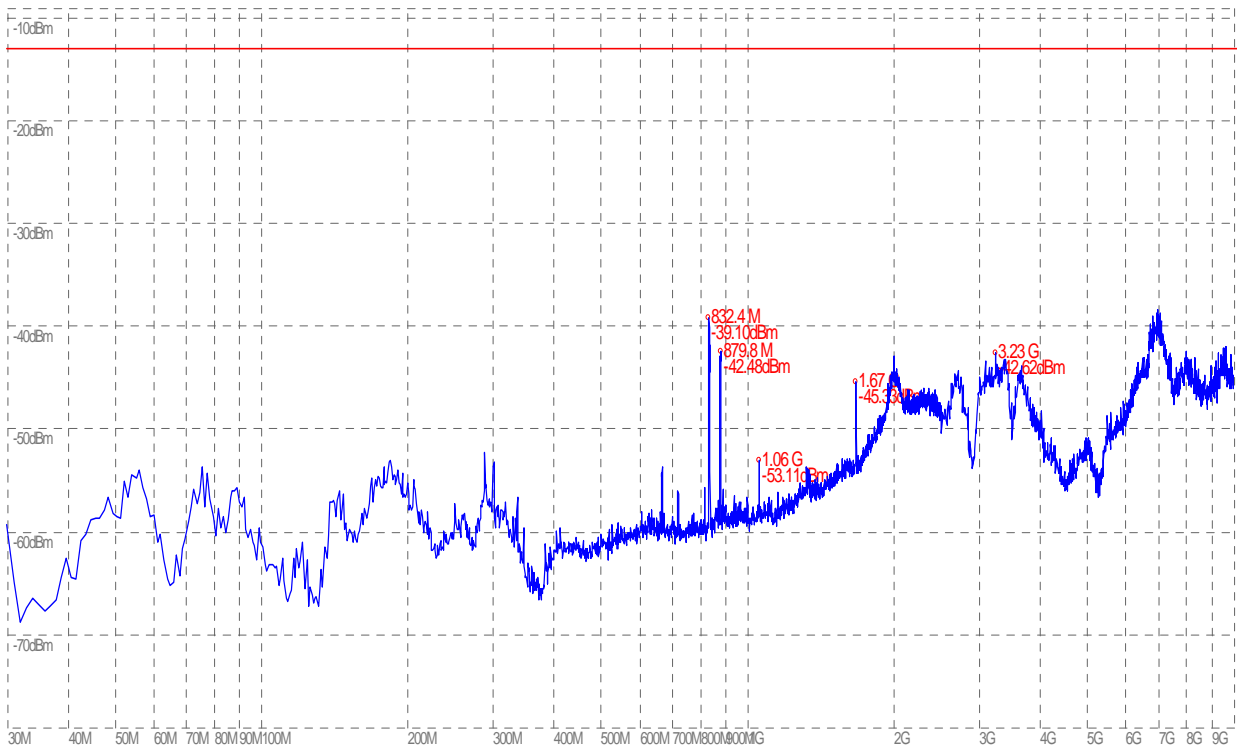
(Plot E.3: HSDPA 850MHz Channel = 4175, Test Antenna Horizontal)



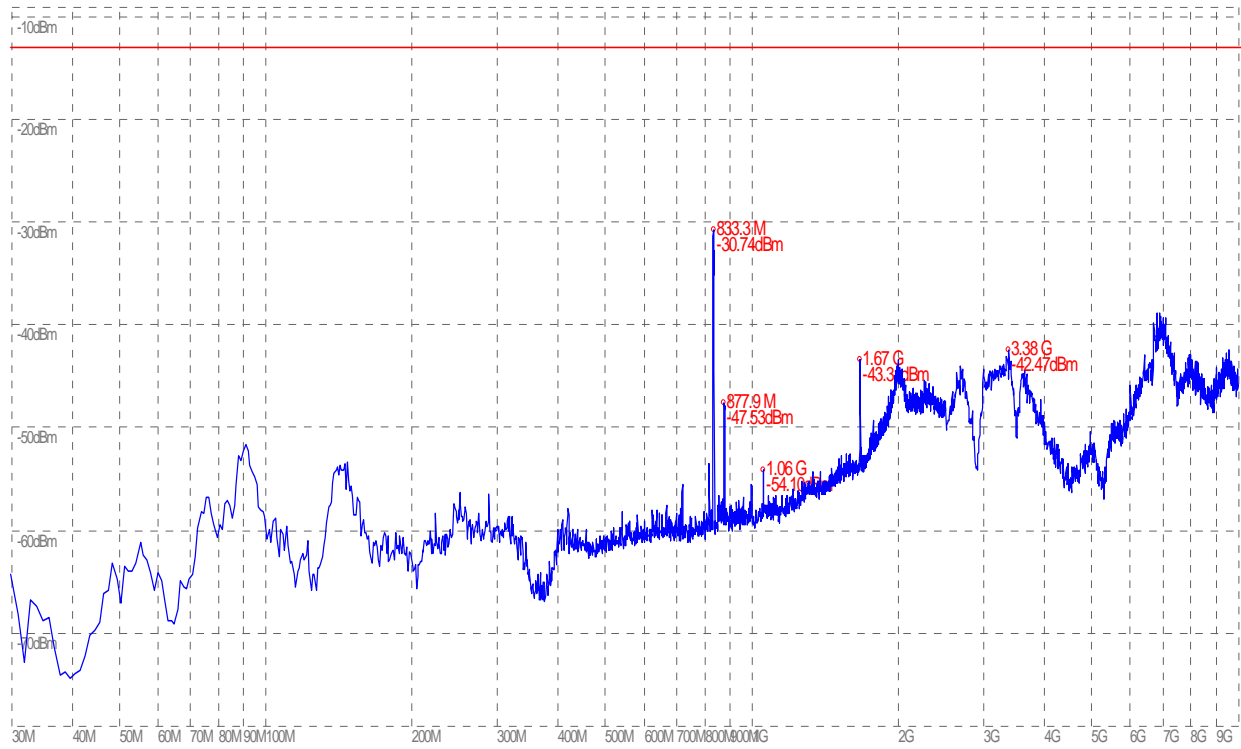
(Plot E.4: HSDPA 850MHz Channel = 4175, Test Antenna Vertical)



(Plot E.5: HSDPA 850MHz Channel = 4233, Test Antenna Horizontal)



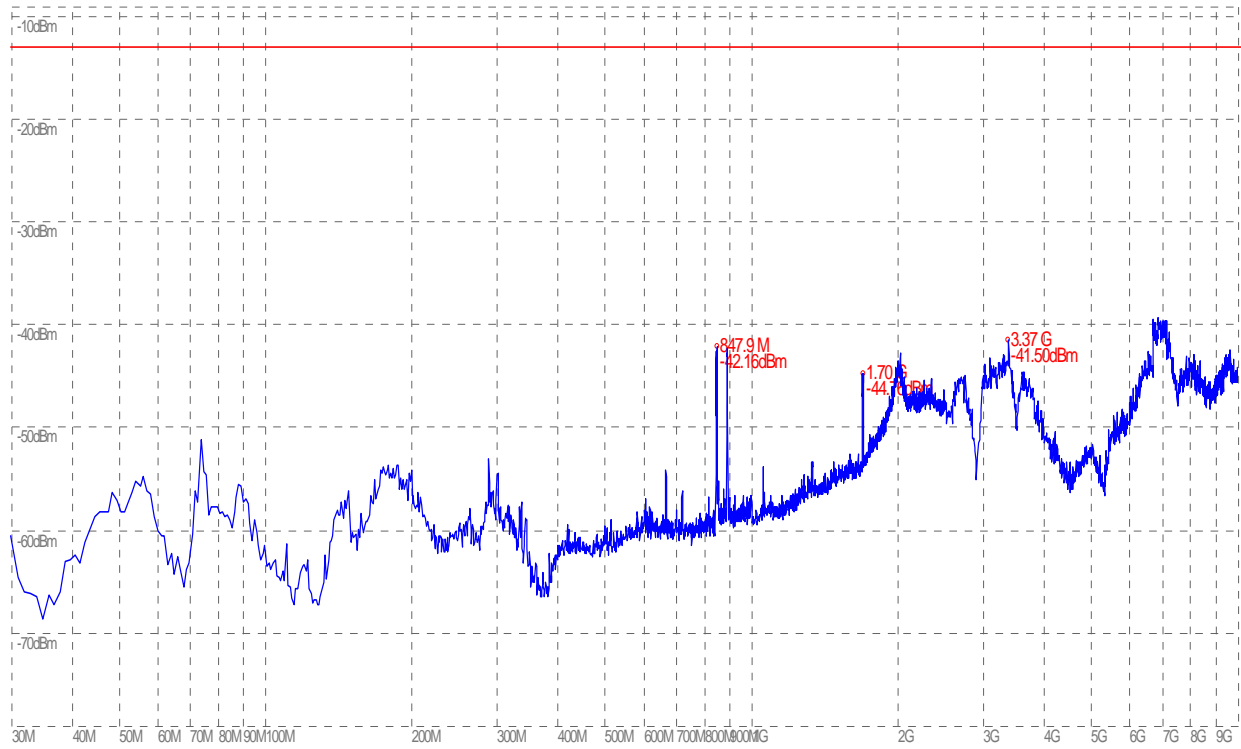
(Plot E.6: HSDPA 850MHz Channel = 4233, Test Antenna Vertical)



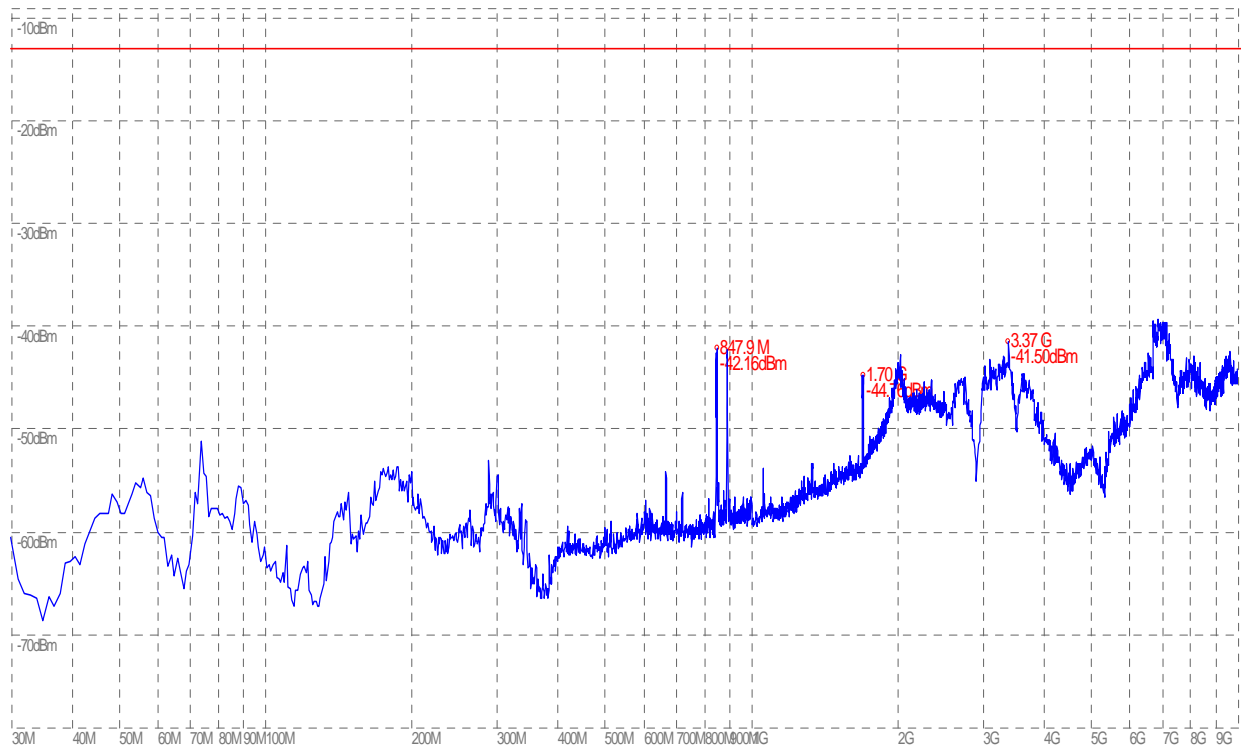
(Plot F.1: HSDPA 1900 MHz Channel = 9262, Test Antenna Horizontal)



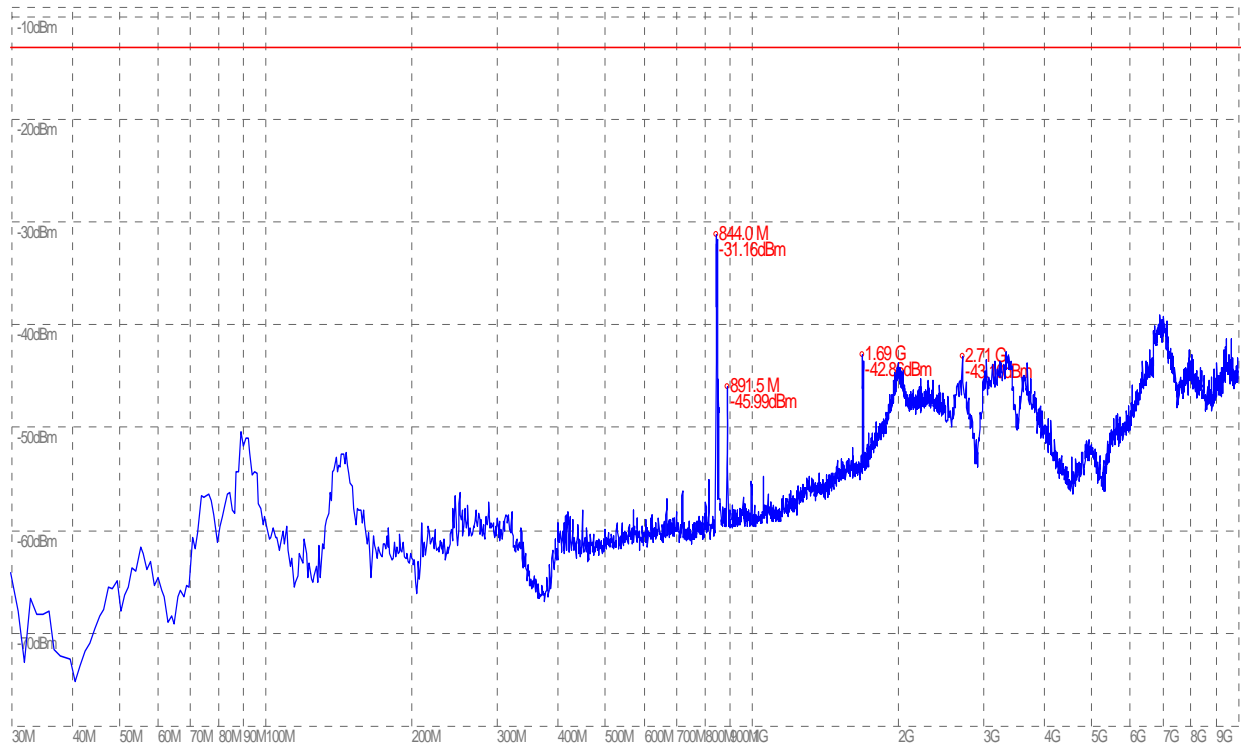
(Plot F.2: HSDPA 1900 MHz Channel = 9262, Test Antenna Vertical)



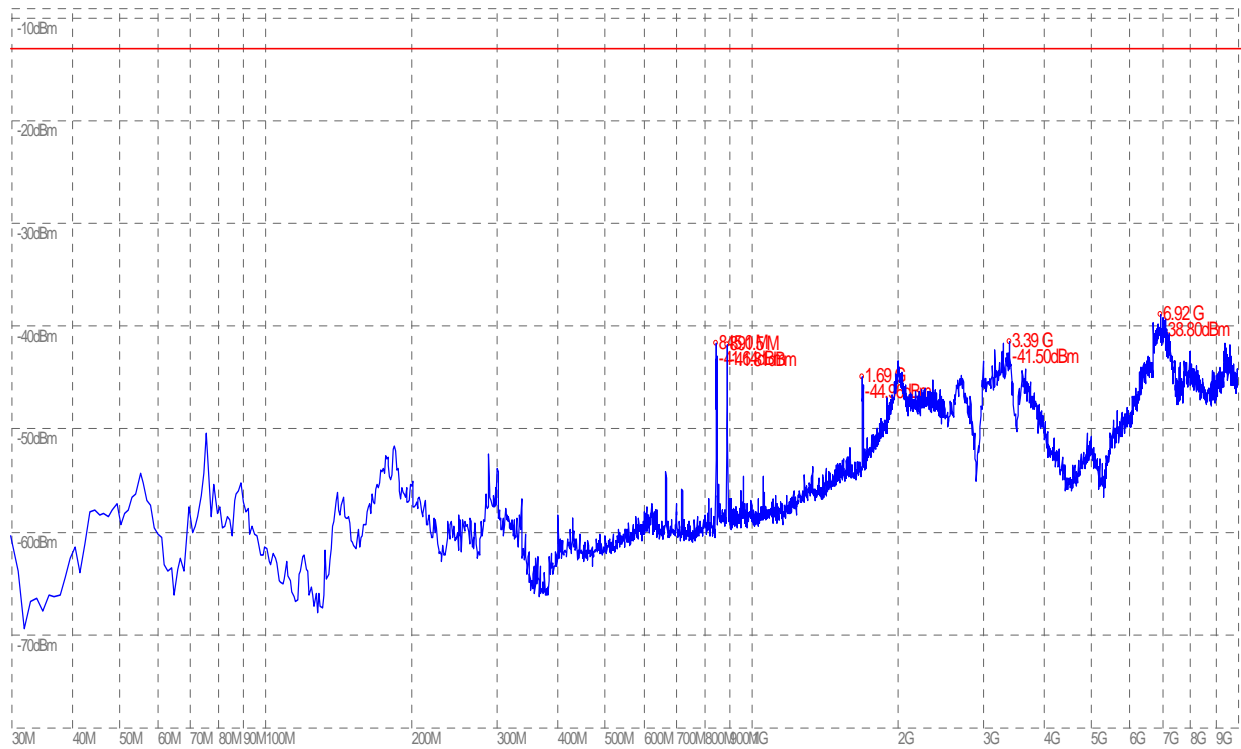
(Plot F.3: HSDPA 1900 MHz Channel = 9400, Test Antenna Horizontal)



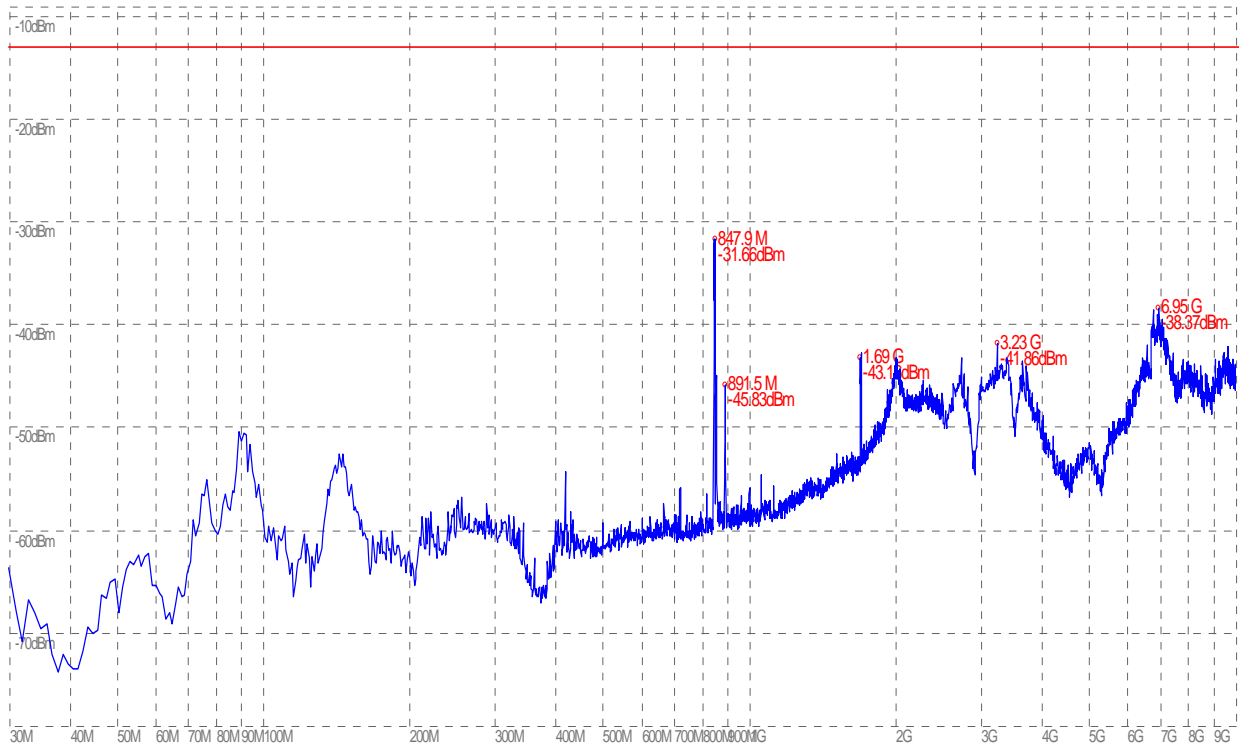
(Plot F.4: HSDPA 1900 MHz Channel = 9400, Test Antenna Vertical)



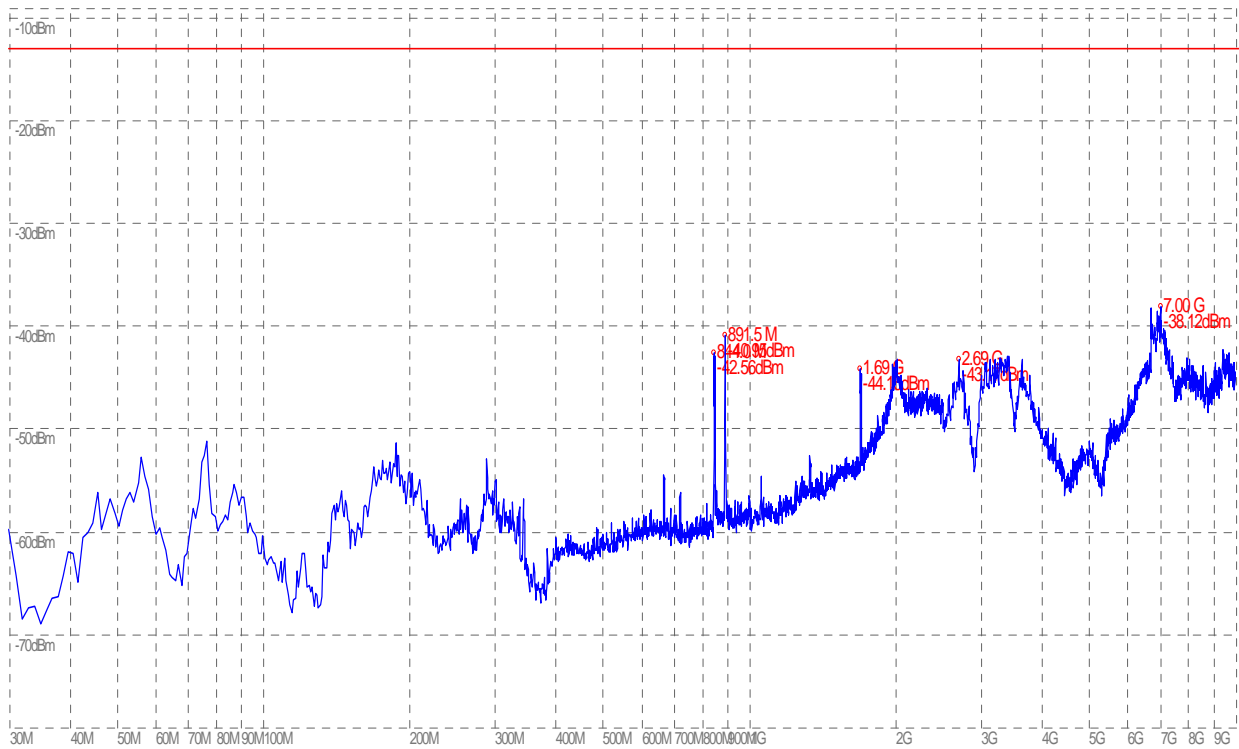
(Plot F.5: HSDPA 1900 MHz Channel = 9538, Test Antenna Horizontal)



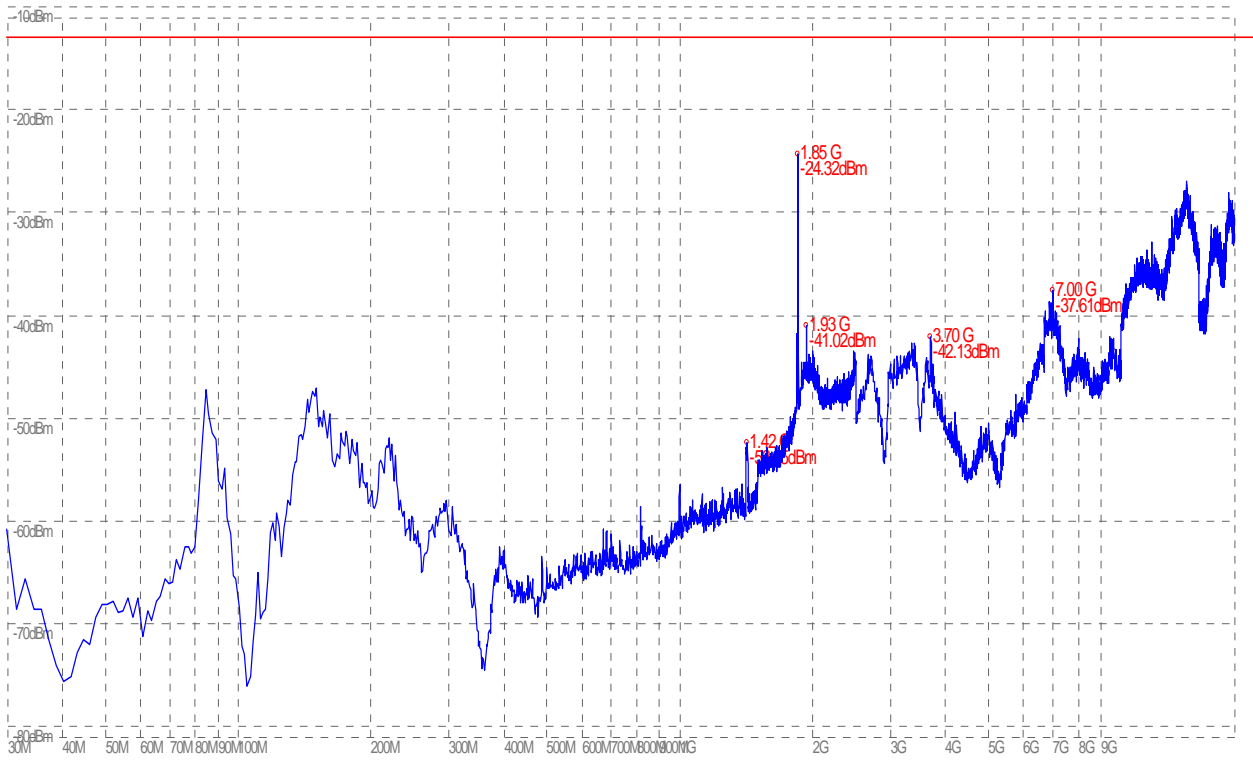
(Plot F.6: HSDPA 1900 MHz Channel = 9538 Test Antenna Vertical)



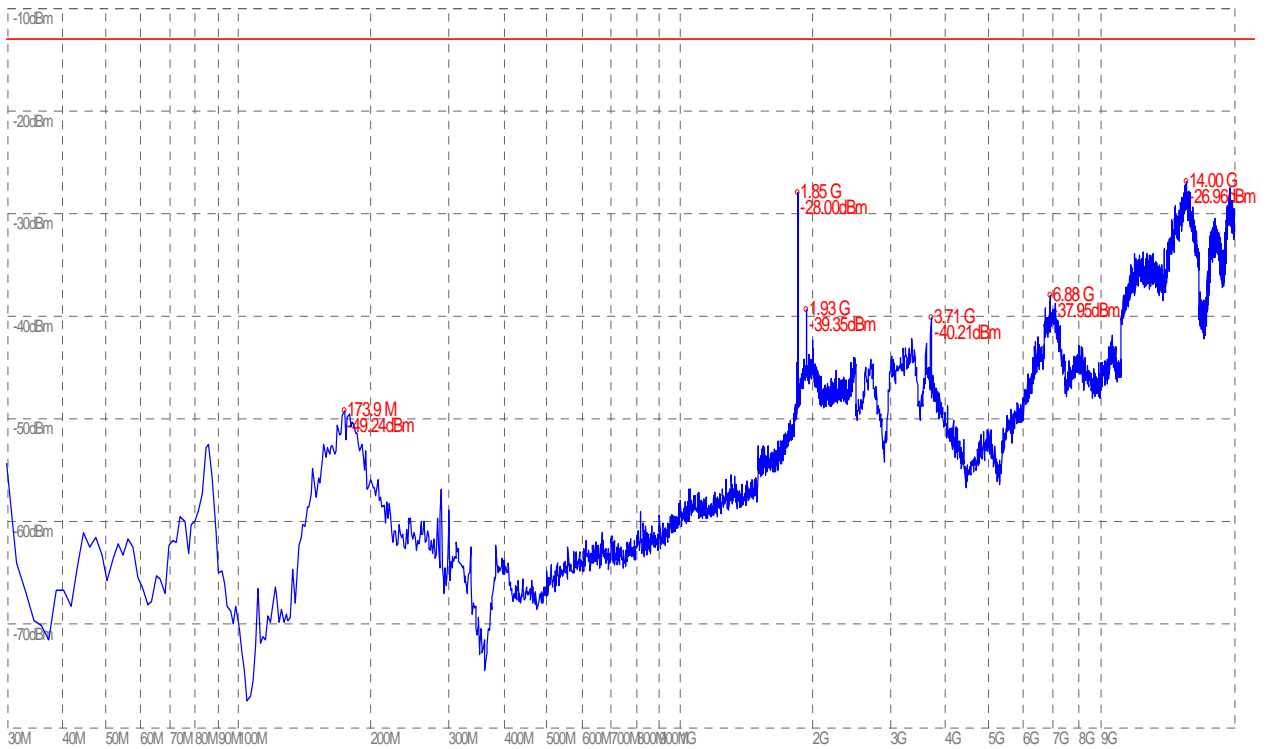
(Plot G.1: HSUPA 850MHz Channel = 4132, Test Antenna Horizontal)



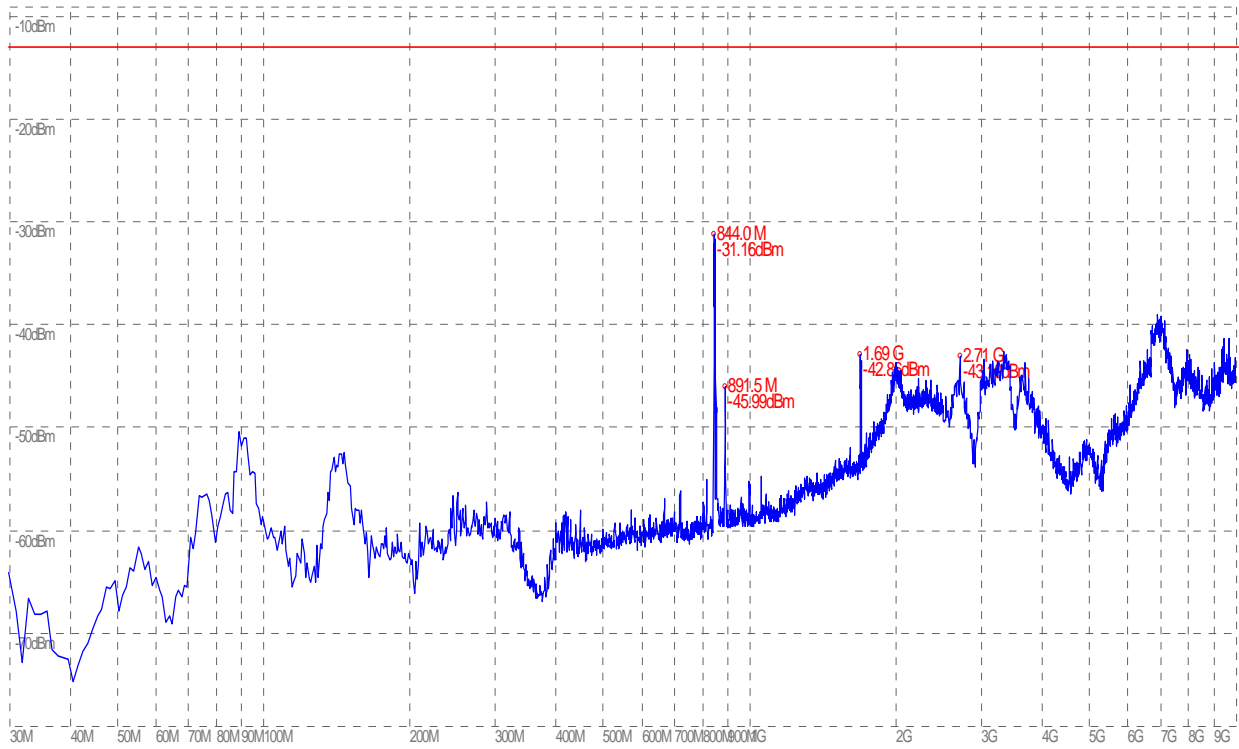
(Plot G.2: HSUPA 850 MHz Channel = 4132, Test Antenna Vertical)



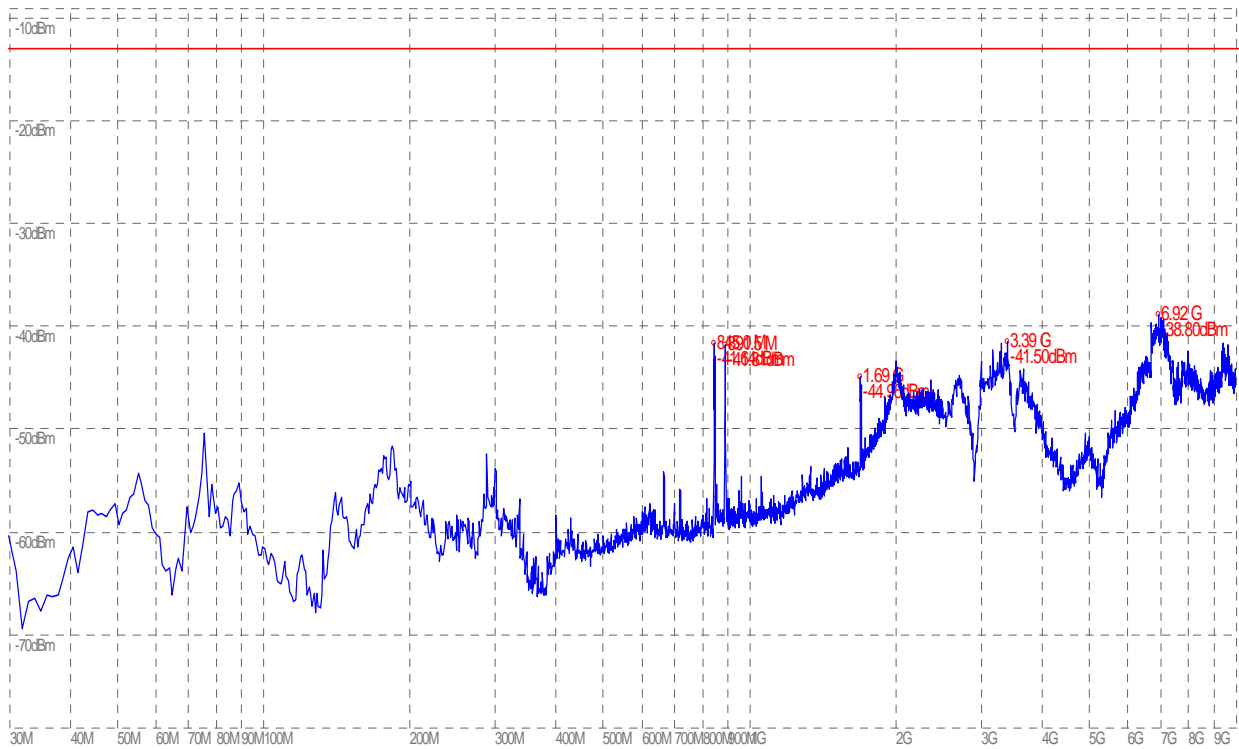
(Plot G.3: HSUPA 850MHz Channel = 4175, Test Antenna Horizontal)



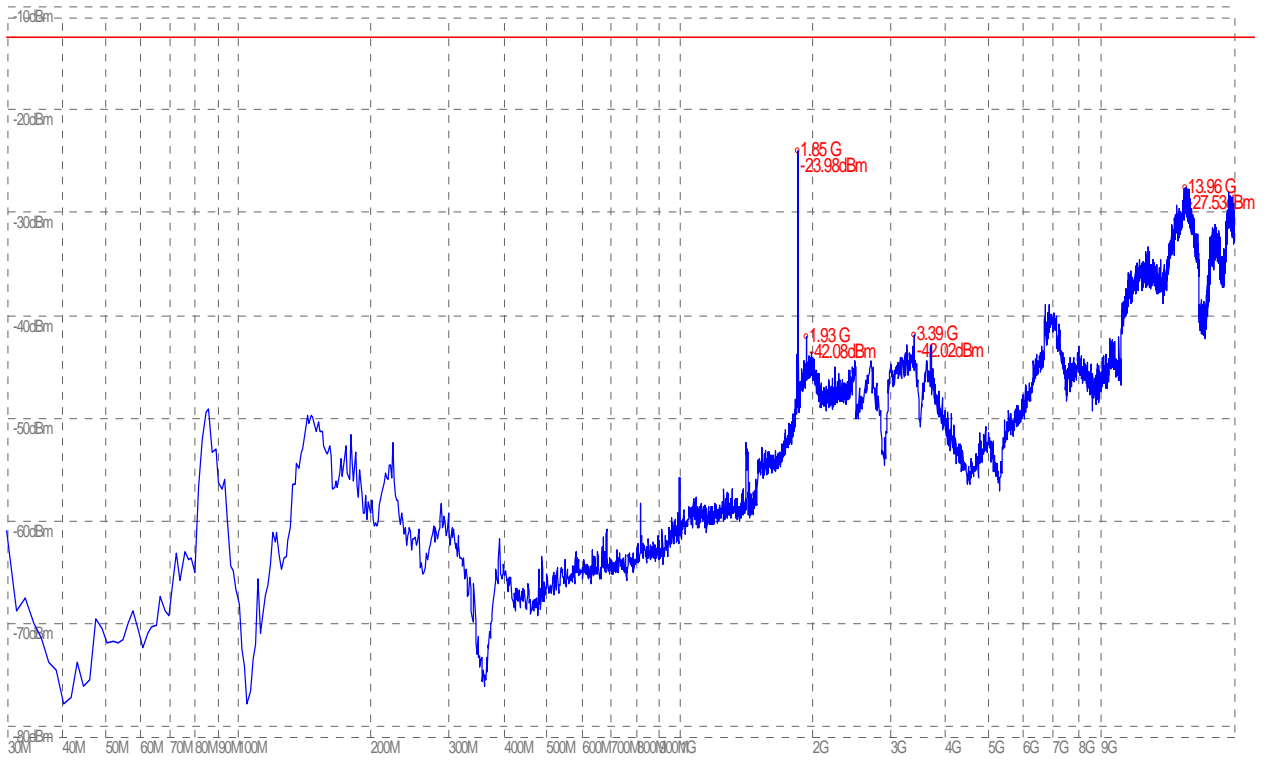
(Plot G.4: HSUPA 850MHz Channel = 4175, Test Antenna Vertical)



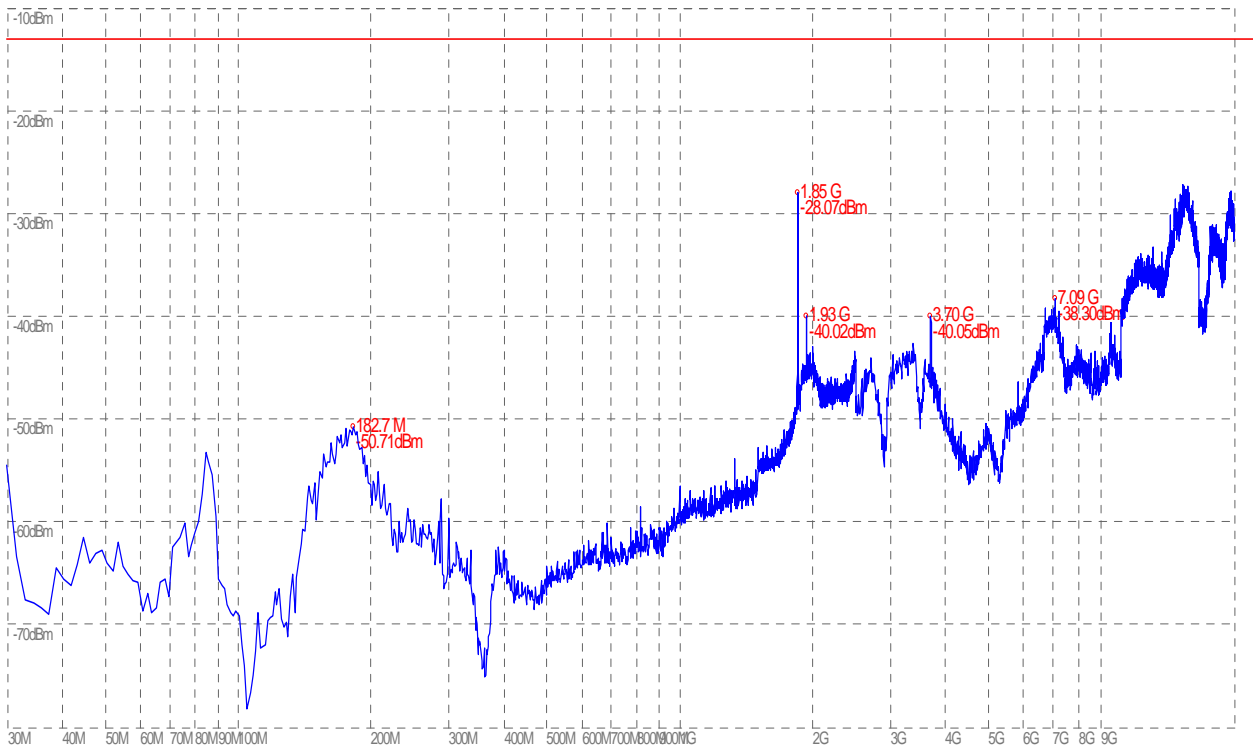
(Plot G.5: HSUPA 850MHz Channel = 4233, Test Antenna Horizontal)



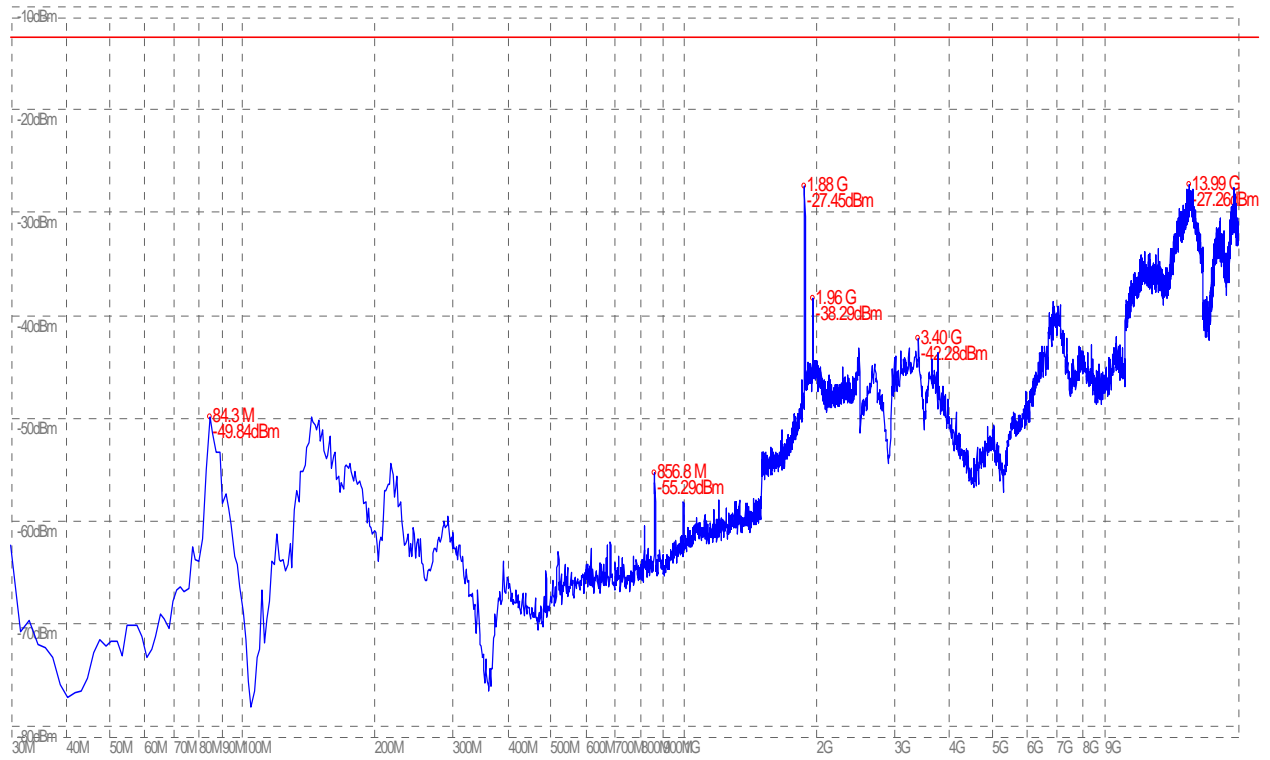
(Plot G.6: HSUPA 850MHz Channel = 4233, Test Antenna Vertical)



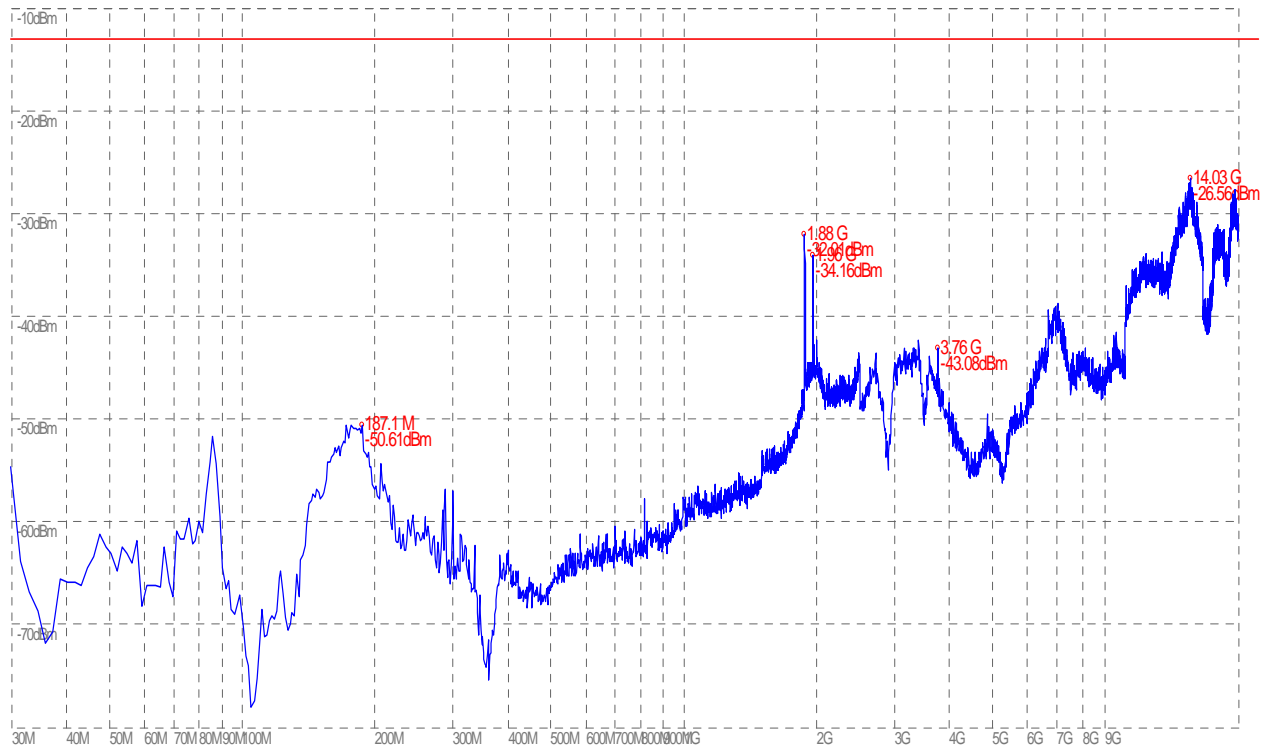
(Plot H.1: HSUPA 1900 MHz Channel = 9262, Test Antenna Horizontal)



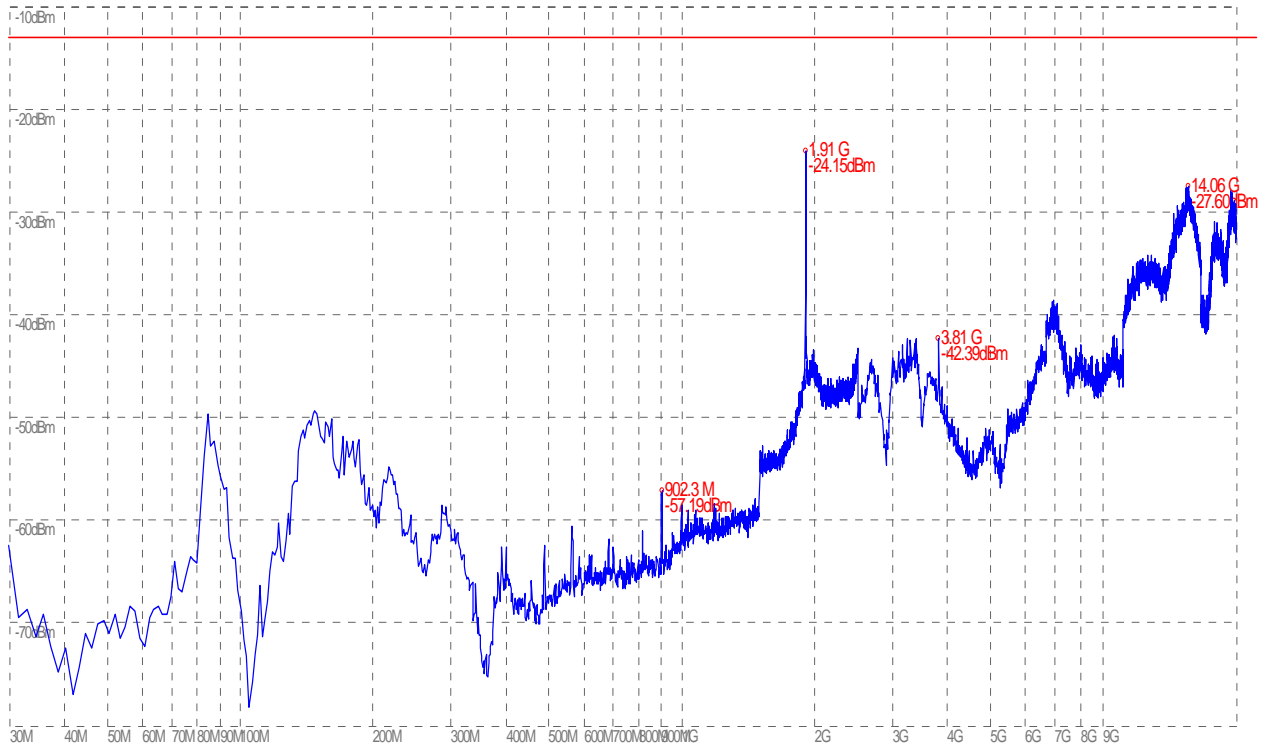
(Plot H.2: HSUPA 1900 MHz Channel = 9262, Test Antenna Vertical)



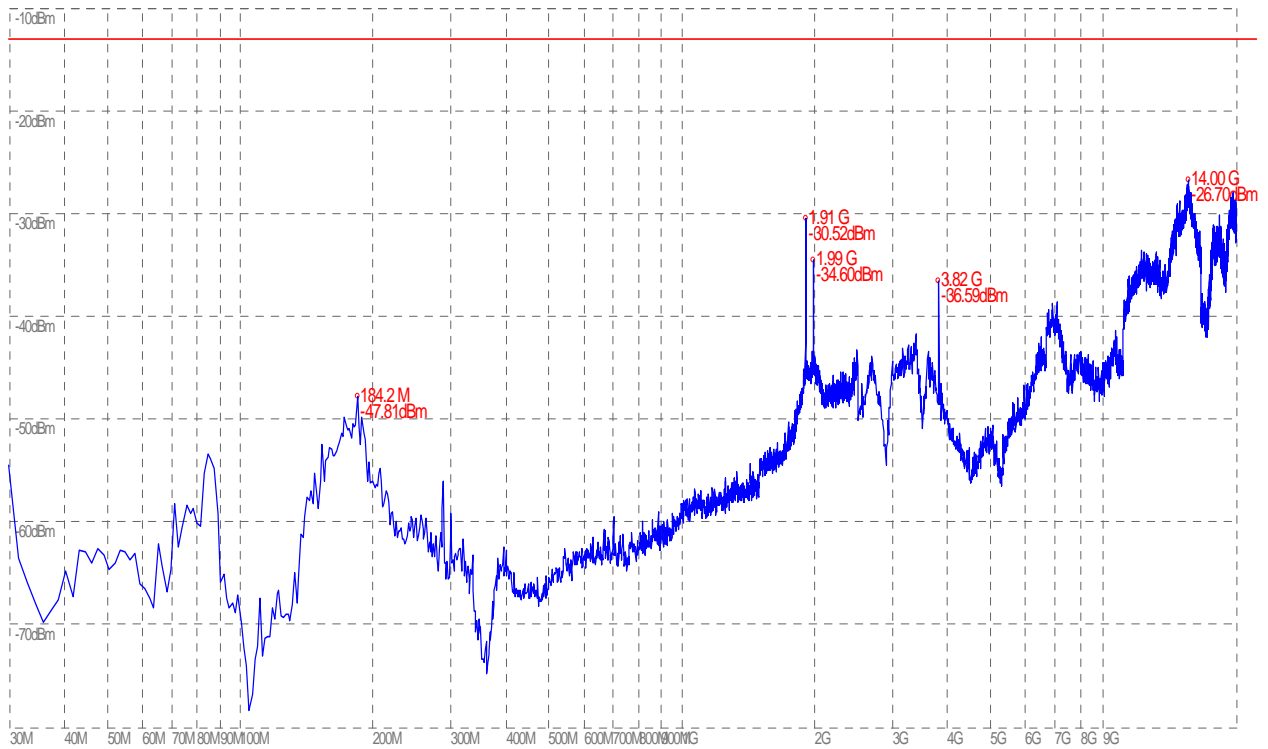
(Plot H.3: HSUPA 1900 MHz Channel = 9400, Test Antenna Horizontal)



(Plot H.4: HSUPA 1900 MHz Channel = 9400, Test Antenna Vertical)



(Plot H.5: HSUPA 1900 MHz Channel = 9538, Test Antenna Horizontal)



(Plot H.6: HSUPA 1900 MHz Channel = 9538, Test Antenna Vertical)

** END OF REPORT **