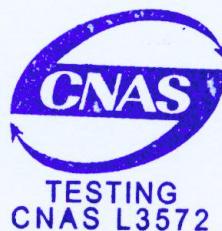




Report No.: SZ14050043W01

# FCC/IC TEST REPORT



Issued to

VSN Technologies Inc.

For

Mobile phone

Model Name: V3000  
Trade Name: Revel Mobile  
Brand Name: Revel  
FCC ID : 2AA9WV3000  
IC Number : 11665A-V3000  
Standard: 47 CFR Part 2, RSS-Gen  
47 CFR Part 22 Subpart H, RSS-132  
47 CFR Part 24 Subpart E, RSS-133  
Test date: 2014-5-13 to 2014-6-6  
Issue date: 2014-6-6

By

Shenzhen Morlab Communications Technology Co., Ltd.

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ShenZhen, GuangDong Province, P. R. China 518101

Tested by Liu Zhisen  
Liu Zhisen  
(Test Engineer)

Date 2014.6.6



Reviewed by Peng Huarui  
Peng Huarui  
(Dept. Manager)  
Date 2014.6.6

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Change History		
Issue	Date	Reason for change
1.0	Jun 6, 2014	First edition

## 1. GENERAL INFORMATION

### 1.1 EUT Description

EUT Type ..... : Mobile Phone  
Serial No..... : (n.a, marked #1 by test site)  
Hardware Version ..... : TBW5976B\_P3\_002  
Software Version..... : 597611\_9511\_V009011  
Applicant..... : VSN Technologies Inc.  
Manufacturer..... : 1975 E Sunrise Blvd,Suite 400,Ft Lauderdale, Fl. 33304  
Beijing Benywave technology Co.,Ltd  
No 55,Jiachuang second road,Zhongguancun Science Park  
OPTO-Mechatronics Industrial Park,Tongzhou District,Beijing,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 ..... : GSM,GPRS Mode with GMSK Modulation  
EDGE Mode with 8PSK Modulation  
WCDMA Mode with QPSK Modulation  
HSDPA Mode with QPSK Modulation  
HSUPA Mode with QPSK Modulation  
HSPA+ Mode with QPSK Modulation  
Multislot Class ..... : GPRS: Multislot Class 12,EGPRS: Multislot Class 12  
Antenna Type ..... : PIFA Antenna  
Emission Designators ..... : GSM 850:250KGXW,GSM 1900:250KGXW  
EGPRS850:248KG7W, EGPRS1900:251KG7W,  
WCDMA 850:4M17F9W ,WCDMA1900:4M19F9W

**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 (ARFCNs) 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 (ARFCNs) 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 (ARFCNs) used and tested in this report are separately 4132 (826.4MHz), 4175(835MHz) and 4233 (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 (ARFCNs) 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(FCC)	Identity (IC)	Document Title
1	47 CFR Part 2 (10-1-13 Edition)	RSS-Gen (Issue 3, December 2010)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-13 Edition)	RSS-132 (Issue 2, September 2005)	Public Mobile Services
3	47 CFR Part 24 (10-1-13 Edition)	RSS-133 (Issue 5, February 2009)	Personal Communications Services

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

No.	Section in CFR 47	Section in RSS GEN/132/133	Description	Result
1	2.1046	4.6, 4.4, 6.4, 6.4	Conducted RF Output Power	PASS
2.	24.232(d)	4.6, 4.4, 6.2, 6.4	Peak to average radio	PASS
2	2.1049,22.917 24.238	4.4.1, 5.6, 6.1	99% Occupied Bandwidth	PASS
3	2.1055,22.355 24.235	4.5, 4.3,7,6.3	Frequency Stability	PASS
4	2.1051,2.1057 22.917,24.238,	4.7, 4.5, 6.3, 6.5	Conducted Out of Band Emissions	PASS
5	2.1051,2.1057 22.917,24.238	4.7, 4.5, 6.3, 6.5	Band Edge	PASS
6	22.913,24.232	4.6, 4.4, 6.2, 6.4	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053,2.1057 22.917,24.238	4.6, 4.4, 6.2, 6.4	Radiated Out of Band Emissions	PASS

**NOTE:** Measurement method according to TIA/EIA 603.D-2010

## 1.3 Facilities and Accreditations

### 1.3.1 Facilities

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 518101. 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 695796.

### 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 (IC RSS-GEN, RSS-132, RSS-133)

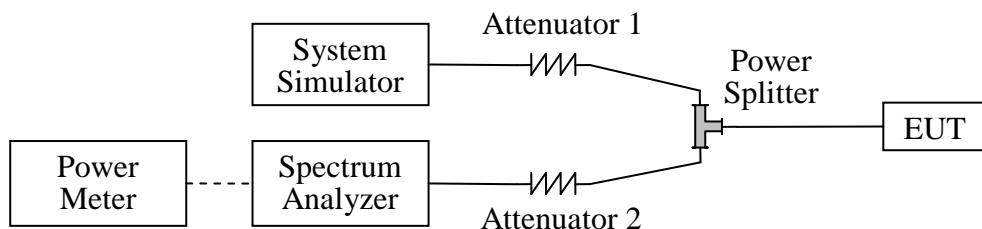
### 2.1 Conducted RF Output Power

#### 2.1.1 Requirement

According to FCC section 2.1046(a) and RSS-GEN section 4.6 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.

The Power Meter was just used for the Conducted RF Output Power test of WCDMA Model.

##### 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2014.02.26	2015.02.25
Spectrum Analyzer	Agilent	E7405A	US44210471	2014.02.26	2015.02.25
Power Meter	Agilent	E4418B	GB43318055	2014.02.26	2015.02.25
Power Sensor	Agilent	8482A	MY41091706	2014.02.26	2015.02.25
Power Splitter	Weinschel	1506A	NW521	2014.02.26	2015.02.25
Attenuator 1	Resnet	20dB	(n.a.)	2014.02.26	2015.02.25

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Attenuator 2	Resnet	3dB	(n.a.)	2014.02.26	2015.02.25

### 2.1.3 Test Results

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

#### 1. GSM Model Test Verdict:

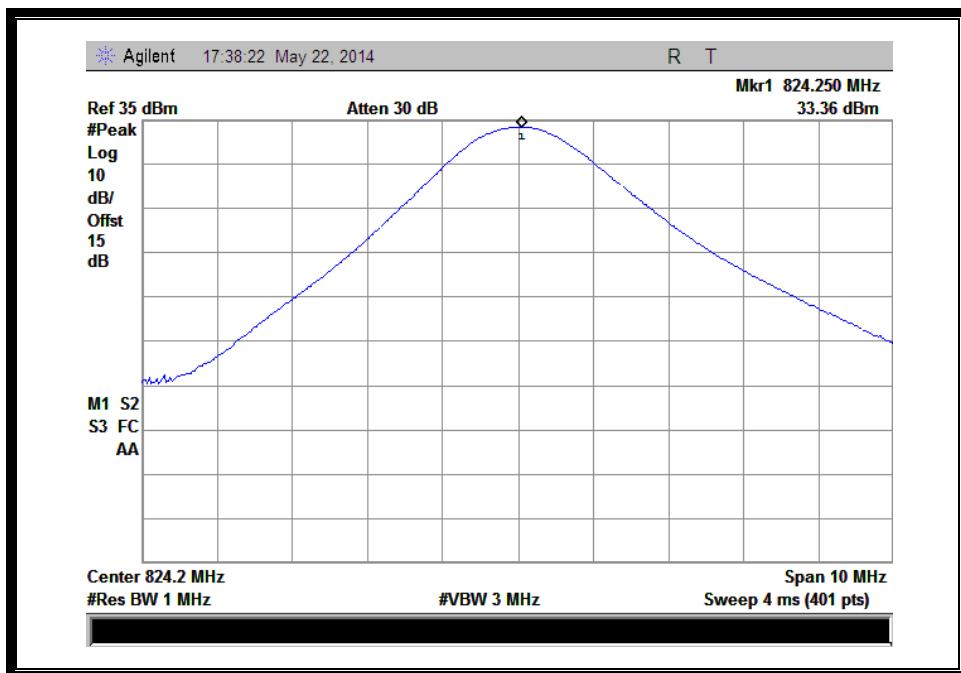
Band	Channel	Frequency (MHz)	Measured Output Power		Limit	Verdict
			dBm	Refer to Plot		
GSM 850MHz	128	824.2	33.36	Plot A1 to A3	35	PASS
	190	836.6	33.91			PASS
	251	848.8	34.21			PASS
GSM 1900MHz	512	1850.2	31.08	Plot B1 to B3	32	PASS
	661	1880.0	30.75			PASS
	810	1909.8	30.09			PASS
GPRS 850MHz	128	824.2	31.61	Plot C1 to C3 <sup>Note 1</sup>	35	PASS
	190	836.6	31.63			PASS
	251	848.8	31.56			PASS
GPRS 1900MHz	512	1850.2	26.18	Plot D1 to D3 <sup>Note 1</sup>	32	PASS
	661	1880.0	28.46			PASS
	810	1909.8	27.80			PASS
EGPRS 850MHz	128	824.2	31.08	Plot E1 to E3 <sup>Note 1</sup>	35	PASS
	190	836.6	31.45			PASS
	251	848.8	31.77			PASS
EGPRS 1900MHz	512	1850.2	30.63	Plot F1 to F3 <sup>Note 1</sup>	32	PASS
	661	1880.0	30.70			PASS
	810	1909.8	30.37			PASS

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

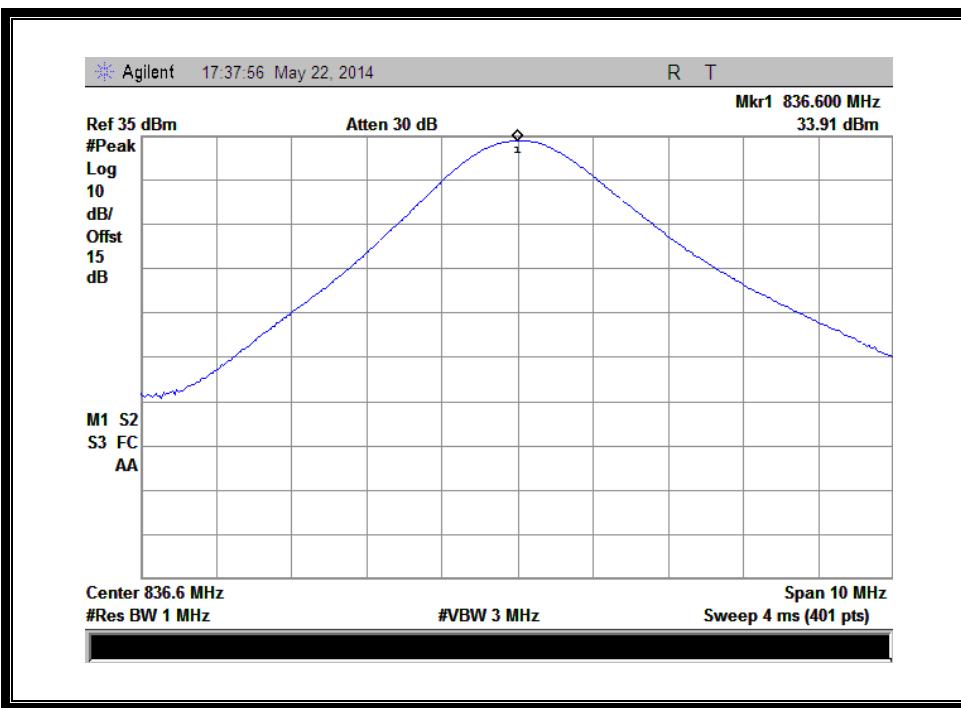
## 2. WCDMA Model Test Verdict:

Item	band	WCDMA 850			WCDMA 1900		
		4132	4175	4233	9262	9400	9538
	subtest	dBm		dBm			
5.2(WCDMA)	non	23.70	24.26	24.04	22.89	23.94	24.40
HSDPA	1	23.68	24.23	24.01	22.80	23.92	24.33
	2	23.66	24.26	24.03	22.85	23.93	24.38
	3	23.16	23.75	23.54	22.34	23.44	23.81
	4	23.20	23.77	23.53	22.30	23.40	23.85
	1	23.62	24.26	23.98	22.81	23.96	24.41
HSUPA	2	21.59	22.30	21.99	20.83	21.98	22.38
	3	22.60	23.24	22.94	21.79	22.89	23.40
	4	21.63	22.26	21.93	20.86	21.99	22.44
	5	23.66	24.22	23.99	22.75	23.86	24.35
HSPA+	1	23.69	24.28	23.98	22.67	23.92	24.39
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.						

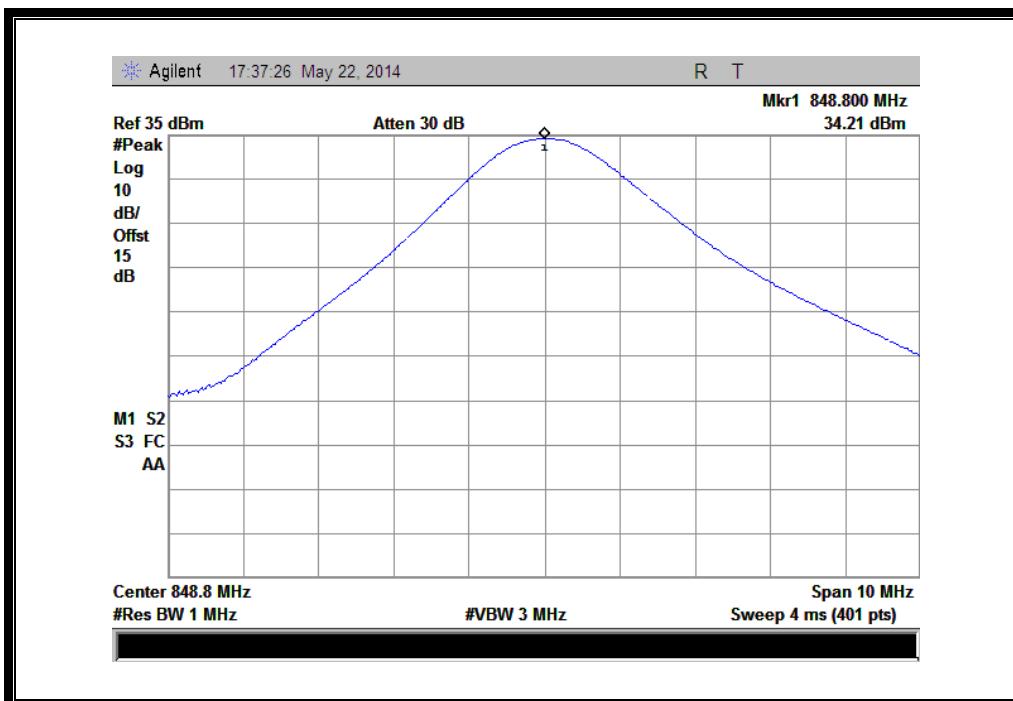
## 3. GSM Model Test Plots:



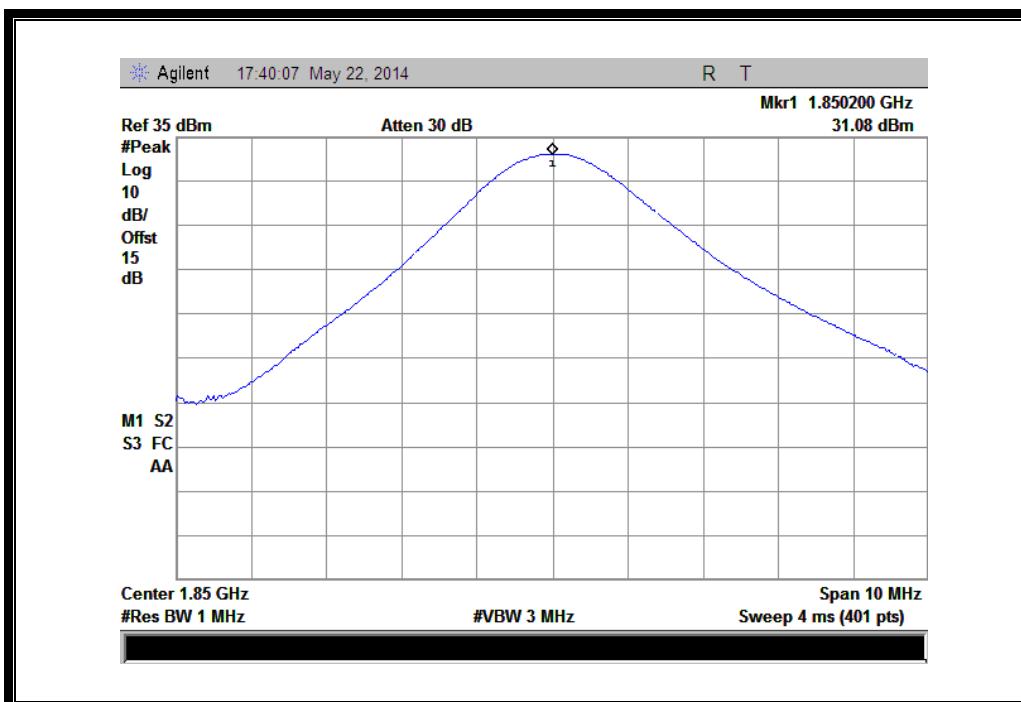
(Plot A1:GSM 850MHz Channel = 128)



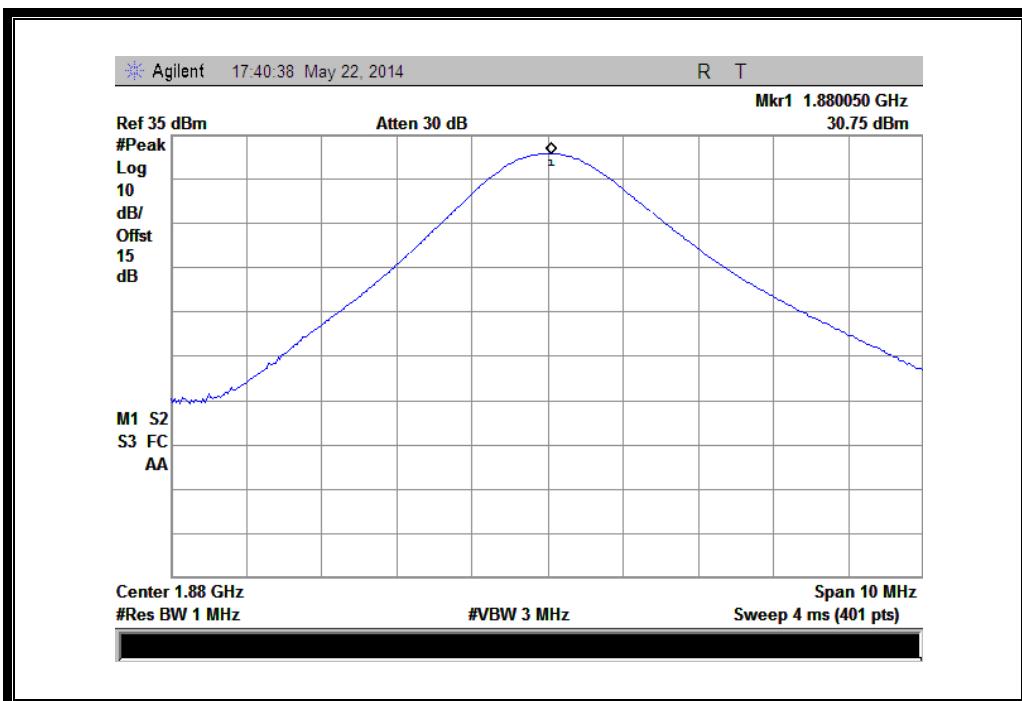
8(Plot A2: GSM 850MHz Channel = 190)



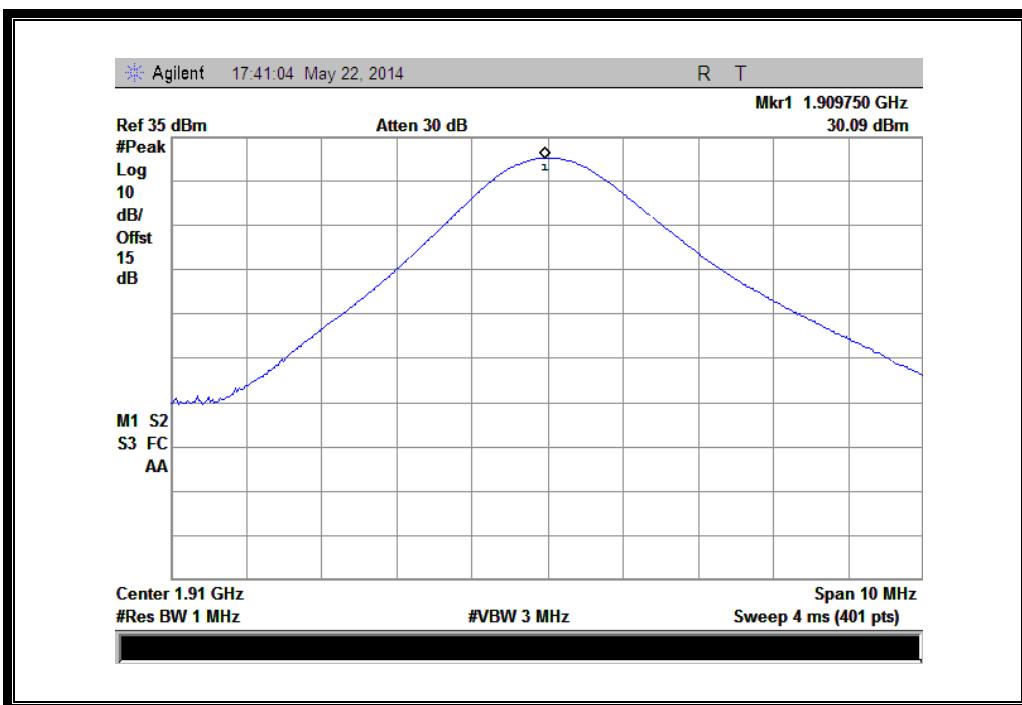
(Plot A3:GSM 850MHz Channel = 251)



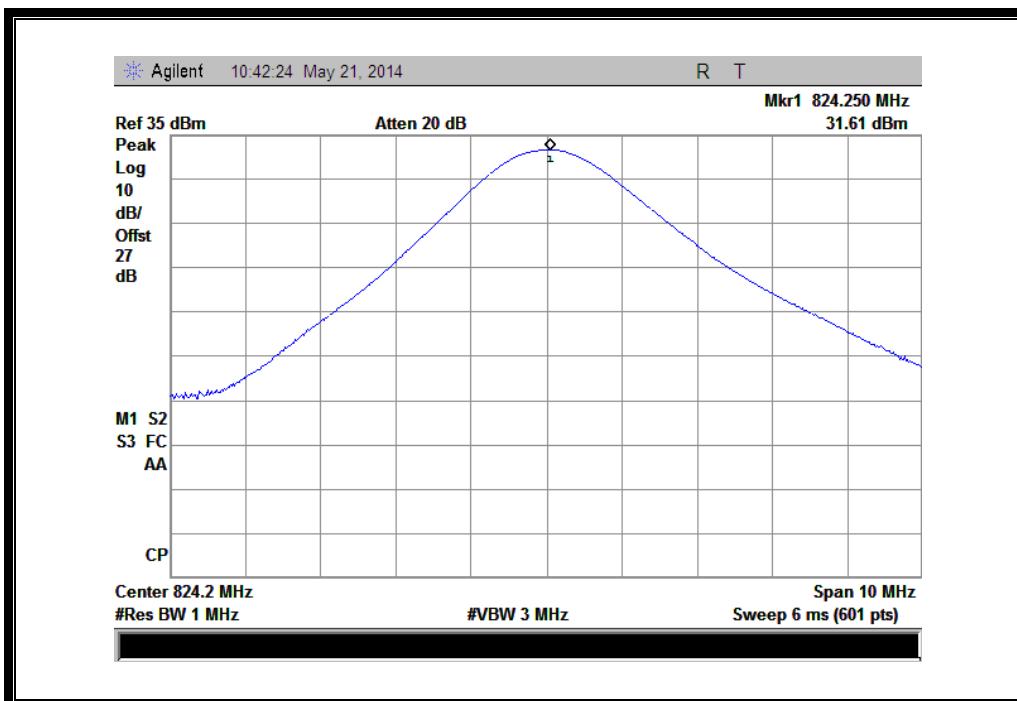
(Plot B1: GSM 1900MHz Channel = 512)



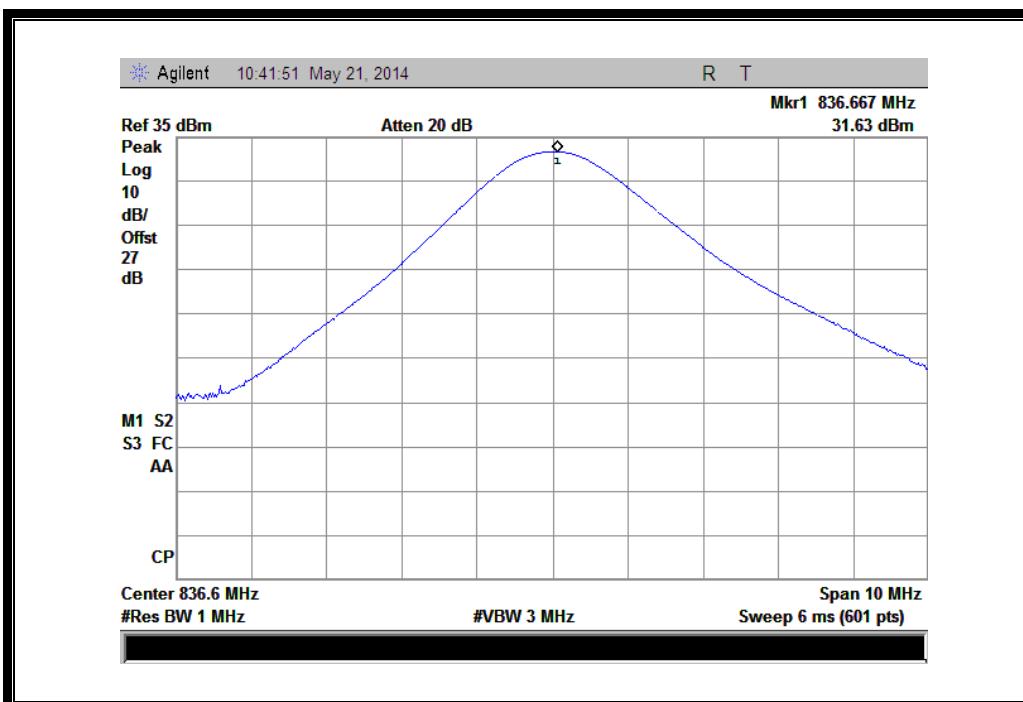
(Plot B2: GSM 1900MHz Channel = 661)



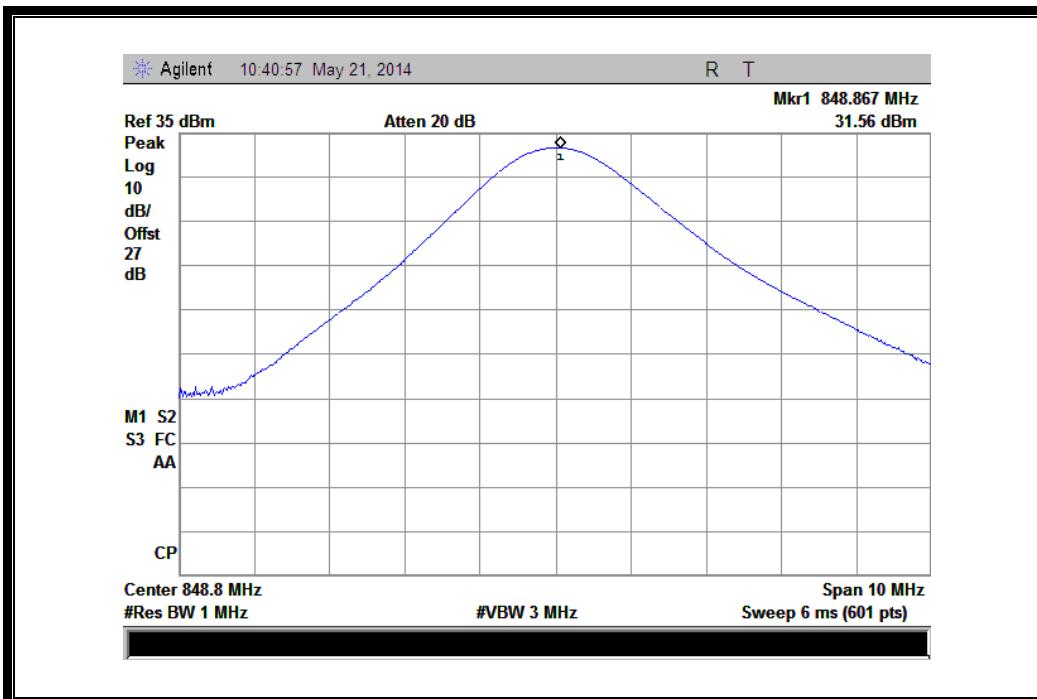
(Plot B3: GSM 1900Hz Channel = 810)



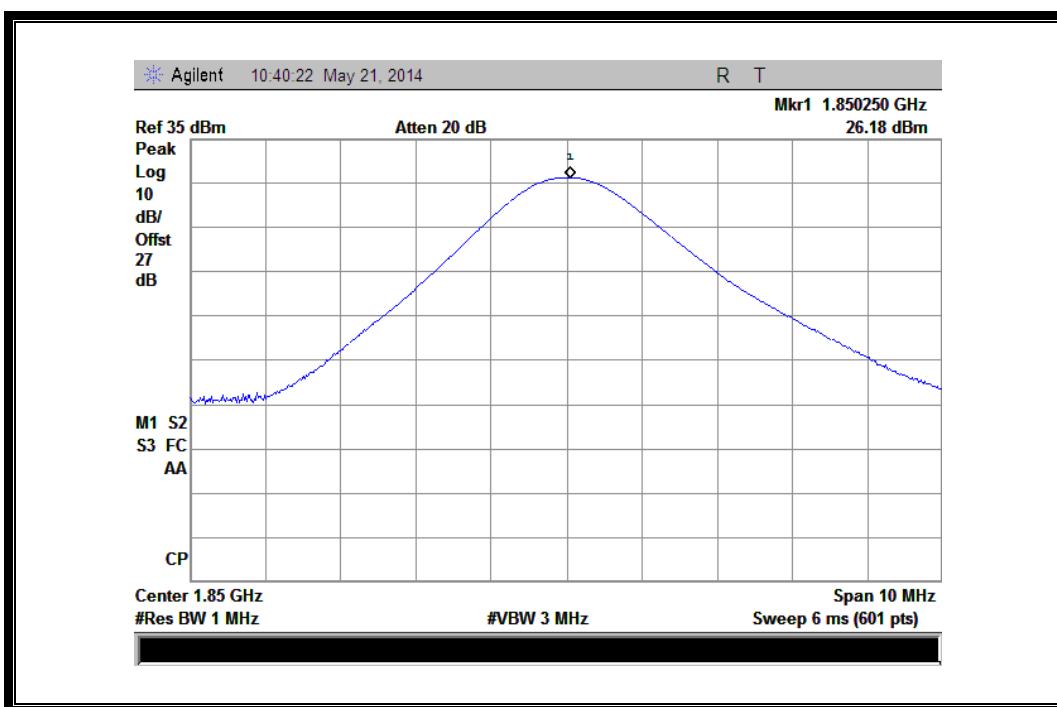
(Plot C 1: GPRS 850MHz Channel = 128)



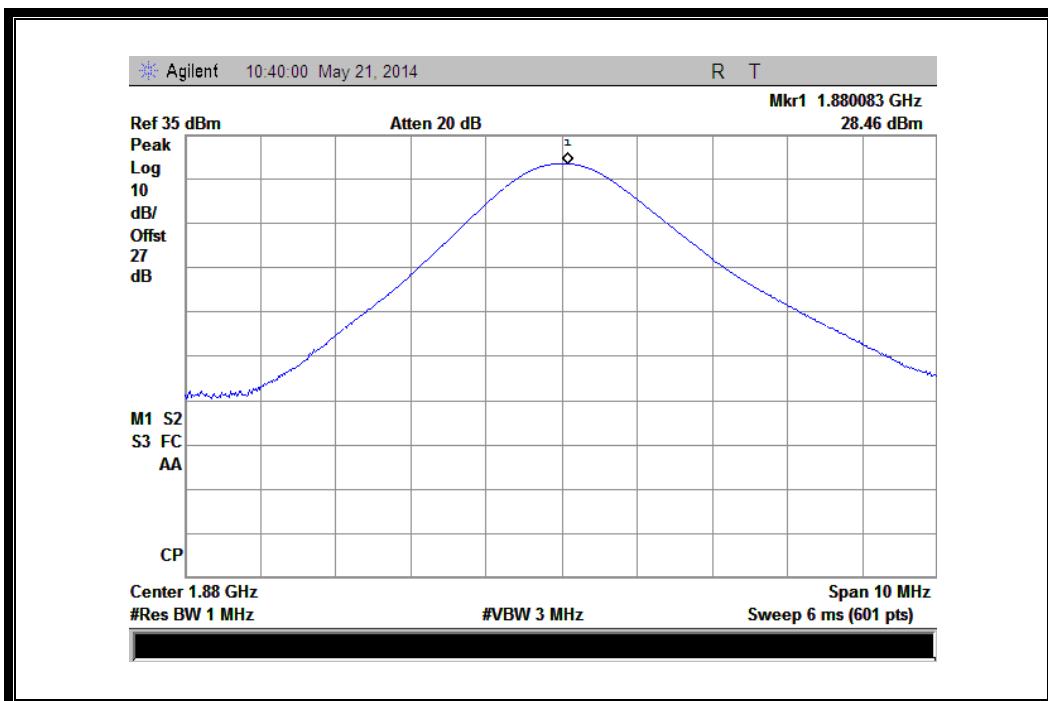
(Plot C 2: GPRS 850MHz Channel = 190)



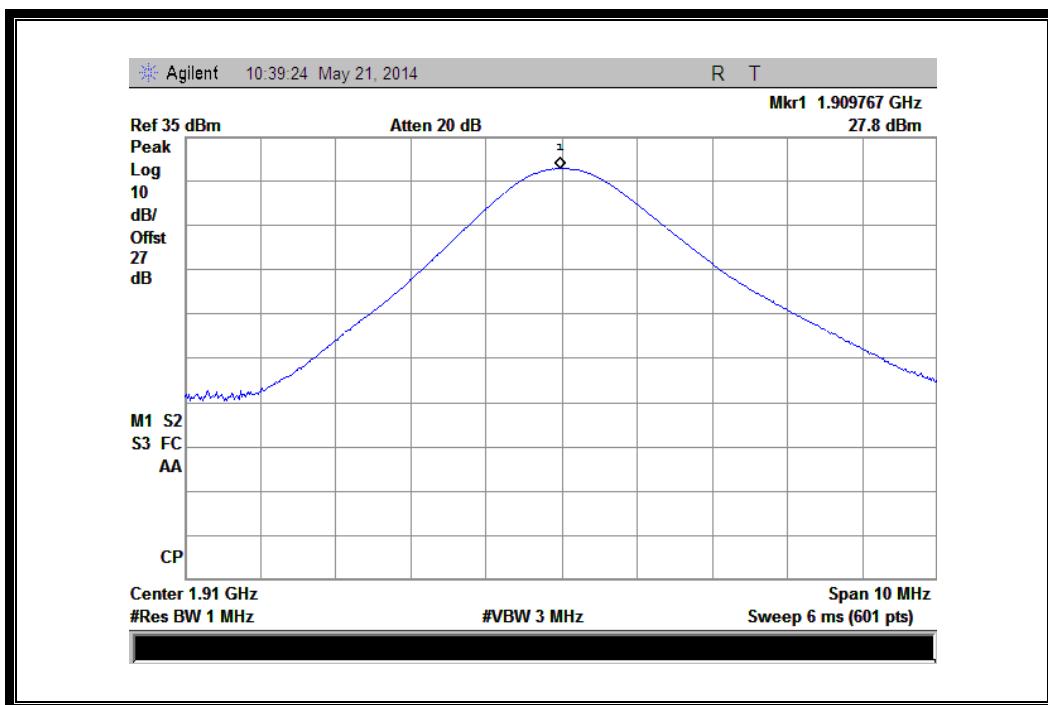
(Plot C 3: GPRS 850MHz Channel = 251)



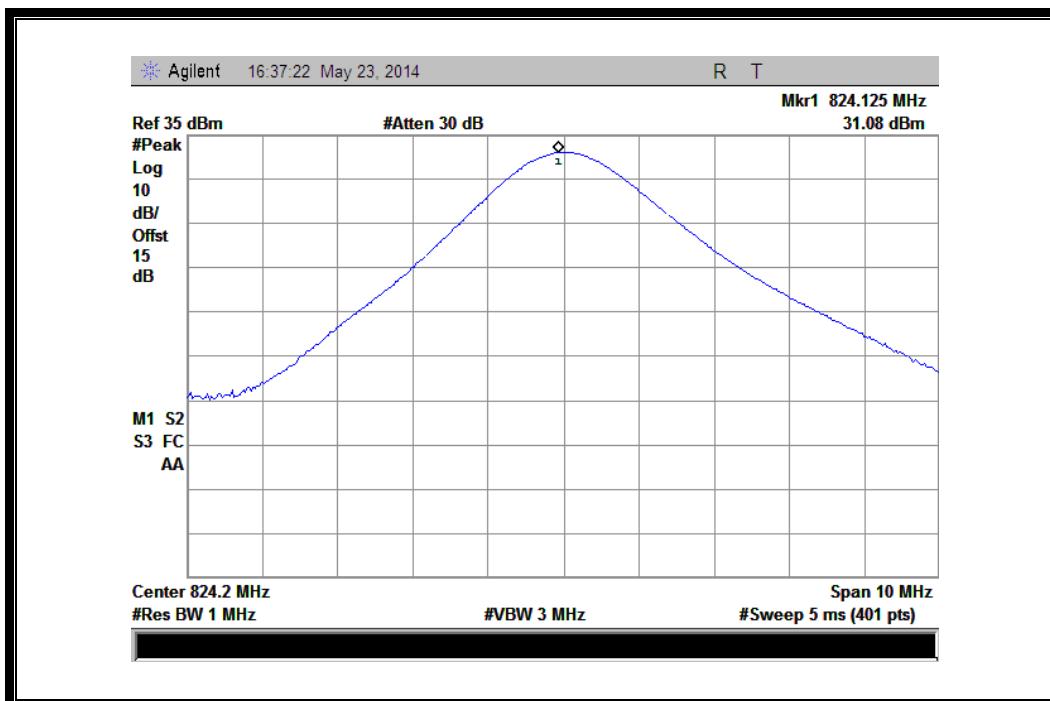
(Plot D 1: GPRS 1900MHz Channel = 512)



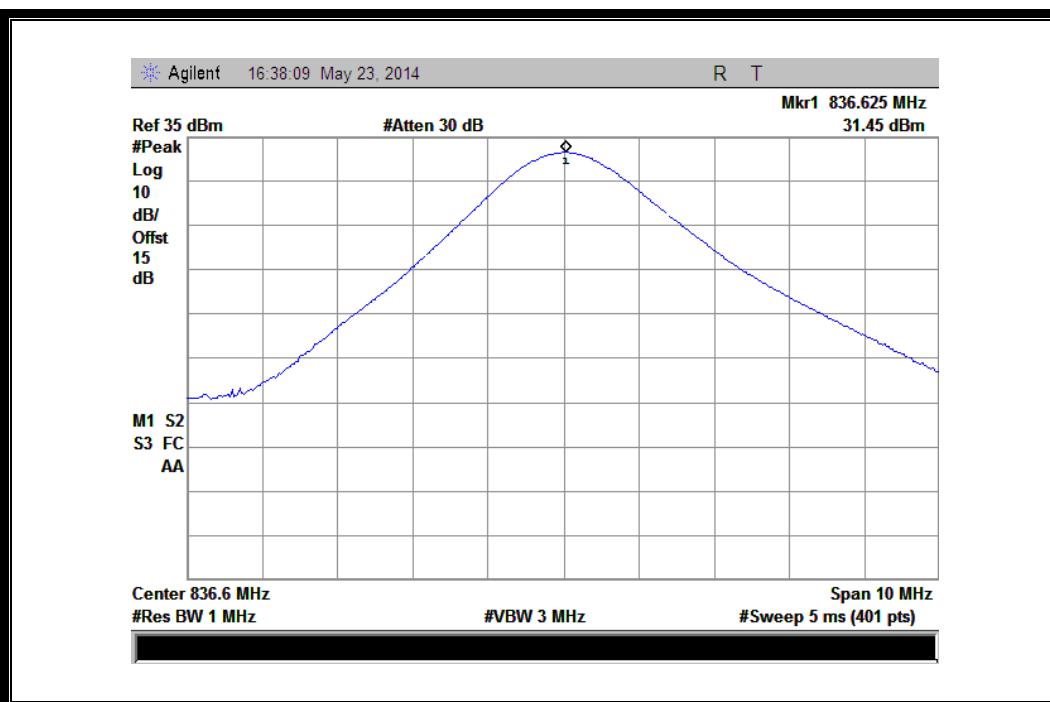
(Plot D 2: GPRS 1900MHz Channel = 661)



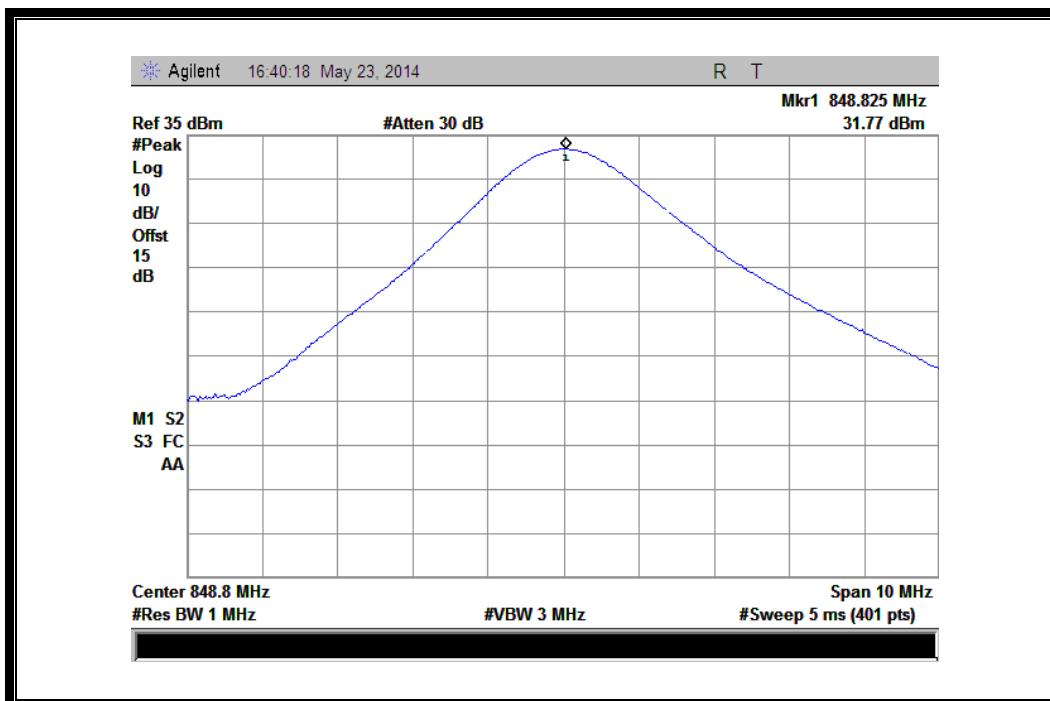
(Plot D 3: GPRS 1900MHz Channel = 810)



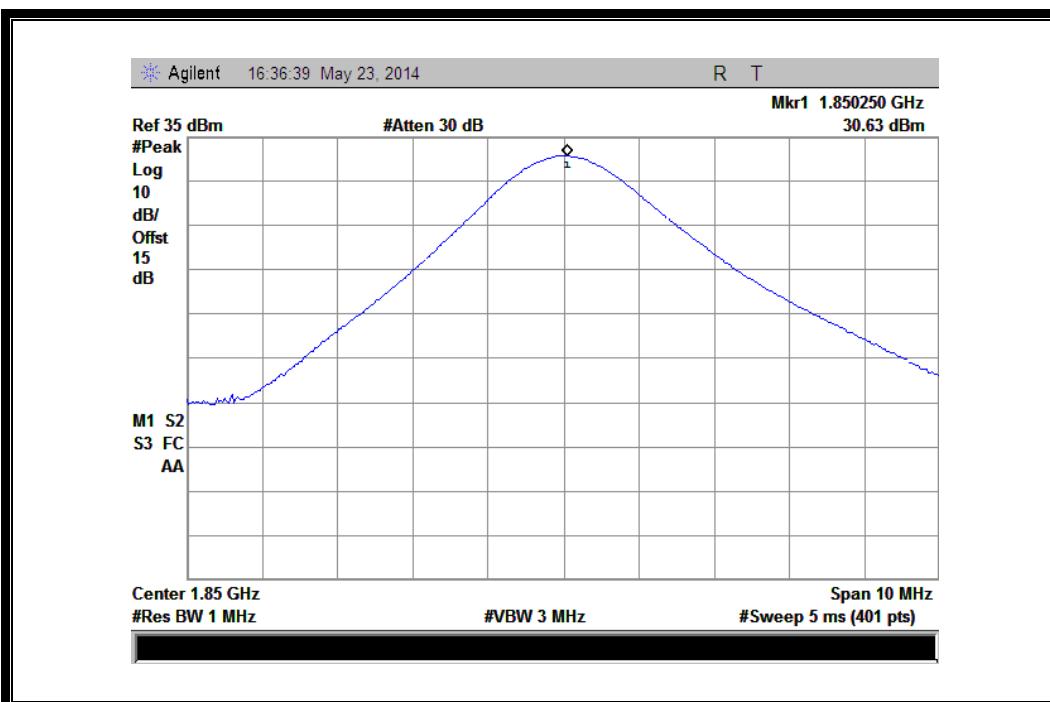
(Plot E1: EGPRS 850MHz Channel = 128)



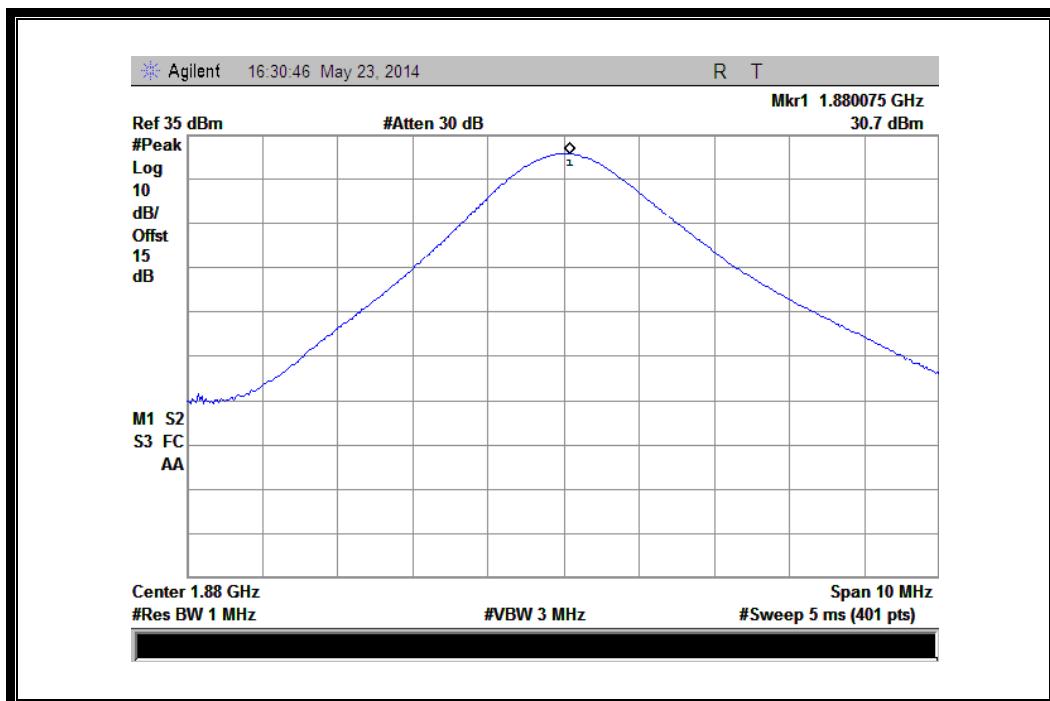
(Plot E2: EGPRS 850MHz Channel = 190)



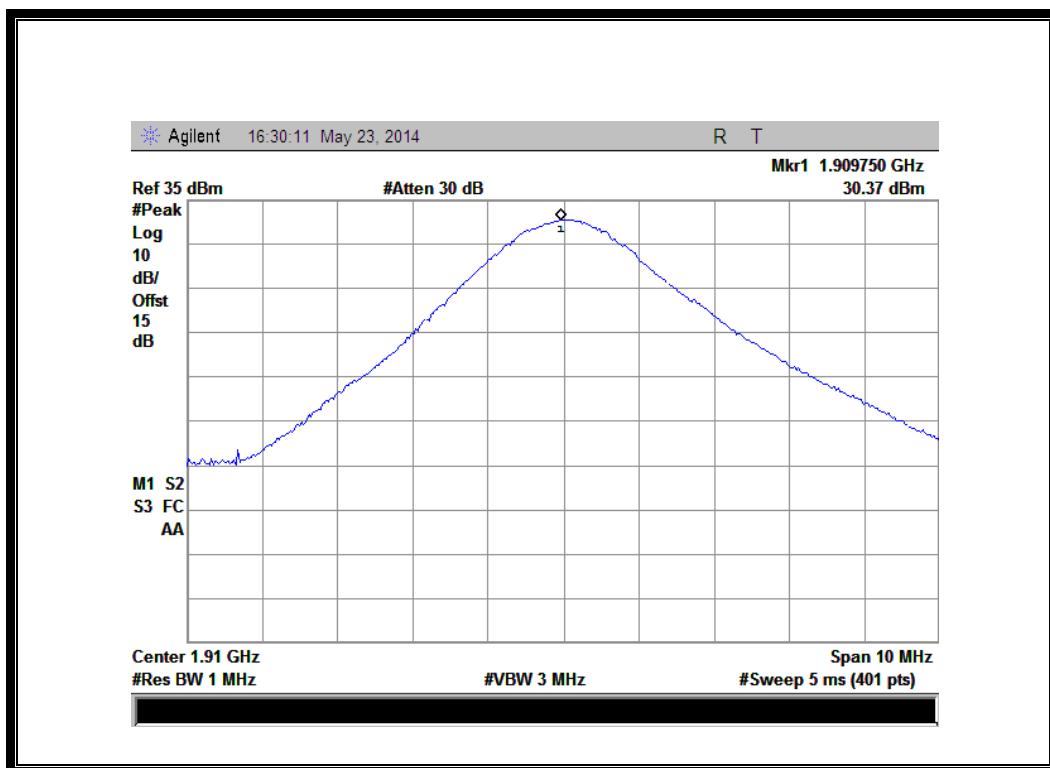
(Plot E3: EGPRS 850MHz Channel = 251)



(Plot F1:EGPRS 1900MHz Channel = 512)



(Plot F2:EGPRS 1900MHz Channel = 661)



(Plot F3:EGPRS 1900Hz Channel = 810)

## 2.2 Peak to Average Ratio

### 2.2.1 Definition

According to FCC section 2.1049 and FCC 24.232(d) and IC RSS-GEN section 4.6 the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 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 selected to perform testing to verify the peak-to-average ratio.

Test procedures:

A .For GSM/EGPRS operating mode:

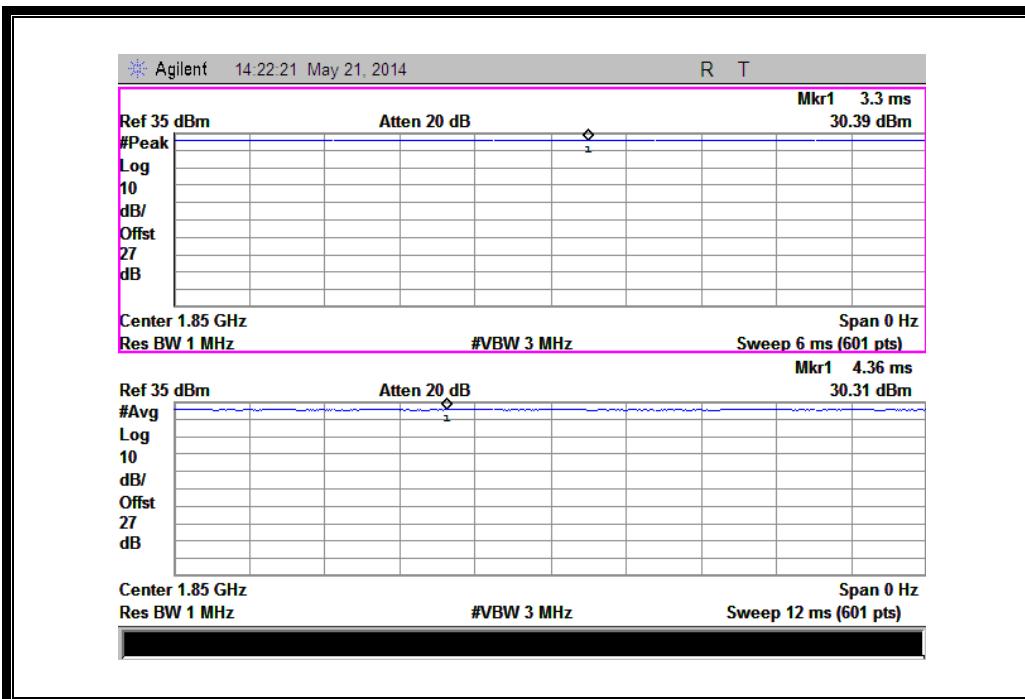
- a. Set RBW=1MHz, VBW=1MHz, peak detector in spectrum analyzer.
- b. Set EUT in maximum output power, and triggered the burst signal.
- c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average radio.

B. For UMTS operating mode:

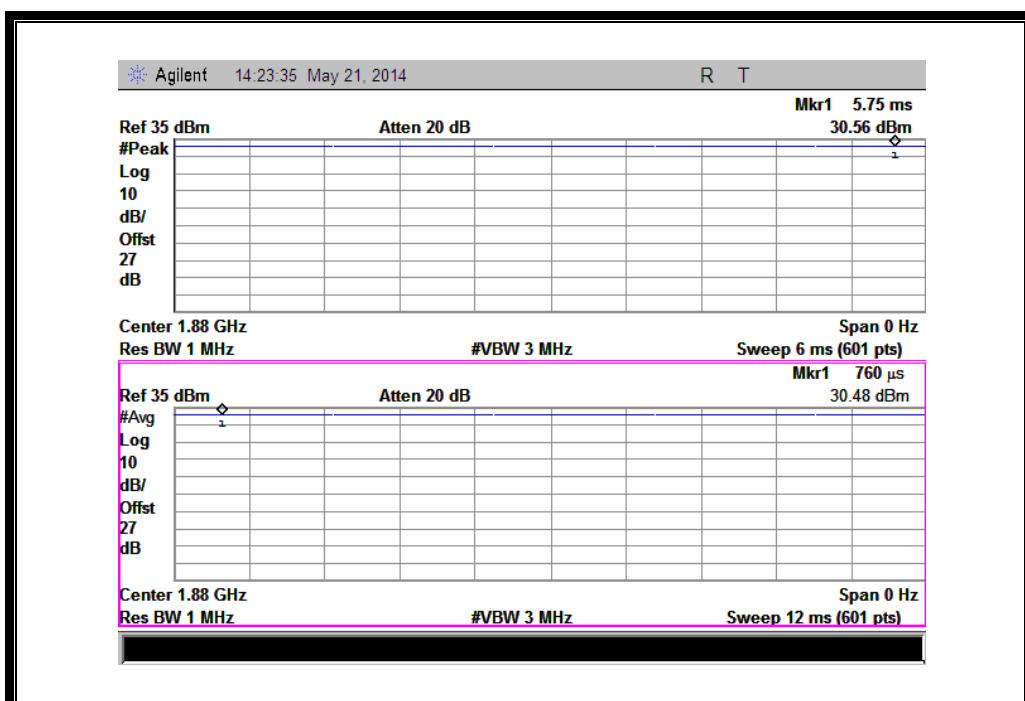
- a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

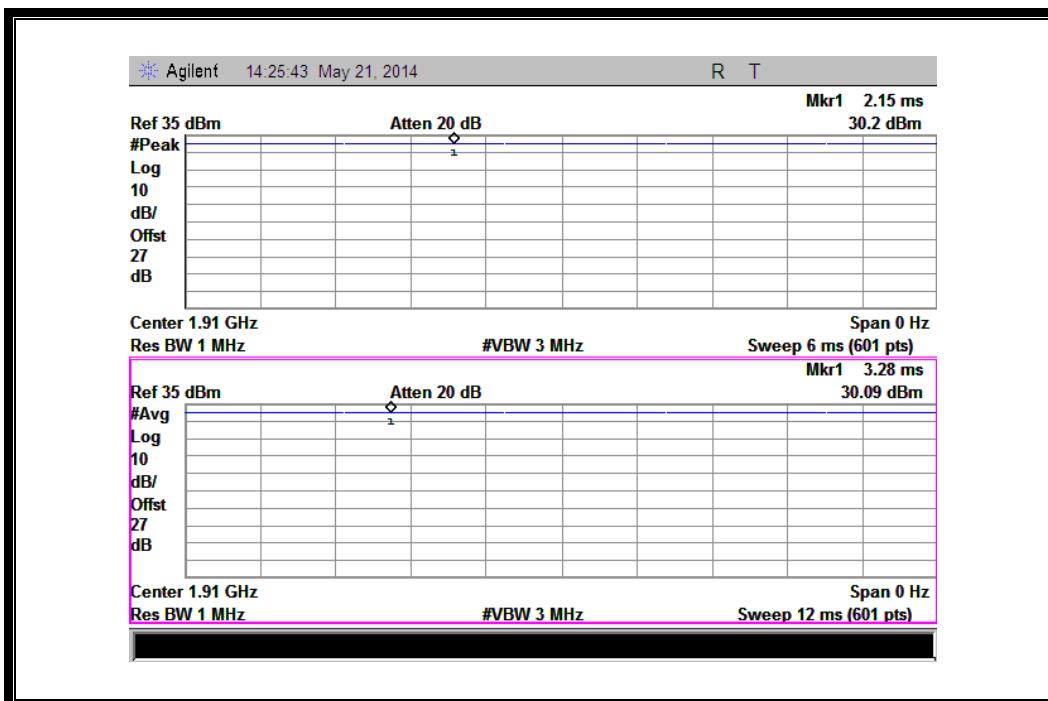
Band	Channel	Frequency (MHz)	Peak to Average ratio		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 1900MHz	512	1850.2	0.08	Plot A1 to A3	13	PASS
	661	1880.0	0.08			PASS
	810	1909.8	0.11			PASS
EGPRS 1900MHz	512	1850.2	0.05	Plot B1 to B3	13	PASS
	661	1880.0	0.02			PASS
	810	1909.8	0.01			PASS
WCDMA 1900MHz	9262	1852.4	2.89	Plot C1 to C3	13	PASS
	9400	1880	2.99			PASS
	9538	1907.6	2.45			PASS



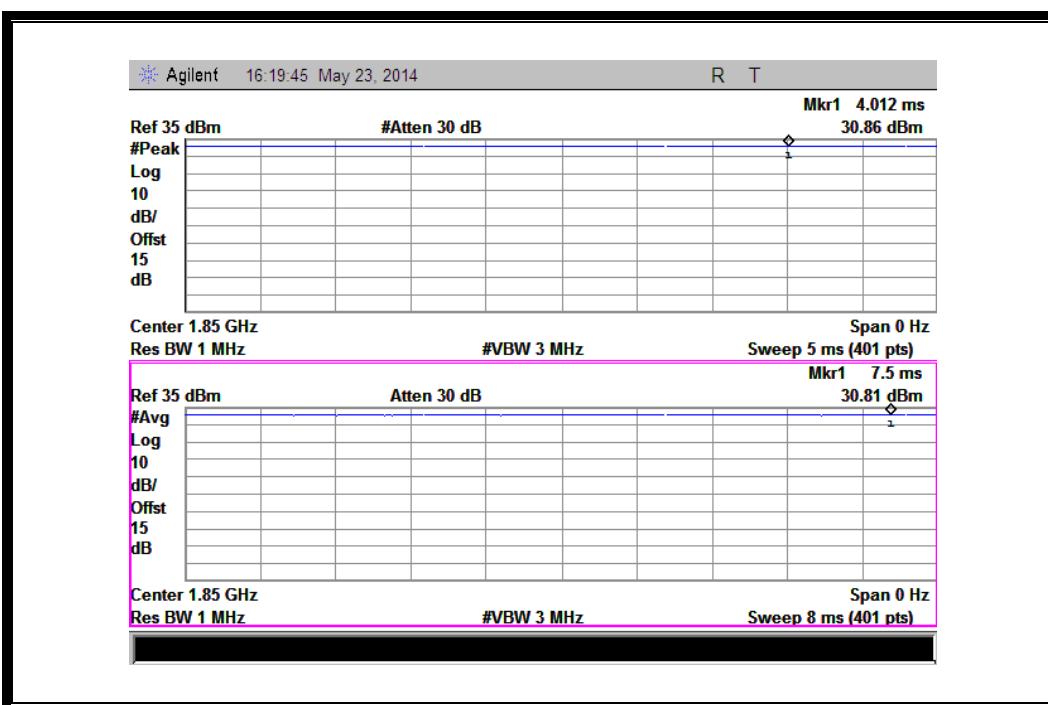
(Plot A1:GSM 1900 MHz Channel = 512)



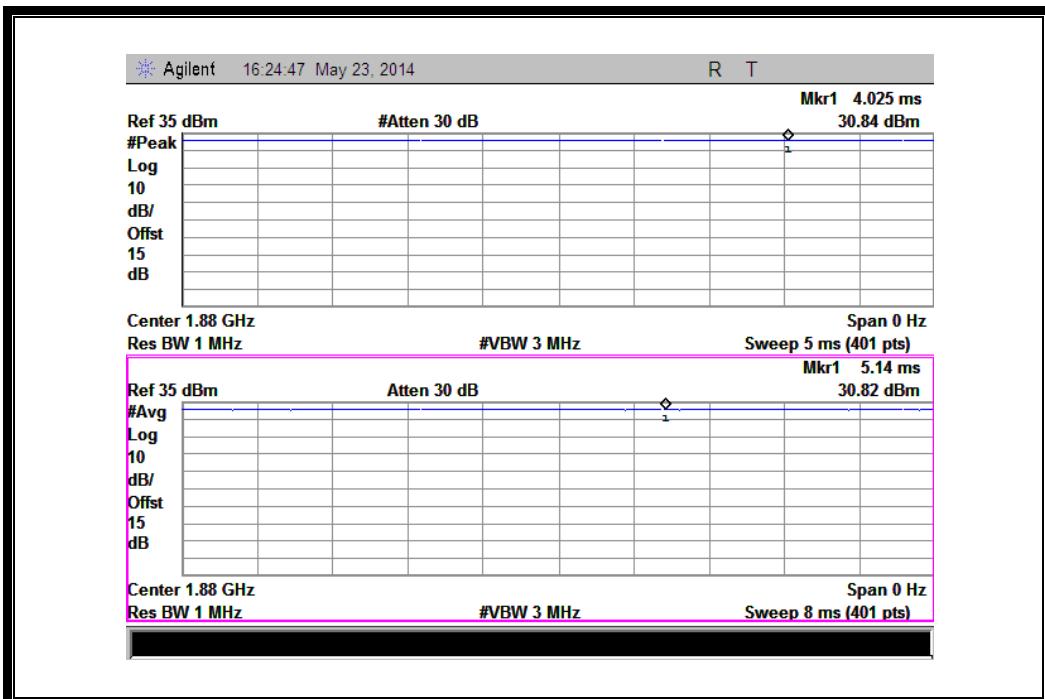
(Plot A2:GSM 1900 MHz Channel = 661)



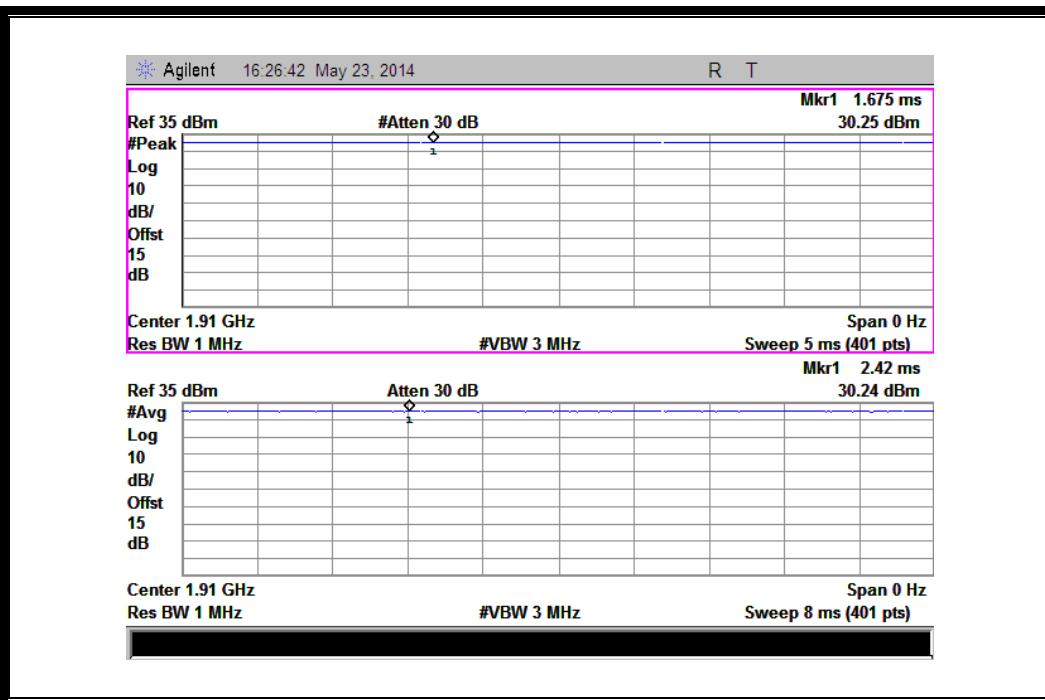
(Plot A3: GSM 1900MHz Channel = 810)



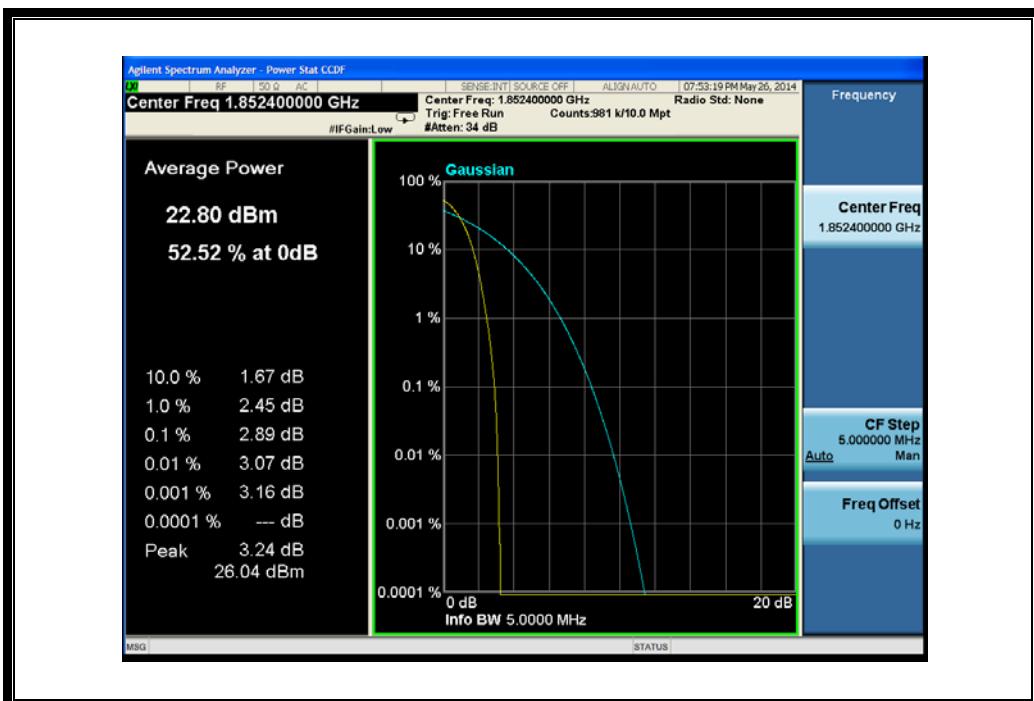
(Plot B1: EGPRS 1900MHz Channel = 512)



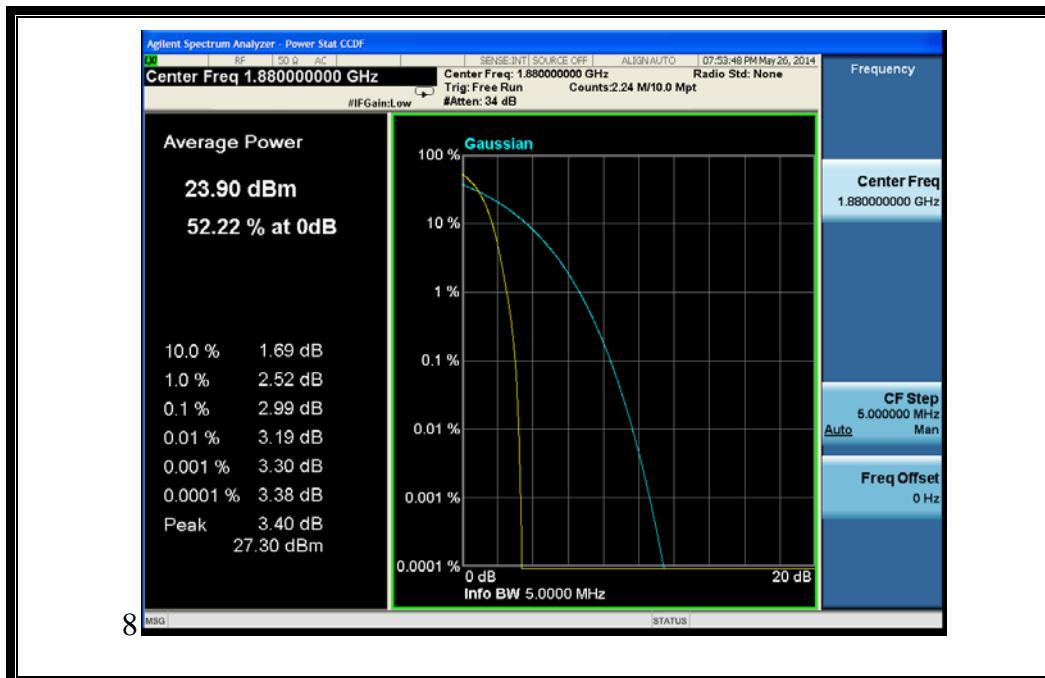
(Plot B2: EGPRS 1900MHz Channel = 661)



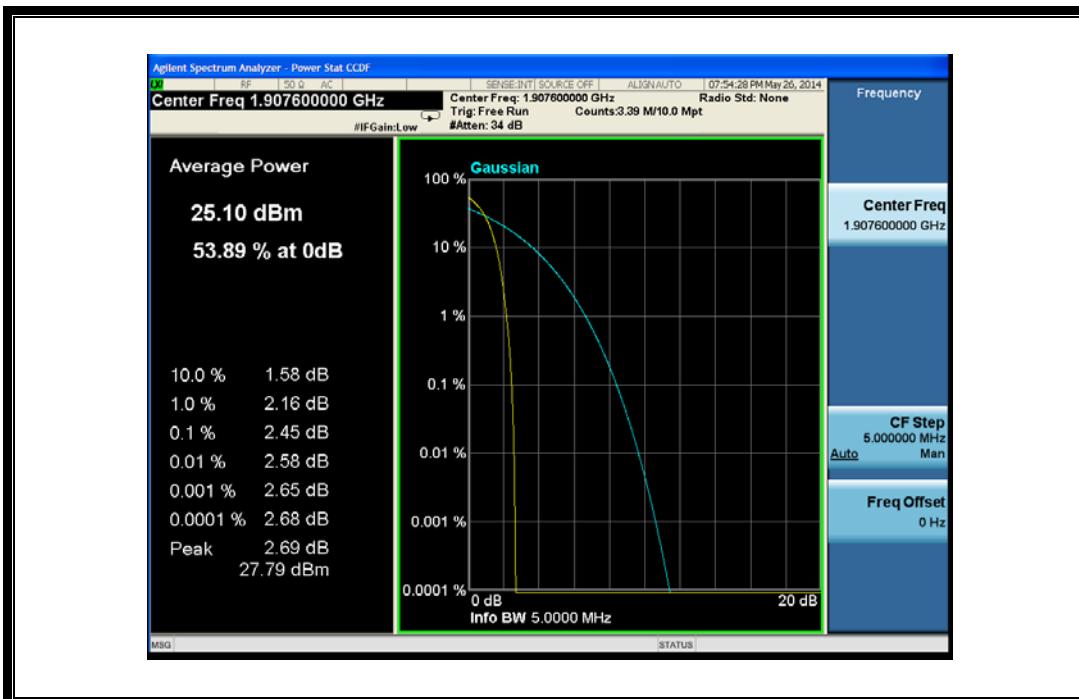
(Plot B3: EGPRS 1900MHz Channel = 810)



(Plot C1: WCDMA 1900MHz Channel = 9262)



(Plot C2: WCDMA 1900MHz Channel = 9400)



(Plot C3: WCDMA 1900MHz Channel = 9538)

## 2.3 99% Occupied Bandwidth

### 2.3.1 Definition

According to FCC section 2.1049 and FCC § 22.917 &24.238 and IC RSS-GEN section 4.6 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,

### 2.3.2 Test Description

See section 2.1.2 of this report.

### 2.3.3 Test Verdict

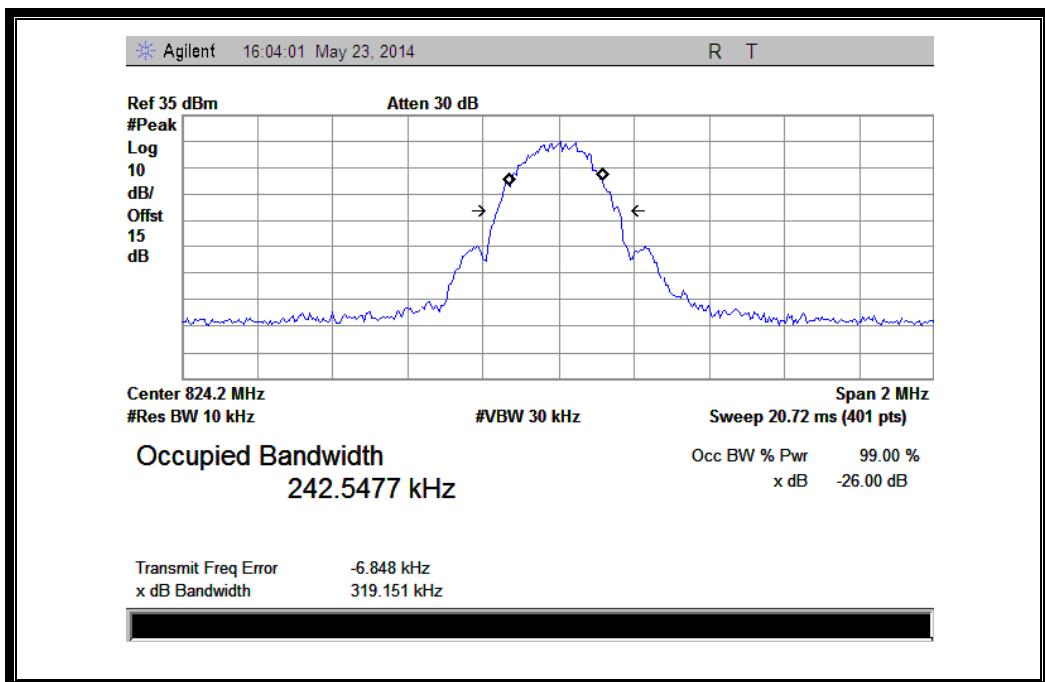
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

2. Test Verdict:

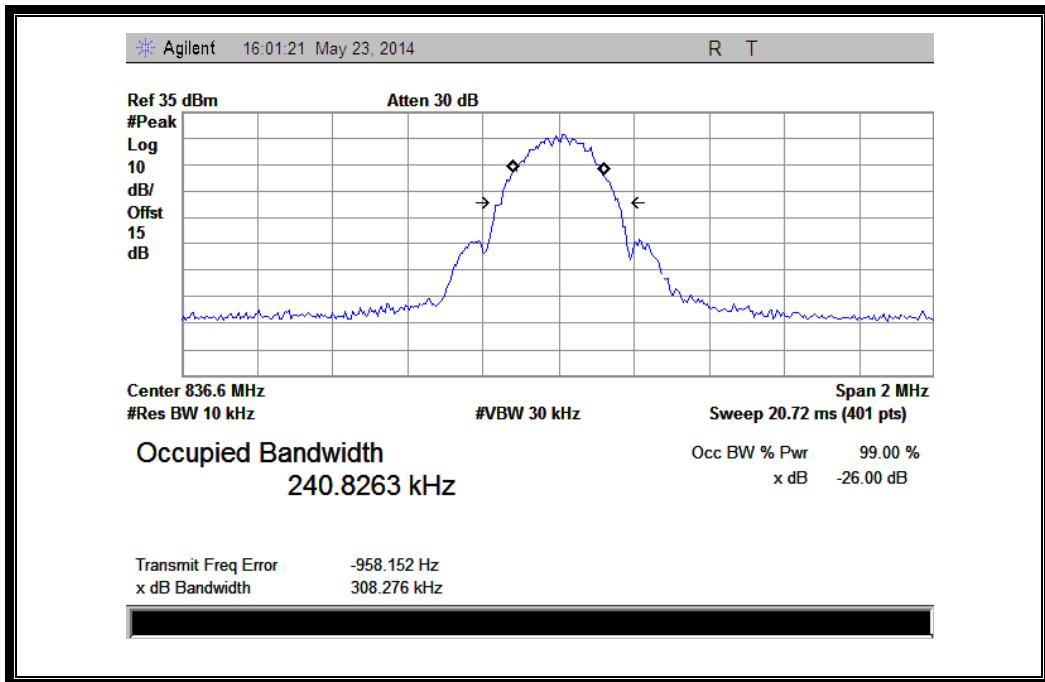
Band	Chann el	Frequen cy (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
EDGE 850MHz	128	824.2	319.151 KHz	242.5477 KHz	Plot A
	190	836.6	308.276 KHz	240.8263 KHz	Plot B
	251	848.8	314.283 KHz	248.0649 KHz	Plot C
EDGE 1900MHz	512	1850.2	303.902 KHz	248.5728 KHz	Plot D
	661	1880.0	316.982 KHz	245.6009 KHz	Plot E
	810	1909.8	313.593 KHz	250.5742 KHz	Plot F
WCDMA 850MHz	4132	826.4	4.666 MHz	4.1633 MHz	Plot G
	4175	835	4.688 MHz	4.1587 MHz	Plot H
	4233	846.6	4.682 MHz	4.1498 MHz	Plot I
WCDMA 1900MHz	9262	1852.4	4.682 MHz	4.1648 MHz	Plot J
	9400	1880	4.692 MHz	4.1617 MHz	Plot K
	9538	1907.6	4.743 MHz	4.1721 MHz	Plot L
HSDPA 850MHz	4132	826.4	4.696 MHz	4.1539 MHz	Plot M
	4175	835	4.688 MHz	4.1590 MHz	Plot N
	4233	846.6	4.655 MHz	4.1685 MHz	Plot O
HSDPA 1900MHz	9262	1852.4	4.670 MHz	4.1613 MHz	Plot P
	9400	1880	4.697 MHz	4.1787 MHz	Plot Q
	9538	1907.6	4.748 MHz	4.1890 MHz	Plot R
HSUPA 850MHz	4132	826.4	4.651 MHz	4.1548 MHz	Plot S
	4175	835	4.714 MHz	4.1607 MHz	Plot T
	4233	846.6	4.684 MHz	4.1655 MHz	Plot U

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
HSUPA 1900MHz	9262	1852.4	4.674 MHz	4.1647 MHz	Plot V
	9400	1880	4.697 MHz	4.1766 MHz	Plot W
	9538	1907.6	4.705 MHz	4.1759 MHz	Plot X
HSPA+ 850MHz	4132	826.4	4.691 MHz	4.1718 MHz	Plot Y
	4175	835	4.677 MHz	4.1515 MHz	Plot Z
	4233	846.6	4.719 MHz	4.1623 MHz	Plot A1
HSPA+ 1900MHz	9262	1852.4	4.716 MHz	4.1672 MHz	Plot B1
	9400	1880	4.698 MHz	4.1666 MHz	Plot C1
	9538	1907.6	4.725 MHz	4.1716 MHz	Plot D1
GSM 850MHz	128	824.2	324.745 KHz	244.2090 KHz	Plot E1
	190	836.6	321.350 KHz	246.3848 KHz	Plot F1
	251	848.8	321.528 KHz	246.9156 KHz	Plot G1
GSM 1900MHz	512	1850.2	317.550 KHz	245.7819 KHz	Plot H1
	661	1880.0	319.907 KHz	241.3692 KHz	Plot I1
	810	1909.8	314.527 KHz	244.9806 KHz	Plot J2
GPRS 850MHz	128	824.2	323.994 KHz	250.1788 KHz	Plot K1
	190	836.6	323.310 KHz	248.8777 KHz	Plot L1
	251	848.8	314.348 KHz	247.5738 KHz	Plot M1
GPRS 1900MHz	512	1850.2	323.145 KHz	240.8957 KHz	Plot N1
	661	1880.0	318.479 KHz	243.3153 KHz	Plot O1
	810	1909.8	321.501 KHz	249.8371 KHz	Plot P1

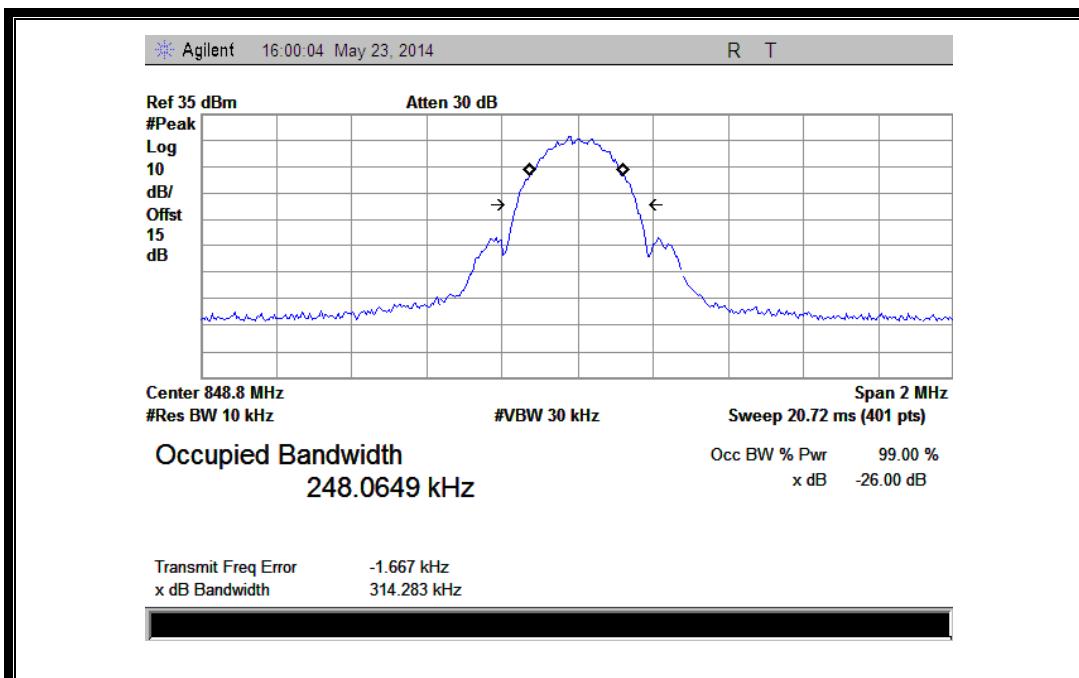
### 3. Test Plots:



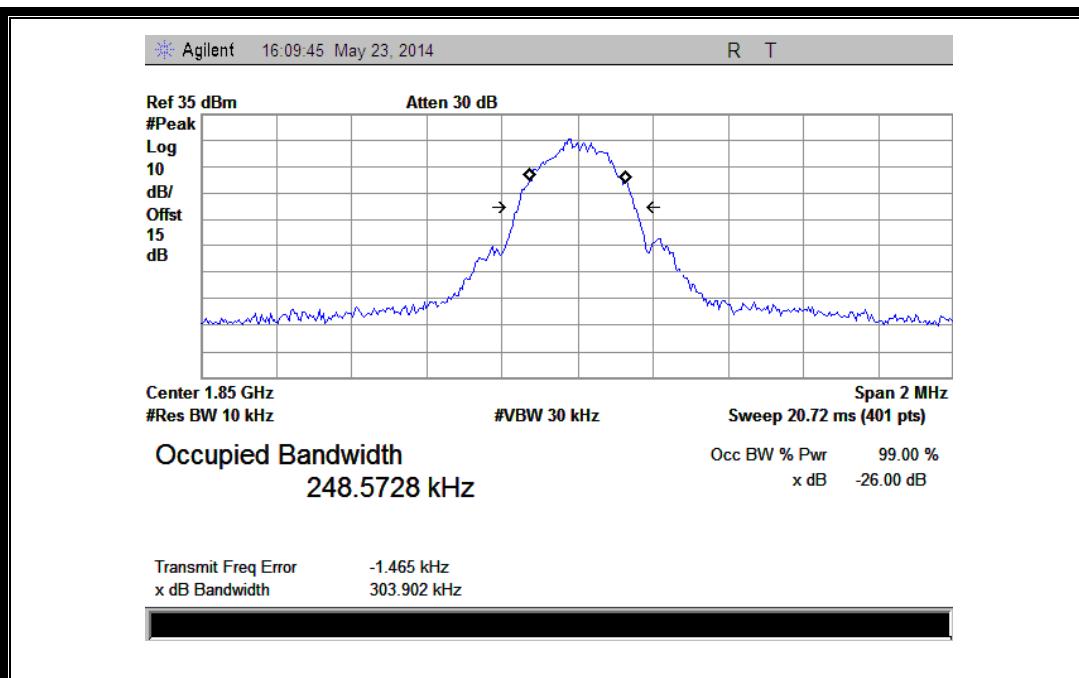
(Plot A: EGPRS 850MHz Channel = 128)



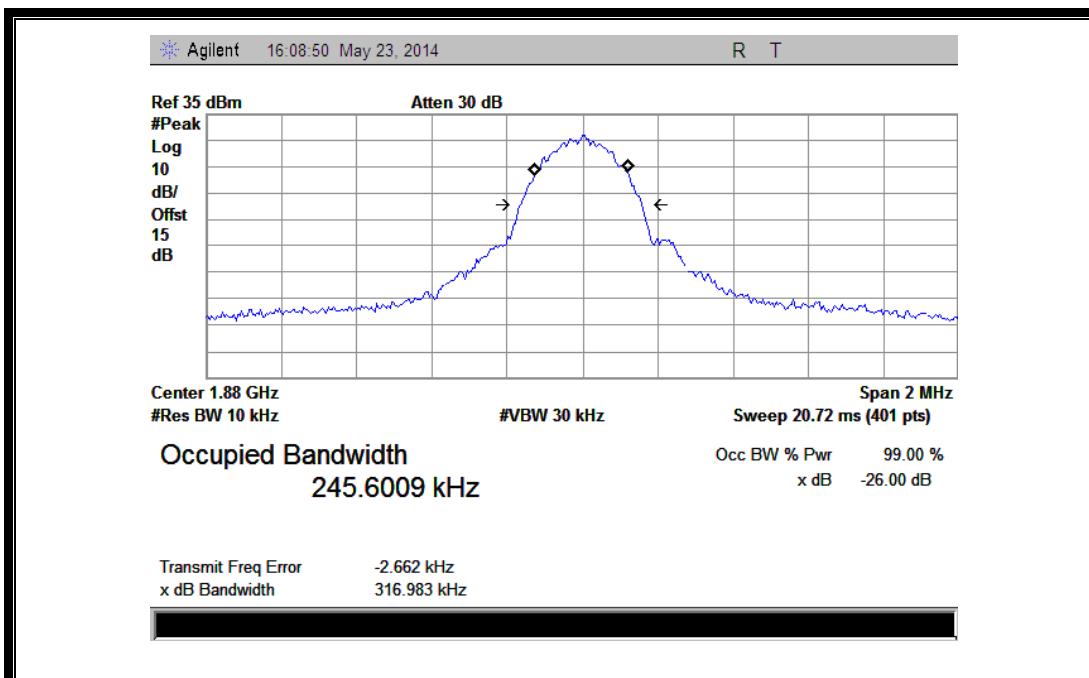
(Plot B: EGPRS 850MHz Channel = 190)



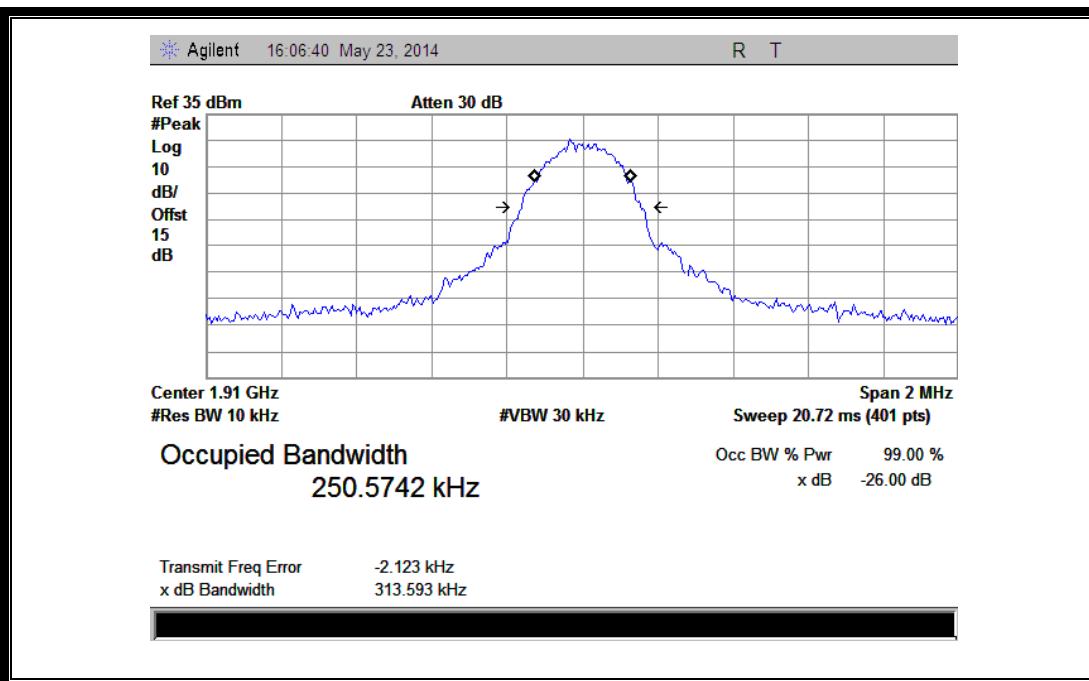
(Plot C: EGPRS 850MHz Channel = 251)



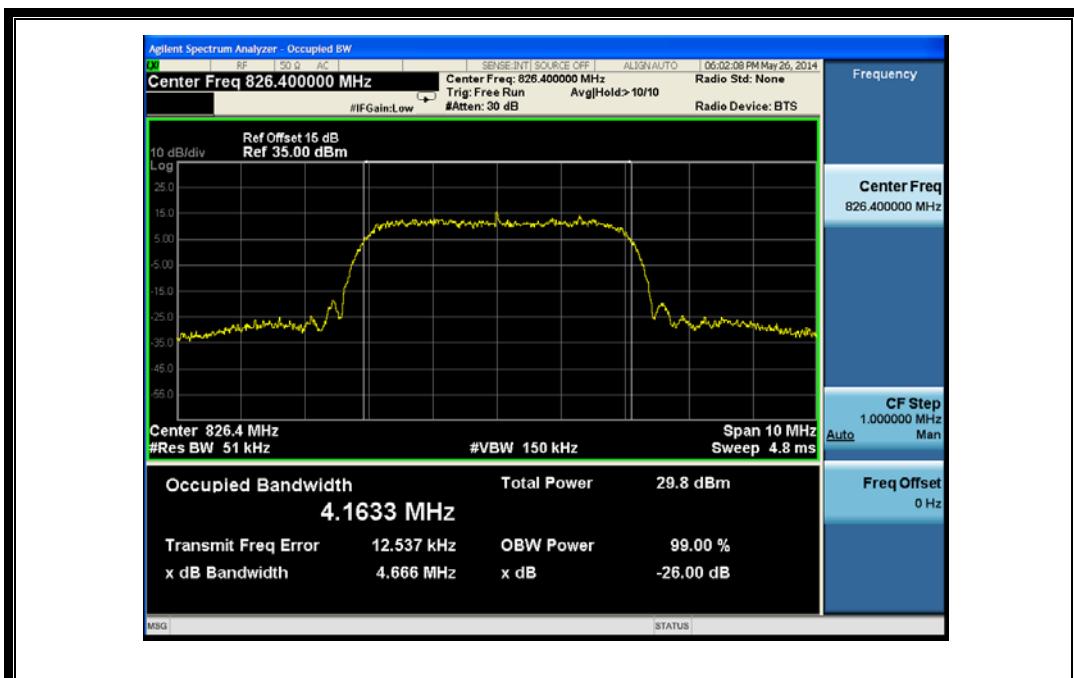
(Plot D: EGPRS1900MHz Channel = 512)



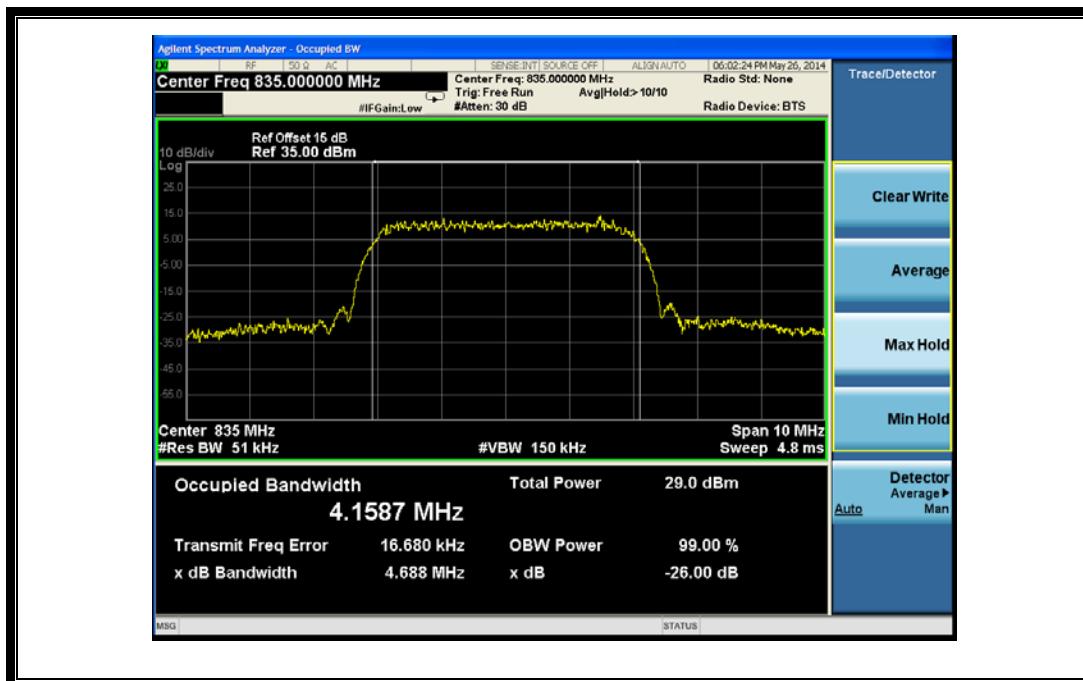
(Plot E: EGPRS1900MHz Channel = 661)



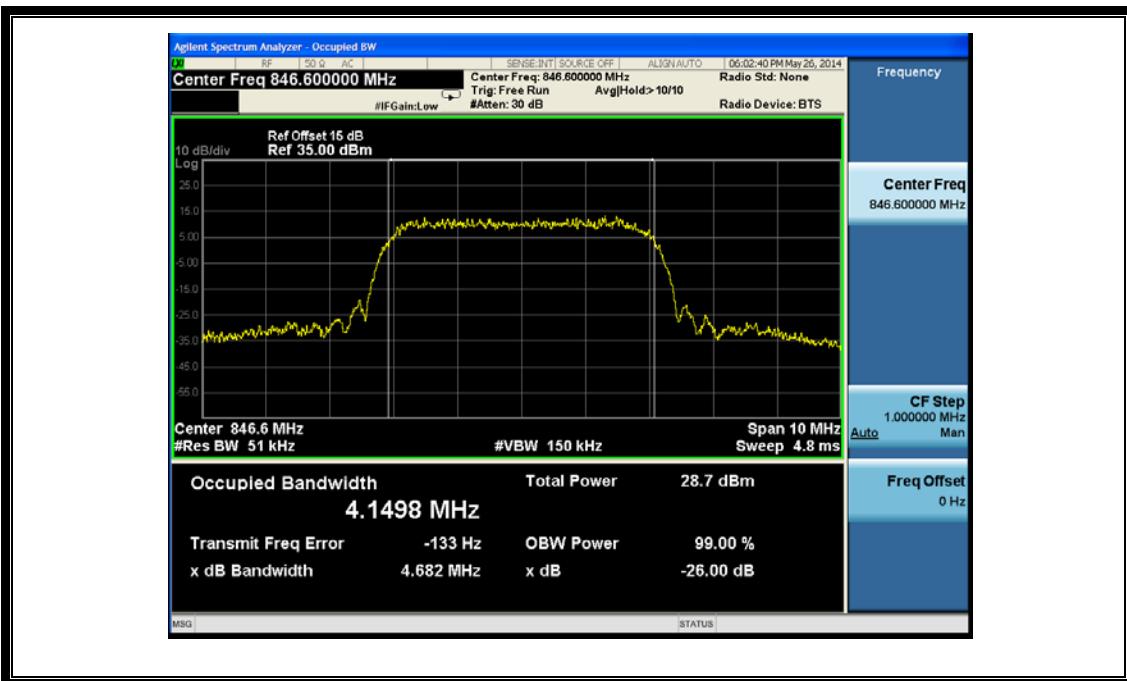
(Plot F: EGPRS 1900MHz Channel = 810)



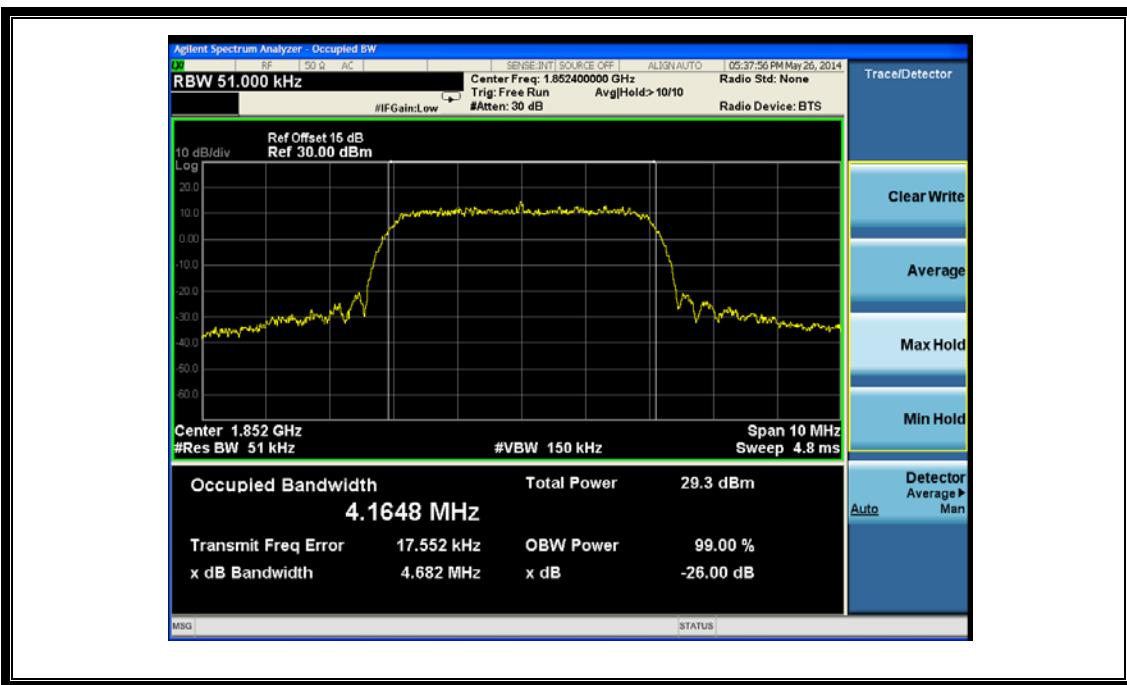
(Plot G: WCDMA 850MHz Channel = 4132)



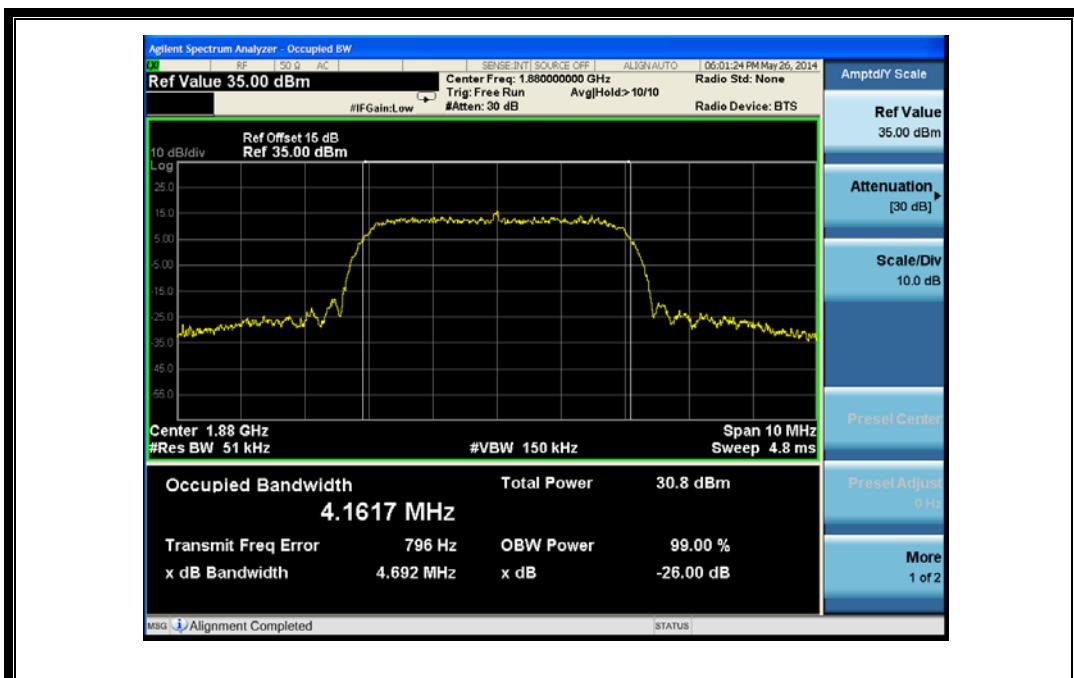
(Plot H: WCDMA 850 MHz Channel = 4175)



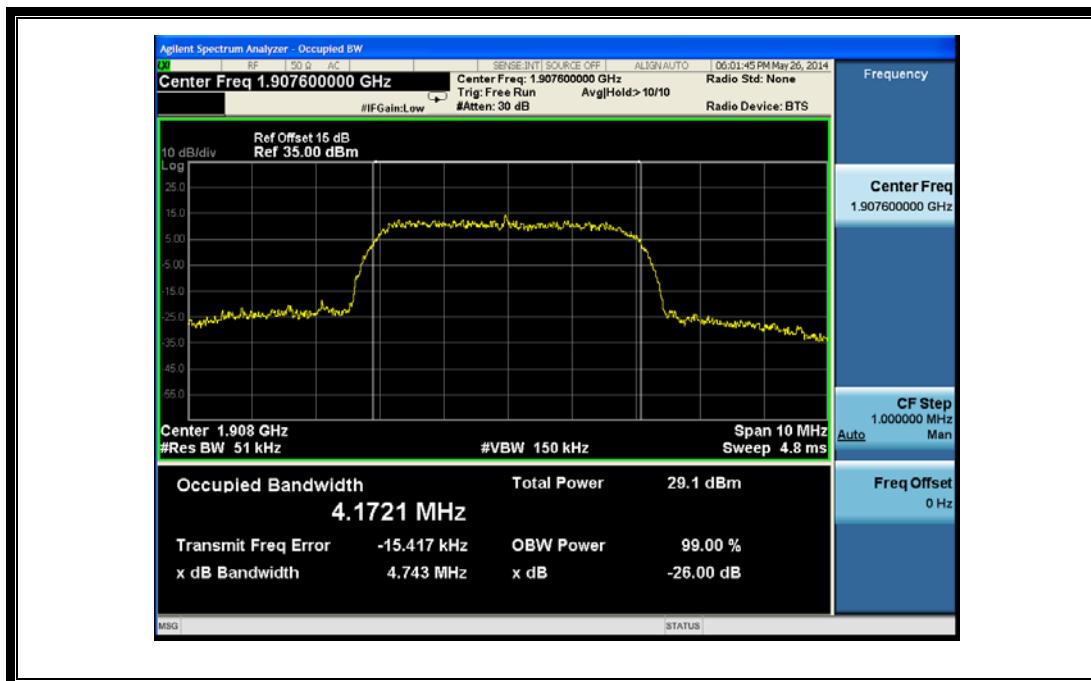
(Plot I: WCDMA 850MHz Channel = 4233)



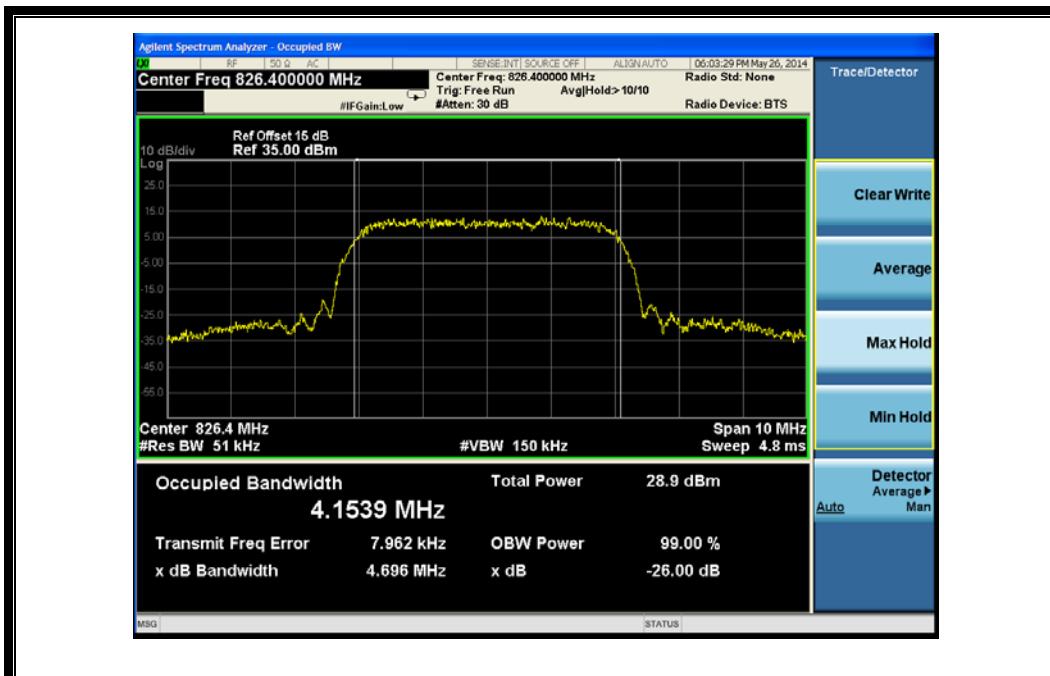
(Plot J: WCDMA 1900MHz Channel = 9262)



(Plot K: WCDMA 1900 MHz Channel = 9400)



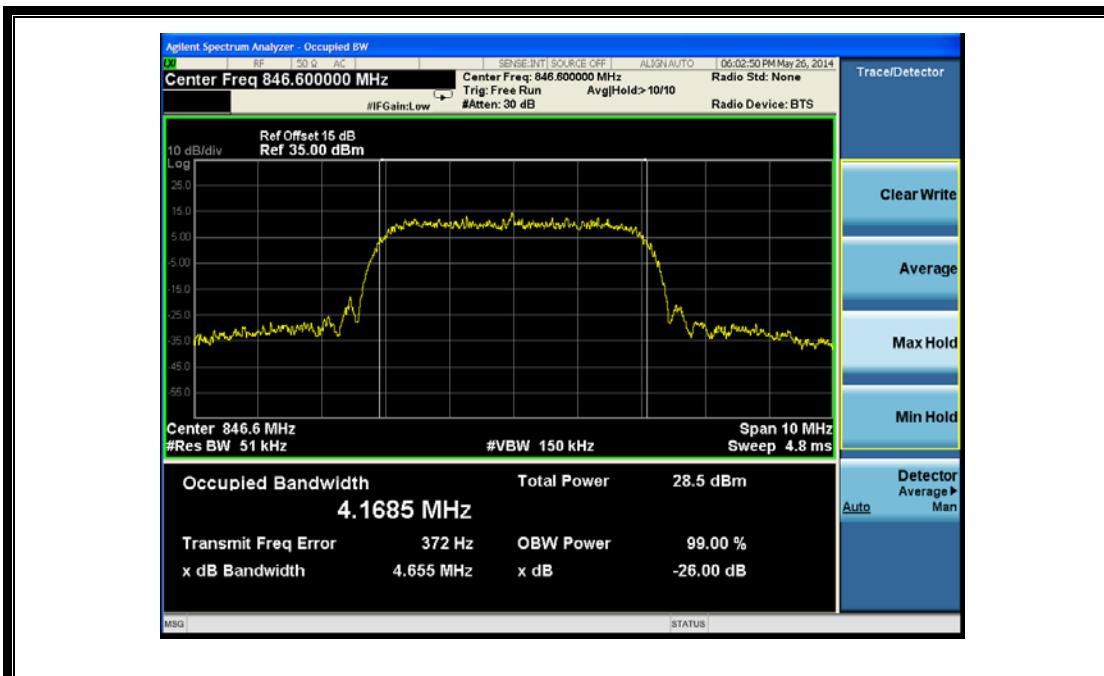
(Plot L: WCDMA1900MHz Channel = 9538)



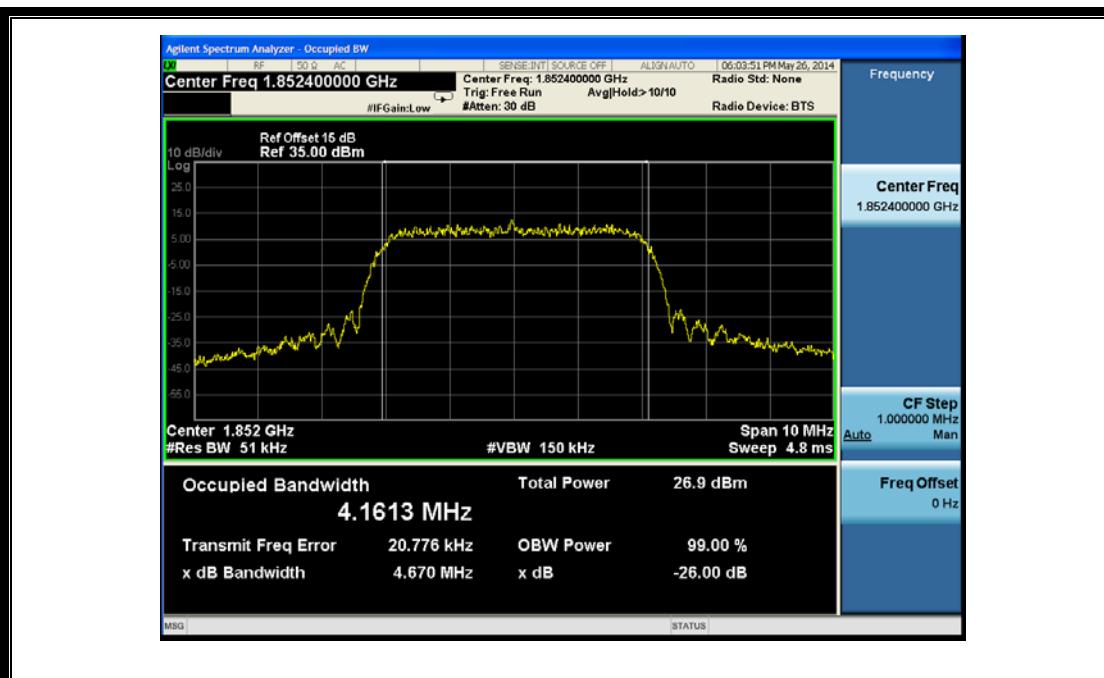
(Plot M: HSDPA 850MHz Channel = 4132)



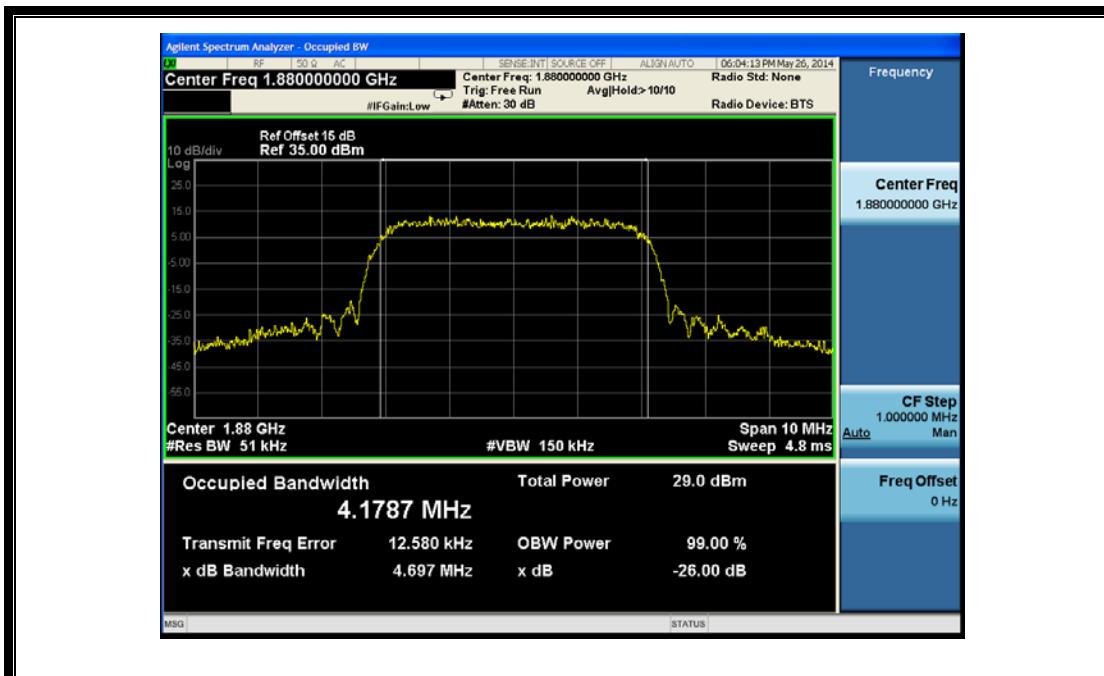
(Plot N: HSDPA850 MHz Channel = 4175)



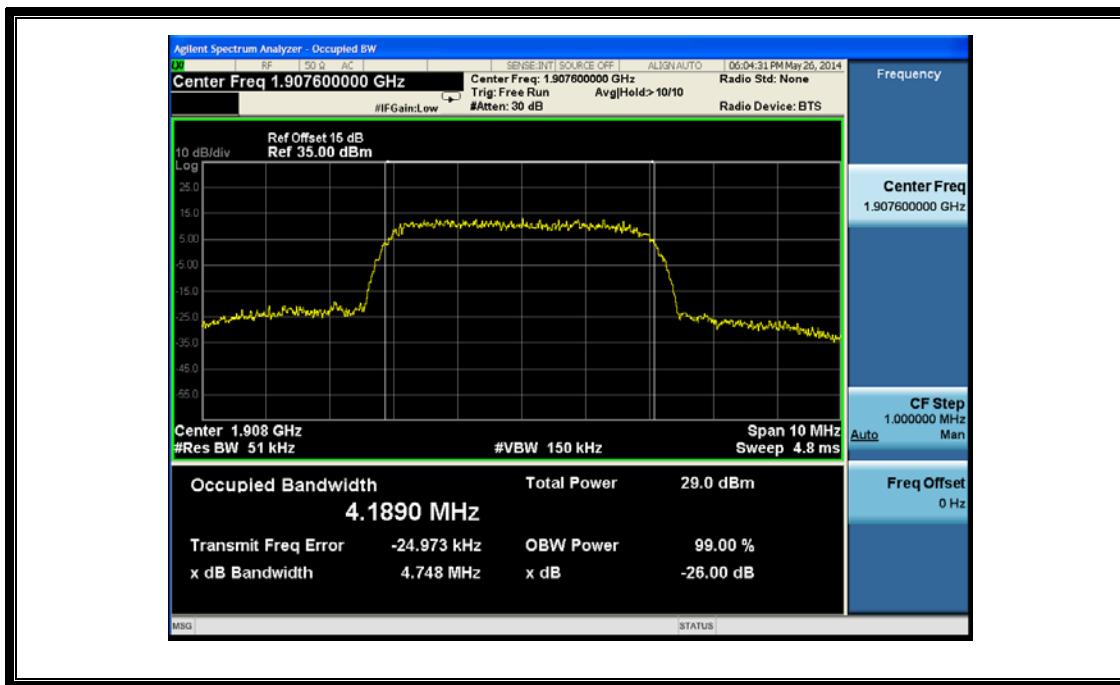
(Plot O: HSDPA 850 MHz Channel = 4233)



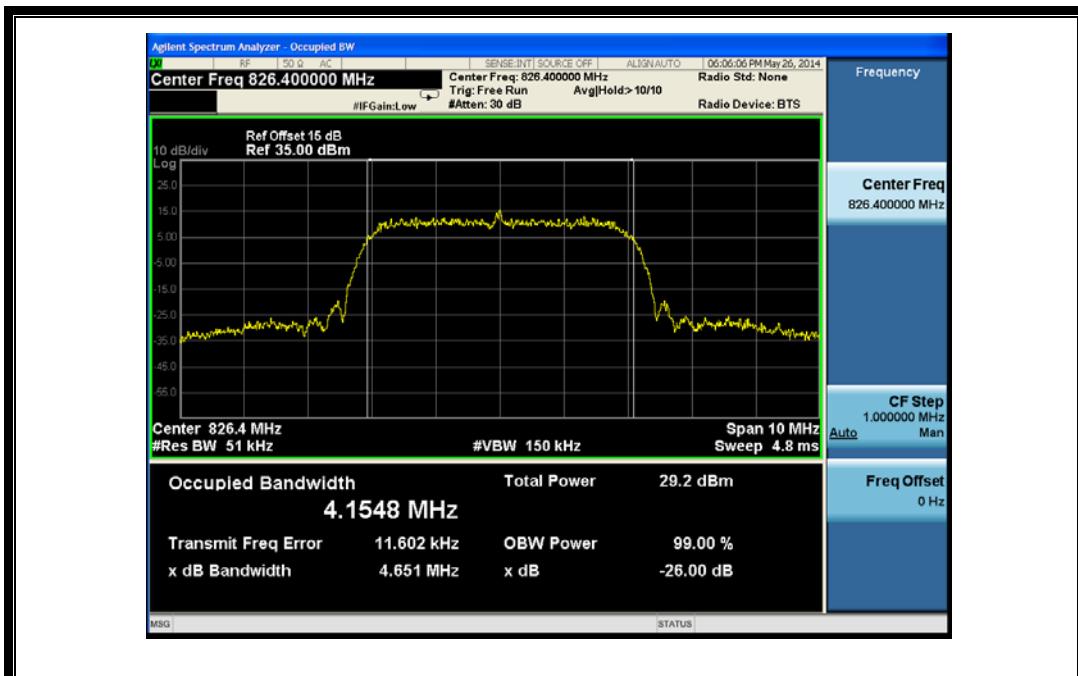
(Plot P: HSDPA1900 MHz Channel = 9262)



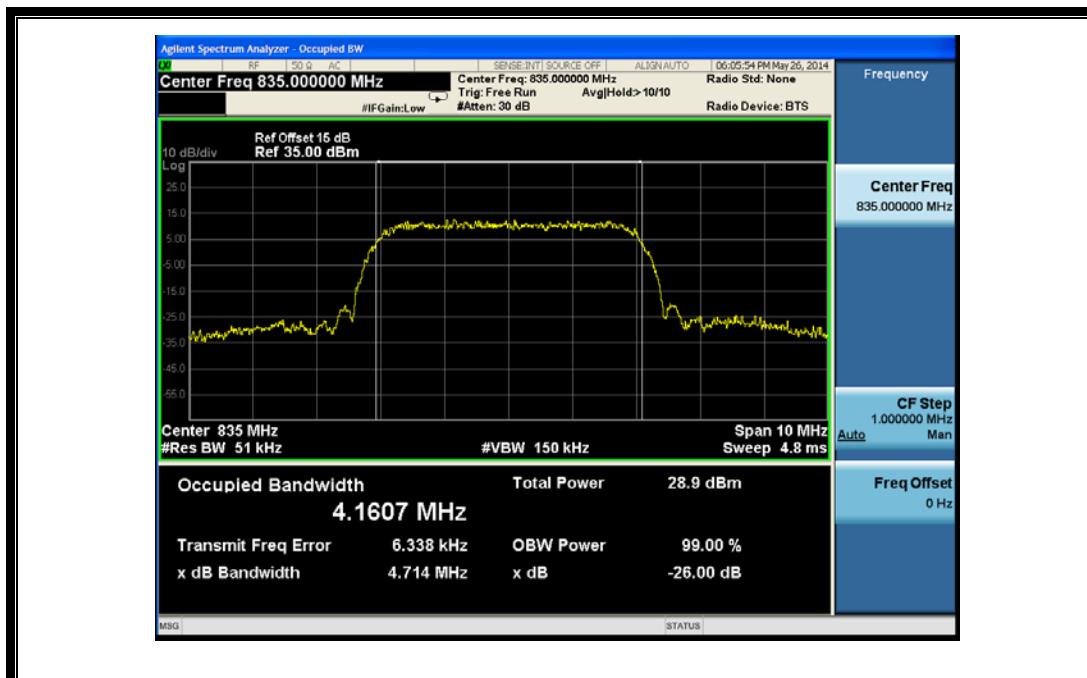
(Plot Q: HSDPA1900 MHz Channel = 9400)



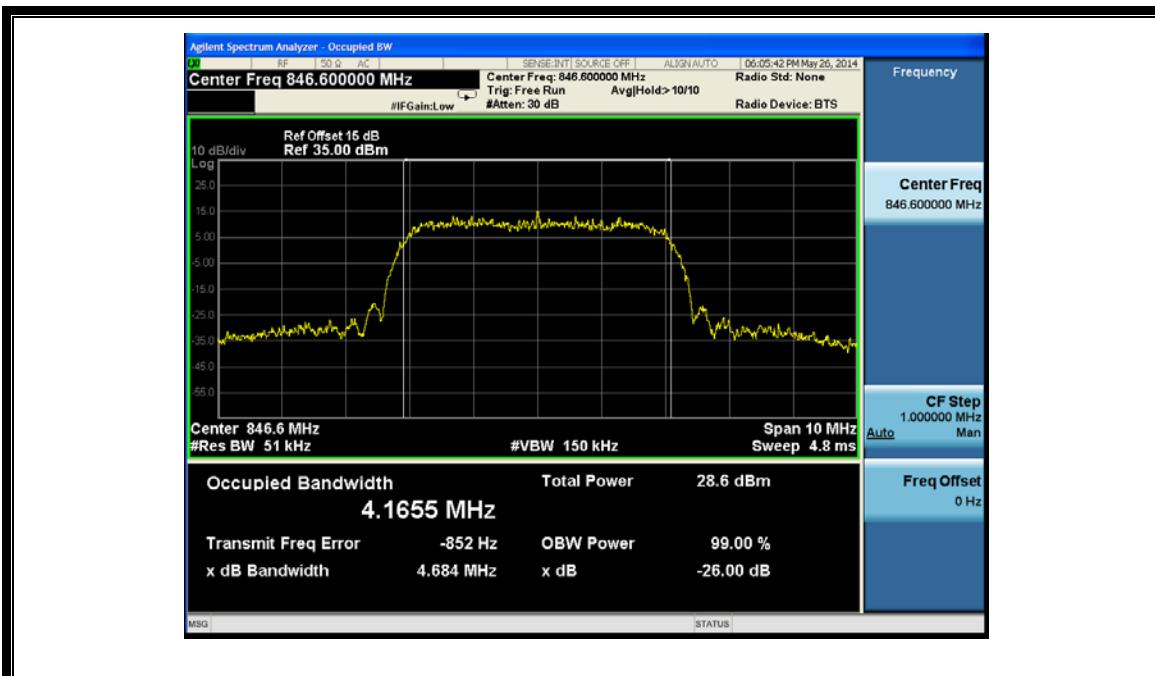
(Plot R: HSDPA 1900 MHz Channel = 9538)



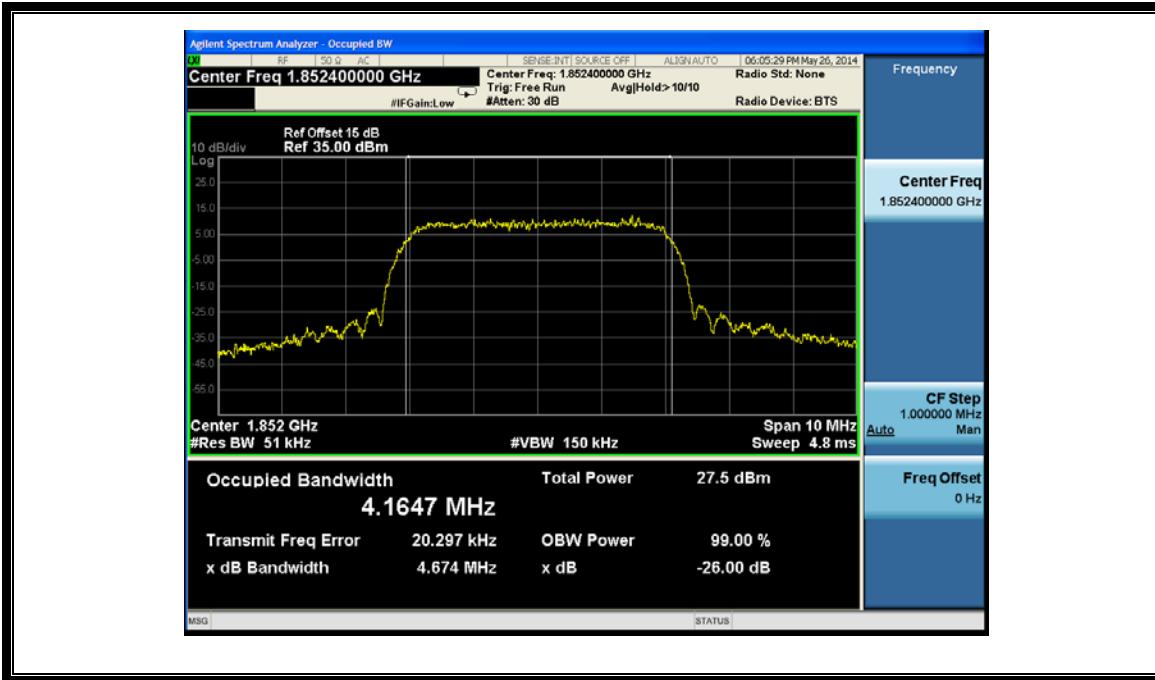
(Plot S: HSUPA850 MHz Channel = 4132)



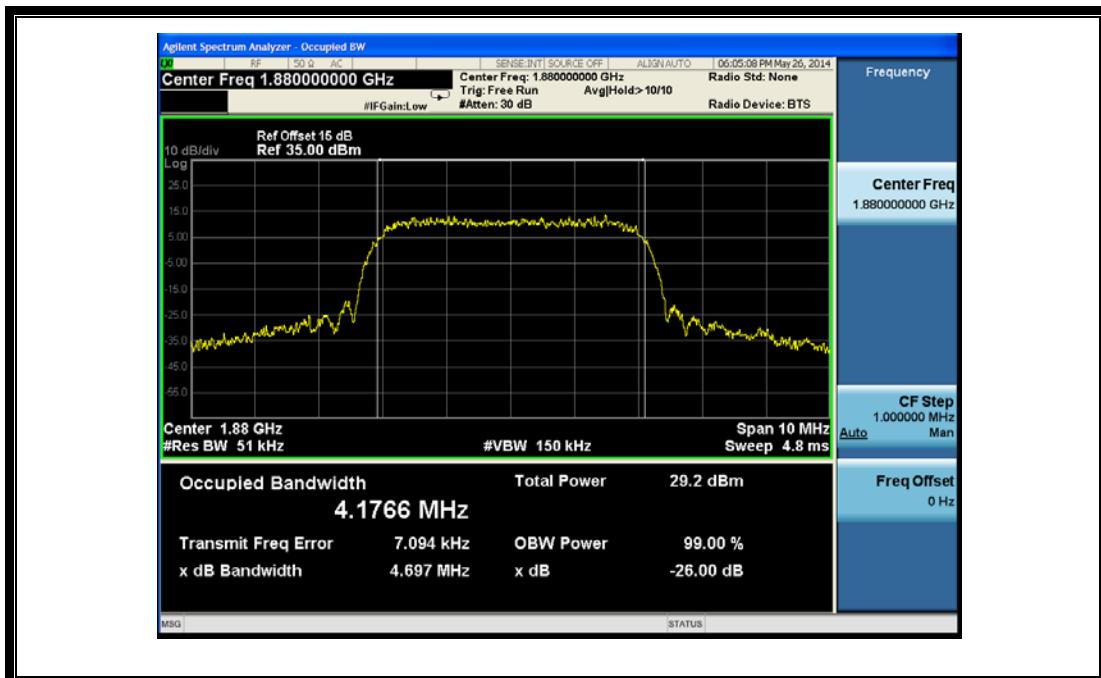
(Plot T: HSUPA850 MHz Channel = 4175)



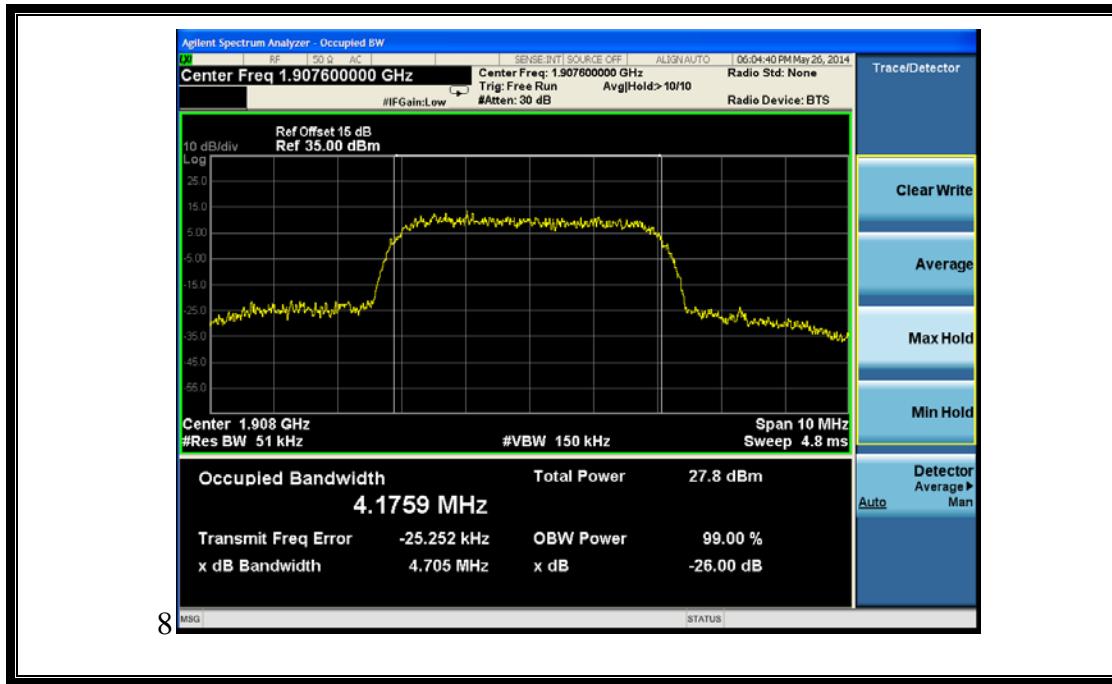
(Plot U: HSUPA850 MHz Channel = 4233)



(Plot V: HSUPA1900 MHz Channel = 9262)

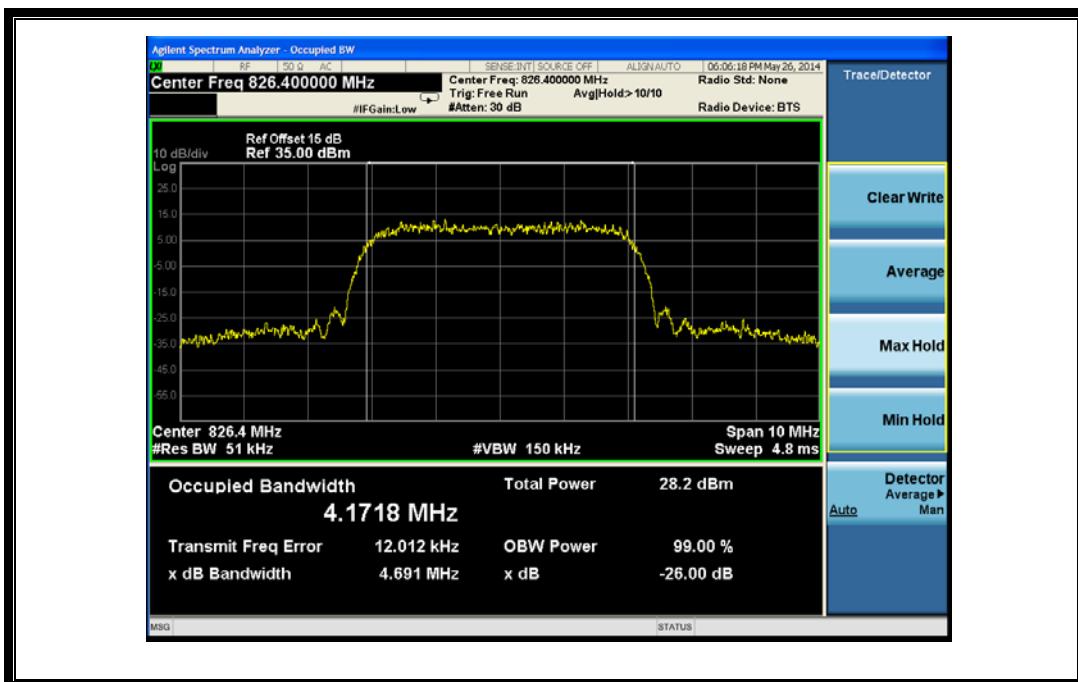


(Plot W: HSUPA1900 MHz Channel = 9400)

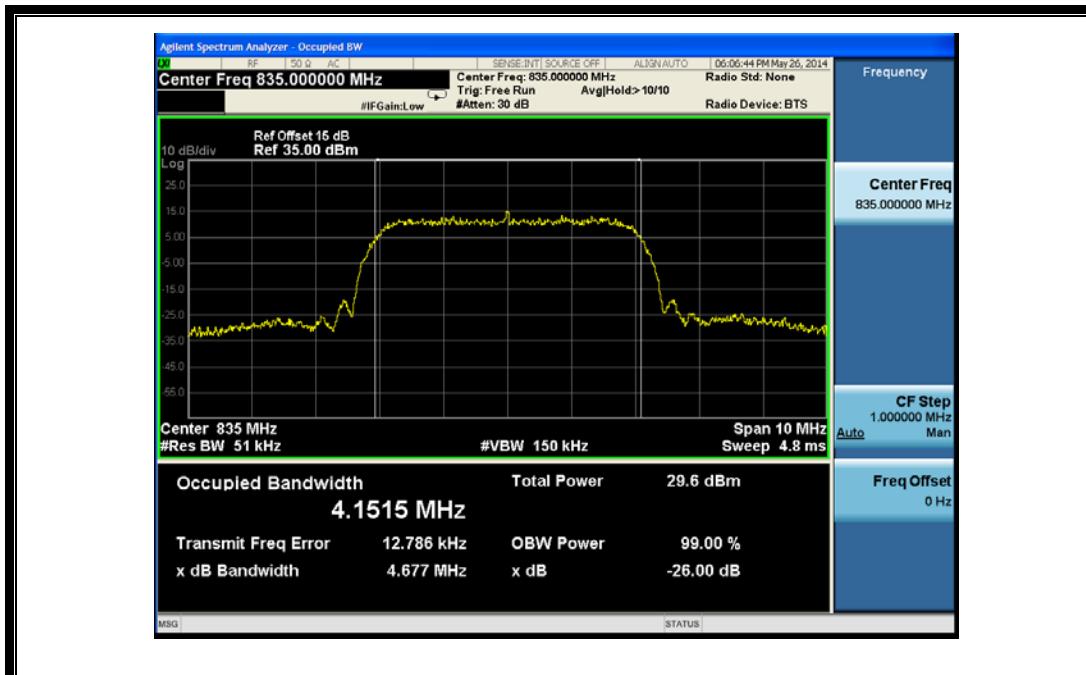


8

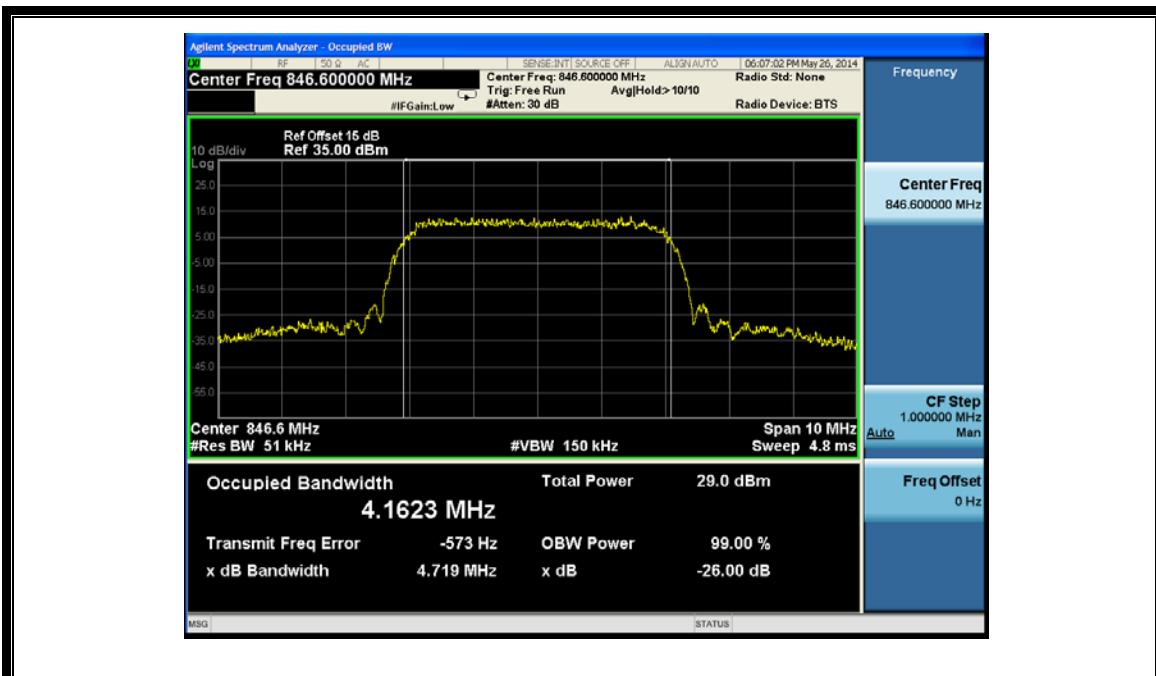
(Plot X: HSUPA1900 MHz Channel = 9538)



(Plot Y: HSPA+850 MHz Channel = 4132)



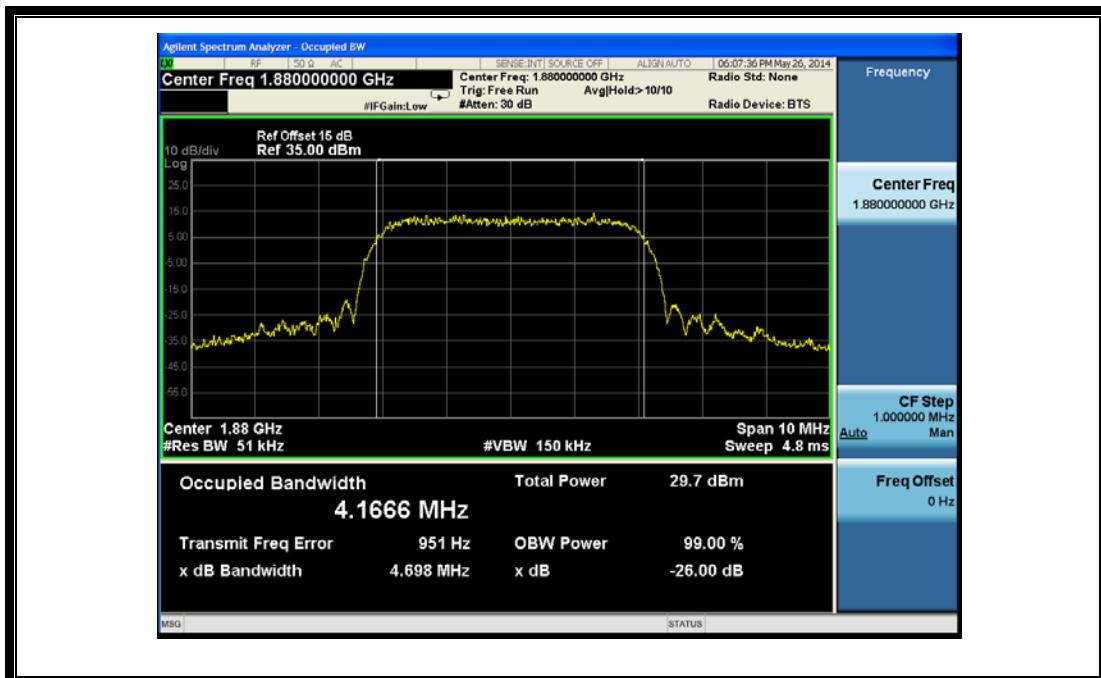
(Plot Z: HSPA+850 MHz Channel = 4175)



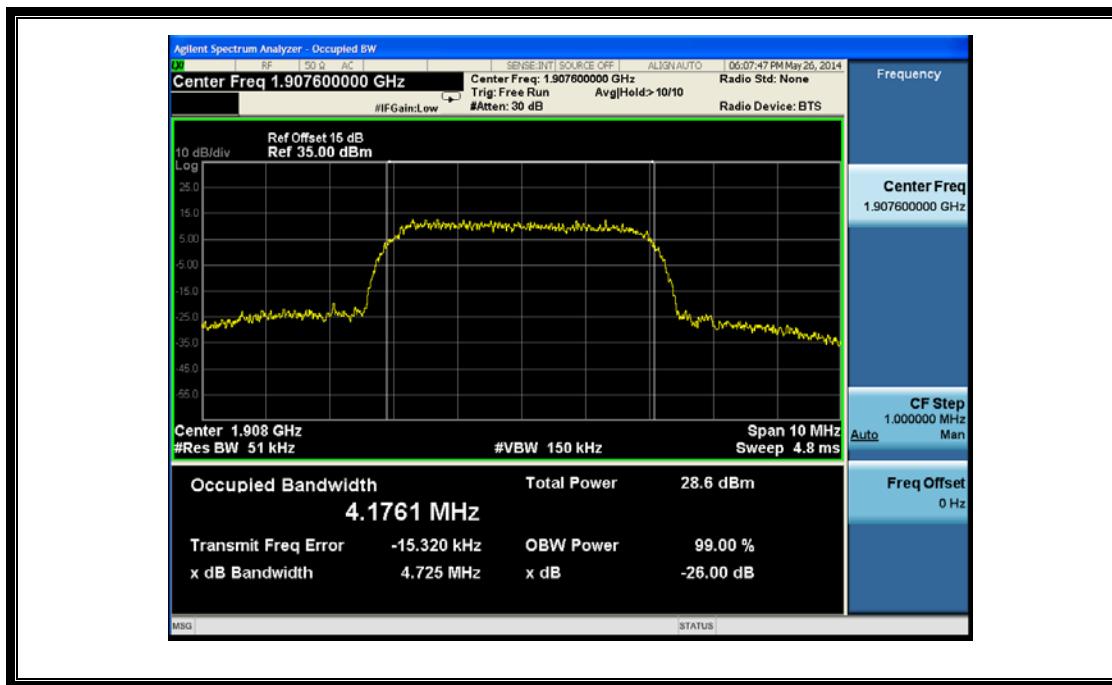
(Plot A1:HSPA+850 MHz Channel = 4233)



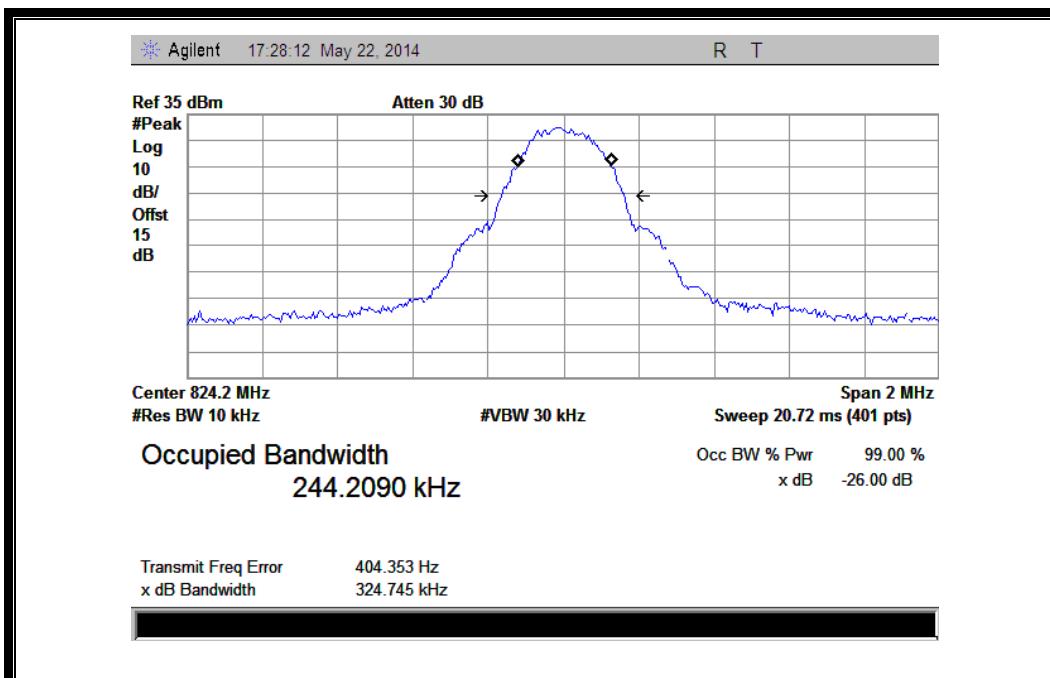
(Plot B1: HSPA+1900 MHz Channel = 9262)



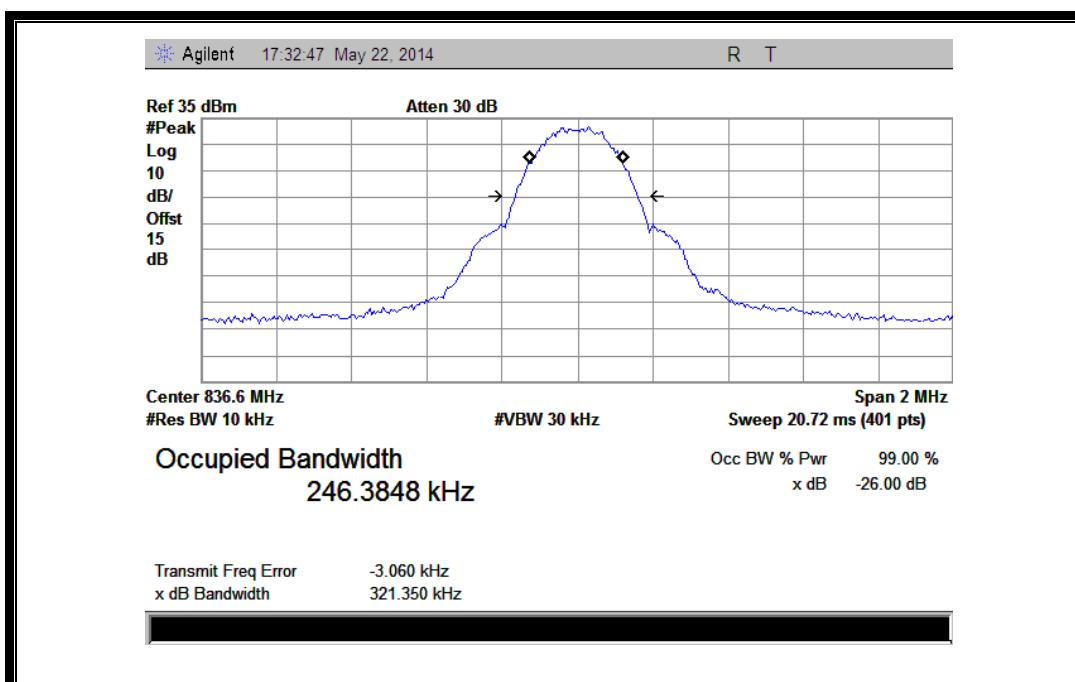
(Plot C1: HSPA+1900 MHz Channel = 9400)



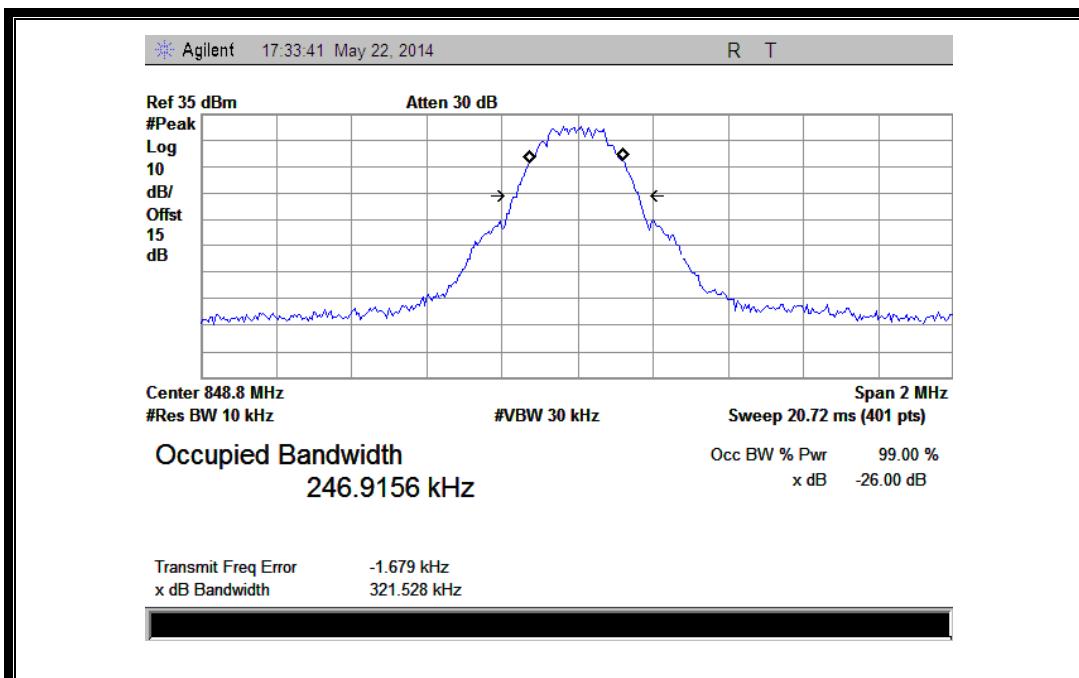
(Plot D1: HSPA+1900 MHz Channel = 9538)



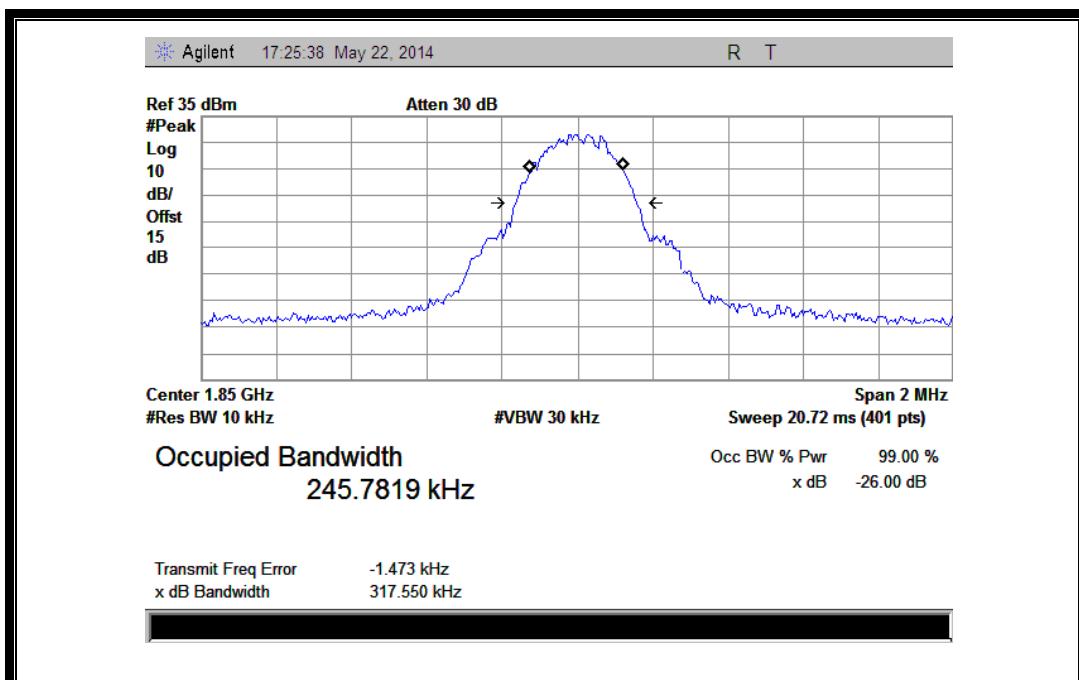
(Plot E1: GSM 850MHz Channel = 128)



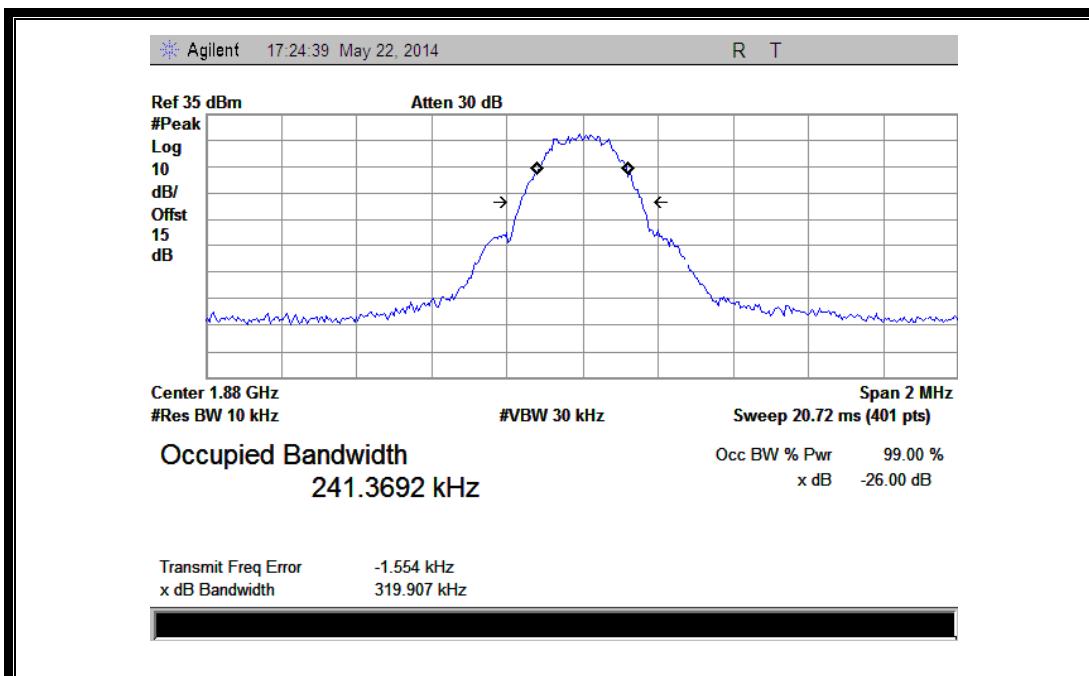
(Plot F1:GSM 850MHz Channel = 190)



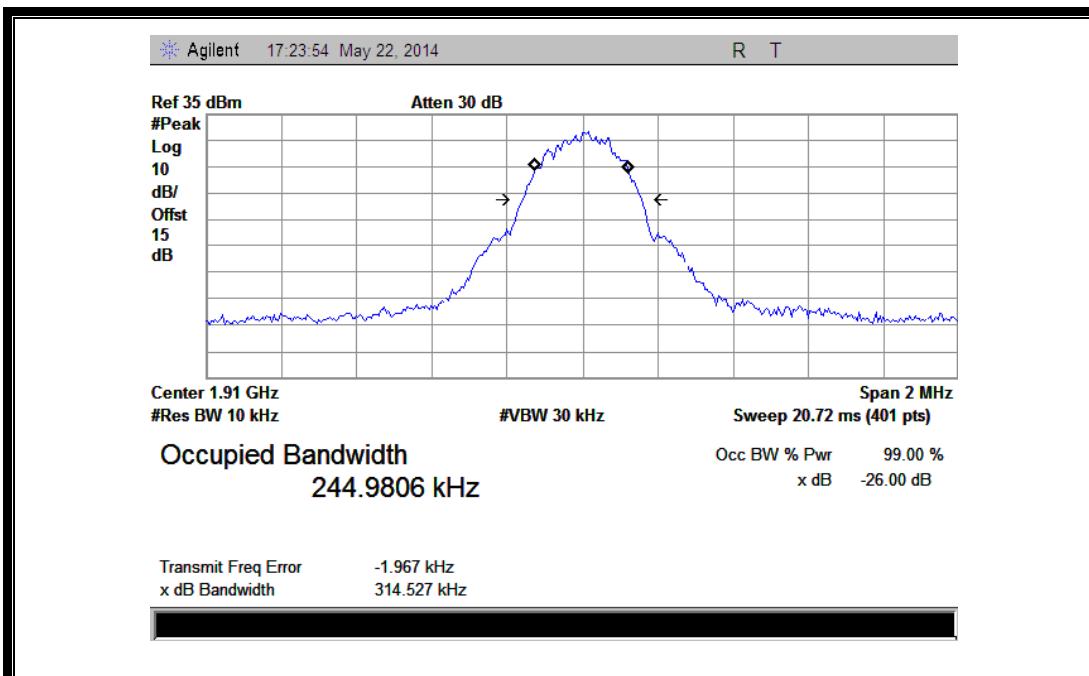
(Plot G1: GSM 850MHz Channel = 251)



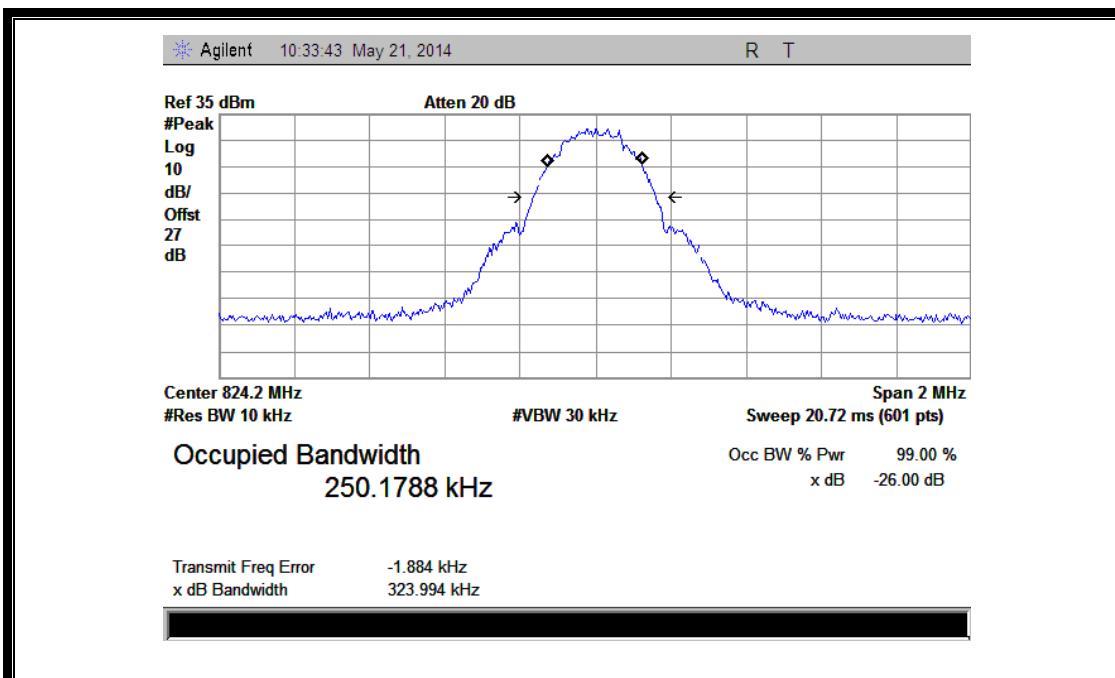
(Plot H1: GSM 1900MHz Channel = 512)



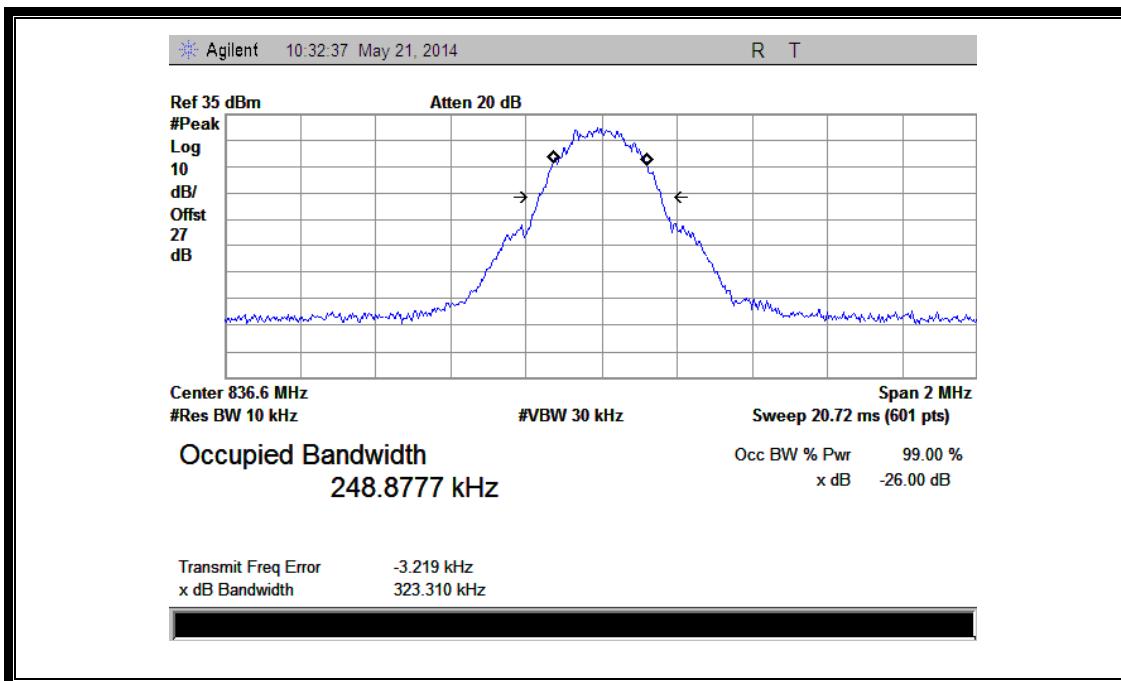
(Plot I1: GSM 1900MHz Channel = 661)



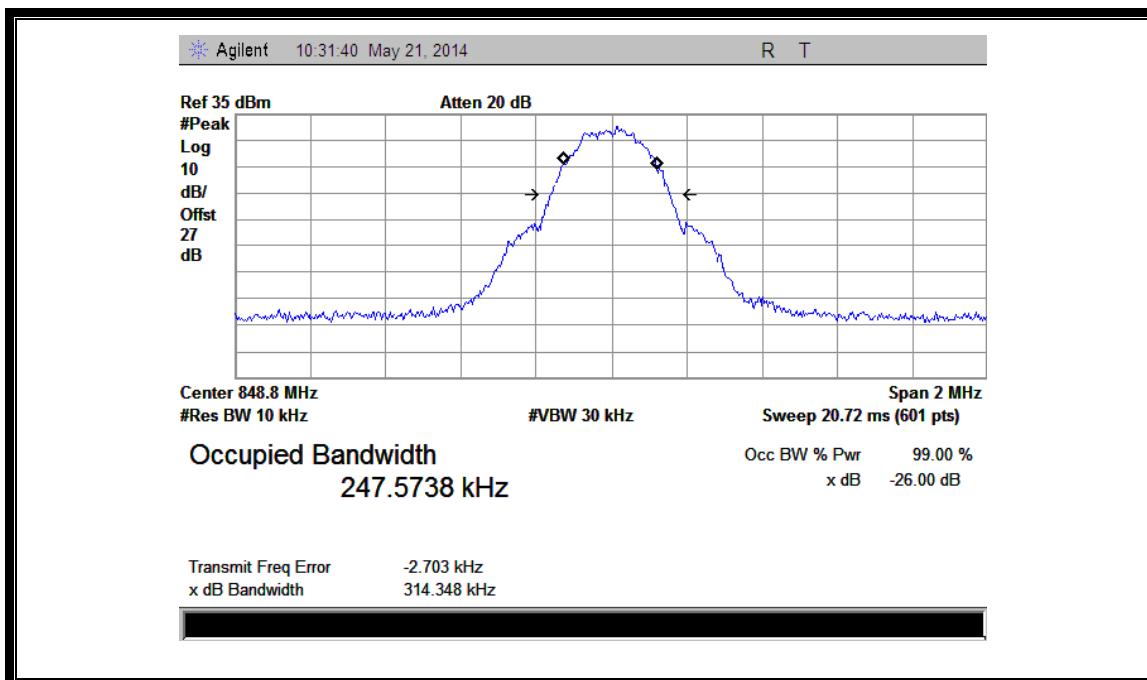
(Plot J1: GSM 1900MHz Channel = 810)



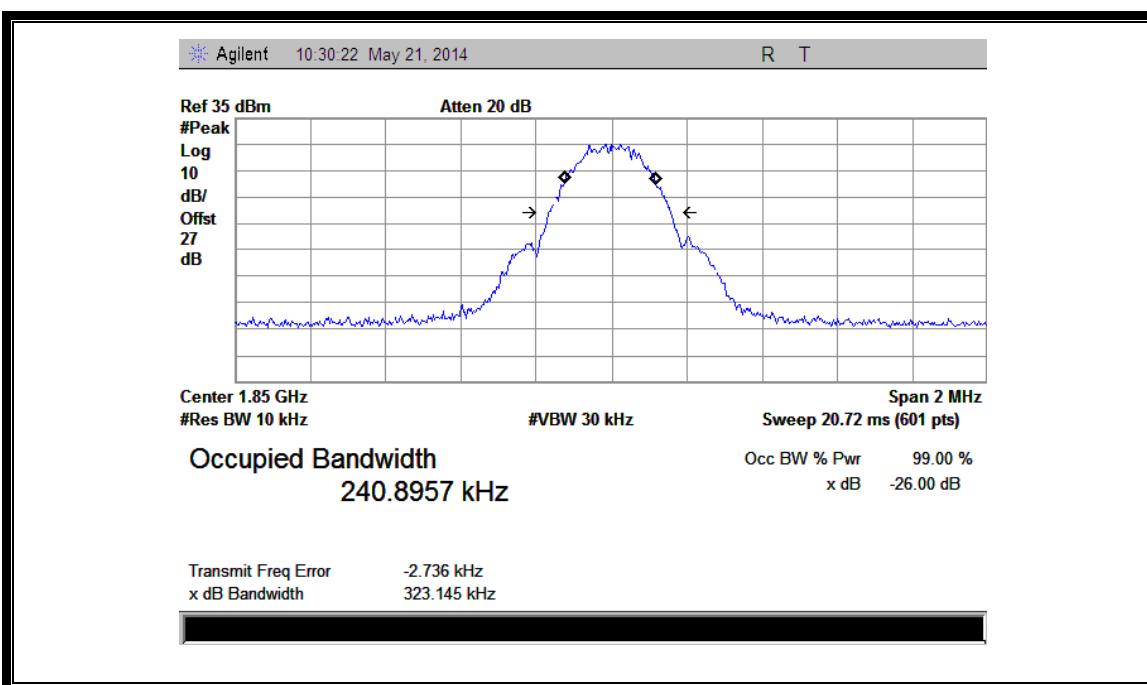
(Plot K1: GPRS 850MHz Channel = 128)



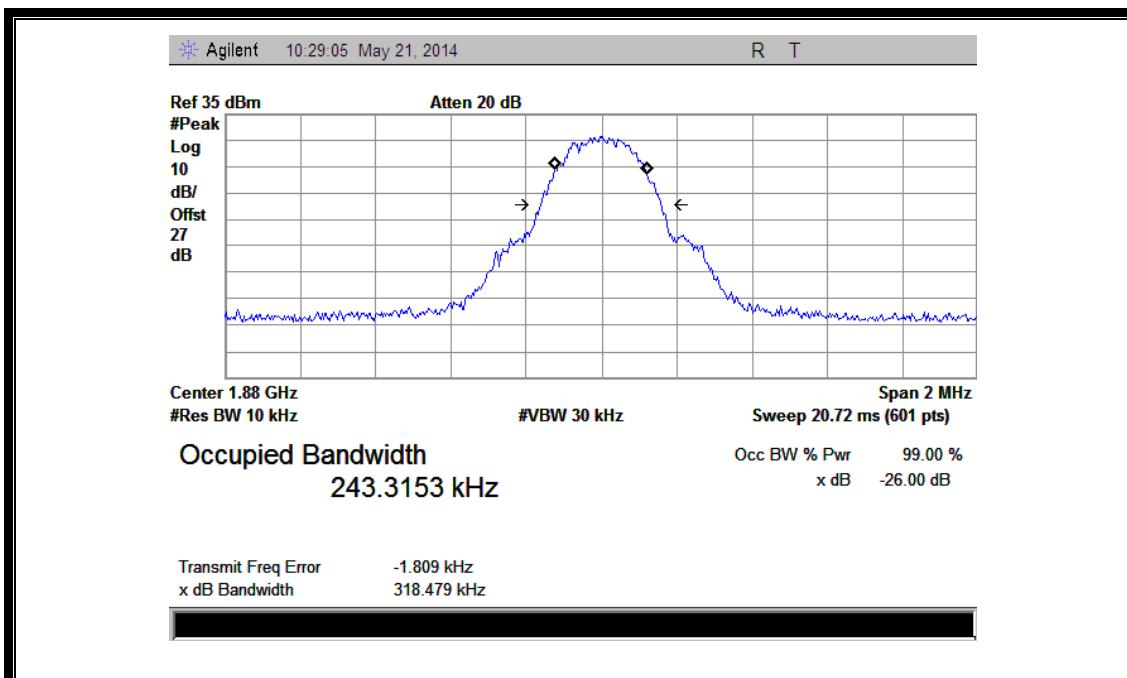
(Plot L1:GPRS 850MHz Channel = 190)



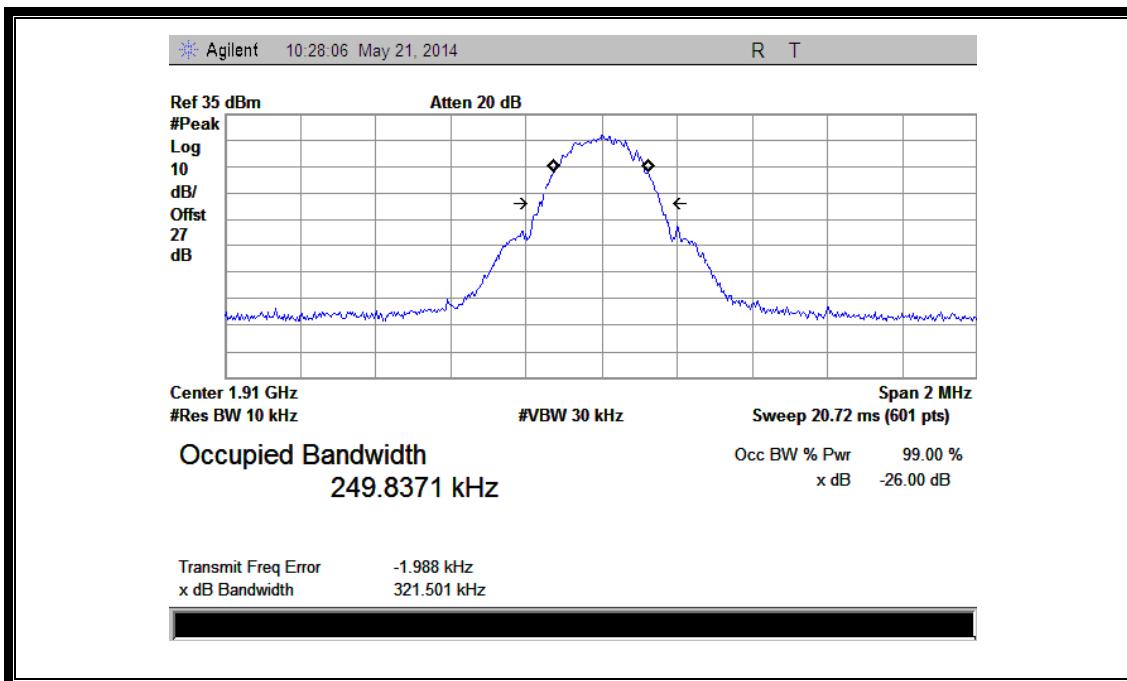
(Plot M1: GPRS850MHz Channel = 251)



(Plot N1: GPRS 1900MHz Channel = 512)



(Plot O1: GPRS 1900MHz Channel = 661)



(Plot P1: GPRS 1900MHz Channel = 810)

## 2.4 Frequency Stability

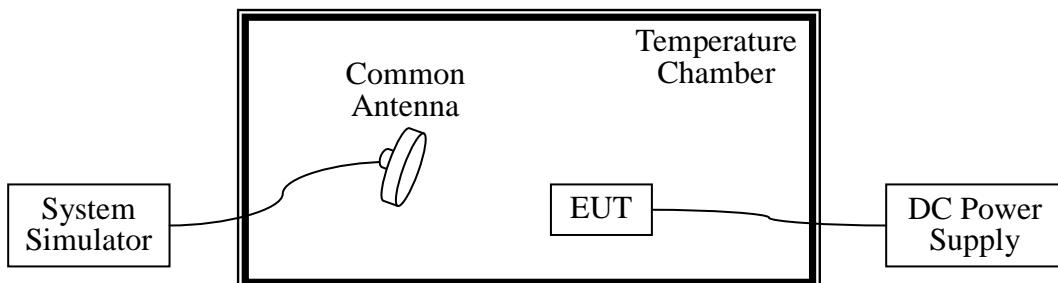
### 2.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235 and IC RSS-GEN section 4.5 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:

- The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
- For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer. 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.

### 2.4.2 Test Description

#### 1. Test Setup:



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

#### 2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Agilent	E5515C	GB43130131	2014.02.26	2015.02.25
DC Power Supply	Good Will	GPS-3030DD	EF920938	2014.02.26	2015.02.25
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2014.02.26	2015.02.25

### 2.4.3 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

850MHz band is  $\pm 2.5$ ppm, and 1900MHz is  $\pm 1$ ppm, 1700MHz  $\pm 1$ ppm.

## 1. 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	-24.35	$\pm 2060.5$	23.12	$\pm 2091.5$	14.87	$\pm 2122$	<u>PASS</u>	
	-20	27.31		12.43		-15.02			
	-10	-2.25		-17.46		15.16			
	0	30.26		32.14		5.05			
	+10	21.79		-24.93		3.02			
	+20	-19.56		-17.19		10.76			
	+30	34.36		19.36		-16.53			
	+40	42.63		19.64		-2.13			
	+55	35.28		23.27		-12.89			
	4.2	+25		29.05		-7.55			
	3.4	+25		37.73		7.78			

## 2. GSM 1900MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperatur e (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)			
		Hz	Limits	Hz	Limits	Hz	Limits		
3.7	-30	19.21	$\pm 1850.2$	21.78	$\pm 1880.0$	32.75	$\pm 1909.8$	<u>PASS</u>	
	-20	37.08		-20.48		-18.88			
	-10	-2.05		-13.76		-16.88			
	0	40.06		-18.38		19.32			
	+10	1.98		-21.61		25.31			
	+20	-19.76		15.52		30.26			
	+30	39.76		-0.78		-29.21			
	+40	46.66		33.37		19.33			
	+55	39.88		24.02		-19.37			
	4.2	+25		23.72		27.09			
	3.4	+25		15.92		19.99			

### 3. 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	-32.12	±2060.5	26.12	±2091.5	6.22	±2122	<u>PASS</u>	
	-20	36.98		13.73		-13.80			
	-10	-3.25		-18.35		12.06			
	0	41.06		38.10		5.05			
	+10	1.99		-22.06		3.02			
	+20	-19.86		-16.11		10.76			
	+30	39.56		17.76		-16.51			
	+40	46.62		15.54		-2.11			
	+55	39.98		3.57		-12.89			
	4.2	+25		14.05		-7.83			
	3.4	+25		6.93		6.98			

### 4. EDGE 1900MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperatur e (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)			
		Hz	Limits	Hz	Limits	Hz	Limits		
3.7	-30	-12.87	±1850.2	25.22	±1880.0	2.57	±1909.8	<u>PASS</u>	
	-20	1.72		7.63		-13.76			
	-10	1.75		-25.78		-13.21			
	0	2.57		-1.36		13.23			
	+10	-10.78		-17.98		5.23			
	+20	-2.11		-21.61		35.16			
	+30	14.03		14.58		-26.88			
	+40	5.43		-0.78		19.34			
	+55	-2.46		37.07		-16.77			
	4.2	+25		4.08		26.59			
	3.4	+25		14.13		19.03			

## 5. WCDMA 850MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperatur e (°C)	Channel = 4123 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)			
		Hz	Limit	Hz	Limit	Hz	Limit		
3.7	-30	19.22	±2066	12.27	±2087.5	-1.20	±2116.5	<u>PASS</u>	
	-20	-7.52		-0.62		-18.48			
	-10	-3.43		22.45		7.67			
	0	16.47		13.25		4.32			
	+10	30.18		1.31		-17.33			
	+20	32.07		-12.22		11.90			
	+30	-7.98		30.62		6.63			
	+40	26.31		13.45		28.93			
	+55	12.10		-12.42		19.76			
	4.2	+25		30.82		23.89			
3.4	+25	18.66		-17.80		-18.60			

## 6. WCDMA 1900MHz 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		
3.7	-30	-4.22	±1852.4	-12.67	±1880.0	-7.29	±1907.6	<u>PASS</u>	
	-20	19.35		13.28		25.60			
	-10	5.35		-14.36		15.11			
	0	18.92		18.59		-3.17			
	+10	31.40		21.39		18.12			
	+20	13.55		37.27		-10.39			
	+30	1.31		2.37		17.47			
	+40	-12.52		-13.47		27.84			
	+55	-13.65		-5.81		-2.53			
	4.2	+25		14.68		21.05			
3.4	+25	23.12		26.37		-25.22			

## 7. HSDPA 850MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperature (°C)	Channel = 4123 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)			
		Hz	Limit	Hz	Limit	Hz	Limit		
3.7	-30	27.46	±2066	-24.07	±2087.5	17.11	±2116.5	<u>PASS</u>	
	-20	-8.66		-14.06		14.41			
	-10	20.85		36.23		21.57			
	0	12.78		-8.41		-24.37			
	+10	-14.75		-13.95		-13.96			
	+20	8.78		-24.37		35.23			
	+30	-1.49		12.88		-8.31			
	+40	17.14		-14.75		-13.95			
	+55	-23.61		23.37		25.37			
	4.2	+25		7.93		7.98			
3.4	+25	17.11		-31.21		1.98			

## 8. HSDPA 1900MHz 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		
3.7	-30	12.57	±1852.4	-351	±1880	2.51	±1907.6	<u>PASS</u>	
	-20	-16.05		22.71		-8.48			
	-10	20.42		15.37		-14.02			
	0	-3.11		-12.21		-9.01			
	+10	21.71		10.60		5.64			
	+20	20.12		-4.81		-3.85			
	+30	-15.01		34.31		9.57			
	+40	22.71		8.46		27.54			
	+55	16.42		-24.88		-12.42			
	4.2	+25		29.53		-2.83			
3.4	+25	10.53		-2.47		15.52			

## 9. HSUPA 850MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperature (°C)	Channel = 4123 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)			
		Hz	Limit	Hz	Limit	Hz	Limit		
3.7	-30	27.52	±2066	15.51	±2087.5	15.75	±2116.5	<u>PASS</u>	
	-20	-15.40		-19.43		27.52			
	-10	-12.71		-12.79		37.71			
	0	-14.09		-0.44		-7.32			
	+10	-0.37		0.01		-4.91			
	+20	-11.85		-6.64		21.35			
	+30	29.57		24.25		-5.94			
	+40	-11.89		9.73		13.78			
	+55	-0.45		24.76		28.55			
	4.2	+25		-4.67		29.31			
	3.4	+25		6.65		-7.60			

## 10. HSUPA 1900MHz 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		
3.7	-30	32.57	±1852.4	-12.79	±1880	7.29	±1907.6	<u>PASS</u>	
	-20	28.13		-0.84		2.11			
	-10	7.82		0.11		-4.85			
	0	2.41		14.82		17.08			
	+10	-4.73		-15.25		-1.86			
	+20	16.22		-11.79		23.52			
	+30	-1.55		-0.44		-0.48			
	+40	24.16		1.25		-12.05			
	+55	14.79		-7.84		-5.81			
	4.2	+25		6.71		25.38			
	3.4	+25		-1.73		-15.88			

## 11. HSPA+ 850MHz Band

Test Conditions		Frequency Deviation						Verdict	
Power (VDC)	Temperature (°C)	Channel = 4123 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)			
		Hz	Limit	Hz	Limit	Hz	Limit		
3.7	-30	27.22	±2066	13.51	±2087.5	12.45	±2116.5	<u>PASS</u>	
	-20	-14.40		-19.43		27.52			
	-10	-12.71		-12.79		37.71			
	0	-14.09		-0.44		-7.32			
	+10	-0.37		0.01		-4.91			
	+20	-11.85		-6.64		21.35			
	+30	29.57		24.25		-5.94			
	+40	-11.89		9.73		13.78			
	+55	-0.45		24.76		28.55			
	4.2	+25		-4.67		29.31			
3.4	+25	1.45		6.75		-7.90			

## 12. HSPA+ 1900MHz 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		
3.7	-30	31.67	±1852.4	-12.29	±1880	7.29	±1907.6	<u>PASS</u>	
	-20	28.13		-0.84		2.11			
	-10	7.82		0.11		-4.85			
	0	2.41		14.82		17.08			
	+10	-4.73		-15.25		-1.86			
	+20	16.22		-11.79		23.52			
	+30	-1.55		-0.44		-0.48			
	+40	24.16		1.25		-12.05			
	+55	14.79		-7.84		-5.81			
	4.2	+25		6.71		25.38			
3.4	+25	23.38		-1.33		-15.38			

## 2.5 Conducted Out of Band Emissions

### 2.5.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a) and IC RSS-GEN section 4.7 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.

### 2.5.2 Test Description

See section 2.1.2 of this report.

### 2.5.3 Test Result

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

#### 1. Test Verdict:

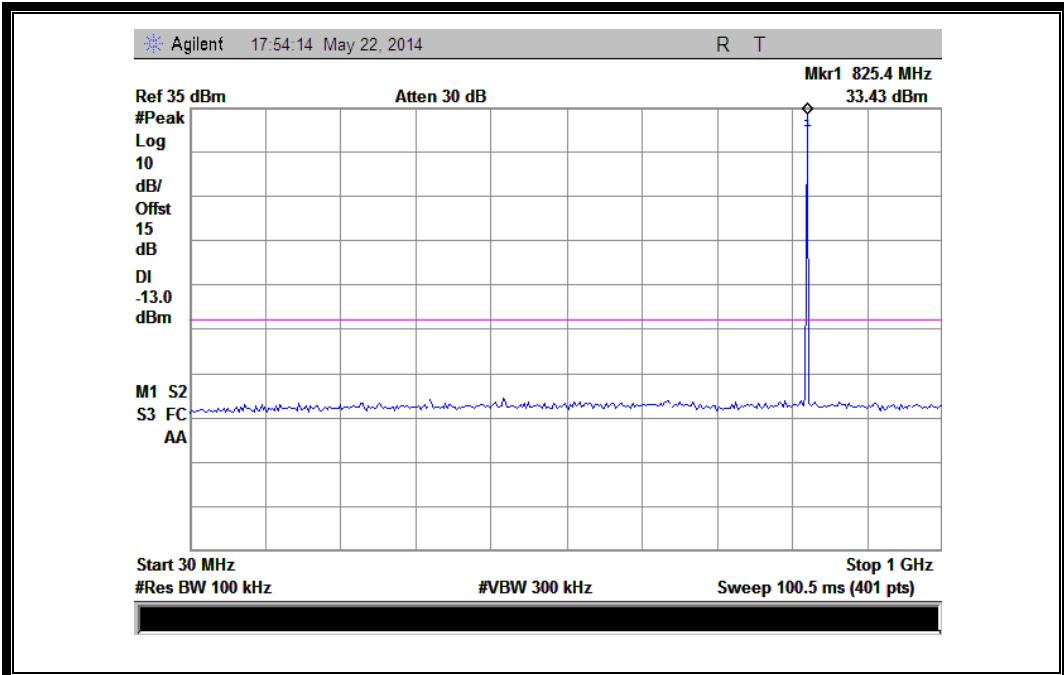
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-19.17	Plot A1toA1.1	-13	PASS
	190	836.6	-18.31	Plot A2toA2.1		PASS
	251	848.8	-19.42	Plot A3toA3.1		PASS
GSM 1900MHz	512	1850.2	-20.41	Plot B1toB1.1	-13	PASS
	661	1880.0	-19.99	Plot B2toB2.1		PASS
	810	1909.8	-18.84	Plot B3toB3.1		PASS
EDGE 850MHz	128	824.2	-19.17	Plot C1toC1.1	-13	PASS
	190	836.6	-19.70	Plot C2toC2.1		PASS
	251	848.8	-19.51	Plot C3toC3.1		PASS
EDGE 1900MHz	512	1850.2	-20.86	Plot D1toD1.1	-13	PASS
	661	1880.0	-19.74	Plot D2toD2.1		PASS
	810	1909.8	-19.68	Plot D3toD3.1		PASS
WCDMA 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
WCDMA 1900MHz	9262	1852.4	<-25	Plot F1toF1.1	-13	PASS
	9400	1880	<-25	Plot F2toF2.1		PASS
	9538	1907.6	<-25	Plot F3toF3.1		PASS
HSDPA	4132	826.4	<-25	Plot G1toG1.1	-13	PASS



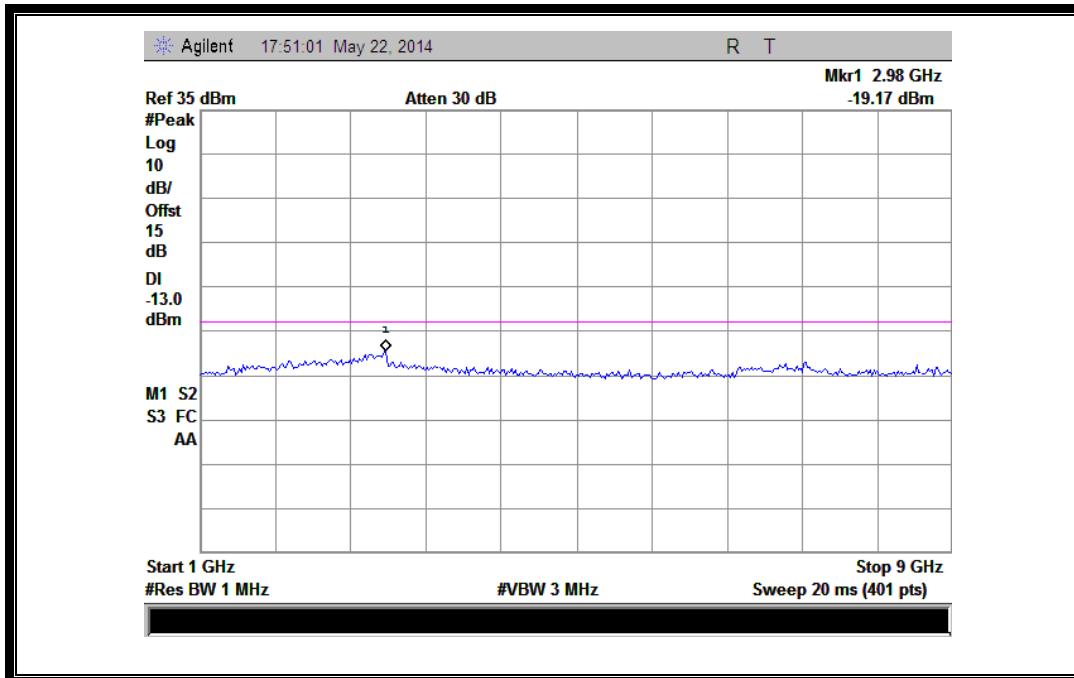
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
850MHz	4175	835	<-25	Plot G2toG2.1		PASS
	4233	846.6	<-25	Plot G3toG3.1		PASS
HSDPA 1900MHz	9262	1852.4	<-25	Plot H1toH1.1	-13	PASS
	9400	1880	<-25	Plot H2toH2.1		PASS
	9538	1907.6	<-25	Plot H3toH3.1		PASS
HSUPA 850MHz	4132	826.4	<-25	Plot I1toI1.1	-13	PASS
	4175	835	<-25	Plot I2toI2.1		PASS
	4233	846.6	<-25	Plot I3toI3.1		PASS
HSUPA 1900MHz	9262	1852.4	<-25	Plot J1toJ1.1	-13	PASS
	9400	1880	<-25	Plot J2toJ2.1		PASS
	9538	1907.6	<-25	Plot J3toJ3.1		PASS
HSPA+ 850MHz	4132	826.4	<-25	Plot K1toK1.1	-13	PASS
	4175	835	<-25	Plot K2toK2.1		PASS
	4233	846.6	<-25	Plot K3toK3.1		PASS
HSPA+ 1900MHz	9262	1852.4	<-25	Plot L1toL1.1	-13	PASS
	9400	1880	<-25	Plot L2toL2.1		PASS
	9538	1907.6	<-25	Plot L3toL3.1		PASS

## 2. Test Plots for the Whole Measurement Frequency Range:

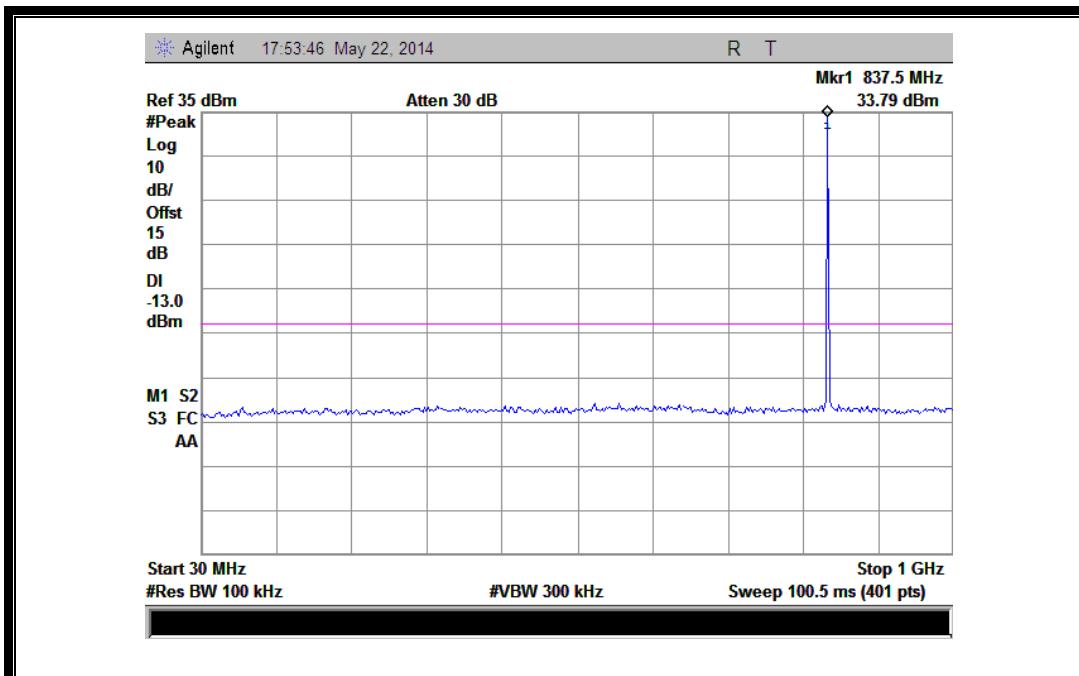
**Note:** the power of the EUT transmitting frequency should be ignored.



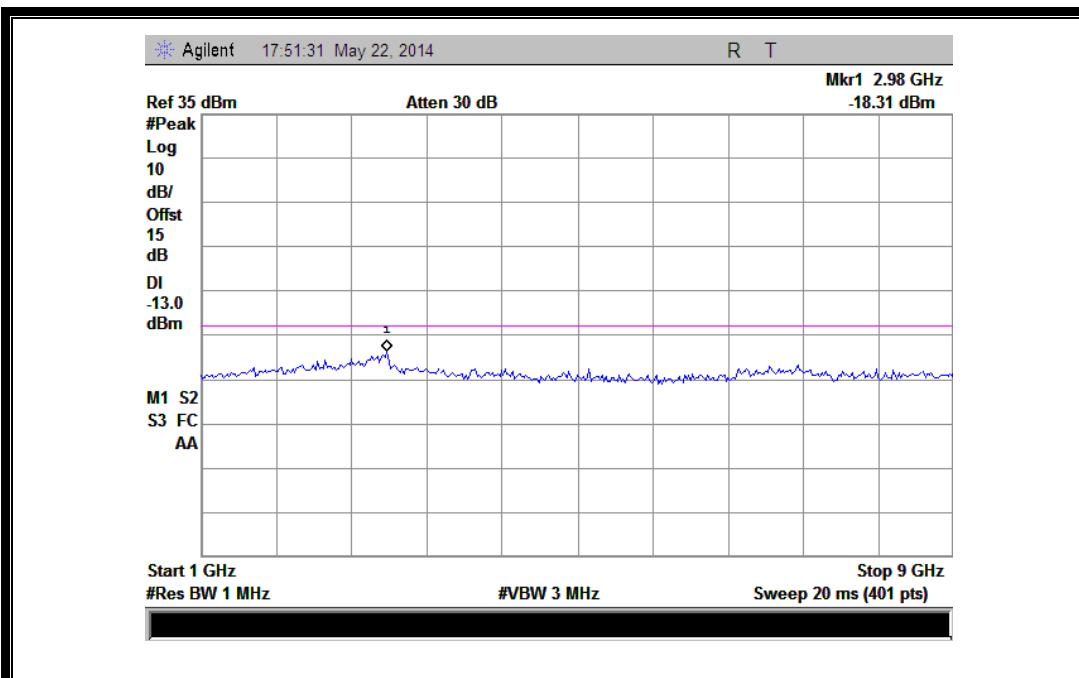
(Plot A1:GSM 850MHz Channel = 128, 30MHz to 1GHz)



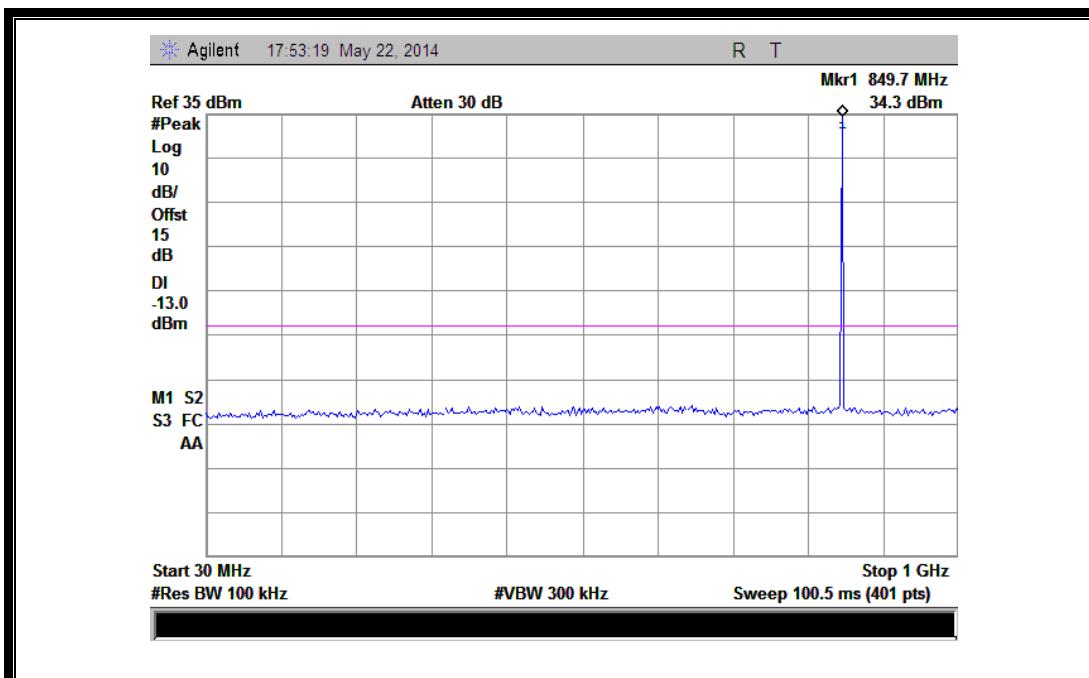
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



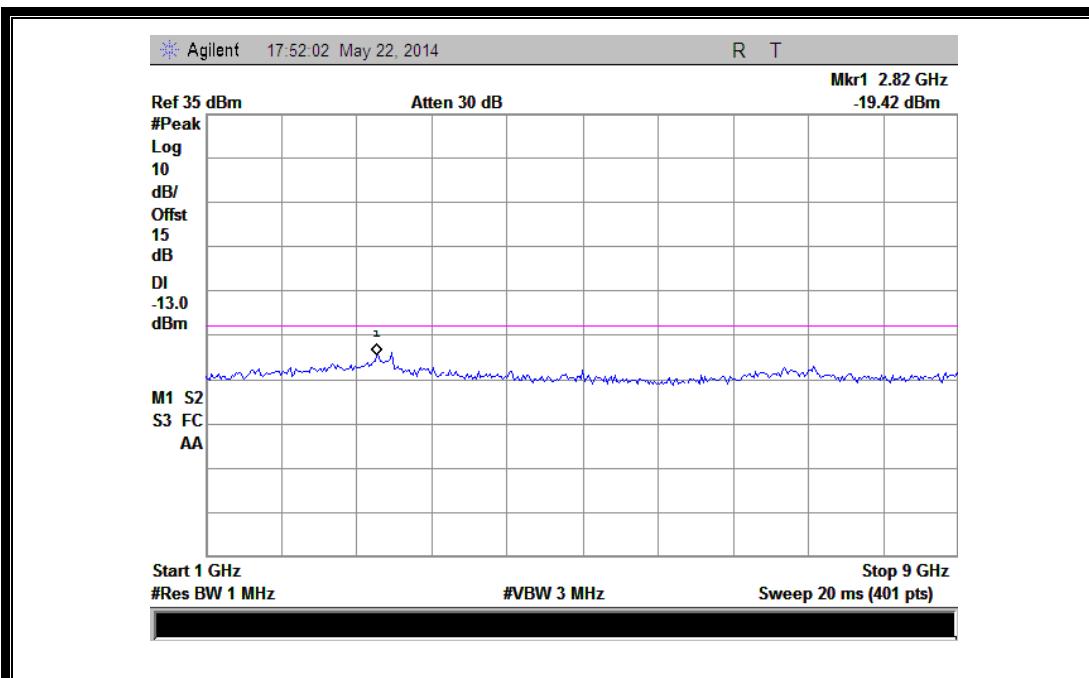
(Plot A2:GSM 850MHz Channel = 190, 30MHz to 1GHz)



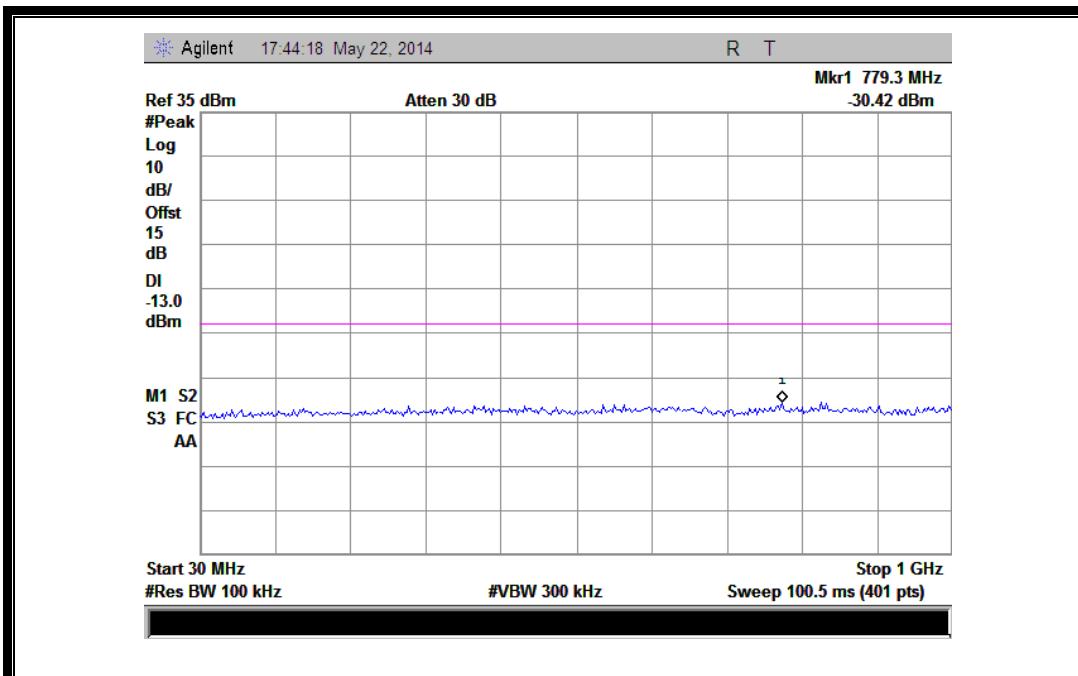
(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



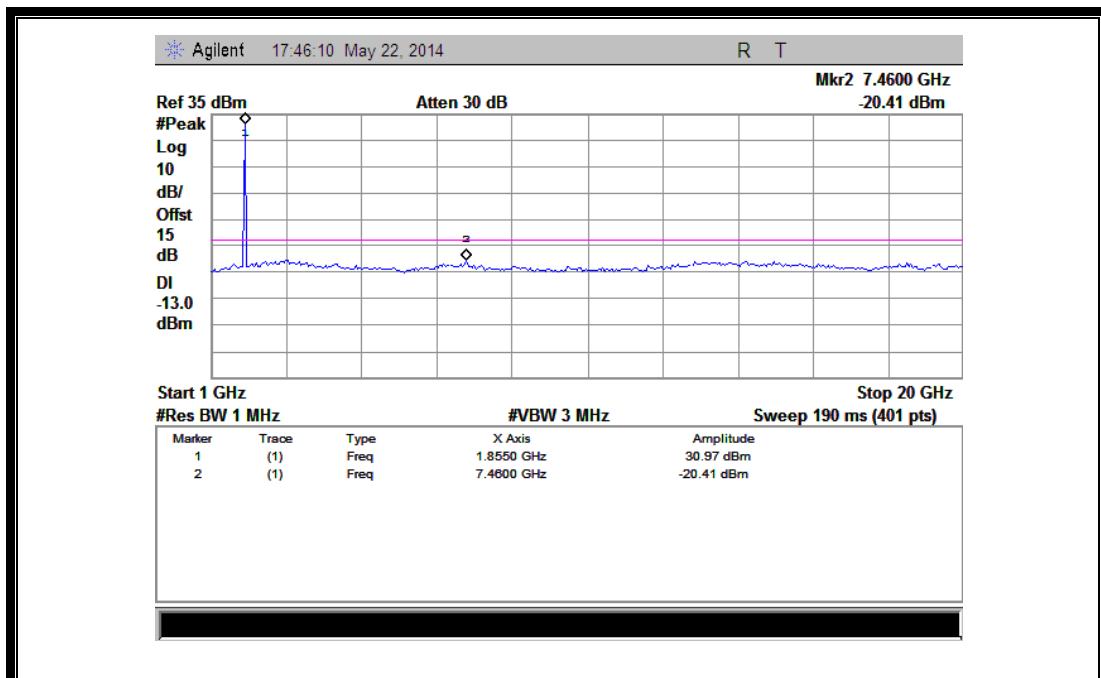
(Plot A3: GSM 850MHz Channel = 251, 30MHz to 1GHz)



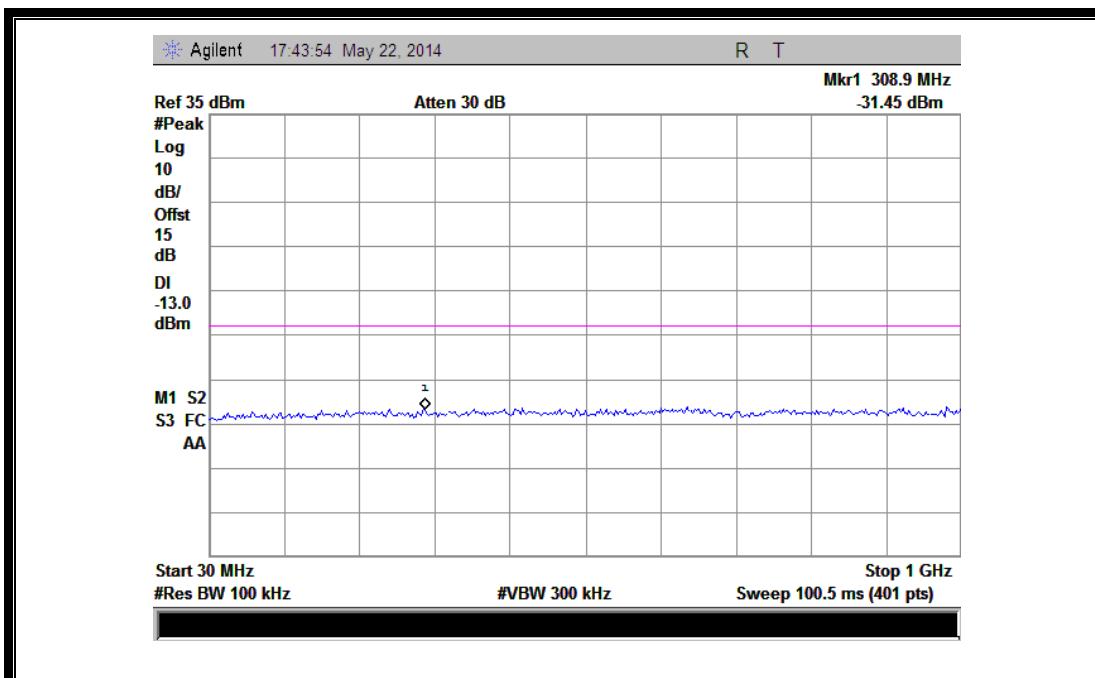
(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



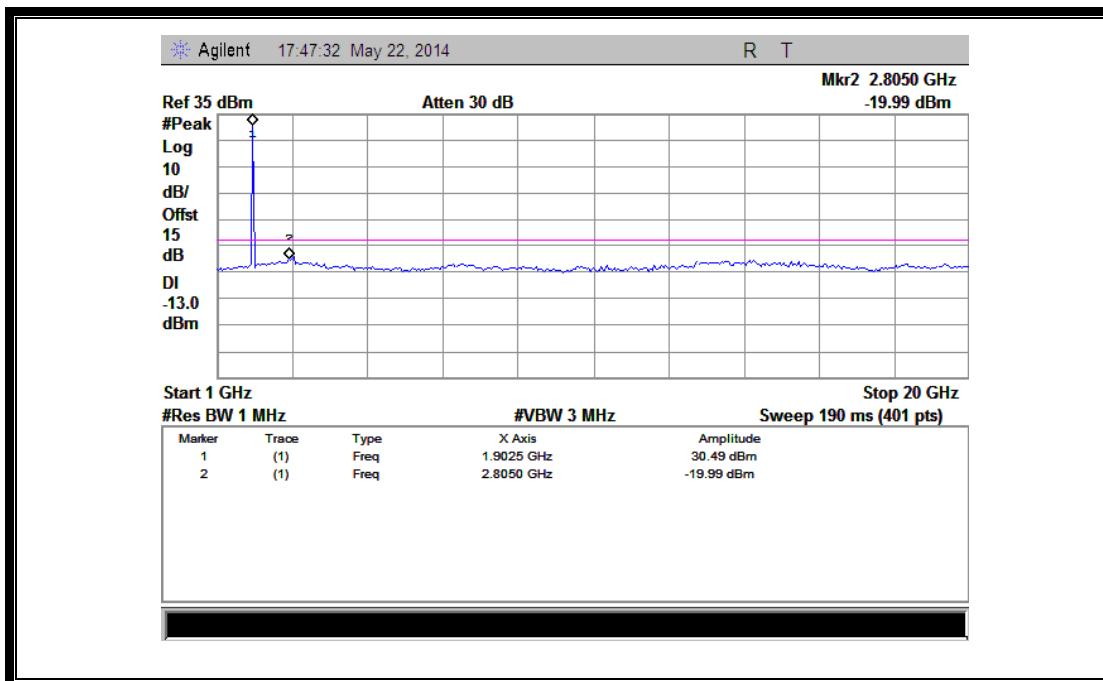
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



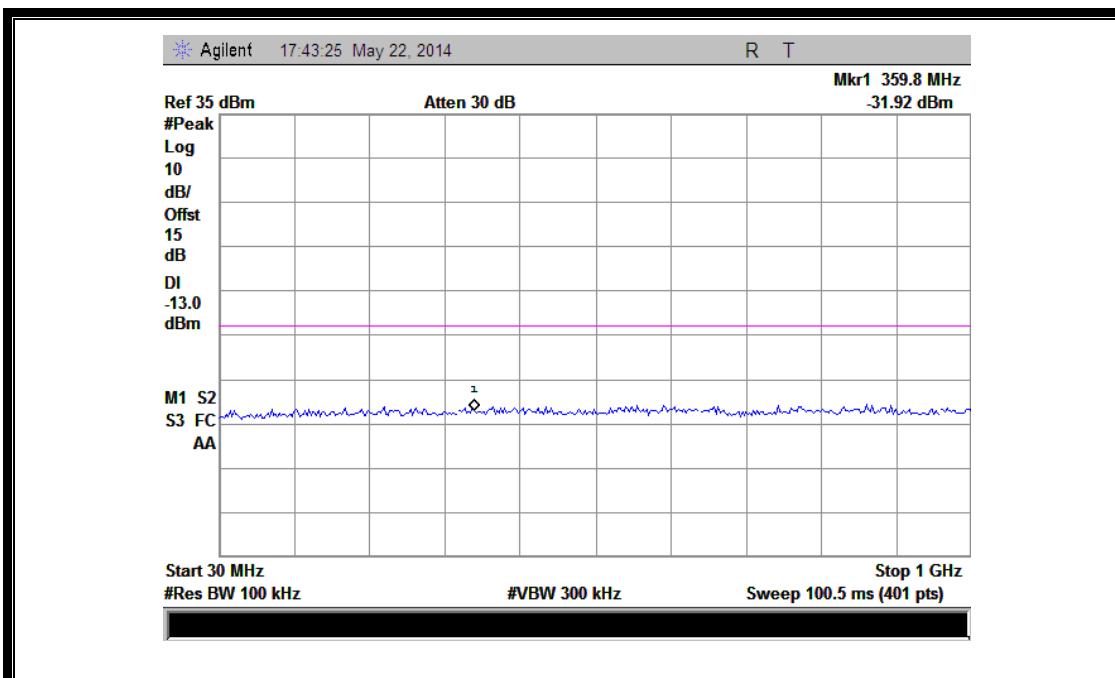
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



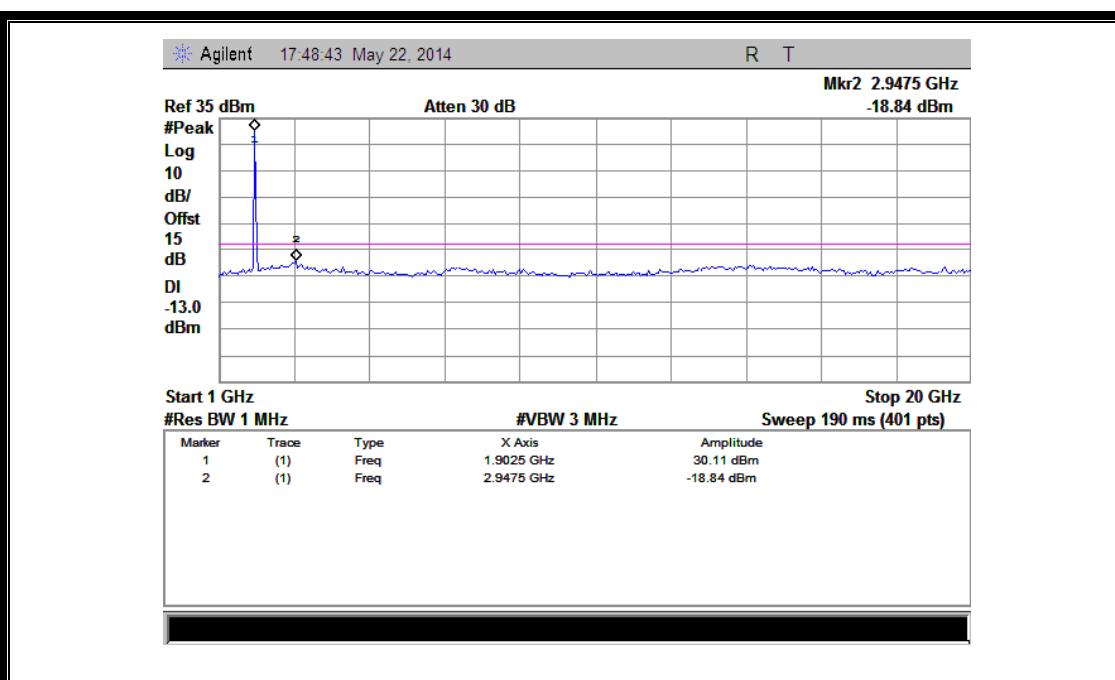
(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



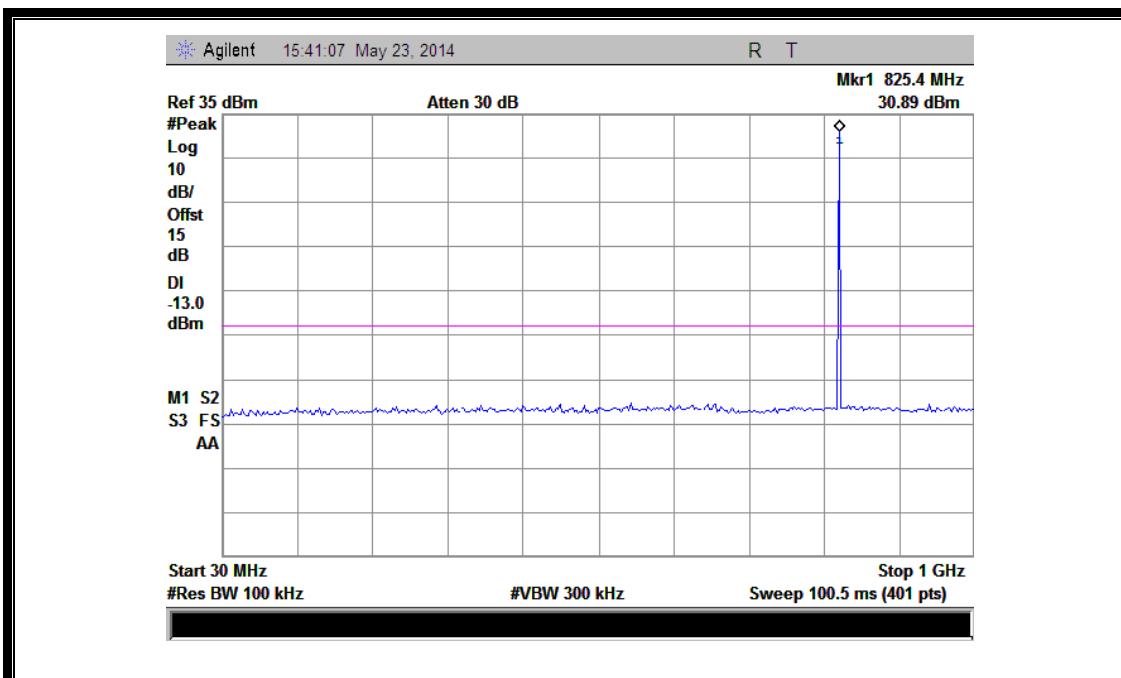
(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



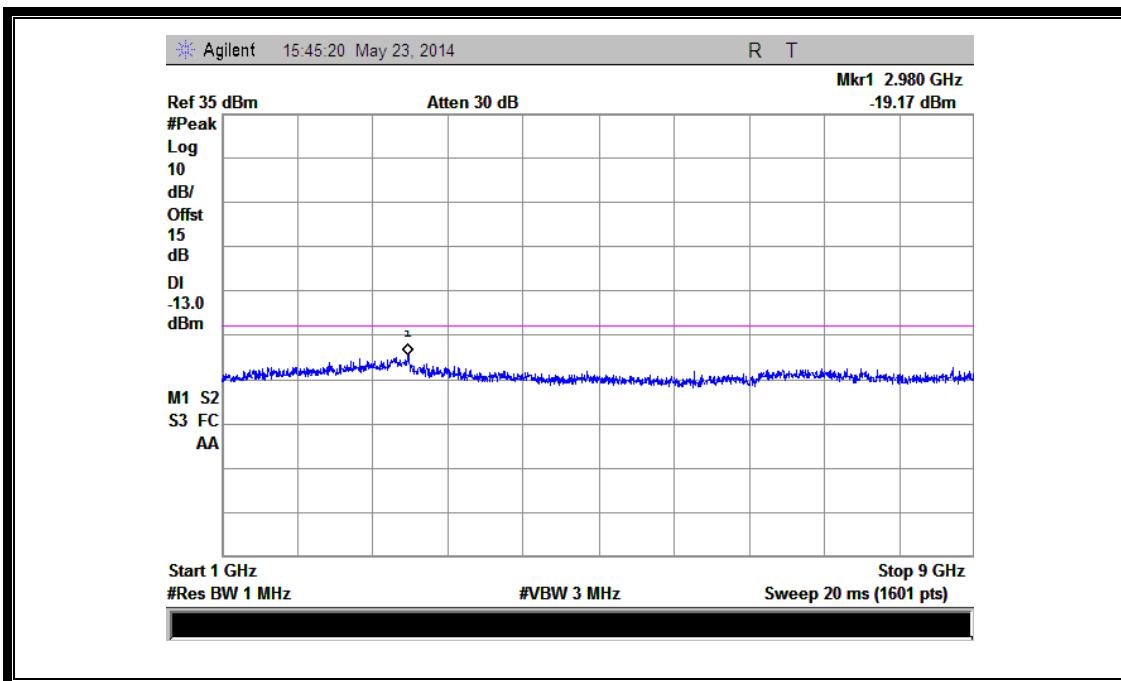
(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



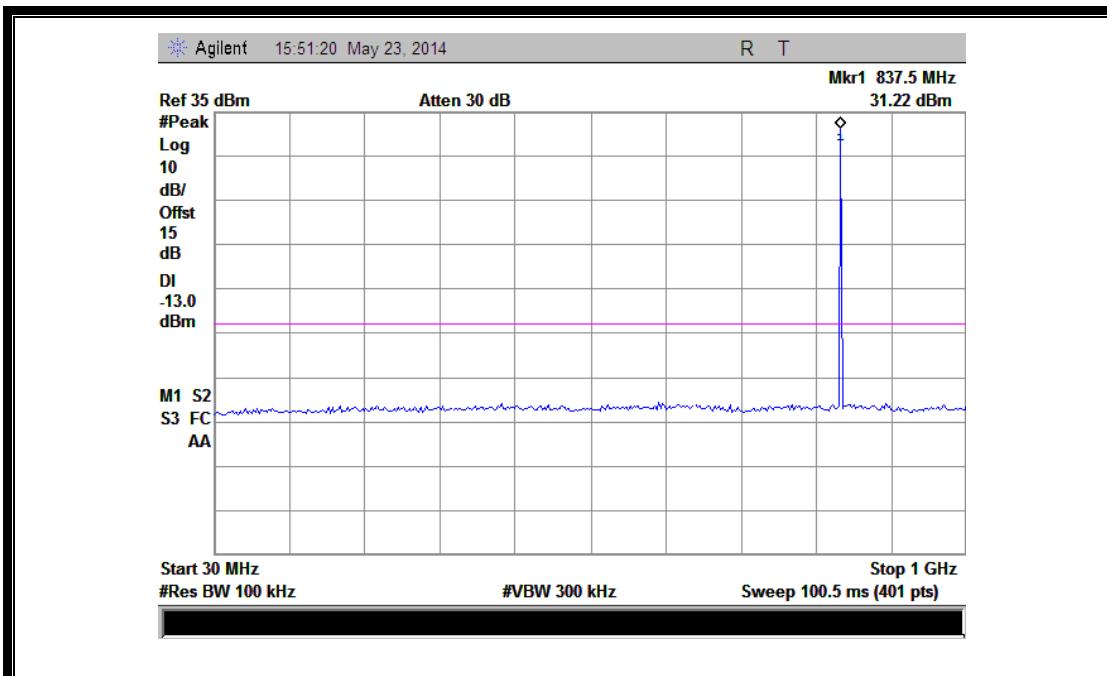
(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



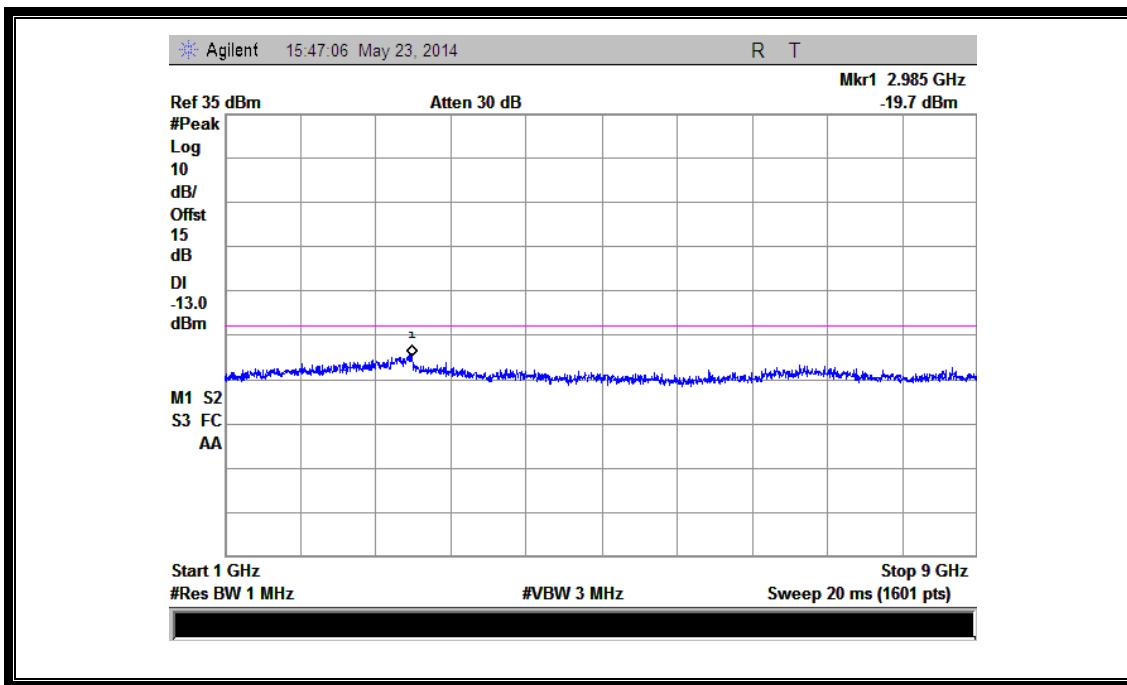
(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



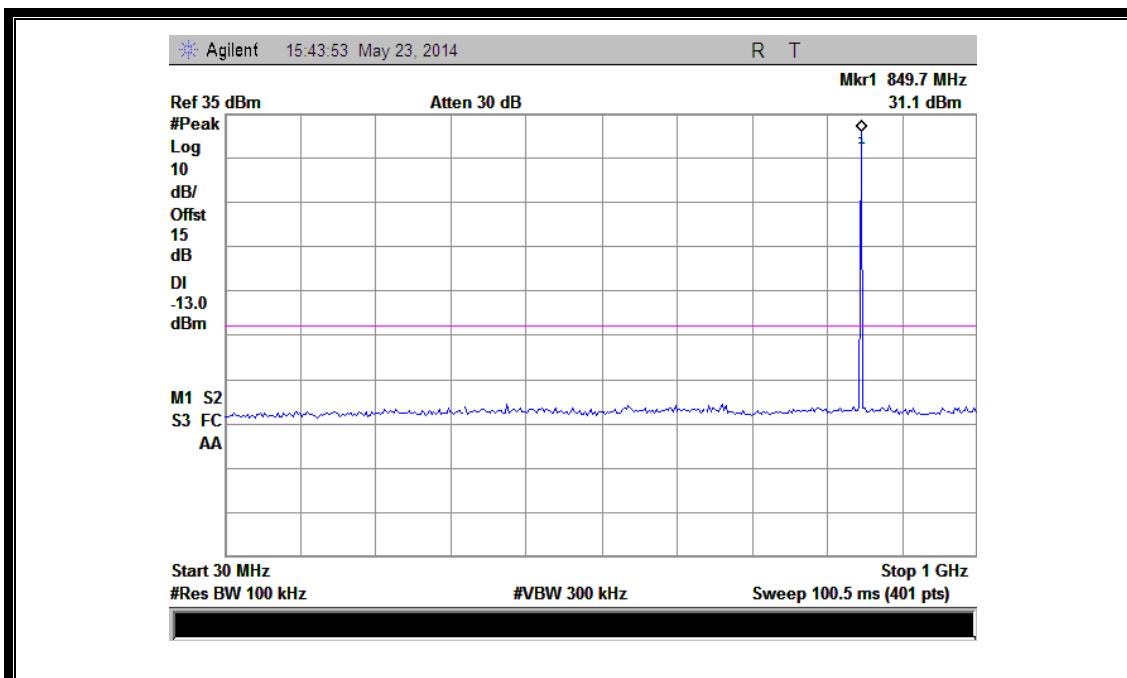
(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



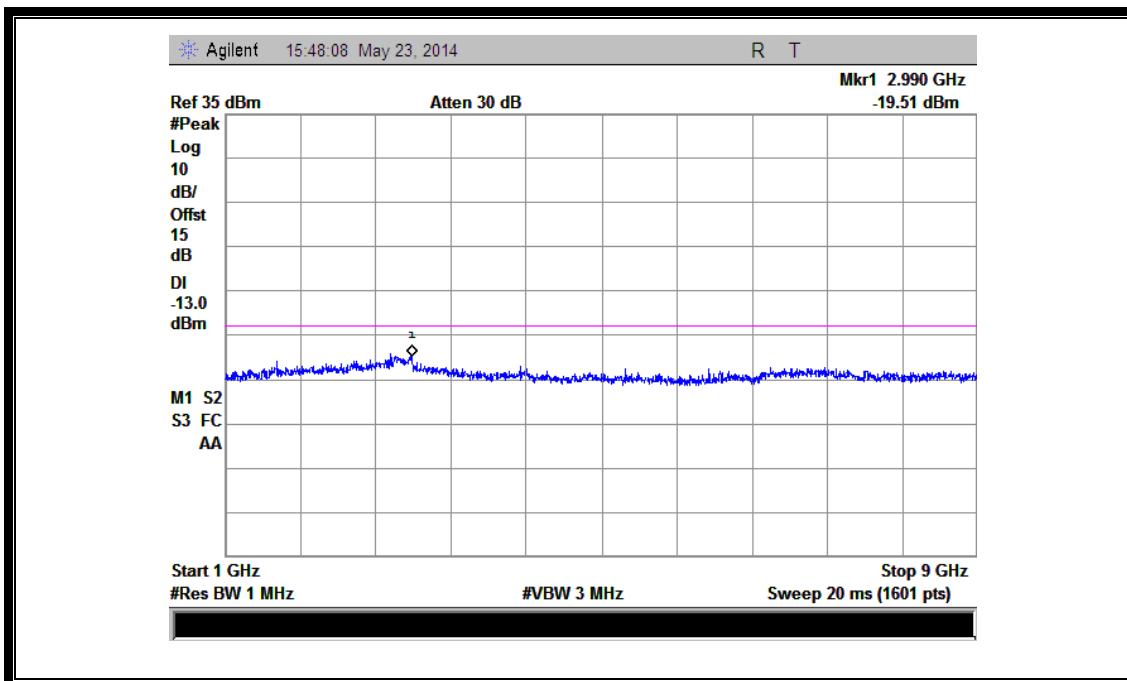
(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



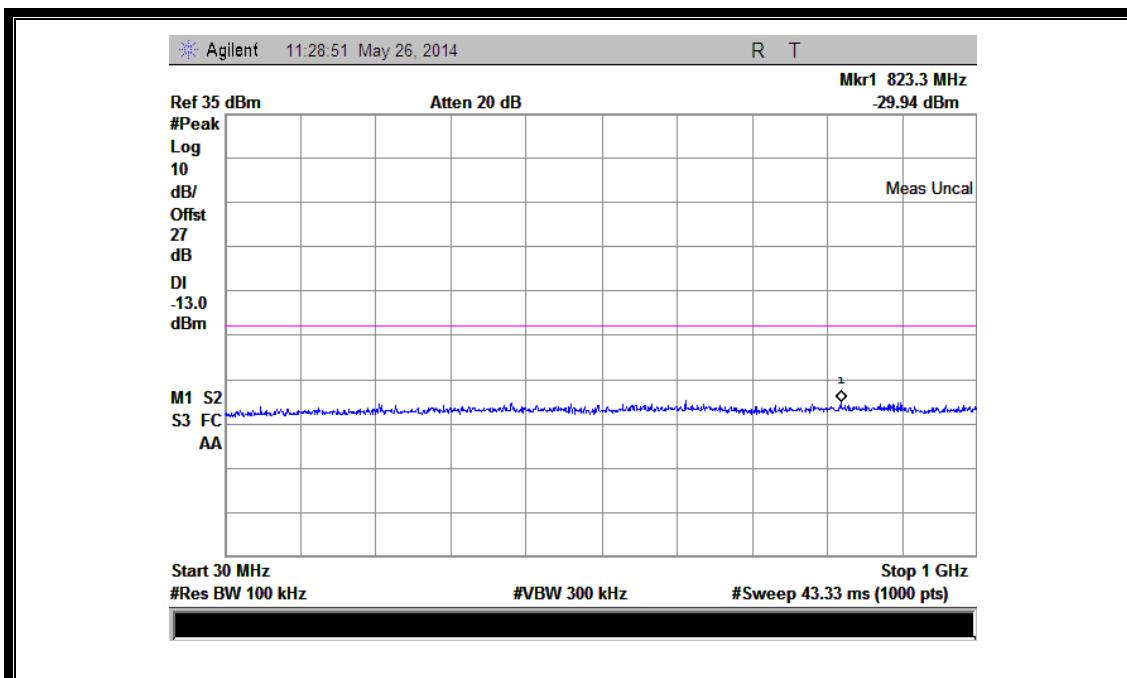
(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



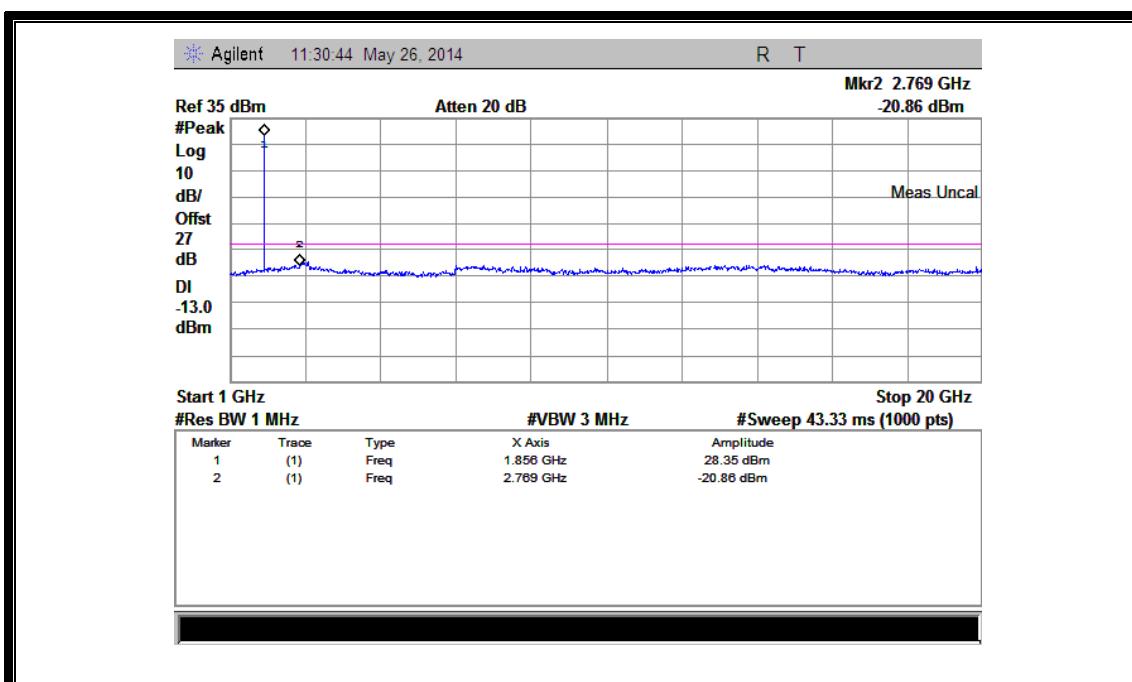
(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



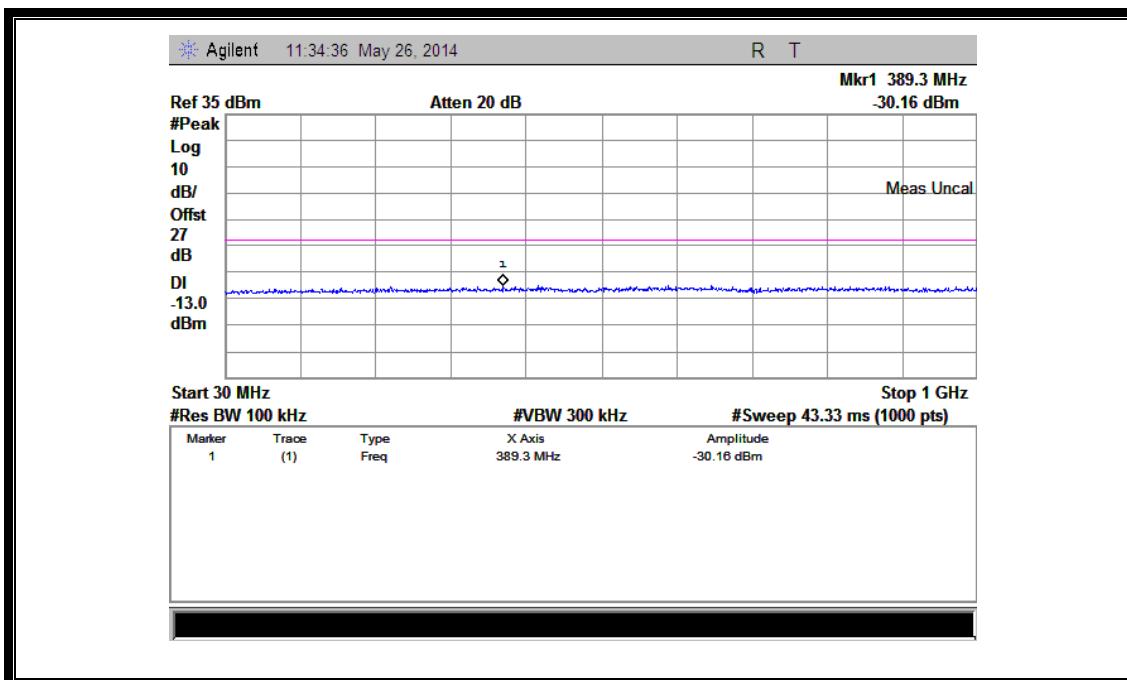
(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



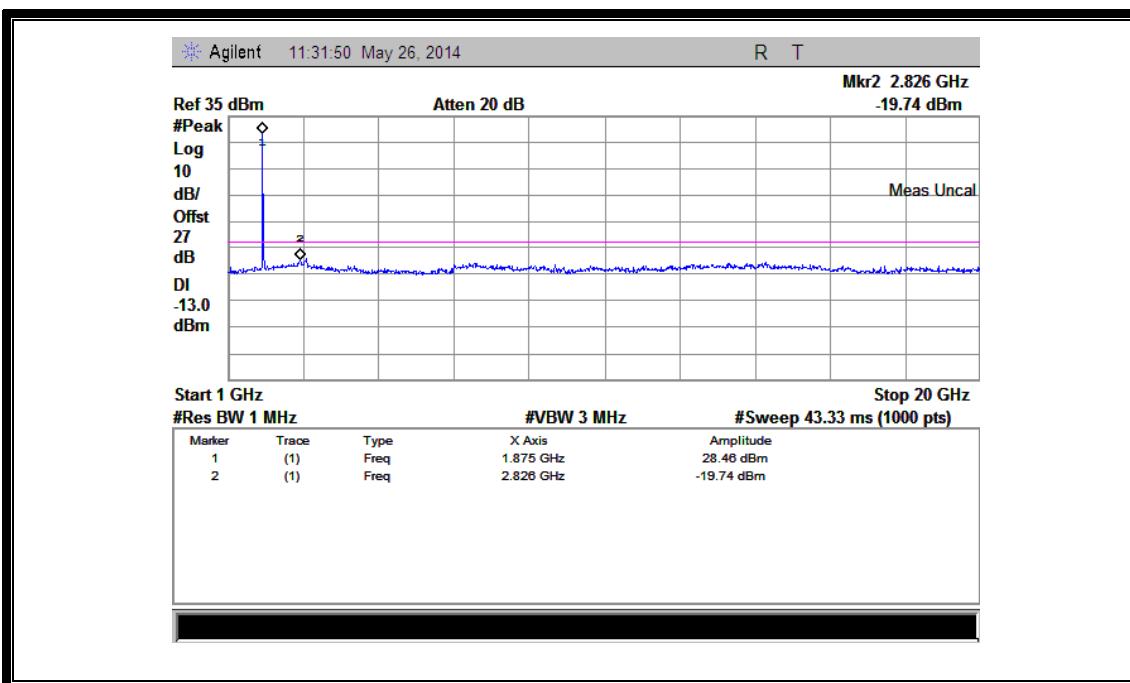
(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



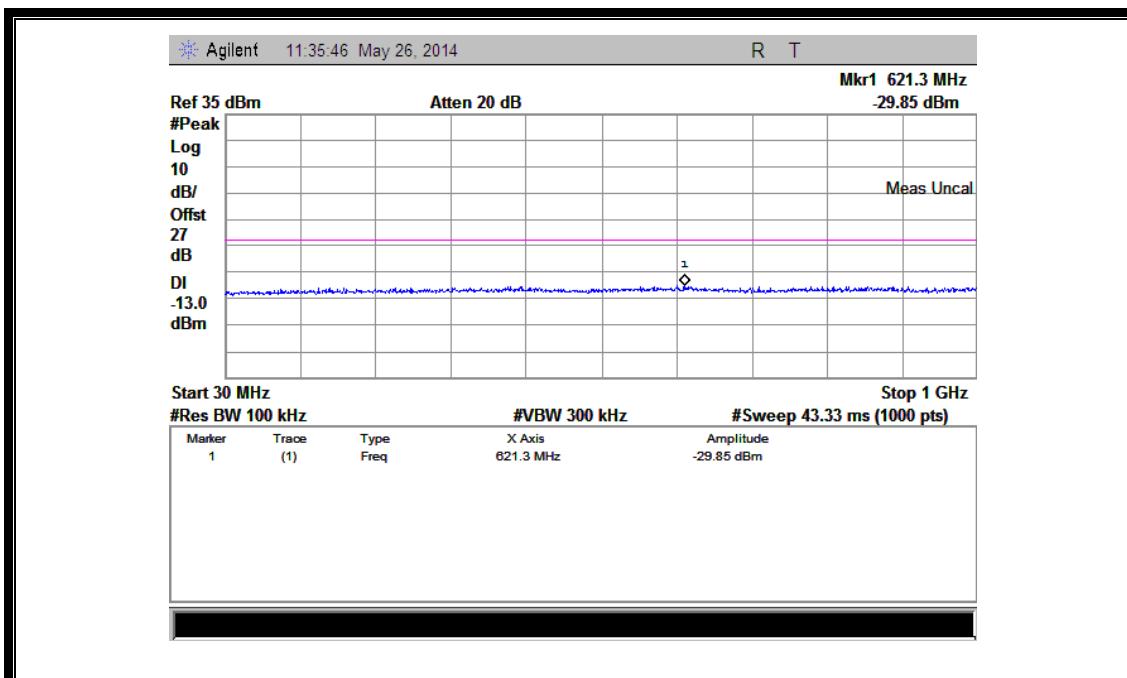
(Plot D1.1: EDGE 1900MHz Channel = 512, 1GHz to 20GHz)



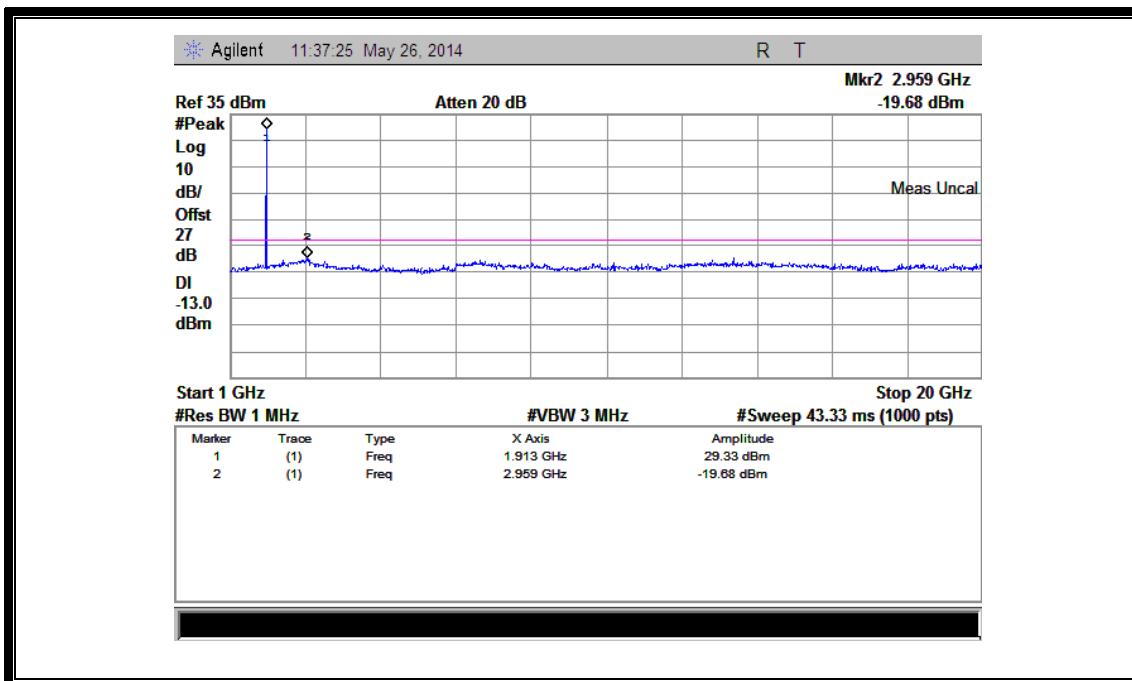
(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



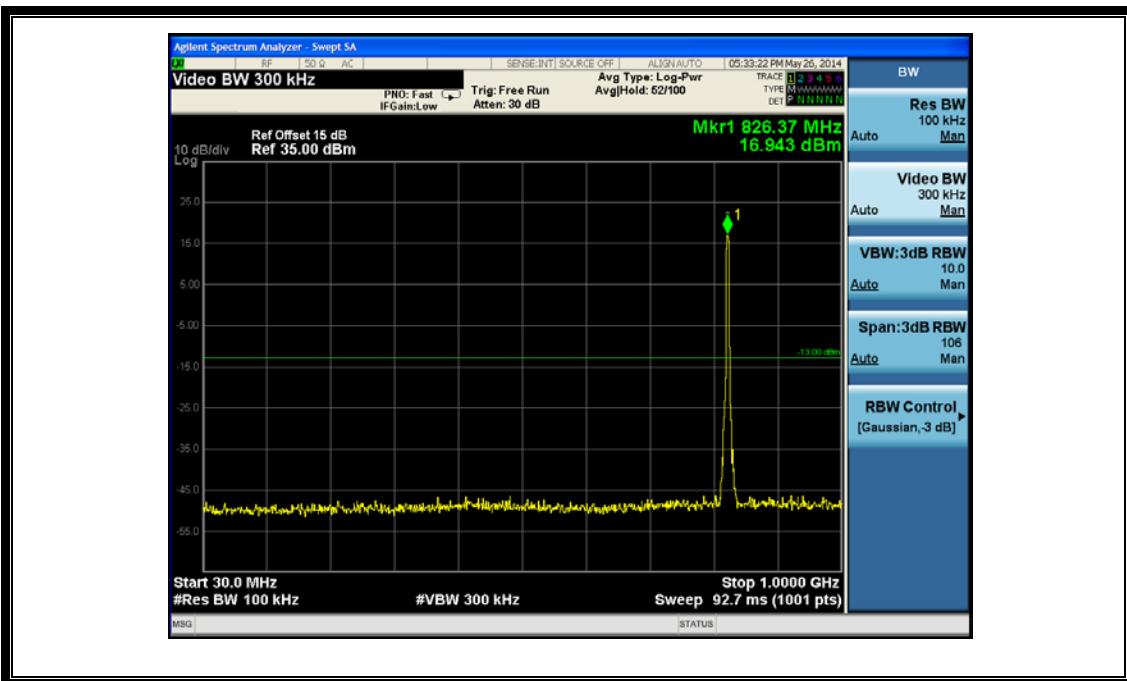
(Plot D2.1: EDGE 1900MHz Channel = 661, 1GHz to 20GHz)



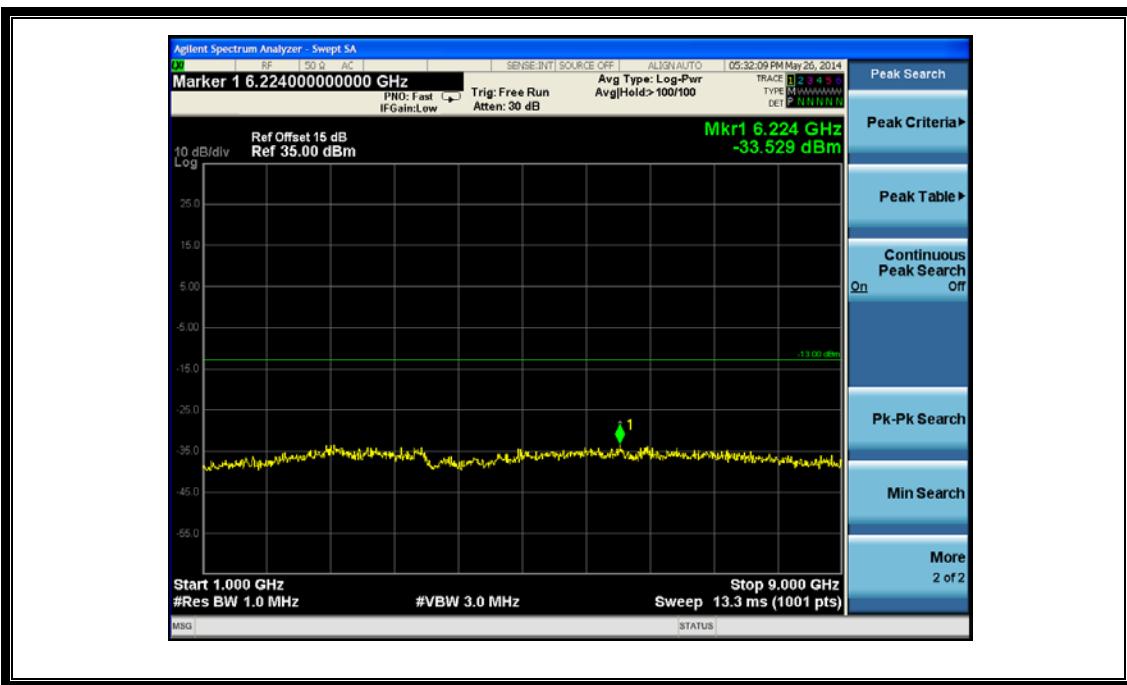
(Plot D3: EDGE 1900MHz Channel = 810, 30MHz to 1GHz)



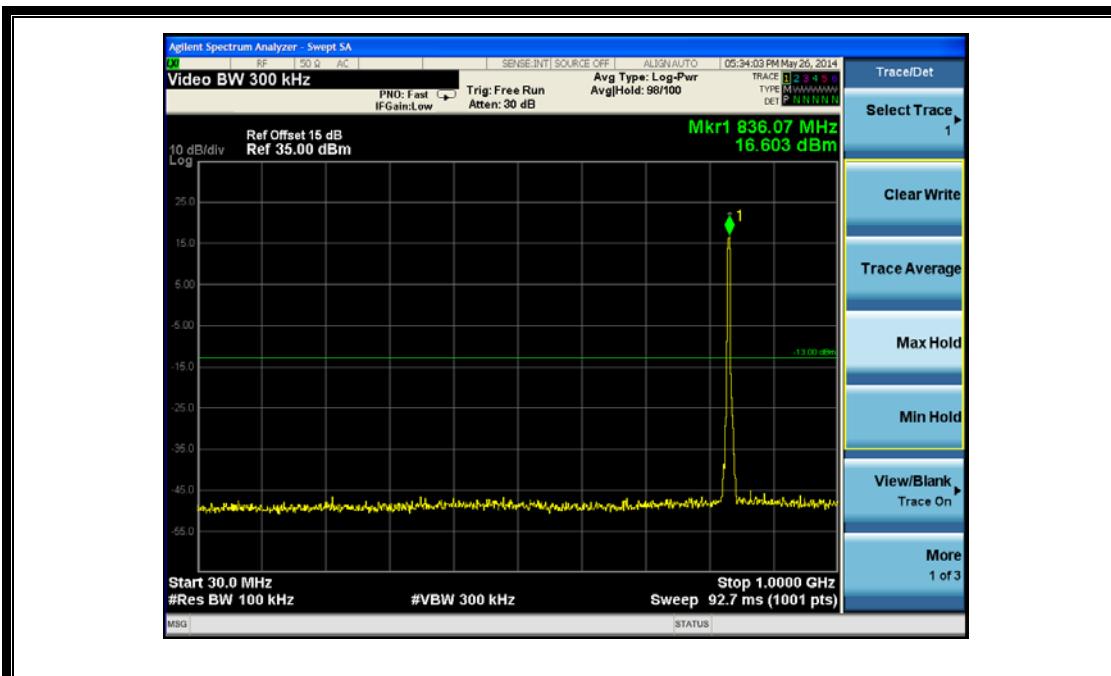
(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)



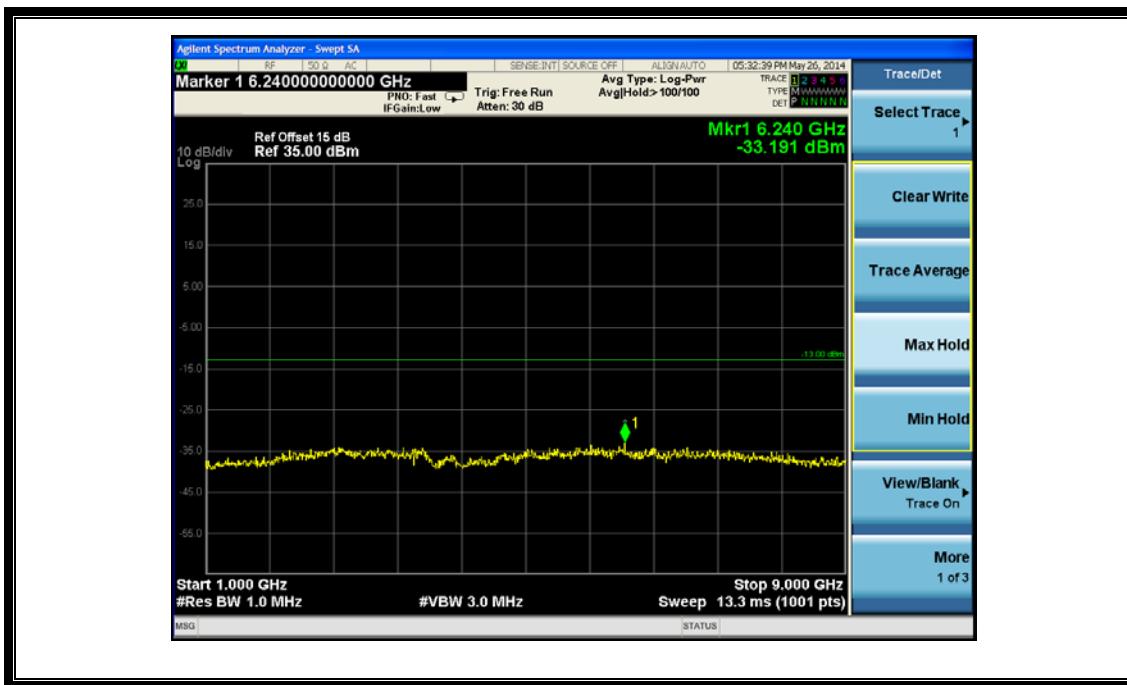
(Plot E1: WCDMA850MHz Channel = 4132, 30MHz to 1GHz)



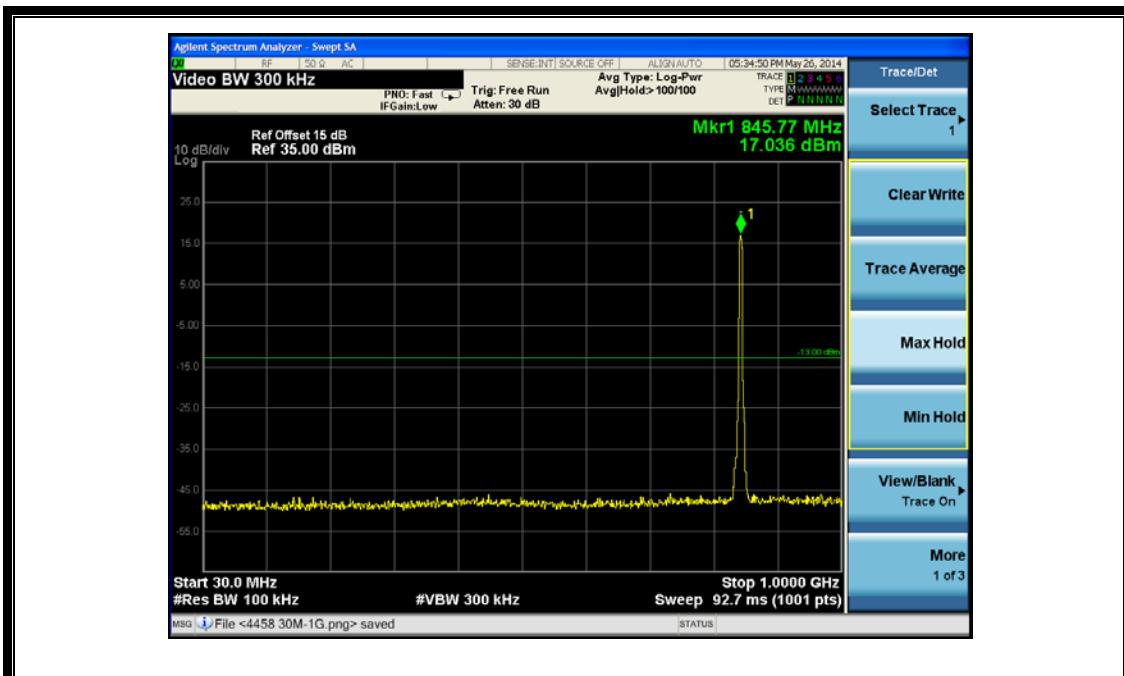
(Plot E1.1: WCDMA850MHz Channel = 4132, 1GHz to 9GHz)



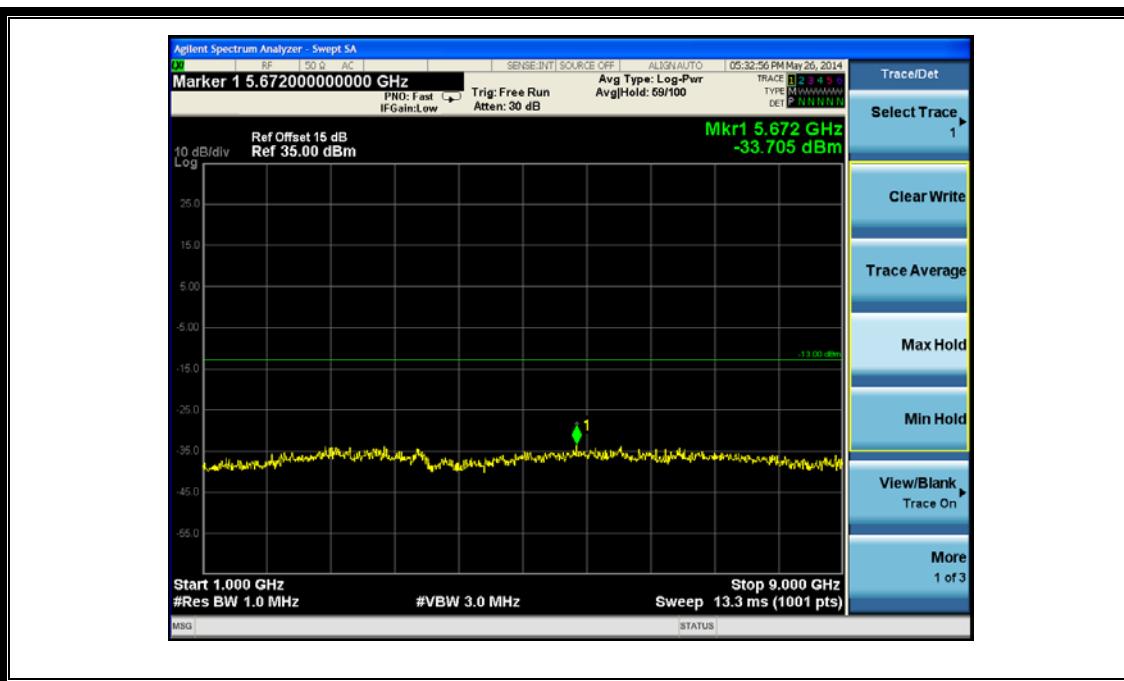
(Plot E2: WCDMA850MHz Channel = 4175, 30MHz to 1GHz)



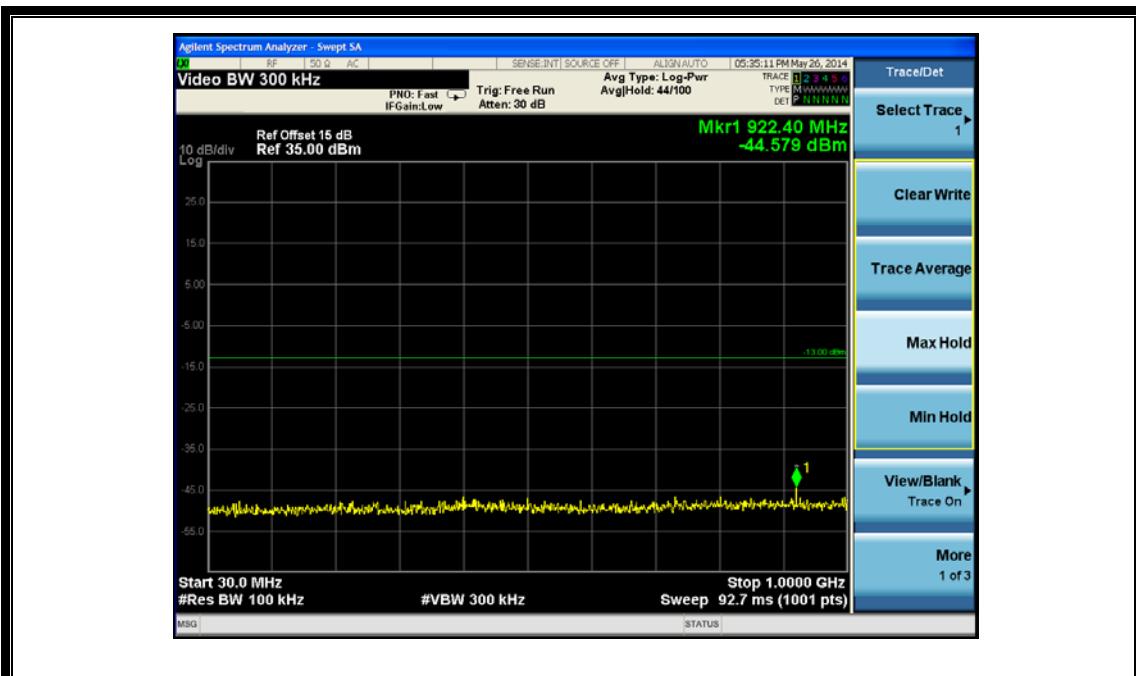
(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)



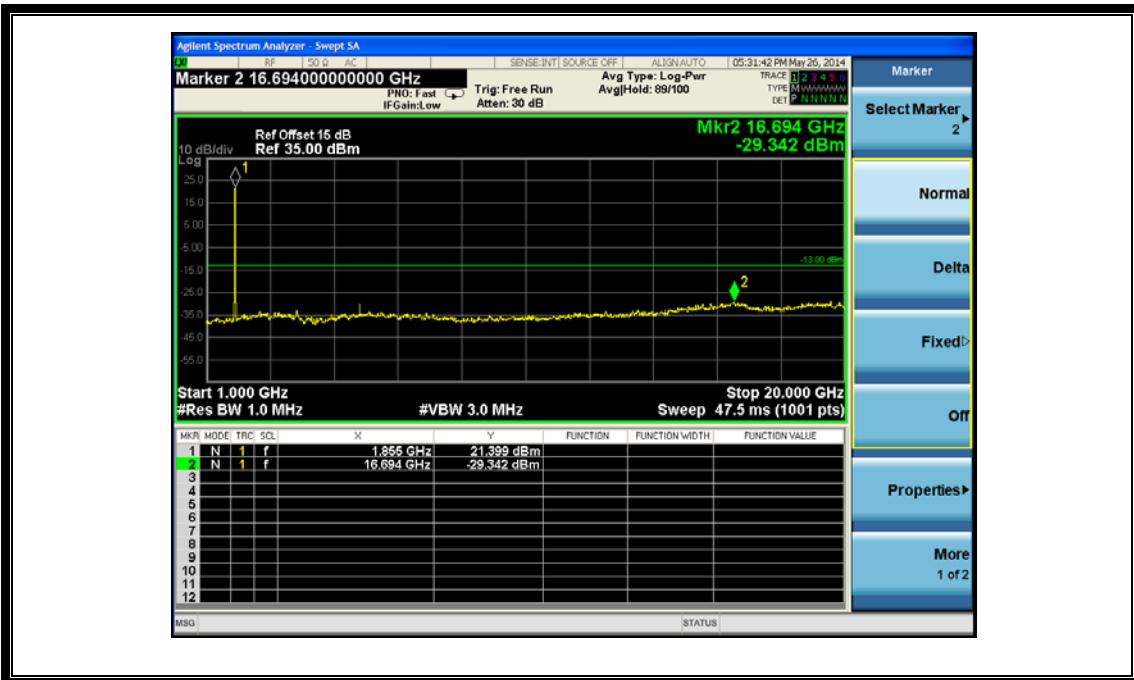
(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)



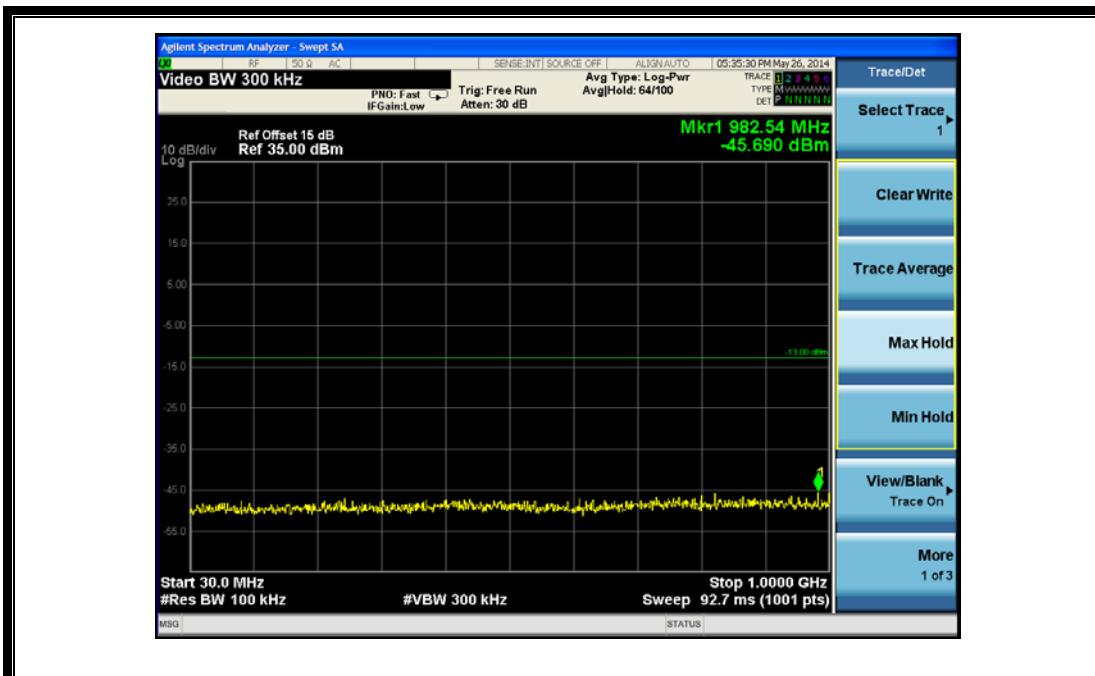
(Plot E3.1: WCDMA850MHz Channel = 4233, 1GHz to 9GHz)



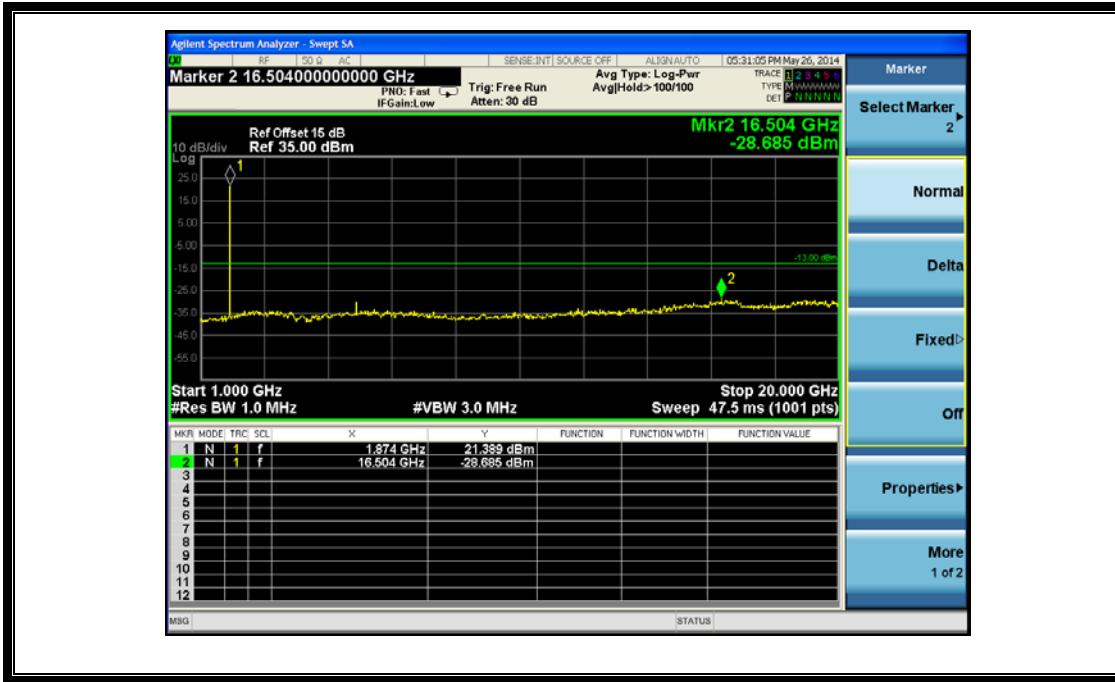
(Plot F1: WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)



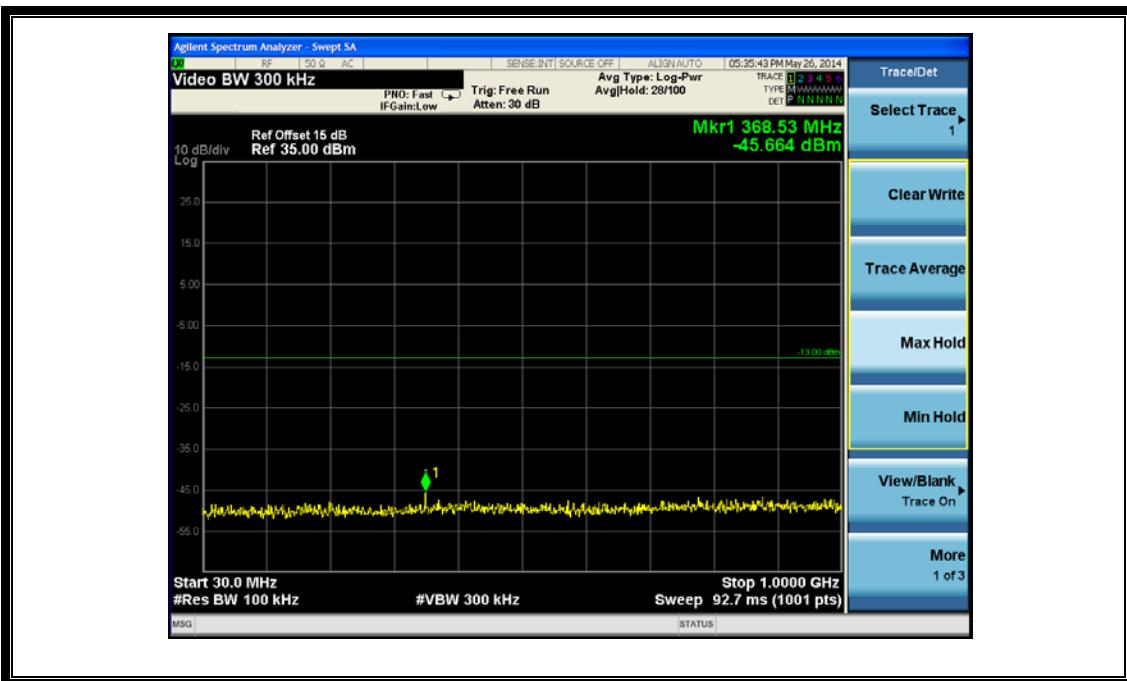
(Plot F1.1: WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)



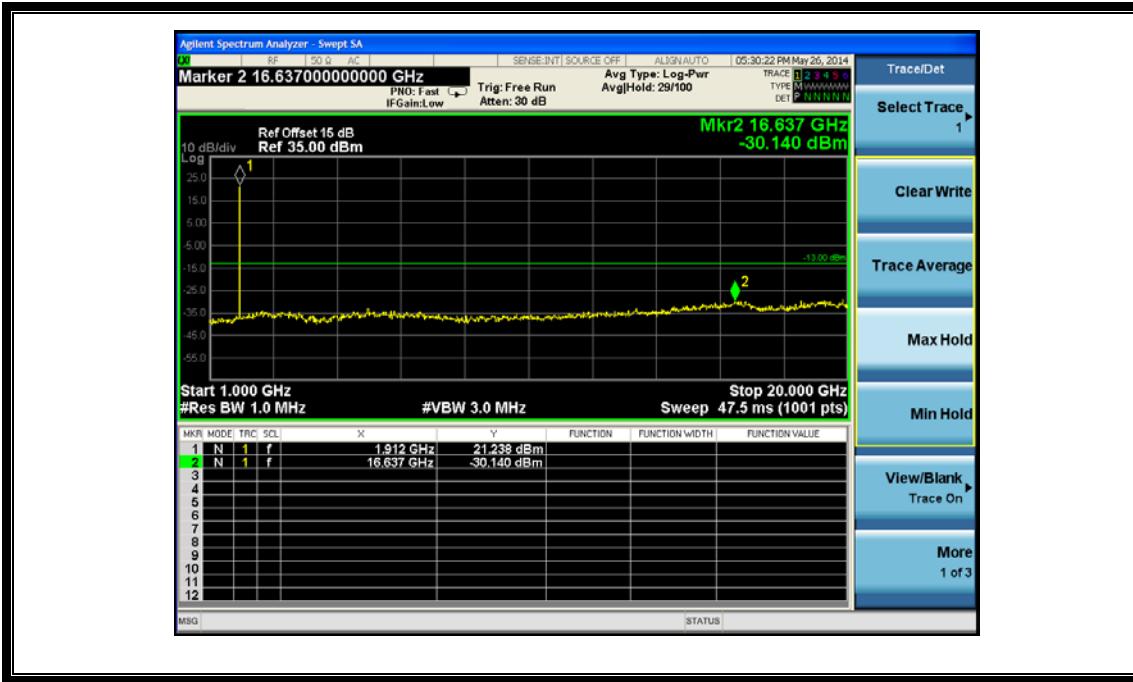
(Plot F2: WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)



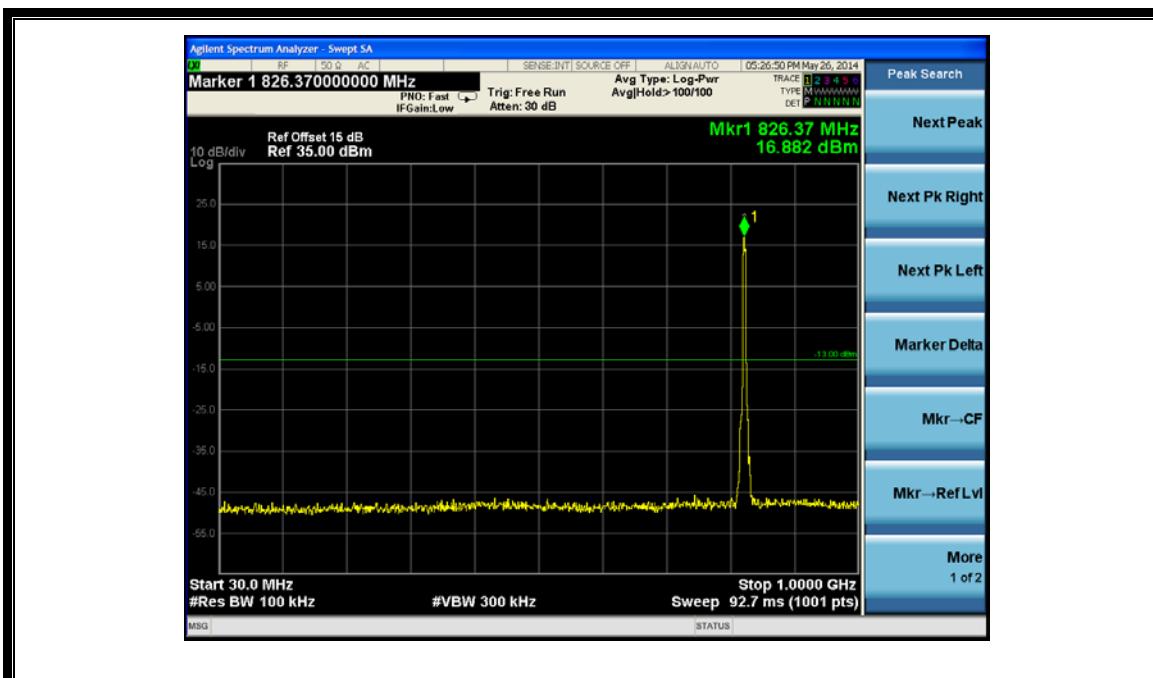
(Plot F2.1: WCDMA1900MHz Channel = 9400, 1GHz to 20GHz)



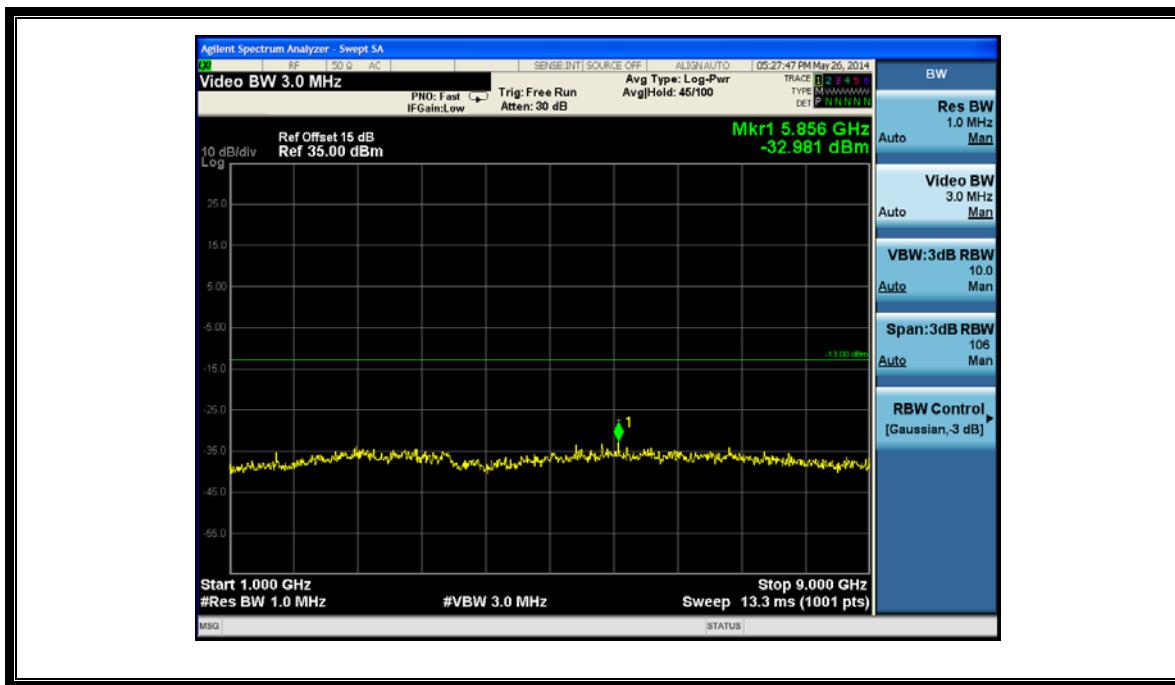
(Plot F3: WCDMA1900MHz Channel = 9538, 30MHz to 1GHz)



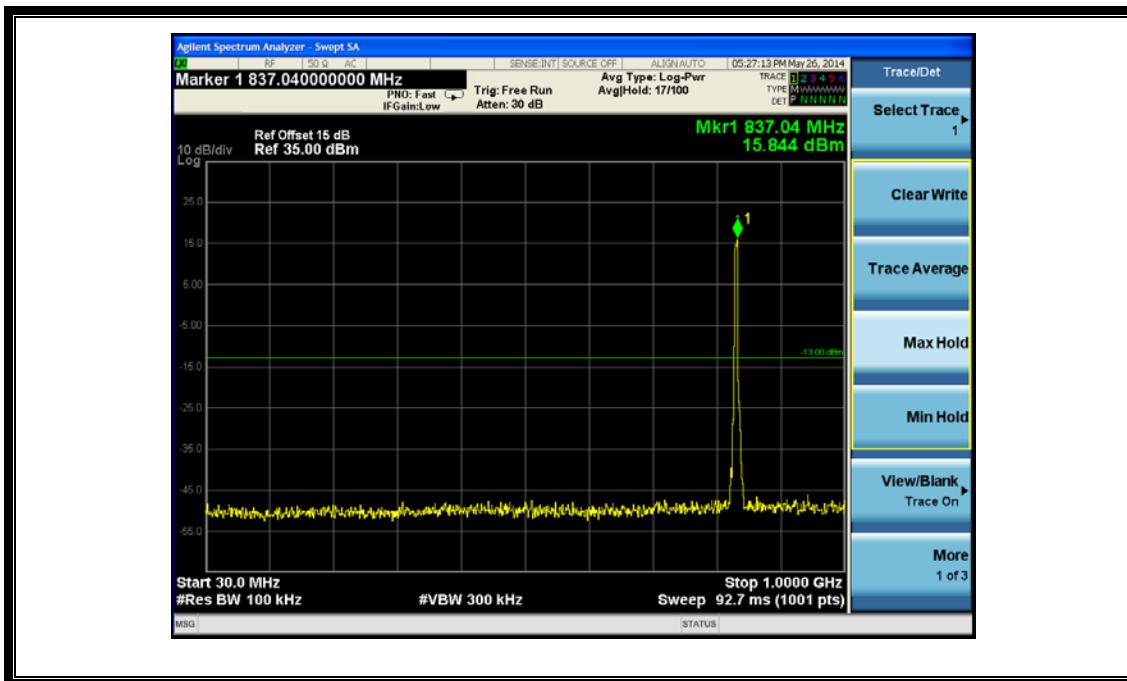
(Plot F3.1: WCDMA1900MHz Channel = 9538 1GHz to 20GHz)



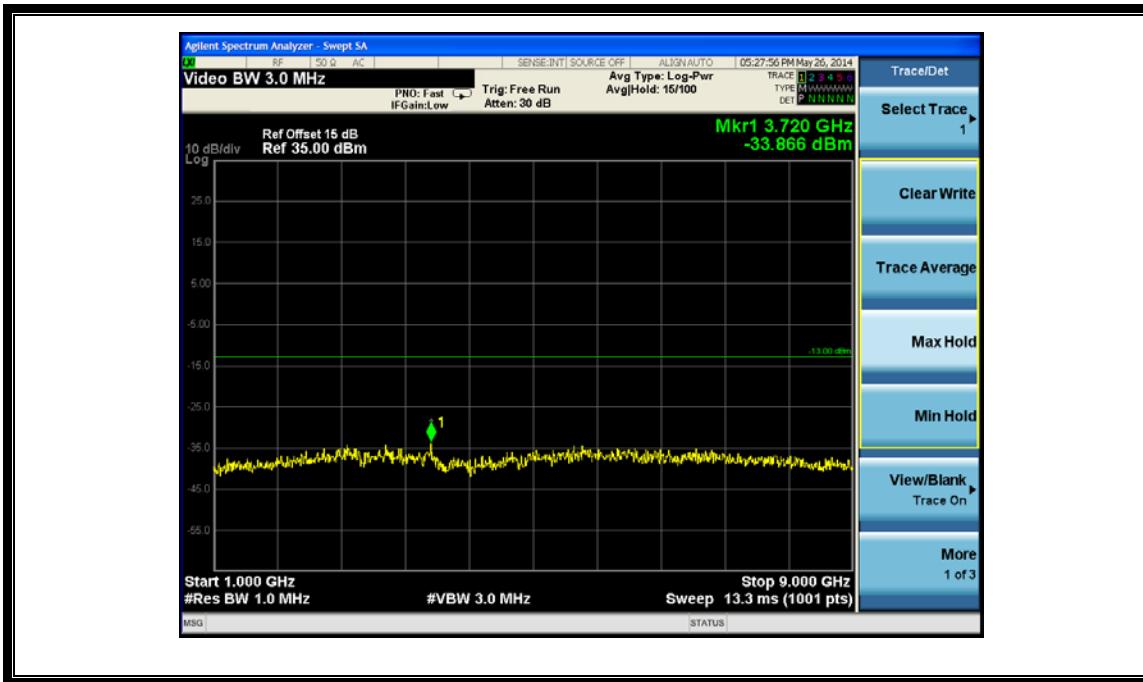
(Plot G1: HSDPA 850MHz Channel = 4132, 30MHz to 1GHz)



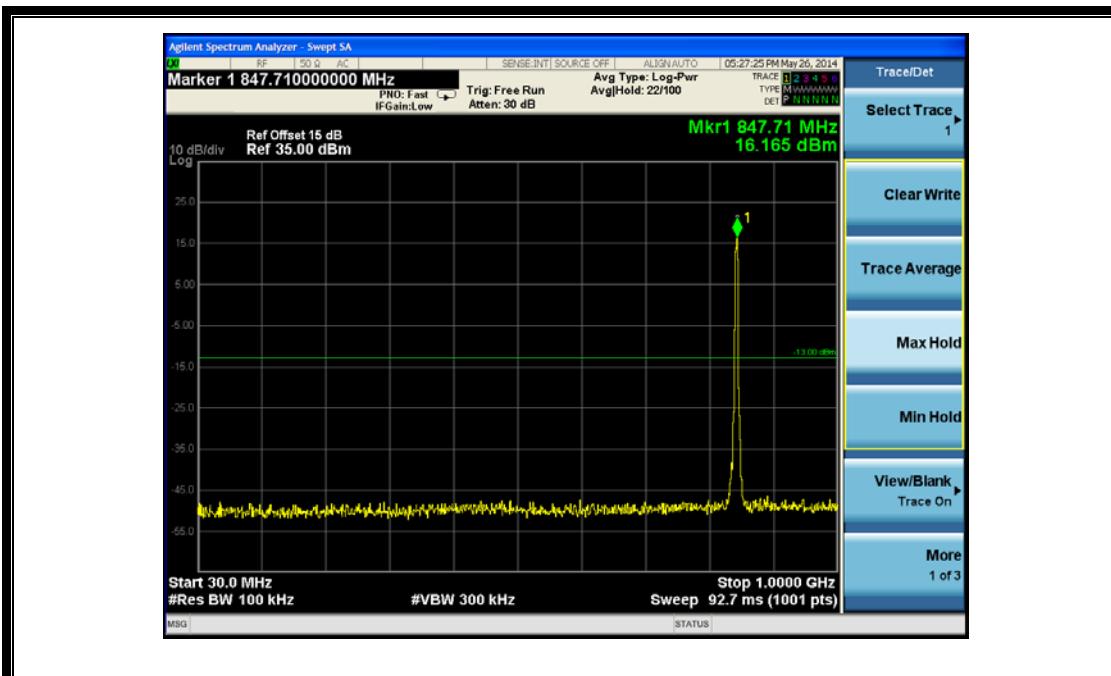
(Plot G1.1: HSDPA 850MHz Channel = 4132, 1GHz to 9GHz)



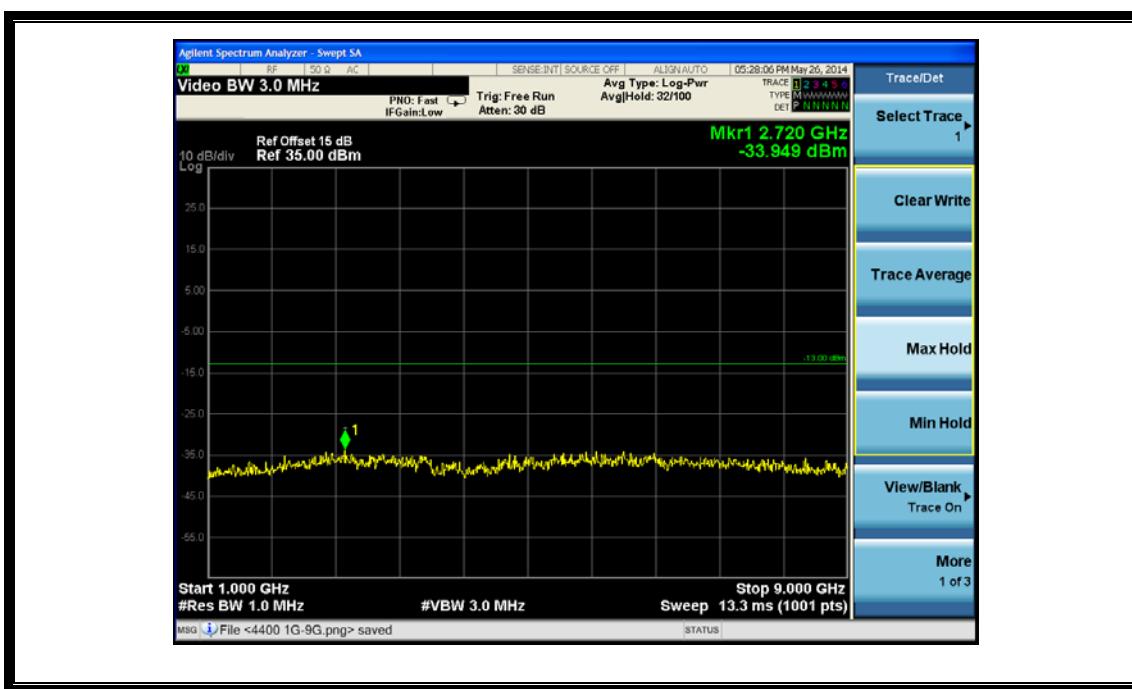
(Plot G2: HSDPA 850MHz Channel = 4175, 30MHz to 1GHz)



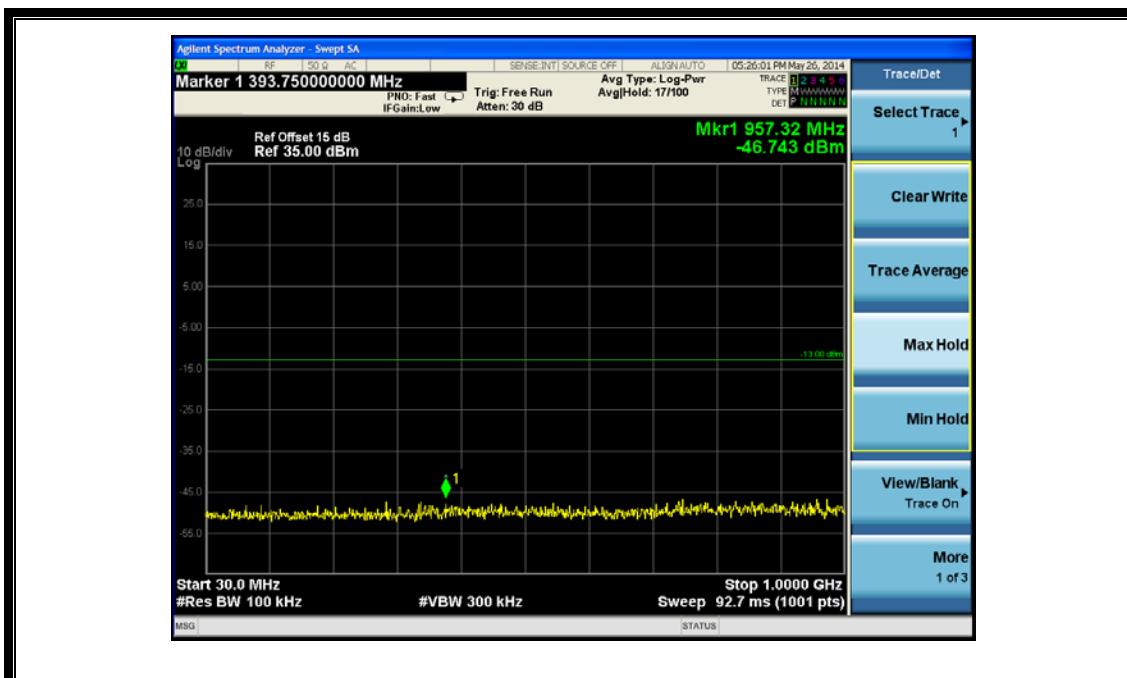
(Plot G2.1: HSDPA 850MHz Channel = 4175, 1GHz to 9GHz)



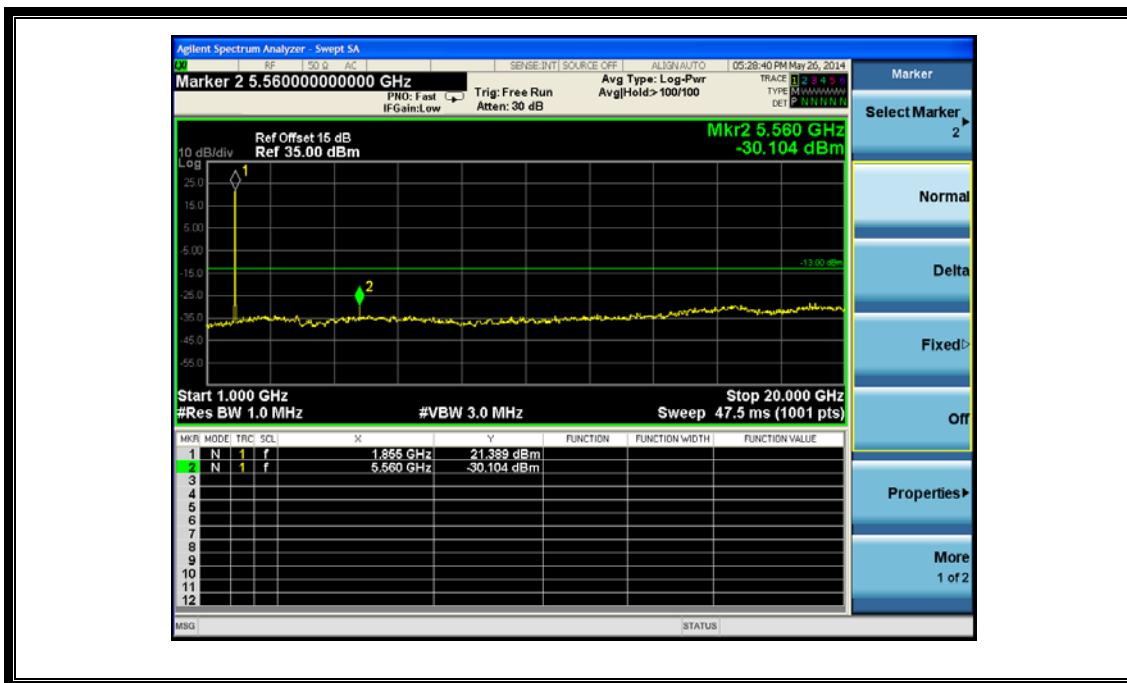
(Plot G3: HSDPA850MHz Channel = 4233, 30MHz to 1GHz)



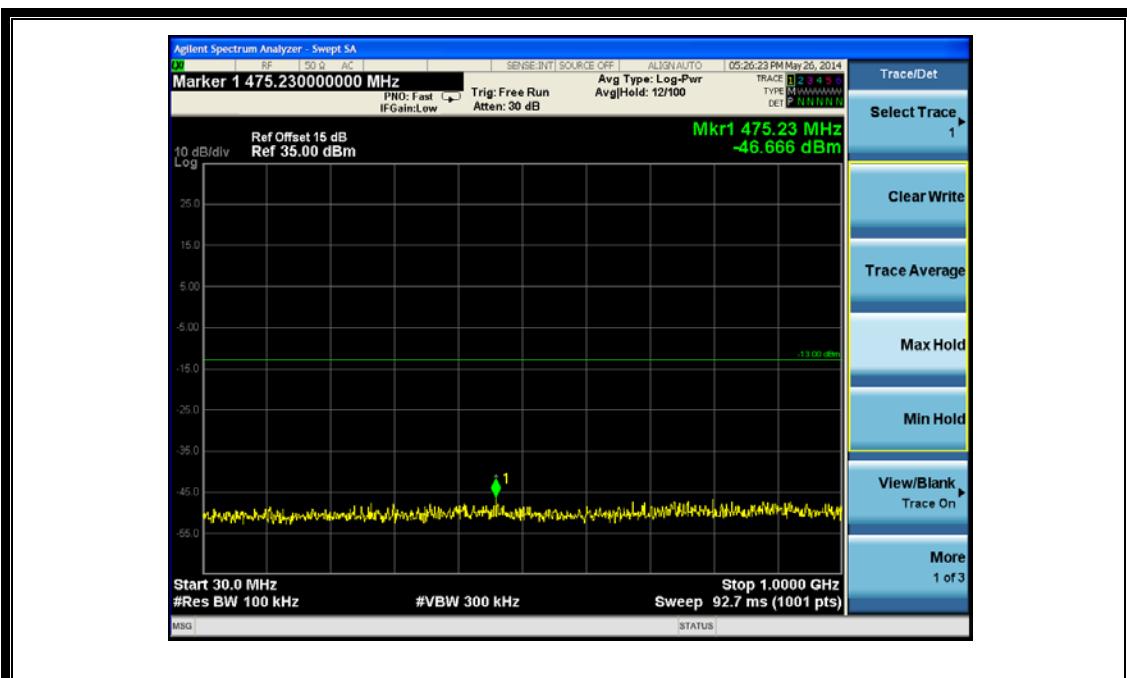
(Plot G3.1: HSDPA850MHz Channel = 4233, 1GHz to 9GHz)



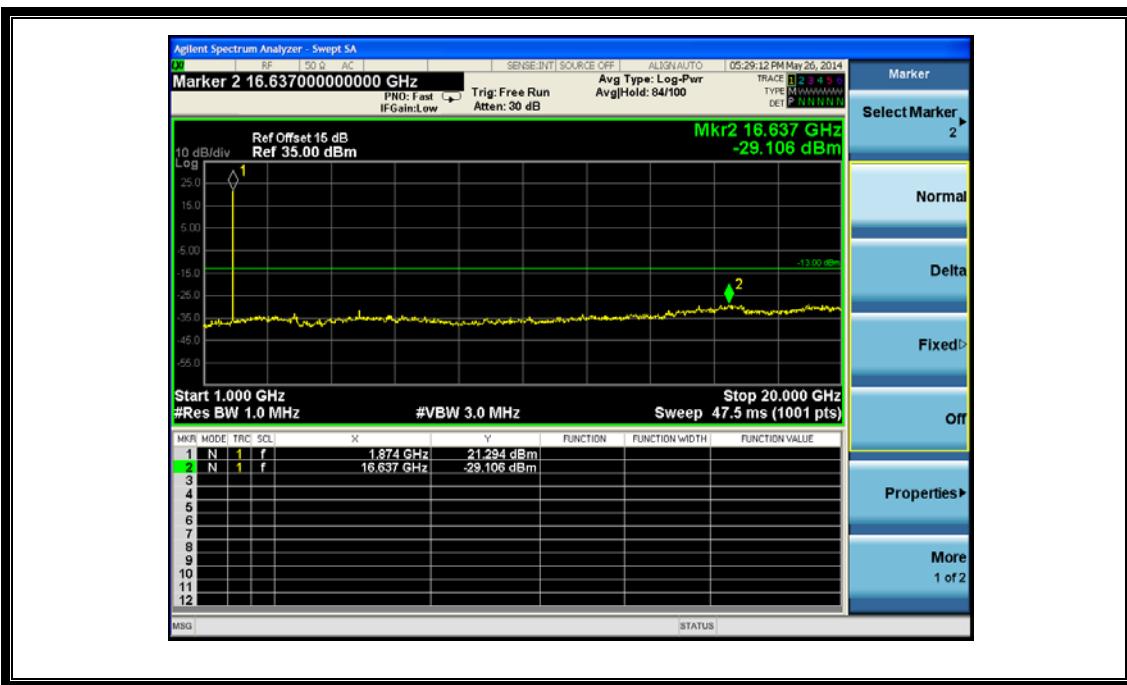
(Plot H1: HSDPA1900MHz Channel = 9262, 30MHz to 1GHz)



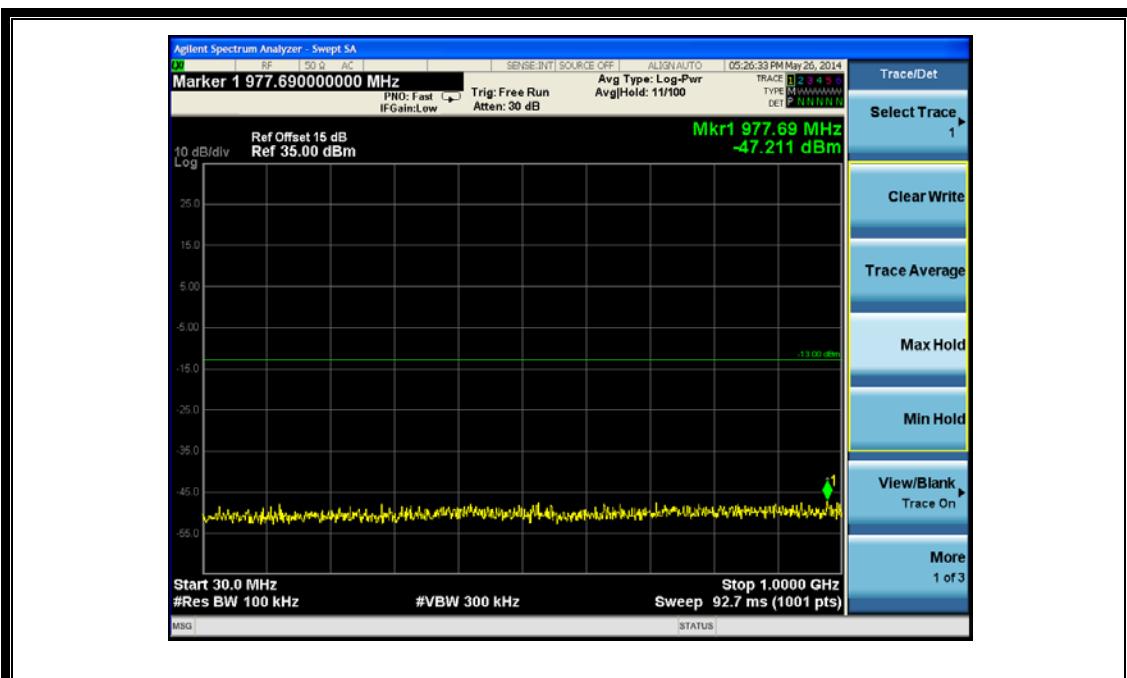
(Plot H1.1: HSDPA1900MHz Channel = 9262, 1GHz to 20GHz)



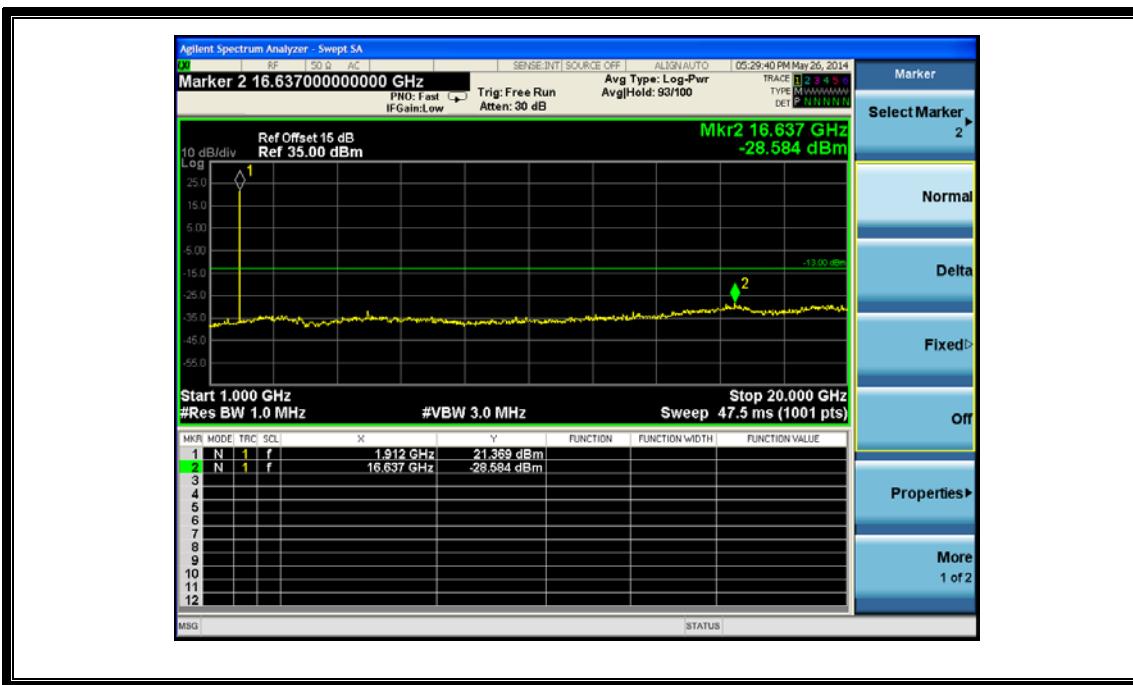
(Plot H2: HSDPA1900MHz Channel = 9400, 30MHz to 1GHz)



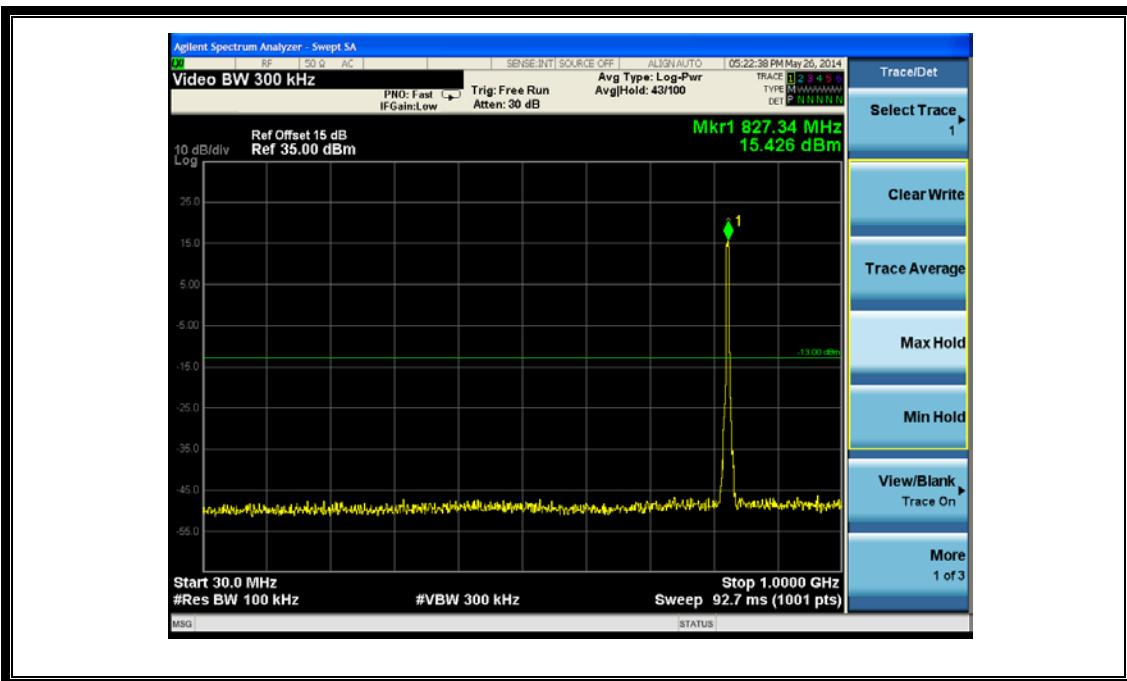
(Plot H2.1: HSDPA1900MHz Channel = 9400, 1GHz to 20GHz)



(Plot H3: HSDPA1900MHz Channel = 9538, 30MHz to 1GHz)



(Plot H3.1: HSDPA1900MHz Channel = 9538 1GHz to 20GHz)



(Plot I 1: HSUPA 850MHz Channel = 4132, 30MHz to 1GHz)



(Plot I1.1: HSUPA 850MHz Channel = 4132, 1GHz to 9GHz)