



FCC TEST REPORT



Issued to

TCT Mobile Limited

For

UMTS USB Modem

Model Name: X602A/X602
Trade Name: ALCATEL
onetouch
Brand Name: ALCATEL
onetouch
FCC ID : RAD502
Standard: 47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E
Test date: 2014-4-18 to 2013-5-16
Issue date: 2014-5-16

By

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Date 2014.5.16



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Date 2014.5.16

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Date 2014.5.16

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Change History		
Issue	Date	Reason for change
1.0	May 16, 2014	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type : UMTS USB Modem
Serial No. : (n.a, marked #1 by test site)
Hardware Version : V2.0
Software Version..... : X602-A-C.140423.R007.00.0.X.T
Applicant : TCT Mobile Limited
5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,
Pudong Area Shanghai, P.R. China. 201203
Manufacturer : TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED
70 Huifeng 4rd,ZhongKai Hi-tech Development
District ,Huizhou,Guangdong 516006 P.R.China (TCL Mobile
Communication Co.,LTD.Huizhou)
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 850:255KGXW,GSM 1900:247KGXW
EGPRS850:248KG7W, EGPRS1900:245KG7W,
WCDMA 850:4M11F9W ,WCDMA1900:4M10F9W

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 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 (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 (10-1-13 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 (10-1-13 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-13 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.	24.232(d)	Peak to average radio	PASS
2	2.1049,22.917 24.238	99% 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 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

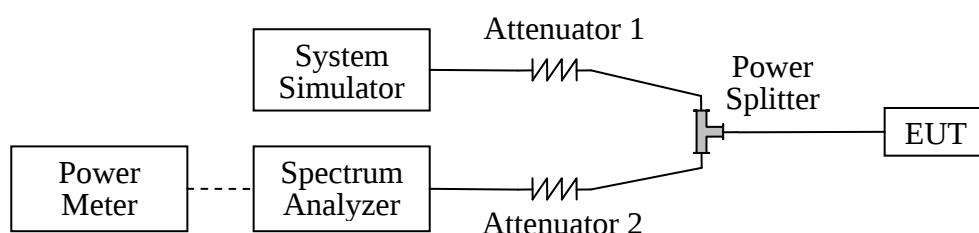
2.1 Conducted RF Output Power

2.1.1 Requirement

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

2.1.2 Test Description

1. Test Setup:



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

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
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:

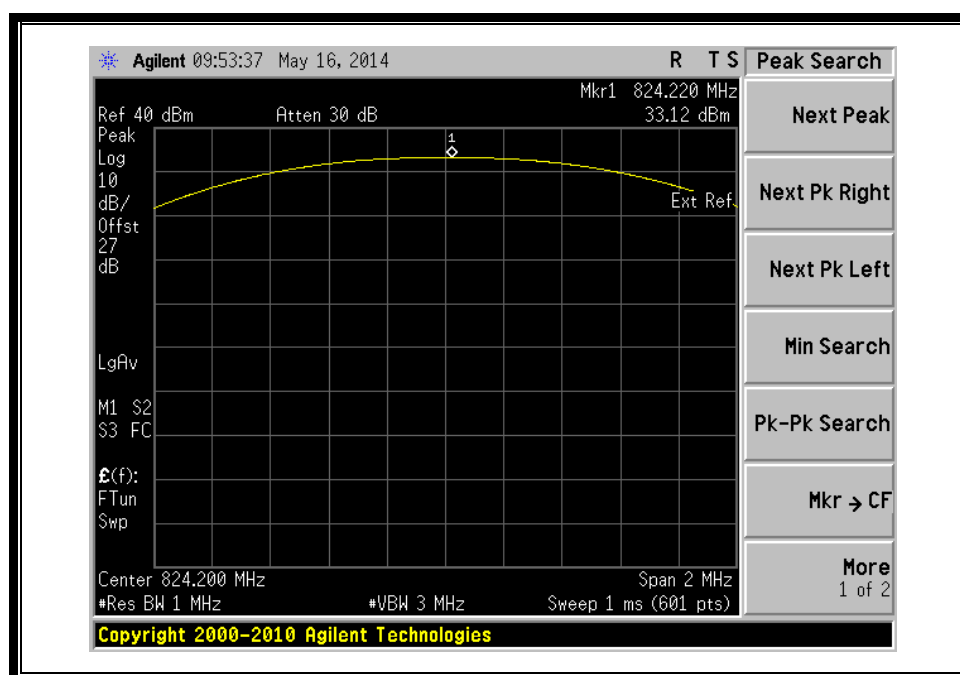
Band	Channel	Frequency (MHz)	Measured Output Power		Limit	Verdict
			dBm	Refer to Plot	dBm	
GSM 850MHz	128	824.2	33.12	Plot A1 to A3	35	<u>PASS</u>
	190	836.6	33.18			<u>PASS</u>
	251	848.8	33.18			<u>PASS</u>
GSM 1900MHz	512	1850.2	29.25	Plot B1 to B3	32	<u>PASS</u>
	661	1880.0	29.18			<u>PASS</u>
	810	1909.8	28.70			<u>PASS</u>
GPRS 850MHz	128	824.2	31.76	Plot C1 to C3 ^{Note 1}	35	<u>PASS</u>
	190	836.6	31.80			<u>PASS</u>
	251	848.8	31.85			<u>PASS</u>
GPRS 1900MHz	512	1850.2	27.33	Plot D1 to D3 ^{Note 1}	32	<u>PASS</u>
	661	1880.0	27.27			<u>PASS</u>
	810	1909.8	26.41			<u>PASS</u>
EGPRS 850MHz	128	824.2	31.74	Plot E1 to E3 ^{Note 1}	35	<u>PASS</u>
	190	836.6	31.83			<u>PASS</u>
	251	848.8	31.80			<u>PASS</u>
EGPRS 1900MHz	512	1850.2	26.84	Plot F1 to F3 ^{Note 1}	32	<u>PASS</u>
	661	1880.0	27.30			<u>PASS</u>
	810	1909.8	27.41			<u>PASS</u>

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

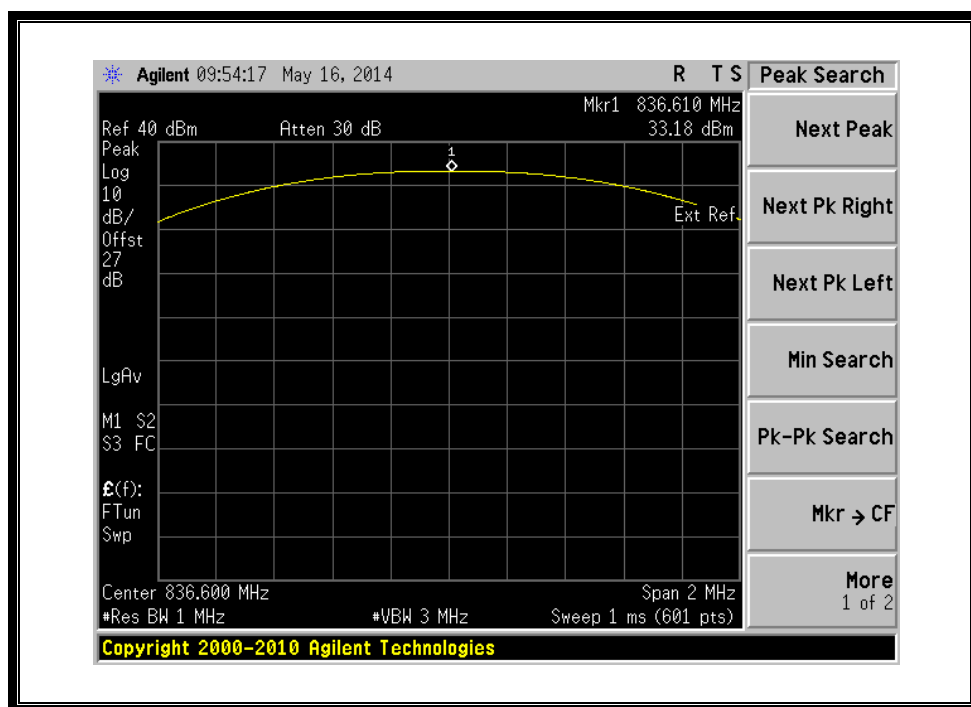
2. WCDMA Model Test Verdict:

Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4175	4233	9262	9400	9538
	subtest	dBm			dBm		
5.2(WCDMA)	non	23.30	22.84	22.80	24.11	24.45	23.85
HSDPA	1	23.30	22.75	22.74	24.11	24.45	23.76
	2	23.26	22.72	22.76	24.08	24.41	23.77
	3	22.81	22.23	22.19	23.55	23.86	23.24
	4	22.78	22.27	22.21	23.48	23.90	23.28
HSUPA	1	23.26	22.80	22.80	24.04	24.40	23.84
	2	21.24	20.82	20.72	22.10	22.37	21.86
	3	22.30	21.79	21.82	23.03	23.42	22.79
	4	21.22	20.80	20.84	22.08	23.39	21.82
	5	23.25	22.75	22.76	23.96	24.28	23.71
HSPA+	1	23.27	22.65	22.75	23.85	24.37	23.67
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.						

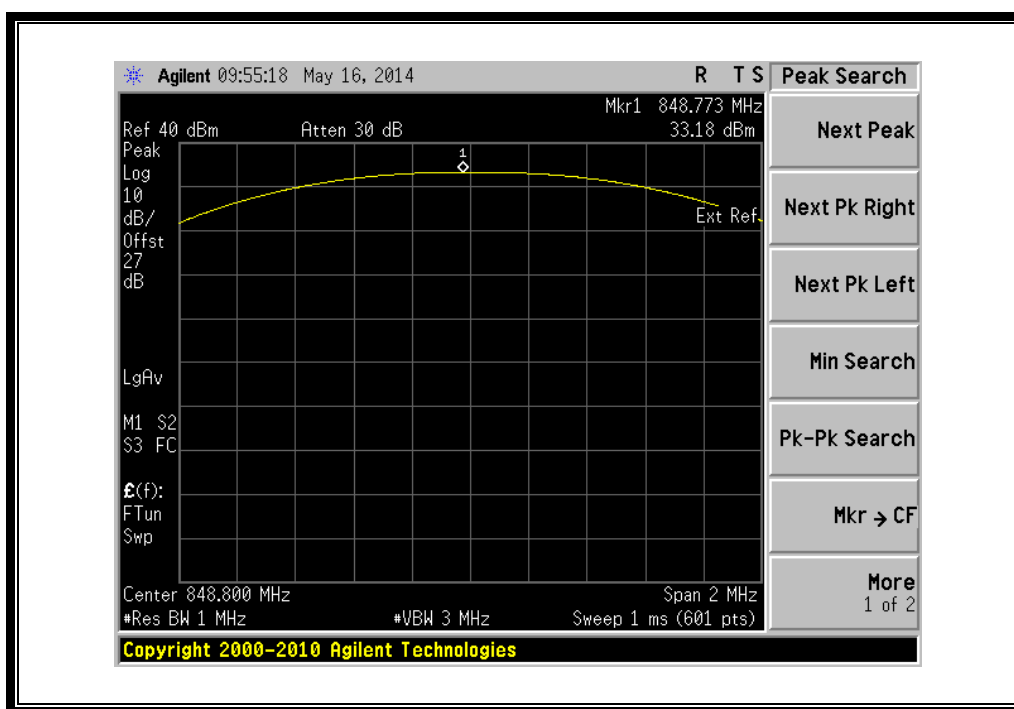
3. GSM Model Test Plots:



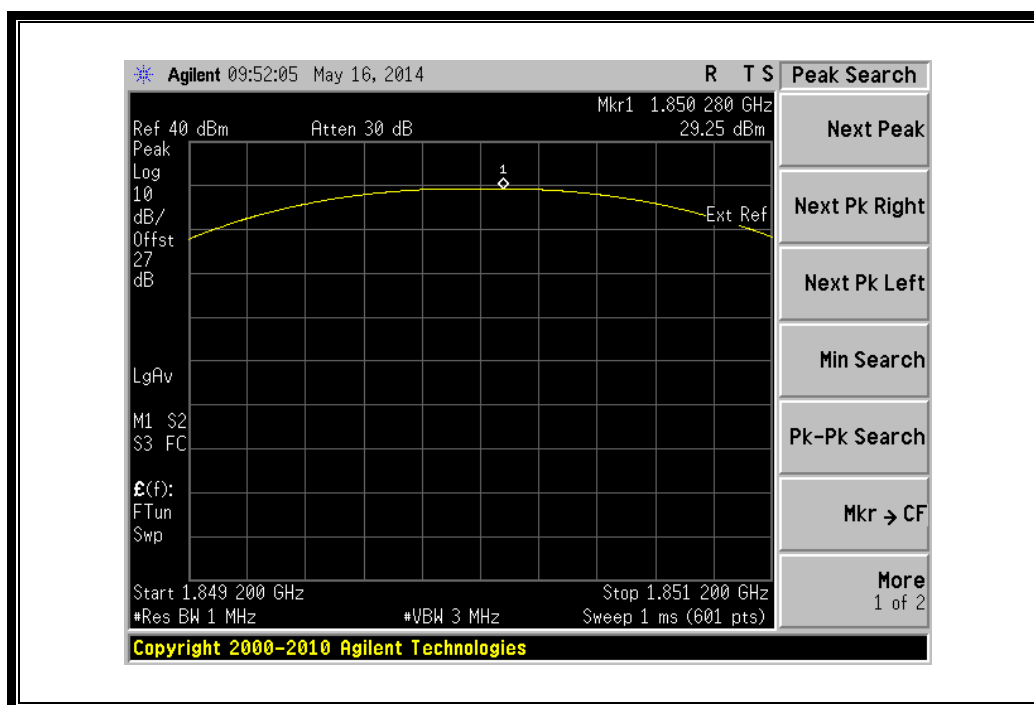
(Plot A1:GSM 850MHz Channel = 128)



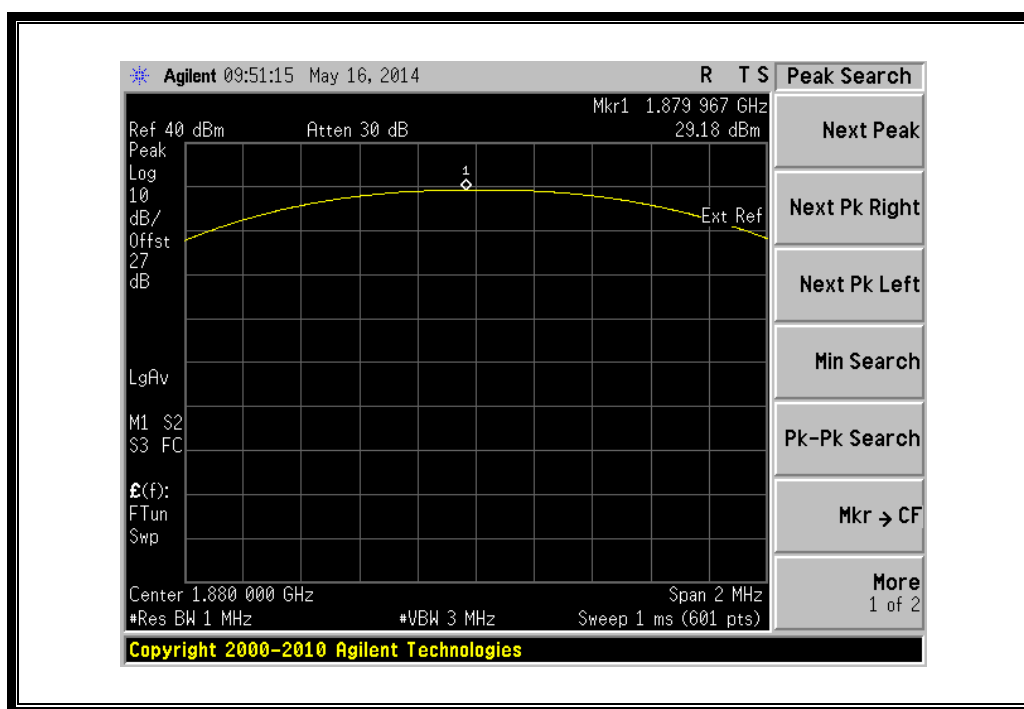
(Plot A2:GSM 850MHz Channel = 190)



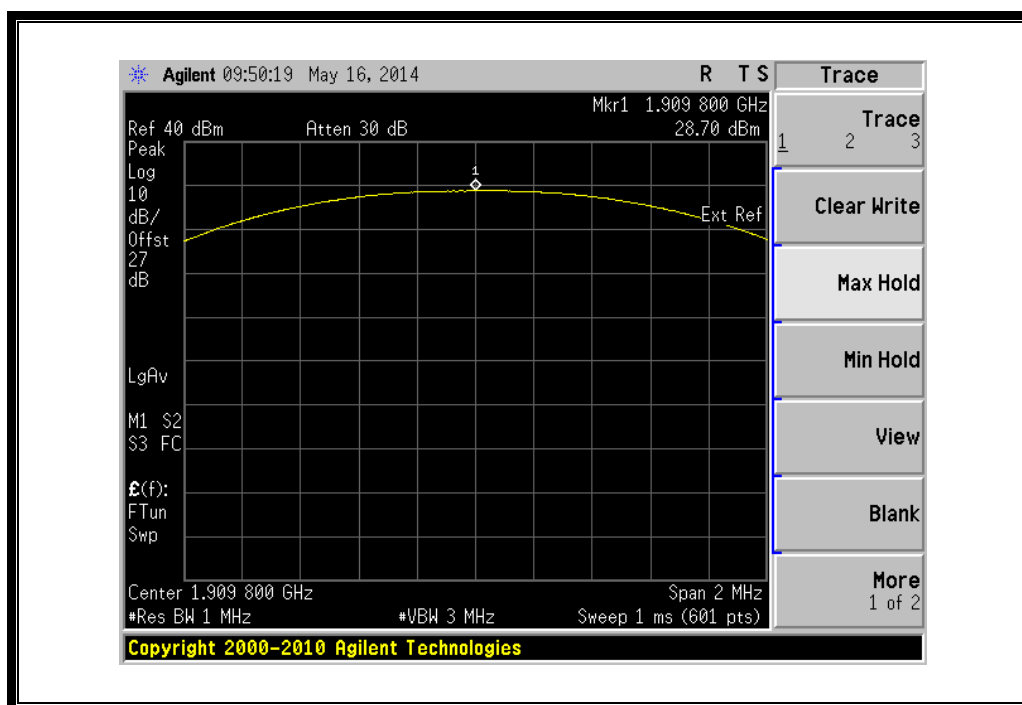
(Plot A3:GSM 850MHz Channel = 251)



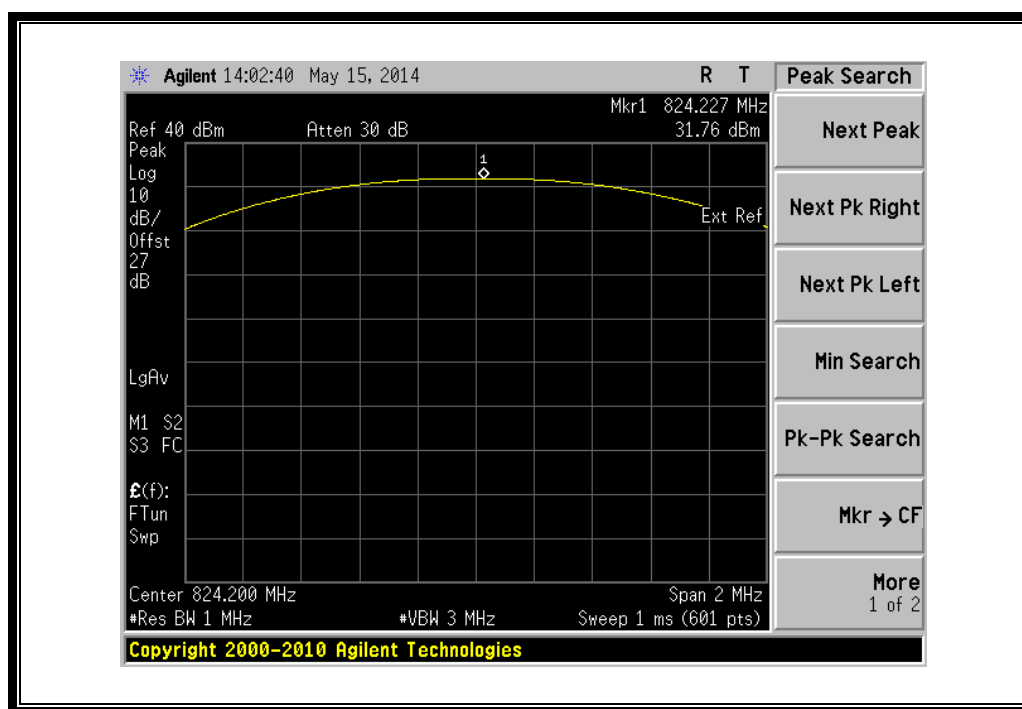
(Plot B1: GSM 1900MHz Channel = 512)



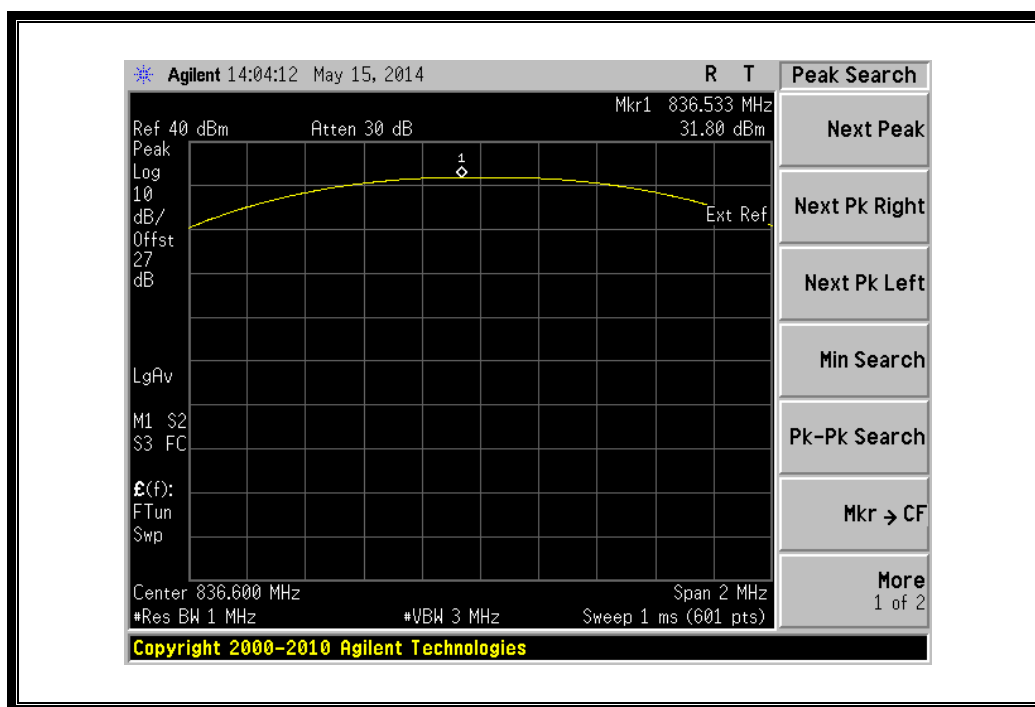
(Plot B2: GSM 1900MHz Channel = 661)



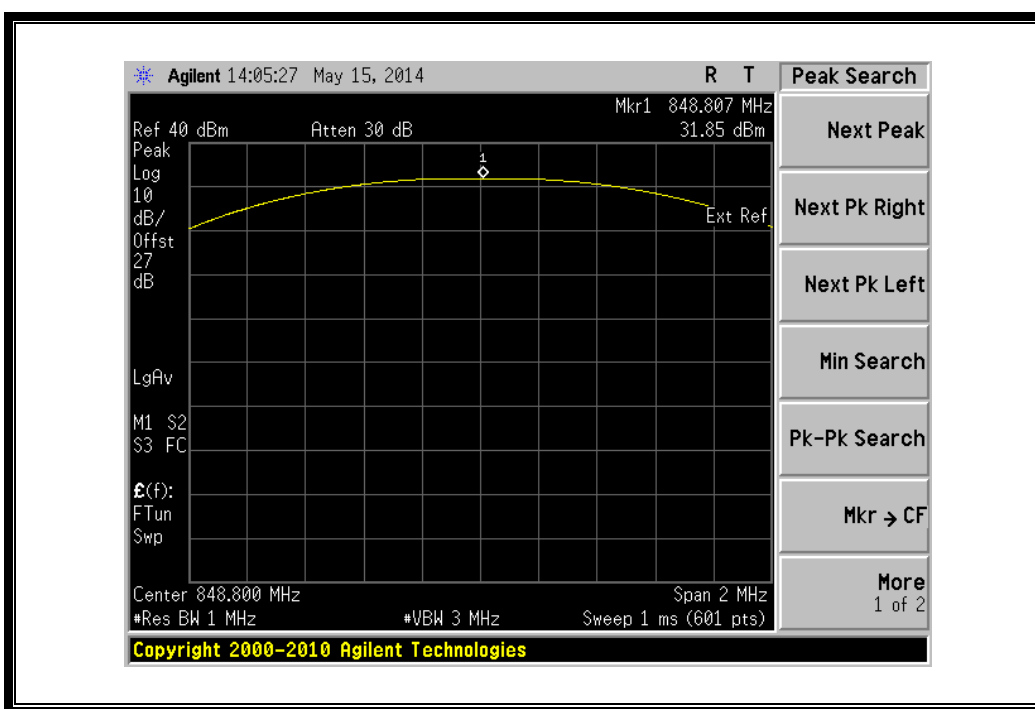
(Plot B3: GSM 1900Hz Channel = 810)



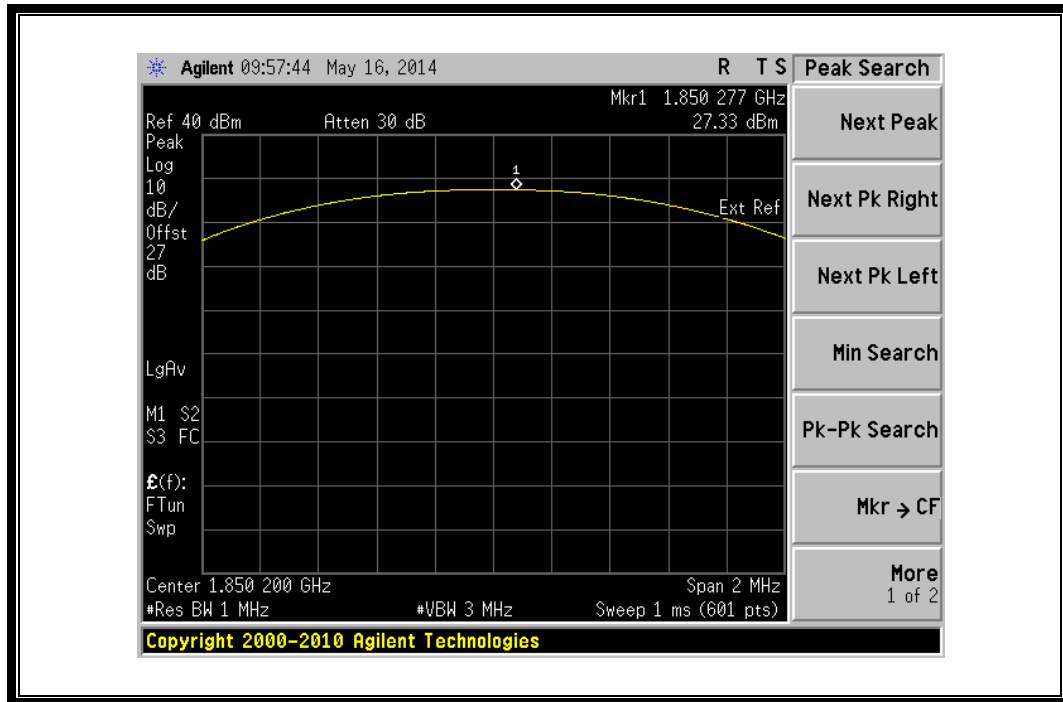
(Plot C 1: GPRS 850MHz Channel = 128)



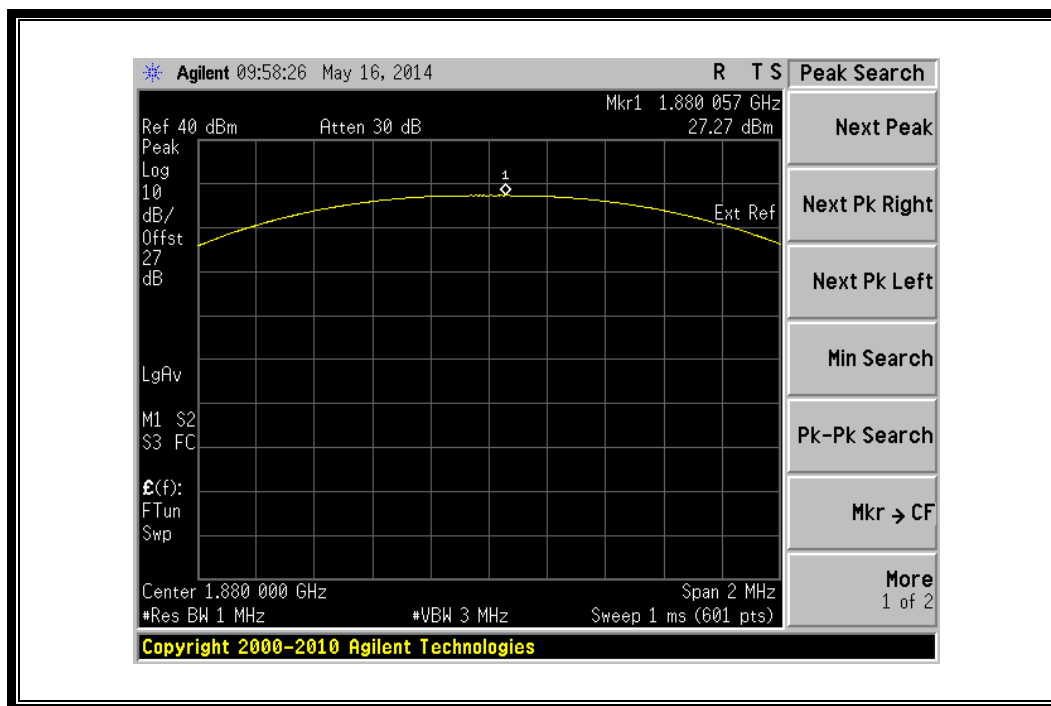
(Plot C 2: GPRS 850MHz Channel = 190)



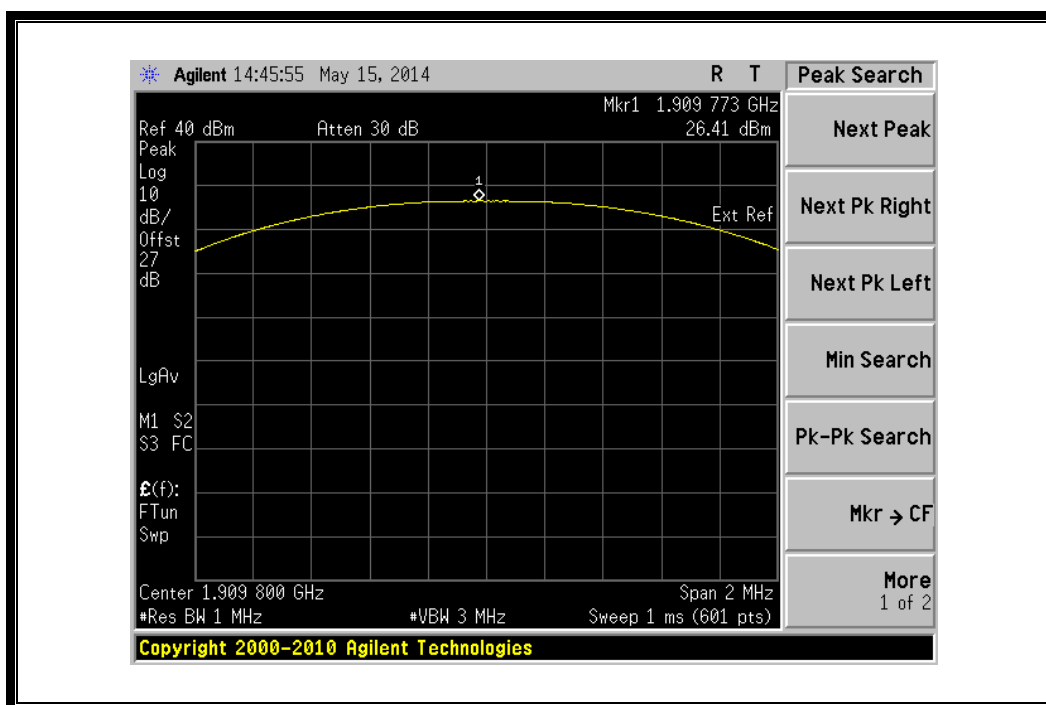
(Plot C 3: GPRS 850MHz Channel = 251)



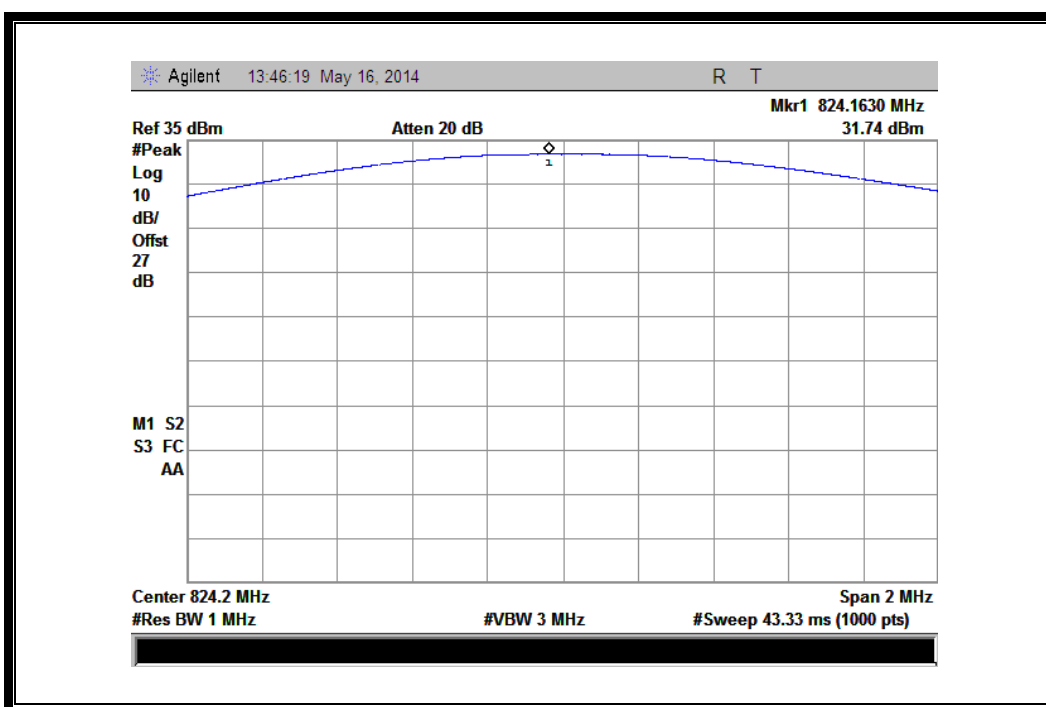
(Plot D 1: GPRS 1900MHz Channel = 512)



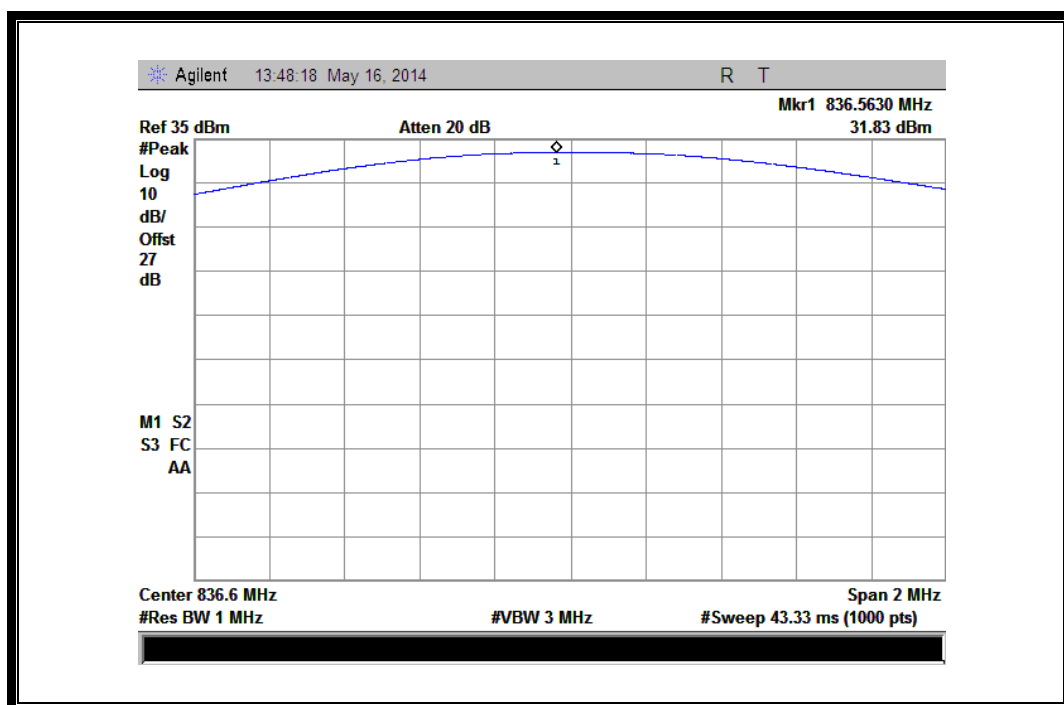
(Plot D 2: GPRS 1900MHz Channel = 661)



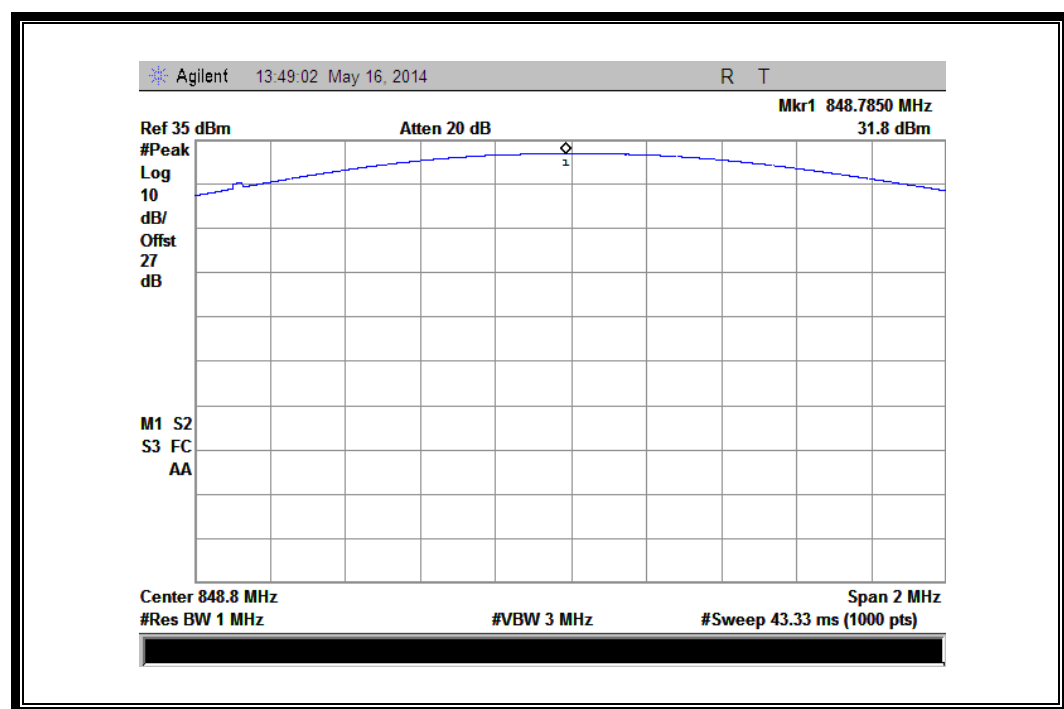
(Plot D 3: GPRS 1900MHz Channel = 810)



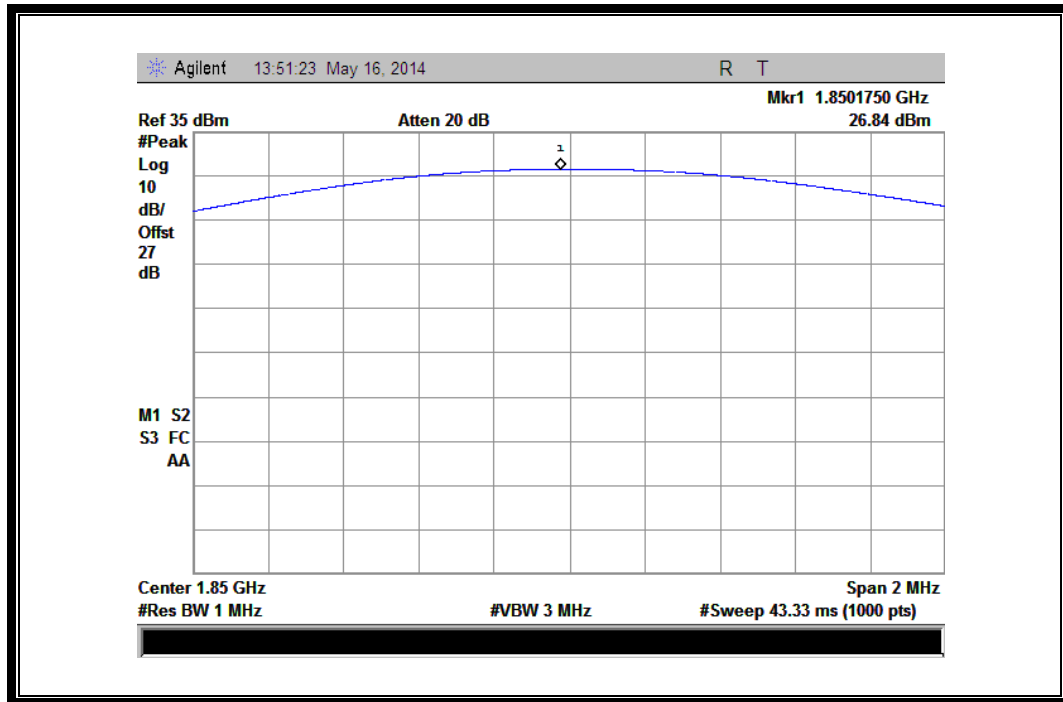
(Plot E1: EGPRS 850MHz Channel = 128)



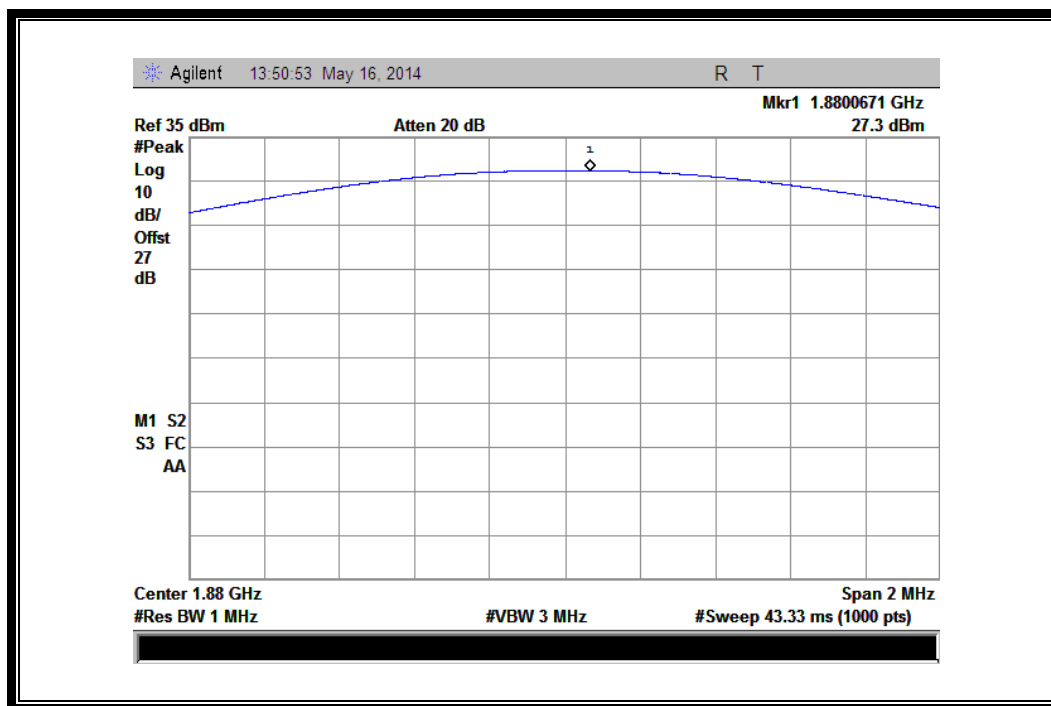
(Plot E2: EGPRS 850MHz Channel = 190)



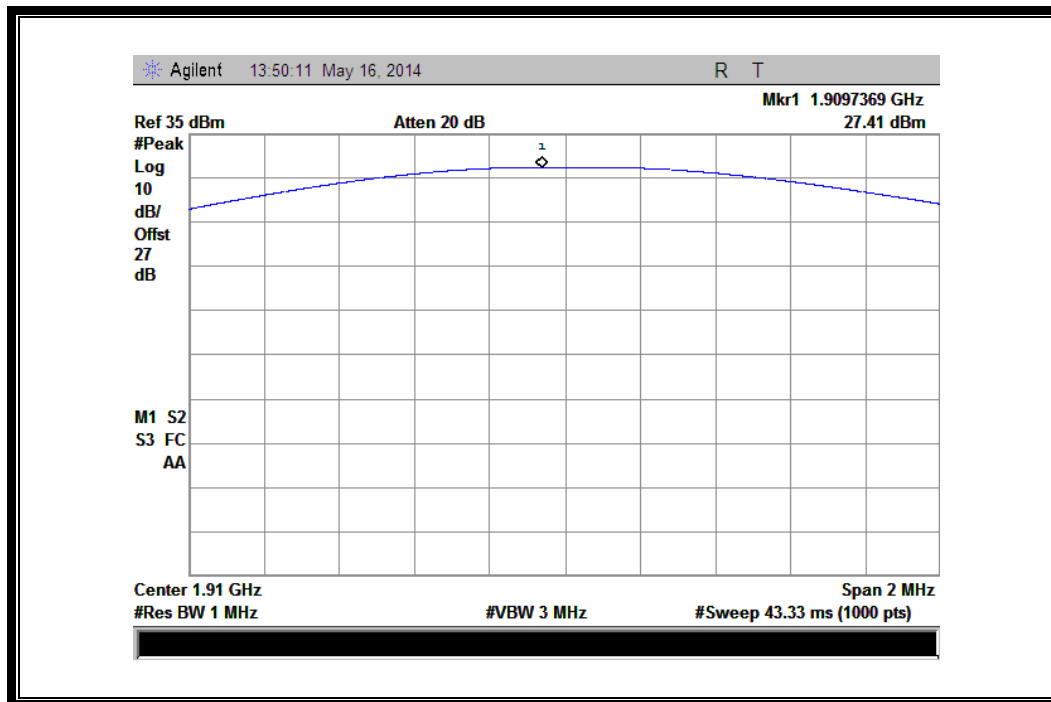
(Plot E3: EGPRS 850MHz Channel = 251)



(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) 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:

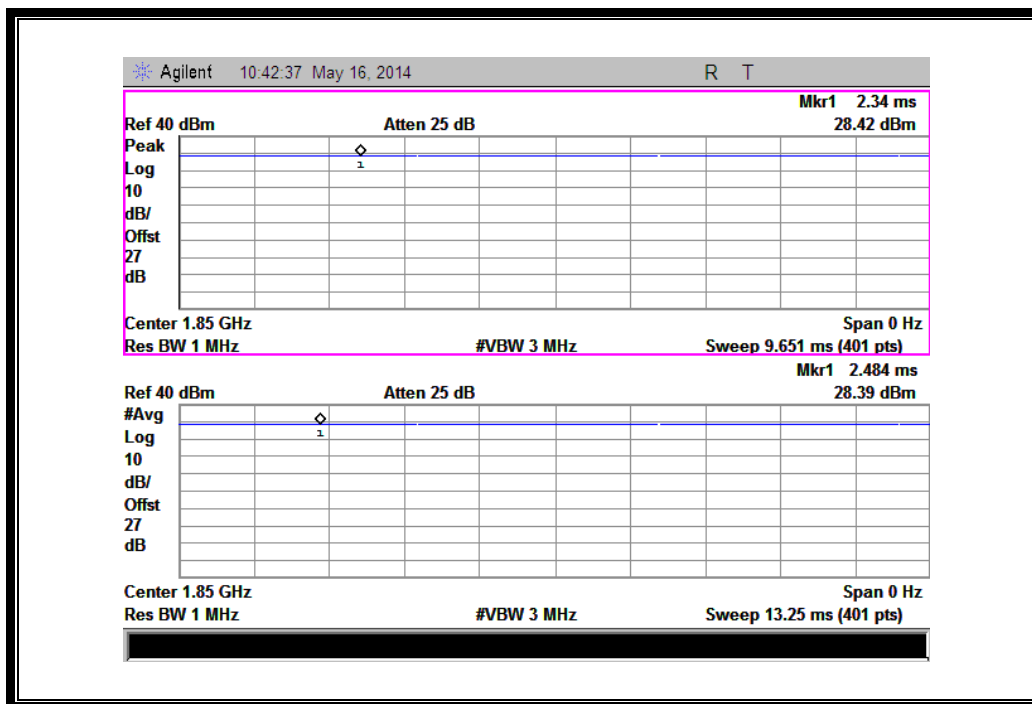
- a. Set RBW=1MHz, VBW=1MHz, peak detector in spectrum analyzer.
- b. Set EUT in maximum output power, and triggered the bust signal.
- c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average radio.

B. For UMTS operating mode:

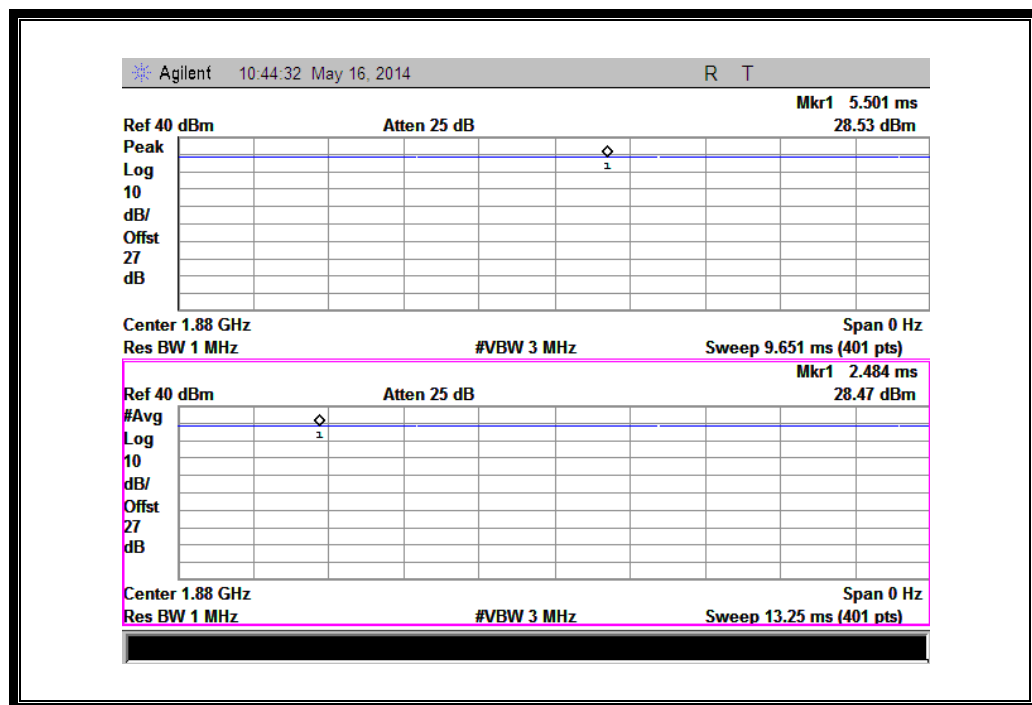
- a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

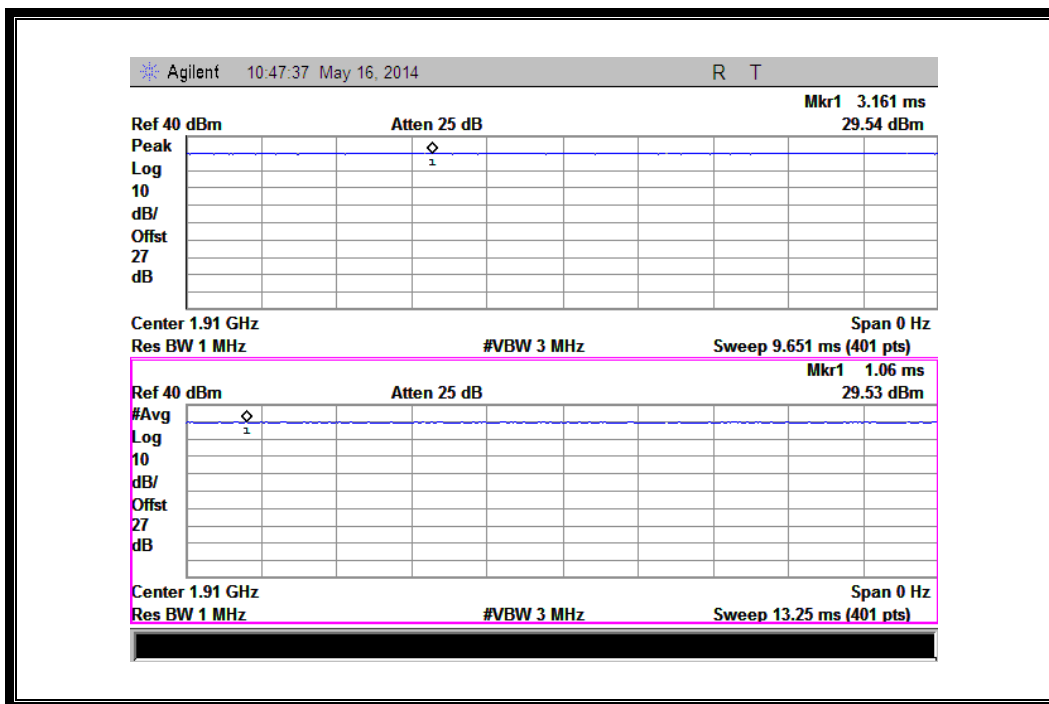
Band	Channel	Frequency (MHz)	Peak to Average radio		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 1900MHz	512	1850.2	0.03	Plot A1 to A3	13	PASS
	661	1880.0	0.06			PASS
	810	1909.8	0.01			PASS
EGPRS 1900MHz	512	1850.2	0.03	Plot B1 to B3	13	PASS
	661	1880.0	0.02			PASS
	810	1909.8	0.02			PASS
WCDMA 1900MHz	9262	1852.4	3.03	Plot C1 toC3	13	PASS
	9400	1880	3.03			PASS
	9538	1907.6	2.89			PASS



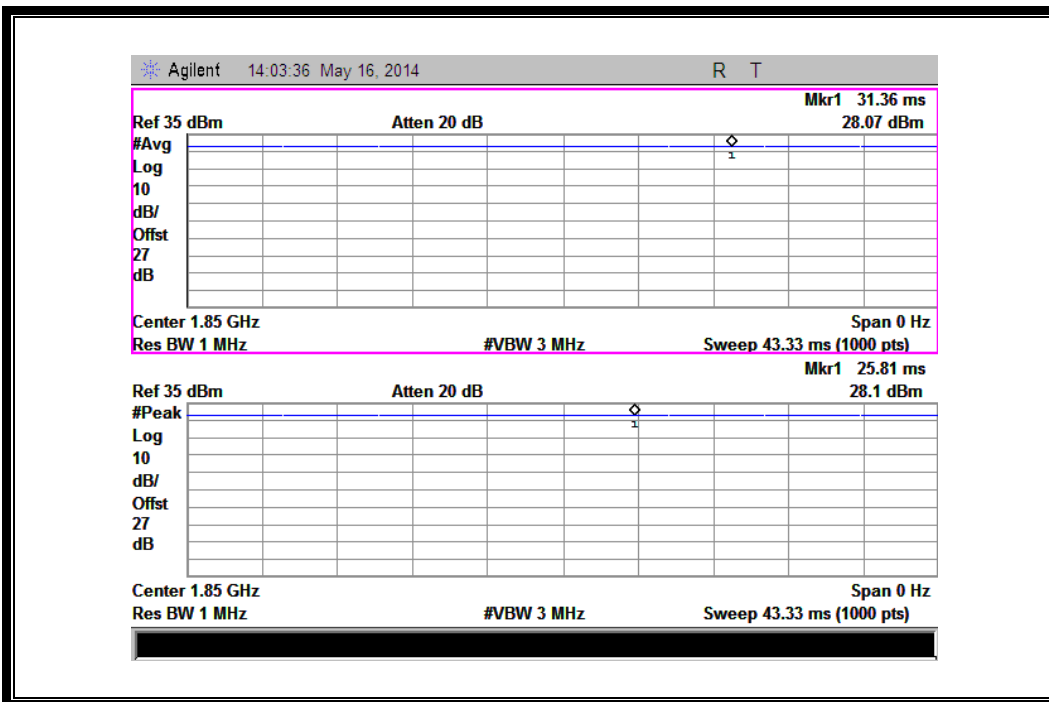
(Plot A1:GSM 1900 MHz Channel = 512)



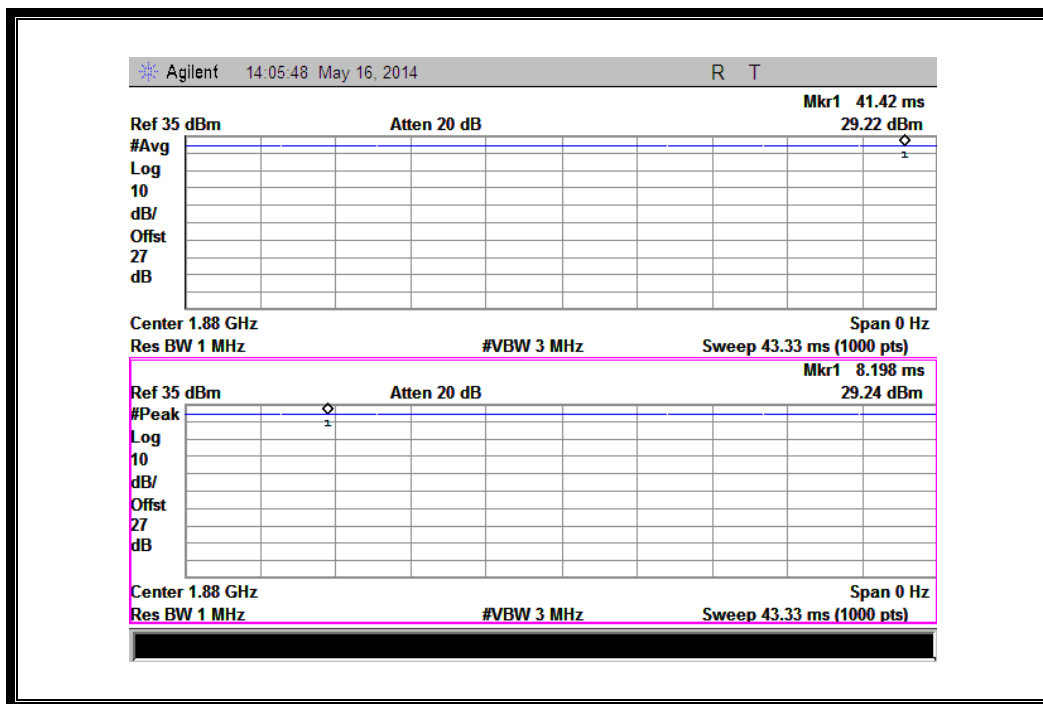
(Plot A2:GSM 1900 MHz Channel = 661)



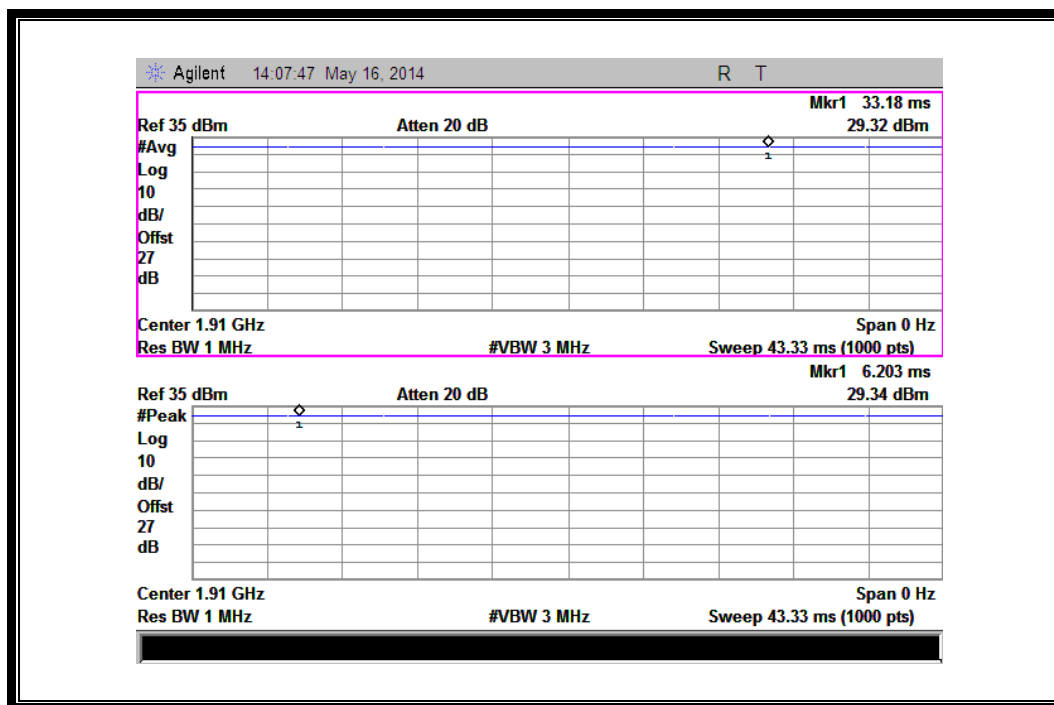
(Plot A3:GSM 1900MHz Channel = 810)



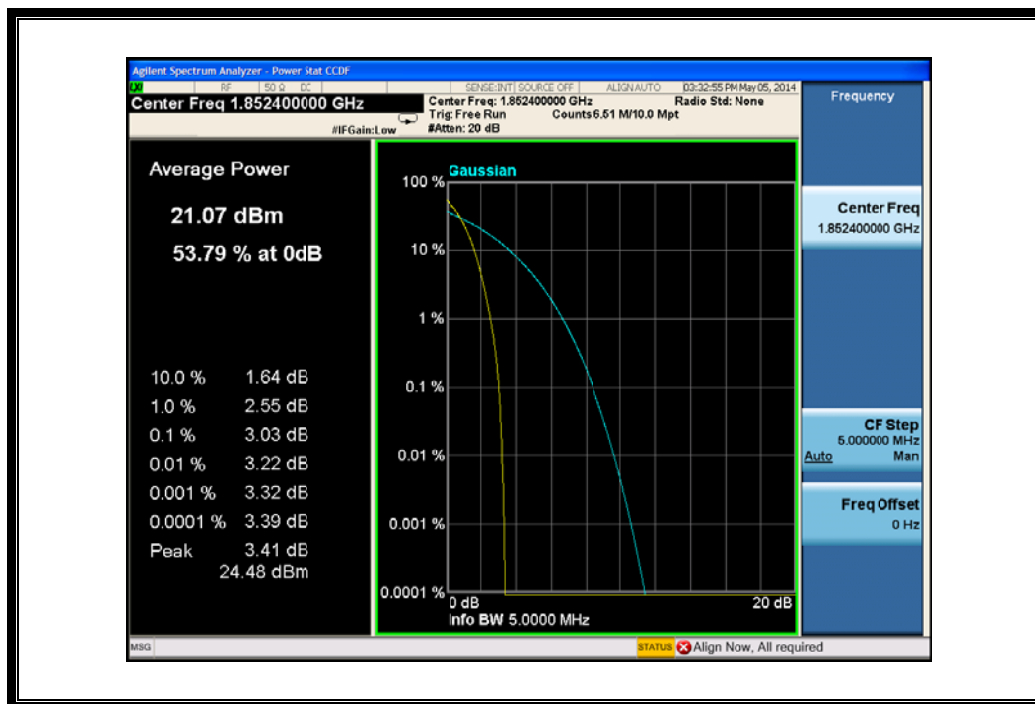
(Plot B1: EGPRS 1900MHz Channel = 512)



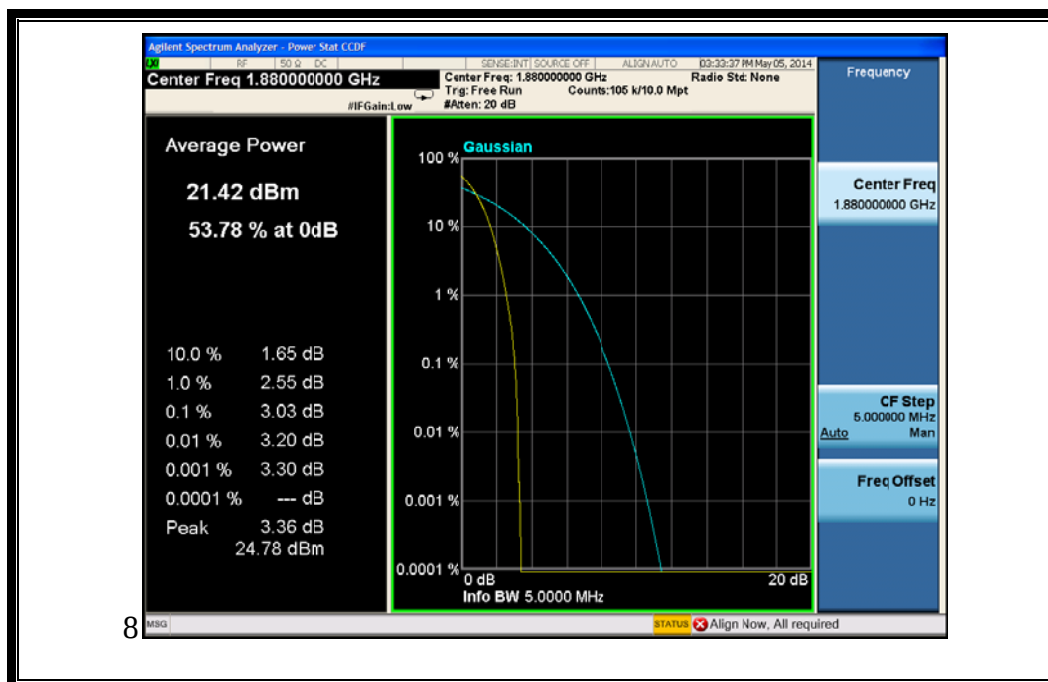
(Plot B2: EGPRS 1900MHz Channel = 661)



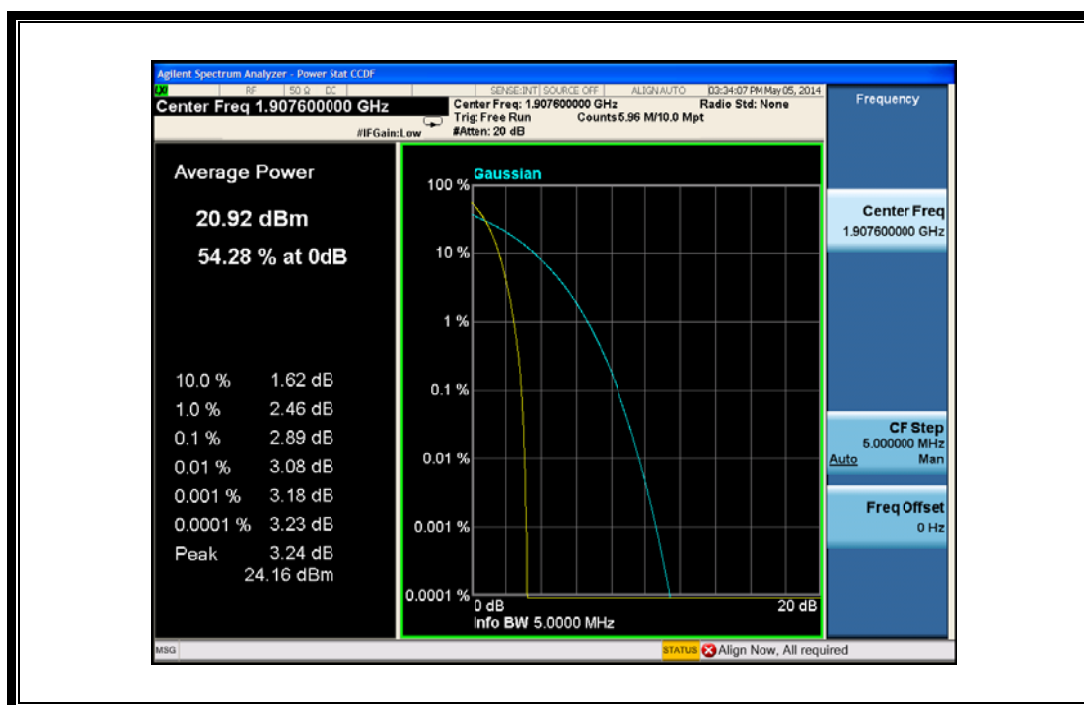
(Plot B3: EGPRS 1900MHz Channel = 810)



(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 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

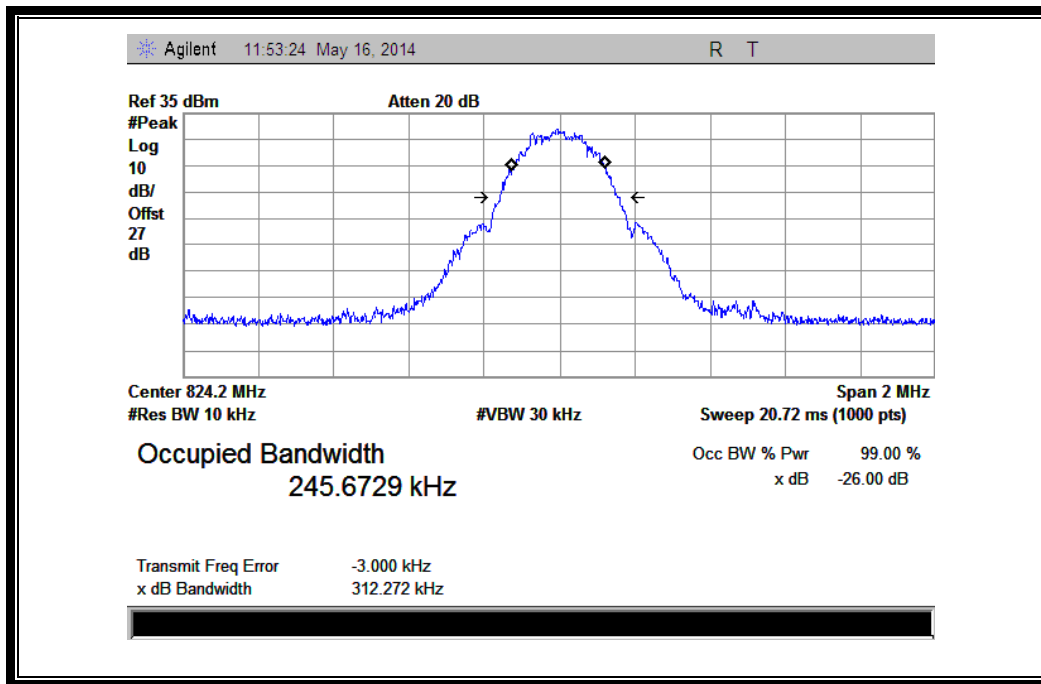
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

2. Test Verdict:

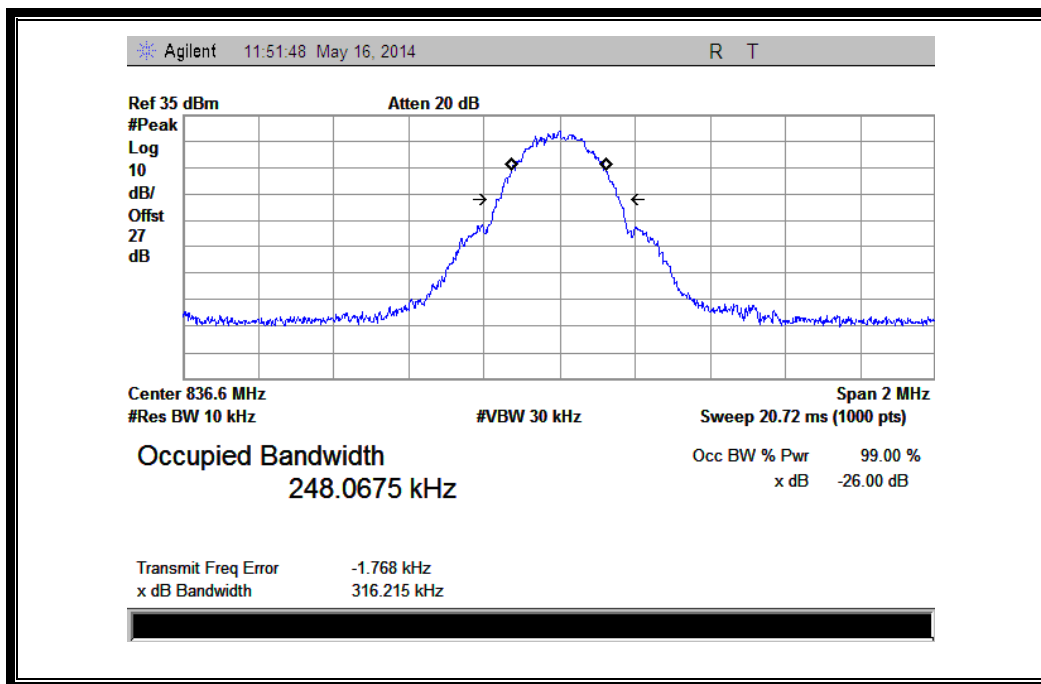
Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
EDGE 850MHz	128	824.2	313.272 KHz	245.6729 KHz	Plot A
	190	836.6	316.215 KHz	248.0675 KHz	Plot B
	251	848.8	323.133 KHz	250.4755 KHz	Plot C
EDGE 1900MHz	512	1850.2	317.219 KHz	242.5933 KHz	Plot D
	661	1880.0	321.300 KHz	244.3849 KHz	Plot E
	810	1909.8	318.164 KHz	245.0918 KHz	Plot F
WCDMA 850MHz	4132	826.4	4.640 MHz	4.0927 MHz	Plot G
	4175	835	4.635 MHz	4.0915 MHz	Plot H
	4233	846.6	4.656 MHz	4.1051 MHz	Plot I
WCDMA 1900MHz	9262	1852.4	4.639 MHz	4.0941 MHz	Plot J
	9400	1880	4.645 MHz	4.0848 MHz	Plot K
	9538	1907.6	4.660 MHz	4.0881 MHz	Plot L
HSDPA 850MHz	4132	826.4	4.635 MHz	4.0871 MHz	Plot M
	4175	835	4.642 MHz	4.0910 MHz	Plot N
	4233	846.6	4.656 MHz	4.1099 MHz	Plot O
HSDPA 1900MHz	9262	1852.4	4.647 MHz	4.0884 MHz	Plot P
	9400	1880	4.649 MHz	4.0906 MHz	Plot Q
	9538	1907.6	4.653 MHz	4.0961 MHz	Plot R
HSUPA 850MHz	4132	826.4	4.635 MHz	4.0914 MHz	Plot S
	4175	835	4.630 MHz	4.0952 MHz	Plot T
	4233	846.6	4.663 MHz	4.1033 MHz	Plot U
HSUPA 1900MHz	9262	1852.4	4.650 MHz	4.0958 MHz	Plot V

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
	9400	1880	4.638 MHz	4.0840 MHz	Plot W
	9538	1907.6	4.656 MHz	4.0860 MHz	Plot X
HSPA+ 850MHz	4132	826.4	4.641 MHz	4.0900 MHz	Plot Y
	4175	835	4.636 MHz	4.0890 MHz	Plot Z
	4233	846.6	4.646 MHz	4.1011 MHz	Plot A1
HSPA+ 1900MHz	9262	1852.4	4.641 MHz	4.0933 MHz	Plot B1
	9400	1880	4.643 MHz	4.0915 MHz	Plot C1
	9538	1907.6	4.658 MHz	4.0916 MHz	Plot D1
GSM 850MHz	128	824.2	339.137 KHz	254.6909 KHz	Plot E1
	190	836.6	308.352 KHz	239.9584 KHz	Plot F1
	251	848.8	307.365 KHz	241.8193 KHz	Plot G1
GSM 1900MHz	512	1850.2	310.851 KHz	242.9647 KHz	Plot H1
	661	1880.0	313.275 KHz	237.9977 KHz	Plot I1
	810	1909.8	308.100 KHz	239.1255 KHz	Plot J2
GPRS 850MHz	128	824.2	323.847 KHz	246.8723 KHz	Plot K1
	190	836.6	325.682 KHz	245.0522 KHz	Plot L1
	251	848.8	319.275 KHz	245.7817 KHz	Plot M1
GPRS 1900MHz	512	1850.2	315.421 KHz	245.3588 KHz	Plot N1
	661	1880.0	323.758 KHz	247.4236 KHz	Plot O1
	810	1909.8	318.863 KHz	246.8903 KHz	Plot P1

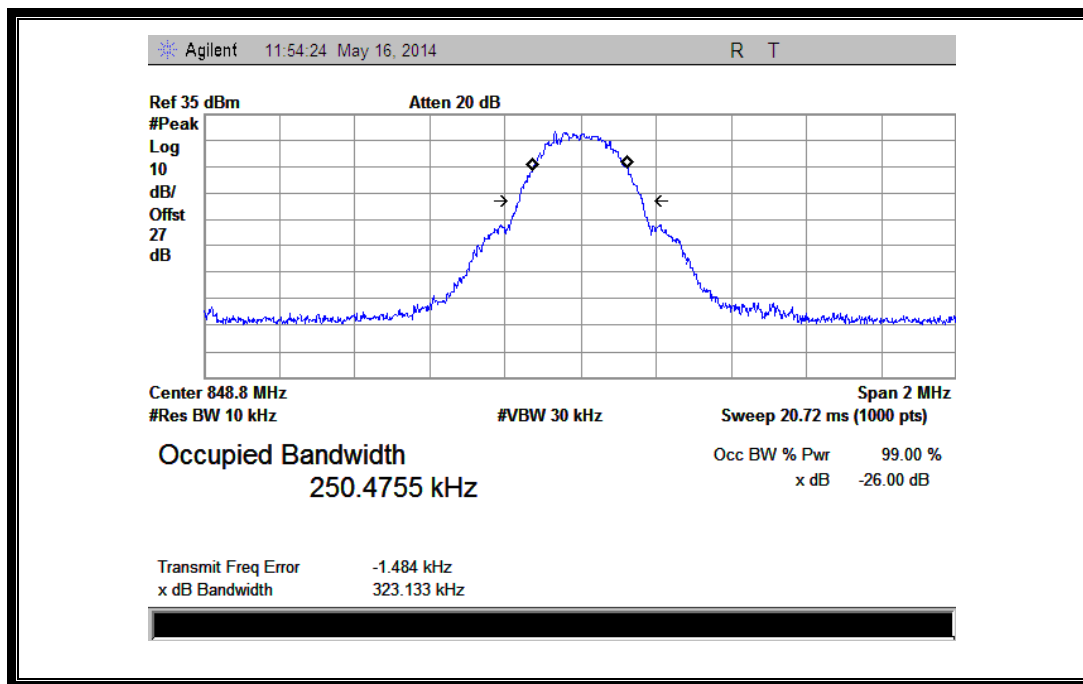
3. Test Plots:



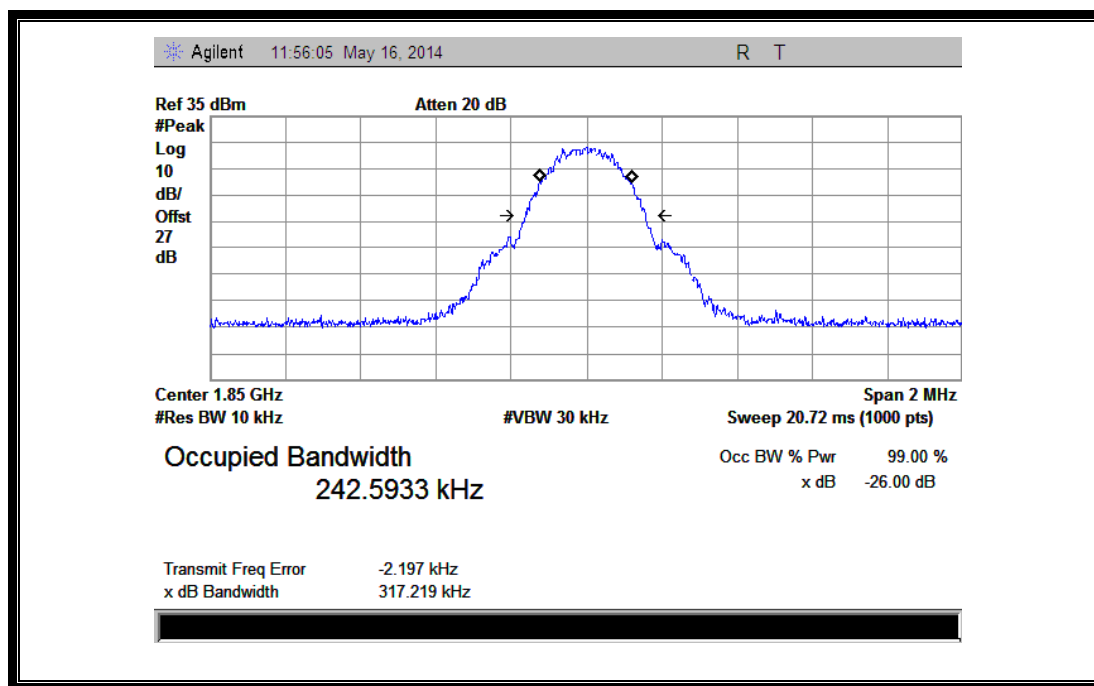
(Plot A: EGPRS 850MHz Channel = 128)



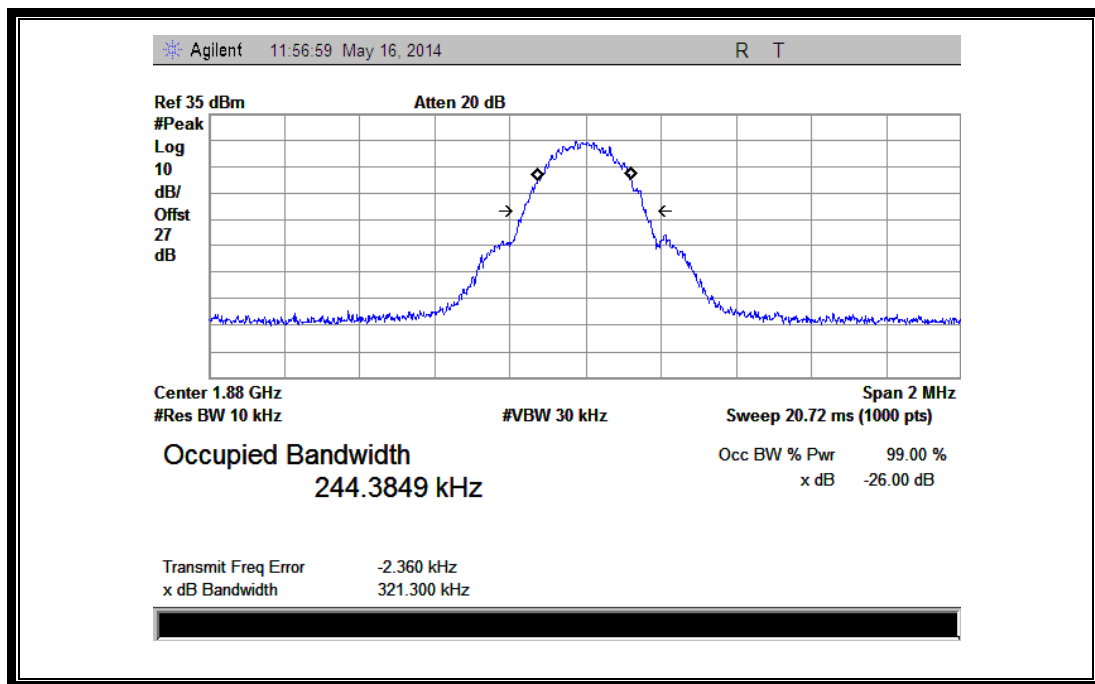
(Plot B: EGPRS 850MHz Channel = 190)



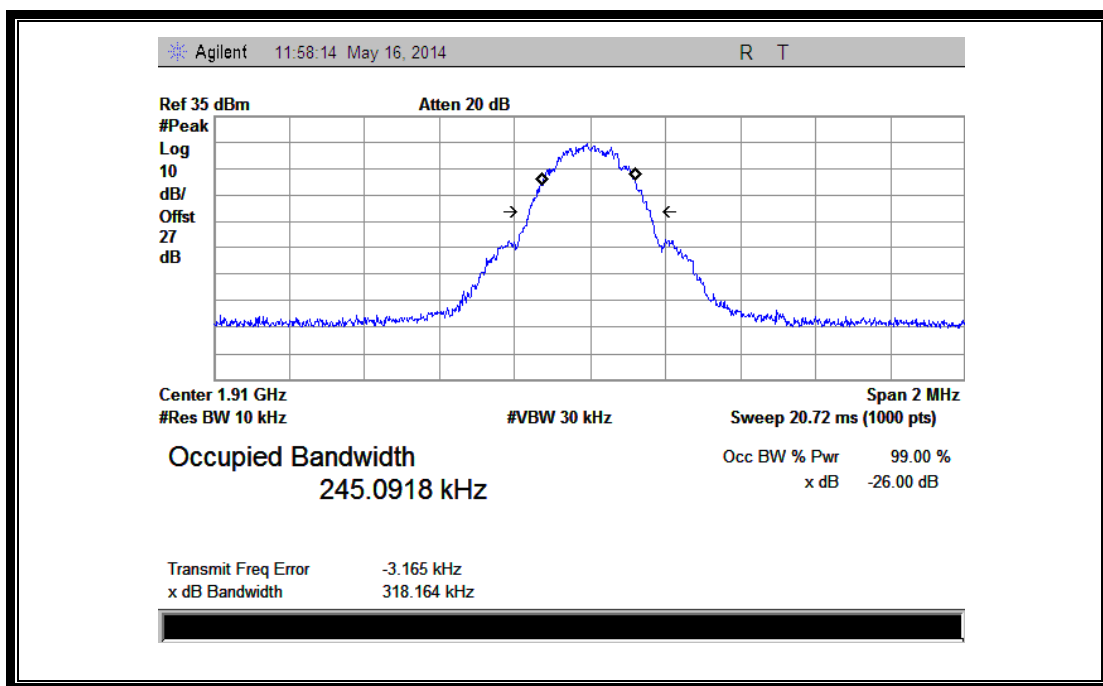
(Plot C: EGPRS 850MHz Channel = 251)



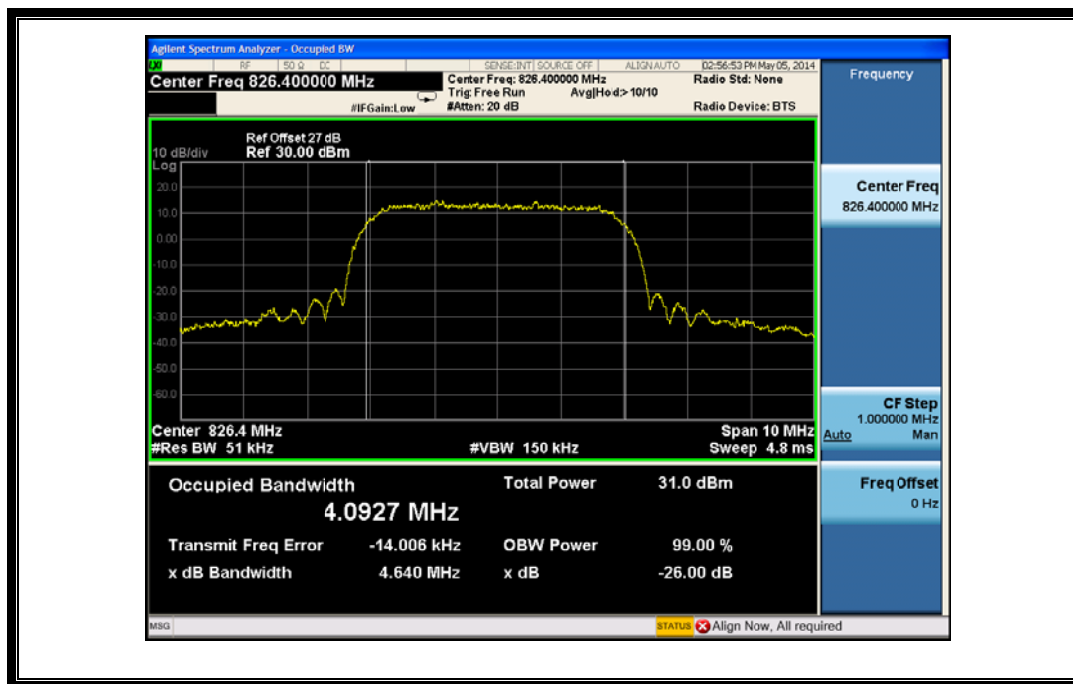
(Plot D: EGPRS1900MHz Channel = 512)



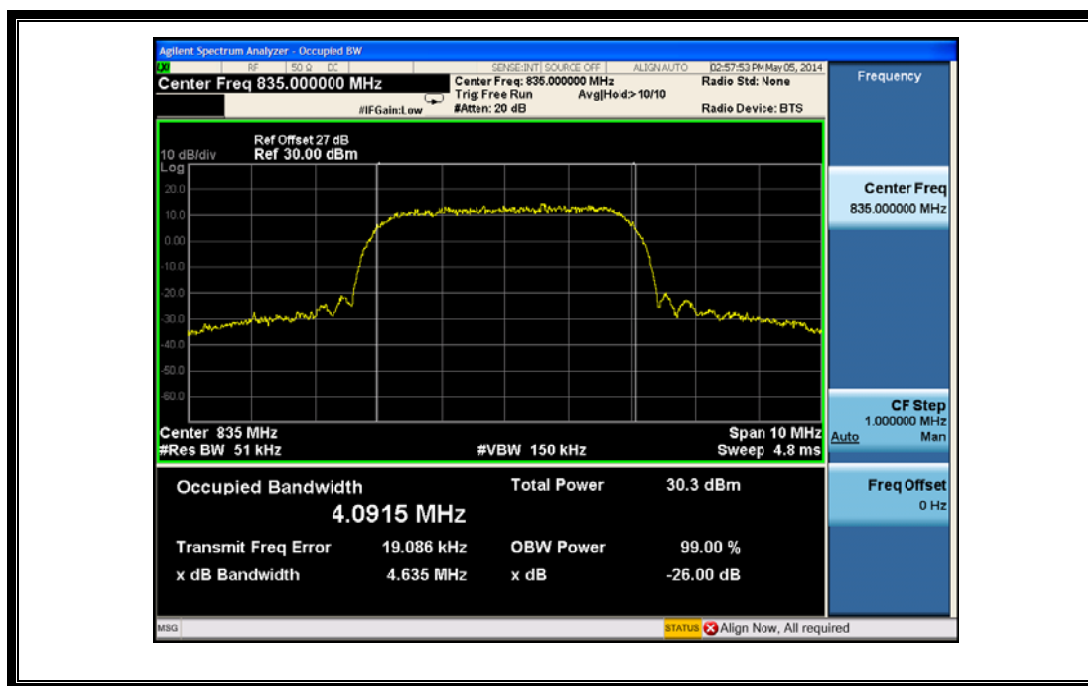
(Plot E: EGPRS1900MHz Channel = 661)



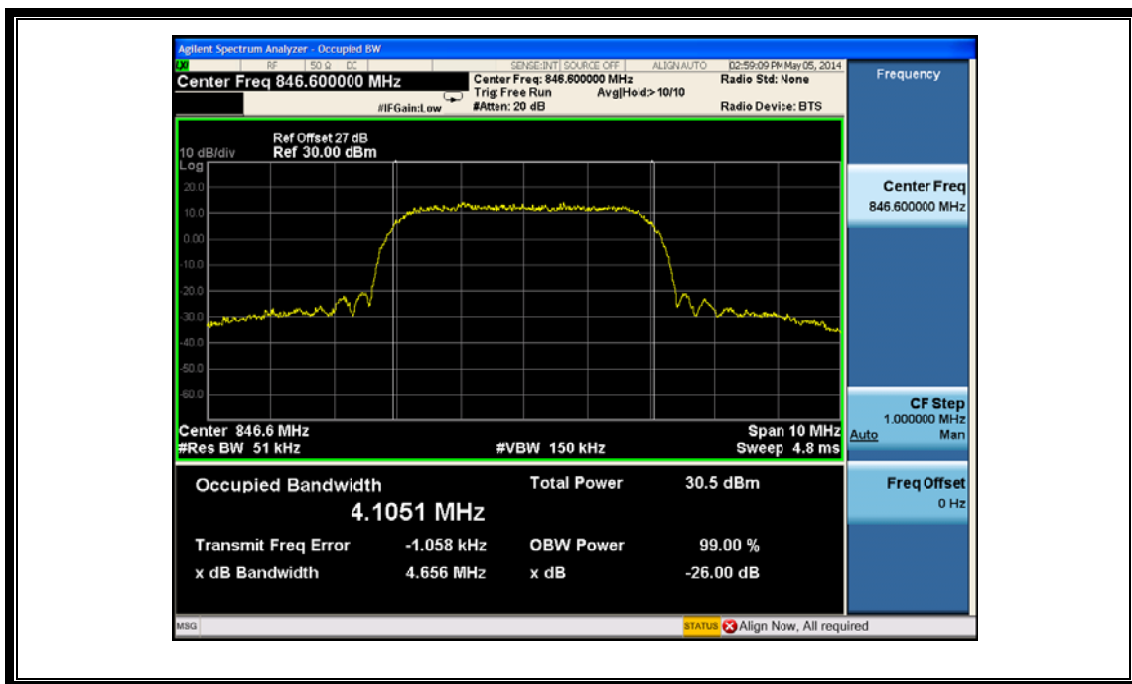
(Plot F: EGPRS 1900MHz Channel = 810)



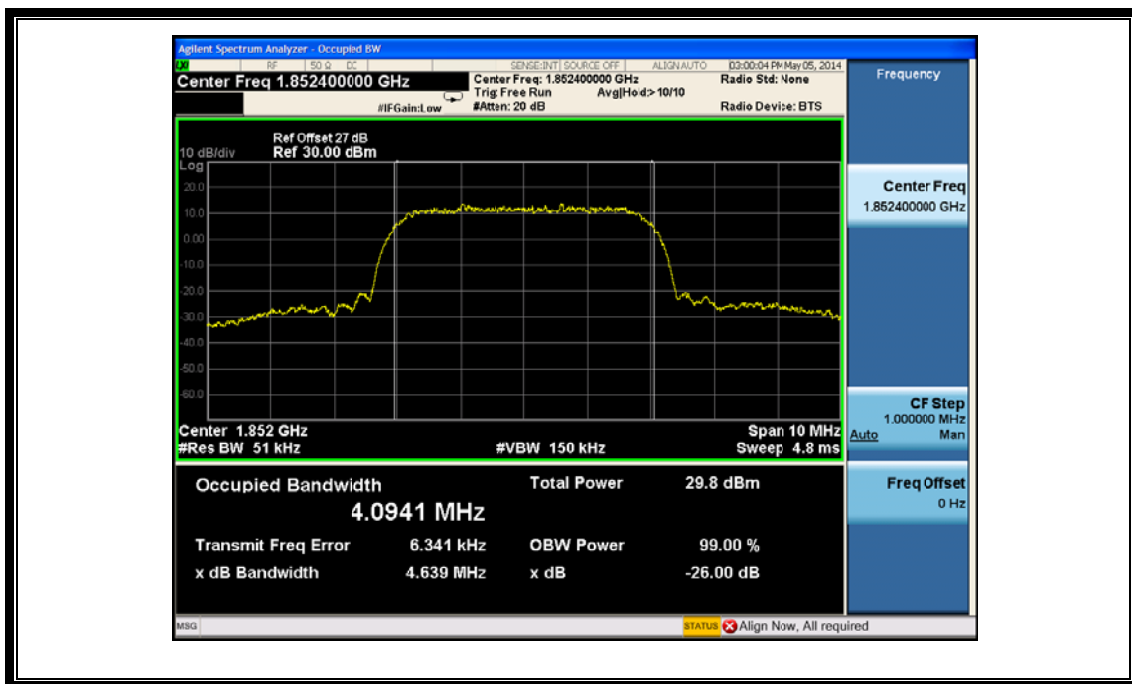
(Plot G: WCDMA 850MHz Channel = 4132)



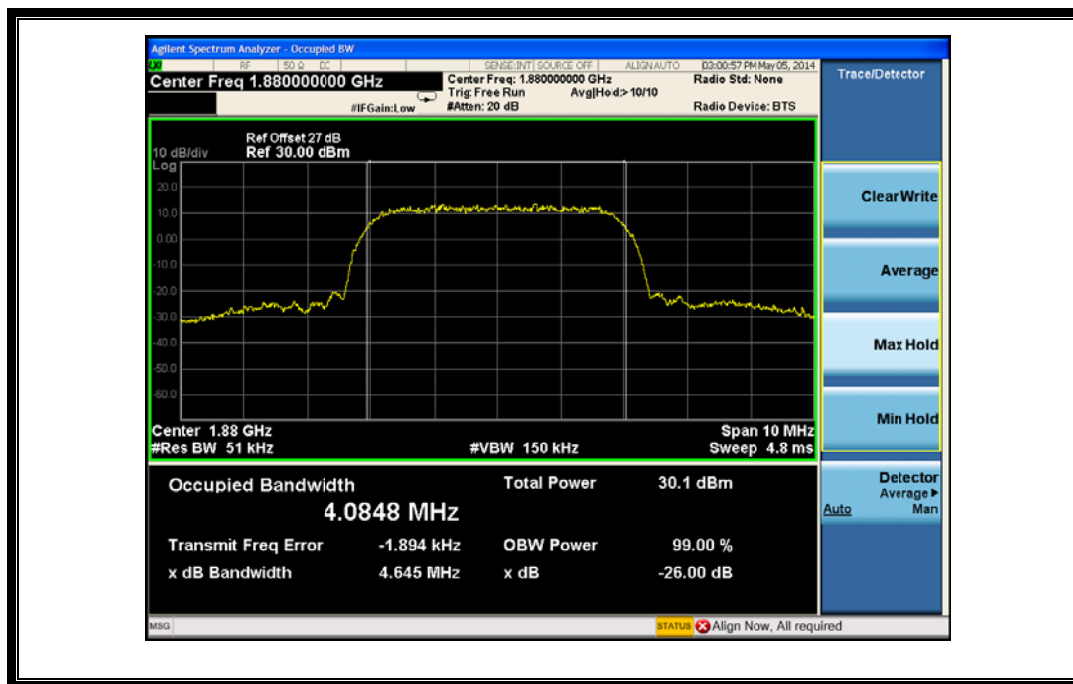
(Plot H: WCDMA 850 MHz Channel = 4175)



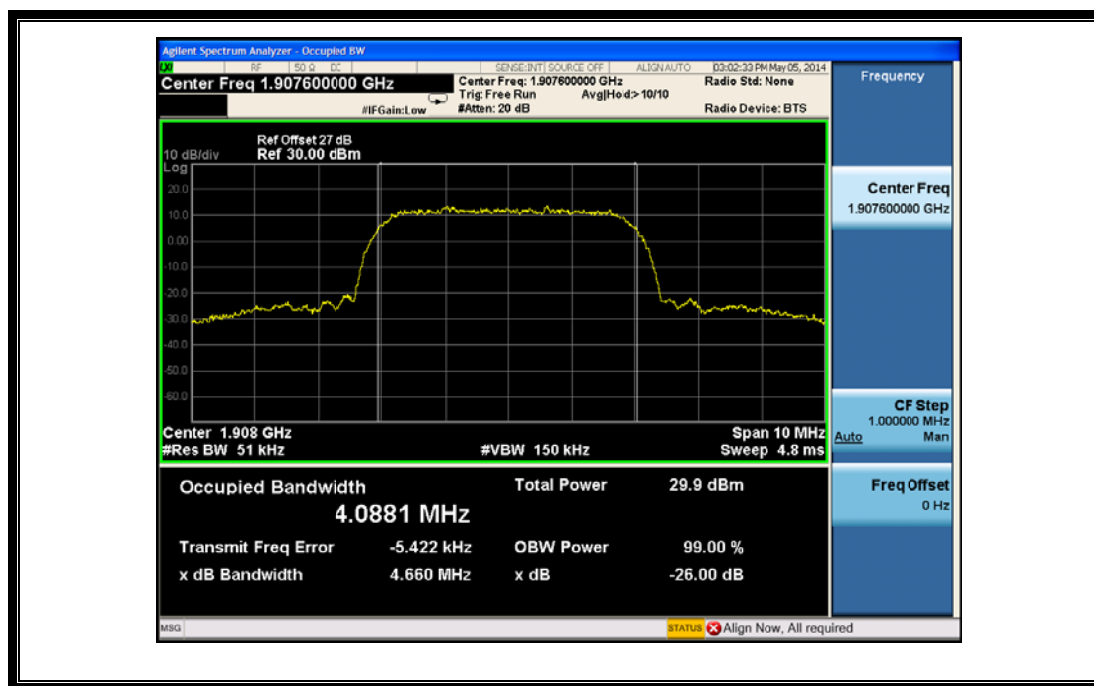
(Plot I: WCDMA 850MHz Channel = 4233)



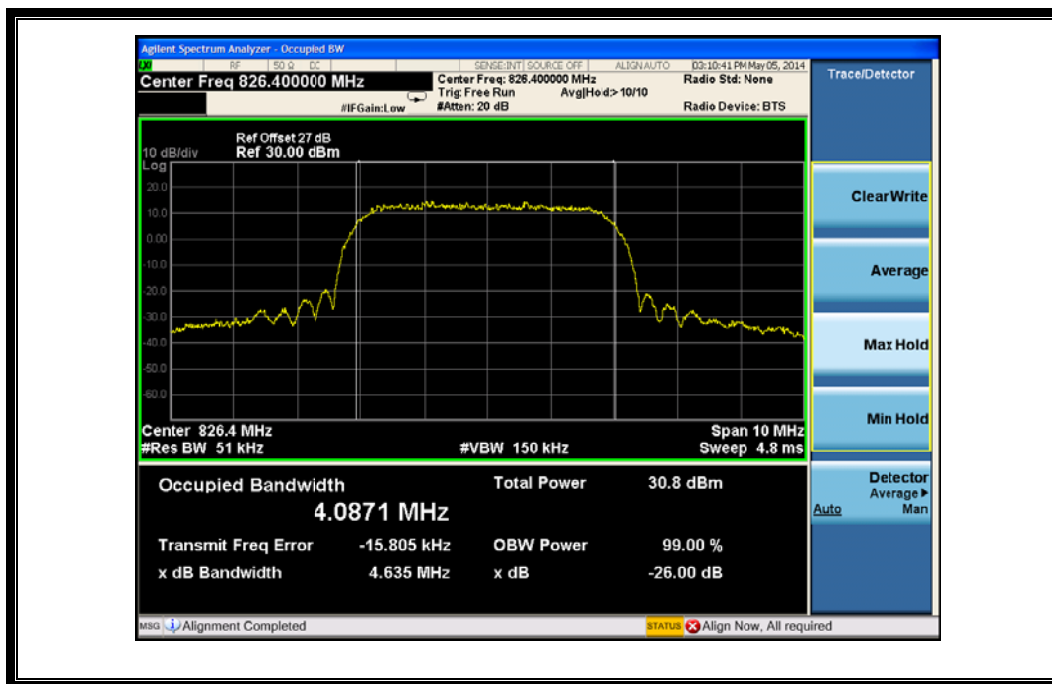
(Plot J: WCDMA 1900MHz Channel = 9262)



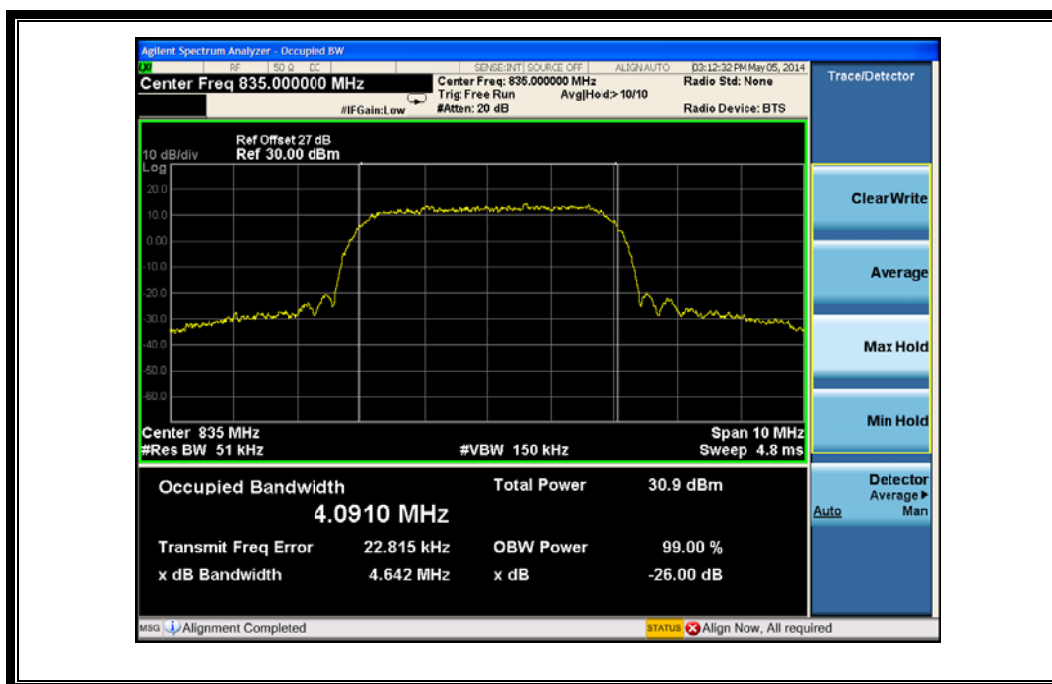
(Plot K: WCDMA 1900 MHz Channel = 9400)



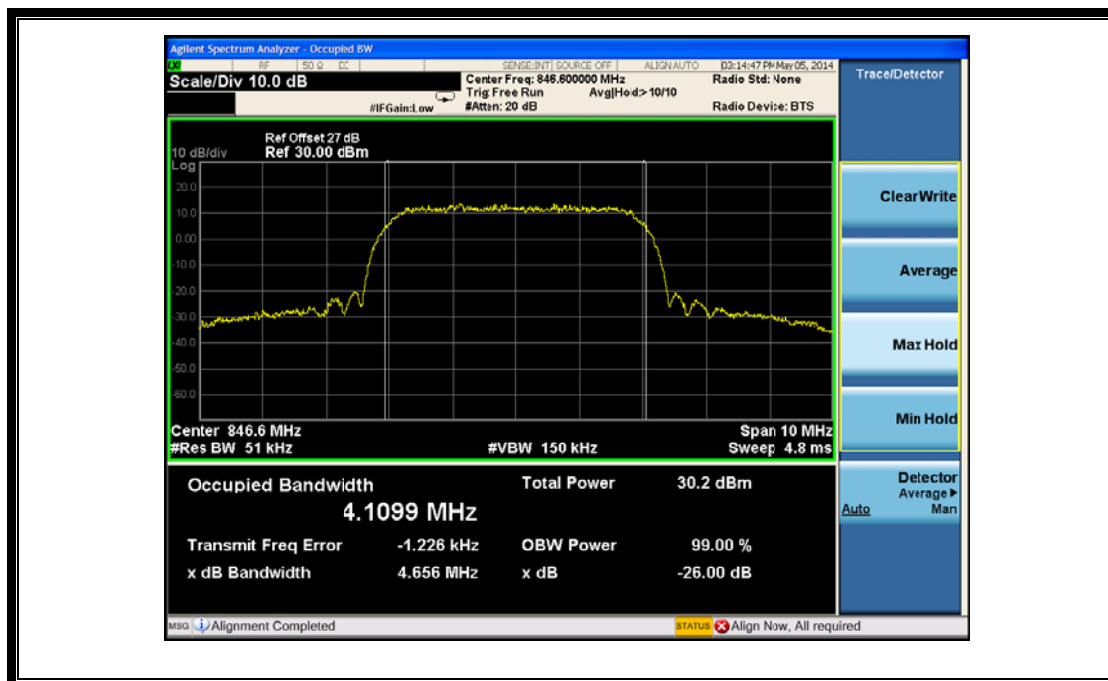
(Plot L: WCDMA1900MHz Channel = 9538)



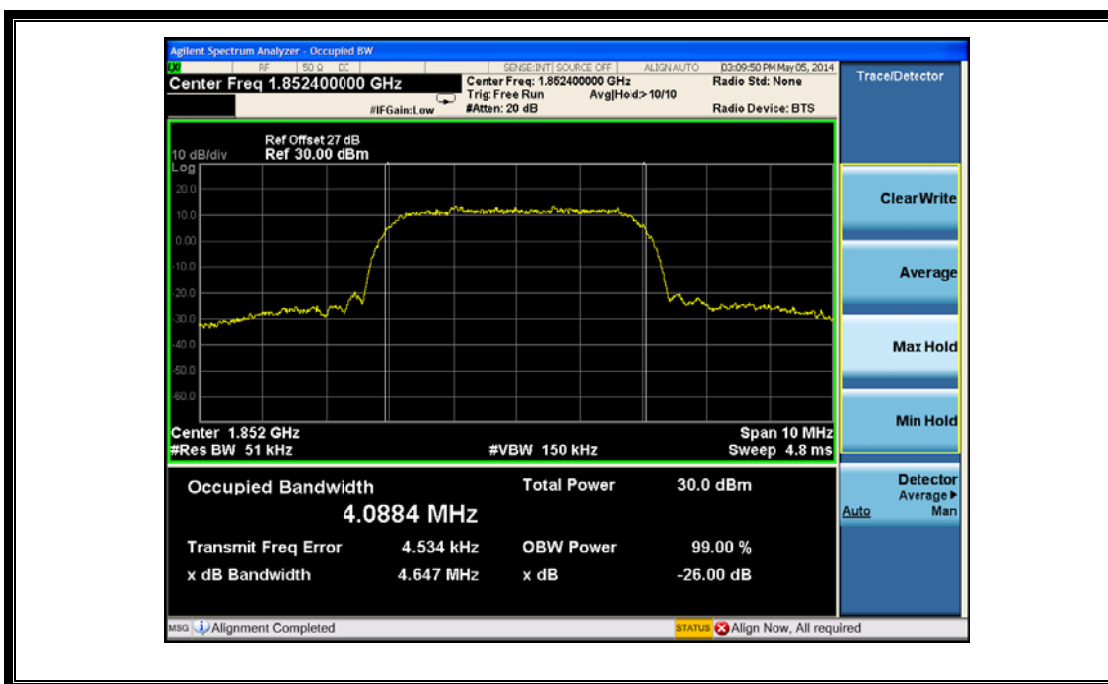
(Plot M: HSDPA 850MHz Channel = 4132)



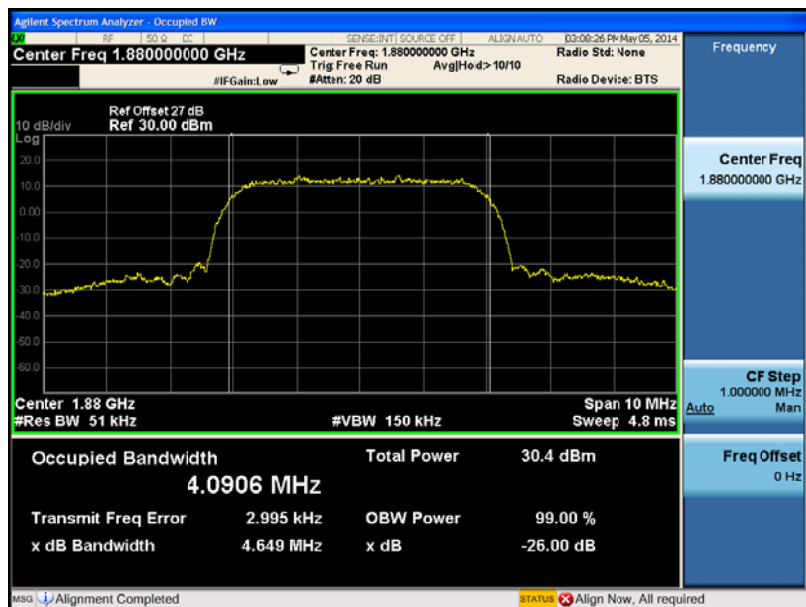
(Plot N: HSDPA 850 MHz Channel = 4175)



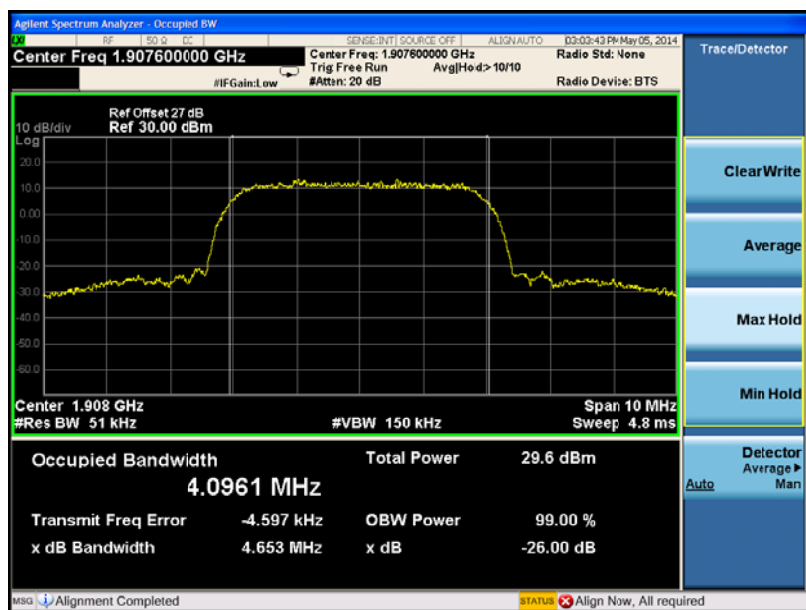
(Plot O: HSDPA 850 MHz Channel = 4233)



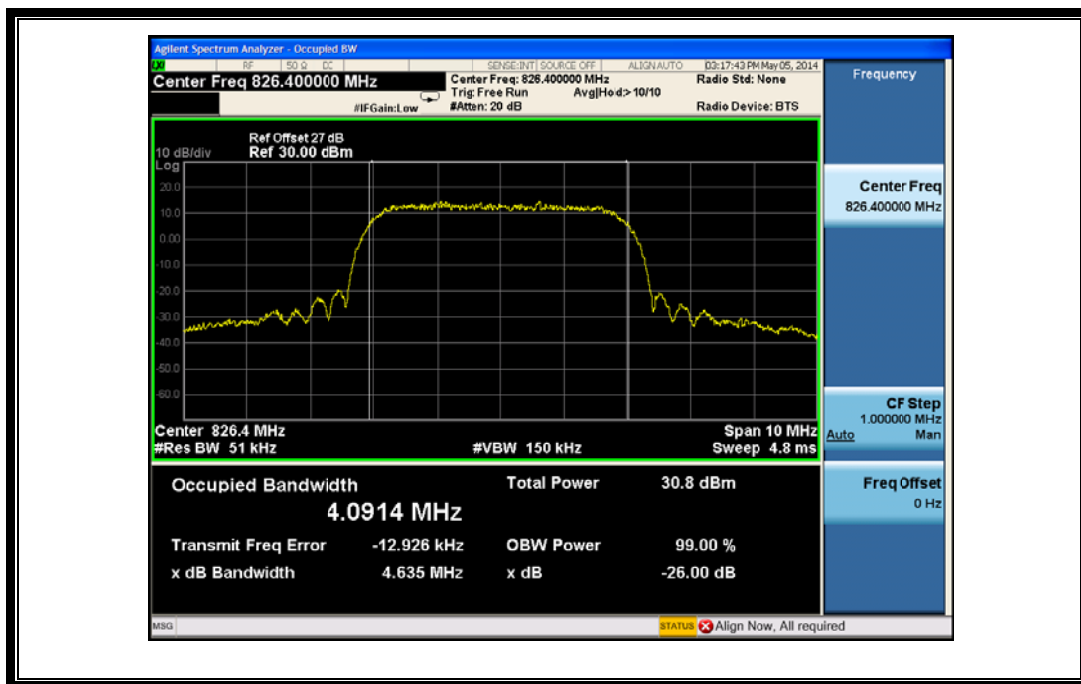
(Plot P: HSDPA 1900 MHz Channel = 9262)



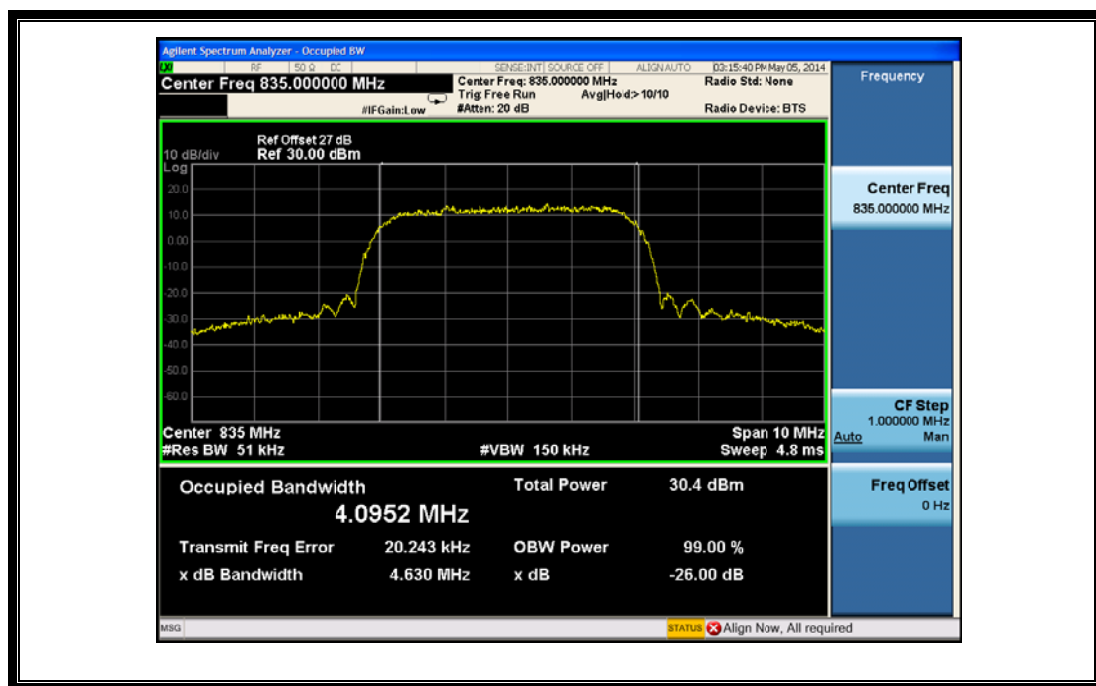
(Plot Q: HSDPA1900 MHz Channel = 9400)



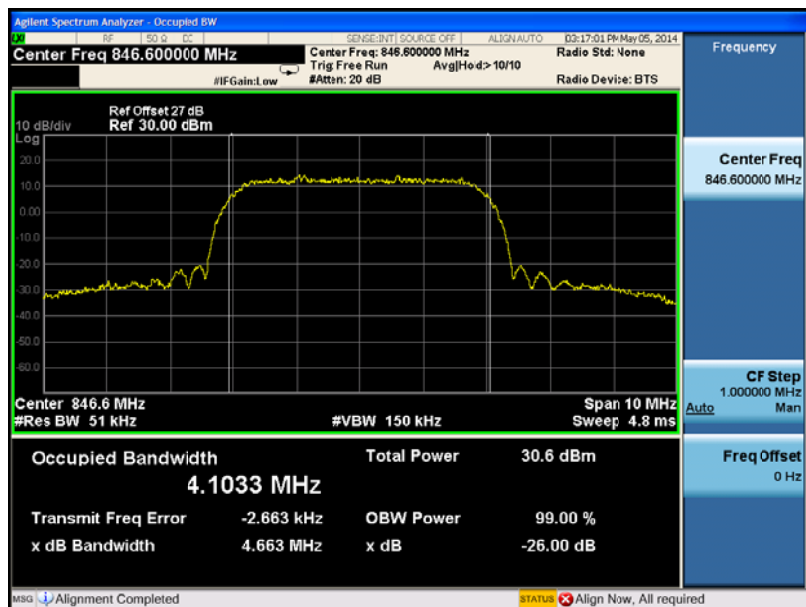
(Plot R: HSDPA 1900 MHz Channel = 9538)



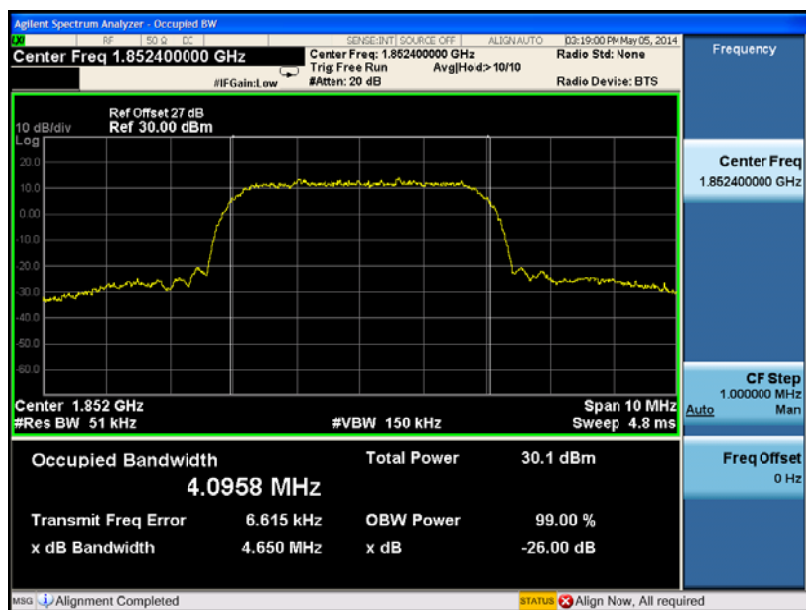
(Plot S: HSUPA850 MHz Channel = 4132)



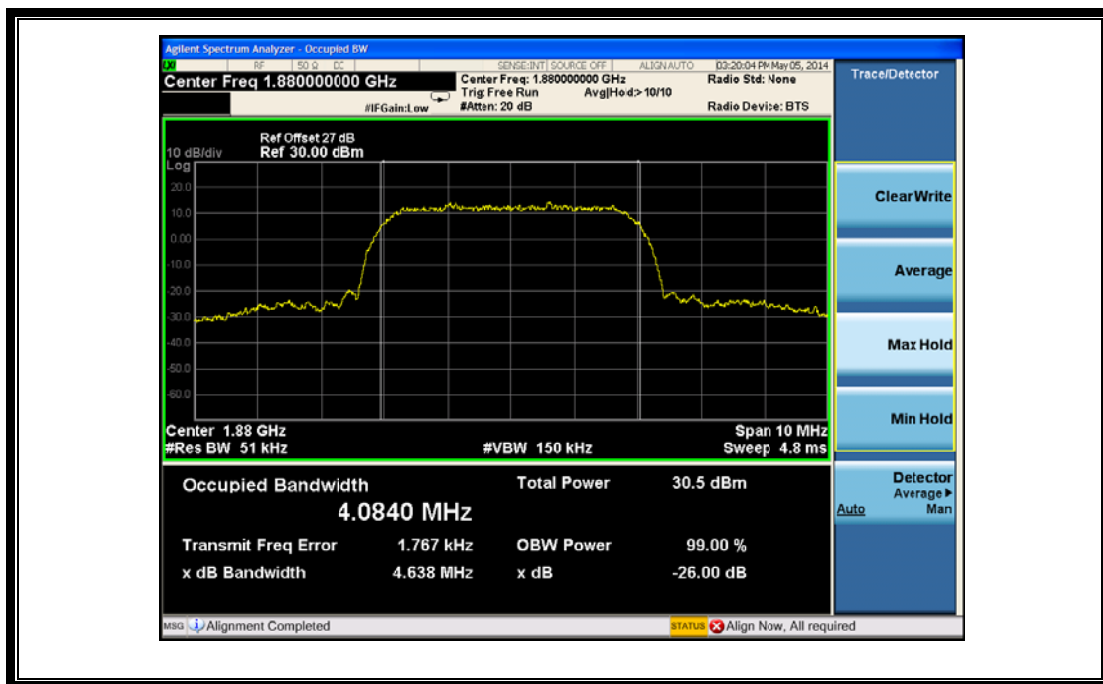
(Plot T: HSUPA850 MHz Channel = 4175)



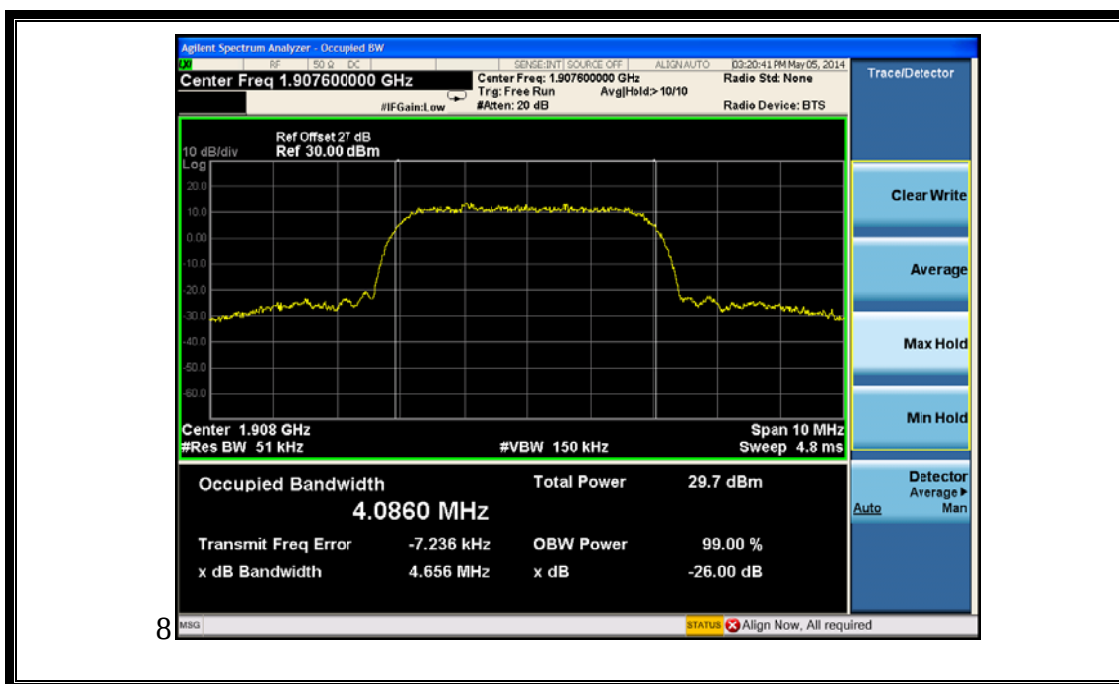
(Plot U: HSUPA850 MHz Channel = 4233)



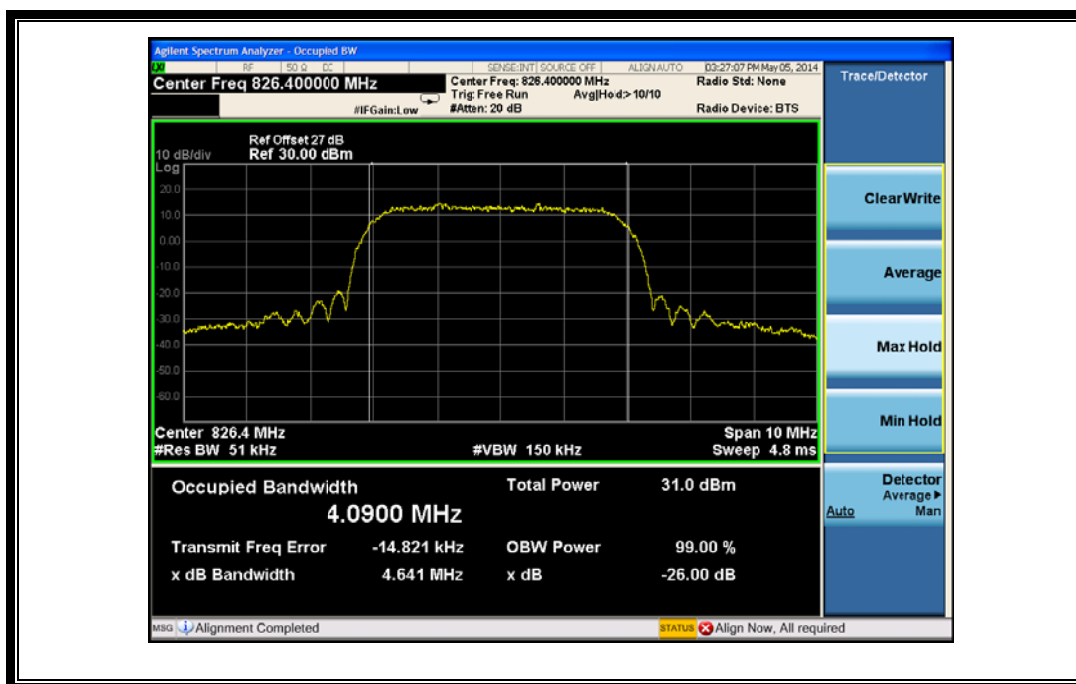
(Plot V: HSUPA1900 MHz Channel = 9262)



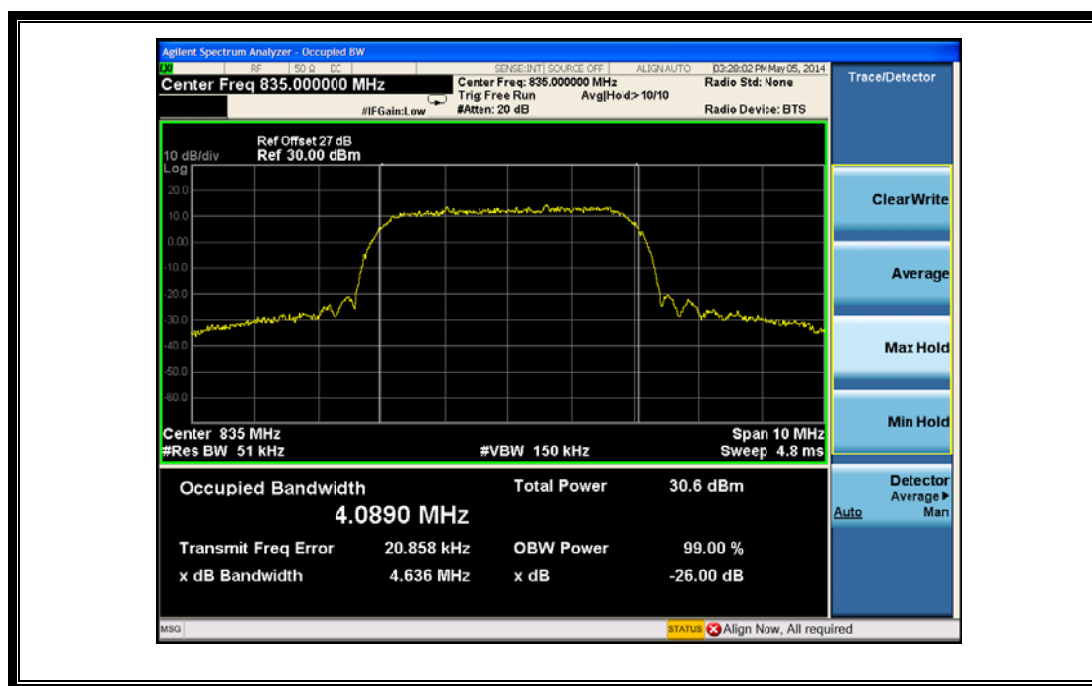
(Plot W: HSUPA1900 MHz Channel = 9400)



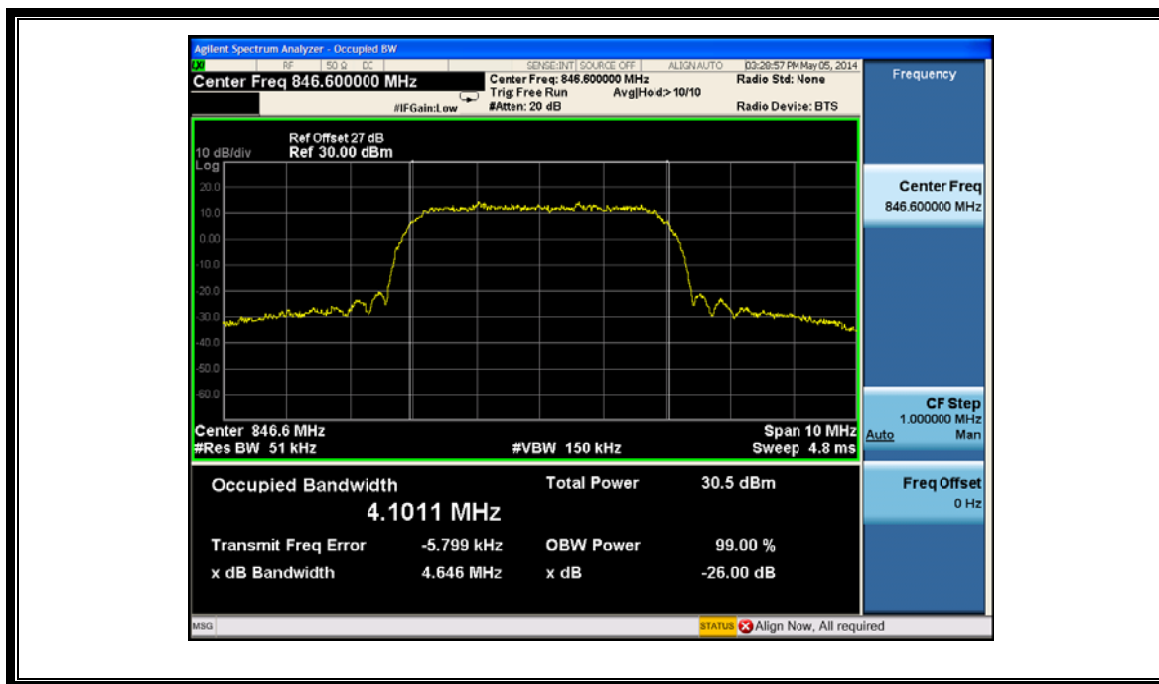
(Plot X: HSUPA1900 MHz Channel = 9538)



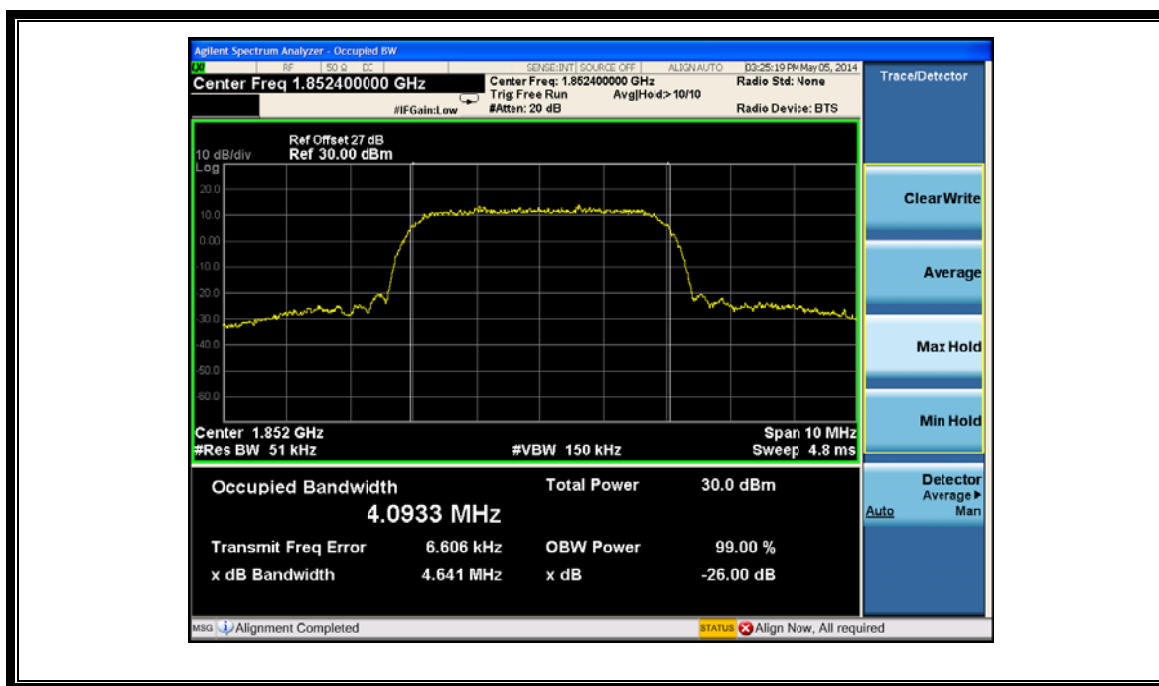
(Plot Y: HSPA+850 MHz Channel = 4132)



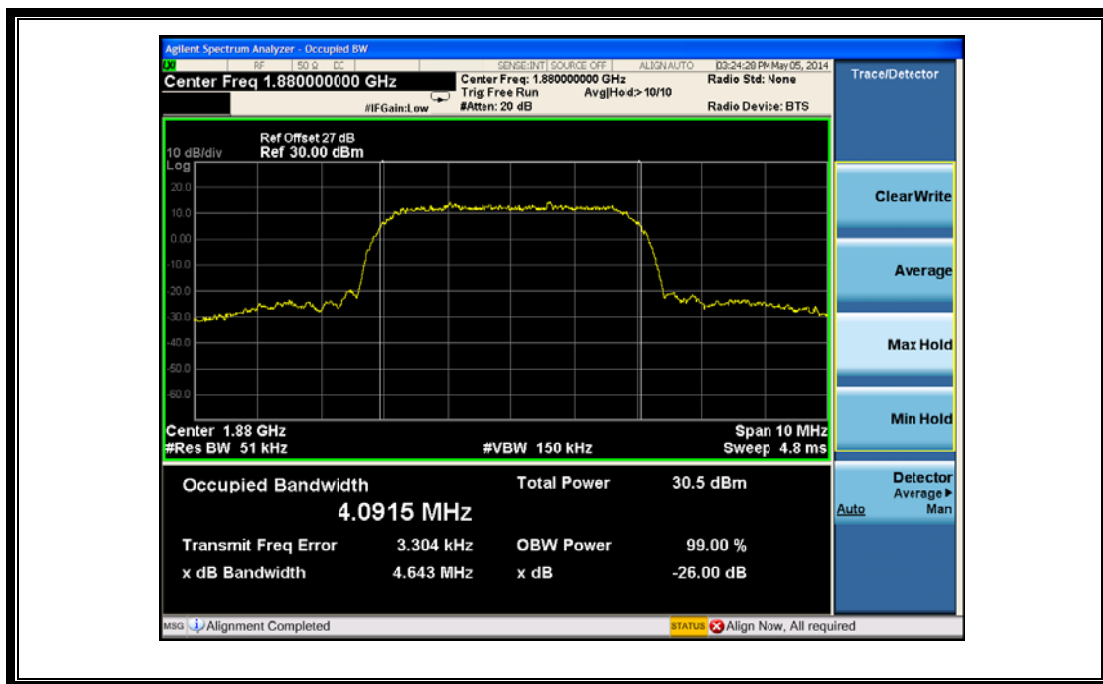
(Plot Z: HSPA+850 MHz Channel = 4175)



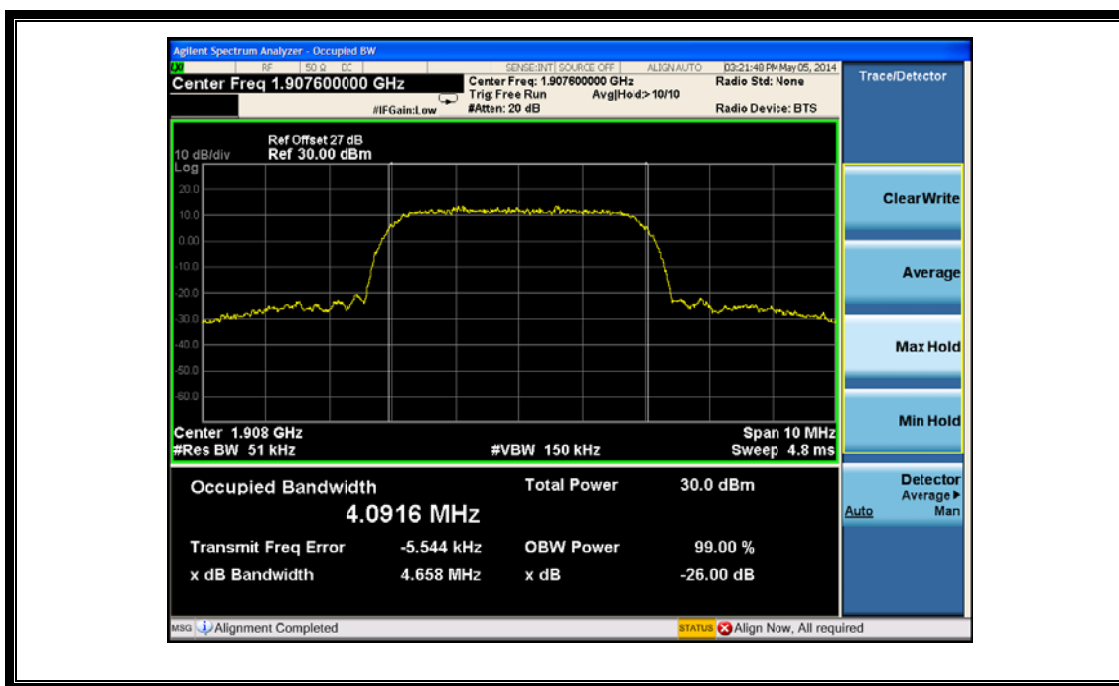
(Plot A1:HSPA+850 MHz Channel = 4233)



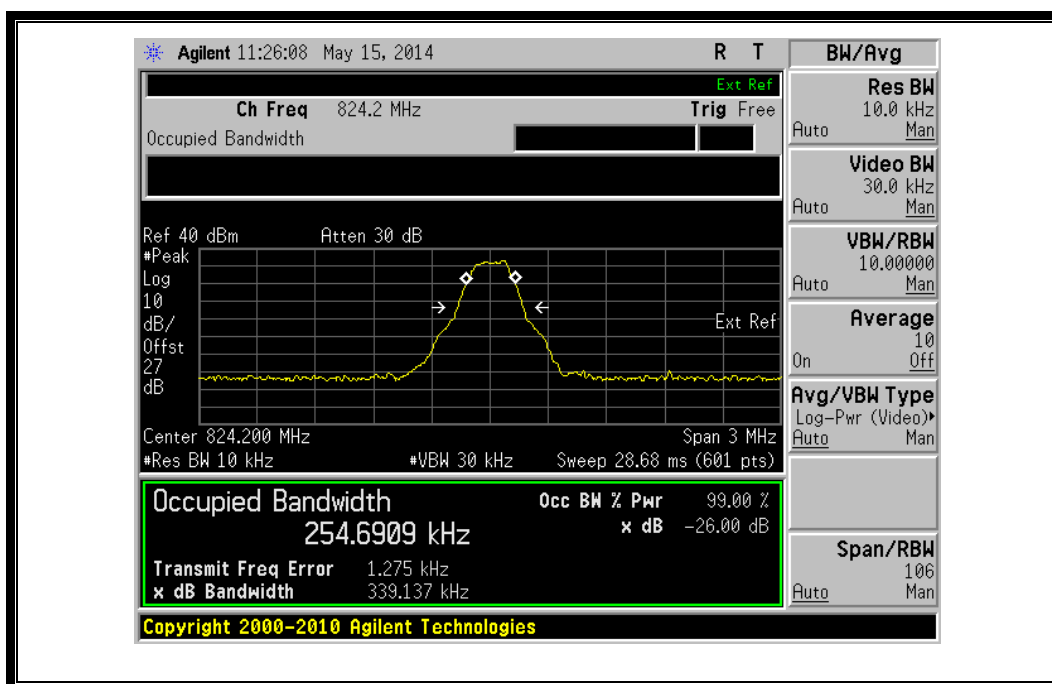
(Plot B1: HSPA+1900 MHz Channel = 9262)



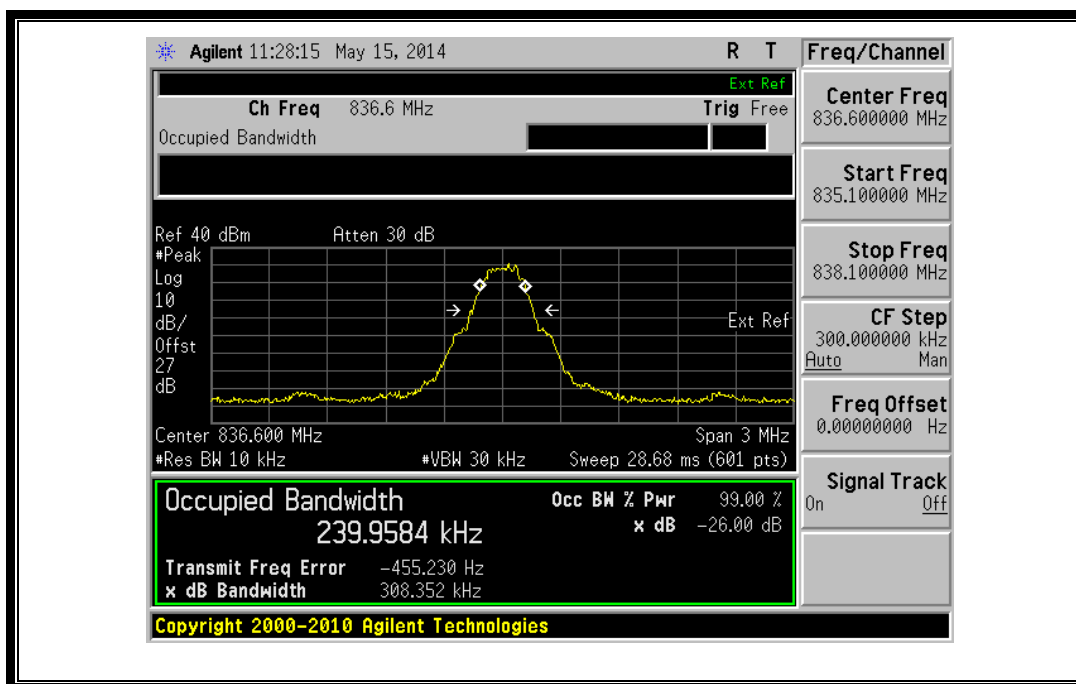
(Plot C1: HSPA+1900 MHz Channel = 9400)



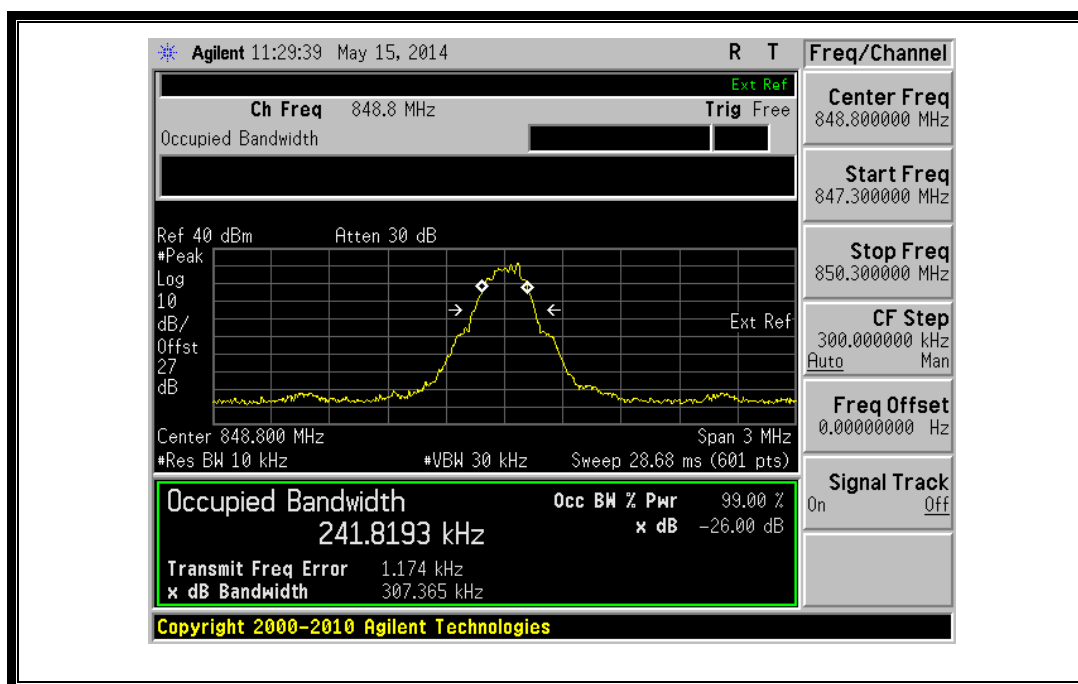
(Plot D1: HSPA+1900 MHz Channel = 9538)



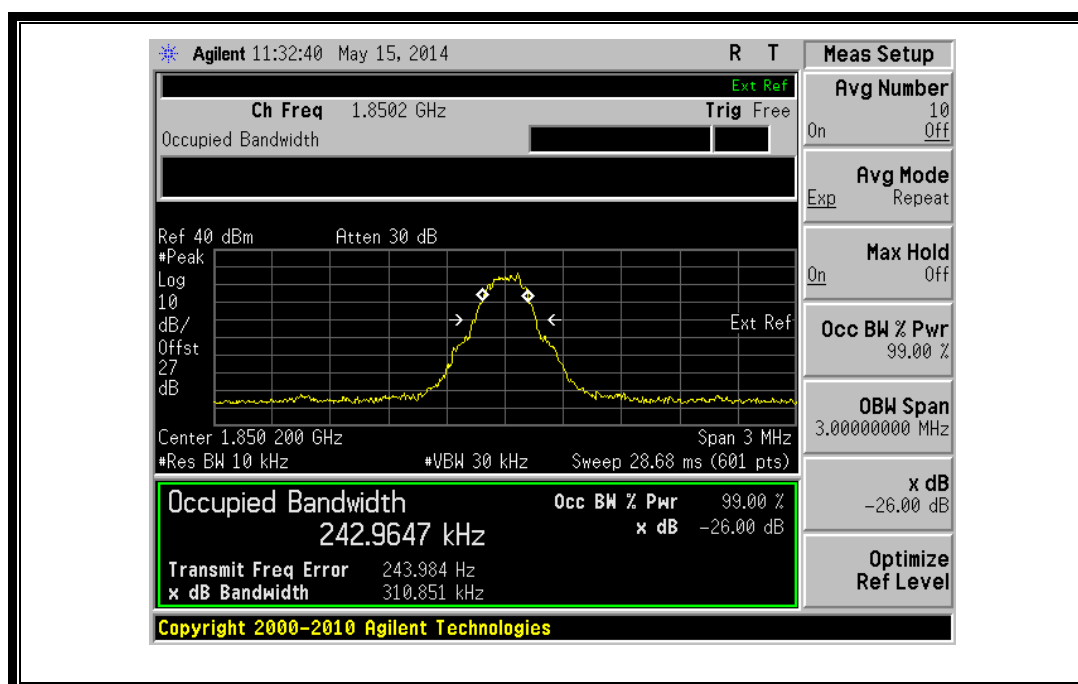
(Plot E1: GSM 850MHz Channel = 128)



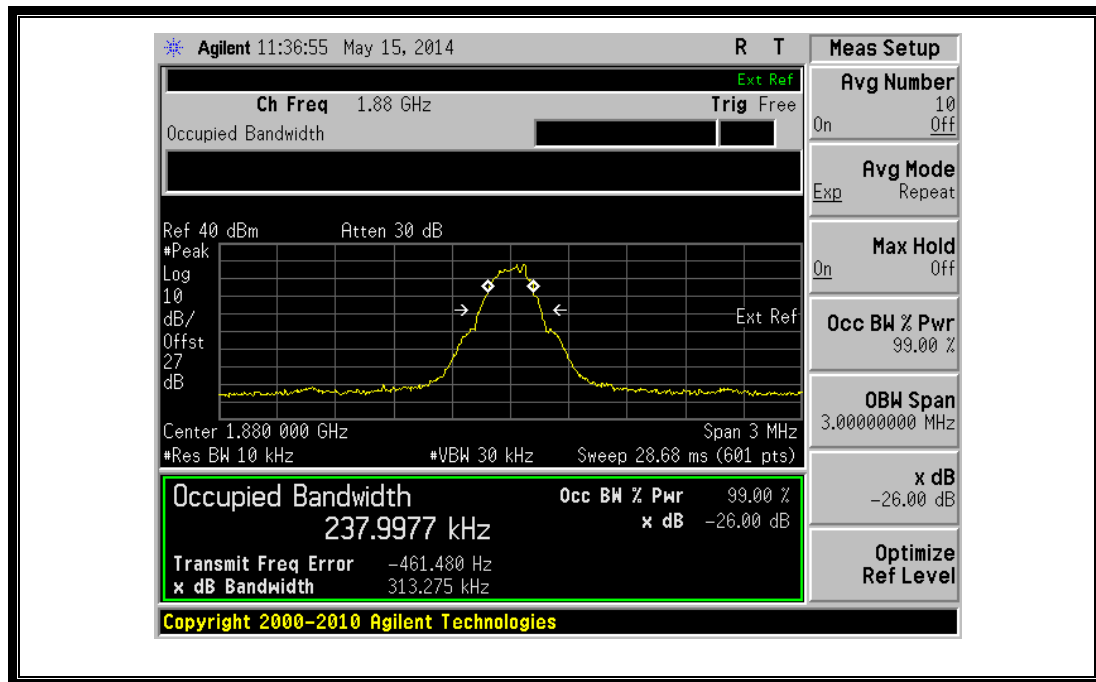
(Plot F1: GSM 850MHz Channel = 190)



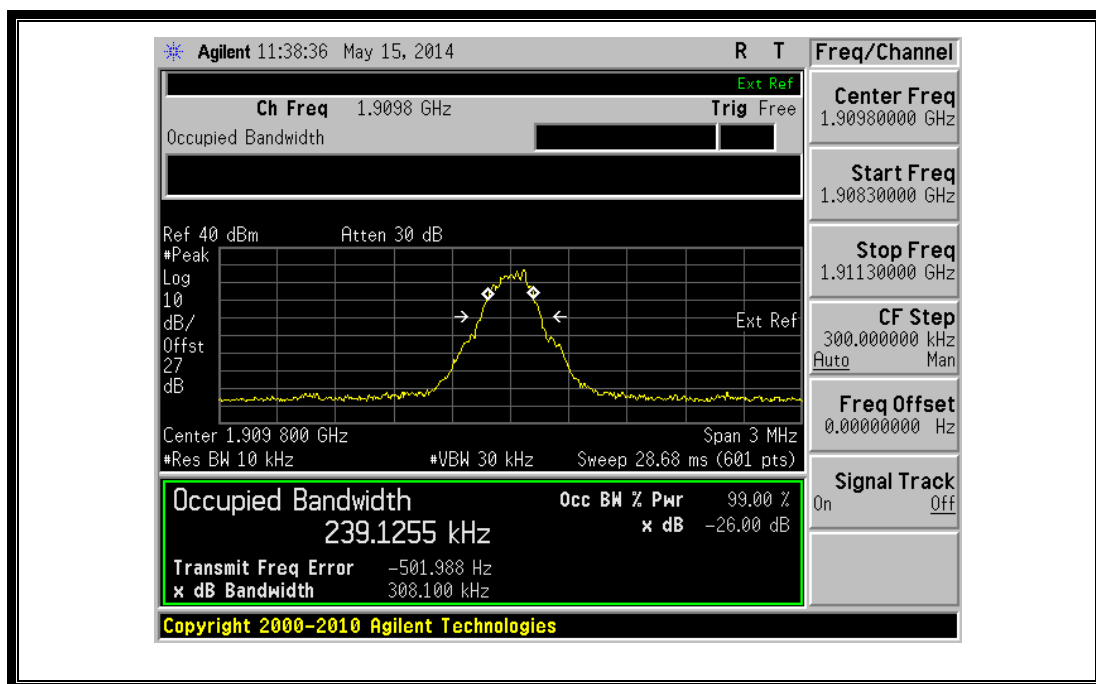
(Plot G1: GSM 850MHz Channel = 251)



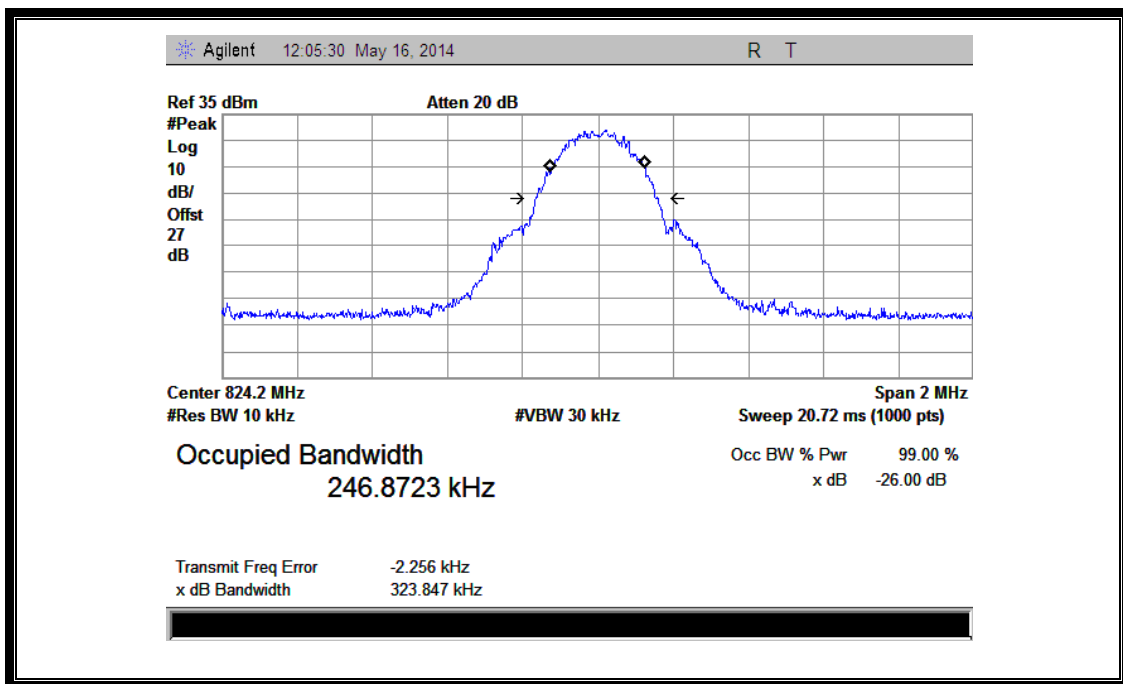
(Plot H1: GSM 1900MHz Channel = 512)



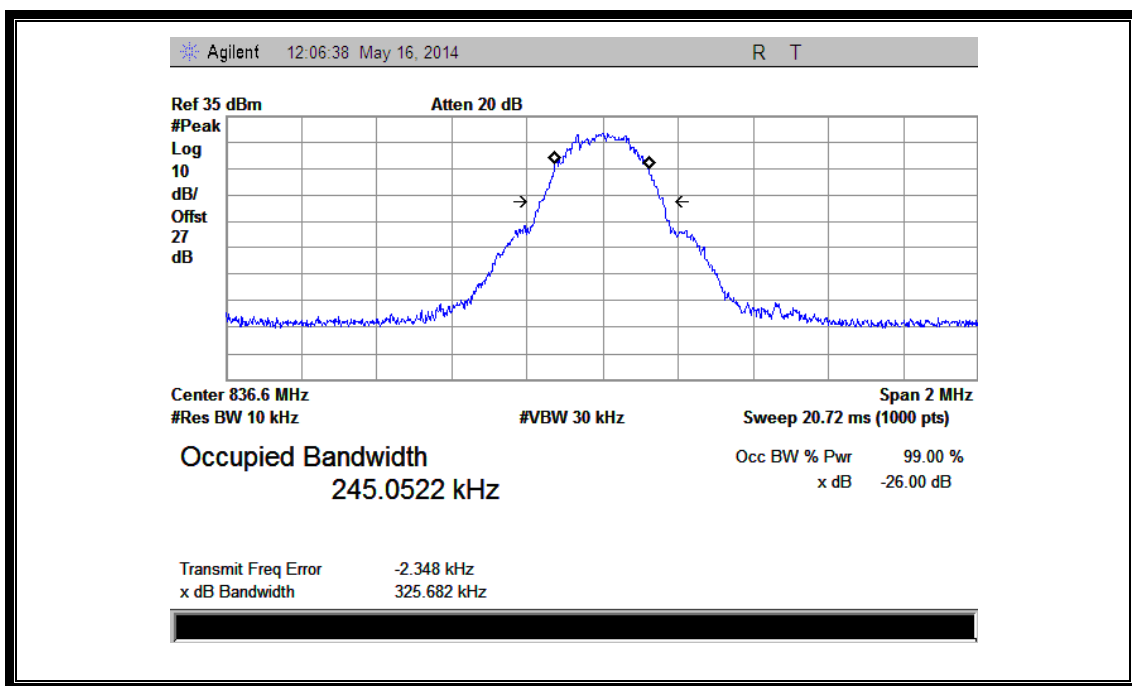
(Plot I1: GSM 1900MHz Channel = 661)



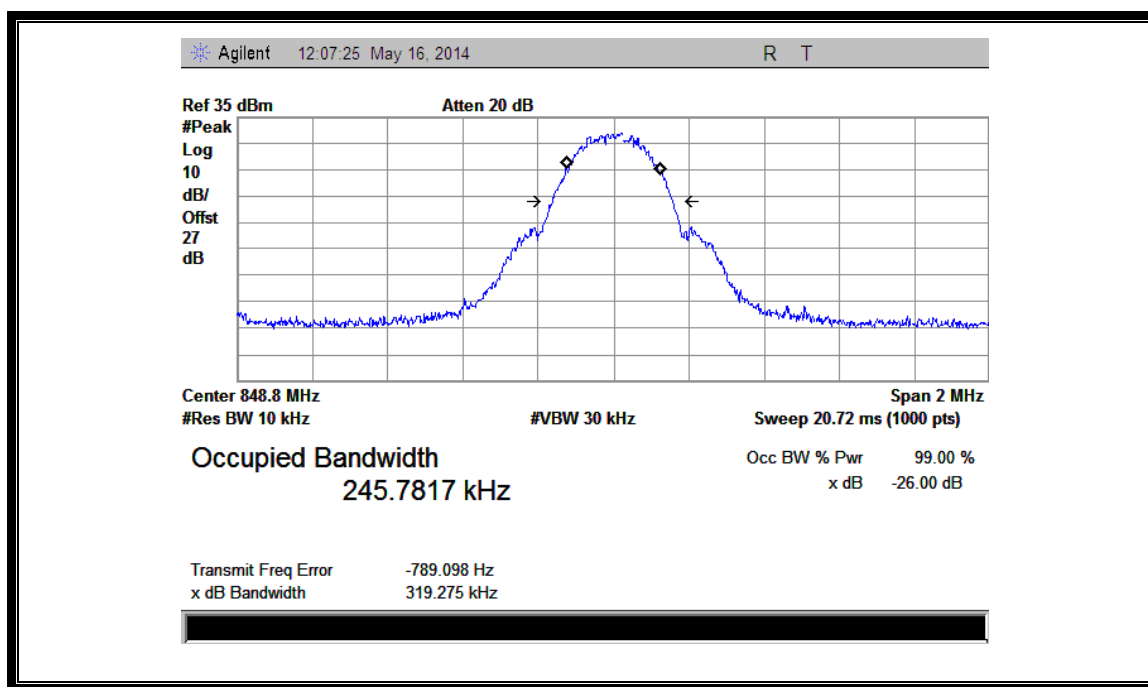
(Plot J1: GSM 1900MHz Channel = 810)



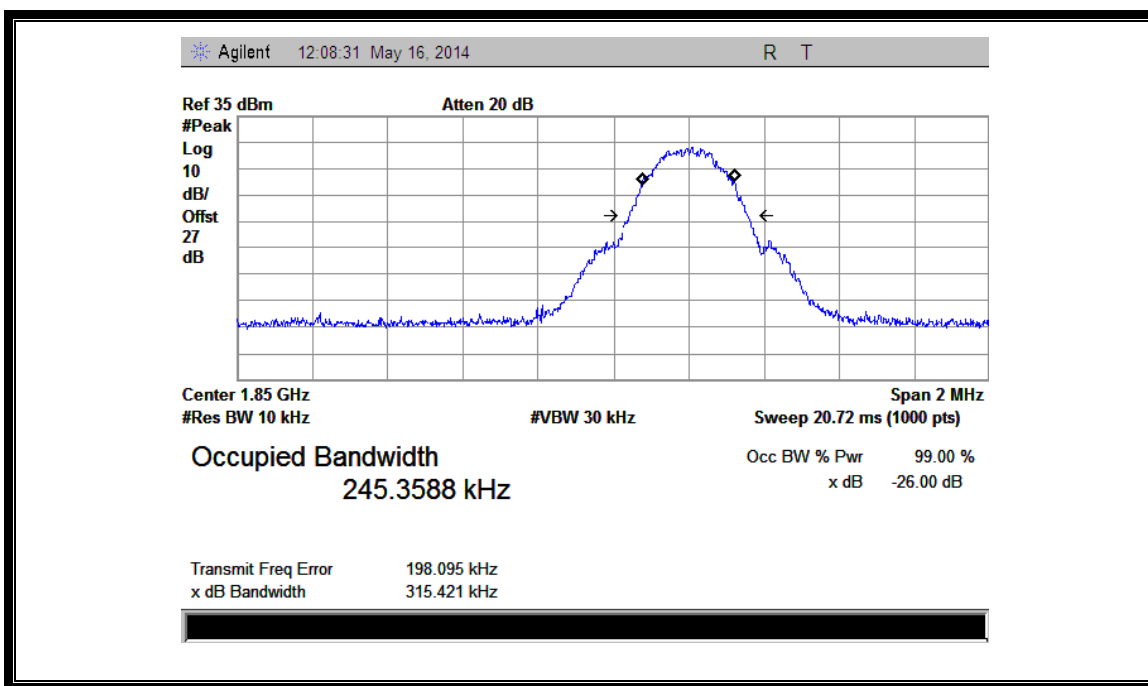
(Plot K1: GPRS 850MHz Channel = 128)



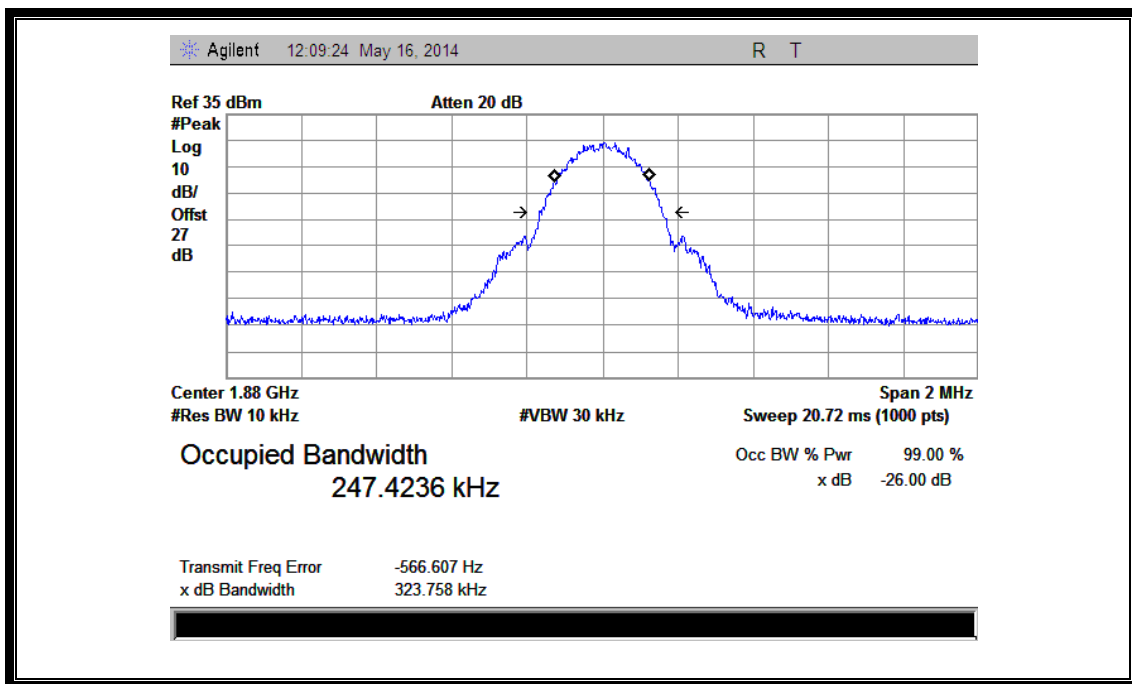
(Plot L1:GPRS 850MHz Channel = 190)



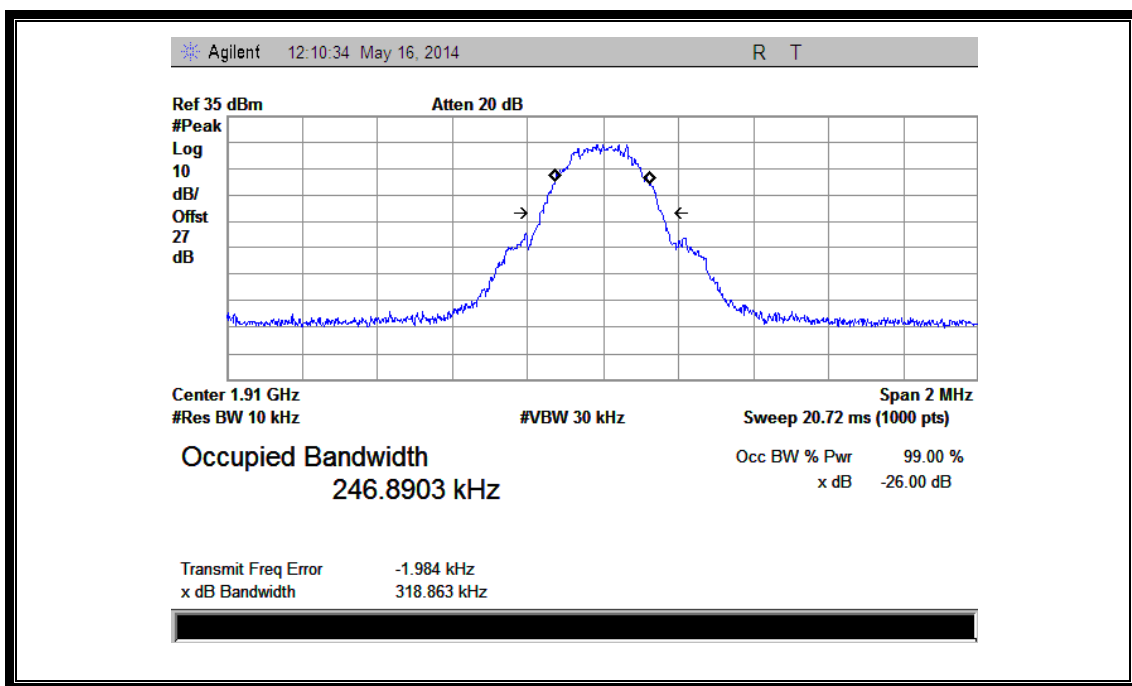
(Plot M1: GPRS850MHz Channel = 251)



(Plot N1: GPRS 1900MHz Channel = 512)



(Plot O1: GPRS 1900MHz Channel = 661)



(Plot P1: GPRS 1900MHz Channel = 810)

2.4 Frequency Stability

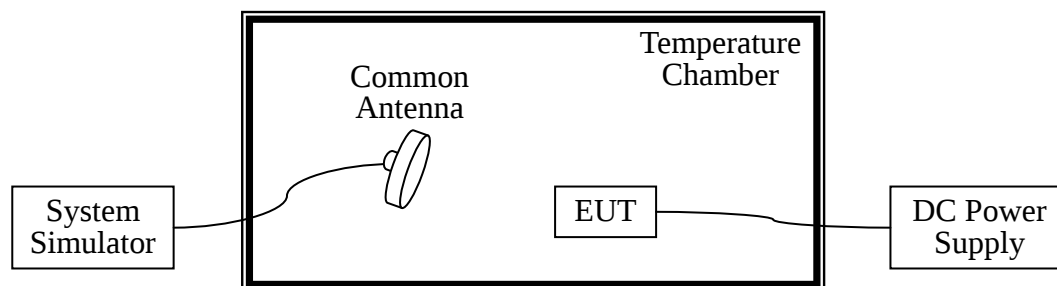
2.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235, 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.

2.4.2 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 3.8VDC, 4.35VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of

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

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	
5.0	-30	-23.45	±2060.5	22.12	±2091.5	16.87	±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		
5.25	+25	-15.73		29.05		-7.55		
4.75	+25	-17.75		37.73		7.78		

2. GSM 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
5.0	-30	18.21	±1850.2	21.78	±1880.0	32.75	±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		
5.25	+25	37.88		23.72		27.09		
4.75	+25	-7.69		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	
5.0	-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		
5.25	+25	-15.71		14.05		-7.83		
4.75	+25	-17.02		6.93		6.98		

4. EDGE 1900MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	Channel = 512 (1850.2MHz)		Channel = 661 (1880.0MHz)		Channel = 810 (1909.8MHz)		
		Hz	Limits	Hz	Limits	Hz	Limits	
5.0	-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		
5.25	+25	18.02	4.08	26.59				
4.75	+25	-7.29	14.13	19.03				

5. WCDMA 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	
5.0	-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		
5.25	+25	-6.87		30.82		23.89		
4.75	+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	
5.0	-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		
5.25	+25	23.23		14.68		21.05		
4.75	+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	
5.0	-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		
5.25	+25	32.03		7.93		7.98		
4.75	+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	
5.0	-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		
5.25	+25	-11.25		29.53		-2.83		
4.75	+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	
5.0	-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		
5.25	+25	1.78		-4.67		29.31		
4.75	+25	1.65		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	
5.0	-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		
5.25	+25	-8.08		6.71		25.38		
4.75	+25	23.78		-1.73		-15.88		

11. HSPA+ 850MHz Band

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperat ure (°C)	Channel = 4123 (826.4MHz)		Channel = 4175 (835MHz)		Channel = 4233 (846.6MHz)		
		Hz	Limit	Hz	Limit	Hz	Limit	
5.0	-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		
5.25	+25	1.78		-4.67		29.31		
4.75	+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	
5.0	-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		
5.25	+25	-8.08		6.71		25.38		
4.75	+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) 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 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

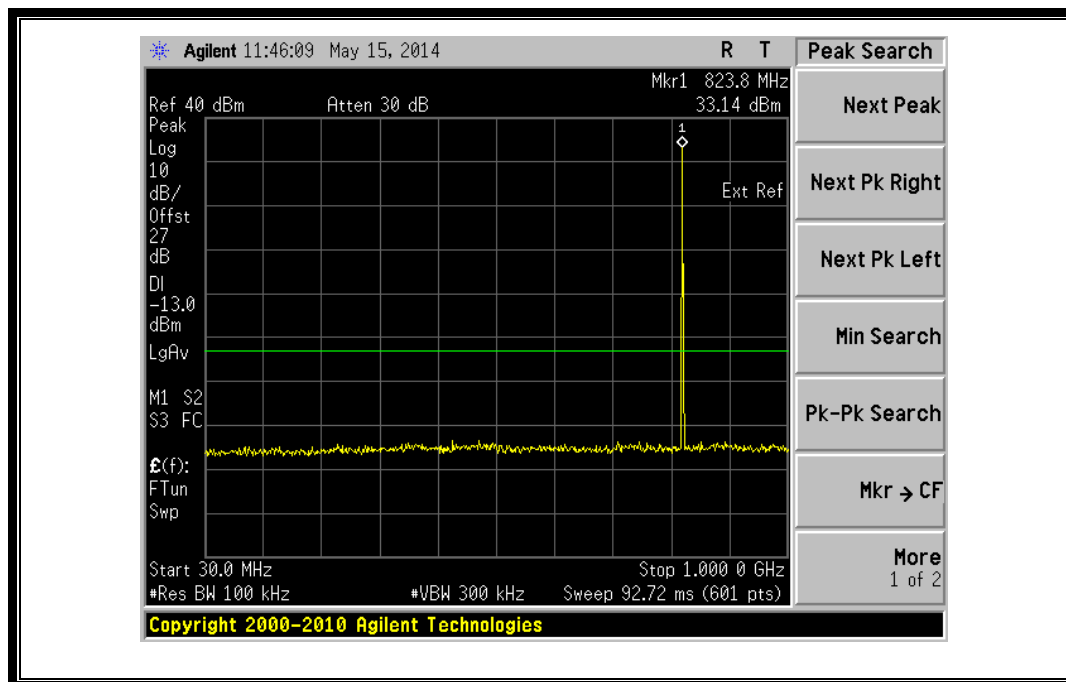
1. Test Verdict:

Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
GSM 850MHz	128	824.2	-21.01	Plot A1toA1.1	-13	<u>PASS</u>
	190	836.6	-21.42	Plot A2toA2.1		<u>PASS</u>
	251	848.8	-20.66	Plot A3toA3.1		<u>PASS</u>
GSM 1900MHz	512	1850.2	-18.81	Plot B1toB1.1	-13	<u>PASS</u>
	661	1880.0	-19.01	Plot B2toB2.1		<u>PASS</u>
	810	1909.8	-20.42	Plot B3toB3.1		<u>PASS</u>
EDGE 850MHz	128	824.2	-22.14	Plot C1toC1.1	-13	<u>PASS</u>
	190	836.6	-18.49	Plot C2toC2.1		<u>PASS</u>
	251	848.8	-18.52	Plot C3toC3.1		<u>PASS</u>
EDGE 1900MHz	512	1850.2	-20.86	Plot D1toD1.1	-13	<u>PASS</u>
	661	1880.0	-19.74	Plot D2toD2.1		<u>PASS</u>
	810	1909.8	-19.68	Plot D3toD3.1		<u>PASS</u>
WCDMA 850MHz	4132	826.4	-20.900	Plot E1toE1.1	-13	<u>PASS</u>
	4175	835	<-25	Plot E2toE2.1		<u>PASS</u>
	4233	846.6	-22.490	Plot E3toE3.1		<u>PASS</u>
WCDMA 1900MHz	9262	1852.4	-23.097	Plot F1toF1.1	-13	<u>PASS</u>
	9400	1880	<-25	Plot F2toF2.1		<u>PASS</u>
	9538	1907.6	<-25	Plot F3toF3.1		<u>PASS</u>
HSDPA	4132	826.4	-21.315	Plot G1toG1.1	-13	<u>PASS</u>

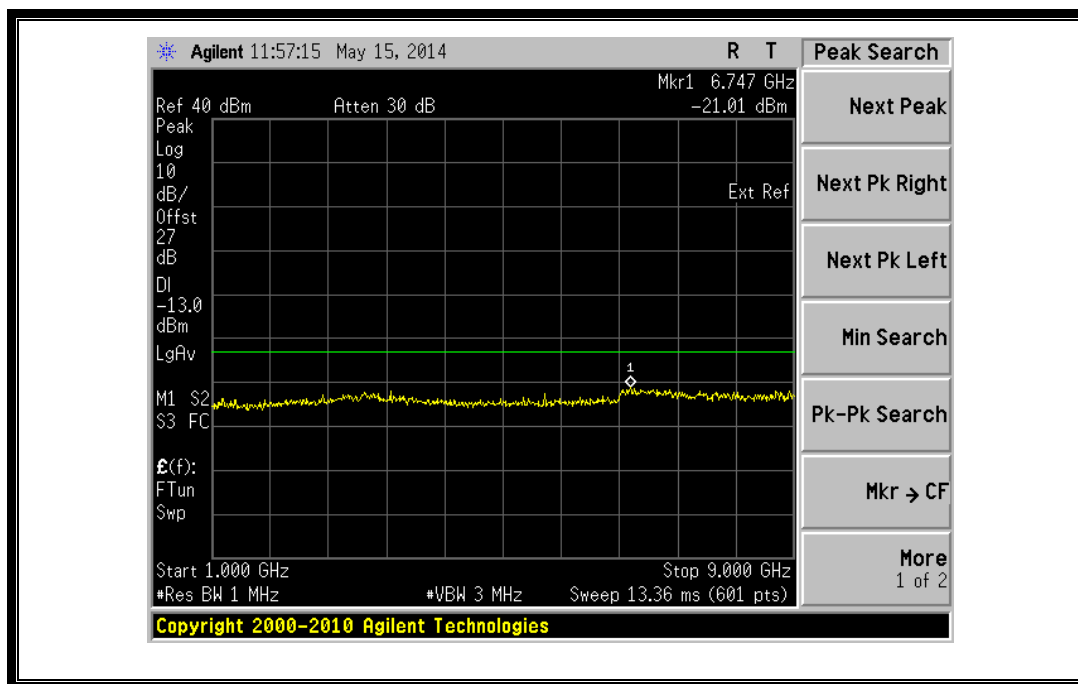
Band	Channel	Frequency (MHz)	Measured Max. Spurious Emission (dBm)	Refer to Plot	Limit (dBm)	Verdict
850MHz	4175	835	<-25	Plot G2toG2.1		<u>PASS</u>
	4233	846.6	-22.719	Plot G3toG3.1		<u>PASS</u>
HSDPA 1900MHz	9262	1852.4	<-25	Plot H1toH1.1	-13	<u>PASS</u>
	9400	1880	<-25	Plot H2toH2.1		<u>PASS</u>
	9538	1907.6	<-25	Plot H3toH3.1		<u>PASS</u>
HSUPA 850MHz	4132	826.4	-21.802	Plot I1toI1.1	-13	<u>PASS</u>
	4175	835	<-25	Plot I2toI2.1		<u>PASS</u>
	4233	846.6	-22.828	Plot I3toI3.1		<u>PASS</u>
HSUPA 1900MHz	9262	1852.4	<-25	Plot J1toJ1.1	-13	<u>PASS</u>
	9400	1880	<-25	Plot J2toJ2.1		<u>PASS</u>
	9538	1907.6	<-25	Plot J3toJ3.1		<u>PASS</u>
HSPA+ 850MHz	4132	826.4	-21.640	Plot K1toK1.1	-13	<u>PASS</u>
	4175	835	<-25	Plot K2toK2.1		<u>PASS</u>
	4233	846.6	-22.633	Plot K3toK3.1		<u>PASS</u>
HSPA+ 1900MHz	9262	1852.4	<-25	Plot L1toL1.1	-13	<u>PASS</u>
	9400	1880	<-25	Plot L2toL2.1		<u>PASS</u>
	9538	1907.6	<-25	Plot L3toL3.1		<u>PASS</u>

2. Test Plots for the Whole Measurement Frequency Range:

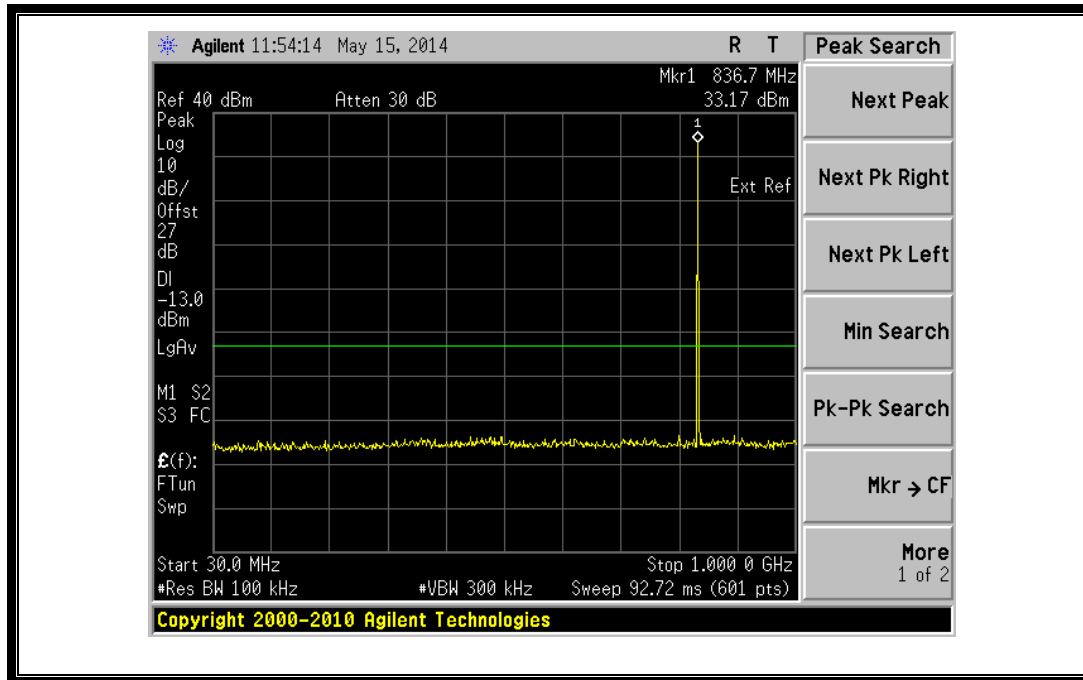
Note: the power of the EUT transmitting frequency should be ignored.



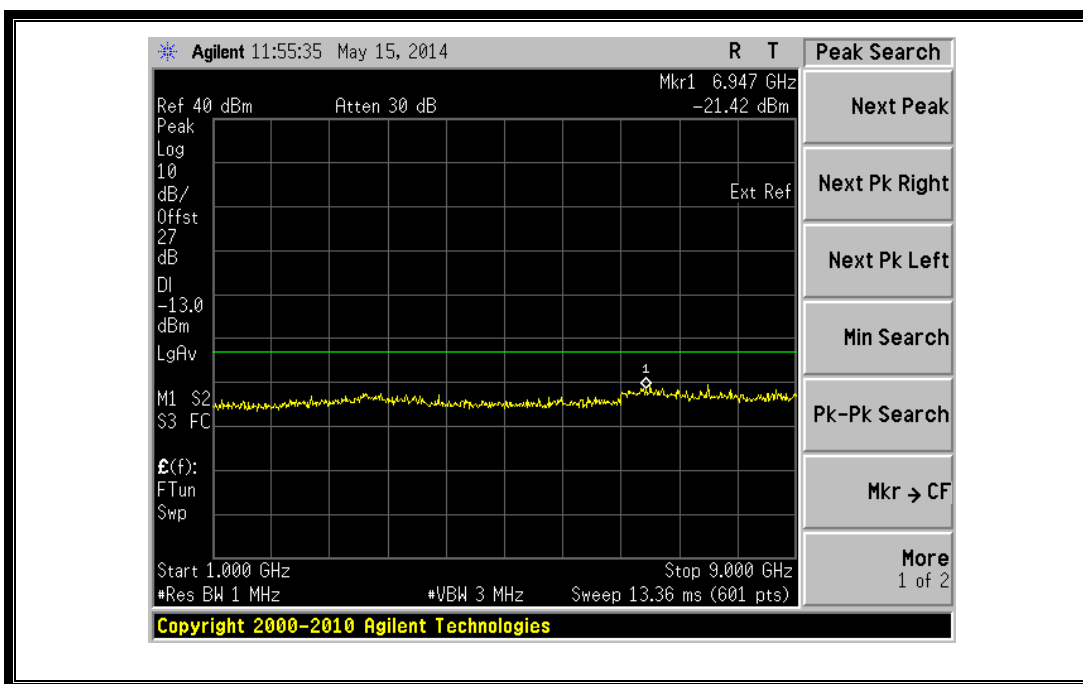
(Plot A1: GSM 850MHz Channel = 128, 30MHz to 1GHz)



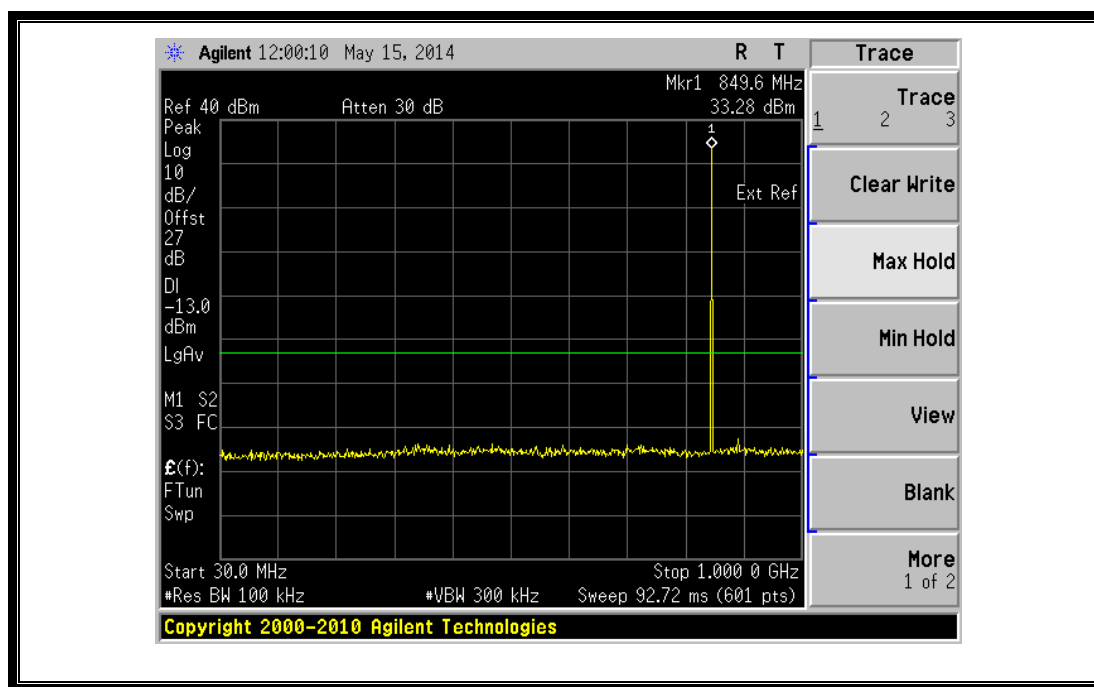
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



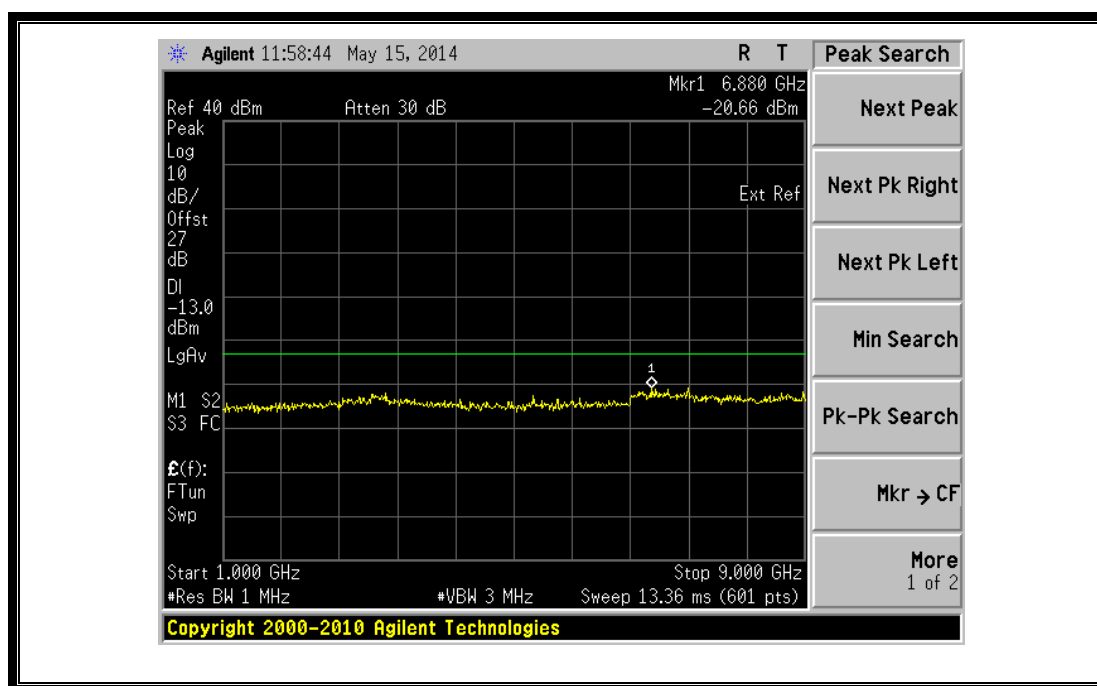
(Plot A2: GSM 850MHz Channel = 190, 30MHz to 1GHz)



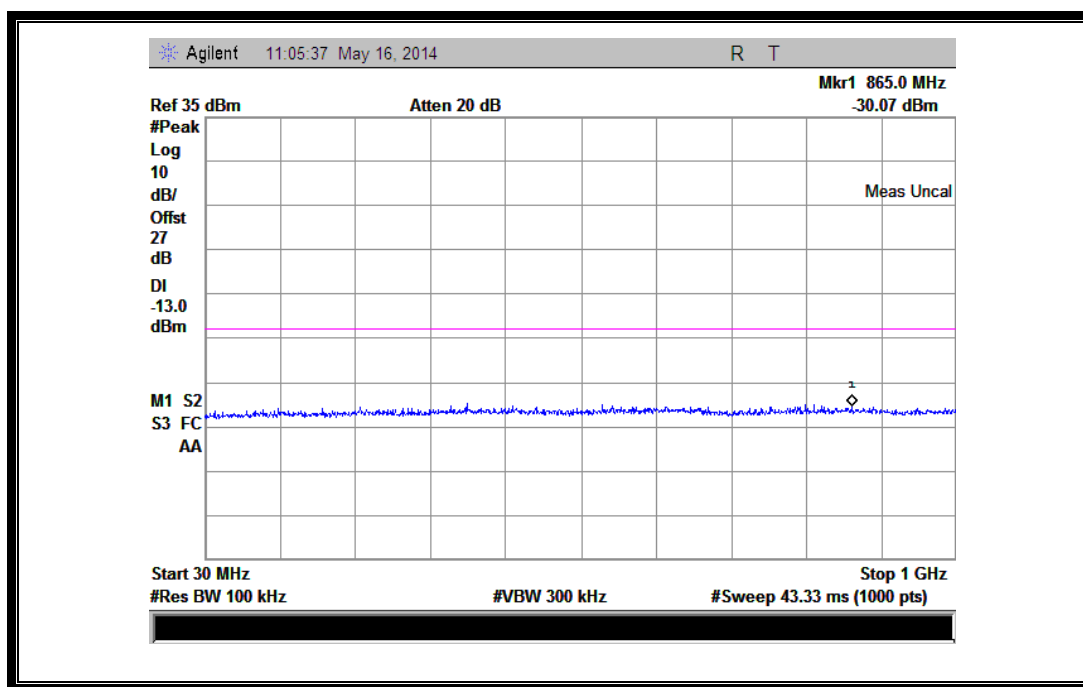
(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



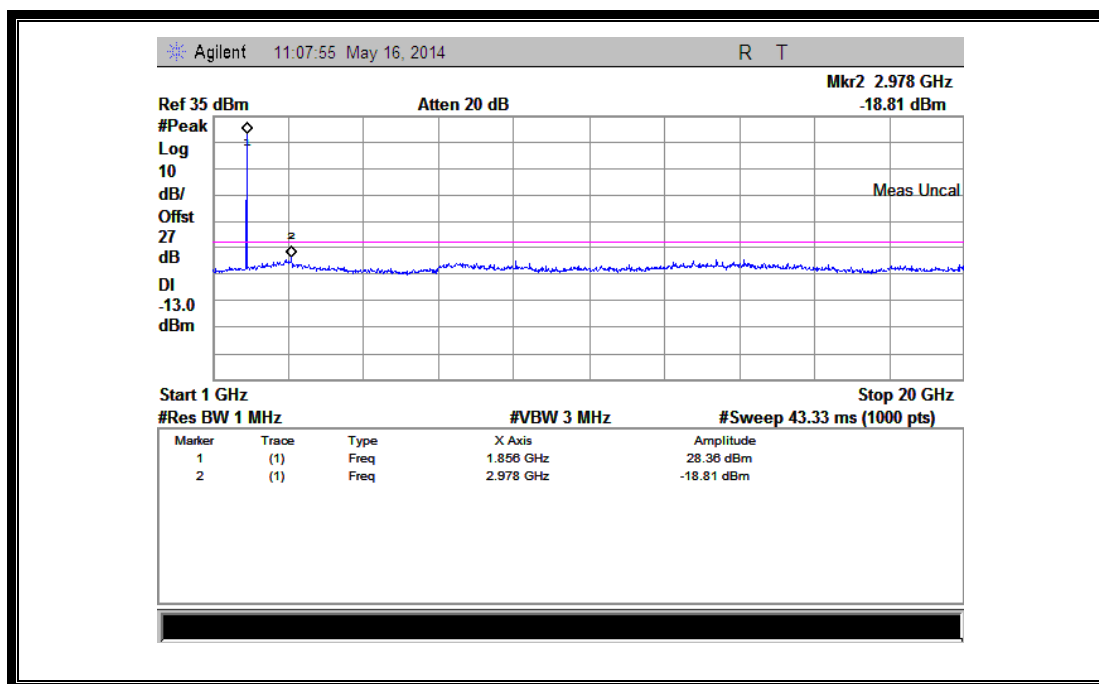
(Plot A3:GSM 850MHz Channel = 251, 30MHz to 1GHz)



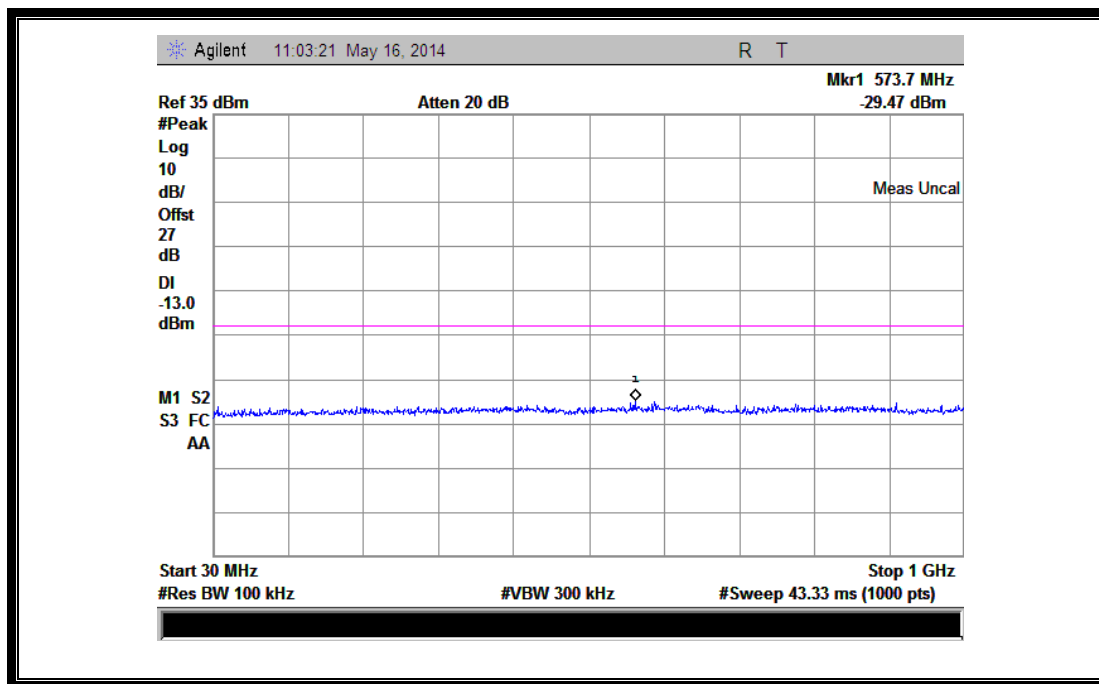
(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



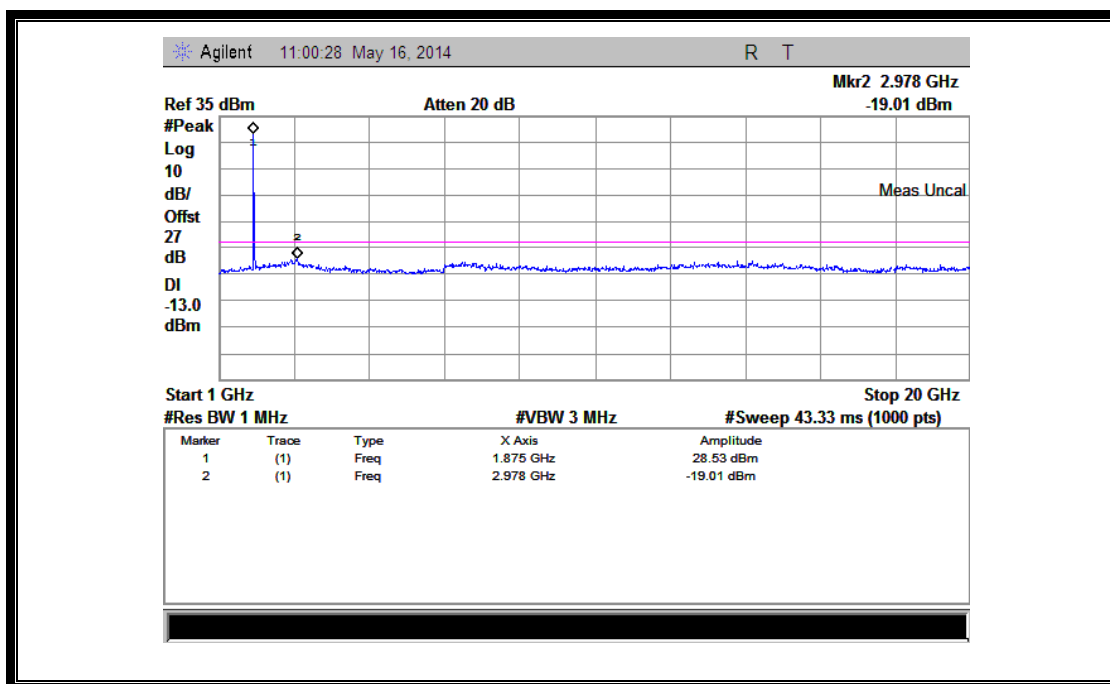
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



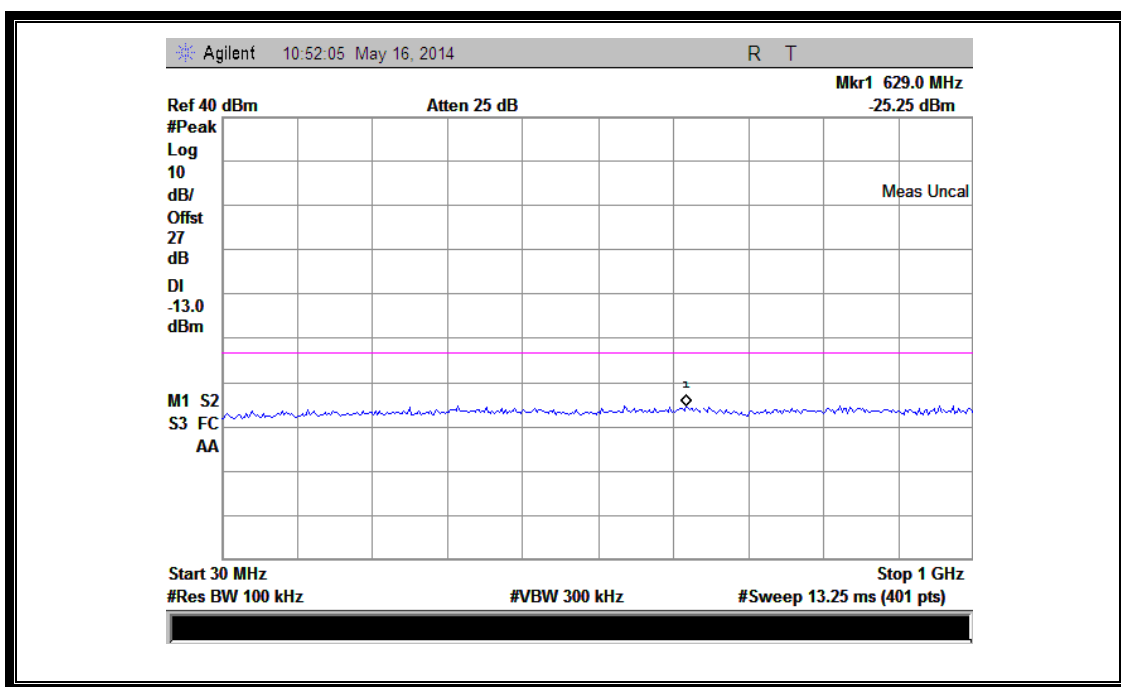
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



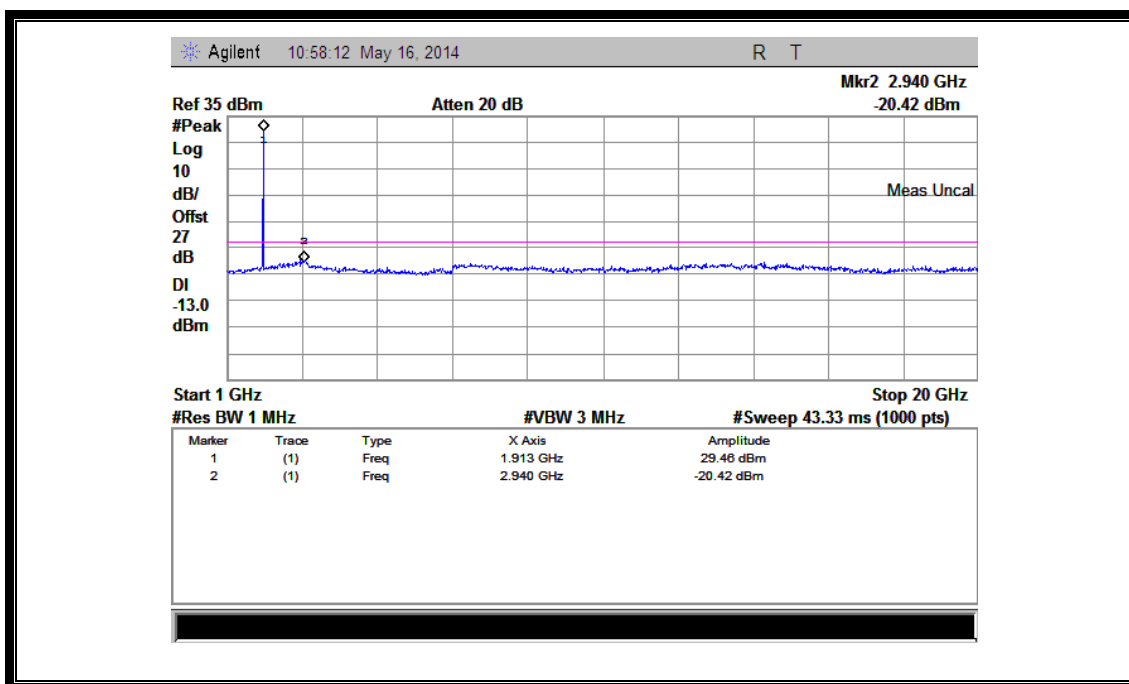
(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



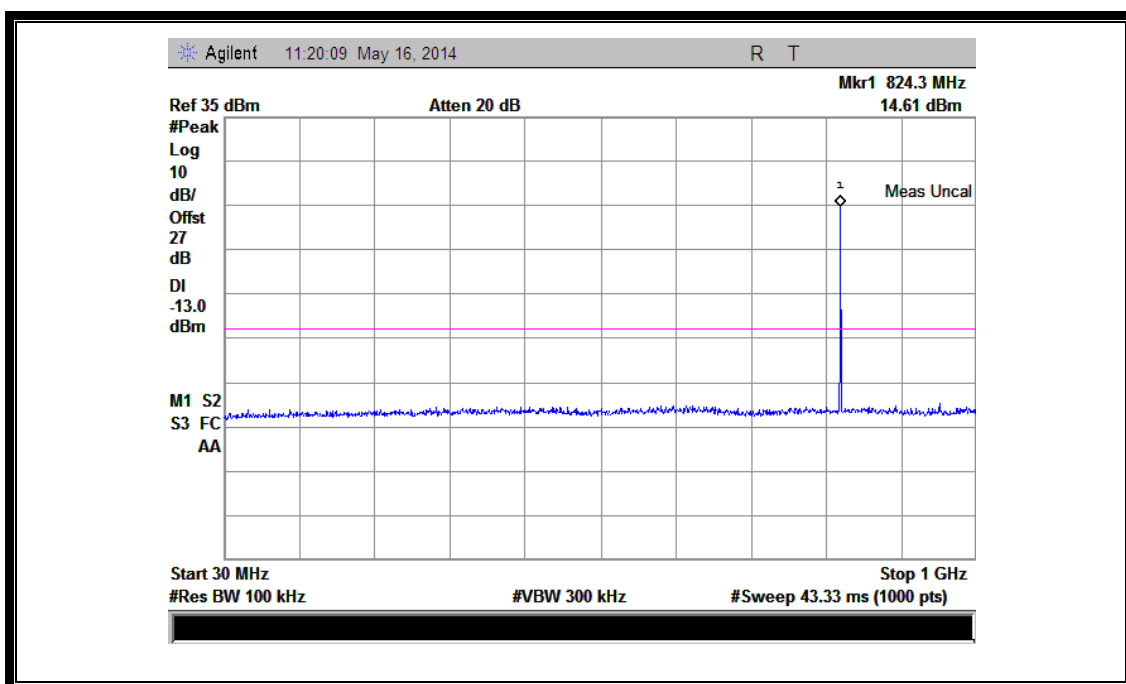
(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



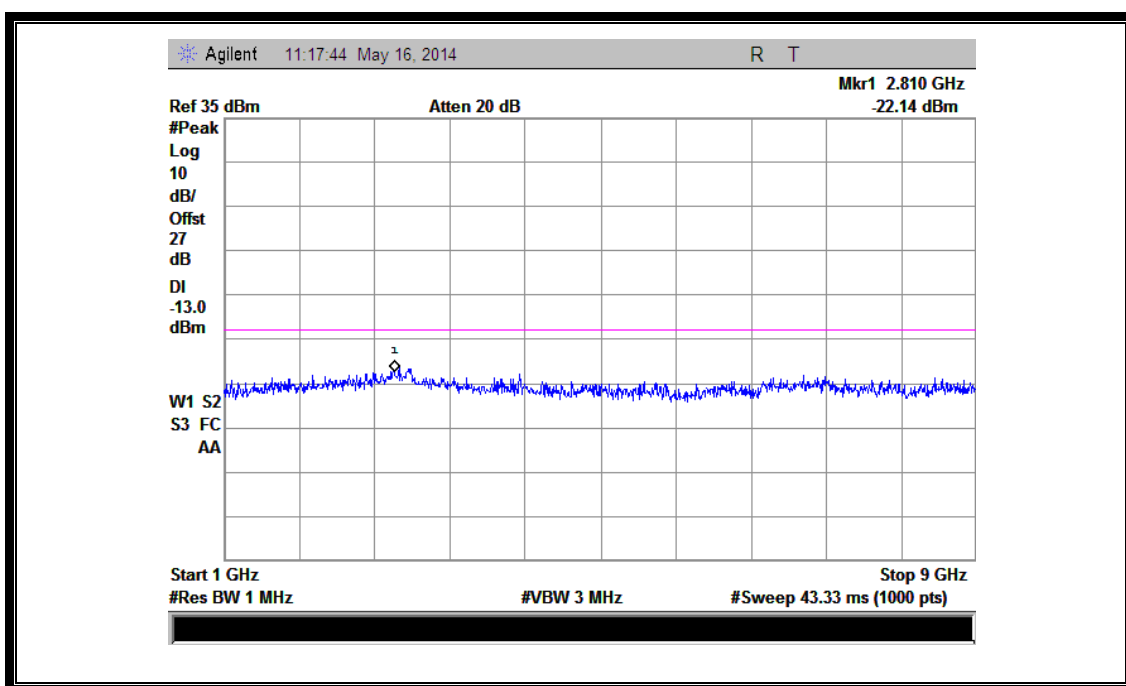
(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



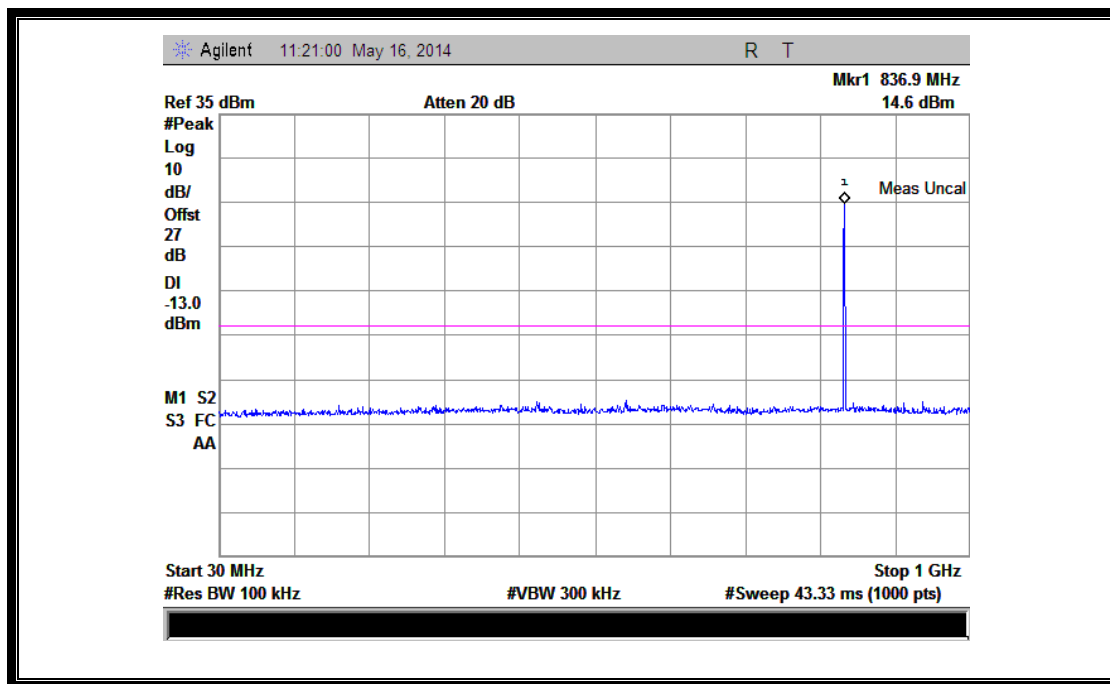
(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



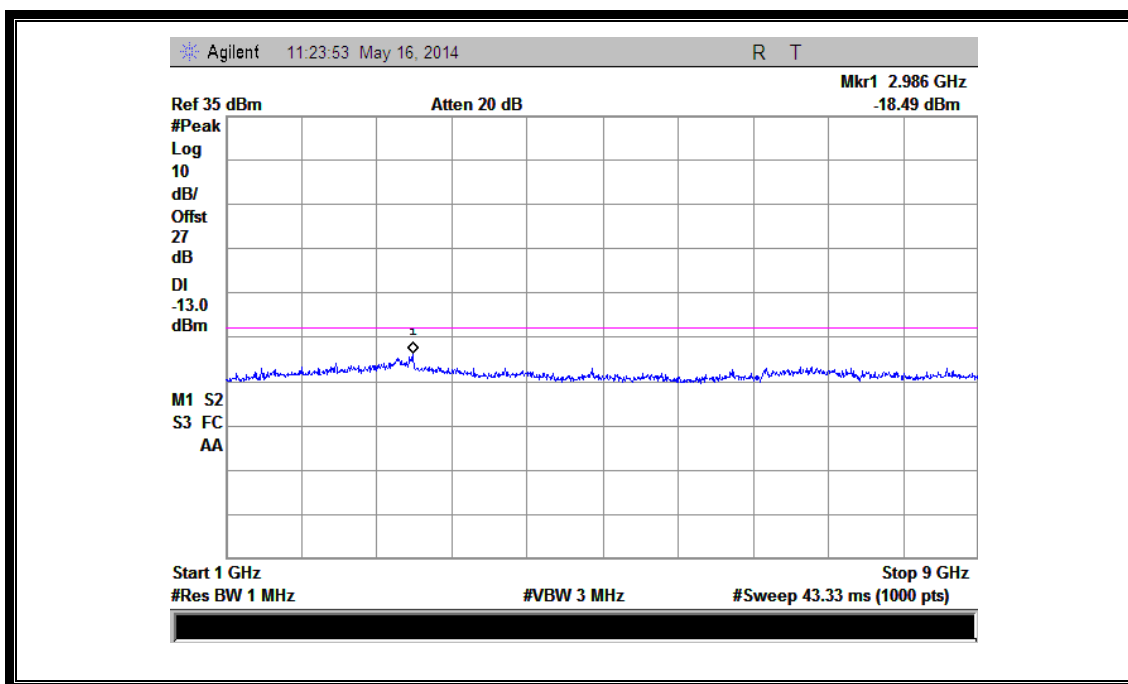
(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



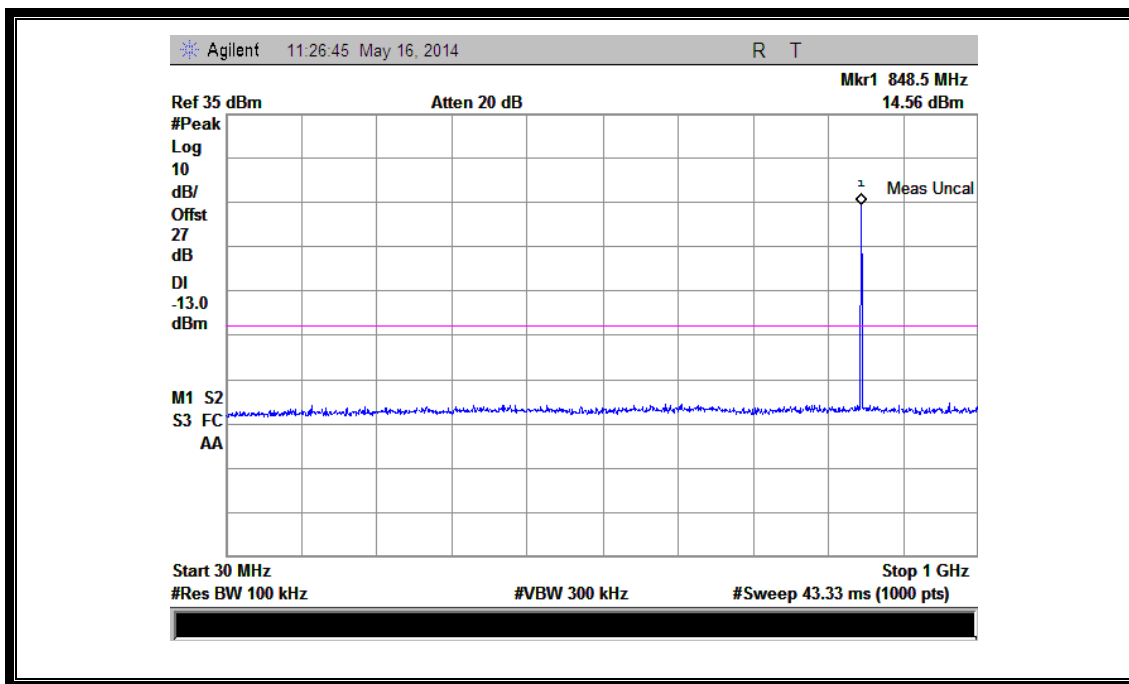
(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



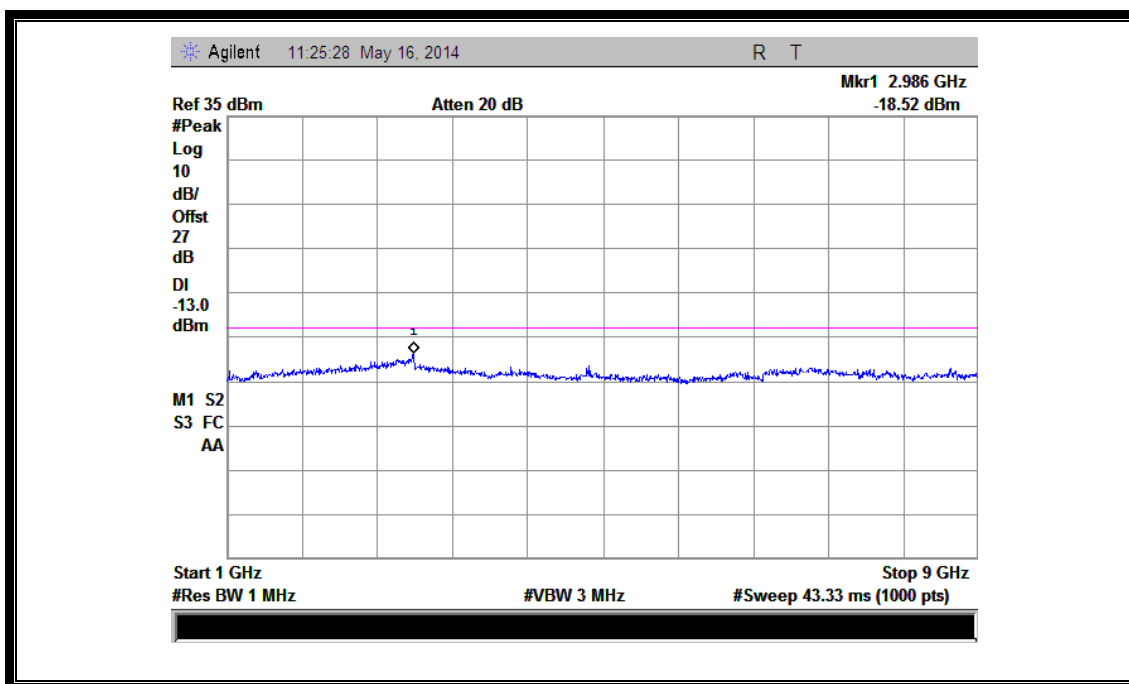
(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



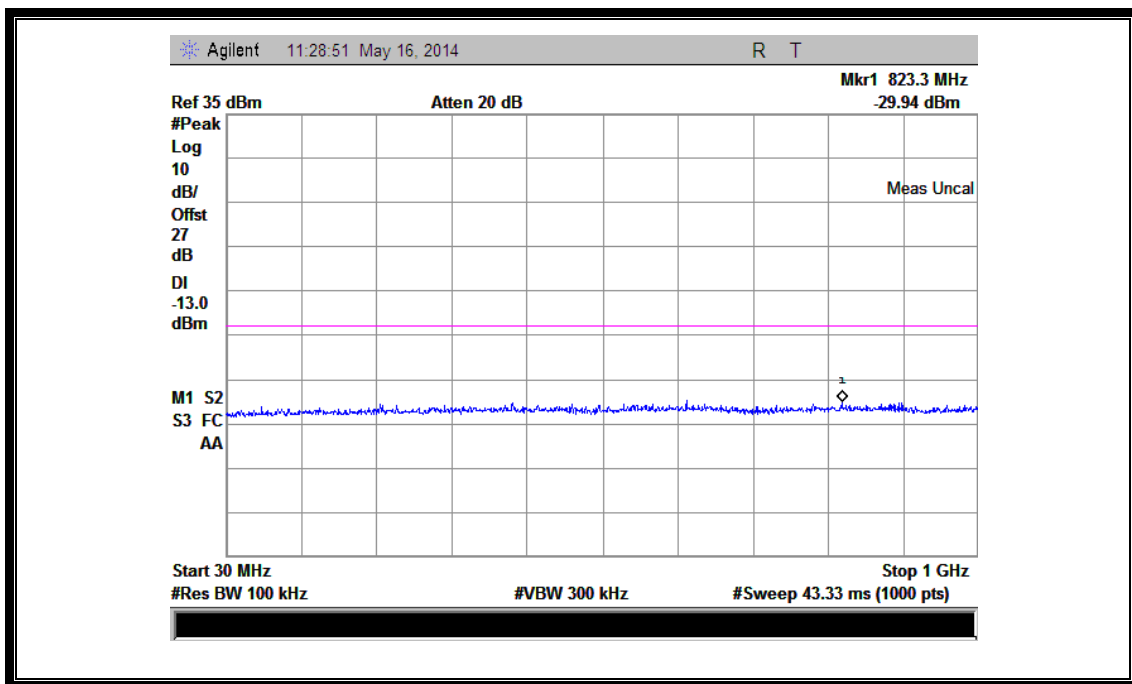
(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



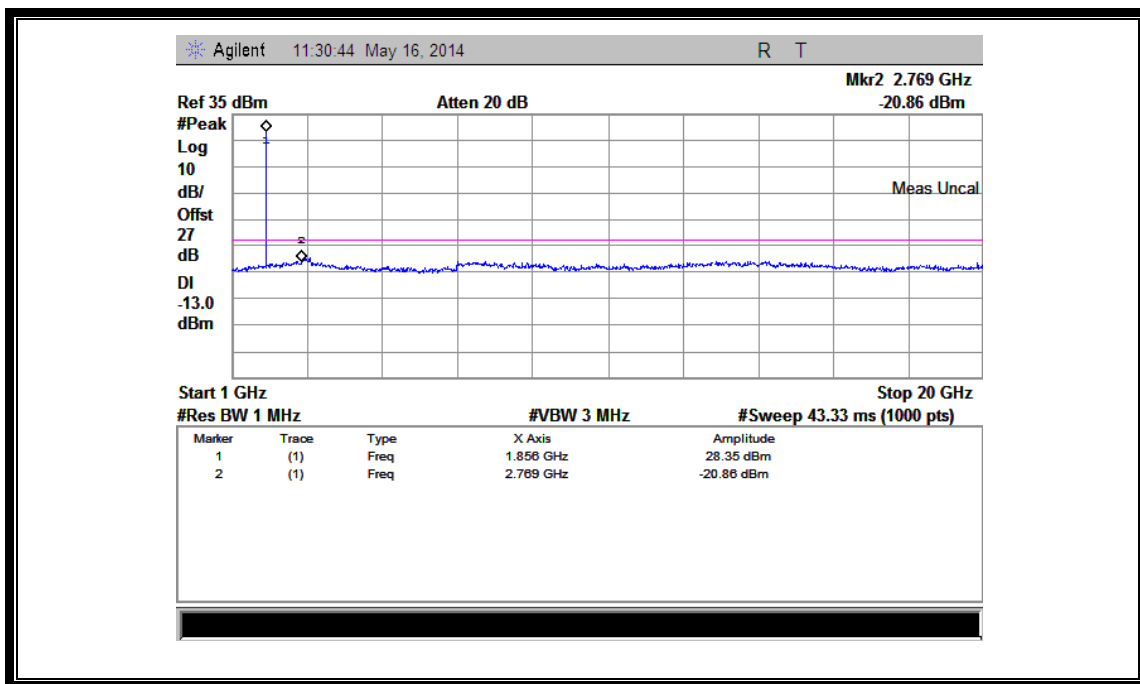
(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



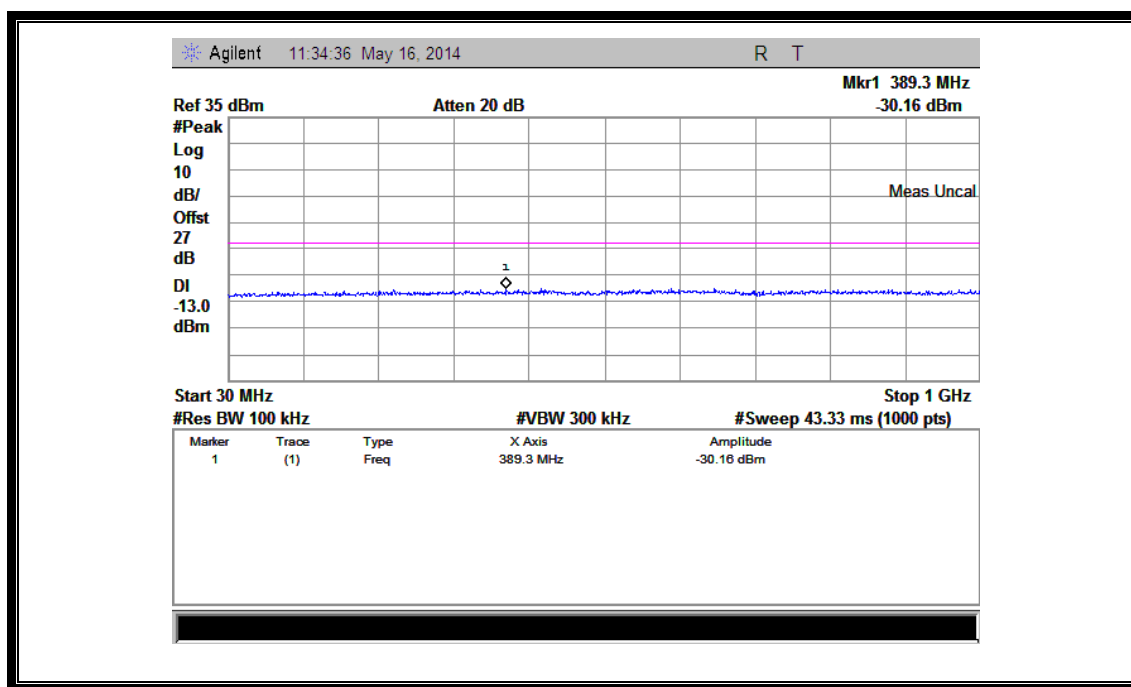
(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



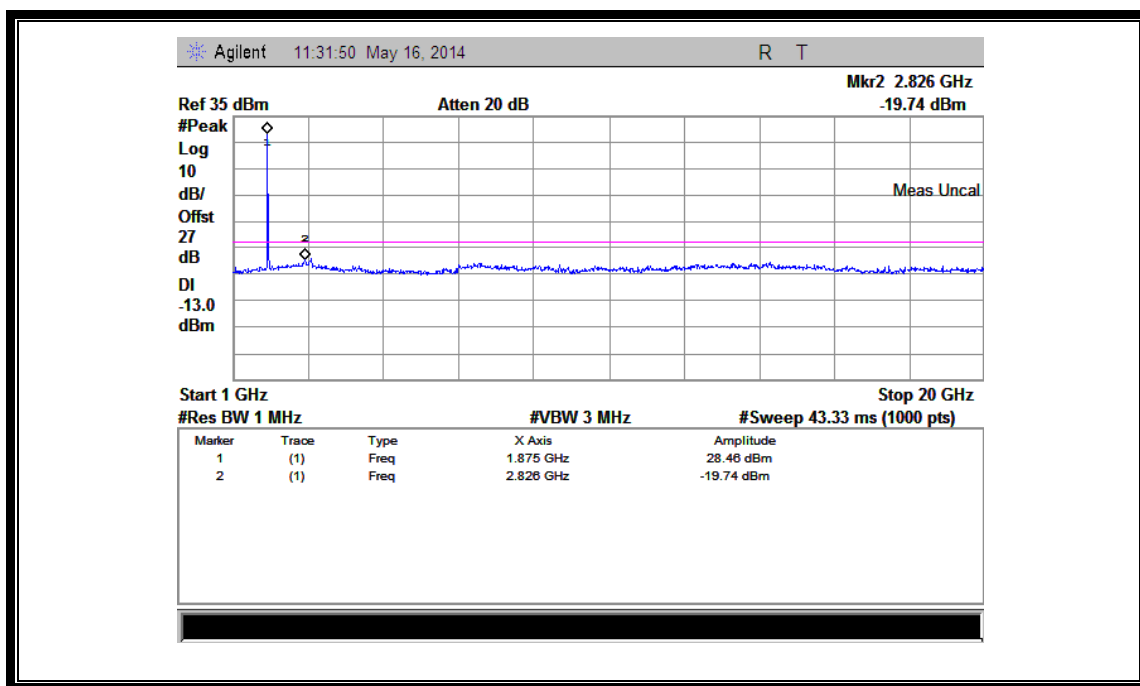
(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



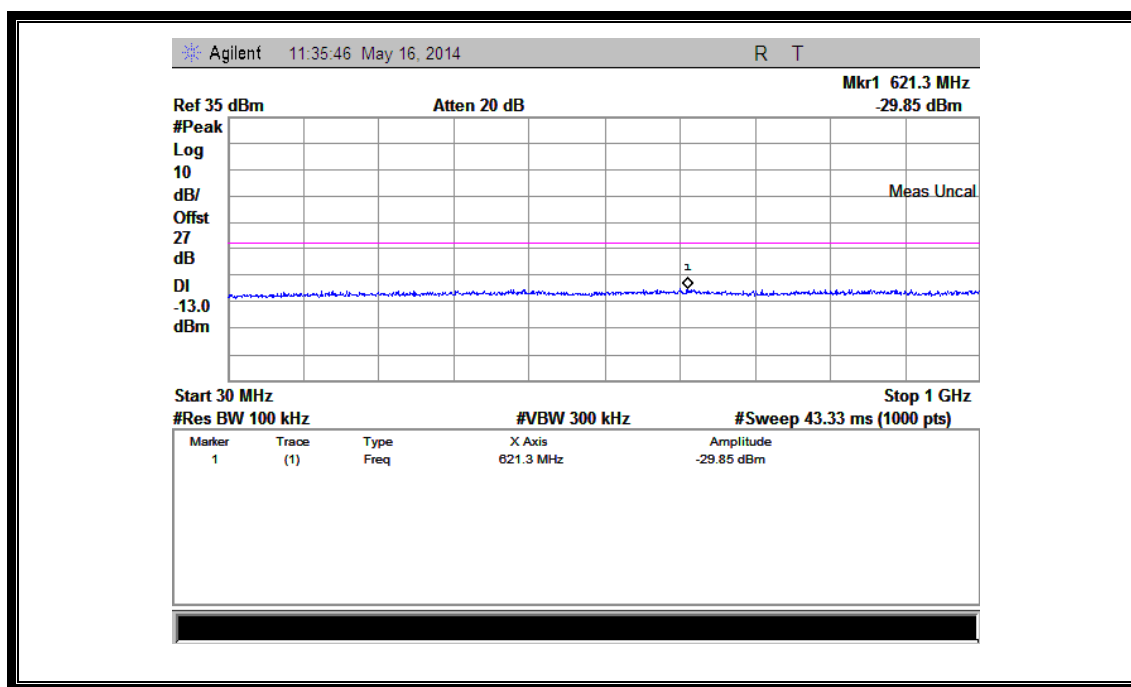
(Plot D1.1: EDGE 1900MHz Channel = 512, 1GHz to 20GHz)



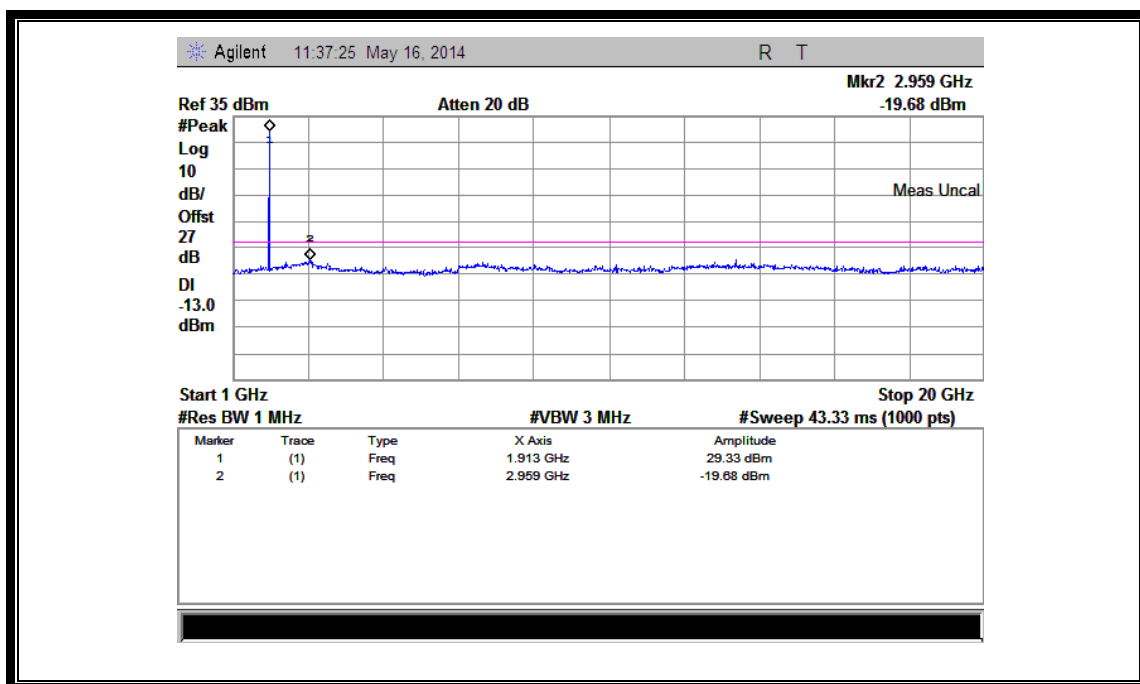
(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



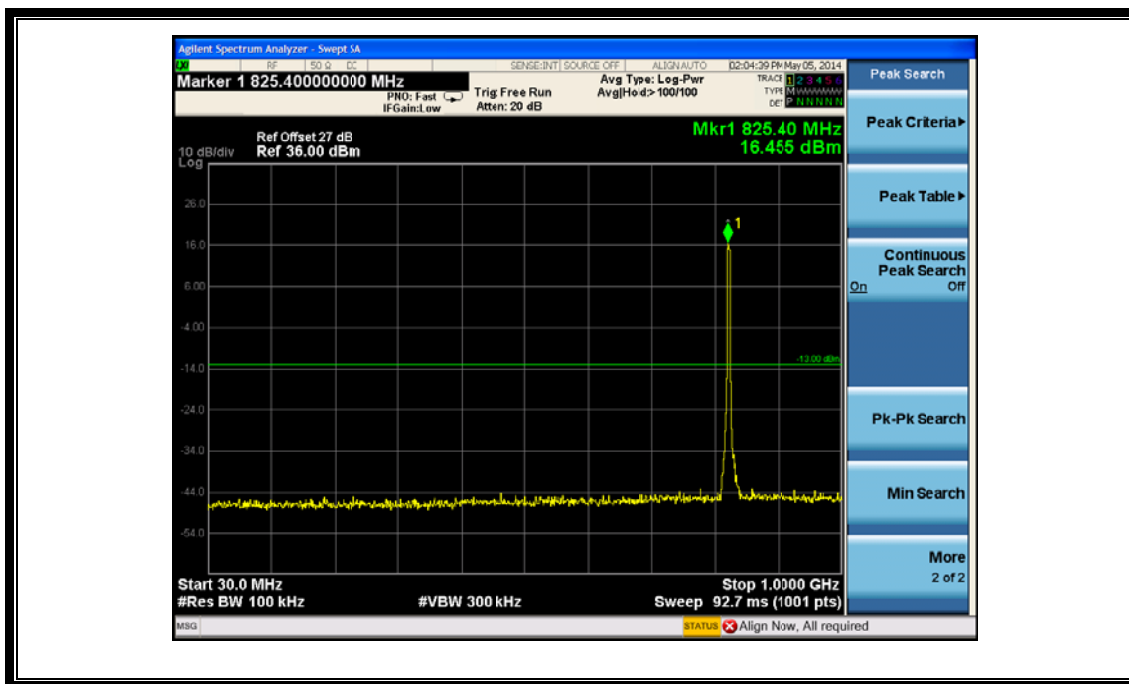
(Plot D2.1: EDGE 1900MHz Channel = 661, 1GHz to 20GHz)



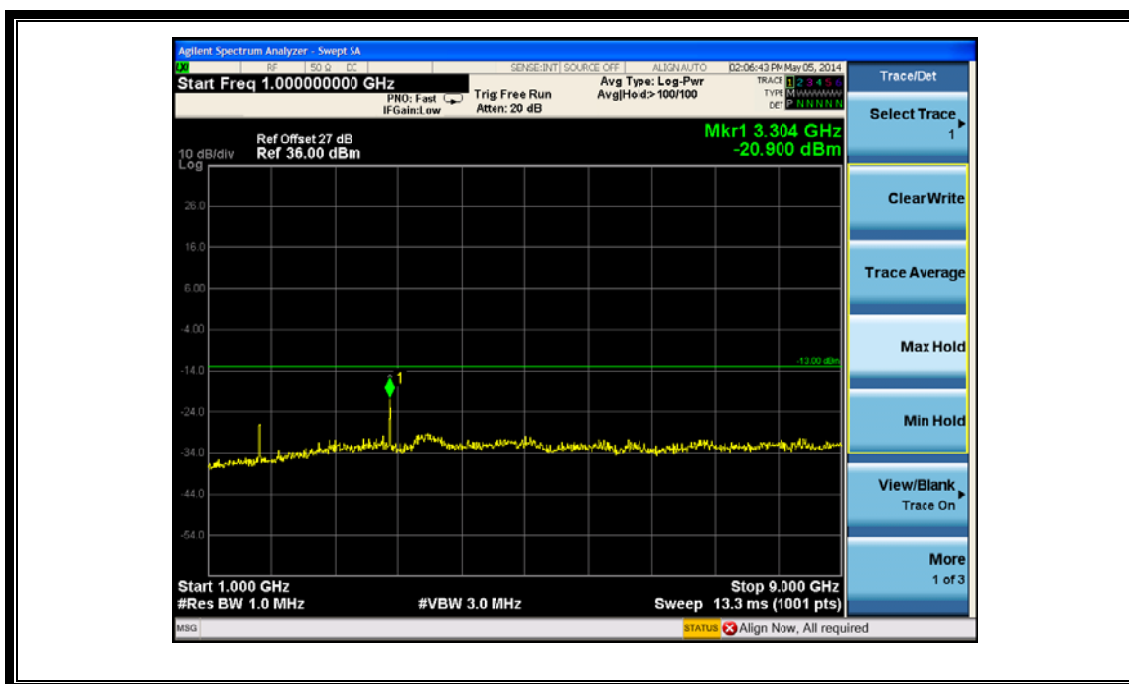
(Plot D3: EDGE 1900MHz Channel = 810, 30MHz to 1GHz)



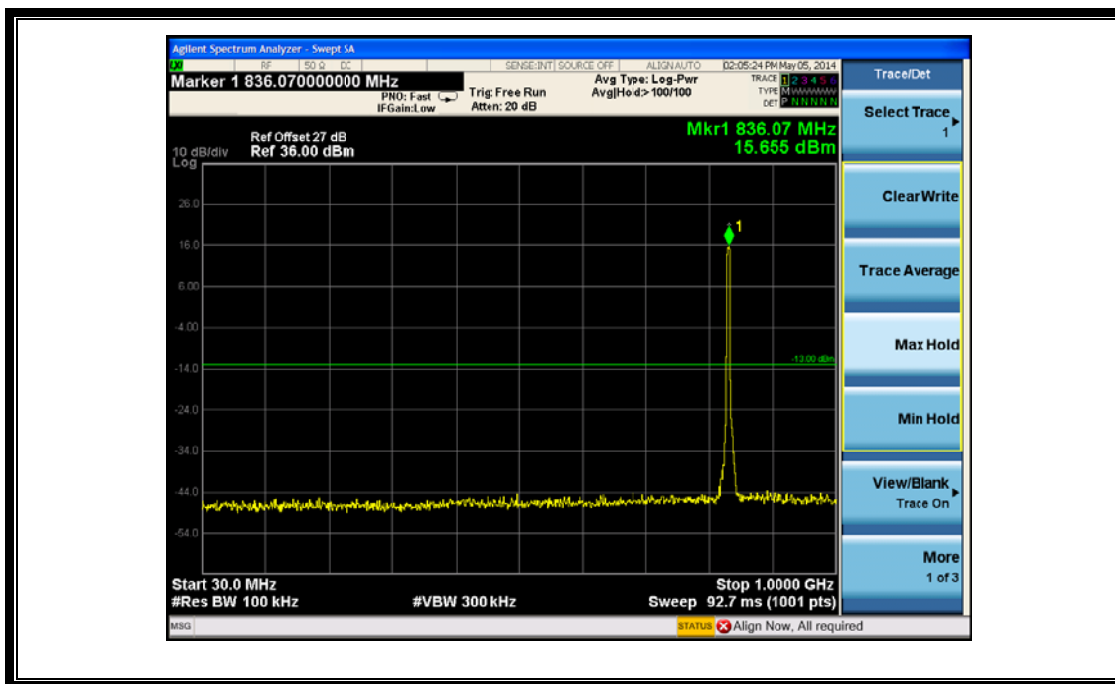
(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)



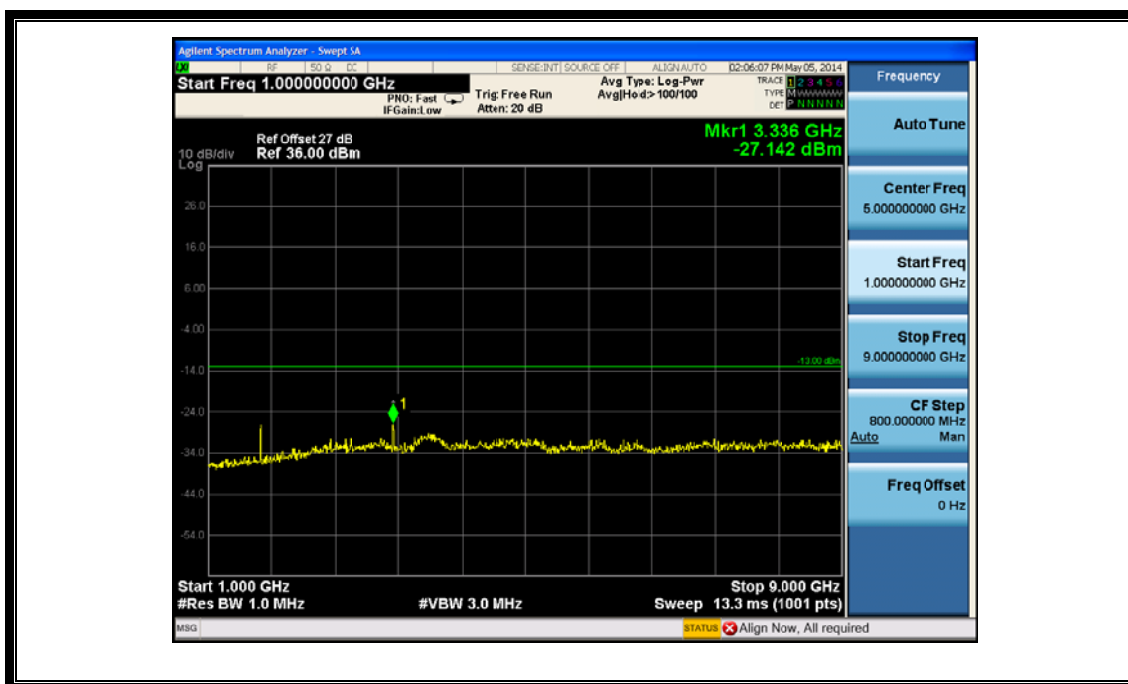
(Plot E1: WCDMA850MHz Channel = 4132, 30MHz to 1GHz)



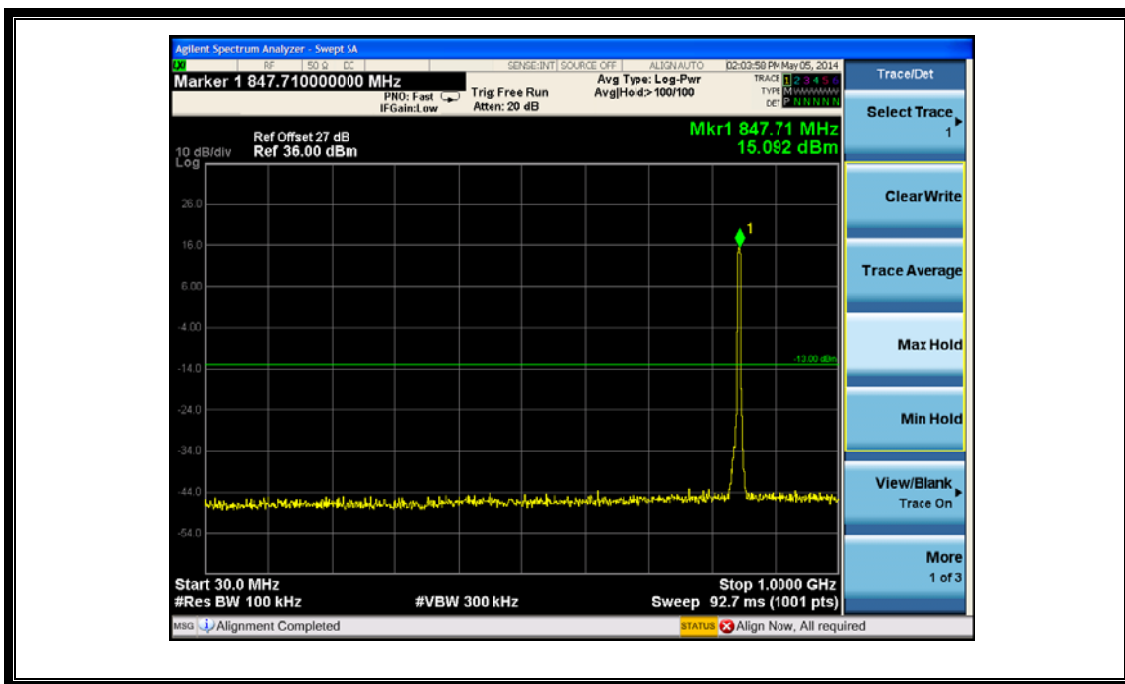
(Plot E1.1: WCDMA850MHz Channel = 4132, 1GHz to 9GHz)



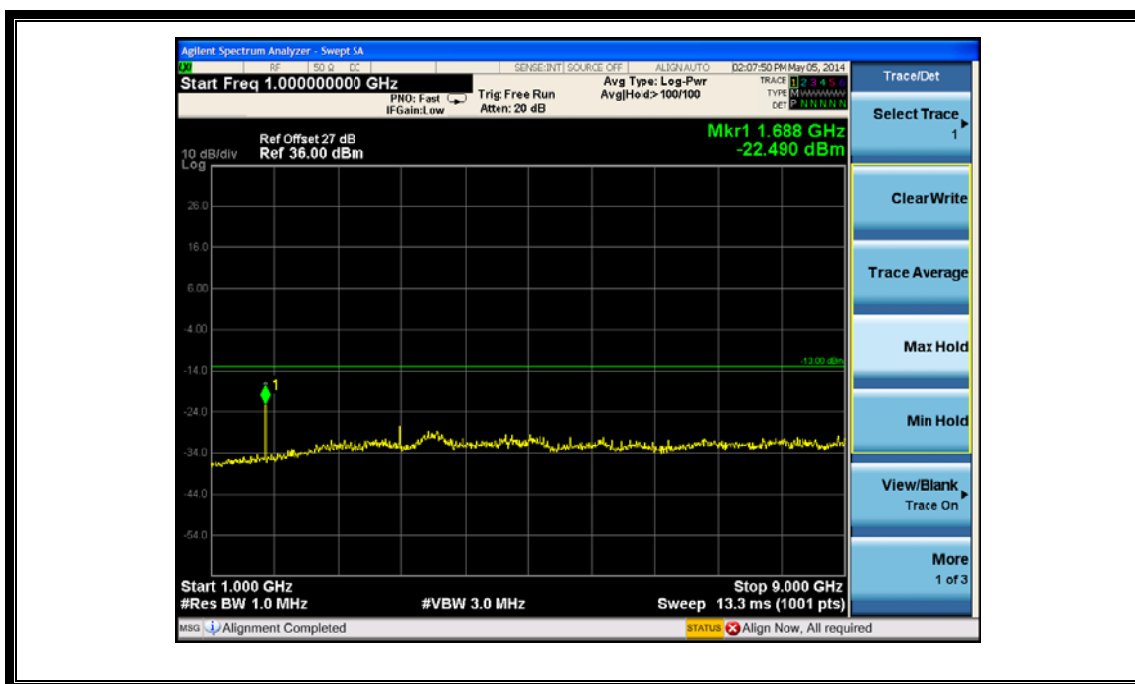
(Plot E2: WCDMA850MHz Channel = 4175, 30MHz to 1GHz)



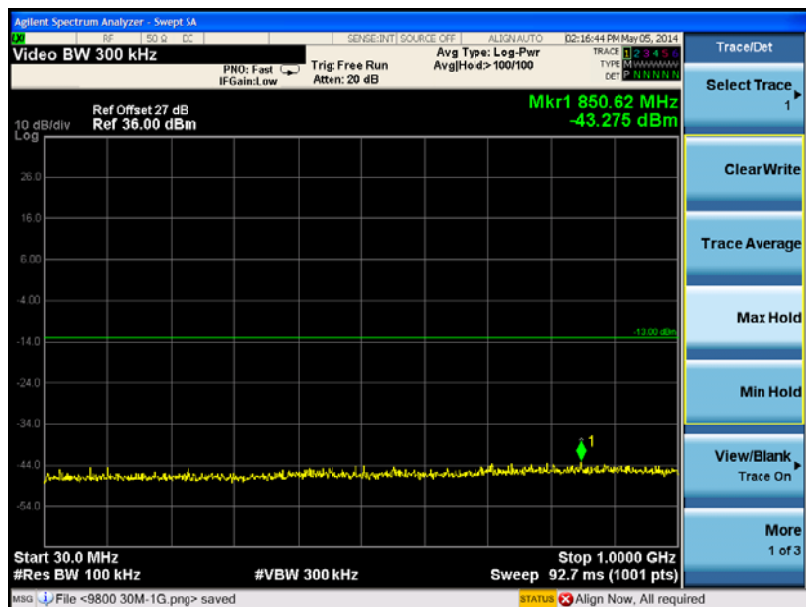
(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)



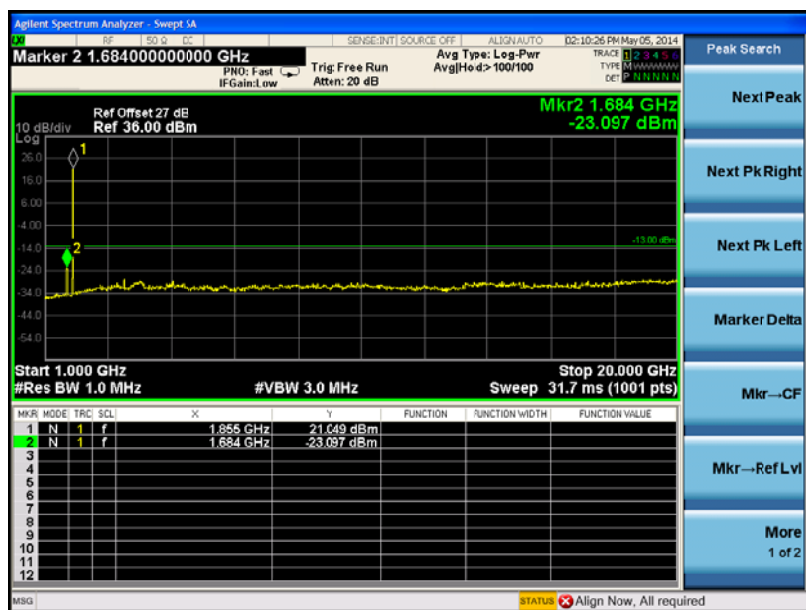
(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)



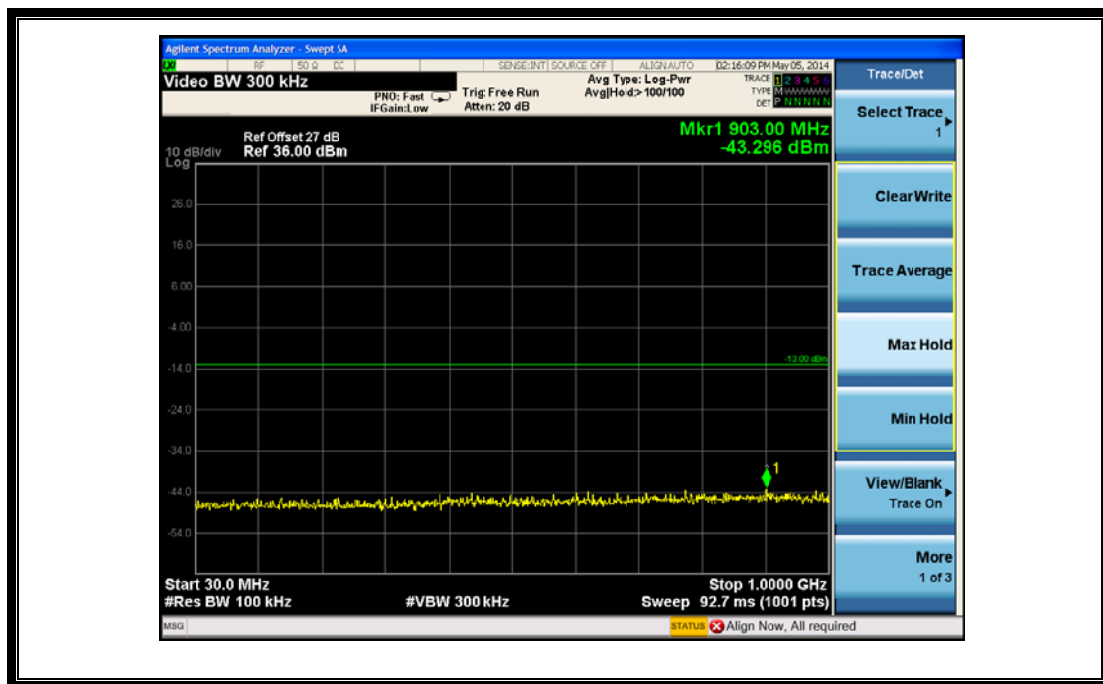
(Plot E3.1: WCDMA850MHz Channel = 4233, 1GHz to 9GHz)



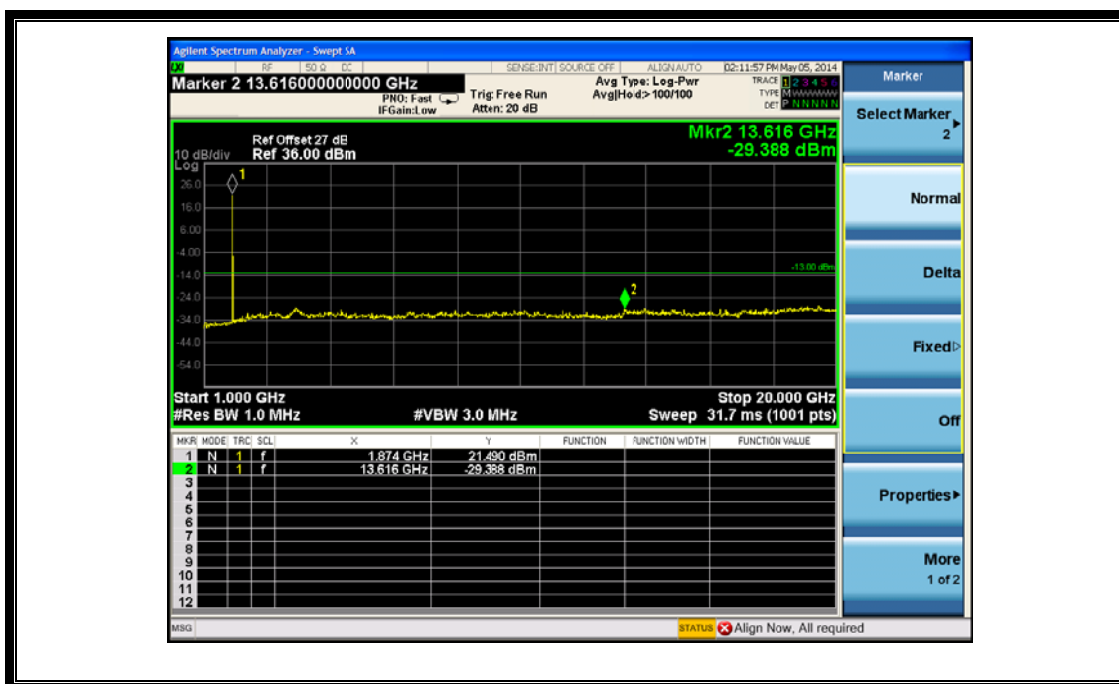
(Plot F1:WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)



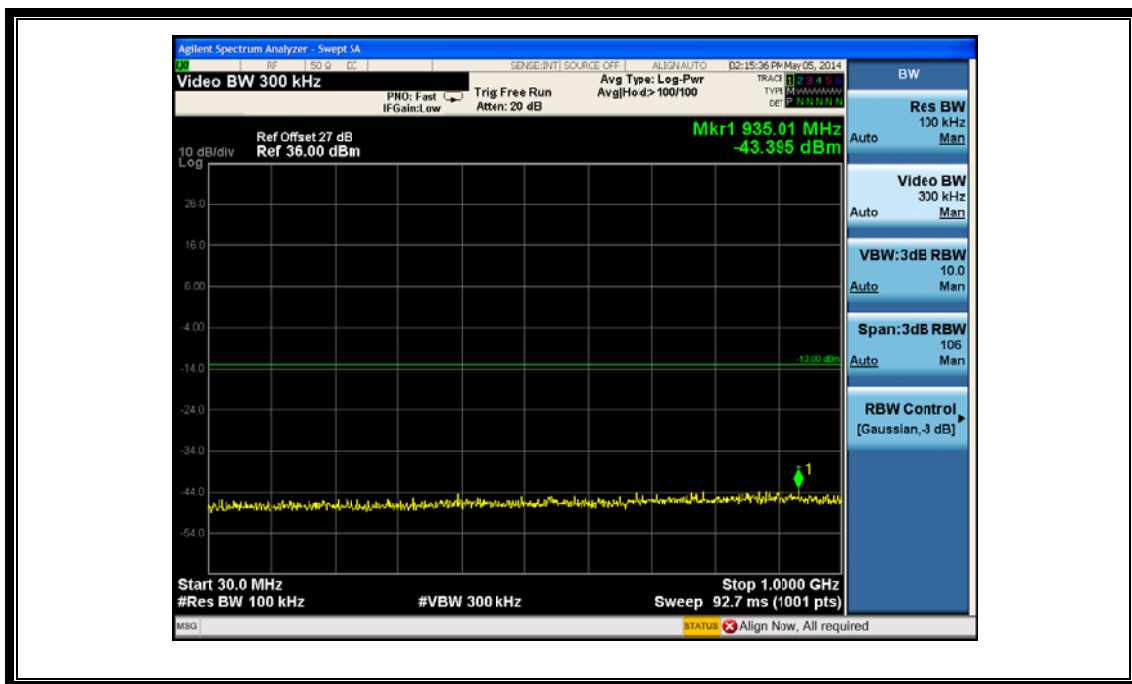
(Plot F1.1: WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)



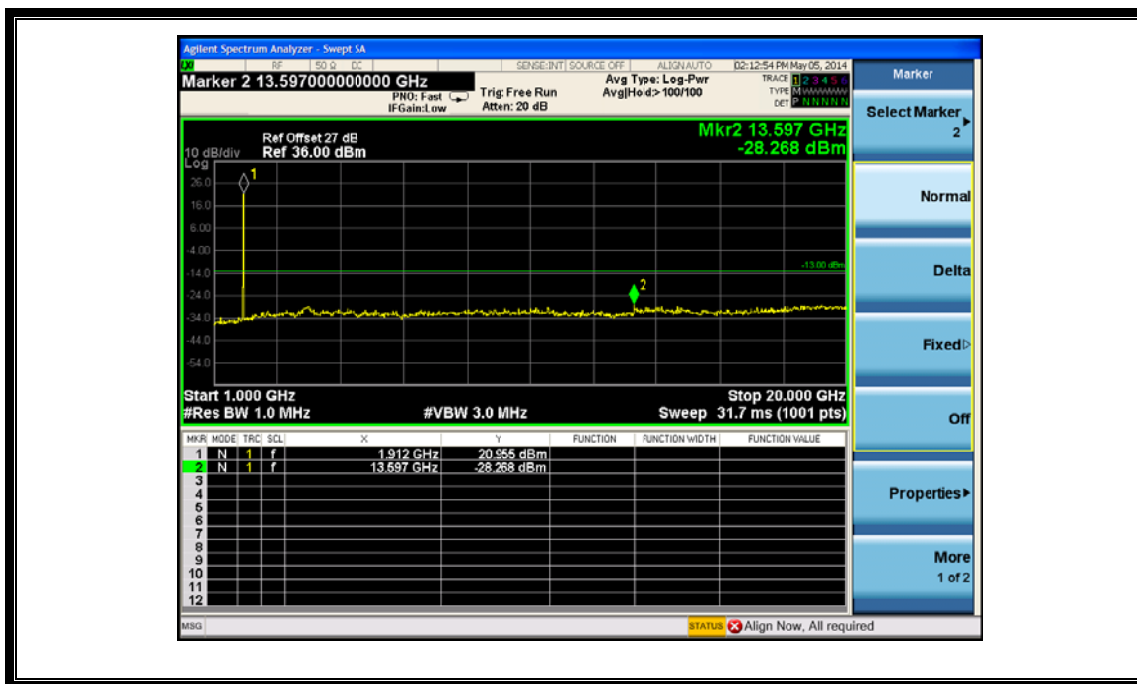
(Plot F2:WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)



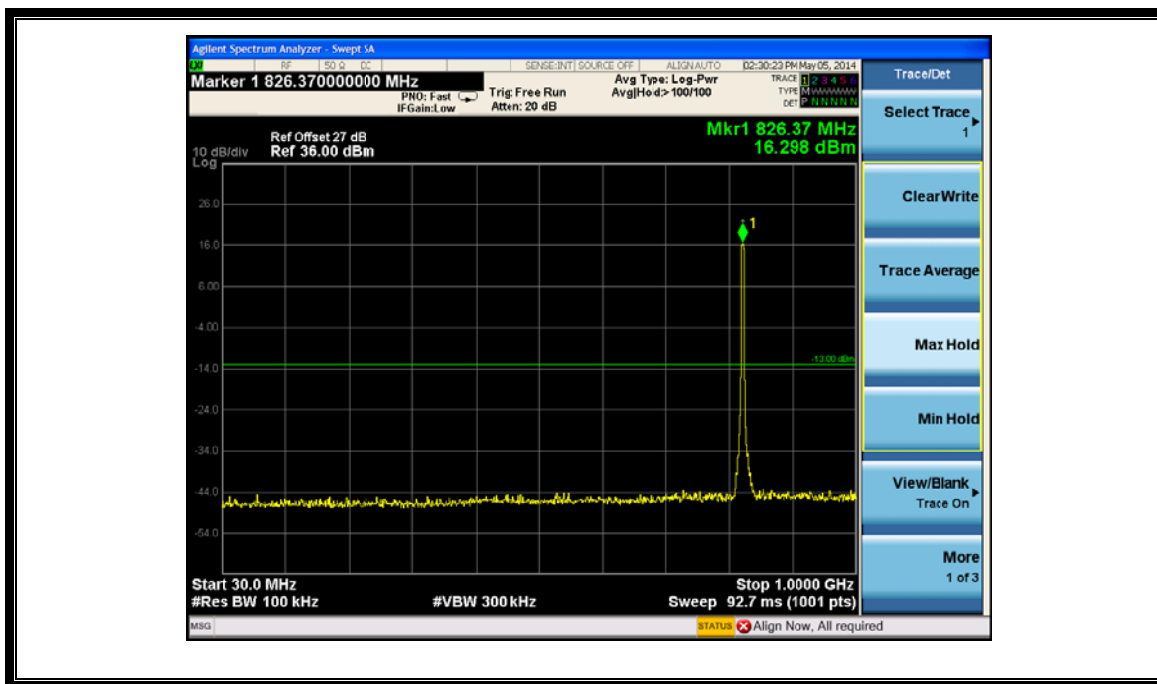
(Plot F2.1: WCDMA1900MHz Channel = 9400, 1GHz to 20GHz)



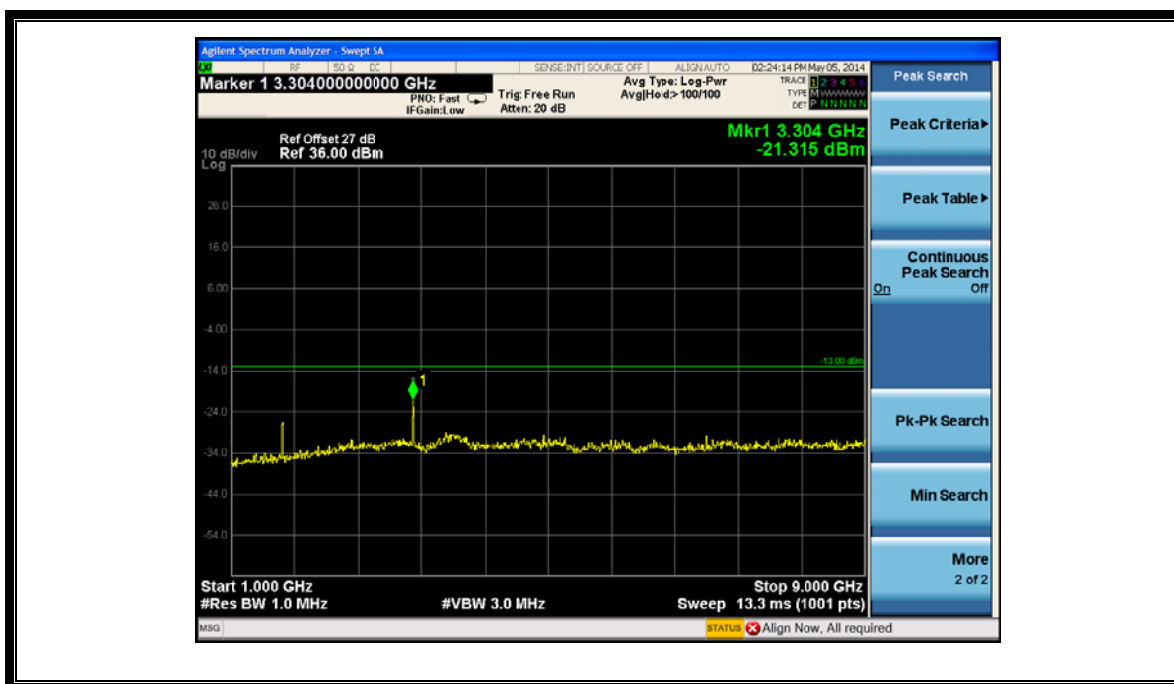
(Plot F3:WCDMA1900MHz Channel = 9538, 30MHz to 1GHz)



(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)