

FCC TEST REPORT



Issued to

GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD

For

Mobile Phone

Model Name: OPPO R831L
Trade Name: OPPO
Brand Name: OPPO
FCC ID : R9C-R831L
Standard: 47 CFR Part 22 Subpart H
47 CFR Part 24 Subpart E
47 CFR Part 27 Subpart L
Test date: 2014-5-14 to 2014-6-4
Issue date: 2014-6-9

By

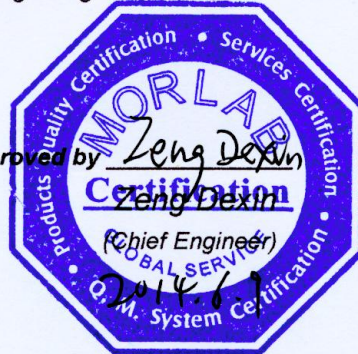
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Date 2014.6.9

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Date 2014.6.9

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Change History		
Issue	Date	Reason for change
1.0	Jun 9, 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..... : 214081
Software Version : R831L_1X_XXXXXX
Applicant..... : GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD
NO.18 HAIBIN ROAD, WUSHA, CHANG'AN, DONGGUAN,
GUANGDONG,CHINA
Manufacturer : GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD
NO.18 HAIBIN ROAD, WUSHA, CHANG'AN, DONGGUAN,
GUANGDONG, 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)
WCDMA 1700MHz
Tx: 1712.4 - 1752.6MHz (at intervals of 200kHz);
Rx: 2112.4 - 2152.6MHz (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 33,EGPRS: Multislot Class 33
Antenna Type : PIFA Antenna
Emission Designators..... : GSM 850:250KGXW,GSM 1900:250KGXW
EGPRS850:249KG7W, EGPRS1900:248KG7W,
WCDMA 850:4M18F9W ,WCDMA1900:4M18F9W
WCDMA1700:4M18F9W

Note 1: The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can

be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128 \leq n \leq 251$; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

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

Note 3: The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula $F(n)=826.4+0.2*(n-4132)$, $4132 \leq n \leq 4233$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 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: The transmitter (Tx) frequency arrangement of the WCDMA 1700MHz band used by the EUT can be represented with the formula $F(n)=1712.4+0.2*(n-1312)$, $1312 \leq n \leq 1513$; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 1312 (1712.4MHz), 1412 (1732.4MHz) and 1513 (1752.6MHz).

Note 6: 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, 27 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
4	47 CFR Part 27 (10-1-13 Edition)	Miscellaneous Wireless Communications Services

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

No.	Section	Description	Result
1	2.1046	Conducted RF Output Power	PASS
2.	24.232(d) ,27.50(d)(5)	Peak to average radio	PASS
2	2.1049,22.917 24.238, 27.53(g)	99% Occupied Bandwidth	PASS
3	2.1055,22.355 24.235,27.54	Frequency Stability	PASS
4	2.1051,2.1057 22.917,24.238, 27.53(g)	Conducted Out of Band Emissions	PASS
5	2.1051,2.1057 22.917,24.238 27.53(g)(h)	Band Edge	PASS
6	22.913,24.232 27.50(d)(4)	Transmitter Radiated Power (EIPR/ERP)	PASS
7	2.1053,2.1057 22.917,24.238 27.53(g)	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

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

All measurement facilities used to collect the measurement data are located at 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 27L REQUIREMENTS

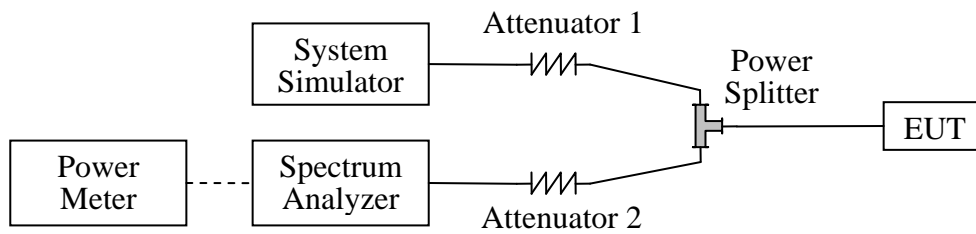
2.1 Conducted RF Output Power

2.1.1 Requirement

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

2.1.2 Test Description

1. Test Setup:



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

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 dBm	Verdict
			dBm	Refer to Plot		
GSM 850MHz	128	824.2	33.27	Plot A1 to A3	35	<u>PASS</u>
	190	836.6	33.17			<u>PASS</u>
	251	848.8	33.20			<u>PASS</u>
GSM 1900MHz	512	1850.2	28.97	Plot B1 to B3	32	<u>PASS</u>
	661	1880.0	30.69			<u>PASS</u>
	810	1909.8	30.09			<u>PASS</u>
GPRS 850MHz	128	824.2	31.61	Plot C1 to C3 ^{Note 1}	35	<u>PASS</u>
	190	836.6	31.63			<u>PASS</u>
	251	848.8	31.56			<u>PASS</u>
GPRS 1900MHz	512	1850.2	26.18	Plot D1 to D3 ^{Note 1}	32	<u>PASS</u>
	661	1880.0	28.46			<u>PASS</u>
	810	1909.8	27.80			<u>PASS</u>
EGPRS 850MHz	128	824.2	33.20	Plot E1 to E3 ^{Note 1}	35	<u>PASS</u>
	190	836.6	33.25			<u>PASS</u>
	251	848.8	33.20			<u>PASS</u>
EGPRS 1900MHz	512	1850.2	28.59	Plot F1 to F3 ^{Note 1}	32	<u>PASS</u>
	661	1880.0	30.90			<u>PASS</u>
	810	1909.8	30.32			<u>PASS</u>

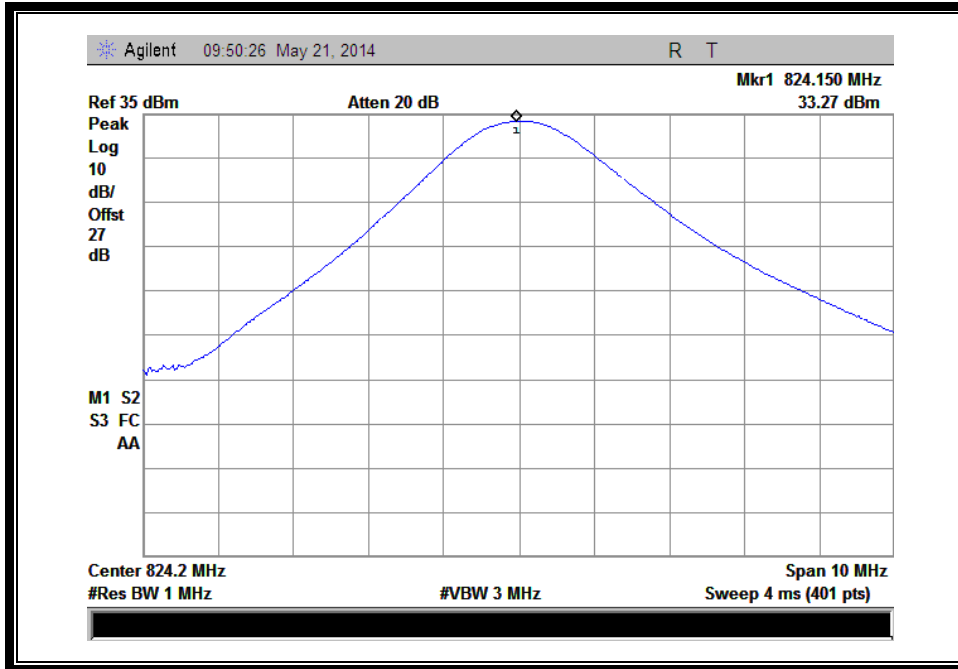
Note 1: For the GPRS and EGPRS model, all the slots were tested and just the worst data was record in this report.

2. WCDMA Model Test Verdict:

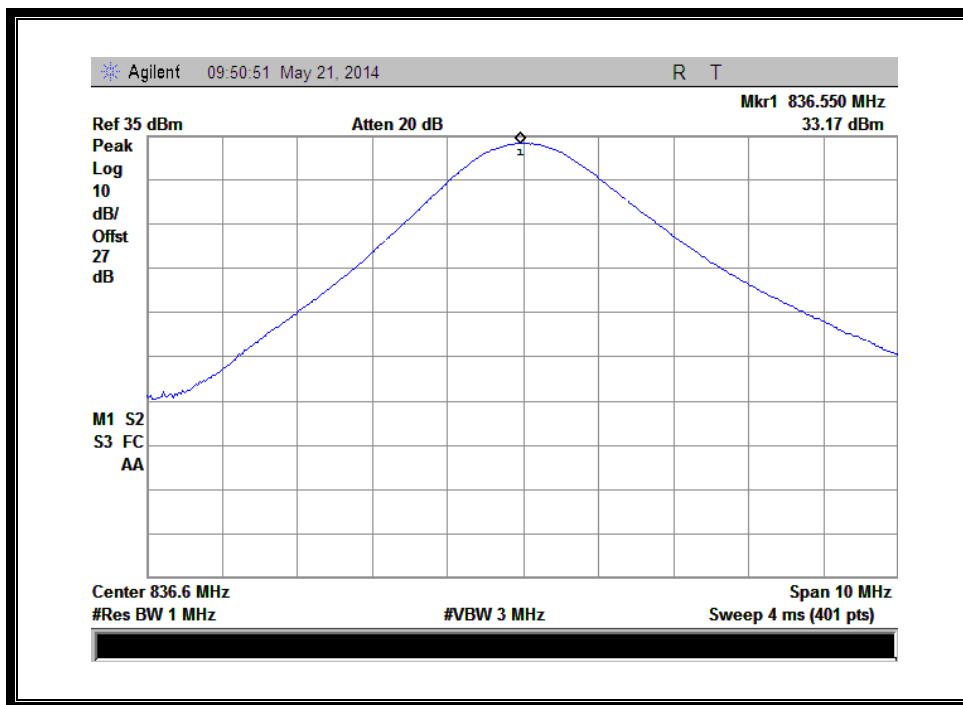
Item	band	WCDMA 850			WCDMA 1900		
	ARFCN	4132	4175	4233	9262	9400	9538
	subtest	dBm			dBm		
5.2(WCDMA)	non	24.26	24.28	24.22	23.38	24.14	23.02
HSDPA	1	24.24	24.19	24.20	23.33	23.76	23.01
	2	24.22	24.15	24.19	23.32	23.75	23.00
	3	23.71	23.64	23.68	22.80	23.24	22.51
	4	23.70	23.65	23.67	22.79	23.25	22.49
HSUPA	1	24.25	24.27	24.23	23.35	23.78	22.97
	2	22.24	22.25	22.21	21.34	21.77	20.96
	3	23.25	23.26	23.22	22.34	22.76	21.96
	4	22.24	22.26	22.23	21.33	21.77	20.95
	5	24.23	24.26	24.20	23.35	23.76	22.98
HSPA+	1	24.24	24.25	24.20	23.37	23.80	23.00
Note:	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.						

Item	band	WCDMA 1700		
	ARFCN	1312	1412	1513
	subtest	dBm		
5.2(WCDMA)	non	24.20	24.13	23.99
HSDPA	1	24.19	24.12	23.96
	2	24.18	24.11	23.93
	3	23.68	23.62	23.45
	4	23.69	23.61	23.46
HSUPA	1	24.17	24.11	23.97
	2	22.15	22.10	21.95
	3	23.16	23.09	22.96
	4	22.16	22.11	21.97
	5	24.16	24.10	23.96
HSPA+	1	24.18	24.12	23.94
Note	The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter.			

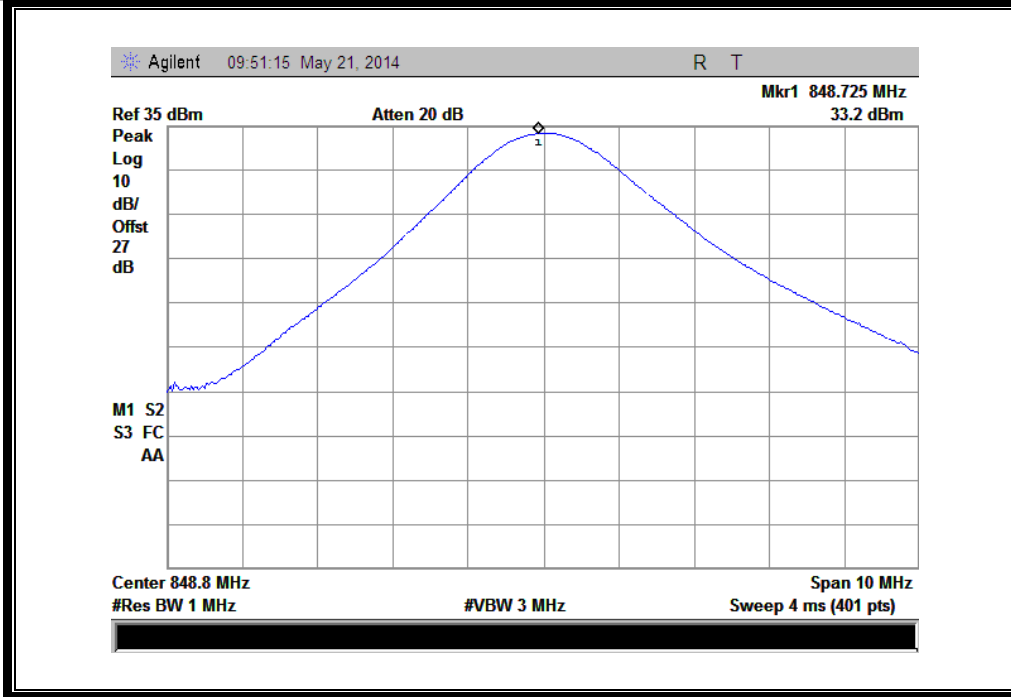
3. GSM Model Test Plots:



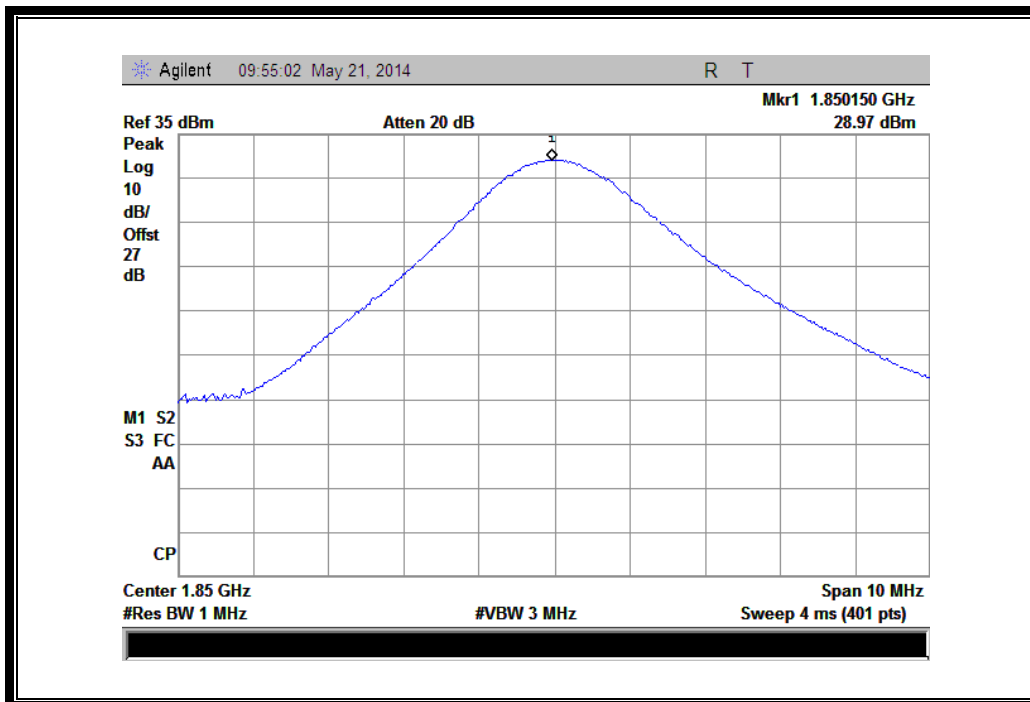
(Plot A1:GSM 850MHz Channel = 128)



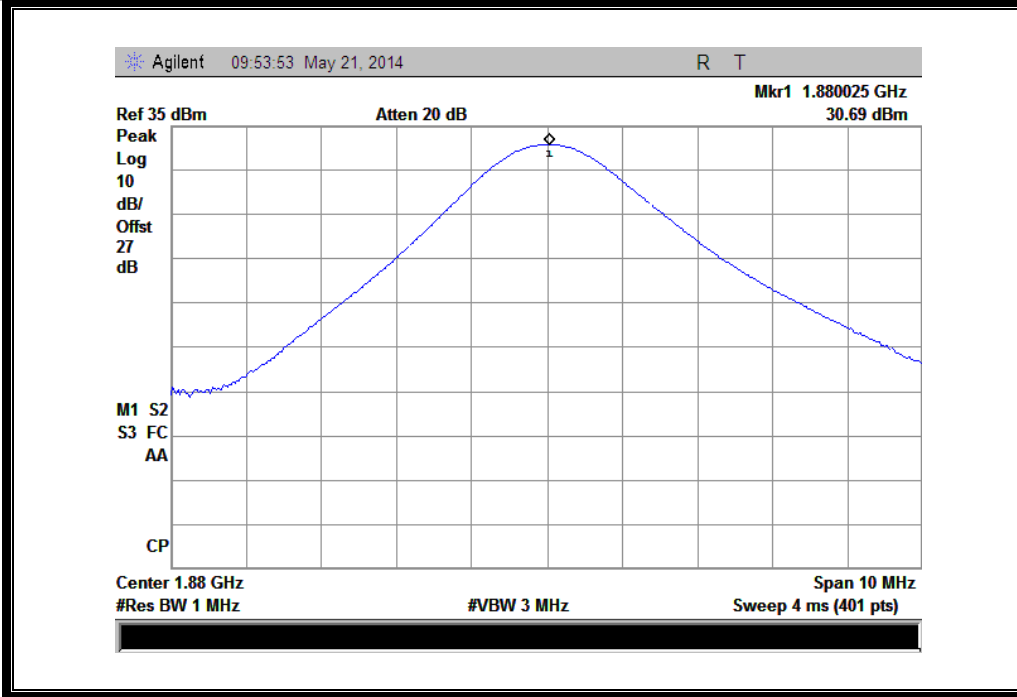
(Plot A2:GSM 850MHz Channel = 190)



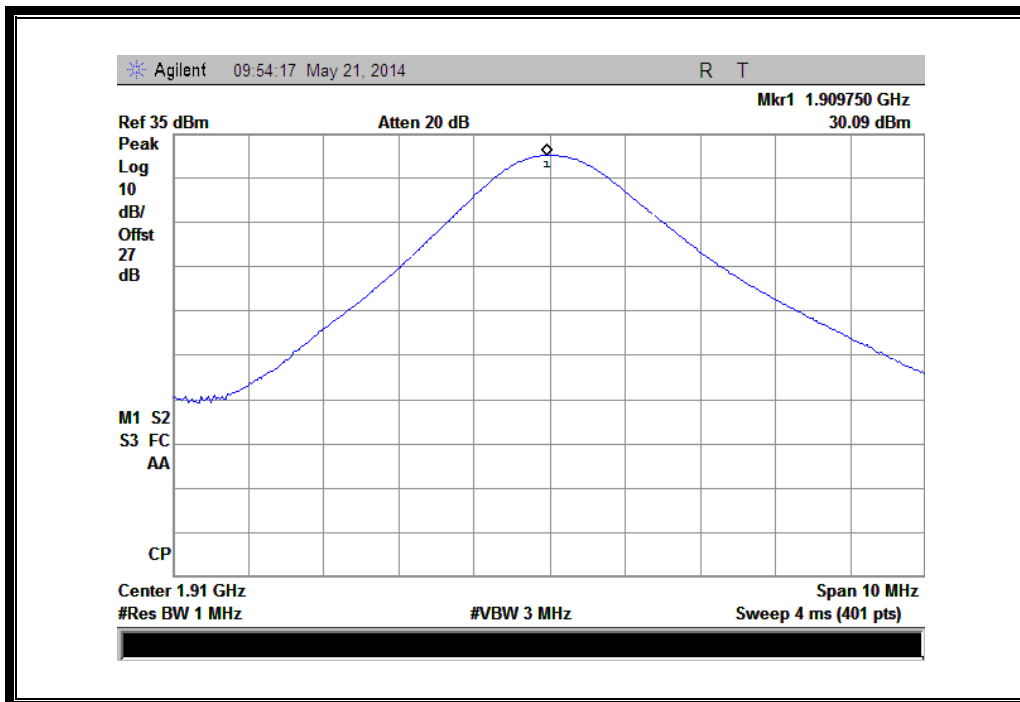
(Plot A3:GSM 850MHz Channel = 251)



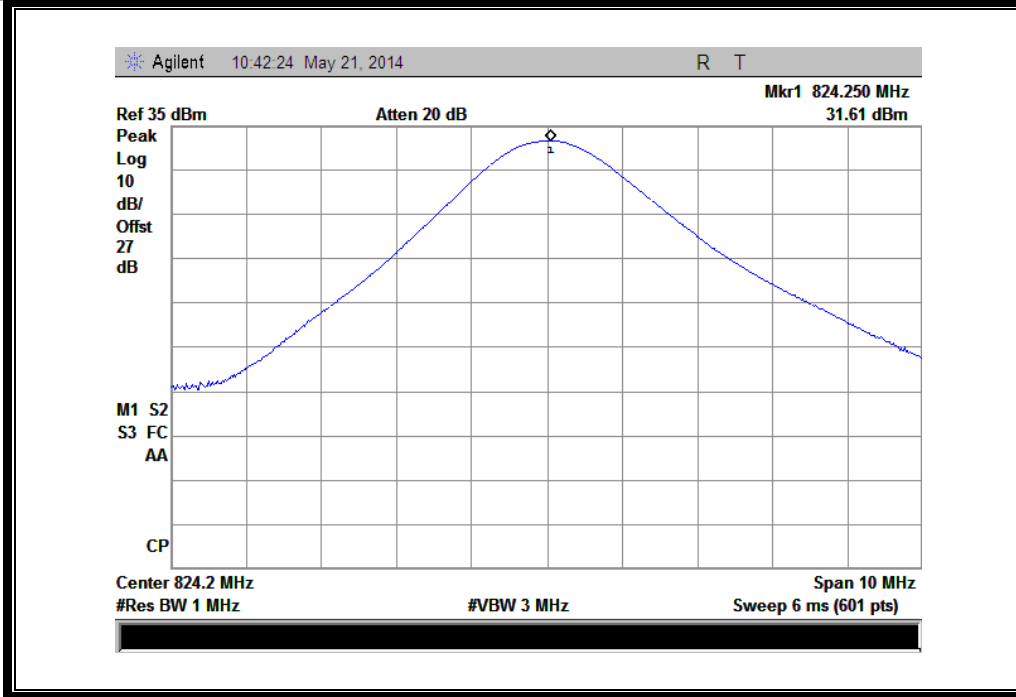
(Plot B1: GSM 1900MHz Channel = 512)



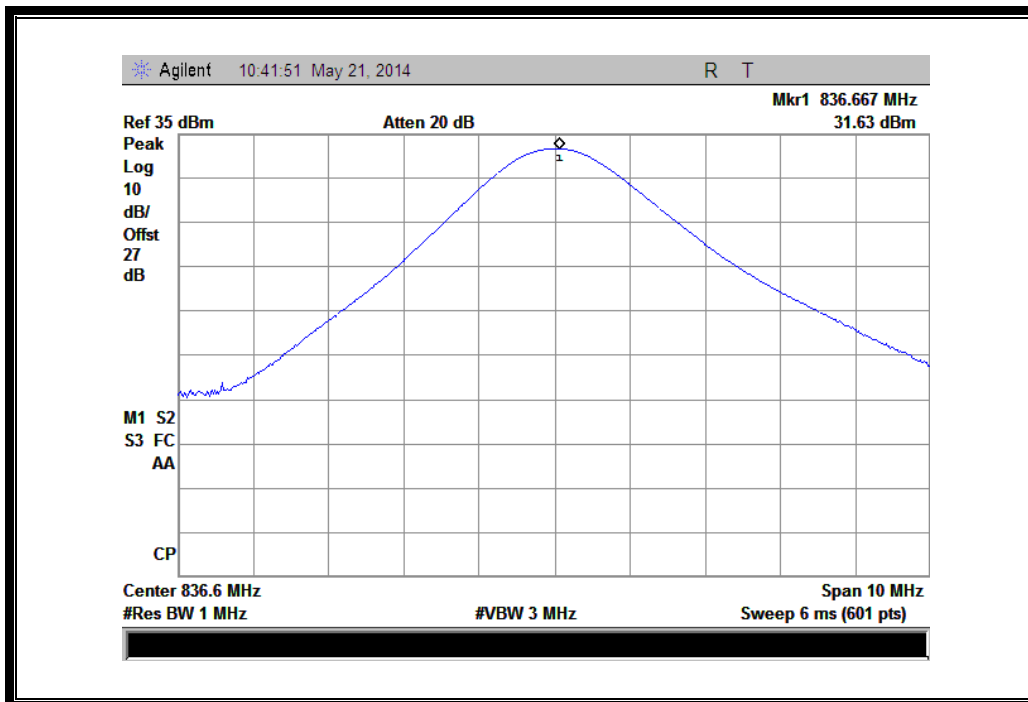
(Plot B2: GSM 1900MHz Channel = 661)



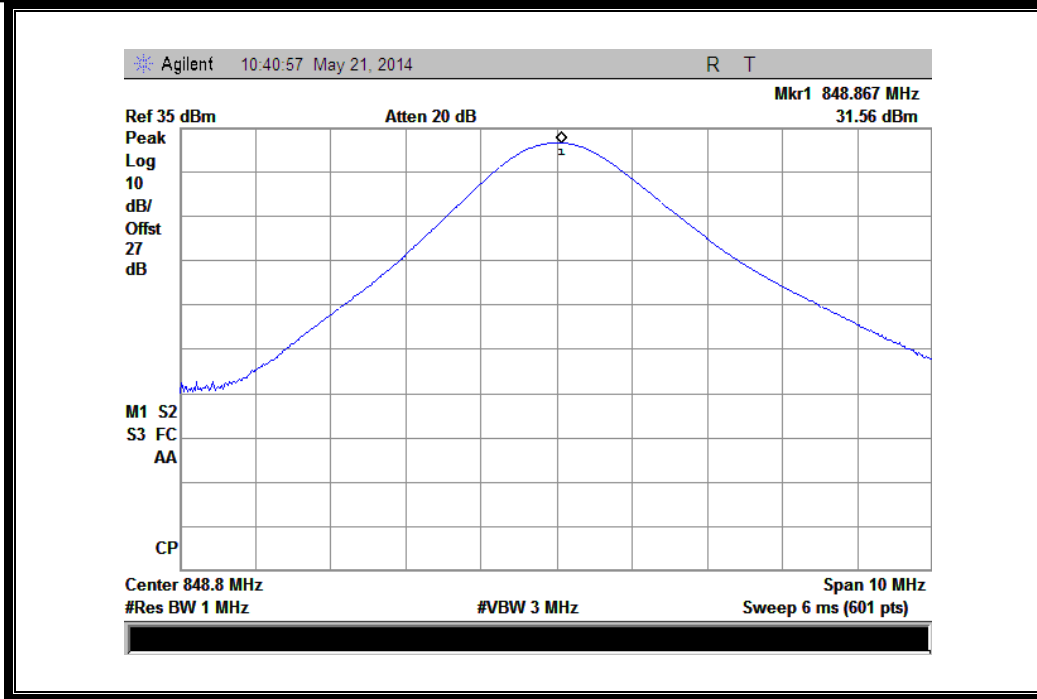
(Plot B3: GSM 1900MHz Channel = 810)



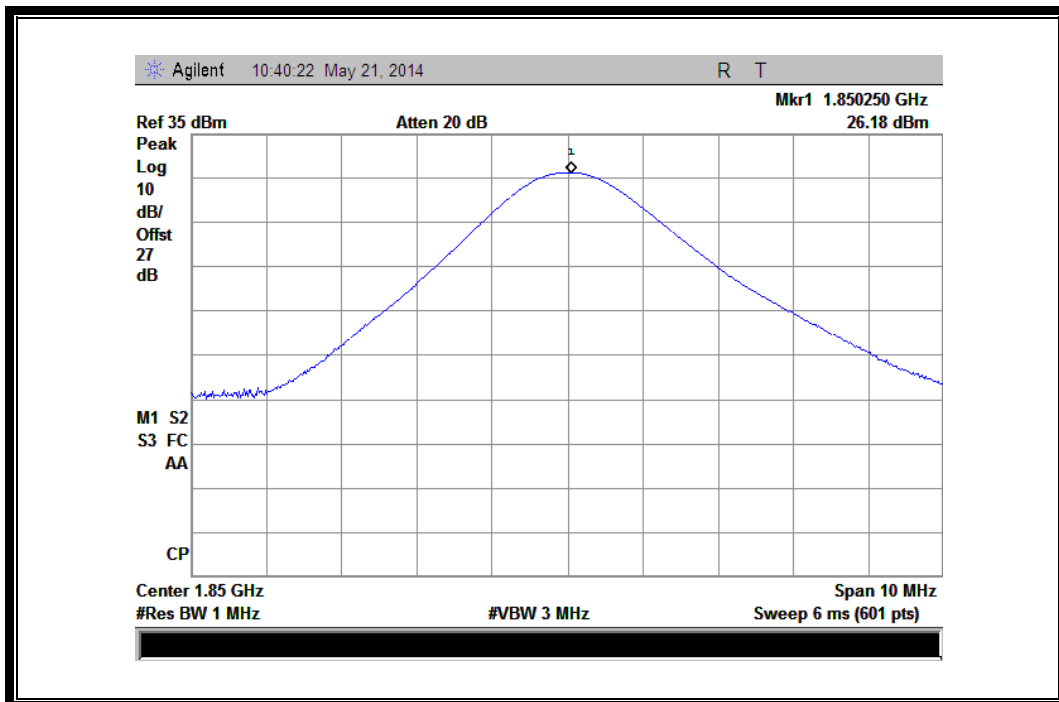
(Plot C 1: GPRS 850MHz Channel = 128)



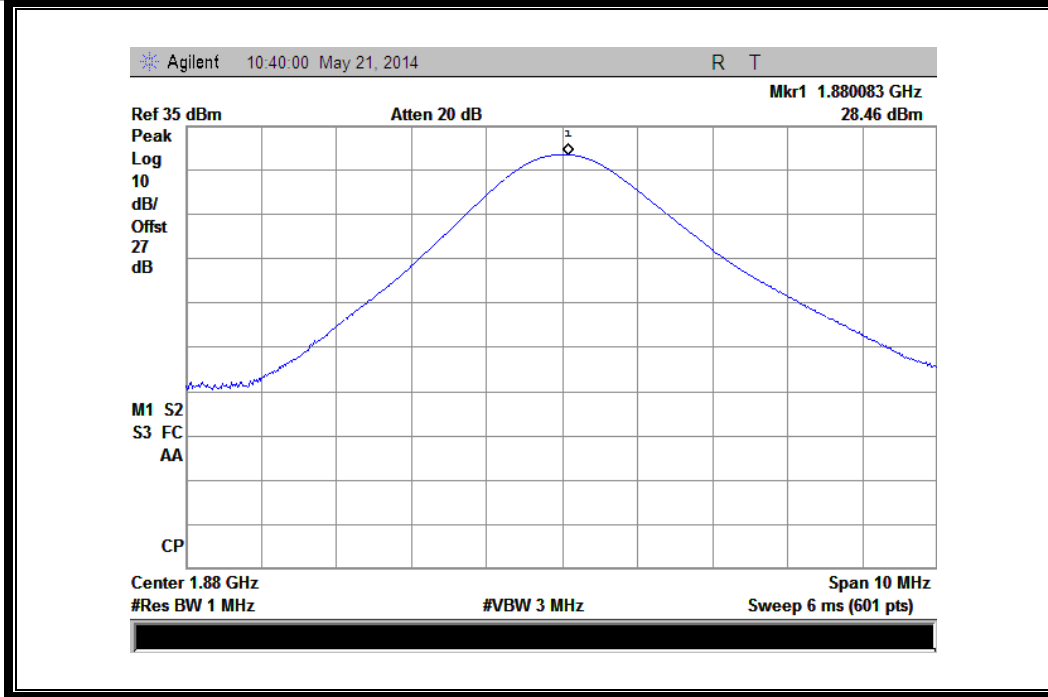
(Plot C 2: GPRS 850MHz Channel = 190)



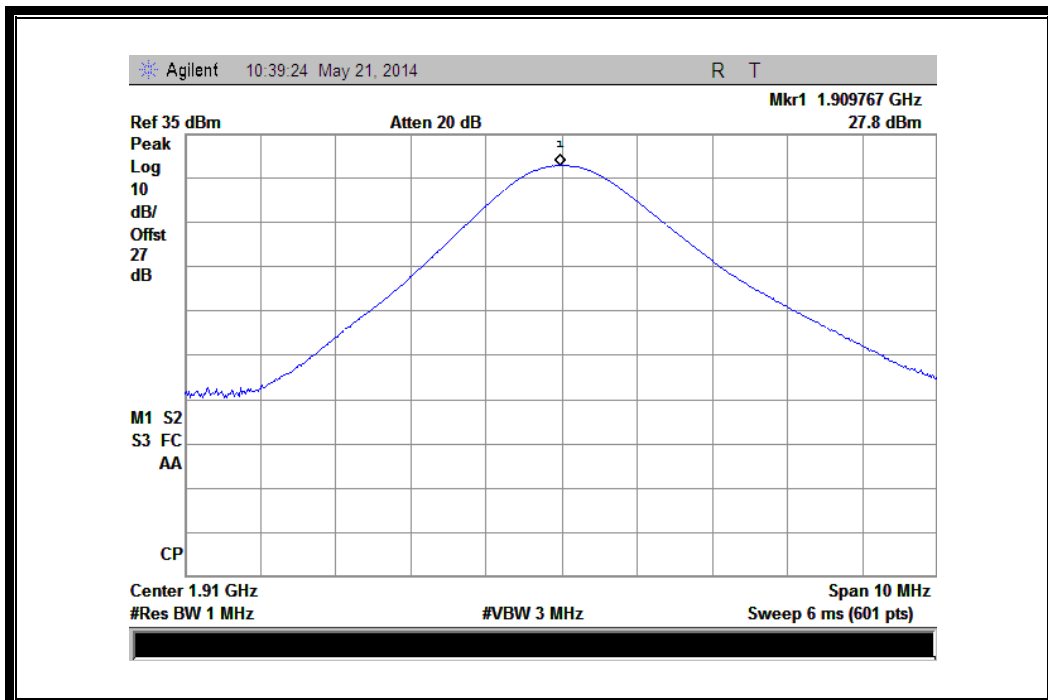
(Plot C 3: GPRS 850MHz Channel = 251)



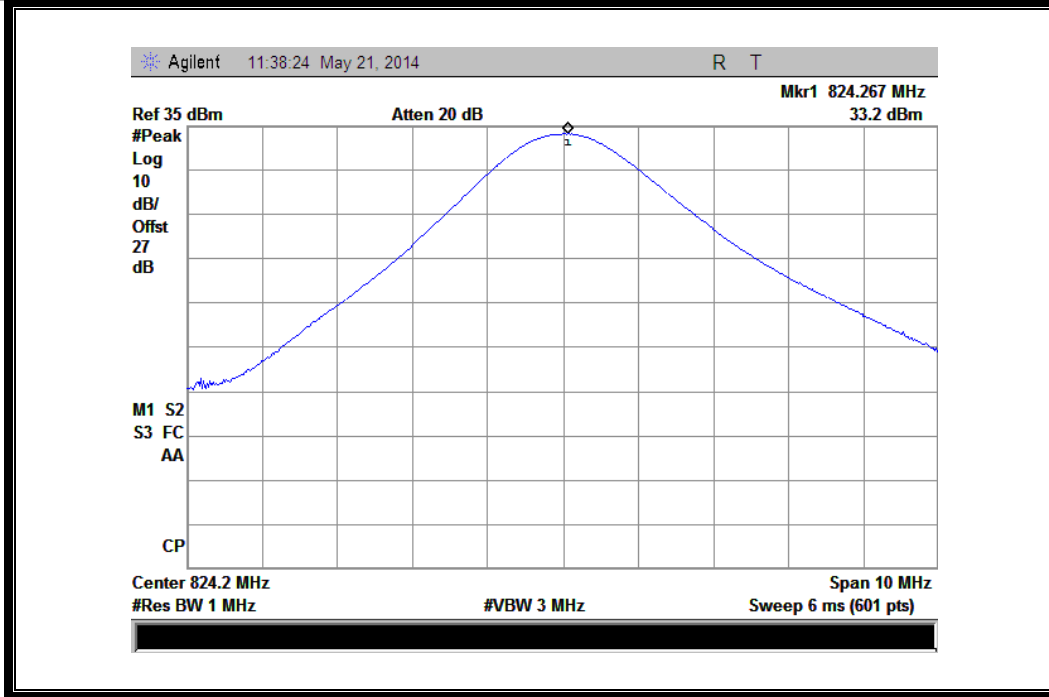
(Plot D 1: GPRS 1900MHz Channel = 512)



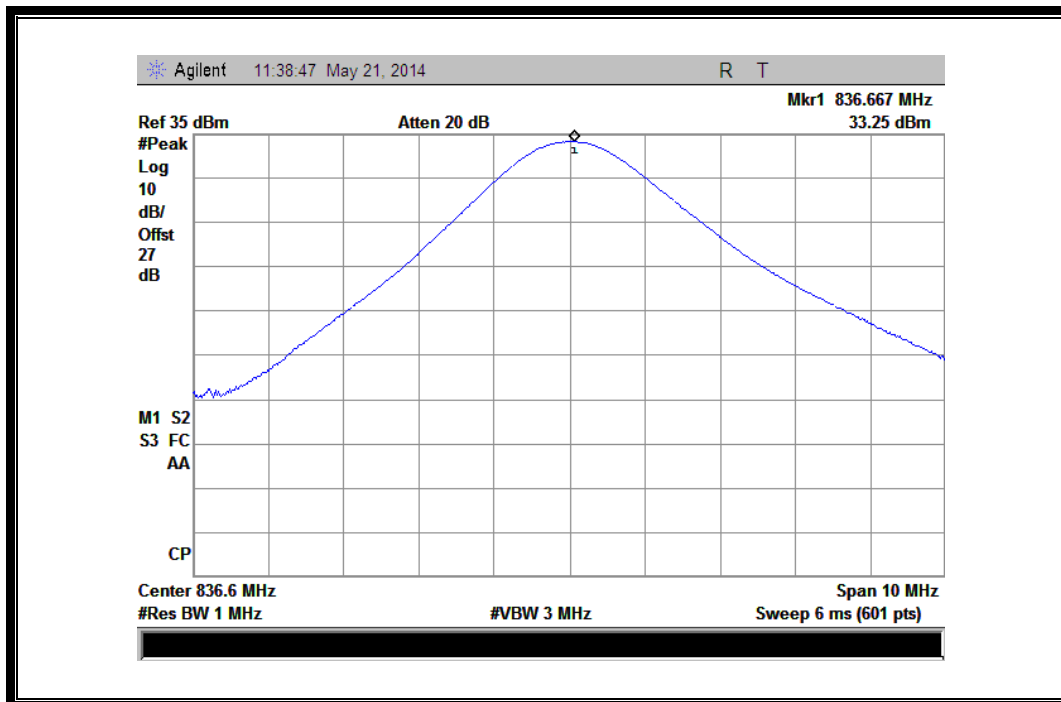
(Plot D 2: GPRS 1900MHz Channel = 661)



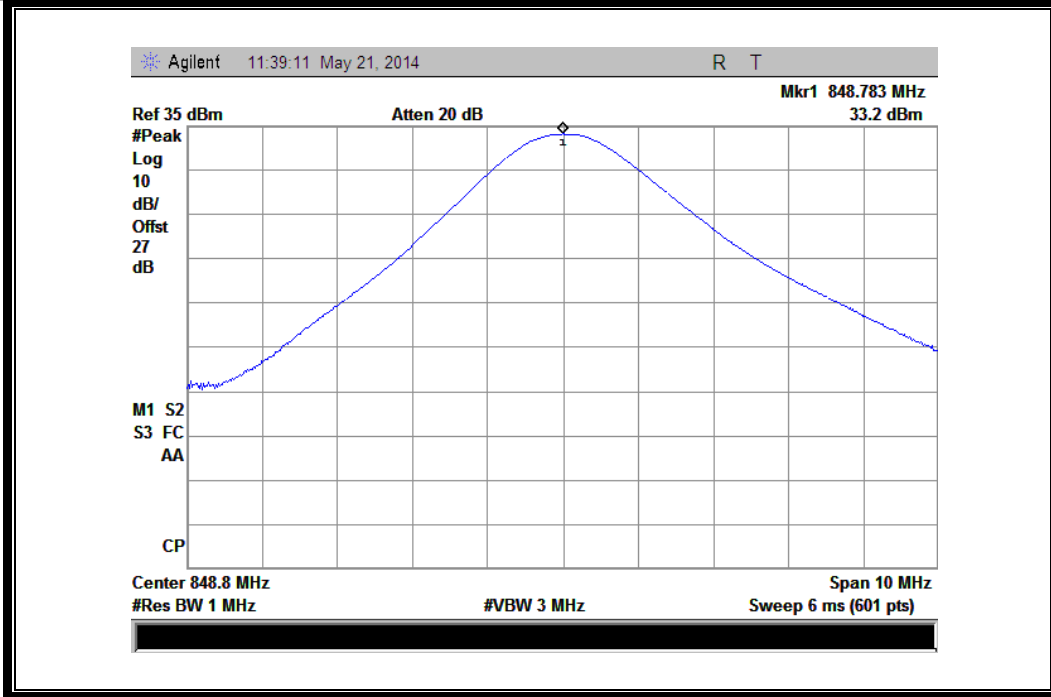
(Plot D 3: GPRS 1900MHz Channel = 810)



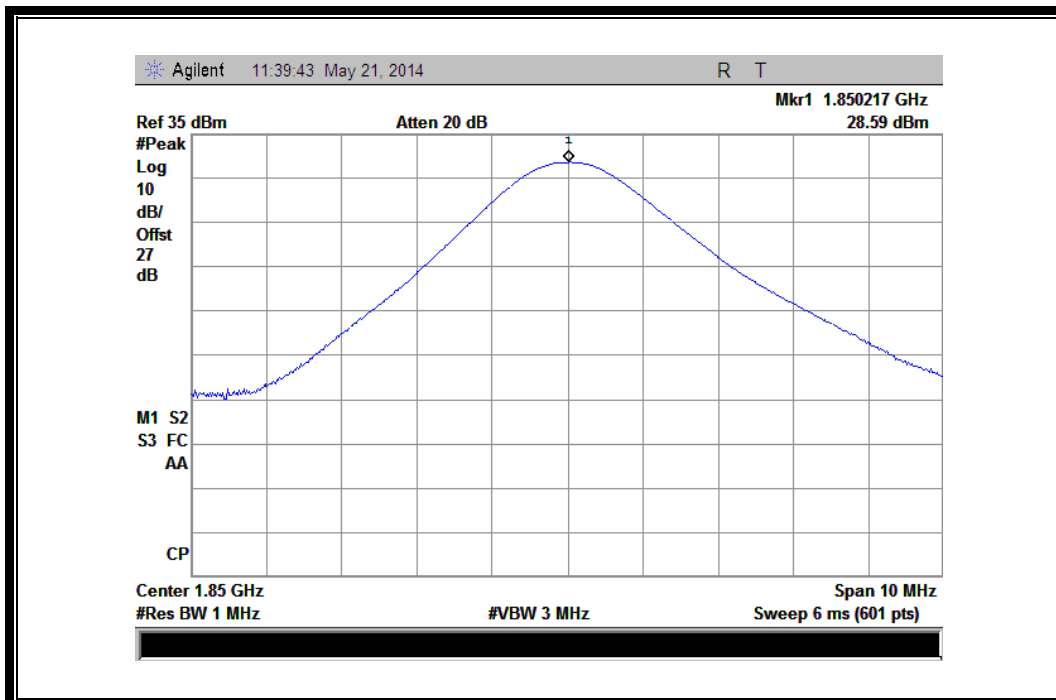
(Plot E1: EGPRS 850MHz Channel = 128)



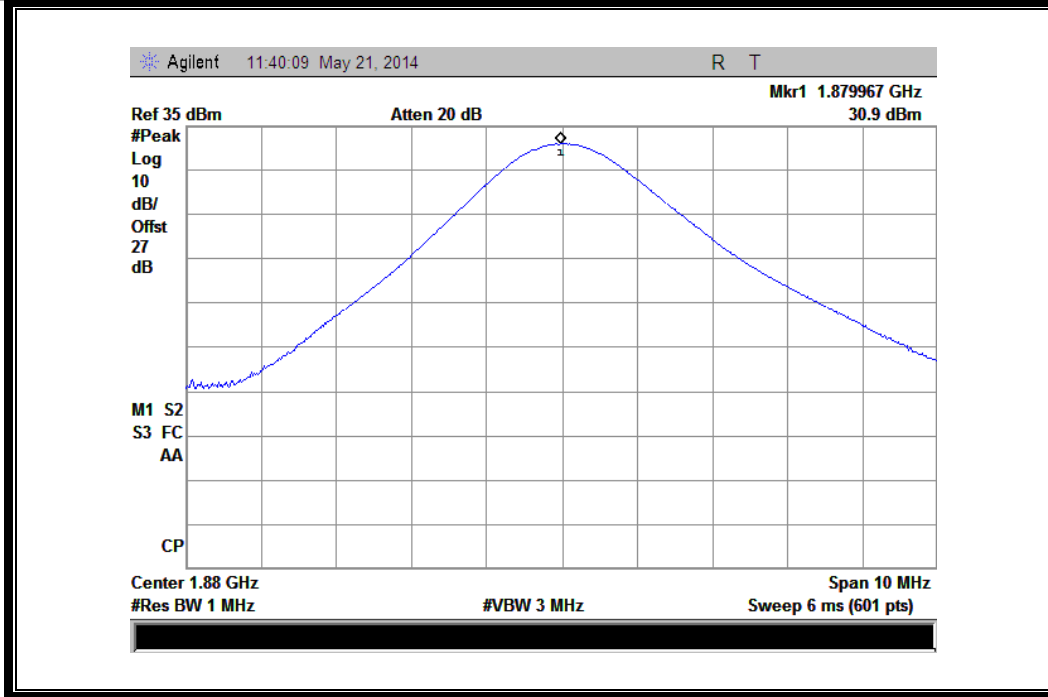
(Plot E2: EGPRS 850MHz Channel = 190)



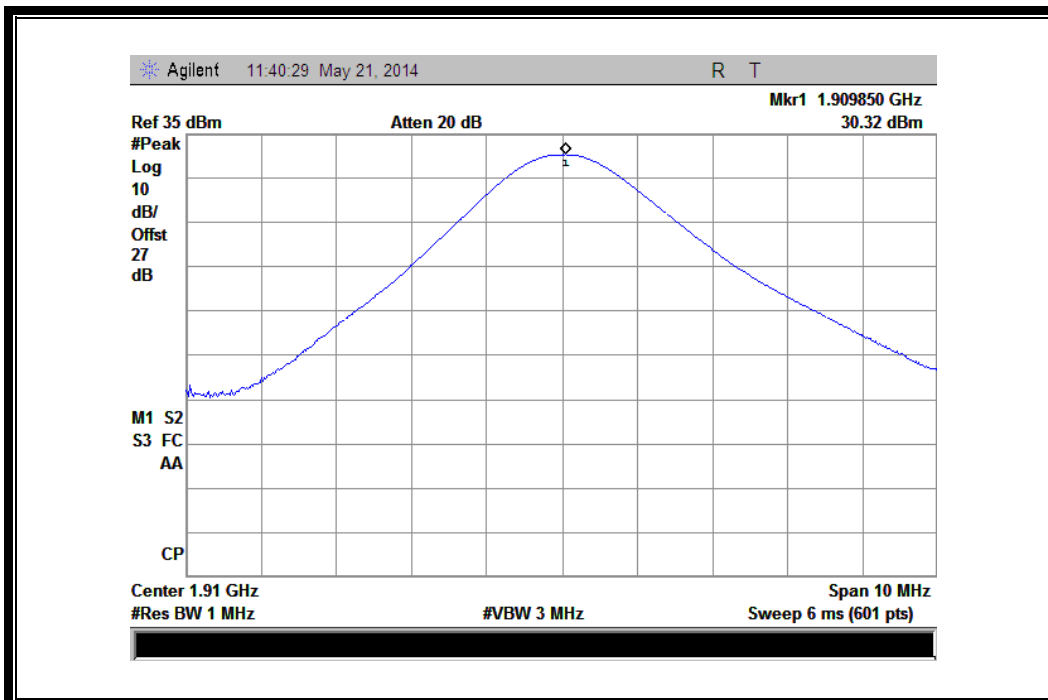
(Plot E3: EGPRS 850MHz Channel = 251)



(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), 27.50(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:

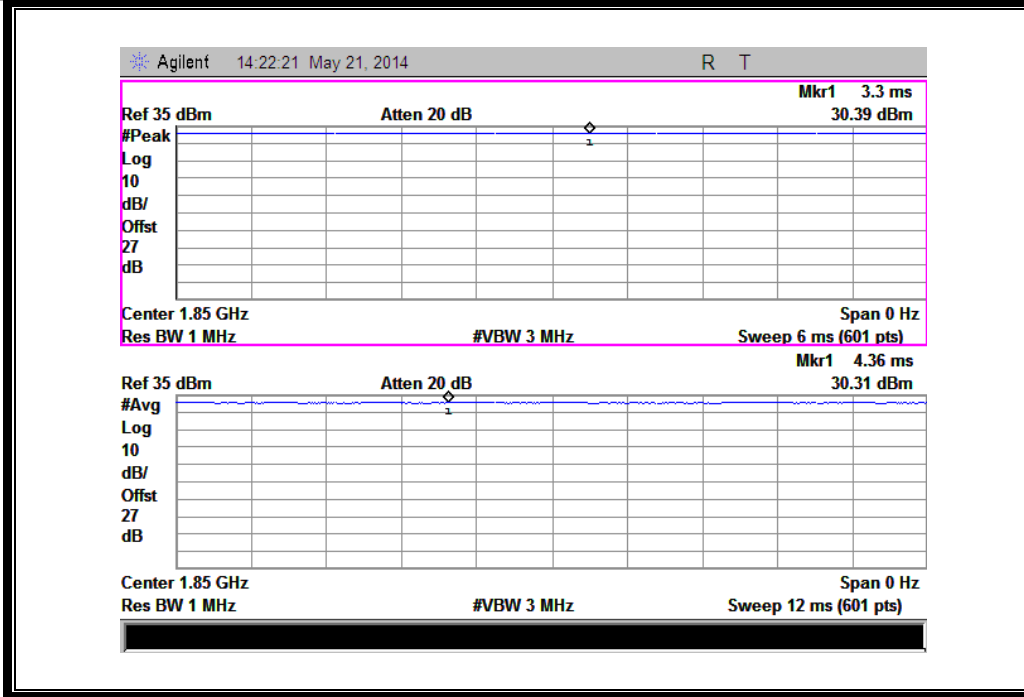
- a. Set RBW=1MHz, VBW=1MHz, peak detector in spectrum analyzer.
- b. Set EUT in maximum output power, and triggered the bust signal.
- c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.

B. For UMTS operating mode:

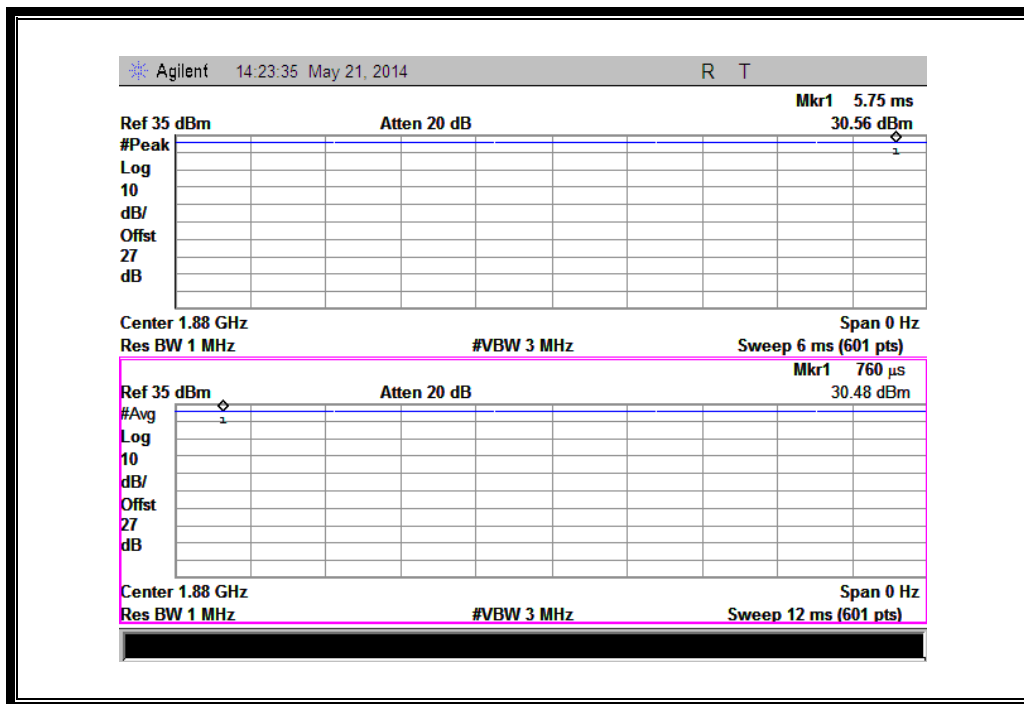
- a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

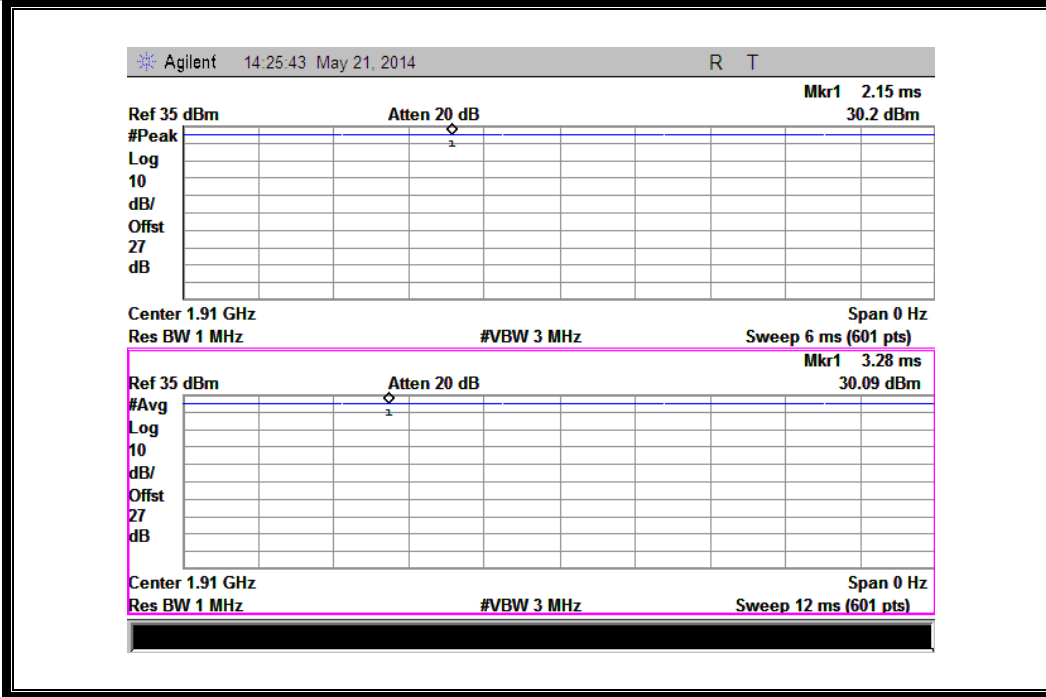
Band	Channel	Frequency (MHz)	Peak to Average ratio		Limit dBm	Verdict
			dBm	Refer to Plot		
GSM 1900MHz	512	1850.2	0.08	Plot A1 to A3	13	PASS
	661	1880.0	0.08			PASS
	810	1909.8	0.11			PASS
EGPRS 1900MHz	512	1850.2	0.04	Plot B1 to B3	13	PASS
	661	1880.0	0.06			PASS
	810	1909.8	0.04			PASS
WCDMA 1900MHz	9262	1852.4	3.56	Plot C1 toC3	13	PASS
	9400	1880	3.16			PASS
	9538	1907.6	3.17			PASS
WCDMA 1700MHz	1312	1712.4	3.30	Plot D1 toD3	13	PASS
	1412	1732.4	3.26			PASS
	1513	1752.6	3.21			PASS



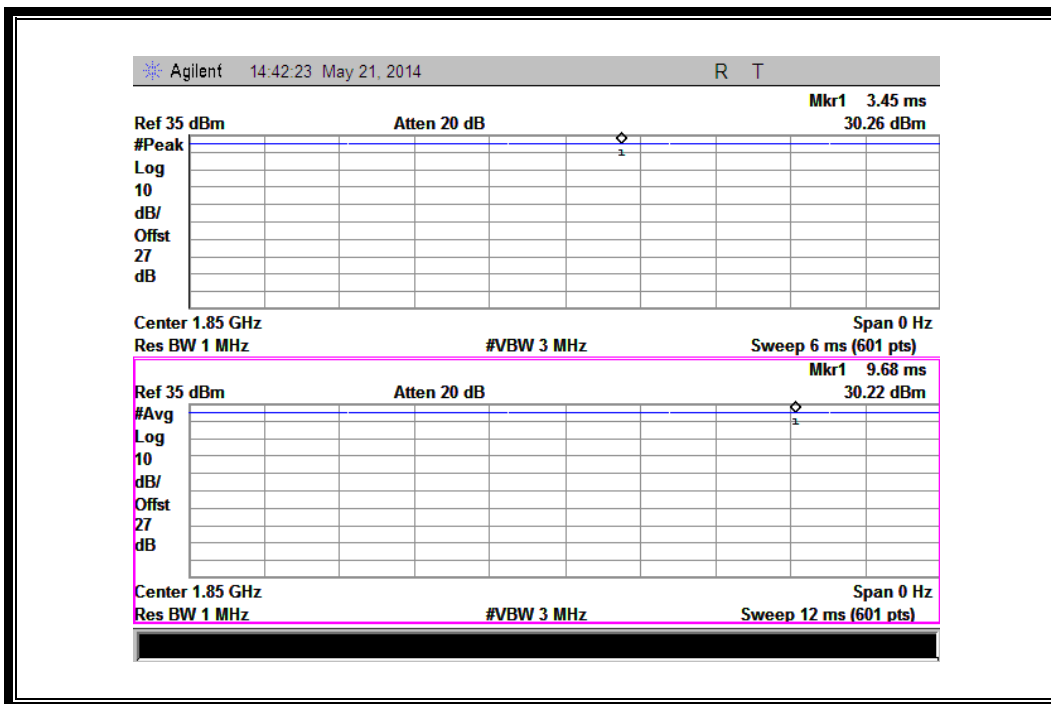
(Plot A1:GSM 1900 MHz Channel = 512)



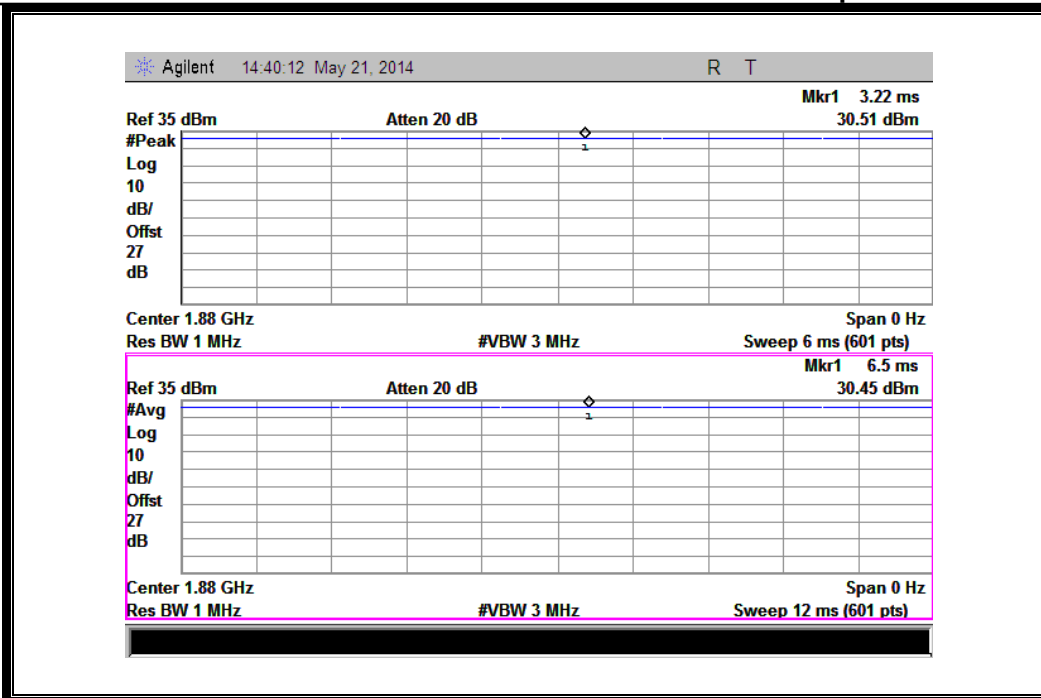
(Plot A2:GSM 1900 MHz Channel = 661)



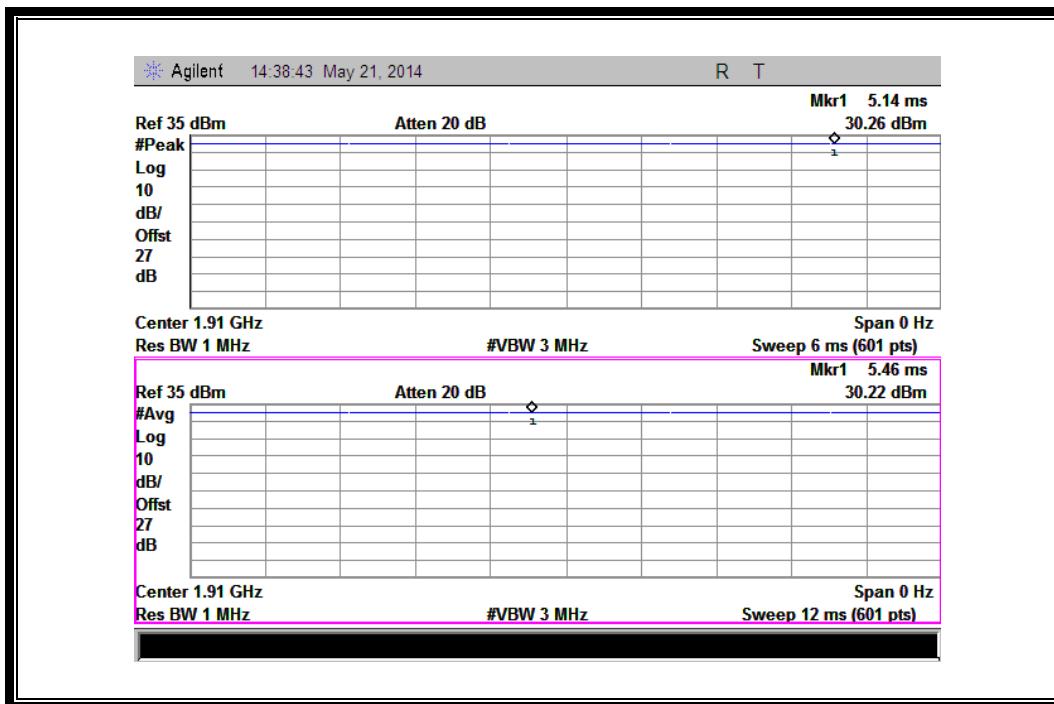
(Plot A3:GSM 1900MHz Channel = 810)



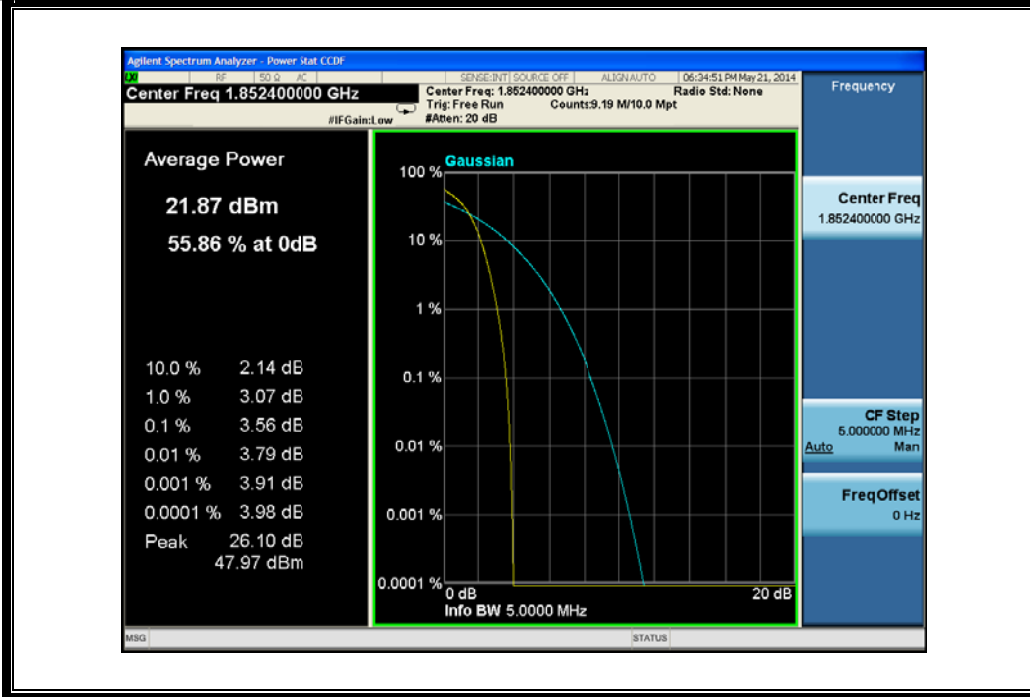
(Plot B1: EGPRS 1900MHz Channel = 512)



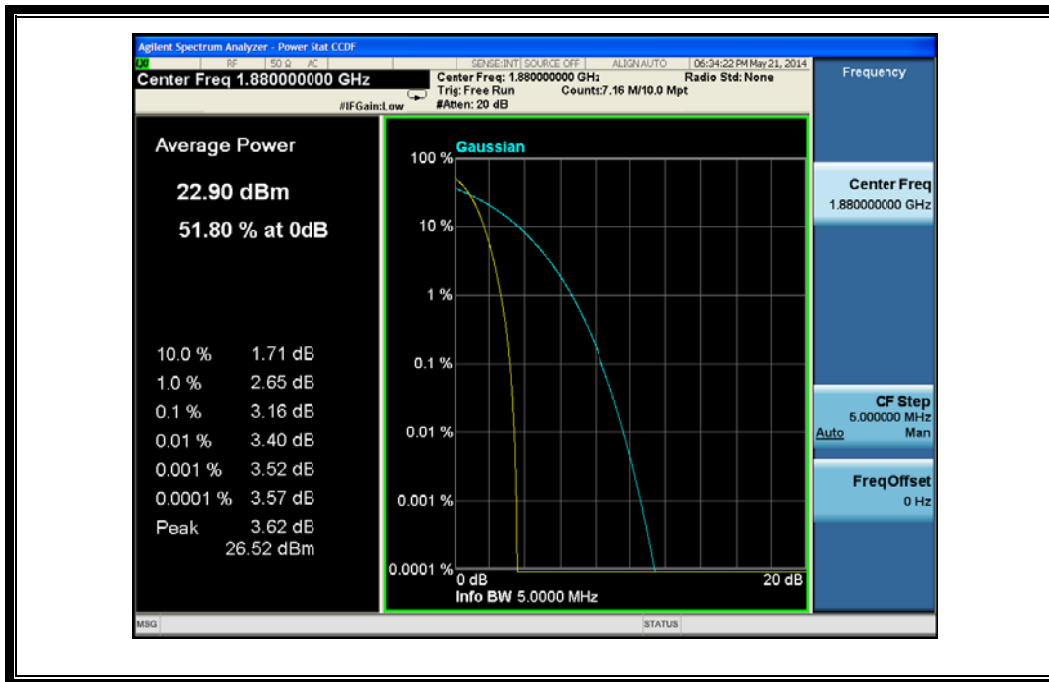
(Plot B2: EGPRS 1900MHz Channel = 661)



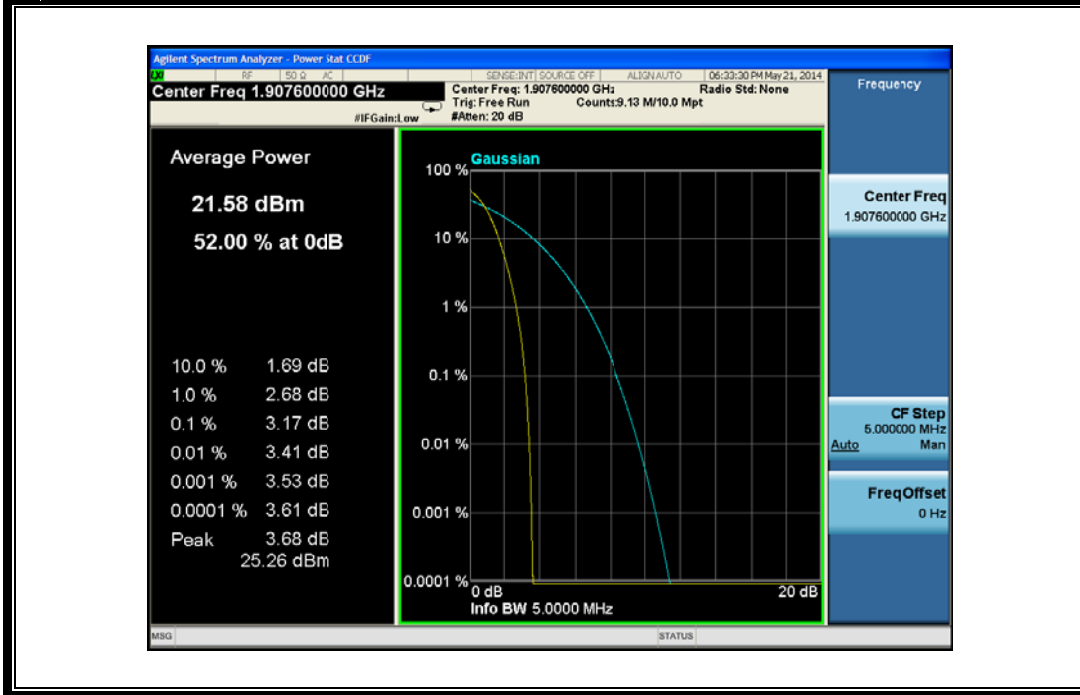
(Plot B3: EGPRS 1900MHz Channel = 810)



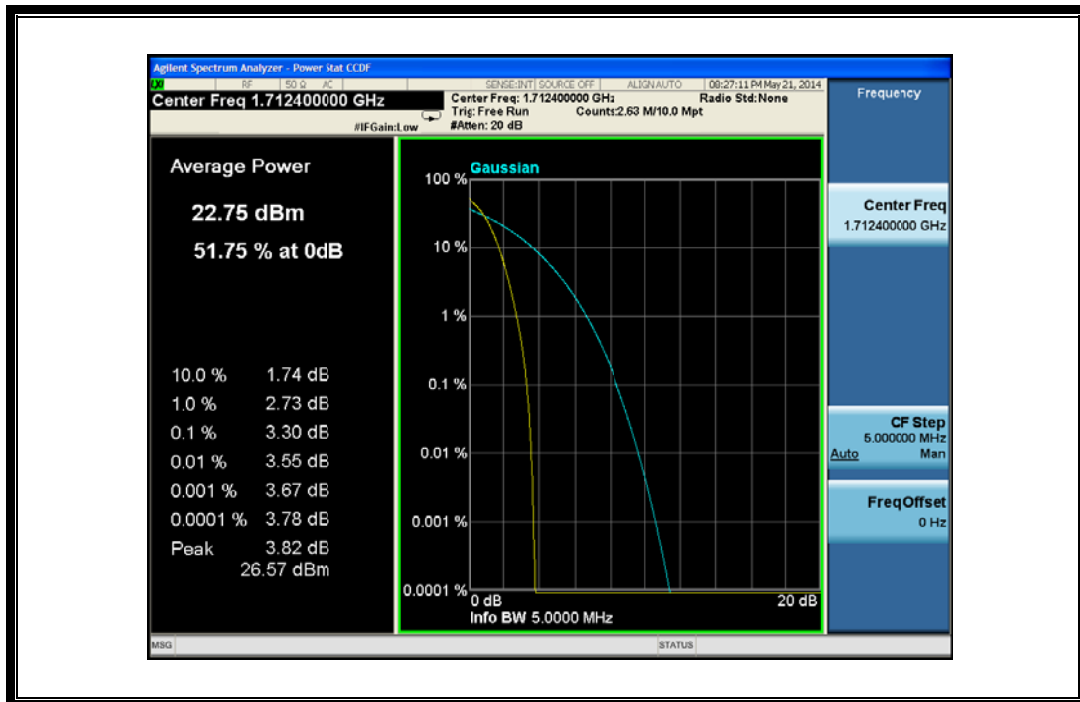
(Plot C1: WCDMA 1900MHz Channel = 9262)



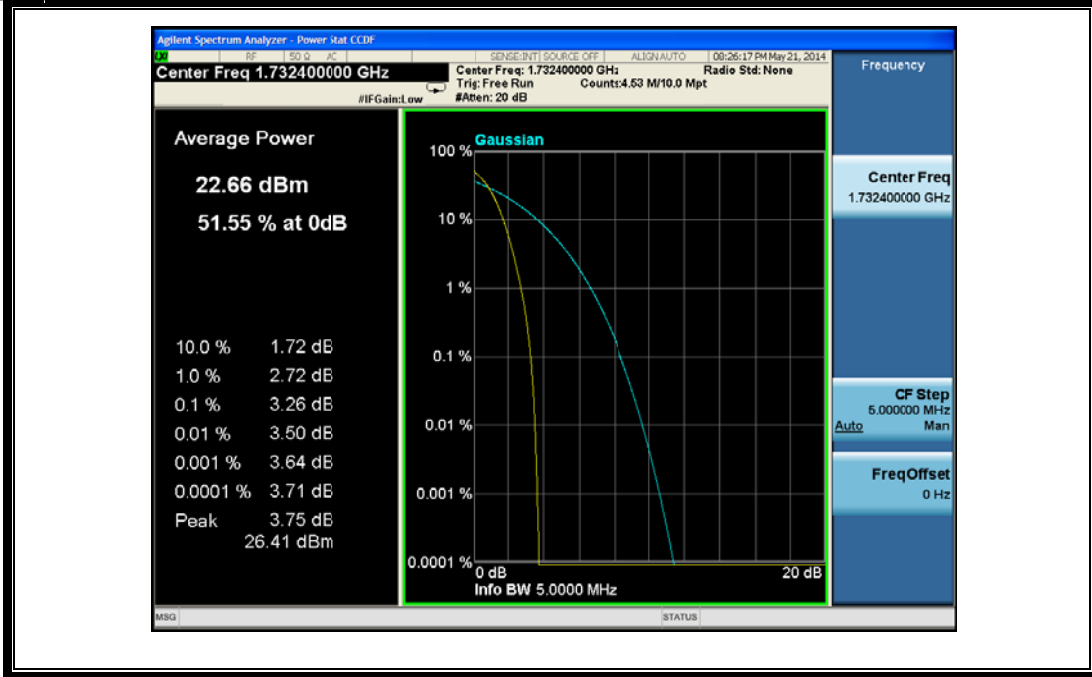
(Plot C2: WCDMA 1900MHz Channel = 9400)



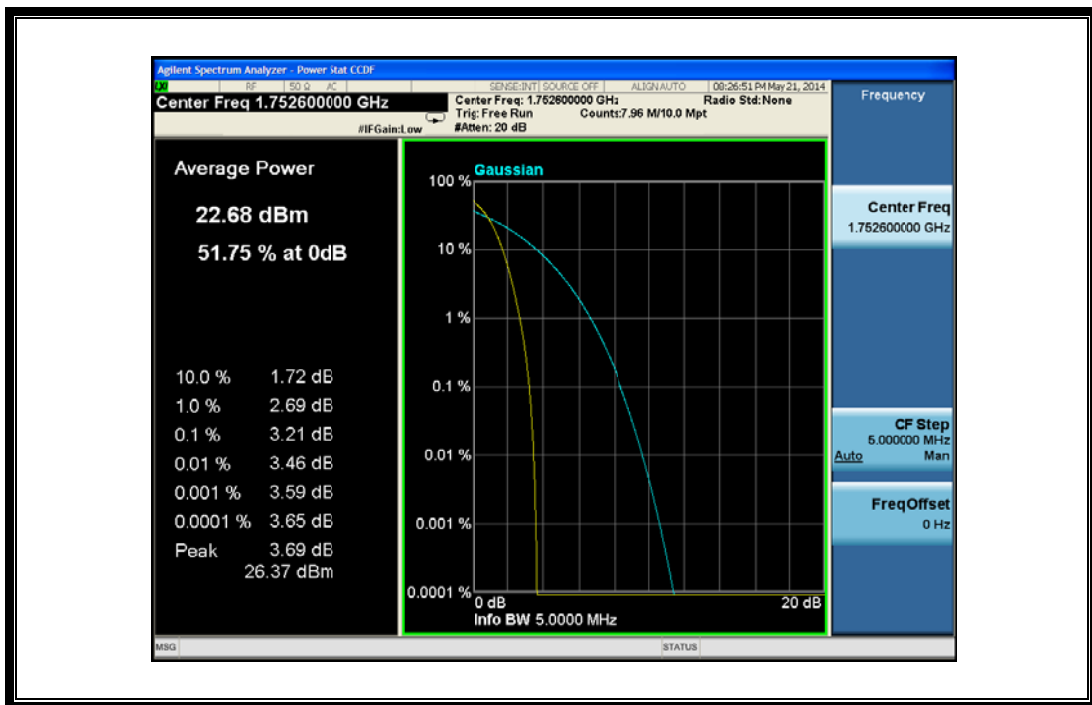
(Plot C3: WCDMA 1900MHz Channel = 9538)



(Plot D1: WCDMA 1700MHz Channel = 1312)



(Plot D2: WCDMA 1700MHz Channel = 1412)



(Plot D3: WCDMA 1700MHz Channel = 1513)

2.3 99% Occupied Bandwidth

2.3.1 Definition

According to FCC section 2.1049 and FCC § 22.917 & 24.238 and 27.53(g), 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.

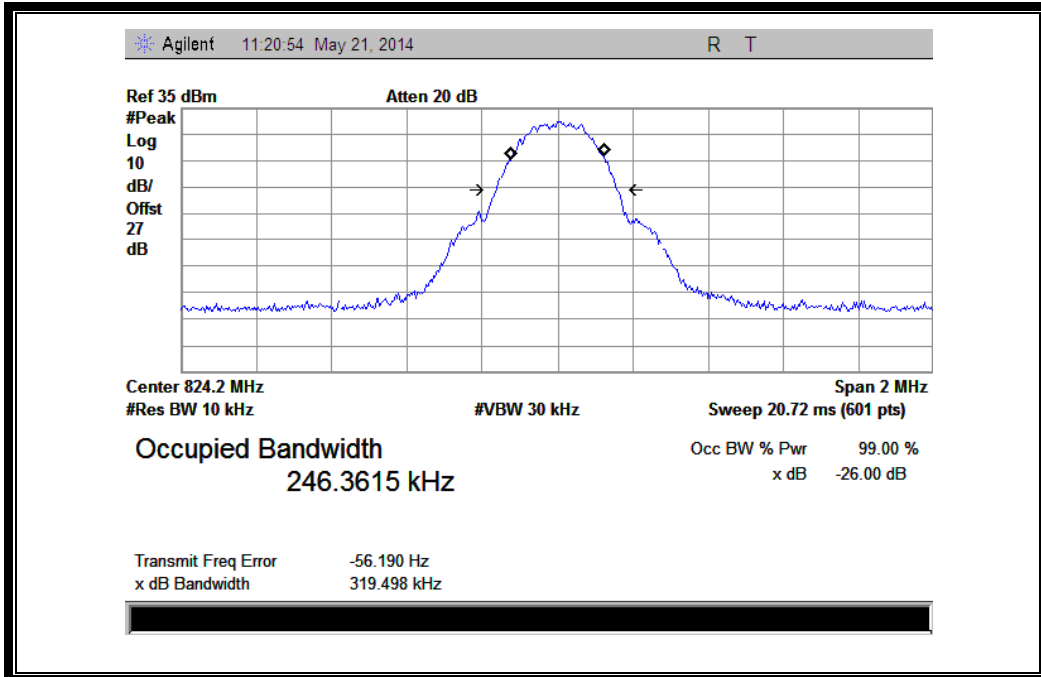
2. Test Verdict:

Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
EDGE 850MHz	128	824.2	319.498 KHz	246.3615 KHz	Plot A
	190	836.6	318.490 KHz	248.5437 KHz	Plot B
	251	848.8	310.263 KHz	241.6547 KHz	Plot C
EDGE 1900MHz	512	1850.2	320.772 KHz	245.2999 KHz	Plot D
	661	1880.0	317.437 KHz	245.9253 KHz	Plot E
	810	1909.8	314.164 KHz	247.5230 KHz	Plot F
WCDMA 850MHz	4132	826.4	4.609MHz	4.1595MHz	Plot G
	4175	835	4.613MHz	4.1563MHz	Plot H
	4233	846.6	4.625MHz	4.1538MHz	Plot I
WCDMA1900MHz	9262	1852.4	4.620MHz	4.1633MHz	Plot J
	9400	1880	4.620MHz	4.1597MHz	Plot K
	9538	1907.6	4.605MHz	4.1515MHz	Plot L
HSDPA 850MHz	4132	826.4	4.628MHz	4.1787MHz	Plot M
	4175	835	4.624MHz	4.1714MHz	Plot N
	4233	846.6	4.612MHz	4.1581MHz	Plot O
HSDPA 1900MHz	9262	1852.4	4.603MHz	4.1763MHz	Plot P
	9400	1880	4.607MHz	4.1790MHz	Plot Q
	9538	1907.6	4.614MHz	4.1685MHz	Plot R
HSUPA 850MHz	4132	826.4	4.618MHz	4.1549MHz	Plot S
	4175	835	4.620MHz	4.1536MHz	Plot T
	4233	846.6	4.614MHz	4.1492MHz	Plot U
HSUPA 1900MHz	9262	1852.4	4.625MHz	4.1623MHz	Plot V
	9400	1880	4.616MHz	4.1501MHz	Plot W

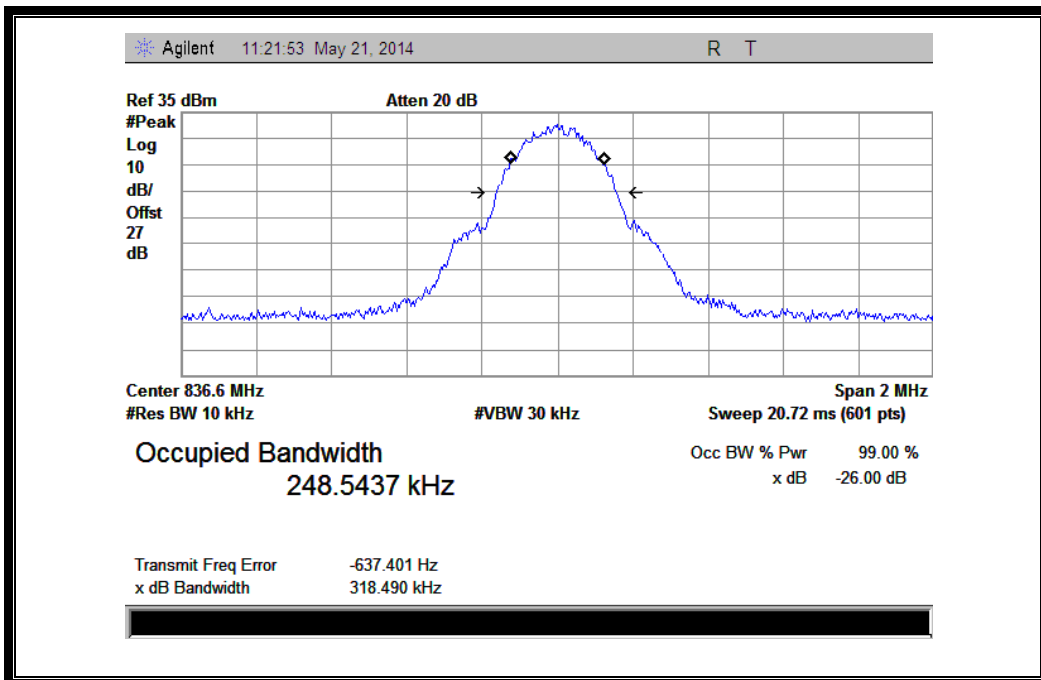


Band	Channel	Frequency (MHz)	26dB bandwidth	99% Occupied Bandwidth	Refer to Plot
	9538	1907.6	4.614MHz	4.1472MHz	Plot X
HSPA+ 850MHz	4132	826.4	4.612MHz	4.1678MHz	Plot Y
	4175	835	4.626MHz	4.1537MHz	Plot Z
	4233	846.6	4.616MHz	4.1571MHz	Plot A1
HSPA+ 1900MHz	9262	1852.4	4.618MHz	4.1669MHz	Plot B1
	9400	1880	4.624MHz	4.1636MHz	Plot C1
	9538	1907.6	4.627MHz	4.1517MHz	Plot D1
GSM 850MHz	128	824.2	321.361 KHz	248.1096 KHz	Plot E1
	190	836.6	319.654 KHz	244.0625 KHz	Plot F1
	251	848.8	319.493 KHz	247.4447 KHz	Plot G1
GSM 1900MHz	512	1850.2	323.277 KHz	243.4289 KHz	Plot H1
	661	1880.0	323.580 KHz	246.9003 KHz	Plot I1
	810	1909.8	317.674 KHz	244.5224 KHz	Plot J1
WCDMA 1700MHz	1312	1712.4	4.618MHz	4.1671MHz	Plot K1
	1412	1732.4	4.613MHz	4.1562MHz	Plot L1
	1513	1752.6	4.624MHz	4.1573MHz	Plot M1
HSDPA 1700MHz	1312	1712.4	4.626MHz	4.1546MHz	Plot N1
	1412	1732.4	4.600MHz	4.1739MHz	Plot O1
	1513	1752.6	4.623MHz	4.1597MHz	Plot P1
HSUPA 1700MHz	1312	1712.4	4.626MHz	4.1704MHz	Plot Q1
	1412	1732.4	4.612MHz	4.1598MHz	Plot R1
	1513	1752.6	4.599MHz	4.1631MHz	Plot S1
HSPA+ 1700MHz	1312	1712.4	4.612MHz	4.1559MHz	Plot T1
	1412	1732.4	4.608MHz	4.1684MHz	Plot U1
	1513	1752.6	4.619MHz	4.1843MHz	Plot V1
GPRS 850MHz	128	824.2	323.994 KHz	250.1788 KHz	Plot W1
	190	836.6	323.310 KHz	248.8777 KHz	Plot X1
	251	848.8	314.348 KHz	247.5738 KHz	Plot Y1
GPRS 1900MHz	512	1850.2	323.145 KHz	240.8957 KHz	Plot Z1
	661	1880.0	318.479 KHz	243.3153 KHz	Plot A2
	810	1909.8	321.501 KHz	249.8371 KHz	Plot B2

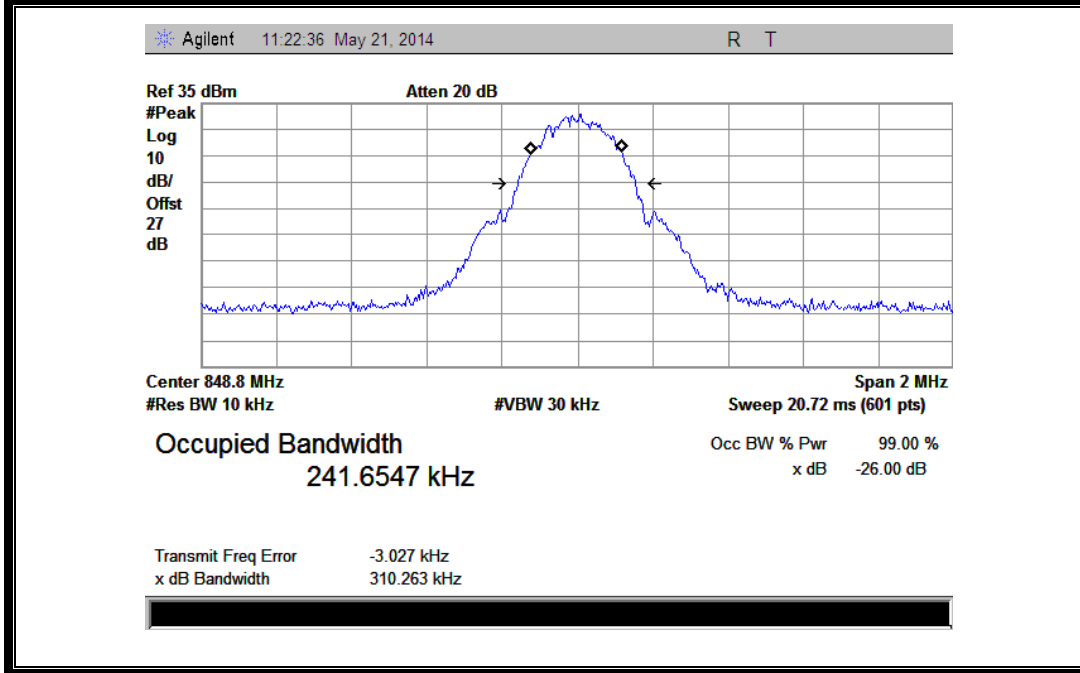
3. Test Plots:



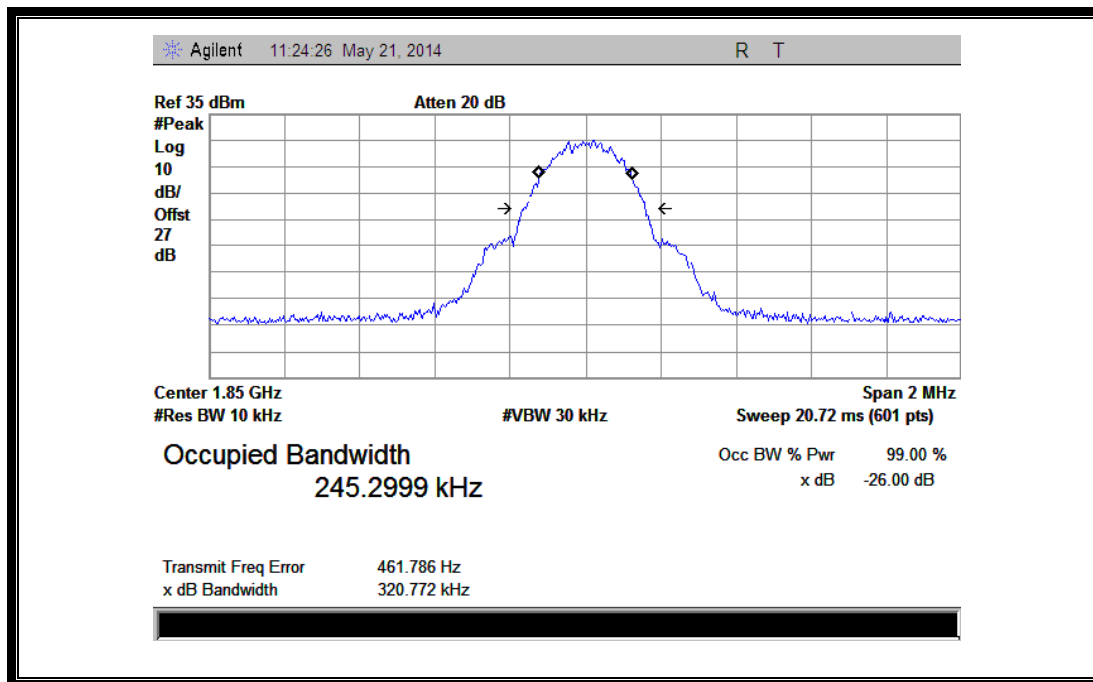
(Plot A: EGPRS 850MHz Channel = 128)



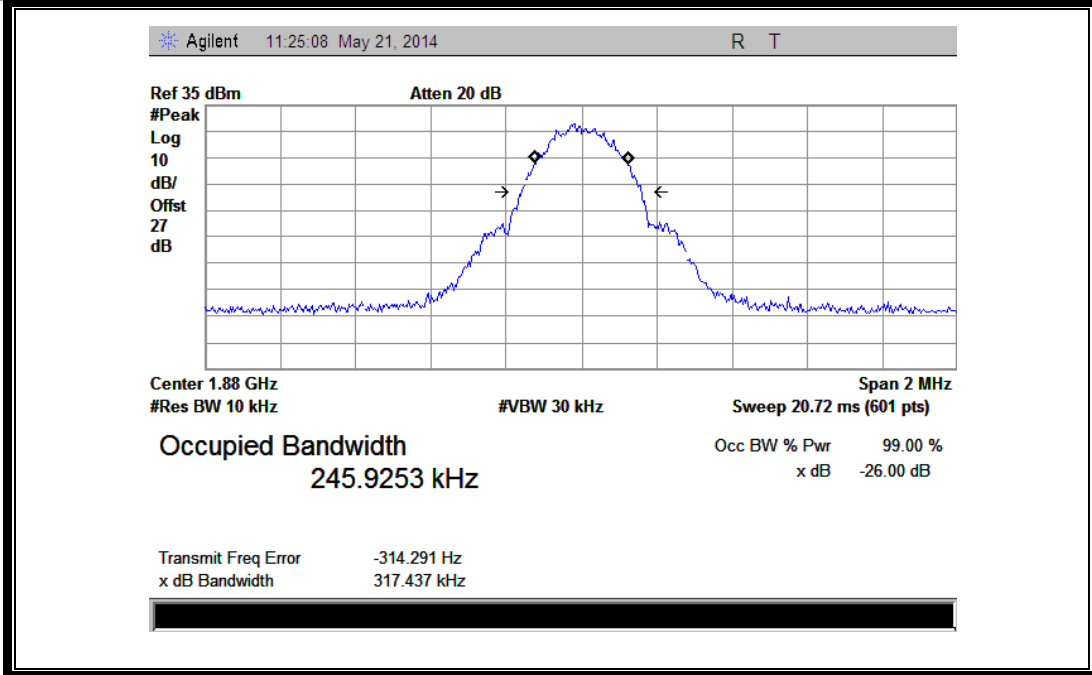
(Plot B: EGPRS 850MHz Channel = 190)



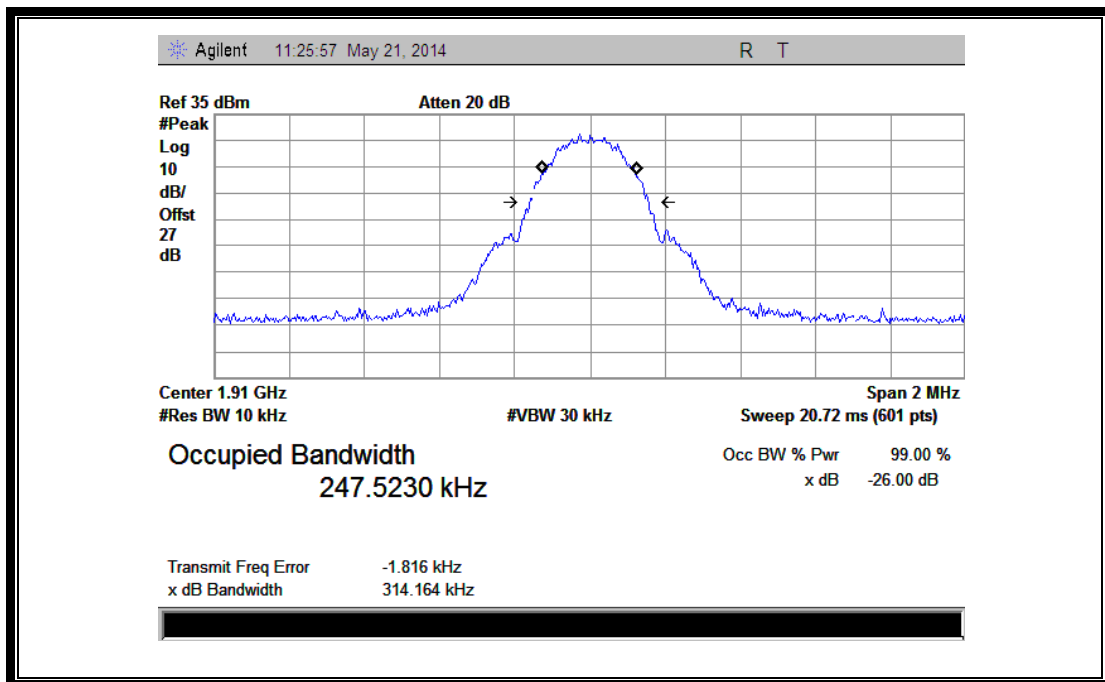
(Plot C: EGPRS 850MHz Channel = 251)



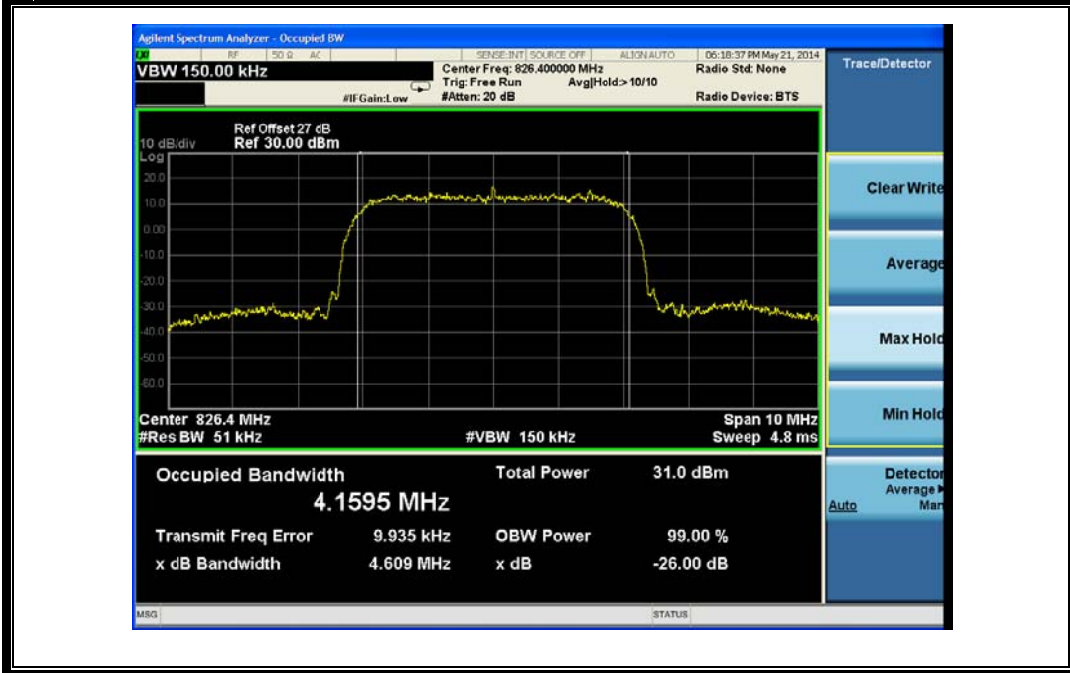
(Plot D: EGPRS1900MHz Channel = 512)



(Plot E: EGPRS1900MHz Channel = 661)



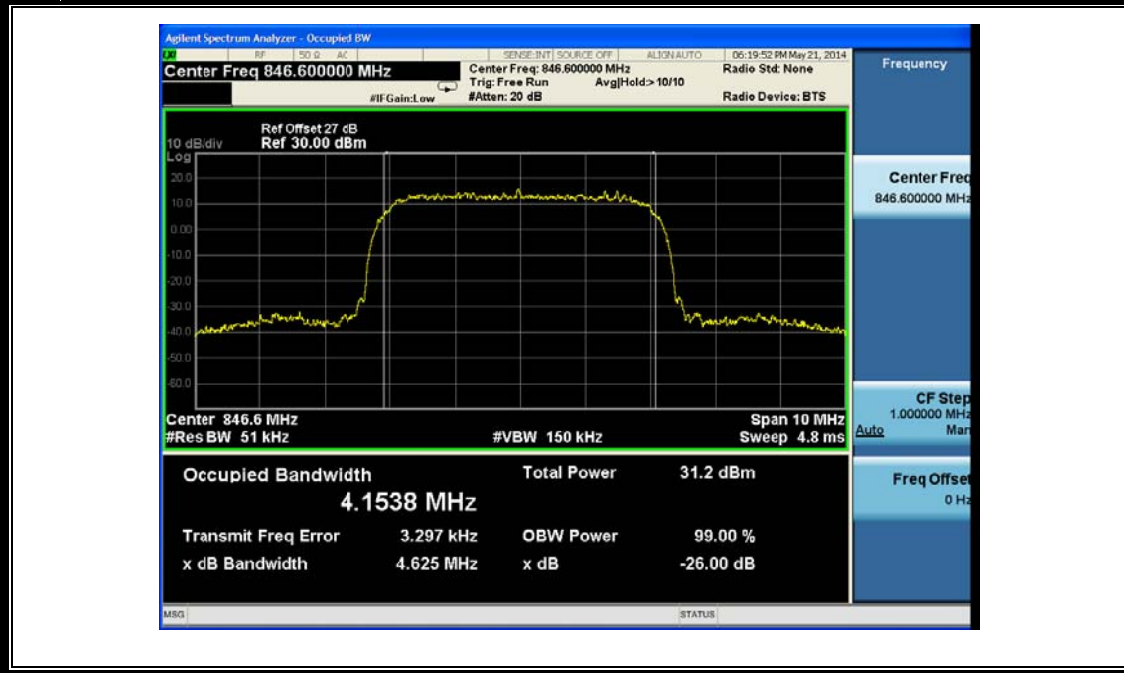
(Plot F: EGPRS 1900MHz Channel = 810)



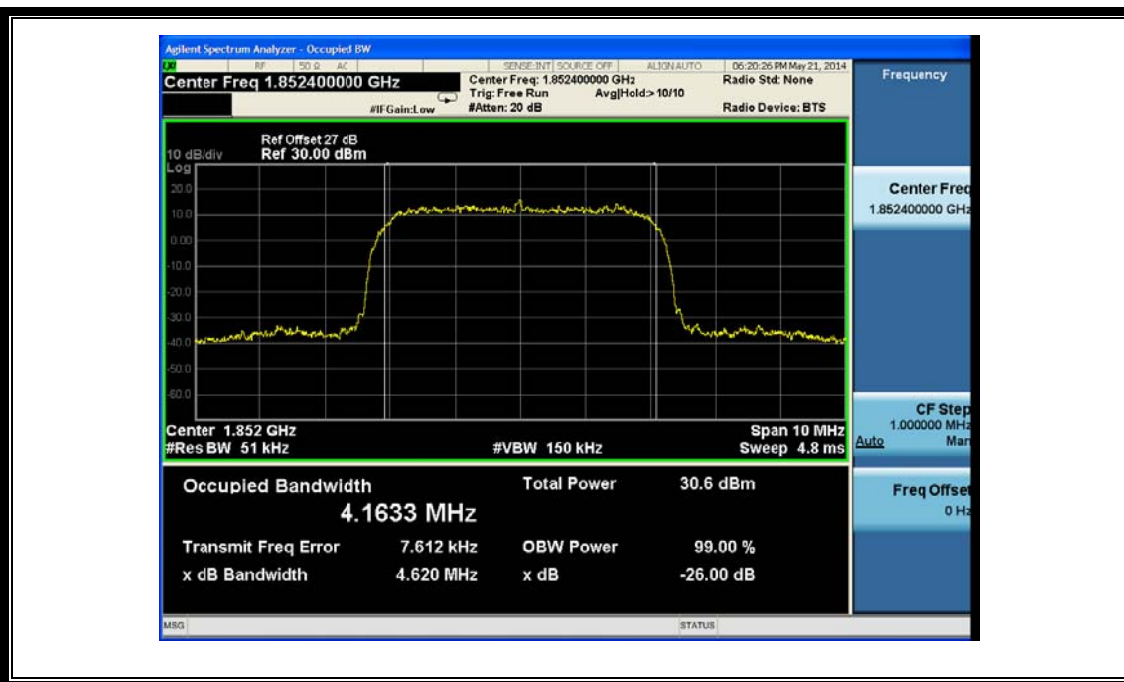
(Plot G: WCDMA 850MHz Channel = 4132)



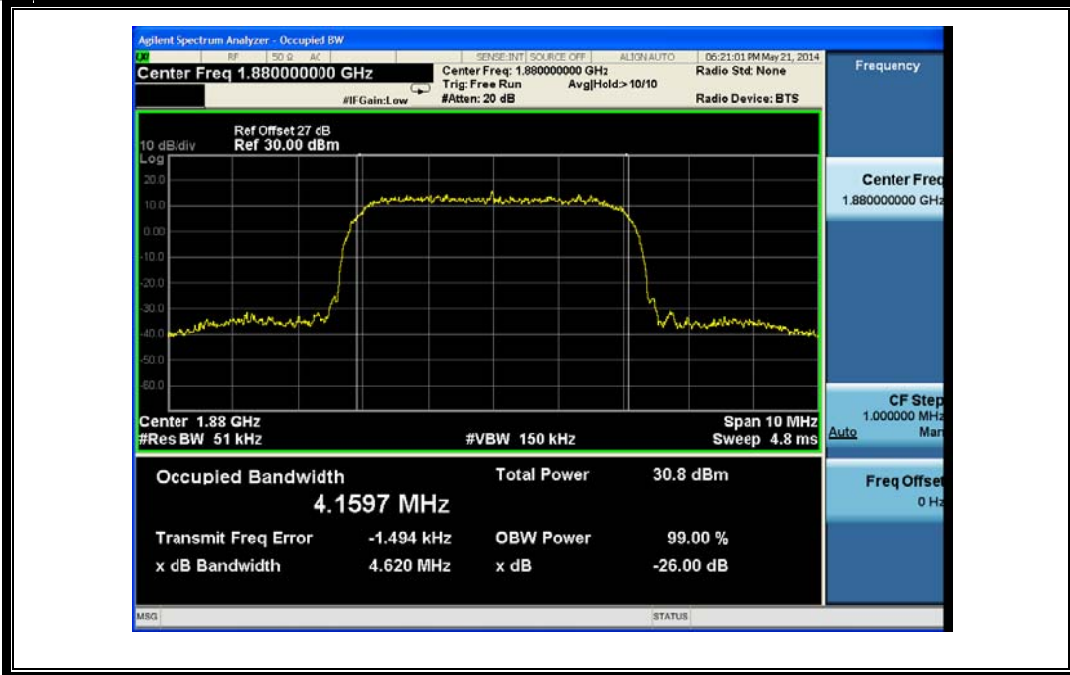
(Plot H: WCDMA 850 MHz Channel = 4175)



(Plot I: WCDMA 850MHz Channel = 4233)



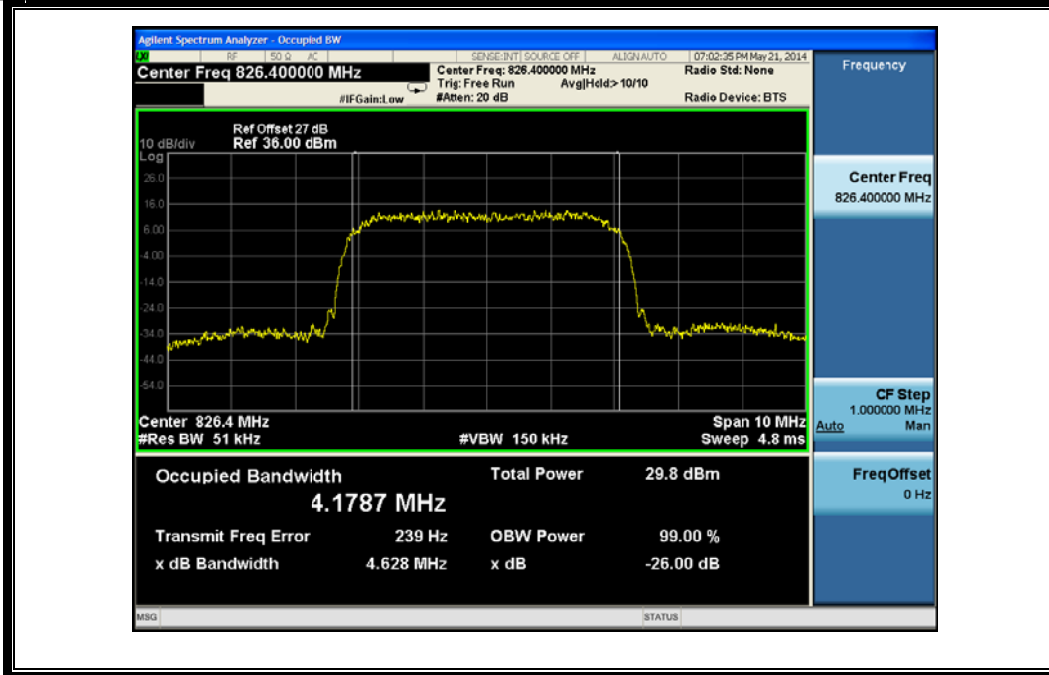
(Plot J: WCDMA 1900MHz Channel = 9262)



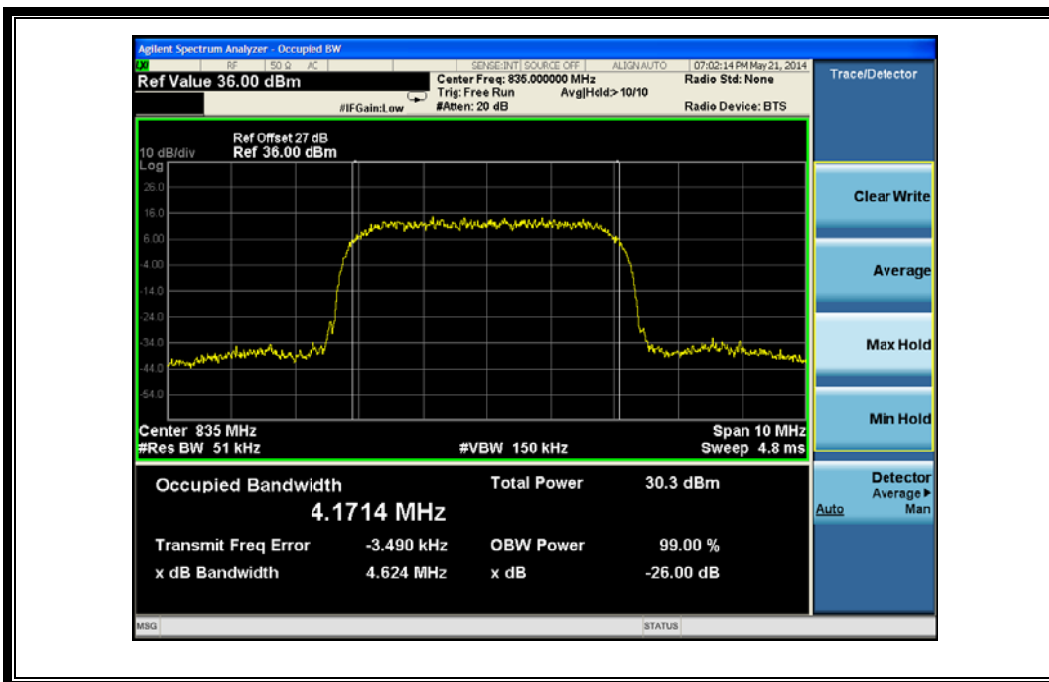
(Plot K: WCDMA 1900 MHz Channel = 9400)



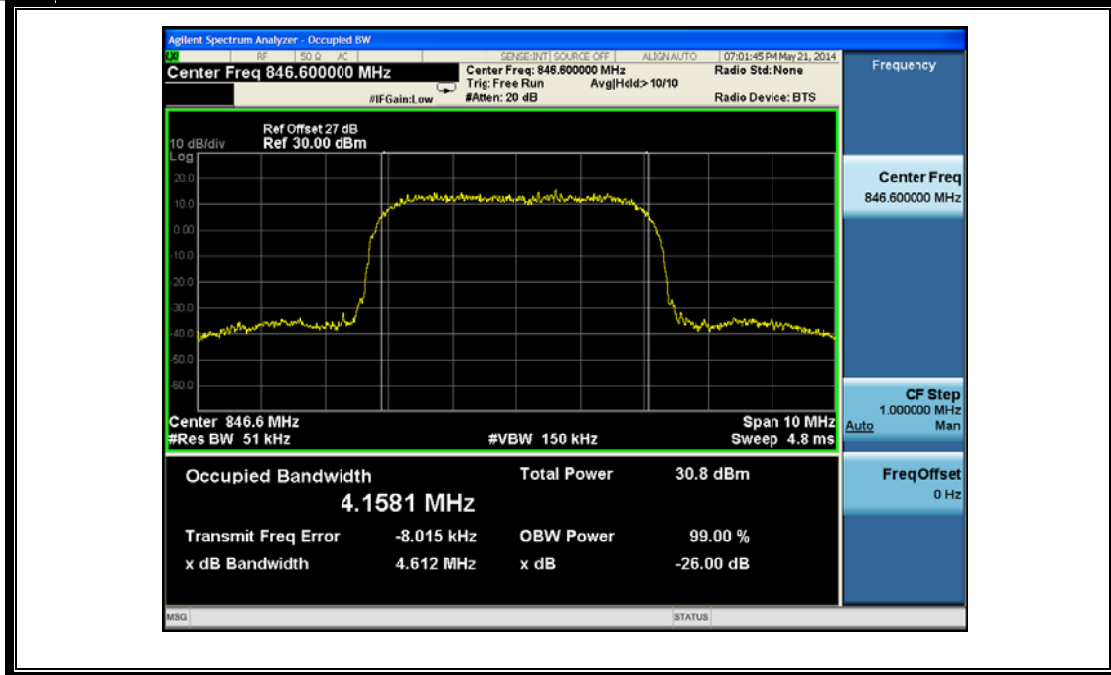
(Plot L: WCDMA1900MHz Channel = 9538)



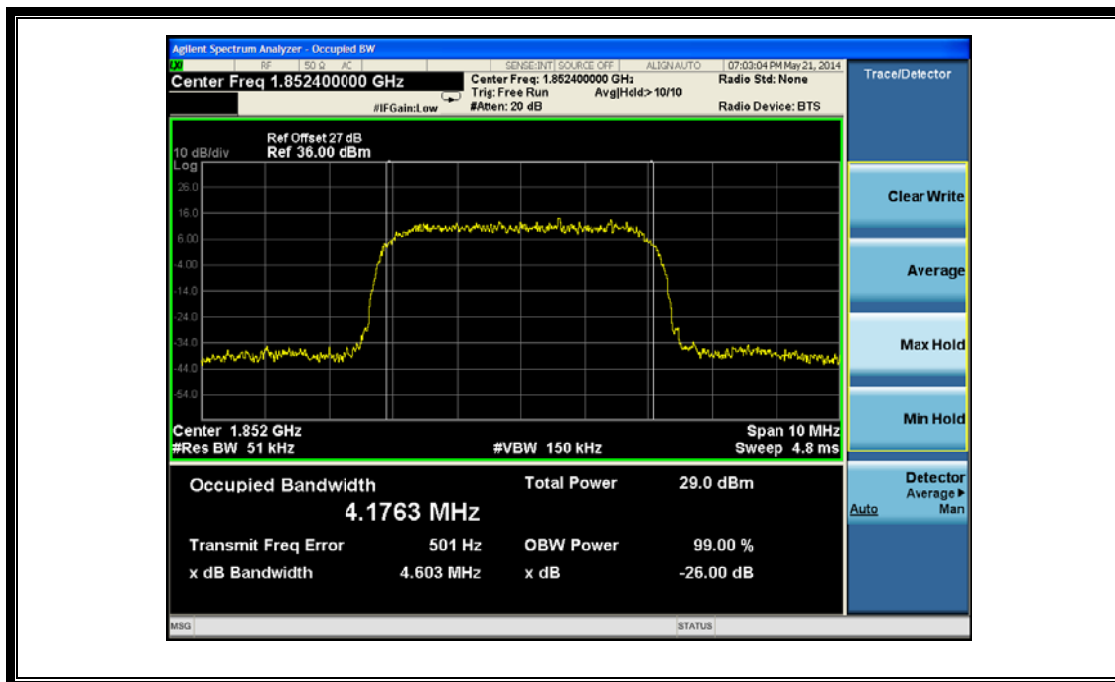
(Plot M: HSDPA 850MHz Channel = 4132)



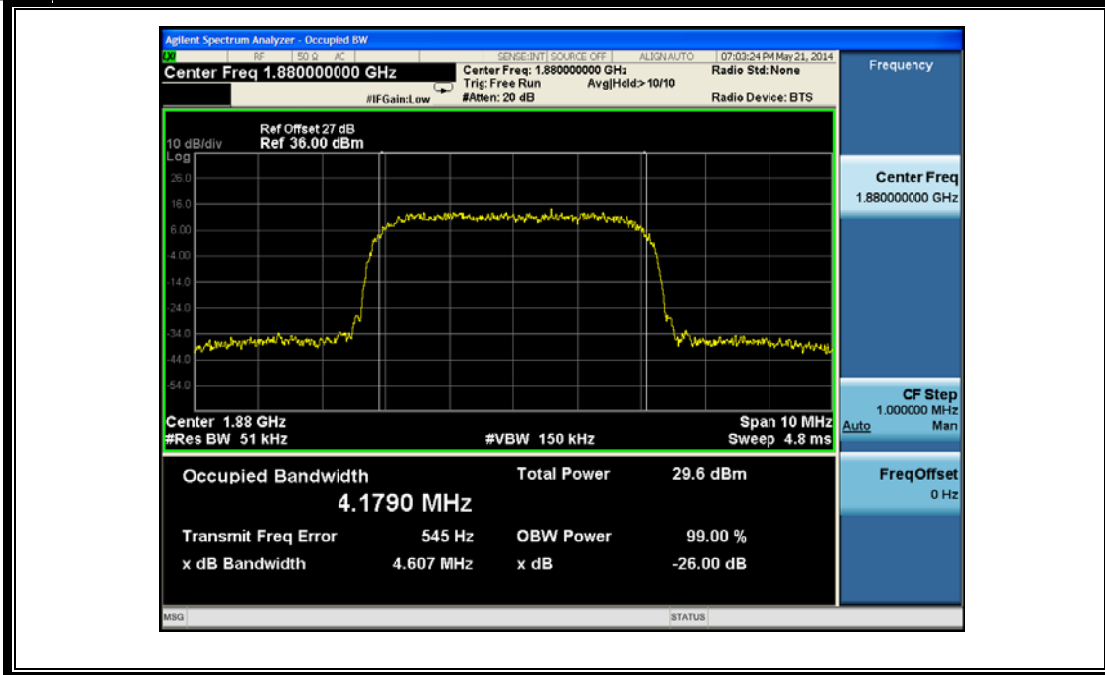
(Plot N: HSDPA850 MHz Channel = 4175)



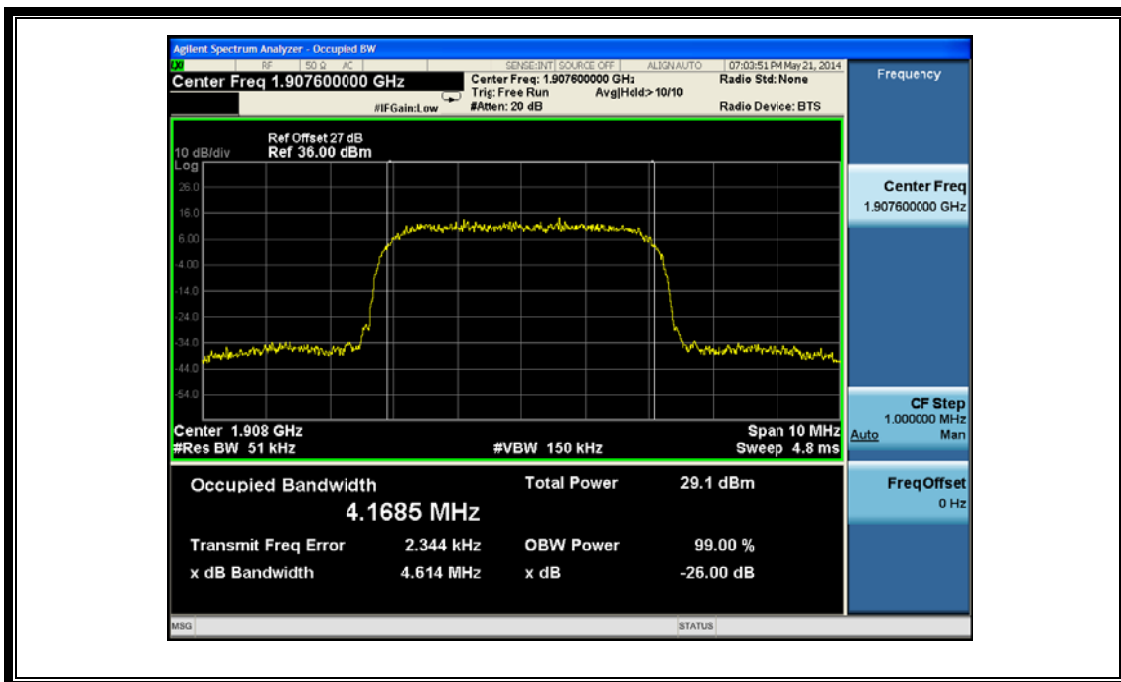
(Plot O: HSDPA 850 MHz Channel = 4233)



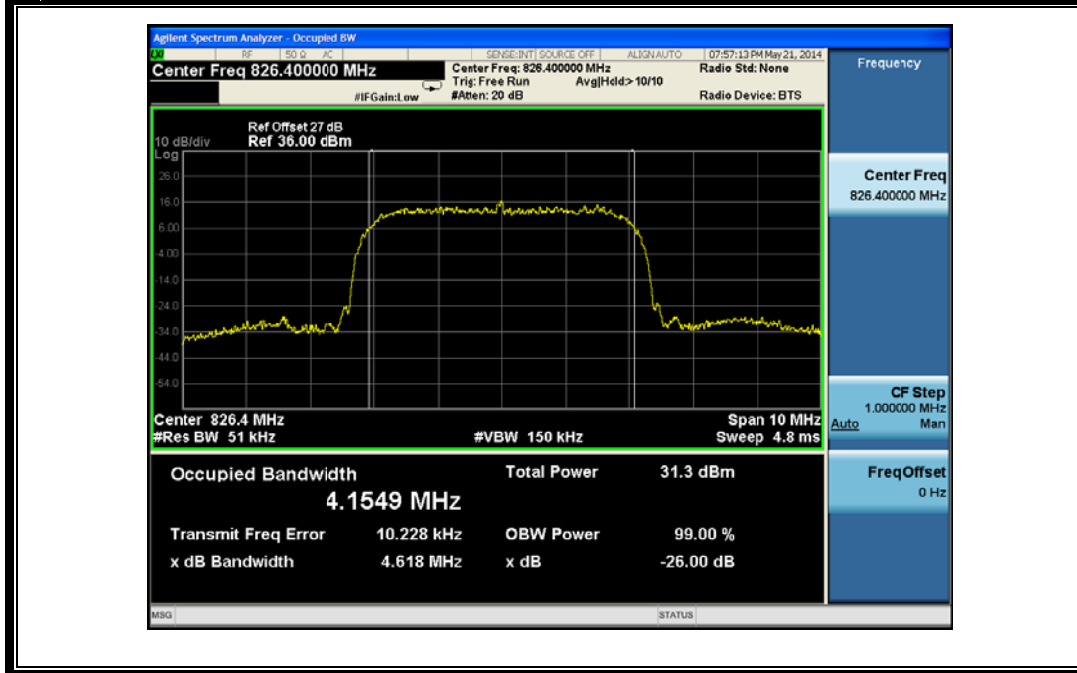
(Plot P: HSDPA 1900 MHz Channel = 9262)



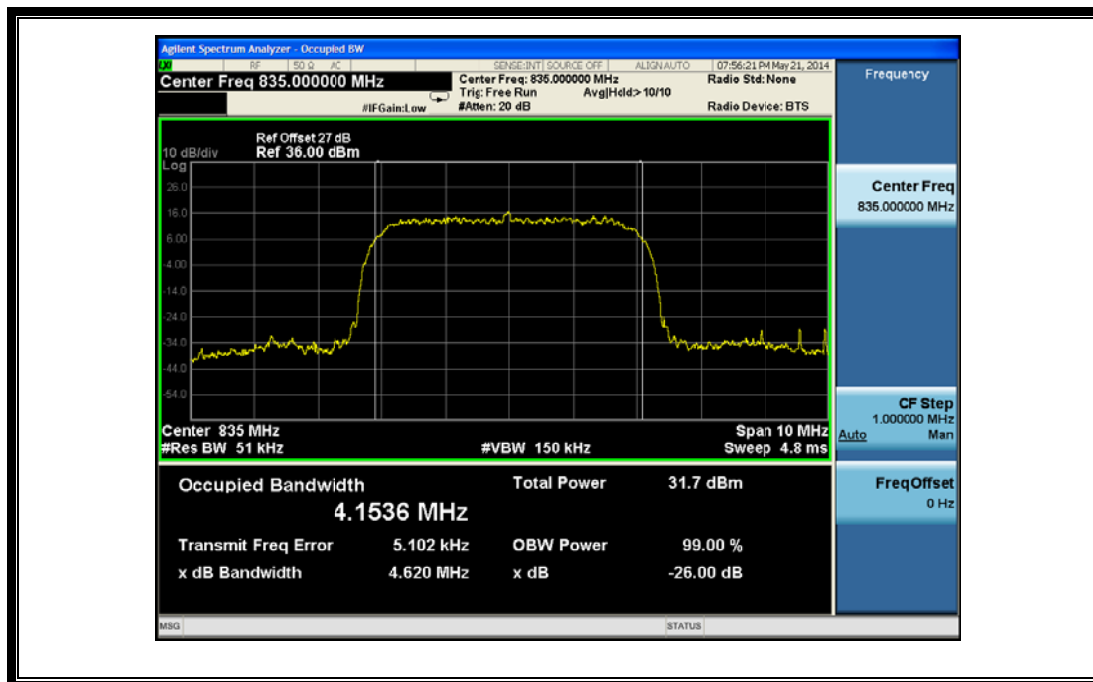
(Plot Q: HSDPA1900 MHz Channel = 9400)



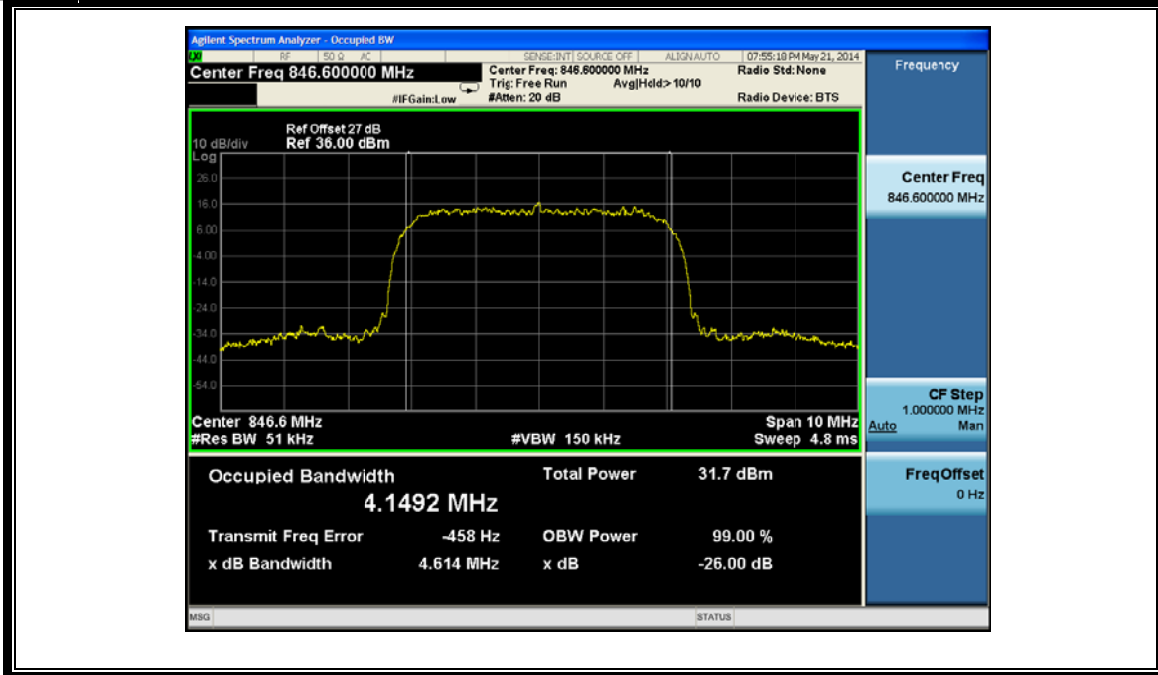
(Plot R: HSDPA 1900 MHz Channel = 9538)



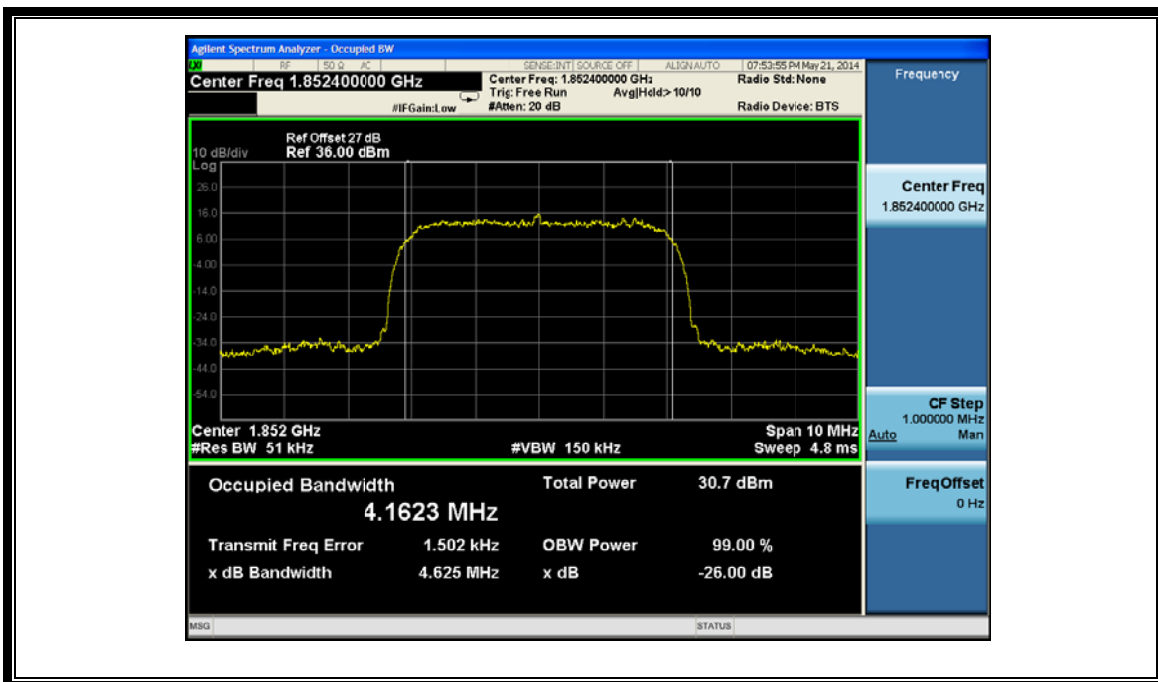
(Plot S: HSUPA850 MHz Channel = 4132)



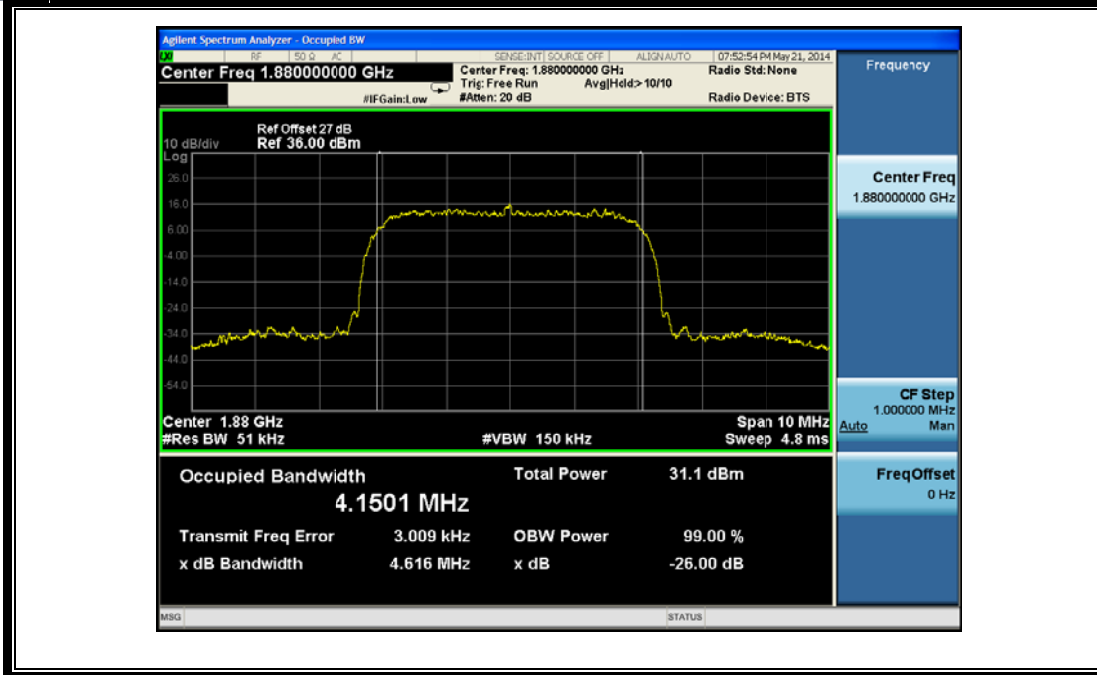
(Plot T: HSUPA850 MHz Channel = 4175)



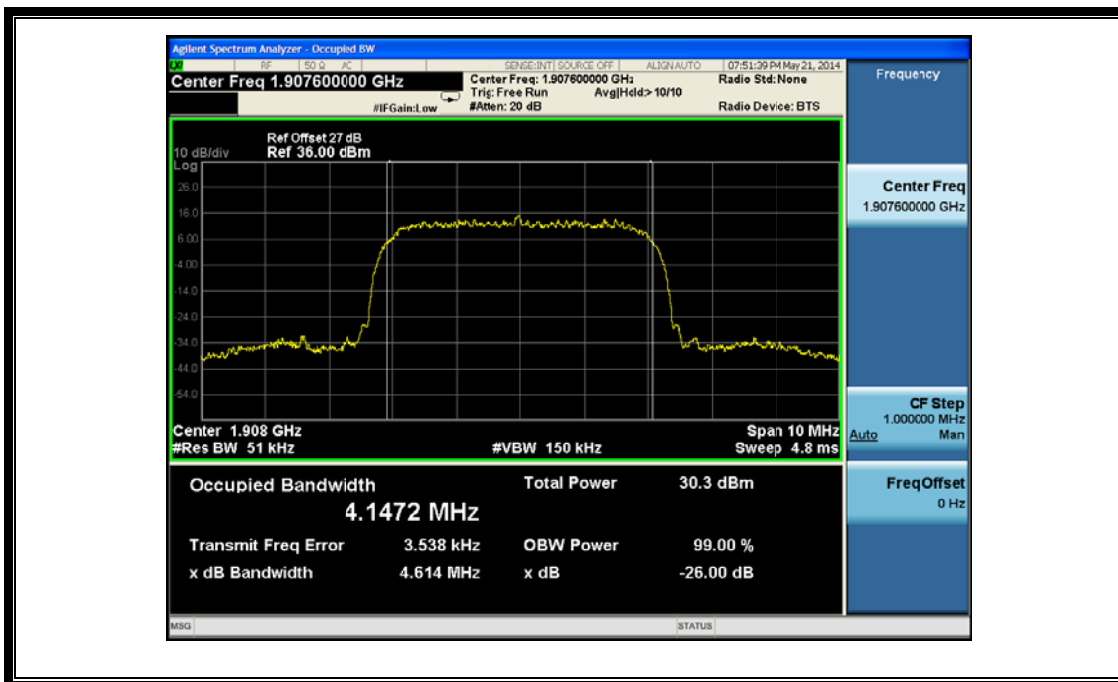
(Plot U: HSUPA850 MHz Channel = 4233)



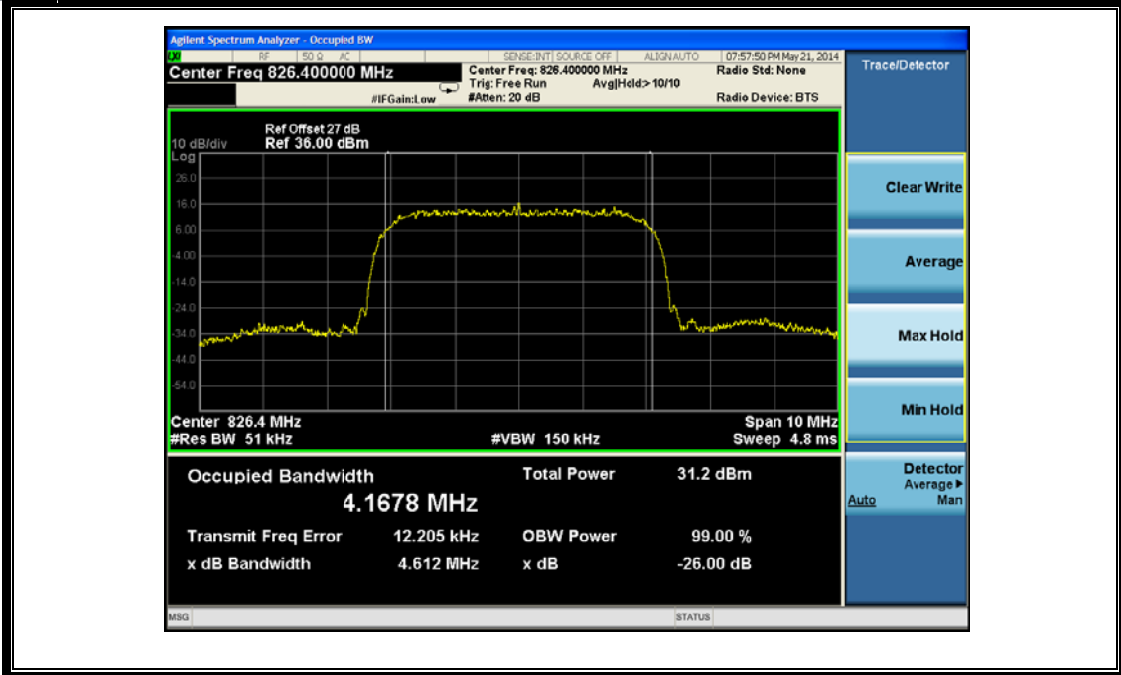
(Plot V: HSUPA1900 MHz Channel = 9262)



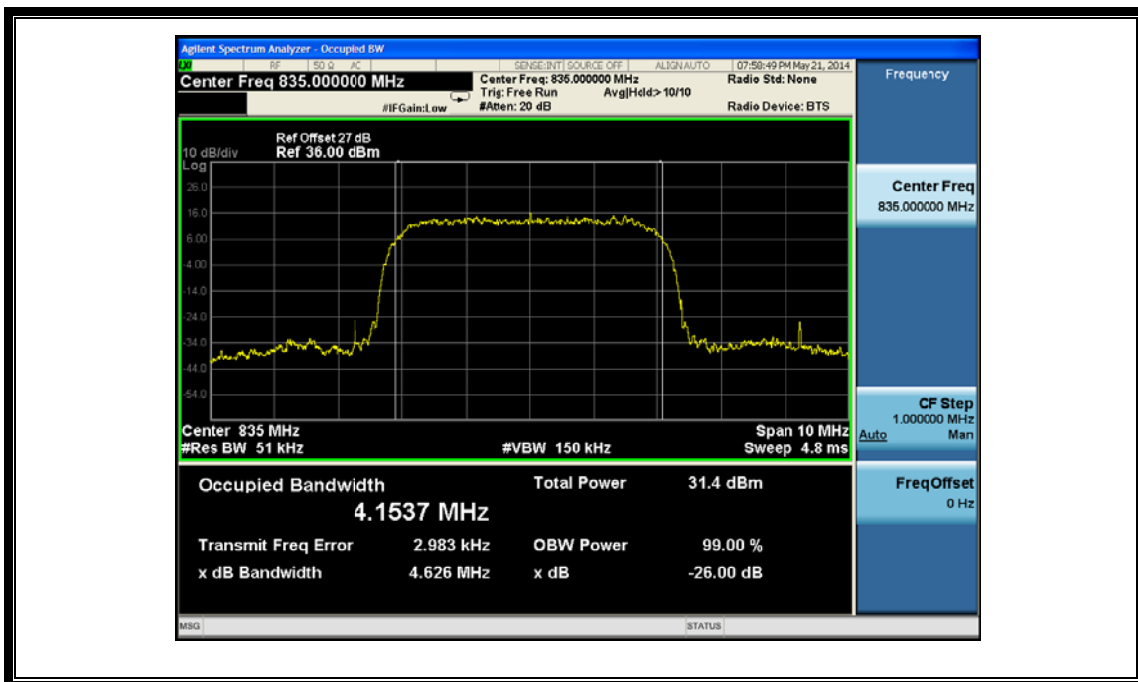
(Plot W: HSUPA1900 MHz Channel = 9400)



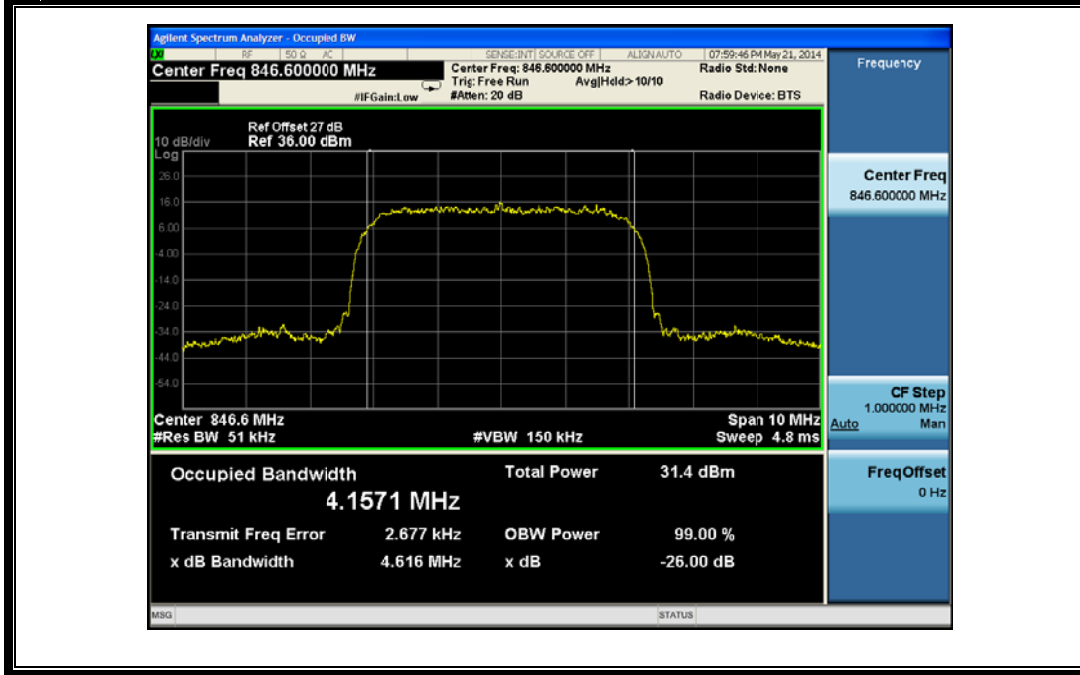
(Plot X: HSUPA1900 MHz Channel = 9538)



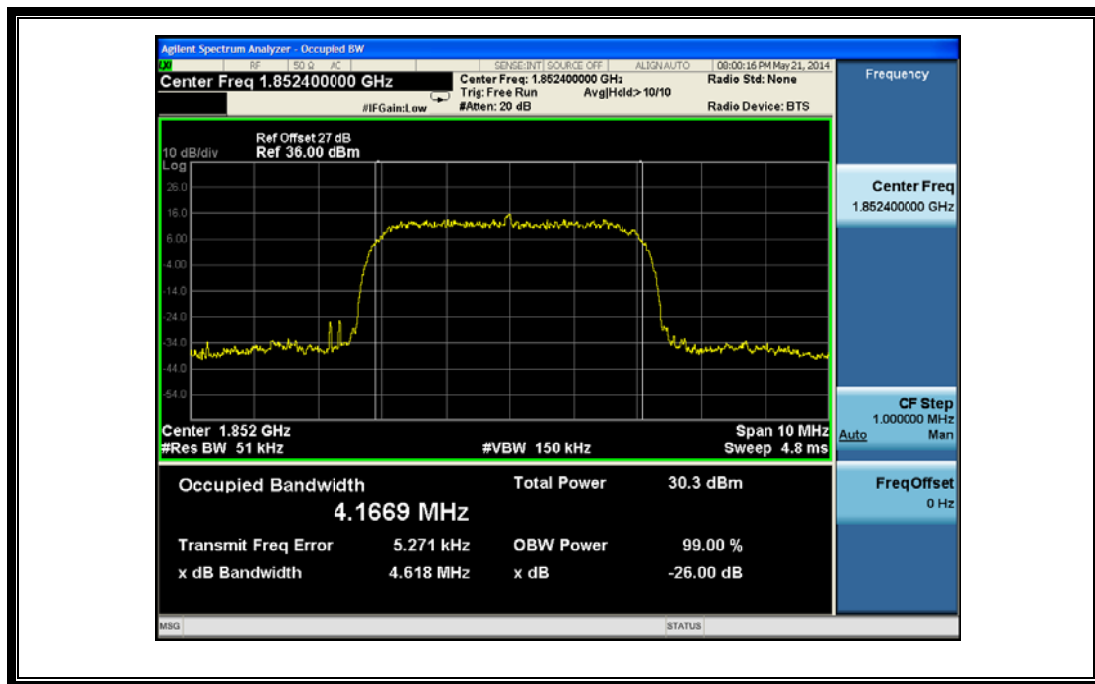
(Plot Y: HSPA+ 850 MHz Channel = 4132)



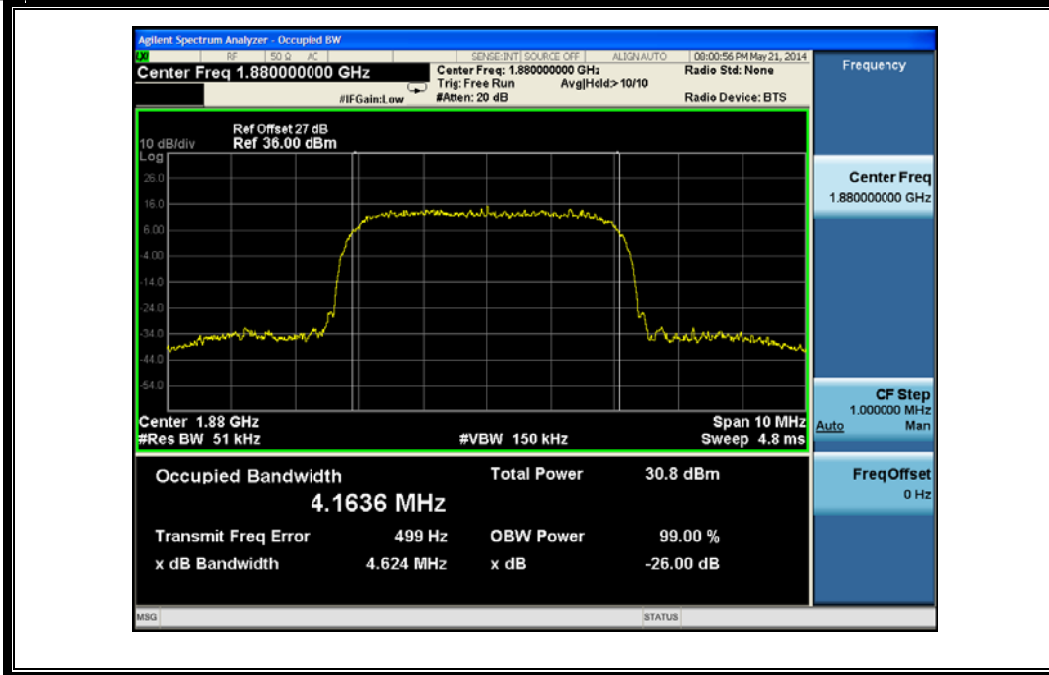
(Plot Z: HSPA+850 MHz Channel = 4175)



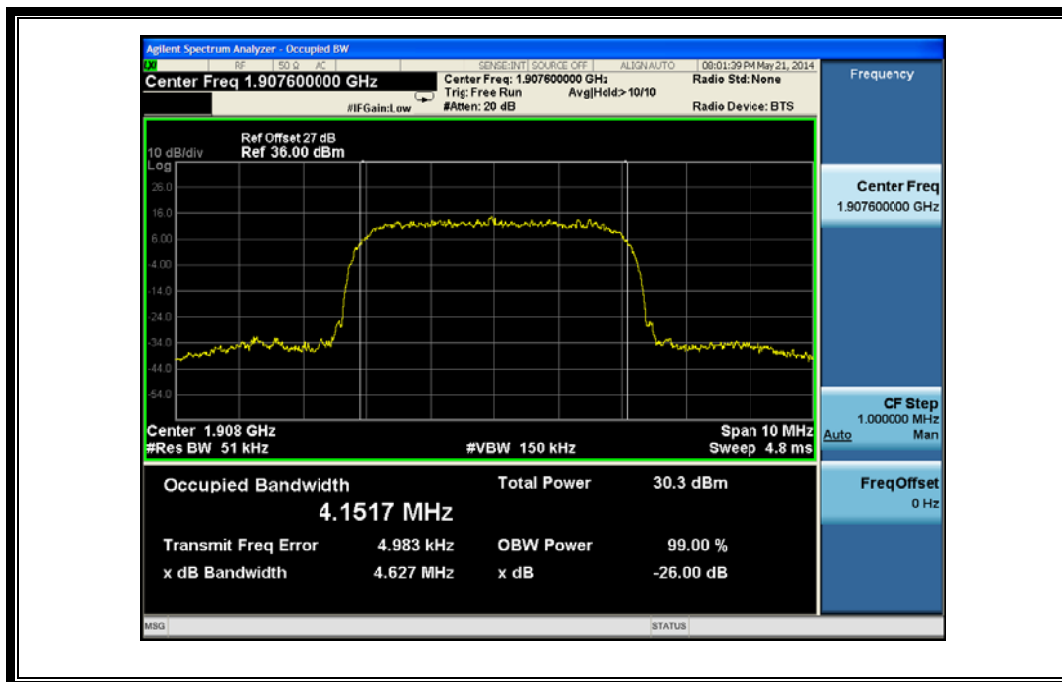
(Plot A1:HSPA+ 850 MHz Channel = 4233)



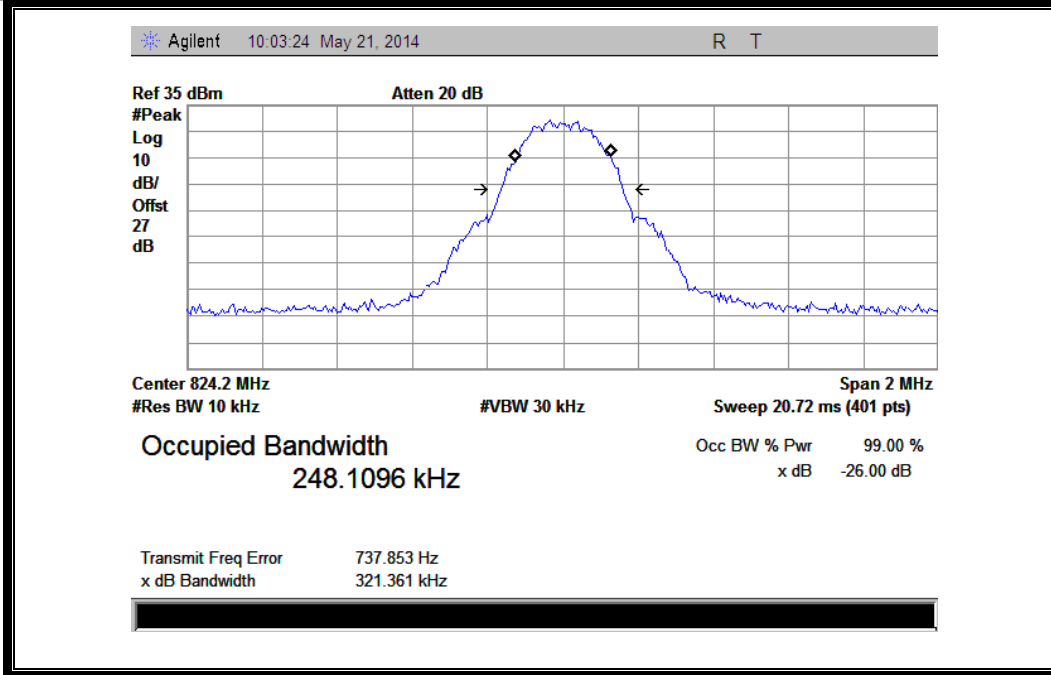
(Plot B1: HSPA+1900 MHz Channel = 9262)



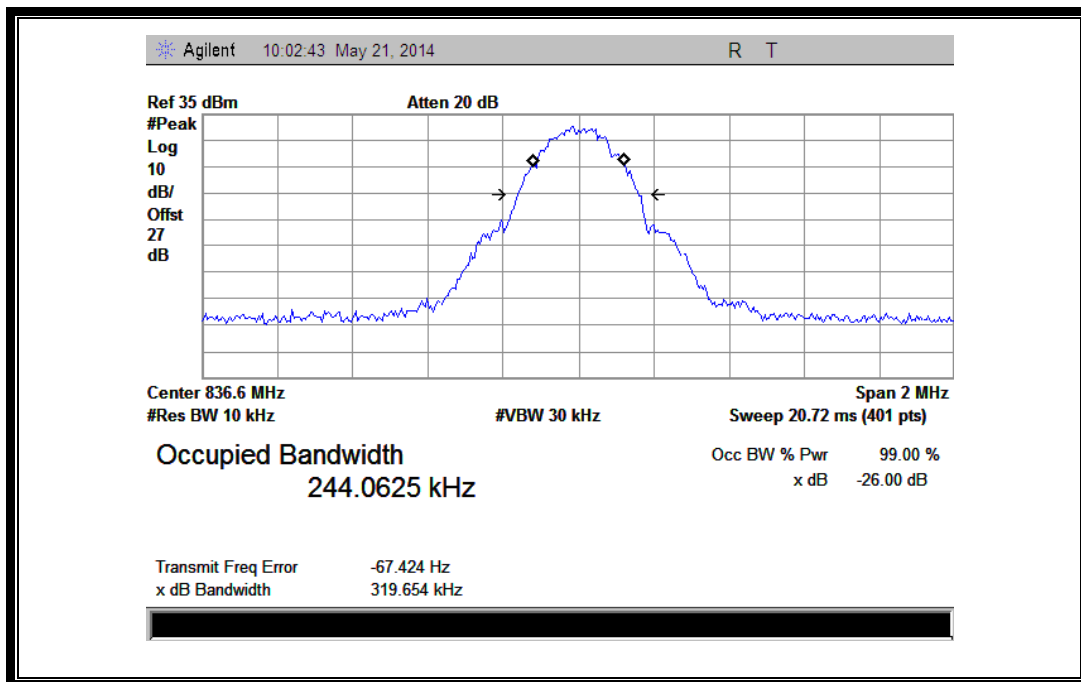
(Plot C1: HSPA+1900 MHz Channel = 9400)



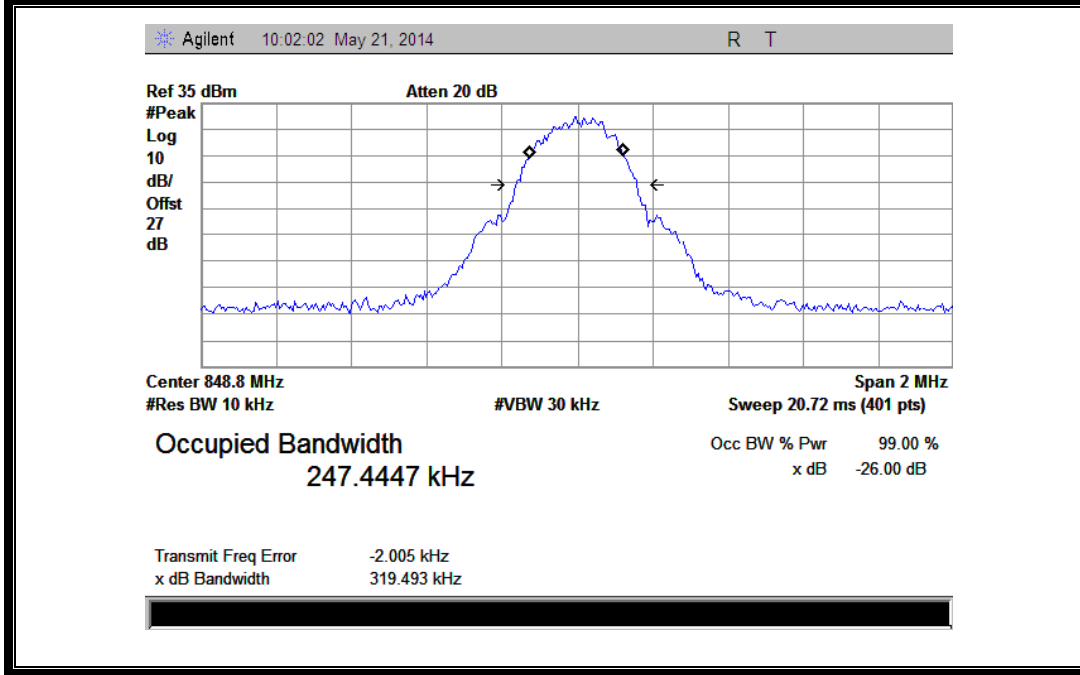
(Plot D1: HSPA+1900 MHz Channel = 9538)



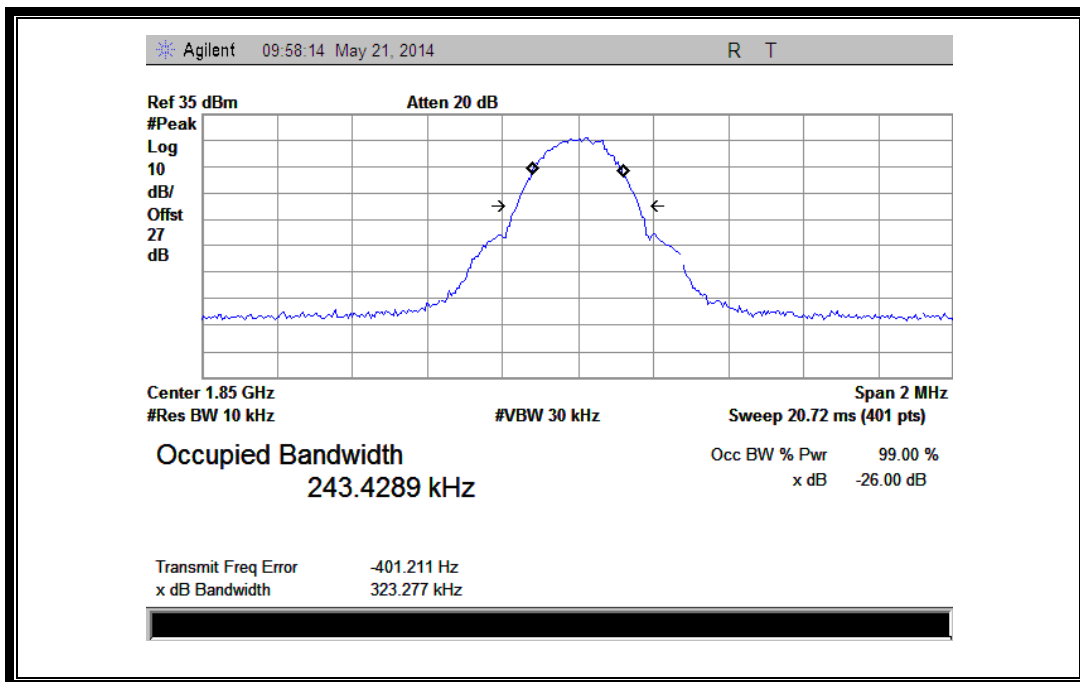
(Plot E1: GSM 850MHz Channel = 128)



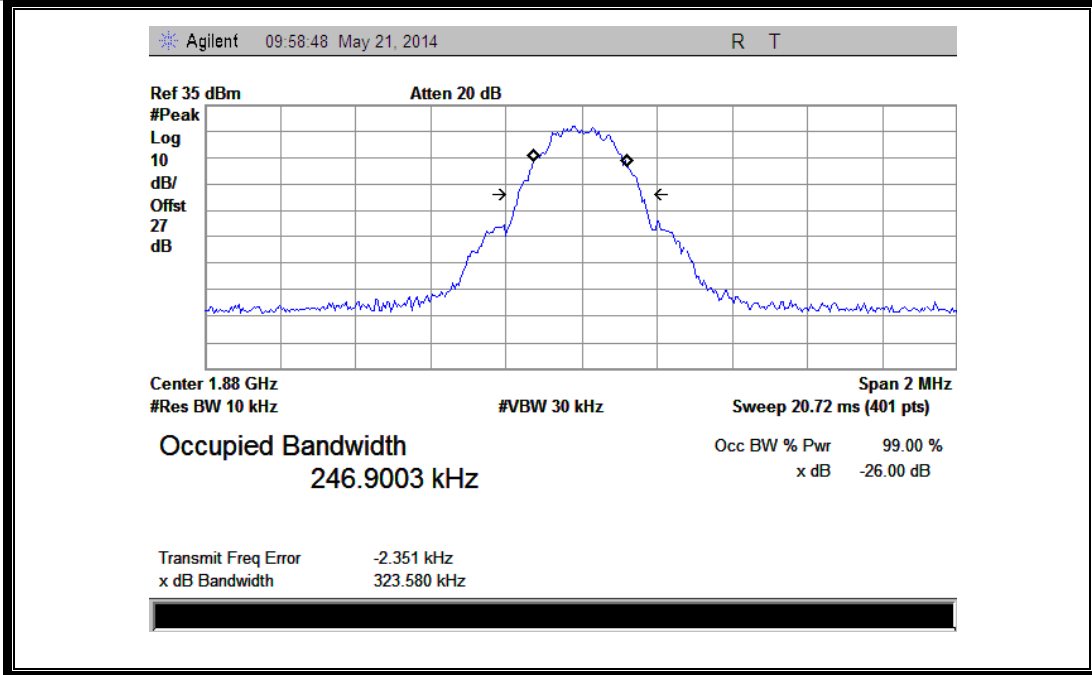
(Plot F1: GSM 850MHz Channel = 190)



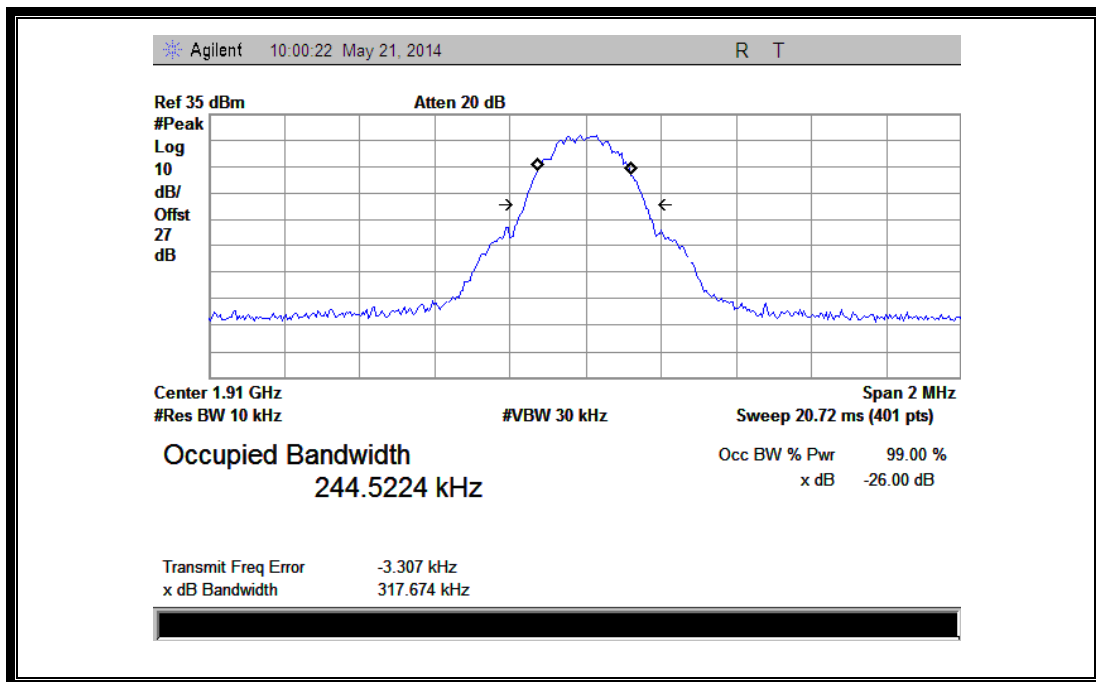
(Plot G1: GSM 850MHz Channel = 251)



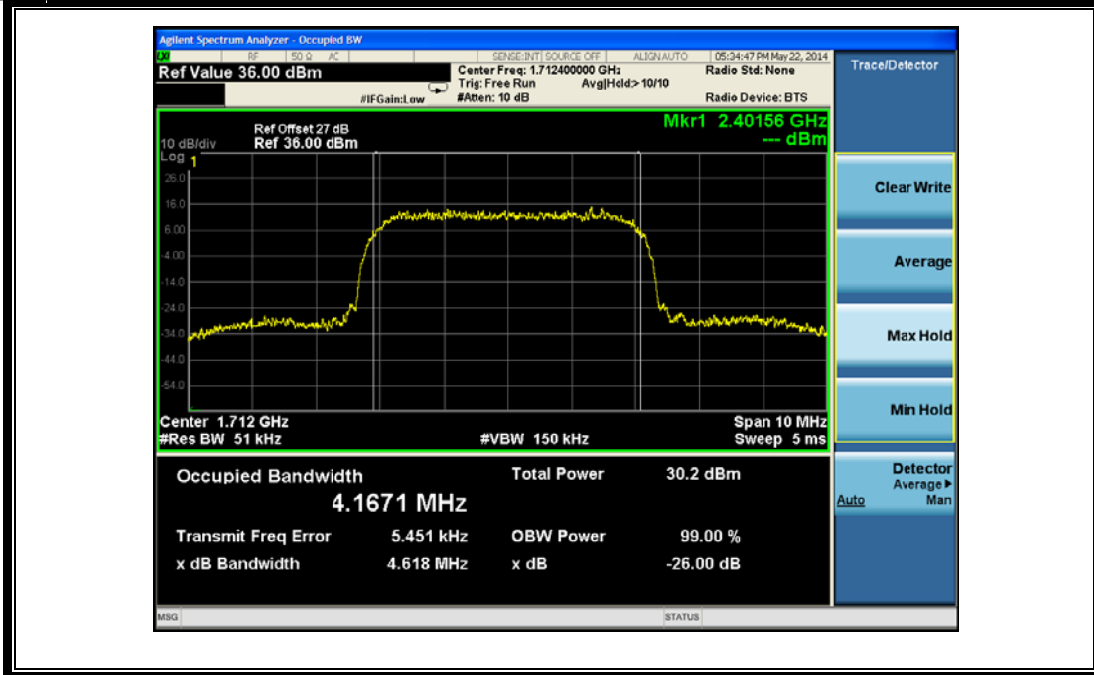
(Plot H1: GSM 1900MHz Channel = 512)



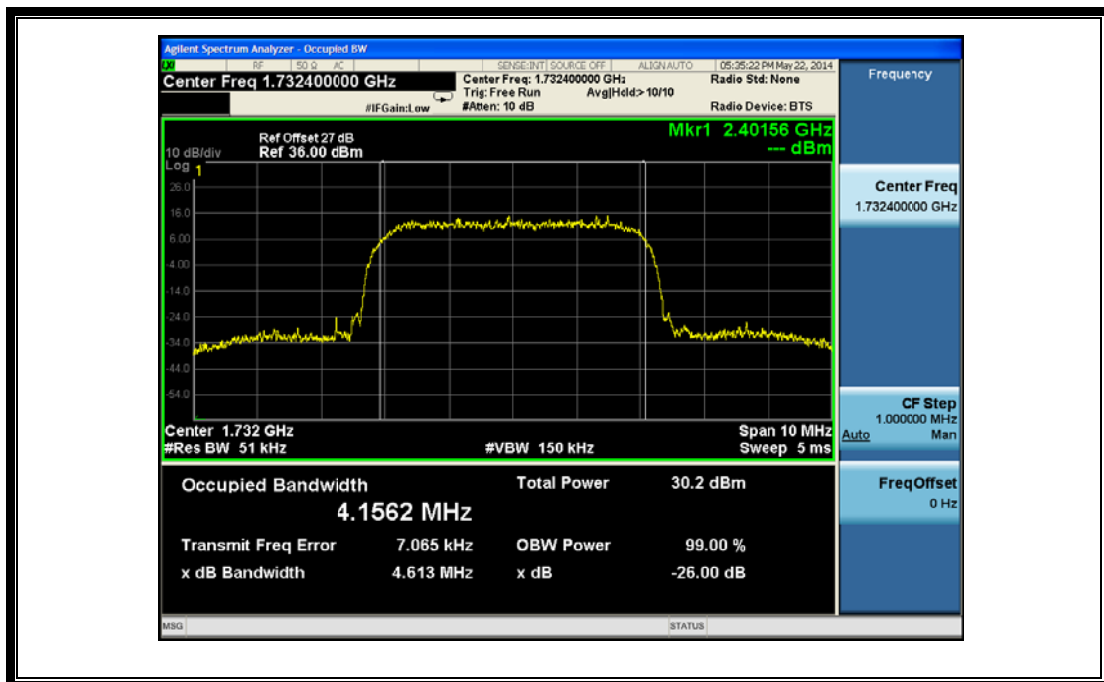
(Plot I1: GSM 1900MHz Channel = 661)



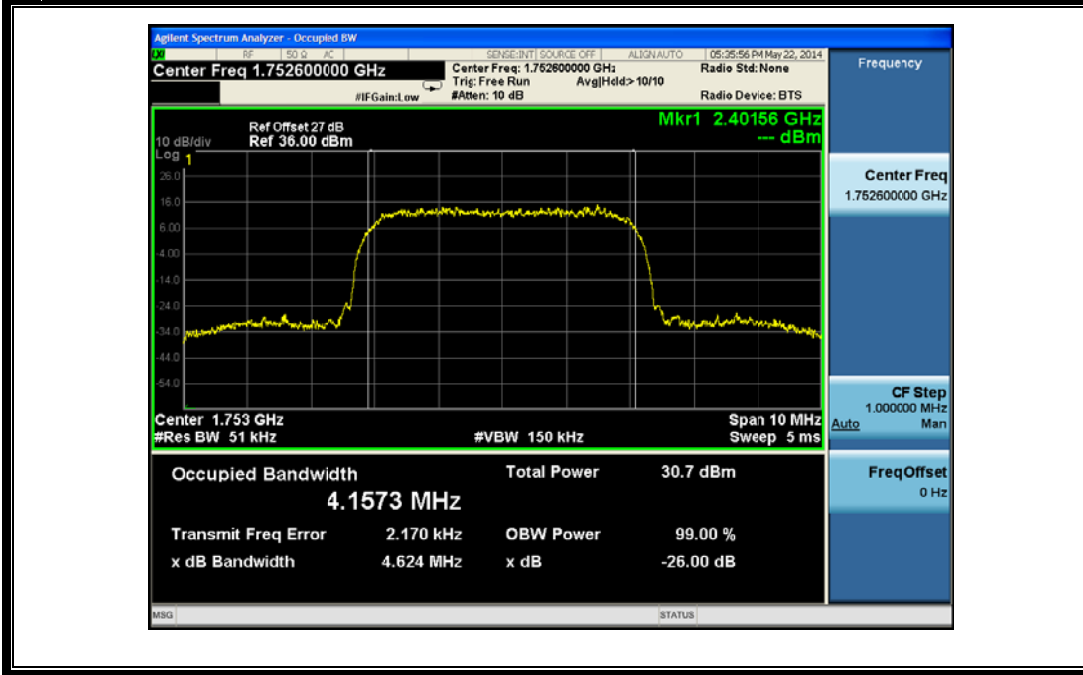
(Plot J1: GSM 1900MHz Channel = 810)



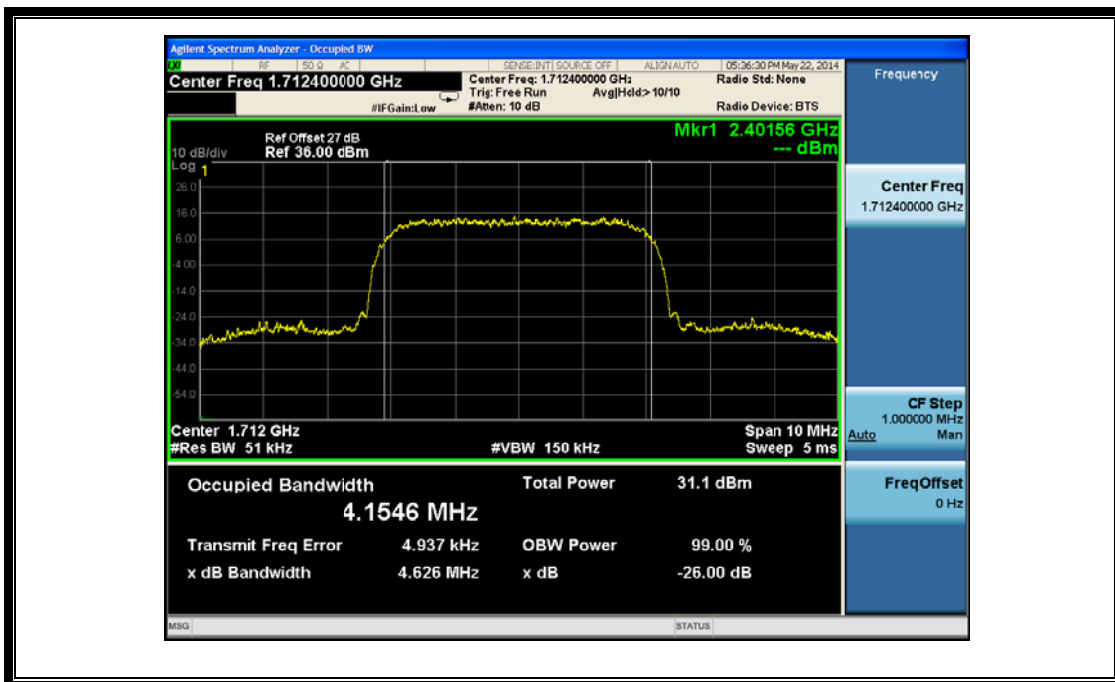
(Plot K1: WCDMA 1700MHz Channel = 1312)



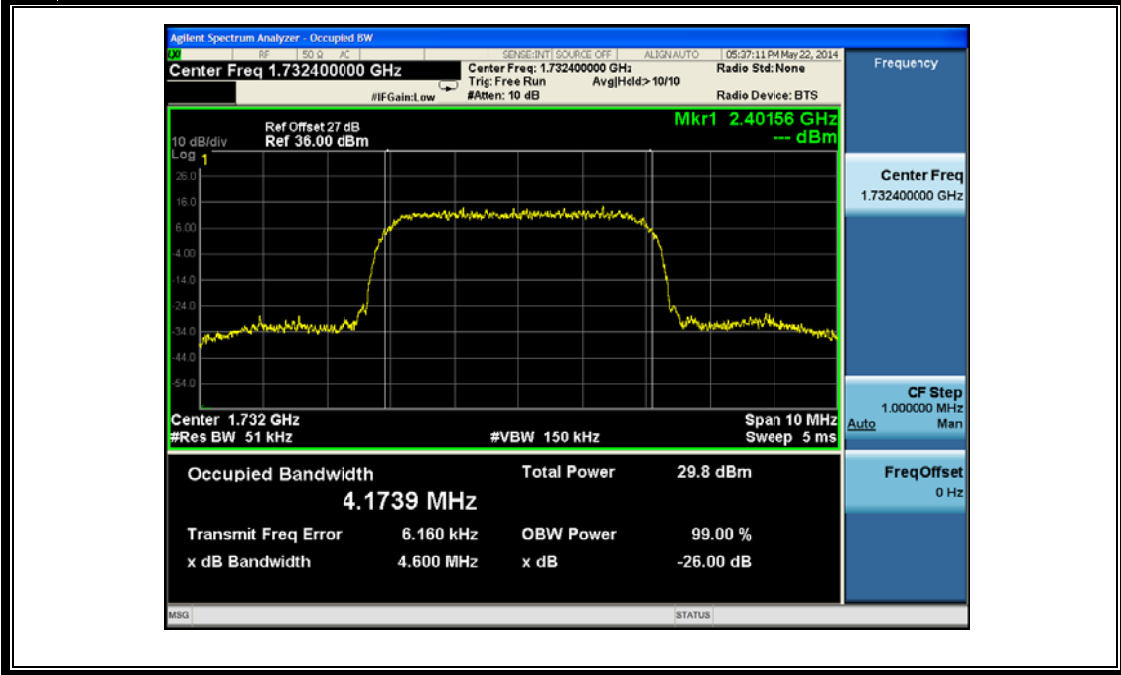
(Plot L1: WCDMA 1700 MHz Channel = 1412)



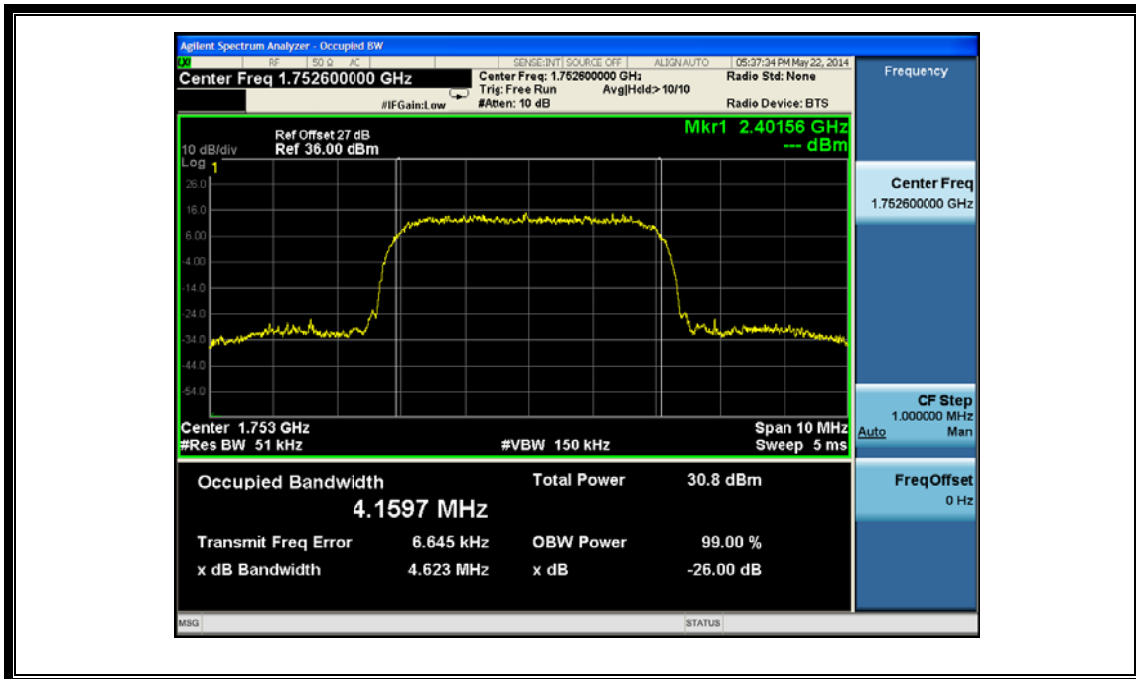
(Plot M1: WCDMA 1700MHz Channel = 1513)



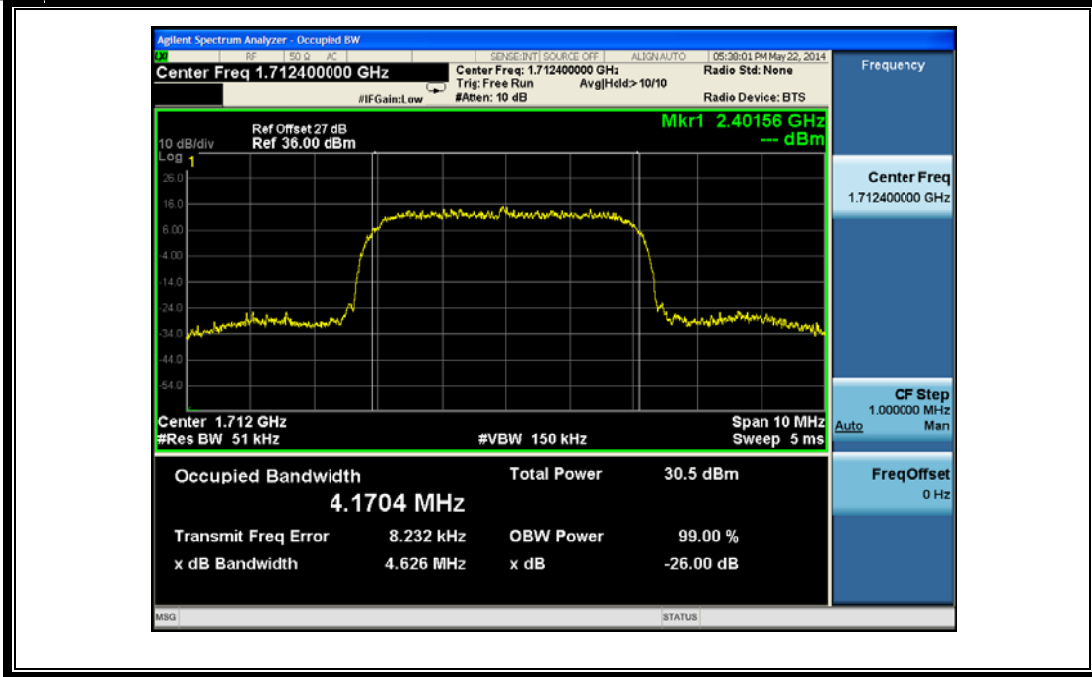
(Plot N1: HSDPA 1700MHz Channel = 1312)



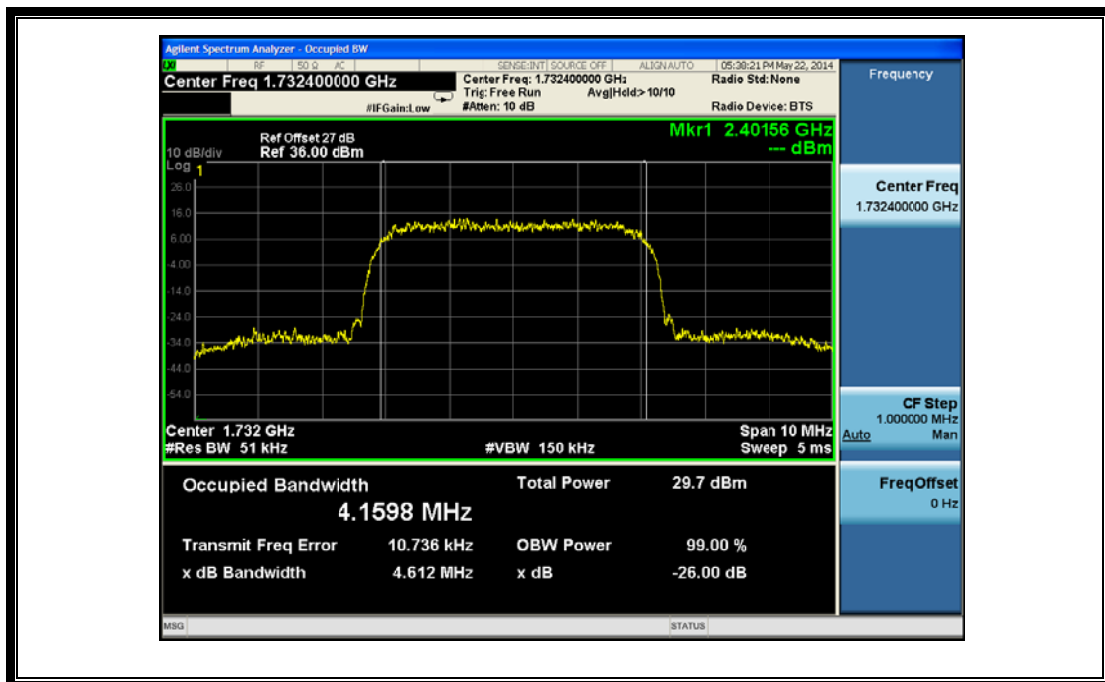
(Plot O1: HSDPA 1700 MHz Channel = 1412)



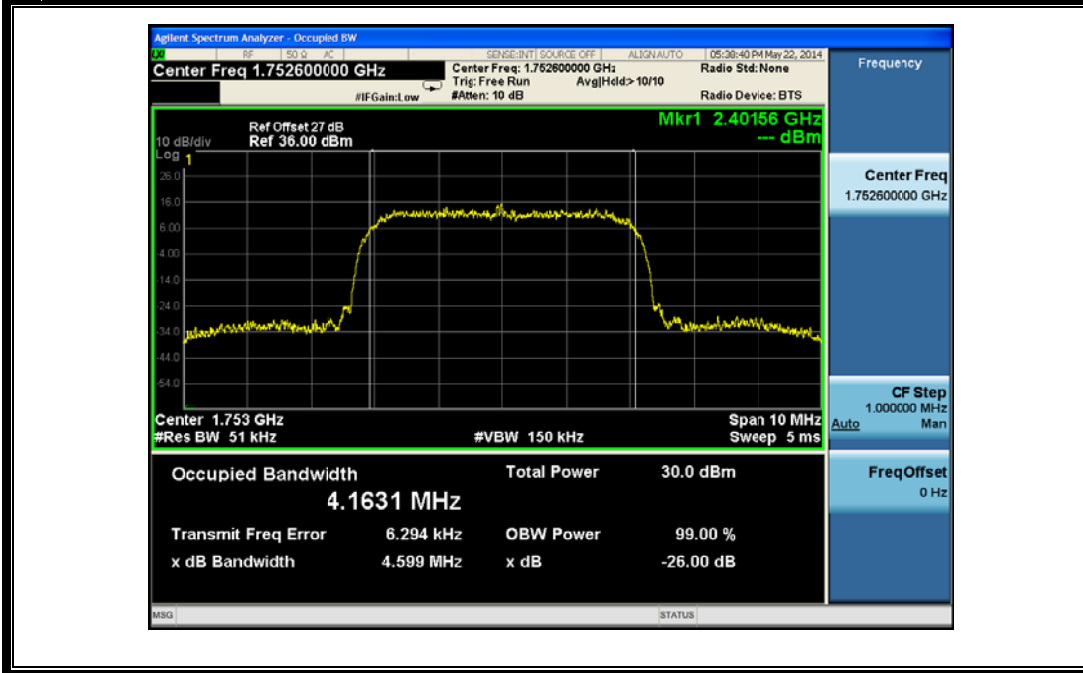
(Plot P1: HSDPA 1700MHz Channel = 1513)



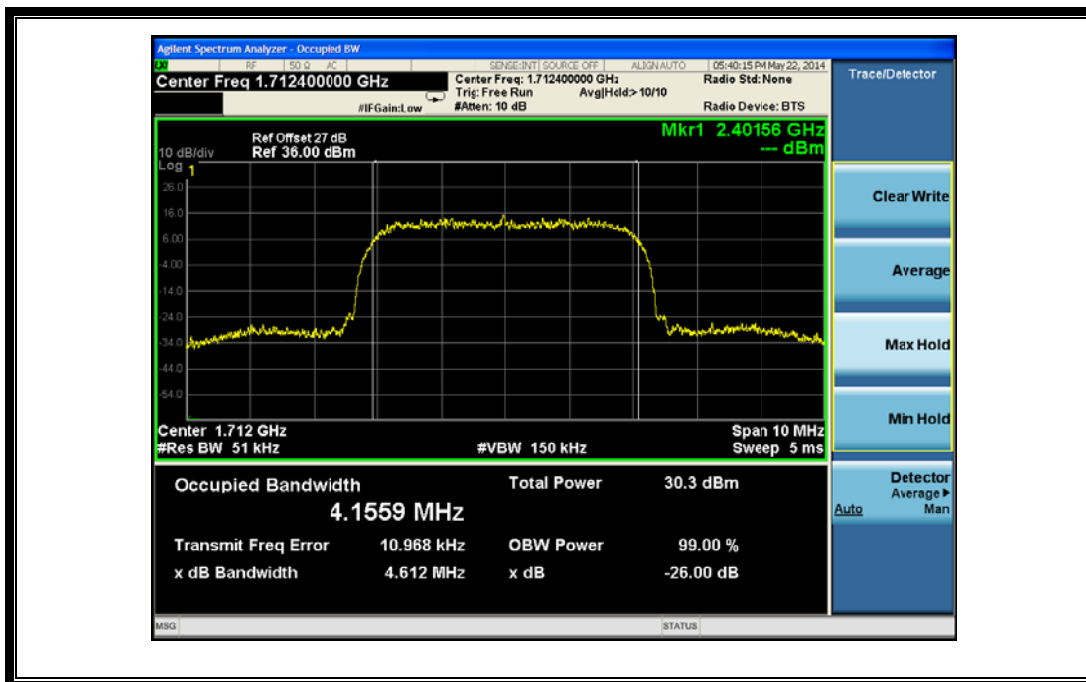
(Plot Q1: HSUPA 1700MHz Channel = 1312)



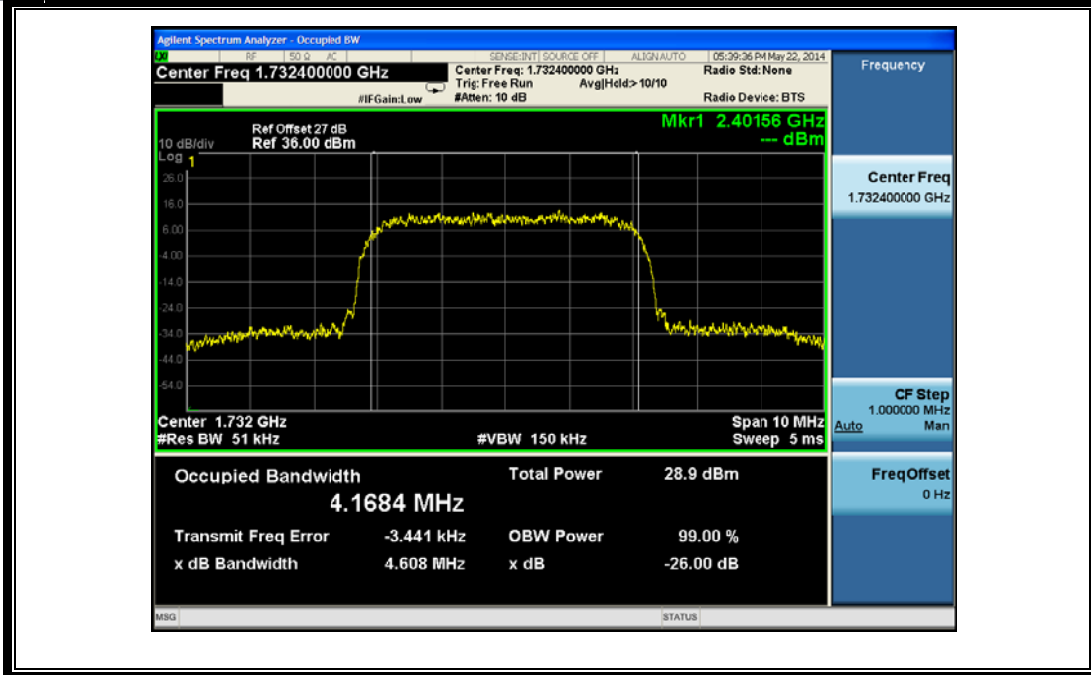
(Plot R1: HSUPA1700 MHz Channel = 1412)



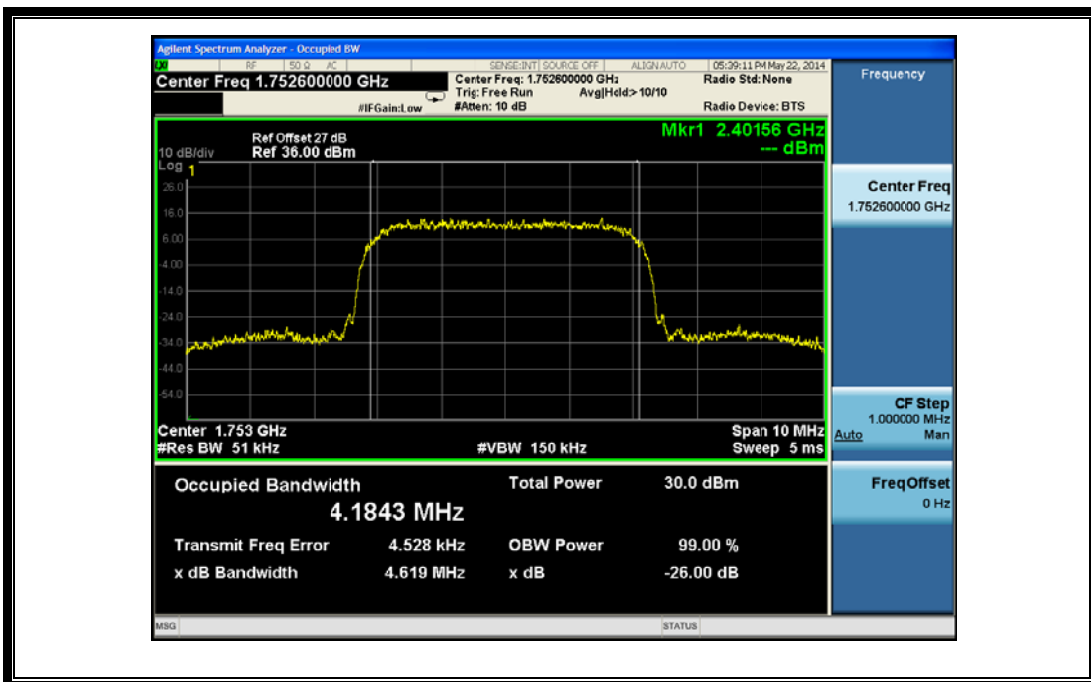
(Plot S1: HSUPA 1700 MHz Channel = 1513)



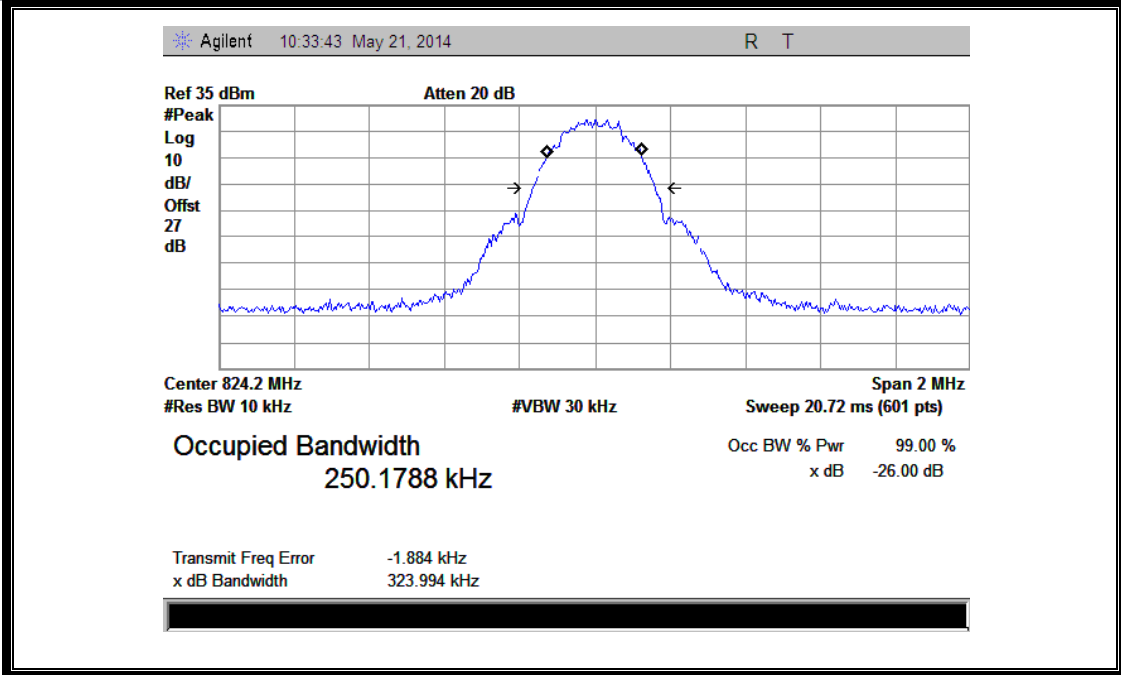
(Plot T1:HSPA+1700 MHz Channel = 1312)



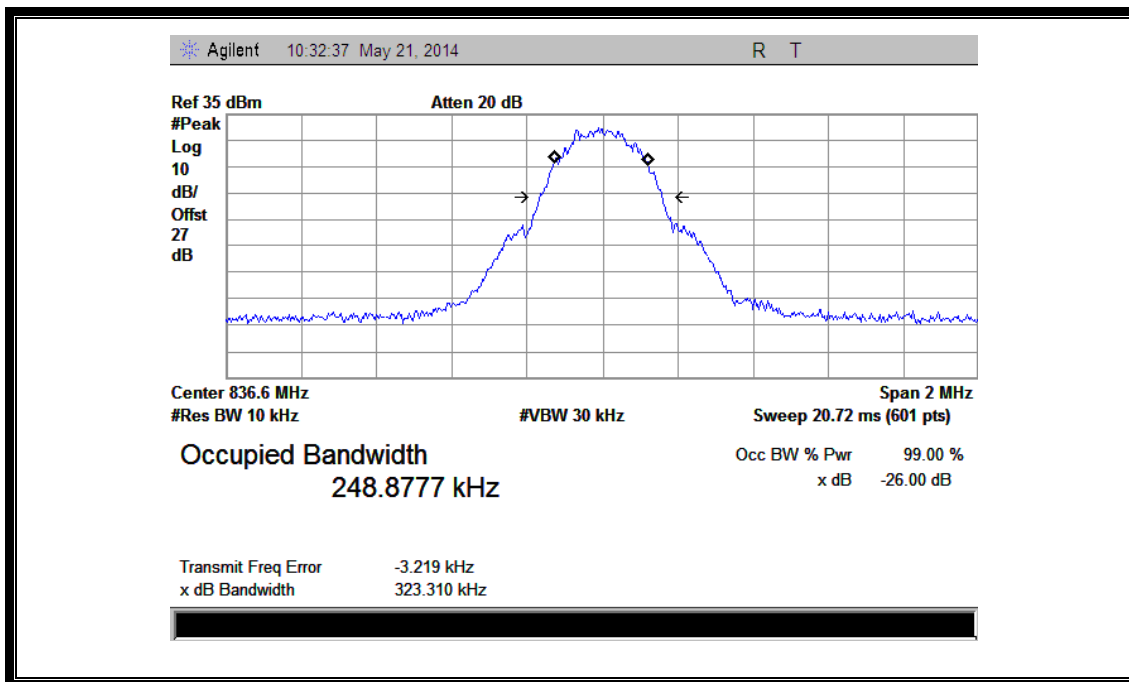
(Plot U1: HSPA+1700 MHz Channel = 1412)



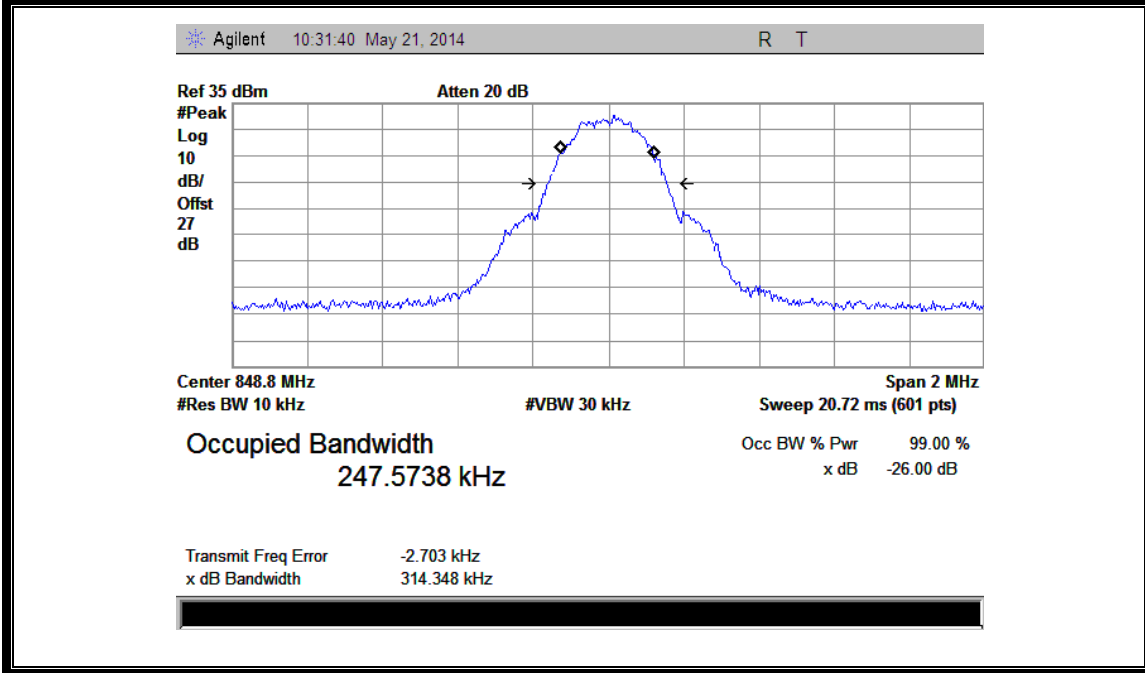
(Plot V1: HSPA+1700 MHz Channel = 1513)



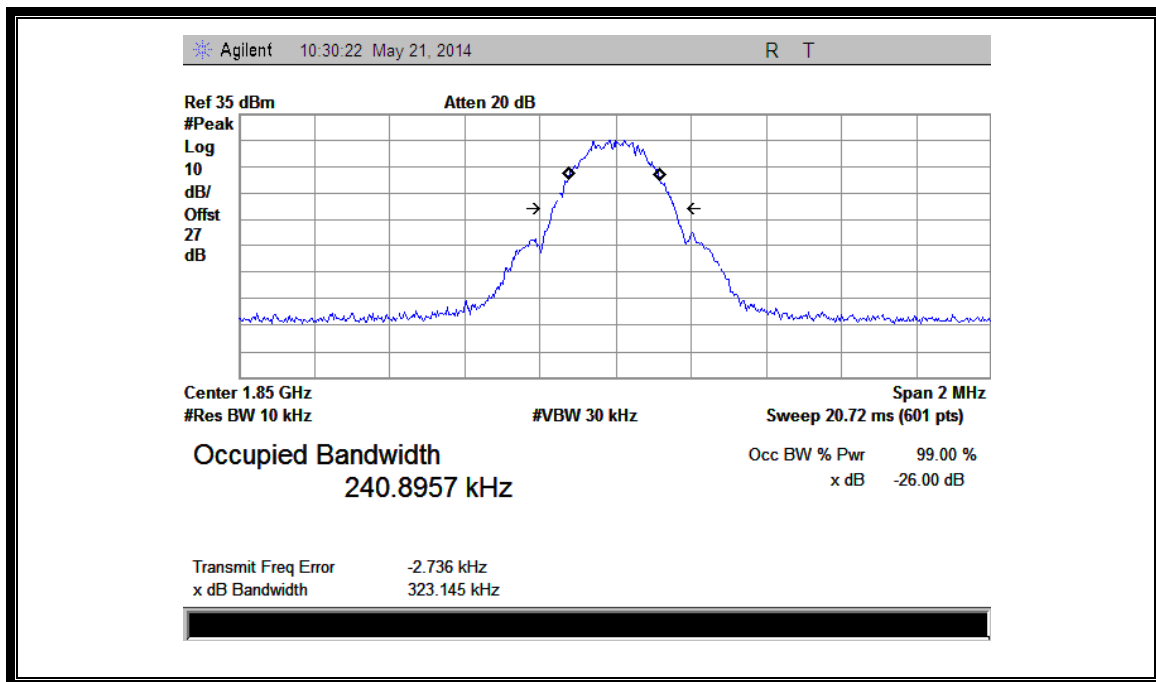
(Plot W1: GPRS 850MHz Channel = 128)



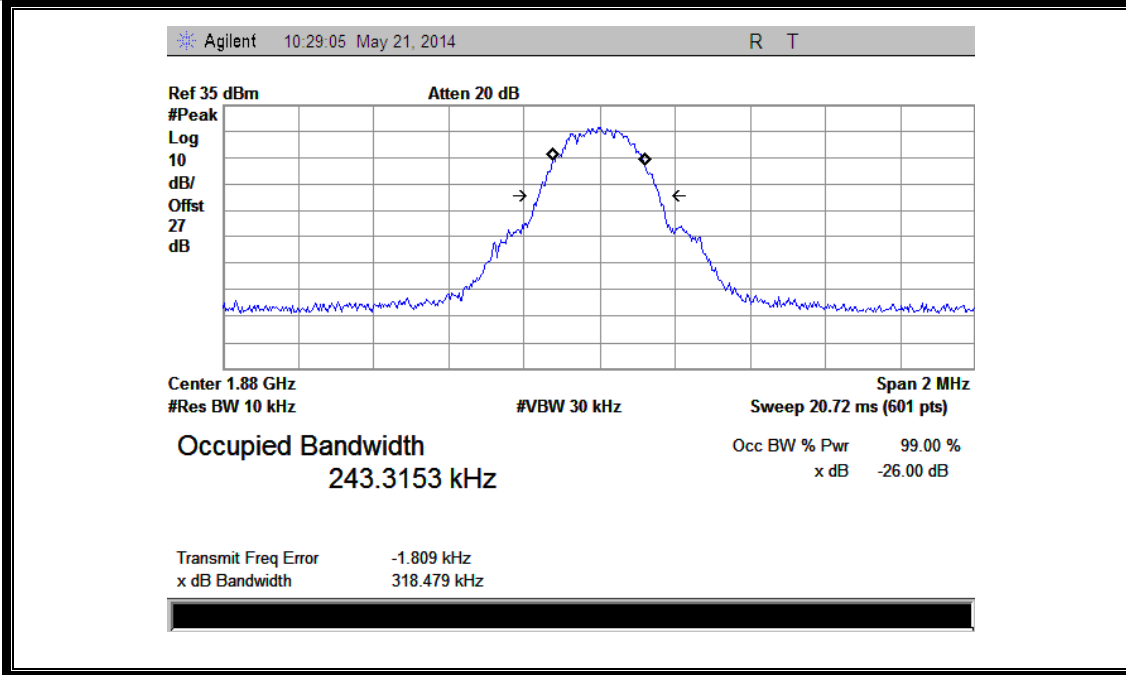
(Plot X1: GPRS 850MHz Channel = 190)



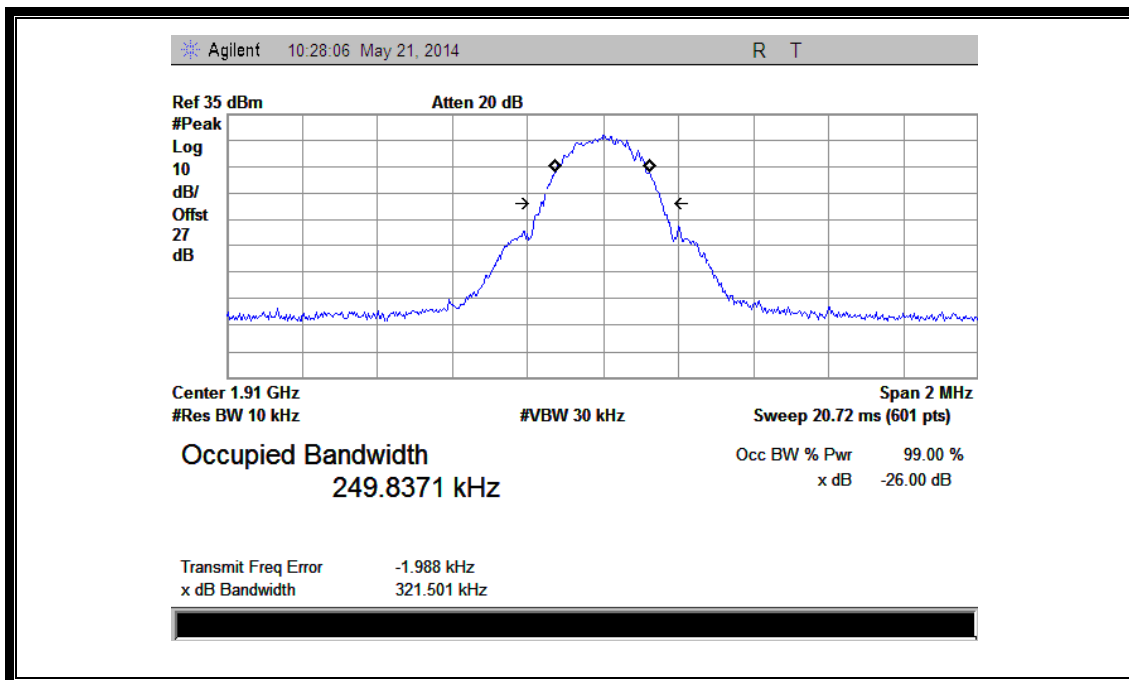
(PlotY1: GPRS850MHz Channel = 251)



(Plot Z1:GPRS 1900MHz Channel = 512)



(Plot A2:GPRS 1900MHz Channel = 661)



(Plot B2: GPRS 1900MHz Channel = 810)

2.4 Frequency Stability

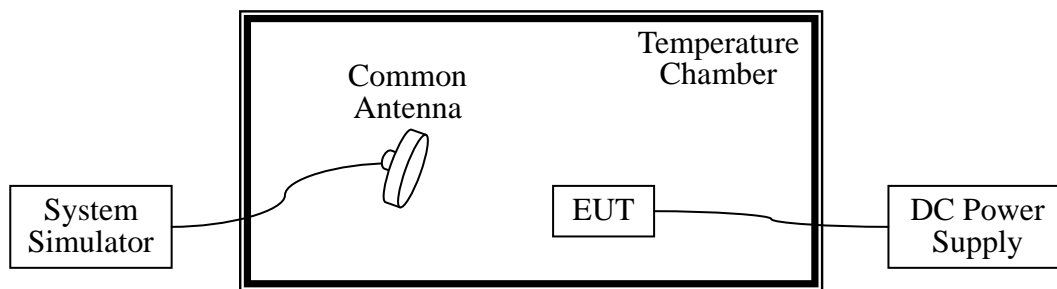
2.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235, section 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

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

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 ±2.5ppm, and 1900MHz is ±1ppm, 1700MHz ±1ppm.

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	
3.8	-30	10.18	±2060.5	21.11	±2091.5	15.22	±2122	
	-20	-15.16		13.23		-12.91		
	-10	17.79		-13.56		14.11		
	0	22.39		31.11		12.09		
	+10	37.27		-25.03		3.02		
	+20	2.37		-17.19		19.71		
	+30	31.26		19.36		-10.21		
	+40	40.55		19.64		-12.10		
4.35	+55	35.48	22.27	-12.79				
	+25	-14.77	28.75	-7.73				
3.6	+25	-10.13	30.21	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	
3.8	-30	7.05	±1850.2	20.63	±1880.0	21.15	±1909.8	
	-20	5.02		-20.25		-11.27		
	-10	11.76		-10.13		-12.22		
	0	-16.51		-13.30		15.31		
	+10	-2.10		-25.67		21.39		
	+20	-12.99		13.51		16.22		
	+30	4.15		-10.61		-21.29		
	+40	3.32		33.27		15.35		
4.35	+55	10.76	23.82	-14.28				
	+25	32.28	23.82	20.29				
3.6	+25	-17.01	12.37	17.95				

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	
3.8	-30	12.23	±2060.5	6.23	±2091.5	-12.72	±2122	<u>PASS</u>
	-20	-17.55		-22.78		-10.21		
	-10	38.10		-1.26		13.33		
	0	-22.06		-18.68		5.33		
	+10	-16.11		-21.61		35.26		
	+20	17.76		14.58		-26.78		
	+30	15.64		-0.68		19.54		
	+40	17.33		36.87		-16.67		
+55	-17.55	3.67	26.79					
4.35	+25	-16.71	16.95	-10.76				
3.6	+25	-15.70	35.23	7.78				

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	
3.8	-30	-1.59	±1850.2	15.41	±1880.0	-18.15	±1909.8	<u>PASS</u>
	-20	20.45		31.18		28.02		
	-10	14.45		32.07		44.04		
	0	1.31		-7.98		-17.39		
	+10	-12.52		26.21		10.91		
	+20	30.62		11.10		6.63		
	+30	13.45		-6.17		28.93		
	+40	-12.52		-12.68		19.22		
+55	-0.59	36.87	22.19					
4.35	+25	15.60	3.02	26.79				
3.6	+25	-37.01	13.19	18.93				

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	
3.8	-30	17.05	±2066	13.18	±2087.5	15.87	±2116.5	<u>PASS</u>
	-20	26.25		-15.06		-14.07		
	-10	11.62		18.79		17.42		
	0	30.03		22.39		-10.39		
	+10	13.45		37.27		17.47		
	+20	1.31		2.37		27.84		
	+30	-12.52		-13.47		-2.53		
	+40	26.21		-5.71		20.95		
+55	11.10	12.18	19.66					
4.35	+25	-6.28	-14.26	21.19				
3.6	+25	18.62	-18.21	-12.33				

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	
3.8	-30	-12.96	±1852.4	-12.43	±1880.0	-7.72	±1907.6	<u>PASS</u>
	-20	31.23		11.08		22.65		
	-10	-8.31		-14.03		14.81		
	0	-13.95		18.79		-3.07		
	+10	-24.37		22.39		17.46		
	+20	12.88		37.27		-10.39		
	+30	-14.75		2.57		17.47		
	+40	23.37		-13.49		27.84		
+55	-13.96	-5.71	-2.57					
4.35	+25	23.41	14.48	22.95				
3.6	+25	21.20	24.37	-24.22				

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	
3.8	-30	26.46	±2066	-25.37	±2087.5	14.81	±2116.5	
	-20	-9.56		-14.96		15.41		
	-10	20.65		35.23		21.57		
	0	12.88		-8.31		-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		
4.35	+25	30.03		23.37		26.37		
3.6	+25	18.51		7.93		7.92		
				-32.21		2.78		

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	
3.8	-30	10.87	±1852.4	-4.01	±1880	3.61	±1907.6	
	-20	-16.55		21.71		-8.58		
	-10	20.12		14.37		-13.02		
	0	-3.01		-11.21		-8.51		
	+10	21.71		10.60		5.64		
	+20	20.12		-4.81		-3.85		
	+30	-15.01		34.31		9.57		
	+40	22.71		8.36		27.54		
4.35	+25	-10.28		-25.88		-12.52		
3.6	+25	10.63		29.53		-2.83		
				-2.37		16.42		

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	
3.8	-30	26.52	±2066	14.8	±2087.5	14.55	±2116.5	<u>PASS</u>
	-20	-17.20		-17.33		28.42		
	-10	-12.61		-11.79		37.01		
	0	-13.09		-0.44		-7.32		
	+10	-0.38		0.01		-4.91		
	+20	-11.85		-6.64		21.35		
	+30	29.57		24.25		-5.94		
	+40	-11.79		9.63		13.78		
+55	-0.44	23.76	28.45					
4.35	+25	1.71		-4.57		29.11		
3.6	+25	1.64		5.05		-7.80		

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	
3.8	-30	32.57	±1852.4	-12.79	±1880	7.69	±1907.6	<u>PASS</u>
	-20	28.13		-0.34		3.01		
	-10	7.62		0.01		-4.75		
	0	2.31		13.82		16.38		
	+10	-4.73		-15.25		-1.76		
	+20	16.22		-11.79		23.52		
	+30	-1.55		-0.44		-0.38		
	+40	23.16		1.15		-11.85		
+55	13.79	-7.94	-5.91					
4.35	+25	-7.08		6.81		25.48		
3.6	+25	21.58		-2.83		-16.78		