# FCC TEST REPORT

*Issued to*

**TCT Mobile Limited**

*For*

**UMTS USB Modem**

| | |
|---|---|
| Model Name: | X602A/X602 |
| Trade Name: | ALCATEL<br>onetouch |
| Brand Name: | ALCATEL<br>onetouch |
| FCC ID : | RAD502 |
| Standard: | 47 CFR Part 22 Subpart H<br>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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|---|---|---|
| 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<br>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<br>70 Huifeng 4rd,ZhongKai Hi-tech Development District ,Huizhou,Guangdong 516006 P.R.China（TCL Mobile Communication Co.,LTD.Huizhou） |
| Frequency Range ..... : | GSM 850MHz:<br>Tx: 824.20 - 848.80MHz (at intervals of 200kHz);<br>Rx: 869.20 - 893.80MHz (at intervals of 200kHz)<br>GSM 1900MHz:<br>Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);<br>Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)<br>WCDMA 850MHz<br>Tx: 826.4 - 846.6MHz (at intervals of 200kHz);<br>Rx: 871.4 - 891.6MHz (at intervals of 200kHz)<br>WCDMA 1900MHz<br>Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);<br>Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz) |
| Modulation Type..... : | GSM,GPRS Mode with GMSK Modulation<br>EDGE Mode with 8PSK Modulation<br>WCDMA Mode with QPSK Modulation<br>HSDPA Mode with QPSK Modulation<br>HSUPA Mode with QPSK Modulation<br>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<br>EGPRS850:248KG7W, EGPRS1900:245KG7W,<br>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<=n<=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<=n<=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<=n<=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<=n<=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

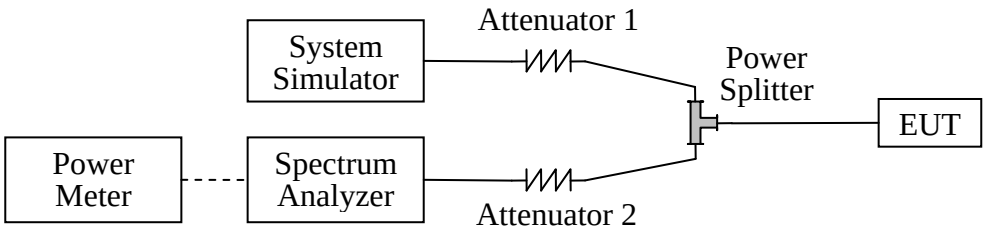
## 2.1 Conducted RF Output Power

### 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:

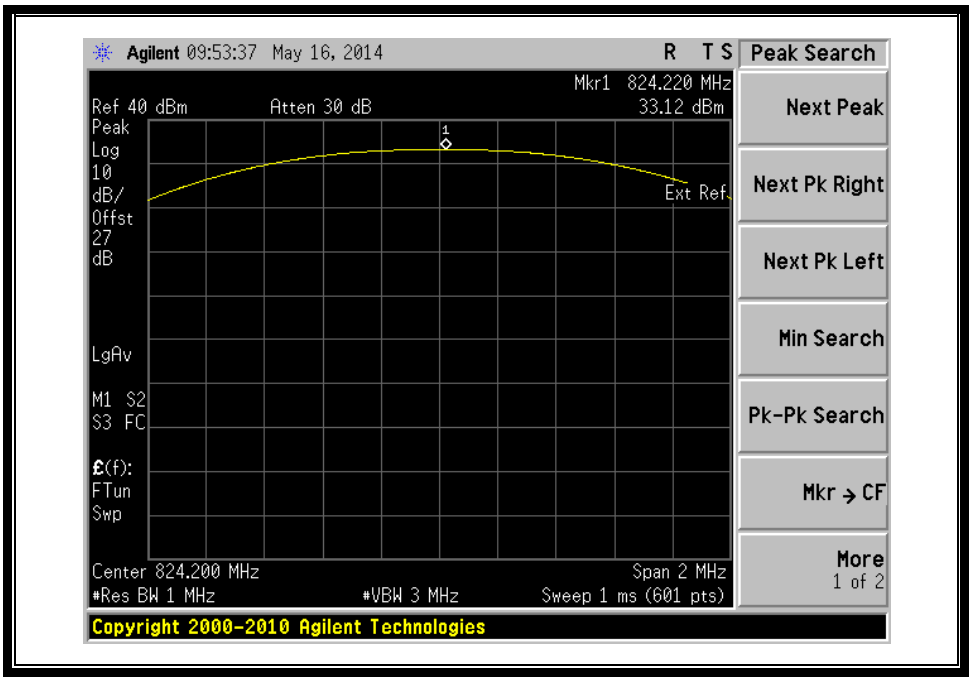
| Band | Channel | Frequency (MHz) | Measured Output Power | | Limit | Verdict |
|---|---|---|---|---|---|---|
| | | | dBm | Refer to Plot | dBm | |
| GSM 850MHz | 128 | 824.2 | 33.12 | Plot A1 to A3 | 35 | PASS |
| | 190 | 836.6 | 33.18 | | | PASS |
| | 251 | 848.8 | 33.18 | | | PASS |
| GSM 1900MHz | 512 | 1850.2 | 29.25 | Plot B1 to B3 | 32 | PASS |
| | 661 | 1880.0 | 29.18 | | | PASS |
| | 810 | 1909.8 | 28.70 | | | PASS |
| GPRS 850MHz | 128 | 824.2 | 31.76 | Plot C1 to C3Note 1 | 35 | PASS |
| | 190 | 836.6 | 31.80 | | | PASS |
| | 251 | 848.8 | 31.85 | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 27.33 | Plot D1 to D3Note 1 | 32 | PASS |
| | 661 | 1880.0 | 27.27 | | | PASS |
| | 810 | 1909.8 | 26.41 | | | PASS |
| EGPRS 850MHz | 128 | 824.2 | 31.74 | Plot E1 to E3Note 1 | 35 | PASS |
| | 190 | 836.6 | 31.83 | | | PASS |
| | 251 | 848.8 | 31.80 | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 26.84 | Plot F1 to F3Note 1 | 32 | PASS |
| | 661 | 1880.0 | 27.30 | | | PASS |
| | 810 | 1909.8 | 27.41 | | | PASS |

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

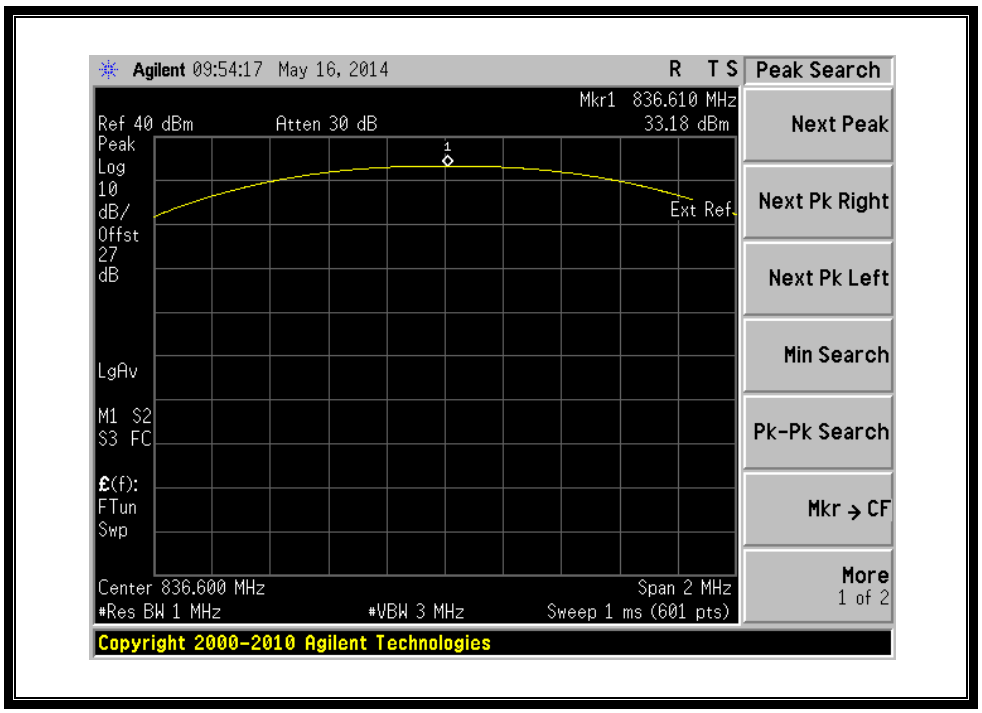
2. WCDMA Model Test Verdict:

| Item | band | WCDMA 850 | | | WCDMA 1900 | | |
|---|---|---|---|---|---|---|---|
| | 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. | | | | | | |

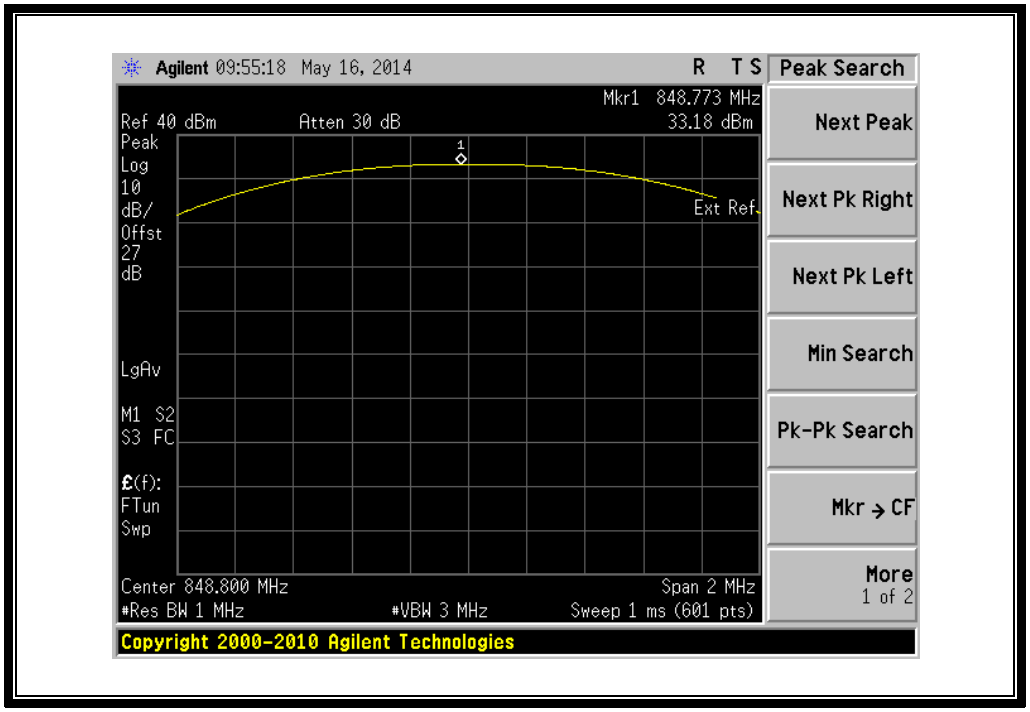
3. GSM Model Test Plots:



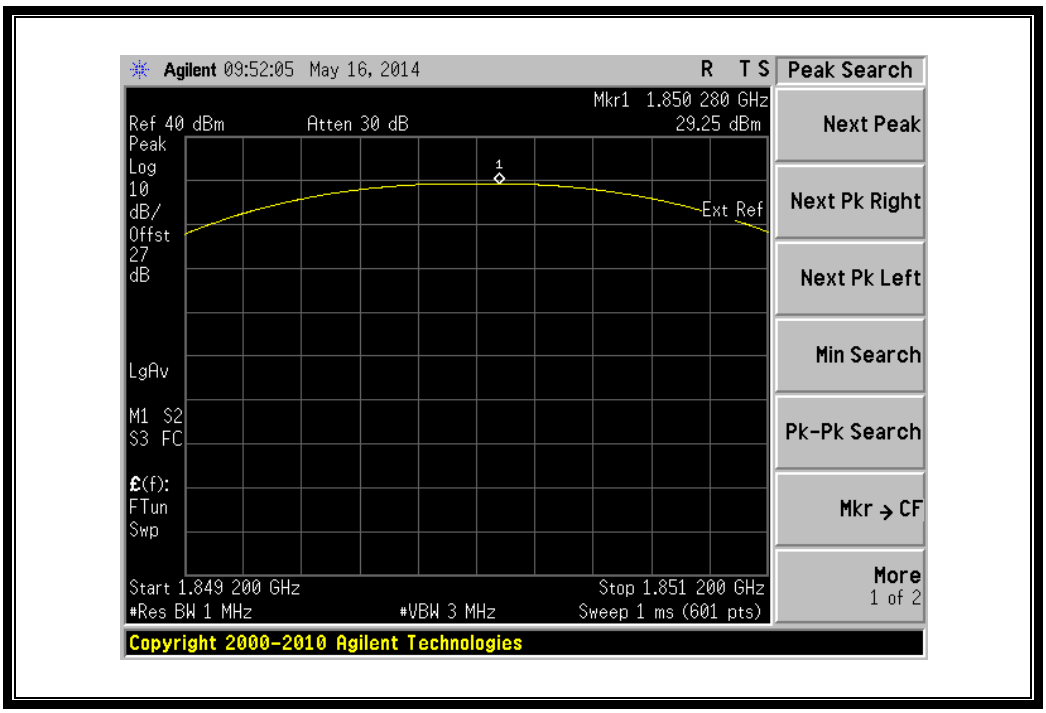

(Plot A1:GSM 850MHz Channel = 128)



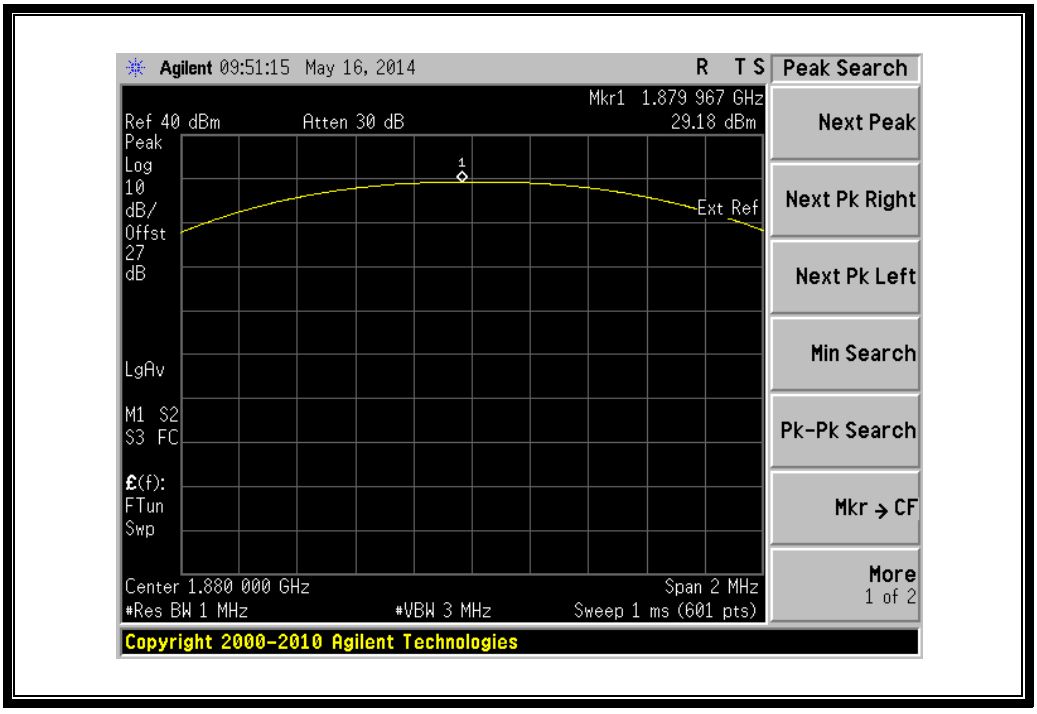

(Plot A2:GSM 850MHz Channel = 190)



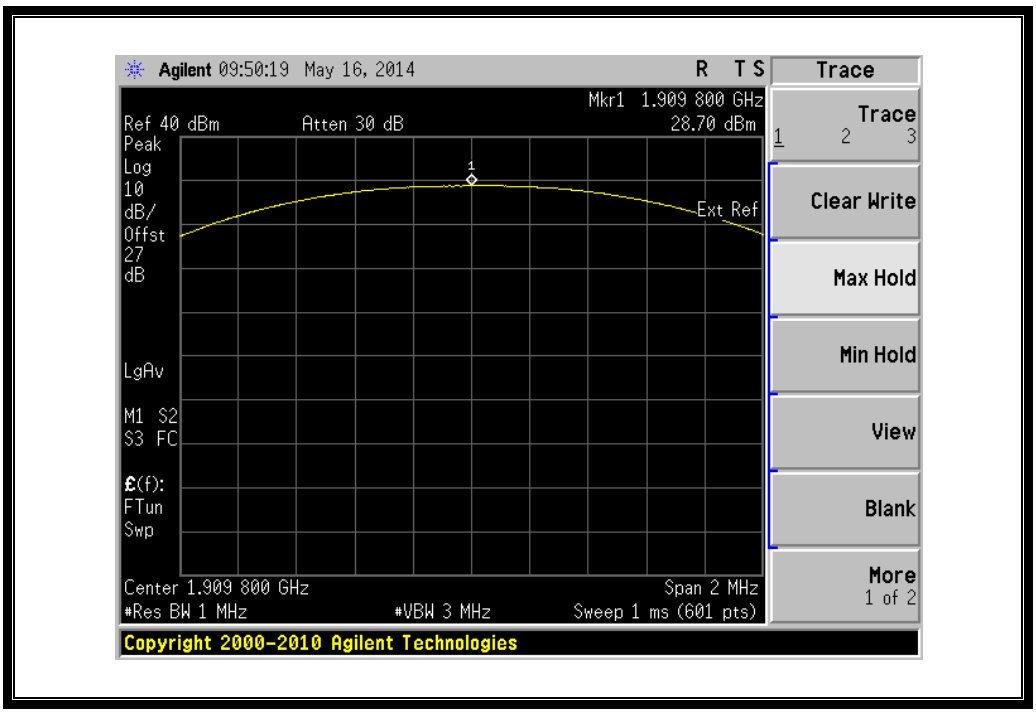

(Plot A3:GSM 850MHz Channel = 251)



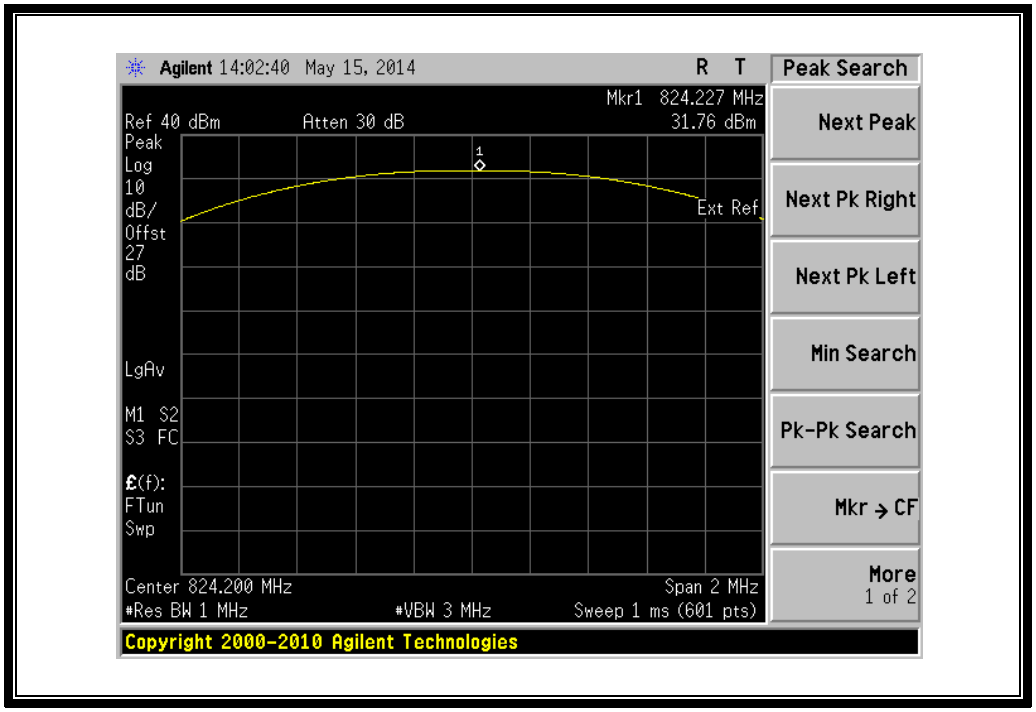

(Plot B1: GSM 1900MHz Channel = 512)



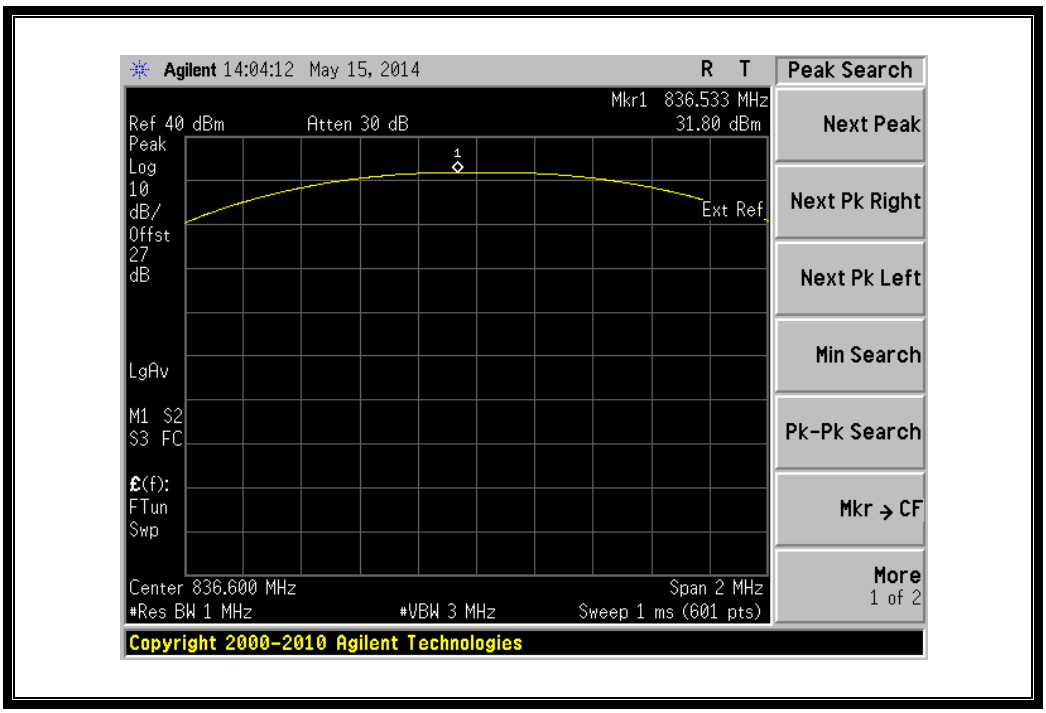

(Plot B2: GSM 1900MHz Channel = 661)



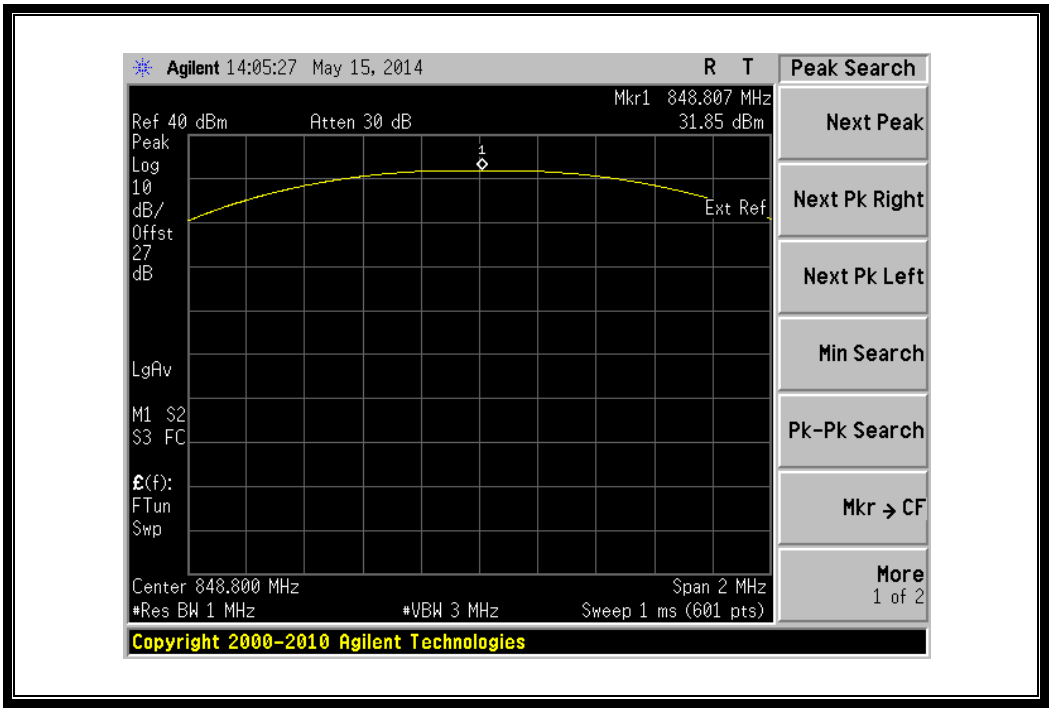

(Plot B3: GSM 1900Hz Channel = 810)



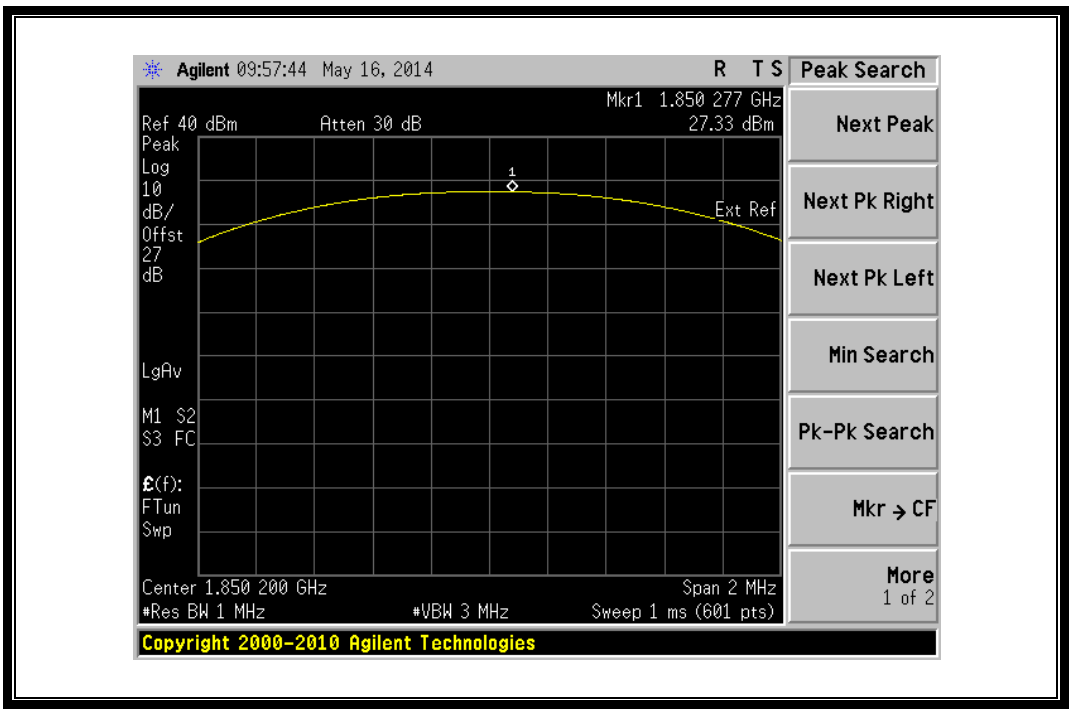

(Plot C 1: GPRS 850MHz Channel = 128)



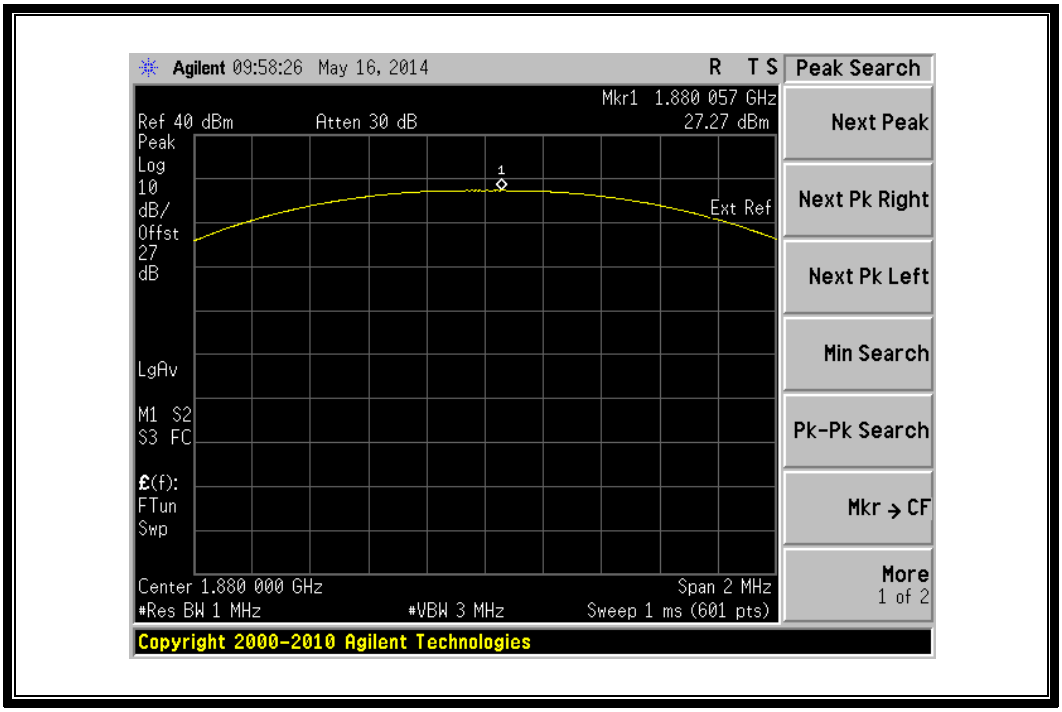

(Plot C 2: GPRS 850MHz Channel = 190)



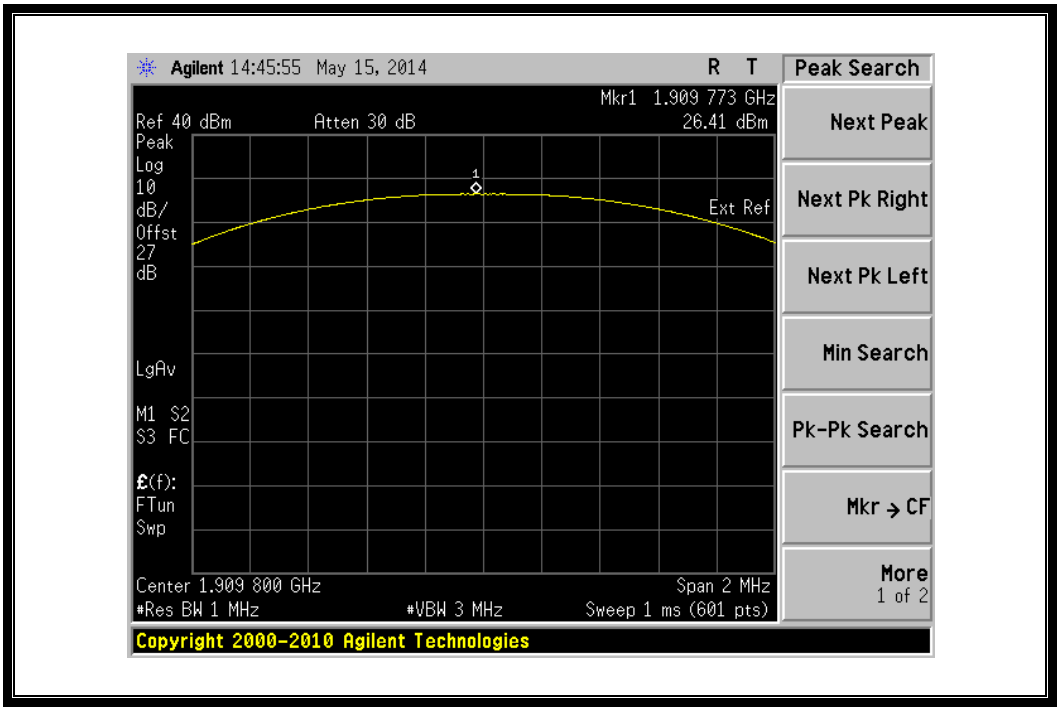

(Plot C 3: GPRS 850MHz Channel = 251)



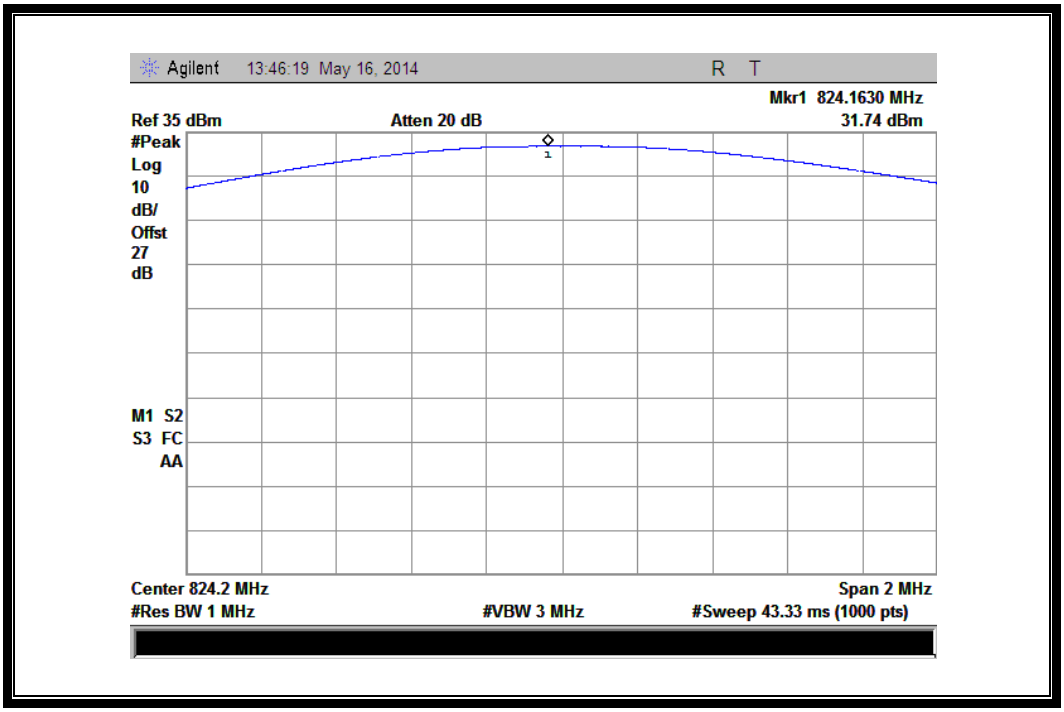

(Plot D 1: GPRS 1900MHz Channel = 512)



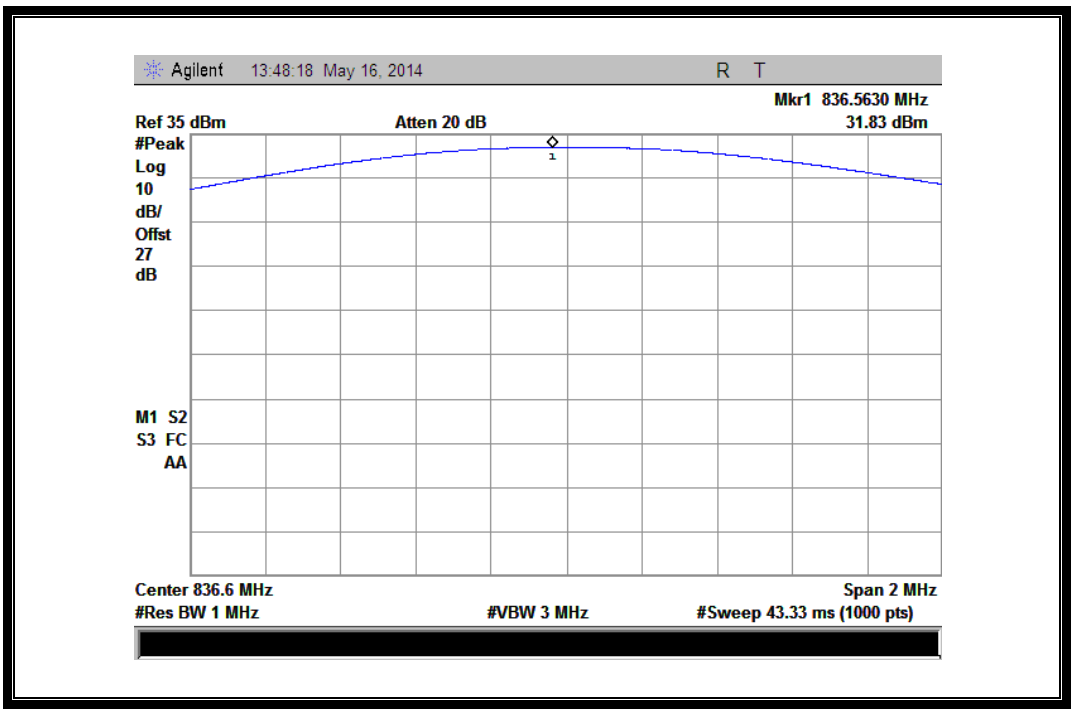

(Plot D 2: GPRS 1900MHz Channel = 661)



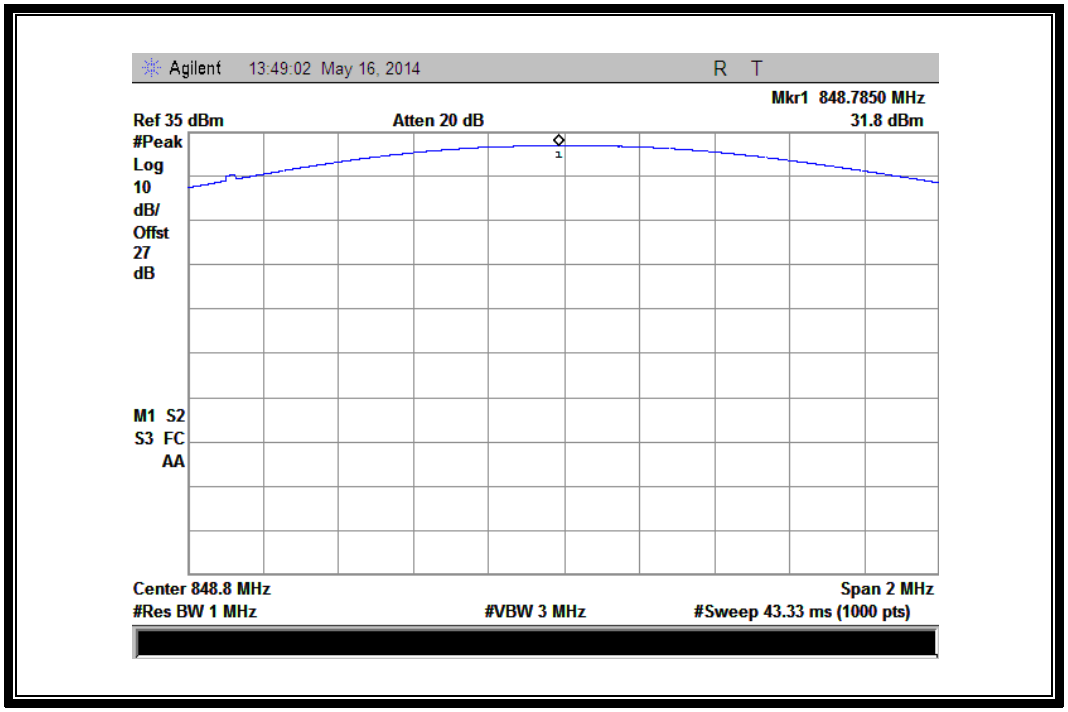

(Plot D 3: GPRS 1900MHz Channel = 810)



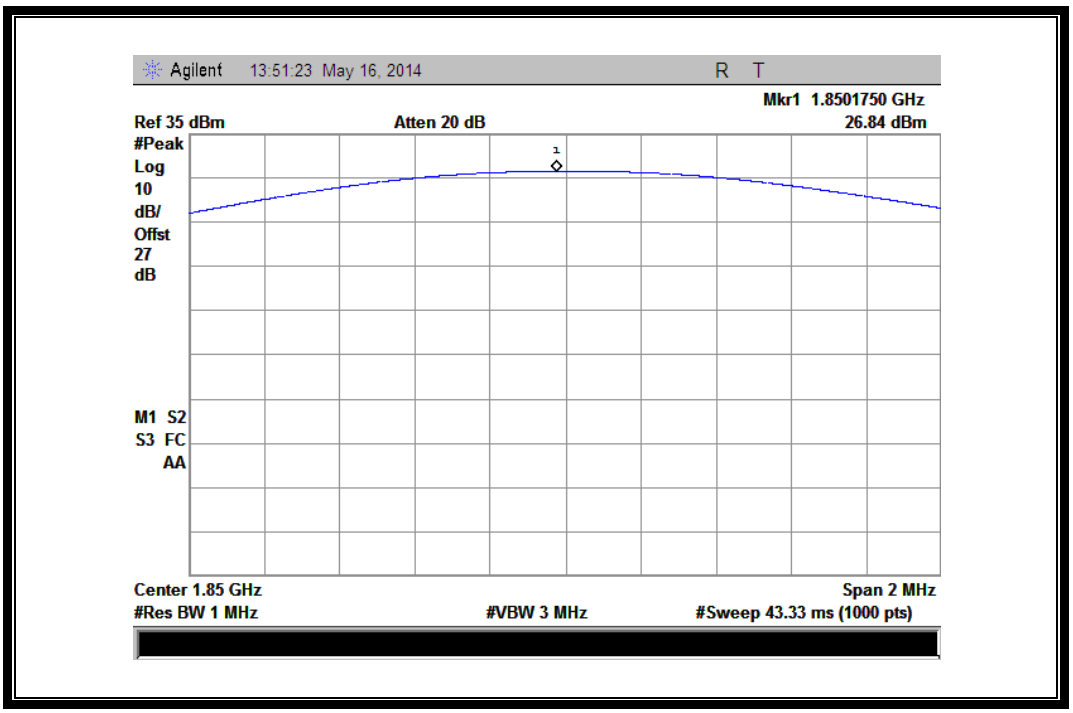

(Plot E1: EGPRS 850MHz Channel = 128)



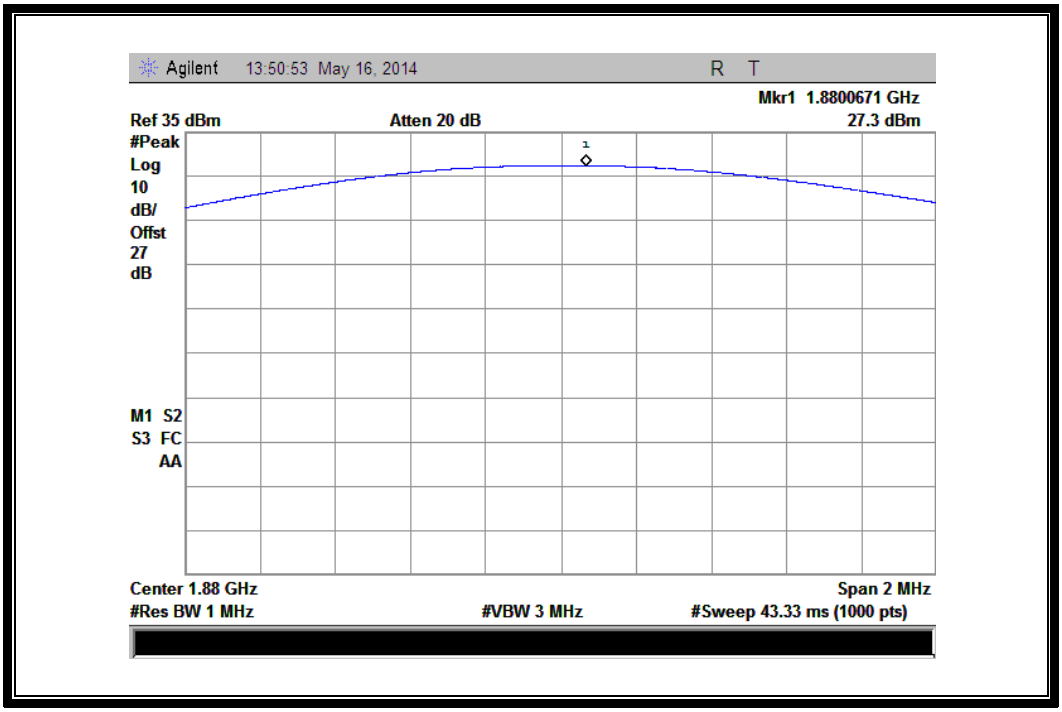

(Plot E2: EGPRS 850MHz Channel = 190)



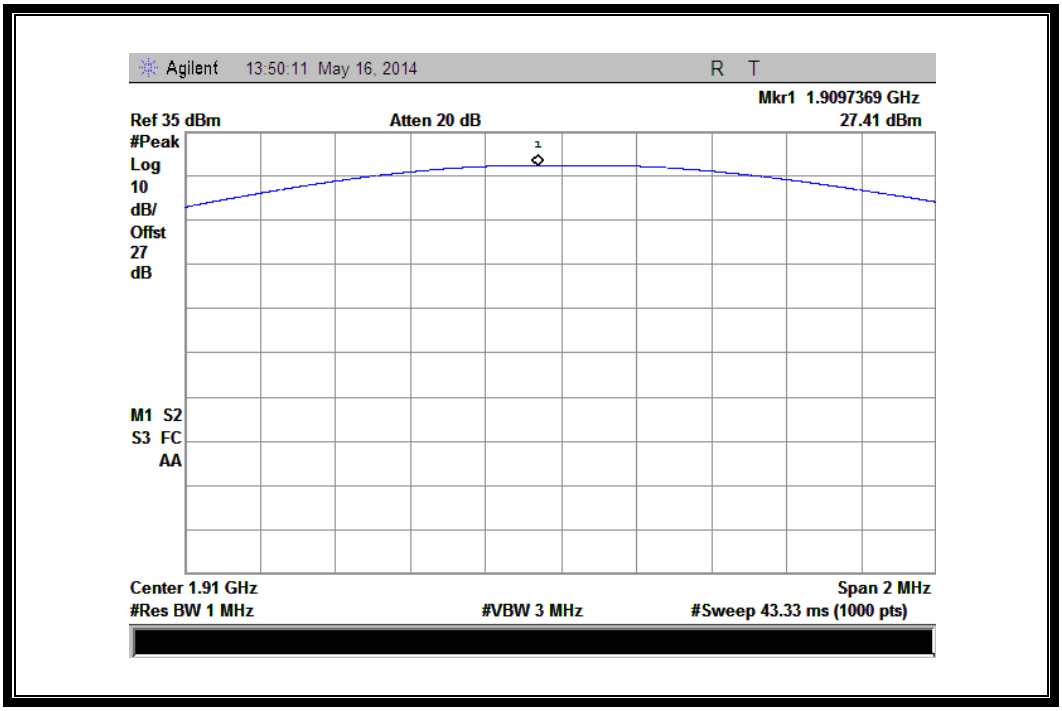

(Plot E3: EGPRS 850MHz Channel = 251)




(Plot F1:EGPRS 1900MHz Channel = 512)




(Plot F2:EGPRS 1900MHz Channel = 661)




(Plot F3:EGPRS 1900Hz Channel = 810)

## 2.2 Peak to Average Radio

### 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.

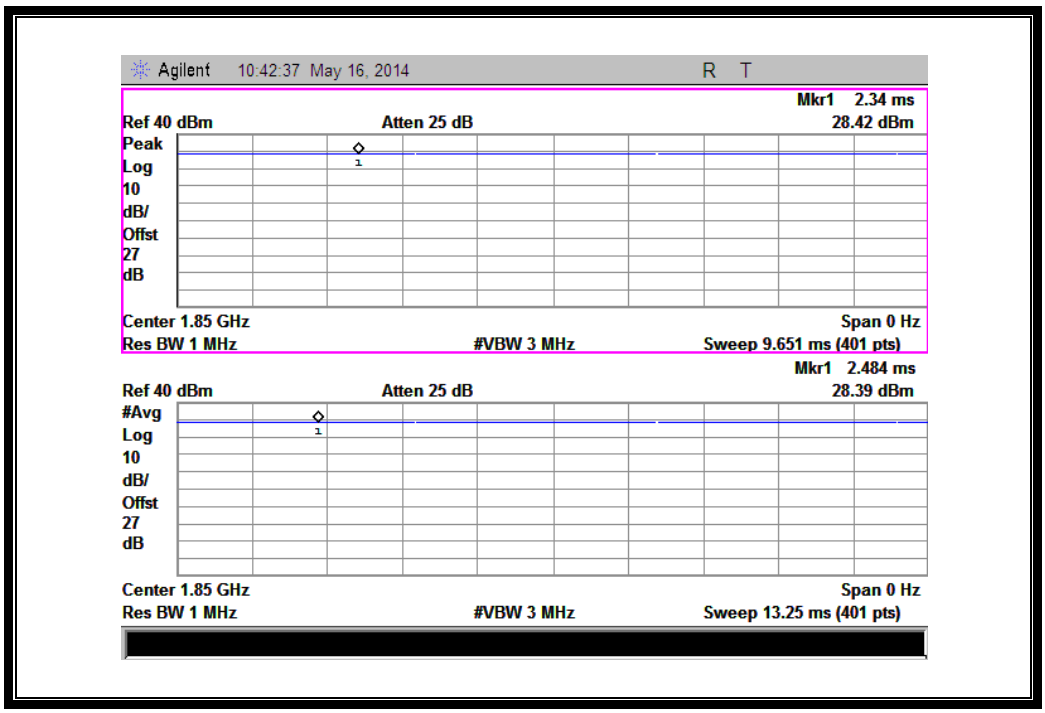
B. For UMTS operating mode:

a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.

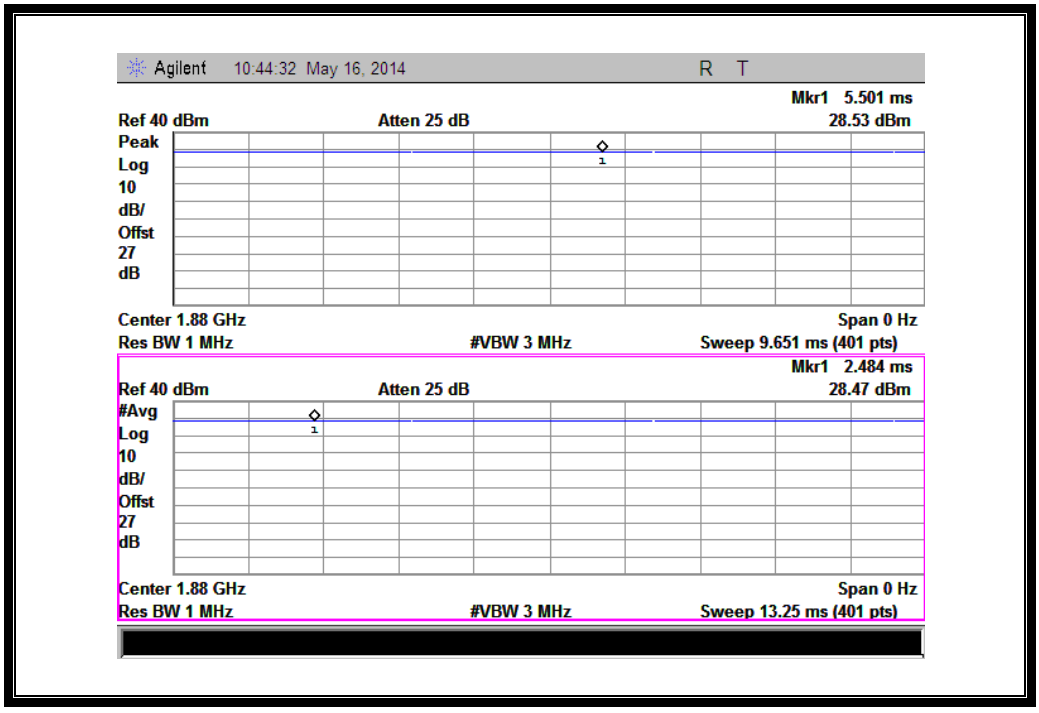
b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

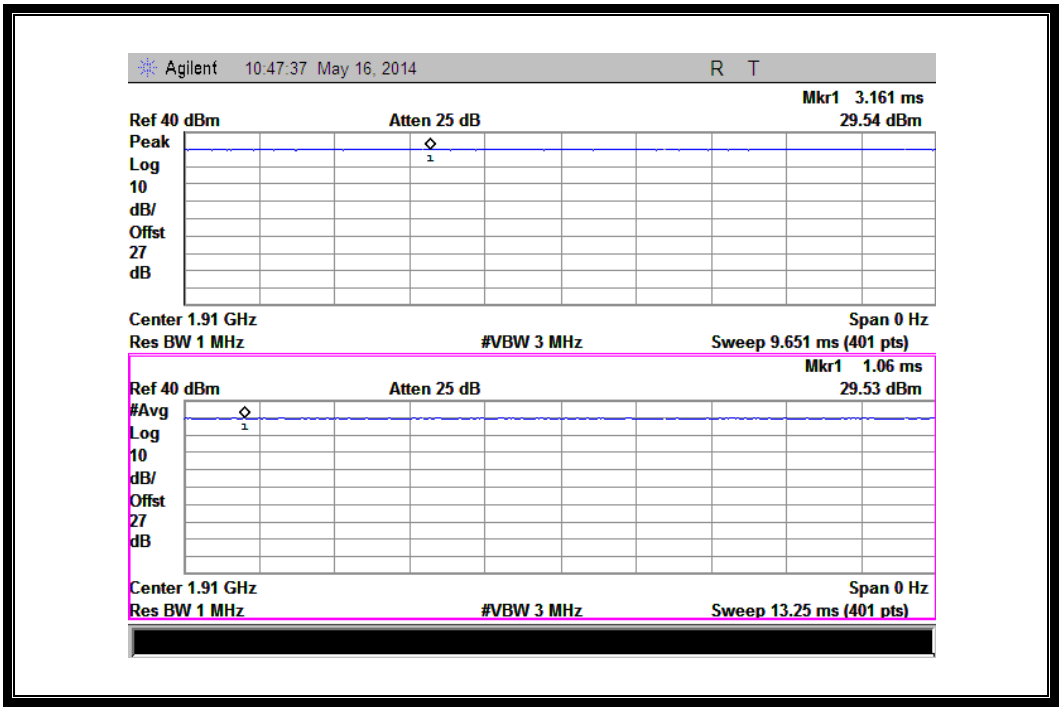
| Band | Channel | Frequency (MHz) | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|
| | | | dBm | Refer to Plot | dBm | |
| GSM 1900MHz | 512 | 1850.2 | 0.03 | Plot A1 to A3 | 13 | PASS |
| | 661 | 1880.0 | 0.06 | | | PASS |
| | 810 | 1909.8 | 0.01 | | | PASS |
| EGPRS 1900MHz | 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 |



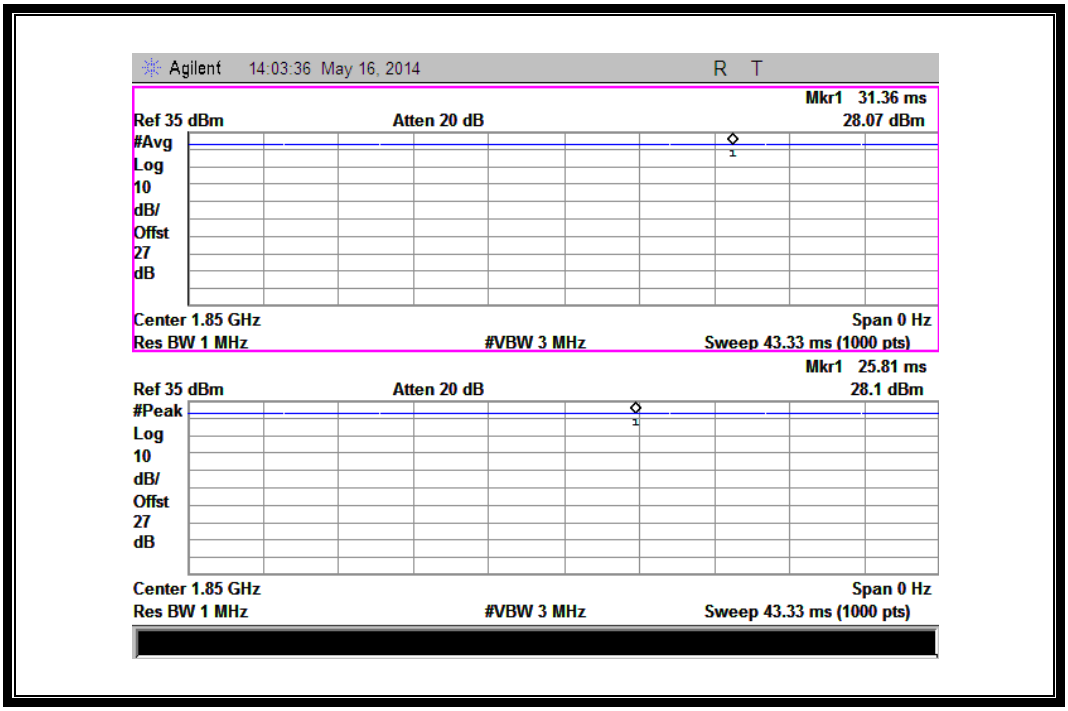

(Plot A1:GSM 1900 MHz Channel = 512)



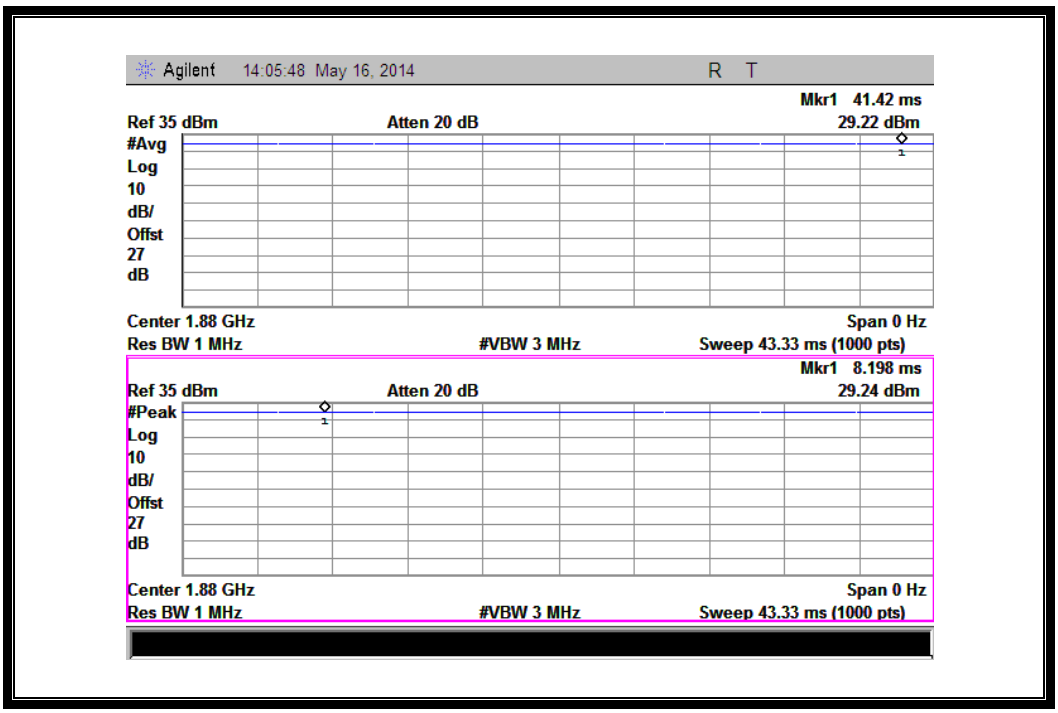

(Plot A2:GSM 1900 MHz Channel = 661)



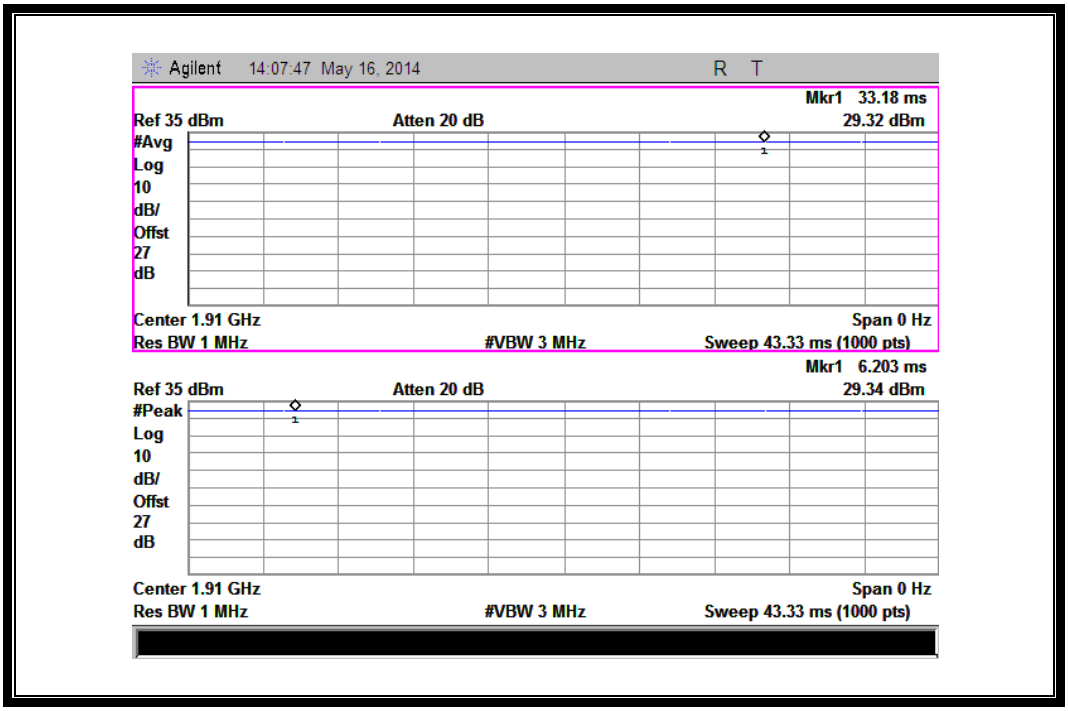

(Plot A3:GSM 1900MHz Channel = 810)



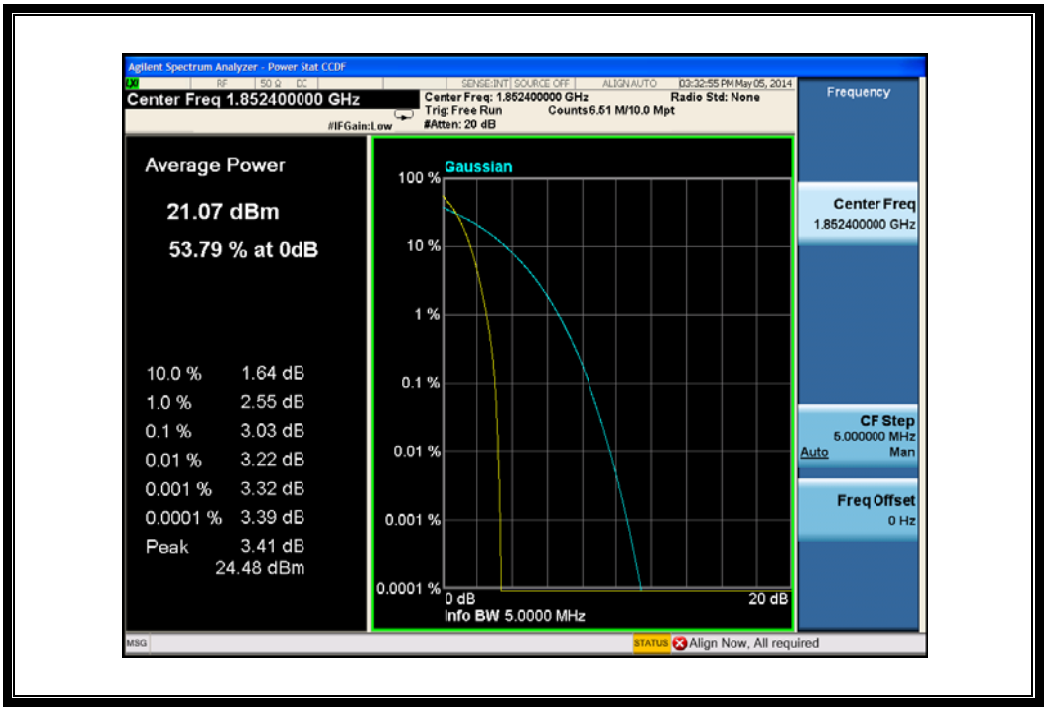

(Plot B1: EGPRS 1900MHz Channel = 512)



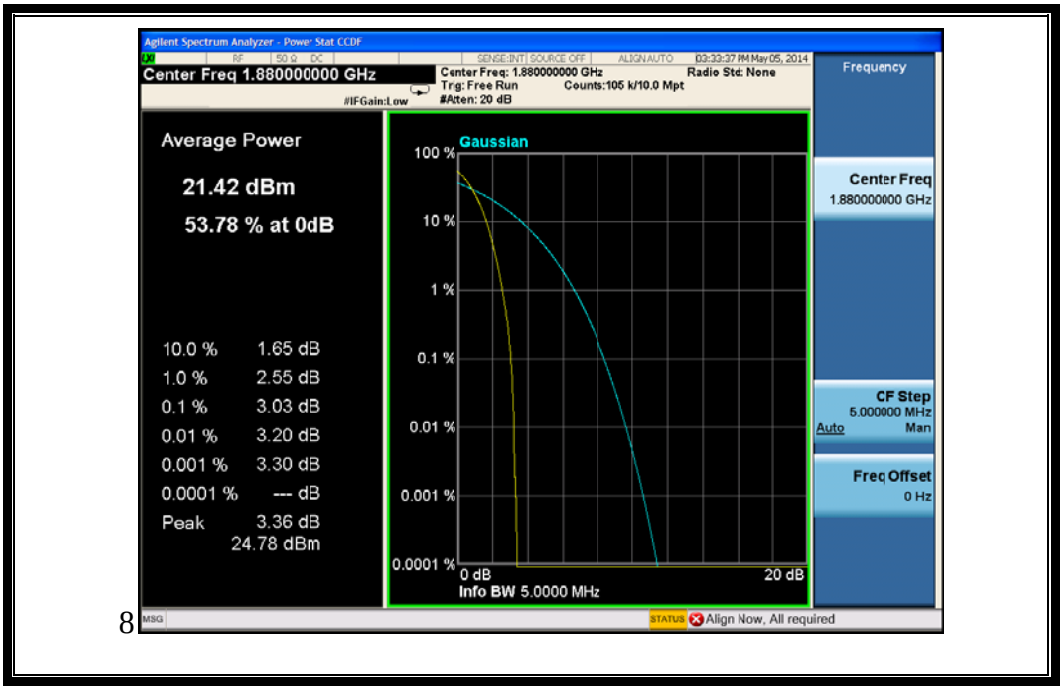

(Plot B2: EGPRS 1900MHz Channel = 661)



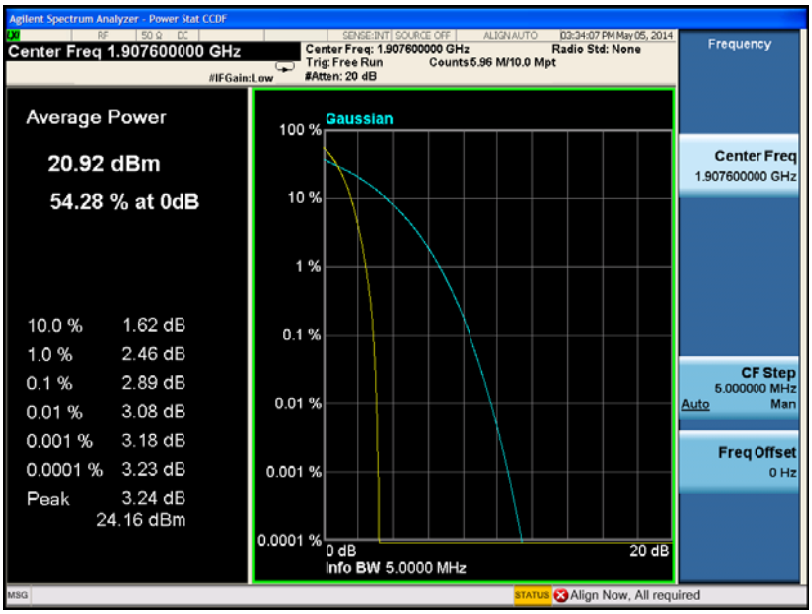

(Plot B3: EGPRS 1900MHz Channel = 810)




(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

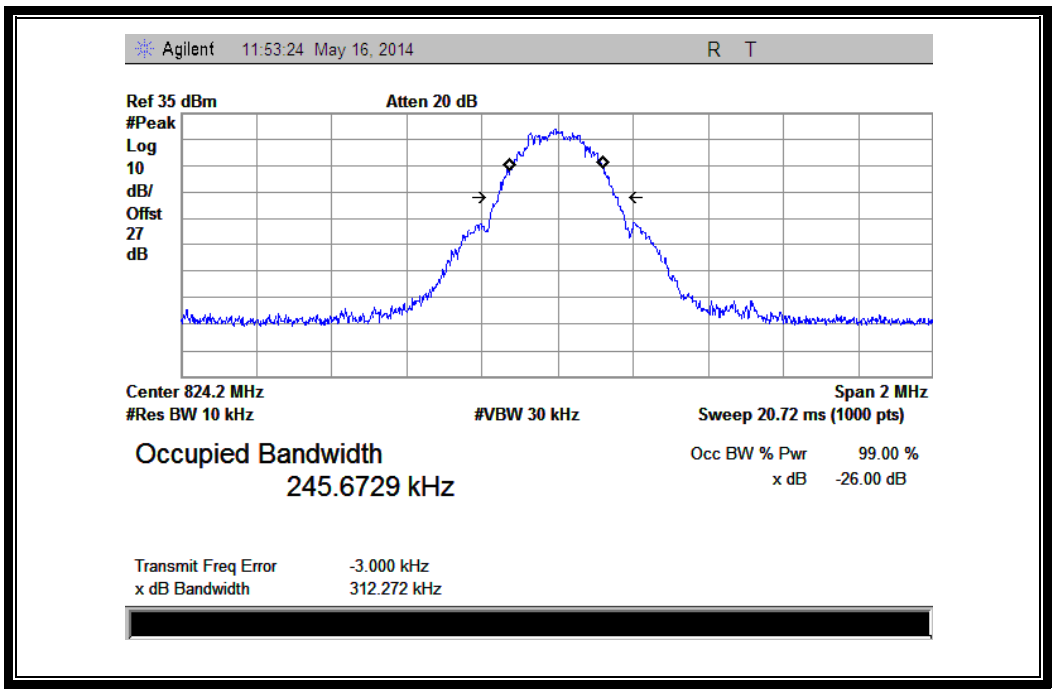
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

2. Test Verdict:

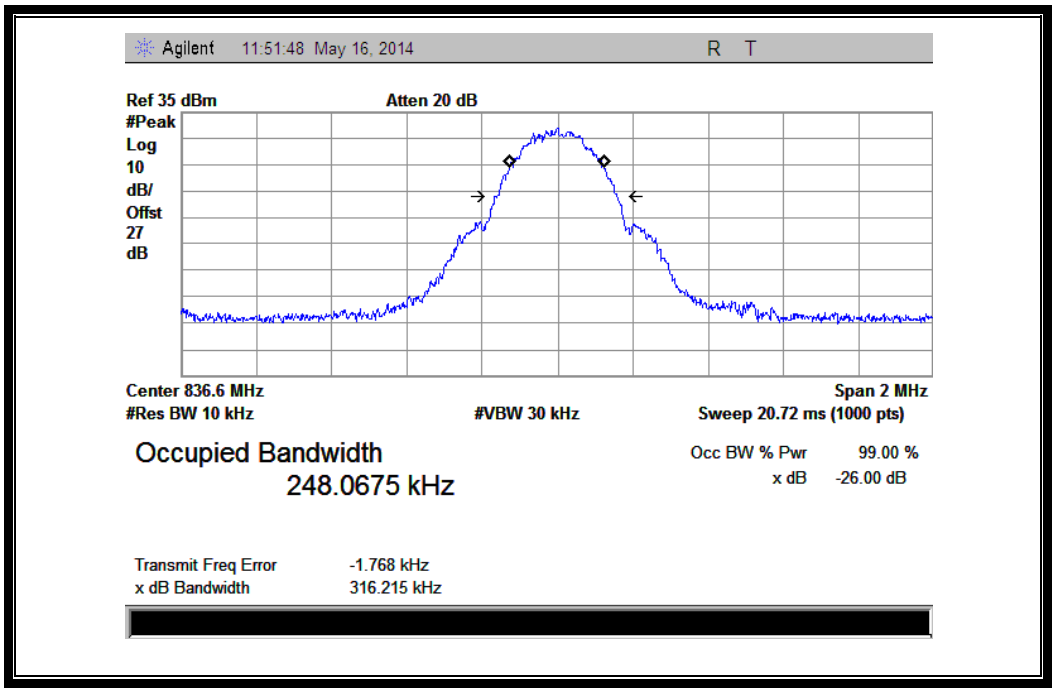
| Band | Channel | Frequency (MHz) | 26dB bandwidth | 99% Occupied Bandwidth | Refer to Plot |
|---|---|---|---|---|---|
| EDGE 850MHz | 128 | 824.2 | 313.272 KHz | 245.6729 KHz | Plot A |
| | 190 | 836.6 | 316.215 KHz | 248.0675 KHz | Plot B |
| | 251 | 848.8 | 323.133 KHz | 250.4755 KHz | Plot C |
| 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 |

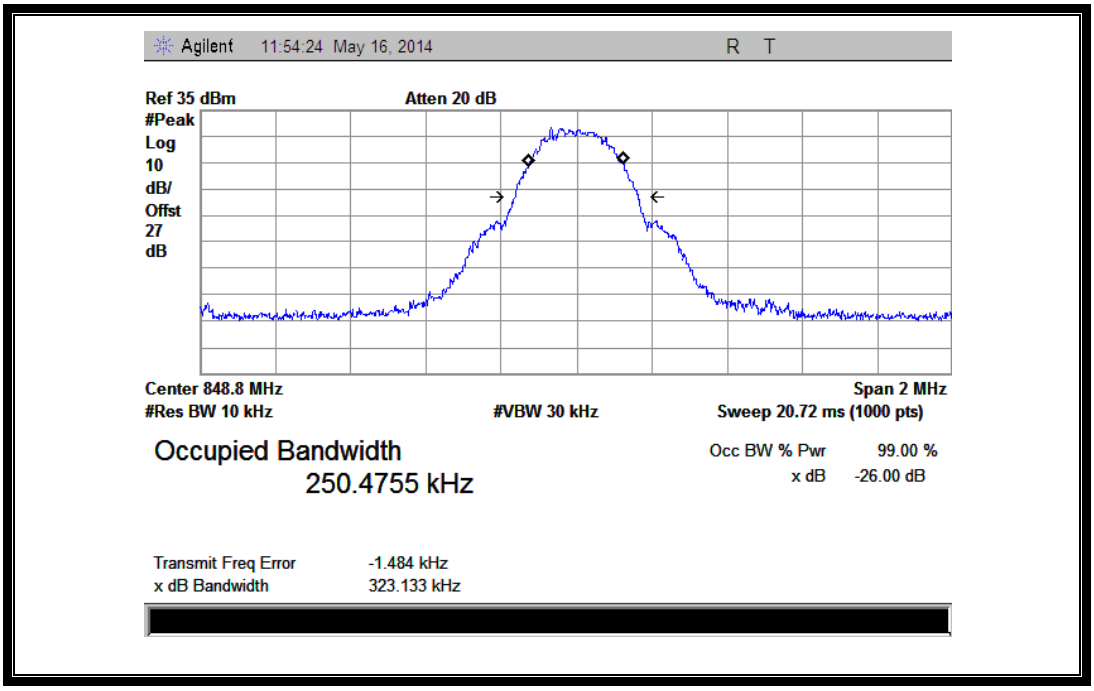
3. Test Plots:



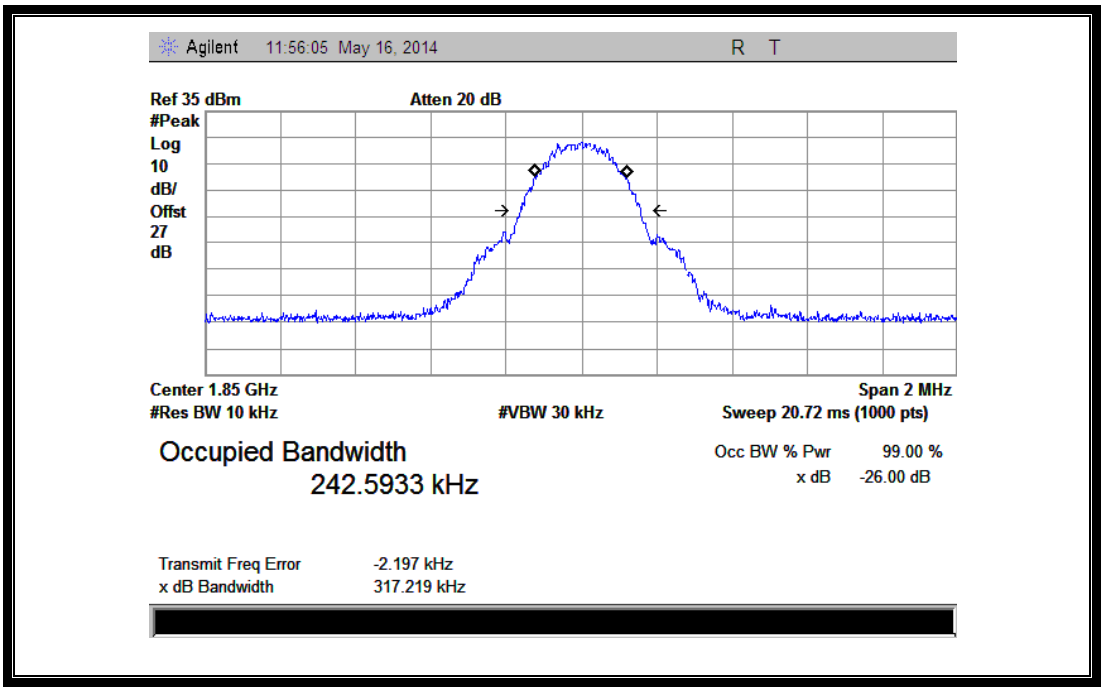

(Plot A: EGPRS 850MHz Channel = 128)



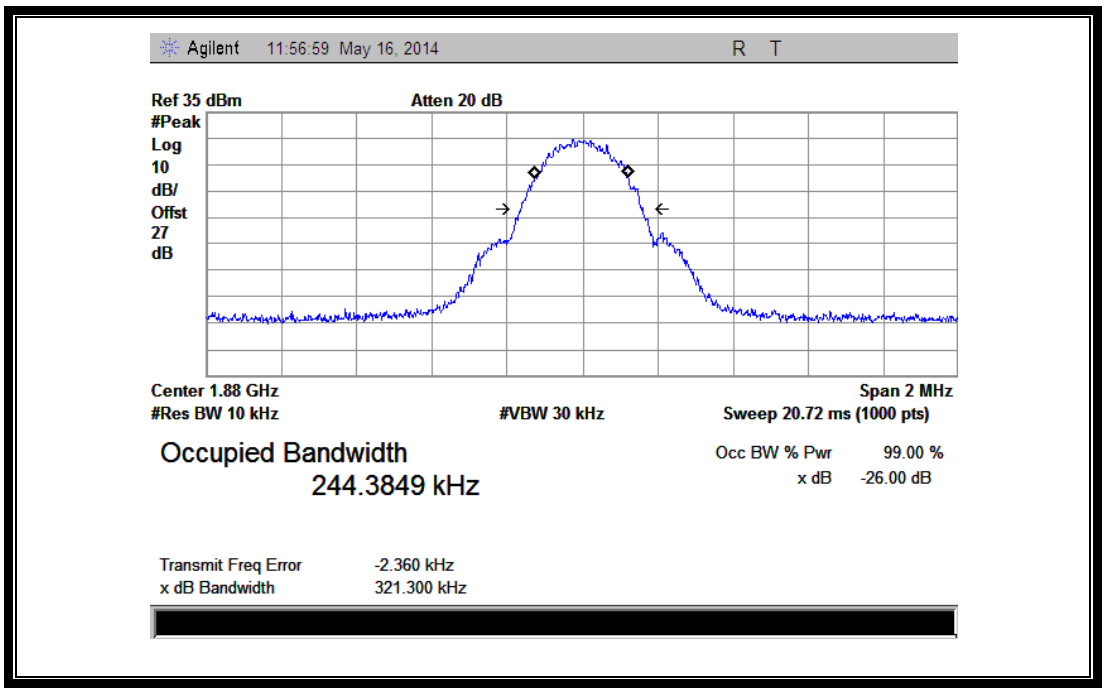

(Plot B: EGPRS 850MHz Channel = 190)



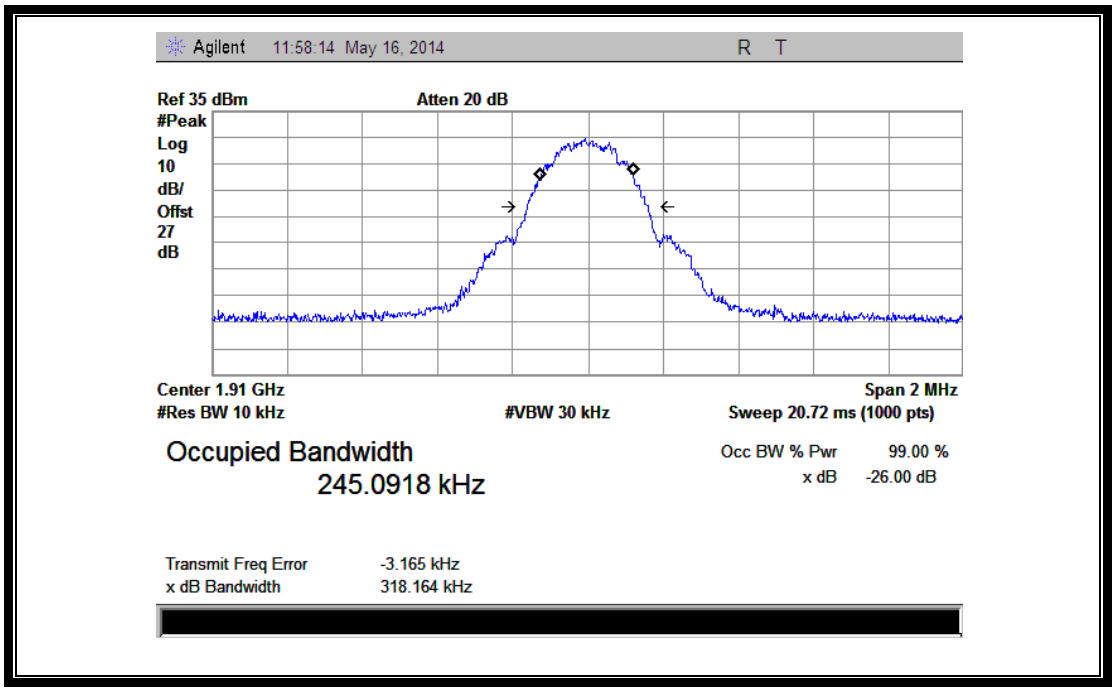

(Plot C: EGPRS 850MHz Channel = 251)



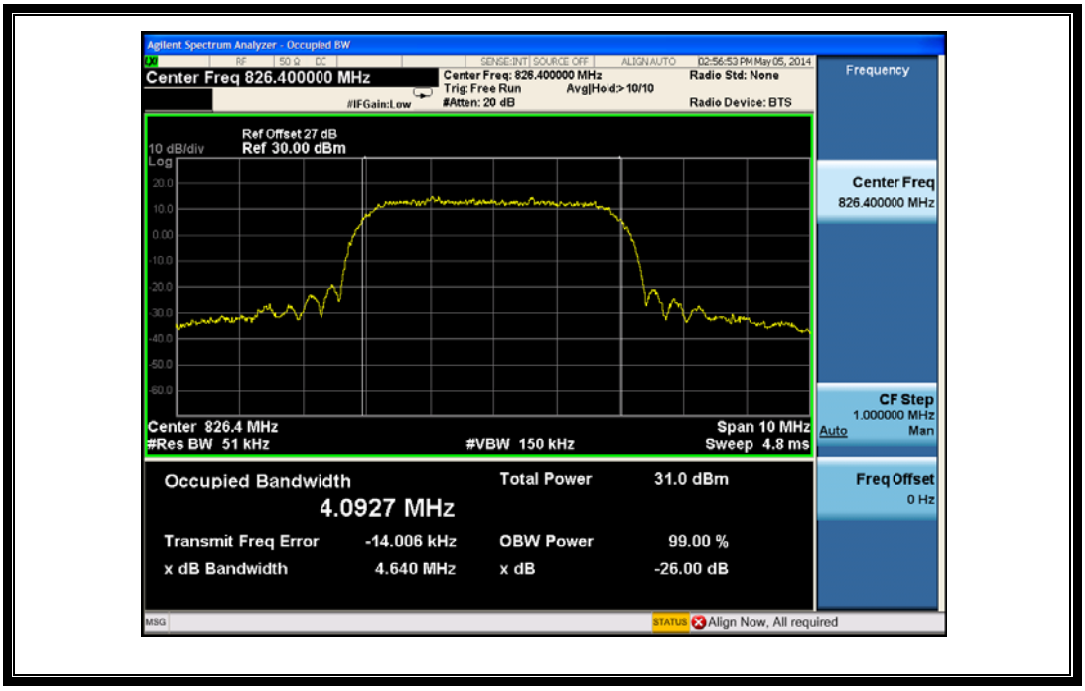

(Plot D: EGPRS1900MHz Channel = 512)




(Plot E: EGPRS1900MHz Channel = 661)

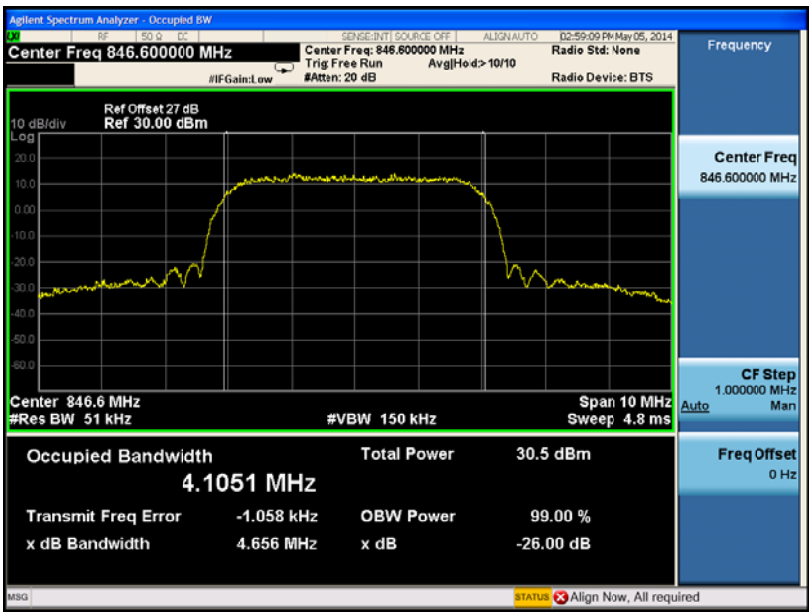



(Plot F: EGPRS 1900MHz Channel = 810)

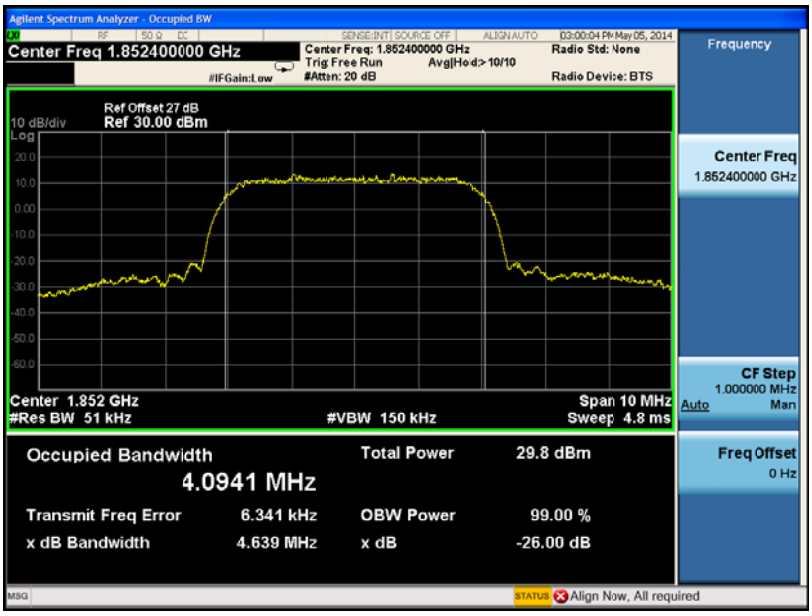



(Plot G: WCDMA 850MHz Channel = 4132)

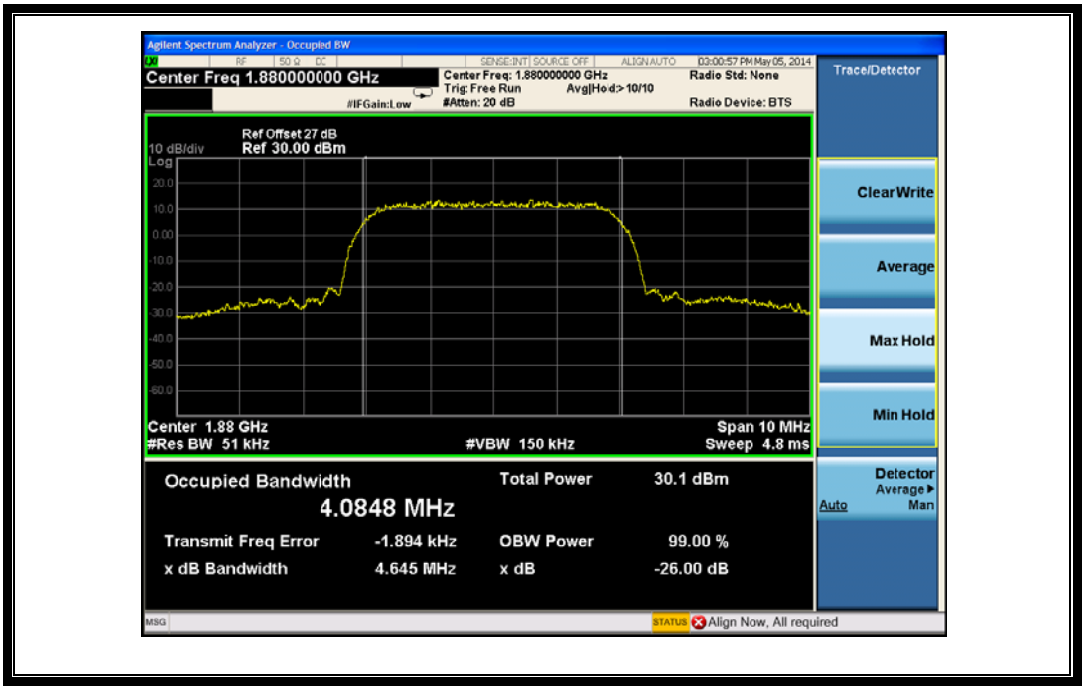

(Plot H: WCDMA 850 MHz Channel = 4175)



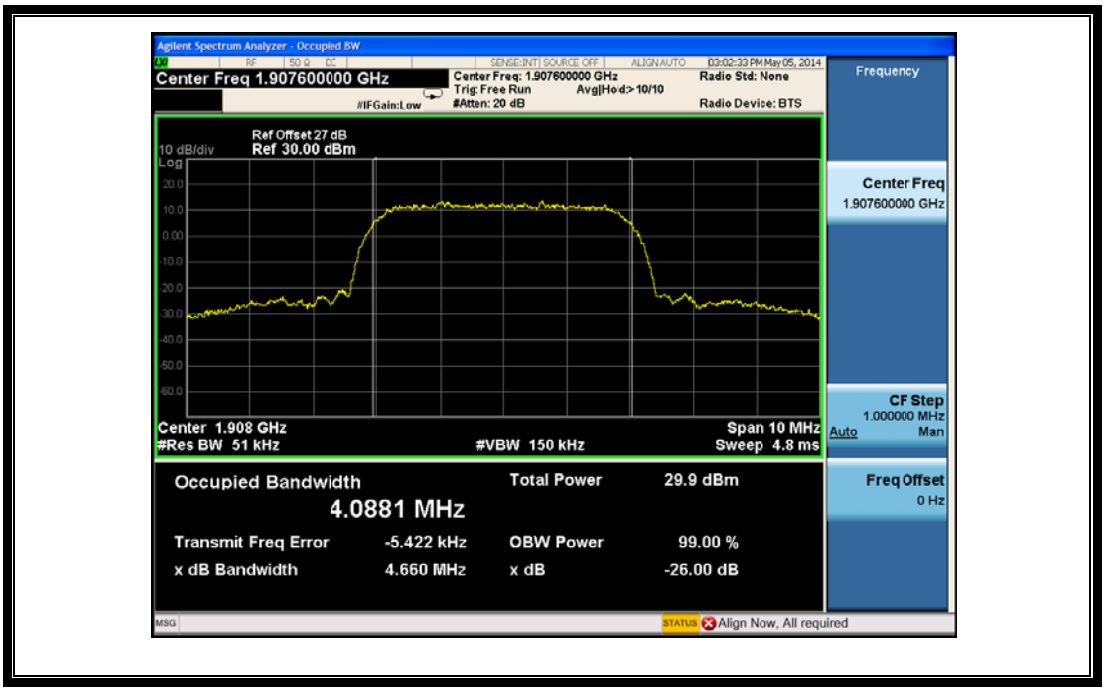

(Plot I: WCDMA 850MHz Channel = 4233)



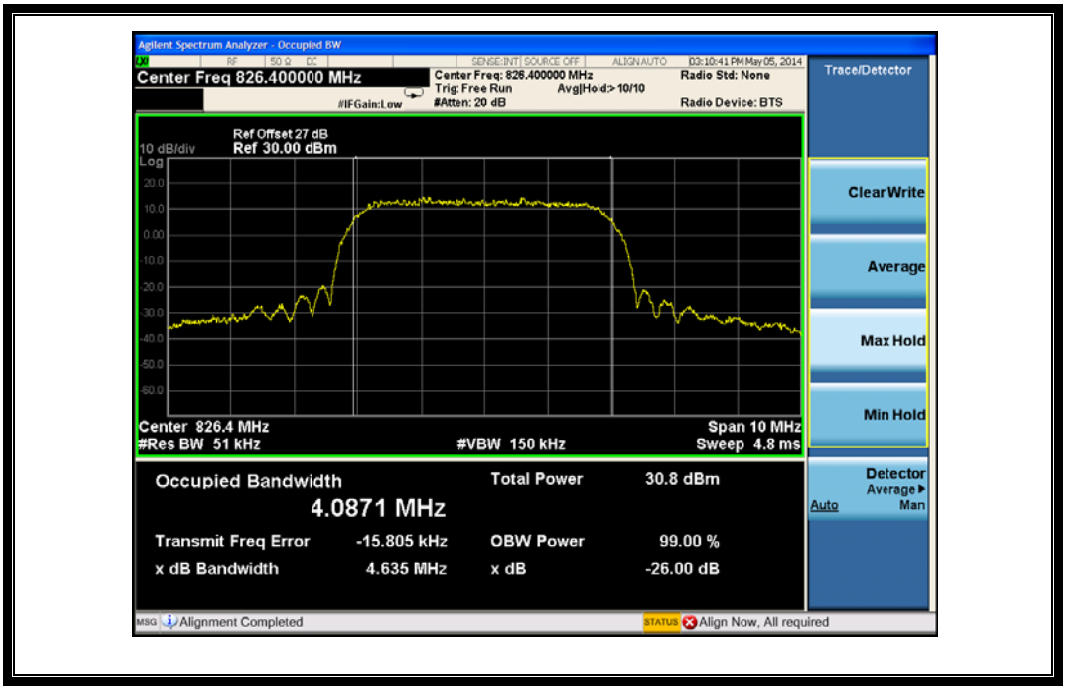

(Plot J: WCDMA 1900MHz Channel = 9262)



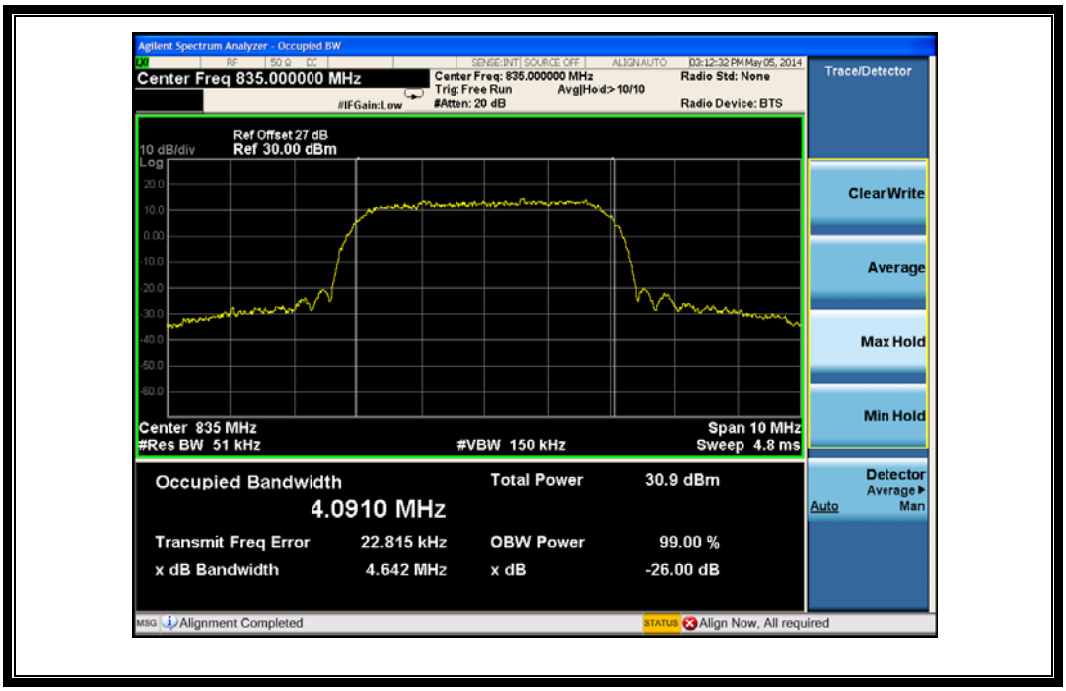

(Plot K: WCDMA 1900 MHz Channel = 9400)



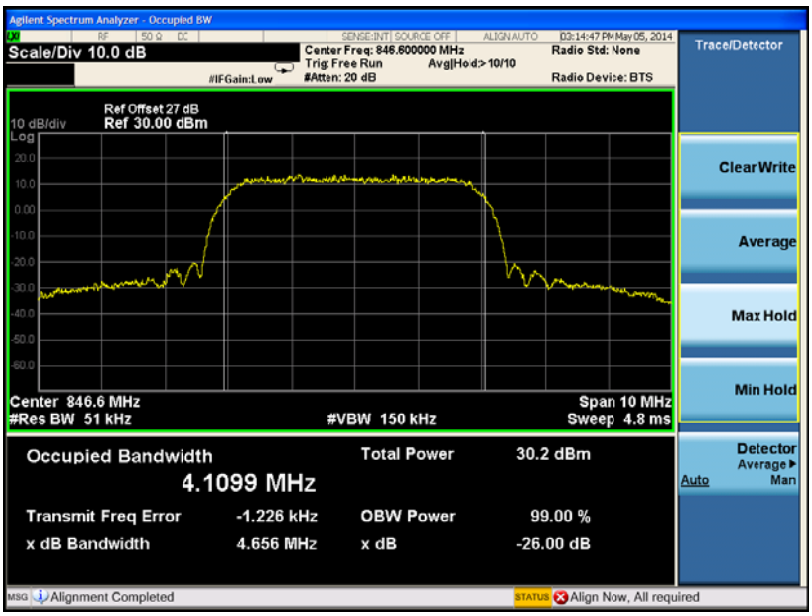

(Plot L: WCDMA1900MHz Channel = 9538)



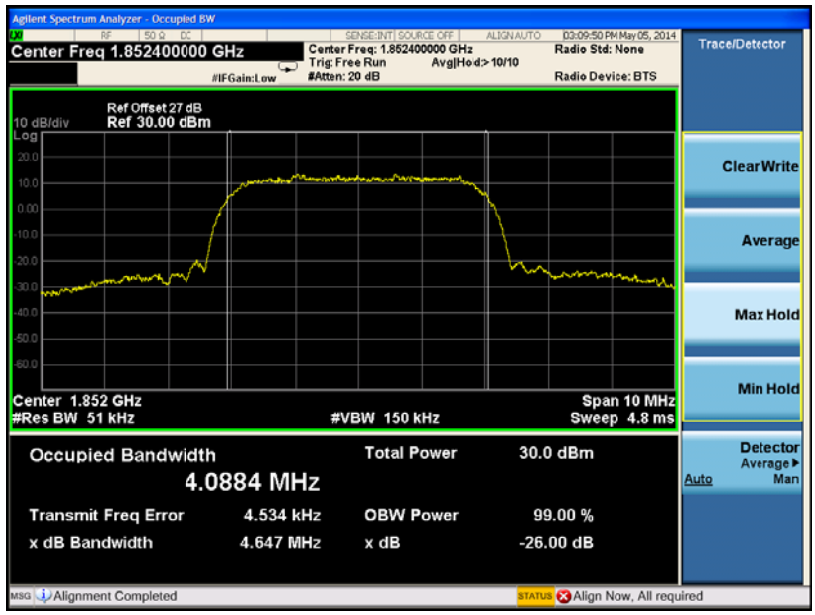

(Plot M: HSDPA 850MHz Channel = 4132)




(Plot N: HSDPA850 MHz Channel = 4175)

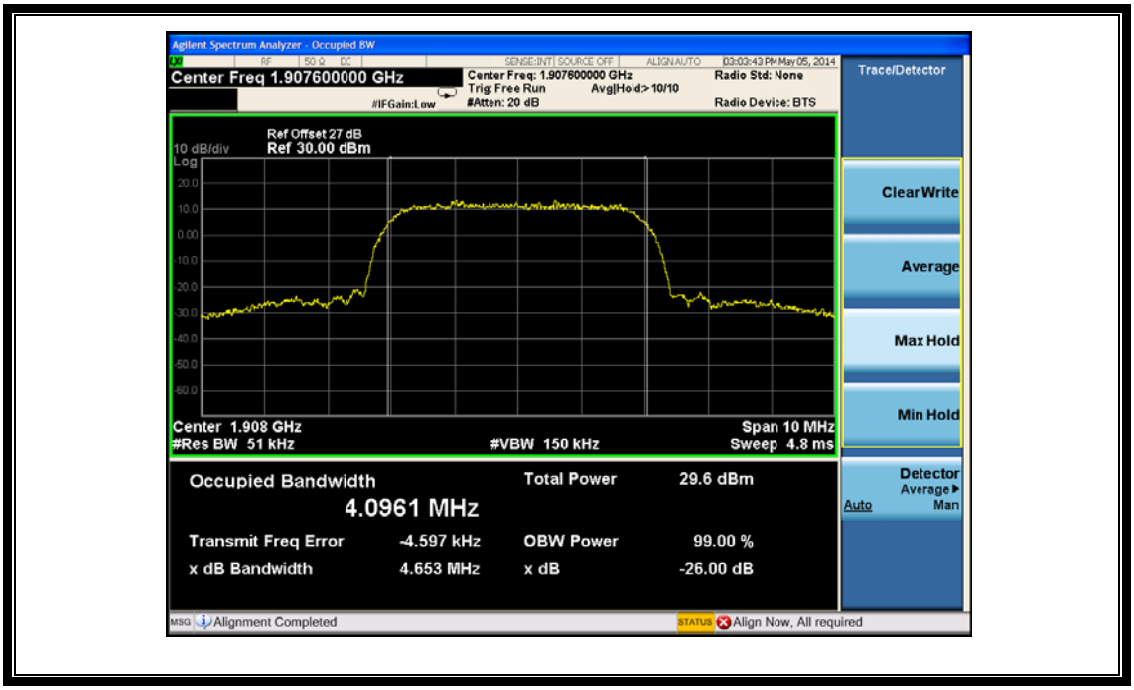



(Plot O: HSDPA 850 MHz Channel = 4233)

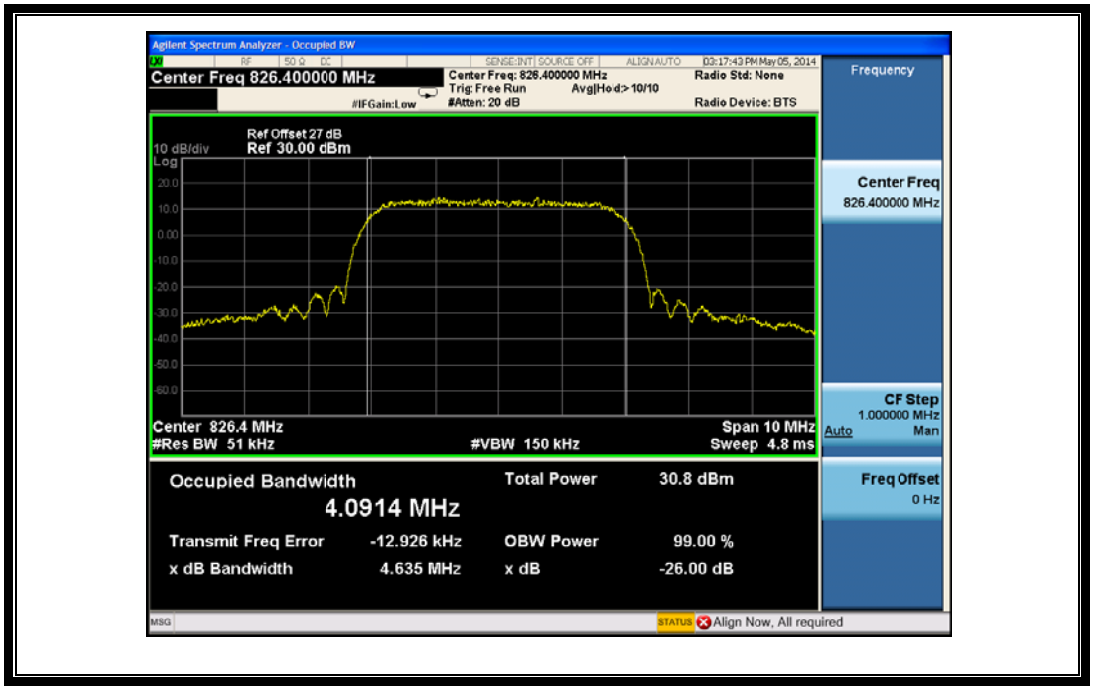



(Plot P: HSDPA1900 MHz Channel = 9262)


(Plot Q: HSDPA1900 MHz Channel = 9400)

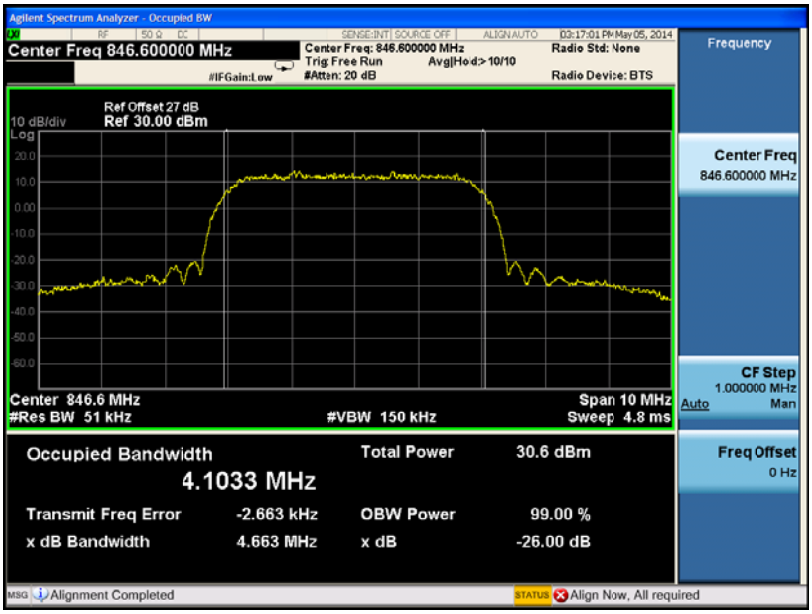



(Plot R: HSDPA 1900 MHz Channel = 9538)

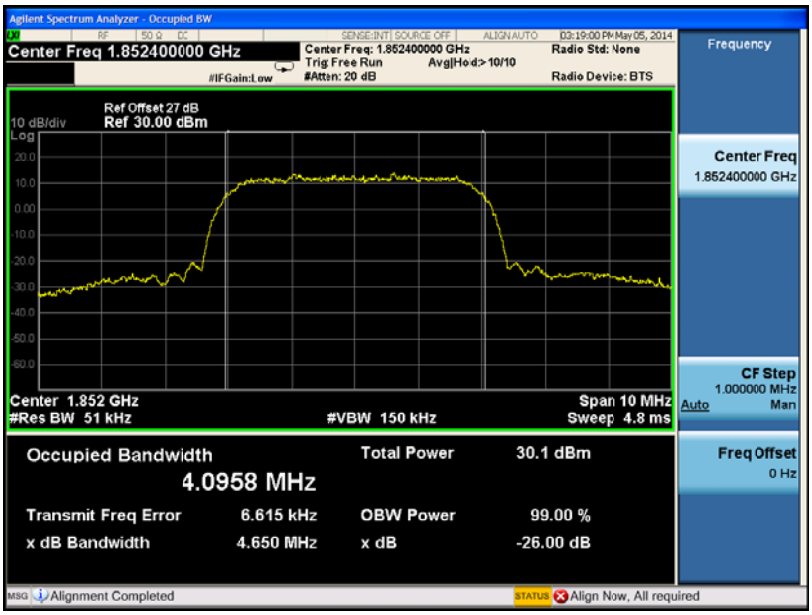



(Plot S: HSUPA850 MHz Channel = 4132)

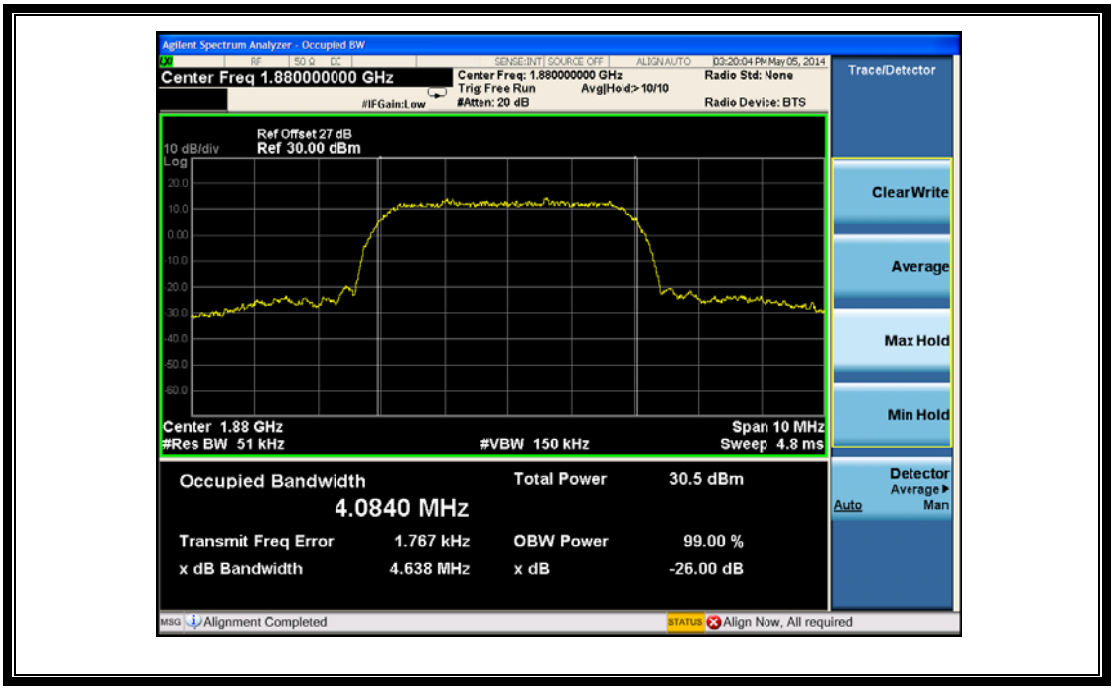

(Plot T: HSUPA850 MHz Channel = 4175)



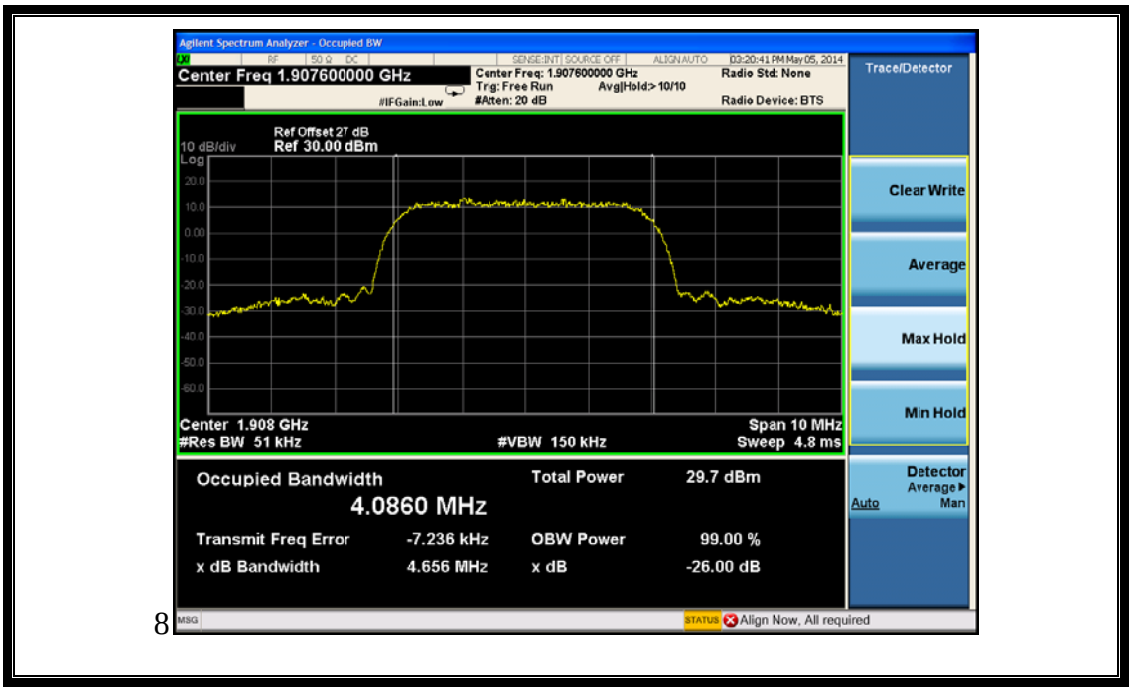

(Plot U: HSUPA850 MHz Channel = 4233)



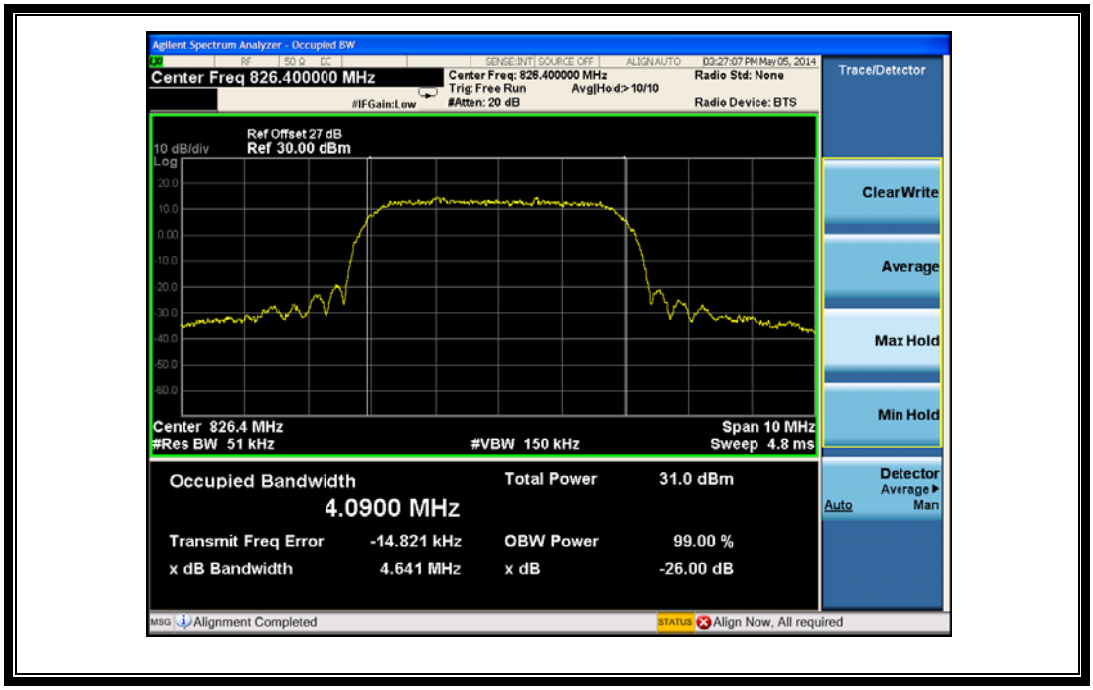

(Plot V: HSUPA1900 MHz Channel = 9262)



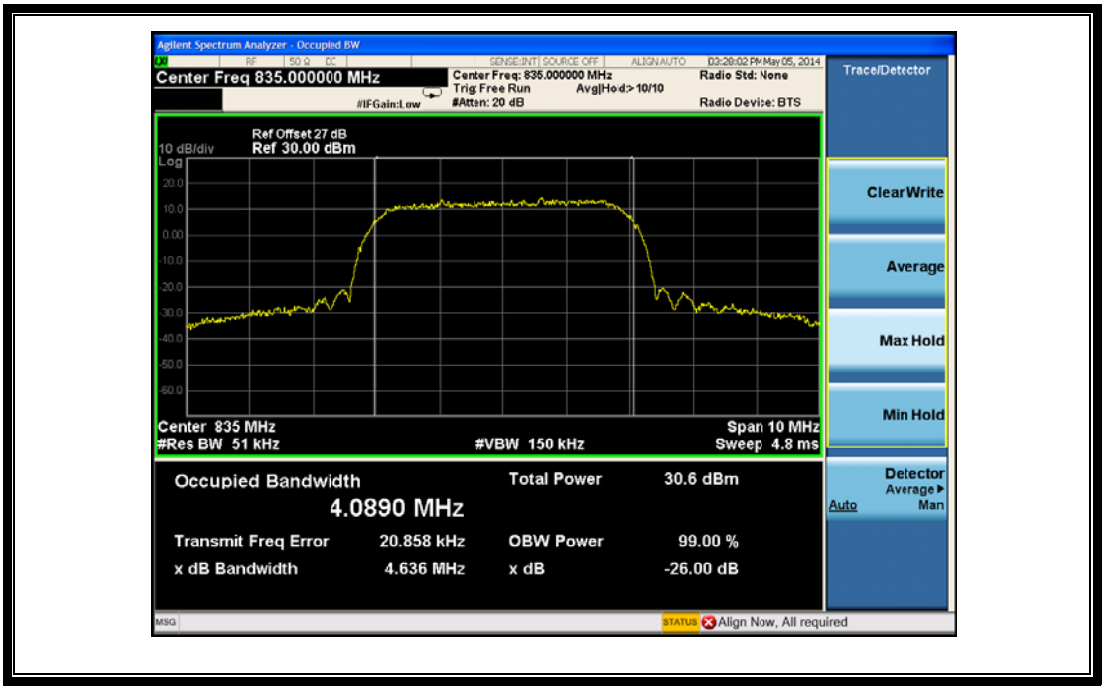

(Plot W: HSUPA1900 MHz Channel = 9400)



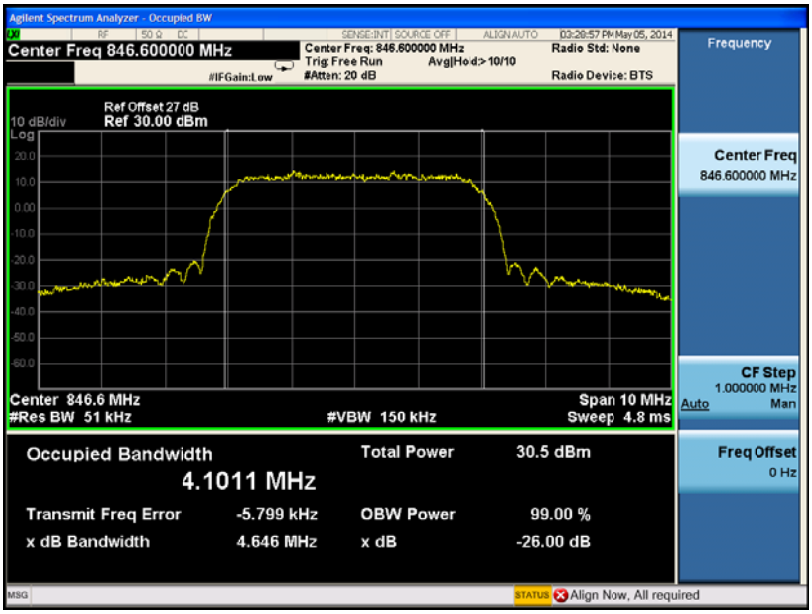

(Plot X: HSUPA1900 MHz Channel = 9538)



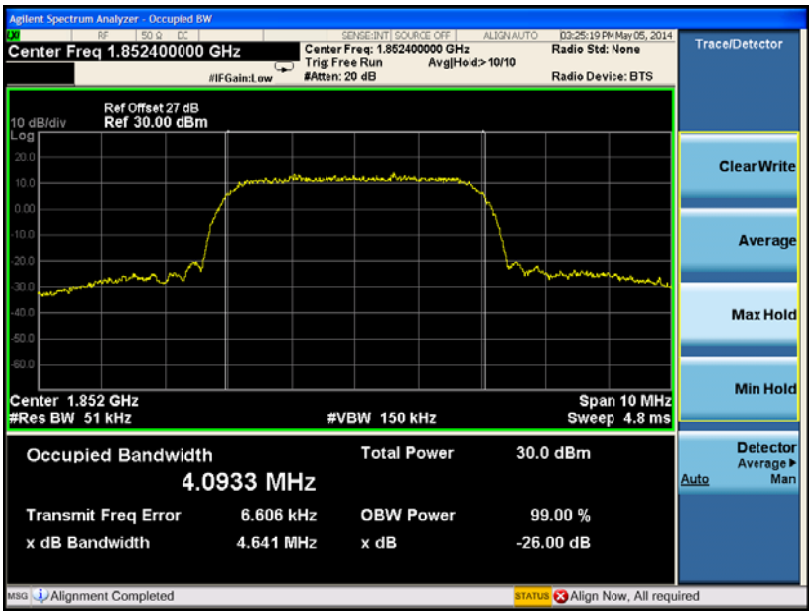

(Plot Y: HSPA+850 MHz Channel = 4132)



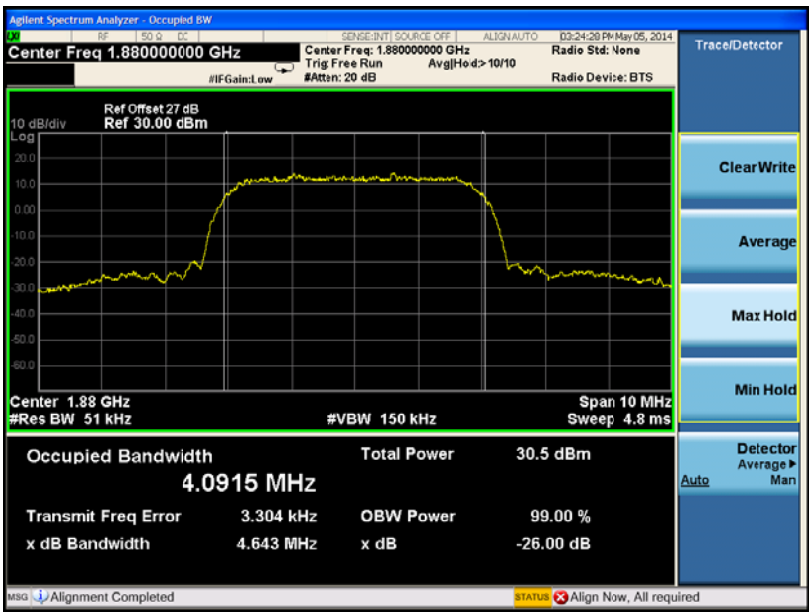

(Plot Z: HSPA+850 MHz Channel = 4175)



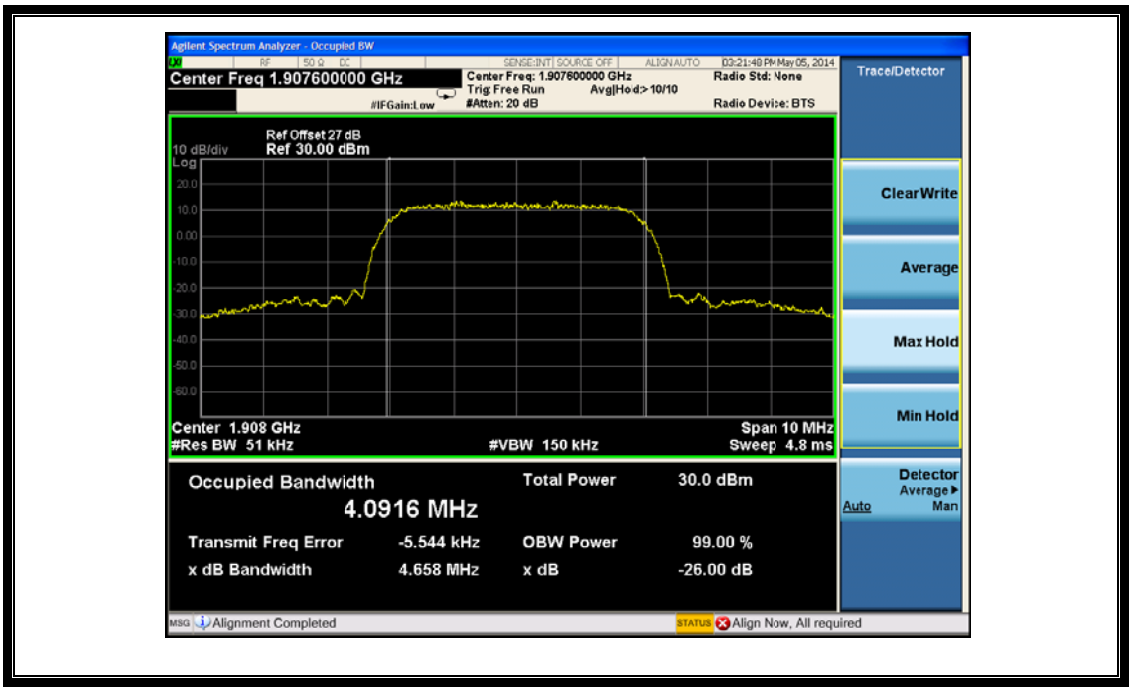

(Plot A1:HSPA+850 MHz Channel = 4233)



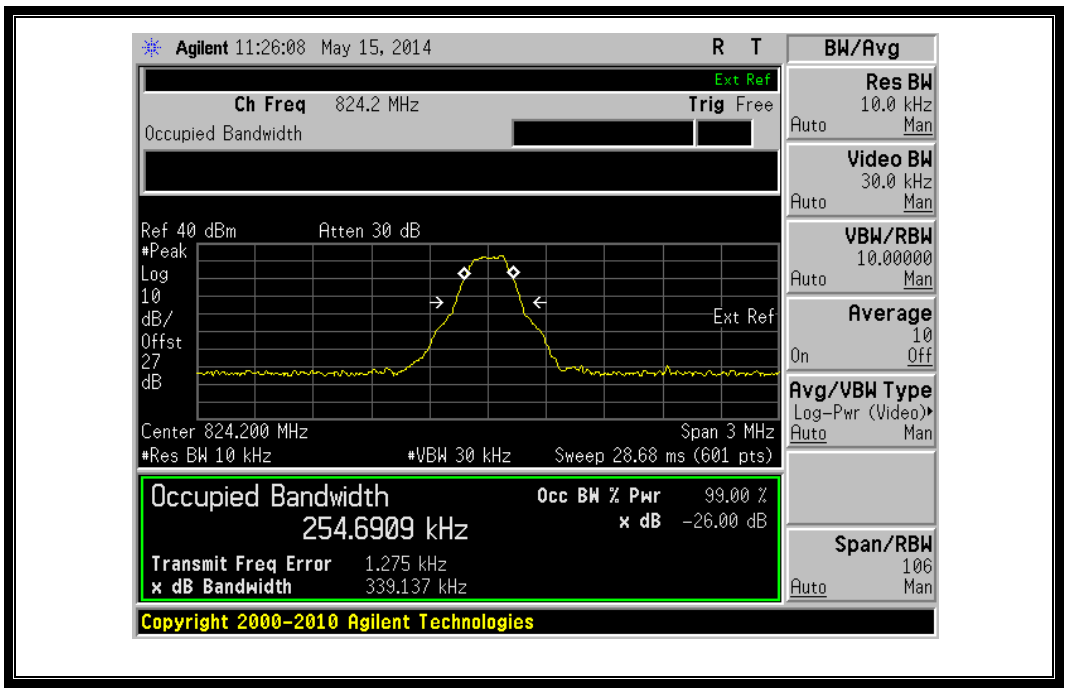

(Plot B1: HSPA+1900 MHz Channel = 9262)



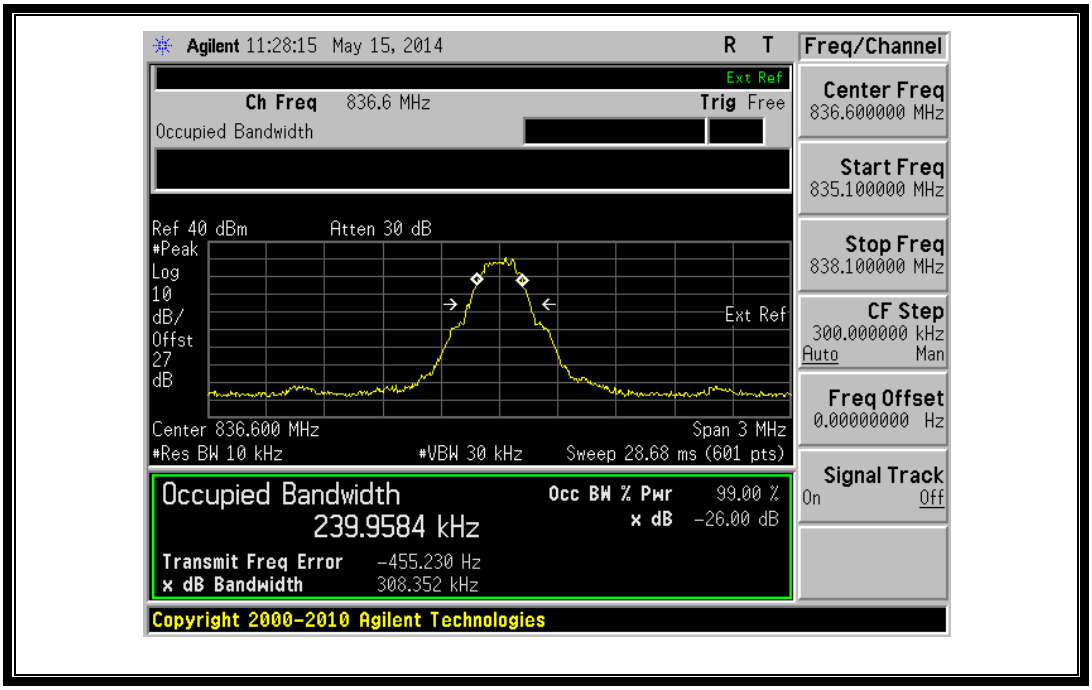

(Plot C1: HSPA+1900 MHz Channel = 9400)



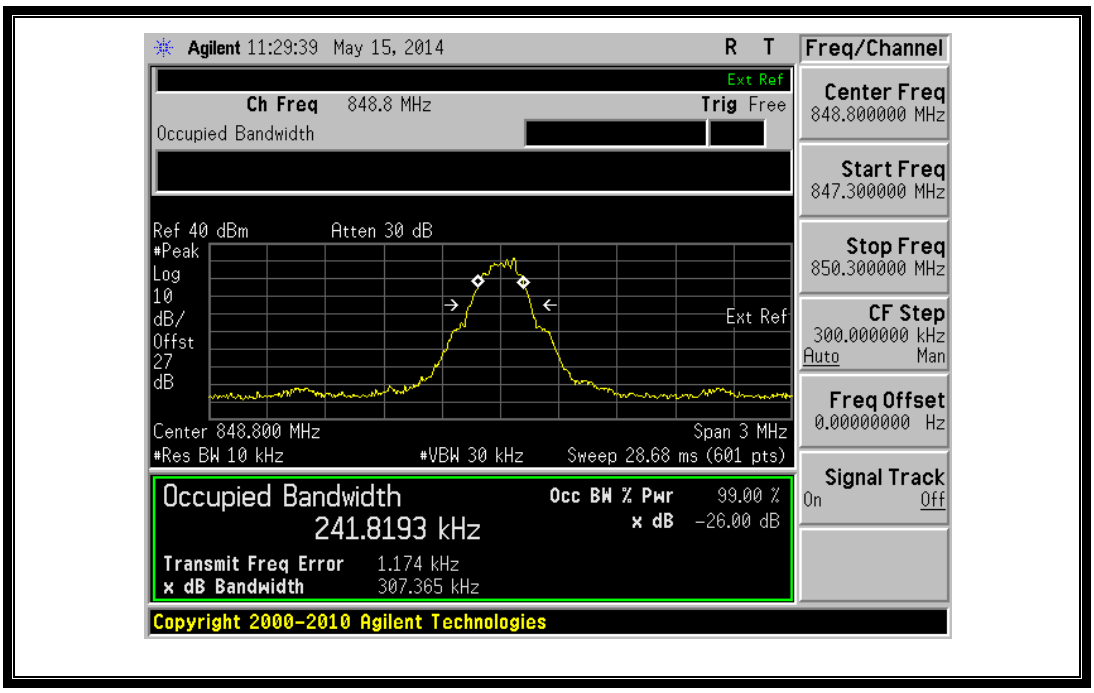

(Plot D1: HSPA+1900 MHz Channel = 9538)



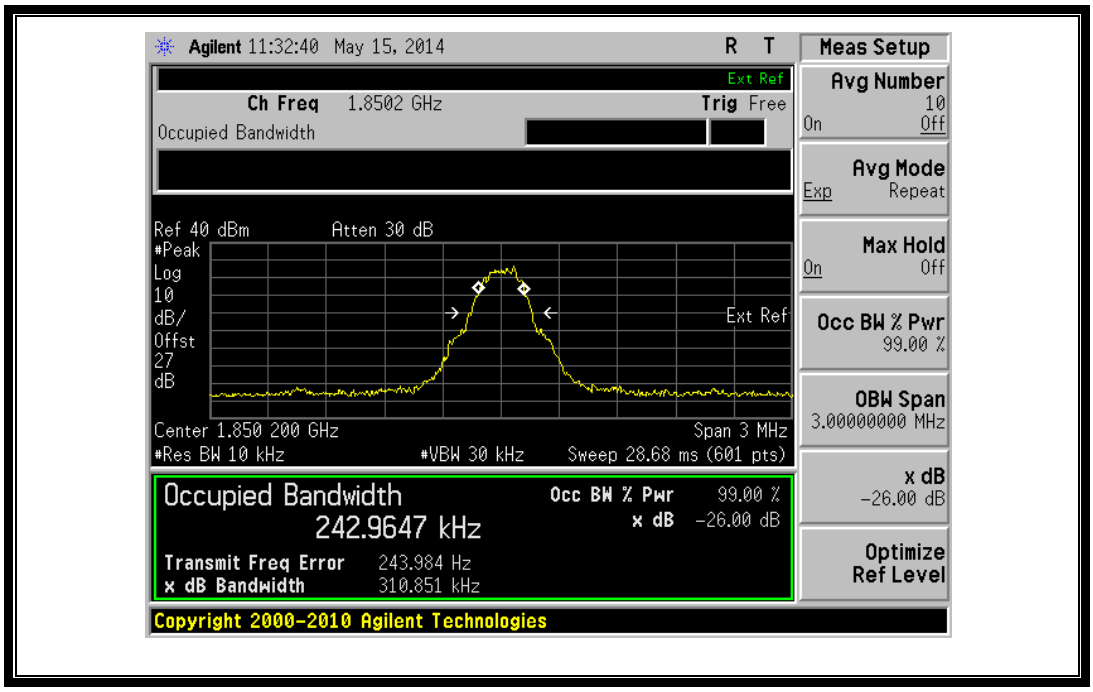

(Plot E1: GSM 850MHz Channel = 128)



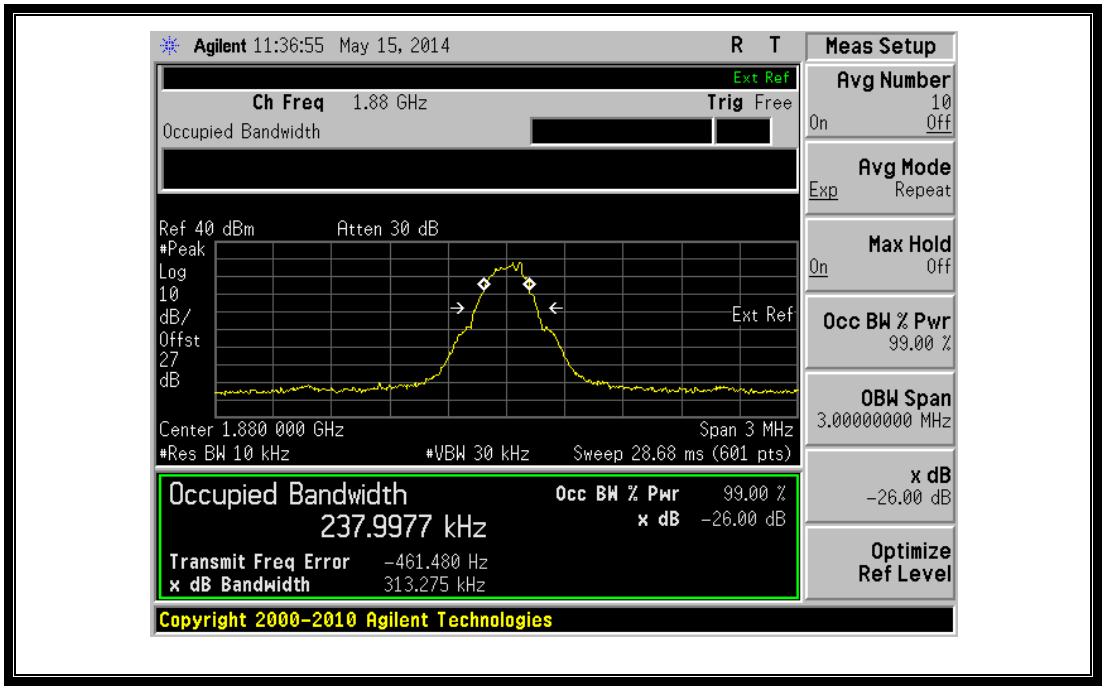

(Plot F1:GSM 850MHz Channel = 190)



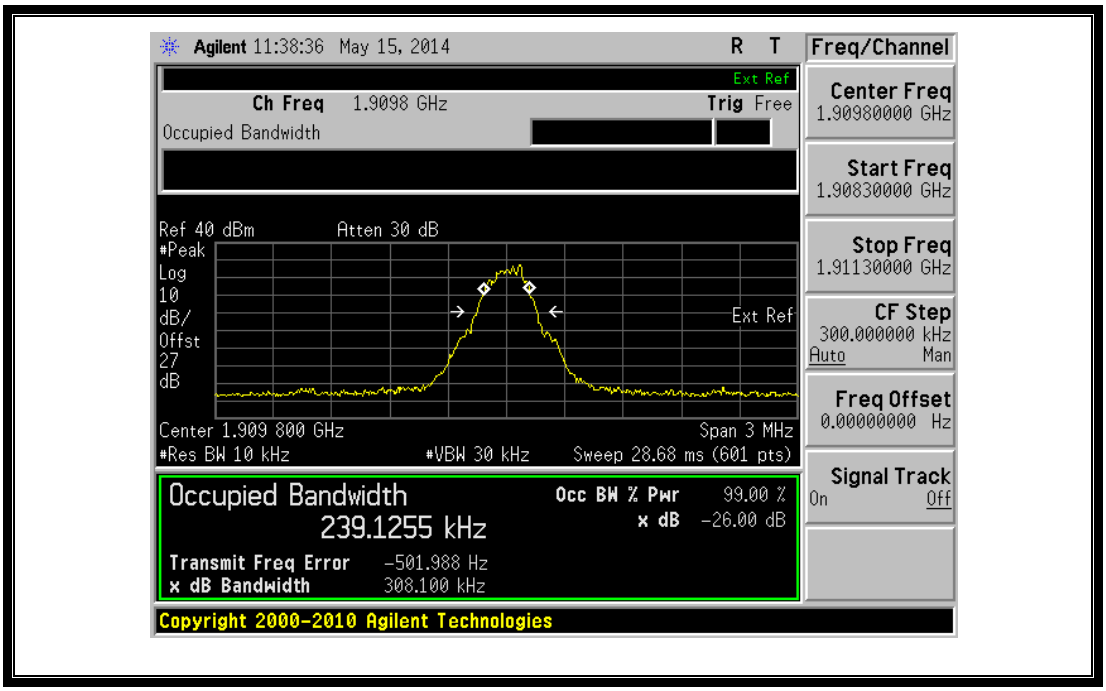

(Plot G1: GSM 850MHz Channel = 251)



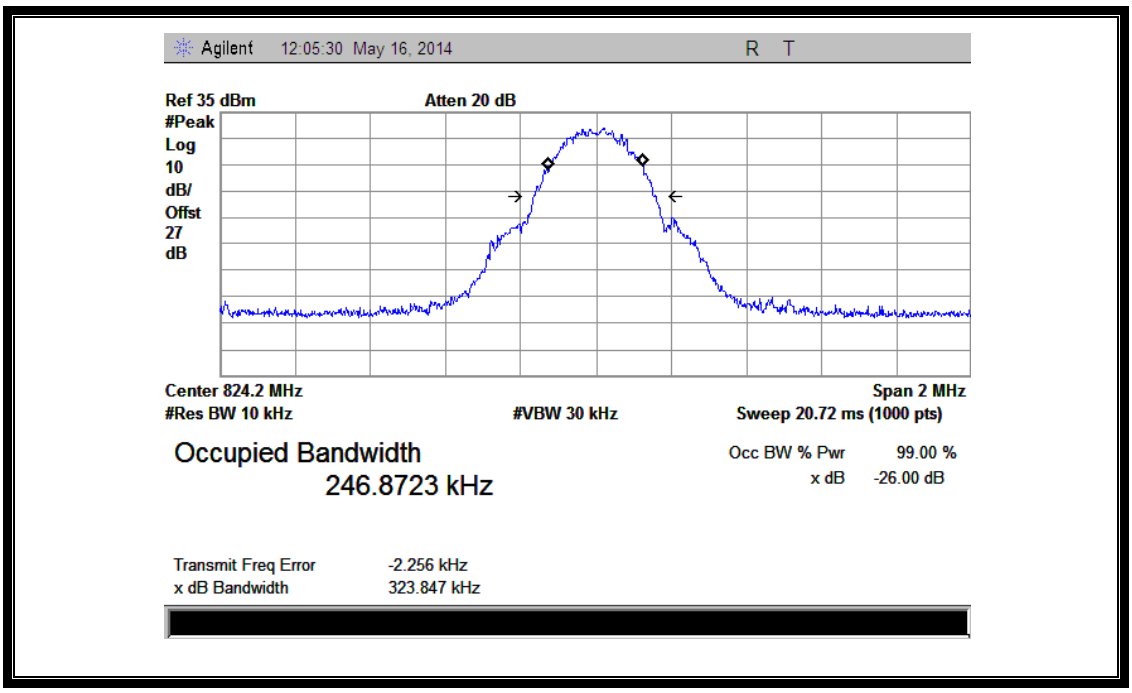

(Plot H1: GSM 1900MHz Channel = 512)



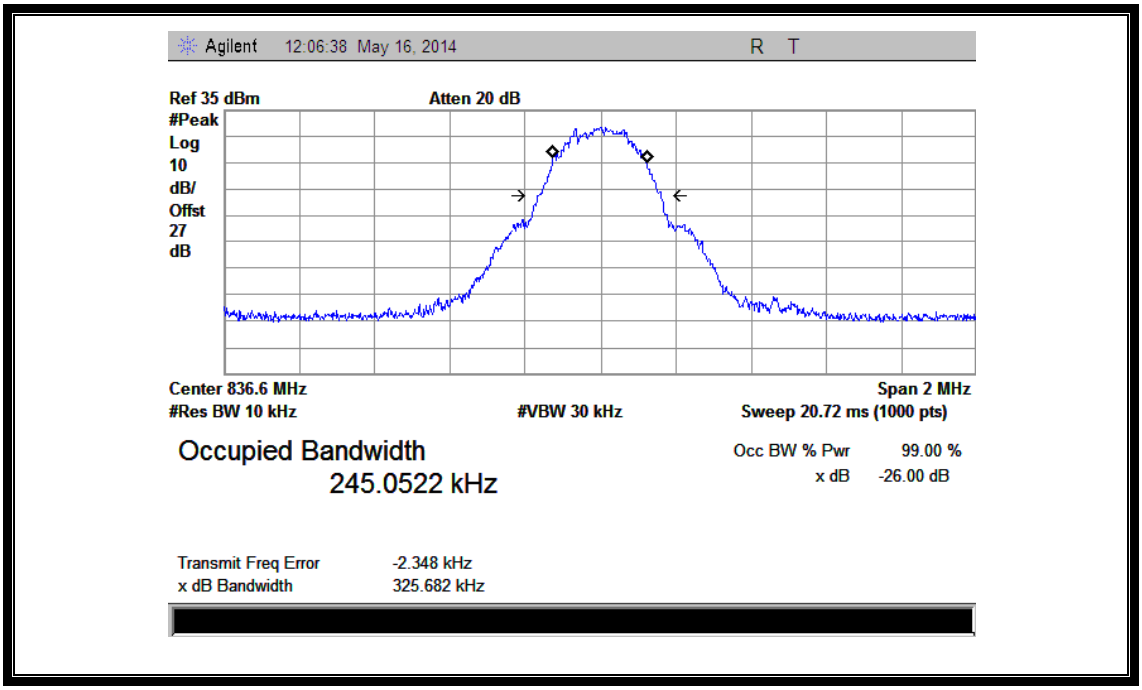

(Plot I1: GSM 1900MHz Channel = 661)



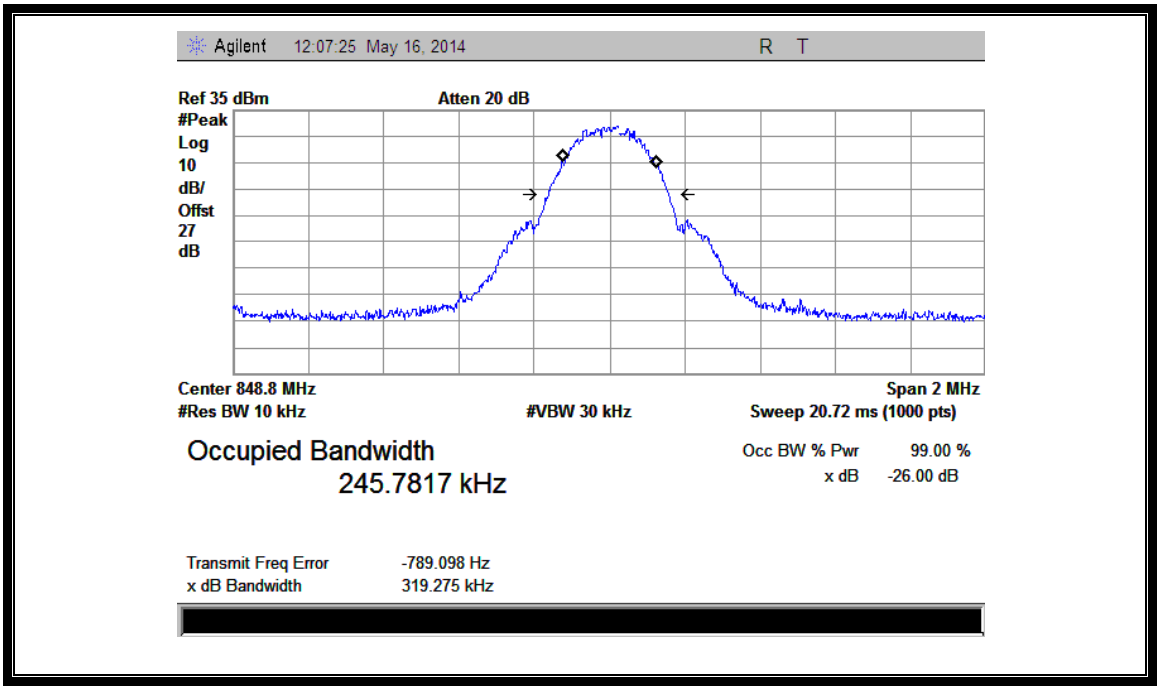

(Plot J1: GSM 1900MHz Channel = 810)



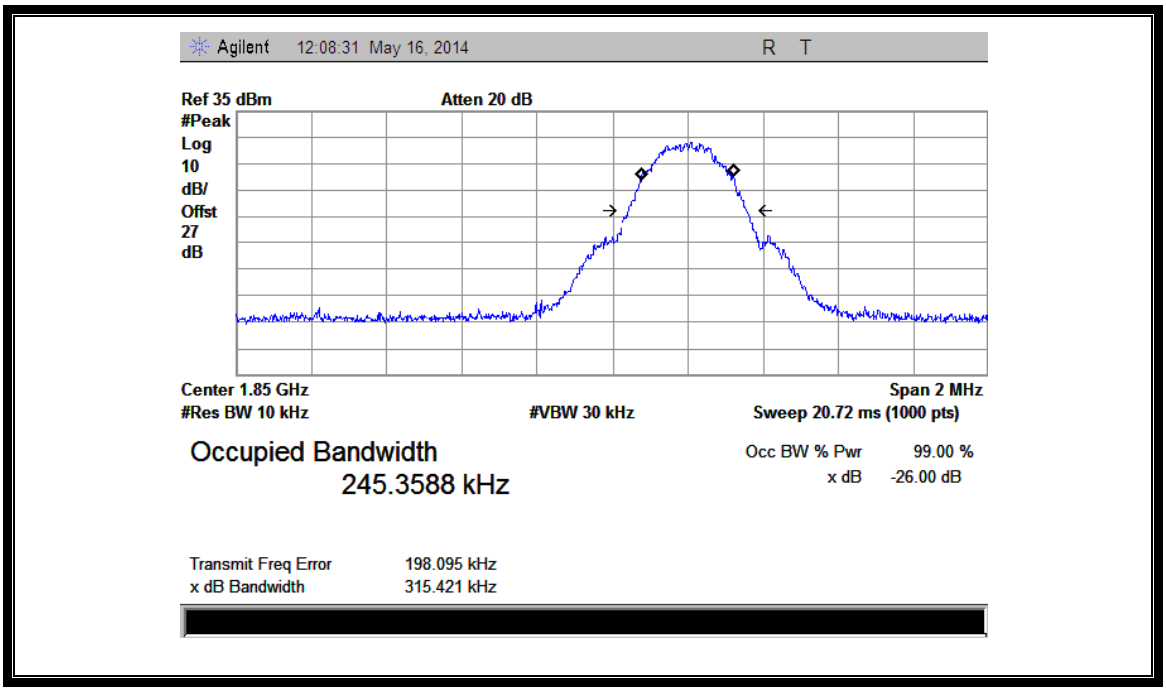

(Plot K1: GPRS 850MHz Channel = 128)



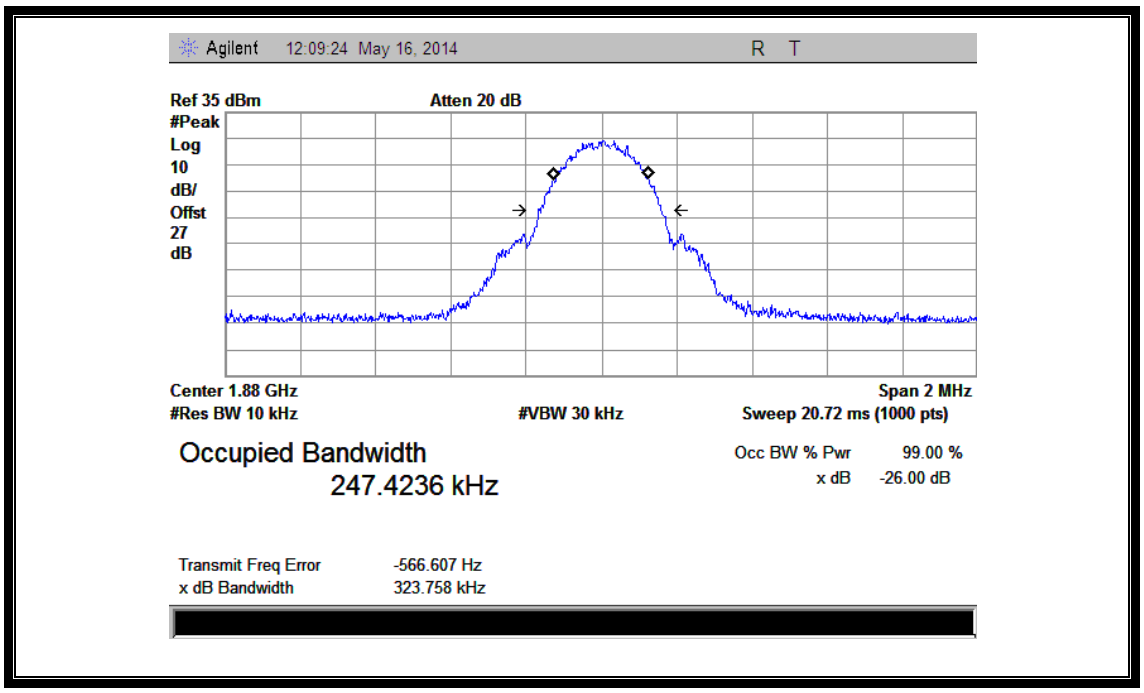

(Plot L1:GPRS 850MHz Channel = 190)



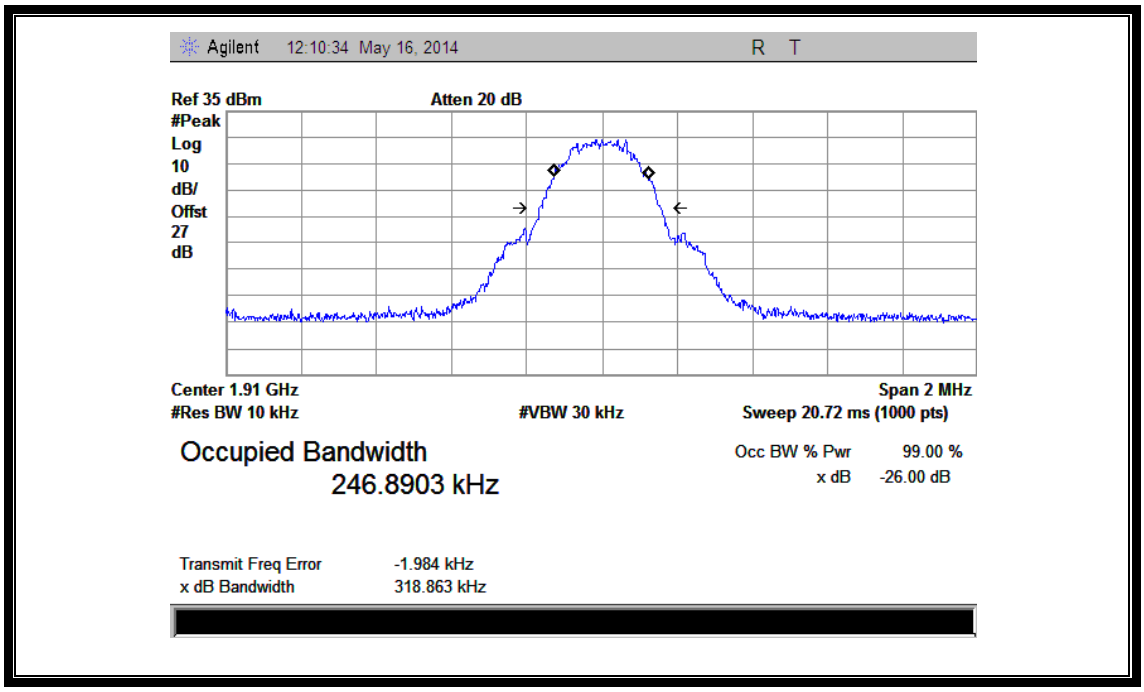

(Plot M1: GPRS850MHz Channel = 251)




(Plot N1: GPRS 1900MHz Channel = 512)




(Plot O1: GPRS 1900MHz Channel = 661)




(Plot P1: GPRS 1900MHz Channel = 810)

## 2.4 Frequency Stability

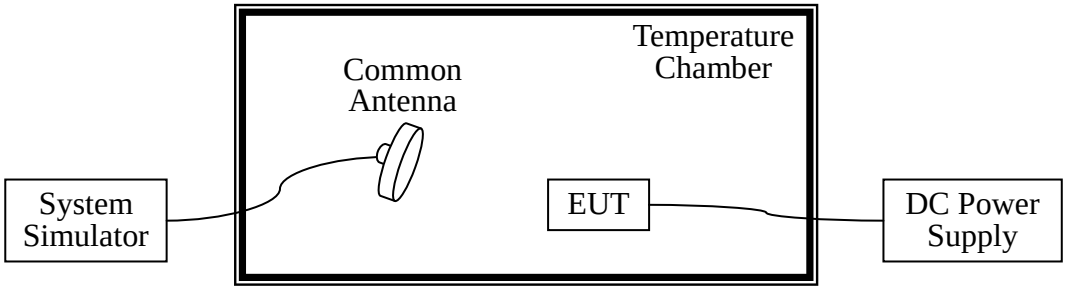
### 2.4.1 Requirement

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°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 | |
| 5.0 | -30 | -23.45 | ±2060.5 | 22.12 | ±2091.5 | 16.87 | ±2122 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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 | PASS |
| | -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) | Temperature (°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 | PASS |
| | -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 | PASS |
| | -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.

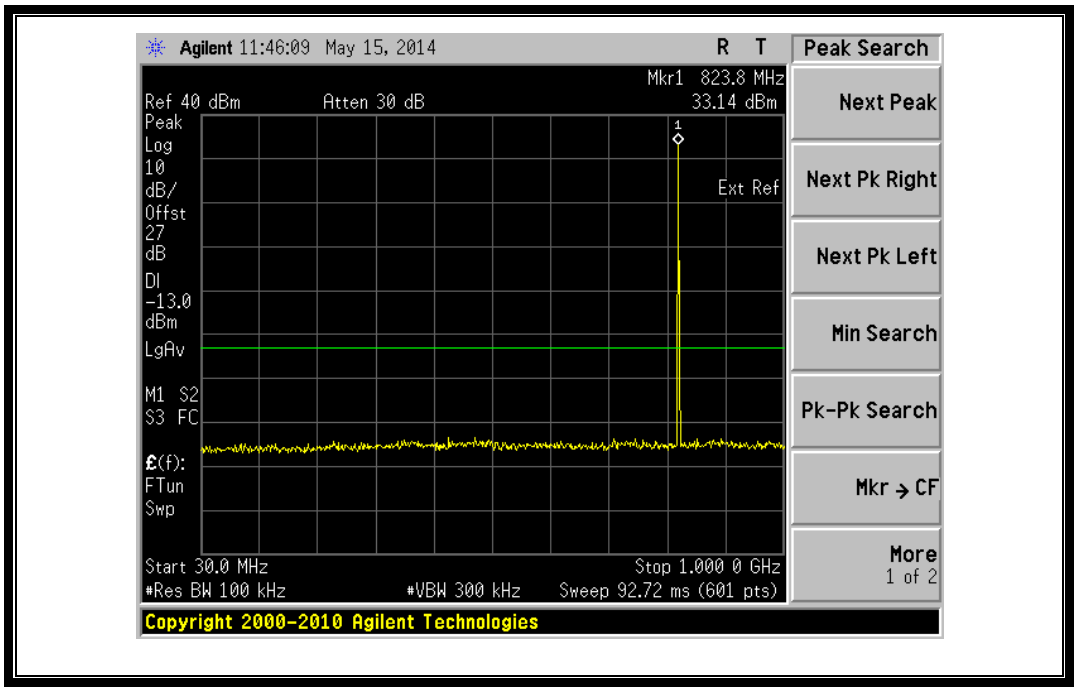
1. Test Verdict:

| 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 | PASS |
| | 190 | 836.6 | -21.42 | Plot A2toA2.1 | | PASS |
| | 251 | 848.8 | -20.66 | Plot A3toA3.1 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | -18.81 | Plot B1toB1.1 | -13 | PASS |
| | 661 | 1880.0 | -19.01 | Plot B2toB2.1 | | PASS |
| | 810 | 1909.8 | -20.42 | Plot B3toB3.1 | | PASS |
| EDGE 850MHz | 128 | 824.2 | -22.14 | Plot C1toC1.1 | -13 | PASS |
| | 190 | 836.6 | -18.49 | Plot C2toC2.1 | | PASS |
| | 251 | 848.8 | -18.52 | Plot C3toC3.1 | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | -20.86 | Plot D1toD1.1 | -13 | PASS |
| | 661 | 1880.0 | -19.74 | Plot D2toD2.1 | | PASS |
| | 810 | 1909.8 | -19.68 | Plot D3toD3.1 | | PASS |
| WCDMA 850MHz | 4132 | 826.4 | -20.900 | Plot E1toE1.1 | -13 | PASS |
| | 4175 | 835 | <-25 | Plot E2toE2.1 | | PASS |
| | 4233 | 846.6 | -22.490 | Plot E3toE3.1 | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | -23.097 | Plot F1toF1.1 | -13 | PASS |
| | 9400 | 1880 | <-25 | Plot F2toF2.1 | | PASS |
| | 9538 | 1907.6 | <-25 | Plot F3toF3.1 | | PASS |
| HSDPA | 4132 | 826.4 | -21.315 | Plot G1toG1.1 | -13 | PASS |

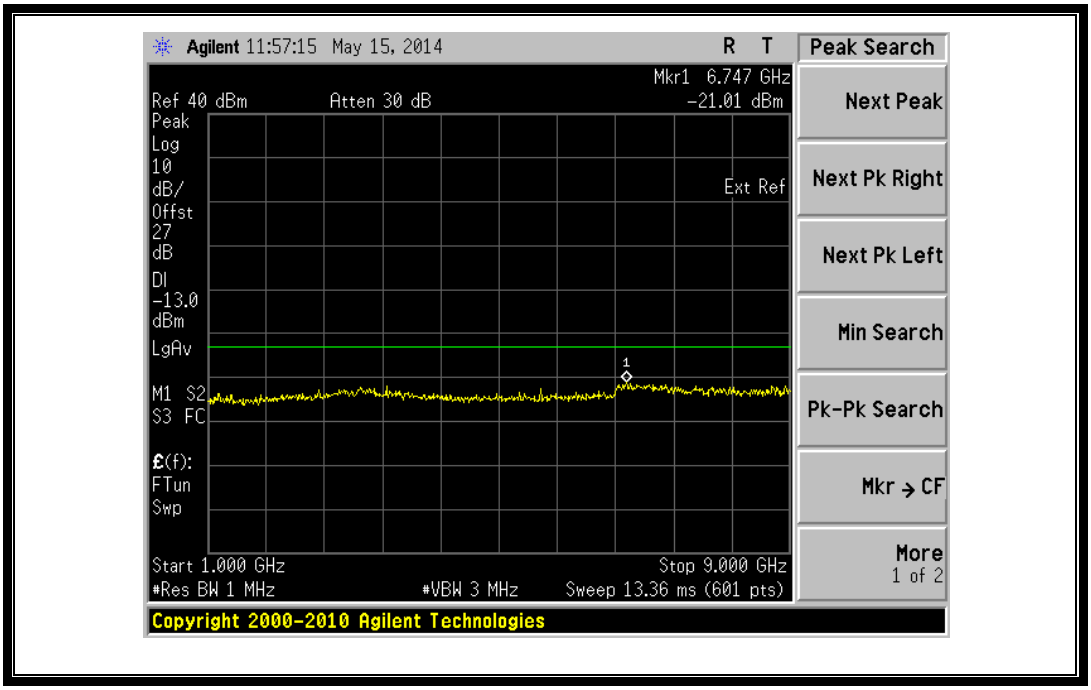
| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| 850MHz | 4175 | 835 | <-25 | Plot G2toG2.1 | | PASS |
| | 4233 | 846.6 | -22.719 | Plot G3toG3.1 | | PASS |
| HSDPA 1900MHz | 9262 | 1852.4 | <-25 | Plot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

2. Test Plots for the Whole Measurement Frequency Range:

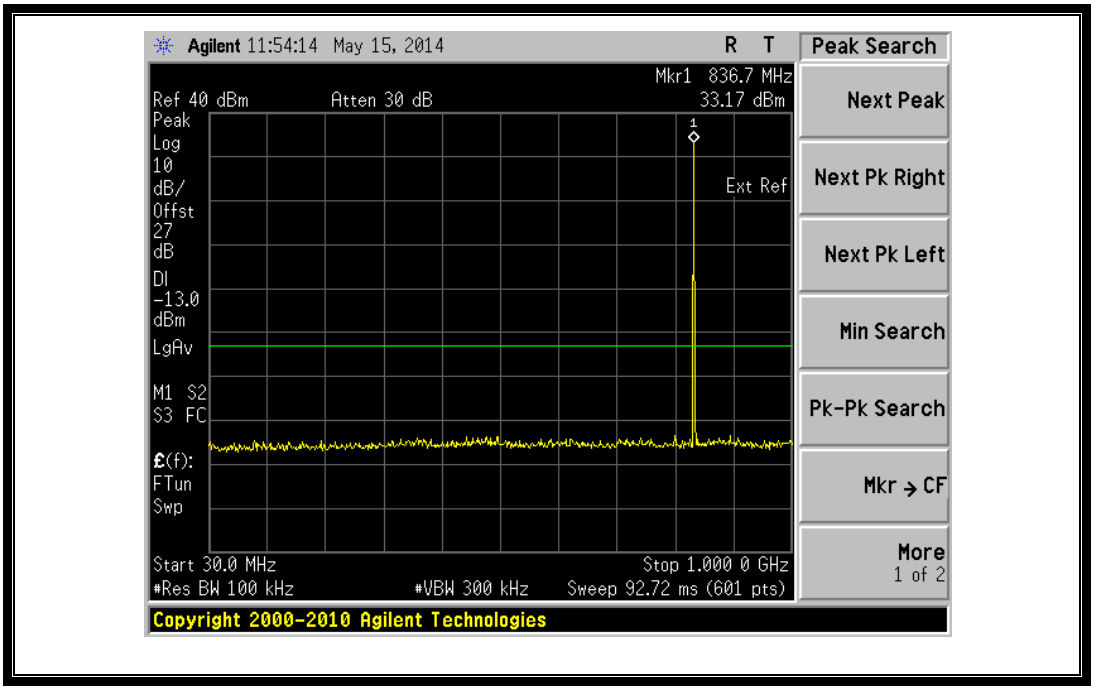
**Note**: the power of the EUT transmitting frequency should be ignored.



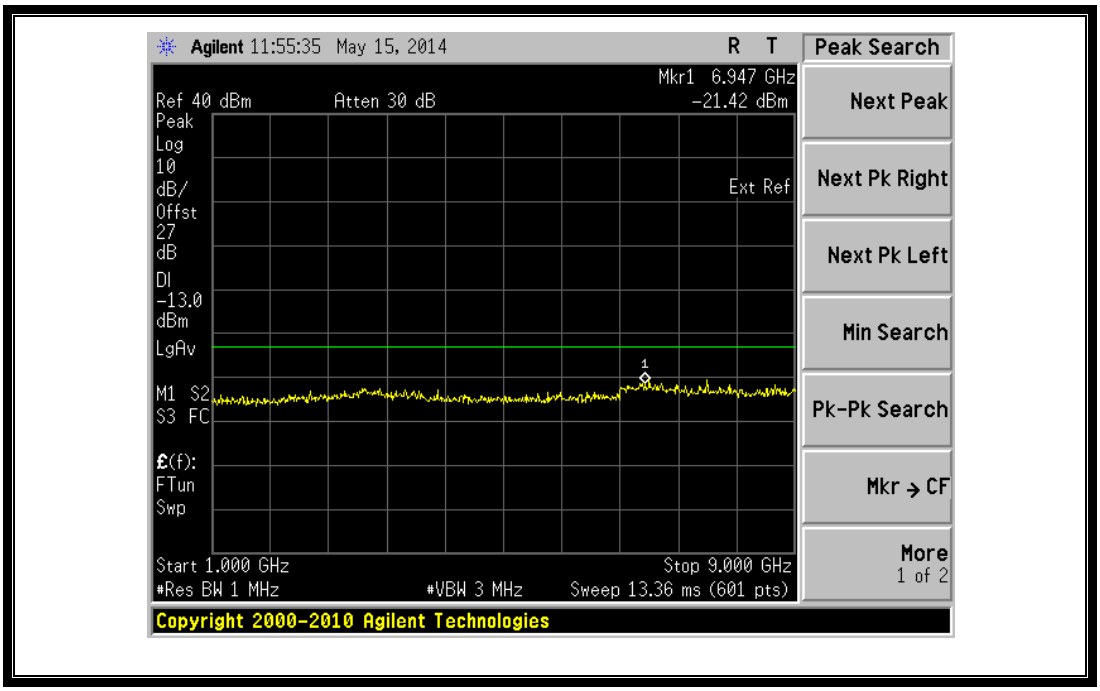

(Plot A1:GSM 850MHz Channel = 128, 30MHz to 1GHz)



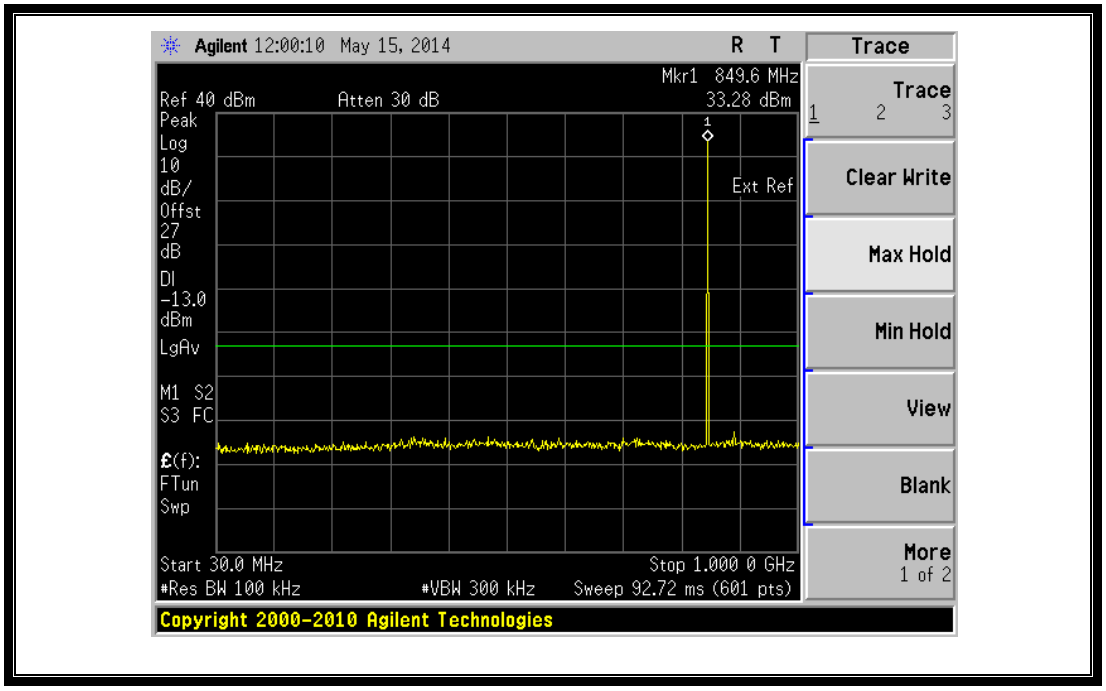

(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



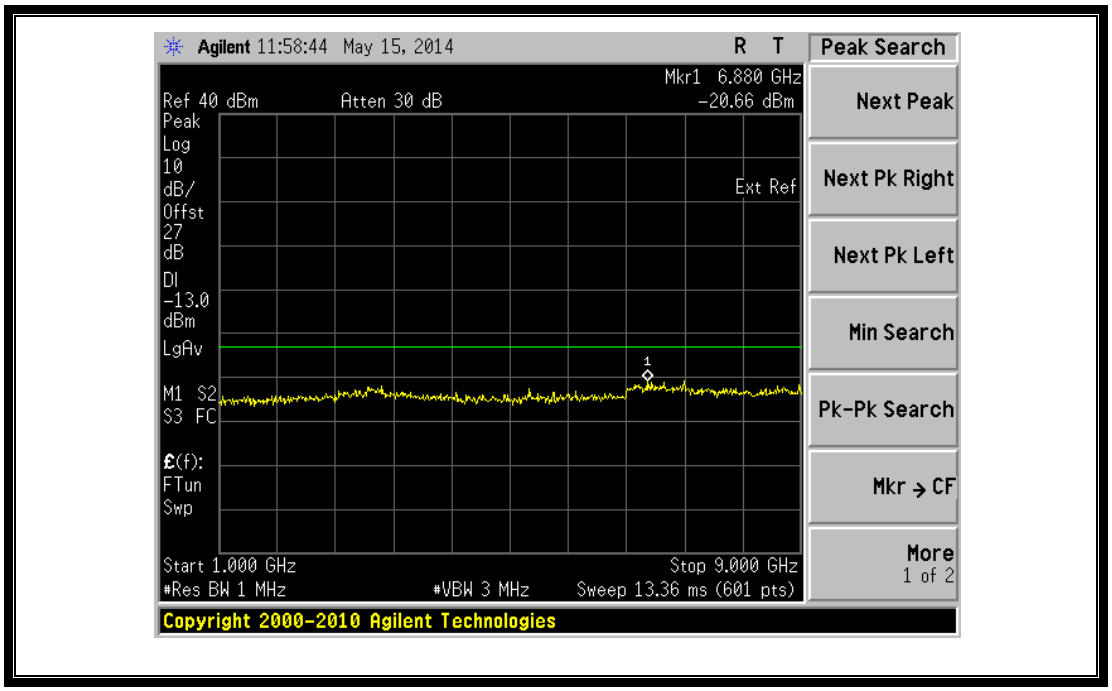

(Plot A2:GSM 850MHz Channel = 190, 30MHz to 1GHz)



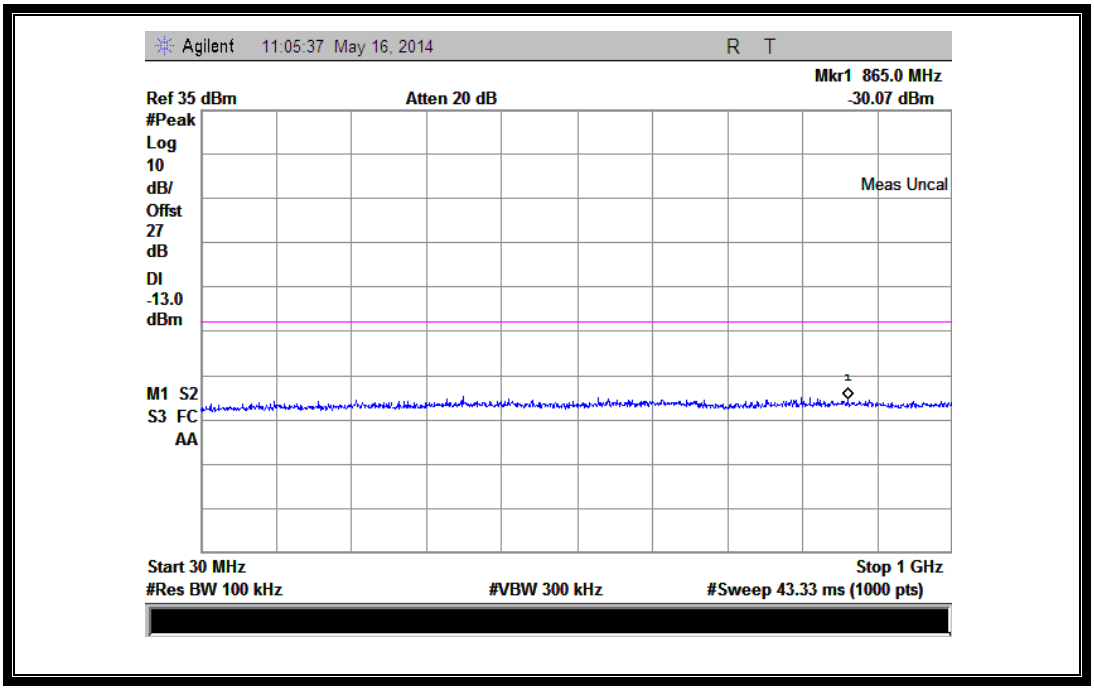

(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



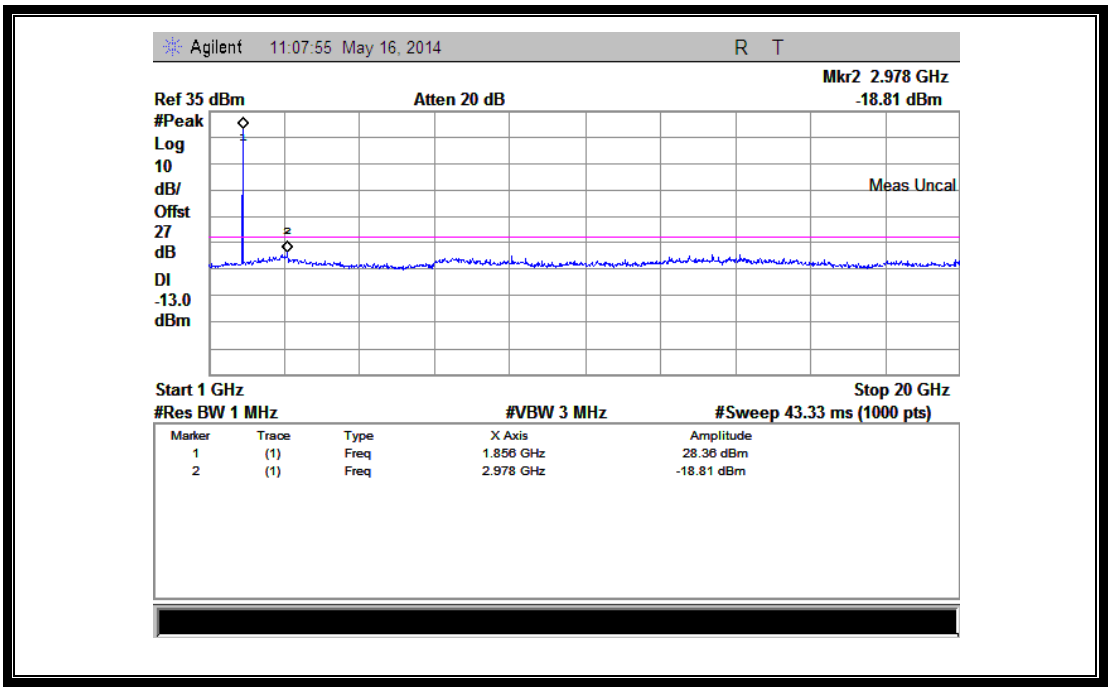

(Plot A3:GSM 850MHz Channel = 251, 30MHz to 1GHz)



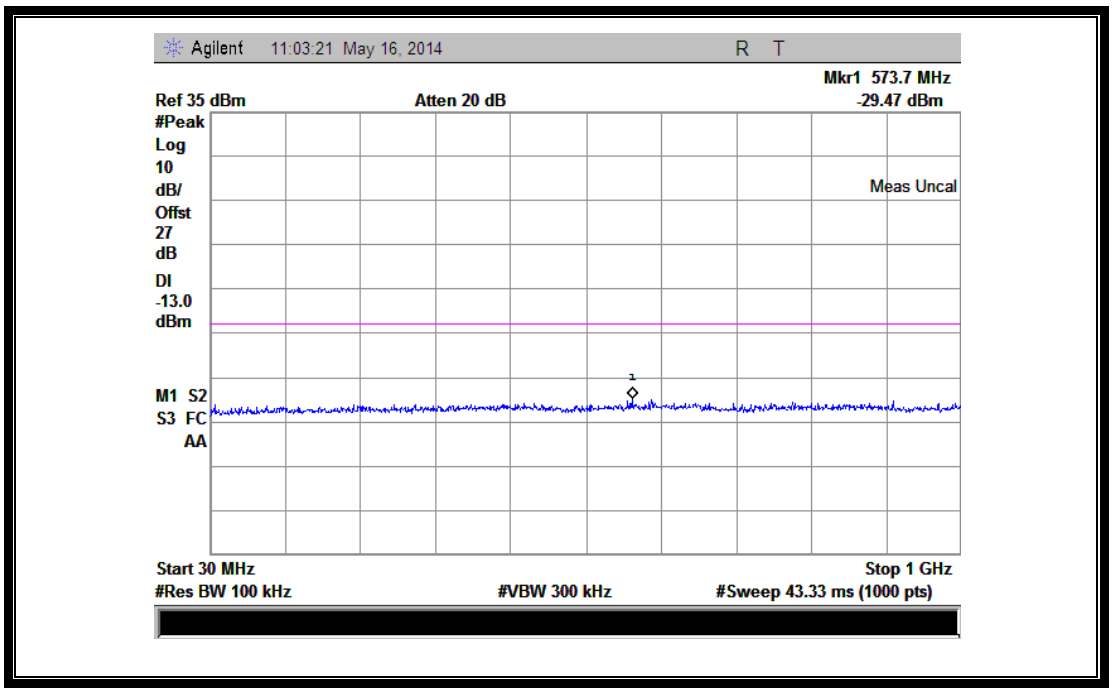

(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



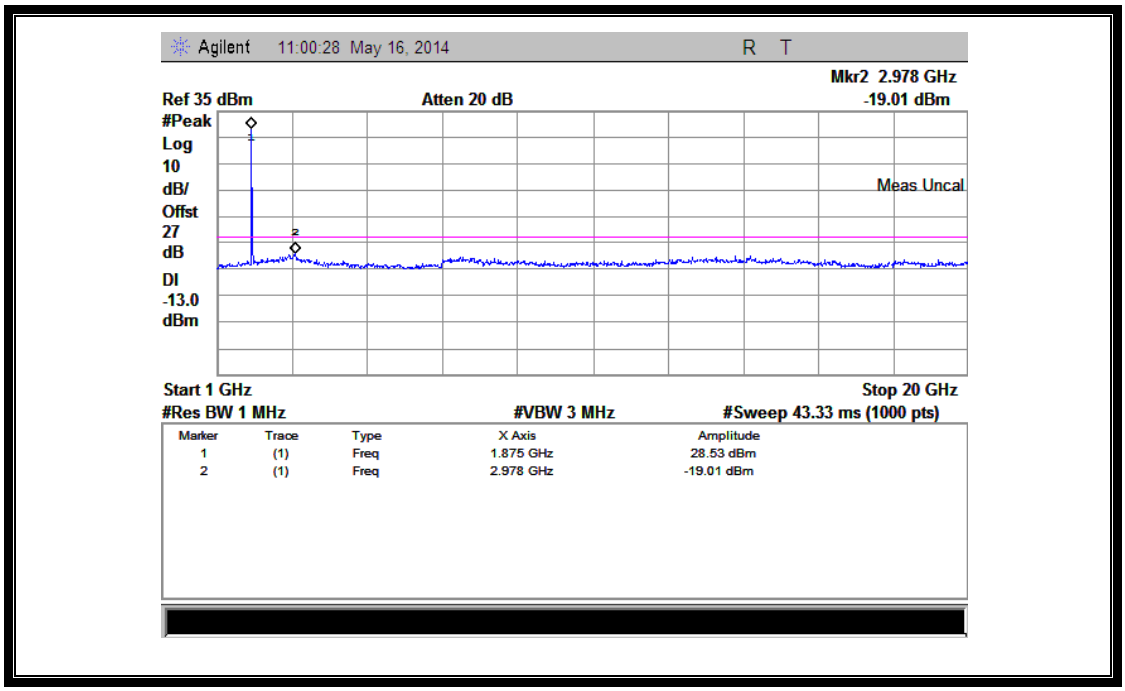

(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



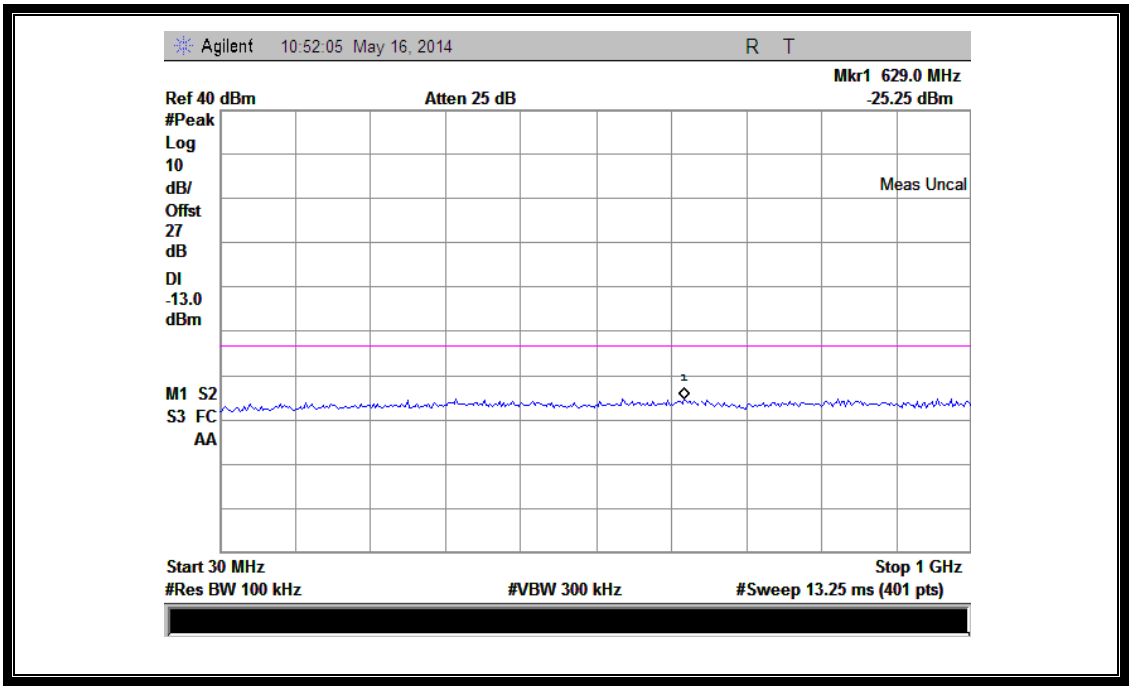

(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



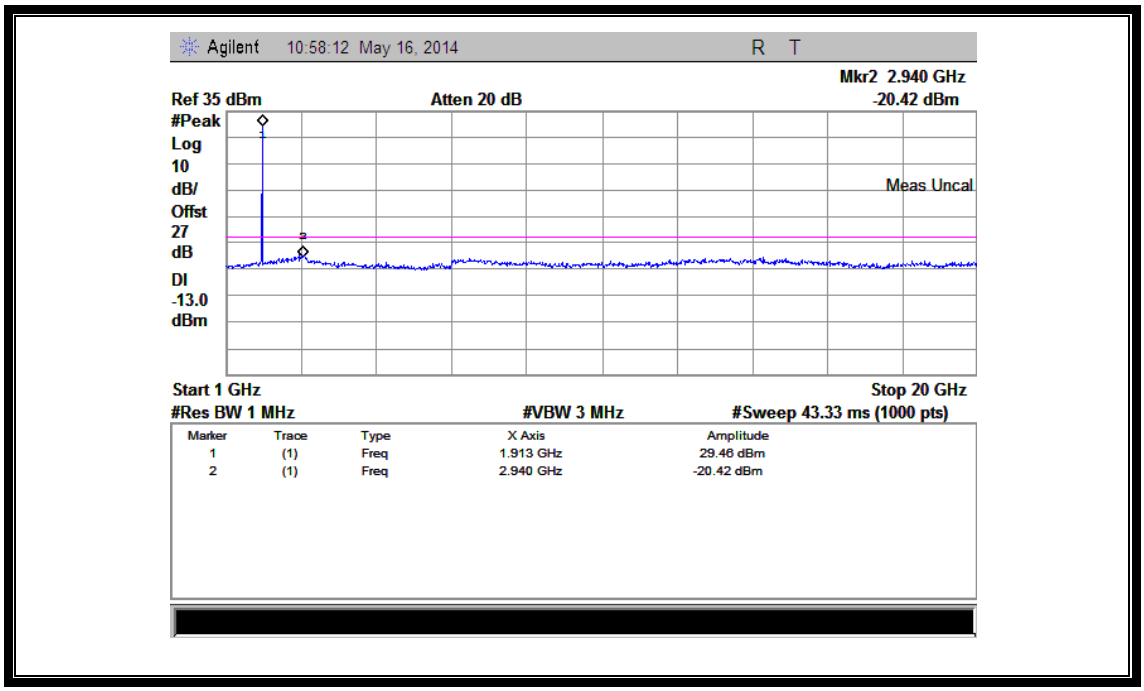

(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



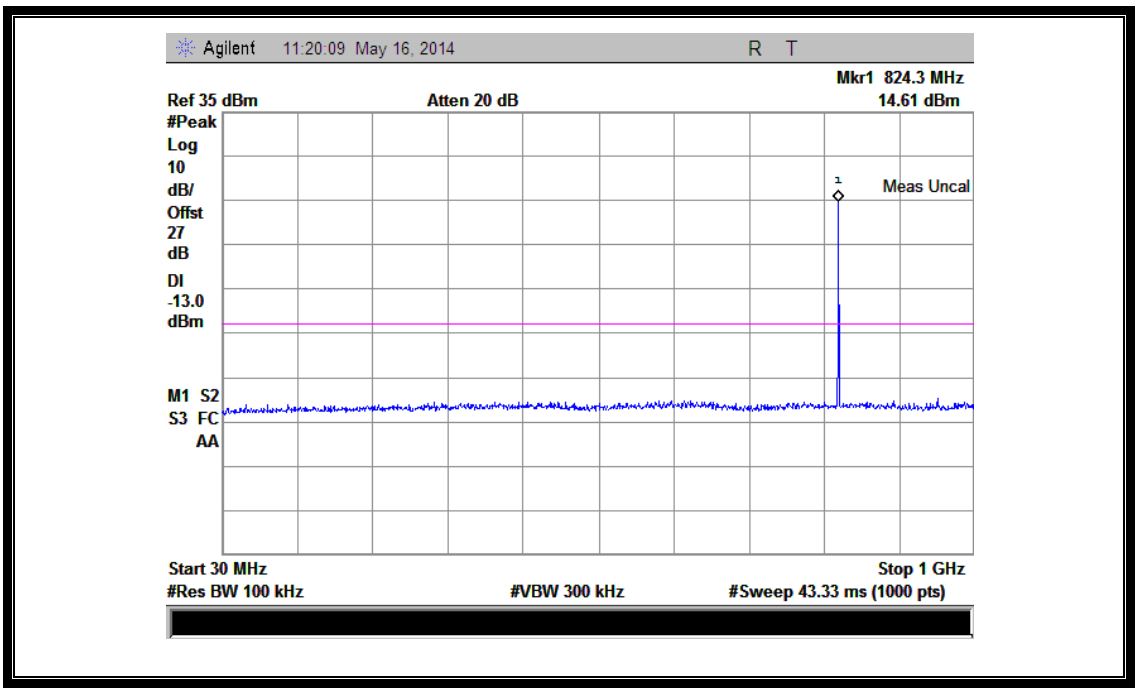

(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



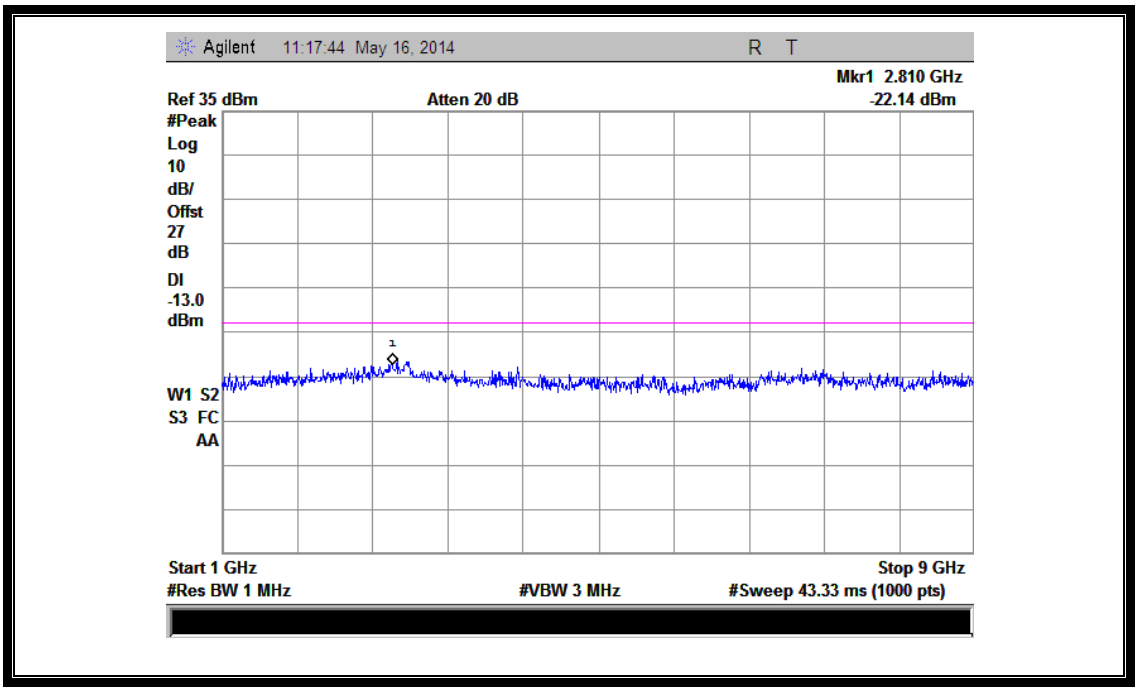

(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



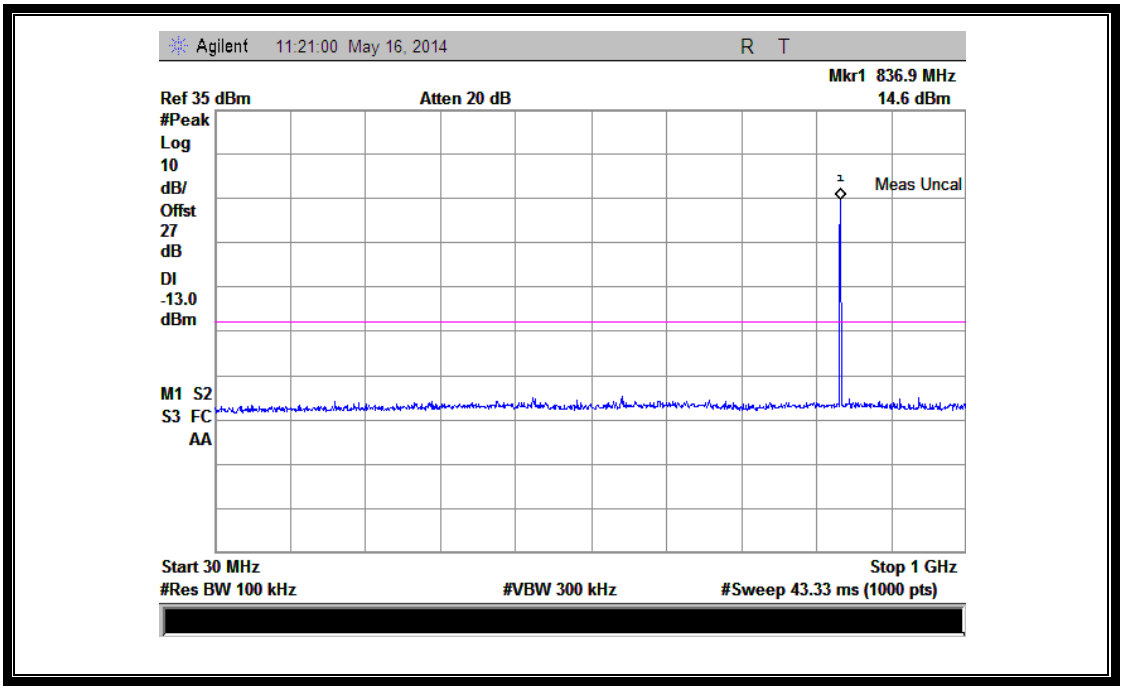

(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



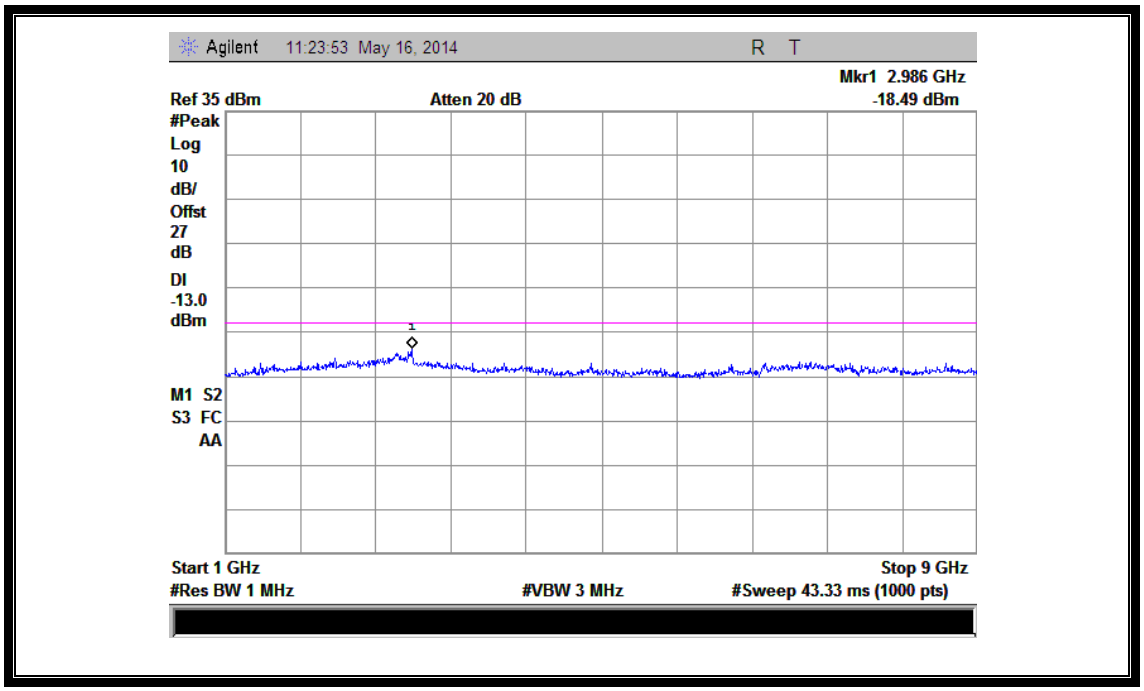

(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



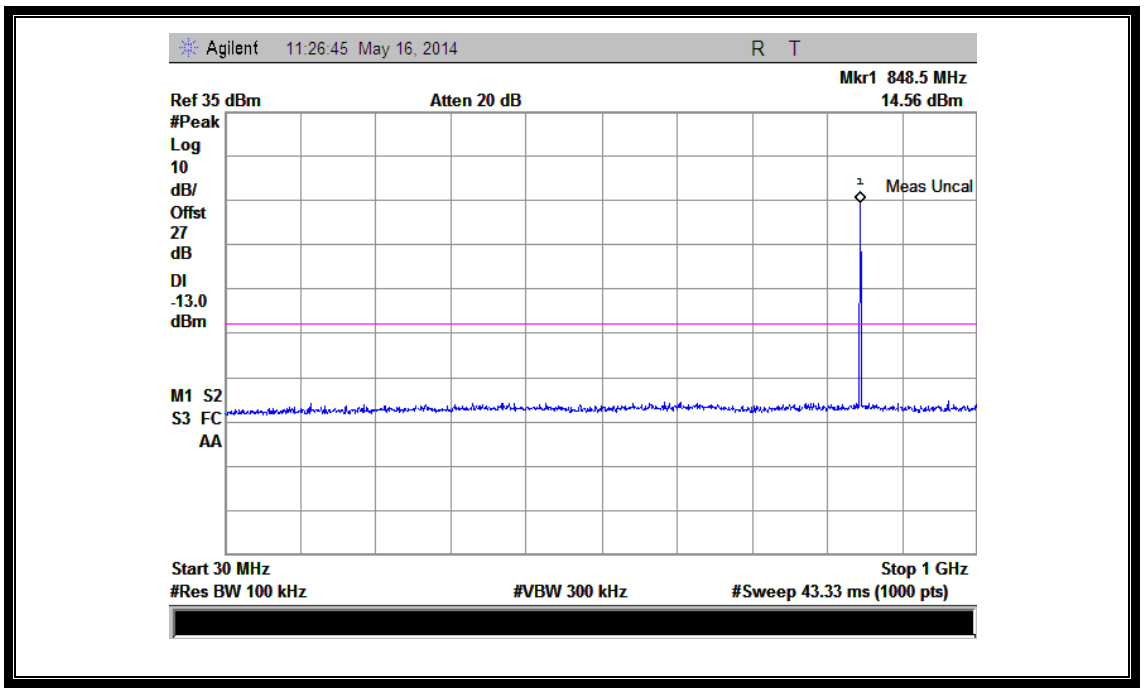

(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



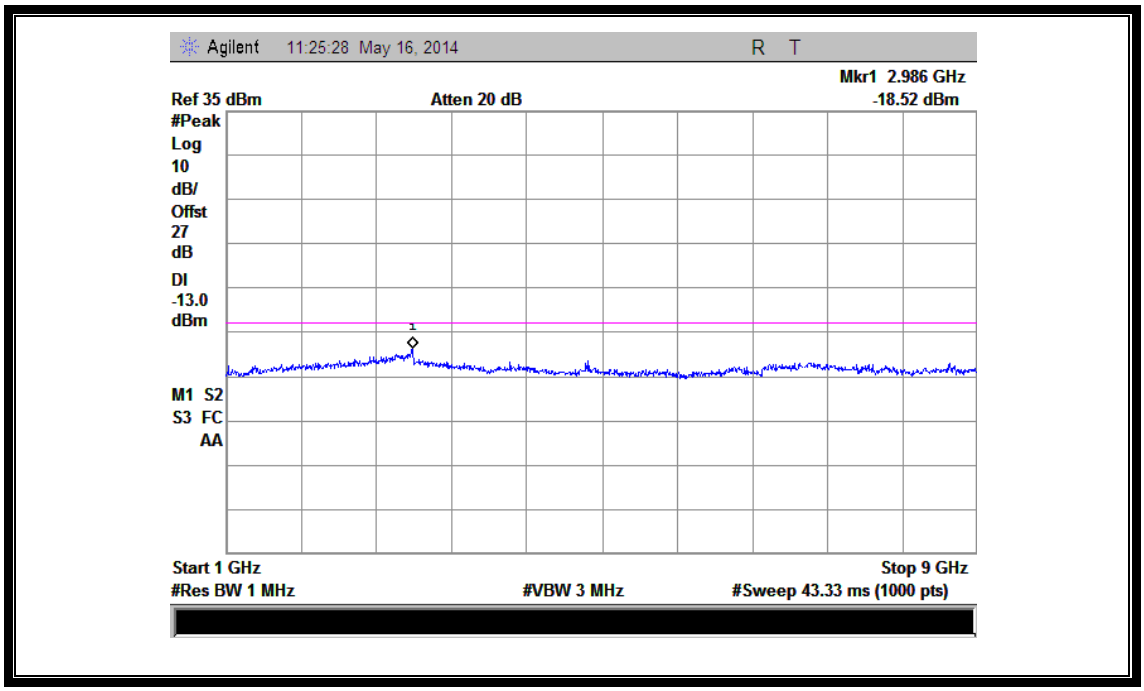

(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



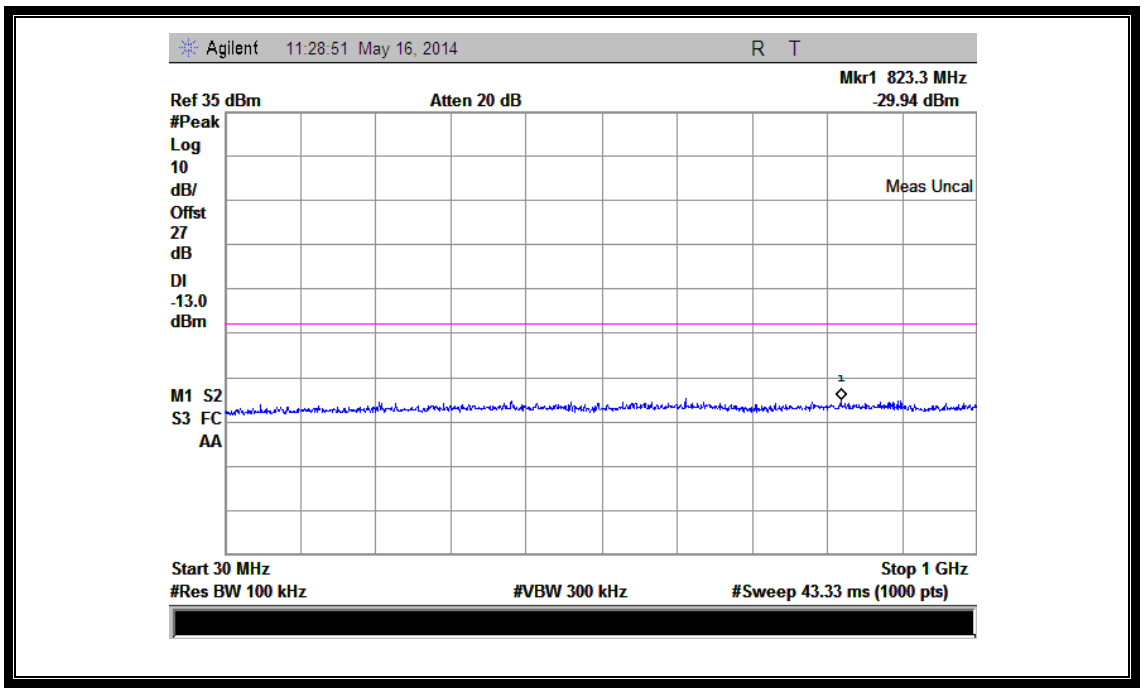

(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



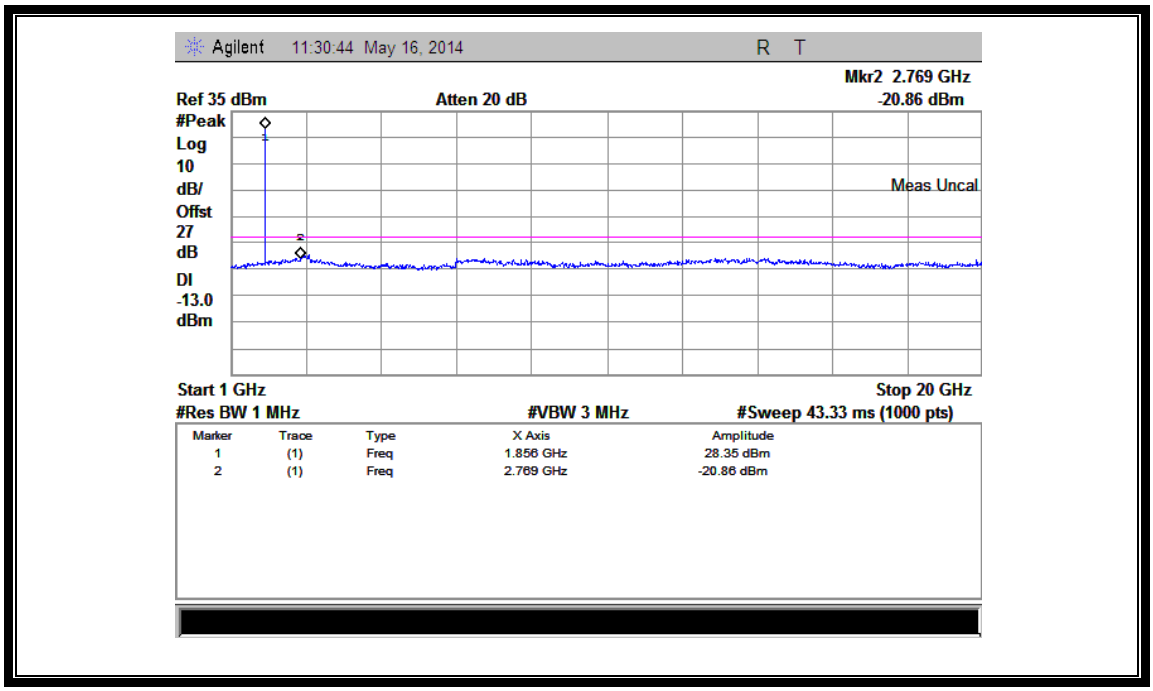

(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



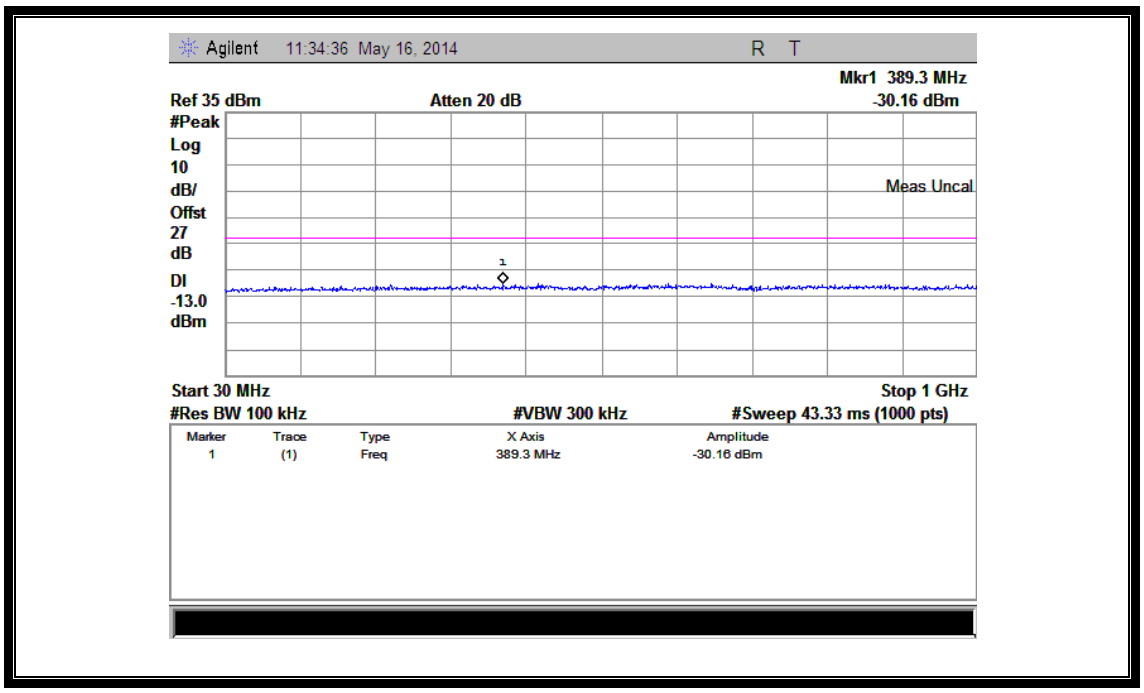

(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



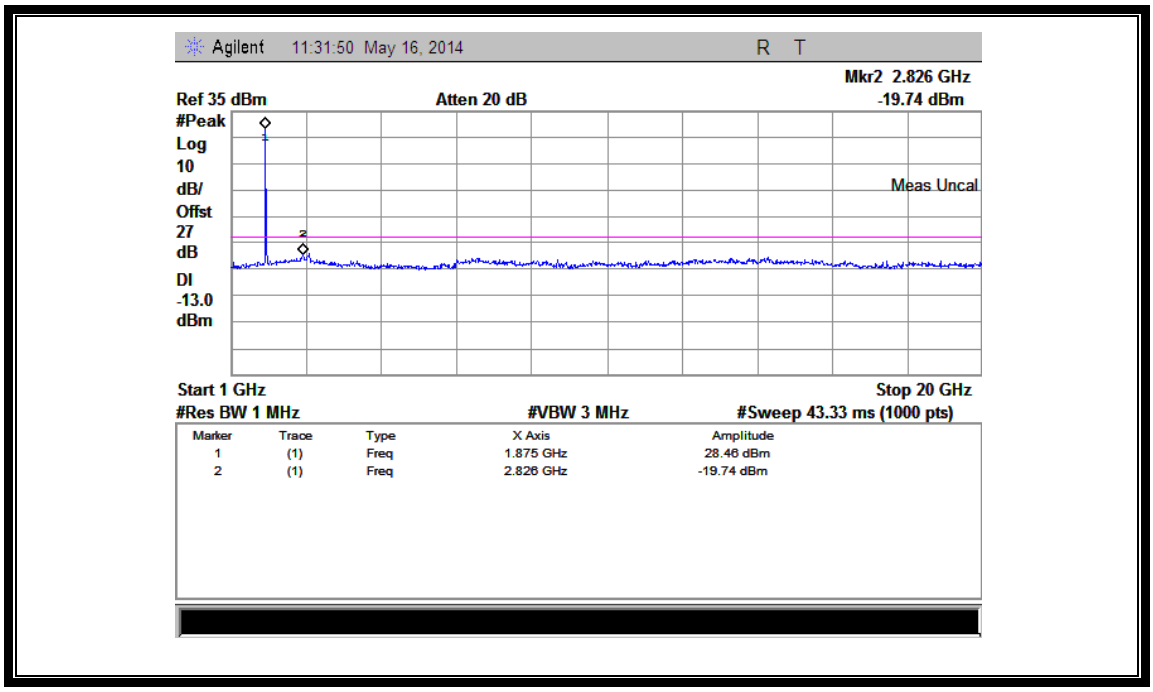

(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



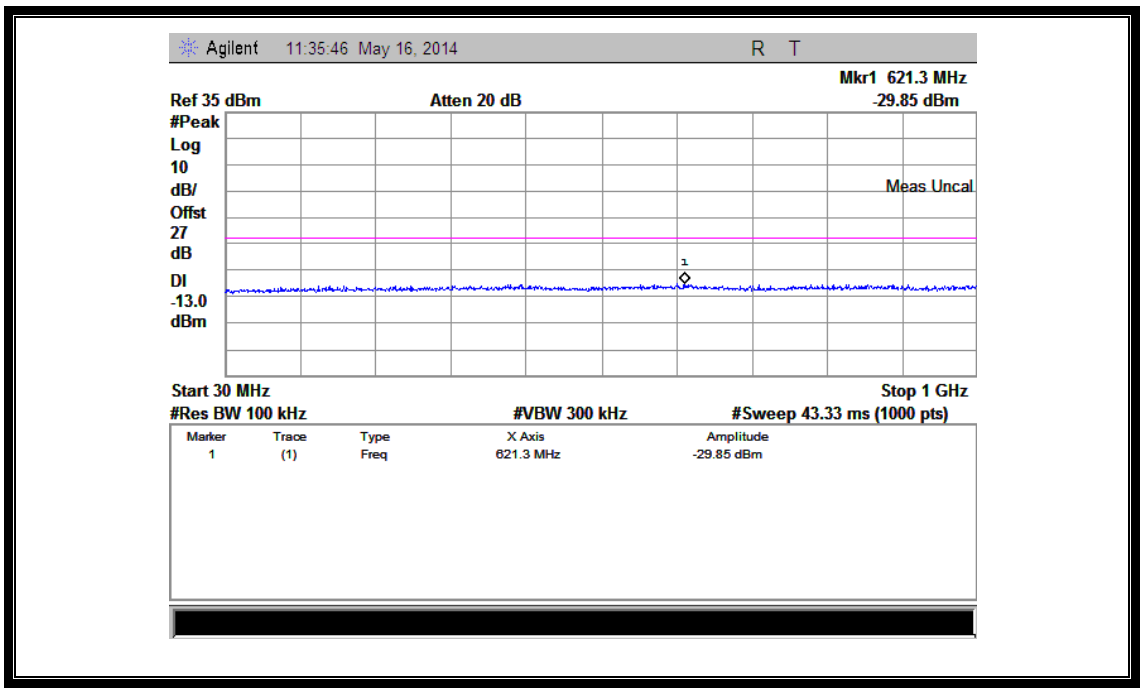

(Plot D1.1: EDGE 1900MHz Channel = 512, 1GHz to 20GHz)



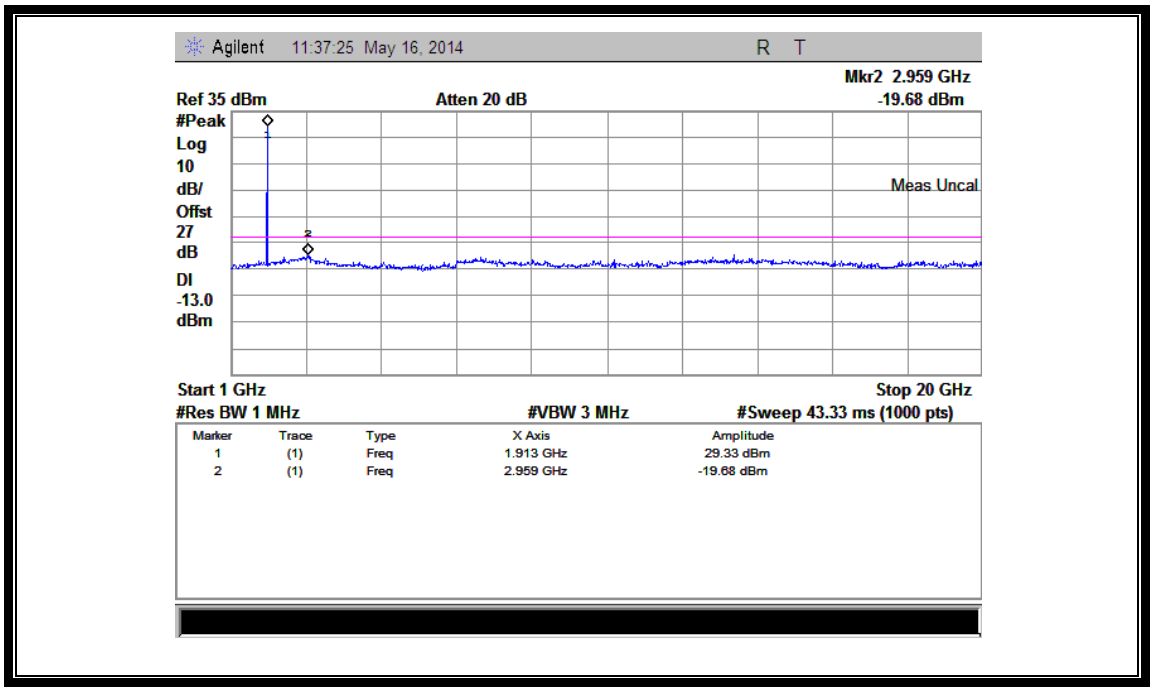

(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



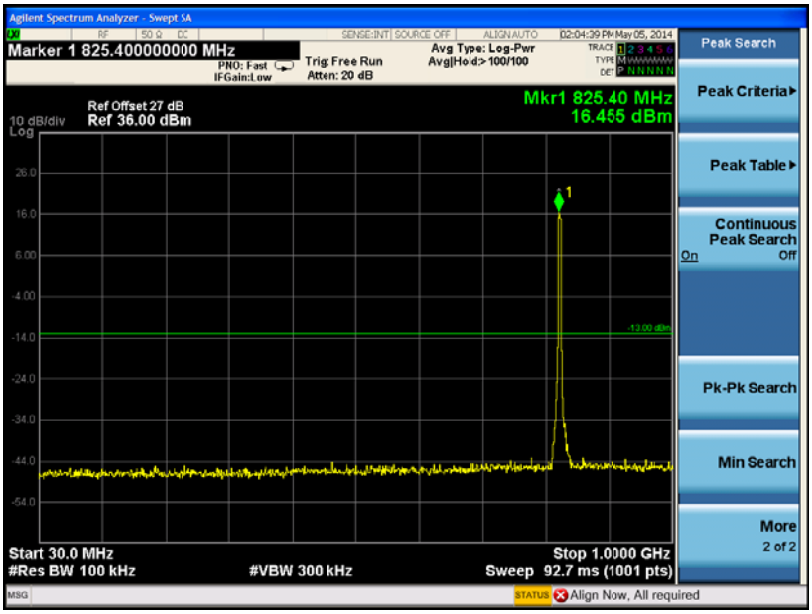

(Plot D2.1: EDGE 1900MHz Channel = 661,1GHz to 20GHz)




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

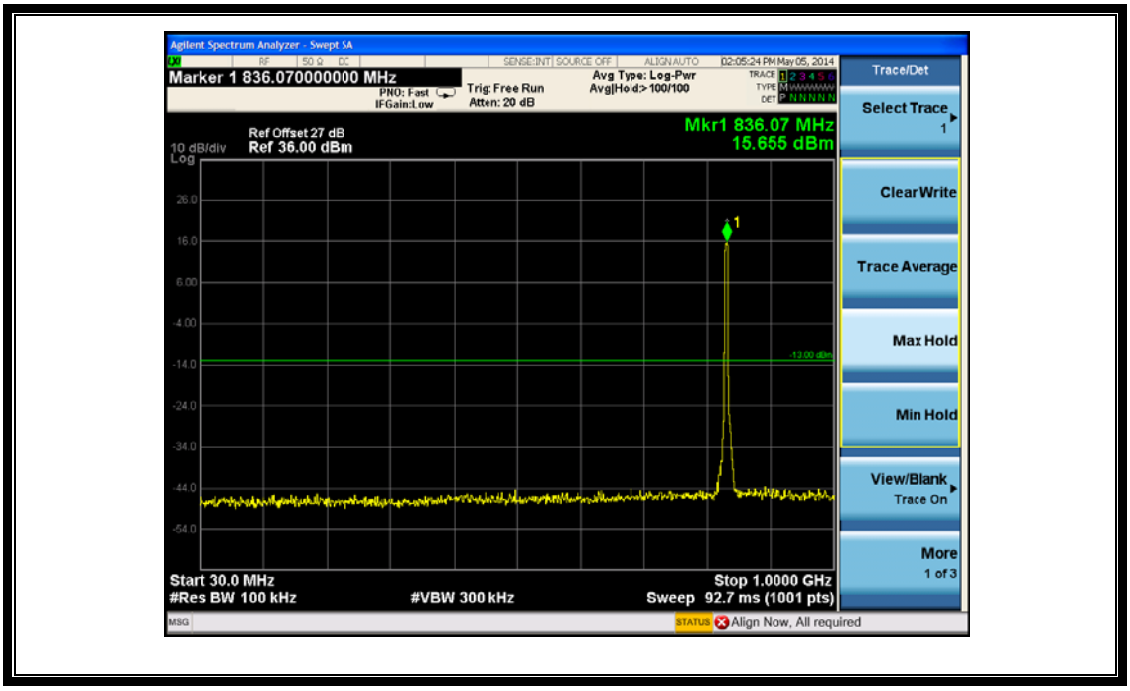



(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)

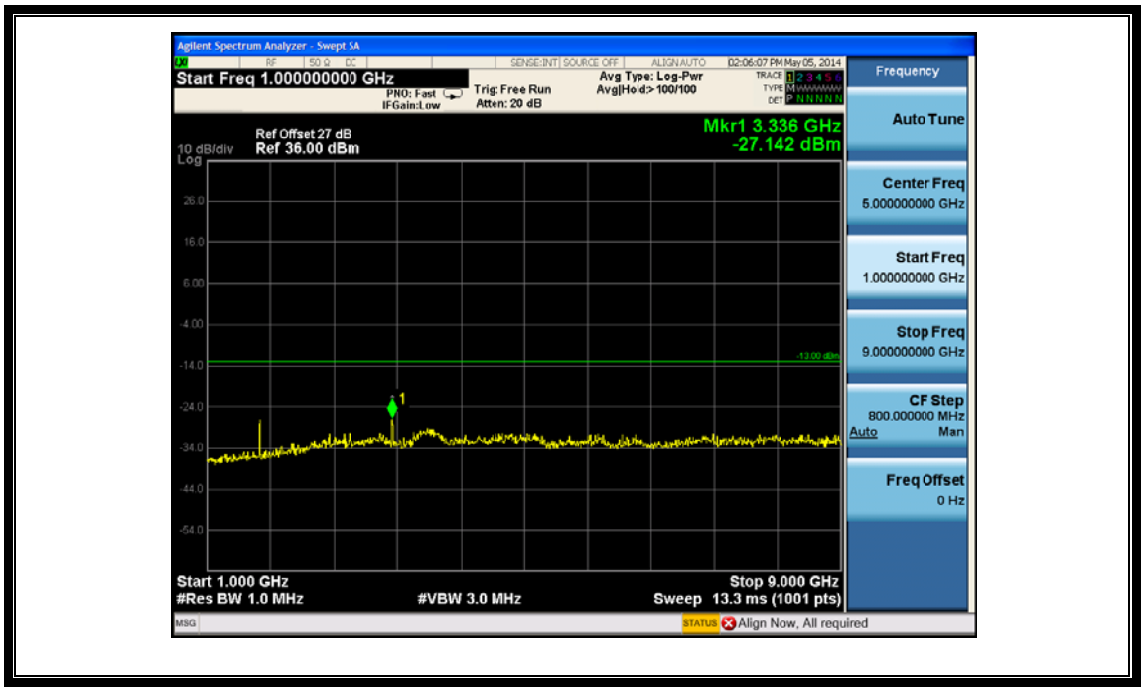



(Plot E1: WCDMA850MHz Channel = 4132, 30MHz to 1GHz)

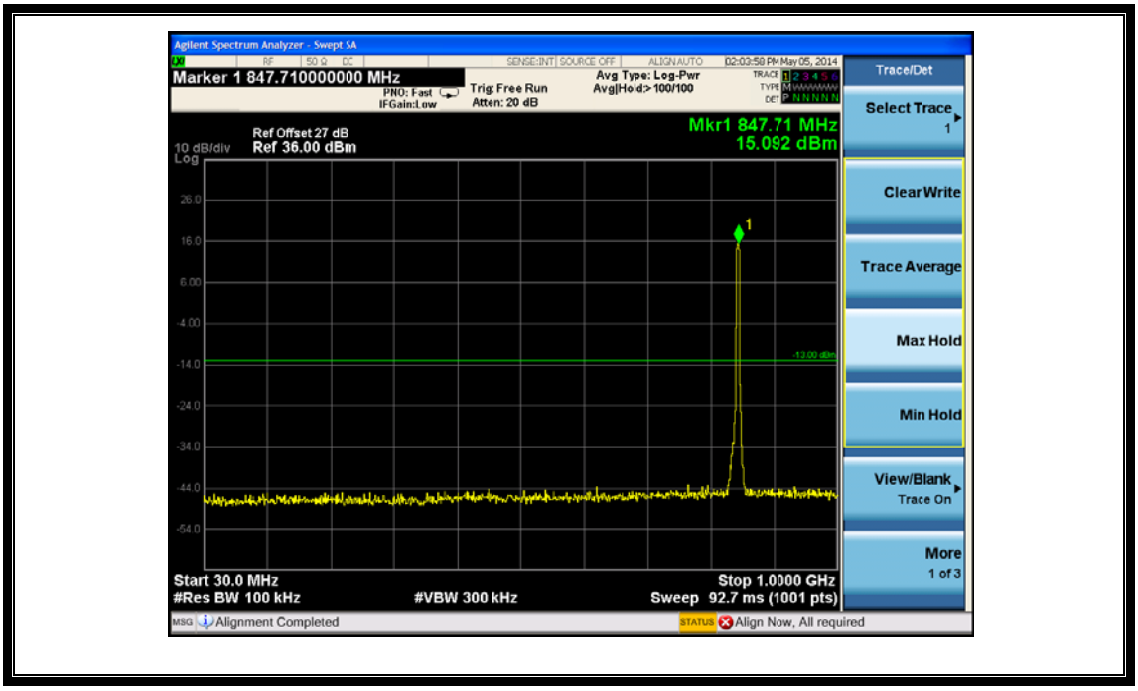

(Plot E1.1: WCDMA850MHz Channel = 4132, 1GHz to 9GHz)



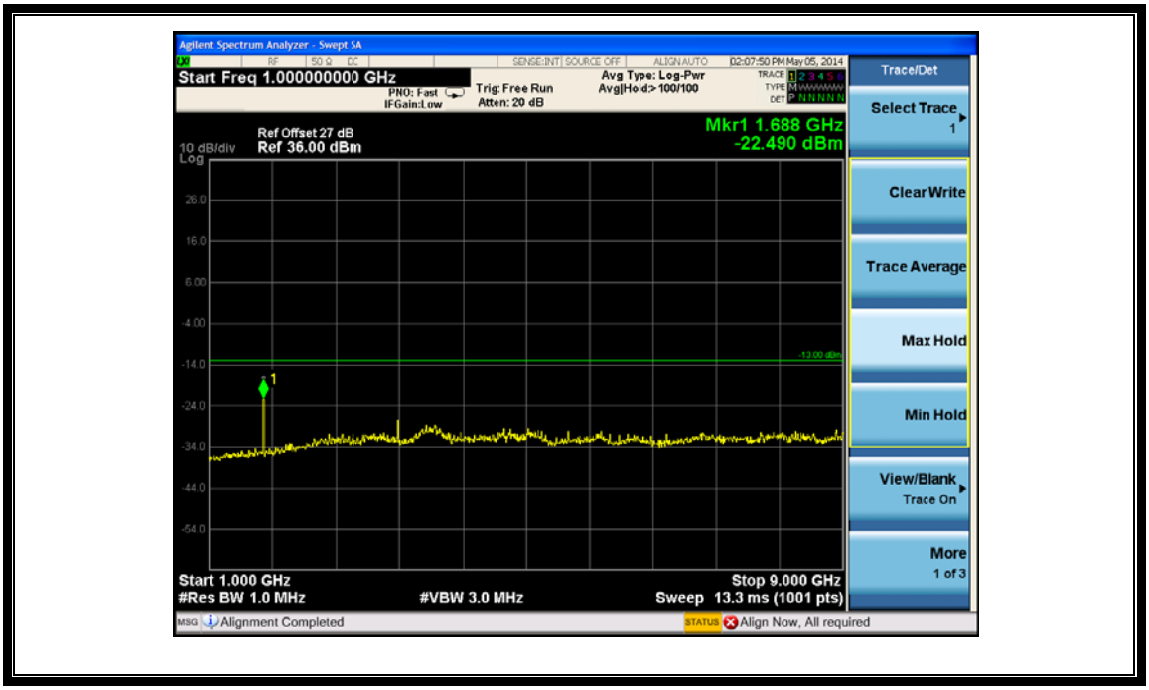

(Plot E2: WCDMA850MHz Channel = 4175, 30MHz to 1GHz)



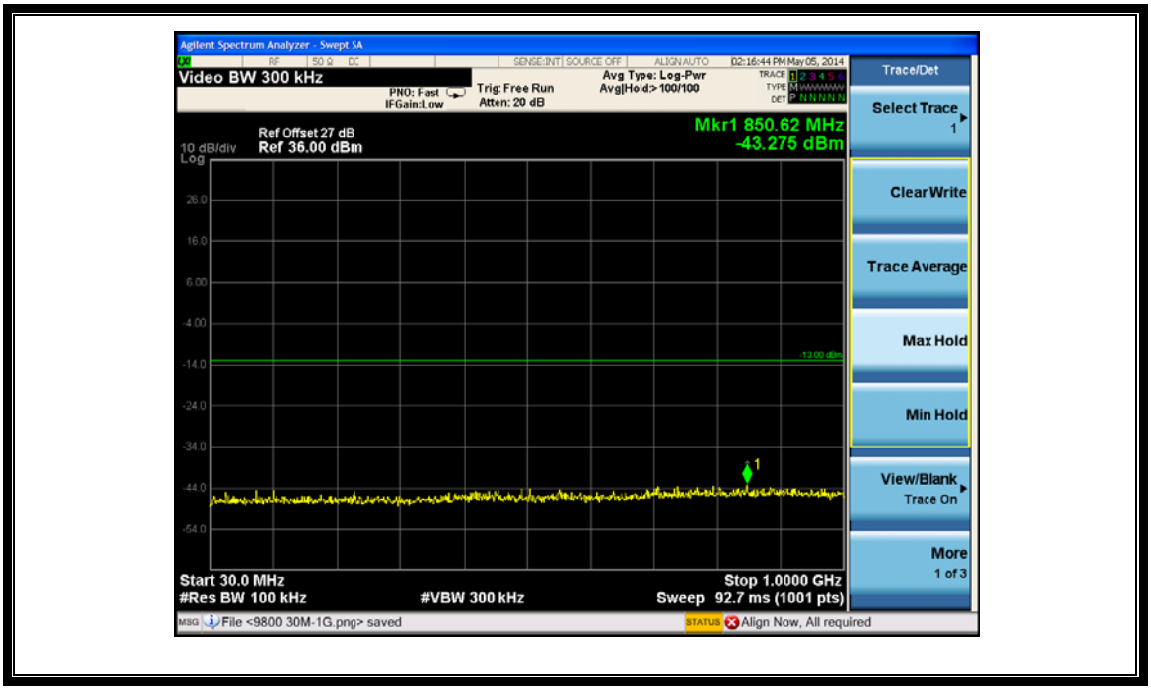

(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)



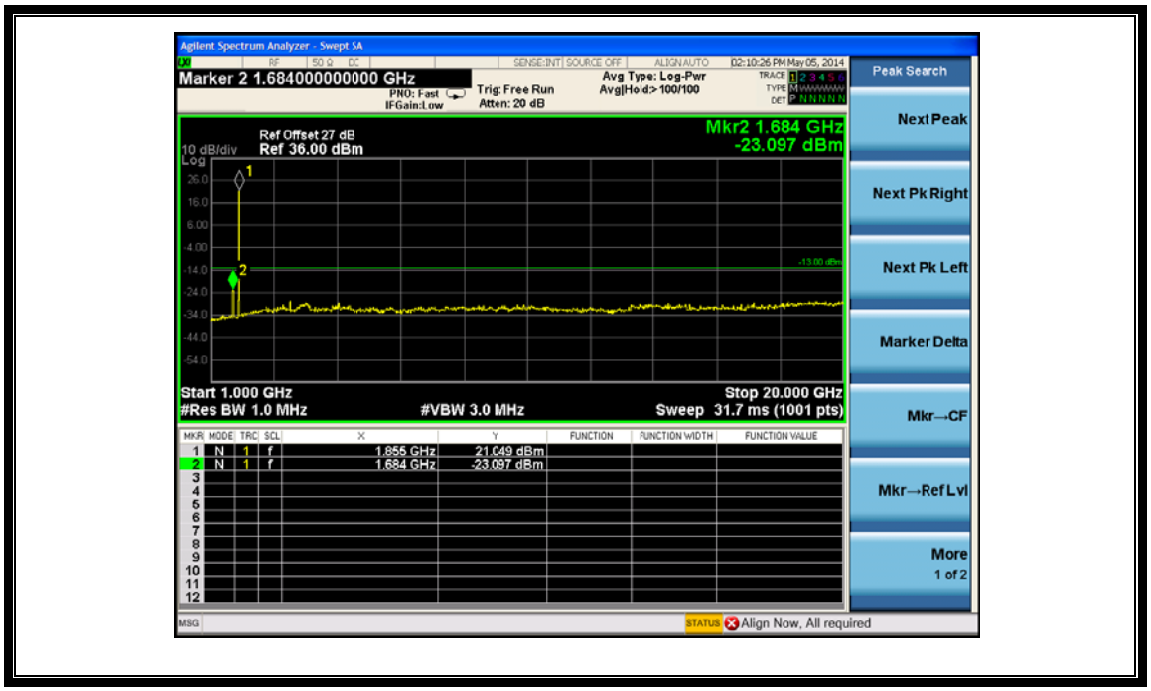

(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)



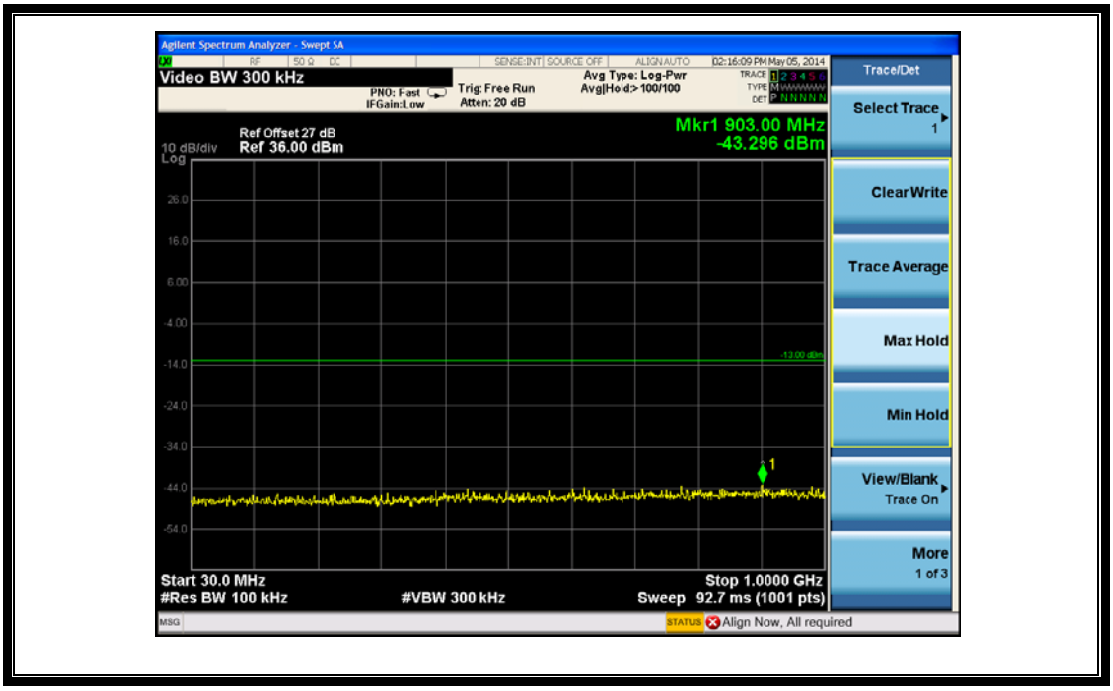

(Plot E3.1: WCDMA850MHz Channel = 4233, 1GHz to 9GHz)



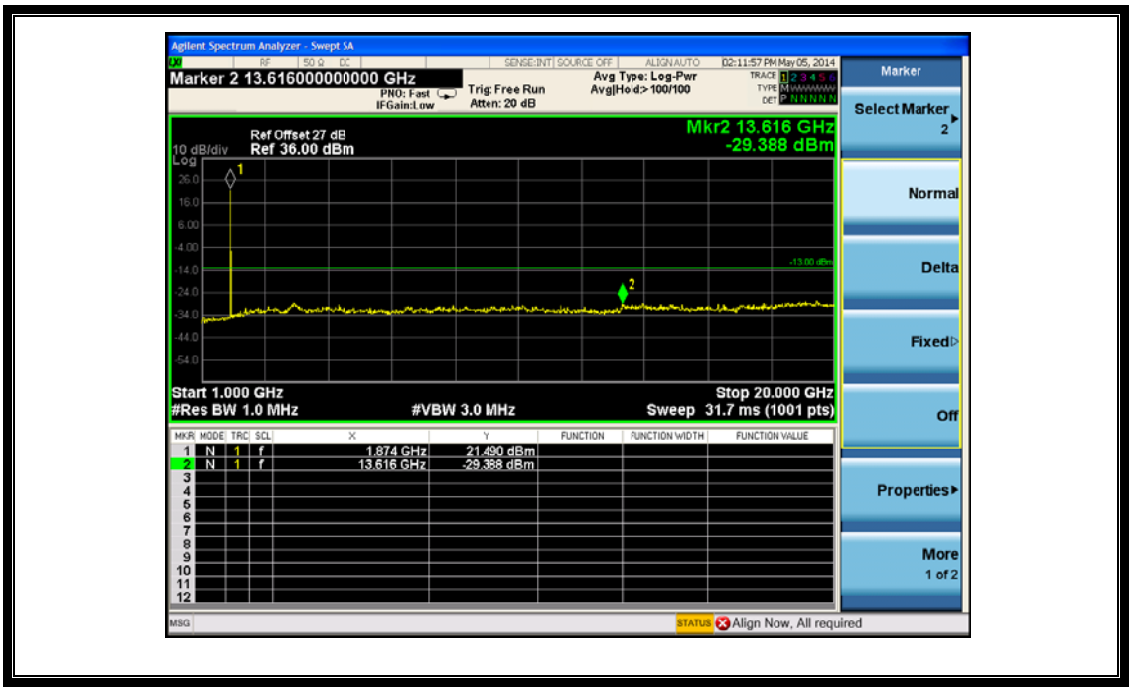

(Plot F1:WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)



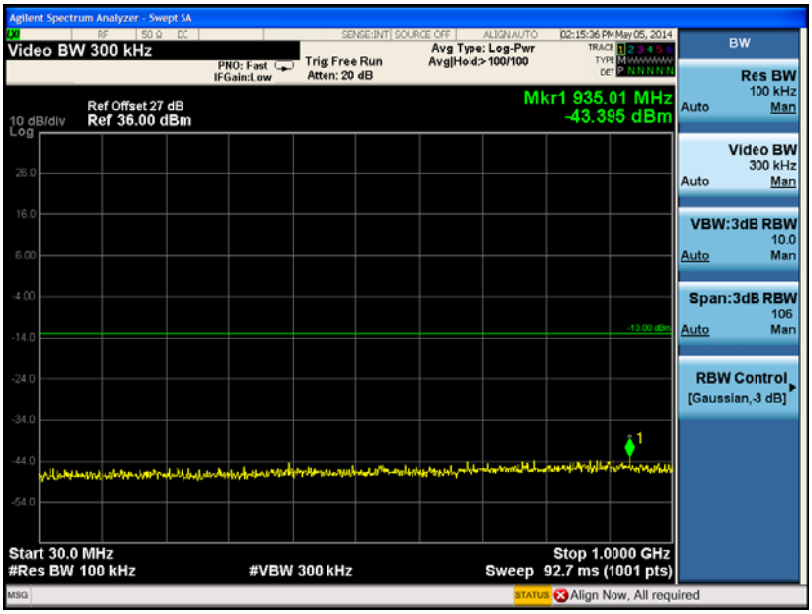

(Plot F1.1: WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)



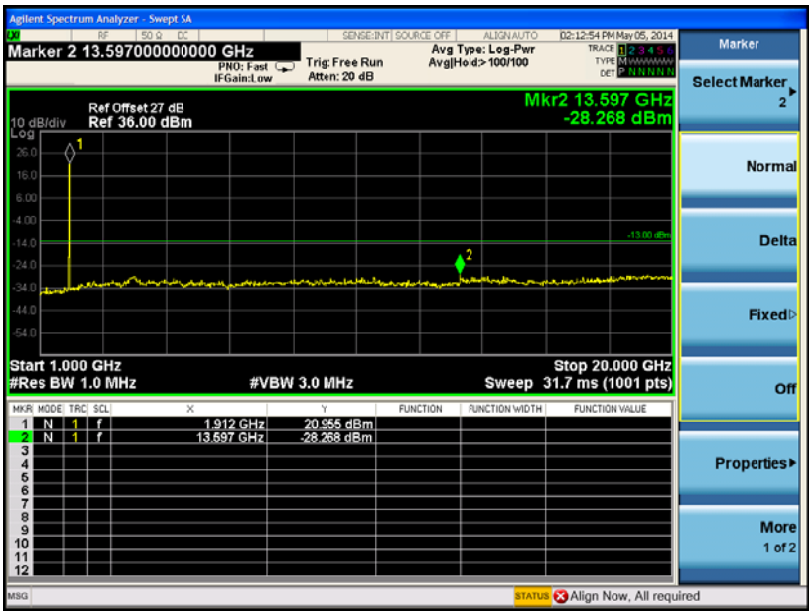

(Plot F2:WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)



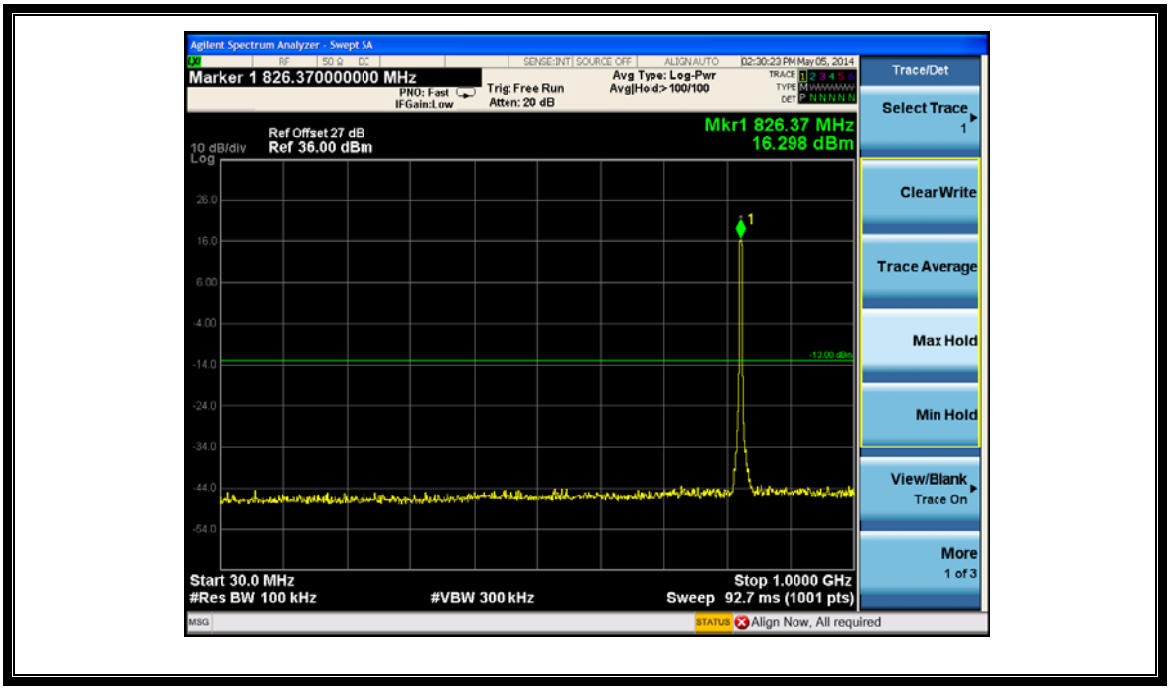

(Plot F2.1: WCDMA1900MHz Channel = 9400, 1GHz to 20GHz)



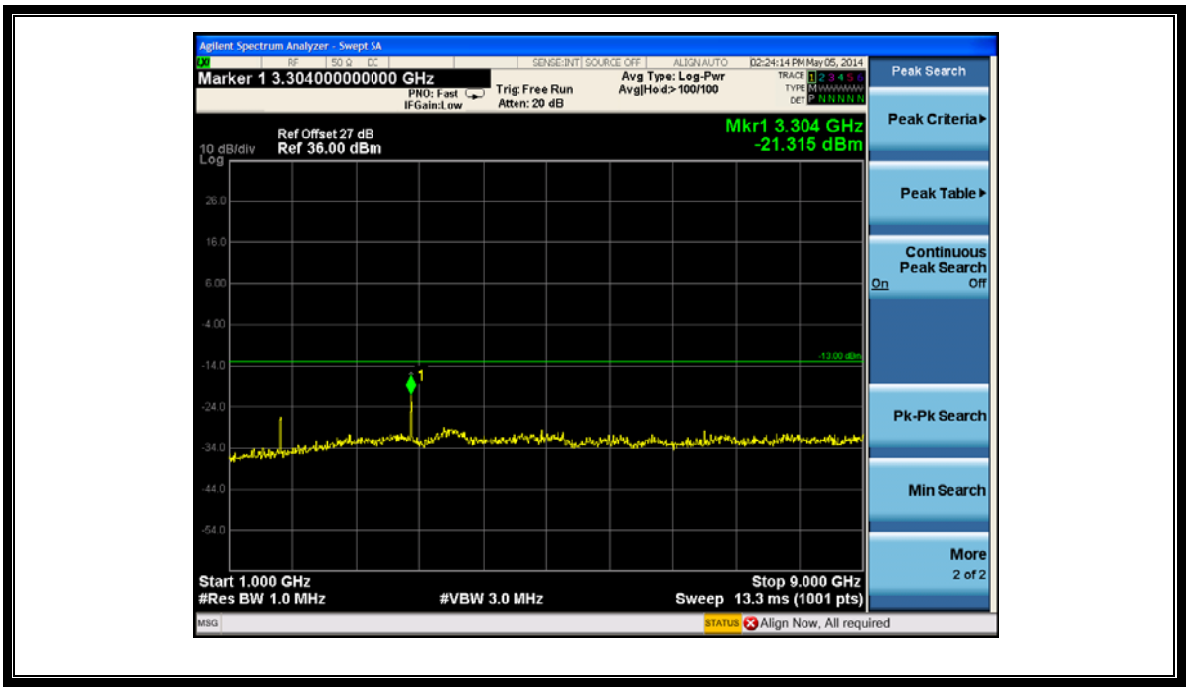

(Plot F3:WCDMA1900MHz Channel = 9538, 30MHz to 1GHz)




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




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




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