

# FCC TEST REPORT



Issued to

Group Sense Mobile-Tech Limited

For

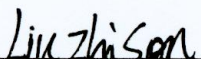
Wireless POS Handheld Terminal

Model Name: DT-07  
Trade Name: Xplore / Touch Dynamic  
Brand Name: Xplore / Touch Dynamic  
FCC ID : VRI-B195  
Standard: 47 CFR Part 22 Subpart H  
47 CFR Part 24 Subpart E  
Test date: 2013-10-15 to 2014-1-20  
Issue date: 2014-3-31

By

Shenzhen Morlab Communications Technology Co., Ltd.  
FL.3, Building A, FeiYang Science Park, No.8 LongChang Road,Block 67, BaoAn District,  
ShenZhen, GuangDong Province,P. R. China 518101

Tested by



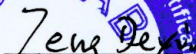
Liu Zhisen

(Test Engineer)

Date

2014.3.31

Approved by



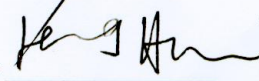
Zeng Dexin

(Chief Engineer)

Date

2014.3.31

Reviewed by



Peng Huarui

(Dept. Manager)

Date

2014.3.31



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| Change History |              |                   |
|----------------|--------------|-------------------|
| Issue          | Date         | Reason for change |
| 1.0            | Mar 31, 2014 | First edition     |
|                |              |                   |

## 1. GENERAL INFORMATION

### 1.1 EUT Description

EUT Type.....: Wireless POS Handheld Terminal  
Serial No.....: (n.a, marked #1 by test site)  
Hardware Version .....: QA1/PP1  
Software Version.....: D13  
Applicant.....: Group Sense Mobile-Tech Limited  
Address: 6th Floor, Enterprise Building, No.5 Science Park West Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong  
Manufacturer .....: Group Sense Mobile-Tech Limited  
Address: 6th Floor, Enterprise Building, No.5 Science Park West Avenue, Hong Kong Science Park, Shatin, New Territories, Hong Kong  
Frequency Range .....: GSM 850MHz:  
Tx: 824.20 - 848.80MHz (at intervals of 200kHz);  
Rx: 869.20 - 893.80MHz (at intervals of 200kHz)  
GSM 1900MHz:  
Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);  
Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)  
WCDMA 850MHz  
Tx: 826.4 - 846.6MHz (at intervals of 200kHz);  
Rx: 871.4 - 891.6MHz (at intervals of 200kHz)  
WCDMA 1900MHz  
Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);  
Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz)  
Modulation Type .....: GSM,GPRS Mode with GMSK Modulation  
EDGE Mode with 8PSK Modulation  
WCDMA Mode with QPSK Modulation  
HSDPA Mode with QPSK Modulation  
HSUPA Mode with QPSK Modulation  
Multislot Class .....: GPRS: Multislot Class12,EGPRS: Multislot Class12  
Antenna Type.....: PIFA Antenna  
Emission Designators .....: GSM 850:251KGXW,GSM 1900:255KGXW  
EGPRS850:250KG7W, EGPRS1900:246KG7W,  
WCDMA 850:4M19F9W ,WCDMA1900:4M21F9W

**Note 1:** The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula  $F(n)=824.2+0.2*(n-128)$ ,  $128 \leq n \leq 251$ ; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128

(824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

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

**Note 3:** The transmitter (Tx) frequency arrangement of the WCDMA 850MHz band used by the EUT can be represented with the formula  $F(n)=826.4+0.2*(n-4132)$ ,  $4132 \leq n \leq 4233$ ; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 4132 (826.4MHz), 4175(835MHz) and 4233 (846.6MHz).

**Note 4:** The transmitter (Tx) frequency arrangement of the WCDMA 1900MHz band used by the EUT can be represented with the formula  $F(n)=1852.4+0.2*(n-9262)$ ,  $9262 \leq n \leq 9538$ ; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 9262 (1852.4MHz), 9400 (1880MHz) and 9538 (1907.6MHz).

**Note 5:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 for the EUT FCC ID Certification:

| No. | Identity                            | Document Title                                                                |
|-----|-------------------------------------|-------------------------------------------------------------------------------|
| 1   | 47 CFR Part 2<br>(10-1-09 Edition)  | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2   | 47 CFR Part 22<br>(10-1-09 Edition) | Public Mobile Services                                                        |
| 3   | 47 CFR Part 24<br>(10-1-09 Edition) | Personal Communications Services                                              |

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

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

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 REQUIREMENTS

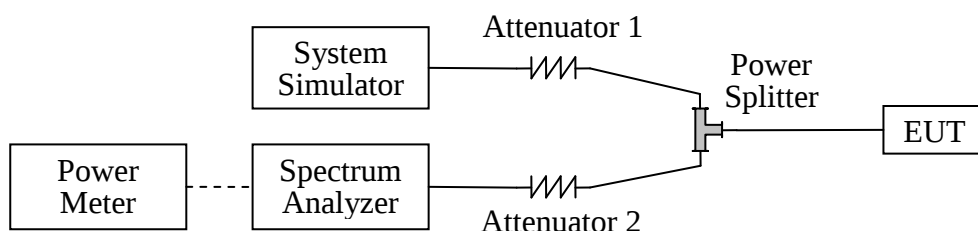
### 2.1 Conducted RF Output Power

#### 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 | 2013.05.13 | 2014.05.12 |
| Spectrum Analyzer | Agilent      | E7405A | US44210471 | 2013.05.13 | 2014.05.12 |
| Power Meter       | Agilent      | E4418B | GB43318055 | 2013.05.13 | 2014.05.12 |
| Power Sensor      | Agilent      | 8482A  | MY41091706 | 2013.05.13 | 2014.05.12 |
| Power Splitter    | Weinschel    | 1506A  | NW521      | 2013.05.13 | 2014.05.12 |
| Attenuator 1      | Resnet       | 20dB   | (n.a.)     | 2013.05.13 | 2014.05.12 |
| Attenuator 2      | Resnet       | 3dB    | (n.a.)     | 2013.05.13 | 2014.05.12 |

### 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:

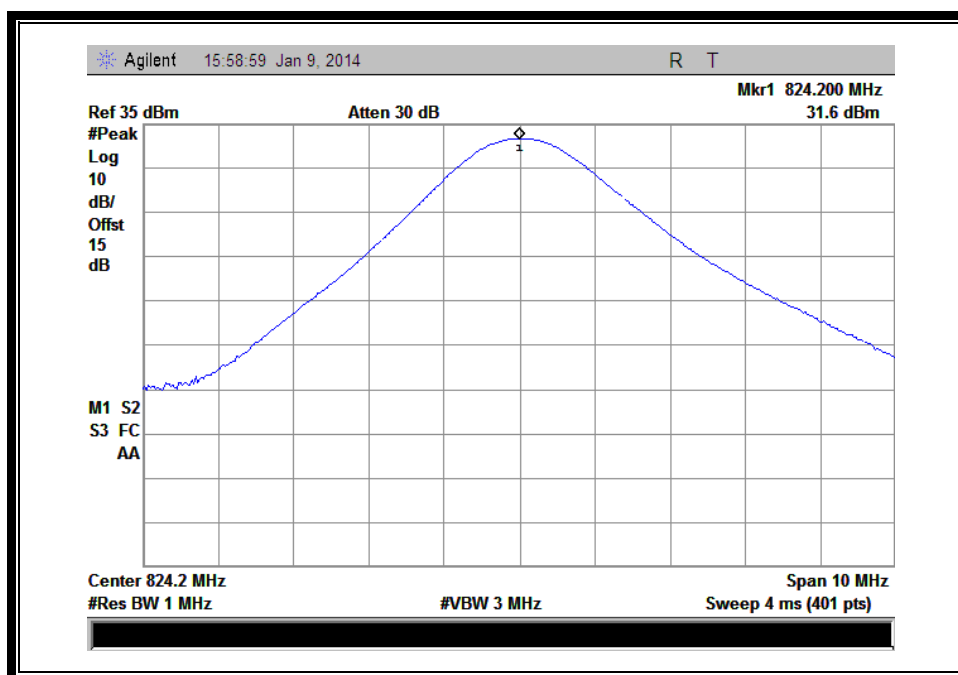
| Band             | Channel | Frequency (MHz) | Measured Output Power |                                    | Limit | Verdict     |
|------------------|---------|-----------------|-----------------------|------------------------------------|-------|-------------|
|                  |         |                 | dBm                   | Refer to Plot                      | dBm   |             |
| GSM<br>850MHz    | 128     | 824.2           | 31.60                 | Plot A1 to<br>A3                   | 35    | <u>PASS</u> |
|                  | 190     | 836.6           | 31.32                 |                                    |       | <u>PASS</u> |
|                  | 251     | 848.8           | 31.27                 |                                    |       | <u>PASS</u> |
| GSM<br>1900MHz   | 512     | 1850.2          | 31.96                 | Plot B1 to<br>B3                   | 32    | <u>PASS</u> |
|                  | 661     | 1880.0          | 31.02                 |                                    |       | <u>PASS</u> |
|                  | 810     | 1909.8          | 29.40                 |                                    |       | <u>PASS</u> |
| GPRS<br>850MHz   | 128     | 824.2           | 30.83                 | Plot C1 to<br>C3 <sup>Note 1</sup> | 35    | <u>PASS</u> |
|                  | 190     | 836.6           | 30.57                 |                                    |       | <u>PASS</u> |
|                  | 251     | 848.8           | 30.51                 |                                    |       | <u>PASS</u> |
| GPRS<br>1900MHz  | 512     | 1850.2          | 30.89                 | Plot D1 to<br>D3 <sup>Note 1</sup> | 32    | <u>PASS</u> |
|                  | 661     | 1880.0          | 30.27                 |                                    |       | <u>PASS</u> |
|                  | 810     | 1909.8          | 28.93                 |                                    |       | <u>PASS</u> |
| EGPRS<br>850MHz  | 128     | 824.2           | 30.61                 | Plot E1 to<br>E3 <sup>Note 1</sup> | 35    | <u>PASS</u> |
|                  | 190     | 836.6           | 31.26                 |                                    |       | <u>PASS</u> |
|                  | 251     | 848.8           | 30.35                 |                                    |       | <u>PASS</u> |
| EGPRS<br>1900MHz | 512     | 1850.2          | 29.45                 | Plot F1 to<br>F3 <sup>Note 1</sup> | 32    | <u>PASS</u> |
|                  | 661     | 1880.0          | 29.28                 |                                    |       | <u>PASS</u> |
|                  | 810     | 1909.8          | 28.83                 |                                    |       | <u>PASS</u> |

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

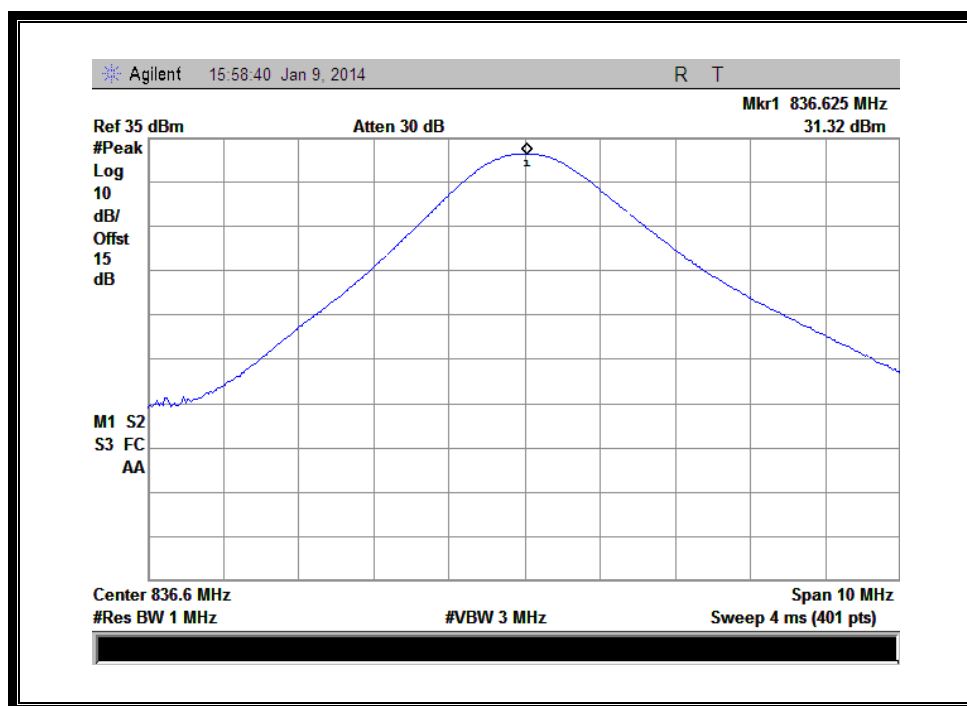
## 2. WCDMA Model Test Verdict:

| Item       | band                                                                                        | WCDMA 850 |       |       | WCDMA 1900 |       |       |
|------------|---------------------------------------------------------------------------------------------|-----------|-------|-------|------------|-------|-------|
|            | ARFCN                                                                                       | 4132      | 4175  | 4233  | 9262       | 9400  | 9538  |
|            | subtest                                                                                     | dBm       |       |       | dBm        |       |       |
| 5.2(WCDMA) | non                                                                                         | 23.68     | 24.04 | 23.97 | 22.28      | 21.79 | 22.42 |
| HSDPA      | 1                                                                                           | 23.59     | 22.21 | 23.88 | 22.12      | 21.70 | 22.35 |
|            | 2                                                                                           | 23.57     | 22.20 | 23.86 | 22.09      | 21.41 | 22.30 |
|            | 3                                                                                           | 23.08     | 21.72 | 23.30 | 21.62      | 21.18 | 21.87 |
|            | 4                                                                                           | 29.98     | 21.71 | 23.29 | 21.60      | 20.95 | 21.77 |
| HSUPA      | 1                                                                                           | 22.95     | 21.80 | 23.53 | 21.49      | 21.20 | 21.77 |
|            | 2                                                                                           | 20.85     | 18.79 | 21.68 | 19.50      | 19.36 | 19.66 |
|            | 3                                                                                           | 21.87     | 19.97 | 22.62 | 20.55      | 20.10 | 20.93 |
|            | 4                                                                                           | 20.92     | 18.86 | 21.82 | 19.84      | 19.79 | 19.79 |
|            | 5                                                                                           | 22.99     | 20.54 | 23.78 | 21.56      | 20.90 | 21.62 |
| Note:      | The Conducted RF Output Power test of WCDMA /HSDPA /HSUPA /HSPA+ was tested by power meter. |           |       |       |            |       |       |

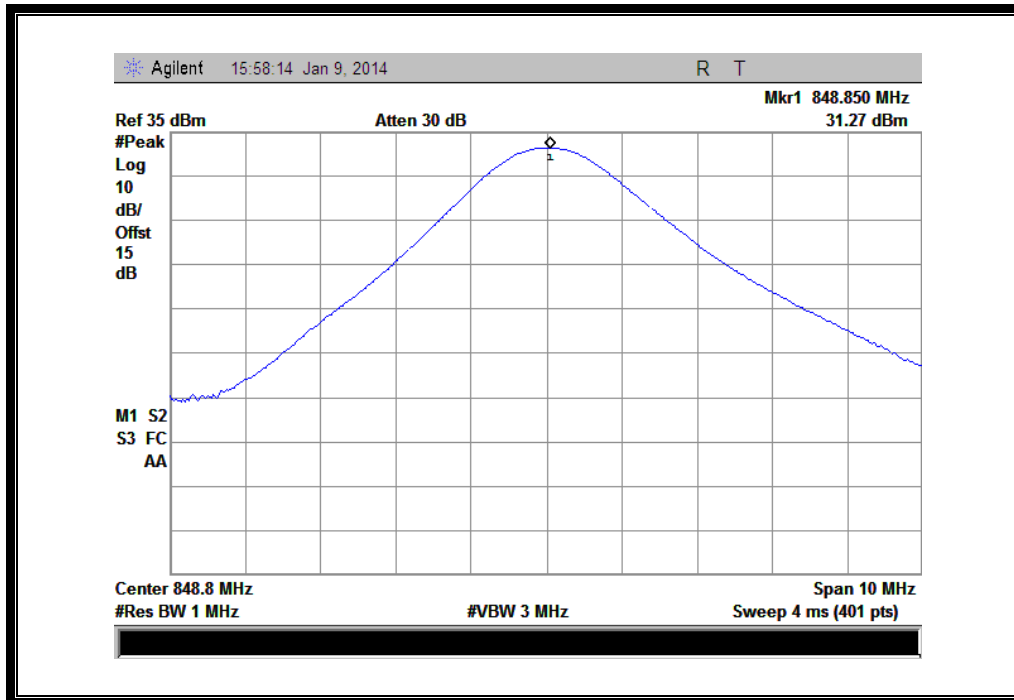
### 3. GSM Model Test Plots:



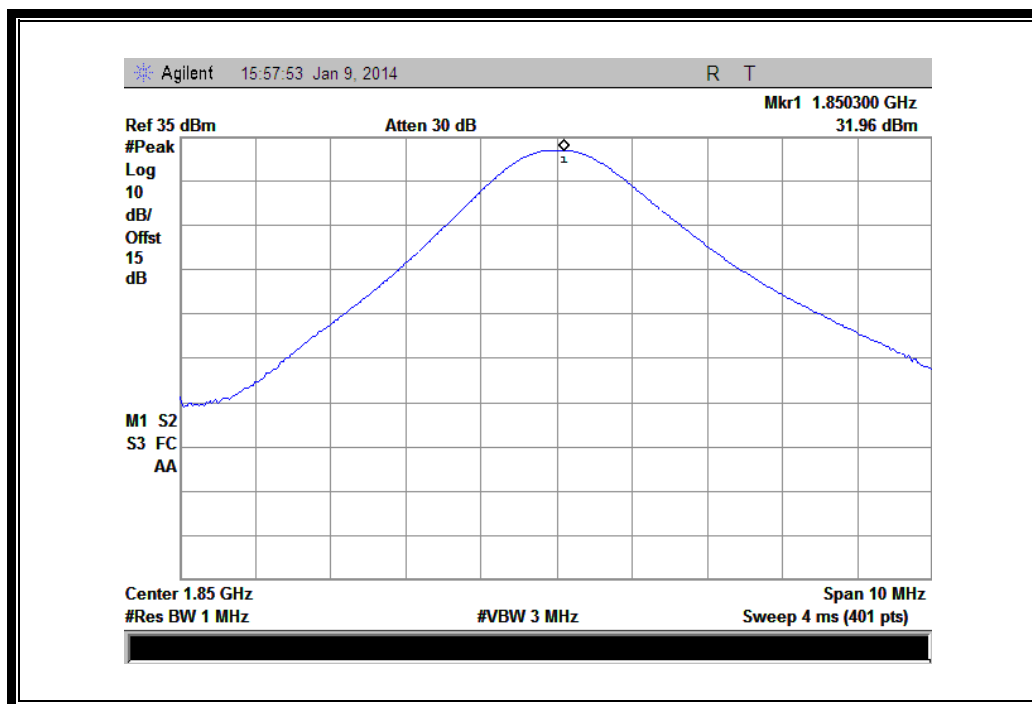
(Plot A1:GSM 850MHz Channel = 128)



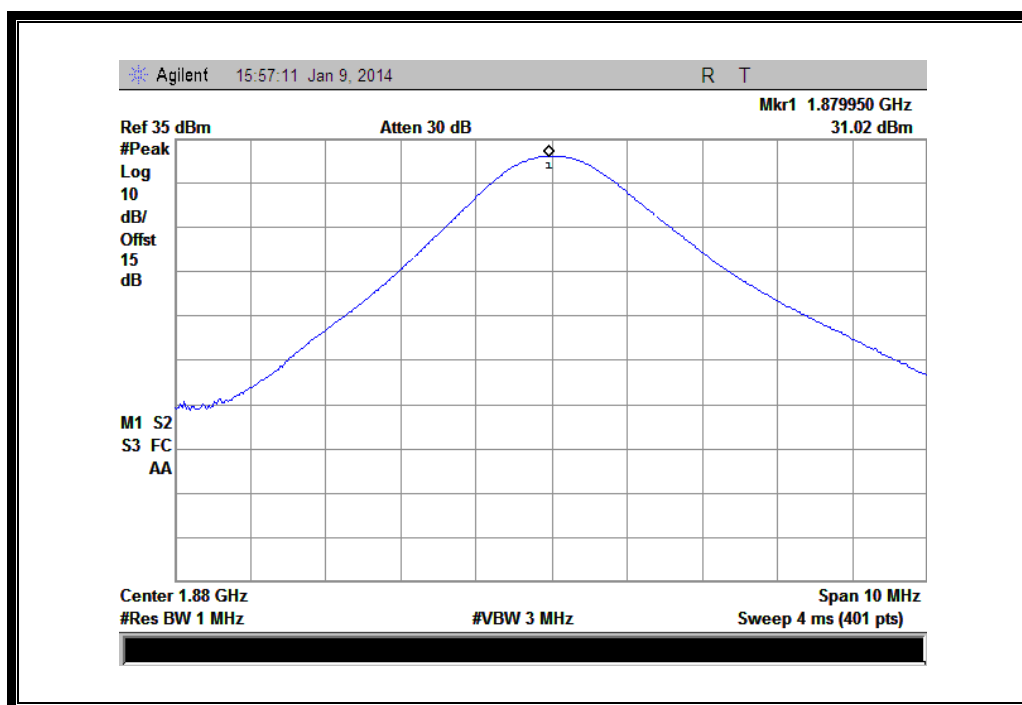
(Plot A2:GSM 850MHz Channel = 190)



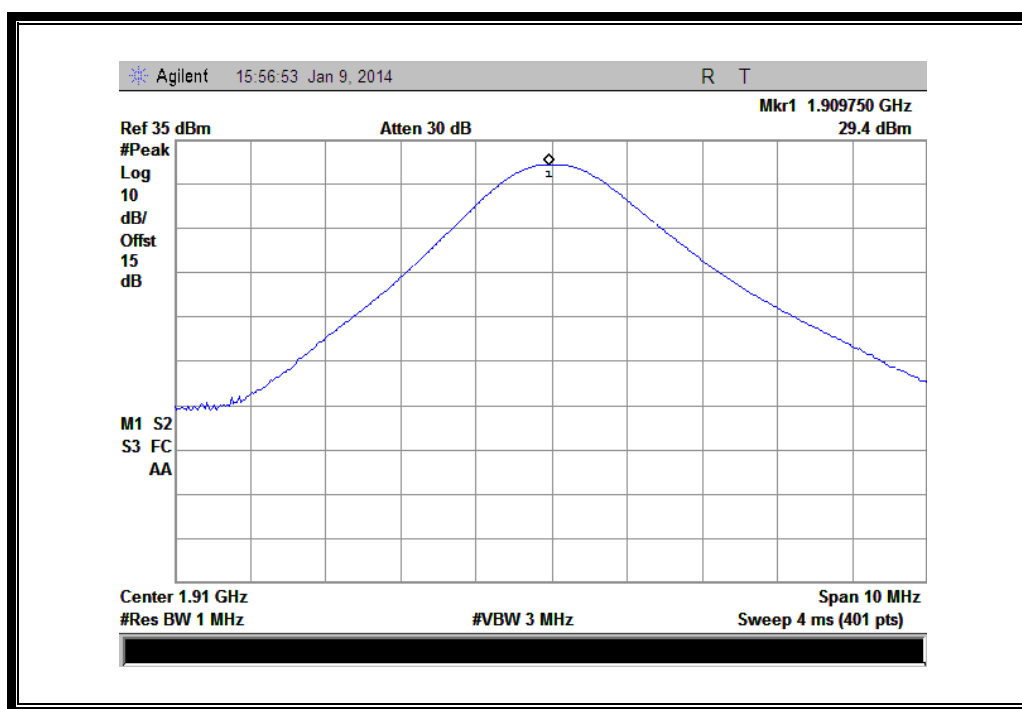
(Plot A3:GSM 850MHz Channel = 251)



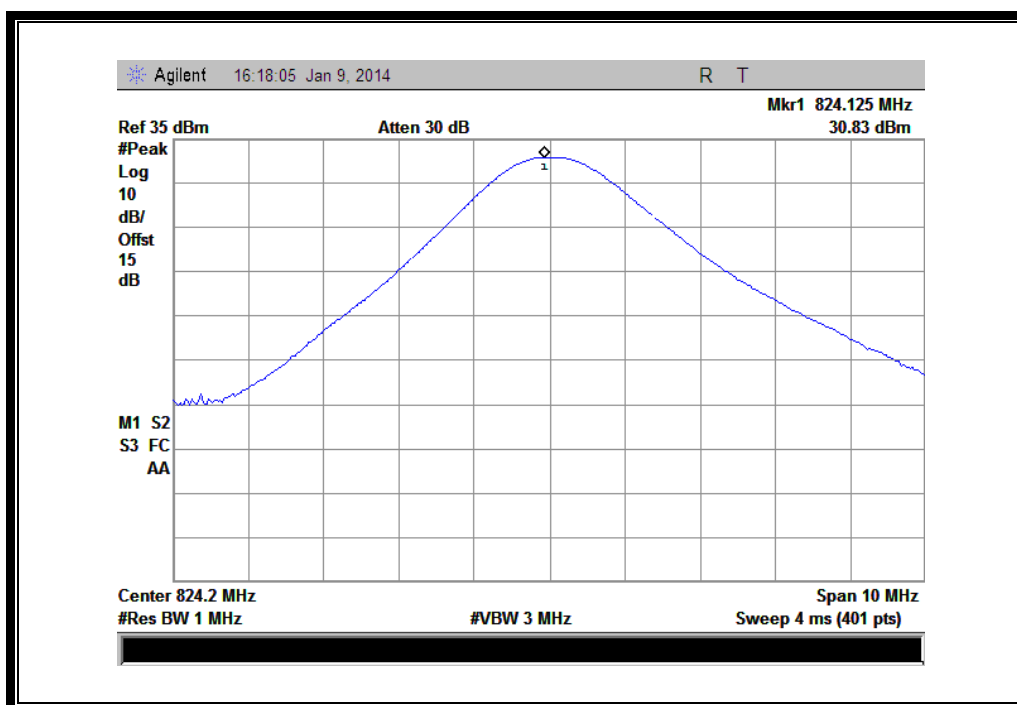
(Plot B1: GSM 1900MHz Channel = 512)



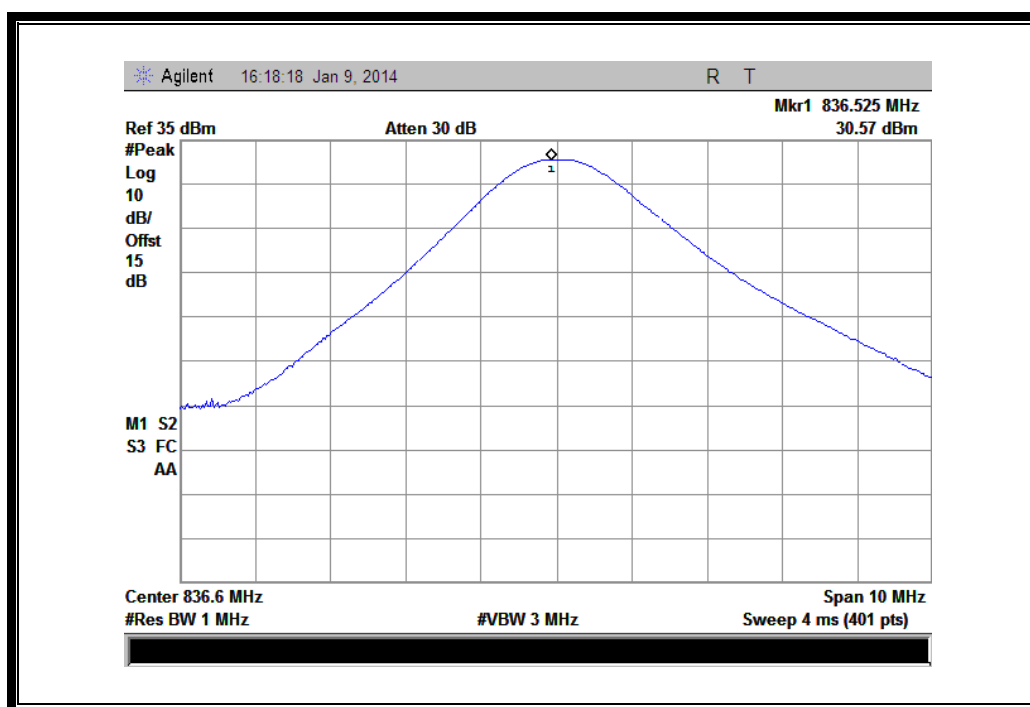
(Plot B2: GSM 1900MHz Channel = 661)



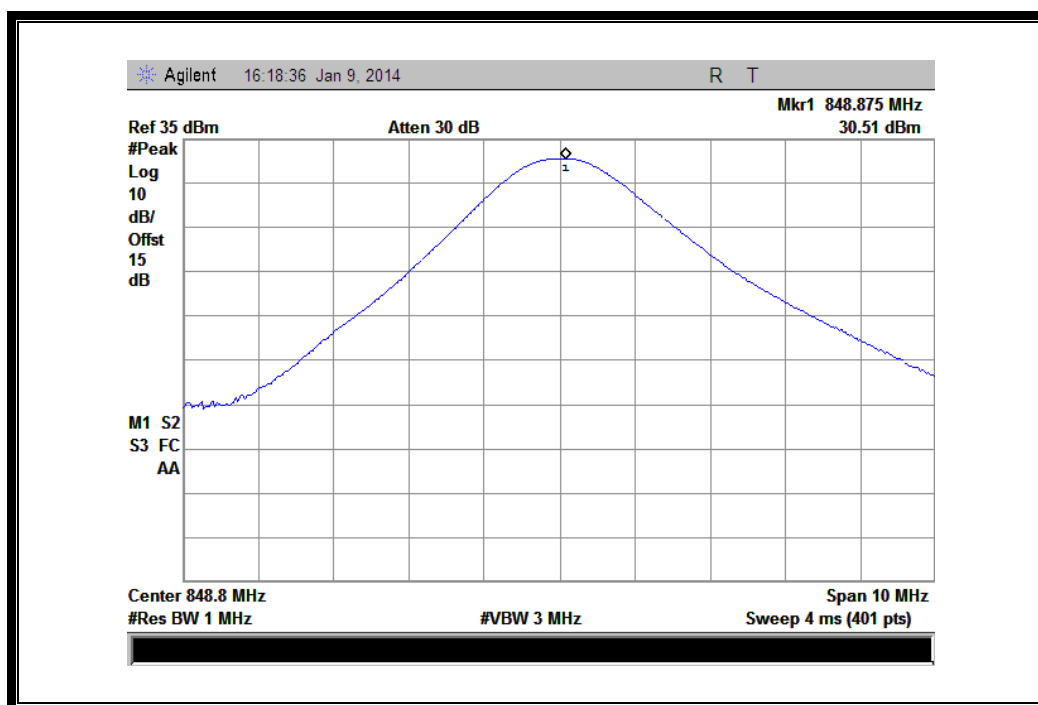
(Plot B3: GSM 1900Hz Channel = 810)



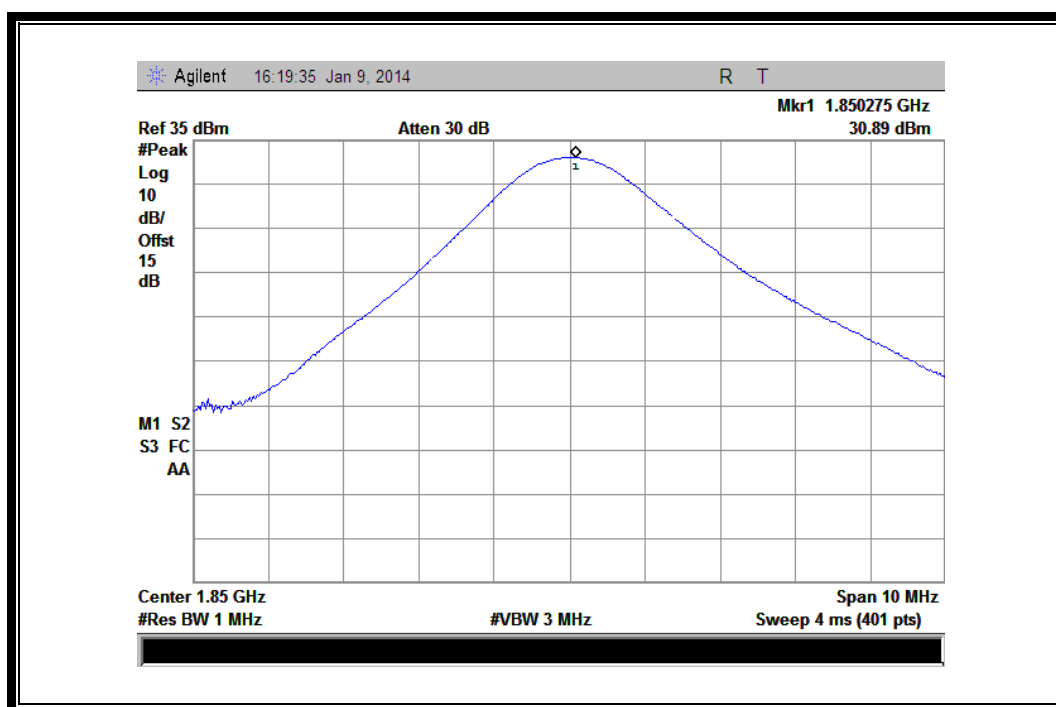
(Plot C 1: GPRS 850MHz Channel = 128)



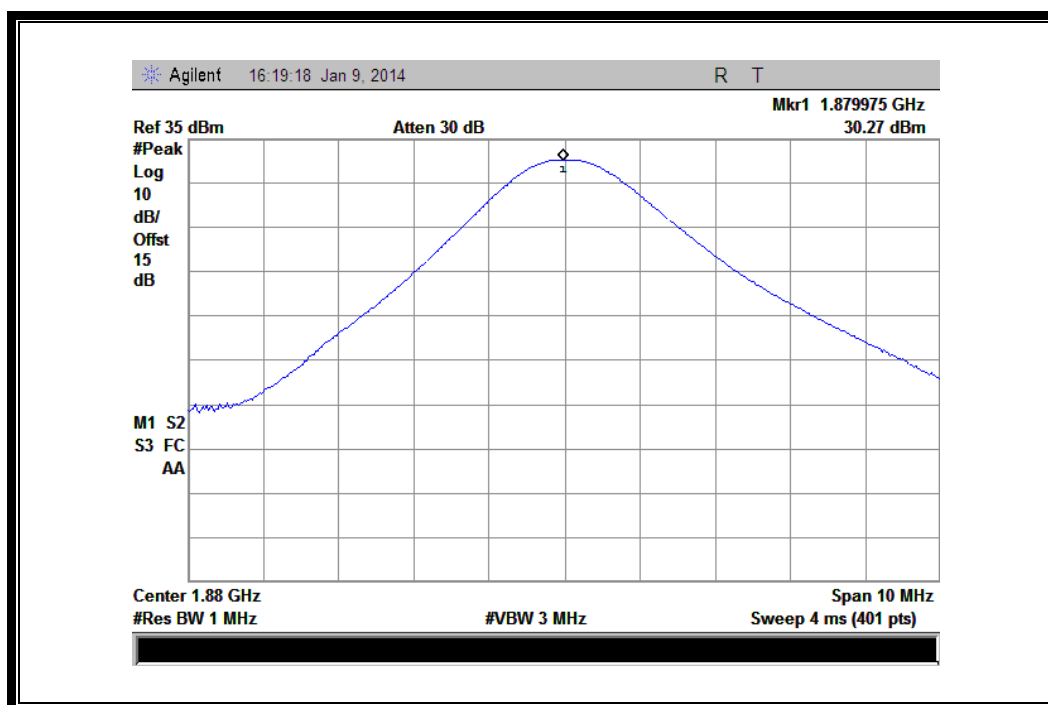
(Plot C 2: GPRS 850MHz Channel = 190)



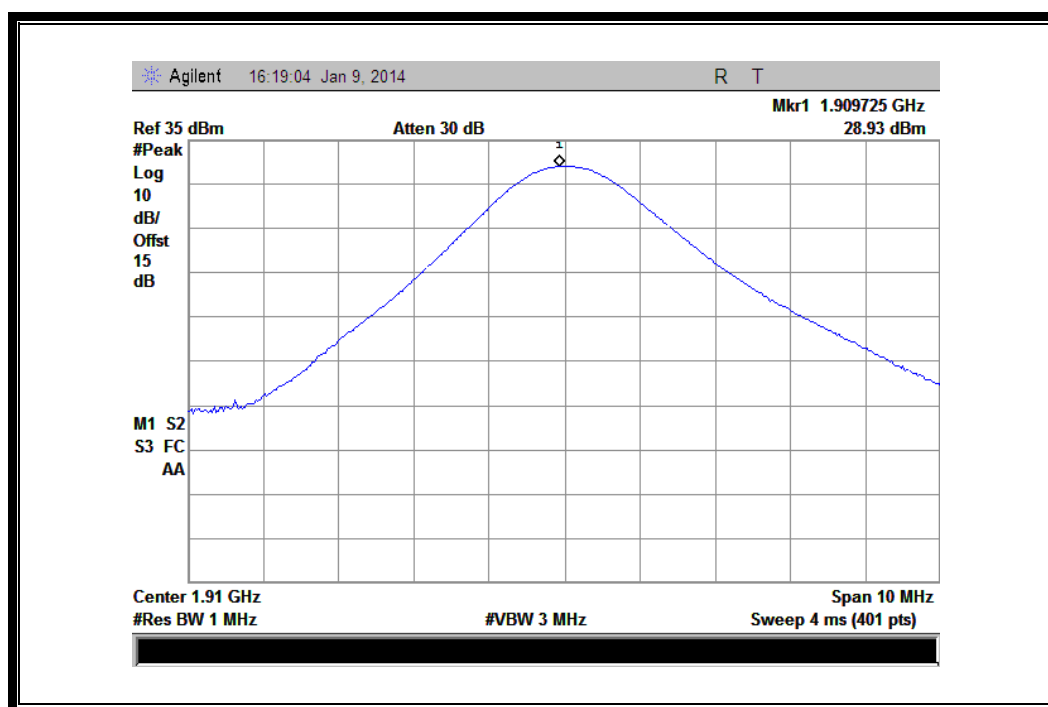
(Plot C 3: GPRS 850MHz Channel = 251)



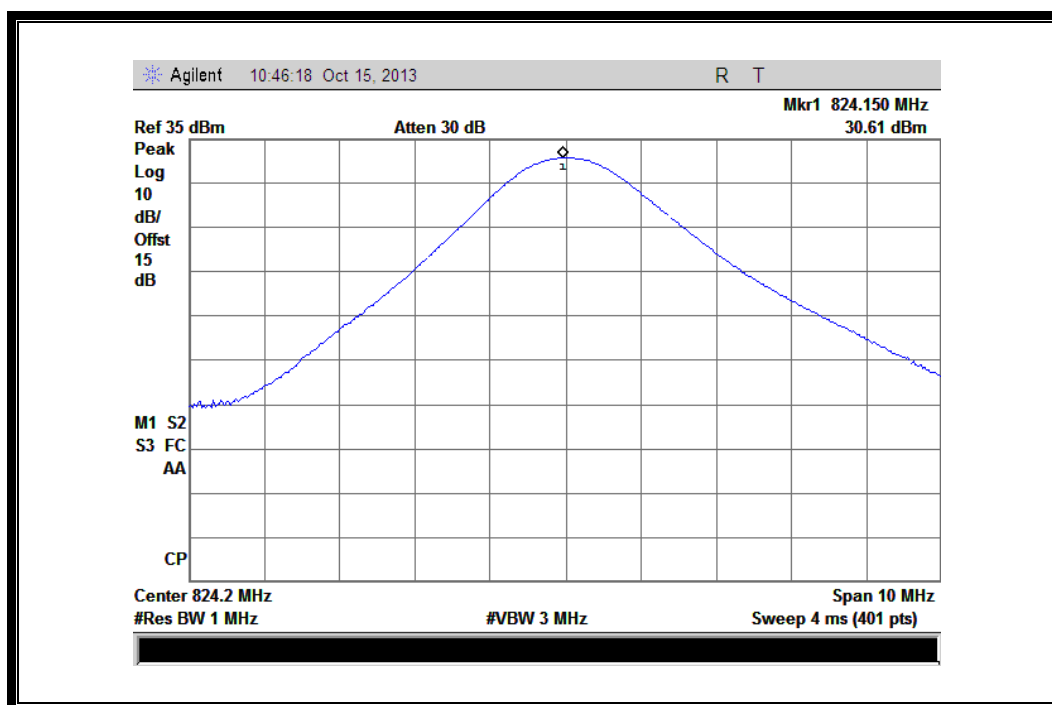
(Plot D 1: GPRS 1900MHz Channel = 512)



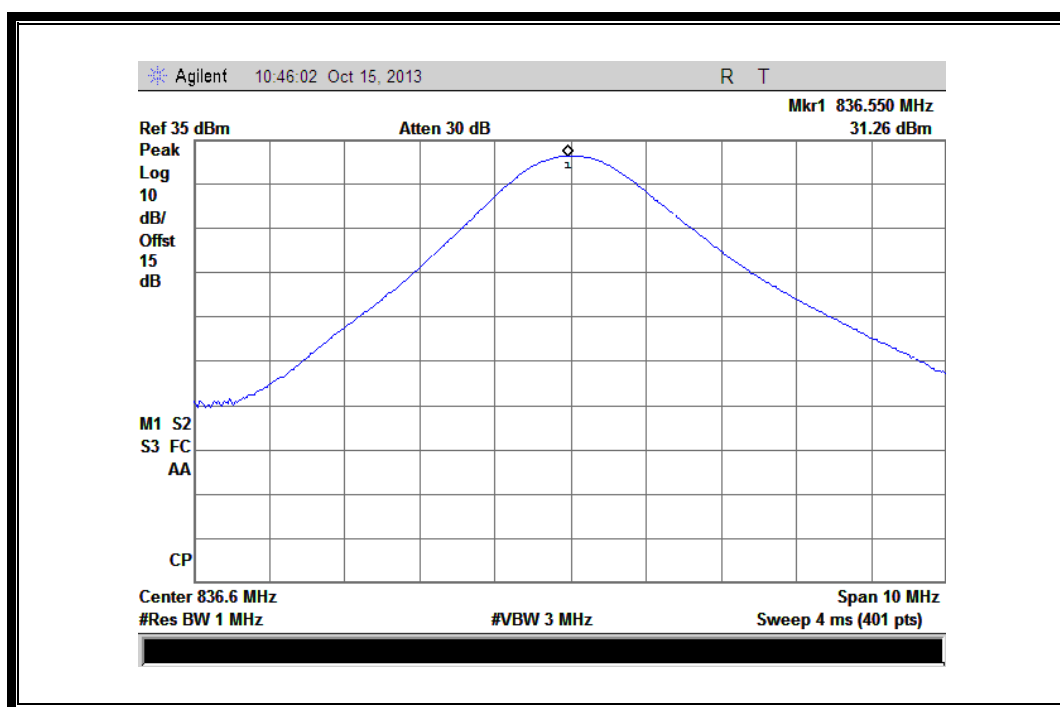
(Plot D 2: GPRS 1900MHz Channel = 661)



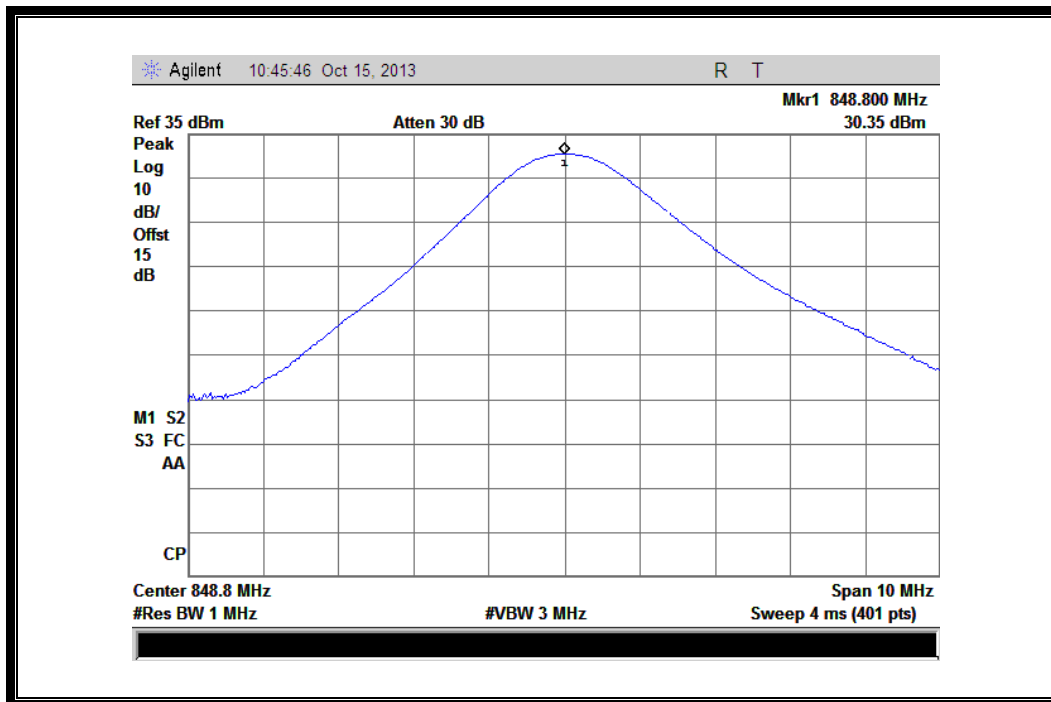
(Plot D 3: GPRS 1900MHz Channel = 810)



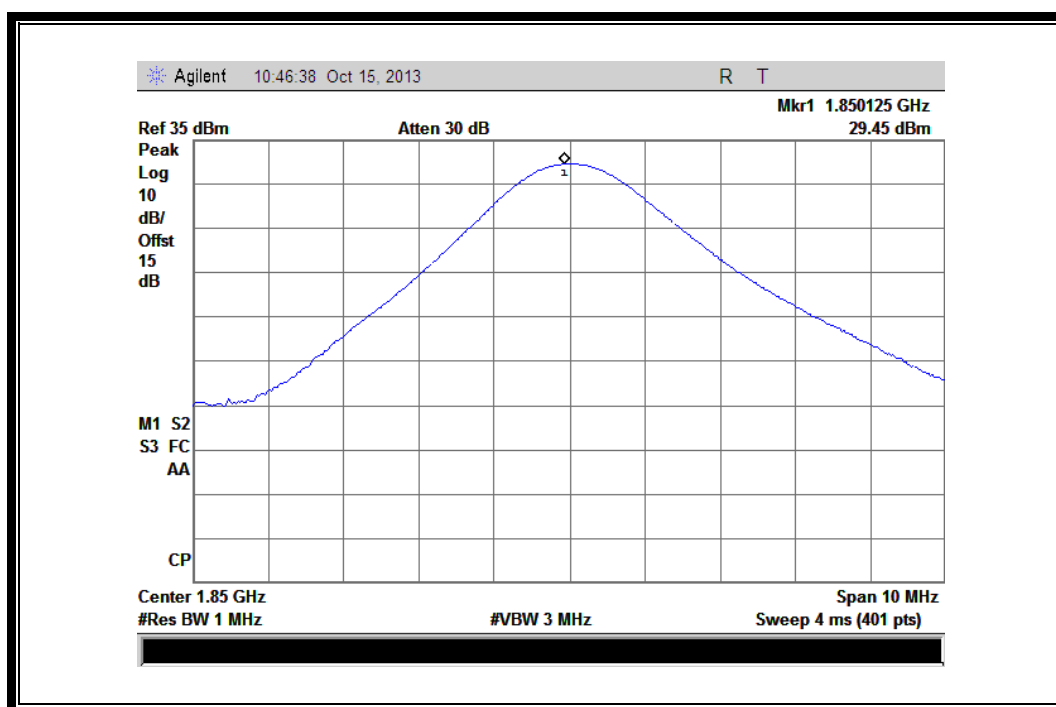
(Plot E1: EGPRS 850MHz Channel = 128)



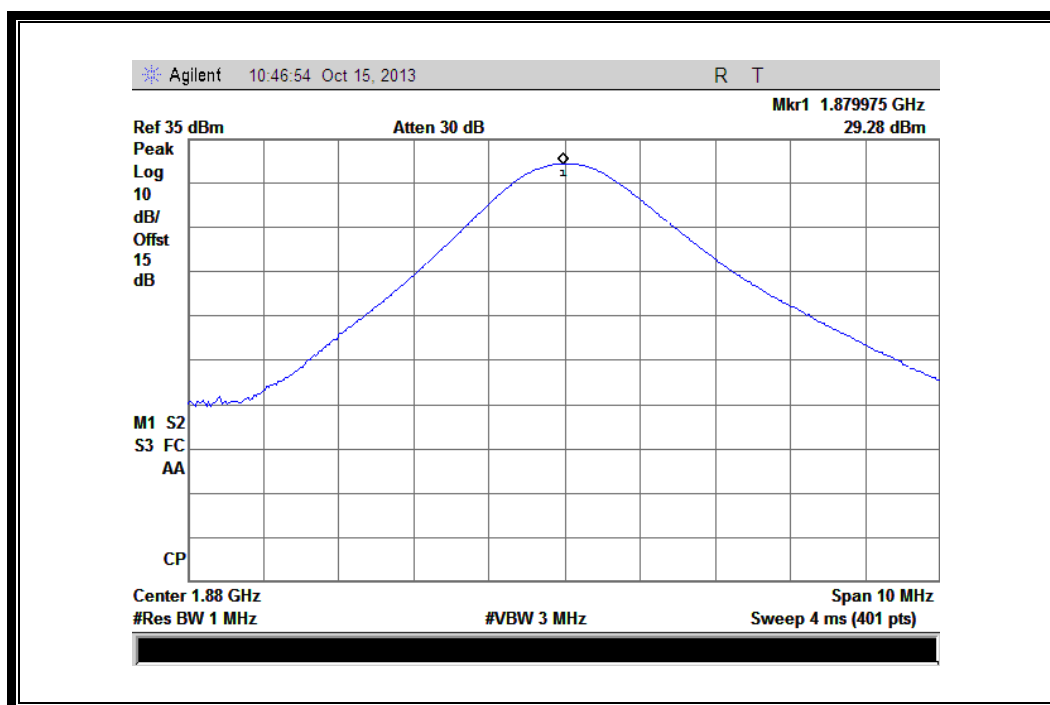
(Plot E2: EGPRS 850MHz Channel = 190)



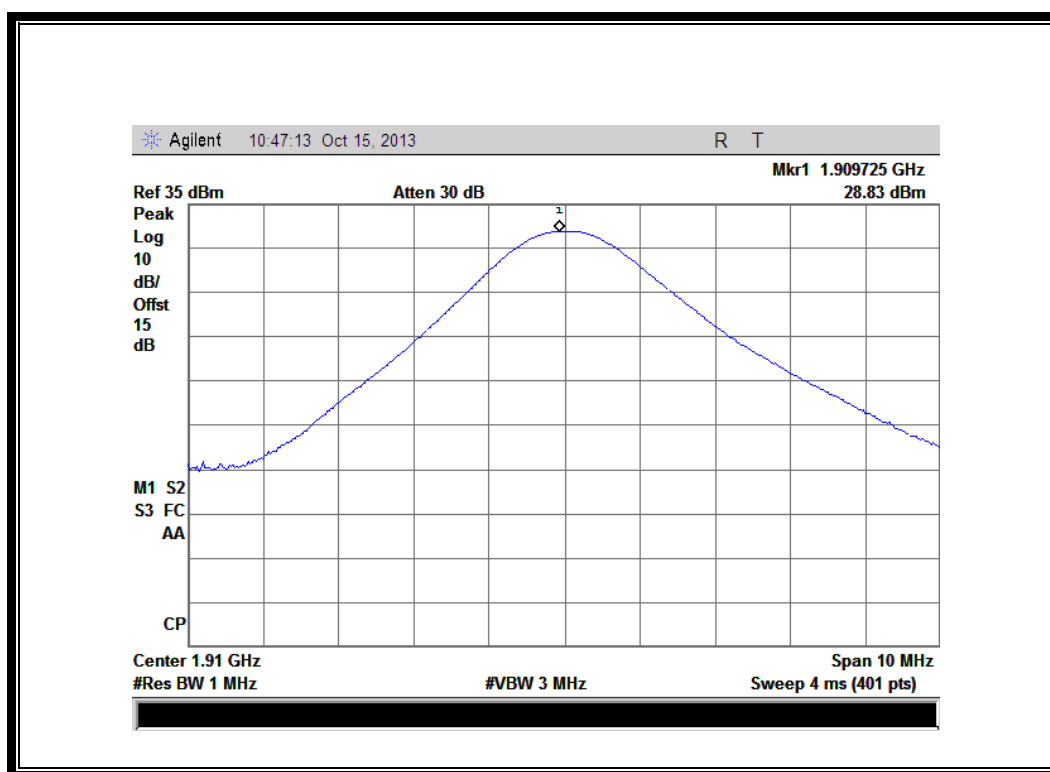
(Plot E3: EGPRS 850MHz Channel = 251)



(Plot F1:EGPRS 1900MHz Channel = 512)



(Plot F2:EGPRS 1900MHz Channel = 661)



(Plot F3:EGPRS 1900Hz Channel = 810)

## 2.2 Peak to Average Ratio

### 2.2.1 Definition

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

### 2.2.2 Test Description

See section 2.1.2 of this report.

### 2.2.3 Test Verdict

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

Test procedures:

A. For GSM/EGPRS operating mode:

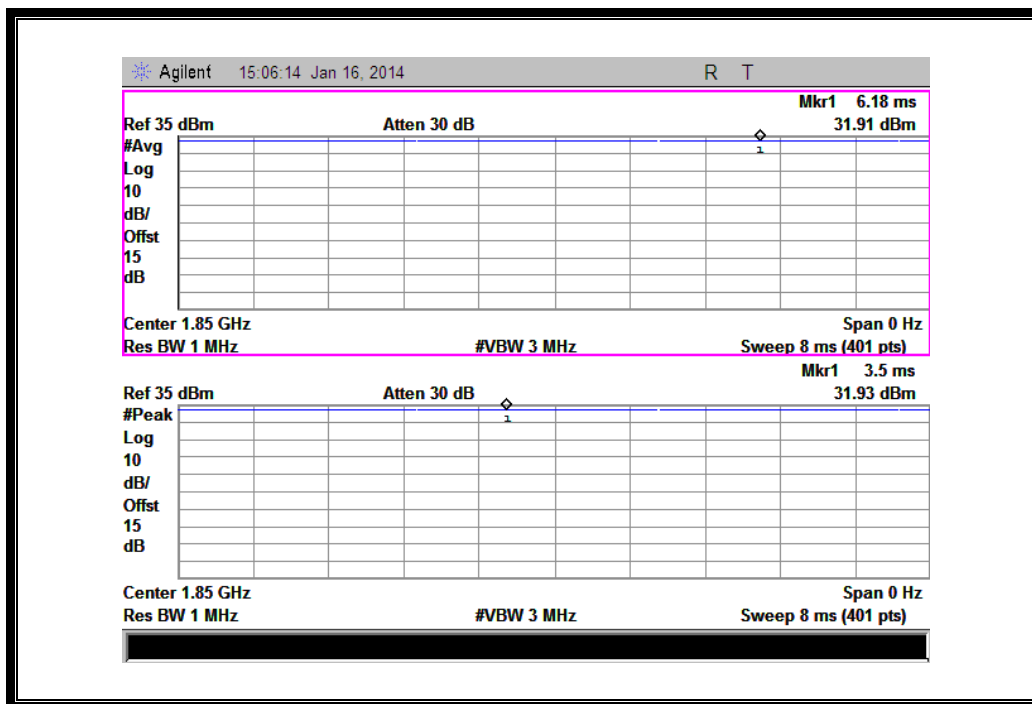
- Set RBW=1MHz, VBW=1MHz, peak detector in spectrum analyzer.
- Set EUT in maximum output power, and triggered the burst signal.
- Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average ratio.

B. For UMTS operating mode:

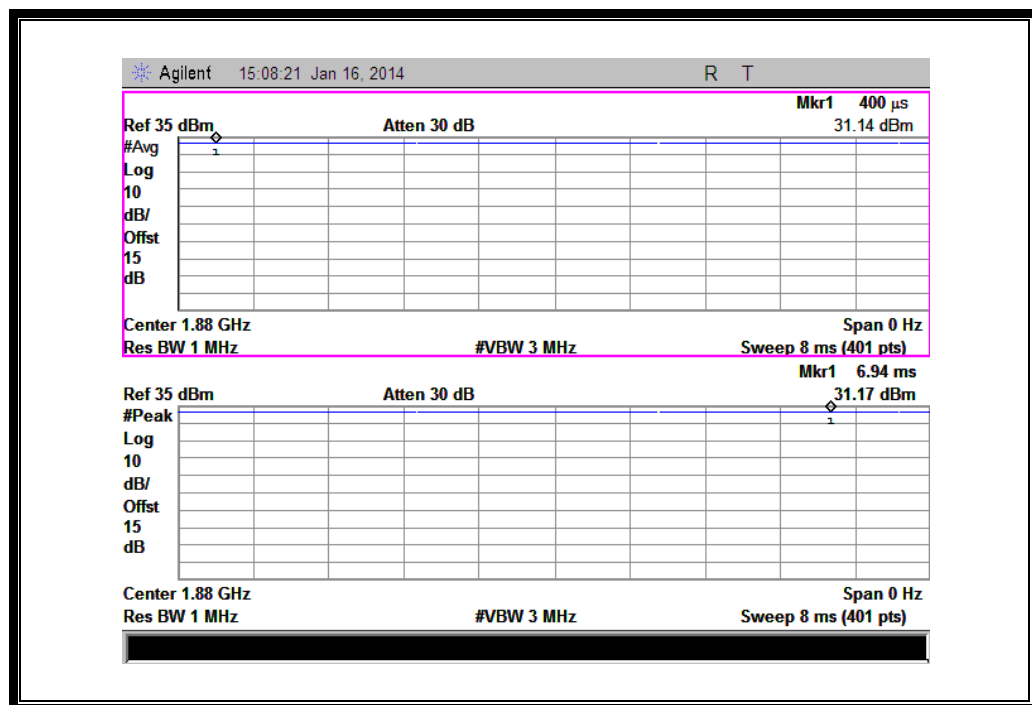
- Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
- The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

1. Test Verdict:

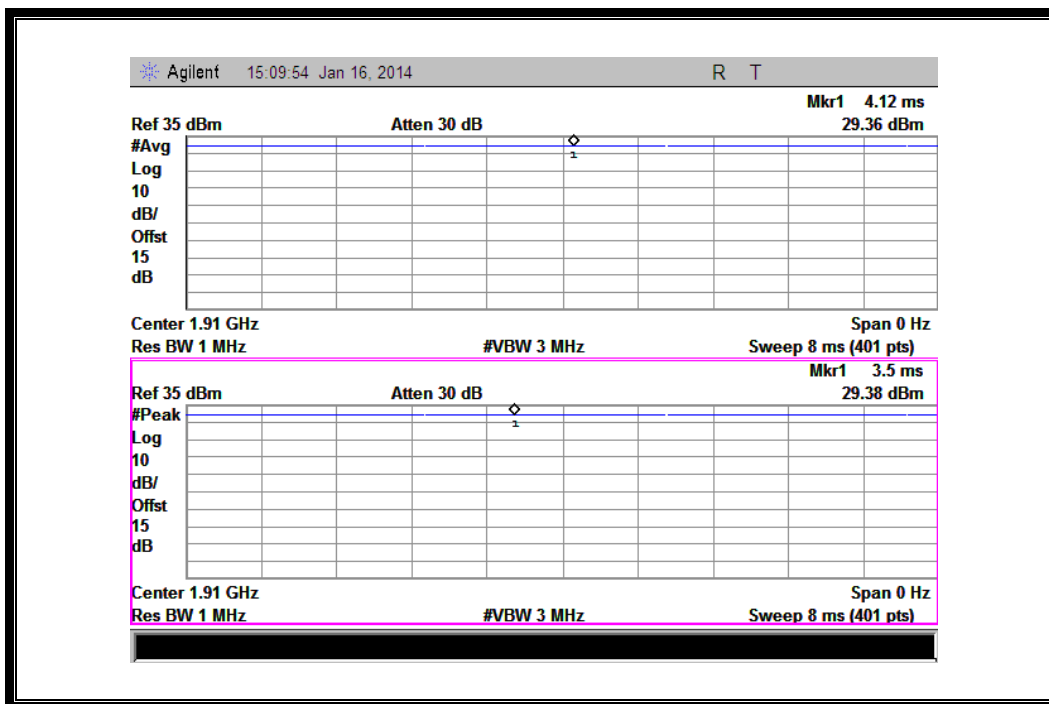
| Band             | Channel | Frequency (MHz) | Peak to Average ratio |               | Limit dBm | Verdict |
|------------------|---------|-----------------|-----------------------|---------------|-----------|---------|
|                  |         |                 | dBm                   | Refer to Plot |           |         |
| GSM<br>1900MHz   | 512     | 1850.2          | 0.02                  | Plot A1 to A3 | 13        | PASS    |
|                  | 661     | 1880.0          | 0.03                  |               |           | PASS    |
|                  | 810     | 1909.8          | 0.02                  |               |           | PASS    |
| EGPRS<br>1900MHz | 512     | 1850.2          | 0.01                  | Plot B1 to B3 | 13        | PASS    |
|                  | 661     | 1880.0          | 0.03                  |               |           | PASS    |
|                  | 810     | 1909.8          | 0.02                  |               |           | PASS    |
| WCDMA<br>1900MHz | 9262    | 1852.4          | 3.28                  | Plot C1 to C3 | 13        | PASS    |
|                  | 9400    | 1880            | 3.25                  |               |           | PASS    |
|                  | 9538    | 1907.6          | 3.23                  |               |           | PASS    |



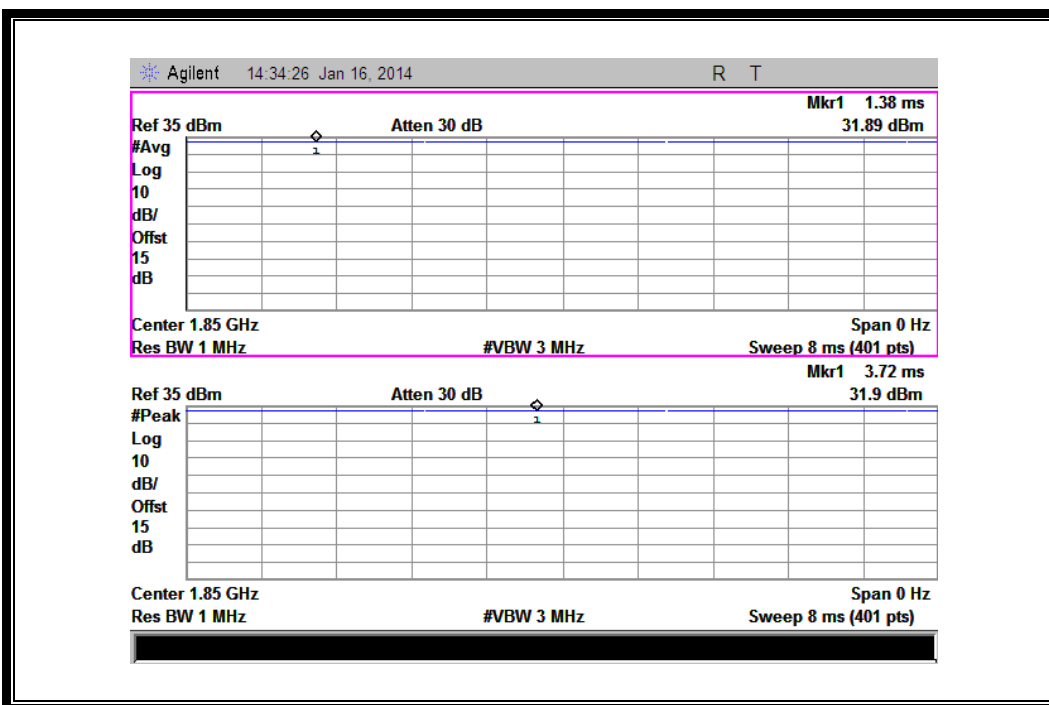
(Plot A1:GSM 1900 MHz Channel = 512)



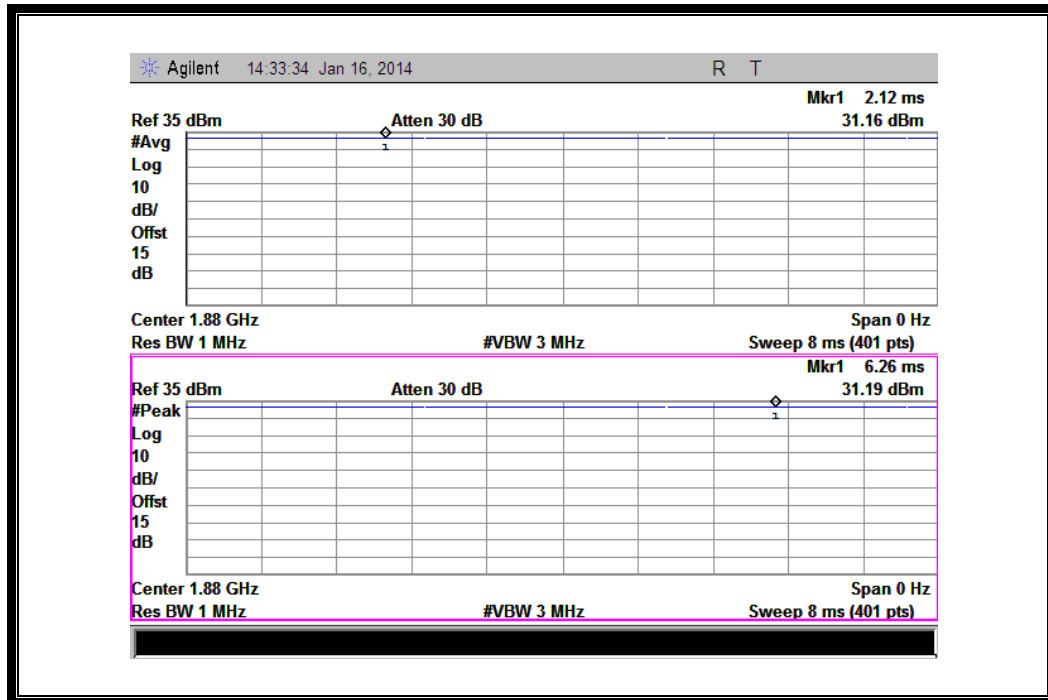
(Plot A2:GSM 1900 MHz Channel = 661)



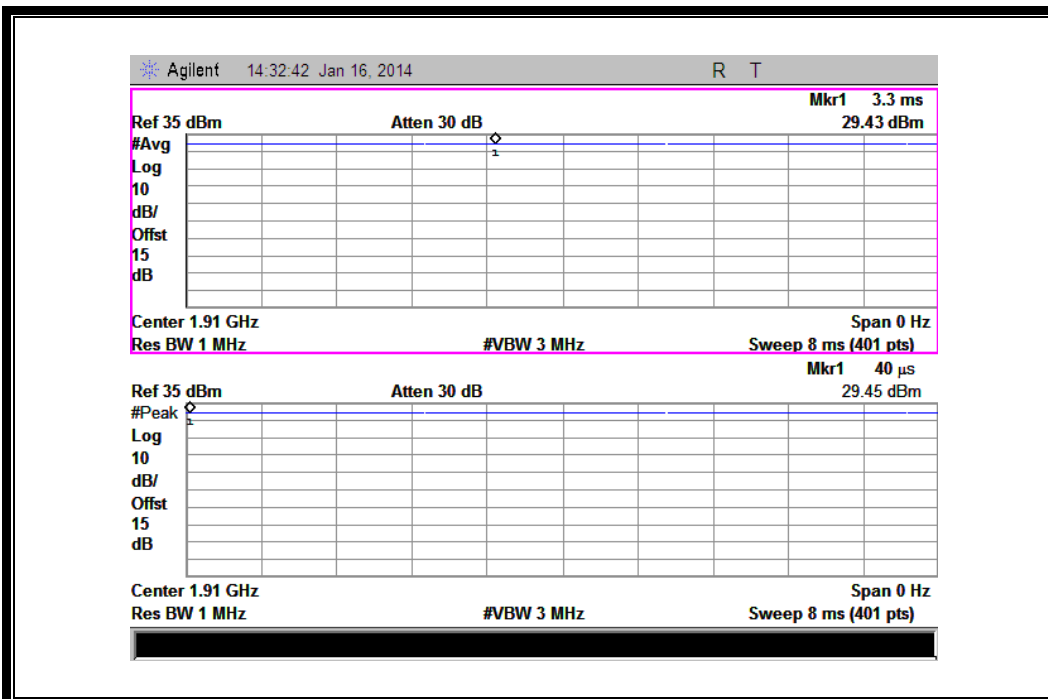
(Plot A3:GSM 1900MHz Channel = 810)



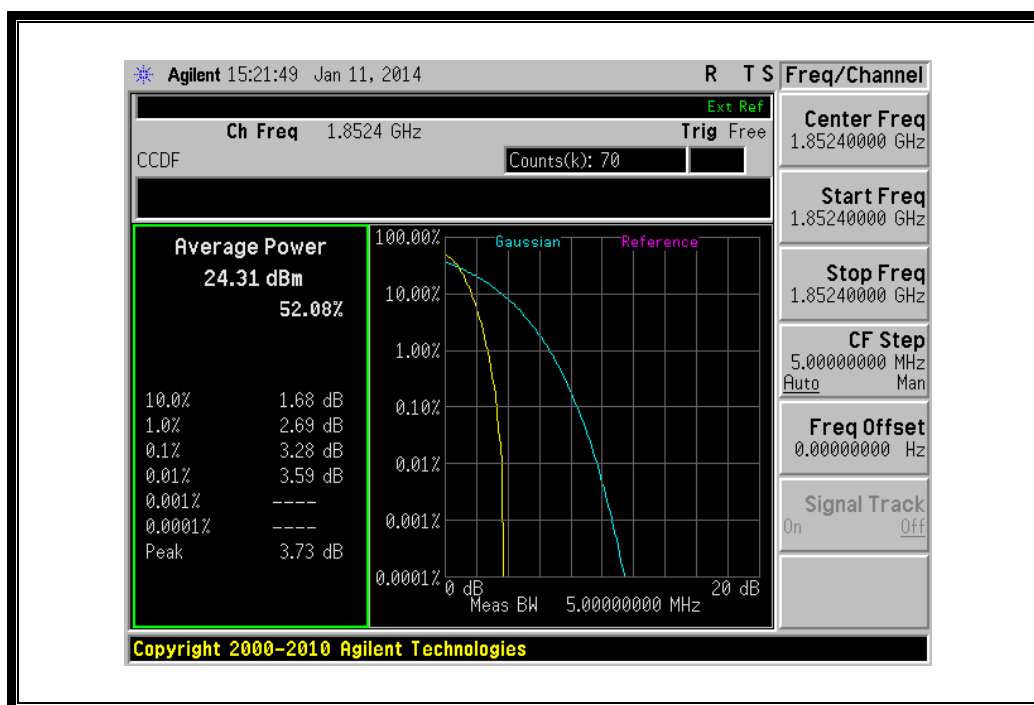
(Plot B1: EGPRS 1900MHz Channel = 512)



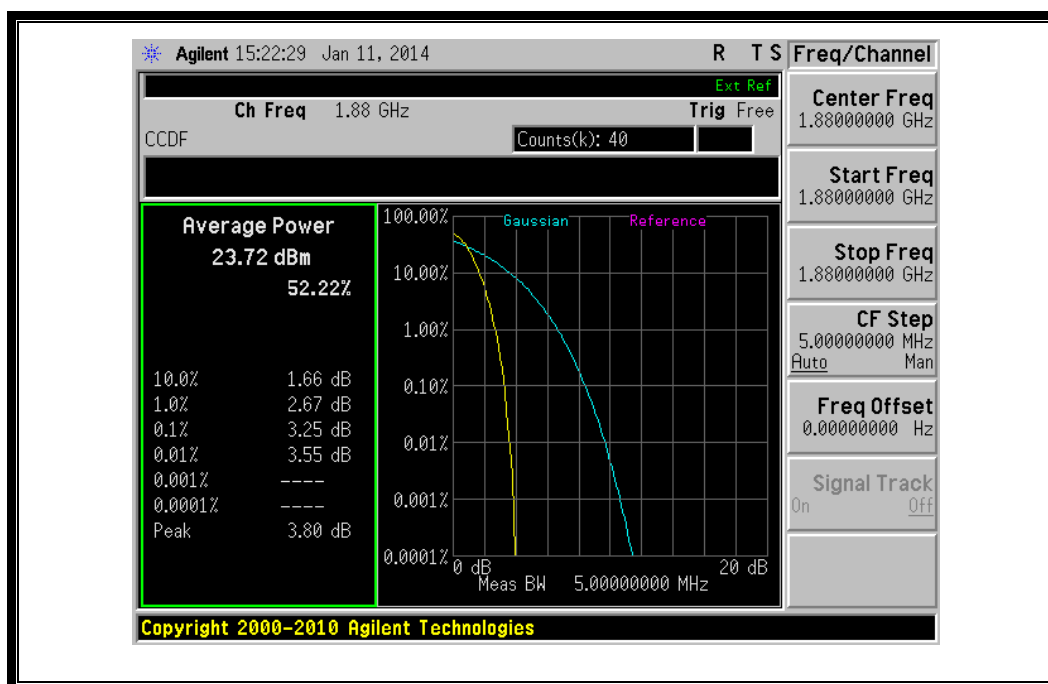
(Plot B2: EGPRS 1900MHz Channel = 661)



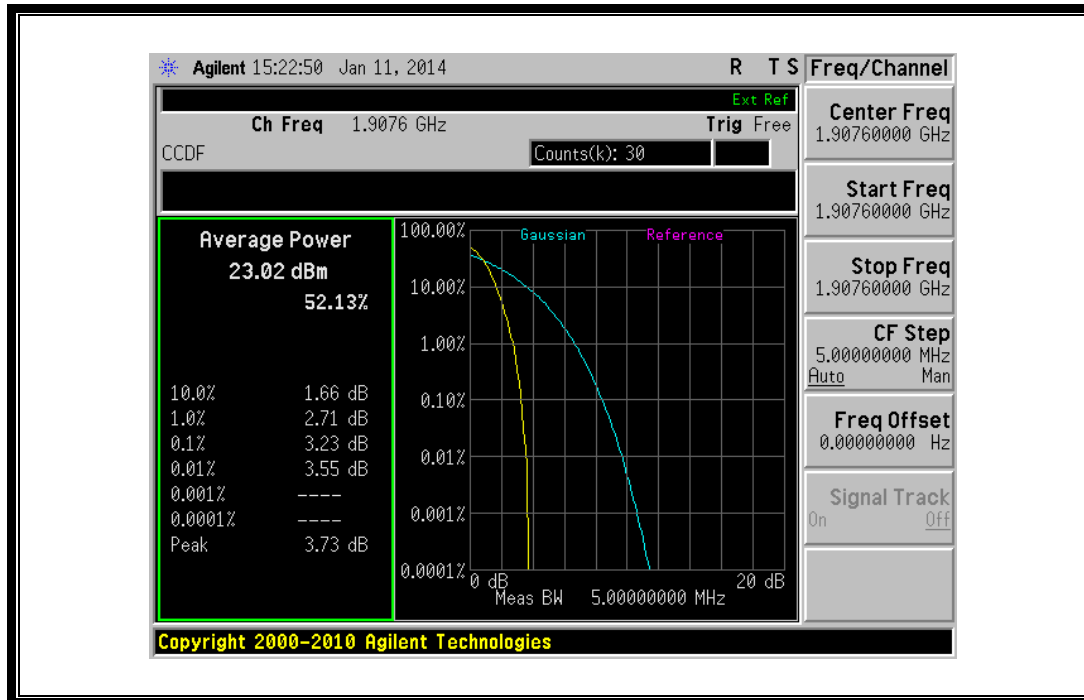
(Plot B3: EGPRS 1900MHz Channel = 810)



(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

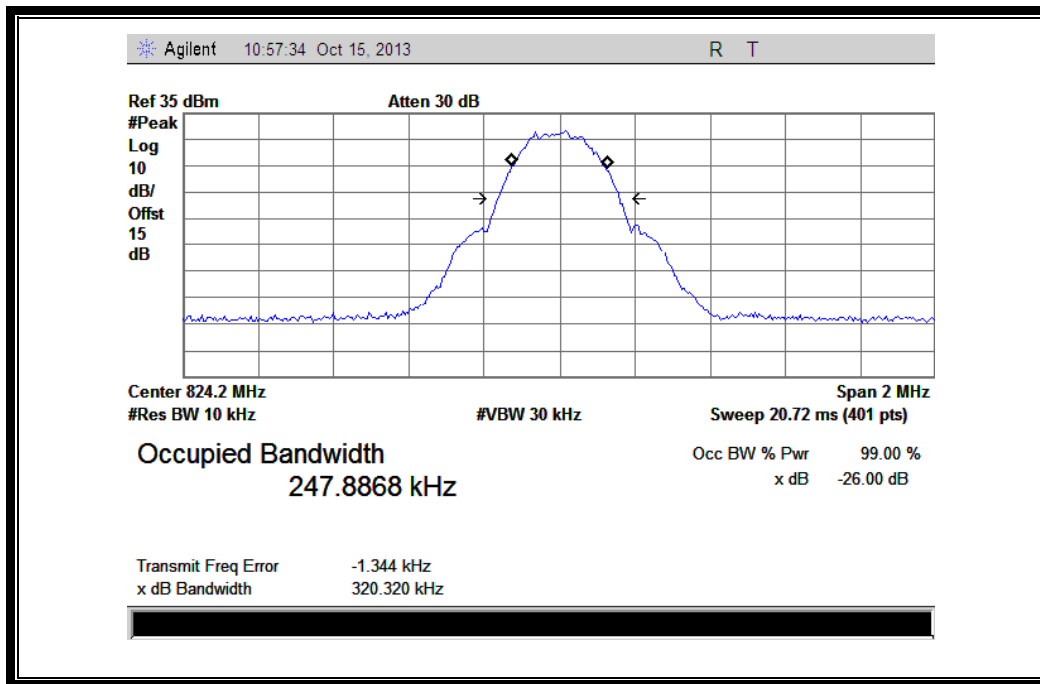
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

#### 2. Test Verdict:

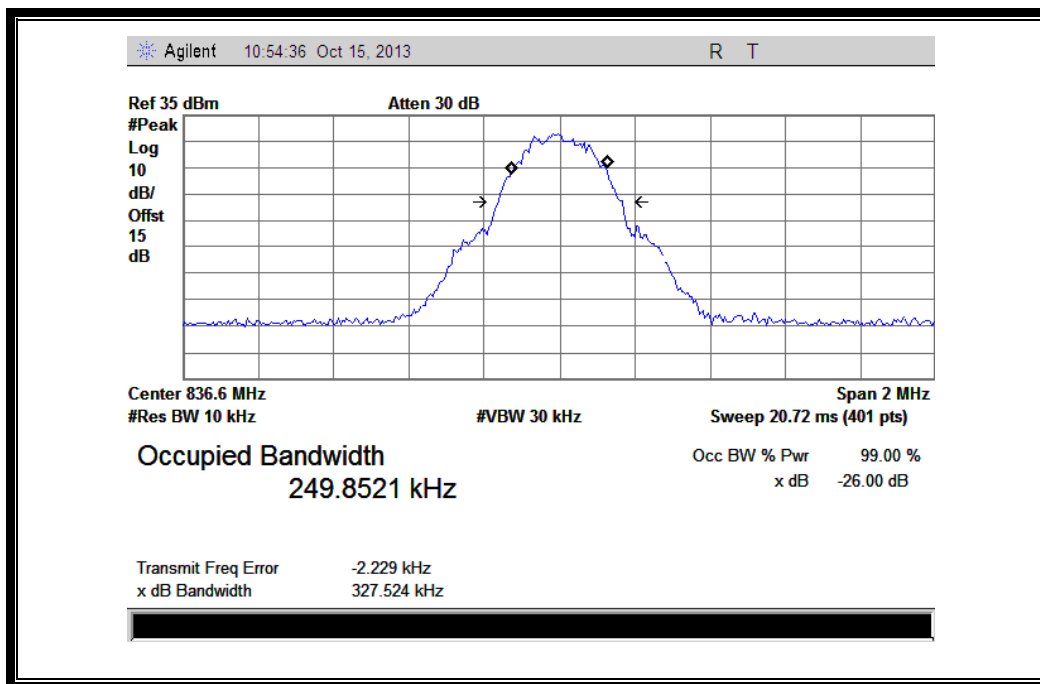
| Band          | Channel | Frequency (MHz) | 26dB bandwidth | 99% Occupied Bandwidth | Refer to Plot |
|---------------|---------|-----------------|----------------|------------------------|---------------|
| EDGE 850MHz   | 128     | 824.2           | 320.320 KHz    | 247.8868 KHz           | Plot A        |
|               | 190     | 836.6           | 327.524 KHz    | 249.8521 KHz           | Plot B        |
|               | 251     | 848.8           | 325.753 KHz    | 246.4210 KHz           | Plot C        |
| EDGE 1900MHz  | 512     | 1850.2          | 315.023 KHz    | 246.4745 KHz           | Plot D        |
|               | 661     | 1880.0          | 310.982 KHz    | 242.9841 KHz           | Plot E        |
|               | 810     | 1909.8          | 315.153 KHz    | 242.1221 KHz           | Plot F        |
| WCDMA 850MHz  | 4132    | 826.4           | 4.654 MHz      | 4.1799 MHz             | Plot G        |
|               | 4175    | 835             | 4.630 MHz      | 4.1860 MHz             | Plot H        |
|               | 4233    | 846.6           | 4.654 MHz      | 4.1684 MHz             | Plot I        |
| WCDMA 1900MHz | 9262    | 1852.4          | 4.659 MHz      | 4.1654 MHz             | Plot J        |
|               | 9400    | 1880            | 4.656 MHz      | 4.1892 MHz             | Plot K        |
|               | 9538    | 1907.6          | 4.669 MHz      | 4.1617 MHz             | Plot L        |
| HSDPA 850MHz  | 4132    | 826.4           | 4.669 MHz      | 4.1902 MHz             | Plot M        |
|               | 4175    | 835             | 4.674 MHz      | 4.1714 MHz             | Plot N        |
|               | 4233    | 846.6           | 4.640 MHz      | 4.1878 MHz             | Plot O        |
| HSDPA 1900MHz | 9262    | 1852.4          | 4.624 MHz      | 4.1624 MHz             | Plot P        |
|               | 9400    | 1880            | 4.656 MHz      | 4.1817 MHz             | Plot Q        |
|               | 9538    | 1907.6          | 4.671 MHz      | 4.1843 MHz             | Plot R        |
| HSUPA 850MHz  | 4132    | 826.4           | 4.657 MHz      | 4.1772 MHz             | Plot S        |
|               | 4175    | 835             | 4.668 MHz      | 4.1654 MHz             | Plot T        |
|               | 4233    | 846.6           | 4.670 MHz      | 4.1749 MHz             | Plot U        |
| HSUPA 1900MHz | 9262    | 1852.4          | 4.662 MHz      | 4.1871 MHz             | Plot V        |

| Band         | Channel | Frequency (MHz) | 26dB bandwidth | 99% Occupied Bandwidth | Refer to Plot |
|--------------|---------|-----------------|----------------|------------------------|---------------|
|              | 9400    | 1880            | 4.659 MHz      | 4.2058 MHz             | Plot W        |
|              | 9538    | 1907.6          | 4.657 MHz      | 4.1736 MHz             | Plot X        |
| GSM 850MHz   | 128     | 824.2           | 316.615 KHz    | 244.7246 KHz           | Plot Y        |
|              | 190     | 836.6           | 312.329 KHz    | 246.3391 KHz           | Plot Z        |
|              | 251     | 848.8           | 318.045 KHz    | 251.2502 KHz           | Plot A1       |
| GSM 1900MHz  | 512     | 1850.2          | 326.103 KHz    | 250.0810 KHz           | Plot B1       |
|              | 661     | 1880.0          | 317.192 KHz    | 249.7498 KHz           | Plot C1       |
|              | 810     | 1909.8          | 319.209 KHz    | 253.6518 KHz           | Plot D1       |
| GPRS 850MHz  | 128     | 824.2           | 325.966 KHz    | 248.0178 KHz           | Plot E1       |
|              | 190     | 836.6           | 311.549 KHz    | 241.6350 KHz           | Plot F1       |
|              | 251     | 848.8           | 312.681 KHz    | 244.9943 KHz           | Plot G1       |
| GPRS 1900MHz | 512     | 1850.2          | 319.940 KHz    | 248.0932 KHz           | Plot H1       |
|              | 661     | 1880.0          | 314.152 KHz    | 246.2721 KHz           | Plot I2       |
|              | 810     | 1909.8          | 325.010 KHz    | 255.3154 KHz           | Plot J2       |

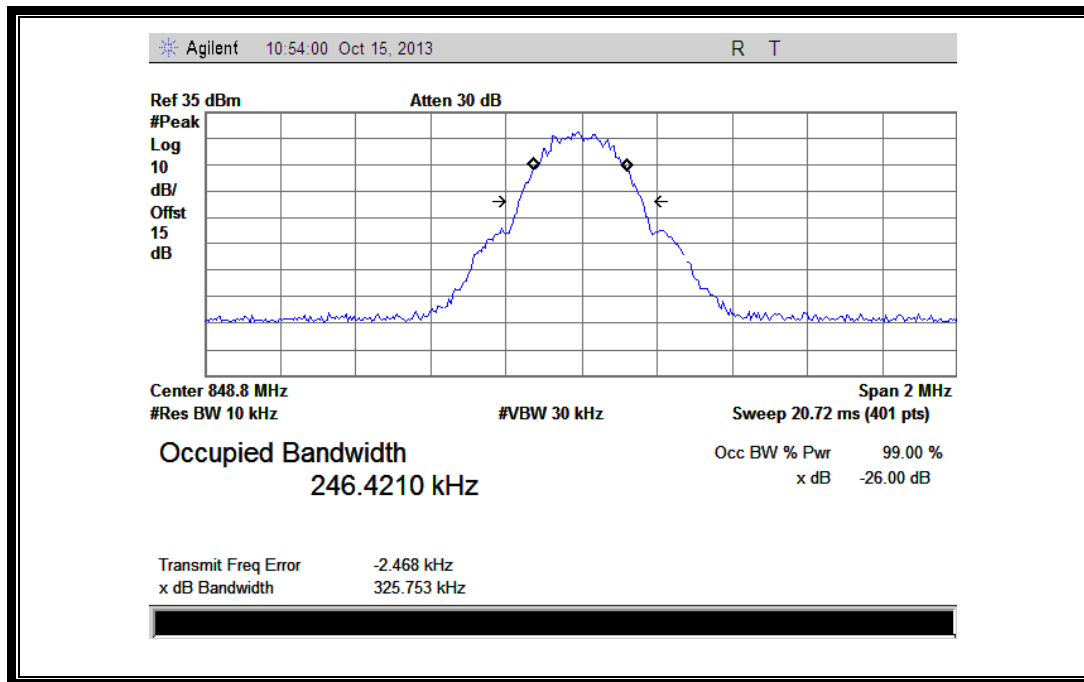
### 3. Test Plots:



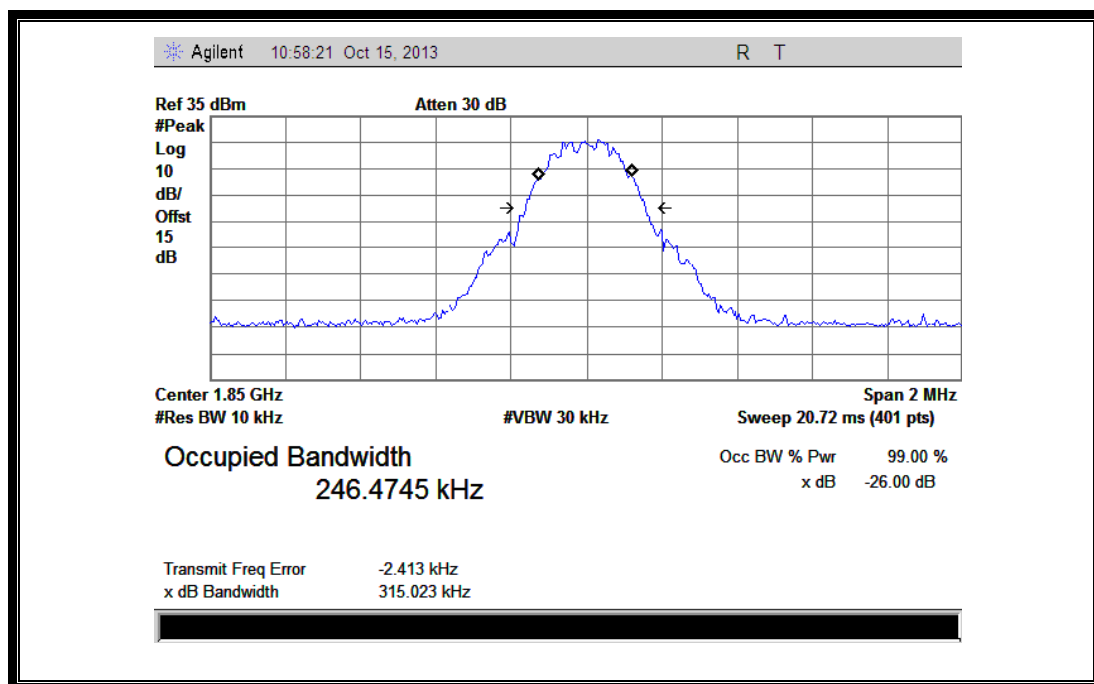
(Plot A: EGPRS 850MHz Channel = 128)



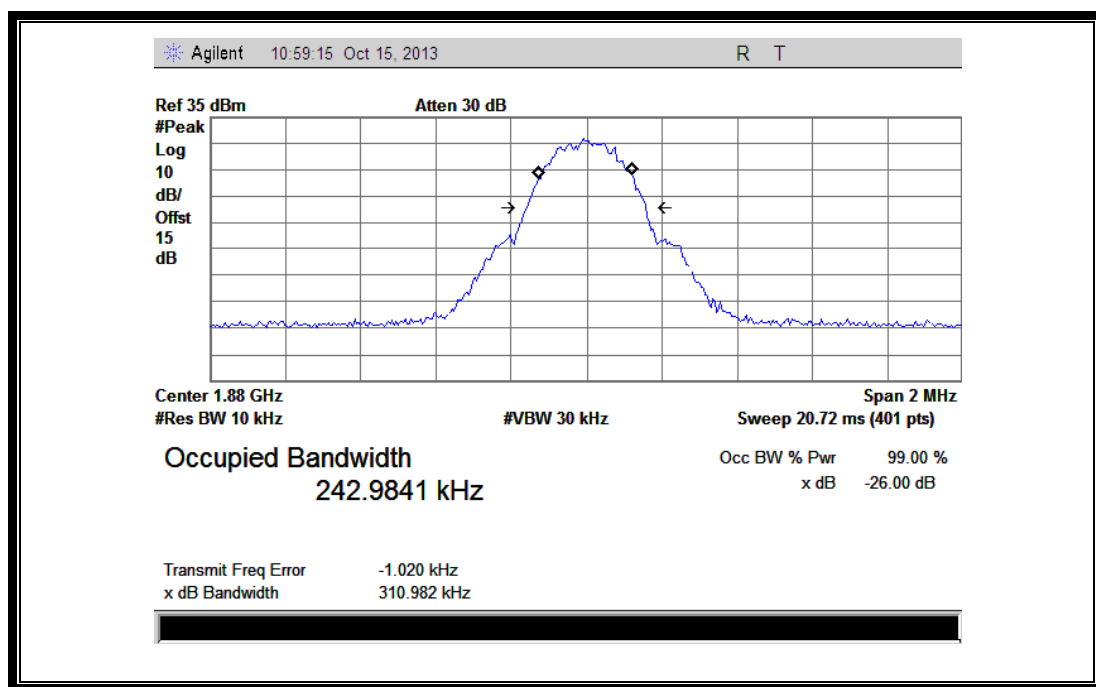
(Plot B: EGPRS 850MHz Channel = 190)



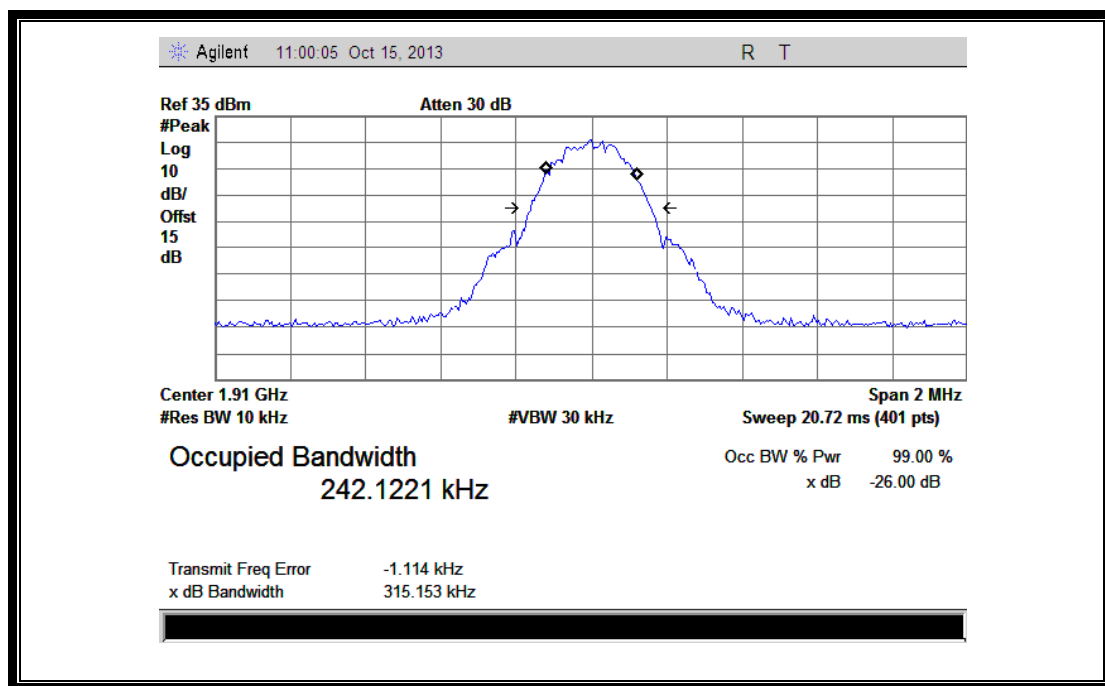
(Plot C: EGPRS 850MHz Channel = 251)



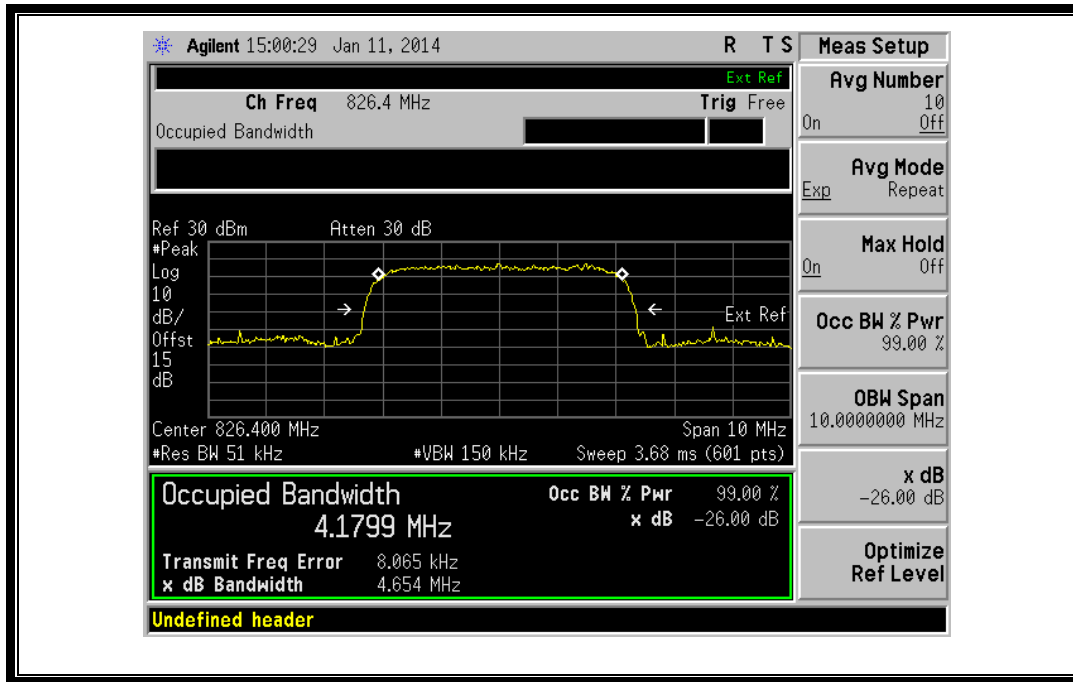
(Plot D: EGPRS1900MHz Channel = 512)



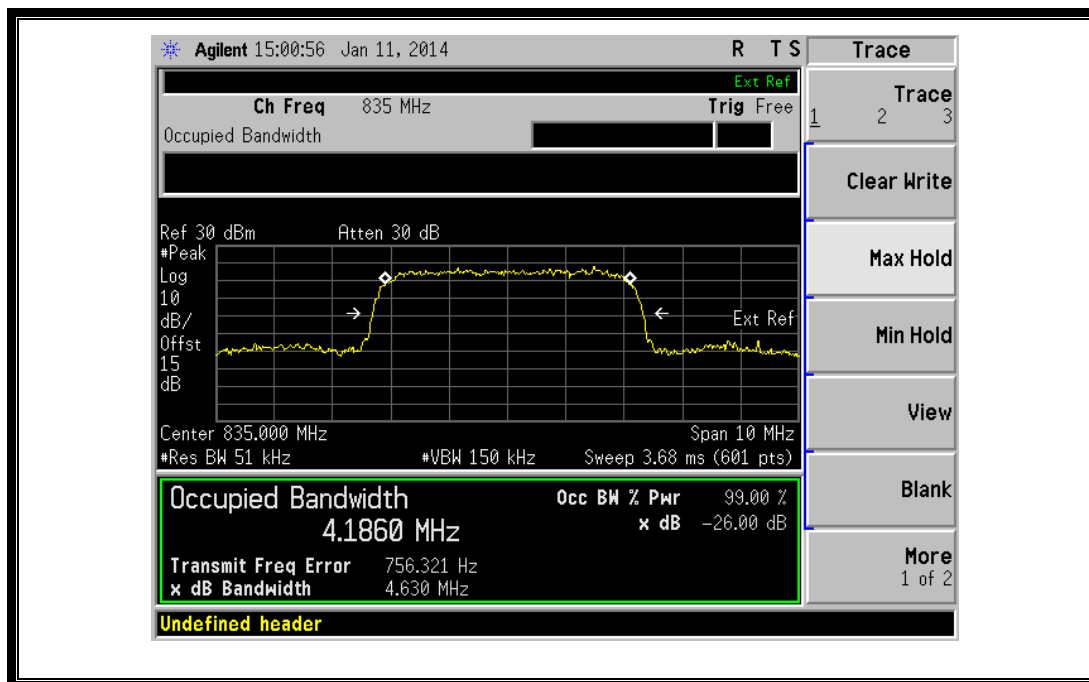
(Plot E: EGPRS1900MHz Channel = 661)



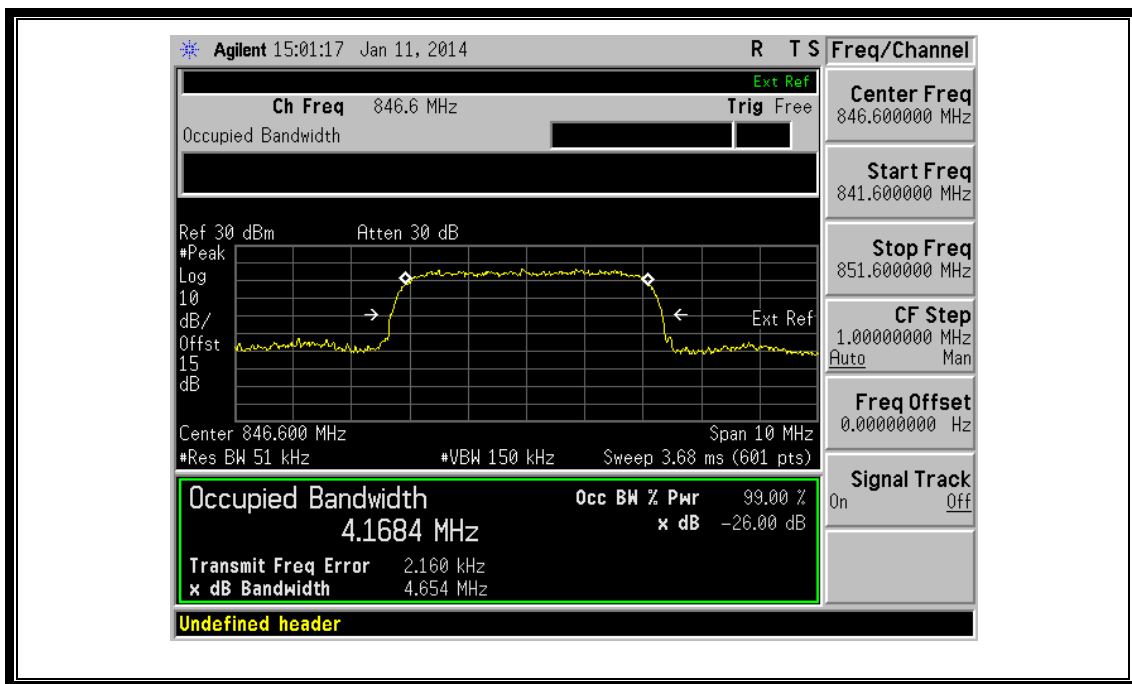
(Plot F: EGPRS 1900MHz Channel = 810)



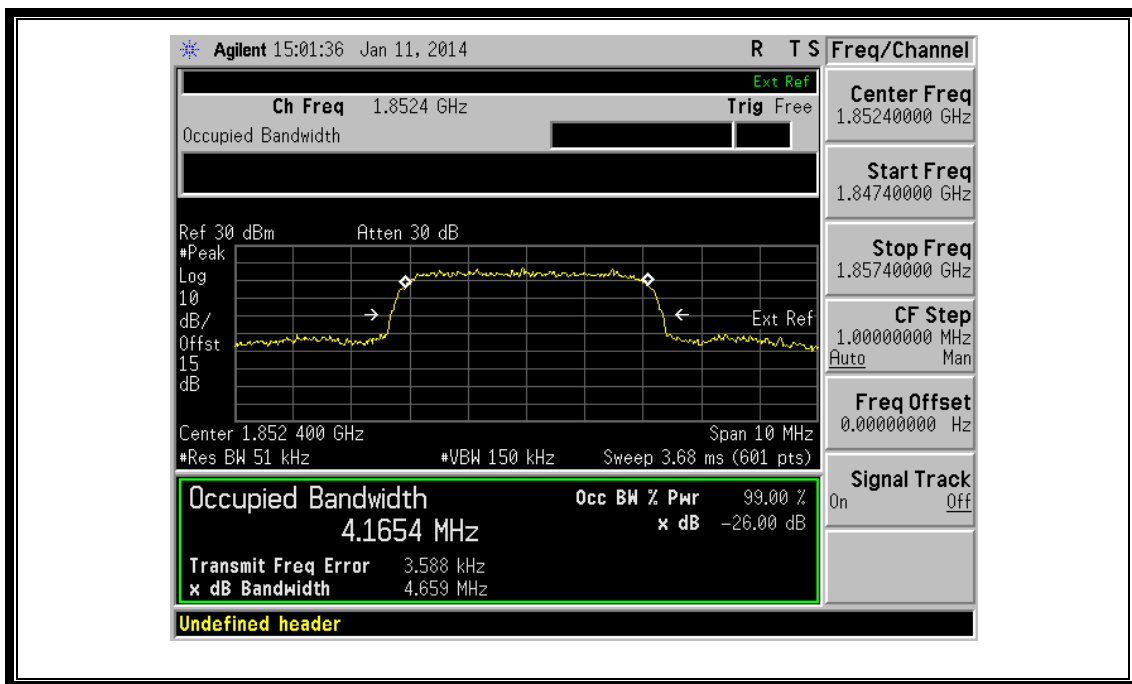
(Plot G: WCDMA 850MHz Channel = 4132)



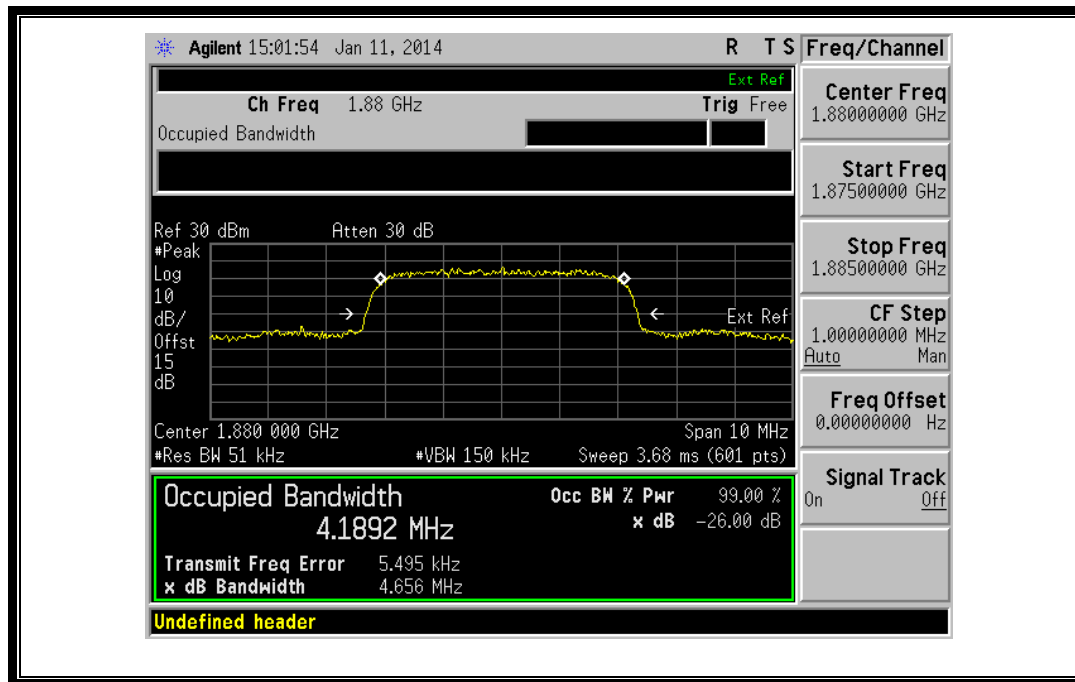
(Plot H: WCDMA 850 MHz Channel = 4175)



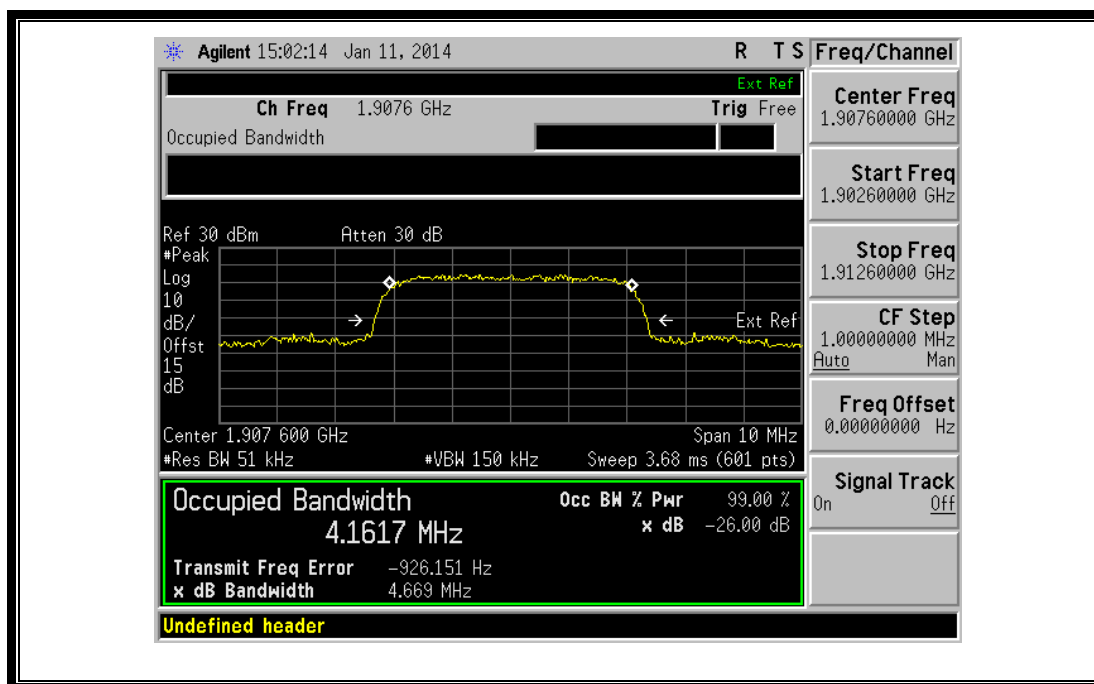
(Plot I: WCDMA 850MHz Channel = 4233)



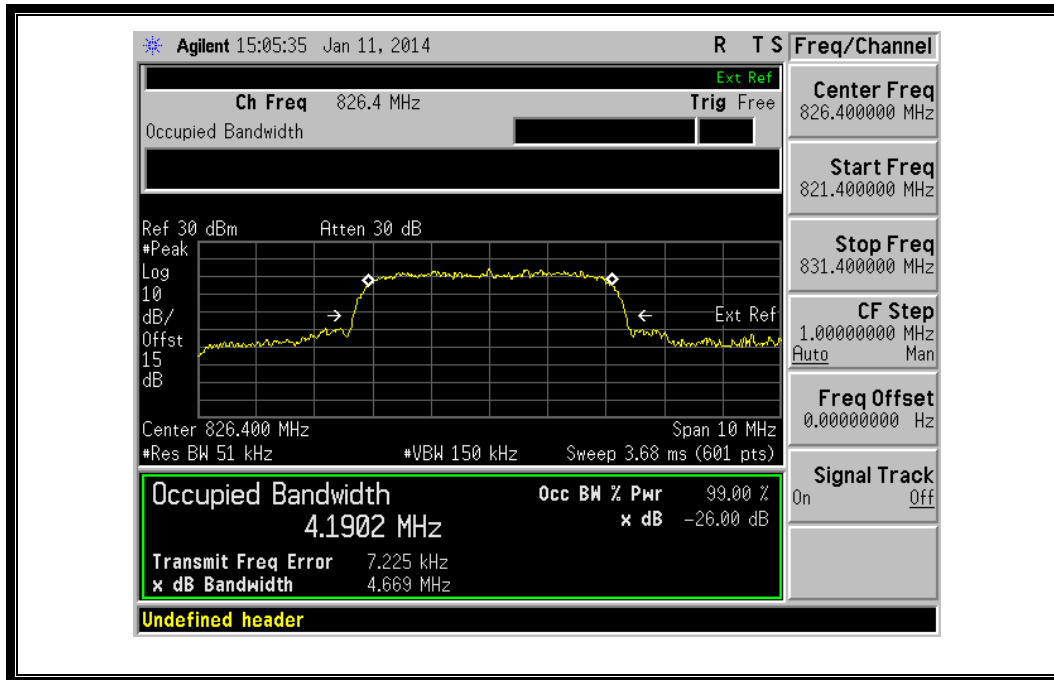
(Plot J: WCDMA 1900MHz Channel = 9262)



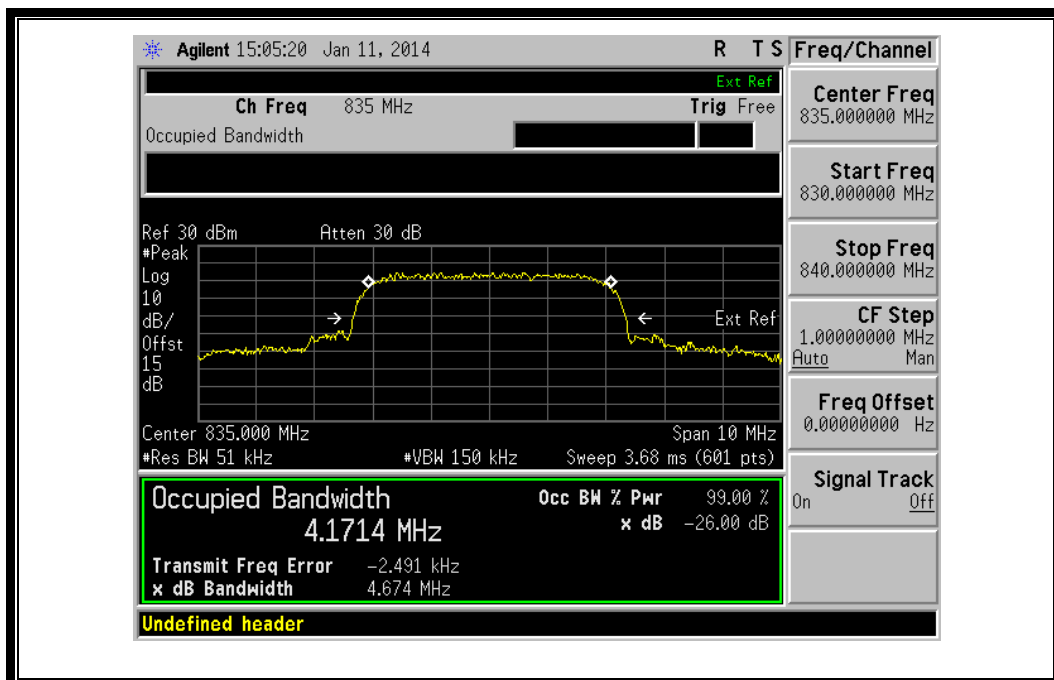
(Plot K: WCDMA 1900 MHz Channel = 9400)



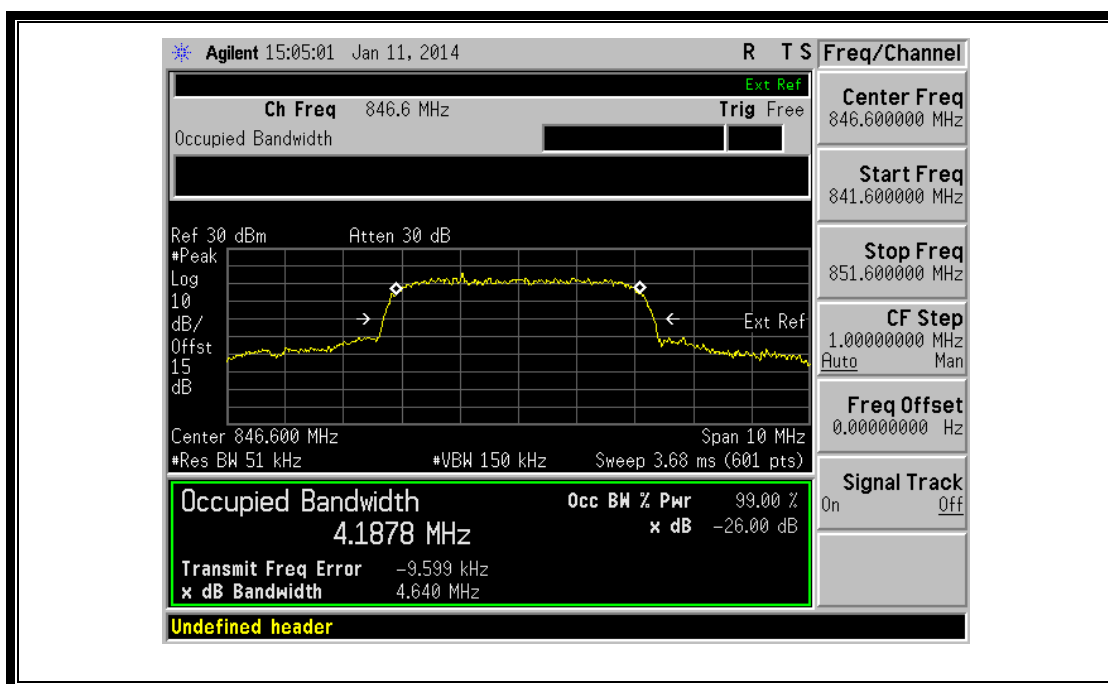
(Plot L: WCDMA1900MHz Channel = 9538)



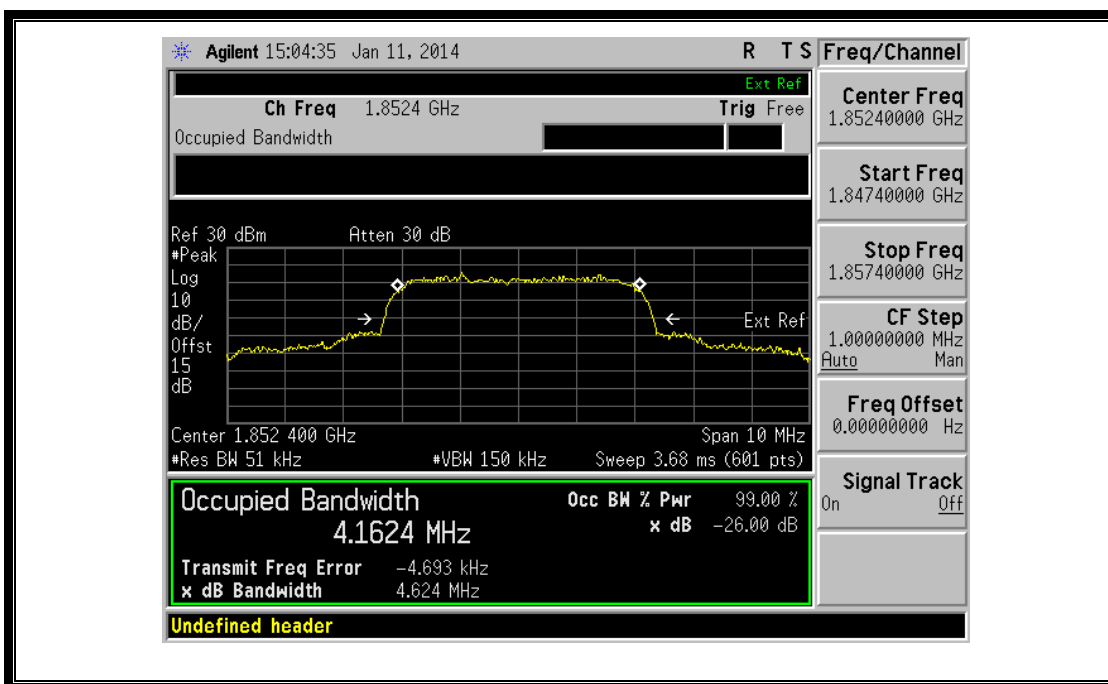
(Plot M: HSDPA 850MHz Channel = 4132)



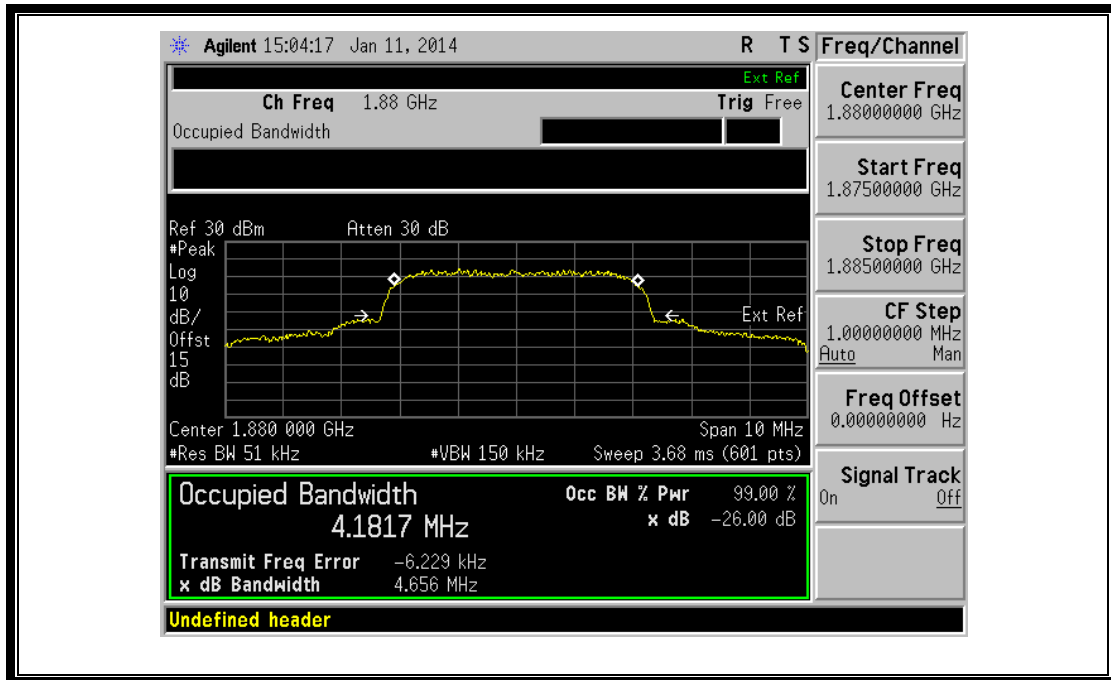
(Plot N: HSDPA850 MHz Channel = 4175)



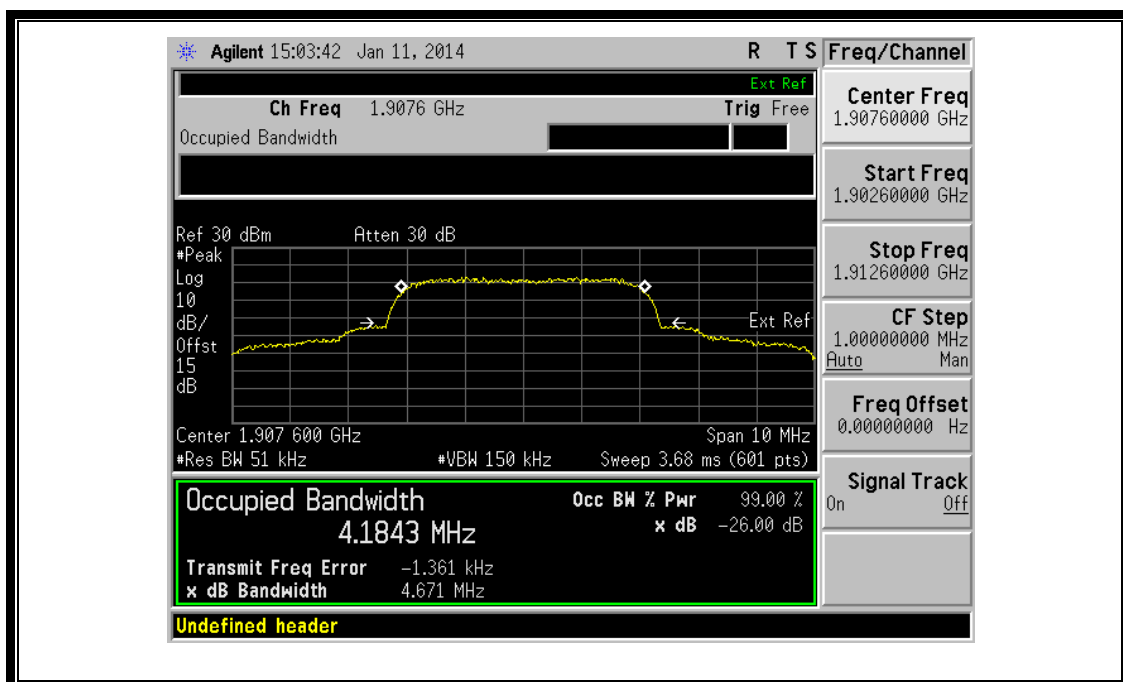
(Plot O: HSDPA 850 MHz Channel = 4233)



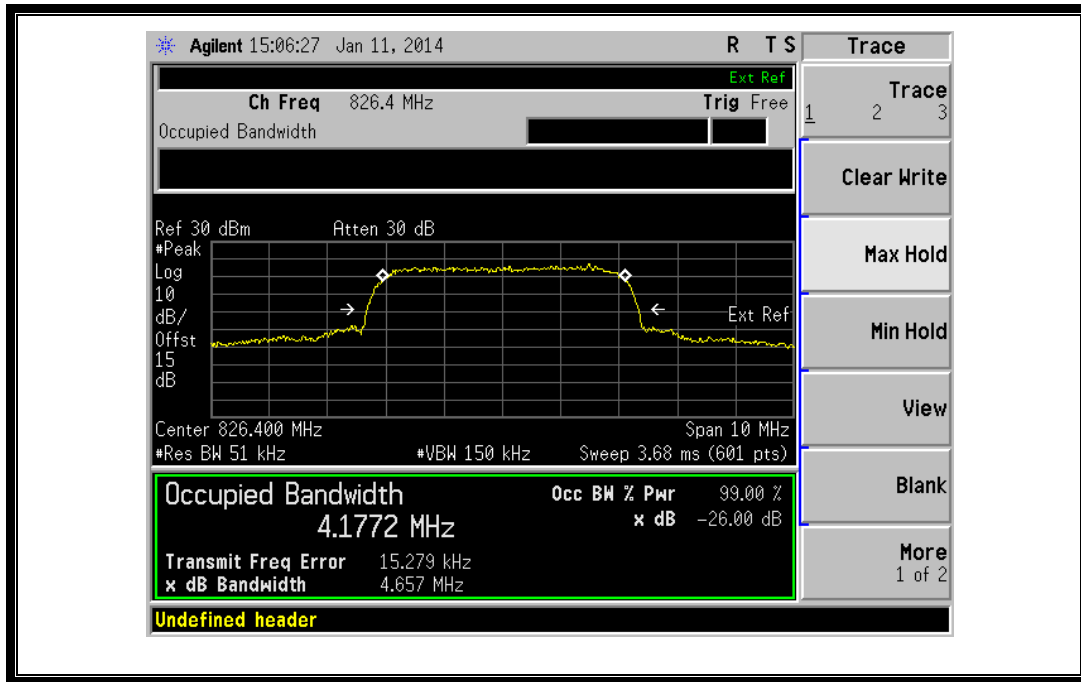
(Plot P: HSDPA1900 MHz Channel = 9262)



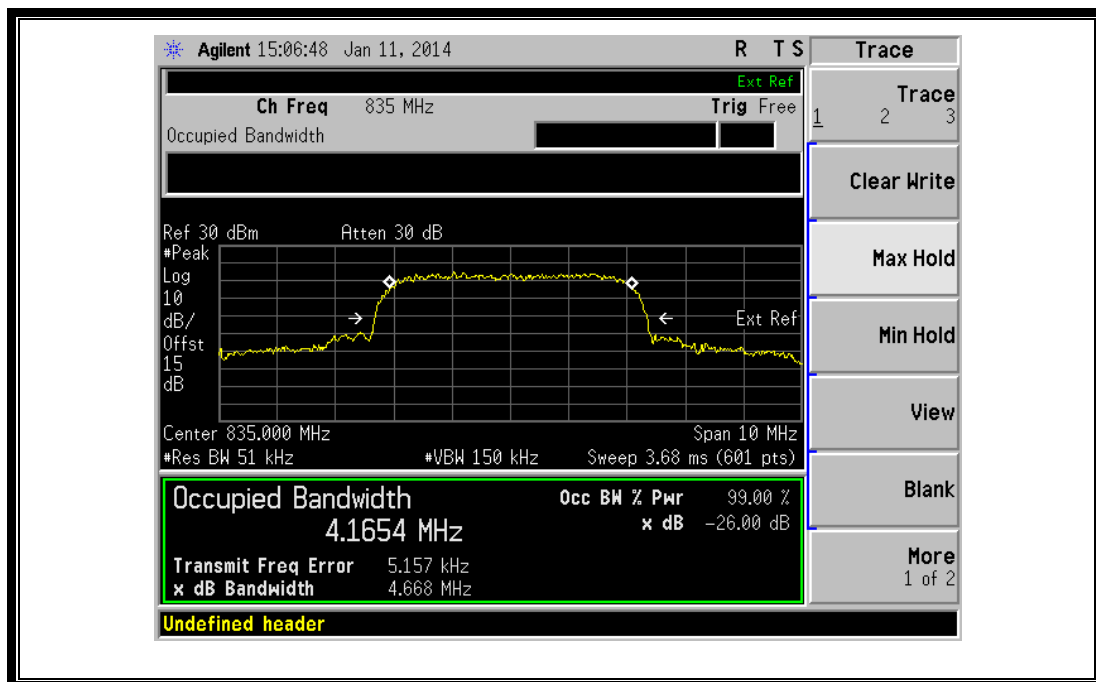
(Plot Q: HSDPA1900 MHz Channel = 9400)



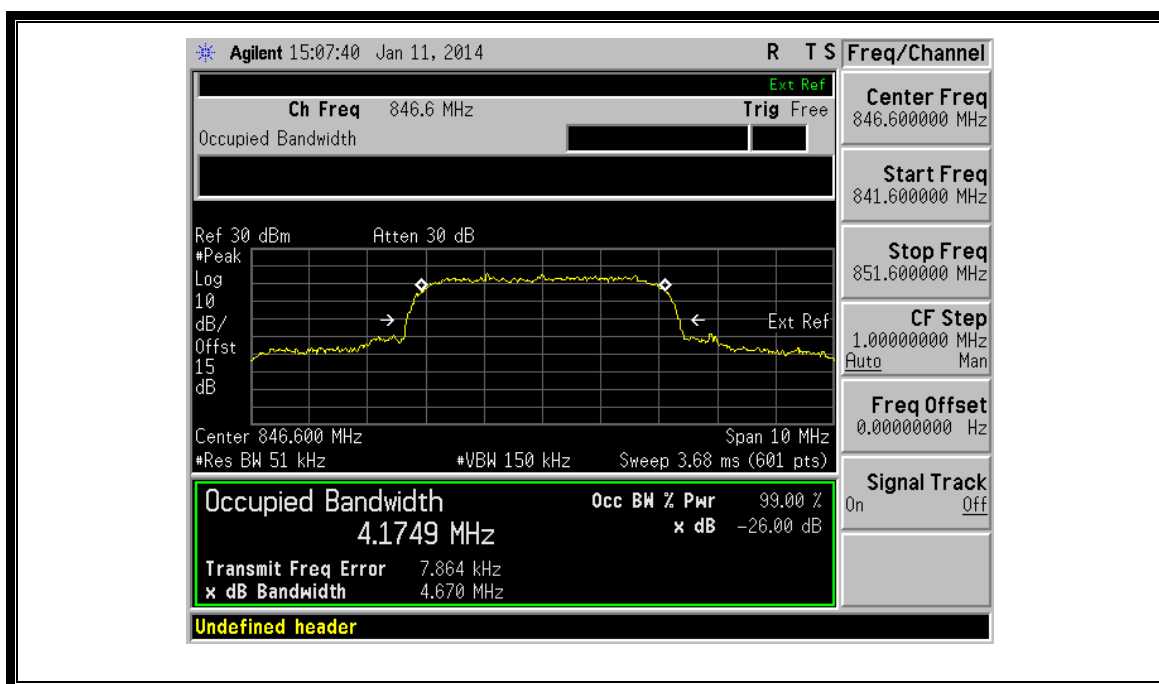
(Plot R: HSDPA 1900 MHz Channel = 9538)



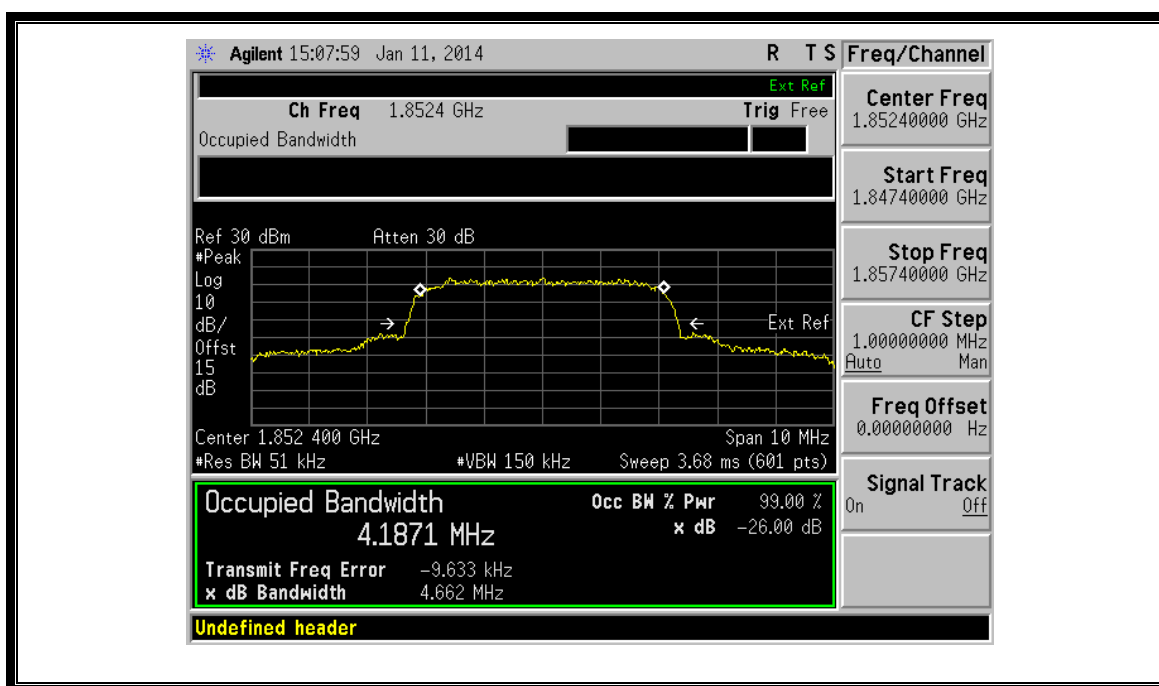
(Plot S: HSUPA850 MHz Channel = 4132)



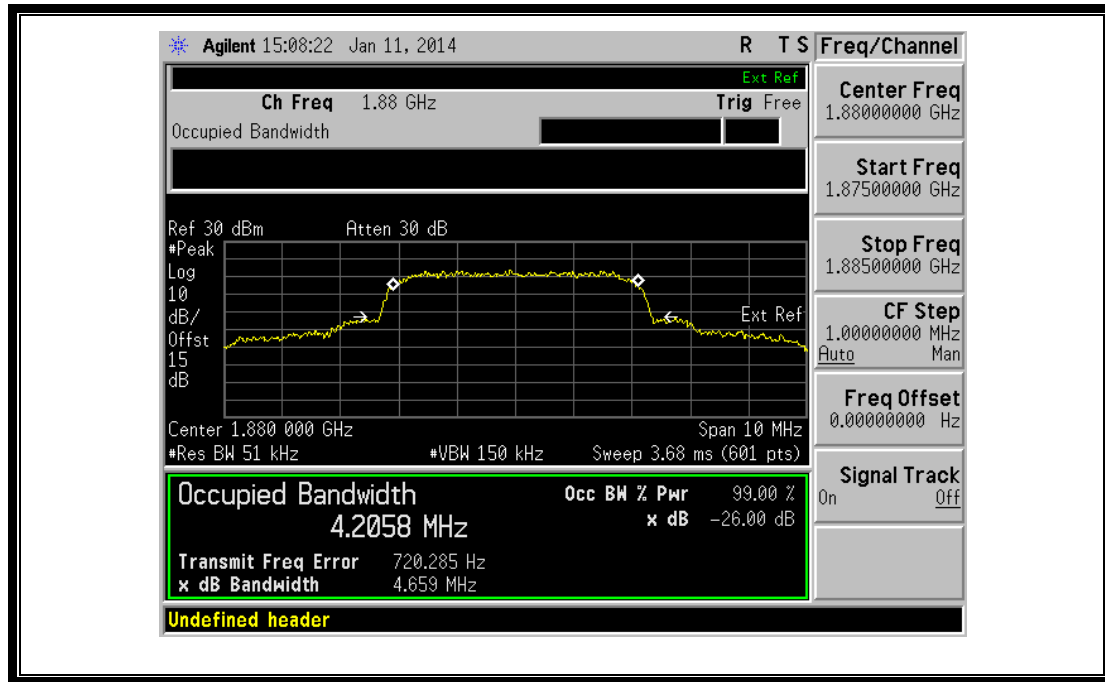
(Plot T: HSUPA850 MHz Channel = 4175)



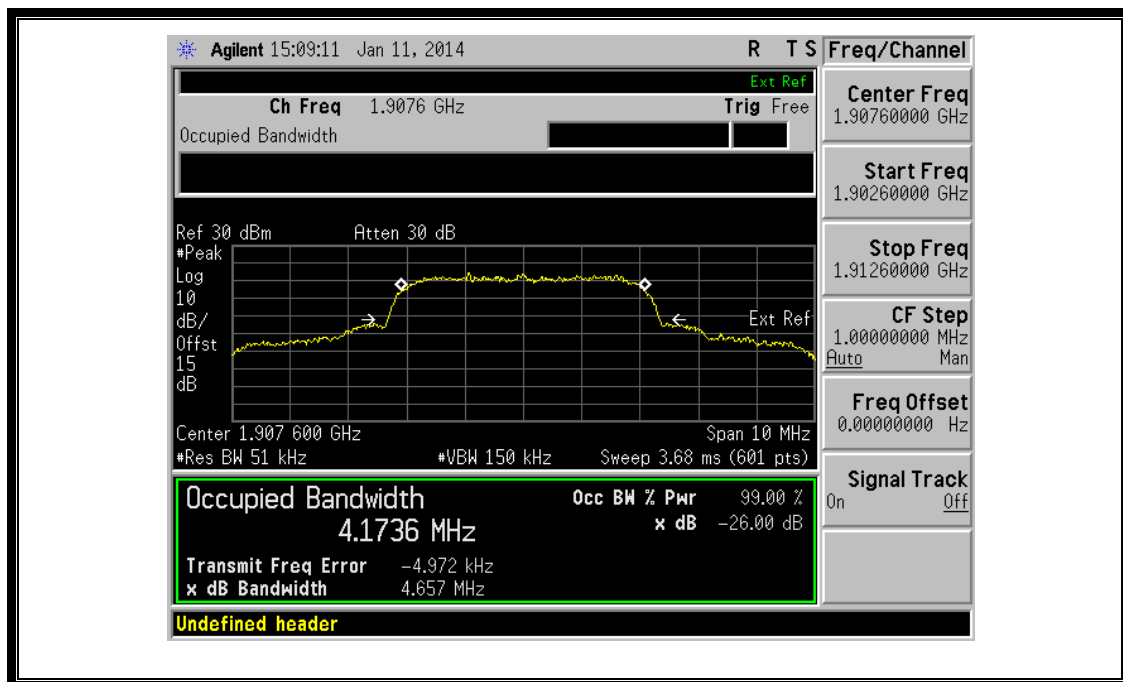
(Plot U: HSUPA850 MHz Channel = 4233)



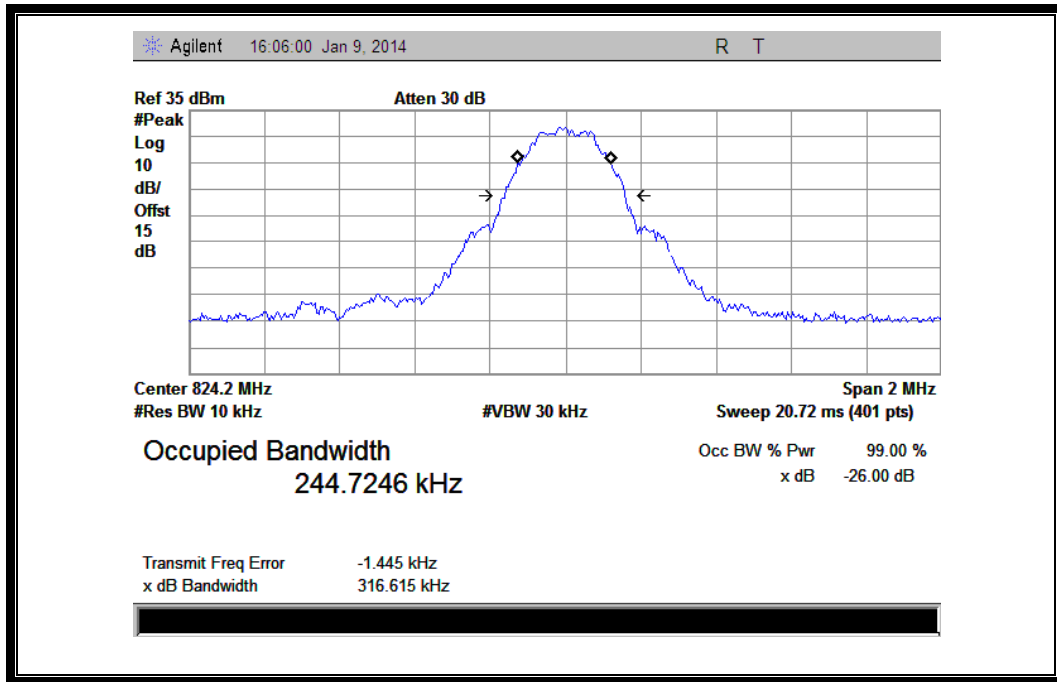
(Plot V: HSUPA1900 MHz Channel = 9262)



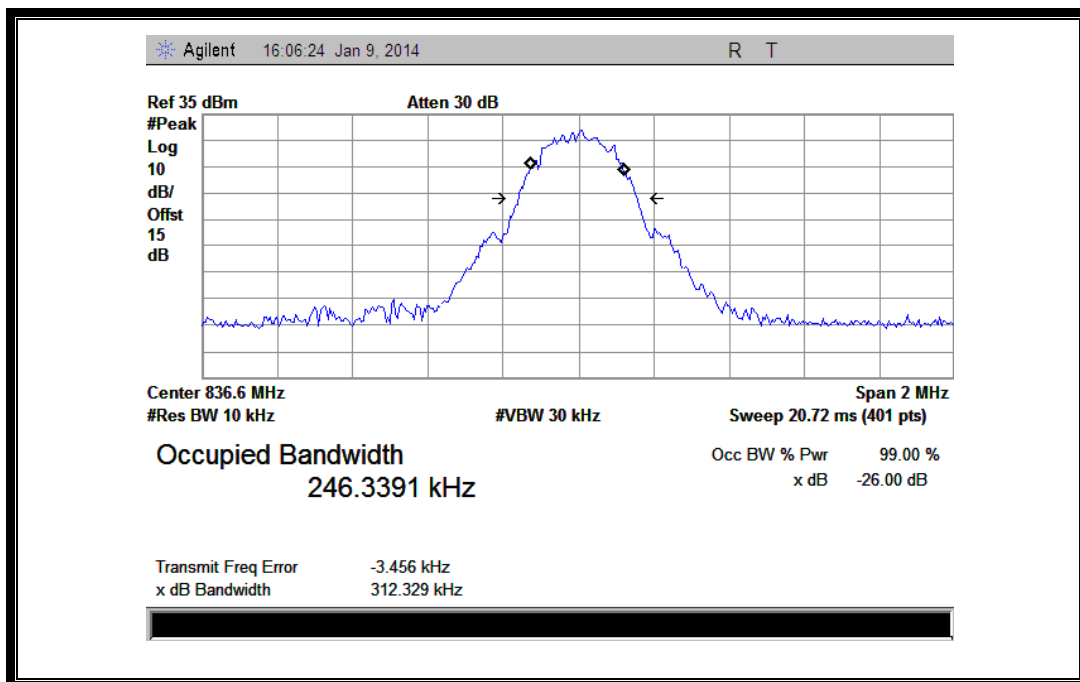
(Plot W: HSUPA1900 MHz Channel = 9400)



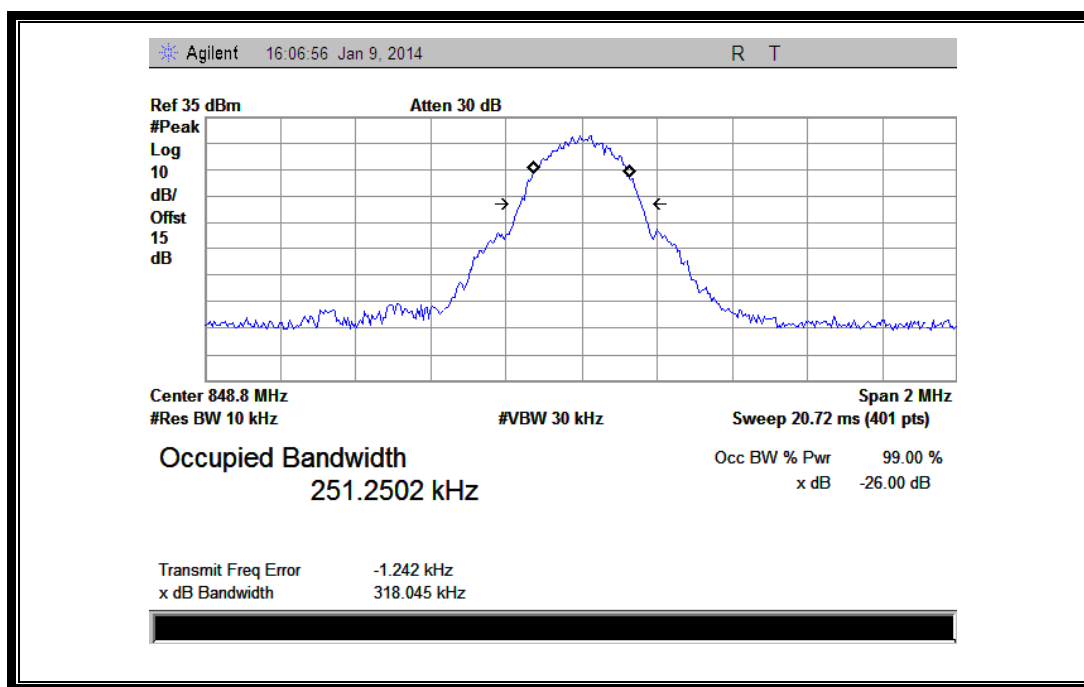
(Plot X: HSUPA1900 MHz Channel = 9538)



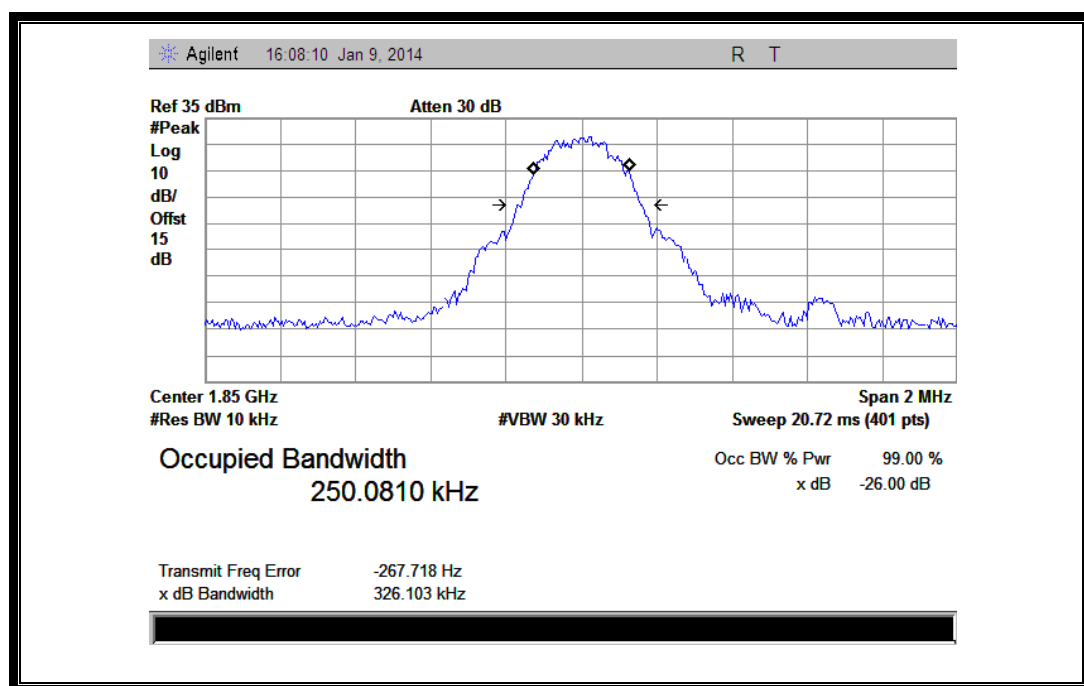
(Plot Y: GSM 850MHz Channel = 128)



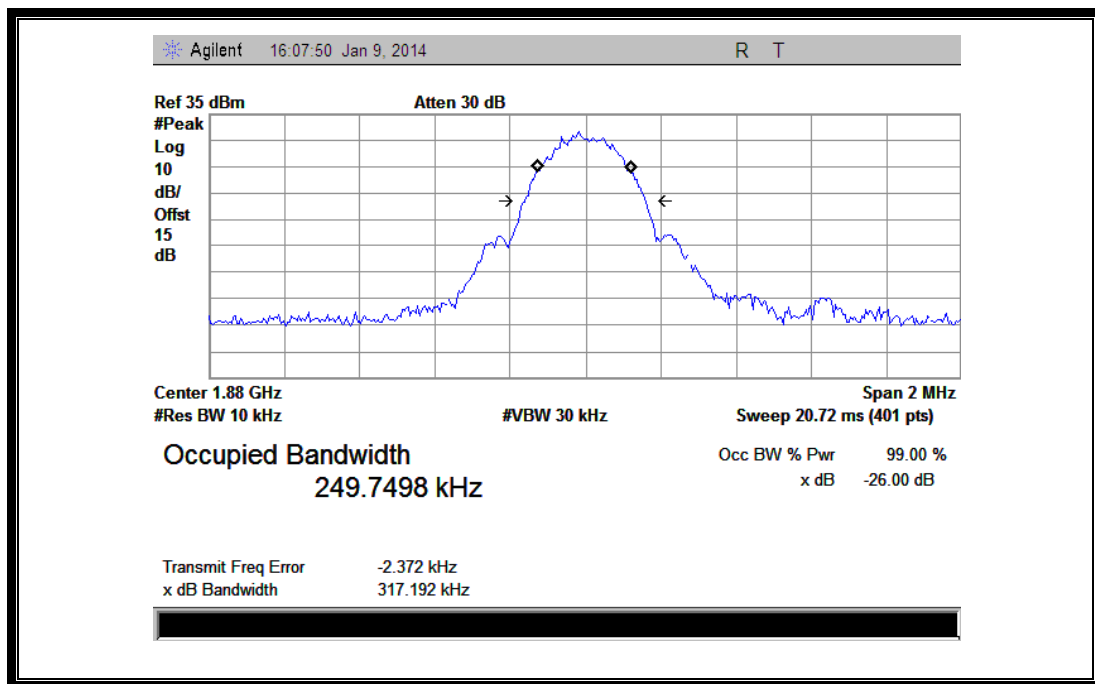
(Plot Z: GSM 850MHz Channel = 190)



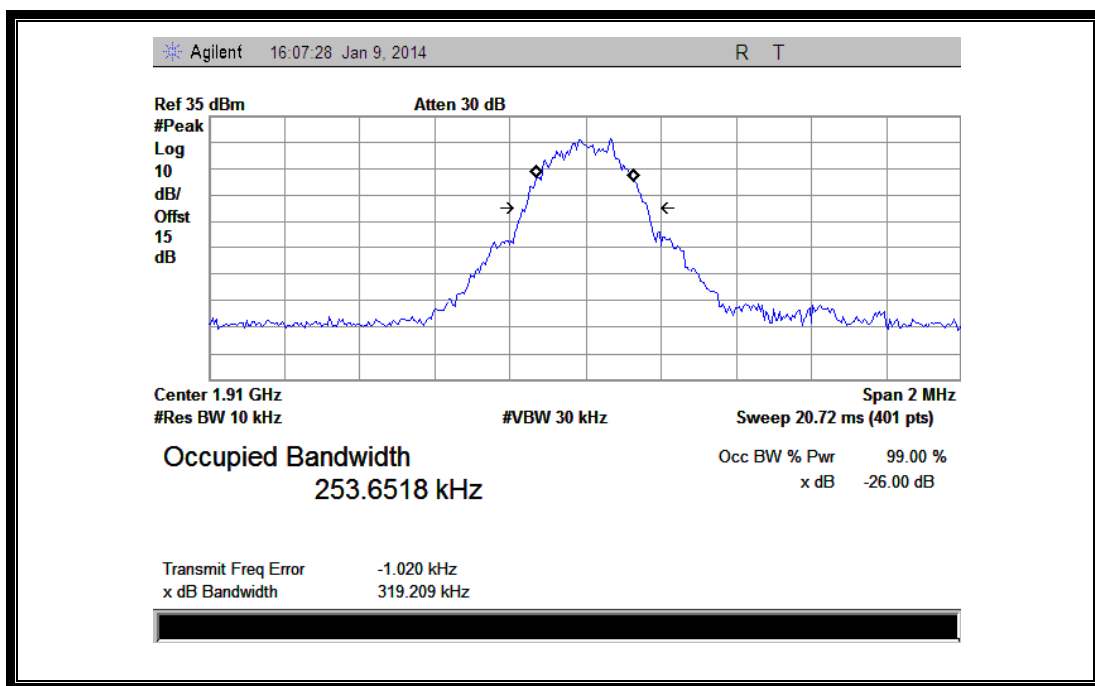
(Plot A1: GSM 850MHz Channel = 251)



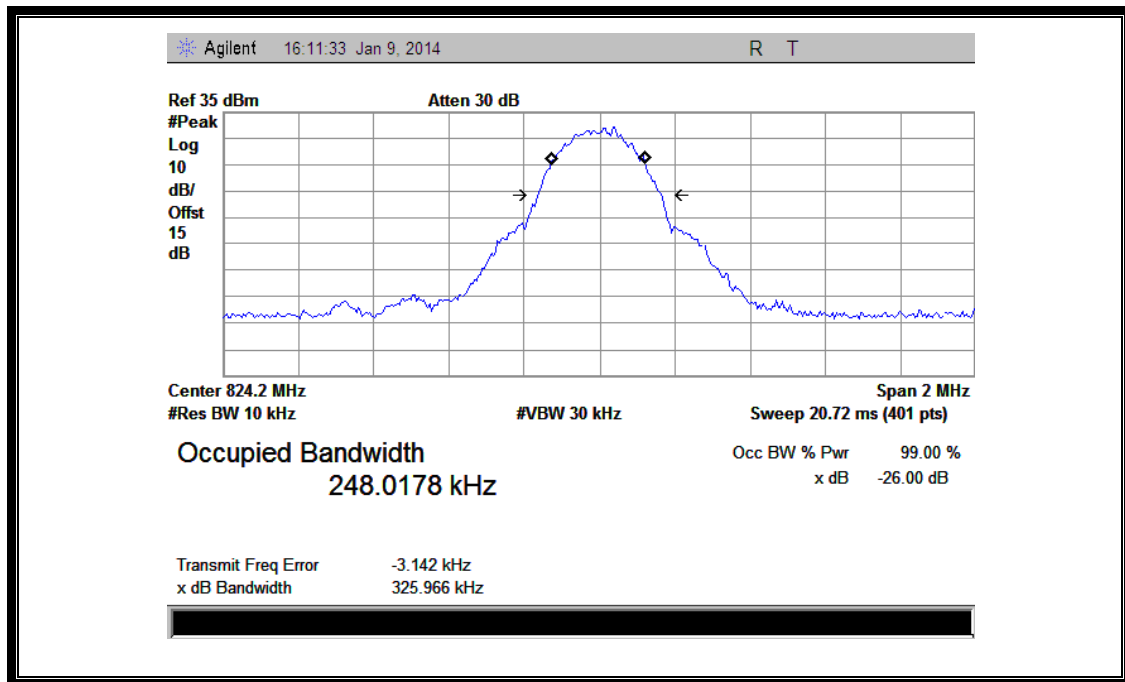
(Plot B1: GSM 1900MHz Channel = 512)



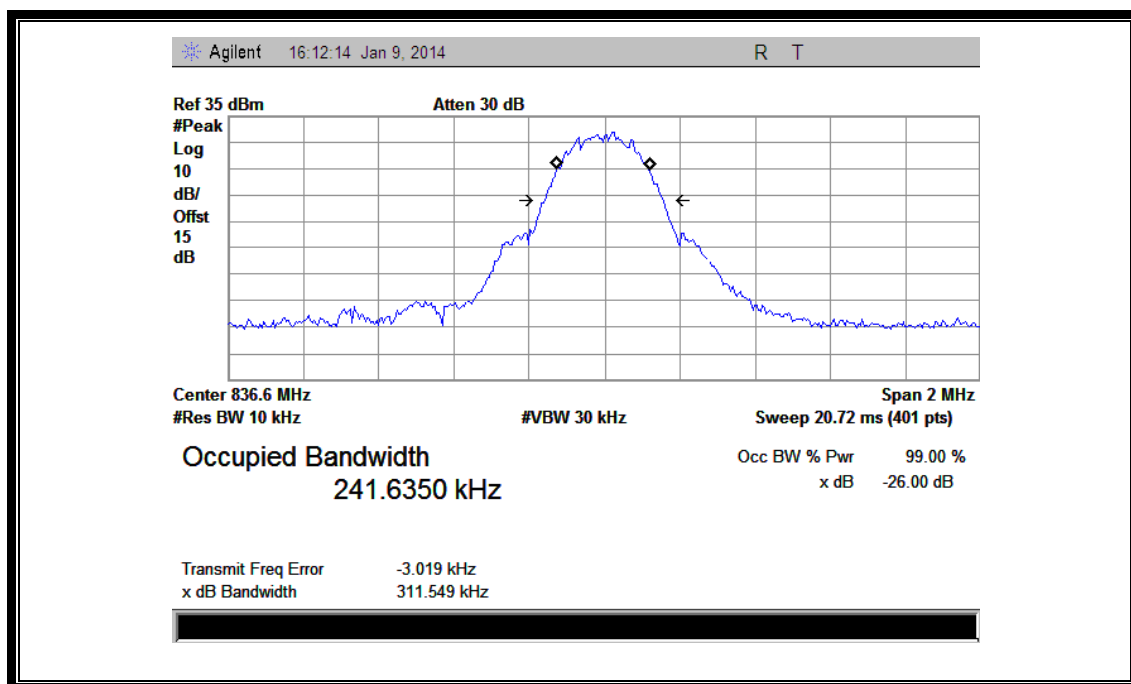
(Plot C1: GSM 1900MHz Channel = 661)



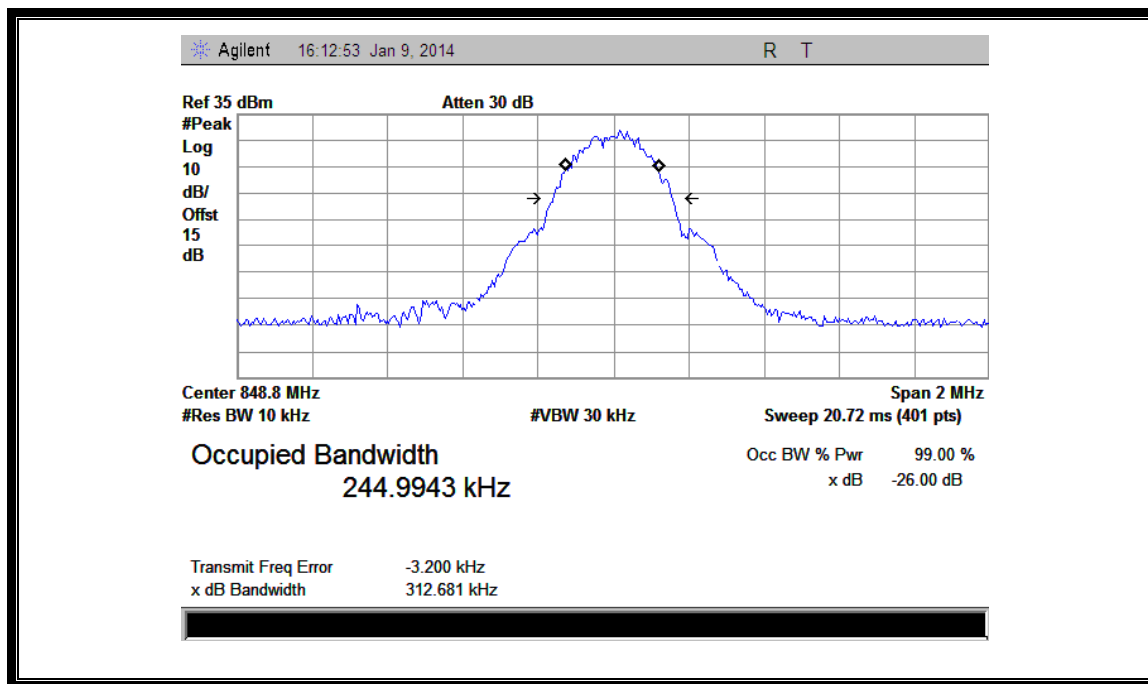
(Plot D1: GSM 1900MHz Channel = 810)



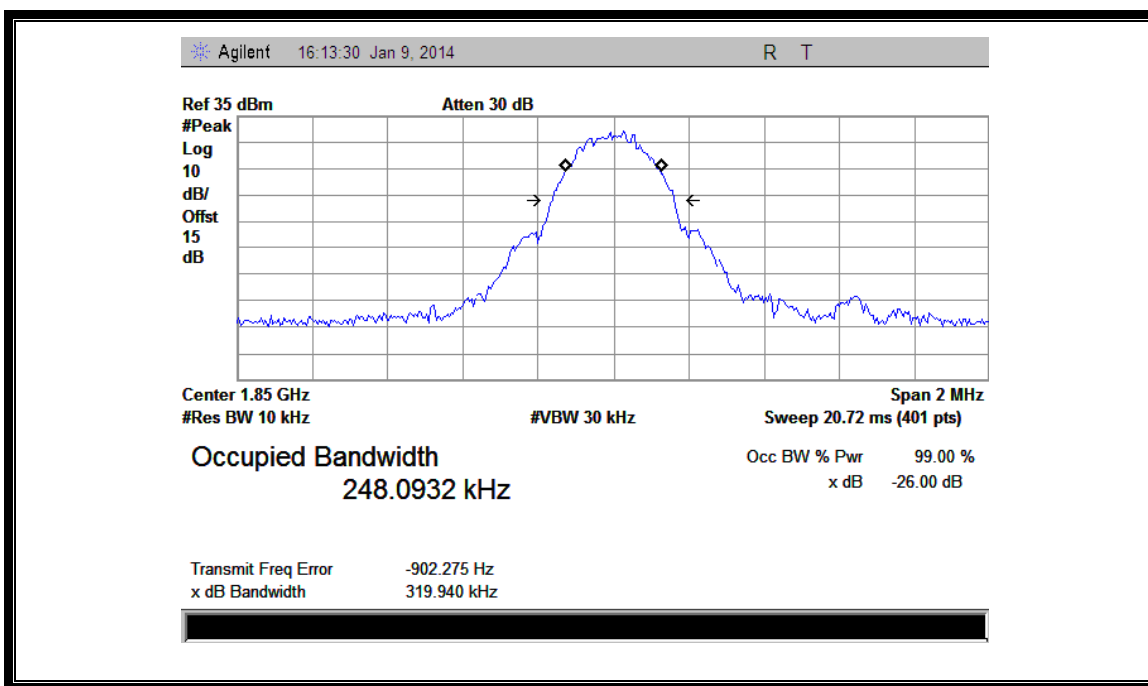
(Plot E1: GPRS 850MHz Channel = 128)



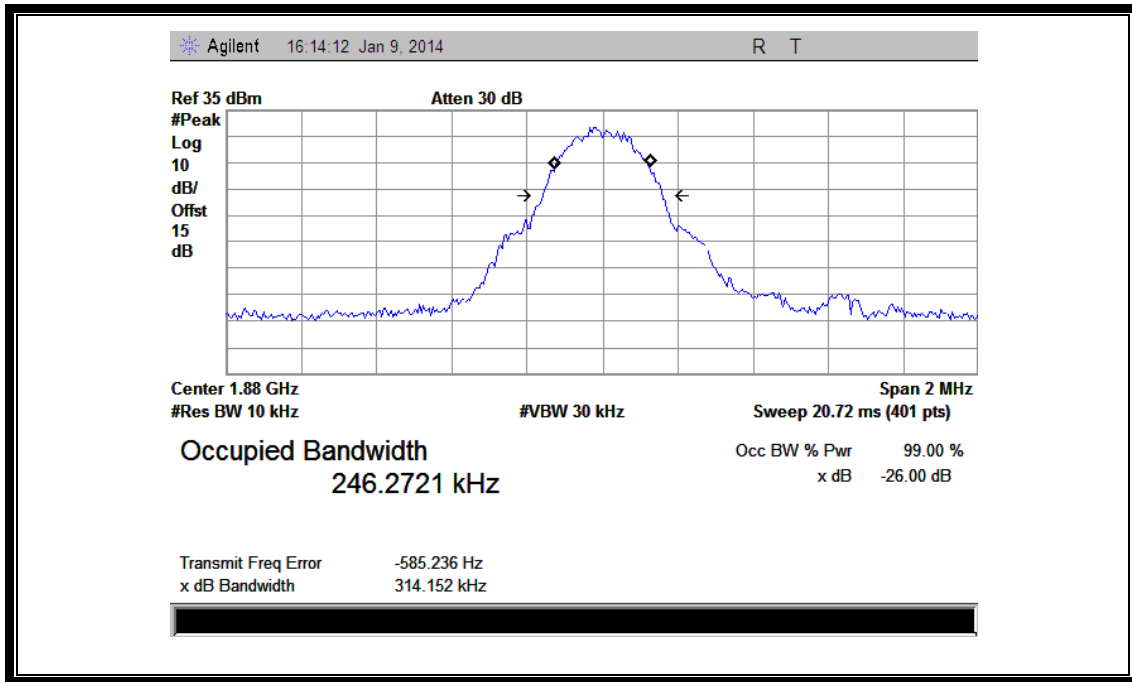
(Plot F1:GPRS 850MHz Channel = 190)



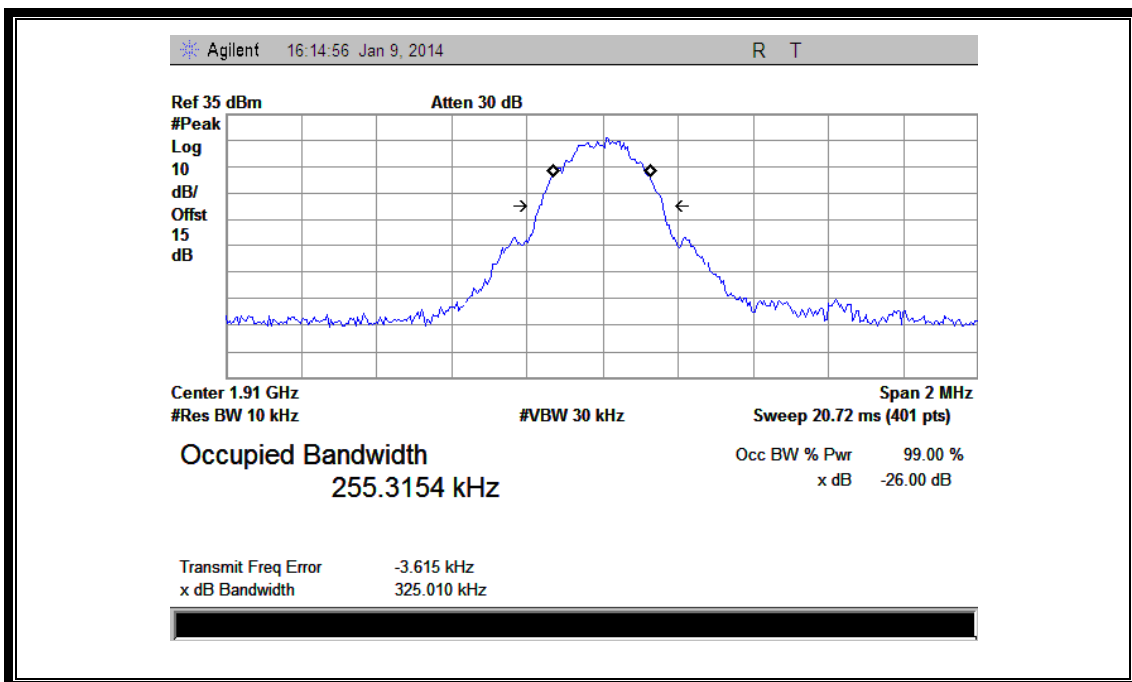
(Plot G1: GPRS850MHz Channel = 251)



(Plot H1: GPRS 1900MHz Channel = 512)



(Plot I2: GPRS 1900MHz Channel = 661)



(Plot J2: GPRS 1900MHz Channel = 810)

## 2.4 Frequency Stability

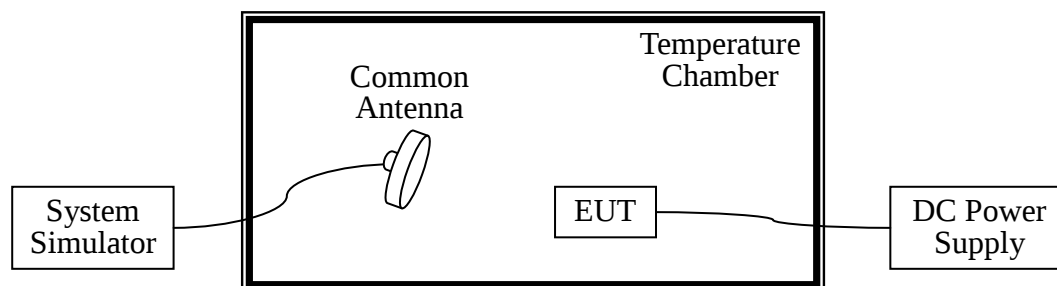
### 2.4.1 Requirement

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  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  at intervals of not more than  $10^{\circ}\text{C}$ .
- (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 | 2013.05.13 | 2014.05.12 |
| DC Power Supply     | Good Will                 | GPS-3030DD | EF920938   | 2013.05.13 | 2014.05.12 |
| Temperature Chamber | YinHe Experimental Equip. | HL4003T    | (n.a.)     | 2013.05.13 | 2014.05.12 |

### 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  $25^{\circ}\text{C}$ . The frequency deviation limit of

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

## 1. GSM 850MHz Band

| Test Conditions |                  | Frequency Deviation      |         |                          |         |                          |        | Verdict     |
|-----------------|------------------|--------------------------|---------|--------------------------|---------|--------------------------|--------|-------------|
| Power (VDC)     | Temperature (°C) | Channel = 128 (824.2MHz) |         | Channel = 190 (836.6MHz) |         | Channel = 251 (848.8MHz) |        |             |
|                 |                  | Hz                       | Limits  | Hz                       | Limits  | Hz                       | Limits |             |
| 3.8             | -30              | -21.45                   | ±2060.5 | 22.12                    | ±2091.5 | 18.87                    | ±2122  | <u>PASS</u> |
|                 | -20              | 28.31                    |         | 11.43                    |         | -14.02                   |        |             |
|                 | -10              | -2.25                    |         | -17.46                   |         | 15.16                    |        |             |
|                 | 0                | 30.26                    |         | 32.14                    |         | 5.05                     |        |             |
|                 | +10              | 21.79                    |         | -24.93                   |         | 3.02                     |        |             |
|                 | +20              | -19.56                   |         | -17.19                   |         | 10.76                    |        |             |
|                 | +30              | 34.36                    |         | 19.36                    |         | -16.53                   |        |             |
|                 | +40              | 42.63                    |         | 19.64                    |         | -2.13                    |        |             |
|                 | +55              | 35.28                    |         | 23.27                    |         | -12.89                   |        |             |
| 4.35            | +25              | -15.73                   |         | 29.05                    |         | -7.55                    |        |             |
| 3.6             | +25              | -18.75                   |         | 36.73                    |         | 7.08                     |        |             |

## 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              | 18.21                     | ±1850.2 | 20.98                     | ±1880.0 | 31.25                     | ±1909.8 | <u>PASS</u> |
|                 | -20              | 37.98                     |         | -21.48                    |         | -18.78                    |         |             |
|                 | -10              | -2.05                     |         | -13.76                    |         | -16.88                    |         |             |
|                 | 0                | 40.06                     |         | -18.38                    |         | 19.32                     |         |             |
|                 | +10              | 1.98                      |         | -21.61                    |         | 25.31                     |         |             |
|                 | +20              | -19.76                    |         | 15.52                     |         | 30.26                     |         |             |
|                 | +30              | 39.76                     |         | -0.78                     |         | -29.21                    |         |             |
|                 | +40              | 46.66                     |         | 33.37                     |         | 19.33                     |         |             |
|                 | +55              | 39.88                     |         | 24.02                     |         | -19.37                    |         |             |
| 4.35            | +25              | 37.88                     |         | 23.72                     |         | 27.09                     |         |             |
| 3.6             | +25              | -8.69                     |         | 16.92                     |         | 18.99                     |         |             |

### 3. EDGE 850MHz Band

| Test Conditions |                  | Frequency Deviation      |         |                          |         |                          |        | Verdict     |
|-----------------|------------------|--------------------------|---------|--------------------------|---------|--------------------------|--------|-------------|
| Power (VDC)     | Temperature (°C) | Channel = 128 (824.2MHz) |         | Channel = 190 (836.6MHz) |         | Channel = 251 (848.8MHz) |        |             |
|                 |                  | Hz                       | Limits  | Hz                       | Limits  | Hz                       | Limits |             |
| 3.8             | -30              | -31.10                   | ±2060.5 | 25.18                    | ±2091.5 | 8.41                     | ±2122  | <u>PASS</u> |
|                 | -20              | 37.98                    |         | 12.73                    |         | -12.80                   |        |             |
|                 | -10              | -2.05                    |         | -18.25                   |         | 13.06                    |        |             |
|                 | 0                | 41.06                    |         | 38.10                    |         | 5.05                     |        |             |
|                 | +10              | 1.99                     |         | -22.06                   |         | 3.02                     |        |             |
|                 | +20              | -19.86                   |         | -16.11                   |         | 10.76                    |        |             |
|                 | +30              | 39.56                    |         | 17.76                    |         | -16.51                   |        |             |
|                 | +40              | 46.62                    |         | 15.54                    |         | -2.11                    |        |             |
|                 | +55              | 39.98                    |         | 3.57                     |         | -12.89                   |        |             |
| 4.35            | +25              | -15.71                   |         | 14.05                    |         | -7.83                    |        |             |
| 3.6             | +25              | -18.02                   |         | 6.73                     |         | 6.88                     |        |             |

### 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              | -14.87                    | ±1850.2 | 24.02                     | ±1880.0 | 2.57                      | ±1909.8 | <u>PASS</u> |
|                 | -20              | 0.72                      |         | 7.43                      |         | -12.76                    |         |             |
|                 | -10              | 1.75                      |         | -25.78                    |         | -13.21                    |         |             |
|                 | 0                | 2.57                      |         | -1.36                     |         | 13.23                     |         |             |
|                 | +10              | -10.78                    |         | -17.98                    |         | 5.23                      |         |             |
|                 | +20              | -2.11                     |         | -21.61                    |         | 35.16                     |         |             |
|                 | +30              | 14.03                     |         | 14.58                     |         | -26.88                    |         |             |
|                 | +40              | 5.43                      |         | -0.78                     |         | 19.34                     |         |             |
|                 | +55              | -2.46                     |         | 37.07                     |         | -16.77                    |         |             |
| 4.35            | +25              | 18.02                     |         | 4.08                      |         | 26.59                     |         |             |
| 3.6             | +25              | -8.29                     |         | 13.13                     |         | 19.73                     |         |             |

## 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              | 18.29                     | ±2066 | 12.87                   | ±2087.5 | -1.30                     | ±2116.5 | <u>PASS</u> |
|                 | -20              | -7.42                     |       | -0.52                   |         | -18.38                    |         |             |
|                 | -10              | -3.43                     |       | 22.45                   |         | 7.67                      |         |             |
|                 | 0                | 16.47                     |       | 13.25                   |         | 4.32                      |         |             |
|                 | +10              | 30.18                     |       | 1.31                    |         | -17.33                    |         |             |
|                 | +20              | 32.07                     |       | -12.22                  |         | 11.90                     |         |             |
|                 | +30              | -7.98                     |       | 30.62                   |         | 6.63                      |         |             |
|                 | +40              | 26.31                     |       | 13.45                   |         | 28.93                     |         |             |
|                 | +55              | 12.10                     |       | -12.42                  |         | 19.76                     |         |             |
| 4.35            | +25              | -6.17                     |       | 30.52                   | 23.19   |                           |         |             |
| 3.6             | +25              | 19.66                     |       | -17.90                  | -19.60  |                           |         |             |

## 6. WCDMA 1900MHz Band

| Test Conditions |                  | Frequency Deviation        |         |                            |         |                            |         | Verdict     |
|-----------------|------------------|----------------------------|---------|----------------------------|---------|----------------------------|---------|-------------|
| Power (VDC)     | Temperature (°C) | Channel = 9262 (1852.4MHz) |         | Channel = 9400 (1880.0MHz) |         | Channel = 9538 (1907.6MHz) |         |             |
|                 |                  | Hz                         | Limits  | Hz                         | Limits  | Hz                         | Limits  |             |
| 3.8             | -30              | -4.72                      | ±1852.4 | -13.57                     | ±1880.0 | -8.89                      | ±1907.6 | <u>PASS</u> |
|                 | -20              | 18.35                      |         | 12.28                      |         | 24.60                      |         |             |
|                 | -10              | 5.35                       |         | -14.36                     |         | 15.11                      |         |             |
|                 | 0                | 18.92                      |         | 18.59                      |         | -3.17                      |         |             |
|                 | +10              | 31.40                      |         | 21.39                      |         | 18.12                      |         |             |
|                 | +20              | 13.55                      |         | 37.27                      |         | -10.39                     |         |             |
|                 | +30              | 1.31                       |         | 2.37                       |         | 17.47                      |         |             |
|                 | +40              | -12.52                     |         | -13.47                     |         | 27.84                      |         |             |
|                 | +55              | -13.65                     |         | -5.81                      |         | -2.53                      |         |             |
| 4.35            | +25              | 23.23                      |         | 14.68                      |         | 21.05                      |         |             |
| 3.6             | +25              | 22.12                      |         | 27.37                      |         | -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 | -25.07                  | ±2087.5 | 16.11                     | ±2116.5 | <u>PASS</u> |
|                 | -20              | -8.66                     |       | -14.06                  |         | 14.41                     |         |             |
|                 | -10              | 20.85                     |       | 36.23                   |         | 21.57                     |         |             |
|                 | 0                | 12.78                     |       | -8.41                   |         | -24.37                    |         |             |
|                 | +10              | -14.75                    |       | -13.95                  |         | -13.96                    |         |             |
|                 | +20              | 8.78                      |       | -24.37                  |         | 35.23                     |         |             |
|                 | +30              | -1.49                     |       | 12.88                   |         | -8.31                     |         |             |
|                 | +40              | 17.14                     |       | -14.75                  |         | -13.95                    |         |             |
|                 | +55              | -23.61                    |       | 23.37                   |         | 25.37                     |         |             |
| 4.35            | +25              | 32.03                     |       | 7.93                    |         | 7.98                      |         |             |
| 3.6             | +25              | 18.11                     |       | -30.21                  |         | 1.88                      |         |             |

## 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              | 12.87                      | ±1852.4 | -3.81                      | ±1880  | 2.51                       | ±1907.6 | <u>PASS</u> |
|                 | -20              | -16.05                     |         | 22.71                      |        | -8.48                      |         |             |
|                 | -10              | 20.42                      |         | 15.37                      |        | -14.02                     |         |             |
|                 | 0                | -3.11                      |         | -12.21                     |        | -9.01                      |         |             |
|                 | +10              | 21.71                      |         | 10.60                      |        | 5.64                       |         |             |
|                 | +20              | 20.12                      |         | -4.81                      |        | -3.85                      |         |             |
|                 | +30              | -15.01                     |         | 34.31                      |        | 9.57                       |         |             |
|                 | +40              | 22.71                      |         | 8.46                       |        | 27.54                      |         |             |
|                 | +55              | 16.42                      |         | -24.88                     |        | -12.42                     |         |             |
| 4.35            | +25              | -11.25                     |         | 29.53                      |        | -2.83                      |         |             |
| 3.6             | +25              | 10.43                      |         | -2.37                      |        | 15.42                      |         |             |

## 9. HSUPA 850MHz Band

| Test Conditions |                   | Frequency Deviation       |       |                         |         |                           |         | Verdict     |
|-----------------|-------------------|---------------------------|-------|-------------------------|---------|---------------------------|---------|-------------|
| Power (VDC)     | Temperat ure (°C) | Channel = 4123 (826.4MHz) |       | Channel = 4175 (835MHz) |         | Channel = 4233 (846.6MHz) |         |             |
|                 |                   | Hz                        | Limit | Hz                      | Limit   | Hz                        | Limit   |             |
| 3.8             | -30               | 26.02                     | ±2066 | 13.51                   | ±2087.5 | 13.75                     | ±2116.5 | <u>PASS</u> |
|                 | -20               | -16.40                    |       | -19.43                  |         | 27.52                     |         |             |
|                 | -10               | -12.71                    |       | -12.79                  |         | 37.71                     |         |             |
|                 | 0                 | -14.09                    |       | -0.44                   |         | -7.32                     |         |             |
|                 | +10               | -0.37                     |       | 0.01                    |         | -4.91                     |         |             |
|                 | +20               | -11.85                    |       | -6.64                   |         | 21.35                     |         |             |
|                 | +30               | 29.57                     |       | 24.25                   |         | -5.94                     |         |             |
|                 | +40               | -11.89                    |       | 9.73                    |         | 13.78                     |         |             |
|                 | +55               | -0.45                     |       | 24.76                   |         | 28.55                     |         |             |
| 4.35            | +25               | 1.78                      |       | -4.67                   |         | 29.31                     |         |             |
| 3.6             | +25               | 1.55                      |       | 6.25                    |         | -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  | 7.09                       | ±1907.6 | <u>PASS</u> |
|                 | -20              | 28.13                      |         | -0.84                      |        | 2.11                       |         |             |
|                 | -10              | 7.82                       |         | 0.11                       |        | -4.85                      |         |             |
|                 | 0                | 2.41                       |         | 14.82                      |        | 17.08                      |         |             |
|                 | +10              | -4.73                      |         | -15.25                     |        | -1.86                      |         |             |
|                 | +20              | 16.22                      |         | -11.79                     |        | 23.52                      |         |             |
|                 | +30              | -1.55                      |         | -0.44                      |        | -0.48                      |         |             |
|                 | +40              | 24.16                      |         | 1.25                       |        | -12.05                     |         |             |
|                 | +55              | 14.79                      |         | -7.84                      |        | -5.81                      |         |             |
| 4.35            | +25              | -8.08                      |         | 6.71                       |        | 25.38                      |         |             |
| 3.6             | +25              | 23.58                      |         | -1.73                      |        | -15.88                     |         |             |

## 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 10<sup>th</sup> harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

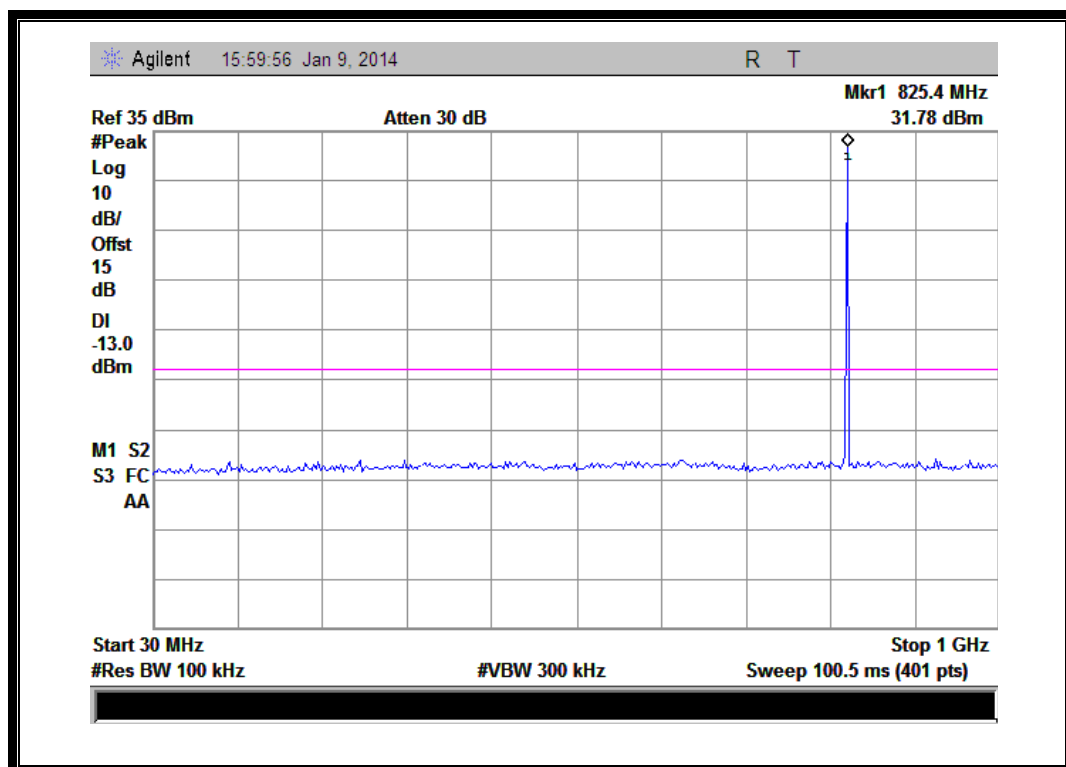
#### 1. Test Verdict:

| Band          | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict     |
|---------------|---------|-----------------|---------------------------------------|---------------|-------------|-------------|
| GSM 850MHz    | 128     | 824.2           | -19.25                                | Plot A1toA1.1 | -13         | <u>PASS</u> |
|               | 190     | 836.6           | -19.28                                | Plot A2toA2.1 |             | <u>PASS</u> |
|               | 251     | 848.8           | -19.23                                | Plot A3toA3.1 |             | <u>PASS</u> |
| GSM 1900MHz   | 512     | 1850.2          | -18.33                                | Plot B1toB1.1 | -13         | <u>PASS</u> |
|               | 661     | 1880.0          | -18.96                                | Plot B2toB2.1 |             | <u>PASS</u> |
|               | 810     | 1909.8          | -18.96                                | Plot B3toB3.1 |             | <u>PASS</u> |
| EDGE 850MHz   | 128     | 824.2           | -19.87                                | Plot C1toC1.1 | -13         | <u>PASS</u> |
|               | 190     | 836.6           | -19.41                                | Plot C2toC2.1 |             | <u>PASS</u> |
|               | 251     | 848.8           | -18.81                                | Plot C3toC3.1 |             | <u>PASS</u> |
| EDGE 1900MHz  | 512     | 1850.2          | -19.48                                | Plot D1toD1.1 | -13         | <u>PASS</u> |
|               | 661     | 1880.0          | -18.88                                | Plot D2toD2.1 |             | <u>PASS</u> |
|               | 810     | 1909.8          | -20.02                                | Plot D3toD3.1 |             | <u>PASS</u> |
| WCDMA 850MHz  | 4132    | 826.4           | -20.17                                | Plot E1toE1.1 | -13         | <u>PASS</u> |
|               | 4175    | 835             | -20.09                                | Plot E2toE2.1 |             | <u>PASS</u> |
|               | 4233    | 846.6           | -20.17                                | Plot E3toE3.1 |             | <u>PASS</u> |
| WCDMA 1900MHz | 9262    | 1852.4          | -18.52                                | Plot F1toF1.1 | -13         | <u>PASS</u> |
|               | 9400    | 1880            | -19.65                                | Plot F2toF2.1 |             | <u>PASS</u> |
|               | 9538    | 1907.6          | -19.30                                | Plot F3toF3.1 |             | <u>PASS</u> |
| HSDPA         | 4132    | 826.4           | -19.98                                | Plot G1toG1.1 | -13         | <u>PASS</u> |

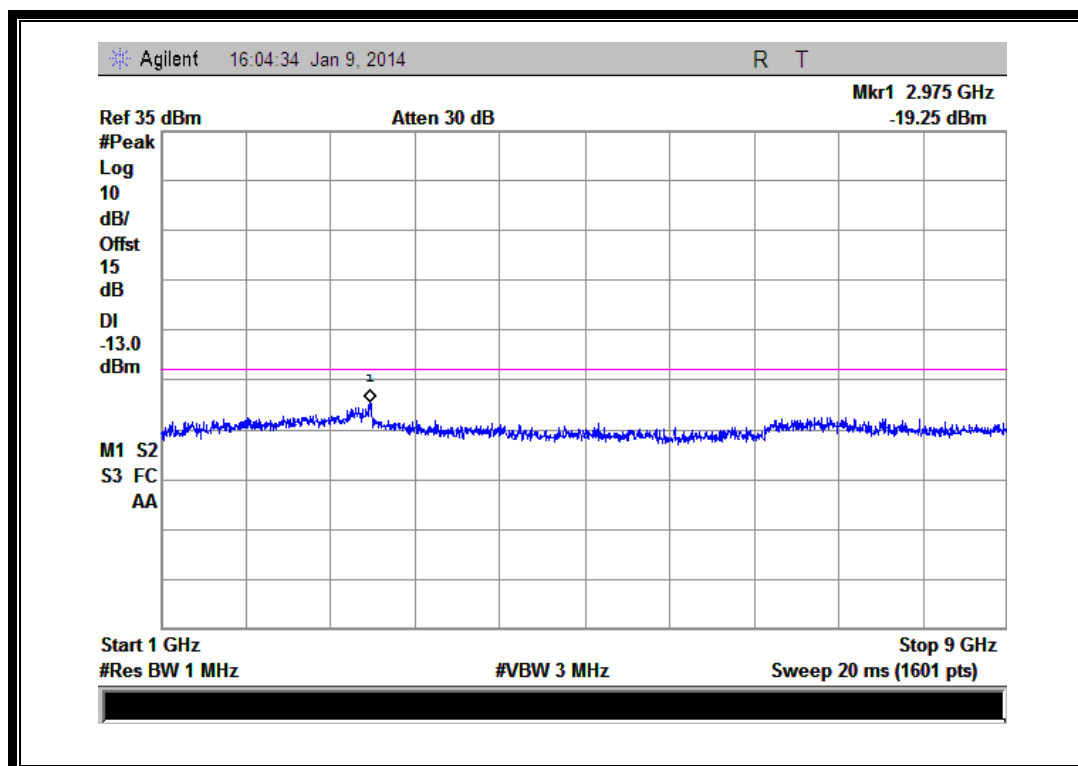
| Band             | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict     |
|------------------|---------|-----------------|---------------------------------------|---------------|-------------|-------------|
| 850MHz           | 4175    | 835             | -21.00                                | Plot G2toG2.1 |             | <u>PASS</u> |
|                  | 4233    | 846.6           | -20.39                                | Plot G3toG3.1 |             | <u>PASS</u> |
| HSDPA<br>1900MHz | 9262    | 1852.4          | -19.55                                | Plot H1toH1.1 | -13         | <u>PASS</u> |
|                  | 9400    | 1880            | -19.35                                | Plot H2toH2.1 |             | <u>PASS</u> |
|                  | 9538    | 1907.6          | -19.46                                | Plot H3toH3.1 |             | <u>PASS</u> |
| HSUPA<br>850MHz  | 4132    | 826.4           | -20.83                                | Plot I1toI1.1 | -13         | <u>PASS</u> |
|                  | 4175    | 835             | -20.59                                | Plot I2toI2.1 |             | <u>PASS</u> |
|                  | 4233    | 846.6           | -20.39                                | Plot I3toI3.1 |             | <u>PASS</u> |
| HSUPA<br>1900MHz | 9262    | 1852.4          | -19.20                                | Plot J1toJ1.1 | -13         | <u>PASS</u> |
|                  | 9400    | 1880            | -19.99                                | Plot J2toJ2.1 |             | <u>PASS</u> |
|                  | 9538    | 1907.6          | -20.89                                | Plot J3toJ3.1 |             | <u>PASS</u> |

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

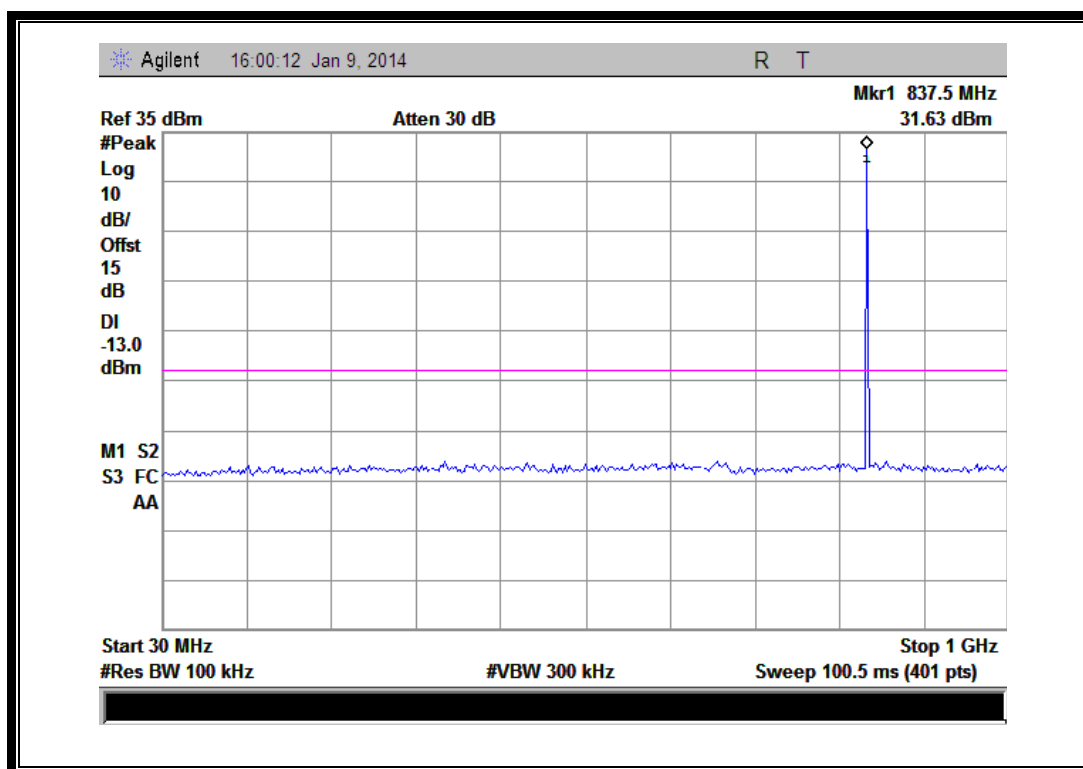
**Note:** the power of the EUT transmitting frequency should be ignored.



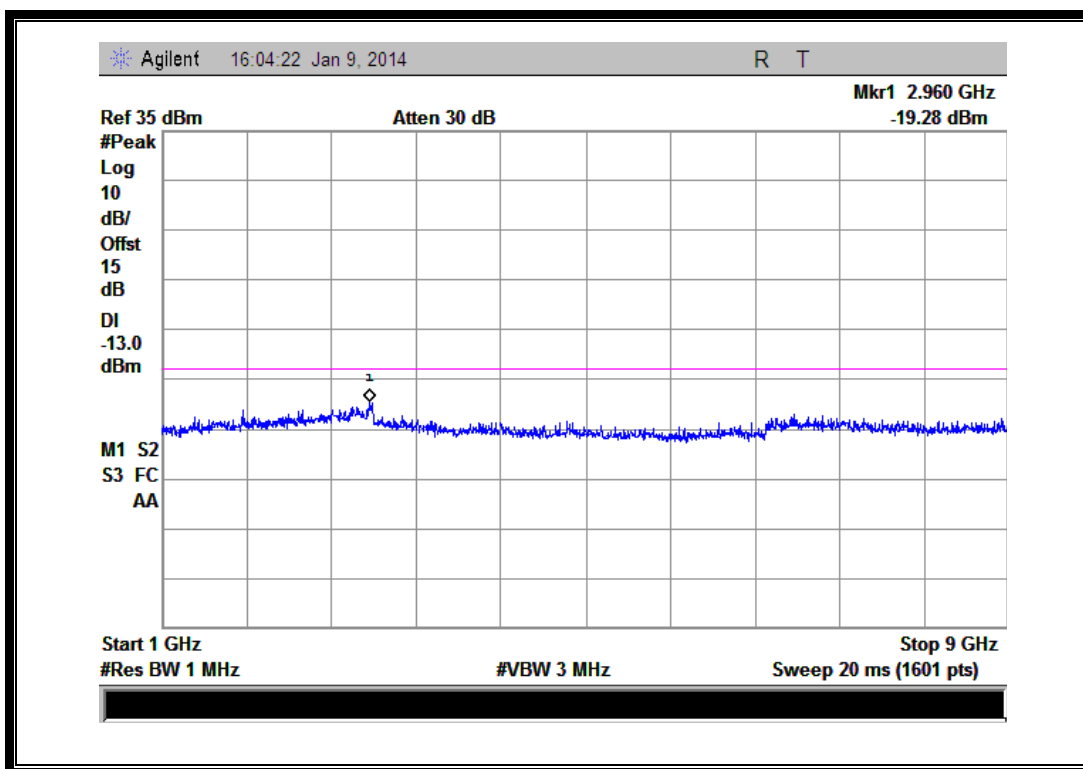
(Plot A1:GSM 850MHz Channel = 128, 30MHz to 1GHz)



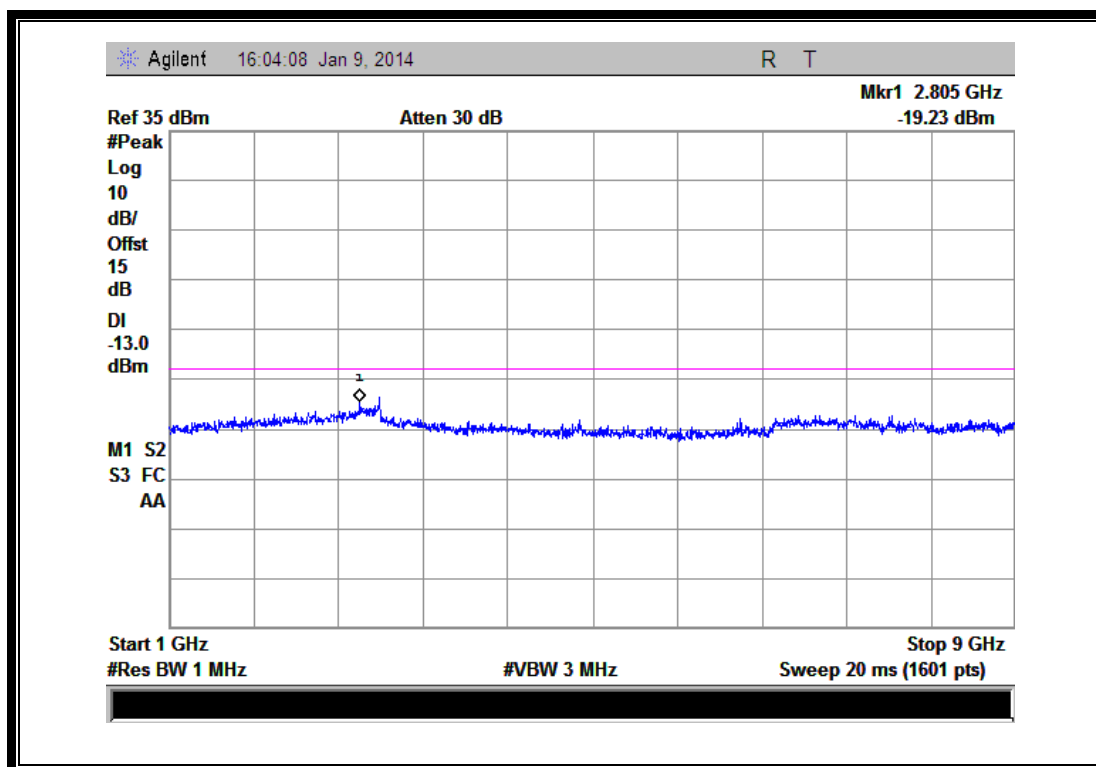
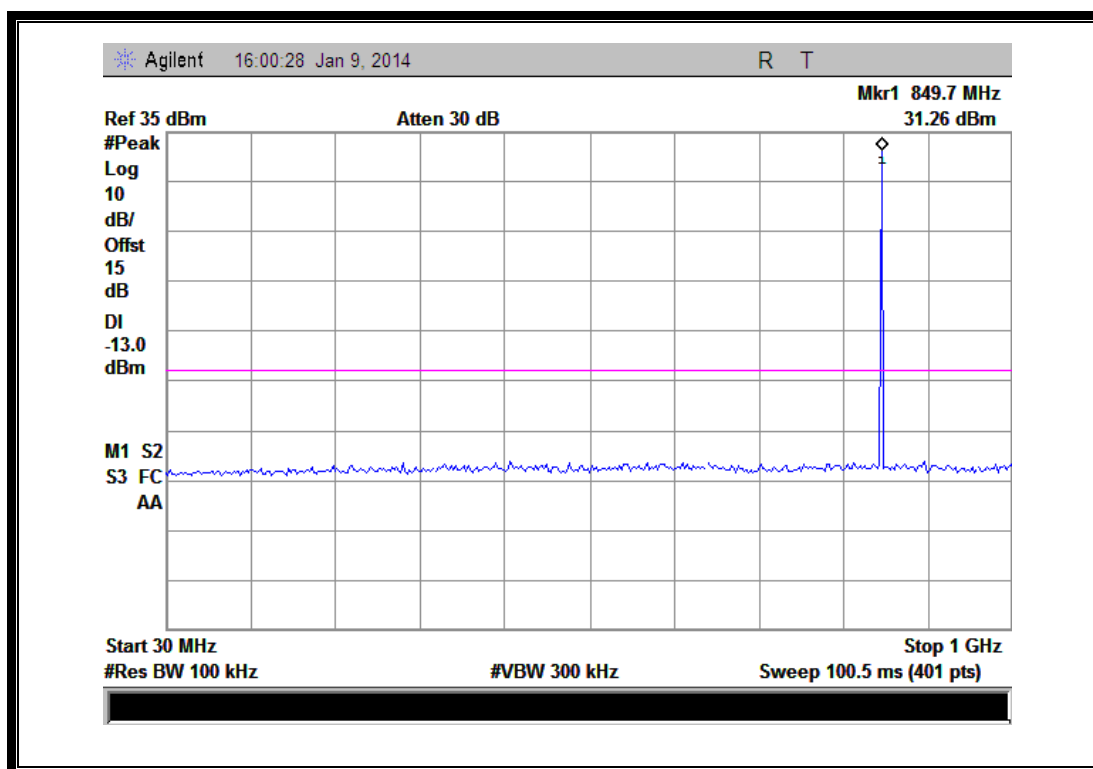
(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)

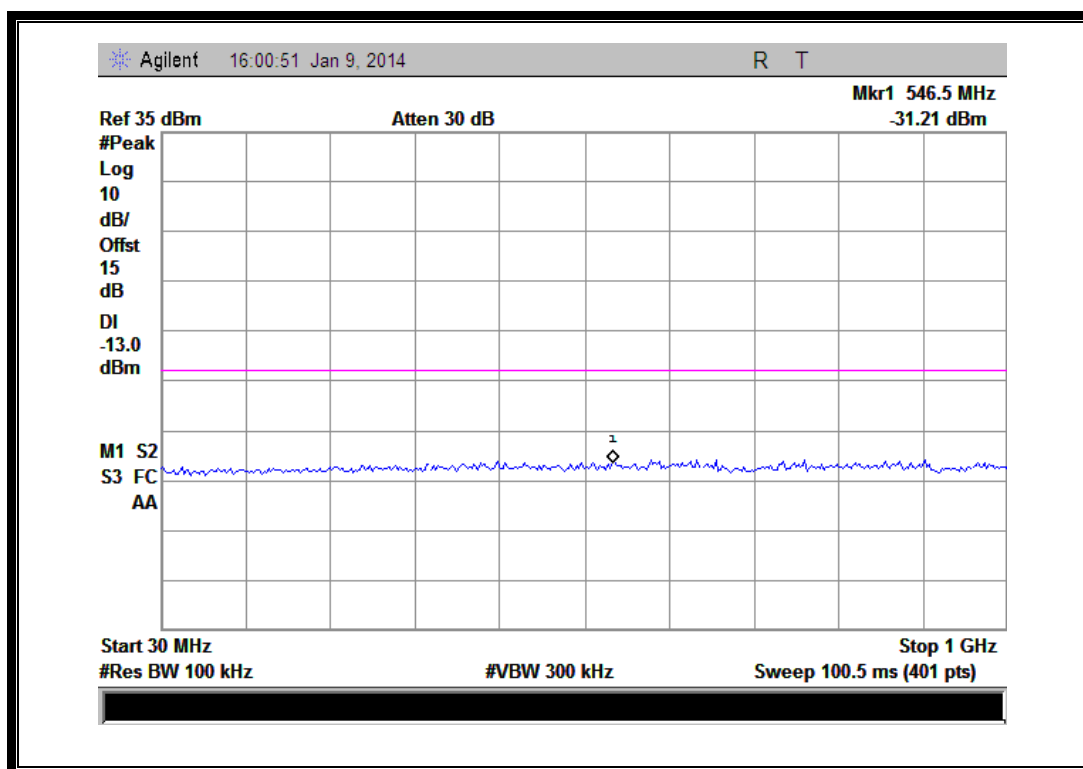


(Plot A2:GSM 850MHz Channel = 190, 30MHz to 1GHz)

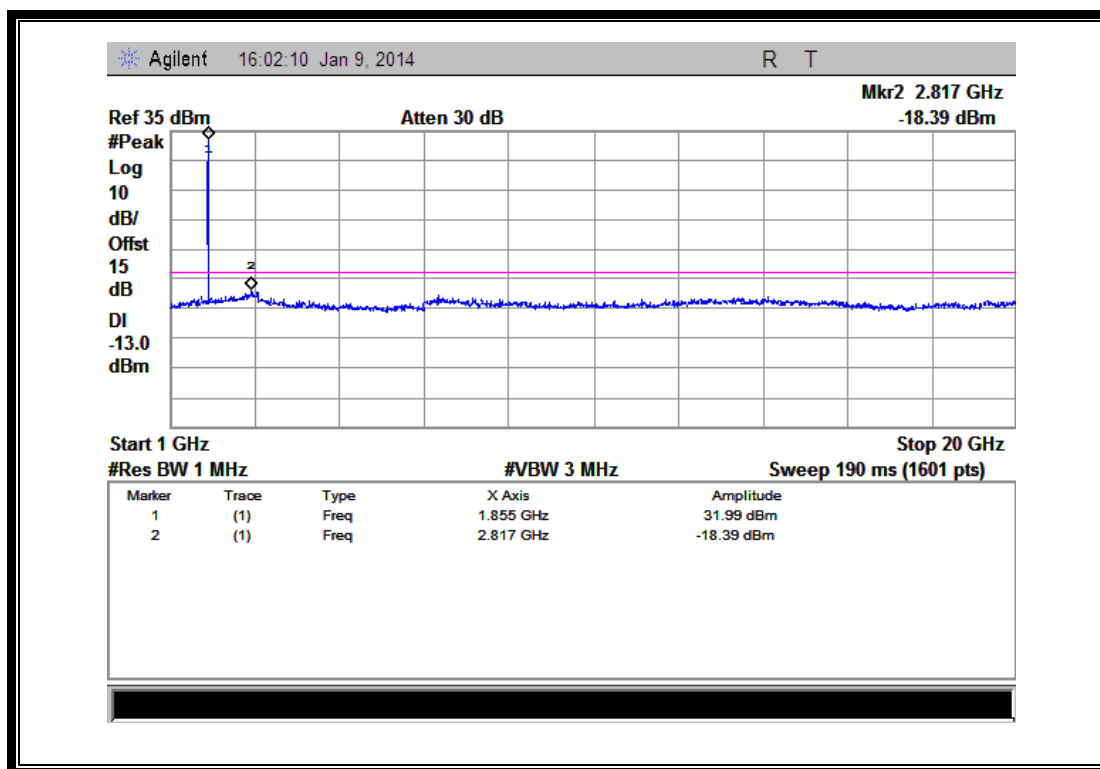


(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)

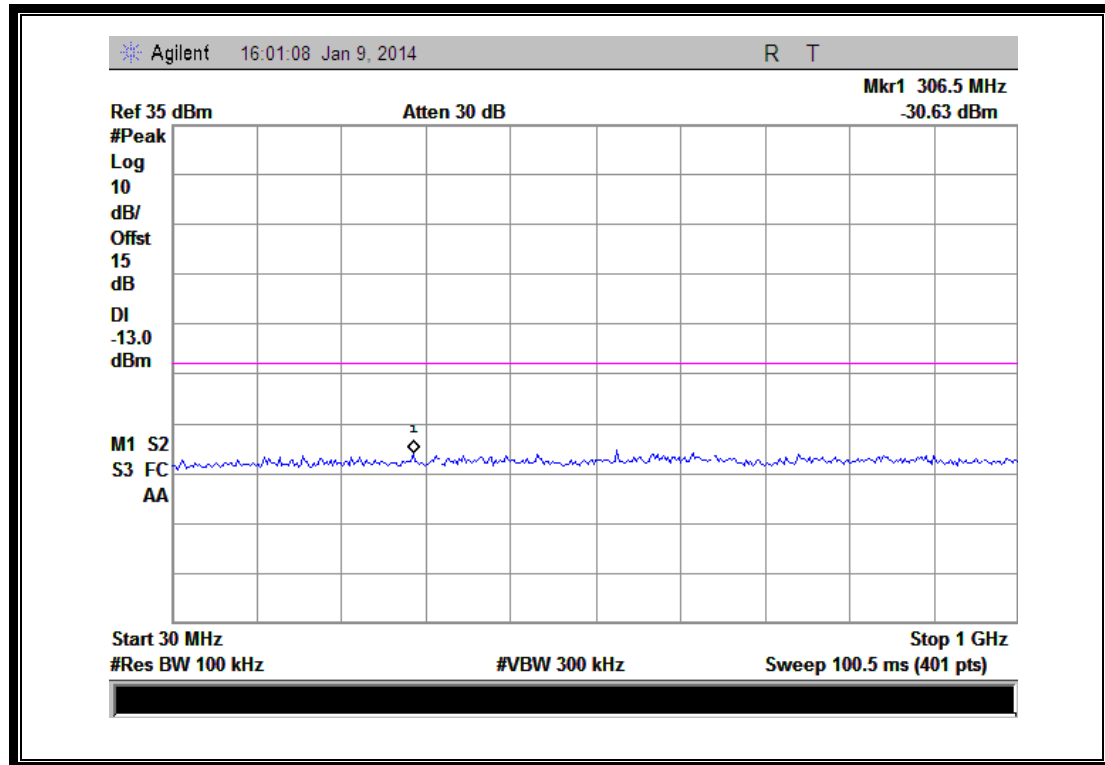




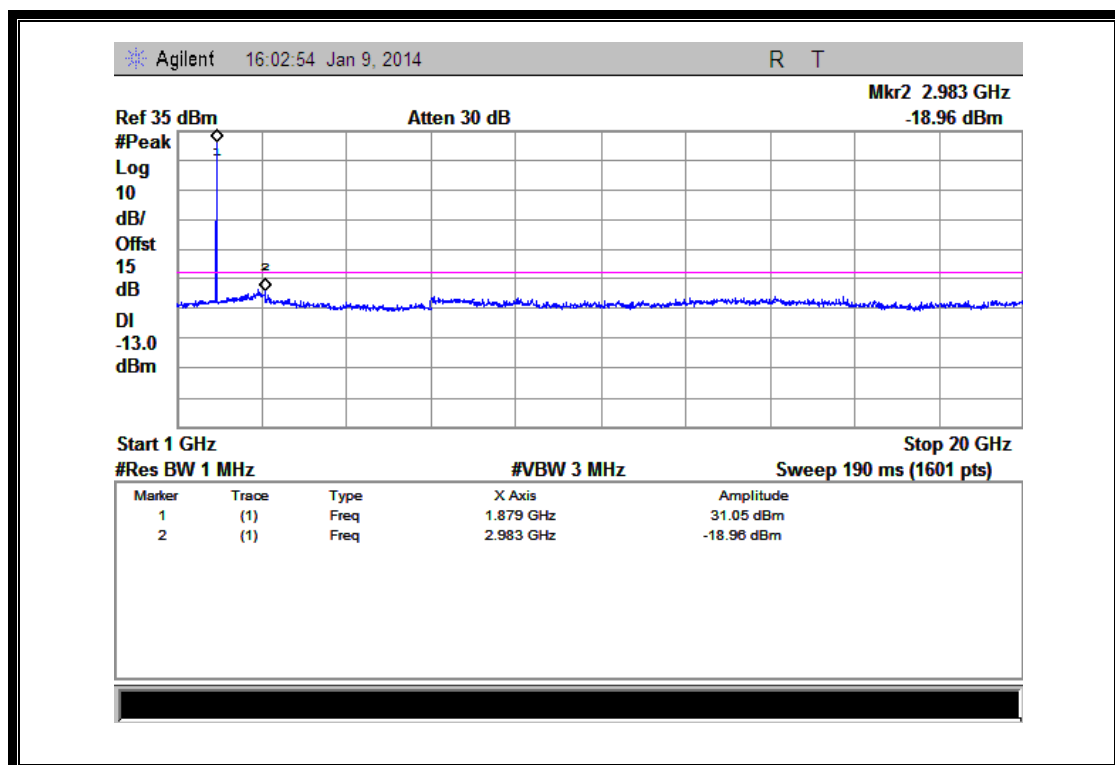
(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



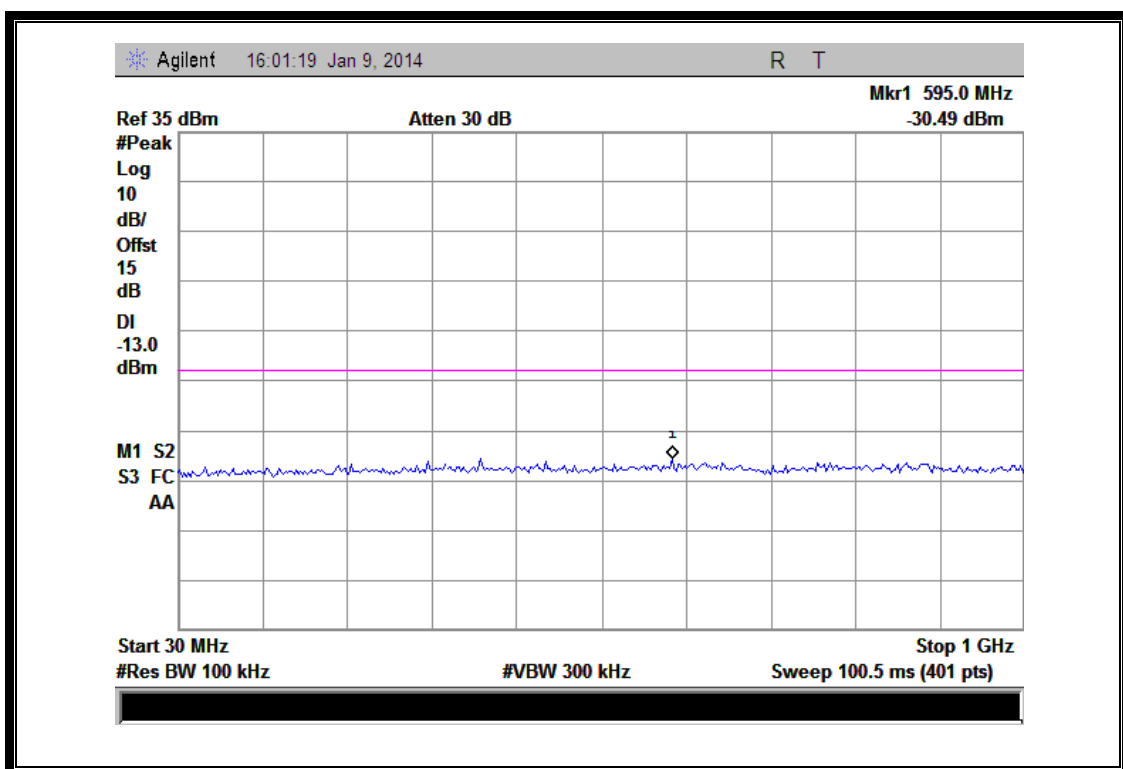
(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



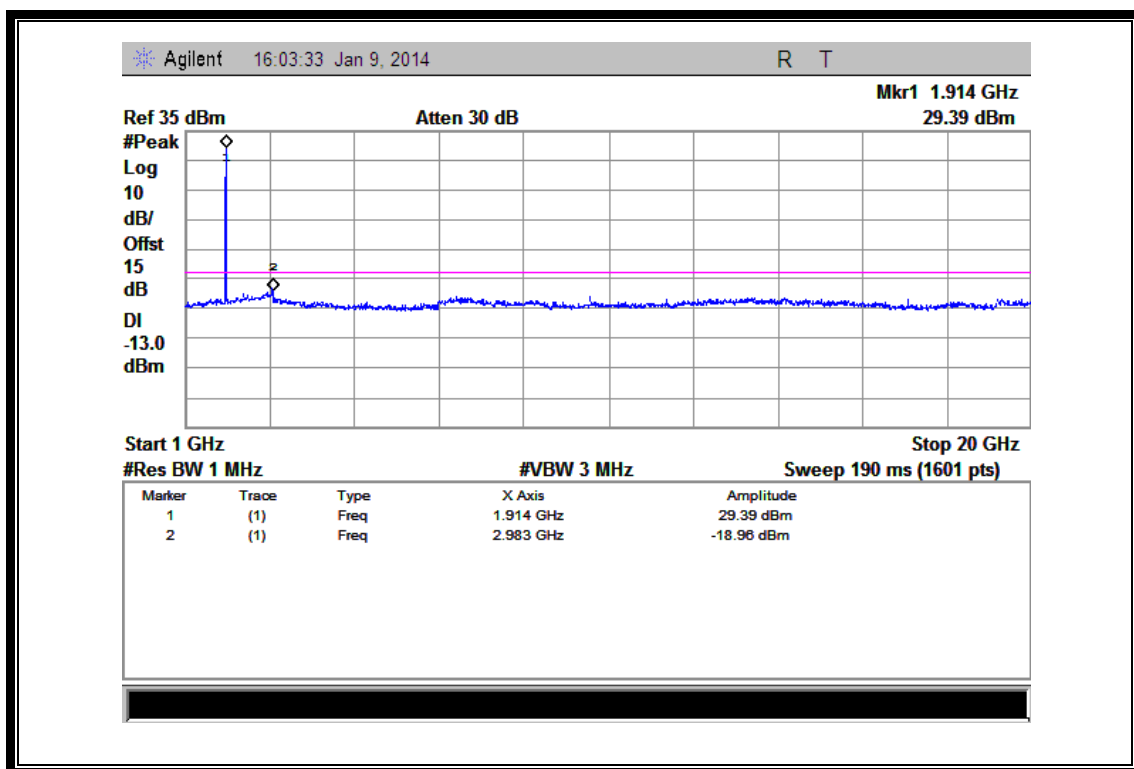
(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



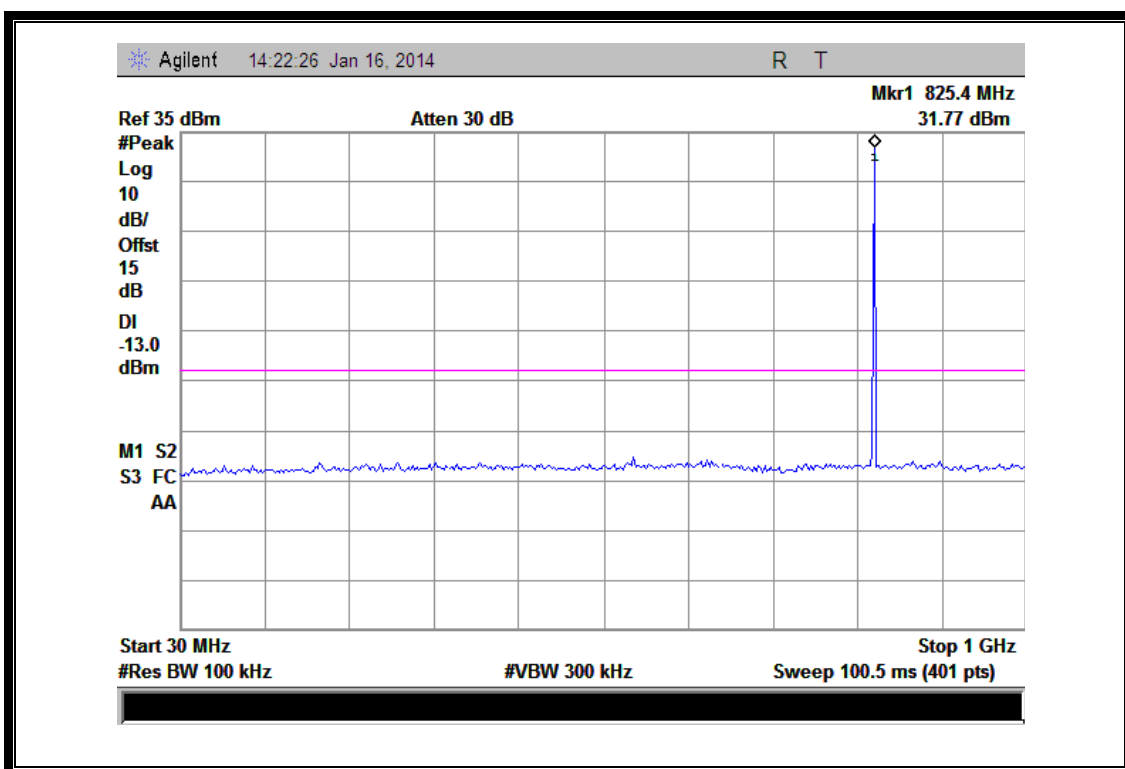
(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



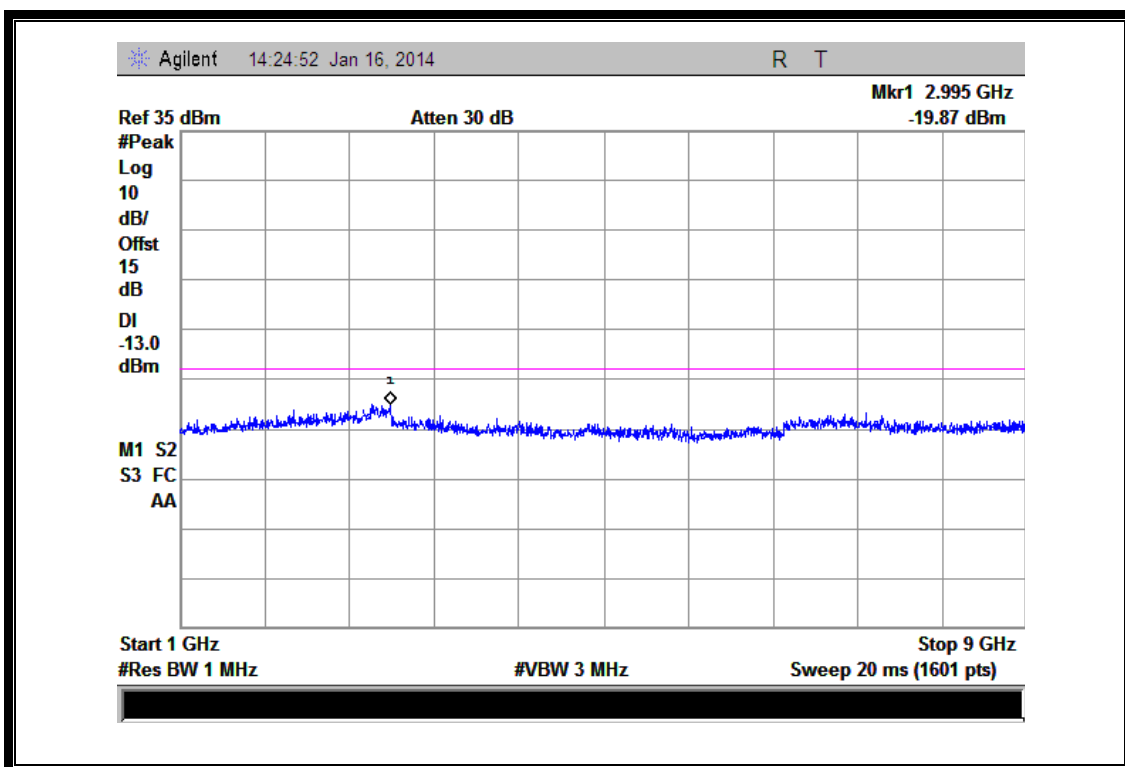
(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



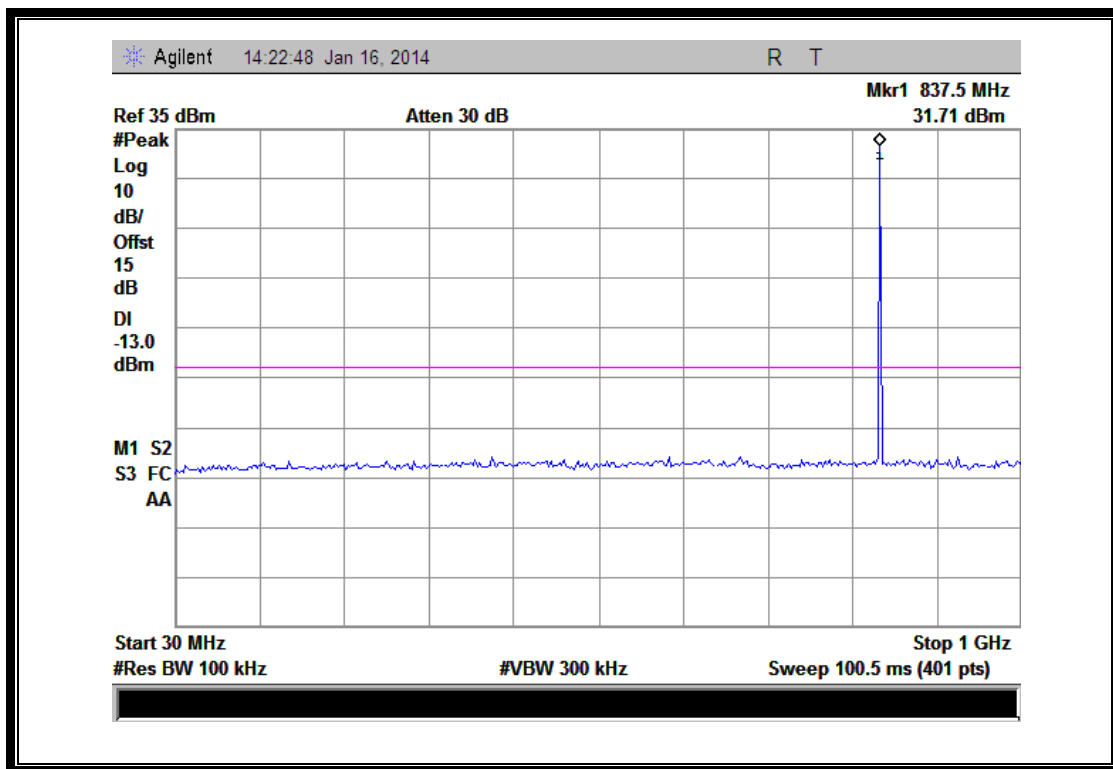
(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



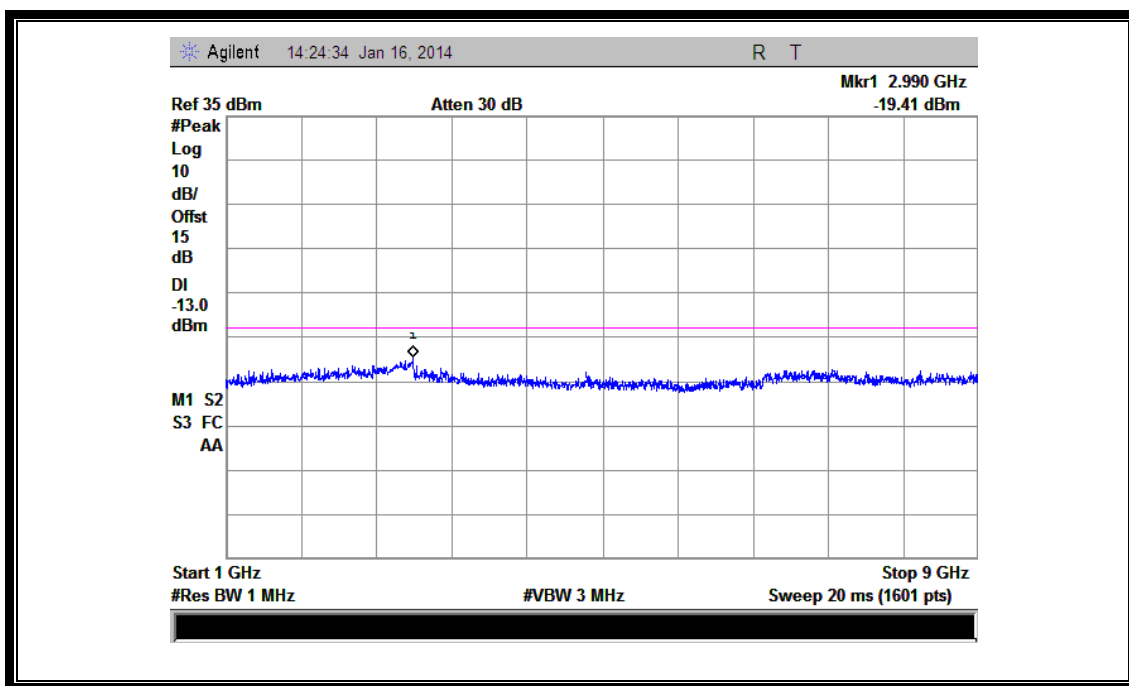
(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



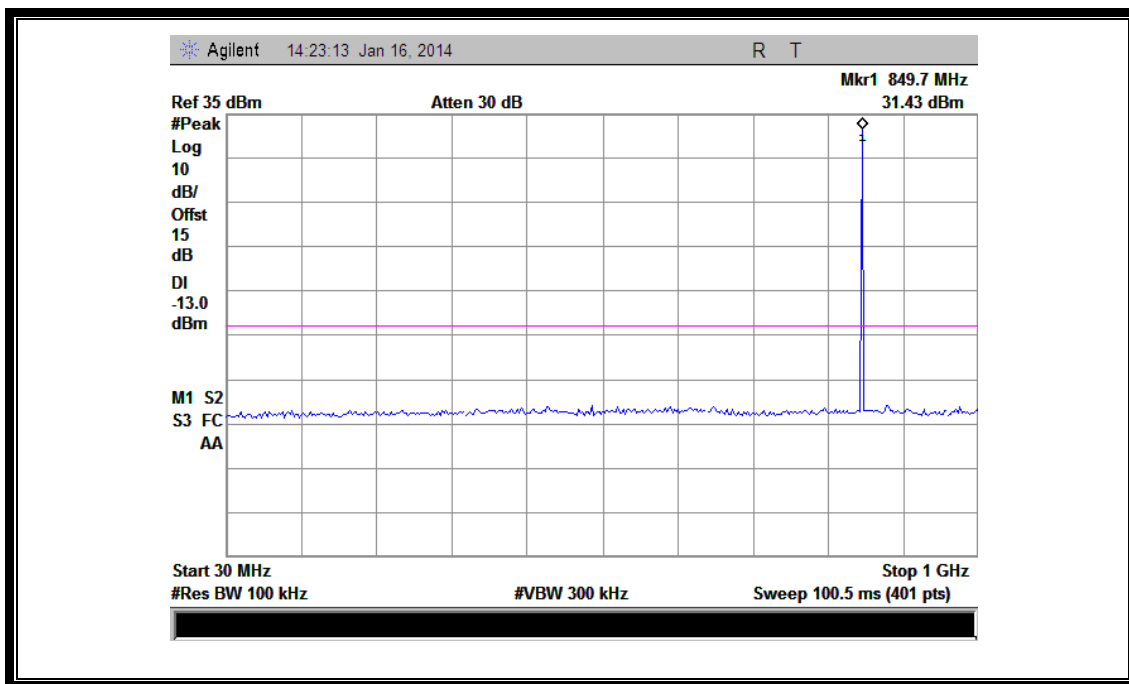
(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



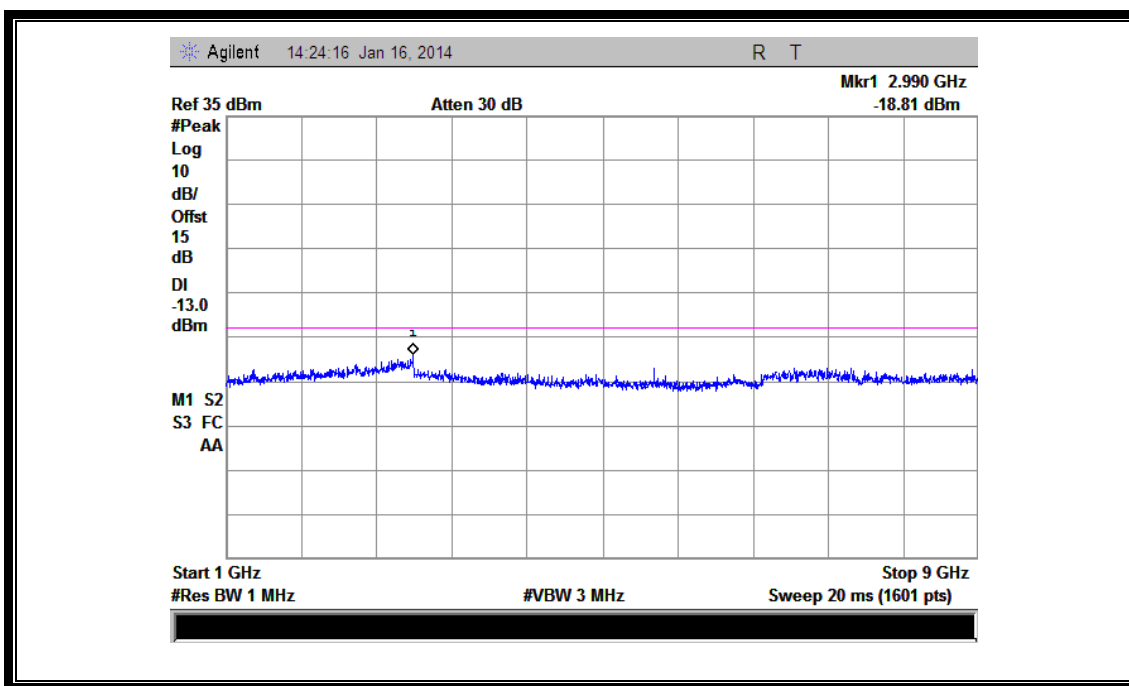
(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



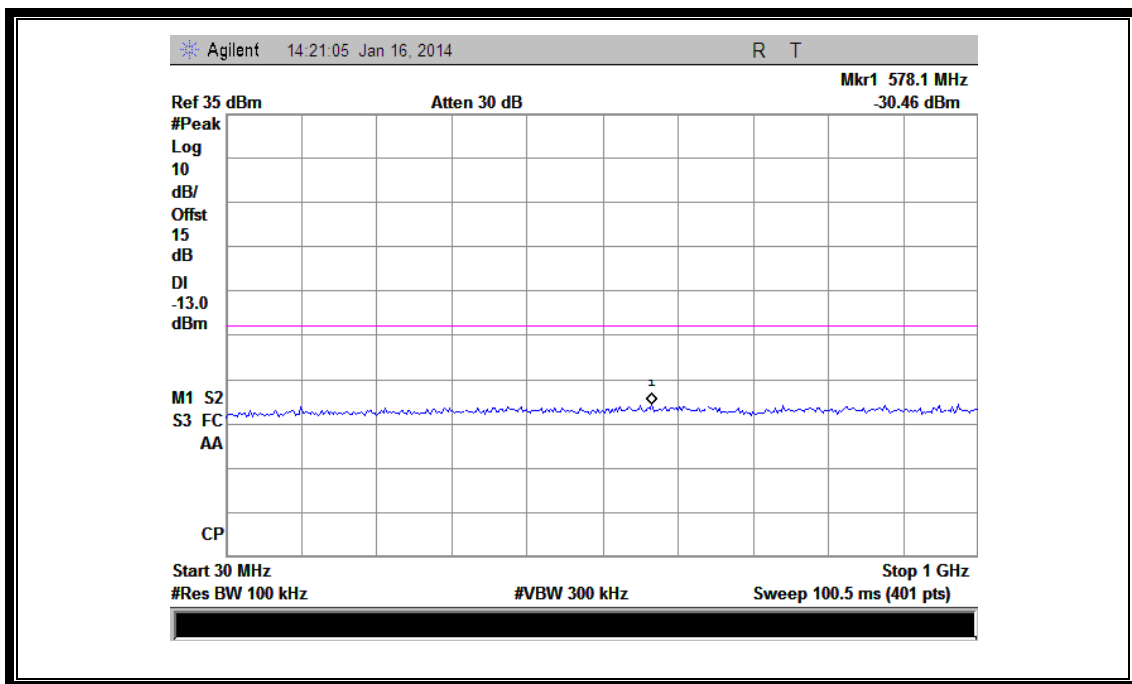
(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



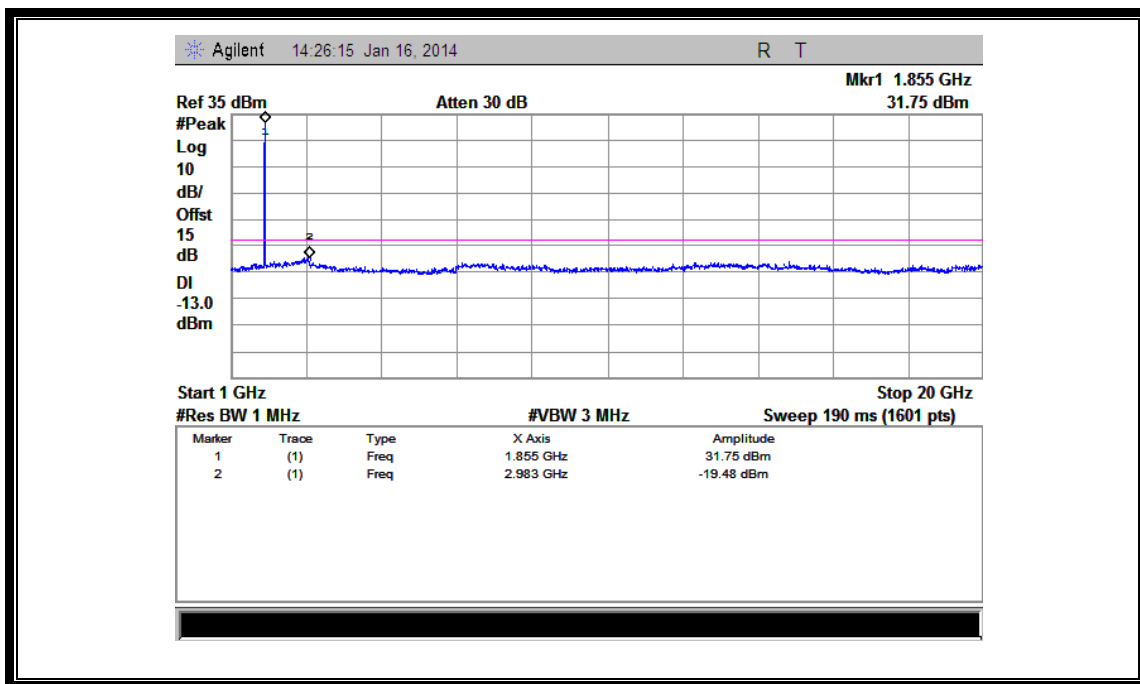
(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



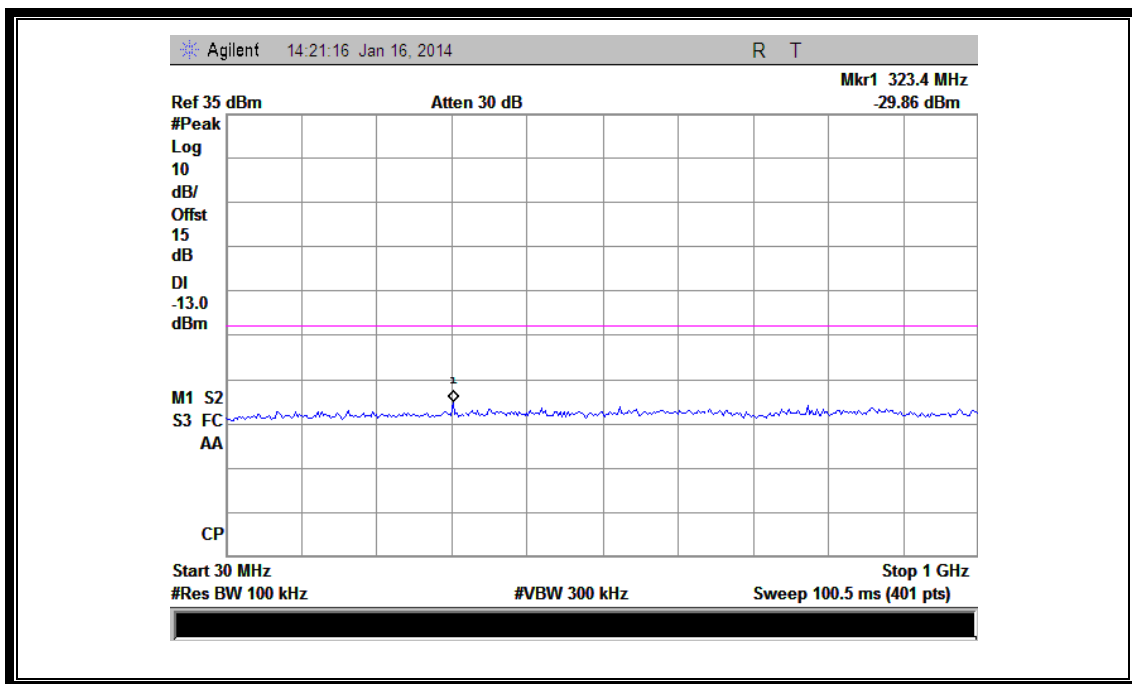
(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



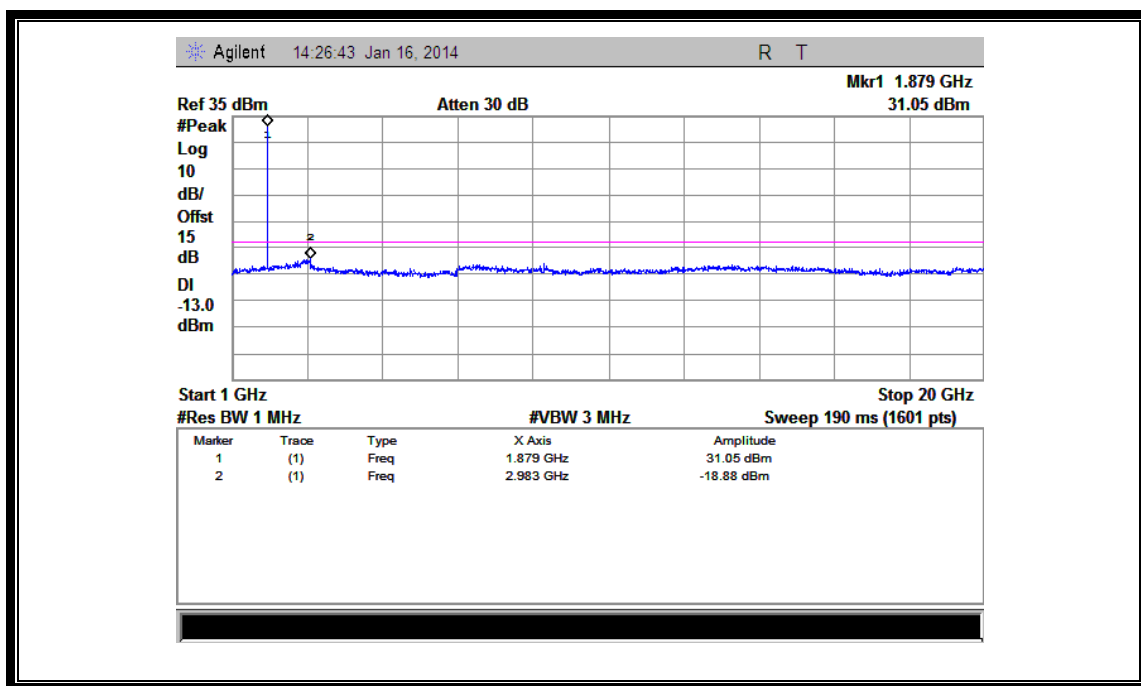
(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



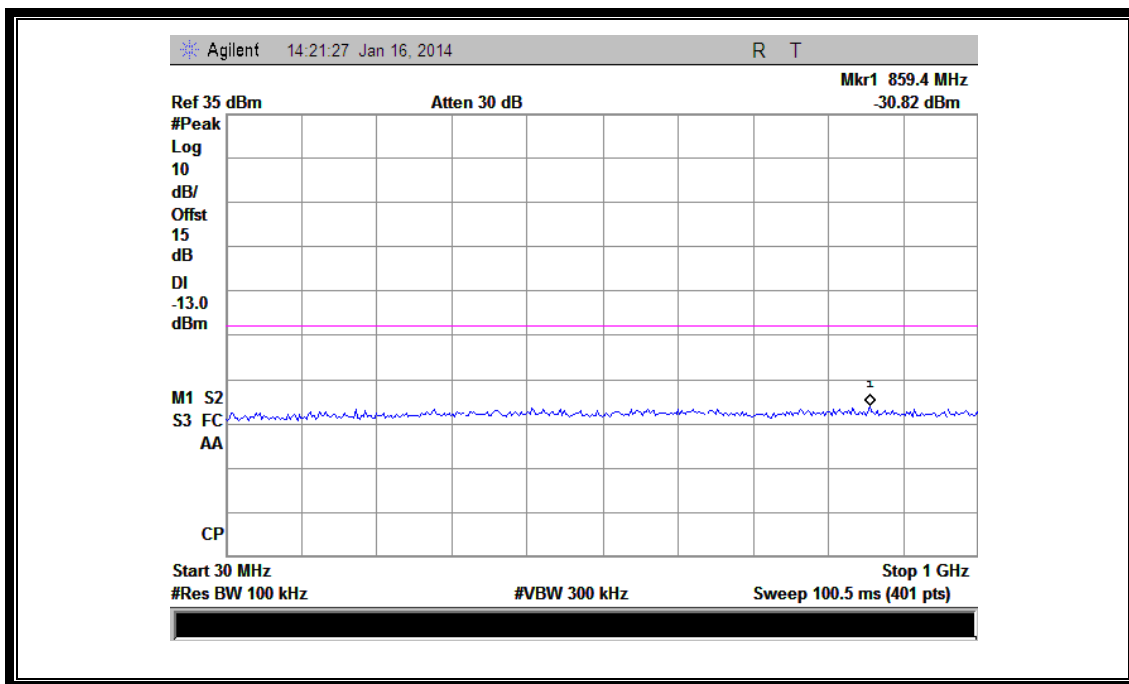
(Plot D1.1: EDGE 1900MHz Channel = 512, 1GHz to 20GHz)



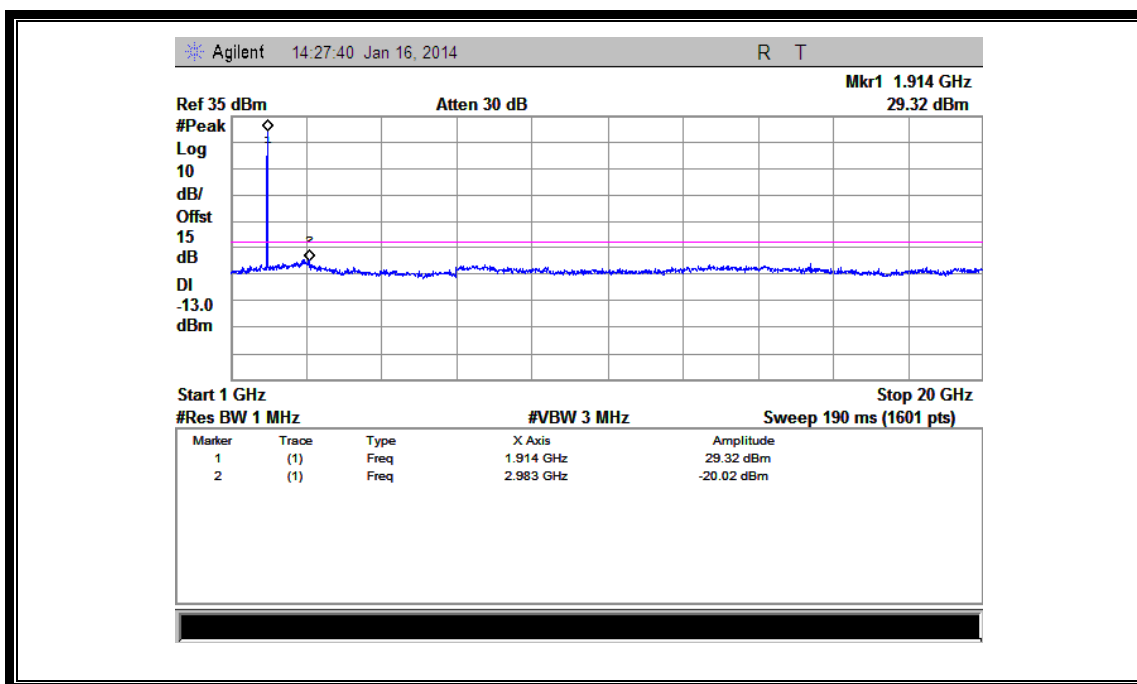
(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



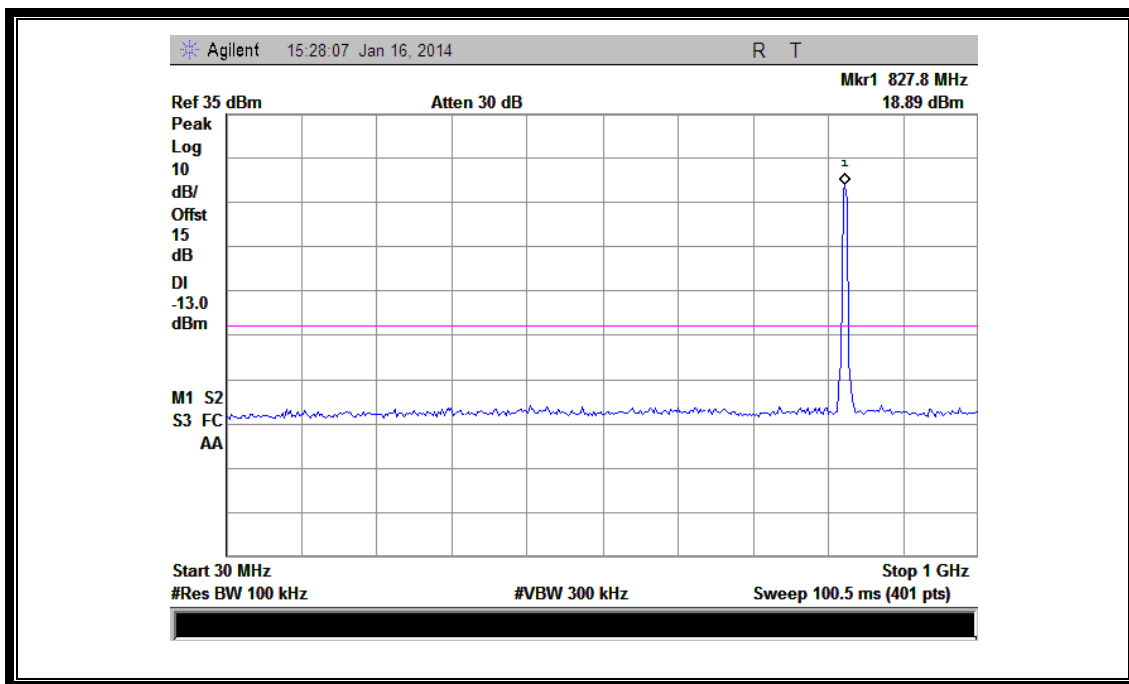
(Plot D2.1: EDGE 1900MHz Channel = 661, 1GHz to 20GHz)



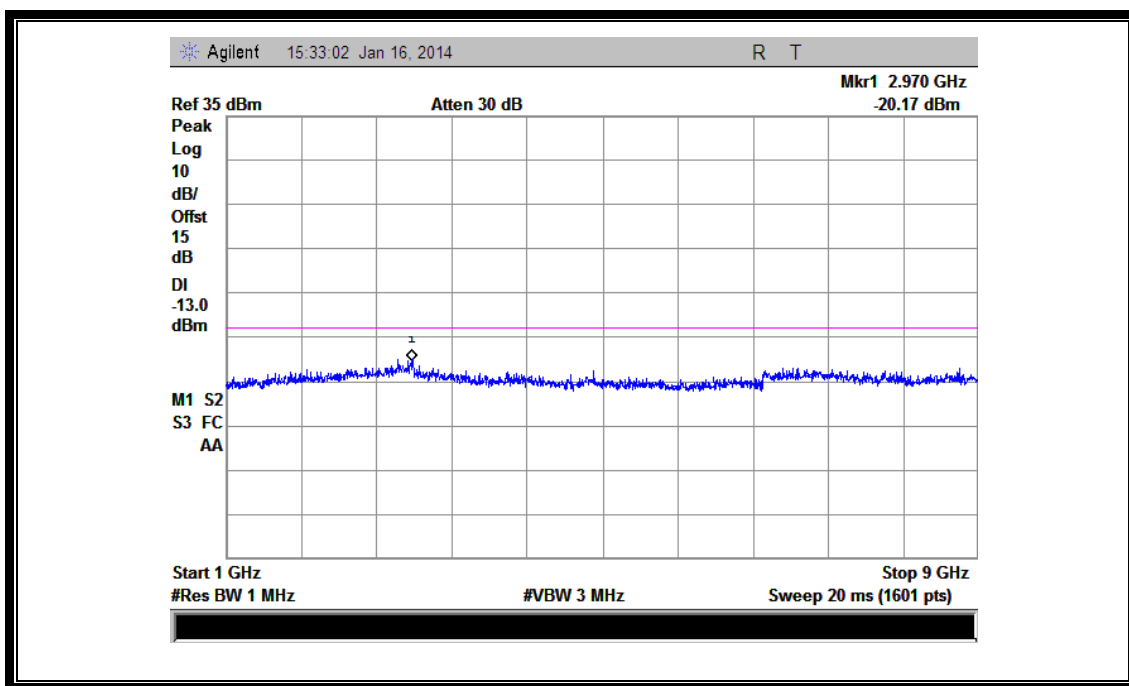
(Plot D3: EDGE 1900MHz Channel = 810, 30MHz to 1GHz)



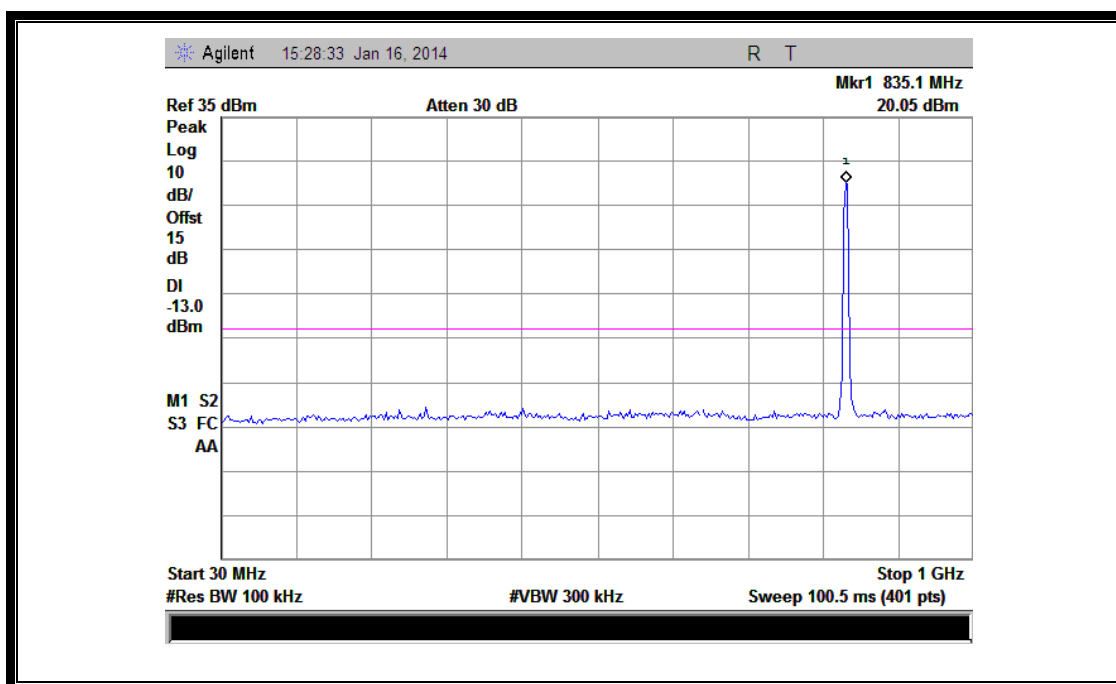
(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)



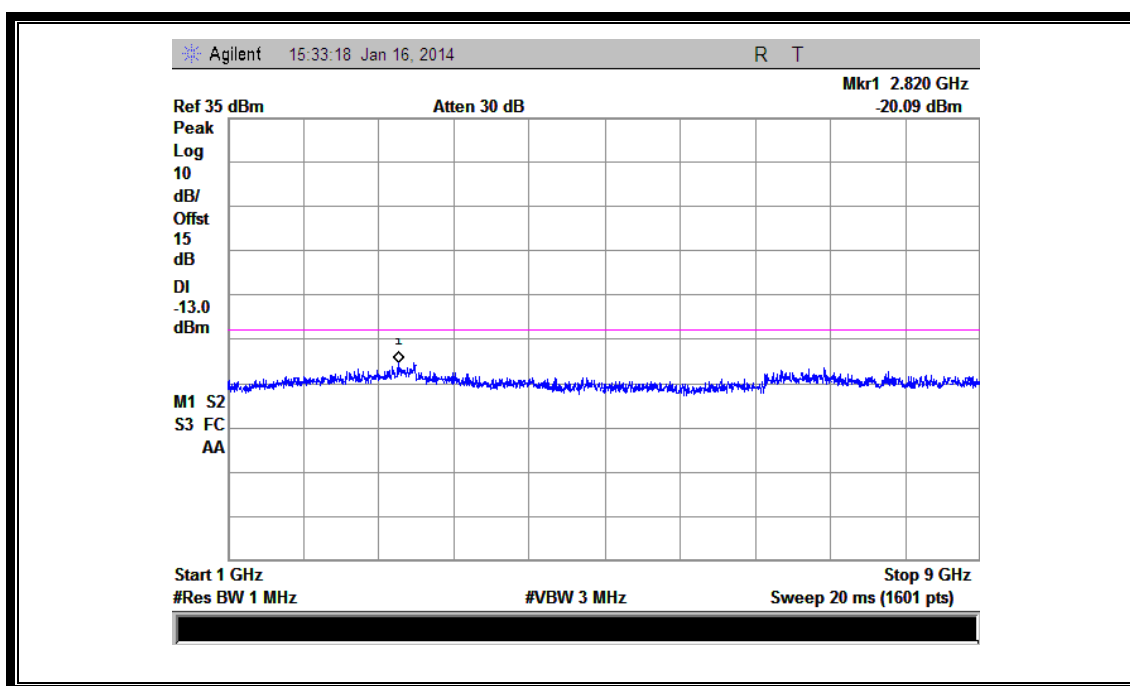
(Plot E1: WCDMA850MHz Channel = 4132, 30MHz to 1GHz)



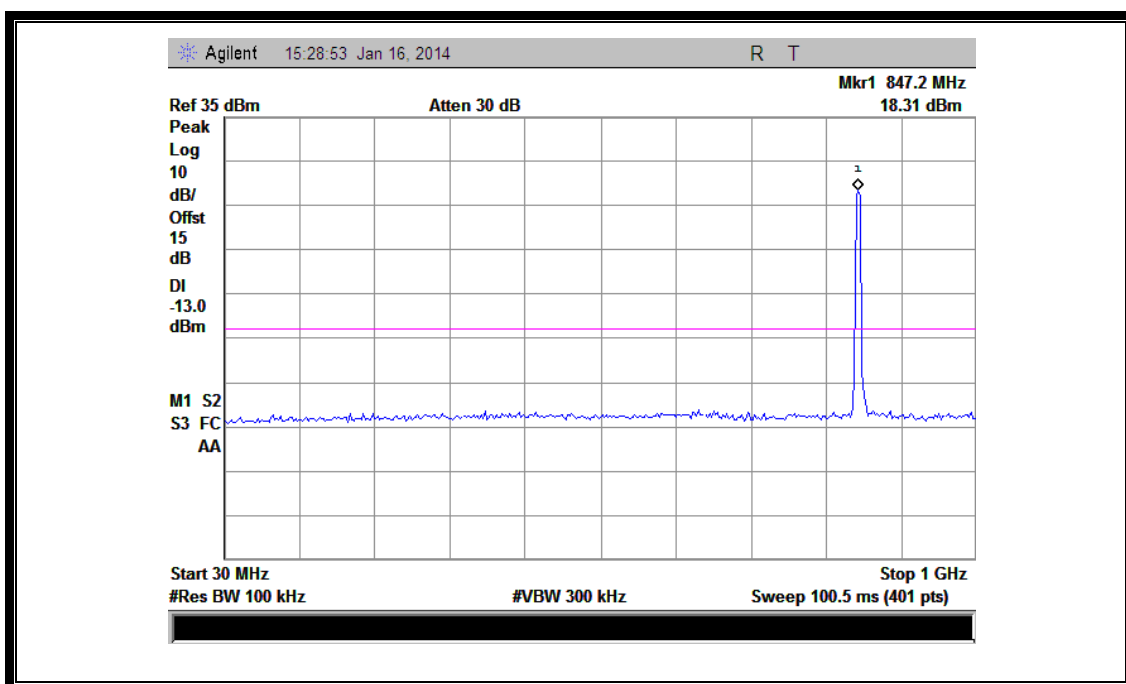
(Plot E1.1: WCDMA850MHz Channel = 4132, 1GHz to 9GHz)



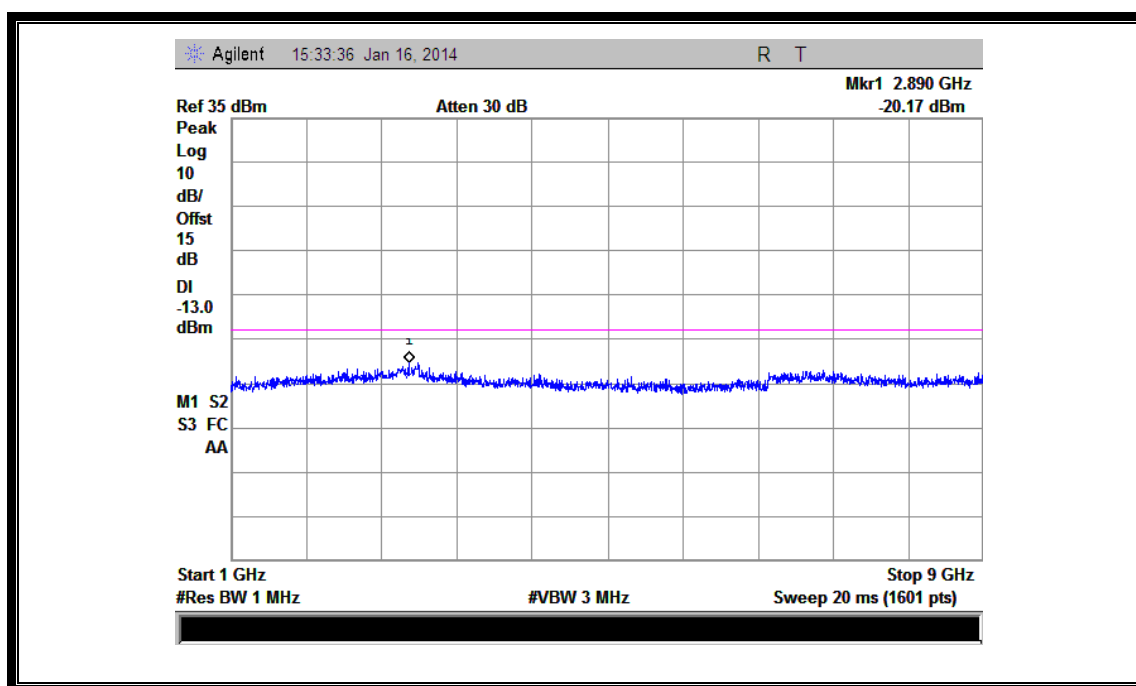
(Plot E2: WCDMA850MHz Channel = 4175, 30MHz to 1GHz)



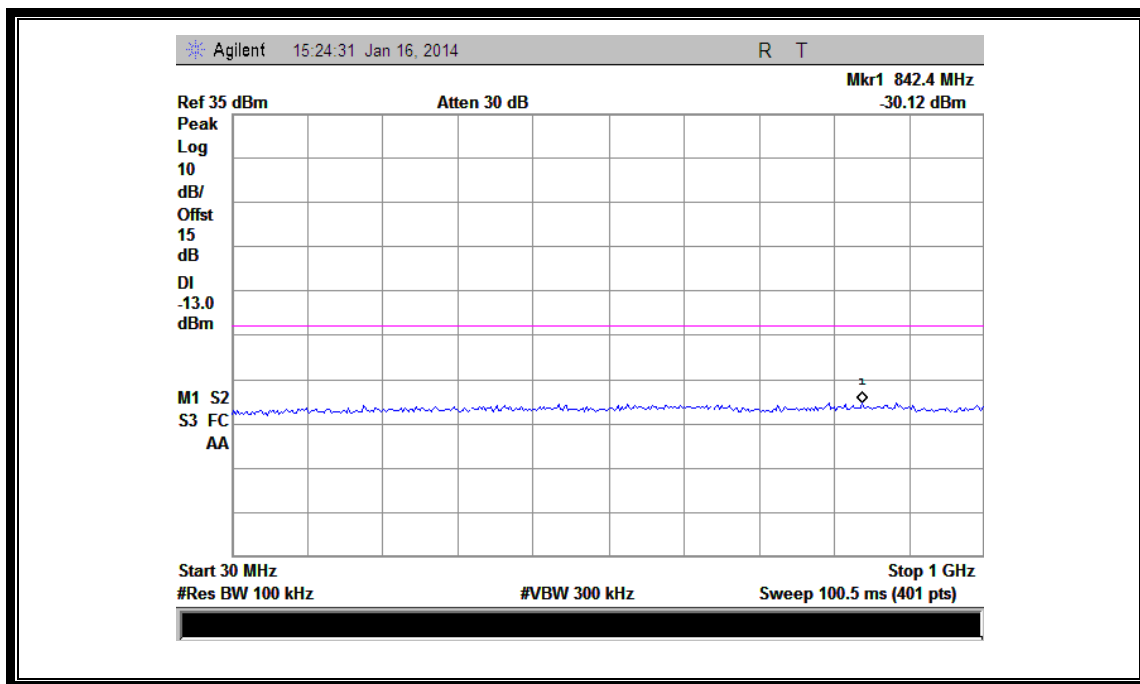
(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)



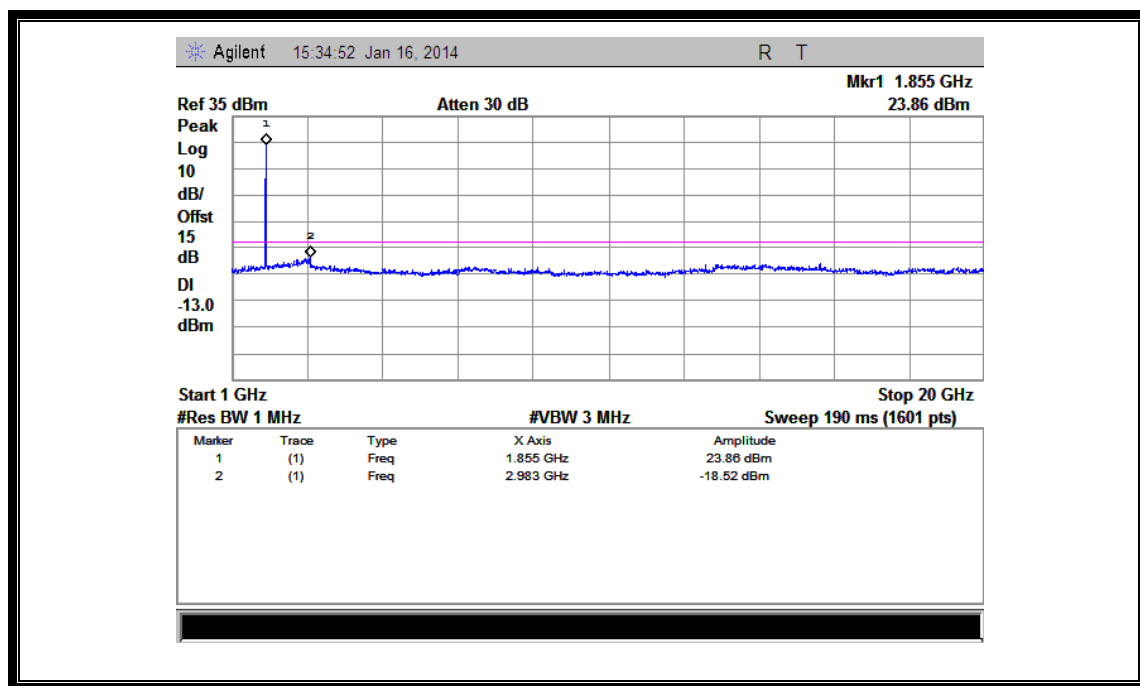
(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)



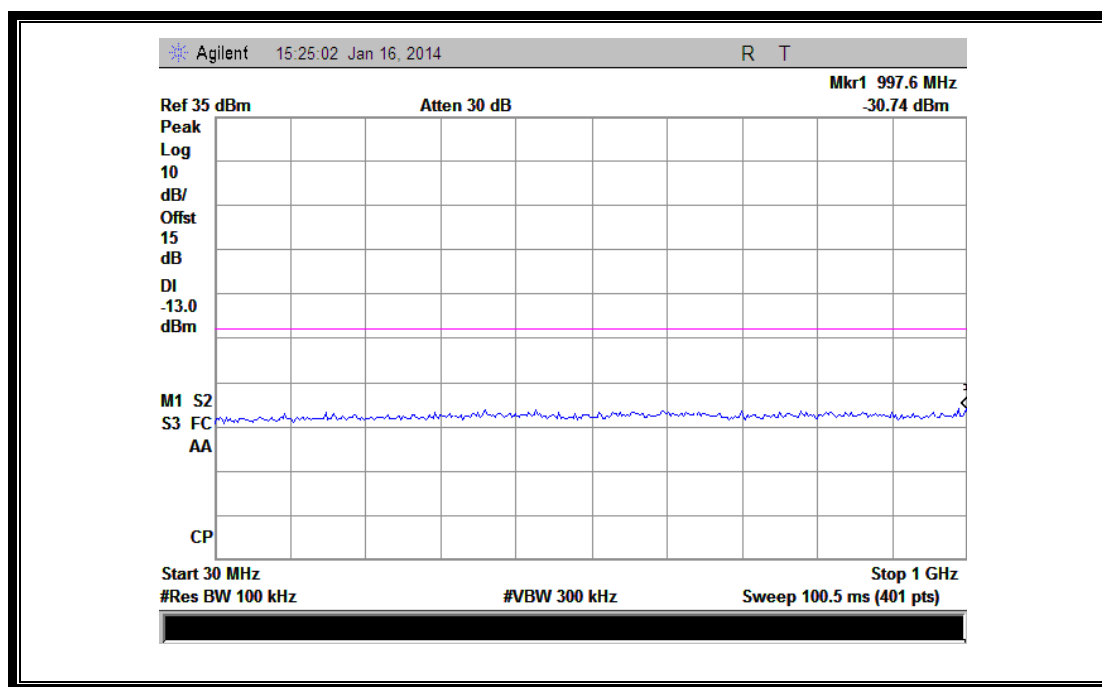
(Plot E3.1: WCDMA850MHz Channel = 4233, 1GHz to 9GHz)



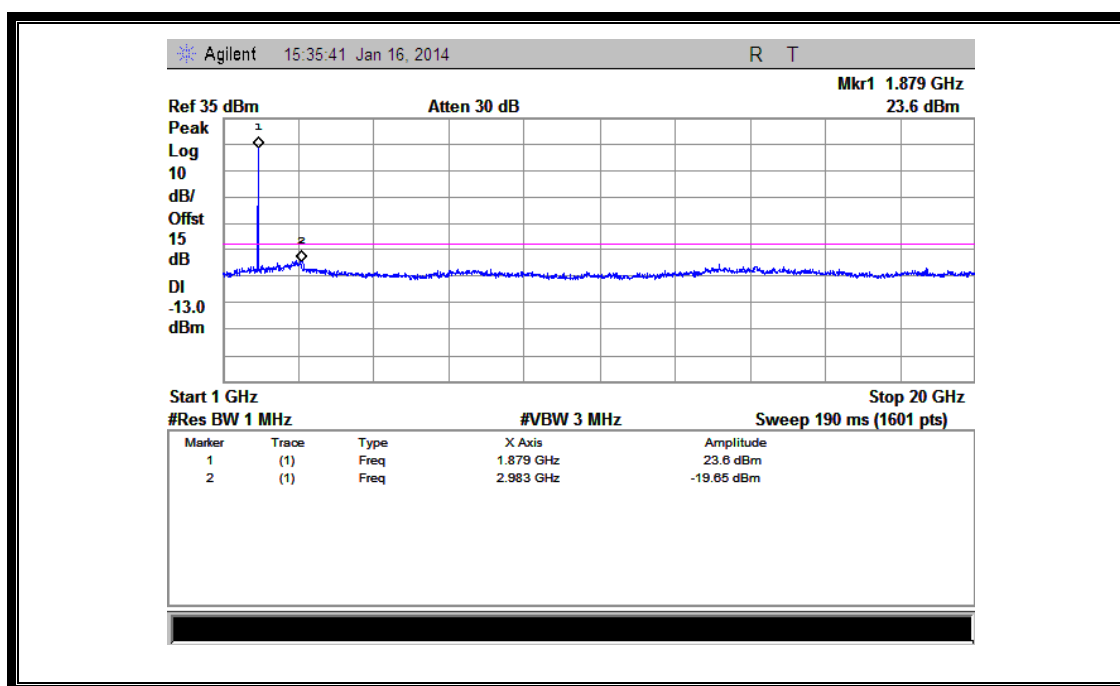
(Plot F1:WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)



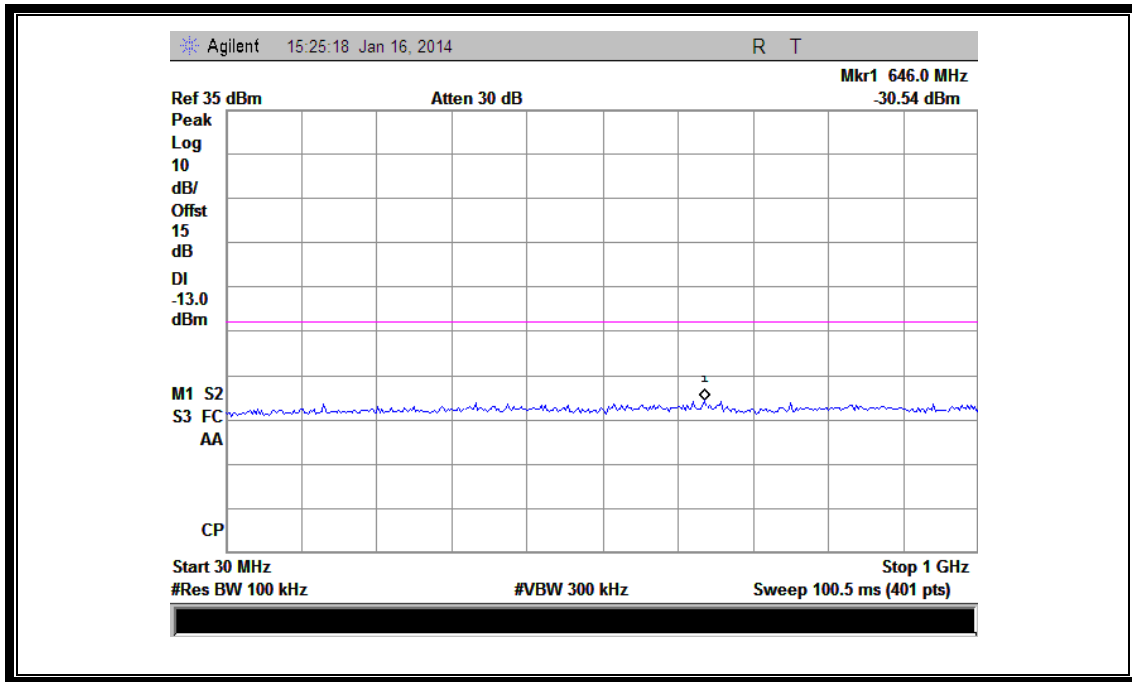
(Plot F1.1: WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)



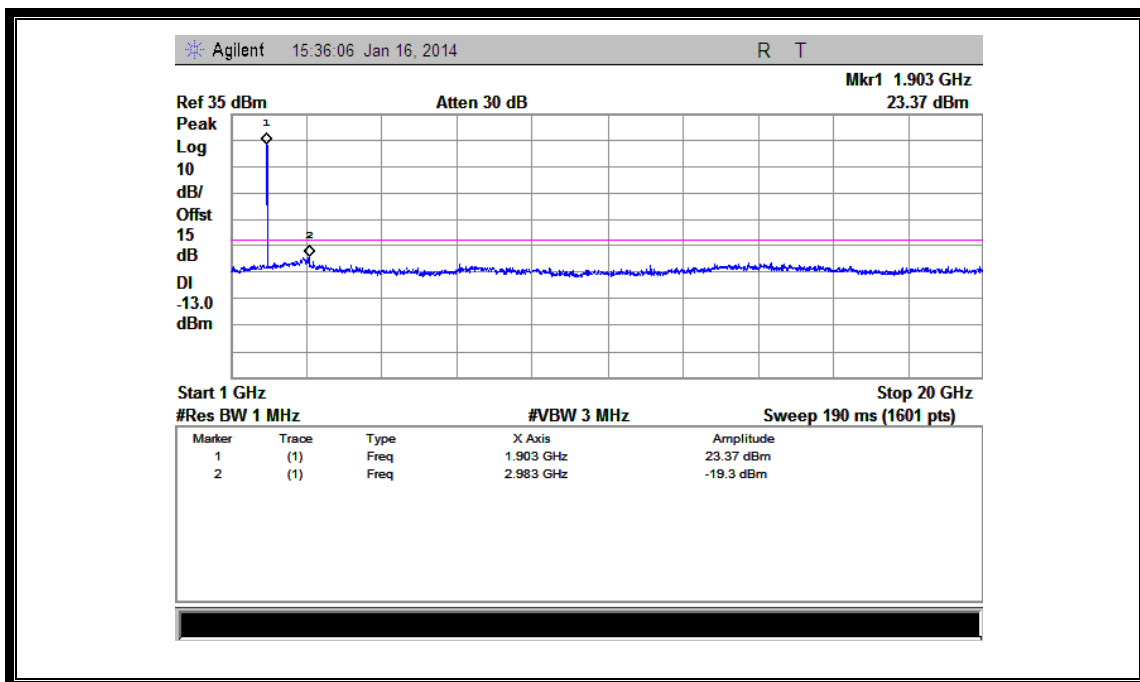
(Plot F2:WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)



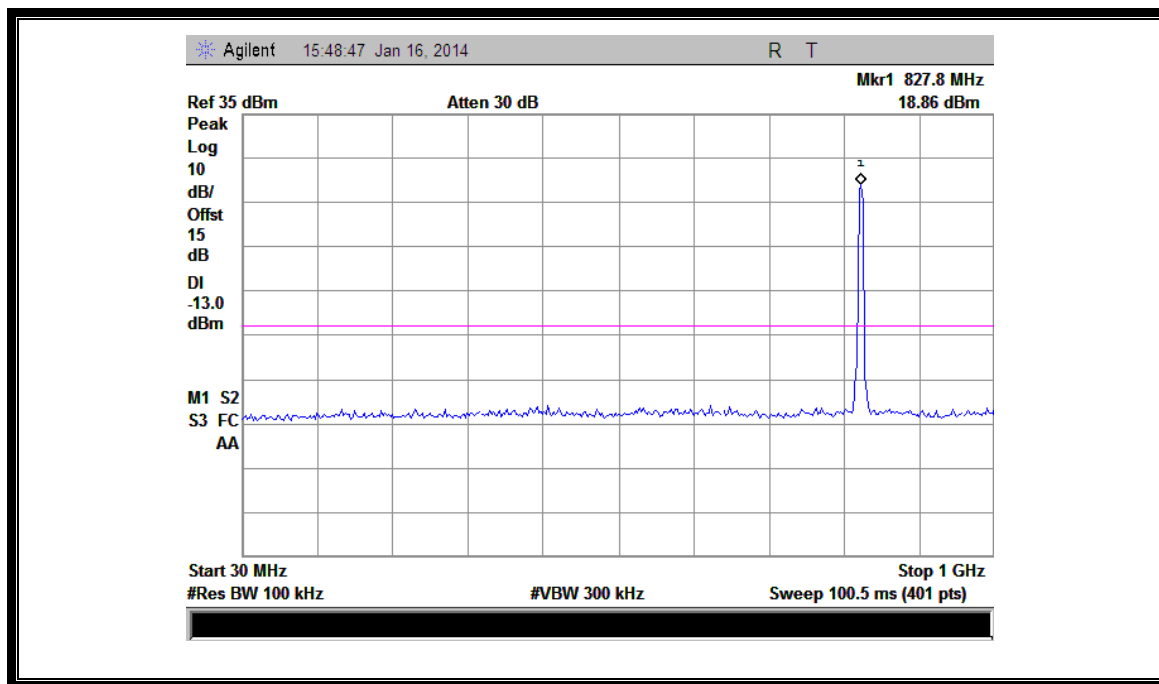
(Plot F2.1: WCDMA1900MHz Channel = 9400, 1GHz to 20GHz)



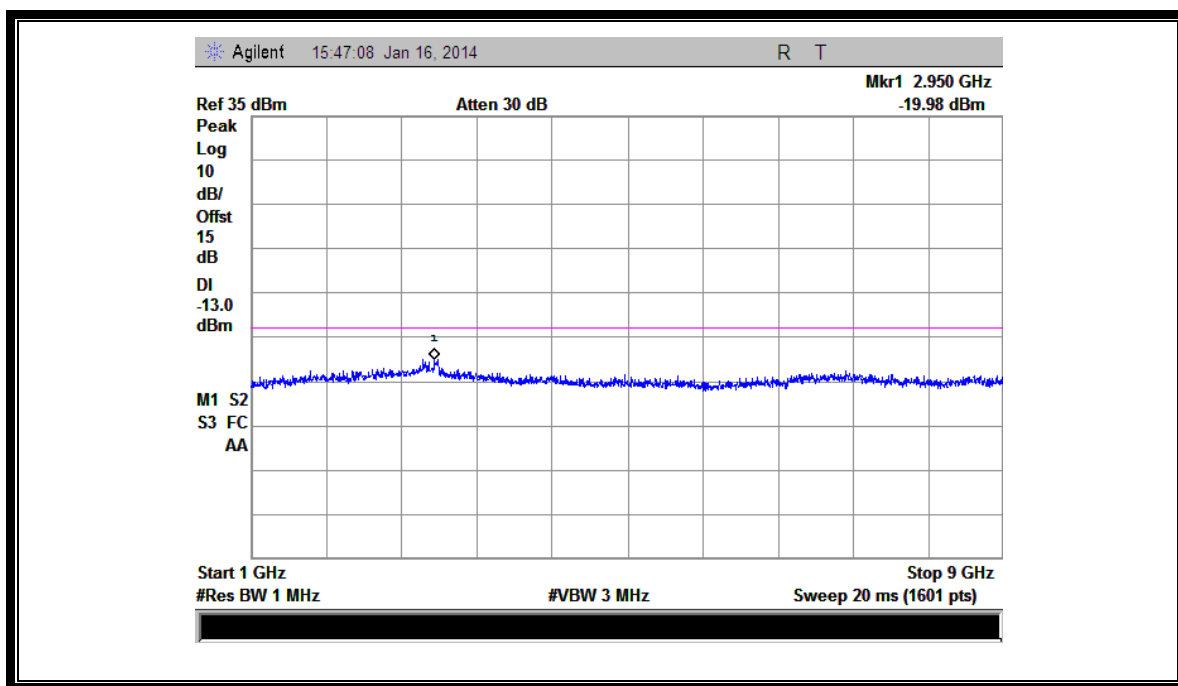
(Plot F3:WCDMA1900MHz Channel = 9538, 30MHz to 1GHz)



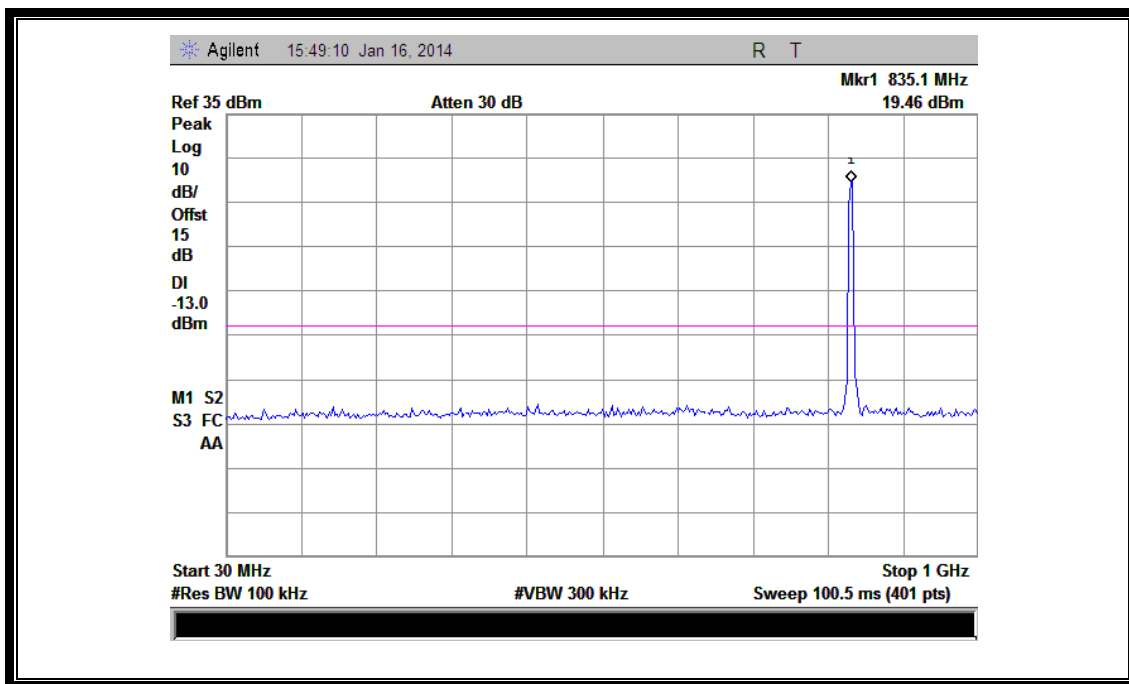
(Plot F3.1: WCDMA1900MHz Channel = 9538 1GHz to 20GHz)



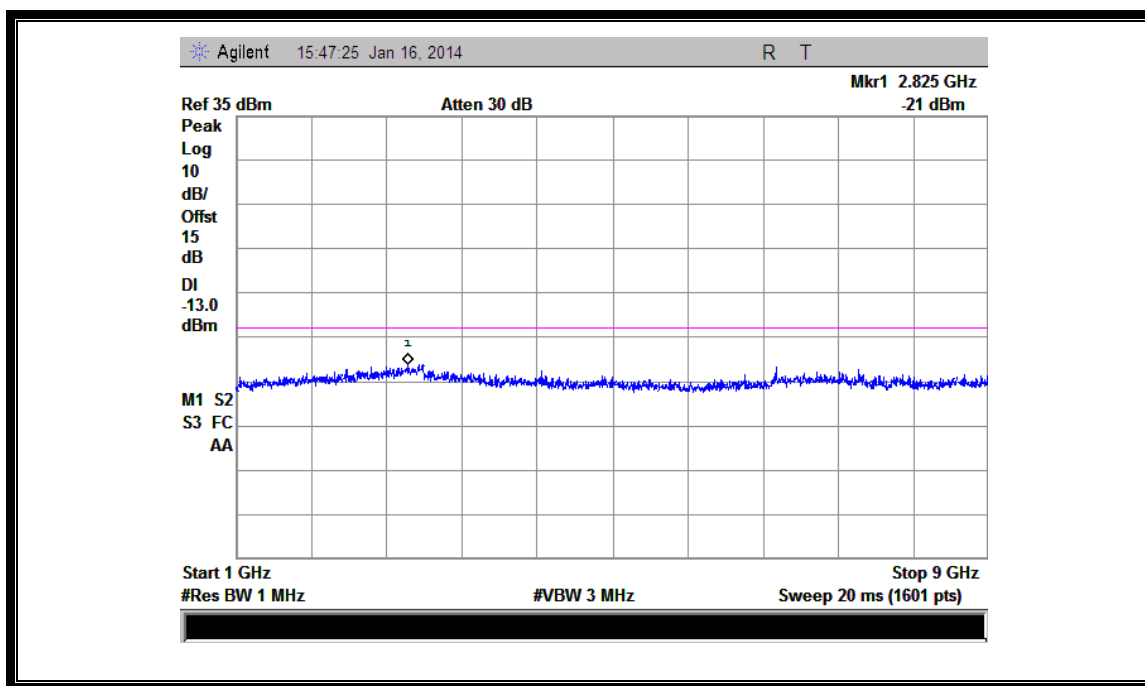
(Plot G1: HSDPA 850MHz Channel = 4132, 30MHz to 1GHz)



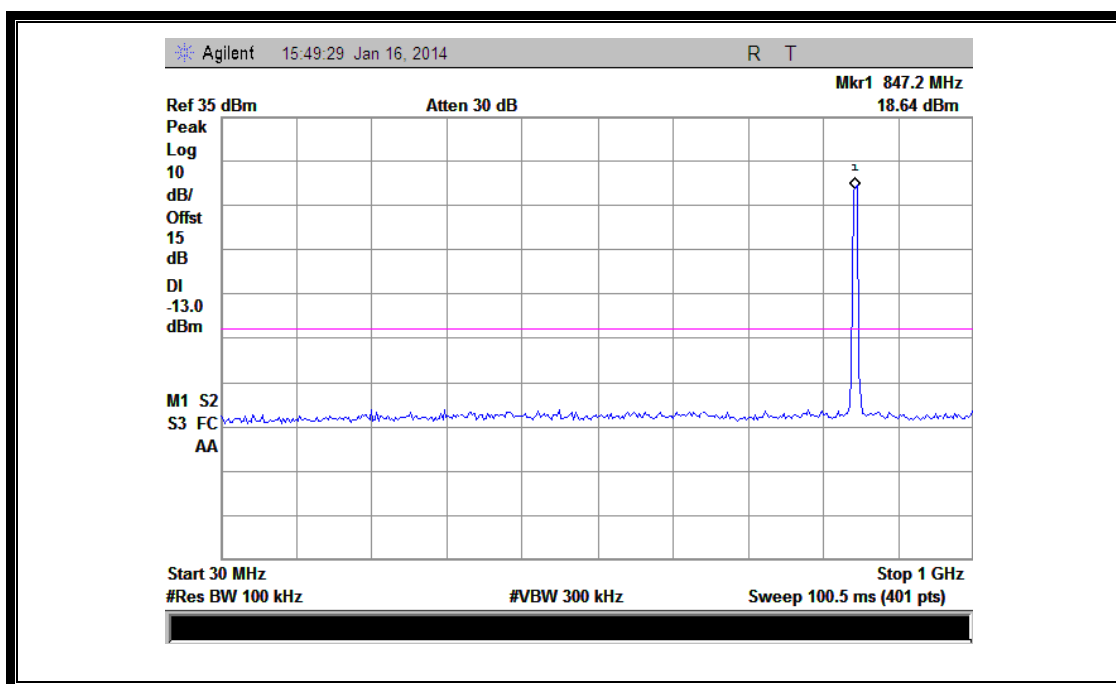
(Plot G1.1: HSDPA 850MHz Channel = 4132, 1GHz to 9GHz)



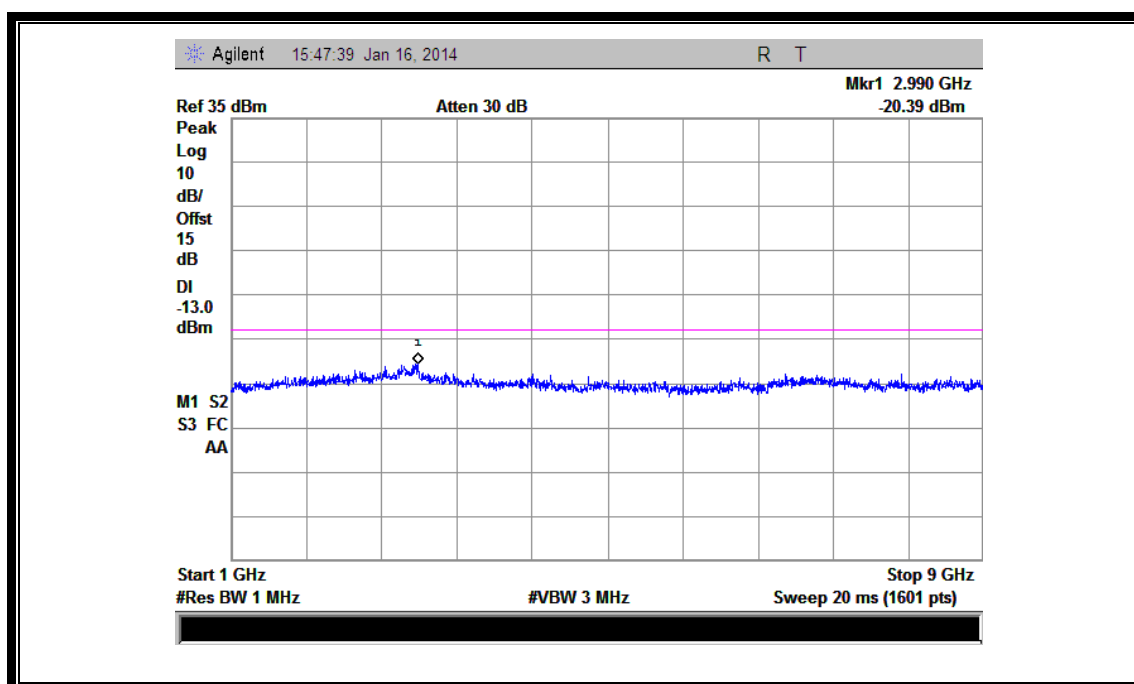
(Plot G2: HSDPA 850MHz Channel = 4175, 30MHz to 1GHz)



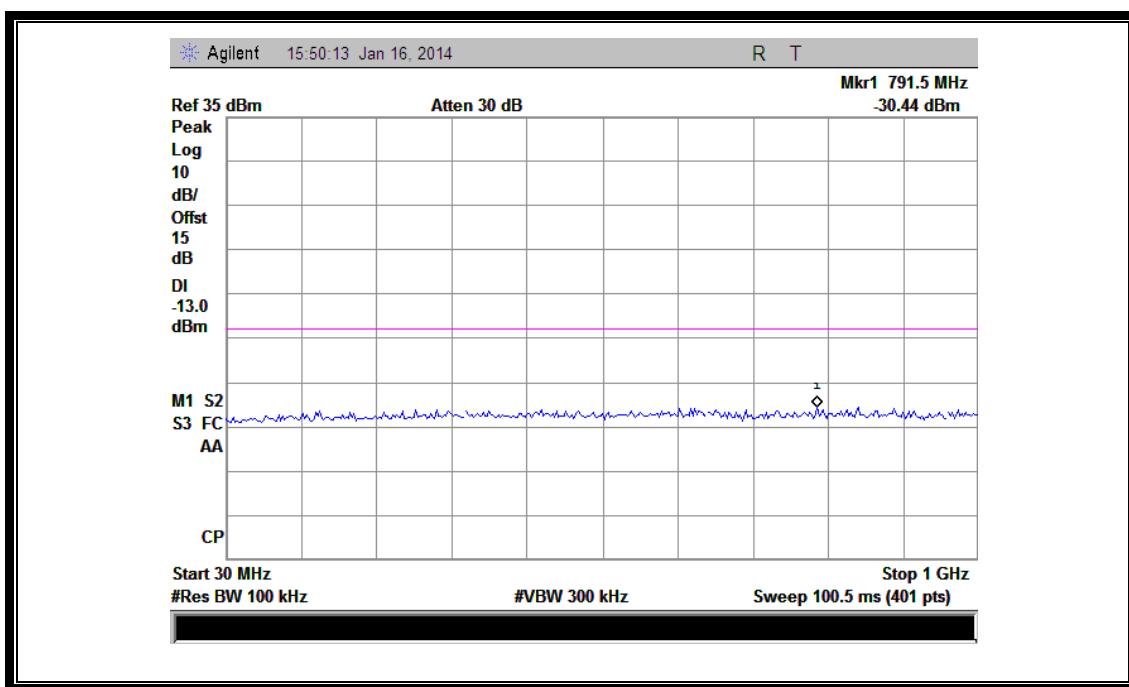
(Plot G2.1: HSDPA 850MHz Channel = 4175, 1GHz to 9GHz)



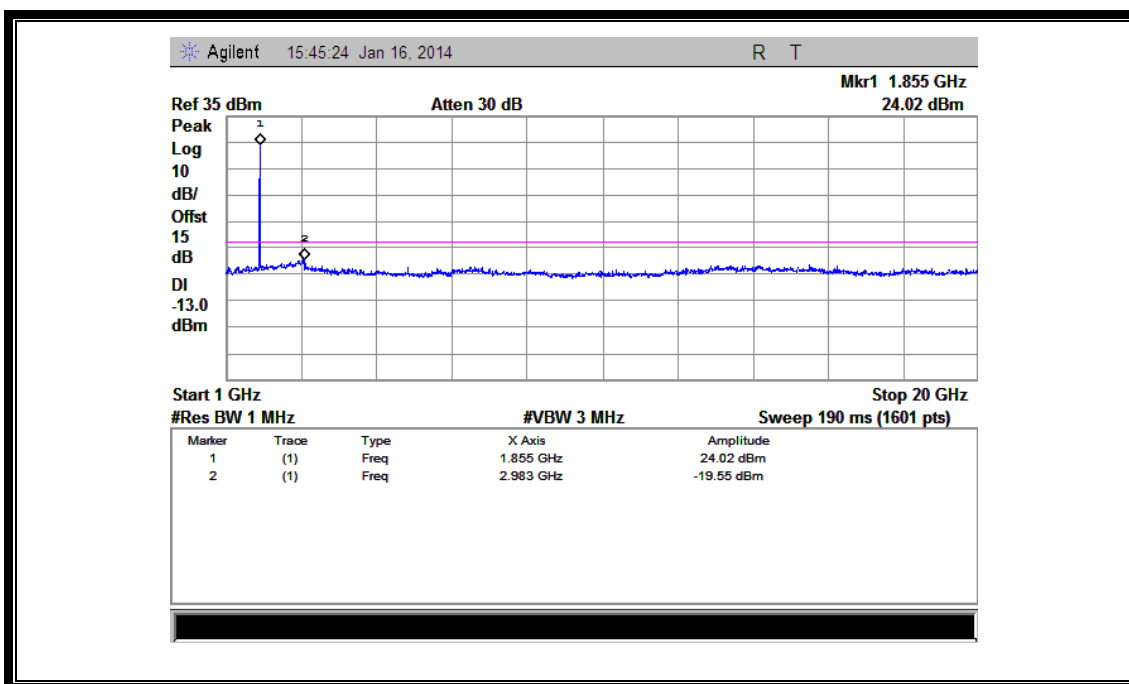
(Plot G3: HSDPA850MHz Channel = 4233, 30MHz to 1GHz)



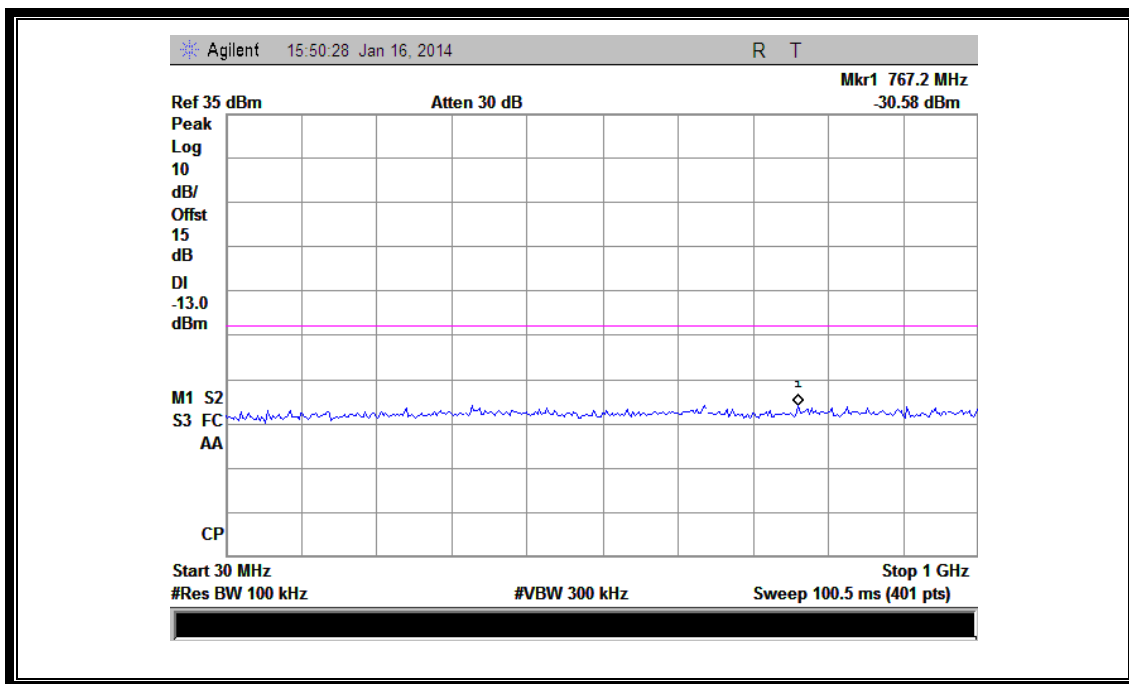
(Plot G3.1: HSDPA850MHz Channel = 4233, 1GHz to 9GHz)



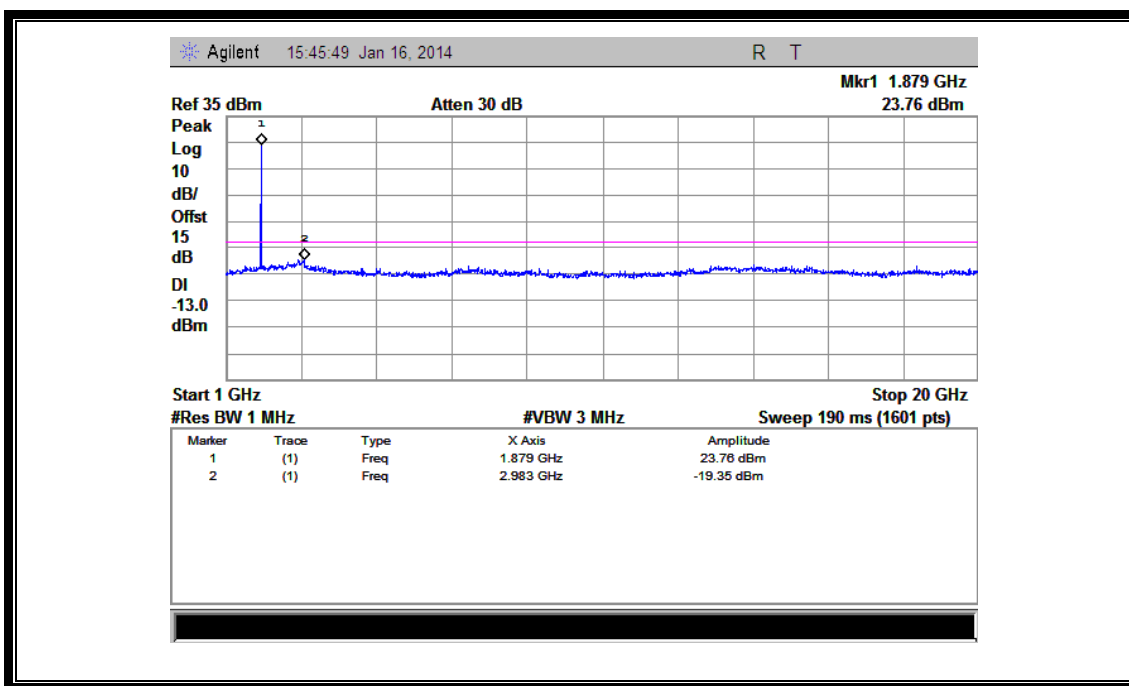
(Plot H1: HSDPA1900MHz Channel = 9262, 30MHz to 1GHz)



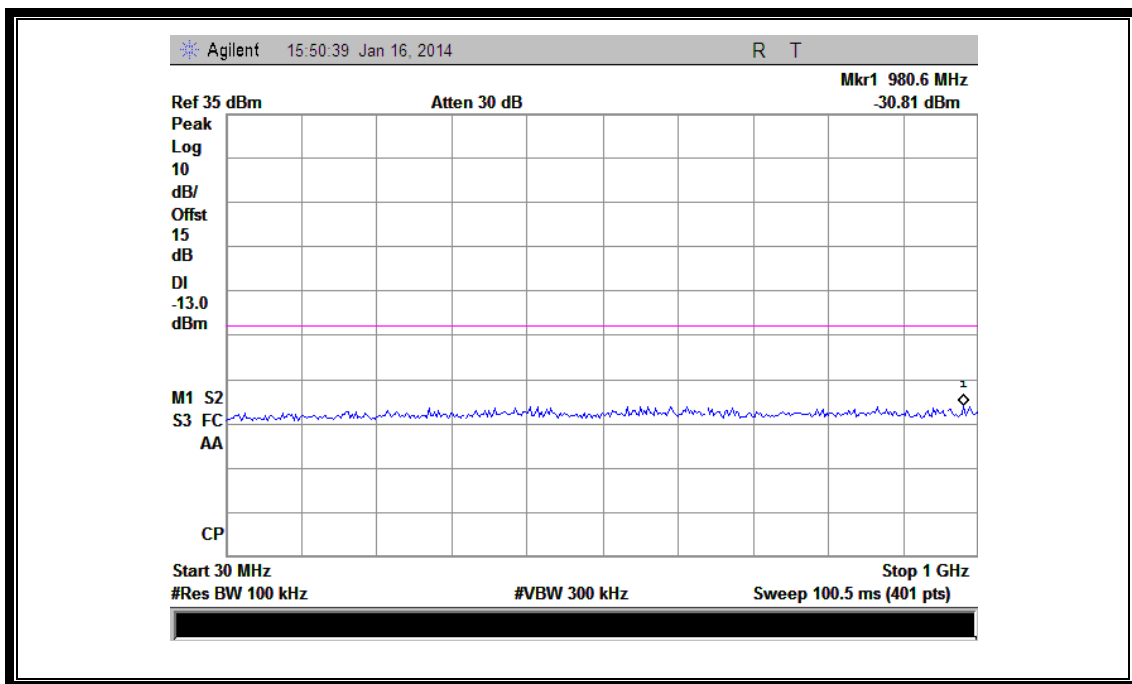
(Plot H1.1: HSDPA1900MHz Channel = 9262, 1GHz to 20GHz)



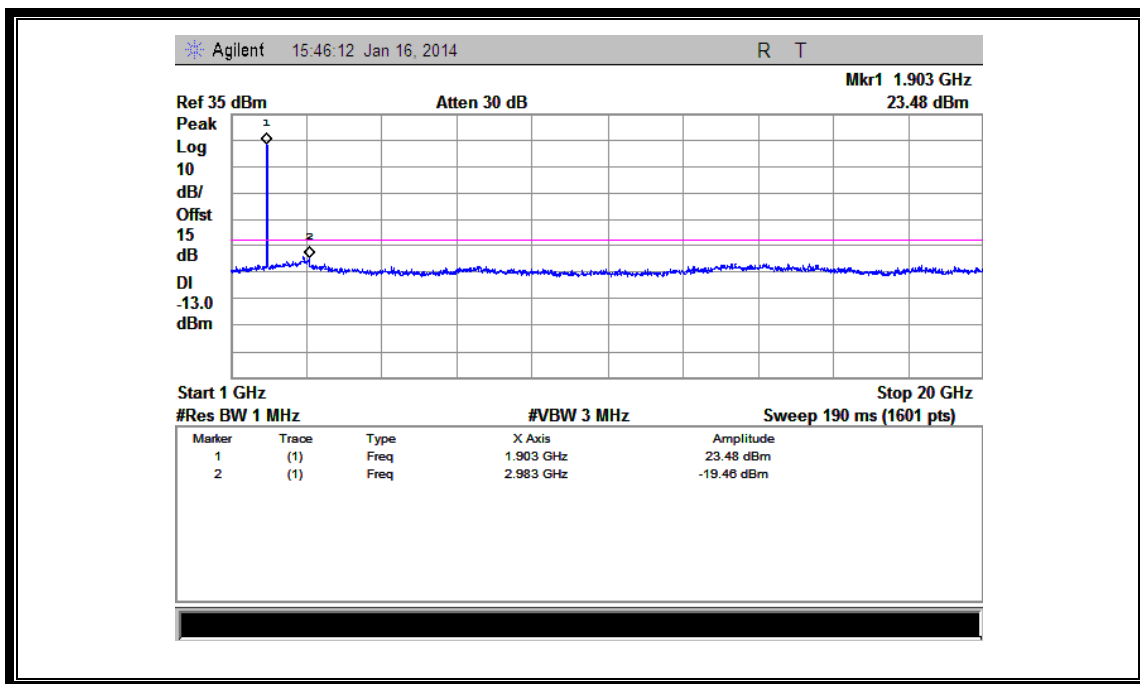
(Plot H2: HSDPA1900MHz Channel = 9400, 30MHz to 1GHz)



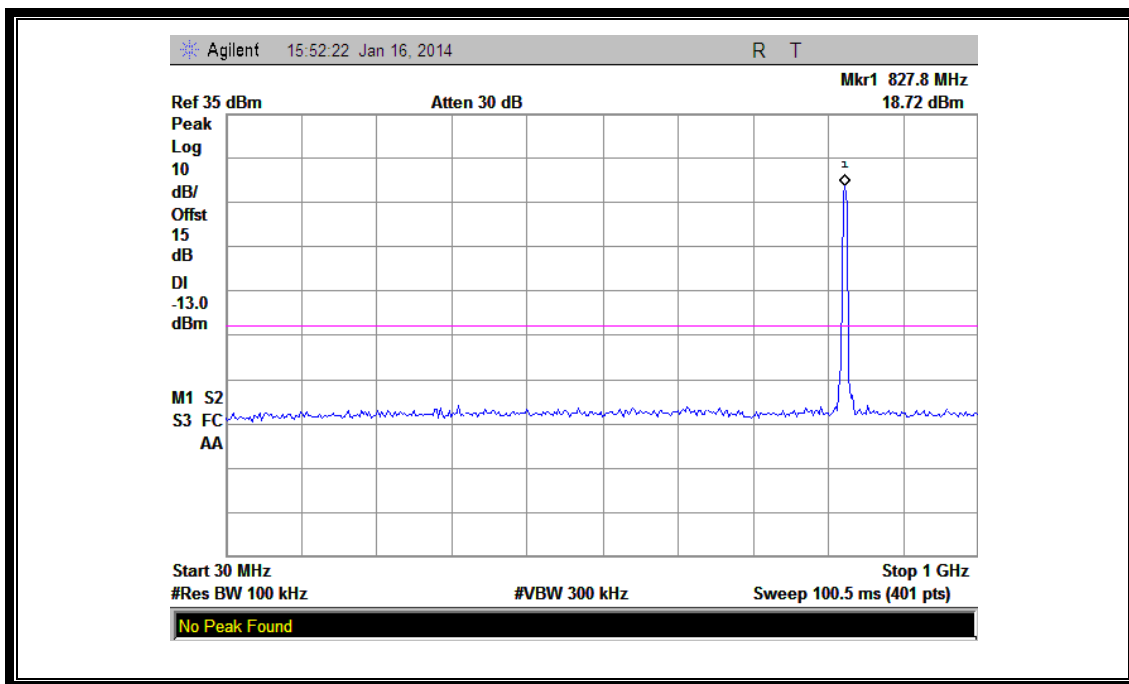
(Plot H2.1: HSDPA1900MHz Channel = 9400, 1GHz to 20GHz)



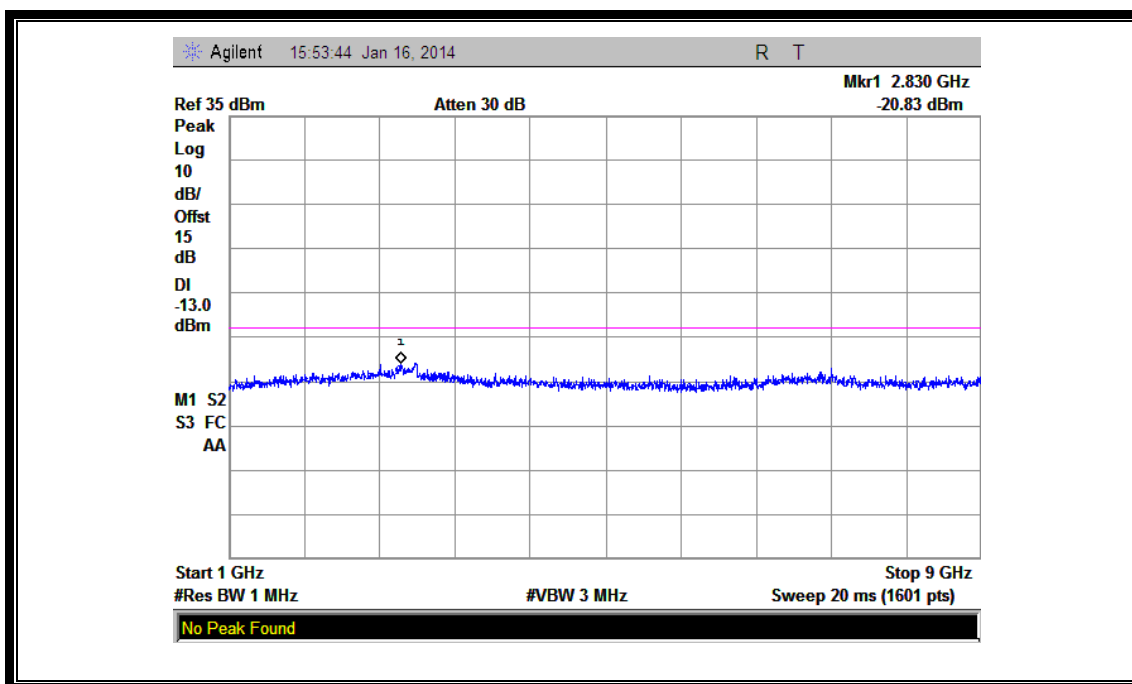
(Plot H3: HSDPA1900MHz Channel = 9538, 30MHz to 1GHz)



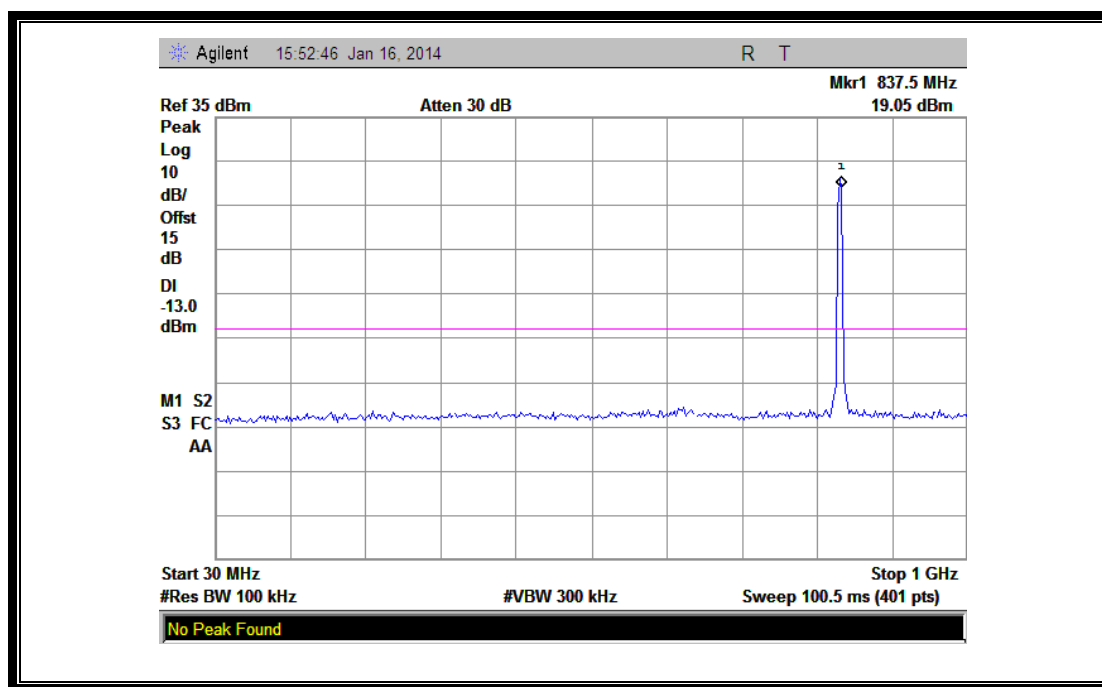
(Plot H3.1: HSDPA1900MHz Channel = 9538 1GHz to 20GHz)



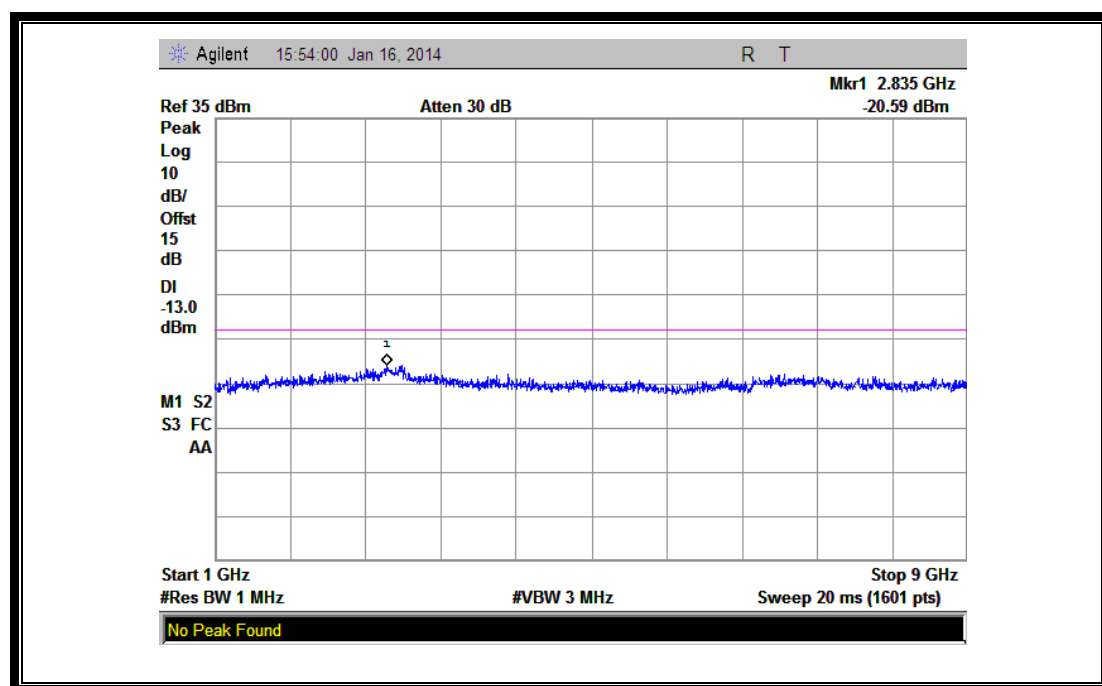
(Plot I 1: HSUPA 850MHz Channel = 4132, 30MHz to 1GHz)



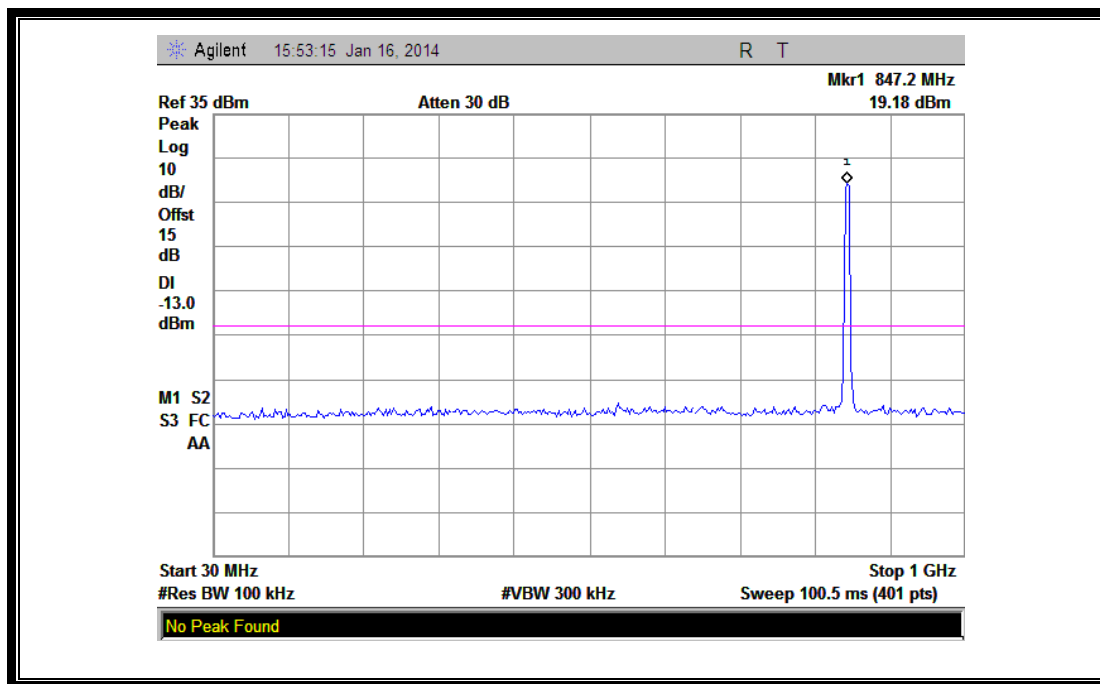
(Plot I1.1: HSUPA 850MHz Channel = 4132, 1GHz to 9GHz)



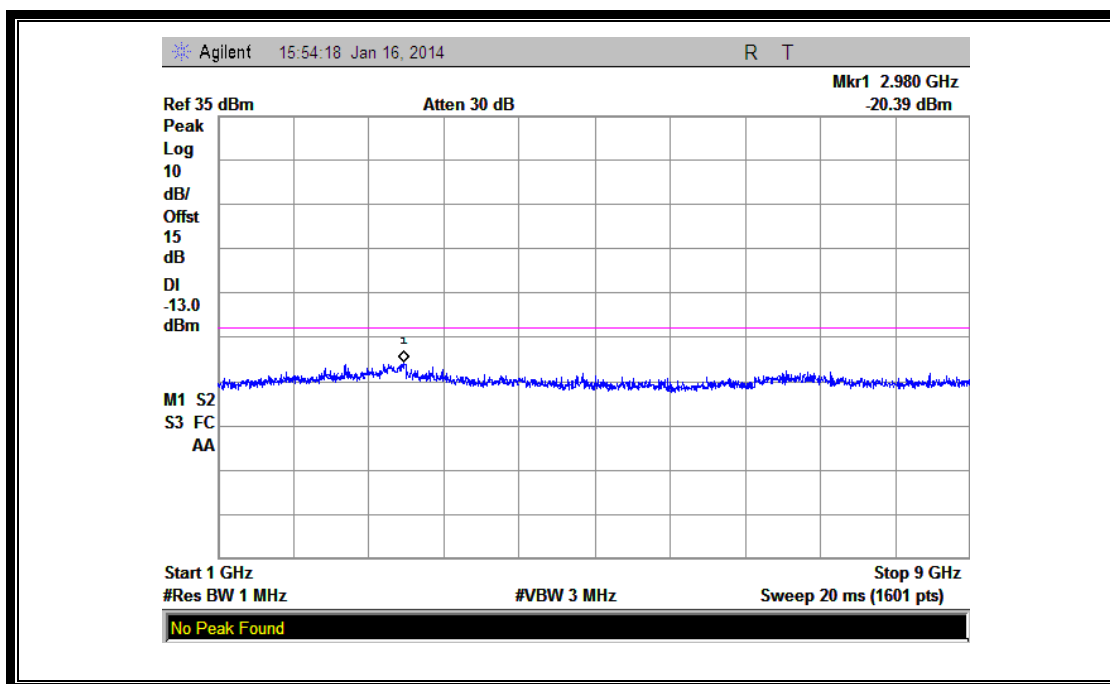
(Plot I 2: HSUPA 850MHz Channel = 4175, 30MHz to 1GHz)



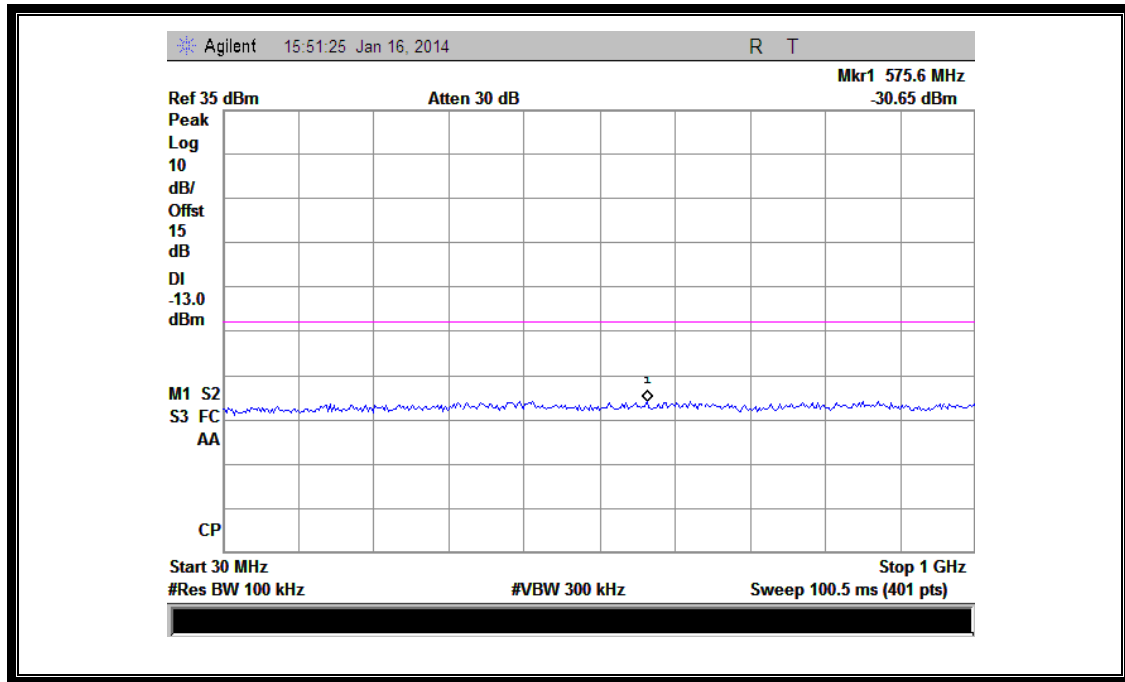
(Plot I2.1: HSUPA 850MHz Channel = 4175, 1GHz to 9GHz)



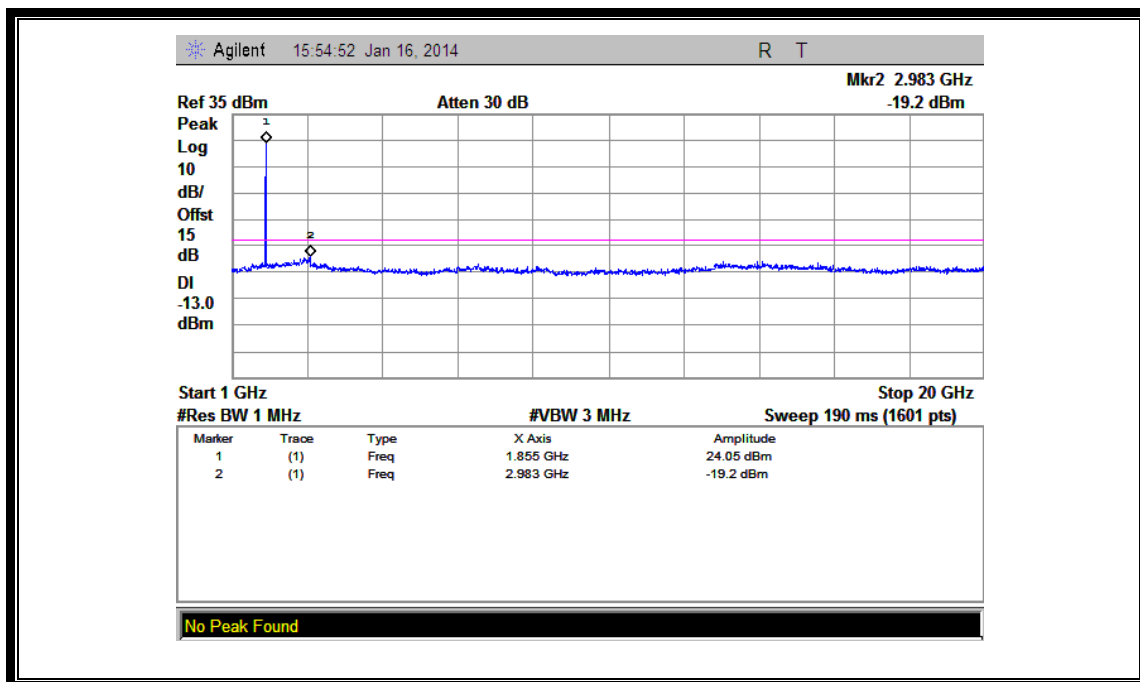
(Plot I 3: HSUPA850MHz Channel = 4233, 30MHz to 1GHz)



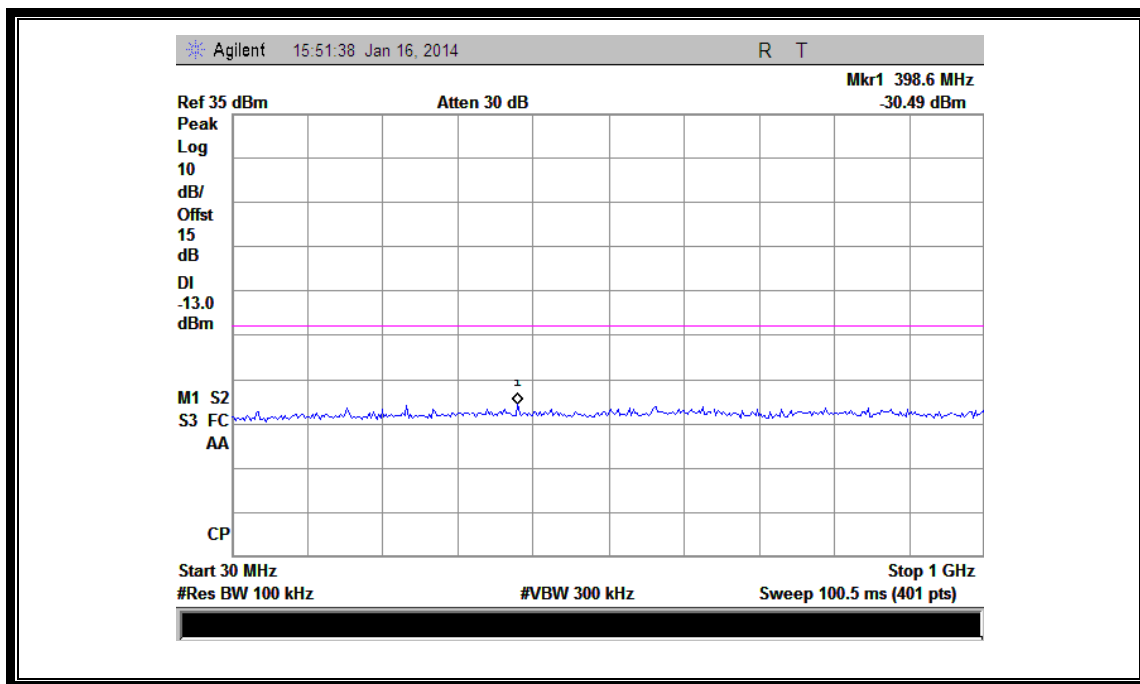
(Plot I3.1: HSUPA850MHz Channel = 4233, 1GHz to 9GHz)



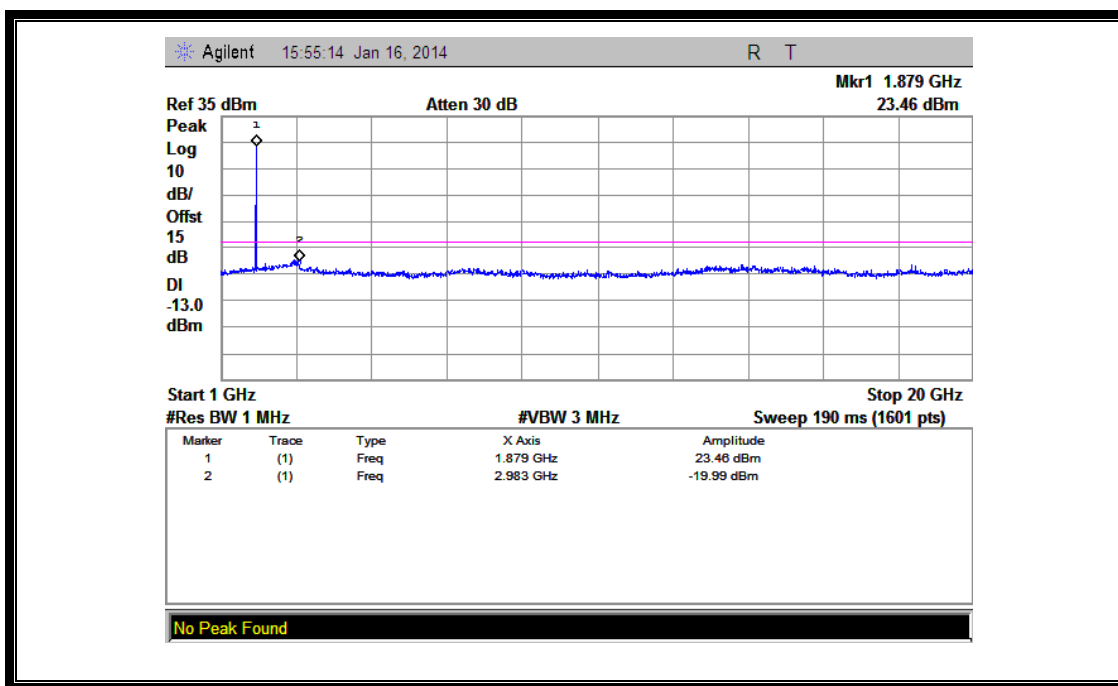
(Plot J 1: HSUPA1900MHz Channel = 9262, 30MHz to 1GHz)



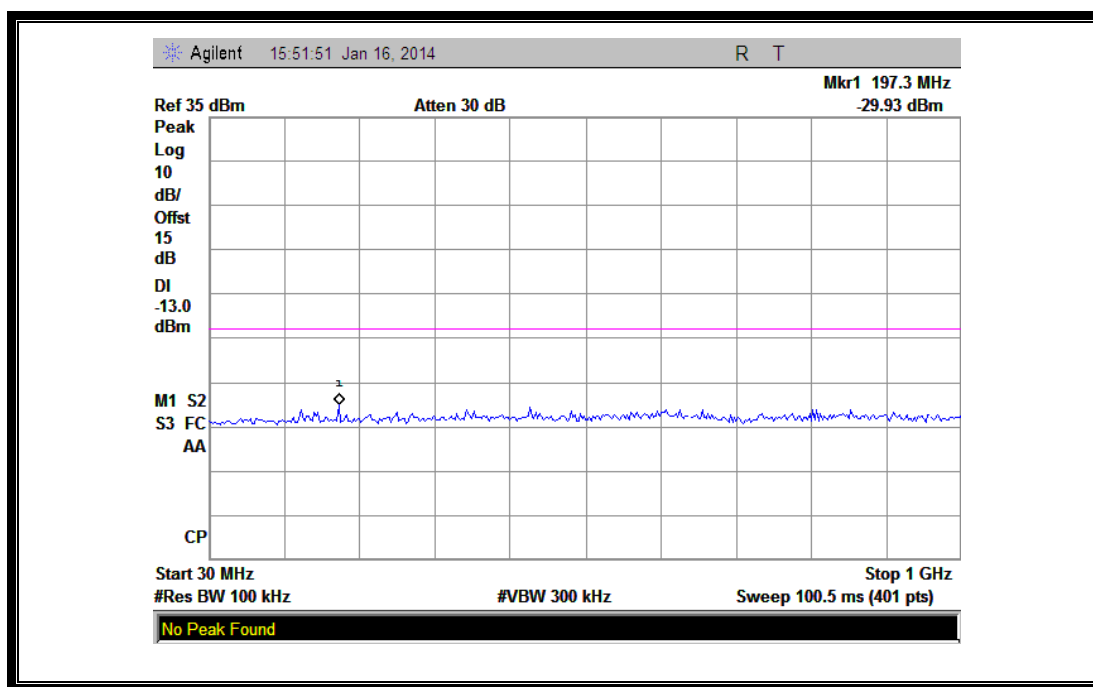
(Plot J1.1: HSUPA1900MHz Channel = 9262, 1GHz to 20GHz)



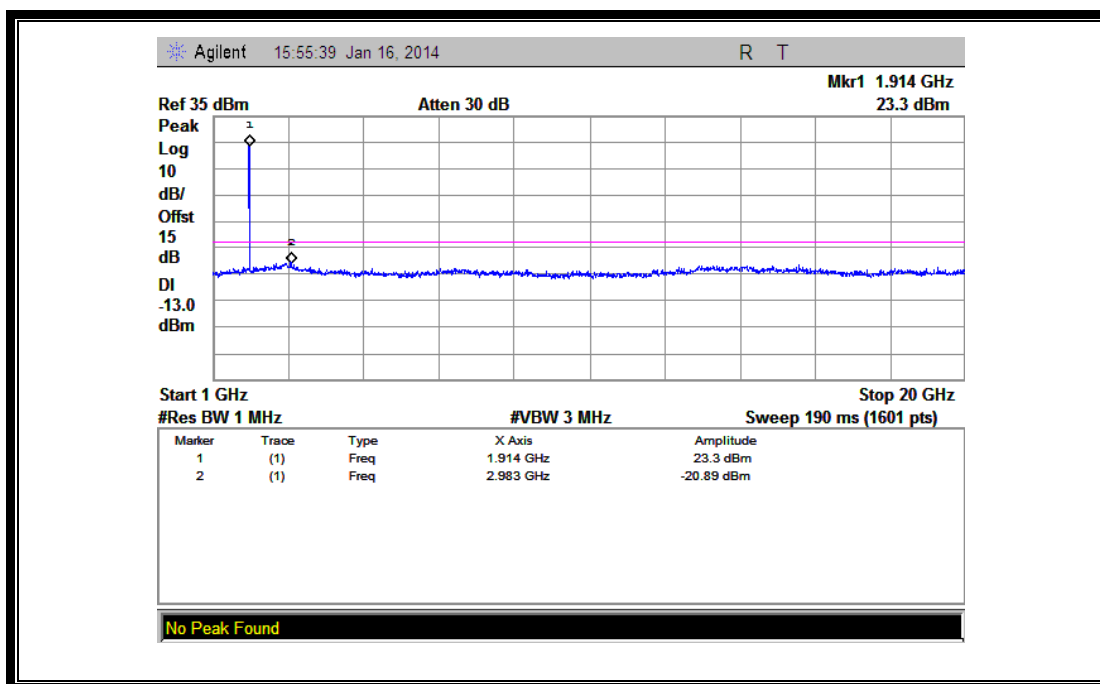
(Plot J 2: HSUPA1900MHz Channel = 9400, 30MHz to 1GHz)



(Plot J2.1: HSUPA1900MHz Channel = 9400, 1GHz to 20GHz)



(Plot J 3: HSUPA1900MHz Channel = 9538, 30MHz to 1GHz)



(Plot J3.1: HSUPA1900MHz Channel = 9538 1GHz to 20GHz)

## 2.6 Band Edge

### 2.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b) in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

### 2.6.2 Test Description

See section 2.1.2 of this report.

### 2.6.3 Test Result

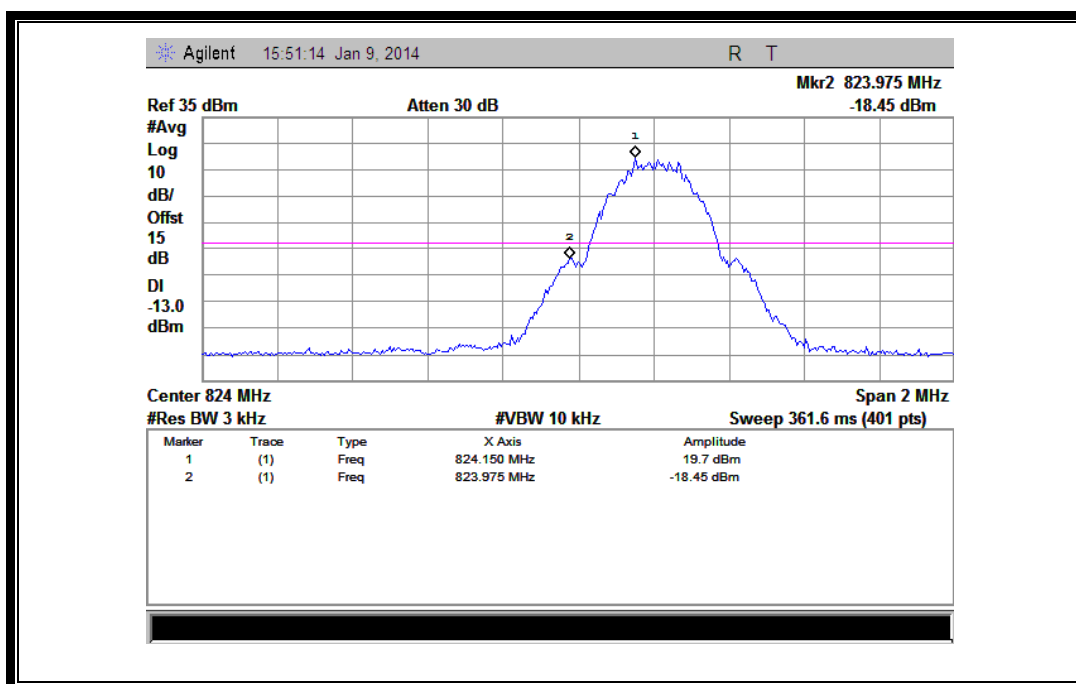
The lowest and highest channels are tested to verify the band edge emissions.

#### 1. Test Verdict:

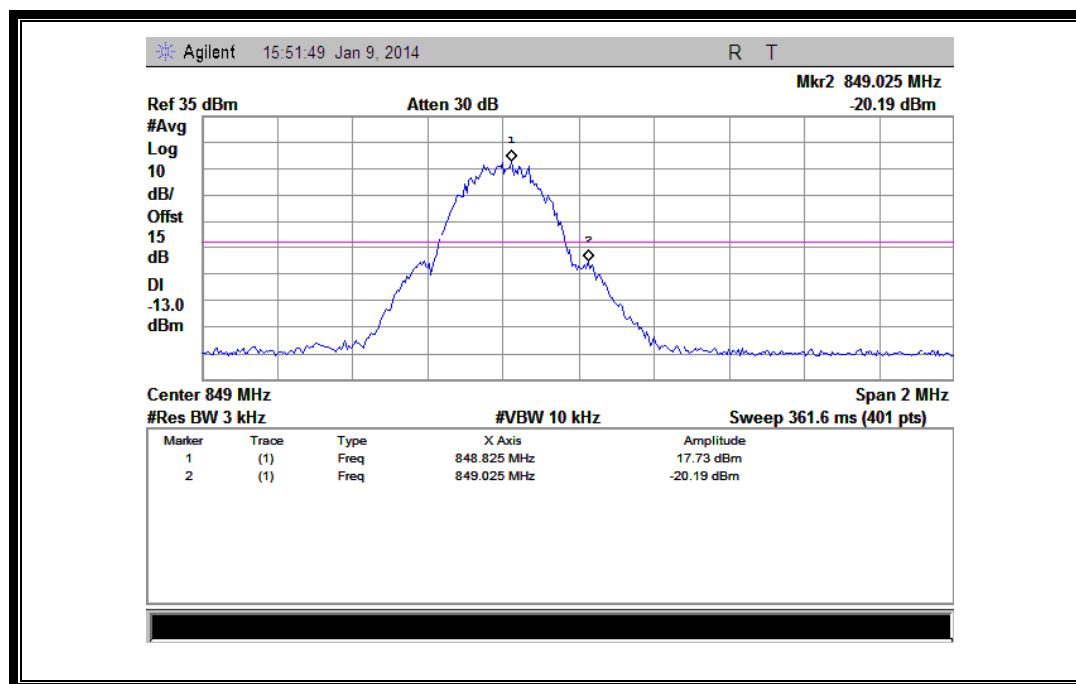
| Band          | Channel | Frequency (MHz) | Measured Max. Band Edge Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict     |
|---------------|---------|-----------------|----------------------------------------|---------------|-------------|-------------|
| GSM 850MHz    | 128     | 824.2           | -18.45                                 | Plat A        | -13         | <u>PASS</u> |
|               | 251     | 848.8           | -20.19                                 | Plot B        |             | <u>PASS</u> |
| GSM 1900MHz   | 512     | 1850.2          | -18.60                                 | Plat C        | -13         | <u>PASS</u> |
|               | 810     | 1909.8          | -20.45                                 | Plot D        |             | <u>PASS</u> |
| EDGE 850MHz   | 128     | 824.2           | -19.40                                 | Plat E        | -13         | <u>PASS</u> |
|               | 251     | 848.8           | -19.52                                 | Plot F        |             | <u>PASS</u> |
| EDGE 1900MHz  | 512     | 1850.2          | -18.66                                 | Plat G        | -13         | <u>PASS</u> |
|               | 810     | 1909.8          | -21.91                                 | Plot H        |             | <u>PASS</u> |
| WCDMA 850MHz  | 4132    | 826.4           | -24.27                                 | Plat I        | -13         | <u>PASS</u> |
|               | 4233    | 846.6           | -24.76                                 | Plot J        |             | <u>PASS</u> |
| WCDMA 1900MHz | 9262    | 1852.4          | -22.22                                 | Plat K        | -13         | <u>PASS</u> |
|               | 9538    | 1907.6          | -19.61                                 | Plot L        |             | <u>PASS</u> |
| HSDPA 850MHz  | 4132    | 826.4           | -22.31                                 | Plat M        | -13         | <u>PASS</u> |
|               | 4233    | 846.6           | -19.32                                 | Plot N        |             | <u>PASS</u> |
| HSDPA 1900MHz | 9262    | 1852.4          | -18.76                                 | Plat O        | -13         | <u>PASS</u> |
|               | 9538    | 1907.6          | -16.25                                 | Plot P        |             | <u>PASS</u> |
| HSUPA 850MHz  | 4132    | 826.4           | -22.28                                 | Plat Q        | -13         | <u>PASS</u> |
|               | 4233    | 846.6           | -21.73                                 | Plot R        |             | <u>PASS</u> |
| HSUPA         | 9262    | 1852.4          | -18.67                                 | Plat S        | -13         | <u>PASS</u> |

|         |      |        |        |        |             |
|---------|------|--------|--------|--------|-------------|
| 1900MHz | 9538 | 1907.6 | -13.15 | Plot T | <u>PASS</u> |
|---------|------|--------|--------|--------|-------------|

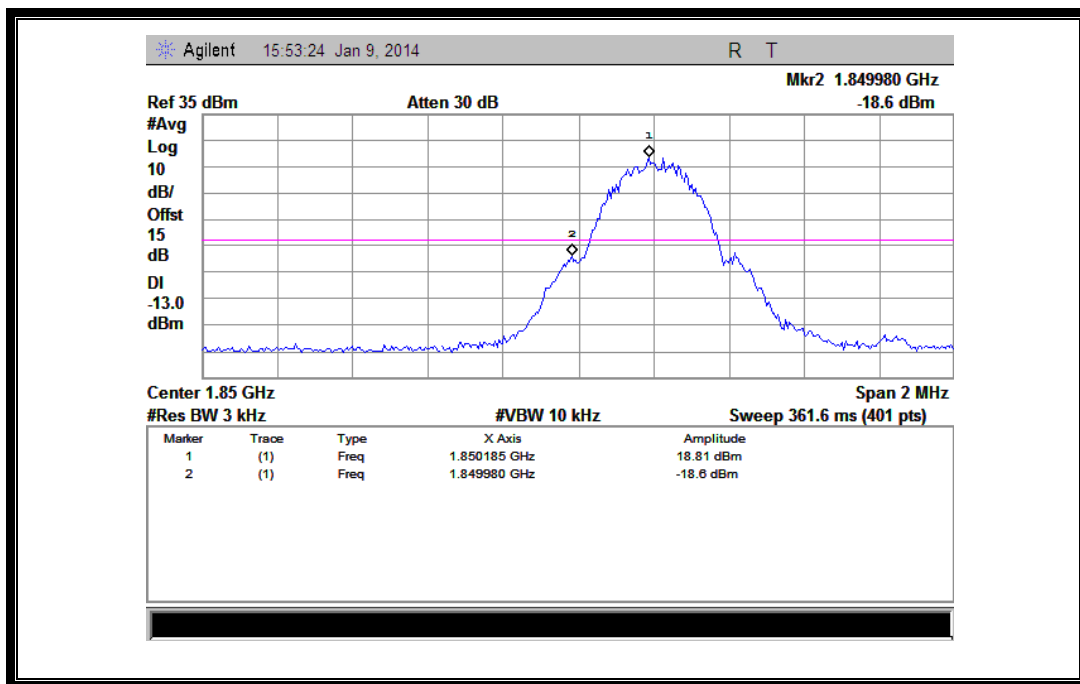
## 2. Test Plots:



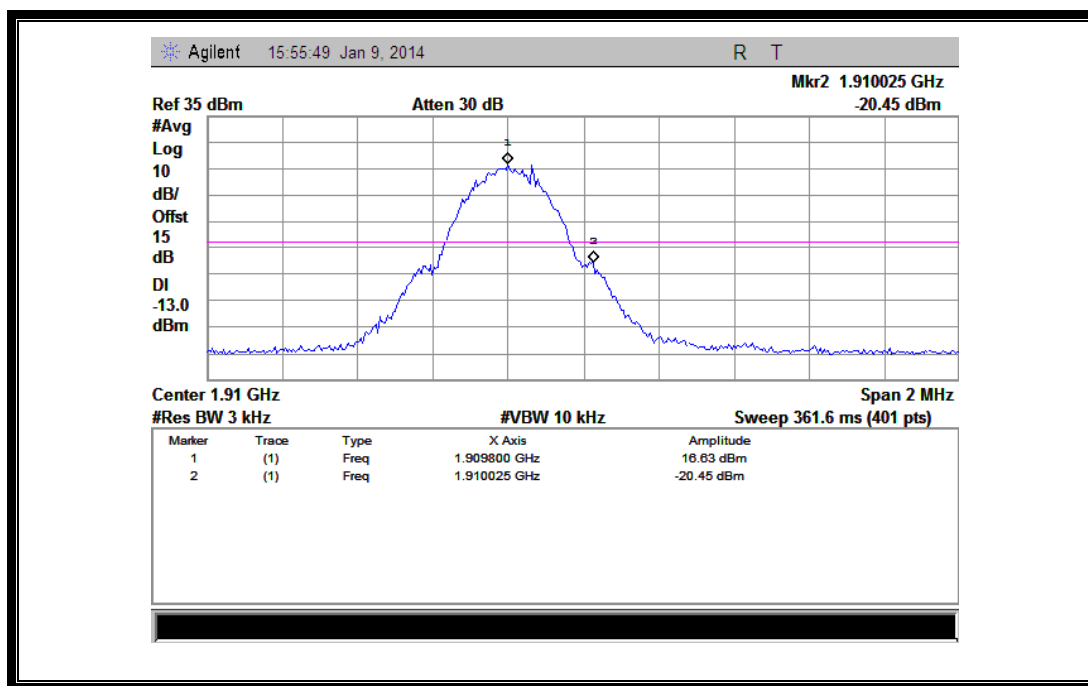
(Plot A: GSM 850 Channel = 128)



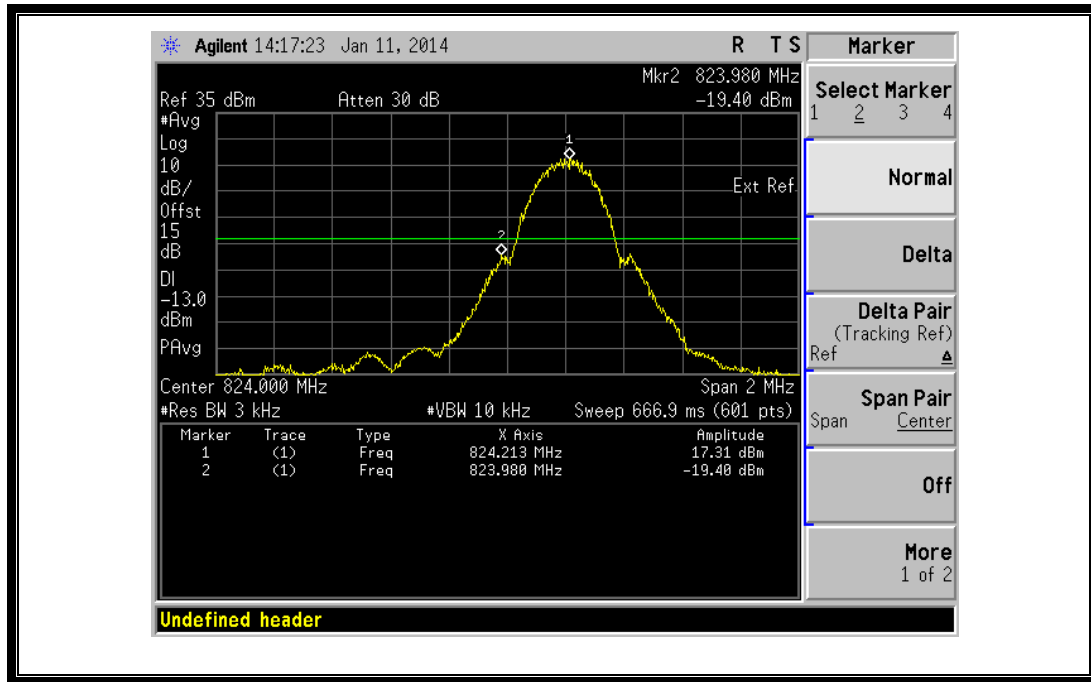
(Plot B: GSM 850 Channel = 251)



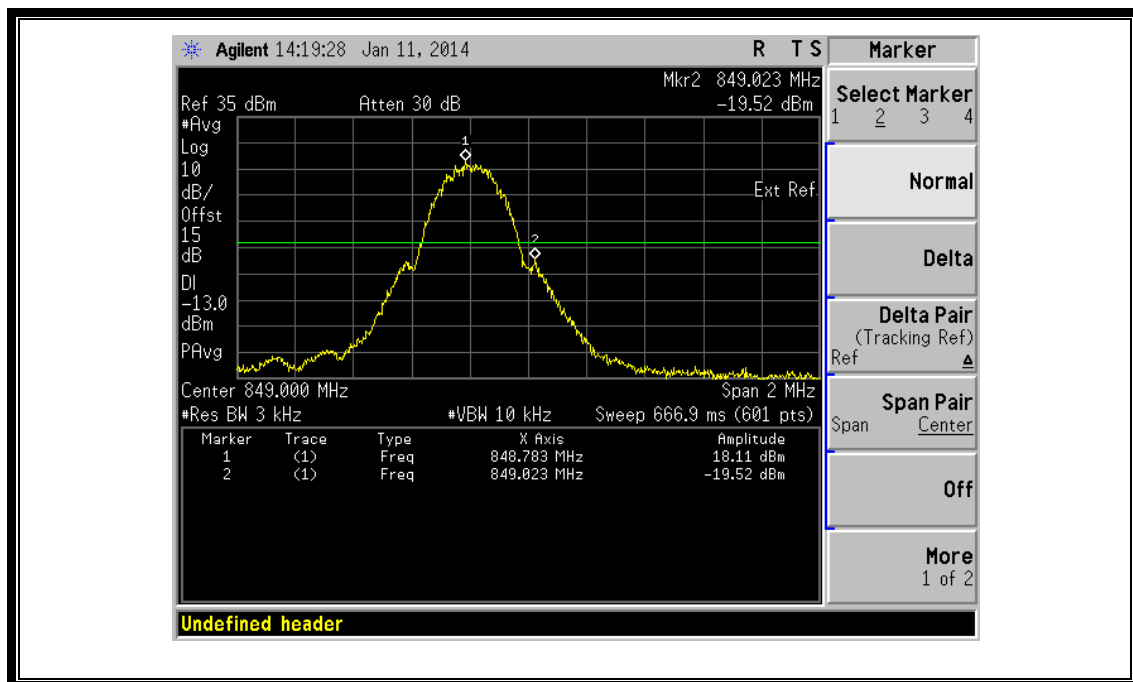
(Plot C: GSM 1900 Channel = 512)



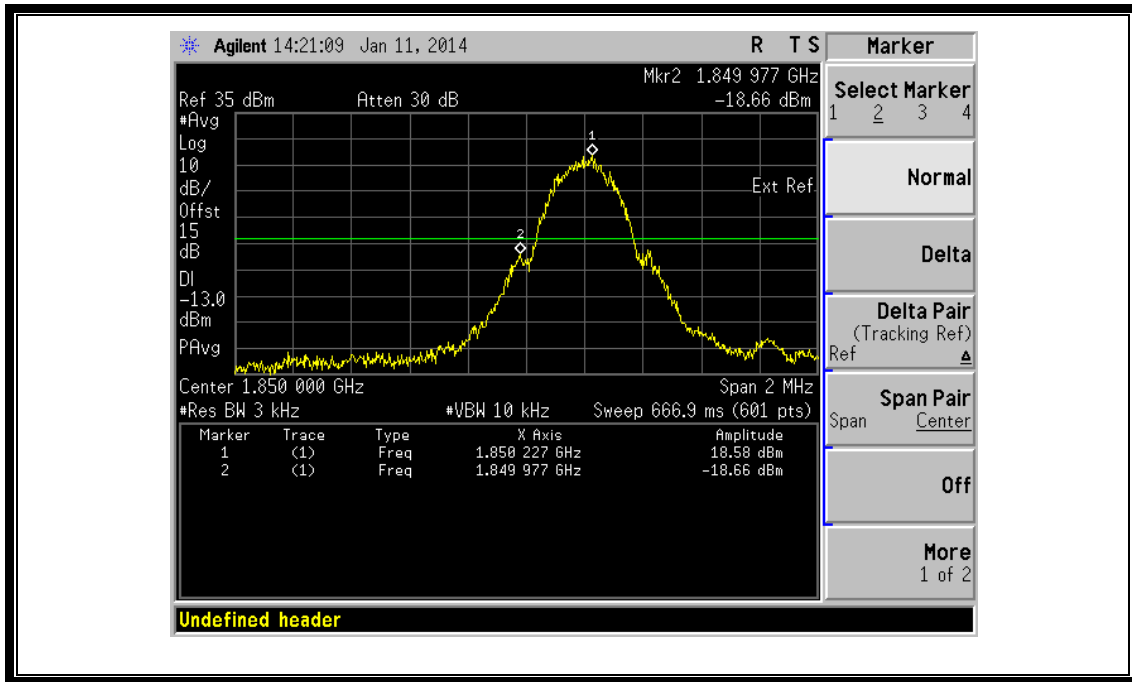
(Plot D: GSM 1900 Channel = 810)



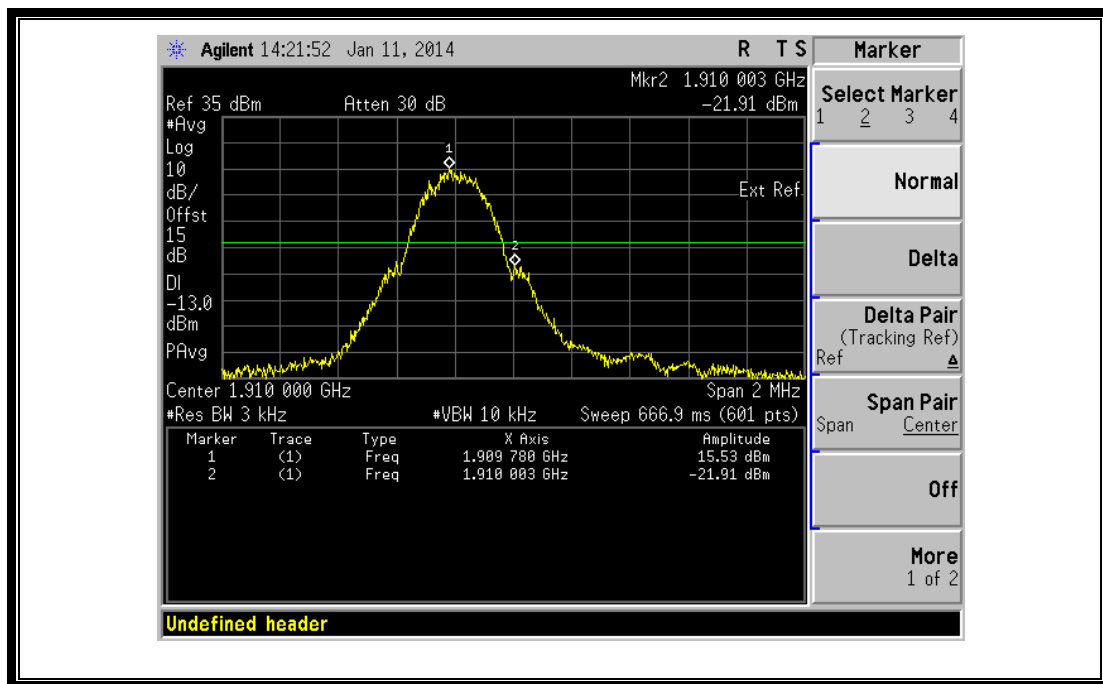
(Plot E: EGPRS 850 Channel = 128)



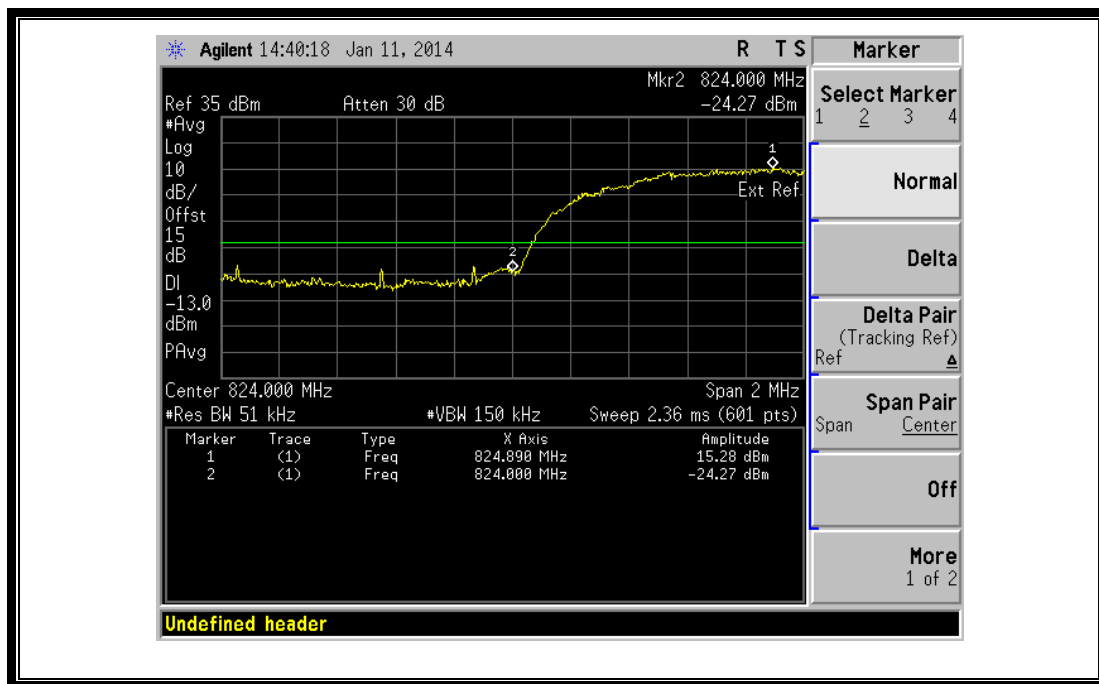
(Plot F: EGPRS 850 Channel = 251)



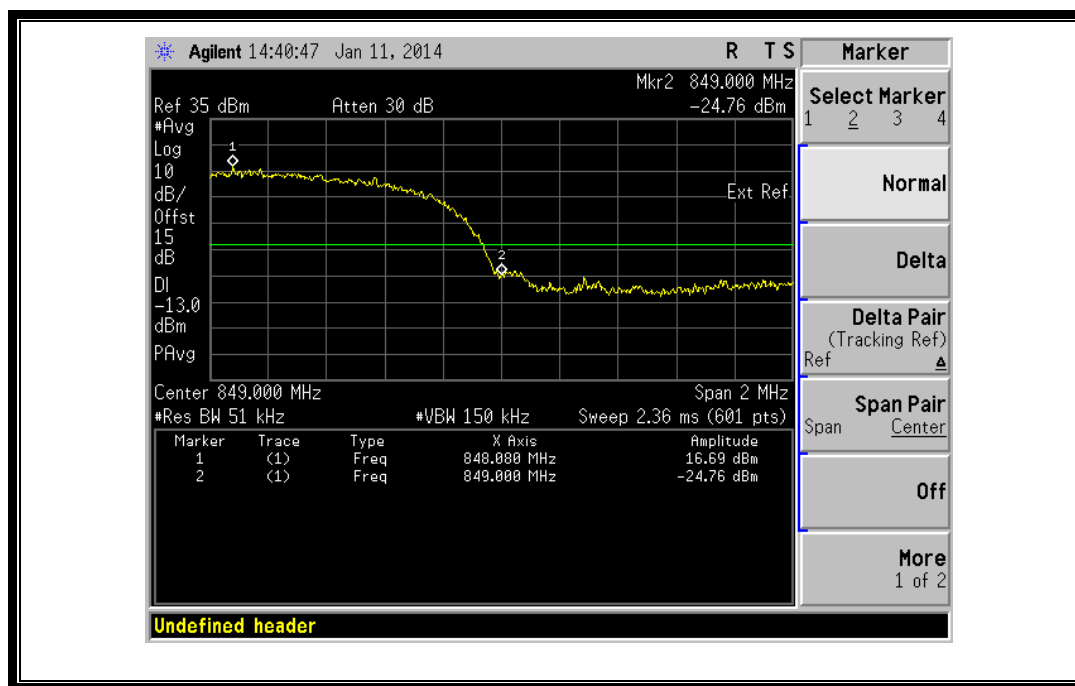
(Plot G: EGPRS 1900 Channel = 512)



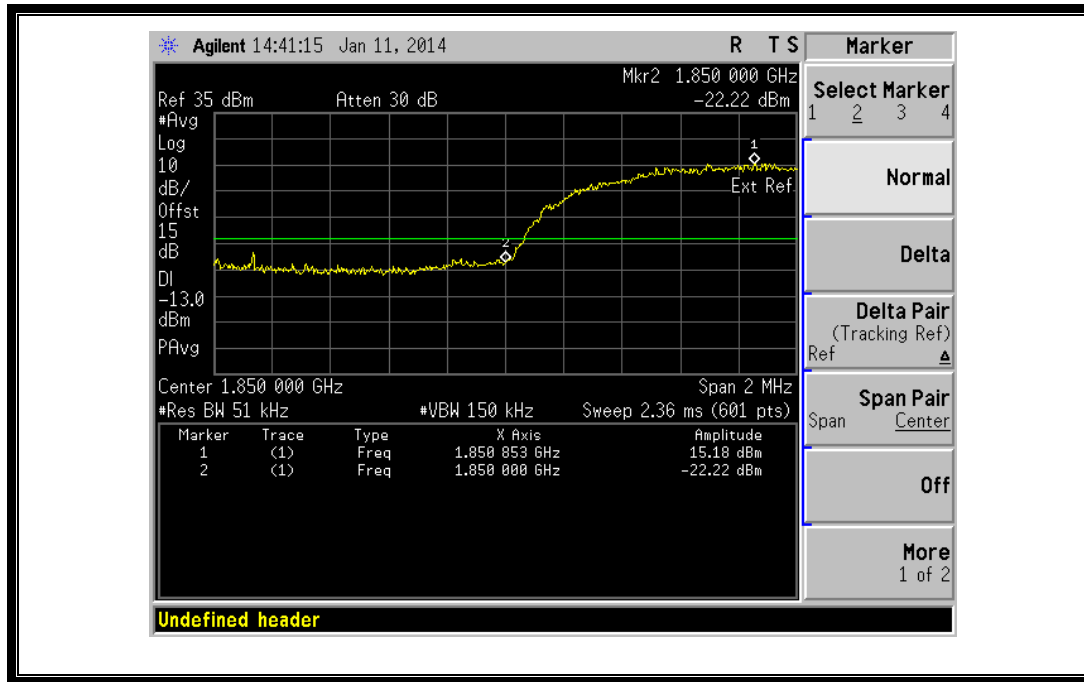
(Plot H: EGPRS 1900 Channel = 810)



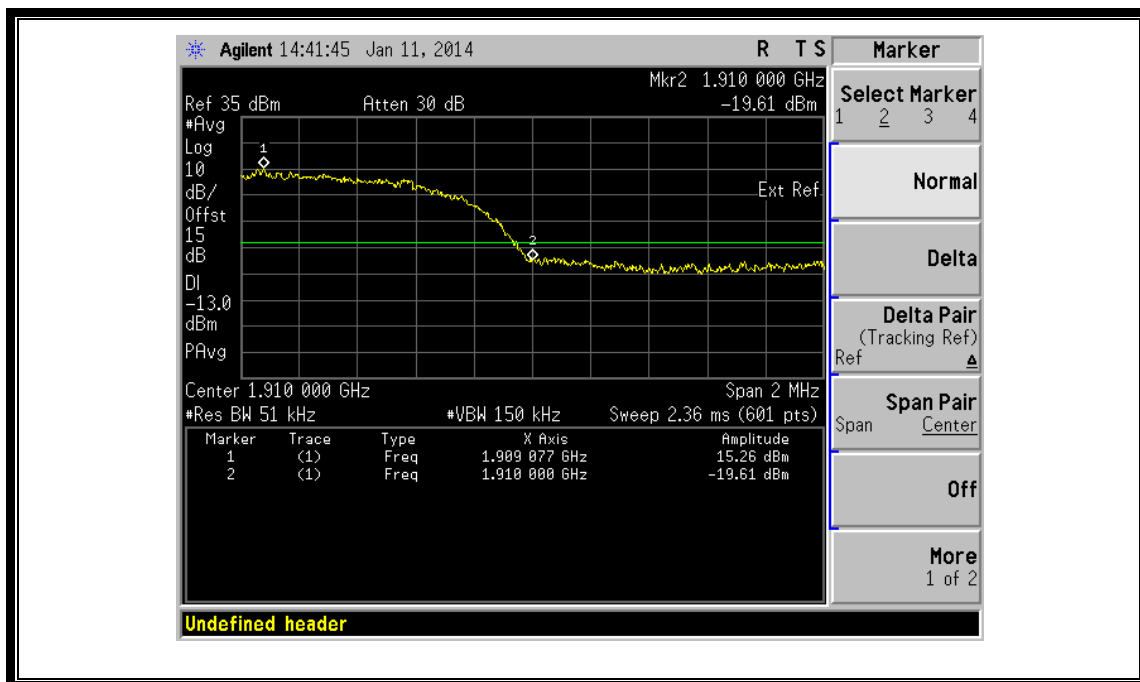
(Plot I: WCDMA 850 Channel = 4132)



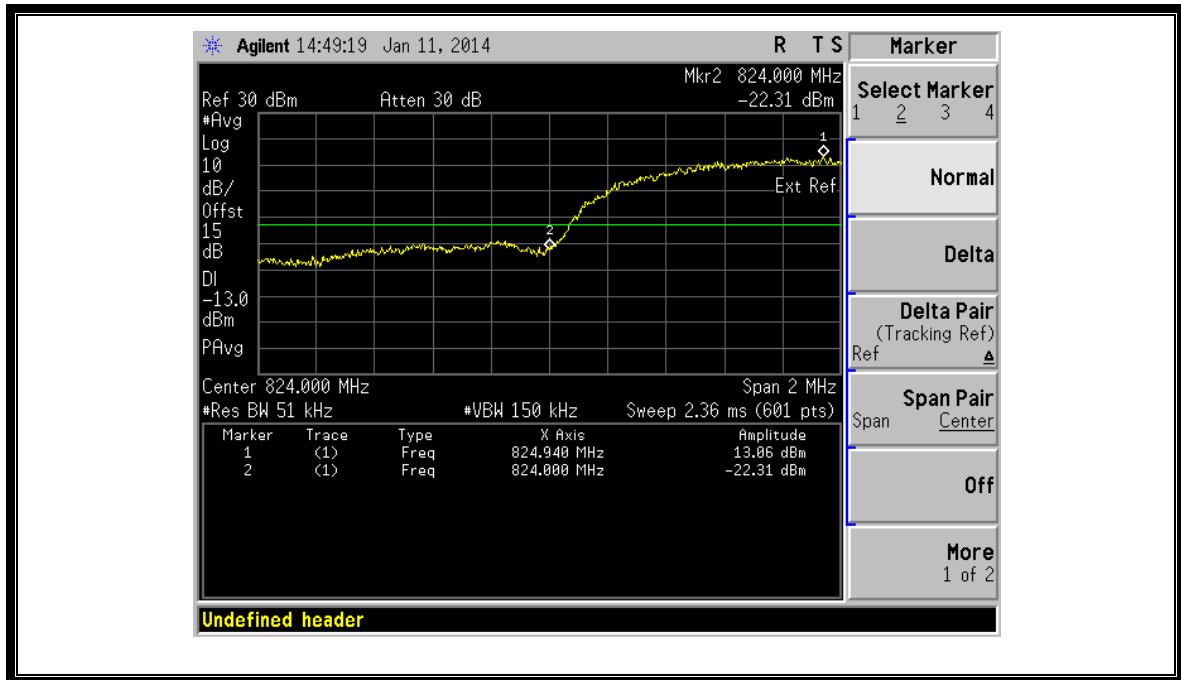
(Plot J: WCDMA 850 Channel = 4233)



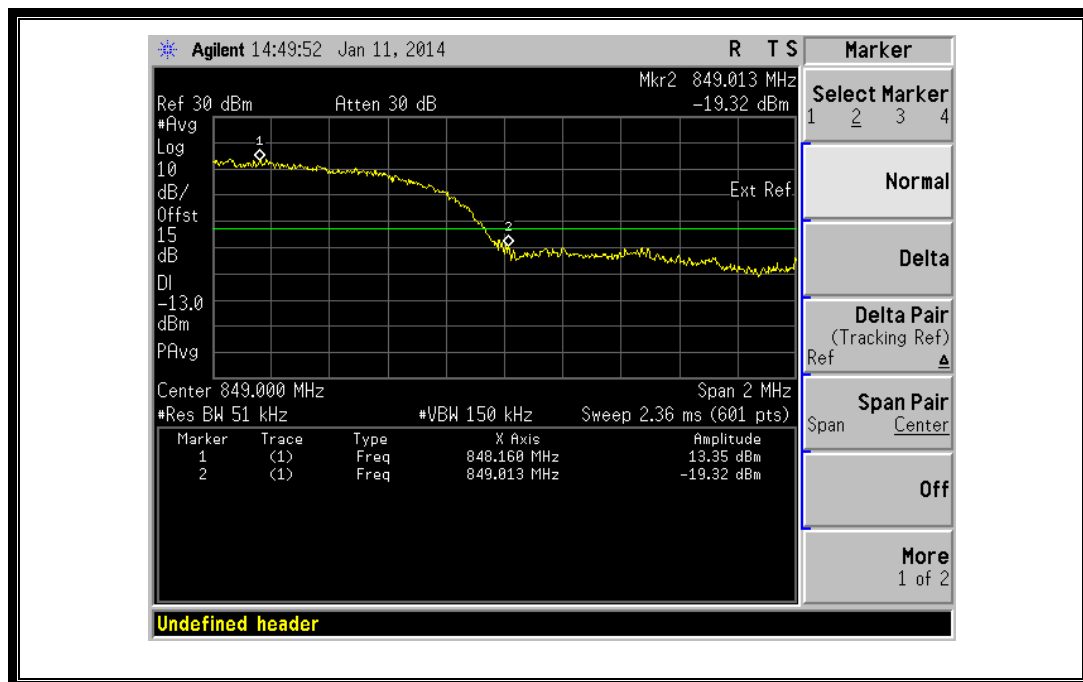
(Plot K: WCDMA 1900 Channel = 9262)



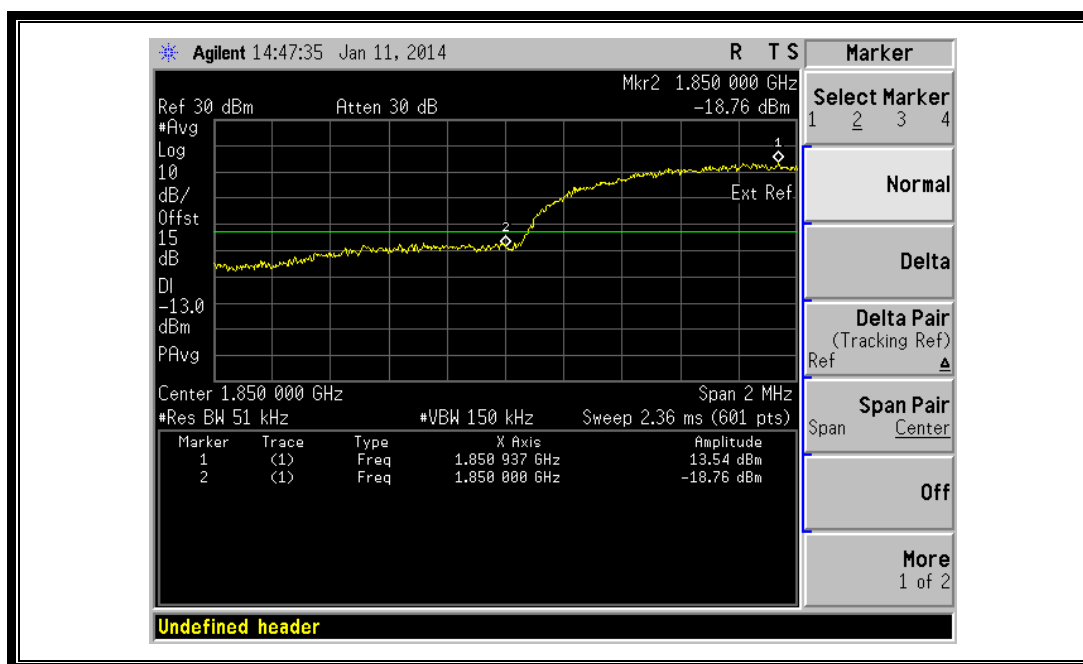
(Plot L: WCDMA 1900 Channel = 9538)



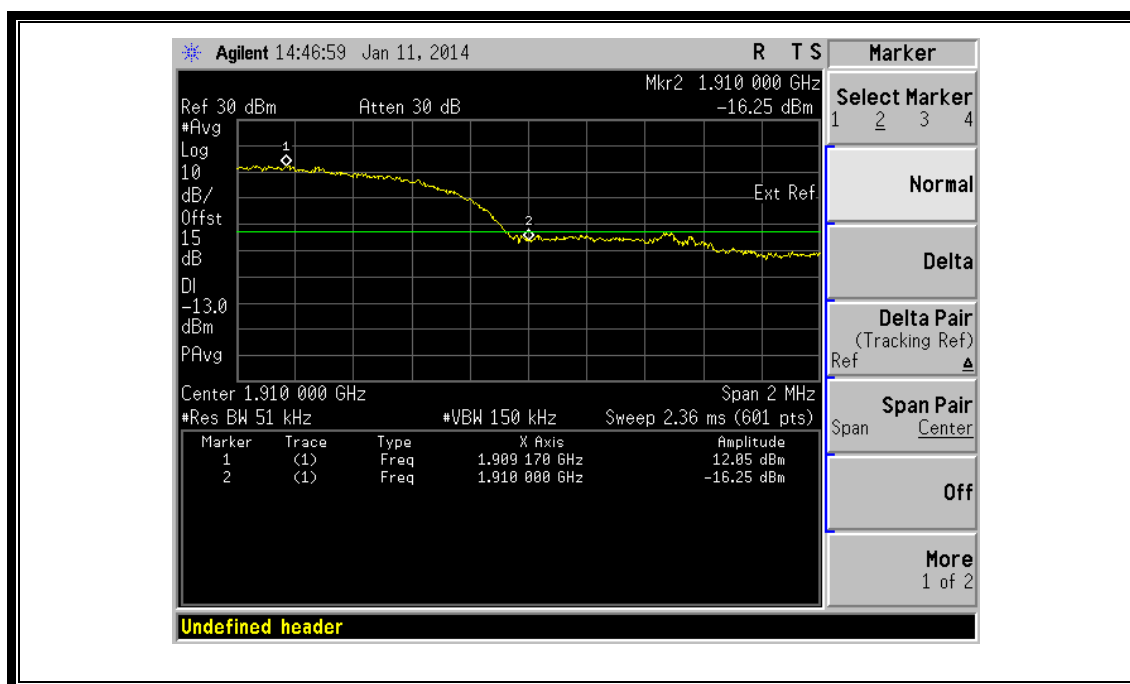
(Plot M: HSDPA 850 Channel = 4132)



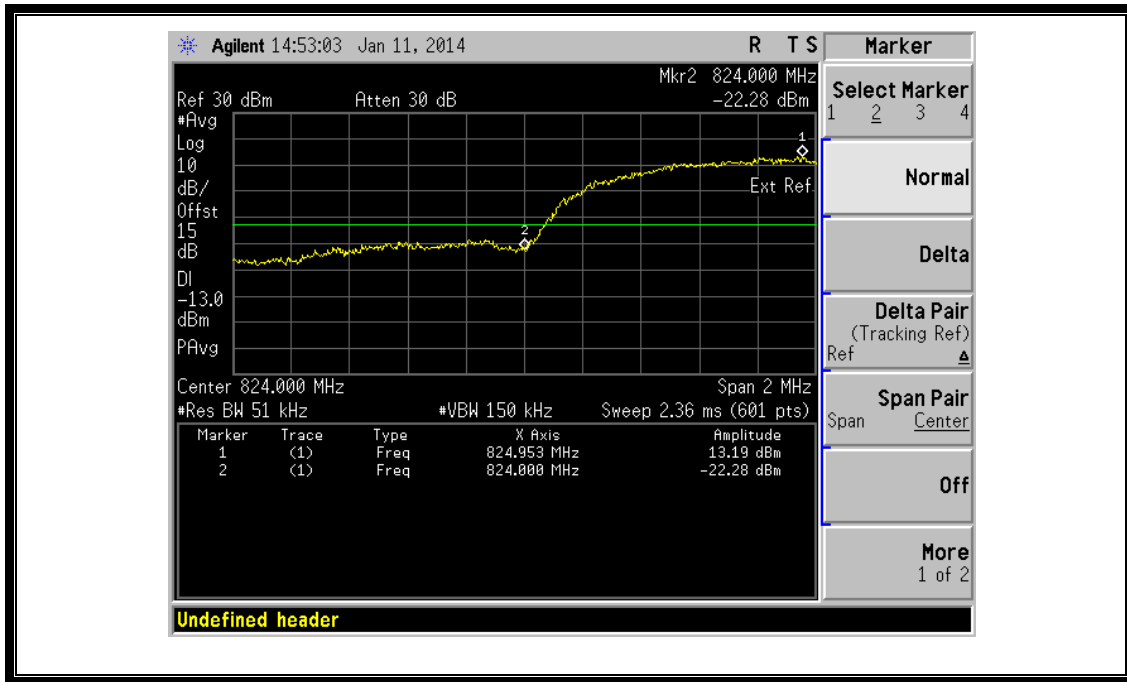
(Plot N: HSDPA850 Channel = 4233)



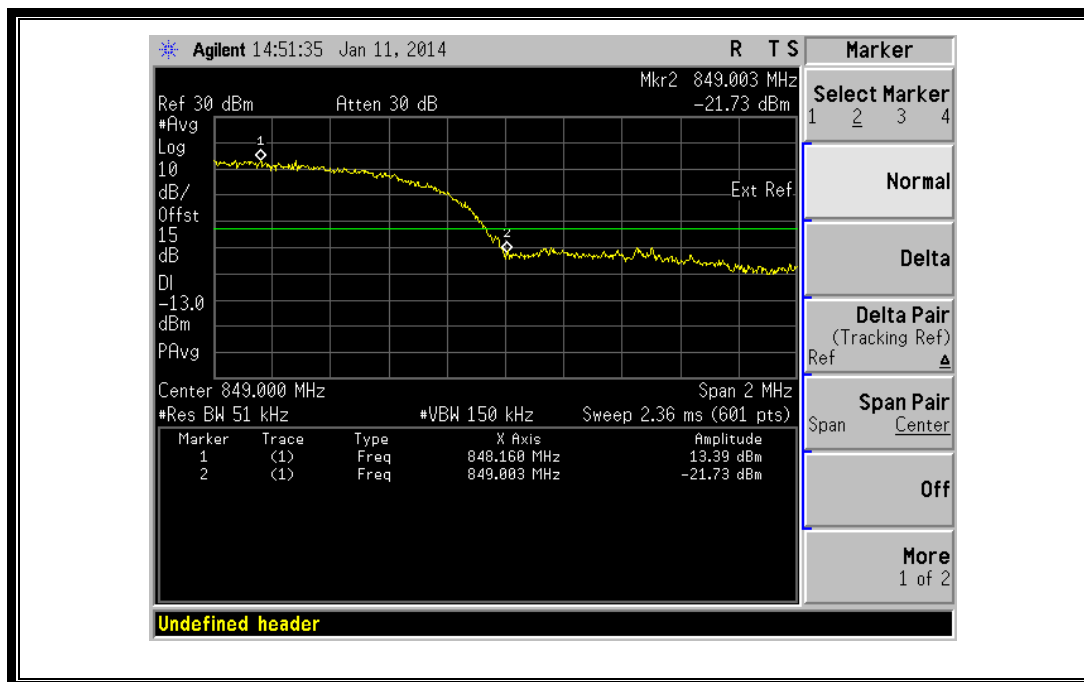
(Plot O: HSDPA 1900 Channel = 9262)



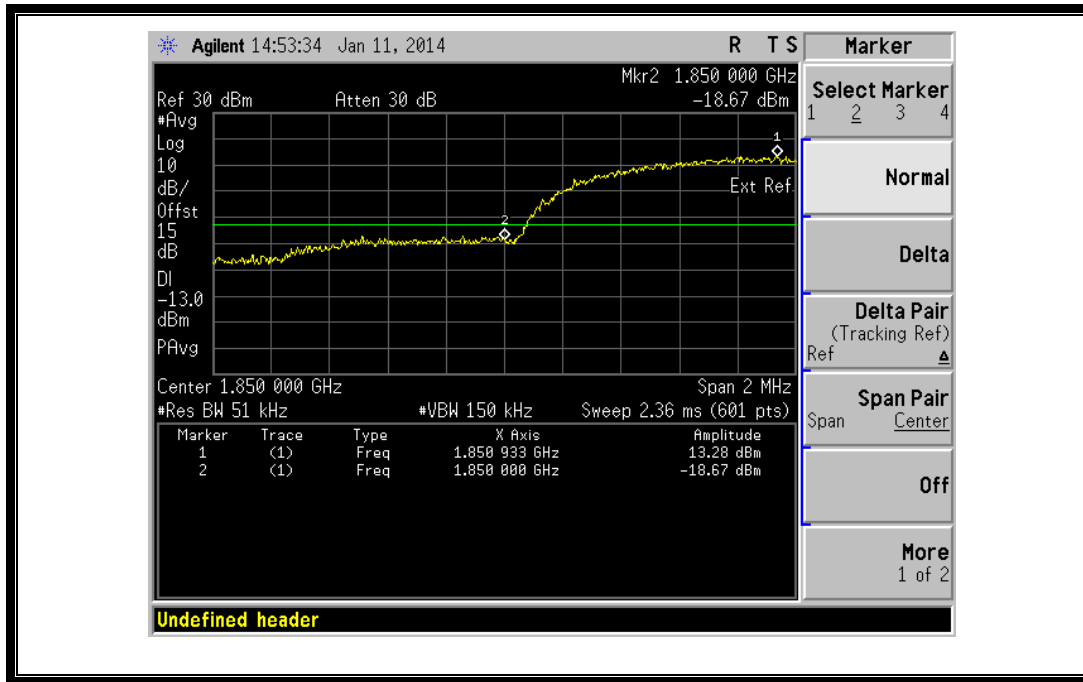
(Plot P: HSDPA 1900 Channel = 9538)



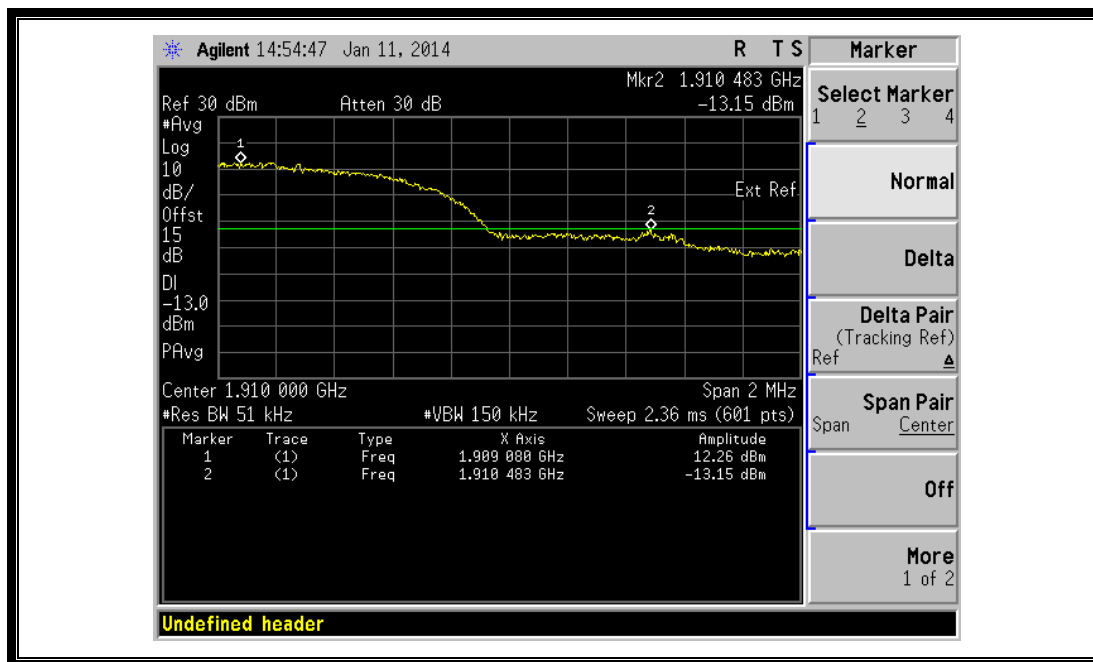
(Plot Q: HSUPA 850 Channel = 4132)



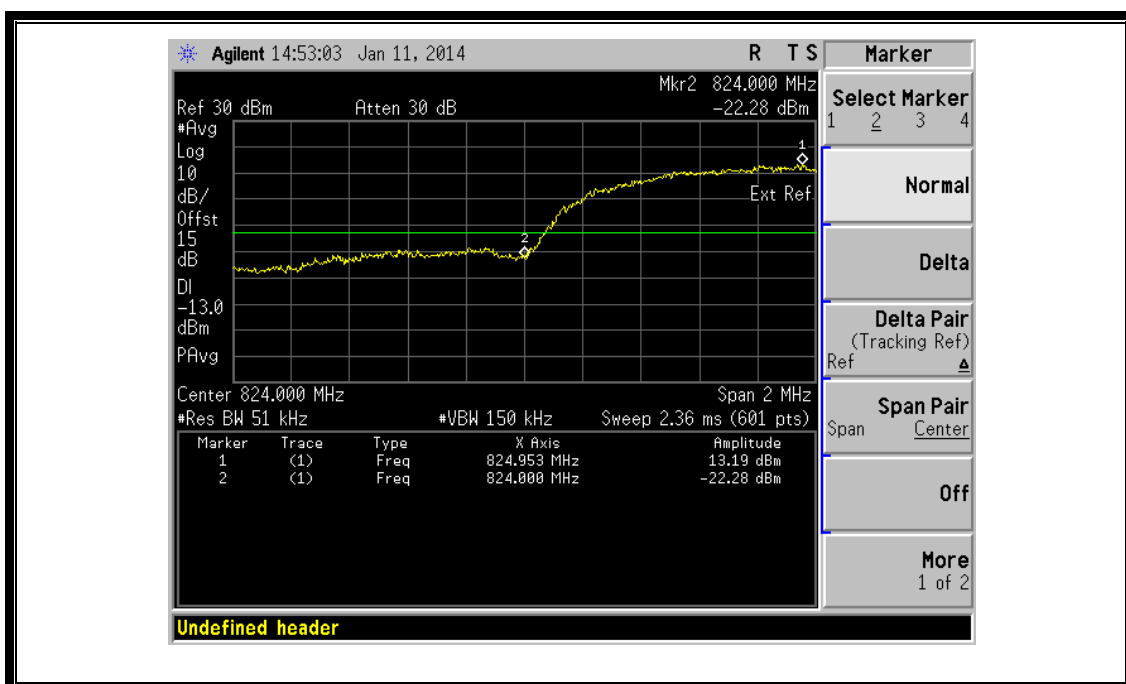
(Plot R: HSUPA850 Channel = 4233)



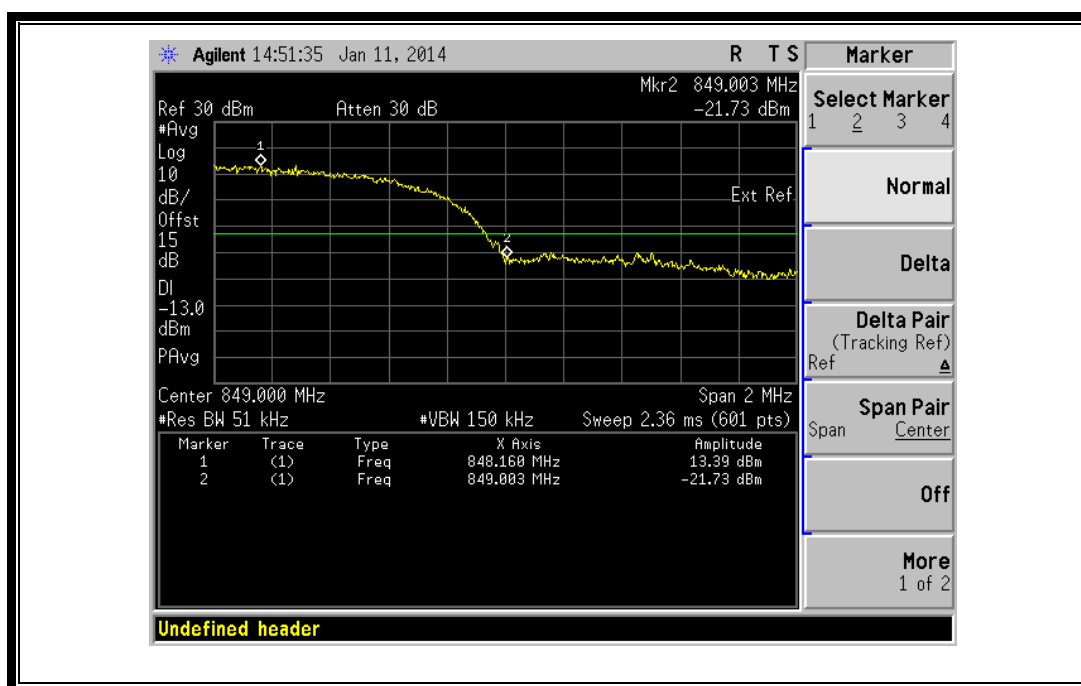
(Plot S: HSUPA 1900 Channel = 9262)



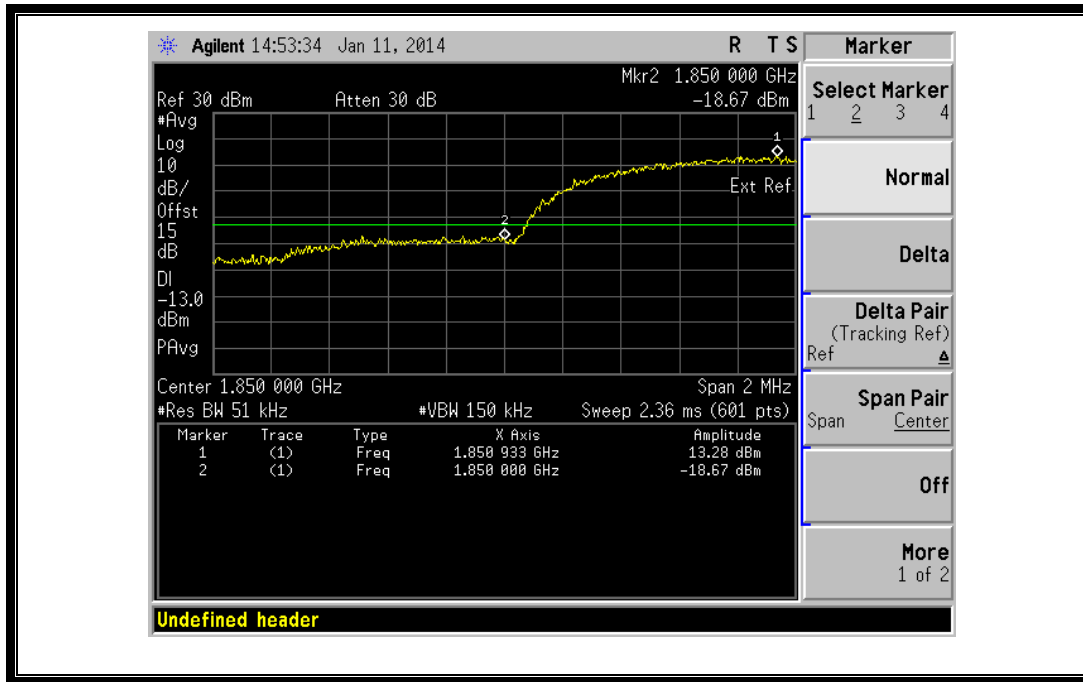
(Plot T: HSUPA 1900 Channel = 9538)



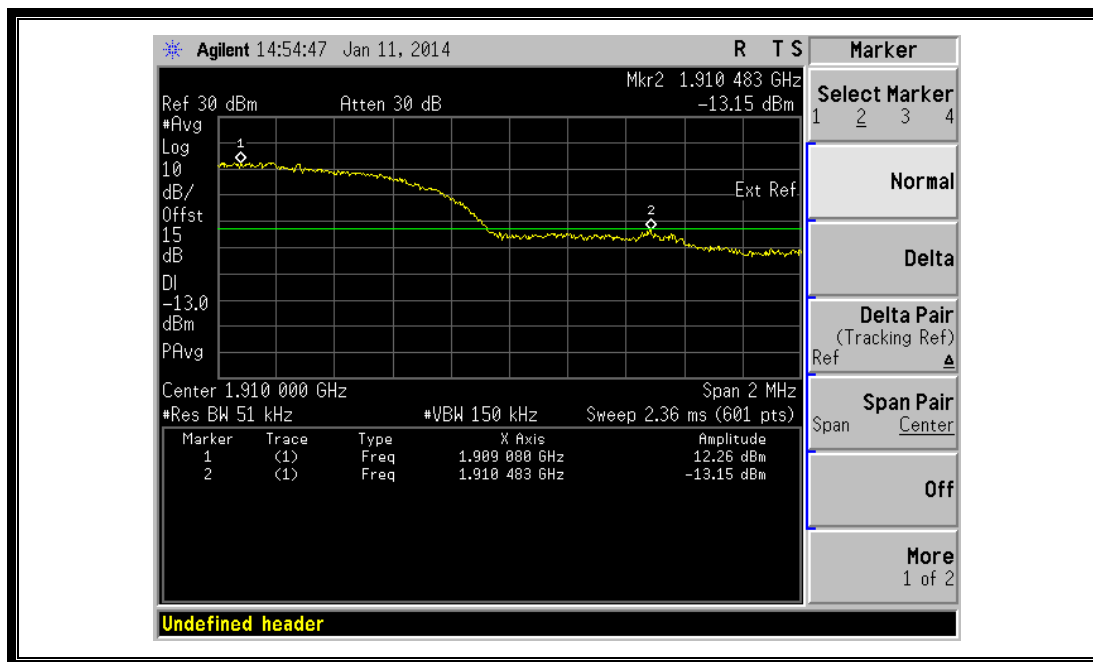
(Plot Q: HSPA+ 850 Channel = 4132)



(Plot R: HSPA+ 850 Channel = 4233)



(Plot S: HSPA+ 1900 Channel = 9262)



(Plot T: HSPA+ 1900 Channel = 9538)

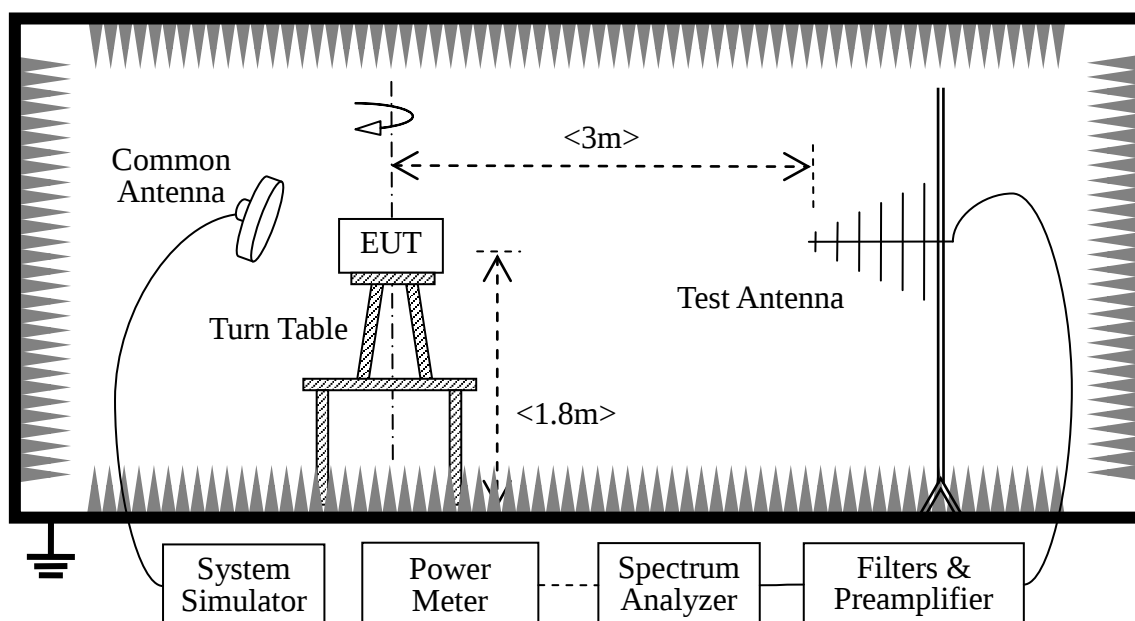
## 2.7 Transmitter Radiated Power (EIRP/ERP)

### 2.7.1 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power

### 2.7.2 Test Description

#### 1. Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power (i.e. GSM850MHz band Power Control Level (PCL) = 5/19 and Power Class = 4, GSM1900MHz band Power Control Level (PCL) = 0/15 and Power Class = 1), and only the test result of the maximum output power was recorded.

- GSM Maximum RF output power: GSM 850 33.52dBm, GSM 1900 28.38dBm, EGPRS 850 31.26dBm, EGPRS 1900 29.45dBm, WCDMA 850 22.83dBm, WCDMA 1900 23.68 dBm, Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM 850 3.1dBm, GSM 1900 0.3dBm, EGPRS 850 3.1dBm, EGPRS 1900

0.21dBm ,WCDMA 850 0.39dBm ,WCDMA 1900 0.5dBm.

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

## 2. Equipments List:

| Description           | Manufacturer | Model              | Serial No.   | Cal. Date  | Cal. Due   |
|-----------------------|--------------|--------------------|--------------|------------|------------|
| System Simulator      | Agilent      | E5515C             | GB43130131   | 2013.05.13 | 2014.05.12 |
| Spectrum Analyzer     | Agilent      | E7405A             | US44210471   | 2013.05.13 | 2014.05.12 |
| Full-Anechoic Chamber | Albatross    | 9m*6m*6m           | (n.a.)       | 2013.05.13 | 2014.05.12 |
| Test Antenna - Bi-Log | Schwarzbeck  | VULB 9163          | 9163-274     | 2013.05.13 | 2014.05.12 |
| Test Antenna - Horn   | Schwarzbeck  | BBHA 9120C         | 9120C-384    | 2013.05.13 | 2014.05.12 |
| Substitution Antenna  | Schwarzbeck  | BBHA 9120C         | 9120C-384    | 2013.05.13 | 2014.05.12 |
| Pre-AMPs              | lucix        | S10M100L3802       | S020180L3203 | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C836.5-25-X   | NA           | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C1747.5-75-X2 | NA           | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C1880-60-X2   | NA           | 2013.05.13 | 2014.05.12 |

### 2.7.3 Test Result

The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST\_TX}} - P_{\text{SUBST\_RX}} - L_{\text{SUBST\_CABLES}} + G_{\text{SUBST\_TX\_ANT}}$$

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

Where  $A_{\text{SUBST}}$  is the final substitution correction including receive antenna gain.

$P_{\text{SUBST\_TX}}$  is signal generator level,

$P_{\text{SUBST\_RX}}$  is receiver level,

$L_{\text{SUBST\_CABLES}}$  is cable losses including TX cable,

$G_{\text{SUBST\_TX\_ANT}}$  is substitution antenna gain.

$A_{\text{TOT}}$  is total correction factor including cable loss and substitution correction

During the test, the data of  $A_{\text{TOT}}$  was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of  $A_{\text{TOT}}$ .

## 1. GSM Model Test Verdict:

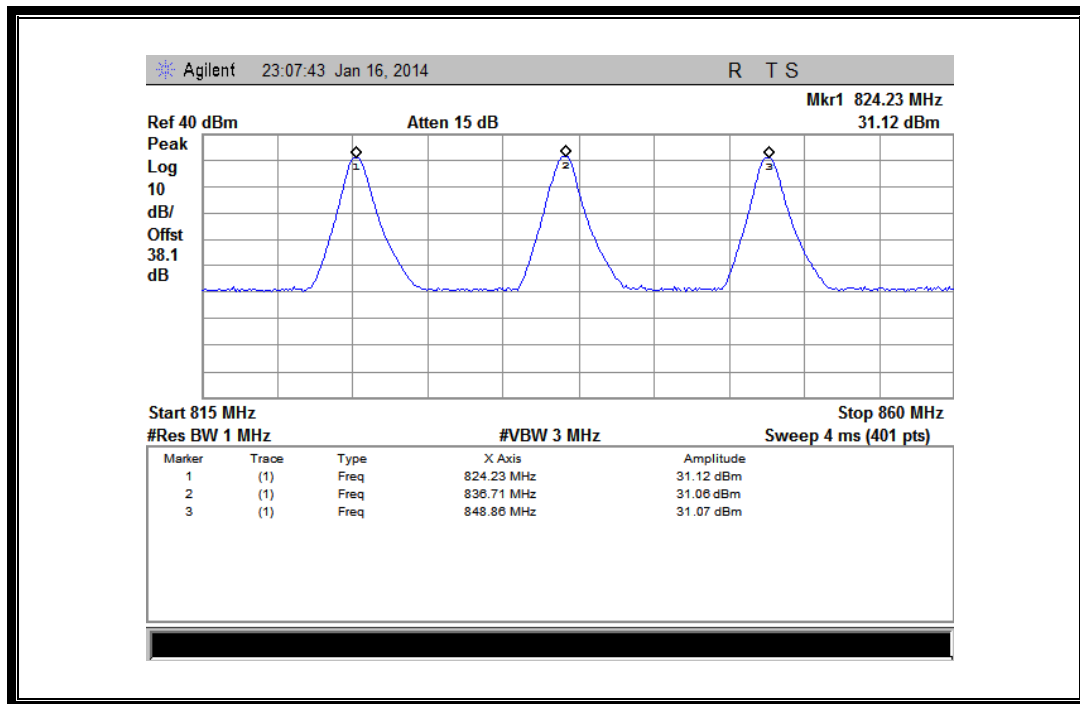
| Band             | Channel                                                                                                    | Frequency (MHz) | PCL | Measured ERP  |       |                          | Limit |   | Verdict |
|------------------|------------------------------------------------------------------------------------------------------------|-----------------|-----|---------------|-------|--------------------------|-------|---|---------|
|                  |                                                                                                            |                 |     | dBm           | W     | Refer to Plot            | dBm   | W |         |
| GSM<br>850MHz    | 128                                                                                                        | 824.20          | 5   | 31.12         | 1.294 | Plot A                   | 38.5  | 7 | PASS    |
|                  | 190                                                                                                        | 836.60          | 5   | 31.06         | 1.276 |                          |       |   | PASS    |
|                  | 251                                                                                                        | 848.80          | 5   | 31.07         | 1.279 |                          |       |   | PASS    |
| GPRS<br>850MHz   | 128                                                                                                        | 824.20          | 5   | 31.03         | 1.268 | Plot B <sup>Note 1</sup> | 38.5  | 7 | PASS    |
|                  | 190                                                                                                        | 836.60          | 5   | 30.74         | 1.186 |                          |       |   | PASS    |
|                  | 251                                                                                                        | 848.80          | 5   | 30.82         | 1.208 |                          |       |   | PASS    |
| EGPRS<br>850MHz  | 128                                                                                                        | 824.20          | 5   | 31.28         | 1.343 | Plot C <sup>Note 1</sup> | 38.5  | 7 | PASS    |
|                  | 190                                                                                                        | 836.60          | 5   | 31.85         | 1.531 |                          |       |   | PASS    |
|                  | 251                                                                                                        | 848.80          | 5   | 31.27         | 1.340 |                          |       |   | PASS    |
|                  |                                                                                                            |                 |     |               |       |                          |       |   |         |
| Band             | Channel                                                                                                    | Frequency (MHz) | PCL | Measured EIRP |       |                          | Limit |   | Verdict |
|                  |                                                                                                            |                 |     | dBm           | W     | Refer to Plot            | dBm   | W |         |
| GSM<br>1900MHz   | 512                                                                                                        | 1850.2          | 0   | 28.63         | 0.729 | Plot D                   | 33    | 2 | PASS    |
|                  | 661                                                                                                        | 1880.0          | 0   | 28.18         | 0.658 |                          |       |   | PASS    |
|                  | 810                                                                                                        | 1909.8          | 0   | 29.27         | 0.845 |                          |       |   | PASS    |
| GPRS<br>1900MHz  | 512                                                                                                        | 1850.2          | 0   | 27.27         | 0.533 | Plot E <sup>Note 1</sup> | 33    | 2 | PASS    |
|                  | 661                                                                                                        | 1880.0          | 0   | 27.46         | 0.557 |                          |       |   | PASS    |
|                  | 810                                                                                                        | 1909.8          | 0   | 27.12         | 0.515 |                          |       |   | PASS    |
| EGPRS<br>1900MHz | 512                                                                                                        | 1850.2          | 0   | 28.60         | 0.724 | Plot F <sup>Note 1</sup> | 33    | 2 | PASS    |
|                  | 661                                                                                                        | 1880.0          | 0   | 28.22         | 0.664 |                          |       |   | PASS    |
|                  | 810                                                                                                        | 1909.8          | 0   | 28.34         | 0.682 |                          |       |   | 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:

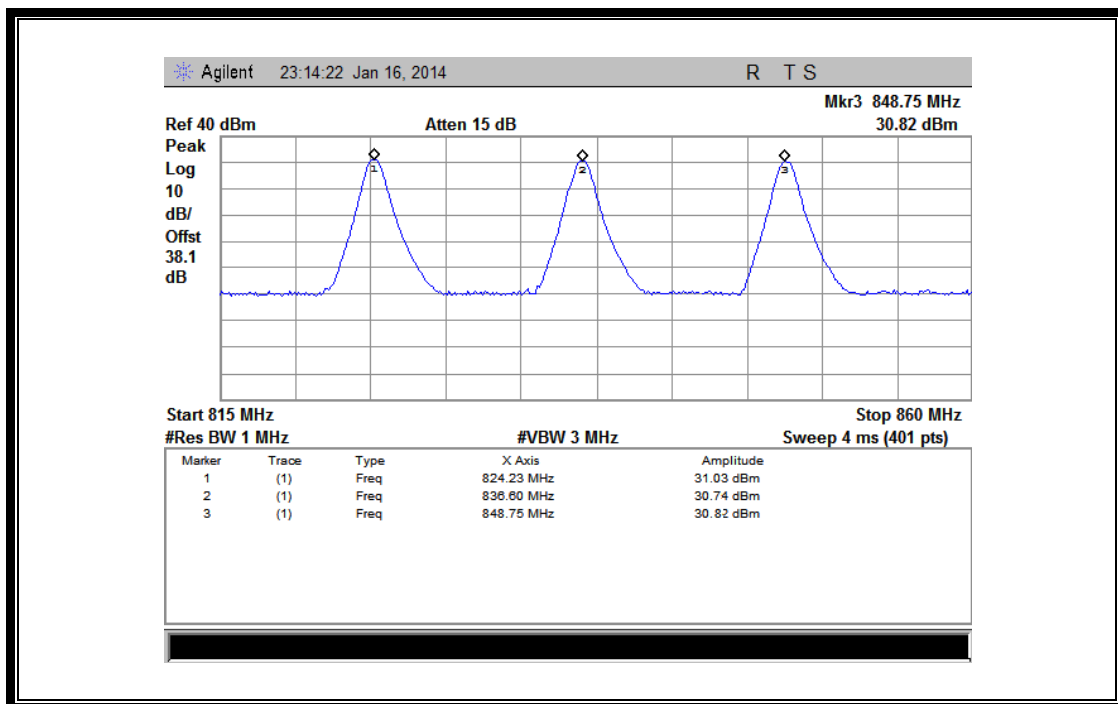
| Band         | Channel | Frequency (MHz) | Measured ERP |       |               | Limit |   | Verdict |
|--------------|---------|-----------------|--------------|-------|---------------|-------|---|---------|
|              |         |                 | dBm          | W     | Refer to Plot | dBm   | W |         |
| WCDMA 850MHz | 4132    | 826.4           | 27.05        | 0.507 | Plot G        | 38.5  | 7 | PASS    |
|              | 4175    | 835             | 28.53        | 0.713 |               |       |   | PASS    |
|              | 4233    | 846.6           | 28.01        | 0.632 |               |       |   | PASS    |
| HSDPA 850MHz | 4132    | 826.4           | 27.12        | 0.515 | Plot H        | 38.5  | 7 | PASS    |
|              | 4175    | 835             | 28.41        | 0.693 |               |       |   | PASS    |
|              | 4233    | 846.6           | 28.01        | 0.632 |               |       |   | PASS    |
| HSUPA 850MHz | 4132    | 826.4           | 27.18        | 0.522 | Plot I        | 38.5  | 7 | PASS    |
|              | 4175    | 835             | 28.42        | 0.695 |               |       |   | PASS    |
|              | 4233    | 846.6           | 28.18        | 0.658 |               |       |   | PASS    |

| Band          | Channel | Frequency (MHz) | Measured EIRP |       |        | Limit |   | Verdict |
|---------------|---------|-----------------|---------------|-------|--------|-------|---|---------|
|               |         |                 | dBm           | W     |        | dBm   | W |         |
| WCDMA 1900MHz | 9262    | 1852.4          | 24.58         | 0.287 | Plot J | 33    | 2 | PASS    |
|               | 9400    | 1880            | 23.45         | 0.221 |        |       |   | PASS    |
|               | 9538    | 1907.6          | 24.27         | 0.267 |        |       |   | PASS    |
| HSDPA 1900MHz | 9262    | 1852.4          | 26.85         | 0.484 | Plot K | 33    | 2 | PASS    |
|               | 9400    | 1880            | 26.49         | 0.446 |        |       |   | PASS    |
|               | 9538    | 1907.6          | 27.34         | 0.542 |        |       |   | PASS    |
| HSUPA 1900MHz | 9262    | 1852.4          | 26.89         | 0.489 | Plot L | 33    | 2 | PASS    |
|               | 9400    | 1880            | 26.54         | 0.451 |        |       |   | PASS    |
|               | 9538    | 1907.6          | 27.36         | 0.545 |        |       |   | PASS    |

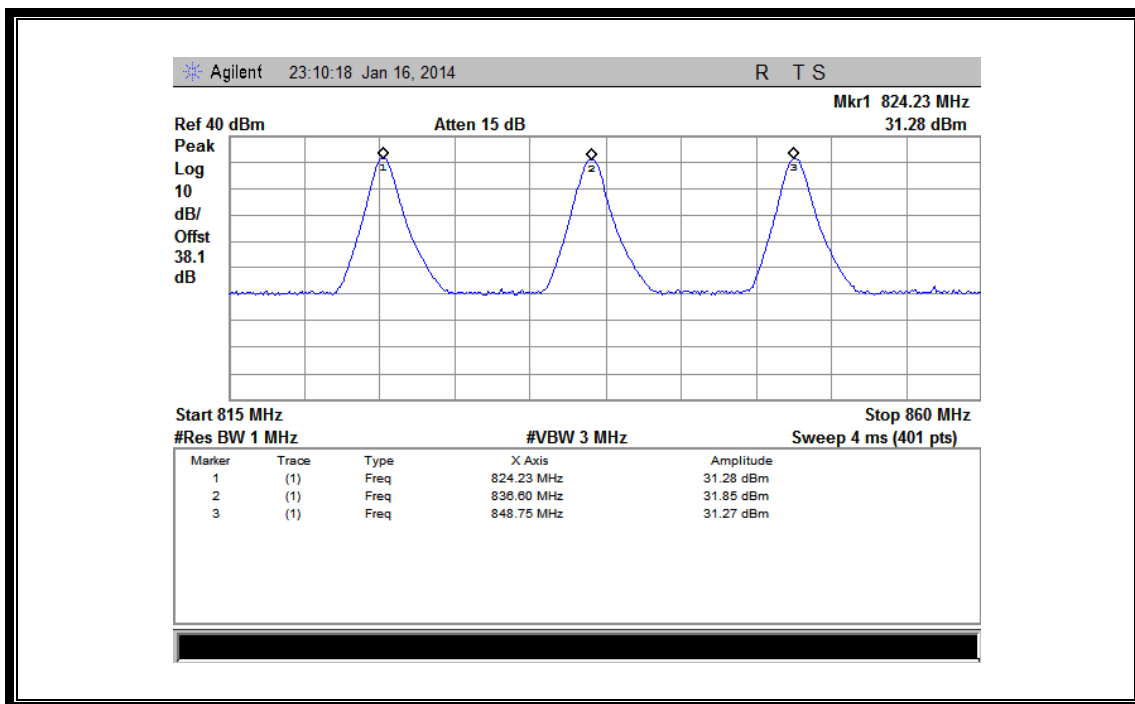
### 3. Test Plots:



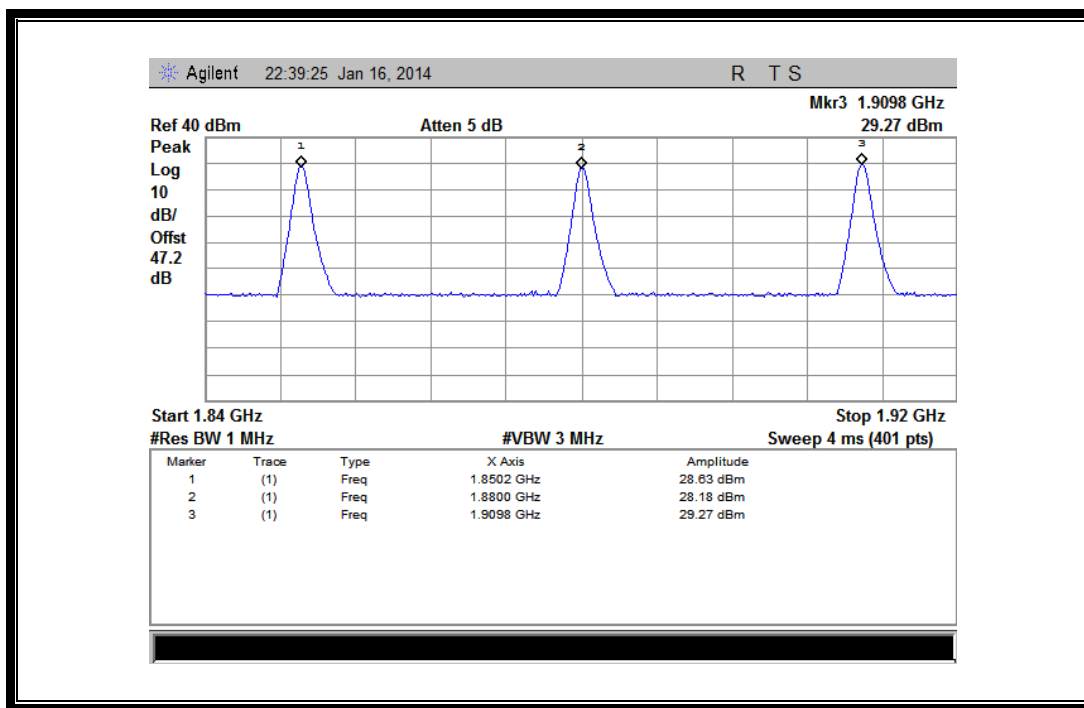
(Plot A: GSM 850MHz Channel = 128, 190, 251)



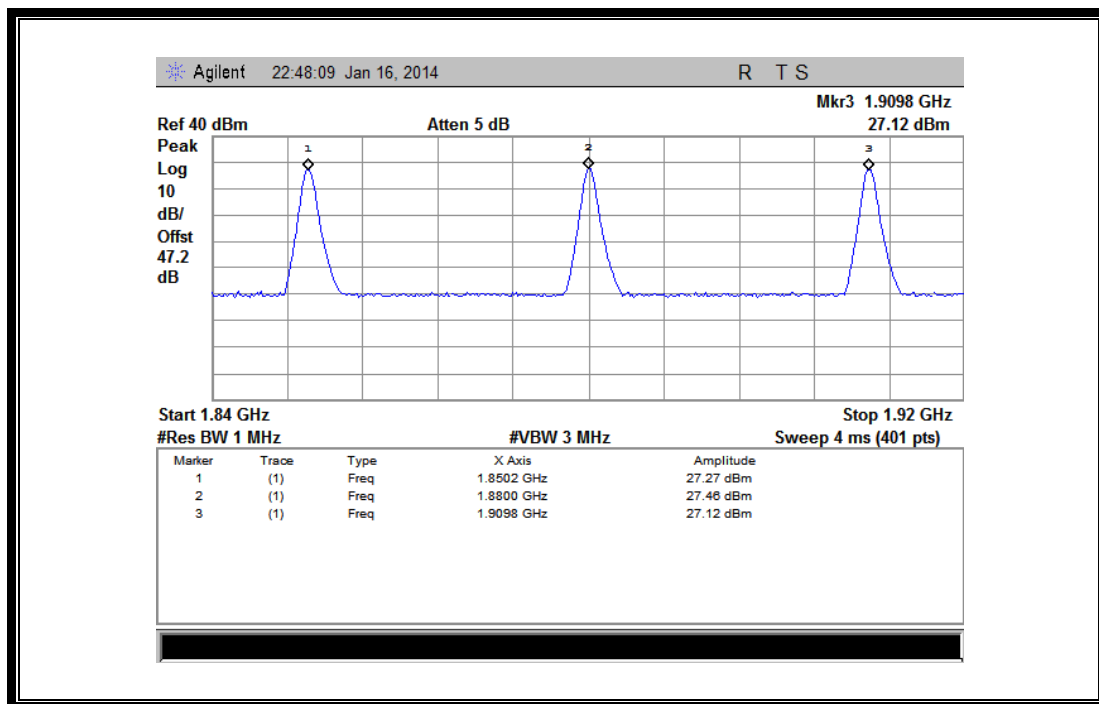
(Plot B: GPRS 850MHz Channel = 128, 190, 251)



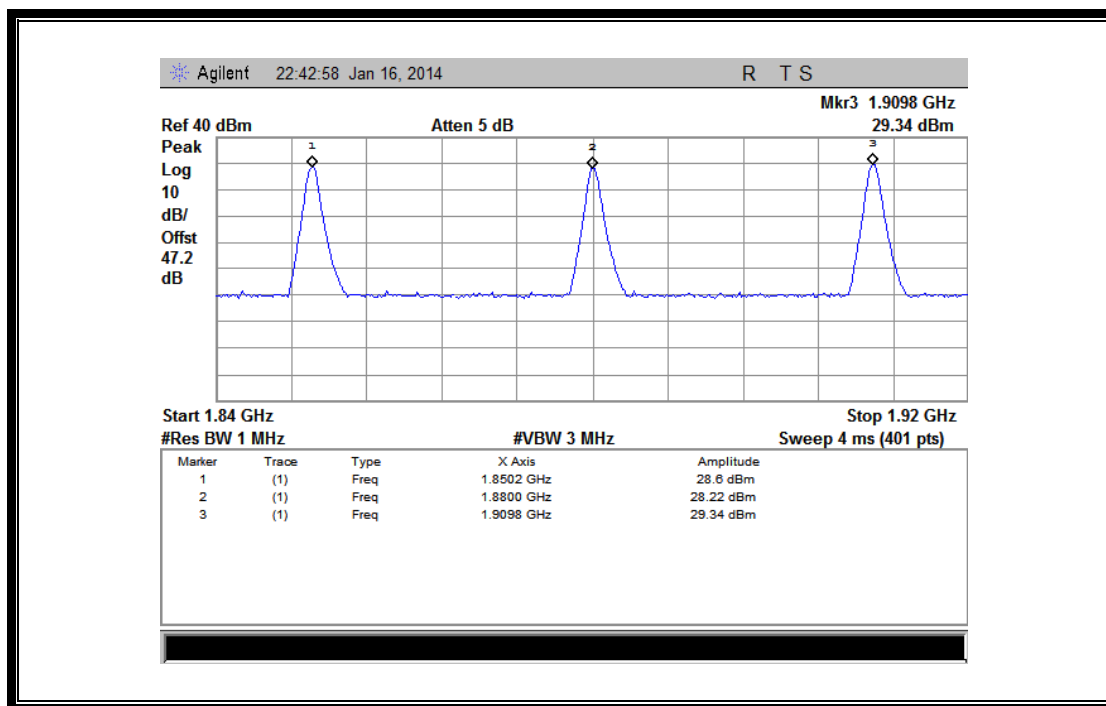
(Plot C: EGPRS 850MHz Channel = 128, 190, 251)



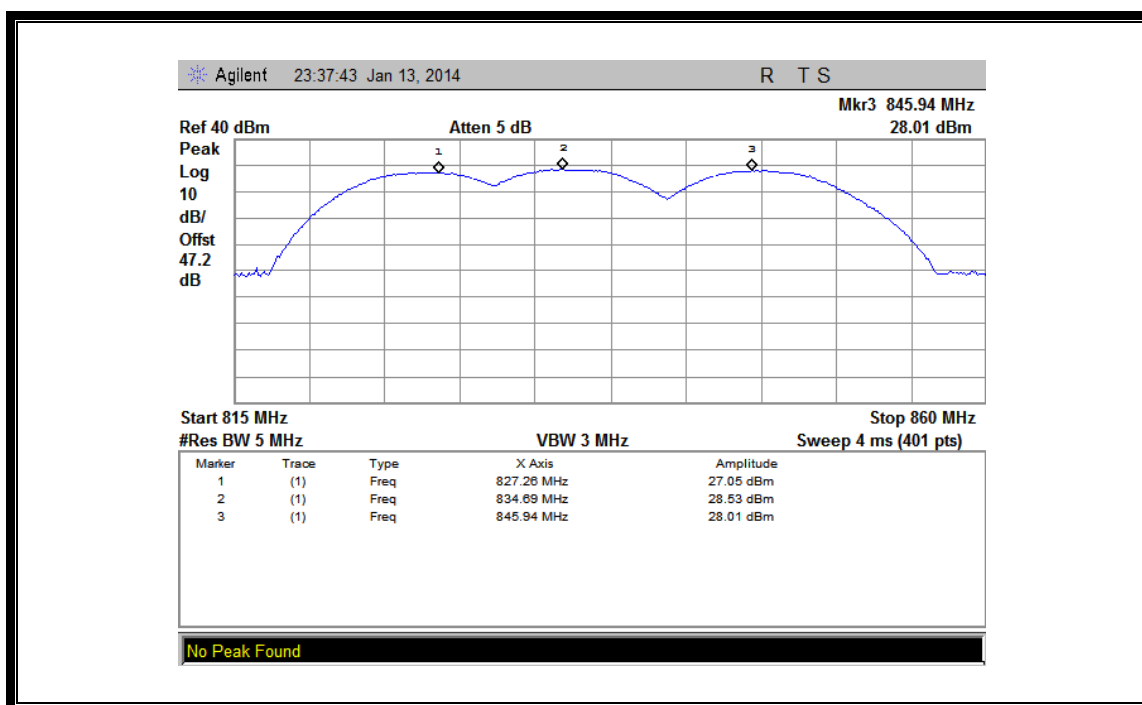
(Plot D: GSM 1900MHz Channel = 512, 661, 810)



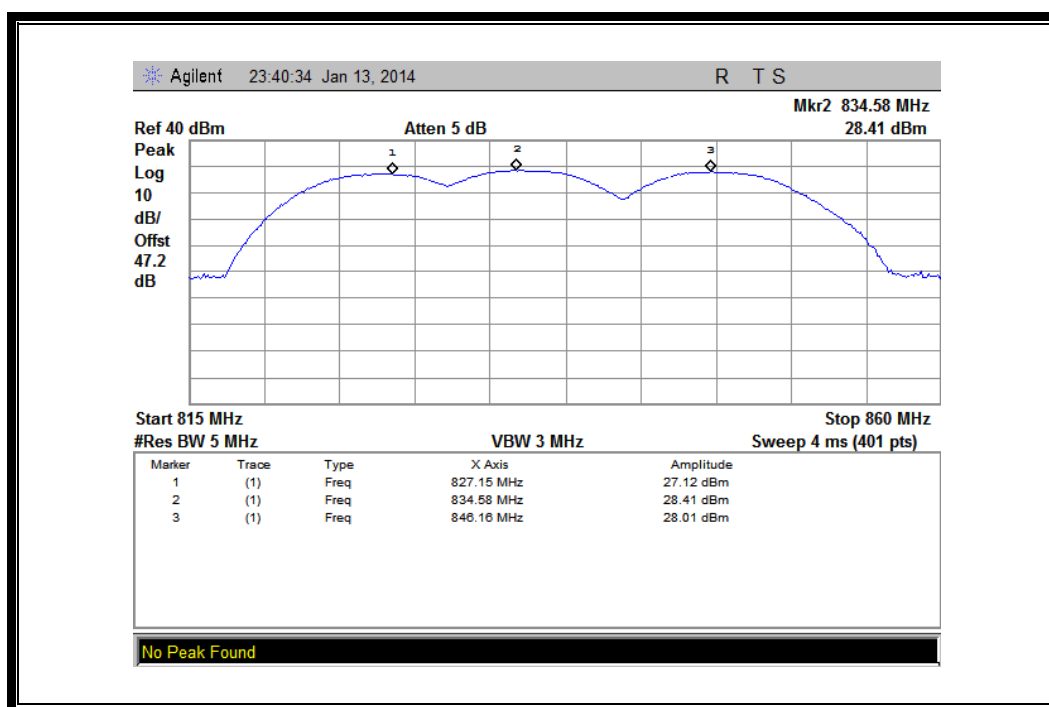
(Plot E: GPRS 1900MHz Channel = 512, 661, 810)



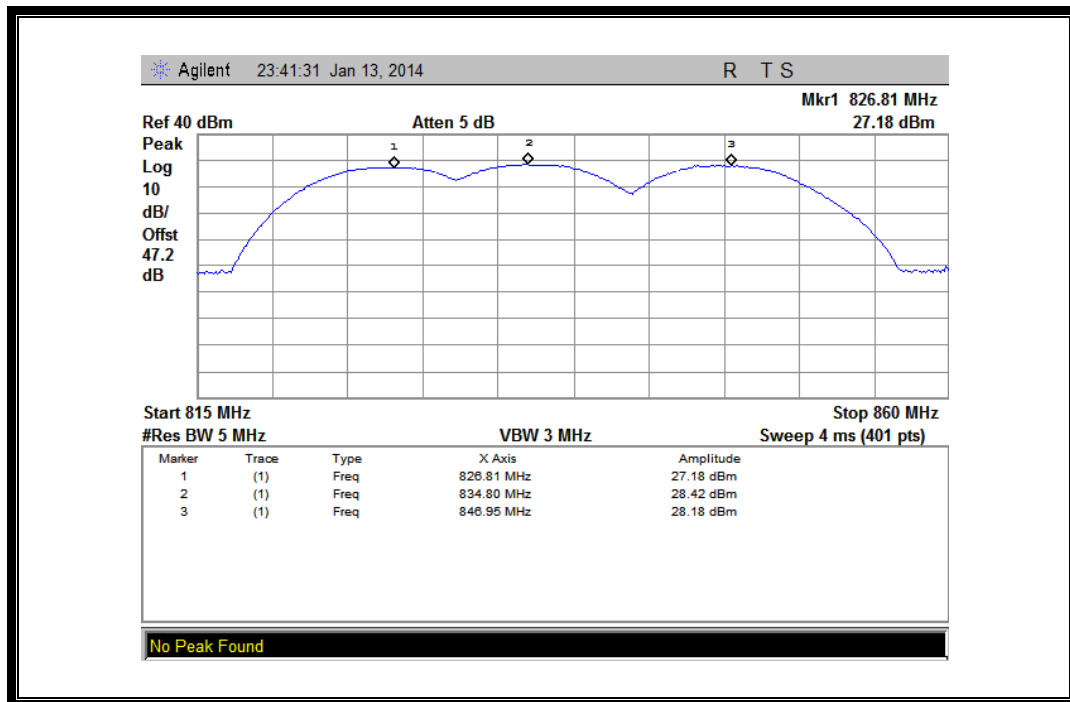
(Plot F: EGPRS 1900MHz Channel = 512, 661, 810)



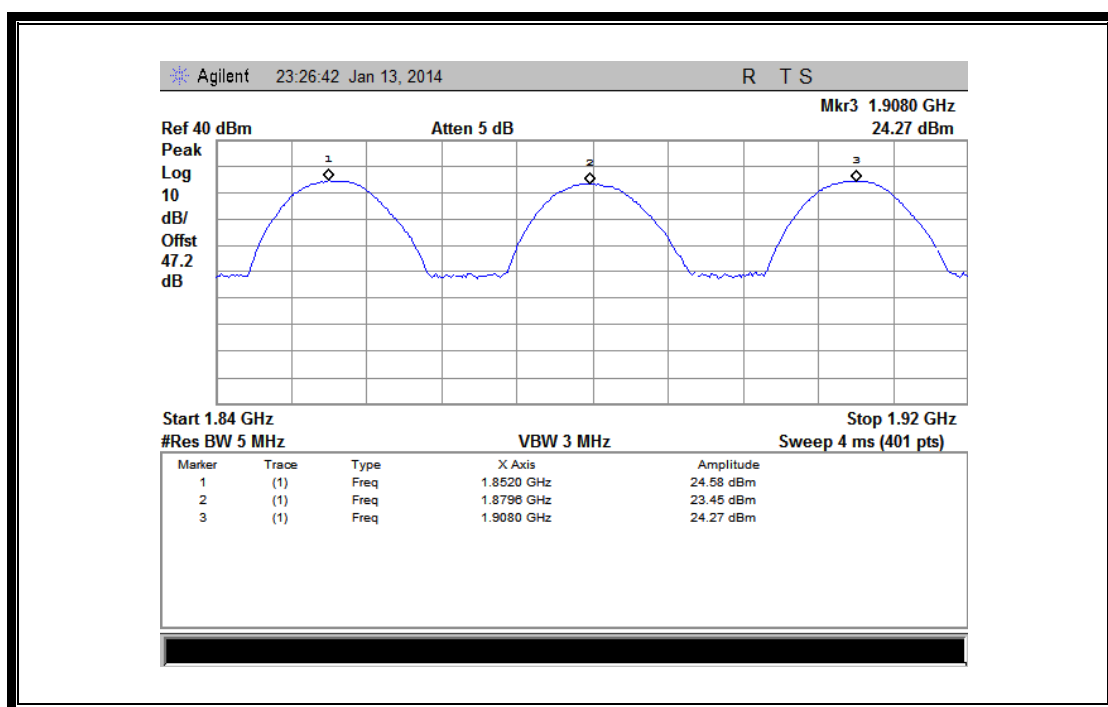
(Plot G: WCDMA 850 MHz Channel = 4132, 4175, 4233)



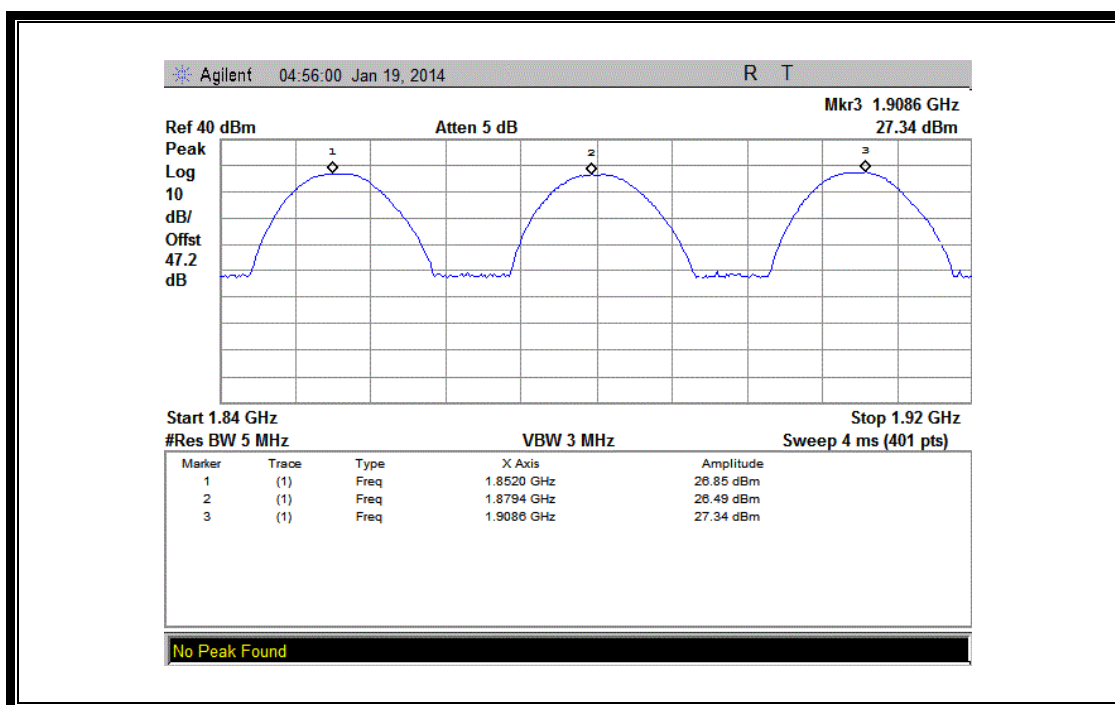
(Plot H: HSDPA 850 MHz Channel = 4132, 4175, 4233)



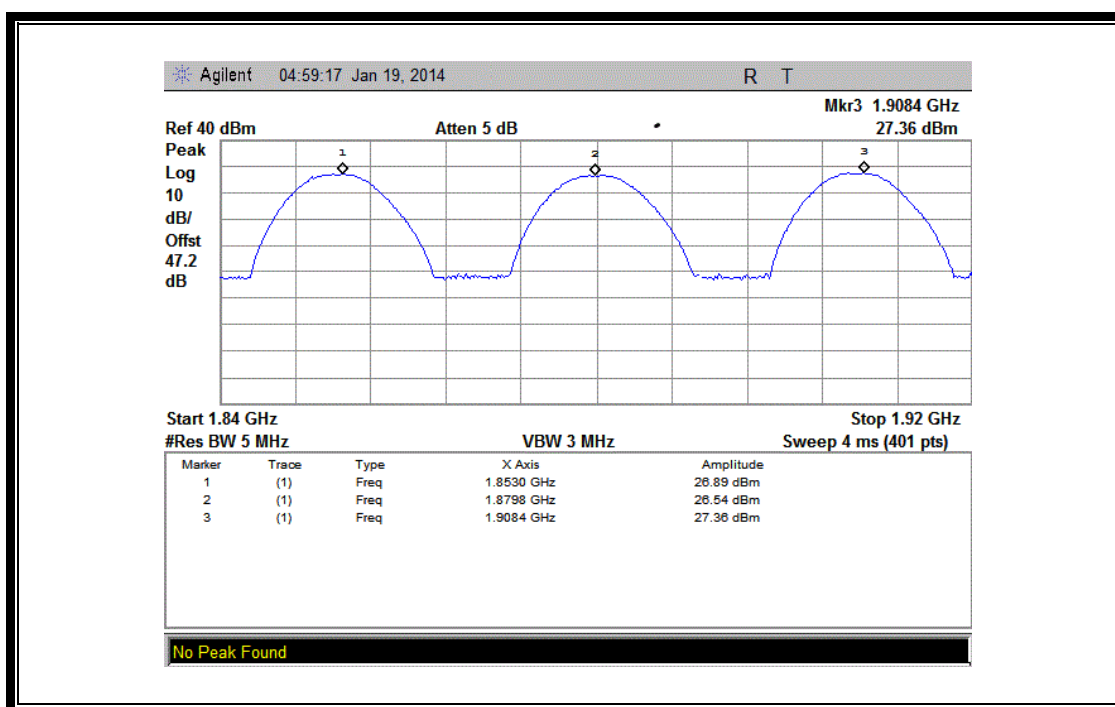
(Plot I: HSUPA 850 MHz Channel = 4132, 4175, 4233)



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



(Plot K: HSDPA1900 MHz Channel = 9262, 9400, 9538)



(Plot L: HSUPA1900 MHz Channel = 9262, 9400, 9538)

## 2.8 Radiated Out of Band Emissions

### 2.8.1 Requirement

According to FCC section 22.917(a) and section 24.238(a) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43+10\log(P)$ dB. This calculated to be -13dBm.

The spurious emission with frequency band 1900 according to FCC section 2.1057.

### 2.8.2 Test Description

See section 2.7.2 of this report.

Equipment List:

| Description           | Manufacturer | Model              | Serial No.   | Cal. Date  | Cal. Due   |
|-----------------------|--------------|--------------------|--------------|------------|------------|
| System Simulator      | Agilent      | E5515C             | GB43130131   | 2013.05.13 | 2014.05.12 |
| Spectrum Analyzer     | Agilent      | E7405A             | US44210471   | 2013.05.13 | 2014.05.12 |
| Full-Anechoic Chamber | Albatross    | 9m*6m*6m           | (n.a.)       | 2013.05.13 | 2014.05.12 |
| Test Antenna - Bi-Log | Schwarzbeck  | VULB 9163          | 9163-274     | 2013.05.13 | 2014.05.12 |
| Test Antenna - Horn   | Schwarzbeck  | BBHA 9120C         | 9120C-384    | 2013.05.13 | 2014.05.12 |
| Substitution Antenna  | Schwarzbeck  | BBHA 9120C         | 9120C-384    | 2013.05.13 | 2014.05.12 |
| Pre-AMPs              | lucix        | S10M100L3802       | S020180L3203 | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C836.5-25-X   | NA           | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C1747.5-75-X2 | NA           | 2013.05.13 | 2014.05.12 |
| Notch Filter          | COM-MW       | ZBSF-C1880-60-X2   | NA           | 2013.05.13 | 2014.05.12 |

**Note:** when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

### 2.8.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

## 1. Test Verdict:

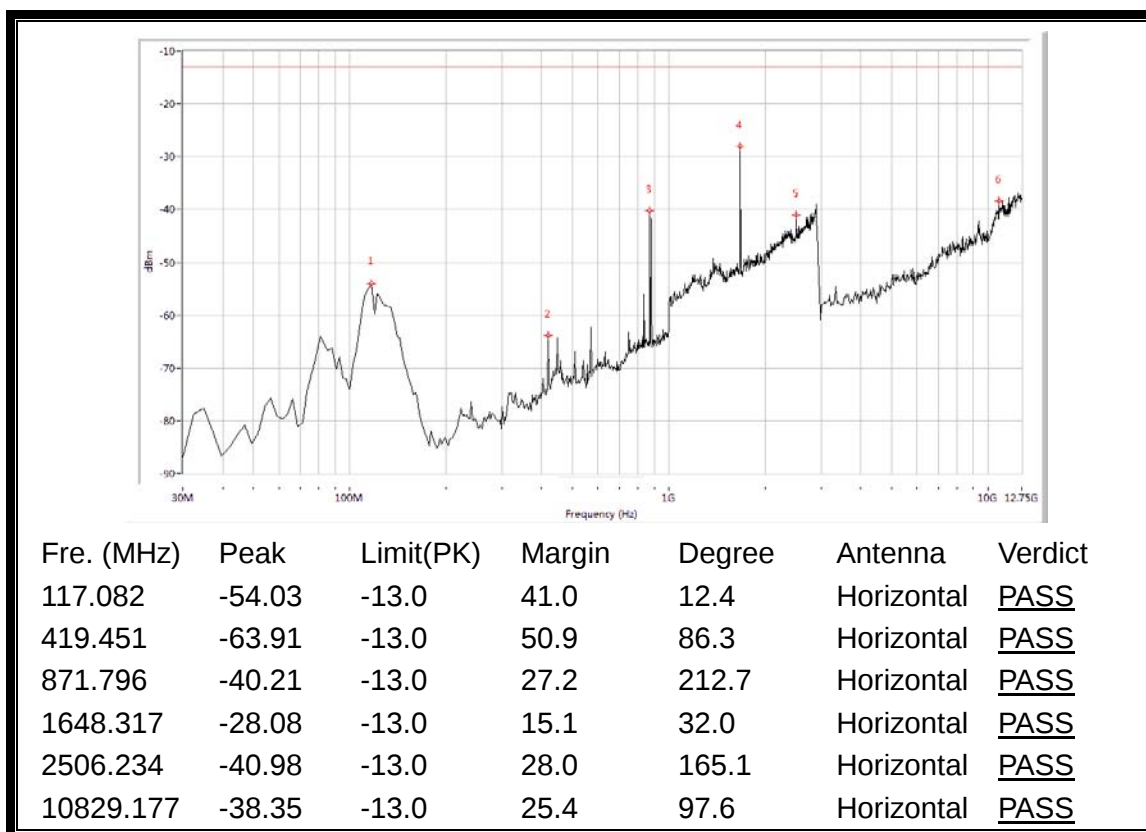
| Band          | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) |                       | Refer to Plot | Limit (dBm) | Verdict     |
|---------------|---------|-----------------|---------------------------------------|-----------------------|---------------|-------------|-------------|
|               |         |                 | Test Antenna Horizontal               | Test Antenna Vertical |               |             |             |
| GSM 850MHz    | 128     | 824.2           | < -25                                 | < -25                 | Plot A.1/A.2  | -13         | <u>PASS</u> |
|               | 190     | 836.6           | < -25                                 | < -25                 | Plot A.3/A.4  |             | <u>PASS</u> |
|               | 251     | 848.8           | < -25                                 | < -25                 | Plot A.5/A.6  |             | <u>PASS</u> |
| GSM 1900MHz   | 512     | 1850.2          | < -25                                 | < -25                 | Plot B.1/B.2  | -13         | <u>PASS</u> |
|               | 661     | 1880.0          | < -25                                 | < -25                 | Plot B.3/B.4  |             | <u>PASS</u> |
|               | 810     | 1909.8          | < -25                                 | < -25                 | Plot B.5/B.6  |             | <u>PASS</u> |
| EDGE 850MHz   | 128     | 824.2           | < -25                                 | < -25                 | Plot C.1/C.2  | -13         | <u>PASS</u> |
|               | 190     | 836.6           | < -25                                 | < -25                 | Plot C.3/C.4  |             | <u>PASS</u> |
|               | 251     | 848.8           | < -25                                 | < -25                 | Plot C.5/C.6  |             | <u>PASS</u> |
| EDGE 1900MHz  | 512     | 1850.2          | < -25                                 | < -25                 | Plot D.1/D.2  | -13         | <u>PASS</u> |
|               | 661     | 1880.0          | < -25                                 | < -25                 | Plot D.3/D.4  |             | <u>PASS</u> |
|               | 810     | 1909.8          | < -25                                 | < -25                 | Plot D.5/D.6  |             | <u>PASS</u> |
| WCDMA 850MHz  | 4132    | 826.4           | < -25                                 | < -25                 | Plot E.1/E.2  | -13         | <u>PASS</u> |
|               | 4175    | 835             | < -25                                 | < -25                 | Plot E.3/E.4  |             | <u>PASS</u> |
|               | 4233    | 846.6           | < -25                                 | < -25                 | Plot E.5/E.6  |             | <u>PASS</u> |
| WCDMA 1900MHz | 9262    | 1852.4          | < -25                                 | < -25                 | Plot F.1/F.2  | -13         | <u>PASS</u> |
|               | 9400    | 1880            | < -25                                 | < -25                 | Plot F.3/F.4  |             | <u>PASS</u> |
|               | 9538    | 1907.6          | < -25                                 | < -25                 | Plot F.5/F.6  |             | <u>PASS</u> |
| HSDPA 850MHz  | 4132    | 826.4           | < -25                                 | < -25                 | Plot G.1/G.2  | -13         | <u>PASS</u> |
|               | 4175    | 835             | < -25                                 | < -25                 | Plot G.3/G.4  |             | <u>PASS</u> |
|               | 4233    | 846.6           | < -25                                 | < -25                 | Plot G.5/G.6  |             | <u>PASS</u> |
| HSDPA 1900MHz | 9262    | 1852.4          | < -25                                 | < -25                 | Plot H.1/H.2  | -13         | <u>PASS</u> |
|               | 9400    | 1880            | < -25                                 | < -25                 | Plot H.3/H.4  |             | <u>PASS</u> |
|               | 9538    | 1907.6          | < -25                                 | < -25                 | Plot H.5/H.6  |             | <u>PASS</u> |
| HSUPA 850MHz  | 4132    | 826.4           | < -25                                 | < -25                 | Plot I.1/I.2  | -13         | <u>PASS</u> |
|               | 4175    | 835             | < -25                                 | < -25                 | Plot I.3/I.4  |             | <u>PASS</u> |
|               | 4233    | 846.6           | < -25                                 | < -25                 | Plot I.5/I.6  |             | <u>PASS</u> |
| HSUPA 1900MHz | 9262    | 1852.4          | < -25                                 | < -25                 | Plot J.1/J.2  | -13         | <u>PASS</u> |
|               | 9400    | 1880            | < -25                                 | < -25                 | Plot J.3/J.4  |             | <u>PASS</u> |
|               | 9538    | 1907.6          | < -25                                 | < -25                 | Plot J.5/J.6  |             | <u>PASS</u> |
|               | 9538    | 1907.6          | < -25                                 | < -25                 | Plot J.5/J.6  |             | <u>PASS</u> |

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

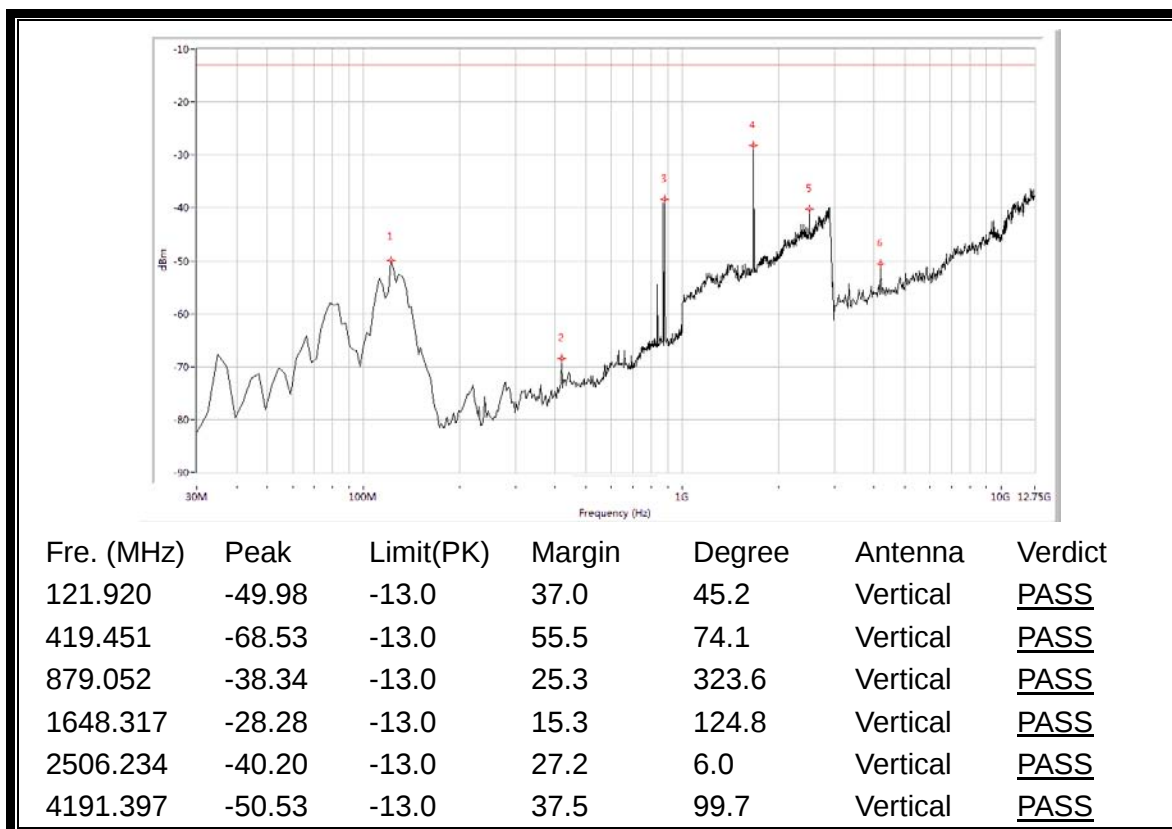
Note1: the power of the EUT transmitting frequency should be ignored.

Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test

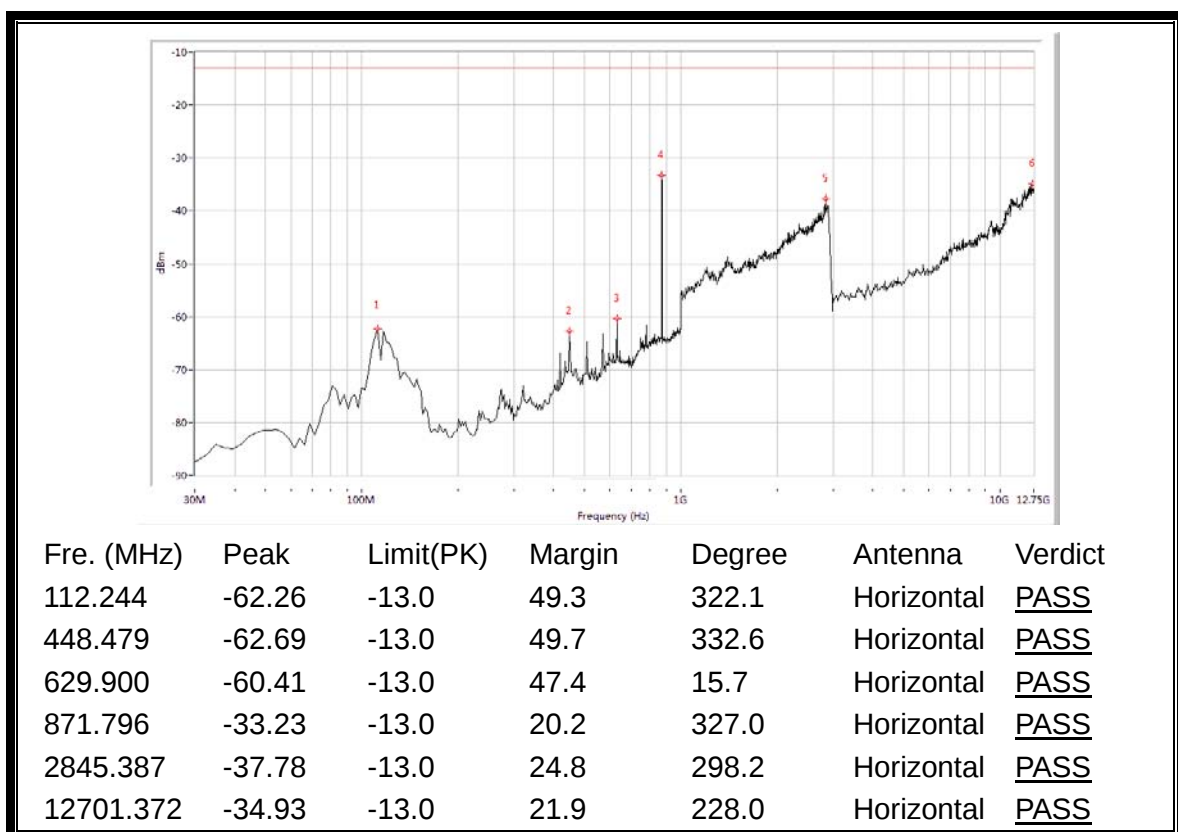
condition was recorded in this test report.



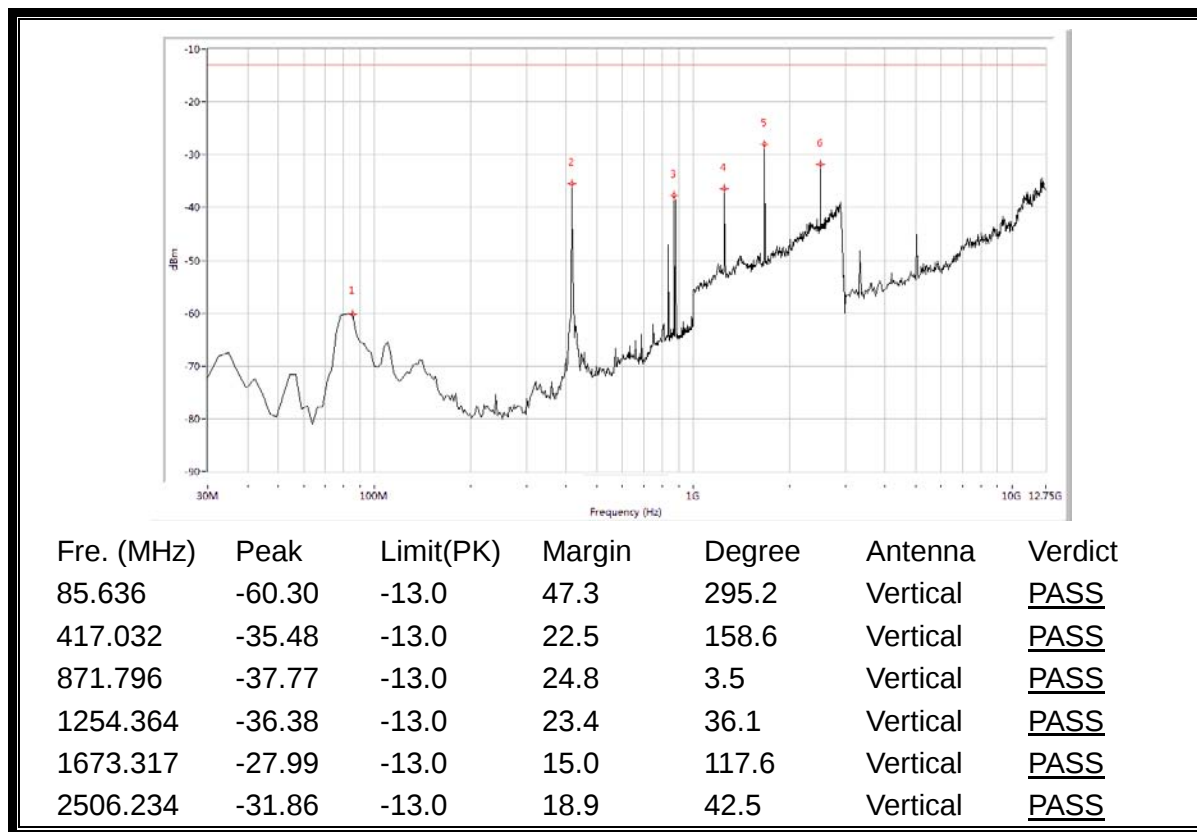
(Plot A.1: GSM 850MHz Channel = 128, Test Antenna Horizontal)



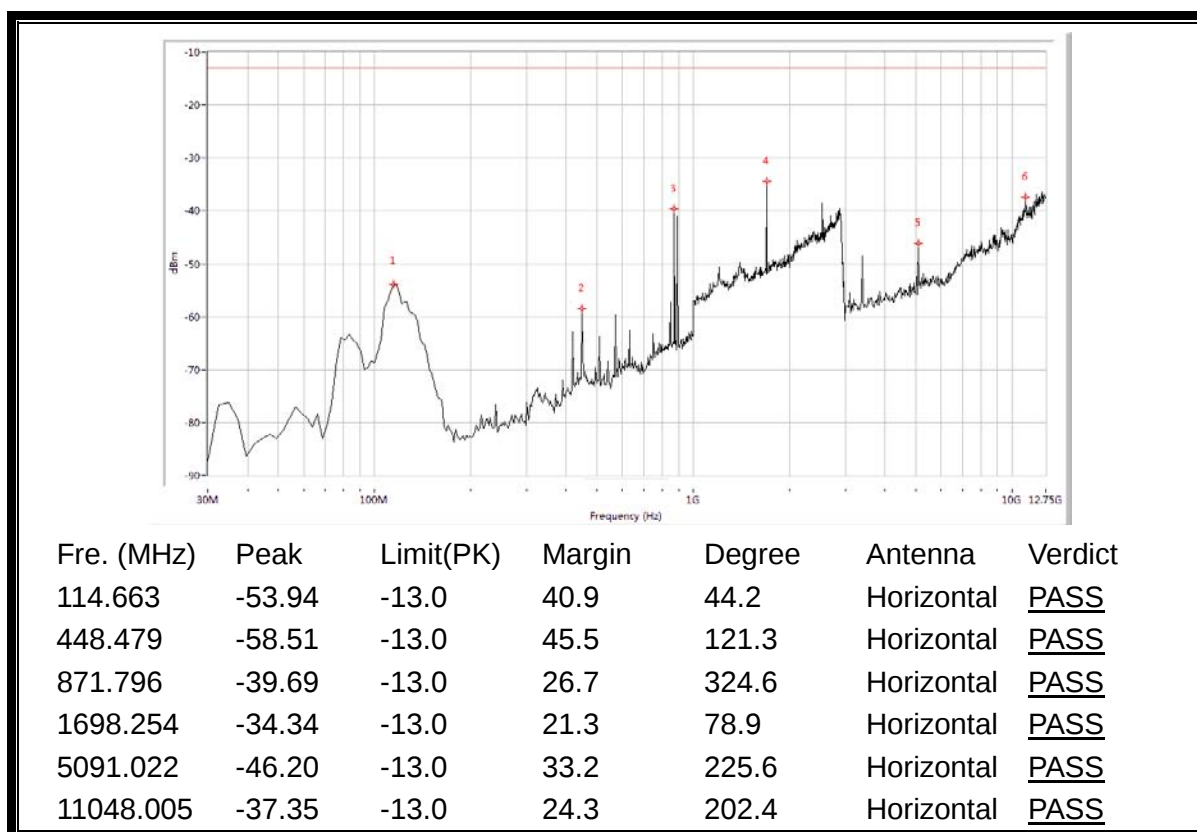
(Plot A.2: GSM 850MHz Channel = 128, Test Antenna Vertical)



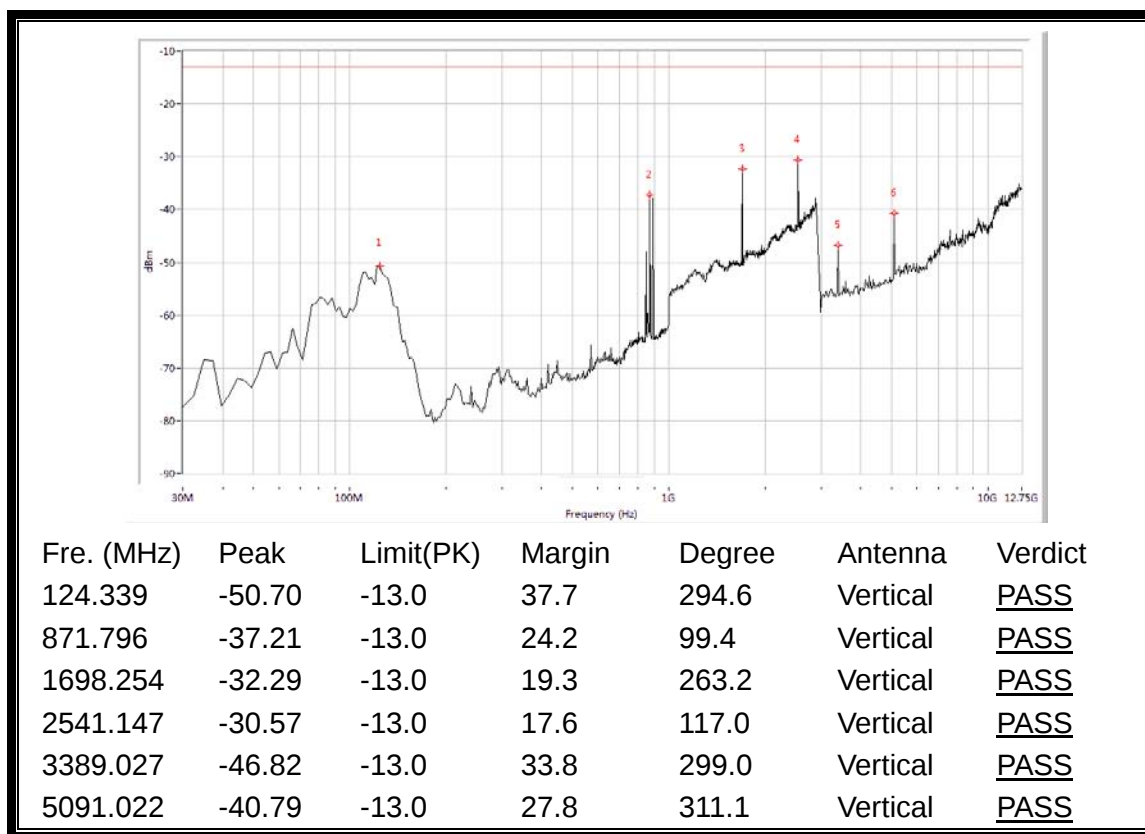
(Plot A.3: GSM 850MHz Channel = 190, Test Antenna Horizontal)



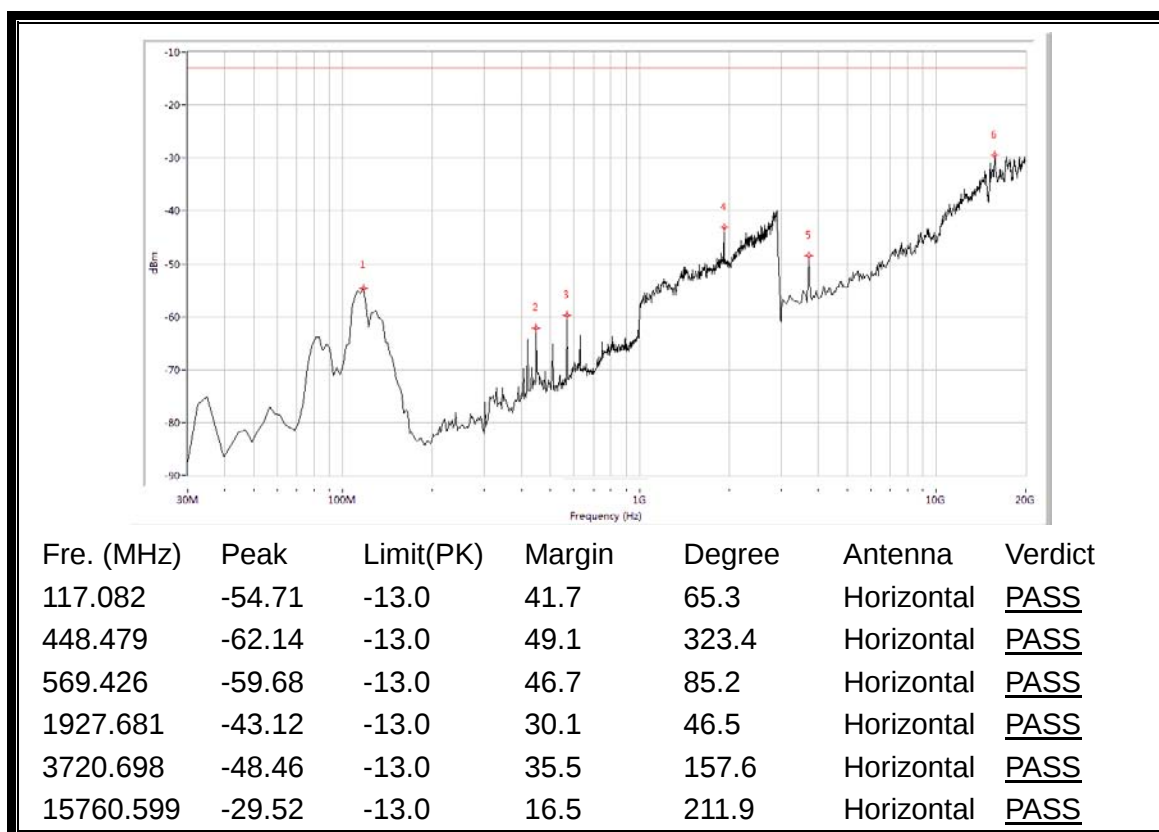
(Plot A.4: GSM 850MHz Channel = 190, Test Antenna Vertical)



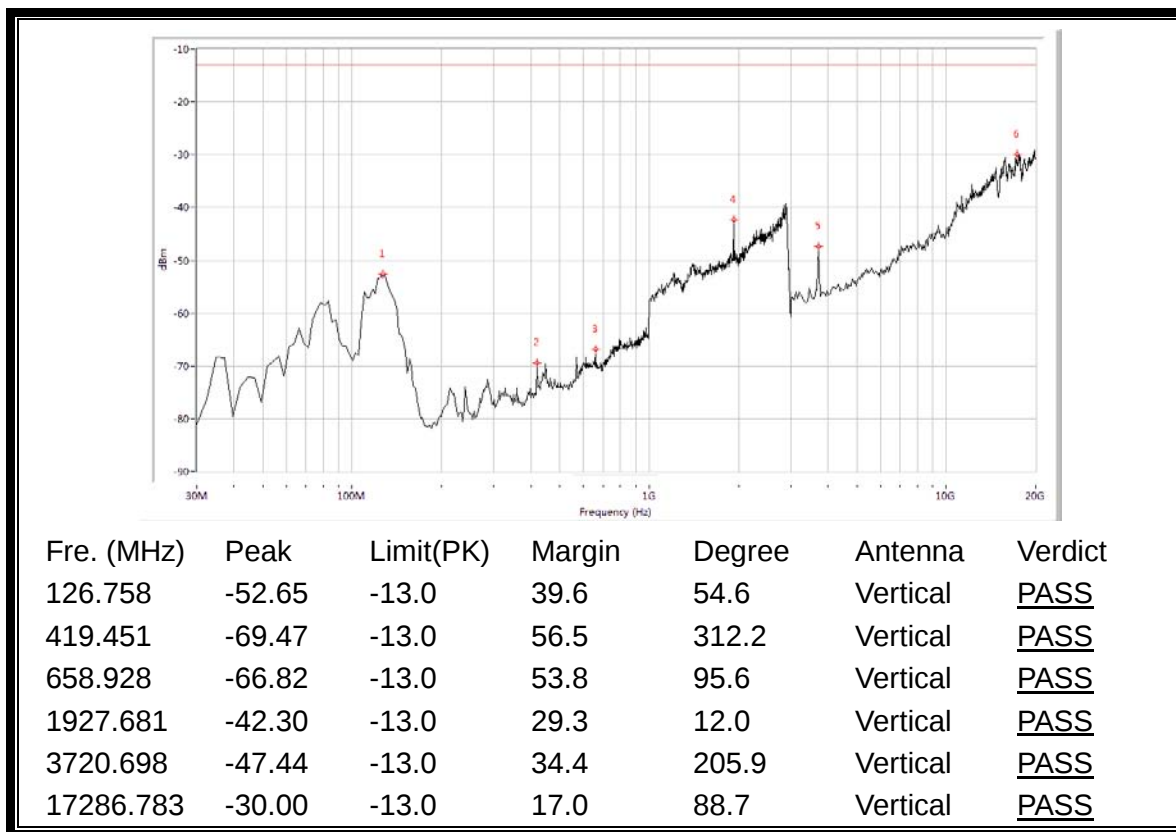
(Plot A.5: GSM 850MHz Channel = 251, Test Antenna Horizontal)



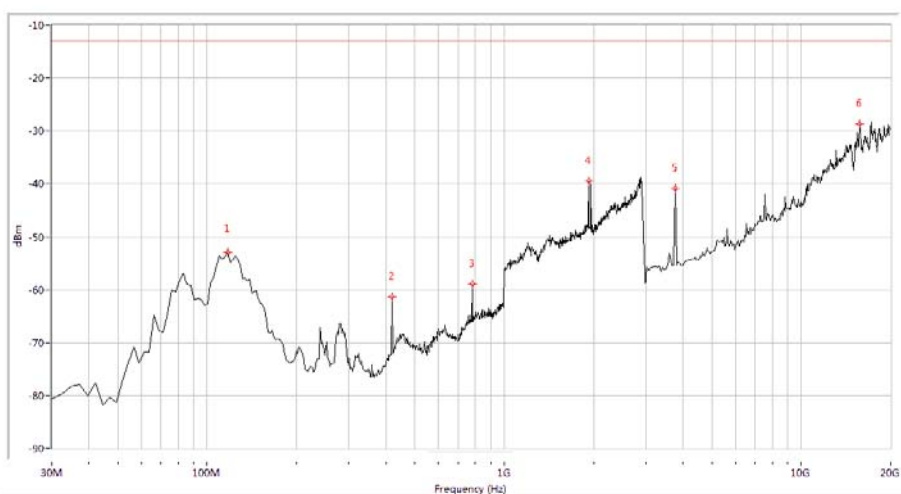
(Plot A.6: GSM 850MHz Channel = 251, Test Antenna Vertical)



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

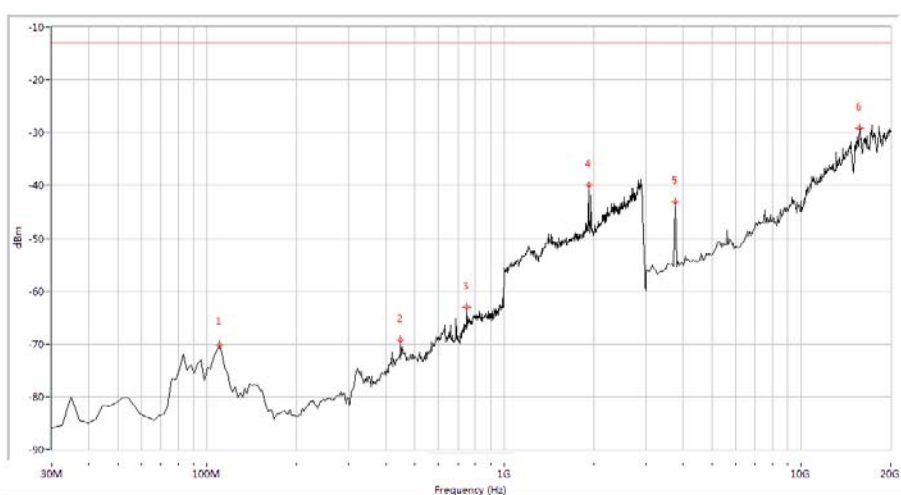


(Plot B.2: GSM 1900MHz Channel = 512, Test Antenna Vertical)



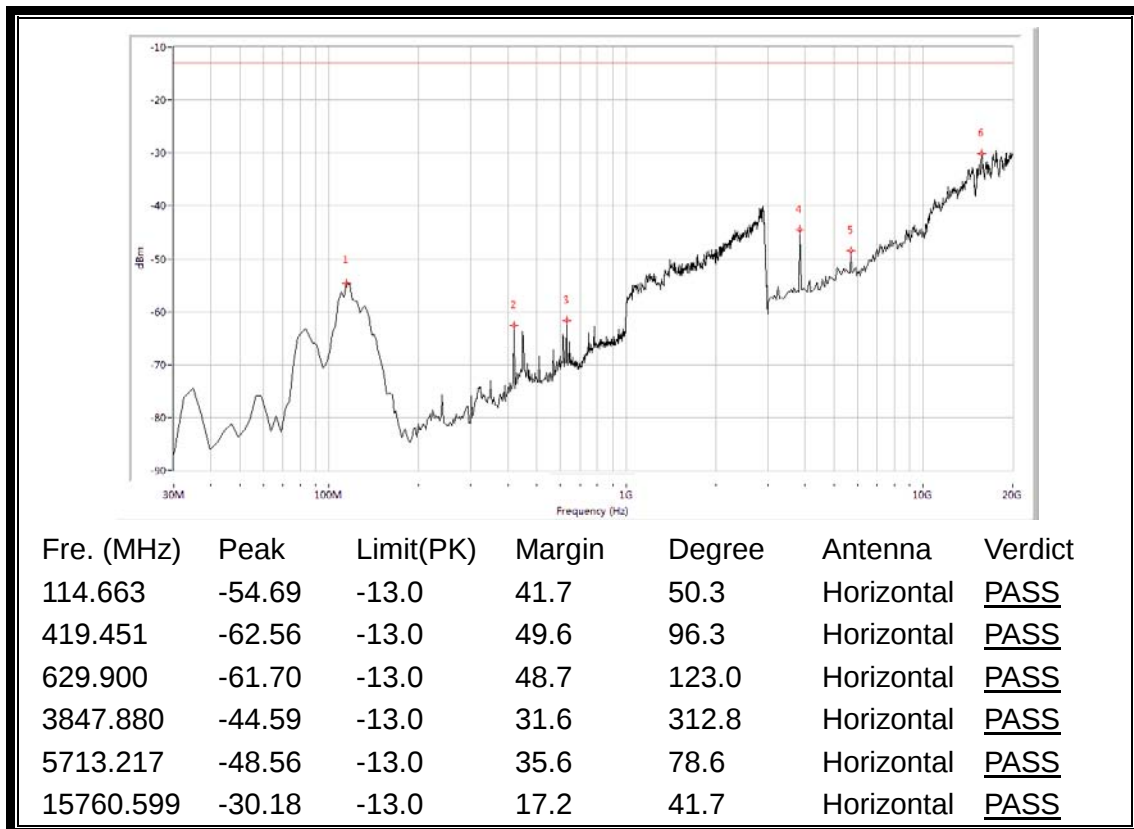
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 117.082    | -52.94 | -13.0     | 39.9   | 328.7  | Horizontal | <u>PASS</u> |
| 419.451    | -61.36 | -13.0     | 48.4   | 343.9  | Horizontal | <u>PASS</u> |
| 779.875    | -58.96 | -13.0     | 46.0   | 328.7  | Horizontal | <u>PASS</u> |
| 1927.681   | -39.51 | -13.0     | 26.5   | 249.2  | Horizontal | <u>PASS</u> |
| 3763.092   | -40.90 | -13.0     | 27.9   | 60.1   | Horizontal | <u>PASS</u> |
| 15760.599  | -28.67 | -13.0     | 15.7   | 5.0    | Horizontal | <u>PASS</u> |

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

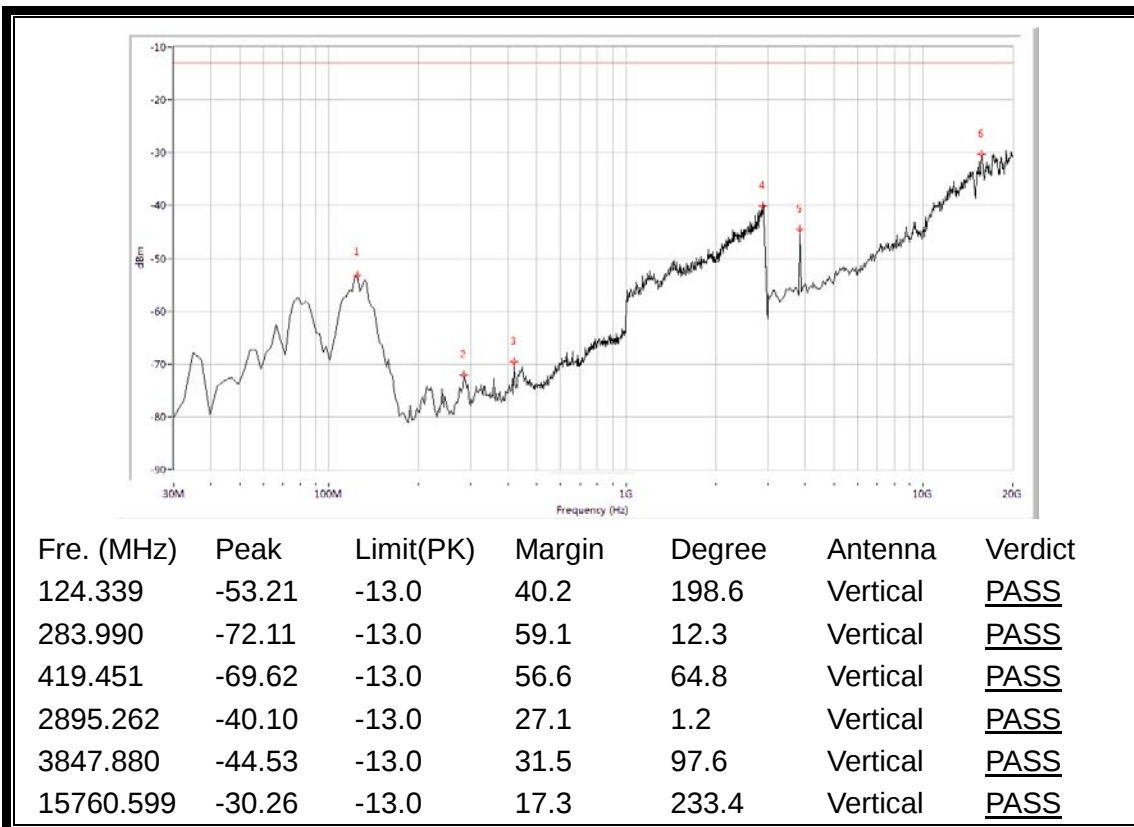


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 109.825    | -70.26 | -13.0     | 57.3   | 230.2  | Vertical | <u>PASS</u> |
| 448.479    | -69.17 | -13.0     | 56.2   | 347.3  | Vertical | <u>PASS</u> |
| 748.429    | -63.02 | -13.0     | 50.0   | 126.5  | Vertical | <u>PASS</u> |
| 1927.681   | -39.94 | -13.0     | 26.9   | 339.5  | Vertical | <u>PASS</u> |
| 3763.092   | -43.12 | -13.0     | 30.1   | 122.1  | Vertical | <u>PASS</u> |
| 15760.599  | -29.12 | -13.0     | 16.1   | 360.0  | Vertical | <u>PASS</u> |

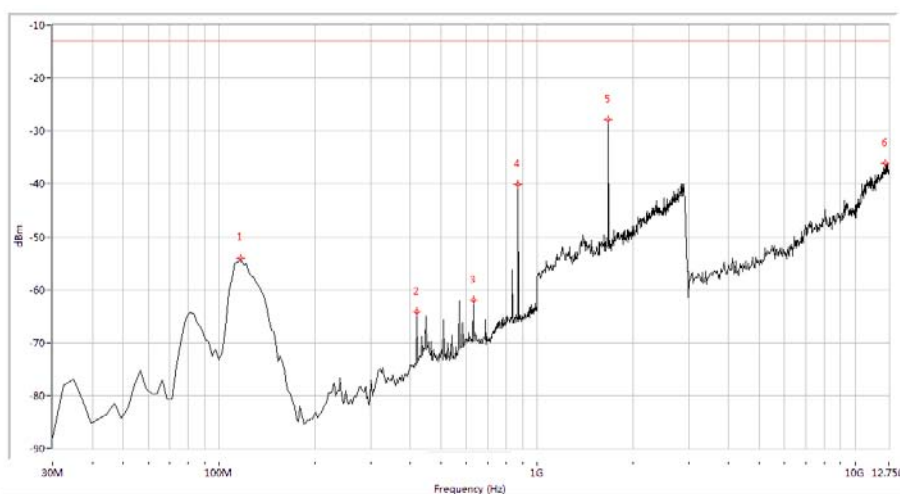
(Plot B.4: GSM 1900MHz Channel = 661, Test Antenna Vertical)



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

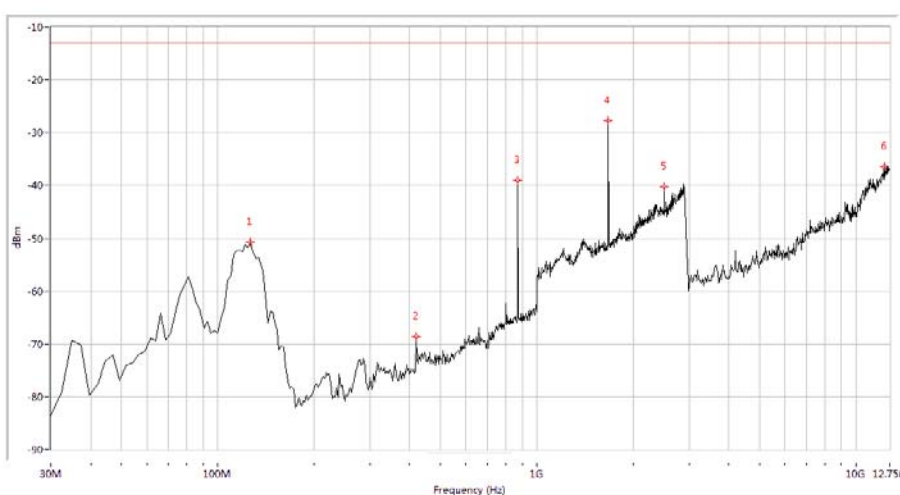


(PlotB.6: GSM 1900MHz Channel = 810, Test Antenna Vertical)



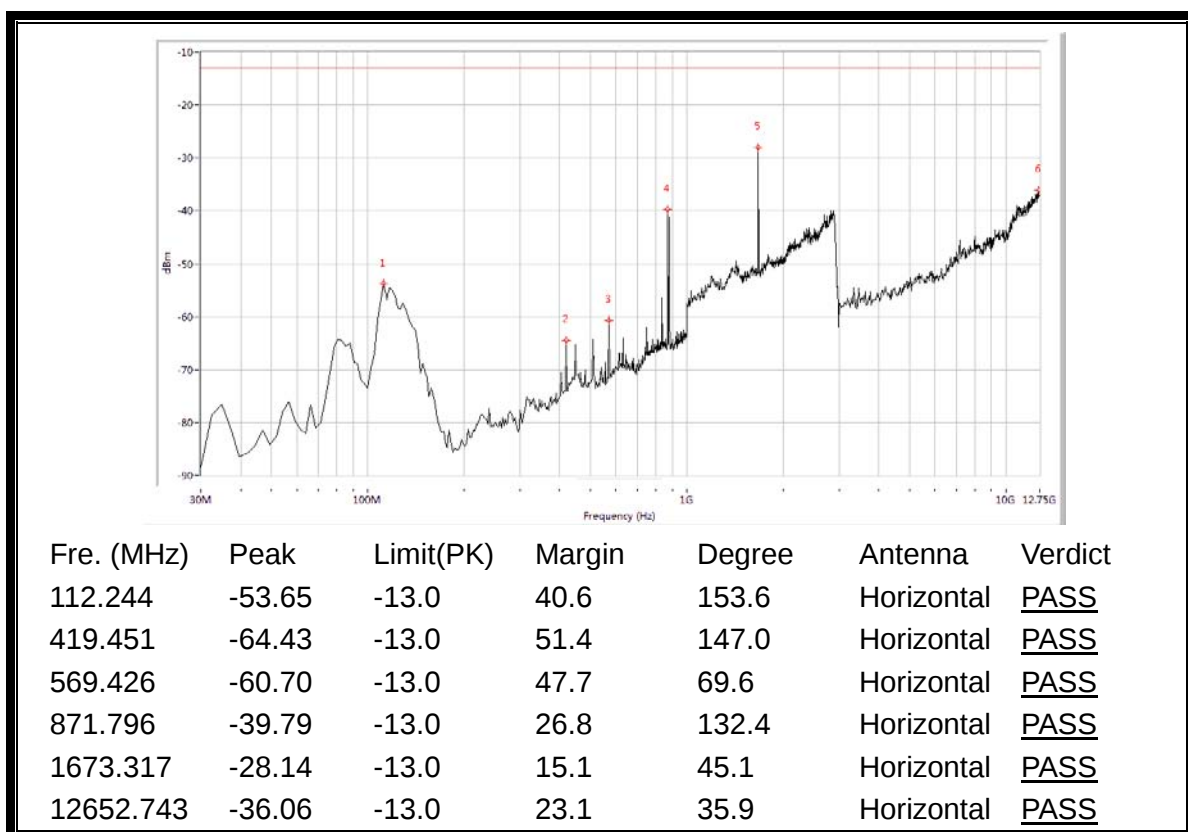
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 117.082    | -54.02 | -13.0     | 41.0   | 153.2  | Horizontal | <u>PASS</u> |
| 419.451    | -64.25 | -13.0     | 51.2   | 21.3   | Horizontal | <u>PASS</u> |
| 629.900    | -61.97 | -13.0     | 49.0   | 45.6   | Horizontal | <u>PASS</u> |
| 871.796    | -40.17 | -13.0     | 27.2   | 78.9   | Horizontal | <u>PASS</u> |
| 1648.317   | -27.94 | -13.0     | 14.9   | 312.0  | Horizontal | <u>PASS</u> |
| 12458.229  | -36.18 | -13.0     | 23.2   | 263.8  | Horizontal | <u>PASS</u> |

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

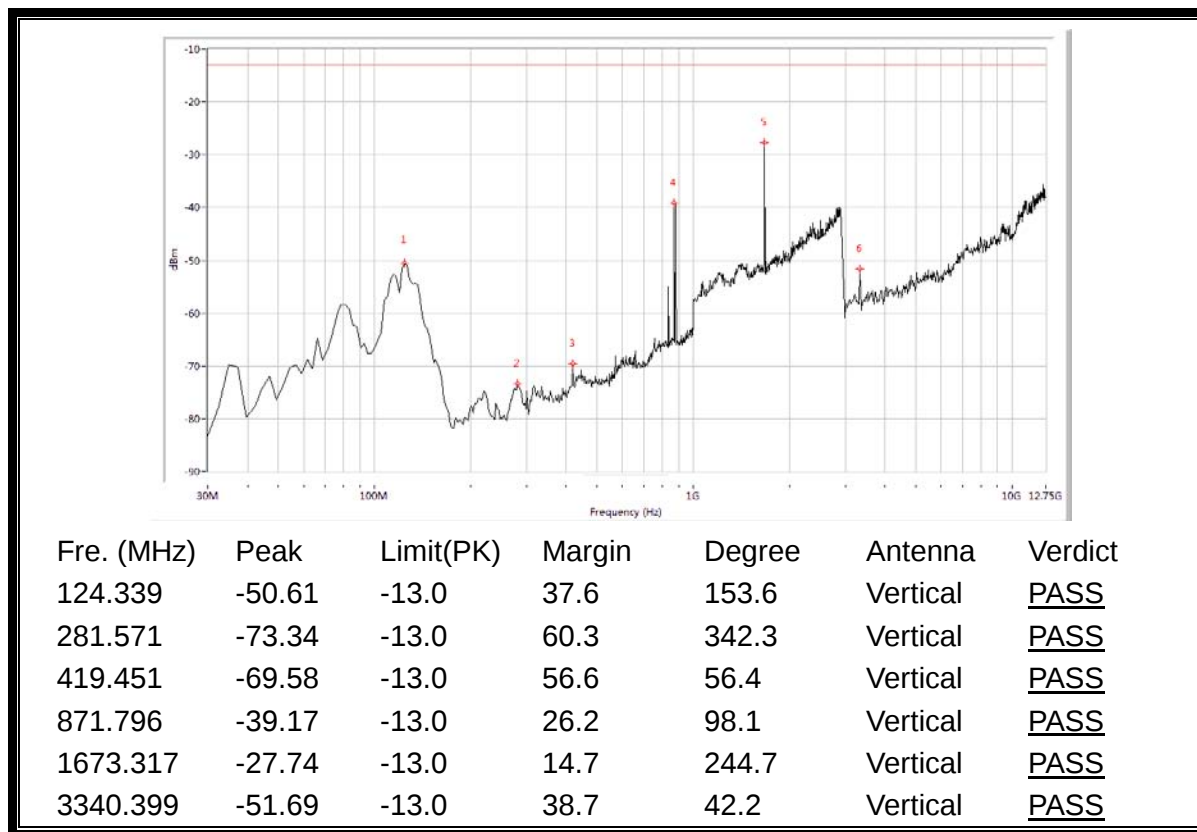


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 126.758    | -50.70 | -13.0     | 37.7   | 54.6   | Vertical | <u>PASS</u> |
| 419.451    | -68.54 | -13.0     | 55.5   | 213.2  | Vertical | <u>PASS</u> |
| 871.796    | -38.96 | -13.0     | 26.0   | 32.0   | Vertical | <u>PASS</u> |
| 1648.317   | -27.72 | -13.0     | 14.7   | 303.7  | Vertical | <u>PASS</u> |
| 2506.234   | -40.26 | -13.0     | 27.3   | 116.5  | Vertical | <u>PASS</u> |
| 12263.716  | -36.53 | -13.0     | 23.5   | 87.9   | Vertical | <u>PASS</u> |

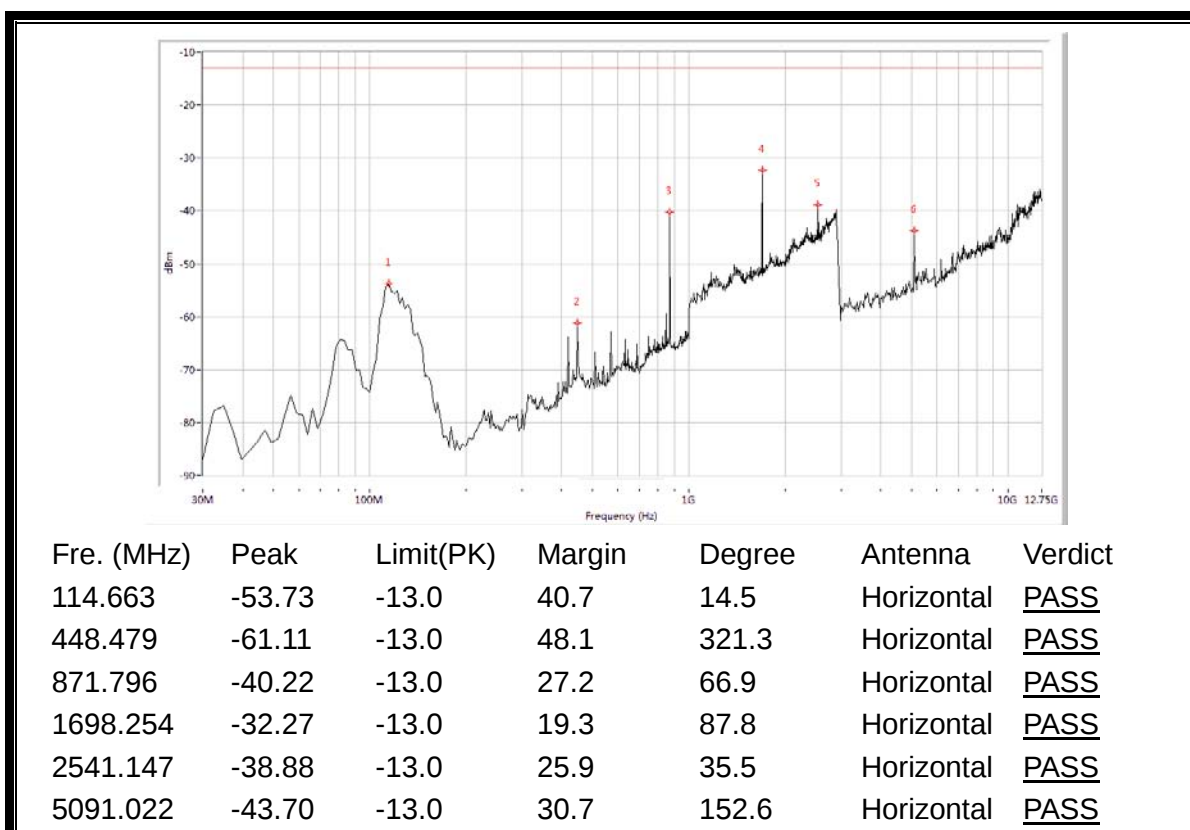
(Plot C.2: EGPRS 850MHz Channel = 128, Test Antenna Vertical)



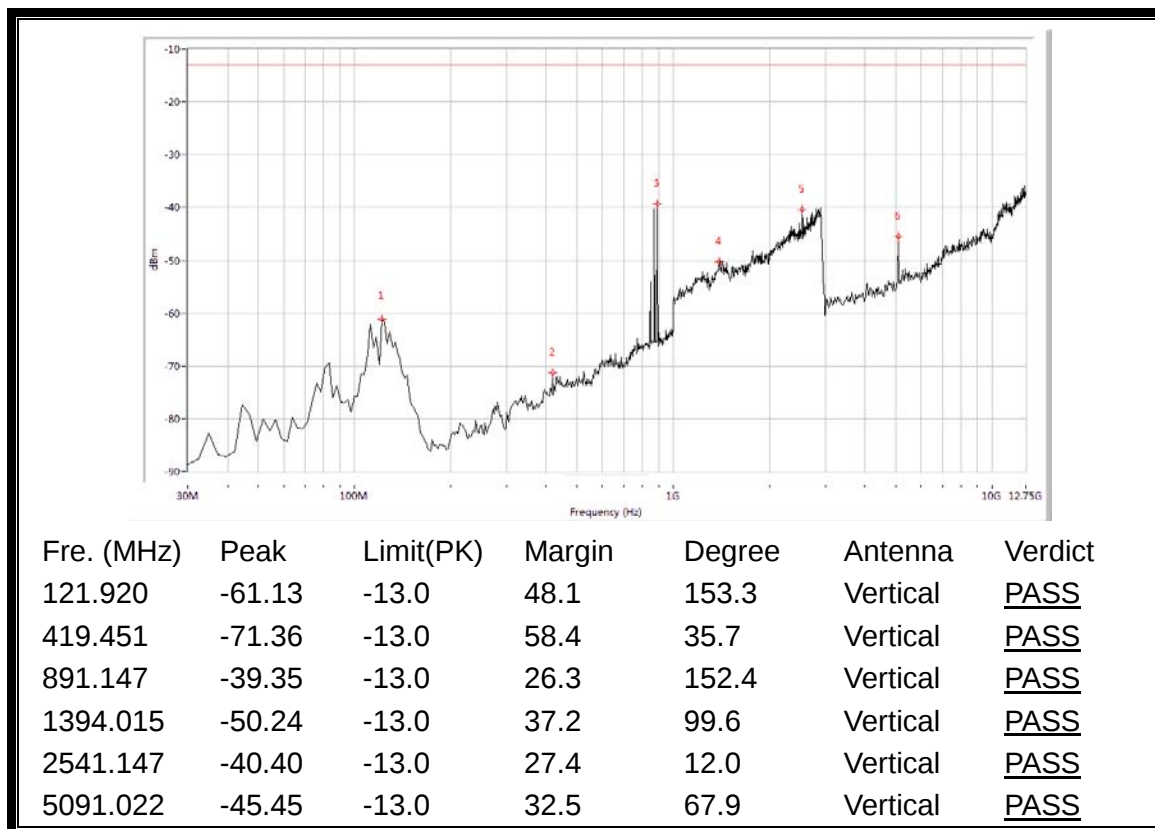
(Plot C.3: EGPRS 850MHz Channel = 190, Test Antenna Horizontal)



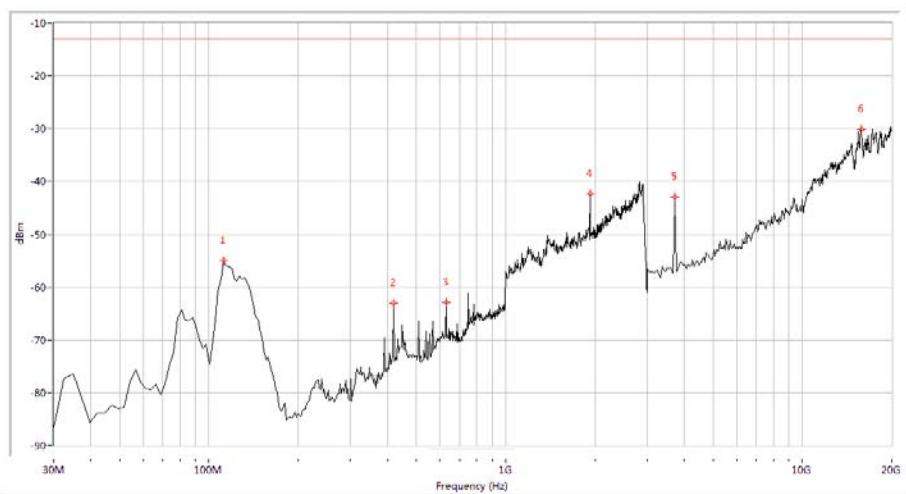
(Plot C.4: EGPRS 850MHz Channel = 190, Test Antenna Vertical)



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

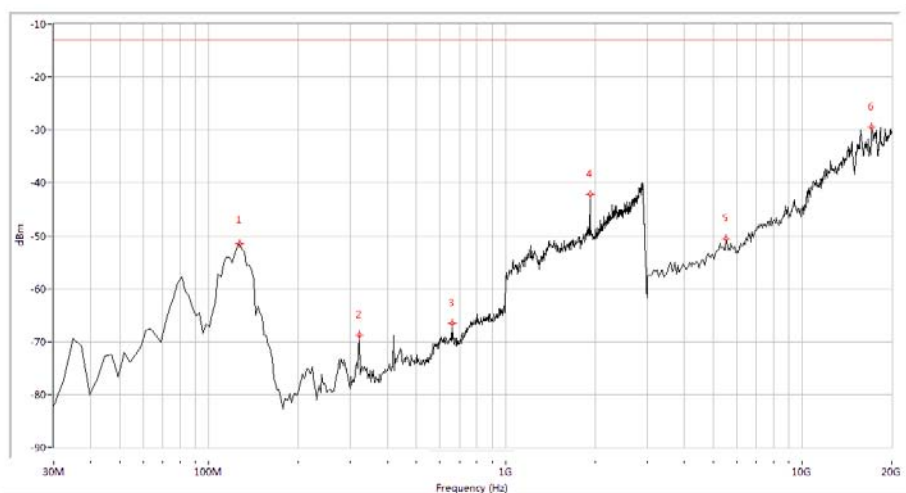


(Plot C.6: EGPRS 850MHz Channel = 251, Test Antenna Vertical)



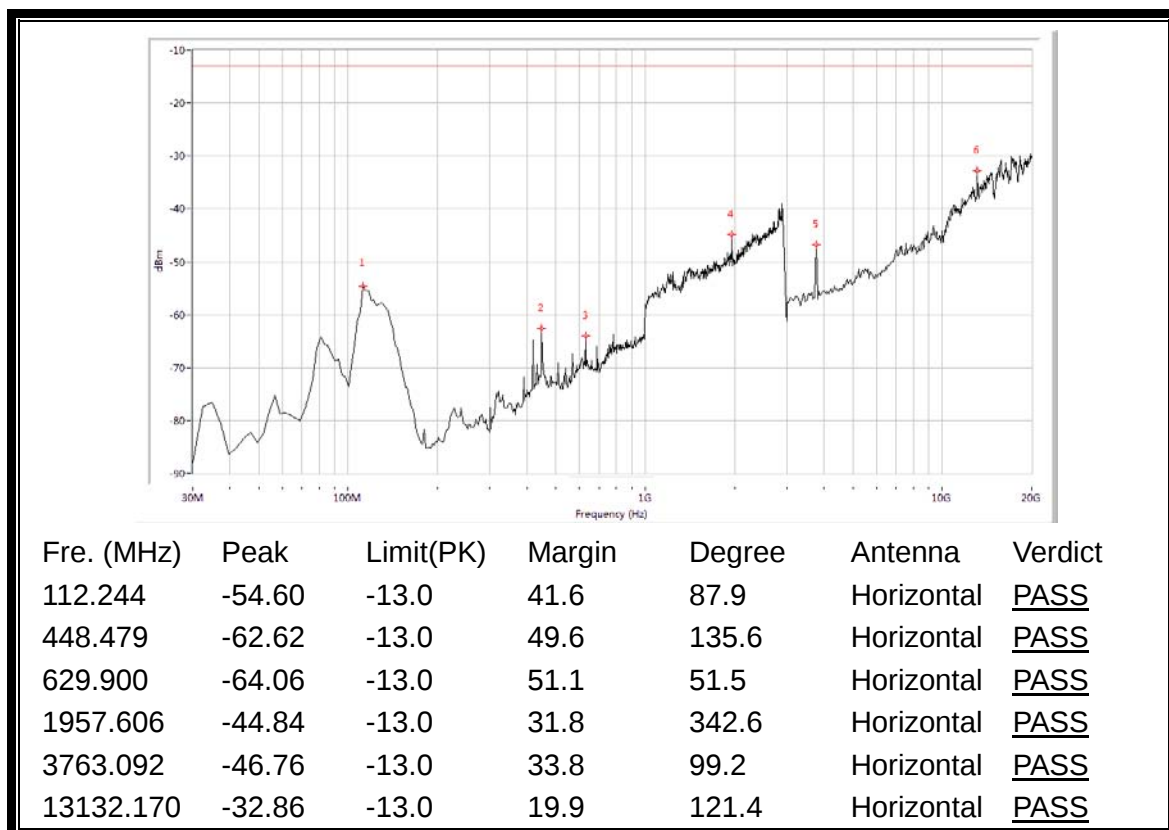
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 112.244    | -55.03 | -13.0     | 42.0   | 157.8  | Horizontal | <u>PASS</u> |
| 419.451    | -63.09 | -13.0     | 50.1   | 142.3  | Horizontal | <u>PASS</u> |
| 629.900    | -62.89 | -13.0     | 49.9   | 14.9   | Horizontal | <u>PASS</u> |
| 1927.681   | -42.30 | -13.0     | 29.3   | 85.0   | Horizontal | <u>PASS</u> |
| 3720.698   | -43.00 | -13.0     | 30.0   | 323.8  | Horizontal | <u>PASS</u> |
| 15802.993  | -30.04 | -13.0     | 17.0   | 247.6  | Horizontal | <u>PASS</u> |

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

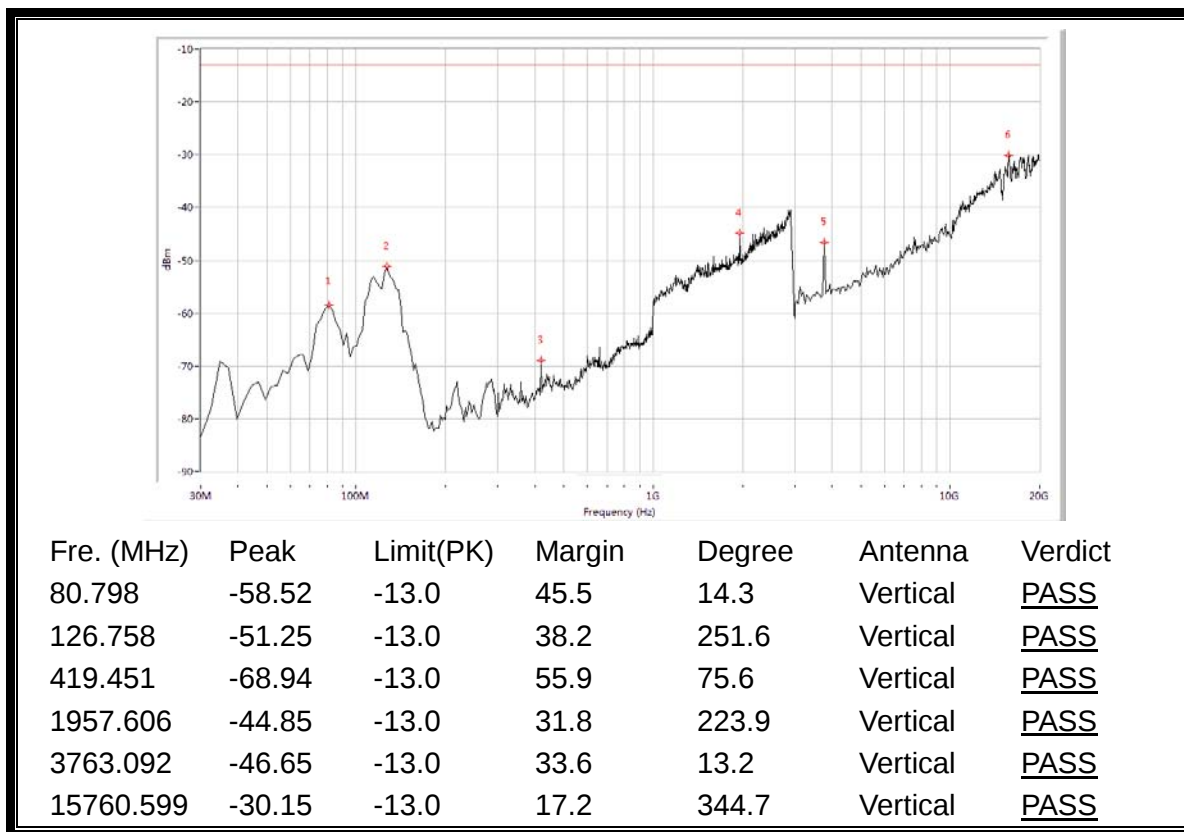


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 126.758    | -51.56 | -13.0     | 38.6   | 63.6   | Vertical | <u>PASS</u> |
| 320.274    | -68.78 | -13.0     | 55.8   | 123.4  | Vertical | <u>PASS</u> |
| 658.928    | -66.60 | -13.0     | 53.6   | 245.7  | Vertical | <u>PASS</u> |
| 1927.681   | -42.17 | -13.0     | 29.2   | 322.8  | Vertical | <u>PASS</u> |
| 5543.641   | -50.52 | -13.0     | 37.5   | 54.9   | Vertical | <u>PASS</u> |
| 17159.601  | -29.44 | -13.0     | 16.4   | 24.1   | Vertical | <u>PASS</u> |

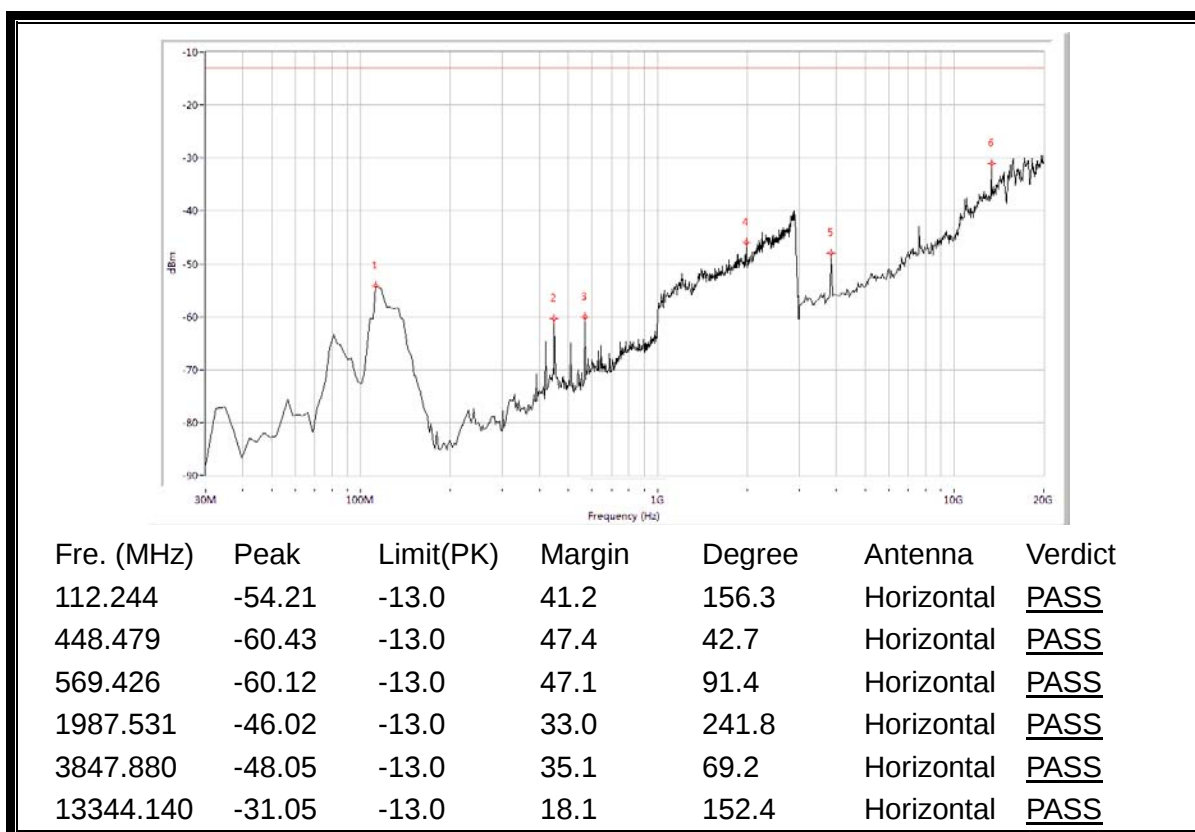
(Plot D.2: EGPRS 1900MHz Channel = 512, Test Antenna Vertical)



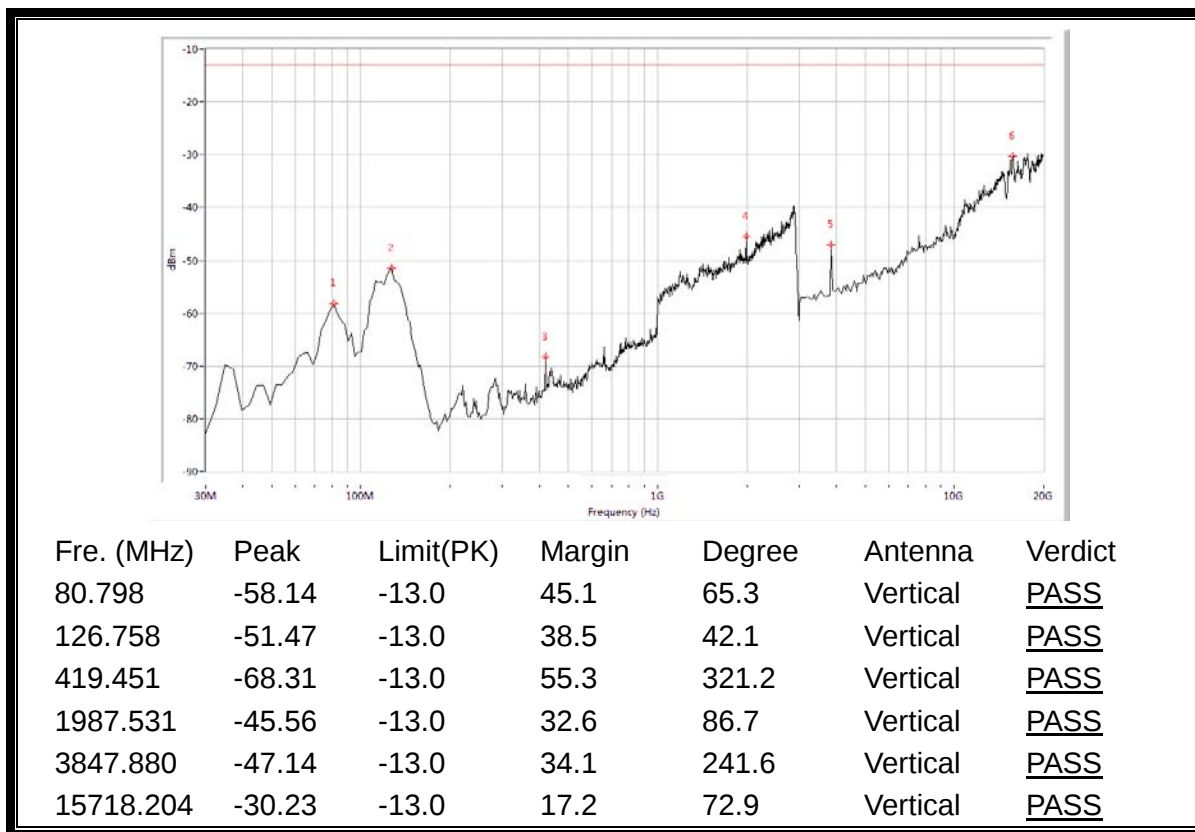
(Plot D.3: EGPRS 1900MHz Channel = 661, Test Antenna Horizontal)



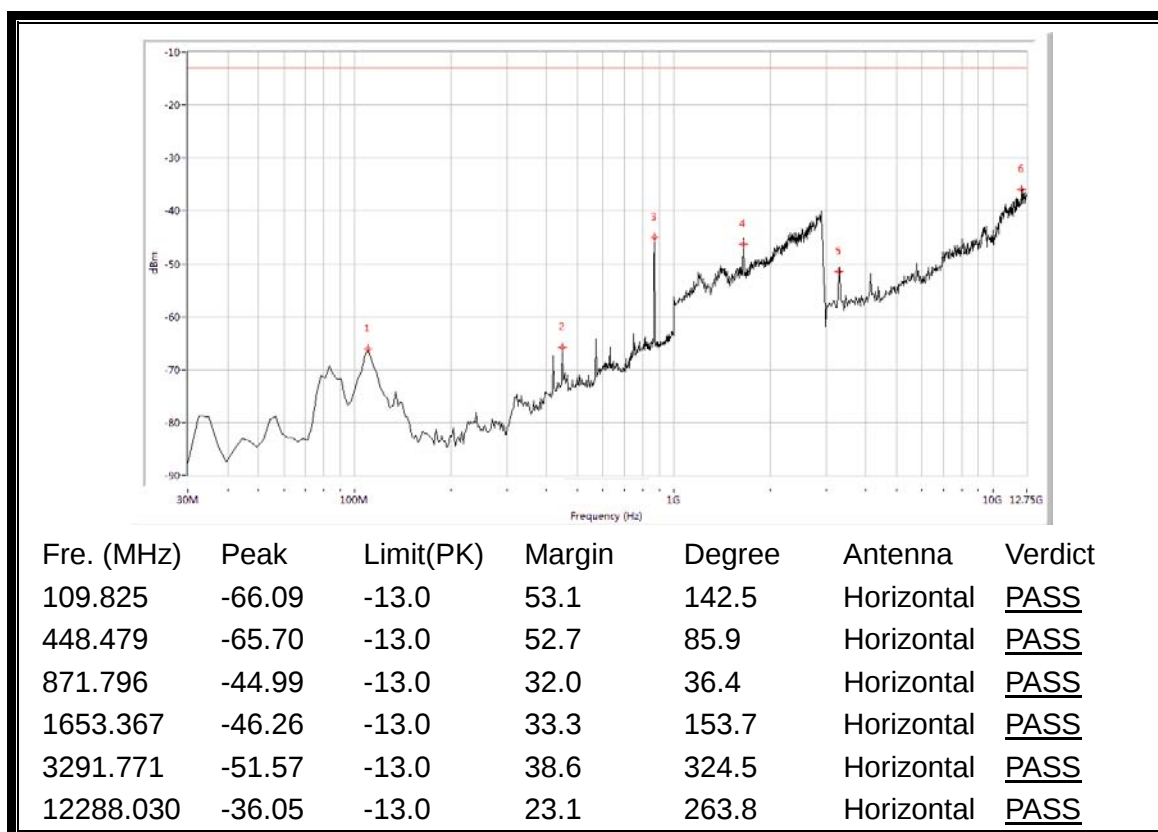
(Plot D.4: EGPRS 1900MHz Channel = 661, Test Antenna Vertical)



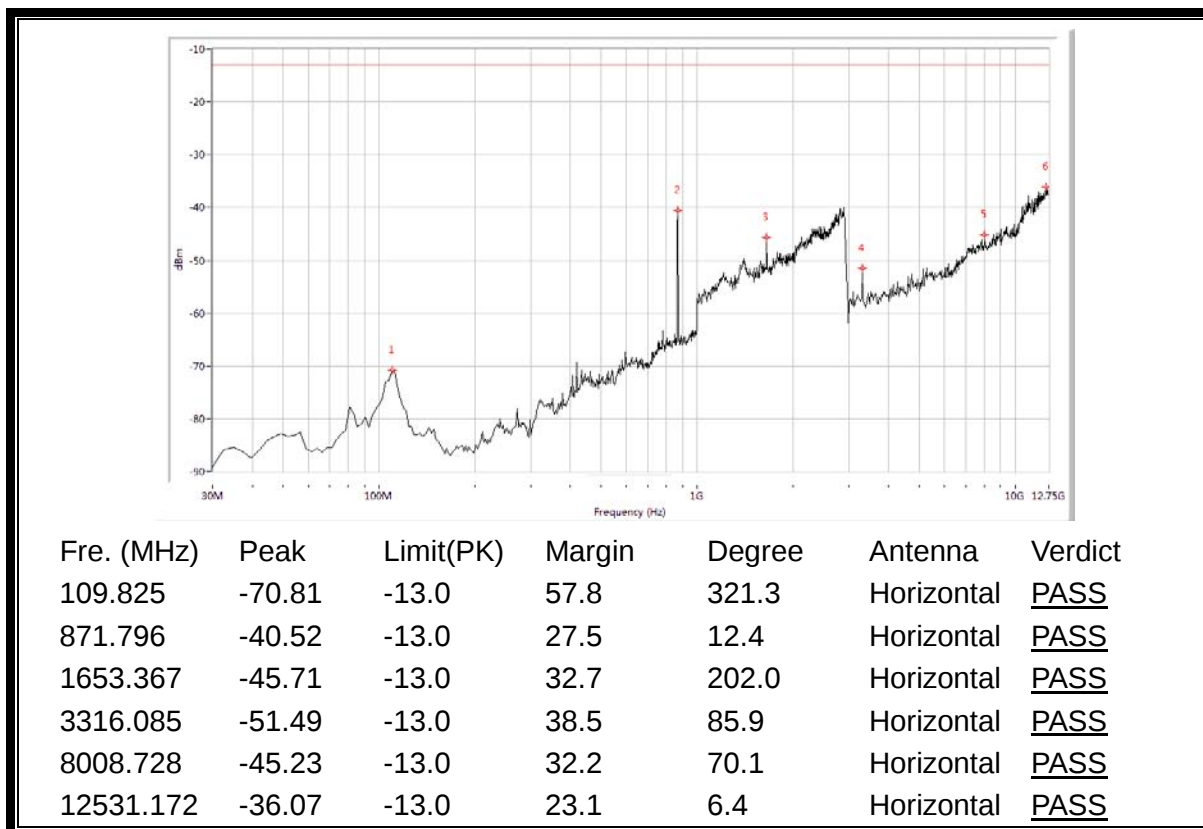
(Plot D.5: EGPRS 1900MHz Channel = 810, Test Antenna Horizontal)



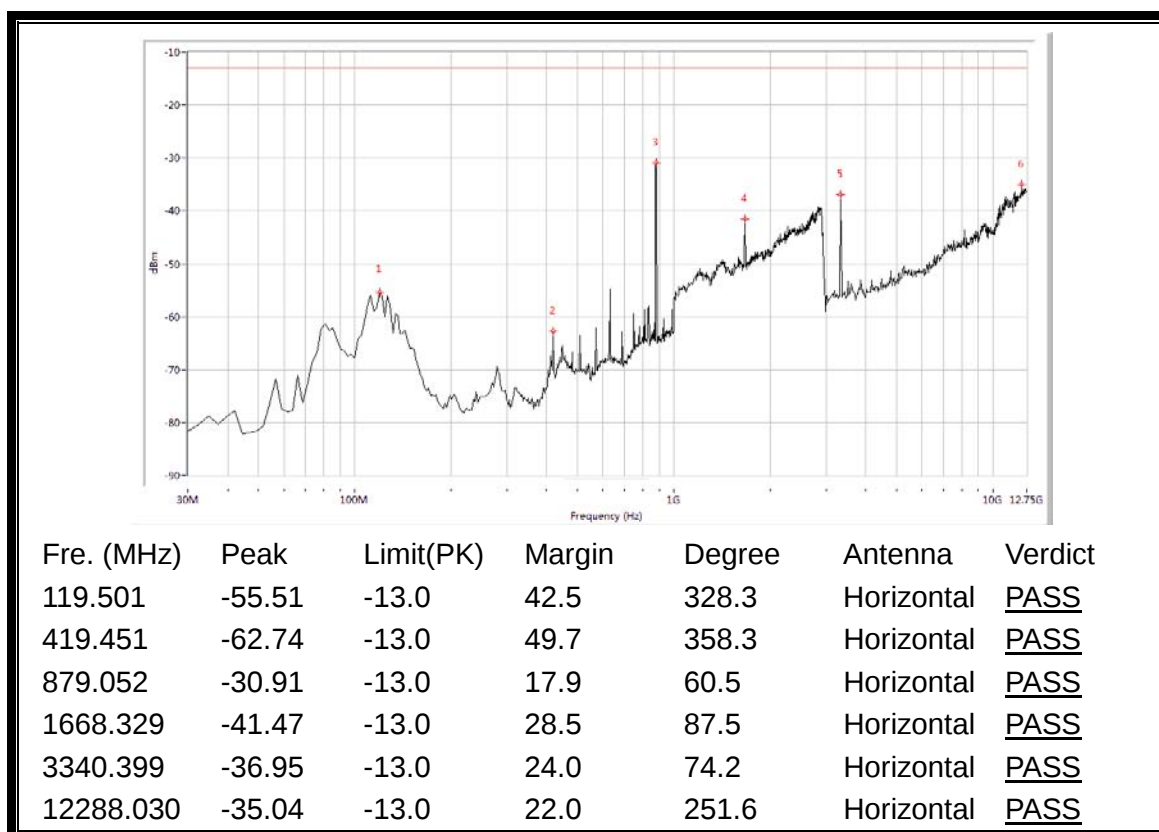
(Plot D.6: EGPRS 1900MHz Channel = 810, Test Antenna Vertical)



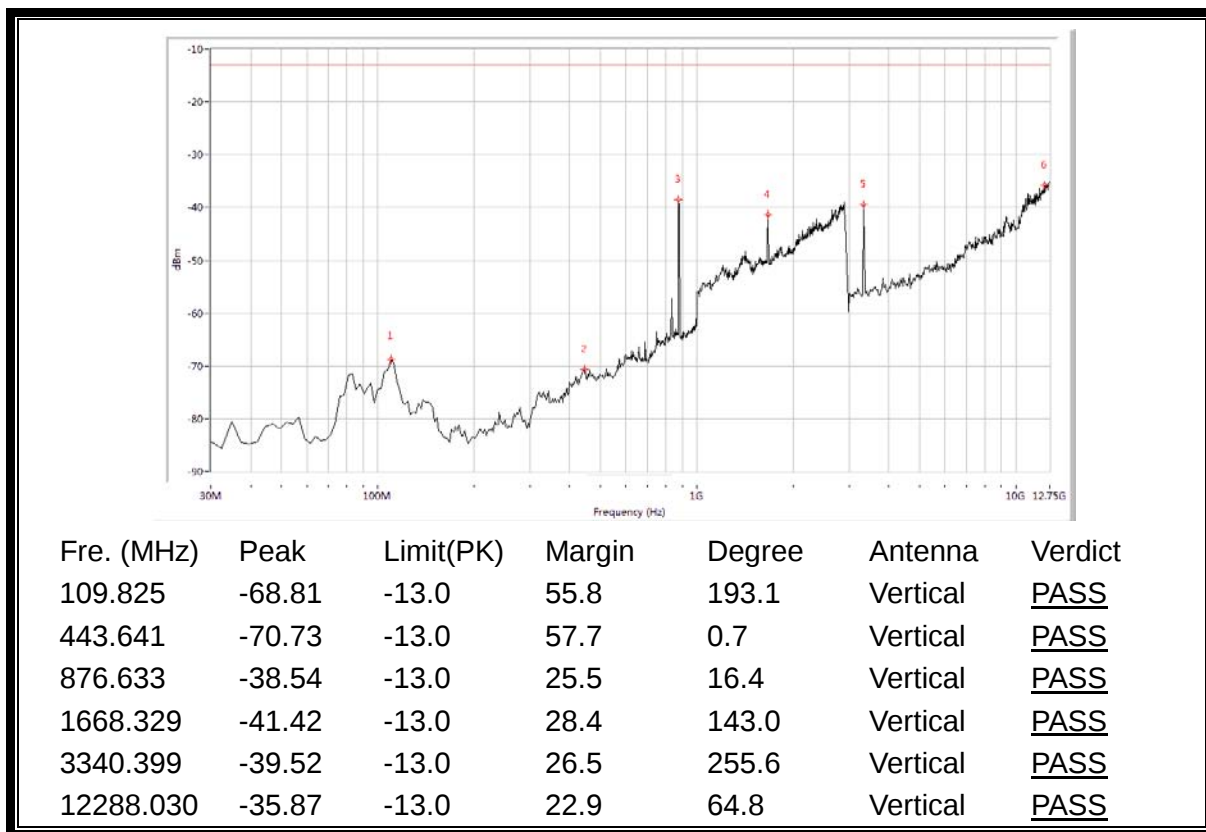
(Plot E.1: WCDMA 850MHz Channel = 4132, Test Antenna Horizontal)



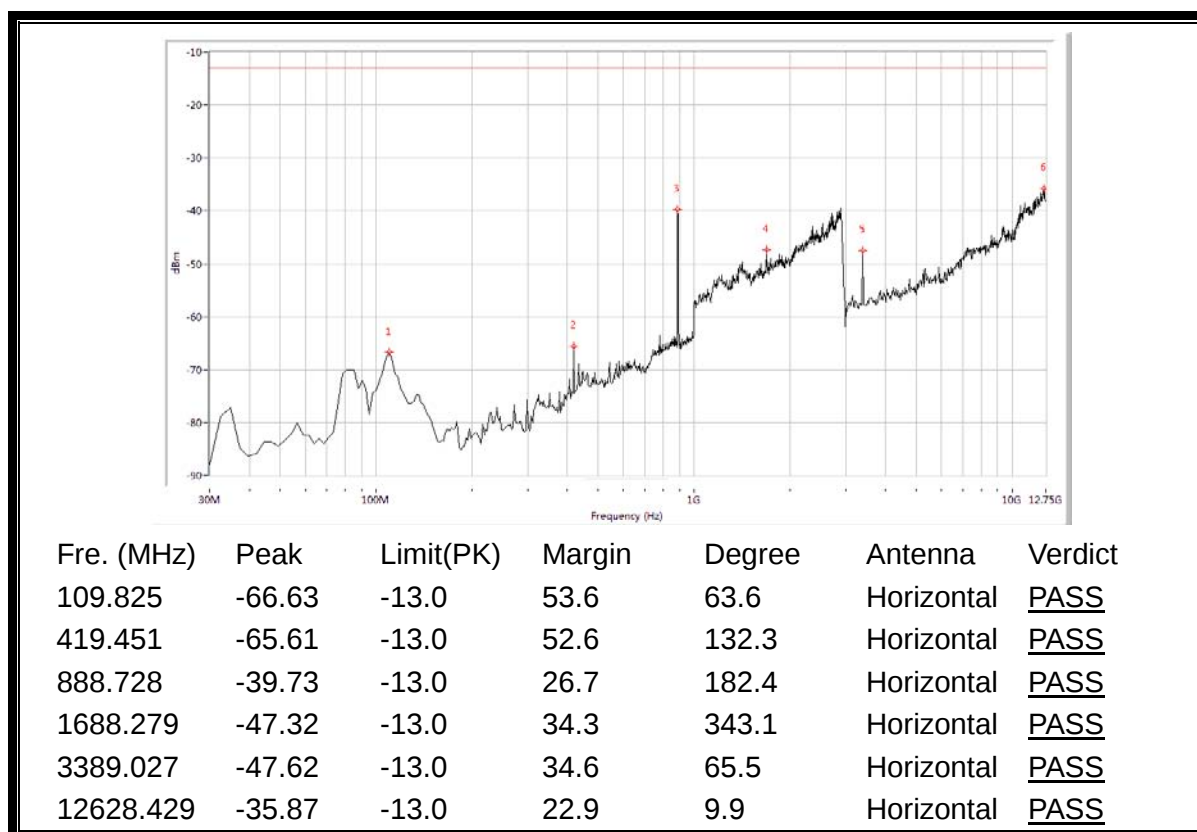
(Plot E.2: WCDMA 850MHz Channel = 4132, Test Antenna Vertical)



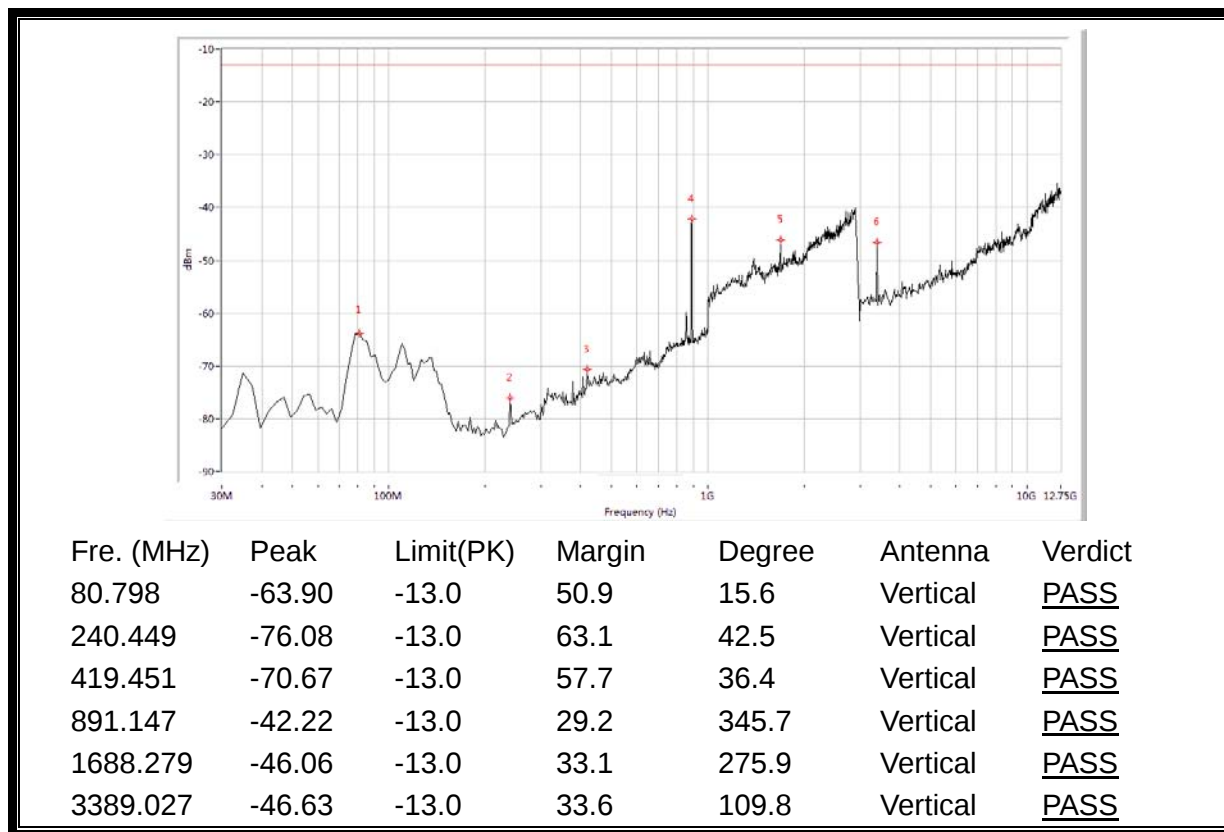
(Plot E.3: WCDMA 850MHz Channel = 4175, Test Antenna Horizontal)



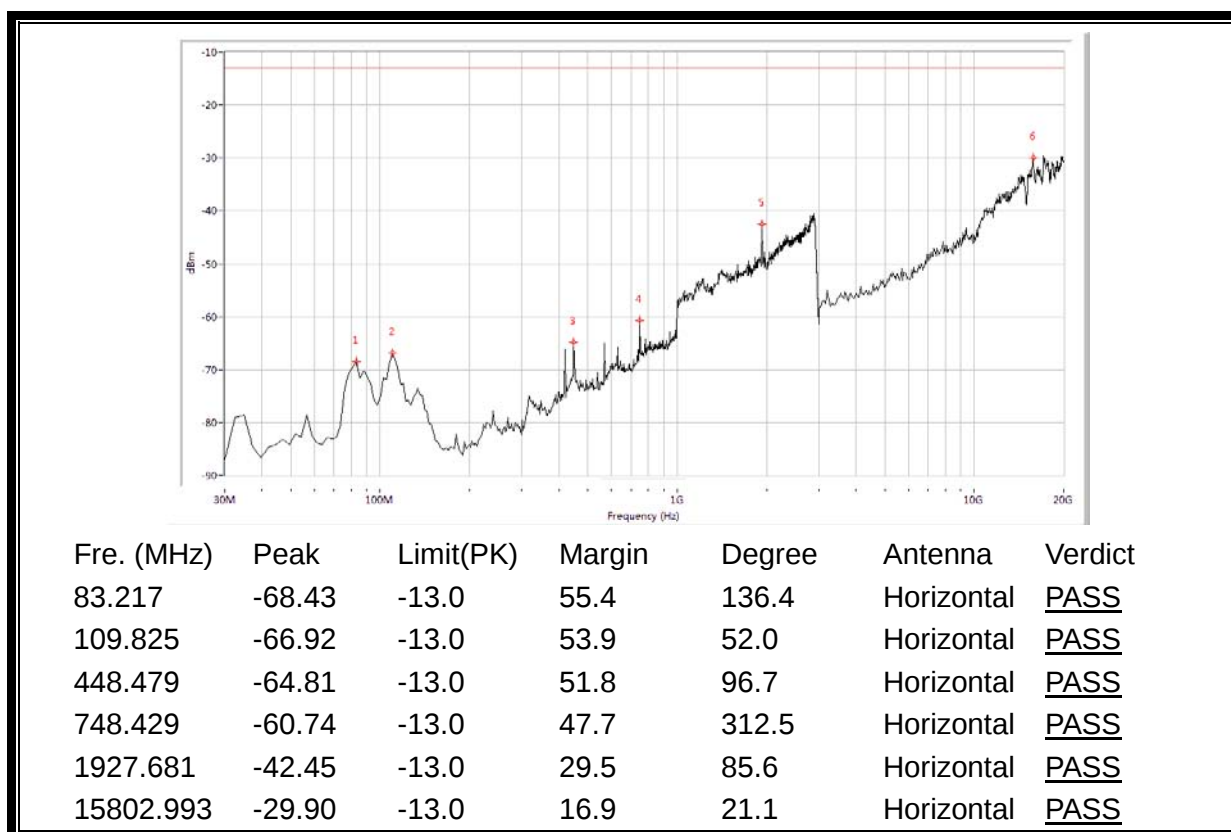
(Plot E.4: WCDMA 850MHz Channel = 4175, Test Antenna Vertical)



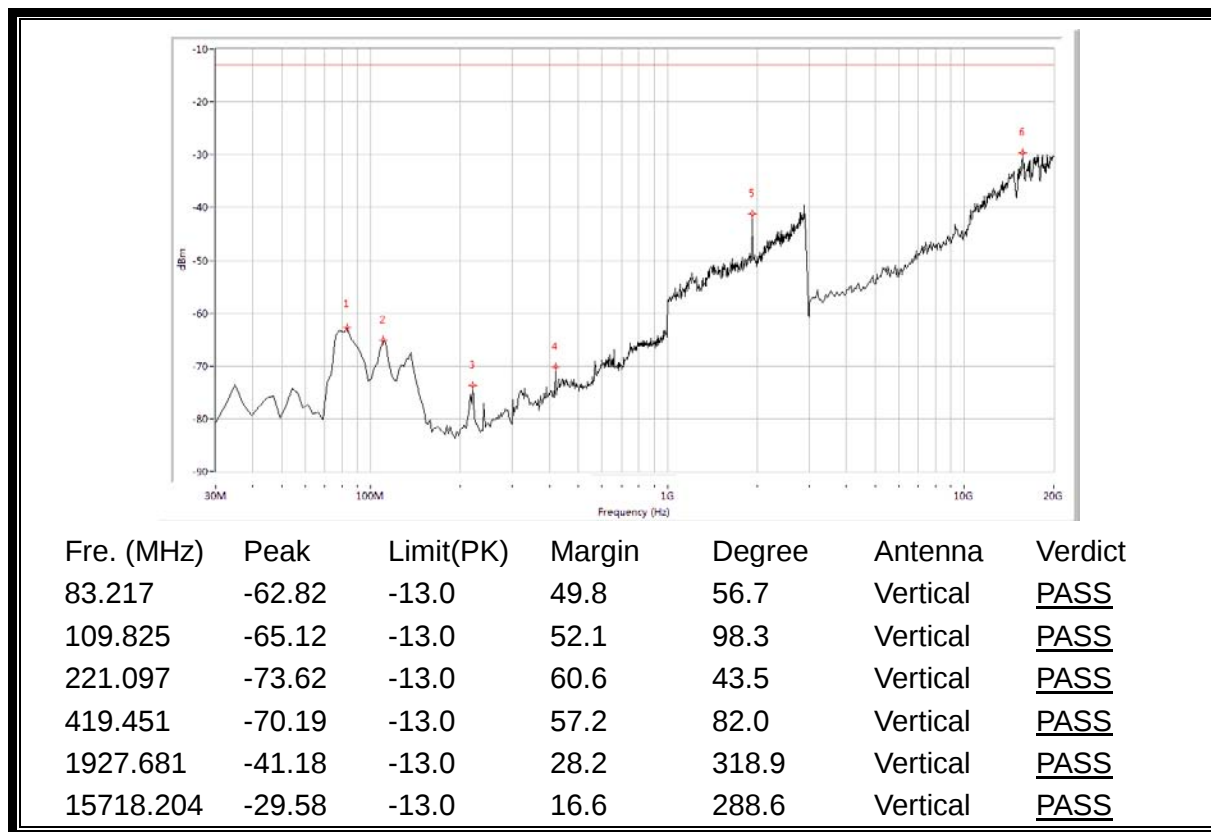
(Plot E.5: WCDMA 850MHz Channel = 4233, Test Antenna Horizontal)



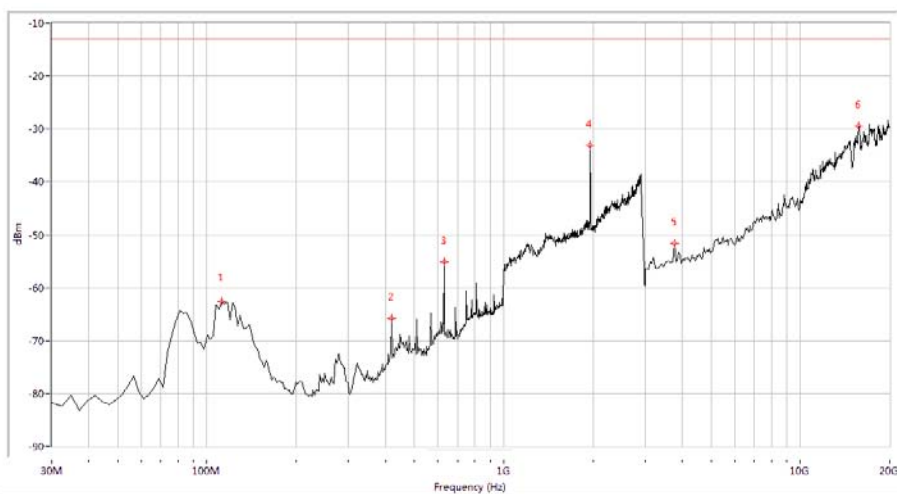
(Plot E.6: WCDMA 850MHz Channel = 4233, Test Antenna Vertical)



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

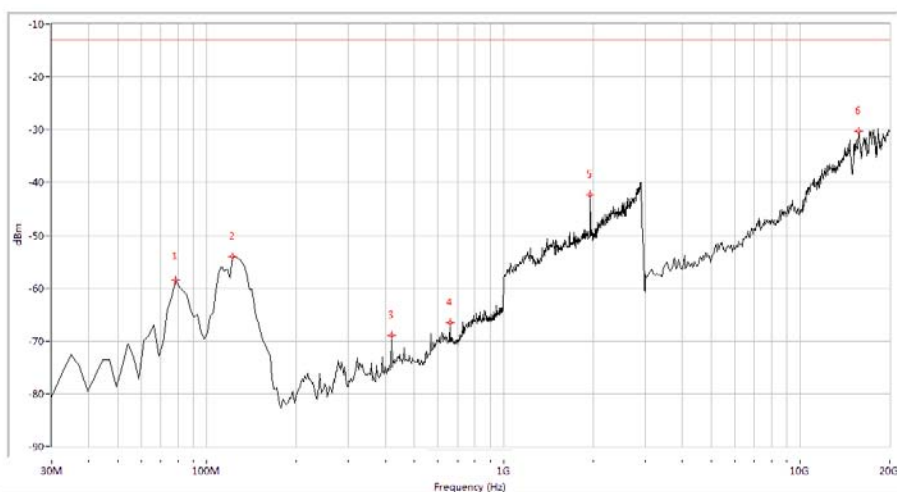


(Plot F.2: WCDMA 1900MHz Channel = 9262, Test Antenna Vertical)



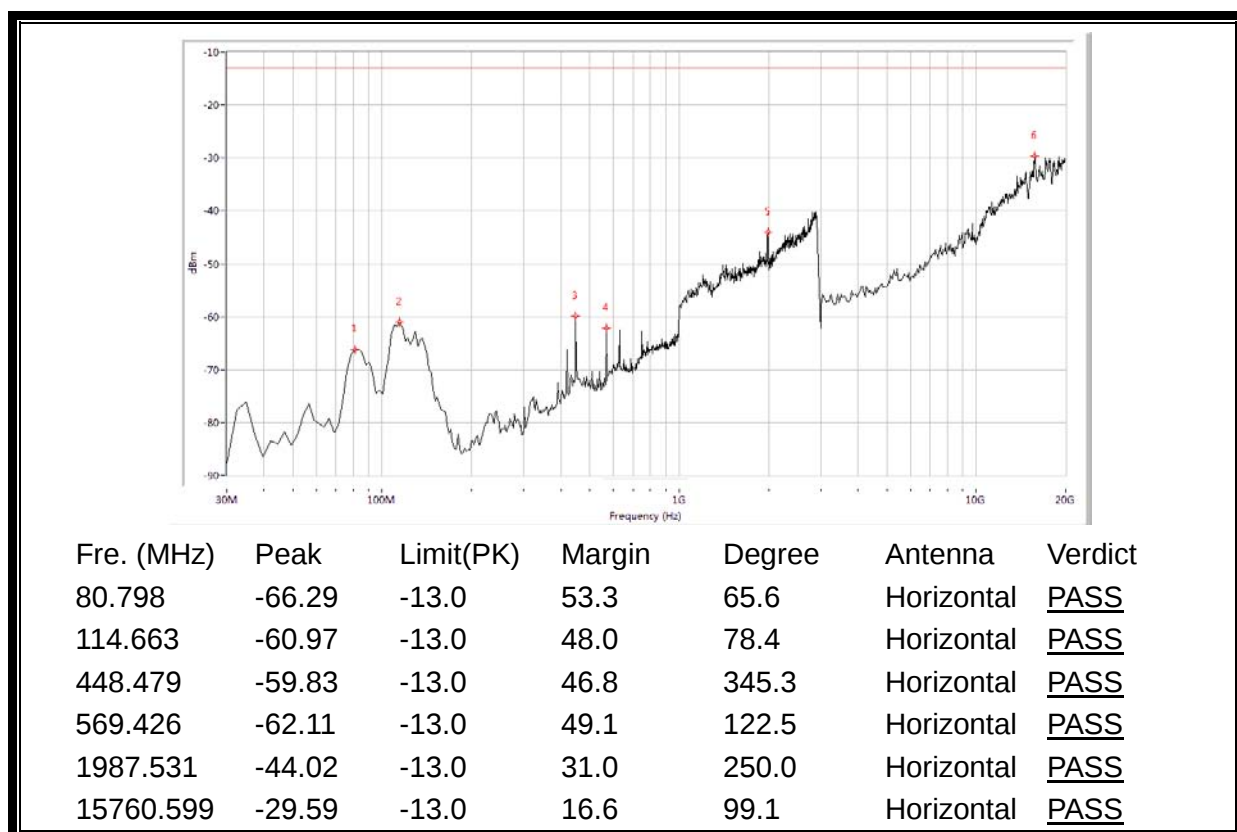
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 112.244    | -62.59 | -13.0     | 49.6   | 351.4  | Horizontal | <u>PASS</u> |
| 419.451    | -65.75 | -13.0     | 52.8   | 360.0  | Horizontal | <u>PASS</u> |
| 629.900    | -55.11 | -13.0     | 42.1   | 360.0  | Horizontal | <u>PASS</u> |
| 1957.606   | -33.15 | -13.0     | 20.1   | 27.8   | Horizontal | <u>PASS</u> |
| 3763.092   | -51.61 | -13.0     | 38.6   | 323.2  | Horizontal | <u>PASS</u> |
| 15760.599  | -29.56 | -13.0     | 16.6   | 243.3  | Horizontal | <u>PASS</u> |

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

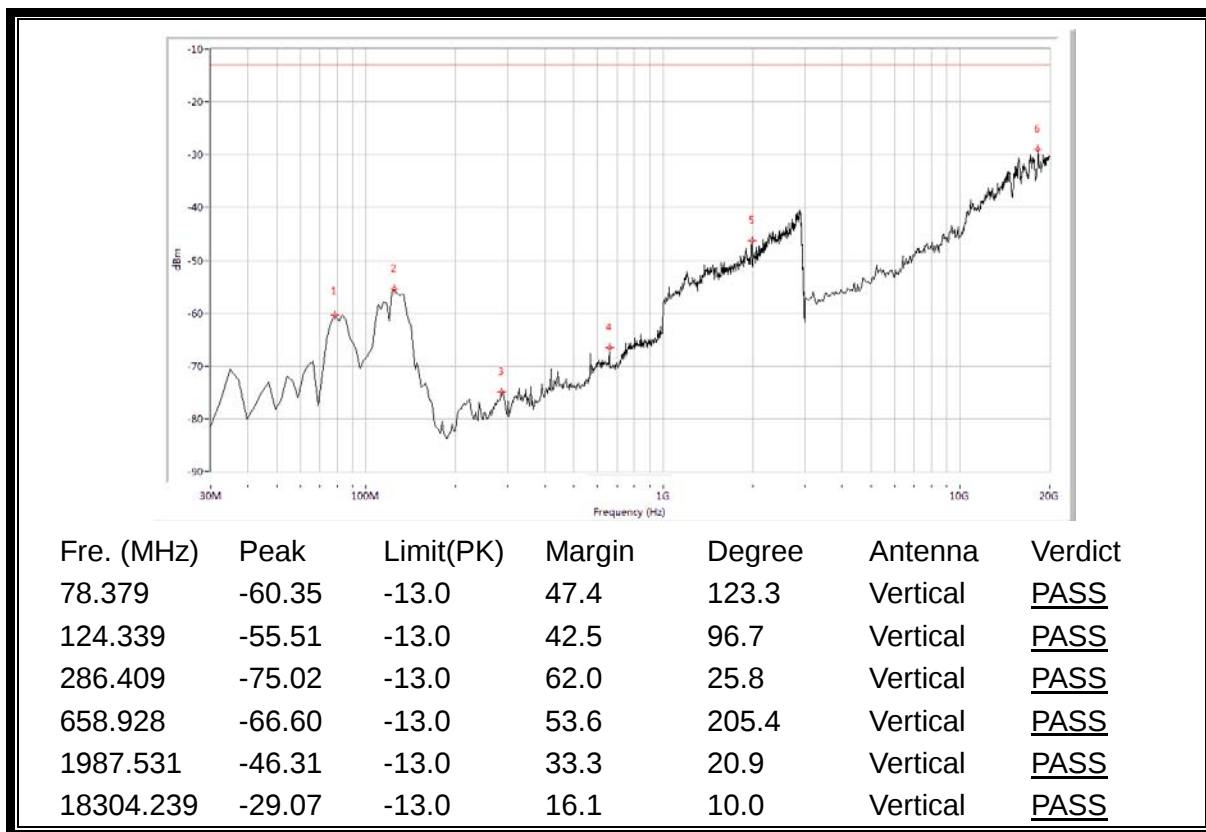


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 78.379     | -58.45 | -13.0     | 45.5   | 13.2   | Vertical | <u>PASS</u> |
| 121.920    | -54.00 | -13.0     | 41.0   | 54.6   | Vertical | <u>PASS</u> |
| 419.451    | -68.91 | -13.0     | 55.9   | 162.8  | Vertical | <u>PASS</u> |
| 658.928    | -66.48 | -13.0     | 53.5   | 247.7  | Vertical | <u>PASS</u> |
| 1957.606   | -42.28 | -13.0     | 29.3   | 313.9  | Vertical | <u>PASS</u> |
| 15760.599  | -30.33 | -13.0     | 17.3   | 20.1   | Vertical | <u>PASS</u> |

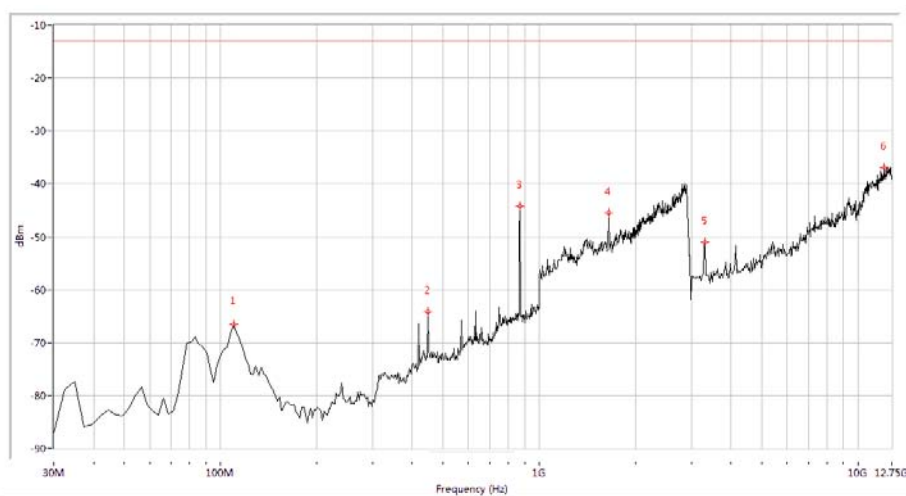
(Plot F.4: WCDMA 1900MHz Channel = 9400, Test Antenna Vertical)



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

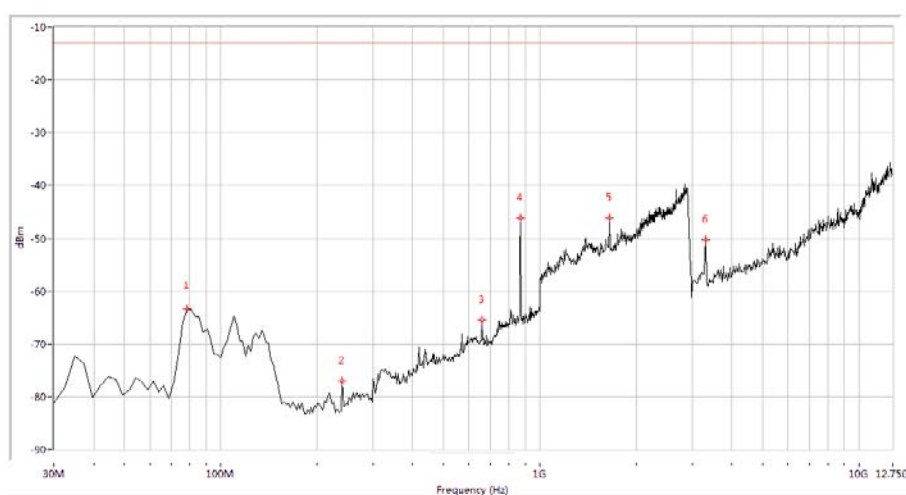


(Plot F.6: WCDMA 1900MHz Channel = 9538, Test Antenna Vertical)



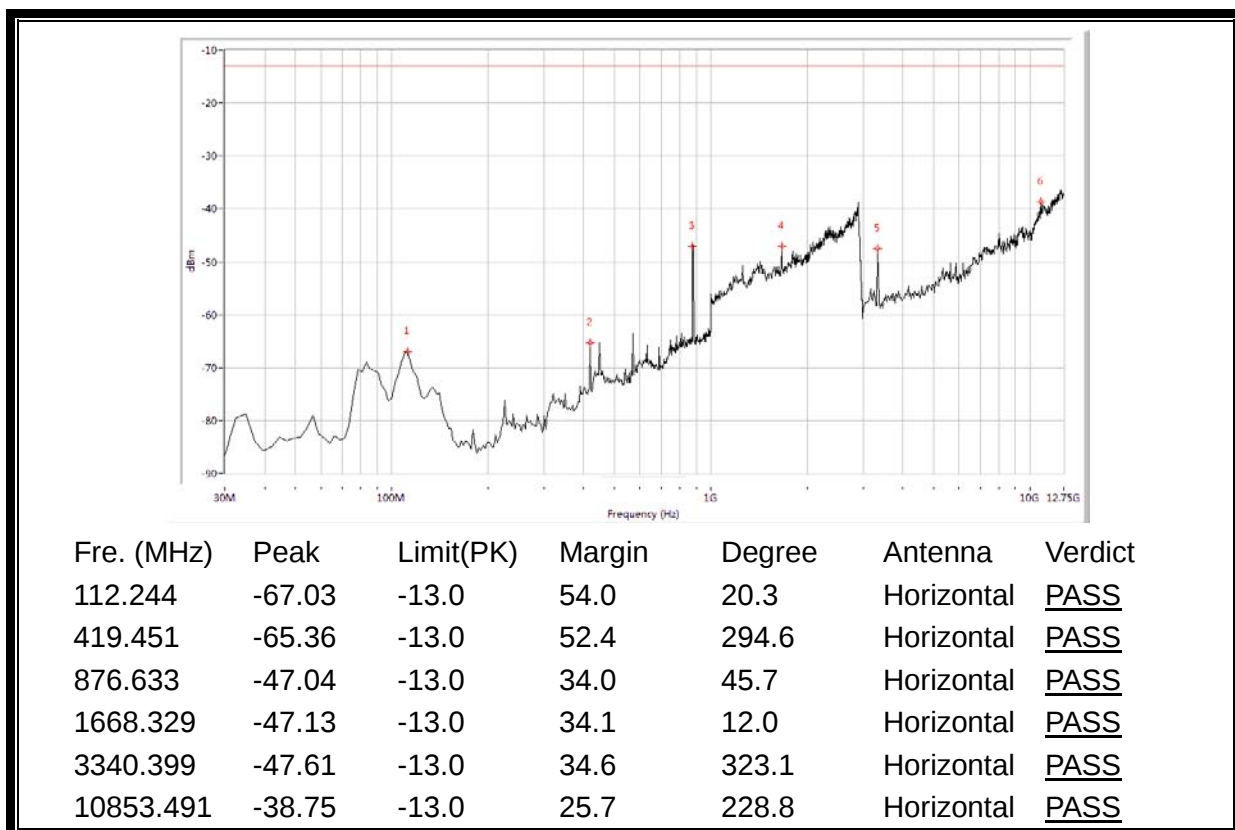
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 109.825    | -66.63 | -13.0     | 53.6   | 33.6   | Horizontal | <u>PASS</u> |
| 448.479    | -64.24 | -13.0     | 51.2   | 152.4  | Horizontal | <u>PASS</u> |
| 871.796    | -44.21 | -13.0     | 31.2   | 24.1   | Horizontal | <u>PASS</u> |
| 1653.367   | -45.50 | -13.0     | 32.5   | 27.8   | Horizontal | <u>PASS</u> |
| 3316.085   | -51.04 | -13.0     | 38.0   | 91.2   | Horizontal | <u>PASS</u> |
| 12093.516  | -36.98 | -13.0     | 24.0   | 324.6  | Horizontal | <u>PASS</u> |

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

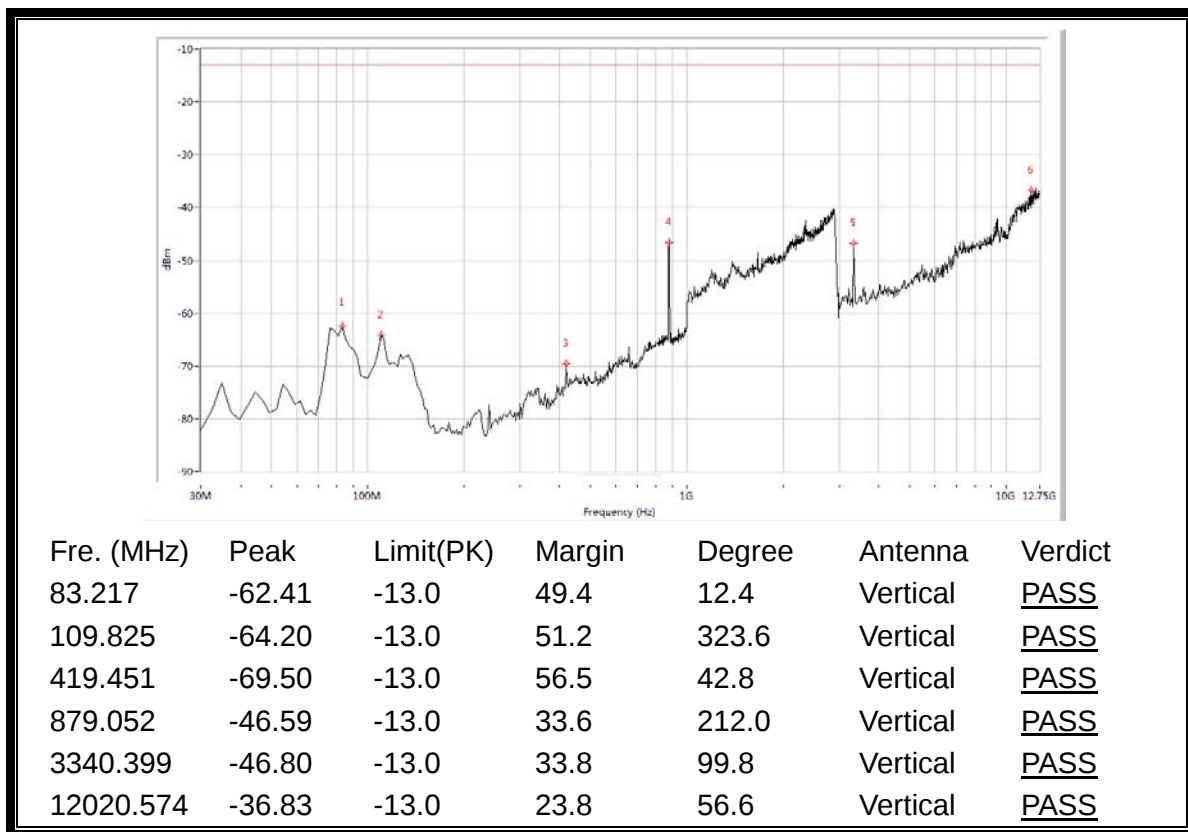


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 78.379     | -63.39 | -13.0     | 50.4   | 142.0  | Vertical | <u>PASS</u> |
| 240.449    | -76.96 | -13.0     | 64.0   | 321.5  | Vertical | <u>PASS</u> |
| 658.928    | -65.41 | -13.0     | 52.4   | 74.6   | Vertical | <u>PASS</u> |
| 869.377    | -46.12 | -13.0     | 33.1   | 91.2   | Vertical | <u>PASS</u> |
| 1653.367   | -46.18 | -13.0     | 33.2   | 16.9   | Vertical | <u>PASS</u> |
| 3316.085   | -50.17 | -13.0     | 37.2   | 241.6  | Vertical | <u>PASS</u> |

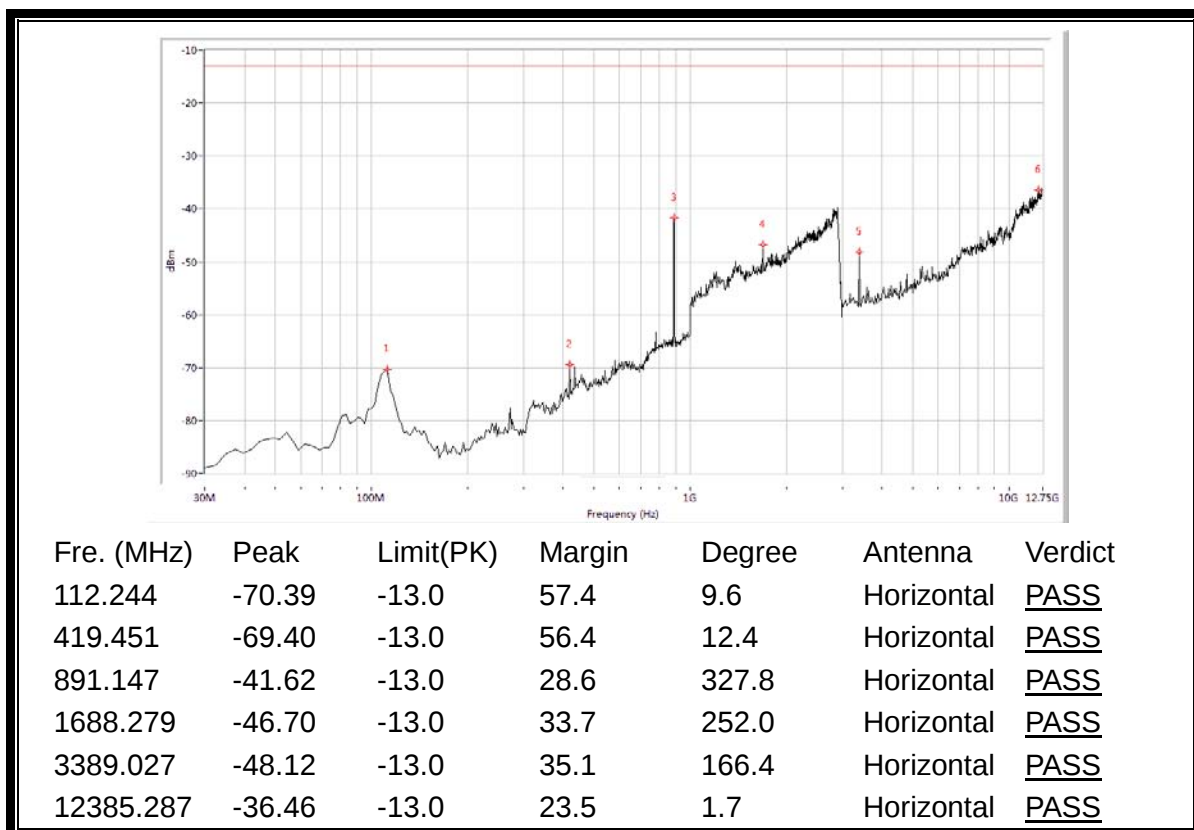
(Plot G.2: HSDPA 850MHz Channel = 4132, Test Antenna Vertical)



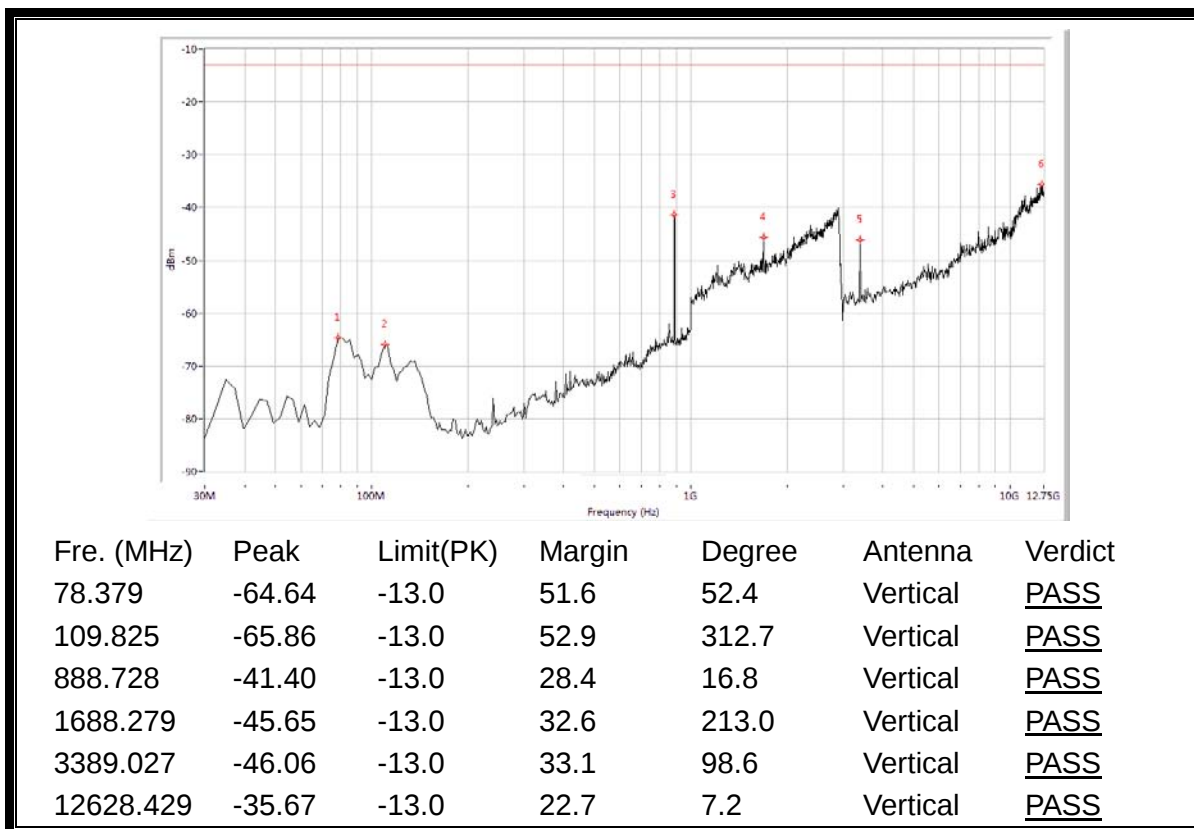
(Plot G.3: HSDPA 850MHz Channel = 4175, Test Antenna Horizontal)



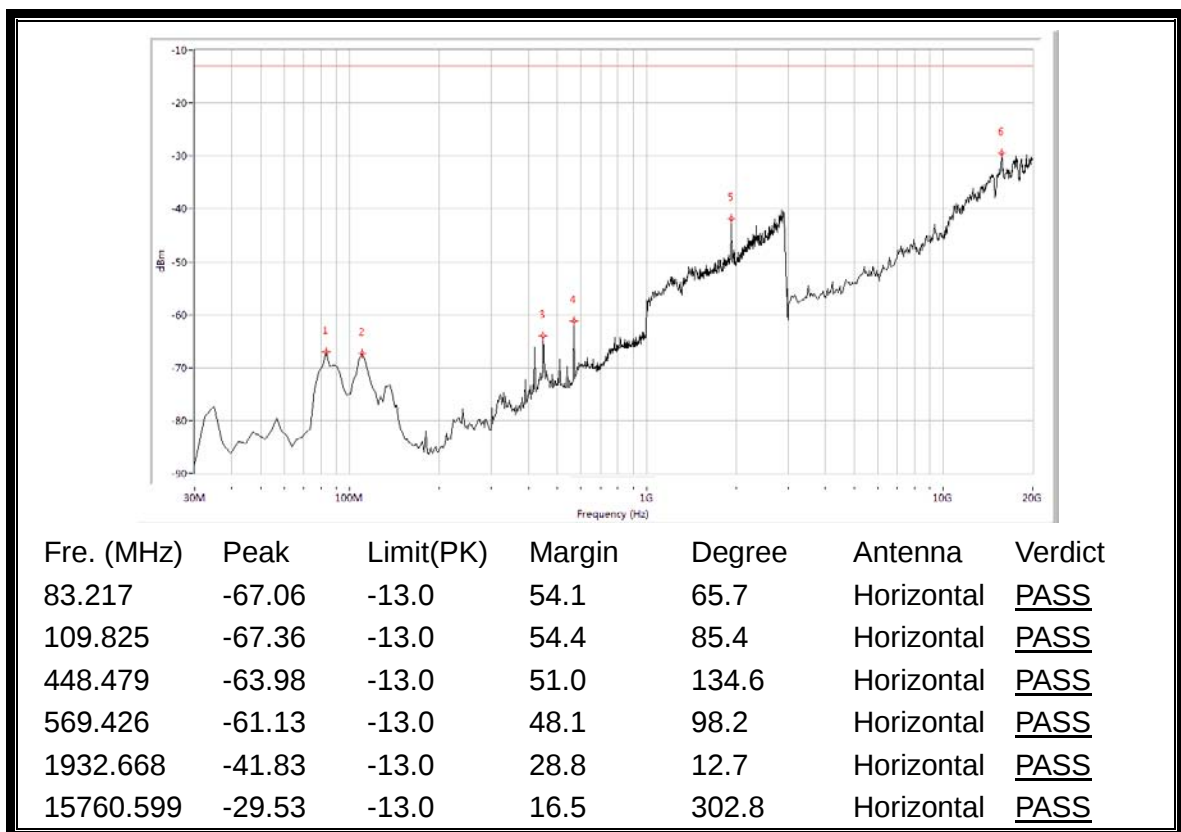
(Plot G.4: HSDPA 850MHz Channel = 4175, Test Antenna Vertical)



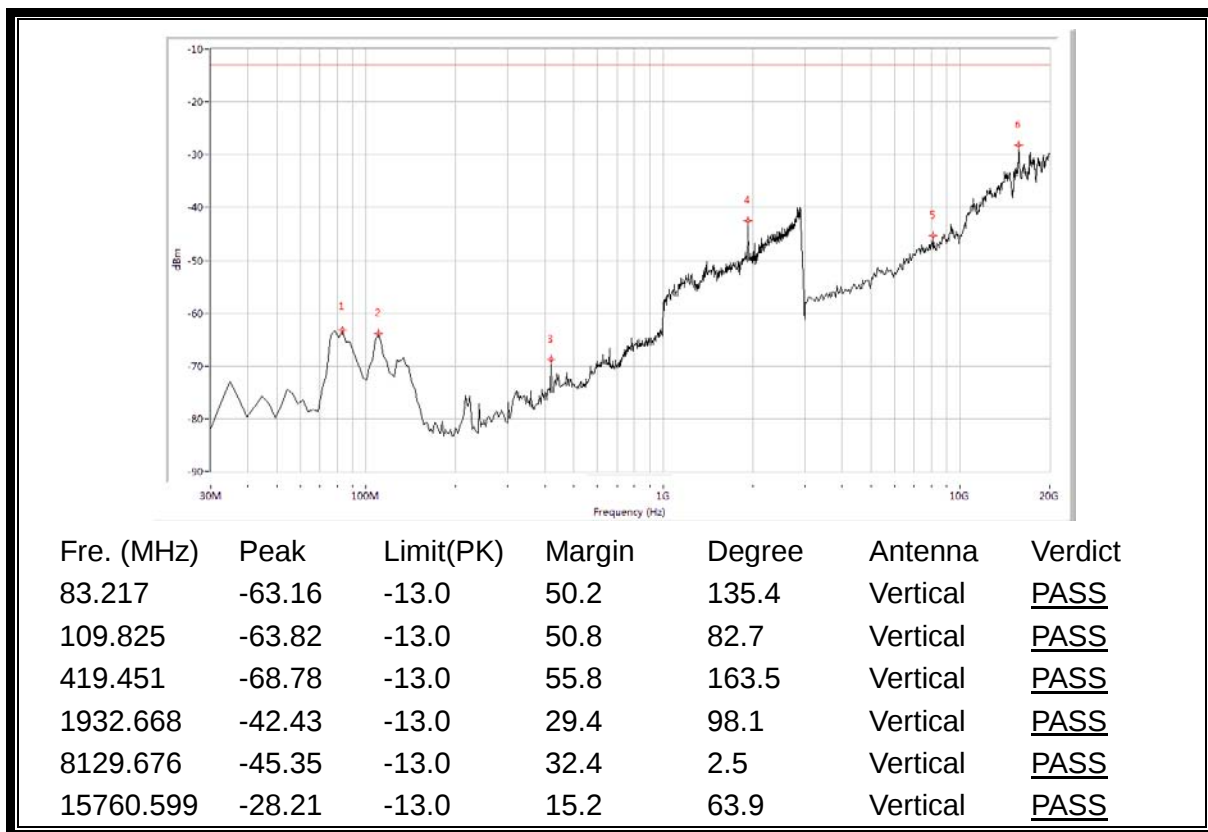
(Plot G.5: HSDPA 850MHz Channel = 4233, Test Antenna Horizontal)



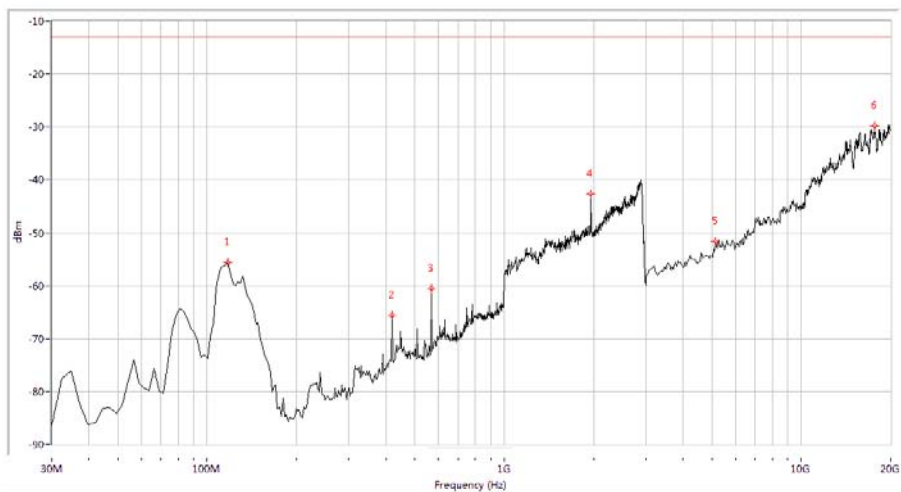
(Plot G.6: HSDPA 850MHz Channel = 4233, Test Antenna Vertical)



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

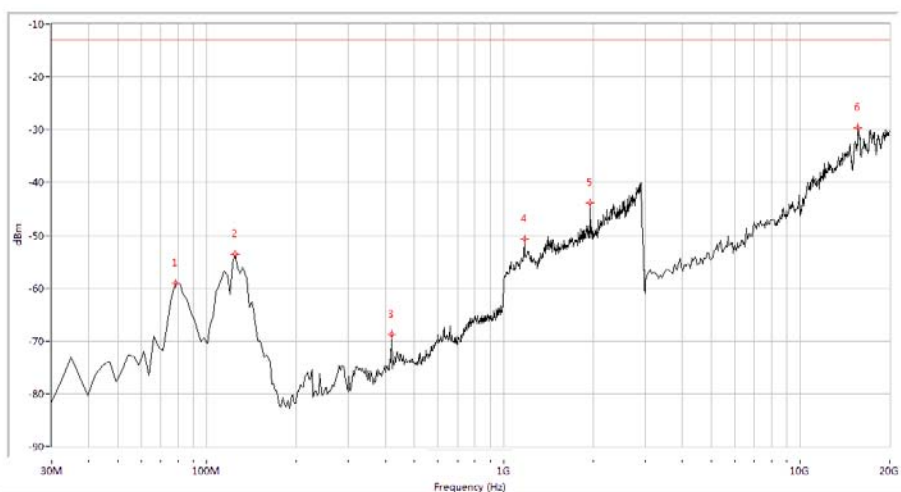


(Plot H.2: HSDPA 1900 MHz Channel = 9262, Test Antenna Vertical)



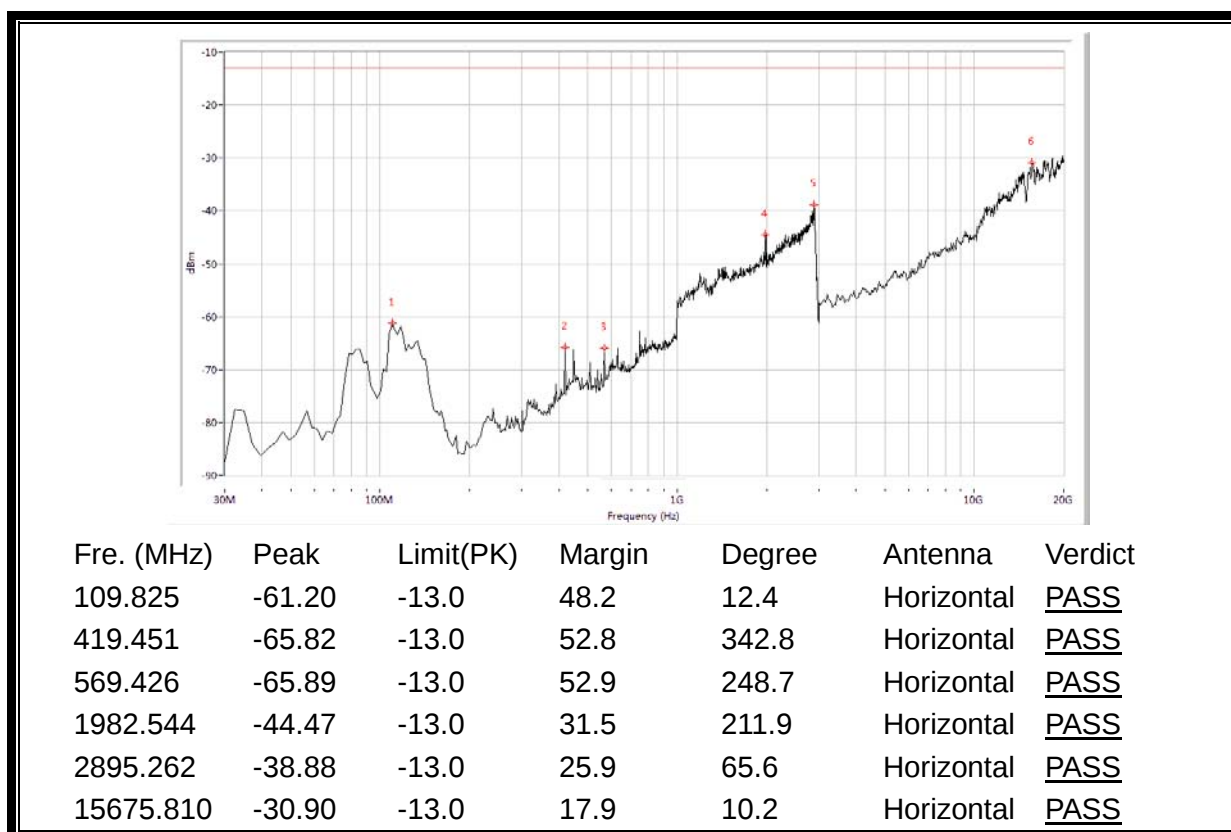
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 117.082    | -55.56 | -13.0     | 42.6   | 1.9    | Horizontal | <u>PASS</u> |
| 419.451    | -65.62 | -13.0     | 52.6   | 34.5   | Horizontal | <u>PASS</u> |
| 569.426    | -60.54 | -13.0     | 47.5   | 277.   | Horizontal | <u>PASS</u> |
| 1957.606   | -42.57 | -13.0     | 29.6   | 139.6  | Horizontal | <u>PASS</u> |
| 5162.095   | -51.59 | -13.0     | 38.6   | 303.4  | Horizontal | <u>PASS</u> |
| 17625.935  | -29.75 | -13.0     | 16.7   | 56.8   | Horizontal | <u>PASS</u> |

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

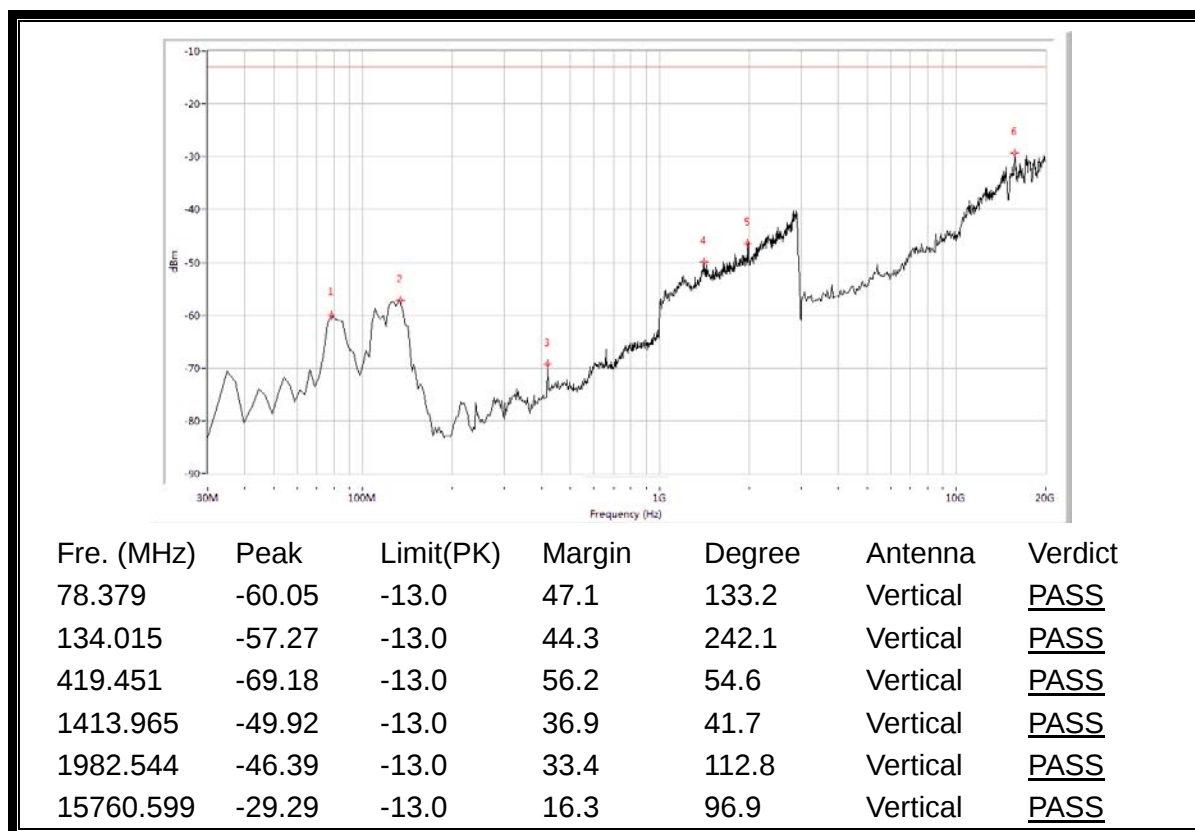


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 78.379     | -59.07 | -13.0     | 46.1   | 96.4   | Vertical | <u>PASS</u> |
| 124.339    | -53.58 | -13.0     | 40.6   | 137.7  | Vertical | <u>PASS</u> |
| 419.451    | -68.77 | -13.0     | 55.8   | 32.4   | Vertical | <u>PASS</u> |
| 1174.564   | -50.69 | -13.0     | 37.7   | 85.3   | Vertical | <u>PASS</u> |
| 1957.606   | -43.90 | -13.0     | 30.9   | 343.8  | Vertical | <u>PASS</u> |
| 15675.810  | -29.57 | -13.0     | 16.6   | 3.9    | Vertical | <u>PASS</u> |

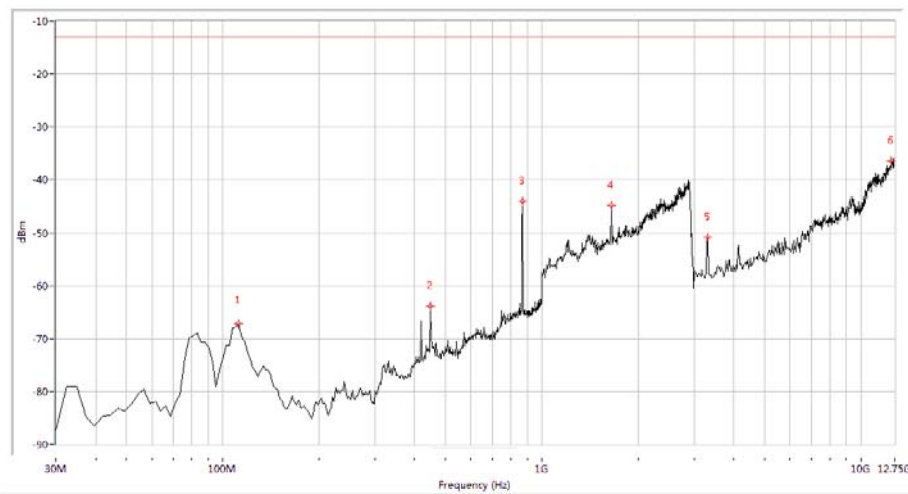
(Plot H.4: HSDPA 1900 MHz Channel = 9400, Test Antenna Vertical)



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

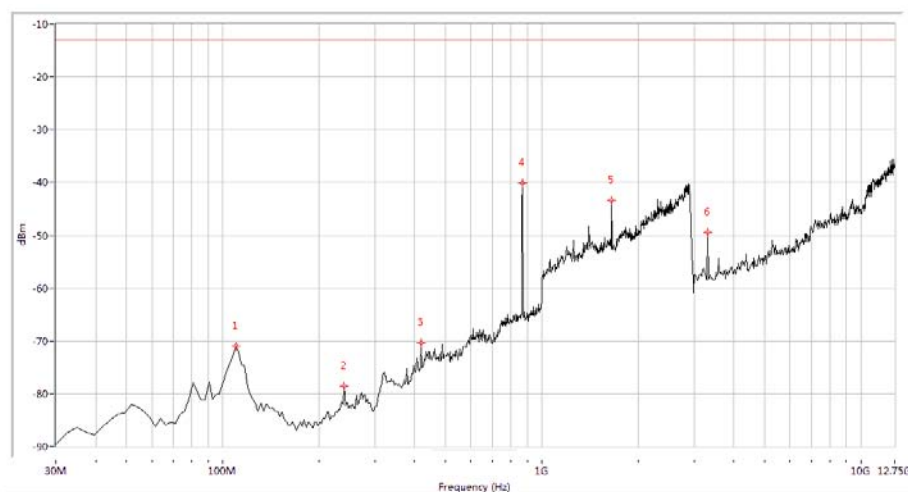


(Plot H.6: HSDPA 1900 MHz Channel = 9538, Test Antenna Vertical)



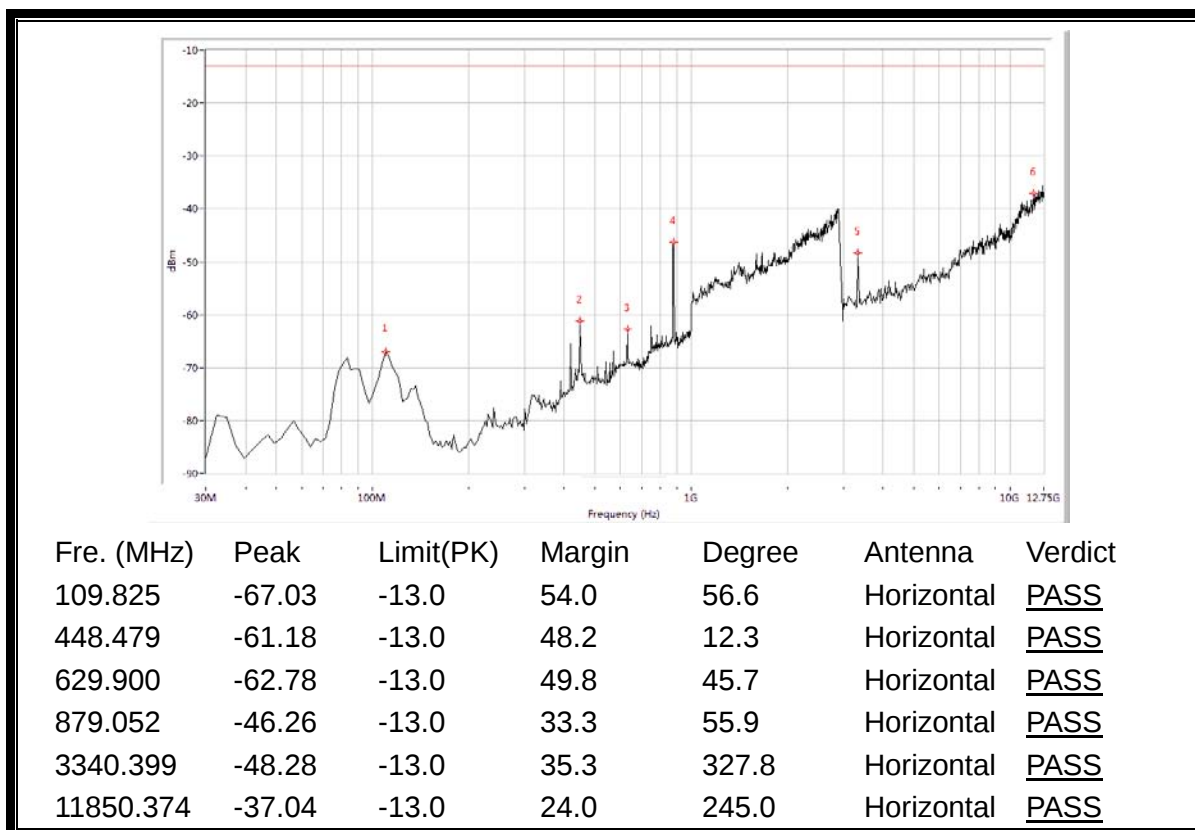
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 112.244    | -67.12 | -13.0     | 54.1   | 63.9   | Horizontal | <u>PASS</u> |
| 448.479    | -63.83 | -13.0     | 50.8   | 123.4  | Horizontal | <u>PASS</u> |
| 869.377    | -44.14 | -13.0     | 31.1   | 245.8  | Horizontal | <u>PASS</u> |
| 1653.367   | -44.81 | -13.0     | 31.8   | 52.6   | Horizontal | <u>PASS</u> |
| 3316.085   | -50.83 | -13.0     | 37.8   | 89.7   | Horizontal | <u>PASS</u> |
| 12409.601  | -36.49 | -13.0     | 23.5   | 78.4   | Horizontal | <u>PASS</u> |

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

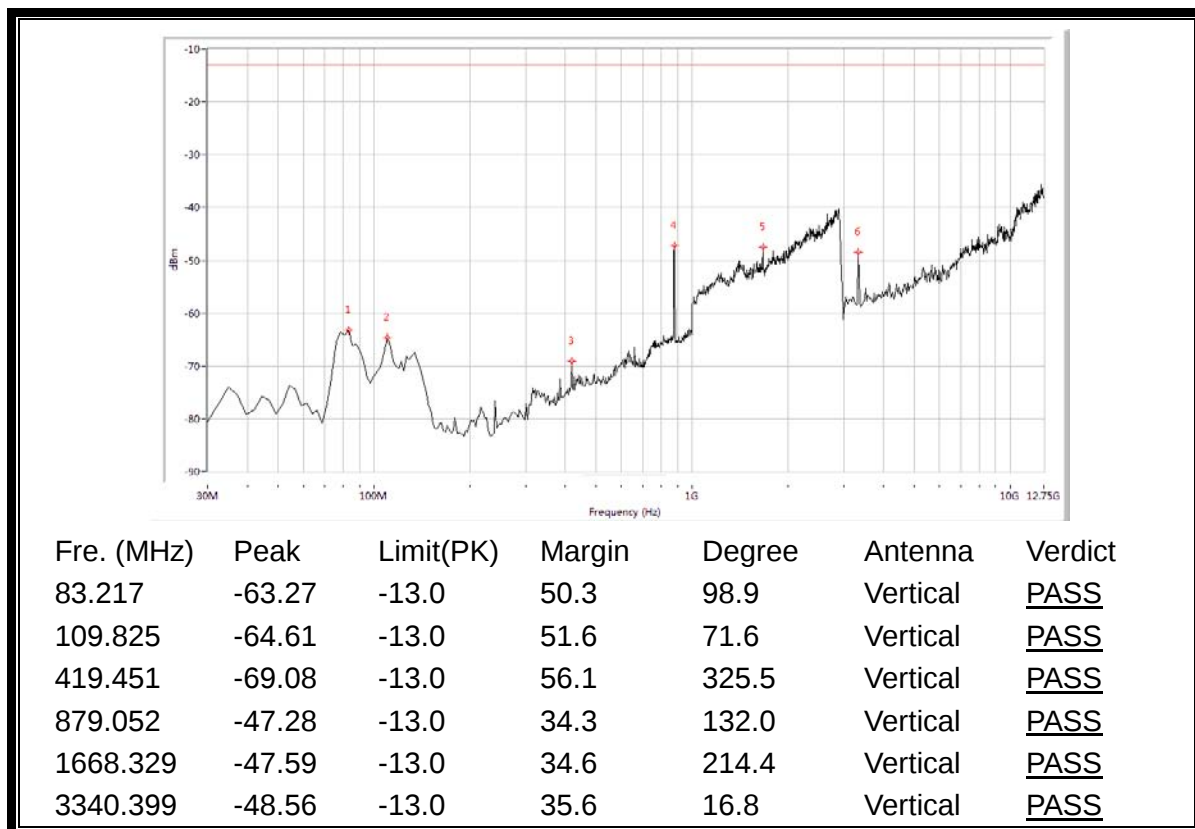


| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 109.825    | -71.03 | -13.0     | 58.0   | 13.4   | Horizontal | <u>PASS</u> |
| 240.449    | -78.56 | -13.0     | 65.6   | 312.7  | Horizontal | <u>PASS</u> |
| 419.451    | -70.36 | -13.0     | 57.4   | 56.8   | Horizontal | <u>PASS</u> |
| 869.377    | -40.09 | -13.0     | 27.1   | 154.9  | Horizontal | <u>PASS</u> |
| 1653.367   | -43.44 | -13.0     | 30.4   | 205.5  | Horizontal | <u>PASS</u> |
| 3316.085   | -49.45 | -13.0     | 36.5   | 35.0   | Horizontal | <u>PASS</u> |

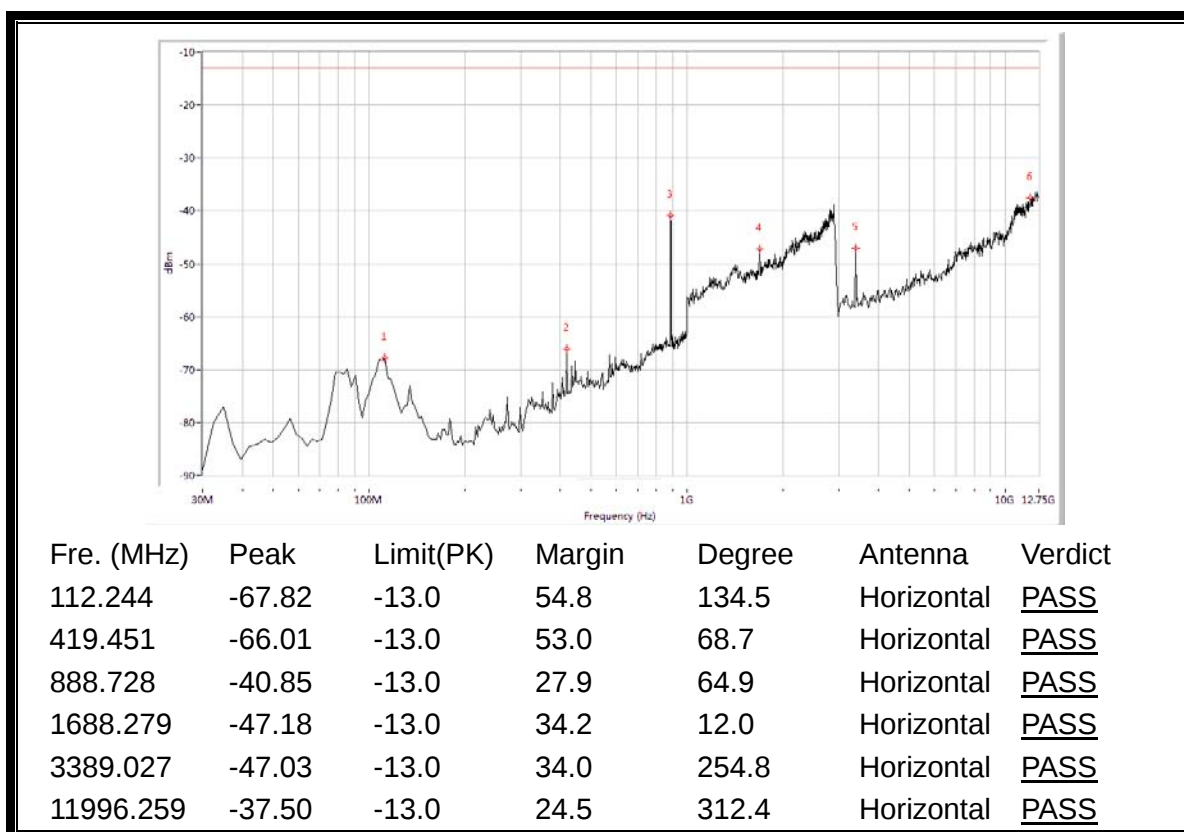
(Plot I.2: HSUPA 850 MHz Channel = 4132, Test Antenna Vertical)



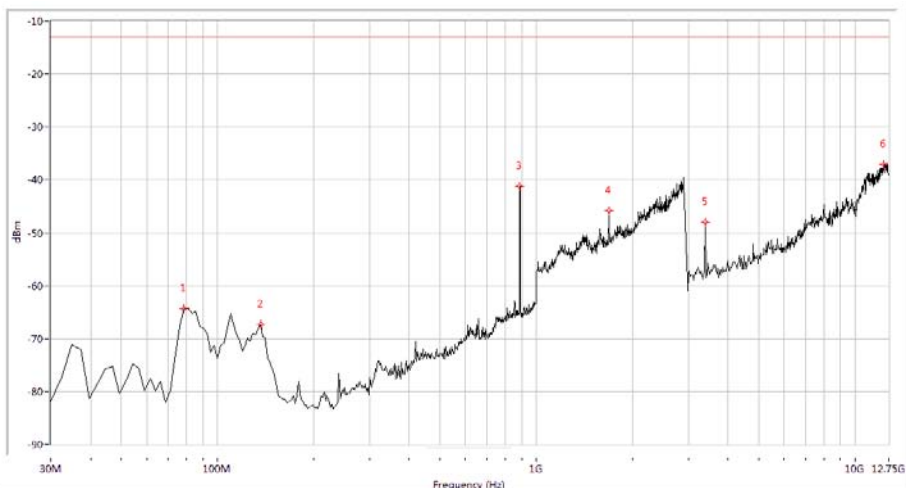
(Plot I.3: HSUPA 850MHz Channel = 4175, Test Antenna Horizontal)



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

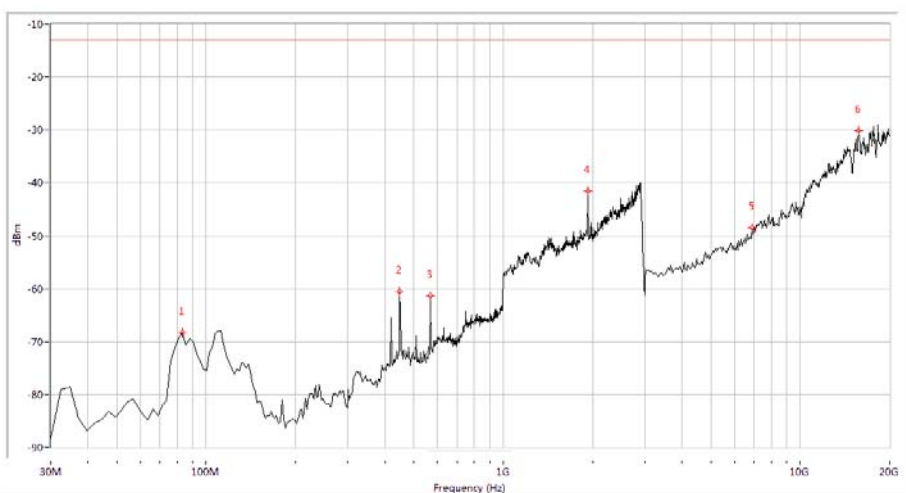


(Plot I.5: HSUPA 850MHz Channel = 4233, Test Antenna Horizontal)



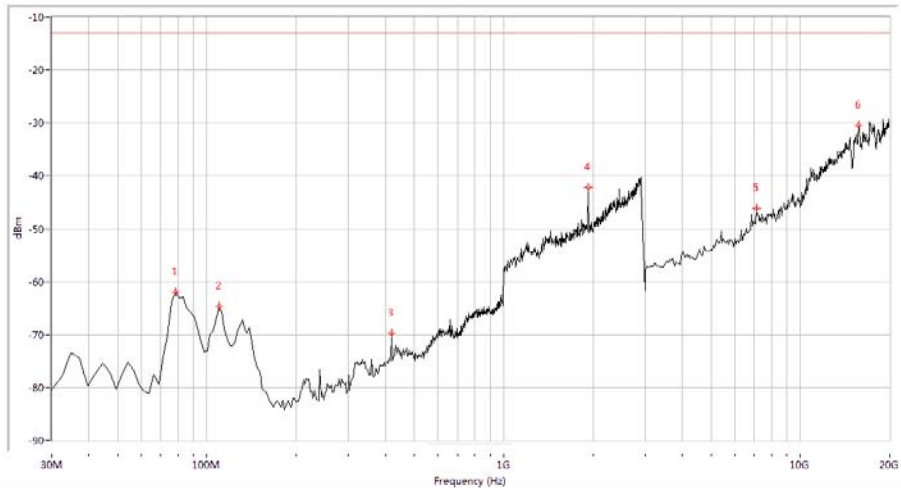
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 78.379     | -64.29 | -13.0     | 51.3   | 46.7   | Vertical | <u>PASS</u> |
| 136.434    | -67.34 | -13.0     | 54.3   | 342.5  | Vertical | <u>PASS</u> |
| 888.728    | -41.22 | -13.0     | 28.2   | 18.9   | Vertical | <u>PASS</u> |
| 1688.279   | -45.81 | -13.0     | 32.8   | 7.2    | Vertical | <u>PASS</u> |
| 3389.027   | -47.96 | -13.0     | 35.0   | 20.4   | Vertical | <u>PASS</u> |
| 12312.344  | -37.13 | -13.0     | 24.1   | 91.8   | Vertical | <u>PASS</u> |

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



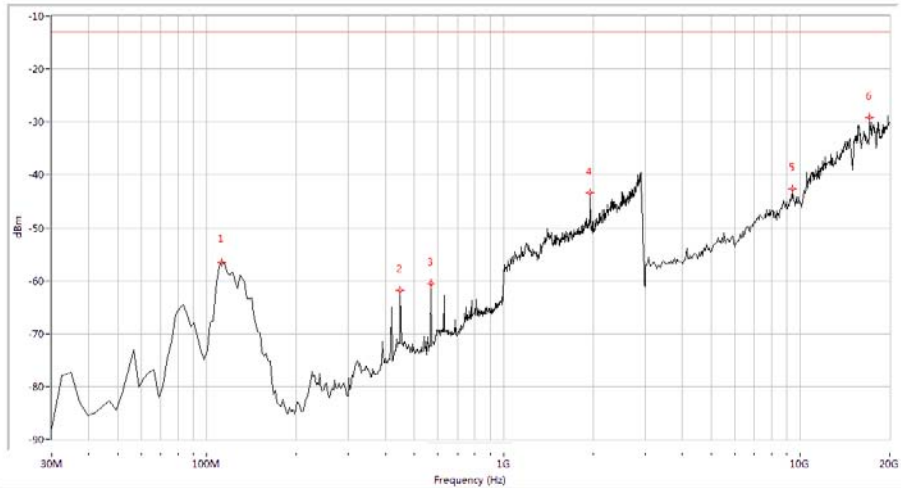
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 83.217     | -68.33 | -13.0     | 55.3   | 154.4  | Horizontal | <u>PASS</u> |
| 448.479    | -60.57 | -13.0     | 47.6   | 52.6   | Horizontal | <u>PASS</u> |
| 569.426    | -61.37 | -13.0     | 48.4   | 120.3  | Horizontal | <u>PASS</u> |
| 1927.681   | -41.59 | -13.0     | 28.6   | 99.7   | Horizontal | <u>PASS</u> |
| 6900.249   | -48.46 | -13.0     | 35.5   | 82.0   | Horizontal | <u>PASS</u> |
| 15760.599  | -30.05 | -13.0     | 17.1   | 312.7  | Horizontal | <u>PASS</u> |

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



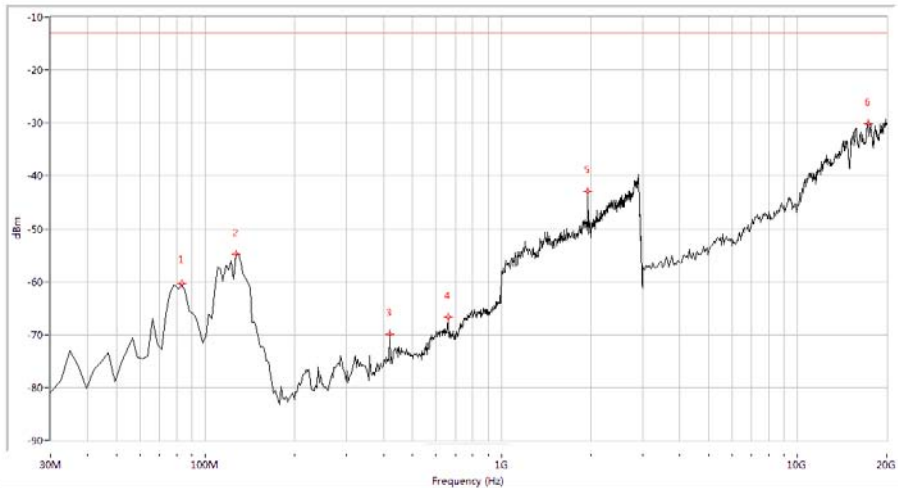
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 78.379     | -61.98 | -13.0     | 49.0   | 134.2  | Vertical | <u>PASS</u> |
| 109.825    | -64.72 | -13.0     | 51.7   | 65.4   | Vertical | <u>PASS</u> |
| 419.451    | -69.80 | -13.0     | 56.8   | 21.7   | Vertical | <u>PASS</u> |
| 1927.681   | -42.22 | -13.0     | 29.2   | 39.6   | Vertical | <u>PASS</u> |
| 7112.219   | -46.12 | -13.0     | 33.1   | 275.0  | Vertical | <u>PASS</u> |
| 15760.599  | -30.47 | -13.0     | 17.5   | 94.9   | Vertical | <u>PASS</u> |

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



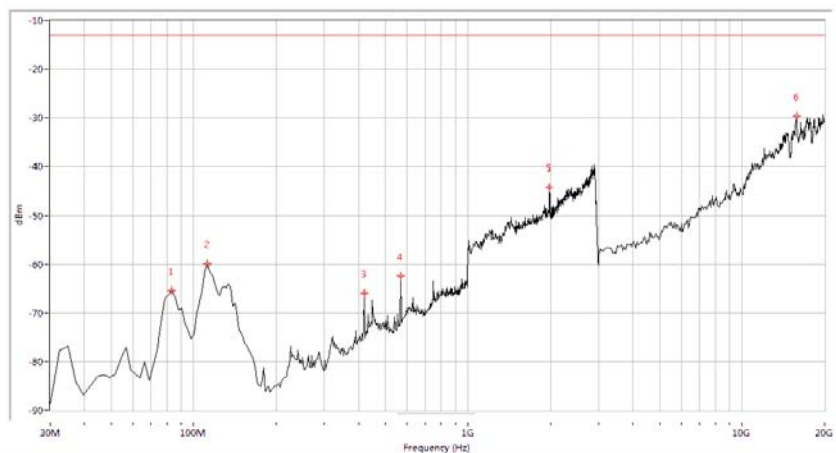
| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 112.244    | -56.61 | -13.0     | 43.6   | 132.4  | Horizontal | <u>PASS</u> |
| 448.479    | -61.78 | -13.0     | 48.8   | 78.8   | Horizontal | <u>PASS</u> |
| 569.426    | -60.50 | -13.0     | 47.5   | 90.0   | Horizontal | <u>PASS</u> |
| 1957.606   | -43.44 | -13.0     | 30.4   | 343.5  | Horizontal | <u>PASS</u> |
| 9443.890   | -42.63 | -13.0     | 29.6   | 288.1  | Horizontal | <u>PASS</u> |
| 17117.207  | -29.23 | -13.0     | 16.2   | 5.6    | Horizontal | <u>PASS</u> |

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



| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna  | Verdict     |
|------------|--------|-----------|--------|--------|----------|-------------|
| 83.217     | -60.36 | -13.0     | 47.4   | 312.8  | Vertical | <u>PASS</u> |
| 126.758    | -54.83 | -13.0     | 41.8   | 284.6  | Vertical | <u>PASS</u> |
| 419.451    | -69.91 | -13.0     | 56.9   | 54.0   | Vertical | <u>PASS</u> |
| 658.928    | -66.69 | -13.0     | 53.7   | 12.6   | Vertical | <u>PASS</u> |
| 1957.606   | -43.00 | -13.0     | 30.0   | 5.9    | Vertical | <u>PASS</u> |
| 17286.783  | -30.13 | -13.0     | 17.1   | 117.4  | Vertical | <u>PASS</u> |

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



| Fre. (MHz) | Peak   | Limit(PK) | Margin | Degree | Antenna    | Verdict     |
|------------|--------|-----------|--------|--------|------------|-------------|
| 83.217     | -65.43 | -13.0     | 52.4   | 63.4   | Horizontal | <u>PASS</u> |
| 112.244    | -59.83 | -13.0     | 46.8   | 124.7  | Horizontal | <u>PASS</u> |
| 419.451    | -65.86 | -13.0     | 52.9   | 92.5   | Horizontal | <u>PASS</u> |
| 569.426    | -62.46 | -13.0     | 49.5   | 312.2  | Horizontal | <u>PASS</u> |
| 1982.544   | -44.29 | -13.0     | 31.3   | 65.8   | Horizontal | <u>PASS</u> |
| 15802.993  | -29.68 | -13.0     | 16.7   | 105.9  | Horizontal | <u>PASS</u> |

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

\*\* END OF REPORT \*\*