**MORLAB**

TESTING
CNAS L3572

# FCC TEST REPORT

*Issued to*

**Brightstar Corporation**

*For*

**Fixed Wireless Phone**

| | |
|---|---|
| Model Name: | IP-850 |
| Trade Name: | AVVIO |
| Brand Name: | AVVIO |
| FCC ID : | WVB-IP850 |
| Standard: | 47 CFR Part 22 Subpart H |
| | 47 CFR Part 24 Subpart E |
| Test date: | 2012-2-17to 2012-3-6 |
| Issue date: | 2012-3-8 |

Shenzhen Morlab Communications Technology Co., Ltd.

*Tested by* Zhang Yan
Zhang Yan
*Date* 2012.3.8

*Approved by* Wu Xueyen
Wu Xueyen
*Date* 2012.03.08

*Reviewed by* Peng Huarui
Peng Huarui
*Date* 2012.3.8

**CTIA** Authorized Test Lab
LAB CODE 20001223-00
**IEEE 1725** **OTA**

**OFTA**
電訊管理局

ilac-MRA

**TAF**
Testing Laboratory
2030

**GCF**
Official Observer of
Global Certification Forum

**Bluetooth**
**BQTF**

**FCC**
Reg. No.
**741109**

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|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | Mar 8, 2012 | First edition |
| | | |

# 1.    GENERAL INFORMATION

## 1.1    EUT Description

| | |
|---|---|
| EUT Type .............................: | Fixed Wireless Phone |
| Serial No.............................: | (n.a, marked #1 by test site) |
| Hardware Version .................: | P2 |
| Software Version ..................: | LKW_11_RK3.00 |
| Applicant .............................: | Brightstar Corporation |
| | 9725 NW 117th Avenue, #300 Miami, FL 33178 |
| Manufacturer .......................: | LAKIA Teletech Co., Ltd. |
| | 2F, Unit A, Technology Service Building, Software Garden 1, Xiamen, China |
| Frequency Range .................: | GSM 850MHz: |
| |      Tx: 824.20 - 848.80MHz (at intervals of 200kHz); |
| |      Rx: 869.20 - 893.80MHz (at intervals of 200kHz) |
| | GSM 1900MHz: |
| |      Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); |
| |      Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz) |
| | WCDMA 850MHz |
| |      Tx: 826.4 - 846.6MHz (at intervals of 200kHz); |
| |      Rx: 871.4 - 891.6MHz (at intervals of 200kHz) |
| | WCDMA 1900MHz |
| |      Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz); |
| |      Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz) |
| Modulation Type...................: | GPRS/GSM Mode with GMSK Modulation |
| | EDGE Mode with 8PSK Modulation |
| | WCDMA Mode with QPSK Modulation |
| | HSDPA Mode with QPSK Modulation |
| Multislot Class......................: | GPRS: Multislot Class12,EGPRS: Multislot Class12 |
| Emission Designators ...........: | GSM:247KGXW, |
| | EGPRS:249KG7W, |
| | WCDMA:4M16F9W |
| Antenna Gain........................: | 4.4 dBi |
| Antenna Type.......................: | Standard Antenna |
| Antenna Manufacturer..........: | PERCSSON COMMUNICATION EQUIPMENT CO.,LTD |
| Model No.  ..........................: | HM-G2/W –TLPB |

*Note 1:* The transmitter (Tx) frequency arrangement of the Cellular 850MHz band used by the EUT can be represented with the formula $F(n)=824.2+0.2*(n-128)$, $128<=n<=251$; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).

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

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

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

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

## 1.2 Test Standards and Results

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

| No. | Identity | Document Title |
|-----|----------|----------------|
| 1 | 47 CFR Part 2 (10-1-09 Edition) | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2 | 47 CFR Part 22 (10-1-09 Edition) | Public Mobile Services |
| 3 | 47 CFR Part 24 (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 | 2.1049 | 99% Occupied Bandwidth | PASS |
| 3 | 2.1055 22.355 24.235 | Frequency Stability | PASS |
| 4 | 2.1051 2.1057 22.917 24.238 | Conducted Out of Band Emissions | PASS |
| 5 | 2.1051 2.1057 22.917 24.238 | Band Edge | PASS |
| 6 | 22.913 24.232 | Transmitter Radiated Power (EIPR/ERP) | PASS |
| 7 | 2.1053 2.1057 22.917 24.238 | Radiated Out of Band Emissions | PASS |

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

## 1.3    Facilities and Accreditations

### 1.3.1    Facilities

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 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. 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 741109.

### 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:
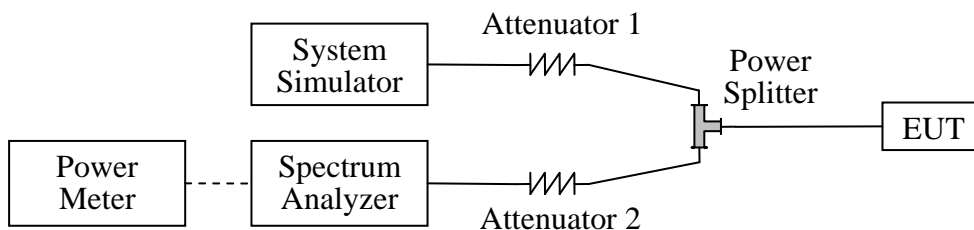


The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded 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 |
|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2011.05 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2011.05 |
| Power Meter | Agilent | E4418B | GB43318055 | 2011.05 |
| Power Splitter | Weinschel | 1506A | NW521 | (n.a.) |
| Attenuator 1 | Resnet | 20dB | (n.a.) | (n.a.) |
| Attenuator 2 | Resnet | 3dB | (n.a.) | (n.a.) |

### 2.1.3 Test Results

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

1. GSM Model Test Verdict:

| Band | Channel | Frequency (MHz) | Measured Output Power | | Limit dBm | Verdict |
|---|---|---|---|---|---|---|
| | | | dBm | Refer to Plot | | |
| GSM 850MHz | 128 | 824.2 | 32.11 | Plot A1 to A3 | 35 | PASS |
| | 190 | 836.6 | 31.80 | | | PASS |
| | 251 | 848.8 | 30.32 | | | PASS |
| GSM 1900MHz | 512 | 1850.2 | 26.69 | Plot B1 to B3 | 32 | PASS |
| | 661 | 1880.0 | 27.26 | | | PASS |
| | 810 | 1909.8 | 28.27 | | | PASS |
| GPRS 850MHz | 128 | 824.2 | 32.08 | Plot C1 to C3[Note 1] | 35 | PASS |
| | 190 | 836.6 | 31.08 | | | PASS |
| | 251 | 848.8 | 30.33 | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 26.78 | Plot D1 to D3[Note 1] | 32 | PASS |
| | 661 | 1880.0 | 27.34 | | | PASS |
| | 810 | 1909.8 | 27.32 | | | PASS |
| EGPRS 850MHz | 128 | 824.2 | 32.14 | Plot E1 to E3[Note 1] | 35 | PASS |
| | 190 | 836.6 | 31.86 | | | PASS |
| | 251 | 848.8 | 30.36 | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 26.80 | Plot F1 to F3[Note 1] | 32 | PASS |
| | 661 | 1880.0 | 27.35 | | | PASS |
| | 810 | 1909.8 | 28.39 | | | PASS |

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

2. WCDMA Model Test Verdict:

| Item | band | WCDMA 850 | | | WCDMA 1900 | | |
|---|---|---|---|---|---|---|---|
| | ARFCN | 4132 | 4175 | 4233 | 9262 | 9400 | 9538 |
| | subtest | dBm | | | dBm | | |
| 5.2(WCDMA) | non | 22.22 | 21.47 | 21.88 | 21.41 | 21.49 | 21.22 |
| HSDPA | 1 | 22.13 | 21.15 | 21.25 | 21.16 | 21.21 | 21.09 |
| | 2 | 22.17 | 21.11 | 21.23 | 21.12 | 21.18 | 21.11 |
| | 3 | 21.61 | 20.52 | 20.81 | 20.65 | 20.69 | 20.55 |
| | 4 | 21.63 | 20.49 | 20.77 | 20.61 | 20.66 | 20.53 |

3. GSM Model Test Plots:



(Plot A1: GSM 850MHz Channel = 128)



(Plot A2: GSM 850MHz Channel = 190)
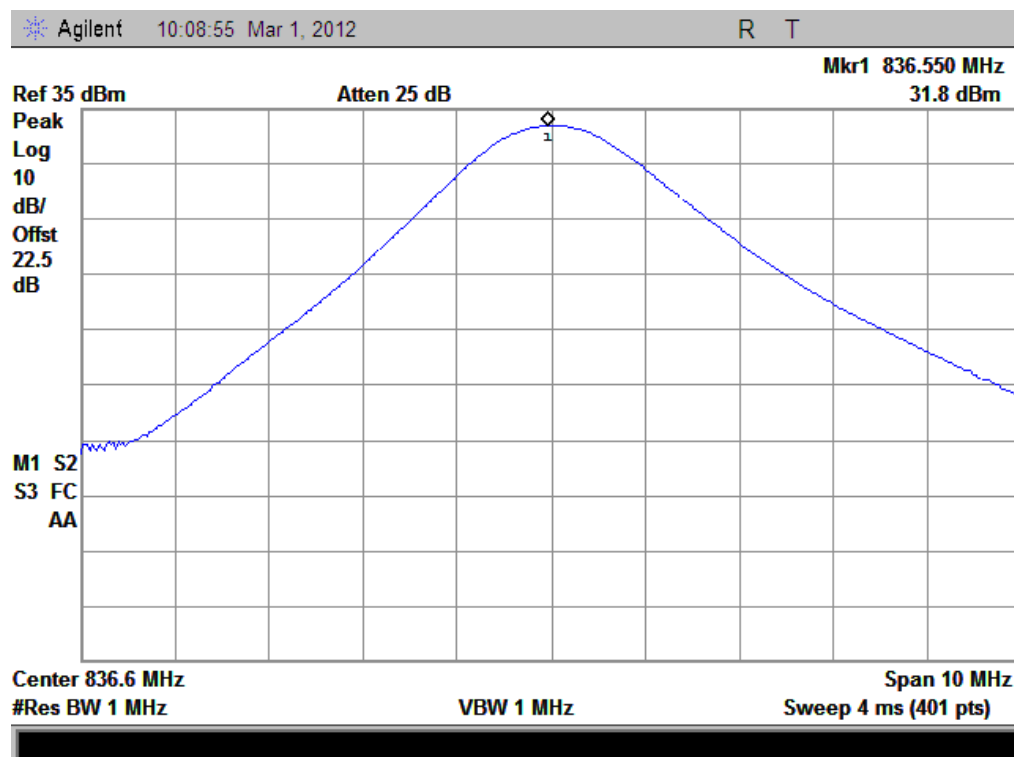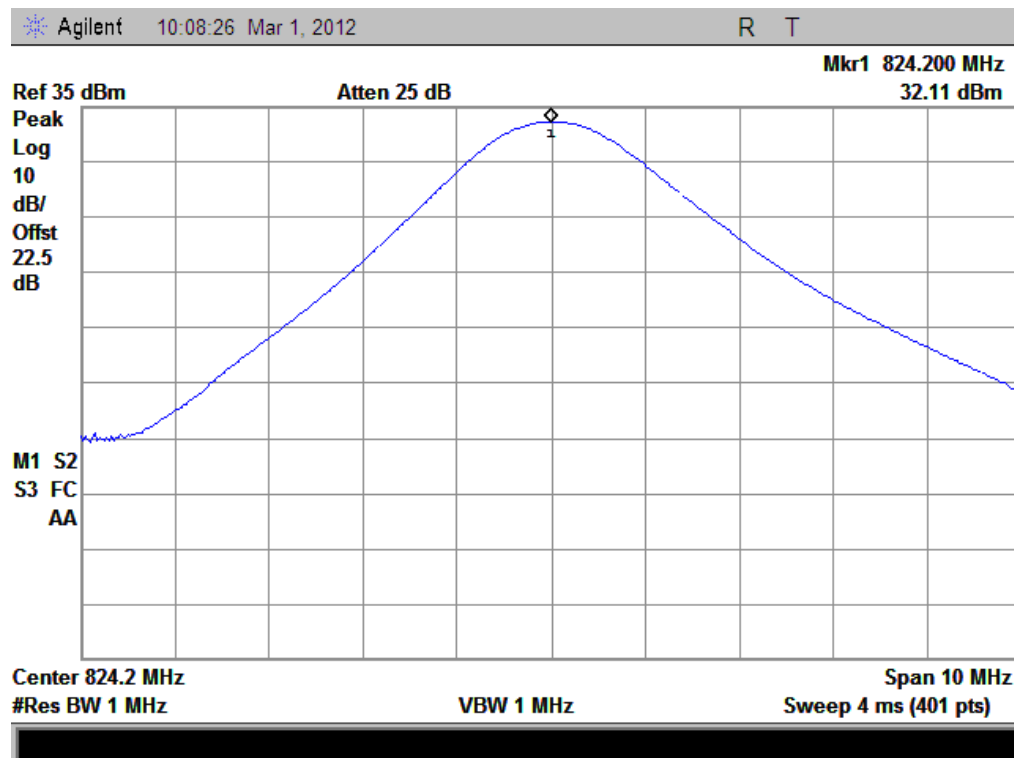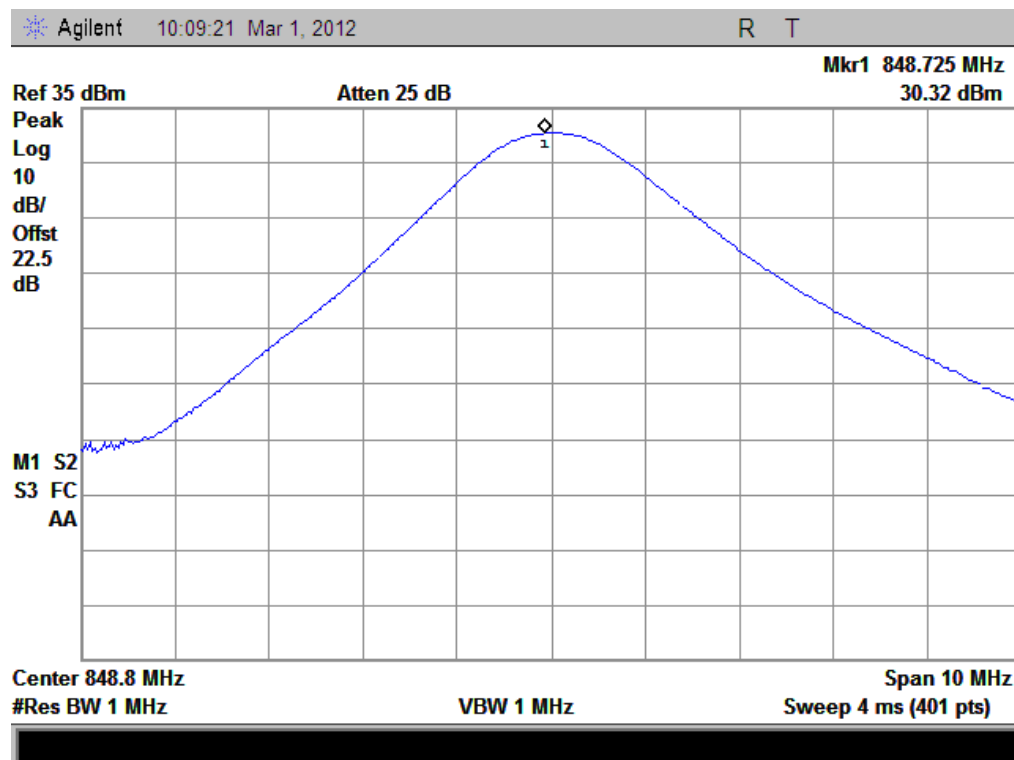
(Plot A3:    GSM 850MHz Channel = 251)
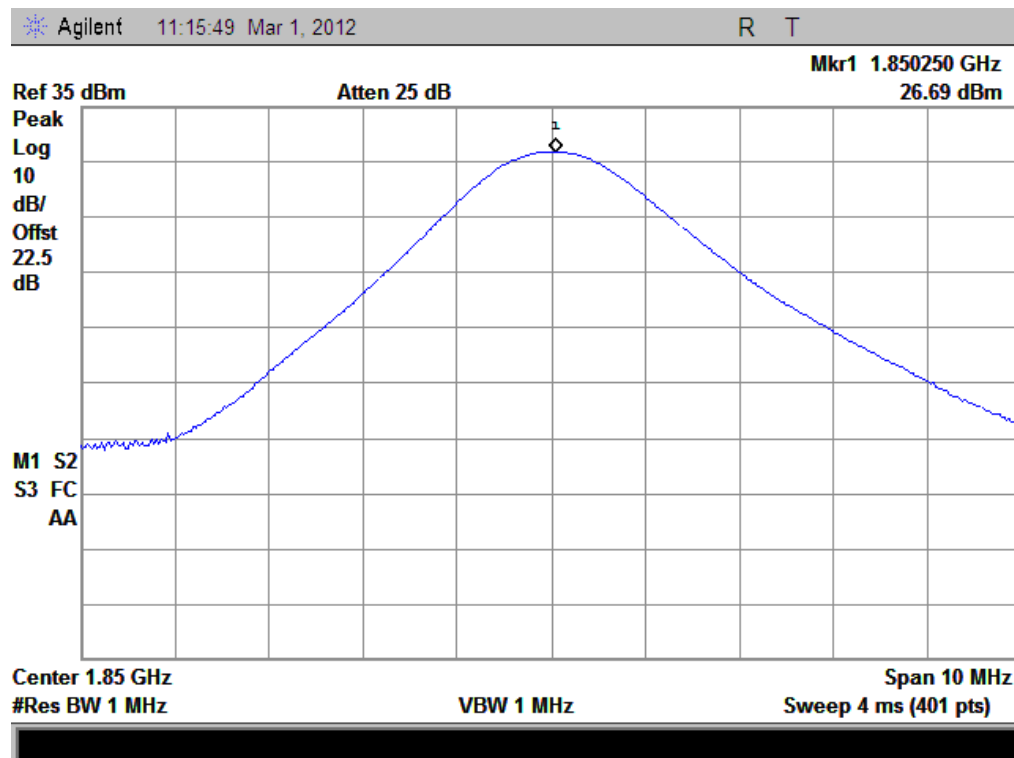


(Plot B1:    GSM 1900MHz Channel = 512)
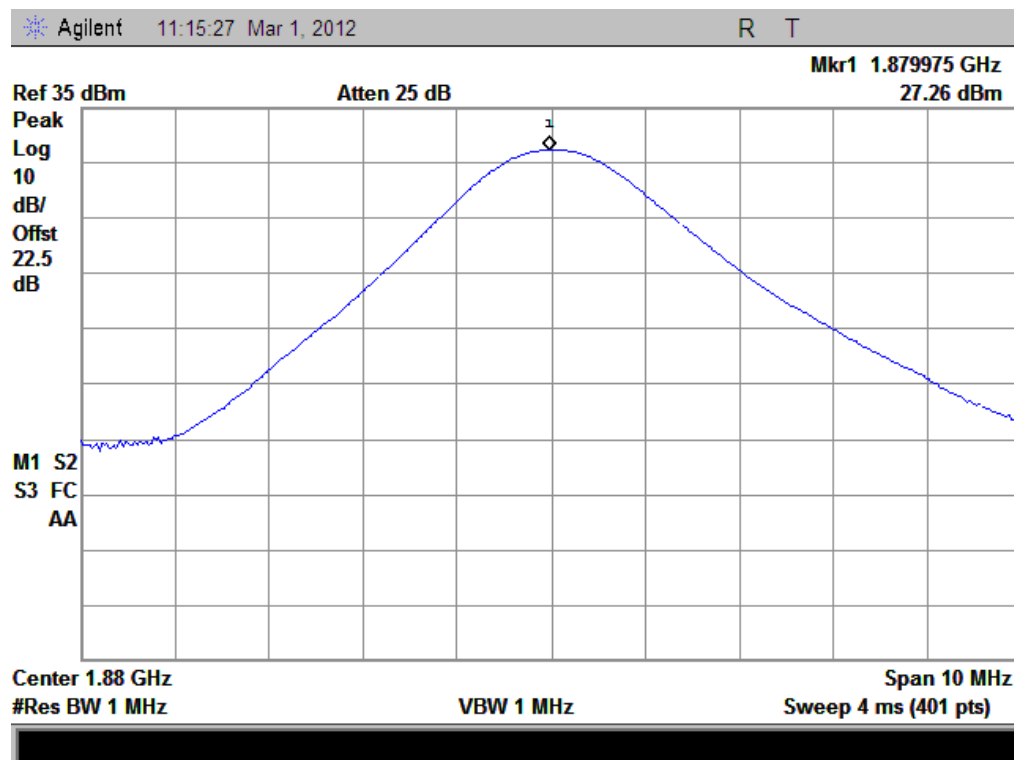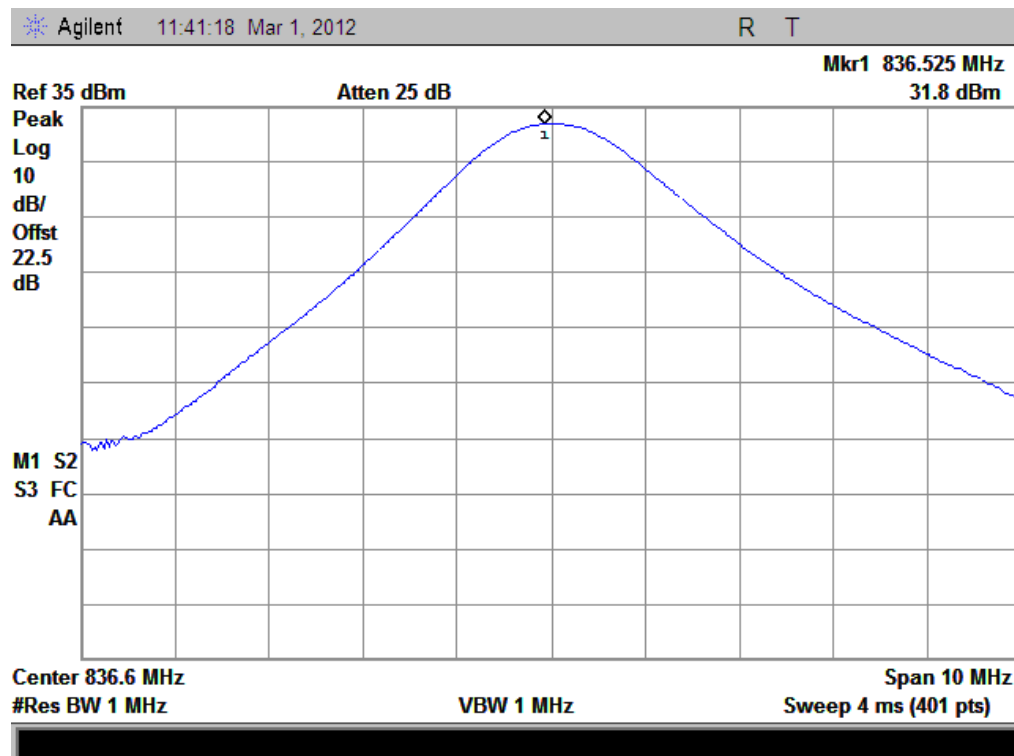
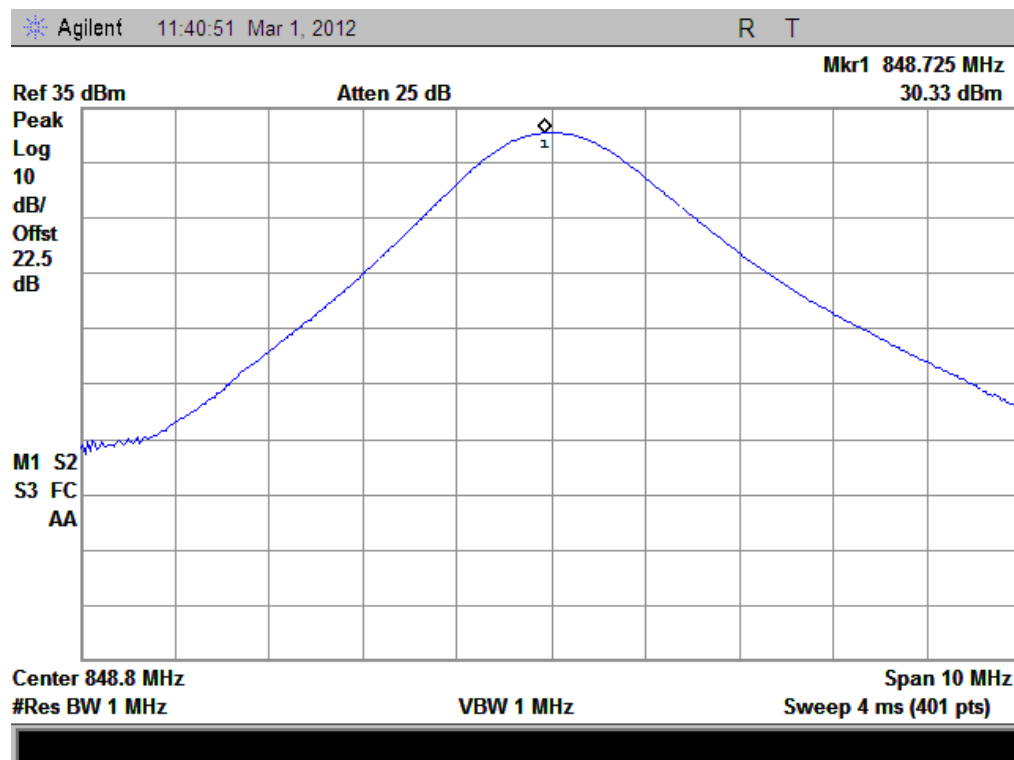(Plot B2:    GSM 1900MHz Channel = 661)
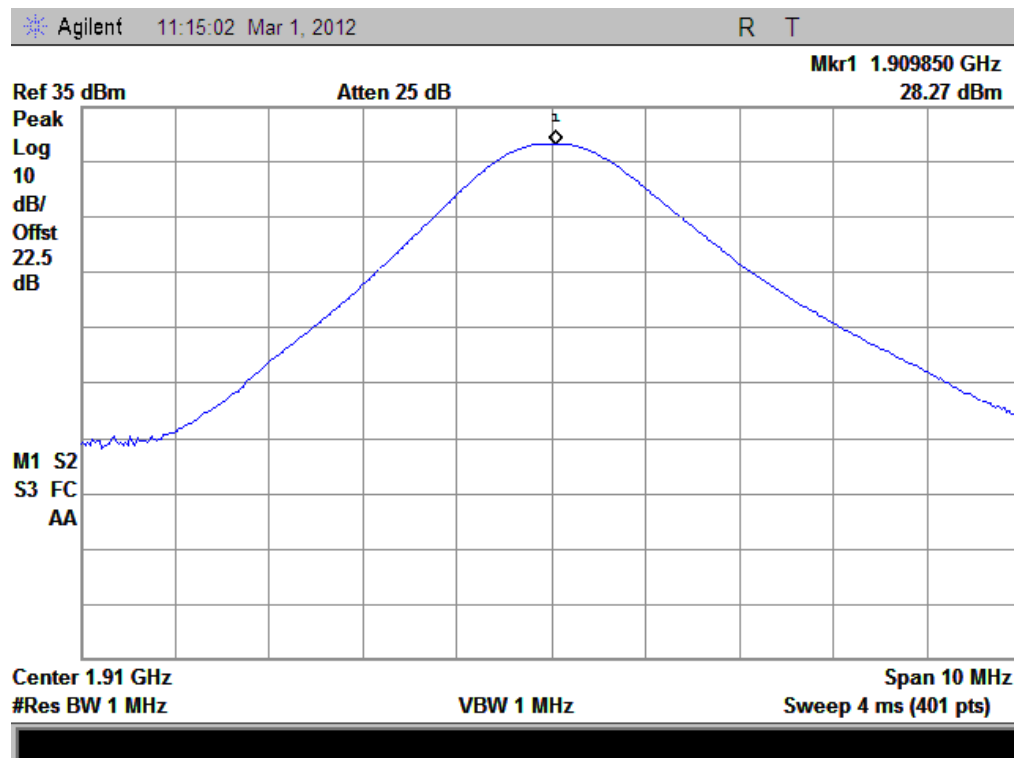
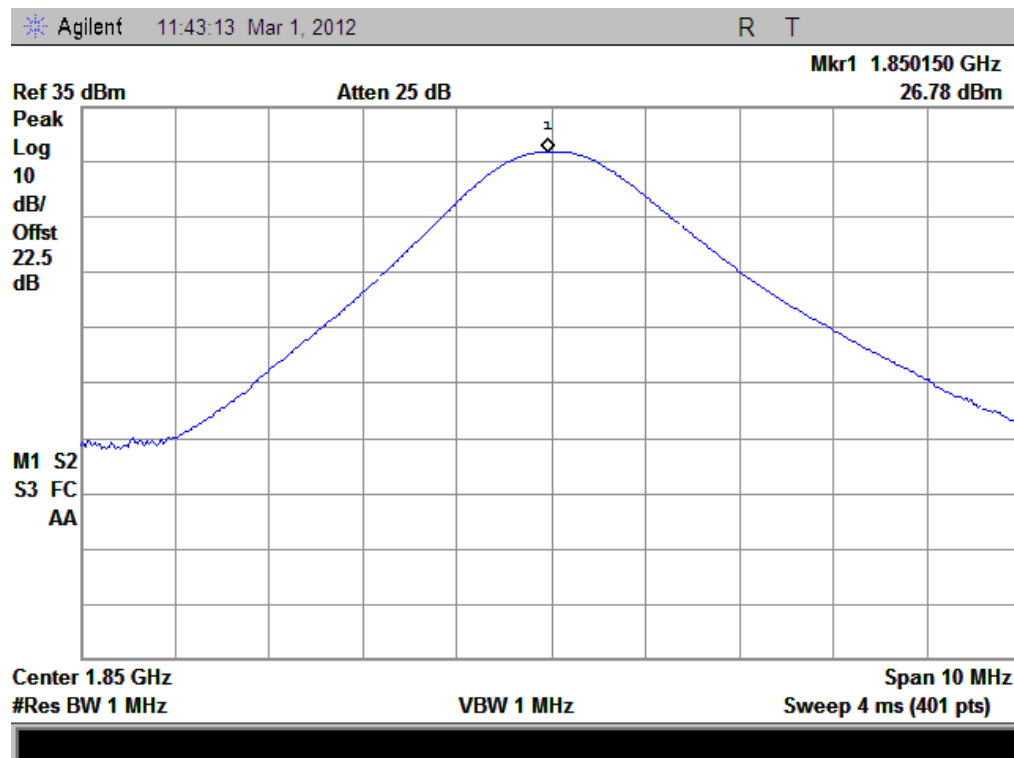

(Plot B3:    GSM 1900MHz Channel = 810)
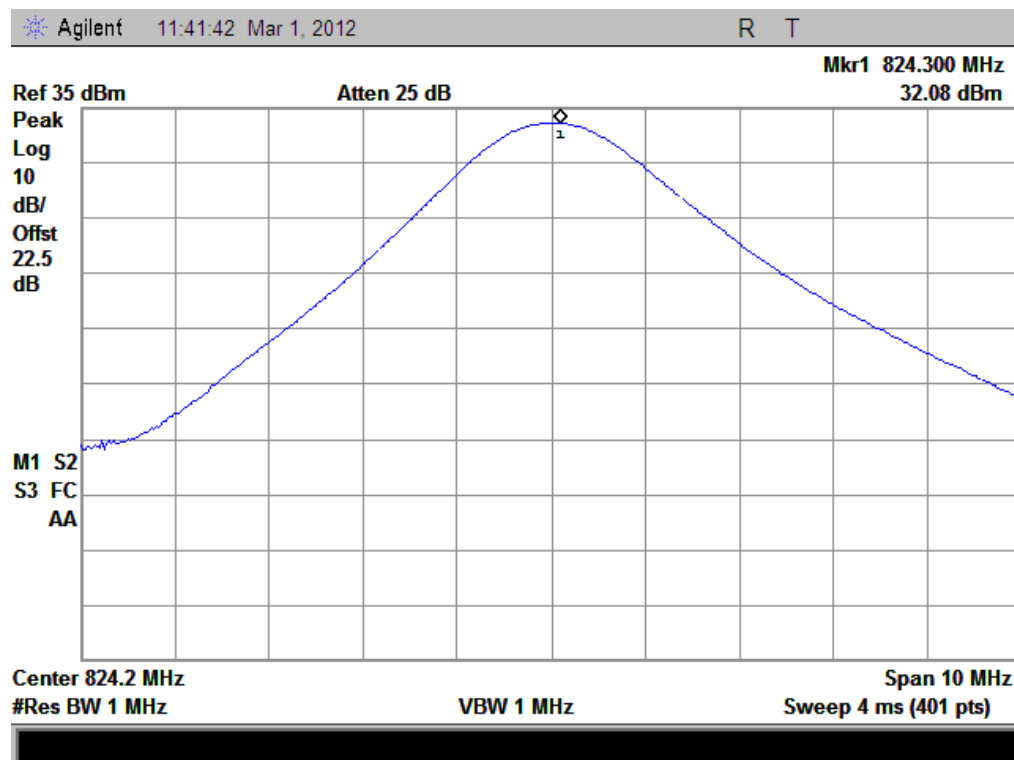
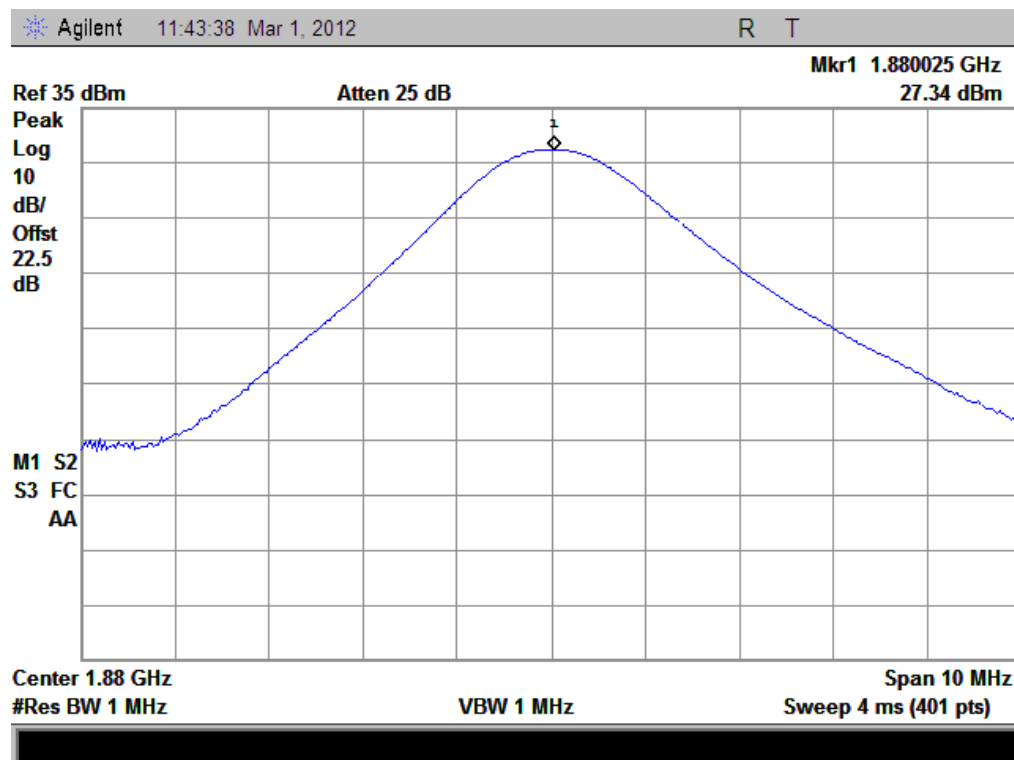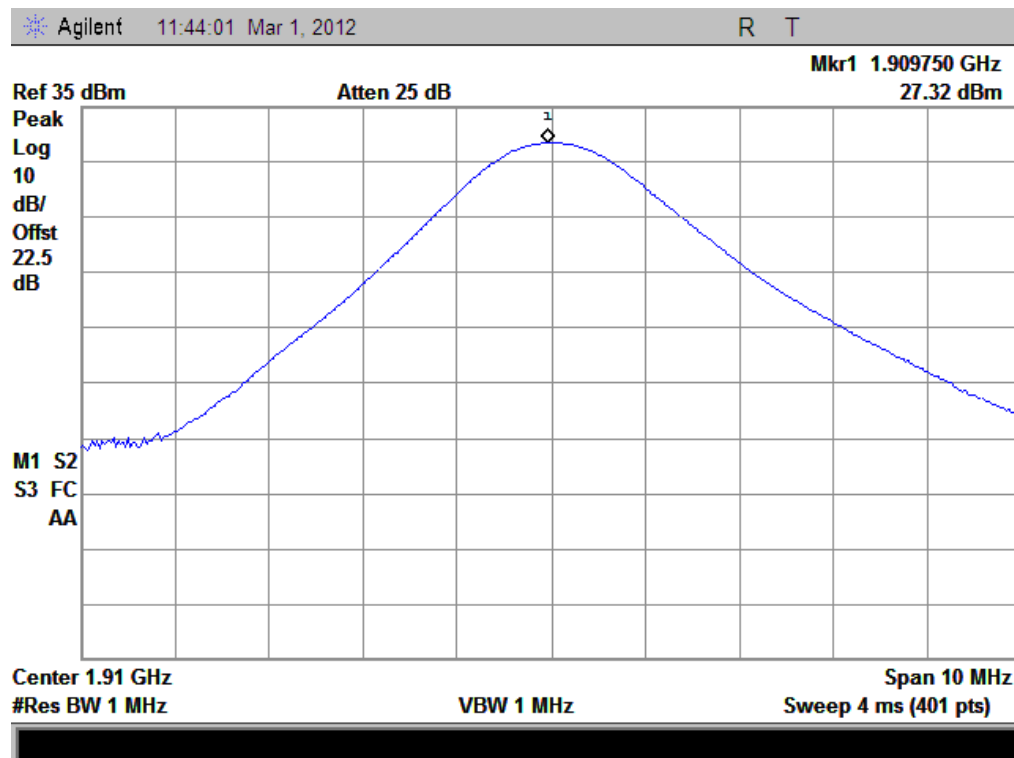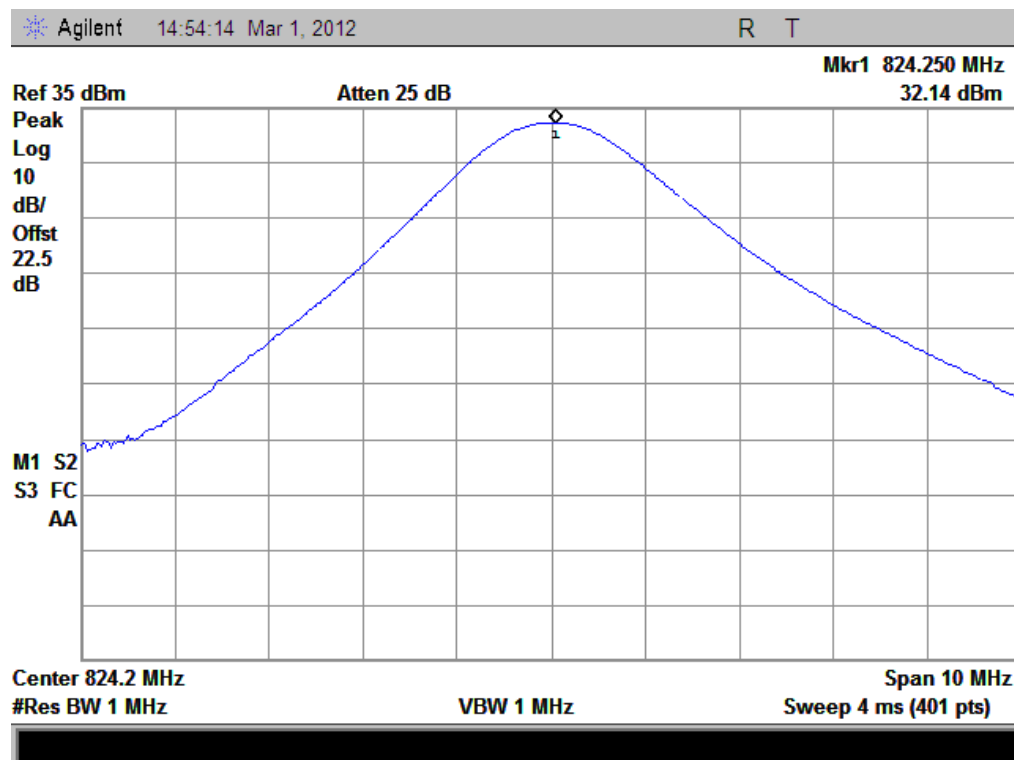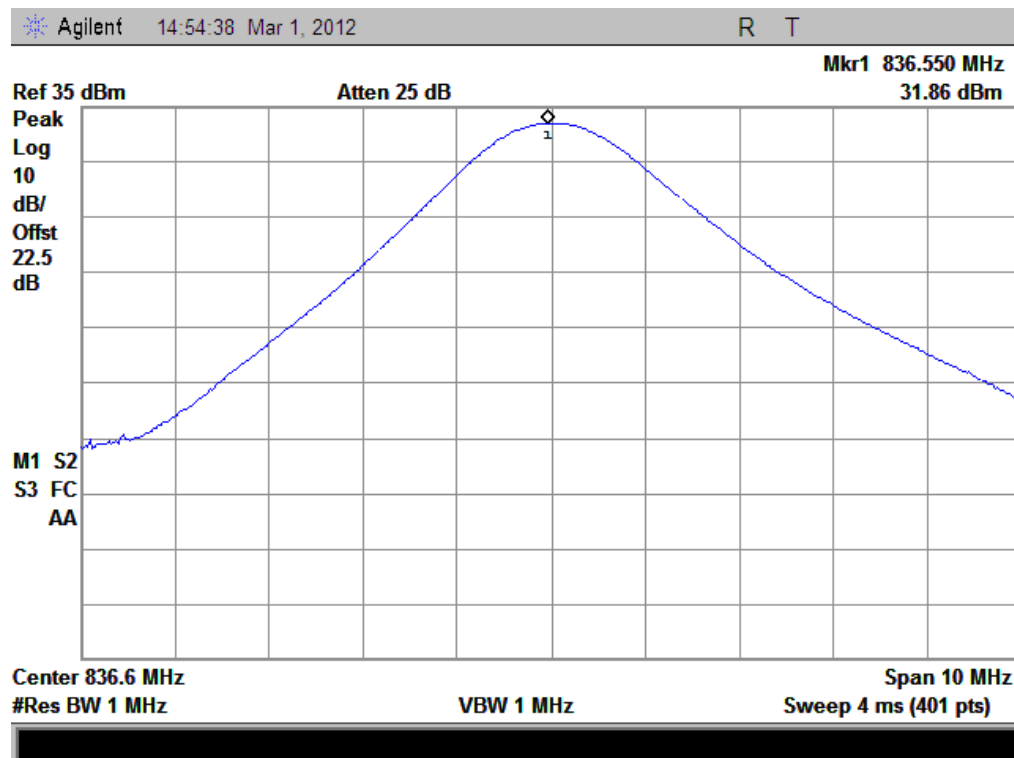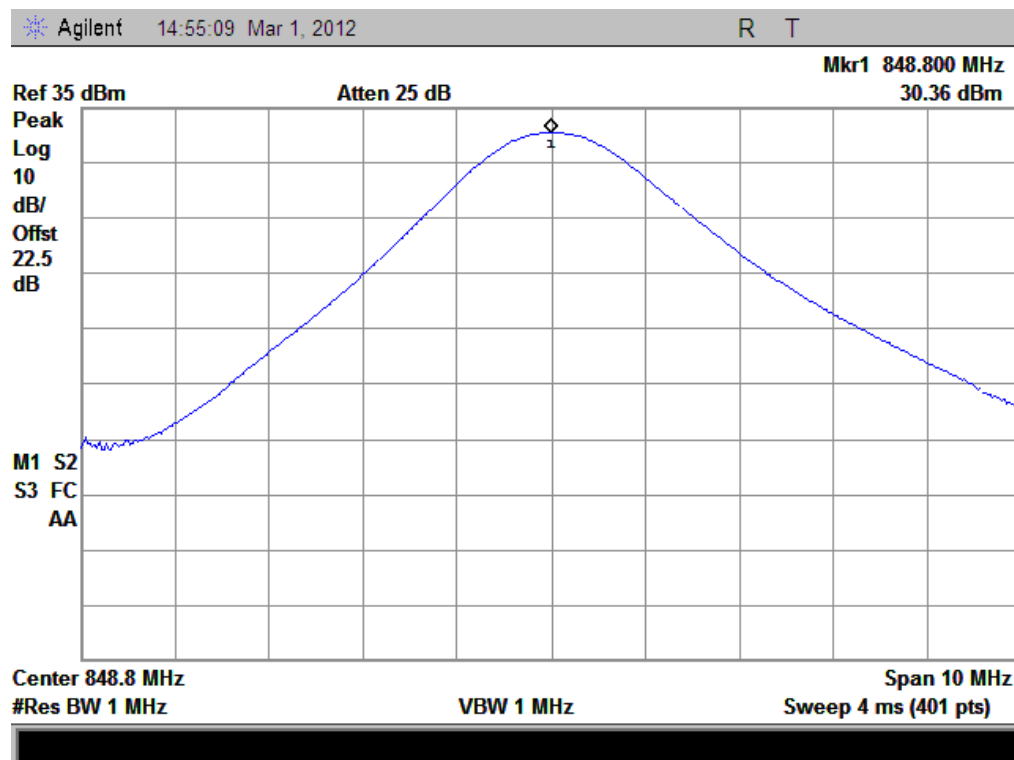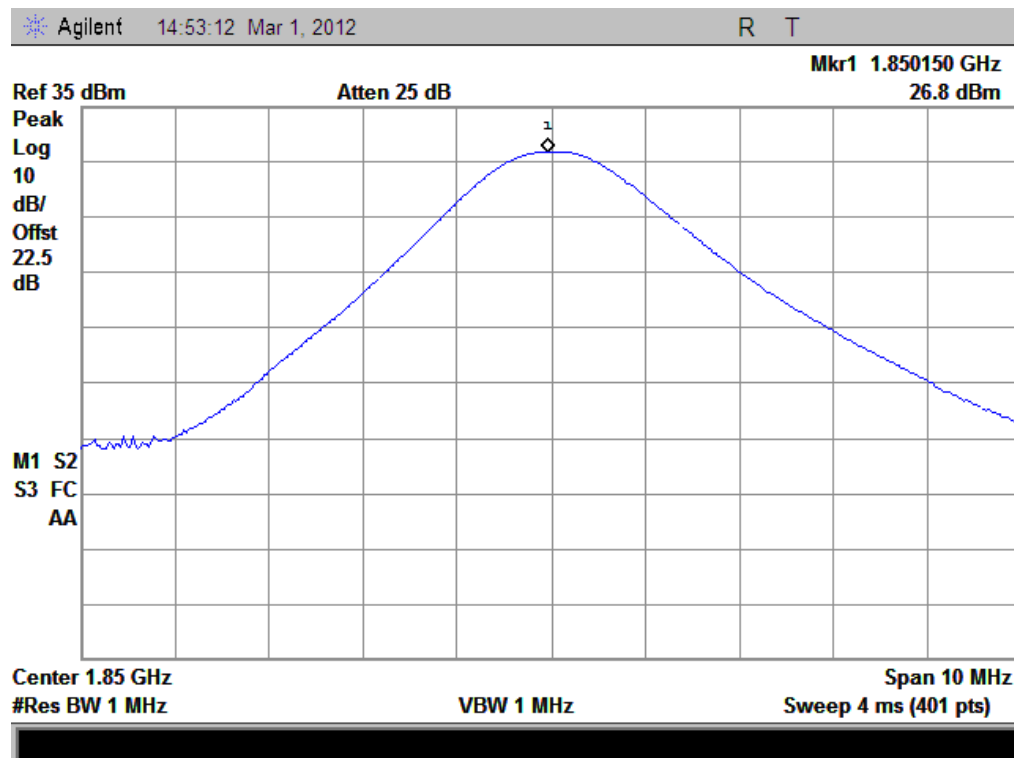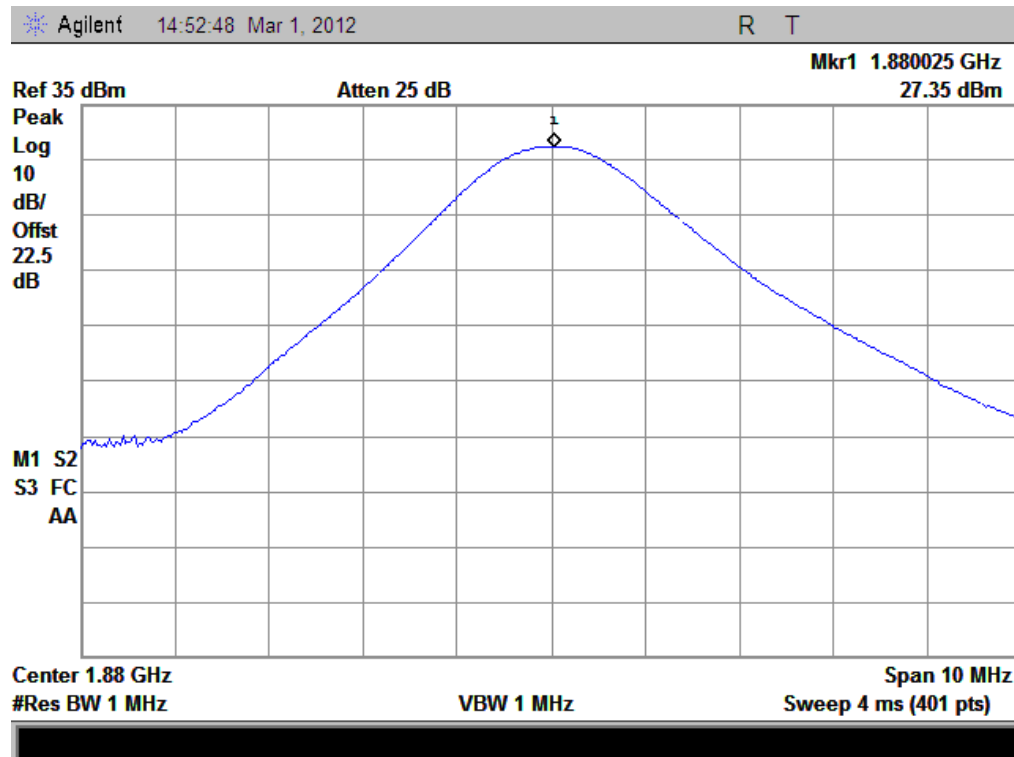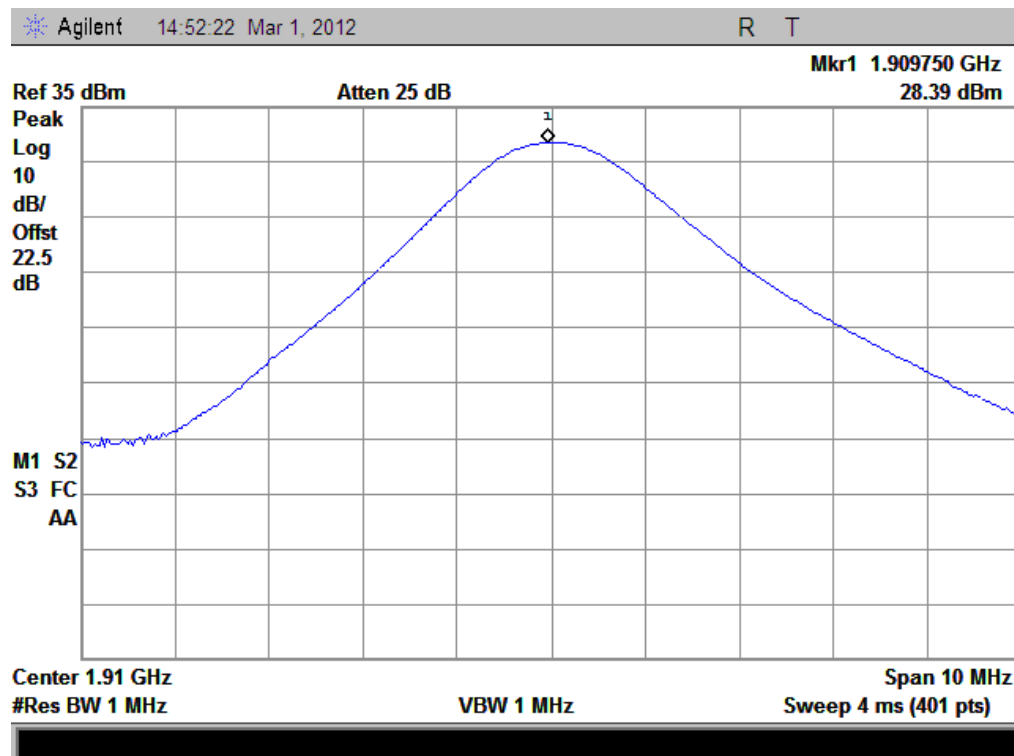(Plot C1:    GPRS 850MHz Channel = 128)



(Plot C2:    GPRS 850MHz Channel = 190)

(Plot C3:     GPRS 850MHz Channel = 251)



(Plot D1:     GPRS 1900MHz Channel = 512)

(Plot D2:      GPRS 1900MHz Channel = 661)



(Plot D3:      GPRS 1900Hz Channel = 810)

(Plot E 1:     EGPRS 850MHz Channel = 128)



(Plot E 2:     EGPRS 850MHz Channel = 190)

(Plot E 3:    EGPRS 850MHz Channel = 251)



(Plot F 1:    EGPRS 1900MHz Channel = 512)

(Plot F 2:     EGPRS 1900MHz Channel = 661)



(Plot F 3:     EGPRS 1900MHz Channel = 810)

## 2.2 99% Occupied Bandwidth

### 2.2.1 Definition

According to FCC section 2.1049, 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,

### 2.2.2 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 99% occupied bandwidth.

1. Test Verdict:

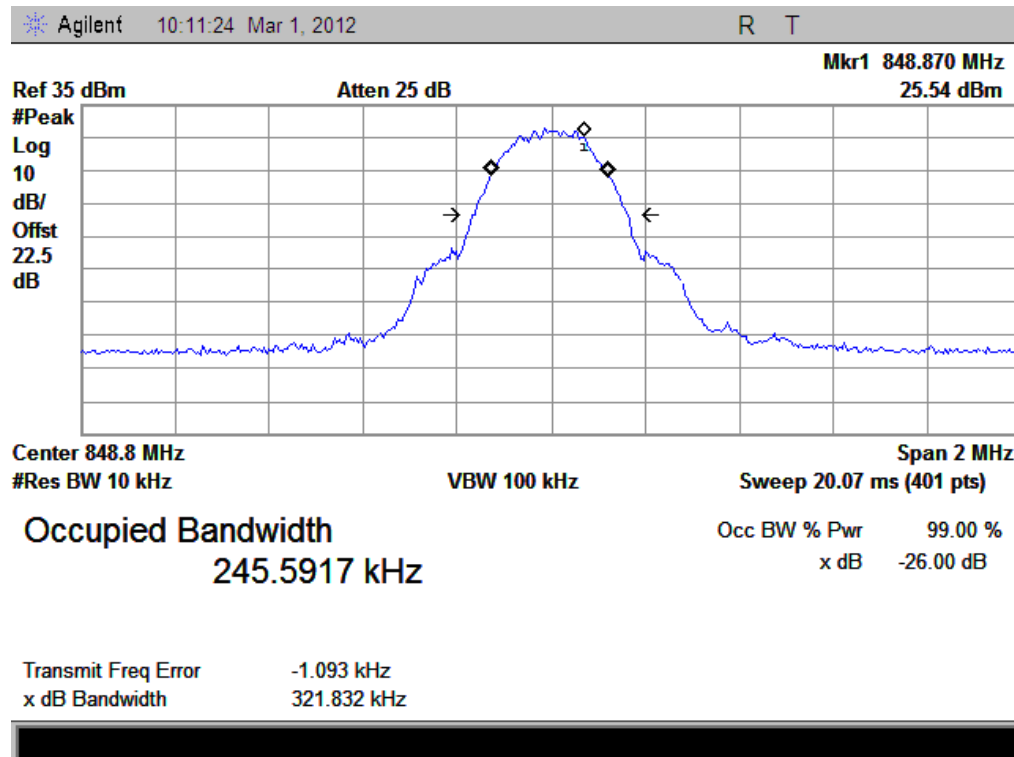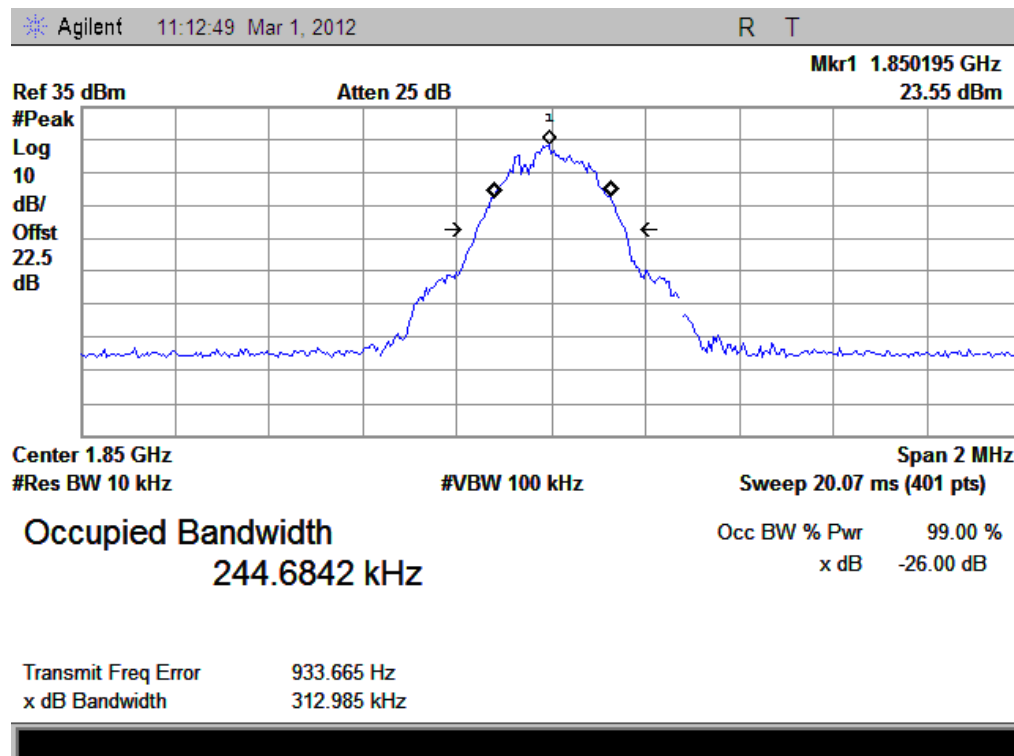| Band | Channel | Frequency (MHz) | 99% Occupied Bandwidth | Refer to Plot |
|---|---|---|---|---|
| GSM 850MHz | 128 | 824.2 | 244.6374 KHz | Plot A |
| | 190 | 836.6 | 247.2606 KHz | Plot B |
| | 251 | 848.8 | 245.5917 KHz | Plot C |
| GSM 1900MHz | 512 | 1850.2 | 244.6842 KHz | Plot D |
| | 661 | 1880.0 | 242.6429 KHz | Plot E |
| | 810 | 1909.8 | 241.0526 KHz | Plot F |
| EDGE 850MHz | 128 | 824.2 | 244.9557 KHz | Plot G |
| | 190 | 836.6 | 243.9577 KHz | Plot H |
| | 251 | 848.8 | 249.4078 KHz | Plot I |
| EDGE 1900MHz | 512 | 1850.2 | 244.6372 KHz | Plot J |
| | 661 | 1880.0 | 240.4536 KHz | Plot K |
| | 810 | 1909.8 | 241.4567KHz | Plot L |
| WCDMA 850MHz | 4175 | 835 | 4.1592MHz | Plot M |
| WCDMA 1900MHz | 9400 | 1880 | 4.1613 MHz | Plot N |
| HSDPA 850MHz | 4175 | 835 | 4.1643 MHz | Plot O |
| HSDPA 1900MHz | 9400 | 1880 | 4.1421 MHz | Plot P |

2.    Test Plots:



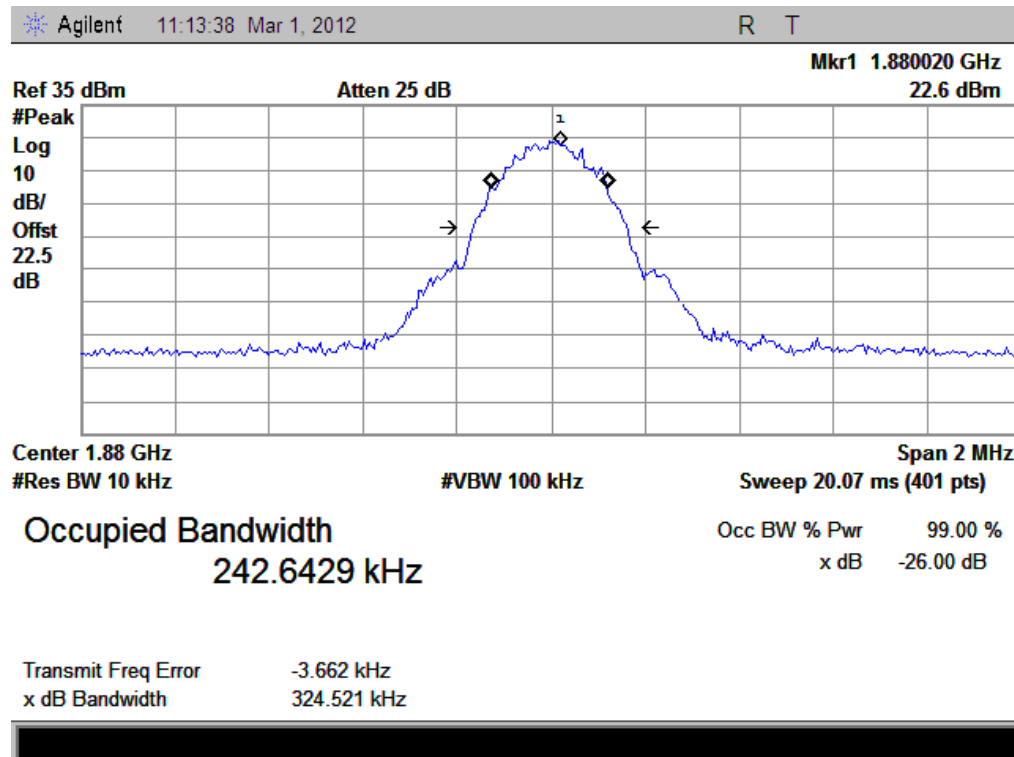(Plot A: GSM 850MHz Channel = 128)



(Plot B: GSM 850MHz Channel = 190)
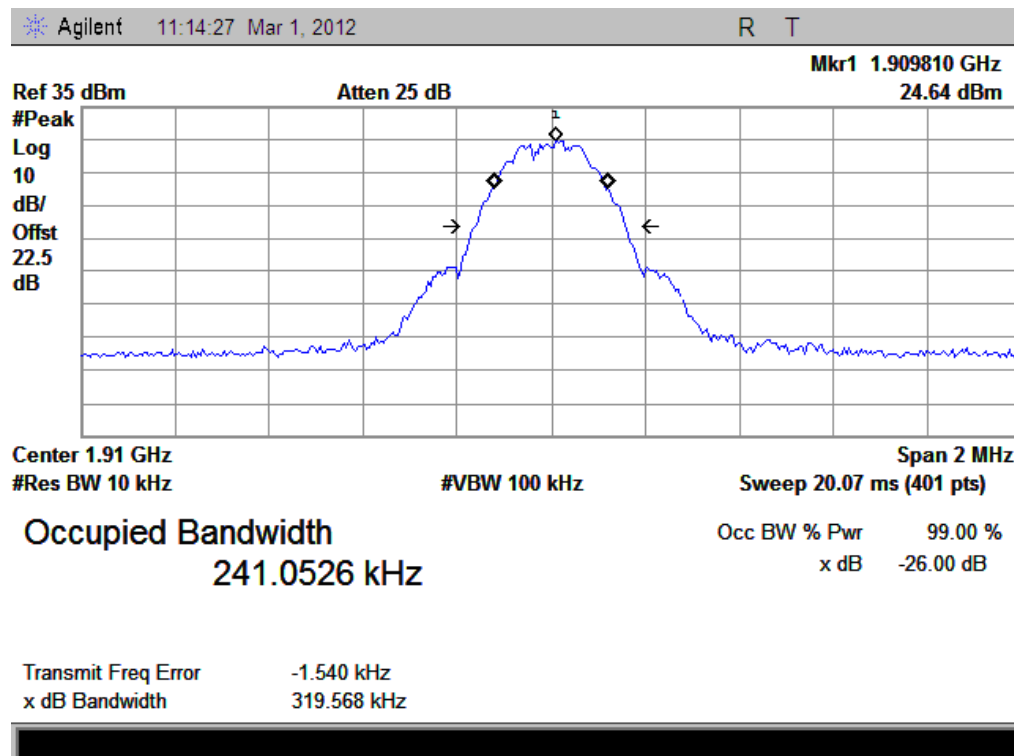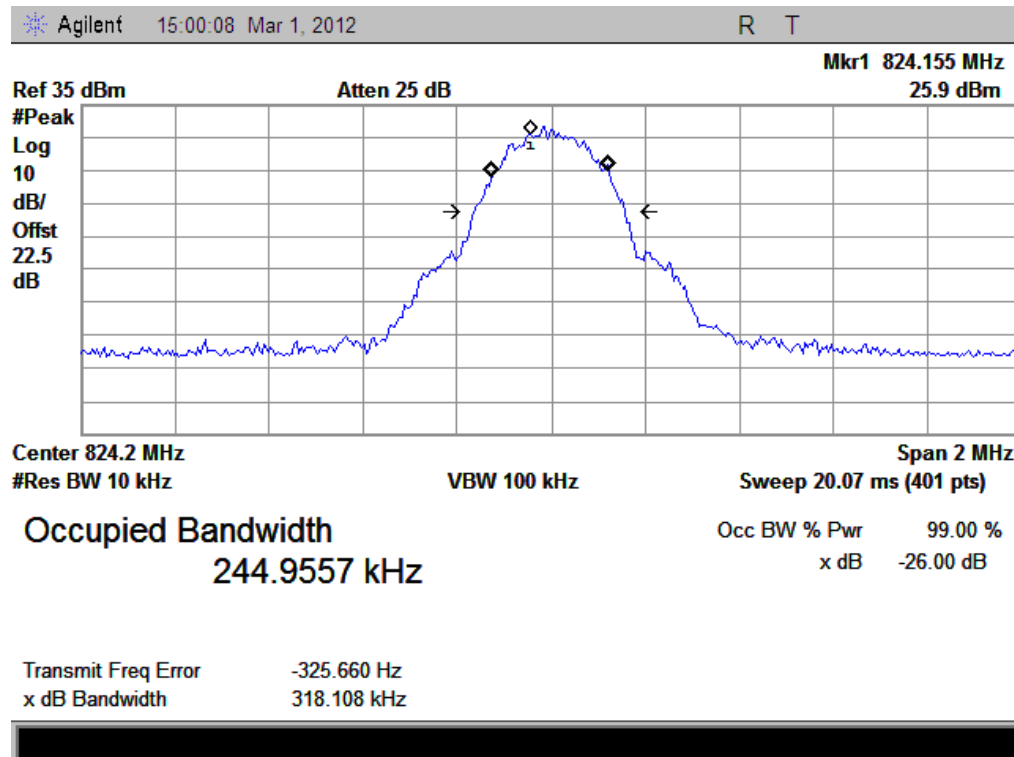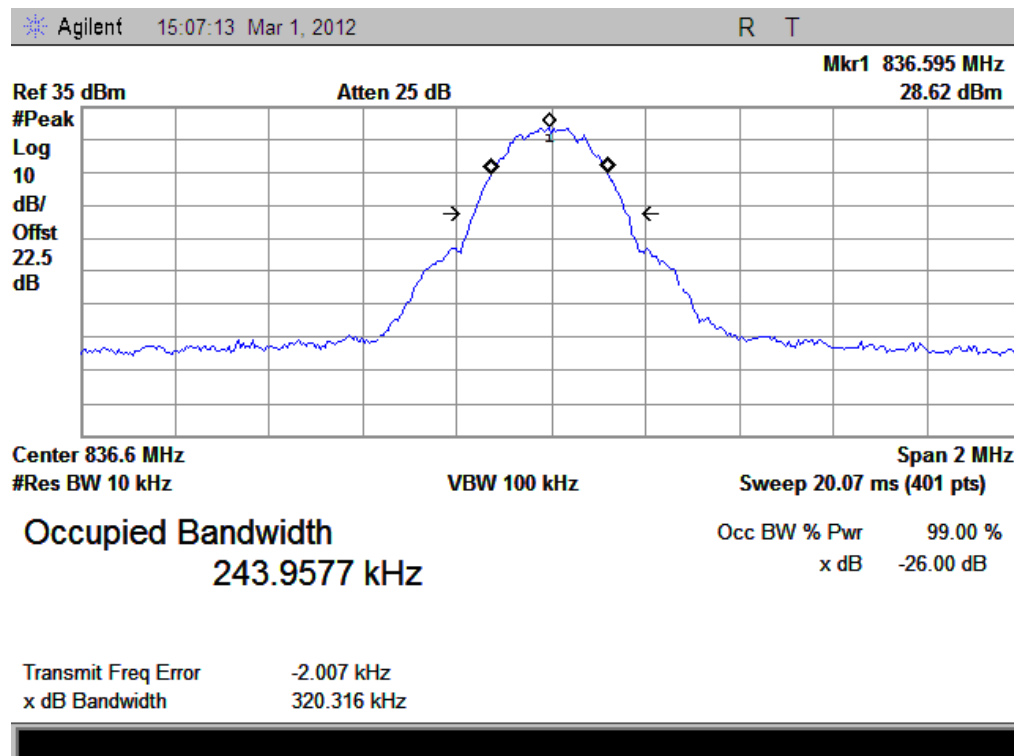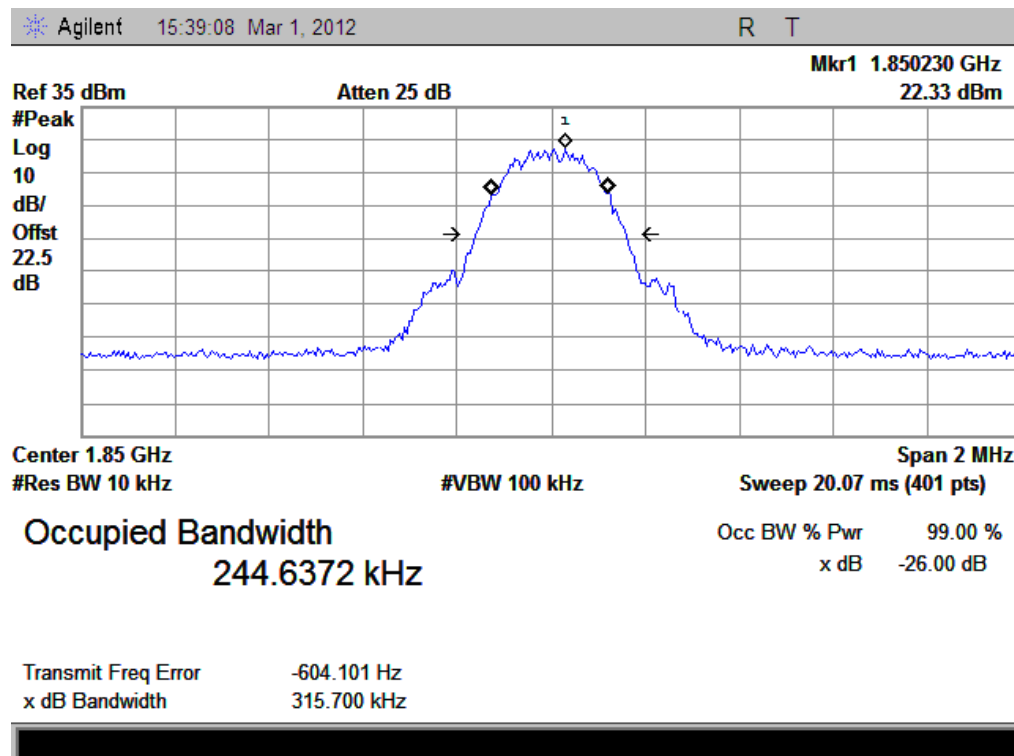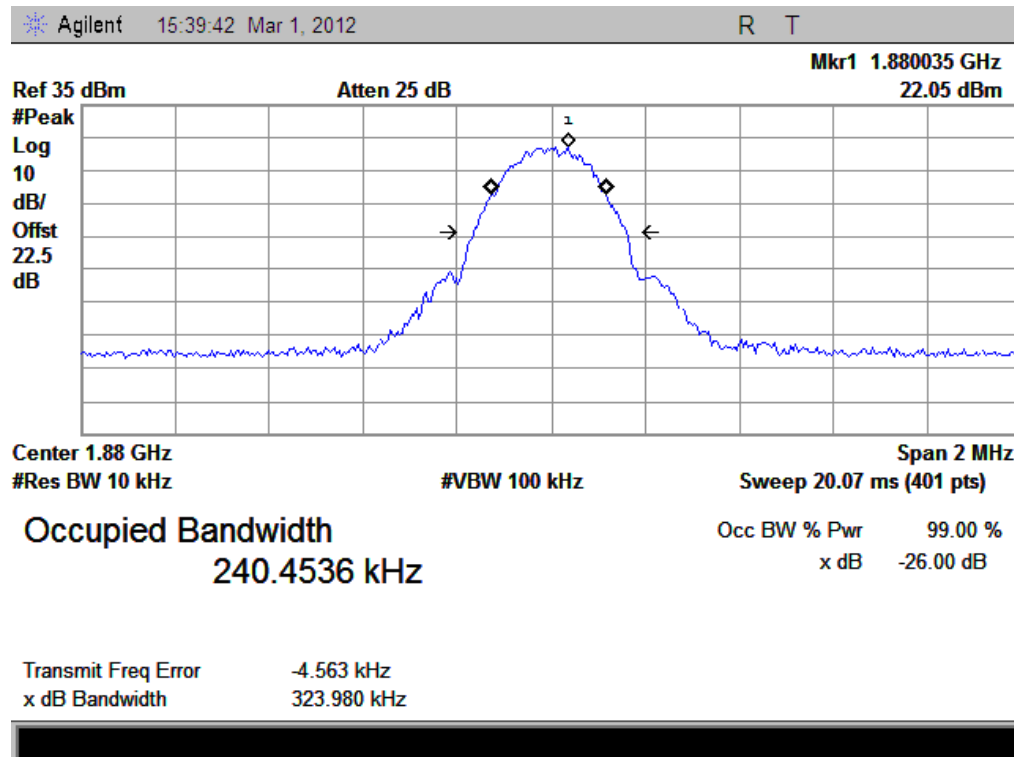
(Plot C: GSM 850MHz Channel = 251)



(Plot D: GSM 1900MHz Channel = 512)

Agilent    11:13:38 Mar 1, 2012                               R  T

Mkr1  1.880020 GHz
Ref 35 dBm                    Atten 25 dB                          22.6 dBm

Center 1.88 GHz                                             Span 2 MHz
#Res BW 10 kHz              #VBW 100 kHz           Sweep 20.07 ms (401 pts)

Occupied Bandwidth                    Occ BW % Pwr      99.00 %
        242.6429 kHz                          x dB     -26.00 dB

Transmit Freq Error        -3.662 kHz
x dB Bandwidth             324.521 kHz

(Plot E:  GSM 1900MHz Channel = 661)



Agilent    11:14:27 Mar 1, 2012                               R  T

Mkr1  1.909810 GHz
Ref 35 dBm                    Atten 25 dB                          24.64 dBm

Center 1.91 GHz                                             Span 2 MHz
#Res BW 10 kHz              #VBW 100 kHz           Sweep 20.07 ms (401 pts)

Occupied Bandwidth                    Occ BW % Pwr      99.00 %
        241.0526 kHz                          x dB     -26.00 dB

Transmit Freq Error        -1.540 kHz
x dB Bandwidth             319.568 kHz

(Plot F:  GSM 1900MHz Channel = 810)

Agilent    15:00:08 Mar 1, 2012                    R   T

Mkr1 824.155 MHz
Ref 35 dBm          Atten 25 dB                        25.9 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 824.2 MHz                                    Span 2 MHz
#Res BW 10 kHz          VBW 100 kHz          Sweep 20.07 ms (401 pts)

Occupied Bandwidth                  Occ BW % Pwr      99.00 %
    244.9557 kHz                        x dB     -26.00 dB

Transmit Freq Error      -325.660 Hz
x dB Bandwidth           318.108 kHz

(Plot G: EDGE 850MHz Channel = 128)



Agilent    15:07:13 Mar 1, 2012                    R   T

Mkr1 836.595 MHz
Ref 35 dBm          Atten 25 dB                        28.62 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 836.6 MHz                                    Span 2 MHz
#Res BW 10 kHz          VBW 100 kHz          Sweep 20.07 ms (401 pts)

Occupied Bandwidth                  Occ BW % Pwr      99.00 %
    243.9577 kHz                        x dB     -26.00 dB

Transmit Freq Error      -2.007 kHz
x dB Bandwidth           320.316 kHz

(Plot H: EDGE 850MHz Channel = 190)

❄ Agilent    15:08:05 Mar 1, 2012                                R  T

Mkr1  848.775 MHz
Ref 35 dBm            Atten 25 dB                            25.84 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 848.8 MHz                                          Span 2 MHz
#Res BW 10 kHz              VBW 100 kHz        Sweep 20.07 ms (401 pts)

Occupied Bandwidth                  Occ BW % Pwr      99.00 %
        249.4078 kHz                      x dB    -26.00 dB

Transmit Freq Error      -865.926 Hz
x dB Bandwidth           317.859 kHz

(Plot I:  EDGE 850MHz Channel = 251)

❄ Agilent    15:39:08 Mar 1, 2012                                R  T

Mkr1  1.850230 GHz
Ref 35 dBm            Atten 25 dB                            22.33 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 1.85 GHz                                           Span 2 MHz
#Res BW 10 kHz             #VBW 100 kHz        Sweep 20.07 ms (401 pts)

Occupied Bandwidth                  Occ BW % Pwr      99.00 %
        244.6372 kHz                      x dB    -26.00 dB

Transmit Freq Error      -604.101 Hz
x dB Bandwidth           315.700 kHz

(Plot J:  EDGE 1900MHz Channel = 512)

Agilent 15:39:42 Mar 1, 2012 R T

Mkr1 1.880035 GHz
22.05 dBm

Ref 35 dBm     Atten 25 dB
#Peak
Log
10
dB/
Offst
22.5
dB

Center 1.88 GHz     Span 2 MHz
#Res BW 10 kHz     #VBW 100 kHz     Sweep 20.07 ms (401 pts)

Occupied Bandwidth
240.4536 kHz

Occ BW % Pwr     99.00 %
x dB     -26.00 dB

Transmit Freq Error     -4.563 kHz
x dB Bandwidth     323.980 kHz

(Plot K: EDGE 1900MHz Channel = 661)



Agilent 15:40:20 Mar 1, 2012 R T

Mkr1 1.909760 GHz
23.89 dBm

Ref 35 dBm     Atten 25 dB
#Peak
Log
10
dB/
Offst
22.5
dB

Center 1.91 GHz     Span 2 MHz
#Res BW 10 kHz     #VBW 100 kHz     Sweep 20.07 ms (401 pts)

Occupied Bandwidth
241.4567 kHz

Occ BW % Pwr     99.00 %
x dB     -26.00 dB

Transmit Freq Error     -3.453 kHz
x dB Bandwidth     307.250 kHz

(Plot L: EDGE 1900MHz Channel = 810)

※ Agilent    16:27:01 Mar 1, 2012                                R  T

Mkr1  834.92 MHz
Ref 35 dBm              Atten 25 dB                              7.578 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 835 MHz                                                  Span 8 MHz
#Res BW 10 kHz              #VBW 100 kHz          Sweep 80.26 ms (401 pts)

Occupied Bandwidth                     Occ BW % Pwr        99.00 %
     4.1592 MHz                              x dB      -26.00 dB

Transmit Freq Error        17.975 kHz
x dB Bandwidth             4.643 MHz

(Plot M: WCDMA 850MHz Channel = 4175)



※ Agilent    16:28:11 Mar 1, 2012                                R  T

Mkr1  1.88126 GHz
Ref 35 dBm              Atten 25 dB                              7.448 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 1.88 GHz                                                 Span 8 MHz
#Res BW 10 kHz              #VBW 100 kHz          Sweep 80.26 ms (401 pts)

Occupied Bandwidth                     Occ BW % Pwr        99.00 %
     4.1613 MHz                              x dB      -26.00 dB

Transmit Freq Error        20.459 kHz
x dB Bandwidth             4.616 MHz

(Plot N: WCDMA 1900MHz Channel = 9400)

Agilent    17:03:49 Mar 1, 2012                              R   T

Mkr1  836.38 MHz
Ref 30 dBm                    Atten 20 dB                              7.302 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 835 MHz                                                    Span 8 MHz
#Res BW 10 kHz                      VBW 100 kHz          Sweep 80.26 ms (401 pts)

Occupied Bandwidth                              Occ BW % Pwr      99.00 %
          4.1643 MHz                                  x dB    -26.00 dB

Transmit Freq Error        17.620 kHz
x dB Bandwidth             4.644 MHz

(Plot O: HSDPA 850MHz Channel = 4175)



Agilent    17:04:47 Mar 1, 2012                              R   T

Mkr1  1.88046 GHz
Ref 30 dBm                    Atten 20 dB                              6.192 dBm
#Peak
Log
10
dB/
Offst
22.5
dB

Center 1.88 GHz                                                   Span 8 MHz
#Res BW 10 kHz                      VBW 100 kHz          Sweep 80.26 ms (401 pts)

Occupied Bandwidth                              Occ BW % Pwr      99.00 %
          4.1421 MHz                                  x dB    -26.00 dB

Transmit Freq Error        16.118 kHz
x dB Bandwidth             4.637 MHz

(Plot P:  HSDPA1900MHz Channel = 9400)

## 2.3 Frequency Stability

### 2.3.1 Requirement

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

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

### 2.3.2 Test Description

1. Test Setup:
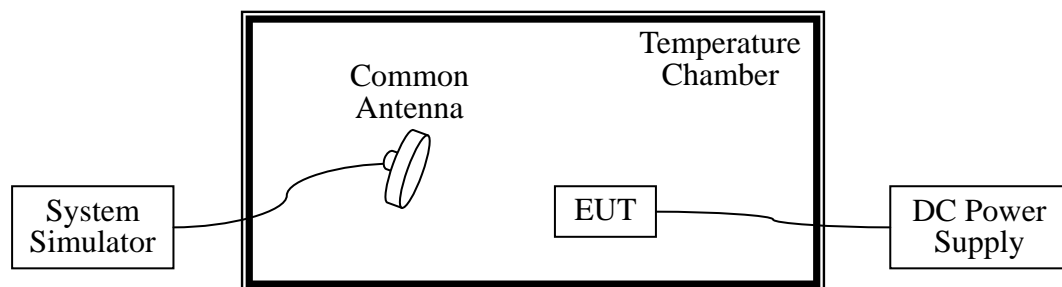


The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common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

2. Equipments List:

| Description | Manufacturer | Model | Serial No. | Cal. Date |
|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2011.05 |
| DC Power Supply | Good Will | GPS-3030DD | EF920938 | 2011.05 |
| Temperature Chamber | YinHe Experimental Equip. | HL4003T | (n.a.) | 2011.05 |

### 2.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25°C. The frequency

deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm

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) | | Verdict |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | 9.78 | ±2060.5 | -5.66 | ±2091.5 | 5.05 | ±2122 | PASS |
| | -20 | -11.17 | | 19.70 | | 7.49 | | |
| | -10 | 23.28 | | -10.06 | | 0.19 | | |
| | 0 | -3.03 | | 21.06 | | 34.30 | | |
| | +10 | -3.03 | | 13.07 | | 45.99 | | |
| | +20 | -10.39 | | -12.76 | | -16.51 | | |
| | +30 | 27.75 | | -2.05 | | 19.46 | | |
| | +40 | 5.31 | | -3.77 | | -6.80 | | |
| | +50 | -22.19 | | 5.39 | | 7.58 | | |
| 4.2 | +25 | 23.74 | | 19.65 | | 23.11 | | |
| 3.6 | +25 | 23.29 | | -20.70 | | -14.93 | | |

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) | | Verdict |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | 23.12 | ±1850.2 | 21.02 | ±1880.0 | 25.47 | ±1909.8 | PASS |
| | -20 | 11.33 | | 41.08 | | 37.73 | | |
| | -10 | -17.55 | | 20.65 | | -5.51 | | |
| | 0 | -21.75 | | -3.32 | | 22.29 | | |
| | +10 | -18.76 | | 42.75 | | 41.22 | | |
| | +20 | 32.54 | | -2.32 | | -8.03 | | |
| | +30 | -18.89 | | 23.12 | | -11.01 | | |
| | +40 | 44.49 | | 11.33 | | 0.52 | | |
| | +50 | 40.72 | | -17.55 | | 25.40 | | |
| 4.2 | +25 | 16.15 | | 38.10 | | -6.06 | | |
| 3.6 | +25 | 32.34 | | -22.06 | | -21.86 | | |

**3.** EDGE 850MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 128 (824.2MHz) | | Channel = 190 (836.6MHz) | | Channel = 251 (848.8MHz) | | |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | -3.10 | ±2060.5 | -2.80 | ±2091.5 | 9.49 | ±2122 | PASS |
| | -20 | 38.28 | | -14.67 | | -12.90 | | |
| | -10 | -2.15 | | 0.84 | | 12.66 | | |
| | 0 | 40.06 | | 9.35 | | 5.05 | | |
| | +10 | 1.99 | | -10.10 | | 3.02 | | |
| | +20 | -19.86 | | -16.11 | | 10.76 | | |
| | +30 | 39.56 | | 17.76 | | -16.51 | | |
| | +40 | 46.60 | | 15.64 | | -2.10 | | |
| | +50 | 39.98 | | 3.67 | | -12.99 | | |
| 4.2 | +25 | -15.71 | | 13.95 | | -7.53 | | |
| 3.6 | +25 | -17.70 | | 6.23 | | 6.78 | | |

**4.** EDGE 1900MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 512 (1850.2MHz) | | Channel = 661 (1880.0MHz) | | Channel = 810 (1909.8MHz) | | |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | -13.77 | ±1850.2 | 23.62 | ±1880.0 | 24.03 | ±1909.8 | PASS |
| | -20 | 0.62 | | 7.23 | | -6.98 | | |
| | -10 | 1.65 | | -24.78 | | 4.55 | | |
| | 0 | 2.47 | | -1.26 | | -0.20 | | |
| | +10 | -10.76 | | -18.68 | | 26.30 | | |
| | +20 | -2.11 | | -21.61 | | 35.26 | | |
| | +30 | 13.33 | | 14.58 | | -26.78 | | |
| | +40 | 5.33 | | -0.68 | | 19.54 | | |
| | +50 | -2.56 | | 36.87 | | -16.67 | | |
| 4.2 | +25 | 17.60 | | 3.88 | | 26.79 | | |
| 3.6 | +25 | -8.09 | | 13.12 | | 19.93 | | |

**5.** WCDMA 850MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 4132 (826.4MHz) | | Channel = 4175 (835MHz) | | Channel = 4233 (846.6MHz) | | |
| | | Hz | Limit | Hz | Limit | Hz | Limit | |
| 3.7 | -30 | 27.16 | ±826.4 | -13.39 | ±835 | -9.81 | ±846.6 | PASS |
| | -20 | -17.02 | | -4.75 | | -23.82 | | |
| | -10 | 10.82 | | 18.85 | | 26.39 | | |
| | 0 | 13.98 | | 5.05 | | 30.98 | | |
| | +10 | -2.66 | | 19.62 | | -2.65 | | |
| | +20 | 32.07 | | 30.40 | | 18.30 | | |
| | +30 | -7.98 | | 13.45 | | -12.57 | | |
| | +40 | 26.21 | | 1.31 | | 28.93 | | |
| | +50 | 11.10 | | -12.52 | | 19.66 | | |
| 4.2 | +25 | -6.18 | | 30.62 | | 22.19 | | |
| 3.6 | +25 | 18.66 | | -18.00 | | -18.70 | | |

6.  WCDMA 1900MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 9262 (1852.4MHz) | | Channel = 9400 (1880.0MHz) | | Channel = 9538 (1907.6MHz) | | |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | 17.29 | ±1852.4 | 18.25 | ±1880.0 | -8.99 | ±1907.6 | PASS |
| | -20 | -7.32 | | 2.49 | | 23.60 | | |
| | -10 | -3.40 | | -10.71 | | 14.81 | | |
| | 0 | 16.47 | | -7.77 | | -3.07 | | |
| | +10 | 30.18 | | 21.97 | | 17.42 | | |
| | +20 | -2.62 | | 11.87 | | -10.39 | | |
| | +30 | 22.31 | | -0.59 | | 17.47 | | |
| | +40 | 0.32 | | 21.45 | | 27.84 | | |
| | +50 | -13.55 | | -5.71 | | -2.53 | | |
| 4.2 | +25 | 23.21 | | 14.58 | | 20.95 | | |
| 3.6 | +25 | 22.00 | | 26.37 | | -23.22 | | |

7. HSDPA 850MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 4132 (826.4MHz) | | Channel = 4175 (835MHz) | | Channel = 4233 (846.6MHz) | | Verdict |
| | | Hz | Limit | Hz | Limit | Hz | Limit | |
| 3.7 | -30 | 8.78 | ±826.4 | 21.77 | ±835 | -3.87 | ±846.6 | PASS |
| | -20 | -1.49 | | -1.93 | | 14.41 | | |
| | -10 | 17.14 | | 18.67 | | 21.57 | | |
| | 0 | -23.61 | | 27.46 | | -24.37 | | |
| | +10 | 32.03 | | -8.56 | | -13.96 | | |
| | +20 | 23.83 | | 20.65 | | 35.23 | | |
| | +30 | 13.31 | | 12.88 | | -8.31 | | |
| | +40 | -14.01 | | -14.75 | | -13.95 | | |
| | +50 | 34.55 | | 23.37 | | 26.37 | | |
| 4.2 | +25 | -3.57 | | 7.93 | | 7.90 | | |
| 3.6 | +25 | 17.51 | | -31.21 | | 1.78 | | |

8. HSDPA 1900MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 9262 (1852.4MHz) | | Channel = 9400 (1880.0MHz) | | Channel = 9538 (1907.6MHz) | | Verdict |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 3.7 | -30 | 1.80 | ±1852.4 | 15.66 | ±1880 | 2.61 | ±1907.6 | PASS |
| | -20 | -17.26 | | 1.75 | | -8.38 | | |
| | -10 | 12.78 | | -7.00 | | -13.02 | | |
| | 0 | 11.87 | | 21.02 | | -8.51 | | |
| | +10 | -16.65 | | 26.48 | | 5.64 | | |
| | +20 | 20.12 | | -4.81 | | -3.85 | | |
| | +30 | -3.01 | | 34.31 | | 9.57 | | |
| | +40 | 21.71 | | 8.36 | | 27.54 | | |
| | +50 | 14.37 | | -25.88 | | -12.52 | | |
| 4.2 | +25 | -11.21 | | 29.43 | | -2.83 | | |
| 3.6 | +25 | 10.60 | | -2.27 | | 14.42 | | |

## 2.4 Conducted Out of Band Emissions

### 2.4.1 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.

### 2.4.2 Test Description

See section 2.1.2 of this report.

### 2.4.3 Test Result

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

1.  Test Verdict:

| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| GSM 850MHz | 128 | 824.2 | < -25 | Plot A1toA1.1 | -13 | PASS |
| | 190 | 836.6 | < -25 | Plot A2toA2.1 | | PASS |
| | 251 | 848.8 | < -25 | Plot A3toA3.1 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | < -25 | Plot B1toB1.1 | -13 | PASS |
| | 661 | 1880.0 | < -25 | Plot B2toB2.1 | | PASS |
| | 810 | 1909.8 | < -25 | Plot B3toB3.1 | | PASS |
| EDGE 850MHz | 128 | 824.2 | < -25 | Plot C1toC1.1 | -13 | PASS |
| | 190 | 836.6 | < -25 | Plot C2toC2.1 | | PASS |
| | 251 | 848.8 | < -25 | Plot C3toC3.1 | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | < -25 | Plot D1toD1.1 | -13 | PASS |
| | 661 | 1880.0 | < -25 | Plot D2toD2.1 | | PASS |
| | 810 | 1909.8 | < -25 | Plot D3toD3.1 | | PASS |
| WCDMA 850MHz | 4132 | 826.4 | < -25 | Plot E1toE1.1 | -13 | PASS |
| | 4175 | 835 | < -25 | Plot E2toE2.1 | | PASS |
| | 4233 | 846.6 | < -25 | Plot E3toE3.1 | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | < -25 | Plot F1toF1.1 | -13 | PASS |
| | 9400 | 1880 | < -25 | Plot F2toF2.1 | | PASS |

| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| | 9538 | 1907.6 | < -25 | Plot F3toF3.1 | | PASS |
| HSDPA 850MHz | 4132 | 826.4 | < -25 | Plot G1toG1.1 | -13 | PASS |
| | 4175 | 835 | < -25 | Plot G2toG2.1 | | PASS |
| | 4233 | 846.6 | < -25 | Plot G3toG3.1 | | PASS |
| HSDPA 1900MHz | 9262 | 1852.4 | < -25 | Plot H1toH1.1 | -13 | PASS |
| | 9400 | 1880 | < -25 | Plot H2toH2.1 | | PASS |
| | 9538 | 1907.6 | < -25 | Plot H3toH3.1 | | PASS |

2.  Test Plots for the Whole Measurement Frequency Range:

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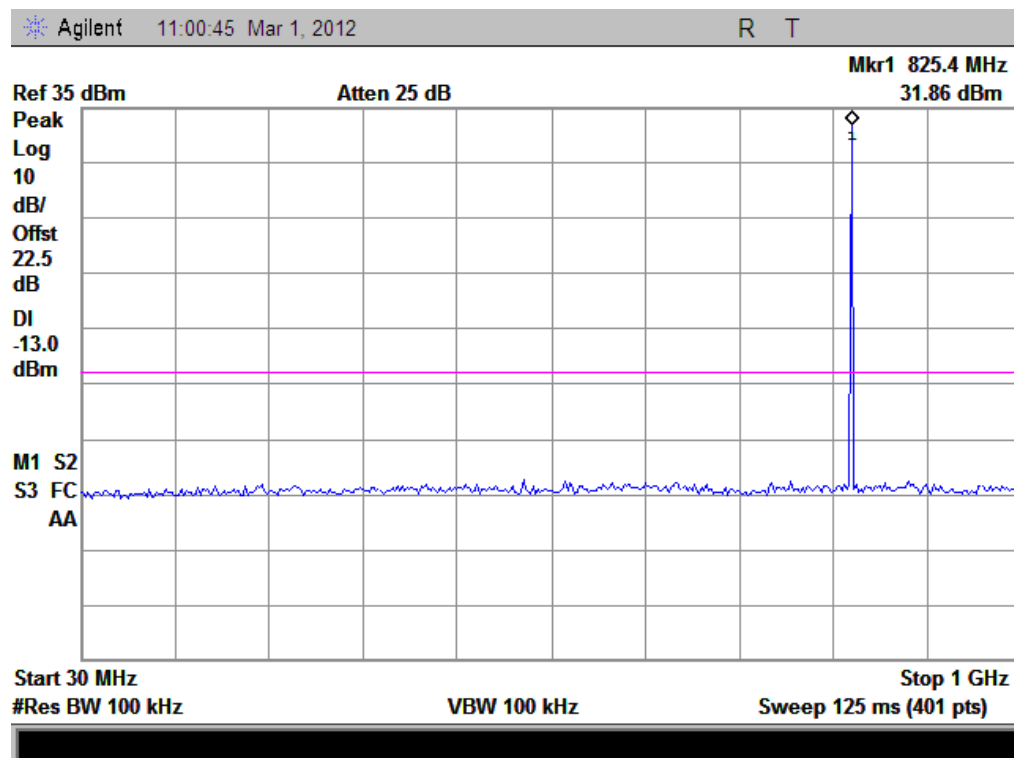


(Plot A1:     GSM 850MHz Channel = 128, 30MHz to 1GHz)
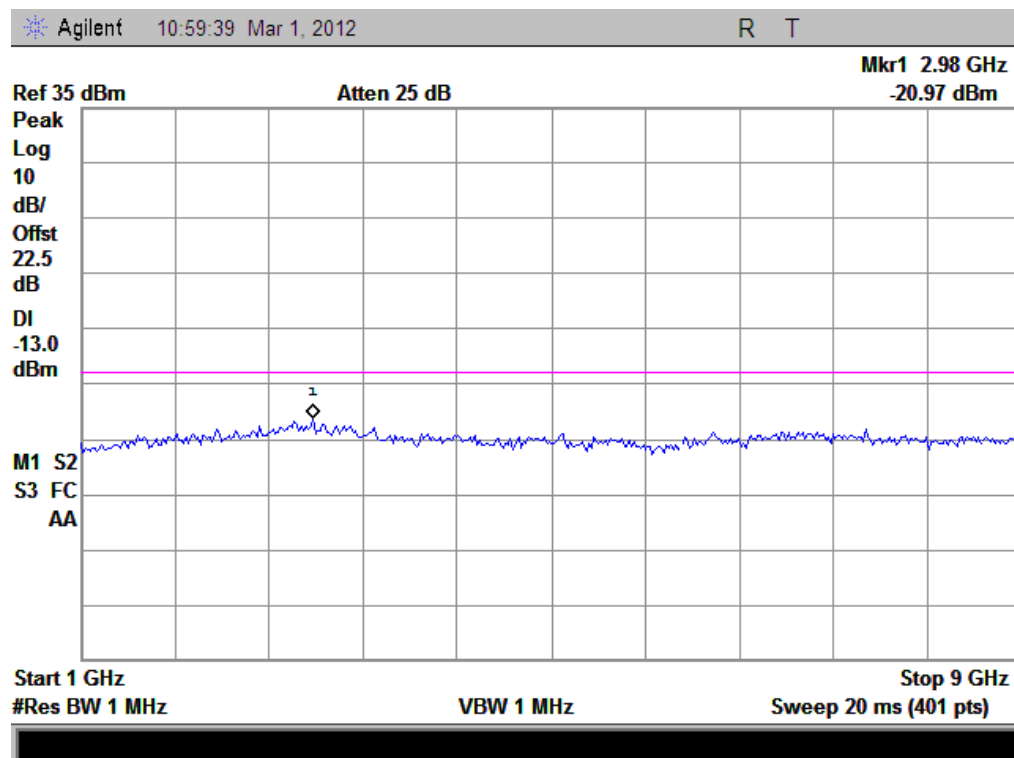
(Plot A1.1:   GSM 850MHz Channel = 128, 1GHz to 9GHz)
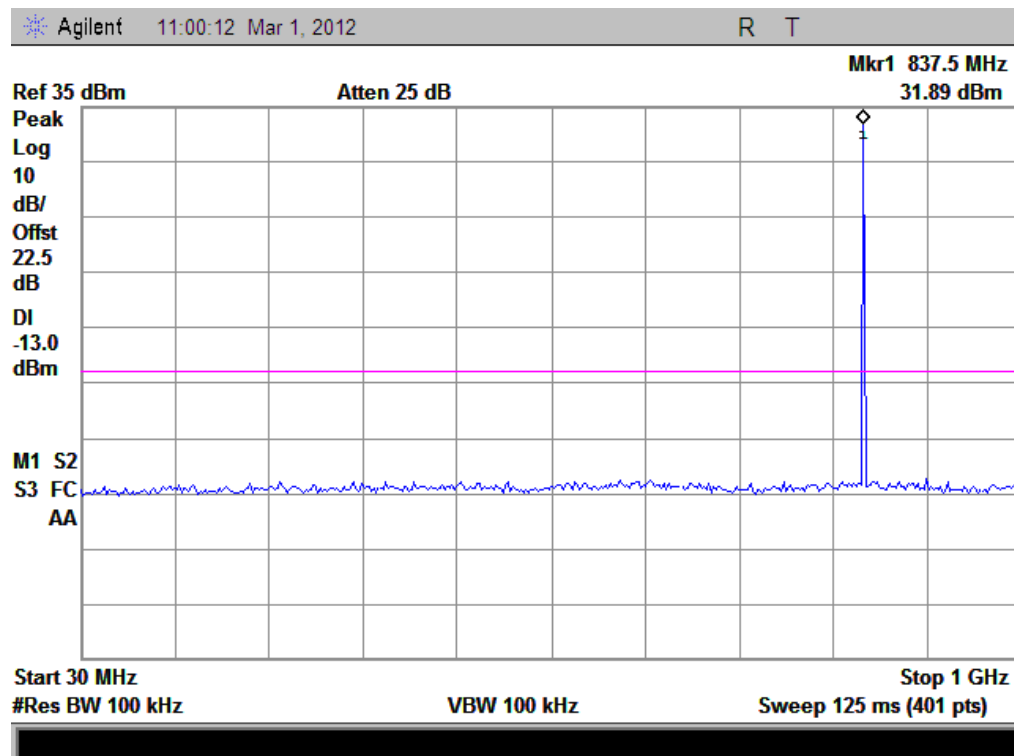


(Plot A2:     GSM 850MHz Channel = 190, 30MHz to 1GHz)
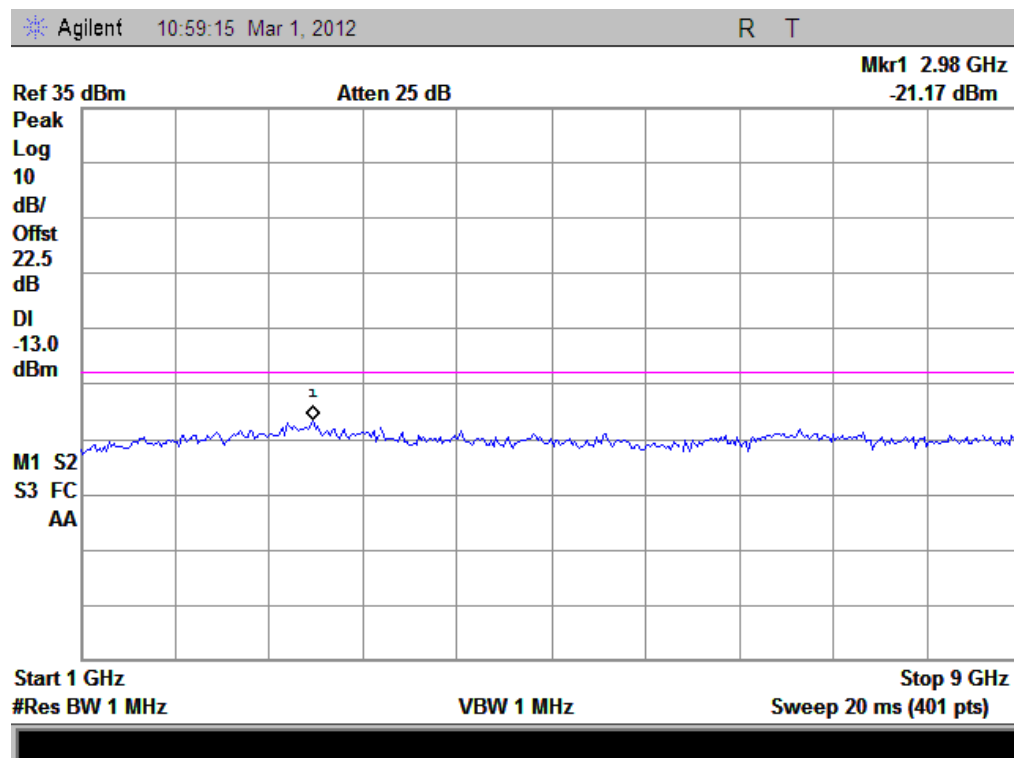
(Plot A2.1:   GSM 850MHz Channel = 190, 1GHz to 9GHz)
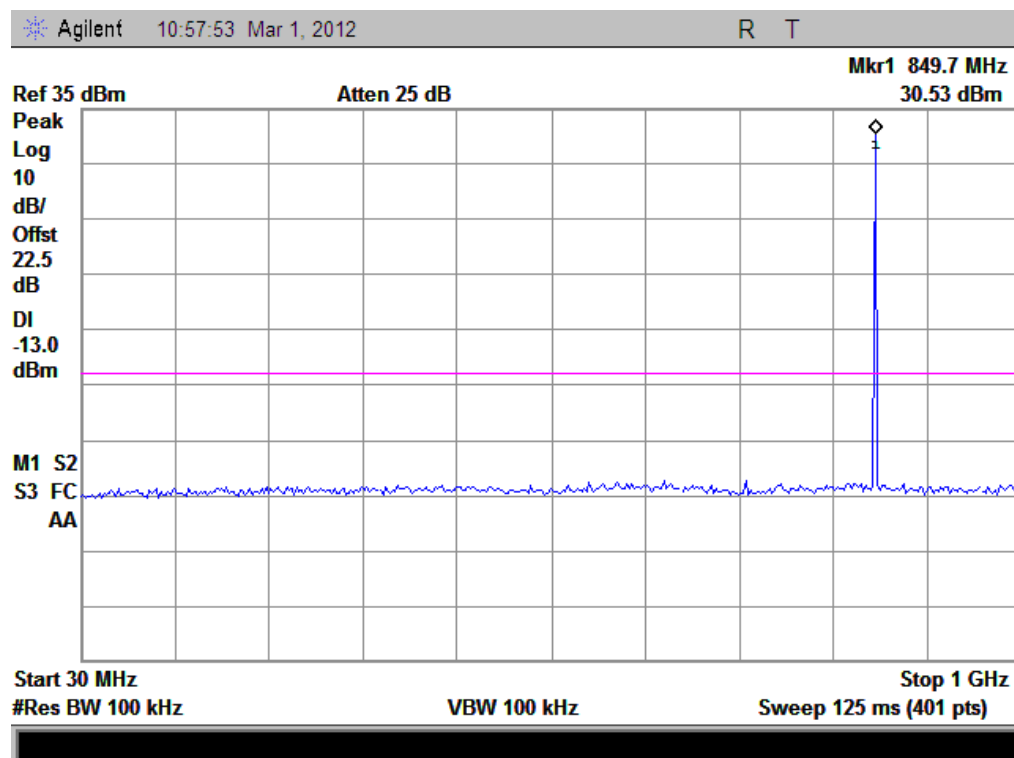


(Plot A3:      GSM 850MHz Channel = 251, 30MHz to 1GHz)
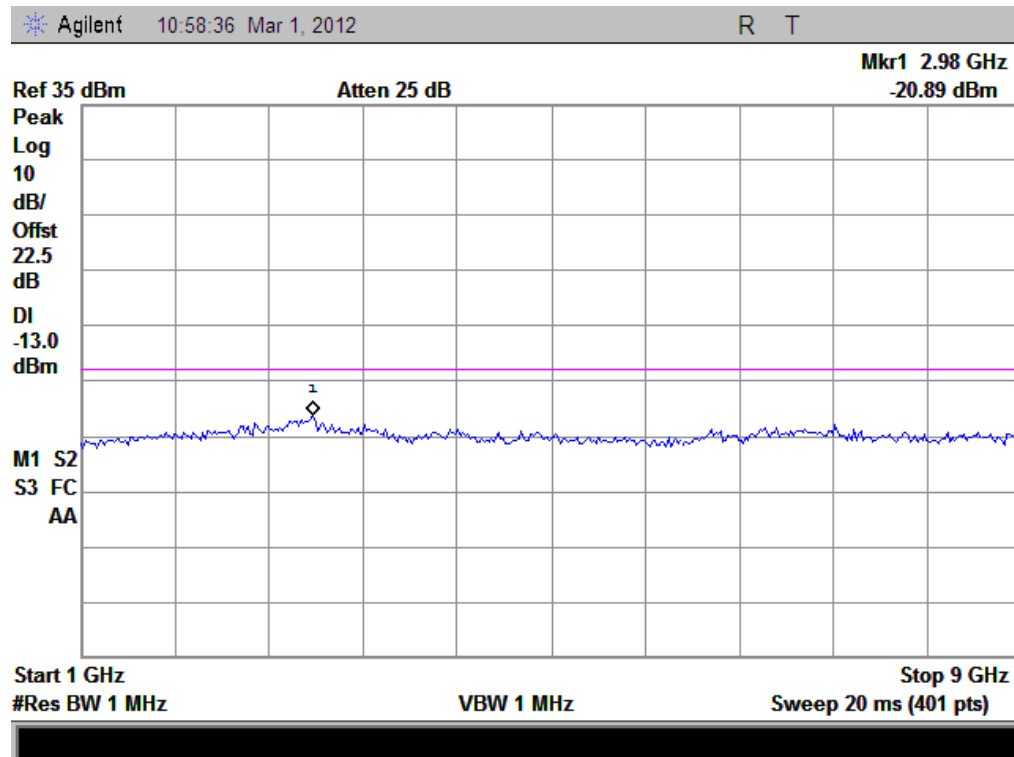
(Plot A3.1:   GSM 850MHz Channel = 251, 1GHz to 9GHz)
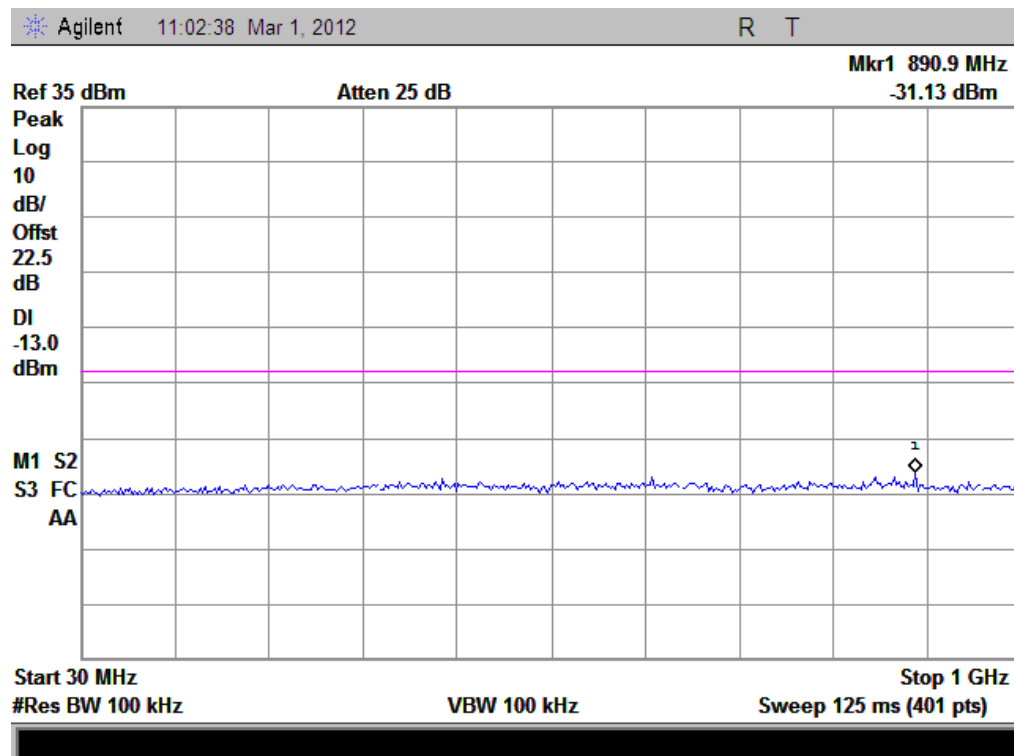


(Plot B1:     GSM 1900MHz Channel = 512, 30MHz to 1GHz)
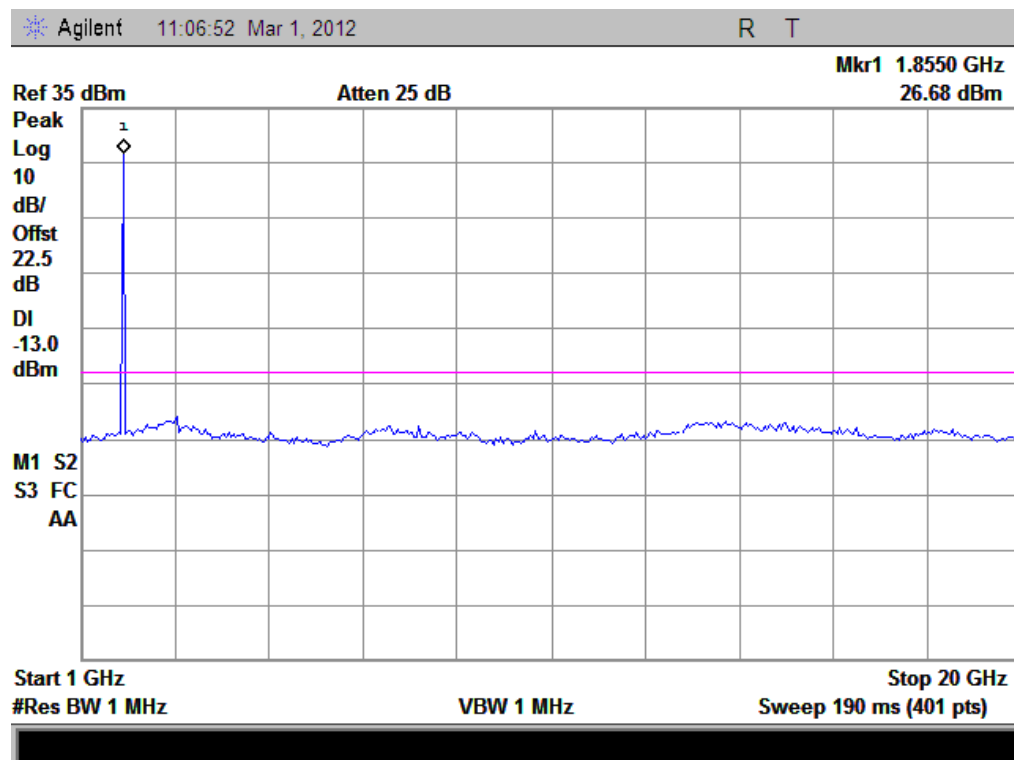
(Plot B1.1:   GSM 1900MHz Channel = 512, 1GHz to 20GHz)
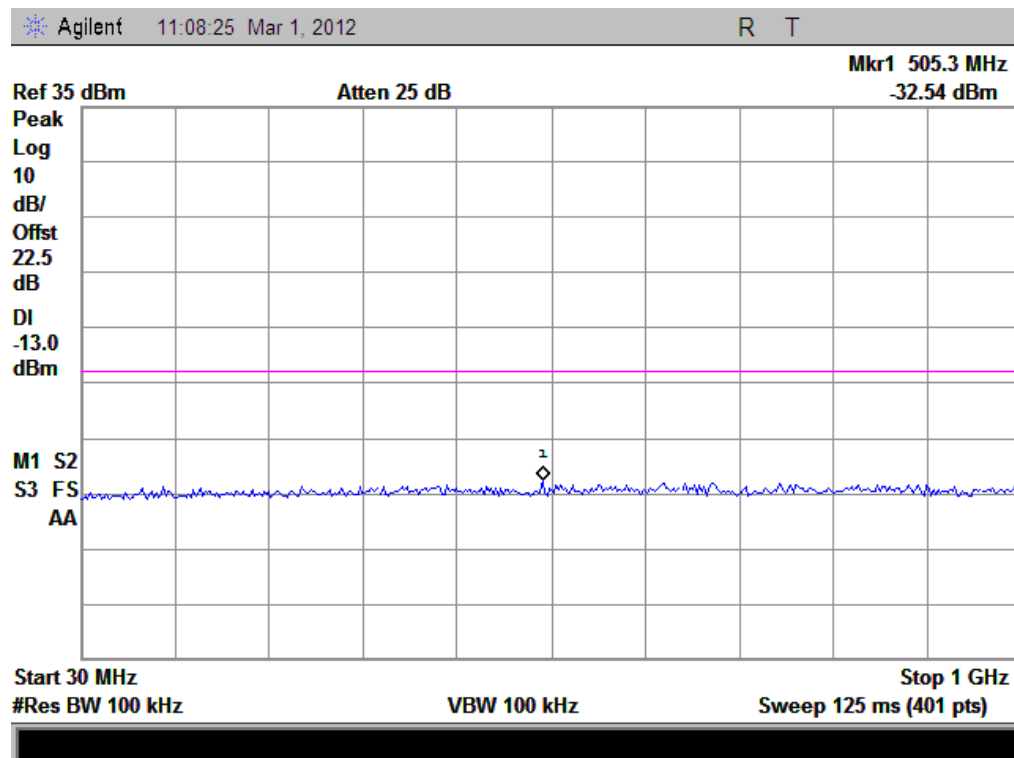


(Plot B2:      GSM 1900MHz Channel = 661, 30MHz to 1GHz)
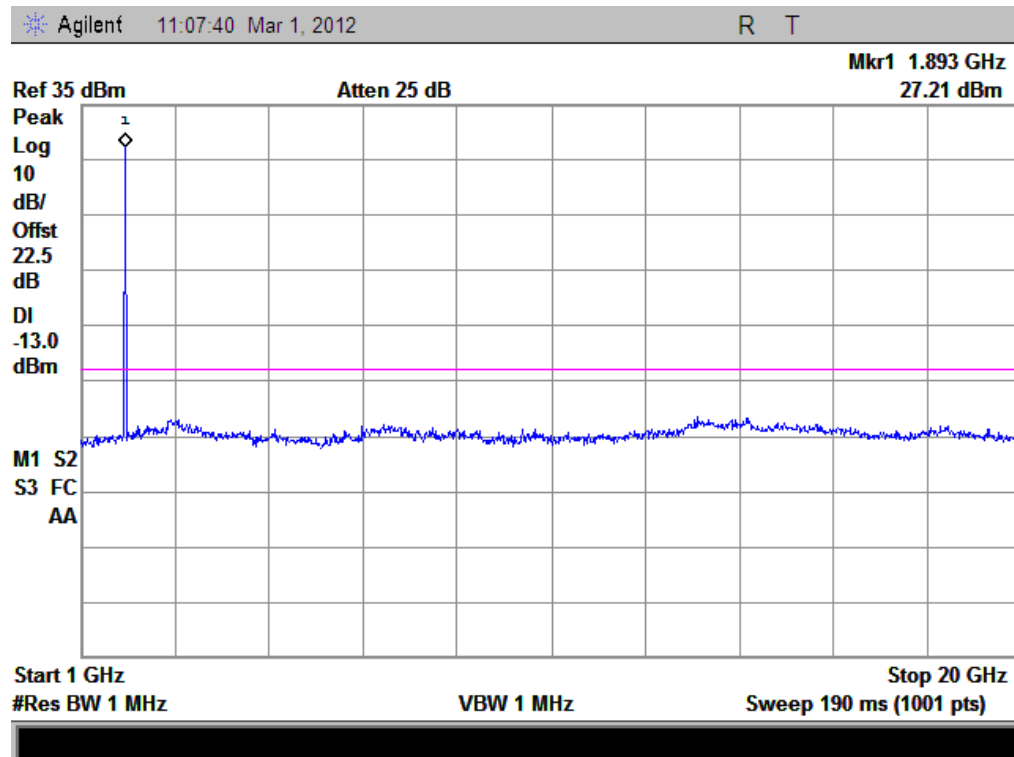
(Plot B2.1:   GSM 1900MHz Channel = 661, 1GHz to 20GHz)
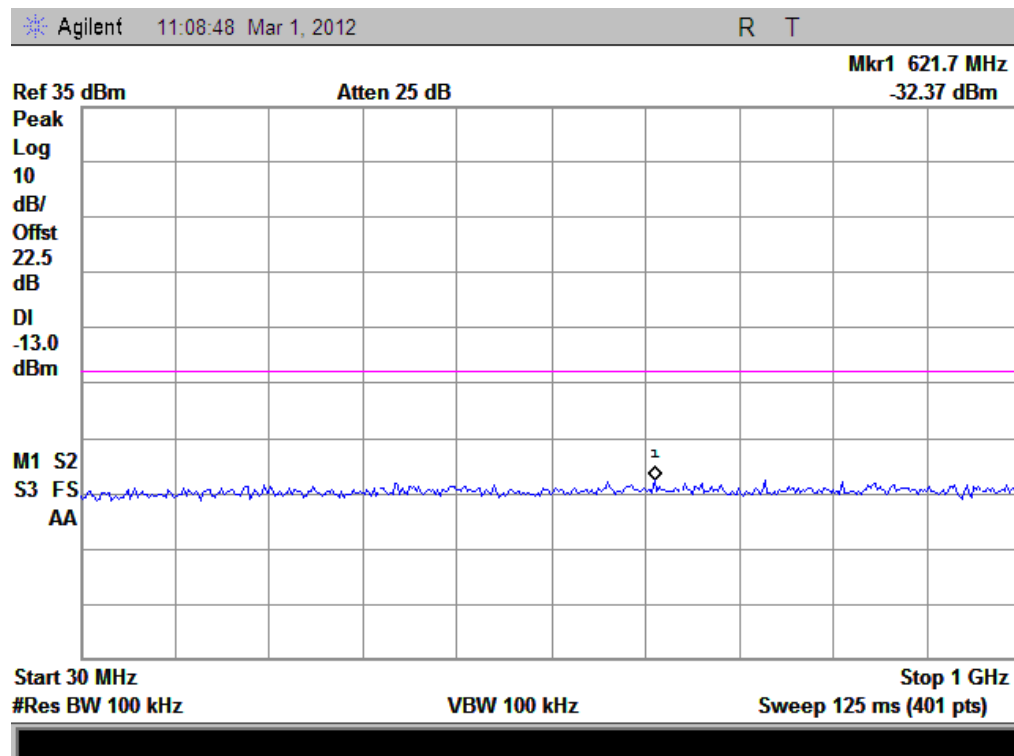


(Plot B3:      GSM 1900MHz Channel = 810, 30MHz to 1GHz)
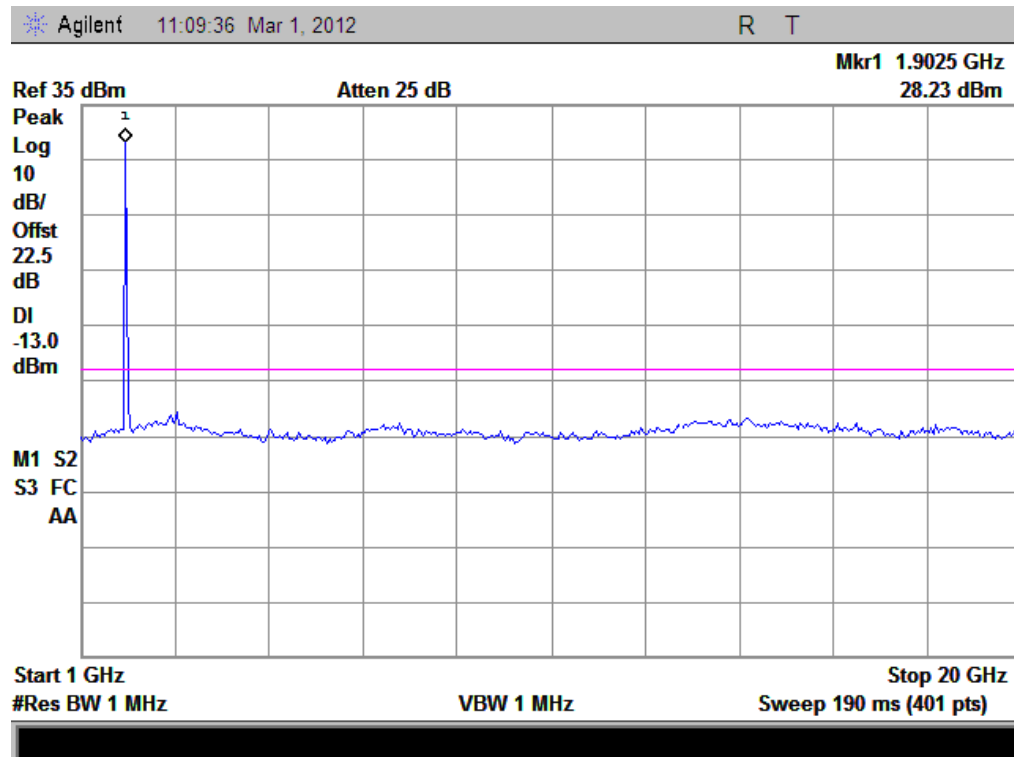
(Plot B3.1:   GSM 1900MHz Channel = 810, 1GHz to 20GHz)
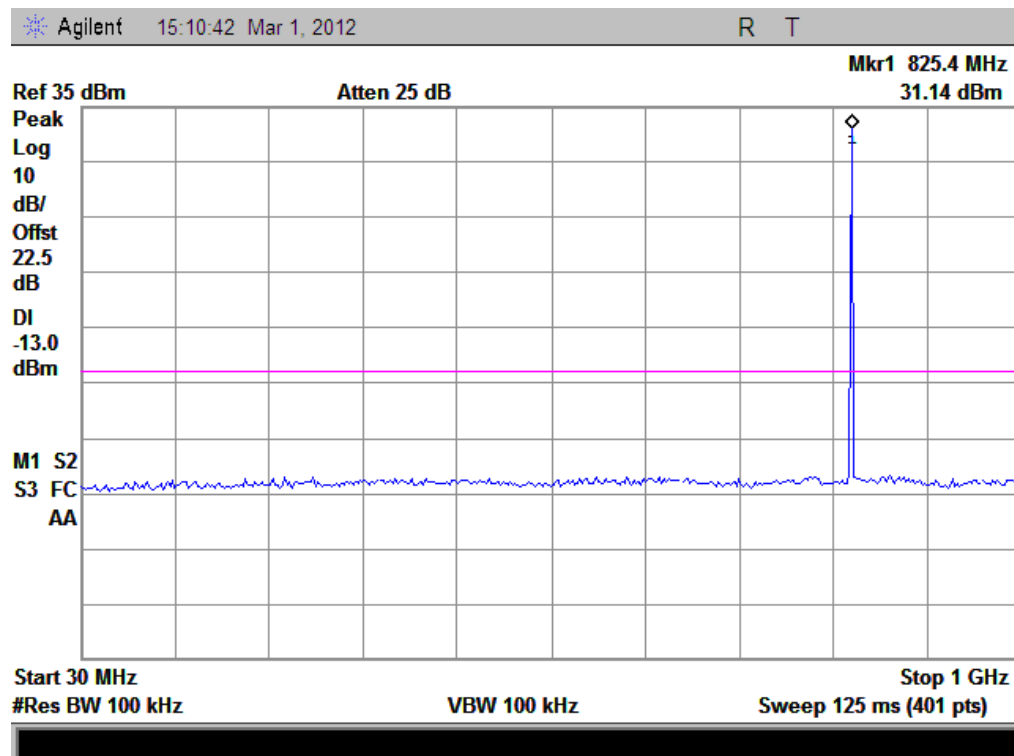


(Plot C1:     EDGE 850MHz Channel = 128, 30MHz to 1GHz)
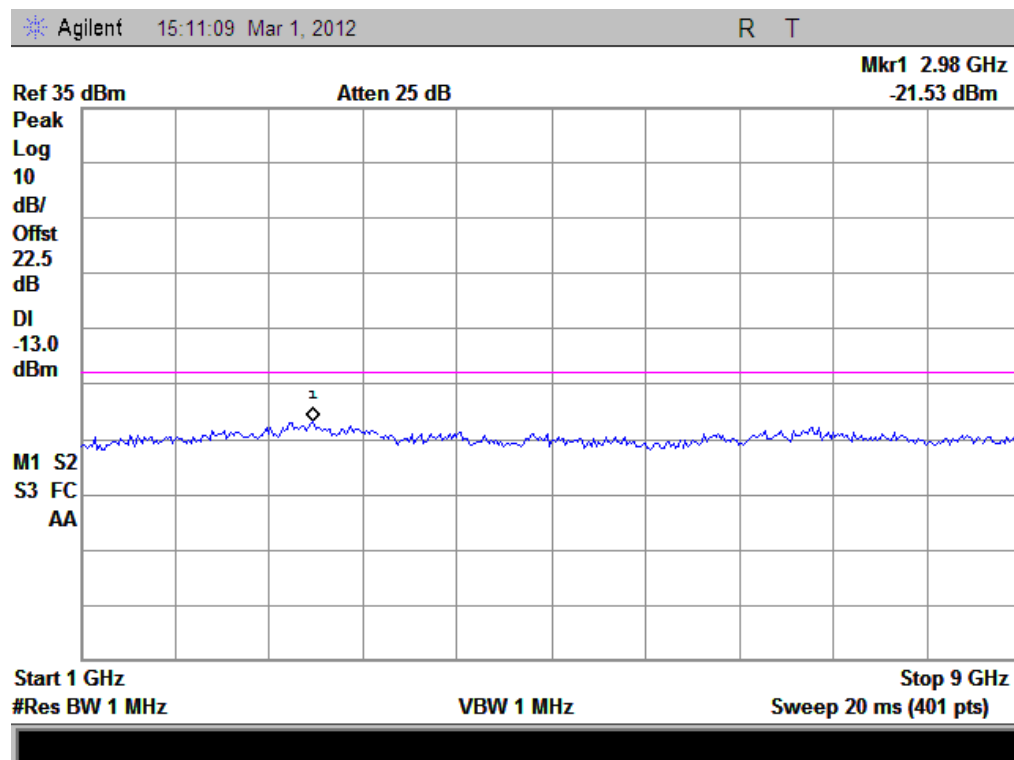
(Plot C1.1:   EDGE 850MHz Channel = 128, 1GHz to 9GHz)
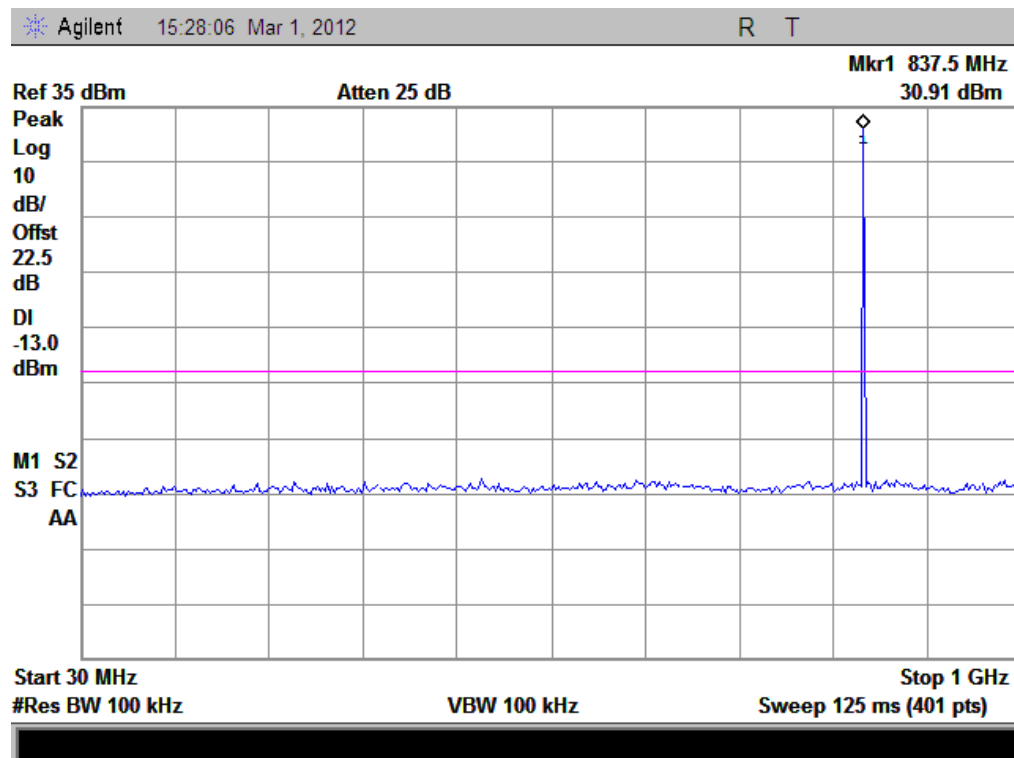


(Plot C2:      EDGE 850MHz Channel = 190, 30MHz to 1GHz)
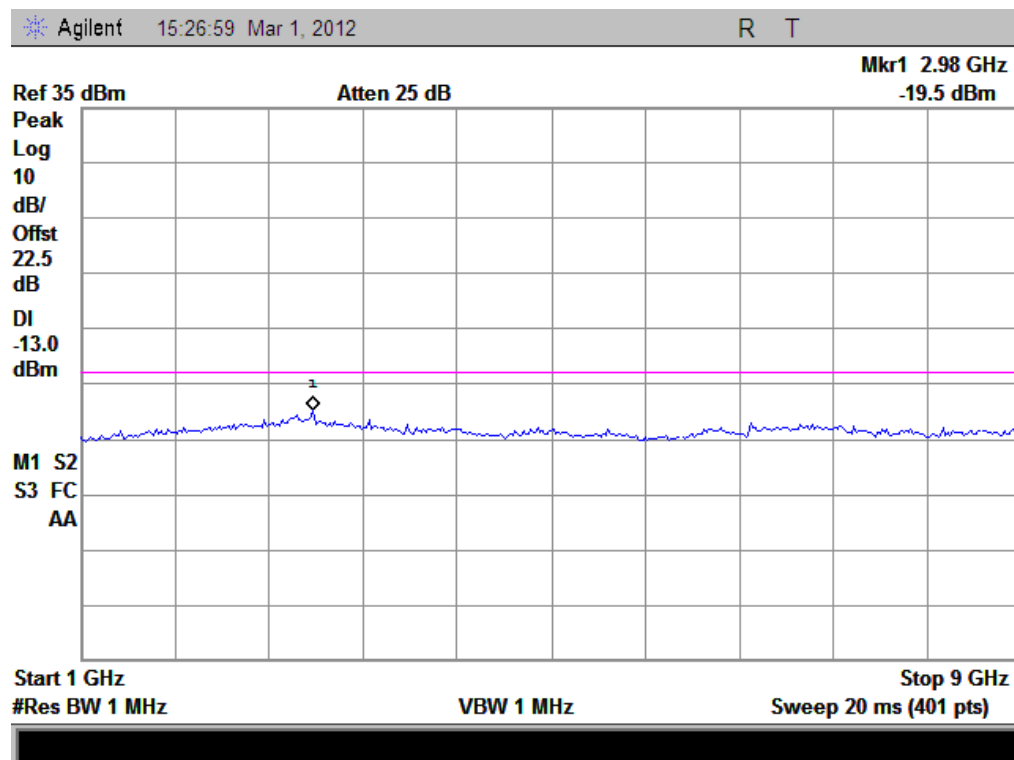
(Plot C2.1:   EDGE 850MHz Channel = 190, 1GHz to 9GHz)
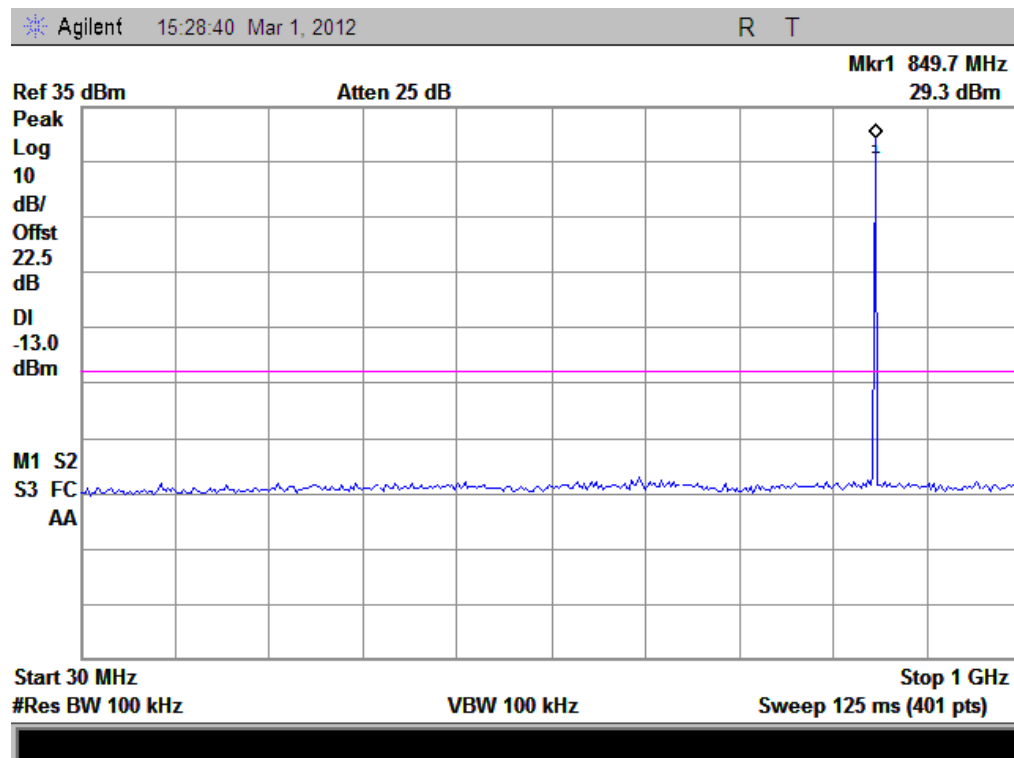


(Plot C3:      EDGE 850MHz Channel = 251, 30MHz to 1GHz)
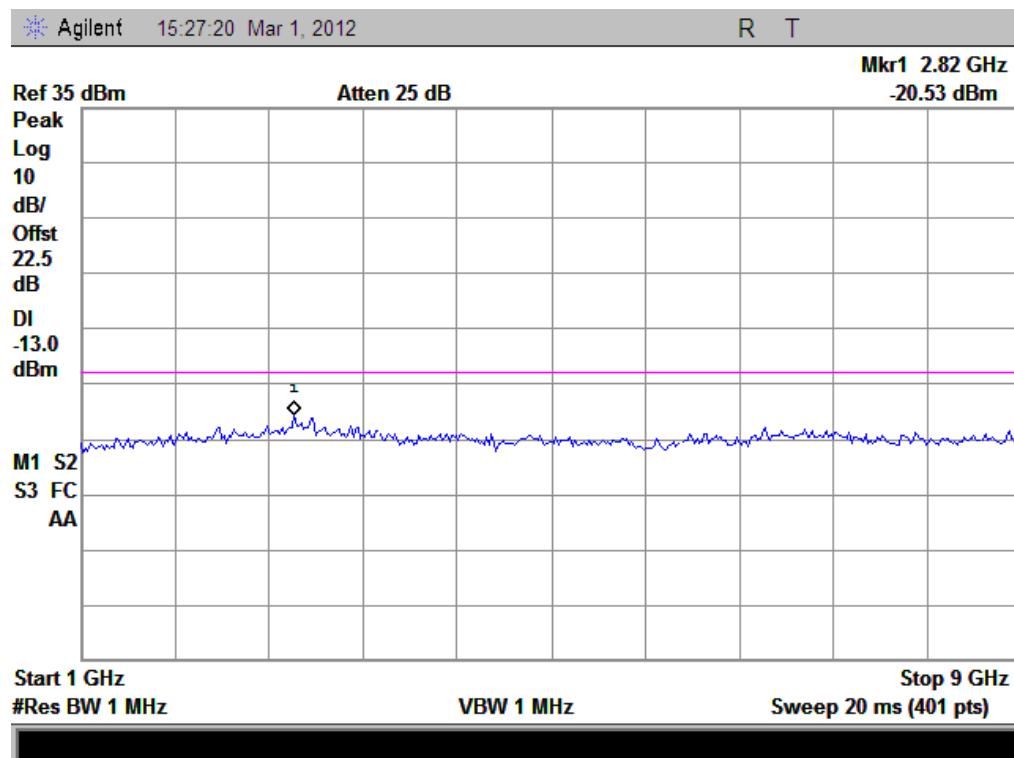
(Plot C3.1:   EDGE 850MHz Channel = 251, 1GHz to 9GHz)
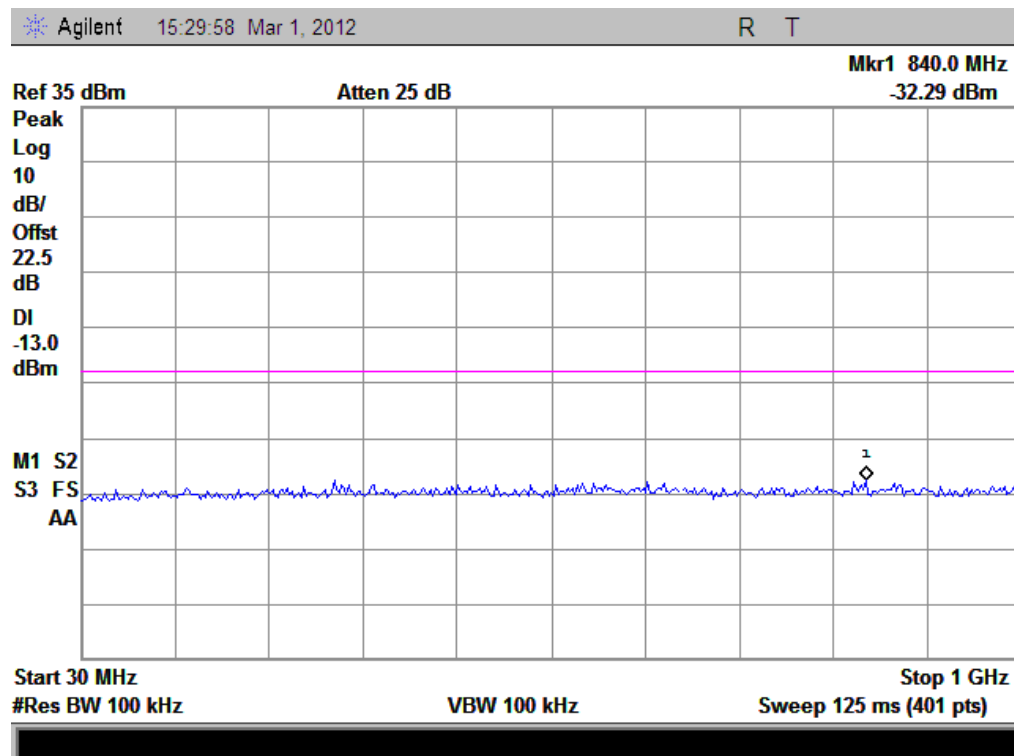


(Plot D1:      EDGE 1900MHz Channel = 512, 30MHz to 1GHz)
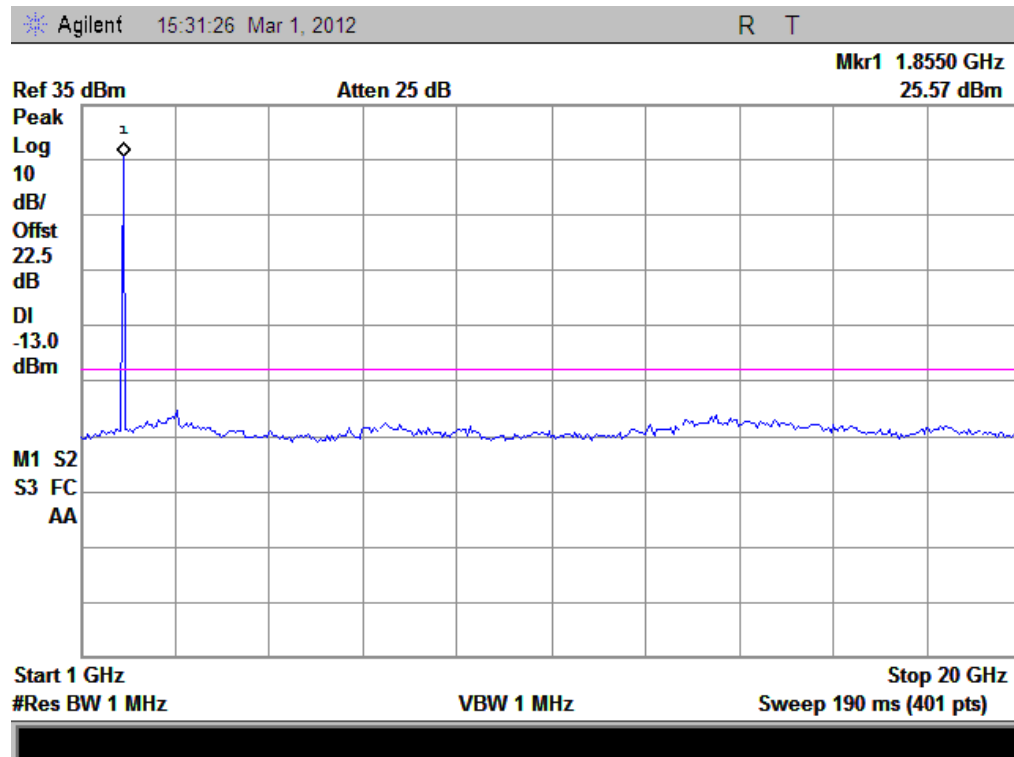
(Plot D1.1:   EDGE 850MHz Channel = 512, 1GHz to 20GHz)
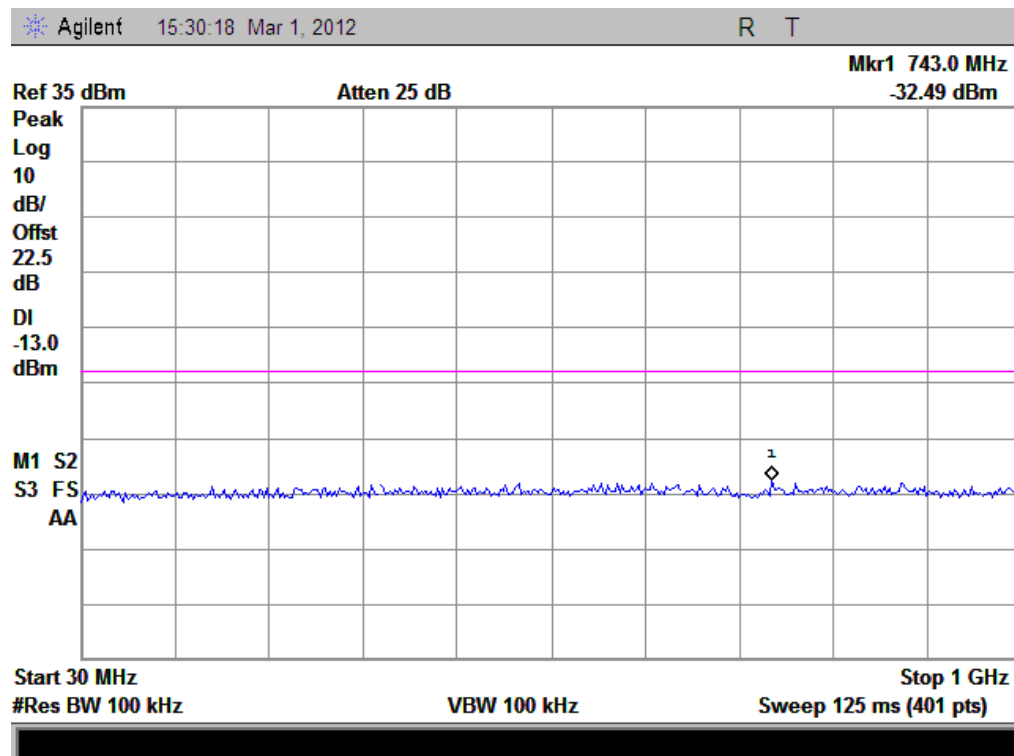


(Plot D2:      EDGE 1900MHz Channel = 661, 30MHz to 1GHz)
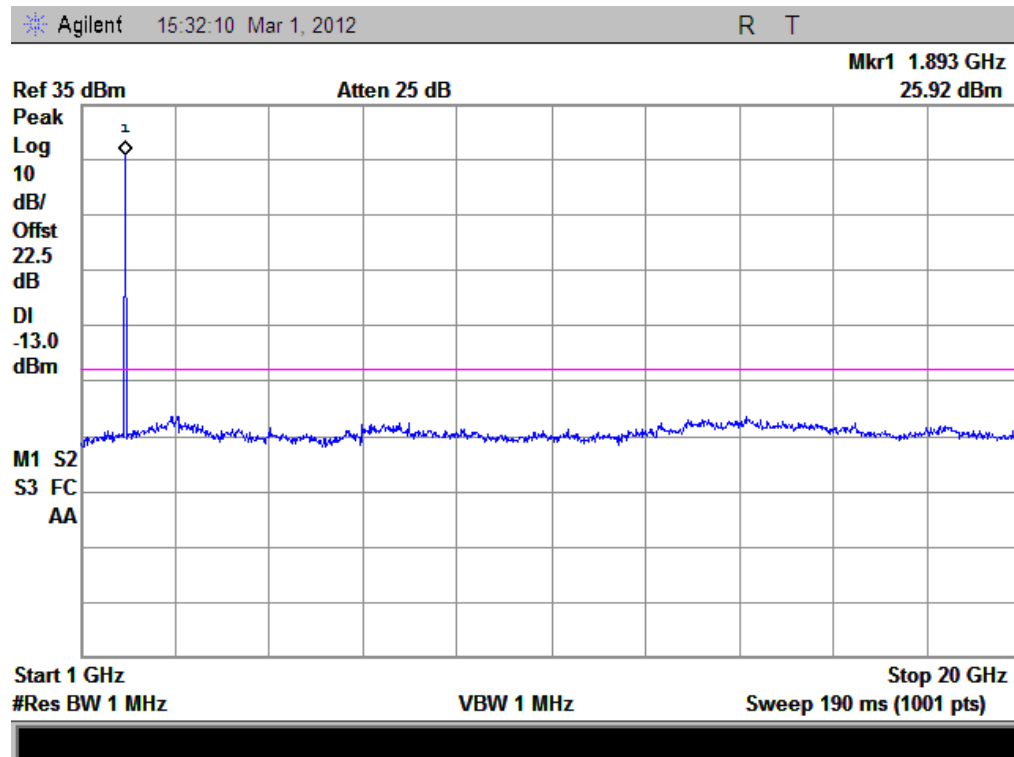
(Plot D2.1:   EDGE 1900MHz Channel = 661,1GHz to 20GHz)
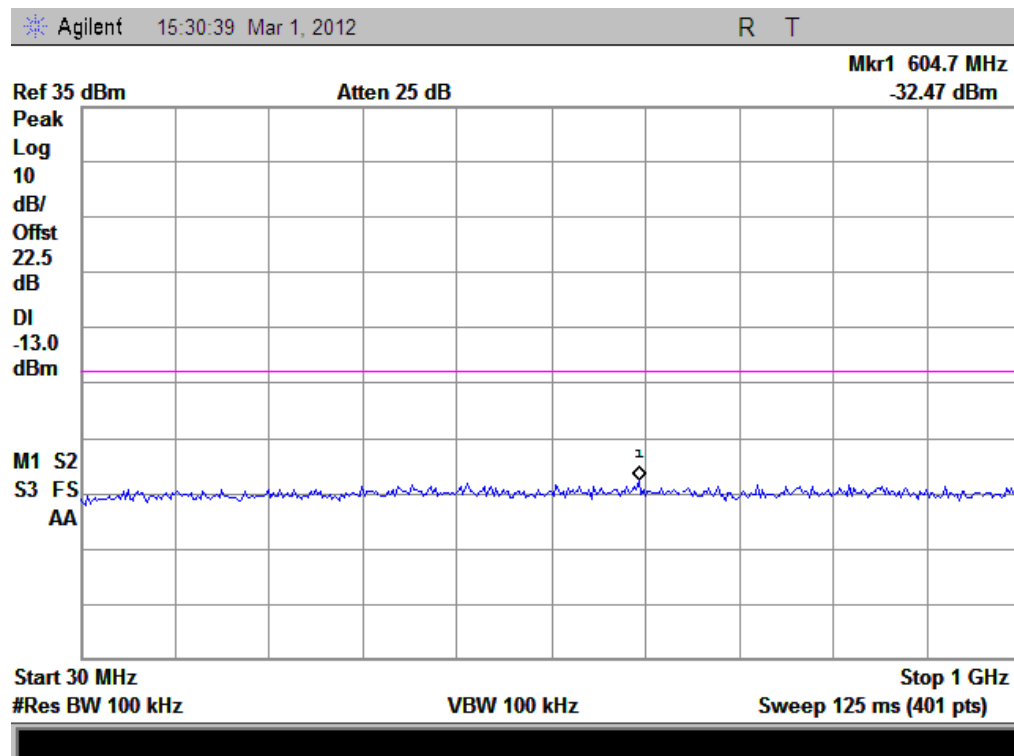


(Plot D3:      EDGE 1900MHz Channel = 810, 30MHz to 1GHz)
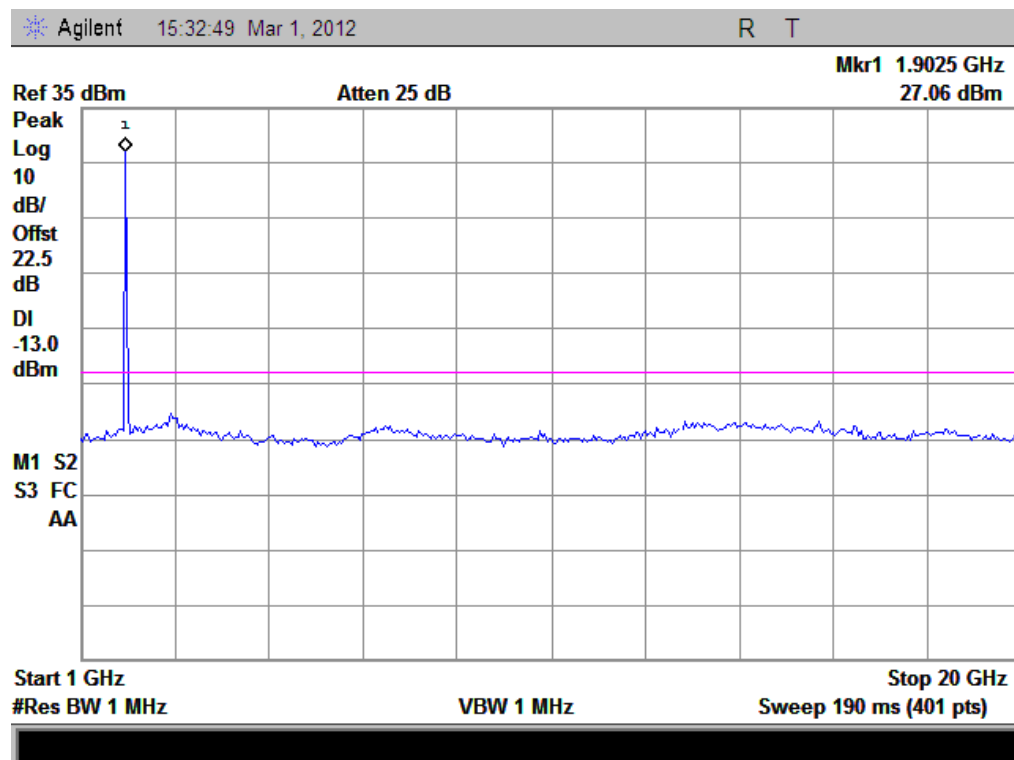
(Plot D3.1:   EDGE 1900MHz Channel = 810, 1GHz to 20GHz)
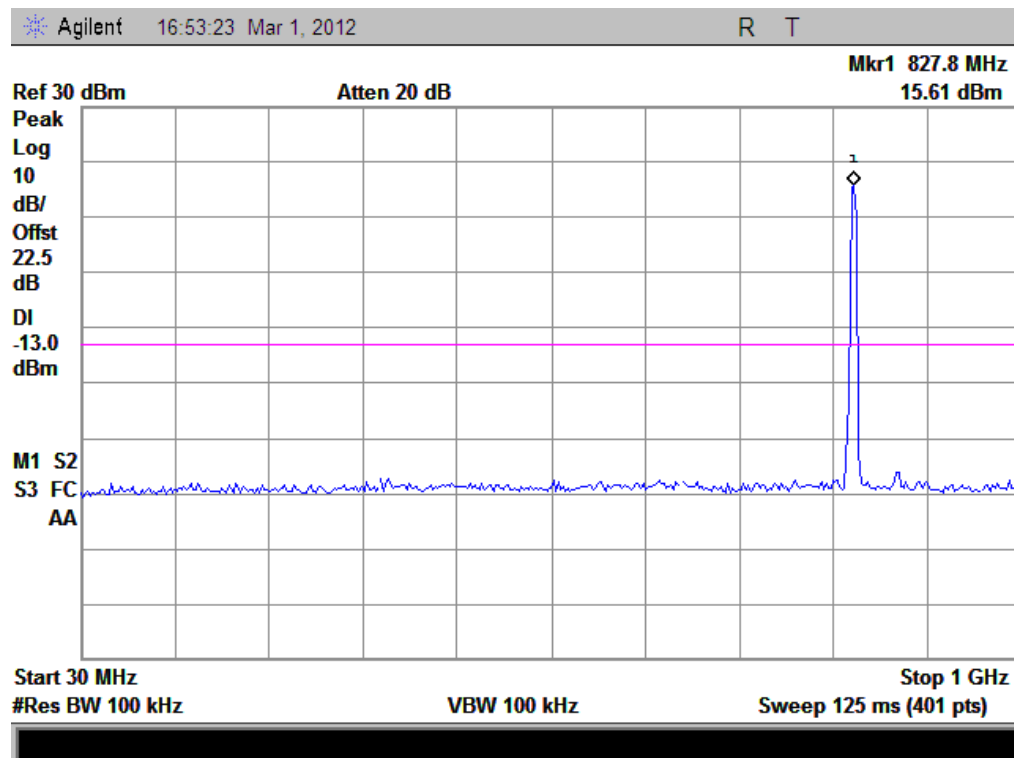


(Plot E1:      WCDMA850MHz Channel = 4132, 30MHz to 1GHz)
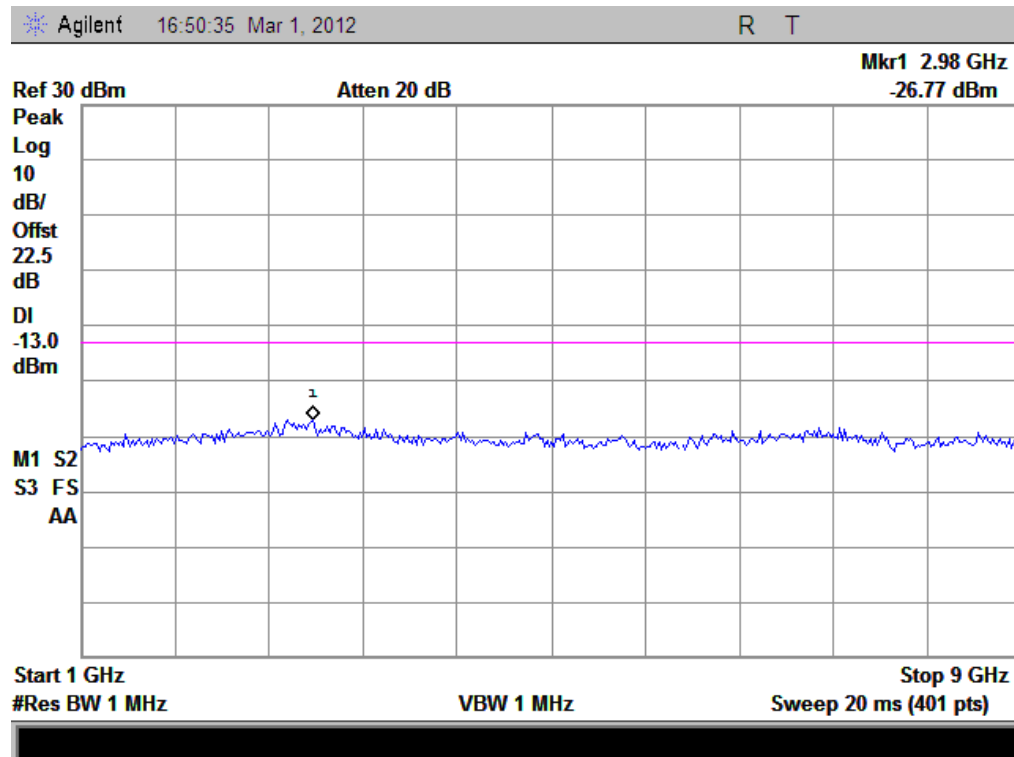
(Plot E1.1:  WCDMA850MHz Channel = 4132, 1GHz to 9GHz)
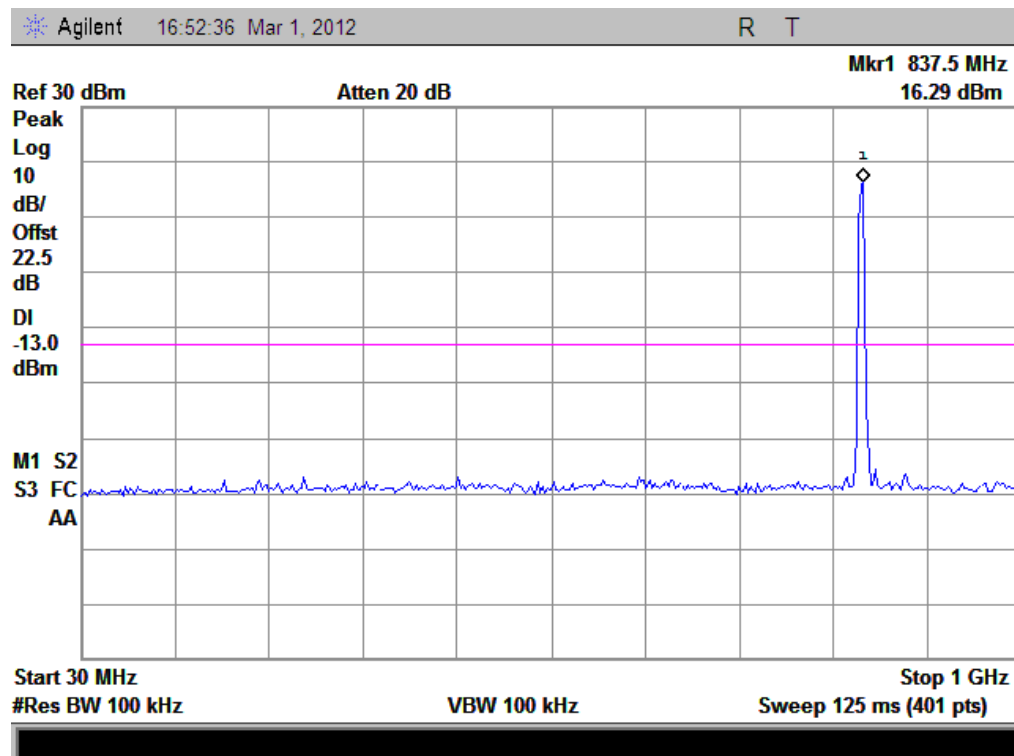


(Plot E2:    WCDMA850MHz Channel = 4175, 30MHz to 1GHz)
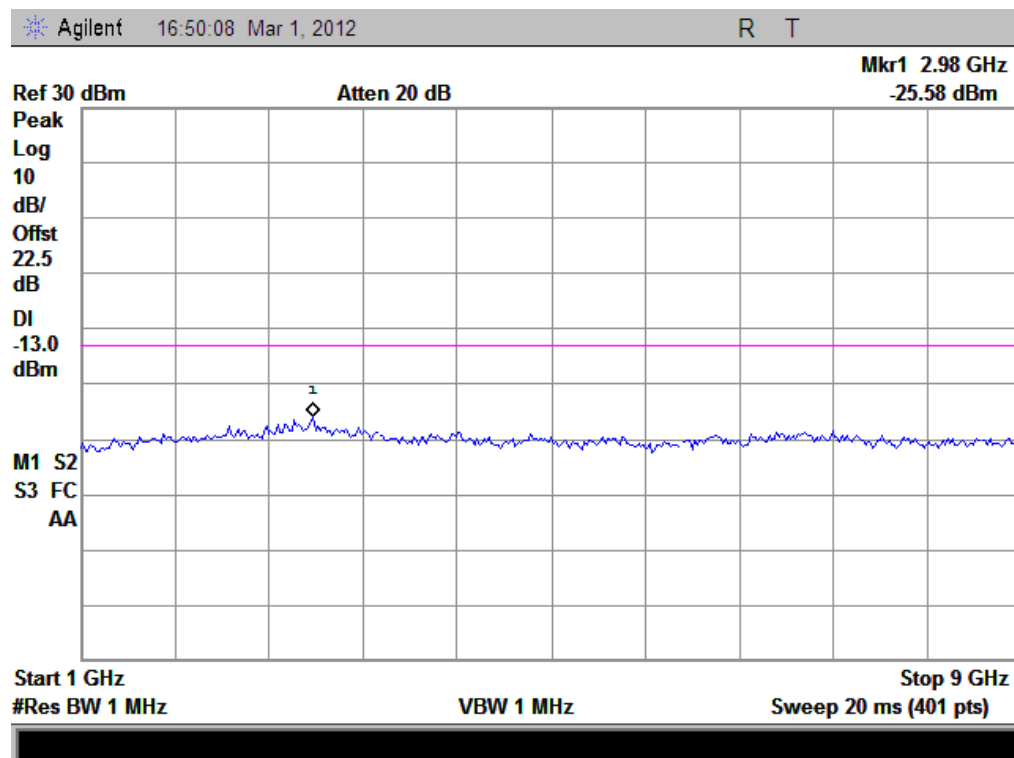
(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)
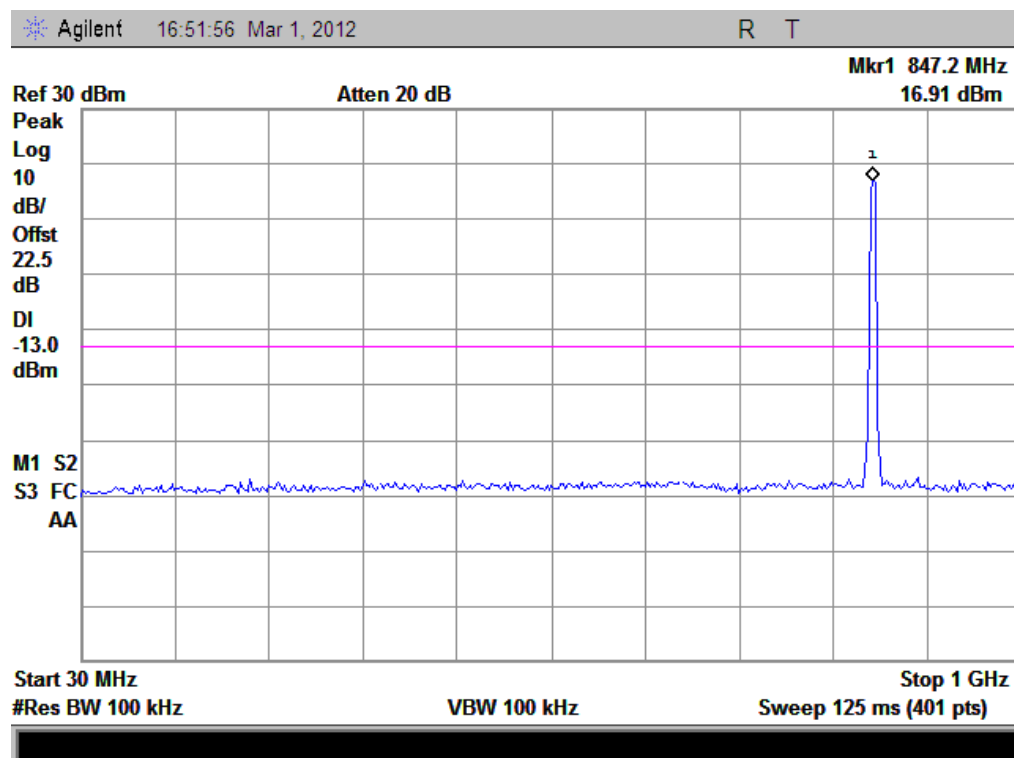


(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)
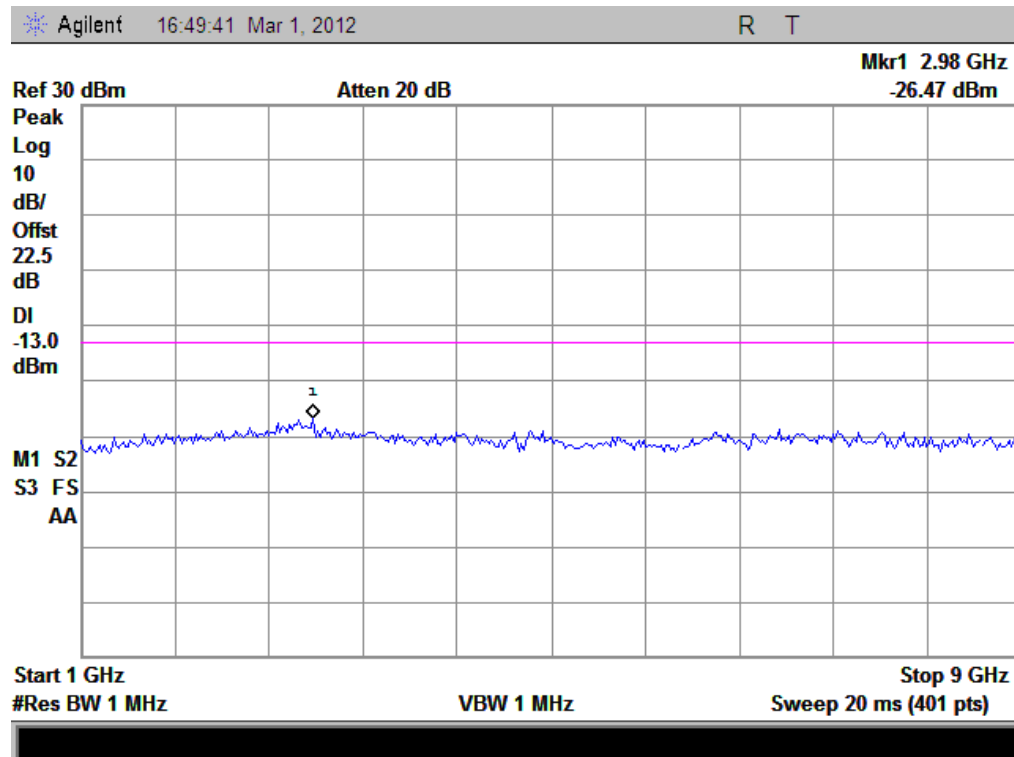
(Plot E3.1:   WCDMA850MHz Channel = 4233, 1GHz to 9GHz)
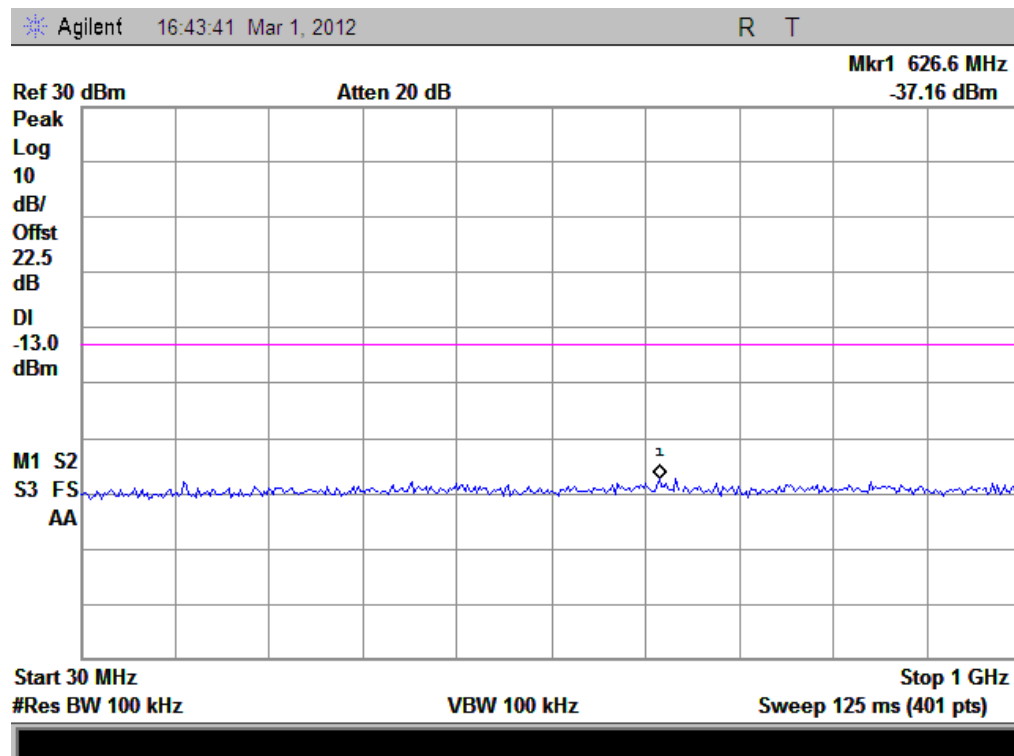


(Plot F1:      WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)
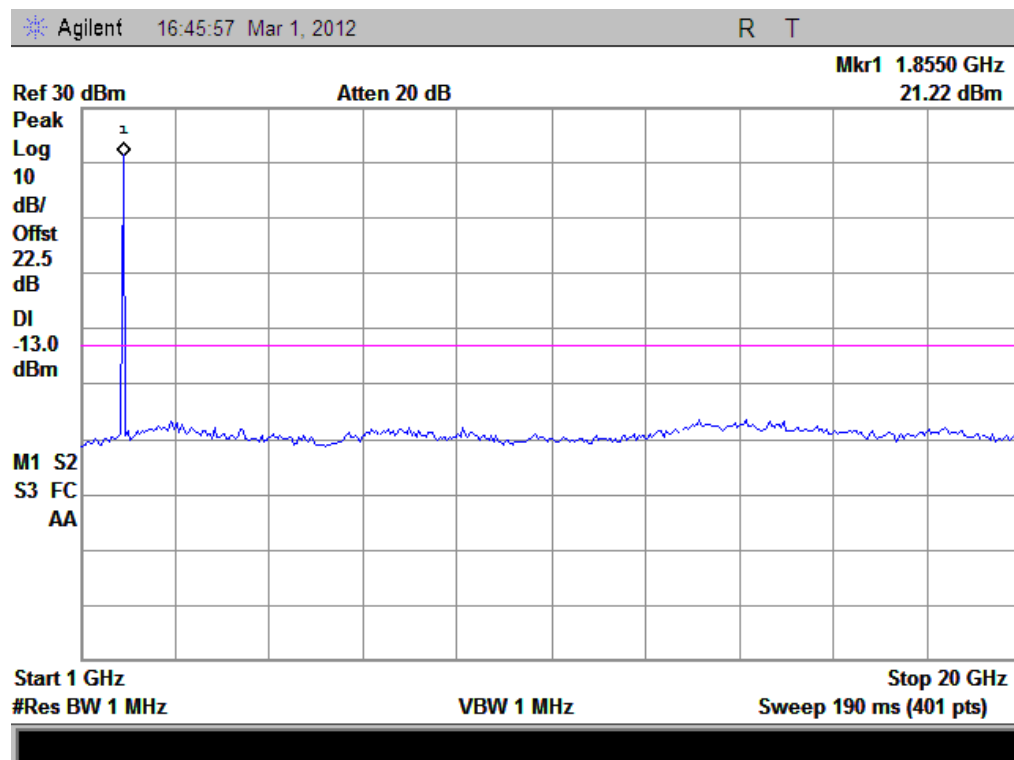
(Plot F1.1:    WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)
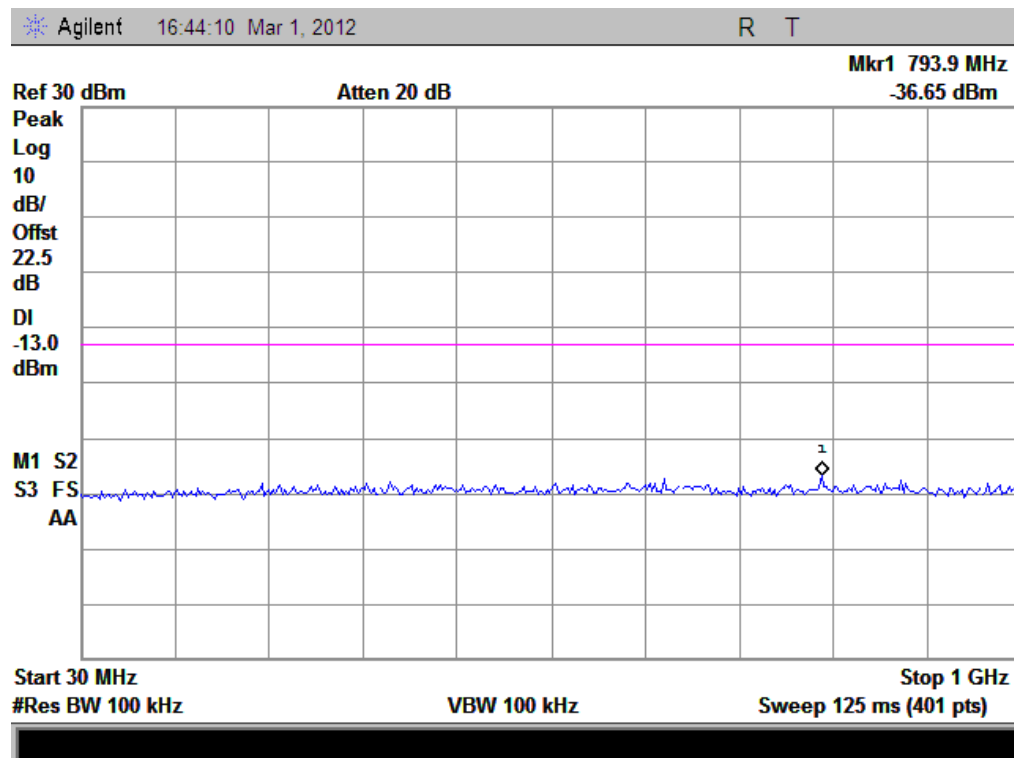


(Plot F2:      WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)
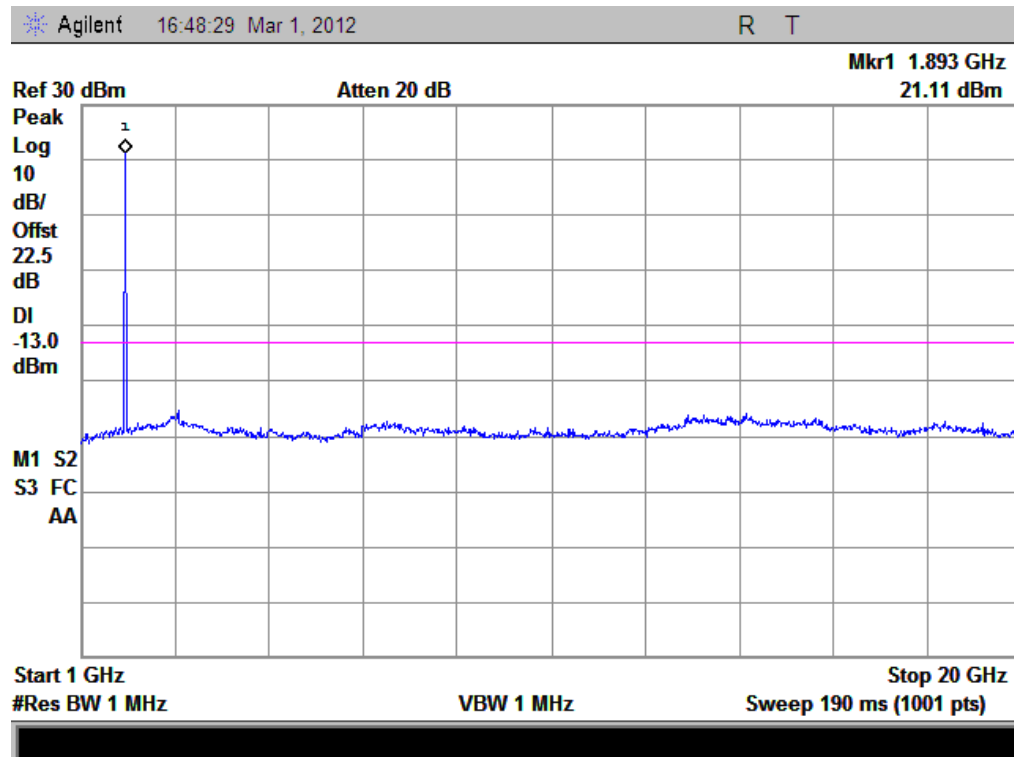
(Plot F2.1: WCDMA1900MHz Channel = 9400, 1GHz to 20GHz)
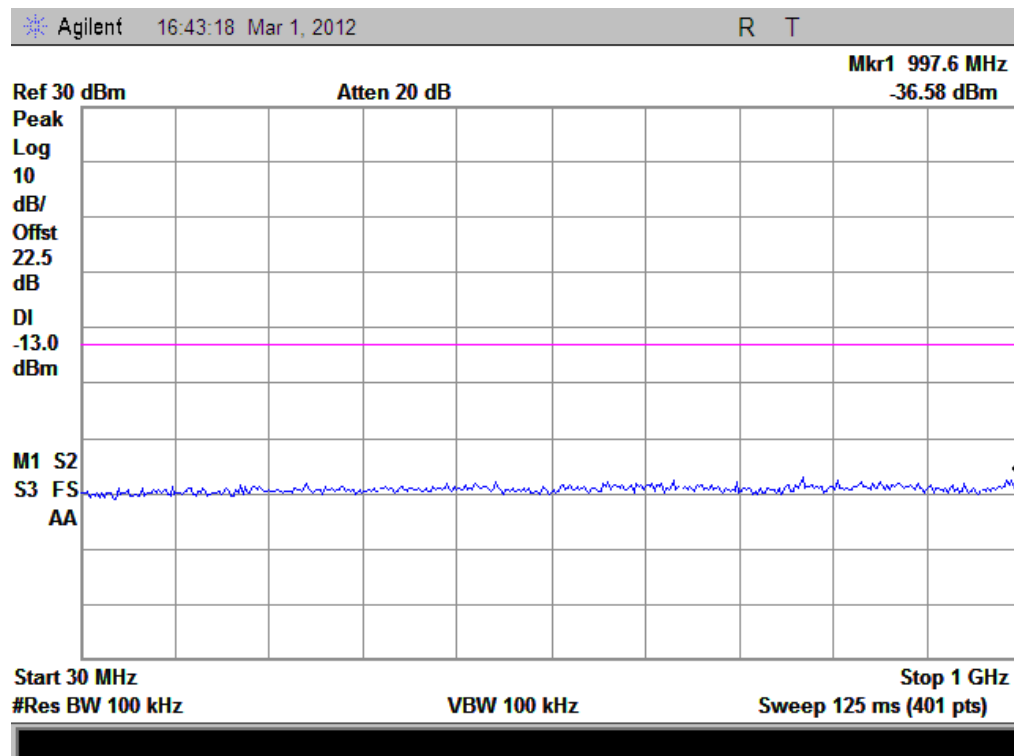


(Plot F3: WCDMA1900MHz Channel = 9538, 30MHz to 1GHz)
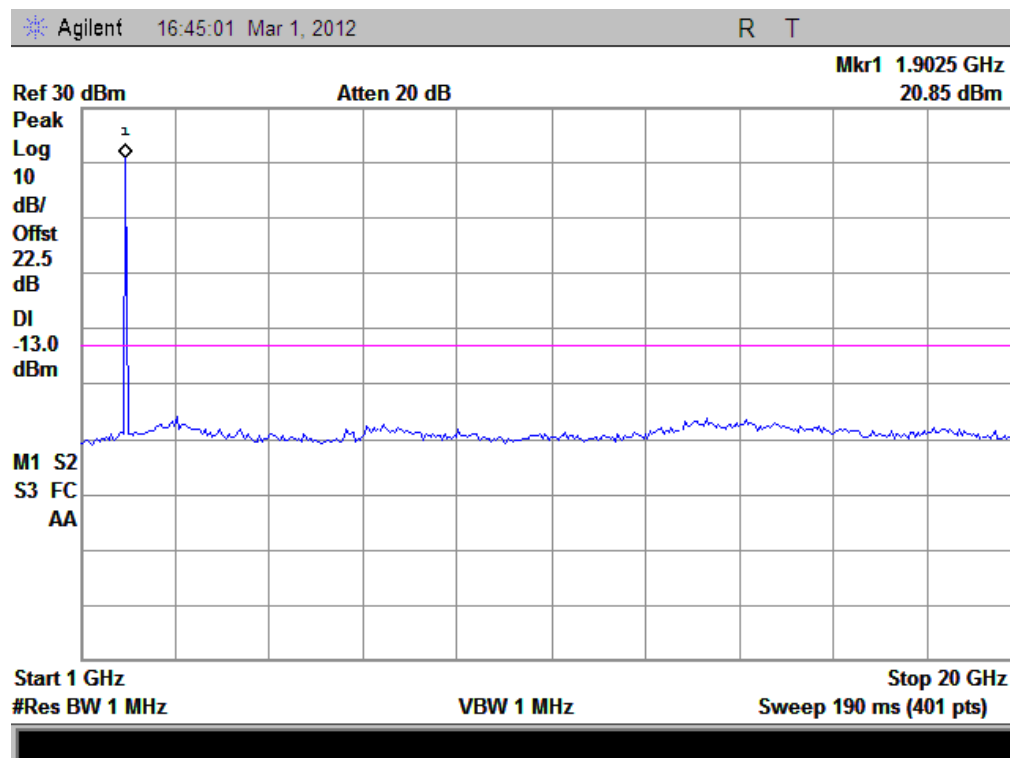
(Plot F3.1:    WCDMA1900MHz Channel = 9538 1GHz to 20GHz)
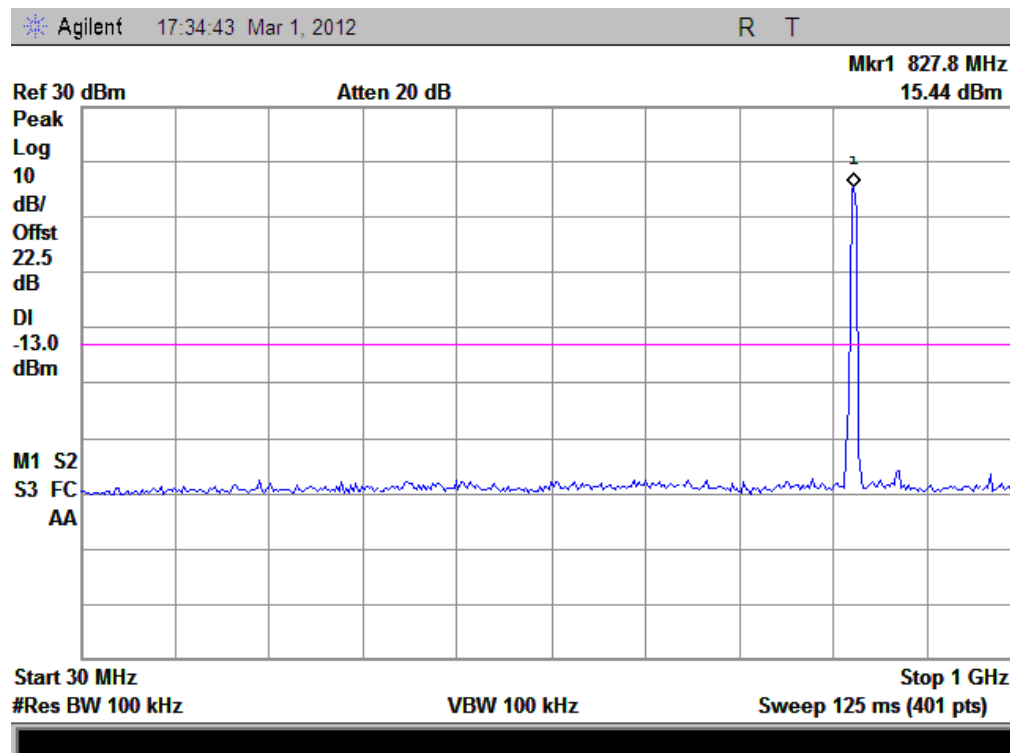


(Plot G1:    HSDPA 850MHz Channel = 4132, 30MHz to 1GHz)
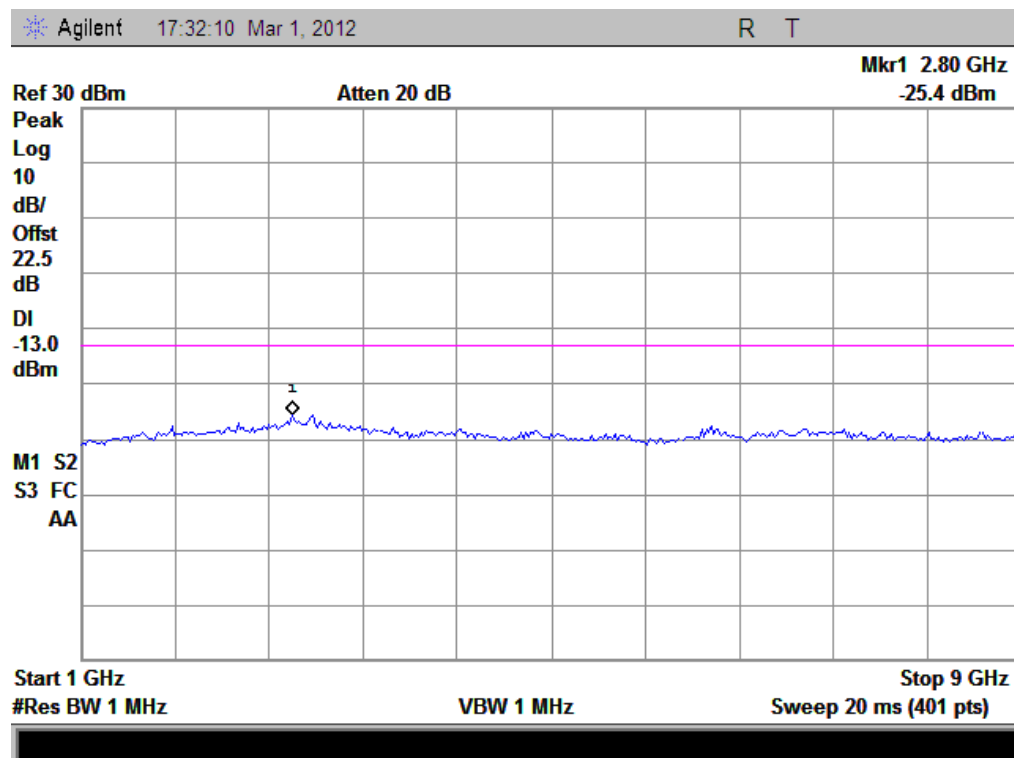
(Plot G1.1:  HSDPA 850MHz Channel = 4132, 1GHz to 9GHz)
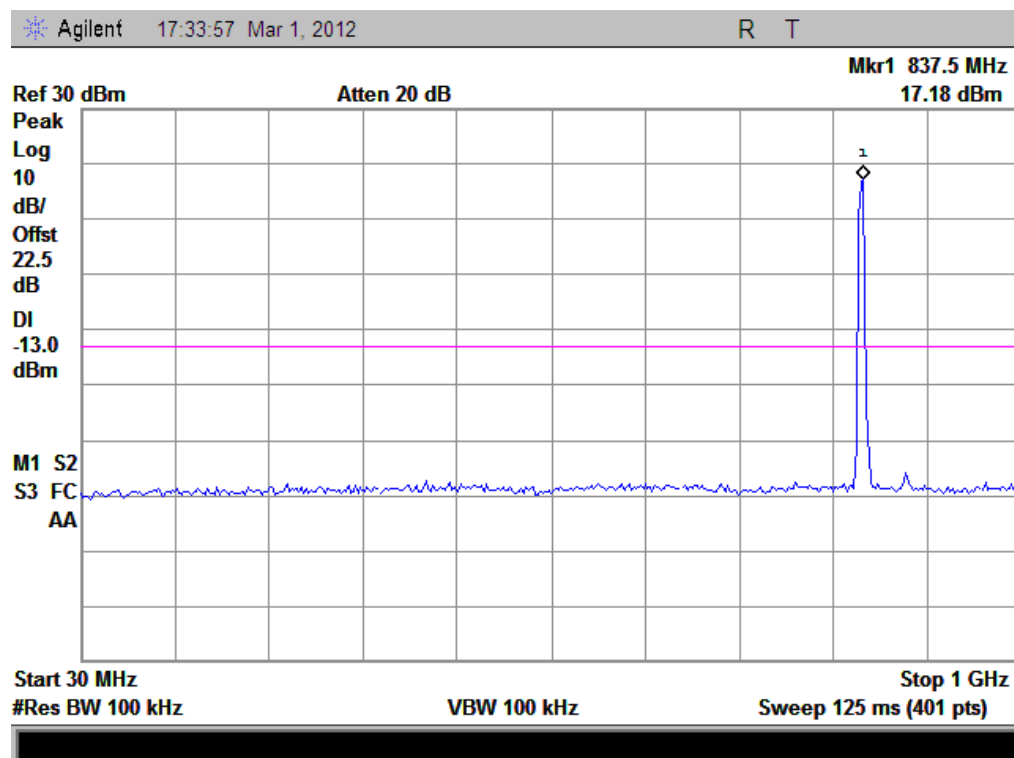


(Plot G2:  HSDPA 850MHz Channel = 4175, 30MHz to 1GHz)
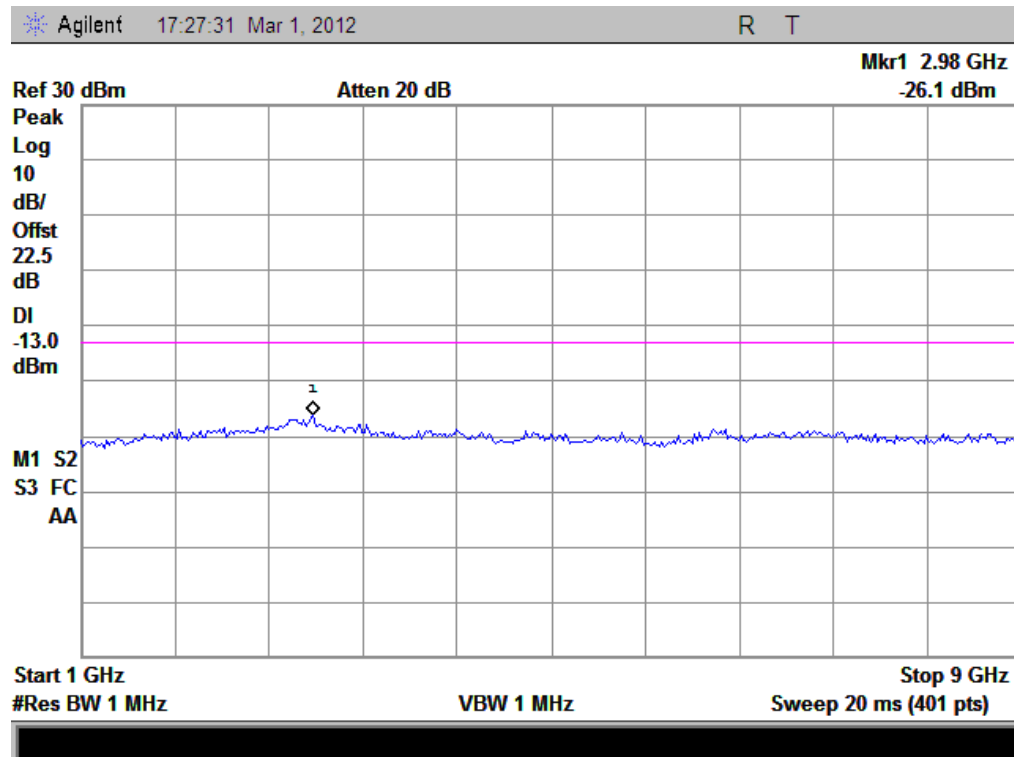
(Plot G2.1:   HSDPA 850MHz Channel = 4175, 1GHz to 9GHz)
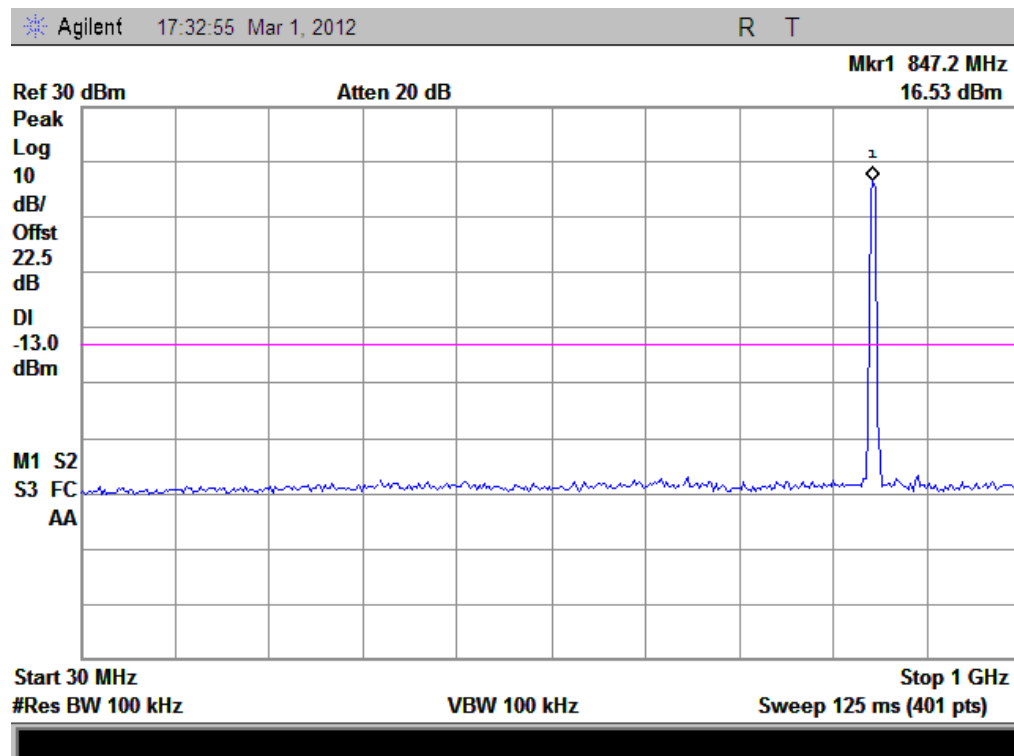


(Plot G3:      HSDPA850MHz Channel = 4233, 30MHz to 1GHz)
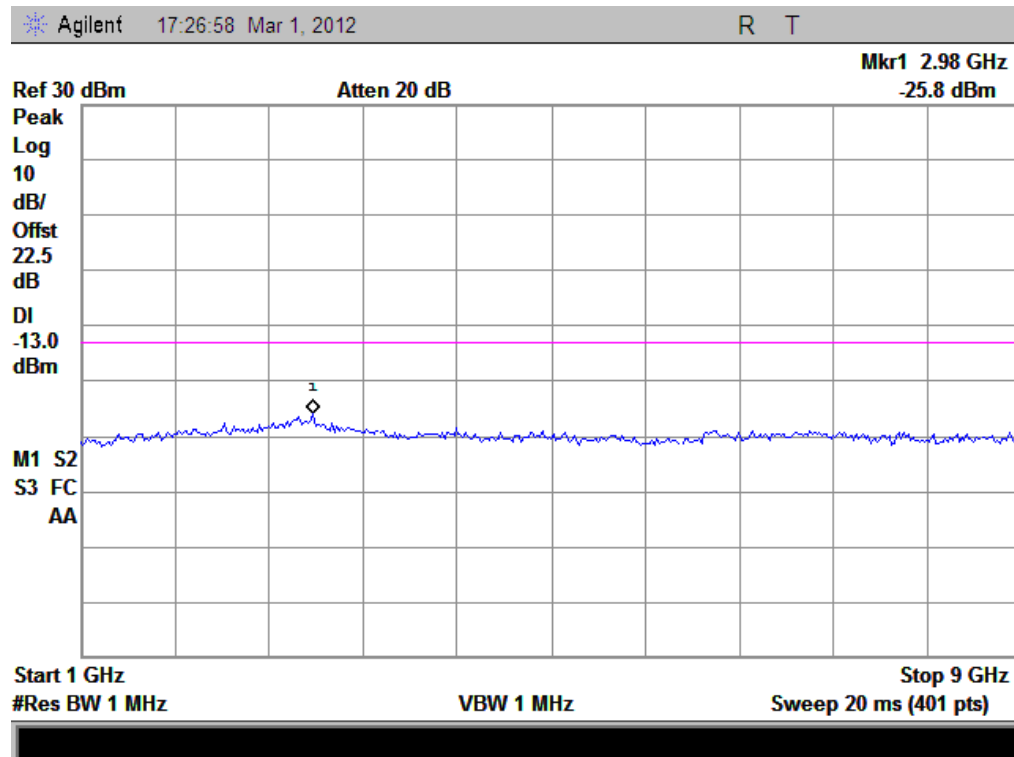
(Plot G3.1:   HSDPA850MHz Channel = 4233, 1GHz to 9GHz)
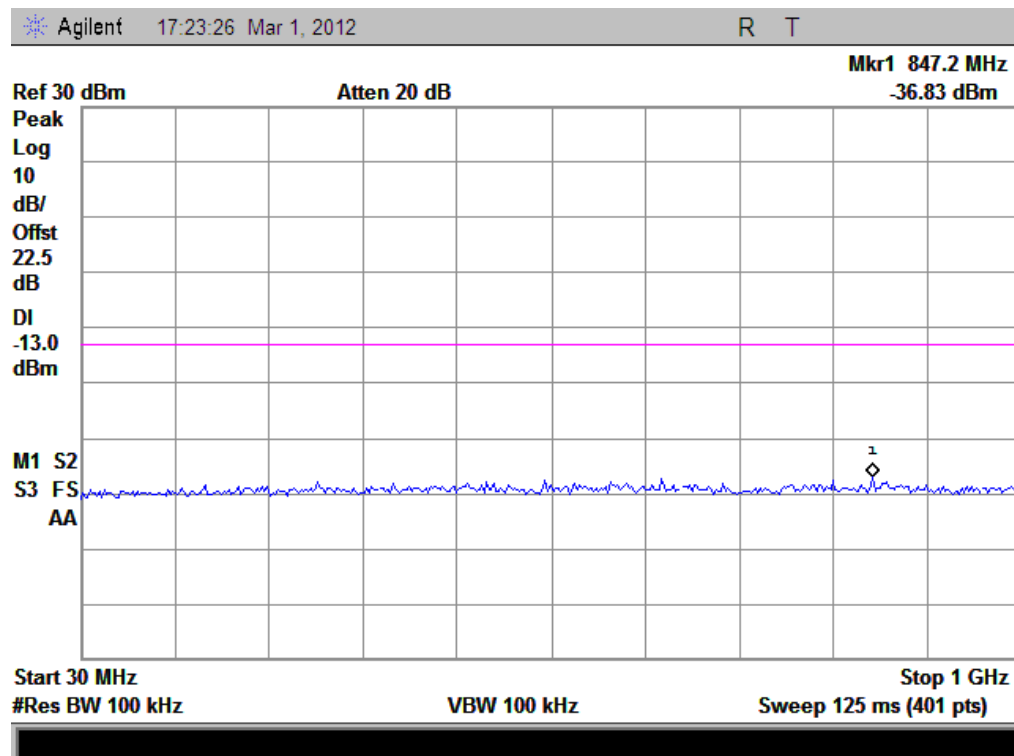


(Plot H1:      HSDPA1900MHz Channel = 9262, 30MHz to 1GHz)
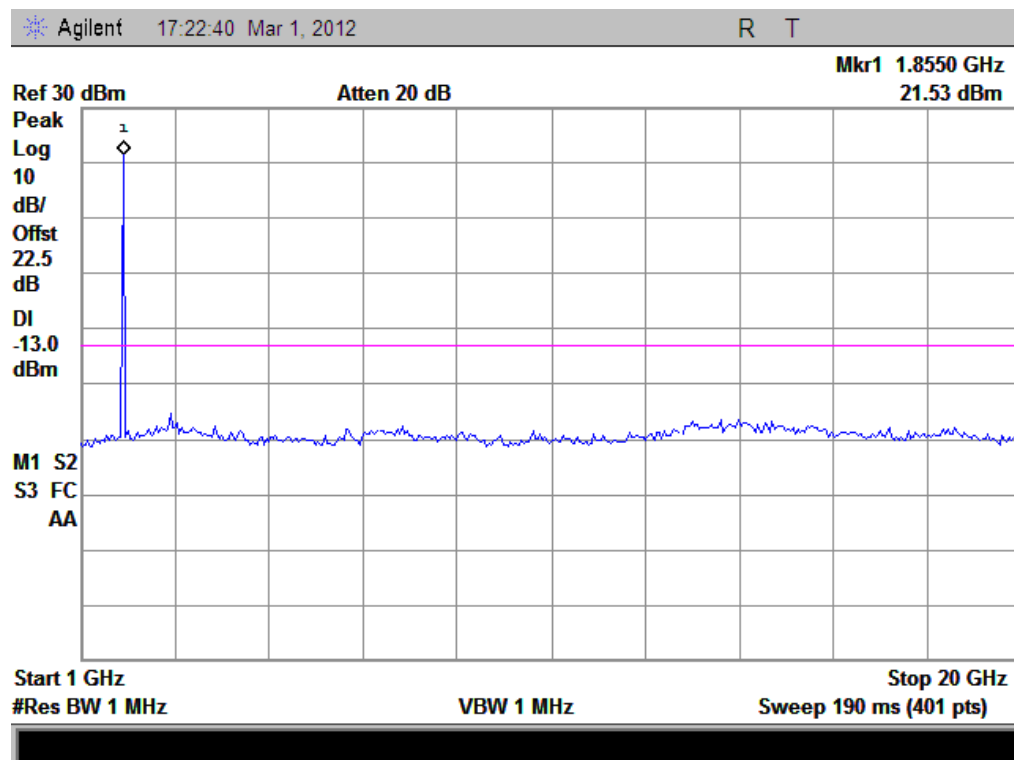
(Plot H1.1:   HSDPA1900MHz Channel = 9262, 1GHz to 20GHz)
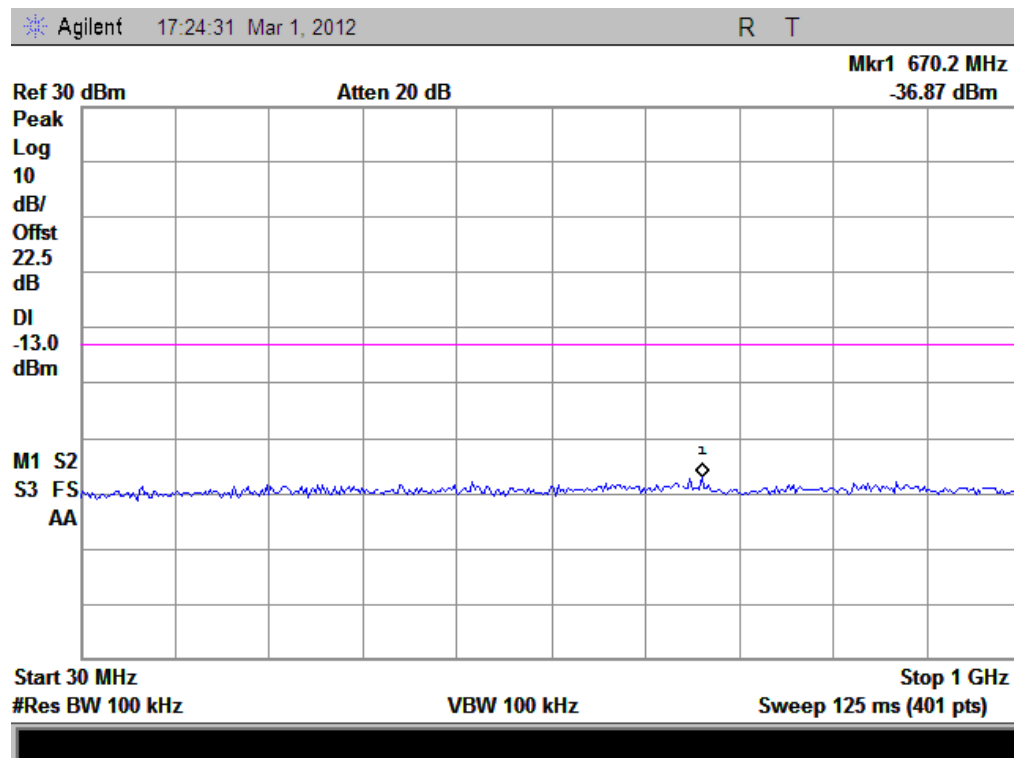


(Plot H2:      HSDPA1900MHz Channel = 9400, 30MHz to 1GHz)
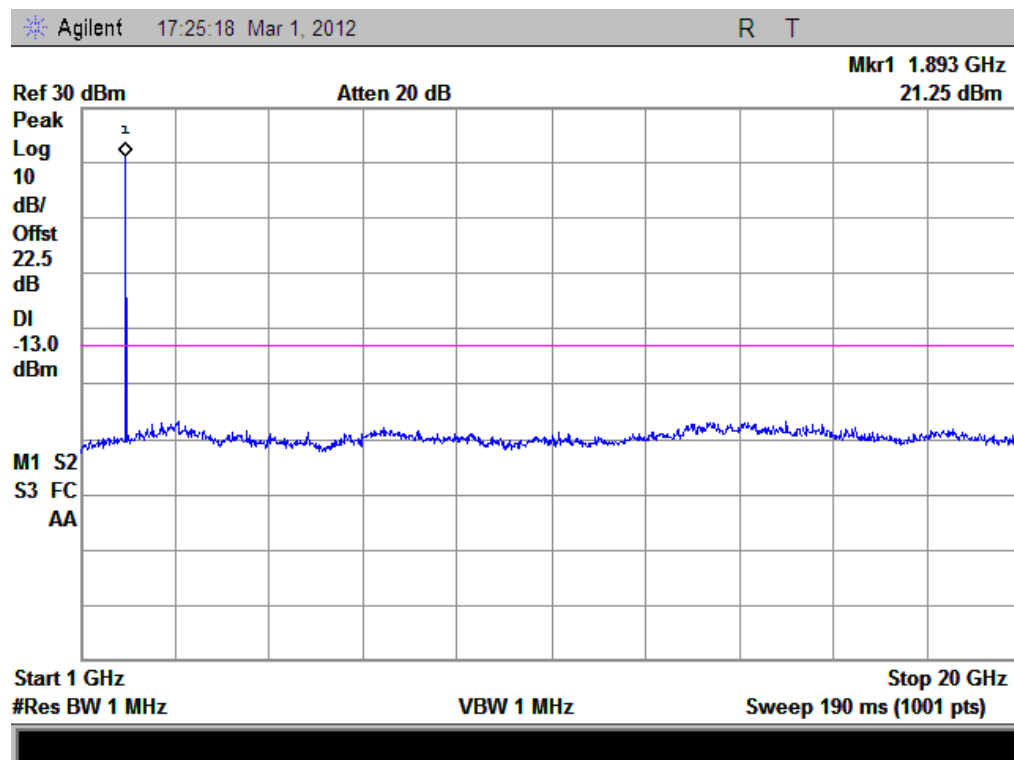
(Plot H2.1:  HSDPA1900MHz Channel = 9400, 1GHz to 20GHz)
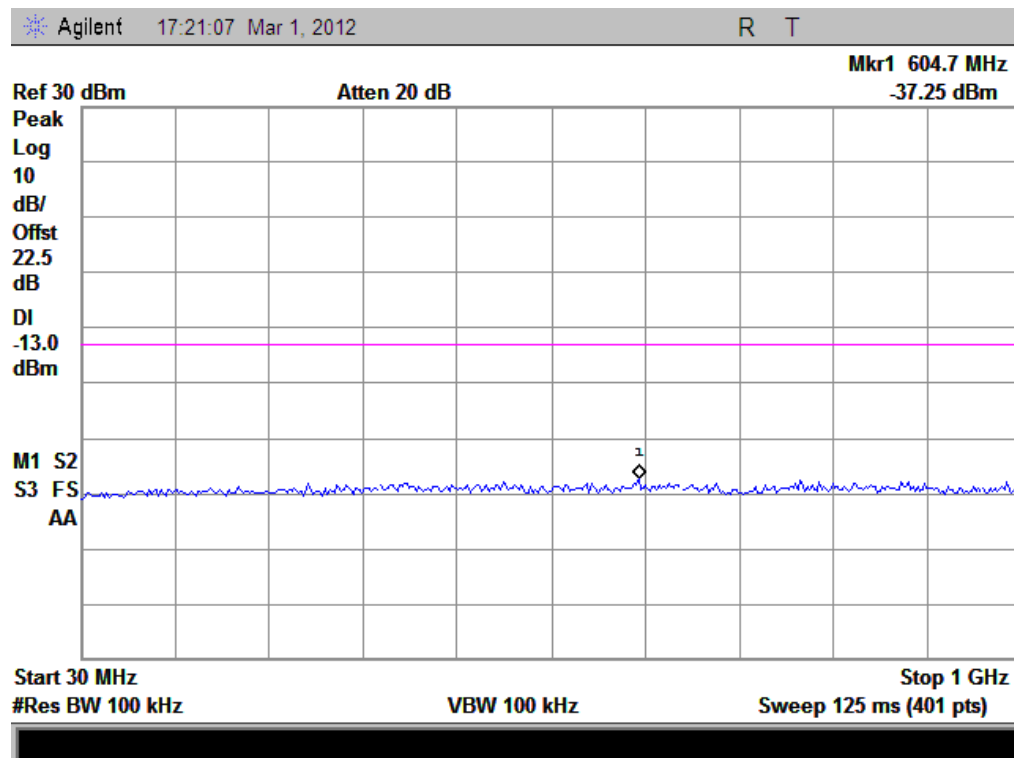


(Plot H3:    HSDPA1900MHz Channel = 9538, 30MHz to 1GHz)
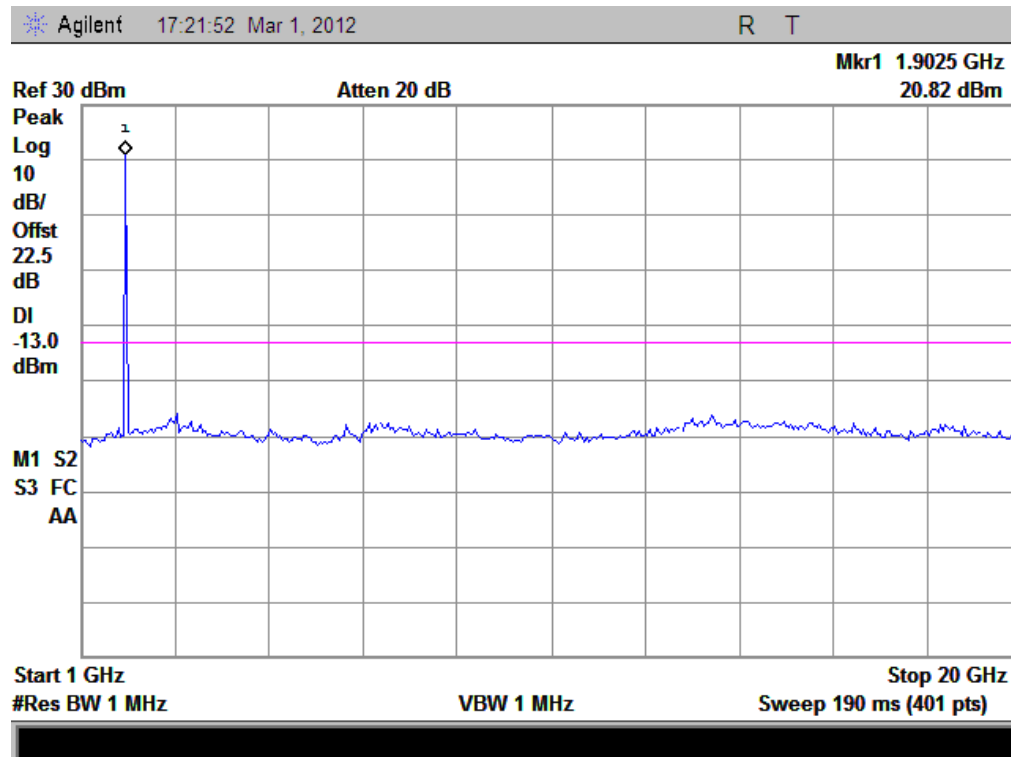
(Plot H3.1:   HSDPA1900MHz Channel = 9538 1GHz to 20GHz)

## 2.5 Band Edge

### 2.5.1 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.

### 2.5.2 Test Description

See section 2.1.2 of this report.

### 2.5.3 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 | -16.13 | Plat A | -13 | PASS |
| | 251 | 848.8 | -16.15 | Plot B | | PASS |
| GSM 1900MHz | 512 | 1850.2 | -19.59 | Plat C | -13 | PASS |
| | 810 | 1909.8 | -19.72 | Plot D | | PASS |
| EDGE 850MHz | 128 | 824.2 | -16.39 | Plat E | -13 | PASS |
| | 251 | 848.8 | -16.42 | Plot F | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | -21.68 | Plat G | -13 | PASS |
| | 810 | 1909.8 | -19.55 | Plot H | | PASS |
| WCDMA 850MHz | 4132 | 826.4 | -24.77 | Plat I | -13 | PASS |
| | 4233 | 846.6 | -28.67 | Plot J | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | -30.71 | Plat K | -13 | PASS |
| | 9538 | 1907.6 | -27.21 | Plot L | | PASS |
| HSDPA 850MHz | 4132 | 826.4 | -24.21 | Plat M | -13 | PASS |
| | 4233 | 846.6 | -26.32 | Plot N | | PASS |
| HSDPA 1900MHz | 9262 | 1852.4 | -28.54 | Plat O | -13 | PASS |
| | 9538 | 1907.6 | -27.32 | Plot P | | PASS |

2. Test Plots:
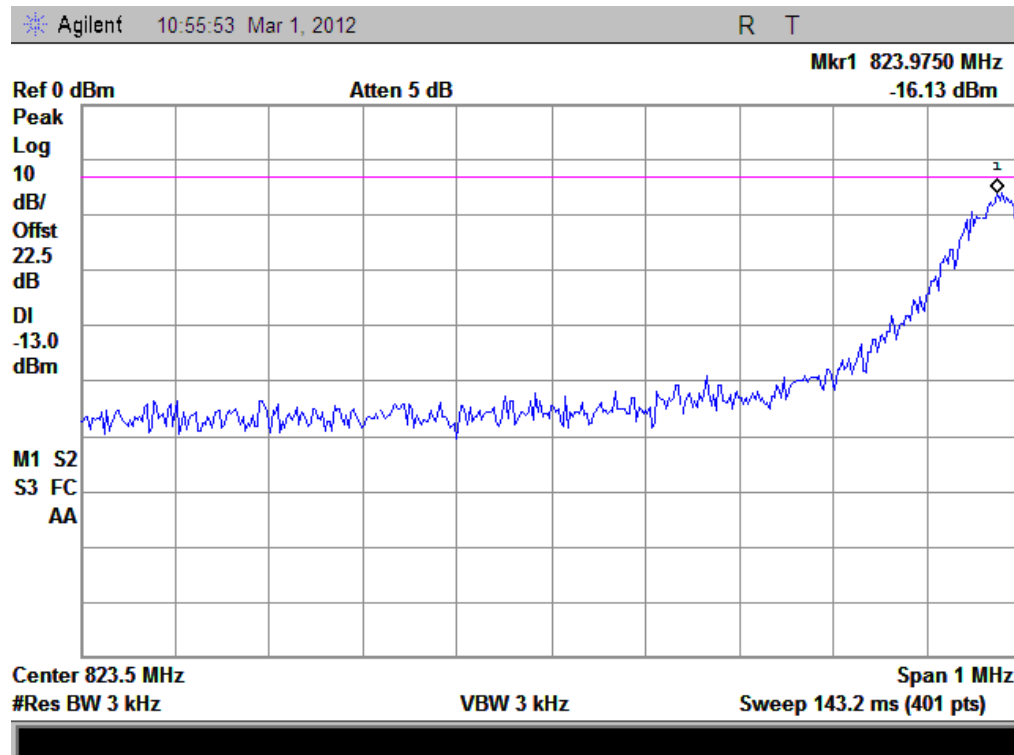


(Plot A: GSM 850 Channel = 128)
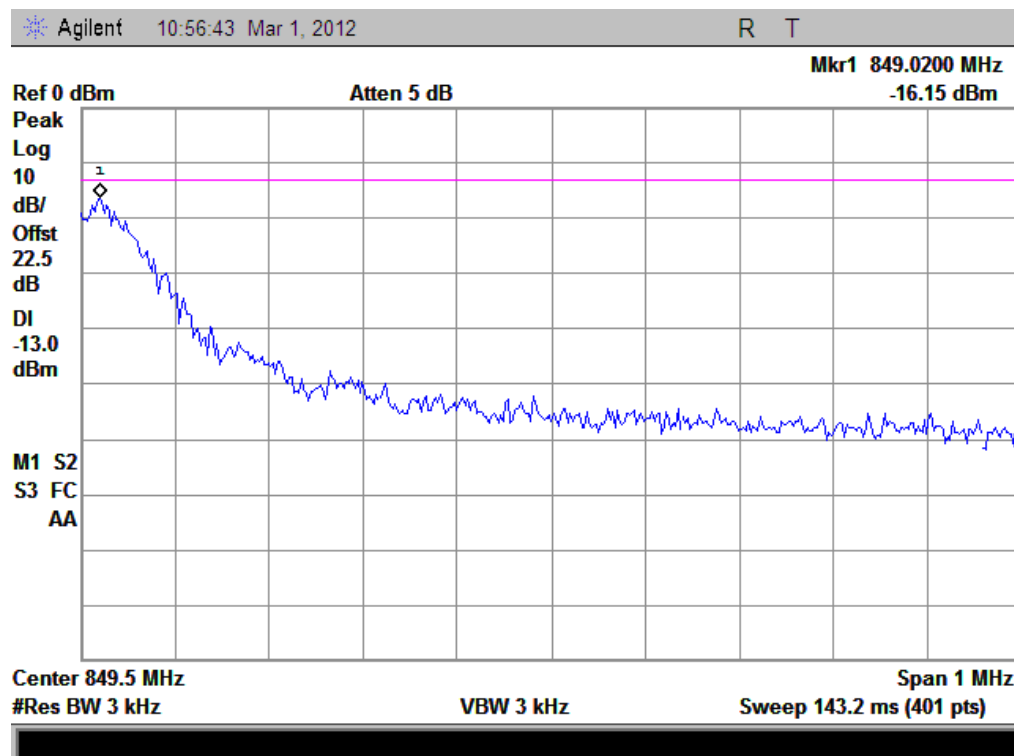


(Plot B: GSM 850 Channel = 251)
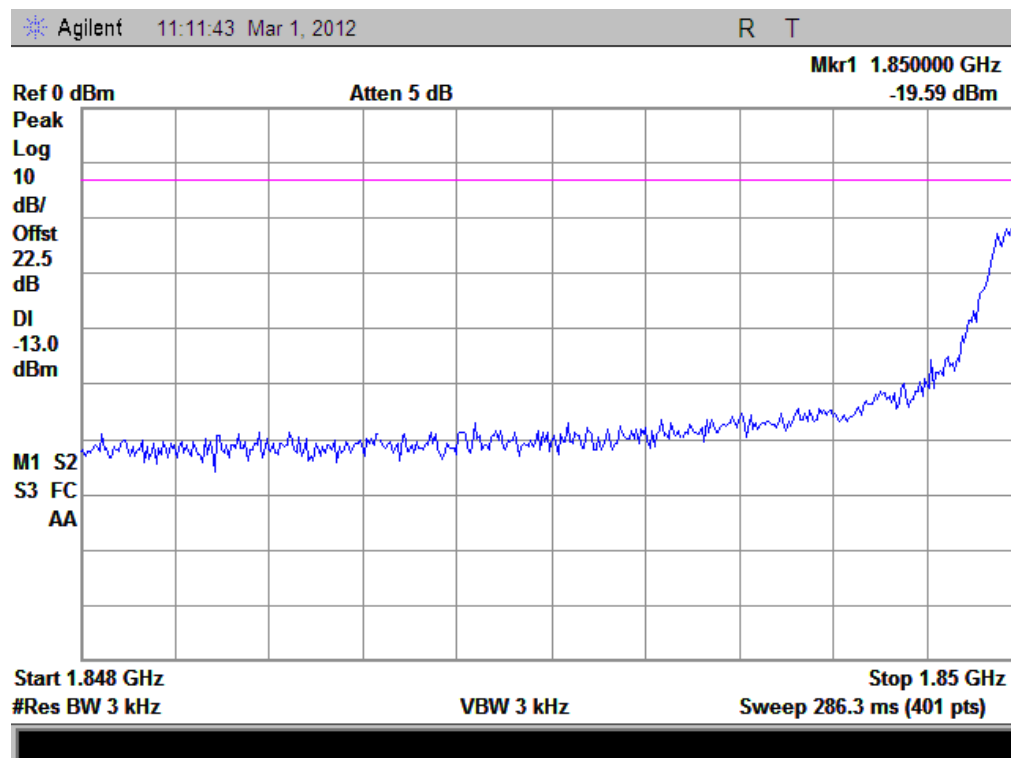
(Plot C: GSM 1900 Channel = 512)
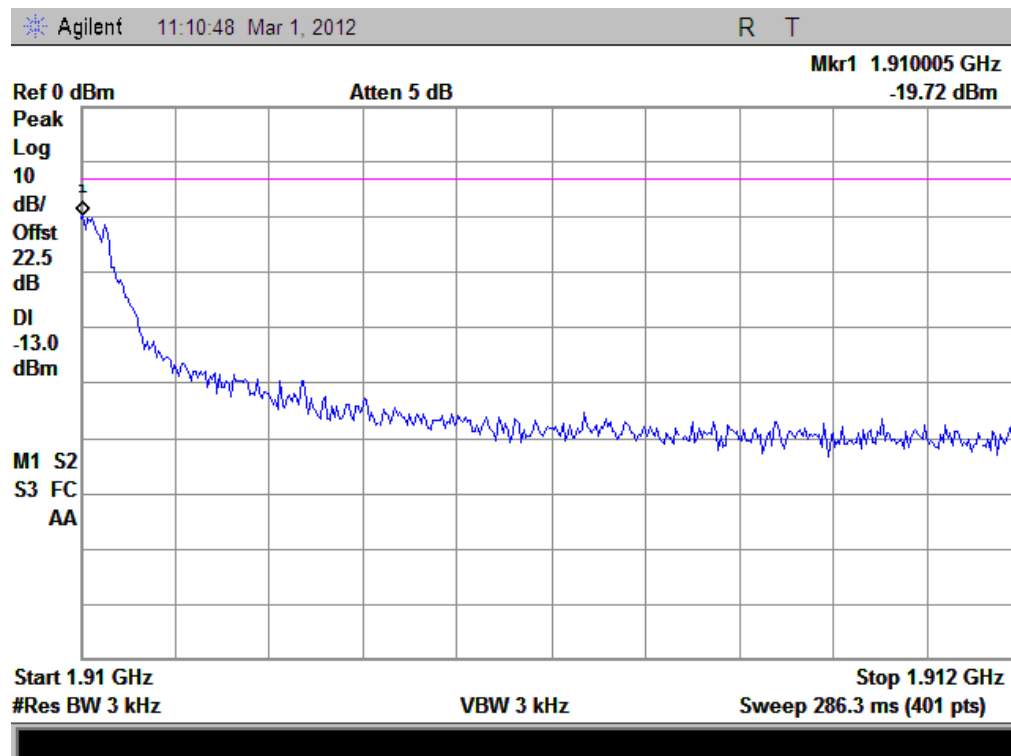


(Plot D: GSM 1900 Channel = 810)
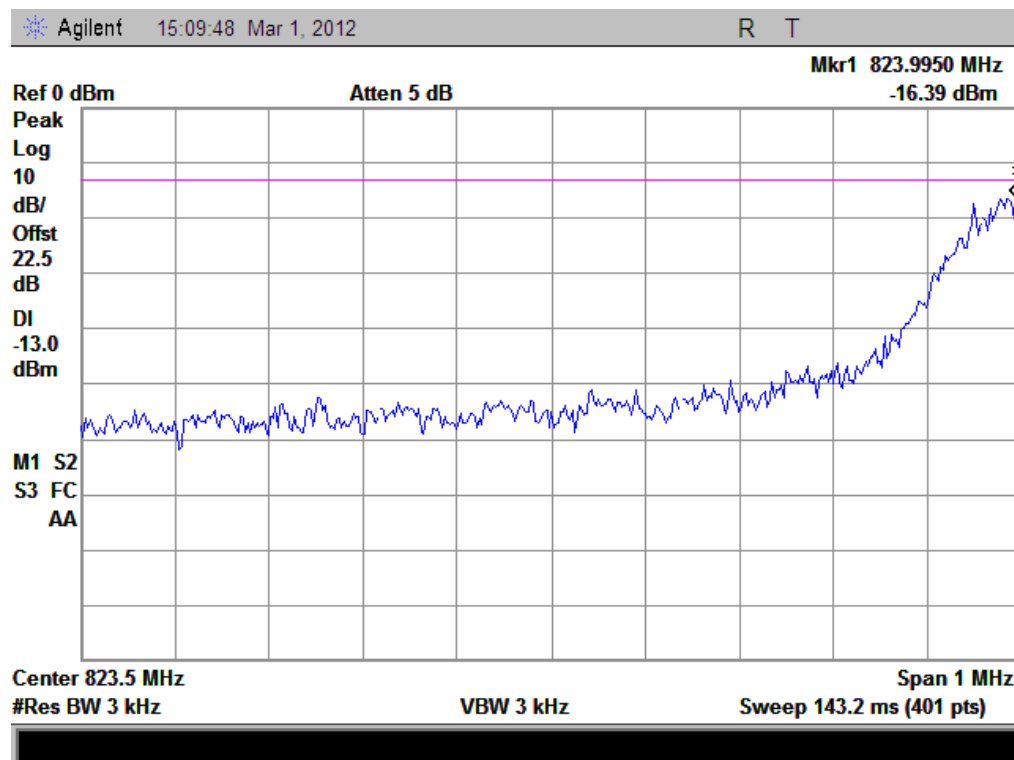
(Plot E: EDGE 850 Channel = 128)
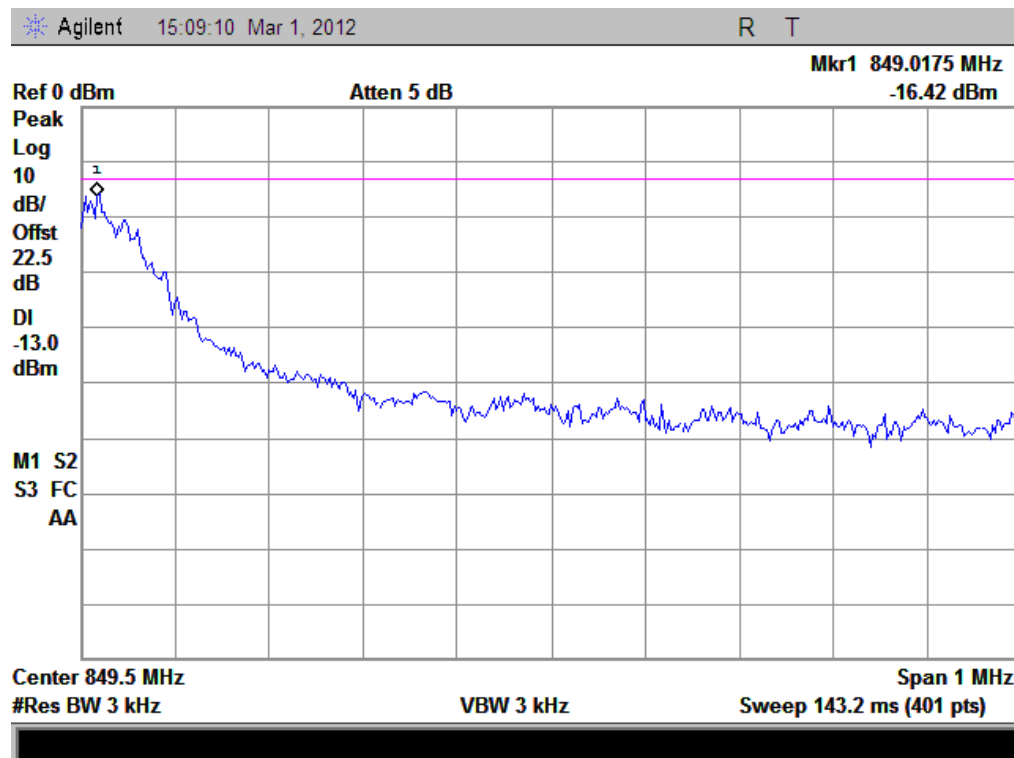


(Plot F: EDGE 850 Channel = 251)
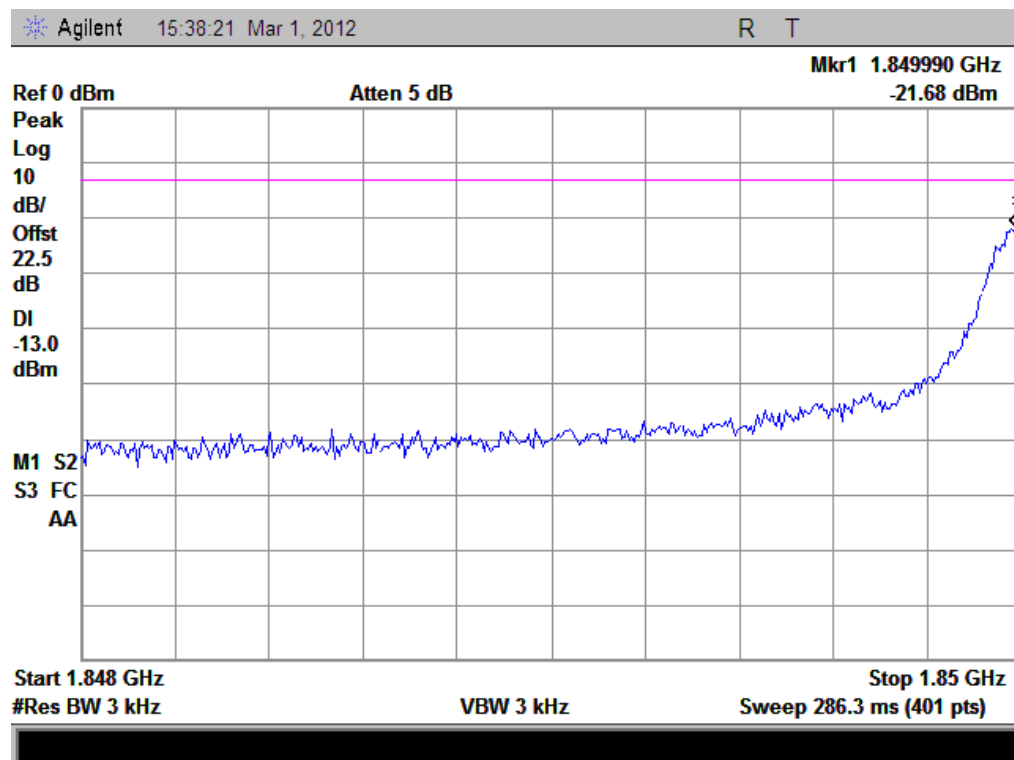
(Plot G: EDGE 1900 Channel = 512)
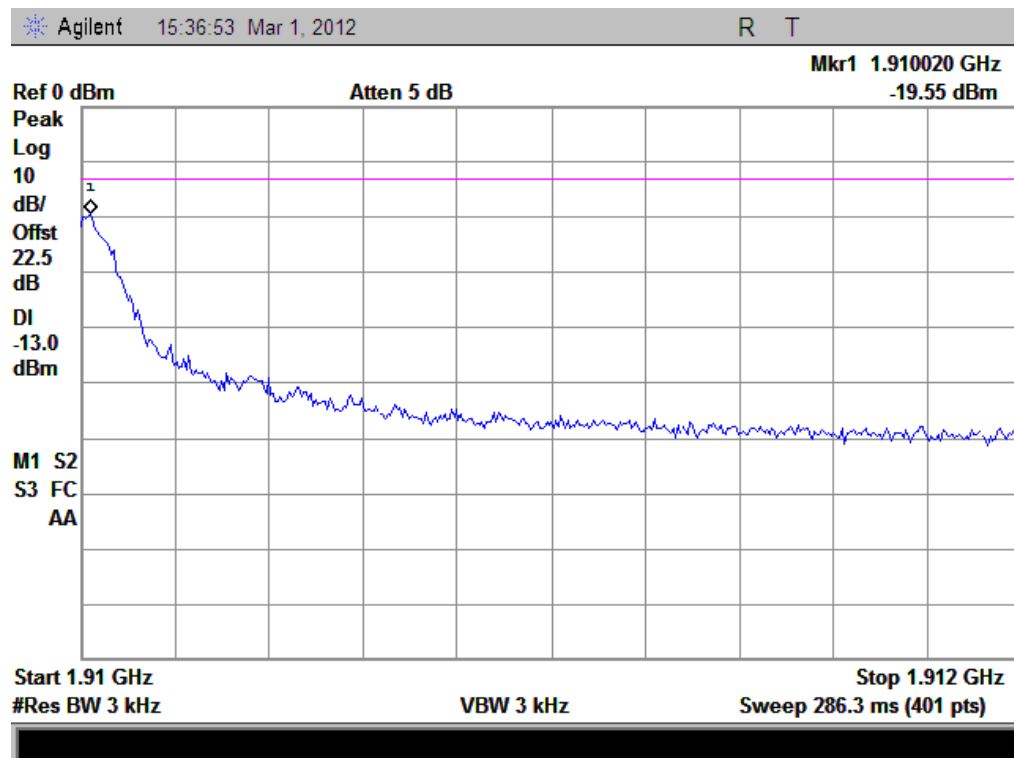


(Plot H: EDGE 1900 Channel = 810)
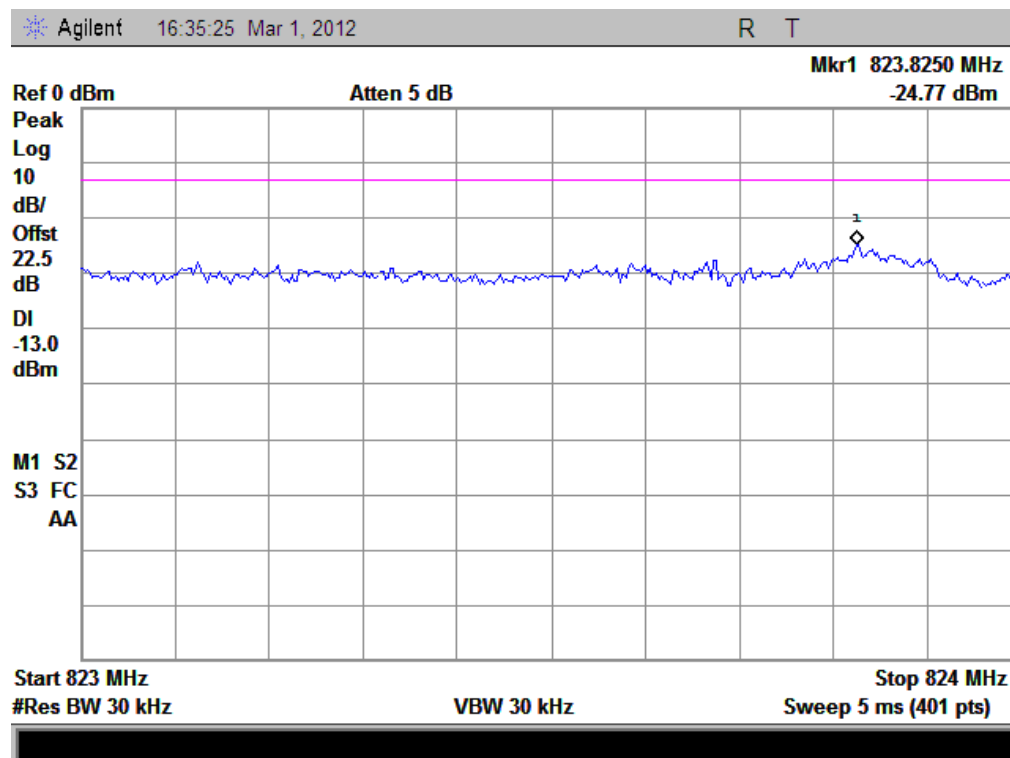
(Plot I:   WCDMA 850 Channel = 4132)
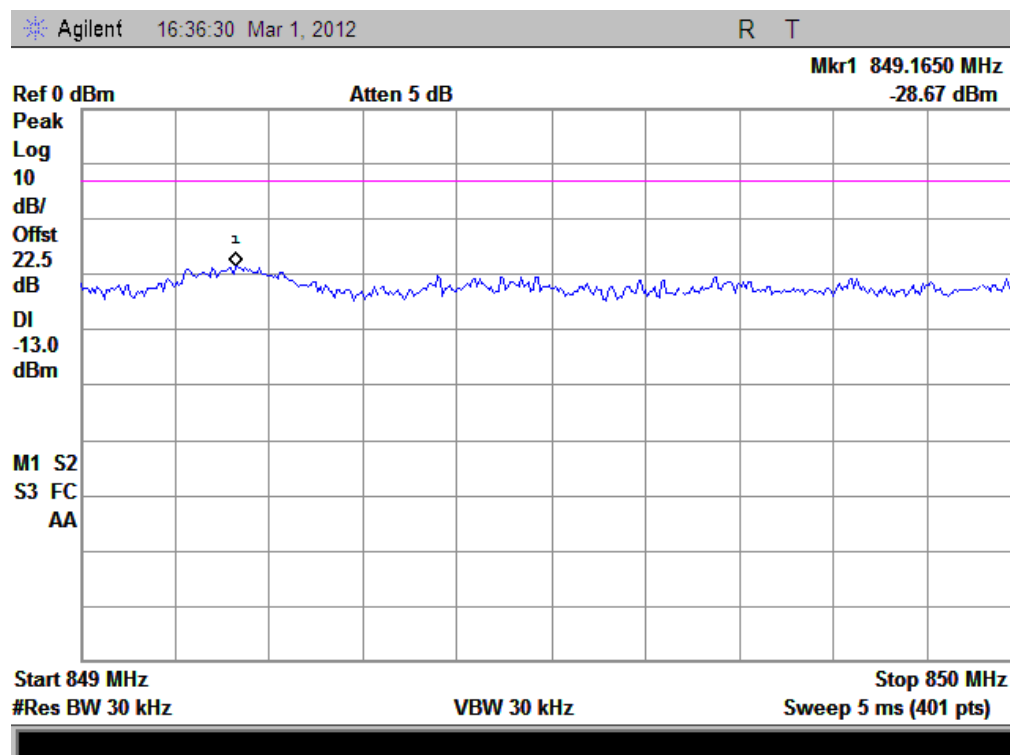


(Plot J:   WCDMA 850 Channel = 4233)
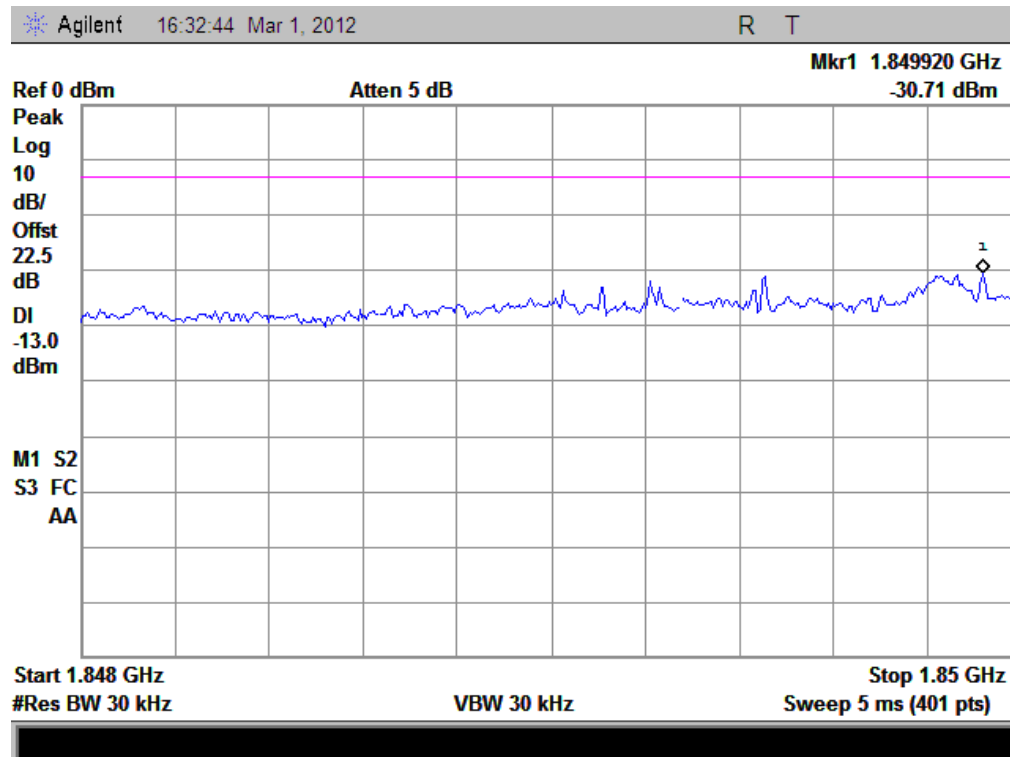
(Plot K: WCDMA 1900 Channel = 9262)
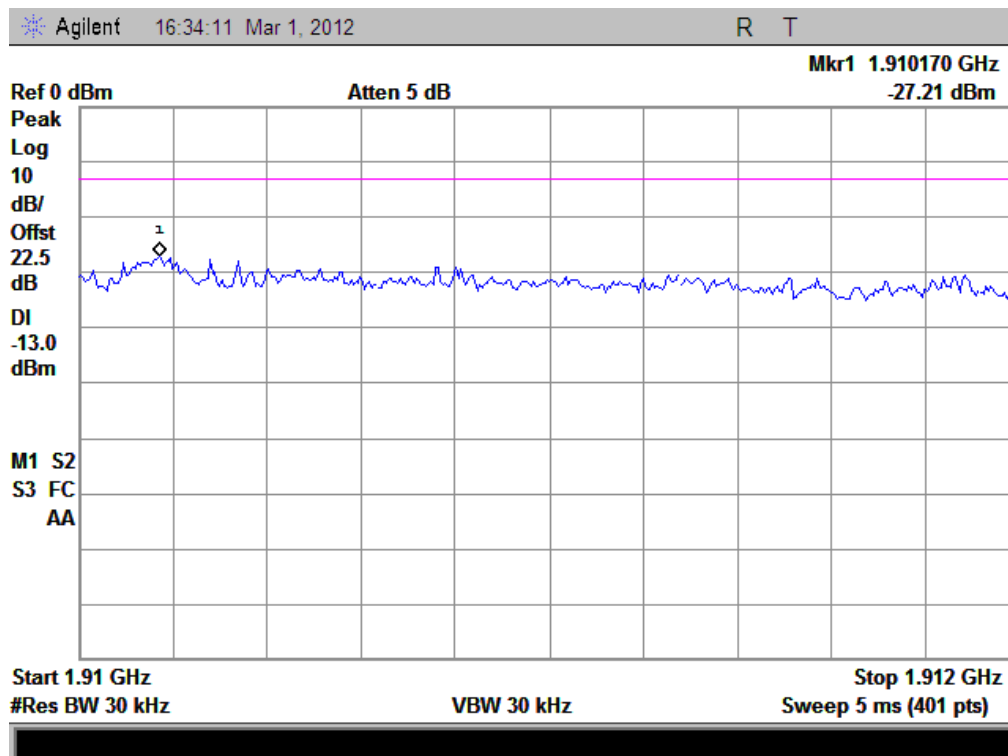


(Plot L: WCDMA 1900 Channel = 9538)
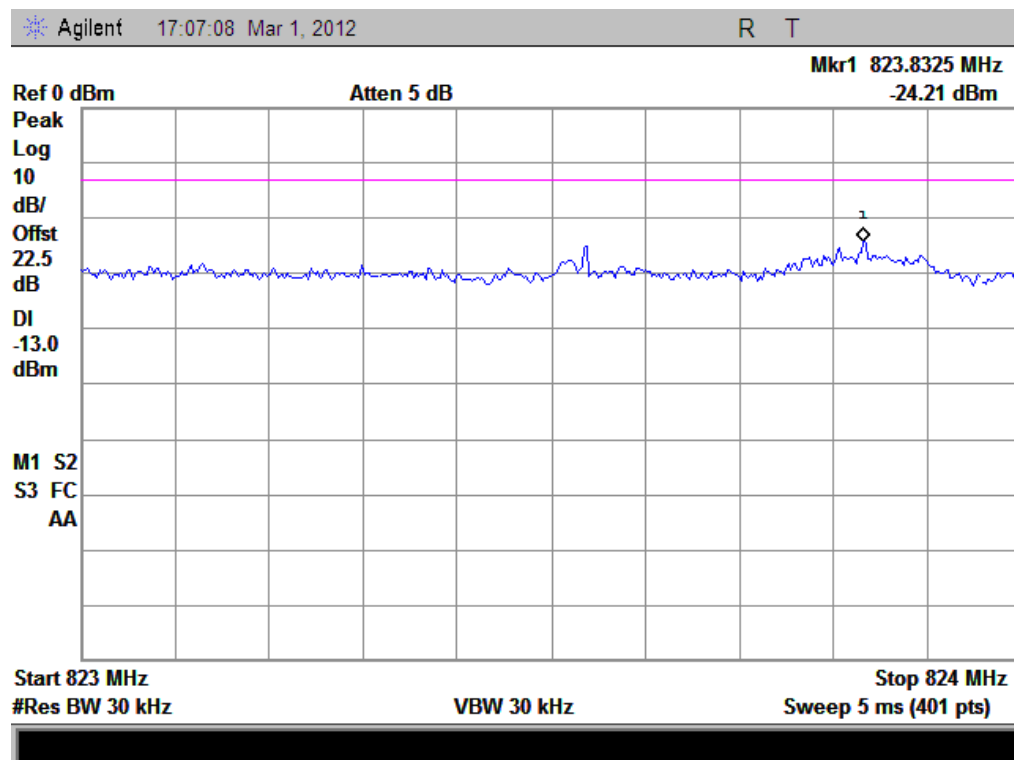
(Plot M: HSDPA 850 Channel = 4132)
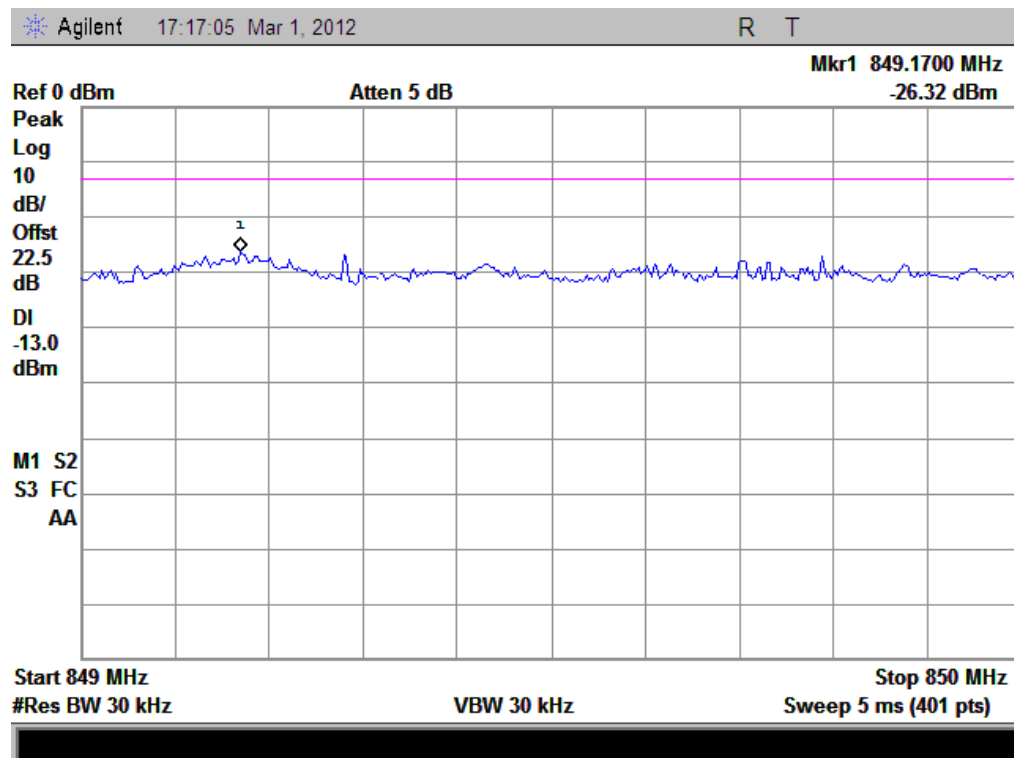


(Plot N: HSDPA850 Channel = 4233)
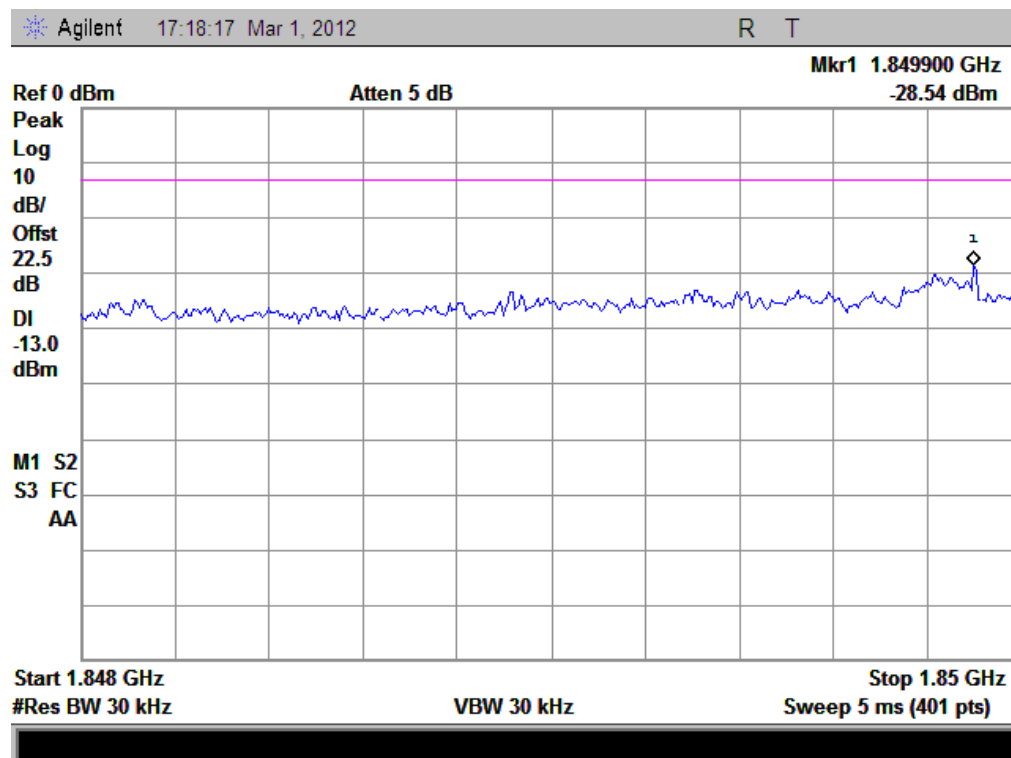
(Plot O: HSDPA 1900 Channel = 9262)
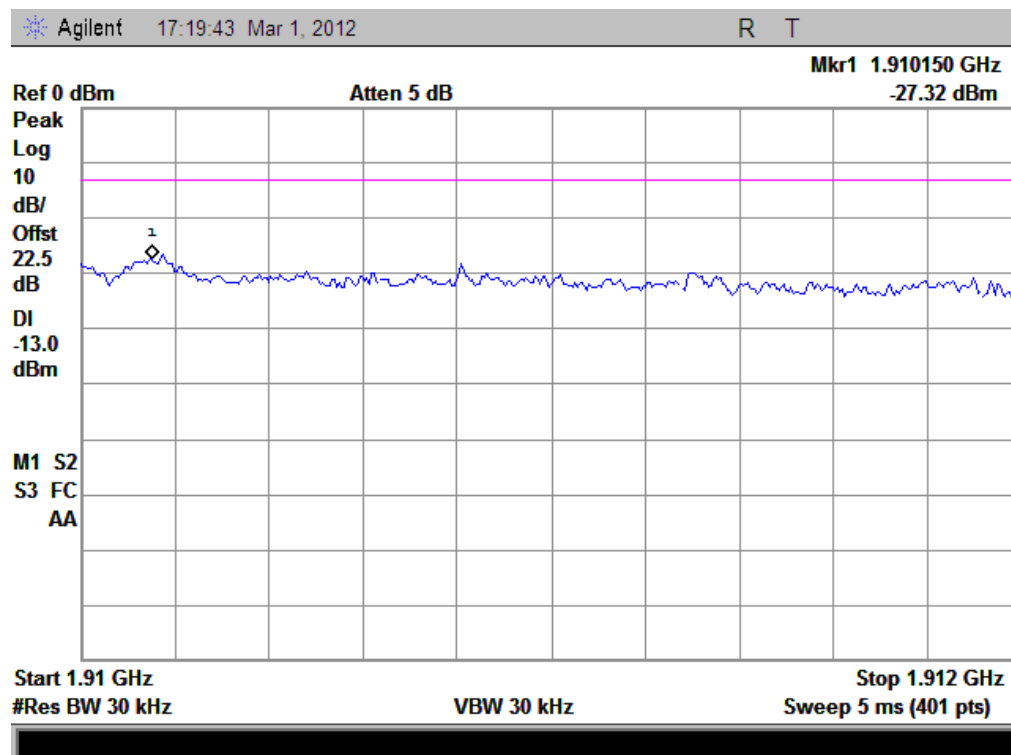


(Plot P: HSDPA 1900 Channel = 9538)

## 2.6 Transmitter Radiated Power (EIRP/ERP)

### 2.6.1 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.

### 2.6.2 Test Description

1.  Test Setup:
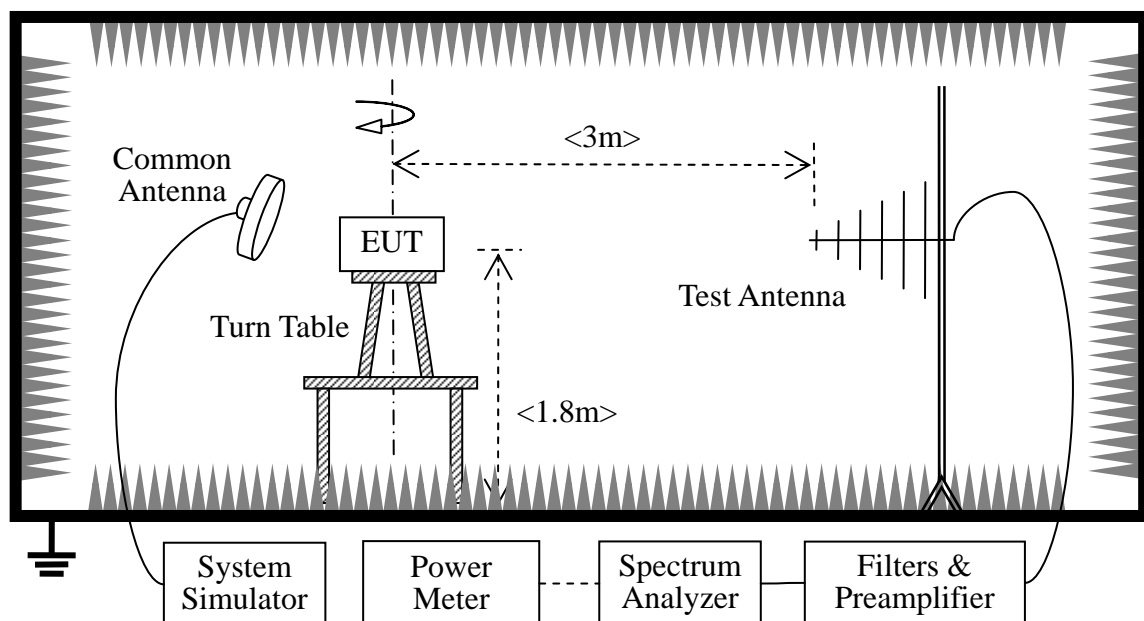


The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

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: GSM850 32.11dBm, GSM 1900 28.27dBm, WCDMA 850 22.22dBm, WCDMA 1900 21.49dBm Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

- Minimum RF power: GSM850 3.1dBm, GSM 1900 0.2dBm, WCDMA 850 1.1dBm, WCDMA 1900 0.1dBm

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 |
|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2011.05 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2011.05 |
| Full-Anechoic Chamber | Albatross | 9m*6m*6m | (n.a.) | 2011.05 |
| Test Antenna - Bi-Log | Schwarzbeck | VULB 9163 | 9163-274 | 2011.05 |
| Test Antenna - Horn | Schwarzbeck | BBHA 9120C | 9120C-384 | 2011.05 |

### 2.6.3   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:

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

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

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

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

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

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

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

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

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

1. GSM Model Test Verdict:

| Band | Channel | Frequency (MHz) | PCL | Measured ERP | | | Limit | | Verdict |
|------|---------|-----------------|-----|------|------|--------------|------|---|---------|
| | | | | dBm | W | Refer to Plot | dBm | W | |
| GSM 850MHz | 128 | 824.20 | 5 | 32.28 | 1.690441 | Plot A | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 32.53 | 1.790606 | | | | PASS |
| | 251 | 848.80 | 5 | 31.88 | 1.541701 | | | | PASS |
| GPRS 850MHz | 128 | 824.20 | 5 | 32.41 | 1.741807 | Plot B Note 1 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 34.59 | 2.877398 | | | | PASS |
| | 251 | 848.80 | 5 | 33.09 | 2.037042 | | | | PASS |
| EGPRS 850MHz | 128 | 824.20 | 5 | 35.82 | 3.819443 | Plot C Note 1 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 35.87 | 3.863670 | | | | PASS |
| | 251 | 848.80 | 5 | 32.34 | 1.713957 | | | | PASS |

| Band | Channel | Frequency (MHz) | PCL | Measured EIRP | | | Limit | | Verdict |
|------|---------|-----------------|-----|------|------|--------------|------|---|---------|
| | | | | dBm | W | Refer to Plot | dBm | W | |
| GSM 1900MHz | 512 | 1850.2 | 0 | 29.54 | 0.899498 | Plot D | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 29.35 | 0.860994 | | | | PASS |
| | 810 | 1909.8 | 0 | 28.75 | 0.749894 | | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 0 | 30.70 | 1.174898 | Plot E Note 1 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 29.77 | 0.860994 | | | | PASS |
| | 810 | 1909.8 | 0 | 27.17 | 0.749894 | | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 0 | 29.89 | 0.974990 | Plot F Note 1 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 29.77 | 0.948418 | | | | PASS |
| | 810 | 1909.8 | 0 | 28.77 | 0.753356 | | | | 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 | dBm | W | |
| WCDMA 850MHz | 4132 | 826.4 | 27.61 | 0.576766 | 38.5 | 7 | PASS |
| | 4175 | 835 | 28.12 | 0.648634 | | | PASS |
| | 4233 | 846.6 | 28.06 | 0.639735 | | | PASS |
| HSDPA 850MHz | 4132 | 826.4 | 27.58 | 0.572796 | 38.5 | 7 | PASS |
| | 4175 | 835 | 28.40 | 0.691831 | | | PASS |
| | 4233 | 846.6 | 27.92 | 0.619441 | | | PASS |

| Band | Channel | Frequency (MHz) | Measured EIRP | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|
| | | | dBm | W | dBm | W | |
| WCDMA 1900MHz | 9262 | 1852.4 | 20.33 | 0.107895 | 33 | 2 | PASS |
| | 9400 | 1880 | 21.21 | 0.132130 | | | PASS |
| | 9538 | 1907.6 | 19.43 | 0.087701 | | | PASS |
| HSDPA 1900MHz | 9262 | 1852.4 | 20.33 | 0.107895 | 33 | 2 | PASS |
| | 9400 | 1880 | 20.85 | 0.121619 | | | PASS |
| | 9538 | 1907.6 | 19.98 | 0.099541 | | | PASS |

Note2: For the WCDMA and HSDPA test band, the measured output power was calculated by the reading of the Power Meter.

3. Test Plots:
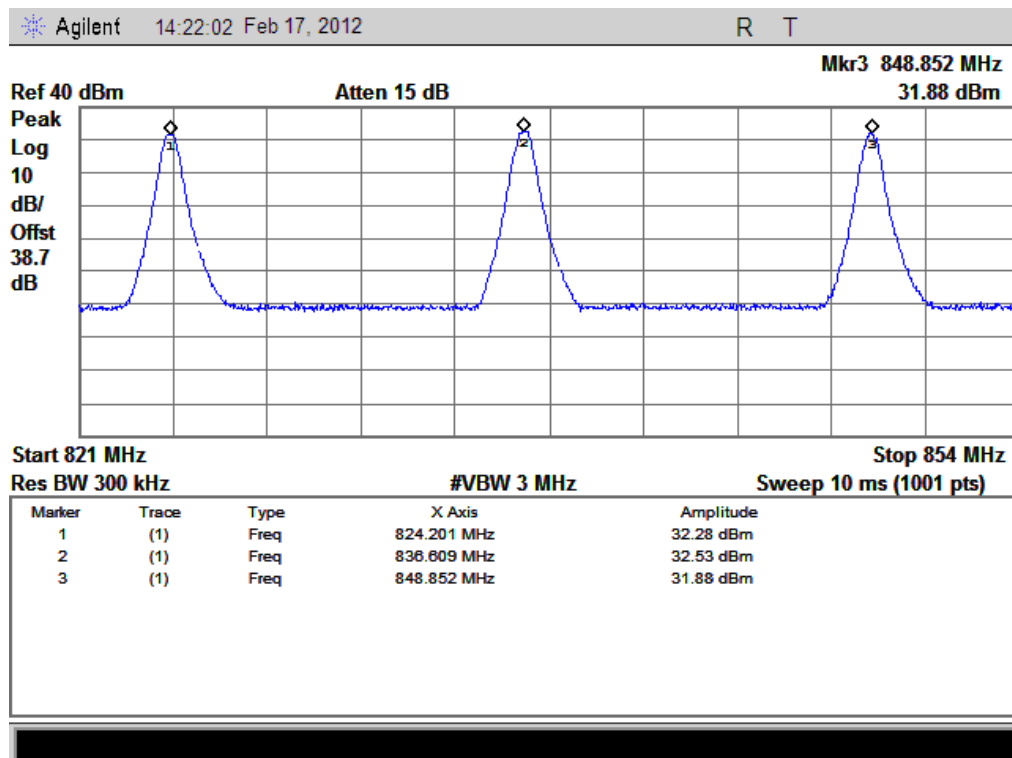


(Plot A: GSM 850MHz Channel = 128, 190, 251)
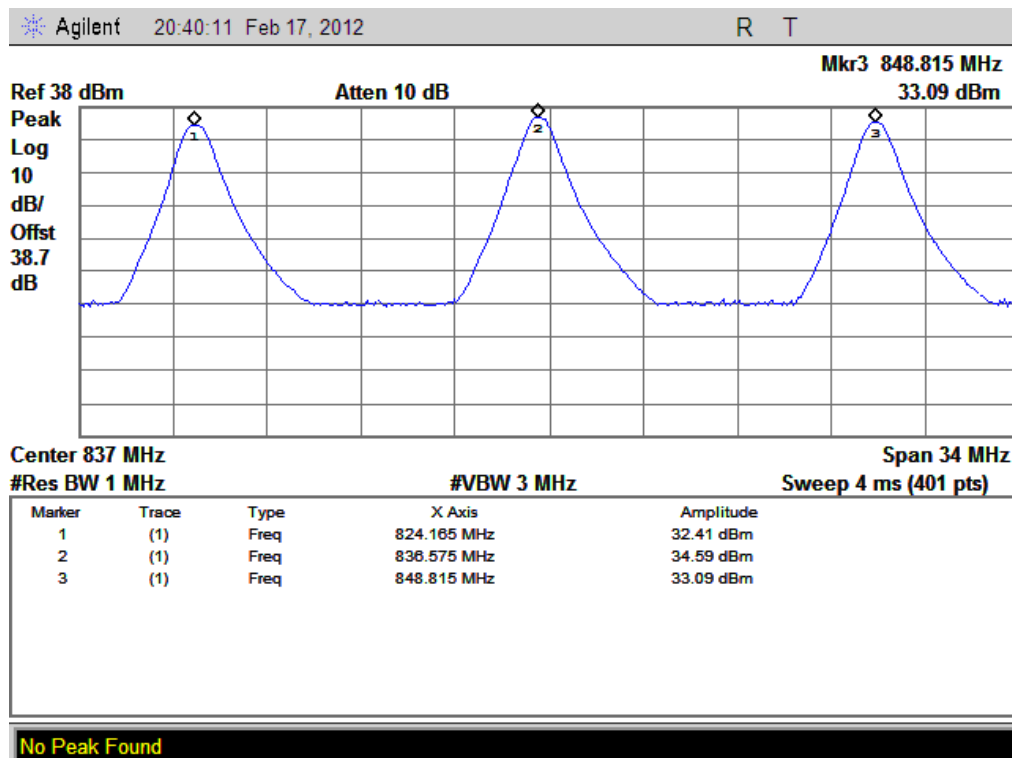


(Plot B: GPRS 850MHz Channel = 128, 190, 251)
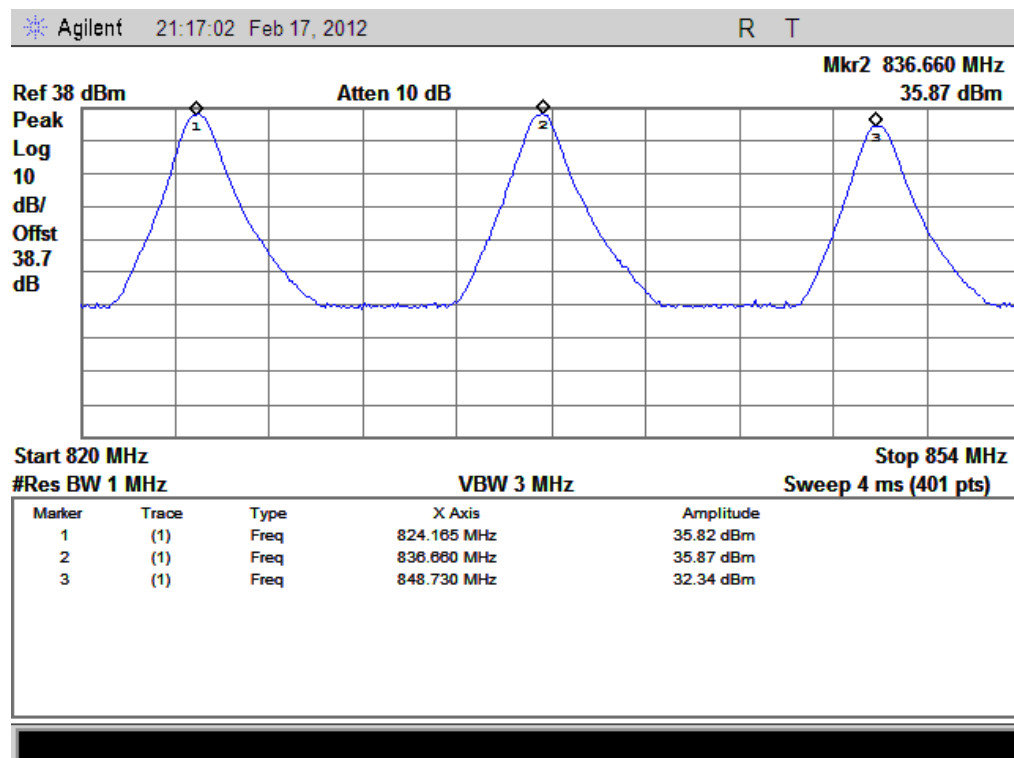
(Plot C: EDGE 850MHz Channel = 128, 190, 251)
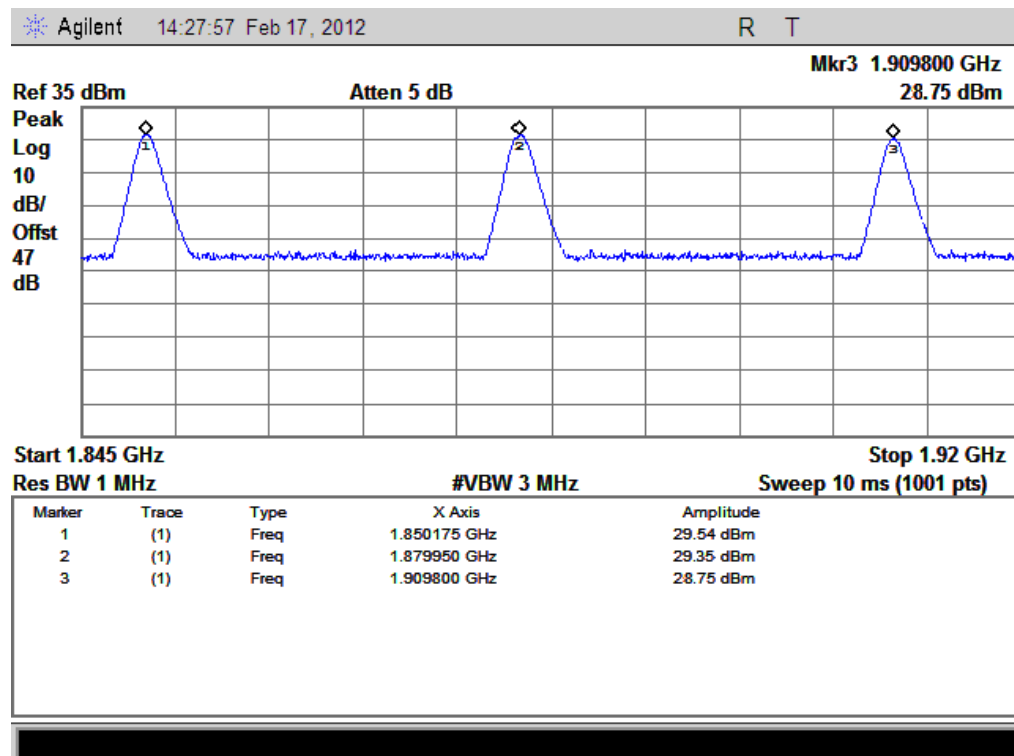


(Plot D: GSM 1900MHz Channel = 512, 661, 810)
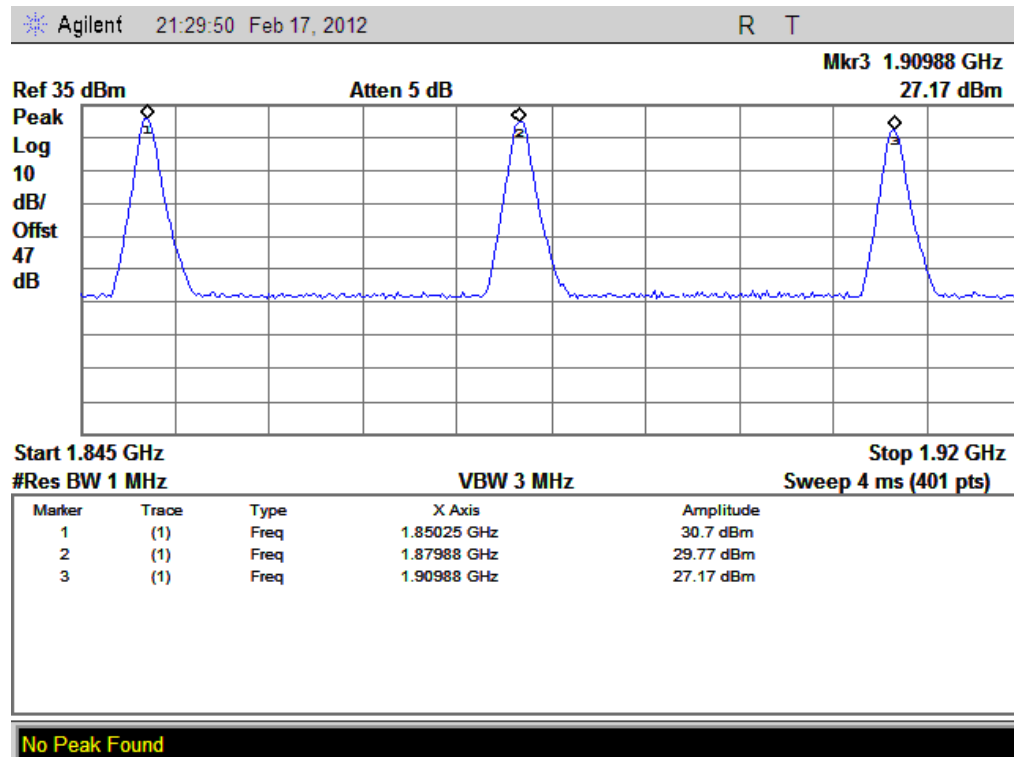
(Plot E: GPRS 1900MHz Channel = 512, 661, 810)
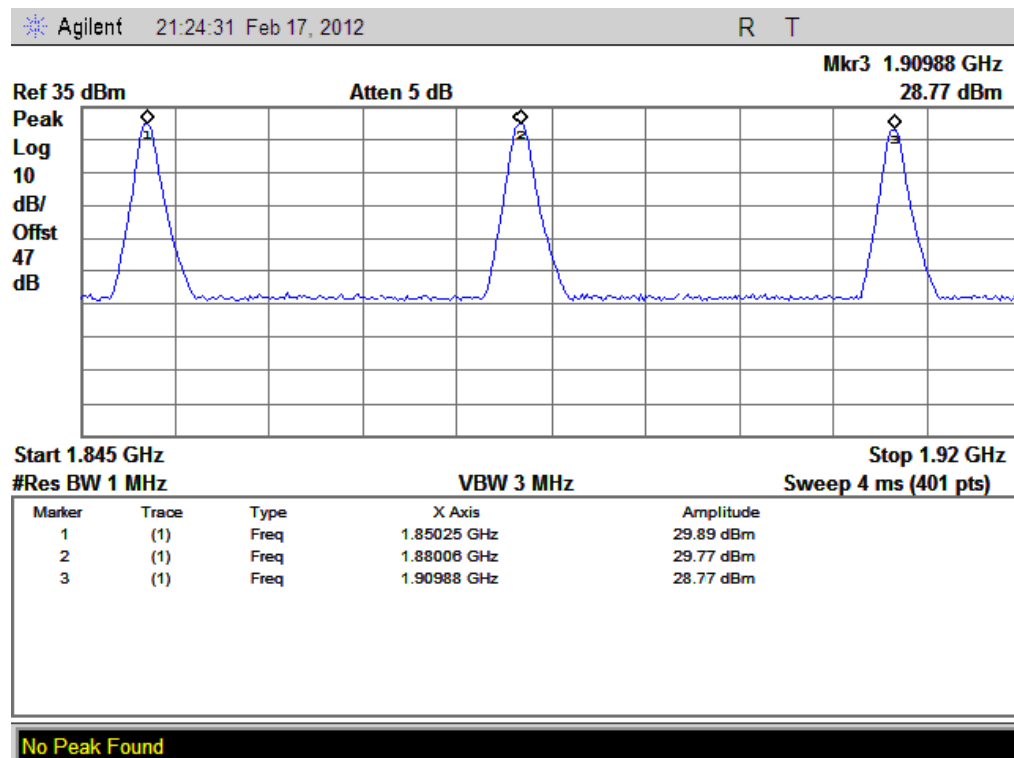


(Plot F: EDGE 1900MHz Channel = 512, 661, 810)

## 2.7 Radiated Out of Band Emissions

### 2.7.1 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.

### 2.7.2 Test Description

See section 2.6.2 of this report.

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

### 2.7.3 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 | PASS |
| | 190 | 836.6 | < -25 | < -25 | Plot A.3/A.4 | | PASS |
| | 251 | 848.8 | < -25 | < -25 | Plot A.5/A.6 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | < -25 | < -25 | Plot B.1/B.2 | -13 | PASS |
| | 661 | 1880.0 | < -25 | < -25 | Plot B.3/B.4 | | PASS |
| | 810 | 1909.8 | < -25 | < -25 | Plot B.5/B.6 | | PASS |
| EDGE 850MHz | 128 | 824.2 | < -25 | < -25 | Plot C.1/C.2 | -13 | PASS |
| | 190 | 836.6 | < -25 | < -25 | Plot C.3/C.4 | | PASS |
| | 251 | 848.8 | < -25 | < -25 | Plot C.5/C.6 | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | < -25 | < -25 | Plot D.1/D.2 | -13 | PASS |
| | 661 | 1880.0 | < -25 | < -25 | Plot D.3/D.4 | | PASS |
| | 810 | 1909.8 | < -25 | < -25 | Plot D.5/D.6 | | PASS |
| WCDMA | 4132 | 826.4 | < -25 | < -25 | Plot E.1/E.2 | -13 | PASS |

| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Test Antenna Horizontal | Test Antenna Vertical | | | |
| 850MHz | 4175 | 835 | < -25 | < -25 | Plot E.3/E.4 | | PASS |
| | 4233 | 846.6 | < -25 | < -25 | Plot E.5/E.6 | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | < -25 | < -25 | Plot F.1/F.2 | -13 | PASS |
| | 9400 | 1880 | < -25 | < -25 | Plot F.3/F.4 | | PASS |
| | 9538 | 1907.6 | < -25 | < -25 | Plot F.5/F.6 | | PASS |
| HSDPA 850MHz | 4132 | 826.4 | < -25 | < -25 | Plot G.1/G.2 | -13 | PASS |
| | 4175 | 835 | < -25 | < -25 | Plot G.3/G.4 | | PASS |
| | 4233 | 846.6 | < -25 | < -25 | Plot G.5/G.6 | | PASS |
| HSDPA 1900MHz | 9262 | 1852.4 | < -25 | < -25 | Plot H.1/H.2 | -13 | PASS |
| | 9400 | 1880 | < -25 | < -25 | Plot H.3/H.4 | | PASS |
| | 9538 | 1907.6 | < -25 | < -25 | Plot H.5/H.6 | | PASS |

2. Test Plots for the Whole Measurement Frequency Range:

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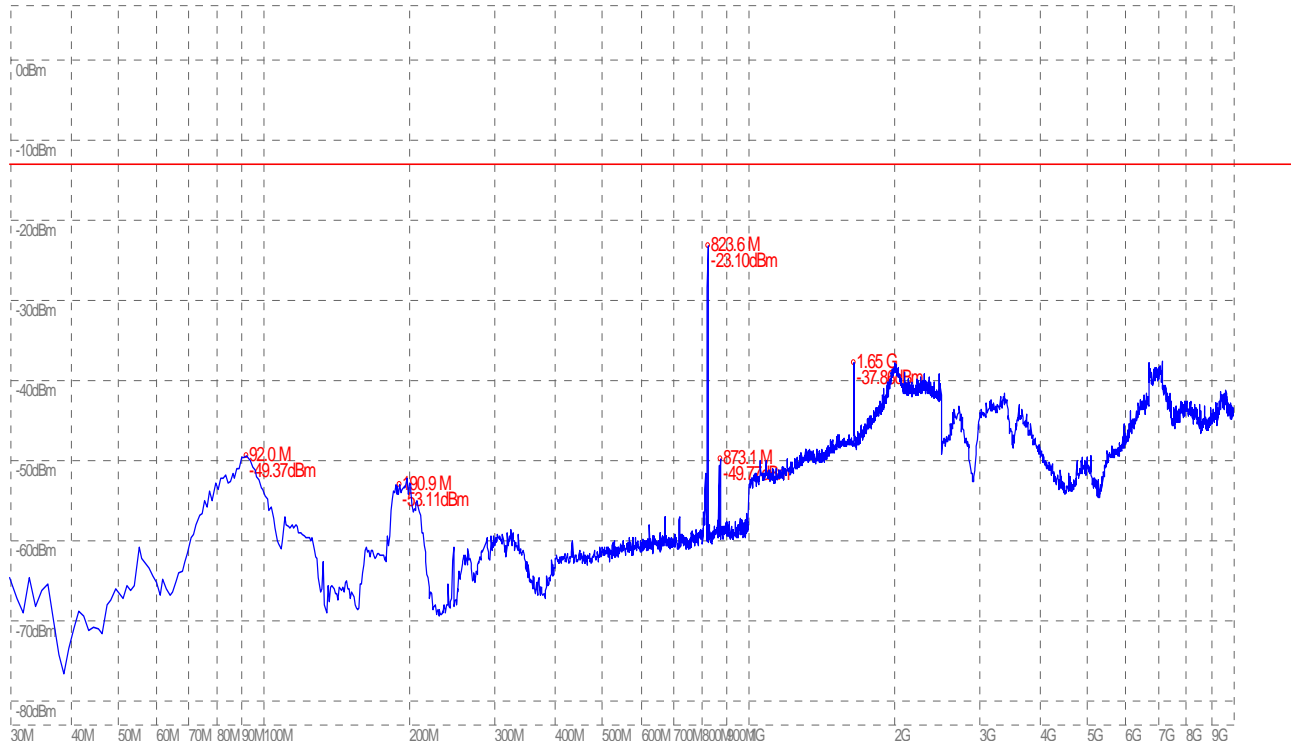


(Plot A.1:    GSM 850MHz Channel = 128, Test Antenna Horizontal)
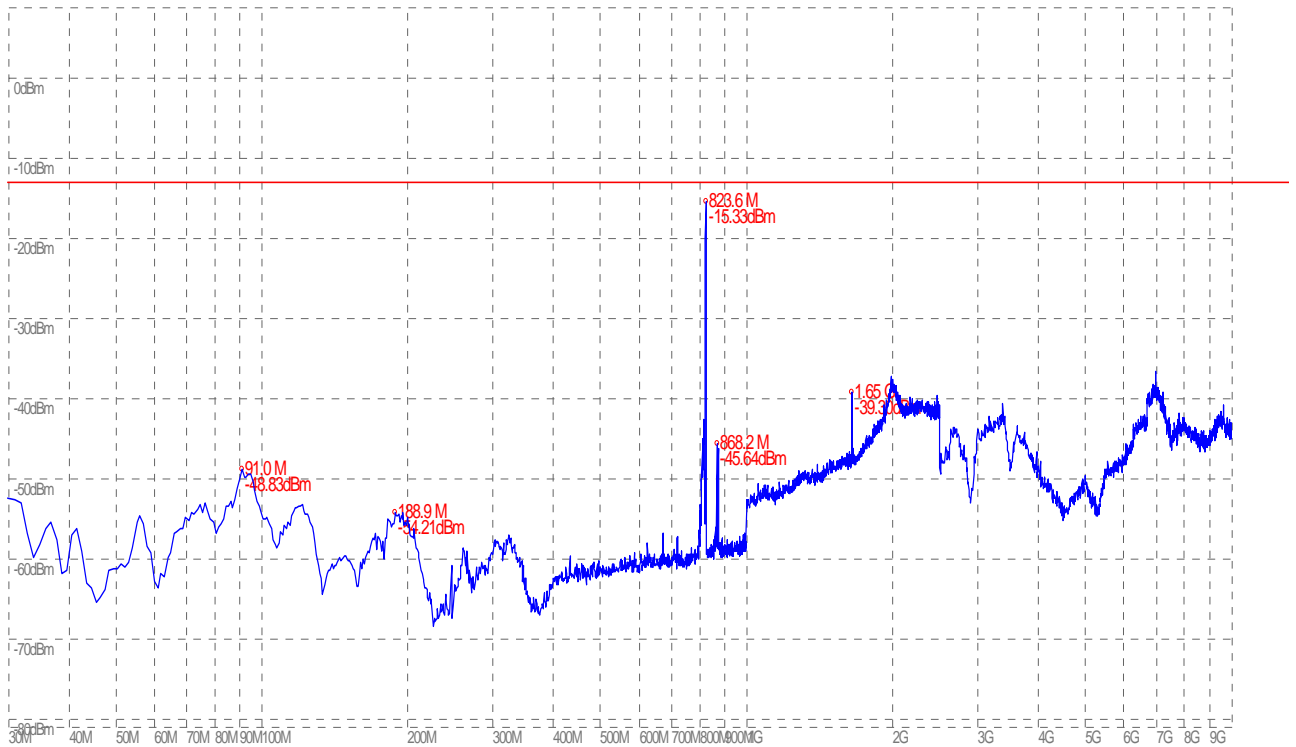
(Plot A.2: GSM 850MHz Channel = 128, Test Antenna Vertical)



(Plot A.3: GSM 850MHz Channel = 190, Test Antenna Horizontal)
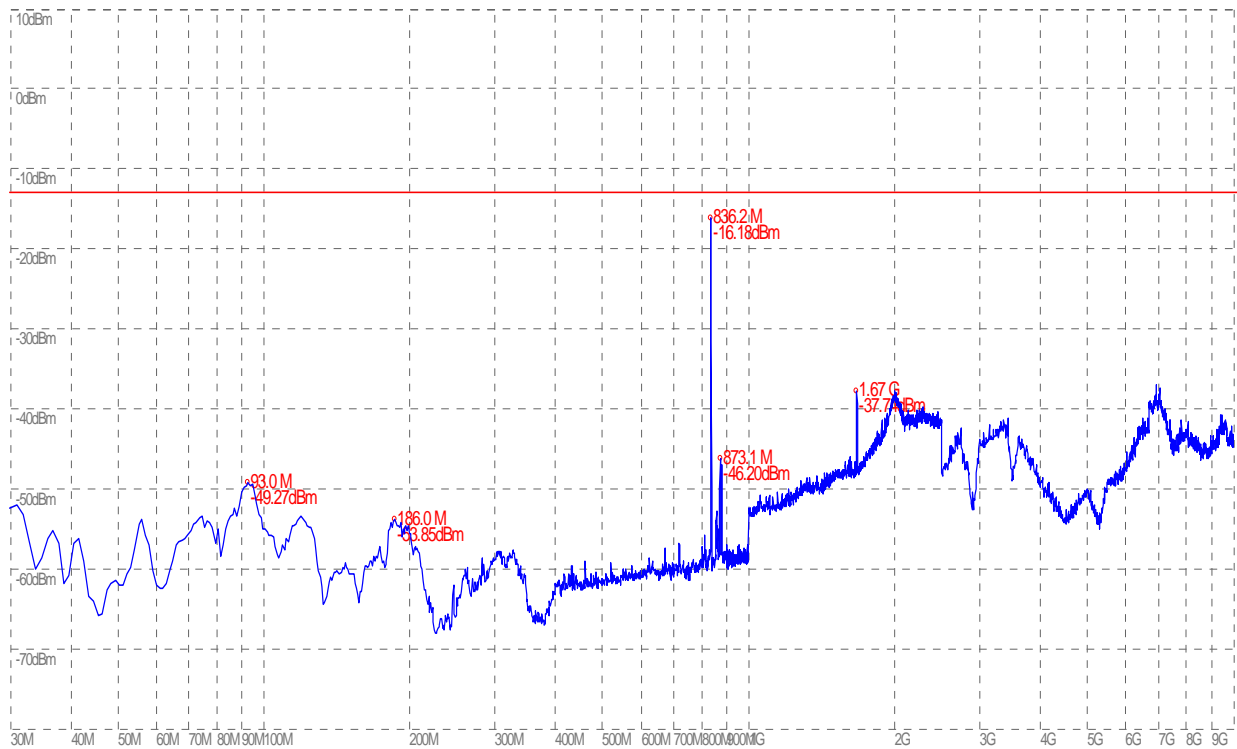
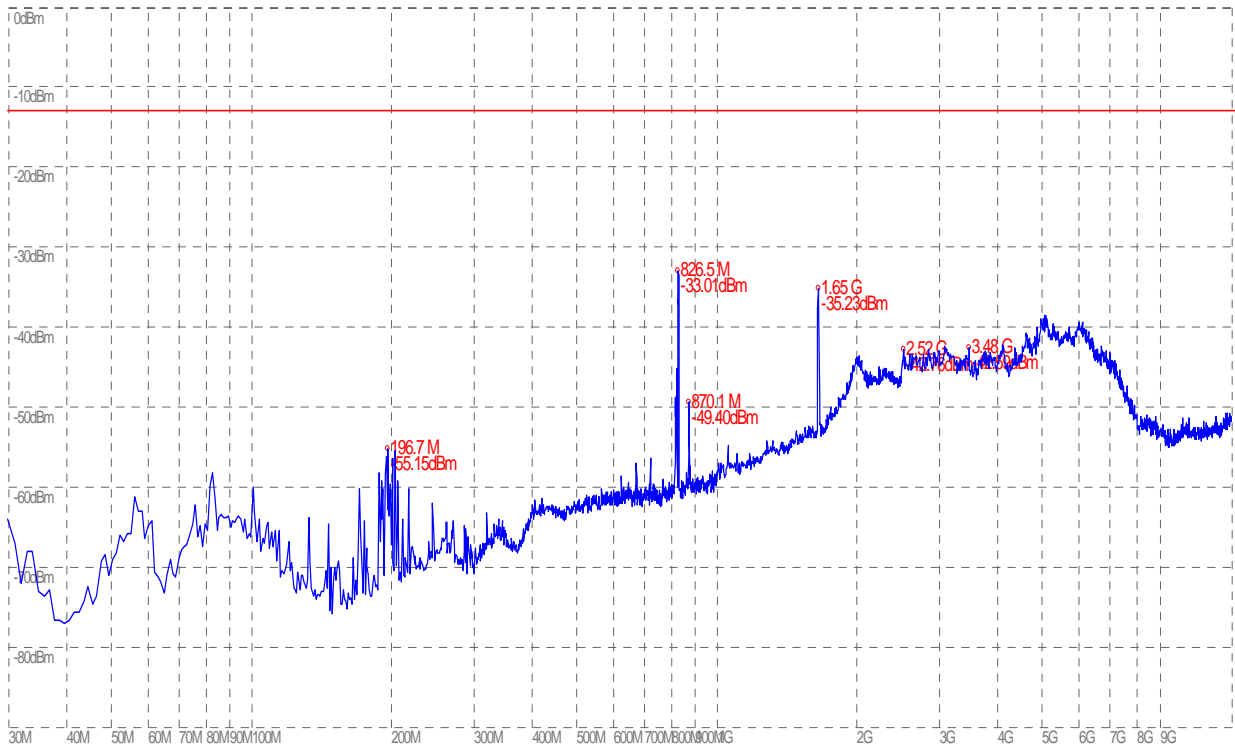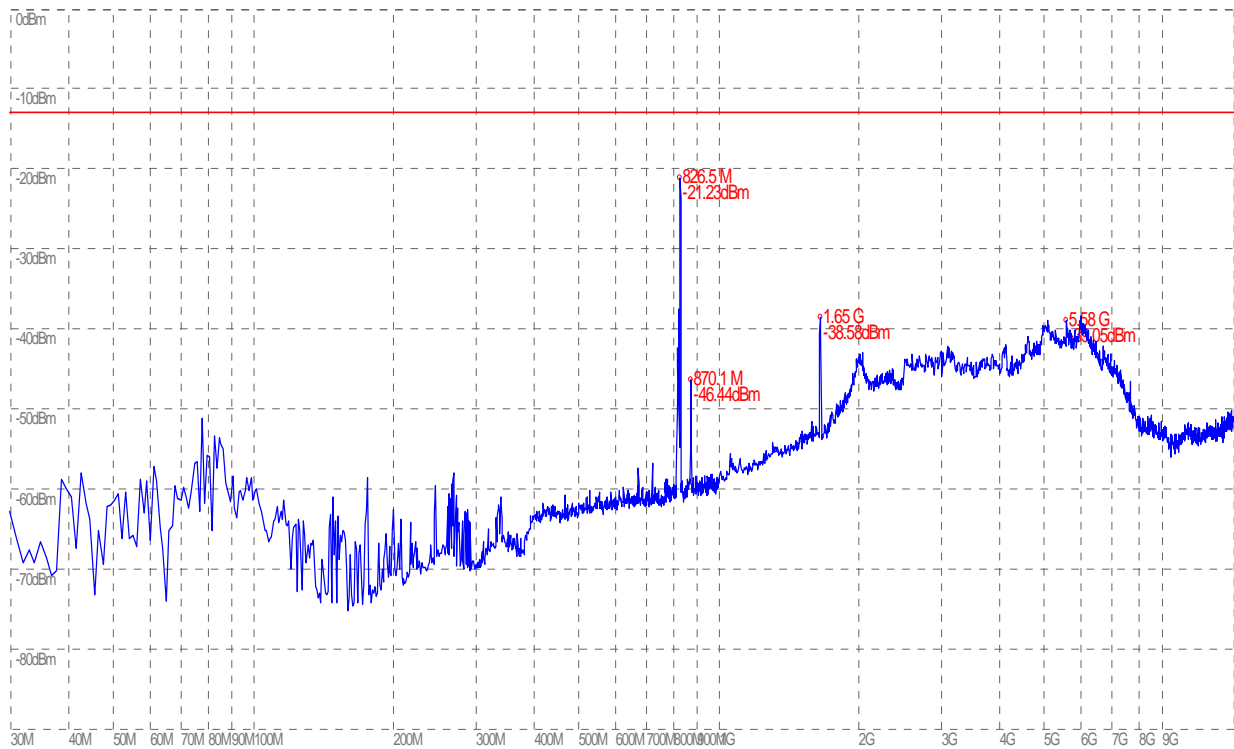(Plot A.4:   GSM 850MHz Channel = 190, Test Antenna Vertical)
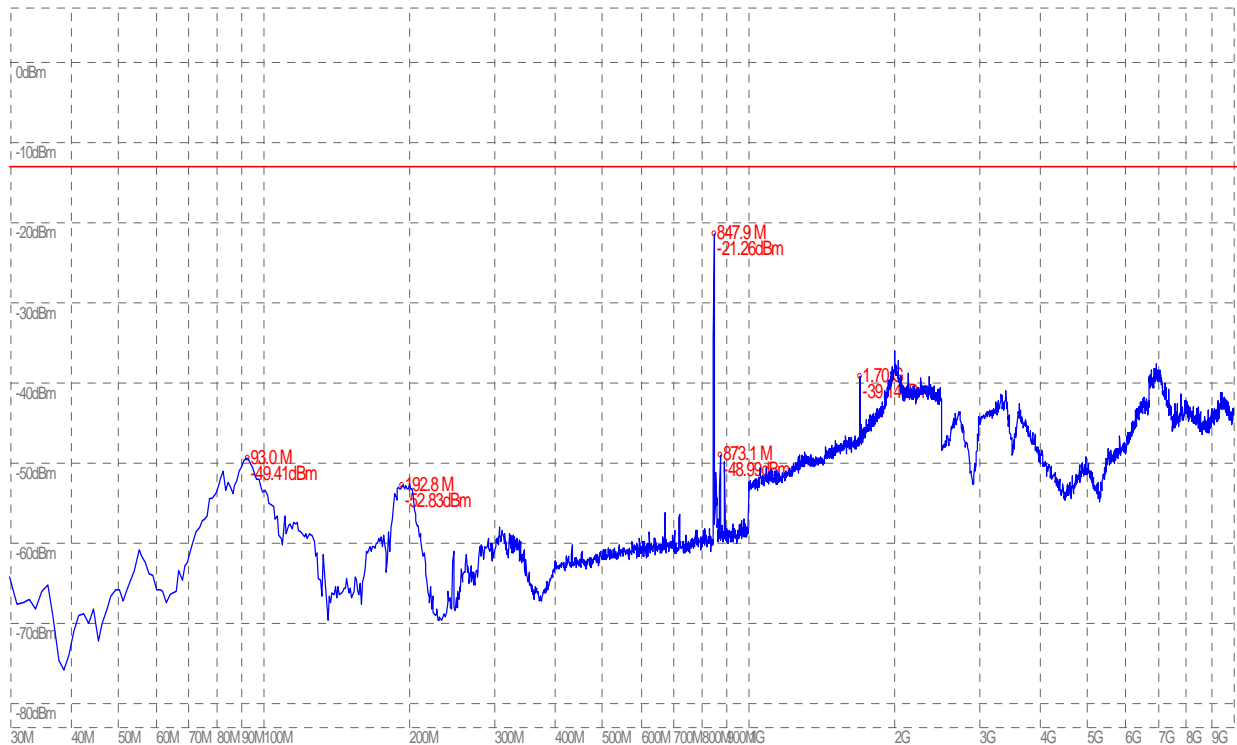


(Plot A.5:     GSM 850MHz Channel = 251, Test Antenna Horizontal)
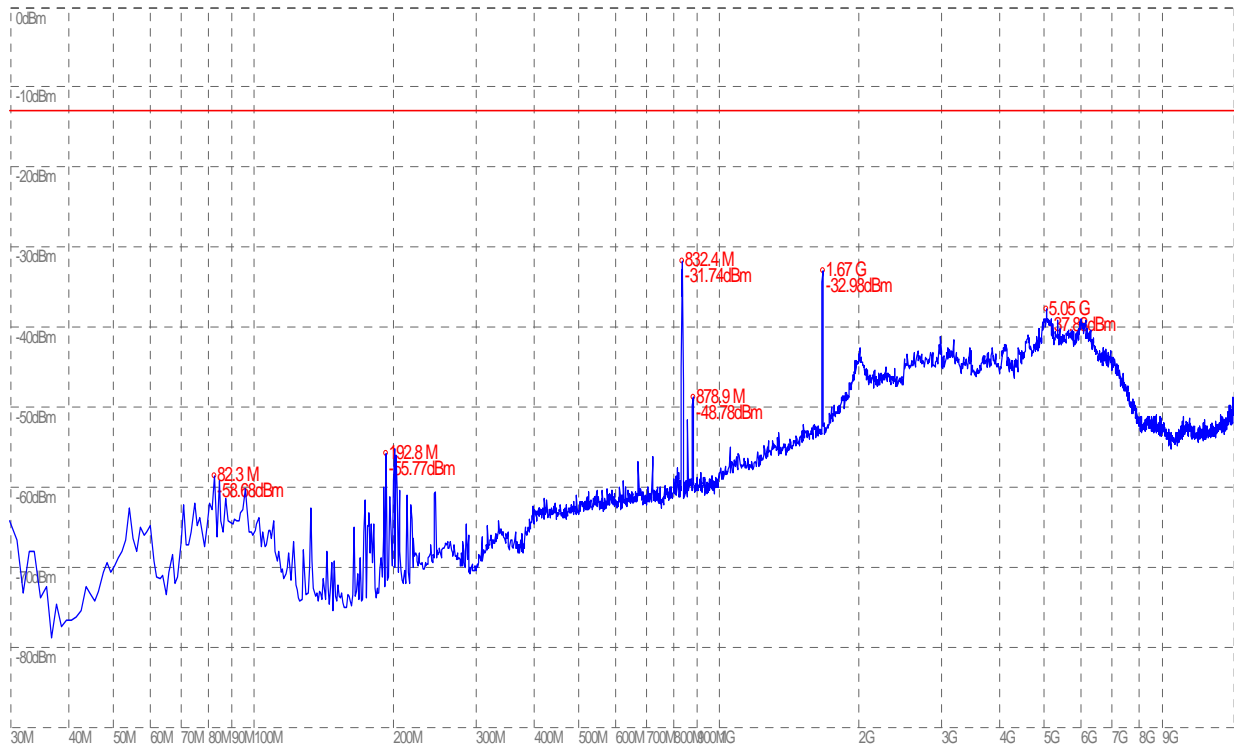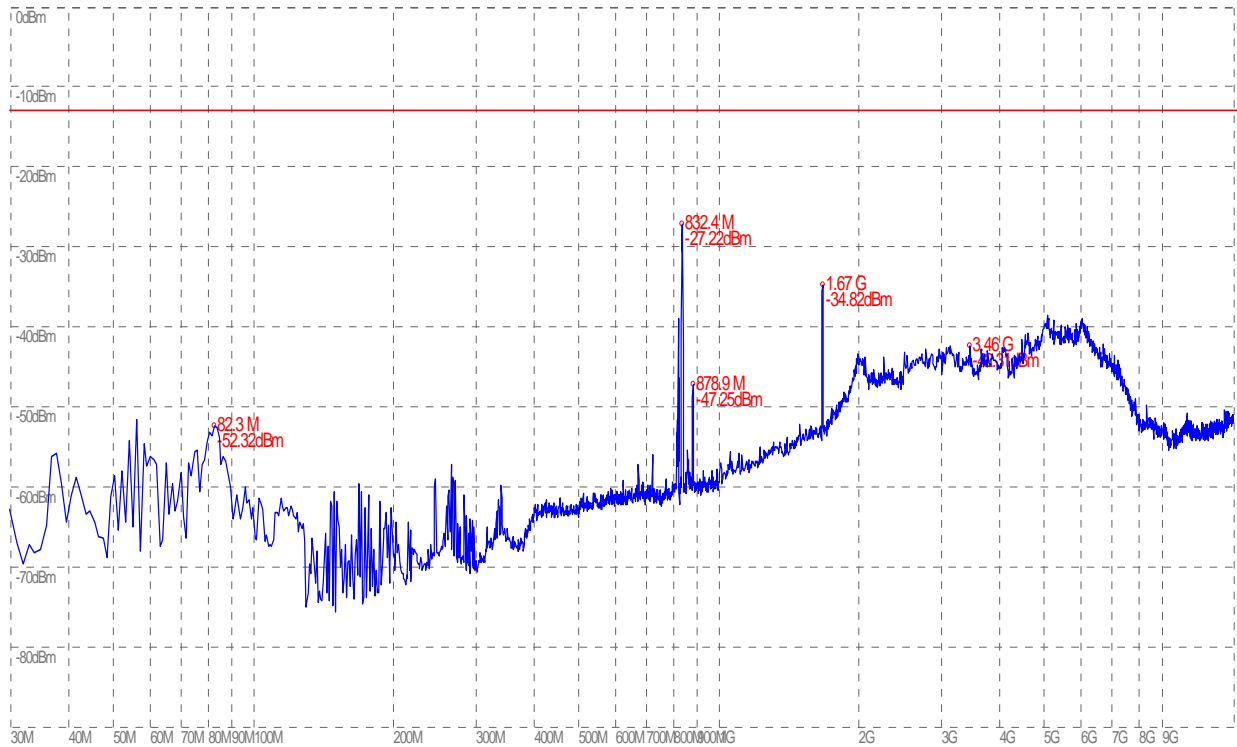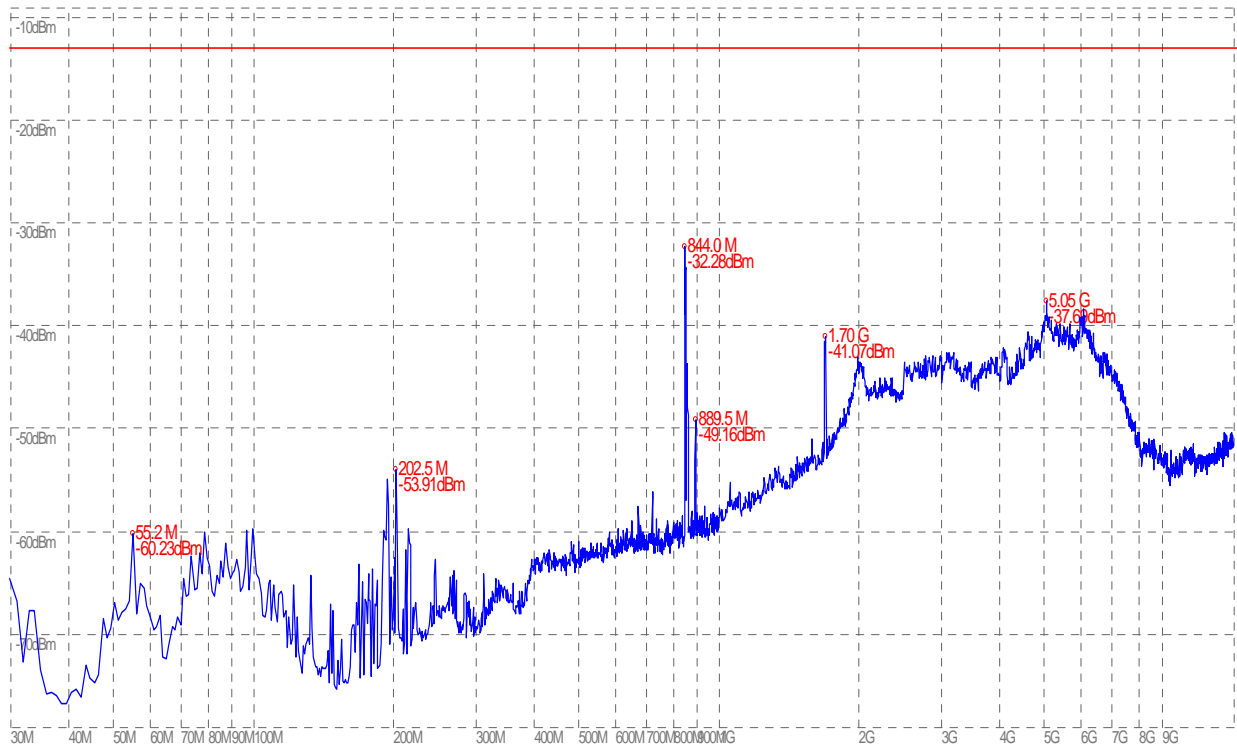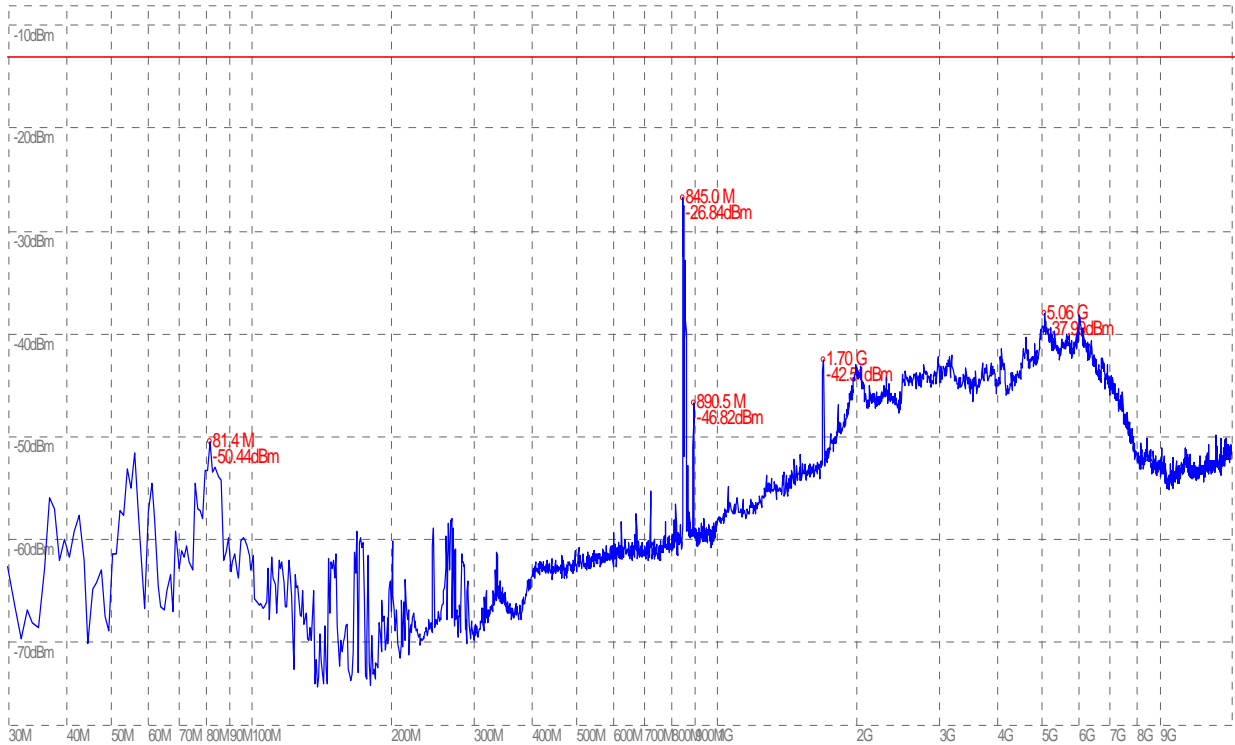
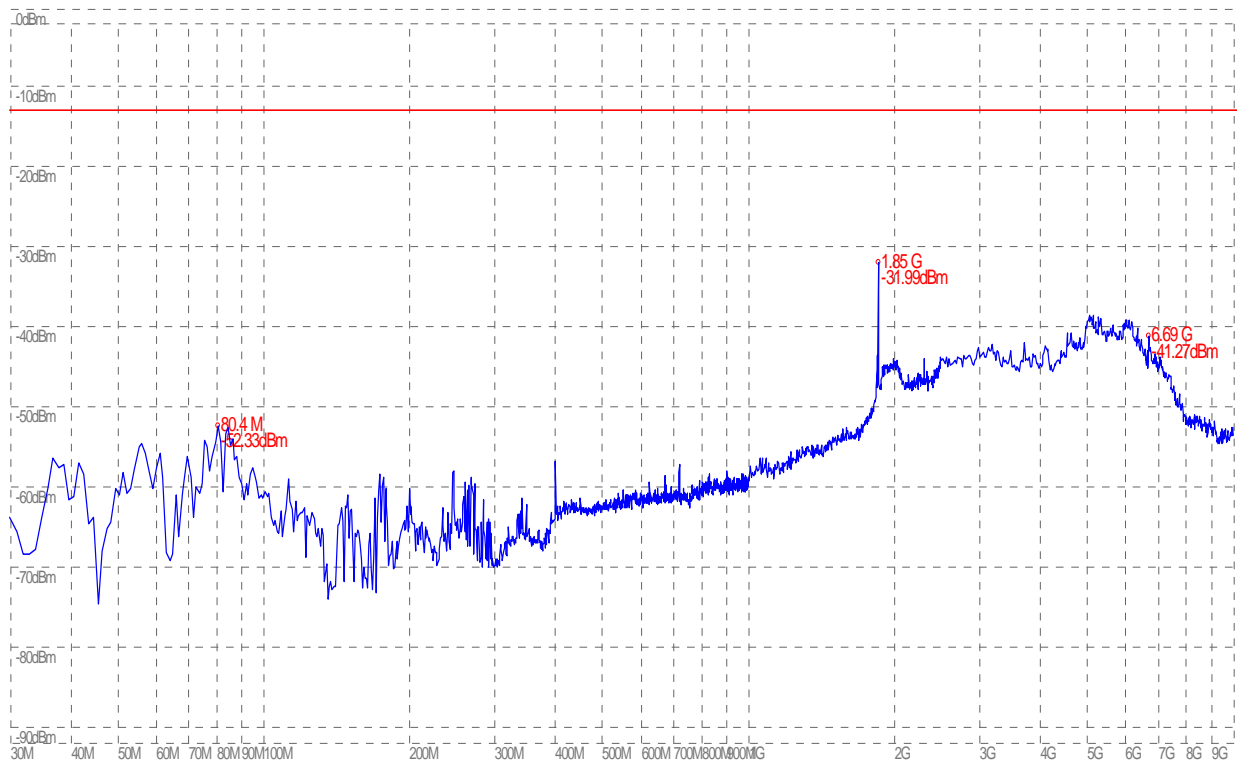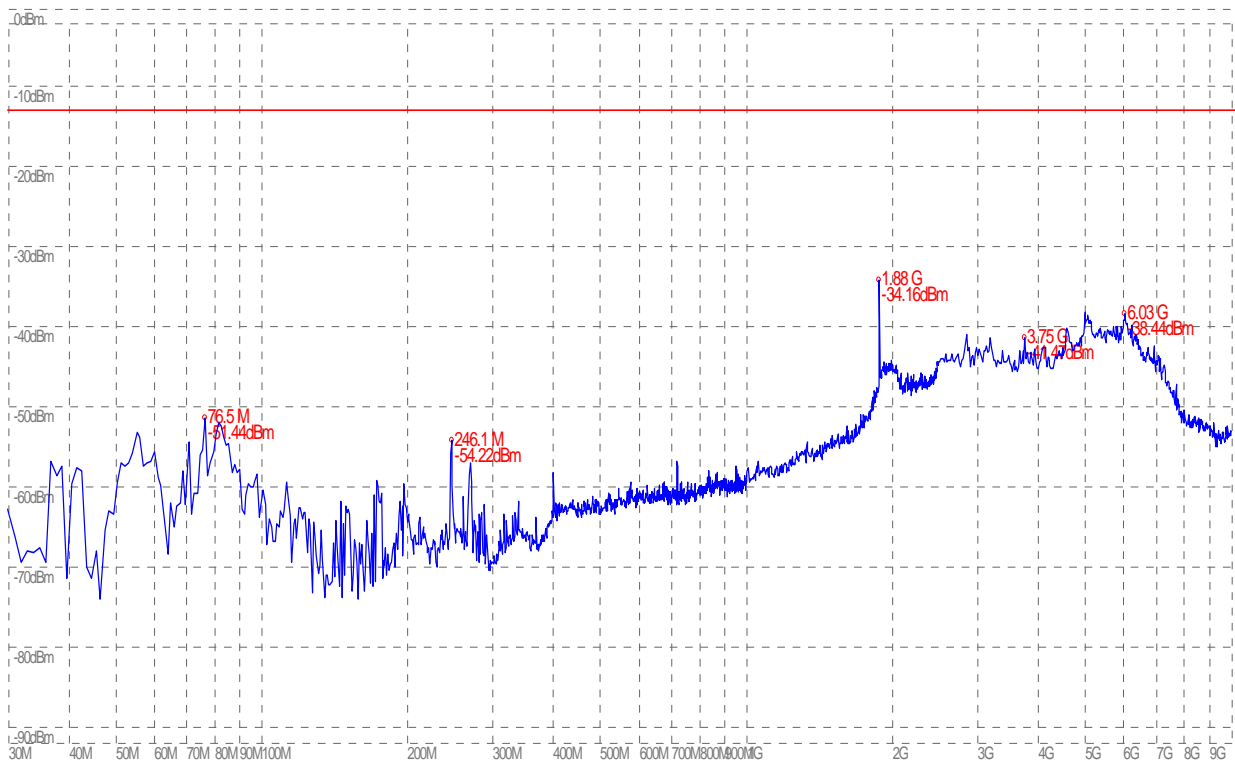(Plot A.6:   GSM 850MHz Channel = 251, Test Antenna Vertical)
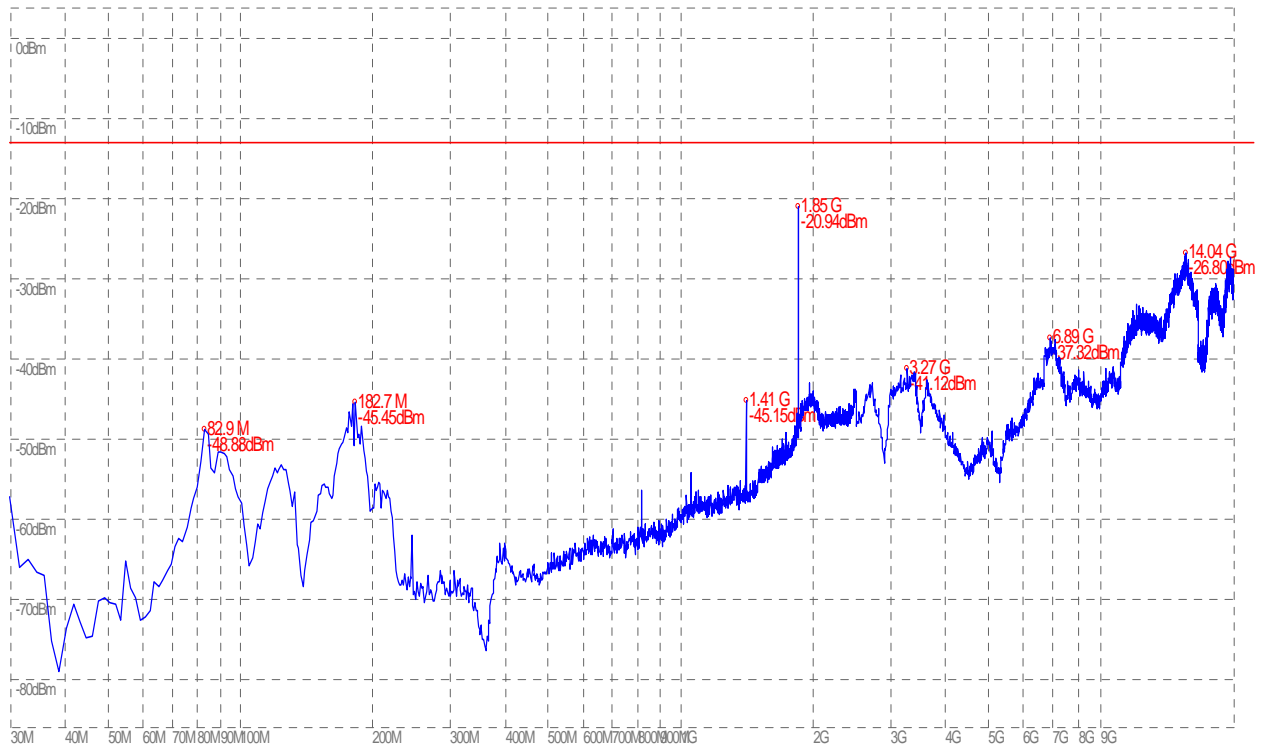


(Plot B.1:    GSM 1900MHz Channel = 512, Test Antenna Horizontal)
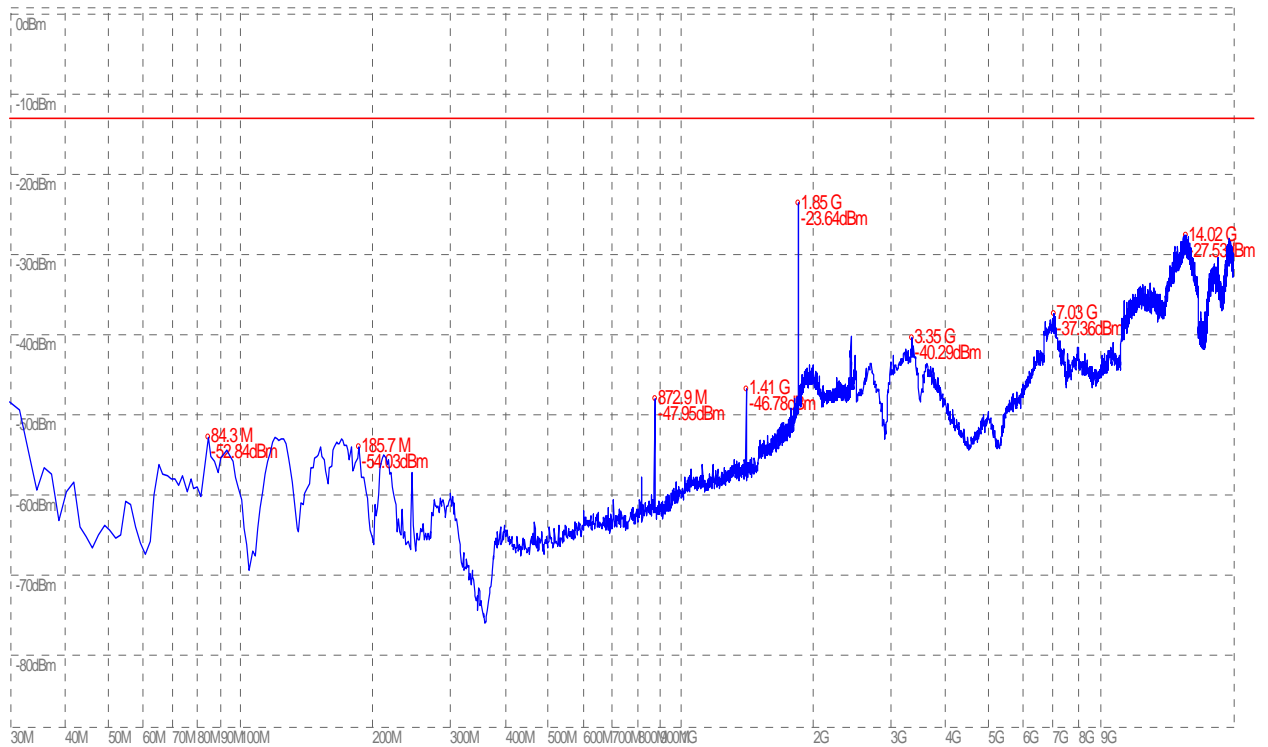
(Plot B.2:     GSM 1900MHz Channel = 512, Test Antenna Vertical)



(Plot B.3:     GSM 1900MHz Channel = 661, Test Antenna Horizontal)
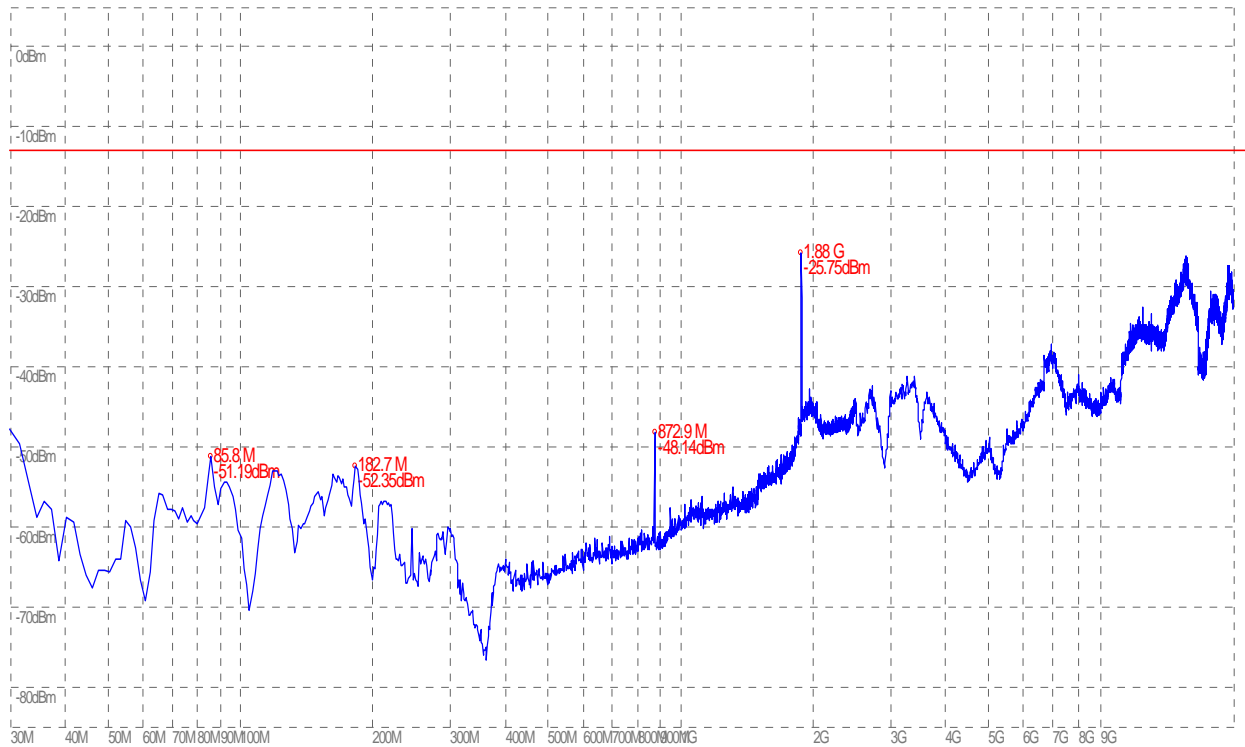
(Plot B.4:   GSM 1900MHz Channel = 661, Test Antenna Vertical)
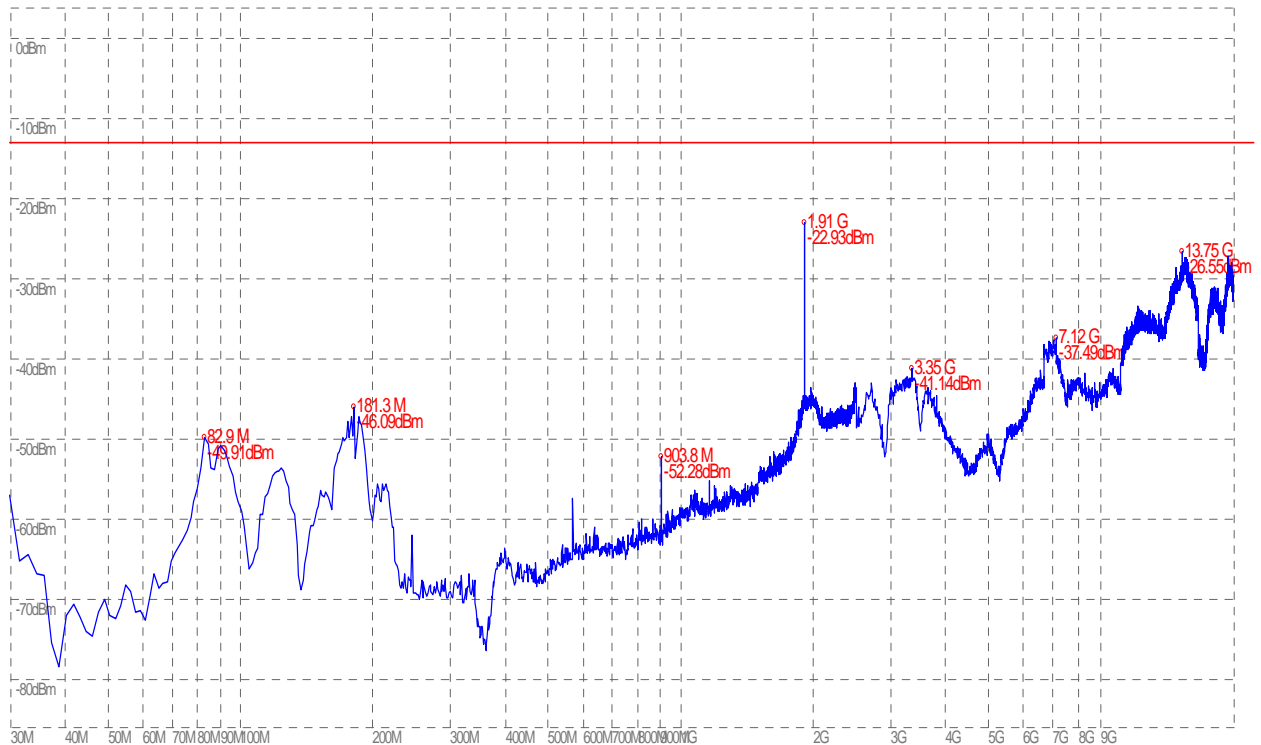


(Plot B.5:     GSM 1900MHz Channel = 810, Test Antenna Horizontal)
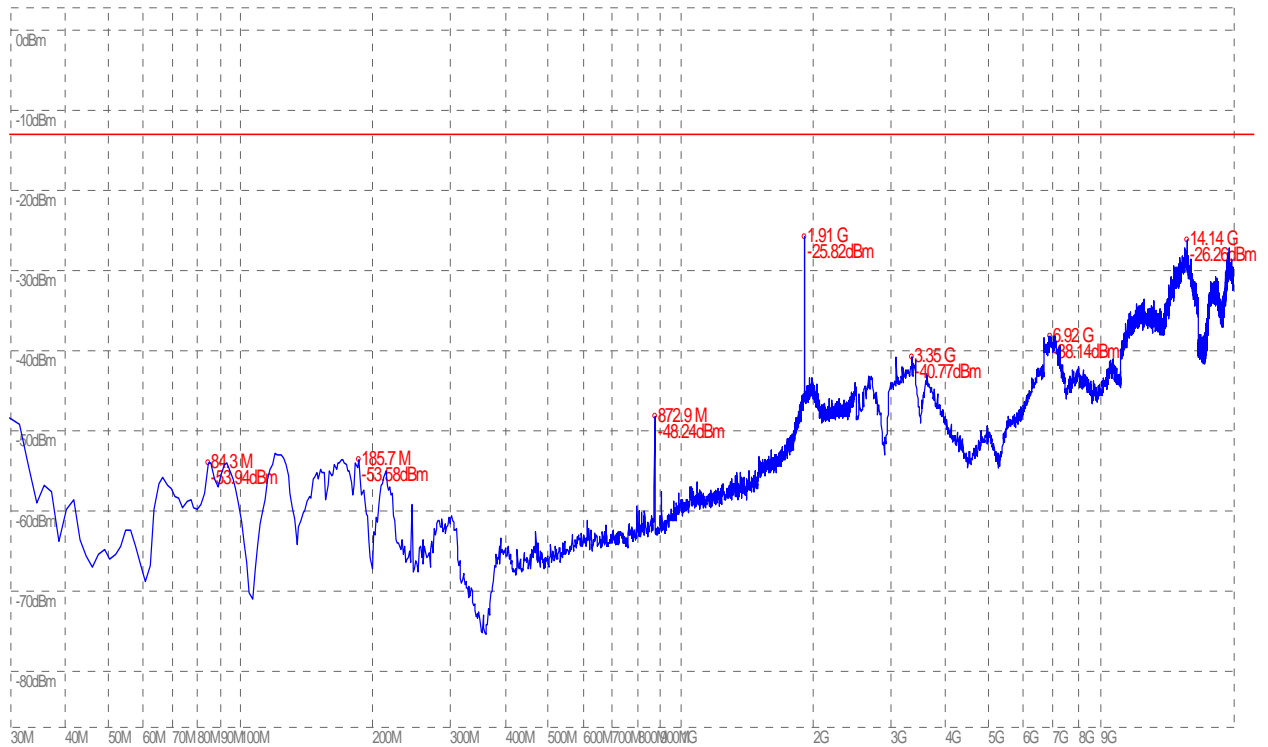
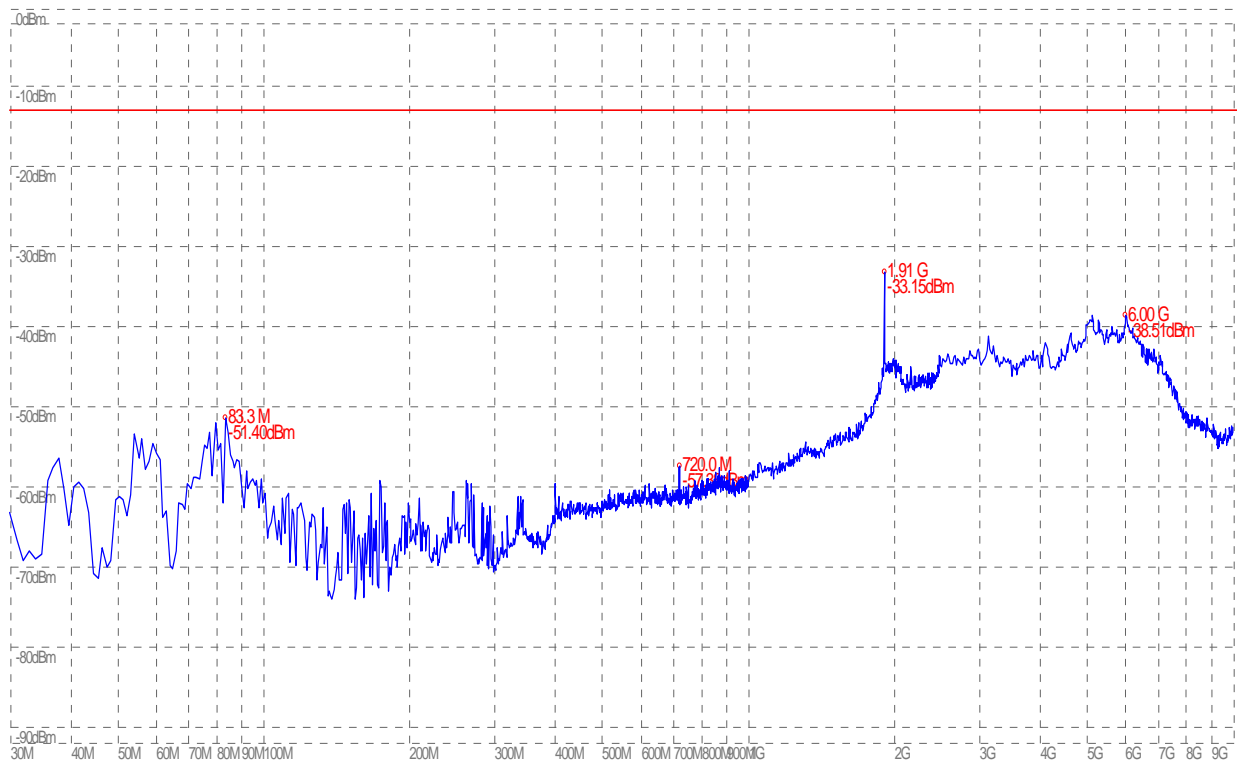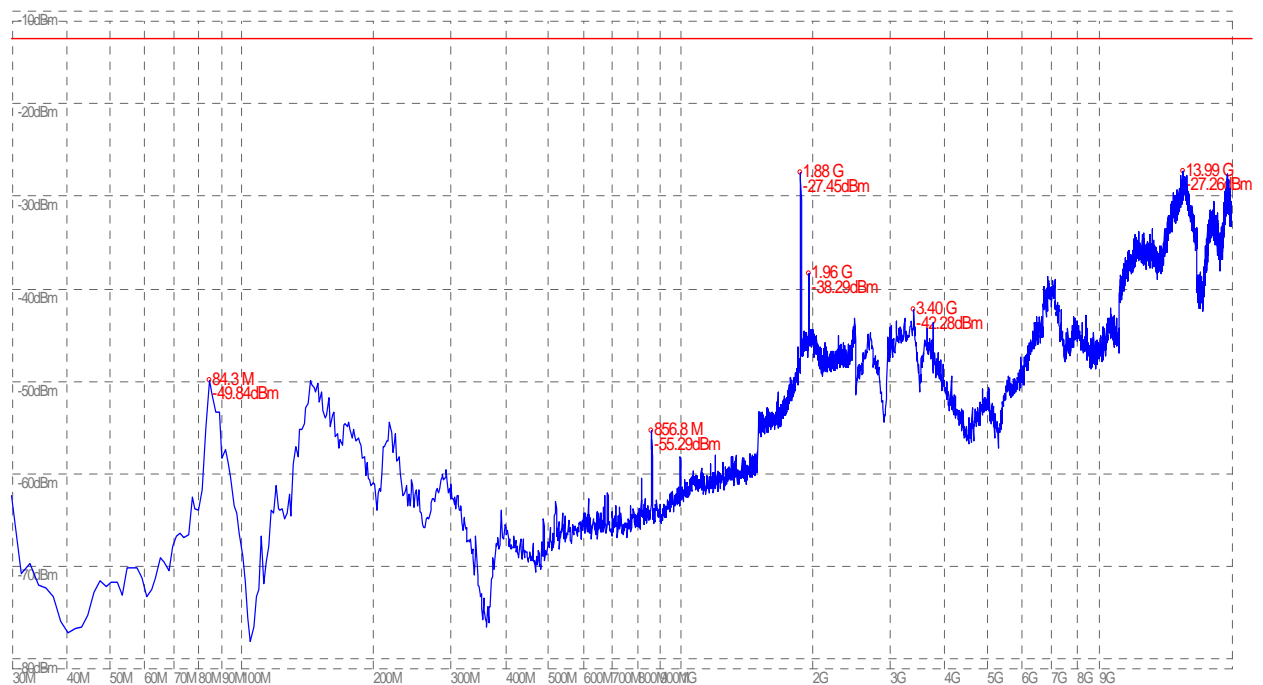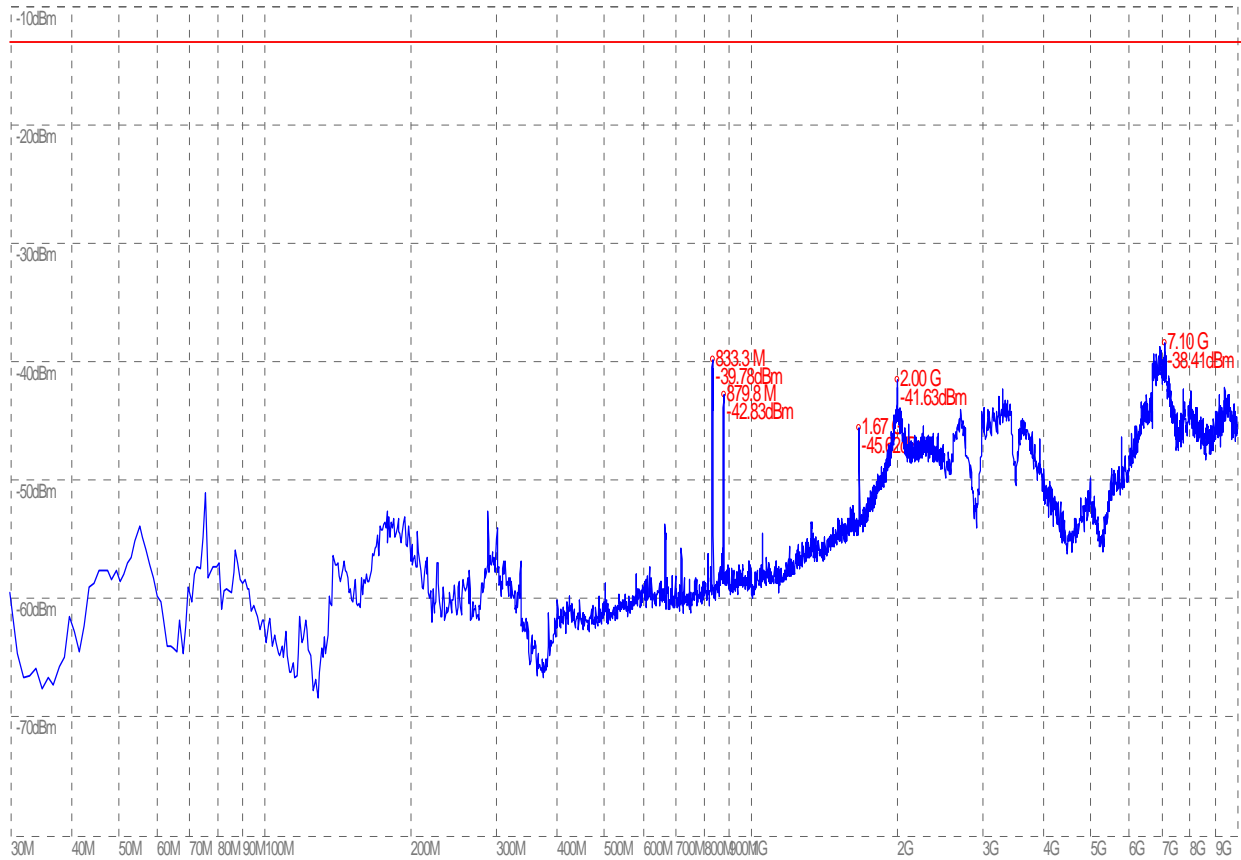(PlotB.6:    GSM 1900MHz Channel = 810, Test Antenna Vertical)
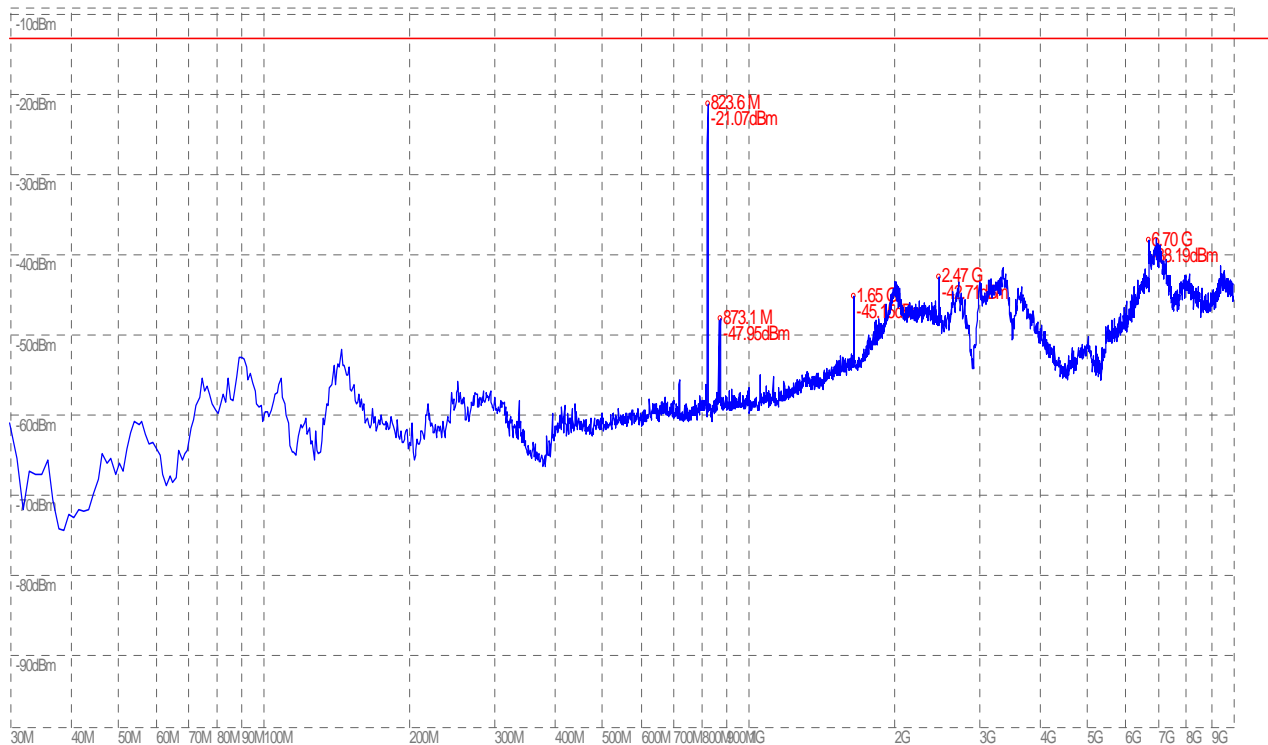


(Plot C.1:    EGPRS 850MHz Channel = 128, Test Antenna Horizontal)
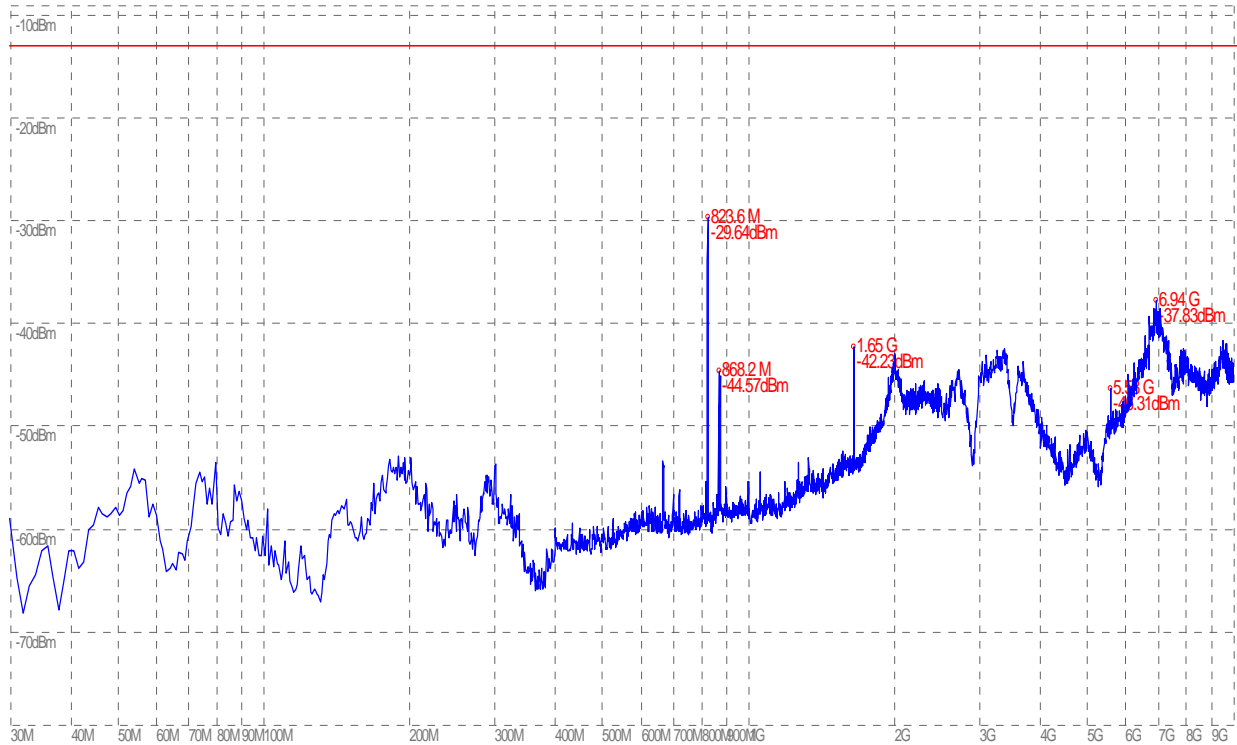
(Plot C.2:  EGPRS 850MHz Channel = 128, Test Antenna Vertical)



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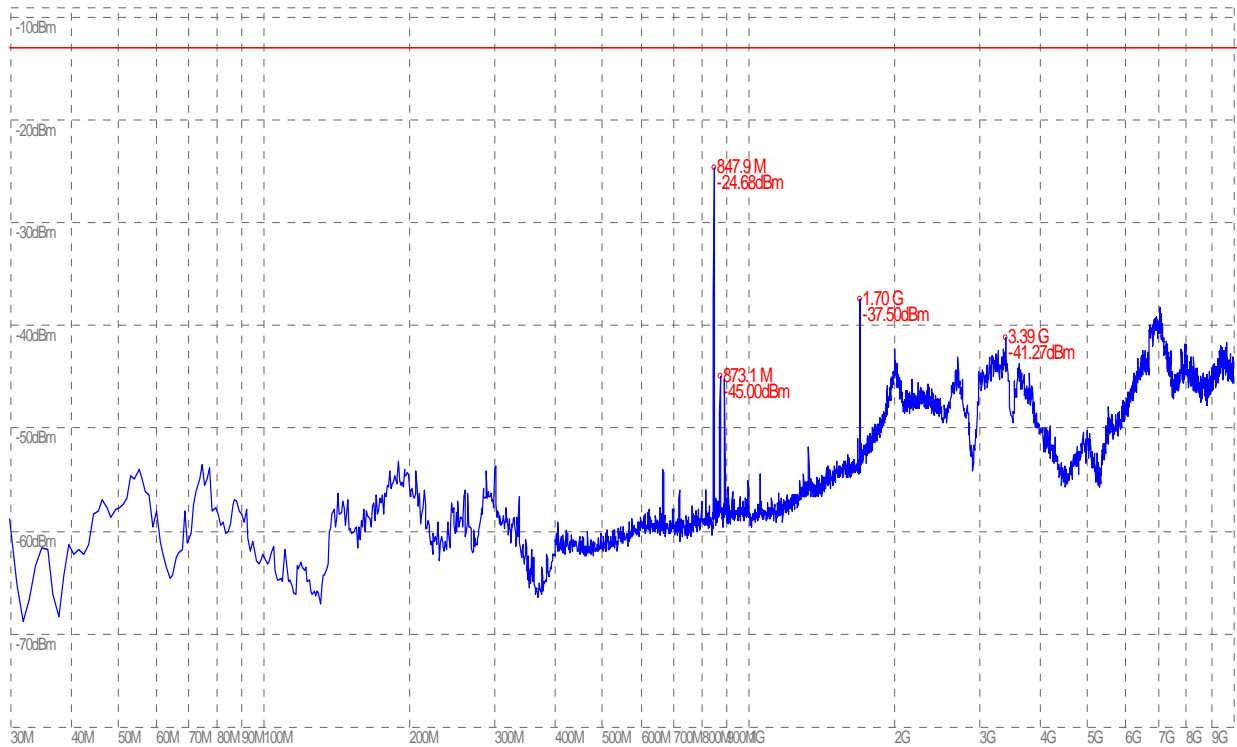
(Plot C.6:    EGPRS 850MHz Channel = 251, Test Antenna Vertical)
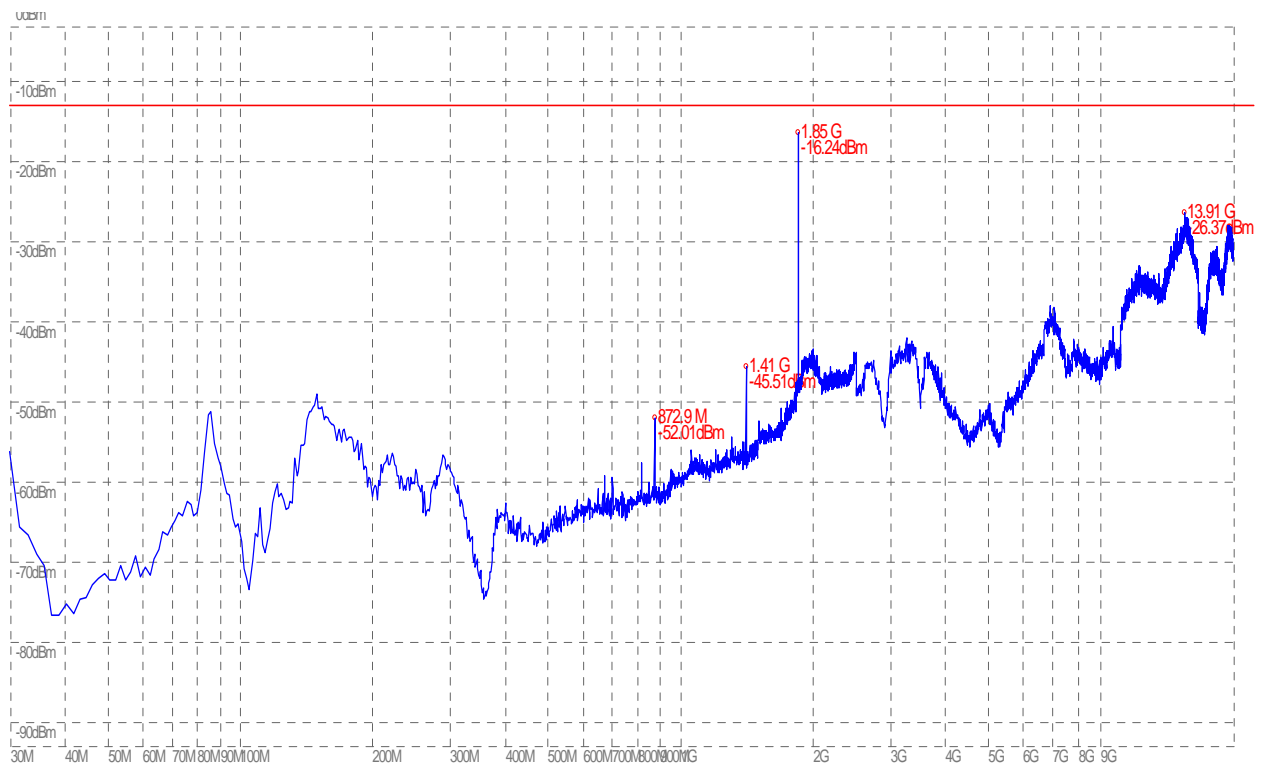


(Plot D.1:    EGPRS 1900MHz Channel = 512, Test Antenna Horizontal)

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



(Plot D.3:    EGPRS 1900MHz Channel = 661, Test Antenna Horizontal)
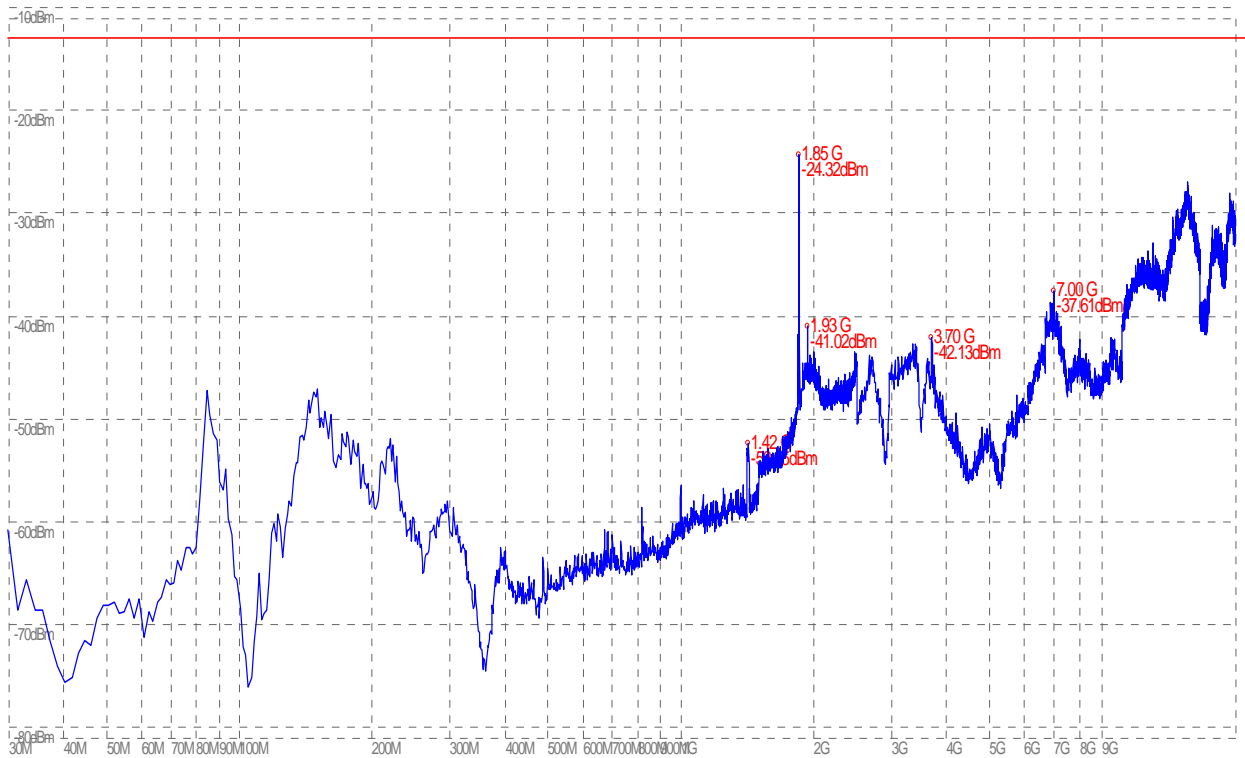
(Plot D.4:   EGPRS 1900MHz Channel = 661, Test Antenna Vertical)
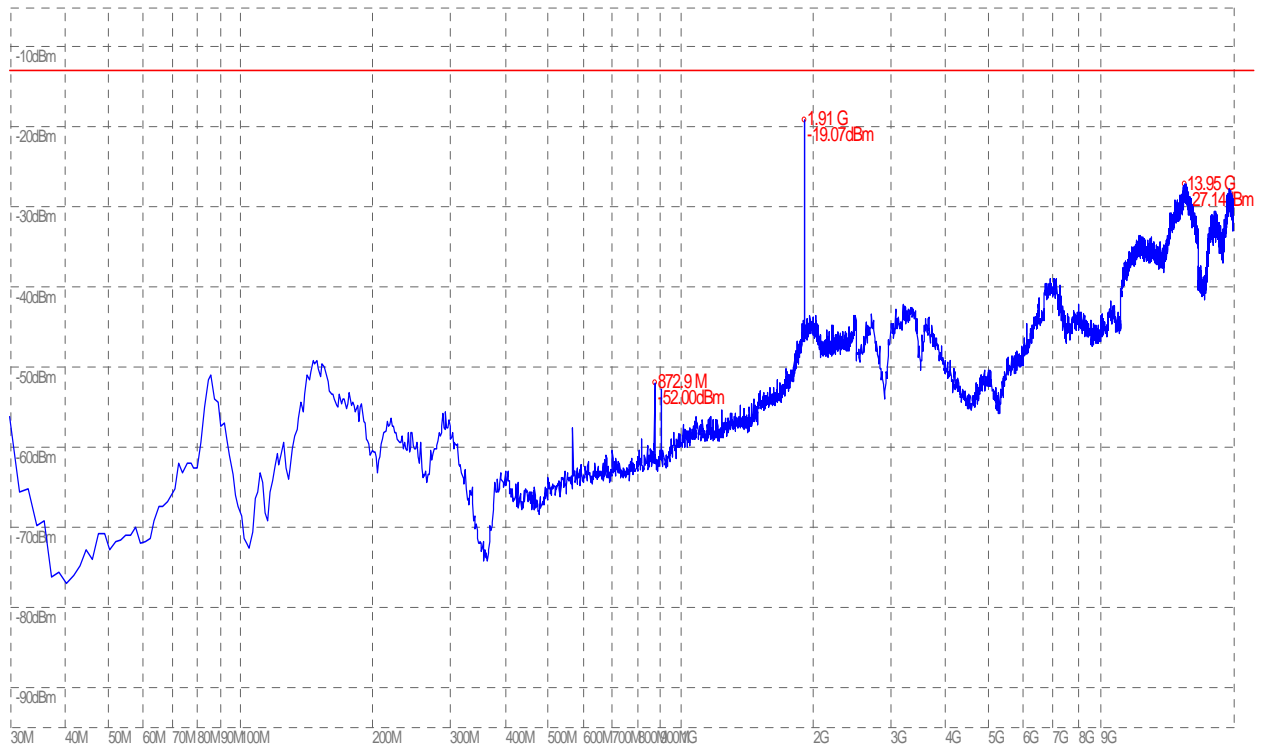


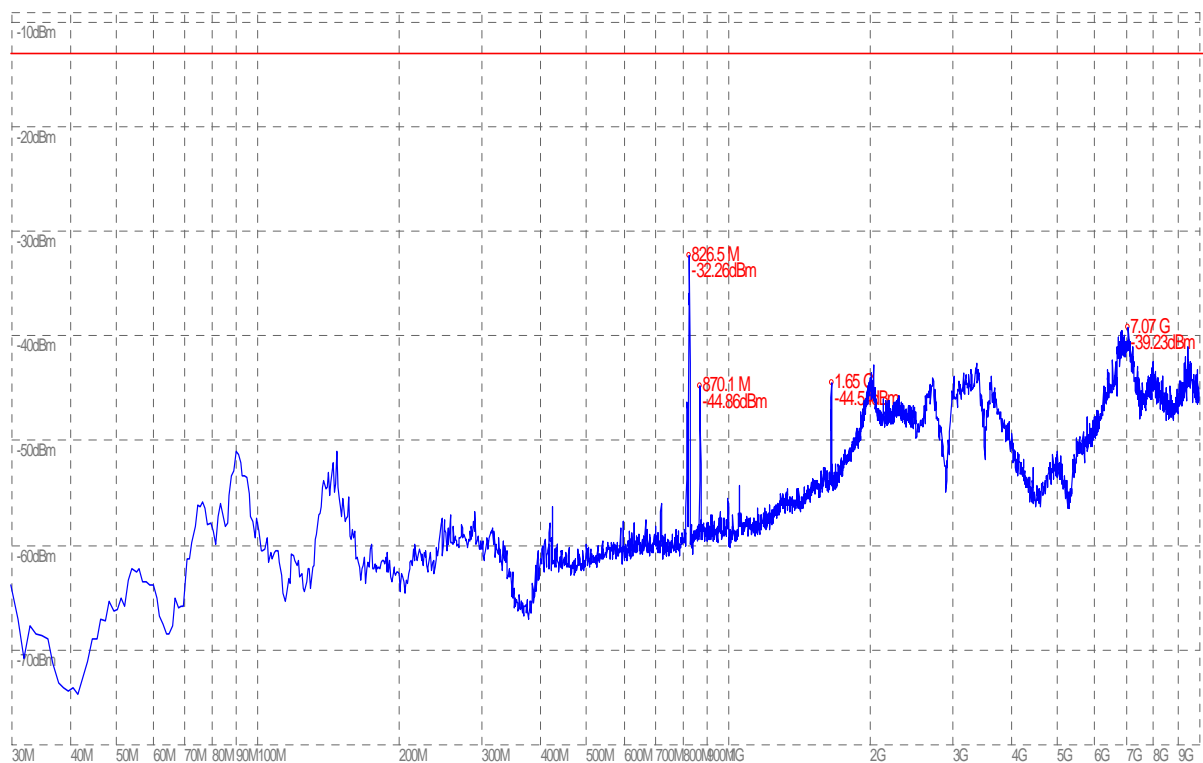(Plot D.5:    EGPRS 1900MHz Channel = 810, Test Antenna Horizontal)
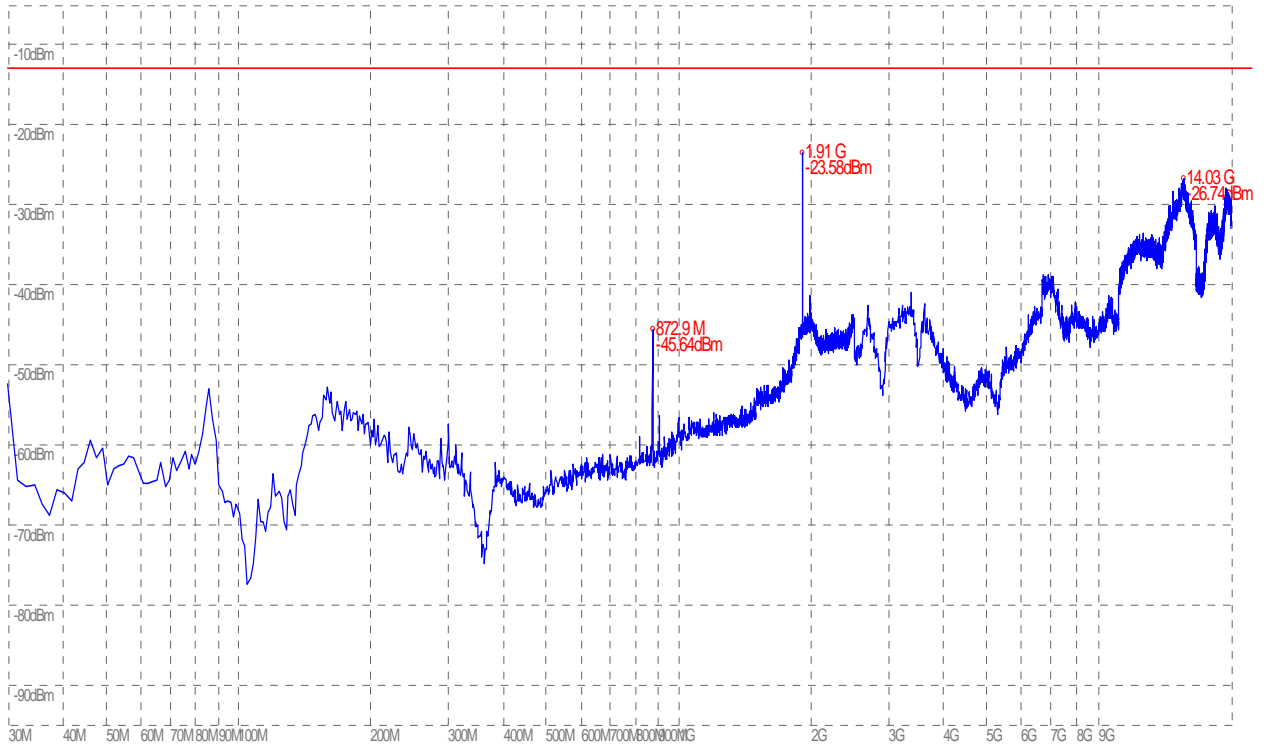
(Plot D.6:   EGPRS 1900MHz Channel = 810, Test Antenna Vertical)
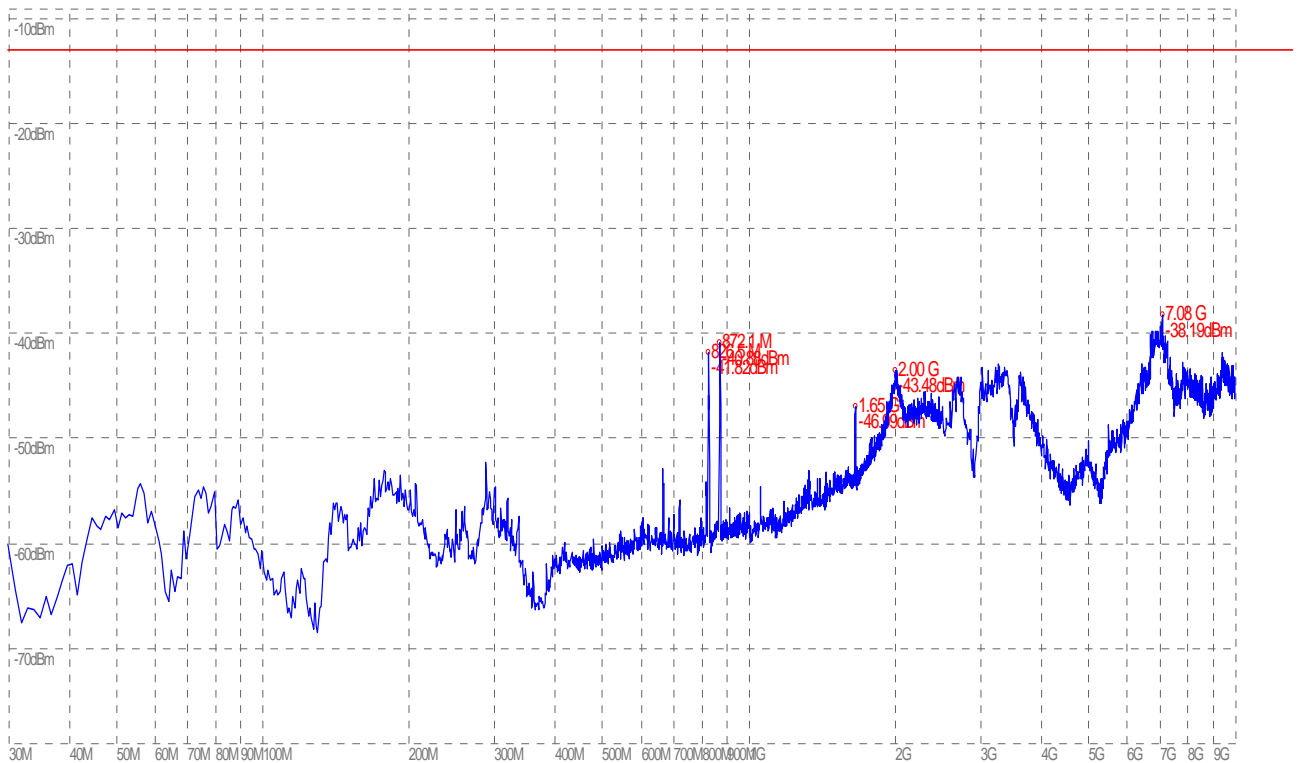


(Plot E.1:     WCDMA 850MHz Channel = 4132, Test Antenna Horizontal)
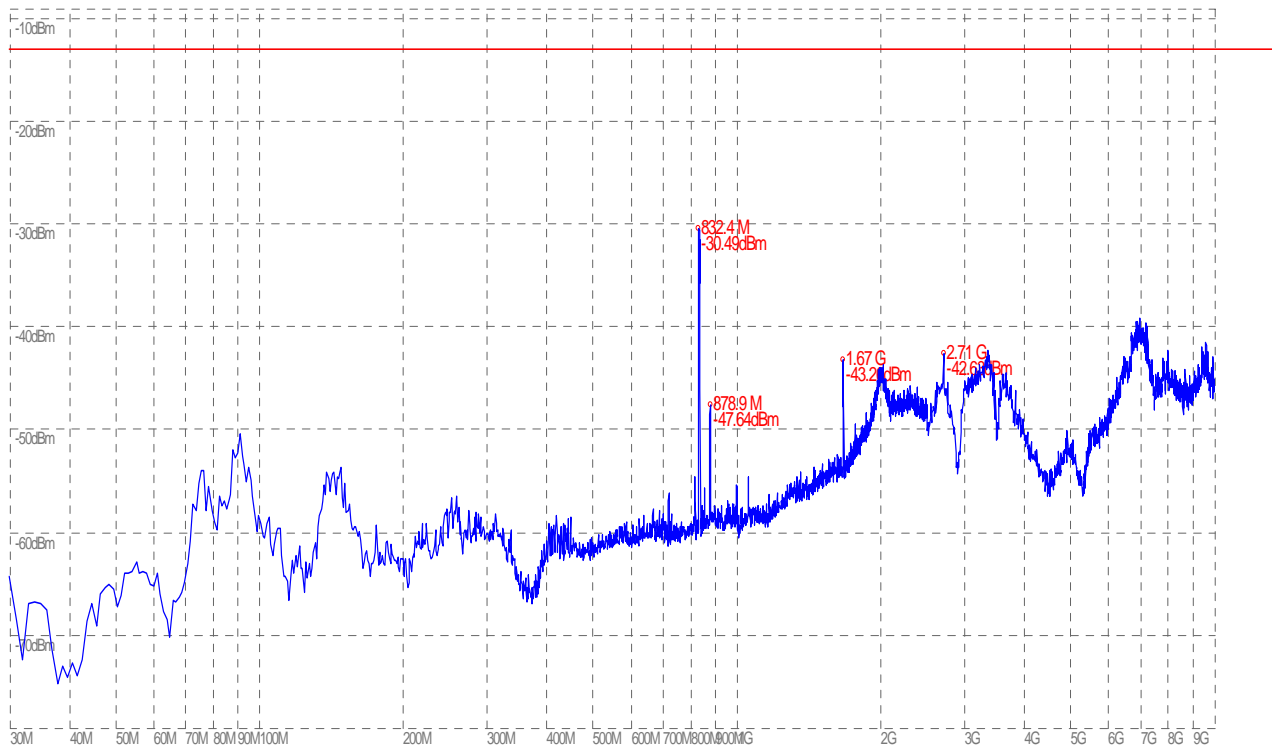
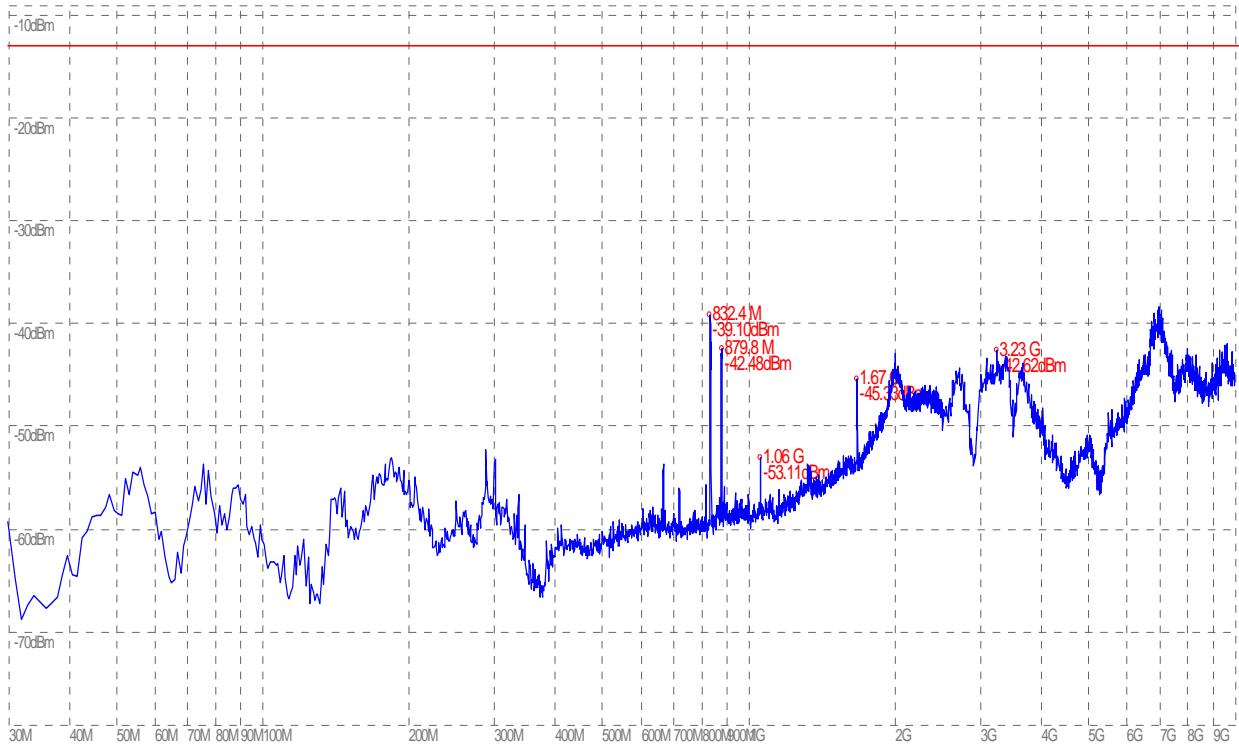(Plot E.2:    WCDMA 850MHz Channel = 4132, Test Antenna Vertical)



(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)



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

(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)



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

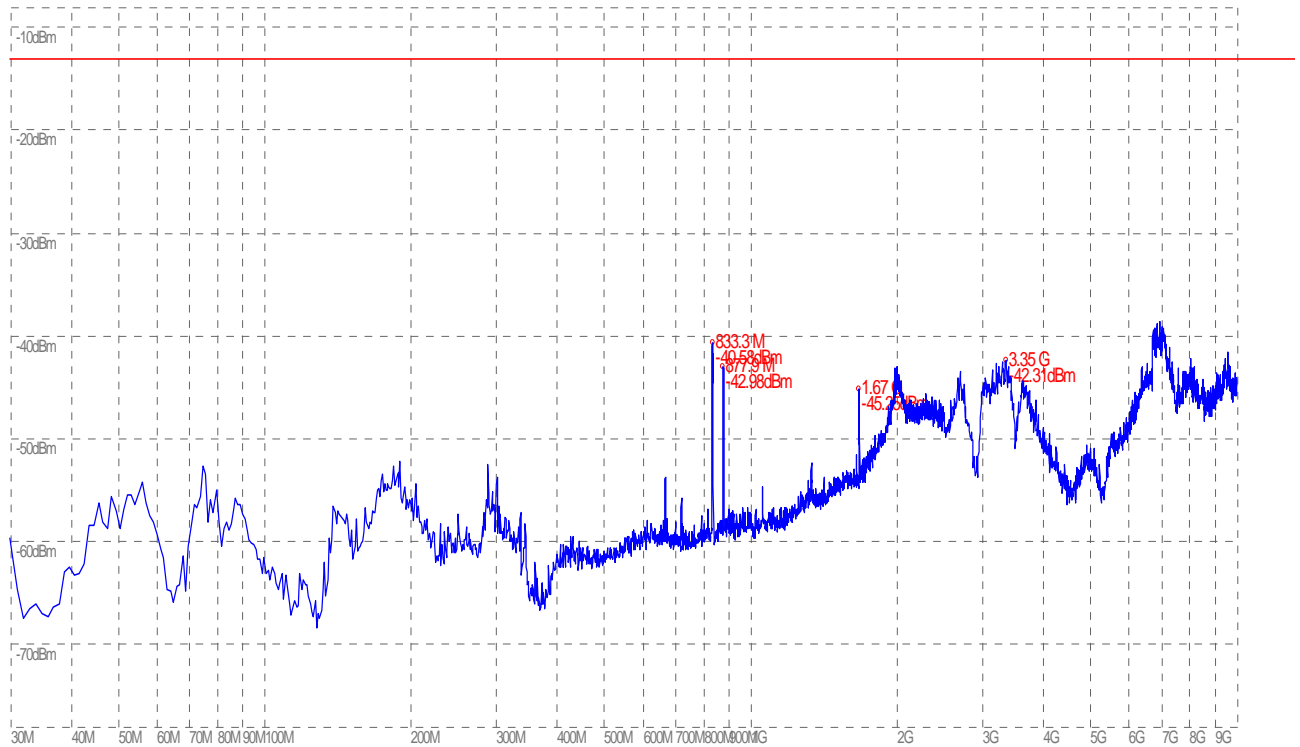(Plot G.2:     HSDPA 850MHz Channel = 4132, Test Antenna Vertical)

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



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



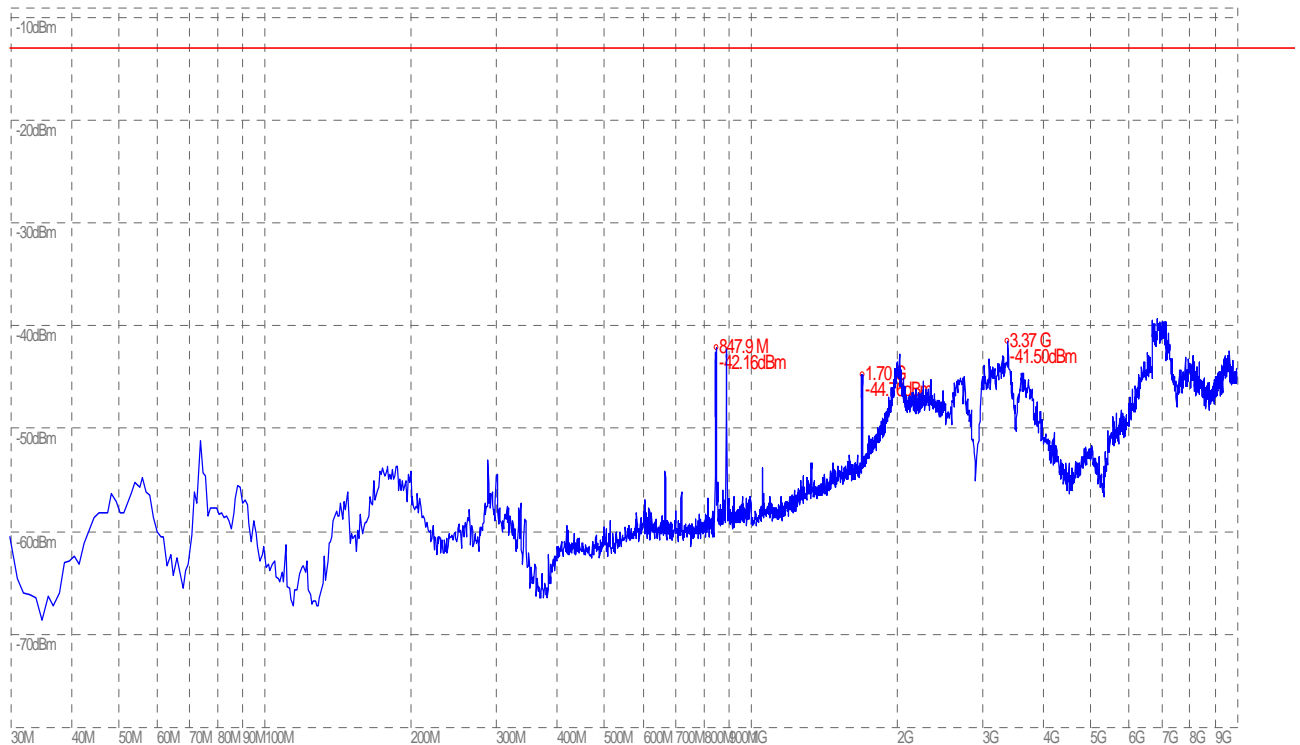(Plot G.5:    HSDPA 850MHz Channel = 4233, Test Antenna Horizontal)

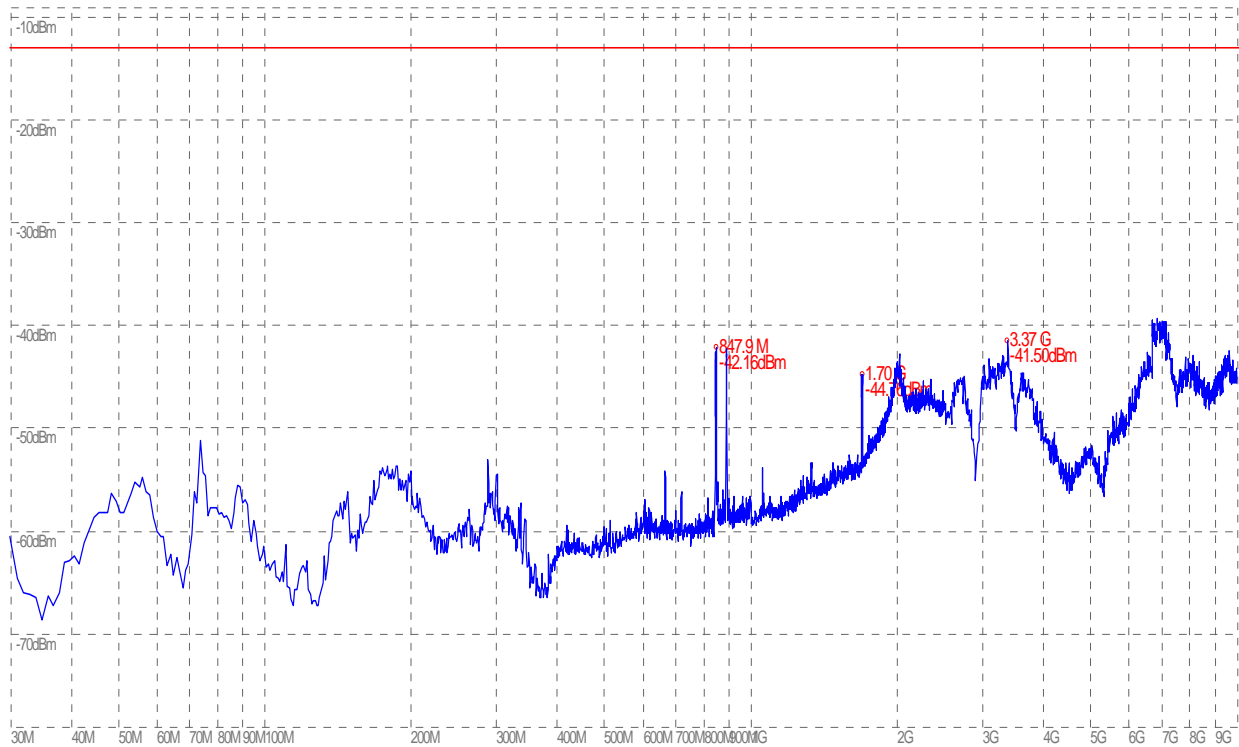(Plot G.6:     HSDPA 850MHz Channel = 4233, Test Antenna Vertical)
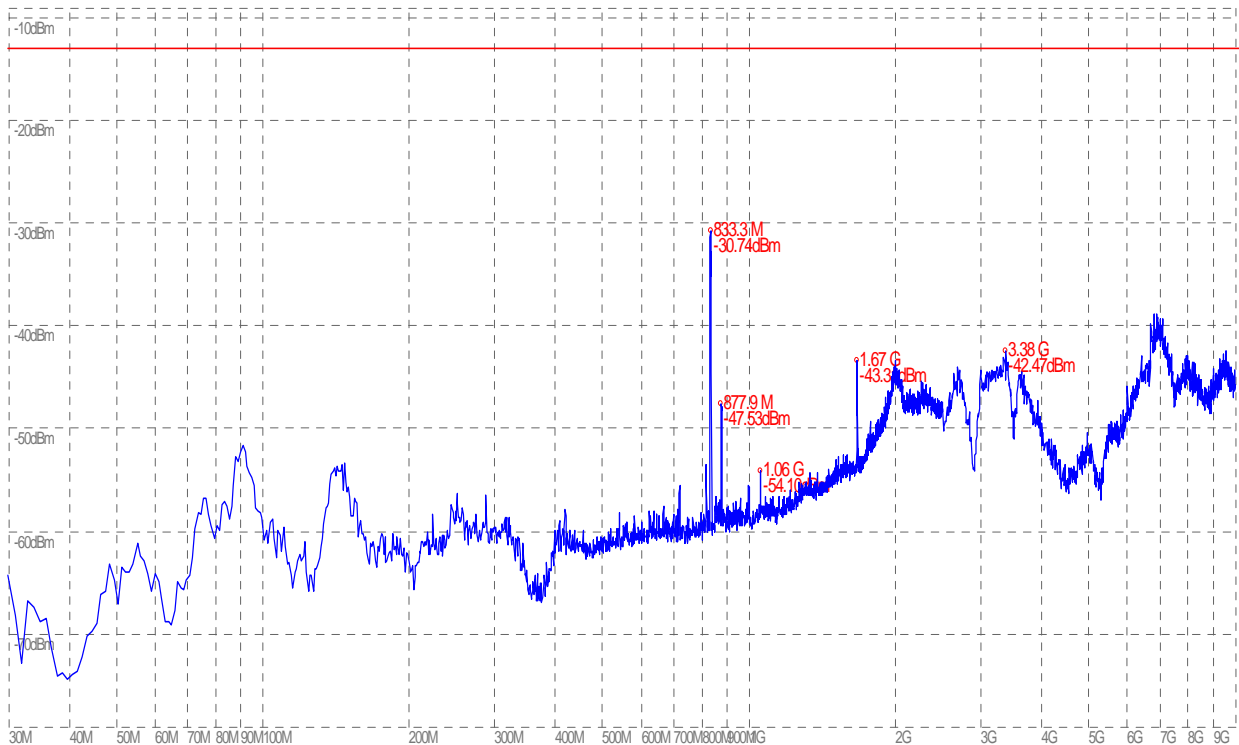


(Plot H.1:     HSDPA 1900 MHz Channel = 9262, Test Antenna Horizontal)
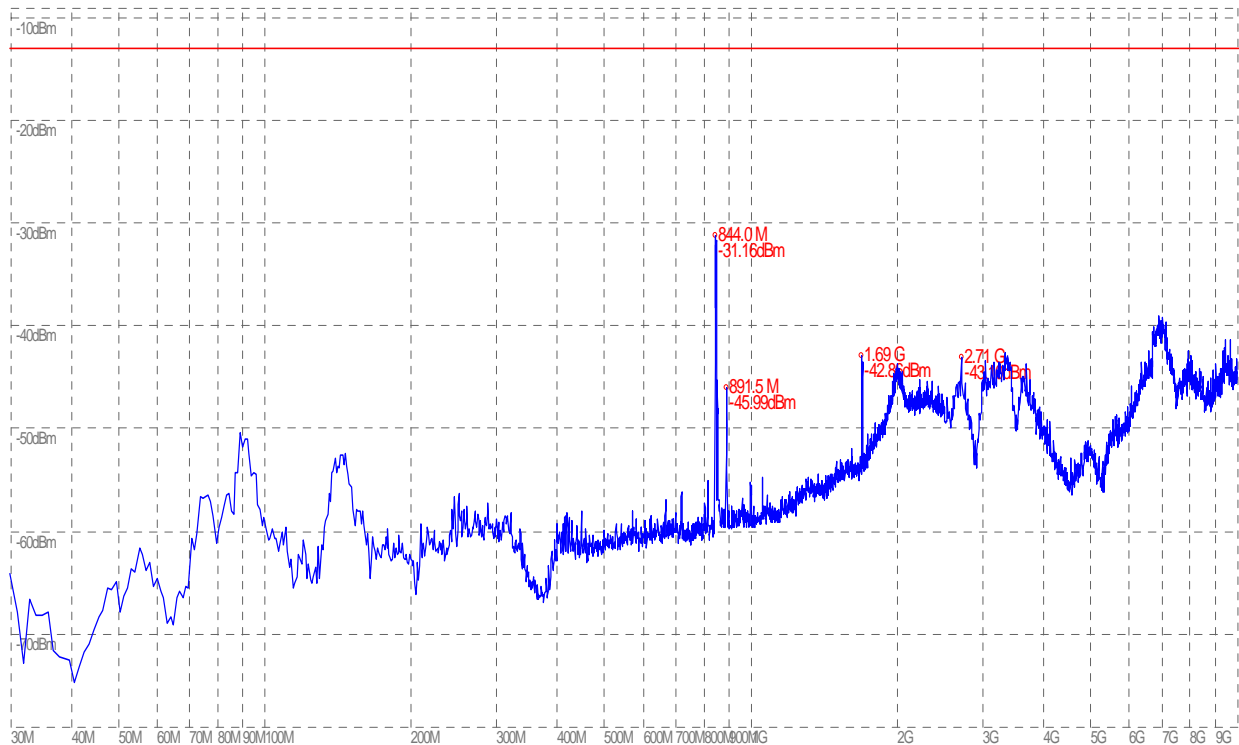
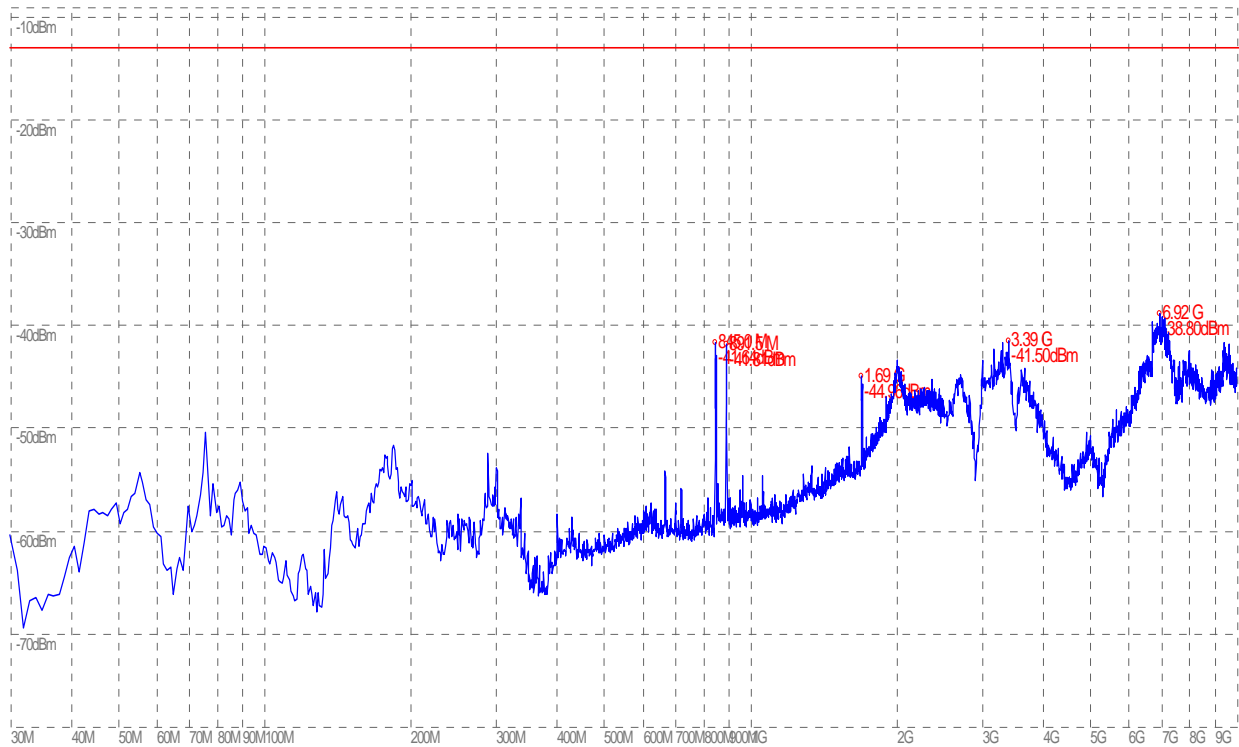(Plot H.2: HSDPA 1900 MHz Channel = 9262, Test Antenna Vertical)



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

(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)

** END OF REPORT **