REPORT No.: SZ16120185W01

# FCC RF TEST REPORT

| | | |
|---|---|---|
| **APPLICANT** | : | TELECOM SA CO., LIMITED |
| **PRODUCT NAME** | : | Feature Phone |
| **MODEL NAME** | : | TD213 |
| **TRADE NAME** | : | N/A |
| **BRAND NAME** | : | N/A |
| **FCC ID** | : | 2AKV3TD213 |
| **STANDARD(S)** | : | 47 CFR Part 22 Subpart H<br>47 CFR Part 24 Subpart E |
| **ISSUE DATE** | : | 2017-01-12 |

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| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2017-01-12 | First edition |
| | | |

# TEST REPORT DECLARATION

| | |
|---|---|
| Applicant | TELECOM SA CO., LIMITED |
| Applicant Address | Room 1701, No 8 donghu garden, Huizhou city, Guangdong,China |
| Manufacturer | TELECOM SA CO., LIMITED |
| Manufacturer Address | Room 1701, No 8 donghu garden, Huizhou city, Guangdong,China |
| Product Name | Feature Phone |
| Model Name | TD213 |
| Brand Name | N/A |
| HW Version | V. 913 |
| SW Version | 913: V1.00 |
| Test Standards | 47 CFR Part 22 Subpart H<br>47 CFR Part 24 Subpart E |
| Test Date | 2014-7-28 to 2014-8-8 |
| Test Result | PASS |

Tested by : Su Hang
Su Hang

Reviewed by : Qiu Xiaojun
Qiu Xiaojun

Approved by : Peng Huarui
Peng Huarui

# 1. GENERAL INFORMATION

## 1.1 EUT Description

EUT Type ..... : Feature Phone
Serial No. ..... : (n.a, marked #1 by test site)
Hardware Version ..... : V. 913
Software Version..... : 913: V1.00
Applicant ..... : TELECOM SA CO., LIMITED
Room 1701, No 8 donghu garden, Huizhou city,
Guangdong,China
Manufacturer..... : TELECOM SA CO., LIMITED
Room 1701, No 8 donghu garden, Huizhou city,
Guangdong,China
Frequency Range ..... : GSM 850MHz:
Tx: 824.20 - 848.80MHz (at intervals of 200kHz);
Rx: 869.20 - 893.80MHz (at intervals of 200kHz)
GSM 1900MHz:
Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);
Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)
WCDMA 850MHz
Tx: 826.4 - 846.6MHz (at intervals of 200kHz);
Rx: 871.4 - 891.6MHz (at intervals of 200kHz)
WCDMA 1900MHz
Tx: 1852.4 - 1907.6MHz (at intervals of 200kHz);
Rx: 1932.4 - 1987.6MHz (at intervals of 200kHz)
Modulation Type..... : GSM,GPRS Mode with GMSK Modulation
EDGE Mode with 8PSK Modulation
WCDMA Mode with QPSK Modulation
Multislot Class..... : GPRS: Multislot Class 12,EGPRS: Multislot Class 12
Antenna Type..... : PIFA Antenna
Emission Designators ..... : GSM 850:254KGXW,GSM 1900:251KGXW
EGPRS850:254KG7W, EGPRS1900:246KG7W,
WCDMA 850:4M18F9W ,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<=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 (10-1-15 Edition) | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2 | 47 CFR Part 22 (10-1-15 Edition) | Public Mobile Services |
| 3 | 47 CFR Part 24 (10-1-15 Edition) | Personal Communications Services |

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

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

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

## 1.3 Facilities and Accreditations

### 1.3.1 Facilities

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, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10 2013 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

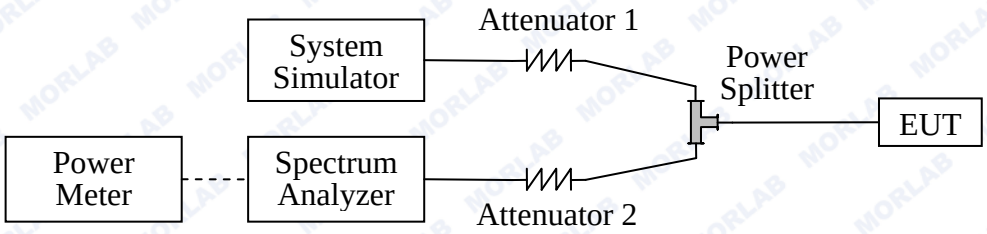
## 2.1 Conducted RF Output Power

### 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

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.

Equipments List:

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2014.02.26 | 2015.02.25 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2014.02.26 | 2015.02.25 |
| Power Meter | Agilent | E4418B | GB43318055 | 2014.02.26 | 2015.02.25 |
| Power Sensor | Agilent | 8482A | MY41091706 | 2014.02.26 | 2015.02.25 |
| Power Splitter | Weinschel | 1506A | NW521 | 2014.02.26 | 2015.02.25 |
| Attenuator 1 | Resnet | 20dB | (n.a.) | 2014.02.26 | 2015.02.25 |
| Attenuator 2 | Resnet | 3dB | (n.a.) | 2014.02.26 | 2015.02.25 |

### 2.1.3 Test Results

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

1. GSM Model Test Verdict:

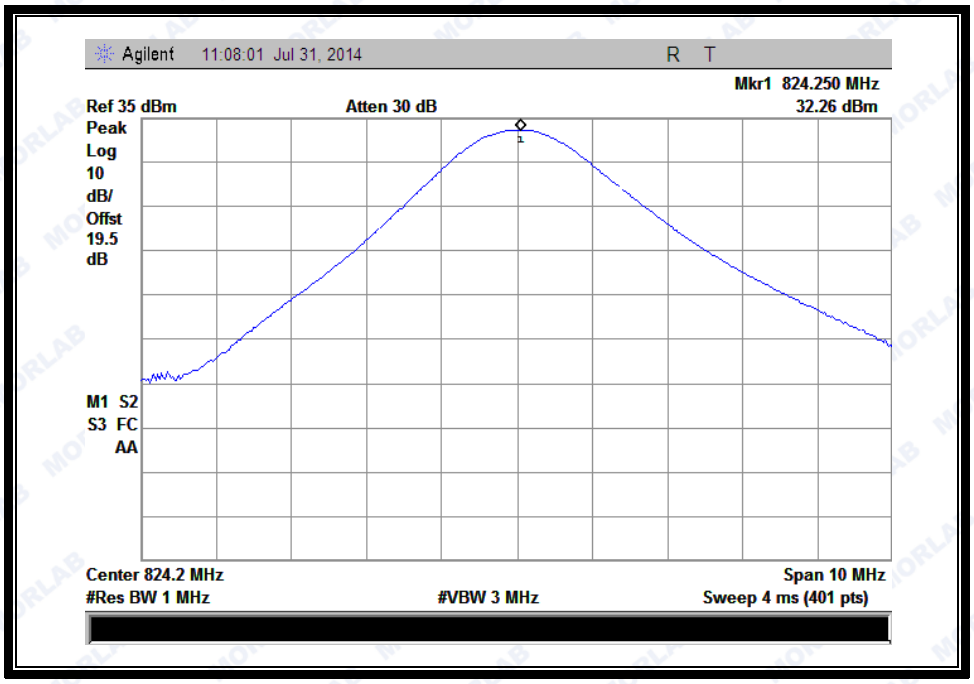
| Band | Channel | Frequency (MHz) | Measured Output Power | | Limit | Verdict |
|---|---|---|---|---|---|---|
| | | | dBm | Refer to Plot | dBm | |
| GSM 850MHz | 128 | 824.2 | 32.26 | Plot A1 to A3 | 35 | PASS |
| | 190 | 836.6 | 32.81 | | | PASS |
| | 251 | 848.8 | 33.29 | | | PASS |
| GSM 1900MHz | 512 | 1850.2 | 29.39 | Plot B1 to B3 | 32 | PASS |
| | 661 | 1880.0 | 30.27 | | | PASS |
| | 810 | 1909.8 | 30.76 | | | PASS |
| GPRS 850MHz | 128 | 824.2 | 28.73 | Plot C1 to C3Note 1 | 35 | PASS |
| | 190 | 836.6 | 29.32 | | | PASS |
| | 251 | 848.8 | 29.98 | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 27.96 | Plot D1 to D3Note 1 | 32 | PASS |
| | 661 | 1880.0 | 28.83 | | | PASS |
| | 810 | 1909.8 | 29.34 | | | PASS |
| EGPRS 850MHz | 128 | 824.2 | 28.65 | Plot E1 to E3Note 1 | 35 | PASS |
| | 190 | 836.6 | 29.31 | | | PASS |
| | 251 | 848.8 | 29.97 | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 28.23 | Plot F1 to F3Note 1 | 32 | PASS |
| | 661 | 1880.0 | 28.94 | | | PASS |
| | 810 | 1909.8 | 29.62 | | | PASS |

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

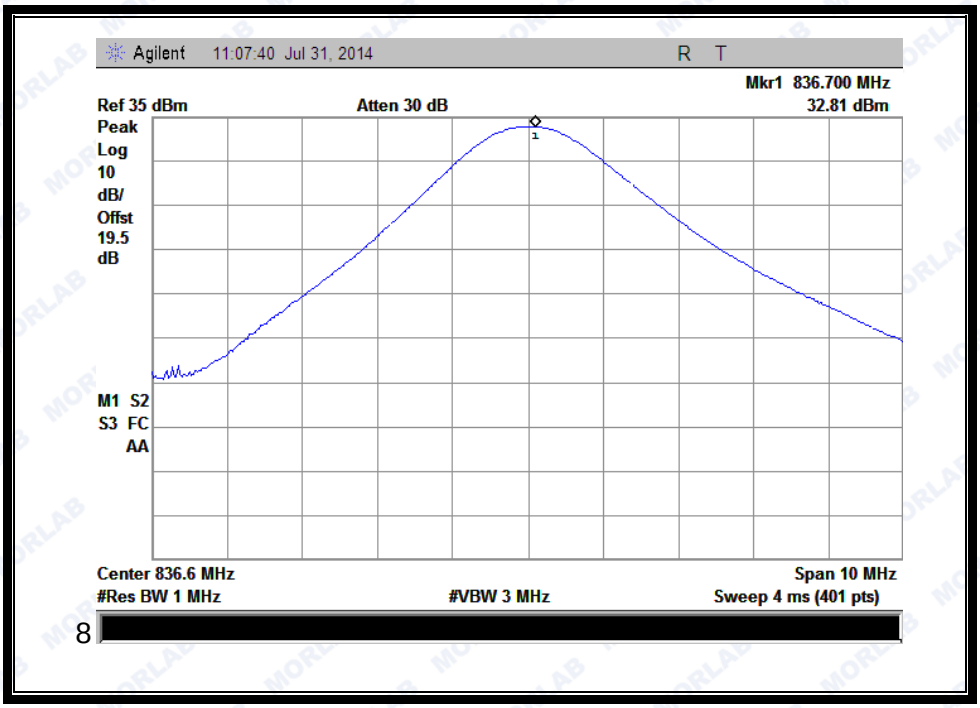
2. WCDMA Model Test Verdict:

| Item | band | WCDMA 850 | | | WCDMA 1900 | | |
|---|---|---|---|---|---|---|---|
| | ARFCN | 4132 | 4175 | 4233 | 9262 | 9400 | 9538 |
| | subtest | dBm | | | dBm | | |
| 5.2(WCDMA) | non | 23.47 | 23.67 | 24.36 | 23.44 | 23.65 | 23.11 |
| Note: | The Conducted RF Output Power test of WCDMA was tested by power meter. | | | | | | |

Test Plots:

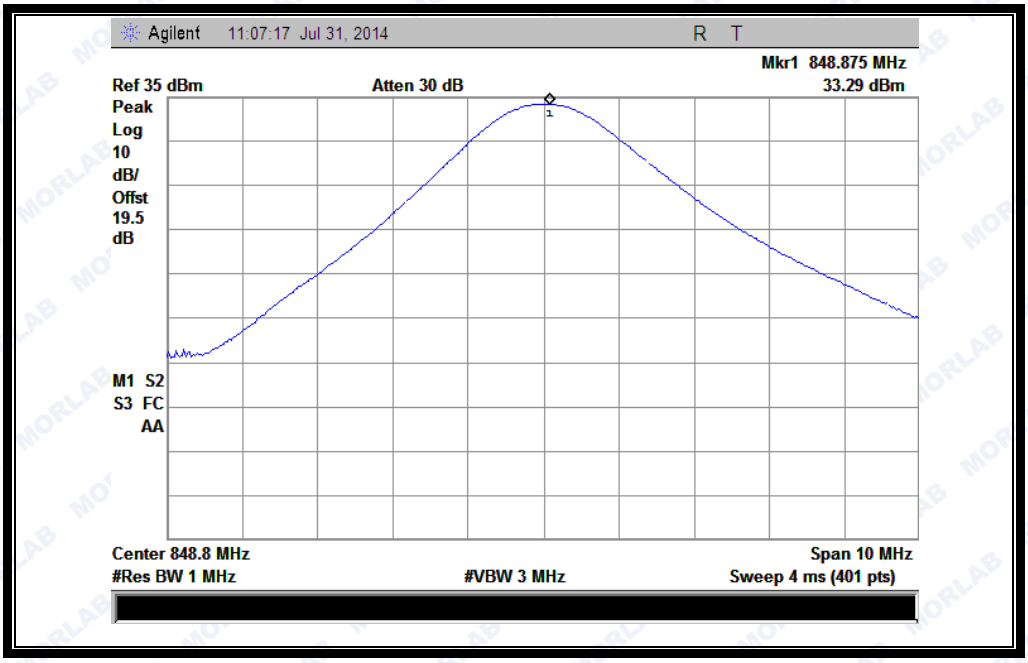



(Plot A1:GSM 850MHz Channel = 128)

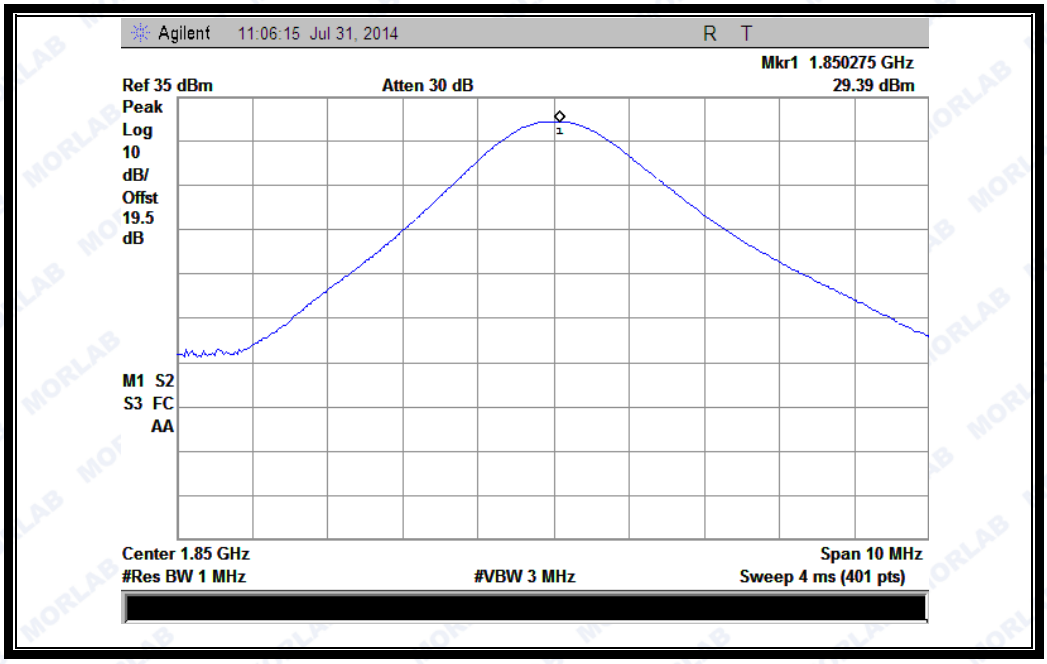



8

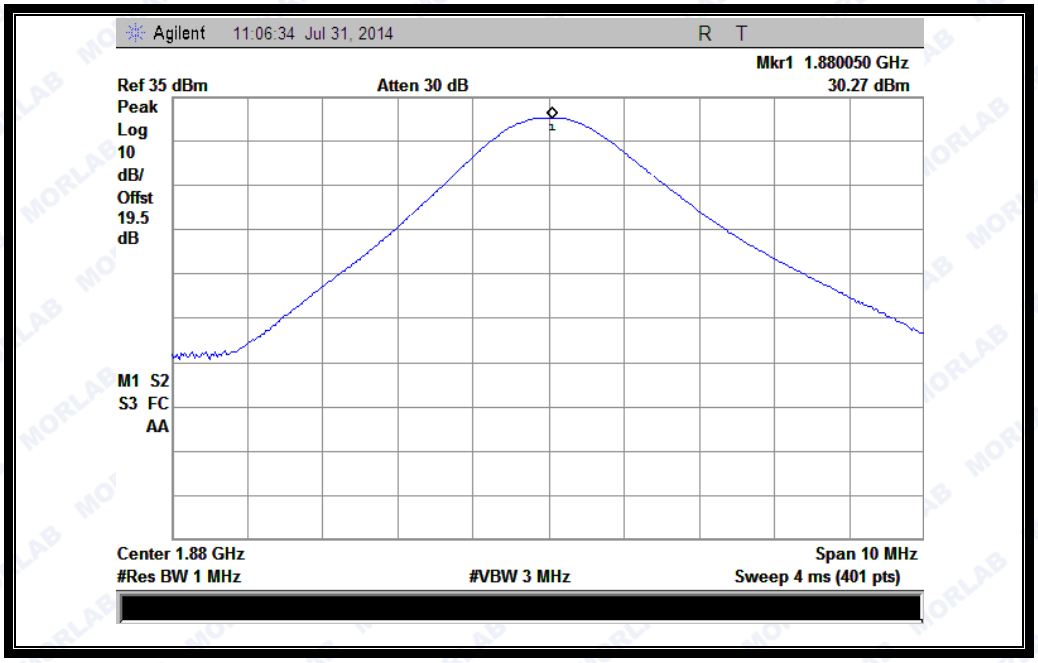
(Plot A2:GSM 850MHz Channel = 190)



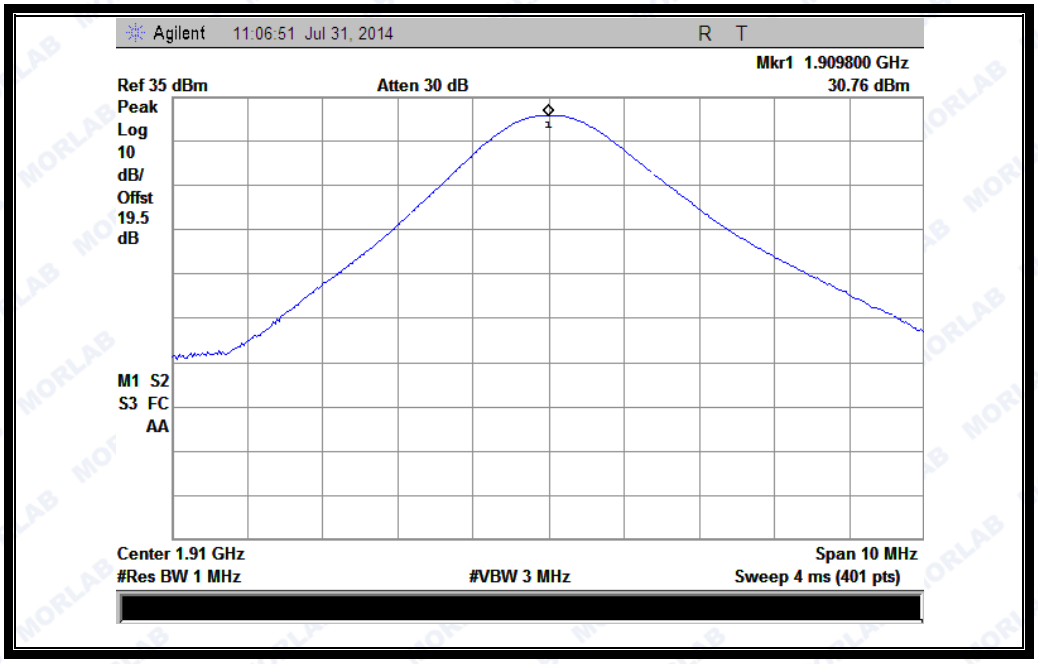

(Plot A3:GSM 850MHz Channel = 251)



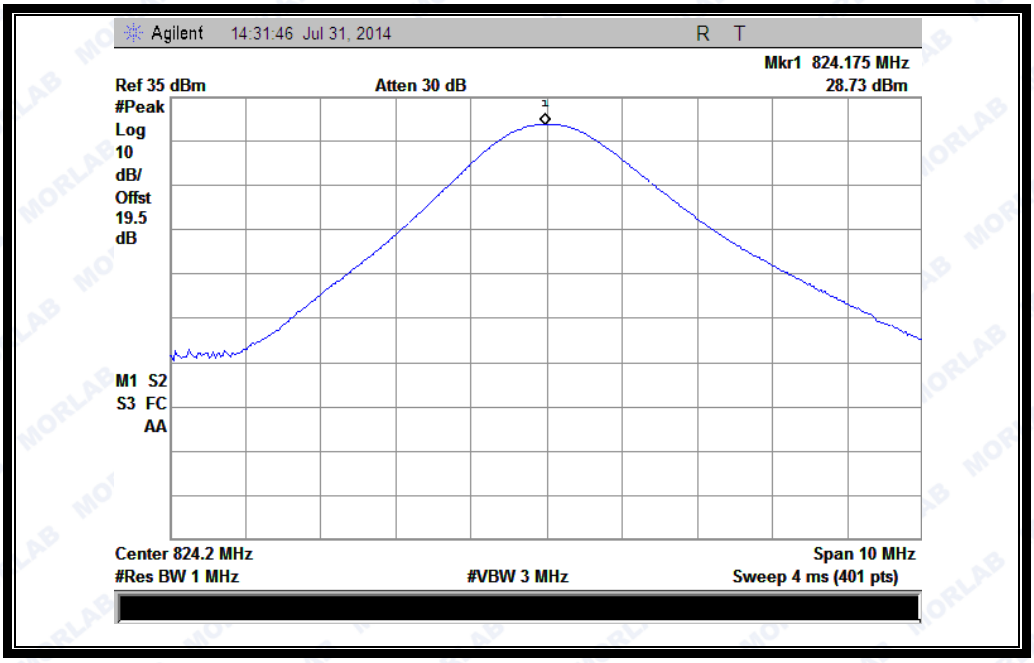

(Plot B1: GSM 1900MHz Channel = 512)



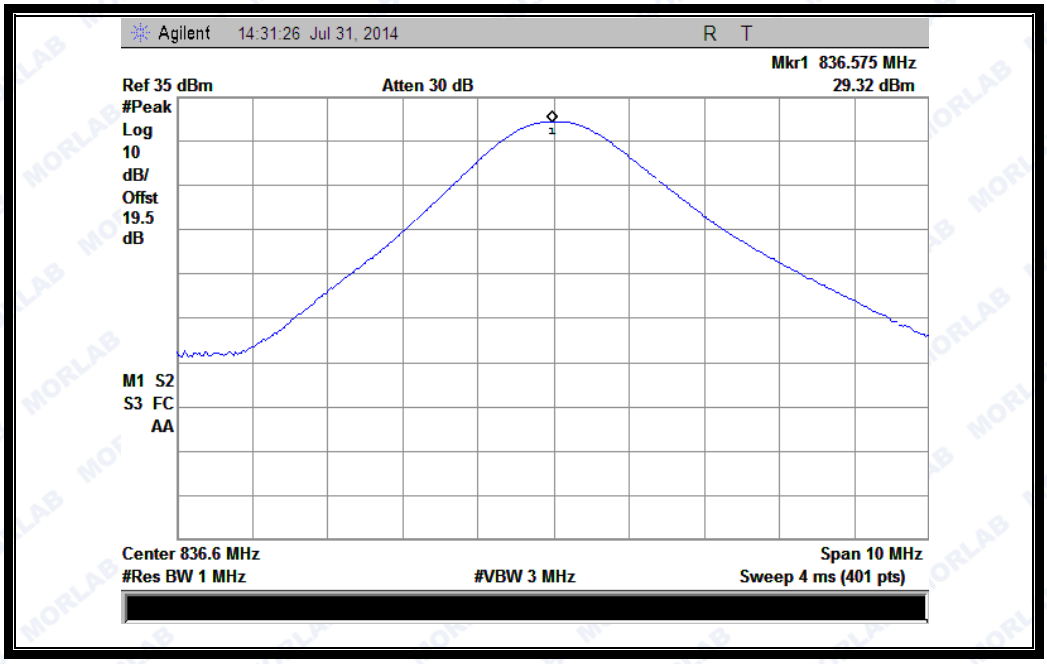

(Plot B2: GSM 1900MHz Channel = 661)



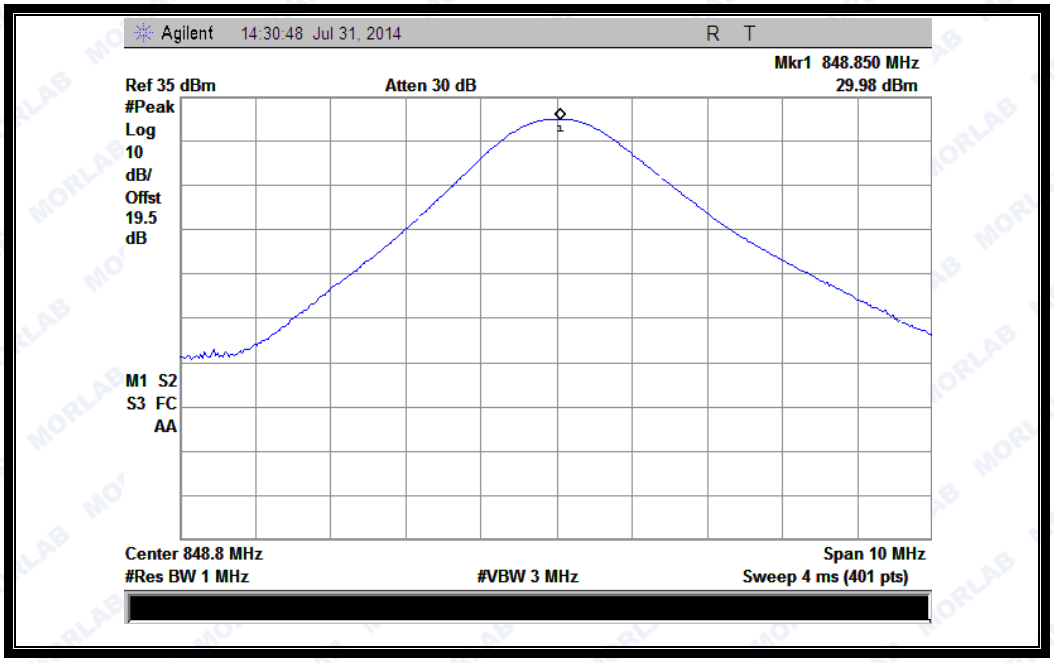

(Plot B3: GSM 1900Hz Channel = 810)



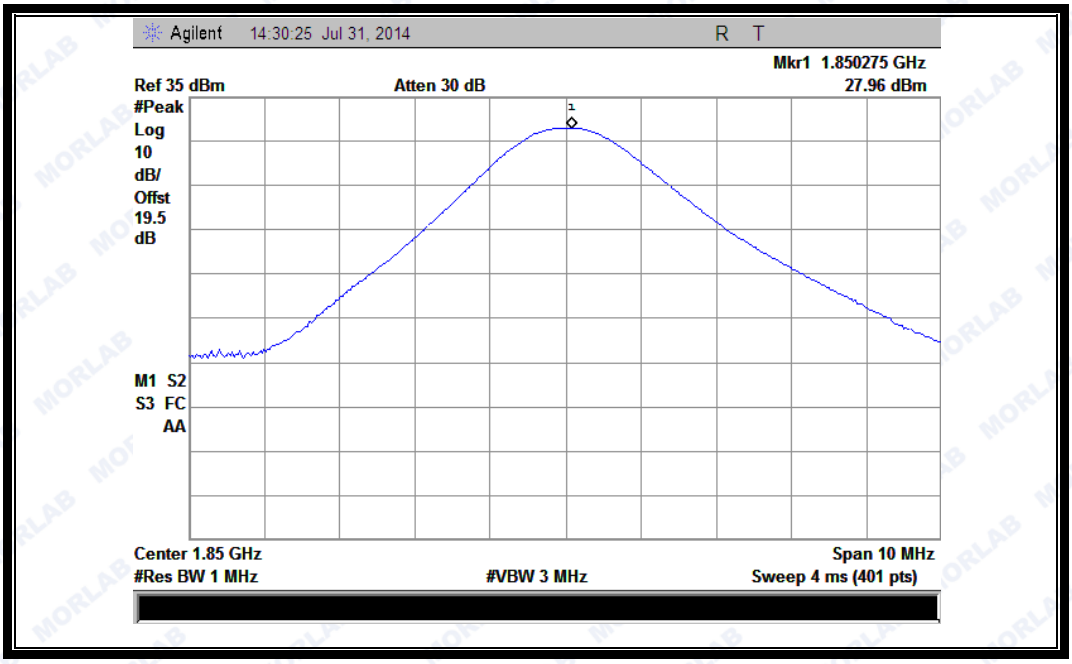

(Plot C 1: GPRS 850MHz Channel = 128)



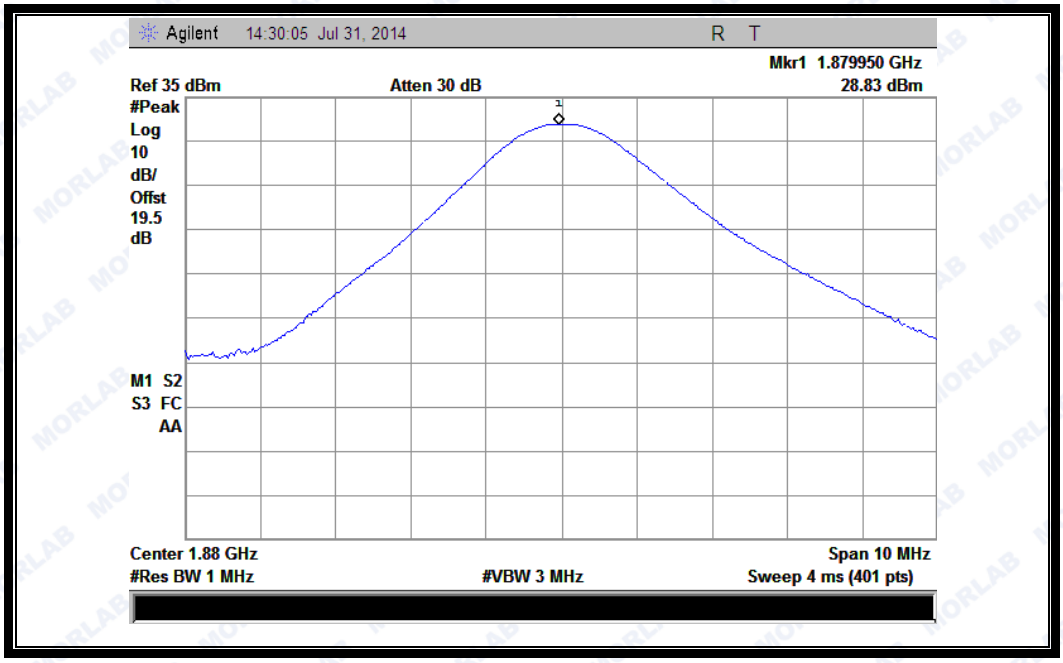

(Plot C 2: GPRS 850MHz Channel = 190)



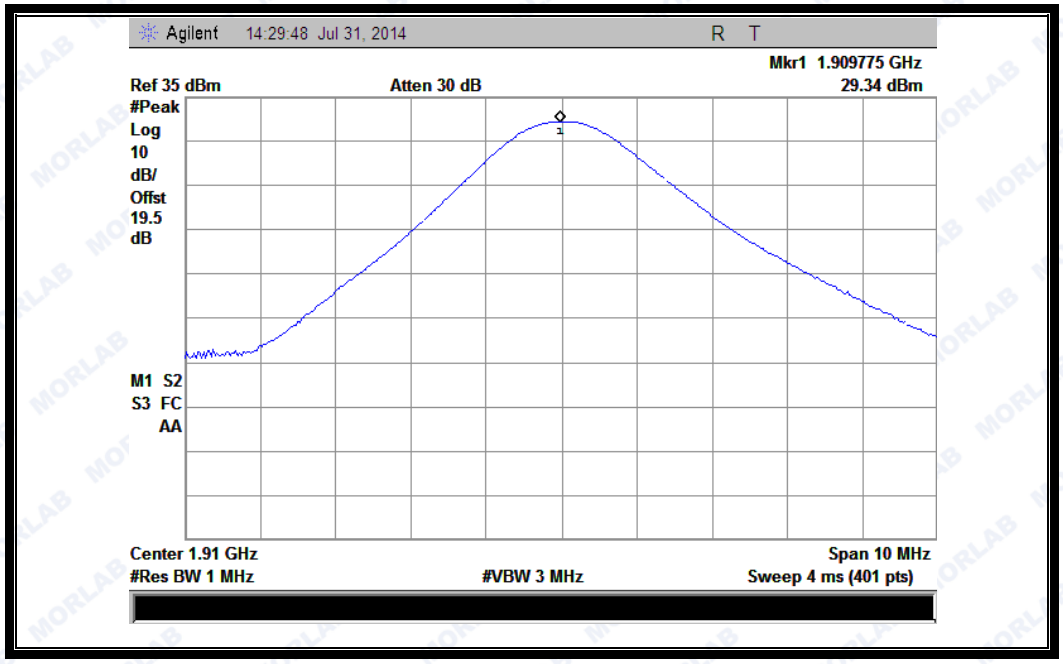

(Plot C 3: GPRS 850MHz Channel = 251)



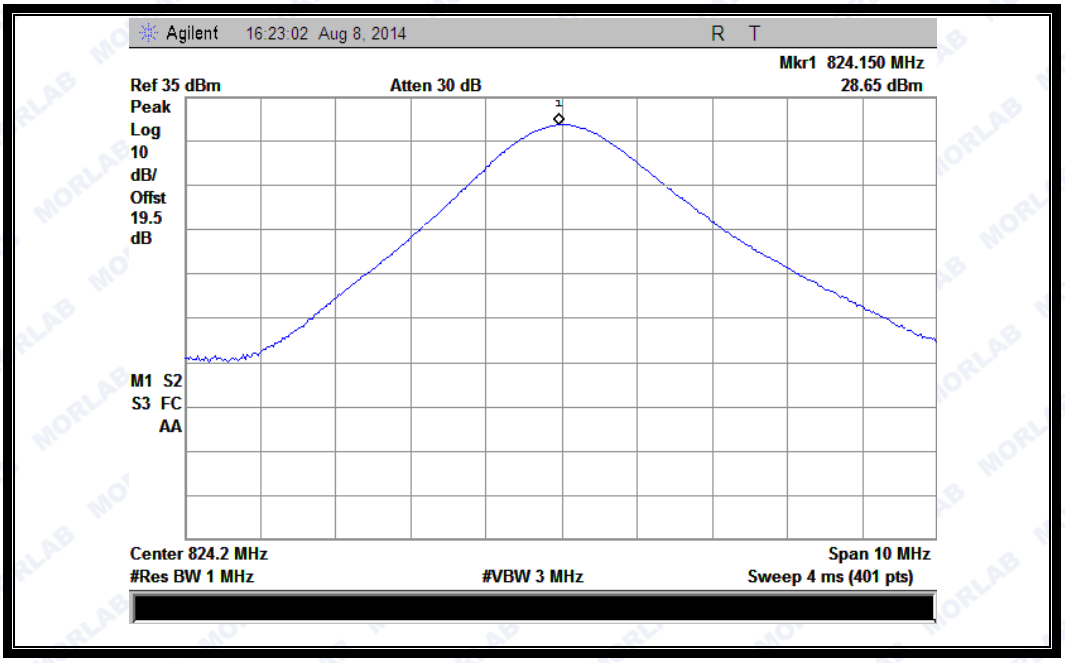

(Plot D 1: GPRS 1900MHz Channel = 512)



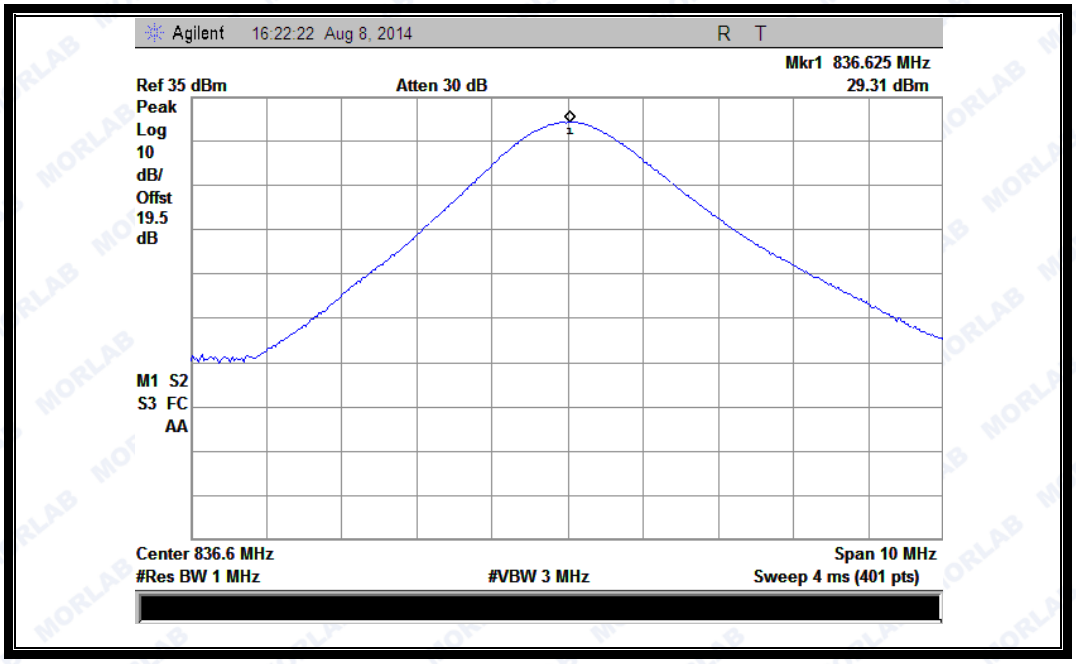

(Plot D 2: GPRS 1900MHz Channel = 661)



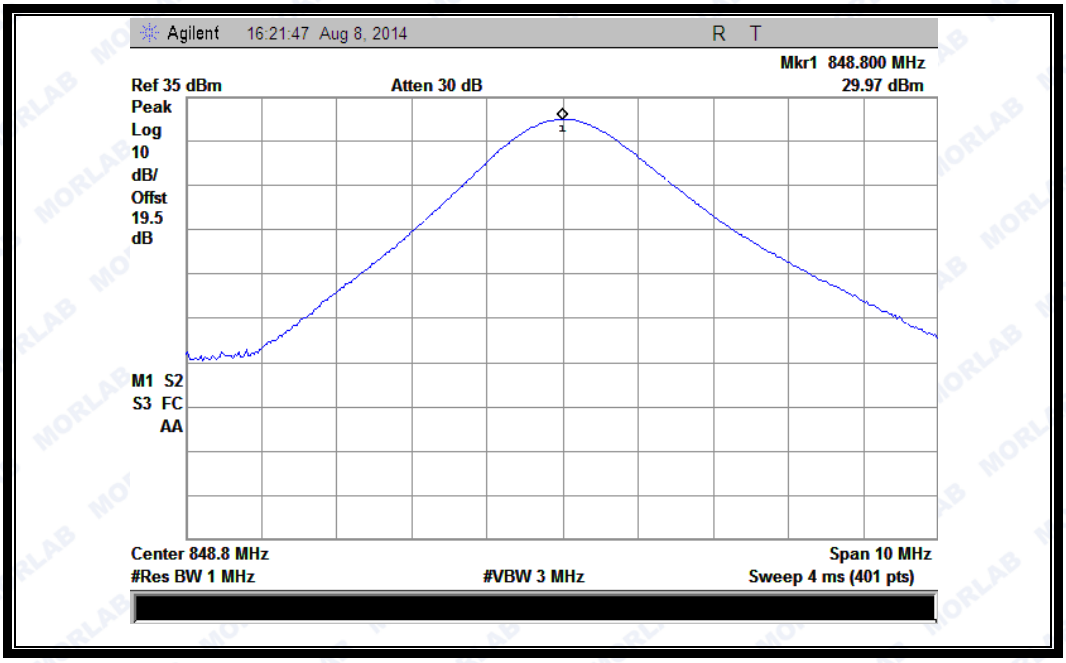

(Plot D 3: GPRS 1900MHz Channel = 810)



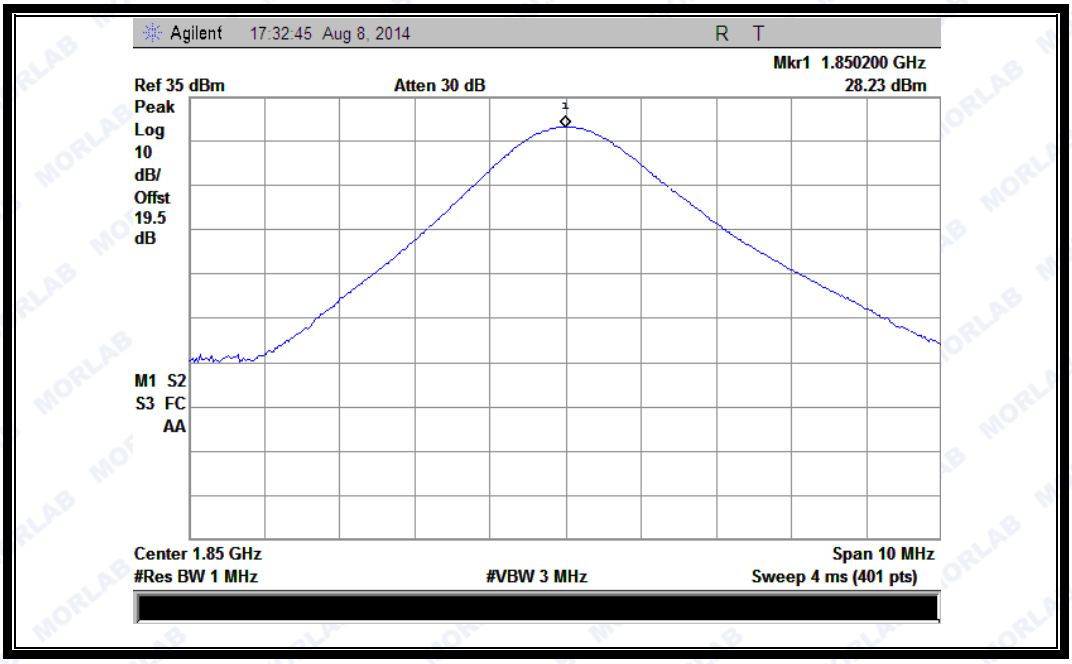

(Plot E1: EGPRS 850MHz Channel = 128)



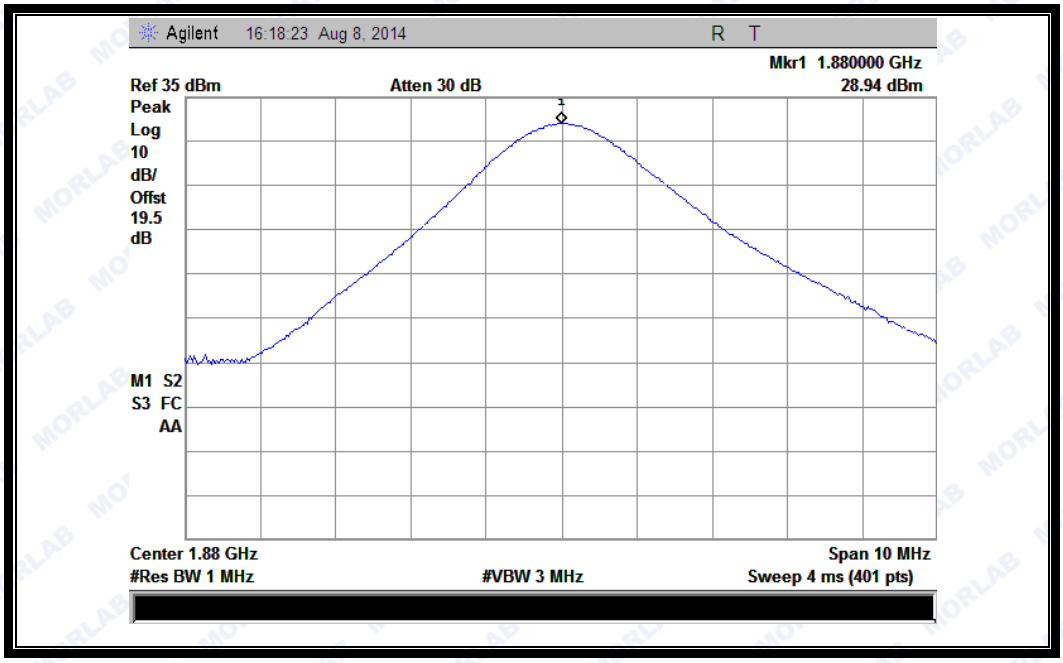

(Plot E2: EGPRS 850MHz Channel = 190)



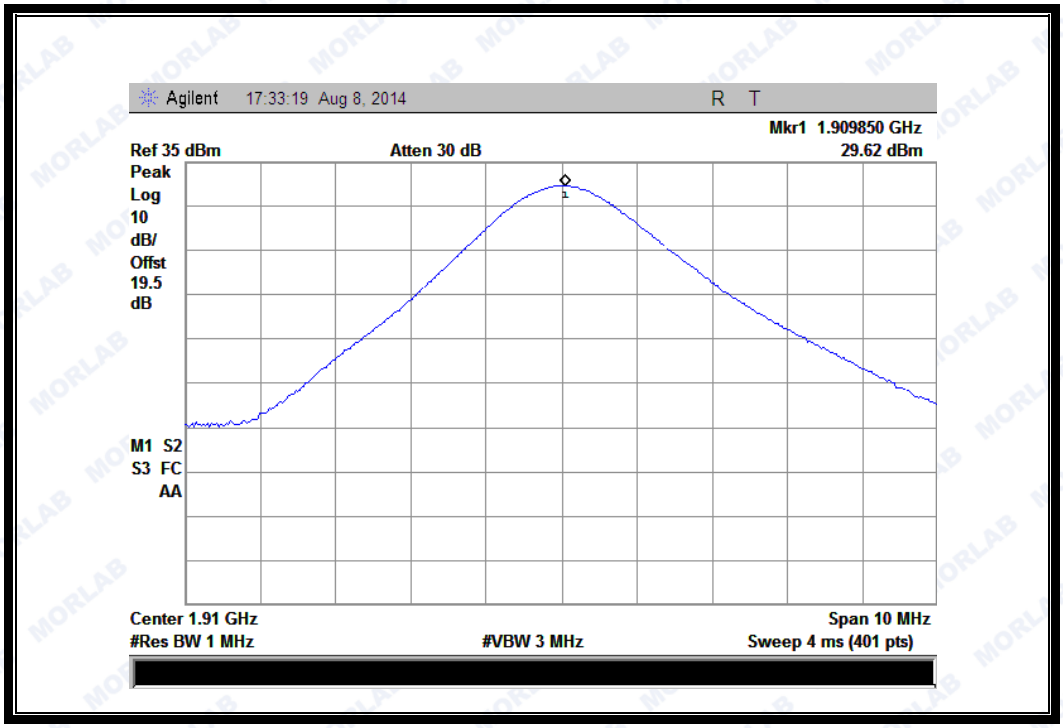

(Plot E3: EGPRS 850MHz Channel = 251)




(Plot F1:EGPRS 1900MHz Channel = 512)




(Plot F2:EGPRS 1900MHz Channel = 661)




(Plot F3:EGPRS 1900Hz Channel = 810)

## 2.2 Peak to Average Radio

### 2.2.1 Definition

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

### 2.2.2 Test Description

See section 2.1.2 of this report.

### 2.2.3 Test Verdict

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

Test procedures:

A .For GSM/EGPRS operating mode:

a. Set RBW=1MHz, VBW=3MHz, peak detector in spectrum analyzer.

b. Set EUT in maximum output power, and triggered the bust signal.

c. Measured respectively the peak level and mean level, and the deviation was recorded as Peak to Average radio.

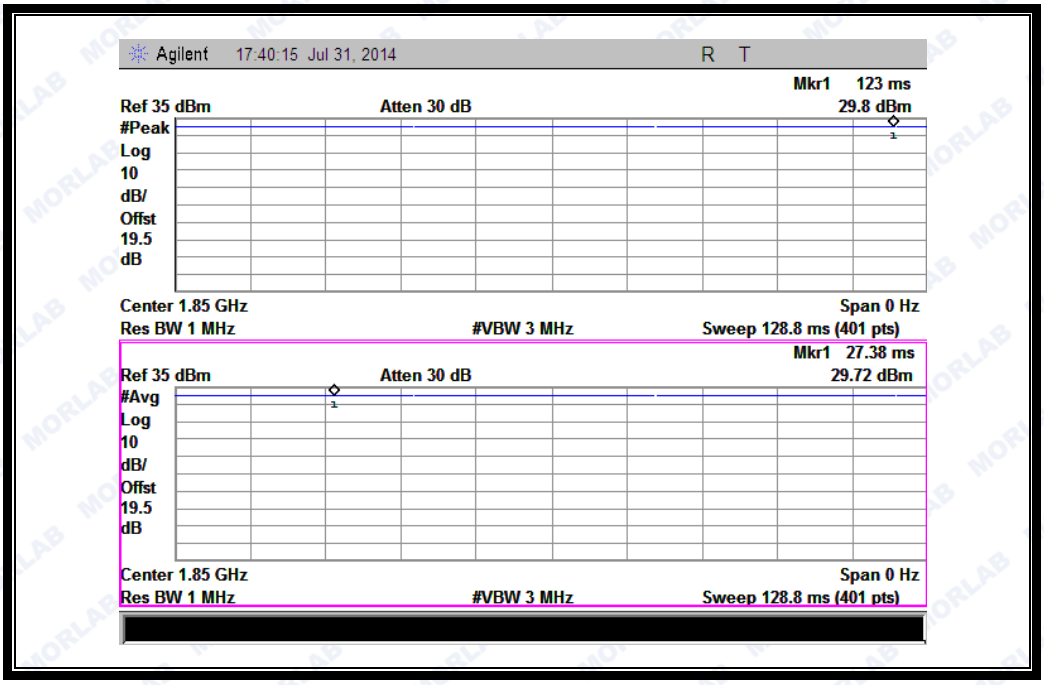
B. For UMTS operating mode:

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

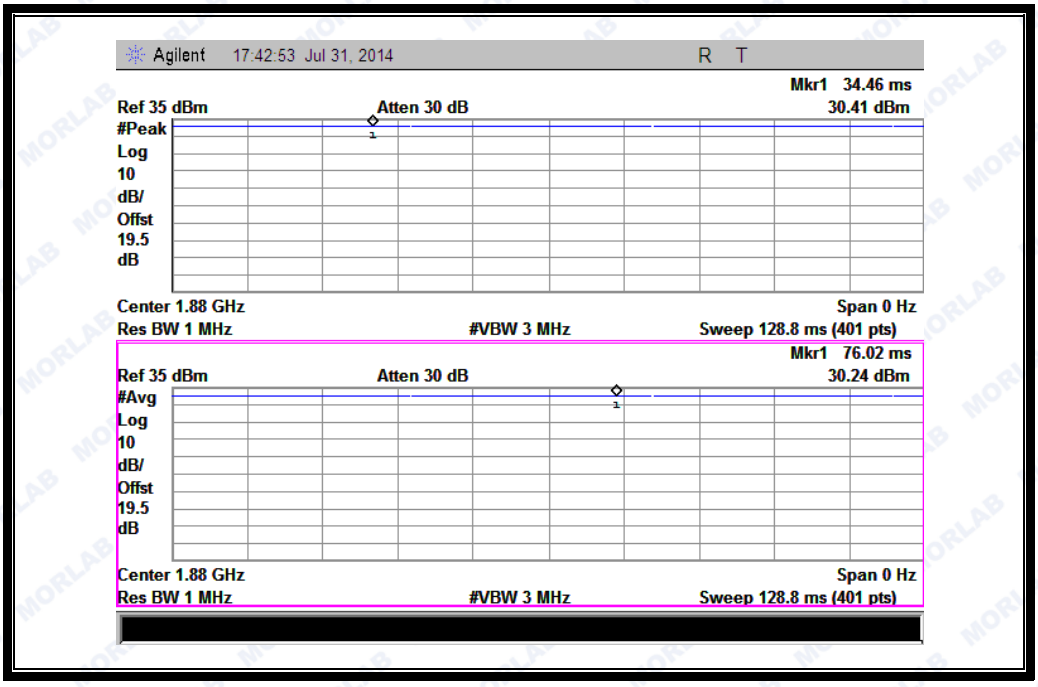
b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1%.

Test Verdict:

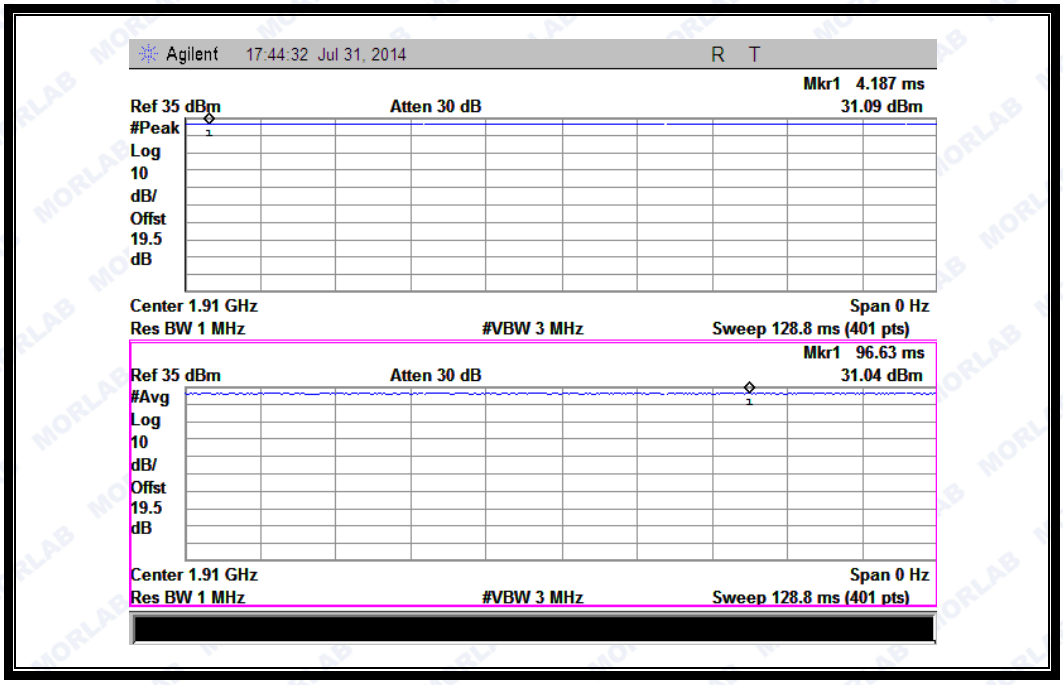
| Band | Channel | Frequency (MHz) | Peak to Average radio | | Limit | Verdict |
|---|---|---|---|---|---|---|
| | | | dBm | Refer to Plot | dBm | |
| GSM 1900MHz | 512 | 1850.2 | 0.08 | Plot A1 to A3 | 13 | PASS |
| | 661 | 1880.0 | 0.17 | | | PASS |
| | 810 | 1909.8 | 0.05 | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 0.13 | Plot B1 to B3 | 13 | PASS |
| | 661 | 1880.0 | 0.06 | | | PASS |
| | 810 | 1909.8 | 0.17 | | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | 2.39 | Plot C1 toC3 | 13 | PASS |
| | 9400 | 1880 | 2.75 | | | PASS |
| | 9538 | 1907.6 | 2.56 | | | PASS |



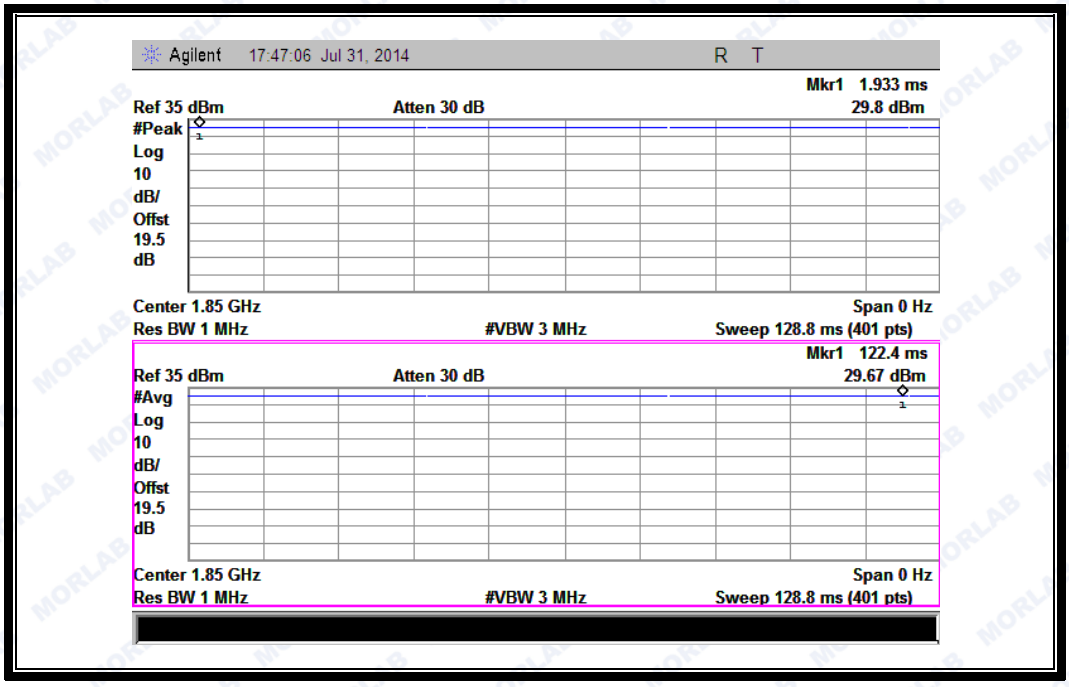

(Plot A1:GSM 1900 MHz Channel = 512)



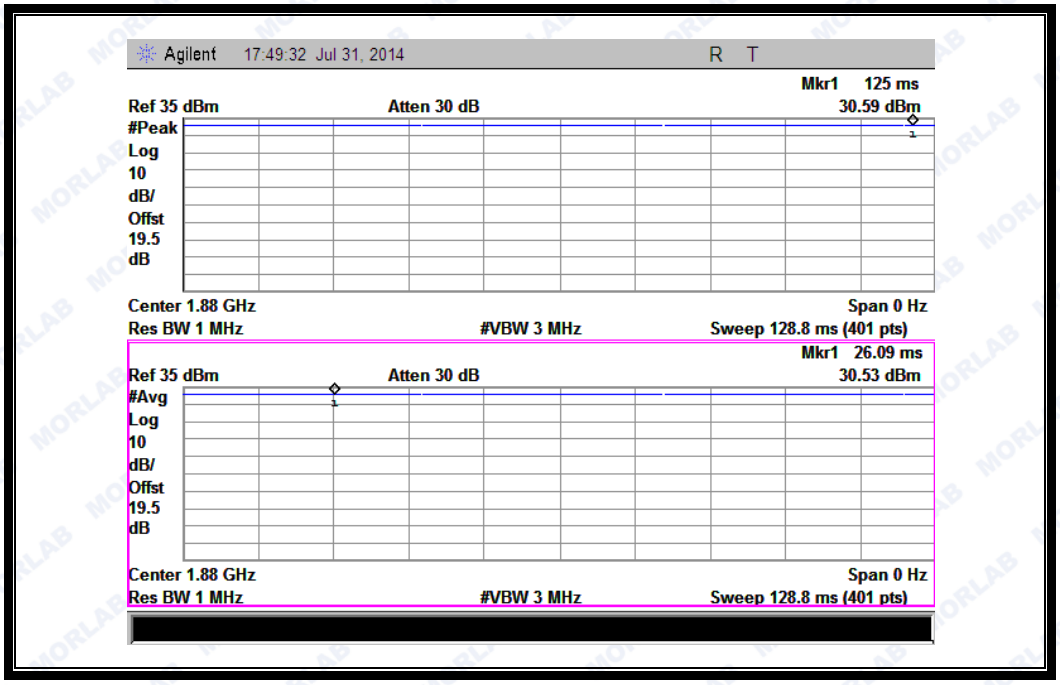

(Plot A2:GSM 1900 MHz Channel = 661)



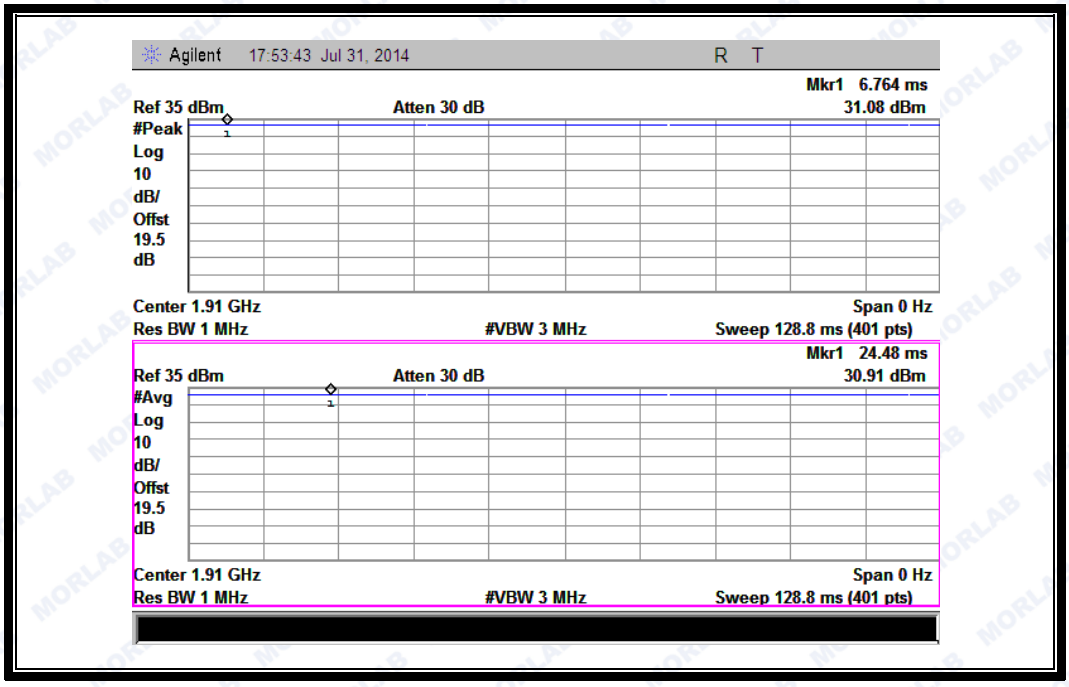

(Plot A3:GSM 1900MHz Channel = 810)



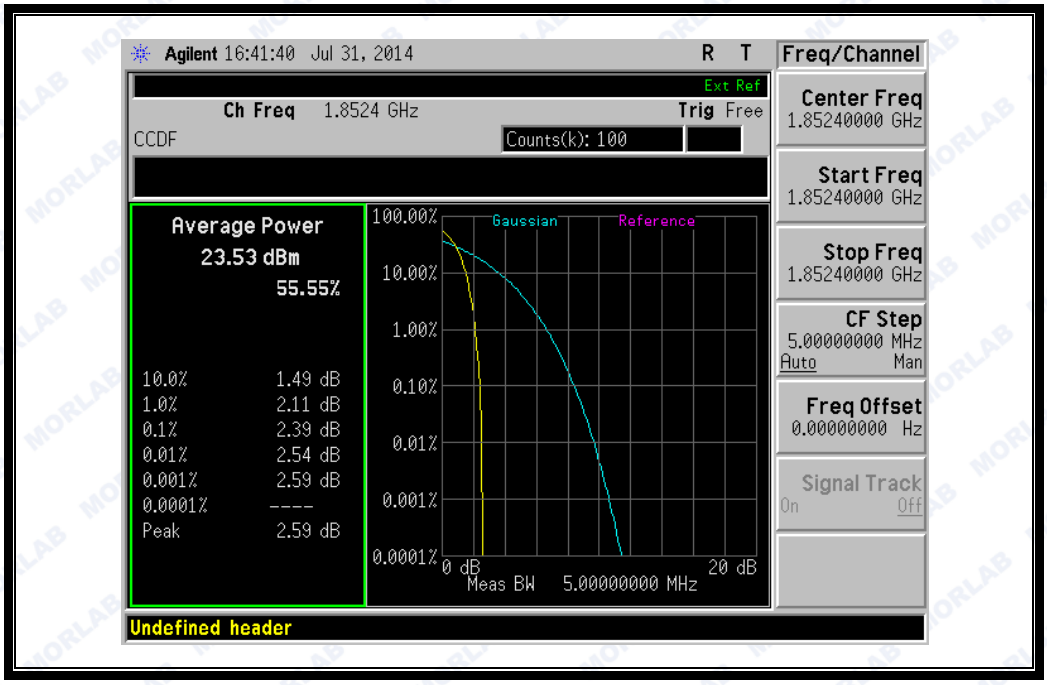

(Plot B1: EGPRS 1900MHz Channel = 512)



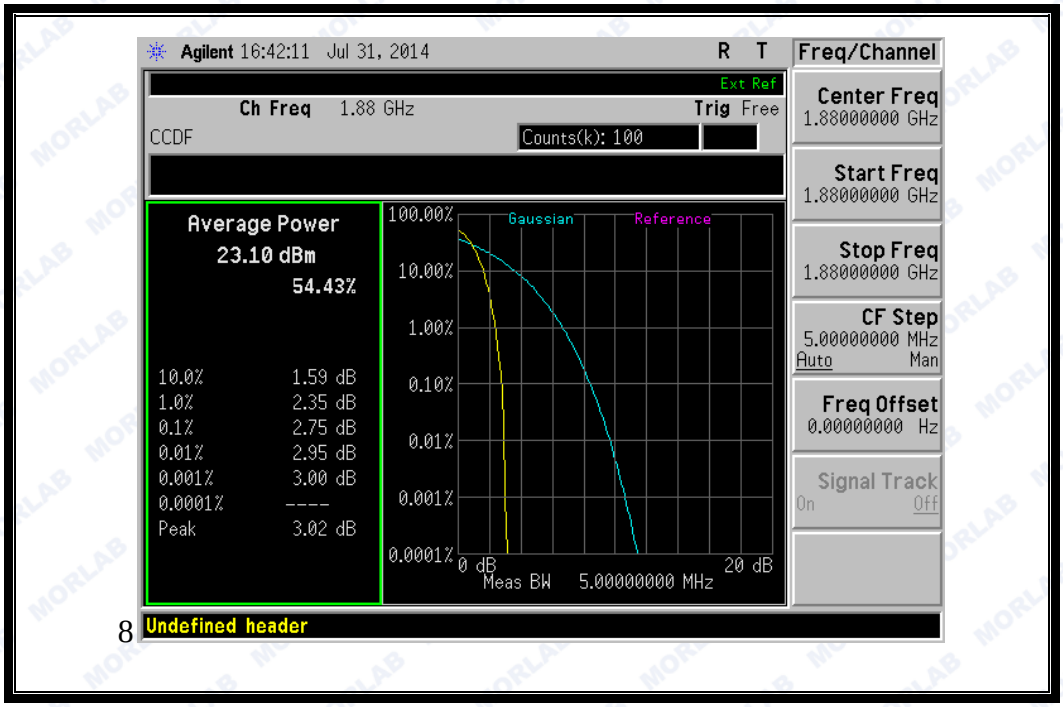

(Plot B2: EGPRS 1900MHz Channel = 661)




(Plot B3: EGPRS 1900MHz Channel = 810)

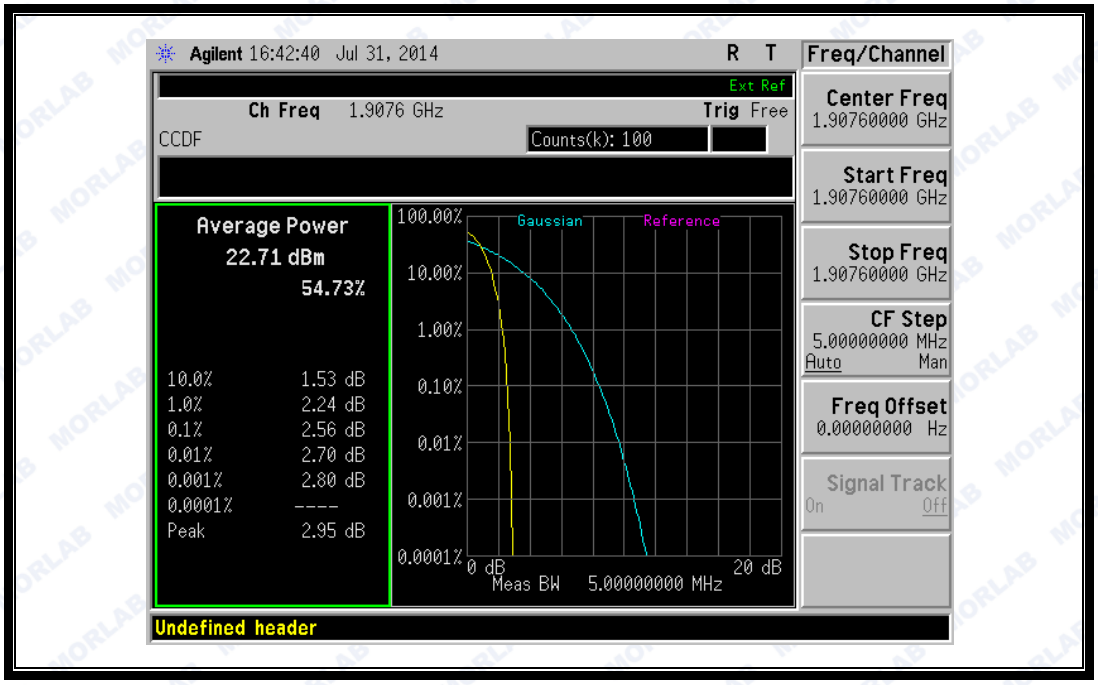



(Plot C1: WCDMA 1900MHz Channel = 9262)




8

(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

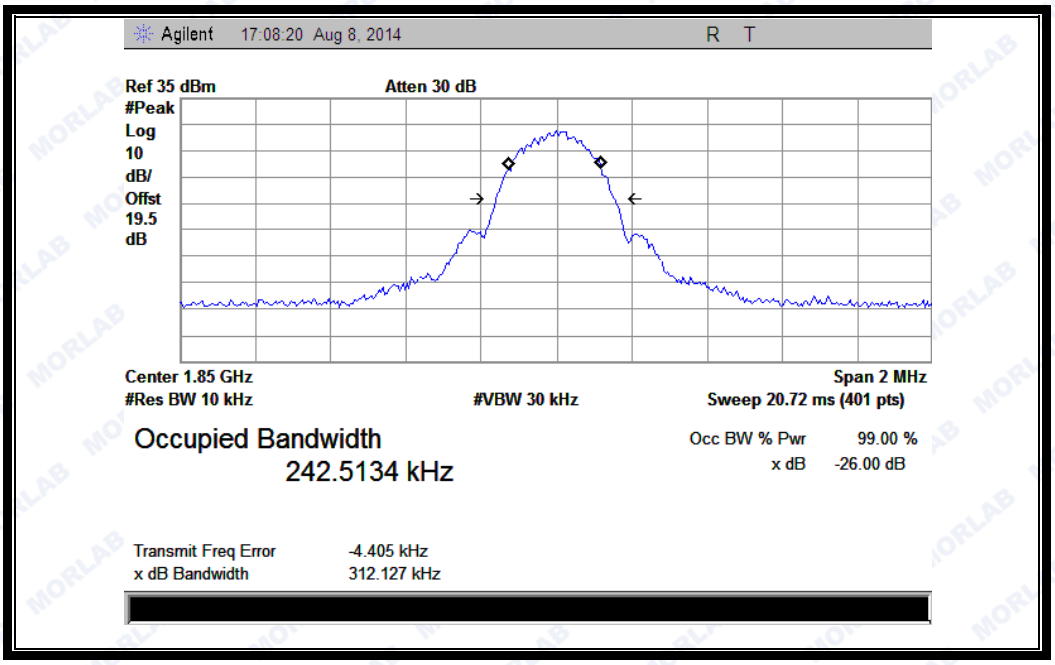
See section 2.1.2 of this report.

### 2.3.3 Test Verdict

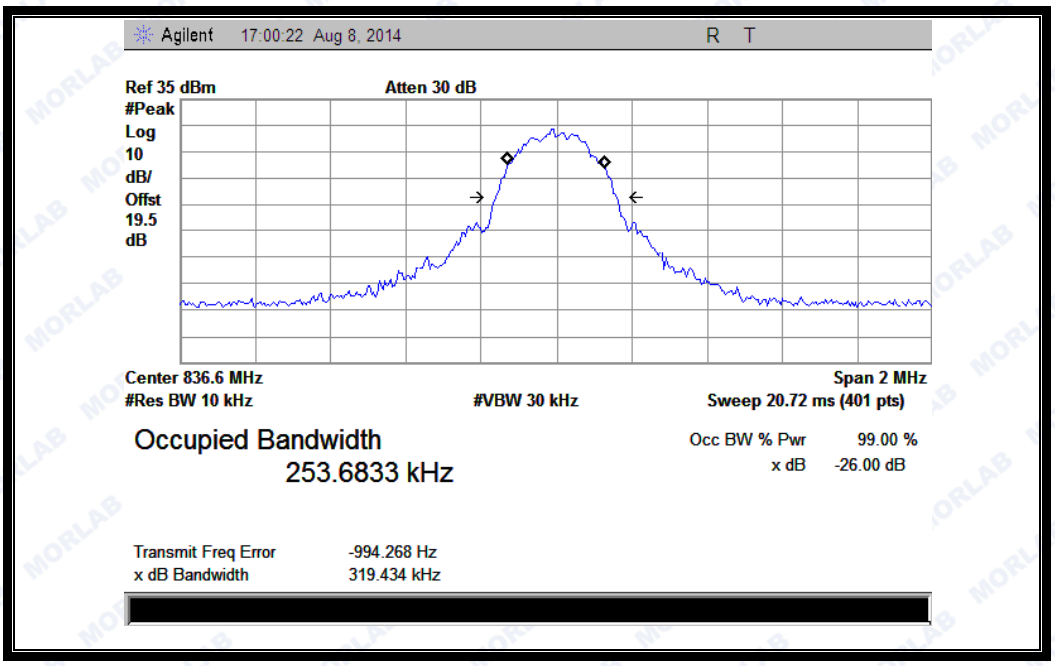
Here the lowest, middle and highest channels are selected to perform testing to verify the 99% occupied bandwidth.

| Band | Channel | Frequency (MHz) | 26dB bandwidth | 99% Occupied Bandwidth | Refer to Plot |
|---|---|---|---|---|---|
| EDGE 850MHz | 128 | 824.2 | 312.127 KHz | 242.5134 KHz | Plot A |
| | 190 | 836.6 | 319.434 KHz | 253.6833 KHz | Plot B |
| | 251 | 848.8 | 311.998 KHz | 246.3135 KHz | Plot C |
| EDGE 1900MHz | 512 | 1850.2 | 318.934 KHz | 246.4323 KHz | Plot D |
| | 661 | 1880.0 | 313.045 KHz | 243.0728 KHz | Plot E |
| | 810 | 1909.8 | 310.718 KHz | 246.3991 KHz | Plot F |
| WCDMA 850MHz | 4132 | 826.4 | 4.628 MHz | 4.1684 MHz | Plot G |
| | 4175 | 835 | 4.678 MHz | 4.1831 MHz | Plot H |
| | 4233 | 846.6 | 4.633 MHz | 4.1478 MHz | Plot I |
| WCDMA 1900MHz | 9262 | 1852.4 | 4.694 MHz | 4.2075 MHz | Plot J |
| | 9400 | 1880 | 4.661 MHz | 4.1867 MHz | Plot K |
| | 9538 | 1907.6 | 4.671 MHz | 4.1743 MHz | Plot L |
| GSM 850MHz | 128 | 824.2 | 318.509 KHz | 244.8923 KHz | Plot M |
| | 190 | 836.6 | 318.994 KHz | 251.3326 KHz | Plot N |
| | 251 | 848.8 | 325.044 KHz | 246.8593 KHz | Plot O |
| GSM 1900MHz | 512 | 1850.2 | 322.955 KHz | 248.5285 KHz | Plot P |
| | 661 | 1880.0 | 325.142 KHz | 244.6306 KHz | Plot Q |
| | 810 | 1909.8 | 315.005 KHz | 251.0542 KHz | Plot R |
| GPRS 850MHz | 128 | 824.2 | 313.087 KHz | 246.4825 KHz | Plot S |
| | 190 | 836.6 | 325.847 KHz | 254.2778 KHz | Plot T |
| | 251 | 848.8 | 320.115 KHz | 244.5027 KHz | Plot U |
| GPRS 1900MHz | 512 | 1850.2 | 318.934 KHz | 246.4323 KHz | Plot V |
| | 661 | 1880.0 | 328.578 KHz | 249.0102 KHz | Plot W |
| | 810 | 1909.8 | 324.116 KHz | 248.9776 KHz | Plot X |

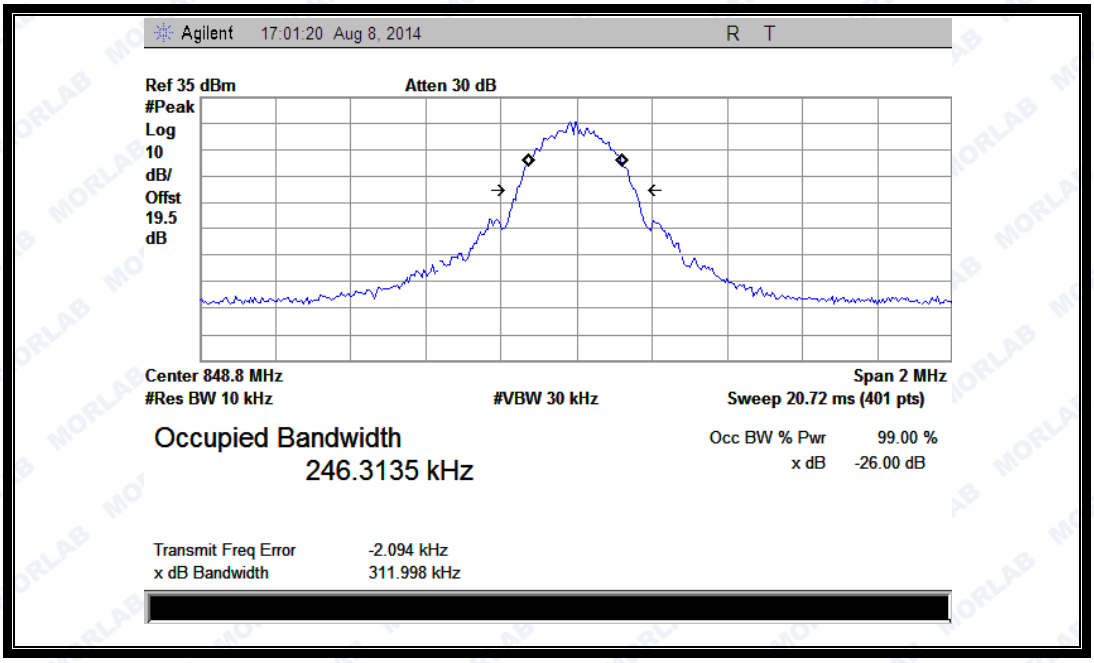
Test Plots:



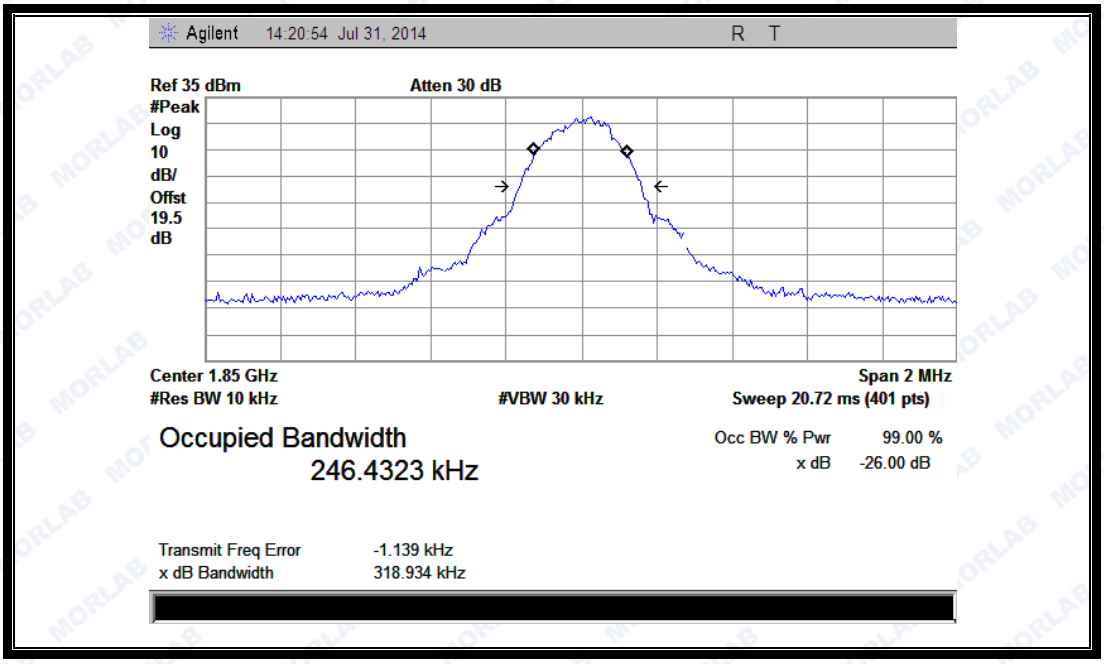

(Plot A: EGPRS 850MHz Channel = 128)



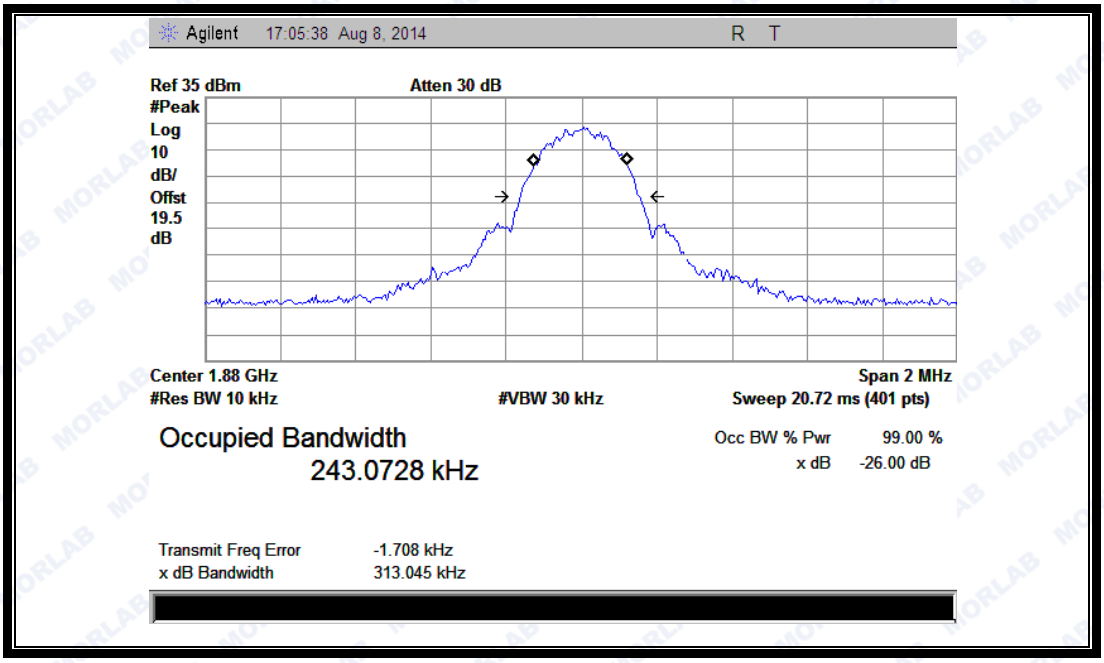

(Plot B: EGPRS 850MHz Channel = 190)



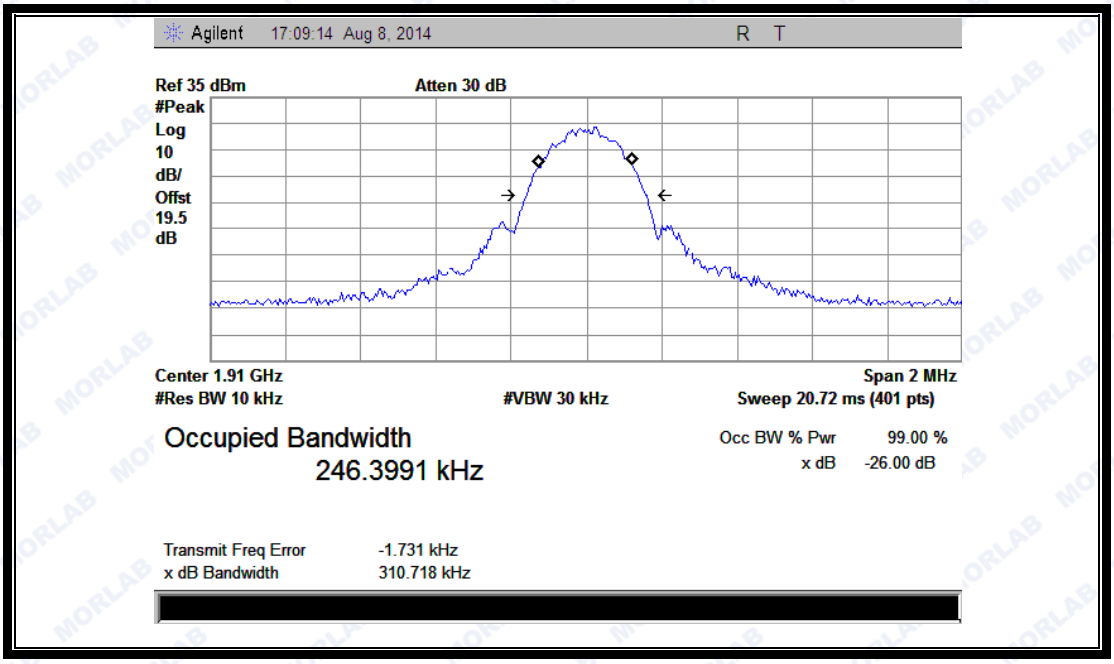

(Plot C: EGPRS 850MHz Channel = 251)



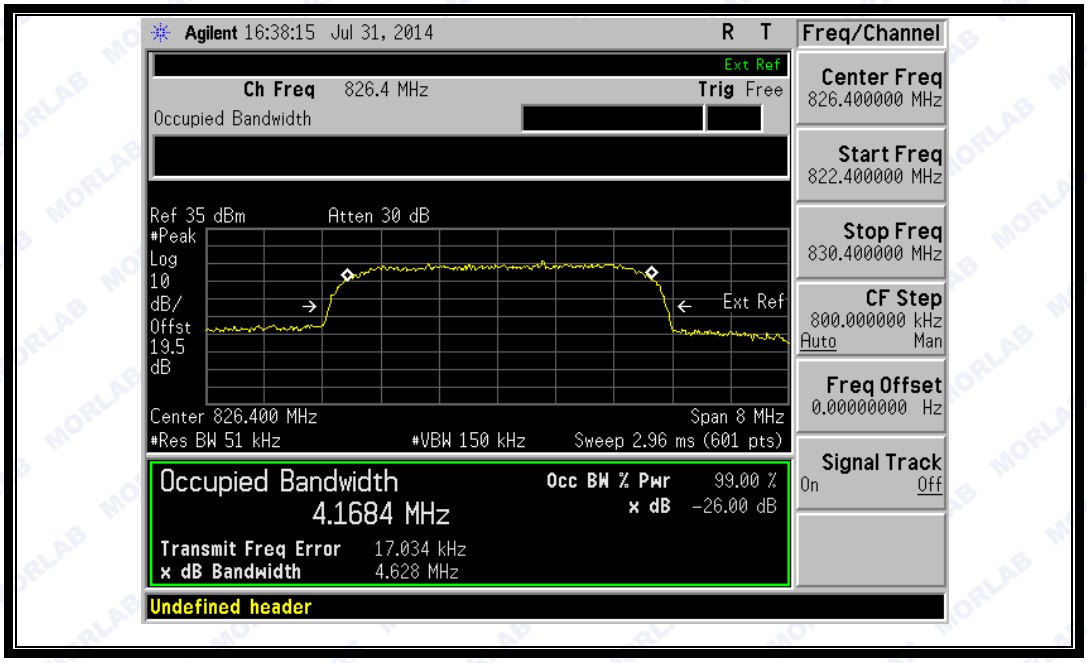

(Plot D: EGPRS1900MHz Channel = 512)



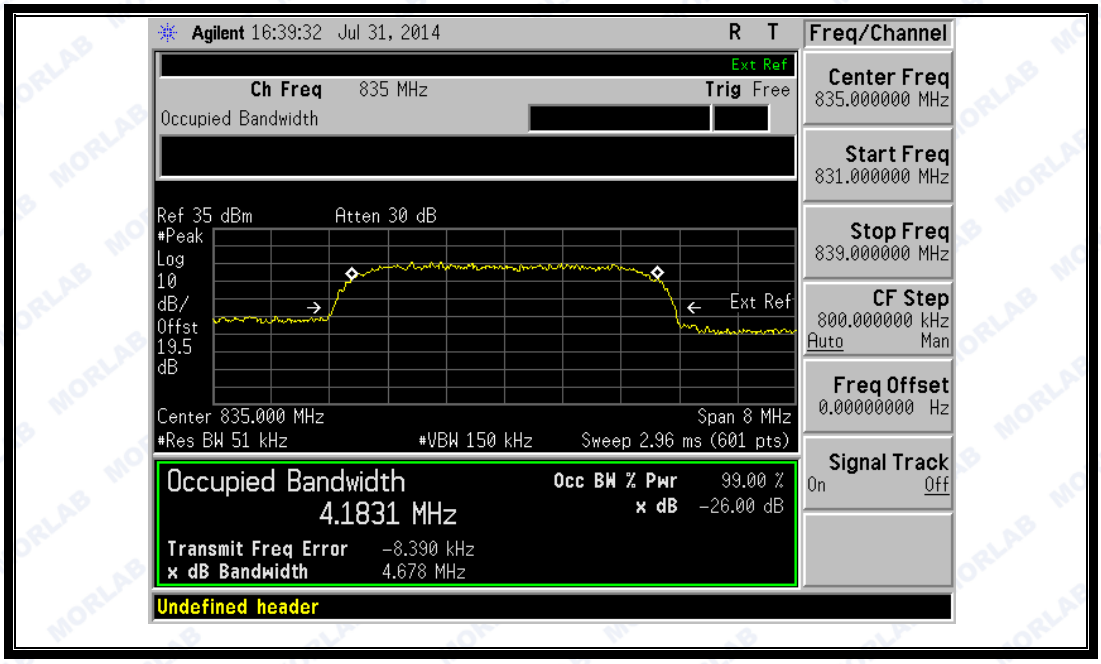

(Plot E: EGPRS1900MHz Channel = 661)



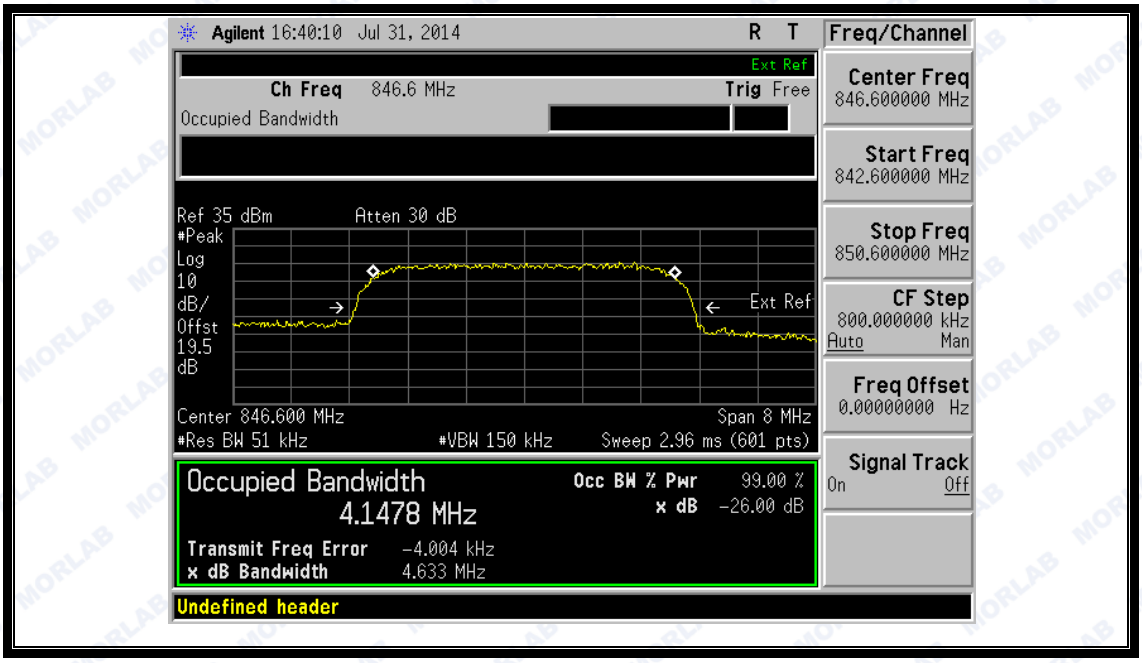

(Plot F: EGPRS 1900MHz Channel = 810)



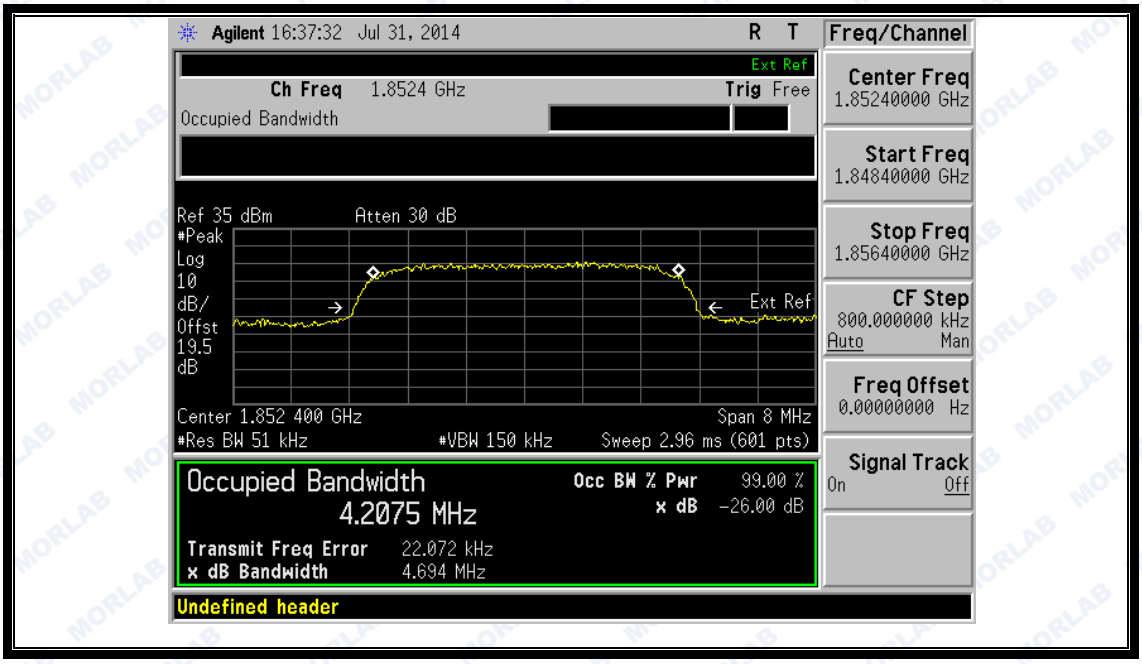

(Plot G: WCDMA 850MHz Channel = 4132)



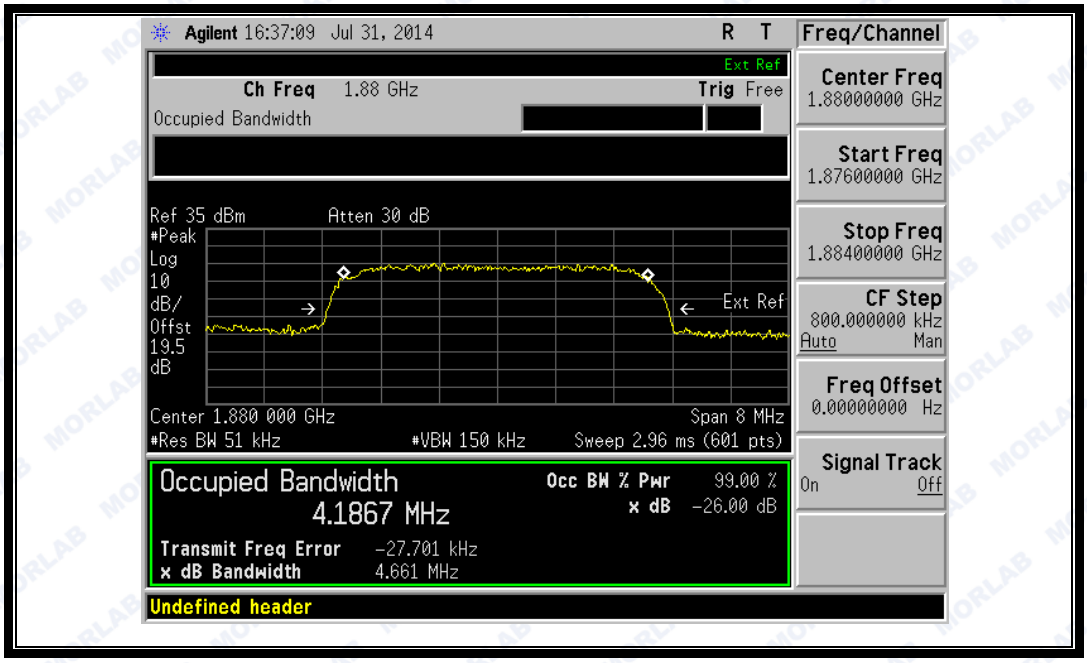

(Plot H: WCDMA 850 MHz Channel = 4175)



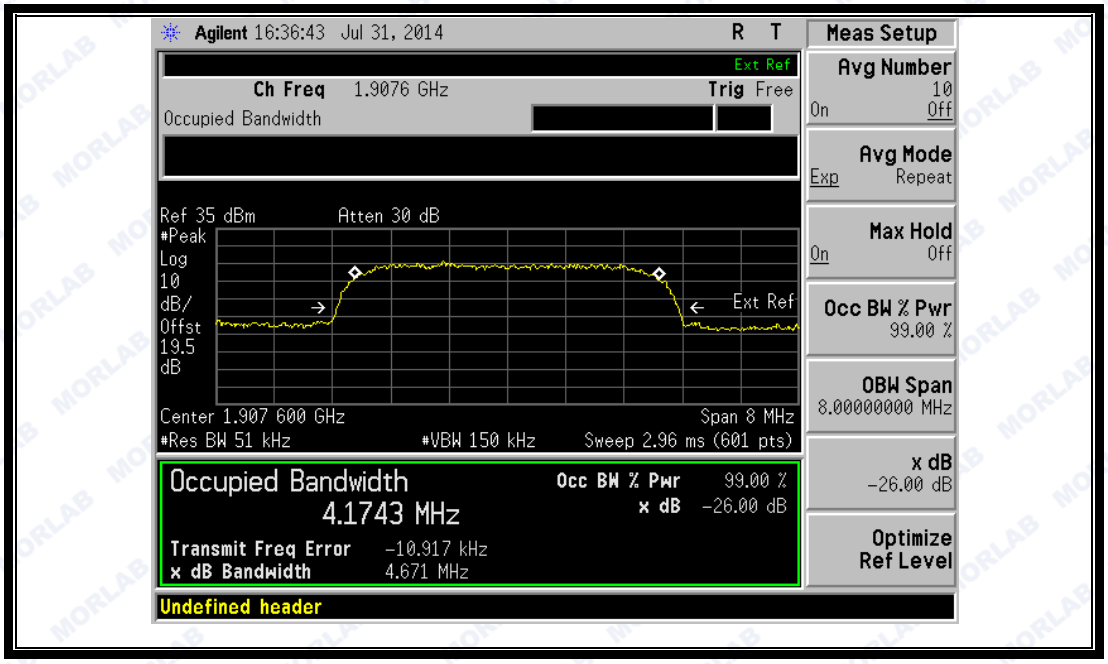

(Plot I: WCDMA 850MHz Channel = 4233)



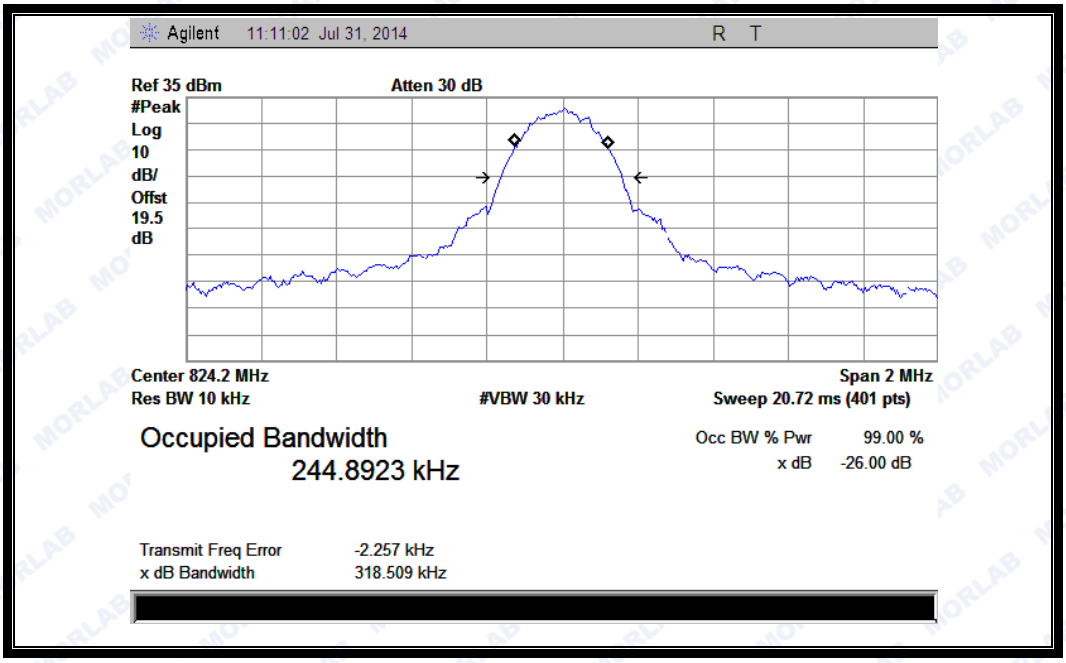

(Plot J: WCDMA 1900MHz Channel = 9262)



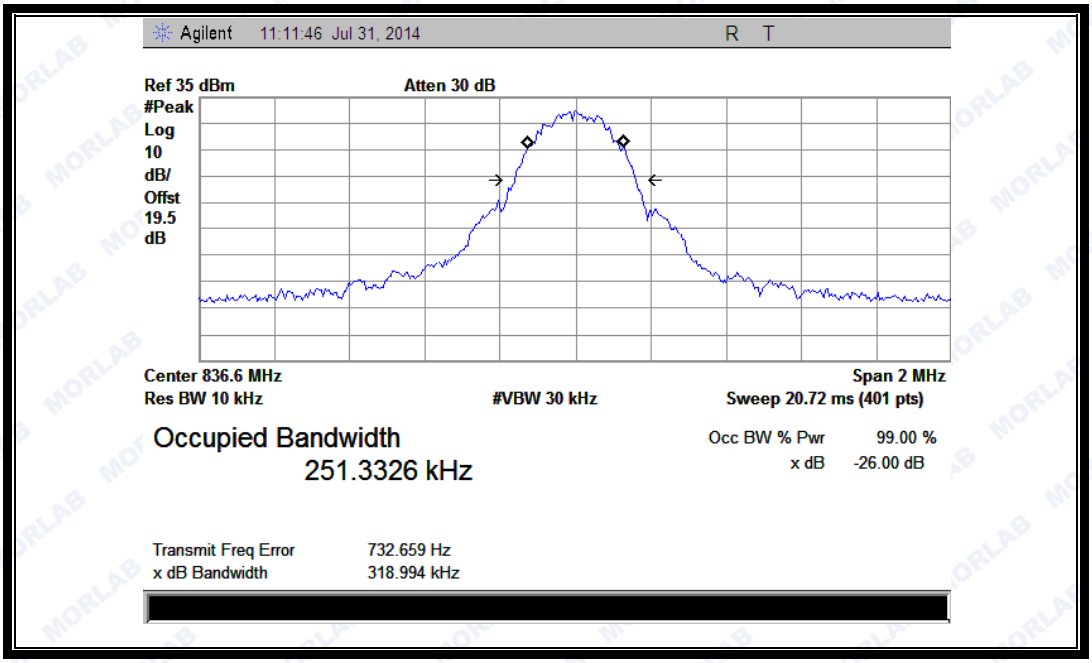

(Plot K: WCDMA 1900 MHz Channel = 9400)



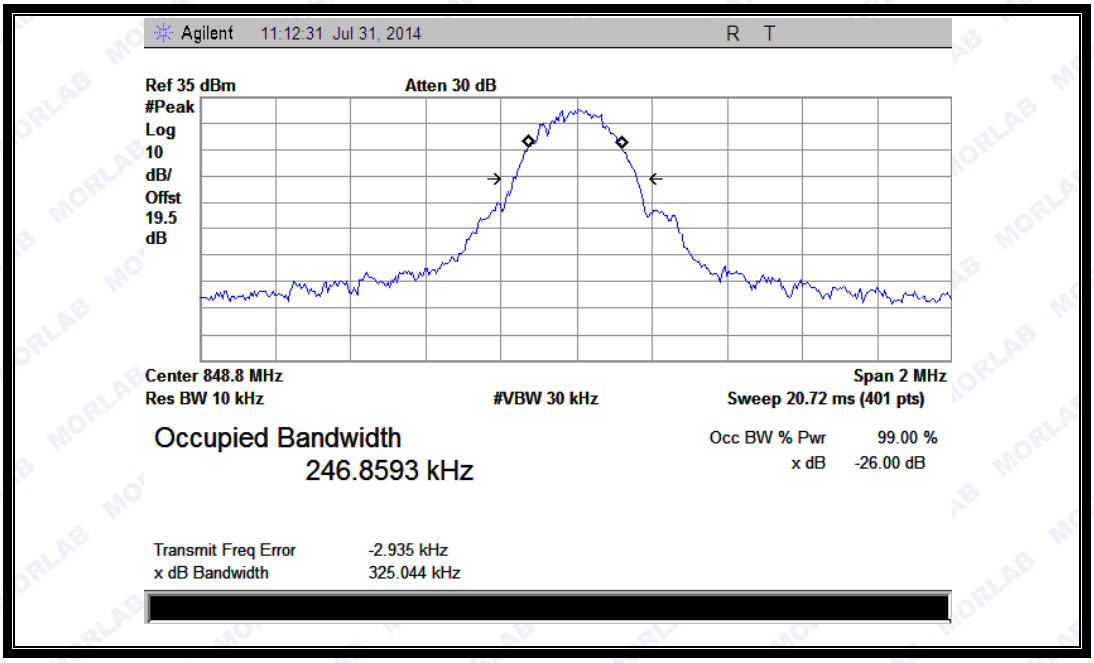

(Plot L: WCDMA1900MHz Channel = 9538)



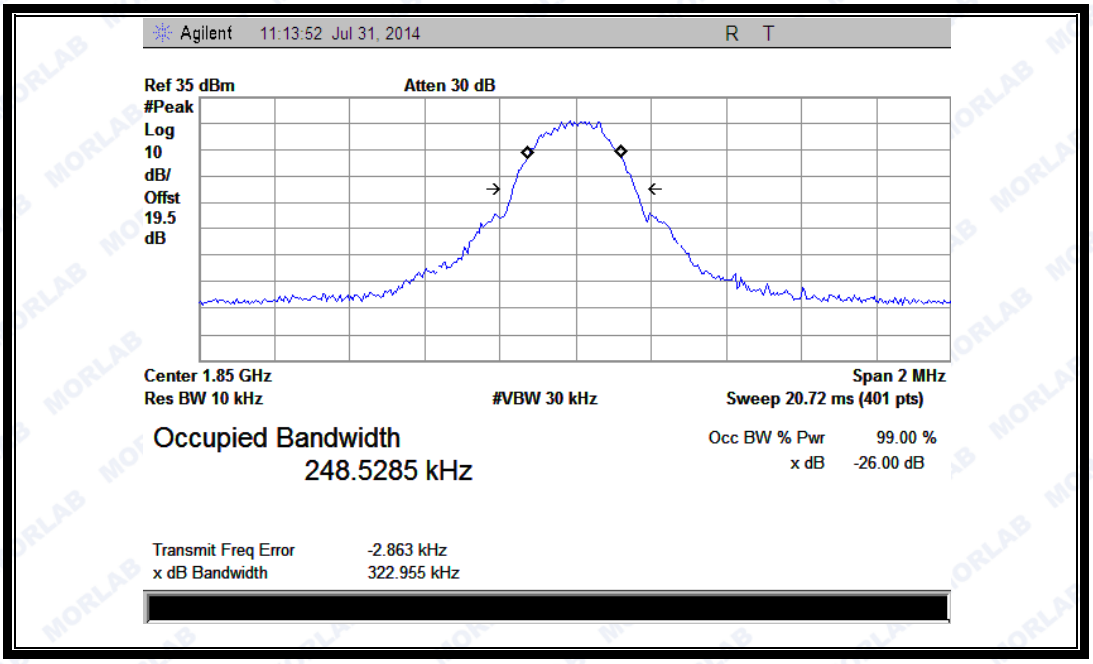

(Plot M: GSM 850MHz Channel = 128)



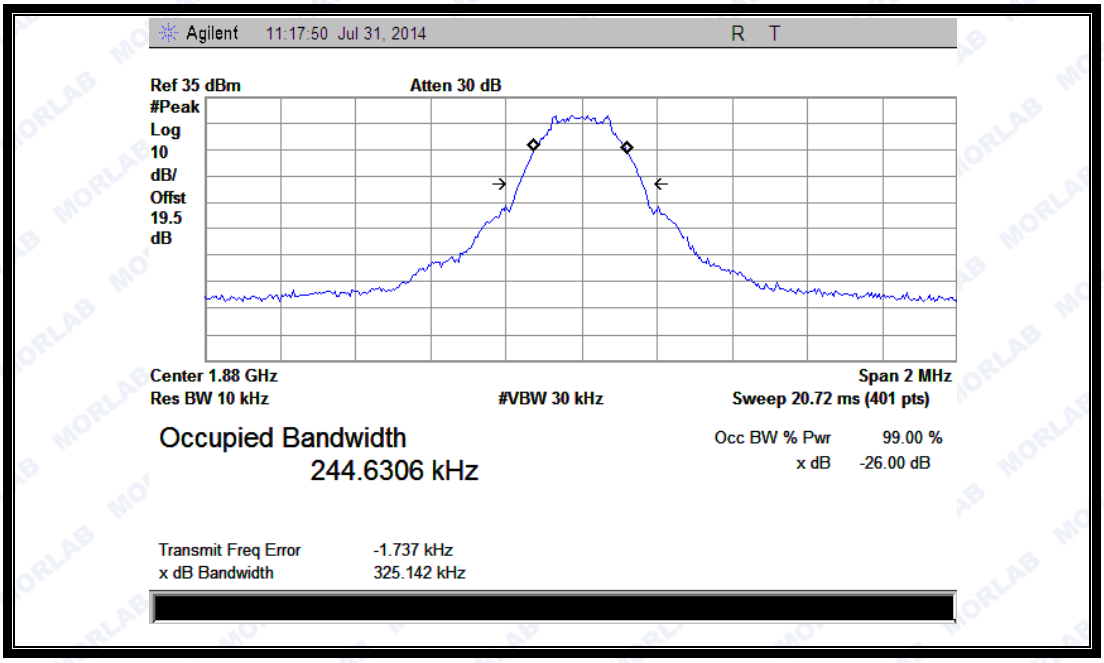

(Plot N: GSM 850MHz Channel = 190)



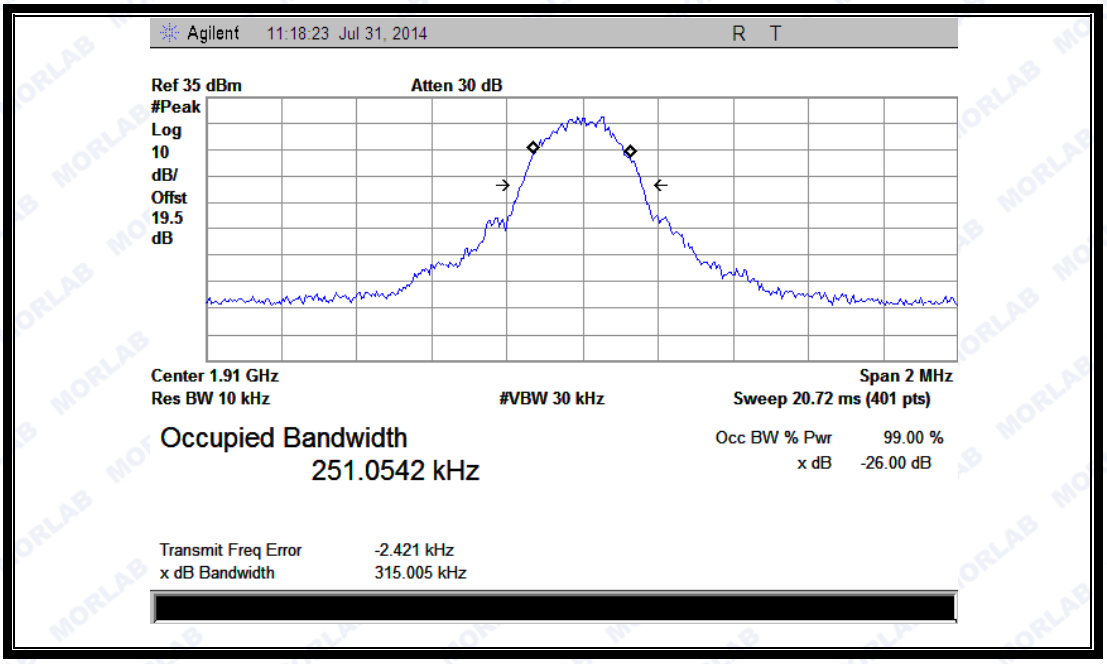

(Plot O: GSM 850MHz Channel = 251)



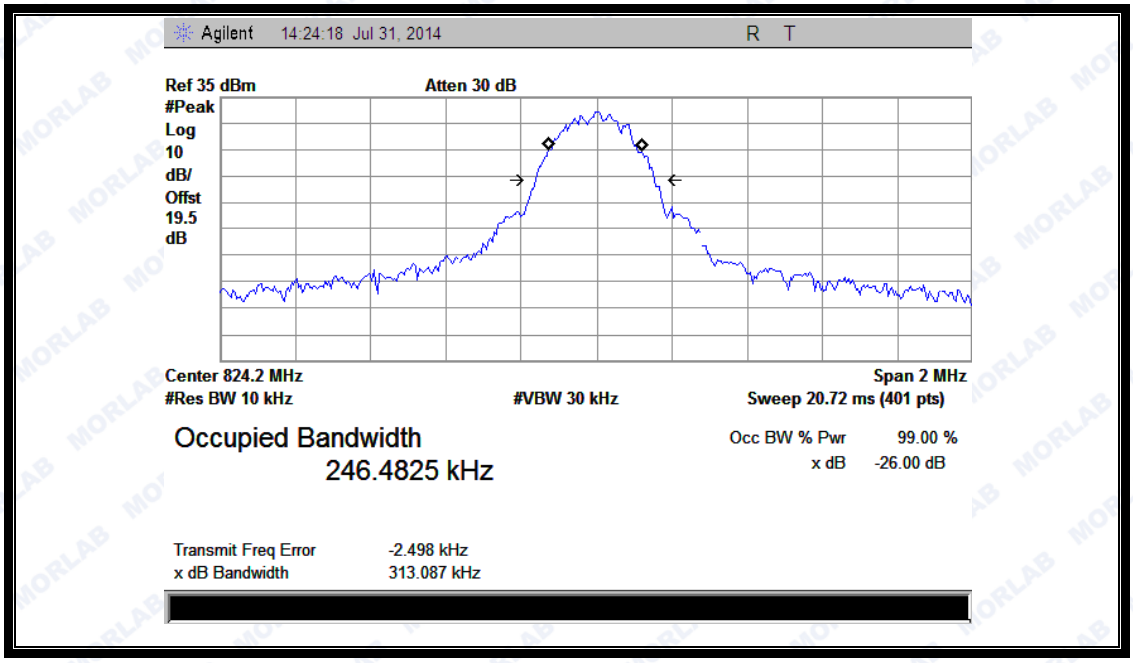

(Plot P: GSM 1900MHz Channel = 512)



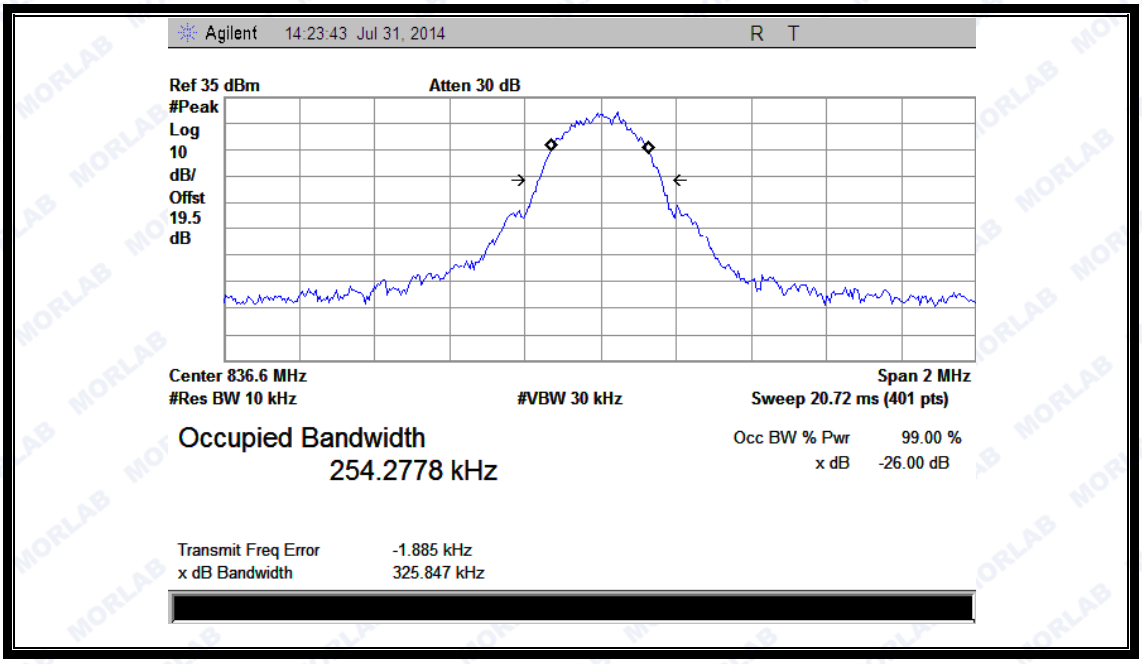

(Plot Q: GSM 1900MHz Channel = 661)



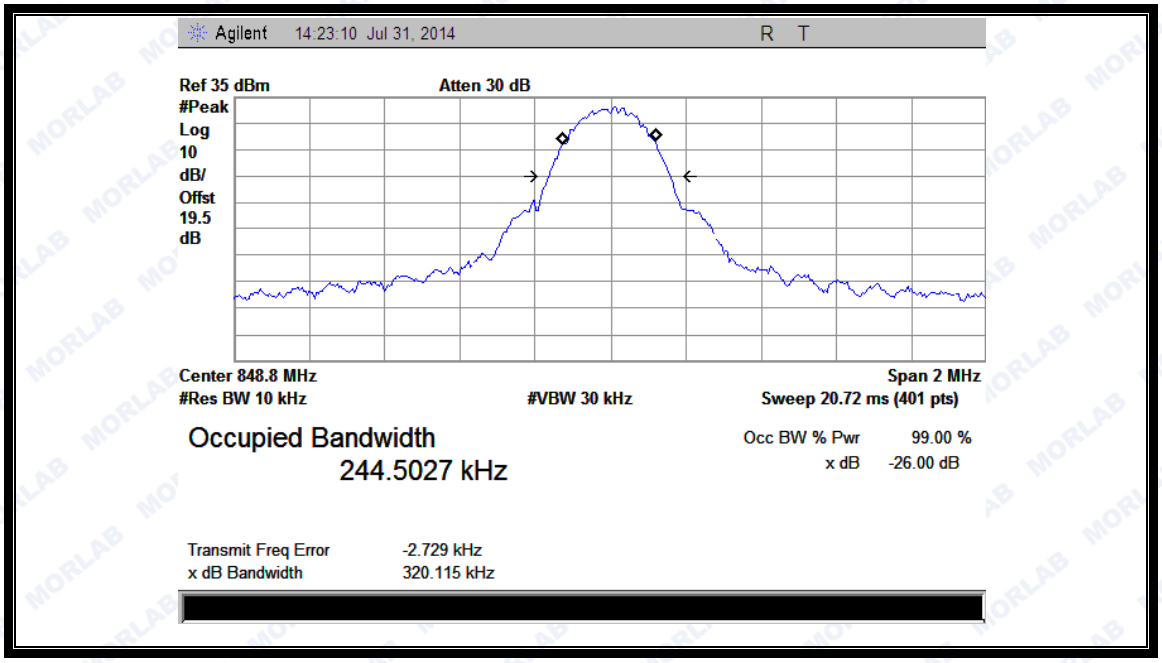

(Plot R: GSM 1900MHz Channel = 810)



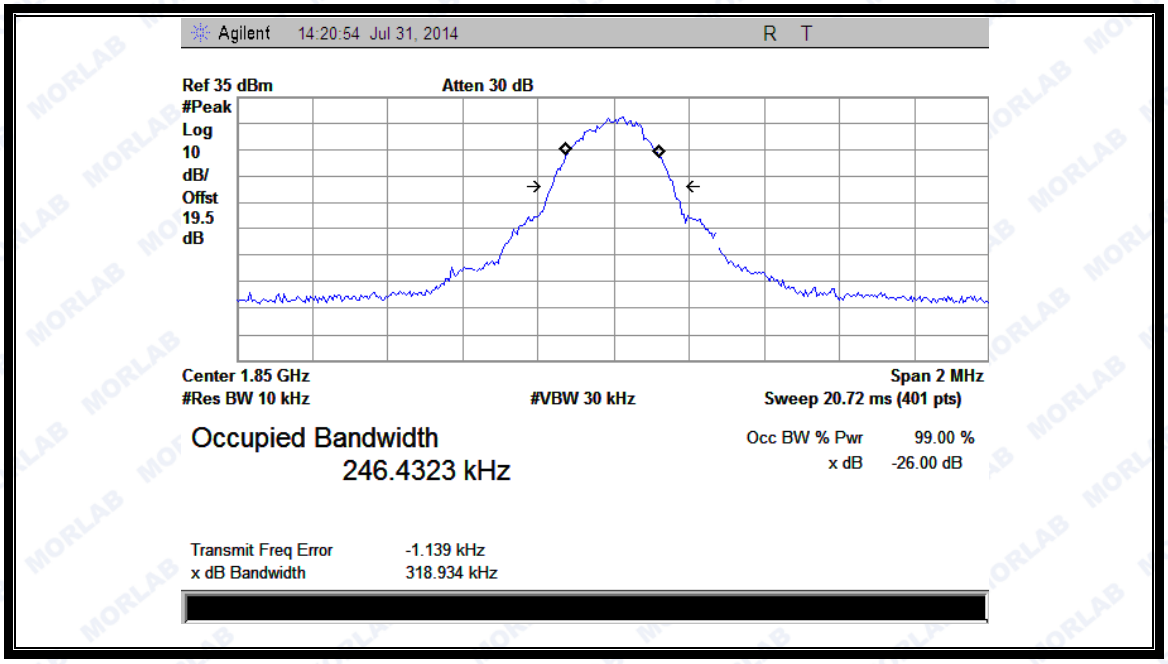

(Plot W: GPRS 850MHz Channel = 128)



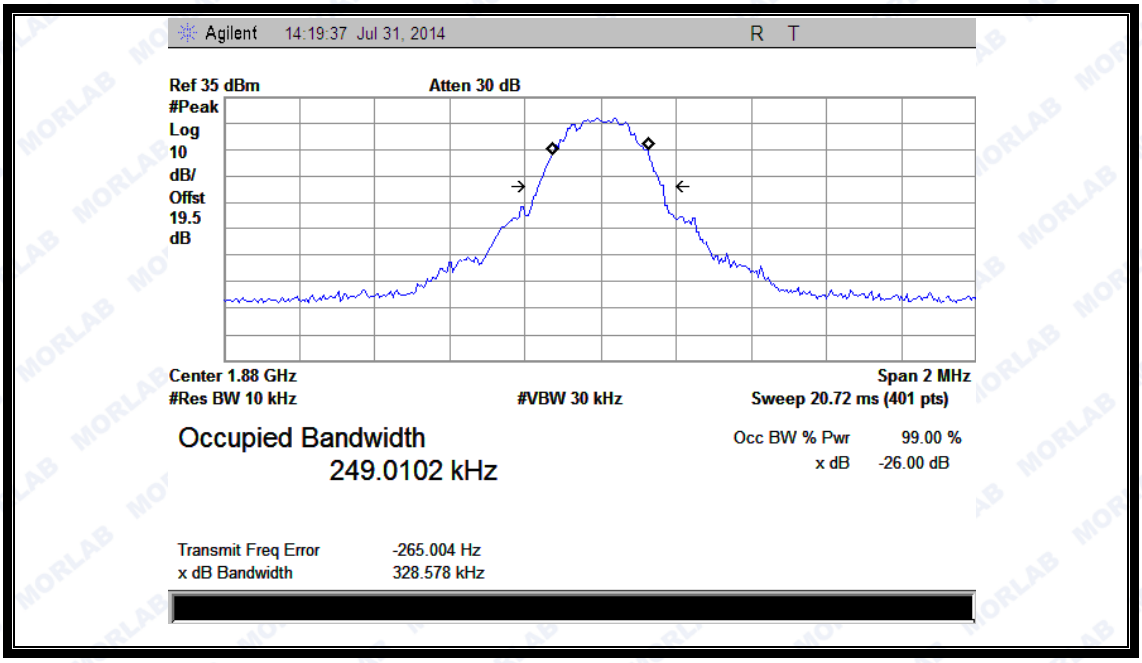

(Plot T: GPRS 850MHz Channel = 190)



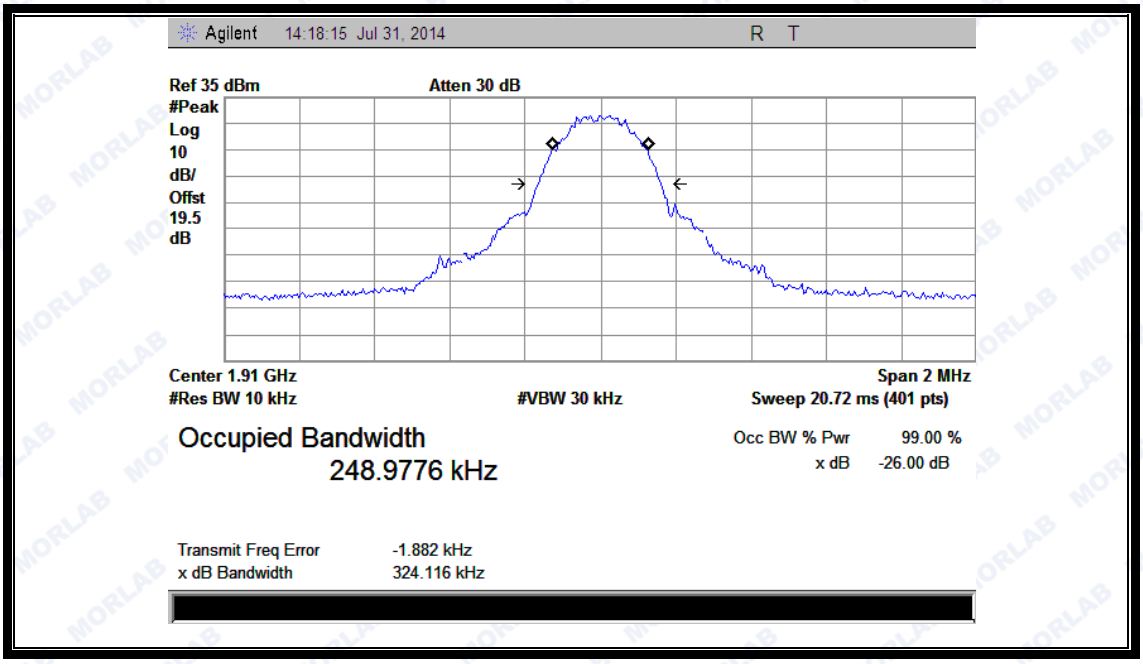

(Plot U: GPRS850MHz Channel = 251)




(Plot V: GPRS 1900MHz Channel = 512)




(Plot W: GPRS 1900MHz Channel = 661)




(Plot X: GPRS 1900MHz Channel = 810)

## 2.4 Frequency Stability

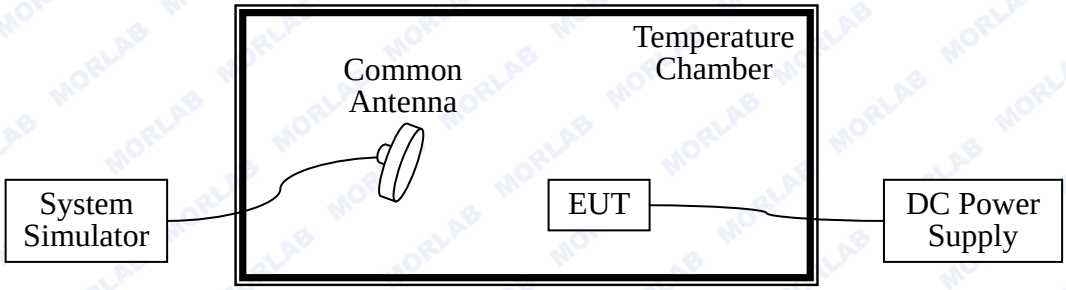
### 2.4.1 Requirement

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

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

### 2.4.2 Test Description

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.

Equipments List:

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2014.02.26 | 2015.02.25 |
| DC Power Supply | Good Will | GPS-3030DD | EF920938 | 2014.02.26 | 2015.02.25 |
| Temperature Chamber | YinHe Experimental Equip. | HL4003T | (n.a.) | 2014.02.26 | 2015.02.25 |

### 2.4.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 6VDC, 7VDC and 4.75VDC, 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) | | |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 6 | -30 | -22.45 | ±2060.5 | 22.12 | ±2091.5 | 18.19 | ±2122 | PASS |
| | -20 | 27.11 | | 12.43 | | -15.02 | | |
| | -10 | -2.25 | | -17.46 | | 15.11 | | |
| | 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 | 41.63 | | 19.64 | | -2.13 | | |
| | +55 | 36.28 | | 23.27 | | -12.89 | | |
| 7 | +25 | -15.73 | | 29.05 | | -7.55 | | |
| 4.35 | +25 | -17.65 | | 37.33 | | 7.78 | | |

2. GSM 1900MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 512 (1850.2MHz) | | Channel = 661 (1880.0MHz) | | Channel = 810 (1909.8MHz) | | |
| | | Hz | Limits | Hz | Limits | Hz | Limits | |
| 6 | -30 | 18.11 | ±1850.2 | 21.18 | ±1880.0 | 34.15 | ±1909.8 | PASS |
| | -20 | 37.18 | | -21.48 | | -18.88 | | |
| | -10 | -2.05 | | -13.76 | | -16.88 | | |
| | 0 | 40.06 | | -18.38 | | 19.32 | | |
| | +10 | 1.98 | | -21.61 | | 25.31 | | |
| | +20 | -19.76 | | 15.52 | | 30.26 | | |
| | +30 | 39.76 | | -0.78 | | -29.21 | | |
| | +40 | 46.56 | | 35.37 | | 19.33 | | |
| | +55 | 39.88 | | 24.02 | | -19.37 | | |
| 7 | +25 | 37.88 | | 23.72 | | 27.09 | | |
| 4.35 | +25 | -5.69 | | 15.22 | | 19.89 | | |

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 | |
| 6 | -30 | -31.22 | ±2060.5 | 26.29 | ±2091.5 | 6.12 | ±2122 | PASS |
| | -20 | 36.98 | | 13.73 | | -13.80 | | |
| | -10 | -3.25 | | -18.35 | | 13.16 | | |
| | 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 | 47.62 | | 15.54 | | -2.11 | | |
| | +55 | 40.98 | | 3.57 | | -12.89 | | |
| 7 | +25 | -15.71 | | 14.05 | | -7.83 | | |
| 4.35 | +25 | -15.01 | | 7.93 | | 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 | |
| 6 | -30 | -11.87 | ±1850.2 | 25.12 | ±1880.0 | 1.57 | ±1909.8 | PASS |
| | -20 | 2.72 | | 7.63 | | -13.76 | | |
| | -10 | 1.25 | | -25.78 | | -13.21 | | |
| | 0 | 2.57 | | -1.36 | | 13.23 | | |
| | +10 | -10.78 | | -17.98 | | 5.23 | | |
| | +20 | -2.11 | | -21.61 | | 37.77 | | |
| | +30 | 14.03 | | 14.58 | | -26.88 | | |
| | +40 | 5.43 | | -0.78 | | 19.34 | | |
| | +55 | -2.46 | | 39.87 | | -16.77 | | |
| 7 | +25 | 18.02 | | 4.08 | | 26.59 | | |
| 4.35 | +25 | -7.19 | | 14.13 | | 19.03 | | |

5. WCDMA 850MHz Band

| Test Conditions | | Frequency Deviation | | | | | | Verdict |
|---|---|---|---|---|---|---|---|---|
| Power (VDC) | Temperature (°C) | Channel = 4123 (826.4MHz) | | Channel = 4175 (835MHz) | | Channel = 4233 (846.6MHz) | | |
| | | Hz | Limit | Hz | Limit | Hz | Limit | |
| 6 | -30 | 17.11 | ±2066 | 12.21 | ±2087.5 | -1.10 | ±2116.5 | PASS |
| | -20 | -7.51 | | -0.62 | | -18.48 | | |
| | -10 | -3.43 | | 22.45 | | 7.67 | | |
| | 0 | 16.47 | | 13.25 | | 4.32 | | |
| | +10 | 30.18 | | 1.31 | | -17.33 | | |
| | +20 | 32.27 | | -12.22 | | 11.90 | | |
| | +30 | -7.98 | | 31.62 | | 6.63 | | |
| | +40 | 26.31 | | 13.45 | | 28.93 | | |
| | +55 | 12.10 | | -12.42 | | 19.76 | | |
| 7 | +25 | -6.17 | | 31.12 | | 23.89 | | |
| 4.35 | +25 | 18.56 | | -17.80 | | -18.12 | | |

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 | |
| 6 | -30 | -4.22 | ±1852.4 | -11.17 | ±1880.0 | -3.29 | ±1907.6 | PASS |
| | -20 | 19.15 | | 12.28 | | 25.60 | | |
| | -10 | 5.35 | | -14.36 | | 15.11 | | |
| | 0 | 18.92 | | 18.59 | | -3.17 | | |
| | +10 | 32.40 | | 21.39 | | 18.12 | | |
| | +20 | 13.55 | | 39.17 | | -10.39 | | |
| | +30 | 2.31 | | 2.37 | | 17.47 | | |
| | +40 | -12.52 | | -13.47 | | 29.89 | | |
| | +55 | -13.65 | | -5.81 | | -2.53 | | |
| 7 | +25 | 24.23 | | 14.68 | | 21.05 | | |
| 4.35 | +25 | 23.12 | | 25.37 | | -25.11 | | |

## 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 low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit. And according to KDB 971168D01 Section 8, the amplitudes of unwanted emissions that are attenuated more than 20 dB below the applicable limit are not required to be reported. So the measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency and was reported. The lowest, middle and highest channels are tested to verify the out of band emissions.

1. Equipment List

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2014.02.26 | 2015.02.25 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2014.02.26 | 2015.02.25 |
| Power Meter | Agilent | E4418B | GB43318055 | 2014.02.26 | 2015.02.25 |
| Power Sensor | Agilent | 8482A | MY41091706 | 2014.02.26 | 2015.02.25 |
| Power Splitter | Weinschel | 1506A | NW521 | 2014.02.26 | 2015.02.25 |
| Attenuator 1 | Resnet | 20dB | (n.a.) | 2014.02.26 | 2015.02.25 |
| Attenuator 2 | Resnet | 3dB | (n.a.) | 2014.02.26 | 2015.02.25 |

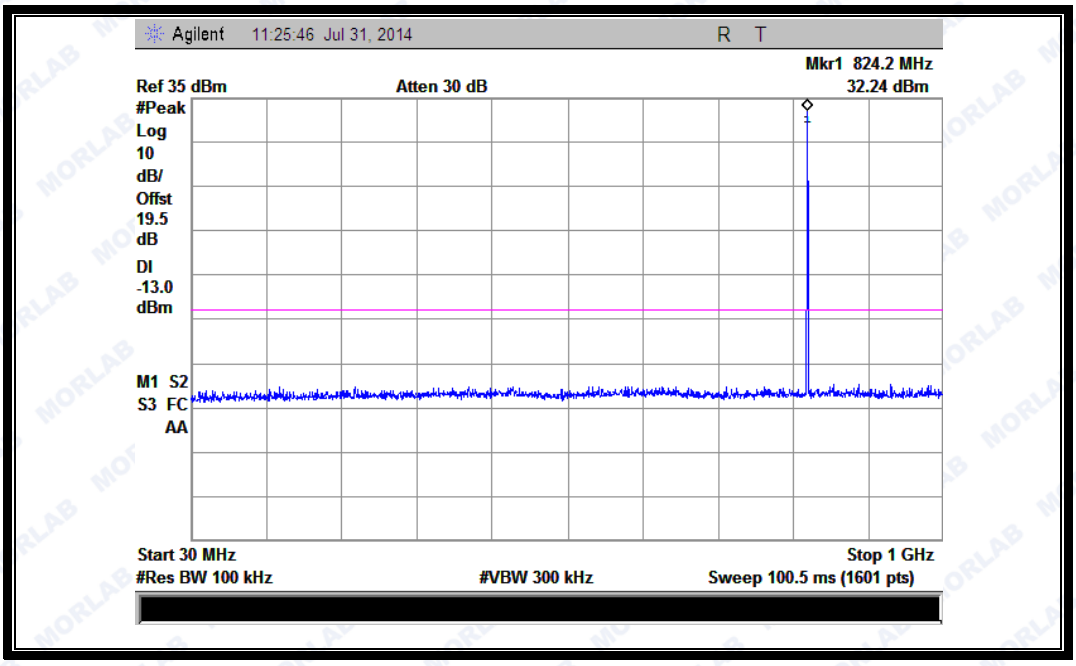
2. Test Verdict:

| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| GSM 850MHz | 128 | 824.2 | -18.65 | Plot A1toA1.1 | -13 | PASS |
| | 190 | 836.6 | -18.96 | Plot A2toA2.1 | | PASS |
| | 251 | 848.8 | -18.14 | Plot A3toA3.1 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | -18.19 | Plot B1toB1.1 | -13 | PASS |
| | 661 | 1880.0 | -19.96 | Plot B2toB2.1 | | PASS |
| | 810 | 1909.8 | -18.15 | Plot B3toB3.1 | | PASS |
| EDGE 850MHz | 128 | 824.2 | -18.6 | Plot C1toC1.1 | -13 | PASS |
| | 190 | 836.6 | -19.17 | Plot C2toC2.1 | | PASS |
| | 251 | 848.8 | -19.09 | Plot C3toC3.1 | | PASS |

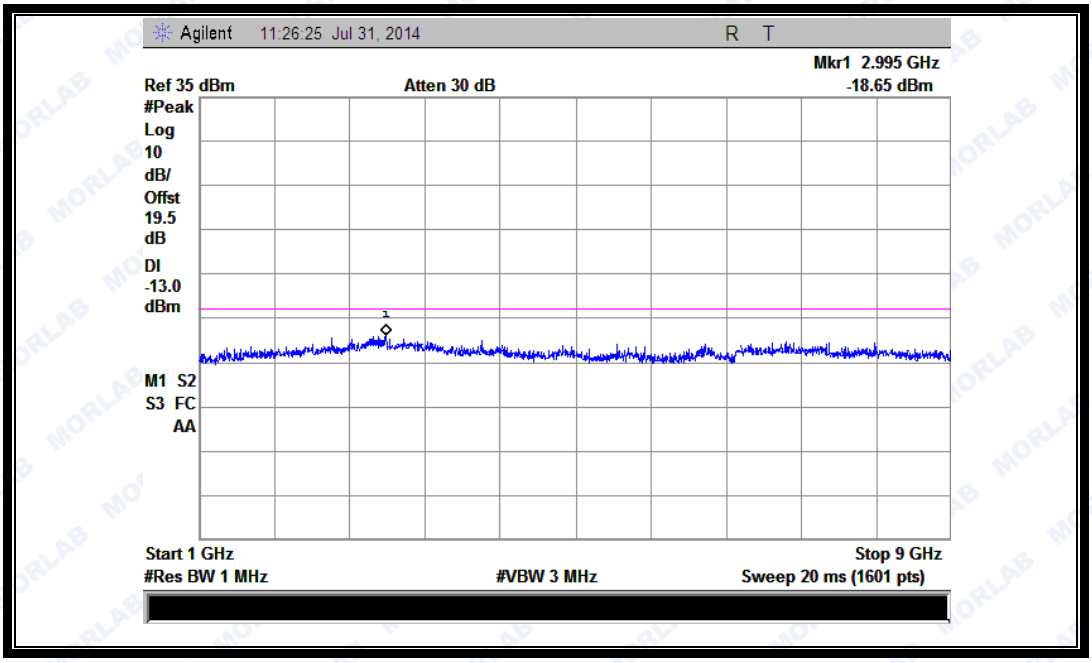
| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| EDGE 1900MHz | 512 | 1850.2 | -19.59 | Plot D1toD1.1 | -13 | PASS |
| | 661 | 1880.0 | -18.97 | Plot D2toD2.1 | | PASS |
| | 810 | 1909.8 | -18.53 | Plot 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 |
| | 9538 | 1907.6 | <-25 | Plot F3toF3.1 | | PASS |

Test Plots for the Whole Measurement Frequency Range:

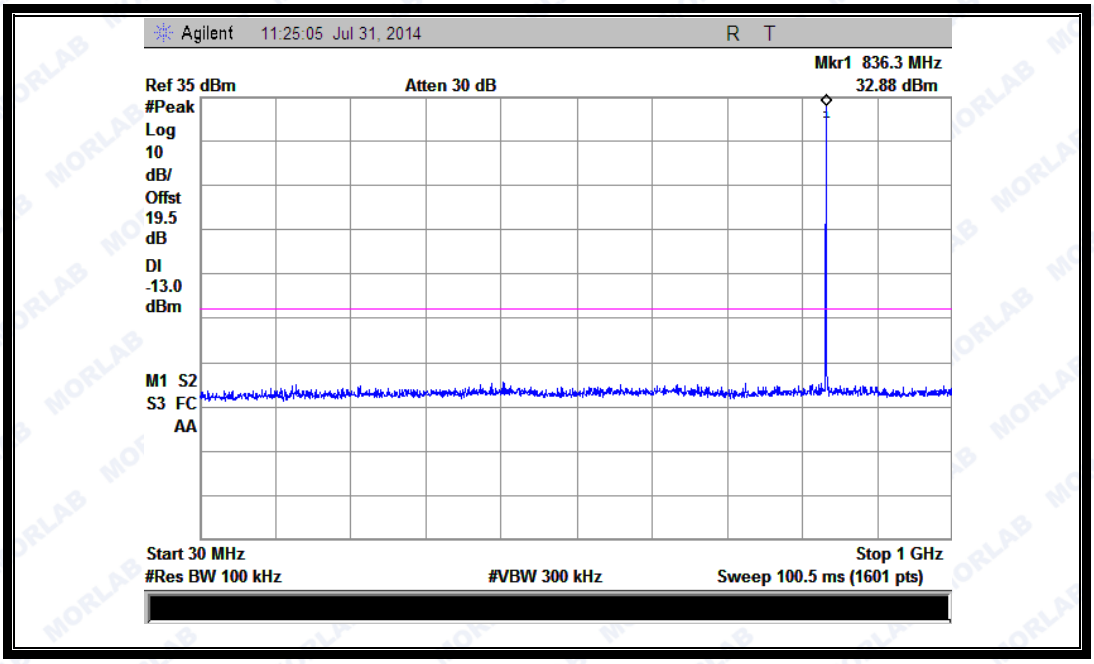
Note: the power of the EUT transmitting frequency should be ignored.



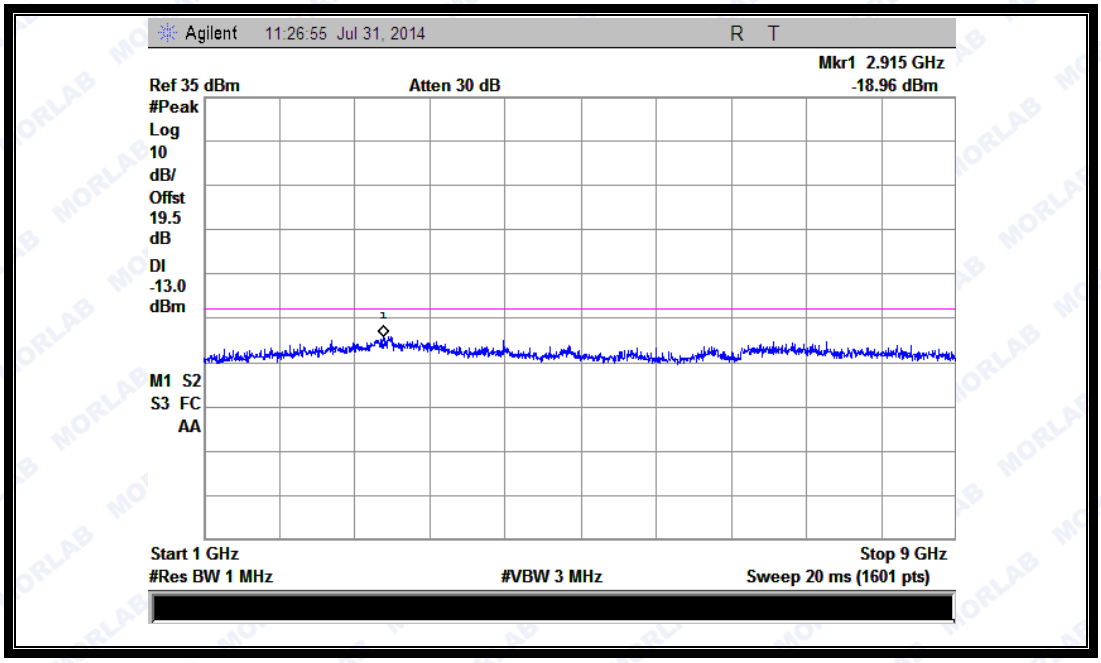

(Plot A1:GSM 850MHz Channel = 128, 30MHz to 1GHz)



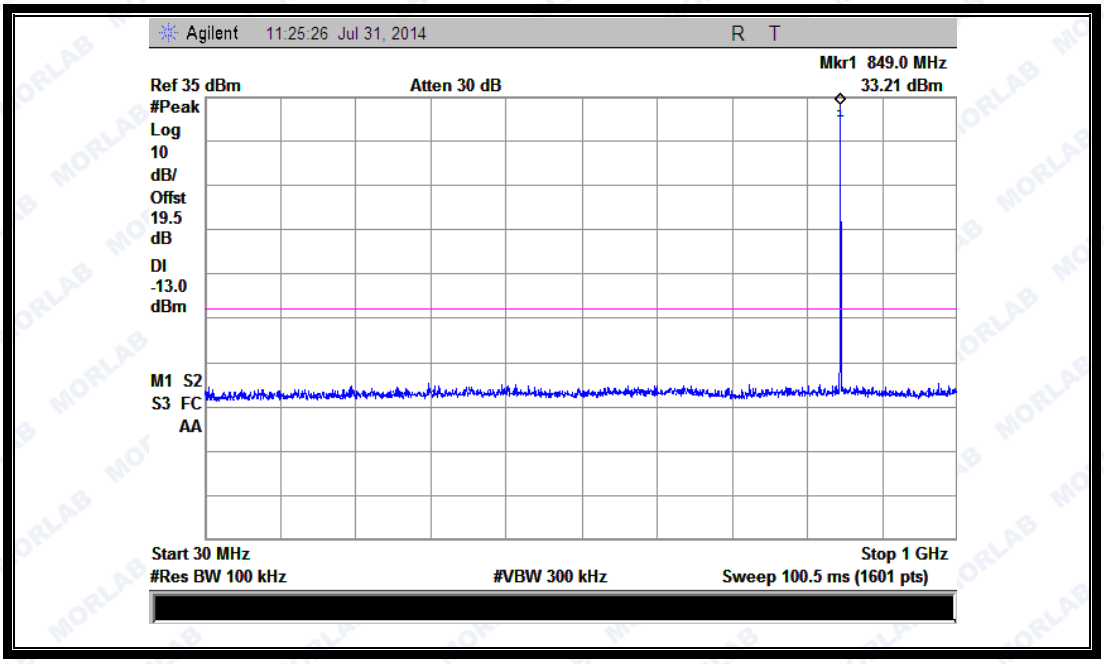

(Plot A1.1: GSM 850MHz Channel = 128, 1GHz to 9GHz)



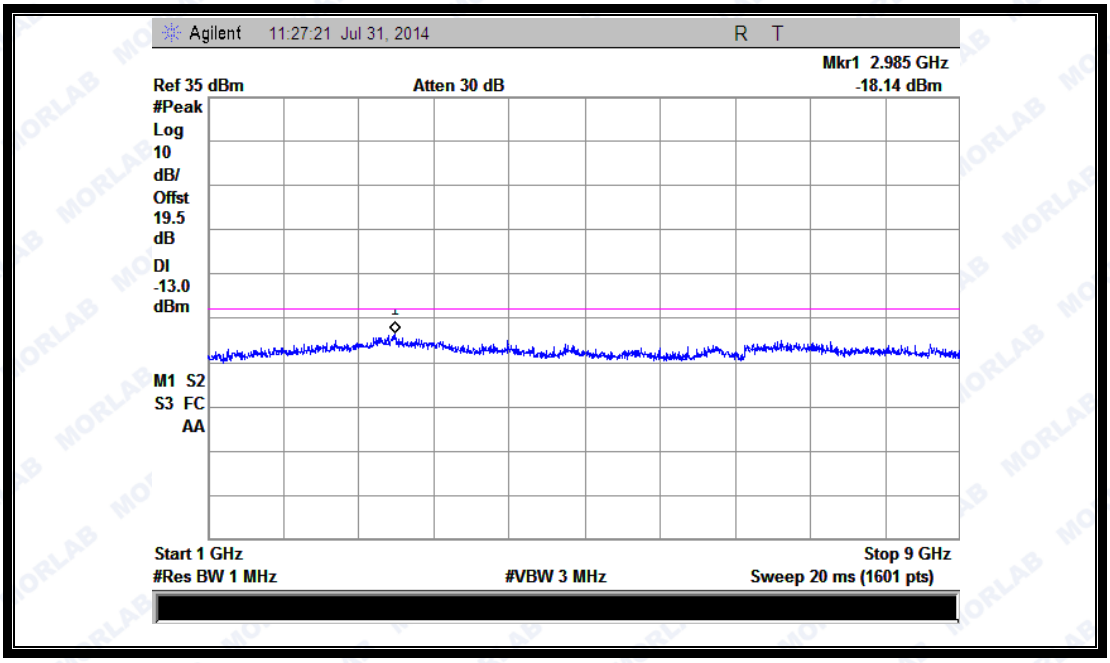

(Plot A2:GSM 850MHz Channel = 190, 30MHz to 1GHz)



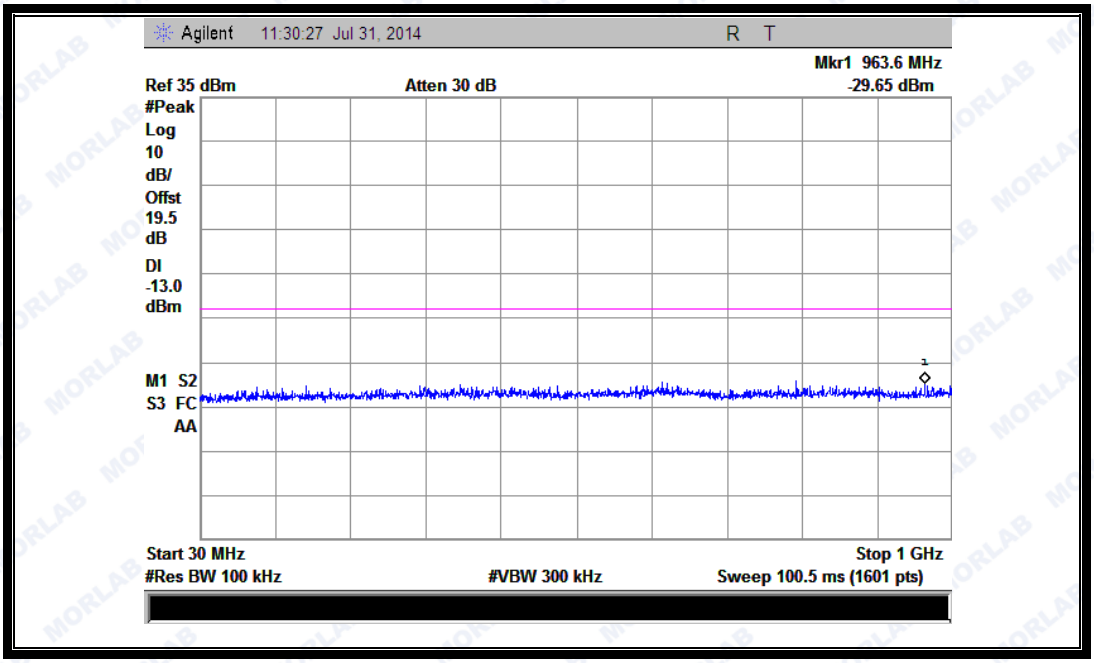

(Plot A2.1: GSM 850MHz Channel = 190, 1GHz to 9GHz)



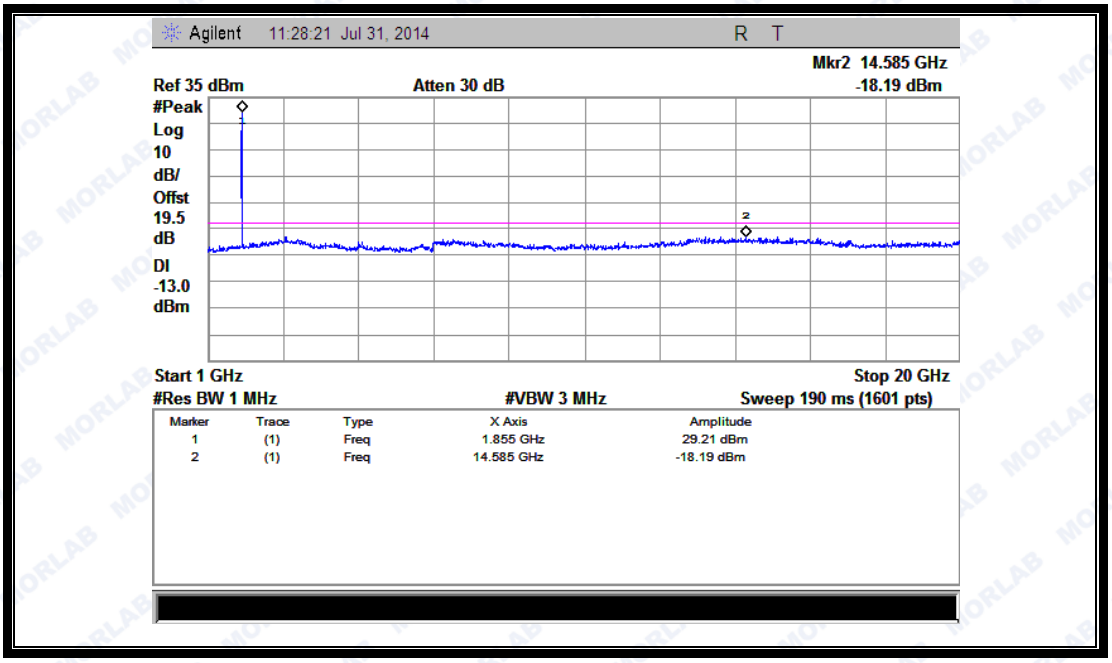

(Plot A3:GSM 850MHz Channel = 251, 30MHz to 1GHz)



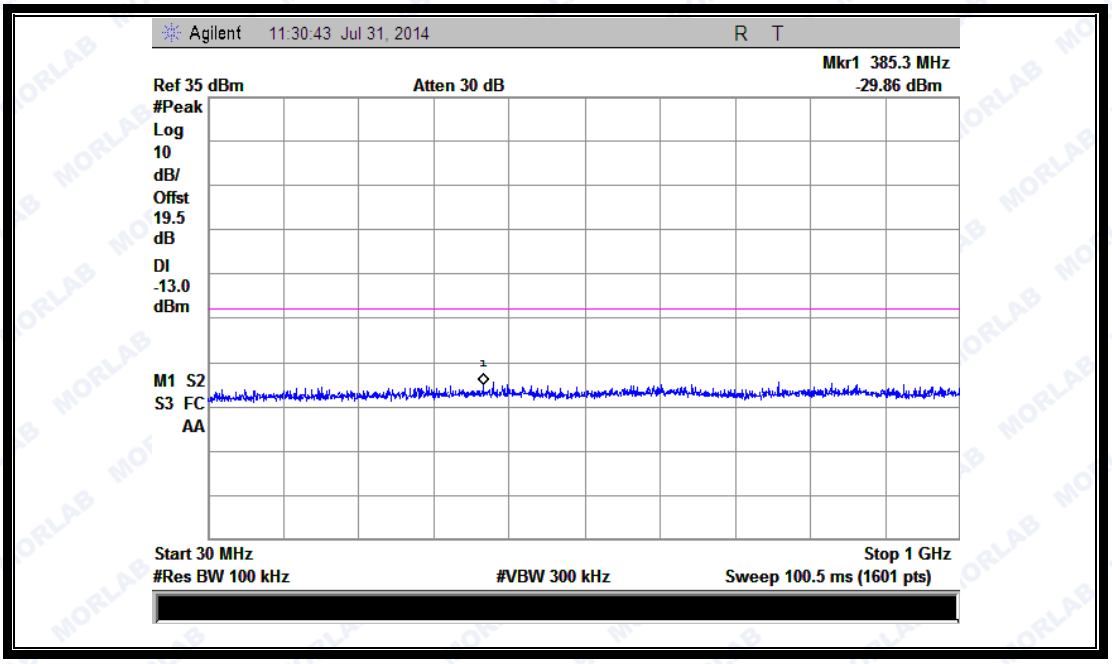

(Plot A3.1: GSM 850MHz Channel = 251, 1GHz to 9GHz)



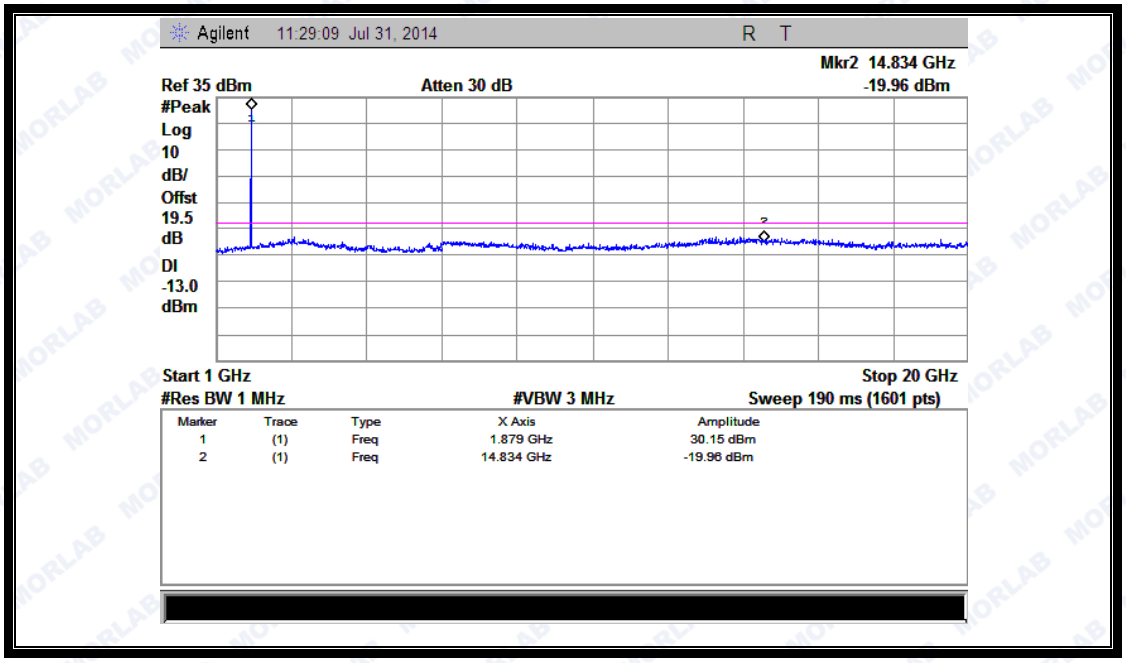

(Plot B1: GSM 1900MHz Channel = 512, 30MHz to 1GHz)



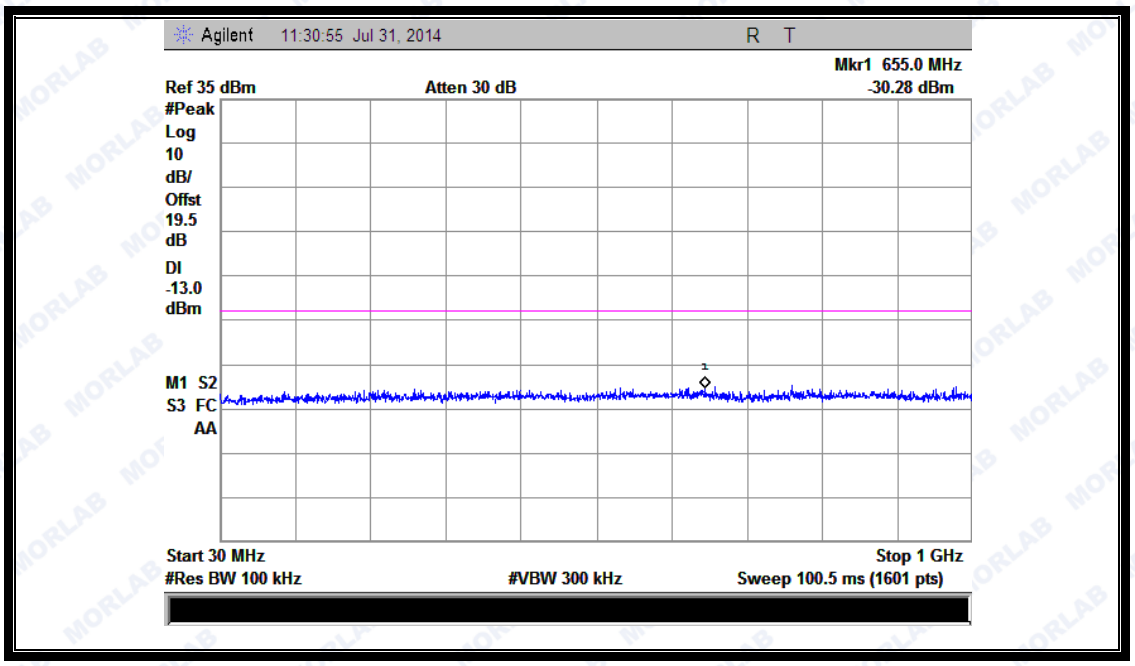

(Plot B1.1: GSM 1900MHz Channel = 512, 1GHz to 20GHz)



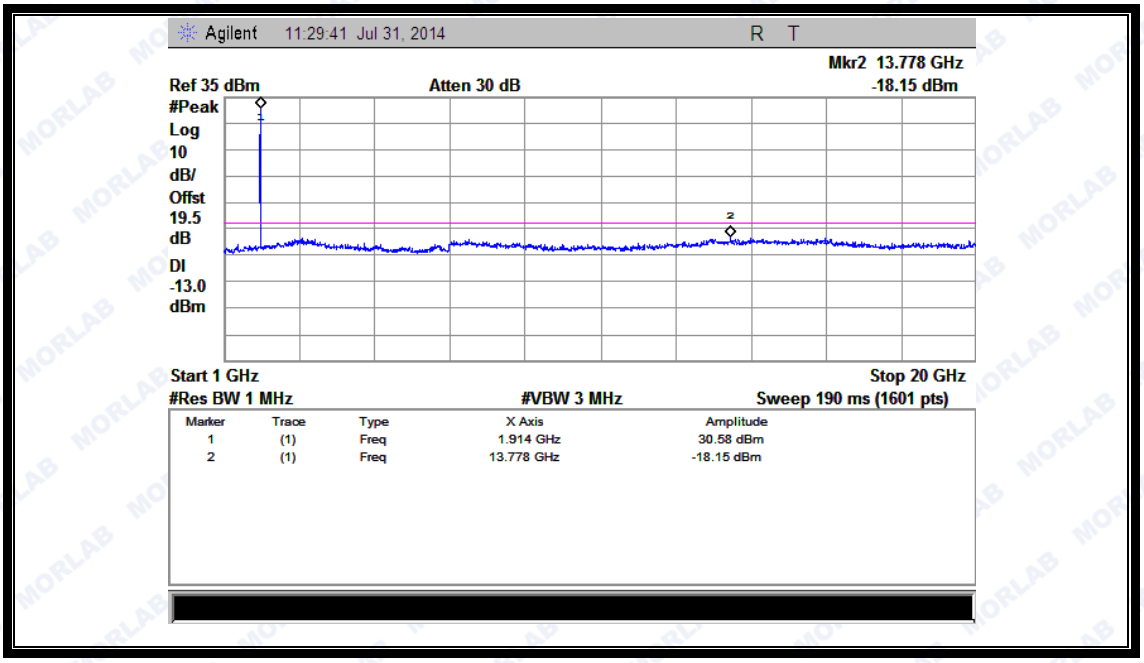

(Plot B2: GSM 1900MHz Channel = 661, 30MHz to 1GHz)



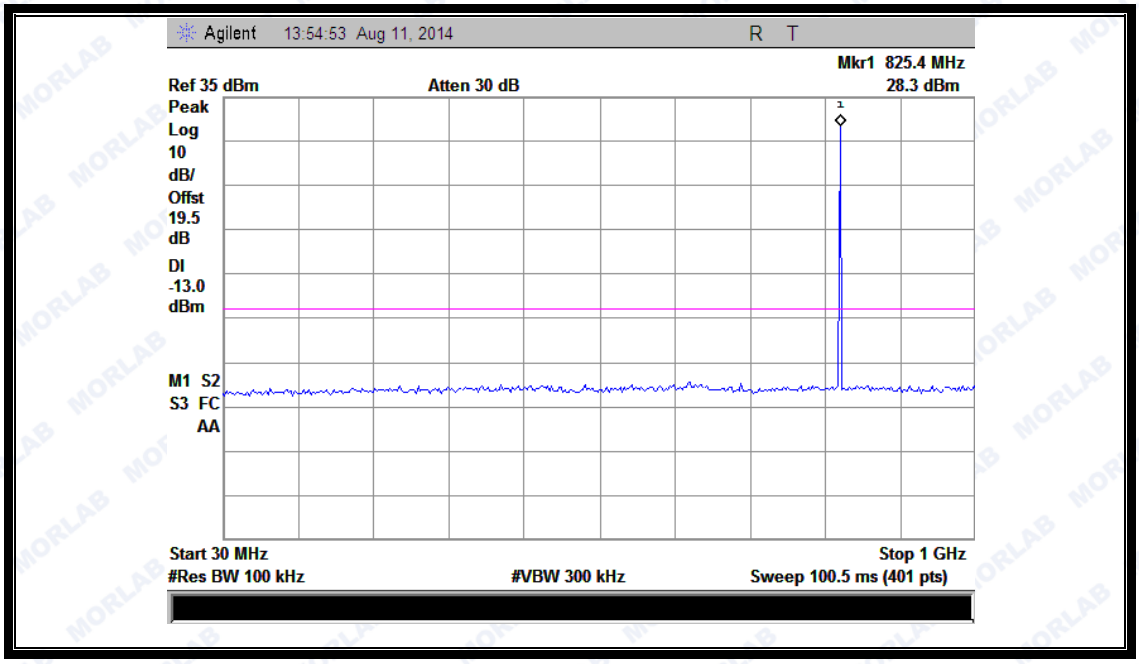

(Plot B2.1: GSM 1900MHz Channel = 661, 1GHz to 20GHz)



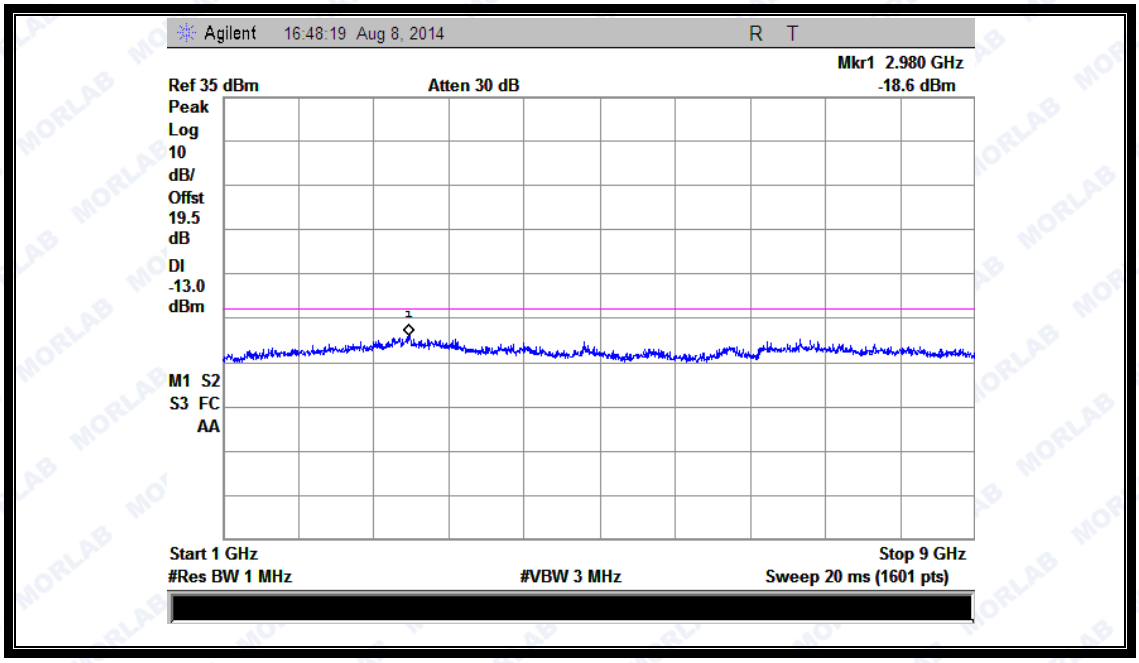

(Plot B3: GSM 1900MHz Channel = 810, 30MHz to 1GHz)



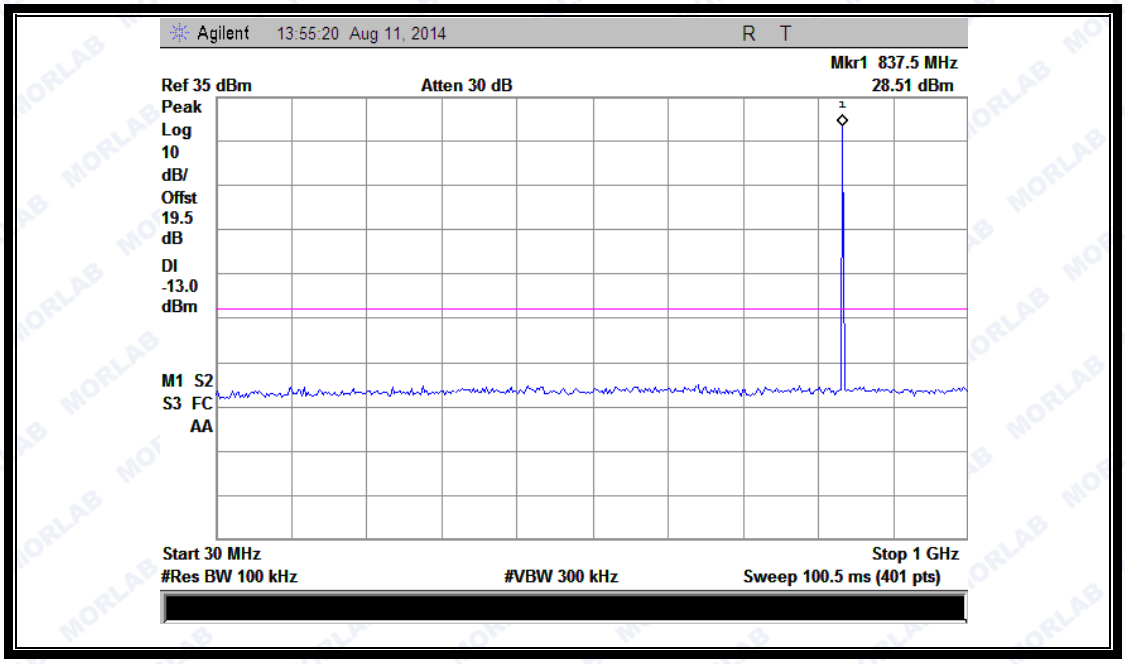

(Plot B3.1: GSM 1900MHz Channel = 810, 1GHz to 20GHz)



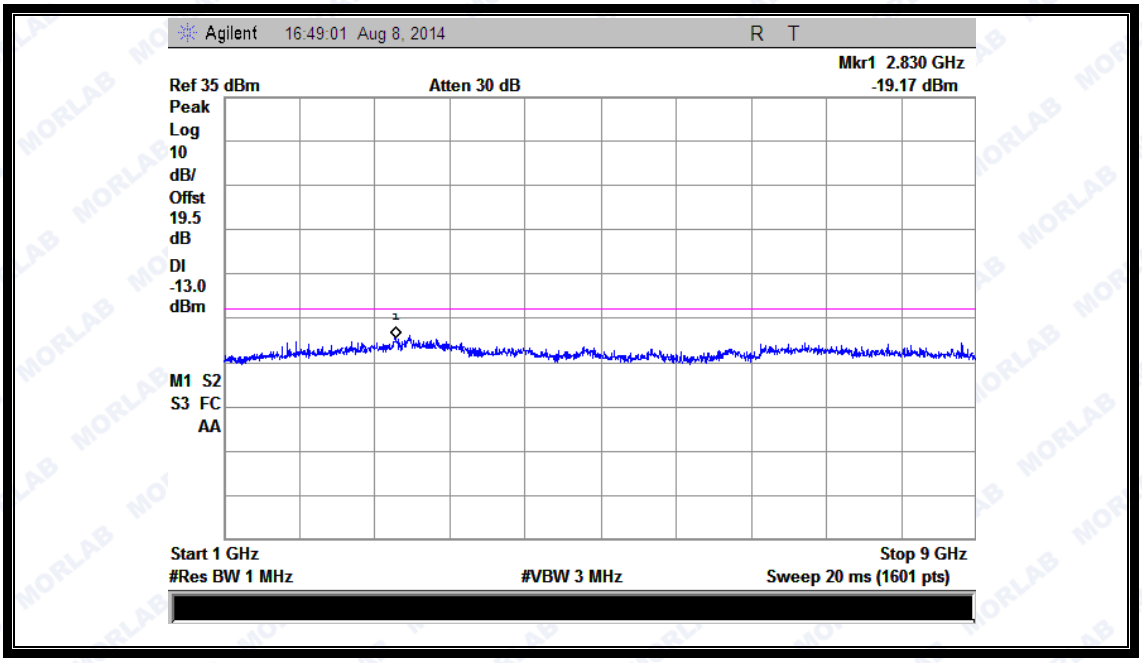

(Plot C1: EDGE 850MHz Channel = 128, 30MHz to 1GHz)



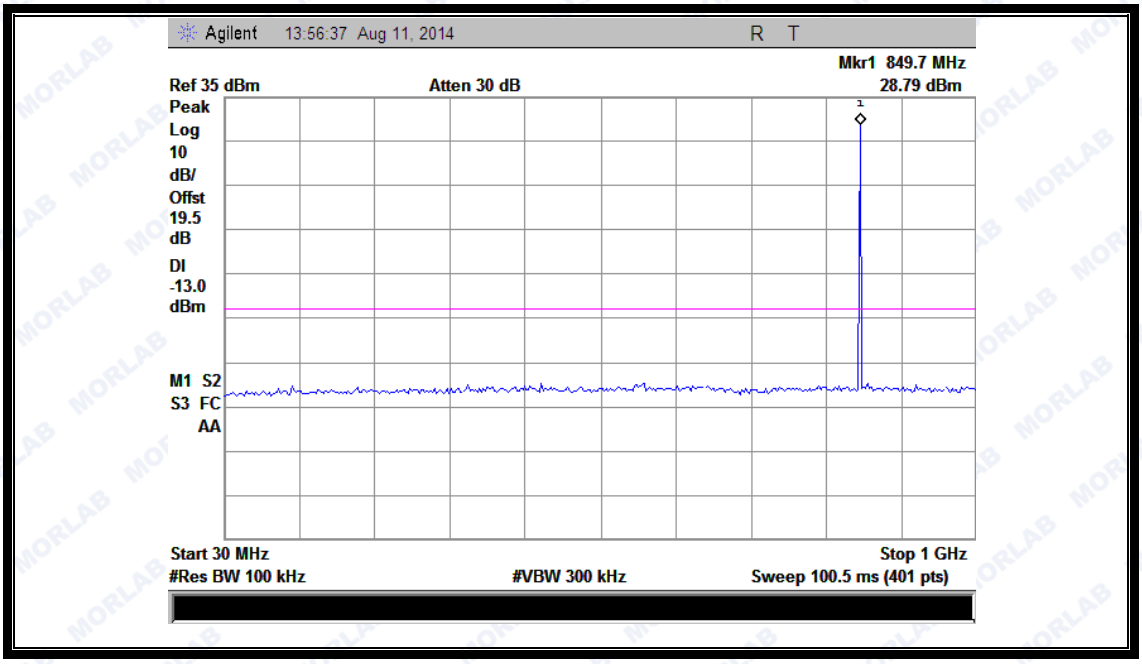

(Plot C1.1: EDGE 850MHz Channel = 128, 1GHz to 9GHz)



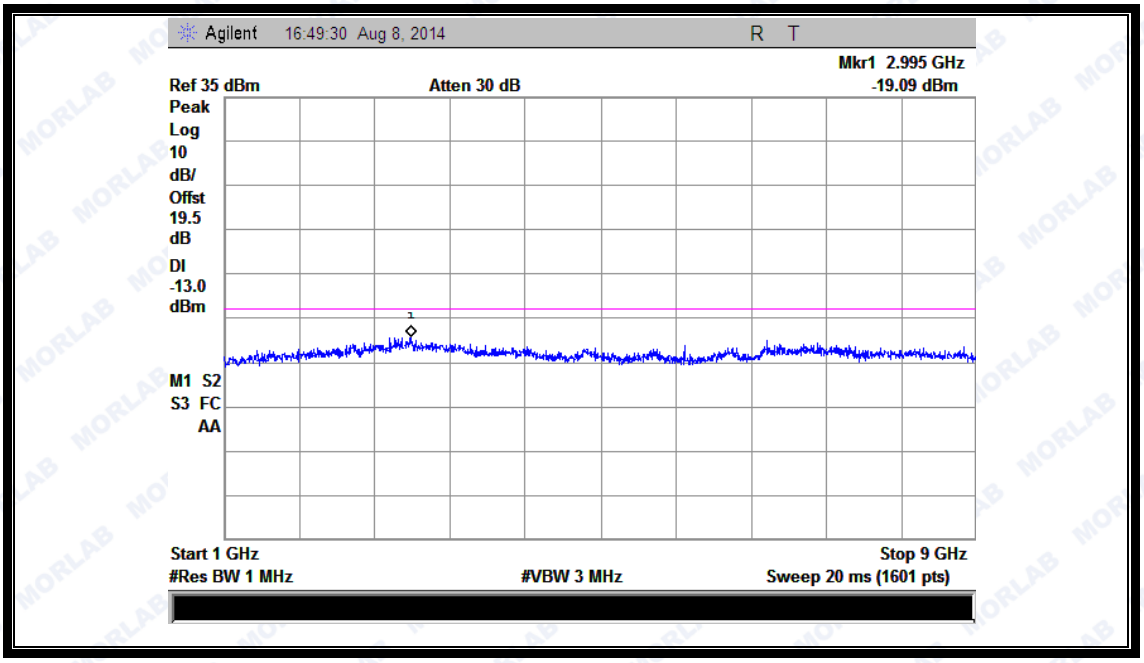

(Plot C2: EDGE 850MHz Channel = 190, 30MHz to 1GHz)



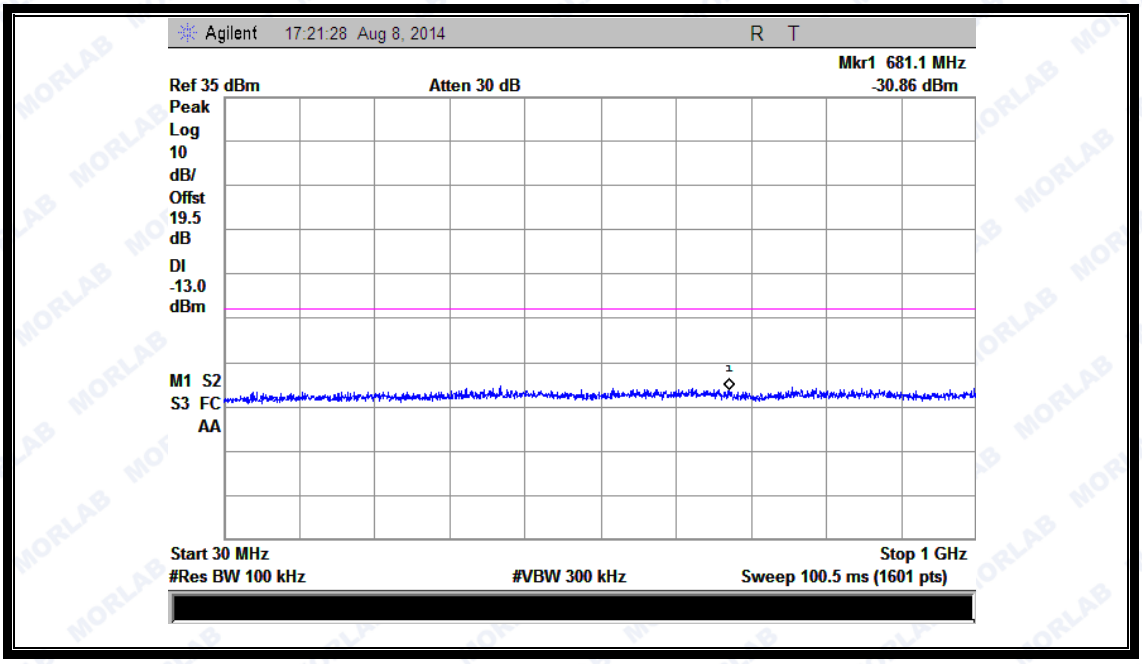

(Plot C2.1: EDGE 850MHz Channel = 190, 1GHz to 9GHz)



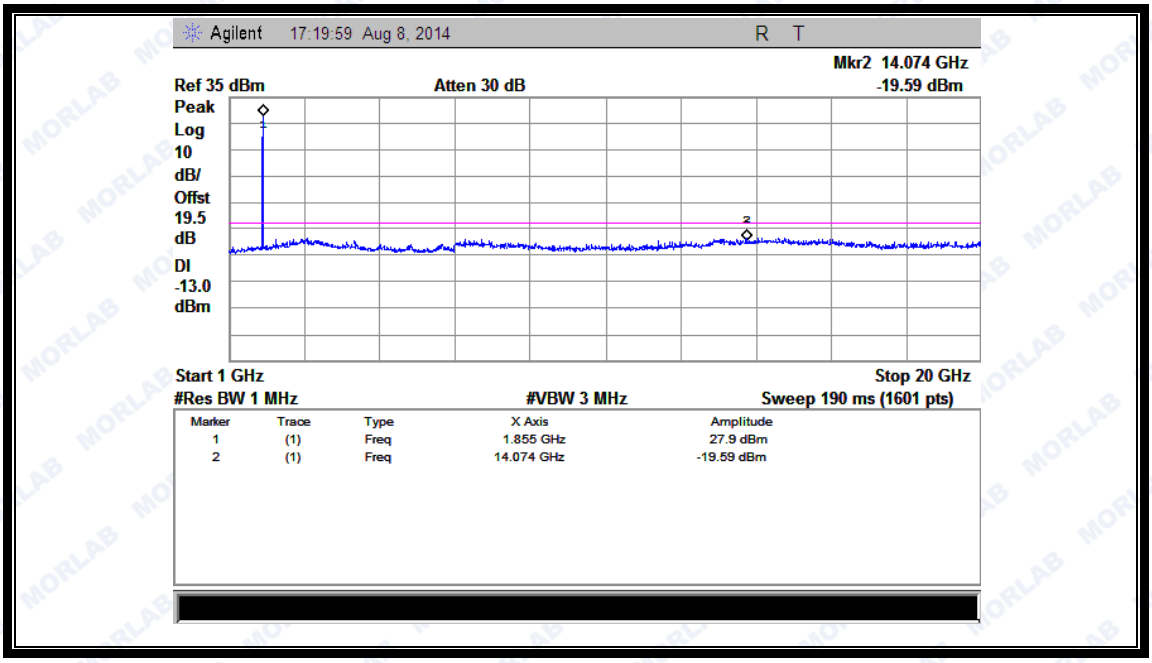

(Plot C3: EDGE 850MHz Channel = 251, 30MHz to 1GHz)



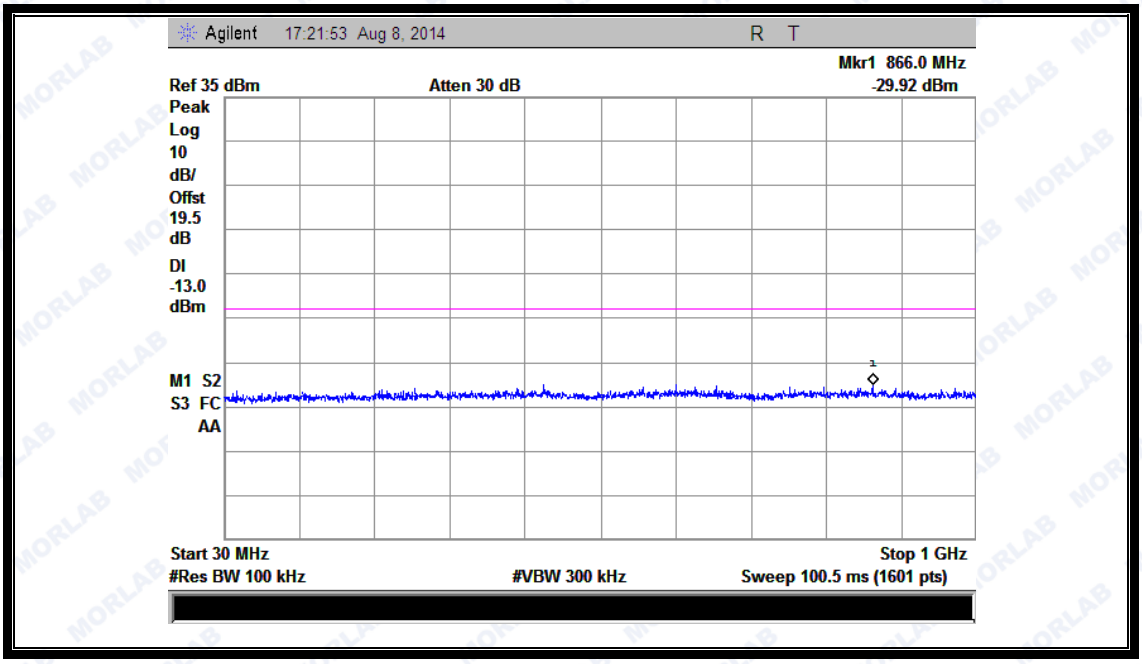

(Plot C3.1: EDGE 850MHz Channel = 251, 1GHz to 9GHz)



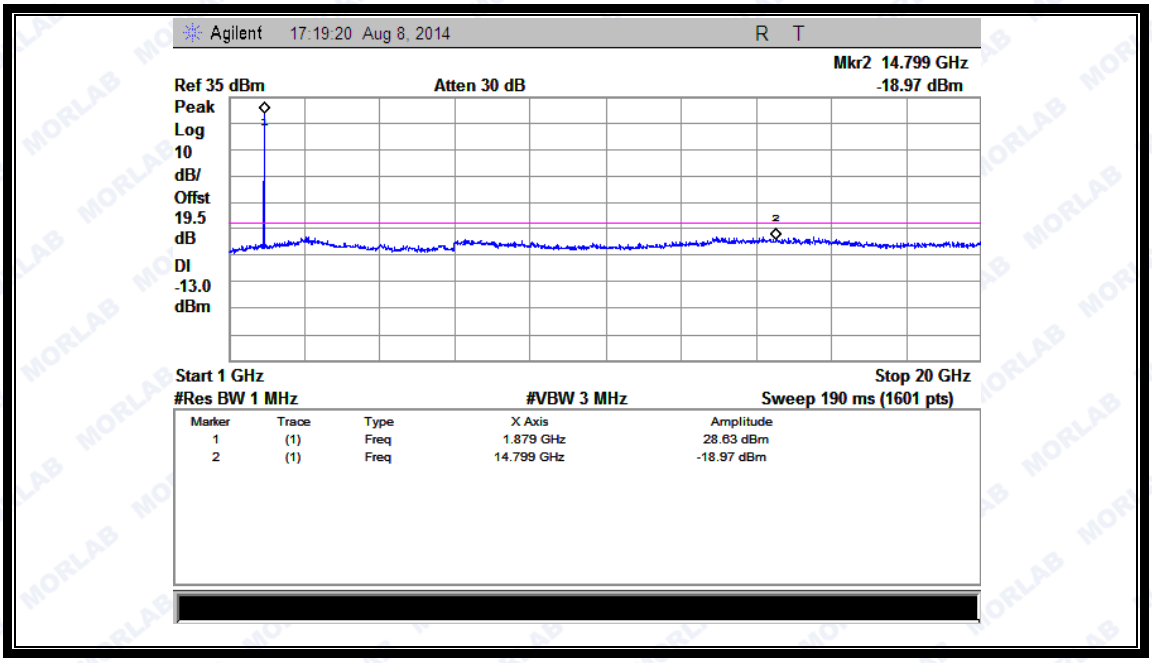

(Plot D1: EDGE 1900MHz Channel = 512, 30MHz to 1GHz)



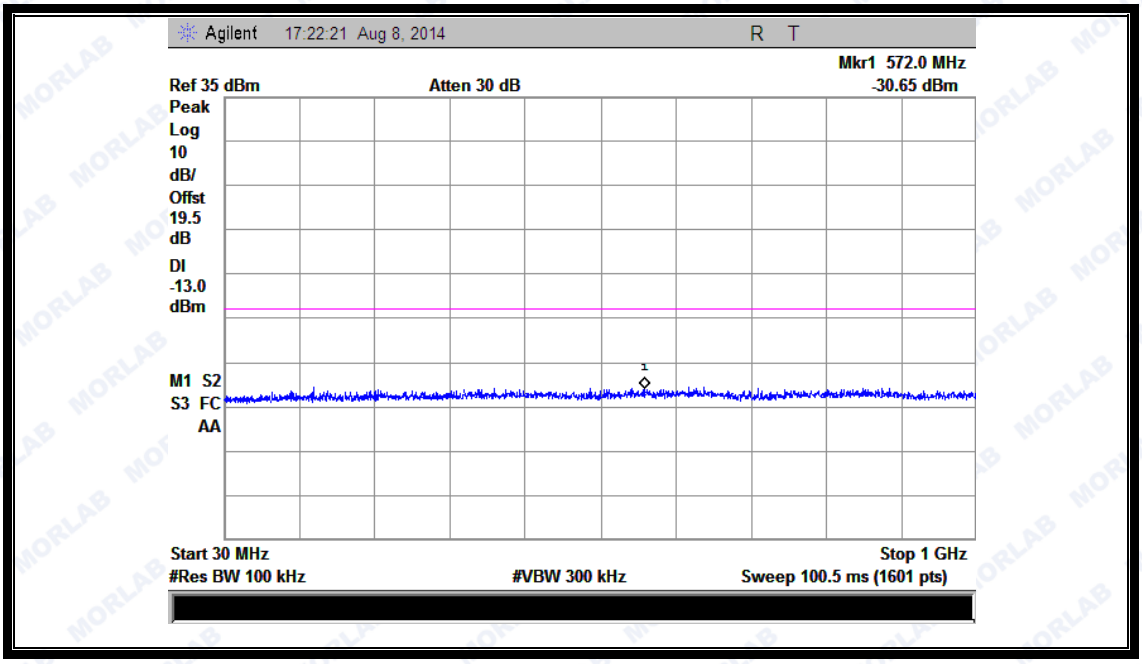

(Plot D1.1: EDGE 1900MHz Channel = 512, 1GHz to 20GHz)



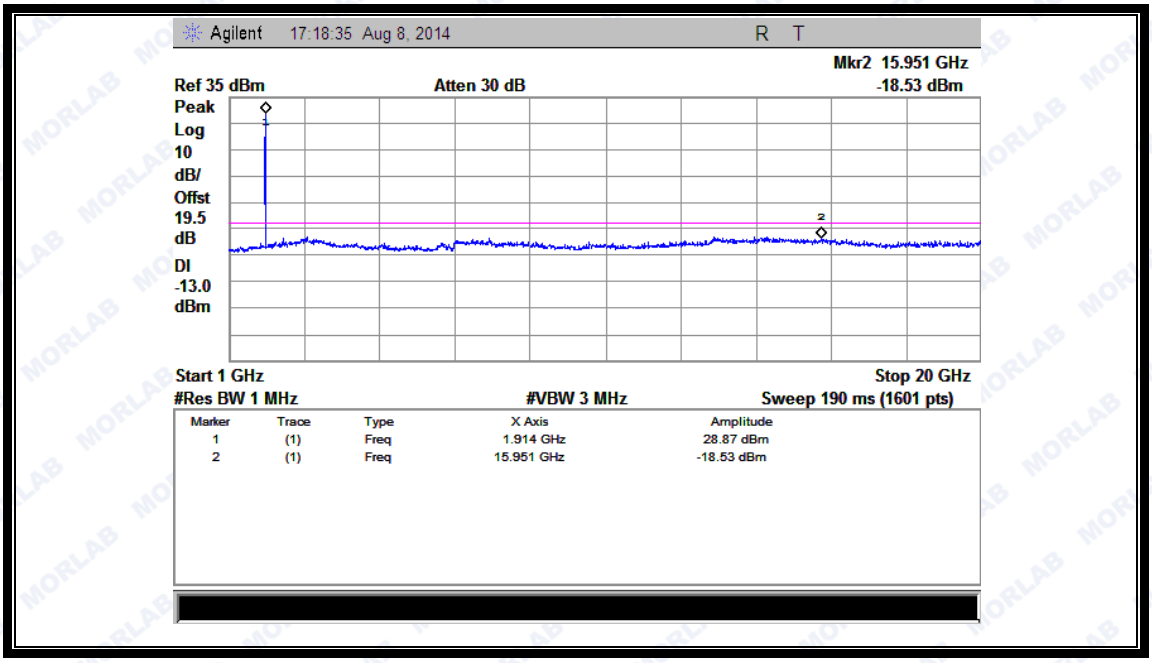

(Plot D2: EDGE 1900MHz Channel = 661, 30MHz to 1GHz)



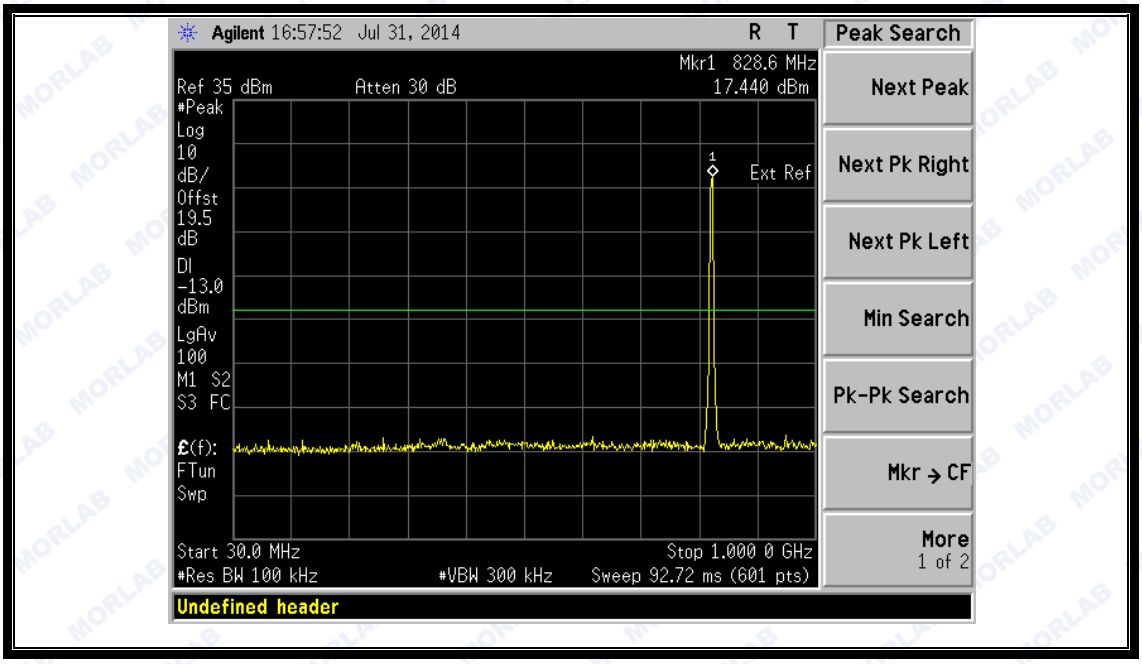

(Plot D2.1: EDGE 1900MHz Channel = 661,1GHz to 20GHz)



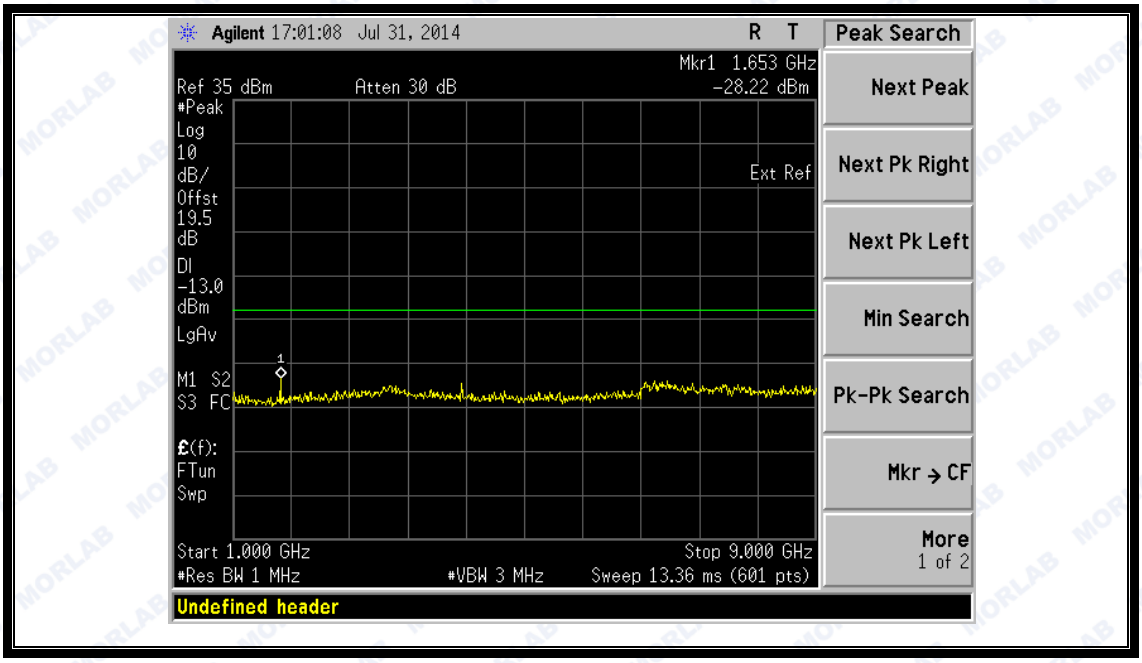

(Plot D3: EDGE 1900MHz Channel = 810, 30MHz to 1GHz)



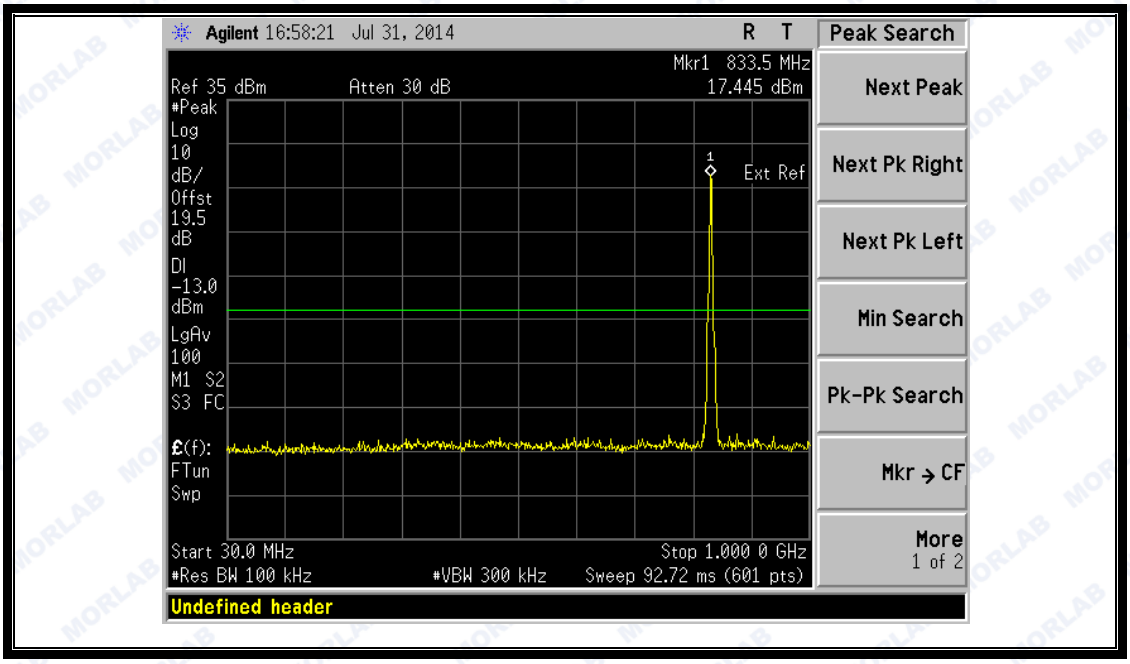

(Plot D3.1: EDGE 1900MHz Channel = 810, 1GHz to 20GHz)



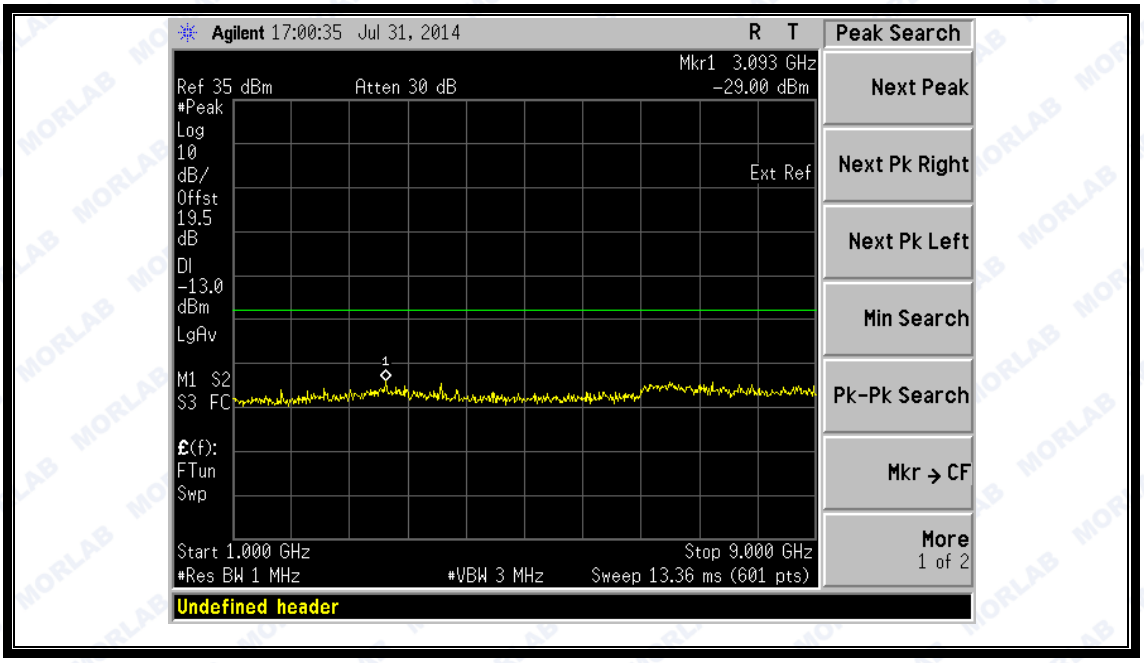

(Plot E1: WCDMA850MHz Channel = 4132, 30MHz to 1GHz)



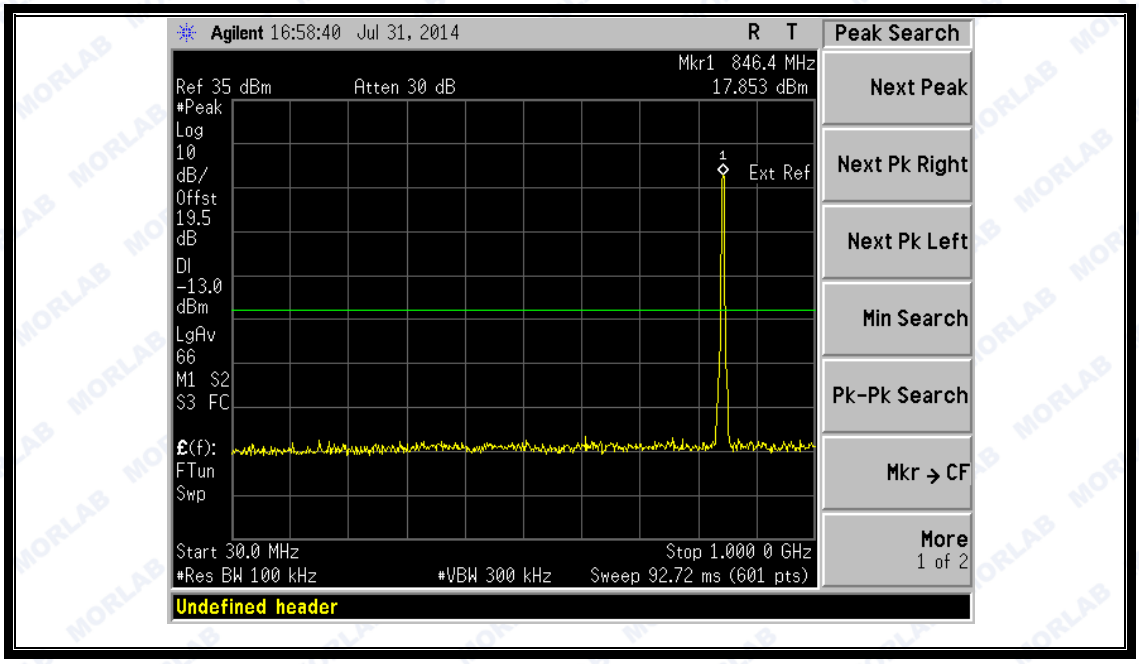

(Plot E1.1: WCDMA850MHz Channel = 4132, 1GHz to 9GHz)



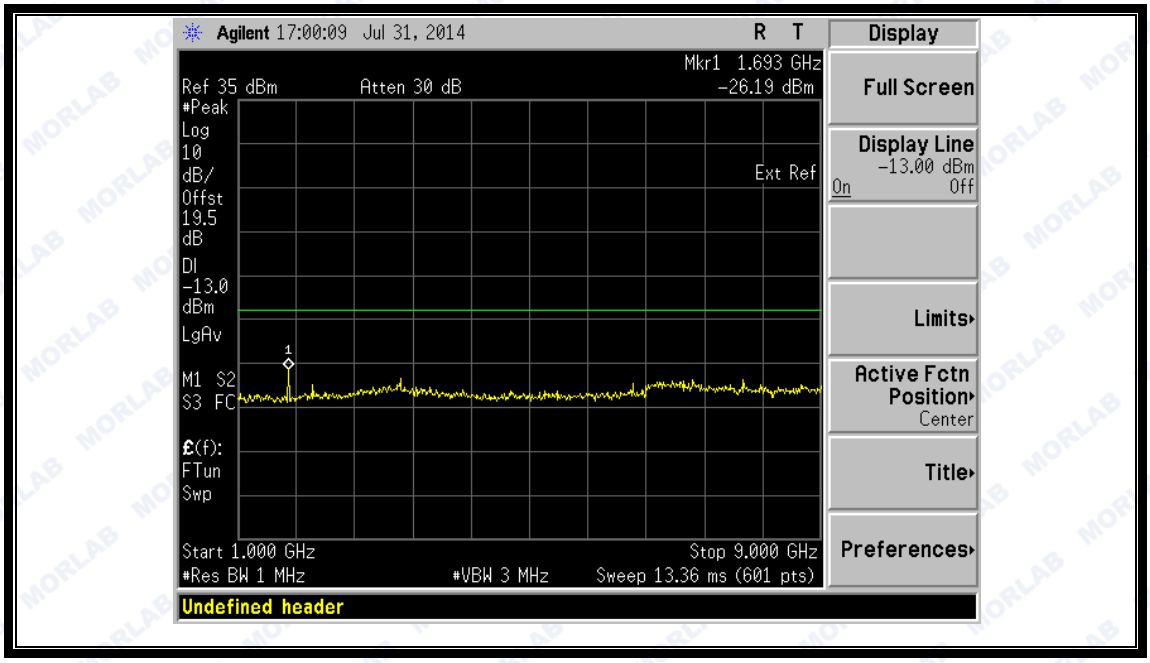

(Plot E2: WCDMA850MHz Channel = 4175, 30MHz to 1GHz)



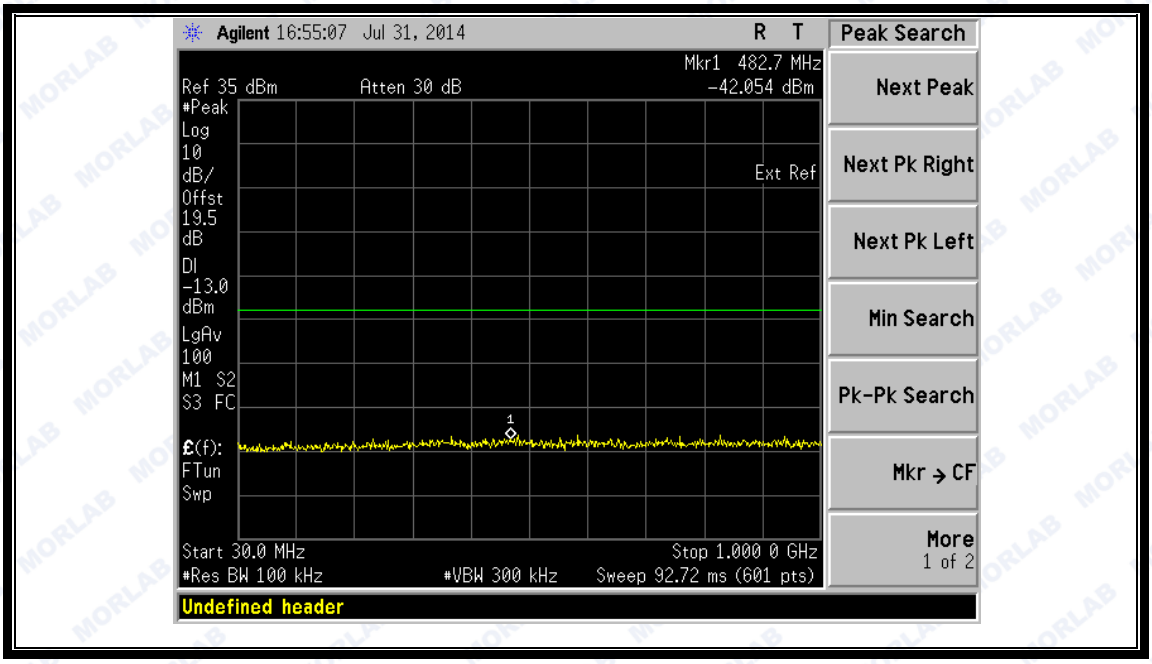

(Plot E2.1: WCDMA850MHz Channel = 4175, 1GHz to 9GHz)



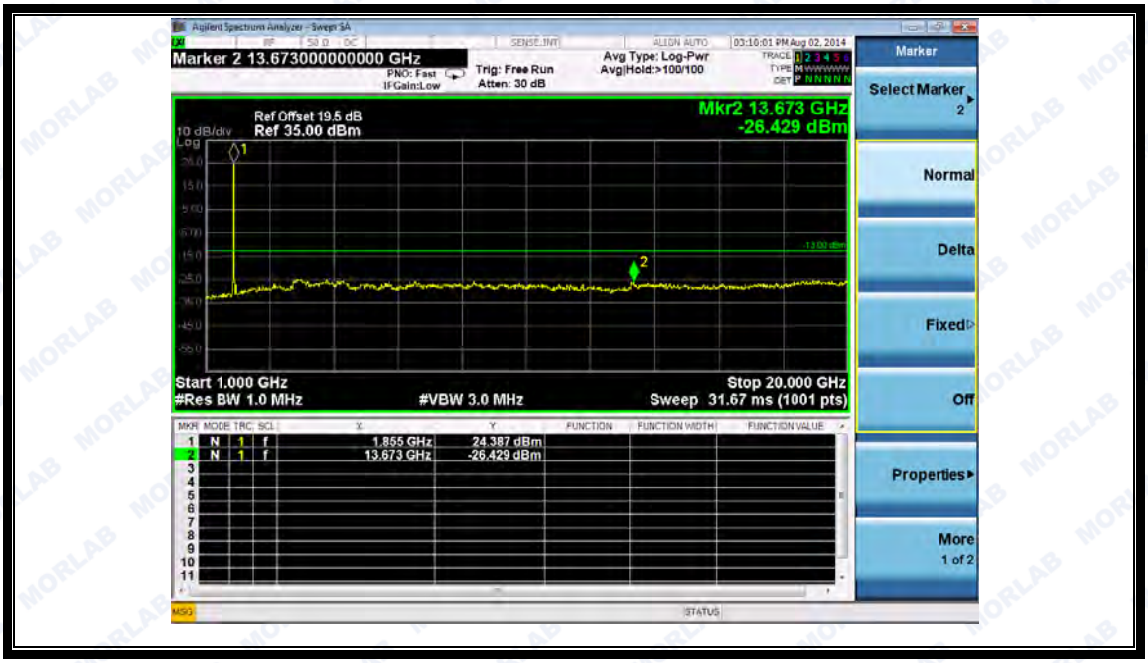

(Plot E3: WCDMA850MHz Channel = 4233, 30MHz to 1GHz)



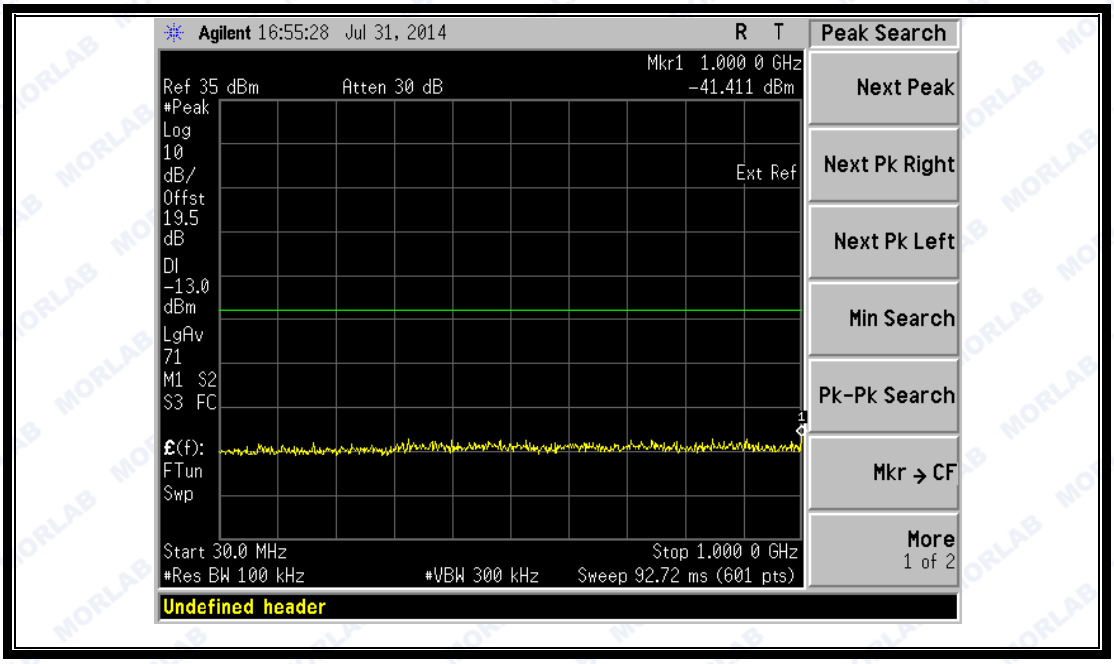

(Plot E3.1: WCDMA850MHz Channel = 4233, 1GHz to 9GHz)



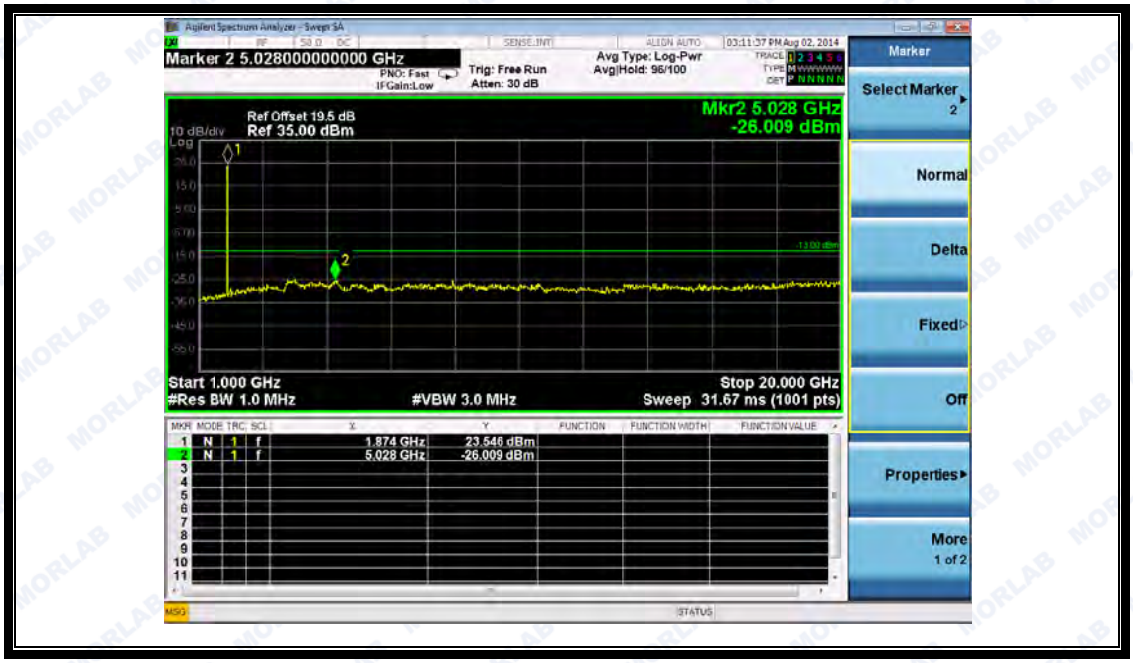

(Plot F1:WCDMA1900MHz Channel = 9262, 30MHz to 1GHz)



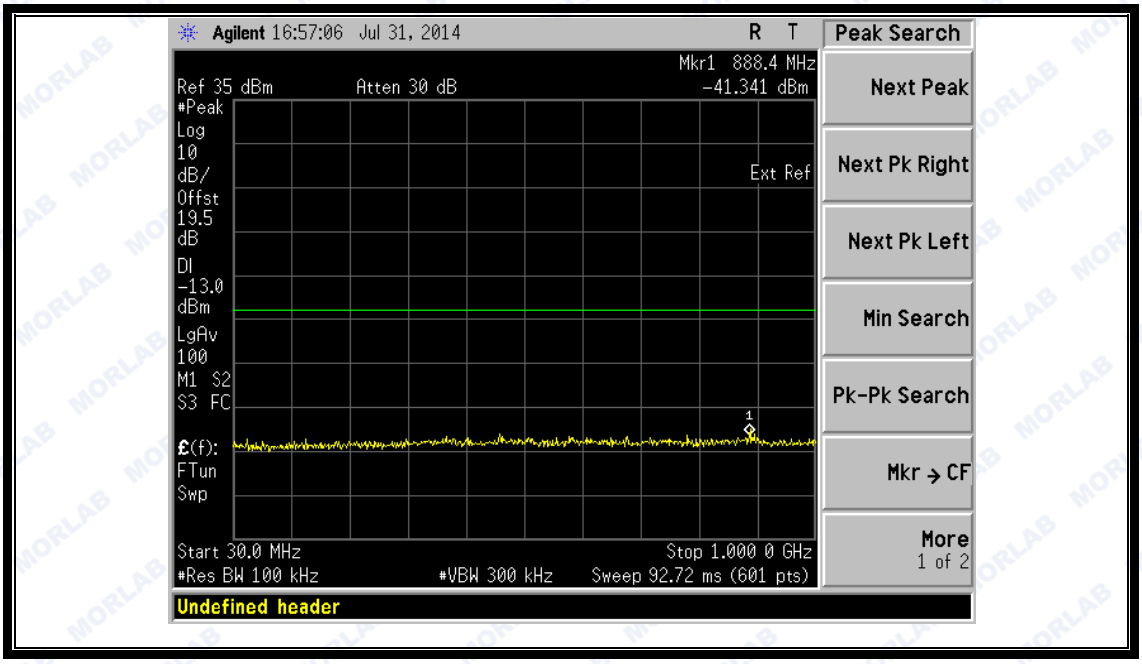

(Plot F1.1: WCDMA1900MHz Channel = 9262, 1GHz to 20GHz)



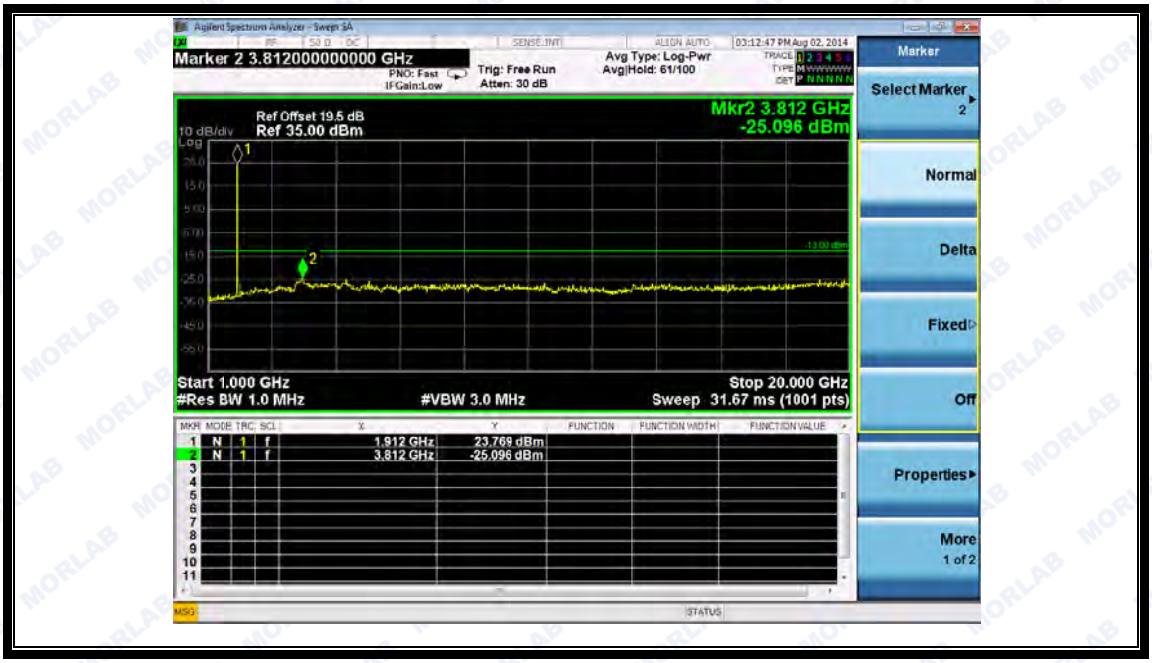

(Plot F2:WCDMA1900MHz Channel = 9400, 30MHz to 1GHz)




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




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




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

## 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.

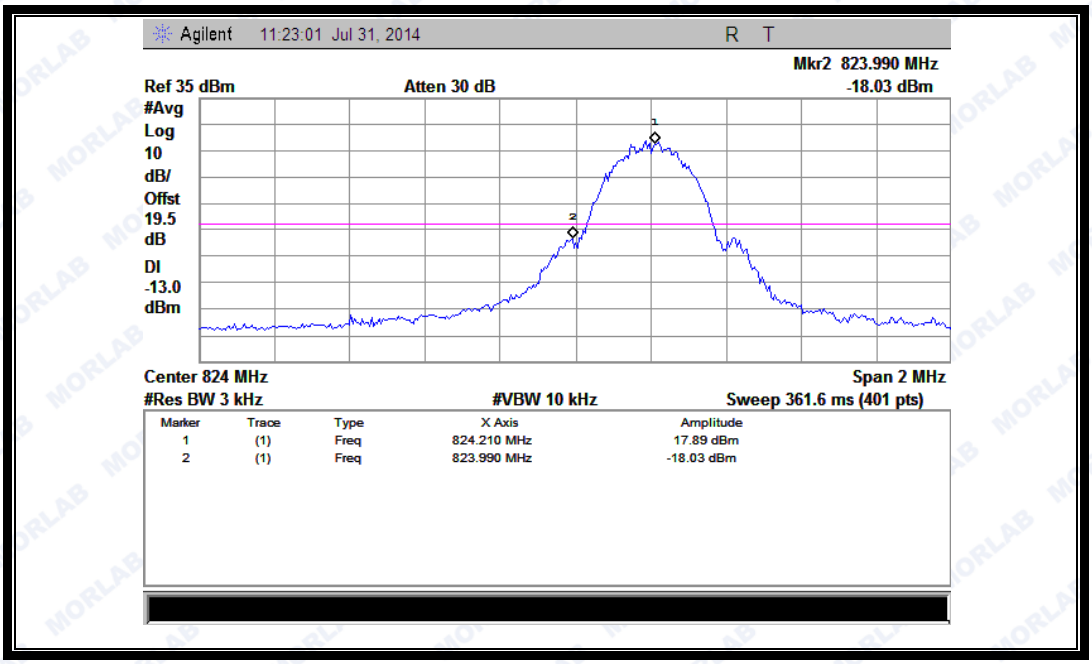
### 2.6.3 Test Result

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

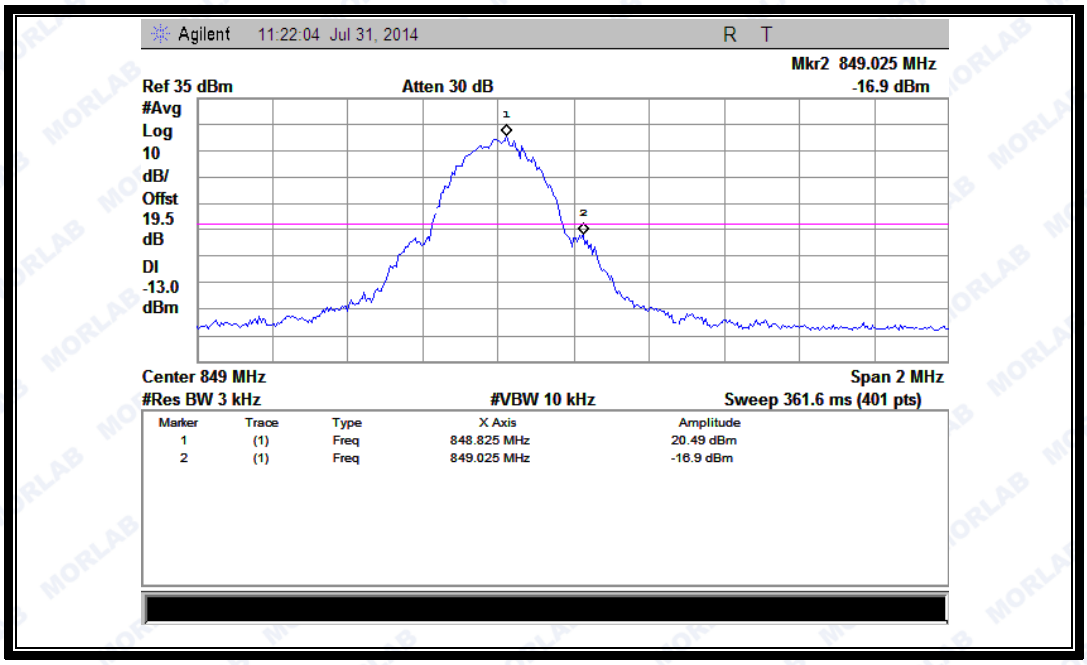
Test Verdict:

| Band | Channel | Frequency (MHz) | Measured Max. Band Edge Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| GSM 850MHz | 128 | 824.2 | -18.03 | Plat A | -13 | PASS |
| | 251 | 848.8 | -16.9 | Plot B | | PASS |
| GSM 1900MHz | 512 | 1850.2 | -20.7 | Plat C | -13 | PASS |
| | 810 | 1909.8 | -18.59 | Plot D | | PASS |
| EDGE 850MHz | 128 | 824.2 | -20.5 | Plat E | -13 | PASS |
| | 251 | 848.8 | -18.99 | Plot F | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | -20.36 | Plat G | -13 | PASS |
| | 810 | 1909.8 | -18.28 | Plot H | | PASS |
| WCDMA 850MHz | 4132 | 826.4 | -21.891 | Plat I | -13 | PASS |
| | 4233 | 846.6 | -21.103 | Plot J | | PASS |
| WCDMA 1900MHz | 9262 | 1852.4 | -15.253 | Plat K | -13 | PASS |
| | 9538 | 1907.6 | -18.515 | Plot L | | PASS |

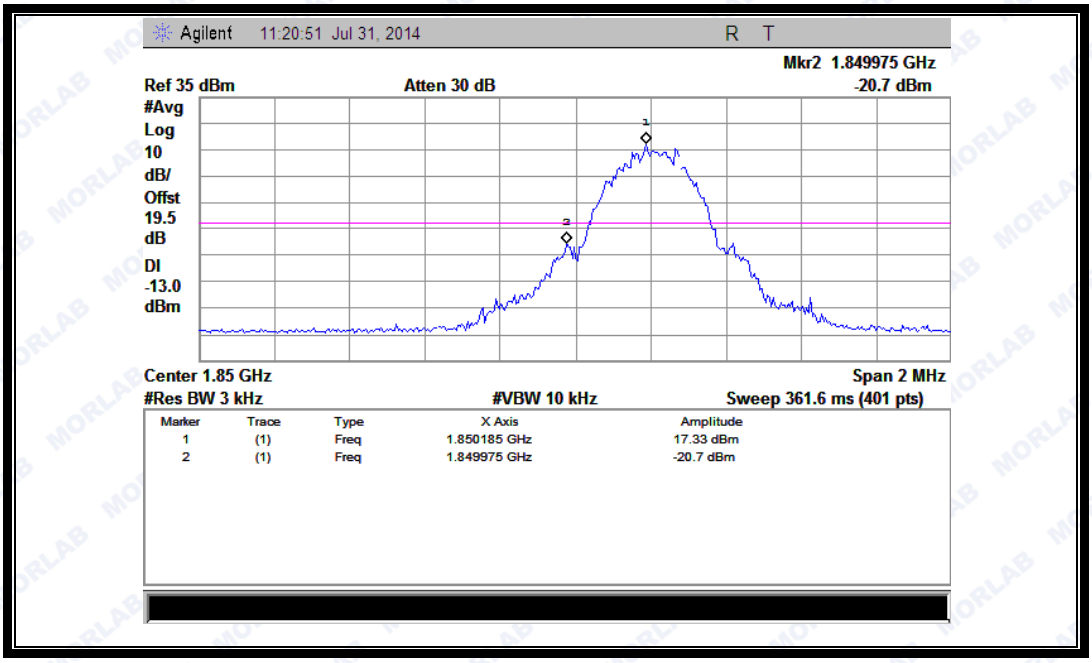
**Test Plots:**



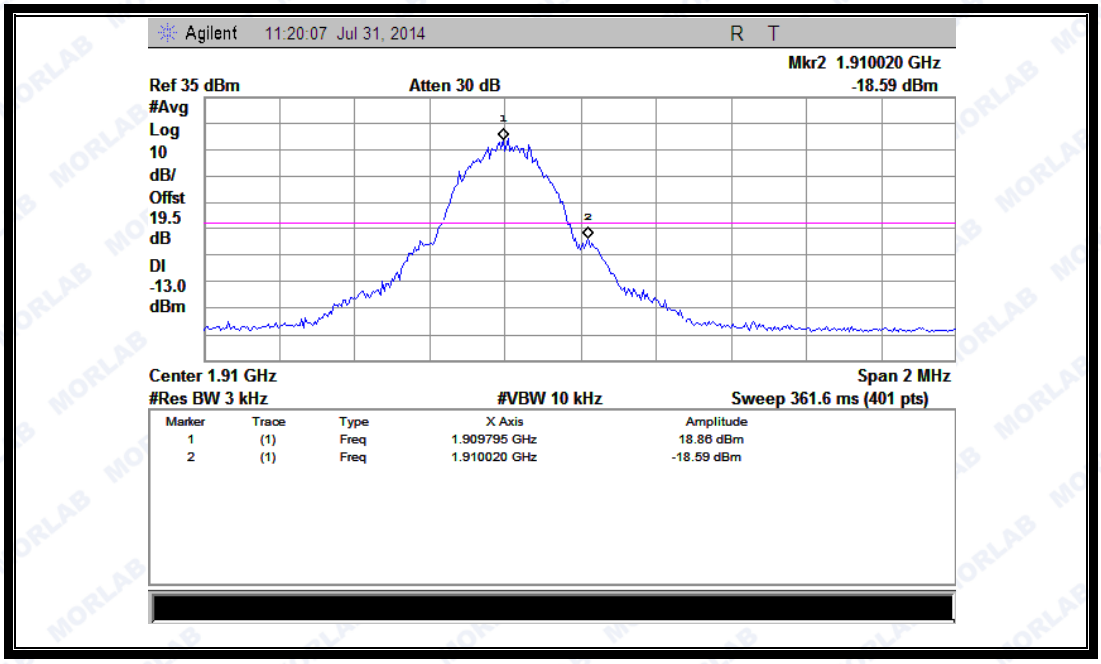

(Plot A: GSM 850 Channel = 128)



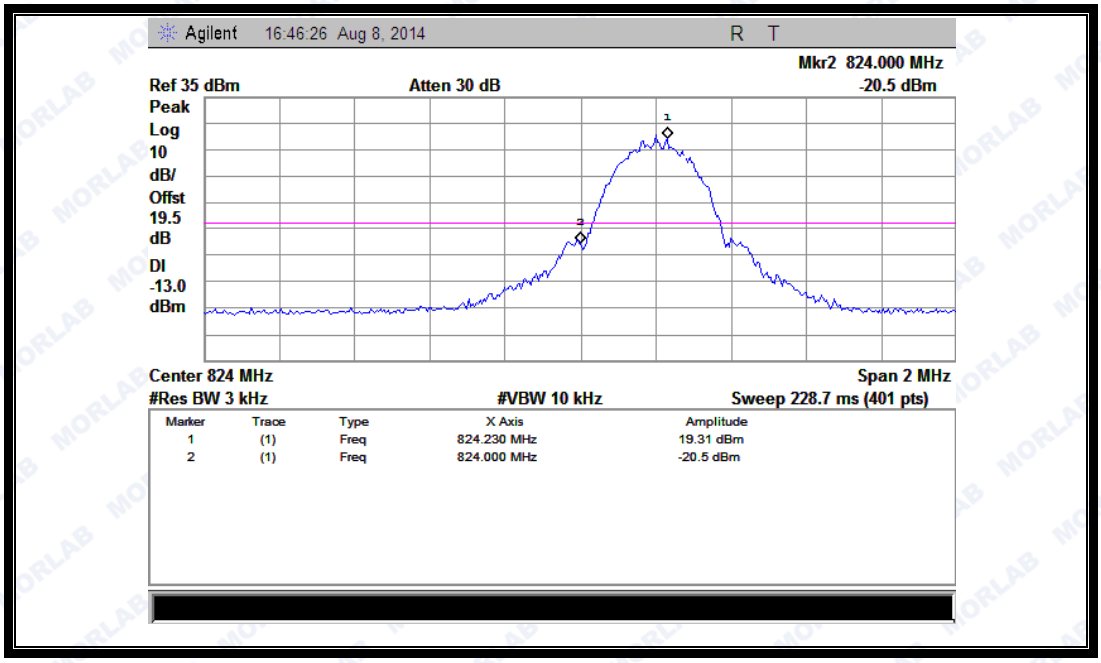

(Plot B: GSM 850 Channel = 251)



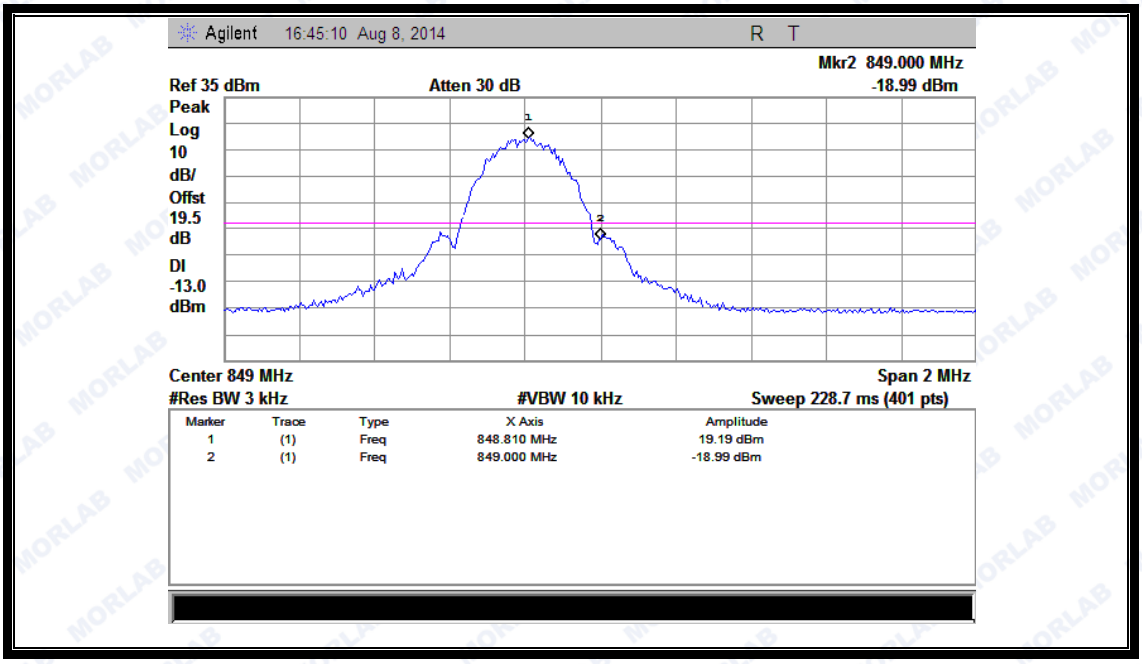

(Plot C: GSM 1900 Channel = 512)



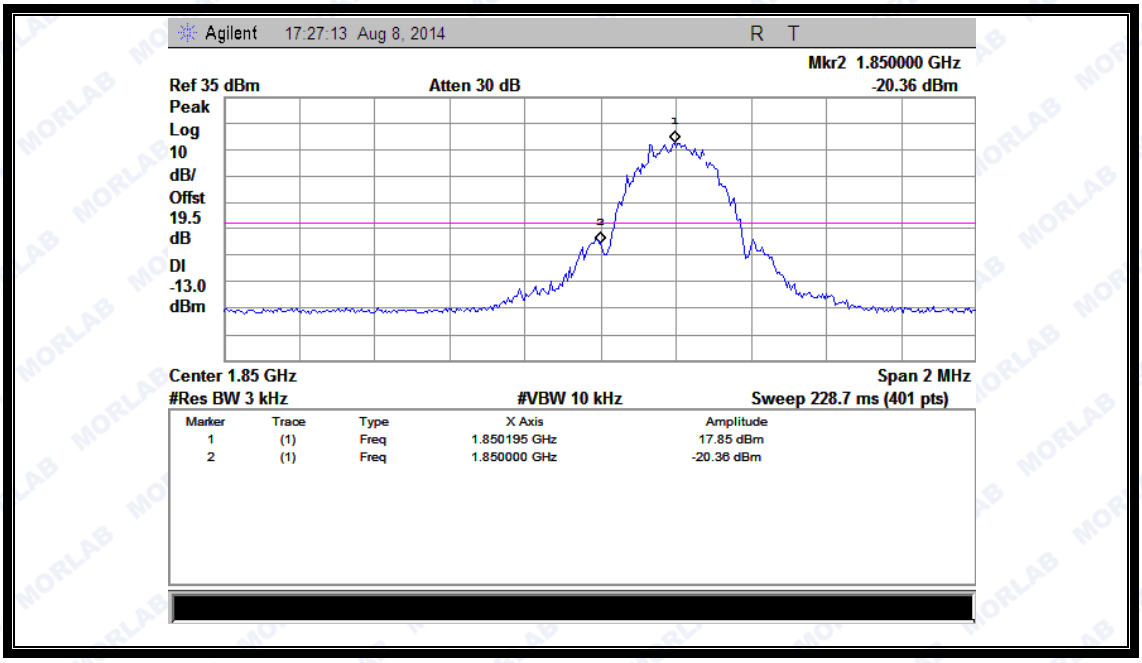

(Plot D: GSM 1900 Channel = 810)



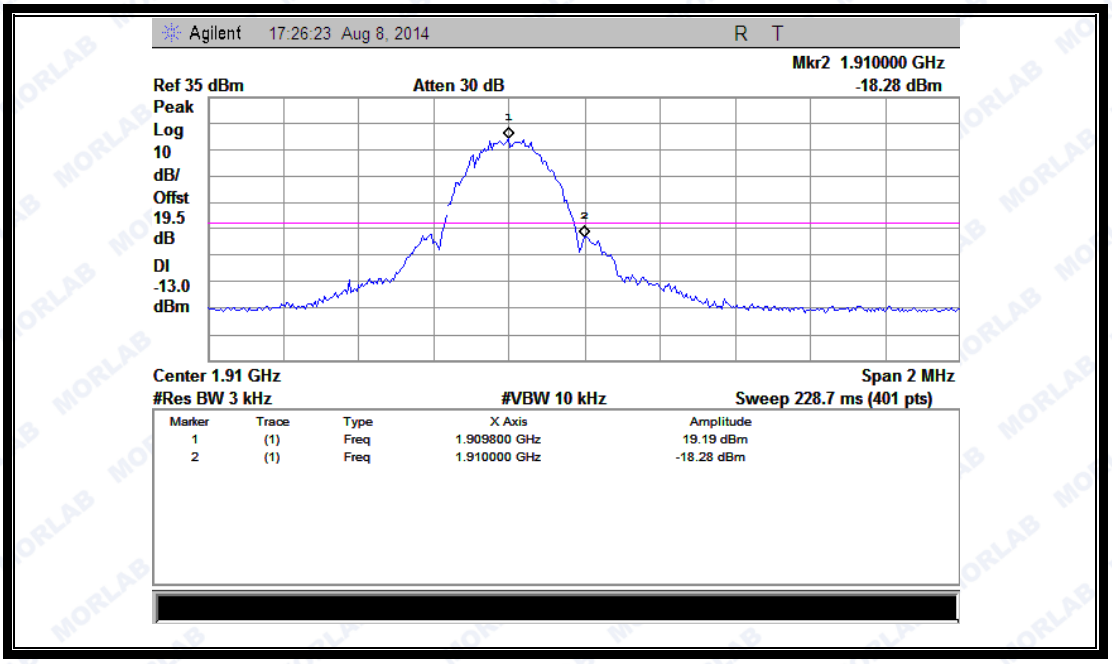

(Plot E: EGPRS 850 Channel = 128)



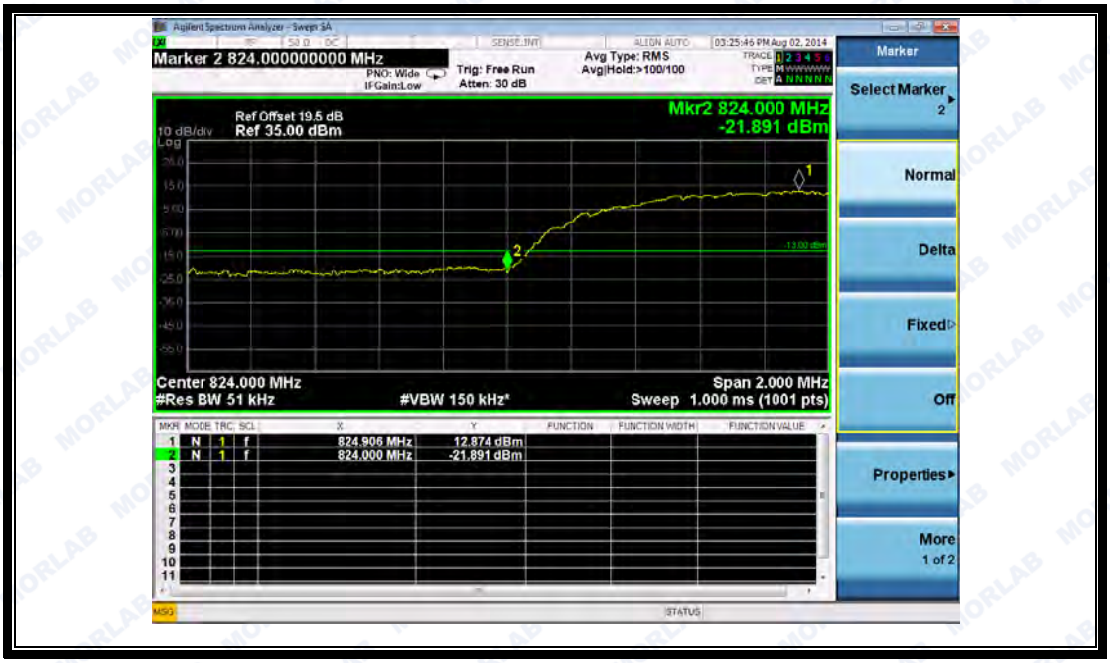

(Plot F: EGPRS 850 Channel = 251)



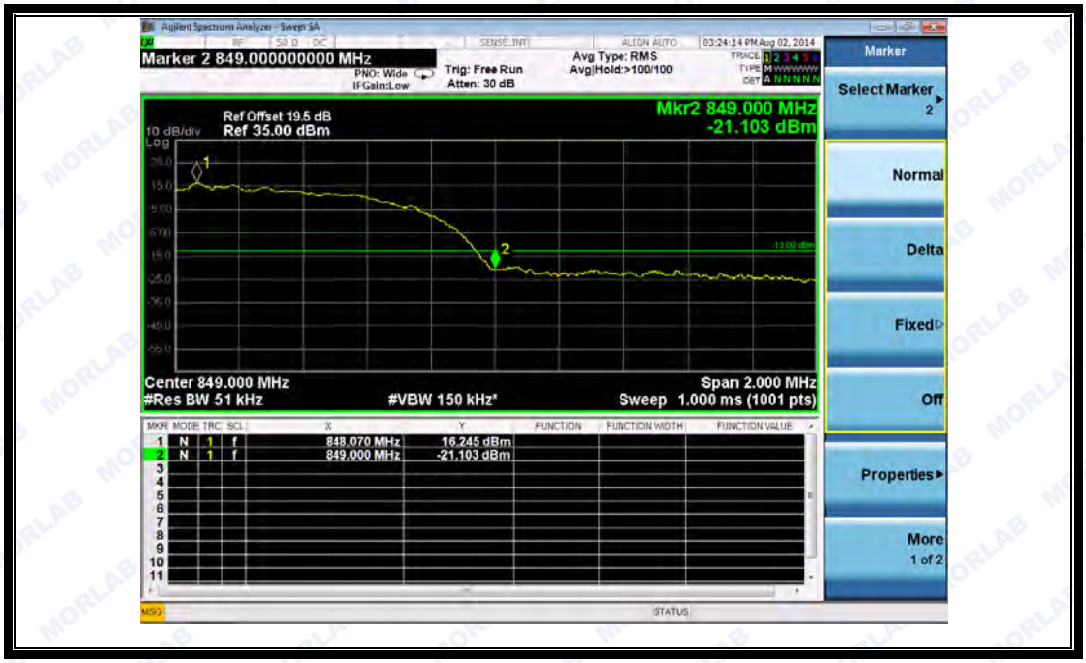

(Plot G: EGPRS 1900 Channel = 512)




(Plot H: EGPRS 1900 Channel = 810)

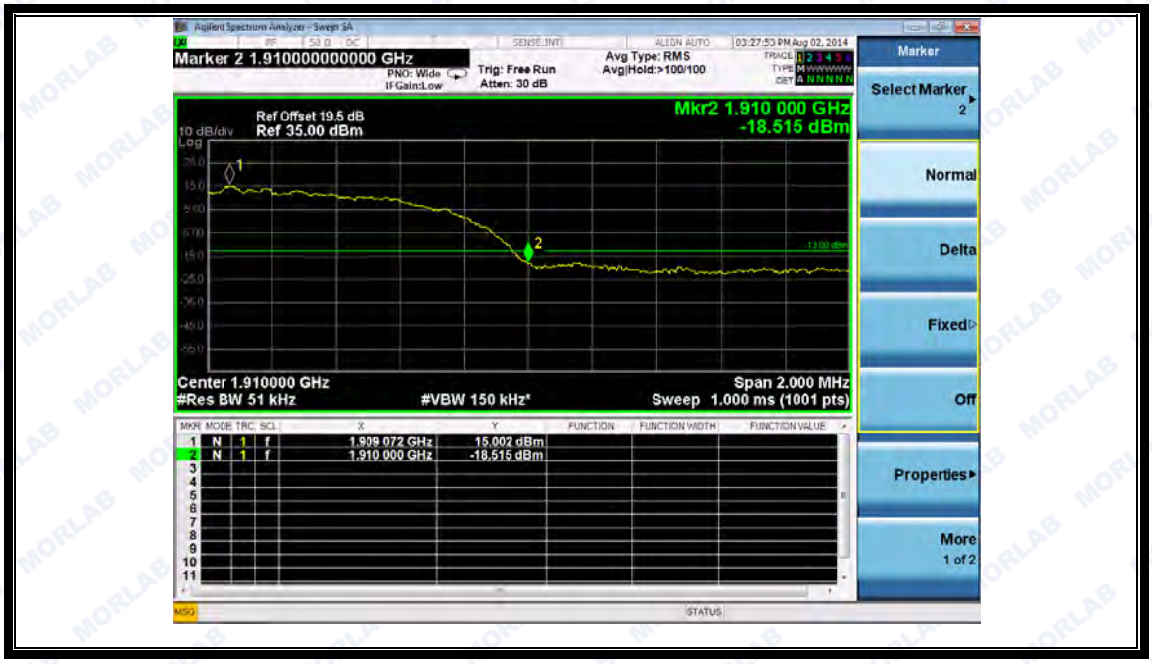



(Plot I: WCDMA 850 Channel = 4132)




(Plot J: WCDMA 850 Channel = 4233)


(Plot K: WCDMA 1900 Channel = 9262)




(Plot L: WCDMA 1900 Channel = 9538)

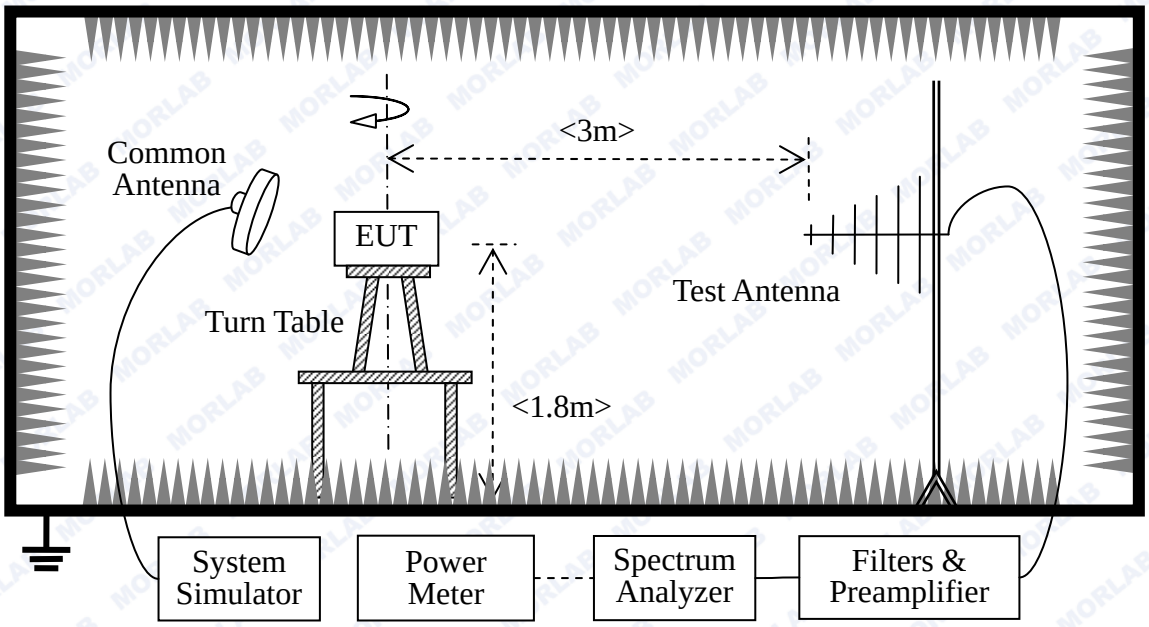
## 2.7 Transmitter Radiated Power (EIRP/ERP)

### 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

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 33.29dBm, GSM 1900 30.76dBm, EGPRS 850 29.97dBm, EGPRS 1900 29.62dBm,WCDMA 850 24.36dBm, WCDMA 1900 23.65dBm, 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.

Equipments List:

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| System Simulator | Agilent | E5515C | GB43130131 | 2014.02.26 | 2015.02.25 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2014.02.26 | 2015.02.25 |
| Full-Anechoic Chamber | Albatross | 9m*6m*6m | (n.a.) | 2014.02.26 | 2015.02.25 |
| Test Antenna - Bi-Log | Schwarzbeck | VULB 9163 | 9163-274 | 2014.02.26 | 2015.02.25 |
| Test Antenna - Horn | Schwarzbeck | BBHA 9120C | 9120C-384 | 2014.02.26 | 2015.02.25 |
| Substitution Antenna | Schwarzbeck | BBHA 9120C | 9120C-384 | 2014.02.26 | 2015.02.25 |
| Pre-AMPs | lucix | S10M100L3802 | S020180L3203 | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C836.5-25-X | NA | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C1747.5-75-X2 | NA | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C1880-60-X2 | NA | 2014.02.26 | 2015.02.25 |

### 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:

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

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

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 $A_{TOT}$.

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 | 31.9 | 1.549 | Plot A | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 31.49 | 1.409 | | | | PASS |
| | 251 | 848.80 | 5 | 31.06 | 1.276 | | | | PASS |
| GPRS 850MHz | 128 | 824.20 | 5 | 27.97 | 0.627 | Plot B Note 1 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 26.46 | 0.443 | | | | PASS |
| | 251 | 848.80 | 5 | 25.87 | 0.386 | | | | PASS |
| EGPRS 850MHz | 128 | 824.20 | 5 | 31.31 | 1.352 | Plot C Note 1 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 29.82 | 0.959 | | | | PASS |
| | 251 | 848.80 | 5 | 29.99 | 0.998 | | | | PASS |

| Band | Channel | Frequency (MHz) | PCL | Measured EIRP | | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| | | | | dBm | W | Refer to Plot | dBm | W | |
| GSM 1900MHz | 512 | 1850.2 | 0 | 30.02 | 1.005 | Plot D | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 30.65 | 1.161 | | | | PASS |
| | 810 | 1909.8 | 0 | 30.99 | 1.256 | | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 0 | 27.17 | 0.521 | Plot E Note 1 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 27.93 | 0.621 | | | | PASS |
| | 810 | 1909.8 | 0 | 28.3 | 0.676 | | | | PASS |
| EGPRS 1900MHz | 512 | 1850.2 | 0 | 28.75 | 0.750 | Plot F Note 1 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 29.5 | 0.891 | | | | PASS |
| | 810 | 1909.8 | 0 | 29.92 | 0.982 | | | | PASS |

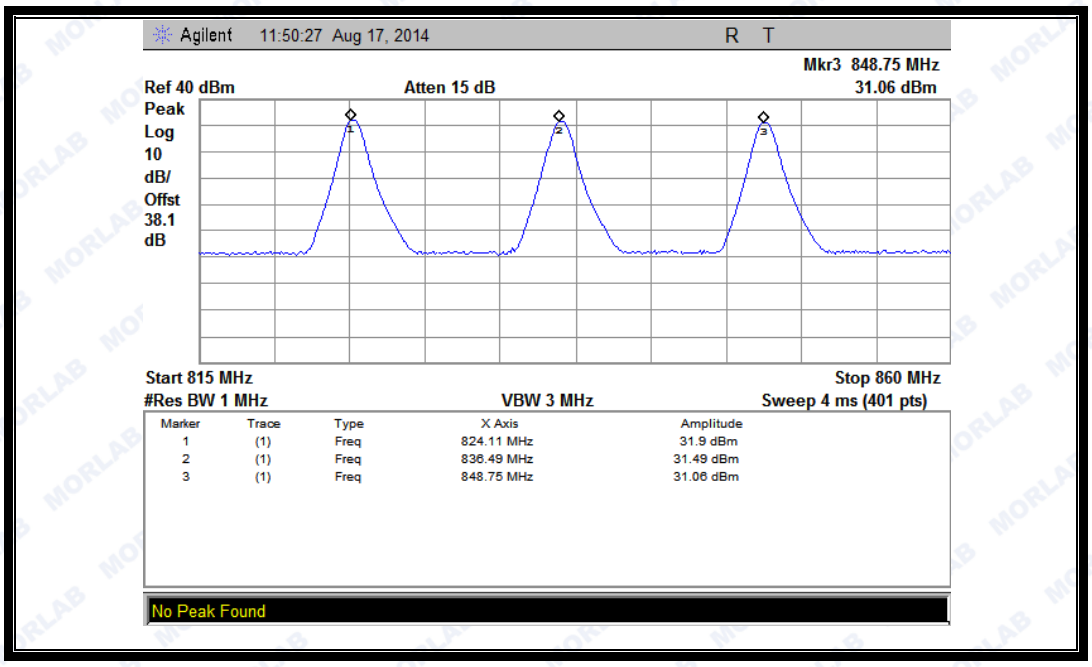
| | |
|---|---|
| Note 1: | For the GPRS and EGPRS model, all the slots were tested and just the worst data was record in this report. |

WCDMA Model Test Verdict:

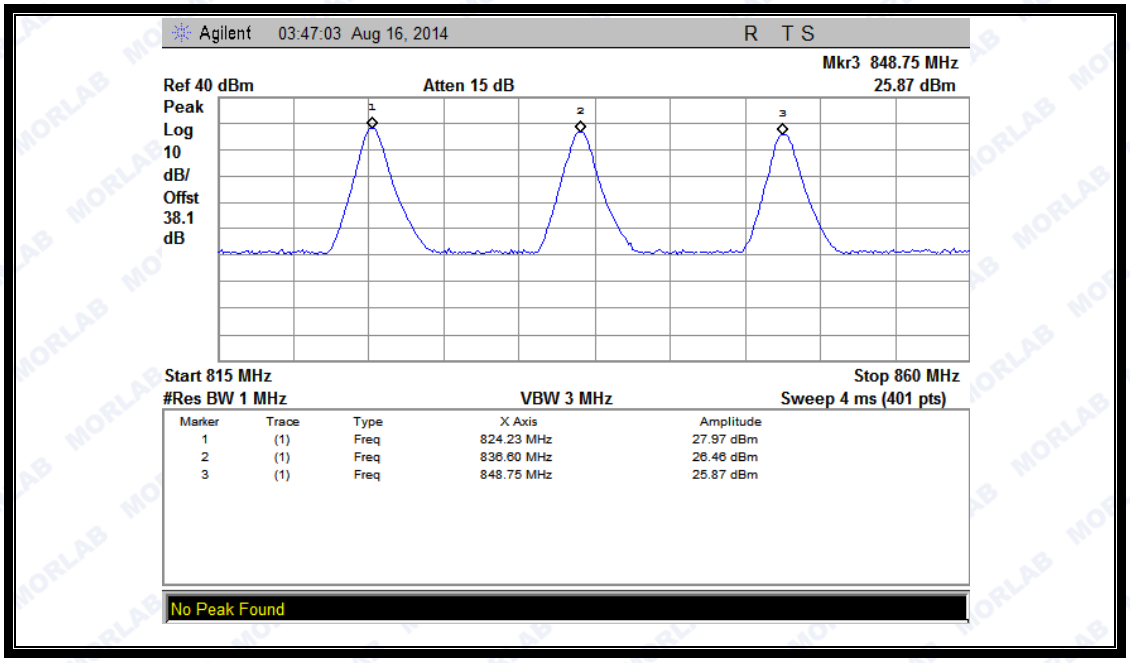
| Band | Channel | Frequency (MHz) | Measured ERP | | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | dBm | W | Refer to Plot | dBm | W | |
| WCDMA 850MHz | 4132 | 826.4 | 21.5 | 0.141 | Plot G | 38.5 | 7 | PASS |
| | 4175 | 835 | 20.98 | 0.125 | | | | PASS |
| | 4233 | 846.6 | 21.78 | 0.151 | | | | PASS |

| Band | Channel | Frequency (MHz) | Measured EIRP | | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | dBm | W | | dBm | W | |
| WCDMA 1900MHz | 9262 | 1852.4 | 24.11 | 0.258 | Plot H | 33 | 2 | PASS |
| | 9400 | 1880 | 23.91 | 0.246 | | | | PASS |
| | 9538 | 1907.6 | 24.03 | 0.253 | | | | PASS |

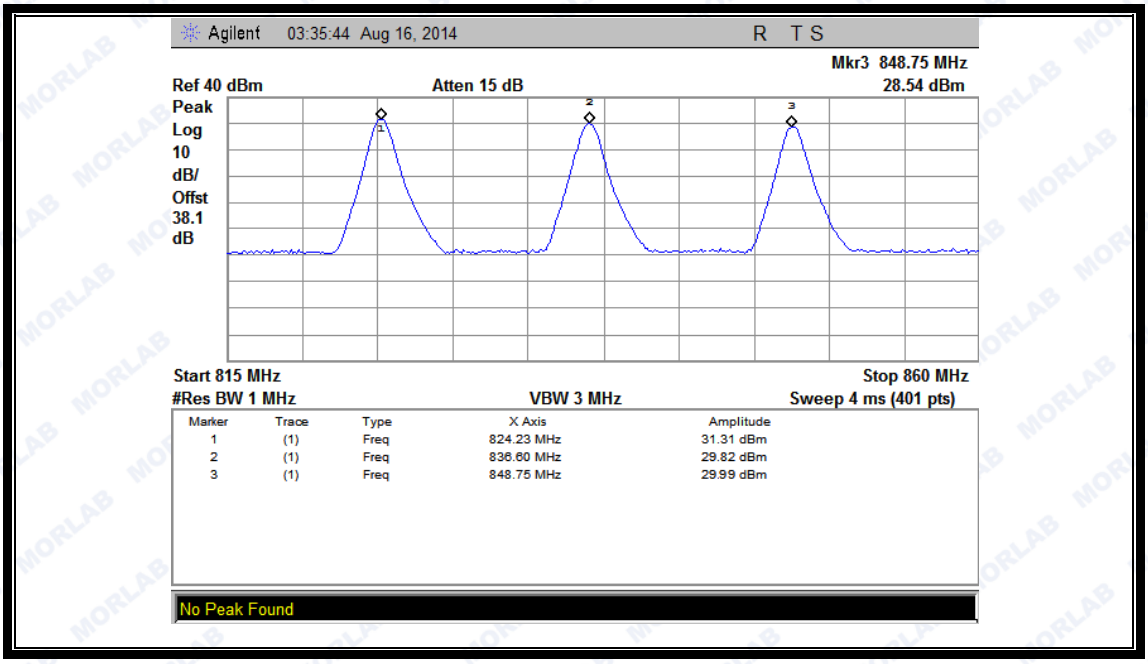
Test Plots:



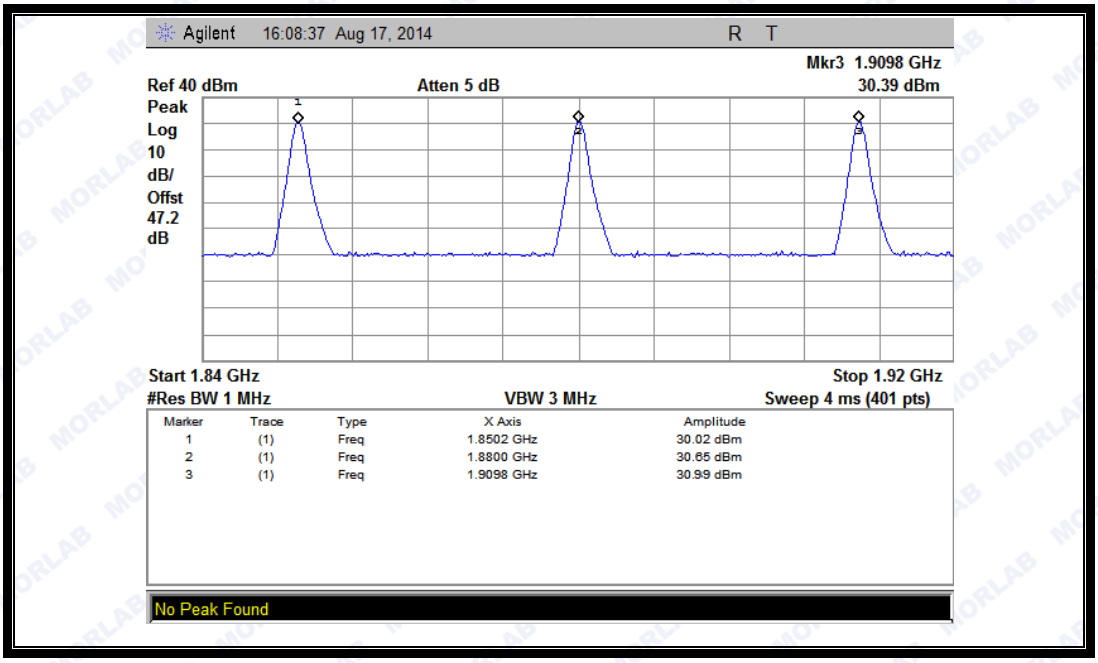

(Plot A: GSM 850MHz Channel = 128, 190, 251)



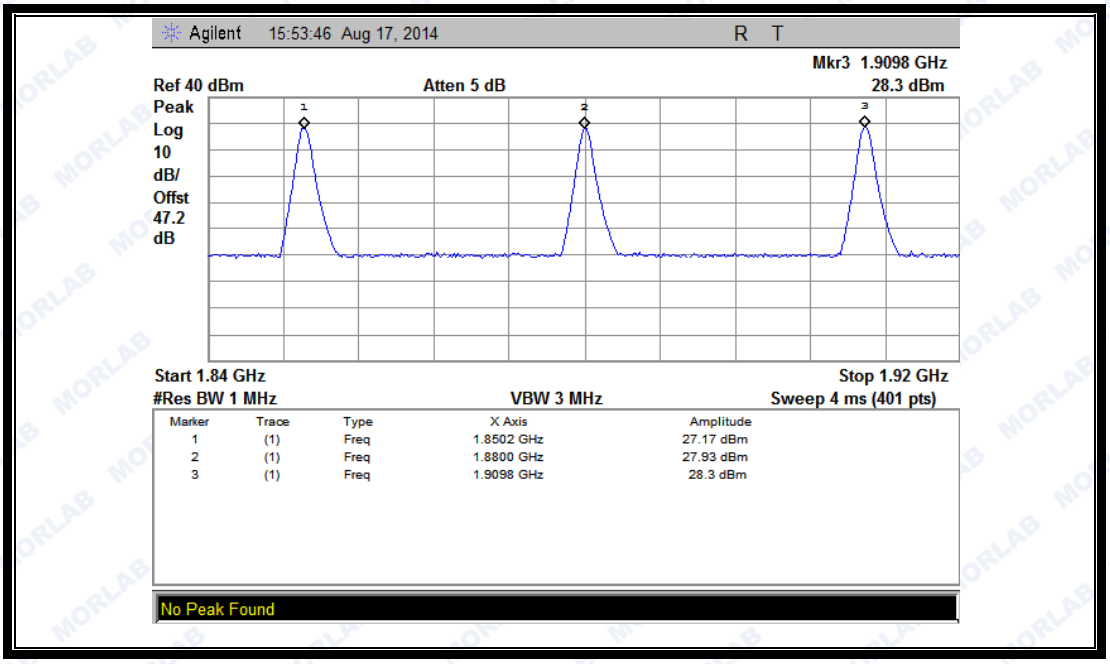

(Plot B: GPRS 850MHz Channel = 128, 190, 251)



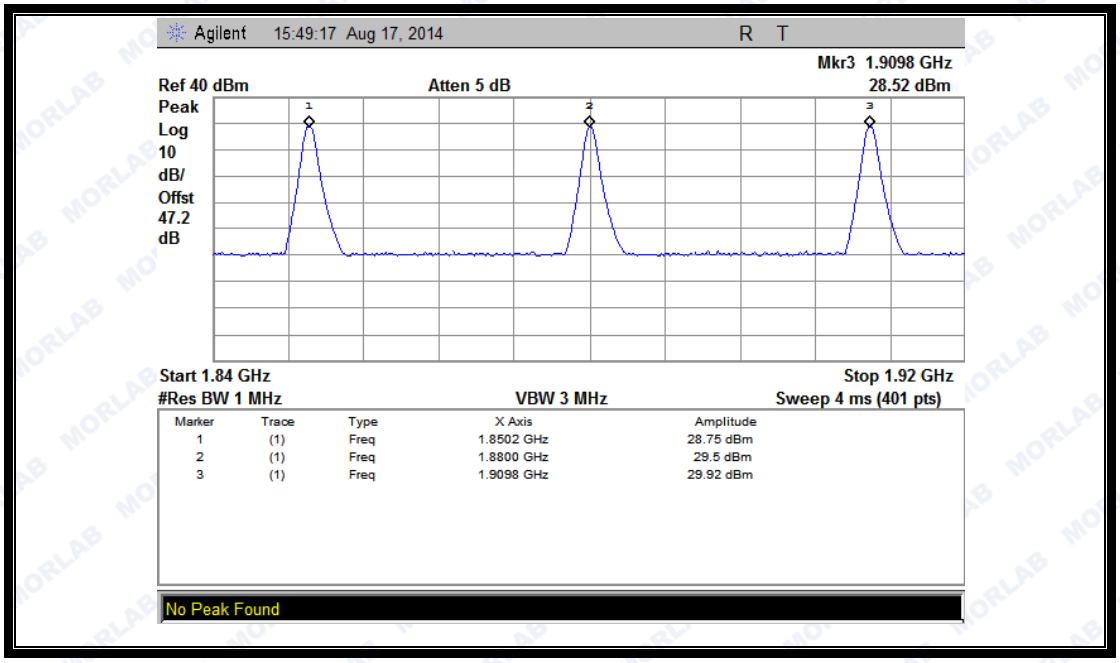

(Plot C: EGPRS 850MHz Channel = 128, 190, 251)



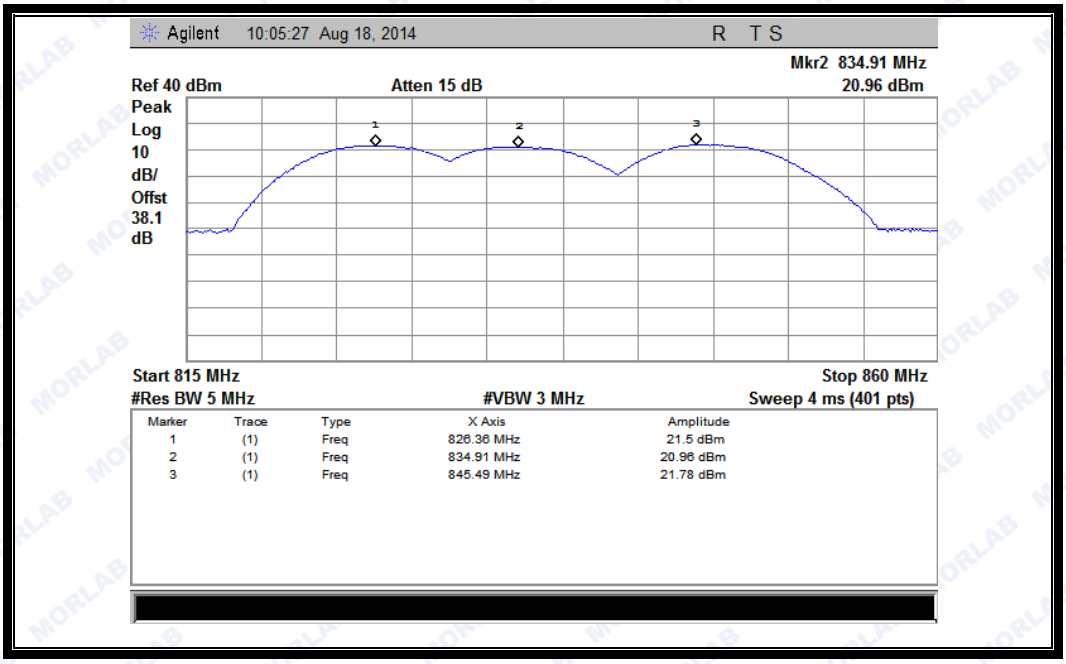

(Plot D: GSM 1900MHz Channel = 512, 661, 810)



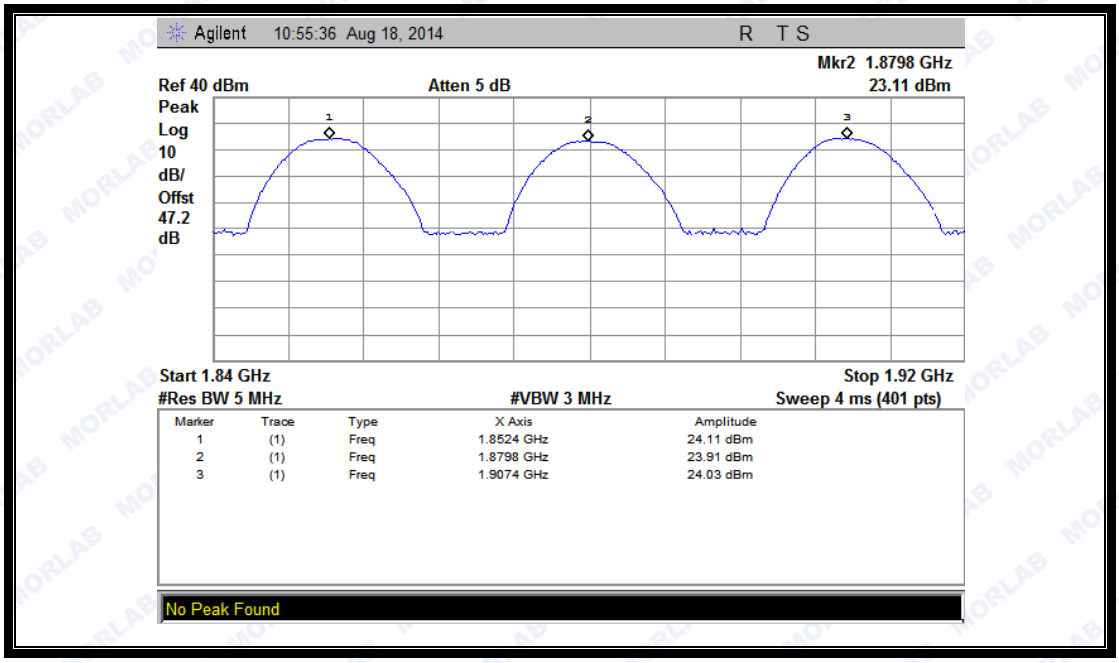

(Plot E: GPRS 1900MHz Channel = 512, 661, 810)




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




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




(Plot H: WCDMA 1900 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 | 2014.02.26 | 2015.02.25 |
| Spectrum Analyzer | Agilent | E7405A | US44210471 | 2014.02.26 | 2015.02.25 |
| Full-Anechoic Chamber | Albatross | 9m*6m*6m | (n.a.) | 2014.02.26 | 2015.02.25 |
| Test Antenna - Bi-Log | Schwarzbeck | VULB 9163 | 9163-274 | 2014.02.26 | 2015.02.25 |
| Test Antenna - Horn | Schwarzbeck | BBHA 9120C | 9120C-384 | 2014.02.26 | 2015.02.25 |
| Substitution Antenna | Schwarzbeck | BBHA 9120C | 9120C-384 | 2014.02.26 | 2015.02.25 |
| Pre-AMPs | lucix | S10M100L3802 | S020180L3203 | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C836.5-25-X | NA | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C1747.5-75-X2 | NA | 2014.02.26 | 2015.02.25 |
| Notch Filter | COM-MW | ZBSF-C1880-60-X2 | NA | 2014.02.26 | 2015.02.25 |

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 low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit. And according to KDB 971168D01 Section 8, the amplitudes of unwanted emissions that are attenuated more than 20 dB below the applicable limit are not required to be reported. So the measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency and was reported. 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:

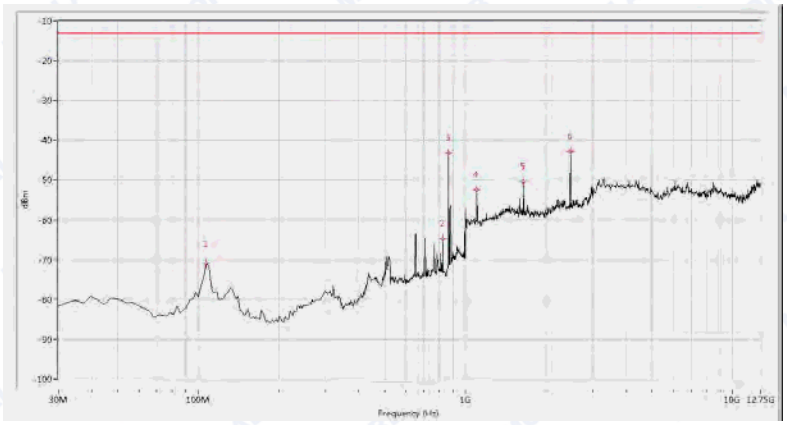
| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | | Refer to Plot | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| | | | Test Antenna Horizontal | Test Antenna Vertical | | | |
| GSM 850MHz | 128 | 824.2 | < -25 | < -25 | Plot A.1/A.2 | -13 | PASS |
| | 190 | 836.6 | < -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 850MHz | 4132 | 826.4 | < -25 | < -25 | Plot E.1/E.2 | -13 | PASS |
| | 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 |
| HSUPA 850MHz | 4132 | 826.4 | < -25 | < -25 | Plot I.1/I.2 | -13 | PASS |
| | 4175 | 835 | < -25 | < -25 | Plot I.3/I.4 | | PASS |
| | 4233 | 846.6 | < -25 | < -25 | Plot I.5/I.6 | | PASS |
| HSUPA 1900MHz | 9262 | 1852.4 | < -25 | < -25 | Plot J.1/J.2 | -13 | PASS |
| | 9400 | 1880 | < -25 | < -25 | Plot J.3/J.4 | | PASS |
| | 9538 | 1907.6 | < -25 | < -25 | Plot J.5/J.6 | | PASS |

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

2. Test Plots for the Whole Measurement Frequency Range:

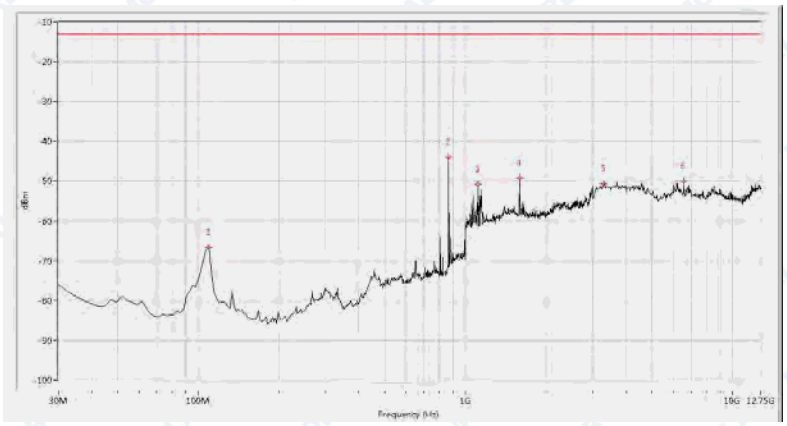
Note1: the power of the EUT transmitting frequency should be ignored.

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.



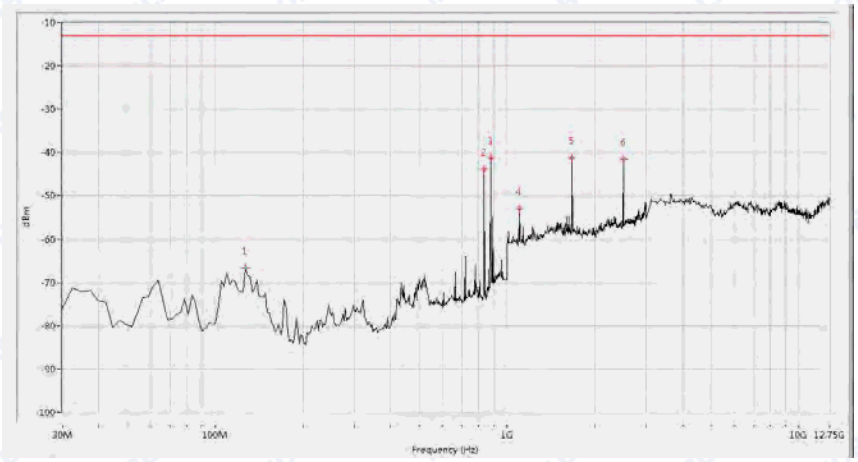
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -71.01 | -13.0 | 58.0 | 180.8 | Horizontal | PASS |
| 823.416 | -64.70 | -13.0 | 51.7 | 311.5 | Horizontal | N.A |
| 866.958 | -43.16 | -13.0 | 30.2 | 289.8 | Horizontal | N.A |
| 1104.738 | -52.49 | -13.0 | 39.5 | 207.2 | Horizontal | PASS |
| 1648.379 | -50.47 | -13.0 | 37.5 | 357.4 | Horizontal | PASS |
| 2471.322 | -42.84 | -13.0 | 29.8 | 146.9 | Horizontal | PASS |

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



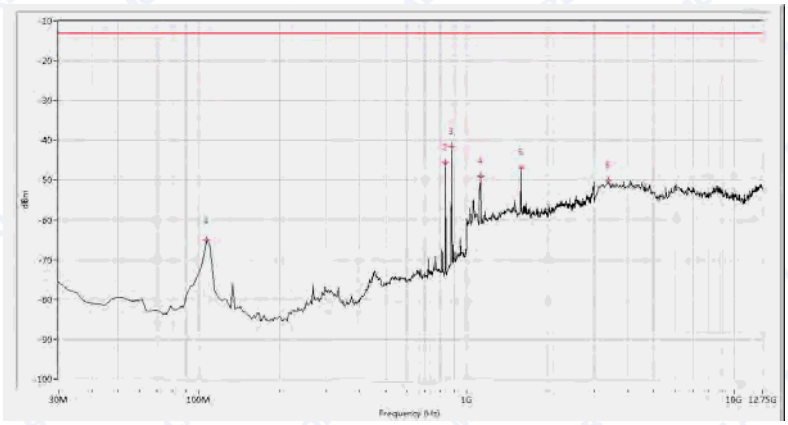
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -66.64 | -13.0 | 53.6 | 305.9 | Vertical | PASS |
| 866.958 | -44.01 | -13.0 | 31.0 | 35.0 | Vertical | N.A |
| 1119.701 | -50.87 | -13.0 | 37.9 | 62.9 | Vertical | PASS |
| 1598.504 | -49.17 | -13.0 | 36.2 | 131.0 | Vertical | PASS |
| 3291.771 | -50.61 | -13.0 | 37.6 | 216.3 | Vertical | PASS |
| 6574.190 | -50.13 | -13.0 | 37.1 | 122.5 | Vertical | PASS |

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



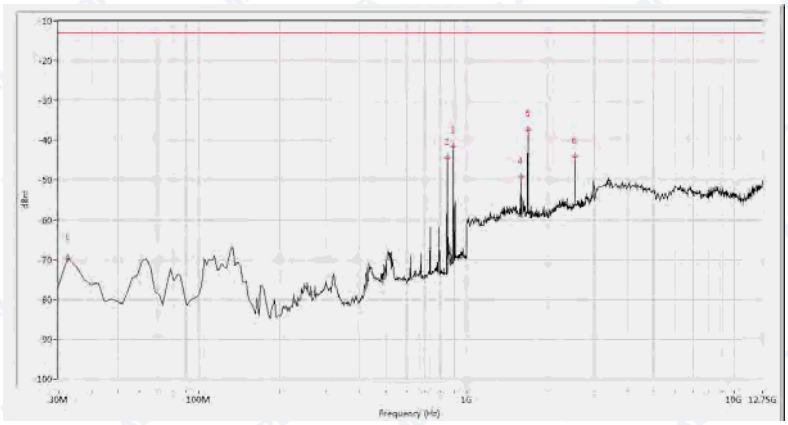
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 126.758 | -66.76 | -13.0 | 53.8 | 86.1 | Horizontal | PASS |
| 835.511 | -43.86 | -13.0 | 30.9 | 341.3 | Horizontal | N.A |
| 879.052 | -41.19 | -13.0 | 28.2 | 332.9 | Horizontal | N.A |
| 1104.738 | -53.04 | -13.0 | 40.0 | 56.7 | Horizontal | PASS |
| 1673.317 | -41.14 | -13.0 | 28.1 | 230.9 | Horizontal | PASS |
| 2506.234 | -41.60 | -13.0 | 28.6 | 153.9 | Horizontal | PASS |

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



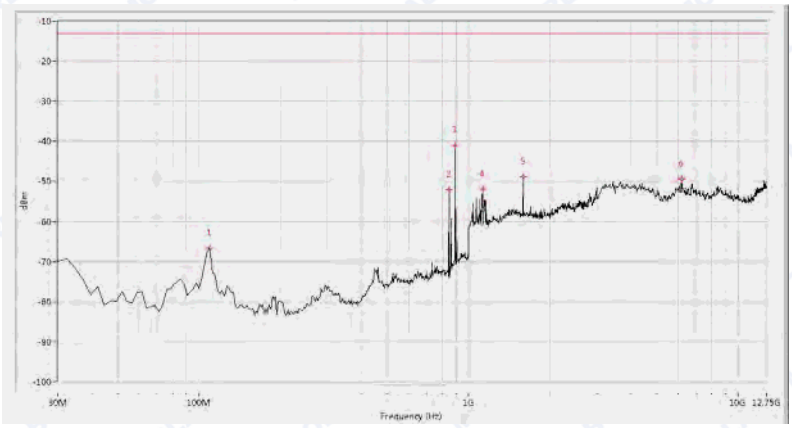
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -65.08 | -13.0 | 52.1 | 231.9 | Vertical | PASS |
| 835.511 | -45.67 | -13.0 | 32.7 | 305.9 | Vertical | N.A |
| 879.052 | -41.46 | -13.0 | 28.5 | 296.6 | Vertical | N.A |
| 1129.676 | -48.99 | -13.0 | 36.0 | 0.0 | Vertical | PASS |
| 1598.504 | -46.95 | -13.0 | 34.0 | 358.5 | Vertical | PASS |
| 3389.027 | -50.17 | -13.0 | 37.2 | 138.5 | Vertical | PASS |

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



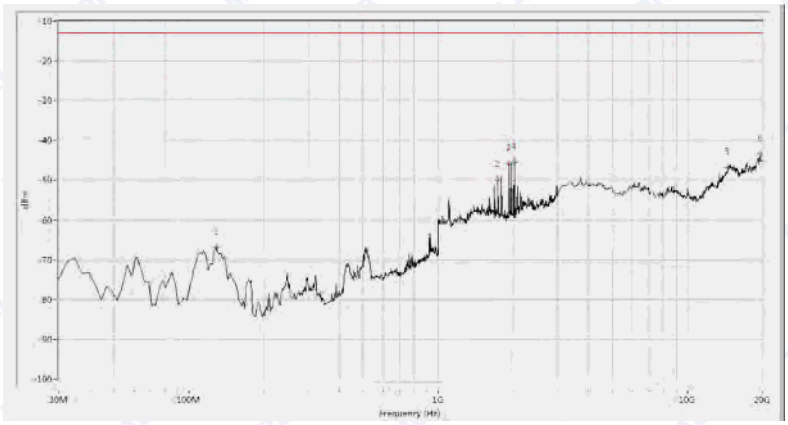
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 32.419 | -69.58 | -13.0 | 56.6 | 356.9 | Horizontal | PASS |
| 847.606 | -44.36 | -13.0 | 31.4 | 340.1 | Horizontal | N.A |
| 891.147 | -41.57 | -13.0 | 28.6 | 121.0 | Horizontal | N.A |
| 1598.504 | -49.13 | -13.0 | 36.1 | 77.4 | Horizontal | PASS |
| 1698.254 | -37.35 | -13.0 | 24.3 | 214.4 | Horizontal | PASS |
| 2541.147 | -44.00 | -13.0 | 31.0 | 222.2 | Horizontal | PASS |

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



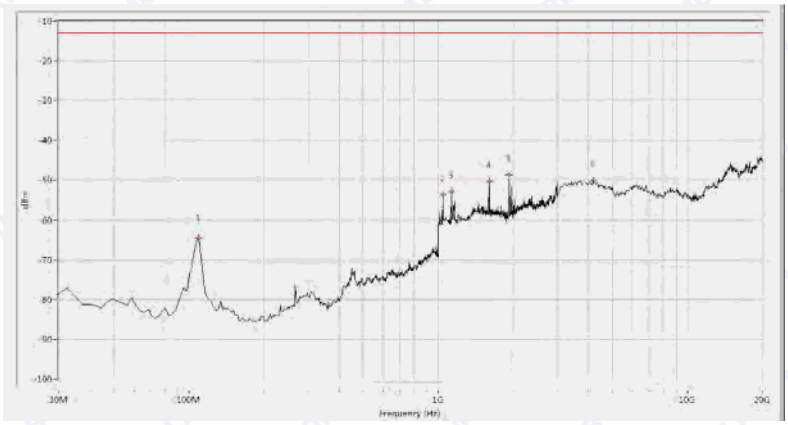
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -66.73 | -13.0 | 53.7 | 360.0 | Vertical | PASS |
| 847.606 | -52.00 | -13.0 | 39.0 | 168.6 | Vertical | N.A |
| 891.147 | -41.01 | -13.0 | 28.0 | 311.5 | Vertical | N.A |
| 1129.676 | -51.81 | -13.0 | 38.8 | 145.5 | Vertical | PASS |
| 1598.504 | -48.79 | -13.0 | 35.8 | 255.7 | Vertical | PASS |
| 6185.162 | -49.37 | -13.0 | 36.4 | 214.2 | Vertical | PASS |

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



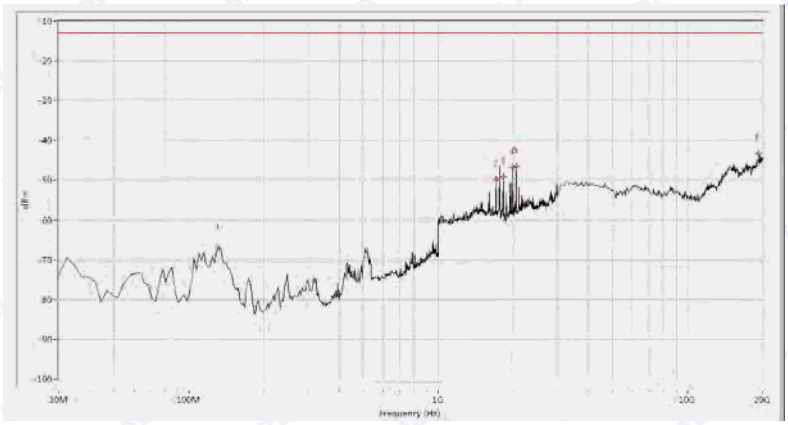
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 129.177 | -66.89 | -13.0 | 53.9 | 324.9 | Horizontal | PASS |
| 1733.167 | -49.93 | -13.0 | 36.9 | 8.8 | Horizontal | PASS |
| 1927.681 | -45.77 | -13.0 | 32.8 | 162.0 | Horizontal | PASS |
| 2022.444 | -45.48 | -13.0 | 32.5 | 350.0 | Horizontal | PASS |
| 14531.172 | -46.97 | -13.0 | 34.0 | 259.7 | Horizontal | PASS |
| 19576.060 | -43.43 | -13.0 | 30.4 | 67.3 | Horizontal | PASS |

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



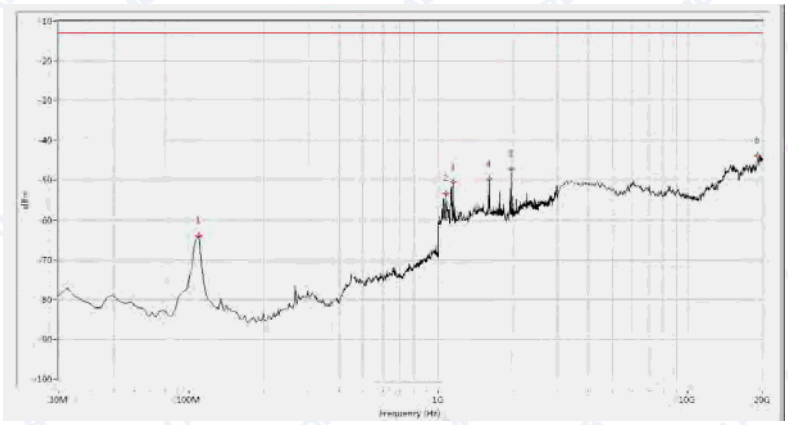
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -64.53 | -13.0 | 51.5 | 131.4 | Vertical | PASS |
| 1044.888 | -53.66 | -13.0 | 40.7 | 225.2 | Vertical | PASS |
| 1129.676 | -52.77 | -13.0 | 39.8 | 322.6 | Vertical | PASS |
| 1598.504 | -50.35 | -13.0 | 37.4 | 164.9 | Vertical | PASS |
| 1927.681 | -48.62 | -13.0 | 35.6 | 65.6 | Vertical | PASS |
| 4187.032 | -49.90 | -13.0 | 36.9 | 88.2 | Vertical | PASS |

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



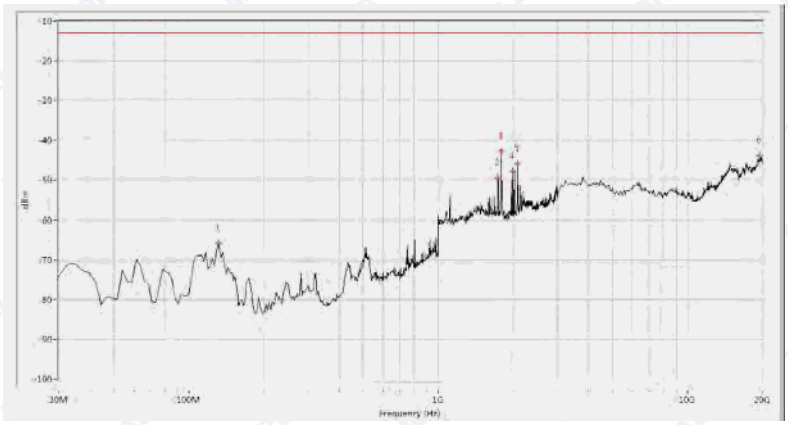
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 131.596 | -66.90 | -13.0 | 53.9 | 44.6 | Horizontal | PASS |
| 1708.229 | -49.71 | -13.0 | 36.7 | 26.7 | Horizontal | PASS |
| 1822.943 | -49.22 | -13.0 | 36.2 | 31.7 | Horizontal | PASS |
| 1992.519 | -46.98 | -13.0 | 34.0 | 358.9 | Horizontal | PASS |
| 2052.369 | -46.52 | -13.0 | 33.5 | 31.7 | Horizontal | PASS |
| 19236.908 | -43.30 | -13.0 | 30.3 | 360.0 | Horizontal | PASS |

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



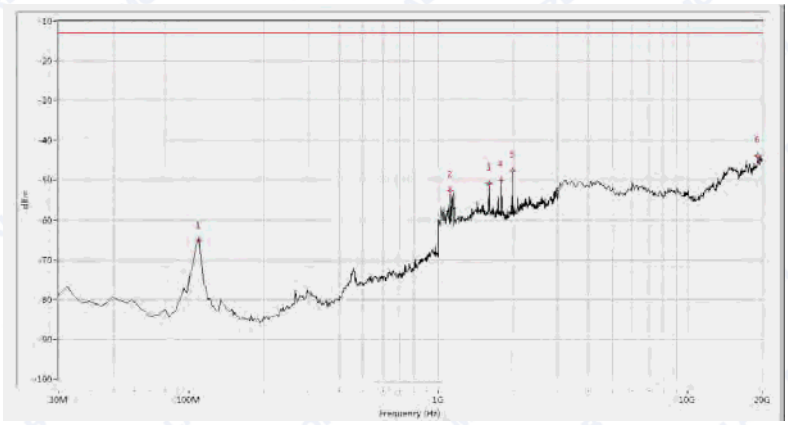
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -63.92 | -13.0 | 50.9 | 172.0 | Vertical | PASS |
| 1074.813 | -53.30 | -13.0 | 40.3 | 356.9 | Vertical | PASS |
| 1144.638 | -50.50 | -13.0 | 37.5 | 360.0 | Vertical | PASS |
| 1598.504 | -49.71 | -13.0 | 36.7 | 352.3 | Vertical | PASS |
| 1957.606 | -47.33 | -13.0 | 34.3 | 68.5 | Vertical | PASS |
| 19109.726 | -43.78 | -13.0 | 30.8 | 360.0 | Vertical | PASS |

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



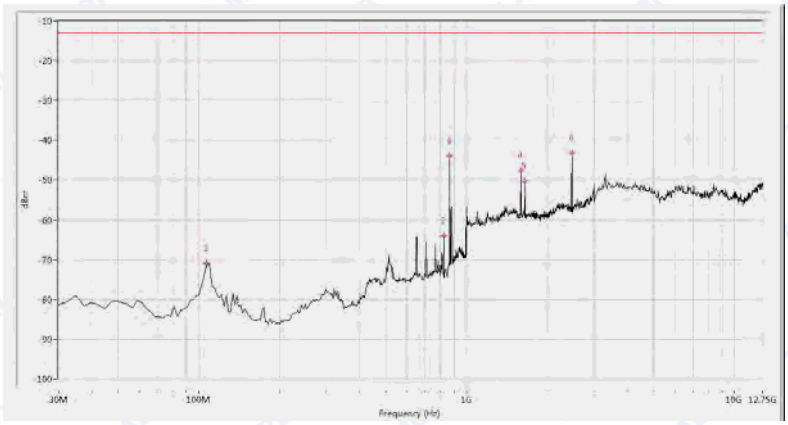
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 131.596 | -65.99 | -13.0 | 53.0 | 1.8 | Horizontal | PASS |
| 1733.167 | -49.39 | -13.0 | 36.4 | 29.5 | Horizontal | PASS |
| 1793.017 | -42.88 | -13.0 | 29.9 | 360.0 | Horizontal | PASS |
| 1987.531 | -47.86 | -13.0 | 34.9 | 338.0 | Horizontal | PASS |
| 2082.294 | -45.79 | -13.0 | 32.8 | 6.9 | Horizontal | PASS |
| 19533.666 | -43.92 | -13.0 | 30.9 | 150.0 | Horizontal | PASS |

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



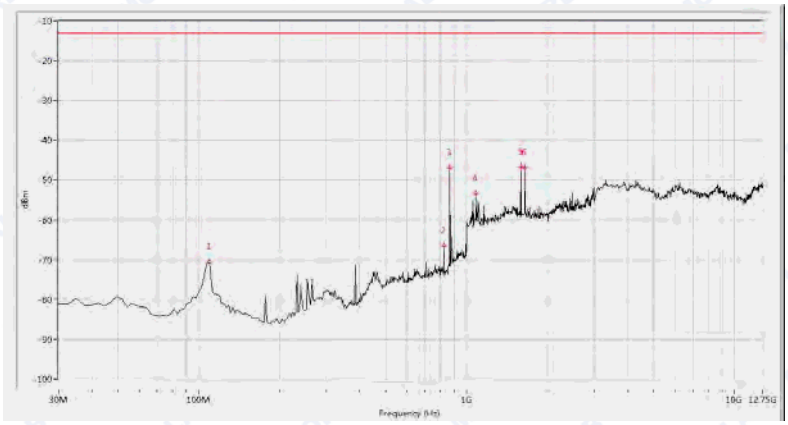
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -65.16 | -13.0 | 52.2 | 275.8 | Vertical | PASS |
| 1119.701 | -52.66 | -13.0 | 39.7 | 56.3 | Vertical | PASS |
| 1598.504 | -50.86 | -13.0 | 37.9 | 344.3 | Vertical | PASS |
| 1793.017 | -49.99 | -13.0 | 37.0 | 220.4 | Vertical | PASS |
| 1987.531 | -47.62 | -13.0 | 34.6 | 50.3 | Vertical | PASS |
| 19152.120 | -43.84 | -13.0 | 30.8 | 124.6 | Vertical | PASS |

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



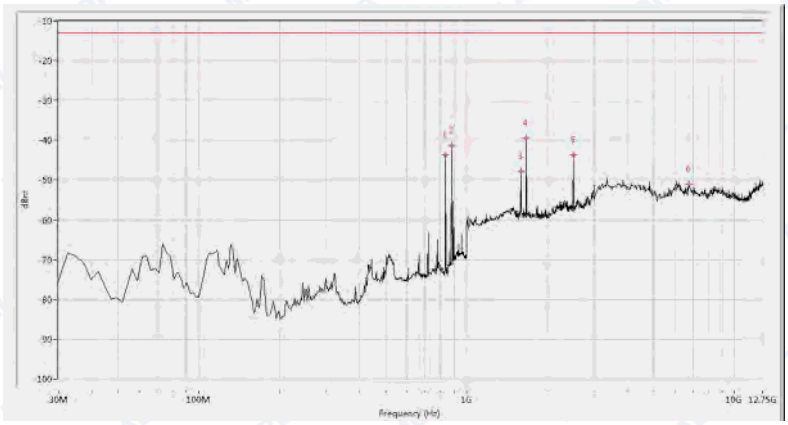
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -70.96 | -13.0 | 58.0 | 0.3 | Horizontal | PASS |
| 823.416 | -64.02 | -13.0 | 51.0 | 298.7 | Horizontal | N.A |
| 866.958 | -43.93 | -13.0 | 30.9 | 158.7 | Horizontal | N.A |
| 1598.504 | -47.52 | -13.0 | 34.5 | 137.9 | Horizontal | PASS |
| 1648.379 | -50.24 | -13.0 | 37.2 | 29.5 | Horizontal | PASS |
| 2471.322 | -43.10 | -13.0 | 30.1 | 148.4 | Horizontal | PASS |

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



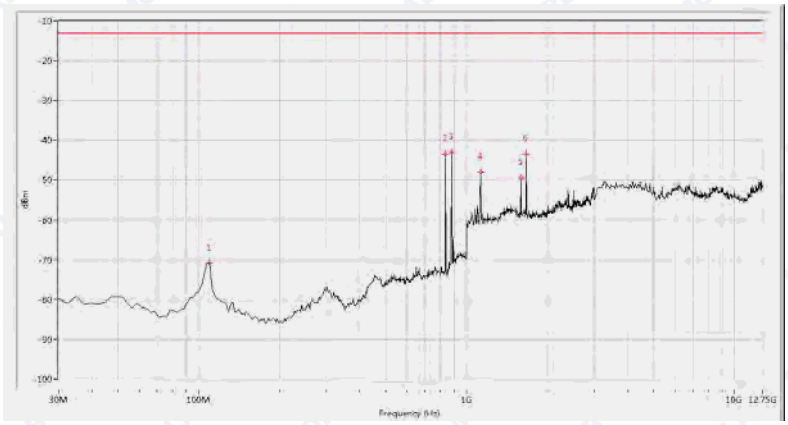
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -70.62 | -13.0 | 57.6 | 155.9 | Vertical | PASS |
| 823.416 | -66.43 | -13.0 | 53.4 | 120.7 | Vertical | N.A |
| 866.958 | -46.97 | -13.0 | 34.0 | 355.9 | Vertical | N.A |
| 1084.788 | -53.38 | -13.0 | 40.4 | 105.2 | Vertical | PASS |
| 1598.504 | -46.74 | -13.0 | 33.7 | 64.1 | Vertical | PASS |
| 1648.379 | -46.91 | -13.0 | 33.9 | 109.5 | Vertical | PASS |

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



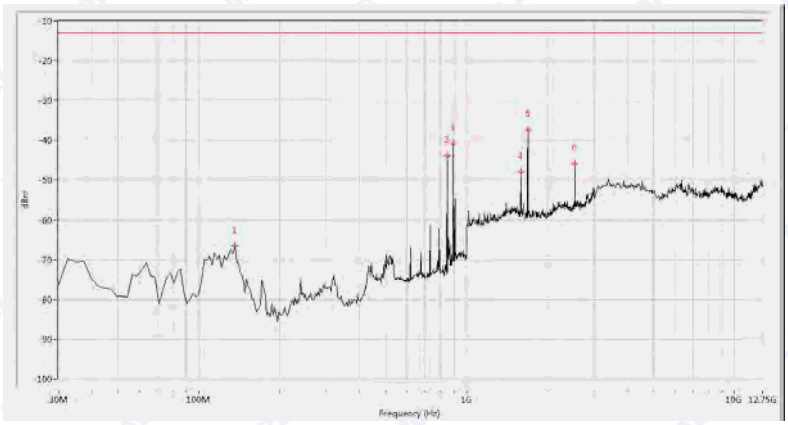
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 835.511 | -43.61 | -13.0 | 30.6 | 156.7 | Horizontal | N.A |
| 879.052 | -41.28 | -13.0 | 28.3 | 156.7 | Horizontal | N.A |
| 1598.504 | -47.86 | -13.0 | 34.9 | 234.4 | Horizontal | PASS |
| 1673.317 | -39.41 | -13.0 | 26.4 | 211.8 | Horizontal | PASS |
| 2506.234 | -43.62 | -13.0 | 30.6 | 198.6 | Horizontal | PASS |
| 6768.703 | -50.92 | -13.0 | 37.9 | 212.3 | Horizontal | PASS |

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



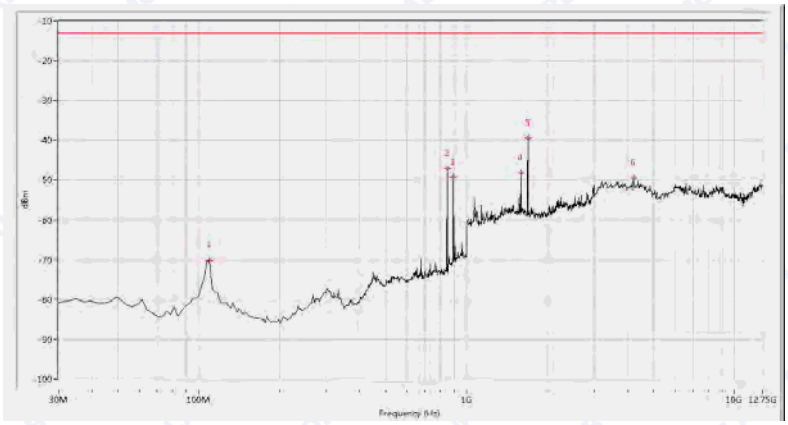
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -70.77 | -13.0 | 57.8 | 37.2 | Vertical | PASS |
| 835.511 | -43.49 | -13.0 | 30.5 | 91.3 | Vertical | N.A |
| 879.052 | -43.03 | -13.0 | 30.0 | -0.0 | Vertical | N.A |
| 1129.676 | -47.94 | -13.0 | 34.9 | 315.6 | Vertical | PASS |
| 1598.504 | -49.36 | -13.0 | 36.4 | 53.3 | Vertical | PASS |
| 1673.317 | -43.56 | -13.0 | 30.6 | 88.0 | Vertical | PASS |

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



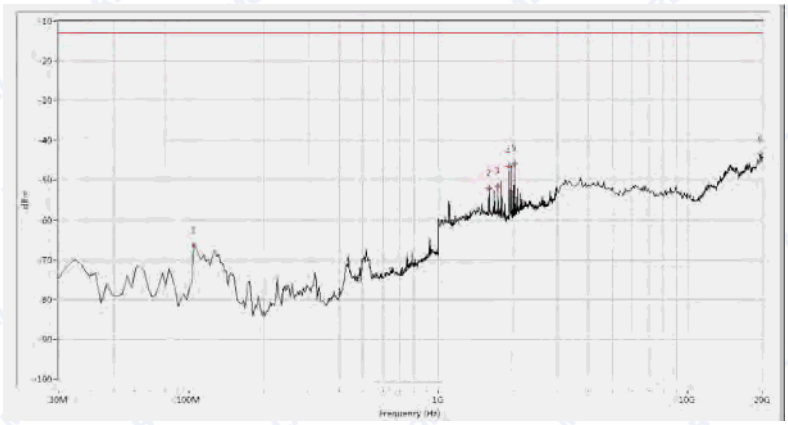
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 136.434 | -66.58 | -13.0 | 53.6 | 23.6 | Horizontal | PASS |
| 847.606 | -43.90 | -13.0 | 30.9 | 177.7 | Horizontal | N.A |
| 891.147 | -40.74 | -13.0 | 27.7 | 300.0 | Horizontal | N.A |
| 1598.504 | -47.98 | -13.0 | 35.0 | 115.1 | Horizontal | PASS |
| 1698.254 | -37.28 | -13.0 | 24.3 | 227.6 | Horizontal | PASS |
| 2541.147 | -45.80 | -13.0 | 32.8 | 211.9 | Horizontal | PASS |

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



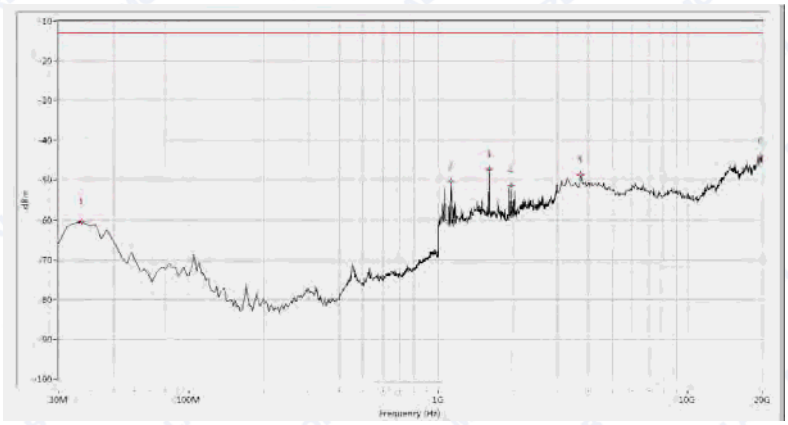
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -70.29 | -13.0 | 57.3 | 97.6 | Vertical | PASS |
| 847.606 | -47.13 | -13.0 | 34.1 | 249.6 | Vertical | N.A |
| 891.147 | -49.30 | -13.0 | 36.3 | 284.2 | Vertical | N.A |
| 1598.504 | -48.11 | -13.0 | 35.1 | 57.9 | Vertical | PASS |
| 1698.254 | -39.48 | -13.0 | 26.5 | 97.2 | Vertical | PASS |
| 4215.711 | -49.40 | -13.0 | 36.4 | 105.6 | Vertical | PASS |

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



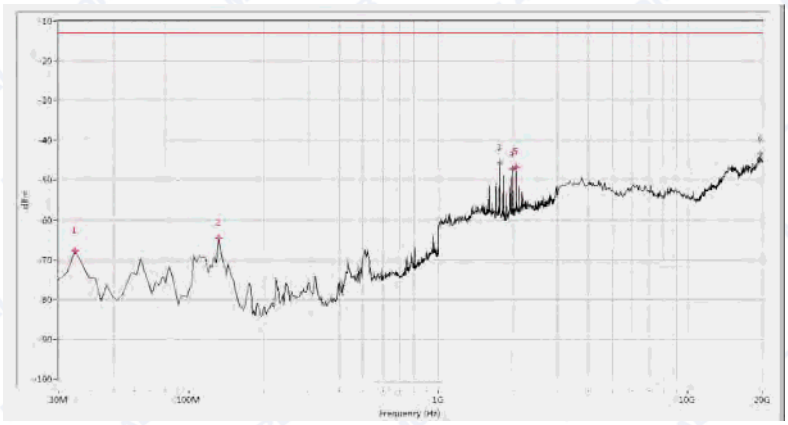
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 104.988 | -66.24 | -13.0 | 53.2 | -0.0 | Horizontal | PASS |
| 1598.504 | -52.03 | -13.0 | 39.0 | 244.3 | Horizontal | PASS |
| 1733.167 | -51.48 | -13.0 | 38.5 | 360.0 | Horizontal | PASS |
| 1927.681 | -46.59 | -13.0 | 33.6 | 163.3 | Horizontal | PASS |
| 2022.444 | -45.89 | -13.0 | 32.9 | 344.7 | Horizontal | PASS |
| 19576.060 | -43.48 | -13.0 | 30.5 | 147.2 | Horizontal | PASS |

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



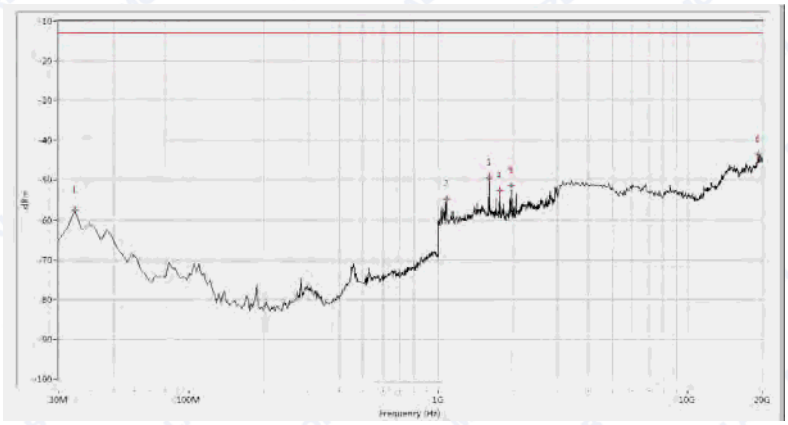
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 37.257 | -60.43 | -13.0 | 47.4 | 201.9 | Vertical | PASS |
| 1124.688 | -50.34 | -13.0 | 37.3 | 234.1 | Vertical | PASS |
| 1598.504 | -47.22 | -13.0 | 34.2 | 81.5 | Vertical | PASS |
| 1962.594 | -51.36 | -13.0 | 38.4 | 248.9 | Vertical | N.A |
| 3720.698 | -48.73 | -13.0 | 35.7 | 100.2 | Vertical | PASS |
| 19618.454 | -44.09 | -13.0 | 31.1 | 51.7 | Vertical | PASS |

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



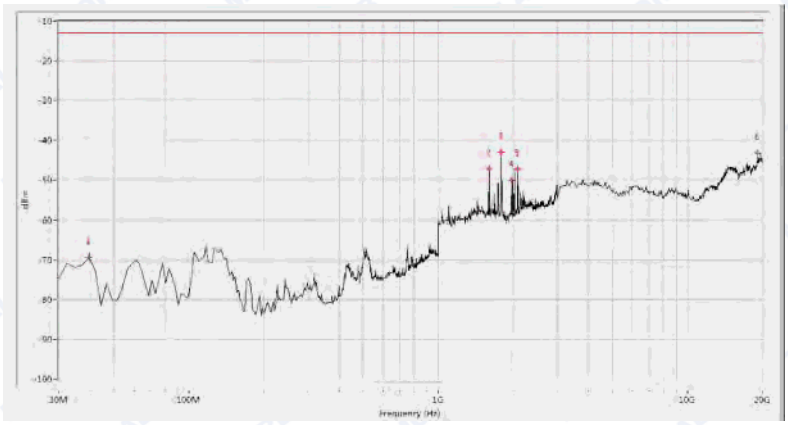
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 34.838 | -67.73 | -13.0 | 54.7 | 90.1 | Horizontal | PASS |
| 131.596 | -64.51 | -13.0 | 51.5 | 326.8 | Horizontal | PASS |
| 1763.092 | -45.62 | -13.0 | 32.6 | -0.0 | Horizontal | PASS |
| 1992.519 | -47.18 | -13.0 | 34.2 | 4.5 | Horizontal | PASS |
| 2052.369 | -46.79 | -13.0 | 33.8 | 359.7 | Horizontal | PASS |
| 19618.454 | -43.48 | -13.0 | 30.5 | 110.8 | Horizontal | PASS |

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



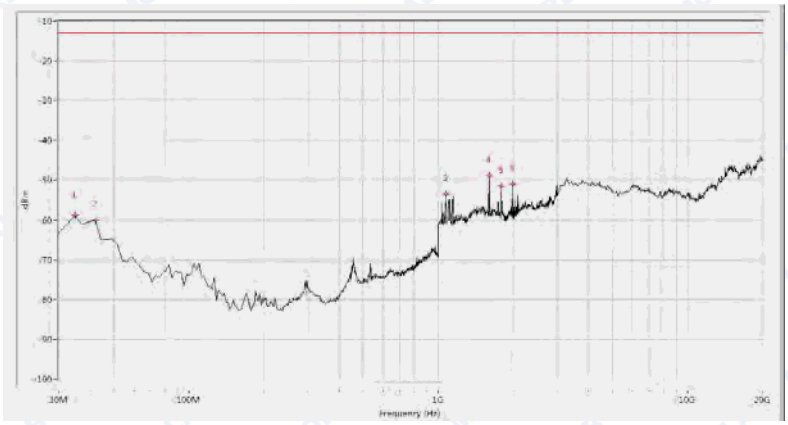
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 34.838 | -57.57 | -13.0 | 44.6 | 325.8 | Vertical | PASS |
| 1079.800 | -54.80 | -13.0 | 41.8 | 360.0 | Vertical | PASS |
| 1598.504 | -49.34 | -13.0 | 36.3 | 132.0 | Vertical | PASS |
| 1763.092 | -52.54 | -13.0 | 39.5 | 244.1 | Vertical | PASS |
| 1957.606 | -51.29 | -13.0 | 38.3 | 163.2 | Vertical | N.A |
| 19194.514 | -43.46 | -13.0 | 30.5 | 34.5 | Vertical | PASS |

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



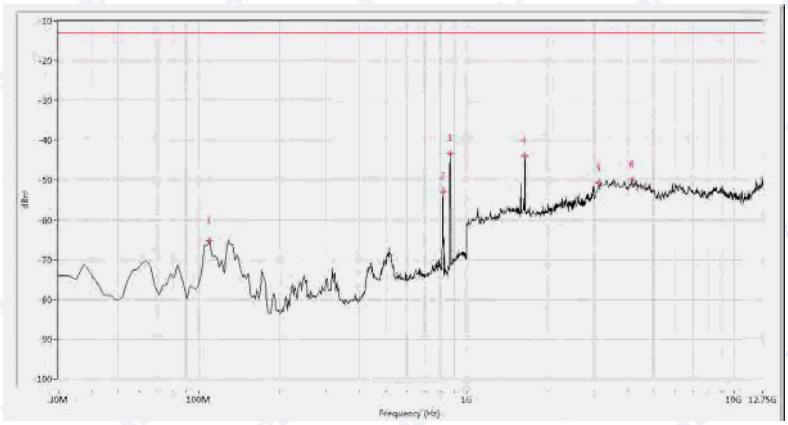
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 39.676 | -69.39 | -13.0 | 56.4 | 130.8 | Horizontal | PASS |
| 1598.504 | -47.09 | -13.0 | 34.1 | 297.1 | Horizontal | PASS |
| 1793.017 | -42.92 | -13.0 | 29.9 | 26.4 | Horizontal | PASS |
| 1967.581 | -49.91 | -13.0 | 36.9 | 345.6 | Horizontal | N.A |
| 2082.294 | -47.19 | -13.0 | 34.2 | 359.6 | Horizontal | PASS |
| 19109.726 | -43.20 | -13.0 | 30.2 | 23.9 | Horizontal | PASS |

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



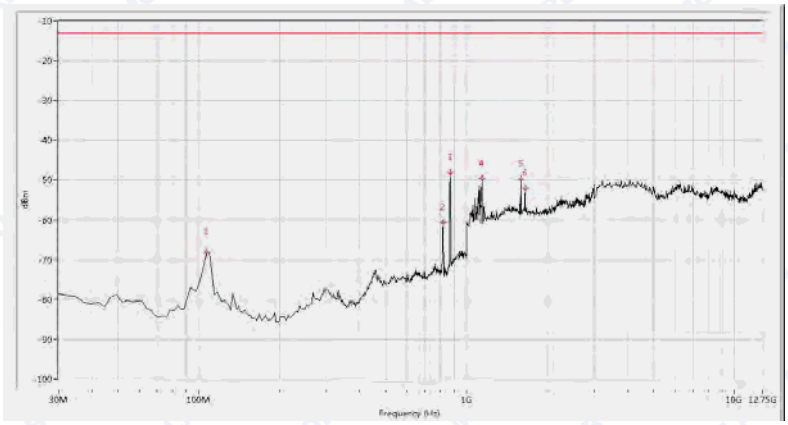
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 34.838 | -58.81 | -13.0 | 45.8 | 121.6 | Vertical | PASS |
| 42.095 | -60.14 | -13.0 | 47.1 | 262.8 | Vertical | PASS |
| 1074.813 | -53.46 | -13.0 | 40.5 | 225.9 | Vertical | PASS |
| 1598.504 | -48.81 | -13.0 | 35.8 | 165.4 | Vertical | PASS |
| 1793.017 | -51.50 | -13.0 | 38.5 | 220.1 | Vertical | PASS |
| 1987.531 | -50.96 | -13.0 | 38.0 | 299.4 | Vertical | N.A |

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



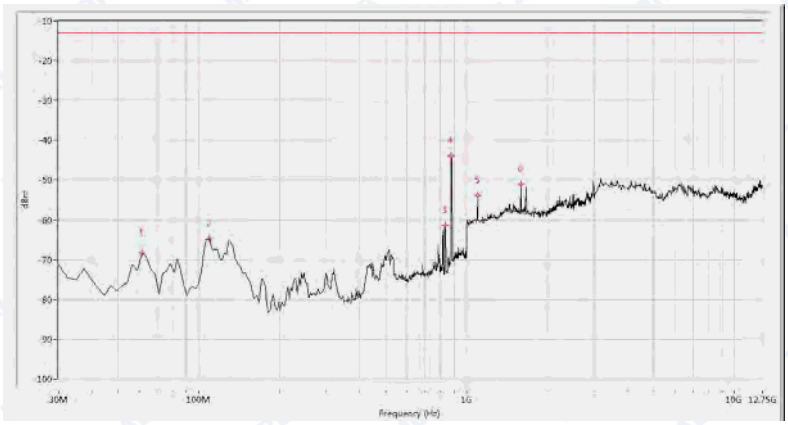
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -65.31 | -13.0 | 52.3 | 355.3 | Horizontal | PASS |
| 816.160 | -52.70 | -13.0 | 39.7 | 308.2 | Horizontal | N.A |
| 871.796 | -43.27 | -13.0 | 30.3 | 355.3 | Horizontal | N.A |
| 1648.379 | -43.89 | -13.0 | 30.9 | 34.7 | Horizontal | PASS |
| 3121.571 | -50.65 | -13.0 | 37.7 | 5.1 | Horizontal | PASS |
| 4167.082 | -49.84 | -13.0 | 36.8 | 140.7 | Horizontal | PASS |

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



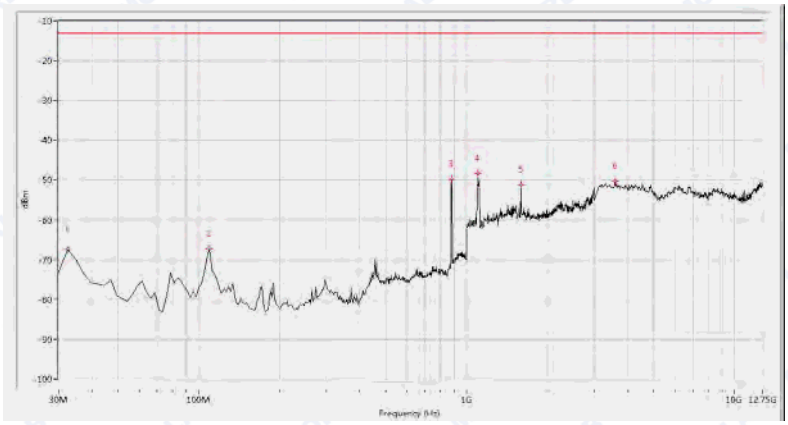
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -68.10 | -13.0 | 55.1 | 109.4 | Vertical | PASS |
| 816.160 | -60.65 | -13.0 | 47.7 | 100.1 | Vertical | N.A |
| 871.796 | -48.21 | -13.0 | 35.2 | 241.2 | Vertical | N.A |
| 1144.638 | -49.58 | -13.0 | 36.6 | 254.9 | Vertical | PASS |
| 1598.504 | -49.66 | -13.0 | 36.7 | 43.3 | Vertical | PASS |
| 1653.367 | -52.12 | -13.0 | 39.1 | 113.1 | Vertical | PASS |

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



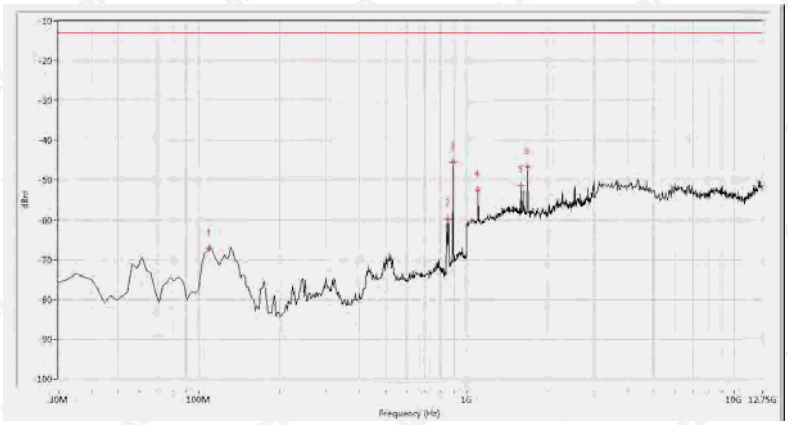
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 61.446 | -68.33 | -13.0 | 55.3 | 114.7 | Horizontal | PASS |
| 109.825 | -64.65 | -13.0 | 51.6 | 0.6 | Horizontal | PASS |
| 835.511 | -61.24 | -13.0 | 48.2 | -0.0 | Horizontal | N.A |
| 876.633 | -43.87 | -13.0 | 30.9 | 297.1 | Horizontal | N.A |
| 1099.751 | -53.80 | -13.0 | 40.8 | 63.3 | Horizontal | PASS |
| 1598.504 | -51.05 | -13.0 | 38.1 | 104.2 | Horizontal | PASS |

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



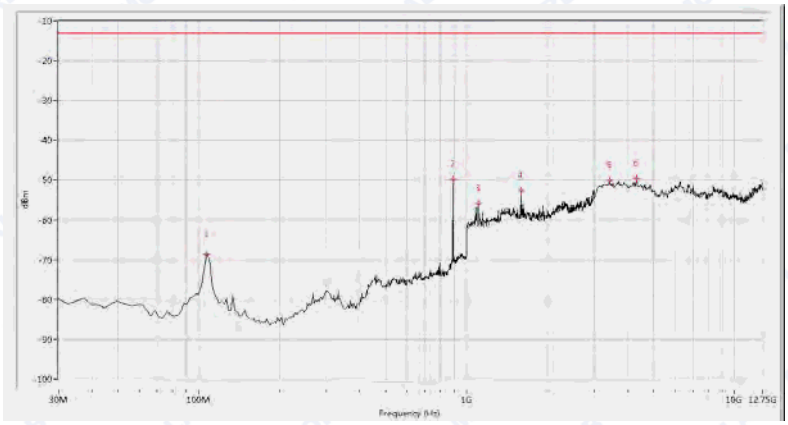
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 32.419 | -67.47 | -13.0 | 54.5 | 201.0 | Vertical | PASS |
| 109.825 | -67.27 | -13.0 | 54.3 | 272.5 | Vertical | PASS |
| 879.052 | -49.67 | -13.0 | 36.7 | 138.4 | Vertical | N.A |
| 1099.751 | -48.36 | -13.0 | 35.4 | 139.2 | Vertical | PASS |
| 1598.504 | -51.16 | -13.0 | 38.2 | 77.1 | Vertical | PASS |
| 3583.541 | -50.31 | -13.0 | 37.3 | 93.8 | Vertical | PASS |

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



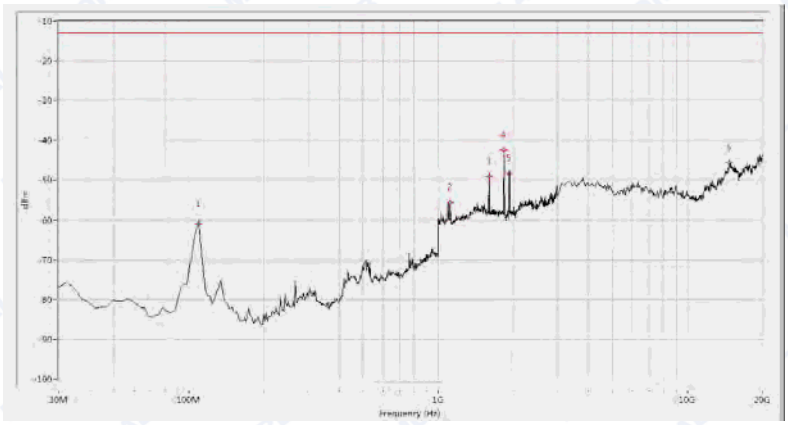
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -67.00 | -13.0 | 54.0 | 78.9 | Horizontal | PASS |
| 854.863 | -59.66 | -13.0 | 46.7 | 140.3 | Horizontal | N.A |
| 891.147 | -45.39 | -13.0 | 32.4 | 37.2 | Horizontal | N.A |
| 1104.738 | -52.38 | -13.0 | 39.4 | 155.1 | Horizontal | PASS |
| 1598.504 | -51.29 | -13.0 | 38.3 | 158.1 | Horizontal | PASS |
| 1688.279 | -46.79 | -13.0 | 33.8 | 14.2 | Horizontal | PASS |

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



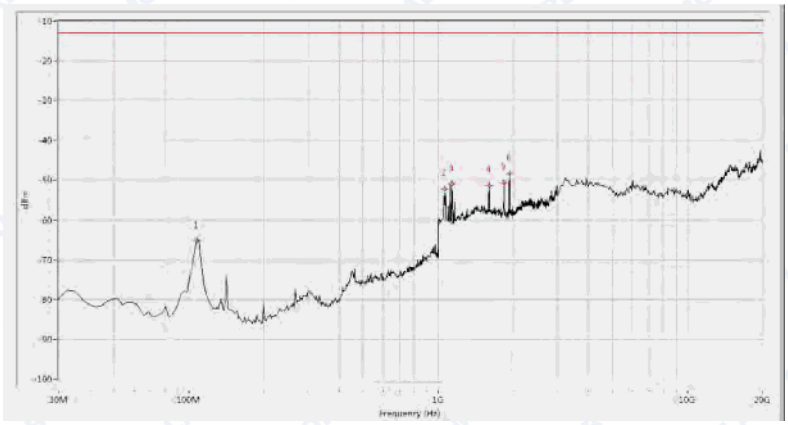
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -68.58 | -13.0 | 55.6 | 126.9 | Vertical | PASS |
| 888.728 | -49.78 | -13.0 | 36.8 | 259.0 | Vertical | PASS |
| 1109.726 | -55.78 | -13.0 | 42.8 | 152.2 | Vertical | PASS |
| 1598.504 | -52.59 | -13.0 | 39.6 | 10.5 | Vertical | PASS |
| 3413.342 | -50.01 | -13.0 | 37.0 | 233.4 | Vertical | PASS |
| 4312.968 | -49.53 | -13.0 | 36.5 | 208.4 | Vertical | PASS |

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



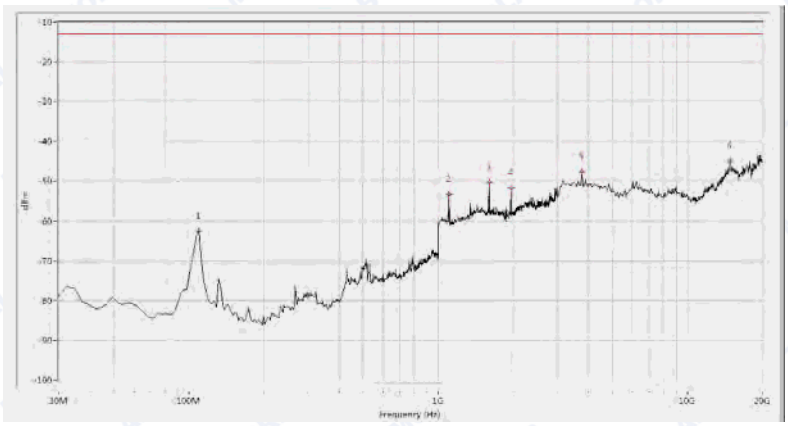
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -60.98 | -13.0 | 48.0 | 257.6 | Horizontal | PASS |
| 1119.701 | -55.66 | -13.0 | 42.7 | 241.9 | Horizontal | PASS |
| 1598.504 | -49.08 | -13.0 | 36.1 | 327.9 | Horizontal | PASS |
| 1837.905 | -42.48 | -13.0 | 29.5 | 62.1 | Horizontal | N.A |
| 1927.681 | -48.29 | -13.0 | 35.3 | 236.3 | Horizontal | N.A |
| 14743.142 | -45.63 | -13.0 | 32.6 | 157.0 | Horizontal | PASS |

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



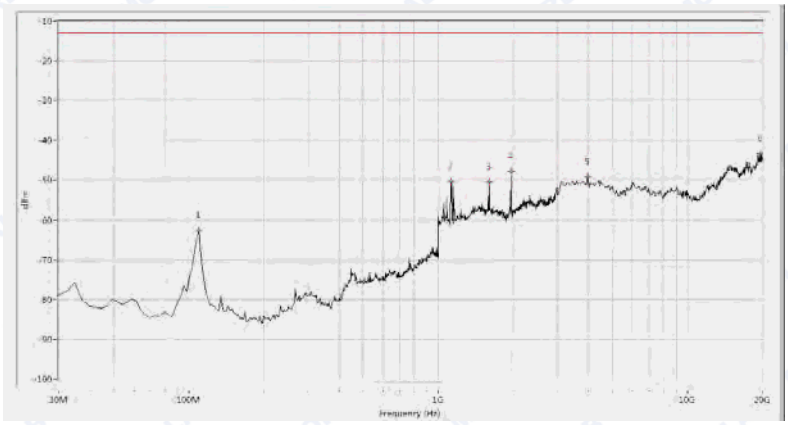
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -65.02 | -13.0 | 52.0 | 357.0 | Vertical | PASS |
| 1059.850 | -52.28 | -13.0 | 39.3 | 241.2 | Vertical | PASS |
| 1134.663 | -51.01 | -13.0 | 38.0 | 202.5 | Vertical | PASS |
| 1598.504 | -51.37 | -13.0 | 38.4 | -0.0 | Vertical | PASS |
| 1837.905 | -50.59 | -13.0 | 37.6 | 107.6 | Vertical | N.A |
| 1932.668 | -48.31 | -13.0 | 35.3 | 194.3 | Vertical | N.A |

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



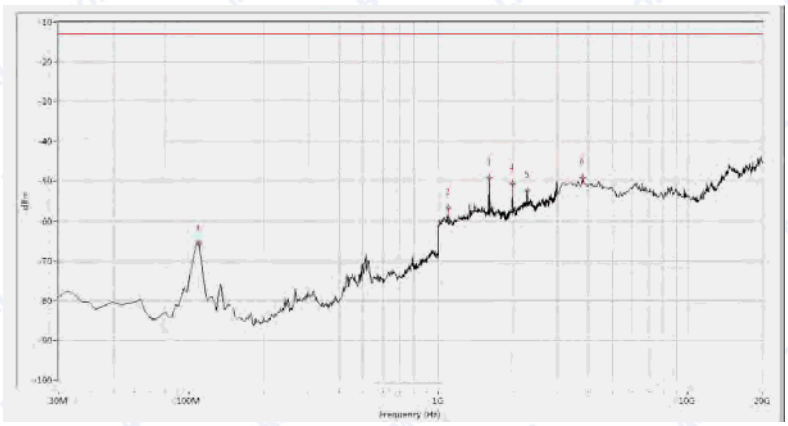
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -62.65 | -13.0 | 49.6 | 35.1 | Horizontal | PASS |
| 1104.738 | -53.22 | -13.0 | 40.2 | 187.6 | Horizontal | PASS |
| 1598.504 | -50.28 | -13.0 | 37.3 | 275.4 | Horizontal | PASS |
| 1957.606 | -51.65 | -13.0 | 38.6 | 194.3 | Horizontal | N.A |
| 3763.092 | -47.56 | -13.0 | 34.6 | 117.2 | Horizontal | PASS |
| 14827.930 | -44.96 | -13.0 | 32.0 | 43.9 | Horizontal | PASS |

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



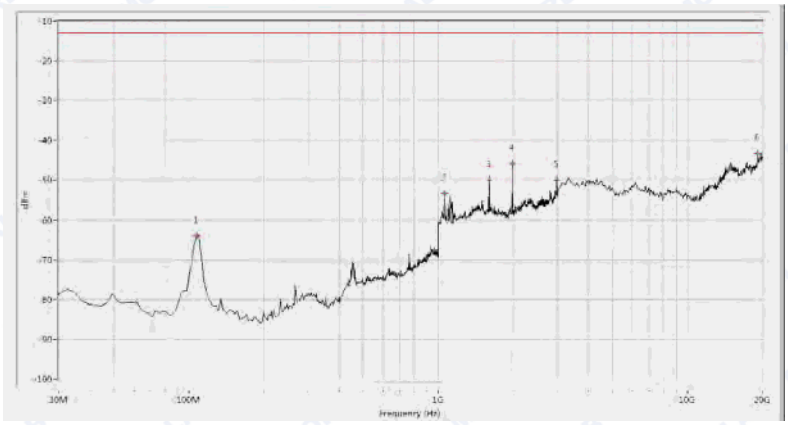
| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -62.78 | -13.0 | 49.8 | 129.9 | Vertical | PASS |
| 1124.688 | -50.30 | -13.0 | 37.3 | 189.4 | Vertical | PASS |
| 1598.504 | -50.49 | -13.0 | 37.5 | 253.5 | Vertical | PASS |
| 1957.606 | -47.81 | -13.0 | 34.8 | 345.0 | Vertical | N.A |
| 3975.062 | -49.27 | -13.0 | 36.3 | 343.1 | Vertical | PASS |
| 19618.454 | -43.34 | -13.0 | 30.3 | 360.0 | Vertical | PASS |

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



| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 109.825 | -65.63 | -13.0 | 52.6 | 22.0 | Horizontal | PASS |
| 1094.763 | -56.69 | -13.0 | 43.7 | 224.8 | Horizontal | PASS |
| 1598.504 | -49.29 | -13.0 | 36.3 | 88.2 | Horizontal | PASS |
| 1987.531 | -50.71 | -13.0 | 37.7 | 339.8 | Horizontal | N.A |
| 2276.808 | -52.49 | -13.0 | 39.5 | 166.0 | Horizontal | PASS |
| 3805.486 | -49.26 | -13.0 | 36.3 | 107.6 | Horizontal | PASS |

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



| Fre. (MHz) | Peak | Limit(PK) | Margin | Degree | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 107.406 | -63.99 | -13.0 | 51.0 | -0.0 | Vertical | PASS |
| 1059.850 | -53.31 | -13.0 | 40.3 | 3.4 | Vertical | PASS |
| 1598.504 | -49.99 | -13.0 | 37.0 | 270.9 | Vertical | PASS |
| 1987.531 | -45.74 | -13.0 | 32.7 | 310.4 | Vertical | N.A |
| 2990.025 | -49.91 | -13.0 | 36.9 | 360.0 | Vertical | PASS |
| 19109.726 | -43.35 | -13.0 | 30.3 | 248.6 | Vertical | PASS |

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

** END OF REPORT **