# TEST REPORT

| | | |
|---|---|---|
| **APPLICANT** | : | LG Electronics USA,Inc. |
| **PRODUCT NAME** | : | Smartphone |
| **MODEL NAME** | : | LM-X440IM |
| **BRAND NAME** | : | LG |
| **FCC ID** | : | ZNFX440IM |
| **STANDARD(S)** | : | 47 CFR Part 22 Subpart H<br>47 CFR Part 24 Subpart E |
| **RECEIPT DATE** | : | 2019-06-06 |
| **TEST DATE** | : | 2019-06-06 to 2019-08-09 |
| **ISSUE DATE** | : | 2019-08-13 |

Edited by: Zhao Zetian

ZhaoZetian (Rapporteur)

Approved by: Peng Hu

Peng Huarui ( Supervisor )

**NOTE:** This document is issued by MORLAB, the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

# DIRECTORY

1. Technical Information ····· 4
1.1. Applicant and Manufacturer Information ····· 4
1.2. Equipment Under Test (EUT) Description ····· 4
1.3. Test Standards and Results ····· 6
1.4. Environmental Conditions ····· 8
2. 47 CFR Part 2, Part 22H , 24E&27L Requirements ····· 9
2.1. Conducted RF Output Power ····· 9
2.2. Peak to Average Ratio ····· 11
2.3. 99% Occupied Bandwidth ····· 19
2.4. Frequency Stability ····· 24
2.5. Conducted Out of Band Emissions ····· 27
2.6. Band Edge ····· 28
2.7. Transmitter Radiated Power (EIRP/ERP) ····· 32
2.8. Radiated Out of Band Emissions ····· 36
Annex A Test Uncertainty ····· 51
Annex B Testing Laboratory Information ····· 52

| Change History | | |
|---|---|---|
| **Version** | **Date** | **Reason for change** |
| 1.0 | 2019-08-13 | Initial Version |
| | | |

# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

| | |
|---|---|
| **Applicant:** | LG Electronics USA,Inc. |
| **Applicant Address:** | 1000 Sylvan Ave. Englewood Cliffs,New Jersey,United States 07632 |
| **Manufacturer:** | OPTIEMUS ELECTRONICS LIMITED . |
| **ManufacturerAddress:** | D-348, Sector 63, Gautam Budh Nagar, Noida, Uttar Pradesh 201307 India |

## 1.2. Equipment Under Test (EUT) Description

| | | |
|---|---|---|
| **Product Name:** | Smartphone | |
| **Serial No:** | (N/A, marked #1 by test site) | |
| **Hardware Version:** | V0.10 | |
| **Software Version:** | LG_IM-X440IM_Software | |
| **Modulation Type:** | GSM/GPRS Mode with GMSK Modulation<br>EDGE Mode with 8PSK Modulation | |
| **Operating Frequency Range:** | **GSM 850MHz:**<br>Tx: 824.20 - 848.80MHz<br>Rx: 869.20 - 893.80MHz<br>**GSM 1900MHz:**<br>Tx: 1850.20 - 1909.80MHz<br>Rx: 1930.20 - 1989.80MHz | |
| **Antenna Type:** | Fixed Internal | |
| **Antenna Gain:** | GSM 850: | -1.5 dBi |
| | GSM1900: | -0.5 dBi |
| **Accessory Information:** | Battery | |
| | Brand Name: | LG |
| | Model No.: | LG4000STCL02 |
| | Serial No.: | (N/A, marked #1 by test site) |
| | Capacity: | 3900mAh |
| | Rated Voltage: | 3.85 |
| | Charge Limit: | 4.4V |

| | | |
|---|---|---|
| | AC Adapter Type1 | |
| | Brand Name: | N/A |
| | Model No.: | TN-050200U4 |
| | Serial No.: | (N/A, marked #1 by test site) |
| | Rated Input: | 100-240V~50/60Hz 0.35A |
| | Rated Output: | 5V⎓ 2A |
| | AC Adapter Type2 | |
| | Brand Name: | N/A |
| | Model No.: | LG2AUKPA-1 |
| | Serial No.: | (N/A, marked #1 by test site) |
| | Rated Input: | 100-240V~50/60Hz 0.35A |
| | Rated Output: | 5V⎓ 2A |

**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:** All modes and data rates were considered and evaluated respectively by performing full test. Test modes are chosen to be reported as the worst case below:
GPRS mode and EDGE mode for GSM 850;
GPRS mode and EDGE mode for GSM 1900;

**Note 4:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.3. Maximum ERP/EIRP and Emission Designator

| System | Maximum ERP/EIRP (W) | Emission Designator |
|---|---|---|
| GSM850 | 0.744 | 258KGXW |
| EDGE850 | 0.151 | 246KG7W |
| GSM1900 | 0.596 | 249KGXW |
| EDGE1900 | 0.215 | 246KG7W |

## 1.4. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22, Part 24 and Part 27 for the EUT FCC ID Certification:

| No | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 2(10-1-12 Edition) | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| 2 | 47 CFR Part 22(10-1-12 Edition) | Public Mobile Services |
| 3 | 47 CFR Part 24(10-1-12 Edition) | Personal Communications Services |

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

| No. | Section | Description | Test Date | Test Engineer | Result |
|---|---|---|---|---|---|
| 1 | 2.1046 | Conducted RF Output Power | Jun17, 2019 | Gao Mingzhou | PASS |
| 2 | 24.232(d), | Peak -Average Ratio | Jun17, 2019 | Gao Mingzhou | PASS |
| 3 | 2.1049 | 99% Occupied Bandwidth | Jun17, 2019 | Gao Mingzhou | PASS |
| 4 | 2.1055,22.355, 24.235, 27.54 | Frequency Stability | Jul07&08, 2019 | Gao Mingzhou | PASS |
| 5 | 2.1051,22.917(a),24.238(a), | Conducted Out of Band Emissions | Jul07&16, 2019 | Gao Mingzhou | PASS |
| 6 | 2.1051,22.917(a),24.238(a), | Band Edge | Jul17, 2019 | Gao Mingzhou | PASS |
| 7 | 22.913(a),24.232(a) | Transmitter Radiated Power (EIPR/ERP) | Jul20, 2019 | Peng Xuewei | PASS |
| 8 | 2.1051,22.917(a),24.238(a), | Radiated Out of Band Emissions | Jul021, 2019 | Peng Xuewei | PASS |

**Note 1:** The tests were performed according to the method of measurements prescribed in KDB 971168 D01 V03R01 (Oct 27, 2017)and ANSI/TIA-603-E-2016.

**Note 2:** The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 26.5dB contains two parts that cable loss 16.5dB and Attenuator 10dB.

## 1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature (°C): | 15 - 35 |
| Relative Humidity (%): | 30 -60 |
| Atmospheric Pressure (kPa): | 86-106 |

# 2. 47 CFR Part 2, Part 22H , 24E&27L Requirements

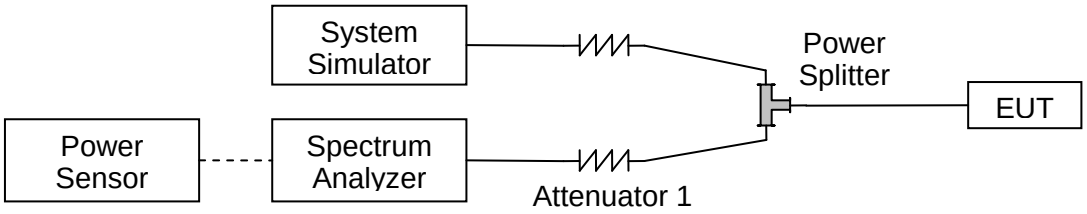
## 2.1. Conducted RF Output Power

### 2.1.1. Requirement

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

### 2.1.2. Test Description

Test Setup:




The EUTis 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.

### 2.1.3. Test Results

| GSM850 | Average Power (dBm) | | |
|---|---|---|---|
| **TX Channel** | **128** | **190** | **251** |
| **Frequency (MHz)** | **824.2** | **836.6** | **848.8** |
| GSM 1 Tx slot | 33.04 | 33.01 | 33.02 |
| GPRS 1 Tx slot | 33.05 | 33.01 | 33.04 |
| GPRS 2 Tx slots | 32.04 | 32.15 | 32.15 |
| GPRS 3 Tx slots | 29.97 | 30.08 | 30.06 |
| GPRS 4 Tx slots | 28.87 | 28.92 | 28.93 |
| EDGE 1 Tx slot | 26.34 | 26.24 | 26.17 |
| EDGE 2 Tx slots | 25.33 | 25.18 | 25.13 |
| EDGE 3 Tx slots | 23.21 | 23.12 | 23.08 |
| EDGE 4 Tx slots | 22.31 | 22.14 | 22.10 |

| GSM1900 | Average Power (dBm) | | |
|---|---|---|---|
| **TX Channel** | **512** | **661** | **810** |
| **Frequency (MHz)** | **1850.2** | **1880** | **1909.8** |
| GSM 1 Tx slot | 30.15 | 30.12 | 30.01 |
| GPRS 1 Tx slot | 30.16 | 30.13 | 30.04 |
| GPRS 2 Tx slots | 29.16 | 29.14 | 29.16 |
| GPRS 3 Tx slots | 27.12 | 27.11 | 27.01 |
| GPRS 4 Tx slots | 26.15 | 26.17 | 26.05 |
| EDGE 1 Tx slot | 25.73 | 25.68 | 25.71 |
| EDGE 2 Tx slots | 24.72 | 24.75 | 24.70 |
| EDGE 3 Tx slots | 22.74 | 22.73 | 22.78 |
| EDGE 4 Tx slots | 21.61 | 21.65 | 21.68 |

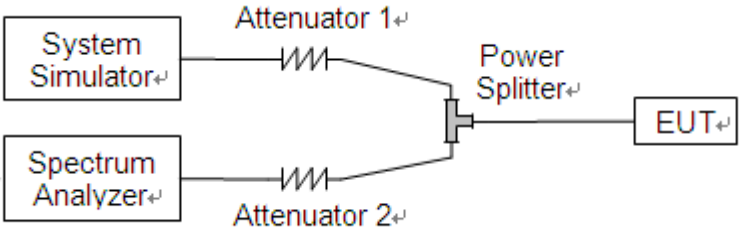
## 2.2. Peak to Average Ratio

### 2.2.1. Requirement

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

### 2.2.2. Test Description

Test Setup:




The EUTis 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.

### 2.2.3. Test procedure

1 .For GSM/EDGE 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 ratio.

2.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%.

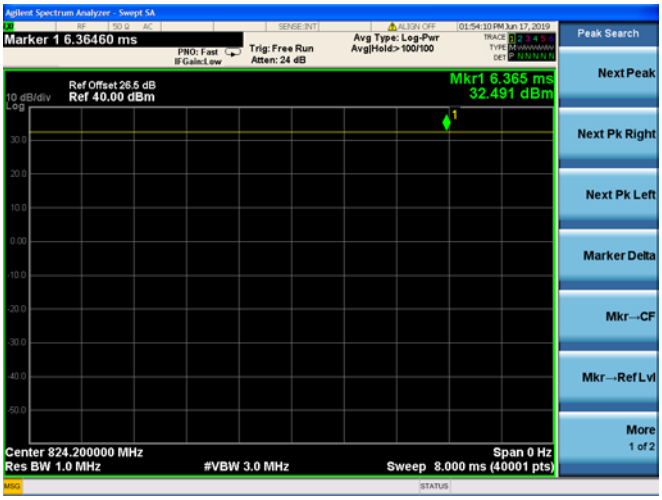
### 2.2.4. Test Result

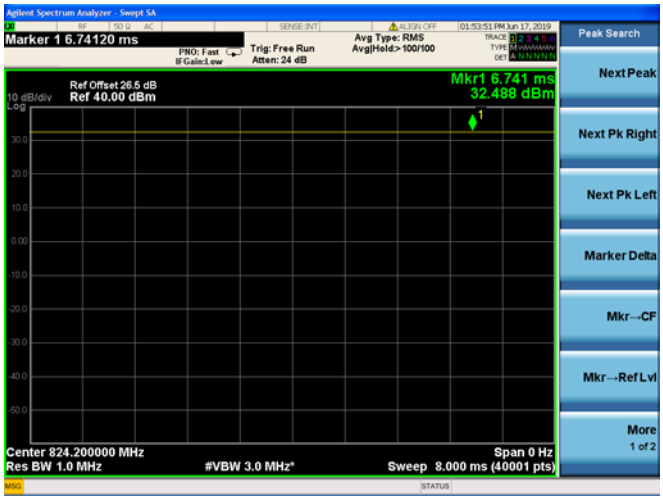
The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

**A. Test Verdict:**

| Band | Channel | Frequency (MHz) | Peak to Average ratio dB | Limit dB | Verdict |
|---|---|---|---|---|---|
| GSM850MHz | 128 | 824.2 | 0.003 | 13 | PASS |
| | 190 | 836.6 | 0.003 | | PASS |
| | 251 | 848.8 | 0.002 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | 0.024 | | PASS |
| | 661 | 1880.0 | 0.029 | | PASS |
| | 810 | 1909.8 | 0.027 | | PASS |
| GPRS850NHz | 128 | 824.2 | 0.607 | | PASS |
| | 190 | 836.6 | 0.003 | | PASS |
| | 251 | 848.8 | 0.009 | | PASS |
| GPRS1900 MHz | 512 | 1850.2 | 0.022 | | PASS |
| | 661 | 1880.0 | 0.016 | | PASS |
| | 810 | 1909.8 | 0.041 | | PASS |
| EDGE850 MHz | 128 | 824.2 | 1.111 | | PASS |
| | 190 | 836.6 | 0.015 | | PASS |
| | 251 | 848.8 | 0.013 | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | 0.022 | | PASS |
| | 661 | 1880.0 | 0.003 | | PASS |
| | 810 | 1909.8 | 0.003 | | PASS |

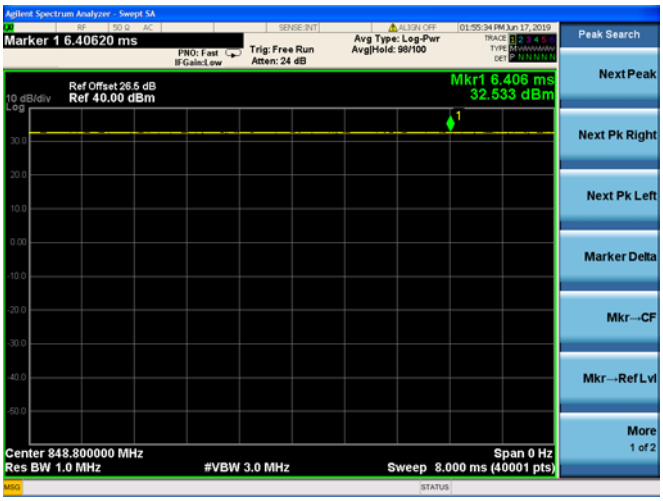
## GSM 850MHz CH128 824.2MHz



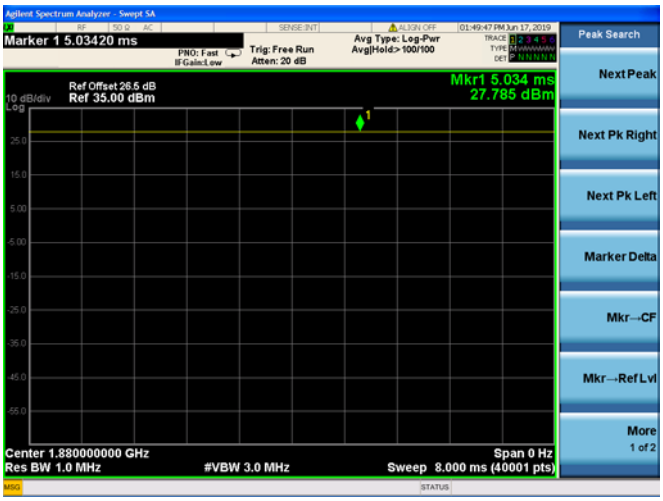

## GSM 850MHz CH190 836.6MHz

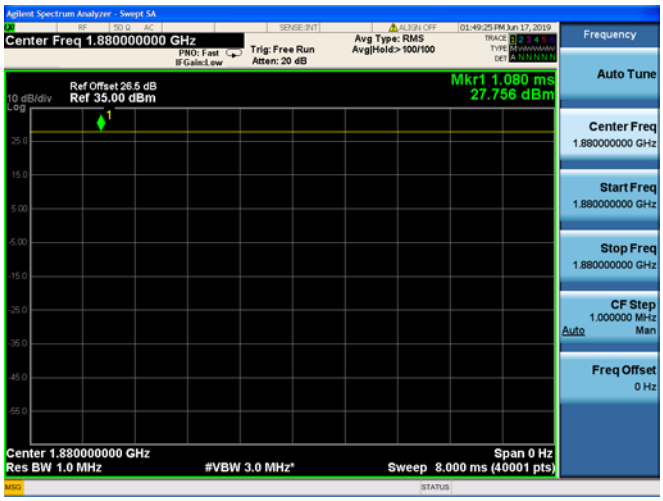
## GSM 850MHz CH251 848.8MHz



## GSM 1900MHz CH512 1850.2MHz

## GSM 1900MHz CH661 1880.0MHz




## GSM 1900MHz CH810 1909.8MHz

## GPRS 850MHz CH128 824.2MHz

## GPRS 850MHz CH190 836.6MHz

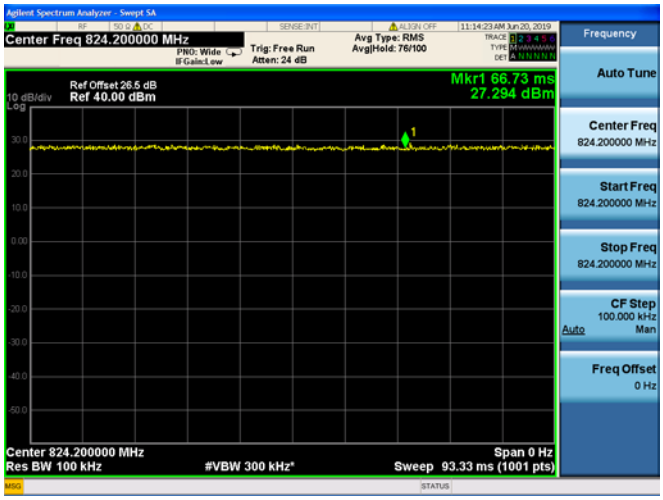
## GPRS 850MHz CH251 848.8MHz

## GPRS 1900MHz CH512 1850.2MHz

## GPRS 850MHz CH661 1880.0MHz

## GPRS 850MHz CH810 1909.8MHz

## EDGE 850MHz CH128 824.2MHz

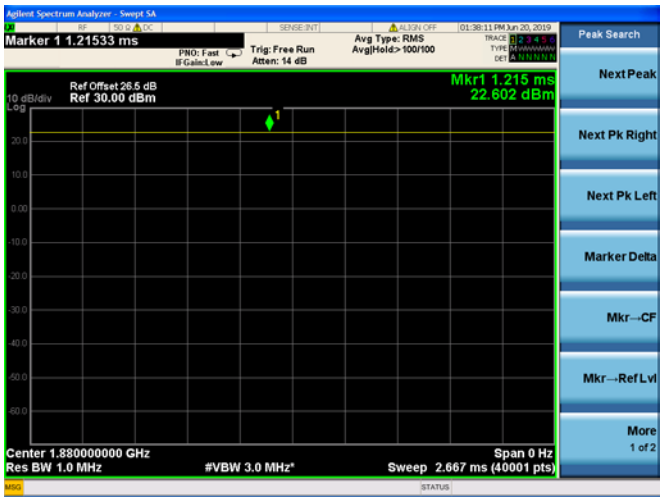



## EDGE 850MHz CH190 836.6MHz

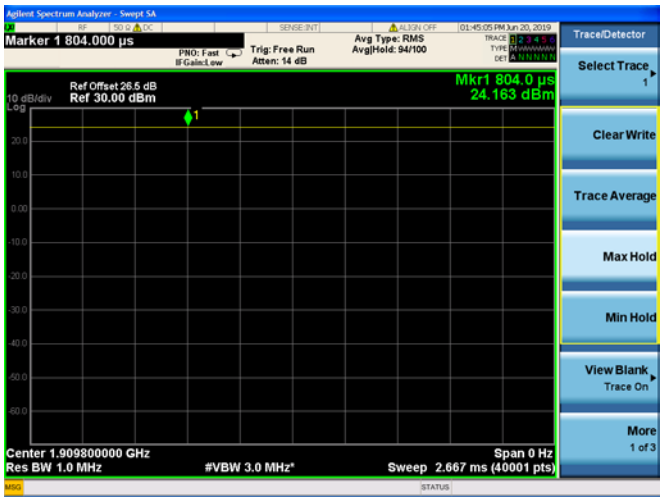
## EDGE 850MHz CH251 848.8MHz

## EDGE 1900MHz CH512 1850.2MHz

## EDGE 1900MHz CH661 1880.0MHz




## EDGE 1900MHz CH810 1909.8MHz



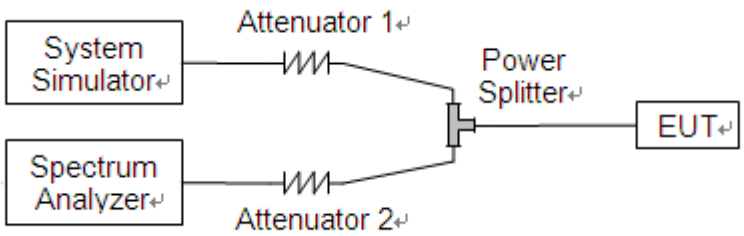
## 2.3. 99% Occupied Bandwidth

### 2.3.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.Occupied bandwidth is also known as the 99% emission bandwidth.

### 2.3.2. Test Description

Test Setup:




The EUTis 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.

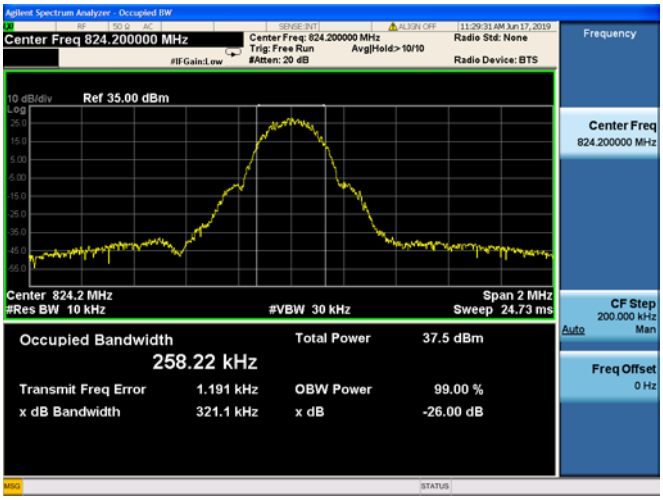
### 2.3.3. Test Result

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

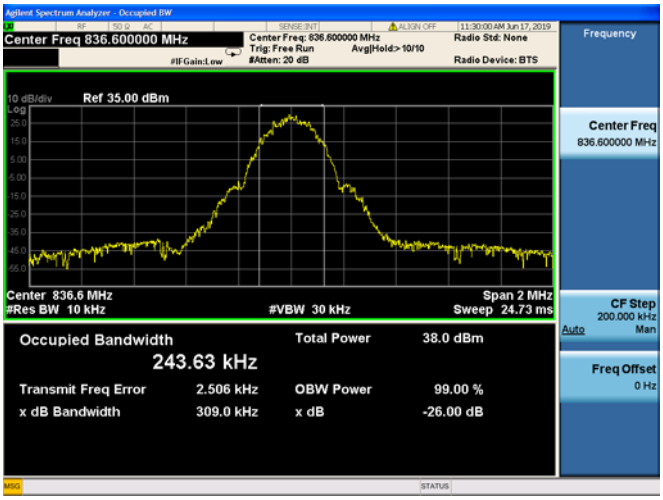
**GSM Test Verdict:**

| Band | Channel | Frequency (MHz) | 99% Occupied Bandwidth (kHz) | 26dB Bandwidth (kHz) |
|---|---|---|---|---|
| GSM 850MHz | 128 | 824.2 | 258.22 | 321.1 |
| | 190 | 836.6 | 243.63 | 309.0 |
| | 251 | 848.8 | 246.67 | 320.0 |
| GSM 1900MHz | 512 | 1850.2 | 244.82 | 314.0 |
| | 661 | 1880.0 | 244.59 | 317.0 |
| | 810 | 1909.8 | 249.20 | 315.6 |
| GPRS 850MHz | 128 | 824.2 | 243.75 | 316.2 |
| | 190 | 836.6 | 243.75 | 317.7 |
| | 251 | 848.8 | 246.39 | 316.3 |
| GPRS 1900MHz | 512 | 1850.2 | 246.59 | 315.8 |
| | 661 | 1880.0 | 248.26 | 317.1 |
| | 810 | 1909.8 | 244.35 | 319.1 |
| EDGE 850MHz | 128 | 824.2 | 245.52 | 316.8 |
| | 190 | 836.6 | 246.30 | 313.6 |
| | 251 | 848.8 | 243.81 | 309.6 |
| EDGE 1900MHz | 512 | 1850.2 | 245.39 | 319.5 |
| | 661 | 1880.0 | 246.11 | 317.3 |
| | 810 | 1909.8 | 245.46 | 316.7 |

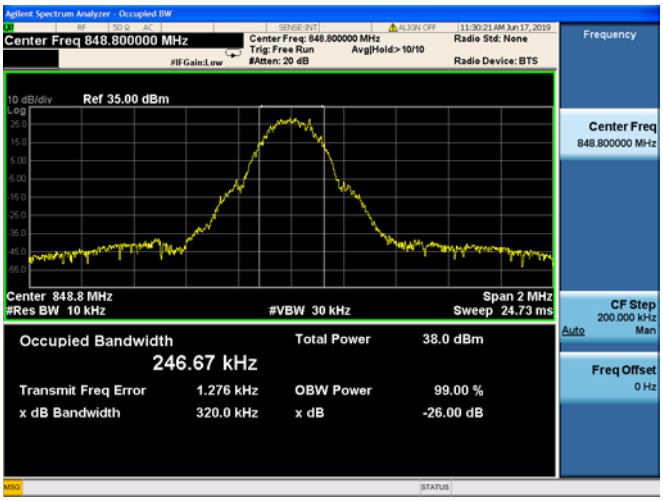
## GSM 850MHz CH128 824.2MHz



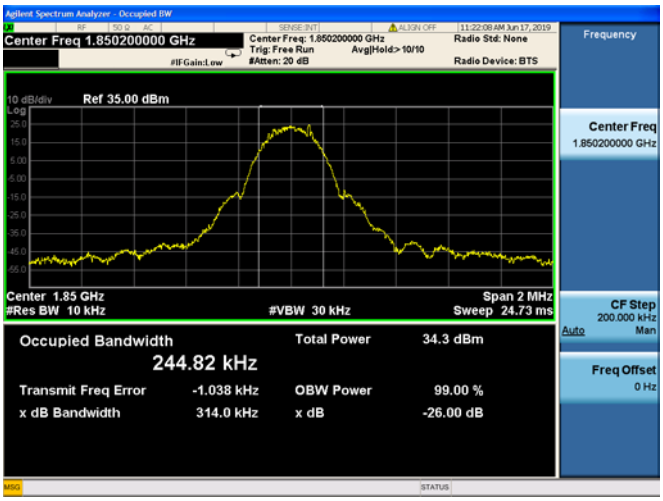

## GSM 850MHz CH190 836.6MHz



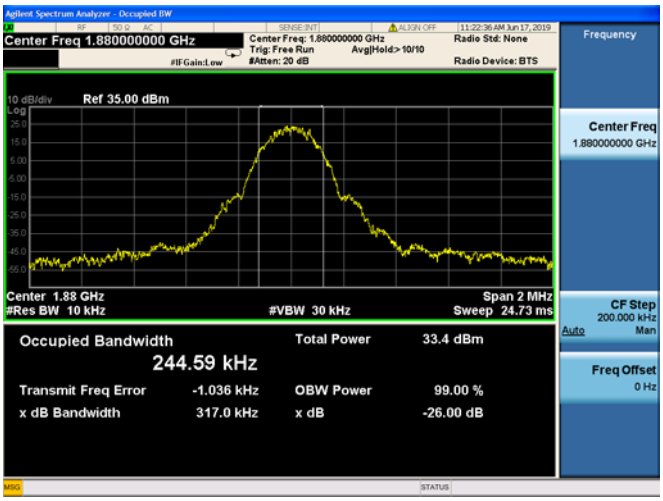

## GSM 850MHz CH251 848.8MHz



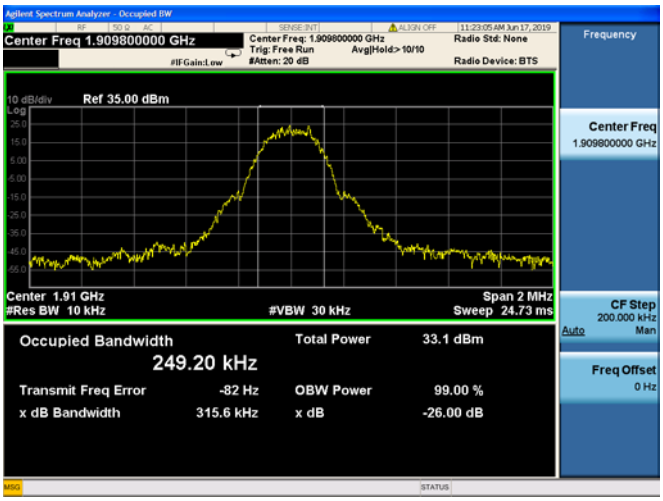

## GSM 1900MHz CH512 1850.2MHz



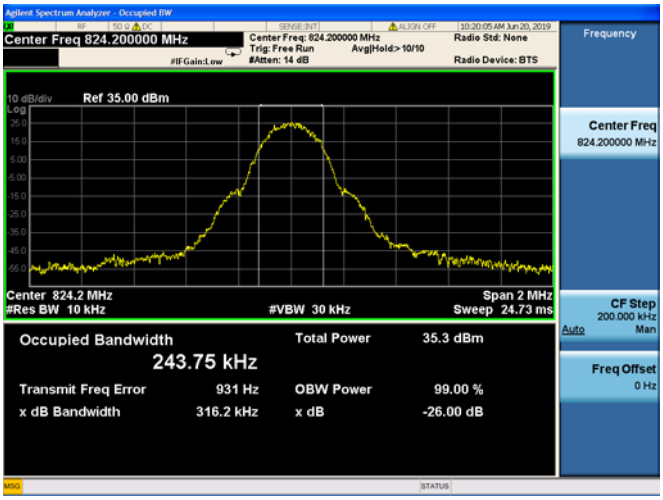

## GSM 1900MHz CH661 1880.0MHz



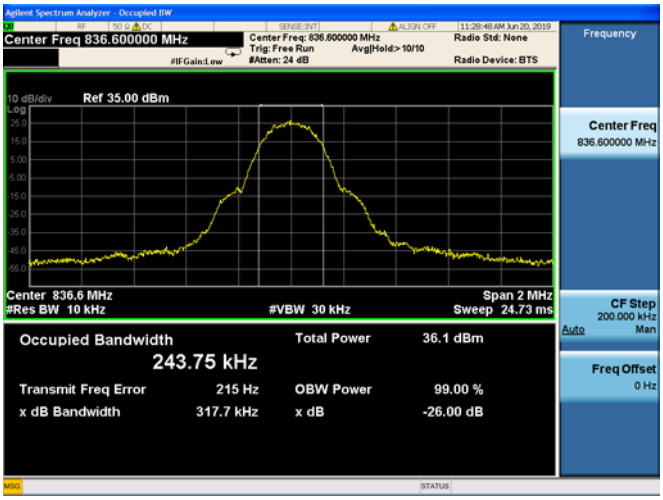

## GSM 1900MHz CH810 1909.8MHz



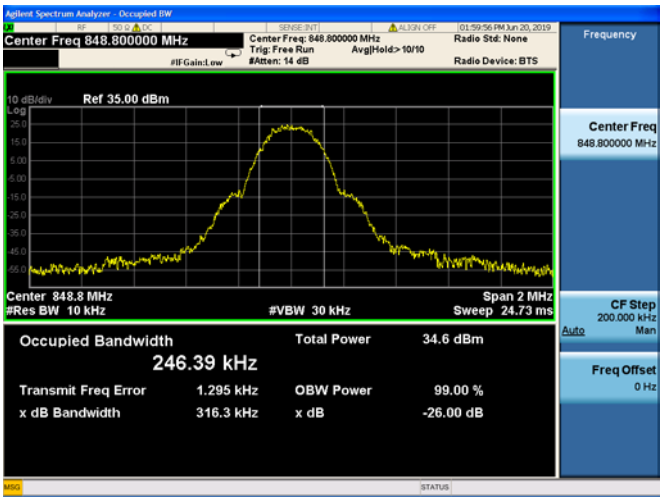
## GPRS 850MHz CH128 824.2MHz



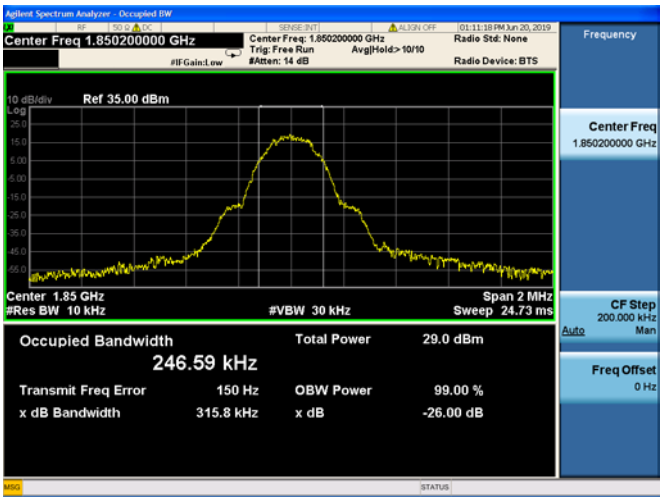

## GPRS 850MHz CH190 836.6MHz



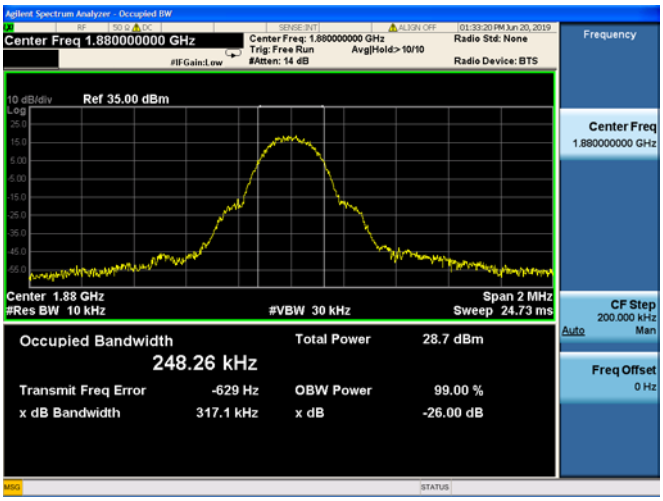

## GPRS 850MHz CH251 848.8MHz



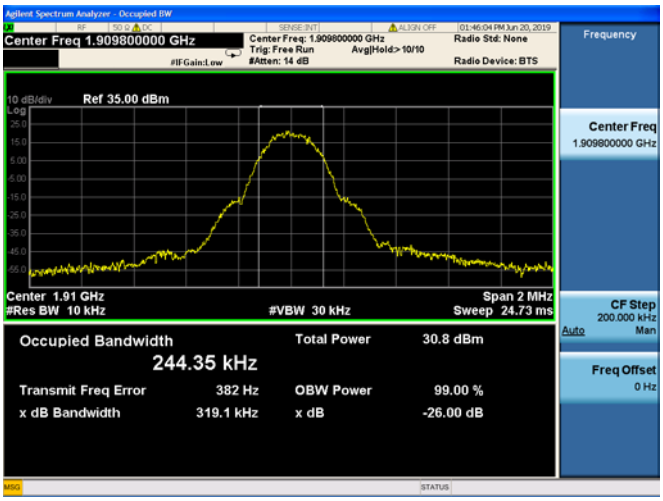

## GPRS 1900MHz CH512 1850.2MHz



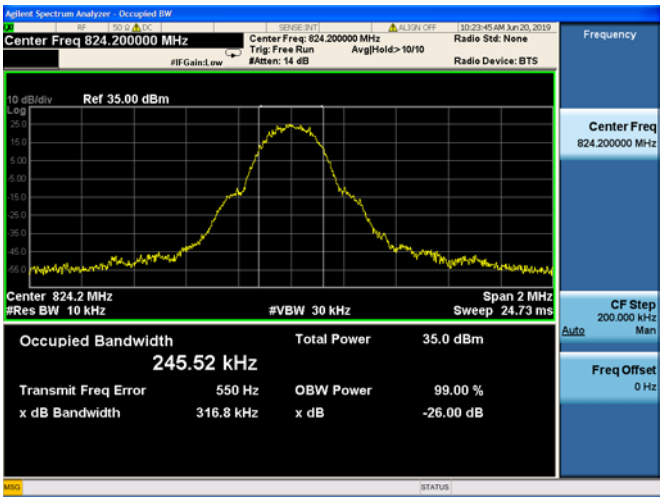

## GPRS 1900MHz CH661 1880MHz



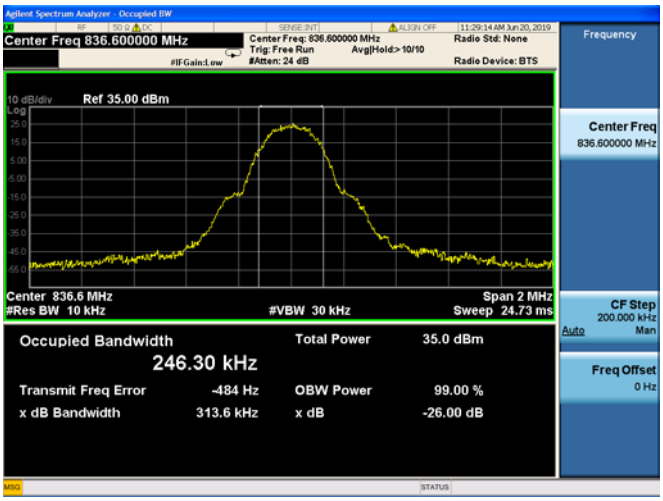

## GPRS 1900MHz CH810 1909.8MHz



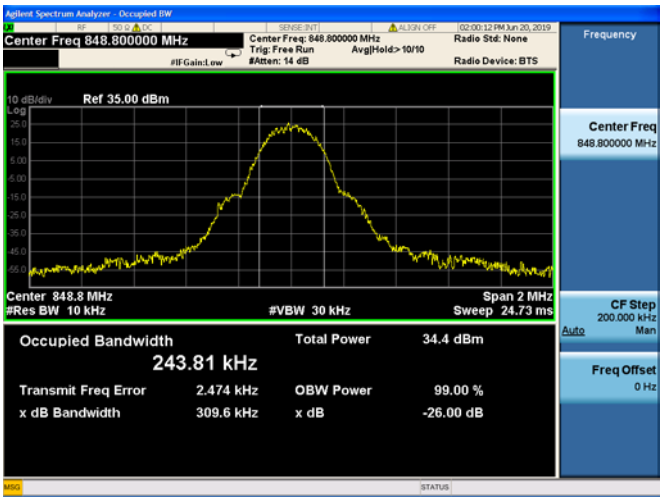
## EDGE 850MHz CH128 824.2MHz



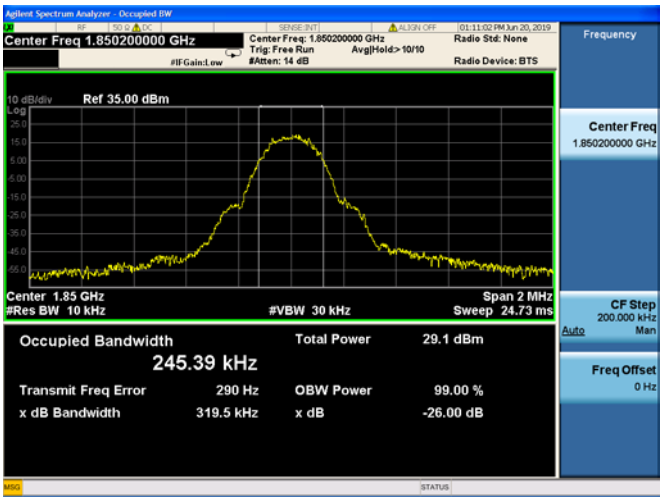

## EDGE 850MHz CH190 836.6MHz



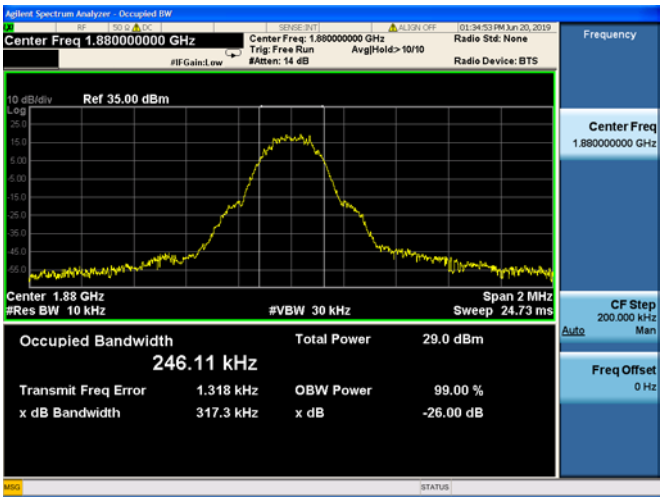

## EDGE 850MHz CH251 848.8MHz



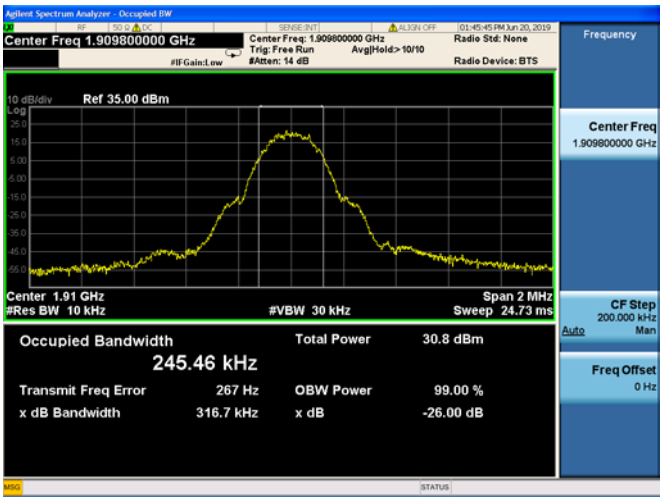

## EDGE 1900MHz CH512 1850.2MHz




## EDGE 1900MHzCH661 1880.0MHz




## EDGE 1900MHzCH810 1909.8MHz



## 2.4. Frequency Stability

### 2.4.1. Requirement

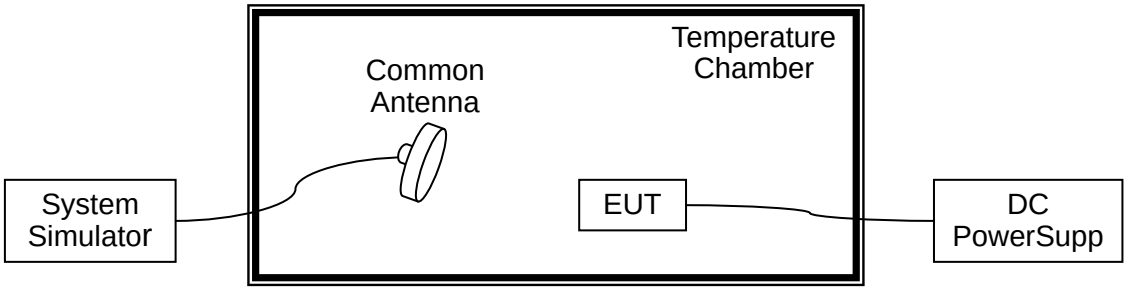
According to FCC section 22.355, 24.235 and 27.54 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

### 2.4.2. Test Description

Test Setup:




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

### 2.4.3. Test Result

**A. Test Verdict:**

| GSM 850MHz, Channel 190, Frequency 836.6MHz<br>Limit =±2.5ppm | | | | | |
|---|---|---|---|---|---|
| **Voltage(%)** | **Power(VDC)** | **Temp(°C)** | **Fre. Dev. (Hz)** | **Deviation (ppm)** | **Result** |
| 100 | 3.8V | +20(Ref) | 14 | 0.017 | PASS |
| 100 | | -30 | -5 | -0.006 | |
| 100 | | -20 | -36 | -0.043 | |
| 100 | | -10 | -71 | -0.085 | |
| 100 | | 0 | -44 | -0.053 | |
| 100 | | +10 | 26 | 0.031 | |
| 100 | | +20 | 41 | 0.049 | |
| 100 | | +30 | 96 | 0.115 | |
| 100 | | +40 | 27 | 0.032 | |
| 100 | | +50 | 37 | 0.044 | |
| 115 | 4.4V | +20 | -16 | -0.019 | |
| 85 | 3.5V | +20 | -71 | -0.085 | |

| GSM 1900MHz, Channel 661, Frequency 1880.0MHz<br>Limit =Within Authorized Band | | | | | |
|---|---|---|---|---|---|
| **Voltage(%)** | **Power(VDC)** | **Temp(°C)** | **Fre. Dev. (Hz)** | **Deviation (ppm)** | **Result** |
| 100 | 3.8V | +20(Ref) | 74 | 0.039 | PASS |
| 100 | | -30 | 23 | 0.012 | |
| 100 | | -20 | 73 | 0.039 | |
| 100 | | -10 | -74 | -0.039 | |
| 100 | | 0 | -67 | -0.036 | |
| 100 | | +10 | -44 | -0.023 | |
| 100 | | +20 | 52 | 0.028 | |
| 100 | | +30 | 29 | 0.015 | |
| 100 | | +40 | 22 | 0.012 | |
| 100 | | +50 | 35 | 0.019 | |
| 115 | 4.4V | +20 | 35 | 0.019 | |
| 85 | 3.5V | +20 | -49 | -0.026 | |

| EDGE 850MHz, Channel 190, Frequency 836.6MHz<br>Limit =±2.5ppm | | | | | |
|---|---|---|---|---|---|
| **Voltage(%)** | **Power(VDC)** | **Temp(°C)** | **Fre. Dev. (Hz)** | **Deviation (ppm)** | **Result** |
| 100 | 3.8V | +20(Ref) | 15 | 0.018 | PASS |
| 100 | | -30 | -13 | -0.016 | |
| 100 | | -20 | -25 | -0.030 | |
| 100 | | -10 | -66 | -0.079 | |
| 100 | | 0 | -37 | -0.044 | |
| 100 | | +10 | 15 | 0.018 | |
| 100 | | +20 | 62 | 0.074 | |
| 100 | | +30 | 75 | 0.090 | |
| 100 | | +40 | 25 | 0.030 | |
| 100 | | +50 | 84 | 0.100 | |
| 115 | 4.4V | +20 | -54 | -0.065 | |
| 85 | 3.5V | +20 | -69 | -0.082 | |

| EDGE 1900MHz, Channel 661, Frequency 1880.0MHz<br>Limit =Within Authorized Band | | | | | |
|---|---|---|---|---|---|
| **Voltage(%)** | **Power(VDC)** | **Temp(°C)** | **Fre. Dev. (Hz)** | **Deviation (ppm)** | **Result** |
| 100 | 3.8V | +20(Ref) | 31 | 0.016 | PASS |
| 100 | | -30 | 52 | 0.028 | |
| 100 | | -20 | 67 | 0.036 | |
| 100 | | -10 | -64 | -0.034 | |
| 100 | | 0 | -31 | -0.016 | |
| 100 | | +10 | -53 | -0.028 | |
| 100 | | +20 | 16 | 0.009 | |
| 100 | | +30 | 78 | 0.041 | |
| 100 | | +40 | 98 | 0.052 | |
| 100 | | +50 | 14 | 0.007 | |
| 115 | 4.4V | +20 | 75 | 0.040 | |
| 85 | 3.5V | +20 | -85 | -0.045 | |

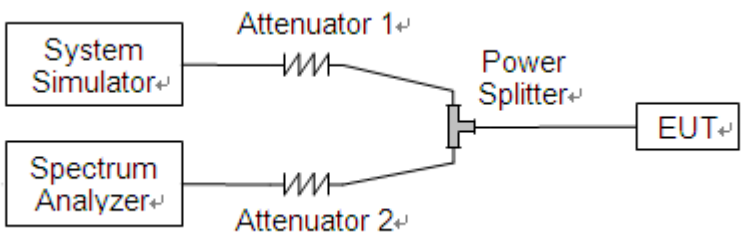
# 2.5. Conducted Out of Band Emissions

## 2.5.1. Requirement

According to FCC section 22.917(a), 24.238(a) and 27.53(h) 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

Test Setup:




The EUTis 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.

## 2.5.3. Test Result

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

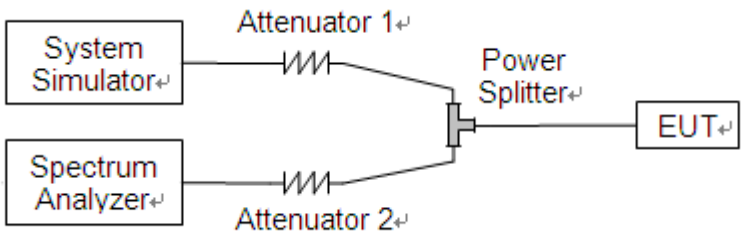
# 2.6. Band Edge

## 2.6.1. Requirement

According to FCC section 22.917(b), 24.238(b) and 27.53(h) 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

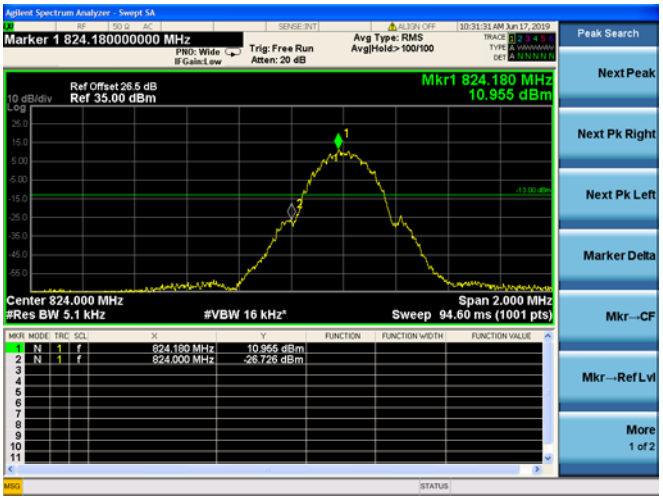
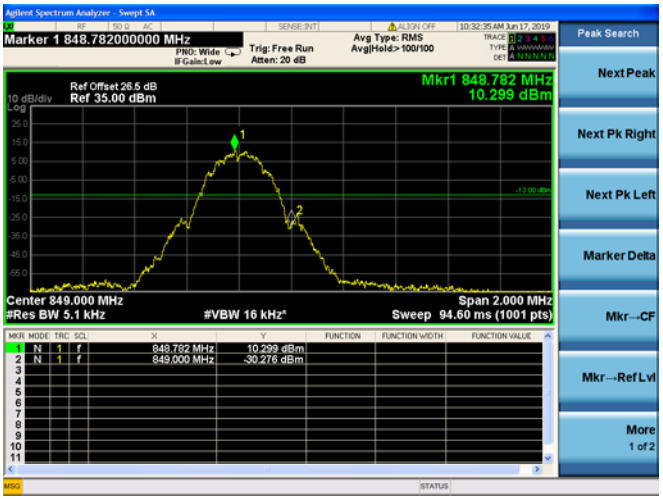
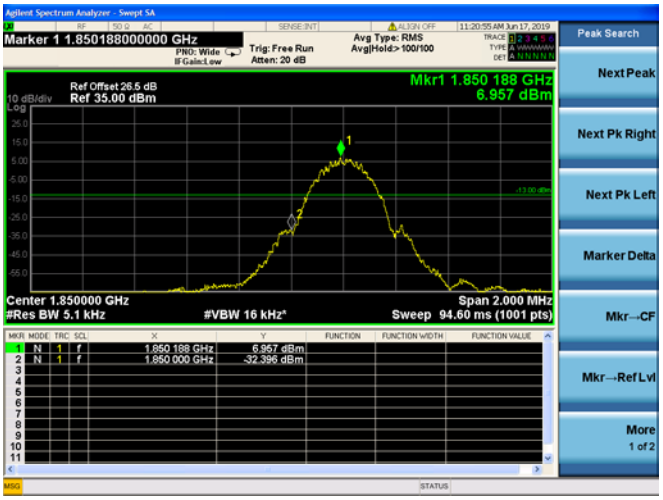
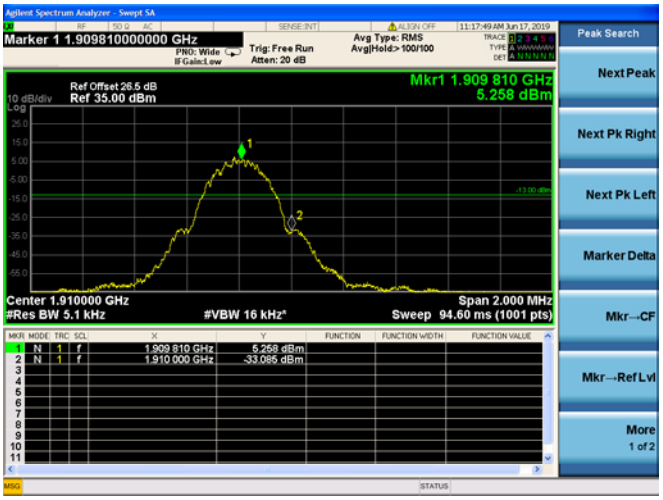
Test Setup:

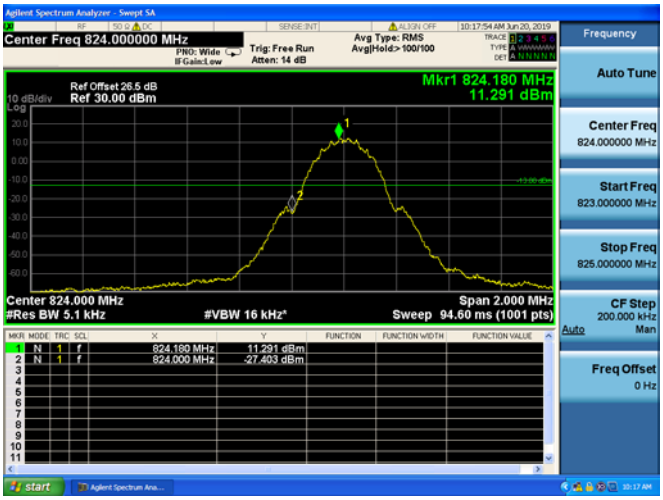
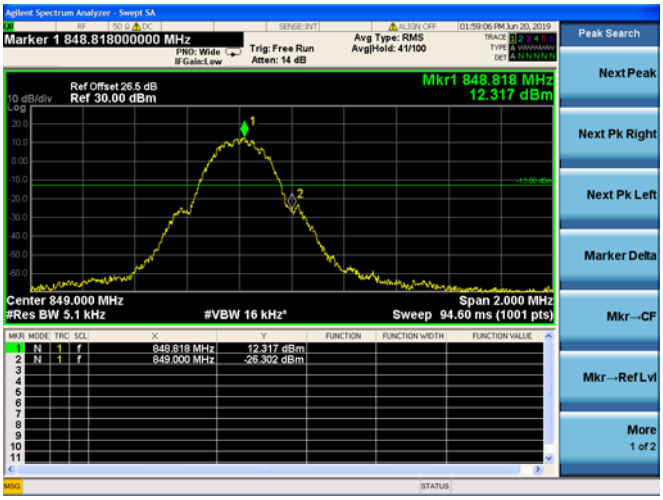
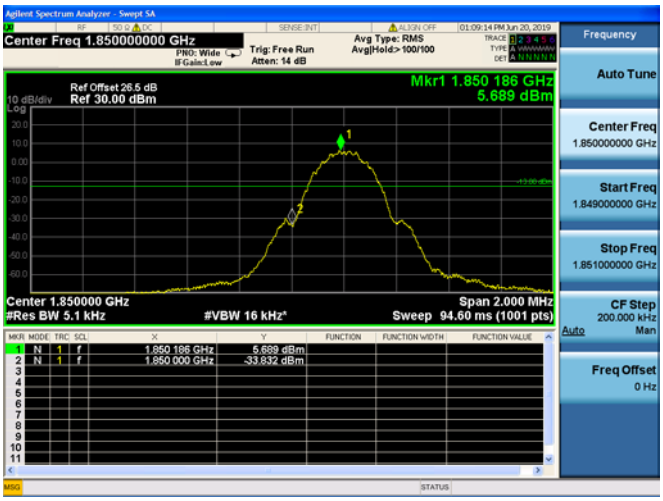
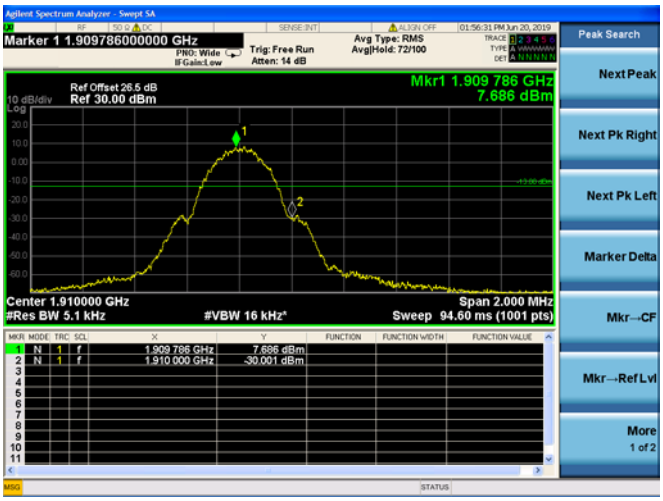


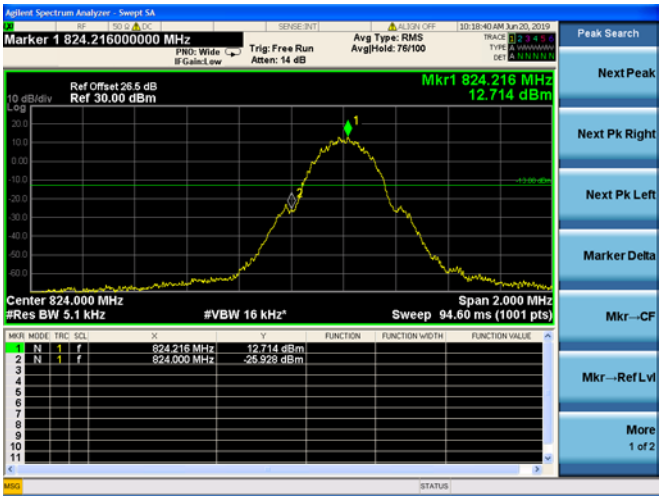
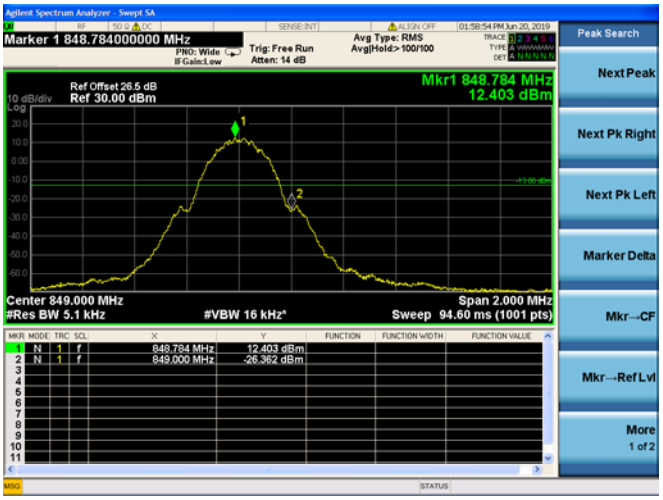
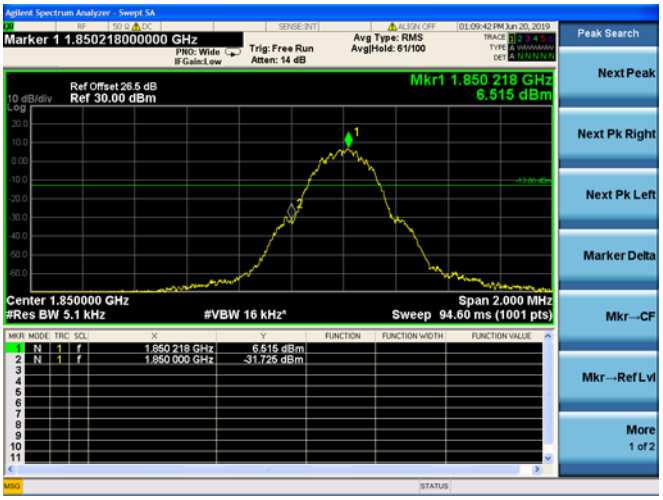
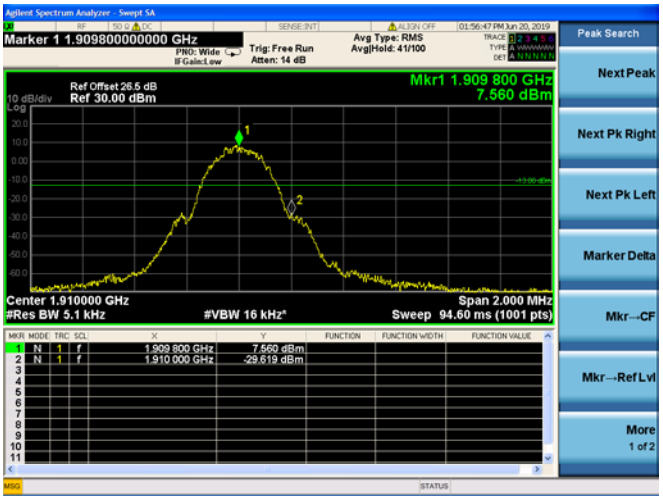

The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

### 2.6.3. Test Result

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

| GSM 850MHz CH128 824.2MHz | GSM 850MHz CH251 848.8MHz |
|---|---|
|  |  |
| **GSM 1900MHz CH521 1850.2MHz** | **GSM 1900MHz CH810 1909.8MHz** |
|  |  |

| GPRS 850MHz CH128 824.2MHz | GSM 850MHz CH251 848.8MHz |
|---|---|
|  |  |
| **GPRS 1900MHz CH521 1850.2MHz** | **GPRS 1900MHz CH810 1909.8MHz** |
|  |  |

| EDGE 850MHz CH128 824.2MHz | EDGE 850MHz CH251 848.8MHz |
|---|---|
|  |  |
| **EDGE 1900MHz CH521 1850.2MHz** | **EDGE 1900MHz CH810 1909.8MHz** |
|  |  |

# 2.7. Transmitter Radiated Power (EIRP/ERP)

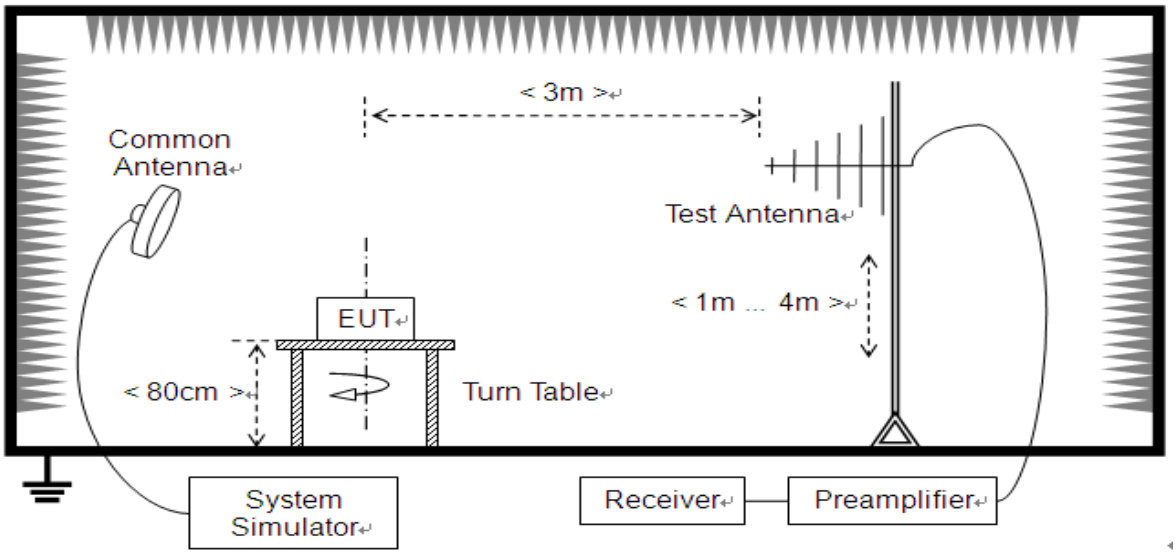
## 2.7.1. Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts.
According to FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.
According to FCC section 27.50, mobile, and portable (hand-held) stations is limited to 1 Watts e.i.r.p. peak power.

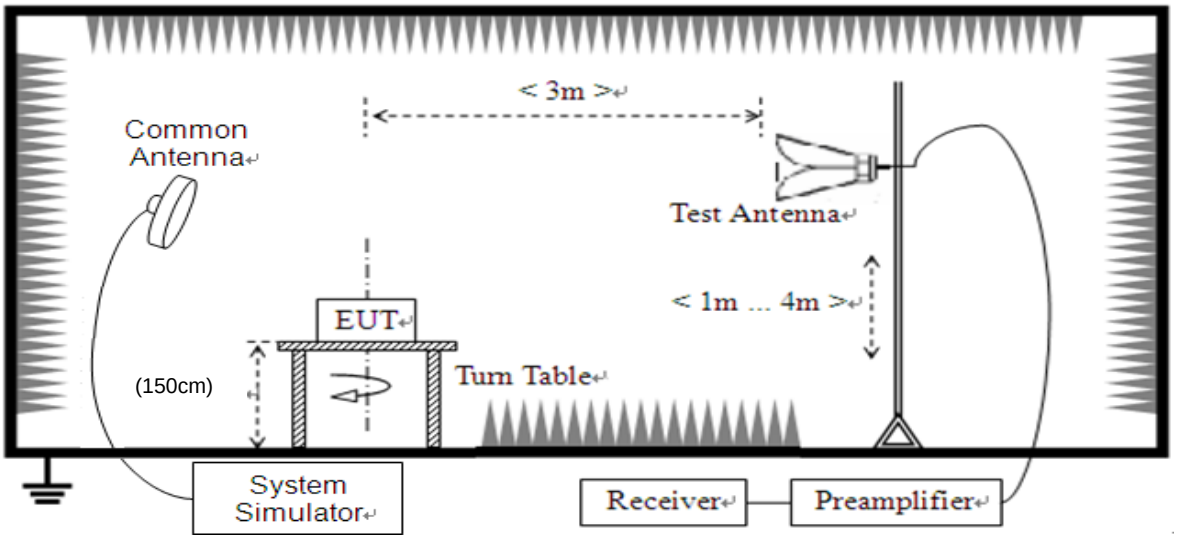
## 2.7.2. Test Description

Test Setup:

1) Below1GHz



2) Above 1GHz




The EUT 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. Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

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

### 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 Test verdict:**

| Band | Channel | Frequency (MHz) | PCL | Measured ERP | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBm | W | dBm | W | |
| GSM 850MHz | 128 | 824.20 | 5 | 28.49 | 0.774 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 28.46 | 0.701 | | | PASS |
| | 251 | 848.80 | 5 | 28.47 | 0.703 | | | PASS |
| GPRS 850MHz | 128 | 824.20 | 5 | 28.50 | 0.708 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 28.46 | 0.701 | | | PASS |
| | 251 | 848.80 | 5 | 28.49 | 0.774 | | | PASS |
| EDGE 850MHz | 128 | 824.20 | 5 | 21.79 | 0.151 | 38.5 | 7 | PASS |
| | 190 | 836.60 | 5 | 21.69 | 0.148 | | | PASS |
| | 251 | 848.80 | 5 | 21.62 | 0.145 | | | PASS |

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

**Note 2:** Both horizontal and vertical polarizations of the test antenna are evaluatedrespectively, only the worst data (horizontal) were recorded in this report.

| Band | Channel | Frequency (MHz) | PCL | Measured EIRP | | Limit | | Verdict |
|---|---|---|---|---|---|---|---|---|
| | | | | dBm | W | dBm | W | |
| GSM 1900MHz | 512 | 1850.2 | 0 | 27.75 | 0.596 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 27.72 | 0.592 | | | PASS |
| | 810 | 1909.8 | 0 | 27.61 | 0.585 | | | PASS |
| GPRS 1900MHz | 512 | 1850.2 | 0 | 27.76 | 0.597 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 27.73 | 0.593 | | | PASS |
| | 810 | 1909.8 | 0 | 27.64 | 0.581 | | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | 0 | 23.33 | 0.215 | 33 | 2 | PASS |
| | 661 | 1880.0 | 0 | 23.28 | 0.213 | | | PASS |
| | 810 | 1909.8 | 0 | 23.31 | 0.214 | | | PASS |

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

**Note 2:** Both horizontal and vertical polarizations of the test antenna are evaluatedrespectively, only the worst data (horizontal) were recorded in this report.

# 2.8. Radiated Out of Band Emissions

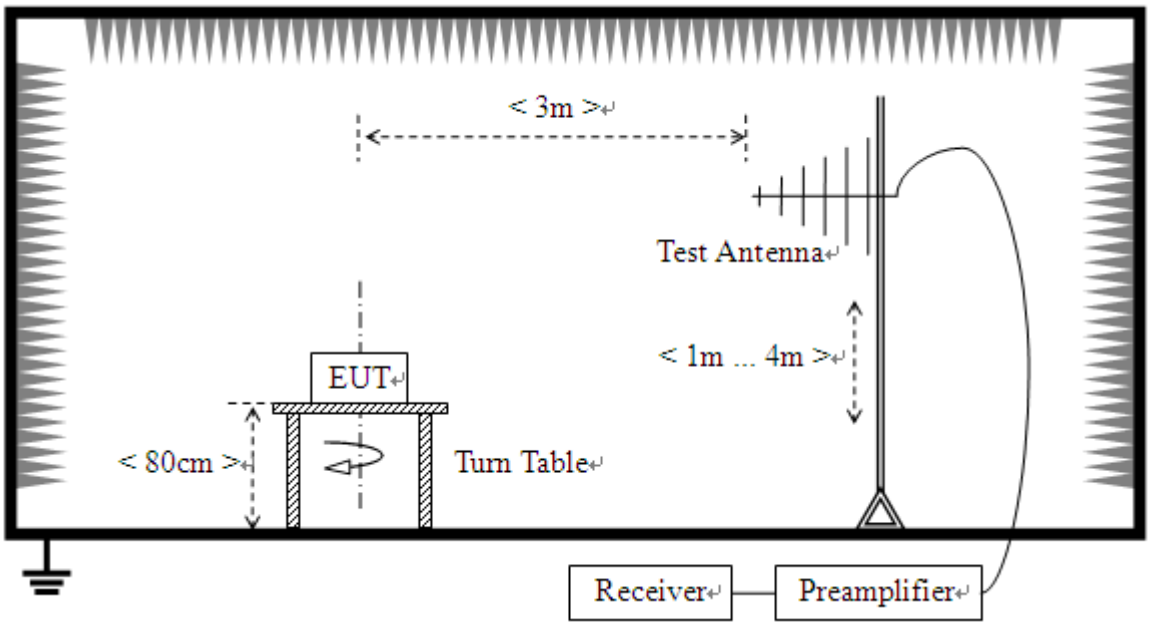
## 2.8.1. Requirement

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.

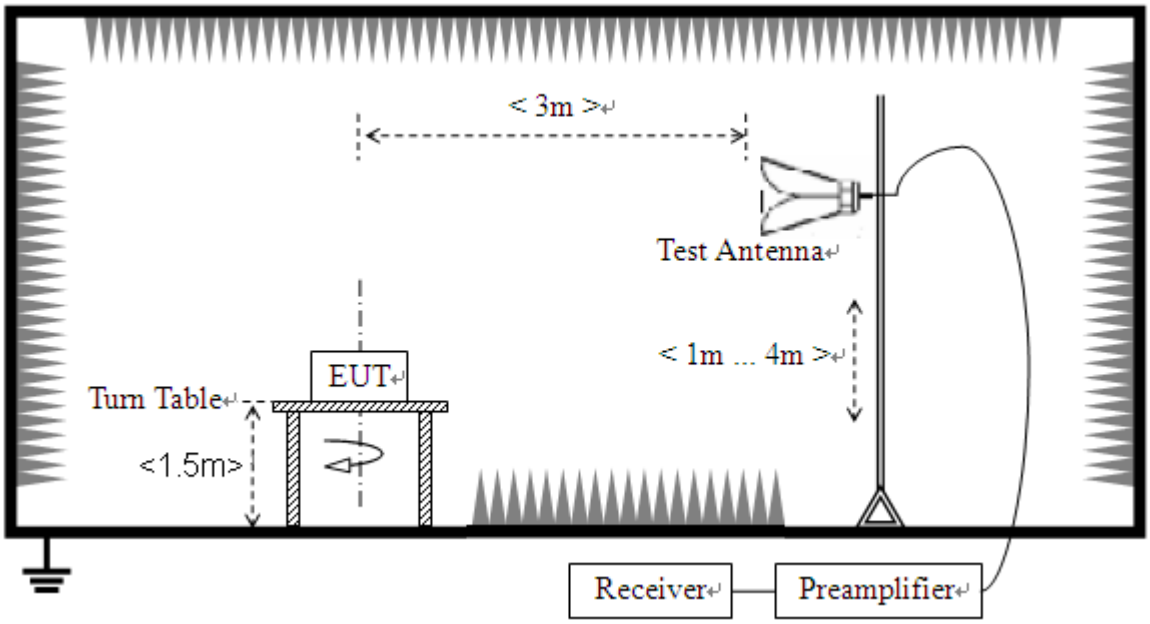
## 2.8.2. Test Description

Test Setup:

1) Below1GHz



2) Above 1GHz




The EUTis 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. Please refer to section 2.1.3 of this report.

- Step size (dB): 3dB

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

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

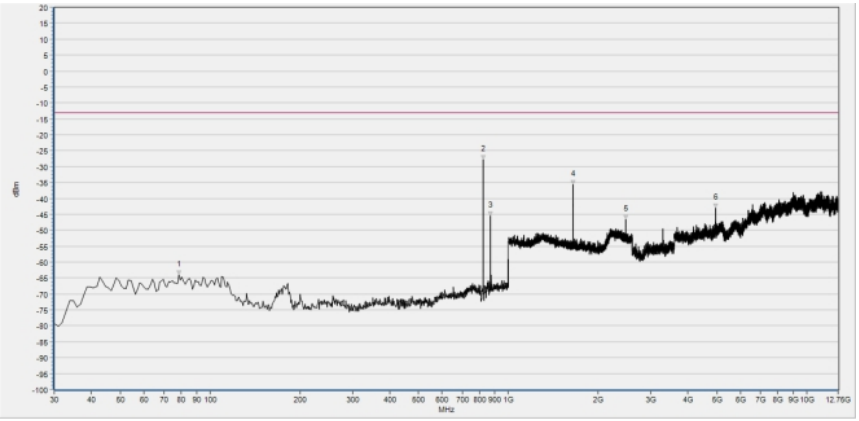
### 2.8.3. Test Result

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

| Band | Channel | Frequency (MHz) | Measured Max. Spurious Emission (dBm) | | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| | | | Test Antenna Horizontal | Test Antenna Vertical | | |
| GSM 850MHz | 128 | 824.2 | < -25 | < -25 | -13 | PASS |
| | 190 | 836.6 | < -25 | < -25 | | PASS |
| | 251 | 848.8 | < -25 | < -25 | | PASS |
| GSM 1900MHz | 512 | 1850.2 | < -25 | < -25 | -13 | PASS |
| | 661 | 1880.0 | < -25 | < -25 | | PASS |
| | 810 | 1909.8 | < -25 | < -25 | | PASS |
| EDGE 850MHz | 128 | 824.2 | < -25 | < -25 | -13 | PASS |
| | 190 | 836.6 | < -25 | < -25 | | PASS |
| | 251 | 848.8 | < -25 | < -25 | | PASS |
| EDGE 1900MHz | 512 | 1850.2 | < -25 | < -25 | -13 | PASS |
| | 661 | 1880.0 | < -25 | < -25 | | PASS |
| | 810 | 1909.8 | < -25 | < -25 | | PASS |

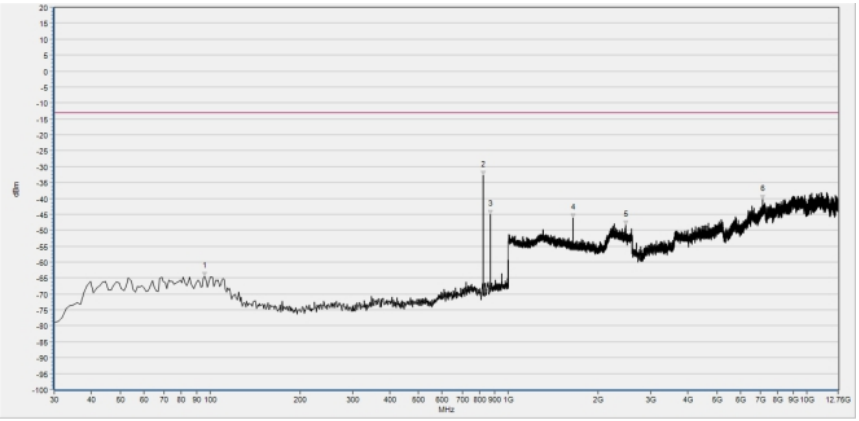
**Note 1:** All test mode and condition mentioned were considered and evaluated respectively by performing full test, only the worst data were recorded and reported.

**Note 2:**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.



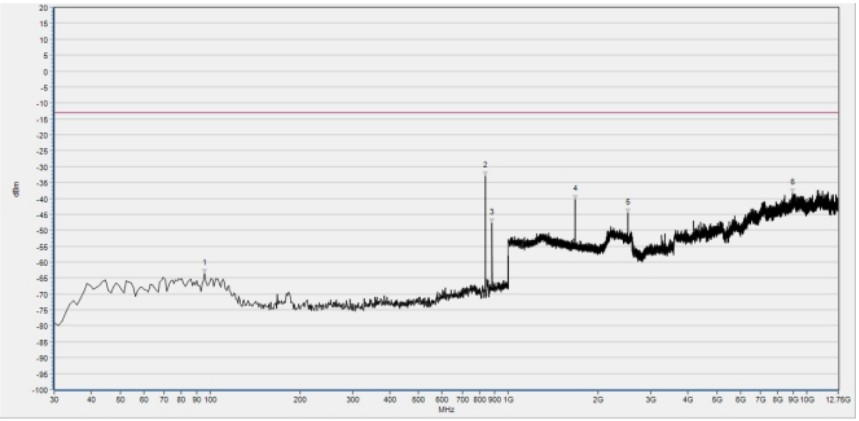
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 66.860 | -57.13 | -13.00 | Horizontal | PASS |
| 2 | 824.430 | -40.99 | -13.00 | Horizontal | NA |
| 3 | 869.050 | -46.10 | -13.00 | Horizontal | NA |
| 4 | 1648.579 | -36.12 | -13.00 | Horizontal | PASS |
| 5 | 2473.229 | -41.15 | -13.00 | Horizontal | PASS |
| 6 | 3297.720 | -47.78 | -13.00 | Horizontal | PASS |

(GSM 850MHz, Channel = 128, Horizontal)



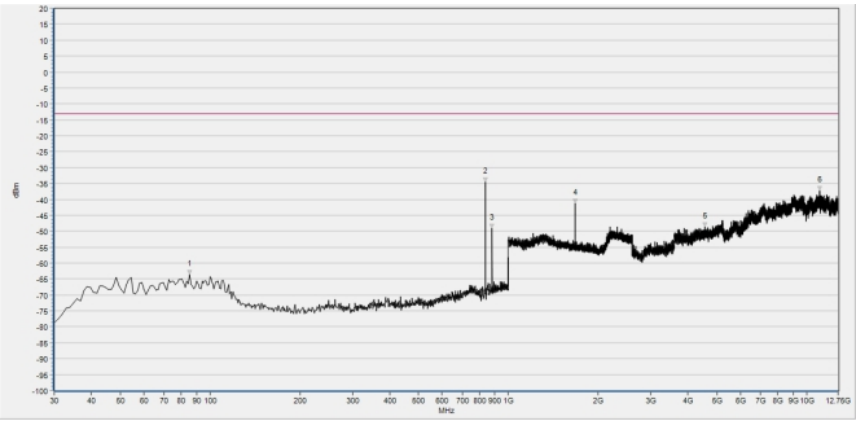
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 63.950 | -51.86 | -13.00 | Vertical | PASS |
| 2 | 824.430 | -36.67 | -13.00 | Vertical | NA |
| 3 | 869.050 | -44.90 | -13.00 | Vertical | NA |
| 4 | 1648.579 | -40.01 | -13.00 | Vertical | PASS |
| 5 | 2473.229 | -40.26 | -13.00 | Vertical | PASS |
| 6 | 7264.312 | -40.84 | -13.00 | Vertical | PASS |

(GSM 850MHz, Channel = 128, Vertical)



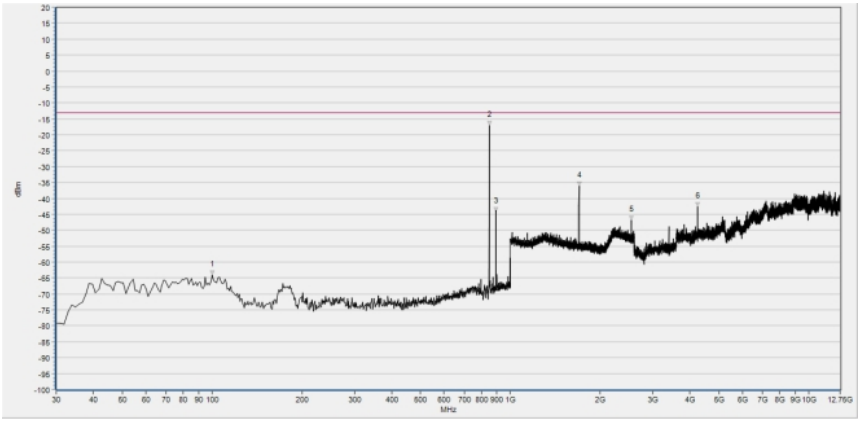
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 62.010 | -58.34 | -13.00 | Horizontal | PASS |
| 2 | 837.040 | -35.83 | -13.00 | Horizontal | N.A |
| 3 | 881.660 | -46.80 | -13.00 | Horizontal | N.A |
| 4 | 1672.909 | -45.16 | -13.00 | Horizontal | PASS |
| 5 | 2509.724 | -42.87 | -13.00 | Horizontal | PASS |
| 6 | 9158.092 | -38.11 | -13.00 | Horizontal | PASS |

(GSM850MHz, Channel = 190, Horizontal)



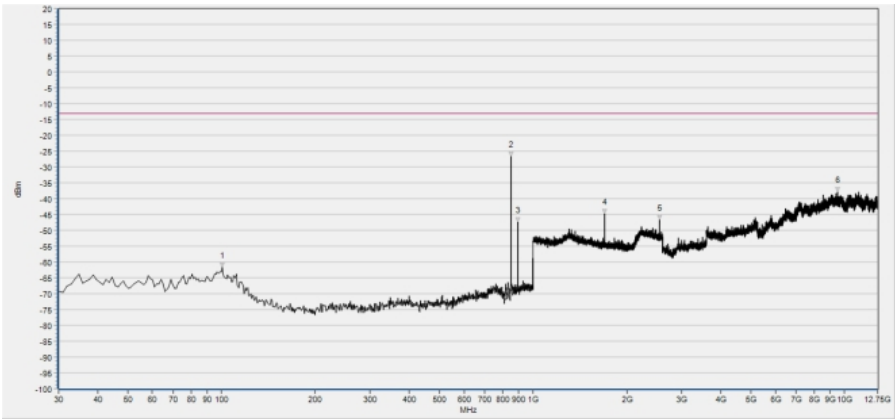
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 63.950 | -51.11 | -13.00 | Vertical | PASS |
| 2 | 836.070 | -35.72 | -13.00 | Vertical | NA |
| 3 | 881.660 | -45.26 | -13.00 | Vertical | NA |
| 4 | 1672.909 | -45.71 | -13.00 | Vertical | PASS |
| 5 | 2509.724 | -42.40 | -13.00 | Vertical | PASS |
| 6 | 9051.037 | -37.99 | -13.00 | Vertical | PASS |

(GSM 850MHz, Channel = 190, Vertical)



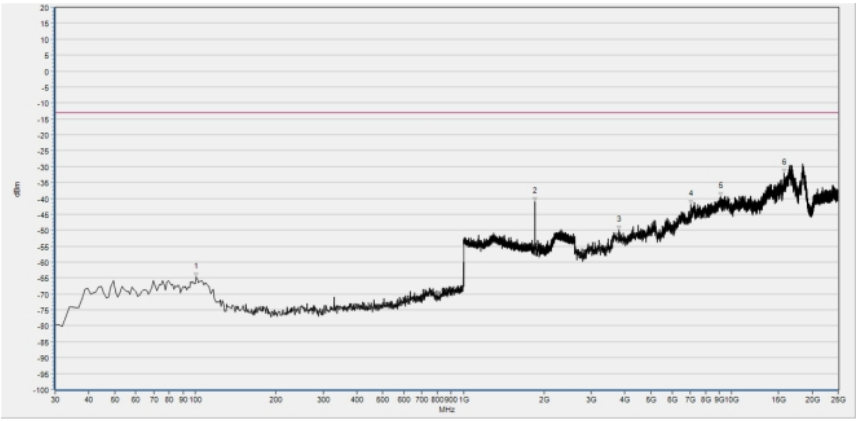
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 101.780 | -62.95 | 101.780 | Horizontal | PASS |
| 2 | 848.680 | -20.29 | 848.680 | Horizontal | NA |
| 3 | 894.270 | -47.65 | 894.270 | Horizontal | NA |
| 4 | 1697.879 | -47.35 | 1697.879 | Horizontal | PASS |
| 5 | 3617.030 | -50.05 | 3617.030 | Horizontal | PASS |
| 6 | 7173.868 | -41.26 | 7173.868 | Horizontal | PASS |

(GSM 850MHz, Channel = 251,Horizontal)



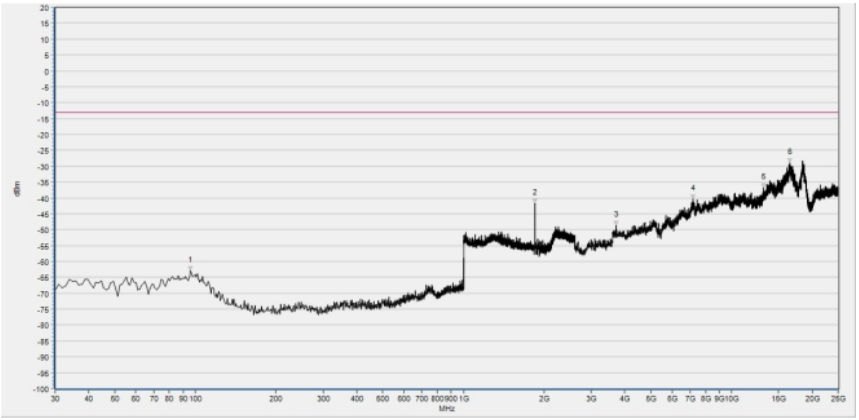
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 100.810 | -61.69 | -13.00 | Vertical | PASS |
| 2 | 848.680 | -26.79 | -13.00 | Vertical | NA |
| 3 | 893.300 | -47.38 | -13.00 | Vertical | NA |
| 4 | 1697.239 | -44.86 | -13.00 | Vertical | PASS |
| 5 | 2546.218 | -46.56 | -13.00 | Vertical | PASS |
| 6 | 9479.260 | -37.96 | -13.00 | Vertical | PASS |

(GSM 850MHz, Channel = 251, Vertical)



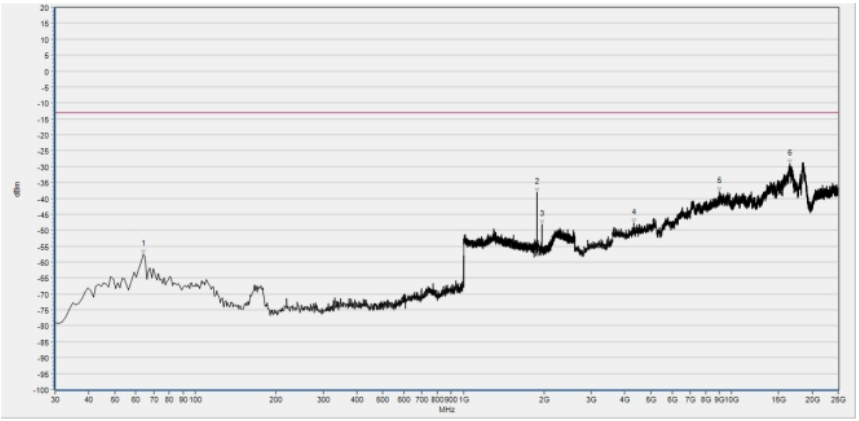
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 100.810 | -64.68 | -13.00 | Horizontal | PASS |
| 2 | 1850.260 | -41.07 | -13.00 | Horizontal | NA |
| 3 | 3809.820 | -49.98 | -13.00 | Horizontal | PASS |
| 4 | 7068.594 | -41.96 | -13.00 | Horizontal | PASS |
| 5 | 9093.108 | -39.52 | -13.00 | Horizontal | PASS |
| 6 | 15671.759 | -32.12 | -13.00 | Horizontal | PASS |

(GSM 1900MHz, Channel = 512, Horizontal)



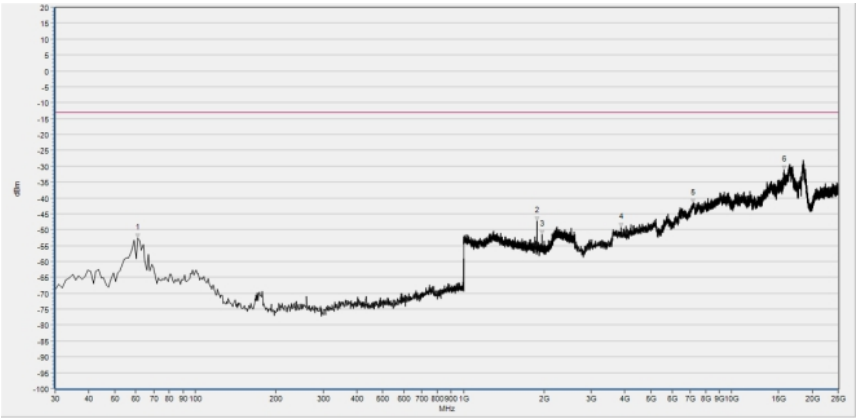
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 95.960 | -62.88 | -13.00 | Vertical | PASS |
| 2 | 1850.260 | -41.64 | -13.00 | Vertical | NA |
| 3 | 3720.204 | -48.59 | -13.00 | Vertical | PASS |
| 4 | 7182.651 | -40.28 | -13.00 | Vertical | PASS |
| 5 | 13178.796 | -36.78 | -13.00 | Vertical | PASS |
| 6 | 16506.819 | -29.02 | -13.00 | Vertical | PASS |

(GSM 1900MHz, Channel = 512, Vertical)



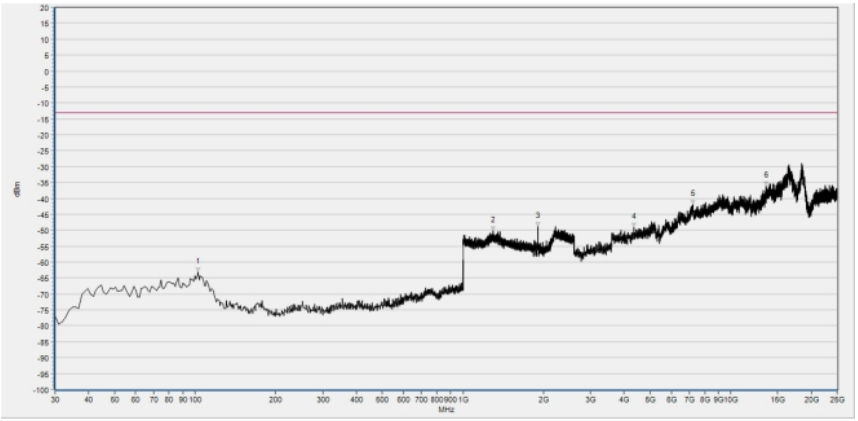
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 63.950 | -57.45 | -13.00 | Horizontal | PASS |
| 2 | 1879.712 | -38.14 | -13.00 | Horizontal | N.A |
| 3 | 1959.744 | -48.18 | -13.00 | Horizontal | N.A |
| 4 | 4331.224 | -47.74 | -13.00 | Horizontal | PASS |
| 5 | 9019.785 | -37.84 | -13.00 | Horizontal | PASS |
| 6 | 16527.187 | -29.07 | -13.00 | Horizontal | PASS |

(GSM 1900MHz, Channel = 661, Horizontal)



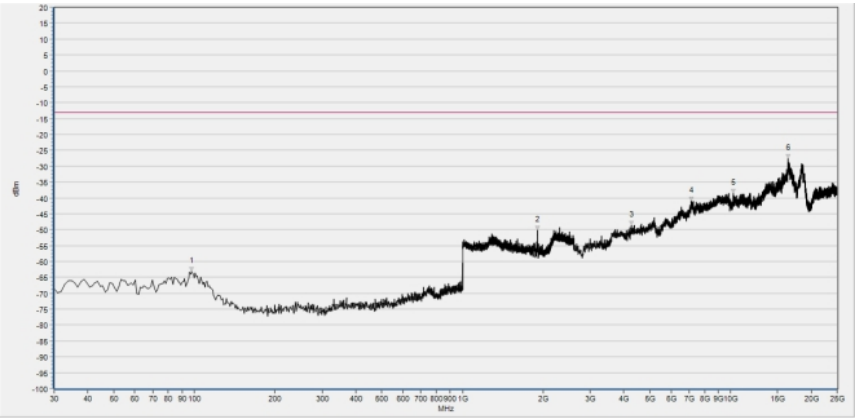
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 61.040 | -52.65 | -13.00 | Vertical | PASS |
| 2 | 1879.712 | -47.19 | -13.00 | Vertical | NA |
| 3 | 1959.744 | -51.53 | -13.00 | Vertical | NA |
| 4 | 3879.069 | -49.24 | -13.00 | Vertical | PASS |
| 5 | 7194.872 | -41.69 | -13.00 | Vertical | PASS |
| 6 | 15683.979 | -31.17 | -13.00 | Vertical | PASS |

(GSM 1900MHz, Channel = 661, Vertical)



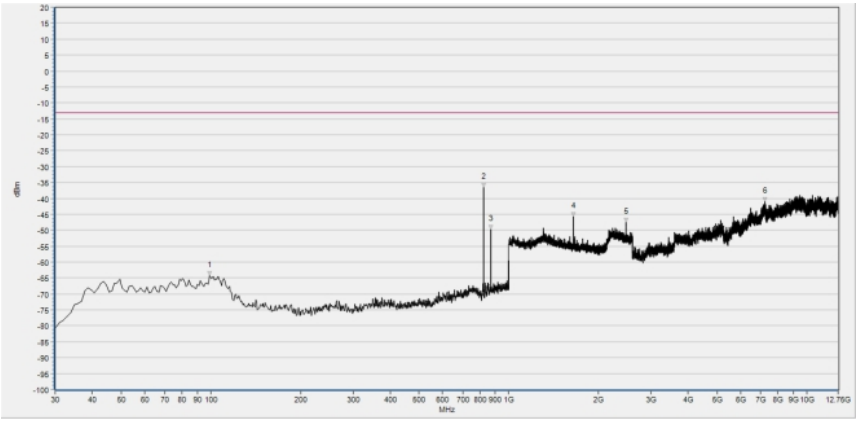
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 102.750 | -63.11 | -13.00 | Horizontal | PASS |
| 2 | 1296.439 | -50.23 | -13.00 | Horizontal | PASS |
| 3 | 1909.804 | -48.84 | -13.00 | Horizontal | NA |
| 4 | 4347.518 | -49.06 | -13.00 | Horizontal | PASS |
| 5 | 7219.313 | -41.86 | -13.00 | Horizontal | PASS |
| 6 | 13590.216 | -36.16 | -13.00 | Horizontal | PASS |

(GSM 1900MHz, Channel = 810, Horizontal)



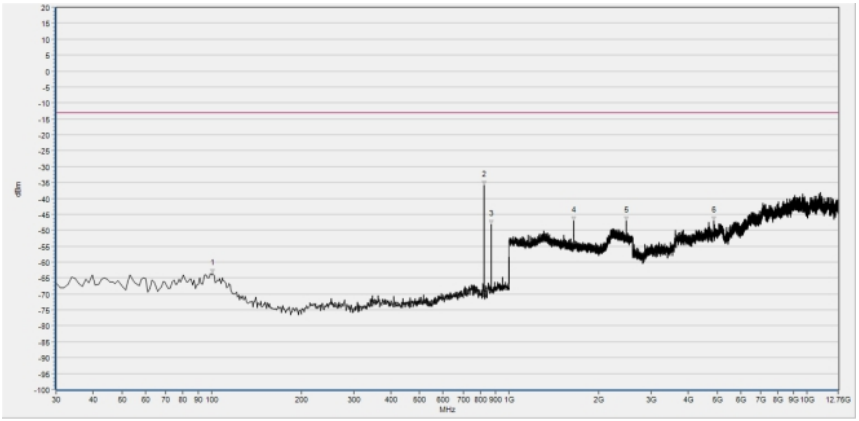
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 97.900 | -63.05 | -13.00 | Vertical | PASS |
| 2 | 1909.804 | -50.27 | -13.00 | Vertical | NA |
| 3 | 4270.122 | -48.67 | -13.00 | Vertical | PASS |
| 4 | 7137.843 | -41.05 | -13.00 | Vertical | PASS |
| 5 | 10270.340 | -38.51 | -13.00 | Vertical | PASS |
| 6 | 16413.130 | -27.50 | -13.00 | Vertical | PASS |

(GSM 1900MHz, Channel = 810, Vertical)



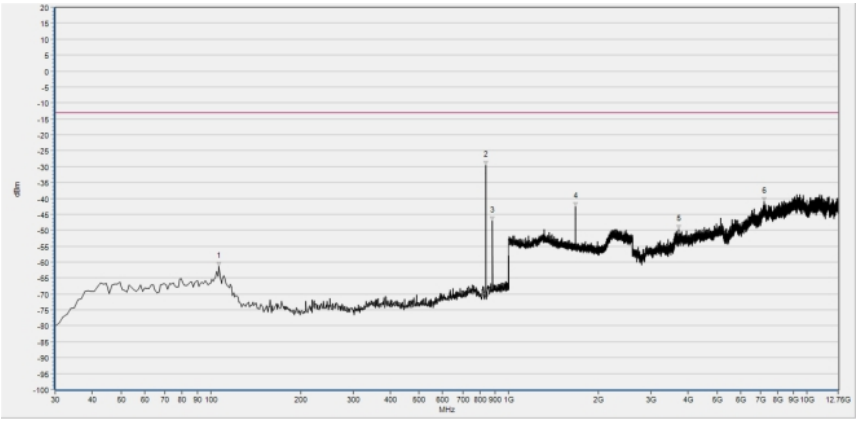
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 98.870 | -64.26 | -13.00 | Horizontal | PASS |
| 2 | 824.430 | -36.58 | -13.00 | Horizontal | NA |
| 3 | 869.050 | -49.72 | -13.00 | Horizontal | NA |
| 4 | 1647.939 | -45.71 | -13.00 | Horizontal | PASS |
| 5 | 2472.589 | -47.40 | -13.00 | Horizontal | PASS |
| 6 | 7240.316 | -41.09 | -13.00 | Horizontal | PASS |

(EDGE 850MHz, Channel = 128, Horizontal)



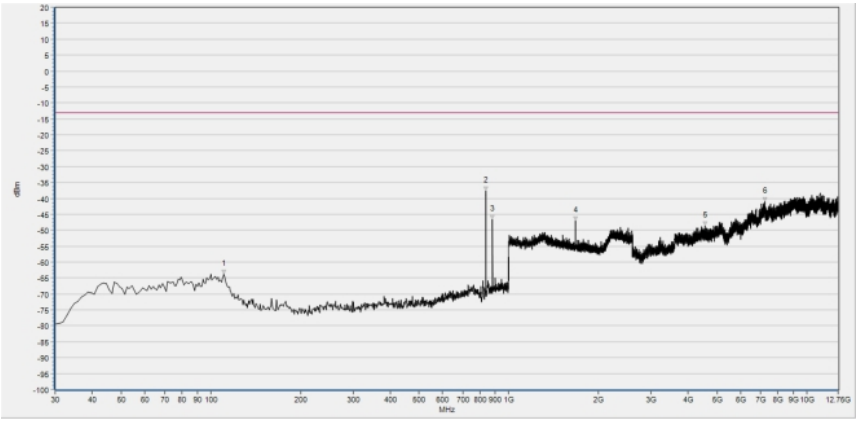
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 100.810 | -63.56 | -13.00 | Vertical | PASS |
| 2 | 824.430 | -35.97 | -13.00 | Vertical | NA |
| 3 | 869.050 | -48.26 | -13.00 | Vertical | NA |
| 4 | 1647.939 | -47.06 | -13.00 | Vertical | PASS |
| 5 | 2472.589 | -47.12 | -13.00 | Vertical | PASS |
| 6 | 4857.401 | -46.96 | -13.00 | Vertical | PASS |

(EDGE 850MHz, Channel = 128, Vertical)



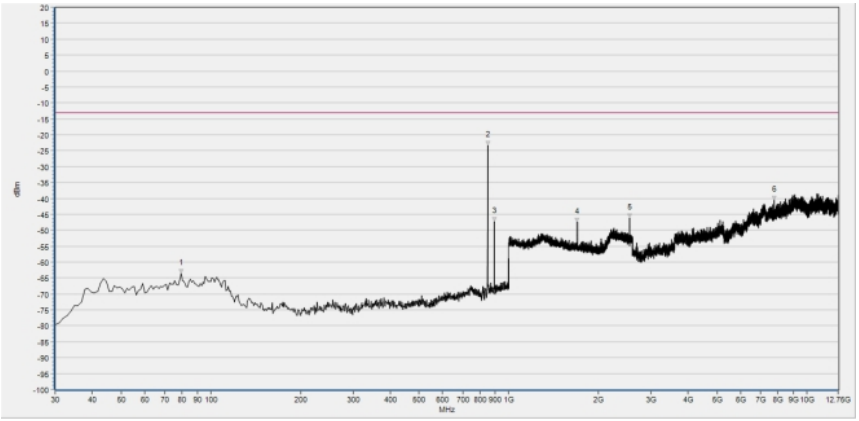
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 106.630 | -61.38 | -13.00 | Horizontal | PASS |
| 2 | 837.040 | -29.61 | -13.00 | Horizontal | N.A |
| 3 | 881.660 | -47.01 | -13.00 | Horizontal | N.A |
| 4 | 1672.909 | -42.66 | -13.00 | Horizontal | PASS |
| 5 | 3716.703 | -49.72 | -13.00 | Horizontal | PASS |
| 6 | 7208.938 | -40.99 | -13.00 | Horizontal | PASS |

(EDGE 850MHz, Channel = 190, Horizontal)



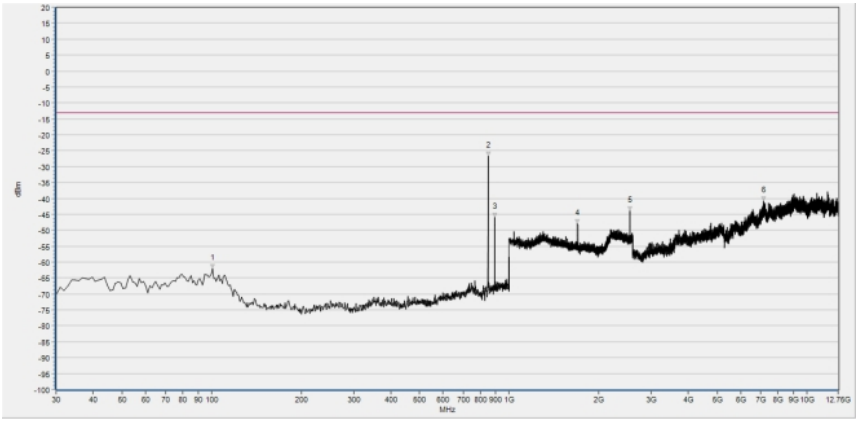
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 110.510 | -63.78 | -13.00 | Vertical | PASS |
| 2 | 837.040 | -37.68 | -13.00 | Vertical | N.A |
| 3 | 881.660 | -46.61 | -13.00 | Vertical | N.A |
| 4 | 1672.909 | -47.02 | -13.00 | Vertical | PASS |
| 5 | 4560.229 | -48.71 | -13.00 | Vertical | PASS |
| 6 | 7242.162 | -41.11 | -13.00 | Vertical | PASS |

(EDGE 850MHz, Channel = 190, Vertical)



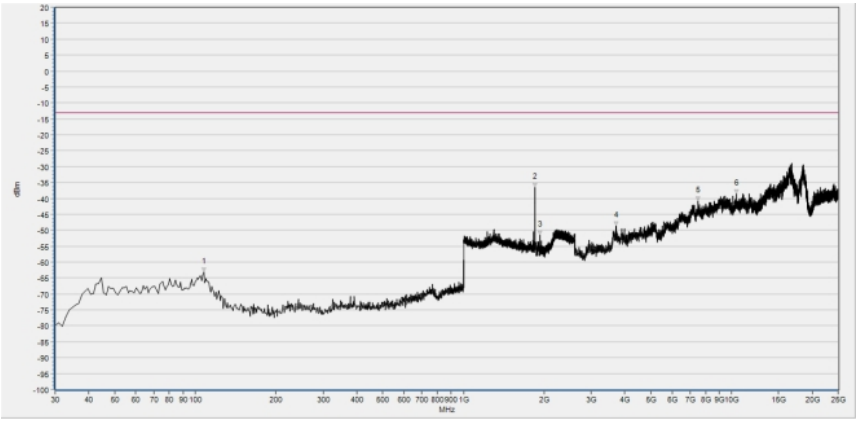
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 79.470 | -63.64 | -13.00 | Horizontal | PASS |
| 2 | 848.680 | -23.36 | -13.00 | Horizontal | N.A |
| 3 | 894.270 | -47.27 | -13.00 | Horizontal | N.A |
| 4 | 1697.239 | -47.50 | -13.00 | Horizontal | PASS |
| 5 | 2546.218 | -46.11 | -13.00 | Horizontal | PASS |
| 6 | 7771.904 | -40.58 | -13.00 | Horizontal | PASS |

(EDGE 850MHz, Channel = 251, Horizontal)



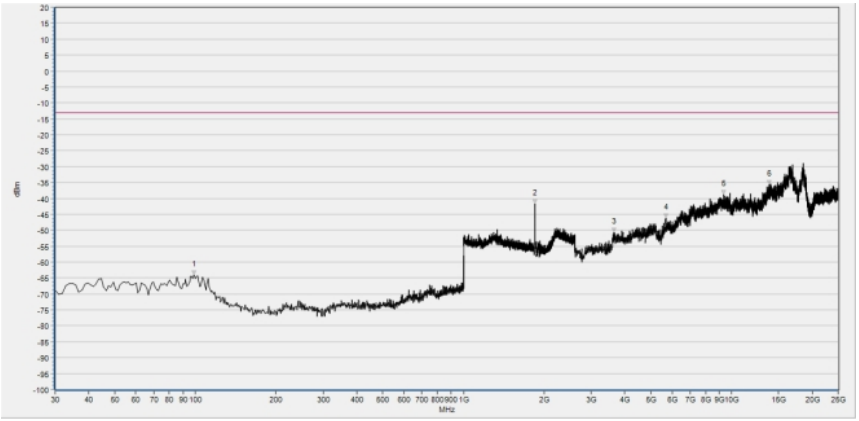
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 100.810 | -61.96 | -13.00 | Vertical | PASS |
| 2 | 848.680 | -26.77 | -13.00 | Vertical | N/A |
| 3 | 894.270 | -45.94 | -13.00 | Vertical | N/A |
| 4 | 1697.239 | -47.84 | -13.00 | Vertical | PASS |
| 5 | 2546.218 | -43.85 | -13.00 | Vertical | PASS |
| 6 | 7136.952 | -40.72 | -13.00 | Vertical | PASS |

(EDGE 850MHz, Channel = 251, Vertical)



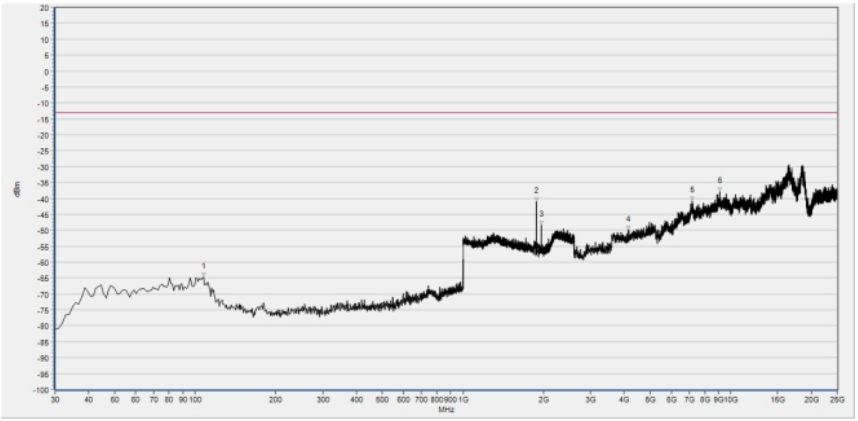
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 107.600 | -63.12 | -13.00 | Horizontal | PASS |
| 2 | 1850.260 | -36.61 | -13.00 | Horizontal | NA |
| 3 | 1929.652 | -51.53 | -13.00 | Horizontal | NA |
| 4 | 3699.836 | -48.54 | -13.00 | Horizontal | PASS |
| 5 | 7508.529 | -40.78 | -13.00 | Horizontal | PASS |
| 6 | 10437.352 | -38.46 | -13.00 | Horizontal | PASS |

(EDGE 1900MHz, Channel = 512, Horizontal)



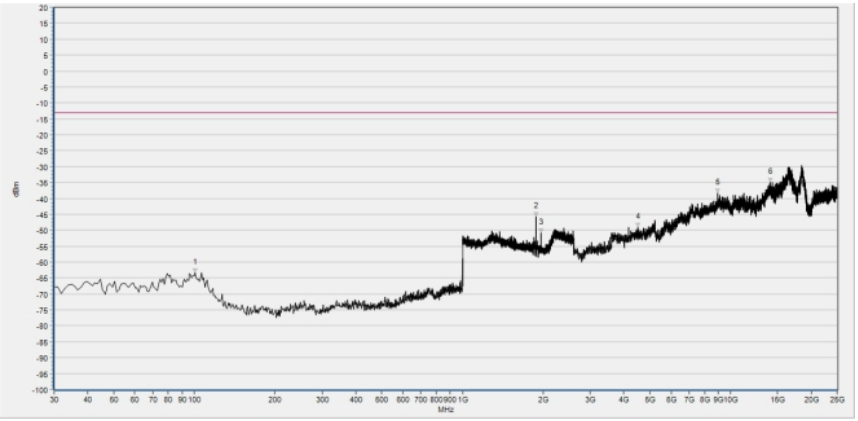
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 98.870 | -63.97 | -13.00 | Vertical | PASS |
| 2 | 1850.260 | -41.64 | -13.00 | Vertical | NA |
| 3 | 3634.661 | -50.65 | -13.00 | Vertical | PASS |
| 4 | 5687.689 | -46.17 | -13.00 | Vertical | PASS |
| 5 | 9321.222 | -38.84 | -13.00 | Vertical | PASS |
| 6 | 13830.551 | -35.55 | -13.00 | Vertical | PASS |

(EDGE 1900MHz, Channel = 512, Vertical)



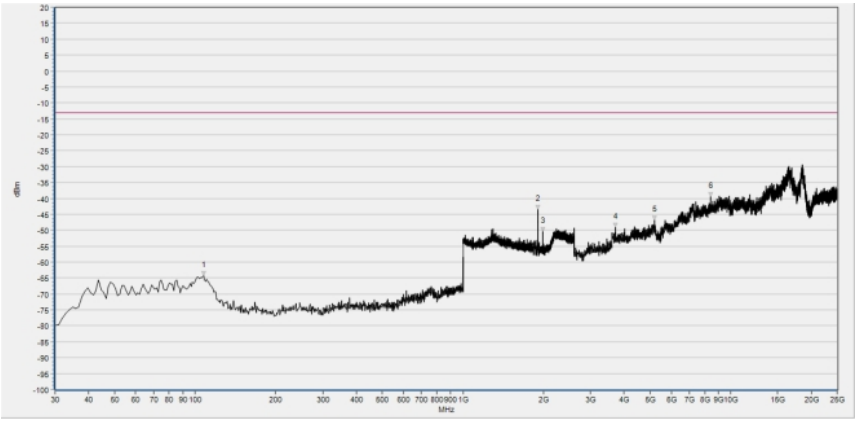
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 107.600 | -64.59 | -13.00 | Horizontal | PASS |
| 2 | 1879.712 | -40.93 | -13.00 | Horizontal | NA |
| 3 | 1959.744 | -48.38 | -13.00 | Horizontal | NA |
| 4 | 4147.918 | -50.00 | -13.00 | Horizontal | PASS |
| 5 | 7194.872 | -40.88 | -13.00 | Horizontal | PASS |
| 6 | 9097.181 | -37.79 | -13.00 | Horizontal | PASS |

(EDGE 1900MHz, Channel = 661, Horizontal)



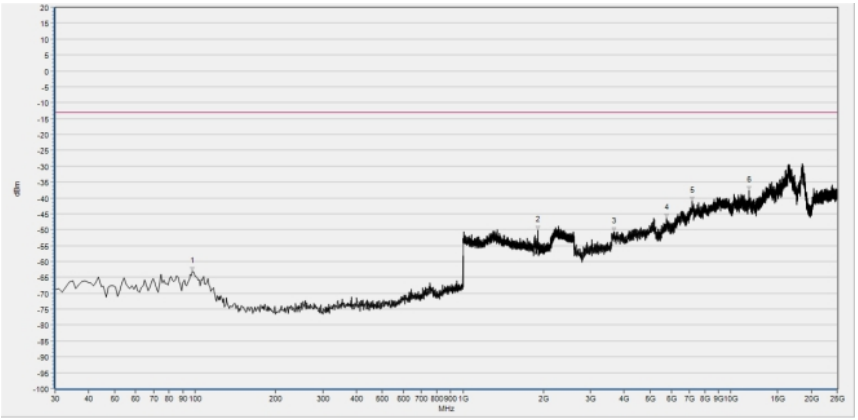
| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 100.810 | -63.32 | -13.00 | Vertical | PASS |
| 2 | 1879.712 | -45.65 | -13.00 | Vertical | NA |
| 3 | 1959.744 | -50.85 | -13.00 | Vertical | NA |
| 4 | 4522.677 | -49.12 | -13.00 | Vertical | PASS |
| 5 | 8966.830 | -38.33 | -13.00 | Vertical | PASS |
| 6 | 14042.371 | -35.04 | -13.00 | Vertical | PASS |

(EDGE 1900MHz, Channel = 661, Vertical)



| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 107.600 | -64.33 | -13.00 | Horizontal | PASS |
| 2 | 1909.804 | -43.54 | -13.00 | Horizontal | NA |
| 3 | 1989.196 | -50.48 | -13.00 | Horizontal | NA |
| 4 | 3720.204 | -48.94 | -13.00 | Horizontal | PASS |
| 5 | 5198.873 | -46.83 | -13.00 | Horizontal | PASS |
| 6 | 8441.353 | -39.48 | -13.00 | Horizontal | PASS |

(EDGE 1900MHz, Channel = 810, Horizontal)



| Num | Freq(MHz) | PK | limit PK | Antenna | Verdict |
|---|---|---|---|---|---|
| 1 | 97.900 | -63.19 | -13.00 | Vertical | PASS |
| 2 | 1909.804 | -50.14 | -13.00 | Vertical | NA |
| 3 | 3655.028 | -50.65 | -13.00 | Vertical | PASS |
| 4 | 5761.011 | -46.43 | -13.00 | Vertical | PASS |
| 5 | 7166.358 | -41.05 | -13.00 | Vertical | PASS |
| 6 | 11716.421 | -37.68 | -13.00 | Vertical | PASS |

(EDGE 1900MHz, Channel = 810, Vertical)

# Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

| Test items | Uncertainty |
|---|---|
| Output Power | ±2.22dB |
| Bandwidth | ±5% |
| Conducted Spurious Emission | ±2.77 dB |
| Radiated Emission | ±2.95dB |

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

# Annex B Testing Laboratory Information

## 1. Identification of the Responsible Testing Laboratory

| | |
|---|---|
| **Laboratory Name:** | Shenzhen Morlab Communications Technology Co., Ltd.<br>Morlab Laboratory |
| **Laboratory Address:** | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |
| **Telephone:** | +86 755 36698555 |
| **Facsimile:** | +86 755 36698525 |

## 2. Identification of the Responsible Testing Location

| | |
|---|---|
| **Name:** | Shenzhen Morlab Communications Technology Co., Ltd.<br>Morlab Laboratory |
| **Address:** | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China |

## 3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, 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 C63.10-2013and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

## 4. Test Equipments Utilized

### 4.1 Conducted Test Equipments

| Equipment Name | Serial No. | Type | Manufacturer | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| Power Splitter | NW521 | 1506A | Weinschel | 2019.04.17 | 2020.04.16 |
| Attenuator 1 | (N/A.) | 10dB | Resnet | 2019.04.17 | 2020.04.16 |
| Attenuator 2 | (N/A.) | 3dB | Resnet | 2019.04.17 | 2020.04.16 |
| EXA Signal Analzyer | MY53470836 | N9010A | Agilent | 2018.11.06 | 2019.11.05 |
| Wireless synthesizer | MY48364176 | 8960 -E5515C | Agilent | 2019.04.17 | 2020.04.16 |
| RF cable (30MHz-26GHz) | CB01 | RF01 | Morlab | N/A | N/A |
| Coaxial cable | CB02 | RF02 | Morlab | N/A | N/A |
| SMA connector | CN01 | RF03 | HUBER-SUHNER | N/A | N/A |
| Temperature Chamber | (N/A) | HUT705P | CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD | 2019.04.17 | 2020.04.16 |
| Computer | T430i | Think Pad | Lenovo | N/A | N/A |

### 4.2 Radiated Test Equipments

| Equipment Name | Serial No. | Type | Manufacturer | Cal. Date | Cal.Due |
|---|---|---|---|---|---|
| System Simulator | 152038 | CMW500 | R&S | 2018.08.04 | 2019.08.03 |
| Receiver | MY54130016 | N9038A | Agilent | 2019.05.08 | 2020.05.07 |
| Test Antenna - Bi-Log | 9163-519 | VULB 9163 | Schwarzbeck | 2019.05.08 | 2020.05.07 |
| Test Antenna - Horn | 9170C-531 | BBHA9170 | Schwarzbeck | 2018.08.06 | 2019.08.05 |
| Test Antenna - Horn | 01774 | BBHA 9120D | Schwarzbeck | 2018.08.02 | 2019.08.01 |
| Coaxial cable (N male) (9KHz-30MHz) | CB04 | EMC04 | Morlab | N/A | N/A |
| Coaxial cable (N male) (30MHz-26GHz) | CB02 | EMC02 | Morlab | N/A | N/A |
| Coaxial cable(N male) (30MHz-26GHz) | CB03 | EMC03 | Morlab | N/A | N/A |
| 1-18GHz pre-Amplifier | MA02 | TS-PR18 | Rohde& Schwarz | 2019.05.08 | 2020.05.07 |
| 18-26.5GHz pre-Amplifier | MA03 | TS-PR18 | Rohde& Schwarz | 2019.05.08 | 2020.05.07 |
| Notch Filter | N/A | WRCG-GSM 850 | Wainwright | 2018.12.01 | 2019.11.30 |
| Notch Filter | N/A | WRCG-GSM 1900 | Wainwright | 2018.12.01 | 2019.11.30 |
| Notch Filter | N/A | WRCGV-W Band V | Wainwright | 2018.12.01 | 2019.11.30 |
| Notch Filter | N/A | WRCGV-W Band II | Wainwright | 2018.12.01 | 2019.11.30 |
| Notch Filter | N/A | WRCGV-W Band IV | Wainwright | 2018.12.01 | 2019.11.30 |
| Anechoic Chamber | N/A | 9m*6m*6m | CRT | 2017.11.19 | 2020.11.18 |

END OF REPORT