

**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E  
&  
INDUSTRY CANADA RSS-132 & RSS-133**

**TEST REPORT**

**For**

**Computer**

**FCC Model No.: AIM8I, AIM8Ixxxxxxxxxxxxxxxxxx,  
AIM-x5ATxxxxxxxxxxxxxx**

**(where "x" may be any alphanumeric character, "-" or blank for  
marketing purpose and no impact safety related critical components  
and constructions)**

**IC Model No.: AIM8I, AIM-25AT, AIM-35AT, AIM-55AT, AIM-65AT,  
AIM-75AT**

**Trade Name: ADVANTECH**

*Issued to*

**Advantech Co.Ltd.**

**No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114,  
Taiwan, R.O.C.**

*Issued by*

**Compliance Certification Services Inc.**

**No.11, Wugong 6th Rd., Wugu Dist.,  
New Taipei City 24891, Taiwan. (R.O.C.)**

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**Issued Date: May 28, 2017**



**Testing Laboratory  
1309**

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**Revision History**

| Rev. | Issue Date    | Revisions                                      | Effect Page     | Revised By  |
|------|---------------|--|-----------------|-------------|
| 00   | May 28, 2017  | Initial Issue                                  | ALL             | Angel Cheng |
| 01   | July 24, 2017 | 1. Added section 7.5<br>2. Revise setup photo. | P.25-29<br>P.60 | Angel Cheng |

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# 1. TEST RESULT CERTIFICATION

**Applicant:** Advantech Co.Ltd.  
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,  
Taipei 114, Taiwan, R.O.C.

**Manufacturer:** Advantech Co.Ltd.  
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,  
Taipei 114, Taiwan, R.O.C.

**Equipment Under Test:** Computer

**Trade Name:** ADVANTECH

**FCC Model No.:** AIM8I, AIM8Ixxxxxxxxxxxxxxxx, AIM-x5ATxxxxxxxxxxxx  
(where "x" may be any alphanumeric character, "-" or blank  
for marketing purpose and no impact safety related critical  
components and constructions)

**IC Model No.:** AIM8I, AIM-25AT, AIM-35AT, AIM-55AT, AIM-65AT, AIM-75AT

**Date of Test:** April 6 ~ May 18, 2017

| APPLICABLE STANDARDS   |                         |
|--|-------------------------|
| STANDARD   | TEST RESULT             |
| FCC 47 CFR Part 22 Subpart H &<br>Part 24 Subpart E<br>&<br>IC RSS-132 Issue 3: January, 2013 and<br>IC RSS-133 Issue 6: January, 2013 | No non-compliance noted |

## We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-D: 2010 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E

The test results of this report relate only to the tested sample identified in this report.

Approved by:



\_\_\_\_\_  
Sam Chuang  
Manager  
Compliance Certification Services Inc.

Tested by:



\_\_\_\_\_  
Timmy Wang  
Engineer  
Compliance Certification Services Inc.

## 2. EUT DESCRIPTION

|                          |  |
|--------------------------|--|
| <b>Product</b>           | Computer   |
| <b>FCC Model No.</b>     | AIM8I, AIM8Ixxxxxxxxxxxxxxxx, AIM-x5ATxxxxxxxxxxxx<br>(where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions) |
| <b>IC Model No.</b>      | AIM8I, AIM-25AT, AIM-35AT, AIM-55AT, AIM-65AT, AIM-75AT  |
| <b>Model Discrepancy</b> | All models are electrically identical, different model names are for marketing purpose   |
| <b>Trade</b>             | ADVANTECH  |
| <b>Received Date</b>     | March 28, 2017   |
| <b>Power Supply</b>      | 1. VDC from Power Adapter<br>Chicony / A16-018N1A<br>I/P: 100-240Vac, 1A, 50-60Hz<br>O/P: 5.15Vdc, 3A, 9.1Vdc, 2A, 18W<br>2. Battery<br>ADVANTECH / AIM-BAT-8<br>Rating: 3.8V, 4900, 18.62Wh               |
| <b>Frequency Range</b>   | WCDMA / HSDPA / HSUPA Band II: 1852.4 ~ 1907.6 MHz<br>WCDMA / HSDPA / HSUPA Band V: 826.4 ~ 846.6MHz   |
| <b>Antenna Gain</b>      | PIFA Antenna<br>WCDMA band II: -1.98 dBi<br>WCDMA band V: -1.91 dBi  |

**Remark:**

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. For test mode WCDMA, HSUPA and HSDPA were pretest. The worst case was WCDMA in this test report

| Emission Designator |      |                      |                               |                 |                  |
|---------------------|------|----------------------|-------------------------------|-----------------|------------------|
| System              | Band | Frequency Range(MHz) | Emission Designator (99% OBW) | Maximum ERP (W) | Maximum EIRP (W) |
| WCDMA<br>12.2K RMC  | II   | 1852.4MHz ~1907.6MHz | 4M06F9W                       | N/A             | 0.3365           |
|                     | V    | 826.4MHz ~ 846.6MHz  | 4M06F9W                       | 0.3630          | N/A              |

### 3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to TIA/EIA-603-D: 2010 and FCC CFR 47, Part 2, Part 22 Subpart H and Part 24 Subpart E

The tests documented in this report were performed in accordance with IC RSS-132, SPSR503, RSS-133, SPSR510 and ANSI C63.26: 2015 and TIA/EIA-603-C.

#### 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 3.2 DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

The EUT be set in maximum power transmission via call box during testing.

##### 3.2.1 The worst mode of measurement

| Radiated Emission Measurement |   |
|-------------------------------|---|
| <b>Test Condition</b>         | <b>Band edge, Emission for Unwanted and Fundamental</b>   |
| <b>Voltage/Hz</b>             | <b>120V/60Hz</b>  |
| <b>Test Mode</b>              | <b>Mode 1:EUT power by AC adapter via power cable.<br/>Mode 2:EUT power by Battery.</b>   |
| <b>Worst Mode</b>             | <input checked="" type="checkbox"/> <b>Mode 1</b> <input type="checkbox"/> <b>Mode 2</b> <input type="checkbox"/> <b>Mode 3</b> <input type="checkbox"/> <b>Mode 4</b>  |
| <b>Position</b>               | <input type="checkbox"/> Placed in fixed position.<br><input type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane)<br><input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane)<br><input checked="" type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane) |

| Radiated Emission Measurement Below 1G |  |
|--|--|
| <b>Test Condition</b>                  | <b>Radiated Emission Below 1G</b>  |
| <b>Voltage/Hz</b>                      | <b>120V/60Hz</b>   |
| <b>Test Mode</b>                       | <b>Mode 1:EUT power by AC adapter via power cable.<br/>Mode 2:EUT power by Battery.</b>  |
| <b>Worst Mode</b>                      | <input checked="" type="checkbox"/> <b>Mode 1</b> <input type="checkbox"/> <b>Mode 2</b> <input type="checkbox"/> <b>Mode 3</b> <input type="checkbox"/> <b>Mode 4</b> |

*Remark:*

- 1. The worst mode was record in this test report.*
- 2. The EUT pre-scanned in three axis ,X, Y, Z for radiated measurement. The worst cases (Z-Plane) were recorded in this report.*
- 3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.*

## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year.

| Conducted Emissions Test Site |              |          |               |                  |                 |
|-------------------------------|--------------|----------|---------------|------------------|-----------------|
| Name of Equipment             | Manufacturer | Model    | Serial Number | Calibration Date | Calibration Due |
| Power Meter                   | Anritsu      | ML2495A  | 1012009       | 07/04/2016       | 07/03/2017      |
| Power Sensor                  | Anritsu      | MA2411B  | 917072        | 07/04/2016       | 07/03/2017      |
| Base Station                  | R&S          | CMU 200  | 101245        | 07/29/2016       | 07/28/2017      |
| Base Station                  | Anritsu      | MT-8820C | 6200938900    | 07/26/2016       | 07/25/2017      |
| Spectrum Analyzer             | R&S          | FSV 40   | 101073        | 10/05/2016       | 10/04/2017      |

| Wugu 966 Chamber A |                    |            |               |                  |                 |
|--------------------|--------------------|------------|---------------|------------------|-----------------|
| Name of Equipment  | Manufacturer       | Model      | Serial Number | Calibration Date | Calibration Due |
| Bilog Antenna      | Sunol Sciences     | JB3        | A030105       | 07/03/2016       | 07/02/2017      |
| Horn Antenna       | EMCO               | 3117       | 00055165      | 02/20/2017       | 02/19/2018      |
| Pre-Amplifier      | EMCI               | EMC 012635 | 980151        | 06/23/2016       | 06/22/2017      |
| Pre-Amplifier      | EMEC               | EM330      | 060609        | 06/08/2016       | 06/07/2017      |
| Spectrum Analyzer  | Agilent            | E4446A     | US42510252    | 12/05/2016       | 12/04/2017      |
| Loop Ant           | COM-POWER          | AL-130     | 121051        | 03/02/2017       | 03/1/2018       |
| Antenna Tower      | CCS                | CC-A-1F    | N/A           | N.C.R            | N.C.R           |
| Controller         | CCS                | CC-C-1F    | N/A           | N.C.R            | N.C.R           |
| Turn Table         | CCS                | CC-T-1F    | N/A           | N.C.R            | N.C.R           |
| Software           | EZ-EMC (CCS-3A1RE) |            |               |                  |                 |

### 4.3 MEASUREMENT UNCERTAINTY

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| 3M Semi Anechoic Chamber / 30M~200M   | +/- 4.0138  |
| 3M Semi Anechoic Chamber / 200M~1000M | +/- 3.9483  |
| 3M Semi Anechoic Chamber / 1G~8G      | +/- 2.5975  |
| 3M Semi Anechoic Chamber / 8G~18G     | +/- 2.6112  |
| 3M Semi Anechoic Chamber / 18G~26G    | +/- 2.7389  |
| 3M Semi Anechoic Chamber / 26G~40G    | +/- 2.9683  |

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.




Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

| Country | Agency          | Scope of Accreditation   | Logo  |
|---------|-----------------|--|---|
| USA     | FCC             | 3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements   | <br>FCC MRA: TW1039          |
| Taiwan  | TAF             | LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310<br>IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17<br>FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959<br>FCC Method -47 CFR Part 15 Subpart B<br>IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11 |                              |
| Canada  | Industry Canada | 3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform  | <br>IC 2324G-1<br>IC 2324G-2 |

*\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

| No | Equipment | Brand | Model | Series No. | FCC ID | Data Cable | Power Cord |
|----|-----------|-------|-------|------------|--------|------------|------------|
|    | N/A       |       |       |            |        |            |            |

**Remark:**

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

## **7. FCC PART 22 & 24 REQUIREMENTS & INDUSTRY CANADA RSS-132 & RSS-133**

### **7.1 AVERAGE POWER**

#### **Test Procedures**

##### **CONDUCTED POWER MEASUREMENT:**

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

**Test Data**

**WCDMA 12.2K RMC**

| Band          | Mode   | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) | Output Power (W) |
|---------------|--------|-------------------|----------------|--------------------|------------------|
| WCDMA Band II | Rel 99 | 9262/9662         | 1852.4         | 23.0               | 0.19953          |
|               |        | 9400/9800         | 1880.0         | 23.2               | 0.20893          |
|               |        | 9538/9983         | 1907.6         | 23.1               | 0.20417          |
| WCDMA Band V  | Rel 99 | 4132/4157         | 826.4          | 23.6               | 0.22909          |
|               |        | 4182/4407         | 836.4          | 23.7               | 0.23442          |
|               |        | 4233/4458         | 846.6          | 24.0               | 0.25119          |

**HSDPA**

**Band II**

| Band     | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) | Output Power (W) |
|----------|------|-------------------|----------------|--------------------|------------------|
| HSDPA II | 1    | 9262/9662         | 1852.4         | 22.9               | 0.19498          |
|          |      | 9400/9800         | 1880.0         | 23.1               | 0.20417          |
|          |      | 9538/9983         | 1907.6         | 23.0               | 0.19953          |
|          | 2    | 9262/9662         | 1852.4         | 22.4               | 0.17418          |
|          |      | 9400/9800         | 1880.0         | 22.6               | 0.18239          |
|          |      | 9538/9983         | 1907.6         | 22.5               | 0.17824          |
|          | 3    | 9262/9662         | 1852.4         | 21.9               | 0.15488          |
|          |      | 9400/9800         | 1880.0         | 22.1               | 0.16218          |
|          |      | 9538/9983         | 1907.6         | 22.1               | 0.16069          |
|          | 4    | 9262/9662         | 1852.4         | 21.9               | 0.15488          |
|          |      | 9400/9800         | 1880.0         | 22.1               | 0.16218          |
|          |      | 9538/9983         | 1907.6         | 22.0               | 0.15849          |

**Band V**

| Band    | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) | Output Power (W) |
|---------|------|-------------------|----------------|--------------------|------------------|
| HSDPA V | 1    | 4132/4157         | 826.4          | 23.6               | 0.22803          |
|         |      | 4182/4407         | 836.4          | 23.7               | 0.23388          |
|         |      | 4233/4458         | 846.6          | 23.9               | 0.24434          |
|         | 2    | 4132/4157         | 826.4          | 23.1               | 0.20417          |
|         |      | 4182/4407         | 836.4          | 23.2               | 0.20941          |
|         |      | 4233/4458         | 846.6          | 23.4               | 0.21827          |
|         | 3    | 4132/4157         | 826.4          | 22.6               | 0.18197          |
|         |      | 4182/4407         | 836.4          | 22.7               | 0.18664          |
|         |      | 4233/4458         | 846.6          | 22.9               | 0.19498          |
|         | 4    | 4132/4157         | 826.4          | 22.6               | 0.18239          |
|         |      | 4182/4407         | 836.4          | 22.7               | 0.18750          |
|         |      | 4233/4458         | 846.6          | 22.9               | 0.19498          |

**HSUPA**

**Band II**

| Band     | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) | Output Power (W) |
|----------|------|-------------------|----------------|--------------------|------------------|
| HSUPA II | 1    | 9262/9662         | 1852.4         | 22.9               | 0.19498          |
|          |      | 9400/9800         | 1880.0         | 23.1               | 0.20370          |
|          |      | 9538/9983         | 1907.6         | 23.0               | 0.20045          |
|          | 2    | 9262/9662         | 1852.4         | 21.0               | 0.12589          |
|          |      | 9400/9800         | 1880.0         | 21.1               | 0.12853          |
|          |      | 9538/9983         | 1907.6         | 21.1               | 0.12882          |
|          | 3    | 9262/9662         | 1852.4         | 21.9               | 0.15488          |
|          |      | 9400/9800         | 1880.0         | 22.1               | 0.16218          |
|          |      | 9538/9983         | 1907.6         | 22.2               | 0.16596          |
|          | 4    | 9262/9662         | 1852.4         | 20.9               | 0.12331          |
|          |      | 9400/9800         | 1880.0         | 21.1               | 0.12912          |
|          |      | 9538/9983         | 1907.6         | 21.0               | 0.12677          |
|          | 5    | 9262/9662         | 1852.4         | 22.9               | 0.19409          |
|          |      | 9400/9800         | 1880.0         | 23.1               | 0.20324          |
|          |      | 9538/9983         | 1907.6         | 23.0               | 0.19770          |

**Band V**

| Band    | Mode | UL/DL Channel No. | Frequency(MHz) | Average power(dBm) | Output Power (W) |
|---------|------|-------------------|----------------|--------------------|------------------|
| HSUPA V | 1    | 4132/4157         | 826.4          | 23.5               | 0.22491          |
|         |      | 4182/4407         | 836.4          | 23.6               | 0.23014          |
|         |      | 4233/4458         | 846.6          | 23.9               | 0.24491          |
|         | 2    | 4132/4157         | 826.4          | 21.5               | 0.14223          |
|         |      | 4182/4407         | 836.4          | 21.7               | 0.14622          |
|         |      | 4233/4458         | 846.6          | 21.9               | 0.15488          |
|         | 3    | 4132/4157         | 826.4          | 22.5               | 0.17947          |
|         |      | 4182/4407         | 836.4          | 22.6               | 0.18323          |
|         |      | 4233/4458         | 846.6          | 22.9               | 0.19498          |
|         | 4    | 4132/4157         | 826.4          | 21.5               | 0.14223          |
|         |      | 4182/4407         | 836.4          | 21.7               | 0.14791          |
|         |      | 4233/4458         | 846.6          | 21.9               | 0.15596          |
|         | 5    | 4132/4157         | 826.4          | 23.5               | 0.22233          |
|         |      | 4182/4407         | 836.4          | 23.6               | 0.22909          |
|         |      | 4233/4458         | 846.6          | 23.8               | 0.24044          |

## **7.2 ERP & EIRP MEASUREMENT**

### **LIMIT**

According to FCC 22.913(a): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

According to FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

RSS-132, section 5.4

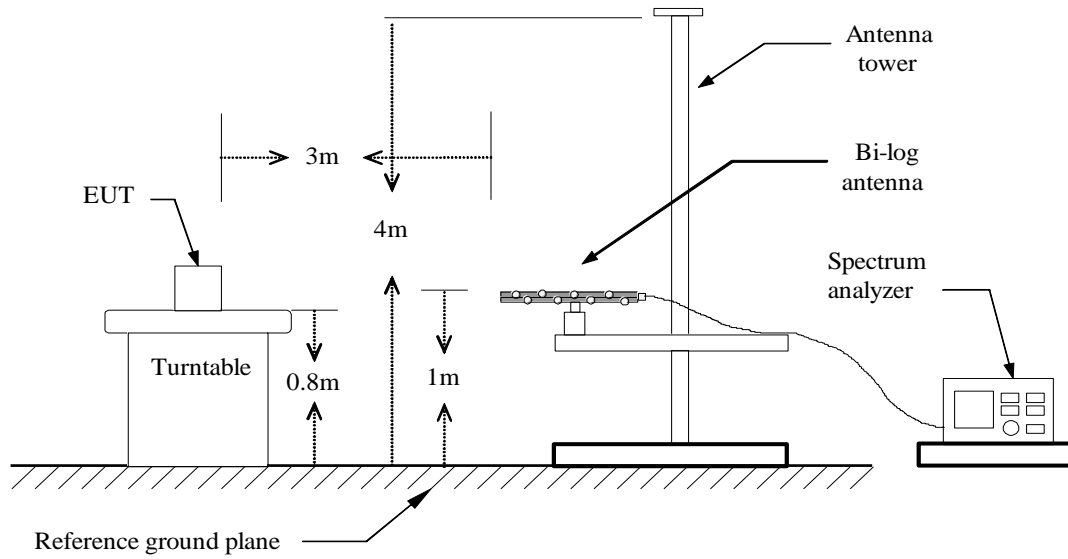
The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base station e.i.r.p. limits.

RSS-133, section 6.4

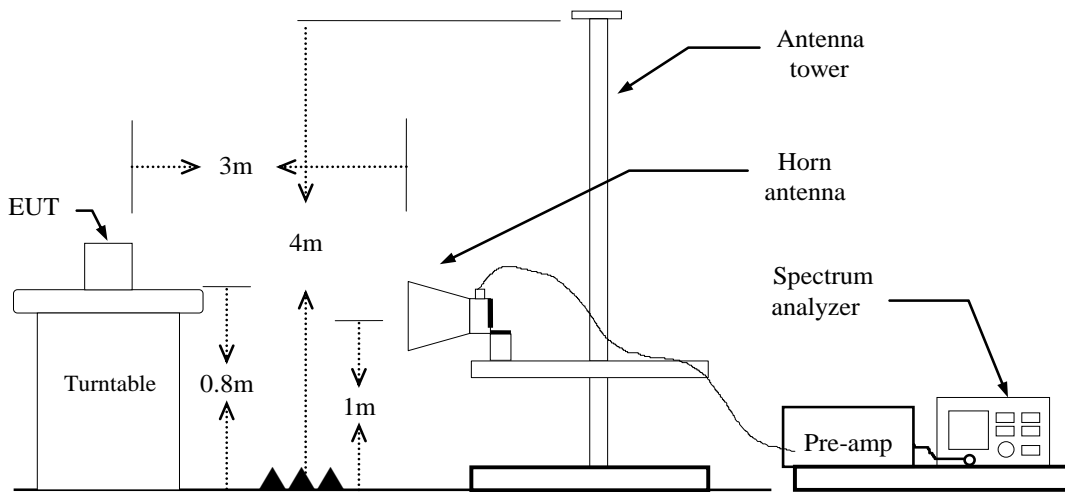
The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts.

**Test Configuration**

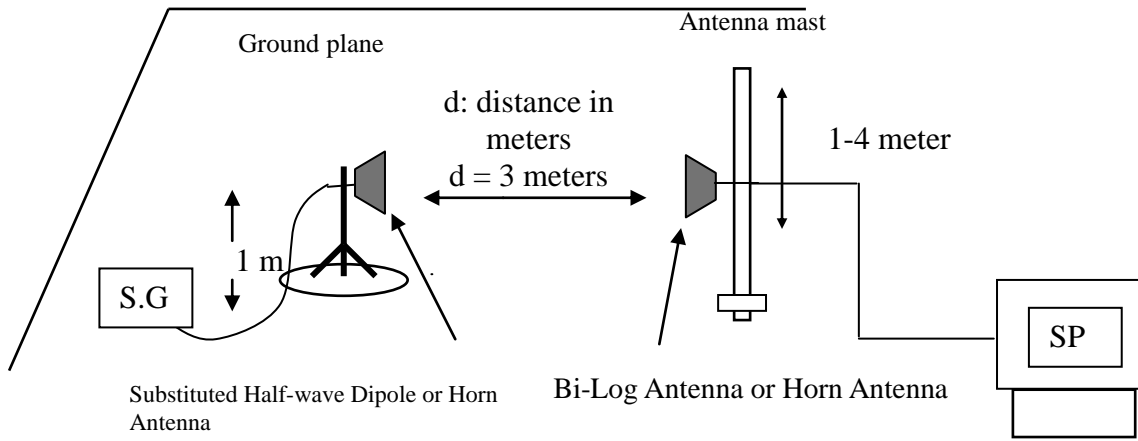
**Below 1 GHz**



**Above 1 GHz**



**For Substituted Method Test Set-UP**



**TEST PROCEDURE**

1. The EUT was placed on a non-conductive rotating platform (0.8m for below 1G and above 1G) in a semi-chamber. The radiated emission at the fundamental frequency was measured at 3m and SA with RMS detector per section 5, KDB 971168 D01.
2. During the measurement, the call box parameters were set to get the maximum output power of the EUT. The maximum emission was recorded from spectrum analyzer power level (LVL) from 360 degrees rotation of turntable and the test antenna raised and lowered over a range from 1m to 4m in both horizontally and vertically polarized orientations.
3. EIRP was measured method according to TIA/EIA-603-D:2010. The EUT was replaced by the substitution antenna at same location, and then record the maximum Analyzer reading through raised and lowered the test antenna.

$ERP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)} - 2.15$

$EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$

**TEST RESULTS**

*No non-compliance noted.*

**WCDMA 12.2K RMC**

| Test Mode                 | Channel | Vertical  |         | Horizontal |         |
|---------------------------|---------|-----------|---------|------------|---------|
|                           |         | EIRP(dBm) | EIRP(W) | EIRP(dBm)  | EIRP(W) |
| WCDMA 12.2K RMC (Band II) | Lowest  | 24.48     | 0.2805  | 25.27      | 0.3365  |
|                           | Middle  | 21.39     | 0.1377  | 24.84      | 0.3047  |
|                           | Highest | 23.42     | 0.2197  | 20.23      | 0.1054  |

| Test Mode                | Channel | Vertical |        | Horizontal |        |
|--------------------------|---------|----------|--------|------------|--------|
|                          |         | ERP(dBm) | ERP(W) | ERP(dBm)   | ERP(W) |
| WCDMA 12.2K RMC (Band V) | Lowest  | 21.02    | 0.1264 | 25.60      | 0.3630 |
|                          | Middle  | 17.45    | 0.0555 | 22.31      | 0.1702 |
|                          | Highest | 24.43    | 0.2773 | 24.91      | 0.3097 |



## 7.3 OCCUPIED BANDWIDTH MEASUREMENT

### Limits

For Reporting purpose only.

### TEST PROCEDURES

KDB 971168 v02r02 - Section 4.2

1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW  $\geq$  3 x RBW
4. Detector = Peak
5. Trace mode = max. hold

### TEST RESULTS

*No non-compliance noted*

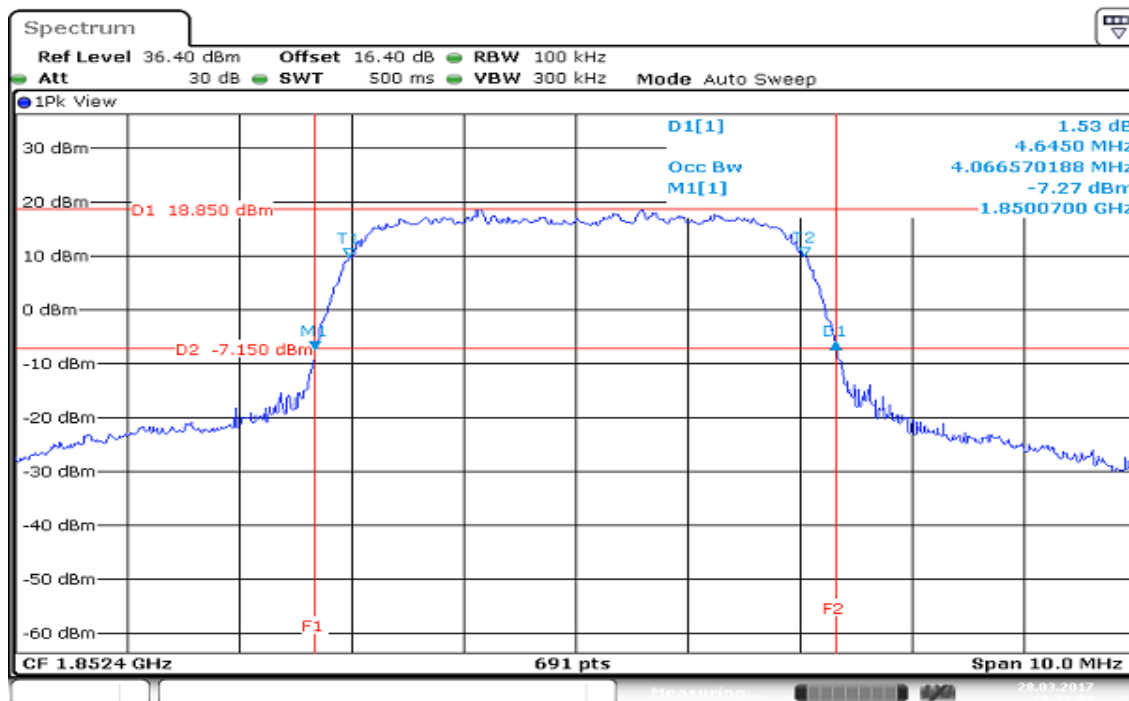
#### Test Data

| Test Mode                 | CH      | Frequency (MHz) | 99% Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------------------------|---------|-----------------|---------------------|-----------------------|
| WCDMA 12.2k RMC (Band II) | Lowest  | 1852.4          | 4.06657             | 4.64500               |
|                           | Middle  | 1880.0          | 4.06657             | 4.64500               |
|                           | Highest | 1907.6          | 4.06657             | 4.63100               |
| WCDMA 12.2k RMC (Band V)  | Lowest  | 826.4           | 4.06657             | 4.63100               |
|                           | Middle  | 836.4           | 4.05209             | 4.61600               |
|                           | Highest | 846.6           | 4.06657             | 4.63100               |

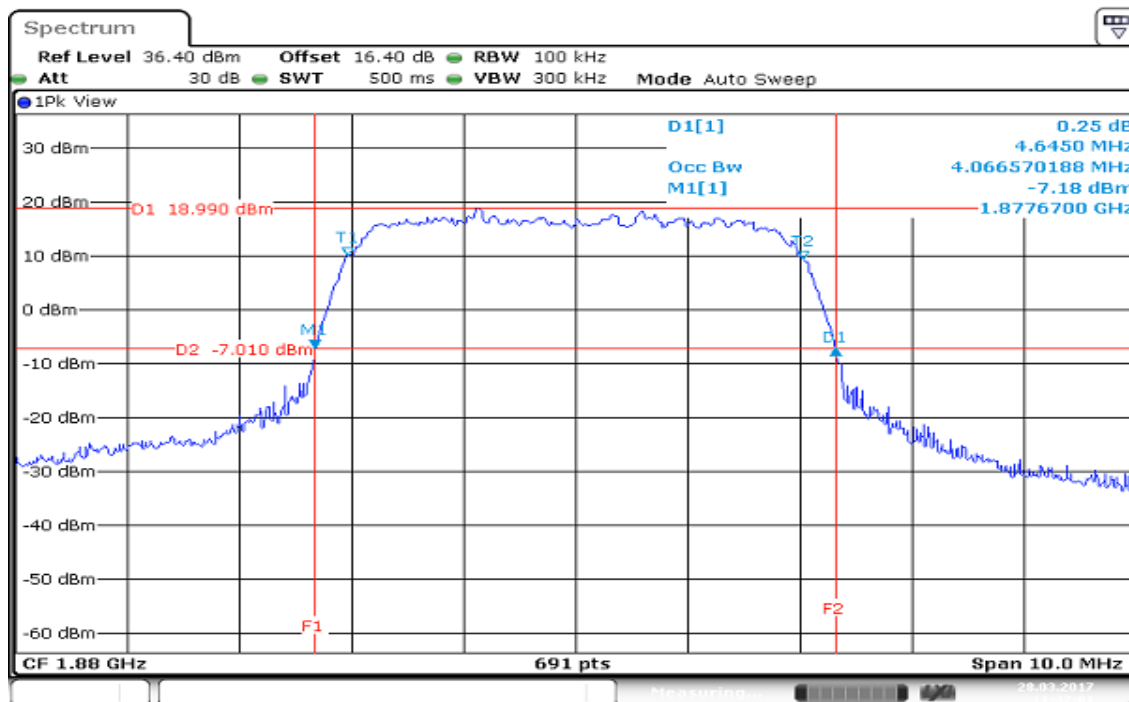
**Test Plot**

**WCDMA 12.2k RMC (Band II)**

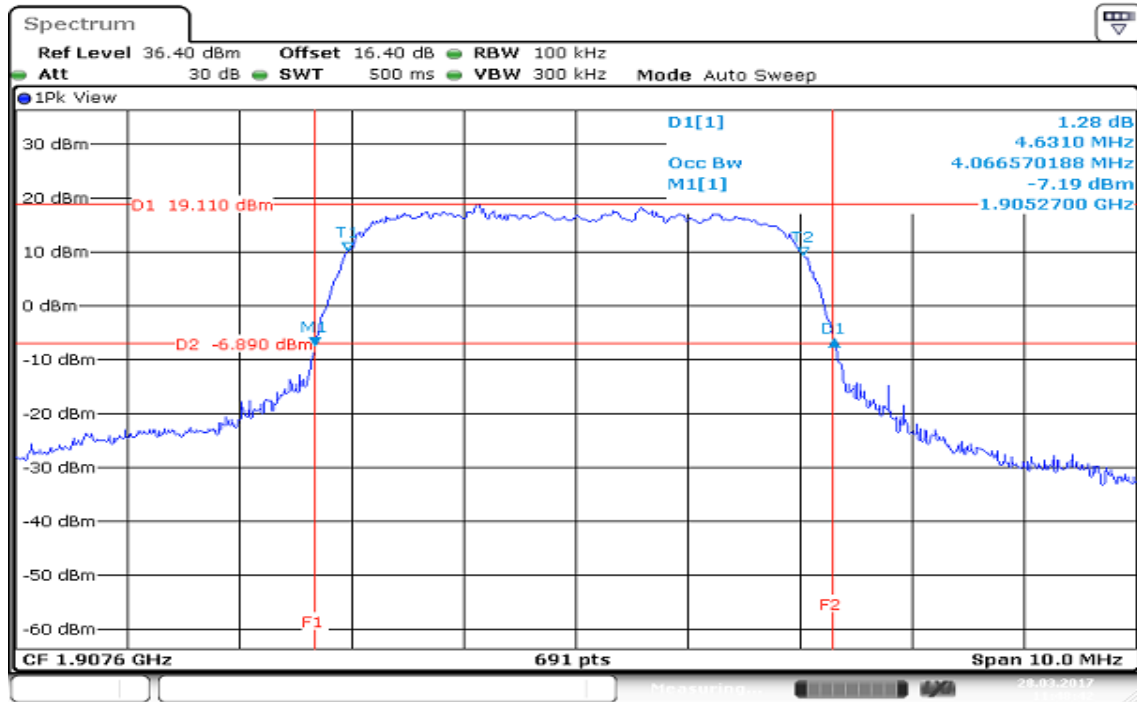
**Low CH**



**Mid CH**



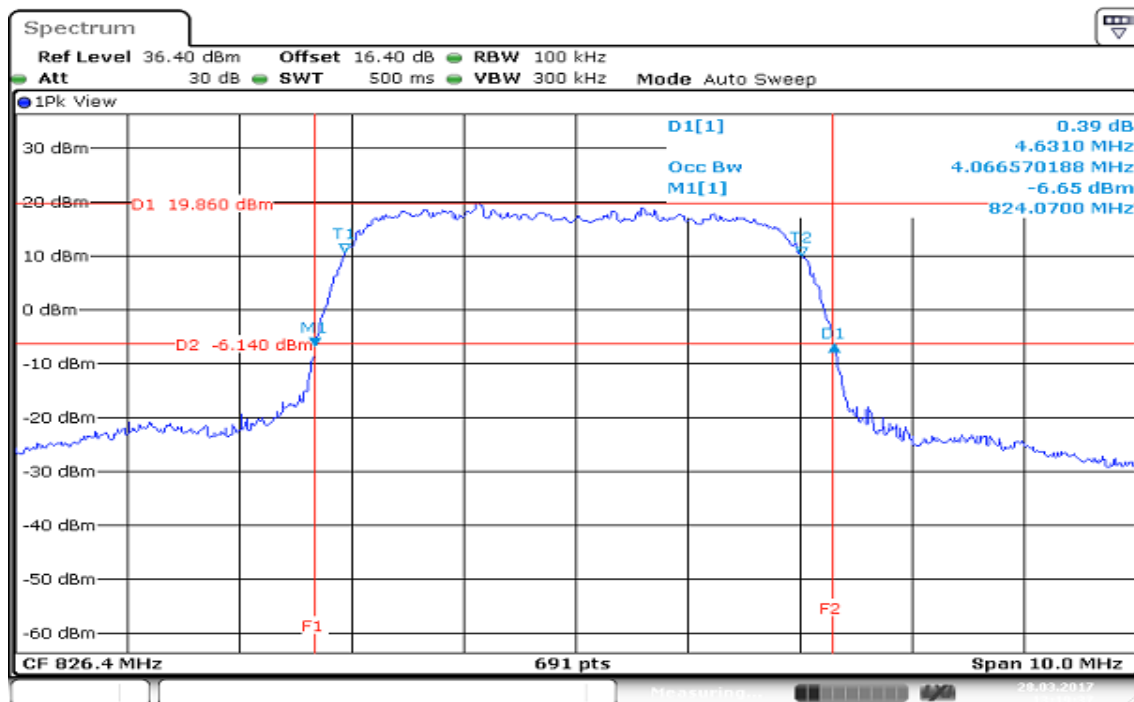
### High CH



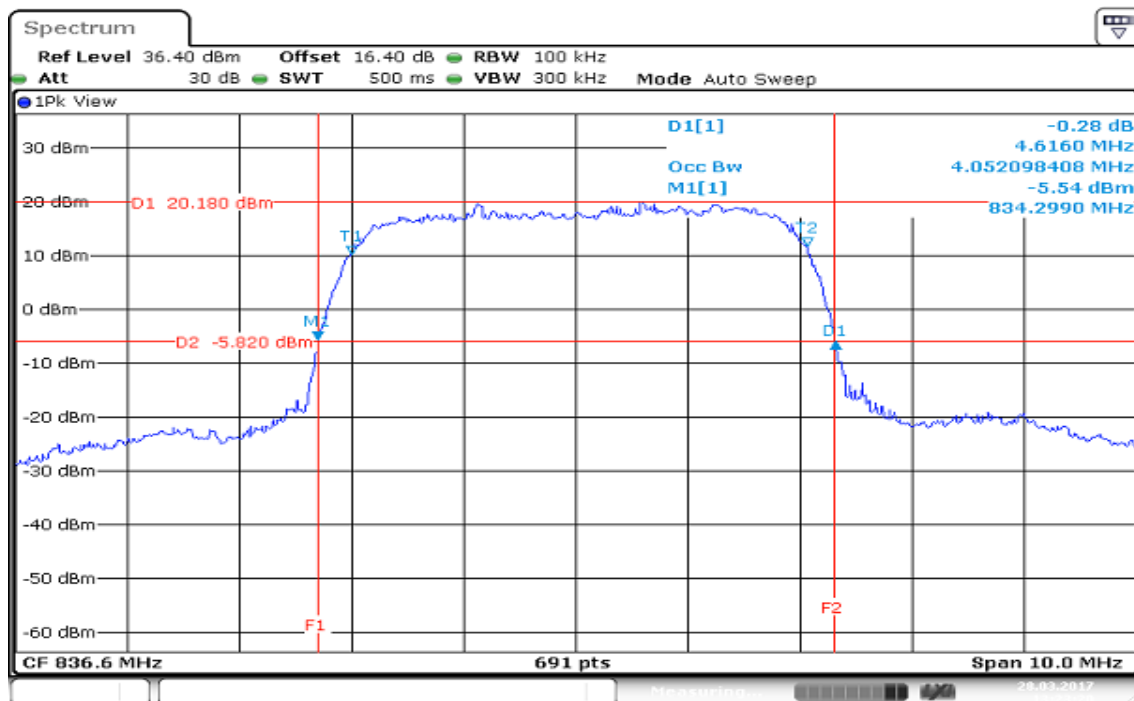
Date: 28 MAR 2017 11:48:43

### WCDMA 12.2k RMC (Band V)

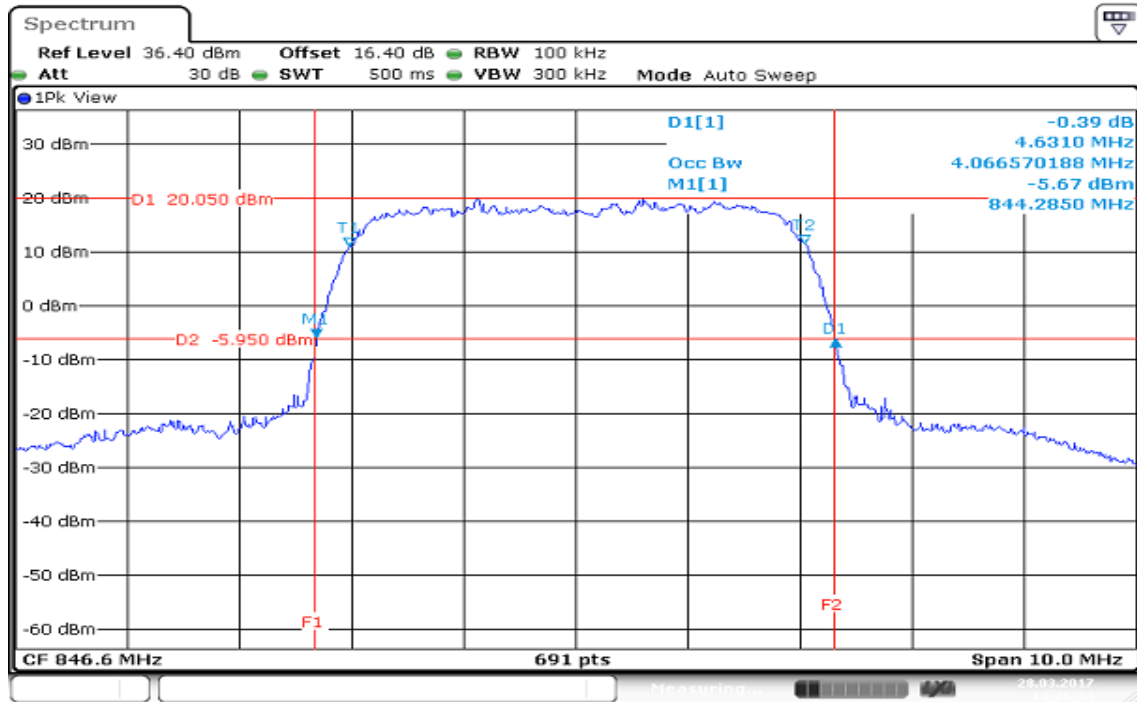
#### Low CH



#### Mid CH



### High CH



Date: 28 MAR 2017 13:26:34

## 7.4 CONDUCTED BANDEDG MEASUREMENT

### Limit

#### **FCC §22.917(a), Band 5**

For operations in the 824-849 MHz band, out of band emissions. 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.

#### **FCC §24.238(a), Band 2**

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. 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.

#### **RSS-132 section 5.5 and RSS-133 section 6.5**

In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts).

## TEST PROCEDURE

According to KDB 971168 D01, section 6.0

1. The EUT was connected to spectrum analyzer and call box.
2. The RF output of EUT was connected to the spectrum analyzer.
3. Start and stop frequency were set such that the band edge would be placed in the center of the plot
4. Span was set large enough so as to capture all out of band emissions near the band edge
5. Set the spectrum analyzer, RBW=100kHz, VBW=300kHz.
6. Record the Band edge emission.

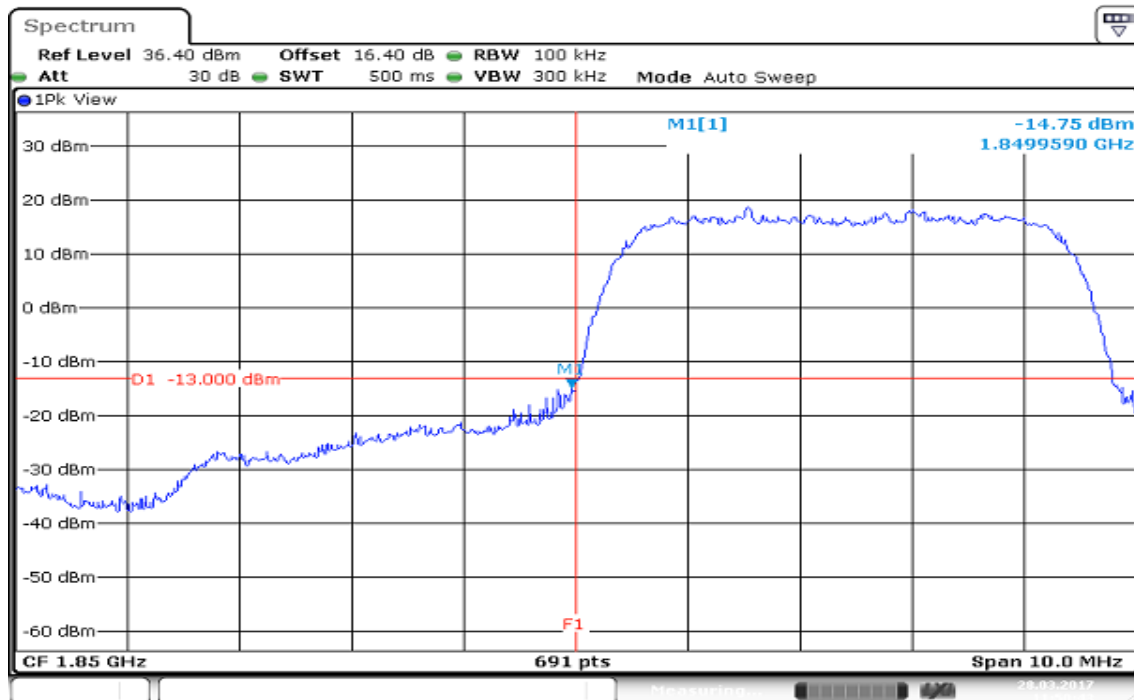
## TEST RESULTS

*No non-compliance noted.*

## Test Data

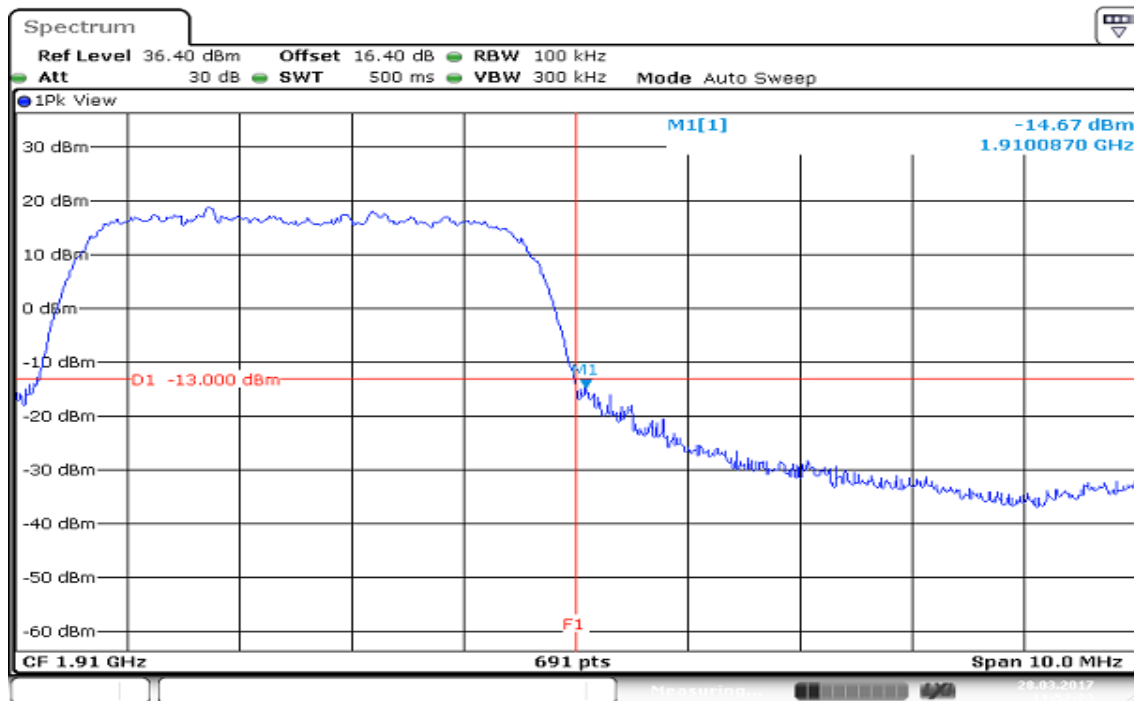
### WCDMA 12.2k RMC (Band II)

#### Low CH



Date: 28 MAR 2017 11:50:43

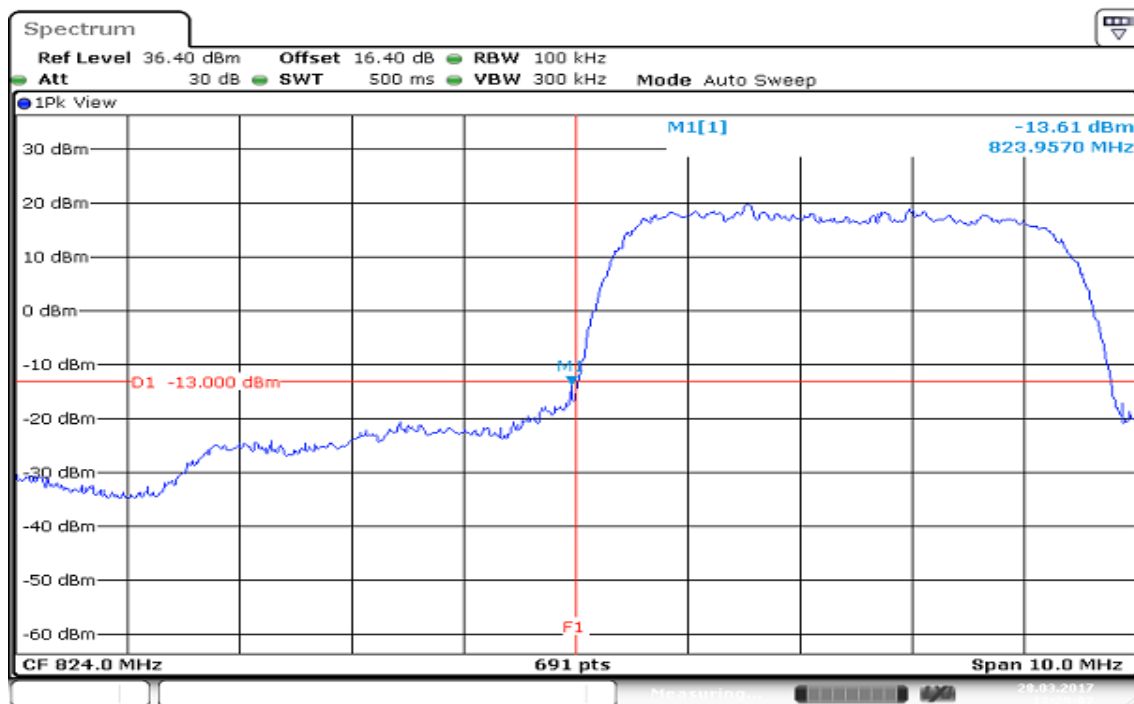
#### High CH



Date: 28 MAR 2017 11:52:24

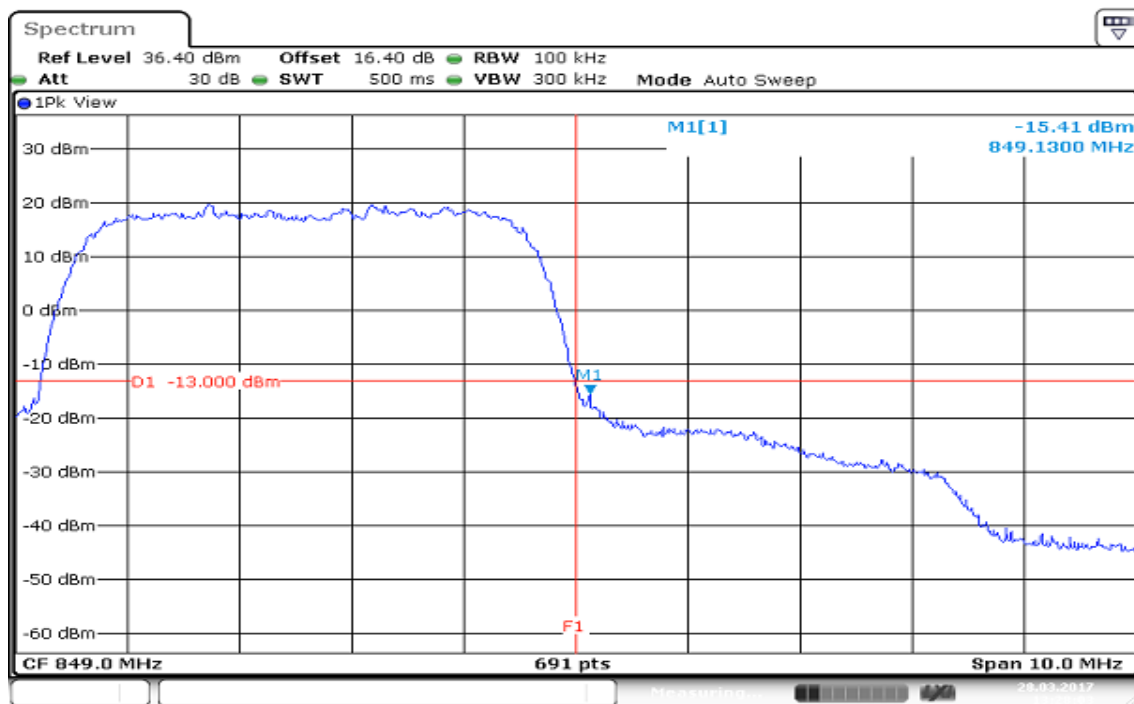
### WCDMA 12.2k RMC (Band V)

#### Low CH



Date: 28 MAR 2017 13:29:07

#### High CH



Date: 28 MAR 2017 13:28:03



## **7.5 PEAK TO AVERAGE RATIO**

### **Limit**

#### **FCC §22.913(d), Band 5**

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

#### **FCC §24.232(d), Band 2**

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

#### **RSS-132 section 5.4 and RSS-133 section 6.4**

The peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

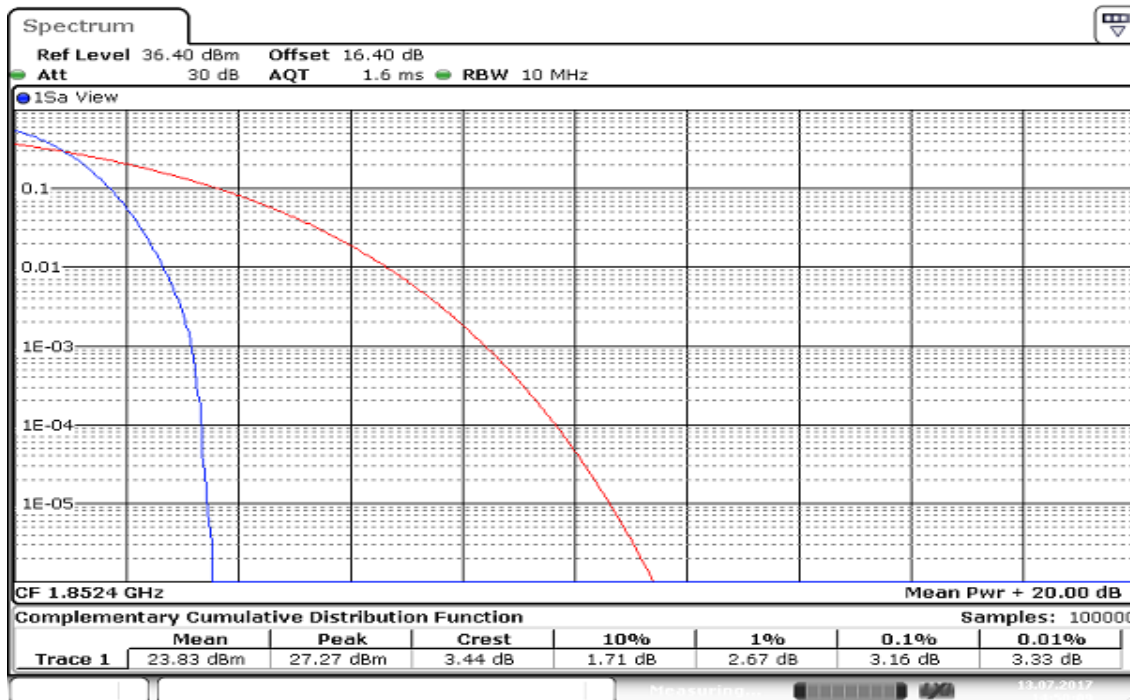
### **Test Procedures**

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

## Test Data

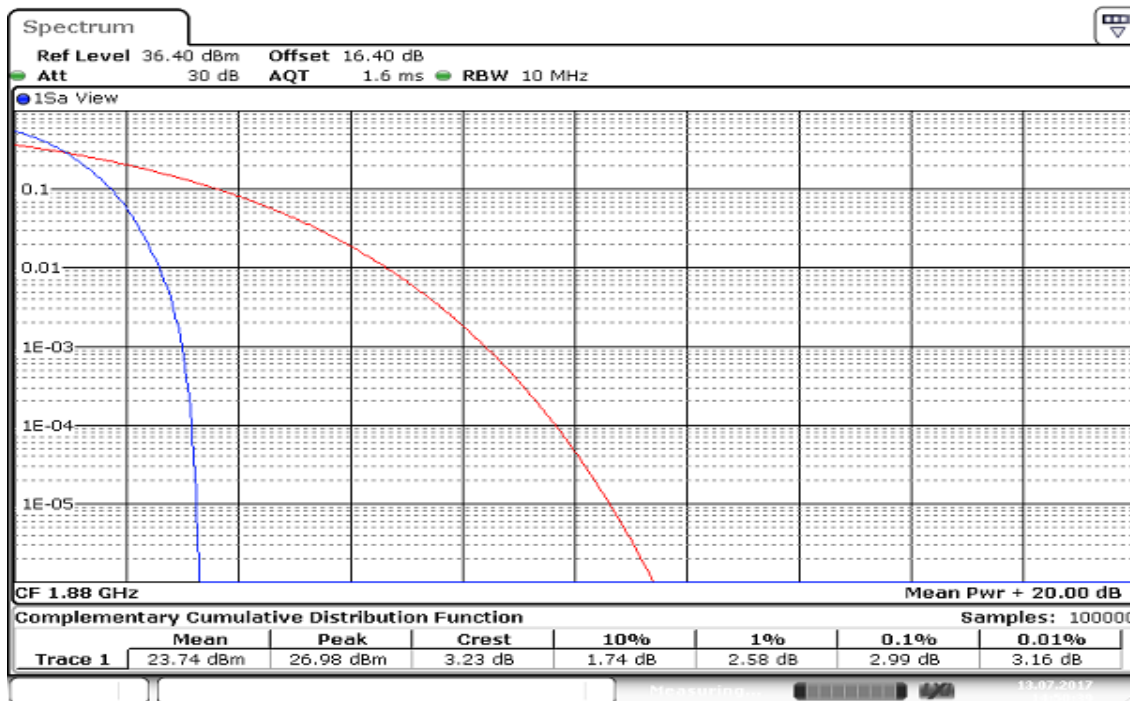
### WCDMA 12.2k RMC (Band II)

#### Low CH



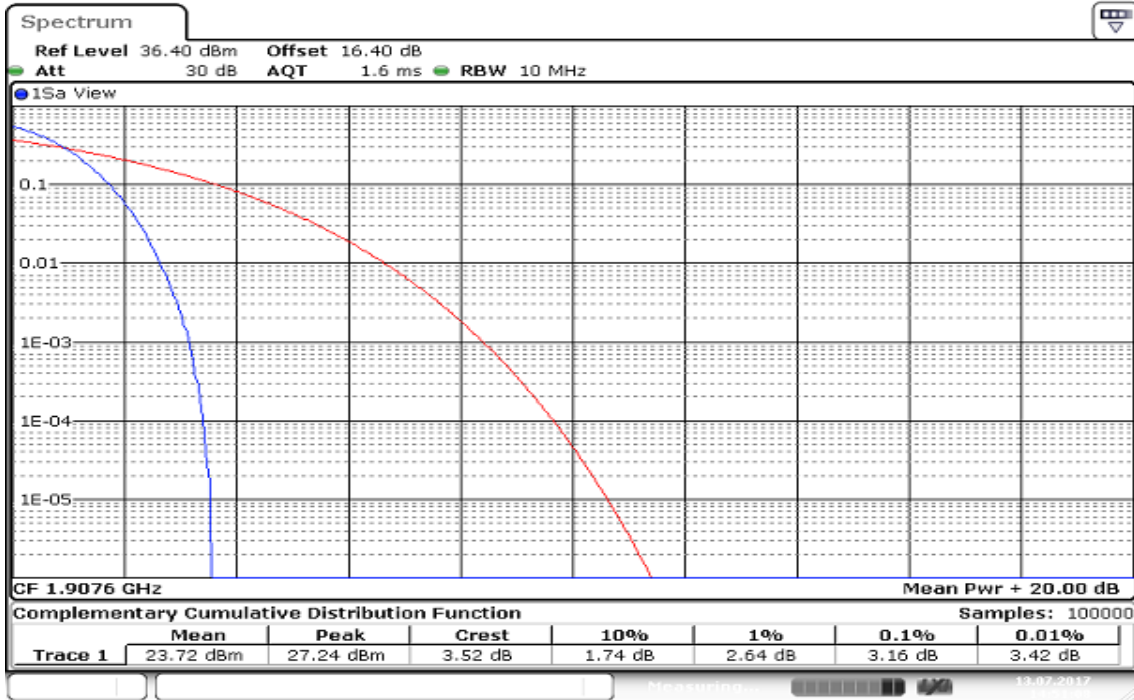
Date: 13.JUL.2017 14:50:09

#### Mid CH



Date: 13.JUL.2017 14:50:39

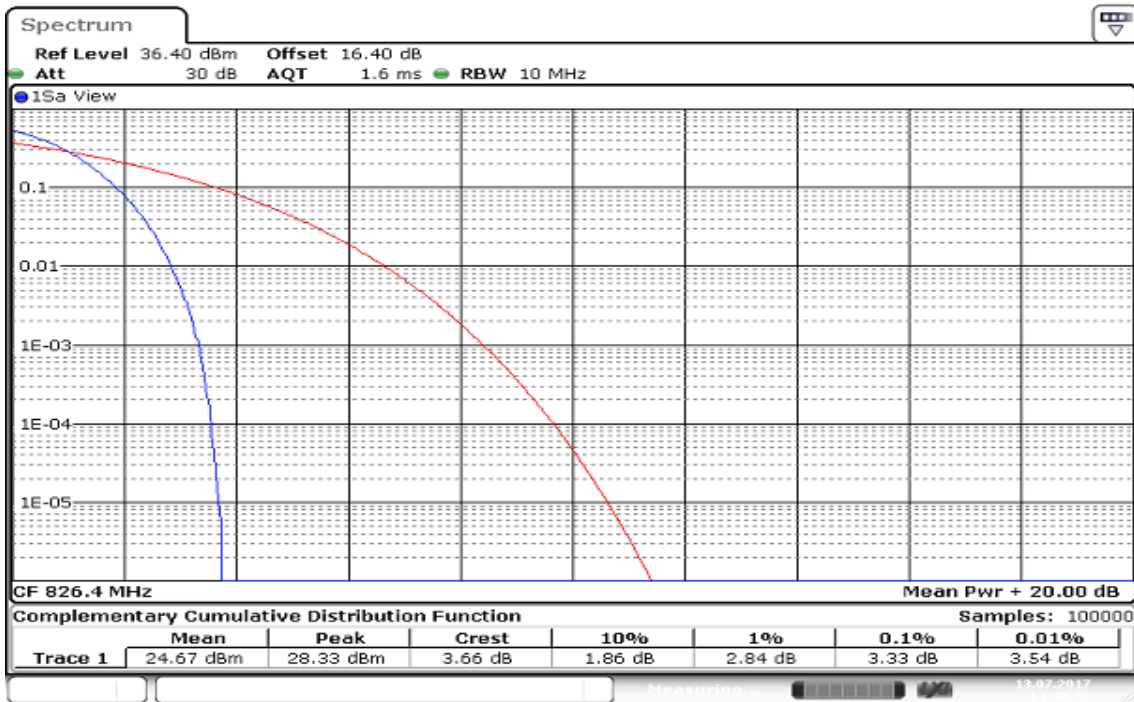
### High CH



Date: 13.JUL.2017 14:51:08

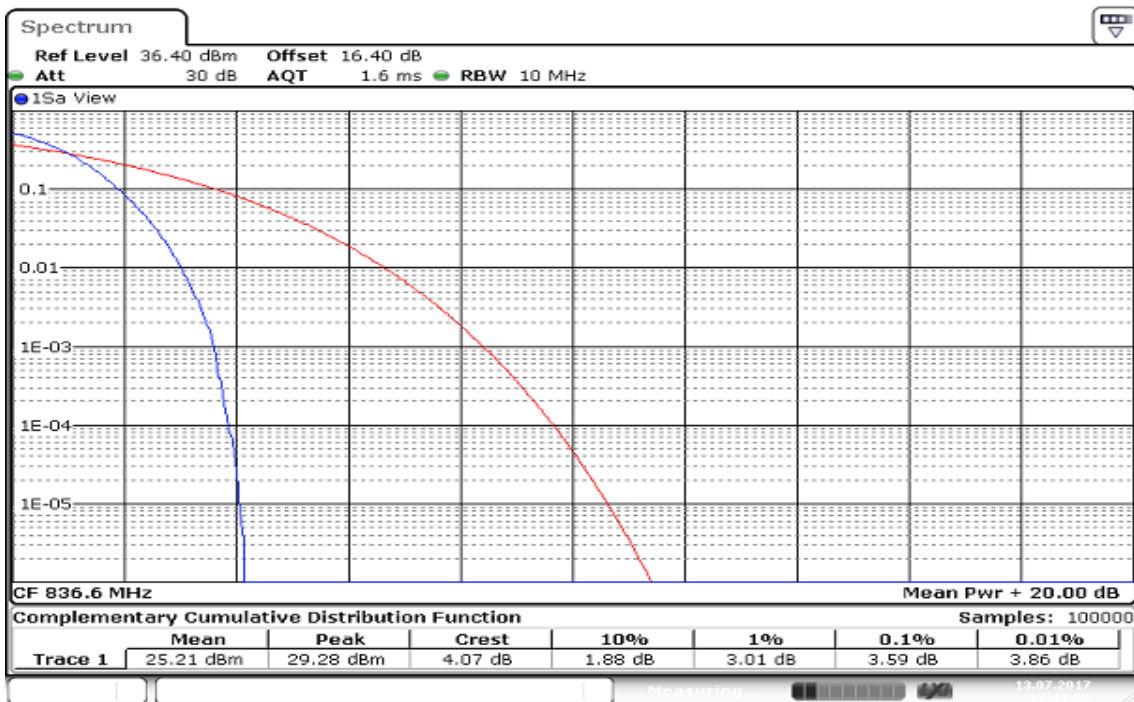
## WCDMA 12.2k RMC (Band V)

### Low CH



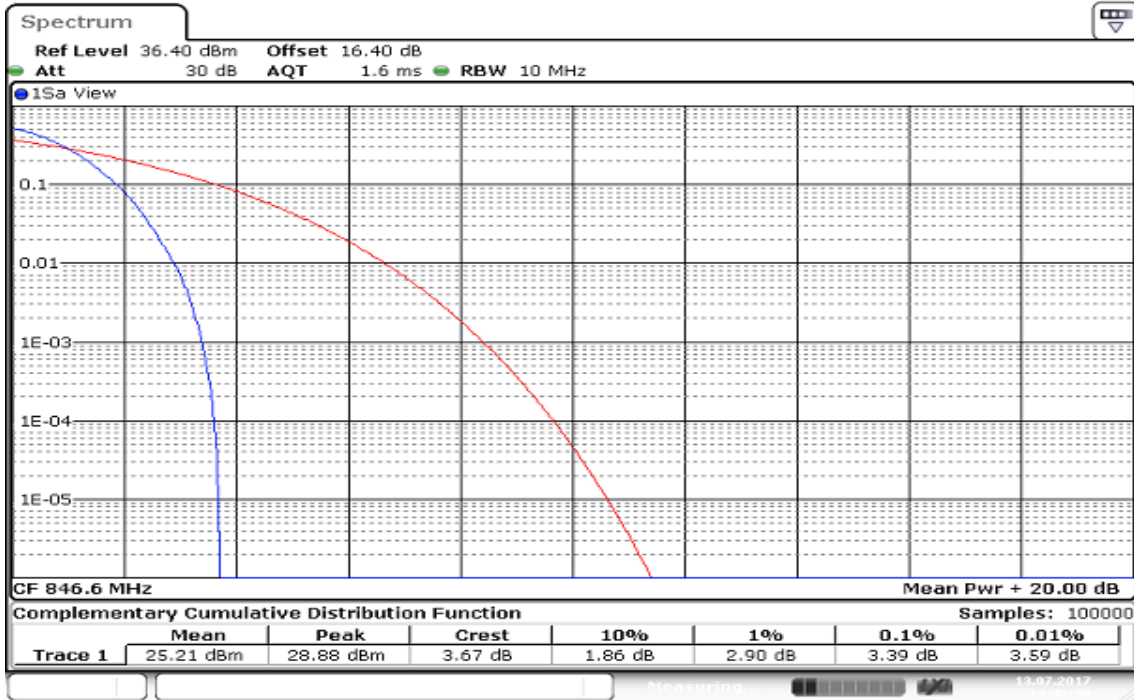
Date: 13.JUL.2017 14:40:51

### Mid CH



Date: 13.JUL.2017 14:41:59

### High CH



Date: 13.JUL.2017 14:42:38

## 7.6 CONDUCTED SPURIOUS EMISSIONS

### Limit

#### **FCC §22.917(a), Band 5**

For operations in the 824-849 MHz band, out of band emissions. 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.

#### **FCC §24.238(a), Band 2**

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. 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.

#### **RSS-132 section 5.5 and RSS-133 section 6.5**

In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts).

### Test Procedures

According to KDB 971168 D01, section 6.0

1. The EUT was connected to spectrum analyzer and call box.
2. The RF output of EUT was connected to the spectrum analyzer.
3. Set the spectrum analyzer, RBW=1MHz, VBW=3MHz.
4. Record the maximum spurious emission.
5. The fundamental frequency should be excluded against the limit in operating band.

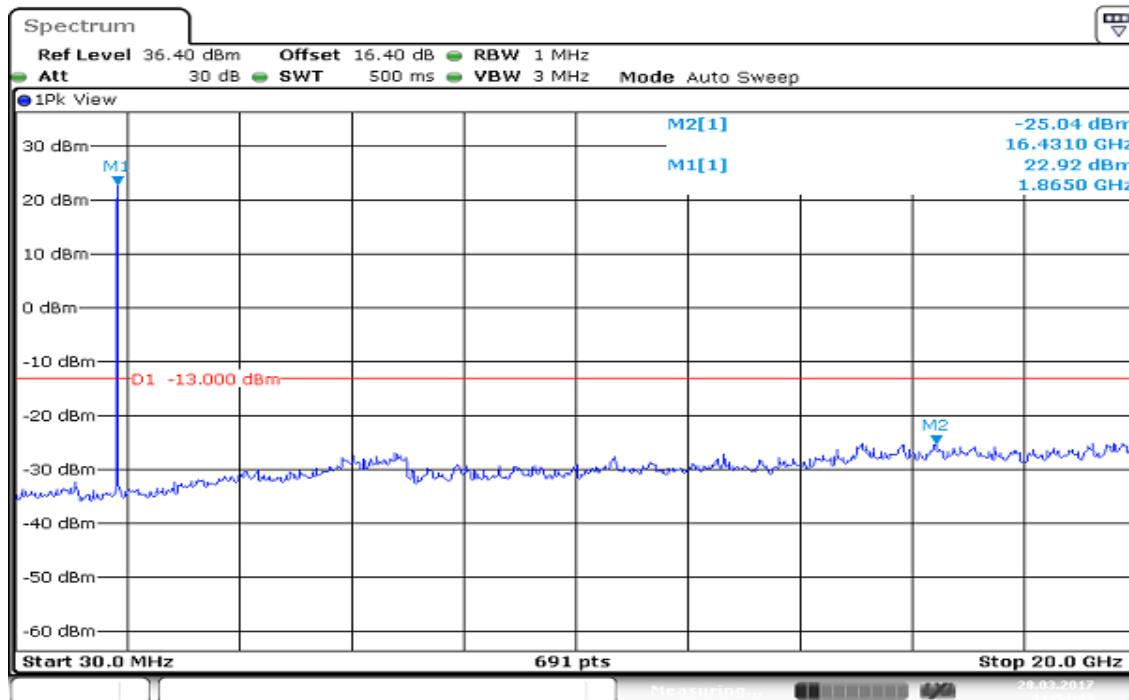
### TEST RESULTS

*No non-compliance noted*

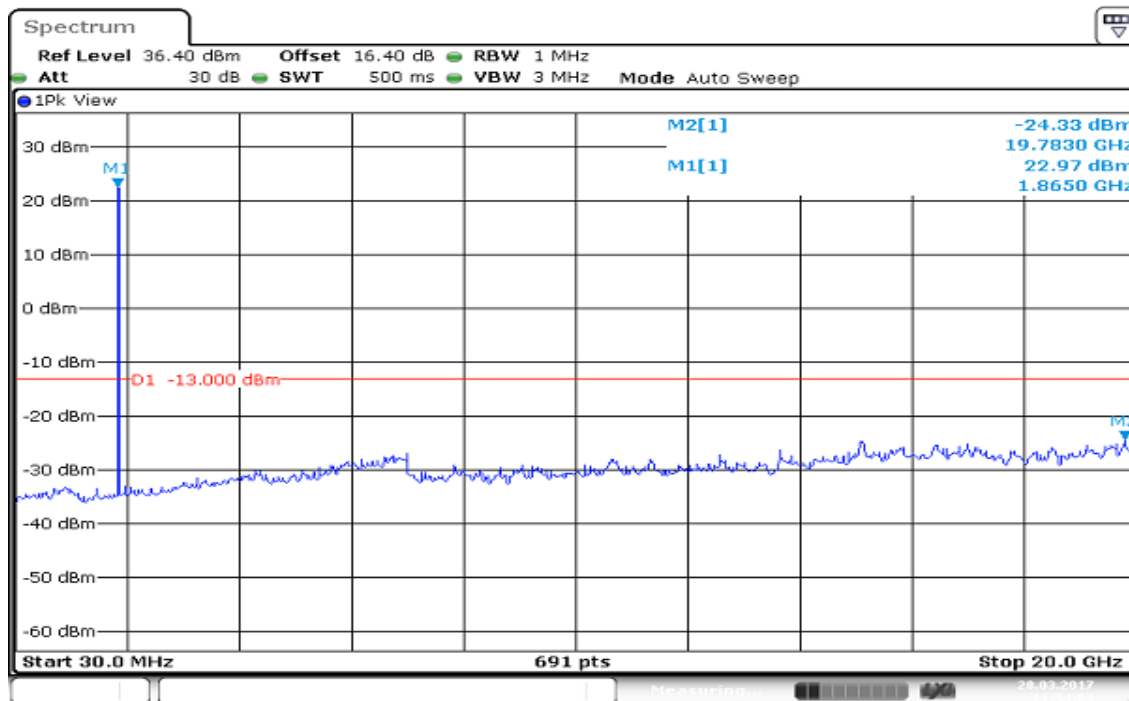
## Test Data

### WCDMA 12.2k RMC (Band II)

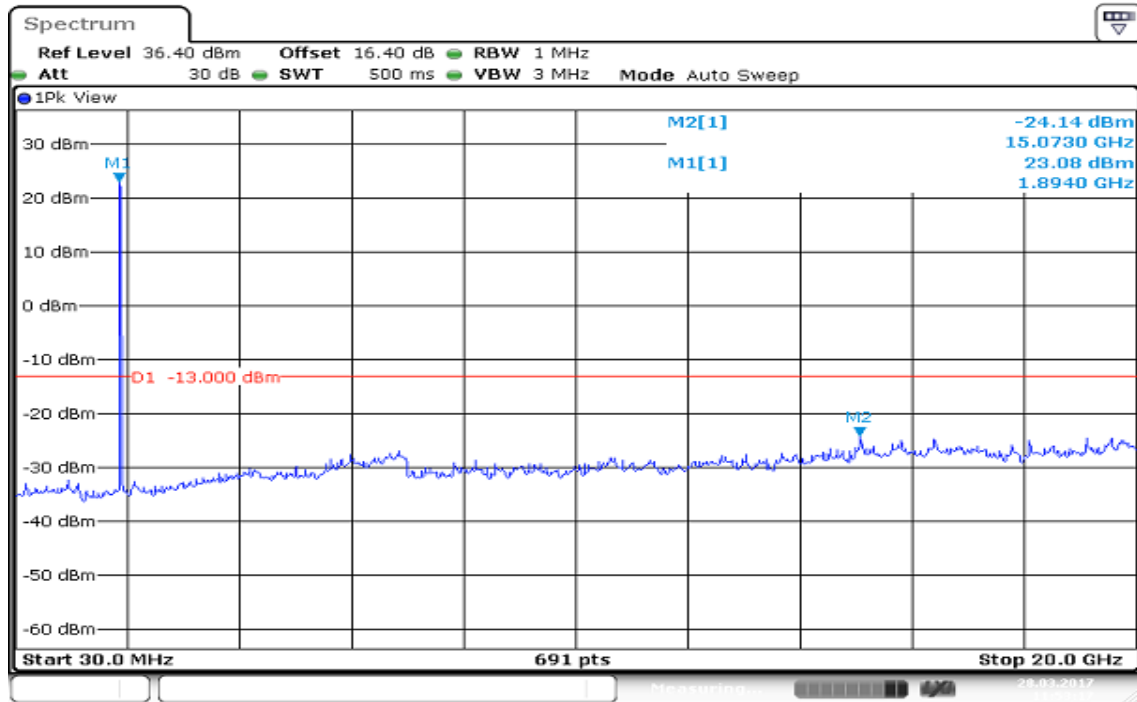
#### Low CH



#### Mid CH



### High CH

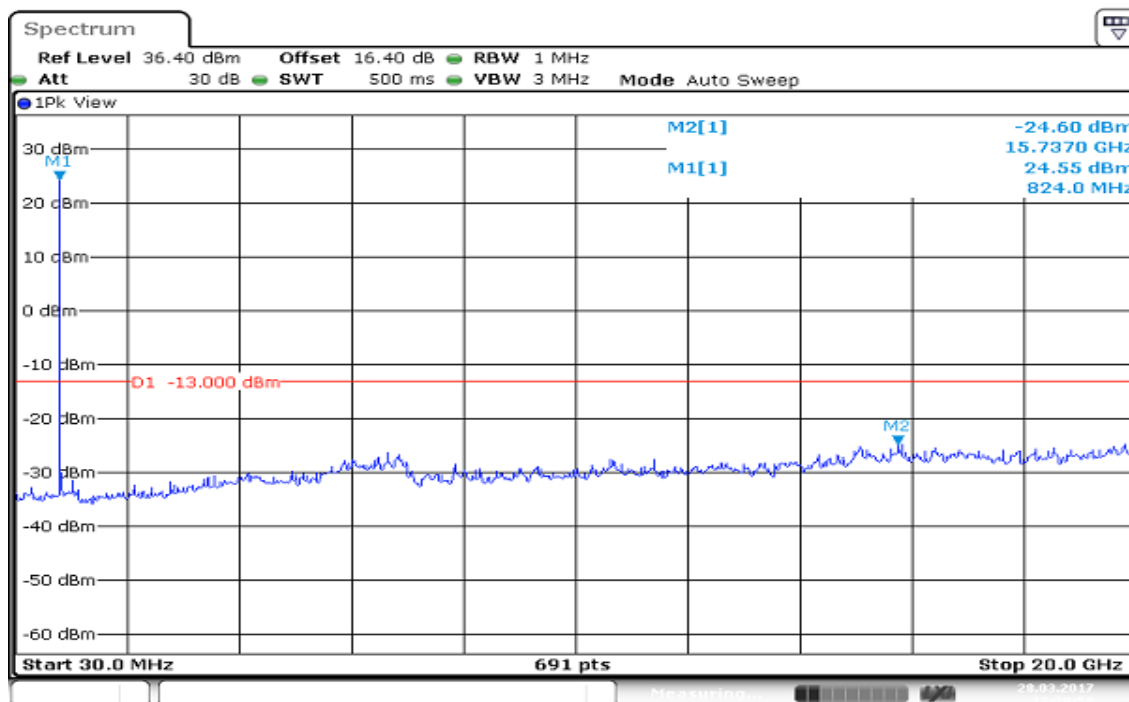


Date: 28 MAR 2017 11:53:18

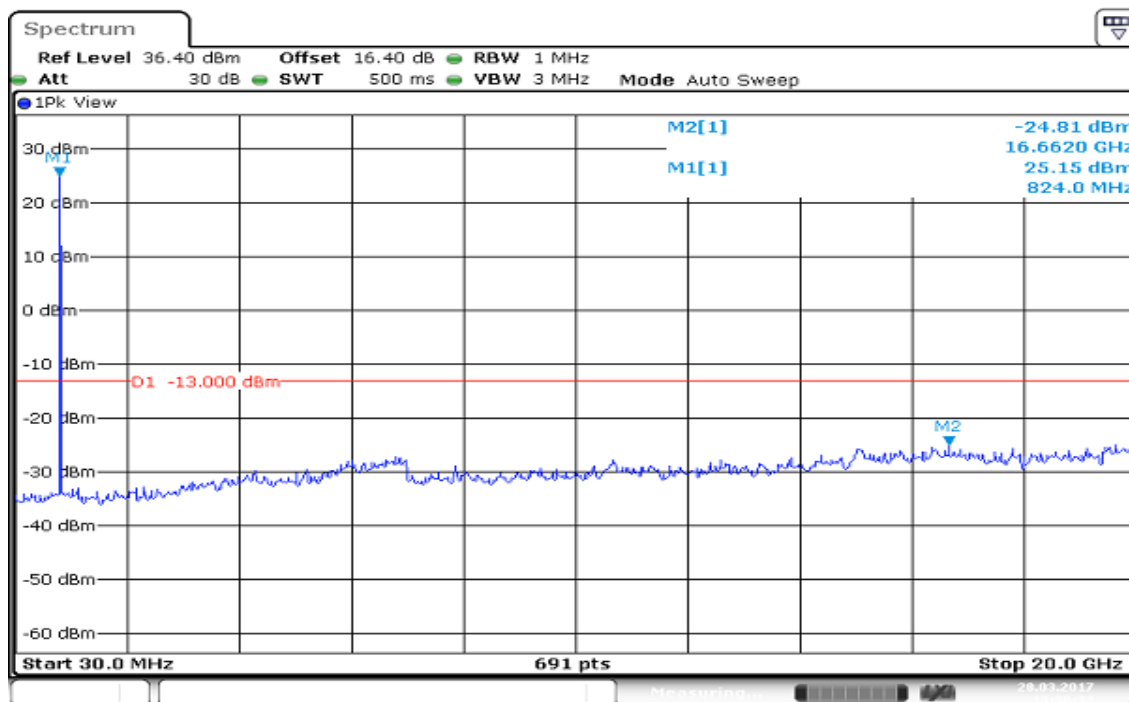


## WCDMA 12.2k RMC (Band V)

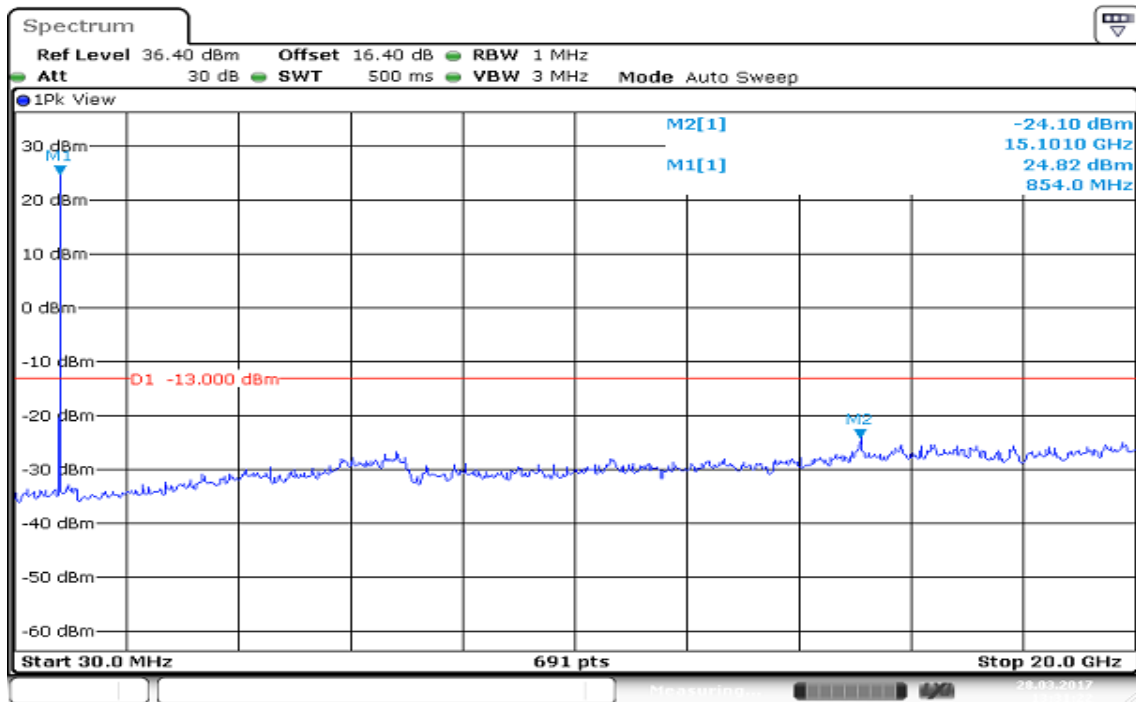
### Low CH



### Mid CH



### High CH



## 7.7 SPURIOUS RADIATION MEASUREMENT

### Limit

#### **FCC §22.917(a), Band 5**

For operations in the 824-849 MHz band, out of band emissions. 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.

#### **FCC §24.238(a), Band 2**

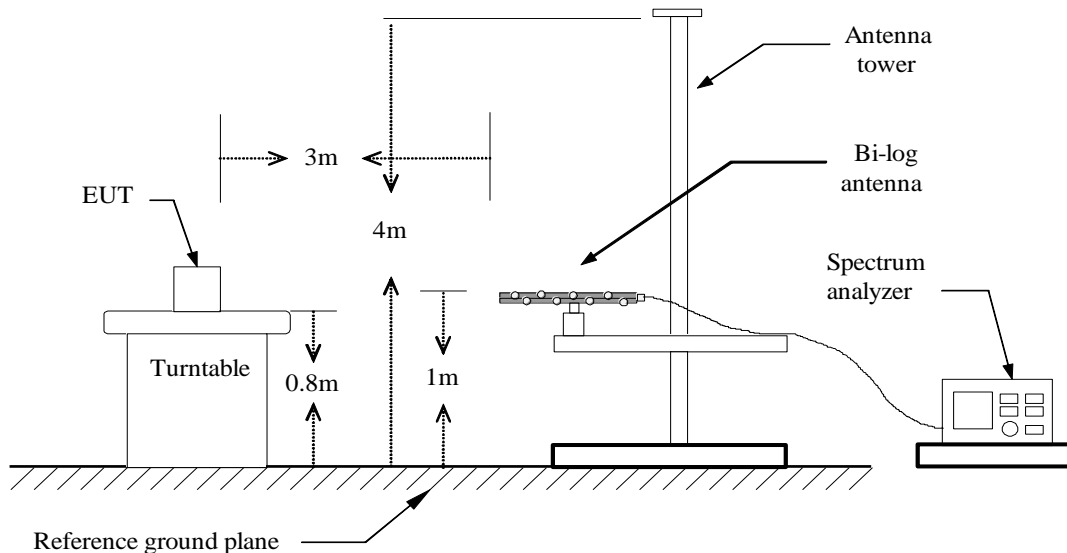
For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

#### **RSS-132 section 5.5 and RSS-133 section 6.5**

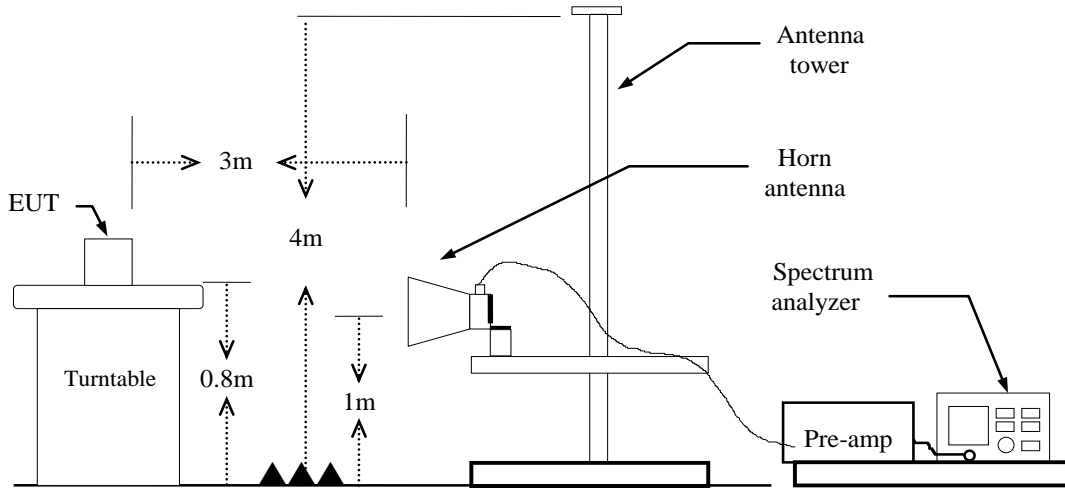
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least  $43 + 10 \log_{10} p$  (watts).

### Test Configuration

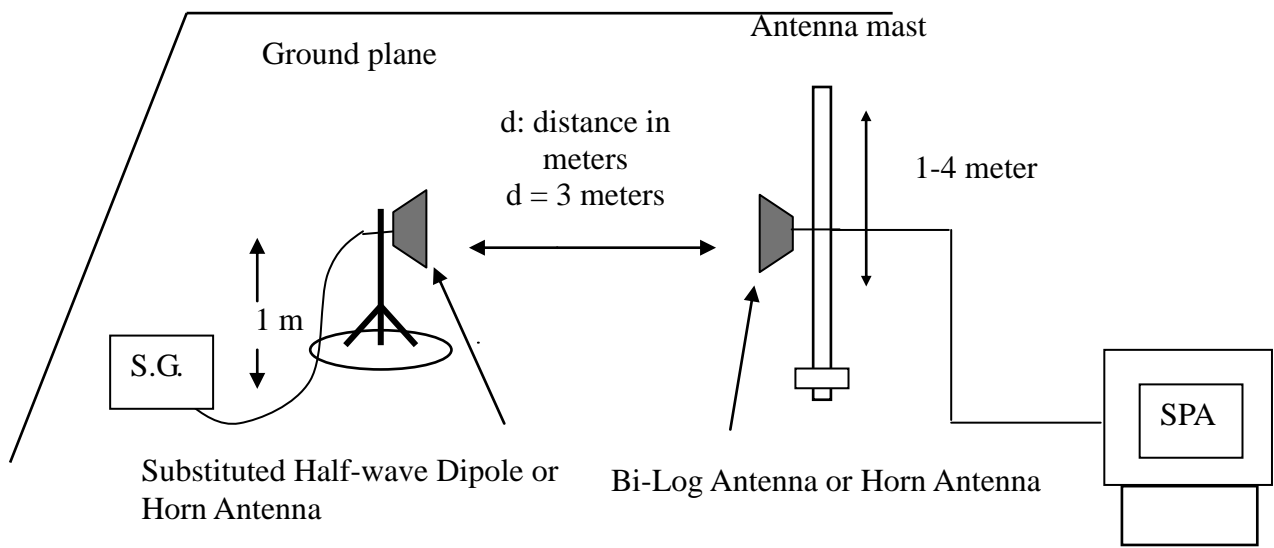
#### **Below 1 GHz**



**Above 1 GHz**



**Substituted Method Test Set-up**



## **TEST PROCEDURE**

1. According to KDB 971168 D01. section 5.8 and TIA-603-D:2010 section 2.2.12.
2. The EUT was placed on a turntable
  - (1) Below 1G : 0.8m
  - (2) Above 1G : 0.8m
  - (3) EUT set 3m from the receiving antenna
  - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

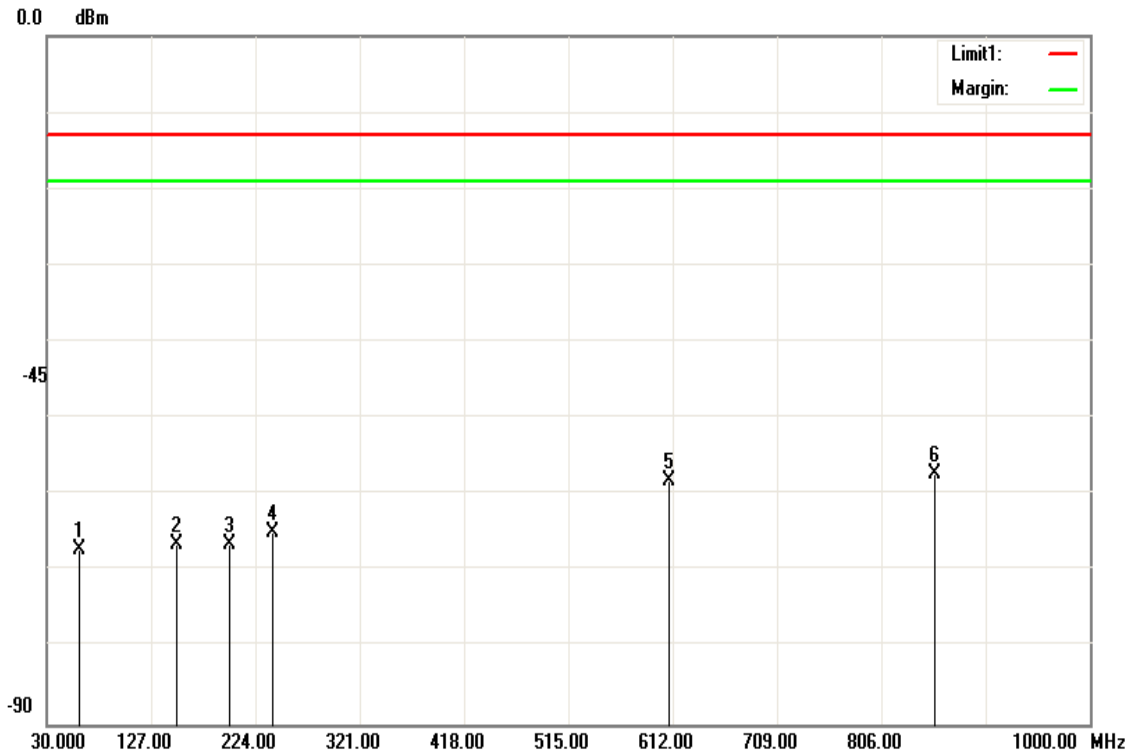
EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

## **TEST RESULTS**

*Refer to the attached tabular data sheets.*

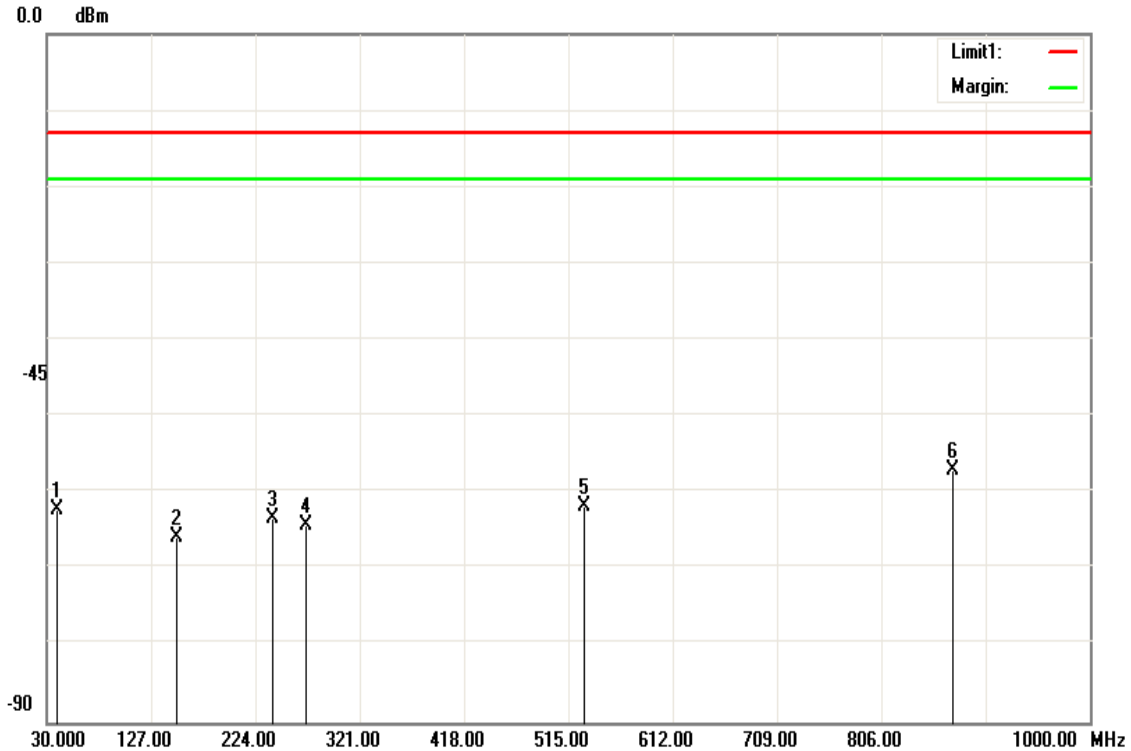
**Radiated Spurious Emission Measurement Result / Below 1GHz**

**Operation Mode:** WCDMA 12.2k RMC Band II / TX /Mid CH      **Test Date:** April 12, 2017  
**Temperature:** 22.1°C      **Tested by:** Timmy Wang  
**Humidity:** 50 % RH      **Polarity:** Ver.



| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 60.0700         | -65.82     | -1.29          | -67.11               | -13.00      | -54.11      | V                          |
| 150.2800        | -66.85     | 0.27           | -66.58               | -13.00      | -53.58      | V                          |
| 199.7500        | -70.58     | 4.1            | -66.48               | -13.00      | -53.48      | V                          |
| 240.4900        | -71.72     | 6.77           | -64.95               | -13.00      | -51.95      | V                          |
| 608.1200        | -57.08     | -1.11          | -58.19               | -13.00      | -45.19      | V                          |
| 855.4700        | -58.41     | 1.2            | -57.21               | -13.00      | -44.21      | V                          |

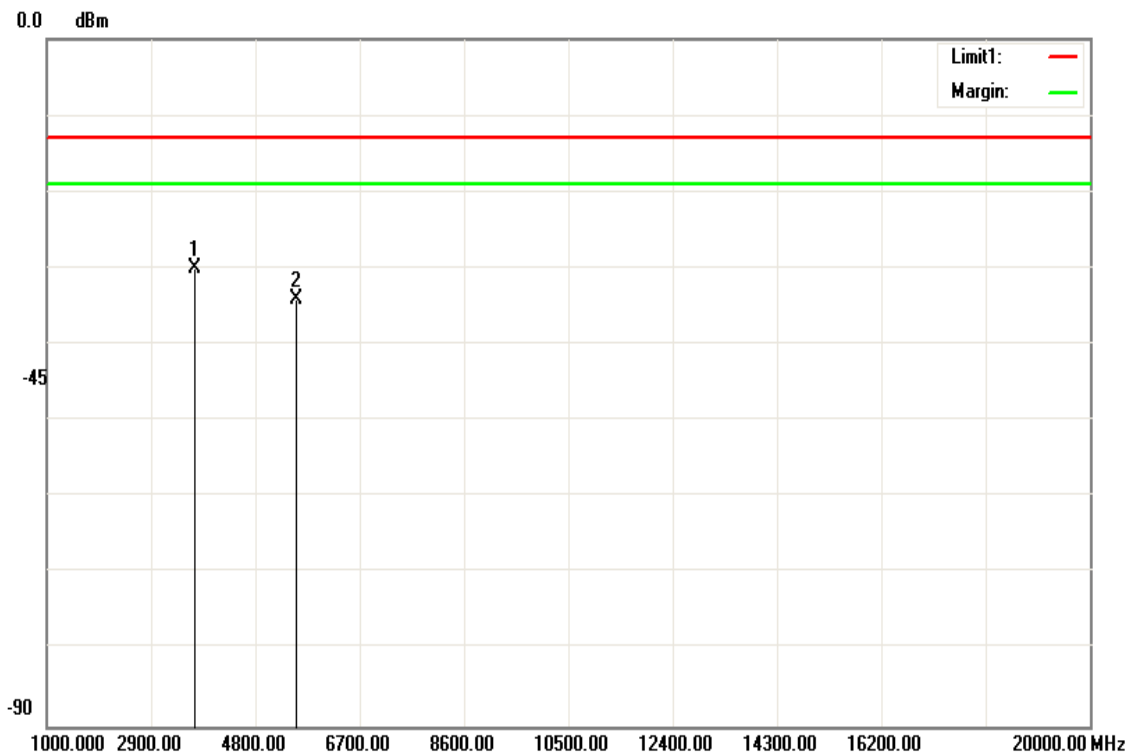
**Operation Mode:** WCDMA 12.2k RMC Band II / TX /Mid CH      **Test Date:** April 12, 2017  
**Temperature:** 22.1°C      **Tested by:** Timmy Wang  
**Humidity:** 50 % RH      **Polarity:** Hor.



| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 39.7000         | -56.31     | -5.91          | -62.22               | -13.00      | -49.22      | H                          |
| 150.2800        | -66.15     | 0.27           | -65.88               | -13.00      | -52.88      | H                          |
| 240.4900        | -70.12     | 6.77           | -63.35               | -13.00      | -50.35      | H                          |
| 270.5600        | -71.53     | 7.19           | -64.34               | -13.00      | -51.34      | H                          |
| 529.5500        | -68.54     | 6.83           | -61.71               | -13.00      | -48.71      | H                          |
| 872.9300        | -58.34     | 1.3            | -57.04               | -13.00      | -44.04      | H                          |

**Above 1GHz**

**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / Low CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Ver.



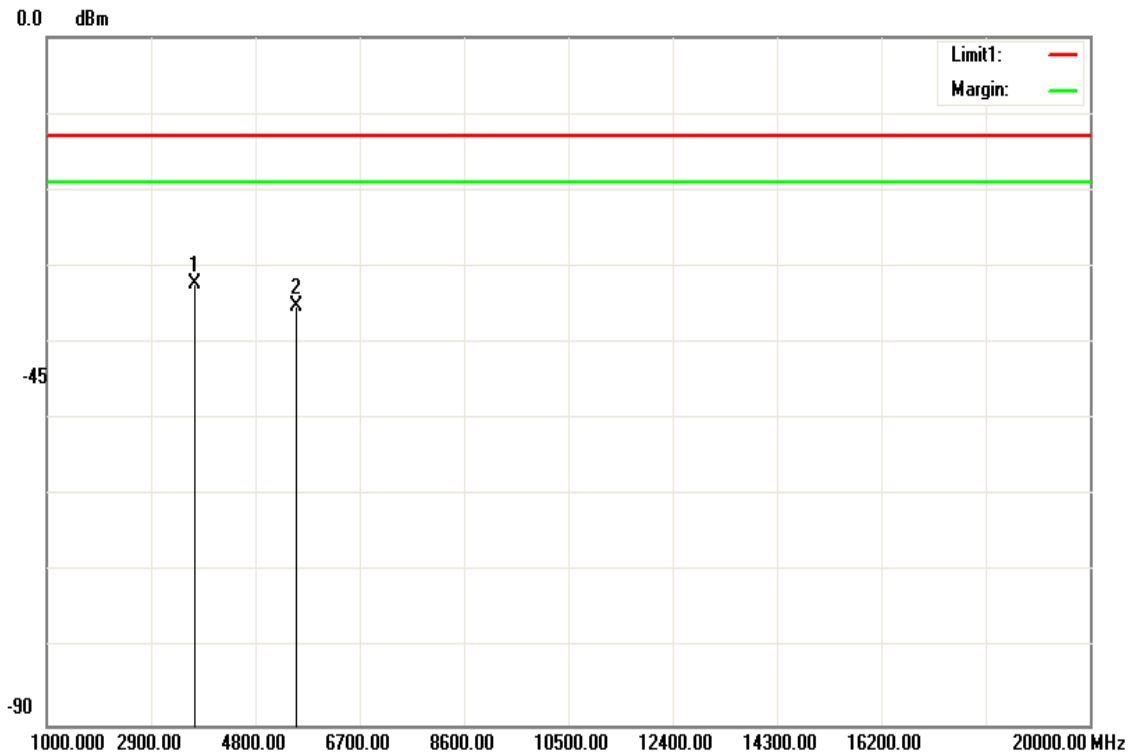
| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3702.000        | -42.56     | 12.54          | -30.02               | -13.00      | -17.02      | V                          |
| 5557.000        | -46.91     | 12.88          | -34.03               | -13.00      | -21.03      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.



**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / Low CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Hor.

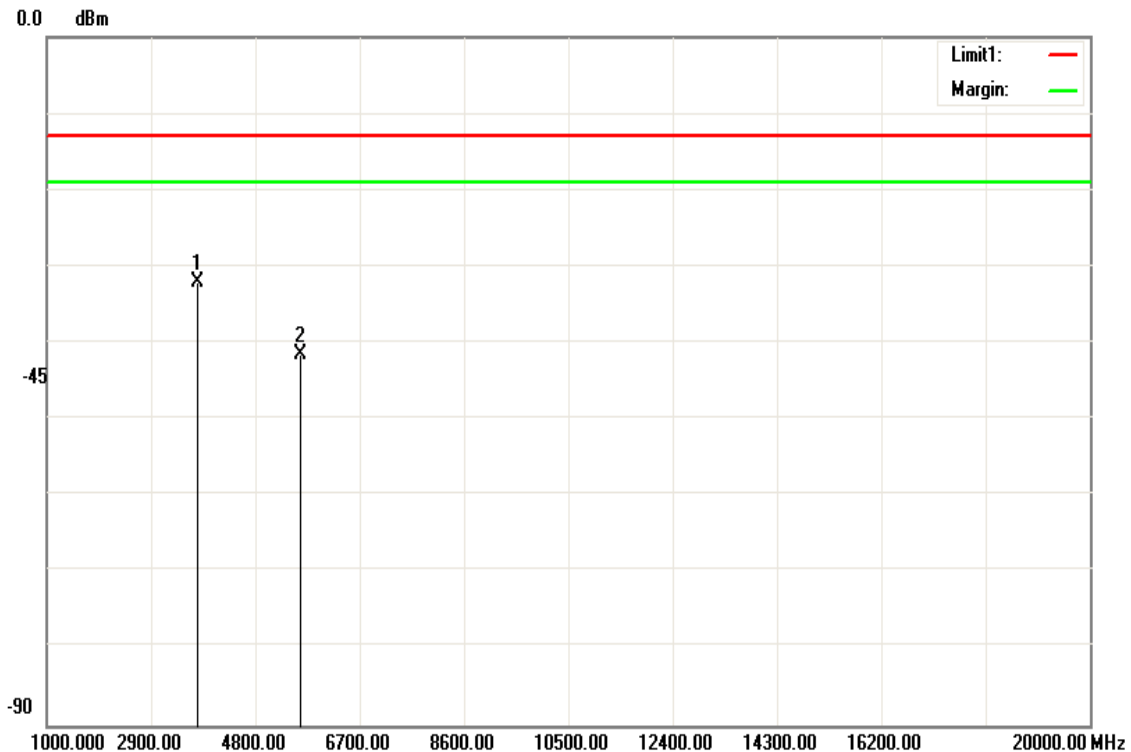


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3702.000        | -44.85     | 12.54          | -32.31               | -13.00      | -19.31      | H                          |
| 5557.000        | -48.02     | 12.88          | -35.14               | -13.00      | -22.14      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / Mid CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Ver.

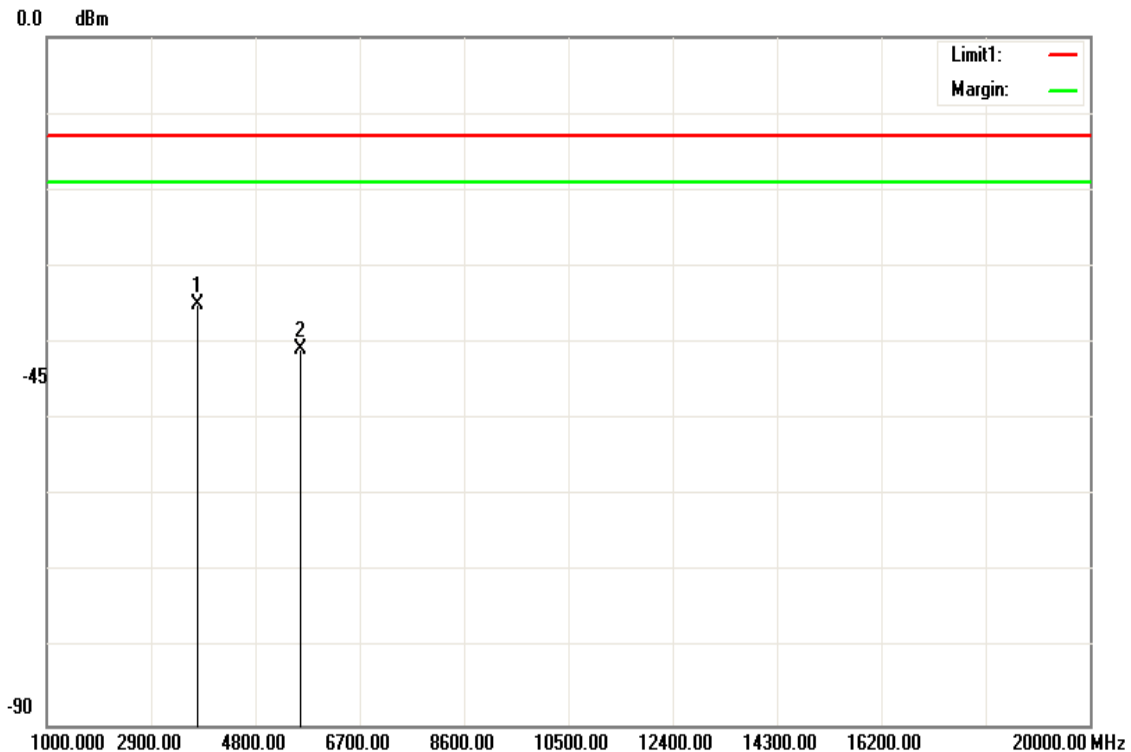


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3758.000        | -44.51     | 12.55          | -31.96               | -13.00      | -18.96      | V                          |
| 5634.000        | -54.27     | 12.85          | -41.42               | -13.00      | -28.42      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / Mid CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Hor.

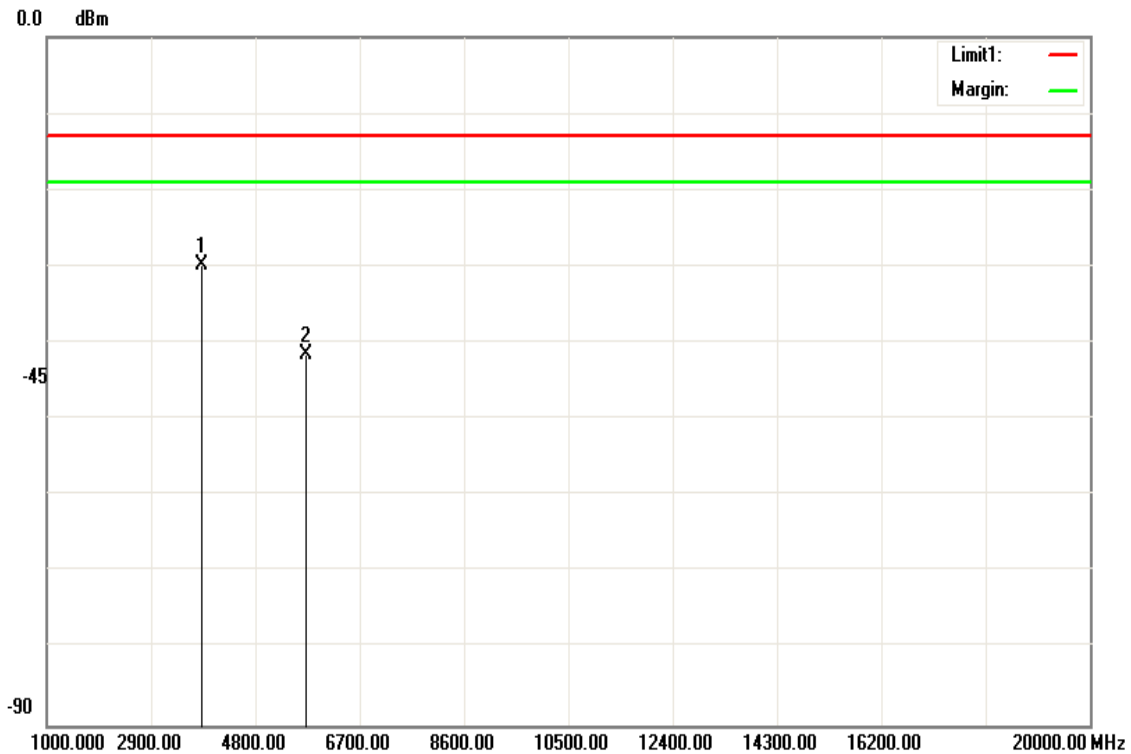


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3758.000        | -47.48     | 12.55          | -34.93               | -13.00      | -21.93      | H                          |
| 5634.000        | -53.67     | 12.85          | -40.82               | -13.00      | -27.82      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / High CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Ver.

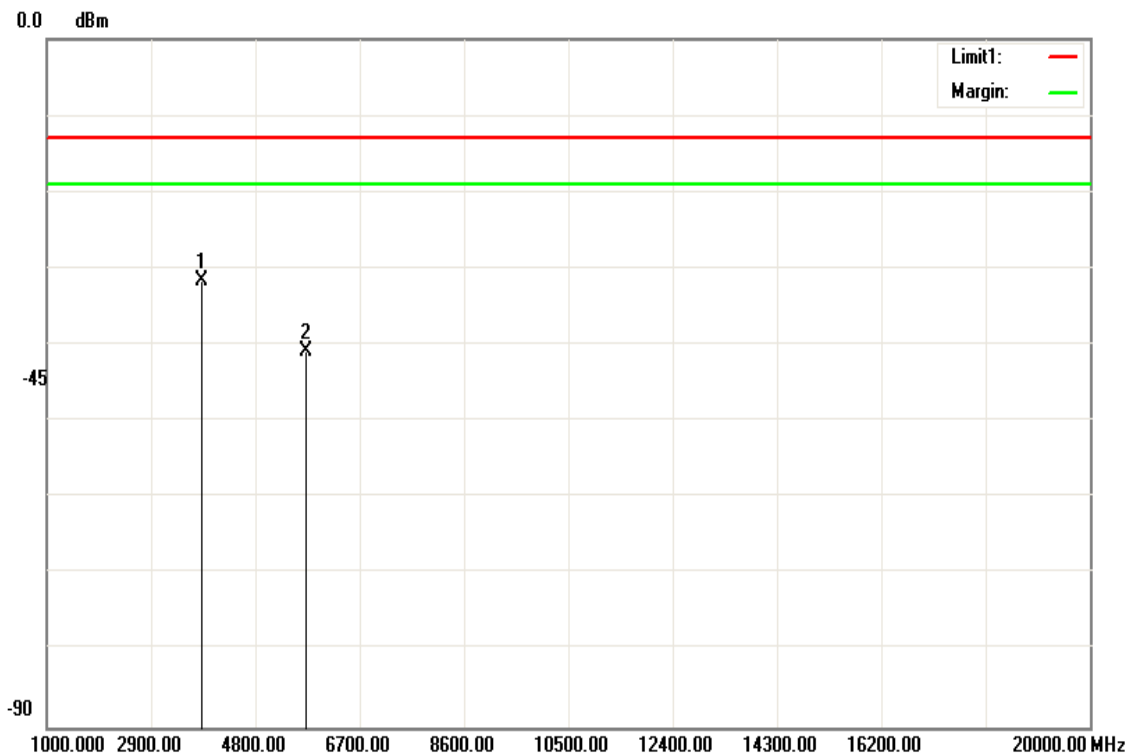


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3814.000        | -42.37     | 12.56          | -29.81               | -13.00      | -16.81      | V                          |
| 5725.000        | -54.31     | 12.81          | -41.50               | -13.00      | -28.50      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band II / TX / High CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Hor.



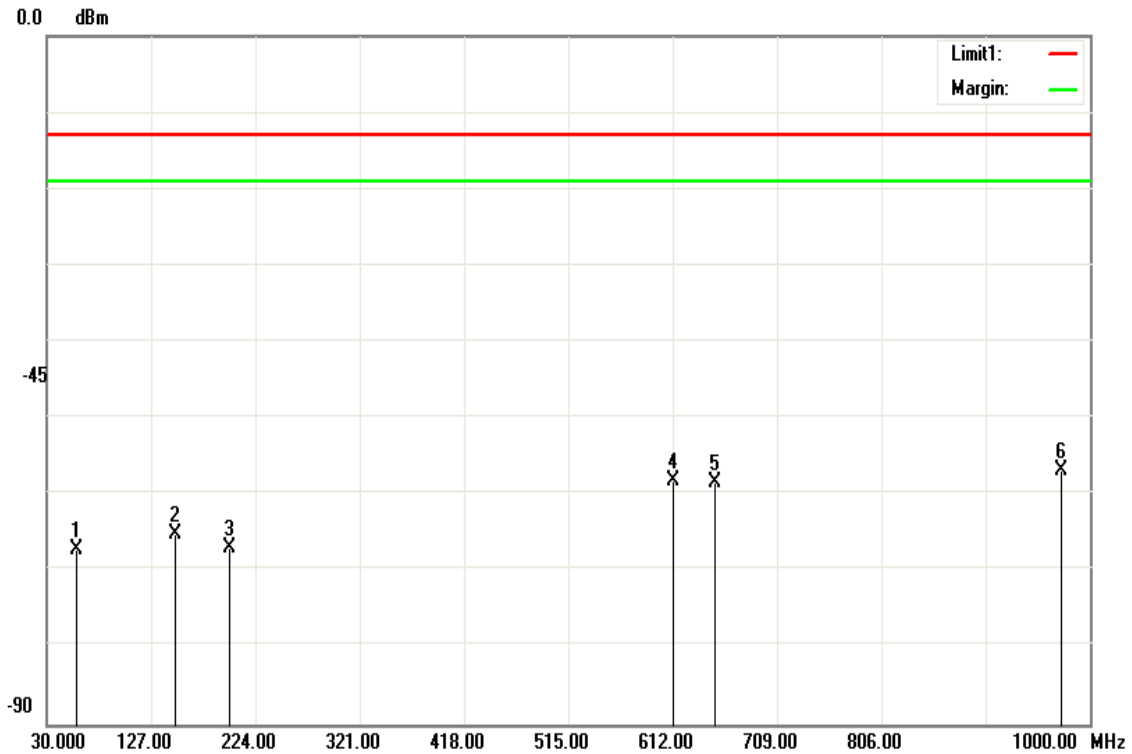
| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 3814.000        | -44.17     | 12.56          | -31.61               | -13.00      | -18.61      | H                          |
| 5725.000        | -53.55     | 12.81          | -40.74               | -13.00      | -27.74      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

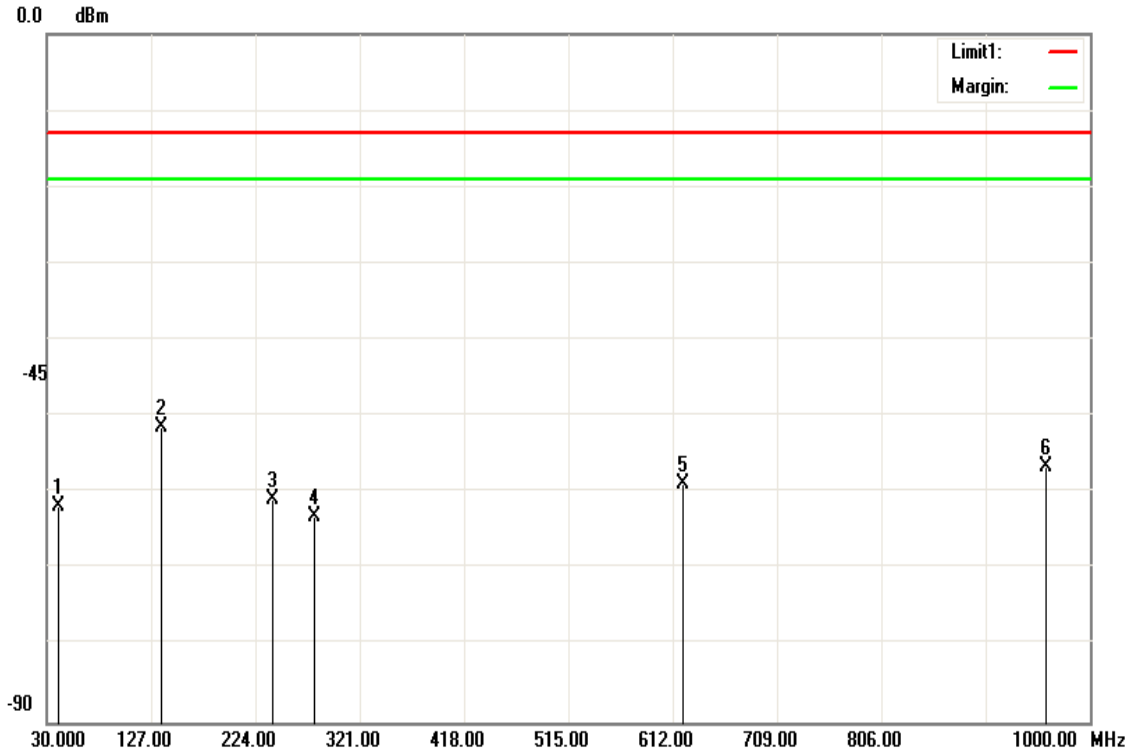
**Radiated Spurious Emission Measurement Result / Below 1GHz**

**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX /Mid CH      **Test Date:** April 12, 2017  
**Temperature:** 22.1°C      **Tested by:** Timmy Wang  
**Humidity:** 50 % RH      **Polarity:** Ver.



| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 57.1600         | -65.53     | -1.58          | -67.11               | -13.00      | -54.11      | V                          |
| 149.3100        | -65.51     | 0.36           | -65.15               | -13.00      | -52.15      | V                          |
| 199.7500        | -70.98     | 4.1            | -66.88               | -13.00      | -53.88      | V                          |
| 612.0000        | -57.33     | -0.89          | -58.22               | -13.00      | -45.22      | V                          |
| 651.7700        | -59.74     | 1.32           | -58.42               | -13.00      | -45.42      | V                          |
| 973.8100        | -60.74     | 3.83           | -56.91               | -13.00      | -43.91      | V                          |

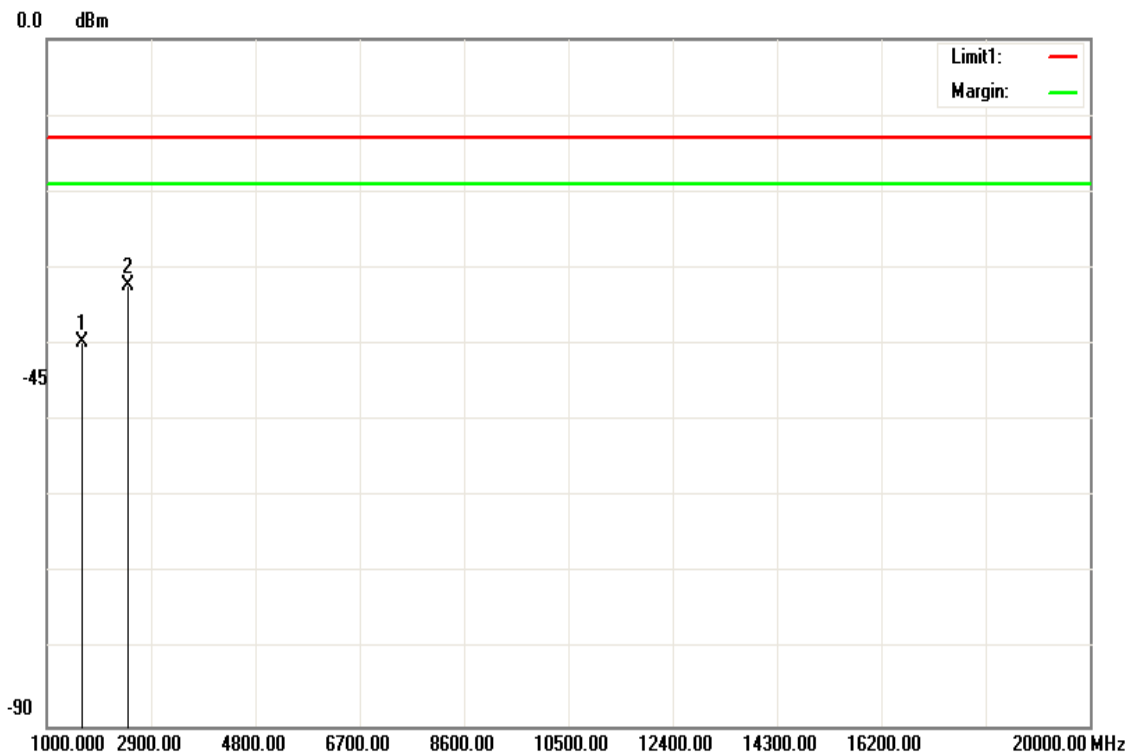
**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX /Mid CH      **Test Date:** April 12, 2017  
**Temperature:** 22.1°C      **Tested by:** Timmy Wang  
**Humidity:** 50 % RH      **Polarity:** Hor.



| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 40.6700         | -56.06     | -5.71          | -61.77               | -13.00      | -48.77      | H                          |
| 136.7000        | -52.66     | 1.15           | -51.51               | -13.00      | -38.51      | H                          |
| 240.4900        | -67.52     | 6.77           | -60.75               | -13.00      | -47.75      | H                          |
| 278.3200        | -70.18     | 7.12           | -63.06               | -13.00      | -50.06      | H                          |
| 621.7000        | -58.49     | -0.33          | -58.82               | -13.00      | -45.82      | H                          |
| 959.2600        | -58.82     | 2.29           | -56.53               | -13.00      | -43.53      | H                          |

**Above 1GHz**

|                        |   |                   |                |
|------------------------|---|-------------------|----------------|
| <b>Operation Mode:</b> | WCDMA 12.2k RMC<br>Band V / TX / Low CH | <b>Test Date:</b> | April 12, 2017 |
| <b>Temperature:</b>    | 22.1°C                                  | <b>Tested by:</b> | Timmy Wang     |
| <b>Humidity:</b>       | 50 % RH                                 | <b>Polarity:</b>  | Ver.           |



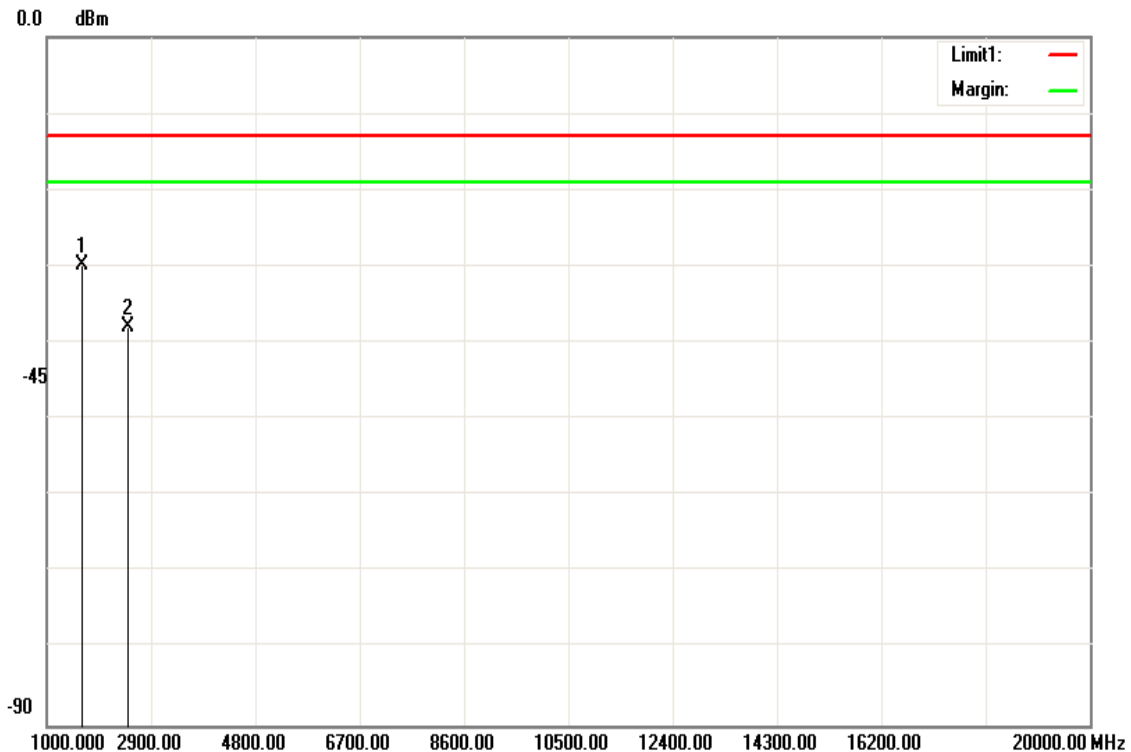
| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1651.000        | -41.24     | 1.52           | -39.72               | -13.00      | -26.72      | V                          |
| 2477.000        | -34.08     | 1.83           | -32.25               | -13.00      | -19.25      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.



**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX / Low CH      **Test Date:** April 12, 2017  
**Temperature:** 22.1°C      **Tested by:** Timmy Wang  
**Humidity:** 50 % RH      **Polarity:** Hor.

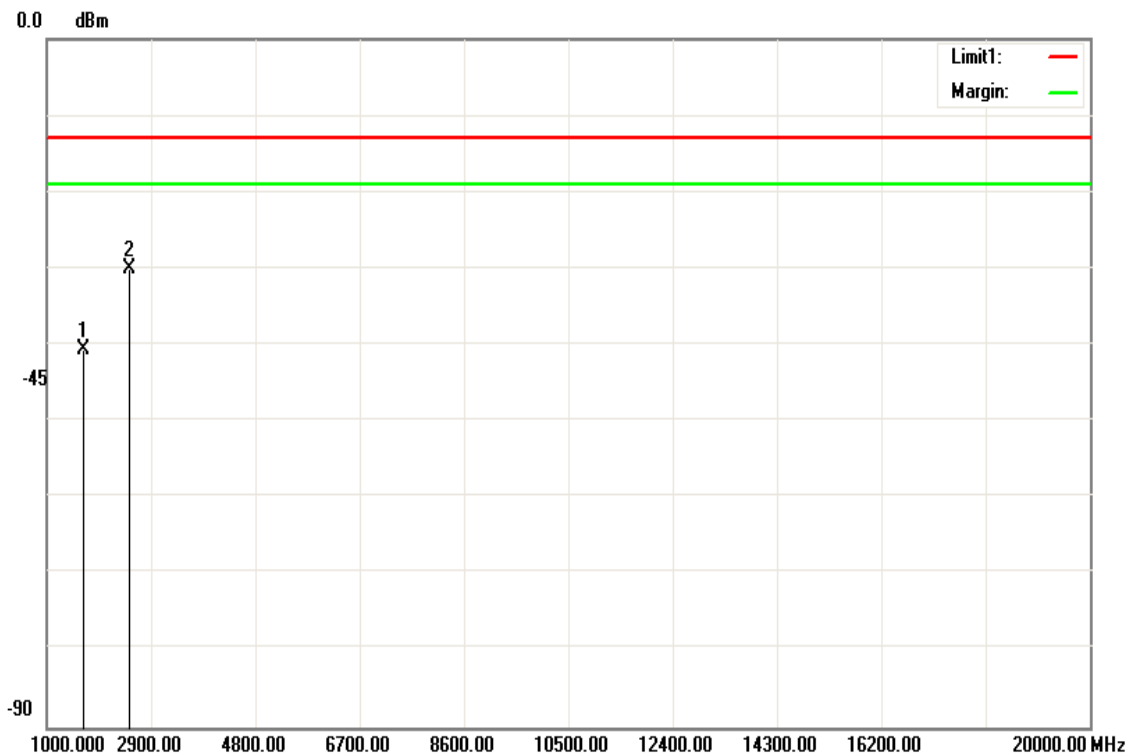


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1651.000        | -31.27     | 1.52           | -29.75               | -13.00      | -16.75      | H                          |
| 2477.000        | -39.76     | 1.83           | -37.93               | -13.00      | -24.93      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX / Mid CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Ver.

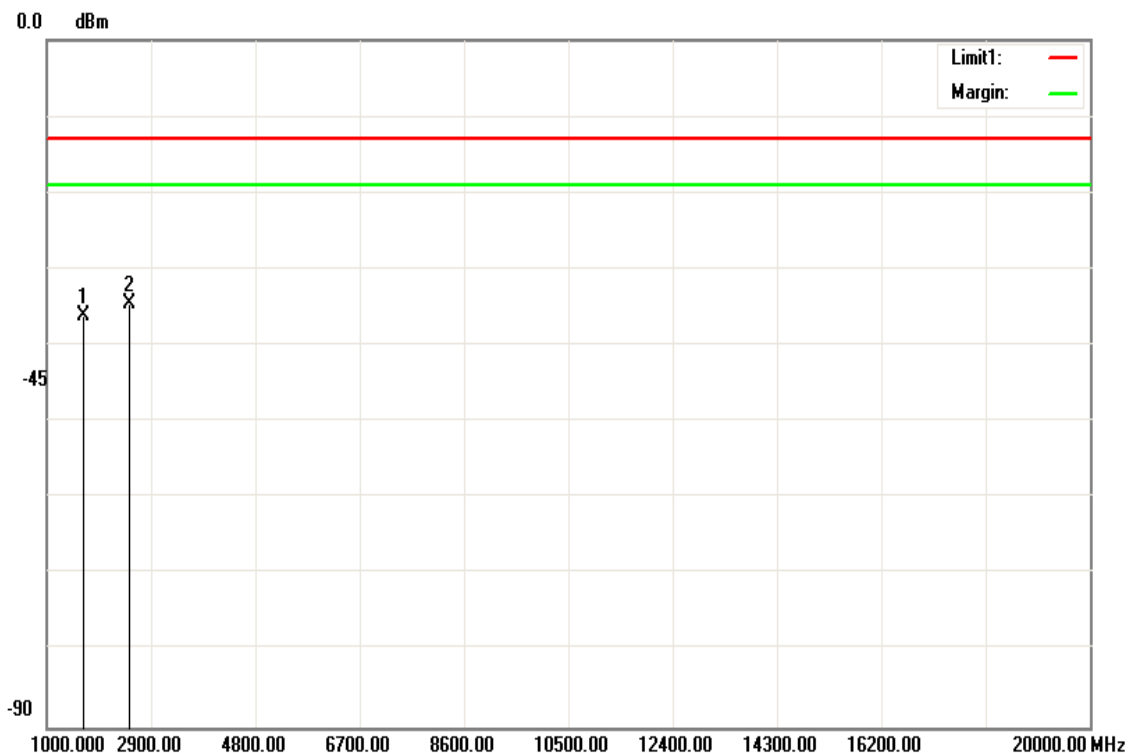


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1672.000        | -42.02     | 1.52           | -40.50               | -13.00      | -27.50      | V                          |
| 2512.000        | -32.16     | 2.07           | -30.09               | -13.00      | -17.09      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX / Mid CH Test Date: April 12, 2017  
 4182  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Hor.

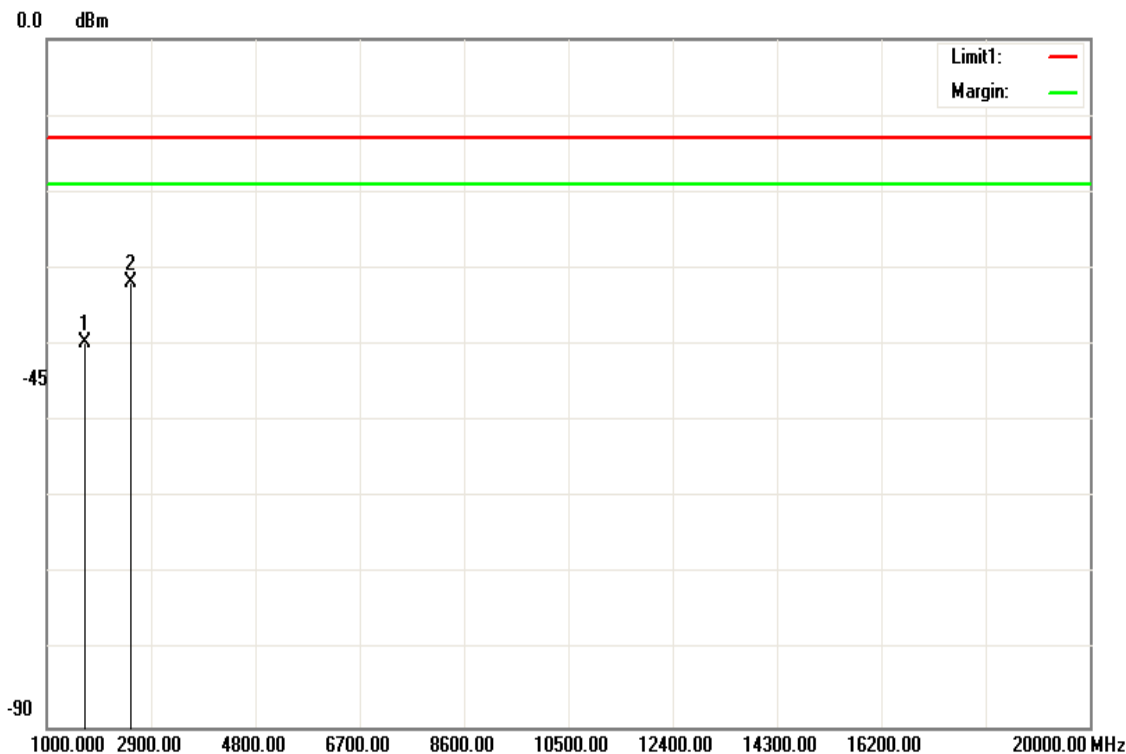


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1672.000        | -37.73     | 1.52           | -36.21               | -13.00      | -23.21      | H                          |
| 2512.000        | -36.59     | 2.07           | -34.52               | -13.00      | -21.52      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC Band V / TX /High CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Ver.

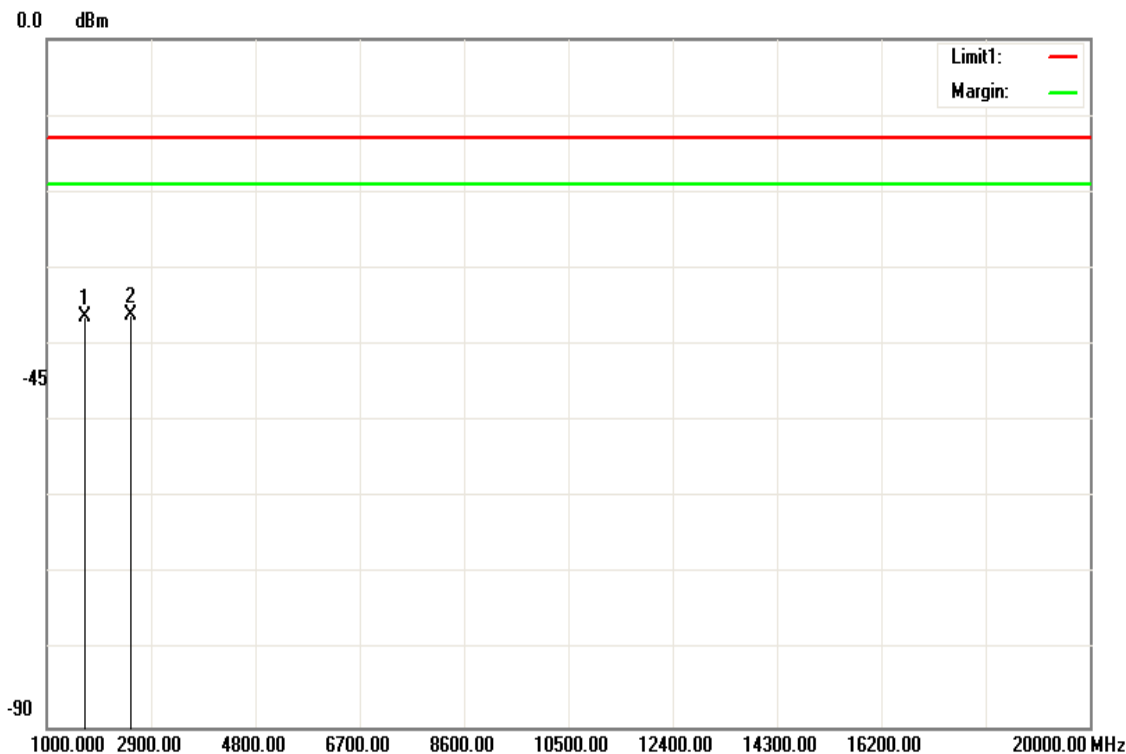


| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1693.000        | -41.27     | 1.51           | -39.76               | -13.00      | -26.76      | V                          |
| 2540.000        | -34.49     | 2.6            | -31.89               | -13.00      | -18.89      | V                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

**Operation Mode:** WCDMA 12.2k RMC  
 Band V / TX /High CH **Test Date:** April 12, 2017  
**Temperature:** 22.1°C **Tested by:** Timmy Wang  
**Humidity:** 50 % RH **Polarity:** Hor.



| Frequency (MHz) | S.G. (dBm) | Ant.Gain (dBi) | Emission level (dBm) | Limit (dBm) | Margin (dB) | Antenna Polarization (V/H) |
|-----------------|------------|----------------|----------------------|-------------|-------------|----------------------------|
| 1693.000        | -37.86     | 1.51           | -36.35               | -13.00      | -23.35      | H                          |
| 2540.000        | -38.7      | 2.6            | -36.10               | -13.00      | -23.10      | H                          |
| N/A             |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |
|                 |            |                |                      |             |             |                            |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

## 7.8 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

According to RSS-132 (5.3) & RSS-133 (6.3).

### Test Procedure

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -30 to +50°C ,Voltage= 85% to 115% of the nominal value for AC powered equipment. Frequency Tolerance: +/-2.5 ppm

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### TEST RESULTS

*No non-compliance noted.*

| Reference Frequency: WCDMA 12.2k RMC Band II Low Channel 1852.4 MHz |                              |                     |                       |             |
|---|------------------------------|---------------------|-----------------------|-------------|
| Limit: ± 2.5 ppm = 4631 Hz  |                              |                     |                       |             |
| Power Supply (Vac)  | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120   | 50                           | 3.00                | 0.0016                | +/- 2.5     |
| 120   | 40                           | -2.00               | -0.0011               |             |
| 120   | 30                           | 2.00                | 0.0011                |             |
| 120   | 20                           | 1.00                | 0.0005                |             |
| 120   | 10                           | 1.00                | 0.0005                |             |
| 120   | 0                            | -2.00               | -0.0011               |             |
| 120   | -10                          | 0.00                | 0.0000                |             |
| 120   | -20                          | 3.00                | 0.0016                |             |

| Reference Frequency: WCDMA 12.2k RMC Band II Mid Channel 1880 MHz |                              |                     |                       |             |
|---|------------------------------|---------------------|-----------------------|-------------|
| Limit: ± 2.5 ppm = 4700 Hz  |                              |                     |                       |             |
| Power Supply (Vac)  | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120   | 50                           | -4.00               | -0.0021               | +/- 2.5     |
| 120   | 40                           | -3.00               | -0.0016               |             |
| 120   | 30                           | -1.00               | -0.0005               |             |
| 120   | 20                           | 0.00                | 0.0000                |             |
| 120   | 10                           | -1.00               | -0.0005               |             |
| 120   | 0                            | 0.00                | 0.0000                |             |
| 120   | -10                          | 3.00                | 0.0016                |             |
| 120   | -20                          | 2.00                | 0.0011                |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band II High Channel 1907.6 MHz</b> |                              |                     |                       |             |
|---|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 4769 Hz  |                              |                     |                       |             |
| Power Supply (Vac)  | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120   | 50                           | 3.00                | 0.0016                | +/- 2.5     |
| 120   | 40                           | -1.00               | -0.0005               |             |
| 120   | 30                           | 2.00                | 0.0010                |             |
| 120   | 20                           | 1.00                | 0.0005                |             |
| 120   | 10                           | -3.00               | -0.0016               |             |
| 120   | 0                            | -2.00               | -0.0010               |             |
| 120   | -10                          | -2.00               | -0.0010               |             |
| 120   | -20                          | -4.00               | -0.0021               |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band V Low Channel 826.4 MHz</b> |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 2066 Hz   |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120  | 50                           | -4.00               | -0.0048               | +/- 2.5     |
| 120  | 40                           | -1.00               | -0.0012               |             |
| 120  | 30                           | 2.00                | 0.0024                |             |
| 120  | 20                           | -2.00               | -0.0024               |             |
| 120  | 10                           | 0.00                | 0.0000                |             |
| 120  | 0                            | -1.00               | -0.0012               |             |
| 120  | -10                          | 1.00                | 0.0012                |             |
| 120  | -20                          | -2.00               | -0.0024               |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 836.6 MHz</b> |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 2091.5 Hz   |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120  | 50                           | -4.00               | -0.0048               | +/- 2.5     |
| 120  | 40                           | 3.00                | 0.0036                |             |
| 120  | 30                           | -2.00               | -0.0024               |             |
| 120  | 20                           | 1.00                | 0.0012                |             |
| 120  | 10                           | -2.00               | -0.0024               |             |
| 120  | 0                            | -1.00               | -0.0012               |             |
| 120  | -10                          | 0.00                | 0.0000                |             |
| 120  | -20                          | -1.00               | -0.0012               |             |

| Reference Frequency: WCDMA 12.2k RMC Band V High Channel 846.6 MHz |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 2116.5 Hz                                   |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 120  | 50                           | 3.00                | 0.0035                | +/- 2.5     |
| 120  | 40                           | -2.00               | -0.0024               |             |
| 120  | 30                           | 3.00                | 0.0035                |             |
| 120  | 20                           | 1.00                | 0.0012                |             |
| 120  | 10                           | 1.00                | 0.0012                |             |
| 120  | 0                            | 2.00                | 0.0024                |             |
| 120  | -10                          | -2.00               | -0.0024               |             |
| 120  | -20                          | 1.00                | 0.0012                |             |



**FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:**

| Reference Frequency: WCDMA 12.2k RMC Band II Low Channel 1852.4 MHz |                              |                     |                       |             |
|---|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 4631Hz                                       |                              |                     |                       |             |
| Power Supply (Vac)  | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102   | 20                           | 0.00                | 0.0000                | +/- 2.5     |
| 120   |                              | 1.00                | 0.0005                |             |
| 138   |                              | 1.00                | 0.0005                |             |

| Reference Frequency: WCDMA 12.2k RMC Band II Mid Channel 1880 MHz |                              |                     |                       |             |
|---|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 4700Hz                                     |                              |                     |                       |             |
| Power Supply (Vac)  | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102   | 20                           | 1.00                | 0.0005                | +/- 2.5     |
| 120   |                              | 0.00                | 0.0000                |             |
| 138   |                              | 1.00                | 0.0005                |             |

| Reference Frequency: WCDMA 12.2k RMC Band II High Channel 1907.6 MHz |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| Limit: $\pm 2.5$ ppm = 4769Hz  |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102  | 20                           | 0.00                | 0.0000                | +/- 2.5     |
| 120  |                              | 1.00                | 0.0005                |             |
| 138  |                              | 2.00                | 0.0010                |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 826.4 MHz</b> |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| <b>Limit: <math>\pm 2.5</math> ppm = 2066Hz</b>                          |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102  | 20                           | -1.00               | -0.0012               | +/- 2.5     |
| 120  |                              | -2.00               | -0.0024               |             |
| 138  |                              | 1.00                | 0.0012                |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 836.6 MHz</b> |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| <b>Limit: <math>\pm 2.5</math> ppm = 2091.5Hz</b>                        |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102  | 20                           | -2.00               | -0.0024               | +/- 2.5     |
| 120  |                              | 1.00                | 0.0012                |             |
| 138  |                              | -1.00               | -0.0012               |             |

| <b>Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 846.6 MHz</b> |                              |                     |                       |             |
|--|------------------------------|---------------------|-----------------------|-------------|
| <b>Limit: <math>\pm 2.5</math> ppm = 2116.5Hz</b>                        |                              |                     |                       |             |
| Power Supply (Vac)   | Environment Temperature (°C) | Frequency Error(Hz) | Frequency Error (ppm) | Limit (ppm) |
| 102  | 20                           | 0.00                | 0.0000                | +/- 2.5     |
| 120  |                              | 1.00                | 0.0012                |             |
| 138  |                              | 2.00                | 0.0024                |             |