

## FCC 47 CFR PART 27 SUBPART L

Product Type : 2G/3G Module

Applicant : Telit Communications S.p.A.

Address : Via Stazione di Prosecco, 5/B, Sgonico, TS 34010, Italy

Trade name : Telit

Model No. : HE910

Test : FCC 47 CFR PART 27 SUBPART L: Oct. 2010

Specification : ANSI/TIA-603-C-2004  
RSS-Gen Issue 3, December 2010  
RSS-139 Issue 2, February 2009

Issue Date : Feb. 03, 2012

### Issue by

A Test Lab Techno Corp.  
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Taiwan Accreditation Foundation accreditation number: 1330

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**Revision History**

| Rev. | Issue Date    | Revisions                                             | Revised By |
|------|---------------|-------------------------------------------------------|------------|
| 00   | Jan. 11, 2012 | Initial Issue                                         |            |
| 01   | Jan. 30, 2012 | Delete IC ID                                          | Nico Peng  |
| 02   | Feb. 03, 2012 | Add IC standard and RX of radiated emission test data | Nico Peng  |
|      |               |                                                       |            |

## Verification of Compliance

Issued Date: 2012/02/03

Product Type : 2G/3G Module

Applicant : Telit Communications S.p.A.

Address : Via Stazione di Prosecco, 5/B, Sgonico, TS 34010, Italy

Trade Name : Telit

Model No. : HE910

FCC ID : RI7HE910

IC ID : 5131A-HE910

EUT Rated Voltage : DC 3.8V

Test Voltage : DC 3.8V

Applicable : FCC 47 CFR PART 27 SUBPART L: Oct. 2010  
Standard ANSI/TIA-603-C-2004  
RSS-Gen Issue 3, December 2010  
RSS-139 Issue 2, February 2009

Test Result : Complied

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Taiwan Accreditation Foundation accreditation number:  
1330  
<http://www.atl-lab.com.tw/e-index.htm>



The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 27L.

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

Approved By :  Reviewed By : 

(Manager) (Murphy Wang) (Testing Engineer) (Charlie Chang)

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## TABLE OF CONTENTS

|          |                                                                                  |           |
|----------|----------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>General Information.....</b>                                                  | <b>6</b>  |
| 1.1.     | EUT Description.....                                                             | 6         |
| 1.2.     | Mode of Operation .....                                                          | 6         |
| 1.3.     | EUT Exercise Software.....                                                       | 7         |
| 1.4.     | Configuration of Test System Details .....                                       | 7         |
| 1.5.     | Test Site Environment.....                                                       | 7         |
| 1.6.     | Summary of Test Result.....                                                      | 8         |
| <b>2</b> | <b>RF Output Power Test.....</b>                                                 | <b>9</b>  |
| 2.1.     | Limit .....                                                                      | 9         |
| 2.2.     | Test Instruments.....                                                            | 9         |
| 2.3.     | Test Setup .....                                                                 | 9         |
| 2.4.     | Test Procedure.....                                                              | 10        |
| 2.5.     | Uncertainty .....                                                                | 10        |
| 2.6.     | Test Result .....                                                                | 10        |
| <b>3</b> | <b>Effective Radiated Power / Equivalent Isotropic Radiated Power Test .....</b> | <b>11</b> |
| 3.1.     | Limit .....                                                                      | 11        |
| 3.2.     | Test Instruments.....                                                            | 11        |
| 3.3.     | Test Setup .....                                                                 | 12        |
| 3.4.     | Test Procedure.....                                                              | 13        |
| 3.5.     | Uncertainty .....                                                                | 13        |
| 3.6.     | Test Result .....                                                                | 14        |
| <b>4</b> | <b>Occupied Bandwidth Test .....</b>                                             | <b>15</b> |
| 4.1.     | Limit .....                                                                      | 15        |
| 4.2.     | Test Instruments.....                                                            | 15        |
| 4.3.     | Setup.....                                                                       | 15        |
| 4.4.     | Test Procedure.....                                                              | 16        |
| 4.5.     | Uncertainty .....                                                                | 16        |
| 4.6.     | Test Result .....                                                                | 16        |
| <b>5</b> | <b>Conducted Emission Test .....</b>                                             | <b>19</b> |
| 5.1.     | Limit .....                                                                      | 19        |
| 5.2.     | Test Instruments.....                                                            | 19        |
| 5.3.     | Setup.....                                                                       | 19        |
| 5.4.     | Test Procedure.....                                                              | 20        |
| 5.5.     | Uncertainty .....                                                                | 20        |
| 5.6.     | Test Result .....                                                                | 20        |

|          |                                                               |           |
|----------|---------------------------------------------------------------|-----------|
| <b>6</b> | <b>Field Strength of Spurious Radiation Test .....</b>        | <b>36</b> |
| 6.1.     | Limit .....                                                   | 36        |
| 6.2.     | Test Instruments.....                                         | 36        |
| 6.3.     | Setup.....                                                    | 36        |
| 6.4.     | Test Procedure.....                                           | 37        |
| 6.5.     | Uncertainty .....                                             | 37        |
| 6.6.     | Test Result .....                                             | 38        |
| <b>7</b> | <b>Frequency Stability (Temperature Variation) Test .....</b> | <b>41</b> |
| 7.1.     | Limit .....                                                   | 41        |
| 7.2.     | Test Instruments.....                                         | 41        |
| 7.3.     | Setup.....                                                    | 41        |
| 7.4.     | Test Procedure.....                                           | 41        |
| 7.5.     | Uncertainty .....                                             | 42        |
| 7.6.     | Test Result .....                                             | 42        |
| <b>8</b> | <b>Frequency Stability (Voltage Variation) Test .....</b>     | <b>43</b> |
| 8.1.     | Limit .....                                                   | 43        |
| 8.2.     | Test Instruments.....                                         | 43        |
| 8.3.     | Setup.....                                                    | 43        |
| 8.4.     | Test Procedure.....                                           | 43        |
| 8.5.     | Uncertainty .....                                             | 43        |
| 8.6.     | Test Result .....                                             | 44        |

## 1 General Information

### 1.1. EUT Description

|                      |                                                         |      |                    |                    |            |
|----------------------|---------------------------------------------------------|------|--------------------|--------------------|------------|
| Applicant            | Telit Communications S.p.A.                             |      |                    |                    |            |
| Applicant Address    | Via Stazione di Prosecco, 5/B, Sgonico, TS 34010, Italy |      |                    |                    |            |
| Manufacturer         | Telit Communications S.p.A.                             |      |                    |                    |            |
| Manufacturer Address | Via Stazione di Prosecco, 5/B, Sgonico, TS 34010, Italy |      |                    |                    |            |
| Product Type         | 2G/3G Module                                            |      |                    |                    |            |
| Trade Name           | Telit                                                   |      |                    |                    |            |
| Model Number         | HE910                                                   |      |                    |                    |            |
| FCC ID               | RI7HE910                                                |      |                    |                    |            |
| IC ID                | 5131A-HE910                                             |      |                    |                    |            |
| Hardware Version     | 0                                                       |      |                    |                    |            |
| Software Version     | 12.00.002                                               |      |                    |                    |            |
| Mode                 | WCDMA                                                   | Band | UL Frequency (MHz) | DL Frequency (MHz) | Modulation |
|                      |                                                         | IV   | 1712.4 ~ 1752.6    | 2112.4 ~ 2152.6    | QPSK       |
| Max. RF Output Power | 26.40 dBm / 0.437 W                                     |      |                    |                    |            |
| Max. EIRP            | 22.75 dBm / 0.188 W                                     |      |                    |                    |            |
| Emission Designator  | 4M06F9W                                                 |      |                    |                    |            |

### 1.2. Mode of Operation

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

|                                       |
|---------------------------------------|
| Test Mode                             |
| Mode 1: WCDMA Band IV Link (Transmit) |
| Mode 2: WCDMA Band IV Link (Receive)  |

Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

#### Tested System Details

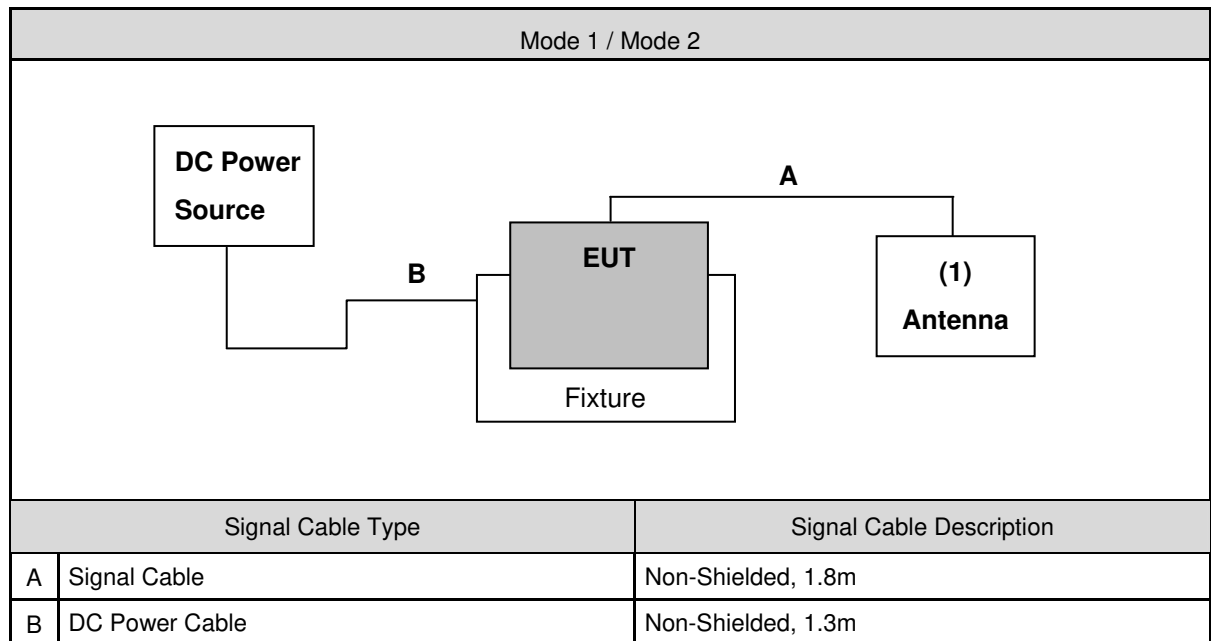
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

|    | Product                              | Manufacturer | Model No. | Serial No. | Power Cord |
|----|--------------------------------------|--------------|-----------|------------|------------|
| 1. | Universal Radio Communication Tester | R&S          | CMU200    | 109369     | N/A        |

### 1.3. EUT Exercise Software

|    |                                                          |
|----|----------------------------------------------------------|
| 1. | Setup the EUT and Base Station (CMU200) as shown on 1.4. |
| 2. | Turn on the power of all equipment.                      |
| 3. | The EUT will start to operate function.                  |

### 1.4. Configuration of Test System Details



### 1.5. Test Site Environment

| Items                      | Required (IEC 68-1) | Actual |
|----------------------------|---------------------|--------|
| Temperature (°C)           | 15-35               | 26     |
| Humidity (%RH)             | 25-75               | 60     |
| Barometric pressure (mbar) | 860-1060            | 950    |

## 1.6. Summary of Test Result

| Description                                   | FCC Rule             | IC Rule                          | Limit                               | Result |
|-----------------------------------------------|----------------------|----------------------------------|-------------------------------------|--------|
| Conducted Output Power                        | §2.1046              | N/A                              | N/A                                 | Pass   |
| Equivalent Isotropic Radiated Power           | §27.50(d)(2)         | RSS-139 (6.4)<br>SRSP-513(5.1.2) | < 1 Watts                           | Pass   |
| Occupied Bandwidth                            | §2.1049<br>§27.53(g) | RSS-GEN(4.6.1)                   | N/A                                 | Pass   |
| Band Edge Measurement                         | §2.1051<br>§27.53(g) | RSS-139 (6.5)                    | < 43+10log <sub>10</sub> (P[Watts]) | Pass   |
| Conducted Emission                            | §2.1051<br>§27.53(g) | RSS-139 (6.5)                    | < 43+10log <sub>10</sub> (P[Watts]) | Pass   |
| Field Strength of Spurious Radiation          | §2.1053<br>§27.53(g) | RSS-139 (6.5)<br>RSS-GEN(4.10)   | < 43+10log <sub>10</sub> (P[Watts]) | Pass   |
| Frequency Stability for Temperature & Voltage | §2.1055<br>§27.54    | RSS-139(6.3)                     | < 2.5 ppm                           | Pass   |

## 2 RF Output Power Test

### 2.1. Limit

N/A

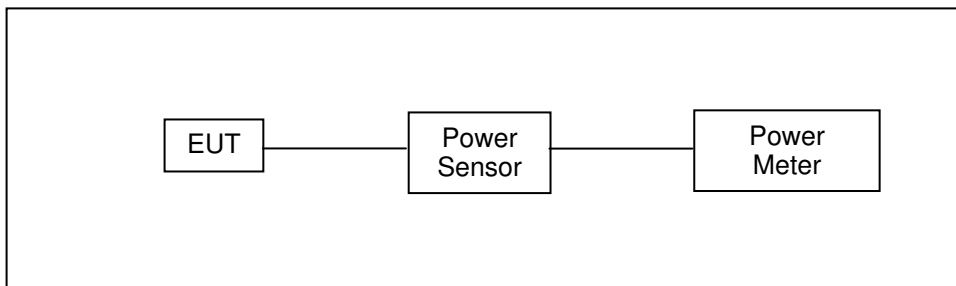
### 2.2. Test Instruments

| Describe                             | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 08/10/2010 | (2)    |
| Single Channel PK Power Sensor       | Agilent         | N1911A    | MY45101619 | 12/15/2011 | (1)    |
| Wideband Power Meter                 | Agilent         | N1921A    | MY45241957 | 12/15/2011 | (1)    |
| Test Site                            | ATL             | TE02      | TE02       | N.C.R.     | -----  |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### 2.3. Test Setup



## 2.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

1. The transmitter output was connected to power meter and base station through power divider.
2. Set base station for EUT at WCDMA Band IV, power level was set to maximum.
3. Select lowest, middle, and highest channels for each band.

## 2.5. Uncertainty

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.

## 2.6. Test Result

| Product              | 2G/3G Module    |                 |               |           |              |              |
|----------------------|-----------------|-----------------|---------------|-----------|--------------|--------------|
| Test Item            | RF Output Power |                 |               |           |              |              |
| Date of Test         | 12/06/2011      |                 |               | Test Site | TE02         |              |
| Bands                | Sub-Test        | Frequency (MHz) | Average Power |           | Peak Power   |              |
|                      |                 |                 | (dBm)         | (W)       | (dBm)        | (W)          |
| WCDMA IV (RMC 12.2K) | -----           | 1712.4          | 23.54         | 0.226     | <b>26.40</b> | <b>0.437</b> |
|                      |                 | 1740.0          | 23.48         | 0.223     | 26.30        | 0.427        |
|                      |                 | 1752.6          | 23.46         | 0.222     | 26.32        | 0.429        |

Note: The testing result was used peak detector.

### 3 Effective Radiated Power / Equivalent Isotropic Radiated Power Test

#### 3.1. Limit

For FCC Part 27.50(d)(2): The EIRP of mobile transmitters are limited to 1 watt for 1710~1755 MHz.

#### 3.2. Test Instruments

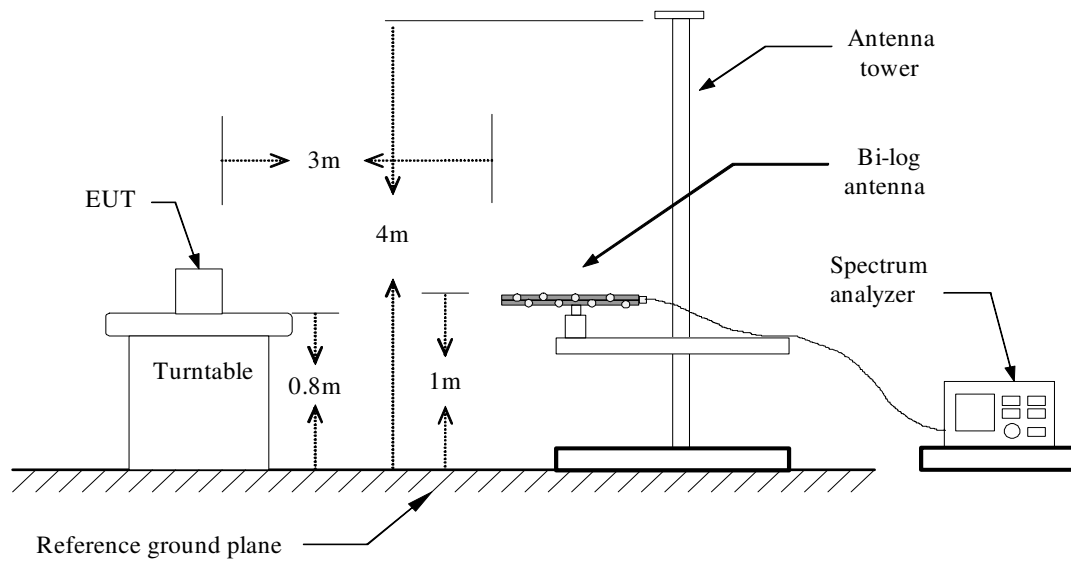
| 3 Meter Chamber (966-A)           |                                |              |               |            |        |
|-----------------------------------|--------------------------------|--------------|---------------|------------|--------|
| Equipment                         | Manufacturer                   | Model Number | Serial Number | Cal. Date  | Remark |
| RF Pre-selector                   | Agilent                        | N9039A       | MY46520256    | 05/23/2011 | (2)    |
| Spectrum Analyzer                 | Agilent                        | E4446A       | MY46180578    | 01/18/2011 | (1)    |
| Pre Amplifier                     | Agilent                        | 8449B        | 3008A02237    | 02/23/2011 | (1)    |
| Pre Amplifier                     | Agilent                        | 8447D        | 2944A10961    | 02/23/2011 | (1)    |
| Broadband Antenna<br>(30MHz~1GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163     | 9163-270      | 07/29/2011 | (1)    |
| Horn Antenna<br>(1~18GHz)         | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D    | 9120D-550     | 06/29/2011 | (1)    |
| Horn Antenna<br>(18~40GHz)        | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170     | 9170-320      | 06/28/2011 | (1)    |
| Test Site                         | ATL                            | TE01         | 888001        | 12/20/2011 | (1)    |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

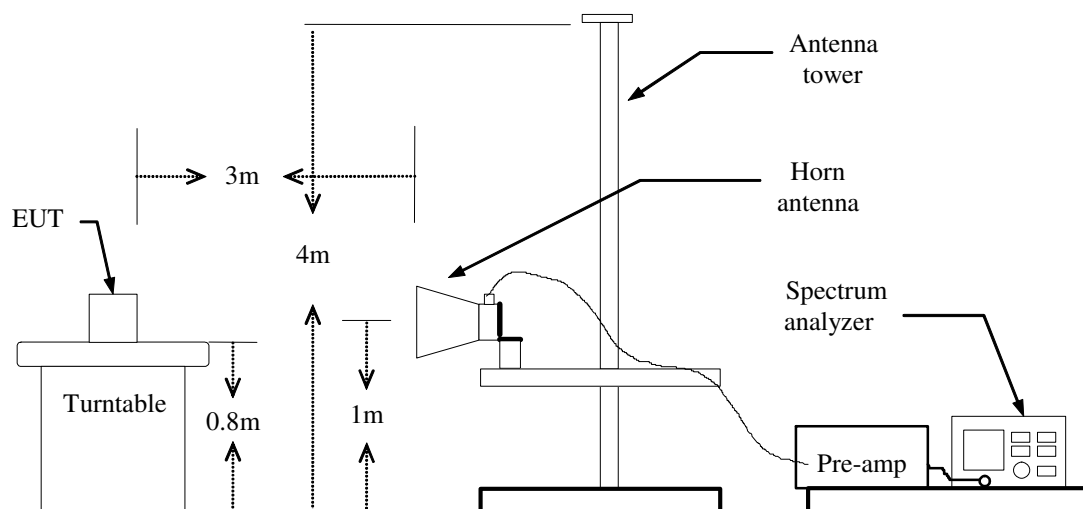
NOTE: N.C.R. = No Calibration Request.

### 3.3. Test Setup

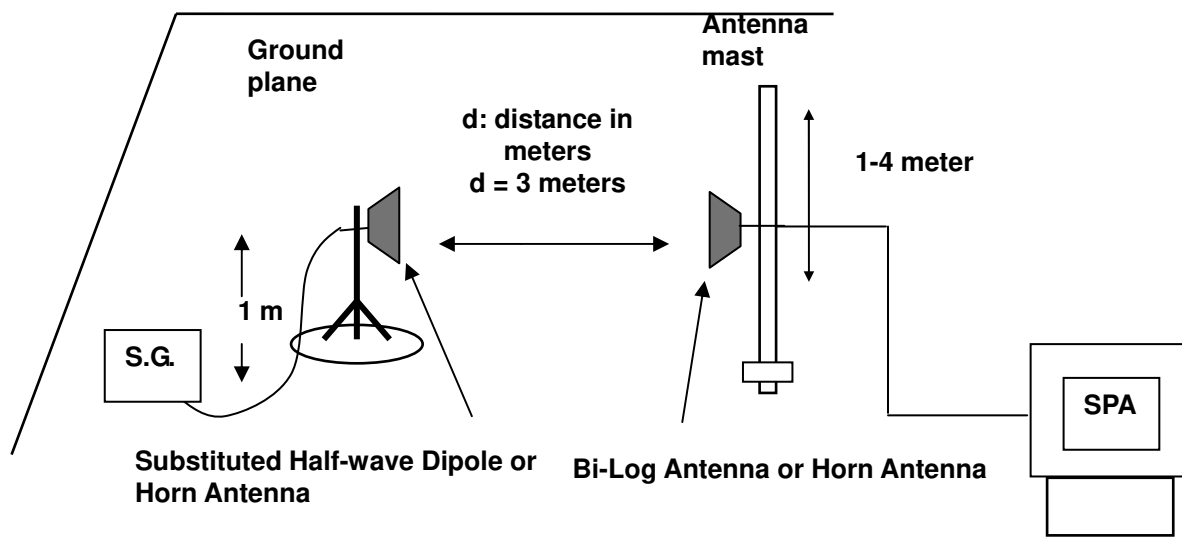
#### Below 1 GHz



#### Above 1 GHz



**For Substituted Method Test Set-UP**



### 3.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

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

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

### 3.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is  $\pm 3.072$  dB.

### 3.6. Test Result

| Model Number         | HE910                      |             |                  |                         |              |              |           |
|----------------------|----------------------------|-------------|------------------|-------------------------|--------------|--------------|-----------|
| Test Item            | E.I.R.P.                   |             |                  |                         |              |              |           |
| Test Mode            | Mode 1: WCDMA Band IV Link |             |                  |                         |              |              |           |
| Date of Test         | 01/06/2012                 |             |                  |                         | Test Site    | TE01         |           |
| Bands                | Frequency (MHz)            | Ant. Polar. | Read Level (dBm) | Correction factor (dBm) | E.I.R.P.     |              | Limit (W) |
|                      |                            |             |                  |                         | (dBm)        | (W)          |           |
| WCDMA IV (RMC 12.2K) | 1712.4                     | H           | 10.14            | 10.45                   | 20.59        | 0.115        | < 1       |
|                      |                            | V           | 15.51            | 7.24                    | <b>22.75</b> | <b>0.188</b> | < 1       |
|                      | 1740.0                     | H           | 8.30             | 10.45                   | 18.75        | 0.075        | < 1       |
|                      |                            | V           | 14.94            | 7.39                    | 22.33        | 0.171        | < 1       |
|                      | 1752.6                     | H           | 10.18            | 10.45                   | 20.63        | 0.116        | < 1       |
|                      |                            | V           | 14.54            | 7.55                    | 22.09        | 0.162        | < 1       |

Note: 1. ERP/EIRP = Read Level + Correction factor.

2. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

## 4 Occupied Bandwidth Test

### 4.1. Limit

**The Occupied Bandwidth Limit:**

N/A.

**The Band Edge Limit:**

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.

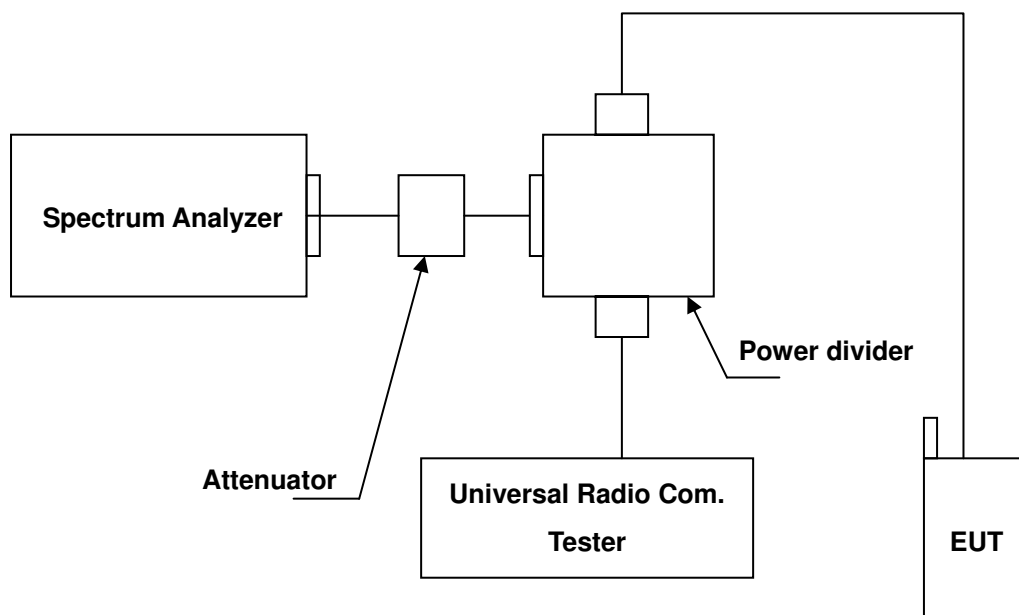
### 4.2. Test Instruments

| Describe                             | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Spectrum Analyzer                    | Agilent         | E4445A    | MY46181986 | 05/16/2011 | (2)    |
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 08/10/2010 | (2)    |
| Attenuator                           | RADIALL         | R41572000 | 0603033073 | N.C.R.     | -----  |
| Power divider                        | Agilent         | 87302C    | 3239A00760 | N.C.R.     | -----  |
| Test Site                            | ATL             | TE05      | TE05       | N.C.R.     | -----  |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### 4.3. Setup



#### 4.4. Test Procedure

The measurement is made according to FCC rules part 27:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.
3. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
4. The band edge setting:RB=51 kHz; VB=160 kHz for WCDMA Band IV.

#### 4.5. Uncertainty

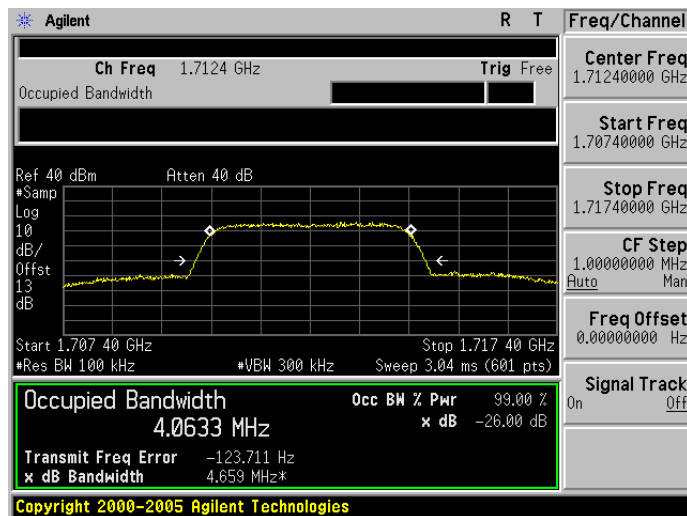
The measurement uncertainty is defined as  $\pm 10\text{Hz}$

#### 4.6. Test Result

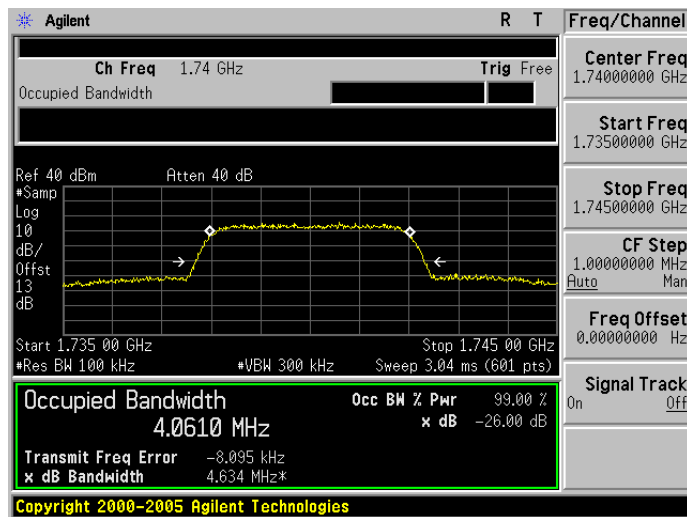
| Product      | 2G/3G Module               |                      |       |                          |
|--------------|----------------------------|----------------------|-------|--------------------------|
| Test Item    | Occupied Bandwidth         |                      |       |                          |
| Test Mode    | Mode 1: WCDMA Band IV Link |                      |       |                          |
| Date of Test | 01/06/2012                 | Test Site            | TE05  |                          |
| Channel No.  | Frequency (MHz)            | 99 % Bandwidth (MHz) | Limit | Note                     |
| 1312         | 1712.4                     | 4.0633               | N/A   | RBW:100 kHz , VBW:300kHz |
| 1450         | 1740.0                     | 4.0610               | N/A   | RBW:100 kHz , VBW:300kHz |
| 1513         | 1752.6                     | 4.0661               | N/A   | RBW:100 kHz , VBW:300kHz |

## Mode 1: WCDMA Band IV Link

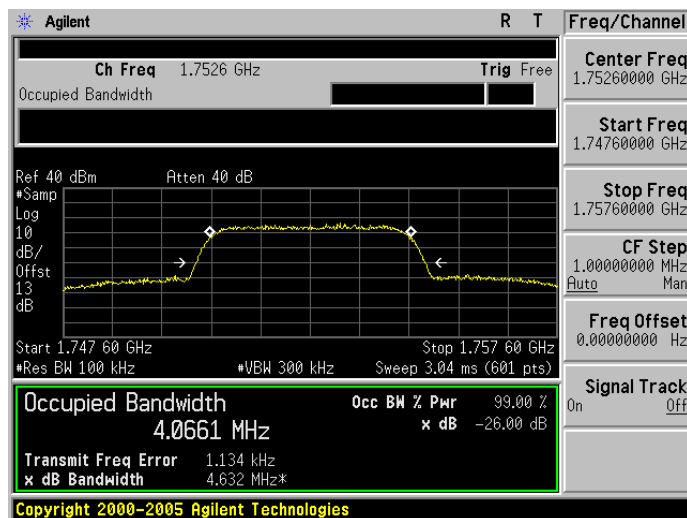
CH 1312



CH1450



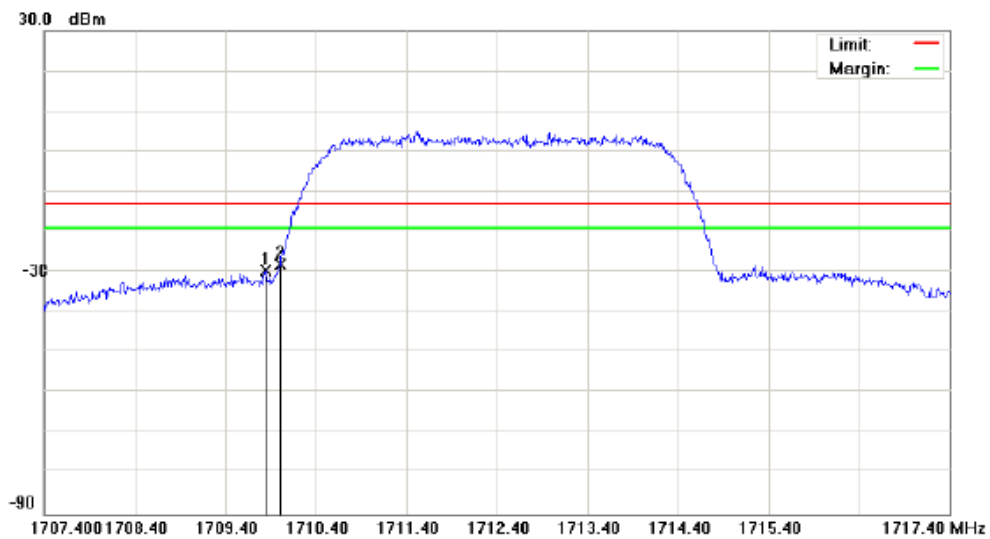
CH1513



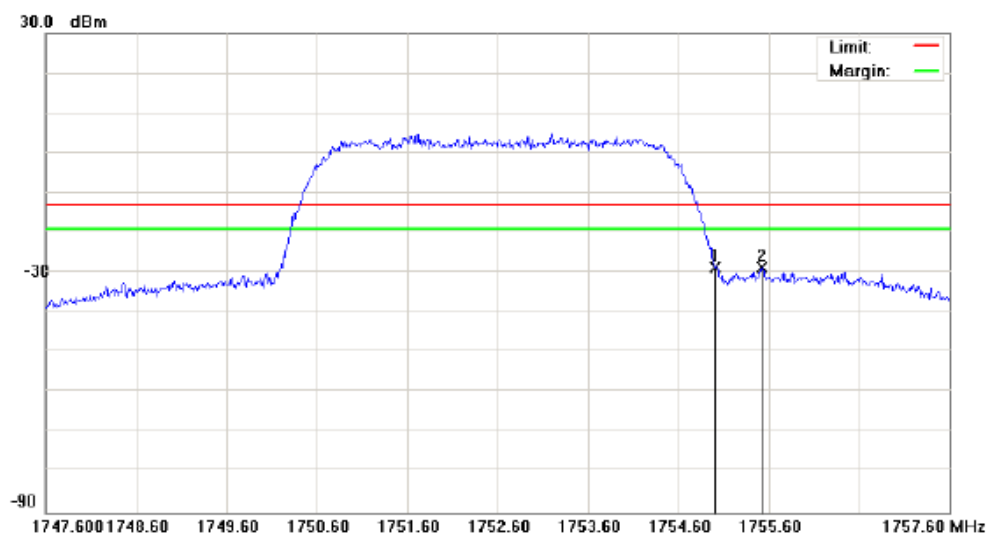
### Band Edge

| Product      | 2G/3G Module               |                 |                 |             |        |
|--------------|----------------------------|-----------------|-----------------|-------------|--------|
| Test Item    | Band Edge                  |                 |                 |             |        |
| Test Mode    | Mode 1: WCDMA Band IV Link |                 |                 |             |        |
| Date of Test | 01/06/2012                 |                 | Test Site       | TE05        |        |
| Band         | Channel                    | Frequency (MHz) | Band Edge (dBm) | Limit (dBm) | Result |
| Lower        | 1312                       | 1710.00         | -27.99          | -13         | Pass   |
| Higher       | 1513                       | 1755.00         | -28.54          | -13         | Pass   |

Lower Band



Higher Band



## 5 Conducted Emission Test

### 5.1. Limit

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.

### 5.2. Test Instruments

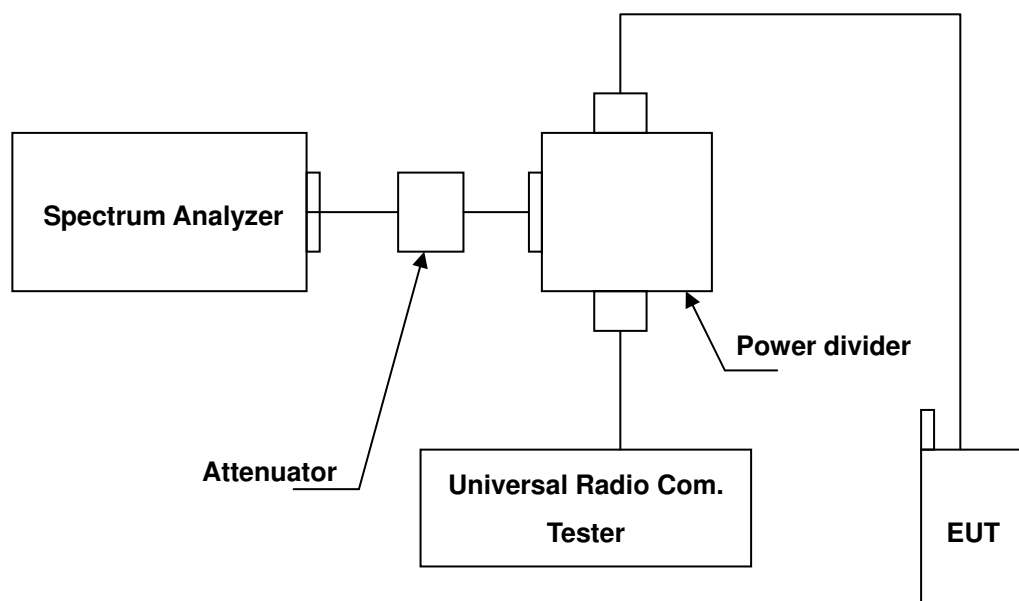
| Describe                             | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Spectrum Analyzer                    | Agilent         | E4445A    | MY46181986 | 05/16/2011 | (2)    |
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 08/10/2010 | (2)    |
| Attenuator                           | RADIALL         | R41572000 | 0603033073 | N.C.R.     | -----  |
| Power divider                        | Agilent         | 87302C    | 3239A00760 | N.C.R.     | -----  |
| Test Site                            | ATL             | TE05      | TE05       | N.C.R.     | -----  |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

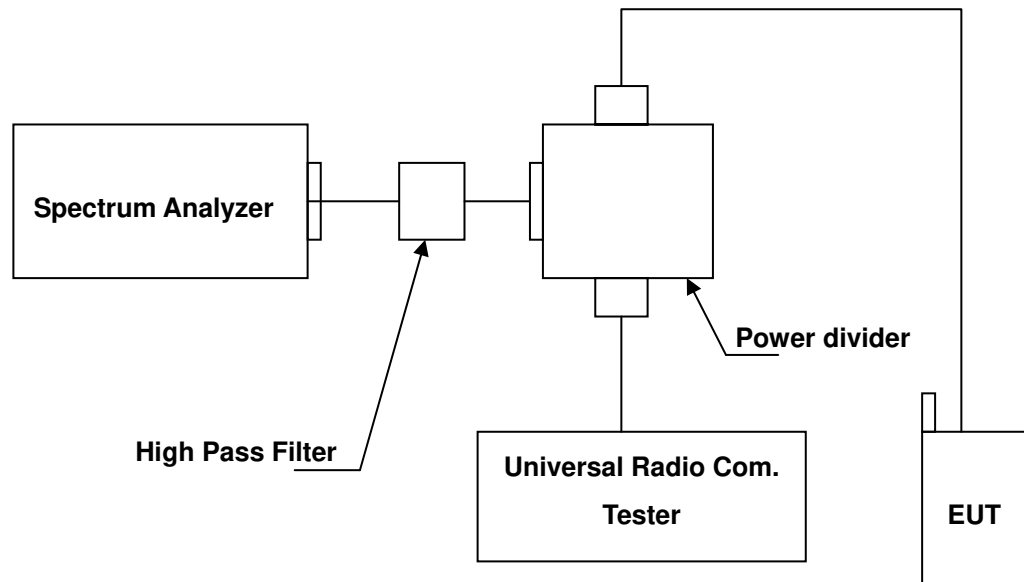
NOTE: N.C.R. = No Calibration Request.

### 5.3. Setup

**Below 2.8GHz**



**Above 2.8GHz**



#### 5.4. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.
4. Test setting at WCDMA Band IV RB=1MHz, VB=1MHz.

#### 5.5. Uncertainty

The measurement uncertainty is evaluated as  $\pm 2.24$  dB.

#### 5.6. Test Result

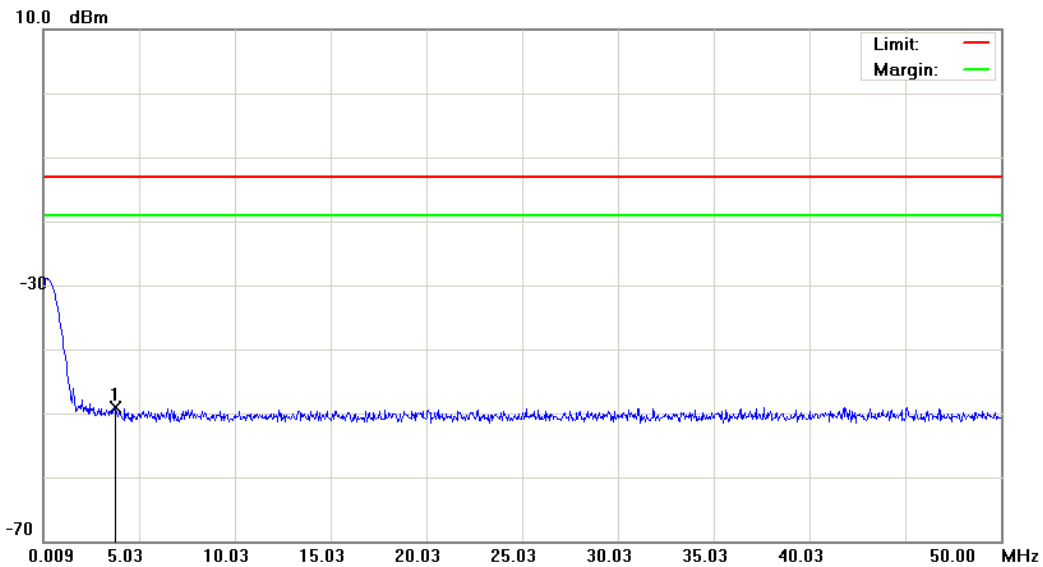
|                                       |                            |           |      |
|---------------------------------------|----------------------------|-----------|------|
| Product                               | 2G/3G Module               |           |      |
| Test Item                             | Conducted Emission         |           |      |
| Mode                                  | Mode 1: WCDMA Band IV Link |           |      |
| Date of Test                          | 01/09/2012                 | Test Site | TE05 |
| Note: The test results see next page. |                            |           |      |

File: HE910/CH1312)

Data :#1

Date: 2012/1/9

Time: 上午 09:40:41



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 3.7332 | -62.24        | 13.18          | -49.06      | -13.00 | -36.06 | peak           |              |         |

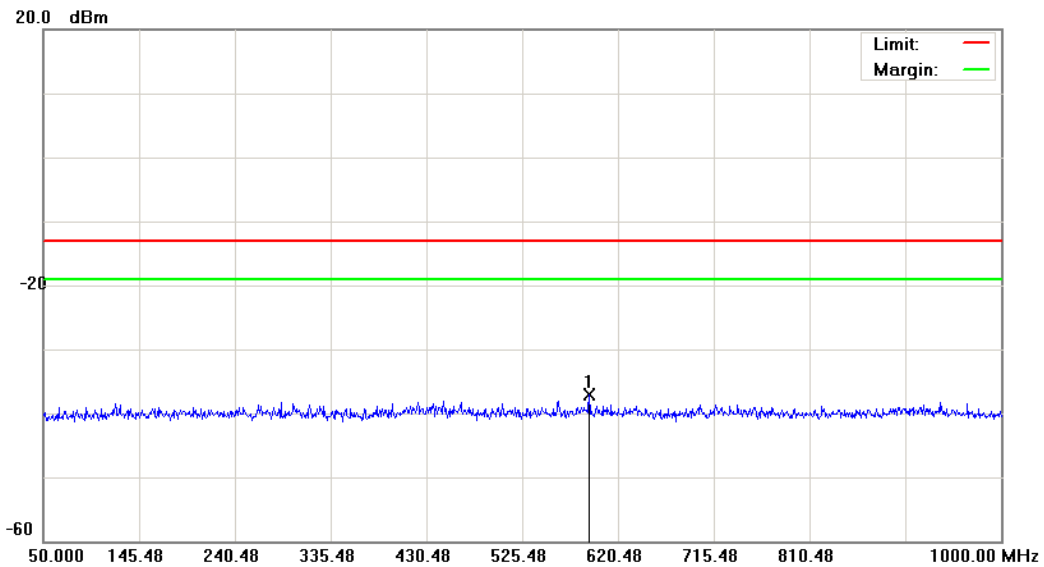
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1312)

Data :#2

Date:2012/1/9

Time: 上午 09:41:06



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 591.5000 | -50.32        | 13.20          | -37.12      | -13.00 | -24.12 | peak           |              |         |

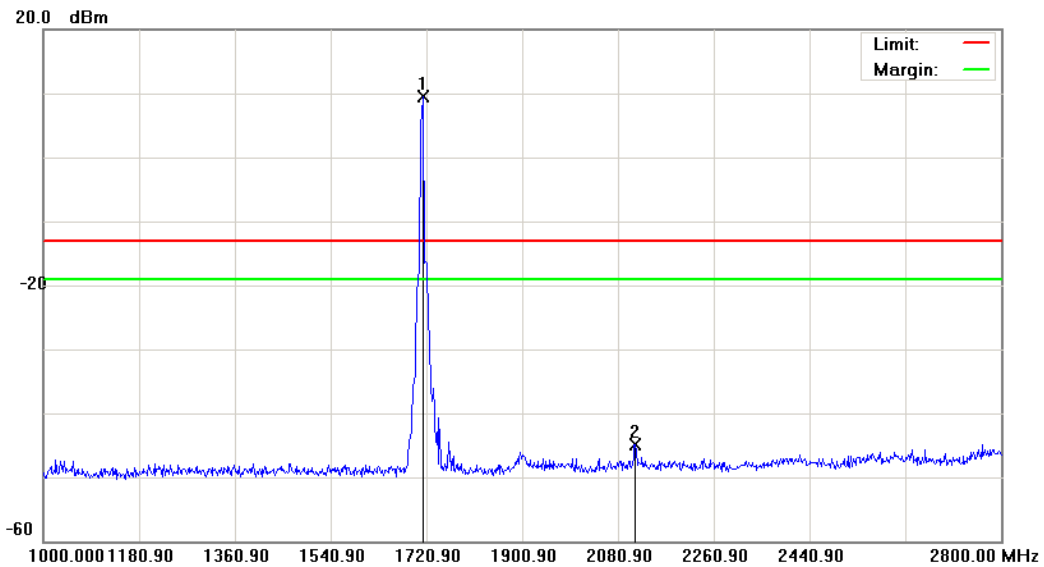
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1312)

Data: #3

Date: 2012/1/9

Time: 上午 09:50:34



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBm | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBm | Limit<br>dBm | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|-------------------------|-------------------------|-------------------------|--------------|------------|-------------------------|---------------------------|---------|
| 1   | *   | 1713.700     | 5.06                    | 4.36                    | 9.42                    | -13.00       | 22.42      | peak                    |                           | Tx      |
| 2   |     | 2111.500     | -49.58                  | 4.71                    | -44.87                  | -13.00       | -31.87     | peak                    |                           |         |

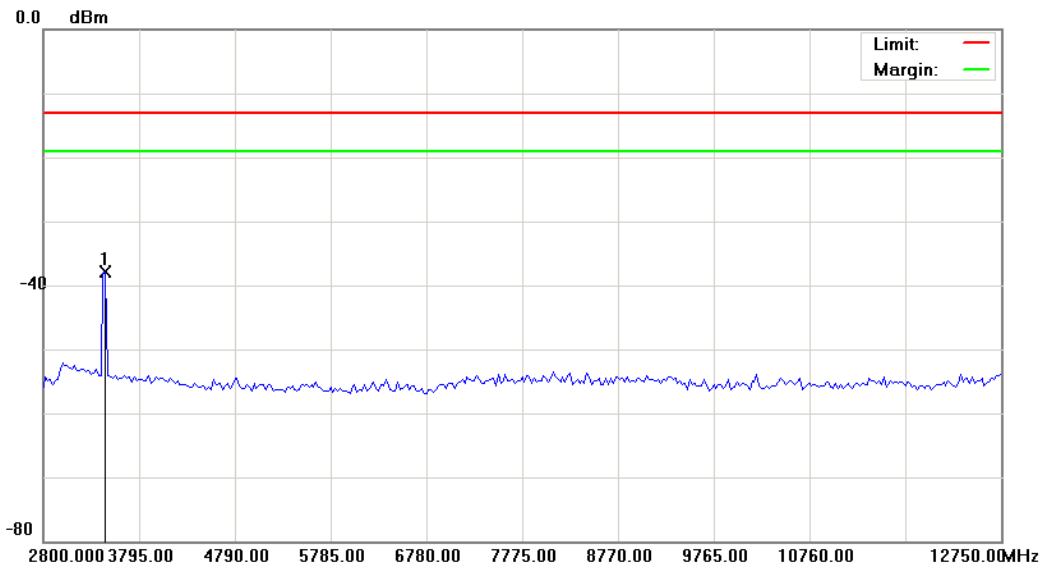
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1312)

Data :#4

Date: 2012/1/9

Time: 上午 09:59:59



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 3446.750 | -42.98        | 5.08           | -37.90      | -13.00 | -24.90 | peak           |              |         |

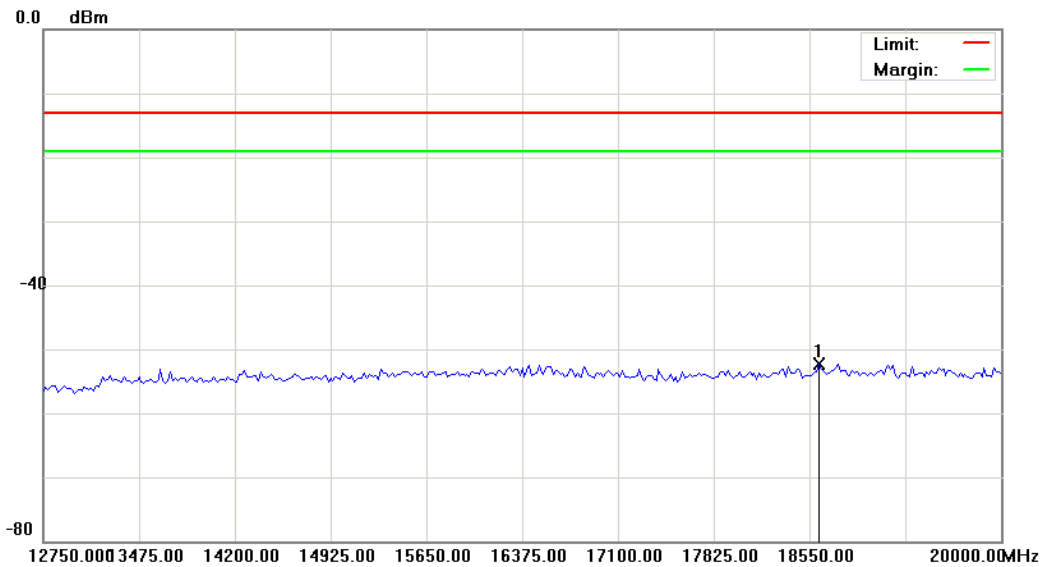
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1312)

Data :#5

Date:2012/1/9

Time: 上午 10:00:20



|                                         |                                   |                             |
|-----------------------------------------|-----------------------------------|-----------------------------|
| Site: : RF Conducted                    | Polarization: <b>Conducted po</b> | Temperature: 23 °C          |
| Limit: FCC Part 27 conducted(9k-12.75G) | Power: AC 120V/60Hz               | Humidity: 55.2 %            |
| EUT: 2G/3G Module                       | Distance:                         | RBW: 1000 KHz VBW: 1000 KHz |
| M/N: HE910                              |                                   |                             |
| Mode: WCDMA Band IV                     |                                   |                             |
| Note:                                   |                                   |                             |

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 18622.500 | -59.36        | 7.05           | -52.31      | -13.00 | -39.31 | peak           |              | Comment |

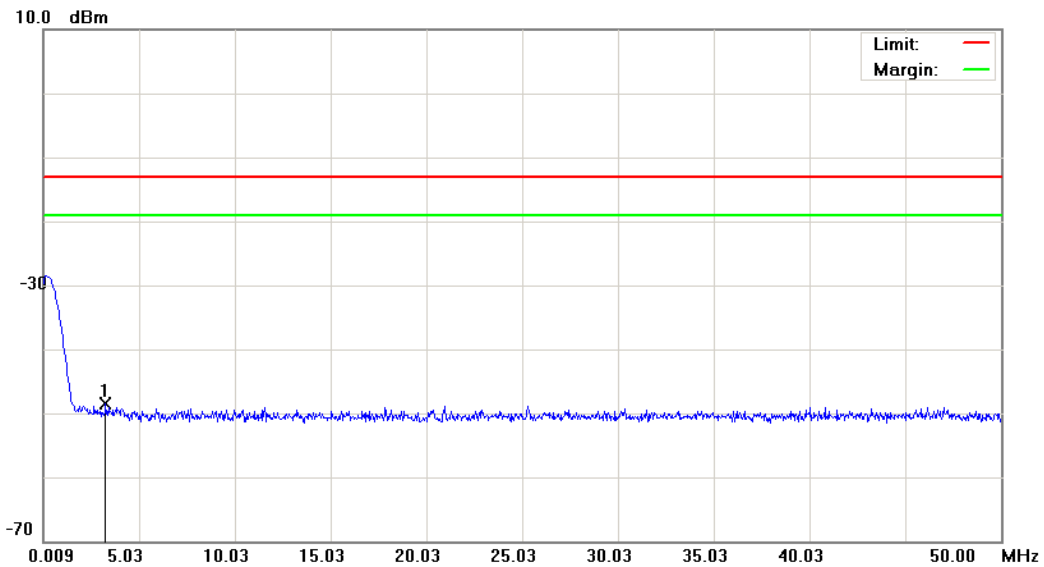
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1450)

Data :#1

Date:2012/1/9

Time: 上午 09:42:23



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 3.2583 | -61.49        | 13.08          | -48.41      | -13.00 | -35.41 | peak           |              | Comment |

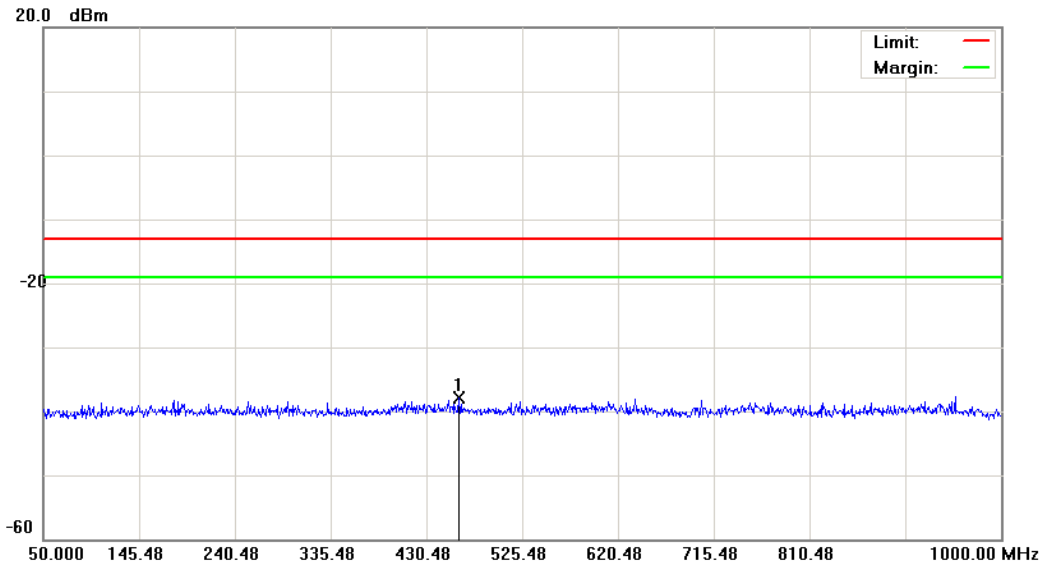
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1450)

Data :#2

Date: 2012/1/9

Time: 上午 09:42:48



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 462.3000 | -51.10        | 13.20          | -37.90      | -13.00 | -24.90 | peak           |              |         |

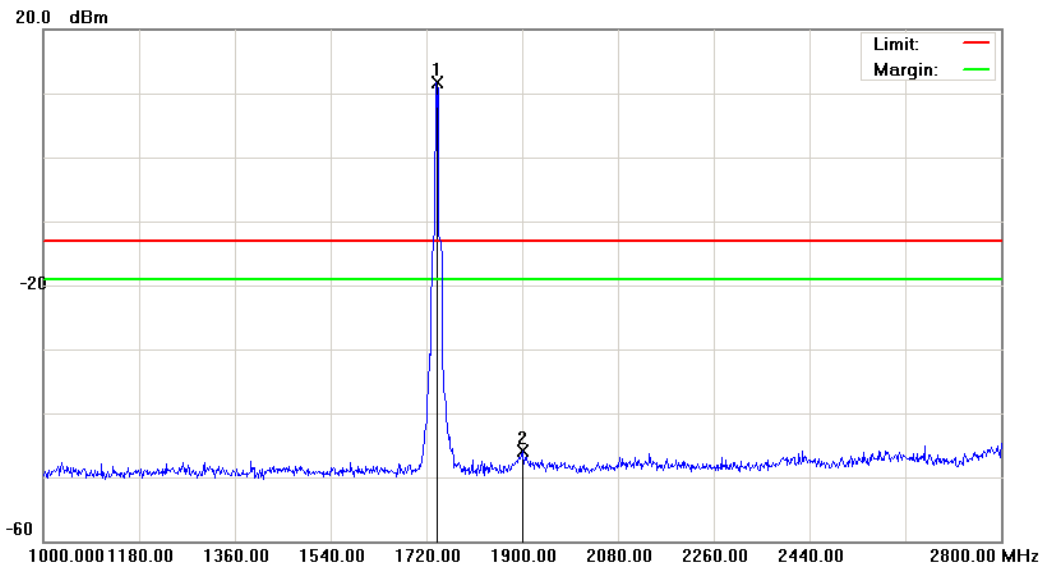
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1450)

Data :#3

Date: 2012/1/9

Time: 上午 09:48:18



Site: : RF Conducted

Limit: FCC Part 27 conducted(9k-12.75G)

EUT: 2G/3G Module

M/N: HE910

Mode: WCDMA Band IV

Note:

Polarization: **Conducted po**

Power: AC 120V/60Hz

Distance:

Temperature: 23 °C

Humidity: 55.2 %

RBW: 1000 KHz VBW: 1000 KHz

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBm | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBm | Limit<br>dBm | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|-------------------------|-------------------------|-------------------------|--------------|------------|-------------------------|---------------------------|---------|
| 1   | *   | 1738.900     | 7.09                    | 4.66                    | 11.75                   | -13.00       | 24.75      | peak                    |                           | Tx      |
| 2   |     | 1900.000     | -52.51                  | 6.63                    | -45.88                  | -13.00       | -32.88     | peak                    |                           |         |

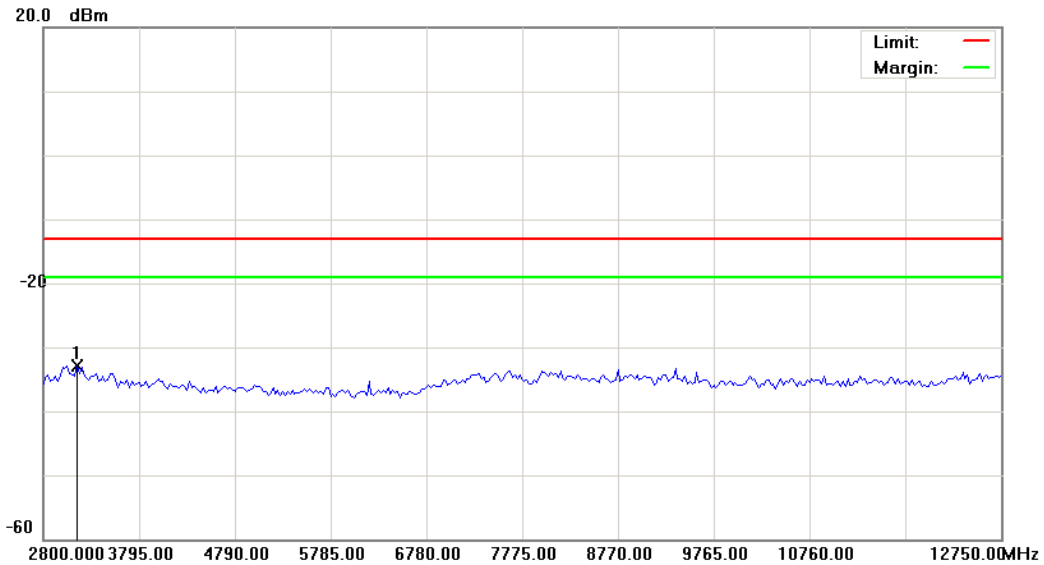
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1450)

Data: #4

Date: 2012/1/9

Time: 上午 10:01:10



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 3148.250 | -38.24        | 5.27           | -32.97      | -13.00 | -19.97 | peak           |              | Comment |

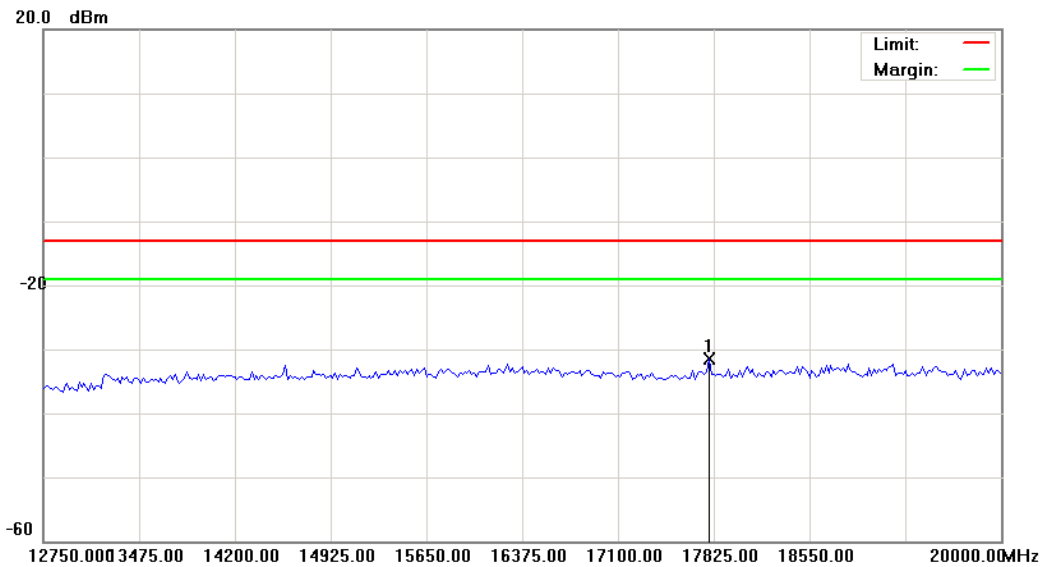
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1450)

Data: #5

Date: 2012/1/9

Time: 上午 10:01:32



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 17788.750 | -38.38        | 6.81           | -31.57      | -13.00 | -18.57 | peak           |              | Comment |

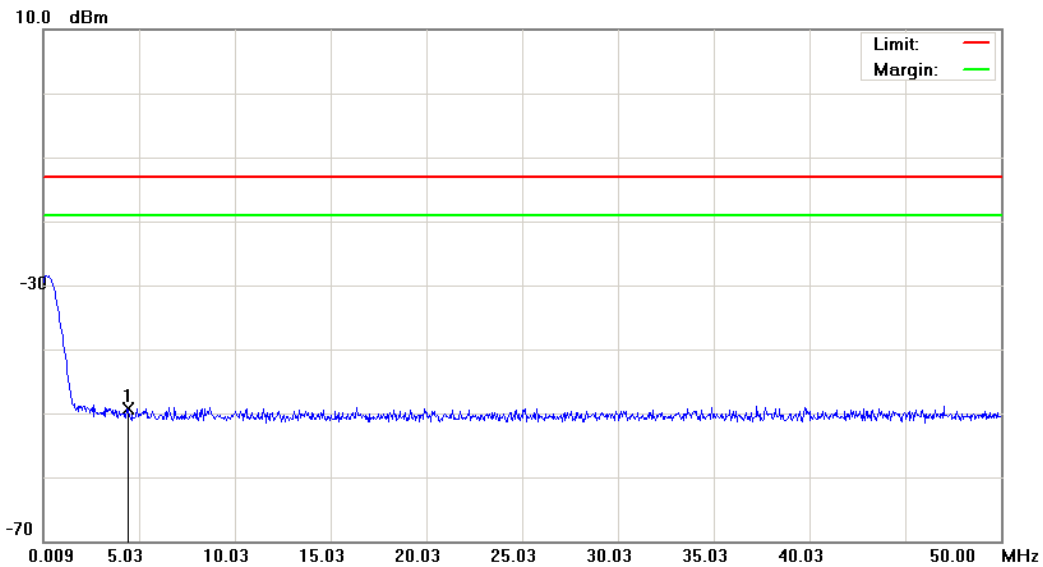
\*:Maximum data    x:Over limit    !:over margin

File:HE910(CH1513)

Data :#1

Date:2012/1/9

Time: 上午 09:43:44



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 4.3832 | -62.44        | 13.22          | -49.22      | -13.00 | -36.22 | peak           |              |         |

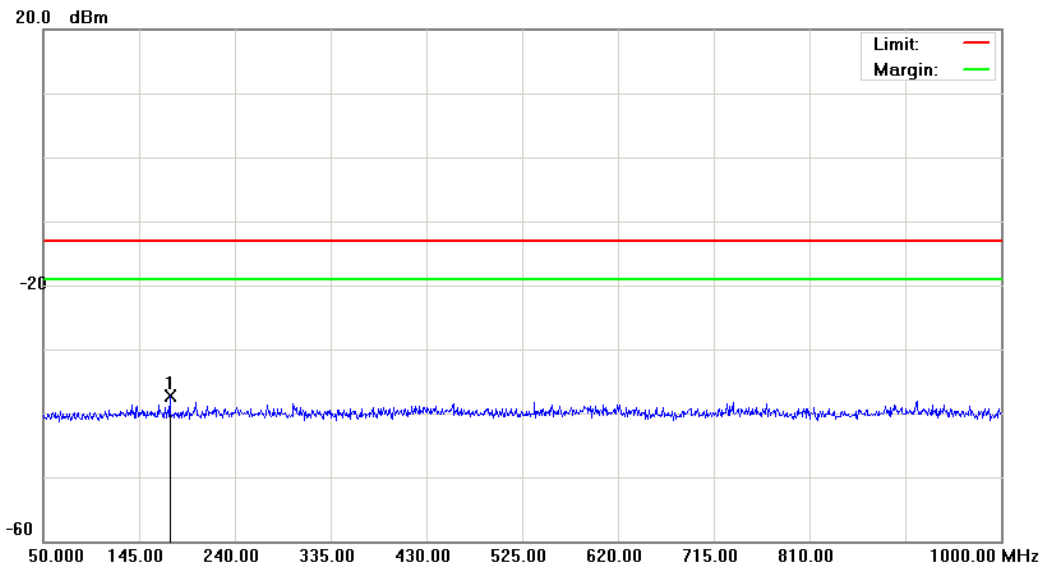
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1513)

Data :#2

Date: 2012/1/9

Time: 上午 09:44:09



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 175.4000 | -50.61        | 13.29          | -37.32      | -13.00 | -24.32 | peak           |              |         |

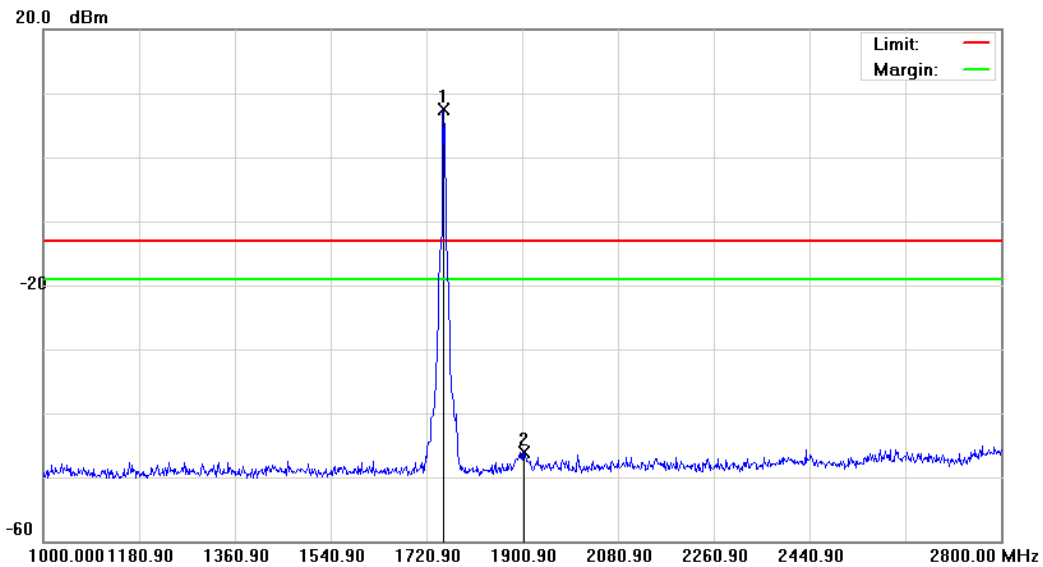
\*:Maximum data x:Over limit !:over margin

File: HE910(CH1513)

Data: #3

Date: 2012/1/9

Time: 上午 09:46:13



Site: : RF Conducted

Polarization: **Conducted po**

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBm | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBm | Limit<br>dBm | Over<br>dB | Antenna<br>Height<br>cm | Table<br>Degree<br>degree | Comment |
|-----|-----|--------------|-------------------------|-------------------------|-------------------------|--------------|------------|-------------------------|---------------------------|---------|
| 1   | *   | 1751.500     | 2.86                    | 4.63                    | 7.49                    | -13.00       | 20.49      | peak                    |                           | Tx      |
| 2   |     | 1903.600     | -52.33                  | 6.30                    | -46.03                  | -13.00       | -33.03     | peak                    |                           |         |

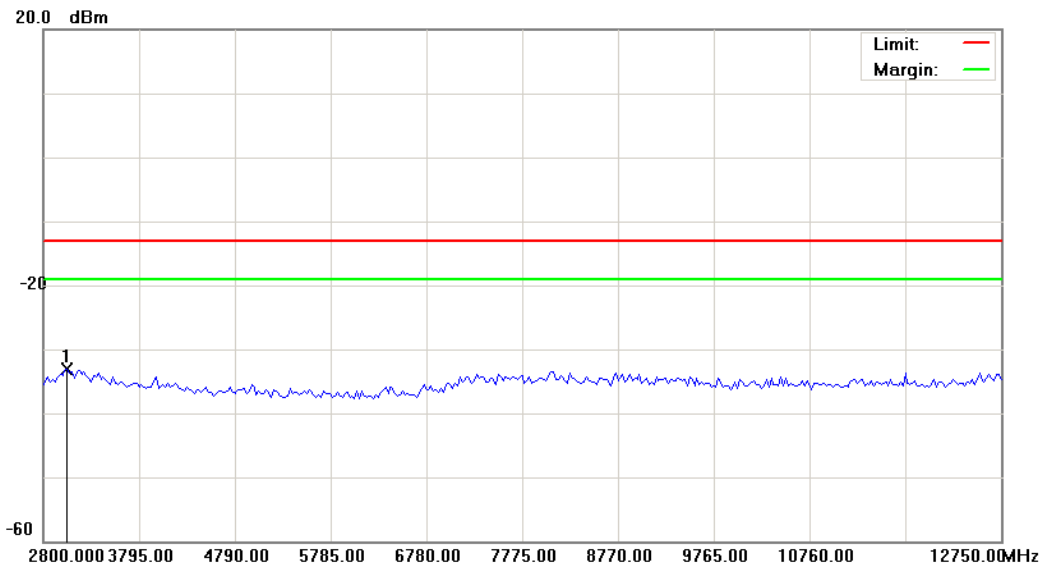
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1513)

Data :#4

Date:2012/1/9

Time: 上午 10:02:27



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | cm             | degree       | Comment |
| 1   | *   | 3048.750 | -38.63        | 5.47           | -33.16      | -13.00 | -20.16 | peak           |              |         |

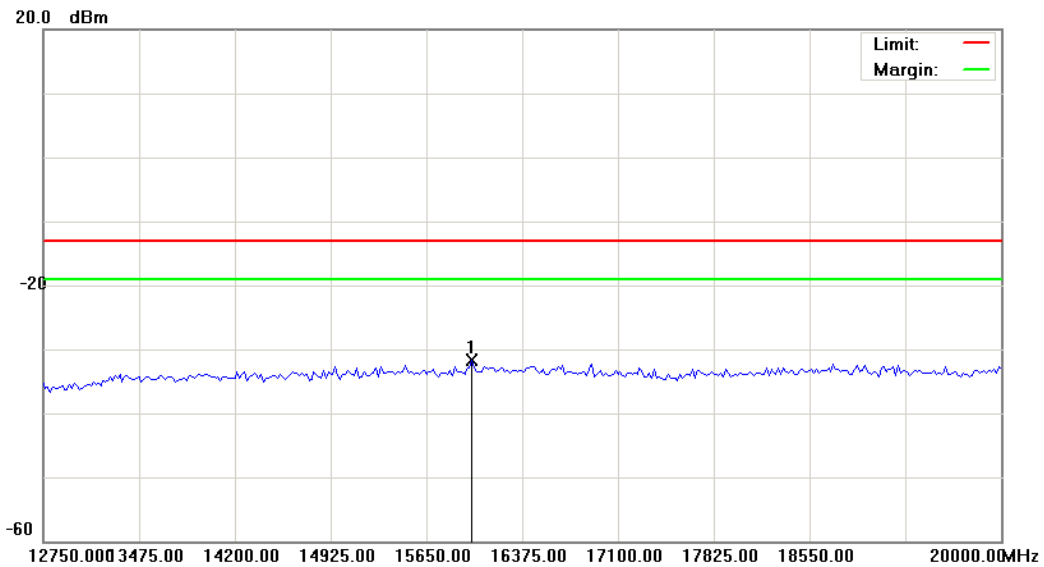
\*:Maximum data x:Over limit !:over margin

File:HE910(CH1513)

Data :#5

Date:2012/1/9

Time: 上午 10:02:49



Site: : RF Conducted

Polarization: Conducted po

Temperature: 23 °C

Limit: FCC Part 27 conducted(9k-12.75G)

Power: AC 120V/60Hz

Humidity: 55.2 %

EUT: 2G/3G Module

Distance:

RBW: 1000 KHz VBW: 1000 KHz

M/N: HE910

Mode: WCDMA Band IV

Note:

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |                |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|----------------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree Comment |
| 1   | *   | 15994.375 | -38.03        | 6.30           | -31.73      | -13.00 | -18.73 | peak           |              |                |

\*:Maximum data x:Over limit !:over margin

## 6 Field Strength of Spurious Radiation Test

### 6.1. Limit

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.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10<sup>th</sup> harmonic.

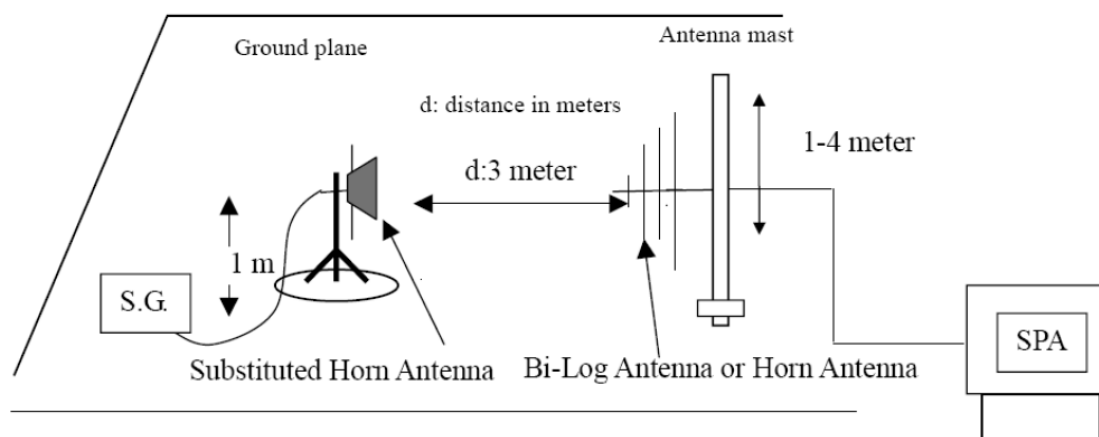
### 6.2. Test Instruments

| 3 Meter Chamber                   |                                |           |            |            |        |
|-----------------------------------|--------------------------------|-----------|------------|------------|--------|
| Equipment                         | Manufacturer                   | Model No. | Serial No. | Cal. Date  | Remark |
| RF Pre-selector                   | Agilent                        | N9039A    | MY46520256 | 05/23/2011 | (2)    |
| Spectrum Analyzer                 | Agilent                        | E4446A    | MY46180578 | 01/18/2011 | (1)    |
| Pre Amplifier                     | Agilent                        | 8449B     | 3008A02237 | 02/23/2011 | (1)    |
| Pre Amplifier                     | Agilent                        | 8447D     | 2944A10961 | 02/23/2011 | (1)    |
| Broadband Antenna<br>(30MHz~1GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163  | 9163-270   | 07/29/2011 | (1)    |
| Horn Antenna<br>(1~18GHz)         | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D | 9120D-550  | 06/29/2011 | (1)    |
| Horn Antenna<br>(18~40GHz)        | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170  | 9170-320   | 06/28/2011 | (1)    |
| Test Site                         | ATL                            | TE01      | 888001     | 12/20/2011 | (1)    |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### 6.3. Setup



#### 6.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

The equipment under test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole. A fully charged battery was used for the supply voltage.

The settings of the receiver were as follows:

|                      |       |
|----------------------|-------|
| Units                | dBm   |
| Resolution Bandwidth | 1 MHz |
| Video Bandwidth      | Auto  |
| Sweep Time           | Auto  |

#### 6.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is  $\pm 3.072$  dB.

## 6.6. Test Result

|            |                   |                      |               |
|------------|-------------------|----------------------|---------------|
| Standard:  | FCC Part 27       | Test Distance:       | 3m            |
| Test item: | Radiated Emission | Power:               | AC 120V/60Hz  |
| Model:     | HE910             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH  |
| Mode:      | Mode 1            | Date:                | 12/06/2011    |
| Frequency: | 1712.4 MHz        | Test By:             | Charlie Chang |

| No. | Frequency<br>(MHz) | Reading<br>(dBm) | Correct<br>Factor(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|-----|--------------------|------------------|-----------------------|-----------------|----------------|----------------|--------|---------------------|
| 1   | 198.5000           | -72.64           | 1.56                  | -71.08          | -13.00         | -58.08         | peak   | H                   |
| 2   | 474.0000           | -79.47           | 5.40                  | -74.07          | -13.00         | -61.07         | peak   | H                   |
| 3   | 538.0000           | -79.41           | 8.19                  | -71.22          | -13.00         | -58.22         | peak   | H                   |
| 4   | 683.0000           | -79.40           | 7.01                  | -72.39          | -13.00         | -59.39         | peak   | H                   |
| 5   | 780.0000           | -74.33           | 10.19                 | -64.14          | -13.00         | -51.14         | peak   | H                   |
| 6   | 902.0000           | -80.14           | 14.14                 | -66.00          | -13.00         | -53.00         | peak   | H                   |
| 7   | 3952.000           | -68.83           | 16.36                 | -52.47          | -13.00         | -39.47         | peak   | H                   |
| 8   | 7744.000           | -70.78           | 29.40                 | -41.38          | -13.00         | -28.38         | peak   | H                   |
| 9   | 11068.000          | -73.46           | 36.49                 | -36.97          | -13.00         | -23.97         | peak   | H                   |
| 1   | 131.5000           | -78.73           | 13.57                 | -65.16          | -13.00         | -52.16         | peak   | V                   |
| 2   | 161.0000           | -79.36           | 11.75                 | -67.61          | -13.00         | -54.61         | peak   | V                   |
| 3   | 215.0000           | -80.31           | 7.11                  | -73.20          | -13.00         | -60.20         | peak   | V                   |
| 4   | 409.5000           | -78.91           | 1.33                  | -77.58          | -13.00         | -64.58         | peak   | V                   |
| 5   | 667.5000           | -80.11           | 9.45                  | -70.66          | -13.00         | -57.66         | peak   | V                   |
| 6   | 957.5000           | -80.79           | 12.42                 | -68.37          | -13.00         | -55.37         | peak   | V                   |
| 7   | 3424.000           | -60.68           | 19.05                 | -41.63          | -13.00         | -28.63         | peak   | V                   |
| 8   | 7216.000           | -70.24           | 25.93                 | -44.31          | -13.00         | -31.31         | peak   | V                   |
| 9   | 9868.000           | -71.62           | 29.98                 | -41.64          | -13.00         | -28.64         | peak   | V                   |

|            |                   |                      |               |
|------------|-------------------|----------------------|---------------|
| Standard:  | FCC Part 27       | Test Distance:       | 3m            |
| Test item: | Radiated Emission | Power:               | AC 120V/60Hz  |
| Model:     | HE910             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH  |
| Mode:      | Mode 1            | Date:                | 12/06/2011    |
| Frequency: | 1740.0 MHz        | Test By:             | Charlie Chang |

| No. | Frequency<br>(MHz) | Reading<br>(dBm) | Correct<br>Factor(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|-----|--------------------|------------------|-----------------------|-----------------|----------------|----------------|--------|---------------------|
| 1   | 37.5000            | -76.18           | 8.89                  | -67.29          | -13.00         | -54.29         | peak   | H                   |
| 2   | 198.0000           | -72.03           | 1.11                  | -70.92          | -13.00         | -57.92         | peak   | H                   |
| 3   | 451.5000           | -78.50           | 4.31                  | -74.19          | -13.00         | -61.19         | peak   | H                   |
| 4   | 552.5000           | -80.01           | 7.97                  | -72.04          | -13.00         | -59.04         | peak   | H                   |
| 5   | 745.0000           | -79.98           | 8.42                  | -71.56          | -13.00         | -58.56         | peak   | H                   |
| 6   | 859.5000           | -81.44           | 13.00                 | -68.44          | -13.00         | -55.44         | peak   | H                   |
| 7   | 5152.000           | -70.49           | 20.58                 | -49.91          | -13.00         | -36.91         | peak   | H                   |
| 8   | 7636.000           | -71.76           | 29.31                 | -42.45          | -13.00         | -29.45         | peak   | H                   |
| 9   | 10660.000          | -72.64           | 34.84                 | -37.80          | -13.00         | -24.80         | peak   | H                   |
| 1   | 140.0000           | -73.73           | 8.94                  | -64.79          | -13.00         | -51.79         | peak   | V                   |
| 2   | 283.5000           | -77.63           | 1.23                  | -76.40          | -13.00         | -63.40         | peak   | V                   |
| 3   | 493.0000           | -79.84           | 2.62                  | -77.22          | -13.00         | -64.22         | peak   | V                   |
| 4   | 530.0000           | -79.58           | 3.68                  | -75.90          | -13.00         | -62.90         | peak   | V                   |
| 5   | 741.0000           | -80.07           | 10.51                 | -69.56          | -13.00         | -56.56         | peak   | V                   |
| 6   | 863.5000           | -80.50           | 11.48                 | -69.02          | -13.00         | -56.02         | peak   | V                   |
| 7   | 3460.000           | -63.93           | 19.26                 | -44.67          | -13.00         | -31.67         | peak   | V                   |
| 8   | 6244.000           | -71.94           | 23.80                 | -48.14          | -13.00         | -35.14         | peak   | V                   |
| 9   | 7648.000           | -70.87           | 26.46                 | -44.41          | -13.00         | -31.41         | peak   | V                   |

|            |                   |                      |               |
|------------|-------------------|----------------------|---------------|
| Standard:  | FCC Part 27       | Test Distance:       | 3m            |
| Test item: | Radiated Emission | Power:               | AC 120V/60Hz  |
| Model:     | HE910             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH  |
| Mode:      | Mode 1            | Date:                | 12/06/2011    |
| Frequency: | 1752.6 MHz        | Test By:             | Charlie Chang |

| No. | Frequency<br>(MHz) | Reading<br>(dBm) | Correct<br>Factor(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|-----|--------------------|------------------|-----------------------|-----------------|----------------|----------------|--------|---------------------|
| 1   | 37.5000            | -75.87           | 8.89                  | -66.98          | -13.00         | -53.98         | peak   | H                   |
| 2   | 101.0000           | -66.41           | -2.10                 | -68.51          | -13.00         | -55.51         | peak   | H                   |
| 3   | 336.5000           | -80.96           | -0.62                 | -81.58          | -13.00         | -68.58         | peak   | H                   |
| 4   | 675.5000           | -79.91           | 7.04                  | -72.87          | -13.00         | -59.87         | peak   | H                   |
| 5   | 780.0000           | -72.84           | 10.19                 | -62.65          | -13.00         | -49.65         | peak   | H                   |
| 6   | 901.5000           | -79.88           | 14.11                 | -65.77          | -13.00         | -52.77         | peak   | H                   |
| 7   | 3508.000           | -63.68           | 15.50                 | -48.18          | -13.00         | -35.18         | peak   | H                   |
| 8   | 6952.000           | -71.40           | 27.44                 | -43.96          | -13.00         | -30.96         | peak   | H                   |
| 9   | 10756.000          | -72.18           | 35.29                 | -36.89          | -13.00         | -23.89         | peak   | H                   |
| 1   | 133.5000           | -65.34           | 12.47                 | -52.87          | -13.00         | -39.87         | peak   | V                   |
| 2   | 199.5000           | -79.60           | 9.69                  | -69.91          | -13.00         | -56.91         | peak   | V                   |
| 3   | 297.5000           | -78.46           | 2.49                  | -75.97          | -13.00         | -62.97         | peak   | V                   |
| 4   | 493.0000           | -79.59           | 2.62                  | -76.97          | -13.00         | -63.97         | peak   | V                   |
| 5   | 633.0000           | -79.67           | 8.72                  | -70.95          | -13.00         | -57.95         | peak   | V                   |
| 6   | 892.5000           | -79.86           | 10.71                 | -69.15          | -13.00         | -56.15         | peak   | V                   |
| 7   | 3508.000           | -62.60           | 19.52                 | -43.08          | -13.00         | -30.08         | peak   | V                   |
| 8   | 6172.000           | -71.63           | 23.49                 | -48.14          | -13.00         | -35.14         | peak   | V                   |
| 9   | 10708.000          | -72.92           | 34.67                 | -38.25          | -13.00         | -25.25         | peak   | V                   |

|            |                   |                      |               |
|------------|-------------------|----------------------|---------------|
| Standard:  | FCC Part 27       | Test Distance:       | 3m            |
| Test item: | Radiated Emission | Power:               | AC 120V/60Hz  |
| Model:     | HE910             | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH  |
| Mode:      | Mode 2            | Date:                | 12/06/2011    |
|            |                   | Test By:             | Charlie Chang |

| No. | Frequency<br>(MHz) | Reading<br>(dBm) | Correct<br>Factor(dB) | Result<br>(dBm) | Peak Limit<br>(dBm) | AVG. Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|-----|--------------------|------------------|-----------------------|-----------------|---------------------|---------------------|----------------|--------|---------------------|
| 1   | 3569.000           | 38.03            | 3.67                  | 41.70           | 74.00               | 54.00               | -32.30         | peak   | H                   |
| 2   | 5473.000           | 35.05            | 9.91                  | 44.96           | 74.00               | 54.00               | -29.04         | peak   | H                   |
| 3   | 6425.000           | 35.93            | 12.58                 | 48.51           | 74.00               | 54.00               | -25.49         | peak   | H                   |
| 1   | 2862.000           | 37.09            | 1.73                  | 38.82           | 74.00               | 54.00               | -35.18         | peak   | V                   |
| 2   | 4199.000           | 36.35            | 5.93                  | 42.28           | 74.00               | 54.00               | -31.72         | peak   | V                   |
| 3   | 5557.000           | 35.05            | 10.08                 | 45.13           | 74.00               | 54.00               | -28.87         | peak   | V                   |

## 7 Frequency Stability (Temperature Variation) Test

### 7.1. Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block.

The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

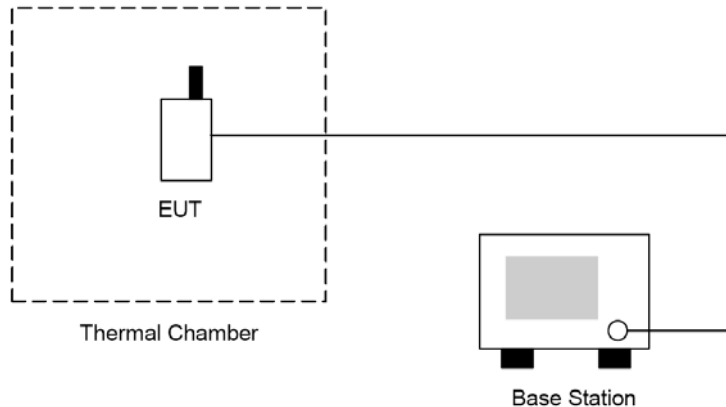
### 7.2. Test Instruments

| Describe                             | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 08/10/2010 | (2)    |
| Temperature & Humidity Chamber       | TAICHY          | MHU-225LA | 980729     | 08/24/2011 | (1)    |
| Test Site                            | ATL             | TE05      | TE05       | N.C.R.     | -----  |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### 7.3. Setup



### 7.4. Test Procedure

The measurement is made according to FCC rules part 27:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The temperature tests were performed for the worst case.
5. Test data was recorded.

## 7.5. Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Temperature Variation) measurement is  $\pm 10\text{Hz}$ .

## 7.6. Test Result

| Product          | 2G/3G Module                                |                 |             |        |
|------------------|---------------------------------------------|-----------------|-------------|--------|
| Test Item        | Frequency Stability (Temperature Variation) |                 |             |        |
| Test Mode        | Mode 1: WCDMA Band IV Link                  |                 |             |        |
| Date of Test     | 01/06/2012                                  |                 | Test Site   | TE05   |
| Temperature (°C) | Deviation (Hz)                              | Deviation (ppm) | Limit (ppm) | Result |
| -30              | -6.00                                       | -0.003          | $\pm 2.5$   | Pass   |
| -20              | -9.00                                       | -0.005          | $\pm 2.5$   | Pass   |
| -10              | -7.00                                       | -0.004          | $\pm 2.5$   | Pass   |
| 0                | -10.00                                      | -0.006          | $\pm 2.5$   | Pass   |
| 10               | -11.00                                      | -0.006          | $\pm 2.5$   | Pass   |
| 20               | -11.00                                      | -0.006          | $\pm 2.5$   | Pass   |
| 30               | -6.00                                       | -0.003          | $\pm 2.5$   | Pass   |
| 40               | -9.00                                       | -0.005          | $\pm 2.5$   | Pass   |
| 50               | -10.00                                      | -0.006          | $\pm 2.5$   | Pass   |

## 8 Frequency Stability (Voltage Variation) Test

### 8.1. Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

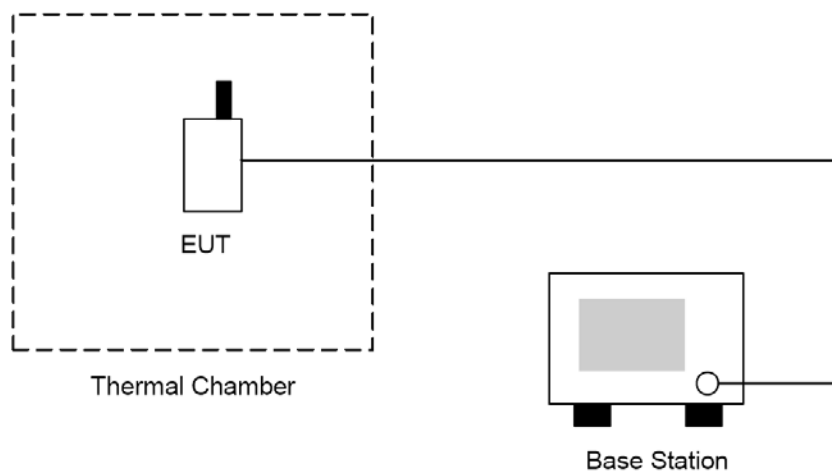
### 8.2. Test Instruments

| Describe                             | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 08/10/2010 | (2)    |
| Temperature & Humidity Chamber       | TAICHY          | MHU-225LA | 980729     | 08/24/2011 | (1)    |
| Test Site                            | ATL             | TE05      | TE05       | N.C.R.     | -----  |

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### 8.3. Setup



### 8.4. Test Procedure

1. The EUT was placed in a temperature chamber at  $25 \pm 5^\circ\text{C}$  and connected as the following section.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

### 8.5. Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Voltage Variation) measurement is  $\pm 10\text{Hz}$ .

## 8.6. Test Result

|              |                                         |                |                 |             |        |
|--------------|-----------------------------------------|----------------|-----------------|-------------|--------|
| Product      | 2G/3G Module                            |                |                 |             |        |
| Test Item    | Frequency Stability (Voltage Variation) |                |                 |             |        |
| Test Mode    | Mode 1: WCDMA Band IV Link              |                |                 |             |        |
| Date of Test | 01/06/2012                              |                | Test Site       | TE05        |        |
| Level        | Voltage (V)                             | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Result |
| High voltage | 4.20                                    | -13.00         | -0.007          | ±2.5        | Pass   |
| Normal       | 3.80                                    | -11.00         | -0.006          | ±2.5        | Pass   |
| Low voltage  | 3.40                                    | -8.00          | -0.005          | ±2.5        | Pass   |