

## FCC 47 CFR PART 27

### RF Test Report

Product Type : Mobile Hotspot  
Applicant : Netgear Inc.  
Address : 350 East Plumeria Drive, San Jose, CA 95134  
Trade name : NETGEAR  
Model No. : AC810S-300  
Test Specification : FCC 47 CFR PART 27 SUBPART L  
ANSI/TIA-603-D 2010  
Application Purpose : Original  
Receive Date : Jul. 13, 2015  
Test Period : Aug. 14 ~ Oct. 02, 2015  
Issue Date : Nov. 24, 2015

#### 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   | Nov. 02, 2015 | Initial Issue               |            |
| 01   | Nov. 24, 2015 | Revised report information. | Joyce Liao |
|      |               |                             |            |
|      |               |                             |            |

## Verification of Compliance

Issued Date: 11/24/2015

Product Type : Mobile Hotspot  
Applicant : Netgear Inc.  
Address : 350 East Plumeria Drive, San Jose, CA 95134  
Trade Name : NETGEAR  
Model Number : AC810S-300  
FCC ID : PY3AC810S  
EUT Rated Voltage : DC 5V, 1A  
Test Voltage : 120 Vac / 60 Hz, DC 3.50 / DC 3.80 / DC 4.35  
Applicable Standard : FCC 47 CFR PART 27 SUBPART L  
ANSI/TIA-603-D 2010

Application Purpose : Original

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.

No. 140-1, Changan Street, Bade City,  
Taoyuan County 334, Taiwan R.O.C.

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

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

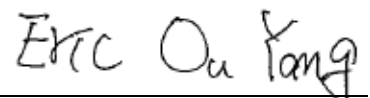
Approved By :



(Manager)

(Fly Lu)

Reviewed By :



(Testing Engineer)

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## 1 General Information

### 1.1. EUT Description

|                      |                                             |      |                       |                       |            |
|----------------------|---------------------------------------------|------|-----------------------|-----------------------|------------|
| Applicant            | Netgear Inc.                                |      |                       |                       |            |
| Applicant Address    | 350 East Plumeria Drive, San Jose, CA 95134 |      |                       |                       |            |
| Manufacturer         | Netgear Inc.                                |      |                       |                       |            |
| Manufacturer Address | 350 East Plumeria Drive, San Jose, CA 95134 |      |                       |                       |            |
| Product Type         | Mobile Hotspot                              |      |                       |                       |            |
| Trade Name           | NETGEAR                                     |      |                       |                       |            |
| Model Number         | AC810S-300                                  |      |                       |                       |            |
| IMEI No.             | 351639070006457                             |      |                       |                       |            |
| Hardware Version     | DV3.2                                       |      |                       |                       |            |
| Software Version     | 11.02.00.00                                 |      |                       |                       |            |
| FCC ID               | PY3AC810S                                   |      |                       |                       |            |
| Mode                 | WCDMA<br>(RMC 12.2K)/<br>HSDPA/<br>HSUPA/   | Band | UL Frequency<br>(MHz) | DL Frequency<br>(MHz) | Modulation |
|                      |                                             | IV   | 1712.4 ~ 1752.6       | 2112.4 ~ 2152.6       | QPSK       |
| Type of Antenna      | Internal PIFA type                          |      |                       |                       |            |
| Antenna Gain (dBi)   | 2.0 dBi                                     |      |                       |                       |            |
| Max. RF Output Power | 25.58 dBm / 0.361 W                         |      |                       |                       |            |
| Max. EIRP            | 21.87 dBm / 0.154 W                         |      |                       |                       |            |

| Power adapter List |                                 |         |              |                 |
|--------------------|---------------------------------|---------|--------------|-----------------|
| Power adapter (1)  | Trade Name                      | NETGEAR | Model Number | MU05BT050100-A1 |
|                    | I/P: 100-240VAC, 50/60Hz, 0.15A |         |              |                 |
|                    | O/P: 5VDC, 1A                   |         |              |                 |
| Power adapter (2)  | Trade Name                      | NETGEAR | Model Number | AD2038F20       |
|                    | I/P: 100-240VAC, 50/60Hz, 0.13A |         |              |                 |
|                    | O/P: 5.0VDC, 1.0A               |         |              |                 |

## 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 Mode |

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.

The device used two models of adapter, adapter number: AD2038F20 is worst case to perform testing.

### Tested System Details

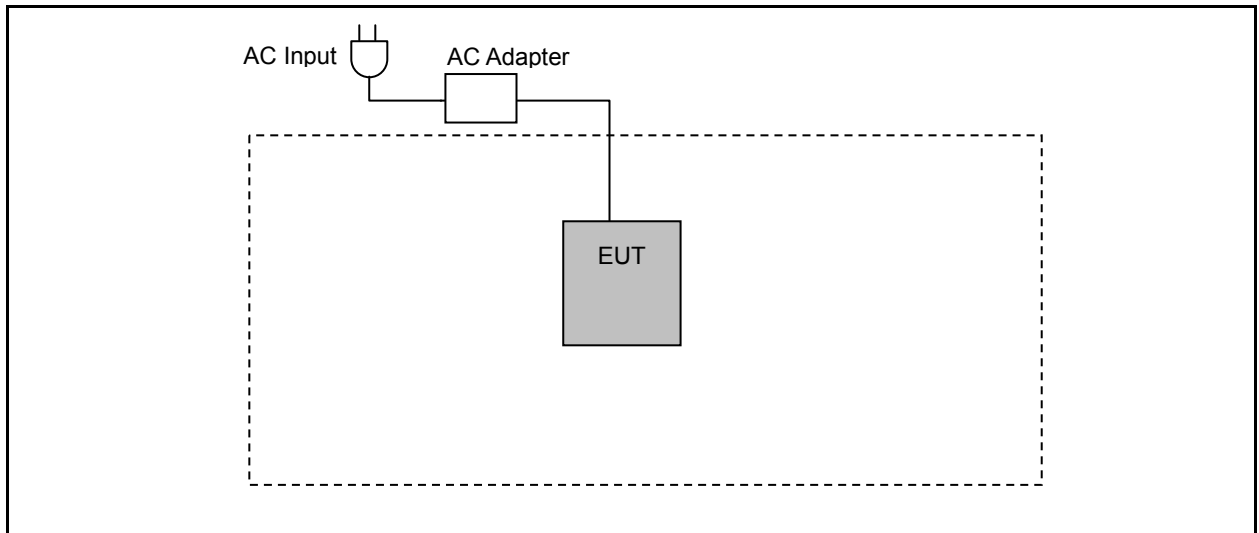
The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

|    | 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.                      |

#### 1.4. Configuration of Test System Details



#### 1.5. Test Site Environment

| Items                      | Required (IEC 60068-1) | Actual |
|----------------------------|------------------------|--------|
| Temperature (°C)           | 15-35                  | 26     |
| Humidity (%RH)             | 25-75                  | 60     |
| Barometric pressure (mbar) | 860-1060               | 950    |

## 1.6. Summary of Test Result

| FCC Rule             | Description                                                        | Result |
|----------------------|--------------------------------------------------------------------|--------|
| §2.1046              | Conducted Output Average Power                                     | Pass   |
| §27.50(d)(2)         | Equivalent Isotropic Radiated Power /<br>Equivalent Radiated Power | Pass   |
| §2.1055<br>§27.54    | Frequency Stability                                                | Pass   |
| §2.1049<br>§27.53(g) | Emission Bandwidth & Occupied Bandwidth                            | Pass   |
| §27.50(d)            | Peak to average ratio                                              | Pass   |
| §27.53(g)            | Band Edge                                                          | Pass   |
| §2.1051<br>§27.53(g) | Conducted Spurious Emissions                                       | Pass   |
| §2.1053<br>§27.53(g) | Radiated Spurious Emissions                                        | Pass   |

## 2 RF Output Power Test

### 2.1. Limit

N/A

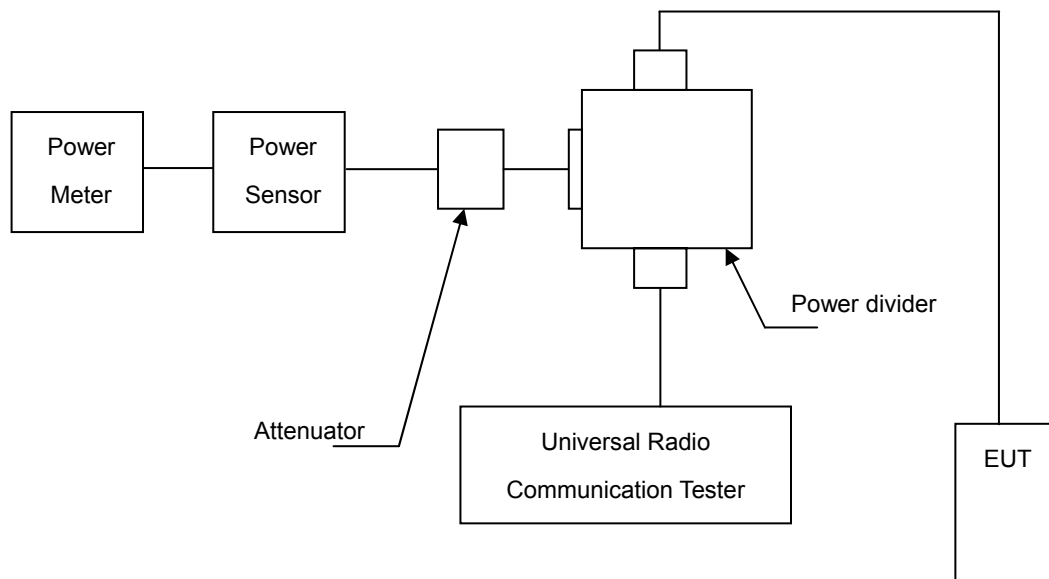
### 2.2. Test Instruments

| Equipment                            | Manufacturer    | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|-----------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | ROHDE & SCHWARZ | CMU200    | 109369     | 10/21/2014 | (2)    |
| Single Channel PK Power Sensor       | Agilent         | N1911A    | MY45101619 | 12/15/2014 | (1)    |
| Wideband Power Meter                 | Agilent         | N1921A    | MY45241957 | 12/15/2014 | (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.

### 2.3. Test Setup



## 2.4. Test Procedure

The measurement is made according to 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.

HSDPA Data Devices setup

| Sub-test | $\beta_c$            | $\beta_d$            | $\beta_d$<br>(SF) | $\beta_c/\beta_d$    | $\beta_{hs}^{(1,2)}$ | CM (dB) <sup>(3)</sup> | MRP (dB) <sup>(3)</sup> |
|----------|----------------------|----------------------|-------------------|----------------------|----------------------|------------------------|-------------------------|
| 1        | 2/15                 | 15/15                | 64                | 2/15                 | 4/15                 | 0.0                    | 0.0                     |
| 2        | 12/15 <sup>(4)</sup> | 15/15 <sup>(4)</sup> | 64                | 12/15 <sup>(4)</sup> | 24/15                | 1.0                    | 0.0                     |
| 3        | 15/15                | 8/15                 | 64                | 15/8                 | 30/15                | 1.5                    | 0.5                     |
| 4        | 15/15                | 4/15                 | 64                | 15/4                 | 30/15                | 1.5                    | 0.5                     |

**Note**

1.  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
2. For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$  and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$
3. CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
4. For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

**Table 1. Setup for Release 5 HSDPA**

## 2.5. Uncertainty

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

## 2.6. Test Result

| Model Number            | AC810S-300      |                    |               |       |              |              |
|-------------------------|-----------------|--------------------|---------------|-------|--------------|--------------|
| Test Item               | RF Output Power |                    |               |       |              |              |
| Date of Test            | 08/14/2015      |                    |               |       | Test Site    | TE05         |
| Bands                   | Sub-Test        | Frequency<br>(MHz) | Average Power |       | Peak Power   |              |
|                         |                 |                    | (dBm)         | (W)   | (dBm)        | (W)          |
| WCDMA IV<br>(RMC 12.2K) | -----           | 1712.4             | 22.29         | 0.169 | 25.44        | 0.350        |
|                         |                 | 1732.6             | 22.49         | 0.177 | <b>25.58</b> | <b>0.361</b> |
|                         |                 | 1752.6             | 22.11         | 0.163 | 25.40        | 0.347        |
| HSDPA IV                | 1               | 1712.4             | 20.43         | 0.110 | 23.53        | 0.225        |
|                         |                 | 1732.6             | 20.68         | 0.117 | 23.75        | 0.237        |
|                         |                 | 1752.6             | 20.78         | 0.120 | 24.09        | 0.256        |
|                         | 2               | 1712.4             | 20.39         | 0.109 | 23.49        | 0.223        |
|                         |                 | 1732.6             | 20.57         | 0.114 | 23.64        | 0.231        |
|                         |                 | 1752.6             | 20.71         | 0.118 | 24.02        | 0.252        |
|                         | 3               | 1712.4             | 19.88         | 0.097 | 22.98        | 0.199        |
|                         |                 | 1732.6             | 20.07         | 0.102 | 23.14        | 0.206        |
|                         |                 | 1752.6             | 20.18         | 0.104 | 23.49        | 0.223        |
|                         | 4               | 1712.4             | 19.84         | 0.096 | 22.94        | 0.197        |
|                         |                 | 1732.6             | 20.01         | 0.100 | 23.08        | 0.203        |
|                         |                 | 1752.6             | 20.03         | 0.101 | 23.34        | 0.216        |
| HSUPA IV                | 1               | 1712.4             | 19.89         | 0.097 | 22.97        | 0.198        |
|                         |                 | 1732.6             | 20.11         | 0.103 | 23.16        | 0.207        |
|                         |                 | 1752.6             | 20.22         | 0.105 | 23.51        | 0.224        |
|                         | 2               | 1712.4             | 19.21         | 0.083 | 22.29        | 0.169        |
|                         |                 | 1732.6             | 19.25         | 0.084 | 22.30        | 0.170        |
|                         |                 | 1752.6             | 19.32         | 0.086 | 22.61        | 0.182        |
|                         | 3               | 1712.4             | 18.17         | 0.066 | 21.23        | 0.133        |
|                         |                 | 1732.6             | 18.73         | 0.075 | 21.77        | 0.150        |
|                         |                 | 1752.6             | 19.18         | 0.083 | 22.48        | 0.177        |
|                         | 4               | 1712.4             | 19.23         | 0.084 | 22.31        | 0.170        |
|                         |                 | 1732.6             | 19.28         | 0.085 | 22.33        | 0.171        |
|                         |                 | 1752.6             | 19.35         | 0.086 | 22.65        | 0.184        |
|                         | 5               | 1712.4             | 20.33         | 0.108 | 23.38        | 0.218        |
|                         |                 | 1732.6             | 20.34         | 0.108 | 23.42        | 0.220        |
|                         |                 | 1752.6             | 20.37         | 0.109 | 23.66        | 0.232        |

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

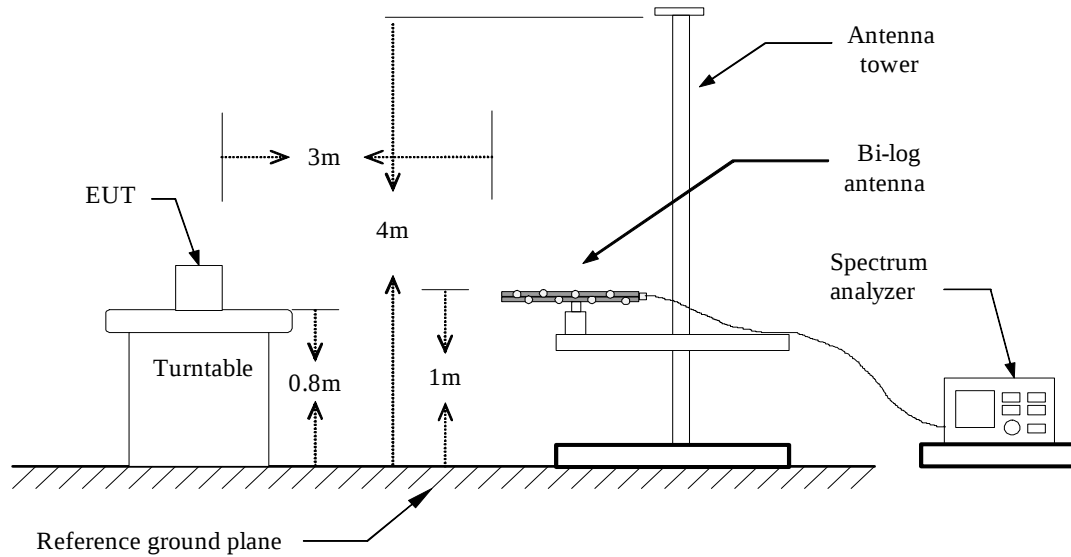
| 3 Meter Chamber                   |                                |           |            |            |        |
|-----------------------------------|--------------------------------|-----------|------------|------------|--------|
| Equipment                         | Manufacturer                   | Model No. | Serial No. | Cal. Date  | Remark |
| RF Pre-selector                   | Agilent                        | N9039A    | MY46520256 | 01/06/2015 | (1)    |
| Spectrum Analyzer                 | Agilent                        | E4446A    | MY46180578 | 01/06/2015 | (1)    |
| Pre Amplifier                     | Agilent                        | 8449B     | 3008A02237 | 02/24/2015 | (1)    |
| Pre Amplifier                     | Agilent                        | 8447D     | 2944A10961 | 02/24/2015 | (1)    |
| Broadband Antenna<br>(30MHz~1GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163  | 9163-270   | 08/11/2015 | (1)    |
| Horn Antenna<br>(1~18GHz)         | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D | 9120D-550  | 06/12/2015 | (1)    |
| Horn Antenna<br>(18~40GHz)        | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170  | 9170-320   | 07/06/2015 | (1)    |
| Test Site                         | ATL                            | TE01      | 888001     | 08/27/2015 | (1)    |

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

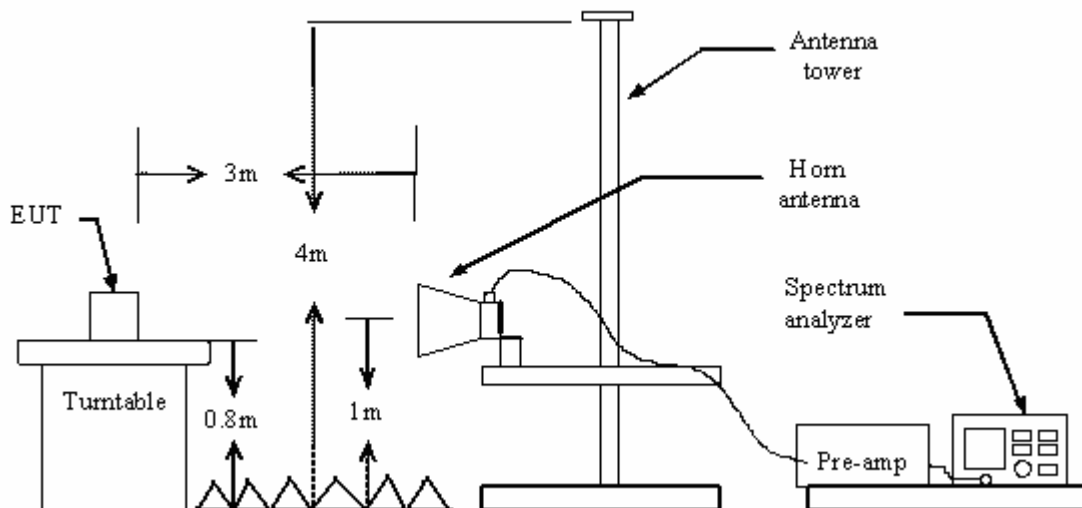
Note: N.C.R. = No Calibration Request.

### 3.3. Test Setup

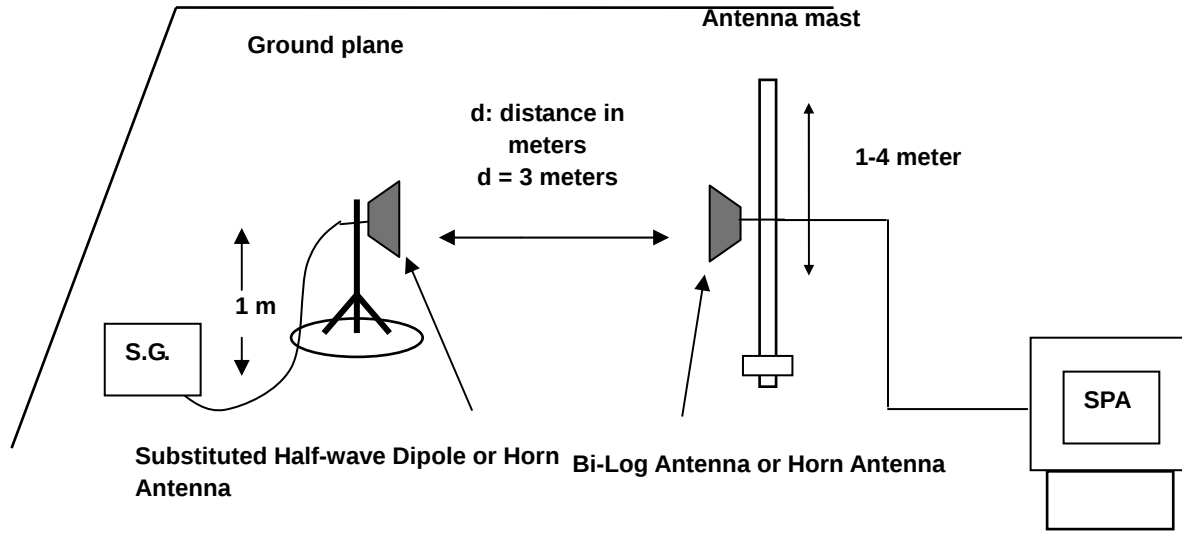
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



### 3.4. Test Procedure

The measurement is made according to as follows:

The EUT was placed on a 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 5MHz (refer to Note) and the average bandwidth was set to 5MHz. 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:

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

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

Note: 1. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.

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

### 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         | AC810S-300      |             |                  |                        |              |              |           |
|----------------------|-----------------|-------------|------------------|------------------------|--------------|--------------|-----------|
| Test Item            | E.I.R.P.        |             |                  |                        |              |              |           |
| Test Mode            | Mode 1          |             |                  |                        |              |              |           |
| Date of Test         | 08/29/2015      |             |                  |                        | Test Site    | TE01         |           |
| Bands                | Frequency (MHz) | Ant. Polar. | Read Level (dBm) | Correction factor (dB) | E.I.R.P.     |              | Limit (W) |
|                      |                 |             |                  |                        | (dBm)        | (W)          |           |
| WCDMA IV (RMC 12.2K) | 1712.4          | H           | 7.77             | 10.05                  | 17.82        | 0.061        | < 1       |
|                      |                 | V           | 11.49            | 10.07                  | 21.56        | 0.143        | < 1       |
|                      | 1732.6          | H           | 7.64             | 10.05                  | 17.69        | 0.059        | < 1       |
|                      |                 | V           | 11.81            | 10.06                  | <b>21.87</b> | <b>0.154</b> | < 1       |
|                      | 1752.6          | H           | 6.49             | 10.04                  | 16.53        | 0.045        | < 1       |
|                      |                 | V           | 11.48            | 10.04                  | 21.52        | 0.142        | < 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, CDMA, and NADC TDMA signals, a peak detector is used, with RBW = VBW= 1 MHz.

## 4 Peak to Average Ratio Test

### 4.1. Limit

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.

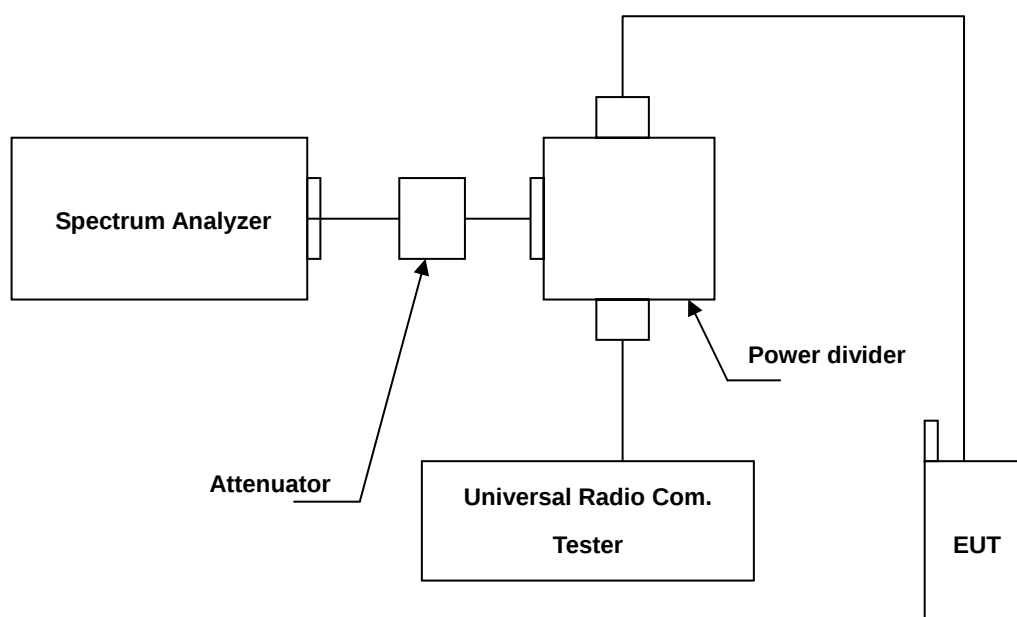
### 4.2. Test Instruments

| Equipment                         | Manufacturer | Model No. | Serial No. | Cal. Date  | Remark |
|-----------------------------------|--------------|-----------|------------|------------|--------|
| Spectrum Analyzer                 | Agilent      | E4445A    | MY46181986 | 05/14/2015 | (1)    |
| Wideband Radio Communication Test | R & S        | CMW500    | 103168     | 11/05/2014 | (1)    |
| 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:

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

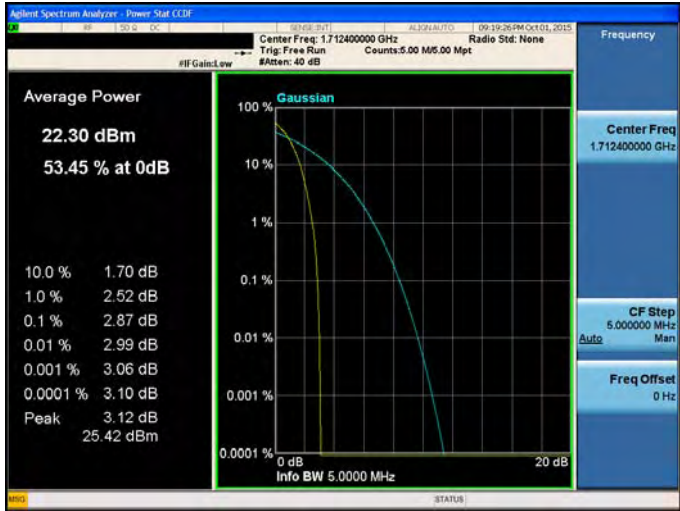
#### 4.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

#### 4.6. Test Result

| Model Number | AC810S-300            |                 |                            |                |
|--------------|-----------------------|-----------------|----------------------------|----------------|
| Test Item    | Peak to Average Ratio |                 |                            |                |
| Test Mode    | Mode 1                |                 |                            |                |
| Date of Test | 10/01/2015            |                 |                            | Test Site TE05 |
| Bands        | Channel               | Frequency (MHz) | Peak to Average Ratio (dB) | Limit (dB)     |
| WCDMA IV     | 1312                  | 1712.4          | 2.87                       | < 13           |
|              | 1413                  | 1732.6          | 2.87                       | < 13           |
|              | 1513                  | 1752.6          | 2.86                       | < 13           |

#### 4.7. Test Graphs

| Mode 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|-------|---------|-------|---------|--------|---------|---------|---------|----------|---------|------|---------|--|-----------|
| 1712.4 MHz |  <p>Agilent Spectrum Analyzer - Power Stat CDF</p> <p>Center Freq: 1.712400000 GHz<br/>Trig: Free Run<br/>#Att: 40 dB</p> <p>Average Power<br/><b>22.30 dBm</b><br/>53.45 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.70 dB</td></tr> <tr><td>1.0 %</td><td>2.52 dB</td></tr> <tr><td>0.1 %</td><td>2.87 dB</td></tr> <tr><td>0.01 %</td><td>2.99 dB</td></tr> <tr><td>0.001 %</td><td>3.06 dB</td></tr> <tr><td>0.0001 %</td><td>3.10 dB</td></tr> <tr><td>Peak</td><td>3.12 dB</td></tr> <tr><td></td><td>25.42 dBm</td></tr> </table> <p>Info BW 5.0000 MHz</p> <p>Frequency<br/>Center Freq<br/>1.712400000 GHz</p> <p>CF Step<br/>5.000000 MHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p>   | 10.0 % | 1.70 dB | 1.0 % | 2.52 dB | 0.1 % | 2.87 dB | 0.01 % | 2.99 dB | 0.001 % | 3.06 dB | 0.0001 % | 3.10 dB | Peak | 3.12 dB |  | 25.42 dBm |
| 10.0 %     | 1.70 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 1.0 %      | 2.52 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.1 %      | 2.87 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.01 %     | 2.99 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.001 %    | 3.06 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.0001 %   | 3.10 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| Peak       | 3.12 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
|            | 25.42 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 1732.6 MHz |  <p>Agilent Spectrum Analyzer - Power Stat CDF</p> <p>Center Freq: 1.732600000 GHz<br/>Trig: Free Run<br/>#Att: 40 dB</p> <p>Average Power<br/><b>22.46 dBm</b><br/>53.37 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.70 dB</td></tr> <tr><td>1.0 %</td><td>2.53 dB</td></tr> <tr><td>0.1 %</td><td>2.87 dB</td></tr> <tr><td>0.01 %</td><td>3.00 dB</td></tr> <tr><td>0.001 %</td><td>3.07 dB</td></tr> <tr><td>0.0001 %</td><td>3.12 dB</td></tr> <tr><td>Peak</td><td>3.13 dB</td></tr> <tr><td></td><td>25.59 dBm</td></tr> </table> <p>Info BW 5.0000 MHz</p> <p>Frequency<br/>Center Freq<br/>1.732600000 GHz</p> <p>CF Step<br/>5.000000 MHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p>  | 10.0 % | 1.70 dB | 1.0 % | 2.53 dB | 0.1 % | 2.87 dB | 0.01 % | 3.00 dB | 0.001 % | 3.07 dB | 0.0001 % | 3.12 dB | Peak | 3.13 dB |  | 25.59 dBm |
| 10.0 %     | 1.70 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 1.0 %      | 2.53 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.1 %      | 2.87 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.01 %     | 3.00 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.001 %    | 3.07 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.0001 %   | 3.12 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| Peak       | 3.13 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
|            | 25.59 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 1752.6 MHz |  <p>Agilent Spectrum Analyzer - Power Stat CDF</p> <p>Center Freq: 1.752600000 GHz<br/>Trig: Free Run<br/>#Att: 40 dB</p> <p>Average Power<br/><b>22.09 dBm</b><br/>53.31 % at 0dB</p> <table border="1"> <tr><td>10.0 %</td><td>1.69 dB</td></tr> <tr><td>1.0 %</td><td>2.52 dB</td></tr> <tr><td>0.1 %</td><td>2.86 dB</td></tr> <tr><td>0.01 %</td><td>2.99 dB</td></tr> <tr><td>0.001 %</td><td>3.05 dB</td></tr> <tr><td>0.0001 %</td><td>3.09 dB</td></tr> <tr><td>Peak</td><td>3.10 dB</td></tr> <tr><td></td><td>25.19 dBm</td></tr> </table> <p>Info BW 5.0000 MHz</p> <p>Frequency<br/>Center Freq<br/>1.752600000 GHz</p> <p>CF Step<br/>5.000000 MHz<br/>Man</p> <p>Freq Offset<br/>0 Hz</p> | 10.0 % | 1.69 dB | 1.0 % | 2.52 dB | 0.1 % | 2.86 dB | 0.01 % | 2.99 dB | 0.001 % | 3.05 dB | 0.0001 % | 3.09 dB | Peak | 3.10 dB |  | 25.19 dBm |
| 10.0 %     | 1.69 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 1.0 %      | 2.52 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.1 %      | 2.86 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.01 %     | 2.99 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.001 %    | 3.05 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| 0.0001 %   | 3.09 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
| Peak       | 3.10 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |
|            | 25.19 dBm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |         |       |         |       |         |        |         |         |         |          |         |      |         |  |           |

## 5 Emission Bandwidth & Occupied Bandwidth Test

### 5.1. Limit

The Occupied Bandwidth Limit:

N/A.

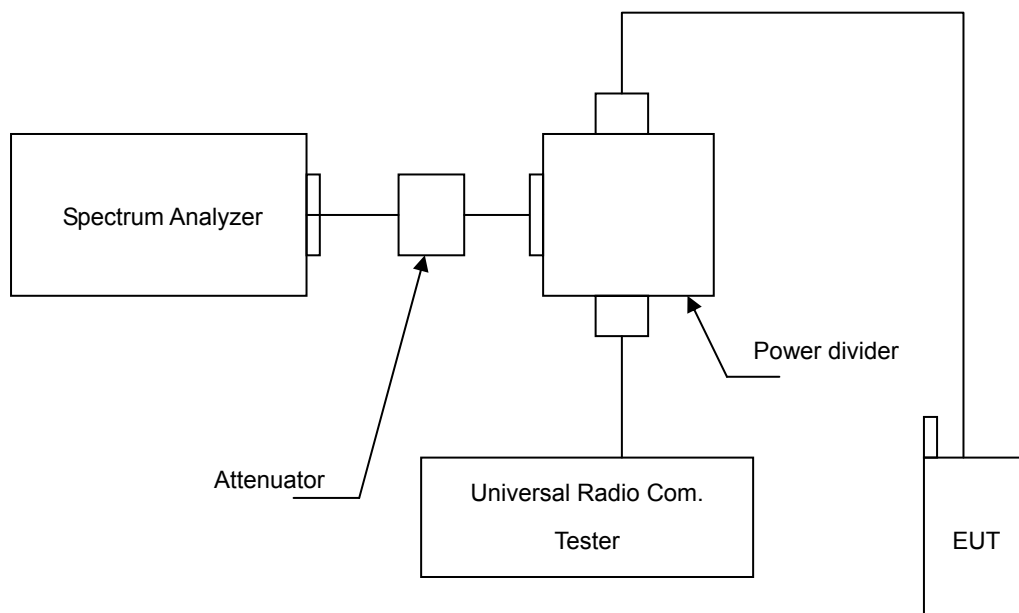
### 5.2. Test Instruments

| Equipment                            | Manufacturer | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|--------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | R & S        | CMU200    | 109369     | 10/21/2014 | (2)    |
| Spectrum Analyzer                    | Agilent      | E4445A    | MY46181986 | 05/14/2015 | (1)    |
| 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



### 5.4. Test Procedure

The measurement is made according to FCC rules part 27:

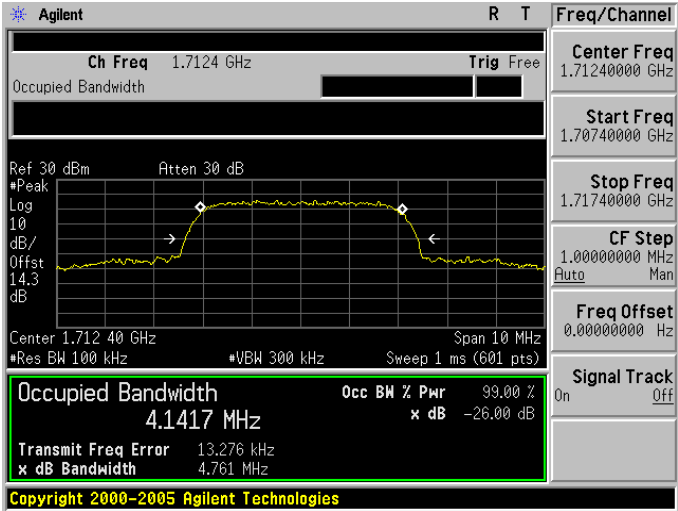
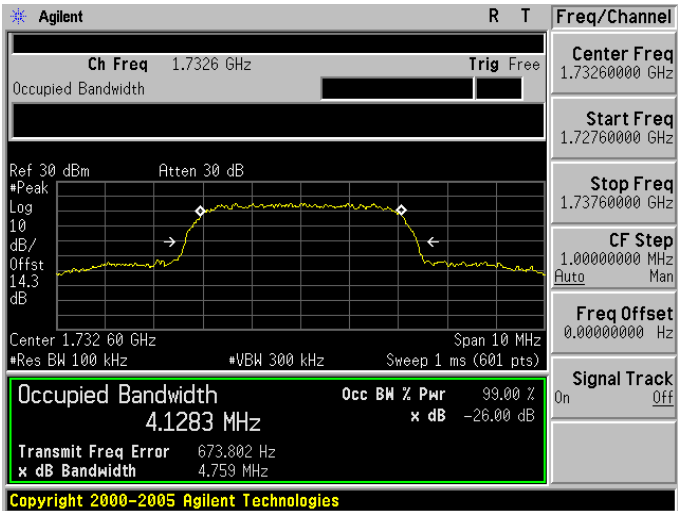
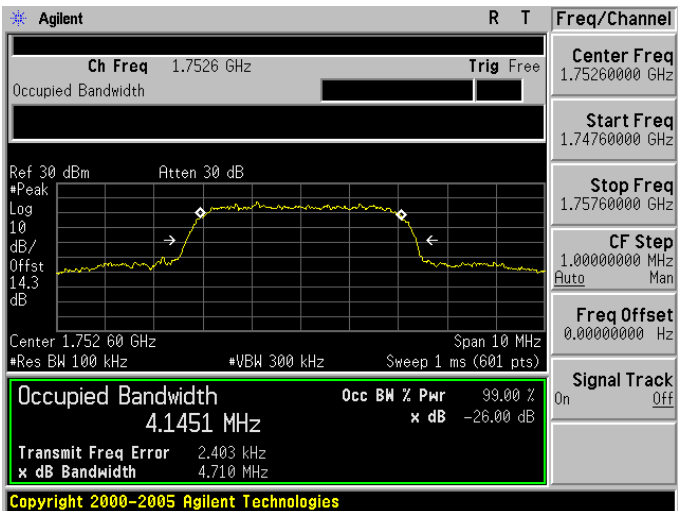
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.

## 5.5. Uncertainty

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

## 5.6. Test Result

| Model Number | AC810S-300                              |                       |                      |       |                         |
|--------------|-----------------------------------------|-----------------------|----------------------|-------|-------------------------|
| Test Item    | Emission Bandwidth & Occupied Bandwidth |                       |                      |       |                         |
| Test Mode    | Mode 1                                  |                       |                      |       |                         |
| Date of Test | 08/17/2015                              |                       |                      |       | Test Site               |
|              |                                         |                       |                      |       | TE05                    |
| Channel No.  | Frequency (MHz)                         | -26dB Bandwidth (MHz) | 99 % Bandwidth (MHz) | Limit | Note                    |
| 1312         | 1712.4                                  | 4.761                 | 4.1417               | N/A   | RBW:100kHz , VBW:300kHz |
| 1413         | 1732.6                                  | 4.759                 | 4.1283               | N/A   | RBW:100kHz , VBW:300kHz |
| 1513         | 1752.6                                  | 4.710                 | 4.1451               | N/A   | RBW:100kHz , VBW:300kHz |

| Mode 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1712.4 MHz |  <p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.7124 GHz Trig Free</p> <p>Center Freq 1.71240000 GHz</p> <p>Start Freq 1.70740000 GHz</p> <p>Stop Freq 1.71740000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.3 dB</p> <p>Center 1.712 40 GHz Span 10 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1417 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 13.276 kHz x dB Bandwidth 4.761 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>  |
| 1732.6 MHz |  <p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.7326 GHz Trig Free</p> <p>Center Freq 1.73260000 GHz</p> <p>Start Freq 1.72760000 GHz</p> <p>Stop Freq 1.73760000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.3 dB</p> <p>Center 1.732 60 GHz Span 10 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1283 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 673.802 Hz x dB Bandwidth 4.759 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> |
| 1752.6 MHz |  <p>Agilent R T Freq/Channel</p> <p>Ch Freq 1.7526 GHz Trig Free</p> <p>Center Freq 1.75260000 GHz</p> <p>Start Freq 1.74760000 GHz</p> <p>Stop Freq 1.75760000 GHz</p> <p>CF Step 1.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 30 dBm Atten 30 dB</p> <p>*Peak Log 10 dB/Offst 14.3 dB</p> <p>Center 1.752 60 GHz Span 10 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 4.1451 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 2.403 kHz x dB Bandwidth 4.710 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p> |

## 6 Band Edge Test

### 6.1. Limit

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.

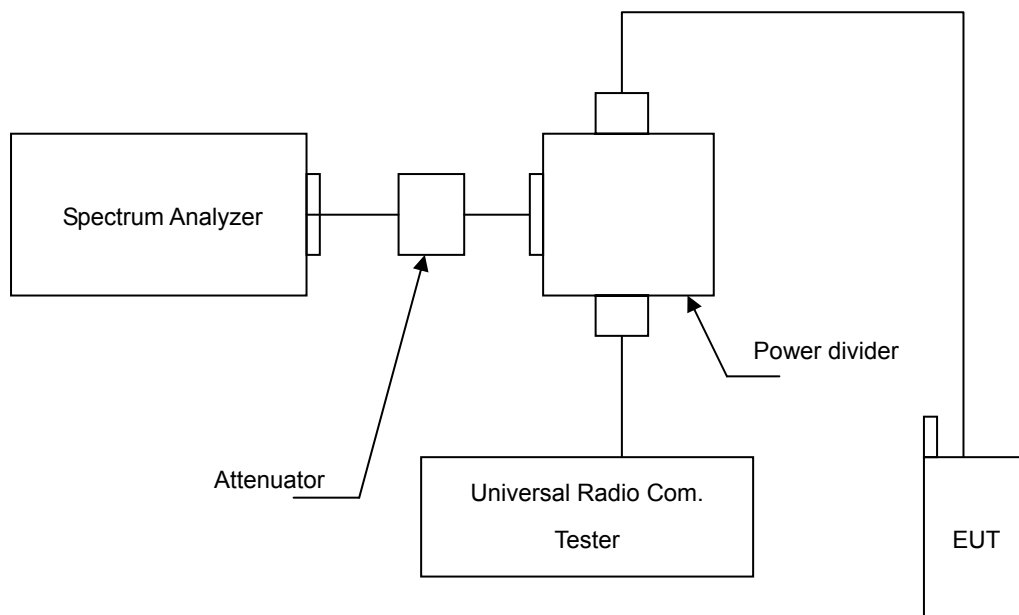
### 6.2. Test Instruments

| Equipment                            | Manufacturer | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|--------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | R & S        | CMU200    | 109369     | 10/21/2014 | (2)    |
| Spectrum Analyzer                    | Agilent      | E4445A    | MY46181986 | 05/14/2015 | (1)    |
| 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.

### 6.3. Setup



#### **6.4. Test Procedure**

The measurement is made according to FCC rules part 27:

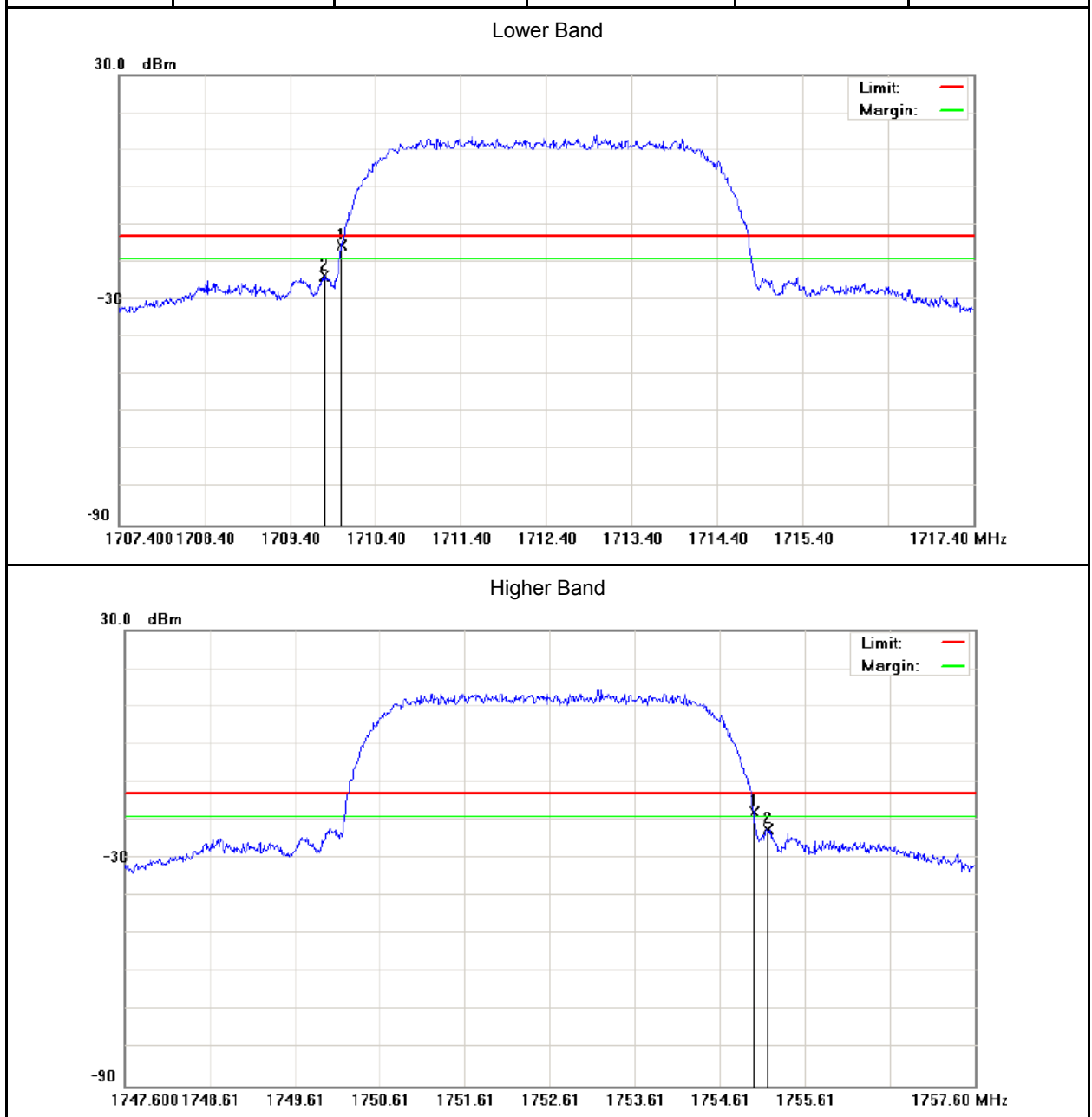
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
3. The band edge setting:RB=51 kHz; VB=160 kHz for WCDMA Band IV.

#### **6.5. Uncertainty**

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

## 6.6. Test Result

| Model Number | AC810S-300 |                 |                 |             |        |
|--------------|------------|-----------------|-----------------|-------------|--------|
| Test Item    | Band Edge  |                 |                 |             |        |
| Test Mode    | Mode 1     |                 |                 |             |        |
| Date of Test | 08/14/2015 |                 | Test Site       | TE05        |        |
| Band         | Channel    | Frequency (MHz) | Band Edge (dBm) | Limit (dBm) | Result |
| Lower        | 1312       | 1710.00         | -15.48          | -13         | Pass   |
| Higher       | 1513       | 1755.00         | -17.97          | -13         | Pass   |



## 7 Conducted Spurious Emission Test

### 7.1. 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.

### 7.2. Test Instruments

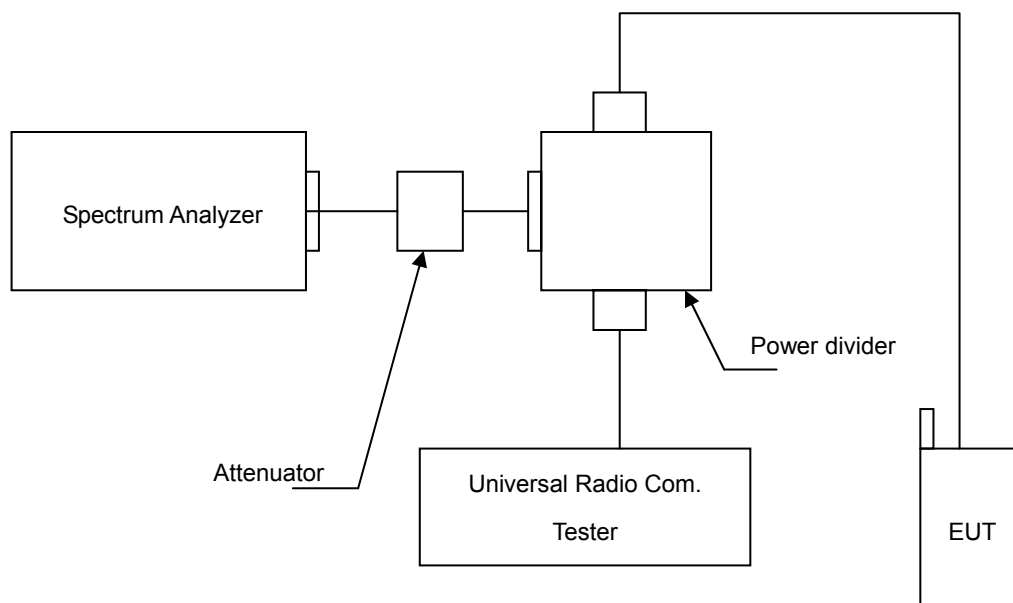
| Equipment                            | Manufacturer | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|--------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | R & S        | CMU200    | 109369     | 10/21/2014 | (2)    |
| Spectrum Analyzer                    | Agilent      | E4445A    | MY46181986 | 05/14/2015 | (1)    |
| 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.

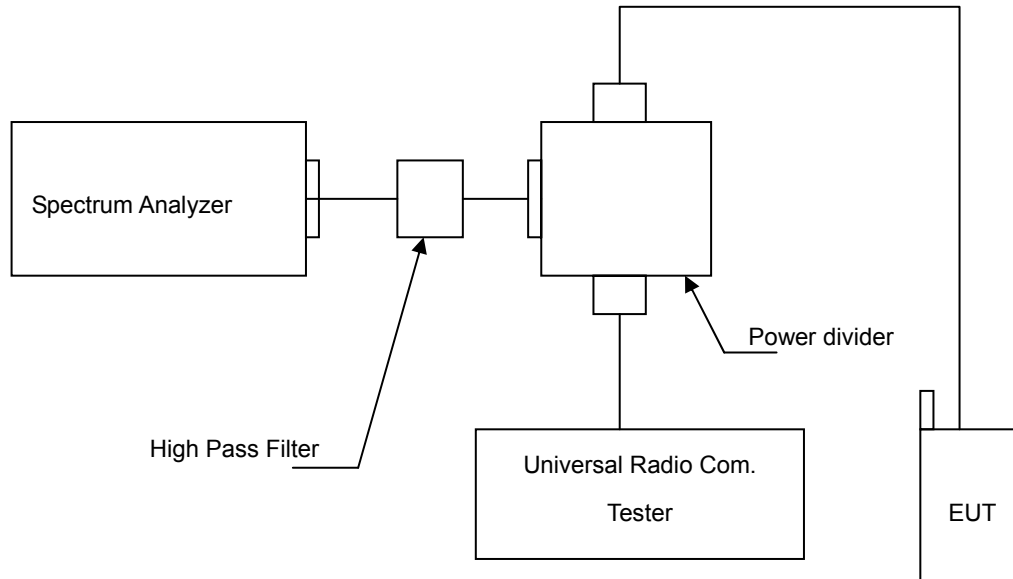
Note: N.C.R. = No Calibration Request.

### 7.3. Setup

Below 2.8GHz



Above 2.8GHz



#### 7.4. 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.

#### 7.5. Uncertainty

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

#### 7.6. Test Result

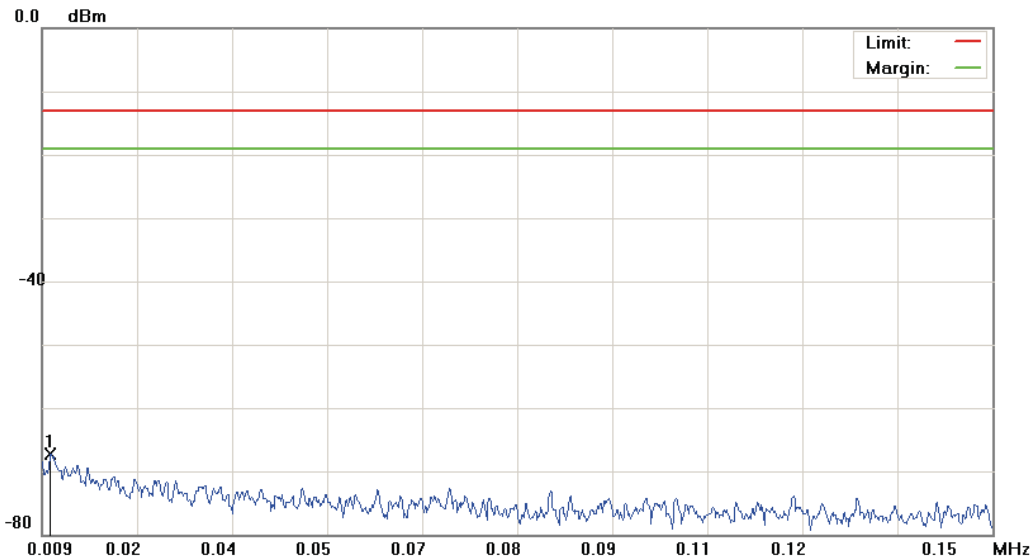
|              |                             |           |      |
|--------------|-----------------------------|-----------|------|
| Model Number | AC810S-300                  |           |      |
| Test Item    | Conducted Spurious Emission |           |      |
| Test Mode    | Mode 1                      |           |      |
| Date of Test | 08/14/2015                  | Test Site | TE05 |

File :AC810-300(CH1312)

Data :#1

Date: 2015/8/14

Time: 下午 04:10:43



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1 KHz VBW: 3 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.0103 | -78.60        | 11.34          | -67.26      | -13.00 | -54.26 | peak           |              | Comment |

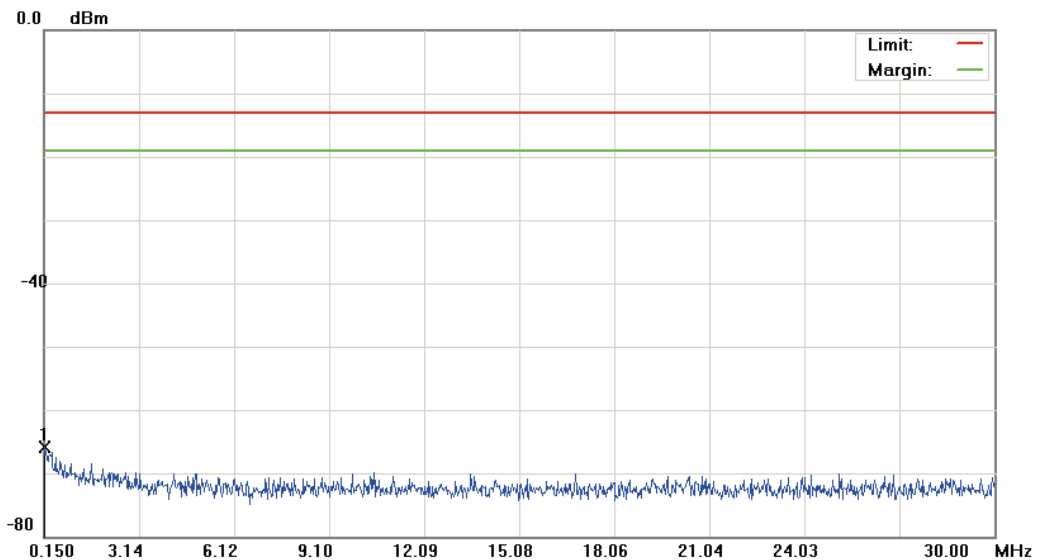
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1312)

Data :#2

Date: 2015/8/14

Time: 下午 04:11:07



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 10 KHz VBW: 30 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.1798 | -78.44        | 12.45          | -65.99      | -13.00 | -52.99 | peak           |              | Comment |

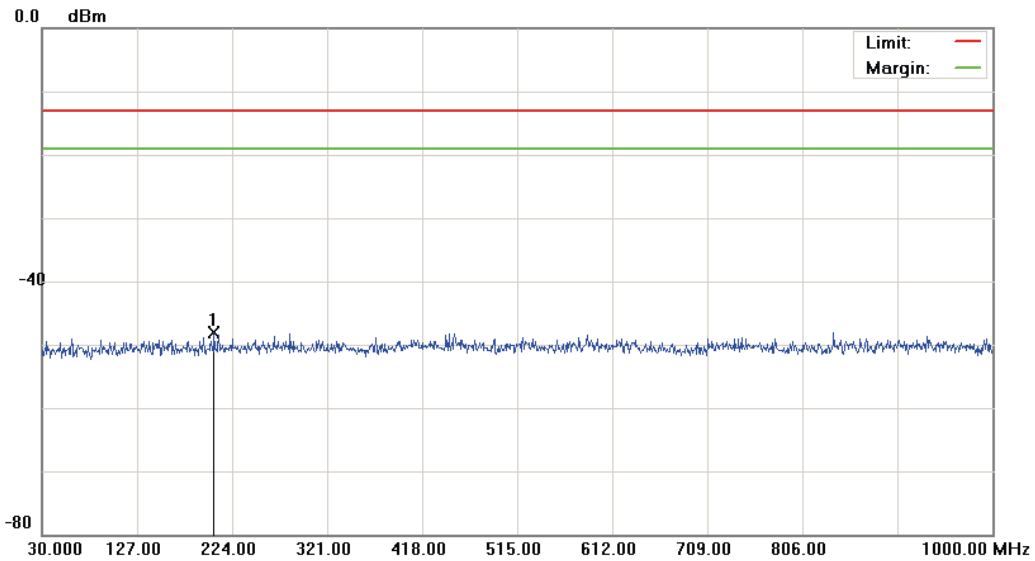
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1312)

Data :#3

Date: 2015/8/14

Time: 下午 04:11:31



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 100 KHz VBW: 300 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 205.5700 | -61.31        | 13.22          | -48.09      | -13.00 | -35.09 | peak           |              | Comment |

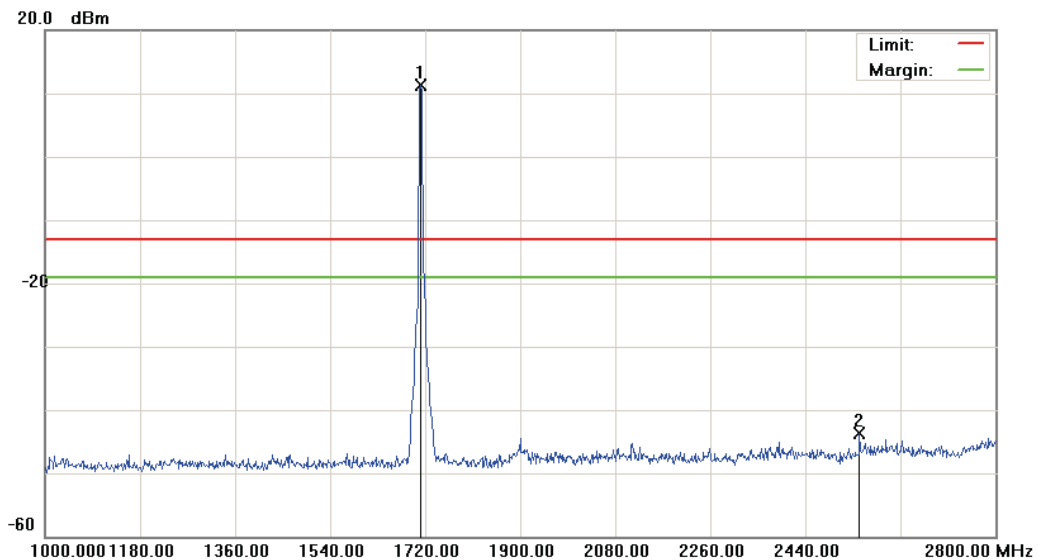
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1312)

Data :#4

Date: 2015/8/14

Time: 下午 04:22:56



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 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   | *   | 1711.000     | 7.01                    | 4.35                    | 11.36                   | -13.00       | 24.36      | peak                    |                           | Tx      |
| 2   |     | 2542.600     | -48.74                  | 5.07                    | -43.67                  | -13.00       | -30.67     | peak                    |                           |         |

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

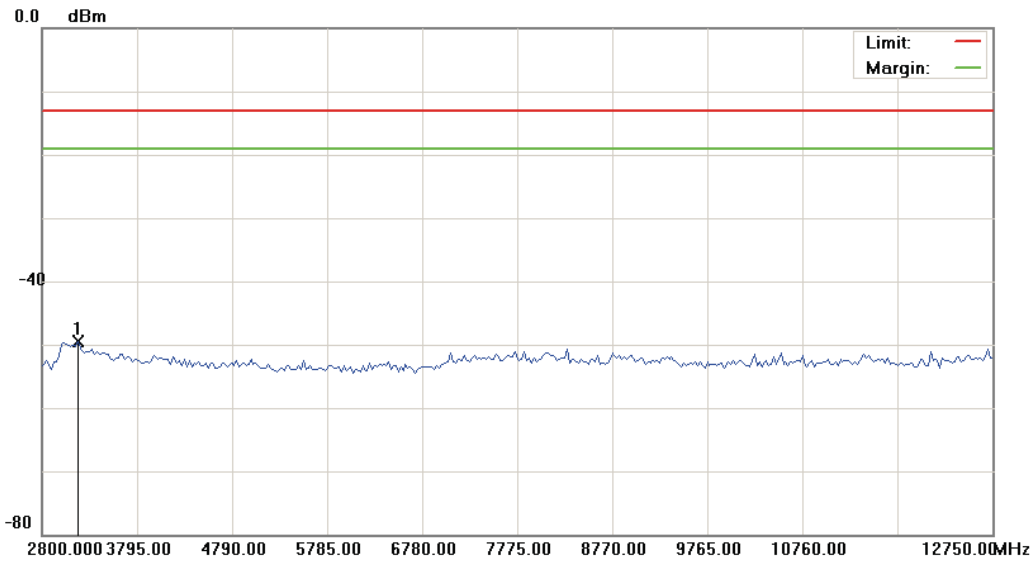


File :AC810-300(CH1312)

Data :#5

Date: 2015/8/14

Time: 下午 04:37:37



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 3173.125 | -54.70        | 5.25           | -49.45      | -13.00 | -36.45 | peak           |              | Comment |

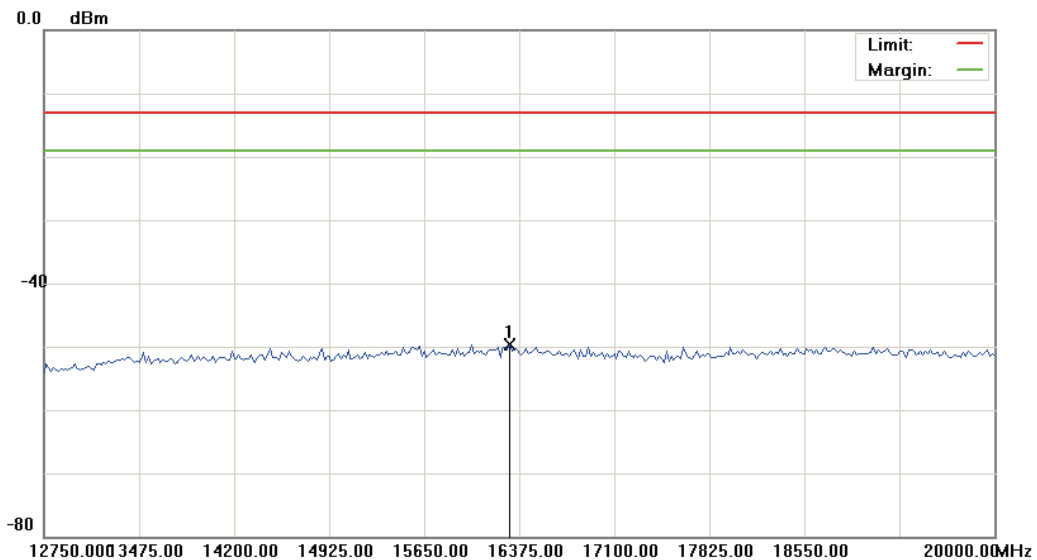
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1312)

Data :#6

Date: 2015/8/14

Time: 下午 04:37:56



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 16302.500 | -56.02        | 6.38           | -49.64      | -13.00 | -36.64 | peak           |              | Comment |

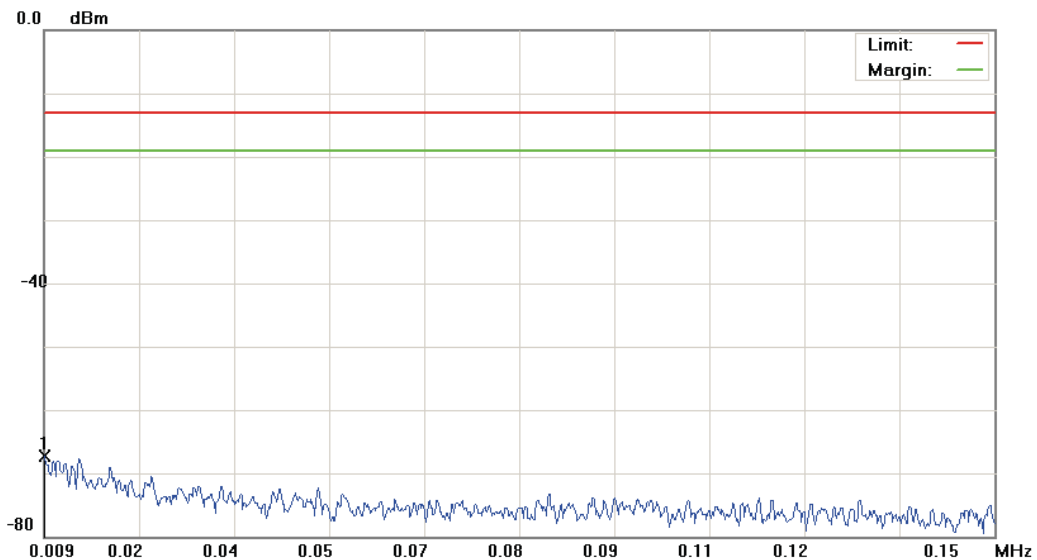
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#1

Date: 2015/8/14

Time: 下午 04:12:31



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1 KHz VBW: 3 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.0090 | -78.64        | 11.32          | -67.32      | -13.00 | -54.32 | peak           |              | Comment |

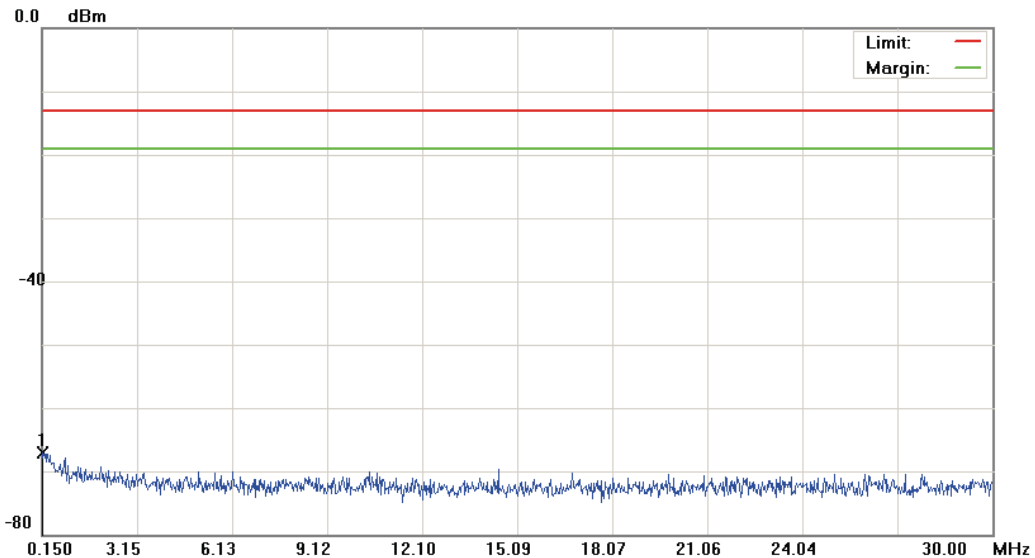
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#2

Date: 2015/8/14

Time: 下午 04:12:55



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 10 KHz VBW: 30 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.1650 | -79.65        | 12.46          | -67.19      | -13.00 | -54.19 | peak           |              | Comment |

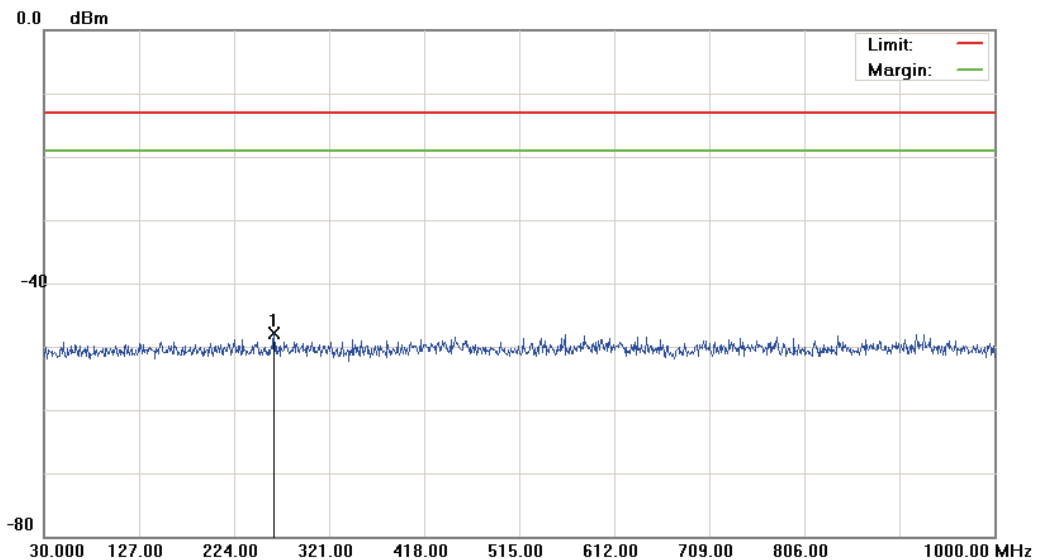
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#3

Date: 2015/8/14

Time: 下午 04:13:19



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 100 KHz VBW: 300 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 264.7400 | -61.23        | 13.31          | -47.92      | -13.00 | -34.92 | peak           |              | Comment |

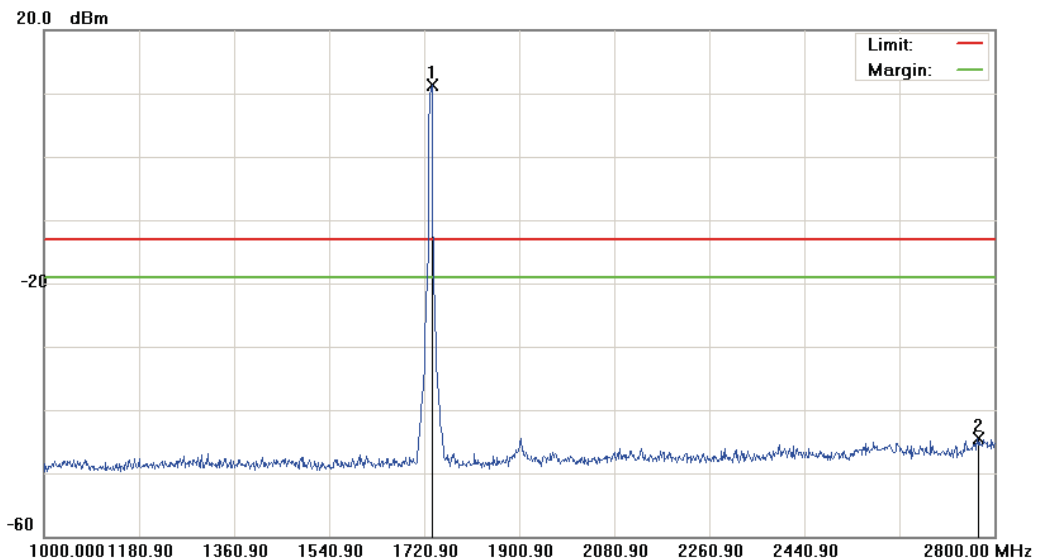
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#4

Date: 2015/8/14

Time: 下午 04:24:42



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 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   | *   | 1734.400     | 6.72                    | 4.60                    | 11.32                   | -13.00       | 24.32      | peak                    |                           | Tx      |
| 2   |     | 2768.500     | -50.22                  | 5.72                    | -44.50                  | -13.00       | -31.50     | peak                    |                           |         |

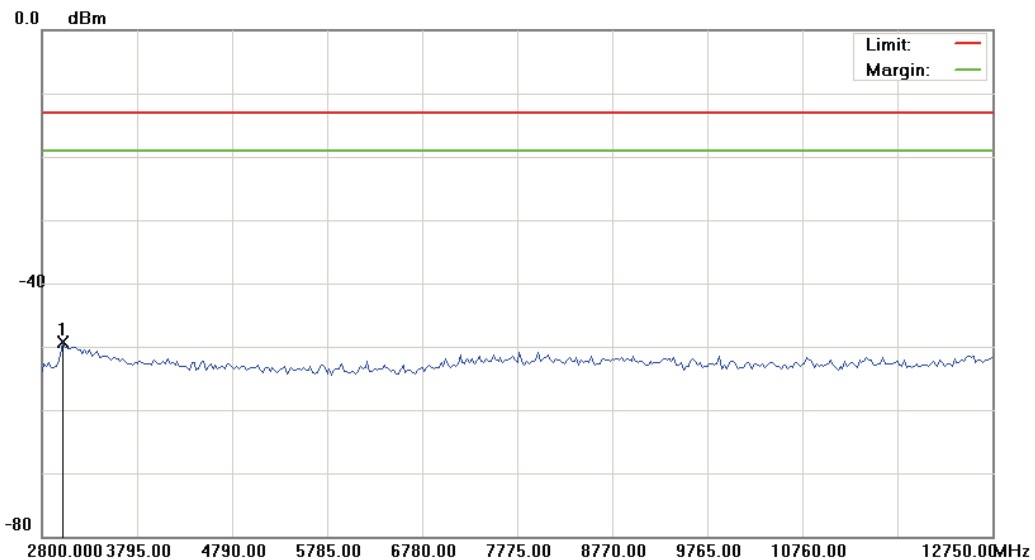
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#5

Date: 2015/8/14

Time: 下午 04:38:55



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 3023.875 | -54.85        | 5.48           | -49.37      | -13.00 | -36.37 | peak           |              | Comment |

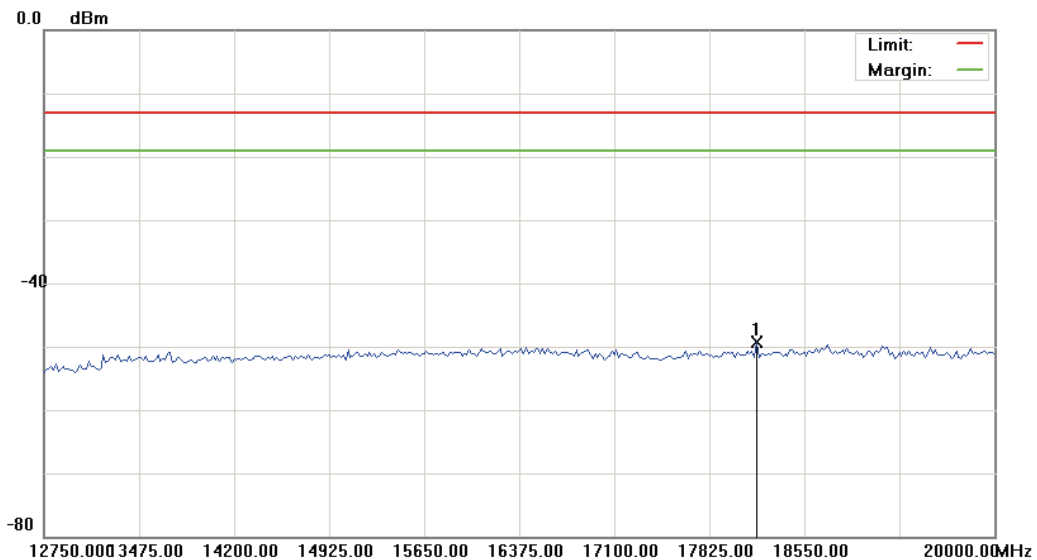
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1413)

Data :#6

Date: 2015/8/14

Time: 下午 04:39:15



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 18187.500 | -56.29        | 6.92           | -49.37      | -13.00 | -36.37 | peak           |              | Comment |

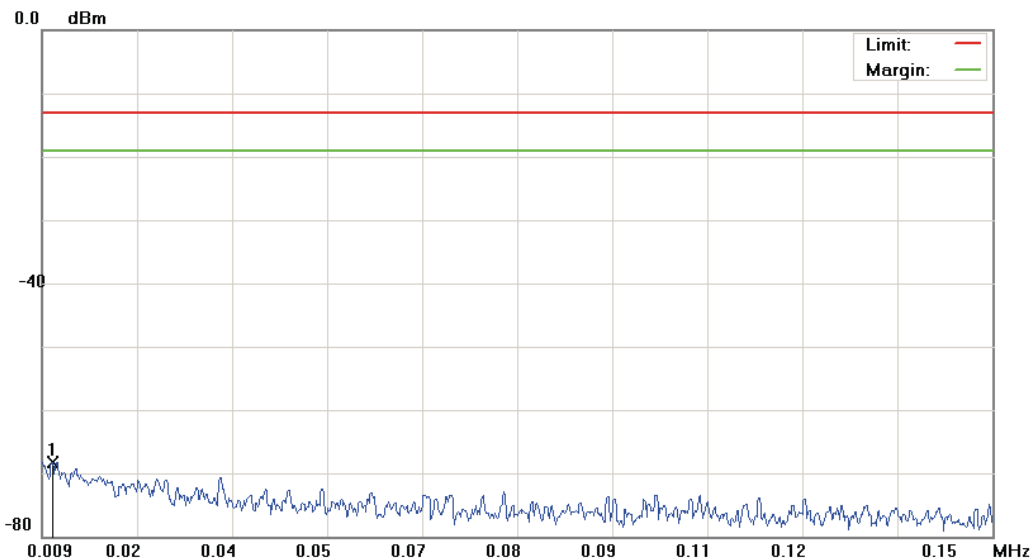
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#1

Date: 2015/8/14

Time: 下午 04:14:27



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1 KHz VBW: 3 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.0105 | -79.70        | 11.34          | -68.36      | -13.00 | -55.36 | peak           |              | Comment |

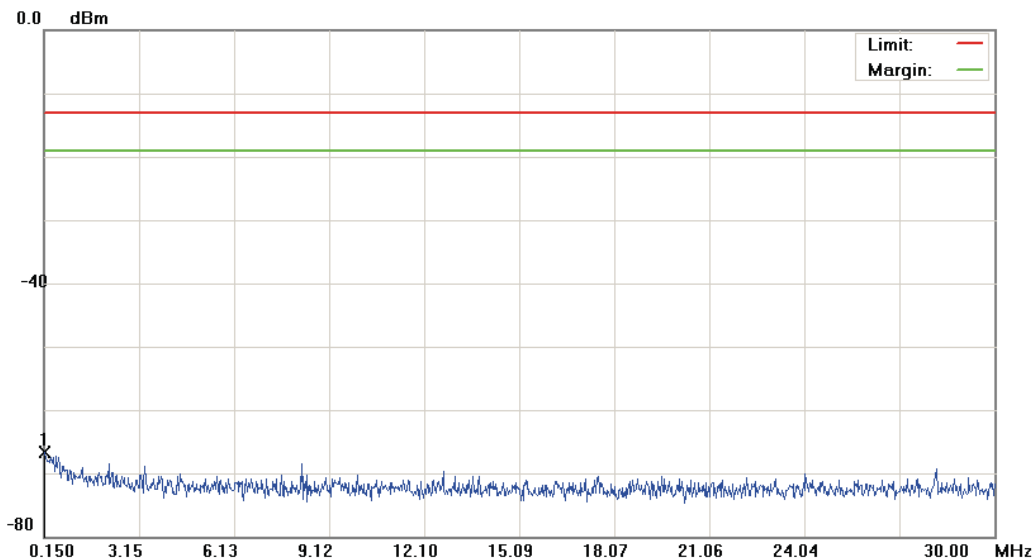
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#2

Date: 2015/8/14

Time: 下午 04:14:51



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 10 KHz VBW: 30 KHz

| No. | Mk. | Freq.  | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|--------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz    | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 0.1650 | -79.21        | 12.46          | -66.75      | -13.00 | -53.75 | peak           |              | Comment |

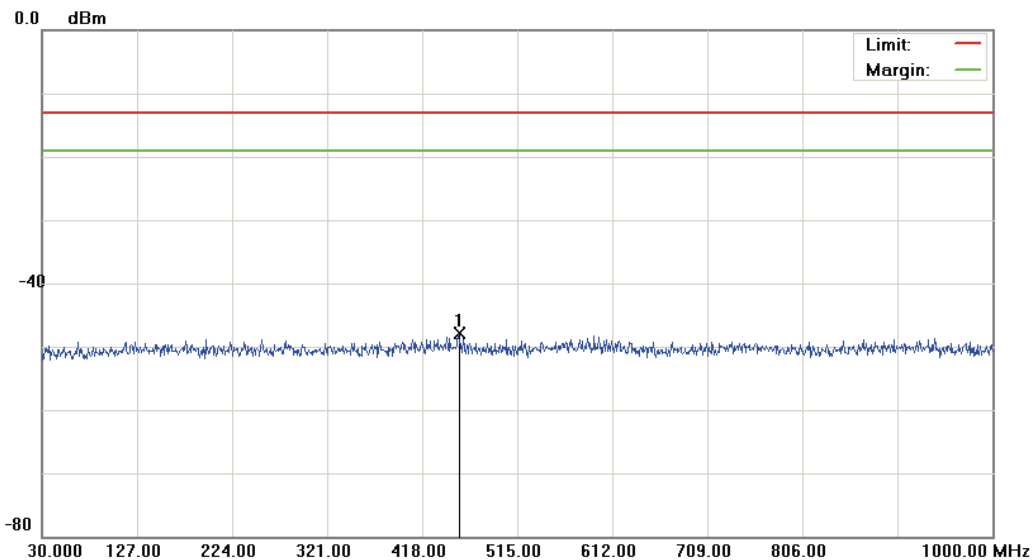
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#3

Date: 2015/8/14

Time: 下午 04:15:15



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 100 KHz VBW: 300 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 455.3450 | -61.14        | 13.22          | -47.92      | -13.00 | -34.92 | peak           |              | Comment |

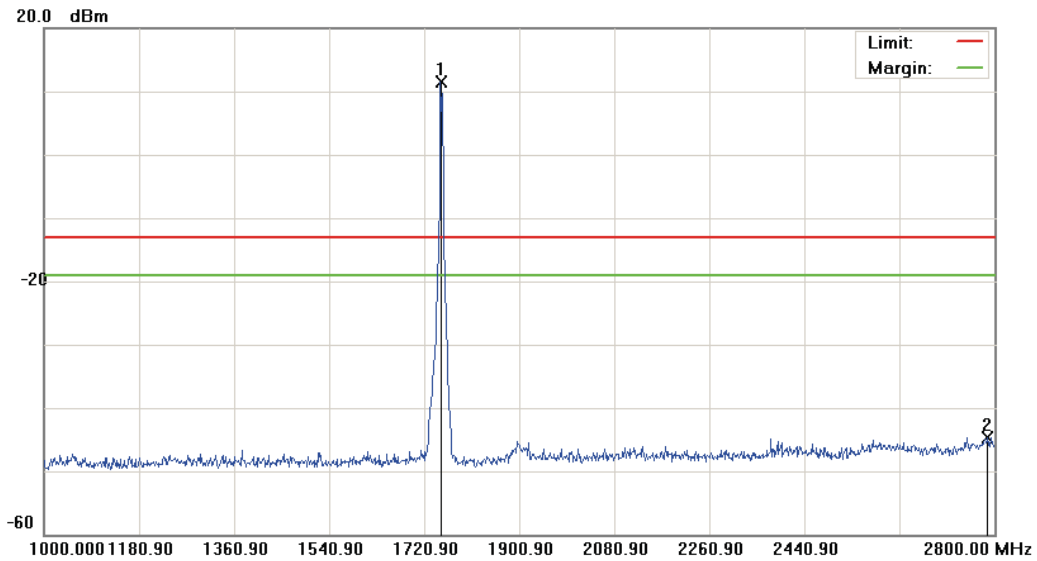
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#4

Date: 2015/8/14

Time: 下午 04:26:17



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 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   | *   | 1751.500     | 6.88                    | 4.63                    | 11.51                   | -13.00       | 24.51      | peak                    |                           | Tx      |
| 2   |     | 2787.400     | -50.58                  | 5.89                    | -44.69                  | -13.00       | -31.69     | peak                    |                           |         |

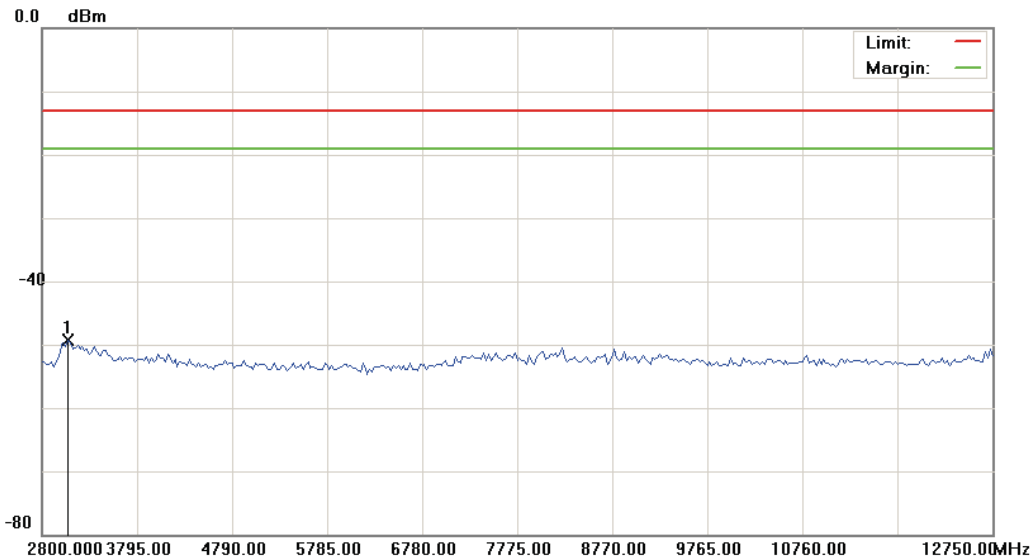
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#5

Date: 2015/8/14

Time: 下午 04:39:58



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz      | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 3073.625 | -54.69        | 5.40           | -49.29      | -13.00 | -36.29 | peak           |              | Comment |

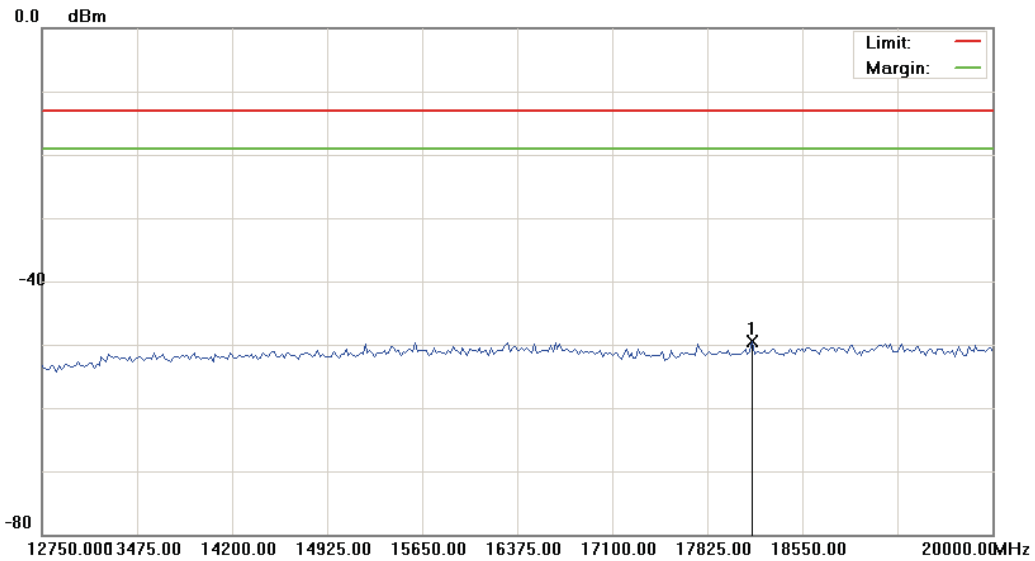
\*:Maximum data x:Over limit !:over margin

File :AC810-300(CH1513)

Data :#6

Date: 2015/8/14

Time: 下午 04:40:18



Site: site #1

Limit: FCC Part 27 conducted(9k-26.5G)

EUT: Mobile Hotspot

M/N: AC810S-300

Mode: WCDMA Band IV

Note:

Polarization: Conducted Power

Power: DC 3.8V

Distance:

Temperature: 26 °C

Humidity: 55 %

RBW: 1000 KHz VBW: 3000 KHz

| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Antenna Height | Table Degree |         |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
|     |     | MHz       | dBm           | dB             | dBm         | dBm    | dB     | Detector       | cm           | degree  |
| 1   | *   | 18169.375 | -56.46        | 6.92           | -49.54      | -13.00 | -36.54 | peak           |              | Comment |

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

## 8 Field Strength of Spurious Radiation Test

### 8.1. 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 10th harmonic.

### 8.2. Test Instruments

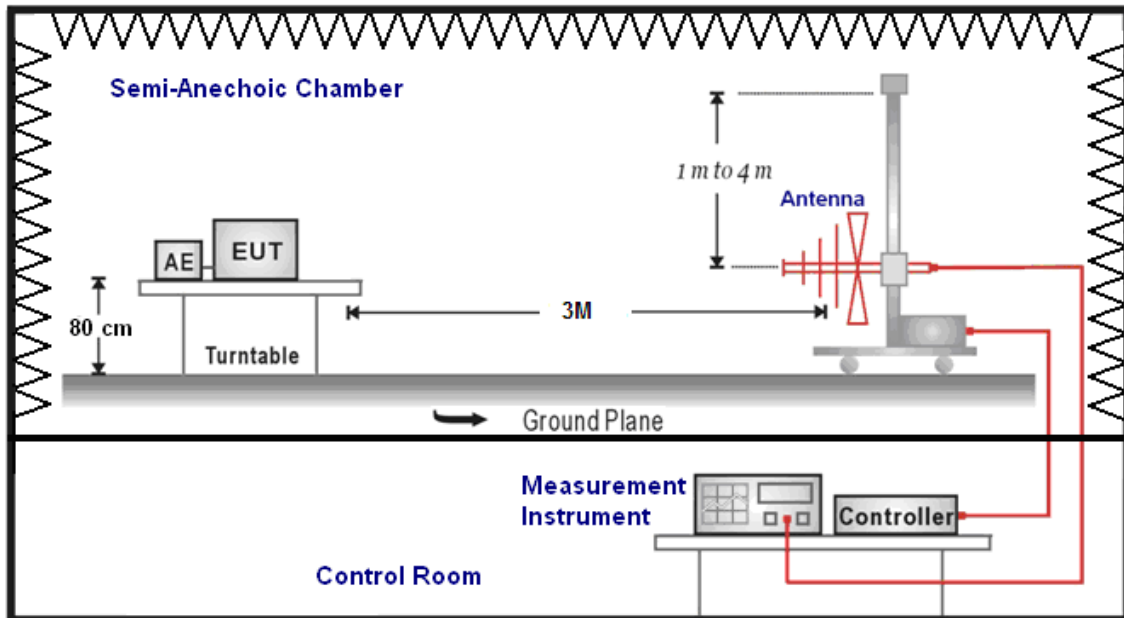
| 3 Meter Chamber                   |                                |           |            |            |        |
|-----------------------------------|--------------------------------|-----------|------------|------------|--------|
| Equipment                         | Manufacturer                   | Model No. | Serial No. | Cal. Date  | Remark |
| RF Pre-selector                   | Agilent                        | N9039A    | MY46520256 | 01/06/2015 | (1)    |
| Spectrum Analyzer                 | Agilent                        | E4446A    | MY46180578 | 01/06/2015 | (1)    |
| Pre Amplifier                     | Agilent                        | 8449B     | 3008A02237 | 02/24/2015 | (1)    |
| Pre Amplifier                     | Agilent                        | 8447D     | 2944A10961 | 02/24/2015 | (1)    |
| Broadband Antenna<br>(30MHz~1GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163  | 9163-270   | 08/11/2015 | (1)    |
| Horn Antenna<br>(1~18GHz)         | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D | 9120D-550  | 06/12/2015 | (1)    |
| Horn Antenna<br>(18~40GHz)        | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170  | 9170-320   | 07/06/2015 | (1)    |
| Test Site                         | ATL                            | TE01      | 888001     | 08/27/2015 | (1)    |

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

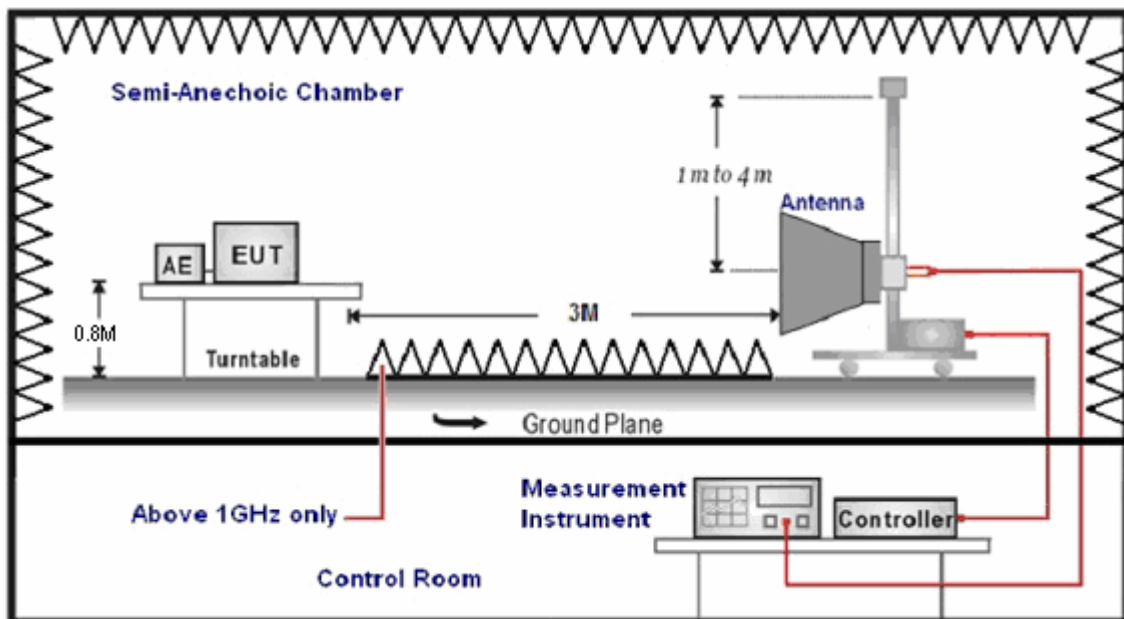
Note: N.C.R. = No Calibration Request.

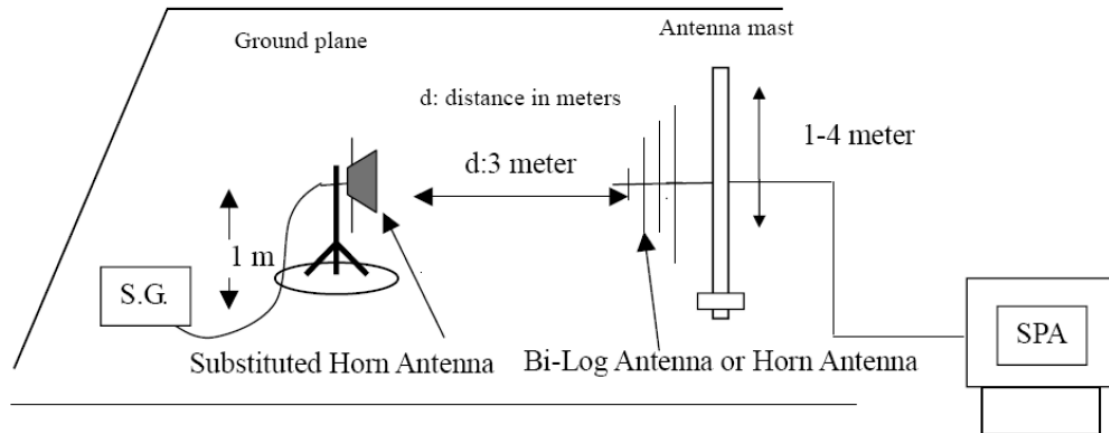
### 8.3. Setup

Below 1GHz



Above 1GHz





#### 8.4. Test Procedure

- The EUT was set up for the maximum power with LTE link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 1MHz for LTE and 5MHz for WCDMA mode.
- Radiation Emission measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G. to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- $E.I.R.P. = \text{Output power level of S.G.} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- $E.R.P. = E.I.R.P. - 2.15 \text{ dB}$

#### 8.5. Uncertainty

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

## 8.6. Test Result

|               |                   |                      |              |
|---------------|-------------------|----------------------|--------------|
| Standard:     | FCC Part 27       | Test Distance:       | 3m           |
| Test item:    | Radiated Emission | Power:               | AC 120V/60Hz |
| Model Number: | AC810S-300        | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | 1                 | Date:                | 08/29/2015   |
| Frequency:    | 1712.4 MHz        | Test By:             | Eric Ou Yang |

| Frequency<br>(MHz) | Reading<br>(dBm) | Correct Factor<br>(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|--------------------|------------------|------------------------|-----------------|----------------|----------------|--------|---------------------|
| 8044.000           | -77.14           | 27.33                  | -49.81          | -13.00         | -36.81         | peak   | H                   |
| 7468.000           | -75.93           | 26.90                  | -49.03          | -13.00         | -36.03         | peak   | V                   |

|               |                   |                      |              |
|---------------|-------------------|----------------------|--------------|
| Standard:     | FCC Part 27       | Test Distance:       | 3m           |
| Test item:    | Radiated Emission | Power:               | AC 120V/60Hz |
| Model Number: | AC810S-300        | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | 1                 | Date:                | 08/29/2015   |
| Frequency:    | 1732.6 MHz        | Test By:             | Eric Ou Yang |

| Frequency<br>(MHz) | Reading<br>(dBm) | Correct Factor<br>(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|--------------------|------------------|------------------------|-----------------|----------------|----------------|--------|---------------------|
| 7636.000           | -76.39           | 27.11                  | -49.28          | -13.00         | -36.28         | peak   | H                   |
| 7360.000           | -74.28           | 26.57                  | -47.71          | -13.00         | -34.71         | peak   | V                   |

|               |                   |                      |              |
|---------------|-------------------|----------------------|--------------|
| Standard:     | FCC Part 27       | Test Distance:       | 3m           |
| Test item:    | Radiated Emission | Power:               | AC 120V/60Hz |
| Model Number: | AC810S-300        | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | 1                 | Date:                | 08/29/2015   |
| Frequency:    | 1752.6 MHz        | Test By:             | Eric Ou Yang |

| Frequency<br>(MHz) | Reading<br>(dBm) | Correct Factor<br>(dB) | Result<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
|--------------------|------------------|------------------------|-----------------|----------------|----------------|--------|---------------------|
| 7684.000           | -75.53           | 27.15                  | -48.38          | -13.00         | -35.38         | peak   | H                   |
| 6580.000           | -75.49           | 24.67                  | -50.82          | -13.00         | -37.82         | peak   | V                   |

## 9 Frequency Stability (Temperature & Voltage Variation) Test

### 9.1. 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.

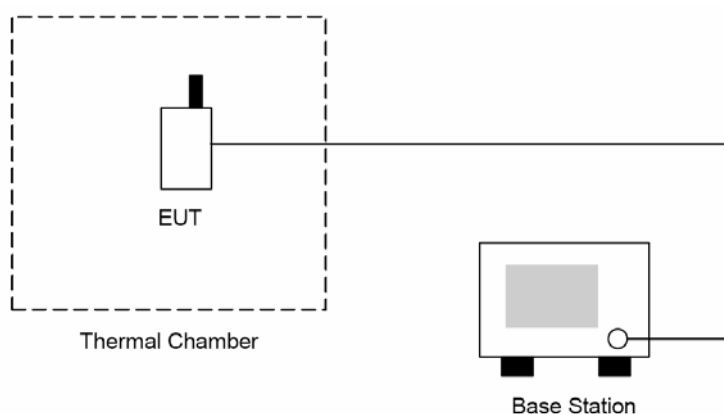
### 9.2. Test Instruments

| Equipment                            | Manufacturer | Model No. | Serial No. | Cal. Date  | Remark |
|--------------------------------------|--------------|-----------|------------|------------|--------|
| Universal Radio Communication Tester | R & S        | CMU200    | 109369     | 10/21/2014 | (2)    |
| Temperature & Humidity Chamber       | TAICHY       | MHU-225LA | 980729     | 04/27/2015 | (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.

### 9.3. Setup



### 9.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

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 note 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 EUT was placed in a temperature chamber at  $25 \pm 5^{\circ}\text{C}$  and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

## 9.5. Uncertainty

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

## 9.6. Test Result

| Model Number          | AC810S-300                                            |                  |                |                 |             |        |
|-----------------------|-------------------------------------------------------|------------------|----------------|-----------------|-------------|--------|
| Test Item             | Frequency Stability (Temperature & Voltage Variation) |                  |                |                 |             |        |
| Test Mode             | Mode 1                                                |                  |                |                 |             |        |
| Date of Test          | 10/02/2015                                            |                  |                |                 | Test Site   | TE05   |
| Level                 | Voltage [Vdc]                                         | Temperature (°C) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Result |
| Normal                | 3.80                                                  | -30              | -1.42          | -0.001          | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | -20              | 4.55           | 0.003           | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | -10              | -7.28          | -0.004          | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 0                | -5.4           | -0.003          | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 10               | -1.27          | -0.001          | $\pm 2.5$   | Pass   |
| Battery full point    | 4.35                                                  | 20               | 8.55           | 0.005           | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 20               | -2.51          | -0.001          | $\pm 2.5$   | Pass   |
| Battery cut-off point | 3.50                                                  | 20               | 7.65           | 0.004           | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 30               | 1.43           | 0.001           | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 40               | -2.38          | -0.001          | $\pm 2.5$   | Pass   |
| Normal                | 3.80                                                  | 50               | -7.69          | -0.004          | $\pm 2.5$   | Pass   |