

# FCC Test Report

APPLICANT : Option nv  
EQUIPMENT : GTM679W  
BRAND NAME : Option  
MODEL NAME : MO6792  
MARKETING NAME : GTM679W  
FCC ID : NCMOMO6792  
STANDARD : FCC 47 CFR FCC Part 15 Subpart B  
CLASSIFICATION : Certification

The product was received on Jan. 02, 2013 and completely tested on Jan. 16, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



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Jones Tsai / Manager



## SPORTON INTERNATIONAL INC.

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SPORTON INTERNATIONAL INC.

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FCC ID : NCMOMO6792

Page Number : 1 of 21

Report Issued Date : Feb. 21, 2013

Report Version : Rev. 01

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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FC310215   | Rev. 01 | Initial issue of report | Feb. 21, 2013 |
|            |         |                         |               |
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|            |         |                         |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description           | Limit                                       | Result | Remark                                                     |
|----------------|----------|---------|-----------------------|---------------------------------------------|--------|------------------------------------------------------------|
| 3.1            | 15.107   | 7.2.4   | AC Conducted Emission | < 15.107 limits<br>< RSS-Gen table 2 limits | PASS   | Under limit<br>15.10 dB at<br>0.342 MHz                    |
| 3.2            | 15.109   | 7.2.3.2 | Radiated Emission     | < 15.109 limits<br>< RSS-Gen table 1 limits | PASS   | Under limit<br>1.99 dB at<br>498.800 MHz<br>for Quasi-Peak |

## 1. General Description

### 1.1. Applicant

Option nv

Gaston Geenslaan 14, 3001 Leuven, Belgium

### 1.2. Manufacturer

Option nv

Gaston Geenslaan 14, 3001 Leuven, Belgium

### 1.3. Feature of Equipment Under Test

| Product Feature                 |                                                      |
|---------------------------------|------------------------------------------------------|
| Equipment                       | GTM679W                                              |
| Brand Name                      | Option                                               |
| Model Name                      | MO6792                                               |
| Marketing Name                  | GTM679W                                              |
| FCC ID                          | NCMOMO6792                                           |
| EUT supports Radios application | CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/<br>WLAN 11bgn / GPS |
| HW Version                      | 3.1                                                  |
| SW Version                      | 2.2.10.0                                             |
| EUT Stage                       | Identical Prototype                                  |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4. Product Specification of Equipment Under Test

| Product Specification subjective to this standard |                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tx Frequency</b>                               | GSM850: 824.2 MHz ~ 848.8 MHz<br>GSM1900: 1850.2 MHz ~ 1909.8MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz<br>CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz<br>CDMA2000 BC1: 1815.25 MHz ~ 1908.75 MHz<br>802.11b/g/n: 2412 MHz ~ 2462 MHz                       |
| <b>Rx Frequency Range</b>                         | GSM850: 869.2 MHz ~ 893.8 MHz<br>GSM1900: 1930.2 MHz ~ 1989.8 MHz<br>WCDMA Band V: 871.4 MHz ~ 891.6 MHz<br>WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz<br>CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz<br>CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz<br>802.11b/g/n: 2412 MHz ~ 2462 MHz<br>GPS : 1.57542 GHz |
| <b>Antenna Type</b>                               | WWAN : Dipole Antenna<br>WLAN : Dipole Antenna<br>GPS : Dipole Antenna                                                                                                                                                                                                                          |
| <b>Type of Modulation</b>                         | GSM: GMSK<br>GPRS: GMSK<br>EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK<br>WCDMA: QPSK (Uplink)<br>HSDPA: QPSK (Uplink)<br>HSUPA: QPSK (Uplink)<br>CDMA2000 : QPSK<br>CDMA2000 1xEV-DO : QPSK<br>802.11b : DSSS (DBPSK / DQPSK / CCK)<br>802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)<br>GPS : BPSK  |

## 1.5. Test Site

|                    |                                                                                                                                                                 |           |                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------|
| Test Site          | SPORTON INTERNATIONAL INC.                                                                                                                                      |           |                         |
| Test Site Location | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |           |                         |
| Test Site No.      | Sporton Site No.                                                                                                                                                |           | FCC/IC Registration No. |
|                    | CO05-HY                                                                                                                                                         | 03CH06-HY | 722060/4086B-1          |

## 1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR FCC Part 15 Subpart B
- ♦ ANSI C63.4-2003

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 2. Test Configuration of Equipment Under Test

### 2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction (150 KHz to 30 MHz), radiation (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

| Item | EUT Configuration                 | Test Condition                      |                                     |
|------|-----------------------------------|-------------------------------------|-------------------------------------|
|      |                                   | EMI AC                              | EMI RE                              |
| 1.   | Charging Mode (EUT with notebook) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

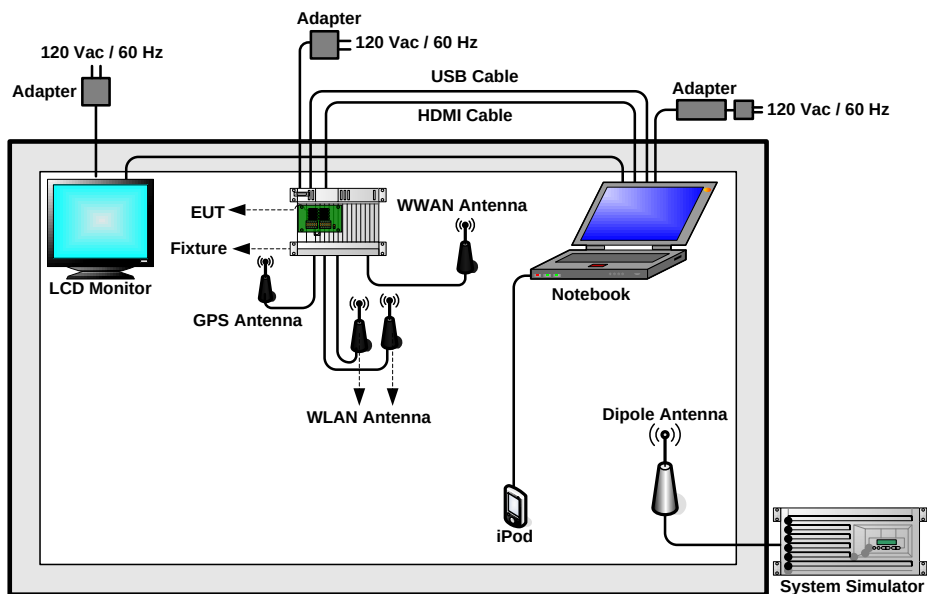
**Abbreviations:**

- EMI AC: AC conducted emissions
- EMI RE : EUT radiated emissions

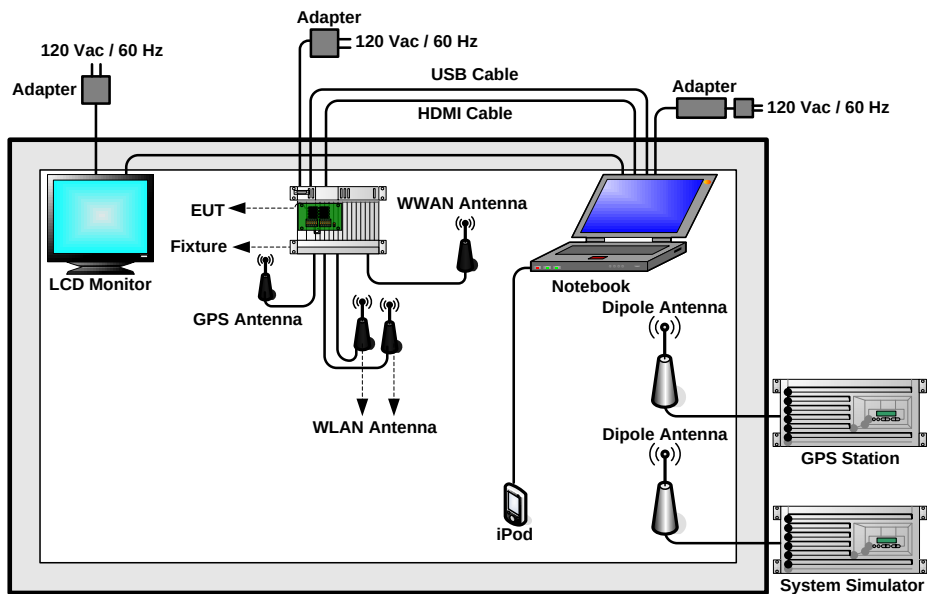


| Test Items                                                                                                                                                                                                                                                                                                 | EUT Configure Mode | Function Type                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC Conducted Emission                                                                                                                                                                                                                                                                                      | 1                  | <p>Mode 1 : GSM850 Idle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 1&gt;</p> <p>Mode 2 : WCDMA Band V dle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 1&gt;</p> <p>Mode 3 : CDMA2000 BC0 Idle + WLAN Idle + GPS Rx + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 2&gt;</p> |
| Radiated Emissions < 1GHz                                                                                                                                                                                                                                                                                  | 1                  | <p>Mode 1 : GSM850 Idle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 1&gt;</p> <p>Mode 2 : WCDMA Band V dle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 1&gt;</p> <p>Mode 3 : CDMA2000 BC0 Idle + WLAN Idle + GPS Rx + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 2&gt;</p> |
| Radiated Emissions ≥ 1GHz                                                                                                                                                                                                                                                                                  | 1                  | <p>Mode 1 : CDMA2000 BC0 Idle + WLAN Idle + GPS Rx + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter &lt;Fig. 2&gt;</p>                                                                                                                                                                                                                                                                                                      |
| <b>Remark:</b> <ol style="list-style-type: none"> <li>1. The worst case of AC is mode 2; only the test data of this mode was reported.</li> <li>2. The worst case of RE &lt; 1G is mode 3; only the test data of this mode was reported.</li> <li>3. Power supply: from Notebook via USB Cable.</li> </ol> |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 2.2. Connection Diagram of Test System



<Fig. 1>



<Fig. 2>

### 2.3. Support Unit used in test configuration and system

| Item | Equipment        | Trade Name   | Model Name     | FCC ID  | Data Cable      | Power Cord                                                 |
|------|------------------|--------------|----------------|---------|-----------------|------------------------------------------------------------|
| 1.   | System Simulator | R&S          | CMU 200        | N/A     | N/A             | Unshielded, 1.8 m                                          |
| 2.   | GPS Station      | T&E          | GS-50          | N/A     | N/A             | Unshielded, 1.8 m                                          |
| 3.   | GPS Station      | Pendulum     | GSG-54         | N/A     | N/A             | Unshielded, 1.8 m                                          |
| 4.   | Notebook         | Lenovo       | 0769           | FCC DoC | N/A             | AC I/P:<br>Unshielded, 1.2 m<br>DC O/P:<br>Shielded, 1.8 m |
| 5.   | LCD Monitor      | Lenovo       | 6135-AB1       | FCC DoC | Shielded, 1.6 m | Unshielded, 1.8 m                                          |
| 6.   | iPod             | Apple        | A1285          | FCC DoC | Shielded, 1.0 m | N/A                                                        |
| 7.   | SD Card          | SanDisk      | MicroSD HC     | FCC DoC | N/A             | N/A                                                        |
| 8.   | Adapter          | Phihong      | PSA15R-050P    | N/A     | N/A             | Unshielded, 0.7m                                           |
| 9.   | WWAN Antenna     | TELSA        | T01111975      | N/A     | N/A             | N/A                                                        |
| 10.  | WLAN Antenna     | Conceptronic | C04-260        | N/A     | N/A             | N/A                                                        |
| 11.  | GPS Antenna      | Galtronics   | 020806127-2063 | N/A     | N/A             | N/A                                                        |

### 2.4. Test Software

The EUT was in GSM or WCDMA or CDMA2000 idle mode during the testing. The EUT was synchronized to the BCCH, and was in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the notebook via WLAN function, and the notebook executes "Mini GPS" to make the EUT receive continuous signals from GPS station.

### 3. Test Result

#### 3.1. Test of AC Conducted Emission Measurement

##### 3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission<br>(MHz) | Conducted limit (dBuV) |           |
|--------------------------------|------------------------|-----------|
|                                | Quasi-peak             | Average   |
| 0.15-0.5                       | 66 to 56*              | 56 to 46* |
| 0.5-5                          | 56                     | 46        |
| 5-30                           | 60                     | 50        |

\*Decreases with the logarithm of the frequency.

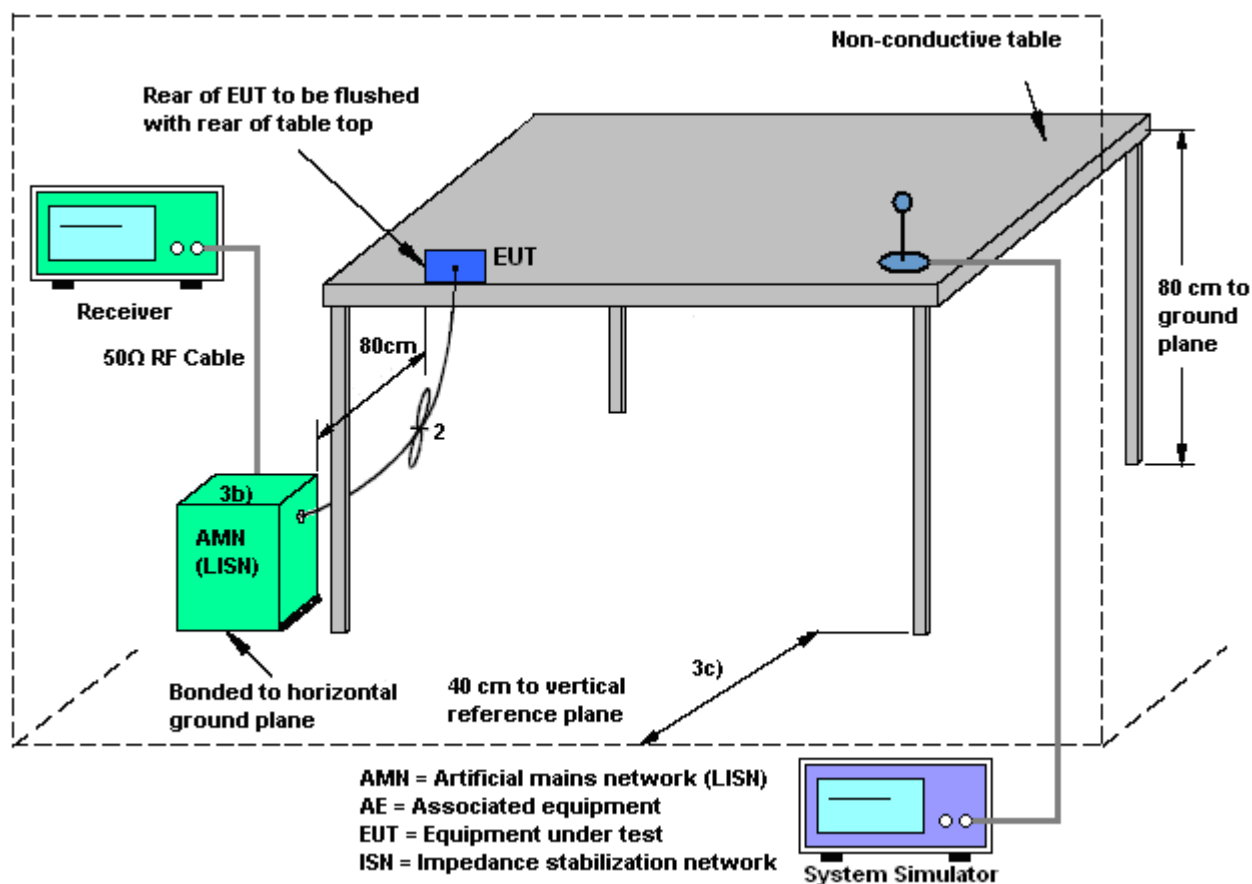
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedure

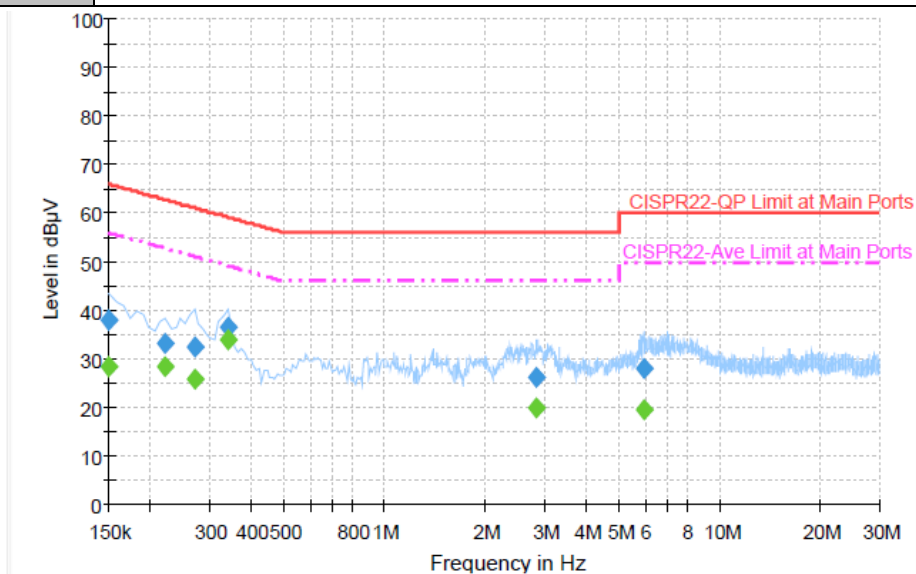
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 KHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 3.1.4 Test Setup



### 3.1.5 Test Result of AC Conducted Emission

|                        |                                                                                                                       |                            |        |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------|--------|
| <b>Test Mode :</b>     | Mode 2                                                                                                                | <b>Temperature :</b>       | 20~22℃ |
| <b>Test Engineer :</b> | Slash Huang                                                                                                           | <b>Relative Humidity :</b> | 45~47% |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                                                         | <b>Phase :</b>             | Line   |
| <b>Function Type :</b> | WCDMA Band V dle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter |                            |        |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.                                       |                            |        |



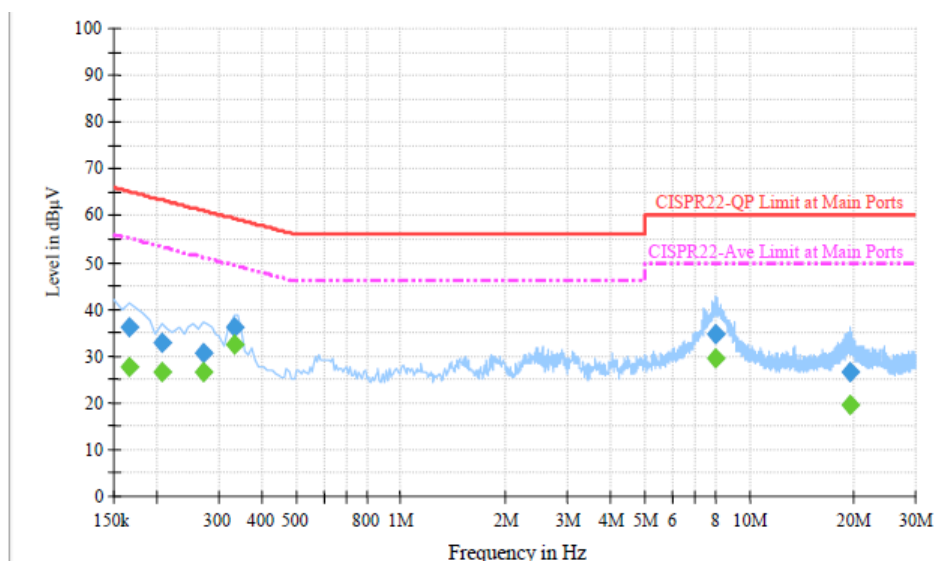
#### Final Result : Quasi-Peak

| Frequency (MHz) | Quasi-Peak (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-------------------|--------|------|------------|-------------|--------------|
| 0.150000        | 37.9              | Off    | L1   | 19.4       | 28.1        | 66.0         |
| 0.222000        | 33.2              | Off    | L1   | 19.3       | 29.5        | 62.7         |
| 0.270000        | 32.5              | Off    | L1   | 19.3       | 28.6        | 61.1         |
| 0.342000        | 36.6              | Off    | L1   | 19.3       | 22.6        | 59.2         |
| 2.838000        | 26.1              | Off    | L1   | 19.6       | 29.9        | 56.0         |
| 5.958000        | 28.1              | Off    | L1   | 19.6       | 31.9        | 60.0         |

#### Final Result : Average

| Frequency (MHz) | Average (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.150000        | 28.3           | Off    | L1   | 19.4       | 27.7        | 56.0         |
| 0.222000        | 28.6           | Off    | L1   | 19.3       | 24.1        | 52.7         |
| 0.270000        | 25.7           | Off    | L1   | 19.3       | 25.4        | 51.1         |
| 0.342000        | 34.1           | Off    | L1   | 19.3       | 15.1        | 49.2         |
| 2.838000        | 19.8           | Off    | L1   | 19.6       | 26.2        | 46.0         |
| 5.958000        | 19.6           | Off    | L1   | 19.6       | 30.4        | 50.0         |

|                        |                                                                                                                       |                            |         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------|---------|
| <b>Test Mode :</b>     | Mode 2                                                                                                                | <b>Temperature :</b>       | 20~22°C |
| <b>Test Engineer :</b> | Slash Huang                                                                                                           | <b>Relative Humidity :</b> | 45~47%  |
| <b>Test Voltage :</b>  | 120Vac / 60Hz                                                                                                         | <b>Phase :</b>             | Neutral |
| <b>Function Type :</b> | WCDMA Band V dle + WLAN Idle + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter |                            |         |
| <b>Remark :</b>        | All emissions not reported here are more than 10 dB below the prescribed limit.                                       |                            |         |


**Final Result : Quasi-Peak**

| Frequency (MHz) | Quasi-Peak (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-------------------|--------|------|------------|-------------|--------------|
| 0.166000        | 36.3              | Off    | N    | 19.4       | 28.9        | 65.2         |
| 0.206000        | 32.8              | Off    | N    | 19.3       | 30.6        | 63.4         |
| 0.270000        | 30.6              | Off    | N    | 19.4       | 30.5        | 61.1         |
| 0.334000        | 36.0              | Off    | N    | 19.3       | 23.4        | 59.4         |
| 7.974000        | 34.8              | Off    | N    | 19.7       | 25.2        | 60.0         |
| 19.382000       | 26.6              | Off    | N    | 19.8       | 33.4        | 60.0         |

**Final Result : Average**

| Frequency (MHz) | Average (dBμV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.166000        | 27.6           | Off    | N    | 19.4       | 27.6        | 55.2         |
| 0.206000        | 26.5           | Off    | N    | 19.3       | 26.9        | 53.4         |
| 0.270000        | 26.6           | Off    | N    | 19.4       | 24.5        | 51.1         |
| 0.334000        | 32.5           | Off    | N    | 19.3       | 16.9        | 49.4         |
| 7.974000        | 29.4           | Off    | N    | 19.7       | 20.6        | 50.0         |
| 19.382000       | 19.7           | Off    | N    | 19.8       | 30.3        | 50.0         |

## 3.2. Test of Radiated Emission Measurement

### 3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 30 – 88            | 100                                  | 3                                |
| 88 – 216           | 150                                  | 3                                |
| 216 - 960          | 200                                  | 3                                |
| Above 960          | 500                                  | 3                                |

### 3.2.2. Measuring Instruments

See list of measuring instruments of this test report.

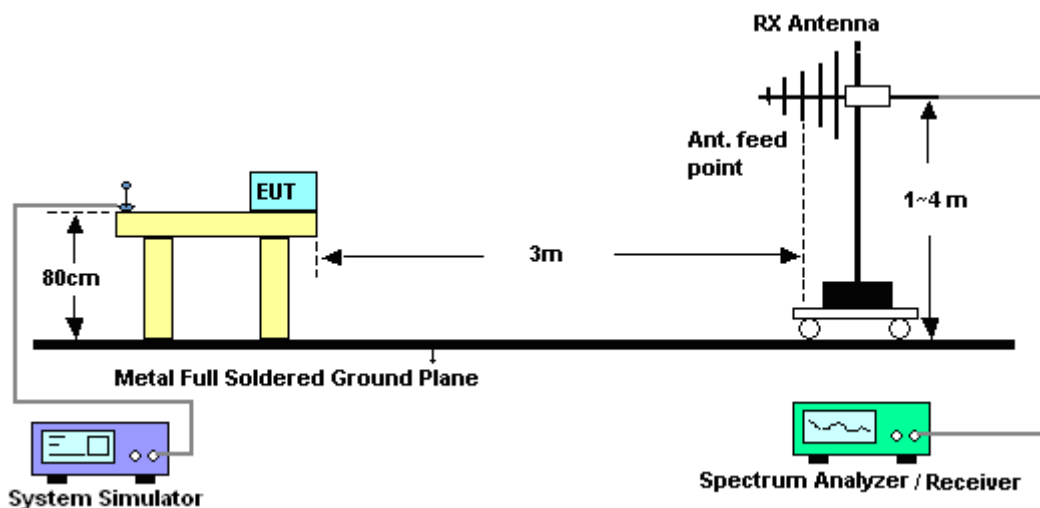
### 3.2.3. Test Procedures

1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBuV/m) = 20 log Emission level (uV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

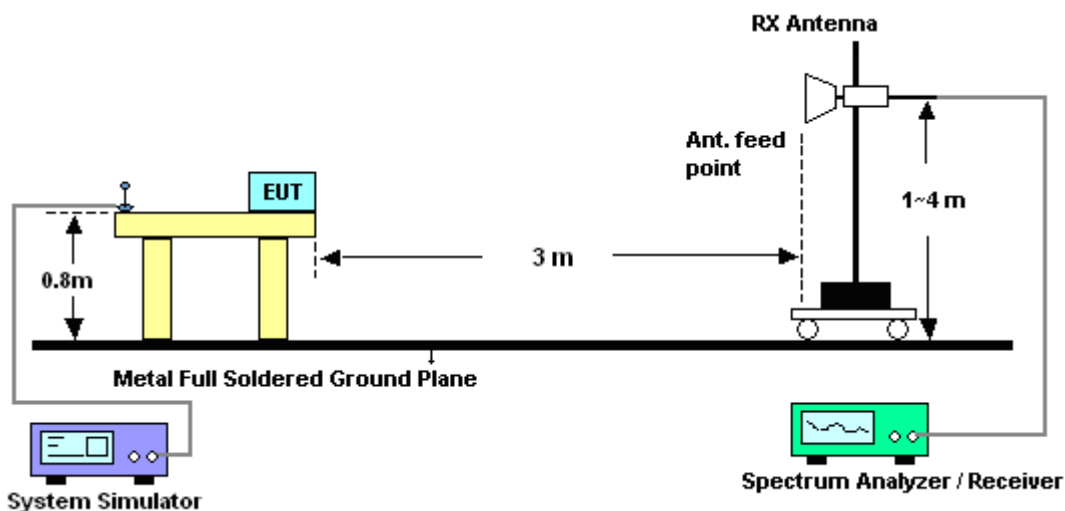


### 3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

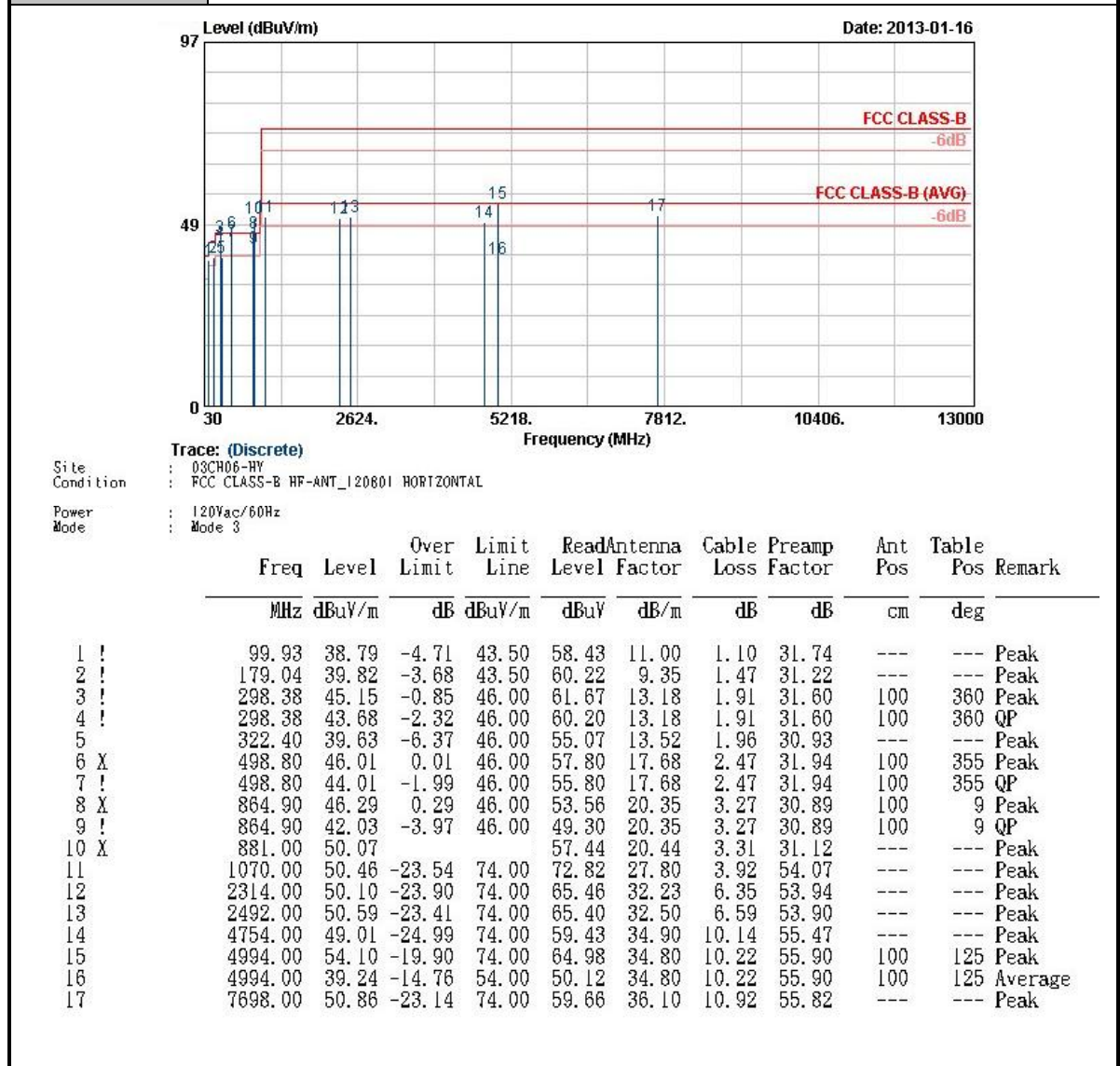


For radiated emissions above 1GHz

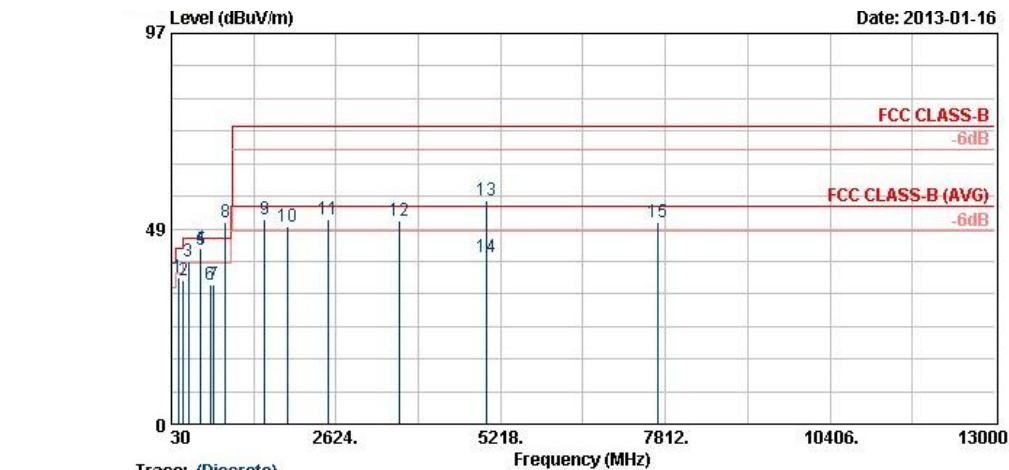


**3.2.5. Test Result of Radiated Emission**

|                        |                                                                                                                                 |                            |            |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|
| <b>Test Mode :</b>     | Mode 3                                                                                                                          | <b>Temperature :</b>       | 22~23°C    |
| <b>Test Engineer :</b> | Timberland Lin                                                                                                                  | <b>Relative Humidity :</b> | 43~44%     |
| <b>Test Distance :</b> | 3m                                                                                                                              | <b>Polarization :</b>      | Horizontal |
| <b>Function Type :</b> | CDMA2000 BC0 Idle + WLAN Idle + GPS Rx + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter |                            |            |
| <b>Remark :</b>        | #10 is system simulator signal which can be ignored.                                                                            |                            |            |



|                        |                                                                                                                                 |                            |          |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|
| <b>Test Mode :</b>     | Mode 3                                                                                                                          | <b>Temperature :</b>       | 22~23°C  |
| <b>Test Engineer :</b> | Timberland Lin                                                                                                                  | <b>Relative Humidity :</b> | 43~44%   |
| <b>Test Distance :</b> | 3m                                                                                                                              | <b>Polarization :</b>      | Vertical |
| <b>Function Type :</b> | CDMA2000 BC0 Idle + WLAN Idle + GPS Rx + HDMI Cable + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + USB Cable + Adapter |                            |          |
| <b>Remark :</b>        | #8 is system simulator signal which can be ignored.                                                                             |                            |          |



Trace: (Discrete)  
 Site : 03CH06-HY  
 Condition : FCC CLASS-B HF-ANT\_120801 VERTICAL  
 Power : 120Vac/60Hz  
 Mode : Mode 3

|     | Freq    | Level  | Over   | Limit  | Read  | Antenna | Cable | Preamp | Ant | Table | Remark  |
|-----|---------|--------|--------|--------|-------|---------|-------|--------|-----|-------|---------|
|     | MHz     | dBuV/m | dB     | dBuV/m | Level | Factor  | Loss  | Factor | Pos | Pos   |         |
|     |         |        |        |        | dBuV  | dB/m    | dB    | dB     | cm  | deg   |         |
| 1   | 143.94  | 36.35  | -7.15  | 43.50  | 55.67 | 10.63   | 1.32  | 31.27  | --- | ---   | Peak    |
| 2   | 215.49  | 35.88  | -7.62  | 43.50  | 56.31 | 9.10    | 1.60  | 31.13  | --- | ---   | Peak    |
| 3 ! | 298.38  | 40.29  | -5.71  | 46.00  | 56.81 | 13.18   | 1.91  | 31.60  | --- | ---   | Peak    |
| 4 ! | 497.40  | 43.56  | -2.44  | 46.00  | 55.31 | 17.67   | 2.46  | 31.89  | 100 | 40    | Peak    |
| 5 ! | 497.40  | 43.45  | -2.55  | 46.00  | 55.20 | 17.67   | 2.46  | 31.89  | 100 | 40    | QP      |
| 6   | 638.80  | 34.72  | -11.28 | 46.00  | 43.96 | 19.20   | 2.79  | 31.23  | --- | ---   | Peak    |
| 7   | 698.30  | 34.53  | -11.47 | 46.00  | 44.71 | 18.90   | 2.89  | 31.97  | --- | ---   | Peak    |
| 8 @ | 881.00  | 50.18  |        |        | 57.56 | 20.44   | 3.31  | 31.12  | --- | ---   | Peak    |
| 9   | 1494.00 | 50.93  | -23.07 | 74.00  | 72.30 | 27.80   | 4.73  | 53.90  | --- | ---   | Peak    |
| 10  | 1864.00 | 49.06  | -24.94 | 74.00  | 66.74 | 30.73   | 5.57  | 53.97  | --- | ---   | Peak    |
| 11  | 2492.00 | 50.98  | -23.02 | 74.00  | 65.79 | 32.50   | 6.59  | 53.90  | --- | ---   | Peak    |
| 12  | 3618.00 | 50.49  | -23.51 | 74.00  | 63.27 | 33.27   | 8.24  | 54.29  | --- | ---   | Peak    |
| 13  | 4994.00 | 55.64  | -18.36 | 74.00  | 66.51 | 34.80   | 10.22 | 55.90  | 100 | 352   | Peak    |
| 14  | 4994.00 | 41.42  | -12.58 | 54.00  | 52.30 | 34.80   | 10.22 | 55.90  | 100 | 352   | Average |
| 15  | 7694.00 | 50.21  | -23.79 | 74.00  | 59.01 | 36.10   | 10.92 | 55.82  | --- | ---   | Peak    |

## 4. List of Measuring Equipment

| Instrument                | Manufacturer    | Model No.                  | Serial No.  | Characteristics | Calibration Date | Test Date                        | Due Date      | Remark                |
|---------------------------|-----------------|----------------------------|-------------|-----------------|------------------|----------------------------------|---------------|-----------------------|
| EMI Test Receiver         | Rohde & Schwarz | ESCS 30                    | 100356      | 9KHz ~ 2.75GHz  | Nov. 13, 2012    | Jan. 09, 2013                    | Nov. 12, 2013 | Conduction (CO05-HY)  |
| Two-LISN                  | Rohde & Schwarz | ENV216                     | 100081      | 9KHz ~ 30MHz    | Dec. 12, 2012    | Jan. 09, 2013                    | Dec. 11, 2013 | Conduction (CO05-HY)  |
| Two-LISN                  | Rohde & Schwarz | ENV216                     | 100080      | 9KHz ~ 30MHz    | Dec. 06, 2012    | Jan. 09, 2013                    | Dec. 05, 2013 | Conduction (CO05-HY)  |
| AC Power Source           | APC             | APC-1000W                  | N/A         | N/A             | N/A              | Jan. 09, 2013                    | N/A           | Conduction (CO05-HY)  |
| GPS Station               | T&E             | GS-50                      | N/A         | N/A             | N/A              | Jan. 09, 2013                    | N/A           | Conduction (CO05-HY)  |
| Spectrum Analyzer         | R&S             | FSP30                      | 101352      | 9KHz~30GHz      | Nov. 07, 2012    | Jan. 16, 2013                    | Nov. 06, 2013 | Radiation (03CH06-HY) |
| Spectrum Analyzer         | Agilent         | E4408B                     | MY44211030  | 9KHz ~ 26.5GHz  | Nov. 26, 2012    | Jan. 16, 2013                    | Nov. 25, 2013 | Radiation (03CH06-HY) |
| EMI Test Receiver         | R&S             | ESVS10                     | 834468/0003 | 20MHz ~ 1000MHz | May 04, 2012     | Jan. 16, 2013                    | May 03, 2013  | Radiation (03CH06-HY) |
| Bilog Antenna             | SCHAFFNER       | CBL6112B                   | 2885        | 30MHz ~ 2GHz    | Oct. 06, 2012    | Jan. 16, 2013                    | Oct. 05, 2013 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | EMCO            | 3117                       | 00066583    | 1GHz ~ 18GHz    | Aug. 01, 2012    | Jan. 16, 2013                    | Jul. 31, 2013 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | COM-POWER       | AH-118                     | 071025      | 1GHz~18GHz      | Aug. 09, 2012    | Jan. 16, 2013                    | Aug. 08, 2013 | Radiation (03CH06-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK     | BBHA 9170                  | BBHA9170251 | 15GHz ~ 40GHz   | Sep. 28, 2012    | Jan. 16, 2013                    | Sep. 27, 2013 | Radiation (03CH06-HY) |
| Preamplifier              | Agilent         | 8449B                      | 3008A01917  | 1GHz ~ 26.5GHz  | Apr. 13, 2012    | Jan. 16, 2013                    | Apr. 12, 2013 | Radiation (03CH06-HY) |
| Amplifier                 | Agilent         | 310N                       | 186713      | 9KHz ~ 1GHz     | Apr. 11, 2012    | Jan. 16, 2013                    | Apr. 10, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier             | EMCI            | EMC051845                  | SN980048    | 1GHz ~ 18GHz    | Jul. 21, 2012    | Jan. 16, 2013                    | Jul. 20, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier             | MITEQ           | AMF-7D-0010<br>1800-30-10P | 159087      | 1GHz~18GHz      | Feb. 27, 2012    | Jan. 16, 2013                    | Feb. 26, 2013 | Radiation (03CH06-HY) |
| GPS Station               | Pendulum        | GSG-54                     | N/A         | N/A             | N/A              | Jan. 16, 2013                    | N/A           | Radiation (03CH06-HY) |
| System Simulator          | R&S             | CMU200                     | 117997      | N/A             | Aug. 22, 2011    | Jan. 09, 2013 ~<br>Jan. 16, 2013 | Aug. 21, 2013 | -                     |

## 5. Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

|                                                                         |      |
|-------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 2.26 |
|-------------------------------------------------------------------------|------|

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                         |      |
|-------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 2.54 |
|-------------------------------------------------------------------------|------|

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

|                                                                         |      |
|-------------------------------------------------------------------------|------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.72 |
|-------------------------------------------------------------------------|------|



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP310215 as below.