# FCC Test Report

| | | |
|---|---|---|
| APPLICANT | : | Intel Corp. |
| EQUIPMENT | : | Android Smart Phone |
| BRAND NAME | : | Intel |
| MODEL NAME | : | AZ210 |
| MARKETING NAME | : | AZ210 |
| FCC ID | | O2Z-AZ210 |
| STANDARD | : | FCC 47 CFR FCC Part 15 Subpart B |
| CLASSIFICATION | : | Certification |

**The product was received on Mar. 23, 2012 and completely tested on May 05, 2012. 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:**

Jones Tsai

**Jones Tsai / Manager**

Testing Laboratory 1190

***SPORTON INTERNATIONAL INC.***
***No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.***

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FC232306 | Rev. 01 | Initial issue of report | Jun. 11, 2012 |
| FC232306 | Rev. 02 | Update report for adding FCC ID | Sep. 03, 2012 |
| FC232306 | Rev. 03 | Update report for revising Classification and adding USB link data | Sep. 06, 2012 |
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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 3.70 dB at 0.870 MHz |
| 3.2 | 15.109 | 7.2.3.2 | Radiated Emission | < 15.109 limits or<br>< RSS-Gen table 1 limits<br>(Section 6) | PASS | Under limit 3.11 dB at 43.230 MHz for peak |

# 1. General Description

## 1.1. Applicant

**Intel Corp.**
RNB-5-112, 2200 Mission College Blvd, Santa Clara, CA 95054, USA

## 1.2. Manufacturer

**Chi Mei Communication Systems, Inc.**
No. 4, Mingsheng Street, Tucheng City, New Taipei City 23678, Taiwan

## 1.3. Feature of Equipment Under Test

| Product Feature & Specification | |
|---|---|
| **Equipment** | Android Smart Phone |
| **Brand Name** | Intel |
| **Model Name** | AZ210 |
| **Marketing Name** | AZ210 |
| **FCC ID** | O2Z-AZ210 |
| **Tx Frequency Range** | GSM850 : 824 MHz ~ 849 MHz<br>GSM1900 : 1850 MHz ~ 1910 MHz<br>WCDMA Band V : 824 MHz ~ 849 MHz<br>WCDMA Band II : 1850 MHz ~ 1910 MHz<br>Bluetooth : 2400 MHz ~ 2483.5 MHz<br>802. 11b/g/n : 2400 MHz ~ 2483.5 MHz<br>802. 11a : 5150 MHz ~ 5250 MHz<br>NFC : 13.56 MHz |
| **Rx Frequency Range** | GSM850 : 869 MHz ~ 894 MHz<br>GSM1900 : 1930 MHz ~ 1990 MHz<br>WCDMA Band V : 869 MHz ~ 894 MHz<br>WCDMA Band II : 1930 MHz ~ 1990 MHz<br>Bluetooth : 2400 MHz ~ 2483.5 MHz<br>802. 11b/g/n : 2400 MHz ~ 2483.5 MHz<br>802. 11a : 5150 MHz ~ 5250 MHz<br>GPS : 1.57542 GHz<br>NFC : 13.56 MHz |
| **Antenna Type** | WWAN: PIFA Antenna<br>WLAN / Bluetooth: PIFA Antenna<br>NFC: FPC Antenna |
| **HW Version** | DV2.0 |
| **SW Version** | 20120409 |
| **Type of Modulation** | GSM: GMSK<br>GPRS: GMSK<br>EDGE: GMSK / 8PSK<br>WCDMA: QPSK (Uplink)<br>HSDPA: QPSK (Uplink)<br>HSUPA: QPSK (Uplink)<br>Bluetooth (1Mbps) : GFSK<br>Bluetooth 2.1 EDR (2Mbps) : $\pi$/4-DQPSK<br>Bluetooth 2.1 EDR (3Mbps) : 8-DPSK<br>802.11b : DSSS (BPSK / QPSK / CCK)<br>802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)<br>GPS : BPSK<br>GPS : ASK |
| **EUT Stage** | Production Unit |

**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. Test Site

| Test Site | SPORTON INTERNATIONAL INC. | | |
|---|---|---|---|
| Test Site Location | No. 52, Hwa Ya 1st 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 |

## 1.5. 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
- IC RSS-Gen Issue 3

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

## 1.6. Ancillary Equipment List

| 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. | Bluetooth Earphone | Sony Ericsson | MW600 | PY70DA2029 | N/A | N/A |
| 5. | WLAN AP | D-Link | DIR-628 | KA2DIR628A2 | N/A | Unshielded, 1.8 m |
| 6. | Earphone | Ergotech | ET-E200 | FCC DoC | Unshielded, 1.8 m | N/A |
| 7. | Notebook | DELL | P20G | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m<br>DC O/P: Shielded, 1.8 m |
| 8. | LCD Monitor | SONY | KDL-22S5700 | N/A | N/A | Unshielded, 1.8 m |
| 9. | iPod | Apple | A1285 | FCC DoC | Shielded, 1.0 m | N/A |

# 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<1G | EMI RE≥1G |
| 1. | Charging Mode (EUT with adapter) | ☒ | ☒ | ☒ |
| 2. | Data application transferred mode (EUT with notebook) | ☒ | ☒ | ☒ |

**Abbreviations:**

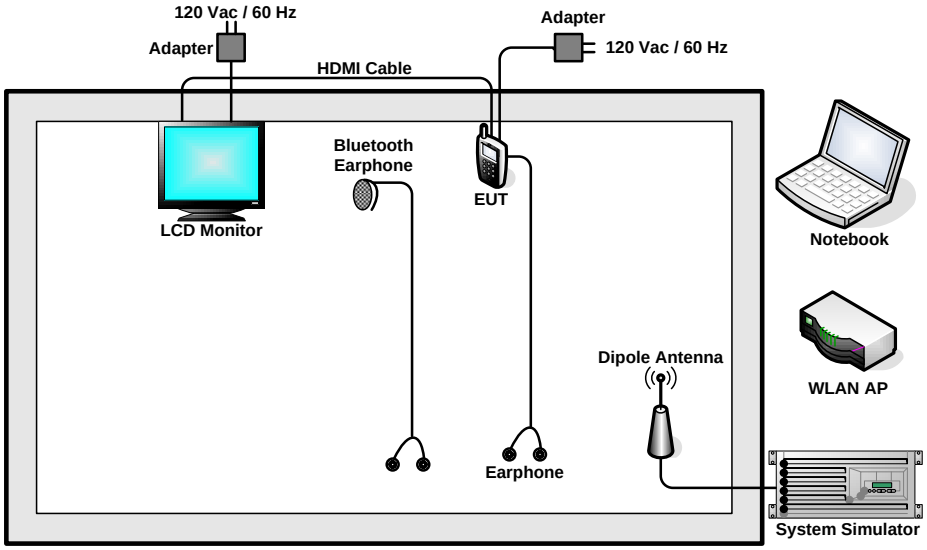
- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

| Test Items | EUT Configure Mode | Function Type |
|---|---|---|
| AC Conducted Emission | 1/2 | Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 1><br>Mode 2: WCDMA Band V Idle + Bluetooth Idle + WLAN (5G) Idle + MPEG4 + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 1><br>Mode 3: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 2><br>Mode 4: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable <Fig. 3> |
| Radiated Emissions < 1GHz | 1/2 | Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 1><br>Mode 2: WCDMA Band V Idle + Bluetooth Idle + WLAN (5G) Idle + MPEG4 + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 1><br>Mode 3: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 2><br>Mode 4: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable <Fig. 3> |
| Radiated Emissions ≥ 1GHz | 1/2 | Mode 1: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 2><br>Mode 2: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable <Fig. 3> |

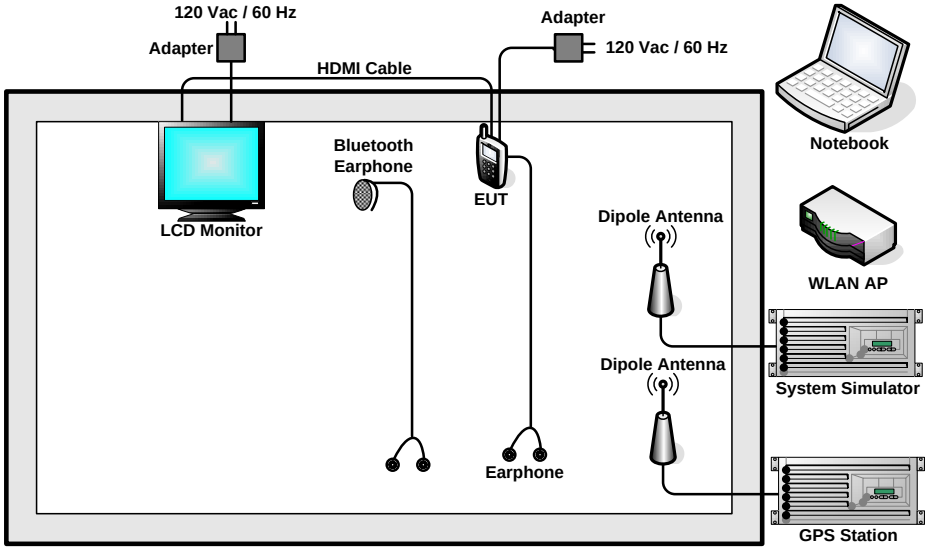
**Remark:**

1. The worst case of AC is mode 1; the test data of this mode was reported.
2. The USB Link mode of AC is mode 4; the test data of this mode was also reported.
3. The worst case of RE < 1G is mode 3; the test data of this mode was reported.
4. The USB Link mode of RE is mode 4; the test data of this mode was reported.
5. Link with Notebook means data application transferred mode between EUT and Notebook.
6. HDMI Cable means media application transferred between EUT and external display.

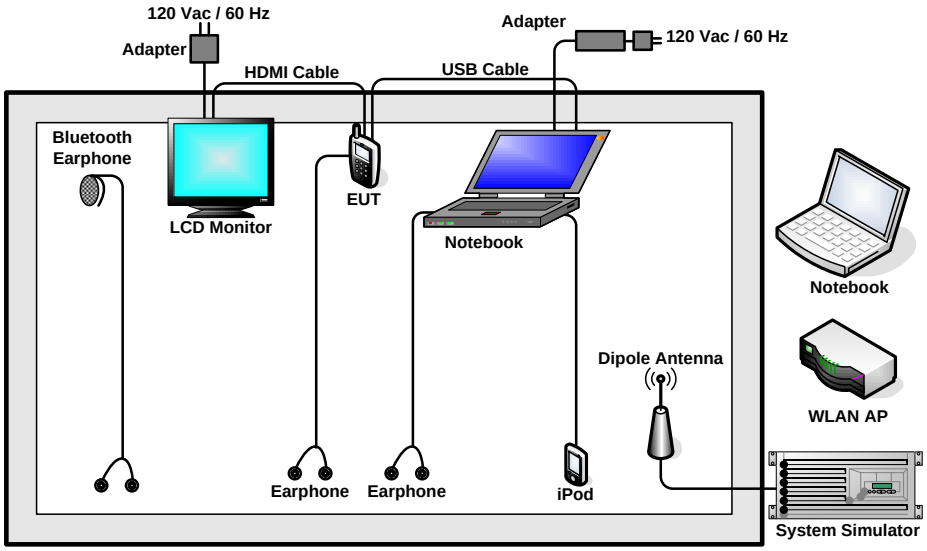
## 2.2. Connection Diagram of Test System




<Fig. 1>




<Fig. 2>




**<Fig. 3>**

## 2.3. Test Software

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

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Execute the programs, "Winthrax", installed in notebook for files transfer with EUT via USB cable.
2. Execute "GPS Test" to make the EUT receive continuous signals from GPS station.
3. Execute "Video Player" to play MPEG4 files.
4. Turn on camera to capture images.
5. The EUT plays files to show on the LCD Monitor via HDMI Cable.
6. Turn on the NFC Function, and the EUT starts to scan continuously the supported NFC tag.

# 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 (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.

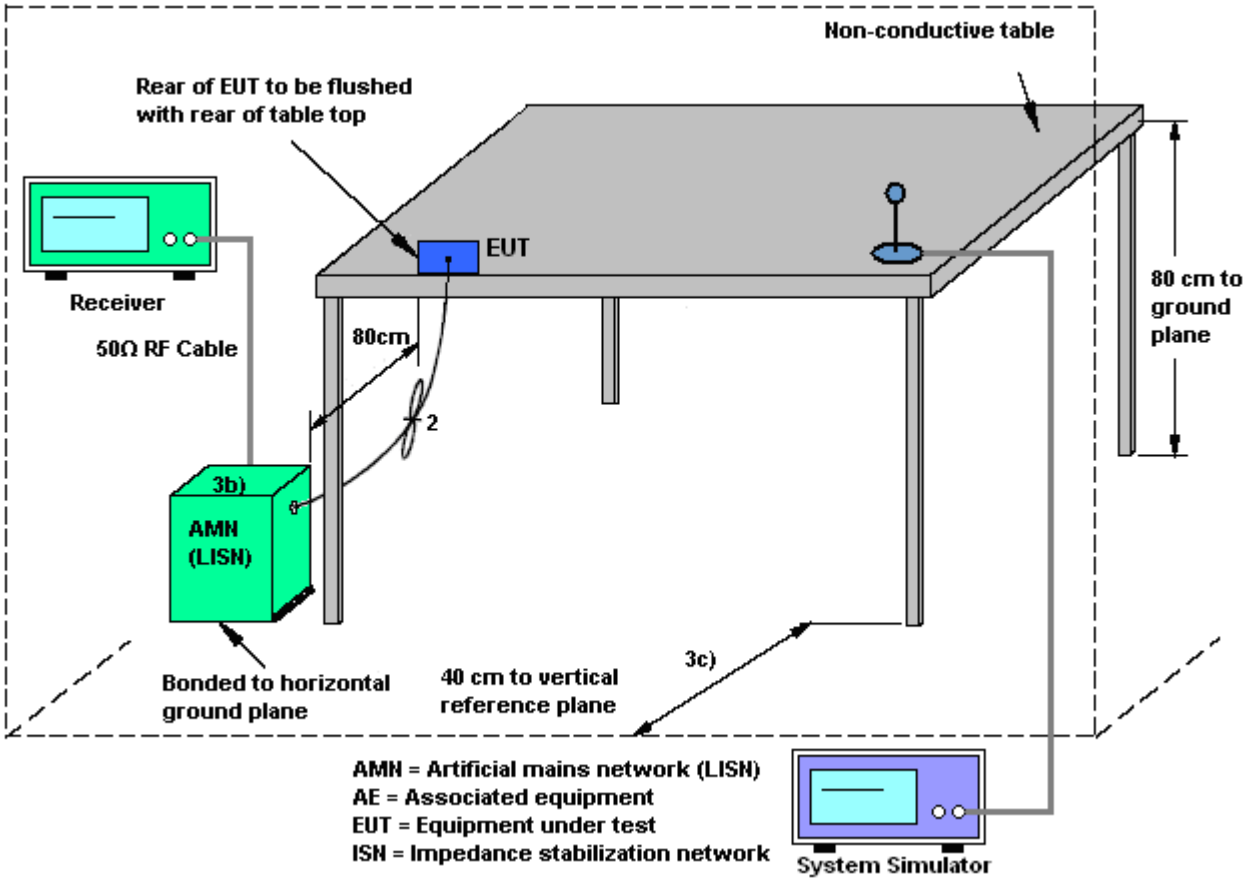
### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.1.3 Test Procedure

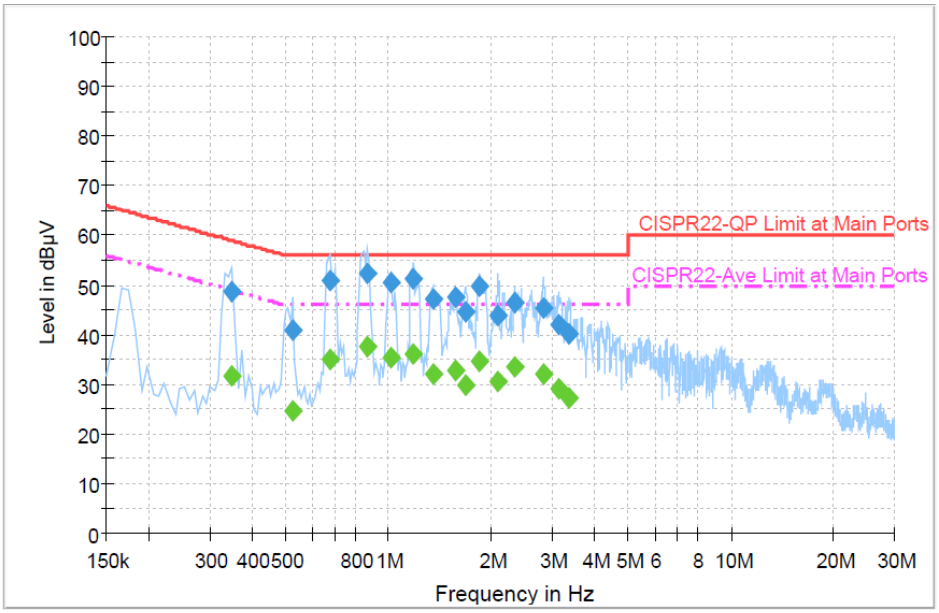
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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

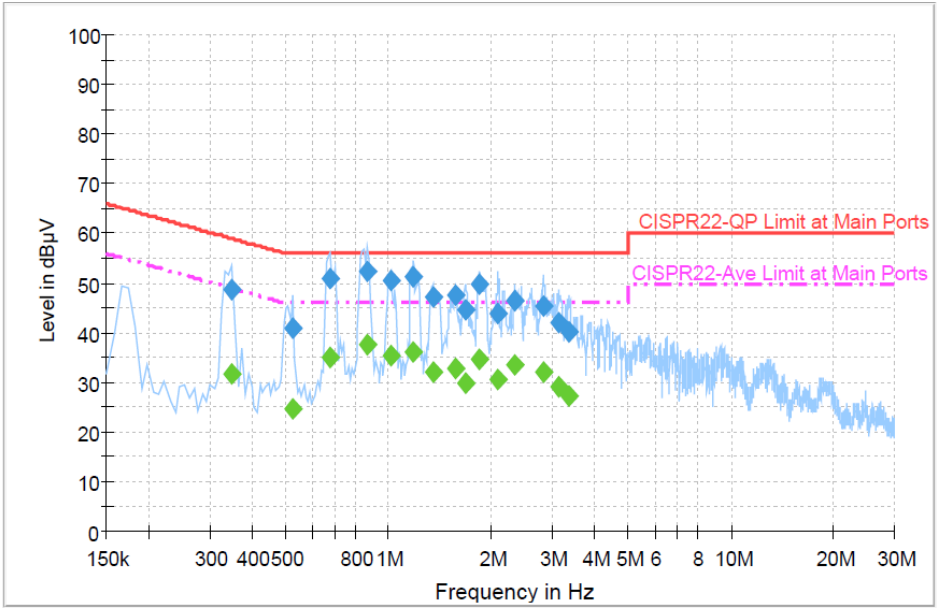
| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit. | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.350000 | 48.8 | Off | L1 | 19.4 | 10.2 | 59.0 |
| 0.526000 | 41.0 | Off | L1 | 19.4 | 15.0 | 56.0 |
| 0.678000 | 50.8 | Off | L1 | 19.4 | 5.2 | 56.0 |
| 0.870000 | 52.3 | Off | L1 | 19.5 | 3.7 | 56.0 |
| 1.014000 | 50.7 | Off | L1 | 19.4 | 5.3 | 56.0 |
| 1.182000 | 51.5 | Off | L1 | 19.4 | 4.5 | 56.0 |
| 1.350000 | 47.2 | Off | L1 | 19.4 | 8.8 | 56.0 |
| 1.574000 | 47.5 | Off | L1 | 19.4 | 8.5 | 56.0 |
| 1.670000 | 44.5 | Off | L1 | 19.4 | 11.5 | 56.0 |
| 1.838000 | 49.7 | Off | L1 | 19.4 | 6.3 | 56.0 |
| 2.086000 | 43.9 | Off | L1 | 19.4 | 12.1 | 56.0 |
| 2.342000 | 46.6 | Off | L1 | 19.5 | 9.4 | 56.0 |
| 2.822000 | 45.3 | Off | L1 | 19.4 | 10.7 | 56.0 |
| 3.142000 | 42.1 | Off | L1 | 19.5 | 13.9 | 56.0 |
| 3.366000 | 40.3 | Off | L1 | 19.5 | 15.7 | 56.0 |

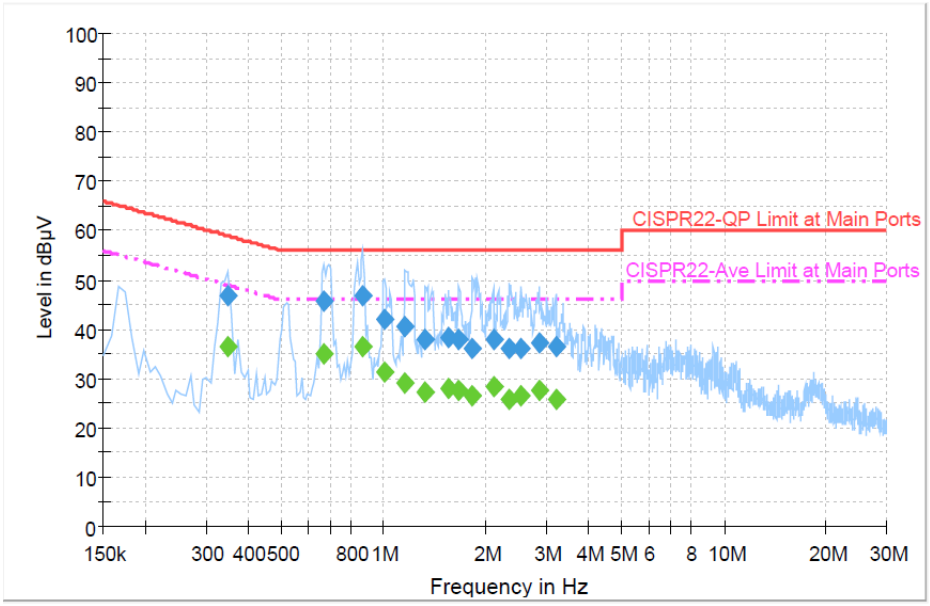
| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit. | | |




**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.350000 | 31.8 | Off | L1 | 19.4 | 17.2 | 49.0 |
| 0.526000 | 24.9 | Off | L1 | 19.4 | 21.1 | 46.0 |
| 0.678000 | 35.0 | Off | L1 | 19.4 | 11.0 | 46.0 |
| 0.870000 | 37.7 | Off | L1 | 19.5 | 8.3 | 46.0 |
| 1.014000 | 35.4 | Off | L1 | 19.4 | 10.6 | 46.0 |
| 1.182000 | 36.3 | Off | L1 | 19.4 | 9.7 | 46.0 |
| 1.350000 | 32.0 | Off | L1 | 19.4 | 14.0 | 46.0 |
| 1.574000 | 32.7 | Off | L1 | 19.4 | 13.3 | 46.0 |
| 1.670000 | 29.8 | Off | L1 | 19.4 | 16.2 | 46.0 |
| 1.838000 | 34.8 | Off | L1 | 19.4 | 11.2 | 46.0 |
| 2.086000 | 30.5 | Off | L1 | 19.4 | 15.5 | 46.0 |
| 2.342000 | 33.7 | Off | L1 | 19.5 | 12.3 | 46.0 |
| 2.822000 | 32.2 | Off | L1 | 19.4 | 13.8 | 46.0 |
| 3.142000 | 29.1 | Off | L1 | 19.5 | 16.9 | 46.0 |
| 3.366000 | 27.4 | Off | L1 | 19.5 | 18.6 | 46.0 |

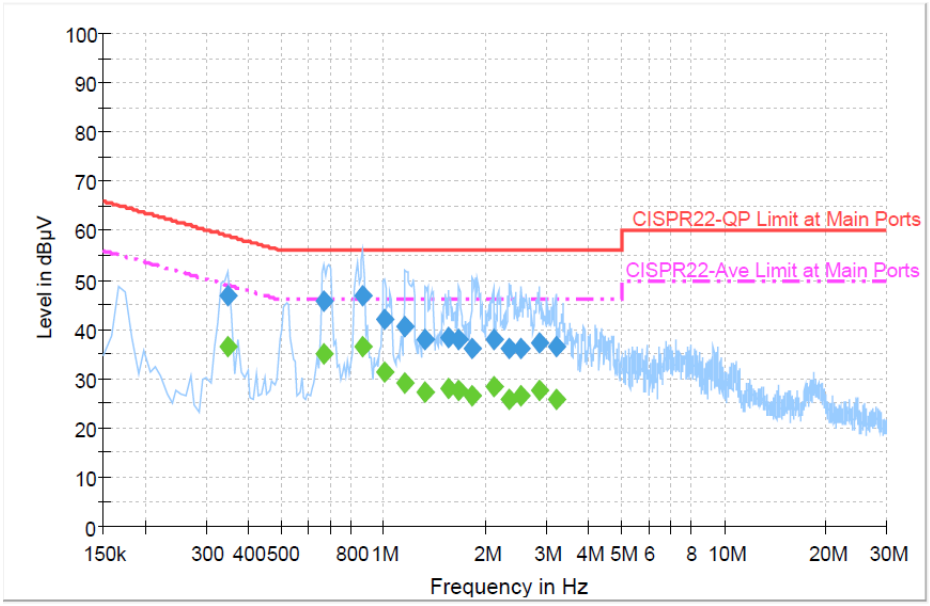
| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit. | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.350000 | 46.8 | Off | N | 19.4 | 12.2 | 59.0 |
| 0.670000 | 45.8 | Off | N | 19.4 | 10.2 | 56.0 |
| 0.870000 | 47.0 | Off | N | 19.5 | 9.0 | 56.0 |
| 1.006000 | 42.2 | Off | N | 19.5 | 13.8 | 56.0 |
| 1.158000 | 40.6 | Off | N | 19.5 | 15.4 | 56.0 |
| 1.326000 | 37.9 | Off | N | 19.5 | 18.1 | 56.0 |
| 1.550000 | 38.5 | Off | N | 19.5 | 17.5 | 56.0 |
| 1.662000 | 38.0 | Off | N | 19.5 | 18.0 | 56.0 |
| 1.822000 | 36.2 | Off | N | 19.5 | 19.8 | 56.0 |
| 2.102000 | 38.2 | Off | N | 19.5 | 17.8 | 56.0 |
| 2.342000 | 36.0 | Off | N | 19.5 | 20.0 | 56.0 |
| 2.542000 | 36.3 | Off | N | 19.5 | 19.7 | 56.0 |
| 2.862000 | 37.3 | Off | N | 19.5 | 18.7 | 56.0 |
| 3.198000 | 36.6 | Off | N | 19.5 | 19.4 | 56.0 |

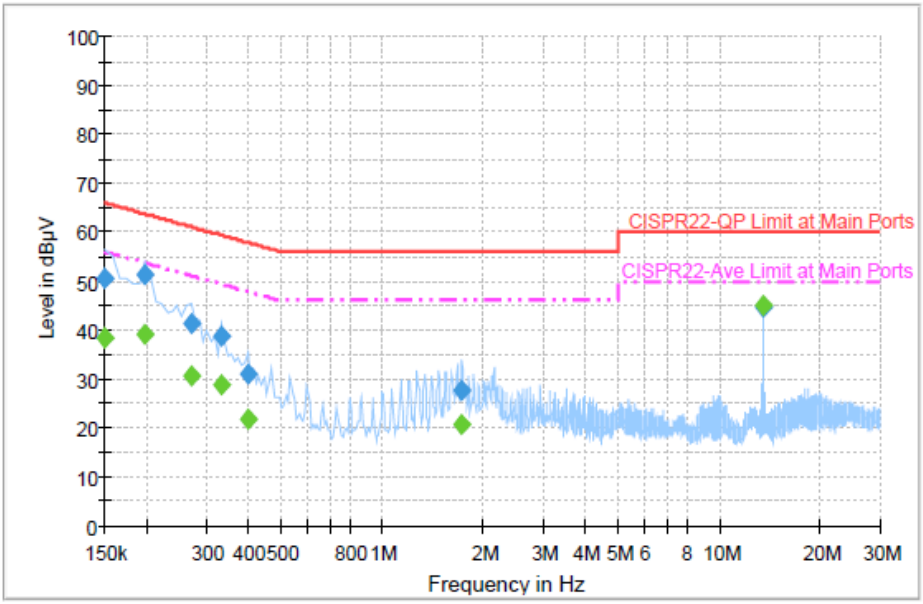
| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + Camera + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit. | | |




**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.350000 | 36.5 | Off | N | 19.4 | 12.5 | 49.0 |
| 0.670000 | 35.1 | Off | N | 19.4 | 10.9 | 46.0 |
| 0.870000 | 36.4 | Off | N | 19.5 | 9.6 | 46.0 |
| 1.006000 | 31.2 | Off | N | 19.5 | 14.8 | 46.0 |
| 1.158000 | 29.2 | Off | N | 19.5 | 16.8 | 46.0 |
| 1.326000 | 27.2 | Off | N | 19.5 | 18.8 | 46.0 |
| 1.550000 | 27.9 | Off | N | 19.5 | 18.1 | 46.0 |
| 1.662000 | 27.7 | Off | N | 19.5 | 18.3 | 46.0 |
| 1.822000 | 26.5 | Off | N | 19.5 | 19.5 | 46.0 |
| 2.102000 | 28.3 | Off | N | 19.5 | 17.7 | 46.0 |
| 2.342000 | 25.8 | Off | N | 19.5 | 20.2 | 46.0 |
| 2.542000 | 26.5 | Off | N | 19.5 | 19.5 | 46.0 |
| 2.862000 | 27.5 | Off | N | 19.5 | 18.5 | 46.0 |
| 3.198000 | 25.8 | Off | N | 19.5 | 20.2 | 46.0 |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 4 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.558 MHz is fundamental signal of RFID/NFC which can be ignored. | | |



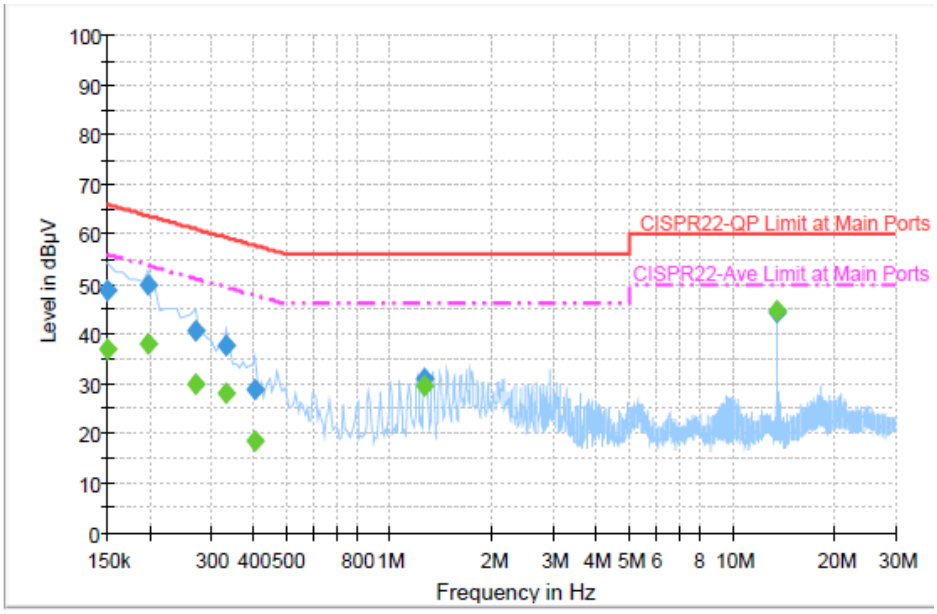

**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 50.7 | Off | L1 | 19.4 | 15.3 | 66.0 |
| 0.198000 | 51.2 | Off | L1 | 19.4 | 12.5 | 63.7 |
| 0.270000 | 41.3 | Off | L1 | 19.4 | 19.8 | 61.1 |
| 0.334000 | 38.7 | Off | L1 | 19.4 | 20.7 | 59.4 |
| 0.398000 | 31.0 | Off | L1 | 19.4 | 26.9 | 57.9 |
| 1.726000 | 27.8 | Off | L1 | 19.4 | 28.2 | 56.0 |
| 13.558000 | 44.8 | Off | L1 | 19.6 | 15.2 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 38.4 | Off | L1 | 19.4 | 17.6 | 56.0 |
| 0.198000 | 39.2 | Off | L1 | 19.4 | 14.5 | 53.7 |
| 0.270000 | 30.4 | Off | L1 | 19.4 | 20.7 | 51.1 |
| 0.334000 | 28.8 | Off | L1 | 19.4 | 20.6 | 49.4 |
| 0.398000 | 21.9 | Off | L1 | 19.4 | 26.0 | 47.9 |
| 1.726000 | 20.6 | Off | L1 | 19.4 | 25.4 | 46.0 |
| 13.558000 | 45.2 | Off | L1 | 19.6 | 4.8 | 50.0 |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 4 | **Temperature :** | 20~22℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 45~47% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable | | |
| **Remark :** | All emissions not reported here are more than 10 dB below the prescribed limit.<br>13.558 MHz is fundamental signal of RFID/NFC which can be ignored. | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 48.6 | Off | N | 19.4 | 17.4 | 66.0 |
| 0.198000 | 49.7 | Off | N | 19.4 | 14.0 | 63.7 |
| 0.270000 | 40.5 | Off | N | 19.4 | 20.6 | 61.1 |
| 0.334000 | 37.7 | Off | N | 19.4 | 21.7 | 59.4 |
| 0.406000 | 28.8 | Off | N | 19.5 | 28.9 | 57.7 |
| 1.270000 | 31.2 | Off | N | 19.5 | 24.8 | 56.0 |
| 13.558000 | 44.3 | Off | N | 19.7 | 15.7 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 37.0 | Off | N | 19.4 | 19.0 | 56.0 |
| 0.198000 | 38.0 | Off | N | 19.4 | 15.7 | 53.7 |
| 0.270000 | 29.9 | Off | N | 19.4 | 21.2 | 51.1 |
| 0.334000 | 28.2 | Off | N | 19.4 | 21.2 | 49.4 |
| 0.406000 | 18.4 | Off | N | 19.5 | 29.3 | 47.7 |
| 1.270000 | 29.6 | Off | N | 19.5 | 16.4 | 46.0 |
| 13.558000 | 44.7 | Off | N | 19.7 | 5.3 | 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 (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 30 – 88 | 100 | 3 |
| 88 – 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

## 3.2.2. Measuring Instruments

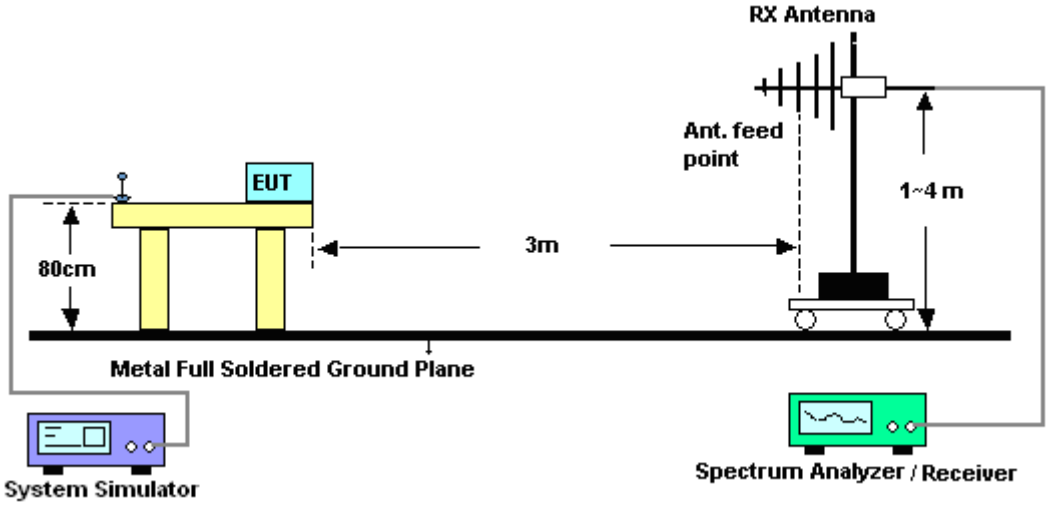
See list of measuring instruments of this test report.

### 3.2.3. Test Procedures

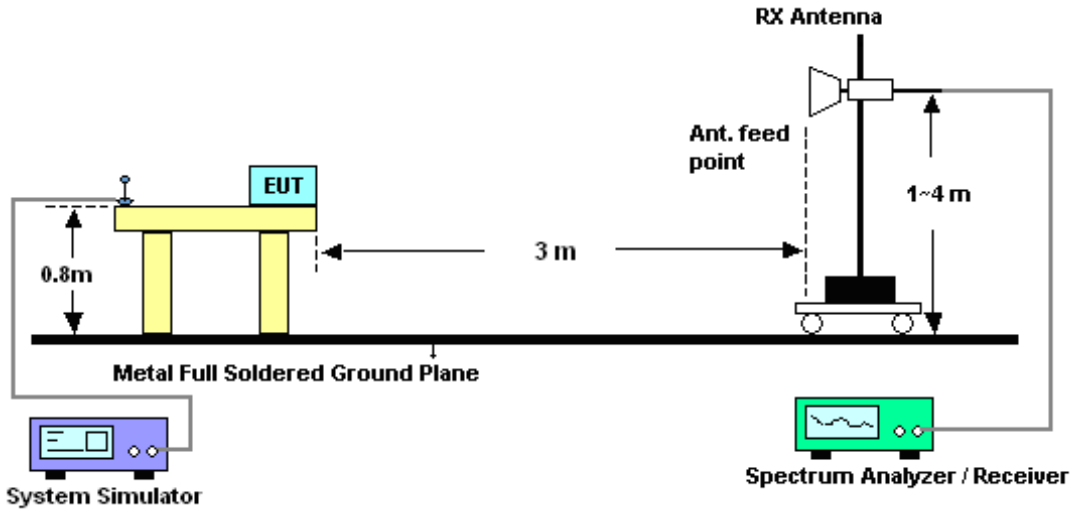
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one meter and 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, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one 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**

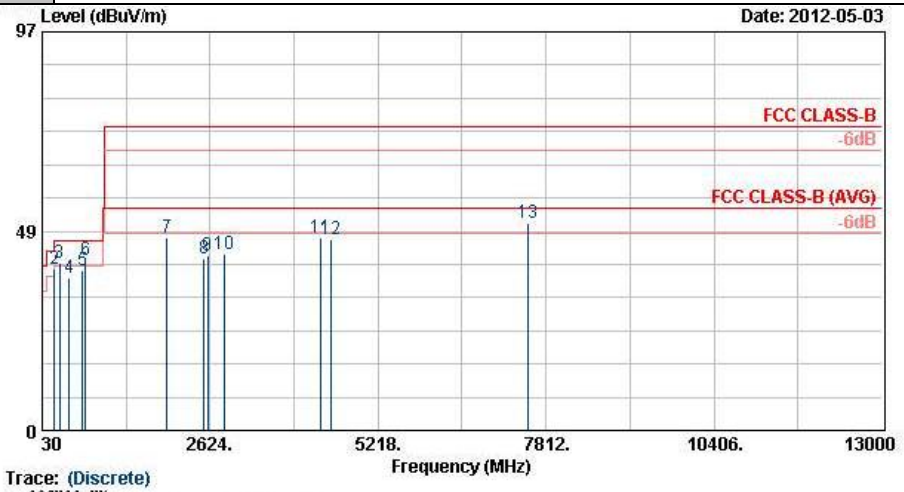



**For radiated emissions above 1GHz**



## 3.2.5. Test Result of Radiated Emission

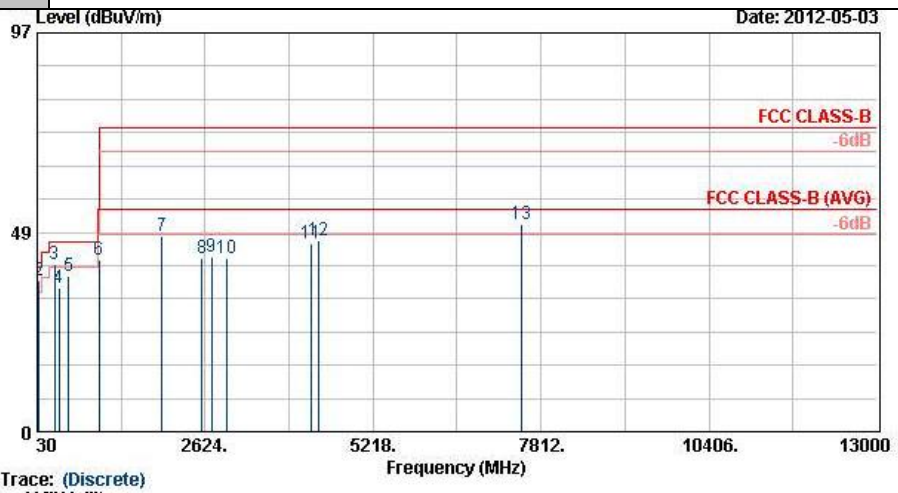
| Test Mode : | Mode 3 | Temperature : | 21~24°C |
|---|---|---|---|
| Test Engineer : | Wii Chang | Relative Humidity : | 53~56% |
| Test Distance : | 3m | Polarization : | Horizontal |
| Function Type : | WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| Remark : | #7 is system simulator signal which can be ignored. | | |




Site : 03CH06-HY
Condition : FCC CLASS-B HF-ANT_110602 HORIZONTAL
Power : 120Vac/60Hz
Project : FD 232306

| | | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | | 39.45 | 33.27 | -6.73 | 40.00 | 51.56 | 12.70 | 0.51 | 31.50 | --- | --- | Peak |
| 2 | | 222.78 | 39.31 | -6.69 | 46.00 | 58.83 | 9.43 | 2.13 | 31.08 | --- | --- | Peak |
| 3 | ! | 297.03 | 40.78 | -5.22 | 46.00 | 56.83 | 13.14 | 2.34 | 31.53 | --- | --- | Peak |
| 4 | | 444.90 | 37.30 | -8.70 | 46.00 | 49.16 | 16.70 | 2.54 | 31.10 | --- | --- | Peak |
| 5 | | 652.80 | 38.83 | -7.17 | 46.00 | 47.28 | 19.20 | 3.42 | 31.07 | --- | --- | Peak |
| 6 | ! | 700.40 | 41.37 | -4.63 | 46.00 | 50.79 | 19.00 | 3.55 | 31.97 | 100 | 77 | Peak |
| 7 | | 1960.00 | 47.00 | ----- | ----- | 65.25 | 31.13 | 4.85 | 54.23 | --- | --- | Peak |
| 8 | | 2524.00 | 41.79 | -32.21 | 74.00 | 58.58 | 32.03 | 5.57 | 54.40 | --- | --- | Peak |
| 9 | | 2582.00 | 42.69 | -31.31 | 74.00 | 59.39 | 32.08 | 5.63 | 54.42 | --- | --- | Peak |
| 10 | | 2846.00 | 43.00 | -31.00 | 74.00 | 59.23 | 32.35 | 5.92 | 54.50 | --- | --- | Peak |
| 11 | | 4326.00 | 46.77 | -27.23 | 74.00 | 60.55 | 34.10 | 7.62 | 55.50 | --- | --- | Peak |
| 12 | | 4500.00 | 46.65 | -27.35 | 74.00 | 59.96 | 34.60 | 7.76 | 55.67 | --- | --- | Peak |
| 13 | | 7524.00 | 50.37 | -23.63 | 74.00 | 59.74 | 35.51 | 11.35 | 56.22 | 100 | 63 | Peak |

| Test Mode : | Mode 3 | Temperature : | 21~24°C |
|---|---|---|---|
| Test Engineer : | Wii Chang | Relative Humidity : | 53~56% |
| Test Distance : | 3m | Polarization : | Vertical |
| Function Type : | WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable (Charging from Adapter) + HDMI Cable | | |
| Remark : | #7 is system simulator signal which can be ignored. | | |

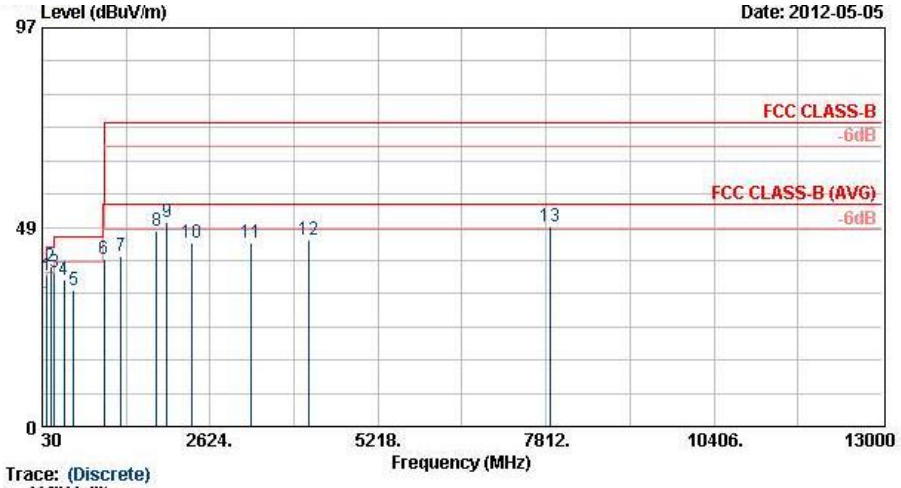



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B HF-ANT_110802 VERTICAL
Power : 120Vac/60Hz
Project : FD 232306

| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 @ | 43.23 | 36.89 | -3.11 | 40.00 | 57.44 | 10.38 | 0.57 | 31.50 | 100 | 17 | Peak |
| 2 ! | 55.38 | 36.88 | -3.12 | 40.00 | 60.80 | 6.90 | 0.67 | 31.49 | --- | --- | Peak |
| 3 ! | 297.03 | 40.65 | -5.35 | 46.00 | 56.70 | 13.14 | 2.34 | 31.53 | --- | --- | Peak |
| 4 | 371.40 | 35.15 | -10.85 | 46.00 | 49.08 | 14.82 | 2.34 | 31.09 | --- | --- | Peak |
| 5 | 519.80 | 37.99 | -8.01 | 46.00 | 48.97 | 17.70 | 2.95 | 31.63 | --- | --- | Peak |
| 6 | 981.80 | 41.72 | -12.28 | 54.00 | 47.02 | 21.20 | 3.93 | 30.43 | --- | --- | Peak |
| 7 | 1960.00 | 47.70 | | | 65.95 | 31.13 | 4.85 | 54.23 | --- | --- | Peak |
| 8 | 2574.00 | 42.15 | -31.85 | 74.00 | 58.85 | 32.08 | 5.63 | 54.42 | --- | --- | Peak |
| 9 | 2726.00 | 42.55 | -31.45 | 74.00 | 58.99 | 32.23 | 5.79 | 54.46 | --- | --- | Peak |
| 10 | 2958.00 | 42.16 | -31.84 | 74.00 | 58.18 | 32.45 | 6.05 | 54.53 | --- | --- | Peak |
| 11 | 4260.00 | 45.67 | -28.33 | 74.00 | 59.64 | 33.90 | 7.56 | 55.44 | --- | --- | Peak |
| 12 | 4372.00 | 46.37 | -27.63 | 74.00 | 60.06 | 34.20 | 7.64 | 55.54 | --- | --- | Peak |
| 13 | 7510.00 | 50.46 | -23.54 | 74.00 | 59.79 | 35.50 | 11.39 | 56.23 | 100 | 37 | Peak |

| Test Mode : | Mode 4 | Temperature : | 21~24°C |
|---|---|---|---|
| Test Engineer : | Wii Chang | Relative Humidity : | 53~56% |
| Test Distance : | 3m | Polarization : | Horizontal |
| Function Type : | GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable | | |
| Remark : | #9 is system simulator signal which can be ignored. | | |

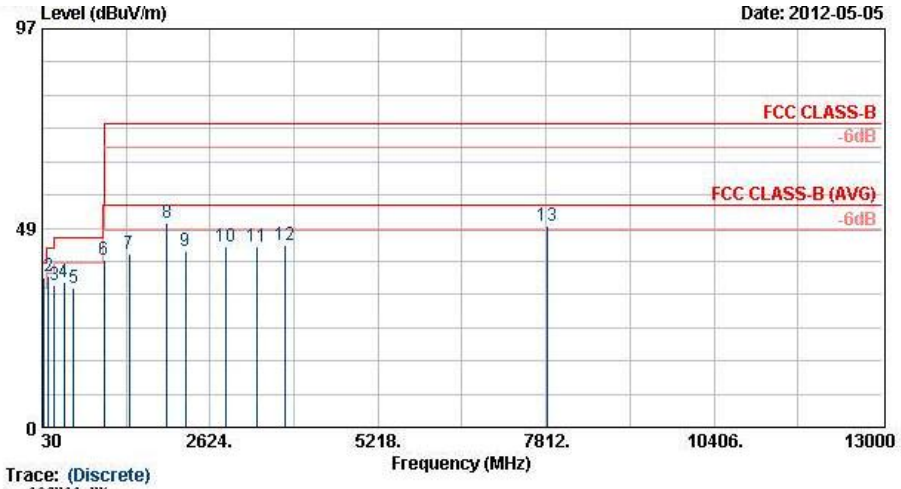



Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B HF-ANT_110802 HORIZONTAL
Power : From System
Project : FD 232306
Mode : Mode 4

| | | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | | 99.93 | 36.88 | -6.62 | 43.50 | 56.41 | 11.20 | 1.01 | 31.74 | --- | --- | Peak |
| 2 | ! | 166.08 | 38.80 | -4.70 | 43.50 | 58.36 | 9.94 | 1.72 | 31.22 | 100 | 44 | Peak |
| 3 | | 222.78 | 37.35 | -8.65 | 46.00 | 56.87 | 9.43 | 2.13 | 31.08 | --- | --- | Peak |
| 4 | | 371.40 | 35.78 | -10.22 | 46.00 | 49.71 | 14.82 | 2.34 | 31.09 | --- | --- | Peak |
| 5 | | 519.80 | 33.28 | -12.72 | 46.00 | 44.26 | 17.70 | 2.95 | 31.63 | --- | --- | Peak |
| 6 | | 981.80 | 40.71 | -13.29 | 54.00 | 46.01 | 21.20 | 3.93 | 30.43 | --- | --- | Peak |
| 7 | | 1244.00 | 41.49 | -32.51 | 74.00 | 63.99 | 27.80 | 3.73 | 54.02 | --- | --- | Peak |
| 8 | | 1796.00 | 47.55 | -26.45 | 74.00 | 67.11 | 30.02 | 4.58 | 54.17 | --- | --- | Peak |
| 9 | | 1960.00 | 49.73 | | | 67.97 | 31.13 | 4.85 | 54.23 | --- | --- | Peak |
| 10 | | 2332.00 | 44.61 | -29.39 | 74.00 | 61.78 | 31.83 | 5.34 | 54.34 | --- | --- | Peak |
| 11 | | 3260.00 | 44.69 | -29.31 | 74.00 | 60.33 | 32.60 | 6.40 | 54.65 | --- | --- | Peak |
| 12 | | 4142.00 | 45.43 | -28.57 | 74.00 | 59.73 | 33.55 | 7.47 | 55.32 | --- | --- | Peak |
| 13 | | 7878.00 | 48.75 | -25.25 | 74.00 | 58.47 | 35.58 | 10.71 | 56.02 | 100 | 0 | Peak |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 4 | **Temperature :** | 21~24°C |
| **Test Engineer :** | Wii Chang | **Relative Humidity :** | 53~56% |
| **Test Distance :** | 3m | **Polarization :** | Vertical |
| **Function Type :** | GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + NFC On + Earphone + Battery + USB Cable (Data Link with Notebook) + HDMI Cable | | |
| **Remark :** | #8 is system simulator signal which can be ignored. | | |




Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B HF-ANT_110802 VERTICAL
Power : From System
Project : FD 232306
Mode : Mode 4

| | Freq | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 @ | 50.79 | 36.38 | -3.62 | 40.00 | 59.12 | 8.40 | 0.65 | 31.79 | 100 | 261 | Peak |
| 2 | 124.23 | 36.87 | -6.63 | 43.50 | 54.99 | 11.82 | 1.34 | 31.29 | --- | --- | Peak |
| 3 | 222.78 | 34.75 | -11.25 | 46.00 | 54.27 | 9.43 | 2.13 | 31.08 | --- | --- | Peak |
| 4 | 371.40 | 35.21 | -10.79 | 46.00 | 49.15 | 14.82 | 2.34 | 31.09 | --- | --- | Peak |
| 5 | 519.80 | 33.96 | -12.04 | 46.00 | 44.94 | 17.70 | 2.95 | 31.63 | --- | --- | Peak |
| 6 | 981.80 | 40.71 | -13.29 | 54.00 | 46.01 | 21.20 | 3.93 | 30.43 | --- | --- | Peak |
| 7 | 1374.00 | 42.11 | -31.89 | 74.00 | 64.41 | 27.80 | 3.94 | 54.04 | --- | --- | Peak |
| 8 | 1960.00 | 49.84 | | | 68.09 | 31.13 | 4.85 | 54.23 | --- | --- | Peak |
| 9 | 2244.00 | 42.78 | -31.22 | 74.00 | 60.14 | 31.74 | 5.23 | 54.32 | --- | --- | Peak |
| 10 | 2862.00 | 43.97 | -30.03 | 74.00 | 60.15 | 32.37 | 5.95 | 54.50 | --- | --- | Peak |
| 11 | 3358.00 | 43.95 | -30.05 | 74.00 | 59.48 | 32.64 | 6.52 | 54.69 | --- | --- | Peak |
| 12 | 3772.00 | 44.28 | -29.72 | 74.00 | 59.27 | 32.92 | 7.07 | 54.98 | --- | --- | Peak |
| 13 | 7838.00 | 48.88 | -25.12 | 74.00 | 58.57 | 35.57 | 10.80 | 56.05 | 100 | 0 | Peak |

# 4. List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| EMI Test Receive | R&S | ESCS 30 | 100356 | 9KHz ~ 2.75GHz | Oct. 27, 2011 | May 04, 2012 | Oct. 26, 2012 | Conduction (CO05-HY) |
| Two-LISN | R&S | ENV216 | 11-100081 | 9KHz ~ 30MHz | Dec. 09, 2011 | May 04, 2012 | Dec. 08, 2012 | Conduction (CO05-HY) |
| Two-LISN | R&S | ENV216 | 11-100080 | 9KHz ~ 30MHz | Dec. 06, 2011 | May 04, 2012 | Dec. 05, 2012 | Conduction (CO05-HY) |
| AC Power Source | APC | APC-1000W | N/A | N/A | N/A | May 04, 2012 | N/A | Conduction (CO05-HY) |
| GPS Station | Pendulum | GSG-54 | N/A | N/A | N/A | May 04, 2012 | N/A | Conduction (CO05-HY) |
| Spectrum Analyzer | Agilent | E4408B | MY44211030 | 9KHz ~ 26.5GHz | Nov. 23, 2011 | May 03, 2012 ~ May 05, 2012 | Nov. 22, 2012 | Radiation (03CH06-HY) |
| Spectrum Analyzer | R&S | FSP30 | 101352 | 9KHz-30GHz | Nov. 01, 2011 | May 03, 2012 ~ May 05, 2012 | Oct. 31, 2012 | Radiation (03CH06-HY) |
| EMI Test Receiver | R&S | ESVS10 | 834468/003 | 20MHz ~ 1000MHz | May 04, 2012 | May 03, 2012 ~ May 05, 2012 | May. 03, 2013 | Radiation (03CH06-HY) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2885 | 30MHz ~ 2GHz | Oct. 22, 2011 | May 03, 2012 ~ May 05, 2012 | Oct. 21, 2012 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00066583 | 1GHz ~ 18GHz | Aug. 01, 2011 | May 03, 2012 ~ May 05, 2012 | Jul. 31, 2012 | Radiation (03CH06-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170251 | 15GHz ~ 40GHz | Oct. 21, 2011 | May 03, 2012 ~ May 05, 2012 | Oct. 20, 2012 | Radiation (03CH06-HY) |
| Pre Amplifier | Agilent | 8449B | 3008A01917 | 1GHz ~ 26.5GHz | Apr. 13, 2012 | May 03, 2012 ~ May 05, 2012 | Apr. 12, 2013 | Radiation (03CH06-HY) |
| Amplifier | Agilent | 310N | 186713 | 9KHz ~ 1GHz | Apr. 11, 2012 | May 03, 2012 ~ May 05, 2012 | Apr. 10, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | EMCI | EMC051845 | SN980048 | 1GHz ~ 18GHz | Jul. 18, 2011 | May 03, 2012 ~ May 05, 2012 | Jul. 17, 2012 | Radiation (03CH06-HY) |
| GPS Station | T&E | GS-50 | N/A | N/A | N/A | May 03, 2012 ~ May 05, 2012 | N/A | Radiation (03CH06-HY) |
| System Simulator | R&S | CMU200 | 117995 | N/A | Jul. 28, 2011 | May 03, 2012~ May 05, 2012 | Nov. 22, 2012 | - |

# 5. Uncertainty of Evaluation

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

| Contribution | Uncertainty of $X_i$ | | $u(X_i)$ |
|---|---|---|---|
| | dB | Probability Distribution | |
| Receiver Reading | 0.10 | Normal (k=2) | 0.05 |
| Cable Loss | 0.10 | Normal (k=2) | 0.05 |
| AMN Insertion Loss | 2.50 | Rectangular | 0.63 |
| Receiver Specification | 1.50 | Rectangular | 0.43 |
| Site Imperfection | 1.39 | Rectangular | 0.80 |
| Mismatch | +0.34 / -0.35 | U-Shape | 0.24 |
| **Combined Standard Uncertainty Uc(y)** | **1.13** | | |
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **2.26** | | |

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

| Contribution | Uncertainty of $X_i$ | | $u(X_i)$ |
|---|---|---|---|
| | dB | Probability Distribution | |
| Receiver Reading | 0.41 | Normal (k=2) | 0.21 |
| Antenna Factor Calibration | 0.83 | Normal (k=2) | 0.42 |
| Cable Loss Calibration | 0.25 | Normal (k=2) | 0.13 |
| Pre-Amplifier Gain Calibration | 0.27 | Normal (k=2) | 0.14 |
| RCV/SPA Specification | 2.50 | Rectangular | 0.72 |
| Antenna Factor Interpolation for Frequency | 1.00 | Rectangular | 0.29 |
| Site Imperfection | 1.43 | Rectangular | 0.83 |
| Mismatch | +0.39 / -0.41 | U-Shape | 0.28 |
| **Combined Standard Uncertainty Uc(y)** | **1.27** | | |
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **2.54** | | |

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

| Contribution | Uncertainty of $X_i$ | | $u(X_i)$ | $C_i$ | $C_i * u(X_i)$ |
|---|---|---|---|---|---|
| | dB | Probability Distribution | | | |
| Receiver Reading | ±0.10 | Normal (k=2) | 0.10 | 1 | 0.10 |
| Antenna Factor Calibration | ±1.70 | Normal (k=2) | 0.85 | 1 | 0.85 |
| Cable Loss Calibration | ±0.50 | Normal (k=2) | 0.25 | 1 | 0.25 |
| Receiver Correction | ±2.00 | Rectangular | 1.15 | 1 | 1.15 |
| Antenna Factor Directional | ±1.50 | Rectangular | 0.87 | 1 | 0.87 |
| Site Imperfection | ±2.80 | Triangular | 1.14 | 1 | 1.14 |
| Mismatch<br>Receiver VSWR Γ1 = 0.197<br>Antenna VSWR Γ2 = 0.194<br>Uncertainty = 20Log(1-Γ1*Γ2) | +0.34 / -0.35 | U-Shape | 0.244 | 1 | 0.244 |
| **Combined Standard Uncertainty Uc(y)** | **2.36** | | | | |
| **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 EP232306 as below.