

## FCC 47 CFR PART 15 SUBPART C

Product Type : BT module  
Applicant : Acer Incorporated  
Address : 8F, 88, Sec 1, Hsin Tai Wu Rd ,Hsichih, Taipei Hsien ,Taiwan 221  
Trade Name : Acer Incorporated  
Model Number : H7550ST Extension Board  
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2014  
ANSI C63.10:2009  
Receive Date : May 06, 2015  
Test Period : Apr. 27 ~ May 15, 2015  
Issue Date : Jun. 12, 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   | Jun. 12, 2015 | Initial Issue |            |
|      |               |               |            |
|      |               |               |            |
|      |               |               |            |

## Verification of Compliance

Issued Date: 06/12/2015

Product Type : BT module  
Applicant : Acer Incorporated  
Address : 8F, 88, Sec 1, Hsin Tai Wu Rd ,Hsichih, Taipei Hsien ,Taiwan 221  
Trade Name : Acer Incorporated  
Model Number : H7550ST Extension Board  
FCC ID : HLZQBT1  
EUT Rated Voltage : DC 5.0V  
Test Voltage : 120 Vac / 60 Hz  
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2014  
ANSI C63.10:2009  
Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.  
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Taiwan Accreditation Foundation 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 : Fly Lu (Fly Lu) Reviewed By : Eric Ou Yang (Eric Ou Yang)  
(Manager) (Testing Engineer)

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## 1 General Information

### 1.1. Summary of Test Result

| Standard          | Item                                    | Result | Remark |
|-------------------|---|--------|--------|
| 15.247            |   |        |        |
| 15.207            | AC Power Conducted Emission             | PASS   | -----  |
| Standard          | Item                                    | Result | Remark |
| 15.247            |   |        |        |
| 15.247(b)(1)      | Max. Output Power                       | N/A    | -----  |
| 15.247(d)         | Transmitter Radiated Emissions          | PASS   | -----  |
| 15.247(a)(1)      | 20dB RF Bandwidth                       | N/A    | -----  |
| 15.247(a)(1)      | Carrier Frequency Separation            | N/A    | -----  |
| 15.247(a)(1)(iii) | Number of Hopping                       | N/A    | -----  |
| 15.247(a)(1)(iii) | Time of Occupancy (Dwell Time)          | N/A    | -----  |
| 15.247(d)         | Out of Band Conducted Spurious Emission | N/A    | -----  |
| 15.247(d)         | Band Edge Measurement                   | PASS   | -----  |
| -                 | Occupied Bandwidth Measurement          | N/A    | -----  |
| 15.203            | Antenna Requirement                     | PASS   | -----  |

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

Note: The device is module: H7550ST Extension Board add host to do Class II Permissive Change report so it only test Conducted Emission, Transmitter Radiated Emissions and Band Edge Measurement.

### 1.2. Measurement Uncertainty

| Test Item          | Frequency Range     | Uncertainty (dB) |        |
|--------------------|---------------------|------------------|--------|
| Conducted Emission | 9kHz ~ 30MHz        | ± 2.02           |        |
| Radiated Emission  | 30MHz ~ 1000MHz     | Horizontal       | ± 3.98 |
|                    |                     | Vertical         | ± 3.62 |
|                    | 1000MHz ~ 18000MHz  | Horizontal       | ± 3.11 |
|                    |                     | Vertical         | ± 3.07 |
|                    | 18000MHz ~ 40000MHz | Horizontal       | ± 3.66 |
|                    |                     | Vertical         | ± 3.54 |

## 2 EUT Description

|                                |  |            |         |
|--------------------------------|--|------------|---------|
| Product                        | BT module  |            |         |
| Trade Name                     | Acer Incorporated  |            |         |
| Model Number                   | H7550ST Extension Board  |            |         |
| Applicant                      | Acer Incorporated<br>8F, 88, Sec 1, Hsin Tai Wu Rd ,Hsichih, Taipei Hsien ,Taiwan 221  |            |         |
| Manufacturer                   | Qisda Corporation<br>No. 157, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan  |            |         |
| FCC ID                         | HLZQBT1  |            |         |
| Frequency Range                | 2402 ~ 2480 MHz  |            |         |
| Modulation Type                | GFSK for 1Mbps   |            |         |
|                                | $\pi/4$ -DQPSK for 2Mbps   |            |         |
|                                | 8DPSK for 3Mbps  |            |         |
| Antenna Type                   | PCB Antenna  |            |         |
| Antenna Gain                   | 2.7 dBi  |            |         |
| RF Output Power<br>(Conducted) | GFSK for 1Mbps   | 0.68 dBm / | 0.001 W |
|                                | $\pi/4$ -DQPSK for 2Mbps   | 0.63 dBm / | 0.001 W |
|                                | 8DPSK for 3Mbps  | 0.78 dBm / | 0.001 W |
| Host Information               | Trade Name: acer<br>Model Number: H6518BD, E341D, HE-813J, H1P1418<br>(*H6518BD/E341D/HE-813J/H1P1418 are the same product with different marketing purposes.) |            |         |
| Host Reference Number          | TL-18677   |            |         |

### 3 Test Methodology

#### 3.1. Mode of Operation

Decision of Test 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:

|                                  |
|----------------------------------|
| Pre-Test Mode                    |
| Mode 1: Normal Operation Mode    |
| Mode 2: GFSK Link Mode           |
| Mode 3: $\pi/4$ -DQPSK Link Mode |
| Mode 4: 8DPSK Link Mode          |

|                               |
|-------------------------------|
| Final-Test Mode               |
| Mode 1: Normal Operation Mode |
| Mode 2: GFSK Link Mode        |
| Mode 4: 8DPSK Link Mode       |

##### Description of Test Modes

Preliminary tests were performed in different modulation to find the worst case. The modulation has shown the worst-case in section 4.5. Investigation has been done on all the possible configurations for searching the worst cases.

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

##### Tested System Details

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

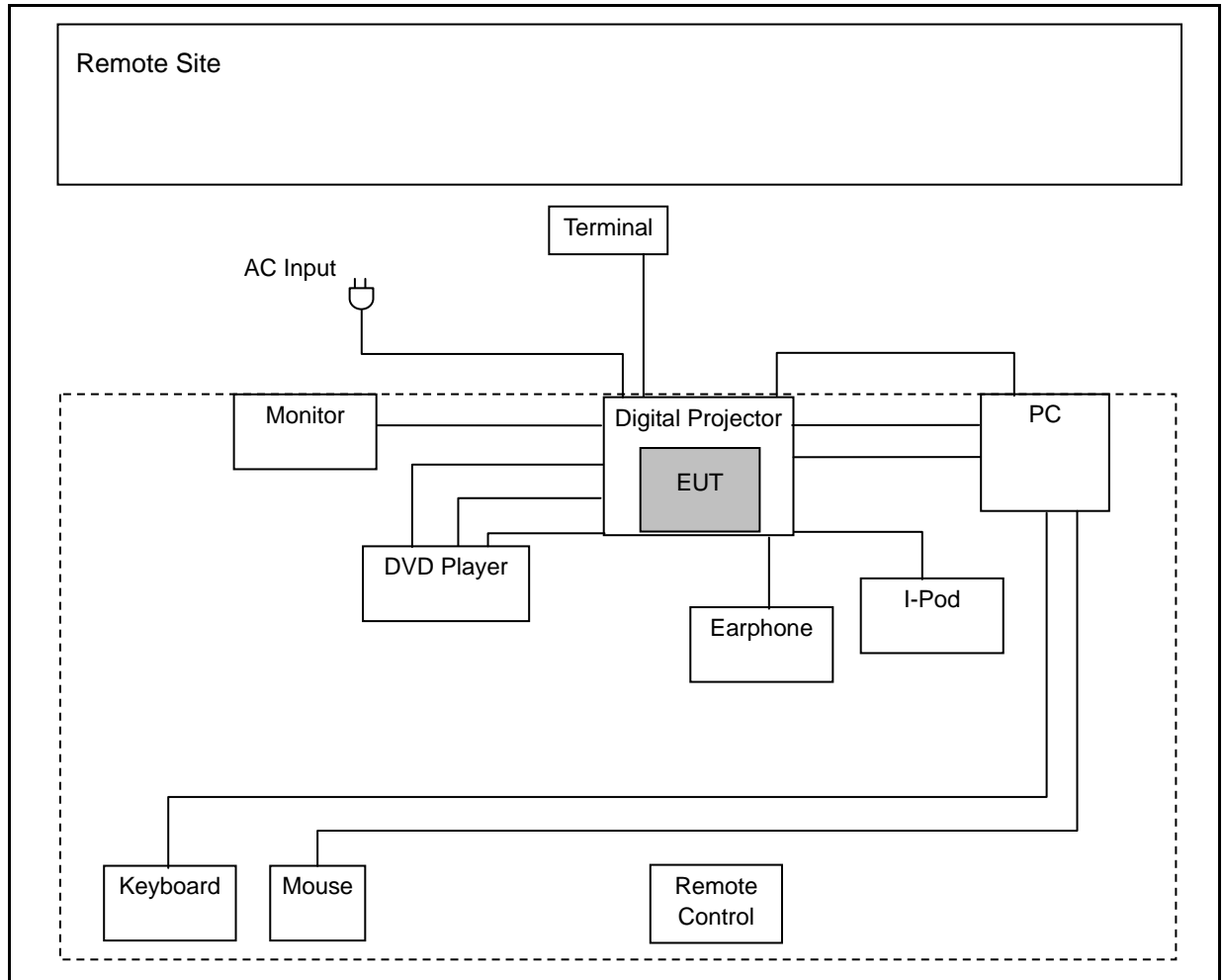
|    | Product          | Manufacturer | Model Number | Serial Number | Power Cord |
|----|------------------|--------------|--------------|---------------|------------|
| 1. | Bluetooth Tester | R & S        | CBT          | 100350        | NA         |

#### 3.2. EUT Exercise Software

|   |   |
|---|---|
| 1 | Setup the EUT and Bluetooth Tester (CBT) as shown on 3.3. |
| 2 | Turn on the power of all equipment.                       |
| 3 | EUT run test program.                                     |
| 4 | Open Bluetooth function link to CBT.                      |

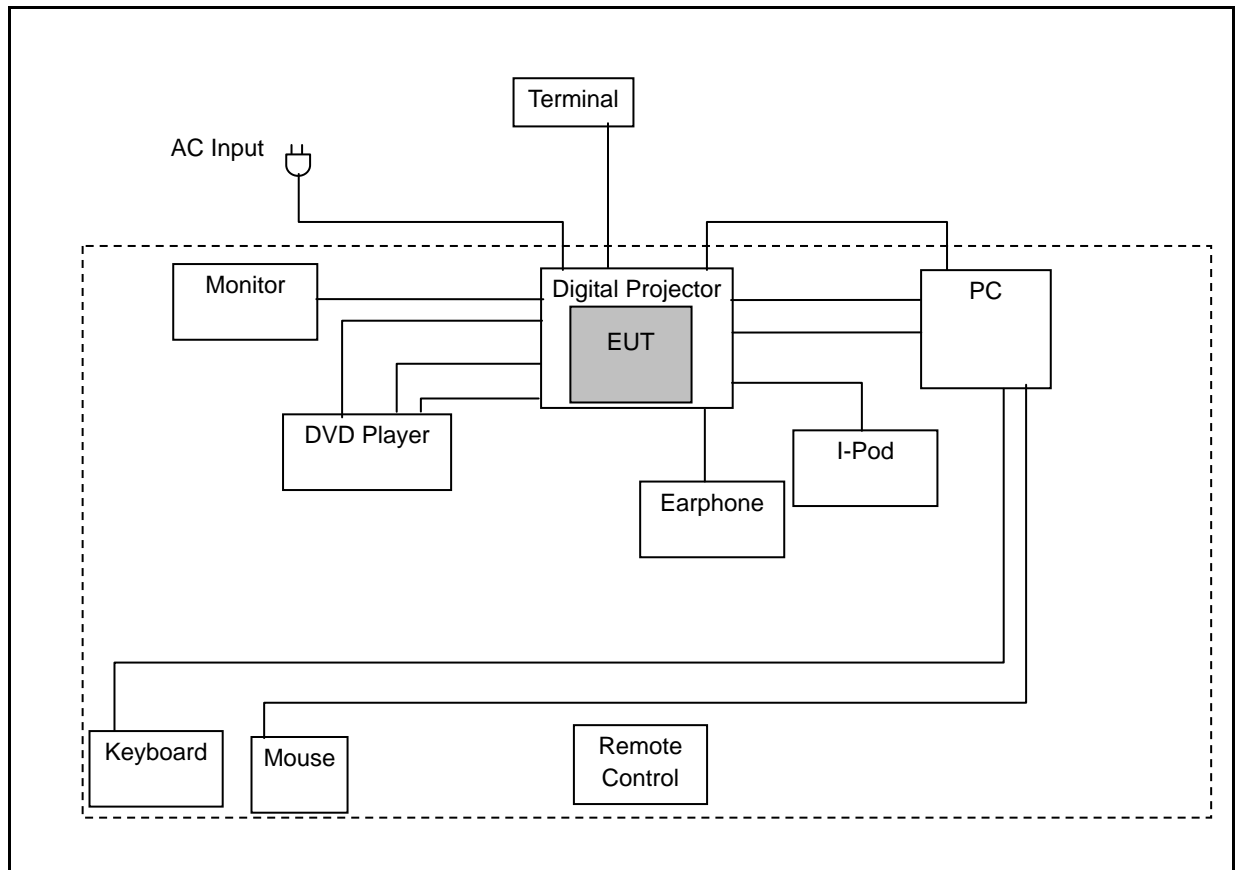
### 3.3. Configuration of Test System Details

#### Conducted Emissions





**Radiated Emissions**



**3.4. 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    |

## 4 Conducted Emission Measurement

### 4.1. Limit

| Frequency (MHz) | Quasi-peak | Average  |
|-----------------|------------|----------|
| 0.15 - 0.5      | 66 to 56   | 56 to 46 |
| 0.50 - 5.0      | 56         | 46       |
| 5.0 - 30.0      | 60         | 50       |

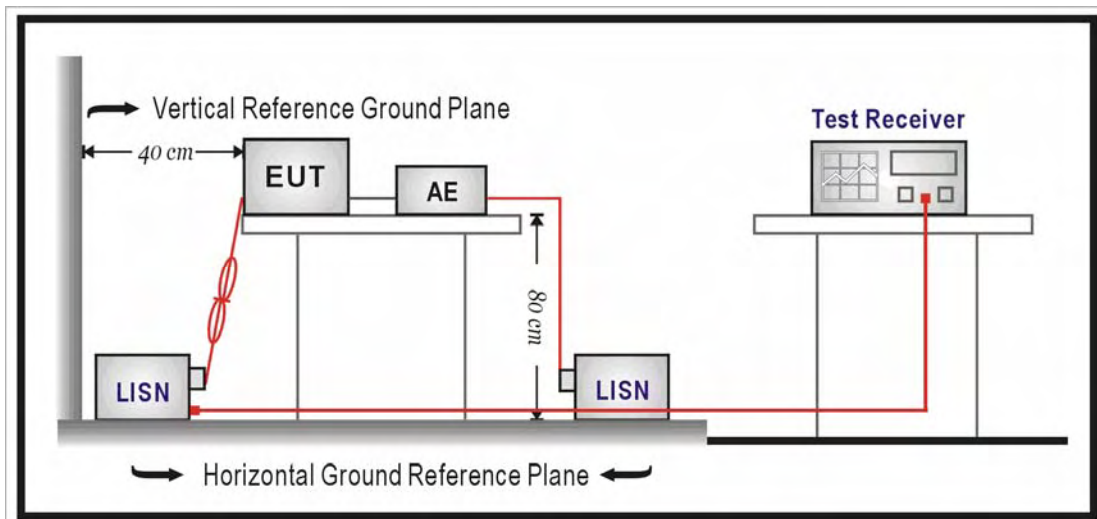
### 4.2. Test Instruments

| Describe      | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|---------------|--------------|--------------|---------------|------------|--------|
| Test Receiver | R&S          | ESCI         | 100367        | 06/12/2014 | (1)    |
| LISN          | R&S          | ENV216       | 101040        | 03/10/2015 | (1)    |
| LISN          | R&S          | ENV216       | 101041        | 03/06/2015 | (1)    |
| RF Cable      | EMCI         | RG 214/U     | TE-02         | 06/30/2014 | (1)    |
| Test Site     | ATL          | TE05         | TE05          | N.C.R.     | -----  |

Remark: (1) Calibration period 1 year.

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

### 4.3. Test Setup



#### 4.4. Test Procedure

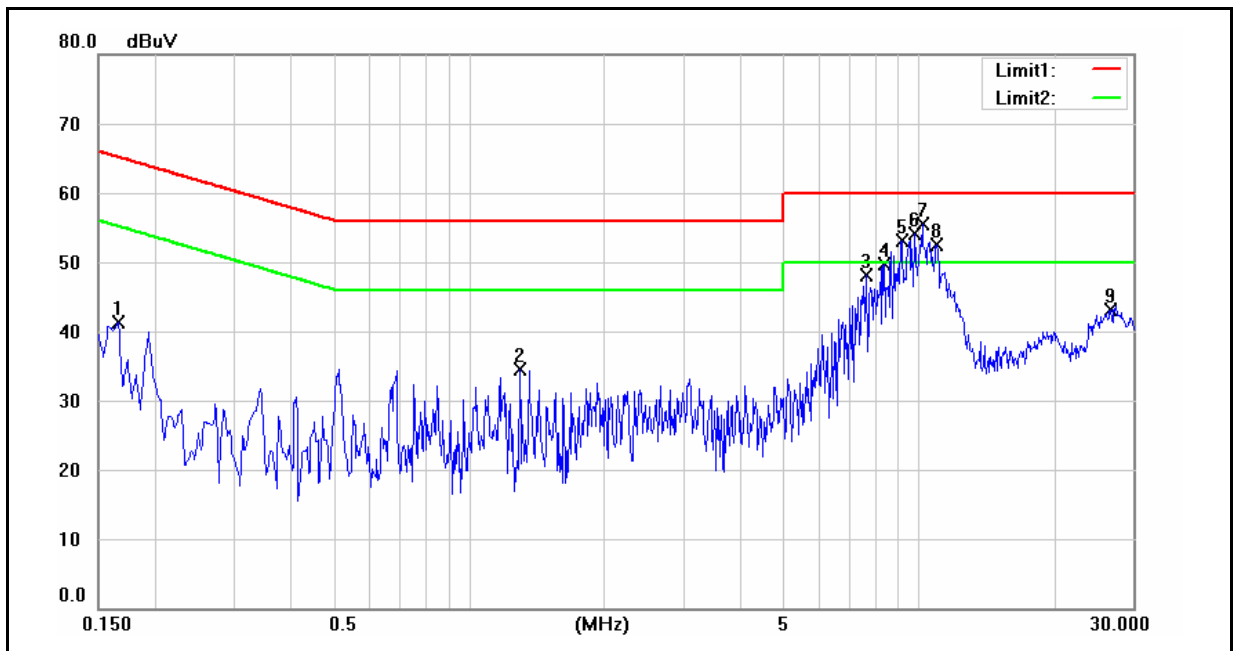
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

**4.5. Test Result**

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Line:                | L1           |
| Test item:    | Conducted Emission      | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 1                  | Date:                | 05/15/2015   |
|               |                         | Test By:             | Eric Ou Yang |
| Description:  | Host: H6518BD           |                      |              |

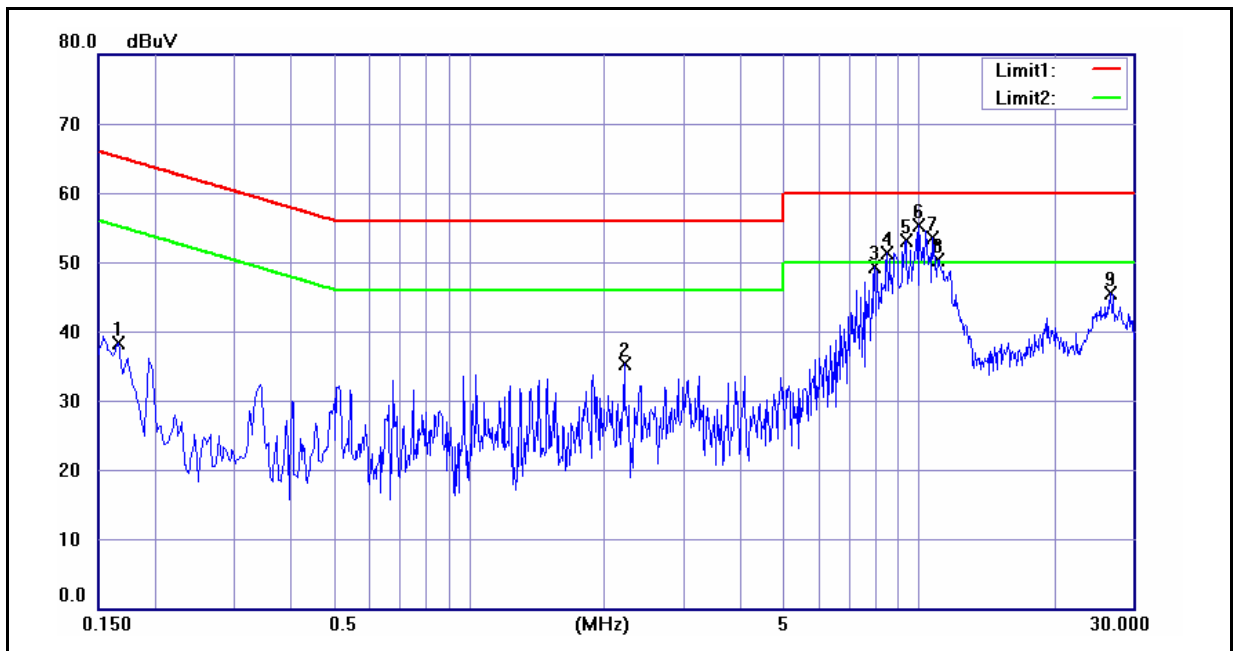


| No. | Frequency (MHz) | QP reading (dBuV) | AVG reading (dBuV) | Correction factor (dB) | QP result (dBuV) | AVG result (dBuV) | QP limit (dBuV) | AVG limit (dBuV) | QP margin (dB) | AVG margin (dB) | Remark |
|-----|-----------------|-------------------|--------------------|------------------------|------------------|-------------------|-----------------|------------------|----------------|-----------------|--------|
| 1   | 0.1660          | 25.17             | 18.04              | 9.60                   | 34.77            | 27.64             | 65.16           | 55.16            | -30.39         | -27.52          | Pass   |
| 2   | 1.3020          | 22.48             | 16.47              | 9.66                   | 32.14            | 26.13             | 56.00           | 46.00            | -23.86         | -19.87          | Pass   |
| 3   | 7.6780          | 34.85             | 28.09              | 9.88                   | 44.73            | 37.97             | 60.00           | 50.00            | -15.27         | -12.03          | Pass   |
| 4   | 8.3980          | 37.76             | 31.18              | 9.90                   | 47.66            | 41.08             | 60.00           | 50.00            | -12.34         | -8.92           | Pass   |
| 5   | 9.1780          | 40.28             | 33.93              | 9.93                   | 50.21            | 43.86             | 60.00           | 50.00            | -9.79          | -6.14           | Pass   |
| 6   | 9.8300          | 40.95             | 35.35              | 9.95                   | 50.90            | 45.30             | 60.00           | 50.00            | -9.10          | -4.70           | Pass   |
| 7   | 10.2180         | 41.50             | 35.89              | 9.95                   | 51.45            | 45.84             | 60.00           | 50.00            | -8.55          | -4.16           | Pass   |
| 8   | 10.9980         | 39.24             | 34.02              | 9.98                   | 49.22            | 44.00             | 60.00           | 50.00            | -10.78         | -6.00           | Pass   |
| 9   | 26.8340         | 28.81             | 22.74              | 10.28                  | 39.09            | 33.02             | 60.00           | 50.00            | -20.91         | -16.98          | Pass   |

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

|                            |                         |                      |              |
|----------------------------|-------------------------|----------------------|--------------|
| Standard:                  | FCC Part 15C            | Line:                | N            |
| Test item:                 | Conducted Emission      | Power:               | AC 120V/60Hz |
| Model Number:              | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:                      | Mode 1                  | Date:                | 05/15/2015   |
|                            |                         | Test By:             | Eric Ou Yang |
| Description: Host: H6518BD |                         |                      |              |



| No. | Frequency (MHz) | QP reading (dBuV) | AVG reading (dBuV) | Correction factor (dB) | QP result (dBuV) | AVG result (dBuV) | QP limit (dBuV) | AVG limit (dBuV) | QP margin (dB) | AVG margin (dB) | Remark |
|-----|-----------------|-------------------|--------------------|------------------------|------------------|-------------------|-----------------|------------------|----------------|-----------------|--------|
| 1   | 0.1660          | 25.44             | 18.14              | 9.60                   | 35.04            | 27.74             | 65.16           | 55.16            | -30.12         | -27.42          | Pass   |
| 2   | 2.2140          | 20.52             | 14.53              | 9.71                   | 30.23            | 24.24             | 56.00           | 46.00            | -25.77         | -21.76          | Pass   |
| 3   | 8.0020          | 34.61             | 28.39              | 9.90                   | 44.51            | 38.29             | 60.00           | 50.00            | -15.49         | -11.71          | Pass   |
| 4   | 8.5260          | 38.83             | 32.14              | 9.93                   | 48.76            | 42.07             | 60.00           | 50.00            | -11.24         | -7.93           | Pass   |
| 5   | 9.3740          | 40.55             | 34.25              | 9.95                   | 50.50            | 44.20             | 60.00           | 50.00            | -9.50          | -5.80           | Pass   |
| 6   | 10.0260         | 41.34             | 34.61              | 9.97                   | 51.31            | 44.58             | 60.00           | 50.00            | -8.69          | -5.42           | Pass   |
| 7   | 10.7380         | 40.66             | 35.08              | 9.99                   | 50.65            | 45.07             | 60.00           | 50.00            | -9.35          | -4.93           | Pass   |
| 8   | 11.0620         | 38.40             | 33.07              | 9.99                   | 48.39            | 43.06             | 60.00           | 50.00            | -11.61         | -6.94           | Pass   |
| 9   | 26.7540         | 30.02             | 23.09              | 10.33                  | 40.35            | 33.42             | 60.00           | 50.00            | -19.65         | -16.58          | Pass   |

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

## 5 Radiated Interference Measurement

### 5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength ( $\mu\text{V}/\text{m}$ at meter) | Measurement Distance (meters) |
|-----------------|---|-------------------------------|
| 0.009 – 0.490   | 2400 / F (kHz)                                    | 300                           |
| 0.490 – 1.705   | 24000 / F (kHz)                                   | 30                            |
| 1.705 – 30.0    | 30  | 30                            |
| 30 - 88         | 100**   | 3                             |
| 88-216          | 150**   | 3                             |
| 216-960         | 200**   | 3                             |
| Above 960       | 500   | 3                             |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

### 5.2. Test Instruments

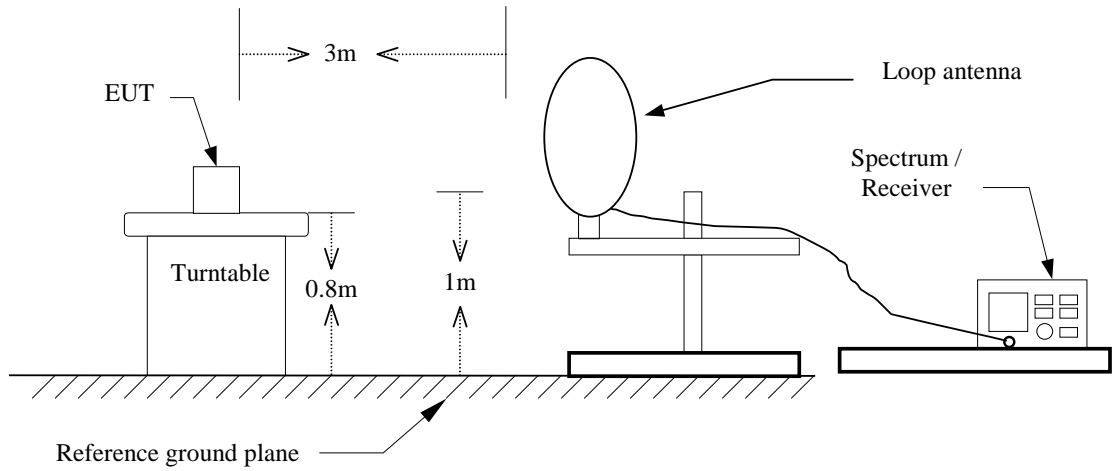
| 3 Meter Chamber                |                                |                         |               |            |        |
|--------------------------------|--------------------------------|-------------------------|---------------|------------|--------|
| Equipment                      | Manufacturer                   | Model Number            | Serial Number | 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 (30MHz~1GHz) | SCHWARZBECK<br>MESS-ELEKTRONIK | VULB9163                | 9163-270      | 07/22/2014 | (1)    |
| Horn Antenna (1~18GHz)         | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9120D               | 9120D-550     | 06/11/2014 | (1)    |
| Horn Antenna (18~40GHz)        | SCHWARZBECK<br>MESS-ELEKTRONIK | BBHA9170                | 9170-320      | 07/02/2014 | (1)    |
| Loop Antenna                   | COM-POWER<br>CORPORATION       | AL-130                  | 121014        | 02/02/2015 | (1)    |
| Microwave Cable                | EMCI                           | EMC-104-SM-S<br>M-14000 | 140202        | 02/24/2015 | (1)    |
| Microwave Cable                | EMCI                           | EMC104-SM-S<br>M-600    | 140301        | 02/24/2015 | (1)    |
| Test Site                      | ATL                            | TE01                    | 888001        | 08/28/2014 | (1)    |

Remark: (1) Calibration period 1 year.

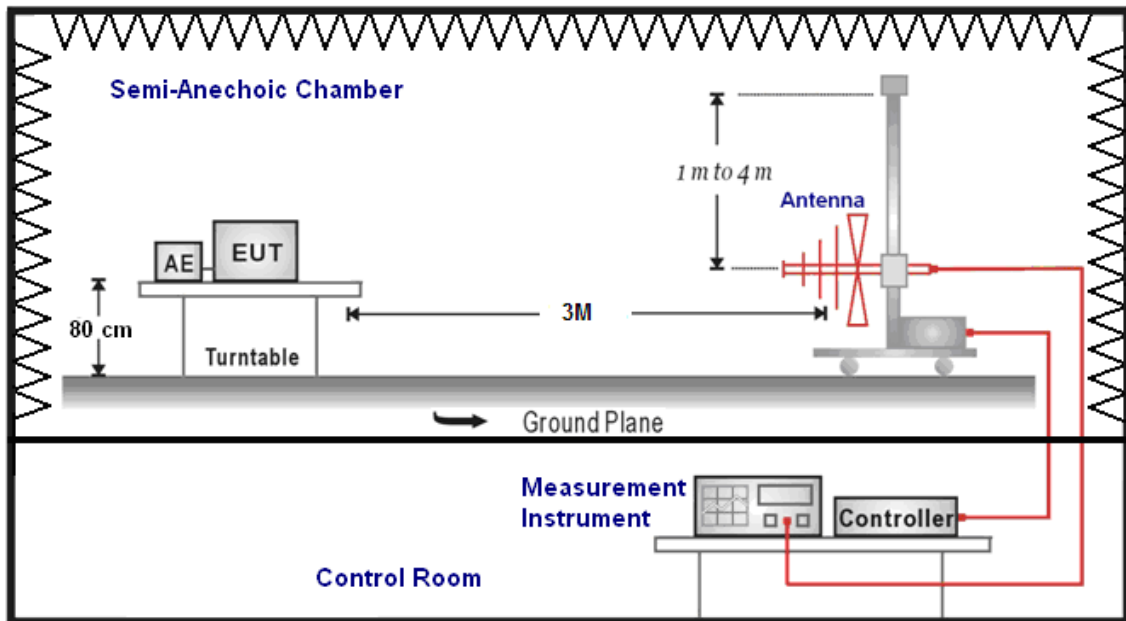
NOTE: N.C.R. = No Calibration Request.

### 5.3. Setup

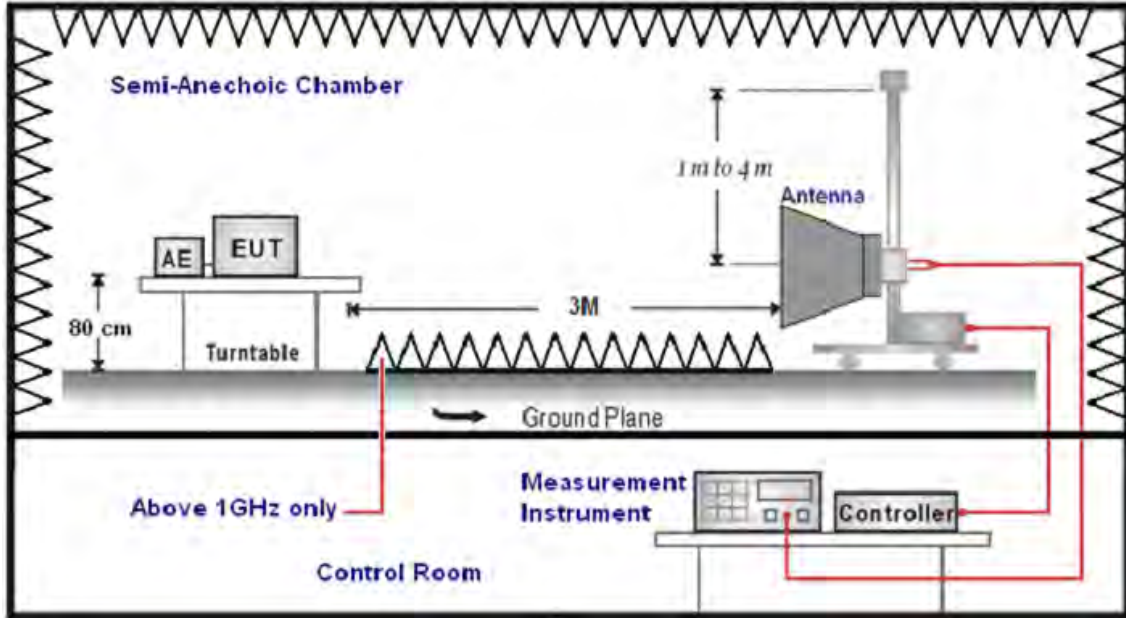
9kHz ~ 30MHz



Below 1GHz



Above 1GHz





## 5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in decibels referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

## 5.5. Test Result

### Below 1GHz

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 1                  | Date:                | 04/28/2015   |
| Host:         | H6518BD                 | Test By:             | Eric Ou Yang |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 107.5000        | 45.85          | -15.43                | 30.42           | 43.50          | -13.08      | QP     | H                |
| 299.0000        | 39.14          | -9.45                 | 29.69           | 46.00          | -16.31      | QP     | H                |
| 390.0000        | 37.08          | -7.57                 | 29.51           | 46.00          | -16.49      | QP     | H                |
| 524.5000        | 28.18          | -4.96                 | 23.22           | 46.00          | -22.78      | QP     | H                |
| 780.0000        | 37.07          | 0.16                  | 37.23           | 46.00          | -8.77       | QP     | H                |
| 925.0000        | 26.84          | 2.93                  | 29.77           | 46.00          | -16.23      | QP     | H                |
| 169.0000        | 42.41          | -11.57                | 30.84           | 43.50          | -12.66      | QP     | V                |
| 229.5000        | 37.39          | -12.57                | 24.82           | 46.00          | -21.18      | QP     | V                |
| 482.5000        | 31.93          | -5.73                 | 26.20           | 46.00          | -19.80      | QP     | V                |
| 624.0000        | 26.76          | -2.87                 | 23.89           | 46.00          | -22.11      | QP     | V                |
| 780.0000        | 32.27          | 0.16                  | 32.43           | 46.00          | -13.57      | QP     | V                |
| 914.5000        | 24.42          | 2.83                  | 27.25           | 46.00          | -18.75      | QP     | V                |

Note: No emission found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).

**Above 1GHz**

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 2                  | Date:                | 04/28/2015   |
| Frequency:    | 2402 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3009.000        | 36.26          | 1.75                  | 38.01           | 74.00          | -35.99      | peak   | H                |
| 4563.000        | 33.13          | 6.66                  | 39.79           | 74.00          | -34.21      | peak   | H                |
| 6719.000        | 33.03          | 12.08                 | 45.11           | 74.00          | -28.89      | peak   | H                |
| 3037.000        | 37.77          | 1.87                  | 39.64           | 74.00          | -34.36      | peak   | V                |
| 4619.000        | 34.51          | 6.83                  | 41.34           | 74.00          | -32.66      | peak   | V                |
| 6670.000        | 34.62          | 11.96                 | 46.58           | 74.00          | -27.42      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 2                  | Date:                | 04/28/2015   |
| Frequency:    | 2441 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3023.000        | 36.45          | 1.81                  | 38.26           | 74.00          | -35.74      | peak   | H                |
| 4577.000        | 34.34          | 6.69                  | 41.03           | 74.00          | -32.97      | peak   | H                |
| 6670.000        | 33.77          | 11.96                 | 45.73           | 74.00          | -28.27      | peak   | H                |
| 2995.000        | 40.15          | 1.70                  | 41.85           | 74.00          | -32.15      | peak   | V                |
| 4605.000        | 34.56          | 6.79                  | 41.35           | 74.00          | -32.65      | peak   | V                |
| 6719.000        | 33.36          | 12.08                 | 45.44           | 74.00          | -28.56      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 2                  | Date:                | 04/28/2015   |
| Frequency:    | 2480 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3051.000        | 37.86          | 1.94                  | 39.80           | 74.00          | -34.20      | peak   | H                |
| 4570.000        | 34.32          | 6.68                  | 41.00           | 74.00          | -33.00      | peak   | H                |
| 6642.000        | 33.50          | 11.89                 | 45.39           | 74.00          | -28.61      | peak   | H                |
| 3030.000        | 37.28          | 1.85                  | 39.13           | 74.00          | -34.87      | peak   | V                |
| 4570.000        | 33.67          | 6.68                  | 40.35           | 74.00          | -33.65      | peak   | V                |
| 6663.000        | 32.98          | 11.94                 | 44.92           | 74.00          | -29.08      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 4                  | Date:                | 04/28/2015   |
| Frequency:    | 2402 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3065.000        | 37.79          | 2.00                  | 39.79           | 74.00          | -34.21      | peak   | H                |
| 4542.000        | 34.08          | 6.59                  | 40.67           | 74.00          | -33.33      | peak   | H                |
| 6698.000        | 33.63          | 12.03                 | 45.66           | 74.00          | -28.34      | peak   | H                |
| 3030.000        | 36.88          | 1.85                  | 38.73           | 74.00          | -35.27      | peak   | V                |
| 4605.000        | 35.22          | 6.79                  | 42.01           | 74.00          | -31.99      | peak   | V                |
| 6649.000        | 33.09          | 11.91                 | 45.00           | 74.00          | -29.00      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 4                  | Date:                | 04/28/2015   |
| Frequency:    | 2441 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3051.000        | 38.12          | 1.94                  | 40.06           | 74.00          | -33.94      | peak   | H                |
| 4577.000        | 34.27          | 6.69                  | 40.96           | 74.00          | -33.04      | peak   | H                |
| 6635.000        | 33.85          | 11.88                 | 45.73           | 74.00          | -28.27      | peak   | H                |
| 3009.000        | 37.12          | 1.75                  | 38.87           | 74.00          | -35.13      | peak   | V                |
| 4626.000        | 34.03          | 6.85                  | 40.88           | 74.00          | -33.12      | peak   | V                |
| 6719.000        | 33.08          | 12.08                 | 45.16           | 74.00          | -28.84      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 4                  | Date:                | 04/28/2015   |
| Frequency:    | 2480 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

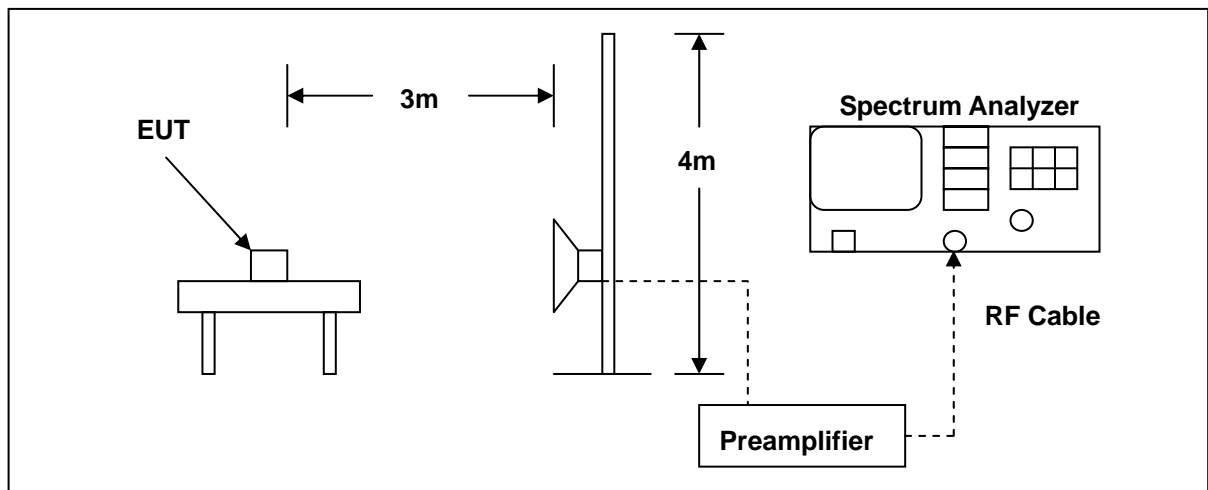
| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 3058.000        | 37.28          | 1.97                  | 39.25           | 74.00          | -34.75      | peak   | H                |
| 4605.000        | 34.03          | 6.79                  | 40.82           | 74.00          | -33.18      | peak   | H                |
| 6677.000        | 33.38          | 11.97                 | 45.35           | 74.00          | -28.65      | peak   | H                |
| 3037.000        | 36.23          | 1.87                  | 38.10           | 74.00          | -35.90      | peak   | V                |
| 4591.000        | 33.75          | 6.74                  | 40.49           | 74.00          | -33.51      | peak   | V                |
| 6698.000        | 33.02          | 12.03                 | 45.05           | 74.00          | -28.95      | peak   | V                |

## 6 Band Edges Measurement

### 6.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

### 6.2. Test Setup



### 6.3. Test Instruments

| Equipment         | Manufacturer                   | Model Number            | Serial Number | Cal. Date  | Remark |
|-------------------|--------------------------------|-------------------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent                        | E4408B                  | MY45107753    | 07/24/2014 | (1)    |
| Pre Amplifier     | Agilent                        | 8449B                   | 3008A02237    | 02/24/2015 | (1)    |
| Horn Antenna      | SCHWARZBECK<br>MESS-ELEKTRONIK | 9120D                   | 9120D-550     | 06/11/2014 | (1)    |
| Microwave Cable   | EMCI                           | EMC-104-SM-SM-1<br>4000 | 140202        | 02/24/2015 | (1)    |
| Microwave Cable   | EMCI                           | EMC104-SM-SM-6<br>00    | 140301        | 02/24/2015 | (1)    |
| Test Site         | ATL                            | TE01                    | 888001        | 08/28/2014 | (1)    |

Remark: (1) Calibration period 1 year.

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

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

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

**6.5. Test Result**

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 2                  | Date:                | 04/27/2015   |
| Frequency:    | 2402 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 2362.470        | 41.38          | -0.59                 | 40.79           | 74.00          | -33.21      | peak   | H                |
| 2390.000        | 38.17          | -0.46                 | 37.71           | 74.00          | -36.29      | peak   | H                |
| 2370.170        | 40.69          | -0.55                 | 40.14           | 74.00          | -33.86      | peak   | V                |
| 2390.000        | 38.25          | -0.46                 | 37.79           | 74.00          | -36.21      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 2                  | Date:                | 04/27/2015   |
| Frequency:    | 2480 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 2483.500        | 44.48          | -0.06                 | 44.42           | 74.00          | -29.58      | peak   | H                |
| 2484.160        | 49.97          | -0.06                 | 49.91           | 74.00          | -24.09      | peak   | H                |
| 2483.500        | 54.24          | -0.06                 | 54.18           | 74.00          | -19.82      | peak   | V                |
| 2483.500        | 33.55          | -0.06                 | 33.49           | 54.00          | -20.51      | AVG    | V                |
| 2483.580        | 54.34          | -0.06                 | 54.28           | 74.00          | -19.72      | peak   | V                |
| 2483.580        | 33.52          | -0.06                 | 33.46           | 54.00          | -20.54      | AVG    | V                |



|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 4                  | Date:                | 04/27/2015   |
| Frequency:    | 2402 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 2365.330        | 41.37          | -0.57                 | 40.80           | 74.00          | -33.20      | peak   | H                |
| 2390.000        | 39.86          | -0.46                 | 39.40           | 74.00          | -34.60      | peak   | H                |
| 2362.800        | 41.11          | -0.59                 | 40.52           | 74.00          | -33.48      | peak   | V                |
| 2390.000        | 39.50          | -0.46                 | 39.04           | 74.00          | -34.96      | peak   | V                |

|               |                         |                      |              |
|---------------|-------------------------|----------------------|--------------|
| Standard:     | FCC Part 15C            | Test Distance:       | 3m           |
| Test item:    | Radiated Emission       | Power:               | AC 120V/60Hz |
| Model Number: | H7550ST Extension Board | Temp.(°C)/Hum.(%RH): | 26(°C)/60%RH |
| Mode:         | Mode 4                  | Date:                | 04/27/2015   |
| Frequency:    | 2480 MHz                | Test By:             | Eric Ou Yang |
| Host:         | H6518BD                 |                      |              |

| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| 2483.500        | 58.47          | -0.06                 | 58.41           | 74.00          | -15.59      | peak   | H                |
| 2483.500        | 34.19          | -0.06                 | 34.13           | 54.00          | -19.87      | AVG    | H                |
| 2483.560        | 60.13          | -0.06                 | 60.07           | 74.00          | -13.93      | peak   | H                |
| 2483.560        | 34.15          | -0.06                 | 34.09           | 54.00          | -19.91      | AVG    | H                |
| 2483.500        | 60.87          | -0.06                 | 60.81           | 74.00          | -13.19      | peak   | V                |
| 2483.500        | 34.62          | -0.06                 | 34.56           | 54.00          | -19.44      | AVG    | V                |
| 2483.600        | 61.79          | -0.06                 | 61.73           | 74.00          | -12.27      | peak   | V                |
| 2483.600        | 34.56          | -0.06                 | 34.50           | 54.00          | -19.50      | AVG    | V                |

| Standard:          | FCC Part 15C            | Test Distance:           | 3m                 |                   |                |        |                     |
|--------------------|-------------------------|--------------------------|--------------------|-------------------|----------------|--------|---------------------|
| Test item:         | Radiated Emission       | Power:                   | AC 120V/60Hz       |                   |                |        |                     |
| Model Number:      | H7550ST Extension Board | Temp.(°C)/Hum.(%RH):     | 26(°C)/60%RH       |                   |                |        |                     |
| Mode:              | Hopping                 | Date:                    | 04/27/2015         |                   |                |        |                     |
| Host:              | H6518BD                 | Test By:                 | Eric Ou Yang       |                   |                |        |                     |
| Frequency<br>(MHz) | Reading<br>(dBuV)       | Correct Factor<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark | Ant.Polar.<br>H / V |
| 2312.850           | 42.98                   | -0.80                    | 42.18              | 74.00             | -31.82         | peak   | H                   |
| 2390.000           | 39.37                   | -0.46                    | 38.91              | 74.00             | -35.09         | peak   | H                   |
| 2483.500           | 37.47                   | -0.06                    | 37.41              | 74.00             | -36.59         | peak   | H                   |
| 2490.880           | 39.90                   | -0.03                    | 39.87              | 74.00             | -34.13         | peak   | H                   |
| 2355.030           | 40.76                   | -0.62                    | 40.14              | 74.00             | -33.86         | peak   | V                   |
| 2390.000           | 37.85                   | -0.46                    | 37.39              | 74.00             | -36.61         | peak   | V                   |
| 2483.500           | 37.98                   | -0.06                    | 37.92              | 74.00             | -36.08         | peak   | V                   |
| 2489.170           | 40.83                   | -0.04                    | 40.79              | 74.00             | -33.21         | peak   | V                   |

## **7 Antenna Measurement**

### **7.1. Limit**

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b)(4), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **7.2. Antenna Connector Construction**

The antenna used in this product is PCB Antenna. And the maximum Gain of this antenna is only 2.7 dBi.