



**FCC 47 CFR PART 15 SUBPART C**

**CERTIFICATION TEST REPORT**

*For*

**4K IPTV Set Top Box  
MODEL NUMBER: A12E**

**FCC ID: WNA-A12E**

**REPORT NUMBER: 4787944978.2-2**

**ISSUE DATE: June 15, 2017**

*Prepared for*

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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|------------------|-------------------|
| --          | 06/15/17          | Initial Issue    |                   |

| Summary of Test Results                                                                                   |                                           |                                                                                              |              |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------|--------------|
| Clause                                                                                                    | Test Items                                | FCC/IC Rules                                                                                 | Test Results |
| 1                                                                                                         | 6dB Bandwidth and 99% Bandwidth           | FCC 15.247 (a)<br>IC RSS-247 Clause 5.1                                                      | Complied     |
| 2                                                                                                         | Peak Conducted Output Power               | FCC 15.247 (b)<br>IC RSS-247 Clause 5.4                                                      | Complied     |
| 3                                                                                                         | Power Spectral Density                    | FCC 15.27 (e)<br>IC RSS-247 Clause 5.1 (2)                                                   | Complied     |
| 4                                                                                                         | Conducted Bandedge and Spurious           | FCC 15.207<br>RSS-Gen Issue 4 clause 7.2                                                     | Complied     |
| 5                                                                                                         | Radiated Bandedge and Spurious            | FCC 15.247 (d)<br>FCC 15.209<br>FCC 15.205<br>IC RSS-247 Clause 5.5<br>IC RSS-GEN Clause 8.9 | Complied     |
| 6                                                                                                         | Conducted Emission Test For AC Power Port | FCC 15.207<br>RSS-GEN Clause 8.8                                                             | Complied     |
| 7                                                                                                         | Antenna Requirement                       | FCC 15.203<br>RSS-GEN Clause 8.3                                                             | Complied     |
| Remark: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device. |                                           |                                                                                              |              |

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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Shenzhen Skyworth Digital Technology Co., Ltd  
Address: Unit A14/F. Skyworth Building, Gaoxin Ave.1s., Nanshan District, Shenzhen, China

### Manufacturer Information

Company Name: Shenzhen Skyworth Digital Technology Co., Ltd  
Address: Unit A14/F. Skyworth Building, Gaoxin Ave.1s., Nanshan District, Shenzhen, China

### EUT Description

Product Name: 4K IPTV Set Top Box  
Brand Name: VectorMax  
Model Name: A12E  
FCC ID: WNA-A12E  
Date Tested: June 08, 2017 ~ June 12, 2017

| APPLICABLE STANDARDS     |              |
|--------------------------|--------------|
| STANDARD                 | TEST RESULTS |
| CFR 47 Part 15 Subpart C | PASS         |

Tested By:



Leo Liu  
Engineer

Checked By:



Shawn Wen  
Laboratory Leader

Approved By:



Stephen Guo  
Laboratory Manager

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 2.

## 3. FACILITIES AND ACCREDITATION

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Location             | Dongguan Dongdian Testing Service Co., Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Address                   | No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Dongguan City, Guangdong Province, 523808, China                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Accreditation Certificate | <p>Dongguan Dongdian Testing Service Co., Ltd.<br/>EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until January 31, 2018.</p> <p>Dongguan Dongdian Testing Service Co., Ltd.<br/>EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 270092, Renewal date March 11, 2015, valid time is until March 11, 2018.</p> <p>The 3m Alternate Test Site of Dongguan Dongdian Testing Service Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 10288A on April 23, 2015, valid time is until April 23, 2018.</p> |

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                                                                                                                                     | UNCERTAINTY                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Bandwidth                                                                                                                                     | 1.1%                              |
| Peak Output Power(Conducted)( Spectrum analyzer)                                                                                              | 0.86dB(10 MHz $\leq$ f < 3.6GHz); |
|                                                                                                                                               | 1.38dB(3.6GHz $\leq$ f < 8GHz)    |
| Peak Output Power(Conducted)(Power Sensor)                                                                                                    | 0.74dB                            |
| Dwell Time                                                                                                                                    | 0.6%                              |
| Conducted spurious emissions                                                                                                                  | 0.86dB(10 MHz $\leq$ f < 3.6GHz); |
|                                                                                                                                               | 1.40dB(3.6GHz $\leq$ f < 8GHz)    |
|                                                                                                                                               | 1.66dB(8GHz $\leq$ f < 22GHz)     |
| Uncertainty for radio frequency (RBW<20KHz)                                                                                                   | 3 $\times$ 10 <sup>-8</sup>       |
| Temperature                                                                                                                                   | 0.4℃                              |
| Humidity                                                                                                                                      | 2%                                |
| Uncertainty for Radiation Emission test<br>(30MHz-1GHz)                                                                                       | 4.70 dB (Antenna Polarize: V)     |
|                                                                                                                                               | 4.84 dB (Antenna Polarize: H)     |
| Uncertainty for Radiation Emission test<br>(1GHz-18GHz)                                                                                       | 4.10dB(1-6GHz)                    |
|                                                                                                                                               | 4.40dB (6GHz-18Gz)                |
| Uncertainty for Power line conduction emission test                                                                                           | 3.32dB (150KHz-30MHz)             |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                                   |

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

|                     |                                                         |                     |           |
|---------------------|---------------------------------------------------------|---------------------|-----------|
| Equipment           | 4K IPTV Set Top Box                                     |                     |           |
| Model Name          | A12E                                                    |                     |           |
| Product Description | Operation Frequency                                     | 2402 MHz ~ 2480 MHz |           |
|                     | Modulation Type                                         |                     | Data Rate |
|                     | GFSK                                                    |                     | 1Mbps     |
| Bluetooth Version   | BT 4.0                                                  |                     |           |
| Battery             | N/A                                                     |                     |           |
| Power Adapter       | Input: AC 100~240V, 50/60Hz, 0.5A<br>Output: DC 12V, 1A |                     |           |

### 5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | Number of Transmit Chains (NTX) | Bluetooth Mode | Frequency (MHz) | Channel Number | Max PK Conducted Power (dBm) |
|-----------------------|---------------------------------|----------------|-----------------|----------------|------------------------------|
| 2400-2483.5           | 1                               | BLE            | 2402-2480       | 0-39[40]       | 8.540                        |

### 5.3. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 00      | 2402            | 11      | 2424            | 22      | 2446            | 33      | 2468            |
| 01      | 2404            | 12      | 2426            | 23      | 2448            | 34      | 2470            |
| 02      | 2406            | 13      | 2428            | 24      | 2450            | 35      | 2472            |
| 03      | 2408            | 14      | 2430            | 25      | 2452            | 36      | 2474            |
| 04      | 2410            | 15      | 2432            | 26      | 2454            | 37      | 2476            |
| 05      | 2412            | 16      | 2434            | 27      | 2456            | 38      | 2478            |
| 06      | 2414            | 17      | 2436            | 28      | 2458            | 39      | 2480            |
| 07      | 2416            | 18      | 2438            | 29      | 2460            |         |                 |
| 08      | 2418            | 19      | 2440            | 30      | 2462            |         |                 |
| 09      | 2420            | 20      | 2442            | 31      | 2464            |         |                 |
| 10      | 2422            | 21      | 2444            | 32      | 2466            |         |                 |

#### 5.4. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel        | Frequency                 |
|-----------|---------------------|---------------------------|
| GFSK      | CH 00, CH 19, CH 39 | 2402MHz, 2440MHz, 2480MHz |

#### 5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band |                         |                        |         |         |
|--------------------------------------------------------------------|-------------------------|------------------------|---------|---------|
| Test Software Version                                              |                         | Bluetooth MP Test Tool |         |         |
| Modulation Type                                                    | Transmit Antenna Number | Test Channel           |         |         |
|                                                                    |                         | CH 00                  | CH 19   | CH 39   |
| GFSK                                                               | 1                       | default                | default | default |

#### 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|------|-----------------|--------------|--------------------|
| 2    | 2402-2480       | PCB Antenna  | 5                  |

| Test Mode | Transmit and Receive Mode | Description                                            |
|-----------|---------------------------|--------------------------------------------------------|
| GFSK      | ☒1TX, 1RX                 | Chain 1 can be used as transmitting/receiving antenna. |

#### 5.7. WORST-CASE CONFIGURATIONS

| Bluetooth Mode | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|----------------|-----------------------|-----------------|------------------|
| BLE            | DTS                   | GFSK            | 1Mbit/s          |

#### 5.8. DESCRIPTION OF TEST SETUP

##### SUPPORT EQUIPMENT

| Item | Equipment   | Brand Name | Model Name    | Remarks |
|------|-------------|------------|---------------|---------|
| 1    | Laptop      | ThinkPad   | Latitude D610 | N/A     |
| 2    | LCD Monitor | DELL       | S2440Lb       | N/A     |

##### I/O CABLES

| Cable No | Port      | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|-----------|----------------|------------|-----------------|---------|
| 1        | USB out 1 | USB            | Unshielded | 0.50            | N/A     |

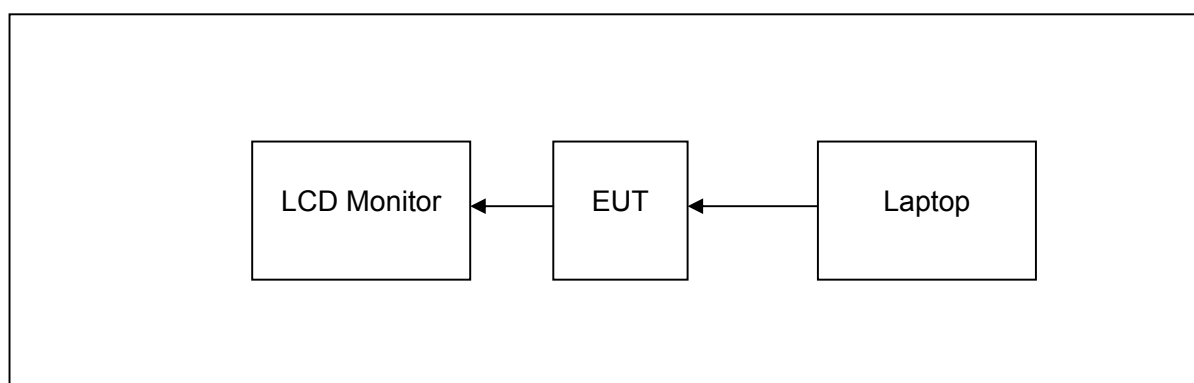
**ACCESSORY**

| Item | Accessory     | Brand Name | Model Name       | Description                                             |
|------|---------------|------------|------------------|---------------------------------------------------------|
| 1    | Power Adapter | GIANTSUN   | GSCU1000S012V15G | Input: AC 100~240V, 50/60Hz, 0.5A<br>Output: DC 12V, 1A |

**TEST SETUP**

The EUT can work in an engineer mode with a software through a Laptop.

**SETUP DIAGRAM FOR TESTS**



## 5.9. MEASURING INSTRUMENT AND SOFTWARE USED

| Instrument (Conducted for RF Port)  |                                     |                                    |             |                |               |               |
|-------------------------------------|-------------------------------------|------------------------------------|-------------|----------------|---------------|---------------|
| Used                                | Equipment                           | Manufacturer                       | Model No.   | Serial No.     | Last Cal.     | Due. Date     |
| <input checked="" type="checkbox"/> | Spectrum analyzer                   | R&S                                | FSU26       | 1166.1660.26   | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/> | Wideband Radio Communication tester | R&S                                | CMW500      | 155523         | Dec. 20, 2016 | Dec. 20, 2017 |
| <input checked="" type="checkbox"/> | Vector Signal Generator             | Agilent                            | E8267D      | MY52098743     | Oct. 20, 2016 | Oct. 20, 2017 |
| <input checked="" type="checkbox"/> | Vector Signal Generator             | Agilent                            | N5182A      | MY48180737     | Jul. 05, 2016 | Jul. 05, 2017 |
| <input checked="" type="checkbox"/> | Power Sensor                        | Agilent                            | U2021XA     | MY55150010     | Apr. 18, 2017 | Apr. 18, 2018 |
| <input checked="" type="checkbox"/> | Power Sensor                        | Agilent                            | U2021XA     | MY55150011     | Apr. 19, 2017 | Apr. 19, 2018 |
| <input checked="" type="checkbox"/> | DC Power Source                     | MATRIS                             | MPS-3005L-3 | D813058W       | Oct. 24, 2016 | Oct. 24, 2017 |
| <input checked="" type="checkbox"/> | Attenuator                          | Mini-Circuits                      | BW-S10W2    | 101109         | Aug. 18, 2016 | Aug. 18, 2017 |
| <input checked="" type="checkbox"/> | RF Cable                            | Micable                            | C10-01-01-1 | 100309         | Aug. 18, 2016 | Aug. 18, 2017 |
| <input checked="" type="checkbox"/> | Test Software                       | JS Tonscend                        | JS1120-2    | Ver.2.5        | N/A           | N/A           |
| <input checked="" type="checkbox"/> | USB Data acquisition                | Agilent                            | U2531A      | TW55043503     | N/A           | N/A           |
| <input checked="" type="checkbox"/> | Auto control Unit                   | JS Tonscend                        | JS0806-2    | 158060010      | N/A           | N/A           |
| Instrument (Radiated Tests)         |                                     |                                    |             |                |               |               |
| Used                                | Equipment                           | Manufacturer                       | Model No.   | Serial No.     | Last Cal.     | Expired date  |
| <input checked="" type="checkbox"/> | EMI Test Receiver                   | R&S                                | ESU8        | 100316         | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/> | PSA Series Spectrum analyzer        | Agilent                            | E4447A      | MY5018003<br>1 | Jul. 06, 2016 | Jul. 06, 2017 |
| <input checked="" type="checkbox"/> | Trilog Broadband Antenna            | Schwarzbeck                        | VULB9163    | 9163-462       | Oct. 27, 2016 | Oct. 27, 2017 |
| <input checked="" type="checkbox"/> | Active Loop antenna                 | Schwarzbeck                        | FMZB-1519   | 1519-038       | Oct. 27, 2016 | Oct. 27, 2017 |
| <input checked="" type="checkbox"/> | Double Ridged Horn Antenna          | R&S                                | HF907       | 100276         | Oct. 12, 2016 | Oct. 12, 2017 |
| <input checked="" type="checkbox"/> | Horn Antenna                        | ETS-LINDGREN                       | 3160-09     | SEL0076        | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/> | Pre-amplifier                       | A.H.                               | PAM-0118    | 360            | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/> | Pre-amplifier                       | Compliance Directions Systems Inc. | PAP-1G26-48 | 6279.628       | Oct. 16, 2016 | Oct. 16, 2017 |

| <input checked="" type="checkbox"/>            | RF Cable      | HUBSER       | CP-X2        | W11.03     | Oct. 16, 2016 | Oct. 16, 2017 |
|------------------------------------------------|---------------|--------------|--------------|------------|---------------|---------------|
| <input checked="" type="checkbox"/>            | RF Cable      | HUBSER       | CP-X1        | W12.02     | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/>            | MI Cable      | HUBSER       | C10-01-01-1M | 1091629    | Oct. 16, 2016 | Oct. 16, 2017 |
| <input checked="" type="checkbox"/>            | Test software | Audix        | E3           | V 6.11111b | N/A           | N/A           |
| Instrument (Line Conducted Emission (AC Main)) |               |              |              |            |               |               |
| Used                                           | Equipment     | Manufacturer | Model No.    | Serial No. | Last Cal.     | Expired date  |
| <input checked="" type="checkbox"/>            | Test Receiver | R&S          | ESU8         | 100316     | Oct.16, 2016  | Oct.16, 2017  |
| <input checked="" type="checkbox"/>            | LISN 1        | R&S          | ENV216       | 101109     | Oct.16, 2016  | Oct.16, 2017  |
| <input checked="" type="checkbox"/>            | LISN 2        | R&S          | ESH2-Z5      | 100309     | Oct.16, 2016  | Oct.16, 2017  |
| <input checked="" type="checkbox"/>            | Pulse Limiter | R&S          | ESH3-Z2      | 101242     | Oct.16, 2016  | Oct.16, 2017  |
| <input checked="" type="checkbox"/>            | CE Cable 1    | HUBSER       | ESU8/RF2     | W10.01     | Oct.16, 2016  | Oct.16, 2017  |
| <input checked="" type="checkbox"/>            | Test software | Audix        | E3           | V 6.11111b | N/A           | N/A           |

## 6. MEASUREMENT METHODS

| No. | Test Item                                     | Standard                                                                         | Results |
|-----|-----------------------------------------------|----------------------------------------------------------------------------------|---------|
| 1   | 6 dB Bandwidth                                | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>RSS-247 Issue 2                       | PASS    |
| 2   | Peak Output Power                             | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>RSS-247 Issue 2                       | PASS    |
| 3   | Power Spectral Density                        | FCC Part 15:15.247<br>ANSI C63.10:2013<br>RSS-247 Issue 2                        | PASS    |
| 4   | Out-of-band emissions in non-restricted bands | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>RSS-247 Issue 2<br>RSS-Gen Issue 4    | PASS    |
| 5   | Out-of-band emissions in restricted bands     | FCC Part 15: 15.247<br>ANSI C63.10:2013<br>RSS-247 Issue 2<br>RSS-Gen Issue 4    | PASS    |
| 6   | Band-edge                                     | FCC Part 15: 15.209<br>FCC Part 15: 15.247<br>RSS-247 Issue 2<br>RSS-Gen Issue 4 | PASS    |
| 7   | Conducted Emission Test For AC Power Port     | FCC Part 15: 15.207<br>RSS-Gen Issue 4                                           | PASS    |

## 7. ANTENNA PORT TEST RESULTS

### 7.1. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

#### LIMITS

| FCC Part15 (15.247) , Subpart C<br>IC RSS-247 ISSUE 1 |                |                              |                       |
|-------------------------------------------------------|----------------|------------------------------|-----------------------|
| Section                                               | Test Item      | Limit                        | Frequency Range (MHz) |
| FCC 15.247(a)(2)<br>IC RSS-247 5.1 (1)                | 6 dB Bandwidth | $\geq 500\text{KHz}$         | 2400-2483.5           |
| RSS-Gen Clause 4.4.1                                  | 99% Bandwidth  | for reporting purposes only. | 2400-2483.5           |

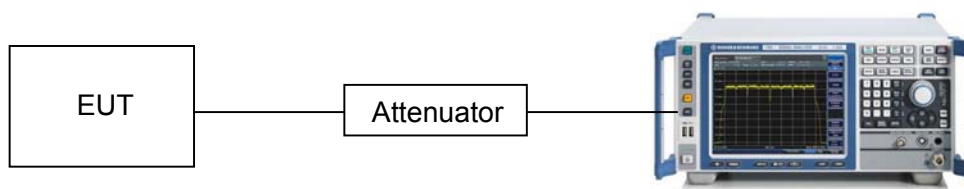
#### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                |
|------------------|------------------------------------------------|
| Center Frequency | The centre frequency of the channel under test |
| Detector         | Peak                                           |
| RBW              | 100K                                           |
| VBW              | $\geq 3 \times \text{RBW}$                     |
| Trace            | Max hold                                       |
| Sweep            | Auto couple                                    |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### TEST SETUP



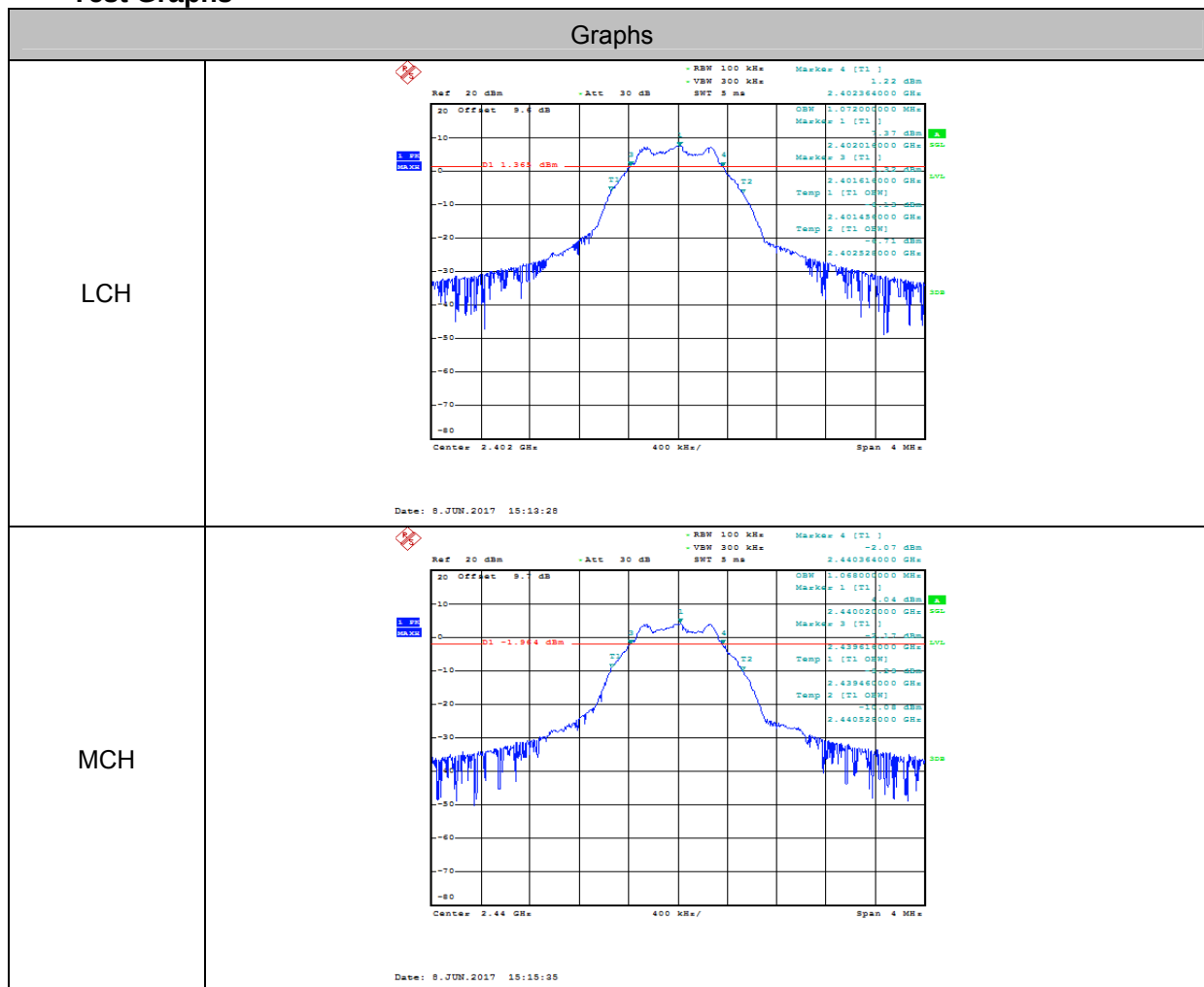
## TEST CONDITIONS

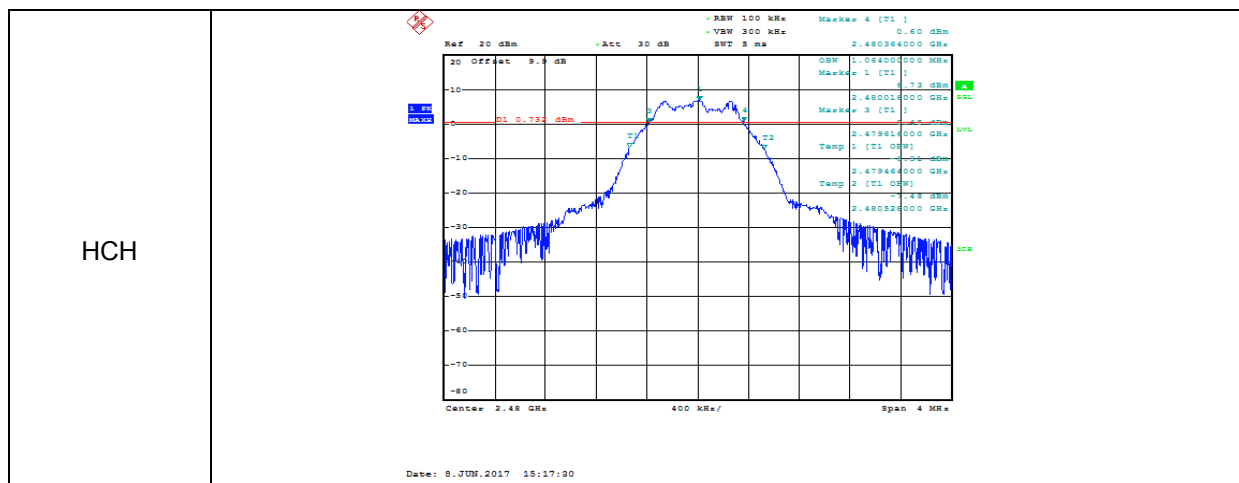
Temperature: 24.6°C  
Relative Humidity: 58%  
Test Voltage: AC 120V/60HZ

## RESULTS

| Mode | Channel | 6dB Bandwidth [MHz] | 99% OBW[MHz] | Verdict |
|------|---------|---------------------|--------------|---------|
| BLE  | LCH     | 0.748               | 1.072        | PASS    |
| BLE  | MCH     | 0.748               | 1.068        | PASS    |
| BLE  | HCH     | 0.748               | 1.064        | PASS    |

## Test Graphs





## 7.2. PEAK CONDUCTED OUTPUT POWER

### LIMITS

| FCC Part15 (15.247) , Subpart C<br>IC RSS-247 ISSUE 1 |                      |                 |                          |
|-------------------------------------------------------|----------------------|-----------------|--------------------------|
| Section                                               | Test Item            | Limit           | Frequency Range<br>(MHz) |
| FCC 15.247(b)(3)<br>IC RSS-247 5.4 (4)                | Peak Output<br>Power | 1 watt or 30dBm | 2400-2483.5              |

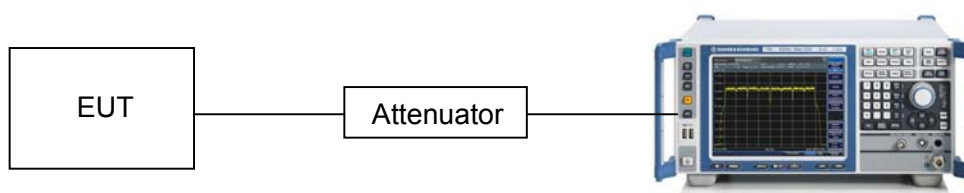
### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                |
|------------------|------------------------------------------------|
| Center Frequency | The centre frequency of the channel under test |
| Detector         | Peak                                           |
| RBW              | $\geq$ DTS bandwidth(e.g. 1 MHz for BLE)       |
| VBW              | $\geq 3 \times$ RBW                            |
| Span             | 3 x RBW                                        |
| Trace            | Max hold                                       |
| Sweep time       | Auto couple.                                   |

Allow trace to fully stabilize and use peak marker function to determine the peak amplitude level.

### TEST SETUP



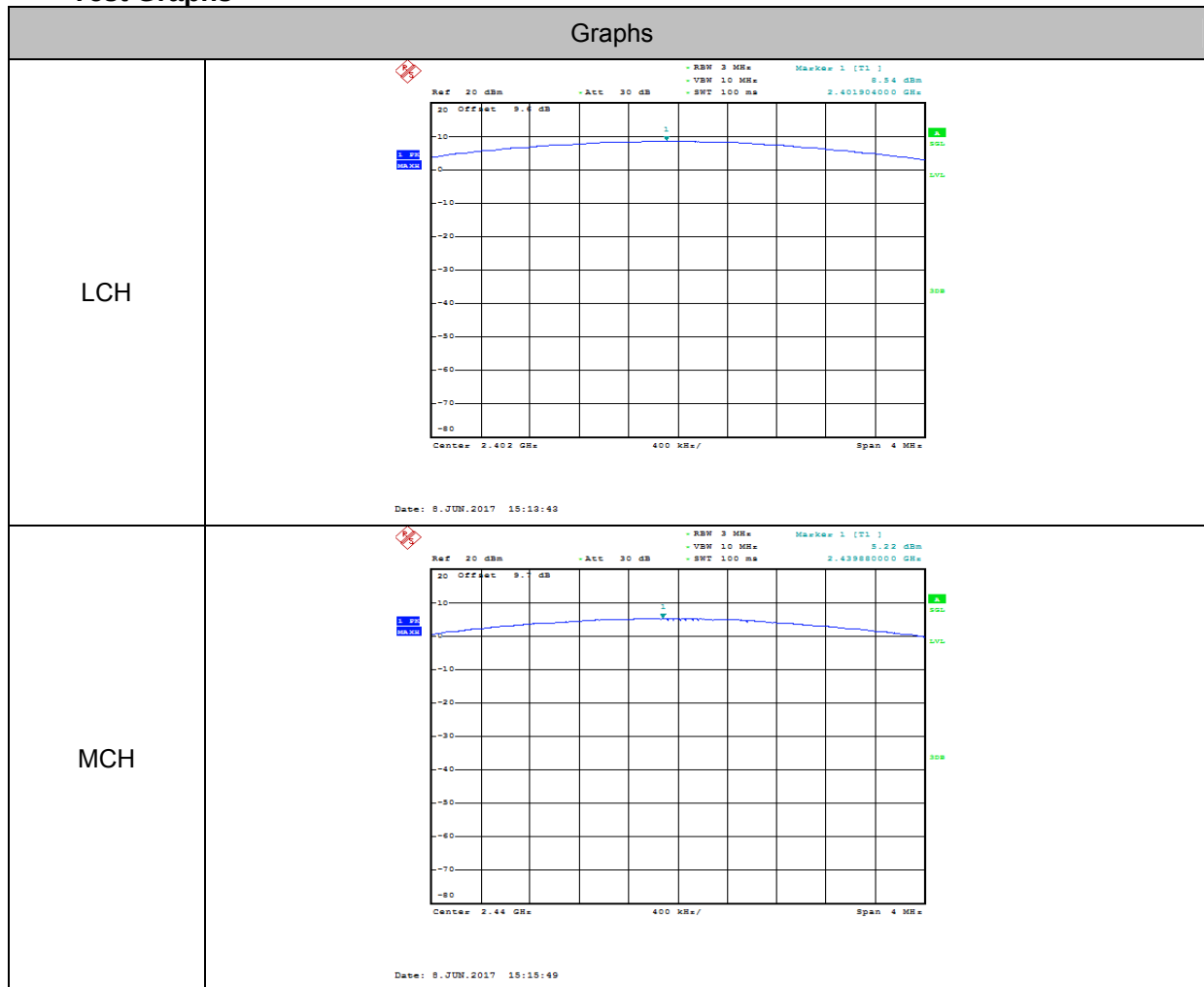
### TEST CONDITIONS

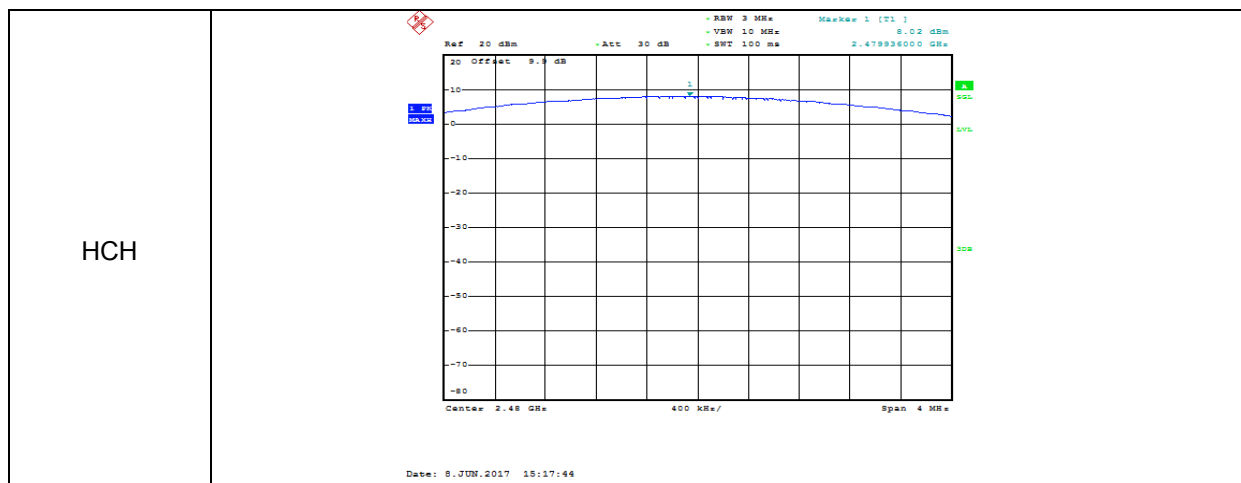
Temperature: 24.6°C  
Relative Humidity: 58%  
Test Voltage: AC 120V/60HZ

## RESULTS

| Mode | Channel | Conduct Peak Power[dBm] | Verdict |
|------|---------|-------------------------|---------|
| BLE  | LCH     | 8.540                   | PASS    |
| BLE  | MCH     | 5.220                   | PASS    |
| BLE  | HCH     | 8.020                   | PASS    |

## Test Graphs





### 7.3. POWER SPECTRAL DENSITY

#### LIMITS

| FCC Part15 (15.247) , Subpart C<br>IC RSS-247 ISSUE 1 |                           |                            |                          |
|-------------------------------------------------------|---------------------------|----------------------------|--------------------------|
| Section                                               | Test Item                 | Limit                      | Frequency Range<br>(MHz) |
| FCC §15.247 (e)<br>IC RSS-247 5.2 (2)                 | Power Spectral<br>Density | 8 dBm in any 3 kHz<br>band | 2400-2483.5              |

#### TEST PROCEDURE

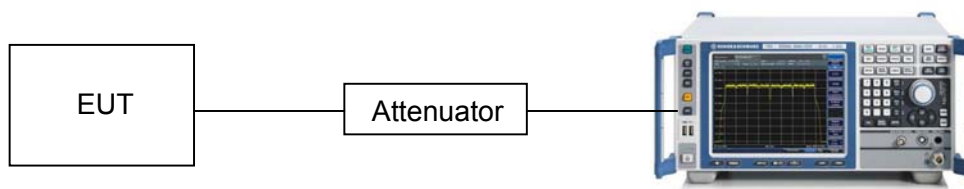
Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                    |
|------------------|----------------------------------------------------|
| Center Frequency | The centre frequency of the channel under test     |
| Detector         | Peak                                               |
| RBW              | $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$ |
| VBW              | $\geq 3 \times \text{RBW}$                         |
| Span             | 1.5 x DTS bandwidth                                |
| Trace            | Max hold                                           |
| Sweep time       | Auto couple.                                       |

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### TEST SETUP



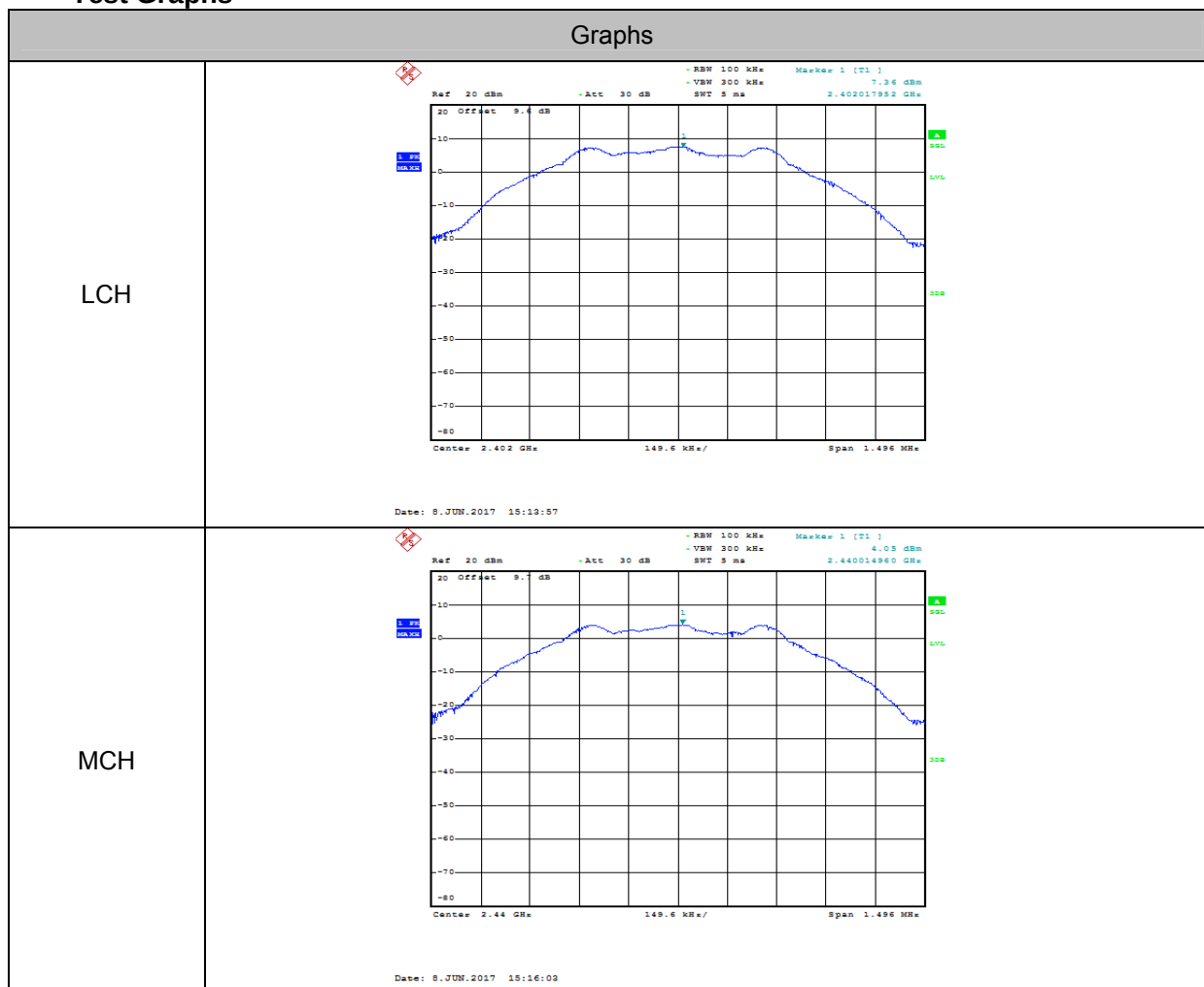
#### TEST CONDITIONS

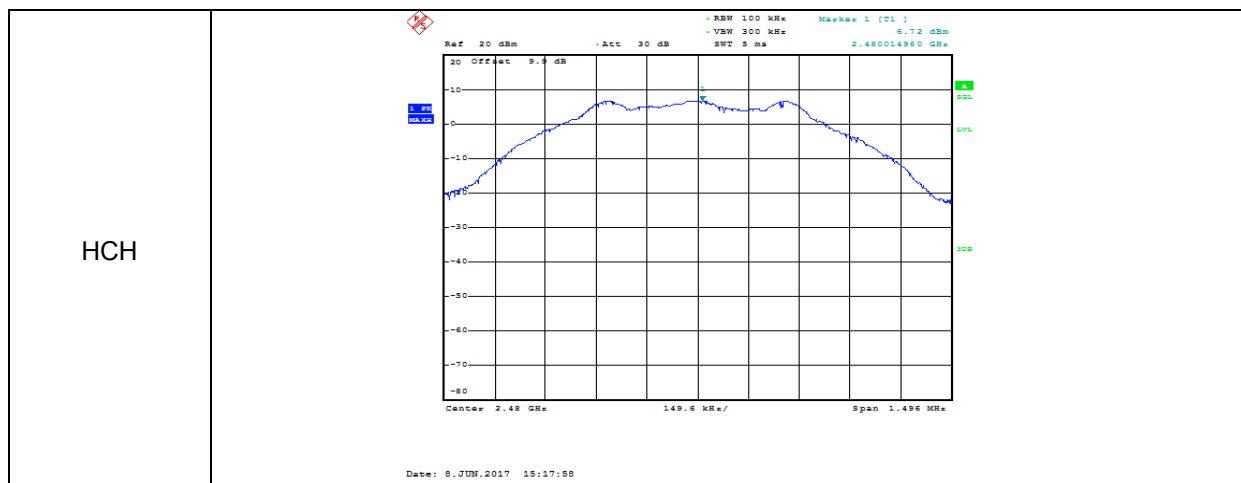
Temperature: 24.6° C  
Relative Humidity: 58%  
Test Voltage: AC 120V/60HZ

## RESULTS

| Mode | Channel | PSD [dBm] | Verdict |
|------|---------|-----------|---------|
| BLE  | LCH     | 7.360     | PASS    |
| BLE  | MCH     | 4.050     | PASS    |
| BLE  | HCH     | 6.720     | PASS    |

## Test Graphs





## 7.4. CONDUCTED BANDEDGE

### LIMITS

| FCC Part15 (15.247) , Subpart C<br>IC RSS-247 ISSUE 1 |                                                 |                                                                                                                               |
|-------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Section                                               | Test Item                                       | Limit                                                                                                                         |
| FCC §15.247 (d)<br>IC RSS-247 5.5                     | Conducted<br>Bandedge and<br>Spurious Emissions | at least 20 dB below that in the 100 kHz<br>bandwidth within the band that contains the<br>highest level of the desired power |

### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

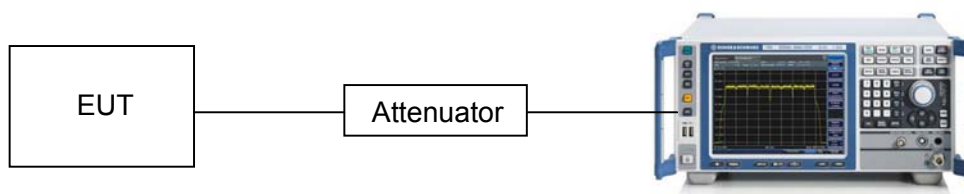
|                  |                                                |
|------------------|------------------------------------------------|
| Center Frequency | The centre frequency of the channel under test |
| Detector         | Peak                                           |
| RBW              | 100K                                           |
| VBW              | $\geq 3 \times \text{RBW}$                     |
| Span             | 1.5 x DTS bandwidth                            |
| Trace            | Max hold                                       |
| Sweep time       | Auto couple.                                   |

Use the peak marker function to determine the maximum PSD level.

|                    |                                                                               |
|--------------------|-------------------------------------------------------------------------------|
| Span               | Set the center frequency and span to encompass frequency range to be measured |
| Detector           | Peak                                                                          |
| RBW                | 100K                                                                          |
| VBW                | $\geq 3 \times \text{RBW}$                                                    |
| measurement points | $\geq \text{span}/\text{RBW}$                                                 |
| Trace              | Max hold                                                                      |
| Sweep time         | Auto couple.                                                                  |

Use the peak marker function to determine the maximum amplitude level.

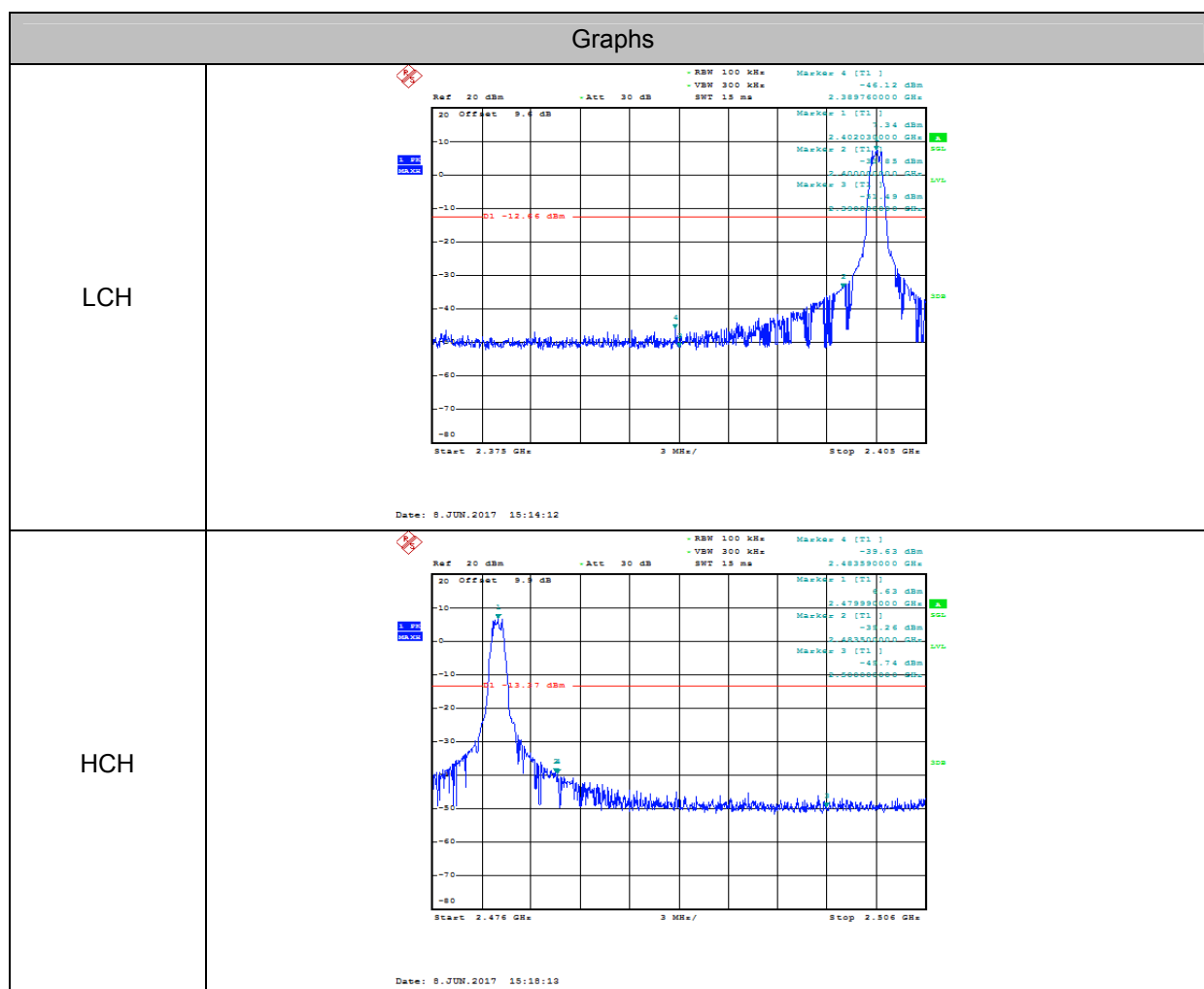
## TEST SETUP



## TEST CONDITIONS

Temperature: 24.6° C  
Relative Humidity: 58%  
Test Voltage: AC 120V/60HZ

## RESULTS



## 8. RADIATED TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to IC RSS-GEN Clause 8.9 (Transmitter)

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

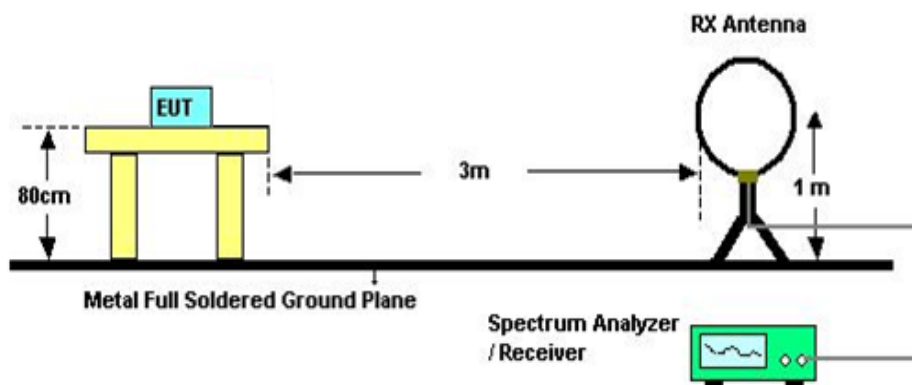
| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009~0.490     | 2400/F(KHz)                       | 300                           |
| 0.490~1.705     | 24000/F(KHz)                      | 30                            |
| 1.705~30.0      | 30                                | 30                            |
| 30~88           | 100                               | 3                             |
| 88~216          | 150                               | 3                             |
| 216~960         | 200                               | 3                             |
| 960~1000        | 500                               | 3                             |

Radiation Disturbance Test Limit for FCC (Above 1G)

| Frequency (MHz) | dB(uV/m) (at 3 meters) |         |
|-----------------|------------------------|---------|
|                 | Peak                   | Average |
| Above 1000      | 74                     | 54      |

## TEST SETUP AND PROCEDURE

Below 30MHz

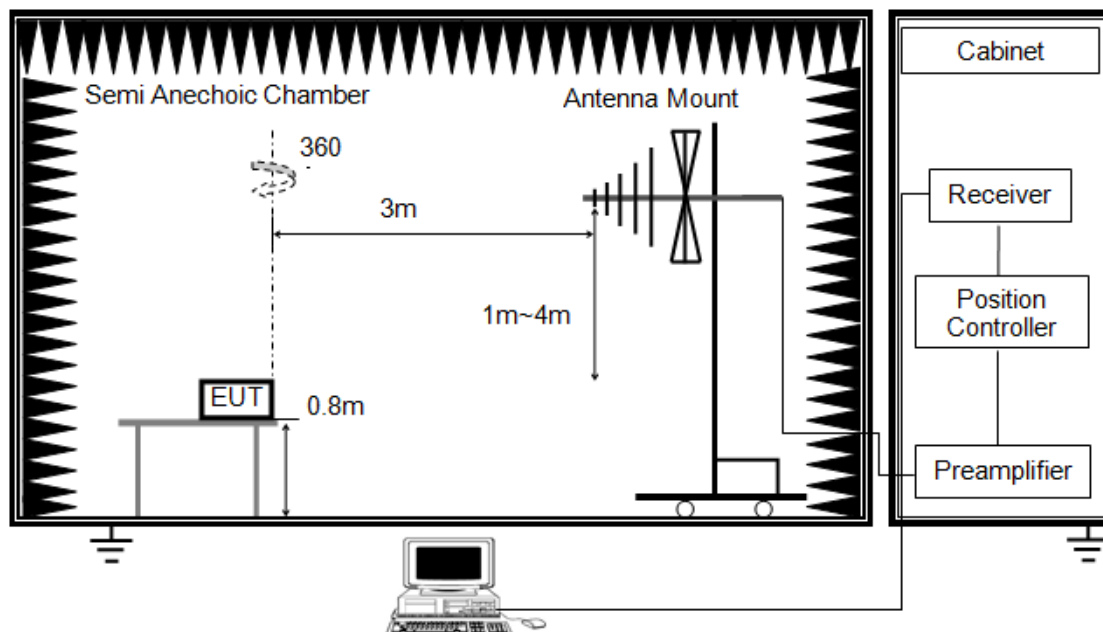


The setting of the spectrum analyser

|          |                                                            |
|----------|------------------------------------------------------------|
| RBW      | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| VBW      | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| Sweep    | Auto                                                       |
| Detector | Peak/QP/ Average                                           |
| Trace    | Max hold                                                   |

1. The testing follows the guidelines in ANSI C63.10-2013
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G

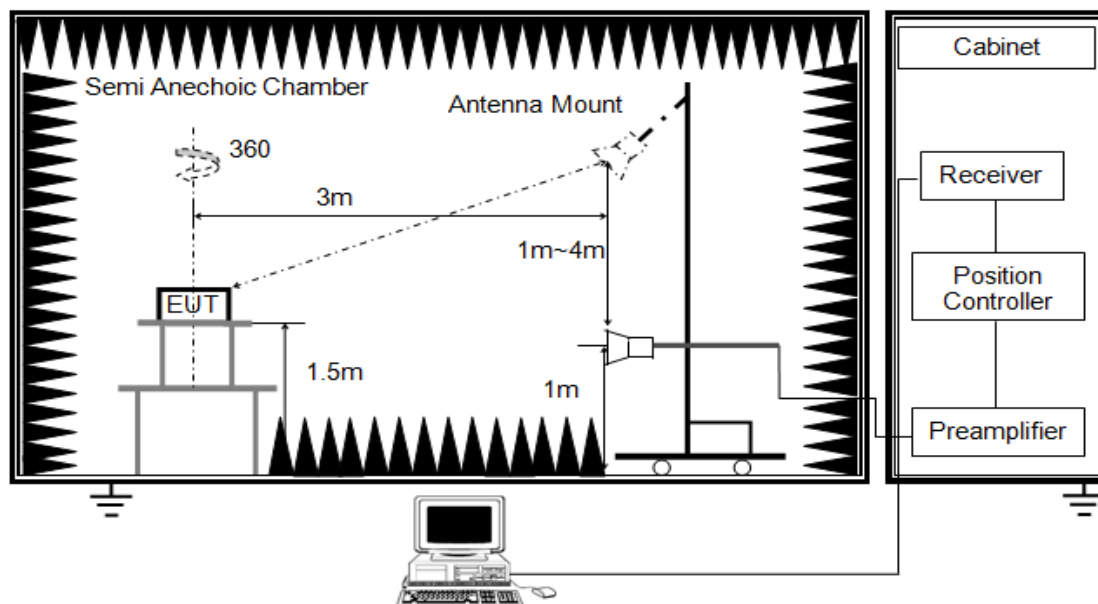


The setting of the spectrum analyser

|          |          |
|----------|----------|
| RBW      | 120K     |
| VBW      | 300K     |
| Sweep    | Auto     |
| Detector | Peak/QP  |
| Trace    | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.
2. 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. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

ABOVE 1G



The setting of the spectrum analyser

|          |                        |
|----------|------------------------|
| RBW      | 1M                     |
| VBW      | 3M                     |
| Sweep    | Auto                   |
| Detector | Peak and CISPR Average |
| Trace    | Max hold               |

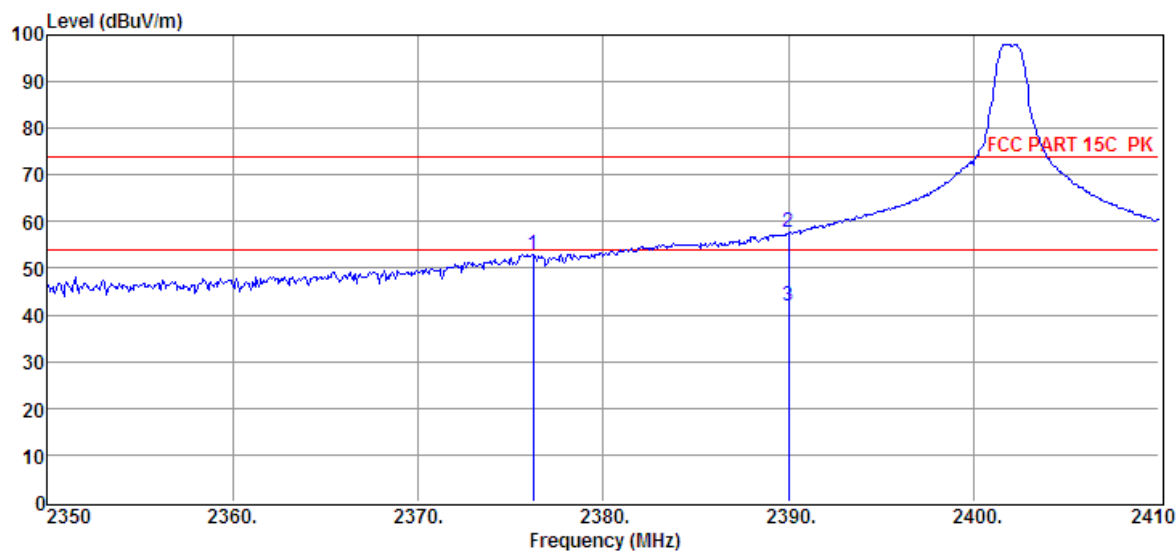
1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement above 1GHz, the emission measurement will be measured by the peak detector and the AV detector.
7. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

**TEST CONDITIONS**

Temperature: 24.8°C  
Relative Humidity: 58%  
Test Voltage: AC 120V/60Hz

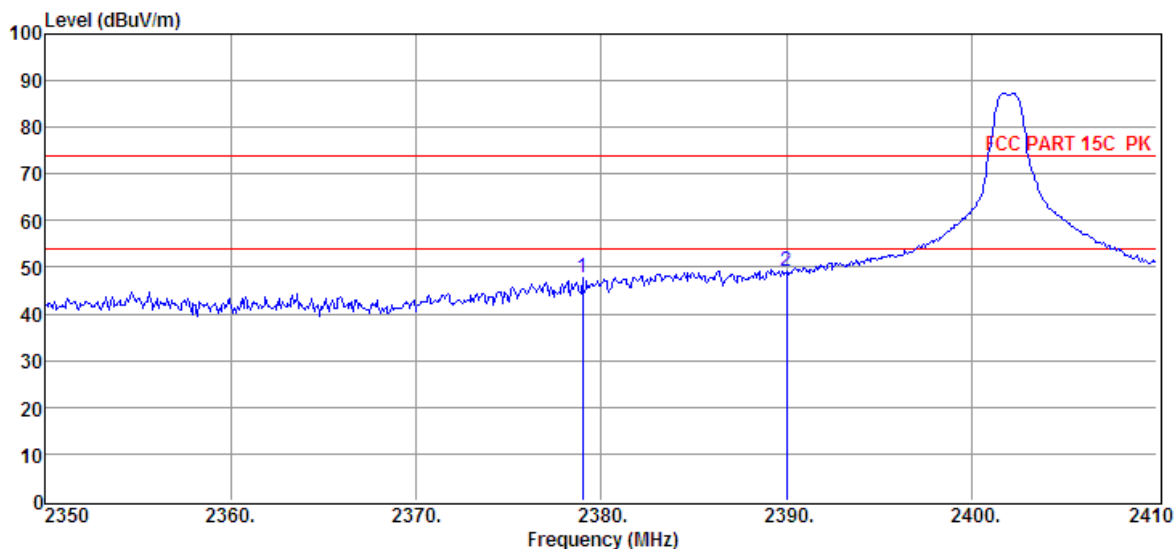
## 8.2. RESTRICTED BANDEDGE

### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



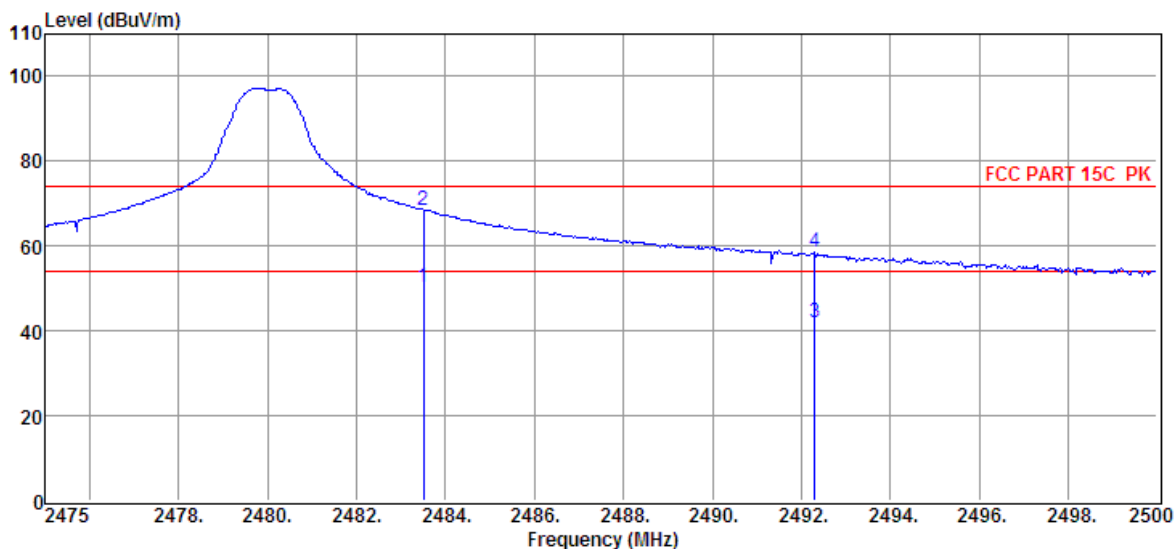
| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBUV) | Antenna<br>Factor<br>(dB/m) | PRM<br>Factor<br>dB | Cable<br>Loss<br>dB | Result<br>Level<br>(dBUV/m) | Limit<br>Line<br>(dBUV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 2376.22        | 46.70                   | 29.72                       | 29.39               | 6.01                | 53.04                       | 74.00                     | -20.96                | Peak     | HORIZONTAL   |
| 2              | 2390.00        | 51.32                   | 29.78                       | 29.42               | 6.03                | 57.71                       | 74.00                     | -16.29                | Peak     | HORIZONTAL   |
| 3              | 2390.02        | 35.63                   | 29.78                       | 29.42               | 6.03                | 42.02                       | 54.00                     | -11.98                | Average  | HORIZONTAL   |

**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



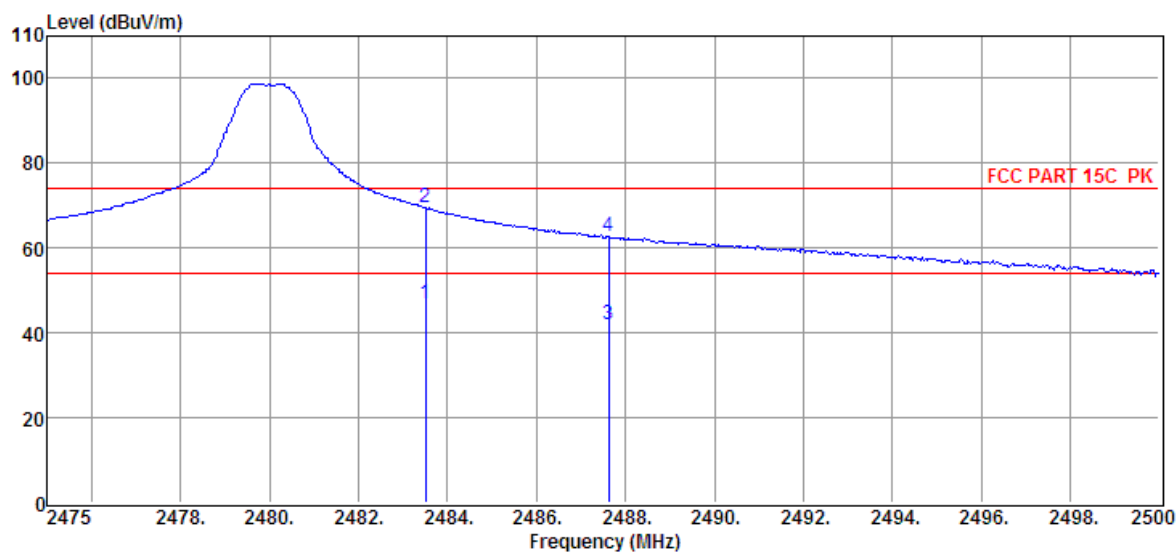
| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBUV) | Antenna<br>Factor<br>(dB/m) | PRM<br>Factor<br>dB | Cable<br>Loss<br>dB | Result<br>Level<br>(dBUV/m) | Limit<br>Line<br>(dBUV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 2378.98        | 41.37                   | 29.73                       | 29.39               | 6.01                | 47.72                       | 74.00                     | -26.28                | Peak     | VERTICAL     |
| 2              | 2390.02        | 42.85                   | 29.78                       | 29.42               | 6.03                | 49.24                       | 74.00                     | -24.76                | Peak     | VERTICAL     |

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB/m) | PRM<br>Factor<br>dB | Cable<br>Loss<br>dB | Result<br>Level<br>(dBuV/m) | Limit<br>Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 2483.50        | 43.53                   | 30.14                       | 29.71               | 6.13                | 50.09                       | 54.00                     | -3.91                 | Average  | HORIZONTAL   |
| 2              | 2483.50        | 62.01                   | 30.14                       | 29.71               | 6.13                | 68.57                       | 74.00                     | -5.43                 | Peak     | HORIZONTAL   |
| 3              | 2492.30        | 35.24                   | 30.17                       | 29.73               | 6.17                | 41.85                       | 54.00                     | -12.15                | Average  | HORIZONTAL   |
| 4              | 2492.30        | 51.84                   | 30.17                       | 29.73               | 6.17                | 58.45                       | 74.00                     | -15.55                | Peak     | HORIZONTAL   |

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



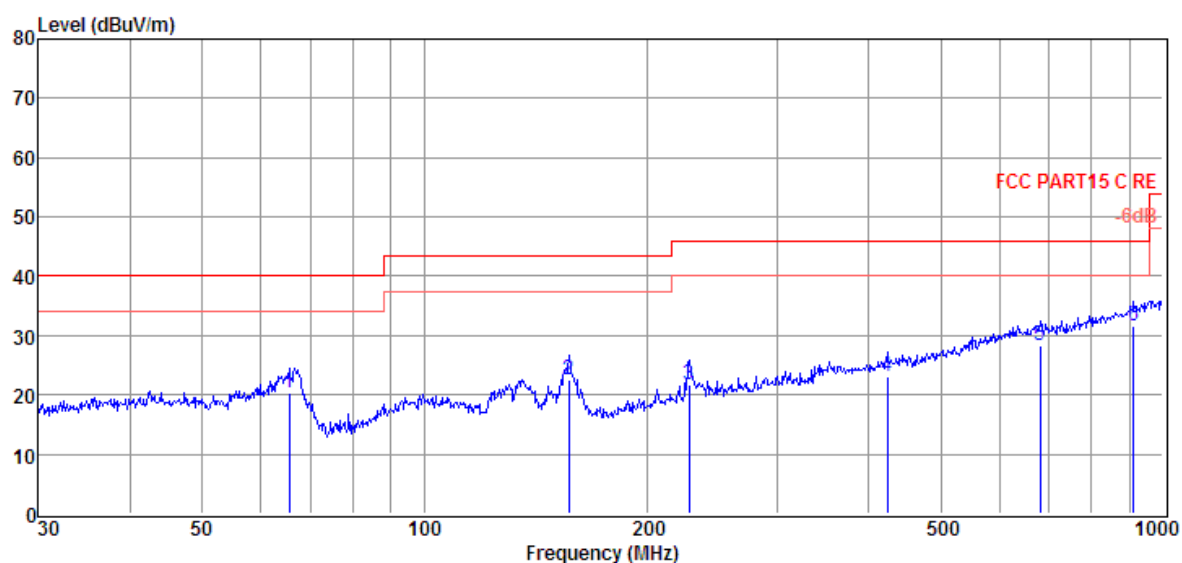
| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | PRM<br>Factor<br>dB | Cable<br>Loss<br>dB | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 2483.50        | 40.24                   | 30.14                       | 29.71               | 6.13                | 46.80                       | 54.00                     | -7.20                 | Average  | VERTICAL     |
| 2              | 2483.50        | 62.92                   | 30.14                       | 29.71               | 6.13                | 69.48                       | 74.00                     | -4.52                 | Peak     | VERTICAL     |
| 3              | 2487.63        | 35.47                   | 30.15                       | 29.71               | 6.13                | 42.04                       | 54.00                     | -11.96                | Average  | VERTICAL     |
| 4              | 2487.63        | 56.32                   | 30.15                       | 29.71               | 6.13                | 62.89                       | 74.00                     | -11.11                | Peak     | VERTICAL     |

Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

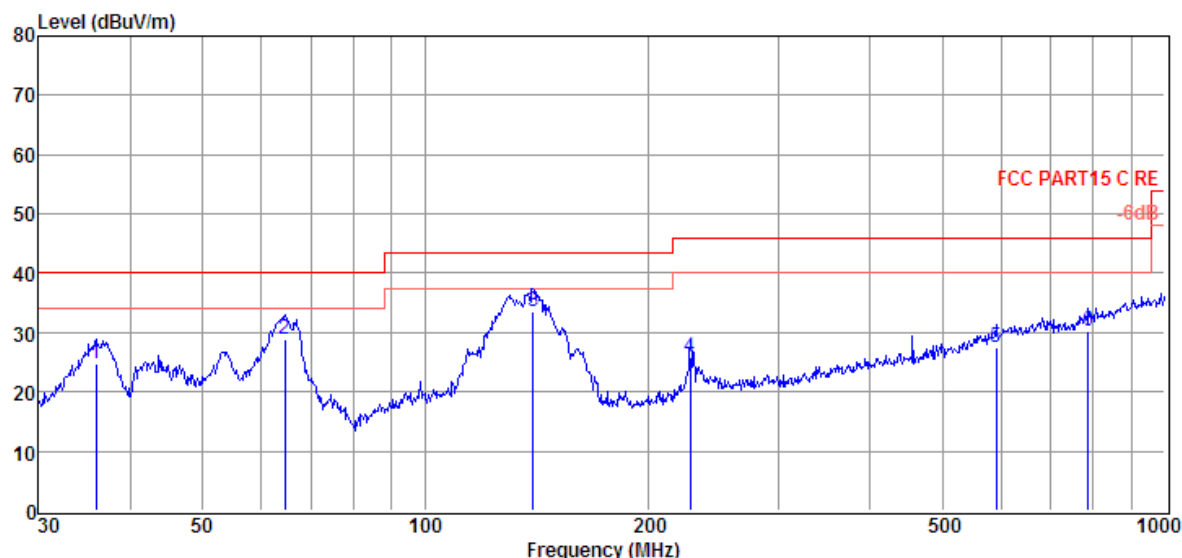
**SPURIOUS EMISSIONS (1~25GHz)**

| Freq (MHz)                                                                                                                           | Read level (dBμV) | Antenna Factor (dB/m) | PRM Factor (dB) | Cable Loss (dB) | Result Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector type | Polarization |
|--------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|-----------------|-----------------|-----------------------|----------------|-------------|---------------|--------------|
| GFSK Tx mode 2402MHz                                                                                                                 |                   |                       |                 |                 |                       |                |             |               |              |
| 5760.00                                                                                                                              | 33.93             | 34.86                 | 29.21           | 9.43            | 49.01                 | 74.00          | -24.99      | Peak          | VERTICAL     |
| 6984.00                                                                                                                              | 34.68             | 36.19                 | 30.38           | 10.40           | 50.89                 | 74.00          | -23.11      | Peak          | VERTICAL     |
| 7936.00                                                                                                                              | 34.72             | 36.69                 | 31.11           | 11.10           | 51.40                 | 74.00          | -22.60      | Peak          | VERTICAL     |
| 8769.00                                                                                                                              | 34.70             | 36.50                 | 32.15           | 11.73           | 50.78                 | 74.00          | -23.22      | Peak          | VERTICAL     |
| 12849.00                                                                                                                             | 34.06             | 38.65                 | 35.61           | 14.66           | 51.76                 | 74.00          | -22.24      | Peak          | VERTICAL     |
| 13257.00                                                                                                                             | 34.17             | 39.06                 | 35.50           | 14.74           | 52.47                 | 74.00          | -21.53      | Peak          | VERTICAL     |
| 4791.00                                                                                                                              | 40.47             | 33.74                 | 29.31           | 8.46            | 53.36                 | 74.00          | -20.64      | Peak          | HORIZONTAL   |
| 7069.00                                                                                                                              | 34.82             | 36.26                 | 30.42           | 10.50           | 51.16                 | 74.00          | -22.84      | Peak          | HORIZONTAL   |
| 8004.00                                                                                                                              | 35.03             | 36.69                 | 31.13           | 11.13           | 51.72                 | 74.00          | -22.28      | Peak          | HORIZONTAL   |
| 9041.00                                                                                                                              | 33.85             | 37.41                 | 32.34           | 11.87           | 50.79                 | 74.00          | -23.21      | Peak          | HORIZONTAL   |
| 12696.00                                                                                                                             | 34.06             | 38.50                 | 35.48           | 14.65           | 51.73                 | 74.00          | -22.27      | Peak          | HORIZONTAL   |
| 12866.00                                                                                                                             | 34.19             | 38.67                 | 35.64           | 14.66           | 51.88                 | 74.00          | -22.12      | Peak          | HORIZONTAL   |
| GFSK Tx mode 2440MHz                                                                                                                 |                   |                       |                 |                 |                       |                |             |               |              |
| 4876.00                                                                                                                              | 38.96             | 33.72                 | 29.33           | 8.56            | 51.91                 | 74.00          | -22.09      | Peak          | VERTICAL     |
| 6865.00                                                                                                                              | 34.09             | 36.09                 | 30.28           | 10.31           | 50.21                 | 74.00          | -23.79      | Peak          | VERTICAL     |
| 7936.00                                                                                                                              | 34.49             | 36.69                 | 31.11           | 11.10           | 51.17                 | 74.00          | -22.83      | Peak          | VERTICAL     |
| 9211.00                                                                                                                              | 34.18             | 37.03                 | 32.42           | 12.05           | 50.84                 | 74.00          | -23.16      | Peak          | VERTICAL     |
| 10775.00                                                                                                                             | 33.30             | 37.18                 | 33.59           | 13.14           | 50.03                 | 74.00          | -23.97      | Peak          | VERTICAL     |
| 12866.00                                                                                                                             | 34.22             | 38.67                 | 35.64           | 14.66           | 51.91                 | 74.00          | -22.09      | Peak          | VERTICAL     |
| 4876.00                                                                                                                              | 39.52             | 33.72                 | 29.33           | 8.56            | 52.47                 | 74.00          | -21.53      | Peak          | HORIZONTAL   |
| 7171.00                                                                                                                              | 34.97             | 36.34                 | 30.48           | 10.57           | 51.40                 | 74.00          | -22.60      | Peak          | HORIZONTAL   |
| 7800.00                                                                                                                              | 35.19             | 36.66                 | 31.04           | 11.02           | 51.83                 | 74.00          | -22.17      | Peak          | HORIZONTAL   |
| 9041.00                                                                                                                              | 34.69             | 37.41                 | 32.34           | 11.87           | 51.63                 | 74.00          | -22.37      | Peak          | HORIZONTAL   |
| 11591.00                                                                                                                             | 33.85             | 36.87                 | 34.56           | 13.70           | 49.86                 | 74.00          | -24.14      | Peak          | HORIZONTAL   |
| 13444.00                                                                                                                             | 34.32             | 39.24                 | 35.28           | 14.78           | 53.06                 | 74.00          | -20.94      | Peak          | HORIZONTAL   |
| GFSK Tx mode 2480MHz                                                                                                                 |                   |                       |                 |                 |                       |                |             |               |              |
| 4960.00                                                                                                                              | 30.14             | 33.71                 | 29.35           | 8.63            | 43.13                 | 54.00          | -10.87      | Average       | VERTICAL     |
| 4960.00                                                                                                                              | 42.65             | 33.71                 | 29.35           | 8.63            | 55.64                 | 74.00          | -18.36      | Peak          | VERTICAL     |
| 7579.00                                                                                                                              | 34.25             | 36.62                 | 30.86           | 10.90           | 50.91                 | 74.00          | -23.09      | Peak          | VERTICAL     |
| 8939.00                                                                                                                              | 34.77             | 37.24                 | 32.26           | 11.79           | 51.54                 | 74.00          | -22.46      | Peak          | VERTICAL     |
| 12016.00                                                                                                                             | 34.08             | 37.62                 | 34.80           | 14.24           | 51.14                 | 74.00          | -22.86      | Peak          | VERTICAL     |
| 13070.00                                                                                                                             | 35.20             | 38.87                 | 35.64           | 14.68           | 53.11                 | 74.00          | -20.89      | Peak          | VERTICAL     |
| 4060.00                                                                                                                              | 36.14             | 33.45                 | 29.05           | 7.67            | 48.21                 | 74.00          | -25.79      | Peak          | HORIZONTAL   |
| 4961.00                                                                                                                              | 38.60             | 33.71                 | 29.35           | 8.63            | 51.59                 | 74.00          | -22.41      | Peak          | HORIZONTAL   |
| 6899.00                                                                                                                              | 34.44             | 36.12                 | 30.31           | 10.33           | 50.58                 | 74.00          | -23.42      | Peak          | HORIZONTAL   |
| 7936.00                                                                                                                              | 34.59             | 36.69                 | 31.11           | 11.10           | 51.27                 | 74.00          | -22.73      | Peak          | HORIZONTAL   |
| 11234.00                                                                                                                             | 34.17             | 37.28                 | 34.25           | 13.53           | 50.73                 | 74.00          | -23.27      | Peak          | HORIZONTAL   |
| 13376.00                                                                                                                             | 34.22             | 39.18                 | 35.38           | 14.76           | 52.78                 | 74.00          | -21.22      | Peak          | HORIZONTAL   |
| Result: Pass                                                                                                                         |                   |                       |                 |                 |                       |                |             |               |              |
| Note1: Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.                                                         |                   |                       |                 |                 |                       |                |             |               |              |
| Note2: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report. |                   |                       |                 |                 |                       |                |             |               |              |

**SPURIOUS EMISSIONS 30M ~ 1 GHz**



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>dB | Result<br>Level<br>(dBuV/m) | Limit<br>Line<br>(dBuV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 65.57          | 7.09                    | 9.26                        | 4.03                | 20.38                       | 40.00                     | -19.62                | QP       | HORIZONTAL   |
| 2              | 157.01         | 10.03                   | 7.92                        | 4.64                | 22.59                       | 43.50                     | -20.91                | QP       | HORIZONTAL   |
| 3              | 228.49         | 5.23                    | 11.57                       | 5.03                | 21.83                       | 46.00                     | -24.17                | QP       | HORIZONTAL   |
| 4              | 423.54         | 1.07                    | 16.26                       | 5.89                | 23.22                       | 46.00                     | -22.78                | QP       | HORIZONTAL   |
| 5              | 682.35         | 1.77                    | 19.88                       | 6.77                | 28.42                       | 46.00                     | -17.58                | QP       | HORIZONTAL   |
| 6              | 912.86         | 1.65                    | 22.56                       | 7.45                | 31.66                       | 46.00                     | -14.34                | QP       | HORIZONTAL   |



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>dB | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|----------------|-------------------------|-----------------------------|---------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 1              | 35.88          | 9.14                    | 11.98                       | 3.74                | 24.86                       | 40.00                     | -15.14                | QP       | VERTICAL     |
| 2              | 64.66          | 15.29                   | 9.64                        | 4.02                | 28.95                       | 40.00                     | -11.05                | QP       | VERTICAL     |
| 3              | 139.85         | 21.51                   | 7.41                        | 4.54                | 33.46                       | 43.50                     | -10.04                | QP       | VERTICAL     |
| 4              | 228.49         | 9.30                    | 11.57                       | 5.03                | 25.90                       | 46.00                     | -20.10                | QP       | VERTICAL     |
| 5              | 590.97         | 1.79                    | 19.12                       | 6.48                | 27.39                       | 46.00                     | -18.61                | QP       | VERTICAL     |
| 6              | 787.85         | 2.25                    | 20.86                       | 7.09                | 30.20                       | 46.00                     | -15.80                | QP       | VERTICAL     |

Note: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

### 8.3. SPURIOUS EMISSIONS BELOW 30M

Note 1: The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Note 2: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

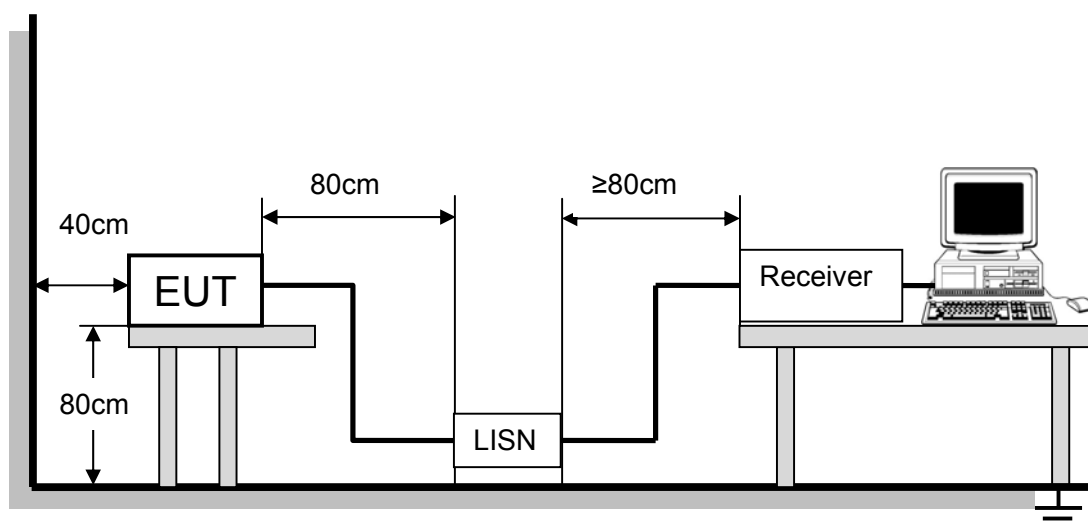
## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

Please refer to FCC §15.207 (a) and RSS-Gen Clause 8.8

| FREQUENCY (MHz) | Class A (dBuV) |         | Class B (dBuV) |           |
|-----------------|----------------|---------|----------------|-----------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average   |
| 0.15 -0.5       | 79.00          | 66.00   | 66 - 56 *      | 56 - 46 * |
| 0.50 -5.0       | 73.00          | 60.00   | 56.00          | 46.00     |
| 5.0 -30.0       | 73.00          | 60.00   | 60.00          | 50.00     |

### TEST SETUP AND PROCEDURE

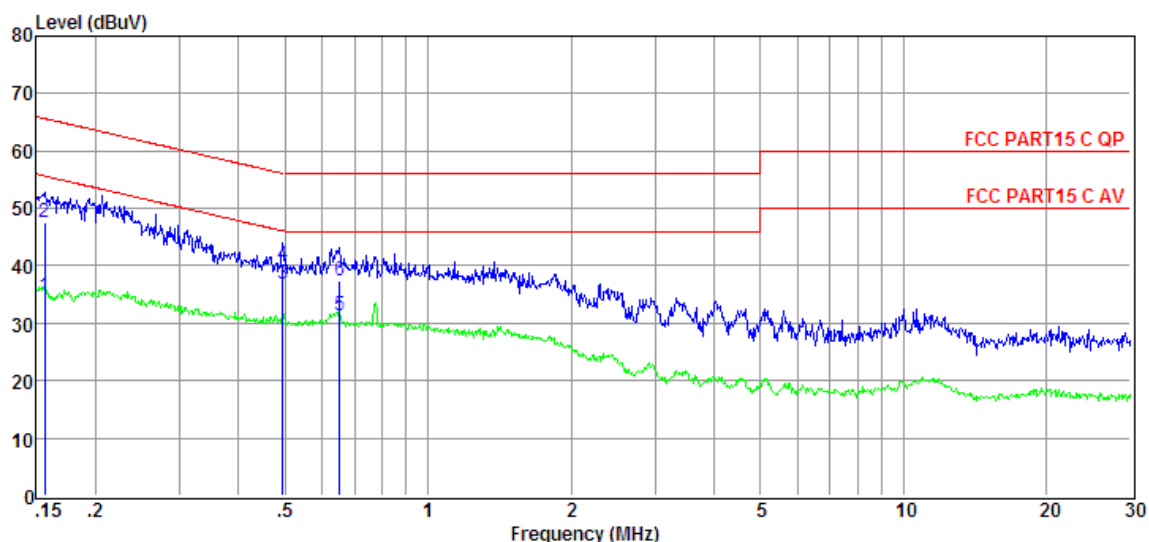


The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2014. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

### TEST RESULTS

|              |          |                    |              |
|--------------|----------|--------------------|--------------|
| Temperature: | 24.5°C   | Relative Humidity: | 55%          |
| Pressure:    | 1012 hPa | Test Voltage:      | AC 120V/60Hz |
| Test Mode:   | Tx Mode  | Phase :            | L1           |



| Item<br>(Mark) | Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Pulse<br>Limiter<br>Factor<br>(dB) | Result<br>Level<br>(dBμV) | Limit<br>Line<br>(dBμV) | Over<br>Limit<br>(dB) | Detector | Phase |
|----------------|----------------|-------------------------|------------------------|-----------------------|------------------------------------|---------------------------|-------------------------|-----------------------|----------|-------|
| 1              | 0.16           | 15.19                   | 9.61                   | 0.02                  | 9.86                               | 34.68                     | 55.65                   | -20.97                | Average  | LINE  |
| 2              | 0.16           | 28.20                   | 9.61                   | 0.02                  | 9.86                               | 47.69                     | 65.65                   | -17.96                | QP       | LINE  |
| 3              | 0.49           | 17.32                   | 9.61                   | 0.02                  | 9.86                               | 36.81                     | 46.10                   | -9.29                 | Average  | LINE  |
| 4              | 0.49           | 20.52                   | 9.61                   | 0.02                  | 9.86                               | 40.01                     | 56.10                   | -16.09                | QP       | LINE  |
| 5              | 0.65           | 11.96                   | 9.61                   | 0.03                  | 9.86                               | 31.46                     | 46.00                   | -14.54                | Average  | LINE  |
| 6              | 0.65           | 17.77                   | 9.61                   | 0.03                  | 9.86                               | 37.27                     | 56.00                   | -18.73                | QP       | LINE  |

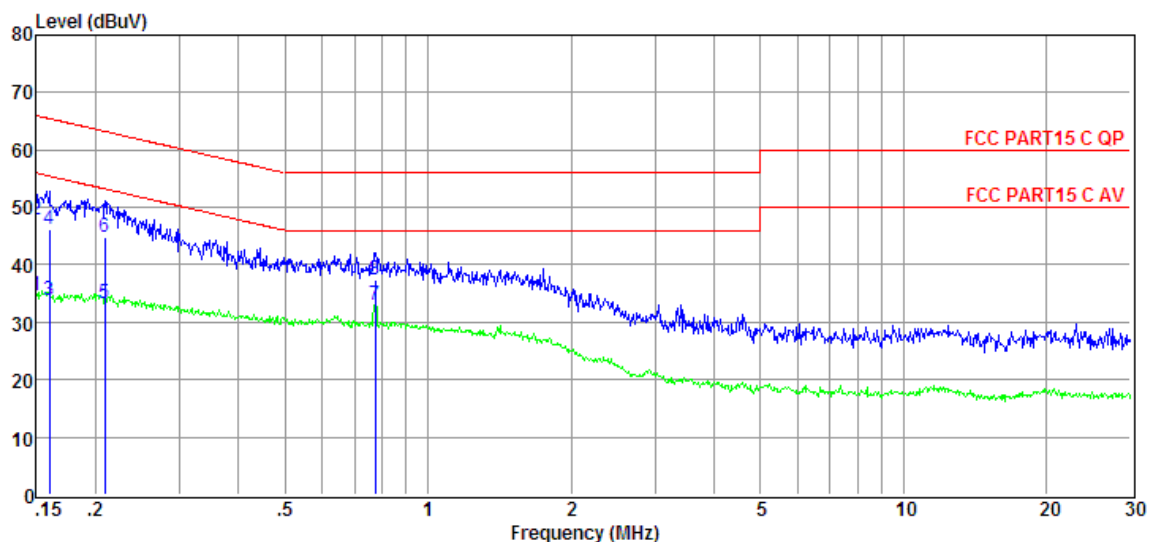
Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

|              |          |                    |              |
|--------------|----------|--------------------|--------------|
| Temperature: | 24.5°C   | Relative Humidity: | 55%          |
| Pressure:    | 1012 hPa | Test Voltage:      | AC 120V/60Hz |
| Test Mode:   | Tx Mode  | Phase :            | N            |



| Item<br>(Mark) | Freq.<br>(MHz) | Read Level<br>(dBμV) | LISN Factor<br>(dB) | Cable Loss<br>(dB) | Pulse Limiter Factor<br>(dB) | Result Level<br>(dBμV) | Limit Line<br>(dBμV) | Over Limit<br>(dB) | Detector | Phase   |
|----------------|----------------|----------------------|---------------------|--------------------|------------------------------|------------------------|----------------------|--------------------|----------|---------|
| 1              | 0.15           | 15.05                | 9.61                | 0.02               | 9.86                         | 34.54                  | 56.00                | -21.46             | Average  | NEUTRAL |
| 2              | 0.15           | 28.43                | 9.61                | 0.02               | 9.86                         | 47.92                  | 66.00                | -18.08             | QP       | NEUTRAL |
| 3              | 0.16           | 14.39                | 9.61                | 0.02               | 9.86                         | 33.88                  | 55.47                | -21.59             | Average  | NEUTRAL |
| 4              | 0.16           | 26.76                | 9.61                | 0.02               | 9.86                         | 46.25                  | 65.47                | -19.22             | QP       | NEUTRAL |
| 5              | 0.21           | 13.73                | 9.61                | 0.02               | 9.86                         | 33.22                  | 53.23                | -20.01             | Average  | NEUTRAL |
| 6              | 0.21           | 25.23                | 9.61                | 0.02               | 9.86                         | 44.72                  | 63.23                | -18.51             | QP       | NEUTRAL |
| 7              | 0.78           | 13.60                | 9.61                | 0.03               | 9.86                         | 33.10                  | 46.00                | -12.90             | Average  | NEUTRAL |
| 8              | 0.78           | 17.97                | 9.61                | 0.03               | 9.86                         | 37.47                  | 56.00                | -18.53             | QP       | NEUTRAL |

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

## **10. ANTENNA REQUIREMENTS**

### **APPLICABLE REQUIREMENTS**

Please refer to FCC §15.203

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### **ANTENNA CONNECTOR**

EUT has a PCB antenna without antenna connector.

### **ANTENNA GAIN**

The antenna gain of EUT is less than 6 dBi.

**END OF REPORT**