




RF TEST REPORT



Report No.: 15020559-FCC-R1

Supersede Report No.: N/A

| | | |
|--|---|---|
| Applicant | Interactive Technologies, Inc. | |
| Product Name | 8 Button Remote | |
| Main Model | 2.4IQ58 | |
| Test Standard | FCC Part 15.247: 2014, ANSI C63.10: 2013 | |
| Test Date | June 24 to July 20, 2015 | |
| Issue Date | July 20, 2015 | |
| Test Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | |
| Equipment complied with the specification | <input checked="" type="checkbox"/> | |
| Equipment did not comply with the specification | <input type="checkbox"/> | |
|  |  |  |
| William Long Test Engineer | Herve Idoko Checked By | |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | | |

Issued by:

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

| Country/Region | Scope |
|----------------|------------------------------------|
| USA | EMC, RF/Wireless, SAR, Telecom |
| Canada | EMC, RF/Wireless, SAR, Telecom |
| Taiwan | EMC, RF, Telecom, SAR, Safety |
| Hong Kong | RF/Wireless, SAR, Telecom |
| Australia | EMC, RF, Telecom, SAR, Safety |
| Korea | EMI, EMS, RF, SAR, Telecom, Safety |
| Japan | EMI, RF/Wireless, SAR, Telecom |
| Singapore | EMC, RF, SAR, Telecom |
| Europe | EMC, RF, SAR, Telecom, Safety |

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|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 3 of 34 |

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CONTENTS

| | |
|---|-----------|
| 1. REPORT REVISION HISTORY..... | 5 |
| 2. CUSTOMER INFORMATION | 5 |
| 3. TEST SITE INFORMATION..... | 5 |
| 4. EQUIPMENT UNDER TEST (EUT) INFORMATION | 6 |
| 5. TEST SUMMARY | 7 |
| 6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS | 8 |
| 6.1 RF EXPOSURE..... | 8 |
| 6.2 ANTENNA REQUIREMENT | 9 |
| 6.3 DTS CHANNEL BANDWIDTH..... | 10 |
| 6.4 MAXIMUM OUTPUT POWER | 12 |
| 6.5 POWER SPECTRAL DENSITY | 14 |
| 6.6 BAND-EDGE & UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS..... | 16 |
| 6.7 AC POWER LINE CONDUCTED EMISSIONS..... | 18 |
| 6.8 RADIATED SPURIOUS EMISSIONS..... | 19 |
| ANNEX A. TEST INSTRUMENT..... | 23 |
| ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS | 24 |
| ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT..... | 30 |
| ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST | 33 |
| ANNEX E. DECLARATION OF SIMILARITY | 34 |

| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 5 of 34 |

1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|-----------------|----------------|-------------|---------------|
| 15020559-FCC-R1 | NONE | Original | July 20, 2015 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

2. Customer information

| | |
|------------------|---|
| Applicant Name | Interactive Technologies, Inc. |
| Applicant Add | 15655 S. Mahaffie Street, Olathe KS 66062 |
| Manufacturer | Beijing Jia An Electronics Technology Co.,Ltd. |
| Manufacturer Add | No.19 GuCheng West Street,Shi Jing Shan District,Beijing 100043,CHINA |

3. Test site information

| | |
|----------------------|--|
| Lab performing tests | SIEMIC (Nanjing-China) Laboratories |
| Lab Address | 2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China |
| FCC Test Site No. | 986914 |
| IC Test Site No. | 4842B-1 |
| Test Software | Labview of SIEMIC version 1.0 |

4. Equipment under Test (EUT) Information

| | |
|-------------------------------|--------------------------|
| Description of EUT: | 8 Button Remote |
| Main Model: | 2.4IQ58 |
| Serial Model: | N/A |
| Date EUT received: | June 15, 2015 |
| Test Date(s): | June 24 to July 20, 2015 |
| Conducted Power (dBm) | -17.165dBm |
| Antenna Gain: | 1 dBi |
| Type of Modulation: | O-QPSK |
| RF Operating Frequency (ies): | 2405-2480 MHz(TX/RX) |
| Number of Channels: | 16CH |
| Port: | N/A |
| Input Power: | DC 3V |
| Trade Name : | N/A |
| FCC ID: | ULP-24IQ58 |

5. Test Summary

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

| FCC Rules | Description of Test | Result |
|--------------------------------|--|------------|
| § 15.247 (i), §2.1093 | RF Exposure | Compliance |
| § 15.203 | Antenna Requirement | Compliance |
| § 15.247 (a)(2) | DTS CHANNEL BANDWIDTH | Compliance |
| § 15.247(b)(3) | Conducted Maximum Output Power | Compliance |
| § 15.247(e) | Power Spectral Density | Compliance |
| § 15.247(d) | Band-Edge & Unwanted Emissions into Non-Restricted Frequency Bands | Compliance |
| § 15.207 (a), | AC Power Line Conducted Emissions | N/A |
| § 15.205, §15.209, § 15.247(d) | Radiated Spurious Emissions & Unwanted Emissions into Restricted Frequency Bands | Compliance |

Measurement Uncertainty

| Emissions | | |
|--------------------|---|-------------|
| Test Item | Description | Uncertainty |
| Radiated Emissions | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | 3.952dB |

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|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 8 of 34 |

6. Measurements, Examination And Derived Results

6.1 RF Exposure

The EUT is a portable device, thus requires please refer to RF Evaluation Report: 15020559-FCC-H1.

6.2 Antenna Requirement

Applicable Standard

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. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules.

§15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit. And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

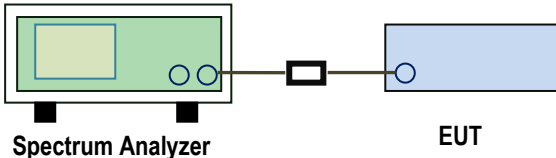
Antenna Connector Construction

The EUT Gain is 1 dBi, which in accordance to section 15.203, please refer to the internal photos.

Result: Compliance.

6.3 DTS Channel Bandwidth

| | |
|----------------------|---------------|
| Temperature | 20°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | June 29, 2015 |
| Tested By : | William Long |

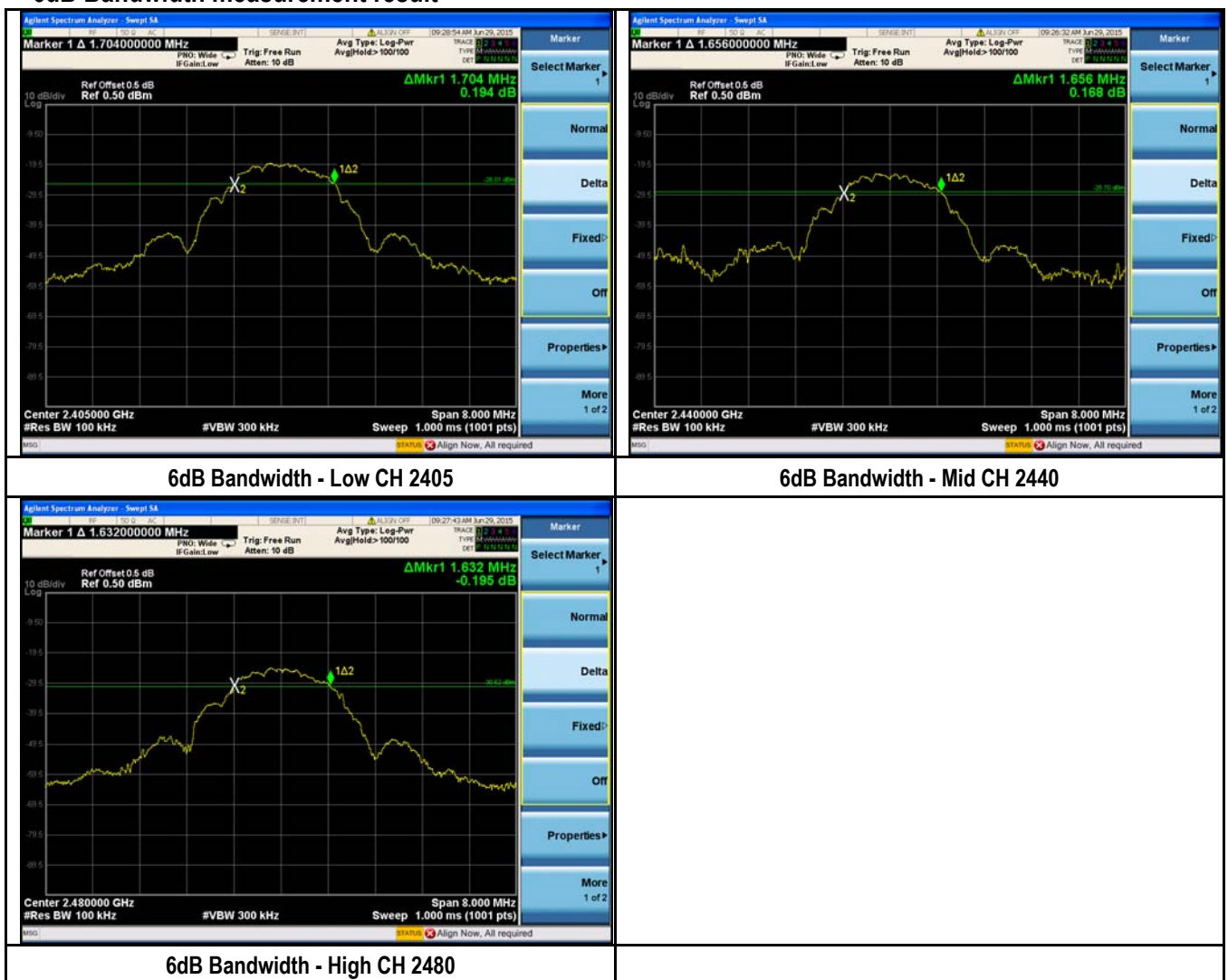
| Spec | Item | Requirement | Applicable |
|-----------------------------------|---|--|-------------------------------------|
| § 15.247(a)(2) RSS Gen (4.6.1) | a) | 6dB BW≥500kHz; | <input checked="" type="checkbox"/> |
| | b) | 20dB BW: For FCC reference only; required by IC. | N/A |
| Test Setup |  <p style="text-align: center;">Spectrum Analyzer EUT</p> | | |
| Test Procedure | <p>558074 D01 DTS Meas Guidance v03r02, 8.1 DTS bandwidth</p> <p><u>6dB Emission bandwidth measurement procedure</u></p> <ul style="list-style-type: none"> - Set RBW = 100 kHz. - Set the video bandwidth (VBW) ≥ 3 x RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. <p>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.</p> | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |
| Test Data | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A | | |
| Test Plot | <input checked="" type="checkbox"/> Yes (See below) <input type="checkbox"/> N/A | | |

6dB Bandwidth measurement result

| Type | Test mode | CH | Freq (MHz) | Result (MHz) | Limit (MHz) | Result |
|--------|-----------|------|------------|--------------|-------------|--------|
| 6dB BW | 2.4G | Low | 2405 | 1.704 | ≥ 0.5 | Pass |
| | | Mid | 2440 | 1.656 | ≥ 0.5 | Pass |
| | | High | 2480 | 1.632 | ≥ 0.5 | Pass |

Test Plots

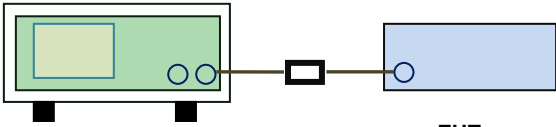
6dB Bandwidth measurement result



6.4 Maximum Output Power

| | |
|----------------------|--------------------------|
| Temperature | 20°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | June 24 to June 29, 2015 |
| Tested By : | William Long |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|---------------------------------|--|---|-------------------------------------|
| §15.247(b) (2),RSS210 (A8.4) | a) | FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt | <input type="checkbox"/> |
| | b) | FHSS in 5725-5850MHz: ≤ 1 Watt | <input type="checkbox"/> |
| | c) | For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt. | <input type="checkbox"/> |
| | d) | FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt | <input type="checkbox"/> |
| | e) | FHSS in 902-928MHz with ≥ 25 & < 50 channels: ≤ 0.25 Watt | <input type="checkbox"/> |
| | f) | DSSS in 902-928MHz, 2400-2483.5MHz, 5725-5850MHz: ≤ 1 Watt | <input checked="" type="checkbox"/> |
| Test Setup |  <p style="text-align: center;">Spectrum Analyzer EUT</p> | | |
| Test Procedure | <p>558074 D01 DTS MEAS Guidance v03r02, 9.1 Maximum peak conducted output power</p> <p>9.1.1 RBW \geq DTS bandwidth</p> <ul style="list-style-type: none"> - This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth. - a) Set the RBW \geq DTS bandwidth. - b) Set VBW $\geq 3 \times$ RBW. - c) Set span $\geq 3 \times$ RBW - d) Sweep time = auto couple. - e) Detector = peak. - f) Trace mode = max hold. - g) Allow trace to fully stabilize. - h) Use peak marker function to determine the peak amplitude level. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |
| Test Data | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A | | |
| Test Plot | <input checked="" type="checkbox"/> Yes (See below) <input type="checkbox"/> N/A | | |

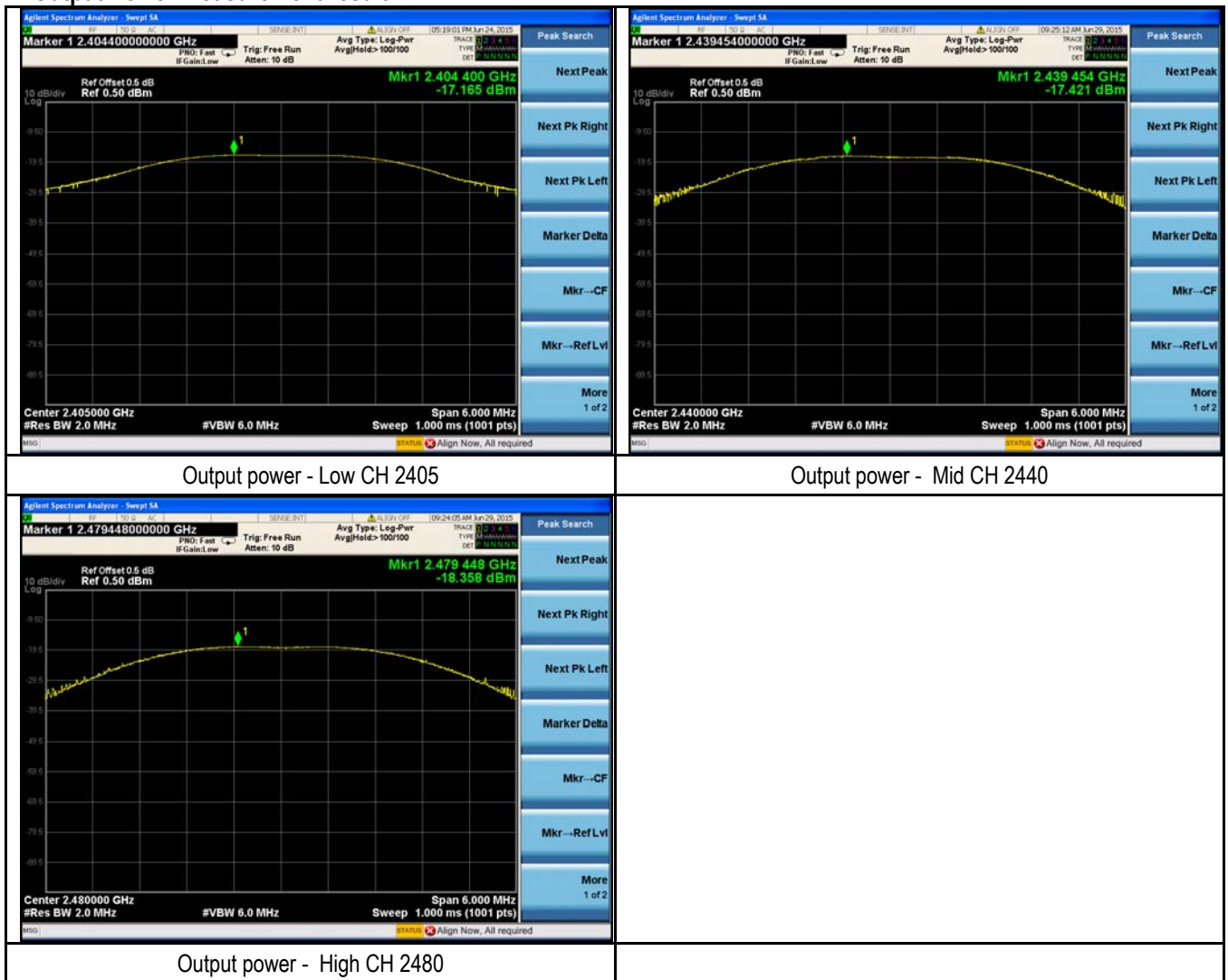
| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 13 of 34 |

Output Power measurement result

| Type | Test mode | CH | Freq (MHz) | Conducted Power (dBm) | Limit (dBm) | Result |
|--------------|-----------|------|------------|-----------------------|-------------|--------|
| Output power | 2.4G | Low | 2405 | -17.165 | 30 | Pass |
| | | Mid | 2440 | -17.421 | 30 | Pass |
| | | High | 2480 | -18.358 | 30 | Pass |

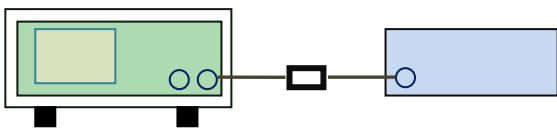
Test Plots

Output Power measurement result



6.5 Power Spectral Density

| | |
|----------------------|---------------|
| Temperature | 20°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | July 20, 2015 |
| Tested By : | William Long |

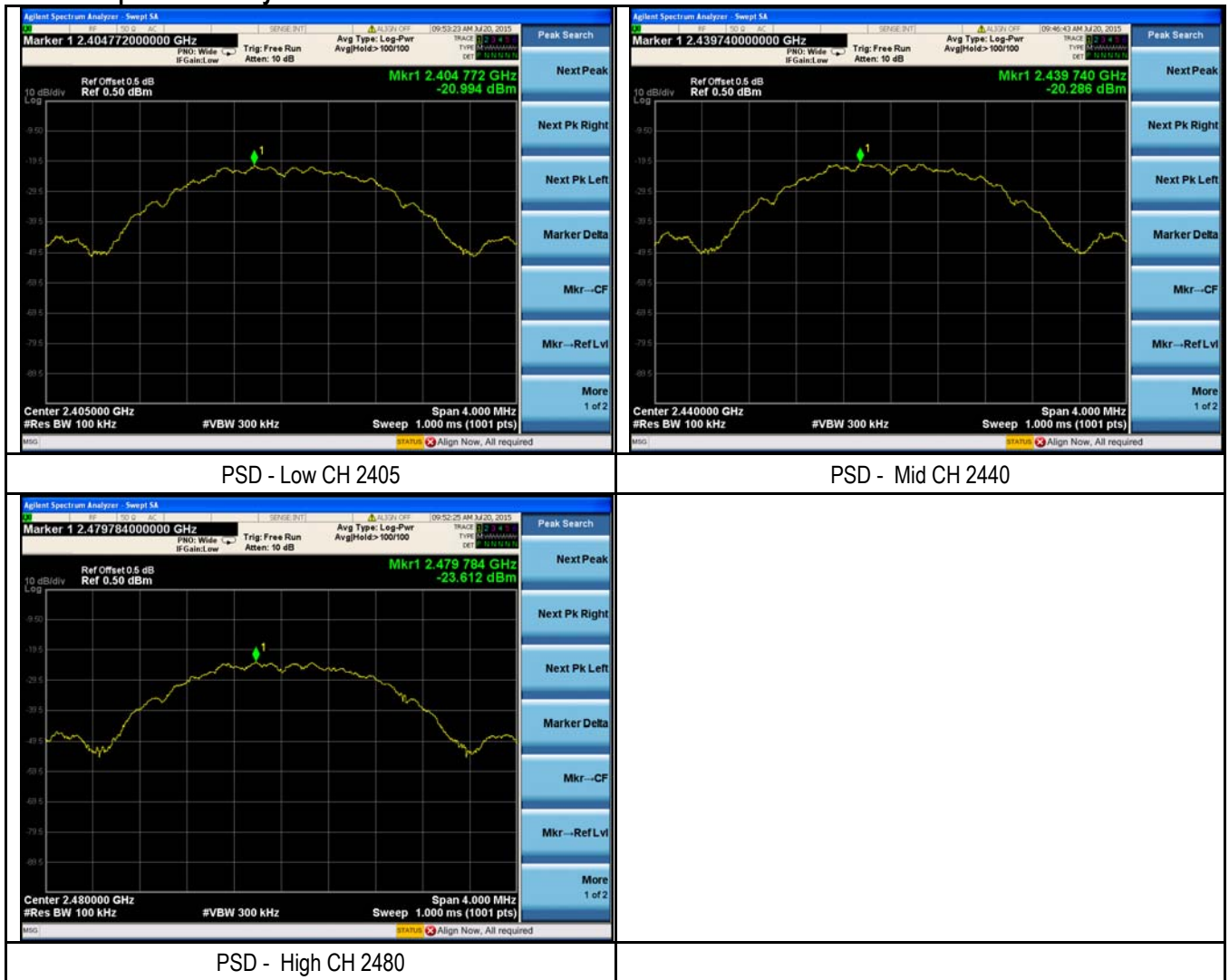
| Spec | Item | Requirement | Applicable |
|----------------|---|--|-------------------------------------|
| §15.247(e) | a) | The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. | <input checked="" type="checkbox"/> |
| Test Setup |  <p style="text-align: center;">Spectrum Analyzer EUT</p> | | |
| Test Procedure | 558074 D01 DTS MEAS Guidance v03r02, 10.2 power spectral density method power spectral density measurement procedure <ul style="list-style-type: none"> - a) Set analyzer center frequency to DTS channel center frequency. - b) Set the span to 1.5 times the DTS bandwidth. - c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. - d) Set the VBW $\geq 3 \times \text{RBW}$. - e) Detector = peak. - f) Sweep time = auto couple. - g) Trace mode = max hold. - h) Allow trace to fully stabilize. - i) Use the peak marker function to determine the maximum amplitude level within the RBW. - j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |
| Test Data | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A | | |
| Test Plot | <input checked="" type="checkbox"/> Yes (See below) <input type="checkbox"/> N/A | | |

Power Spectral Density measurement result

| Type | Test mode | CH | Freq (MHz) | PSD (dBm) | Limit (dBm) | Result |
|------|-----------|------|------------|-----------|-------------|--------|
| PSD | 2.4G | Low | 2405 | -20.994 | 8 | Pass |
| | | Mid | 2440 | -20.286 | 8 | Pass |
| | | High | 2480 | -23.612 | 8 | Pass |

Test Plots

Power Spectral Density measurement result

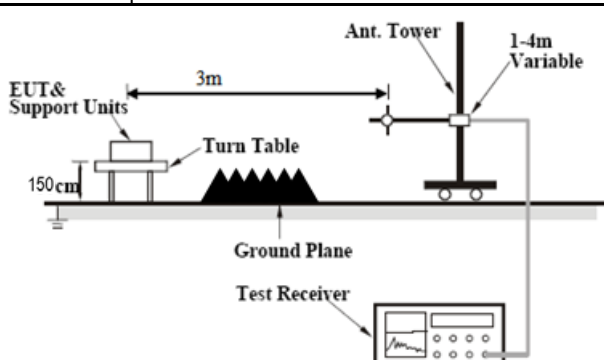


6.6 Band-Edge & Unwanted Emissions into Non-Restricted Frequency Bands

| | |
|----------------------|---------------|
| Temperature | 20°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | July 20, 2015 |
| Tested By : | William Long |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|------------|------|---|-------------------------------------|
| §15.247(d) | a) | 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. | <input checked="" type="checkbox"/> |

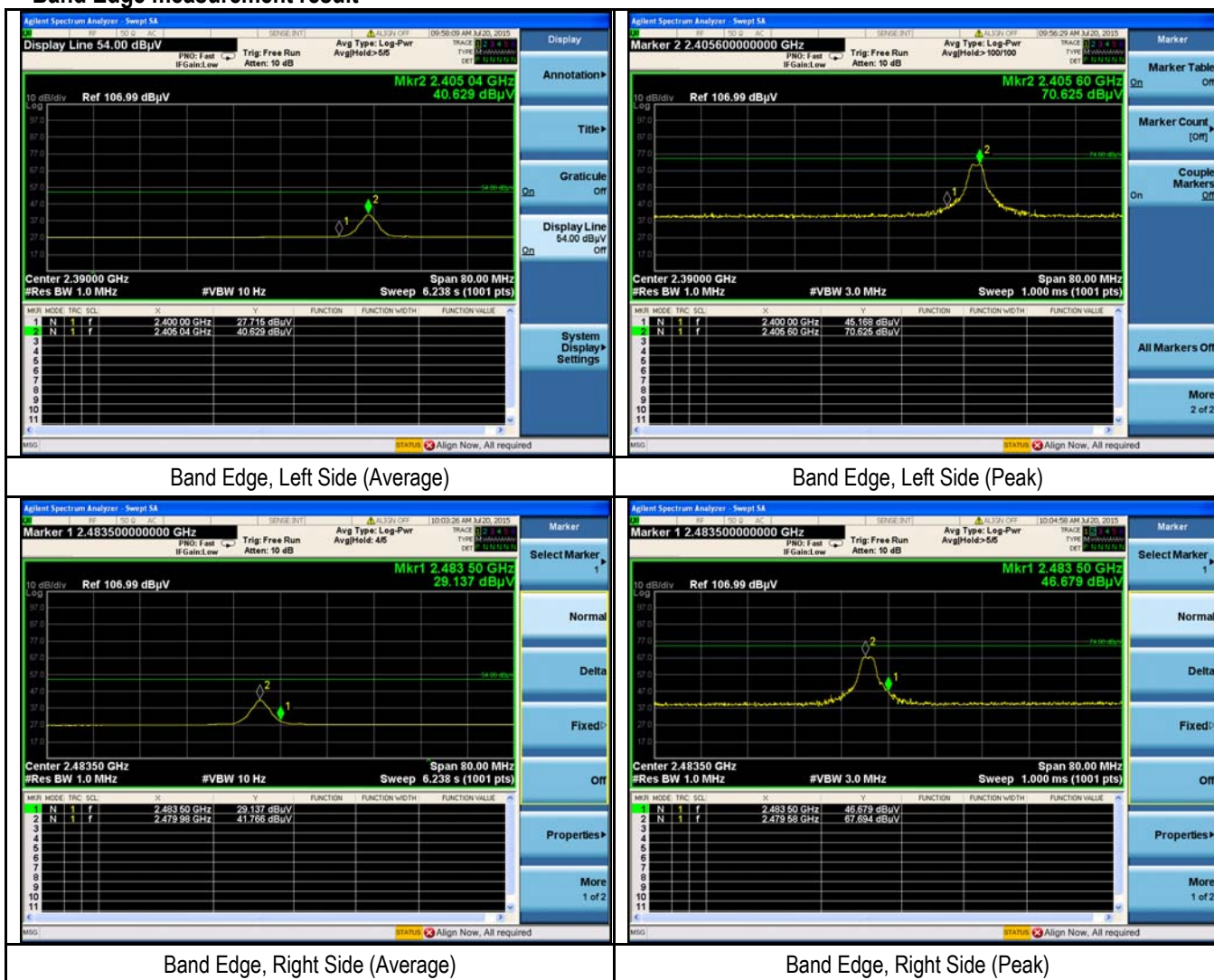
| | |
|------------|---|
| Test Setup |  |
|------------|---|

| | |
|----------------|---|
| Test Procedure | <p>Radiated Method Only</p> <ul style="list-style-type: none"> 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range. 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: <ul style="list-style-type: none"> a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi Peak detection at frequency below 1GHz. b. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz. c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth for Average detection (AV) as below at frequency above 1GHz. <ul style="list-style-type: none"> ■ 1/T kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%) 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete. |
|----------------|---|

| | |
|-----------|--|
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Test Data | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A |
| Test Plot | <input checked="" type="checkbox"/> Yes (See below) <input type="checkbox"/> N/A |

Test Plots

Band Edge measurement result



Band Edge, Left Side (Average)

Band Edge, Left Side (Peak)

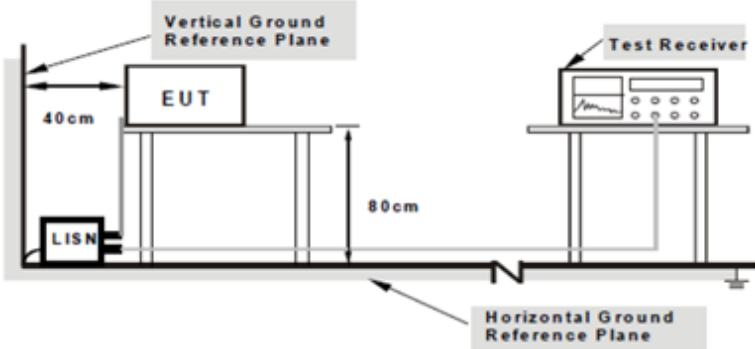
Band Edge, Right Side (Average)

Band Edge, Right Side (Peak)

6.7 AC Power Line Conducted Emissions

| | |
|----------------------|---------|
| Temperature | ---°C |
| Relative Humidity | ---50% |
| Atmospheric Pressure | ---mbar |
| Test date : | --- |
| Tested By : | --- |

Requirement(s):

| Spec | Item | Requirement | Applicable | | | | | | | | | | | | | | |
|-----------------------------------|---|---|--|---------------------------|--------------|--|----|---------|------------|---------|---------|---------|----|----|--------|----|----|
| 47CFR§15.207, RSS210 (A8.1) | a) | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges. | <div><input checked="" type="checkbox"/></div> | | | | | | | | | | | | | | |
| | | <table><tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBµV)</th></tr><tr><th>QP</th><th>Average</th></tr><tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr><tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr><tr><td>5 ~ 30</td><td>60</td><td>50</td></tr></table> | | Frequency ranges (MHz) | Limit (dBµV) | | QP | Average | 0.15 ~ 0.5 | 66 – 56 | 56 – 46 | 0.5 ~ 5 | 56 | 46 | 5 ~ 30 | 60 | 50 |
| | | Frequency ranges (MHz) | | | Limit (dBµV) | | | | | | | | | | | | |
| | | | | QP | Average | | | | | | | | | | | | |
| | | 0.15 ~ 0.5 | | 66 – 56 | 56 – 46 | | | | | | | | | | | | |
| 0.5 ~ 5 | 56 | 46 | | | | | | | | | | | | | | | |
| 5 ~ 30 | 60 | 50 | | | | | | | | | | | | | | | |
| Test Setup | <div><p>Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</p></div> | <div><ul style="list-style-type: none">- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.- The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.- All other supporting equipment were powered separately from another main supply.- The EUT was switched on and allowed to warm up to its normal operating condition.- A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.- High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.- Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</div> | | | | | | | | | | | | | | | |
| | | | Remark | | | | | | | | | | | | | | |
| | | | Result | | | | | | | | | | | | | | |
| Test Data | <div><input checked="" type="checkbox"/> N/A</div> <div><input type="checkbox"/> Fail</div> | <div><input type="checkbox"/> Yes</div> <div><input checked="" type="checkbox"/> N/A</div> | | | | | | | | | | | | | | | |
| Test Plot | <div><input type="checkbox"/> Yes (See below)</div> <div><input checked="" type="checkbox"/> N/A</div> | | | | | | | | | | | | | | | | |

Note: Power supply by battery

6.8 Radiated Spurious Emissions

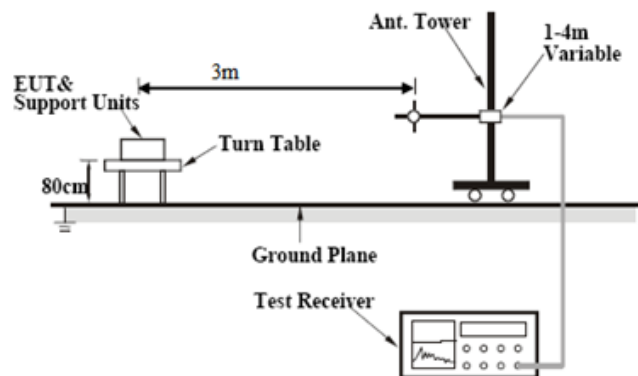
| | |
|----------------------|---------------|
| Temperature | 20°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | June 26, 2015 |
| Tested By : | William Long |

Requirement(s):

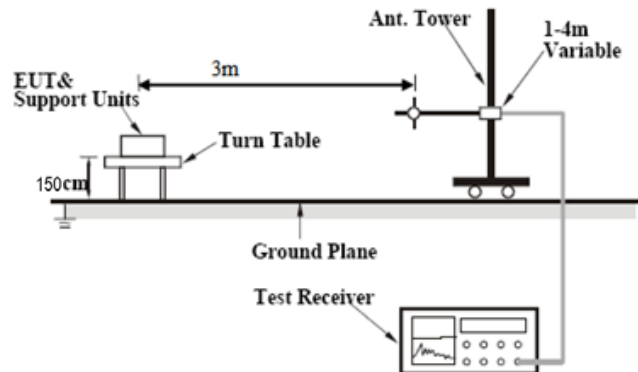
| Spec | Item | Requirement | Applicable | | | | | | | | | | |
|---------------------------------------|---|--|-----------------------|-----------------------|---------|-----|----------|-----|---------|-----|-----------|-----|--|
| 47CFR§15.247(d) , RSS210 (A8.5) | a) | <div>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</div> <table><tr><th>Frequency range (MHz)</th><th>Field Strength (µV/m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table> | Frequency range (MHz) | Field Strength (µV/m) | 30 – 88 | 100 | 88 – 216 | 150 | 216 960 | 200 | Above 960 | 500 | <div><input checked="" type="checkbox"/></div> |
| | Frequency range (MHz) | Field Strength (µV/m) | | | | | | | | | | | |
| | 30 – 88 | 100 | | | | | | | | | | | |
| | 88 – 216 | 150 | | | | | | | | | | | |
| 216 960 | 200 | | | | | | | | | | | | |
| Above 960 | 500 | | | | | | | | | | | | |
| b) | <div>For non-restricted band, 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 or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required</div> <div><input checked="" type="checkbox"/> 20 dB down <input type="checkbox"/> 30 dB down</div> | <div><input checked="" type="checkbox"/></div> | | | | | | | | | | | |
| c) | <div>or restricted band, emission must also comply with the radiated emission limits specified in 15.209</div> | <div><input checked="" type="checkbox"/></div> | | | | | | | | | | | |

Test Setup

A: Frequency Below 1000MHz:



B: Frequency Above 1000MHz:



Procedure

- The EUT was switched on and allowed to warm up to its normal operating condition.
- The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - The EUT was then rotated to the direction that gave the maximum emission.
 - Finally, the antenna height was adjusted to the height that gave the maximum emission.
- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi Peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz.
- Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

Remark

Result

☒ Pass ☐ Fail

Test Data

☒ Yes ☐ N/A

Test Plot

☒ Yes (See below) ☐ N/A

Data sample

| Frequency (MHz) | Quasi Peak (dB μ V/m) | Azimuth | Polarity (H/V) | Height (cm) | Factors (dB) | Limit (dB μ V/m) | Margin (dB) |
|-----------------|---------------------------|---------|----------------|-------------|--------------|----------------------|-------------|
| xxx | 32.23 | 181.00 | H | 350.00 | -38.23 | 40.00 | -7.77 |

Frequency (MHz) = Emission frequency in MHz

Quais-Peak (dB μ V/m)= Receiver Reading(dB μ V/m)+ Factor(dB)

Azimuth=Position of turn table

Polarity=Polarity of Receiver antenna

Height(cm)= Height of Receiver antenna

Factor (dB)=Antenna factor + cable loss- antenna gain



Limit (dB μ V/m)=Limit stated in standard

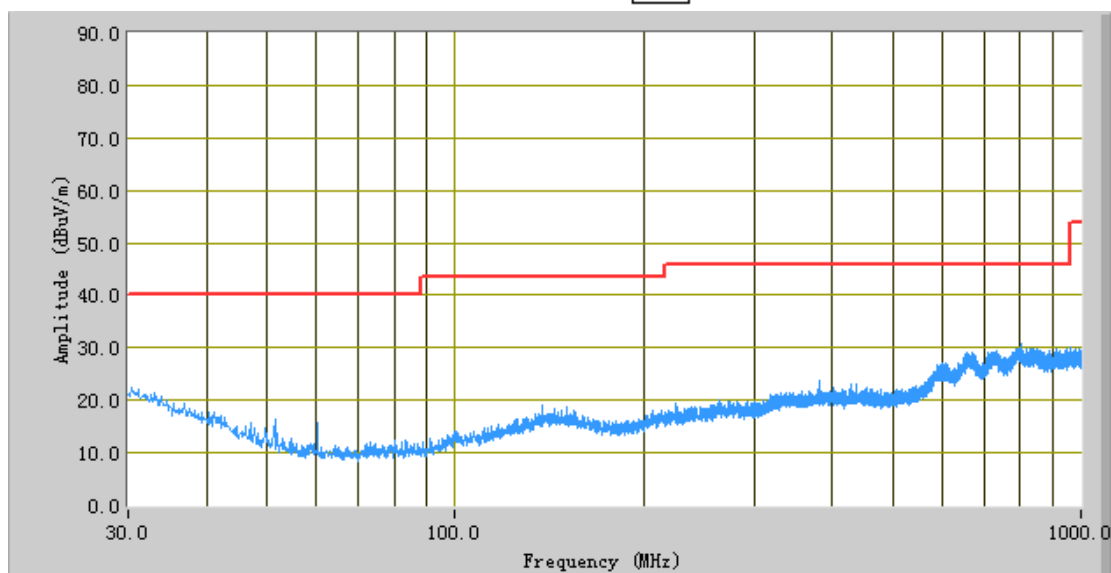
Calculation Formula:

Margin (dB)=Quasi Peak (dB μ V/m) – limit (dB μ V/m)

| | |
|-------------------|--------------------------|
| Test Mode: | Transmitting Mode |
|-------------------|--------------------------|

(Below 1GHz)

Peak Detector 
Quasi Peak Limit 



Test Data

Vertical & Horizontal Polarity Plot @3m

| Frequency (MHz) | Peak (dB μ V/m) | Azimuth | Polarity (H/V) | Height (cm) | Factors (dB) | Limit (dB μ V/m) | Margin (dB) |
|-----------------|---------------------|---------|----------------|-------------|--------------|----------------------|-------------|
| 801.27 | 30.84 | 136.00 | H | 200.00 | -17.48 | 46.00 | -15.16 |
| 788.05 | 29.88 | 246.30 | H | 200.00 | -17.82 | 46.00 | -16.12 |
| 818.00 | 29.88 | 304.30 | V | 100.00 | -17.54 | 46.00 | -16.12 |
| 832.43 | 29.74 | 78.10 | V | 100.00 | -17.60 | 46.00 | -16.26 |
| 914.40 | 29.70 | 145.20 | V | 100.00 | -18.53 | 46.00 | -16.30 |
| 951.74 | 29.69 | 267.50 | V | 100.00 | -18.13 | 46.00 | -16.31 |

| | |
|------------|-------------------|
| Test Mode: | Transmitting Mode |
|------------|-------------------|

Low Channel (2405 MHz)

| Frequency (MHz) | Substituted level (dBμV/m) | Detector (PK/AV) | Direction (degree) | Height (cm) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------------|------------------|--------------------|-------------|----------------|--------------------|-----------------|--------------------|---------------------|----------------|-------------|
| 4811.63 | 53.43 | AV | 34 | 232 | V | 32.2 | 7 | 55 | 37.63 | 54 | -16.37 |
| 4811.63 | 50.54 | AV | 234 | 109 | H | 32.2 | 7 | 55 | 34.74 | 54 | -19.26 |
| 4811.63 | 60.43 | PK | 35 | 232 | V | 32.2 | 7 | 55 | 44.63 | 74 | -29.37 |
| 4811.63 | 59.93 | PK | 2 | 211 | H | 32.2 | 7 | 55 | 44.13 | 74 | -29.87 |
| 2304.53 | 50.25 | AV | 56 | 192 | V | 27.5 | 4.33 | 55 | 27.08 | 54 | -26.92 |
| 2304.53 | 52.3 | AV | 34 | 209 | H | 27.5 | 4.33 | 55 | 29.13 | 54 | -24.87 |
| 2304.53 | 58.65 | PK | 266 | 281 | V | 27.5 | 4.33 | 55 | 35.48 | 74 | -38.52 |
| 2304.53 | 59.3 | PK | 36 | 209 | H | 27.5 | 4.33 | 55 | 36.13 | 74 | -37.87 |

Middle Channel (2440 MHz)

| Frequency (MHz) | Substituted level (dBμV/m) | Detector (PK/AV) | Direction (degree) | Height (cm) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------------|------------------|--------------------|-------------|----------------|--------------------|-----------------|--------------------|---------------------|----------------|-------------|
| 4880.45 | 54.23 | AV | 233 | 292 | V | 32.2 | 7 | 55 | 38.43 | 54 | -15.57 |
| 4880.45 | 53.09 | AV | 26 | 182 | H | 32.2 | 7 | 55 | 37.29 | 54 | -16.71 |
| 4880.45 | 60.43 | PK | 246 | 209 | V | 32.2 | 7 | 55 | 44.63 | 74 | -29.37 |
| 4880.45 | 59.27 | PK | 64 | 278 | H | 32.2 | 7 | 55 | 43.47 | 74 | -30.53 |
| 3049.34 | 50.32 | AV | 7 | 233 | V | 30.3 | 5.33 | 55 | 30.95 | 54 | -23.05 |
| 3049.34 | 49.38 | AV | 45 | 109 | H | 30.3 | 5.33 | 55 | 30.01 | 54 | -23.99 |
| 3049.34 | 60.23 | PK | 35 | 232 | V | 30.3 | 5.33 | 55 | 40.86 | 74 | -33.14 |
| 3049.34 | 59.25 | PK | 235 | 198 | H | 30.3 | 5.33 | 55 | 39.88 | 74 | -34.12 |

High Channel (2480 MHz)

| Frequency (MHz) | Substituted level (dBμV/m) | Detector (PK/AV) | Direction (degree) | Height (cm) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|----------------------------|------------------|--------------------|-------------|----------------|--------------------|-----------------|--------------------|---------------------|----------------|-------------|
| 4960.07 | 50.34 | AV | 263 | 287 | V | 32.2 | 7 | 55 | 34.54 | 54 | -19.46 |
| 4923.82 | 52.98 | AV | 23 | 198 | H | 32.2 | 7 | 55 | 37.18 | 54 | -16.82 |
| 4923.82 | 60.12 | PK | 24 | 232 | V | 32.2 | 7 | 55 | 44.32 | 74 | -29.68 |
| 4923.82 | 63.33 | PK | 266 | 198 | H | 32.2 | 7 | 55 | 47.53 | 74 | -26.47 |
| 3045.23 | 49.89 | AV | 43 | 232 | V | 30.3 | 5.33 | 55 | 30.52 | 54 | -23.48 |
| 3045.23 | 50.93 | AV | 231 | 209 | H | 30.3 | 5.33 | 55 | 31.56 | 54 | -22.44 |
| 3045.23 | 55.89 | PK | 24 | 189 | V | 30.3 | 5.33 | 55 | 36.52 | 74 | -37.48 |
| 3045.23 | 58.37 | PK | 164 | 209 | H | 30.3 | 5.33 | 55 | 39 | 74 | -35 |

Annex A. TEST INSTRUMENT

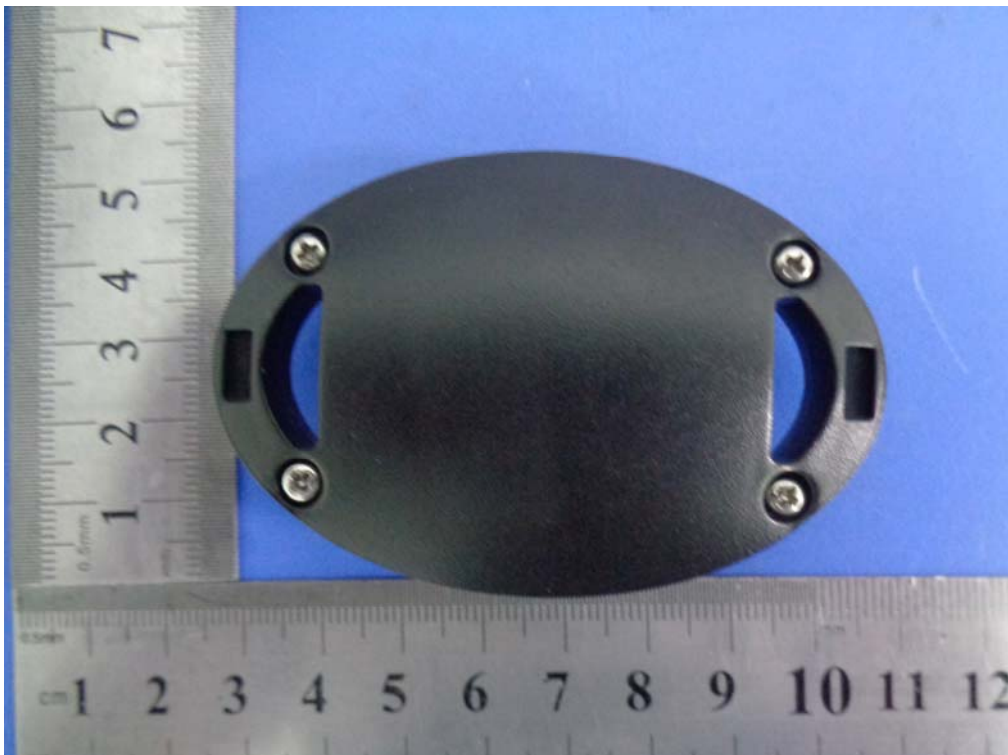
| Instrument | Model | Serial # | Cal Date | Cal Due | In use |
|---|--------------------------------|----------------|------------|------------|-------------------------------------|
| AC Line Conducted Emissions | | | | | |
| R&S EMI Test Receiver | ESPI3 | 101216 | 11/04/2014 | 11/03/2015 | N/A |
| V-LISN | ESH3-Z5 | 838979/005 | 09/27/2014 | 09/26/2015 | N/A |
| INFOMW Antenna (1 ~18GHz) | JXTXLB-10180 | J2031081120092 | 10/09/2014 | 10/08/2015 | N/A |
| SIEMIC Labview Conducted Emissions software | V1.0 | N/A | N/A | N/A | N/A |
| RF conducted test | | | | | |
| R&S EMI Receiver | ESPI3 | 101216 | 11/04/2014 | 11/03/2015 | <input checked="" type="checkbox"/> |
| Power Splitter | 1# | 1# | 02/02/2015 | 02/01/2016 | <input checked="" type="checkbox"/> |
| Hp Spectrum Analyzer | 8563E | 3821A09023 | 10/09/2014 | 10/08/2015 | <input checked="" type="checkbox"/> |
| Temperature/Humidity Chamber | 1007H | N/A | 01/07/2015 | 01/06/2016 | <input checked="" type="checkbox"/> |
| Radiated Emissions | | | | | |
| Hp Spectrum Analyzer | 8563E | 3821A09023 | 10/09/2014 | 10/08/2015 | <input checked="" type="checkbox"/> |
| R&S EMI Receiver | ESPI3 | 101216 | 11/04/2014 | 11/03/2015 | <input checked="" type="checkbox"/> |
| Antenna (30MHz~6GHz) | JB6 | A121411 | 04/15/2015 | 04/14/2016 | <input checked="" type="checkbox"/> |
| EMCO Horn Antenna (1 ~18GHz) | 3115 | N/A | 11/15/2014 | 11/14/2015 | <input checked="" type="checkbox"/> |
| INFOMW Antenna (1 ~18GHz) | JXTXLB-10180 | J2031081120092 | 10/09/2014 | 10/08/2015 | <input checked="" type="checkbox"/> |
| Horn Antenna (18~40GHz) | AH-840 | 101013 | 04/22/2015 | 04/21/2016 | <input checked="" type="checkbox"/> |
| Microwave Pre-Amp (18~40GHz) | PA-840 | 181250 | 05/29/2015 | 05/28/2016 | <input checked="" type="checkbox"/> |
| Hp Agilent Pre-Amplifier | 8447F | 1937A01160 | 10/27/2014 | 10/26/2015 | <input checked="" type="checkbox"/> |
| MITEQ Pre-Amplifier (0.1 ~ 18GHz) | AMF-7D- 00101800-30- 10P | 1451709 | 10/27/2014 | 10/26/2015 | <input checked="" type="checkbox"/> |
| SIEMIC Labview Radiated Emissions software | V1.0 | N/A | N/A | N/A | <input checked="" type="checkbox"/> |

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph EUT Internal Photo

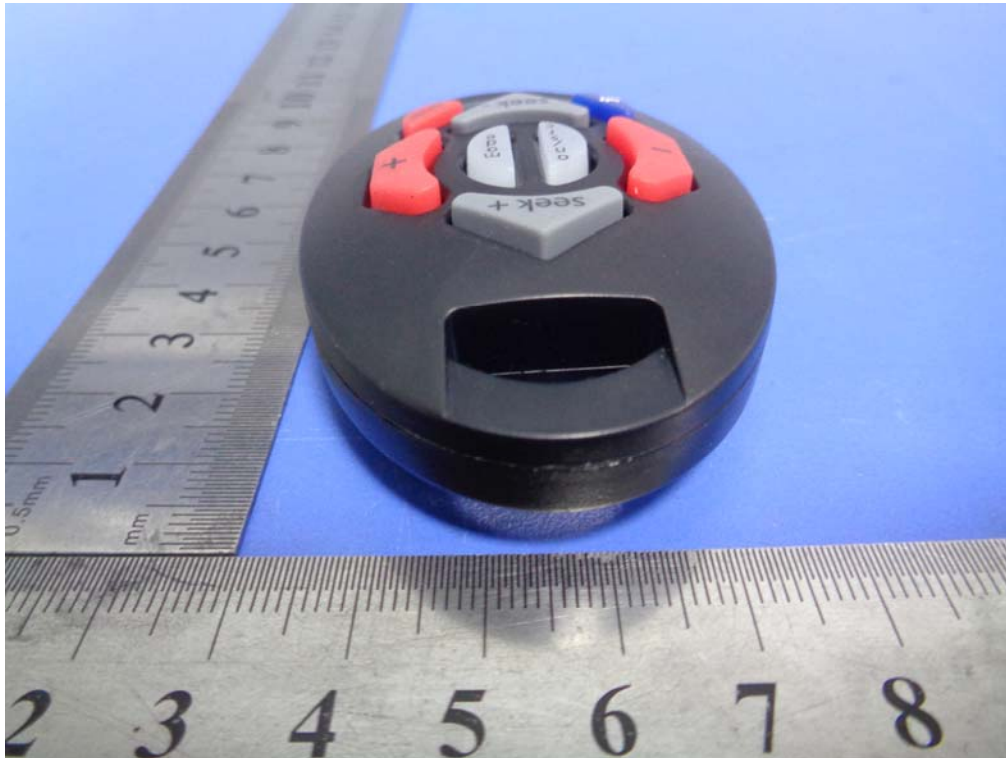


Front View of EUT



Rear View of EUT

| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 25 of 34 |



Top View of EUT



Bottom View of EUT

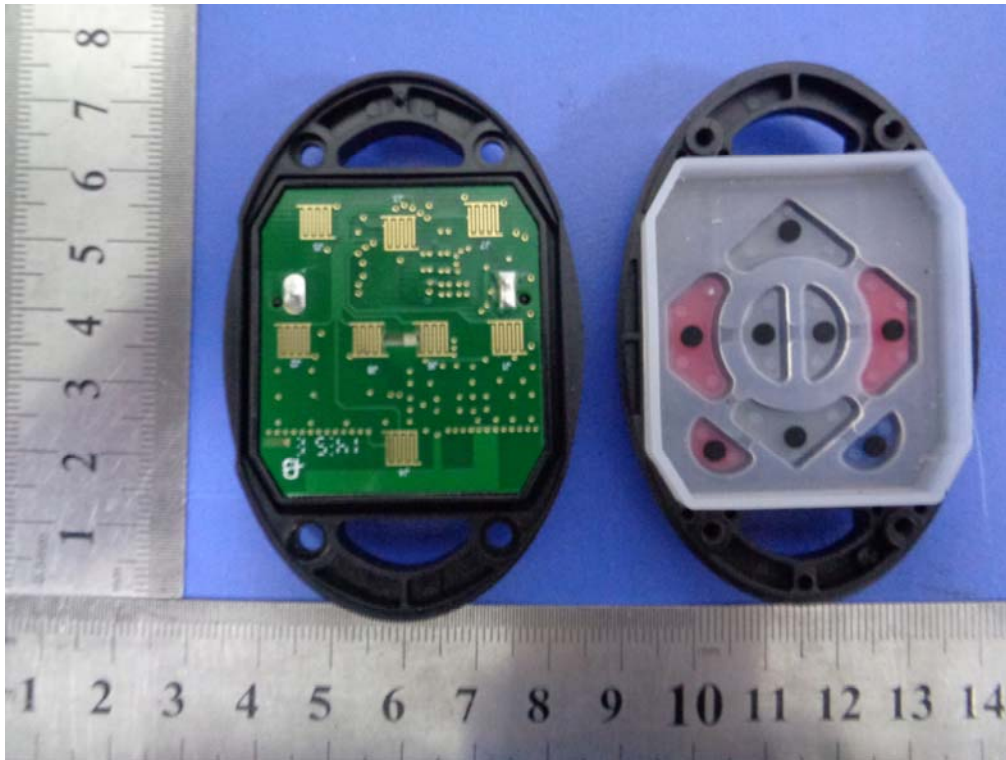


Left View of EUT

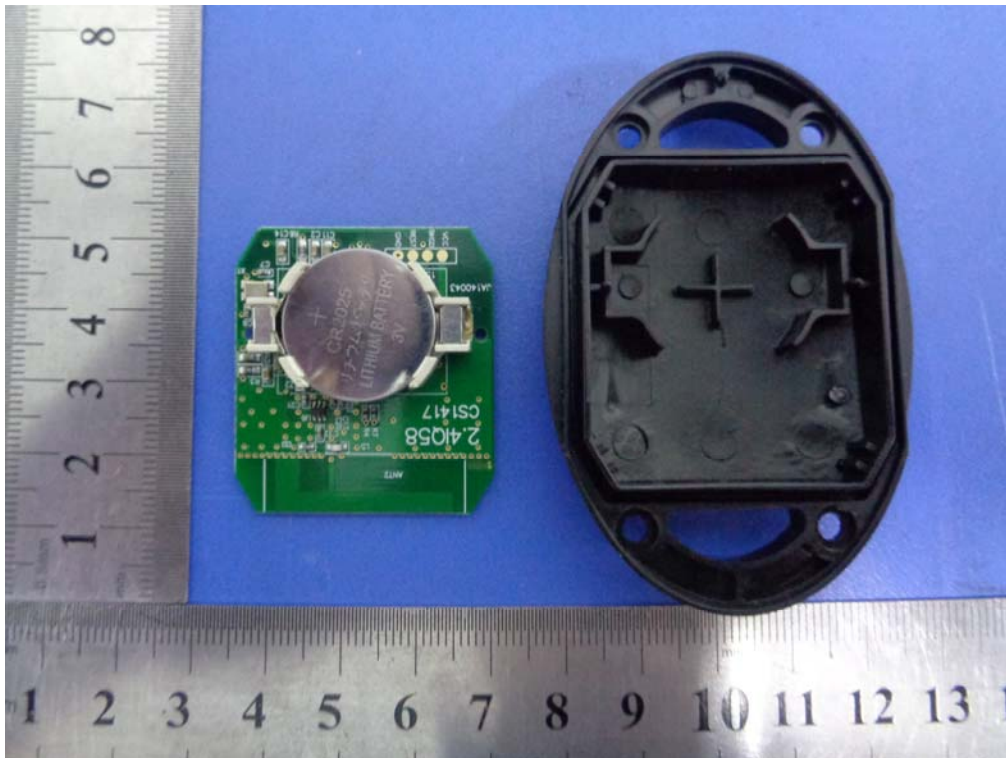


Right View of EUT

Annex B.ii. Photograph EUT Internal Photo

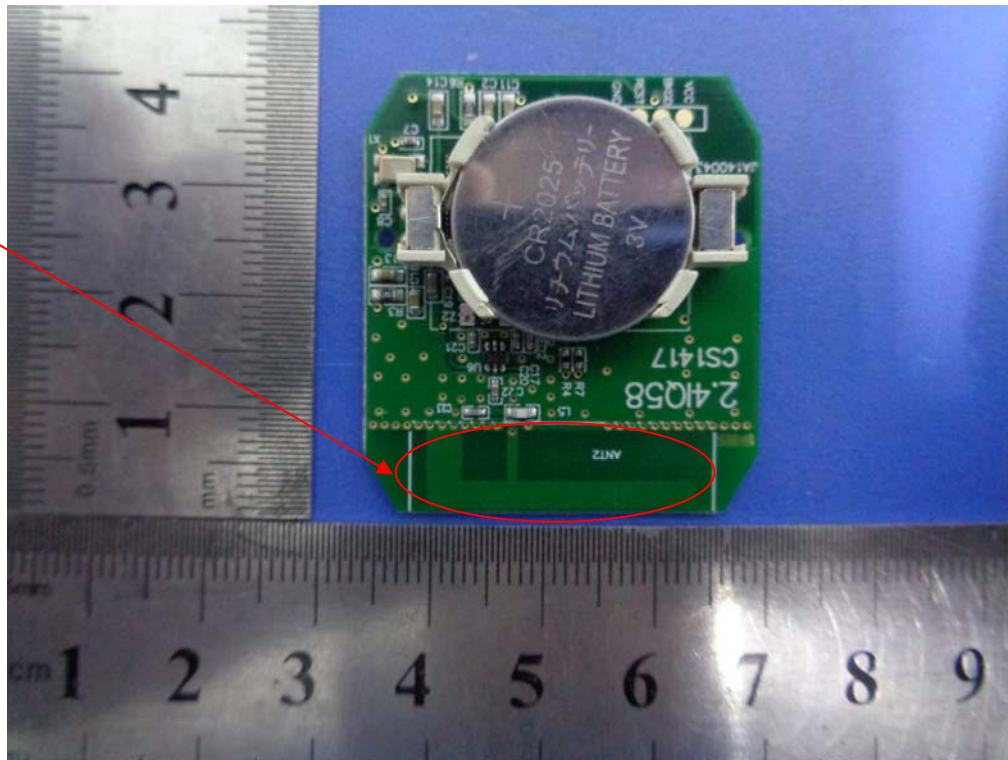


EUT Uncover - Front View

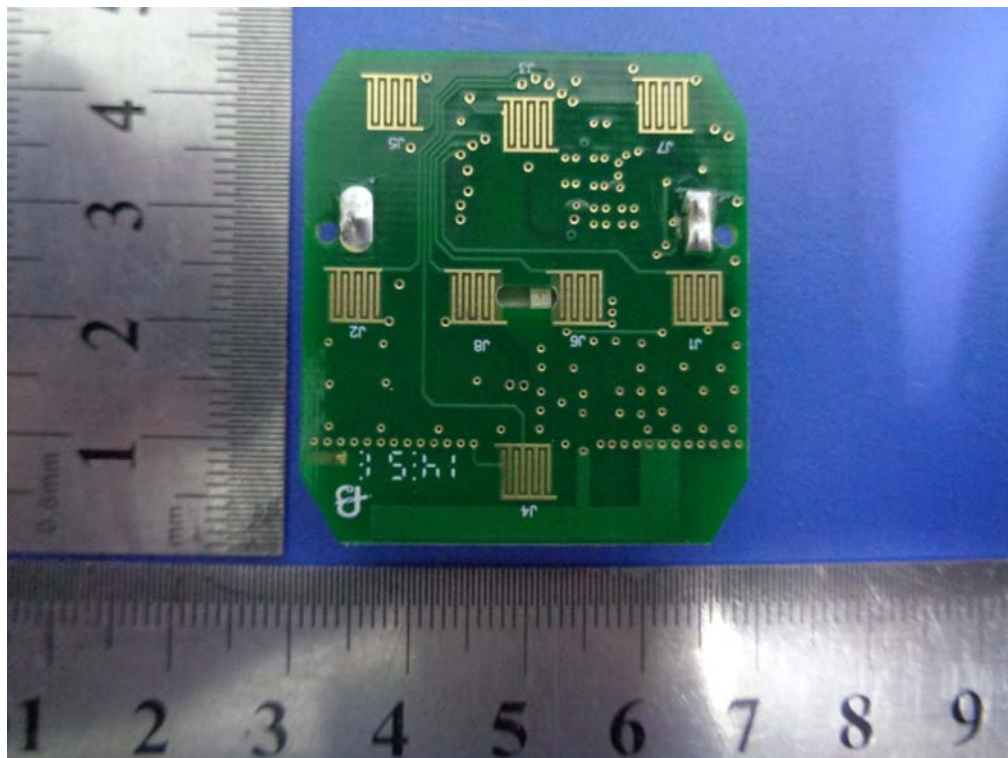


EUT Uncover - Rear View

Antenna

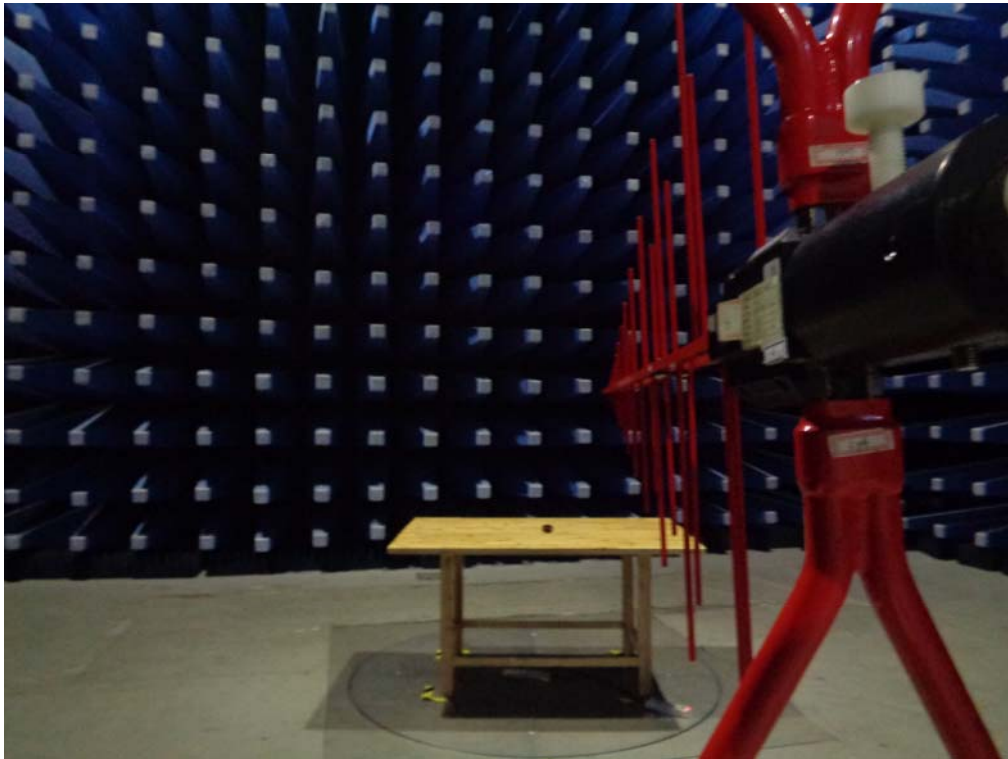


EUT PCBA - Front View

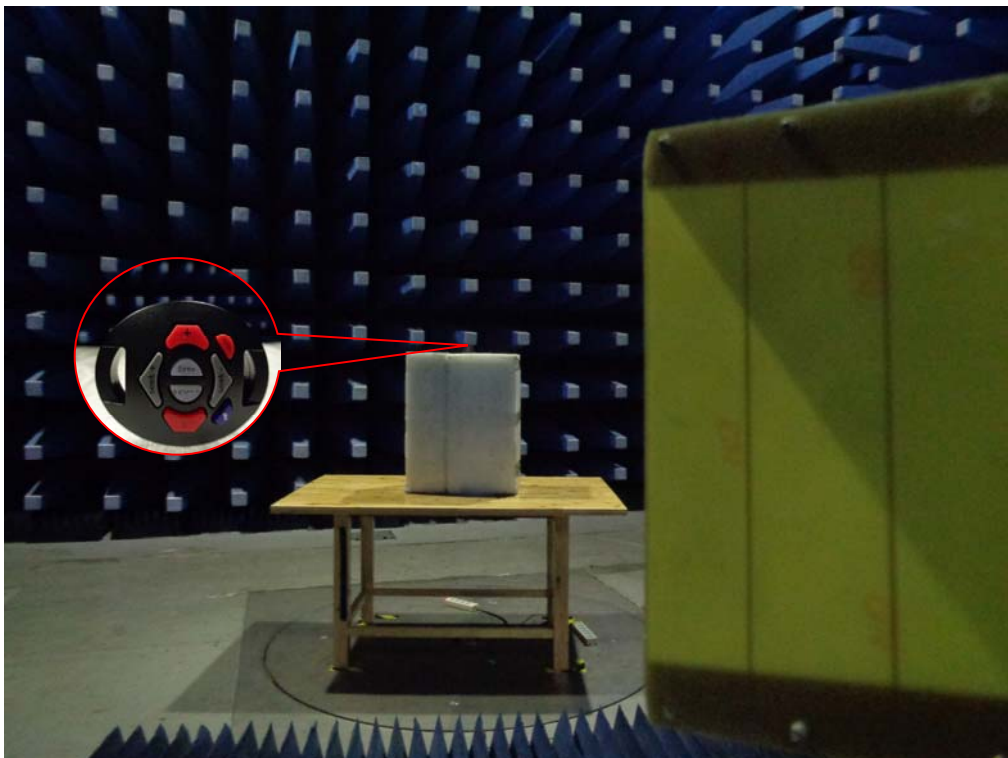


EUT PCBA - Rear View

Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Below 1GHz

| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 30 of 34 |

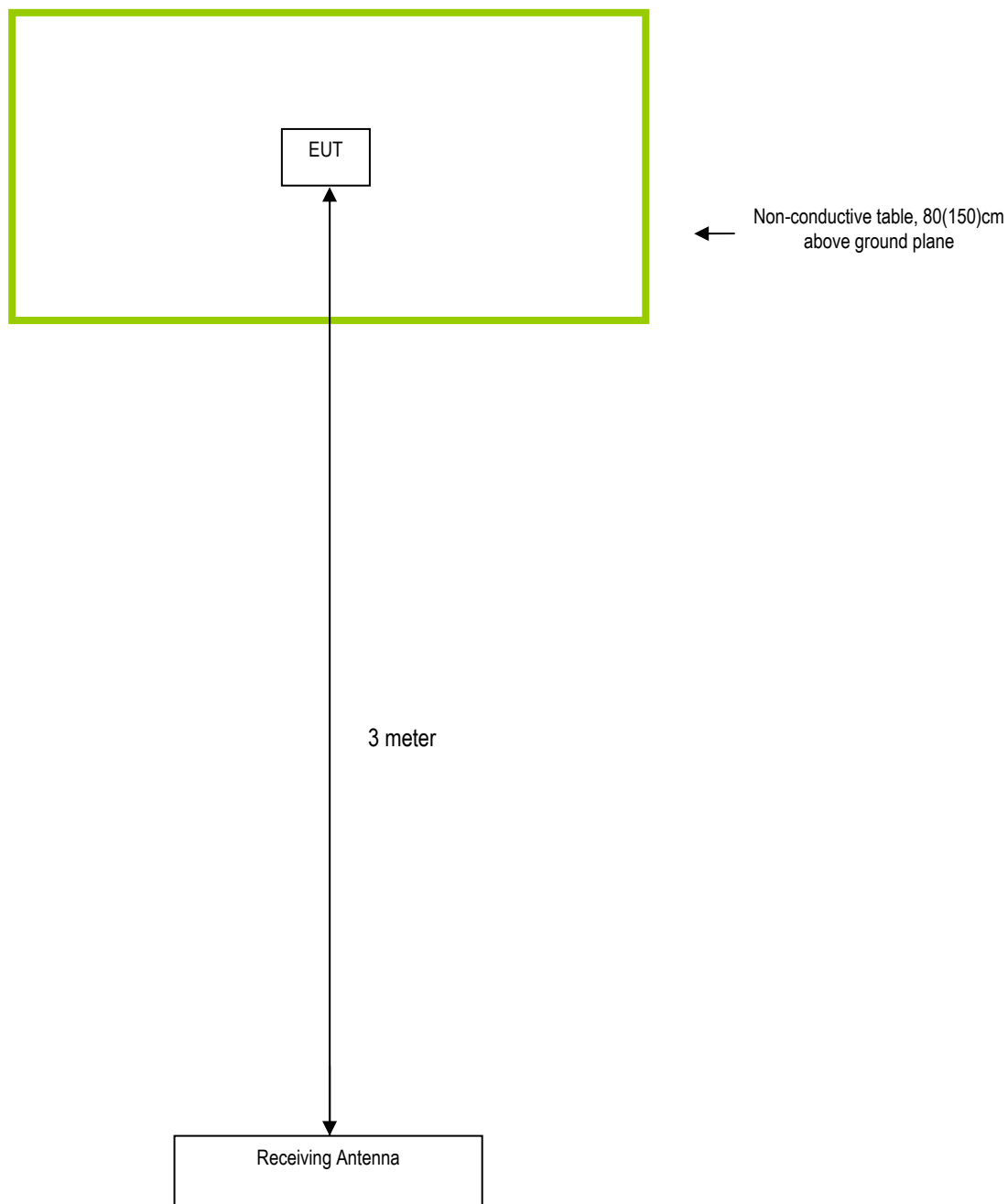
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.i. TEST SET UP BLOCK

Block Configuration Diagram for AC Line Conducted Emissions

N/A

Block Configuration Diagram for Radiated Emissions



| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 32 of 34 |

Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

| Manufacturer | Equipment Description | Model | Calibration Date | Calibration Due Date |
|---------------------|------------------------------|--------------|-------------------------|-----------------------------|
| N/A | N/A | N/A | N/A | N/A |

| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 33 of 34 |

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

| | |
|-----------------|-----------------|
| Test Report No. | 15020559-FCC-R1 |
| Page | 34 of 34 |

Annex E. DECLARATION OF SIMILARITY

N/A