


RF TEST REPORT



Report No.: 17020459-FCC-R1

Supersede Report No.: N/A

| | | |
|---|--|---|
| Applicant | CHAMPION POWER EQUIPMENT, INC | |
| Product Name | Remote Controller | |
| Main Model | K185-2 | |
| Serial Model | N/A | |
| Test Standard | FCC Part 15.231: 2016, ANSI C63.10: 2013 | |
| Test Date | April 24, 2017 | |
| Issue Date | April 25, 2017 | |
| 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"/> | |
| <i>Deon Dai</i> | <i>Miro Bao</i> |  |
| Deon Dai Test Engineer | Miro Bao Checked By | |
| <p>This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only</p> | | |

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Laboratories Introduction

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Accreditations for Conformity Assessment

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

| | |
|-----------------|-----------------|
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1. Report Revision History

| Report No. | Report Version | Description | Issue Date |
|-----------------|----------------|-------------|----------------|
| 17020459-FCC-R1 | NONE | Original | April 25, 2017 |
| | | | |
| | | | |
| | | | |
| | | | |

2. Customer information

| | |
|-------------------|---|
| Applicant Name | CHAMPION POWER EQUIPMENT, INC |
| Applicant Add | 12039 Smith Avenue, Santa Fe Springs, CA90670, USA |
| Manufacturer Name | Zhongshan Kingcobra Electronics Co., Ltd. |
| Manufacturer Add | 20#Tongxing East Road, Dongsheng Town, Zhongshan City, Guangdong, China |

3. Test site information

| | |
|----------------------|--|
| Lab performing tests | SIEMIC (Nanjing-China) Laboratories |
| Lab Add | 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 | EZ_EMG |

4. Equipment Under Test (EUT) Information

| | |
|-------------------------------|-------------------|
| Description of EUT: | Remote Controller |
| Main Model: | K185-2 |
| Serial Model: | N/A |
| Date EUT received: | April 21, 2017 |
| Test Date(s): | April 24, 2017 |
| Antenna Gain: | 2 dBi |
| Type of Modulation: | ASK |
| RF Operating Frequency (ies): | Tx:433.90MHz |
| Number of Channels: | 1 CH |
| Port: | N/A |
| Power: | DC6V |
| Trade Name: | CHAMPION |
| FCC ID: | YA3-K185 |

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 |
|---------------|--|------------|
| §15.203 | Antenna Requirement | Compliance |
| §15.207 | Conducted Emissions Voltage | N/A* |
| §15.231(b) | Fundamental & Radiated Spurious Emission | Compliance |
| §15.231(c) | 20dB Bandwidth | Compliance |
| §15.231(a)(1) | Deactivation | Compliance |

Note: Preliminary radiated emission testing has been performed on X, Y, Z axis, only worst case test result is presented in this test report.

Measurement Uncertainty

| Emissions | | |
|-----------------------------|---|-------------|
| Test Item | Description | Uncertainty |
| Radiated Spurious 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) | 3.92dB |

N/A*: EUT is Power Supply by Battery

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

Requirement(s): 47 CFR §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.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The antenna is permanently attached to the device which meets the requirement.

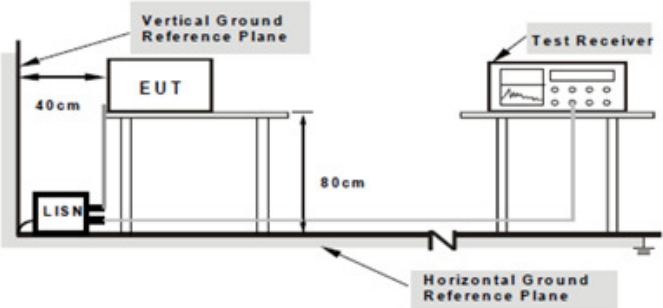
Result: Compliance.

6.2 AC Conducted Emissions Voltage

| | |
|----------------------|---|
| Temperature | - |
| Relative Humidity | - |
| Atmospheric Pressure | - |
| Test date : | - |
| Tested By : | - |

Conducted Emission Limit

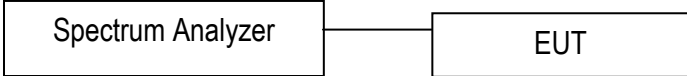
| Frequency ranges (MHz) | Limit (dB μ V) | |
|------------------------|--------------------|---------|
| | QP | Average |
| 0.15 ~ 0.5 | 66 – 56 | 56 – 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

| 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 frequency ranges. | <input type="checkbox"/> |
| Test Setup | |  <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> | |
| Procedure | | <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, as shown in Annex B. - 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. | |
| Remark | | EUT is Power Supply by Battery | |
| Result | | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Fail | |

6.3 20dB Occupied Bandwidth

| | |
|----------------------|----------------|
| Temperature | 25°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | April 24, 2017 |
| Tested By : | Deon Dai |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|--|--|-------------------------------------|
| §15.231(c) | a) | The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. | <input checked="" type="checkbox"/> |
| | b) | For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. | <input type="checkbox"/> |
| Test Setup |  <pre> graph LR SA[Spectrum Analyzer] --- EUT[EUT] </pre> | | |
| Test Procedure | <p><u>20dB Emission bandwidth measurement procedure</u></p> <ul style="list-style-type: none"> - Set RBW = 100 kHz. - Set the video bandwidth (VBW) $\geq 3 \times$ 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 20 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 Yes N/A

Test Plot Yes N/A

20dB Bandwidth measurement result

| Type | Freq (MHz) | CH | Measured 20dB Bandwidth (kHz) | Limit (kHz) | Result |
|---------|------------|------|-------------------------------|-------------|--------|
| 20dB BW | 433.90 | 1 CH | 280.3 | 1084.75 | Pass |

Test Plots

20dB Bandwidth measurement result

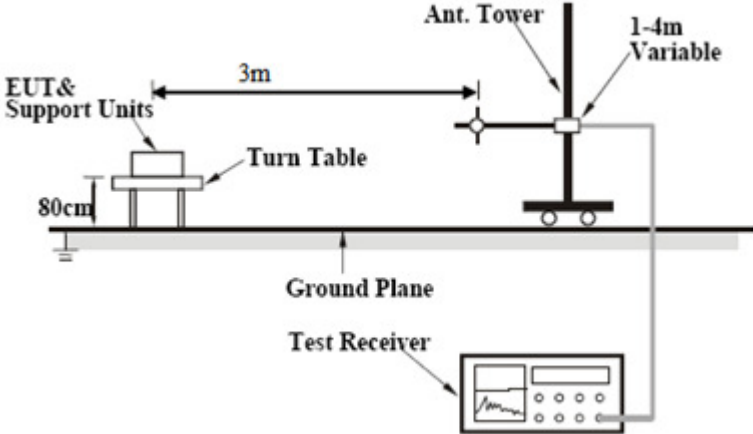


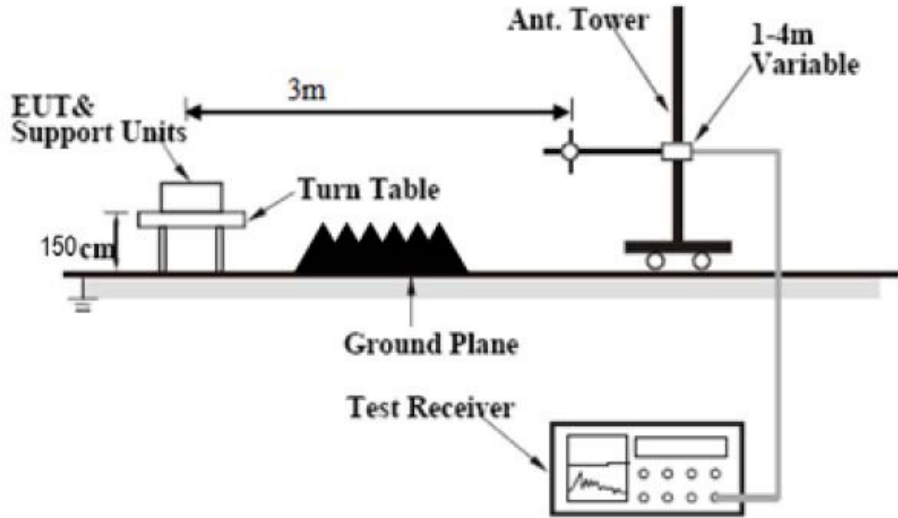
6.4 Radiated Fundamental and Spurious Emission

| | |
|----------------------|----------------|
| Temperature | 25°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | April 24, 2017 |
| Tested By : | Deon Dai |

Requirement(s):

| Spec | Item | Requirement | Applicable | | | | | | | | | | | | | | | | | | | | | |
|---|-------|--|------------|--|---|---|-------------|------|-----|--------|------|-----|---------|--------------|------------|---------|------|-----|---------|------------|-------------|-----------|-------|------|
| §15.231(b) | a) | 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 | ☒ | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Fundamental frequency (MHz)</th> <th>Field strength of fundamental (microvolts/meter)</th> <th>Field strength of spurious emissions (microvolts/meter)</th> </tr> </thead> <tbody> <tr> <td>40.66-40.70</td> <td>2250</td> <td>225</td> </tr> <tr> <td>70-130</td> <td>1250</td> <td>125</td> </tr> <tr> <td>130-174</td> <td>1250 to 3750</td> <td>125 to 375</td> </tr> <tr> <td>174-260</td> <td>3750</td> <td>375</td> </tr> <tr> <td>260-470</td> <td>3750-12500</td> <td>375 to 1250</td> </tr> <tr> <td>Above 470</td> <td>12500</td> <td>1250</td> </tr> </tbody> </table> | | Fundamental frequency (MHz) | Field strength of fundamental (microvolts/meter) | Field strength of spurious emissions (microvolts/meter) | 40.66-40.70 | 2250 | 225 | 70-130 | 1250 | 125 | 130-174 | 1250 to 3750 | 125 to 375 | 174-260 | 3750 | 375 | 260-470 | 3750-12500 | 375 to 1250 | Above 470 | 12500 | 1250 |
| | | Fundamental frequency (MHz) | | Field strength of fundamental (microvolts/meter) | Field strength of spurious emissions (microvolts/meter) | | | | | | | | | | | | | | | | | | | |
| | | 40.66-40.70 | | 2250 | 225 | | | | | | | | | | | | | | | | | | | |
| | | 70-130 | | 1250 | 125 | | | | | | | | | | | | | | | | | | | |
| | | 130-174 | | 1250 to 3750 | 125 to 375 | | | | | | | | | | | | | | | | | | | |
| | | 174-260 | | 3750 | 375 | | | | | | | | | | | | | | | | | | | |
| | | 260-470 | | 3750-12500 | 375 to 1250 | | | | | | | | | | | | | | | | | | | |
| Above 470 | 12500 | 1250 | | | | | | | | | | | | | | | | | | | | | | |
| Note: All 3 axes have been investigated. Only worst case is presented in the test report. | | | | | | | | | | | | | | | | | | | | | | | | |

| | | |
|------------|-----------|--|
| Test Setup | A: < 1GHz |  |
| | B: >1GHz | |

| | |
|-----------|--|
| |  |
| Procedure | <ol style="list-style-type: none"> 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 characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarisation (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. A Quasi-peak measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. |
| Remark | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A
 Test Plot Yes (See below) N/A

Data sample

| No. | Frequency (MHz) | Reading (dBµV/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------|----------|--------------|-----------|------------|-----------------|----------------|-------------|-------------|------------|
| | | | | | | | | | | | |

Frequency (MHz) = Emission frequency in MHz

Reading (dBµV/m) = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Ant_F=Antenna Factor

PA_G=Pre-Amplifier Gain

Cab_L=Cable Loss

Result (dBµV/m) = Reading Value + Corrected Value

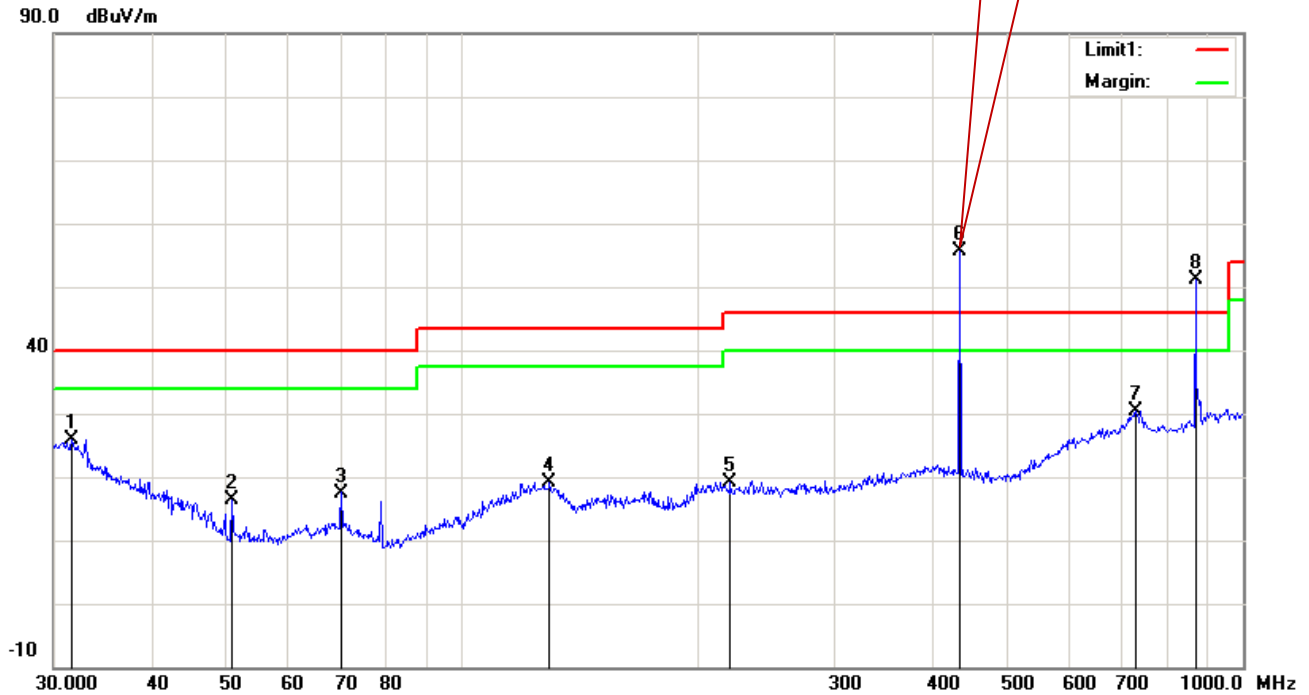
Limit (dBµV/m) = Limit stated in standard

Height (cm) = Height of Receiver antenna

Degree = Turn table degree

Calculation Formula:

Margin (dB) = Result (dBμV/m) – limit (dBμV/m)



Vertical Polarity Plot @3m

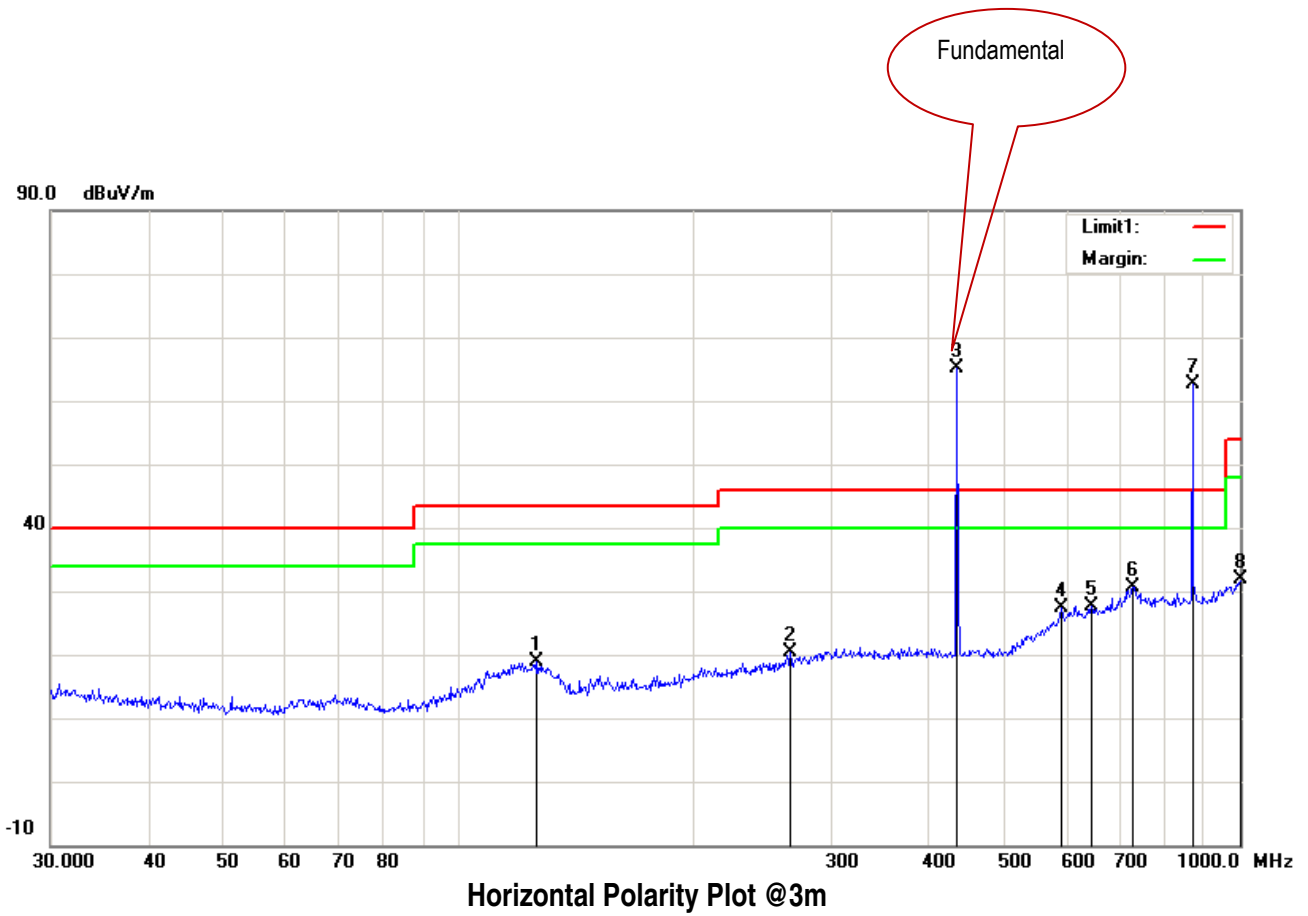
Field strength of fundamental Result

| No. | Frequency (MHz) | Reading (dBμV/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------|----------|--------------|-----------|------------|-----------------|----------------|-------------|-------------|------------|
| 6 | 433.90 | 85.07 | Pk | 16.43 | 49.13 | 3.35 | 55.72 | 100.8 | -45.08 | 200 | 222 |
| 6 | 433.90 | - | Ave | - | - | - | 44.5 | 80.8 | -36.3 | - | - |

Field strength of spurious emissions Result

| No. | Frequency (MHz) | Reading (dBμV/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------|----------|--------------|-----------|------------|-----------------|----------------|-------------|-------------|------------|
| 8 | 867.80 | 69.46 | peak | 23.02 | 46.12 | 4.76 | 51.12 | 80.8 | -29.68 | 200 | 83 |
| 8 | 867.80 | - | Ave | - | - | - | 39.9 | 60.8 | -20.9 | - | - |

Notes: Duty cycle is 27.49%, 20log (duty cycle) = -11.22dB correction was used to determine the average level from the peak reading.
Average = peak reading + 20log (duty cycle), Final Average= peak reading-11.22dB



Field strength of fundamental Result

| No. | Frequency (MHz) | Reading (dB μ V/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------------|----------|--------------|-----------|------------|-----------------------|----------------------|-------------|-------------|------------|
| 3 | 433.90 | 94.97 | Pk | 16.00 | 49.13 | 3.35 | 65.19 | 100.8 | -35.61 | 200 | 291 |
| 3 | 433.90 | - | Ave | - | - | - | 53.97 | 80.8 | -26.83 | - | - |

Field strength of spurious emissions Result

| No. | Frequency (MHz) | Reading (dB μ V/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------------|----------|--------------|-----------|------------|-----------------------|----------------------|-------------|-------------|------------|
| 7 | 867.80 | 81.15 | Pk | 22.79 | 46.12 | 4.76 | 62.58 | 80.8 | -18.22 | 200 | 360 |
| 7 | 867.80 | - | Ave | - | - | - | 51.36 | 60.8 | -9.44 | - | - |

Notes: Duty cycle is 27.49%, $20\log(\text{duty cycle}) = -11.22\text{dB}$ correction was used to determine the average level from the peak reading.
Average = peak reading + $20\log(\text{duty cycle})$, Final Average = peak reading - 11.22dB

Spurious Emissions (< 1GHz) Measurement Result

Vertical Polarity Plot @3m

| No. | Frequency (MHz) | Reading (dB μ V/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------------|----------|--------------|-----------|------------|-----------------------|----------------------|-------------|-------------|------------|
| 1 | 31.6202 | 50.10 | peak | 20.66 | 45.67 | 0.90 | 25.99 | 40.00 | -14.01 | 100 | 172 |
| 2 | 50.7637 | 52.73 | peak | 8.96 | 46.49 | 1.25 | 16.45 | 40.00 | -23.55 | 100 | 46 |
| 3 | 70.0903 | 53.52 | peak | 10.42 | 47.88 | 1.44 | 17.50 | 40.00 | -22.50 | 200 | 6 |
| 4 | 129.4678 | 48.19 | peak | 16.34 | 47.26 | 1.86 | 19.13 | 43.50 | -24.37 | 100 | 72 |
| 5 | 220.6171 | 49.65 | peak | 14.87 | 47.80 | 2.36 | 19.08 | 46.00 | -26.92 | 100 | 41 |
| 7 | 729.3583 | 49.22 | peak | 22.28 | 45.46 | 4.34 | 30.38 | 46.00 | -15.62 | 119 | 360 |

Horizontal Polarity Plot @3m

| No. | Frequency (MHz) | Reading (dB μ V/m) | Detector | Ant_F (dB/m) | PA_G (dB) | Cab_L (dB) | Result (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Height (cm) | Degree (°) |
|-----|-----------------|------------------------|----------|--------------|-----------|------------|-----------------------|----------------------|-------------|-------------|------------|
| 1 | 125.8864 | 48.49 | peak | 15.67 | 47.00 | 1.83 | 18.99 | 43.50 | -24.51 | 300 | 191 |
| 2 | 265.6757 | 50.41 | peak | 15.70 | 48.22 | 2.59 | 20.48 | 46.00 | -25.52 | 300 | 48 |
| 4 | 590.9737 | 51.32 | peak | 20.79 | 48.67 | 3.90 | 27.34 | 46.00 | -18.66 | 300 | 242 |
| 5 | 645.1195 | 49.36 | peak | 21.77 | 47.47 | 4.08 | 27.74 | 46.00 | -18.26 | 300 | 14 |
| 6 | 729.3583 | 49.17 | peak | 22.58 | 45.46 | 4.34 | 30.63 | 46.00 | -15.37 | 300 | 76 |
| 8 | 1000.0000 | 47.88 | peak | 25.10 | 46.17 | 5.06 | 31.87 | 54.00 | -22.13 | 200 | 279 |

Notes:

- Duty cycle is 27.49%, $20\log(\text{duty cycle}) = -11.22\text{dB}$ correction was used to determine the average level from the peak reading.
Average = peak reading + $20\log(\text{duty cycle})$, Final Average = peak reading - 11.22dB
- All the data measurement of peak values.
- FCC Limit for Average Measurement = $41.67 + (433.90\text{MHz}) - 7083.3333 = 10998.1131\mu\text{V/m} = 80.8\text{dB}\mu\text{V/m}$
- Average pulsed signal over one complete pulse train or 100 ms time frame if pulse train exceeds 100 ms
- Maximum average in 100 ms
- Calculate duty cycle for pulse train or 100 ms
- Duty cycle = $(t_1 + t_2 + t_3 + \dots + t_n) / T$ where t_n = pulse width, T = pulse train length or 100 ms

Spurious Emissions (> 1GHz) Measurement Result

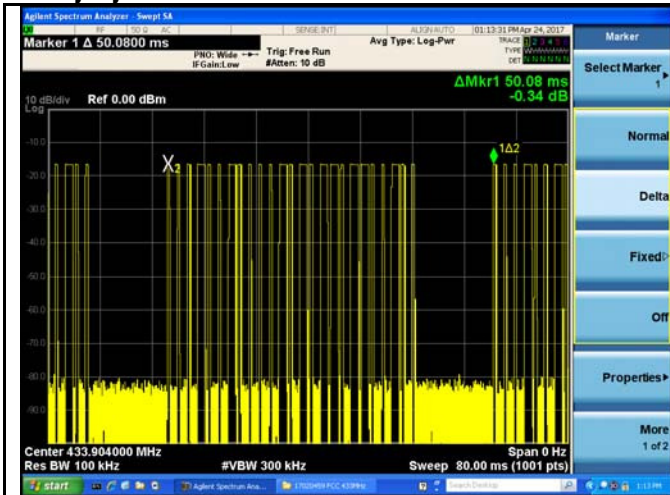
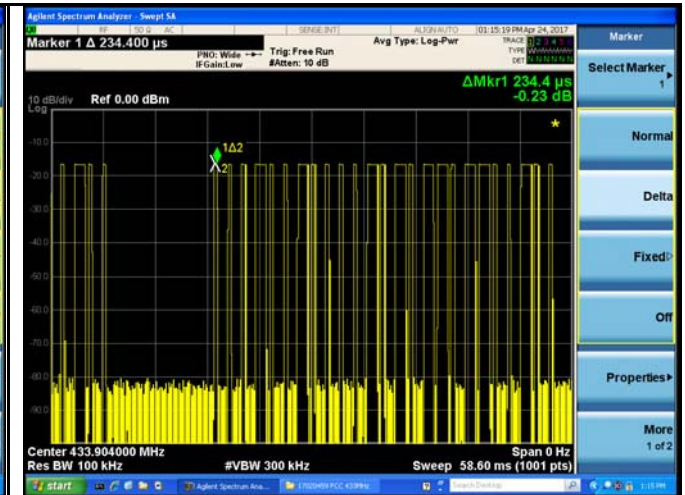
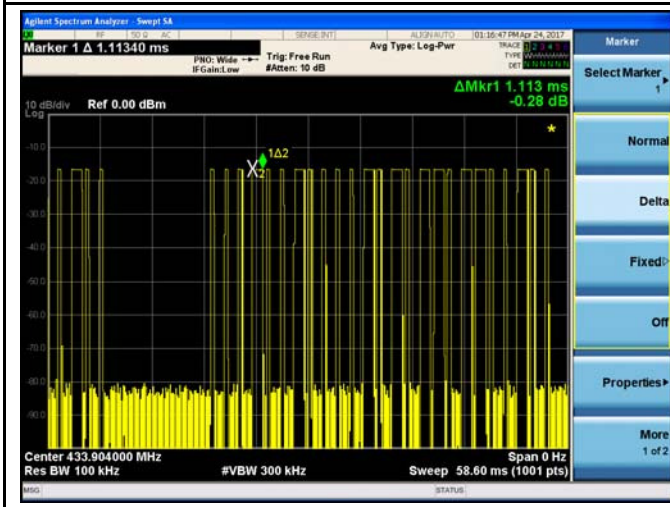
| Frequency GHz | Reading (dBμV/m) | Direction Degree | Height Meter | Polar H/V | Ant_F (dB/M) | PA_G (dB) | Cab_L (dB) | correct (dBμV/m) | FCC 15.231 Limit (dBμV/m) | Margin | Comments |
|---------------|------------------|------------------|--------------|-----------|--------------|-----------|------------|------------------|---------------------------|--------|----------|
| 1.302 | 81.24 | 276 | 2 | H | 24.64 | 51.56 | 2.85 | 57.17 | 74 | -16.83 | Peak |
| 1.302 | - | - | - | H | - | - | - | 45.95 | 54 | -8.05 | Ave |
| 1.736 | 77.26 | 131 | 1 | H | 25.99 | 50.98 | 3.99 | 56.26 | 80.8 | -24.54 | Peak |
| 1.736 | - | - | - | H | - | - | - | 45.04 | 60.8 | -15.76 | Ave |
| 2.169 | 73.25 | 56 | 2 | H | 27.84 | 52.38 | 4.17 | 52.88 | 80.8 | -27.92 | Peak |
| 2.169 | - | - | - | H | - | - | - | 41.66 | 60.8 | -19.14 | Ave |
| 2.603 | 77.25 | 89 | 1 | H | 29.26 | 52.68 | 4.13 | 57.96 | 80.8 | -22.84 | Peak |
| 2.603 | - | - | - | H | - | - | - | 46.74 | 60.8 | -14.06 | Ave |
| 3.037 | 76.93 | 355 | 2 | H | 29.33 | 52.82 | 4.5 | 57.94 | 80.8 | -22.86 | Peak |
| 3.037 | - | - | - | H | - | - | - | 46.72 | 60.8 | -14.08 | Ave |
| 3.471 | 68.02 | 244 | 1 | H | 32.02 | 52.88 | 4.91 | 52.07 | 74 | -21.93 | Peak |
| 3.471 | - | - | - | H | - | - | - | 40.85 | 54 | -13.15 | Ave |
| 1.302 | 64.89 | 65 | 2 | V | 24.64 | 51.56 | 2.85 | 40.82 | 74 | -33.18 | Peak |
| 1.302 | - | - | - | V | - | - | - | 29.60 | 54 | -24.4 | Ave |
| 1.736 | 61.26 | 138 | 1 | V | 25.99 | 50.98 | 3.99 | 40.26 | 80.8 | -40.54 | Peak |
| 1.736 | - | - | - | V | - | - | - | 29.04 | 60.8 | -31.76 | Ave |
| 2.169 | 79.79 | 319 | 2 | V | 27.84 | 52.38 | 4.17 | 59.42 | 80.8 | -21.38 | Peak |
| 2.169 | - | - | - | V | - | - | - | 48.2 | 60.8 | -12.6 | Ave |
| 2.603 | 78.92 | 286 | 2 | V | 29.26 | 52.68 | 4.13 | 59.63 | 80.8 | -21.17 | Peak |
| 2.603 | - | - | - | V | - | - | - | 48.41 | 60.8 | -12.39 | Ave |
| 3.037 | 74.48 | 188 | 2 | V | 29.33 | 52.82 | 4.5 | 55.49 | 80.8 | -25.31 | Peak |
| 3.037 | - | - | - | V | - | - | - | 47.96 | 60.8 | -12.84 | Ave |
| 3.471 | 79.27 | 2 | 2 | V | 32.02 | 52.88 | 4.91 | 63.32 | 74 | -10.68 | Peak |
| 3.471 | - | - | - | V | - | - | - | 52.1 | 57 | -4.9 | Ave |

Note: Duty cycle is 27.49%, $20\log(\text{duty cycle}) = -11.22\text{dB}$ correction was used to determine the average level from the peak reading.
Average = peak reading + $20\log(\text{duty cycle})$, final Average = peak reading -11.22dB

Note:

Narrow Pulse: 0.2344ms
 $2/NP = 2/0.2344\text{ms} = 8.53\text{kHz}$
RBW > 2/NP (8.53kHz)
Therefore PDCF is not needed.

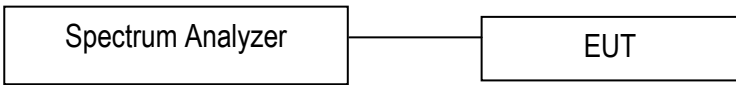
Duty Cycle Measurement Result

| | |
|---|---|
|  <p>Agilent Spectrum Analyzer - Swept SA Marker 1 Δ 50.0800 ms Ref 0.00 dBm ΔMkr1 50.08 ms -0.34 dB Center 433.904000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 80.00 ms (1001 pts)</p> |  <p>Agilent Spectrum Analyzer - Swept SA Marker 1 Δ 234.400 μs Ref 0.00 dBm ΔMkr1 234.4 μs -0.23 dB Center 433.904000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 58.60 ms (1001 pts)</p> |
| Duty Cycle 1# | Duty Cycle 2# |
|  <p>Agilent Spectrum Analyzer - Swept SA Marker 1 Δ 1.11340 ms Ref 0.00 dBm ΔMkr1 1.113 ms -0.28 dB Center 433.904000 MHz Res BW 100 kHz #VBW 300 kHz Sweep 58.60 ms (1001 pts)</p> | |
| Duty Cycle 3# | |
| <p>Wide Pulse: 0.2344ms Narrow Pulse: 1.113ms Duty cycle= $(1.113*9+0.2344*16)/50.08 = 27.49\%$ Average Duty Factor: $20*\log(\text{Duty Cycle}) = -11.22\text{dB}$</p> | |
| Pulse Duty Cycle | |

6.5 Deactivation

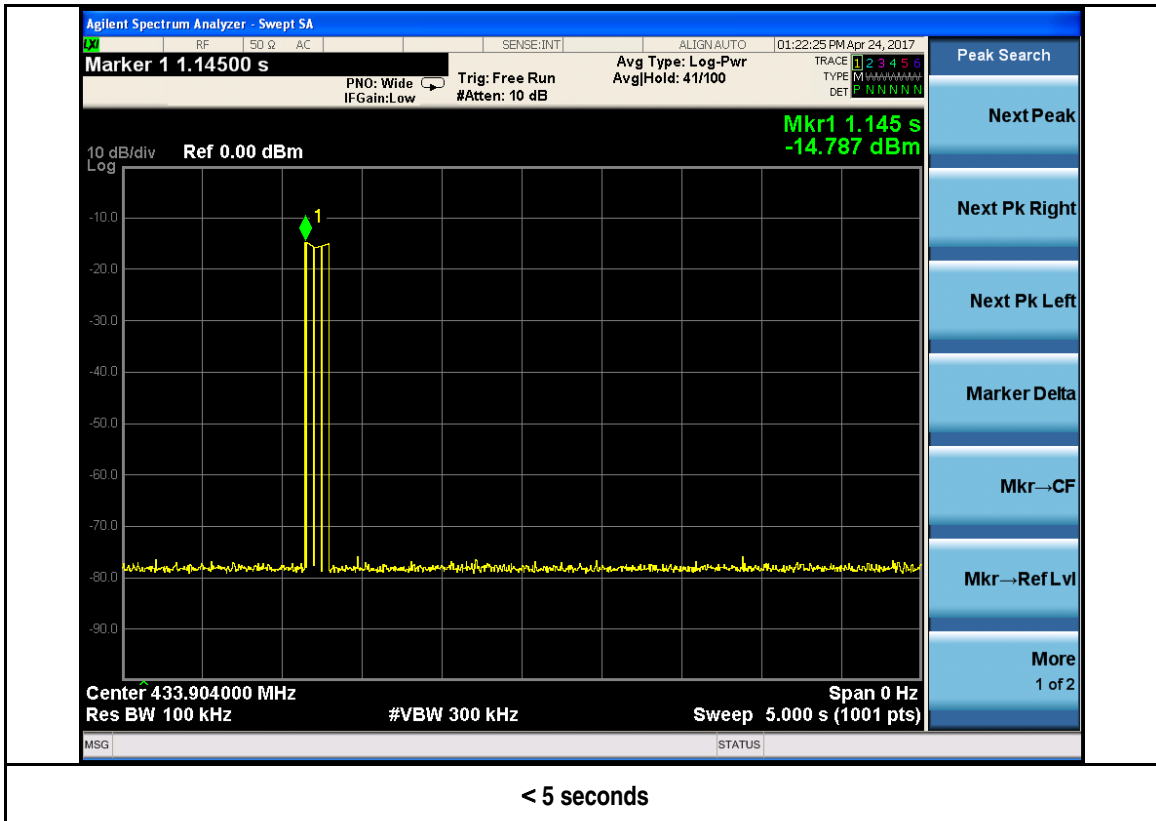
| | |
|----------------------|----------------|
| Temperature | 25°C |
| Relative Humidity | 50% |
| Atmospheric Pressure | 1019mbar |
| Test date : | April 24, 2017 |
| Tested By : | Deon Dai |

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|--|--|-------------------------------------|
| §15.231 (a)(1) | a) | A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. | <input checked="" type="checkbox"/> |
| Test Setup |  <pre> graph LR SA[Spectrum Analyzer] --- EUT[EUT] </pre> | | |
| Test Procedure | <u>measurement procedure</u> <ul style="list-style-type: none"> - Set analyzer center frequency to channel center frequency. - Set the span to 0Hz. - Set the RBW = 100 kHz - Set the VBW ≥ 3 ' RBW. - Detector = peak. - Sweep time = auto couple. - Trace mode = max hold. - Allow trace to fully stabilize. | | |
| Remark | | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Test Data Yes N/A
Test Plot Yes (See below) N/A

Test Plots
Deactivation Measurement Result



Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Due | In use |
|---|--------------|------------|------------|------------|-------------------------------------|
| AC Line Conducted Emissions | | | | | |
| R&S EMI Test Receiver | ESPI3 | 101216 | 03/31/2017 | 03/31/2018 | <input type="checkbox"/> |
| V-LISN | ESH3-Z5 | 838979/005 | 03/31/2017 | 03/31/2018 | <input type="checkbox"/> |
| SIEMIC EZ_EMC software Conducted Emissions | Ver.ICP-03A1 | N/A | N/A | N/A | <input type="checkbox"/> |
| RF conducted test | | | | | |
| Spectrum Analyzer | N9010A | MY47191130 | 03/11/2017 | 03/10/2018 | <input checked="" type="checkbox"/> |
| Temperature/Humidity Chamber | 1007H | N/A | 01/07/2017 | 01/06/2018 | <input checked="" type="checkbox"/> |
| Radiated Emissions | | | | | |
| Agilent Technologies | N9010A | MY47191130 | 03/11/2017 | 03/10/2018 | <input checked="" type="checkbox"/> |
| R&S EMI Receiver | ESPI3 | 101216 | 03/31/2017 | 03/31/2018 | <input checked="" type="checkbox"/> |
| Antenna (30MHz~6GHz) | JB6 | A121411 | 10/31/2016 | 10/31/2017 | <input checked="" type="checkbox"/> |
| EMCO Horn Antenna (1 ~18GHz) | 3115 | N/A | 10/09/2016 | 10/08/2017 | <input checked="" type="checkbox"/> |
| Hp Agilent Pre-Amplifier | 8447F | 1937A01160 | 10/27/2016 | 10/26/2017 | <input checked="" type="checkbox"/> |
| Pre-Amplifier | 8449B | 3008A02224 | 10/30/2016 | 10/30/2017 | <input checked="" type="checkbox"/> |
| SIEMIC EZ_EMC software Radiated Emissions | Ver.ICP-03A1 | N/A | N/A | N/A | <input checked="" type="checkbox"/> |

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photos



Top View of EUT



Bottom View of EUT



Front View of EUT



Rear View of EUT



Left View of EUT

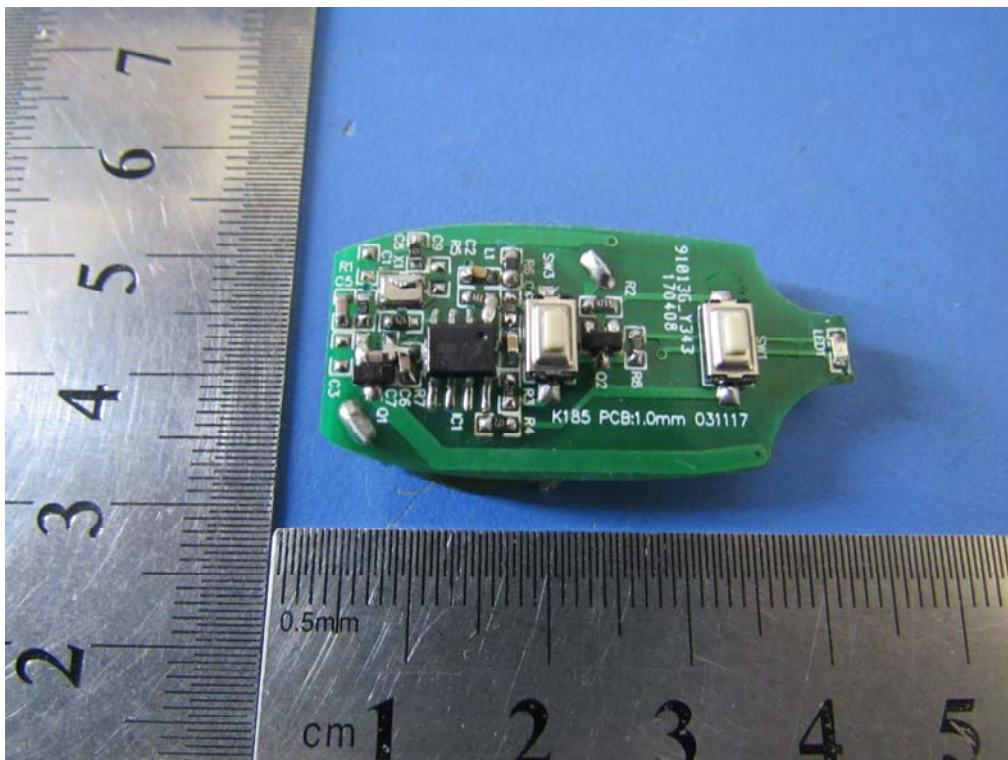


Right View of EUT

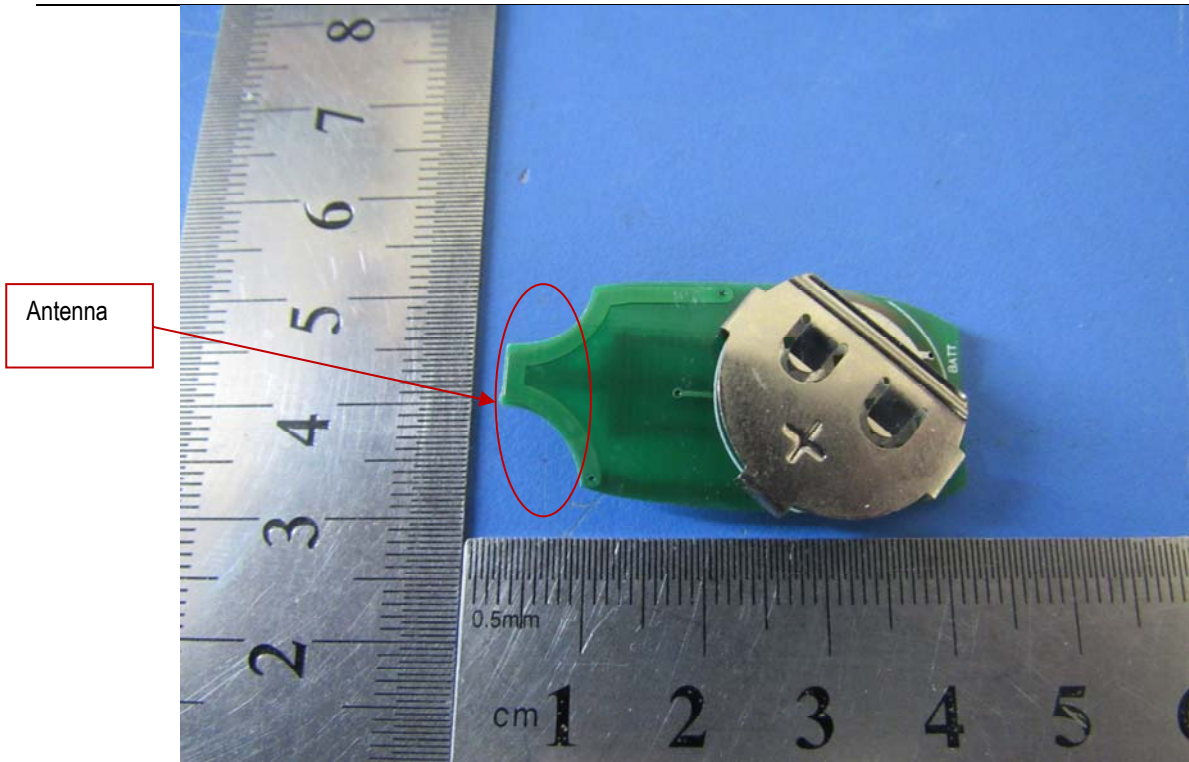
Annex B.ii. Photograph EUT Internal Photos



EUT Uncover- Front View

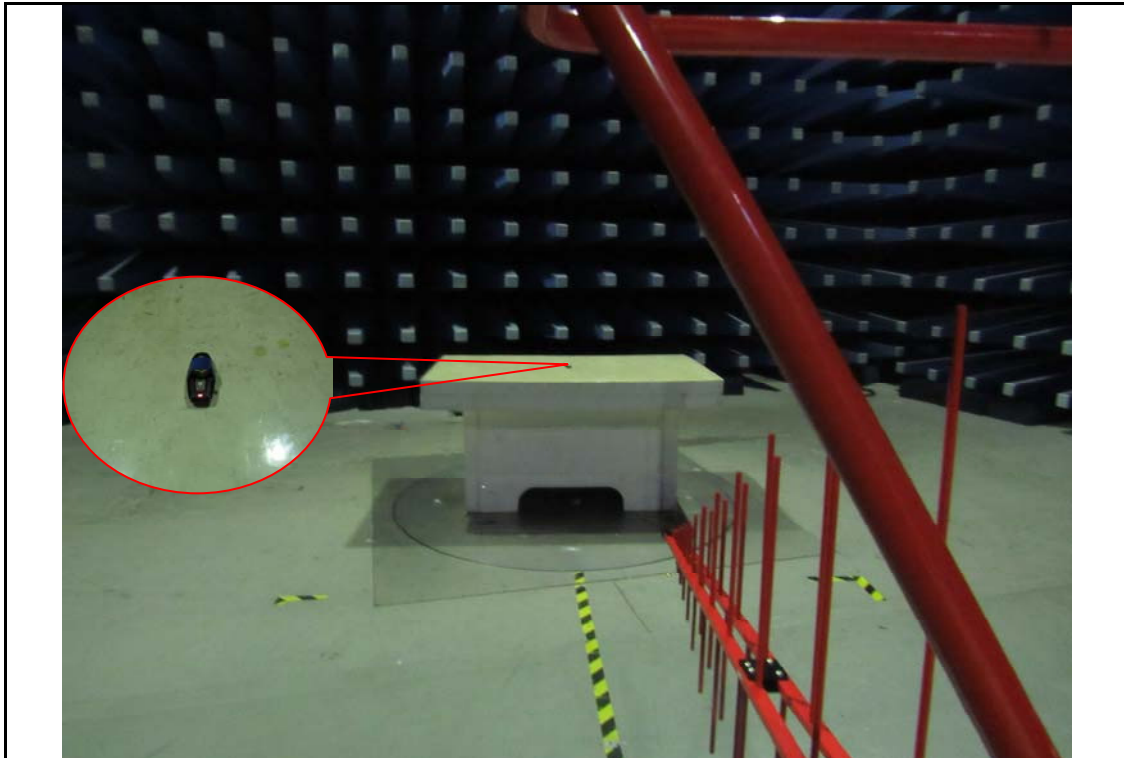


EUT PCBA - Front View



EUT PCBA 1 – Rear View

Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz

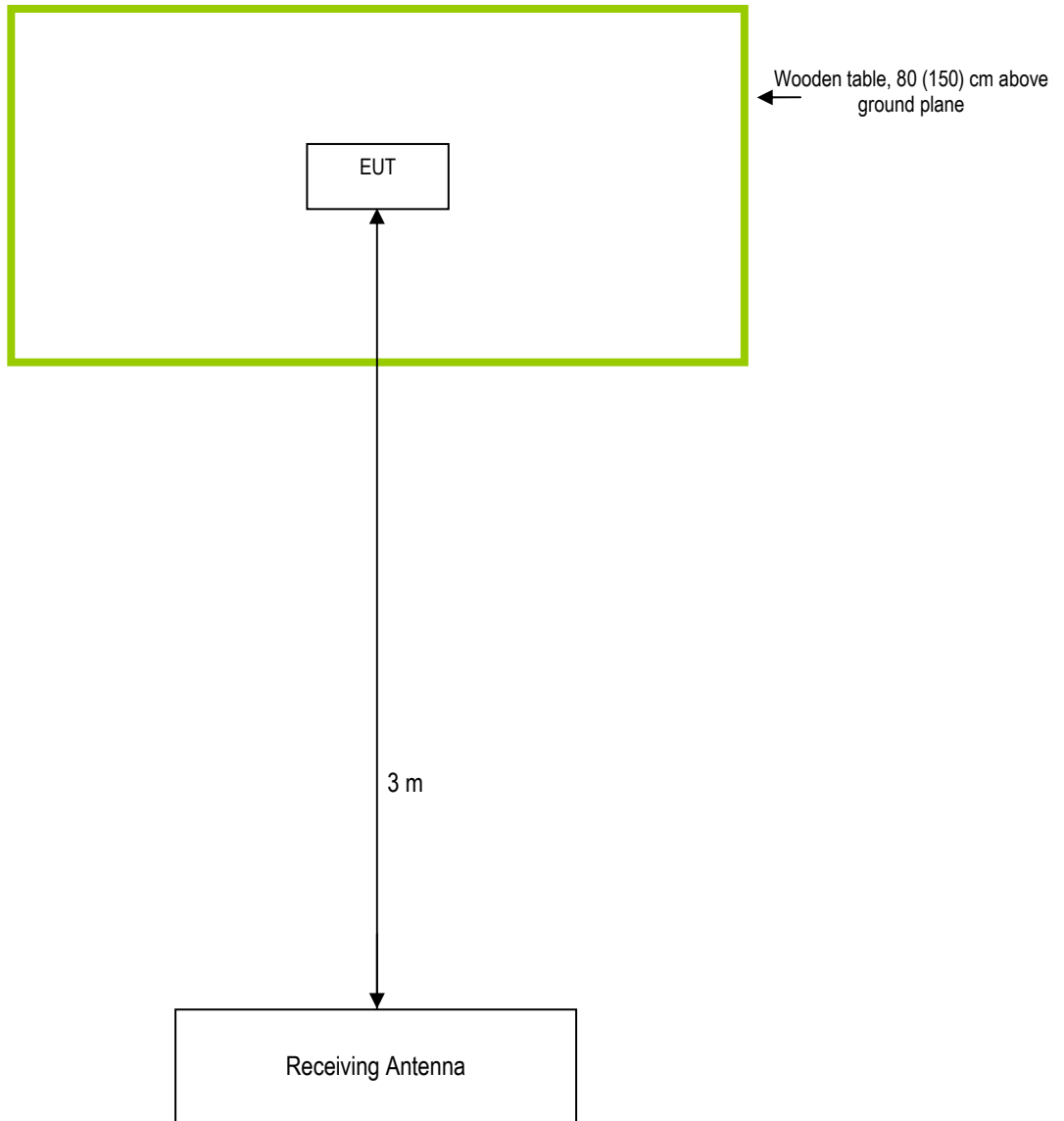


Radiated Spurious Emissions Test Setup Above 1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.i. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



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 |
|---------------------|------------------------------|--------------|
| N/A | N/A | N/A |

| | |
|-----------------|-----------------|
| Test Report No. | 17020459-FCC-R1 |
| Page | 30 of 31 |

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

Please see attachment

| | |
|-----------------|-----------------|
| Test Report No. | 17020459-FCC-R1 |
| Page | 31 of 31 |

Annex E. DECLARATION OF SIMILARITY

N/A

Thank you!

Printed name/title: Purchasing Manager

FCC ID: 2AGCVT7XXX2017

Signature: Hangzhou HILAND Technology CO., LTD

Address: 4TH BUILDING, 2XIYUANWU ROAD, WESTLAKE

TECHNOLOGY GRADEN, HANGZHOU, CHINA

Company representative

