



FCC TEST REPORT

**Test report
On Behalf of
Articom Electronic Co.Ltd of ZhongShan
For
 earmuff
Model No.: Vanquish Pro.
FCC ID: 2ARWF-EARMUFF**

Prepared for : **Articom Electronic Co.Ltd of ZhongShan**
5/F Factory 1 NO.142 Tanshen South Road, Tanzhou Town, ZhongShan, China

Prepared By : **Shenzhen HUAK Testing Technology Co., Ltd.**
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Date of Test: **Nov. 16, 2018 ~ Nov. 22, 2018**

Date of Report: **Nov. 22, 2018**

Report Number: **HK1811161698-E**



TEST RESULT CERTIFICATION

Applicant's name : Articom Electronic Co.Ltd of ZhongShan

Address : 5/F Factory 1 NO.142 Tanshen South Road,
Tanzhou Town, ZhongShan, China

Manufacture's Name : Outcome Driven Innovation, Inc.

Address : 974 Commercial St, Suite 100, Palo Alto, CA 94303, USA.

Product description

Trade Mark: N/A

Product name : earmuff

Model and/or type reference : Vanquish Pro.

Standards : FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.10: 2013

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Date of Test :

Date (s) of performance of tests : Nov. 16, 2018 ~ Nov. 22, 2018

Date of Issue : Nov. 22, 2018

Test Result : **Pass**

Testing Engineer :

(Gary Qian)

Technical Manager :

(Eden Hu)

Authorized Signatory :

(Jason Zhou)



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1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

| DESCRIPTION OF TEST | RESULT |
|--------------------------------|-----------|
| CONDUCTED EMISSIONS TEST | N/A |
| RADIATED EMISSION TEST | COMPLIANT |
| BAND EDGE | COMPLIANT |
| OCCUPIED BANDWIDTH MEASUREMENT | COMPLIANT |
| ANTENNA REQUIREMENT | COMPLIANT |

1.2 TEST FACILITY

Test Firm : Shenzhen HUAKE Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

1.3 MEASUREMENT UNCERTAINTY

| | |
|---|---------------|
| Measurement Uncertainty | |
| Conducted Emission Expanded Uncertainty | = 2.23dB, k=2 |
| Radiated emission expanded uncertainty(9kHz-30MHz) | = 3.08dB, k=2 |
| Radiated emission expanded uncertainty(30MHz-1000MHz) | = 4.42dB, k=2 |
| Radiated emission expanded uncertainty(Above 1GHz) | = 4.06dB, k=2 |



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------|----------------------------|
| Equipment | earmuff |
| Model Name | Vanquish Pro. |
| Serial No | N/A |
| Model Difference | N/A |
| FCC ID | 2ARWF-EARMUFF |
| Antenna Type | Chip Antenna |
| Antenna Gain | 0 dBi |
| BT Operation frequency | 2402-2480MHz |
| Number of Channels | 79CH |
| Modulation Type | GFSK, $\pi/4$ DQPSK, 8DPSK |
| Power Source | DC 3V From Battery |
| Power Rating | DC 3V From Battery |



2.1.1 Carrier Frequency of Channels

| Channel List | | | | | |
|--------------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

2.2 Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz



2.3 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing:



Operation of EUT during Radiation testing and Above1GHz Radiation testing:





2.4 MEASUREMENT INSTRUMENTS LIST

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---|-----------------|---------------------|------------|---------------|---------------|
| 1. | L.I.S.N. Artificial Mains Network | R&S | ENV216 | HKE-002 | Dec. 28, 2017 | 1 Year |
| 2. | Receiver | R&S | ESCI 7 | HKE-010 | Dec. 28, 2017 | 1 Year |
| 3. | RF automatic control unit | Tonscend | JS0806-2 | HKE-060 | Dec. 28, 2017 | 1 Year |
| 4. | Spectrum analyzer | R&S | FSP40 | HKE-025 | Dec. 28, 2017 | 1 Year |
| 5. | Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 28, 2017 | 1 Year |
| 6. | Preamplifier | Schwarzbeck | BBV 9743 | HKE-006 | Dec. 28, 2017 | 1 Year |
| 7. | EMI Test Receiver | Rohde & Schwarz | ESCI 7 | HKE-010 | Dec. 28, 2017 | 1 Year |
| 8. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | HKE-012 | Dec. 28, 2017 | 1 Year |
| 9. | Loop Antenna | Schwarzbeck | FMZB 1519 B | HKE-014 | Dec. 28, 2017 | 1 Year |
| 10. | Horn Antenna | Schwarzbeck | 9120D | HKE-013 | Dec. 28, 2017 | 1 Year |
| 11. | Pre-amplifier | EMCI | EMC051845 SE | HKE-015 | Dec. 28, 2017 | 1 Year |
| 12. | Pre-amplifier | Agilent | 83051A | HKE-016 | Dec. 28, 2017 | 1 Year |
| 13. | EMI Test Software EZ-EMC | Tonscend | JS1120-B Version | HKE-083 | Dec. 28, 2017 | N/A |
| 14. | Power Sensor | Agilent | E9300A | HKE-086 | Dec. 28, 2017 | 1 Year |
| 15. | Spectrum analyzer | Agilent | N9020A | HKE-048 | Dec. 28, 2017 | 1 Year |
| 16. | Signal generator | Agilent | N5182A | HKE-029 | Dec. 28, 2017 | 1 Year |
| 17. | Signal Generator | Agilent | 83630A | HKE-028 | Dec. 28, 2017 | 1 Year |
| 18. | Shielded room | Shiel Hong | 4*3*3 | HKE-039 | Dec. 28, 2017 | 3 Year |



3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

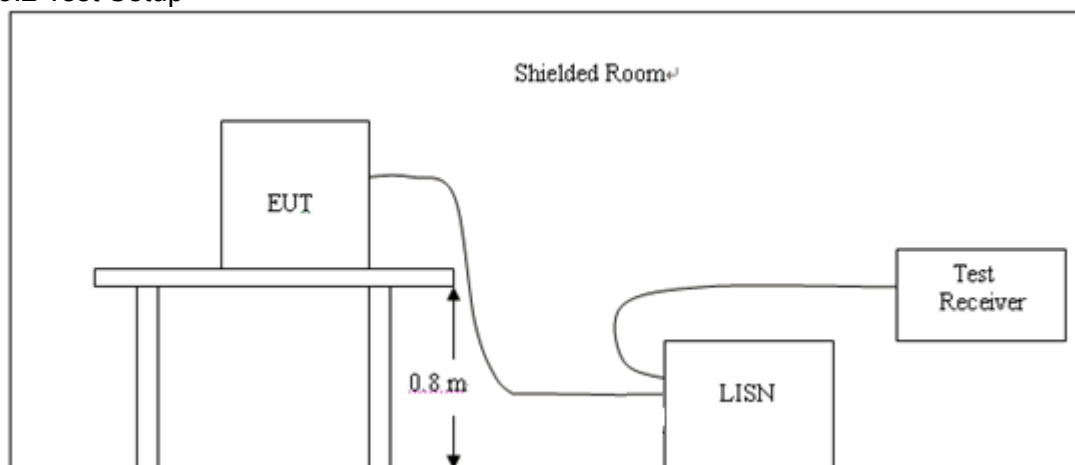
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

| Frequency (MHz) | Maximum RF Line Voltage (dBμV) | | | |
|--------------------|--------------------------------|------|---------|--------|
| | CLASS A | | CLASS B | |
| | Q.P. | Ave. | Q.P. | Ave. |
| 0.15 - 0.50 | 79 | 66 | 66-56* | 56-46* |
| 0.50 - 5.00 | 73 | 60 | 56 | 46 |
| 5.00 - 30.0 | 73 | 60 | 60 | 50 |

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

3.4 Test Result

Not applicable.

Note: EUT power supply by DC Power, so this test not applicable.

4 RADIATED EMISSION TEST

4.1 Radiation Limit

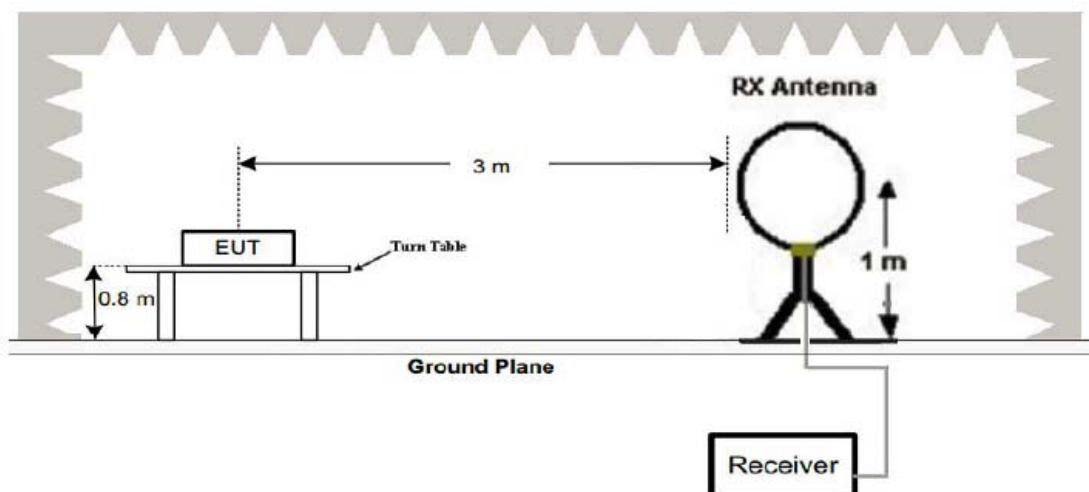
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m) | Radiated (μV/m) |
|-----------------|-------------------|--|-----------------------|
| 0.009-0.49 | 3 | $20\log(2400/F(\text{KHz}))+40\log(300/3)$ | $2400/F(\text{KHz})$ |
| 0.49-1.705 | 3 | $20\log(24000/F(\text{KHz}))+40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30 | 3 | $20\log(30)+40\log(30/3)$ | 30 |
| 30-88 | 3 | 40.0 | 100 |
| 88-216 | 3 | 43.5 | 150 |
| 216-960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |

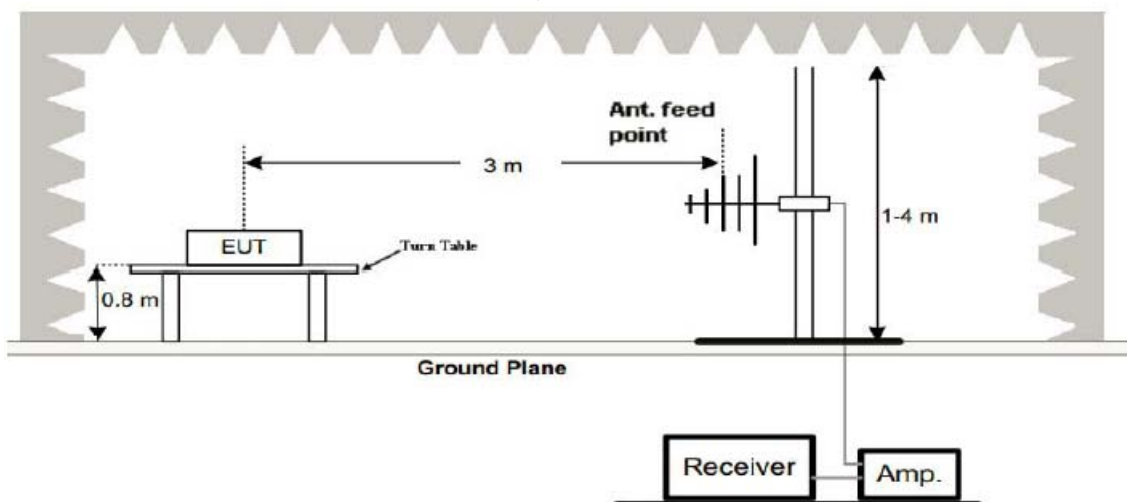
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

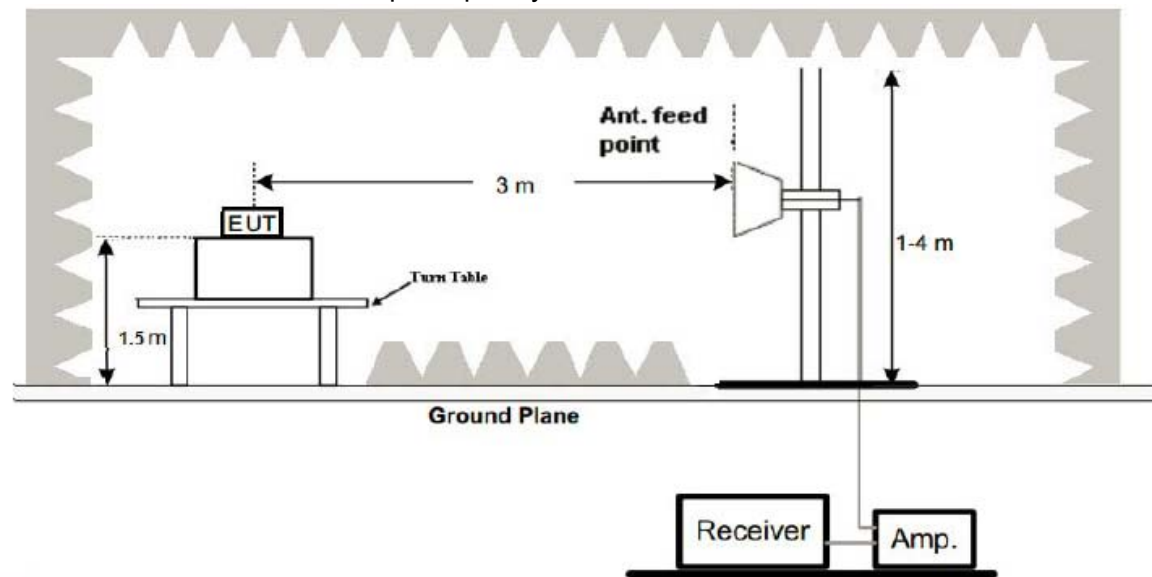
(1) Radiated Emission Test-Up Frequency Below 30MHz



(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



(3) Radiated Emission Test-Up Frequency Above 1GHz



4.3 Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

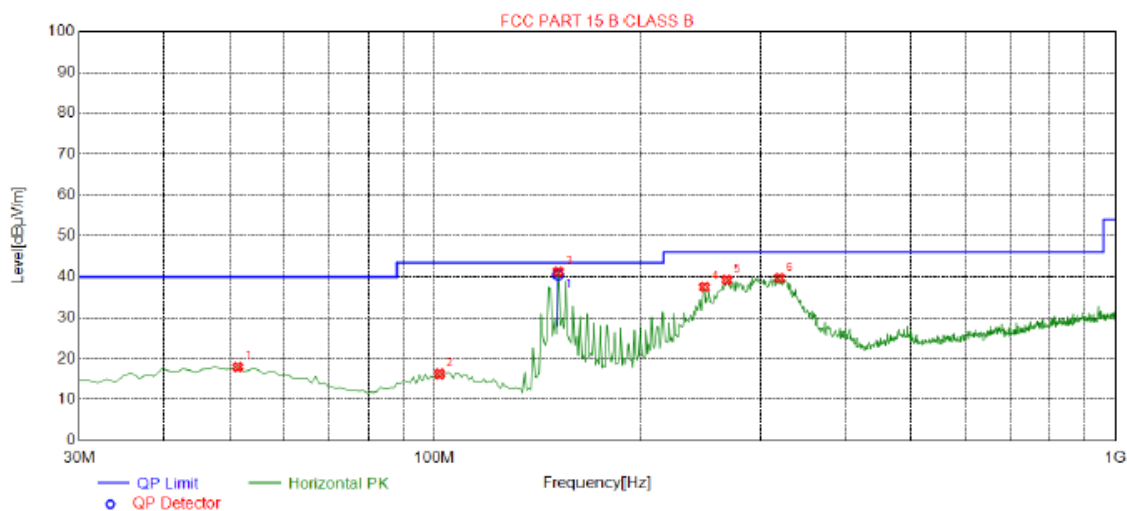
4.4 Test Result

PASS

All the test modes completed for test. only the worst result of 8DPSK Low Channel was reported as below:



Below 1GHz Test Results:
Antenna polarity: H



Suspected List

| NO. | Freq. [MHz] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|-------------|----------------|-------------|-------------|-----------|------------|
| 1 | 51.3400 | 17.98 | -13.85 | 40.00 | 22.02 | 100 | 234 | Horizontal |
| 2 | 101.780 | 16.26 | -15.41 | 43.50 | 27.24 | 100 | 308 | Horizontal |
| 3 | 152.220 | 41.25 | -18.78 | 43.50 | 2.25 | 100 | 10 | Horizontal |
| 4 | 248.250 | 37.50 | -13.47 | 46.00 | 8.50 | 100 | 240 | Horizontal |
| 5 | 267.650 | 39.23 | -13.63 | 46.00 | 6.77 | 100 | 234 | Horizontal |
| 6 | 320.030 | 39.73 | -12.10 | 46.00 | 6.27 | 100 | 123 | Horizontal |

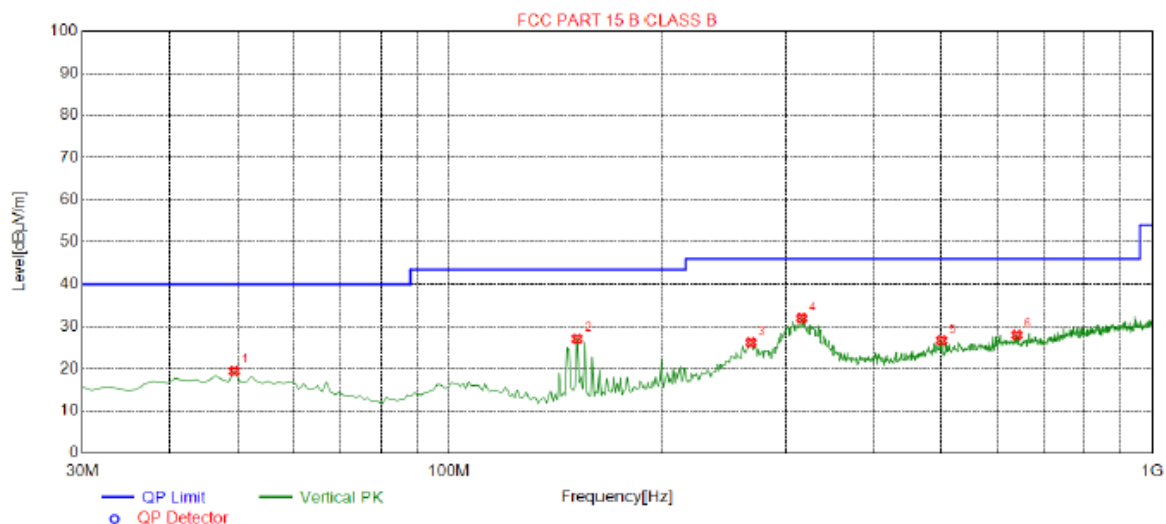
Final Data List

| NO. | Freq. [MHz] | Factor [dB] | QP Value [dBμV/m] | QP Limit [dBμV/m] | QP Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|-------------|-------------------|-------------------|----------------|-------------|-----------|------------|
| 1 | 152.019 | -18.80 | 40.50 | 43.50 | 3.00 | 130 | 165.9 | Horizontal |

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level



Antenna polarity: V



| Suspected List | | | | | | | | |
|----------------|-------------|----------------|-------------|----------------|-------------|-------------|-----------|----------|
| NO. | Freq. [MHz] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 49.4000 | 19.46 | -13.65 | 40.00 | 20.54 | 100 | 314 | Vertical |
| 2 | 152.220 | 27.08 | -18.78 | 43.50 | 16.42 | 100 | 132 | Vertical |
| 3 | 267.650 | 26.17 | -13.63 | 46.00 | 19.83 | 100 | 350 | Vertical |
| 4 | 316.150 | 31.94 | -12.30 | 46.00 | 14.06 | 100 | 183 | Vertical |
| 5 | 500.450 | 26.68 | -8.29 | 46.00 | 19.32 | 100 | 239 | Vertical |
| 6 | 641.100 | 28.01 | -5.67 | 46.00 | 17.99 | 100 | 38 | Vertical |

Remark: Transd = Cable lose + Antenna factor - Pre-amplifier; Margin = Limit – Level

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

Above 1 GHz Test Results:

CH Low (2402MHz)

Horizontal:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2402 | 116.22 | -5.81 | 110.41 | 114.00 | -3.59 | peak |
| 2402 | 89.49 | -5.81 | 83.68 | 94.00 | -10.32 | AVG |
| 4804 | 59.31 | -3.65 | 55.66 | 74.00 | -18.34 | peak |
| 4804 | 49.54 | -3.65 | 45.89 | 54.00 | -8.11 | AVG |
| 7206 | 58.95 | -0.95 | 58.00 | 74.00 | -16.00 | peak |
| 7206 | 46.07 | -0.95 | 45.12 | 54.00 | -8.88 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2402 | 113.69 | -5.81 | 107.88 | 114.00 | -6.12 | peak |
| 2402 | 89.49 | -5.81 | 83.68 | 94.00 | -10.32 | AVG |
| 4804 | 58.01 | -3.65 | 54.36 | 74.00 | -19.64 | peak |
| 4804 | 46.69 | -3.65 | 43.04 | 54.00 | -10.96 | AVG |
| 7206 | 58.65 | -0.95 | 57.70 | 74.00 | -16.30 | peak |
| 7206 | 43.13 | -0.95 | 42.18 | 54.00 | -11.82 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

CH Middle (2441MHz)

Horizontal:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2441.00 | 113.28 | -5.73 | 107.55 | 114.00 | -6.45 | peak |
| 2441.00 | 88.87 | -5.73 | 83.14 | 94.00 | -10.86 | AVG |
| 4882.00 | 58.33 | -3.54 | 54.79 | 74.00 | -19.21 | peak |
| 4882.00 | 46.36 | -3.54 | 42.82 | 54.00 | -11.18 | AVG |
| 7323.00 | 60.24 | -0.81 | 59.43 | 74.00 | -14.57 | peak |
| 7323.00 | 42.04 | -0.81 | 41.23 | 54.00 | -12.77 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2441.00 | 113.59 | -5.73 | 107.86 | 114.00 | -6.14 | peak |
| 2441.00 | 86.99 | -5.73 | 81.26 | 94.00 | -12.74 | AVG |
| 4882.00 | 57.23 | -3.54 | 53.69 | 74.00 | -20.31 | peak |
| 4882.00 | 47.11 | -3.54 | 43.57 | 54.00 | -10.43 | AVG |
| 7323.00 | 57.87 | -0.81 | 57.06 | 74.00 | -16.94 | peak |
| 7323.00 | 43.04 | -0.81 | 42.23 | 54.00 | -11.77 | AVG |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



CH High (2480MHz)

Horizontal:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2480 | 112.27 | -5.63 | 106.64 | 114.00 | -7.36 | peak |
| 2480 | 88.23 | -5.63 | 82.60 | 94.00 | -11.40 | AVG |
| 4960 | 54.74 | -3.43 | 51.31 | 74.00 | -22.69 | peak |
| 4960 | 47.14 | -3.44 | 43.70 | 54.00 | -10.30 | AVG |
| 7440 | 56.92 | -0.77 | 56.15 | 74.00 | -17.85 | peak |
| 7440 | 41.58 | -0.77 | 40.81 | 54.00 | -13.19 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2480 | 110.06 | -5.63 | 104.43 | 114.00 | -9.57 | peak |
| 2480 | 85.11 | -5.63 | 79.48 | 94.00 | -14.52 | AVG |
| 4960 | 56.69 | -3.43 | 53.26 | 74.00 | -20.74 | peak |
| 4960 | 46.39 | -3.44 | 42.95 | 54.00 | -11.05 | AVG |
| 7440 | 56.69 | -0.77 | 55.92 | 74.00 | -18.08 | peak |
| 7440 | 41.04 | -0.77 | 40.27 | 54.00 | -13.73 | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Remark :

- (1) Measuring frequencies from 1 GHz to the 25 GHz .
- (2) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to be completed.
- (7) All modes of operation were investigated and the worst-case emissions are reported.

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|-----------|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2310.00 | 58.27 | -5.81 | 52.46 | 74 | -21.54 | peak |
| 2310.00 | / | -5.81 | / | 54 | / | AVG |
| 2390.00 | 55.20 | -5.84 | 49.36 | 74 | -24.64 | peak |
| 2390.00 | / | -5.84 | / | 54 | / | AVG |
| 2400.00 | 57.25 | -5.84 | 51.41 | 74 | -22.59 | peak |
| 2400.00 | / | -5.84 | / | 54 | / | AVG |

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Operation Mode: TX CH High (2480MHz)

Horizontal (Worst case)

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|---|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2483.50 | 60.40 | -5.81 | 54.59 | 74 | -19.41 | peak |
| 2483.50 | / | -5.81 | / | 54 | / | AVG |
| 2500.00 | 52.93 | -6.06 | 46.87 | 74 | -27.13 | peak |
| 2500.00 | / | -6.06 | / | 54 | / | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

Vertical:

| Frequency | Reading Result | Factor | Emission Level | Limits | Margin | Detector Type |
|--|----------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 2483.50 | 56.35 | -5.81 | 50.54 | 74 | -23.46 | peak |
| 2483.50 | / | -5.81 | / | 54 | / | AVG |
| 2500.00 | 52.45 | -6.06 | 46.39 | 74 | -27.61 | peak |
| 2500.00 | / | -6.06 | / | 54 | / | AVG |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |
| Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit. | | | | | | |



6 OCCUPIED BANDWIDTH MEASUREMENT

6.1 Test Setup

Same as Radiated Emission Measurement

6.2 Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on ANSI C63.10 section 6.9.2: RBW= 30KHz. VBW= 100 KHz, Span=2MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement

6.4 Test Result

PASS

| Test Mode | Frequency | 20dB Bandwidth (MHz) | Result |
|---------------|-----------|-------------------------|-------------|
| GFSK | 2402 MHz | 0.8270 | PASS |
| | 2441 MHz | 0.8257 | PASS |
| | 2480 MHz | 0.8152 | PASS |
| $\pi/4$ DQPSK | 2402 MHz | 1.117 | PASS |
| | 2441 MHz | 1.113 | PASS |
| | 2480 MHz | 1.116 | PASS |
| 8DPSK | 2402 MHz | 1.144 | PASS |
| | 2441 MHz | 1.122 | PASS |
| | 2480 MHz | 1.139 | PASS |



Test Mode: GFSK

CH: 2402MHz



CH: 2441MHz





CH: 2480MHz

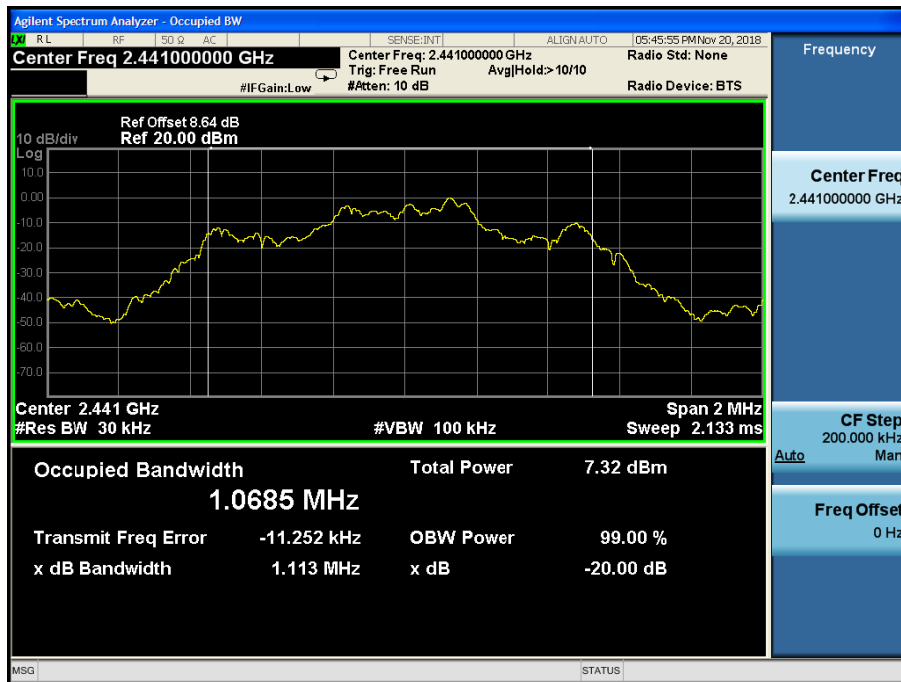
Test Mode: $\pi/4$ QPSK

CH: 2402MHz





CH: 2441MHz



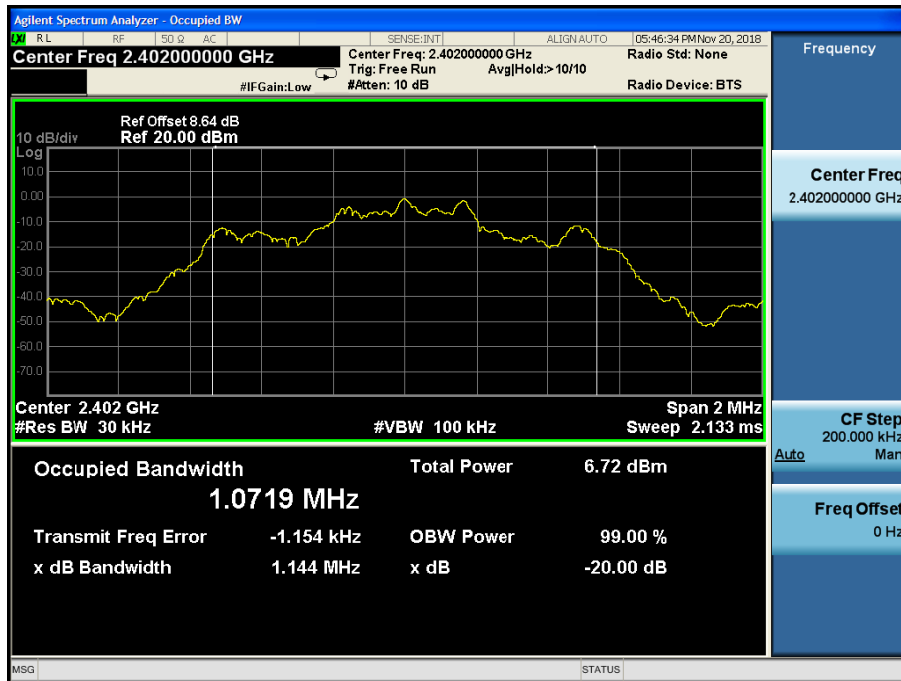
CH: 2480MHz



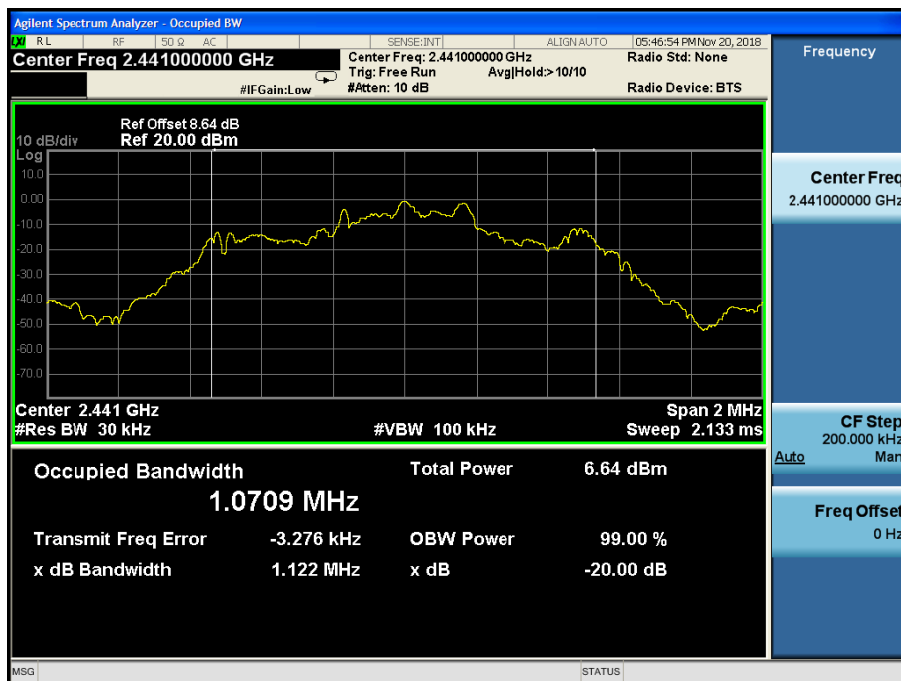


Test Mode: 8DPSK

CH: 2402MHz

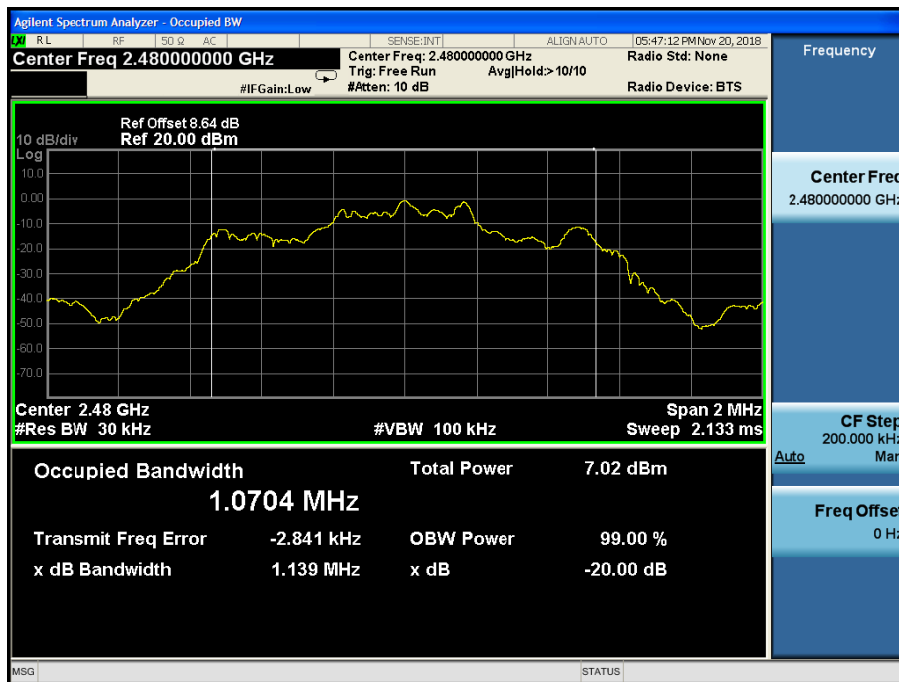


CH: 2441MHz





CH: 2480MHz





7 ANTENNA REQUIREMENT

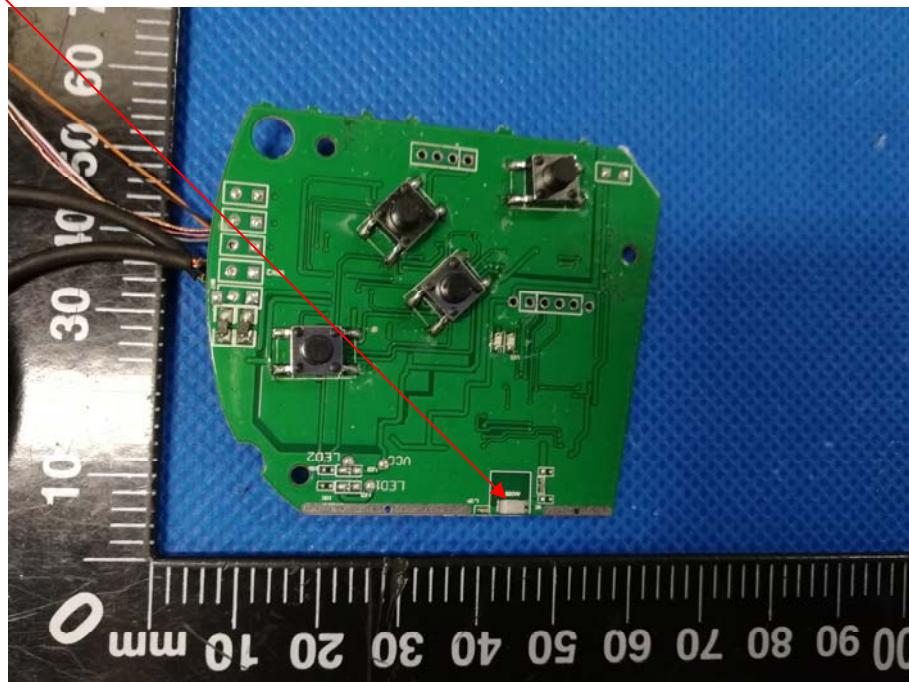
Standard Applicable

For intentional device, according to FCC 47 CFR Section 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 Connected Construction

The antenna used in this product is a Chip Antenna, The directional gains of antenna used for transmitting is 0dBi.

ANTENNA





8 PHOTOGRAPH OF TEST

8.1 Radiated Emission

