



FCC TEST REPORT

Test report
On Behalf of
GuangZhou Chicken Run Network Technology Co,Ltd.
For
Gamesir

Model No.:GameSir-T1, GameSir-T1s,GameSir-T1w,GameSir-T1f

FCC ID: 2AF9S-T1

Prepared for : **GuangZhou Chicken Run Network Technology Co,Ltd.**
301A-1,NO.68-1,Huacui Street,Jianye Road,Tianhe District,
GuangZhou China

Prepared By : **Shenzhen United Testing Technology Co., Ltd.**
2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang
Community, Xixiang Str, Bao'an District, Shenzhen, China

Date of Test: **Aug. 27, 2018 ~ Sep. 14, 2018**
Date of Report: **Sep. 14, 2018**
Report Number: **UNIA2018091053RF-01**

TEST RESULT CERTIFICATION

Applicant's name : GuangZhou Chicken Run Network Technology Co,Ltd.

Address : 301A-1,NO.68-1,Huacui Street,Jianye Road,Tianhe District,
GuangZhou China

Manufacture's Name : Chuzhou heyizhi control co.LTD

Address : Building 21, zhaoyang industrial park, west maanshan road,
langya economic development zone, chuzhou city, anhui
province

Product description

Trade Mark: N/A

Product name : Gamesir

Model and/or type reference : GameSir-T1,GameSir-T1s,GameSir-T1w,GameSir-T1f

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

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen United Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen United Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Date of Test

Date (s) of performance of tests : Aug. 27, 2018 ~ Sep. 10, 2018

Date of Issue : Sep. 10, 2018

Test Result : Pass

Testing Engineer : Kahn Yang

Kahn yang/Editor

Technical Manager : Sherwin Qian

Sherwin Qian/Supervisor

Authorized Signatory : Liuze

Liuze/Manager

Table of Contents

	Page
1 . TEST SUMMARY	4
2 . GENERAL INFORMATION	5
2.1 GENERAL DESCRIPTION OF EUT	5
2.2 Operation of EUT during testing	7
2.3 DESCRIPTION OF TEST SETUP	9
2.4 MEASUREMENT INSTRUMENTS LIST	10
3 . CONDUCTED EMISSIONS TEST	11
3.1 Conducted Power Line Emission Limit	11
3.2 Test Setup	11
3.3 Test Procedure	11
3.4 Test Result	11
4 RADIATED EMISSION TEST	14
4.1 Radiation Limit	14
4.2 Test Setup	14
4.3 Test Procedure	15
4.4 Test Result	15
5 BAND EDGE	25
5.1 Limits	25
5.2 Test Procedure	25
5.3 Test Result	25
6 OCCUPIED BANDWIDTH MEASUREMENT	30
6.1 Test Setup	30
6.2 Test Procedure	30
6.3 Measurement Equipment Used	30
6.4 Test Result	30
7 ANTENNA REQUIREMENT	34
8 PHOTOGRAPH OF TEST	35
8.1 Radiated Emission	35
8.2 Conducted Emission	36



1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT
CONDUCTED EMISSIONS TEST	COMPLIANT
RADIATED EMISSION TEST	COMPLIANT
BAND EDGE	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	COMPLIANT
ANTENNA REQUIREMENT	COMPLIANT

1.2 TEST FACILITY

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

Address 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd,
Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, 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	Gamesir
Model Name	GameSir-T1
Serial No	GameSir-T1s, GameSir-T1w, GameSir-T1f
Model Difference	Only the mode name difference
FCC ID	2AF9S-T1
Antenna Type	Pcb onboard antenna
Antenna Gain	0 dBi
Operation frequency	BT: 2402-2480MHz 2.4G: 2405 MHz to 2480 MHz 2.4G
Modulation Type	GFSK
Power Source	DC 5V by adapter AC 120V/60Hz DC 3.7V battery
Power Rating	DC 5V by adapter AC 120V/60Hz DC 3.7V battery

2.1.1 Carrier Frequency of Channels

BT 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		

2.4g Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2405	27	2432	54	2459
01	2406	28	2433	55	2460
02	2407	29	2434	56	2461
03	2408	30	2435	57	2462
04	2409	31	2436	58	2463
05	2410	32	2437	59	2464
06	2411	33	2438	60	2465
07	2412	34	2439	61	2466
08	2413	35	2440	62	2467
09	2414	36	2441	63	2468
10	2415	37	2442	64	2469
11	2416	38	2443	65	2470
12	2417	39	2444	66	2471
13	2418	40	2445	67	2472
14	2419	41	2446	68	2473
15	2420	42	2447	69	2474
16	2421	43	2448	70	2475
17	2422	44	2449	71	2476
18	2423	45	2450	72	2477

19	2424	46	2451	73	2478
20	2425	47	2452	74	2479
21	2426	48	2453	75	2480
22	2427	49	2454		
23	2428	50	2455		
24	2429	51	2456		
25	2430	52	2457		
26	2431	53	2458		

2.2 Operation of EUT during testing



Operating Mode

BT		2.4g	
Test mode	Frequency	Test mode	Frequency
Low Channel:	2402 MHz	Low Channel:	2405 MHz
Middle Channel:	2441 MHz	Middle Channel:	2443 MHz
High Channel:	2480 MHz	High Channel:	2480 MHz

The mode is used: **Transmitting mode**

2.3 DESCRIPTION OF TEST SETUP

Operation of EUT during Conducted testing:



Operation of EUT during Radiation and Above1GHz Radiation testing:



● Adapter information

Model: HW-059100CHQ

Input: 100-240V~, 50/60Hz, 0.5A

Output: 5VDC, 1A

2.4 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2019.9.9
2	AMN	ETS	3810/2	00020199	2019.9.9
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2019.9.9
4	AAN	TESEQ	T8-Cat6	38888	2019.9.9
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2018.9.29
2	BicoNILog Antenna	Sunol	JB1 Antenna	A090215	2018.9.29
3	PREAMP	HP	8449B	3008A00160	2019.9.9
4	PREAMP	HP	8447D	2944A07999	2019.9.9
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2019.9.9
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2018.9.28
7	Signal Generator	Agilent	E4421B	MY4335105	2018.9.28
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2018.9.28
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2019.9.9
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2018.9.28
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2019.9.9
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2019.9.9
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2019.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2019.3.14
15	RF power divider	Anritsu	K241B	992289	2018.9.28
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2018.9.28
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2018.9.8
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2018.9.8
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2018.9.8
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2019.1.12
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2018.11.02
22	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2019.03.14
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2018.10.24
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2019.05.10
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2019.05.10

3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

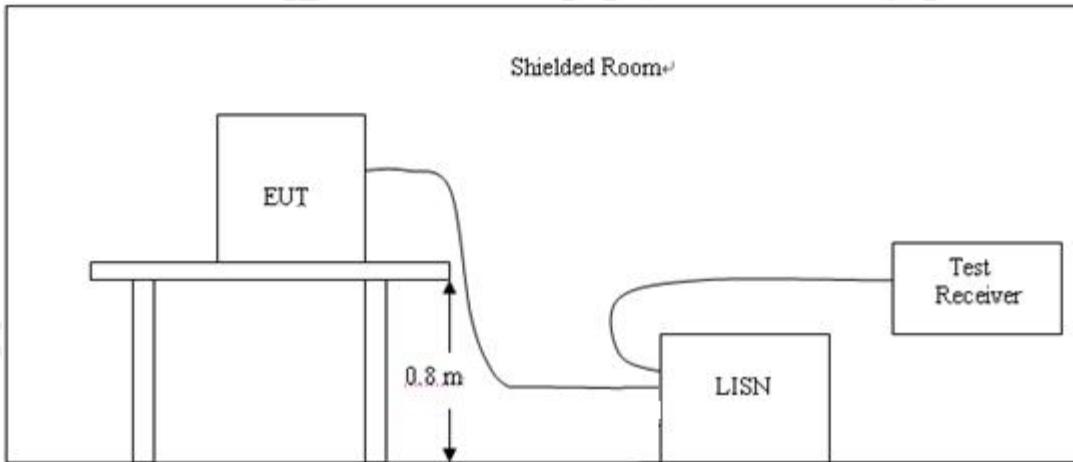
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	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

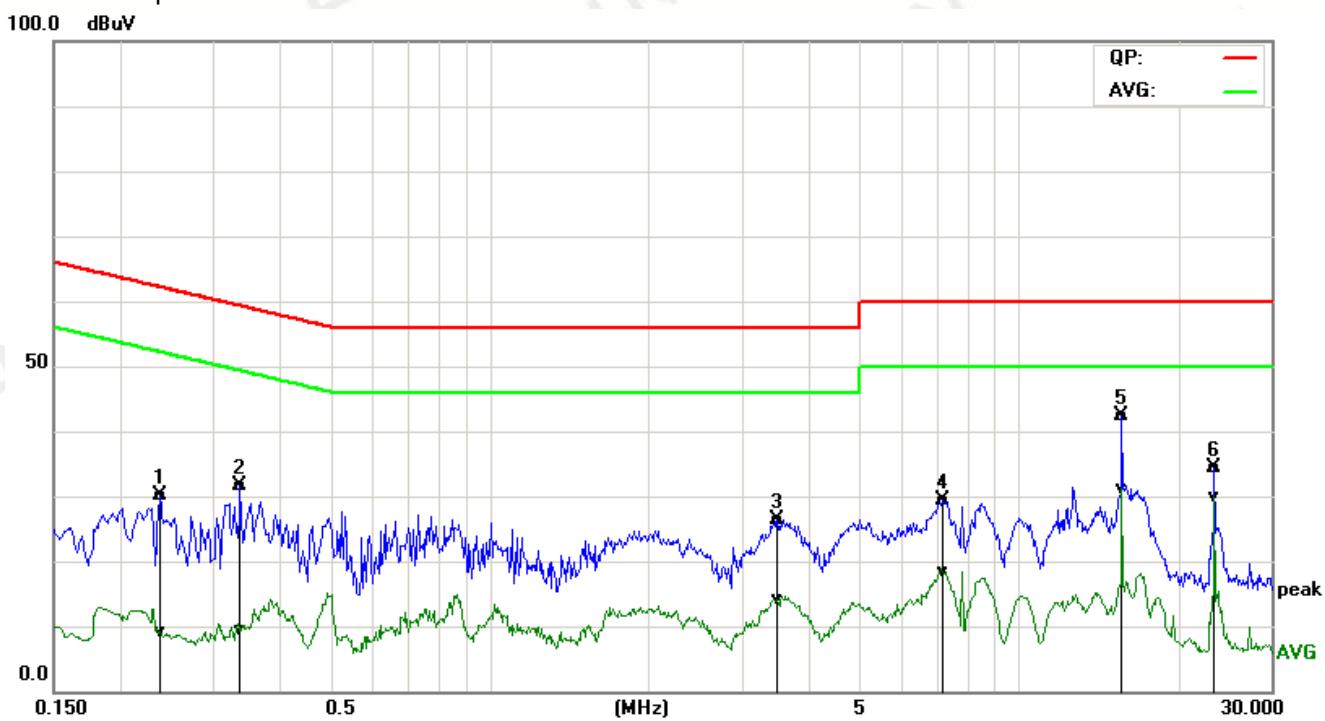
- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.1 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per 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

PASS

All the test modes completed for test. only reported the worst case(bt TX 2402MHz)

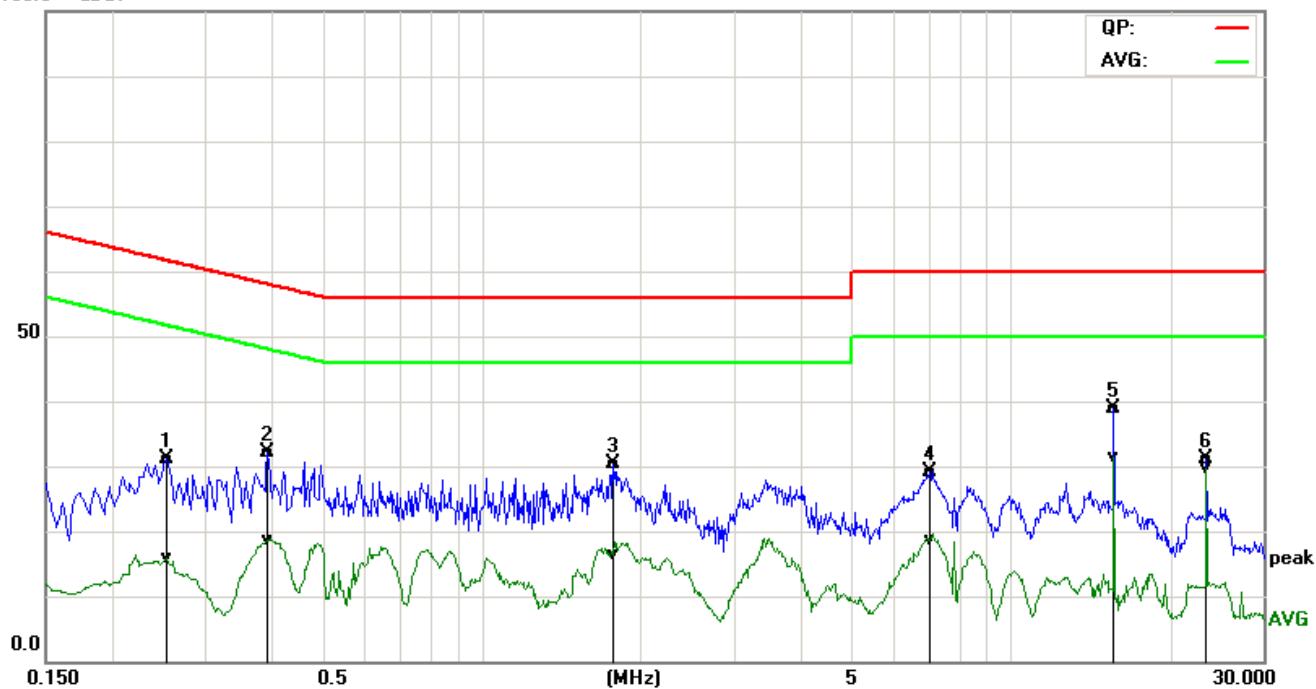
Test Specification: Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.2380	20.33	-0.61	9.77	30.10	9.16	62.16	52.17	-32.06	-43.01	Pass
2P	0.3379	21.78	-0.45	9.82	31.60	9.37	59.25	49.25	-27.65	-39.88	Pass
3P	3.4940	16.39	4.13	9.96	26.35	14.09	56.00	46.00	-29.65	-31.91	Pass
4P	7.1780	19.53	8.51	9.92	29.45	18.43	60.00	50.00	-30.55	-31.57	Pass
5*	15.6620	41.98	30.77	0.31	42.29	31.08	60.00	50.00	-17.71	-18.92	Pass
6P	23.4940	33.86	29.24	0.60	34.46	29.84	60.00	50.00	-25.54	-20.16	Pass

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

100.0 dBuV



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.2540	21.38	6.07	9.78	31.16	15.85	61.62	51.63	-30.46	-35.78	Pass
2P	0.3940	22.22	8.69	9.82	32.04	18.51	57.98	47.98	-25.94	-29.47	Pass
3P	1.7780	20.47	6.62	9.87	30.34	16.49	56.00	46.00	-25.66	-29.51	Pass
4P	7.0260	19.23	8.75	9.92	29.15	18.67	60.00	50.00	-30.85	-31.33	Pass
5*	15.6660	38.48	31.10	0.31	38.79	31.41	60.00	50.00	-21.21	-18.59	Pass
6P	23.4940	30.59	29.08	0.60	31.19	29.68	60.00	50.00	-28.81	-20.32	Pass

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

4 RADIATED EMISSION TEST

4.1 Radiation Limit

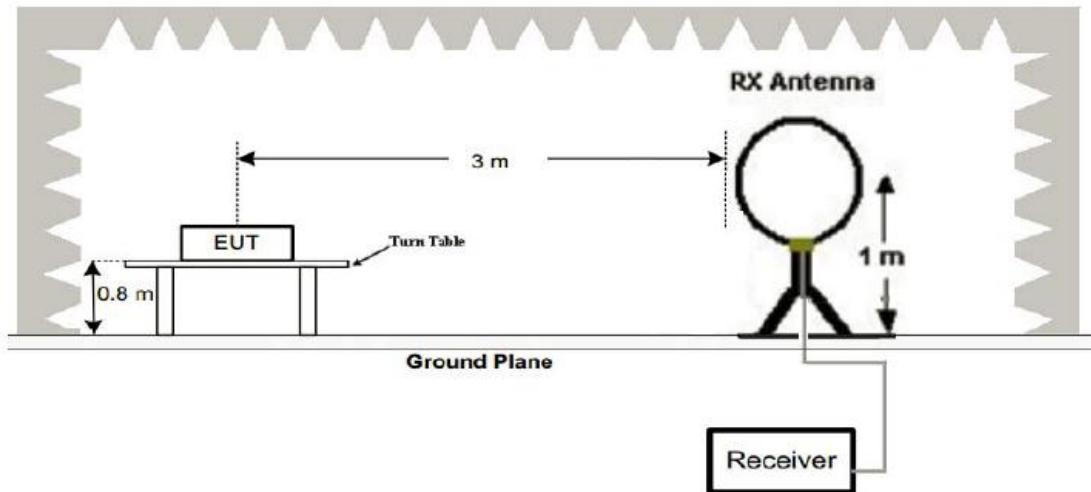
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(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

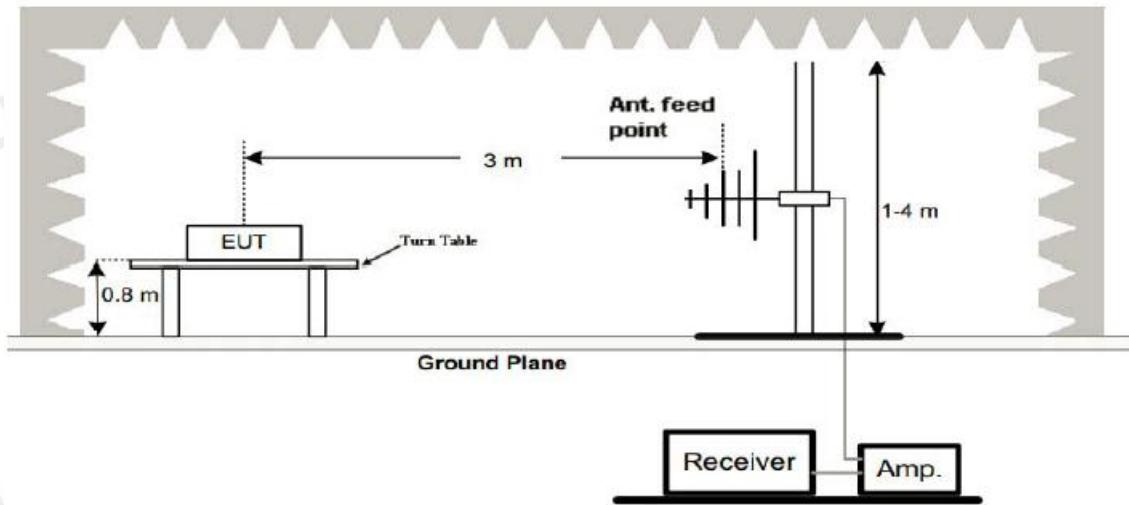
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

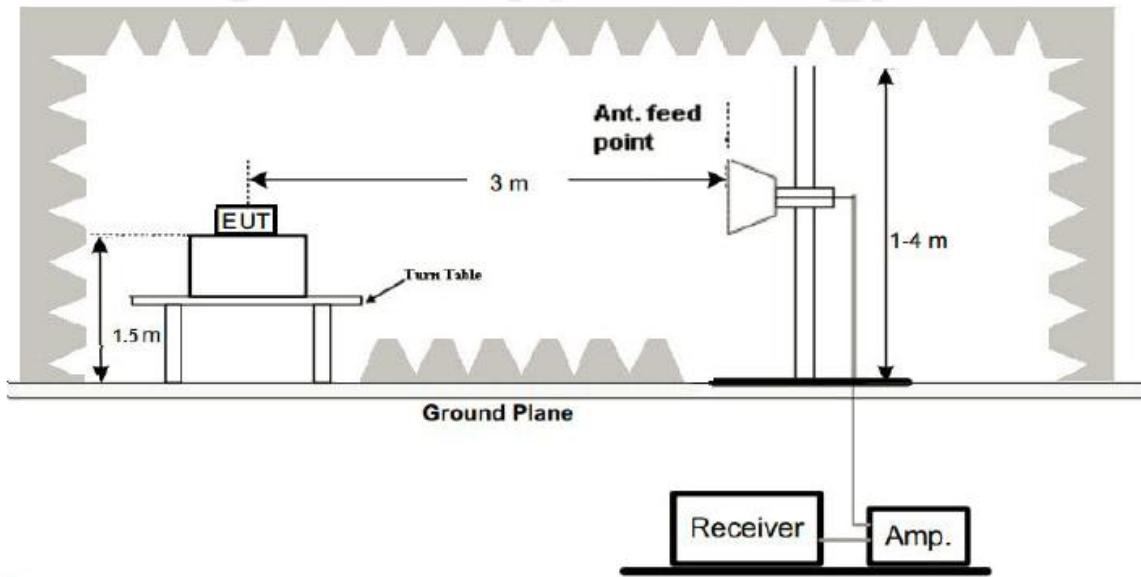
(1) Radiated Emission Test-Up Frequency Below 30MHz



(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

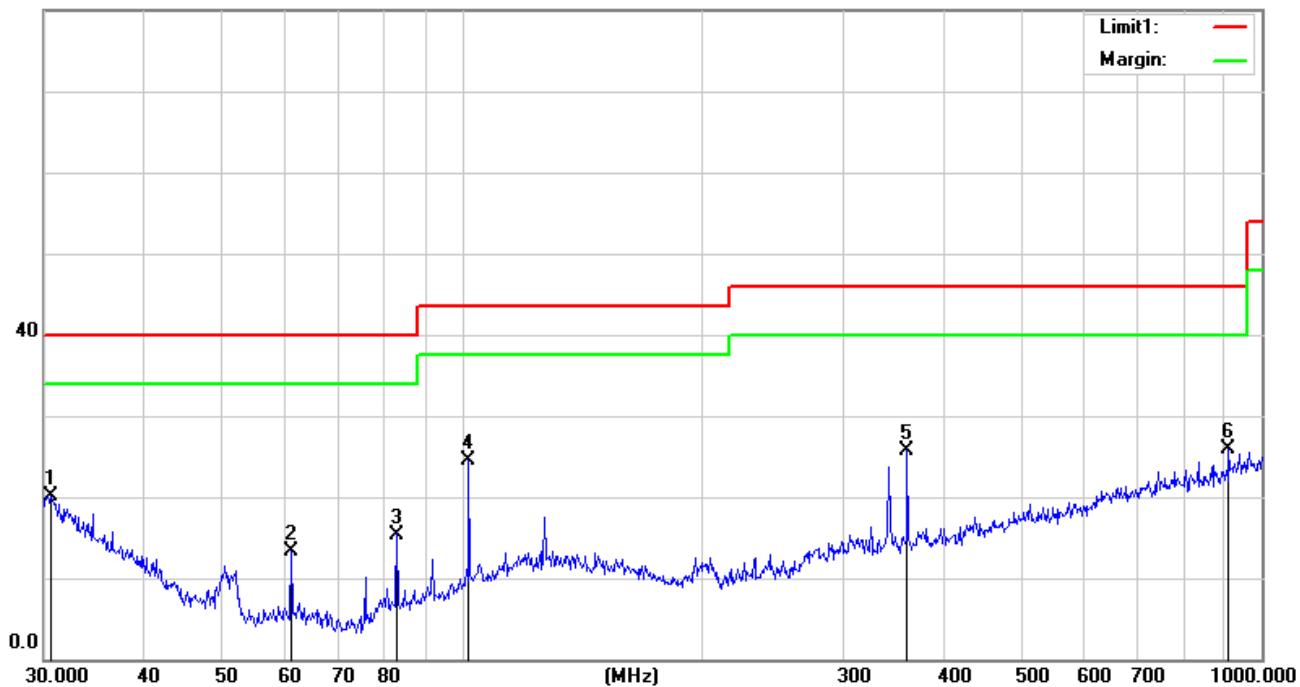
All the test modes completed for test. The worst case of Radiated Emission is BT CH 2402; the test data of this mode was reported.

Below 1GHz Test Results:

Antenna polarity: H

No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.6379	27.32	-7.25	20.07	40.00	-19.93			peak
2	61.1316	34.32	-21.04	13.28	40.00	-26.72			peak
3	82.9385	35.25	-19.85	15.40	40.00	-24.60			peak
4*	102.0014	41.46	-16.97	24.49	43.50	-19.01			peak
5	360.4477	37.44	-11.75	25.69	46.00	-20.31			peak
6	909.6667	29.16	-3.21	25.95	46.00	-20.05			peak

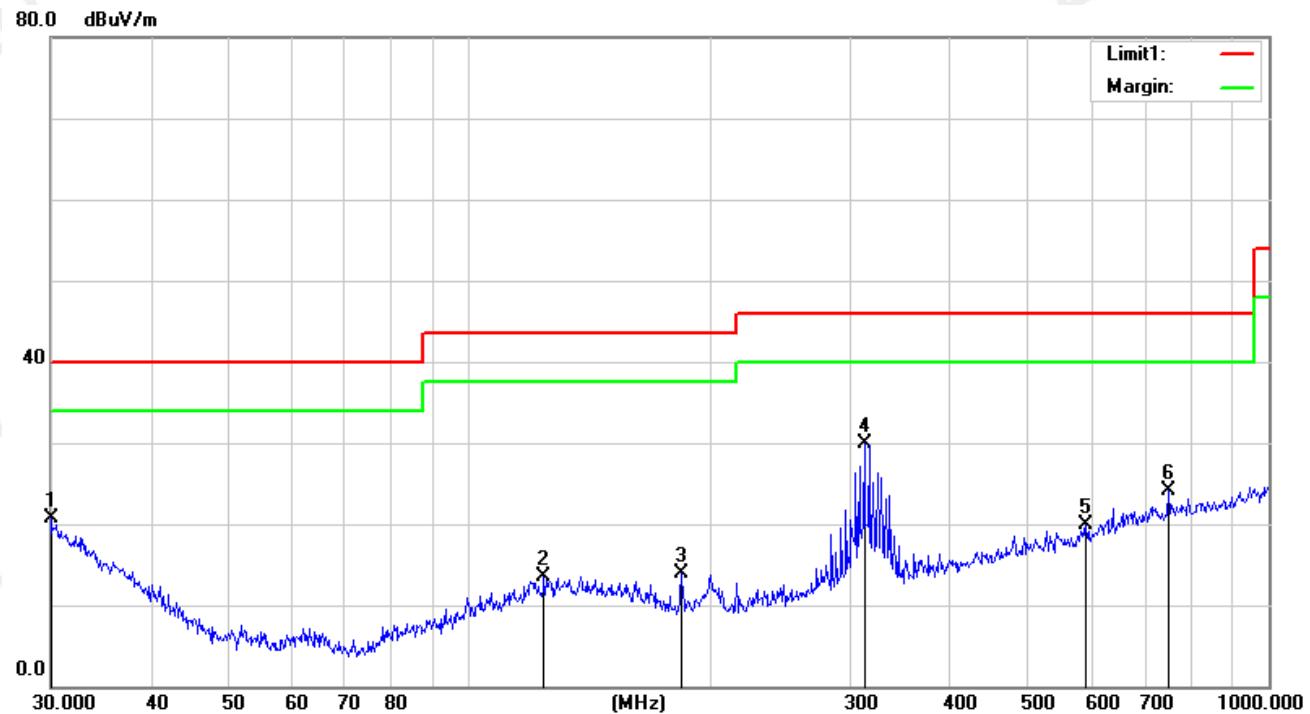
80.0 dBuV/m



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

Antenna polarity: V

No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.0000	27.26	-6.65	20.61	40.00	-19.39			peak
2	124.1330	28.14	-14.59	13.55	43.50	-29.95			peak
3	184.4898	30.26	-16.42	13.84	43.50	-29.66			peak
4*	312.1794	41.92	-12.04	29.88	46.00	-16.12			peak
5	590.9737	28.08	-8.19	19.89	46.00	-26.11			peak
6	750.1083	29.31	-5.21	24.10	46.00	-21.90			peak



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:

BT CH Low (2402MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2402	107.95	-5.81	98.34	114.00	-15.66	peak
2402	89.16	-5.81	78.61	94.00	-15.39	Avg
4804	51.28	-3.65	52.37	74.00	-21.63	peak
4804	42.97	-3.65	40.19	54.00	-13.81	Avg
7206	53.17	-0.95	57.83	74.00	-16.17	peak
7206	39.48	-0.95	42.61	54.00	-11.39	Avg
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2402	103.25	-5.81	95.66	114.00	-18.34	peak
2402	85.15	-5.81	76.32	94.00	-17.68	Avg
4804	58.49	-3.65	59.87	74.00	-14.13	peak
4804	42.62	-3.65	41.24	54.00	-12.76	Avg
7206	59.46	-0.95	61.52	74.00	-12.48	peak
7206	36.79	-0.95	38.74	54.00	-15.26	Avg
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

BT CH Middle (2441MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2441.00	102.62	-5.73	93.16	114.00	-20.84	peak
2441.00	87.64	-5.73	76.18	94.00	-17.82	Avg
4882.00	62.13	-3.54	59.34	74.00	-14.66	peak
4882.00	39.72	-3.54	41.26	54.00	-12.74	Avg
7323.00	49.87	-0.81	51.49	74.00	-22.51	peak
7323.00	39.61	-0.81	41.25	54.00	-12.75	Avg
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2441.00	105.23	-5.73	96.14	114.00	-17.86	peak
2441.00	92.24	-5.73	81.25	94.00	-12.75	Avg
4882.00	61.39	-3.54	58.15	74.00	-15.85	peak
4882.00	41.75	-3.54	39.19	54.00	-14.81	Avg
7323.00	57.81	-0.81	59.34	74.00	-14.66	peak
7323.00	35.73	-0.81	36.92	54.00	-17.08	Avg
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

BT CH High (2480MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	106.54	-5.63	98.17	114.00	-15.83	peak
2480	88.95	-5.63	81.94	94.00	-12.06	AVG
4960	59.47	-3.43	55.79	74.00	-18.21	peak
4960	45.97	-3.44	43.68	54.00	-10.32	AVG
7440	58.34	-0.77	59.74	74.00	-14.26	peak
7440	32.97	-0.77	35.68	54.00	-18.32	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	105.65	-5.63	96.74	114.00	-17.26	peak
2480	84.96	-5.63	75.35	94.00	-18.65	AVG
4960	57.69	-3.43	51.47	74.00	-22.53	peak
4960	41.90	-3.44	39.56	54.00	-14.44	AVG
7440	56.18	-0.77	58.97	74.00	-15.03	peak
7440	40.97	-0.77	43.18	54.00	-10.82	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

2.4G CH Low (2405MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2405	105.21	-5.88	99.33	114.00	-14.67	peak
2405	89.75	-5.88	83.87	94.00	-10.13	AVG
4810	50.33	-3.74	46.59	74.00	-27.41	peak
4810	41.17	-3.74	37.43	54.00	-16.57	AVG
7215	49.78	-0.83	48.95	74.00	-25.05	peak
7215	38.47	-0.83	37.64	54.00	-16.36	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2405	101.14	-5.88	95.26	114.00	-18.74	peak
2405	84.36	-5.88	78.48	94.00	-15.52	AVG
4810	57.14	-3.74	53.40	74.00	-20.60	peak
4810	40.55	-3.74	36.81	54.00	-17.19	AVG
7215	57.64	-0.83	56.81	74.00	-17.19	peak
7215	35.35	-0.83	34.52	54.00	-19.48	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

2.4G CH Middle (2443MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2443.00	101.72	-5.27	96.45	114.00	-17.55	peak
2443.00	85.67	-5.27	80.40	94.00	-13.60	AVG
4886.00	59.78	-3.10	56.68	74.00	-17.32	peak
4886.00	37.58	-3.10	34.48	54.00	-19.52	AVG
7329.00	46.66	-0.42	46.24	74.00	-27.76	peak
7329.00	37.18	-0.42	36.76	54.00	-17.24	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2443.00	103.24	-5.27	97.97	114.00	-16.03	peak
2443.00	85.33	-5.27	80.06	94.00	-13.94	AVG
4886.00	58.72	-3.10	55.62	74.00	-18.38	peak
4886.00	45.37	-3.10	42.27	54.00	-11.73	AVG
7329.00	55.67	-0.42	55.25	74.00	-18.75	peak
7329.00	40.27	-0.42	39.85	54.00	-14.15	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

2.4G CH High (2480MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	105.72	-5.63	100.09	114.00	-13.91	peak
2480	87.63	-5.63	82.00	94.00	-12.00	AVG
4960	58.77	-3.43	55.34	74.00	-18.66	peak
4960	46.35	-3.44	42.91	54.00	-11.09	AVG
7440	55.25	-0.77	54.48	74.00	-19.52	peak
7440	40.26	-0.77	39.49	54.00	-14.51	AVG
---	---	---	---	---	---	---
---	---	---	---	---	---	---

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

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	104.25	-5.63	98.62	114.00	-15.38	peak
2480	85.37	-5.63	79.74	94.00	-14.26	AVG
4960	56.52	-3.43	53.09	74.00	-20.91	peak
4960	43.33	-3.44	39.89	54.00	-14.11	AVG
7440	55.18	-0.77	54.41	74.00	-19.59	peak
7440	41.96	-0.77	41.19	54.00	-12.81	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 73.16dB_V/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dB_V/m(PK Value) <54 dB_V/m(AV Limit), the Average Detected not need to completed.
- (7)All modes of operation were investigated and the worst-case emissions are reported.

5 BAND EDGE

5.1 Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBW to 300 KHz, to measure the conducted peak band edge.

5.3 Test Result

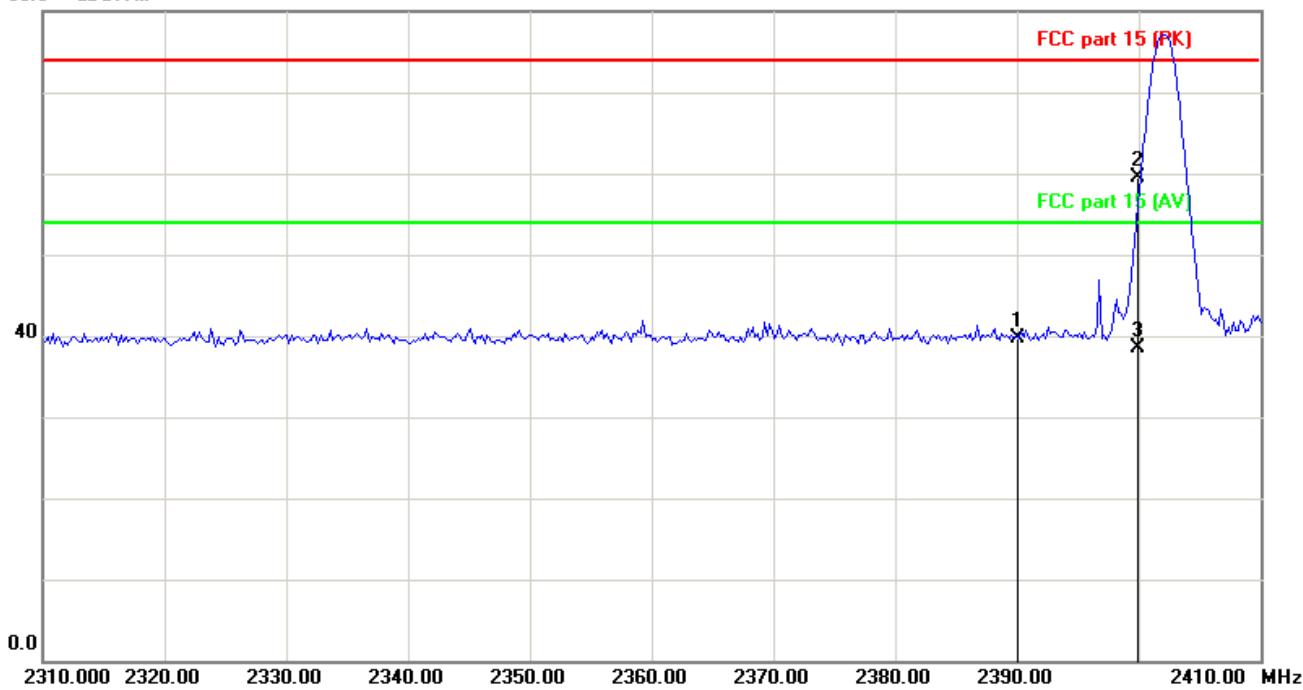
PASS

Radiated Band Edge Test:

Operation Mode: TX CH Low (2402MHz)

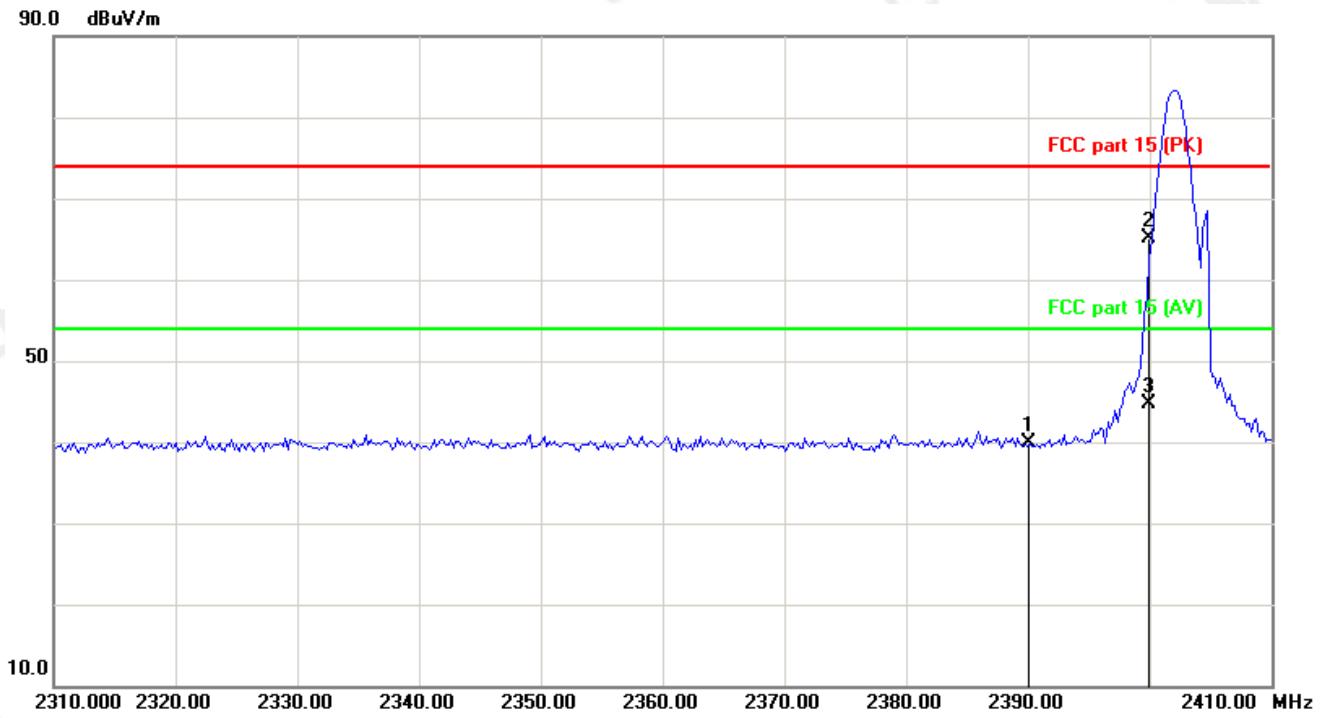
Horizontal (Worst case)

80.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dB/m	dB	
1		2390.000	47.99	-8.30	39.69	74.00	-34.31	peak
2	*	2400.000	67.67	-8.25	59.42	74.00	-14.58	peak
3		2400.000	46.71	-8.25	38.46	54.00	-15.54	AVG

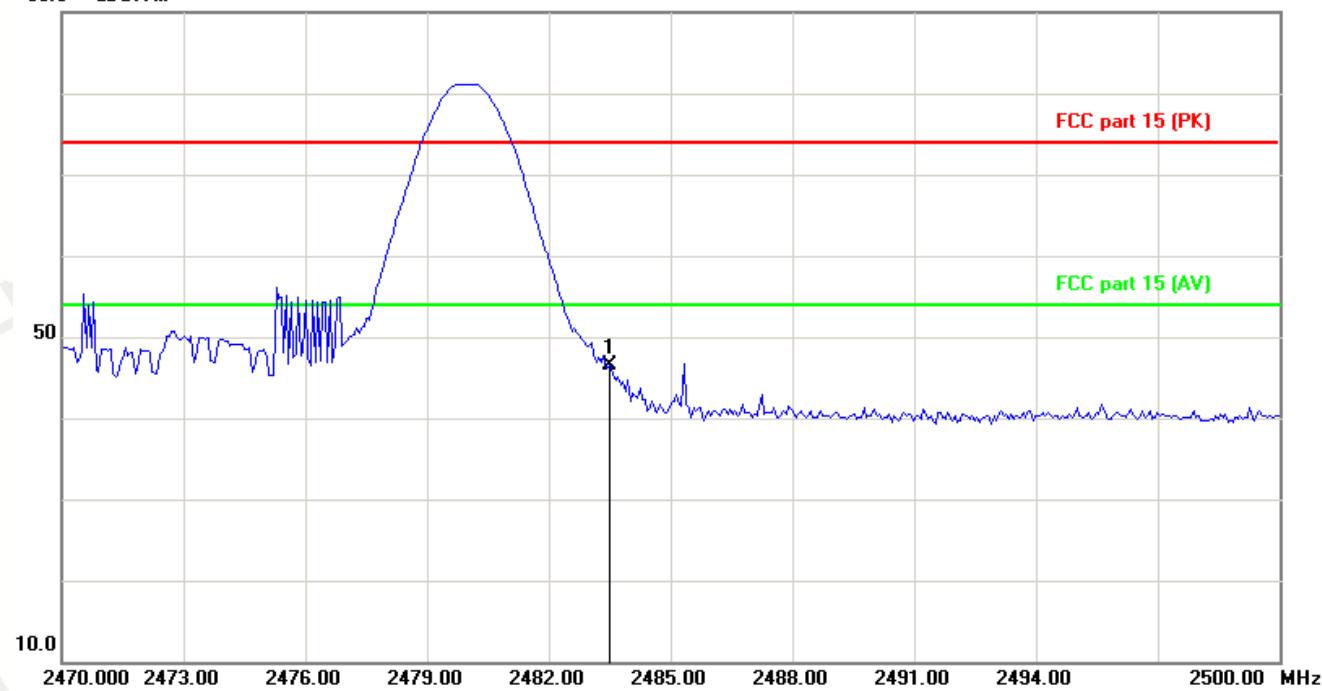
Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Over Detector
1		2390.000	48.25	-8.30	39.95	74.00	-34.05	peak
2	*	2400.000	73.42	-8.25	65.17	74.00	-8.83	peak
3		2400.000	52.87	-8.25	44.62	54.00	-9.38	AVG

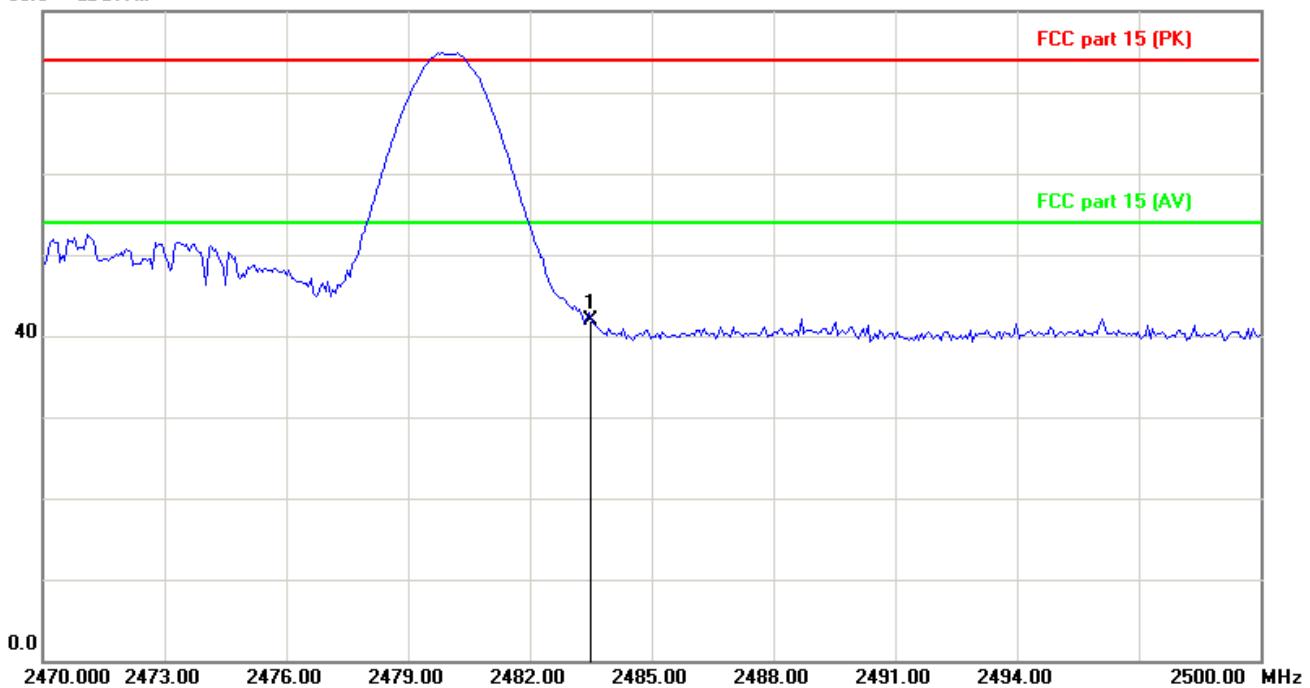
Operation Mode: TX CH High (2480MHz)

Horizontal (Worst case)

90.0 dB_{UV}/m

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over
		MHz	dBuV	dB	dBuV/m	dB/m	dB Detector
1	*	2483.500	54.38	-7.82	46.56	74.00	-27.44 peak

Vertical:
80.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Over Detector
1	*	2483.500	49.64	-7.82	41.82	74.00	-32.18	peak

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=3MHz.
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

RF function	Frequency	20dB Bandwidth (MHz)	Result
BT	2402 MHz	0.962	PASS
	2441 MHz	0.966	PASS
	2480 MHz	1.014	PASS
2.4G	2405 MHz	1.182	PASS
	2443 MHz	1.106	PASS
	2480 MHz	1.099	PASS

CH: 2402MHz



CH: 2441MHz



CH: 2480MHz



CH: 2405MHz



CH: 2443MHz



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. And according to FCC 47 CFR Section 15.249, if 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 6dBi.

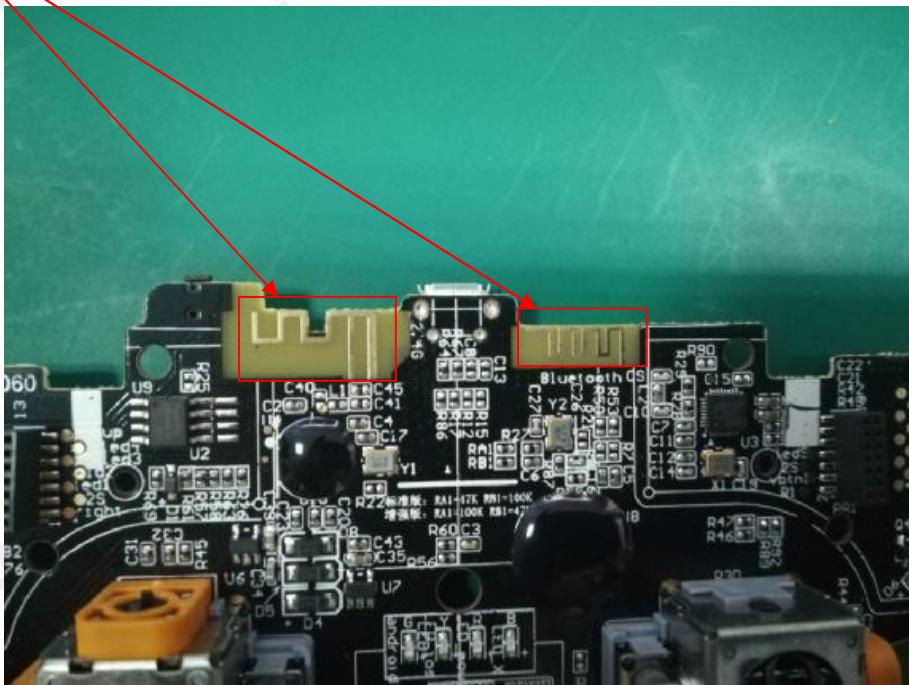
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

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

ANTENNA



8 PHOTOGRAPH OF TEST**8.1 Radiated Emission**

8.2 Conducted Emission



EUT
Photo 1

Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9

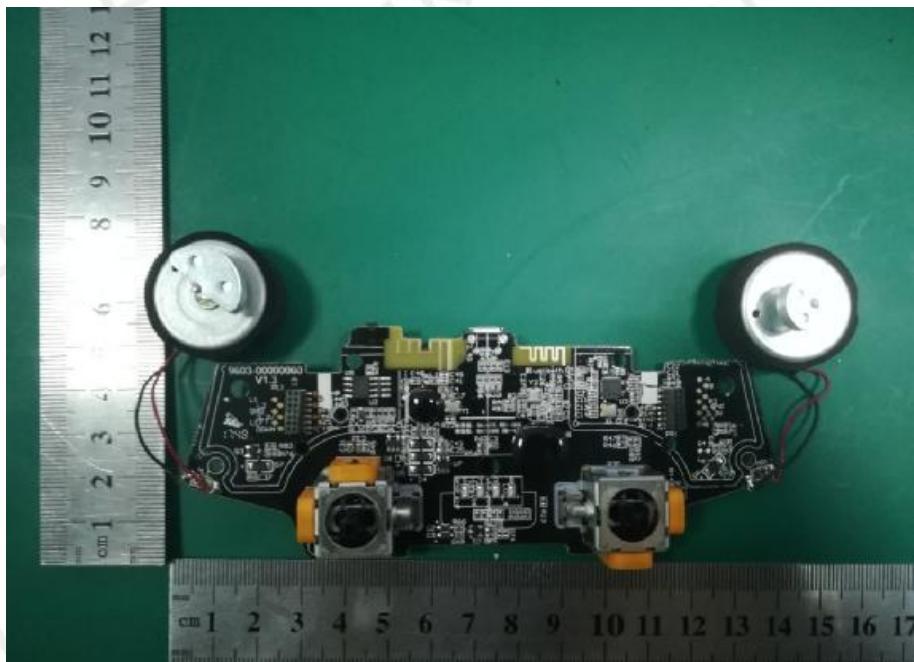


Photo 10

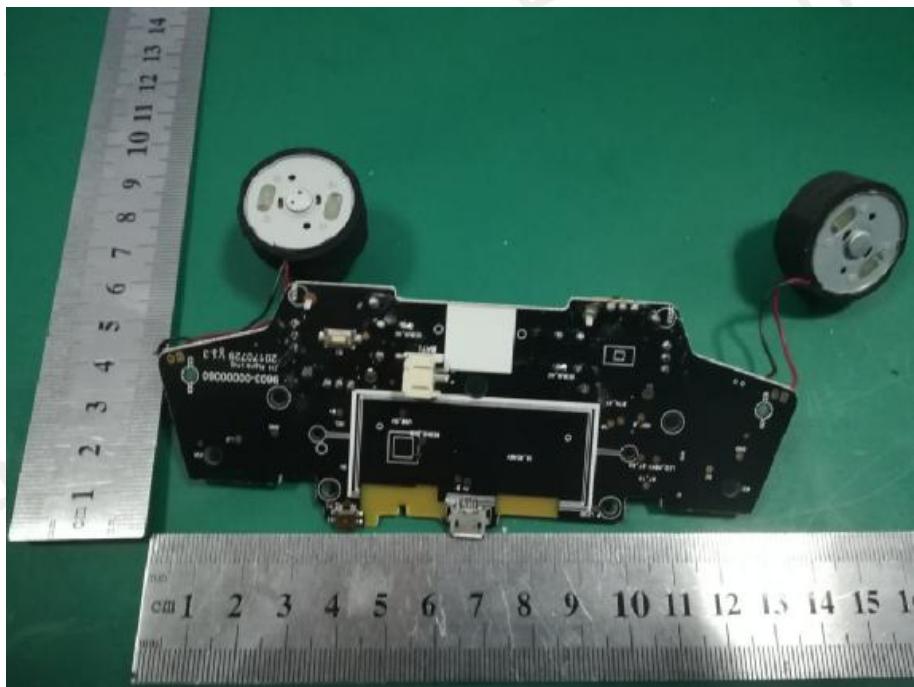


Photo 11

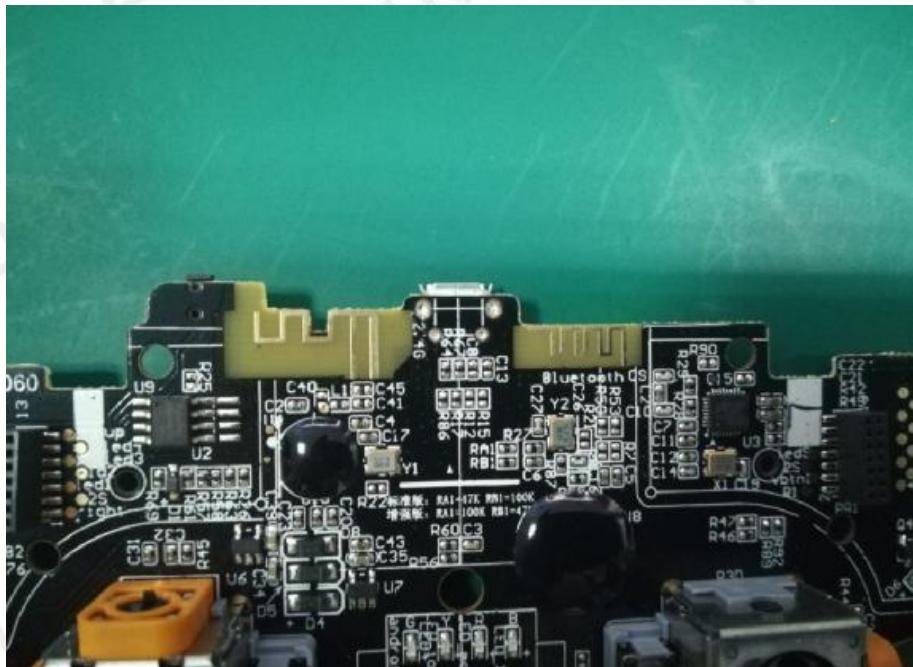


Photo 12

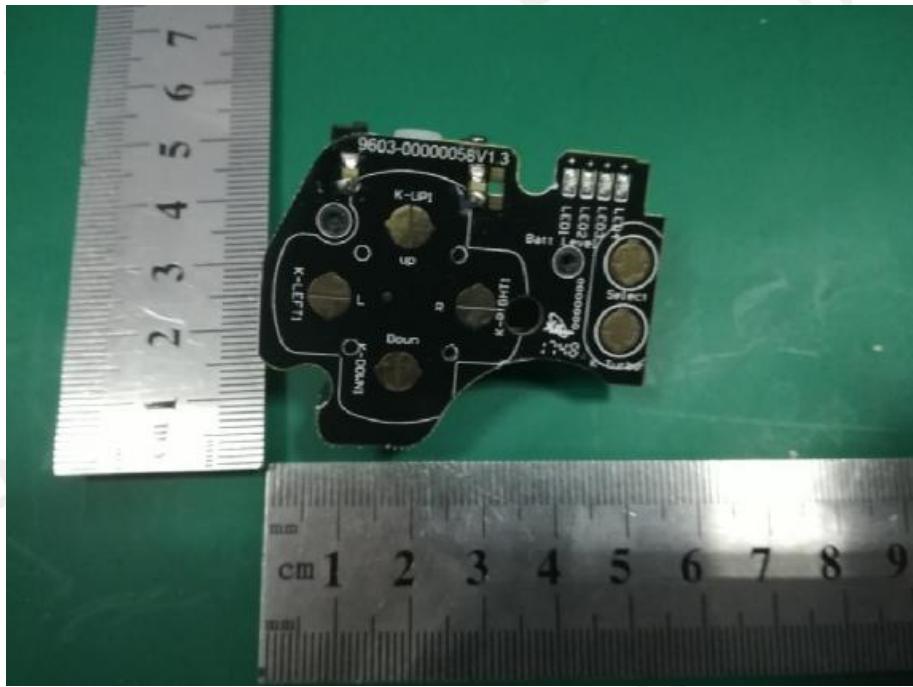


Photo 13



Photo 14

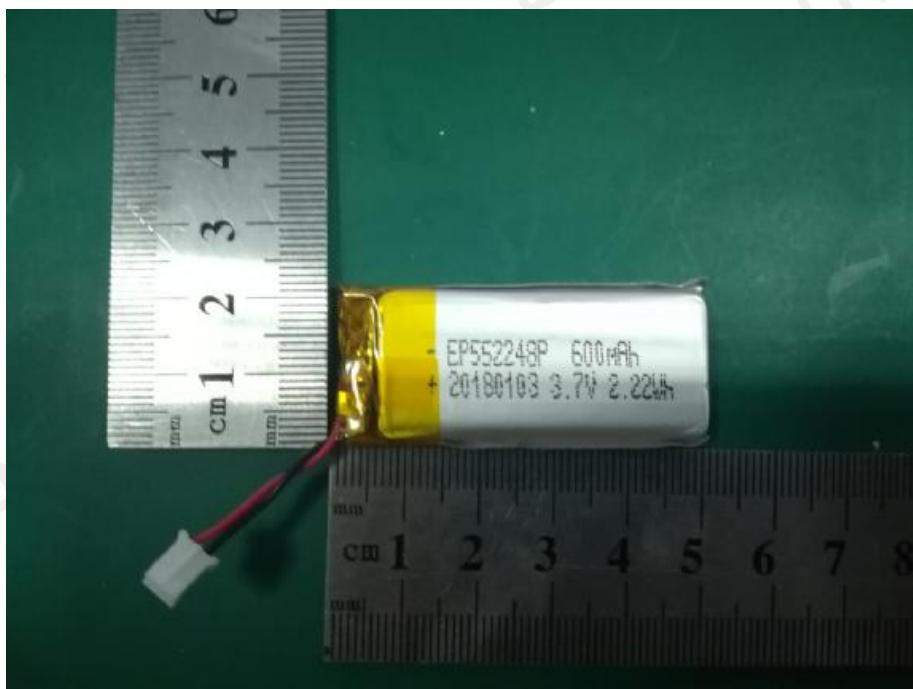
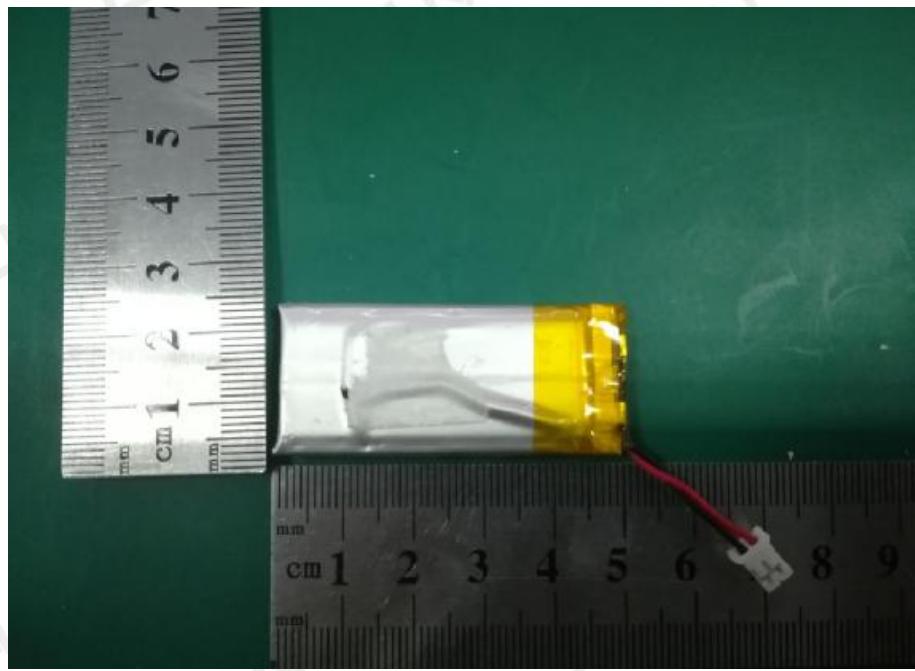


Photo 15



--The end of report--