

FCC RADIO TEST REPORT

FCC ID:2AF9S-T4PRO

Product : gamesir game controllers

Trade Name : N/A

Model Name : GameSir-T4pro

Serial Model : GameSir-T5,GameSir-T5pro

Report No. : UNIA20060104ER

Prepared for

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

Prepared by

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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: Dongguan KingSheng Electronics&Technology Co., Limited
Address: No 9, Xinfu Road, Lincun, Tangxia Town, Dongguan,
Guangdong.CHINA

Product description

Product name: gamesir game controllers
Trade Mark: N/A
Model and/or type reference .: GameSir-T4pro

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

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests: Jun.01, 2020 ~ Jun.23, 2020

Date of Issue: Jun.23, 2020

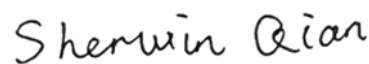
Test Result: Pass

Prepared by:



Kahn yang/Editor

Reviewer:



Sherwin Qian/Supervisor

Approved & Authorized Signer:



Liuze/Manager

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11. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

DESCRIPTION OF TEST	RESULT	STANGARD
CONDUCTED EMISSIONS TEST	N/A	FCC Part 15.207
RADIATED EMISSION TEST	COMPLIANT	FCC Part15.209/15.249
BAND EDGE	COMPLIANT	FCC Part15.249/15.205
20dB bandwidth	COMPLIANT	FCC Part15.215
ANTENNA REQUIREMENT	COMPLIANT	FCC Part15.203

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

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

A2LA Certificate Number: 4747.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 21947

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

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

22. GENERAL INFORMATION

2.12.1 GENERAL DESCRIPTION OF EUT

Equipment	gamesir game controllers
Trade Mark	N/A
Model Name	GameSir-T4pro
Serial No.	GameSir-T5,GameSir-T5pro
Model Difference	All model' s the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: GameSir-T4pro.
Antenna Type	PCB Antenna
Antenna Gain	0.13 dBi
Frequency Range	2402~2480MHz
Number of Channels	79CH
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Battery	DC 3.7V battery

2.22.2 Carrier Frequency of Channels

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

2.32.3 Operation of EUT during testing

Operating Mode
The mode is used: Transmitting mode
Low Channel: 2402MHz
Middle Channel: 2441MHz
High Channel: 2480MHz

2.4 2.4DESCRIPTION OF TEST SETUP

Operation of EUT duringRadiation testing:



Table forauxiliary equipment:

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

2.5 2.5MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2020.9.6
2	AMN	ETS	3810/2	00020199	2020.9.6
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2020.9.6
4	AAN	TESEQ	T8-Cat6	38888	2020.9.6
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2020.9.6
2	BicoNILog Antenna	Sunol	JB1 Antenna	A090215	2020.9.6
3	PREAMP	HP	8449B	3008A00160	2020.9.6
4	PREAMP	HP	8447D	2944A07999	2020.9.6
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2020.9.6
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2020.9.6
7	Signal Generator	Agilent	E4421B	MY4335105	2020.9.6
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2020.9.6
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2020.9.6
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2020.9.6
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2020.9.6
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2020.9.6
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2021.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2021.3.14
15	RF power divider	Anritsu	K241B	992289	2020.9.6
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2020.9.6
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2020.9.6
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2020.9.6
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2020.9.6
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2020.9.6
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2020.9.6
22	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2020.9.6
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2020.9.6
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2020.9.6
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2020.9.6
26	Frequency Meter	VICTOR	VC2000	997406086	2020.9.6
27	DC Power Source	HYELEC	HY5020E	055161818	2020.9.6

33. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

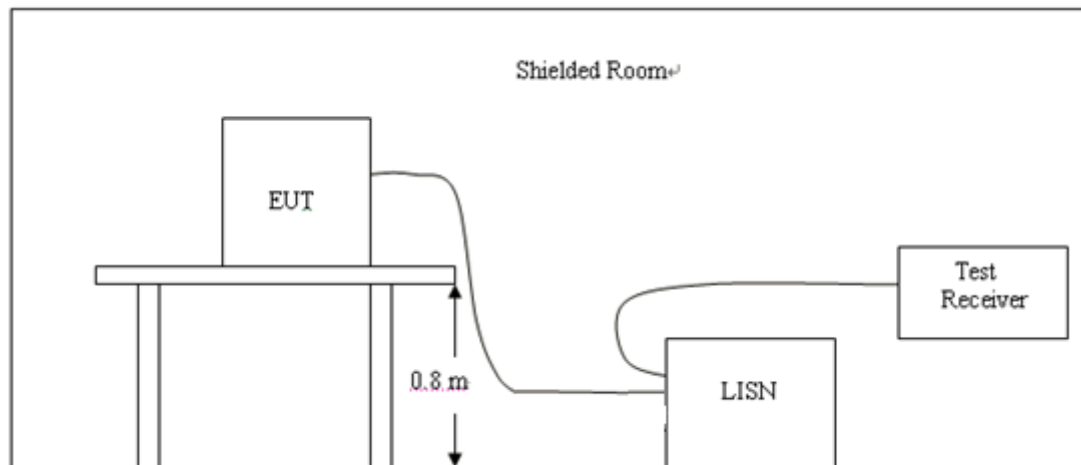
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

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 0.8 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 AC 120V/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.

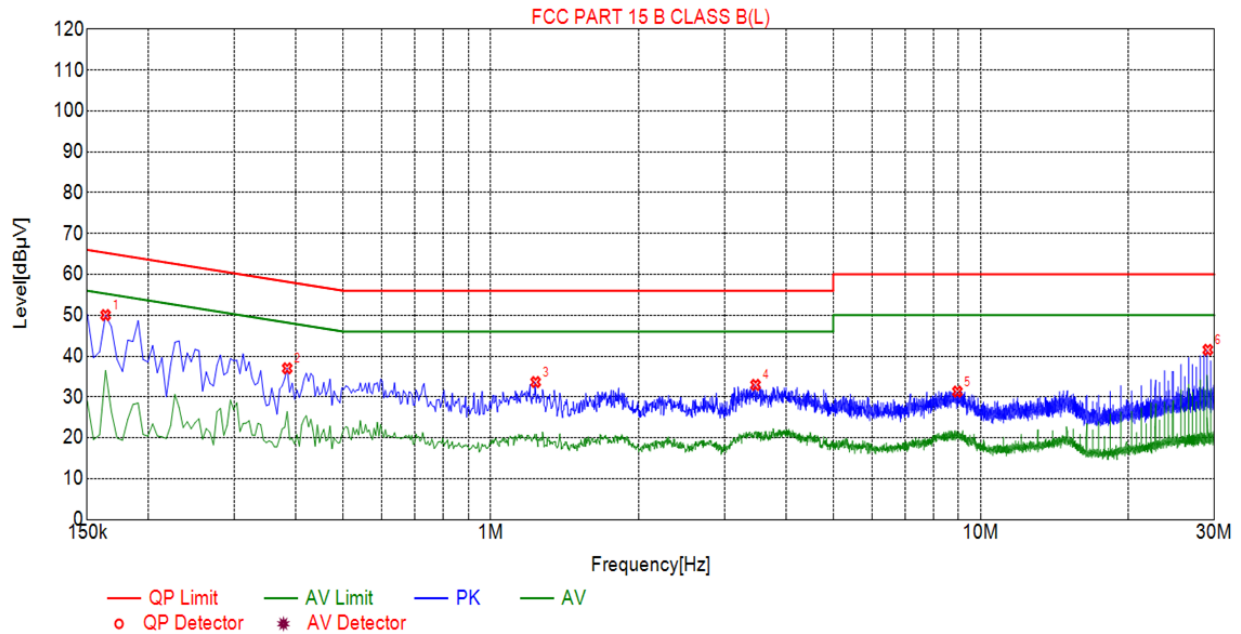
3.4 Test Result

Pass

Remark:

1. All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.
2. All modes of Low, Middle, and High channel were tested, only the worst result of High Channel was reported as below:

Temperature:	24°C	Relative Humidity:	45%
Test Date:	Jun. 22, 2020	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of GFSK 2480MHz		

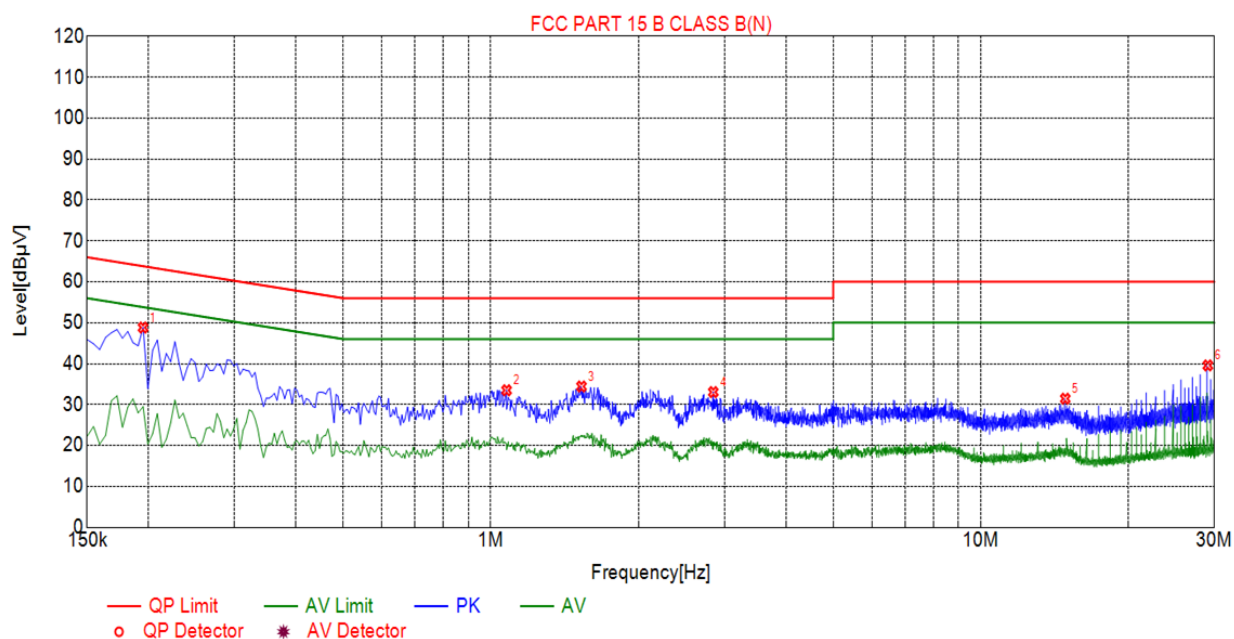


Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1635	50.05	9.98	65.28	15.23	40.07	PK	L
2	0.3840	37.01	10.04	58.19	21.18	26.97	PK	L
3	1.2345	33.65	10.09	56.00	22.35	23.56	PK	L
4	3.4710	32.96	10.25	56.00	23.04	22.71	PK	L
5	8.9610	31.31	10.11	60.00	28.69	21.20	PK	L
6	29.0850	41.54	10.26	60.00	18.46	31.28	PK	L

Remark: Factor = Insertion Loss + Cable Loss, Result=Reading + Factor, Margin=Result – Limit.

Temperature:	24°C	Relative Humidity:	45%
Test Date:	Jun. 22, 2020	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of GFSK 2480MHz		



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1950	48.83	10.03	63.82	14.99	38.80	PK	N
2	1.0770	33.50	10.07	56.00	22.50	23.43	PK	N
3	1.5315	34.42	10.11	56.00	21.58	24.31	PK	N
4	2.8455	33.06	10.21	56.00	22.94	22.85	PK	N
5	14.8830	31.44	9.96	60.00	28.56	21.48	PK	N
6	29.0850	39.57	10.26	60.00	20.43	29.31	PK	N

Remark: Factor = Insertion Loss + Cable Loss, Result=Reading + Factor, Margin=Result – Limit.

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:

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	Limit (dBuV/m)	Distance (m)
0.009-0.490	$20\log(2400/F(\text{KHz})) + 40\log(300/3)$	3
0.490-1.705	$20\log(24000/F(\text{KHz})) + 40\log(30/3)$	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

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.

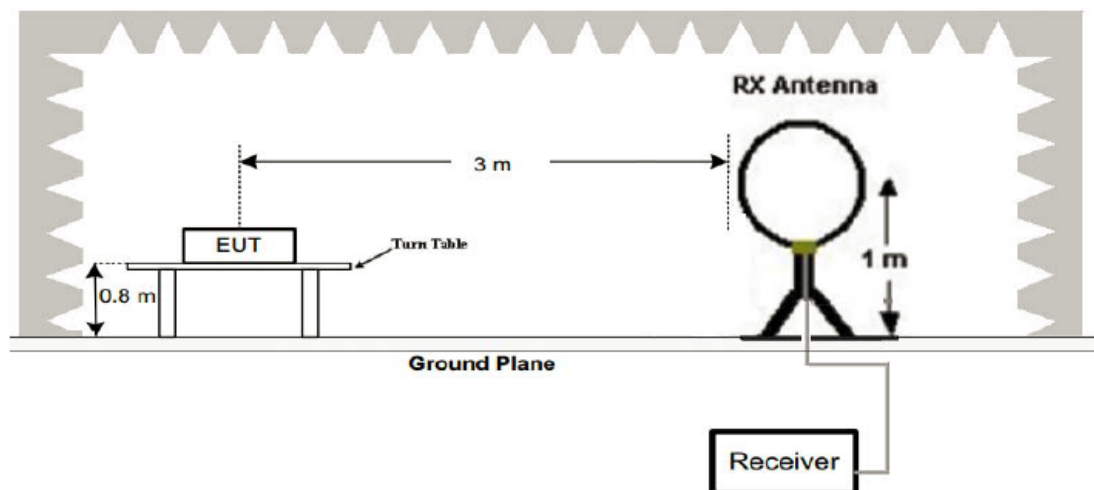
(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

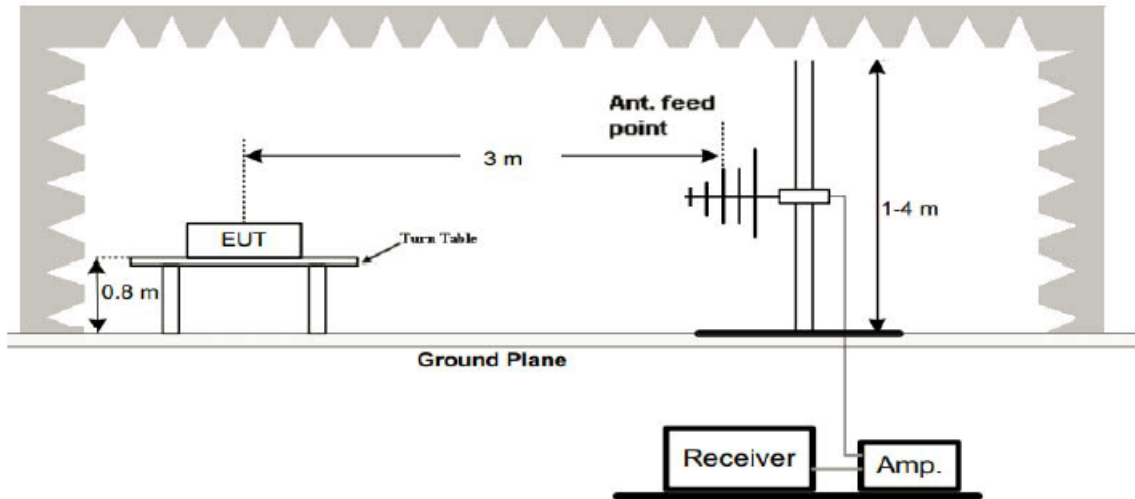
For intentionally used equipment, the general requirements for the magnetic field strength limits of the fundamental and harmonic radiation from the intentional radiator at a distance of 3 meters shall not exceed the above table, as specified in § 15.249(a).

4.2 Test Setup

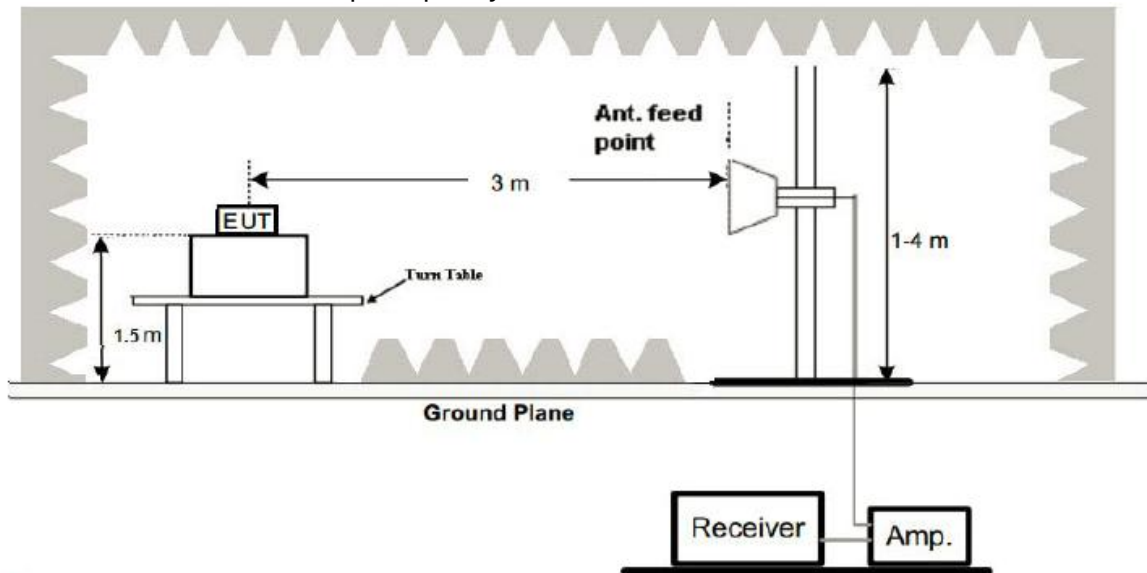
1. Radiated Emission Test-Up Frequency Below 30MHz



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

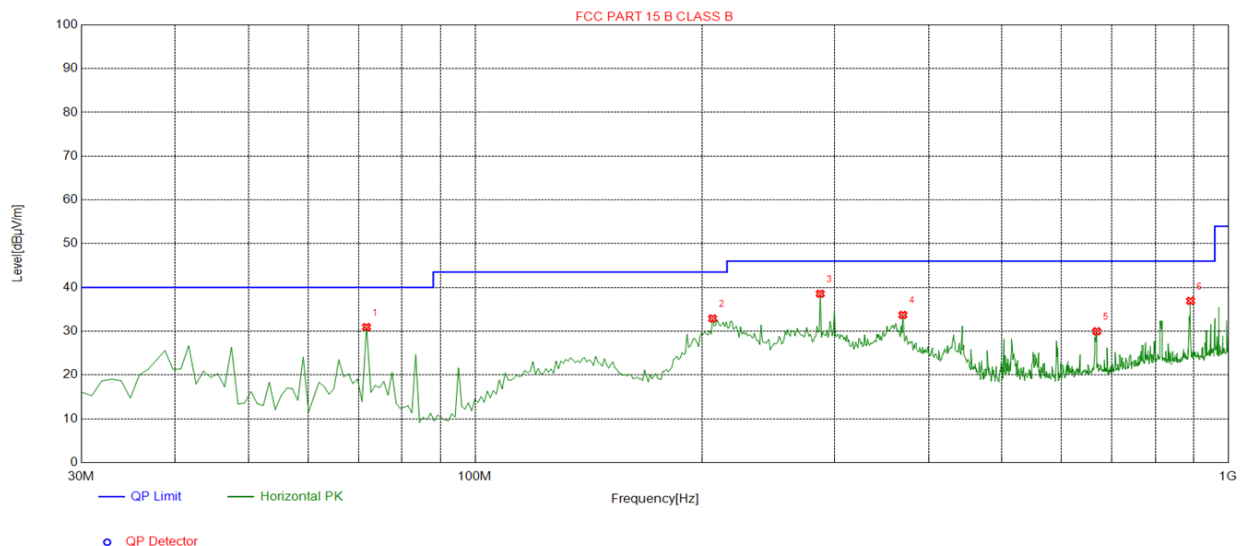
PASS

Remark:

1. All the test modes completed for test. The worst case of Radiated Emission is High channel, the test data of this mode was reported.
2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, and test data recorded in this report.
3. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.

Below 1GHz Test Results:

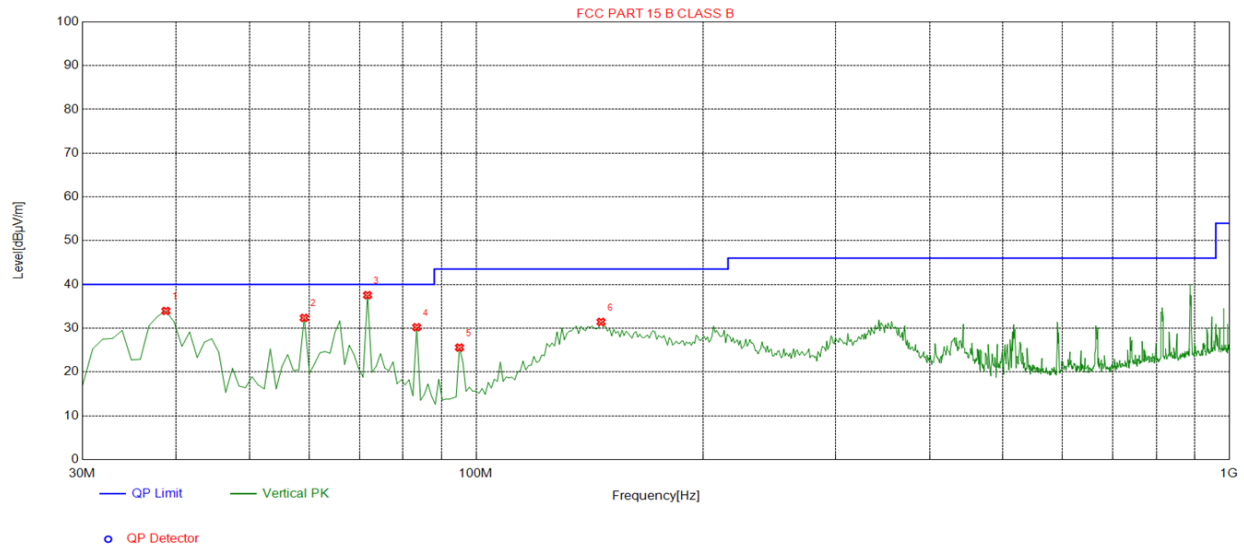
Temperature:	24°C	Relative Humidity:	45%
Test Date:	Jun. 22, 2020	Pressure:	1010hPa
Test Voltage:	DC 3.7V	Polarization:	Horizontal
Test Mode:	Transmitting mode of GFSK2480MHz		



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.7518	-17.99	48.93	30.94	40.00	9.06	100	101	Horizontal
2	206.7167	-14.89	47.79	32.90	43.50	10.60	100	12	Horizontal
3	287.3073	-12.95	51.51	38.56	46.00	7.44	100	235	Horizontal
4	369.8398	-11.01	44.73	33.72	46.00	12.28	100	328	Horizontal
5	668.8989	-4.63	34.60	29.97	46.00	16.03	100	67	Horizontal
6	891.2513	-1.87	38.80	36.93	46.00	9.07	100	290	Horizontal

Remark: Absolute Level= Reading Level+ Factor, Margin= Absolute Level – Limit
 Factor=Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24°C	Relative Humidity:	45%
Test Date:	Jun. 22, 2020	Pressure:	1010hPa
Test Voltage:	DC 3.7V	Polarization:	Vertical
Test Mode:	Transmitting mode of GFSK2480MHz		



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	38.7387	-14.95	48.90	33.95	40.00	6.05	100	47	Vertical
2	59.1291	-15.03	47.39	32.36	40.00	7.64	100	18	Vertical
3	71.7518	-17.99	55.55	37.56	40.00	2.44	100	198	Vertical
4	83.4034	-18.65	48.87	30.22	40.00	9.78	100	70	Vertical
5	95.0551	-16.23	41.81	25.58	43.50	17.92	100	214	Vertical
6	146.5165	-19.02	50.46	31.44	43.50	12.06	100	12	Vertical

Remark: Absolute Level= Reading Level+ Factor, Margin= Absolute Level – Limit
Factor=Ant. Factor + Cable Loss – Pre-amplifier

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.

GFSK
Horizontal:

Vertical:

[illegible]

Horizontal:

Vertical:

[illegible]

CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	104.92	-5.65	99.27	114	-14.73	PK
2480	82.63	-5.65	76.98	94	-17.02	AV
4960	54.39	-3.43	50.96	74	-23.04	PK
4960	45.26	-3.43	41.83	54	-12.17	AV
7440	54.71	-0.75	53.96	74	-20.04	PK
7440	45.84	-0.75	45.09	54	-8.91	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	104.92	-5.65	99.27	114	-14.73	PK
2480	83.49	-5.65	77.84	94	-16.16	AV
4960	55.73	-3.43	52.3	74	-21.7	PK
4960	45.81	-3.43	42.38	54	-11.62	AV
7440	55.39	-0.75	54.64	74	-19.36	PK
7440	45.18	-0.75	44.43	54	-9.57	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

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 ,that the value more than 20dB below limit is not record in the form.

(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 completed.

(7) All modes of operation were investigated and the worst-case emissions are reported.

Horizontal:

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit

Vertical:

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit

Horizontal:

Vertical:

[illegible]

CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	104.36	-5.65	98.71	114	-15.29	PK
2480	82.74	-5.65	77.09	94	-16.91	AV
4960	54.68	-3.43	51.25	74	-22.75	PK
4960	45.32	-3.43	41.89	54	-12.11	AV
7440	54.96	-0.75	54.21	74	-19.79	PK
7440	46.07	-0.75	45.32	54	-8.68	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	104.94	-5.65	99.29	114	-14.71	PK
2480	83.26	-5.65	77.61	94	-16.39	AV
4960	55.12	-3.43	51.69	74	-22.31	PK
4960	45.28	-3.43	41.85	54	-12.15	AV
7440	54.73	-0.75	53.98	74	-20.02	PK
7440	45.66	-0.75	44.91	54	-9.09	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

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 ,that the value more than 20dB below limit is not record in the form.

(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 73.16 dBuV/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 completed.

(7) All modes of operation were investigated and the worst-case emissions are reported.

Horizontal:

Vertical:

[illegible]

Horizontal:

Vertical:

[illegible]

CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	103.69	-5.65	98.04	114	-15.96	PK
2480	82.71	-5.65	77.06	94	-16.94	AV
4960	54.68	-3.43	51.25	74	-22.75	PK
4960	44.23	-3.43	40.8	54	-13.2	AV
7440	54.89	-0.75	54.14	74	-19.86	PK
7440	45.62	-0.75	44.87	54	-9.13	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	Type
2480	103.87	-5.65	98.22	114	-15.78	PK
2480	82.69	-5.65	77.04	94	-16.96	AV
4960	54.36	-3.43	50.93	74	-23.07	PK
4960	44.92	-3.43	41.49	54	-12.51	AV
7440	54.28	-0.75	53.53	74	-20.47	PK
7440	44.13	-0.75	43.38	54	-10.62	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin= Absolute Level – Limit						

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 ,that the value more than 20dB below limit is not record in the form.

(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 completed.

(7) All modes of operation were investigated and the worst-case emissions are reported.

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	55.37	-5.81	49.56	74	-24.44	PK
2310	45.82	-5.81	40.01	54	-13.99	AV
2390	54.83	-5.84	48.99	74	-25.01	PK
2390	45.41	-5.84	39.57	54	-14.43	AV
2400	54.62	-5.84	48.78	74	-25.22	PK
2400	45.16	-5.84	39.32	54	-14.68	AV

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

Horizontal:

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	54.66	-5.65	49.01	74	-24.99	PK
2483.5	45.08	-5.65	39.43	54	-14.57	AV
2500	54.89	-5.72	49.17	74	-24.83	PK
2500	45.34	-5.72	39.62	54	-14.38	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	54.93	-5.81	49.12	74	-24.88	PK
2310	45.28	-5.81	39.47	54	-14.53	AV
2390	54.37	-5.84	48.53	74	-25.47	PK
2390	44.64	-5.84	38.8	54	-15.20	AV
2400	54.26	-5.84	48.42	74	-25.58	PK
2400	44.39	-5.84	38.55	54	-15.45	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	54.62	-5.81	48.81	74	-25.19	PK
2310	45.31	-5.81	39.5	54	-14.5	AV
2390	54.29	-5.84	48.45	74	-25.55	PK
2390	44.95	-5.84	39.11	54	-14.89	AV
2400	55.61	-5.84	49.77	74	-24.23	PK
2400	45.98	-5.84	40.14	54	-13.86	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Operation Mode: TX CH High (2480MHz)

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	55.32	-5.65	49.67	74	-24.33	PK
2483.5	45.64	-5.65	39.99	54	-14.01	AV
2500	55.06	-5.72	49.34	74	-24.66	PK
2500	45.19	-5.72	39.47	54	-14.53	AV
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)	
2483.5	54.69	-5.65	49.04	74	-24.96	PK
2483.5	45.37	-5.65	39.72	54	-14.28	AV
2500	55.02	-5.72	49.3	74	-24.7	PK
2500	45.84	-5.72	40.12	54	-13.88	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Horizontal:

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2310	55.12	-5.81	49.31	74	-24.69	PK
2310	45.39	-5.81	39.58	54	-14.42	AV
2390	54.78	-5.84	48.94	74	-25.06	PK
2390	45.24	-5.84	39.4	54	-14.6	AV
2400	55.06	-5.84	49.22	74	-24.78	PK
2400	45.65	-5.84	39.81	54	-14.19	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Horizontal:

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.5	54.36	-5.65	48.71	74	-25.29	PK
2483.5	45.84	-5.65	40.19	54	-13.81	AV
2500	54.26	-5.72	48.54	74	-25.46	PK
2500	45.74	-5.72	40.02	54	-13.98	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

6 20dB bandwidth

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=100KHz. VBW=100KHz, Span=3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

6.3 Measurement Equipment Used

Same as Radiated Emission Measurement. The two headset circuits of the prototype are the same, so only one headset is tested.

6.4 Test Result

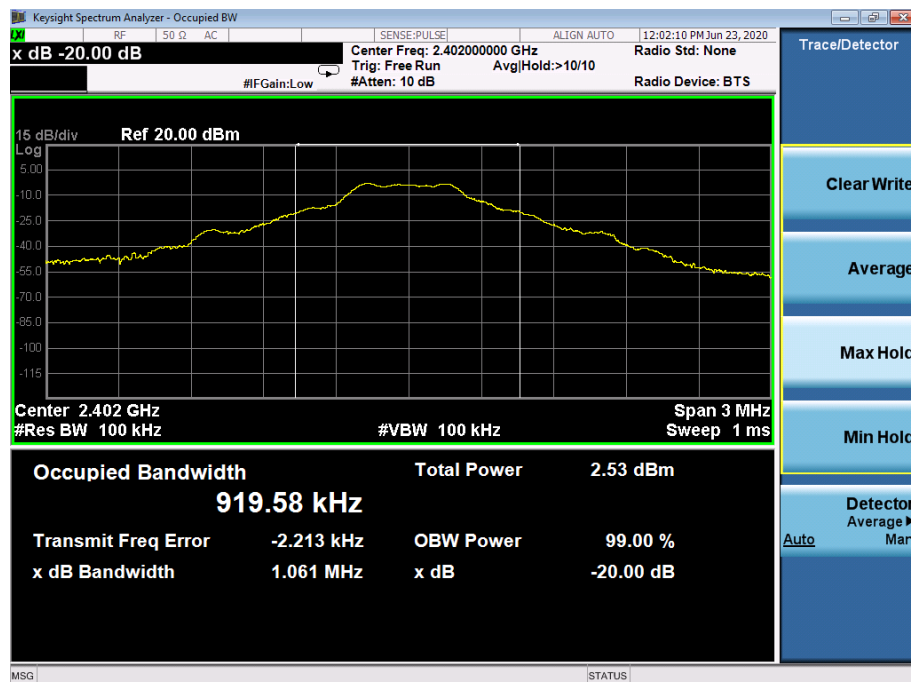
PASS

Left earphone

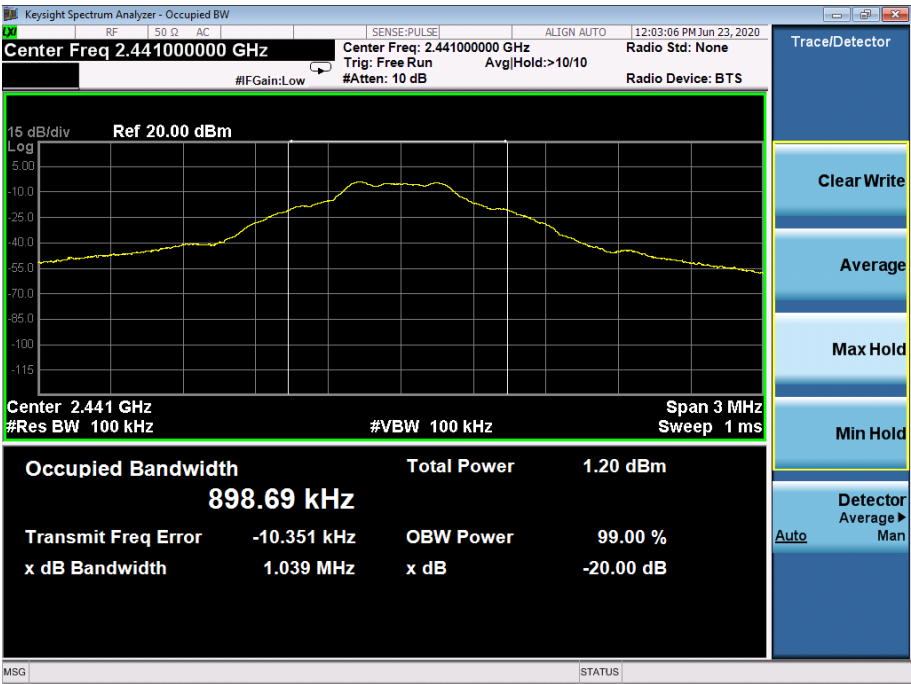
DH5

Frequency (MHz)	20dB Bandwidth (MHz)	Result
2402	1.061	PASS
2441	1.039	PASS
2480	1.056	PASS

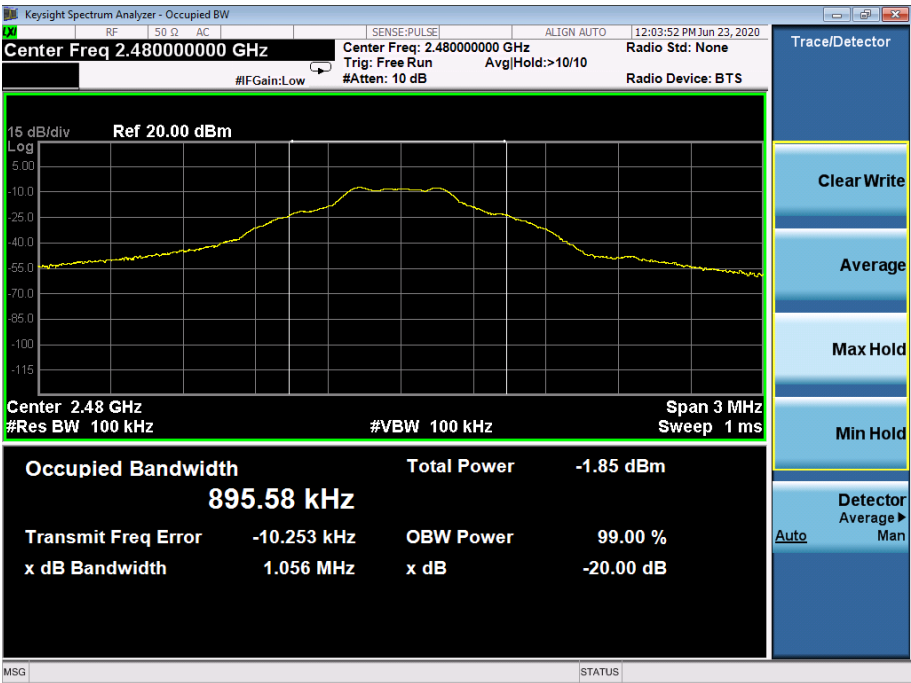
CH:2402MHz



CH:2441MHz



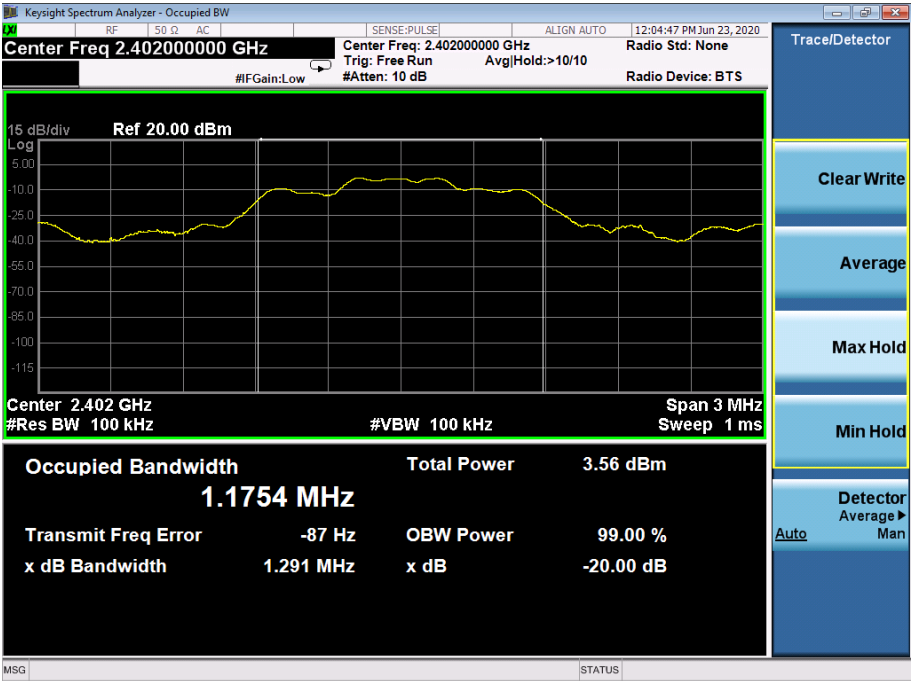
CH:2480MHz



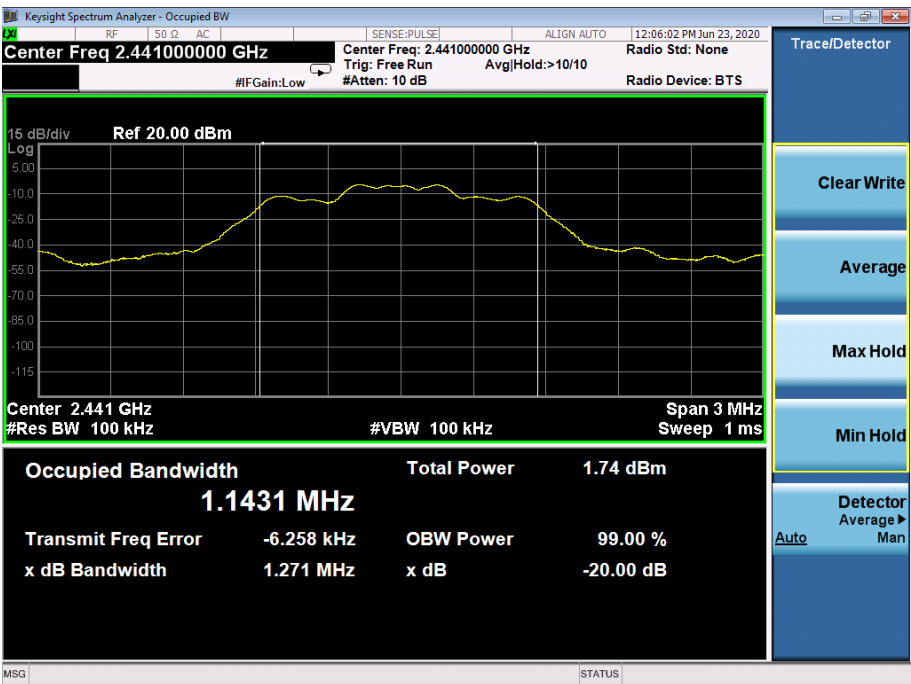
2DH5

Frequency (MHz)	20dB Bandwidth (MHz)	Result
2402	1.291	PASS
2441	1.271	PASS
2480	1.258	PASS

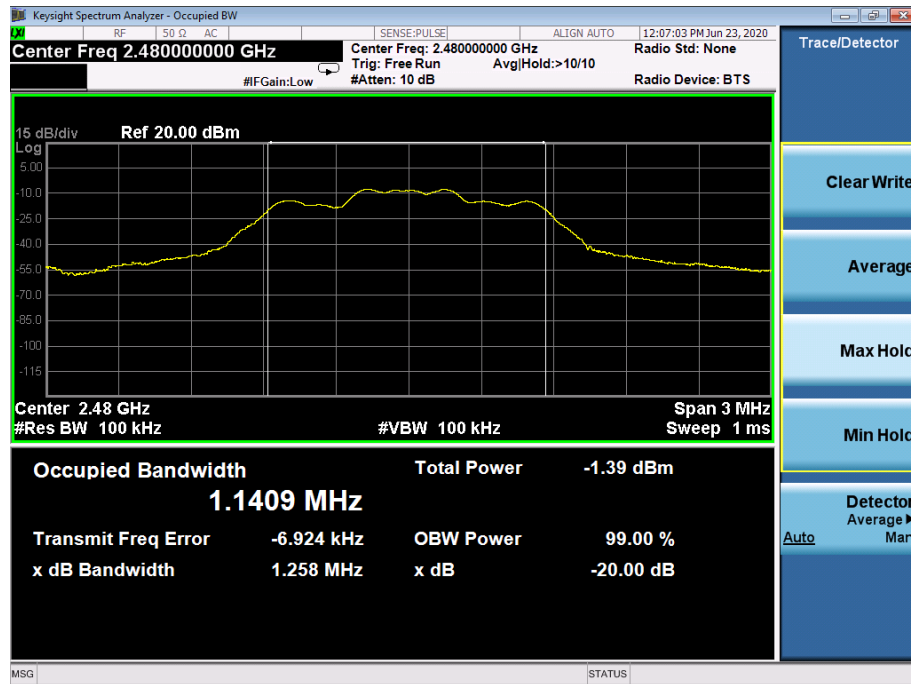
CH:2402MHz



CH:2441MHz



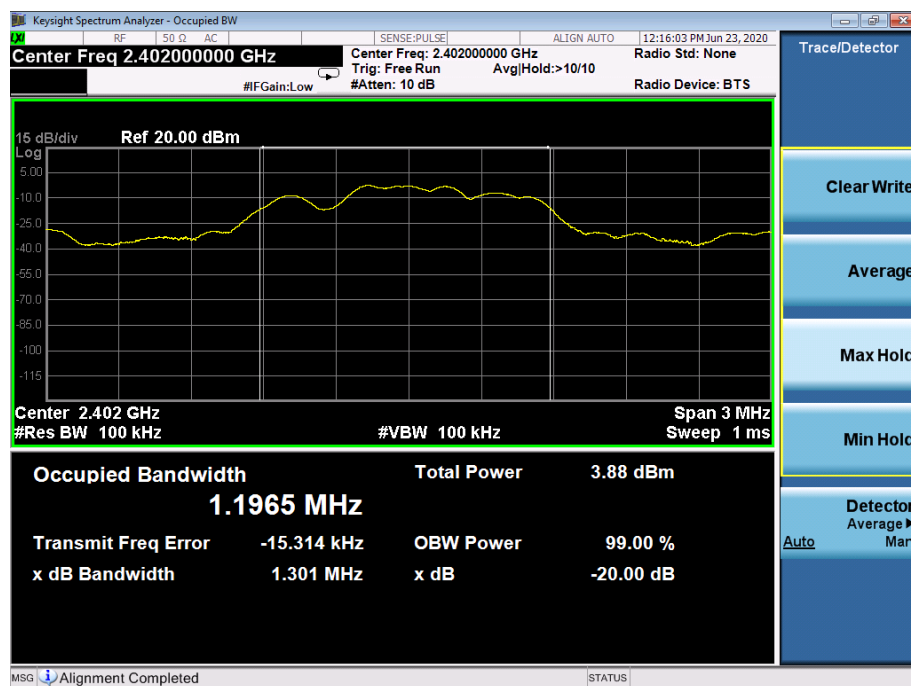
CH:2480MHz



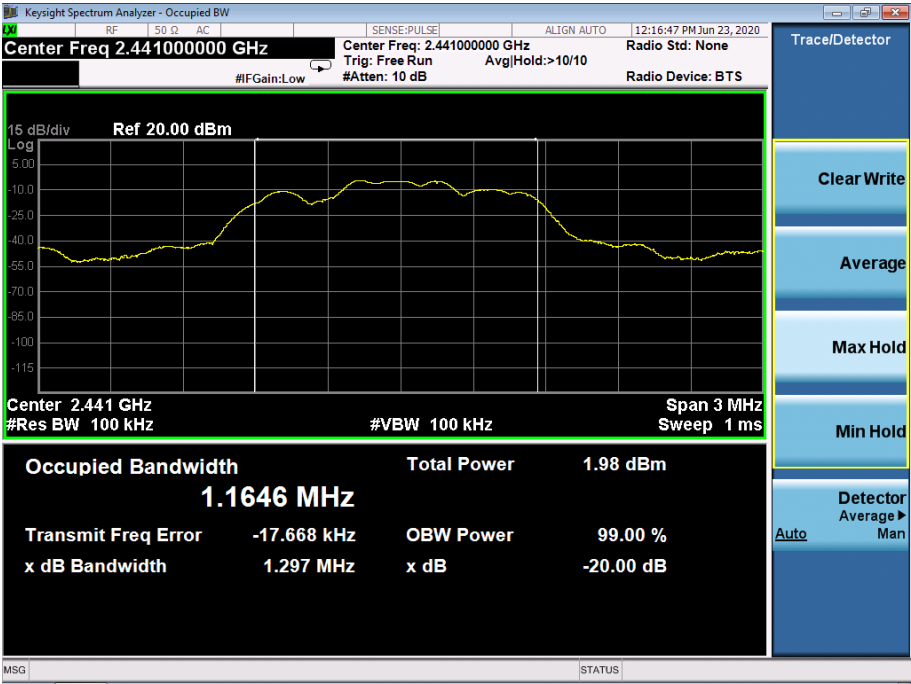
3DH5

Frequency (MHz)	20dB Bandwidth (MHz)	Result
2402	1.301	PASS
2441	1.297	PASS
2480	1.300	PASS

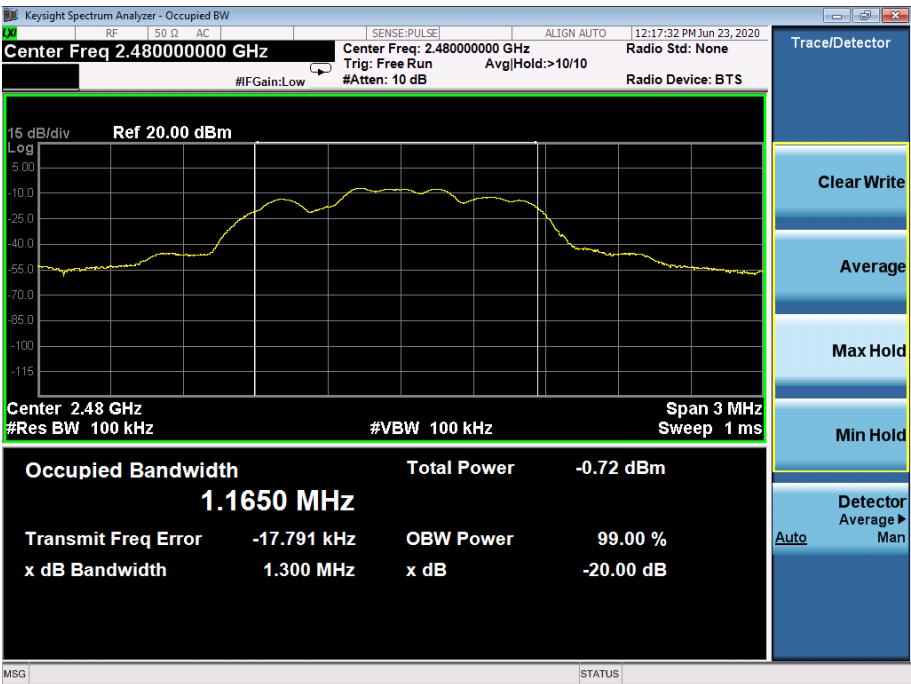
CH:2402MHz



CH:2441MHz



CH:2480MHz



7 ANTENNA REQUIREMENT

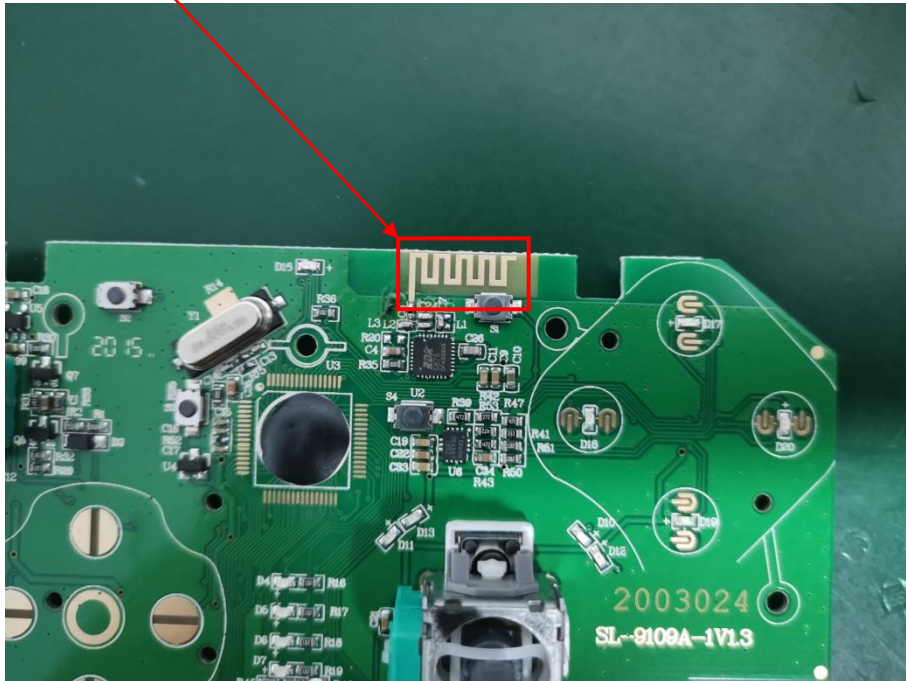
Standard Applicable:

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 PCB Antenna, The directional gains of antenna used for transmitting is 0.13dBi.

ANTENNA:



8 PHOTOGRAPH OF TEST

8.1 Radiated Emission



Photo 1

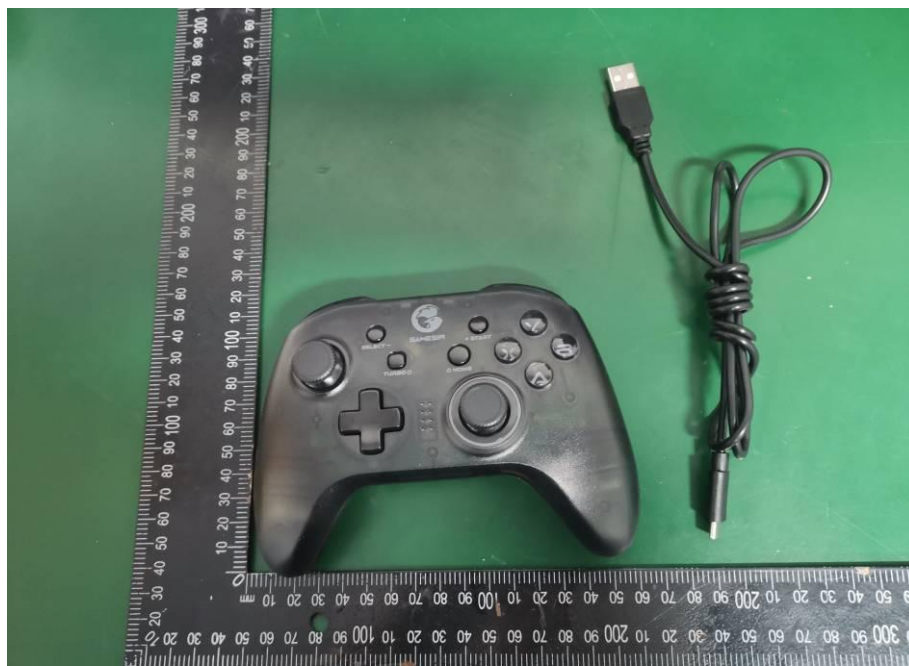


Photo 2

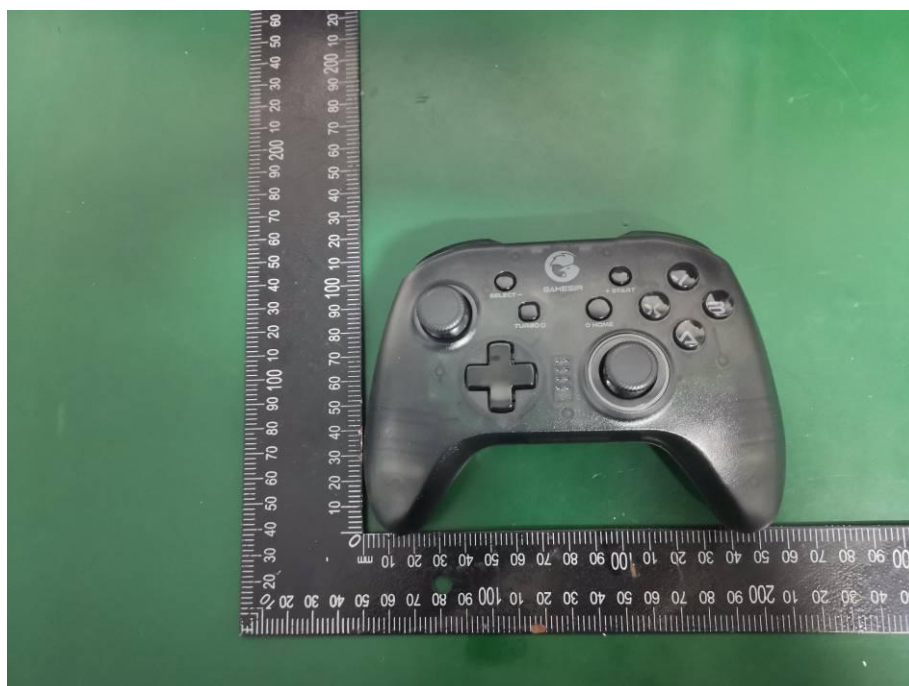


Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9

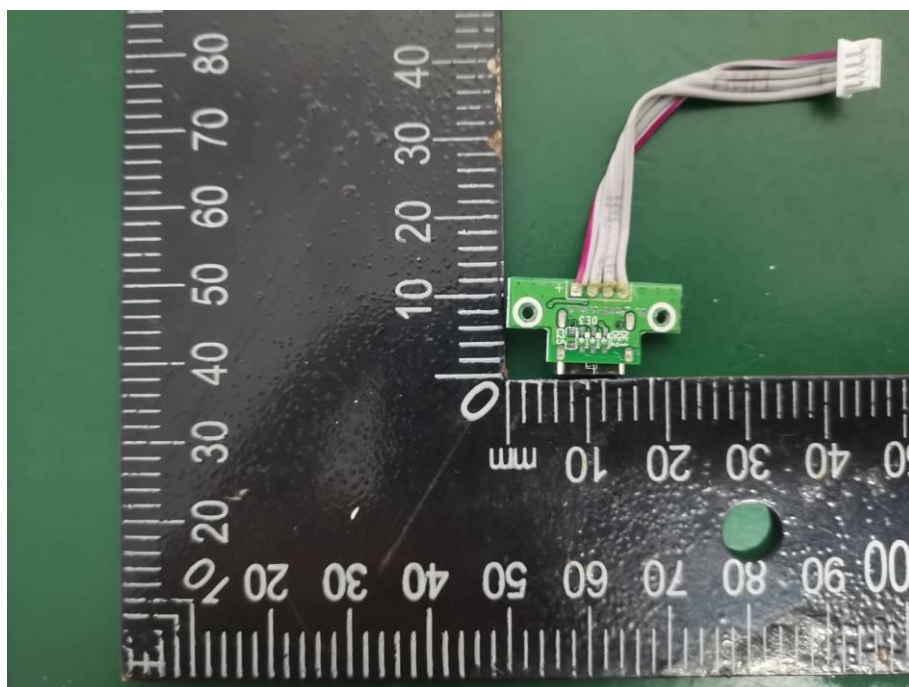


Photo 10

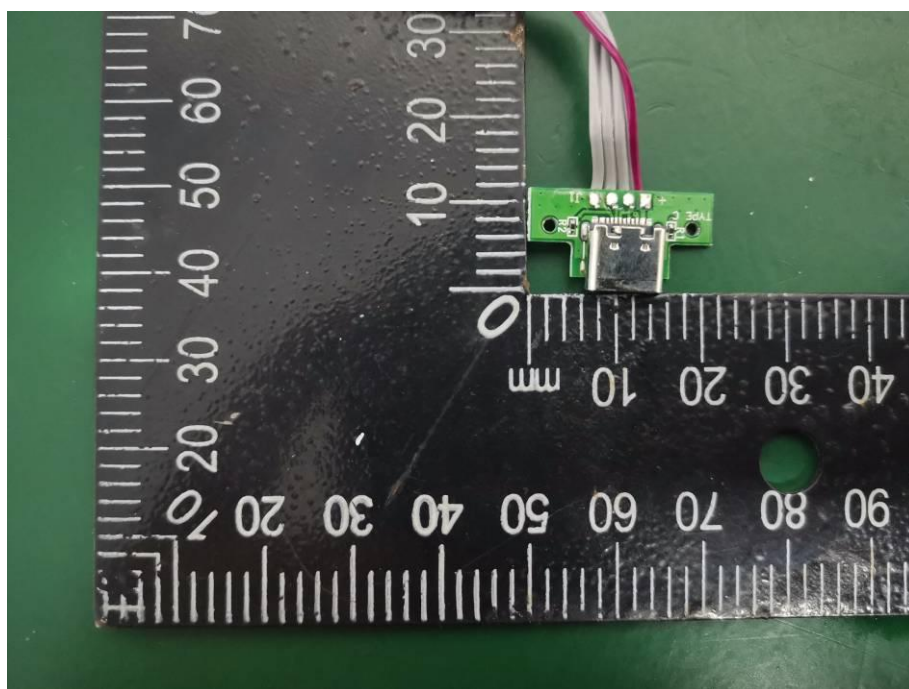


Photo 11

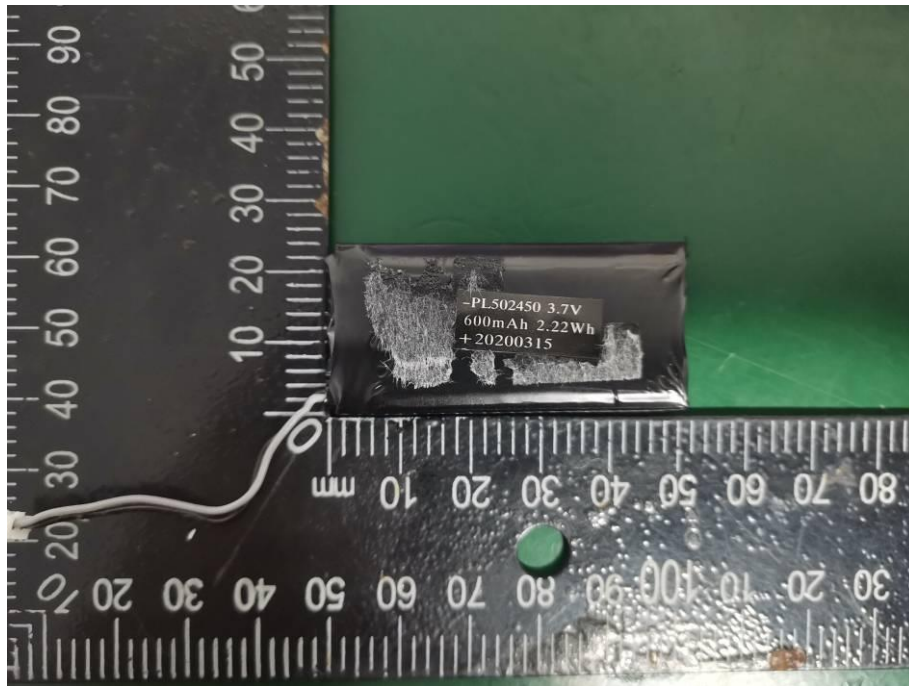


Photo 12

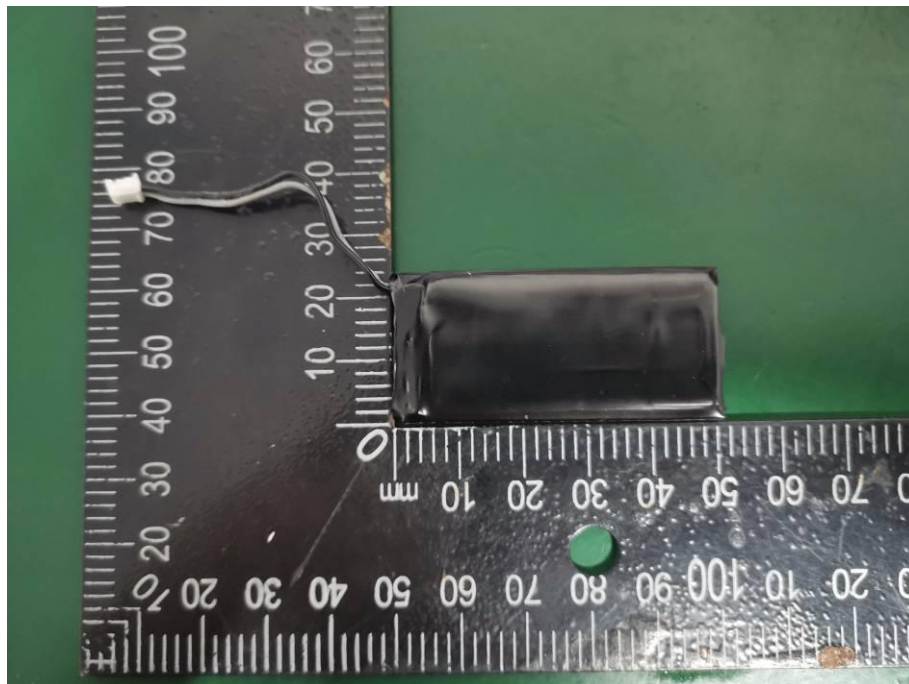


Photo 13

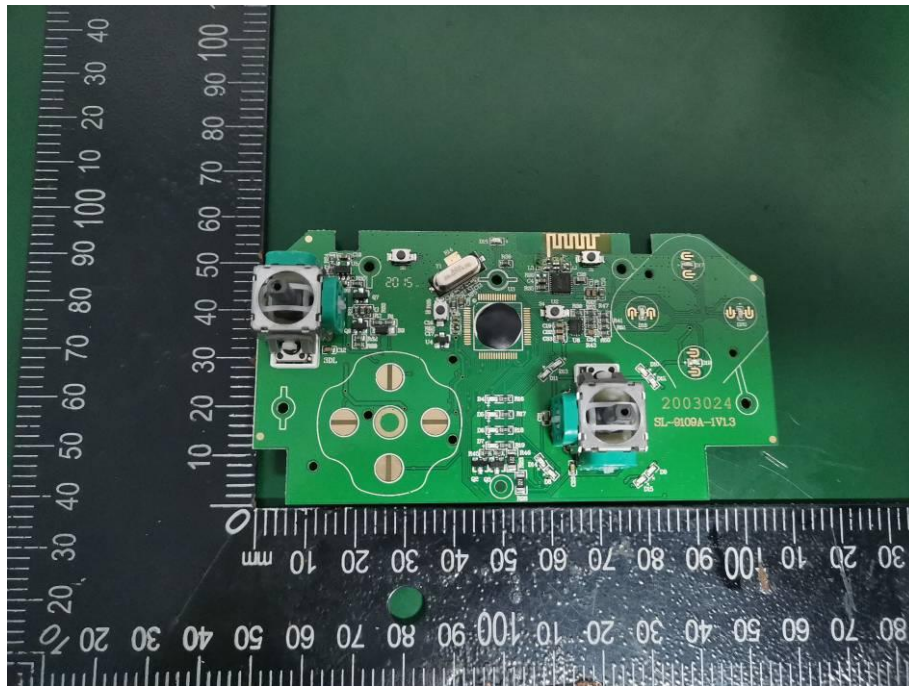


Photo 14

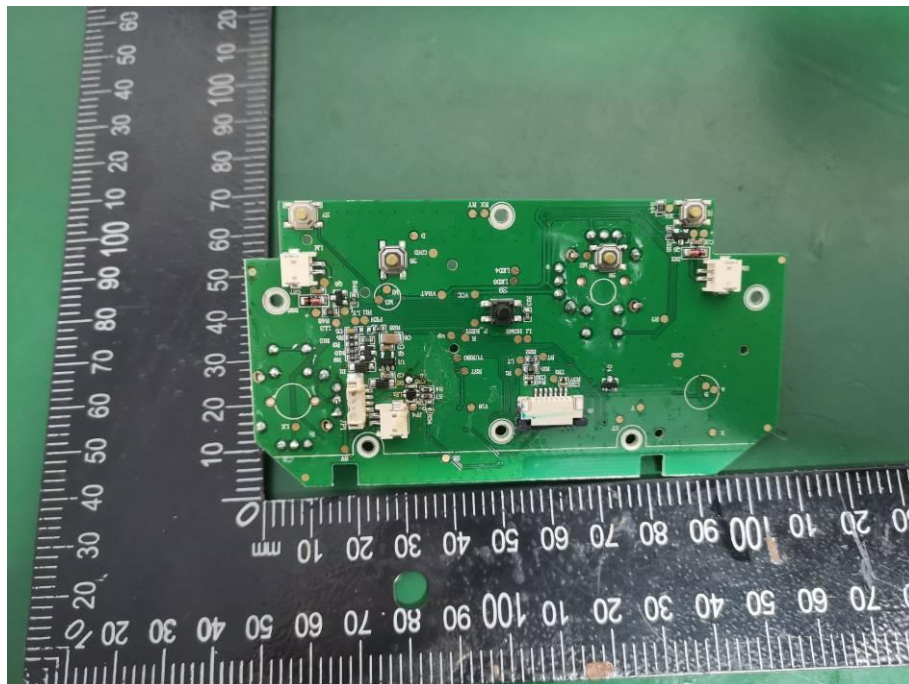
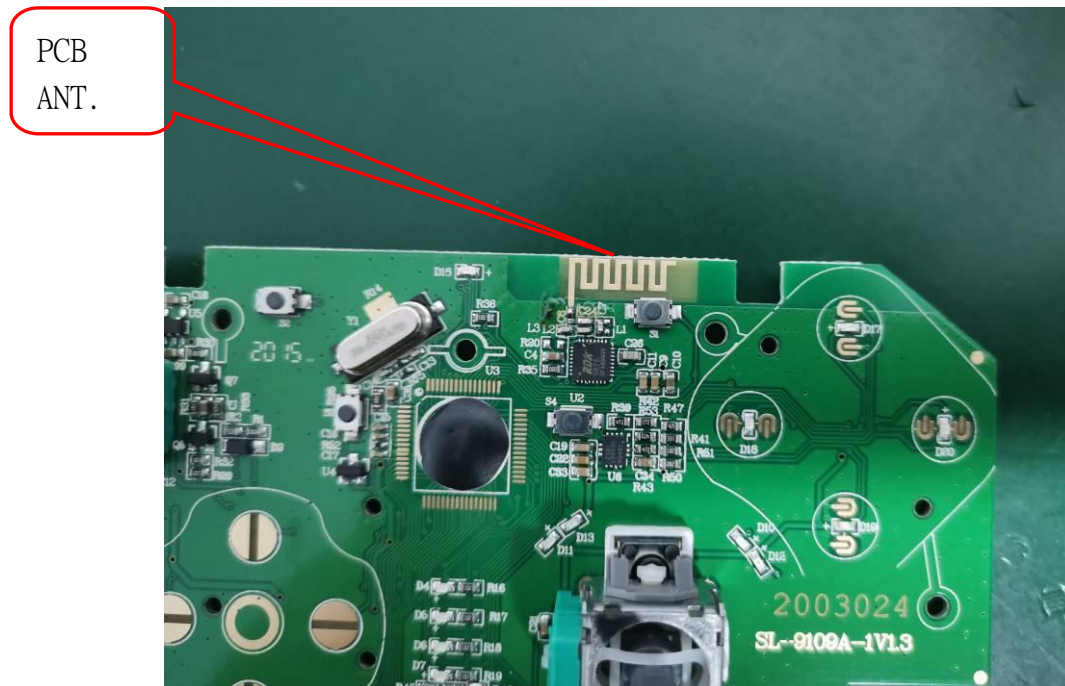


Photo 15



End of Report