



FCC TEST REPORT

**Test report
On Behalf of
Guangdong Weili Intelligent Development Co., Ltd.
For
Remote Control Car Series
Model No.: 144001**

FCC ID: 2ASUS-144001

Prepared for : Guangdong Weili Intelligent Development Co., Ltd.
D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District,
Shantou, 515800 China

Prepared By : Shenzhen HUAKE Testing Technology Co., Ltd.
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Date of Test: Sep. 26, 2023 ~ Oct. 13, 2023

Date of Report: Oct. 13, 2023

Report Number: HK2310094665-E

**TEST RESULT CERTIFICATION**

Applicant's name : Guangdong Weili Intelligent Development Co., Ltd.
Address : D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District, Shantou, 515800 China
Manufacture's Name : Guangdong Weili Intelligent Development Co., Ltd.
Address : D Zone, Xiehe Industrial Park, South of Laimei Road, Chenghai District, Shantou, 515800 China
Product description
Trade Mark : N/A
Product name : Remote Control Car Series
Model and/or type reference : 144001
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 : **Sep. 26, 2023 ~ Oct. 13, 2023**
Date of Issue : **Oct. 13, 2023**
Test Result : **Pass**

Testing Engineer :

(Gary Qian)

Technical Manager :

(Eden Hu)

Authorized Signatory :

(Jason Zhou)

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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Oct. 13, 2023	Jason Zhou



1. TEST SUMMARY

1.1 Test Procedures And Results

DESCRIPTION OF TEST		RESULT
CONDUCTED EMISSIONS TEST	§ 15.207	N/A
RADIATED EMISSION TEST	§ 15.249 (a) / §15.209	COMPLIANT
BAND EDGE	§ 15.249 (d) / §15.209	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	§ 15.215 (c)	COMPLIANT
ANTENNA REQUIREMENT	§ 15.203	COMPLIANT

1.2 Information of The Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization :

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

1.3 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	Remote Control Car Series
Model Name	144001
Serial Model	N/A
Model Difference	N/A
FCC ID	2ASUS-144001
Antenna Type	Internal Antenna
Antenna Gain	2.97dBi
Equipment	Remote Control Car Series
Operation frequency	2407MHz~2478MHz
Number of Channels	34CH
Modulation Type	GFSK
Power Source	DC 6V from Battery
Power Rating	DC 6V from Battery
Firmware Version	05
Hardware Version	04



2.2 Carrier Frequency of Channels

Description of Channel:							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2407	10	2454	19	2463	28	2472
2	2414	11	2455	20	2464	29	2473
3	2428	12	2456	21	2465	30	2474
4	2436	13	2457	22	2466	31	2475
5	2442	14	2458	23	2467	32	2476
6	2443	15	2459	24	2468	33	2477
7	2451	16	2460	25	2469	34	2478
8	2452	17	2461	26	2470		
9	2453	18	2462	27	2471		

2.3 Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode**

Channel1: 2407MHz

Channel2: 2442MHz

Channel3: 2478MHz

2.4 Description of Test Setup

Operation of EUT during conducted testing and radiation testing:

EUT

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position



2.5 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Note
1	Remote Control Car Series	N/A	144001	N/A	EUT

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



2.6 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	Feb. 17, 2023	1 Year
2.	Receiver	R&S	ESR-7	HKE-010	Feb. 17, 2023	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 17, 2023	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 17, 2023	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Feb. 17, 2023	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 17, 2023	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 17, 2023	1 Year
10.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 17, 2023	1 Year
11.	Pre-amplifier	EMCI	EMC051845S E	HKE-015	Feb. 17, 2023	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 17, 2023	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JY3120-B Version	HKE-083	N/A	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 17, 2023	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 17, 2023	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 17, 2023	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 09, 2021	3 Year
19.	High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	Feb. 17, 2023	1 Year
20.	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 17, 2023	1 Year



3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

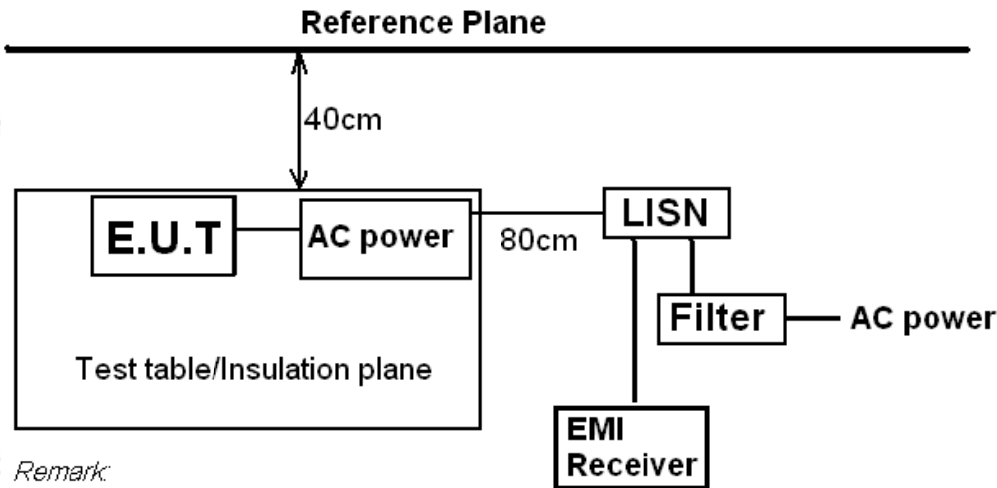
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

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



Remark:

E.U.T: Equipment Under Test

LISN: Line Impedance Stabilization Network

Test table height=0.8m

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 powers supply by DC Power, so this test item not applicable.



4 RADIATED EMISSION TEST

4.1 Radiation Limit

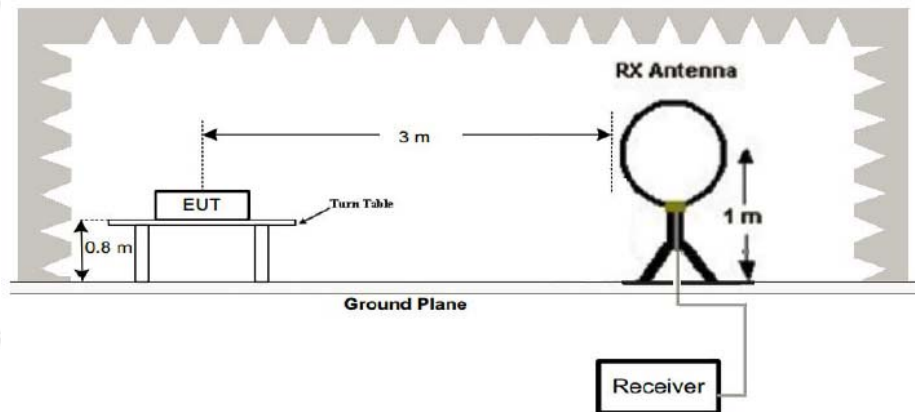
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

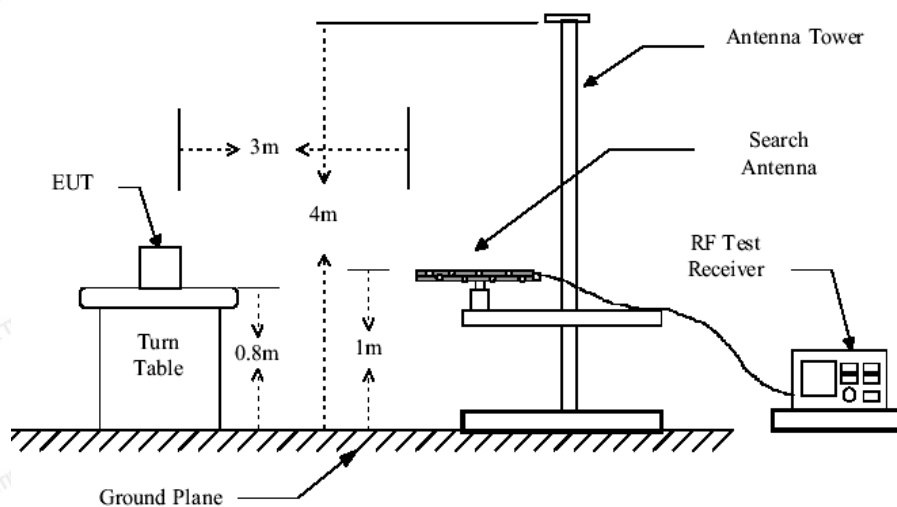
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

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

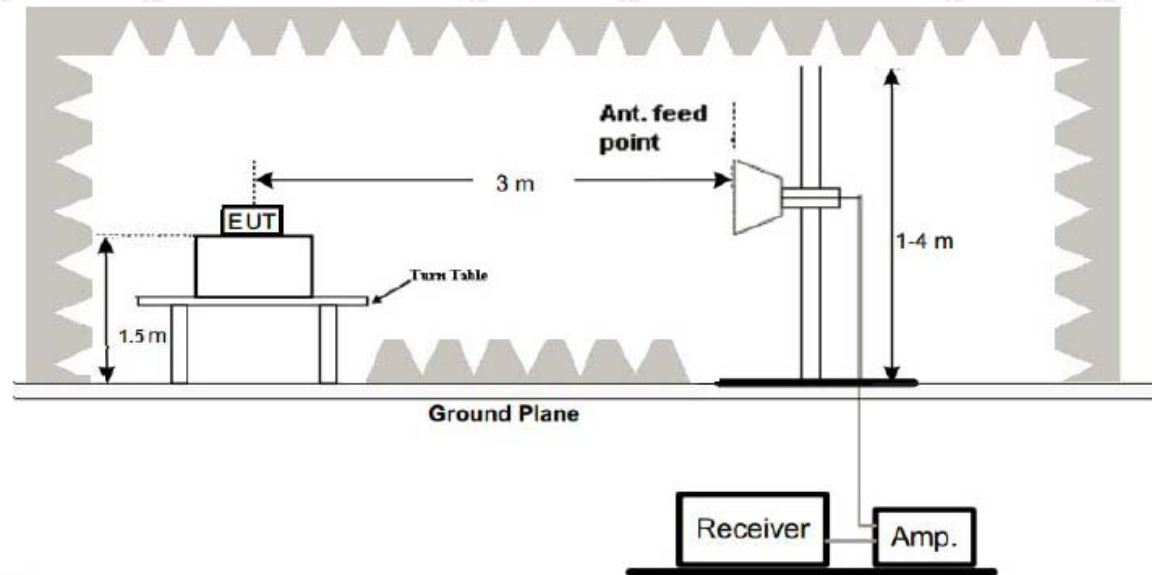


(2) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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.

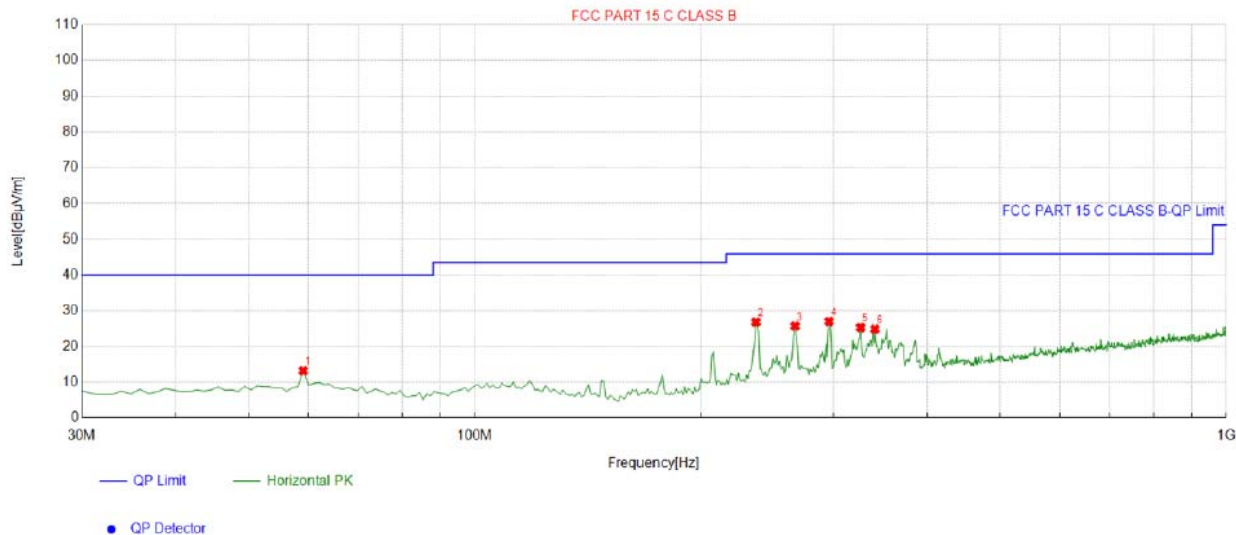
4.4 Test Result

PASS



Below 1GHz Test Results:

Antenna polarity: H



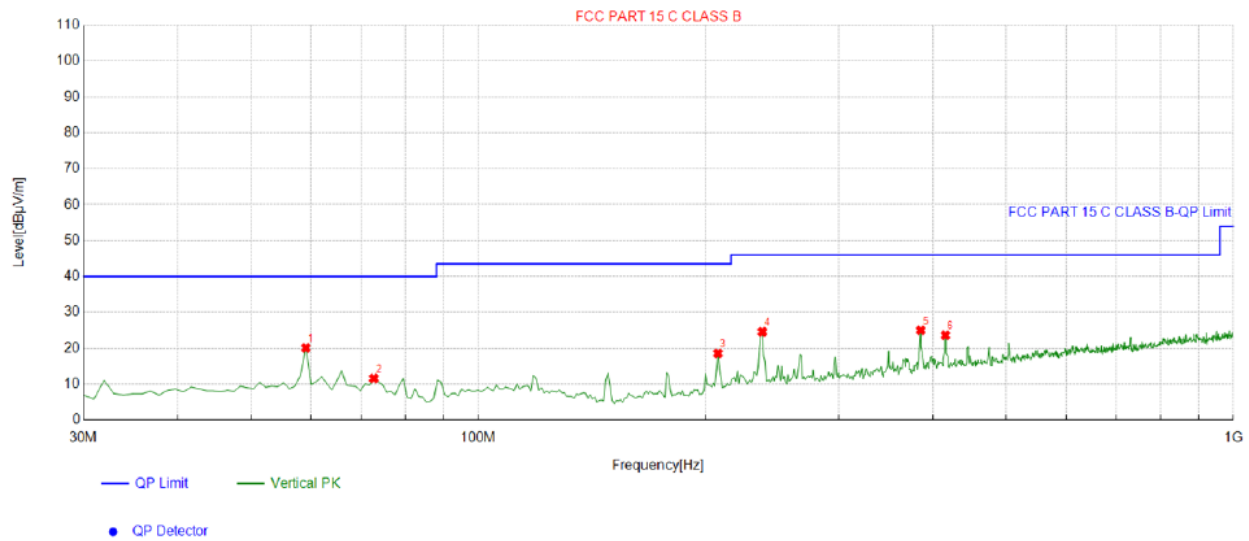
Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	59.129129	-14.55	27.78	13.23	40.00	26.77	100	213	Horizontal
2	236.81681	-13.40	40.27	26.87	46.00	19.13	100	312	Horizontal
3	266.91691	-12.70	38.43	25.73	46.00	20.27	100	264	Horizontal
4	296.04604	-12.08	39.12	27.04	46.00	18.96	100	253	Horizontal
5	326.14614	-11.60	36.90	25.30	46.00	20.70	100	226	Horizontal
6	340.71071	-11.32	36.19	24.87	46.00	21.13	100	256	Horizontal

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level



Antenna polarity: V



Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	59.129129	-14.55	34.63	20.08	40.00	19.92	100	160	Vertical
2	72.722723	-16.35	27.94	11.59	40.00	28.41	100	274	Vertical
3	207.68768	-14.61	33.18	18.57	43.50	24.93	100	168	Vertical
4	237.78778	-13.37	37.95	24.58	46.00	21.42	100	214	Vertical
5	385.37537	-10.40	35.39	24.99	46.00	21.01	100	0	Vertical
6	415.47547	-8.88	32.49	23.61	46.00	22.39	100	131	Vertical

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; 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 Middle (2407MHz)****Horizontal:**

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2407	95.1	-5.71	89.39	114	-24.61	peak
2407	76.57	-5.71	70.86	94	-23.14	AVG
4814	50.41	-3.51	46.9	74	-27.1	peak
4814	33.17	-3.51	29.66	54	-24.34	AVG
7221	47.89	-0.82	47.07	74	-26.93	peak
7221	29.37	-0.82	28.55	54	-25.45	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2407	95.94	-5.71	90.23	114	-23.77	peak
2407	78.6	-5.71	72.89	94	-21.11	AVG
4814	50.94	-3.51	47.43	74	-26.57	peak
4814	33.22	-3.51	29.71	54	-24.29	AVG
7221	47.09	-0.82	46.27	74	-27.73	peak
7221	29.48	-0.82	28.66	54	-25.34	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

**CH Middle (2442MHz)****Horizontal:**

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2442	94.32	-5.71	88.61	114	-25.39	peak
2442	77.21	-5.71	71.5	94	-22.5	AVG
4884	50.75	-3.51	47.24	74	-26.76	peak
4884	31.52	-3.51	28.01	54	-25.99	AVG
7326	46.15	-0.82	45.33	74	-28.67	peak
7326	28.46	-0.82	27.64	54	-26.36	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2442	96.37	-5.71	90.66	114	-23.34	peak
2442	78.39	-5.71	72.68	94	-21.32	AVG
4884	50.18	-3.51	46.67	74	-27.33	peak
4884	32.54	-3.51	29.03	54	-24.97	AVG
7326	46.85	-0.82	46.03	74	-27.97	peak
7326	29.59	-0.82	28.77	54	-25.23	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



CH High (2478MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2478	95.08	-5.65	89.43	114	-24.57	peak
2478	77.61	-5.65	71.96	94	-22.04	AVG
4956	51.69	-3.43	48.26	74	-25.74	peak
4956	31.92	-3.43	28.49	54	-25.51	AVG
7434	47.10	-0.75	46.35	74	-27.65	peak
7434	30.89	-0.75	30.14	54	-23.86	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2478	94.13	-5.65	88.48	114	-25.52	peak
2478	76.91	-5.65	71.26	94	-22.74	AVG
4956	50.27	-3.43	46.84	74	-27.16	peak
4956	31.13	-3.43	27.7	54	-26.3	AVG
7434	45.55	-0.75	44.8	74	-29.2	peak
7434	30.10	-0.75	29.35	54	-24.65	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) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
- (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.



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 1MHz and VBM to 3MHz 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 1MHz and VBW to 3MHz, to measure the conducted peak band edge.



5.3 Test Result

PASS

Radiated Band Edge Test:

Operation Mode: TX CH Low (2407MHz)

Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	56.01	-5.81	50.2	74	-23.8	peak
2310	/	-5.81	/	54	/	AVG
2390	54.28	-5.84	48.44	74	-25.56	peak
2390	/	-5.84	/	54	/	AVG
2400	56.29	-5.84	50.45	74	-23.55	peak
2400	/	-5.84	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2310	54.16	-5.81	48.35	74	-25.65	peak
2310	/	-5.81	/	54	/	AVG
2390	56.38	-5.84	50.54	74	-23.46	peak
2390	/	-5.84	/	54	/	AVG
2400	55.28	-5.84	49.44	74	-24.56	peak
2400	/	-5.84	/	54	/	AVG
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



Operation Mode: TX CH High (2478MHz)

Horizontal (Worst case)

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2483.50	54.01	-5.65	48.36	74	-25.64	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.36	-5.65	49.71	74	-24.29	peak
2500.00	/	-5.65	/	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	54.01	-5.65	48.36	74	-25.64	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.93	-5.65	50.28	74	-23.72	peak
2500.00	/	-5.65	/	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= 20KHz. VBW= 62 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

Frequency	20dB Bandwidth (MHz)	Result
2407 MHz	1.089	PASS
2442 MHz	1.079	PASS
2478 MHz	1.071	PASS

CH: 2407MHz





CH: 2442MHz



CH: 2478MHz





7 ANTENNA REQUIREMENT

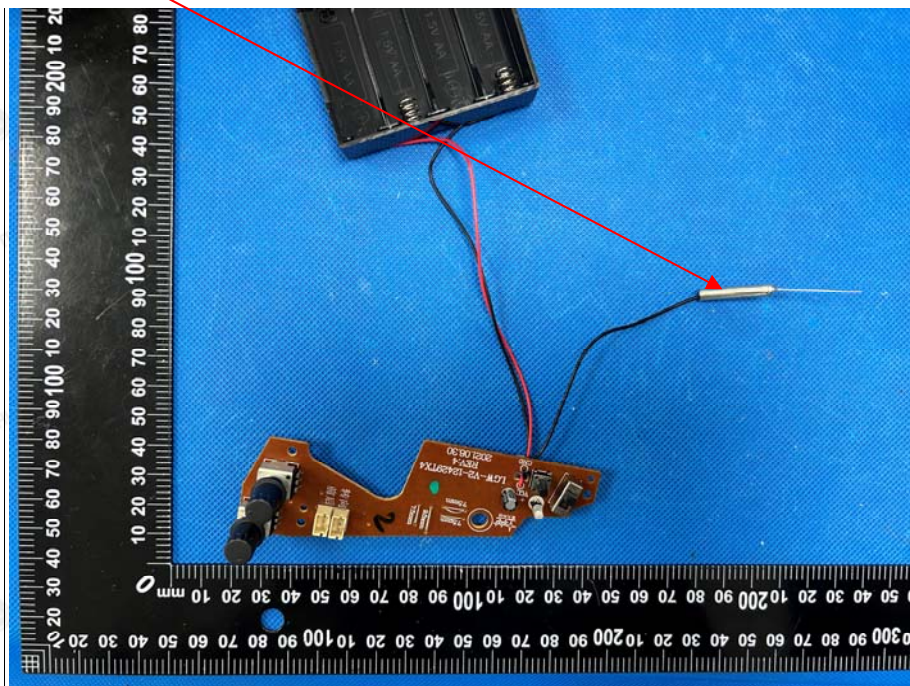
Standard Applicable

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 Internal Antenna which use a special interface and cannot easily replace, The directional gains of antenna used for transmitting is 2.97dBi.

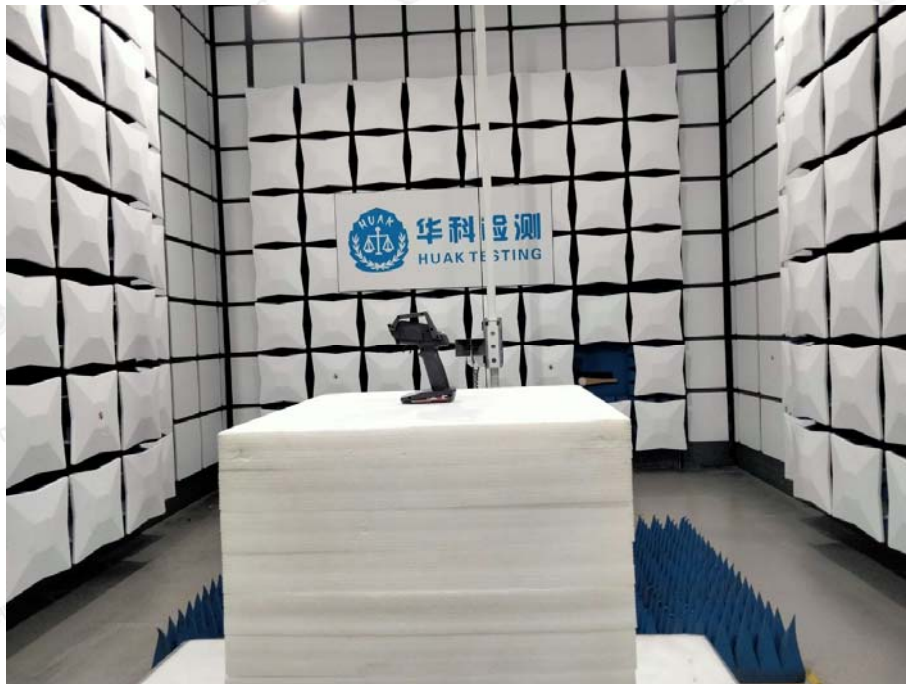
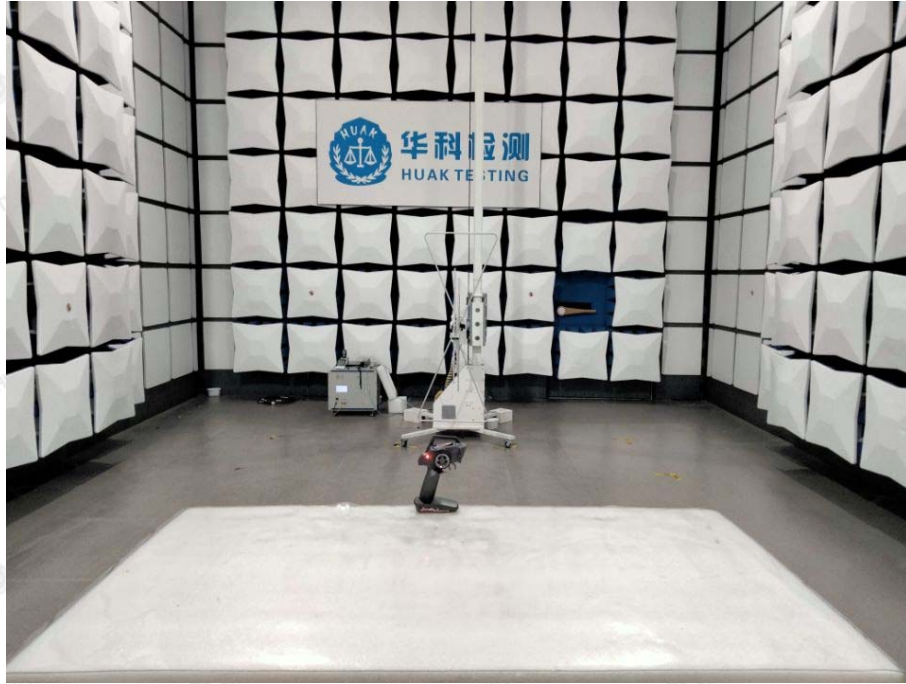
ANTENNA





8 PHOTOGRAPH OF TEST

8.1 Radiated Emission



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9 PHOTOS OF THE EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos

-----End of test report-----