



FCC TEST REPORT

Test report

On Behalf of

DONGGUAN JITUO ELECTRONIC TECHNOLOGY CO.,LTD

For

Multi function transparent custom keyboard

Model No.: G2 MINI, G2 PRO, G2 MAX, G3, G4, G5, G6, G7, G8, G9, G10

FCC ID: 2AZ9M-G2MINI

Prepared for : DONGGUAN JITUO ELECTRONIC TECHNOLOGY CO.,LTD
GUANGDONG DONGGUANSHI QIAOTOUZHENG QIAOTOSHEQU
WENMINGLU (QIAOTOU DUAN) 177HAO F DONG SI LOU B QU

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Date of Test: Sept. 11, 2023 ~ Jan. 04, 2024
Date of Report: Jan. 04, 2024
Report Number: HK2309114177-E



TEST RESULT CERTIFICATION

Applicant's name : DONGGUAN JITUO ELECTRONIC TECHNOLOGY CO.,LTD
Address : GUANGDONG DONGGUANSHI QIAOTOUZHENG QIAOTOUSHEQU WENMINGLU (QIAOTOU DUAN) 177HAO F DONG SI LOU B QU
Manufacturer's Name : DONGGUAN JITUO ELECTRONIC TECHNOLOGY CO.,LTD
Address : GUANGDONG DONGGUANSHI QIAOTOUZHENG QIAOTOUSHEQU WENMINGLU (QIAOTOU DUAN) 177HAO F DONG SI LOU B QU
Product description
Trade Mark : GITOPER
Product name : Multi function transparent custom keyboard
Model and/or type reference : G2 MINI, G2 PRO, G2 MAX, G3, G4, G5, G6, G7, G8, G9, G10
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 : Sept. 11, 2023 ~ Jan. 04, 2024
Date of Issue : Jan. 04, 2024
Test Result : Pass

Testing Engineer : Len Liao
(Len Liao)

Technical Manager : Sliver Wan
(Sliver Wan)

Authorized Signatory : Jason Zhou
(Jason Zhou)

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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Jan. 04, 2024	Jason Zhou



1. TEST SUMMARY

1.1 Test Procedures And Results

DESCRIPTION OF TEST		RESULT
CONDUCTED EMISSIONS TEST	§ 15.207	COMPLIANT
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 HUAK 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	Multi function transparent custom keyboard
Model Name	G2 MINI
Serial Model	G2 PRO, G2 MAX, G3, G4, G5, G6, G7, G8, G9, G10
Model Difference	All model's the function, software and electric circuit are the same, only with model named different. Test sample model: G2 MINI.
FCC ID	2AZ9M-G2MINI
Antenna Type	PCB Antenna
Antenna Gain	1.58dBi
Equipment	Multi function transparent custom keyboard
Operation frequency	2402MHz~2479MHz
Number of Channels	78CH
Modulation Type	GFSK
Power Source	DC 5V from Type-C or DC 3.7V from Battery
Power Rating	DC 5V from Type-C or DC 3.7V from Battery
Firmware Version	V2.0
Hardware Version	V2.0



2.2 Carrier Frequency of Channels

Description of Channel:							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	21	2422	41	2442	61	2462
2	2403	22	2423	42	2443	62	2463
3	2404	23	2424	43	2444	63	2464
4	2405	24	2425	44	2445	64	2465
5	2406	25	2426	45	2446	65	2466
6	2407	26	2427	46	2447	66	2467
7	2408	27	2428	47	2448	67	2468
8	2409	28	2429	48	2449	68	2469
9	2410	29	2430	49	2450	69	2470
10	2411	30	2431	50	2451	70	2471
11	2412	31	2432	51	2452	71	2472
12	2413	32	2433	52	2453	72	2473
13	2414	33	2434	53	2454	73	2474
14	2415	34	2435	54	2455	74	2475
15	2416	35	2436	55	2456	75	2476
16	2417	36	2437	56	2457	76	2477
17	2418	37	2438	57	2458	77	2478
18	2419	38	2439	58	2459	78	2479
19	2420	39	2440	59	2460		
20	2421	40	2441	60	2461		

2.3 Operation of EUT during testing

Operating Mode

The mode is used: **Transmitting mode**

Channel1: 2420MHz

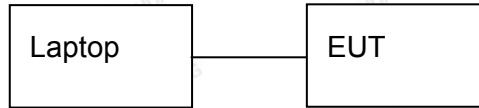
Channel: 2440MHz

Channel78: 2479MHz



2.4 Description of Test Setup

Operation of EUT during radiation testing:



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	Multi function transparent custom keyboard	GITOPER	G2 MINI	N/A	EUT
2	Laptop	Lenovo	Thinkpad E450	Input: 20V 2.25A/3.25A	Peripheral

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

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3. CONDUCTED EMISSIONS TEST

3.1 Conducted Power Line Emission Limit

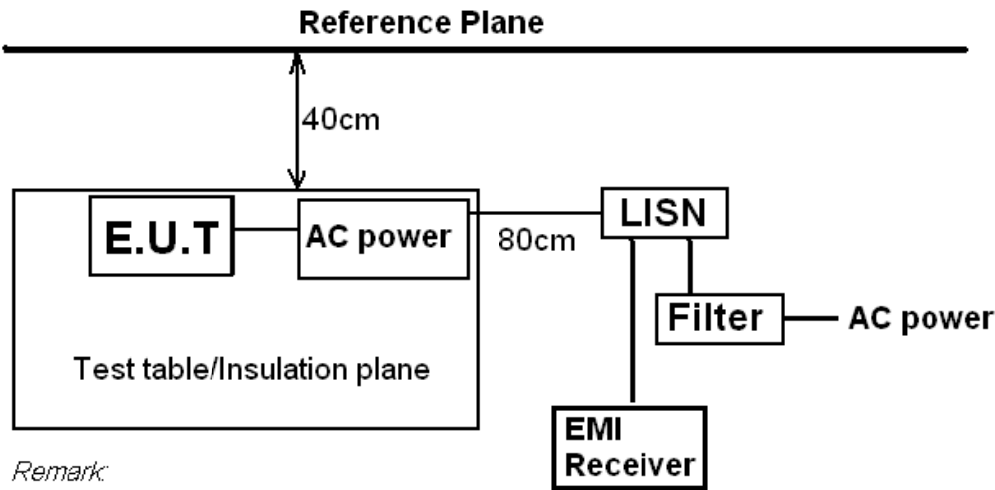
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

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

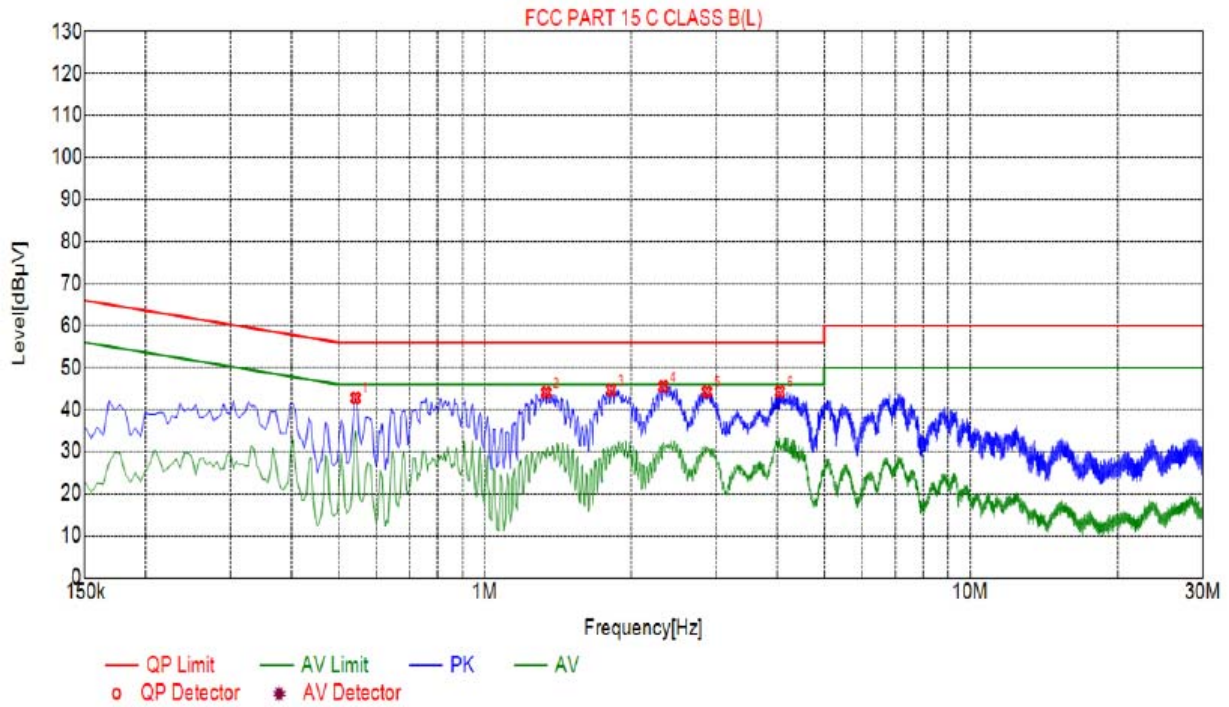
- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per 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

All modes have been tested, only the worst result (GFSK DH5 low channel) was reported as below:

Test Specification: Line



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.5415	42.79	20.05	56.00	13.21	22.74	PK	L
2	1.3380	44.05	20.10	56.00	11.95	23.95	PK	L
3	1.8195	44.69	20.14	56.00	11.31	24.55	PK	L
4	2.3325	45.54	20.18	56.00	10.46	25.36	PK	L
5	2.8680	44.24	20.21	56.00	11.76	24.03	PK	L
6	4.0560	44.27	20.25	56.00	11.73	24.02	PK	L

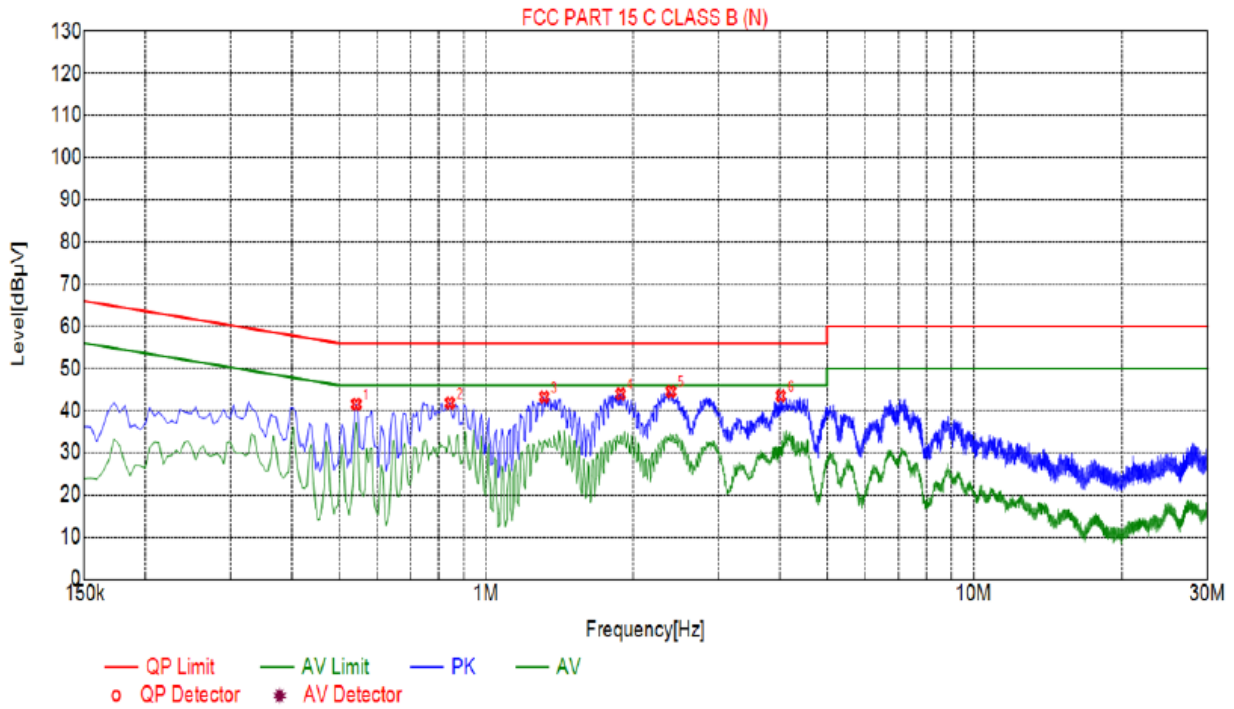
Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor



Test Specification: Neutral



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.5415	41.53	20.05	56.00	14.47	21.48	PK	N
2	0.8430	41.83	20.06	56.00	14.17	21.77	PK	N
3	1.3155	43.26	20.10	56.00	12.74	23.16	PK	N
4	1.8870	43.93	20.14	56.00	12.07	23.79	PK	N
5	2.3955	44.54	20.18	56.00	11.46	24.36	PK	N
6	4.0200	43.50	20.25	56.00	12.50	23.25	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

4 RADIATED EMISSION TEST

4.1 Radiation Limit

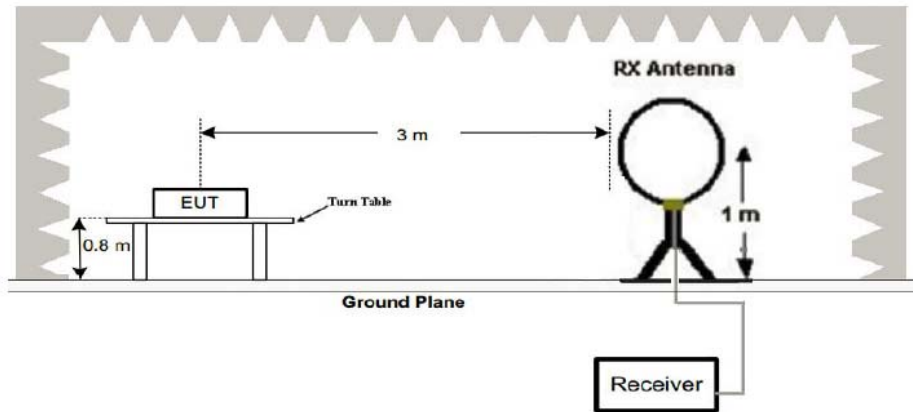
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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

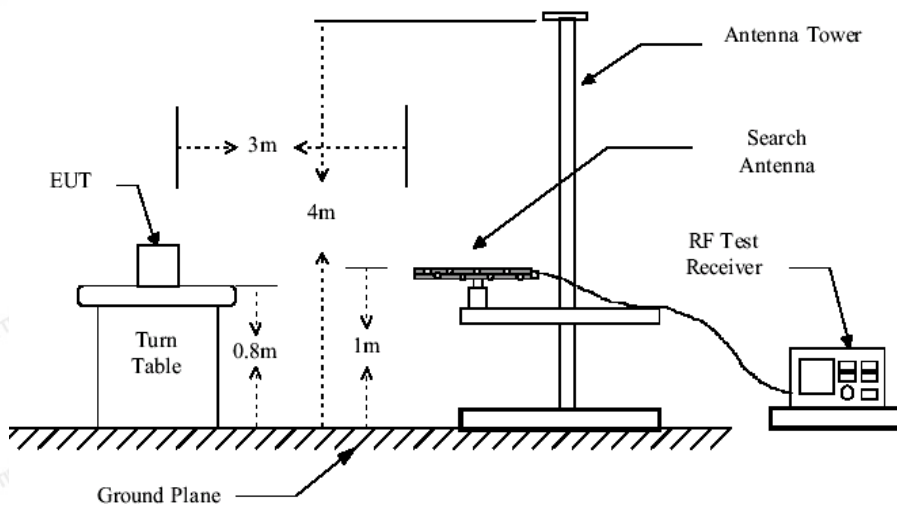
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2 Test Setup

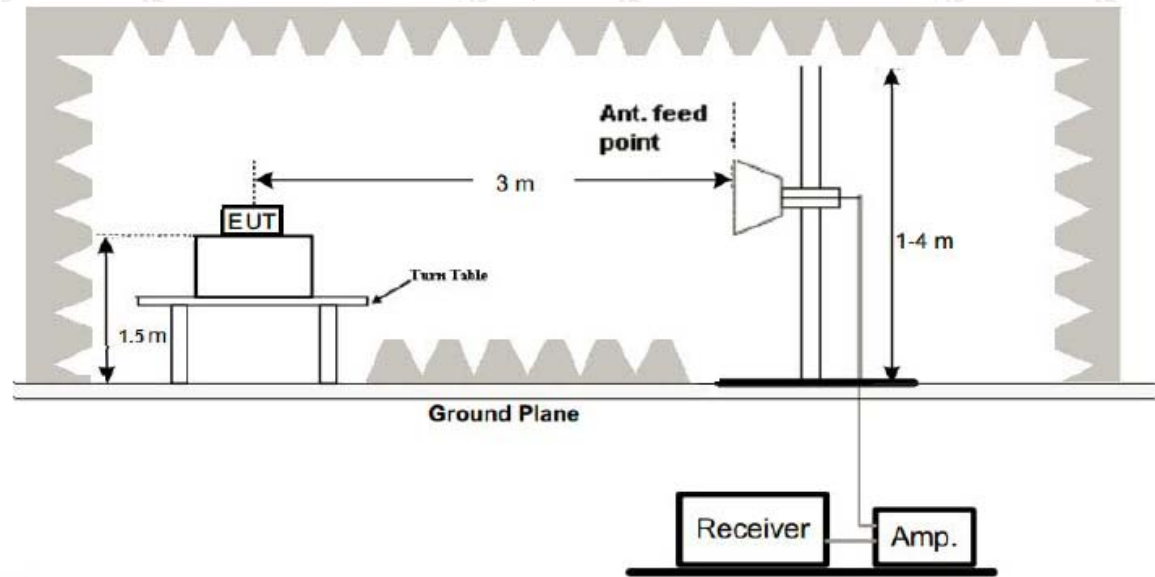
(1) Radiated Emission Test-Up Frequency Below 30MHz



(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.

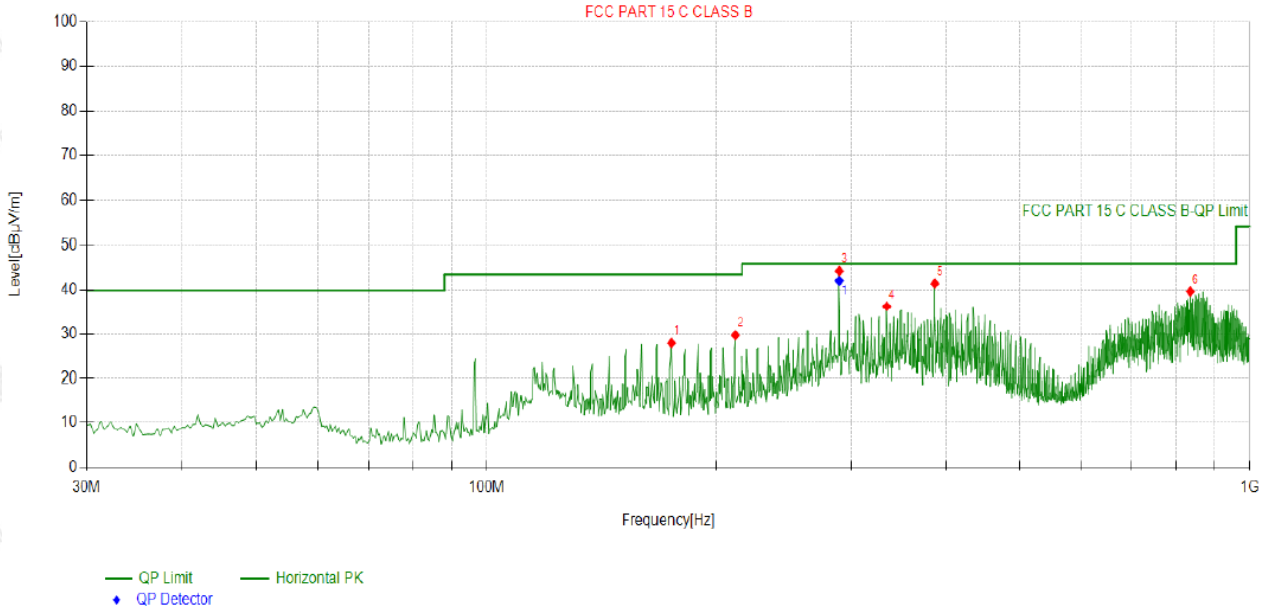
4.4 Test Result

PASS



Below 1GHz Test Results:

Antenna polarity: H



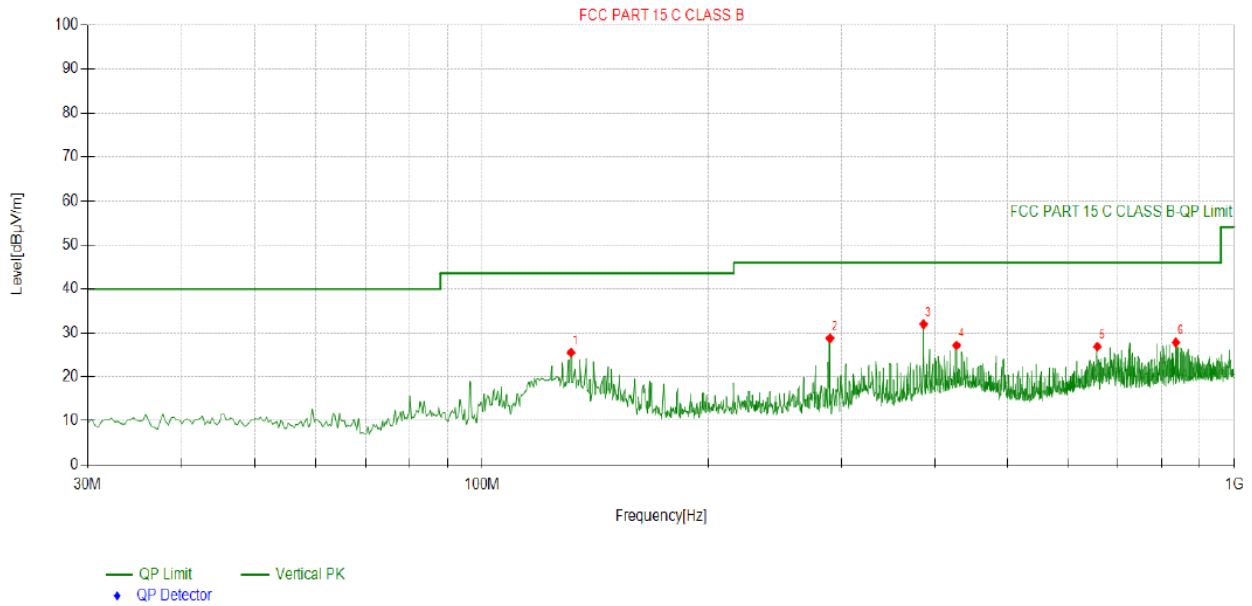
Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	174.57819	-17.71	45.62	27.91	43.50	15.59	100	205	Horizontal
2	211.77392	-19.81	49.46	29.65	43.50	13.85	100	13	Horizontal
3	289.72324	-17.58	61.90	44.32	46.00	1.68	100	199	Horizontal
4	334.35811	-16.68	52.98	36.30	46.00	9.70	100	195	Horizontal
5	386.43214	-15.85	57.35	41.50	46.00	4.50	100	9	Horizontal
6	835.69189	-9.26	48.98	39.72	46.00	6.28	100	36	Horizontal

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	289.69324	-17.58	59.72	42.14	46.00	3.86	100	199	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	131.23707	-17.27	42.78	25.51	43.50	17.99	100	330	Vertical
2	290.04668	-17.57	46.34	28.77	46.00	17.23	100	155	Vertical
3	386.10870	-15.85	47.85	32.00	46.00	14.00	100	117	Vertical
4	427.18572	-14.92	42.08	27.16	46.00	18.84	100	125	Vertical
5	657.47582	-11.16	38.01	26.85	46.00	19.15	100	73	Vertical
6	836.01533	-9.26	37.07	27.81	46.00	18.19	100	24	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 (2402MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2402	98.25	-5.71	92.54	114	-21.46	peak
2402	78.04	-5.71	72.33	94	-21.67	AVG
4804	54.15	-3.51	50.64	74	-23.36	peak
4804	35.02	-3.51	31.51	54	-22.49	AVG
7206	49.67	-0.82	48.85	74	-25.15	peak
7206	34.25	-0.82	33.43	54	-20.57	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

Vertical:

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2402	95.26	-5.71	89.55	114	-24.45	peak
2402	80.25	-5.71	74.54	94	-19.46	AVG
4804	54.16	-3.51	50.65	74	-23.35	peak
4804	35.98	-3.51	32.47	54	-21.53	AVG
7206	51.02	-0.82	50.2	74	-23.8	peak
7206	35.35	-0.82	34.53	54	-19.47	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



CH Middle (2440MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	94.26	-5.71	88.55	114	-25.45	peak
2440	78.26	-5.71	72.55	94	-21.45	AVG
4880	56.34	-3.51	52.83	74	-21.17	peak
4880	35.16	-3.51	31.65	54	-22.35	AVG
7320	51.79	-0.82	50.97	74	-23.03	peak
7320	34.69	-0.82	33.87	54	-20.13	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2440	95.26	-5.71	89.55	114	-24.45	peak
2440	81.81	-5.71	76.1	94	-17.9	AVG
4880	53.14	-3.51	49.63	74	-24.37	peak
4880	35.28	-3.51	31.77	54	-22.23	AVG
7320	36.63	-0.82	35.81	74	-38.19	peak
7320	36.74	-0.82	35.92	54	-18.08	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit



CH High (2479MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2479	96.41	-5.65	90.76	114	-23.24	peak
2479	78.25	-5.65	72.6	94	-21.4	AVG
4958	54.16	-3.43	50.73	74	-23.27	peak
4958	36.52	-3.43	33.09	54	-20.91	AVG
7437	45.21	-0.75	44.46	74	-29.54	peak
7437	34.25	-0.75	33.5	54	-20.5	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

Vertical:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2479	99.15	-5.65	93.5	114	-20.5	peak
2479	79.35	-5.65	73.7	94	-20.3	AVG
4958	54.16	-3.43	50.73	74	-23.27	peak
4958	35.26	-3.43	31.83	54	-22.17	AVG
7437	51.58	-0.75	50.83	74	-23.17	peak
7437	36.66	-0.75	35.91	54	-18.09	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = 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) 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 (2420MHz)

Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2310	55.02	-5.81	49.21	74	-24.79	peak
2310	/	-5.81	/	54	/	AVG
2390	56.38	-5.84	50.54	74	-23.46	peak
2390	/	-5.84	/	54	/	AVG
2400	57.41	-5.84	51.57	74	-22.43	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	57.41	-5.81	51.6	74	-22.4	peak
2310	/	-5.81	/	54	/	AVG
2390	56.39	-5.84	50.55	74	-23.45	peak
2390	/	-5.84	/	54	/	AVG
2400	55.16	-5.84	49.32	74	-24.68	peak
2400	/	-5.84	/	54	/	AVG

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



Operation Mode: TX CH High (2479MHz)

Horizontal (Worst case)

Frequency (MHz)	Reading Result (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2483.50	55.26	-5.65	49.61	74	-24.39	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	57.41	-5.65	51.76	74	-22.24	peak
2500.00	/	-5.65	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

Vertical:

Frequency (MHz)	Reading Result (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detector Type
2483.50	54.25	-5.65	48.6	74	-25.4	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	56.29	-5.65	50.64	74	-23.36	peak
2500.00	/	-5.65	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

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= 62KHz, Span=3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

6.3 Measurement Equipment Used

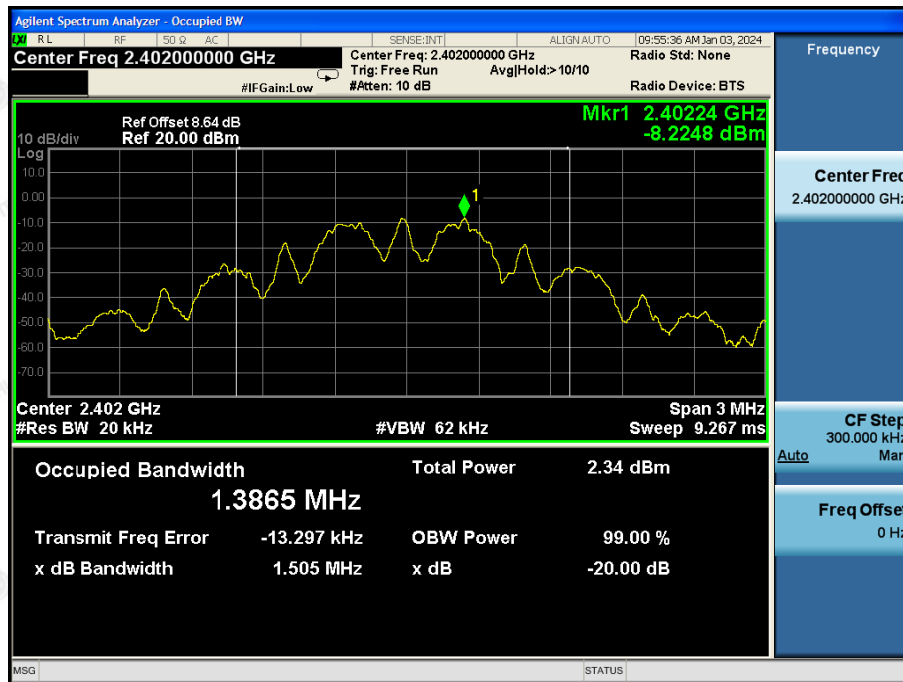
Same as Radiated Emission Measurement

6.4 Test Result

PASS

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.505	PASS
2440 MHz	1.433	PASS
2479 MHz	1.523	PASS

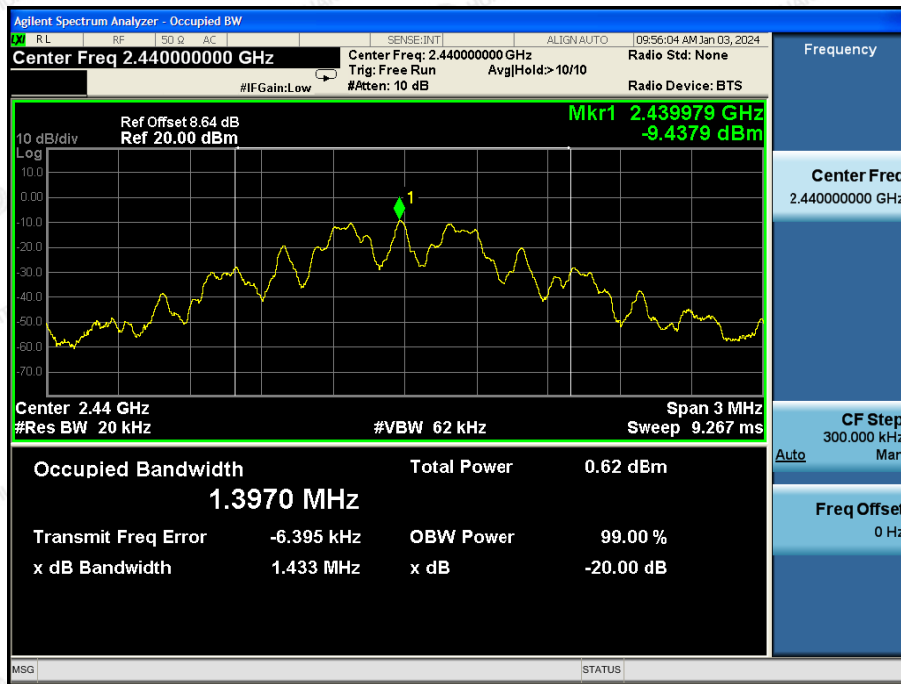
CH 1: 2402MHz



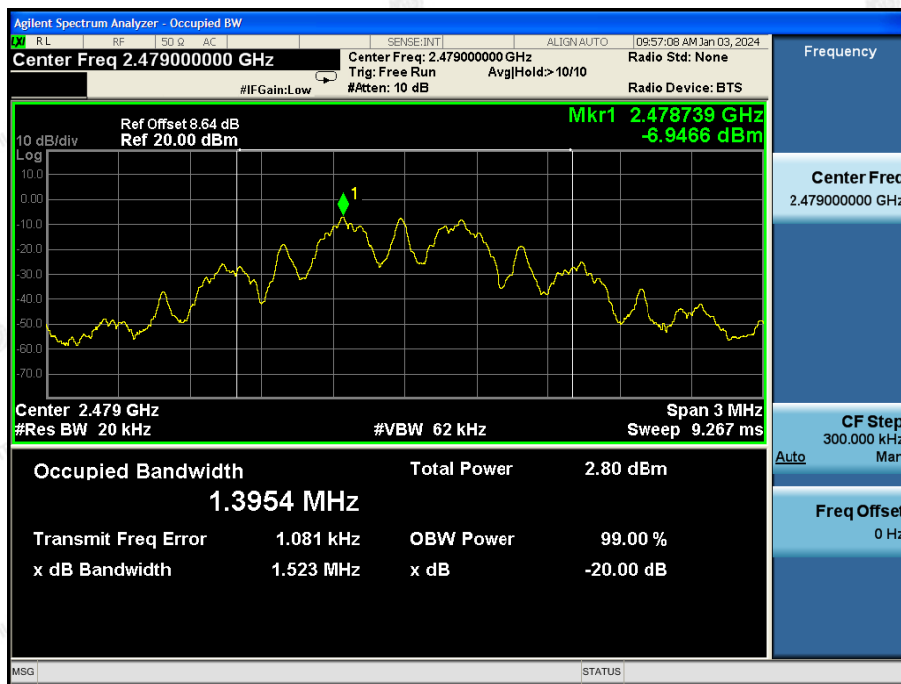
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. This document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.



CH 39: 2440MHz



CH 78: 2479MHz



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7 ANTENNA REQUIREMENT

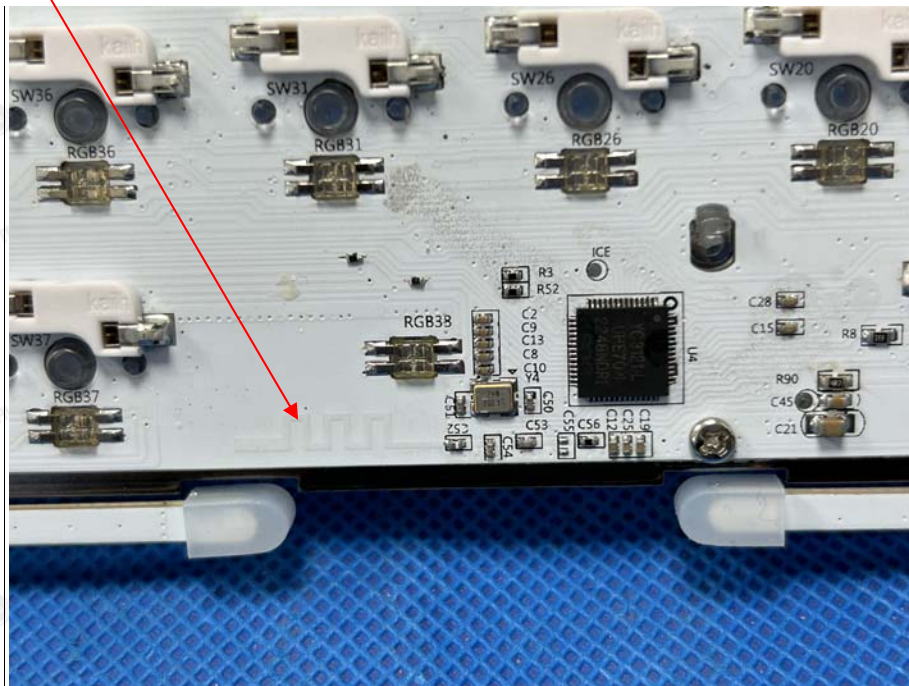
Standard Applicable

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 which permanently attached. It conforms to the standard requirements, The directional gains of antenna used for transmitting is 1.58dBi.

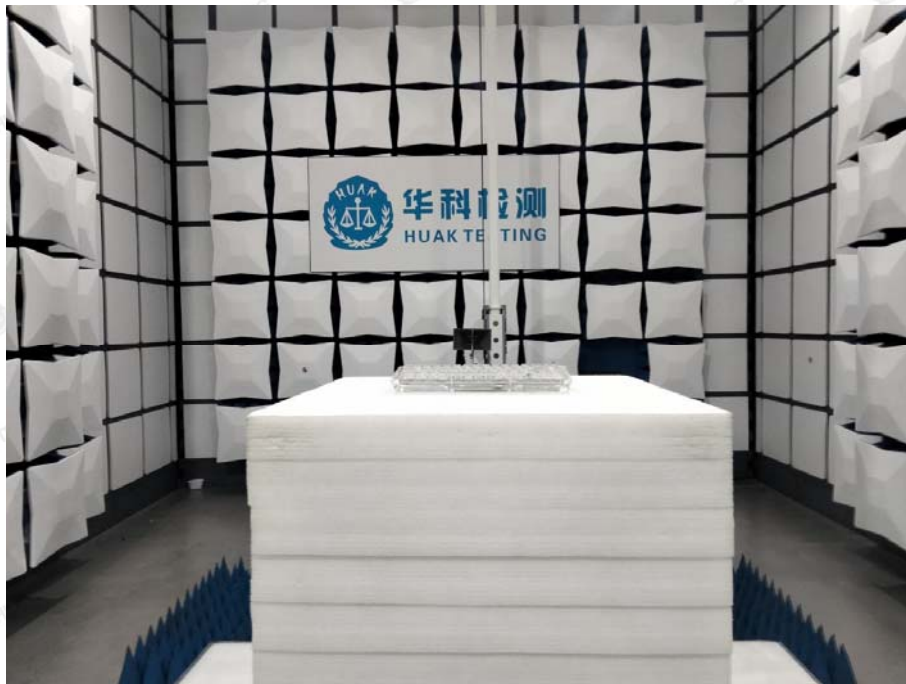
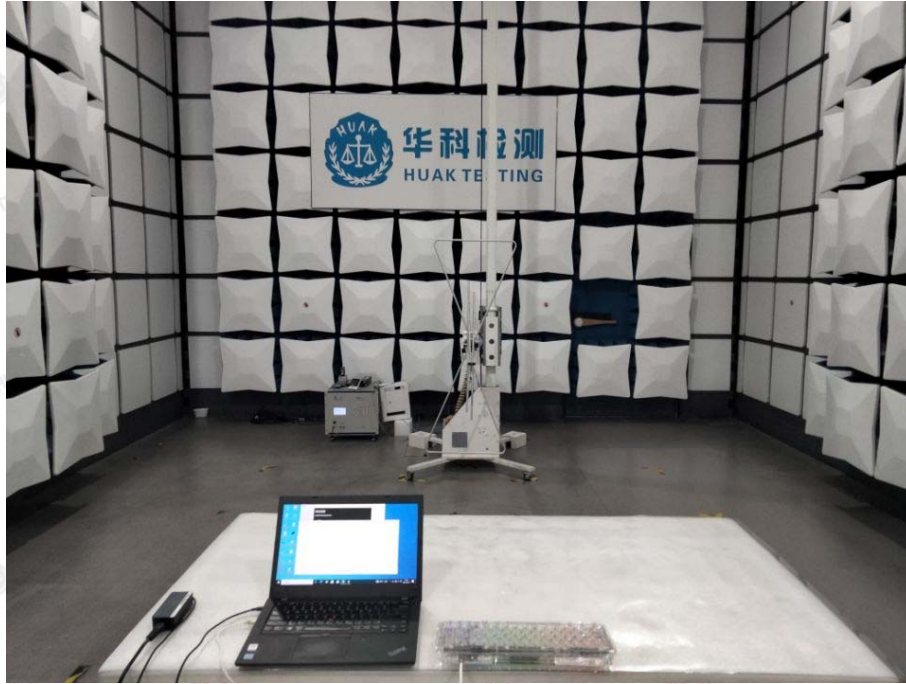
ANTENNA





8 PHOTOGRAPH OF TEST

8.1 Radiated Emission



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8.2 Conducted 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-----

