

## TEST REPORT

**Applicant:** RADIOSHACK WORLDWIDE CORP.

**Address:** Building AFRA, Ave. Samuel Lewis and street 54, Panama City,  
Panama 5, Republic of Panama

**Product Name:** Wireless keyboard

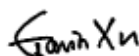
**FCC ID:** 2BDUR-2604811K

**Standard(s):** 47 CFR Part 15, Subpart C(15.249)  
ANSI C63.10-2013

**Report Number:** DG1231220-77067E-RF-00

**Report Date:** 2024/3/1

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).



**Reviewed By:** Gavin Xu

Title: RF Engineer



**Approved By:** Ivan Cao

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	DG1231220-77067E-RF-00	Original Report	2024/3/1

## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

<b>EUT Name:</b>	Wireless keyboard
<b>EUT Model:</b>	2604811
<b>Operation Frequency:</b>	2402-2480 MHz
<b>Modulation Type:</b>	GFSK
<b>Rated Input Voltage:</b>	DC 1.5V from battery
<b>Serial Number:</b>	2FK0-1
<b>EUT Received Date:</b>	2023/12/20
<b>EUT Received Status:</b>	Good

### 1.2 Accessory Information

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

### 1.3 Antenna Information Detail▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Shenzh Boychuang Technology Co.,LTD	PCB	50	2.4~2.5GHz	-0.43 dBi
<b>The design of compliance with §15.203:</b>				
<input checked="" type="checkbox"/> Unit uses a permanently attached antenna.				
<input type="checkbox"/> Unit uses a unique coupling to the intentional radiator.				
<input type="checkbox"/> Unit was professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.				

### 1.4 Equipment Modifications

No modifications are made to the EUT during all test items.

## 2. DESCRIPTION OF TEST CONFIGURATION

### 2.1 Operation Frequency Detail

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	<b>2402</b>	21	2442
2	2404	22	2444
...	...	...	...
19	2438	39	2478
20	<b>2440</b>	40	<b>2480</b>

### 2.2 EUT Operation Condition

The system was configured for testing in Engineering Mode, which was provided by the manufacturer. The test modes and channel can be switched by keys in this Engineering Mode sample. The following summary table is showing all test modes to demonstrate in compliance with the standard:

Test Items	Test Modes
<b>Radiated Emission</b>	Mode 1: Transmitting
<b>AC Line Conducted Emission</b>	Not Applicable, the device was powered by battery.
Note: Mode 1 was tested with the frequencies in bold in section 2.1.	

### 2.3 EUT Exercise Software

No.

### 2.4 Support Equipment List and Details

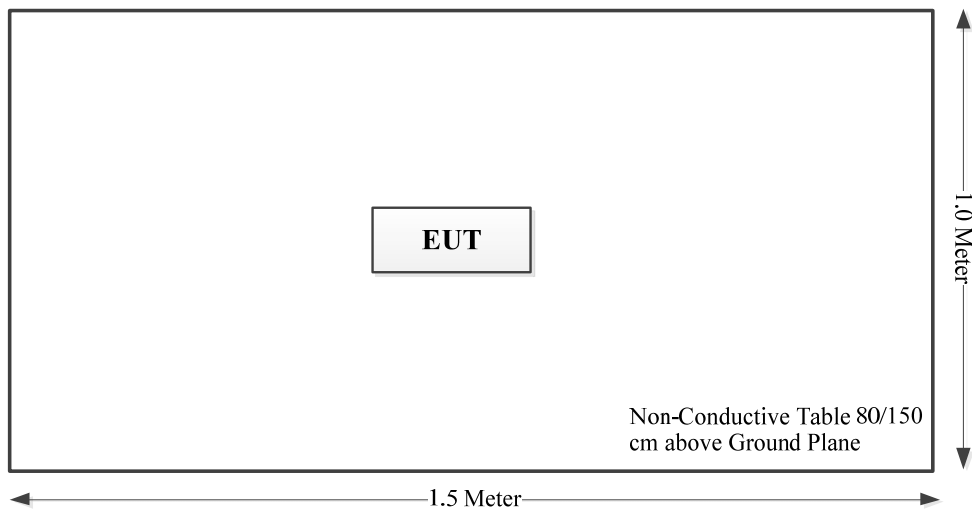
Manufacturer	Description	Model	Serial Number
/	/	/	/

### 2.5 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

## 2.6 Block Diagram of Test Setup

Radiated Spurious Emissions:



## 2.7 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 829273, the FCC Designation No. : CN5044.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

## 2.8 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
Unwanted Emissions, radiated	9kHz~30MHz: 3.3dB, 30MHz~200MHz: 4.55 dB, 200MHz~1GHz: 5.92 dB, 1GHz~6GHz: 4.98 dB, 6GHz~18GHz: 5.89 dB, 18GHz~26.5GHz: 5.47 dB, 26.5GHz~40GHz: 5.63 dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 0.4\%$
AC Power Lines Conducted Emission	3.11 dB (150 kHz to 30 MHz)



### 3. SUMMARY OF TEST RESULTS

Standard(s)/Rule(s)	Description of Test	Result
§ 15.203	Antenna Requirement	Compliant
§ 15.207(a)	Conduction Emissions	Not Applicable
15.205, § 15.209, § 15.249	Radiated Emissions	Compliant
§ 15.215 (c)	20 dB Bandwidth	Compliant

## 4. REQUIREMENTS AND TEST PROCEDURES

### 4.1 AC Line Conducted Emissions

#### 4.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

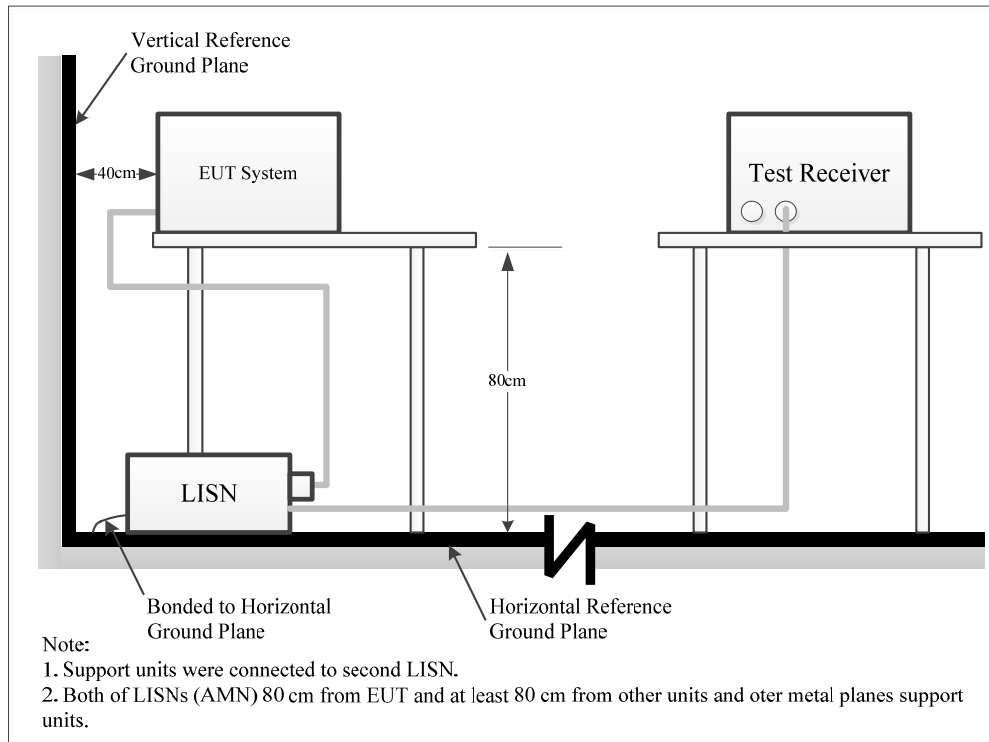
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000  $\mu$ V within the frequency band 535-1705 kHz, as measured using a 50  $\mu$ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

#### 4.1.2 EUT Setup



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The Adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

#### 4.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

#### 4.1.4 Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase (“hot”) line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

#### 4.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = attenuation caused by cable loss + voltage division factor of AMN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

#### 4.1.6 Test Result

Please refer to section 5.1.

## 4.2 Radiated Emissions

### 4.2.1 Applicable Standard

As per FCC§15.249 (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:

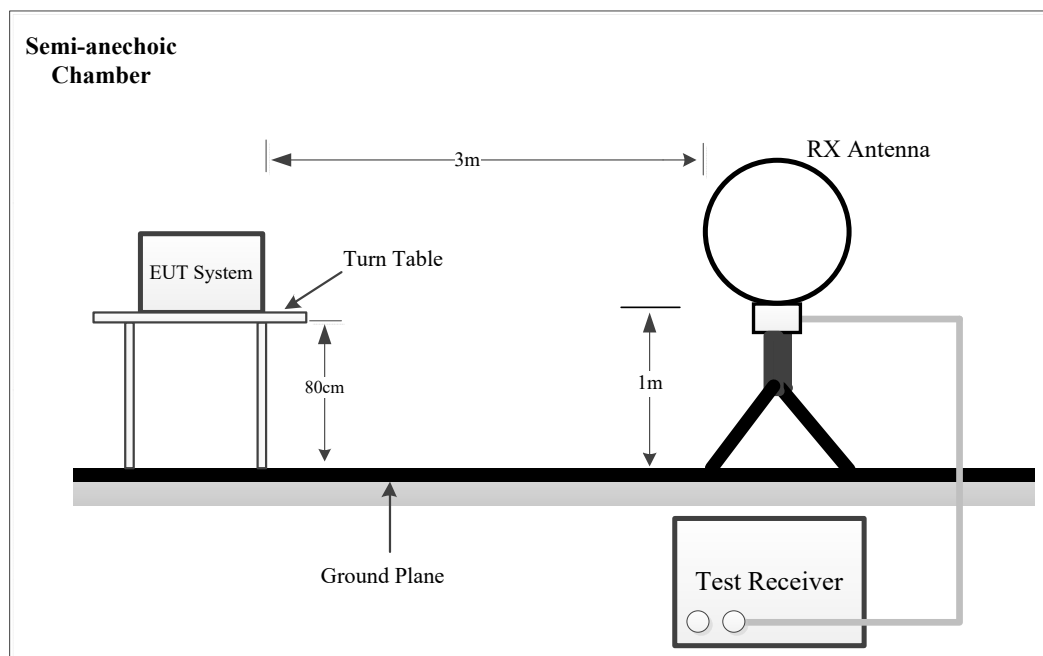
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

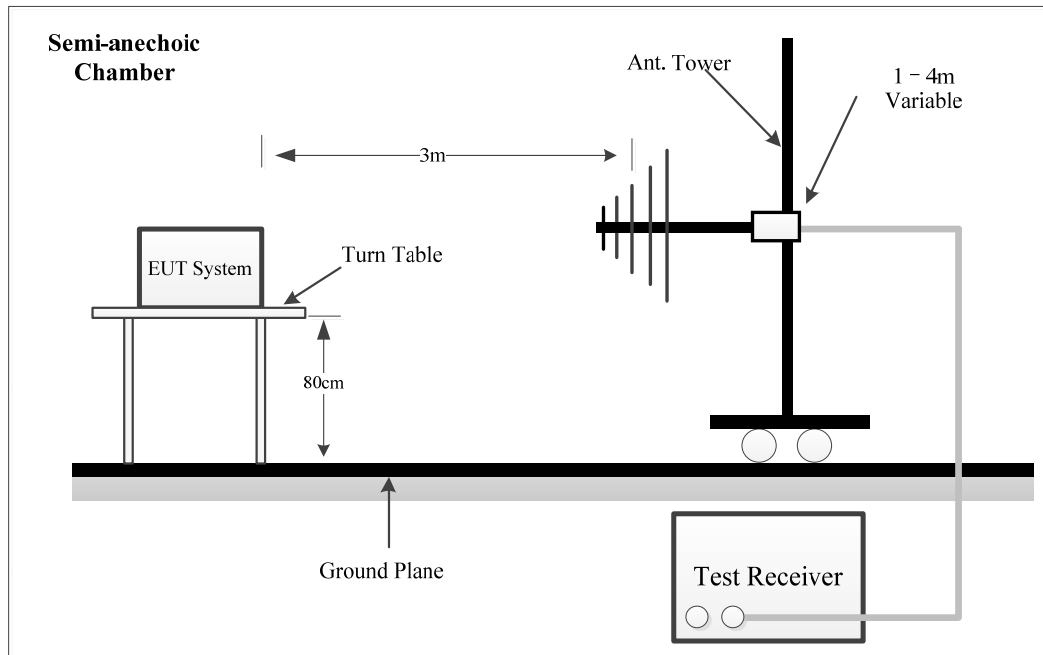
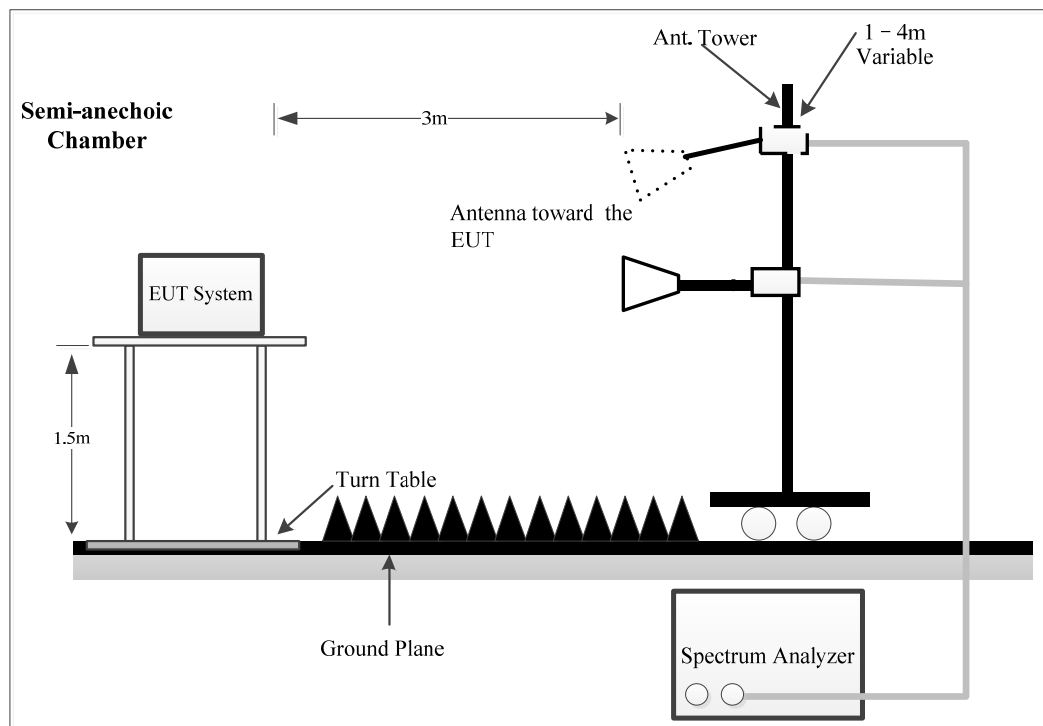
As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(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.

### 4.2.2 EUT Setup

9kHz~30MHz:



**Below 1GHz:****Above 1GHz:**

The radiated emissions were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

For 9kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

#### 4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

9kHz-1000MHz:

Frequency Range	Measurement	RBW	Video B/W	IF B/W
9 kHz – 150 kHz	QP/AV	200 Hz	1 kHz	200 Hz
150 kHz – 30 MHz	QP/AV	9 kHz	30 kHz	9 kHz
30 MHz – 1000 MHz	PK	100 kHz	300 kHz	/
	QP	/	/	120 kHz
Above 1 GHz	PK	1MHz	3 MHz	/
	AV	1MHz	10 Hz	/

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

#### 4.2.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz -1 GHz, except 9-90 kHz, 110-490 kHz, employing an average detector, peak and Average detection modes for frequencies above 1 GHz.

#### 4.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

#### 4.2.6 Test Result

Please refer to section 5.2.

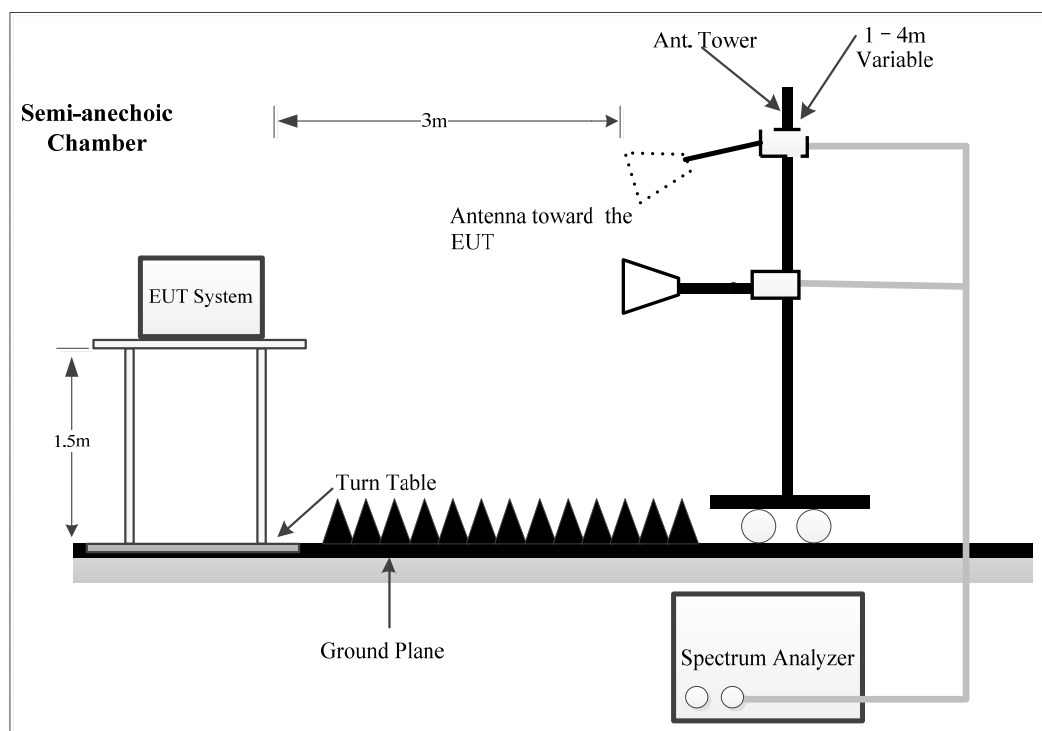
### 4.3 20 dB Emission Bandwidth

#### 4.3.1 Applicable Standard

FCC §15.215

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

#### 4.3.2 EUT Setup



#### 4.3.3 Test Procedure

According to ANSI C63.10-2013 Section 6.9.2

- The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, unless otherwise specified by the applicable requirement.
- Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.



#### **4.3.4 Test Result**

Please refer to section 5.3.

## 4.4 Antenna Requirement

### 4.4.1 Applicable Standard

FCC §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 4.4.2 Judgment

**Compliant.** Please refer to the Antenna Information detail in Section 1.3.

## 5. Test DATA AND RESULTS

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### 5.1 AC Line Conducted Emissions

**Not Applicable.** The device was powered by battery.

**5.2 Radiation Spurious Emissions**

Serial Number:	2FK0-1	Test Date:	Below 1GHz: 2024/1/11 Above 1GHz: 2024/1/23~2024/2/2
Test Site:	Chamber A	Test Mode:	Transmitting
Tester:	Joe Li, Leo Xiao	Test Result:	Pass

**Environmental Conditions:**

Temperature: (°C)	18.5~23	Relative Humidity: (%)	35~46	ATM Pressure: (kPa)	101.3~101.5
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**Test Equipment List and Details:**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
9kHz~1000MHz					
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/21	2024/10/20
Sunol Sciences	Hybrid Antenna	JB3	A060611-3	2021/1/12	2024/1/11
Wilson	Attenuator	859936	F-08-EM014	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2023/7/1	2024/6/30
Sonoma	Amplifier	310N	372193	2023/7/1	2024/6/30
R&S	EMI Test Receiver	ESR3	102453	2023/8/18	2024/8/17
Audix	Test Software	E3	191218 (V9)	N/A	N/A
Above 1GHz					
AH	Horn Antenna	SAS-571	1394	2023/2/22	2024/2/21
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26EA	2023/9/6	2024/9/5
AH	Preamplifier	PAM-0118P	530	2023/9/1	2024/8/31
AH	Preamplifier	PAM-1840VH	191	2023/9/7	2024/9/6
R&S	Spectrum Analyzer	FSP 38	100478	2023/10/18	2024/10/17
E-Microwave	Band Rejection Filter	OBSF-2400-2483.5-S	OE01601525	2023/6/16	2024/6/15
Mini Circuits	High Pass Filter	VHF-6010+	OE48747	2023/6/16	2024/6/15
Audix	Test Software	E3	191218 (V9)	N/A	N/A

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Data:**

Please refer to the below table and plots.

After pre-scan in the X, Y and Z axes of orientation, the worst case is below:

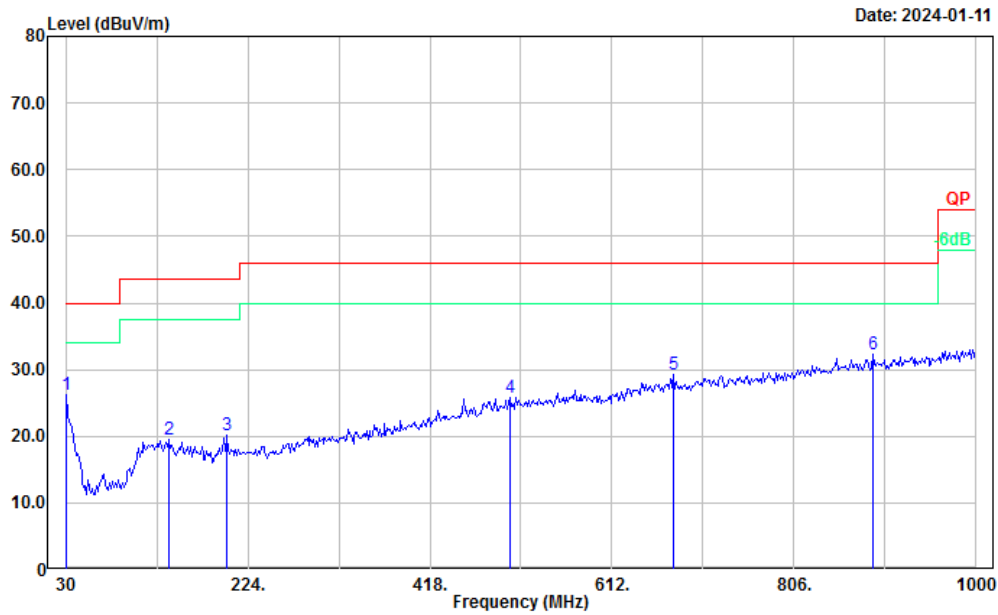
**1) 9kHz~30MHz**

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

2) 30MHz-1GHz (maximum output power Channel(Middle Channel) was tested)

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_middle channel

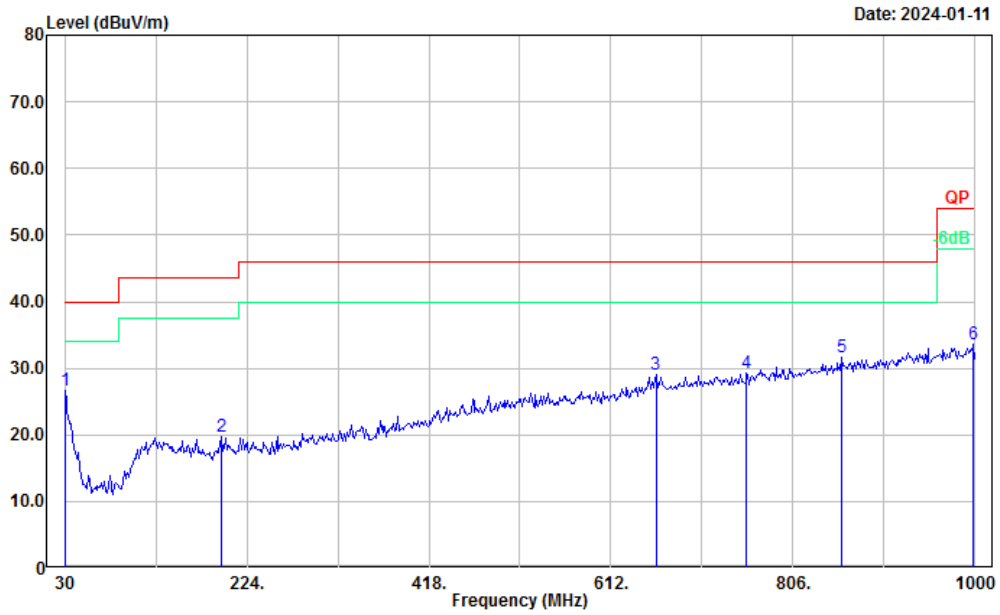
Serial No.: 2FK0-1  
Tester: Joe Li



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.000	29.234	-2.990	26.244	40.000	13.756	Peak
2	139.652	29.666	-10.171	19.495	43.500	24.005	Peak
3	201.507	30.845	-10.763	20.082	43.500	23.418	Peak
4	503.754	29.382	-3.580	25.802	46.000	20.198	Peak
5	678.072	29.917	-0.649	29.268	46.000	16.732	Peak
6	890.348	29.290	3.046	32.336	46.000	13.664	Peak

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_middle channel

Serial No.: 2FK0-1  
Tester: Joe Li



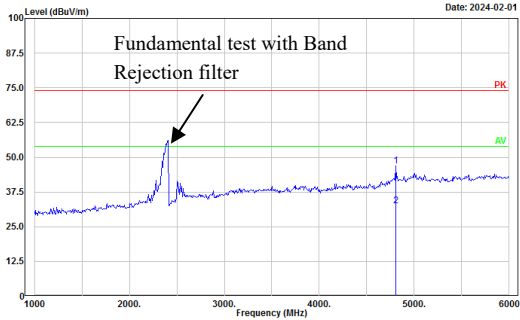
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.000	29.577	-2.990	26.587	40.000	13.413	Peak
2	197.290	30.632	-10.961	19.671	43.500	23.829	Peak
3	659.797	29.940	-0.918	29.022	46.000	16.978	Peak
4	756.797	28.738	0.507	29.245	46.000	16.755	Peak
5	858.015	29.127	2.450	31.577	46.000	14.423	Peak
6	998.594	28.578	5.071	33.649	54.000	20.351	Peak

## 3) 1-18GHz:

## Low Channel, Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_low channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

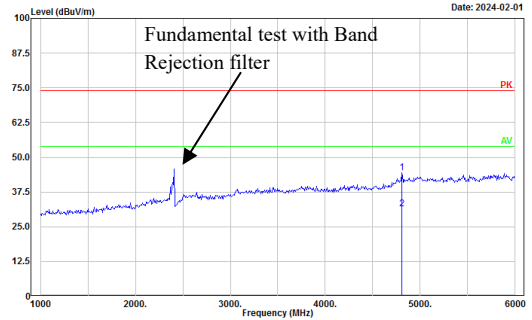


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4804.000	55.515	-8.595	46.920	74.000	27.080	Peak
2	4804.000	41.180	-8.595	32.585	54.000	21.415	Average

## Low Channel, Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_low channel

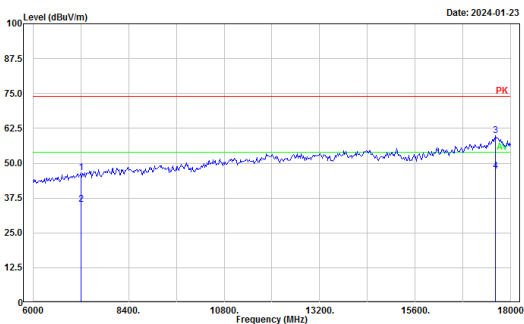
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4804.000	52.915	-8.595	44.320	74.000	29.680	Peak
2	4804.000	40.110	-8.595	31.515	54.000	22.485	Average

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_low channel

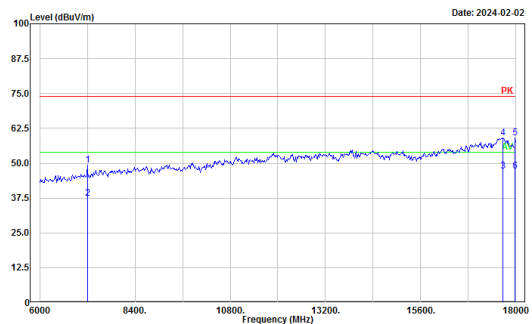
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7206.000	51.610	-5.063	46.547	74.000	27.453	Peak
2	7206.000	40.191	-5.063	35.128	54.000	18.872	Average
3	17617.390	52.760	7.136	59.896	74.000	14.104	Peak
4	17617.390	40.060	7.136	47.196	54.000	6.804	Average

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_low channel

Serial No.: 2FK0-1  
Tester: Leo Xiao



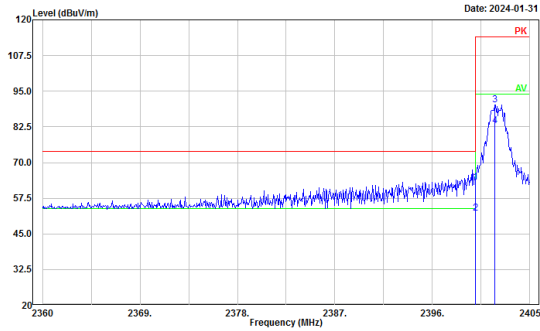
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7206.000	54.343	-5.063	49.280	74.000	24.720	Peak
2	7206.000	42.343	-5.063	37.280	54.000	16.720	Average
3	17669.560	39.741	7.302	47.043	54.000	6.957	Average
4	17669.560	51.764	7.302	59.066	74.000	14.934	Peak
5	17982.610	50.499	8.581	59.080	74.000	14.920	Peak
6	17982.610	38.539	8.581	47.120	54.000	6.880	Average



Low Channel, Fundamental And Bandedge,  
Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_low channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

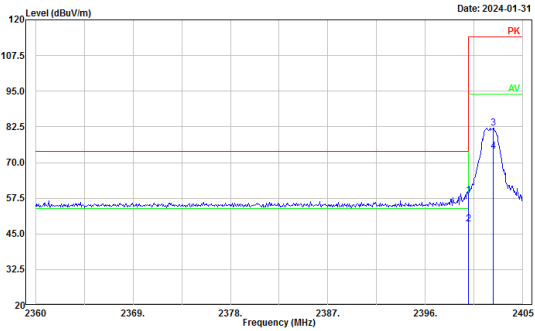


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2400.000	31.916	31.070	62.986	74.000	11.014	Peak
2	2400.000	21.270	31.070	52.340	54.000	1.660	Average
3	2401.739	59.189	31.081	90.270	114.000	23.730	Peak
4	2401.739	51.799	31.081	82.880	94.000	11.120	Average

Low Channel, Fundamental And Bandedge,  
Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_low channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

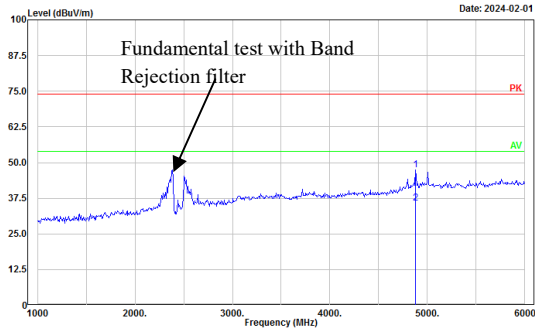


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2400.000	27.365	31.070	58.435	74.000	15.565	Peak
2	2400.000	17.330	31.070	48.400	54.000	5.600	Average
3	2402.261	50.940	31.085	82.025	114.000	31.975	Peak
4	2402.261	42.779	31.085	73.864	94.000	20.136	Average

## Middle Channel, Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_middle channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

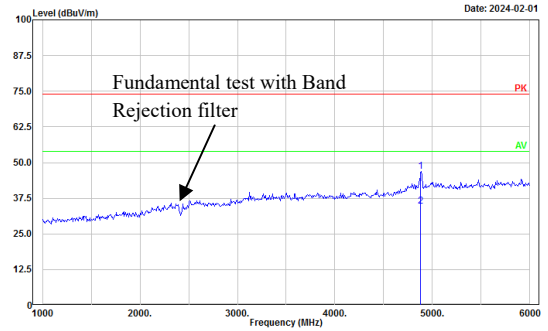


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4880.000	56.118	-8.648	47.470	74.000	26.530	Peak
2	4880.000	44.370	-8.648	35.722	54.000	18.278	Average

## Middle Channel, Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_middle channel

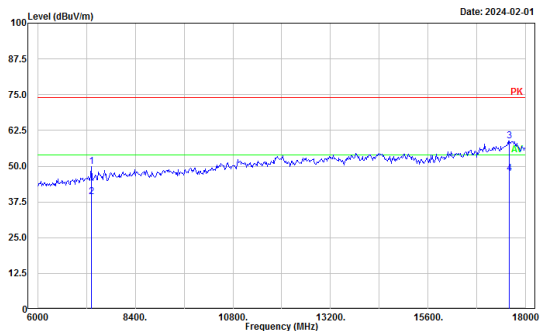
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4880.000	55.491	-8.648	46.843	74.000	27.157	Peak
2	4880.000	43.273	-8.648	34.625	54.000	19.375	Average

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_middle channel

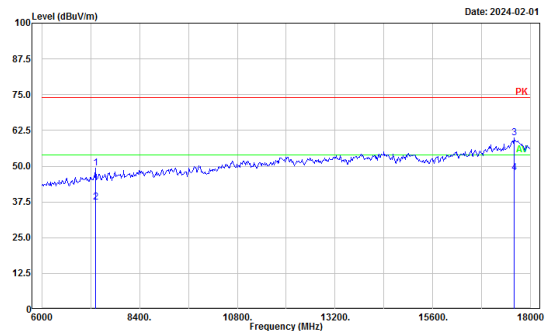
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7320.000	54.824	-4.836	49.988	74.000	24.012	Peak
2	7320.000	44.104	-4.836	39.268	54.000	14.732	Average
3	17600.000	51.815	7.080	58.895	74.000	15.105	Peak
4	17600.000	40.410	7.080	47.490	54.000	6.510	Average

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_middle channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

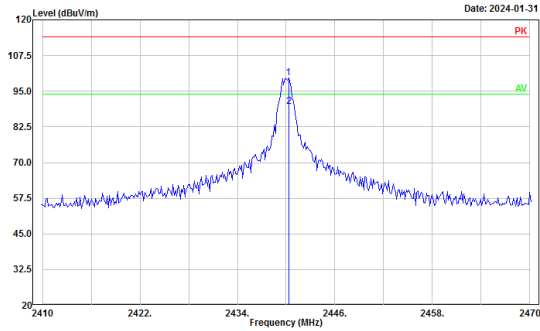


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7320.000	54.192	-4.836	49.356	74.000	24.644	Peak
2	7320.000	42.184	-4.836	37.348	54.000	16.652	Average
3	17600.000	52.807	7.080	59.887	74.000	14.113	Peak
4	17600.000	40.600	7.080	47.680	54.000	6.320	Average

Middle Channel, Fundamental, Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_middle channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

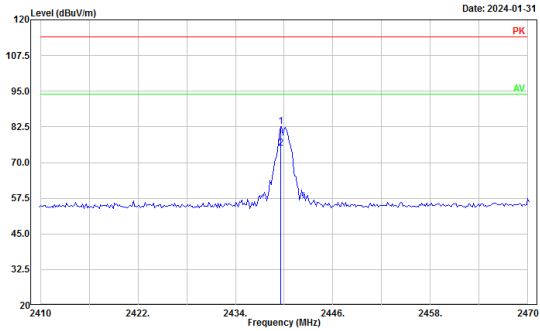


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2440.290	68.481	31.328	99.809	114.000	14.191	Peak
2	2440.290	58.230	31.328	89.558	94.000	4.442	Average

Middle Channel, Fundamental, Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_middle channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

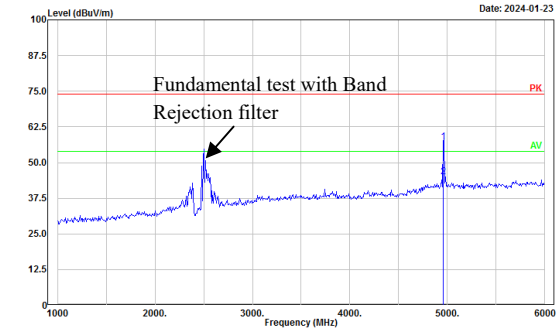


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2439.565	51.404	31.323	82.727	114.000	31.273	Peak
2	2439.565	43.670	31.323	74.993	94.000	19.007	Average

## High Channel, Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_high channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

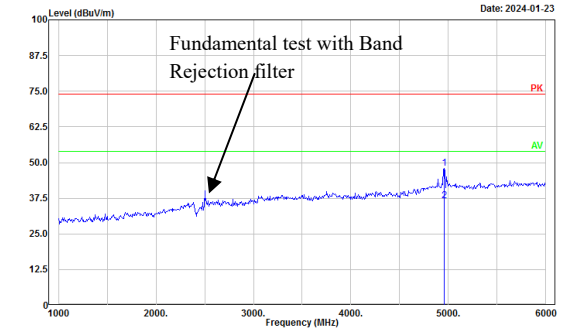


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4960.000	65.467	-8.258	57.209	74.000	16.791	Peak
2	4960.000	53.310	-8.258	45.052	54.000	8.948	Average

## High Channel, Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_high channel

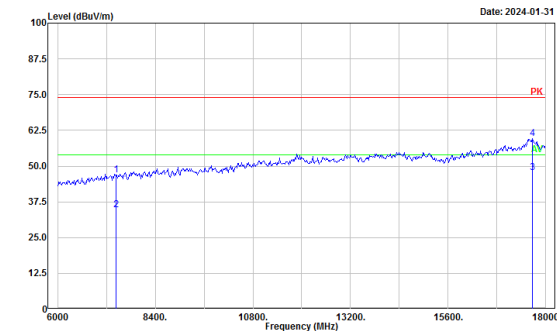
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4960.000	56.178	-8.258	47.920	74.000	26.080	Peak
2	4960.000	44.870	-8.258	36.612	54.000	17.388	Average

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_high channel

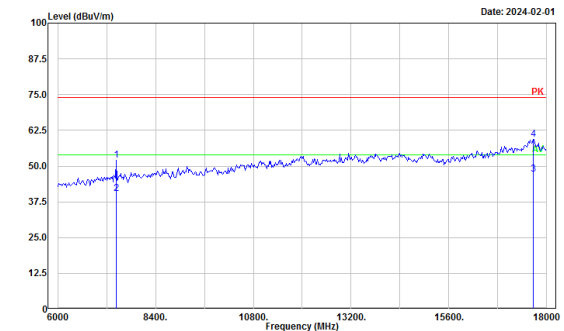
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7440.000	51.382	-4.612	46.770	74.000	27.230	Peak
2	7440.000	39.330	-4.612	34.718	54.000	19.282	Average
3	17669.500	40.391	7.302	47.693	54.000	6.307	Average
4	17669.500	52.284	7.302	59.586	74.000	14.414	Peak

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_high channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

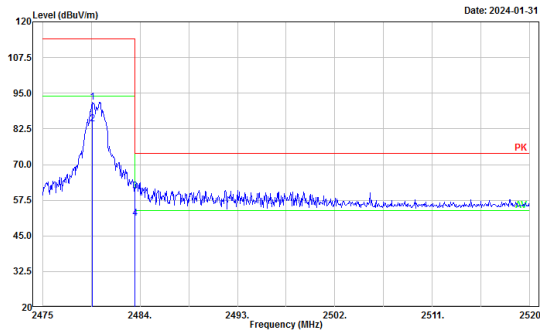


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	7440.000	56.660	-4.612	52.048	74.000	21.952	Peak
2	7440.000	44.951	-4.612	40.339	54.000	13.661	Average
3	17669.500	39.851	7.302	47.153	54.000	6.847	Average
4	17669.500	52.159	7.302	59.461	74.000	14.539	Peak

High Channel, Fundamental And Bandedge,  
Horizontal

Project No.: DG1231220-77067E -RF  
Polarization: Horizontal  
Test Mode: Transmitting  
Note: TX mode\_high channel

Serial No.: 2FK0-1  
Tester: Leo Xiao

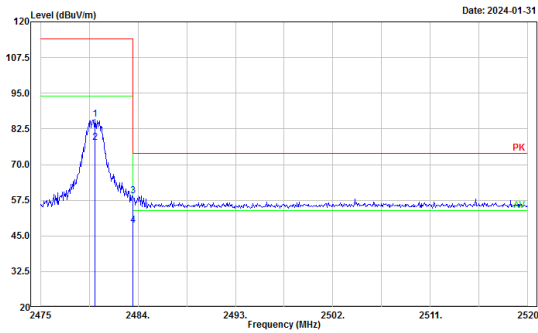


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2479.630	60.326	31.544	91.870	114.000	22.130	Peak
2	2479.630	52.760	31.544	84.304	94.000	9.696	Average
3	2483.500	29.105	31.564	60.669	74.000	13.331	Peak
4	2483.500	19.550	31.564	51.114	54.000	2.886	Average

High Channel, Fundamental And Bandedge, Vertical

Project No.: DG1231220-77067E -RF  
Polarization: Vertical  
Test Mode: Transmitting  
Note: TX mode\_high channel

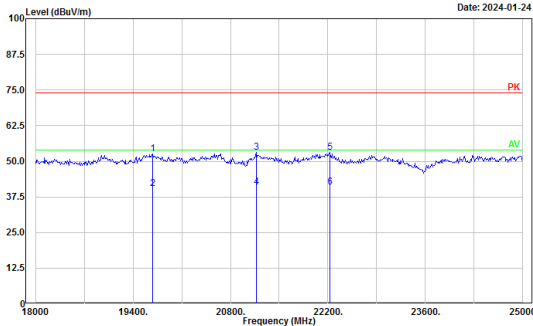
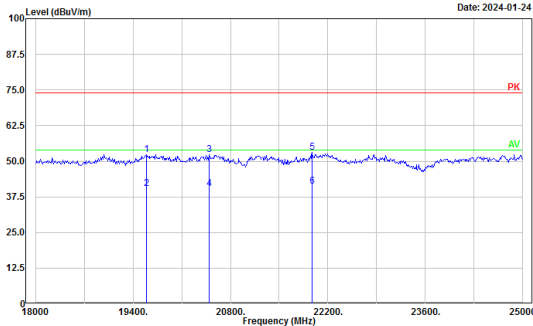
Serial No.: 2FK0-1  
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2480.022	54.247	31.546	85.793	114.000	28.207	Peak
2	2480.022	46.210	31.546	77.756	94.000	16.244	Average
3	2483.500	27.352	31.564	58.916	74.000	15.084	Peak
4	2483.500	17.180	31.564	48.744	54.000	5.256	Average

18-25GHz:

No Emission was detected in the range 18-25GHz, test was performed on channel which with the maximum power.

Horizontal				Vertical			
Project No.: DG1231220-77067E -RF Polarization: Horizontal Test Mode: Transmitting Note: TX mode_middle channel				Project No.: DG1231220-77067E -RF Polarization: Vertical Test Mode: Transmitting Note: TX mode_middle channel			
Serial No.: 2FK0-1 Tester: Leo Xiao				Serial No.: 2FK0-1 Tester: Leo Xiao			
							
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	19684.060	46.690	5.990	52.680	74.000	21.320	Peak
2	19684.060	34.470	5.990	40.460	54.000	13.540	Average
3	21175.360	45.775	7.345	53.120	74.000	20.880	Peak
4	21175.360	33.515	7.345	40.860	54.000	13.140	Average
5	22230.440	44.641	8.349	52.990	74.000	21.010	Peak
6	22230.440	32.631	8.349	40.980	54.000	13.020	Average

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	19592.750	46.127	6.153	52.280	74.000	21.720	Peak
2	19592.750	34.237	6.153	40.390	54.000	13.610	Average
3	20495.650	46.079	6.311	52.390	74.000	21.610	Peak
4	20495.650	34.159	6.311	40.470	54.000	13.530	Average
5	21976.810	45.602	7.518	53.120	74.000	20.880	Peak
6	21976.810	33.572	7.518	41.090	54.000	12.910	Average

5.3 20 dB Emission Bandwidth:

Serial No.:	2FK0-1	Test Date:	2024/2/29
Test Site:	Chamber A	Test Mode:	Transmitting
Tester:	Alan Xie	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	21.8	Relative Humidity: (%)	52	ATM Pressure: (kPa)	101.1
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Test Equipment List and Details:

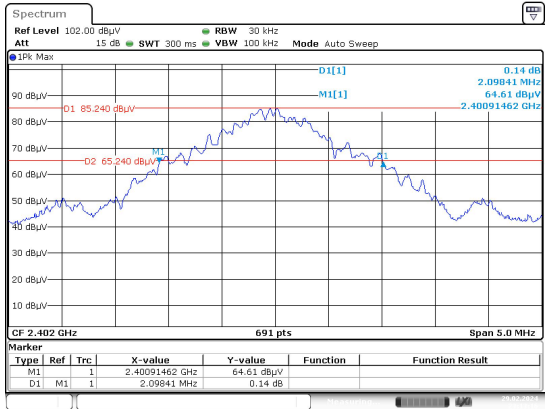
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	000 527 35	2023/9/7	2024/9/6
HUBER+SUHNER	Coaxial Cable	SUCOFLEX 126EA	MY369/26/26EA	2023/9/6	2024/9/5
AH	Preamplifier	PAM-0118P	530	2023/9/1	2024/8/31
R&S	Spectrum Analyzer	FSV40	101944	2023/10/18	2024/10/17

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

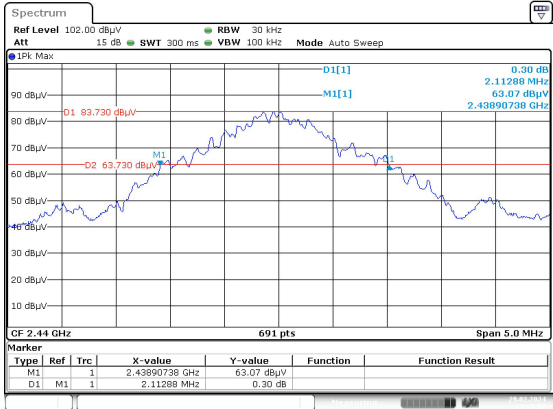
Test Channel	Value (MHz)	F <sub>L</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> (MHz)	F <sub>H</sub> Limit (MHz)
Low	2.09841	2400.91462	2400	2403.01303	2483.5
Mid	2.11288	2438.90738	2400	2441.02026	2483.5
High	2.11288	2478.90015	2400	2481.01303	2483.5

Low



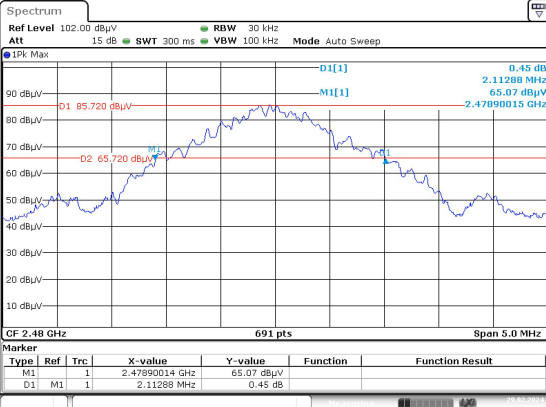
ProjectNo.:DG1231220-77067E -RF Tester:Alan Xie  
Date: 29.FEB.2024 23:13:16

Mid



ProjectNo.:DG1231220-77067E -RF Tester:Alan Xie  
Date: 29.FEB.2024 22:27:07

High



ProjectNo.:DG1231220-77067E -RF Tester:Alan Xie  
Date: 29.FEB.2024 23:07:24



## **APPENDIX A - EUT PHOTOGRAPHS**

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Please refer to the attachment DG1231220-77067E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and DG1231220-77067E-RF-INP EUT INTERNAL PHOTOGRAPHS

## **APPENDIX B - TEST SETUP PHOTOGRAPHS**

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Please refer to the attachment DG1231220-77067E-RF-00-TSP TEST SETUP PHOTOGRAPHS.

## APPENDIX C - RF EXPOSURE EVALUATION

### Applicable Standard

According to §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v06:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

### Measurement Result

The max conducted power including tune-up tolerance is 6.0 dBm (3.98 mW).

$[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$   
 $= 3.98/5 \cdot (\sqrt{2.480}) = 1.3 < 3.0$

Note:

1. This device maximum E-Field level is 99.809 dB $\mu$ V/m at 3m, so the EIRP power is 4.609 dBm,

Antenna Gain is -0.43 dBi

Maximum Conduct Power is 5.039 dBm

EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2 (dB),

Maximum Conduct Power (dBm)= EIRP(dBm)- Antenna Gain(dBi)

Maximum Power declared by manufacturer.

**Result: Compliant. The stand-alone SAR evaluation is not necessary.**

**===== END OF REPORT =====**