



# FCC PART 15.247 TEST REPORT

For

## Xiamen Jing Xin Science and Technology Co., Ltd

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Xiamen, China

**FCC ID: 2BB6HBR2551E**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Bluetooth Dual Mode SOC module
<b>Report Number:</b>	<u>2407V34489E-RF-02</u>
<b>Report Date:</b>	<u>2024-11-14</u>
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## **REPORT REVISION HISTORY**

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Number of Revisions	Report No.	Version	Issue Date	Description
0	2407V34489E-RF-02	R1V1	2024-11-14	Initial Release

## GENERAL INFORMATION

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

Product Name:	Bluetooth Dual Mode SOC module
Tested Model:	BR2551E
Power Supply:	DC 3.3V
Maximum Conducted Output Peak Power:	-2.68dBm
Frequency Range:	BLE: 2402~2480MHz
Modulation Technique:	BLE: GFSK
Antenna Type:	Ceramic chip Antenna
★Maximum Antenna Gain:	1.36 dBi
EUT Received Status:	Good
<i>Note:</i> 1. The Maximum Antenna Gain was declared by manufacturer. 2. All measurement and test data in this report was gathered from production sample serial number: 2OLT-2 (Assigned by the BACL (Xiamen). The EUT supplied by the applicant was received on 2024-07-17)	

### Objective

This report is prepared on behalf of *Xiamen Jing Xin Science and Technology Co., Ltd* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Xiamen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone Xiamen.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN1384.

**Measurement Uncertainty**

Item		$U_{lab}$
Conducted Emission	150kHz-30MHz	2.33 dB
Radiated Emission	9kHz-30MHz	2.59 dB
	30MHz~200MHz	4.38dB
	200MHz~1GHz	4.50dB
	1GHz~6GHz	4.58dB
	6GHz~18GHz	5.43dB
	18GHz~26.5GHz	5.47dB
Occupied Channel Bandwidth		0.053kHz
Transmitter Conducted Power(Conducted RF power)		0.624 dB
Conducted Spurious Emission		2.52 dB
Power Spectral Density		0.61dB
Duty Cycle		1%
Temperature		1°C
Humidity		5%
Supply voltages		0.4%

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

## SYSTEM TEST CONFIGURATION

### Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Test mode 1: Transmitting
Test voltage:	Test mode 1: DC 3.3V
Remark:	During all emission tests, the EUT was configured to measure its highest possible emission level and the worst case's test data was presented in this test report.

### Description of Test Configuration

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

### Equipment Modifications

No modification was made to the EUT tested.

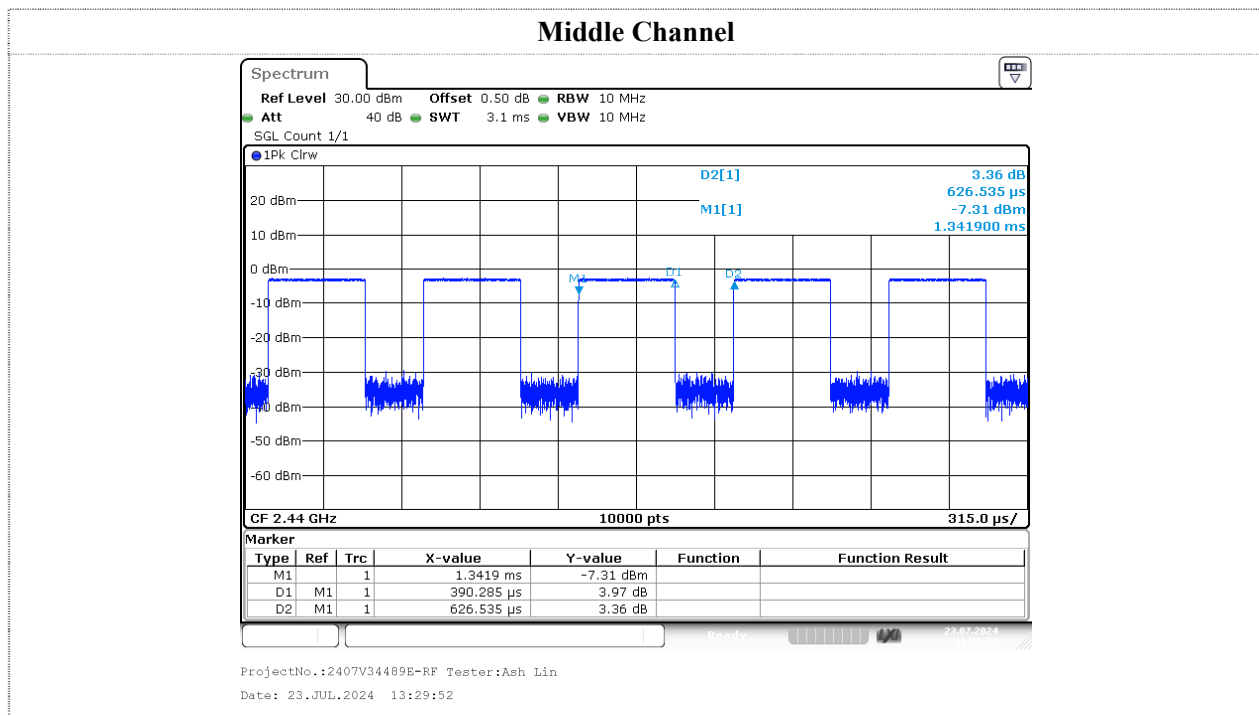
**EUT Exercise Software**

RF Test Tool: BR BlueletSuite

Mode	Power level		
	Low channel	Middle channel	High channel
BLE	Default	Default	Default

**Duty cycle**

Mode	Test Frequency (MHz)	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/T (Hz)	VBW Setting (kHz)
BLE	2440	0.39	0.627	62.20	2564	3



**Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
Thinkpad	DESKTOP-945K19U	TA80	B6B1ABD0-4BE1-431B-9C95-C4F23F04BBA4
Adapter	Adapter	ADLX45YDC3D	SA10R16864
Telink	Debug board	EVK	EVK01

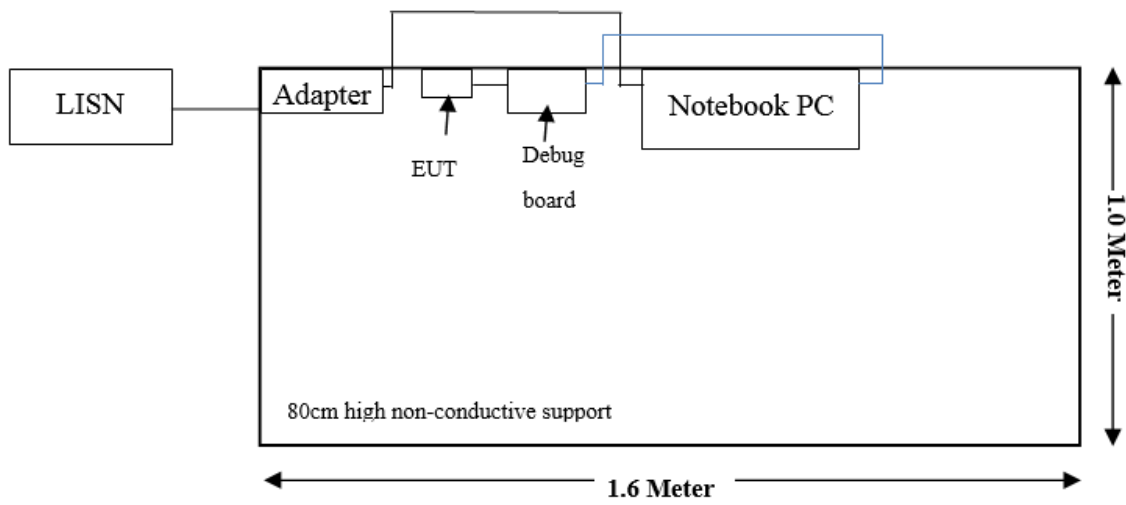


**External I/O Cable**

Cable Description	Length (m)	From Port	To
USB cable (CE)	0.5	Notebook PC	Debug board
USB extension cable (RE)	8m	Debug board	Notebook PC
Dupont Line	0.2	Debug board	EUT

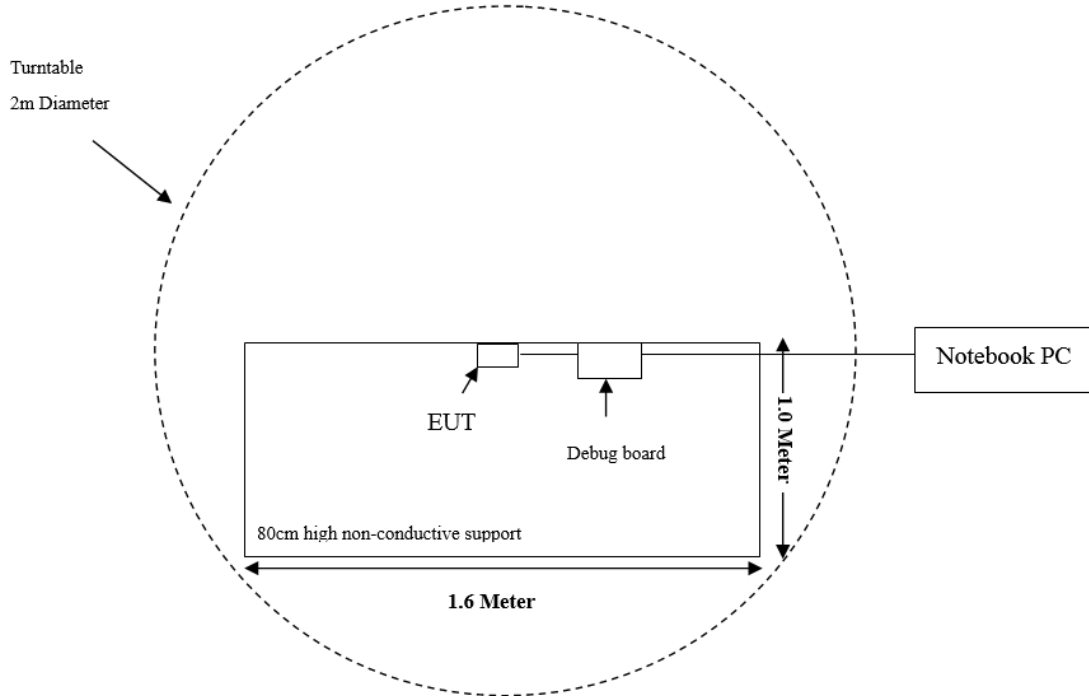
**Block Diagram of Test Setup**

Conducted Emission:

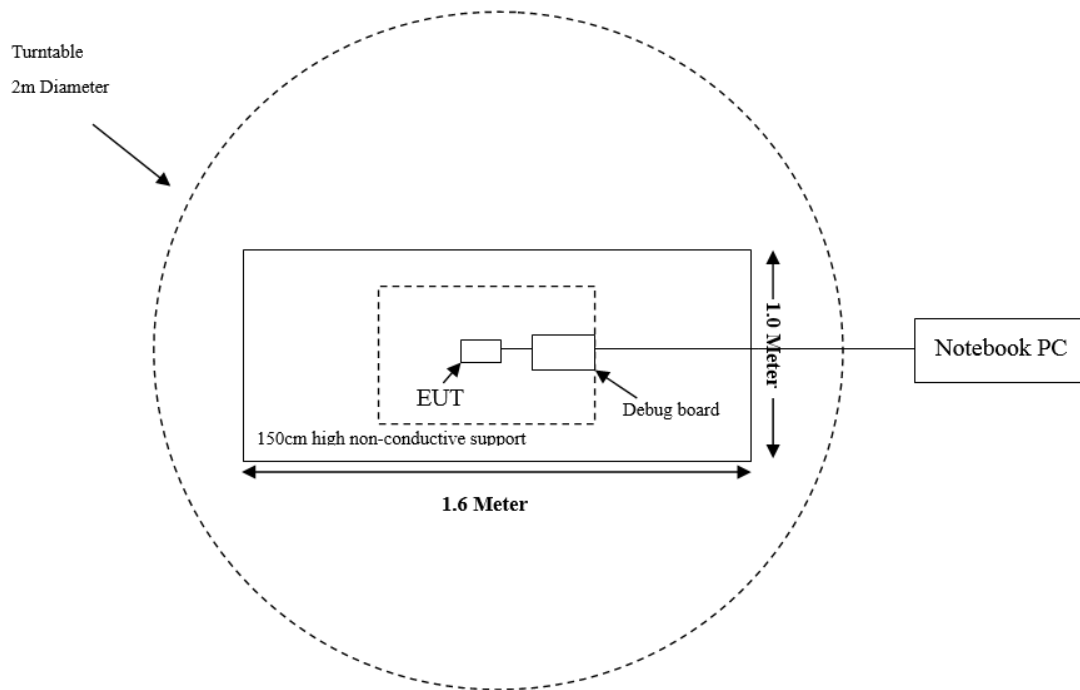


Radiated Emission:

Below 1GHz



Above 1GHz



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

**TEST EQUIPMENT LIST**

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Conducted Emissions</b>					
EMI Test Receiver	Rohde & Schwarz	ESR	103105	2024/03/29	2025/03/28
LISN	Rohde & Schwarz	ENV216	100129	2024/03/29	2025/03/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
<b>Radiated Emissions Below 1GHz</b>					
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2024/03/29	2025/03/28
Loop Antenna	Rohde & Schwarz	HFH2-Z2	830749/001	2023/07/27	2026/07/26
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26
Amplifier	Sonoma	310B	120903	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	HFH2-CC	335.3609	2023/09/20	2026/09/19
Test Software	Audix	E3	18621a	N/A	N/A
<b>Radiated Emissions Above 1 GHz</b>					
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102051	2024/03/29	2025/03/28
Filter Switch Unit	Decentest	DT7220FSU	DS79904	2024/02/23	2025/02/22
Multiplex Switch Test Control Set	Decentest	DT7220SCU	DS79901	2024/02/23	2025/02/22
Double Ridge Guide Horn Antenna	A.H.Systems	SAS-571	1980	2023/07/28	2026/07/27
Preamplifier	A.H.Systems	PAM-0118P	489	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2024/03/29	2025/03/28
Horn Antenna	EMCO	3116	9407-2232	2023/07/31	2026/07/30
Preamplifier	A.H.Systems	PAM-1840	200	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-3M	CC008	2024/03/29	2025/03/28
Coaxial Cable	XINHANGWEIBO	XH360A-2.92-1M	CC009	2024/03/29	2025/03/28
Test Software	Audix	E3	18621a	N/A	N/A
<b>RF Conducted Test</b>					
Spectrum Analyzer	Rohde & Schwarz	FSU	100405	2024/03/29	2025/03/28
Coaxial Cable	N/A	N/A	N/A	2024/03/29	2025/03/28
Power Sensor	HP	8481A	PS20240325	2024/03/29	2025/03/28

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

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## **FCC §15.203 - ANTENNA REQUIREMENT**

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### **Applicable Standard**

According to § 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.
- c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **Antenna Connector Construction**

The EUT has one Ceramic chip antenna arrangement for Bluetooth, which was permanently attached and the antenna gain is 1.36 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

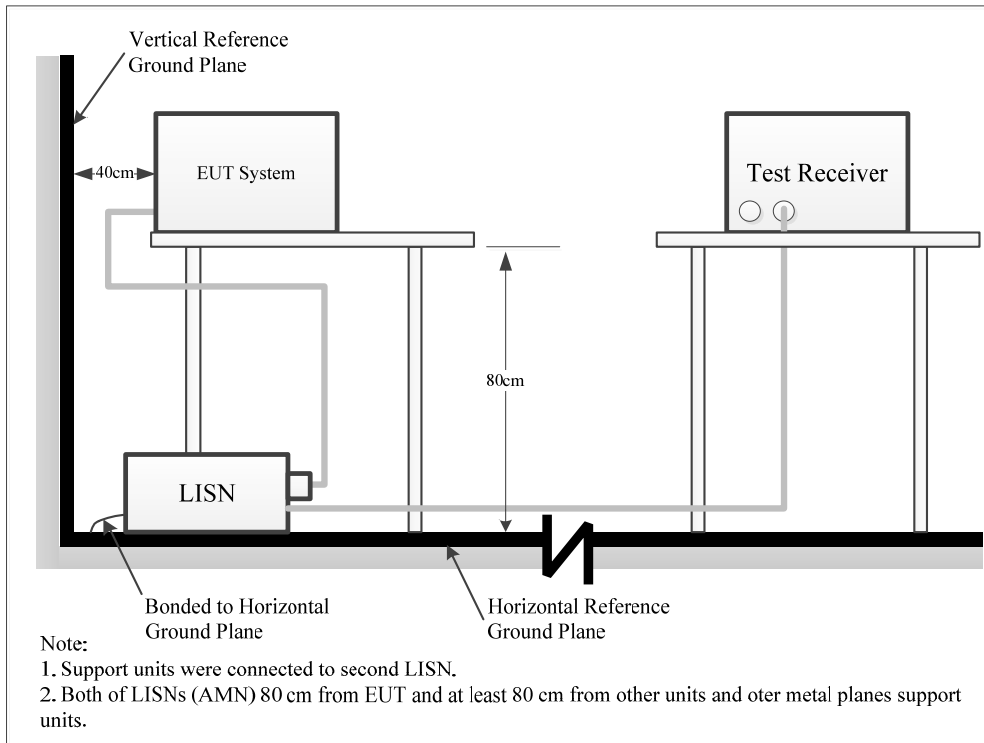
### **Result: Compliance**

**FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS**

**Applicable Standard**

FCC§15.207

**EUT Setup**



The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

**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	RBW	VBW	Detector
150 kHz – 30 MHz	9 kHz	30 kHz	QP/AV

## Test Procedure

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

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

## Result & Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\begin{aligned} \text{Factor (dB)} &= \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)} \\ \text{Result (dB}\mu\text{V)} &= \text{Reading (dB}\mu\text{V)} + \text{Factor (dB)} \end{aligned}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Result (dB}\mu\text{V)}$$

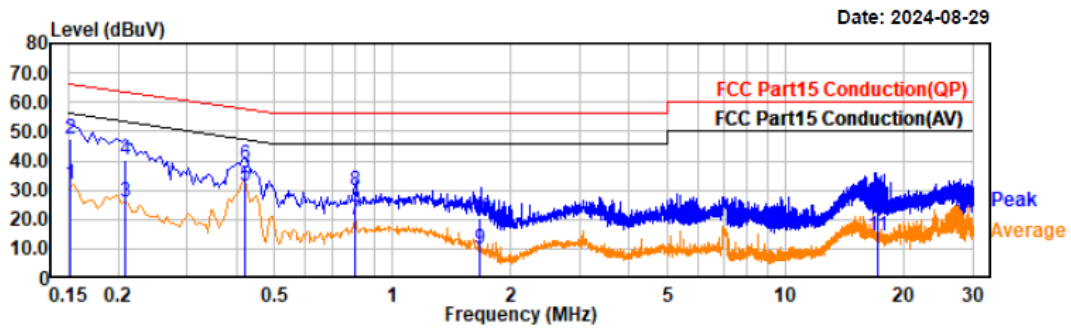
**Test Data**

<b>Frequency Range:</b>	150kHz~30MHz
<b>Temperature:</b>	22.4°C
<b>Relative Humidity:</b>	59%
<b>ATM Pressure:</b>	100.1kPa
<b>Test Date:</b>	2024-08-29
<b>Test Engineer:</b>	Spike Gao

*EUT operation mode: Transmitting in low channel (worst case)*

Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402  
 EUT Model: BR2551E

Temp/Humi/ATM: 22.4°C/59%/100.1kPa  
 Tested by: Spike Gao  
 Power Source: AC 120V/60Hz



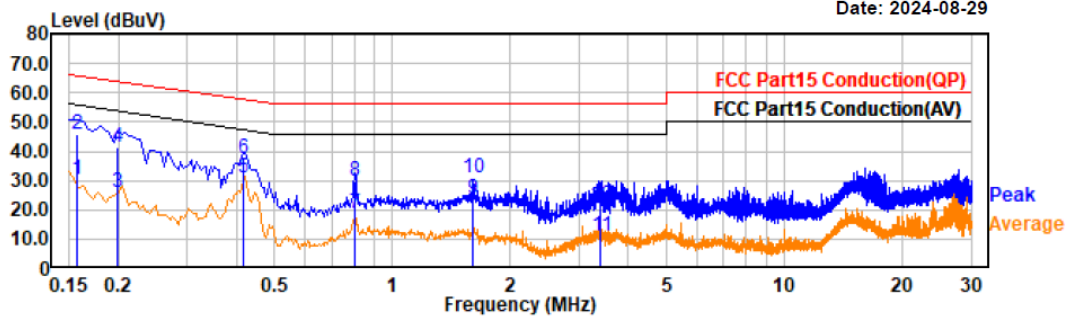
Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.15	10.70	21.04	31.74	55.93	24.19	Line	Average
0.15	26.56	21.04	47.60	65.93	18.33	Line	QP
0.21	4.71	21.23	25.94	53.28	27.34	Line	Average
0.21	18.89	21.23	40.12	63.28	23.16	Line	QP
0.42	11.01	20.47	31.48	47.40	15.92	Line	Average
0.42	18.24	20.47	38.71	57.40	18.69	Line	QP
0.80	-0.51	20.61	20.10	46.00	25.90	Line	Average
0.80	9.21	20.61	29.82	56.00	26.18	Line	QP
1.67	-10.83	20.93	10.10	46.00	35.90	Line	Average
1.67	-0.45	20.93	20.48	56.00	35.52	Line	QP
17.09	-6.62	21.11	14.49	50.00	35.51	Line	Average
17.09	3.58	21.11	24.69	60.00	35.31	Line	QP



Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402  
 EUT Model: BR2551E

Temp/Humi/ATM: 22.4°C/59%/100.1kPa  
 Tested by: Spike Gao  
 Power Source: AC 120V/60Hz



Trace: 1

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.16	9.22	20.88	30.10	55.59	25.49	Neutral	Average
0.16	25.18	20.88	46.06	65.59	19.53	Neutral	QP
0.20	4.93	21.07	26.00	53.64	27.64	Neutral	Average
0.20	20.08	21.07	41.15	63.64	22.49	Neutral	QP
0.42	10.48	20.45	30.93	47.52	16.59	Neutral	Average
0.42	17.14	20.45	37.59	57.52	19.93	Neutral	QP
0.80	-1.85	20.53	18.68	46.00	27.32	Neutral	Average
0.80	9.31	20.53	29.84	56.00	26.16	Neutral	QP
1.60	2.58	21.00	23.58	46.00	22.42	Neutral	Average
1.60	9.69	21.00	30.69	56.00	25.31	Neutral	QP
3.40	-9.75	21.00	11.25	46.00	34.75	Neutral	Average
3.40	0.30	21.00	21.30	56.00	34.70	Neutral	QP

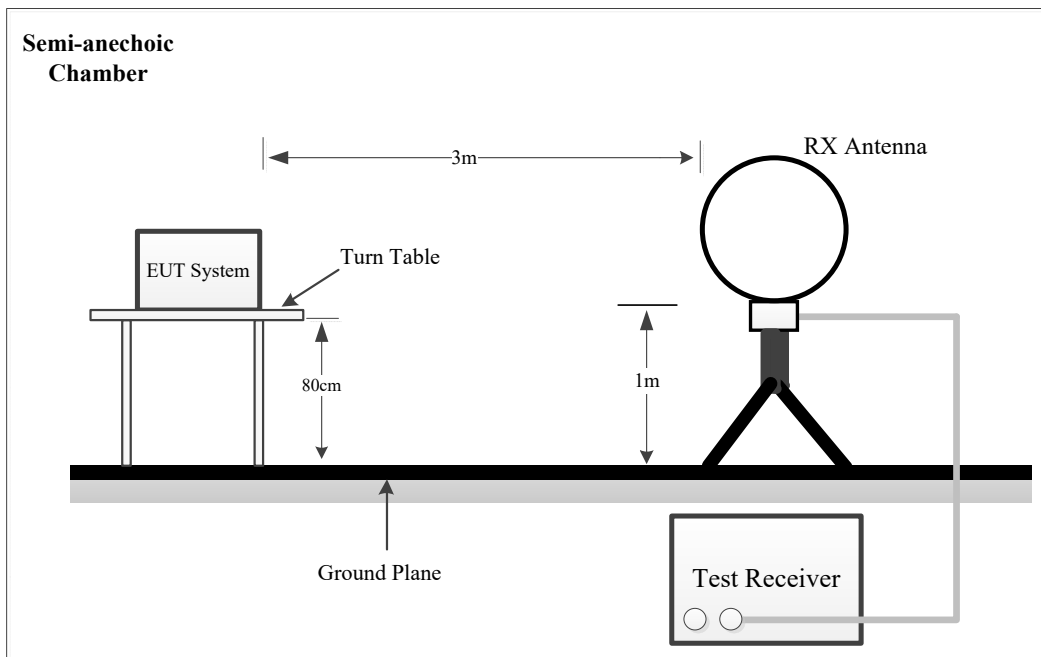
### FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

#### Applicable Standard

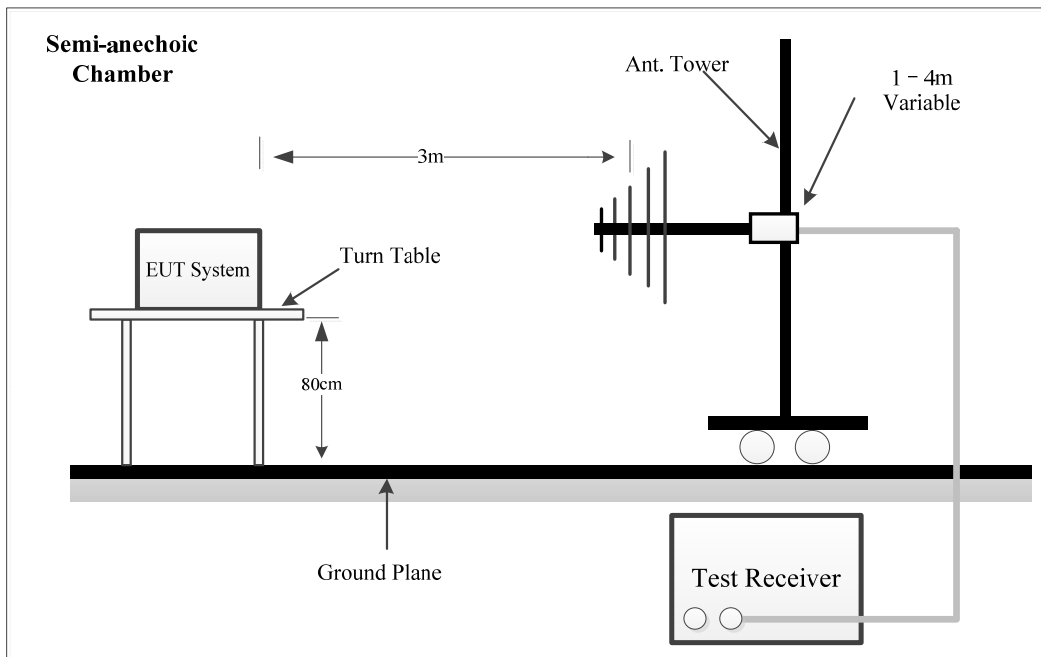
FCC §15.247 (d); §15.209; §15.205;

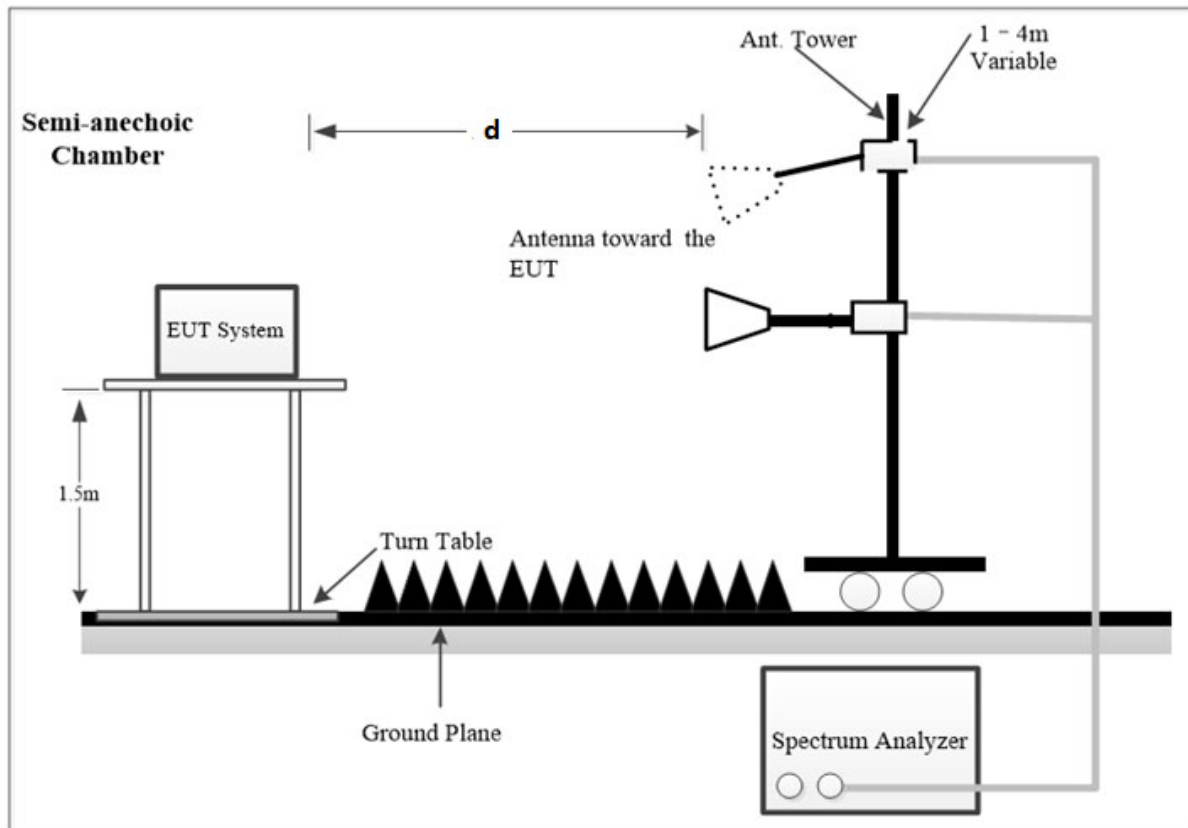
#### EUT Setup

9 kHz-30MHz:



30MHz -1 GHz:



**Above 1GHz:**

The radiated emission tests using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209 and FCC 15.247 limits.

**NOTE:**

d is testing distance;

For Radiated Emission test (1GHz-3GHz), which was performed at 3 m distance.

For Radiated Emission test(3GHz-18GHz), which was performed at 1.8 m distance, according to C63.10-2020, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.8m.

Distance extrapolation Factor =  $20 \log (\text{specific distance } [3\text{m}]/\text{test distance } [1.8\text{m}]) \text{ dB} = 4.44 \text{ dB}$

For Radiated Bandedge Emission test, which was performed at 1.5 m distance, according to C63.10-2020, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m.

Distance extrapolation Factor =  $20 \log (\text{specific distance } [3\text{m}]/\text{test distance } [1.5\text{m}]) \text{ dB} = 6 \text{ dB}$

For Radiated Emission test(18GHz-25GHz), which was performed at 1.0 m distance, according to C63.10-2020, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.0m.

Distance extrapolation Factor =  $20 \log (\text{specific distance } [3\text{m}]/\text{test distance } [1.0\text{m}]) \text{ dB} = 9.54 \text{ dB}$

## 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:

Below 1GHz:

Frequency Range	RBW	VBW	Measurement
9 kHz – 150 kHz	200Hz	1 kHz	PK
	200Hz	/	QP
150 kHz – 30 MHz	10 kHz	30 kHz	PK
	9kHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	PK
	120kHz	/	QP

Above 1GHz:

Pre-scan:

Measurement	Duty Cycle	RBW	Video B/W
PK	Any	1MHz	3MHz
Ave.	>98%	1MHz	5kHz
	<98%	1MHz	1/T, not less than 5kHz

Final measurement for emission identified during the pre-scan:

Measurement	Duty Cycle	RBW	Video B/W
PK	Any	1MHz	3MHz
Ave.	>98%	1MHz	10Hz
	<98%	1MHz	1/T

Note: T is minimum transmission duration

### 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 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable. The report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground parallel) unless the margin is greater than 20 dB, then the following statement shall be made: “all emissions were greater than 20 dB below the limit.”

**Result & Margin Calculation**

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

For 9 kHz to 3GHz Radiated emission test

$$\text{Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

For 3GHz to 25GHz Radiated emission test and Bandedge emissions test

$$\text{Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)} - \text{Extrapolation factor(dB)}$$

$$\text{Extrapolation factor} = 6\text{dB (distance} = 1.5\text{m)}$$

$$\text{Extrapolation factor} = 4.44\text{dB (distance} = 1.8\text{m)}$$

$$\text{Extrapolation factor} = 9.54\text{dB (distance} = 1\text{m)}$$

$$\text{Result (dB}\mu\text{V/m)} = \text{Reading (dB}\mu\text{V)} + \text{Factor (dB/m)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Result (dB}\mu\text{V/m)}$$

**Test Data**

Please refer to the below table and plots.

*Pre-Scan the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded*

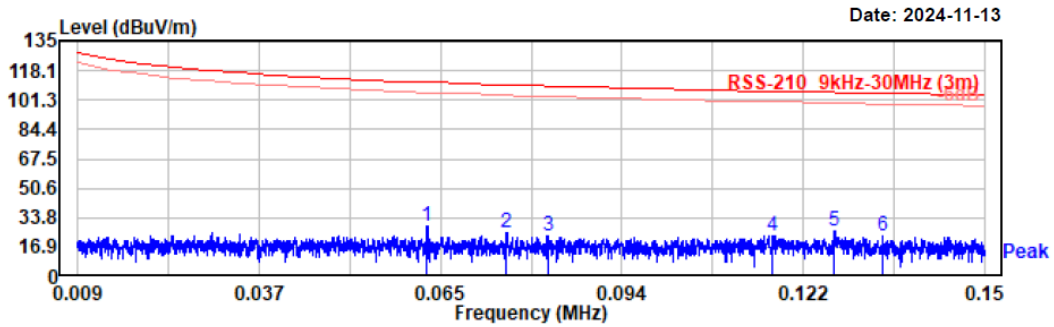
<b>Frequency Range:</b>	Below 1 GHz	Above 1 GHz
<b>Temperature:</b>	23.0°C~23.4°C	23.4°C~23.6°C
<b>Relative Humidity:</b>	50 %~52%	52 %~55 %
<b>ATM Pressure:</b>	100.1 kPa	100.1 kPa~100.5 kPa
<b>Test Date:</b>	2024-08-29~2024-11-13	2024-08-27~2024-11-14
<b>Test Engineer:</b>	Wlif Wu	Wlif Wu

**1) 9 kHz~30MHz**

*EUT operation mode: Transmitting in low channel in parallel (worst case)*

Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402MHz  
 EUT Model: BR2551E  
 Test distance: 3m

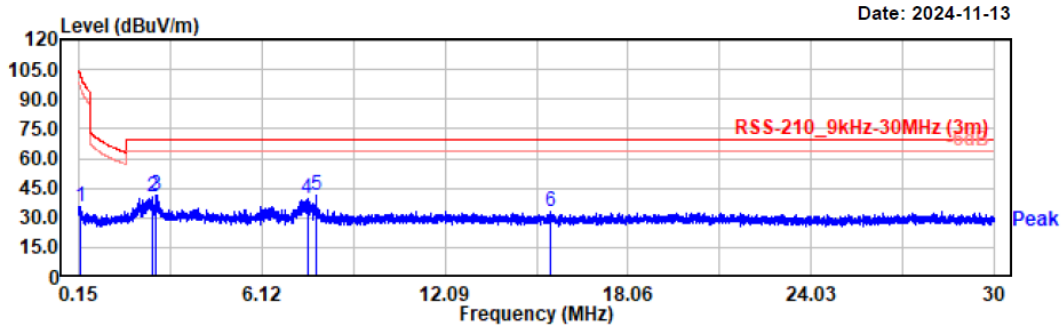
Temp/Humi/ATM: 23.4°C/55%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC 120V/60Hz



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.063	9.28	19.88	29.16	111.57	82.41	Peak
0.076	5.68	19.75	25.43	110.03	84.60	Peak
0.082	3.18	19.73	22.91	109.33	86.42	Peak
0.117	3.65	19.73	23.38	106.23	82.85	Peak
0.127	6.03	19.73	25.76	105.55	79.79	Peak
0.134	3.64	19.73	23.37	105.05	81.68	Peak

Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.4°C/55%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC 120V/60Hz



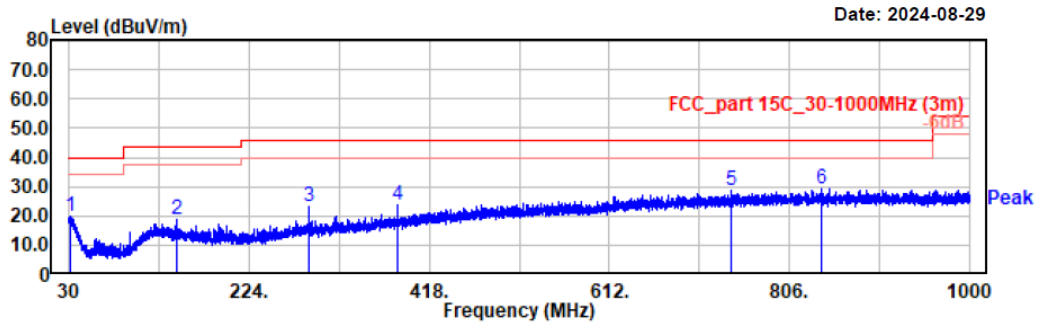
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
0.189	16.06	19.72	35.78	102.08	66.30	Peak
2.562	21.23	19.73	40.96	69.54	28.58	Peak
2.678	21.49	19.76	41.25	69.54	28.29	Peak
7.595	19.79	19.68	39.47	69.54	30.07	Peak
7.875	21.59	19.68	41.27	69.54	28.27	Peak
15.532	12.99	19.79	32.78	69.54	36.76	Peak

2) 30MHz -1GHz

EUT operation mode: Transmitting in low channel (worst case)

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.0°C/50%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

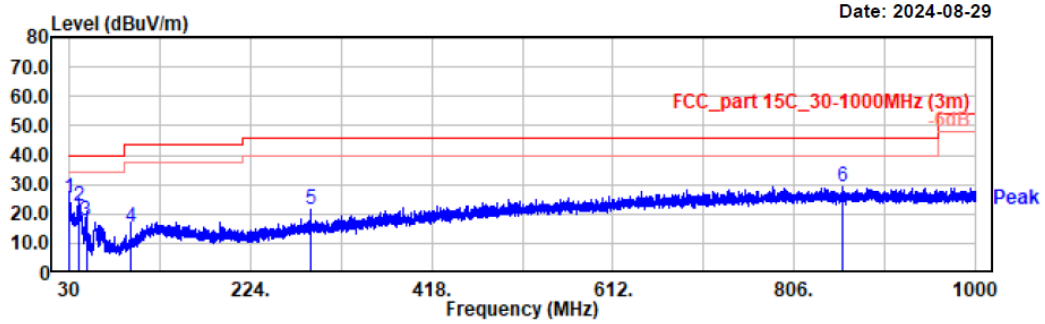


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
31.46	25.75	-6.10	19.65	40.00	20.35	Horizontal	QP
145.62	29.69	-10.97	18.72	43.50	24.78	Horizontal	QP
288.02	32.59	-9.25	23.34	46.00	22.66	Horizontal	QP
383.95	30.75	-6.94	23.81	46.00	22.19	Horizontal	QP
744.02	28.42	0.42	28.84	46.00	17.16	Horizontal	QP
840.05	27.30	1.80	29.10	46.00	16.90	Horizontal	QP



Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.0°C/50%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

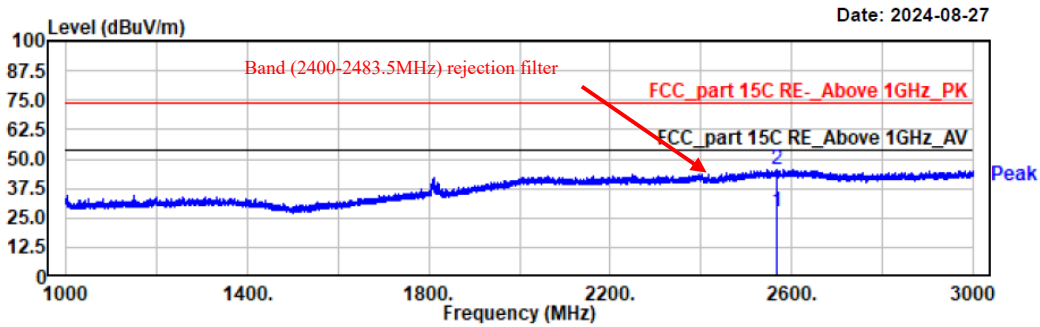


Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
30.19	30.79	-5.65	25.14	40.00	14.86	Vertical	QP
40.28	34.43	-11.90	22.53	40.00	17.47	Vertical	QP
47.95	34.63	-16.82	17.81	40.00	22.19	Vertical	QP
95.96	31.73	-16.13	15.60	43.50	27.90	Vertical	QP
288.02	30.75	-9.25	21.50	46.00	24.50	Vertical	QP
857.41	26.95	2.02	28.97	46.00	17.03	Vertical	QP

### 3) 1GHz~3GHz

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

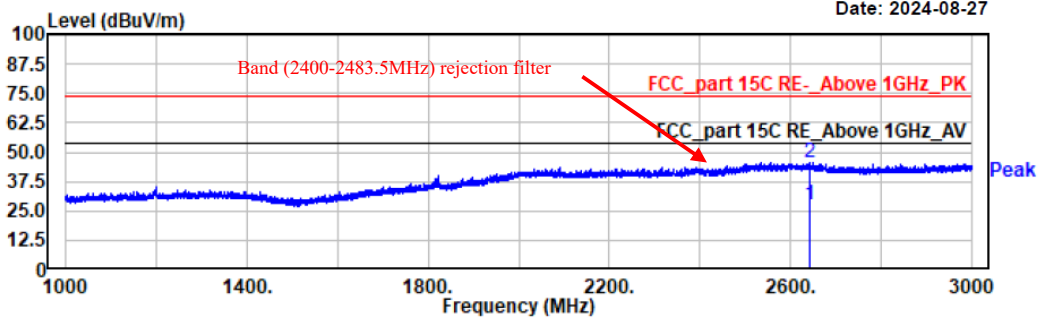


Date: 2024-08-27

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2568.40	30.78	-3.41	27.37	54.00	26.63	horizontal	Average
2568.40	48.67	-3.41	45.26	74.00	28.74	horizontal	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

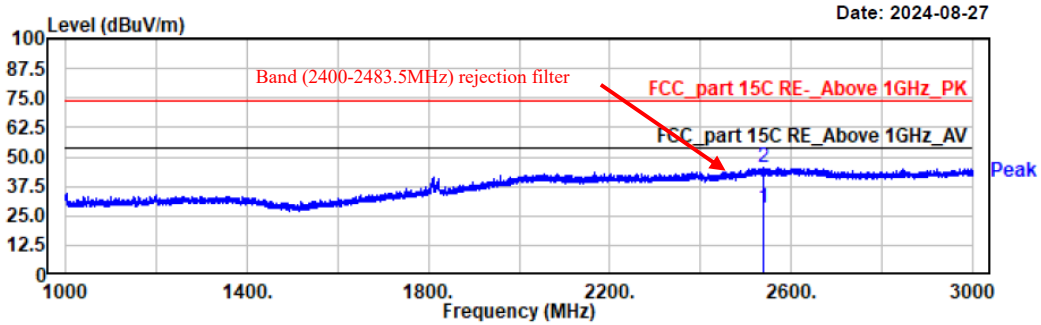


Date: 2024-08-27

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2642.60	30.74	-3.37	27.37	54.00	26.63	vertical	Average
2642.60	48.99	-3.37	45.62	74.00	28.38	vertical	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2440  
 EUT Model: BR2551E  
 Test distance: 3m

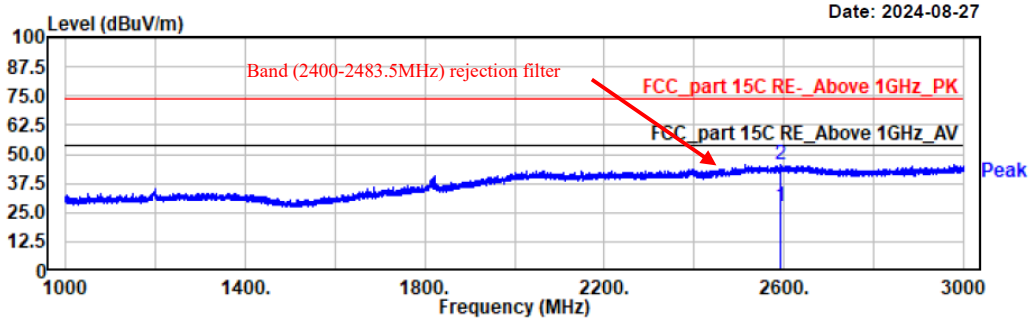
Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2538.80	31.79	-3.62	28.17	54.00	25.83	horizontal	Average
2538.80	49.29	-3.62	45.67	74.00	28.33	horizontal	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2440  
 EUT Model: BR2551E  
 Test distance: 3m

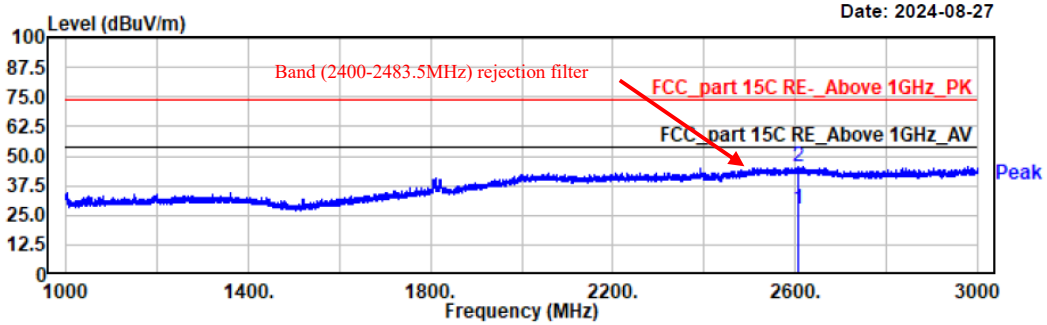
Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2593.00	30.78	-3.32	27.46	54.00	26.54	vertical	Average
2593.00	48.67	-3.32	45.35	74.00	28.65	vertical	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

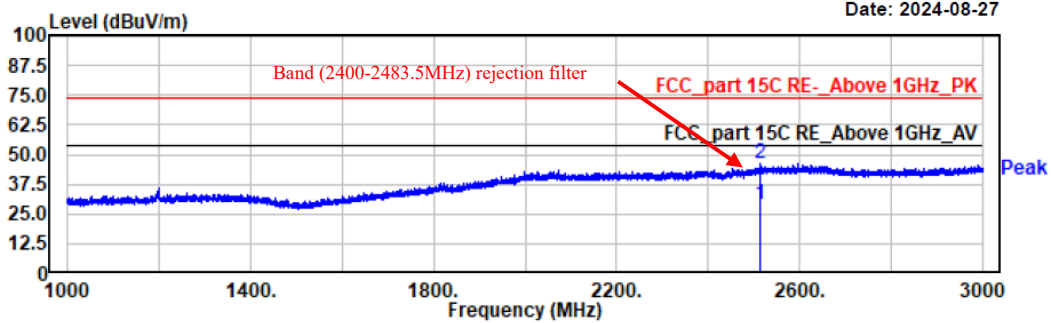


Date: 2024-08-27

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2606.20	30.72	-3.30	27.42	54.00	26.58	horizontal	Average
2606.20	48.65	-3.30	45.35	74.00	28.65	horizontal	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 3m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



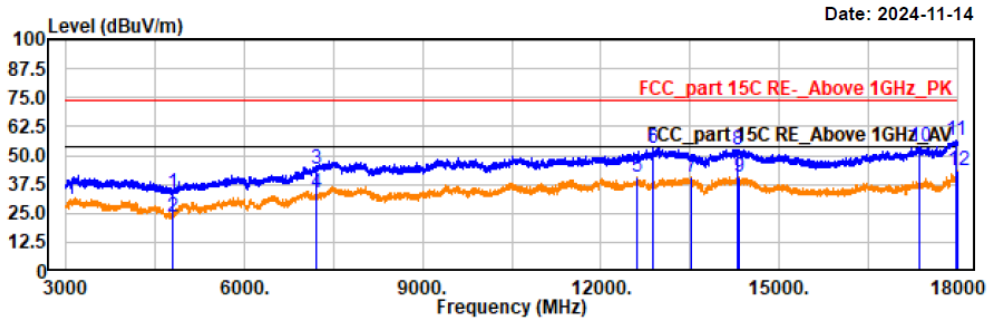
Date: 2024-08-27

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2514.60	32.86	-3.95	28.91	54.00	25.09	vertical	Average
2514.60	50.30	-3.95	46.35	74.00	27.65	vertical	Peak

4) 3GHz~18GHz

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

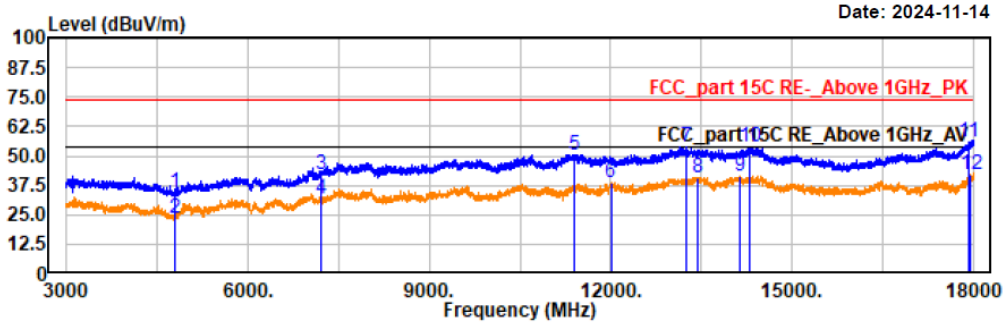


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4804.50	47.31	-13.55	33.76	74.00	40.24	horizontal	Peak
4804.50	37.15	-13.55	23.60	54.00	30.40	horizontal	Average
7206.00	49.84	-6.03	43.81	74.00	30.19	horizontal	Peak
7206.00	39.74	-6.03	33.71	54.00	20.29	horizontal	Average
12609.00	38.70	1.75	40.45	54.00	13.55	horizontal	Average
12882.00	49.70	3.60	53.30	74.00	20.70	horizontal	Peak
13518.00	36.51	3.94	40.45	54.00	13.55	horizontal	Average
14310.00	49.23	3.30	52.53	74.00	21.47	horizontal	Peak
14323.50	37.54	3.21	40.75	54.00	13.25	horizontal	Average
17361.00	51.10	2.86	53.96	74.00	20.04	horizontal	Peak
17968.50	49.42	6.79	56.21	74.00	17.79	horizontal	Peak
17998.50	36.70	6.99	43.69	54.00	10.31	horizontal	Average

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Date: 2024-11-14

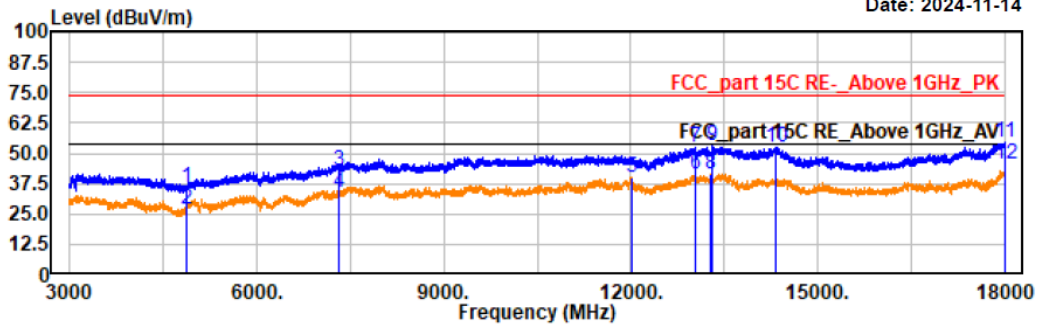
Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4804.50	47.76	-13.55	34.21	74.00	39.79	Vertical	Peak
4804.50	37.21	-13.55	23.66	54.00	30.34	Vertical	Average
7206.00	48.02	-6.03	41.99	74.00	32.01	Vertical	Peak
7206.00	37.58	-6.03	31.55	54.00	22.45	Vertical	Average
11400.00	50.90	-0.36	50.54	74.00	23.46	Vertical	Peak
12004.50	37.98	0.94	38.92	54.00	15.08	Vertical	Average
13249.50	50.06	3.90	53.96	74.00	20.04	Vertical	Peak
13437.00	36.87	4.09	40.96	54.00	13.04	Vertical	Average
14136.00	38.71	2.40	41.11	54.00	12.89	Vertical	Average
14308.50	50.14	3.31	53.45	74.00	20.55	Vertical	Peak
17923.50	49.14	6.49	55.63	74.00	18.37	Vertical	Peak
17941.50	35.64	6.62	42.26	54.00	11.74	Vertical	Average

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2440  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

Date: 2024-11-14

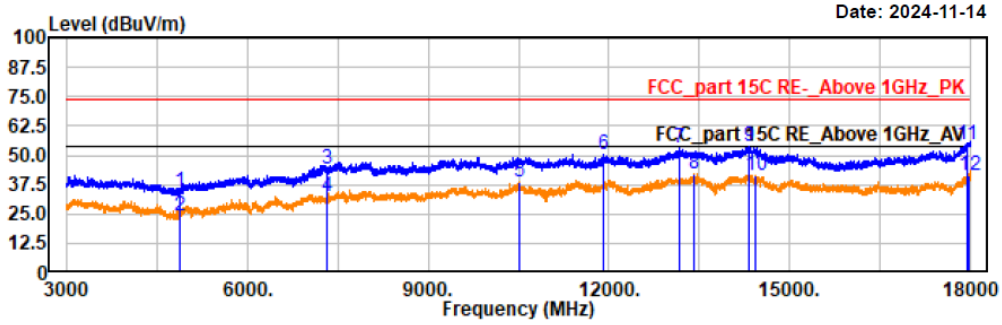


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4879.50	48.35	-12.56	35.79	74.00	38.21	horizontal	Peak
4879.50	39.24	-12.56	26.68	54.00	27.32	horizontal	Average
7320.00	48.68	-5.60	43.08	74.00	30.92	horizontal	Peak
7320.00	39.05	-5.60	33.45	54.00	20.55	horizontal	Average
12016.50	39.08	0.93	40.01	54.00	13.99	horizontal	Average
13033.50	36.88	4.48	41.36	54.00	12.64	horizontal	Average
13044.00	47.69	4.42	52.11	74.00	21.89	horizontal	Peak
13291.50	37.75	3.63	41.38	54.00	12.62	horizontal	Average
13314.00	49.28	3.65	52.93	74.00	21.07	horizontal	Peak
14337.00	49.46	3.13	52.59	74.00	21.41	horizontal	Peak
17998.50	47.62	6.99	54.61	74.00	19.39	horizontal	Peak
17998.50	38.34	6.99	45.33	54.00	8.67	horizontal	Average

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2440  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Date: 2024-11-14

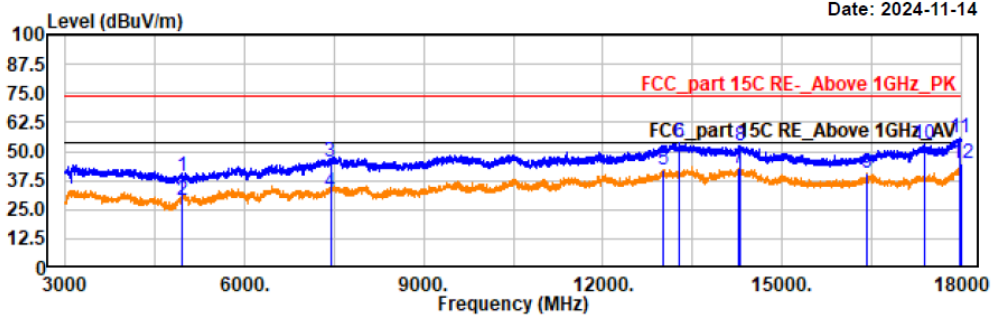
Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4880.00	46.86	-12.55	34.31	74.00	39.69	Vertical	Peak
4880.00	36.72	-12.55	24.17	54.00	29.83	Vertical	Average
7320.00	49.92	-5.60	44.32	74.00	29.68	Vertical	Peak
7320.00	37.69	-5.60	32.09	54.00	21.91	Vertical	Average
10507.50	39.53	-0.75	38.78	54.00	15.22	Vertical	Average
11910.00	49.54	0.58	50.12	74.00	23.88	Vertical	Peak
13159.50	49.09	4.18	53.27	74.00	20.73	Vertical	Peak
13414.50	37.80	4.09	41.89	54.00	12.11	Vertical	Average
14322.00	50.88	3.22	54.10	74.00	19.90	Vertical	Peak
14428.50	38.86	2.71	41.57	54.00	12.43	Vertical	Average
17943.00	48.19	6.63	54.82	74.00	19.18	Vertical	Peak
17973.00	34.62	6.83	41.45	54.00	12.55	Vertical	Average



Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



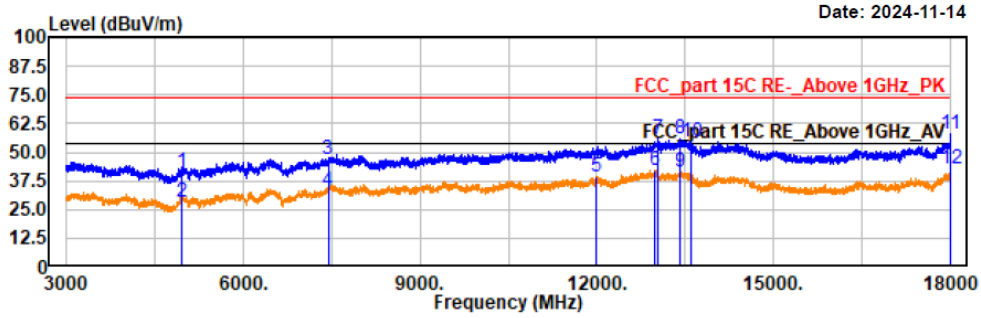
Date: 2024-11-14

Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.50	51.01	-11.64	39.37	74.00	34.63	horizontal	Peak
4960.50	40.90	-11.64	29.26	54.00	24.74	horizontal	Average
7440.00	49.95	-4.76	45.19	74.00	28.81	horizontal	Peak
7440.00	37.28	-4.76	32.52	54.00	21.48	horizontal	Average
13011.00	37.46	4.61	42.07	54.00	11.93	horizontal	Average
13272.00	50.00	3.76	53.76	74.00	20.24	horizontal	Peak
14281.50	39.65	3.19	42.84	54.00	11.16	horizontal	Average
14307.00	49.41	3.32	52.73	74.00	21.27	horizontal	Peak
16420.50	40.63	-0.13	40.50	54.00	13.50	horizontal	Average
17376.00	50.51	2.90	53.41	74.00	20.59	horizontal	Peak
17968.50	49.40	6.79	56.19	74.00	17.81	horizontal	Peak
17998.50	38.04	6.99	45.03	54.00	8.97	horizontal	Average

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 1.8m

Temp/Humi/ATM: 23.4°C/52%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Date: 2024-11-14

Trace: 1

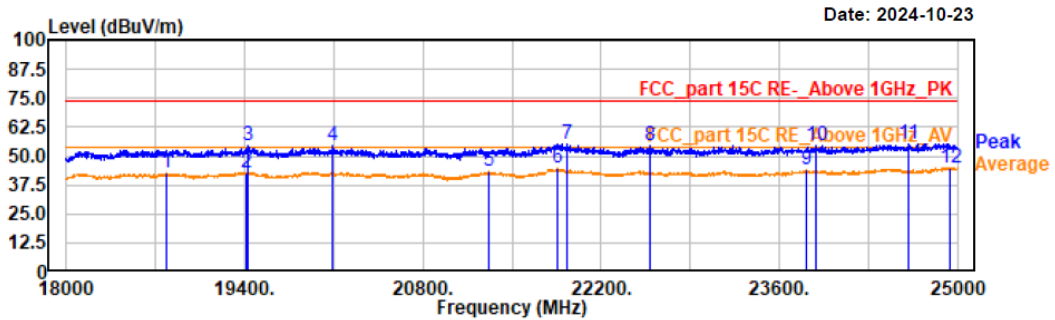
Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
4960.50	53.09	-11.64	41.45	74.00	32.55	vertical	Peak
4960.50	40.12	-11.64	28.48	54.00	25.52	vertical	Average
7440.00	51.33	-4.76	46.57	74.00	27.43	vertical	Peak
7440.00	37.89	-4.76	33.13	54.00	20.87	vertical	Average
11994.00	38.53	0.92	39.45	54.00	14.55	vertical	Average
12978.00	37.55	4.46	42.01	54.00	11.99	vertical	Average
13041.00	51.31	4.45	55.76	74.00	18.24	vertical	Peak
13407.00	51.57	4.10	55.67	74.00	18.33	vertical	Peak
13416.00	37.25	4.10	41.35	54.00	12.65	vertical	Average
13597.50	51.28	3.53	54.81	74.00	19.19	vertical	Peak
17998.50	50.91	6.99	57.90	74.00	16.10	vertical	Peak
17998.50	36.04	6.99	43.03	54.00	10.97	vertical	Average

5) 18GHz~25GHz (Worst case)

EUT operation mode: Transmitting in low channel

Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402MHz  
 EUT Model: BR2551E  
 Test distance: 1m

Temp/Humi/ATM: 23.5°C/54%/100.5kPa  
 Tested by: Wlif Wu  
 Power Source: DC 3.3V

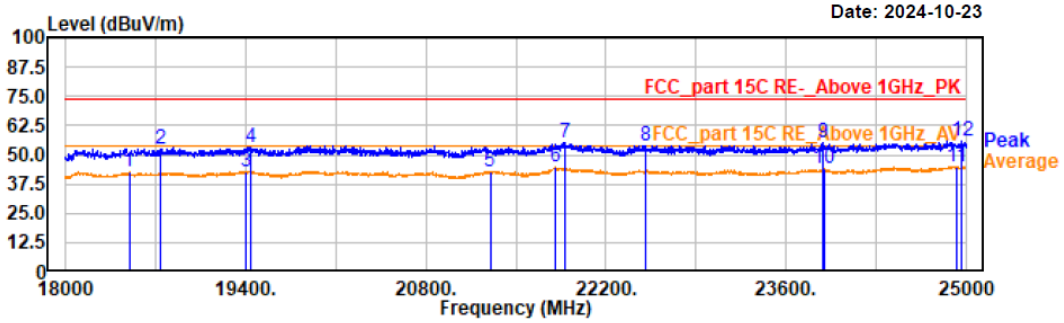


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
18787.60	27.54	14.93	42.47	54.00	11.53	horizontal	Average
19416.80	27.97	15.06	43.03	54.00	10.97	horizontal	Average
19430.00	39.33	15.06	54.39	74.00	19.61	horizontal	Peak
20094.40	39.23	15.27	54.50	74.00	19.50	horizontal	Peak
21315.40	27.36	16.08	43.44	54.00	10.56	horizontal	Average
21856.60	28.10	16.43	44.53	54.00	9.47	horizontal	Average
21929.20	38.81	16.53	55.34	74.00	18.66	horizontal	Peak
22580.40	37.47	16.70	54.17	74.00	19.83	horizontal	Peak
23812.40	26.00	17.82	43.82	54.00	10.18	horizontal	Average
23885.00	36.50	17.92	54.42	74.00	19.58	horizontal	Peak
24608.80	36.17	18.99	55.16	74.00	18.84	horizontal	Peak
24938.80	26.26	18.86	45.12	54.00	8.88	horizontal	Average

Project No.: 2407V34489E-RF  
 Test Mode: BLE 1M 2402MHz  
 EUT Model: BR2551E  
 Test distance: 1m

Temp/Humi/ATM: 23.5°C/54%/100.5kPa  
 Tested by: Wlif Wu  
 Power Source: DC 3.3V



Date: 2024-10-23

Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
18492.80	27.80	14.83	42.63	54.00	11.37	vertical	Average
18737.00	37.63	14.91	52.54	74.00	21.46	vertical	Peak
19405.80	28.00	15.05	43.05	54.00	10.95	vertical	Average
19434.40	38.26	15.06	53.32	74.00	20.68	vertical	Peak
21300.00	26.98	16.08	43.06	54.00	10.94	vertical	Average
21808.20	28.31	16.38	44.69	54.00	9.31	vertical	Average
21878.60	38.86	16.58	55.44	74.00	18.56	vertical	Peak
22503.40	37.34	16.70	54.04	74.00	19.96	vertical	Peak
23889.40	37.05	17.92	54.97	74.00	19.03	vertical	Peak
23893.80	26.05	17.93	43.98	54.00	10.02	vertical	Average
24927.80	26.09	18.86	44.95	54.00	9.05	vertical	Average
24969.60	36.97	18.84	55.81	74.00	18.19	vertical	Peak

**Restricted Bands Emissions:**

*Pre-Scan the X, Y and Z axes of orientation, the worst case in Z-axis of orientation was recorded*

**Note:**

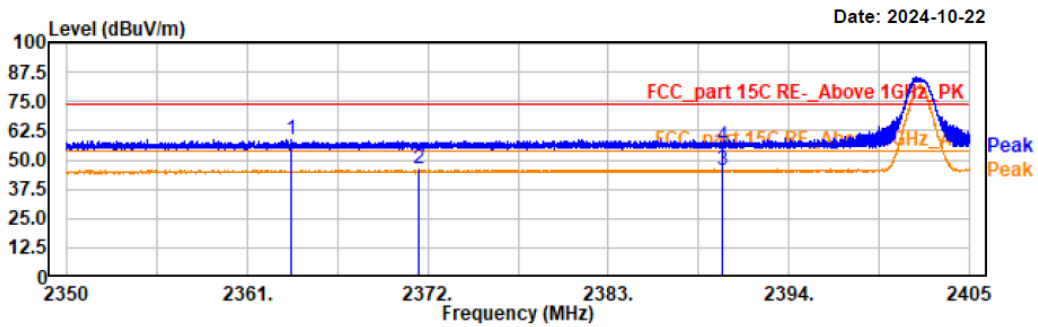
Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

Result (dBµV/m) = Reading (dBµV) + Factor (dB/m)

Margin (dB) = Limit (dBµV/m) - Result (dBµV/m)

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 1.5m

Temp/Humi/ATM: 23.6°C/53%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



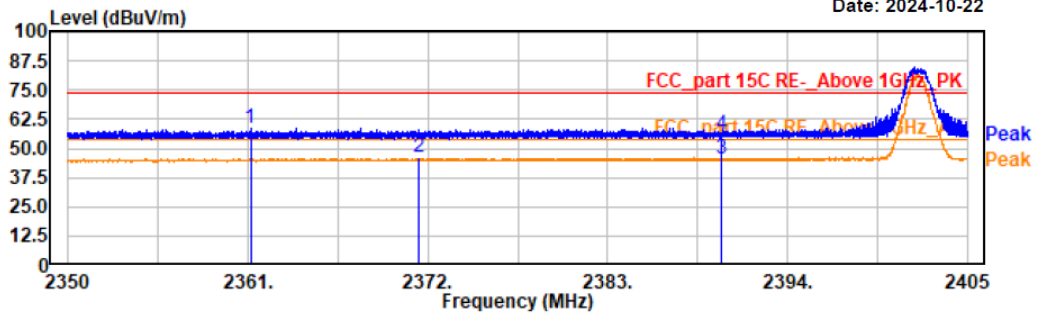
Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2363.63	28.17	30.59	58.76	74.00	15.24	horizontal	Peak
2371.49	15.29	30.69	45.98	54.00	8.02	horizontal	Average
2390.00	14.62	30.93	45.55	54.00	8.45	horizontal	Average
2390.00	25.23	30.93	56.16	74.00	17.84	horizontal	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2402  
 EUT Model: BR2551E  
 Test distance: 1.5m

Temp/Humi/ATM: 23.6°C/53%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

Date: 2024-10-22

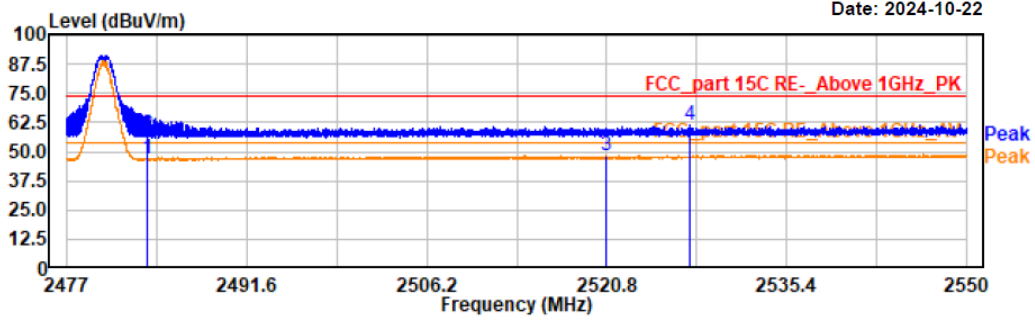


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2361.16	28.01	30.56	58.57	74.00	15.43	vertical	Peak
2371.49	15.29	30.69	45.98	54.00	8.02	horizontal	Average
2390.00	14.62	30.93	45.55	54.00	8.45	horizontal	Average
2390.00	24.78	30.93	55.71	74.00	18.29	vertical	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 1.5m

Temp/Humi/ATM: 23.6°C/53%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz

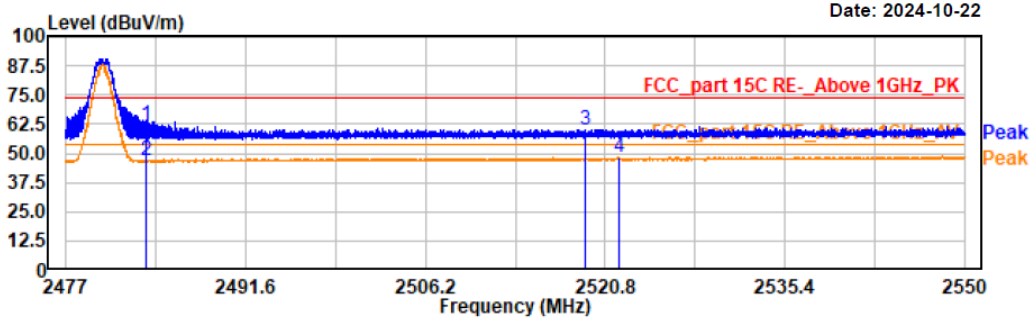


Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50	14.83	31.75	46.58	54.00	7.42	horizontal	Average
2483.50	25.62	31.75	57.37	74.00	16.63	horizontal	Peak
2520.75	15.84	32.36	48.20	54.00	5.80	horizontal	Average
2527.61	28.84	32.46	61.30	74.00	12.70	horizontal	Peak

Project No.: 2407V34489E-RF  
 Test Mode: 1M-2480  
 EUT Model: BR2551E  
 Test distance: 1.5m

Temp/Humi/ATM: 23.6°C/53%/100.1kPa  
 Tested by: Wlif Wu  
 Power Source: AC120V/60Hz



Trace: 1

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2483.50	30.39	31.75	62.14	74.00	11.86	vertical	Peak
2483.50	14.99	31.75	46.74	54.00	7.26	vertical	Average
2519.15	27.94	32.34	60.28	74.00	13.72	vertical	Peak
2521.88	15.69	32.38	48.07	54.00	5.93	vertical	Average

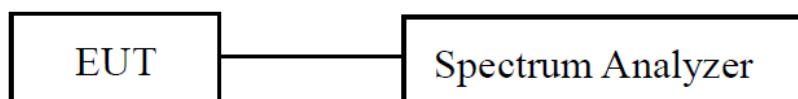


## FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

### Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### EUT Setup



### Test Procedure

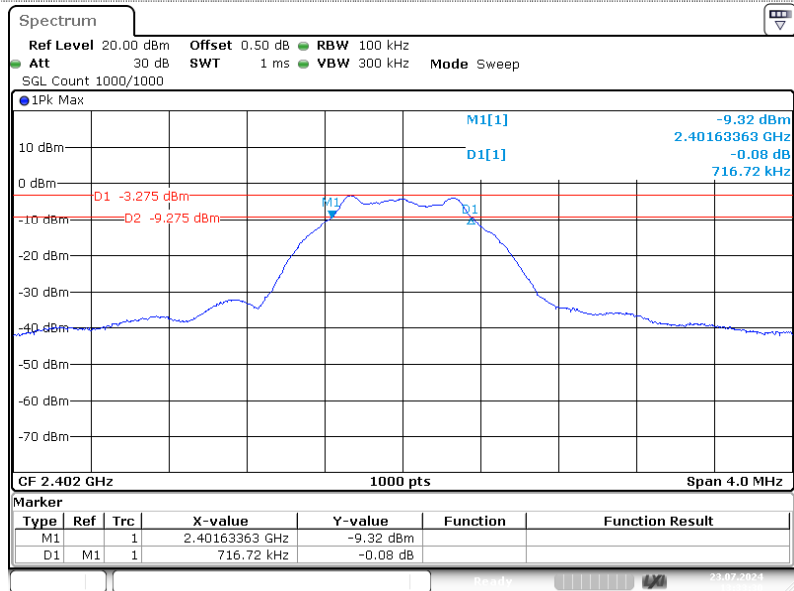
According to ANSI C63.10-2013 Section 11.8

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) 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 6 dB relative to the maximum level measured in the fundamental emission.

### Test Data

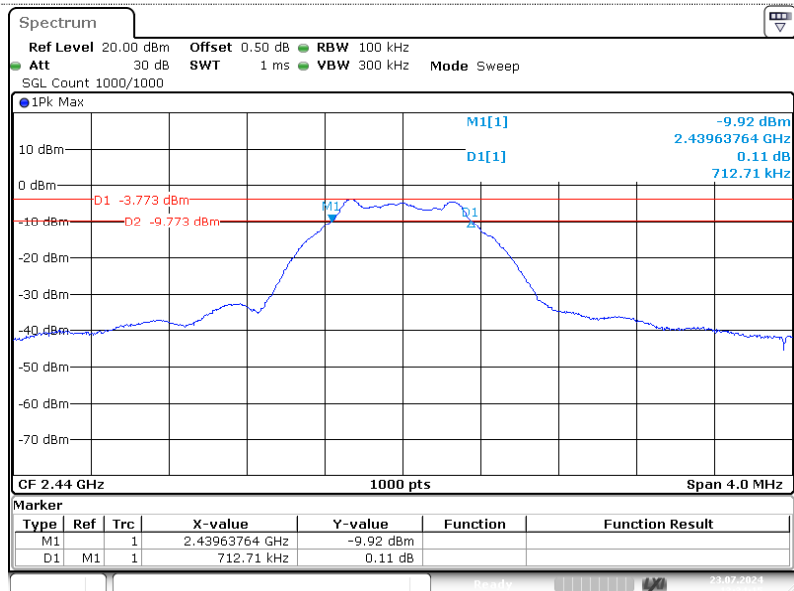
<b>Test Mode:</b>	Transmitting	<b>Test Engineer:</b>	Ash Lin
<b>Test Date:</b>	2024-07-23	<b>Test Voltage:</b>	DC 3.3V
<b>Test Result:</b>	Compliance	<b>Environment:</b>	Temp.: 22.5°C Humi.: 54% Atm :100.5kPa
<b>Test Channel</b>	<b>Test Frequency (MHz)</b>	<b>6 dB Bandwidth (MHz)</b>	<b>Limit (MHz)</b>
Lowest	2402	0.717	$\geq 0.5$
Middle	2440	0.713	$\geq 0.5$
Highest	2480	0.705	$\geq 0.5$

### Low Channel



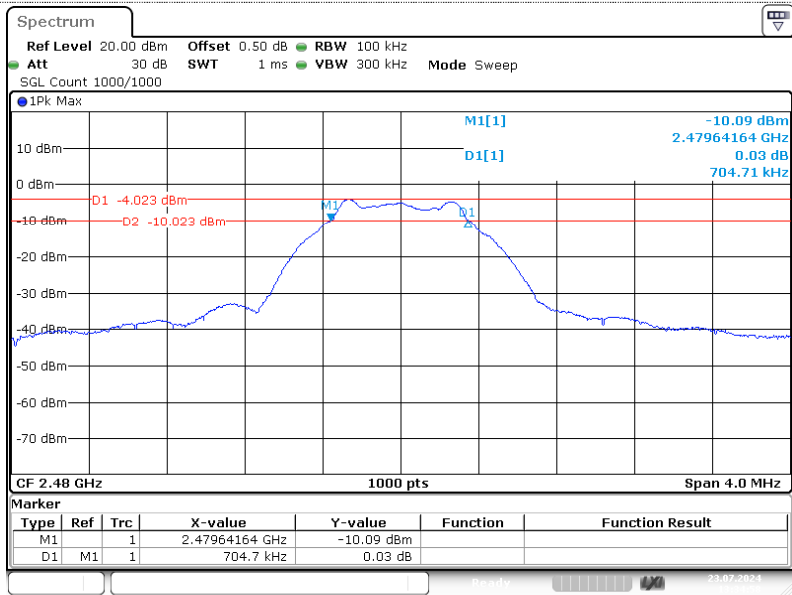
ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:33:30

### Middle Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:34:14

### High Channel



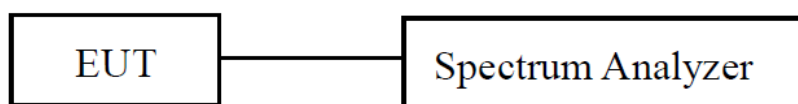
ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:34:58

## FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

### Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

### EUT Setup



### Test Procedure

According to ANSI C63.10-2013 Section 11.9.1.1

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

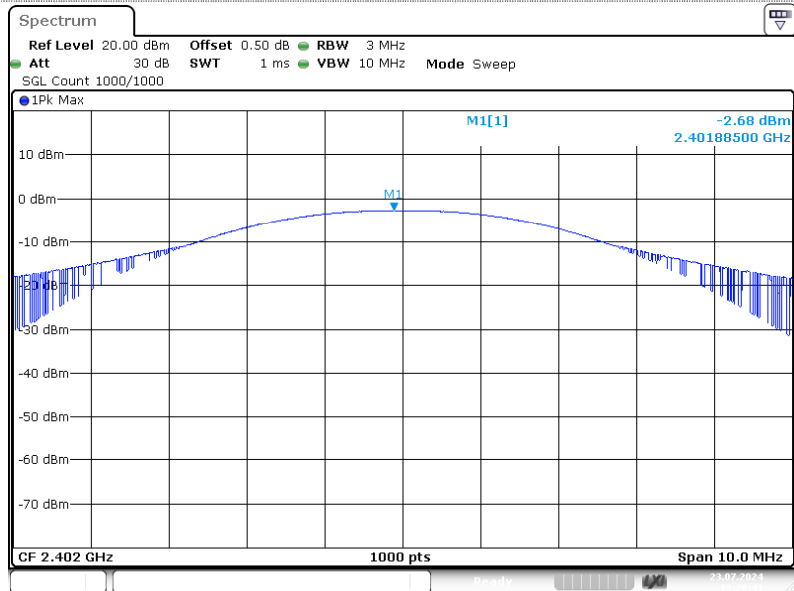
- a) Set the RBW  $\geq$  DTS bandwidth.
- b) Set VBW  $\geq$  [3  $\times$  RBW].
- c) Set span  $\geq$  [3  $\times$  RBW].
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

### Test Data

<b>Test Mode:</b>	Transmitting	<b>Test Engineer:</b>	Ash Lin
<b>Test Date:</b>	2024-07-23	<b>Test Voltage:</b>	DC 3.3V
<b>Test Result:</b>	Compliance	<b>Environment:</b>	Temp.: 22.5°C Humi.: 54% Atm :100.5kPa
<b>Test Channel</b>	<b>Test Frequency (MHz)</b>	<b>Maximum Conducted Peak Output Power(dBm)</b>	<b>Limit (dBm)</b>
Lowest	2402	-2.68	$\leq 30$
Middle	2440	-3.14	$\leq 30$
Highest	2480	-3.39	$\leq 30$

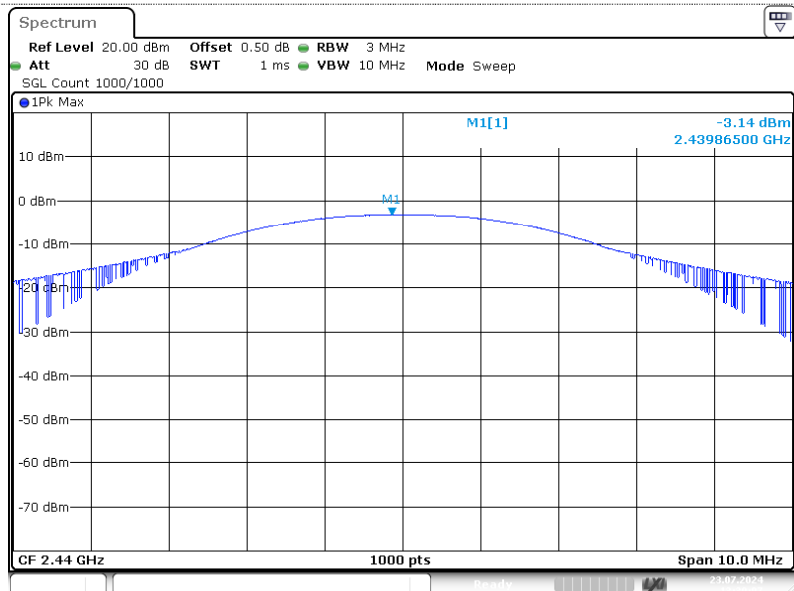
Please refer to the below plots:

### Lowest Channel



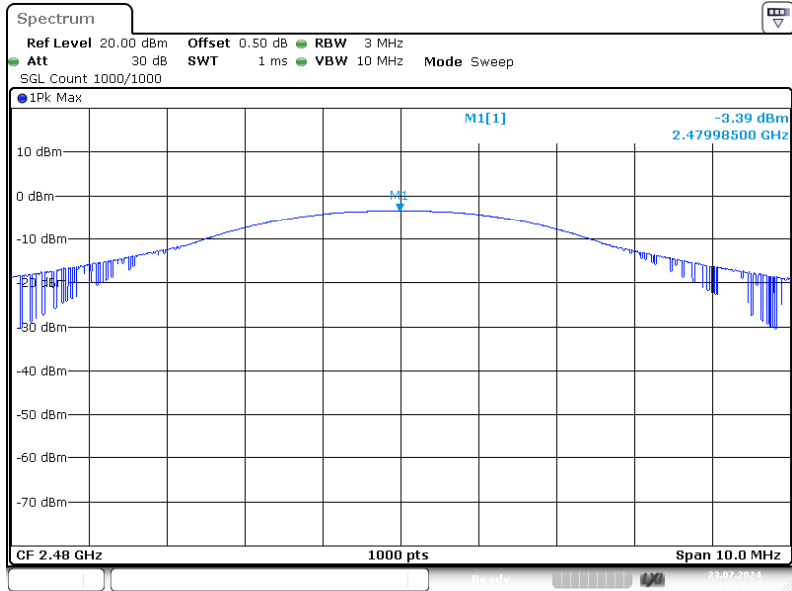
ProjectNo.:2407V34489E-RF Tester:Ash Lin  
Date: 23.JUL.2024 13:28:41

### Middle Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
Date: 23.JUL.2024 13:30:07

### Highest Channel



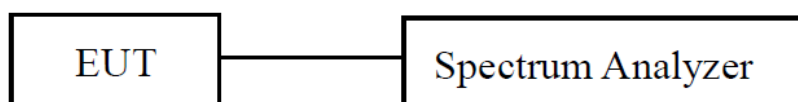
ProjectNo.:2407V34489E-RF Tester:Ash Lin  
Date: 23.JUL.2024 13:31:24

## FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

### Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### EUT Setup



### Test Procedure

According to ANSI C63.10-2013 Section 11.11

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW  $\geq [3 \times \text{RBW}]$ .
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

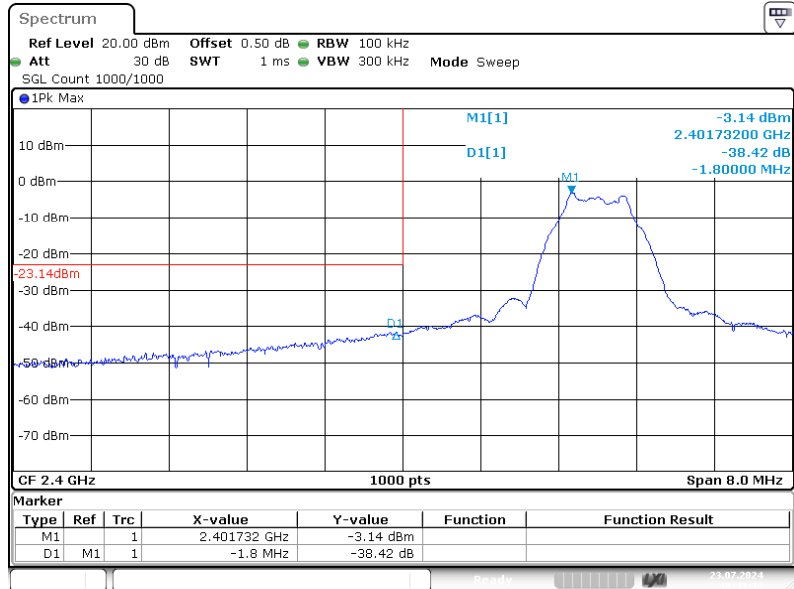
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

### Test Data

<b>Test Mode:</b>	Transmitting	<b>Test Engineer:</b>	Ash Lin
<b>Test Date:</b>	2024-07-23	<b>Test Voltage:</b>	DC 3.3V
<b>Test Result:</b>	Compliance	<b>Environment:</b>	Temp.: 22.5°C Humi.: 54% Atm :100.5kPa

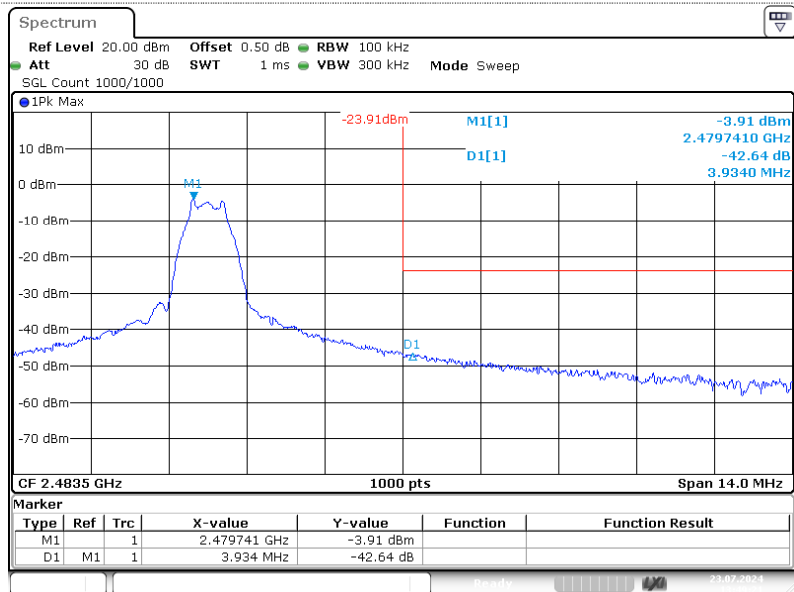
Please refer to the below plots:

### Lowest Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:43:32

### Highest Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:49:21

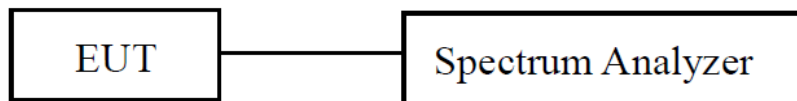


## **FCC §15.247(e) - POWER SPECTRAL DENSITY**

### **Applicable Standard**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### **EUT Setup**



### **Test Procedure**

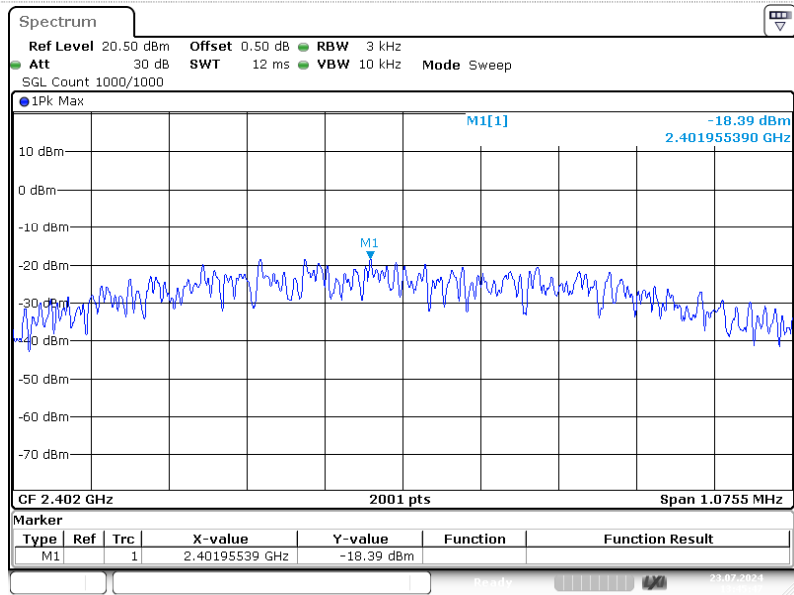
According to ANSI C63.10-2013 Section 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq [3 \times \text{RBW}]$ .
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

**Test Data**

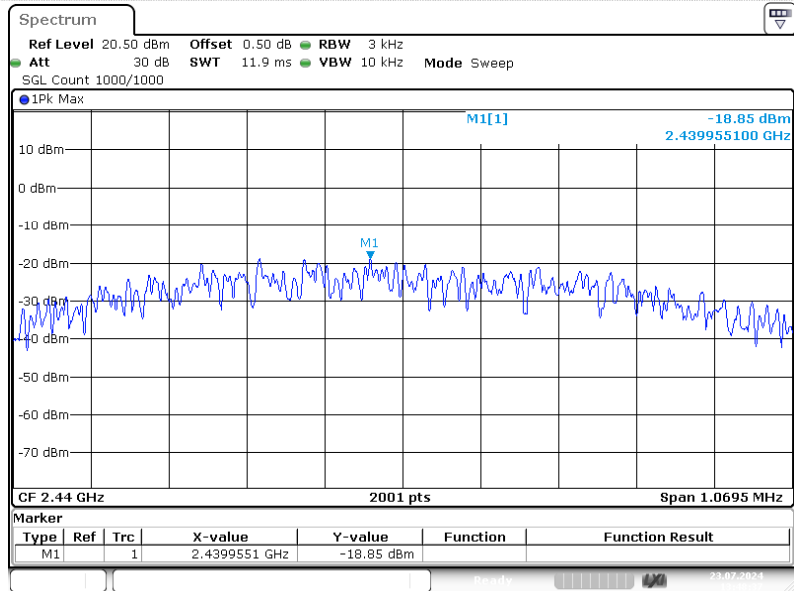
<b>Test Mode:</b>	Transmitting	<b>Test Engineer:</b>	Ash Lin
<b>Test Date:</b>	2024-07-23	<b>Test Voltage:</b>	DC 3.3V
<b>Test Result:</b>	Compliance	<b>Environment:</b>	Temp.: 22.5°C Humi.: 54% Atm :100.5kPa
<b>Test Channel</b>	<b>Test Frequency (MHz)</b>	<b>Power Spectral Density (dBm/3kHz)</b>	<b>Limit (dBm/3kHz)</b>
Lowest	2402	-18.39	≤8.00
Middle	2440	-18.85	≤8.00
Highest	2480	-19.06	≤8.00

**Lowest Channel**



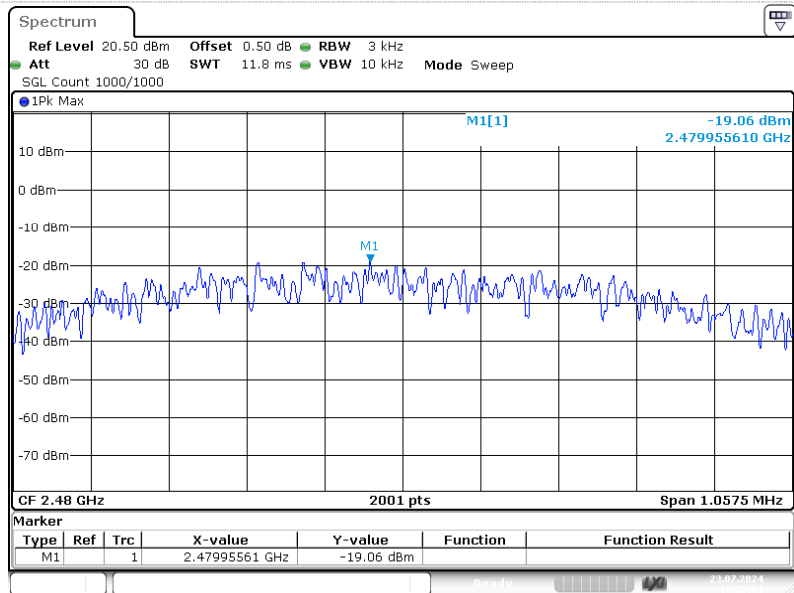
ProjectNo.:2407V34489E-RF Tester:Ash Lin  
Date: 23.JUL.2024 13:45:47

### Middle Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:40:38

### Highest Channel



ProjectNo.:2407V34489E-RF Tester:Ash Lin  
 Date: 23.JUL.2024 13:52:00

## **EUT PHOTOGRAPHS**

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Please refer to the attachment 2407V34489E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2407V34489E-RF -INP EUT INTERNAL PHOTOGRAPHS.

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## **TEST SETUP PHOTOGRAPHS**

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Please refer to the attachment 2407V34489E-RF-TSP SETUP PHOTOGRAPHS.

### **Declarations**

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk “★”.
2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor  $k=2$  with the 95.45% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).
6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***