TEST REPORT

Applicant Name:	FCC: Porta Phone Company Inc IC: PORTA PHONE CO., INC.
Address:	FCC: 145 Dean Knauss Drive Narragansett, Rhode Island 02882 United States IC: 145 Dean Knauss Drive Narragansett, RI 02882, United States of America
Report Number:	2401Y98785E-RF
FCC ID:	B4HEVXT2-M
IC:	3064A-EVXT2M

Test Standard (s)

FCC PART 15.247; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2; RSS-247 ISSUE 3, AUGUST 2023

Sample Description

Product Type:	Full Duplex 2.4 GHz Transceiver-Main
Model No.:	EVXT2-M
Multiple Model(s) No.:	N/A
Trade Mark:	EVADE PRO
Date Received:	2024/10/14
Issue Date:	2024/12/26

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ekko Wu

RF Engineer

Approved By:

Nancy Wang

RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "▼".

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Y98785E-RF	Original Report	2024/12/26

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

HVIN	EVXT2-M
FVIN	N/A
Product	Full Duplex 2.4 GHz Transceiver-Main
Tested Model	EVXT2-M
Multiple Model(s)	N/A
Frequency Range	2407-2475MHz
Maximum conducted Peak output power	18.02dBm
Modulation Technique	FLRC
Antenna Specification#	2dBi(It is provided by the applicant)
Voltage Range	DC 3.7V from battery
Sample number	2SOZ-1 for RF Conducted Test 2SOZ-2 for Radiated Emissions (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	N/A

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules and RSS-247 Issue 3, August 2023, RSS-GEN Issue 5, Feb. 2021Amendment 2 of the Innovation, Science and Economic Development Canada rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and RSS-247 Issue 3, August 2023, RSS-GEN Issue 5, Feb. 2021 Amendment 2 of the Innovation, Science and Economic Development Canada rules.

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

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
RF Frequency		56.6Hz(k=2, 95% level of confidence)
RF output power, conducted		0.86dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.60dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9 kHz~150 KHz	3.63dB(k=2, 95% level of confidence)
	150 kHz ~30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	9kHz - 30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.34dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.40dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.64dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
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.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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. : 715558, the FCC Designation No. : CN5045.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0023.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

Channel List#

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

Note:
1. The equipment has designed 69 channels totally, but only 20 channels selected from the 69 channels active at same time, which were separated by more than 2MHz.
2. EUT was test in channel 1, 44, 69.

EUT Exercise Software

EUT was configured to testing mode by applicant and power level is below. The power level was provided by the manufacturer.

Mode	Data rate	Power Level#		
		Low Channel	Middle Channel	High Channel
FLRC	1.3Mbps	Default	Default	Default

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

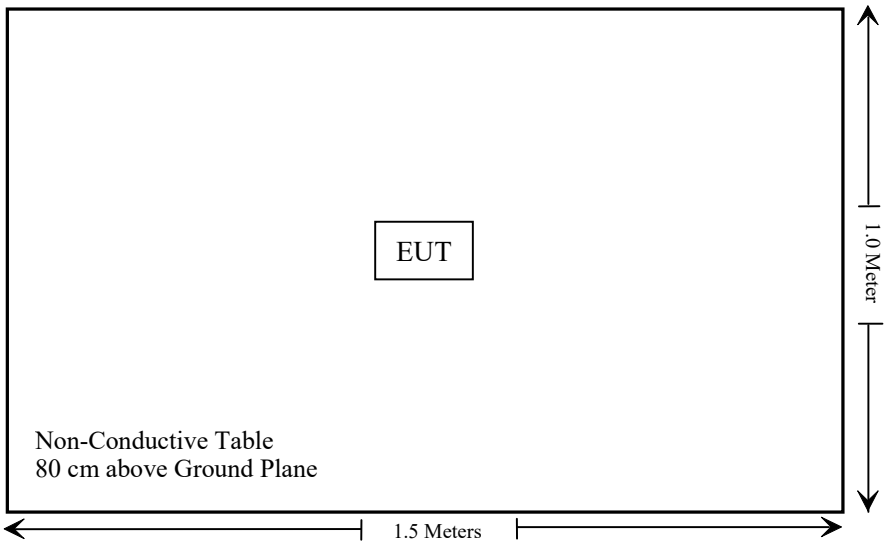
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

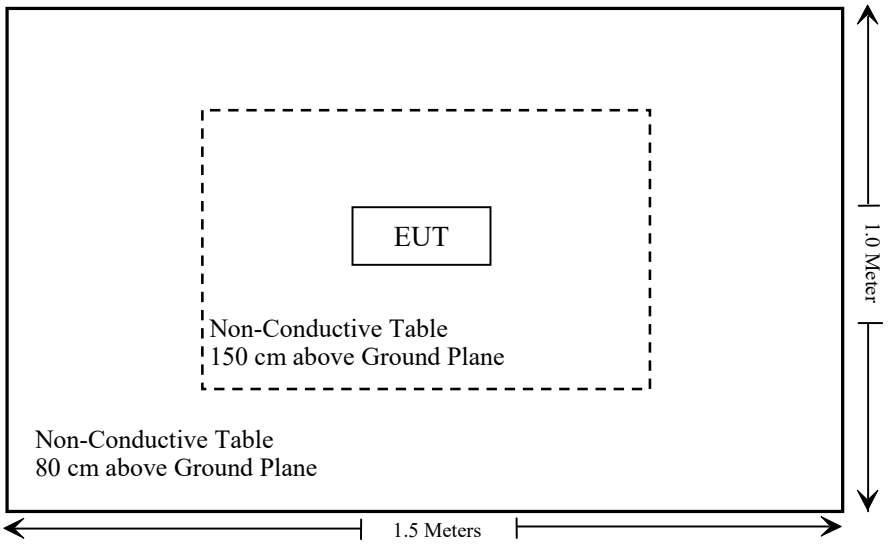
Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emission below 1GHz:



For Radiated Emission above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	ISEDC Rules	Description of Test	Result
FCC §15.247 (i) & §1.1307 (b) (1) & §2.1093	RSS-102	RF Exposure	Compliant
§15.203	RSS-Gen §6.8	Antenna Requirement	Compliant
§15.207(a)	RSS-Gen §8.8	AC Line Conducted Emissions	Not Applicable
§15.205, §15.209 & §15.247(d)	RSS-247 § 5.5	Radiated Emissions	Compliant
§15.247(a)(1)	RSS- Gen§6.7, RSS-247 § 5.1 (a)	99% Occupied Bandwidth & 20 dB Emission Bandwidth	Compliant
§15.247(a)(1)	RSS-247 § 5.1 (b)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	RSS-247 § 5.1 (d)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	RSS-247 § 5.1 (d)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	RSS-247 § 5.1(b) &§ 5.4(b)	Peak Output Power Measurement	Compliant
§15.247(d)	RSS-247 § 5.5	Band edges	Compliant

Not Applicable: EUT only powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test_ Below 1GHz					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber A Cable 1	N/A	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Radiated Emission Test_ Above 1GHz					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
Unknown	RF Cable	KMSE	735	2024/06/18	2025/06/17
Unknown	RF Cable	UFA147	219661	2024/06/18	2025/06/17
Unknown	RF Cable	XH750A-N	J-10M	2024/06/18	2025/06/17
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	2024/06/18	2025/06/17
A.H.System	Pre-amplifier	PAM-1840VH	190	2024/06/18	2025/06/17
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2024/06/18	2025/06/17
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
Band Edge					
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Harmonics					
A.H.System	Preamplifier	PAM-0118P	489	2024/11/15	2025/11/14
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200982	2024/09/20	2025/09/19
MARCONI	10dB Attenuator	6534/3	2942	2024/06/27	2025/06/26

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

FCC §15.247 (i) & §1.1307 (B) (1) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), 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.

Measurement Result

Please refer to SAR test report: 2401Y98785E-SAA.

RSS-102 – RF EXPOSURE

Applicable Standard

According to RSS-102 Issue 6, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

Result

Compliance. Please refer to SAR test report: 2401Y98785E-SAB.

FCC §15.203 & RSS-GEN §6.8 - ANTENNA REQUIREMENT

Applicable Standard

According to 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.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:
This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antenna arrangements which were permanently attached for FHSS and the gain is 2dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Type	Antenna Gain#	Impedance
Monopole	2dBi	50Ω

Result: Compliant

FCC §15.205, §15.209 & §15.247(d) & RSS-247§ 5.5 - RADIATED EMISSIONS

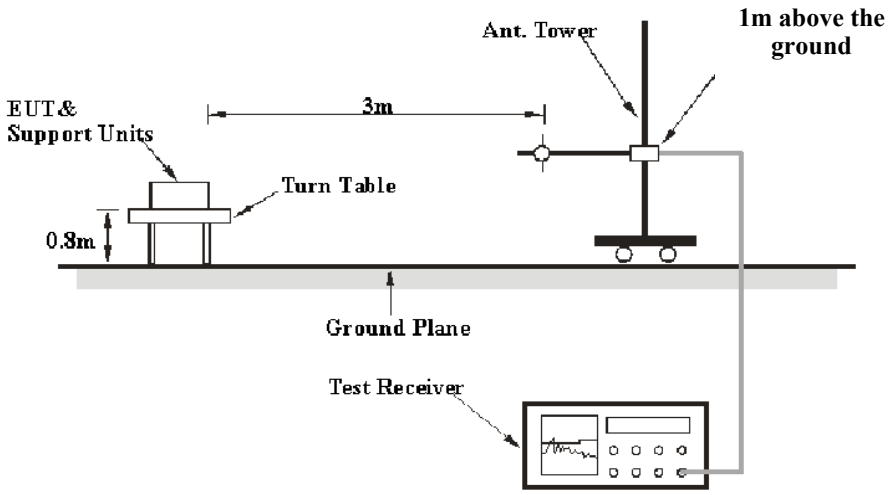
Applicable Standard

FCC §15.205; §15.209; §15.247(d) and RSS-247 §5.5

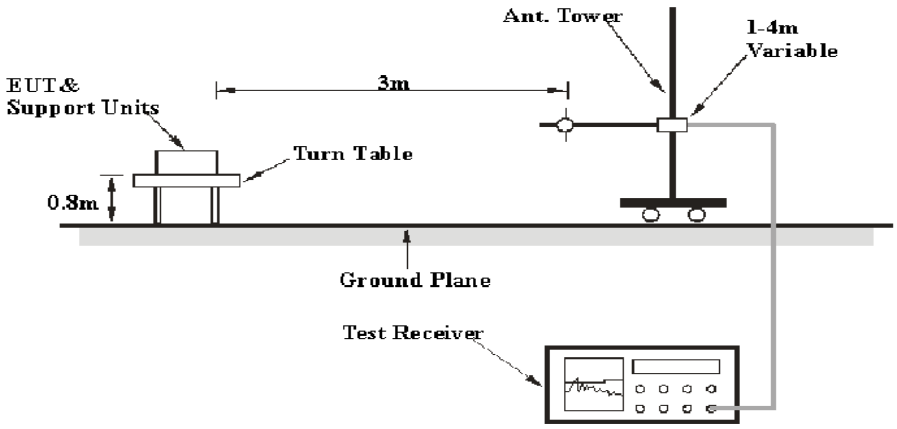
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

EUT Setup

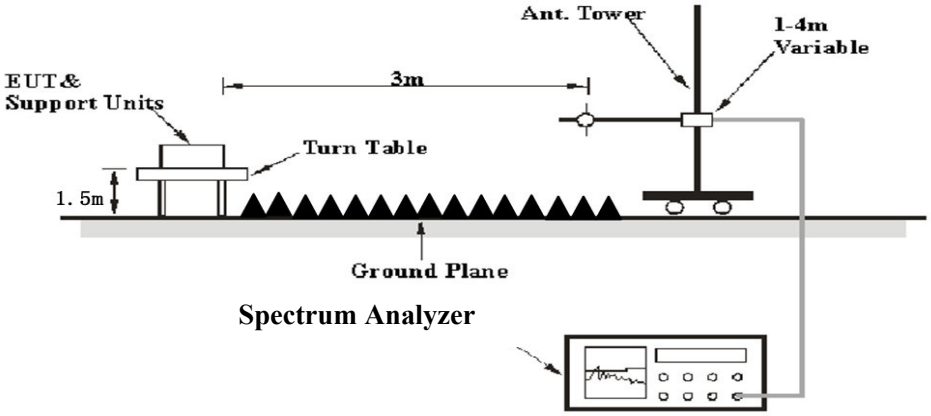
9 kHz-30MHz:



30MHz-1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, FCC 15.247 limits and RSS-247/RSS-Gen limits.

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

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

Test Procedure

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

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, 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.

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.

All emissions under the average limit and under the noise floor have not recorded in the report.

Factor & Over Limit/Margin Calculation

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

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit/Margin = Level/Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	22~25.1 ℃
Relative Humidity:	50~54 %
ATM Pressure:	101 kPa

The testing was performed by Anson Su on 2024-10-22 for below 1GHz and Karl Xu on 2024-10-29 for above 1GHz band edge test and Dylan Yang on 2024-12-21 for above 1GHz harmonics and other emissions test.

EUT operation mode: Transmitting

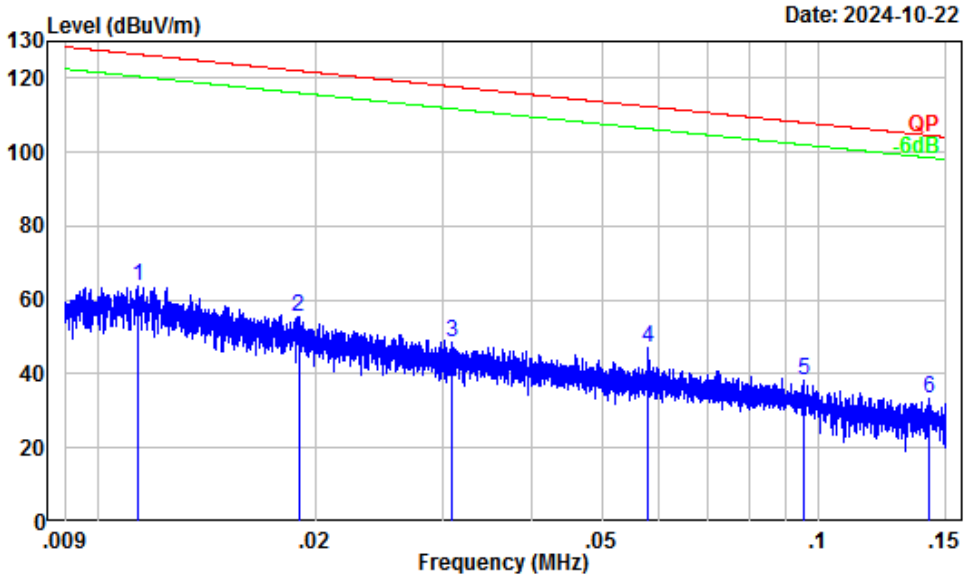
Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Z-axis of orientation was recorded.

The spurious emission from 9 kHz-30MHz of IC RSS-Gen standard, the unit of final result on the test plots are dBµV/m, so the limit should be added by 51,5 dB from dBµA/m to dBµV/m.

9 kHz-30MHz: (*Maximum output power mode, High Channel)*

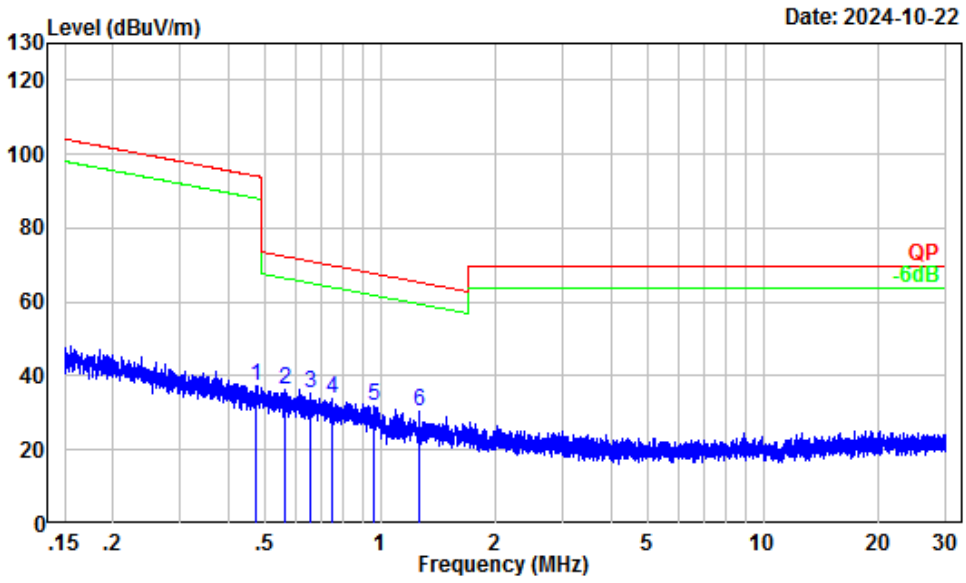
Note: When the test result of peak was less than the limit of QP/Average more than 6dB, just peak value were recorded.

Parallel (worst case)



Site : Chamber A
Condition : 3m
Project Number: 2401Y98785E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	36.99	26.81	63.80	126.49	-62.69	Peak
2	0.02	33.10	22.41	55.51	122.04	-66.53	Peak
3	0.03	27.25	21.38	48.63	117.77	-69.14	Peak
4	0.06	21.99	25.12	47.11	112.34	-65.23	Peak
5	0.10	17.51	20.53	38.04	108.02	-69.98	Peak
6	0.14	15.09	18.16	33.25	104.55	-71.30	Peak

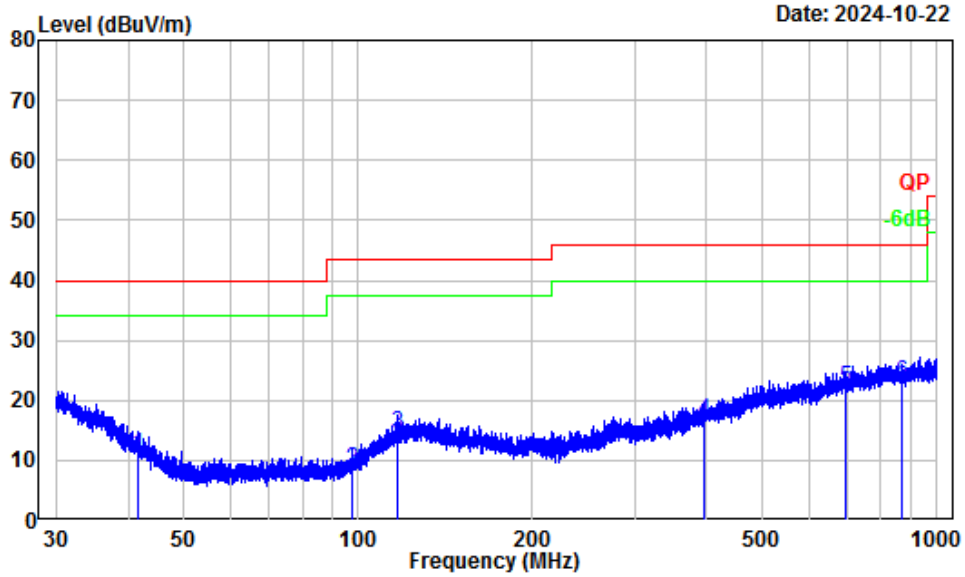


Site : Chamber A
Condition : 3m
Project Number: 2401Y98785E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.47	4.02	33.47	37.49	94.08	-56.59	Peak
2	0.56	2.73	33.69	36.42	72.57	-36.15	Peak
3	0.66	1.60	33.76	35.36	71.20	-35.84	Peak
4	0.75	0.51	33.38	33.89	70.05	-36.16	Peak
5	0.96	-1.31	33.32	32.01	67.81	-35.80	Peak
6	1.26	-2.51	32.83	30.32	65.40	-35.08	Peak

30MHz-1GHz: (*Maximum output power mode, High Channel)*

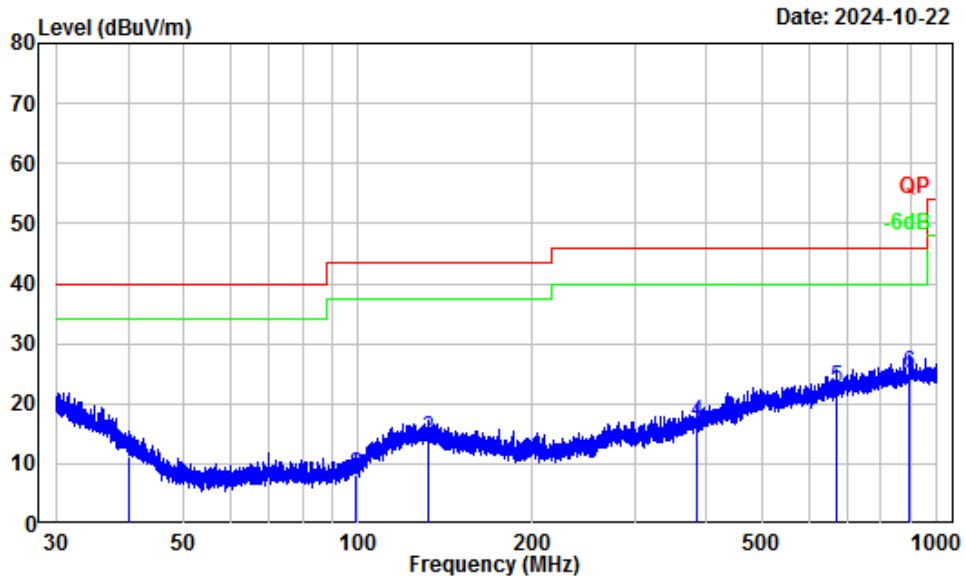
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: 2401Y98785E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	41.62	-13.57	24.30	10.73	40.00	-29.27	QP
2	97.41	-16.69	25.12	8.43	43.50	-35.07	QP
3	116.54	-11.89	26.36	14.47	43.50	-29.03	QP
4	396.24	-8.59	25.13	16.54	46.00	-29.46	QP
5	697.47	-3.53	25.48	21.95	46.00	-24.05	QP
6	872.95	-1.56	24.56	23.00	46.00	-23.00	QP

Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: 2401Y98785E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	40.21	-12.51	23.75	11.24	40.00	-28.76	QP
2	98.75	-16.28	24.53	8.25	43.50	-35.25	QP
3	131.82	-11.30	25.40	14.10	43.50	-29.40	QP
4	383.93	-9.04	25.95	16.91	46.00	-29.09	QP
5	669.02	-3.85	26.56	22.71	46.00	-23.29	QP
6	896.60	-1.31	26.41	25.10	46.00	-20.90	QP

Above 1GHz:

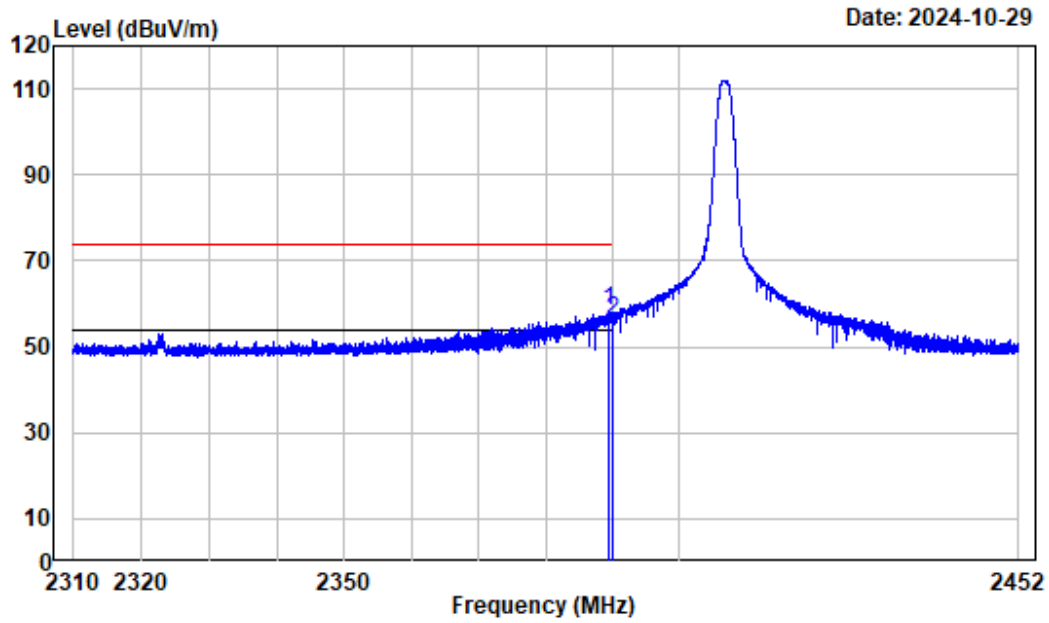
Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/AV					
Low Channel							
4814.00	67.86	PK	H	-7.77	60.09	74	-13.91
4814.00	49.18	AV	H	-7.77	41.41	54	-12.59
4814.00	67.32	PK	V	-7.77	59.55	74	-14.45
4814.00	49.03	AV	V	-7.77	41.26	54	-12.74
Middle Channel							
4900.00	69.07	PK	H	-7.52	61.55	74	-12.45
4900.00	49.10	AV	H	-7.52	41.58	54	-12.42
4900.00	67.95	PK	V	-7.52	60.43	74	-13.57
4900.00	49.79	AV	V	-7.52	42.27	54	-11.73
High Channel							
4950.00	69.15	PK	H	-7.62	61.53	74	-12.47
4950.00	49.54	AV	H	-7.62	41.92	54	-12.08
4950.00	67.98	PK	V	-7.62	60.36	74	-13.64
4950.00	49.86	AV	V	-7.62	42.24	54	-11.76

Note:

Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
Other emissions which were more than 20dB below limit or on noise floor level was not recorded.

Test plots for Band Edge Measurements (Radiated):

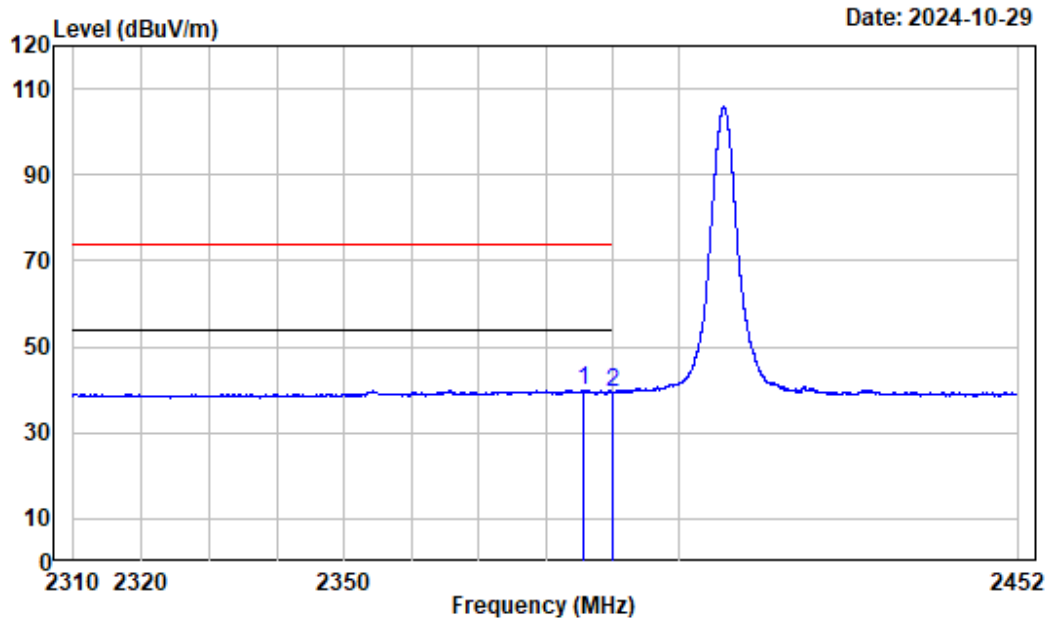
Test Channel:	2407MHz	Ant. Polar. :	Horizontal _Peak



Condition : Horizontal
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2407

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.494	-3.20	61.44	58.24	74.00	-15.76	Peak
2	2390.000	-3.20	59.19	55.99	74.00	-18.01	Peak

Test Channel:	2407MHz	Ant. Polar. :	Horizontal _Average

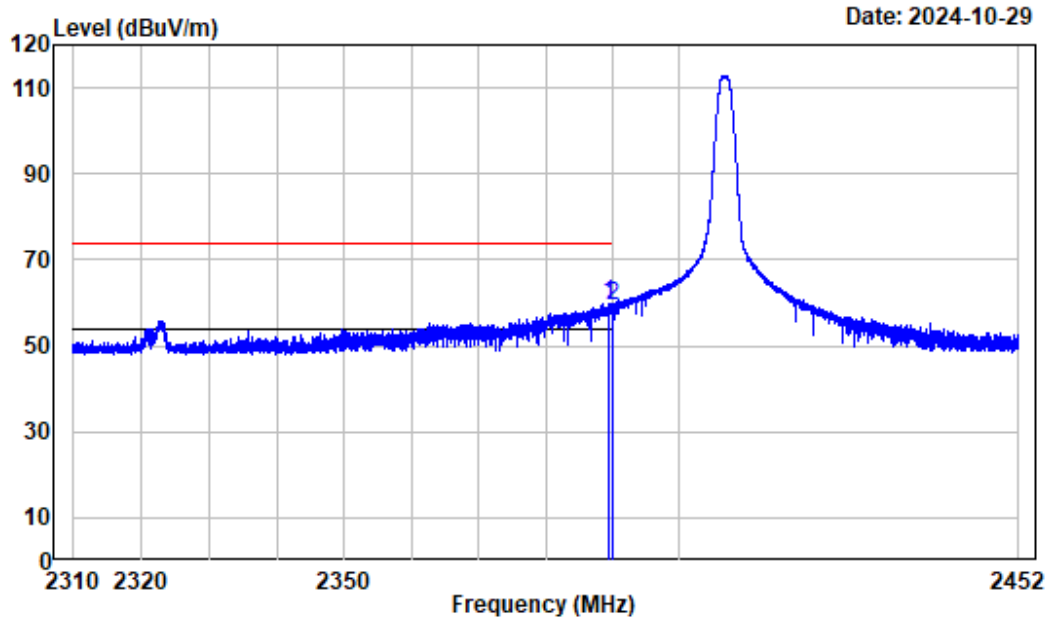


Condition : Horizontal
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2407_Ave

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2385.642	-3.19	43.12	39.93	54.00	-14.07	Average
2	2390.000	-3.20	42.51	39.31	54.00	-14.69	Average

Spectrum Setting: RBW=1MHz, VBW=10Hz, Detector= Peak

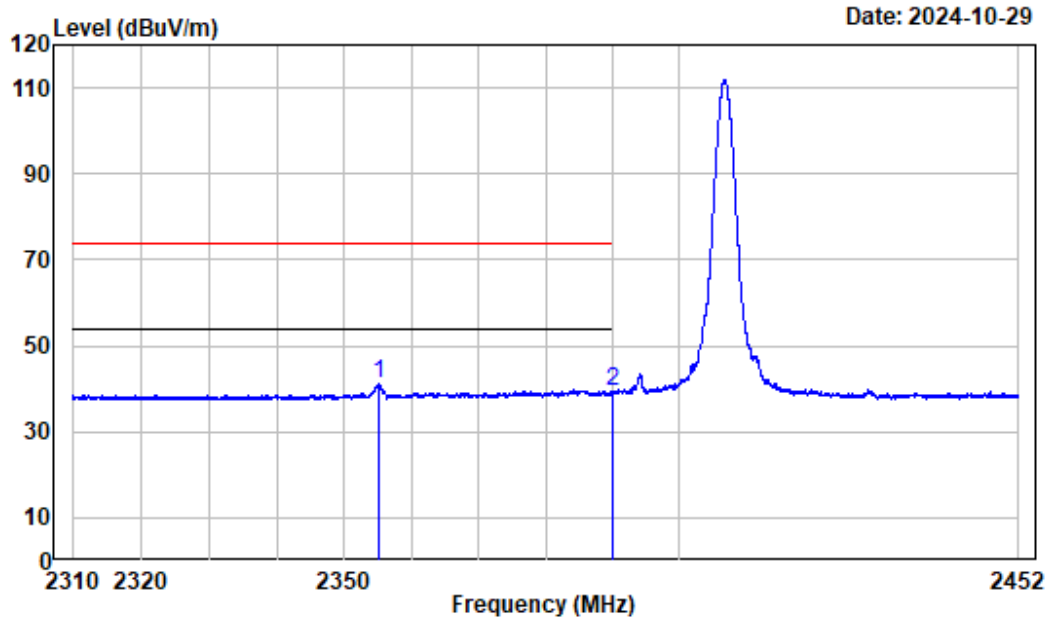
Test Channel:	2407MHz	Ant. Polar. :	Vertical _Peak



Condition : Vertical
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2407

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.477	-3.20	62.90	59.70	74.00	-14.30	Peak
2	2390.000	-3.20	62.47	59.27	74.00	-14.73	Peak

Test Channel:	2407MHz	Ant. Polar. :	Vertical _Average

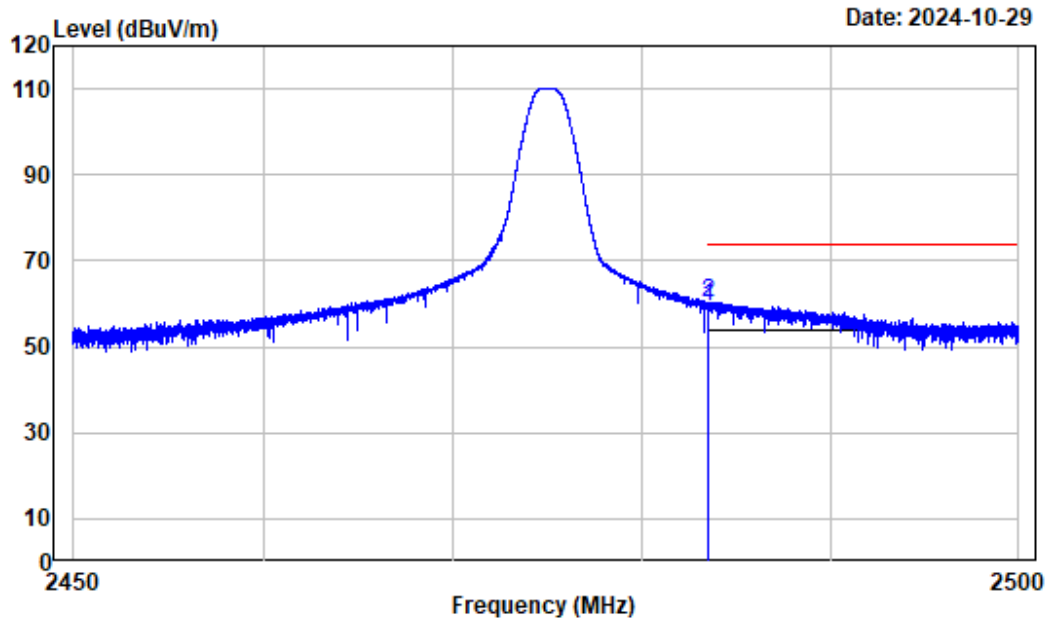


Condition : Vertical
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2407_Ave

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2355.037	-3.15	44.31	41.16	54.00	-12.84	Average
2	2390.000	-3.20	42.43	39.23	54.00	-14.77	Average

Spectrum Setting: RBW=1MHz, VBW=10Hz, Detector= Peak

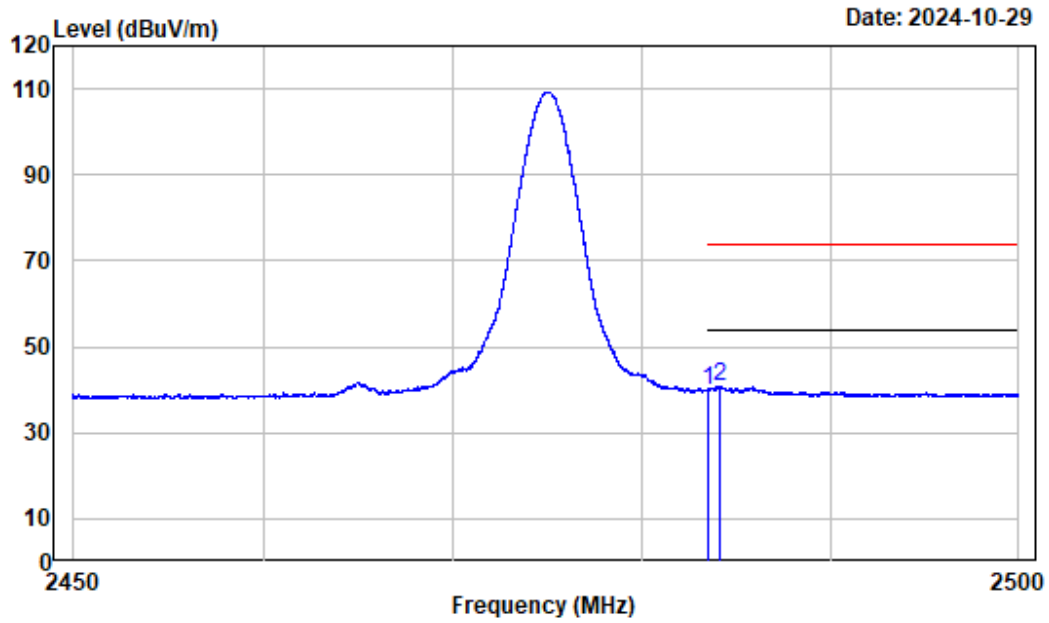
Test Channel:	2475MHz	Ant. Polar. :	Horizontal _Peak



Condition : Horizontal
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2475

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	62.44	59.27	74.00	-14.73	Peak
2	2483.504	-3.17	63.55	60.38	74.00	-13.62	Peak

Test Channel:	2475MHz	Ant. Polar. :	Horizontal _Average

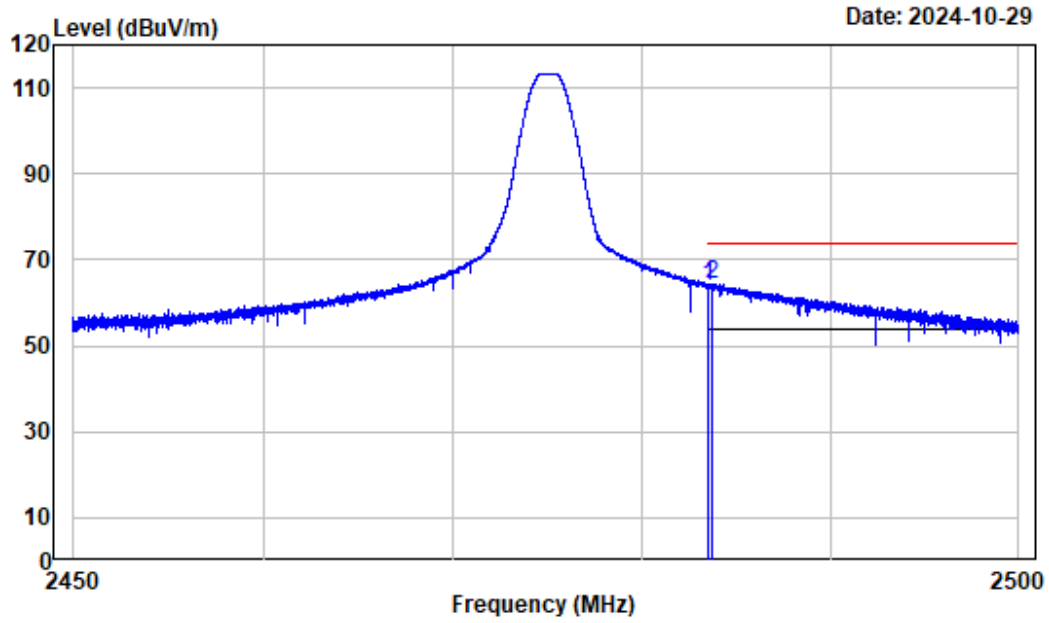


Condition : Horizontal
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2475_Ave

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	43.21	40.04	54.00	-13.96	Average
2	2484.148	-3.17	44.07	40.90	54.00	-13.10	Average

Spectrum Setting: RBW=1MHz, VBW=10Hz, Detector= Peak

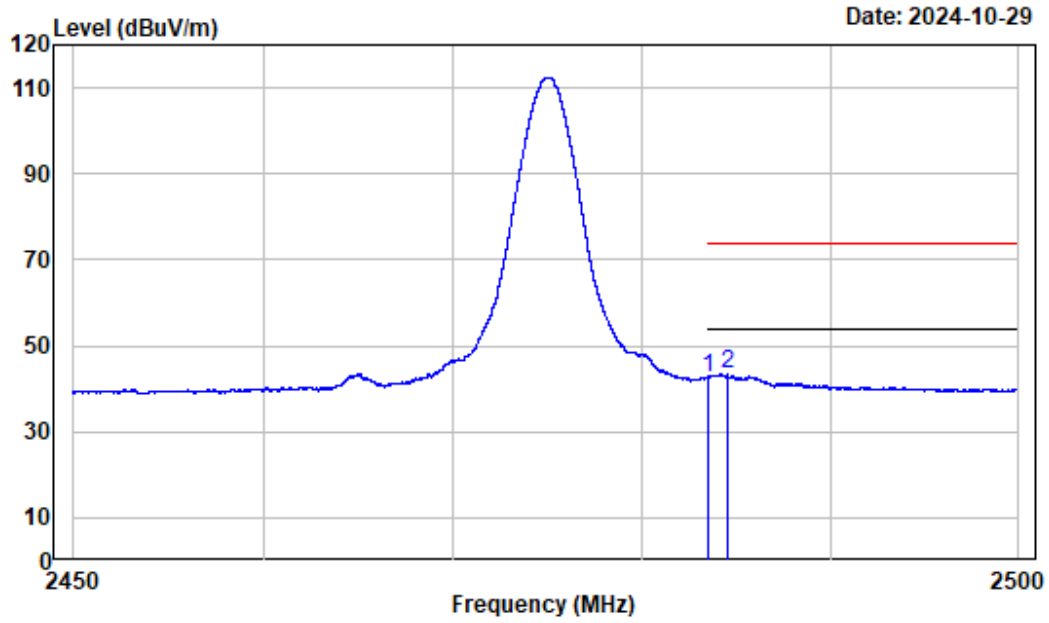
Test Channel:	2475MHz	Ant. Polar. :	Vertical _Peak



Condition : Vertical
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2475

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	67.05	63.88	74.00	-10.12	Peak
2	2483.654	-3.17	67.55	64.38	74.00	-9.62	Peak

Test Channel:	2475MHz	Ant. Polar. :	Vertical _Average

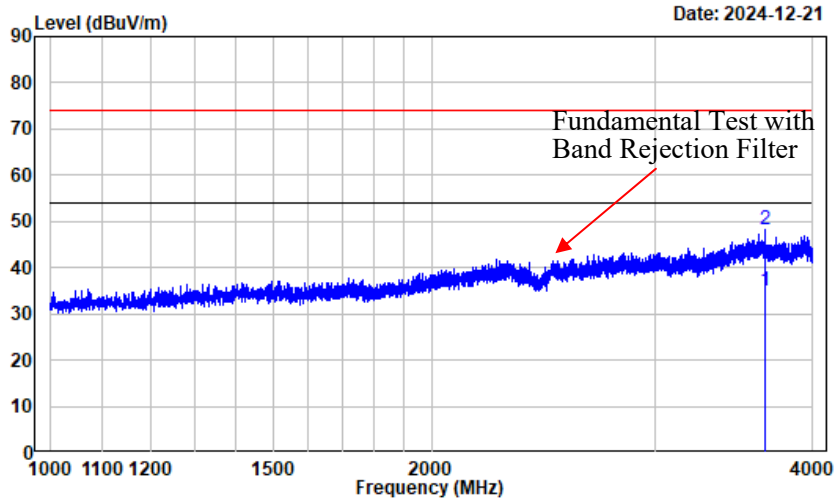


Condition : Vertical
Project Number: 2401Y98785E-RF
Tester : Karl Xu
Note : FHSS_2475_Ave

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2483.500	-3.17	45.82	42.65	54.00	-11.35	Average
2	2484.486	-3.17	46.47	43.30	54.00	-10.70	Average

Spectrum Setting: RBW=1MHz, VBW=10Hz, Detector= Peak

Listed with the worst harmonic margin test plot:

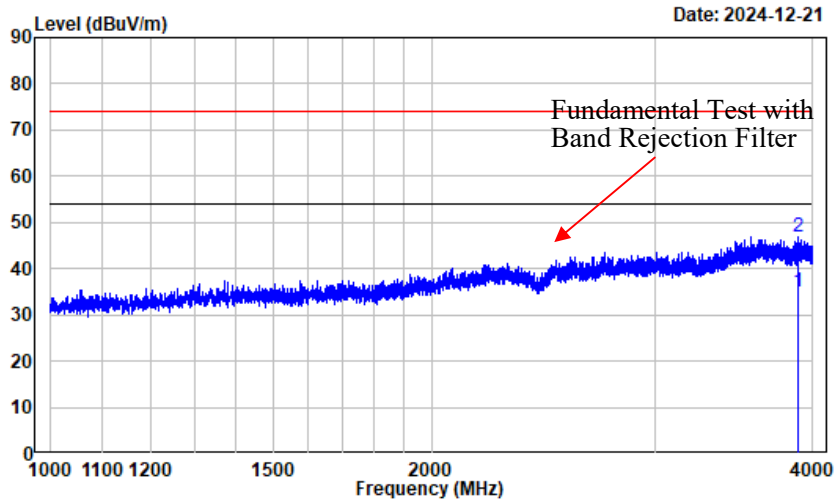
Horizontal	
1-4GHz	

Condition : Horizontal
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
: Average reading: RBW:1MHz VBW:3kHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	3666.583	-9.68	44.54	34.86	54.00	-19.14	Average
2	3666.583	-9.68	57.81	48.13	74.00	-25.87	Peak

Vertical

1-4GHz

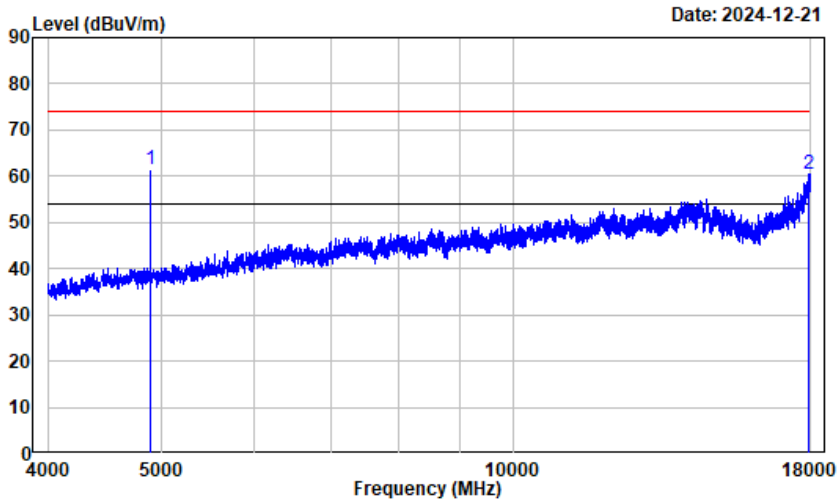


Condition : Vertical
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
: Average reading: RBW:1MHz VBW:3kHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	3900.613	-9.83	44.86	35.03	54.00	-18.97	Average
2	3900.613	-9.83	56.73	46.90	74.00	-27.10	Peak

Horizontal _Peak

4-18GHz

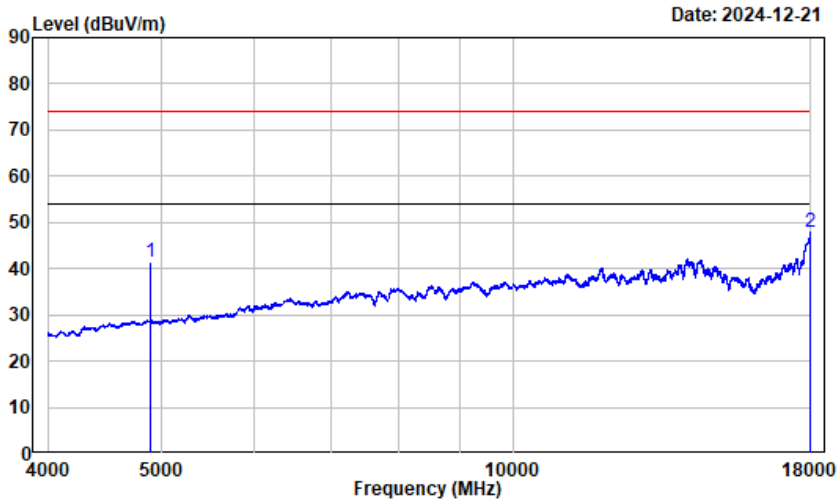


Condition : Horizontal
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4900.000	-7.52	69.07	61.55	74.00	-12.45	Peak
2	17935.240	12.88	47.62	60.50	74.00	-13.50	Peak

Horizontal _Average

4-18GHz

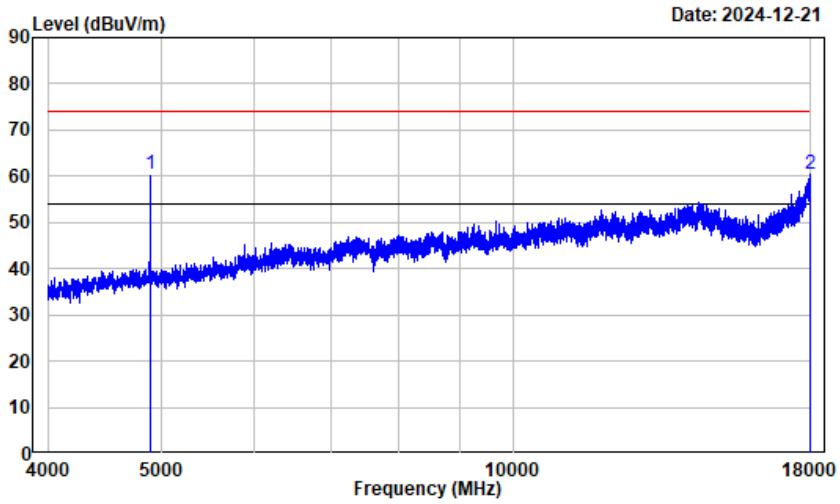


Condition : Horizontal
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Average reading: RBW:1MHz VBW:3kHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4900.000	-7.52	49.10	41.58	54.00	-12.42	Average
2	17998.250	13.19	34.53	47.72	54.00	-6.28	Average

Vertical _Peak

4-18GHz

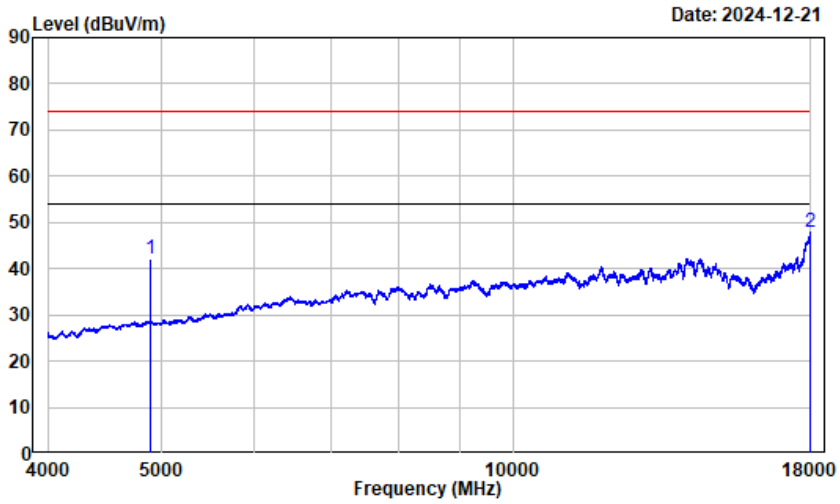


Condition : Vertical
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4900.000	-7.52	67.95	60.43	74.00	-13.57	Peak
2	17968.500	13.05	47.51	60.56	74.00	-13.44	Peak

Vertical _Average

4-18GHz

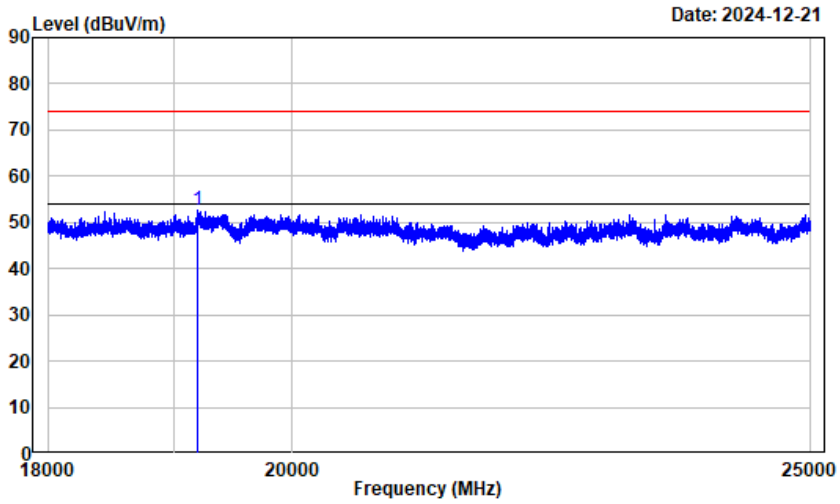


Condition : Vertical
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Average reading: RBW:1MHz VBW:3kHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4900.000	-7.52	49.79	42.27	54.00	-11.73	Average
2	18000.000	13.20	34.64	47.84	54.00	-6.16	Average

Horizontal

18-25GHz

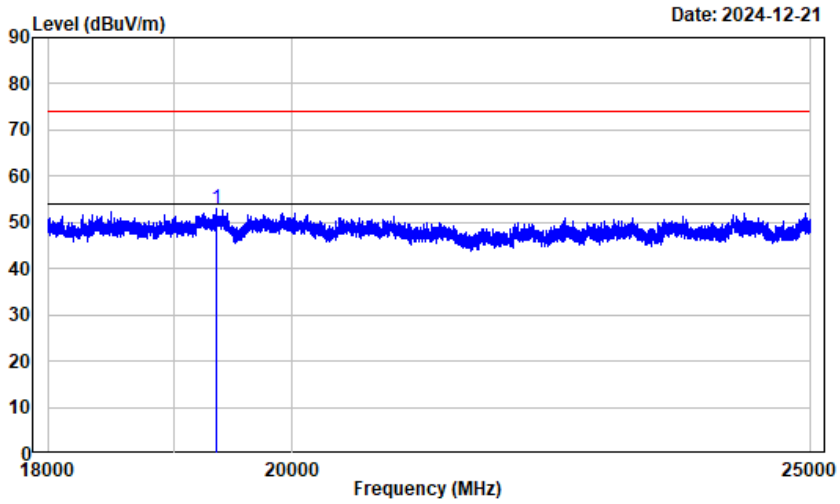


Condition : Horizontal
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	19200.650	15.32	37.30	52.62	74.00	-21.38	Peak

Vertical

18-25GHz



Condition : Vertical
Project No. : 2401Y98785E-RF
Tester : Dylan Yang
Spectrum setting: Peak reading: RBW:1MHz VBW:3MHz Detector:Peak
Note : 2.4G_2450

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	19360.790	15.13	37.76	52.89	74.00	-21.11	Peak

FCC §15.247(a) (1) & RSS-247 § 5.1 (b) - CHANNEL SEPARATION TEST

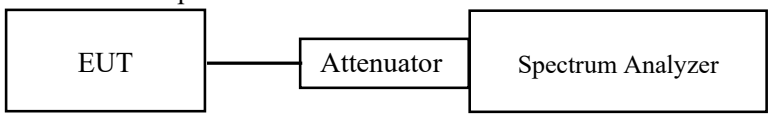
Applicable Standard

Frequency hopping systems (FHSs) shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Test Procedure

According to ANSI C63.10-2013 section 7.8.2

1. Set the EUT in transmitting mode, maxhold the channel and in Operating mode, RBW was set at 100 kHz, VBW≥ 3RBW max-hold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Rainbow Zhu on 2024-10-23.

EUT operation mode: Transmitting

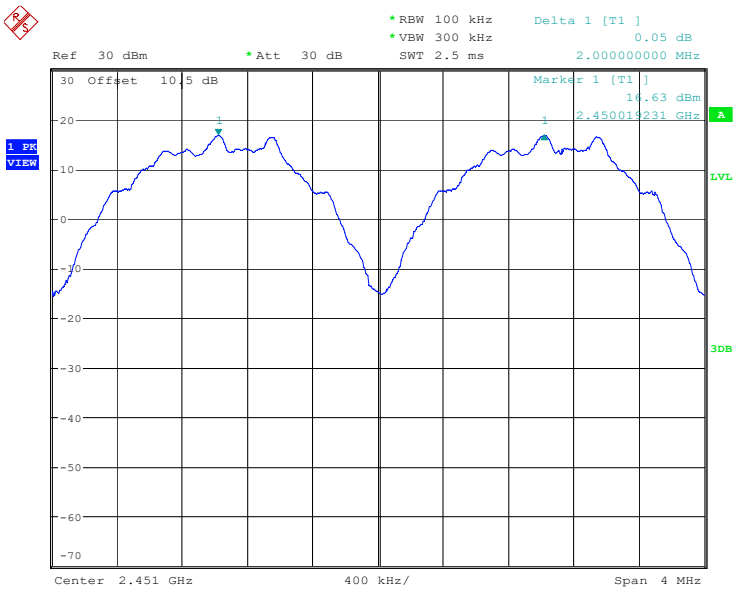
Test Result: Compliant

Note: According to frequency table in page 7 and inverstigating the hopping channel test in page 46, the minimum channel separation is the worst case which were recorded as below:

Test Mode	Test Frequency (MHz)	Channel Separation (MHz)	Limits (MHz)
FLRC	Hop_2450	2.000	1.013
Note: Limit= Two-thirds of the 20 dB bandwidth			

Please refer to the below plots:

Hop_2450MHz



ProjectNo.:2401Y98785E-RF Tester:Rainbow Zhu
Date: 23.OCT.2024 13:28:59

FCC §15.247(a) (1) & RSS-GEN § 6.7 & RSS-247 § 5.1 (a) - 99% OCCUPIED BANDWIDTH & 20 dB EMISSION BANDWIDTH

Applicable Standard

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the "20 dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated 20 dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

Test Procedure

According to ANSI C63.10-2013 section 7.8.7

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

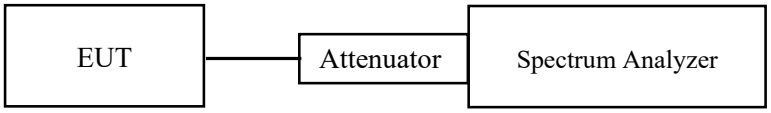
The following conditions shall be observed for measuring the occupied bandwidth and 20 dB bandwidth:
• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / 20 dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / 20 dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

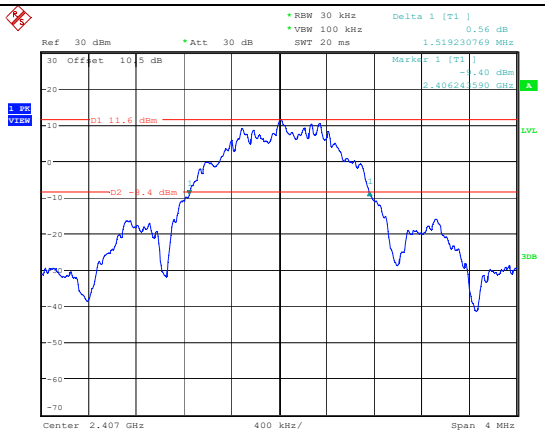
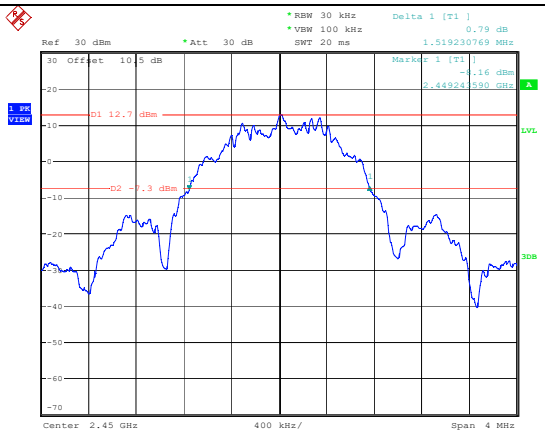
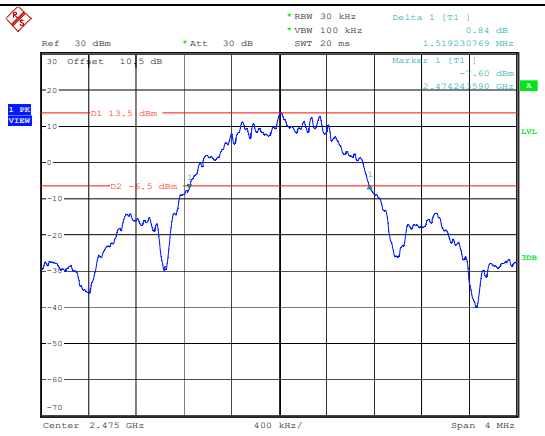
The testing was performed by Rainbow Zhu on 2024-10-23.

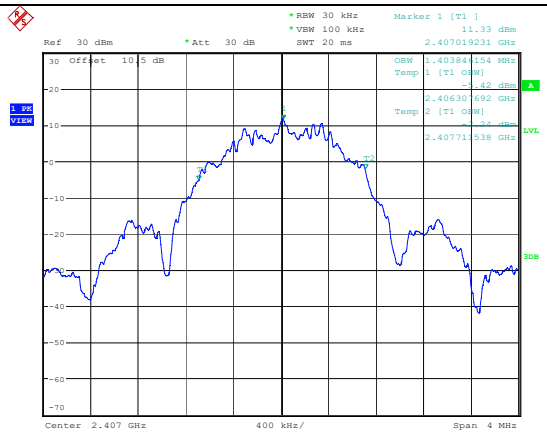
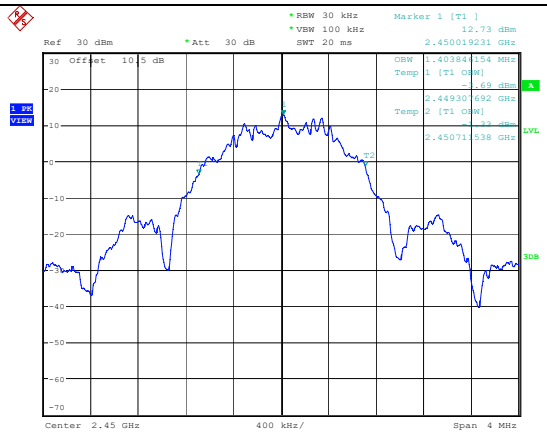
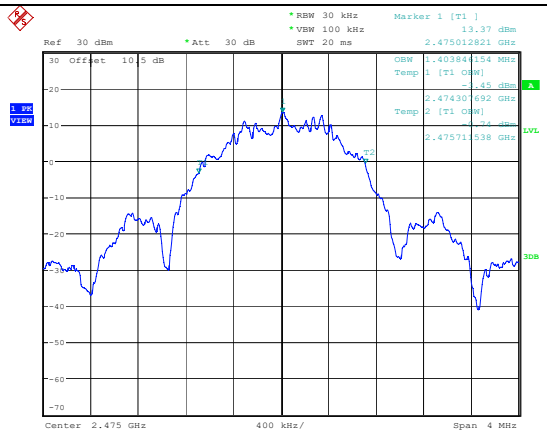
EUT operation mode: Transmitting

Test Result: Compliant

Mode	Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)	OBW (MHz)
FLRC	Lowest	2407	1.519	1.404
	Middle	2450	1.519	1.404
	Highest	2475	1.519	1.404

Please refer to the below plots:

20 dB Bandwidth	
Low Channel	
Middle Channel	
High Channel	

99% Emission Bandwidth	
Low Channel	
Middle Channel	
High Channel	

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

Frequency hopping systems (FHSs) in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

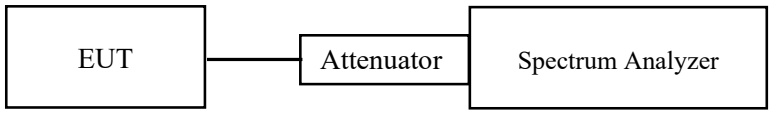
Test Procedure

According to ANSI C63.10-2013 section 7.8.3

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the max-hold function record the quantity of the channel.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

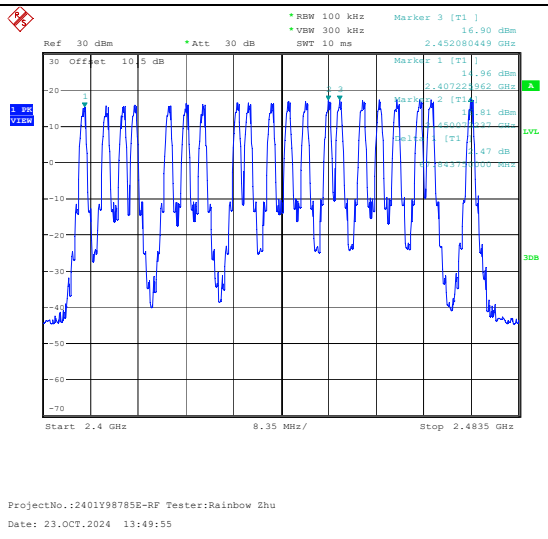
Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Rainbow Zhu on 2024-10-23.

EUT operation mode: Transmitting

Test Result: Compliant

Mode	Frequency Range (MHz)	Number of Hopping Channel (CH)	Limit (CH)
FLRC	2400-2483.5	20	≥15

Hopping Channel	
FLRC	

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - TIME OF OCCUPANCY (DWELL TIME)

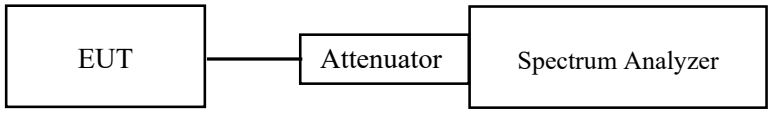
Applicable Standard

Frequency hopping systems (FHSs) in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Procedure

According to ANSI C63.10-2013 section 7.8.4

1. The EUT was worked in channel hopping.
2. Set the RBW to: 1MHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 0Hz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Recorded the time of single pulses



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

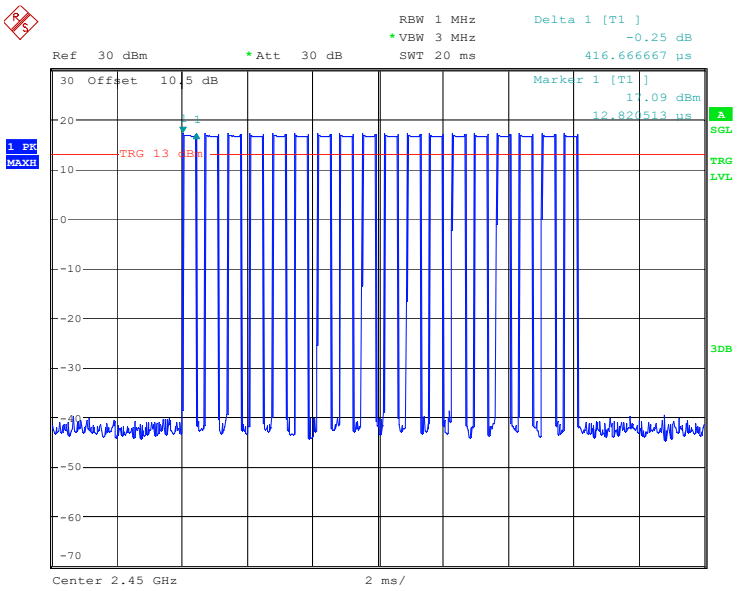
The testing was performed by Rainbow Zhu on 2024-10-23.

EUT operation mode: Transmitting

Test Result: Compliant

Test Frequency (MHz)	Pulse Width (ms)	Observation time (s)	Hopping Numbers in Observation time	Dwell Time (s)	Limit (s)
Hop_2450	7.506	8.0	20	0.150	0.400
Note: Observation time= Hopping Channel Number× 0.4= 20× 0.4= 8 (s) Pulse Width = Pulse Time* Pulse Number =0.417ms*18= 7.506ms Dwell Time = Pulse Width × Hopping Numbers in Observation time					

Pulse Time: 0.417ms & Maximum Pulse number in one hop: 18



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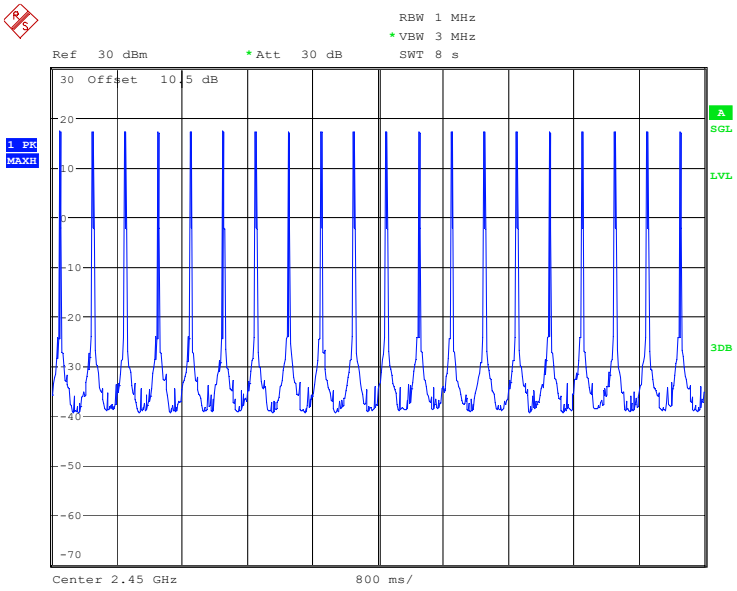
Hopping Numbers in 8s



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FCC §15.247(b) (1) & RSS-247§ 5.1(b) &§ 5.4(b) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

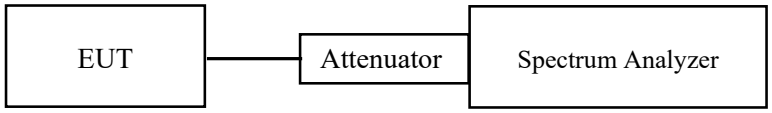
For frequency hopping systems (FHSs) operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W (see Section 5.4(e) for exceptions).

Frequency hopping systems (FHSs) shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the -20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two thirds of the -20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W.

Test Procedure

According to ANSI C63.10-2013 section 7.8.5

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

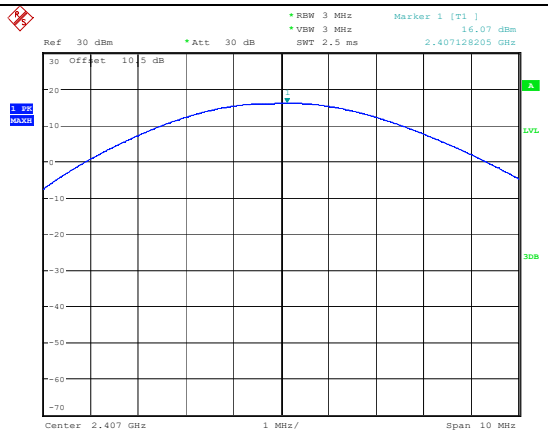
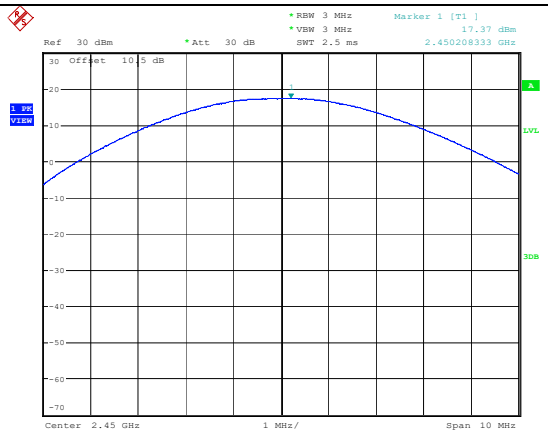
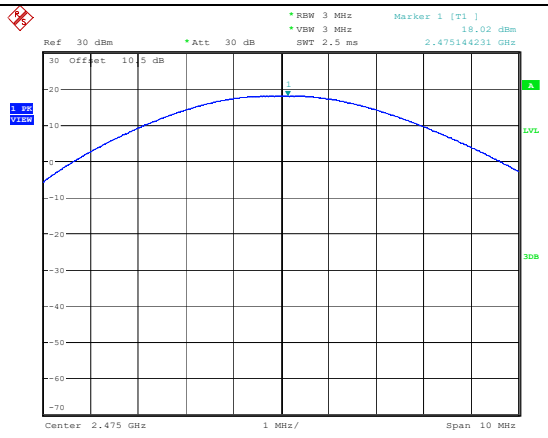
Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

The testing was performed by Rainbow Zhu on 2024-10-23.

EUT operation mode: Transmitting

Test Result: Compliant

Mode	Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
FLRC	Lowest	2407	16.07	21
	Middle	2450	17.37	21
	Highest	2475	18.02	21
Note: the antenna gain=2dBi, the maximum EIRP=20.02dBm<36dBm				

Low Channel	 ProjectNo.:2401Y98785E-RF Tester:Rainbow Zhu Date: 23.OCT.2024 11:18:08
Middle Channel	 ProjectNo.:2401Y98785E-RF Tester:Rainbow Zhu Date: 23.OCT.2024 11:19:12
High Channel	 ProjectNo.:2401Y98785E-RF Tester:Rainbow Zhu Date: 23.OCT.2024 11:19:48

FCC §15.247(d) & RSS-247 § 5.5 - BAND EDGES TESTING

Applicable Standard

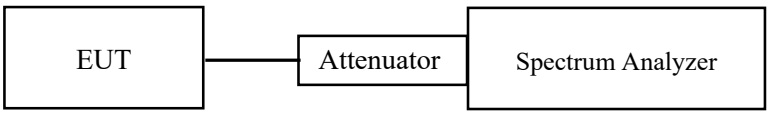
According to FCC §15.247(d) & RSS-247 § 5.5.

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)) & RSS-Gen.

Test Procedure

According to ANSI C63.10-2013 section 6.10

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Note: A short RF cable with low cable loss connected to the EUT antenna port, which was provided by client or lab, the cable loss was add with offset into test equipment, the total offset consists of attenuator and/or RF cable and/or power splitter loss.

Test Data

Environmental Conditions

Temperature:	26 ℃
Relative Humidity:	46 %
ATM Pressure:	101 kPa

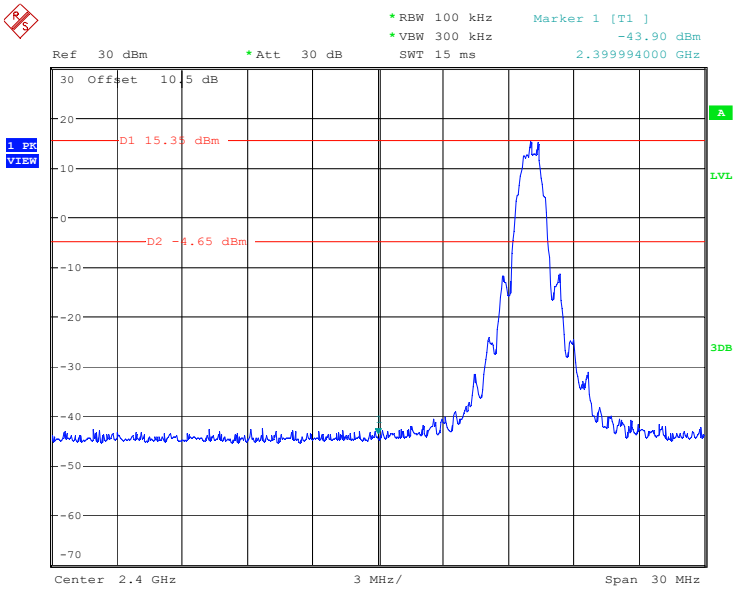
The testing was performed by Rainbow Zhu on 2024-10-23.

EUT operation mode: Transmitting

Test Result: Compliant

Conducted Band Edge Result:

Low Channel



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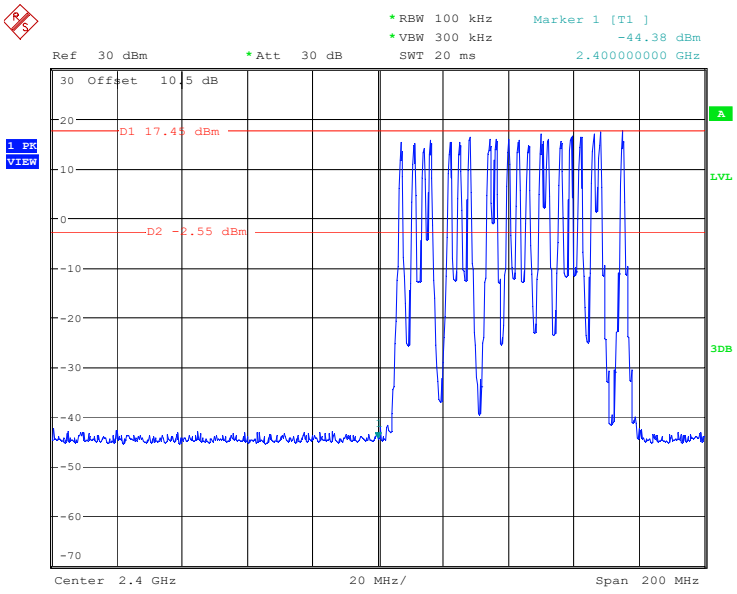
Hop_Low Channel



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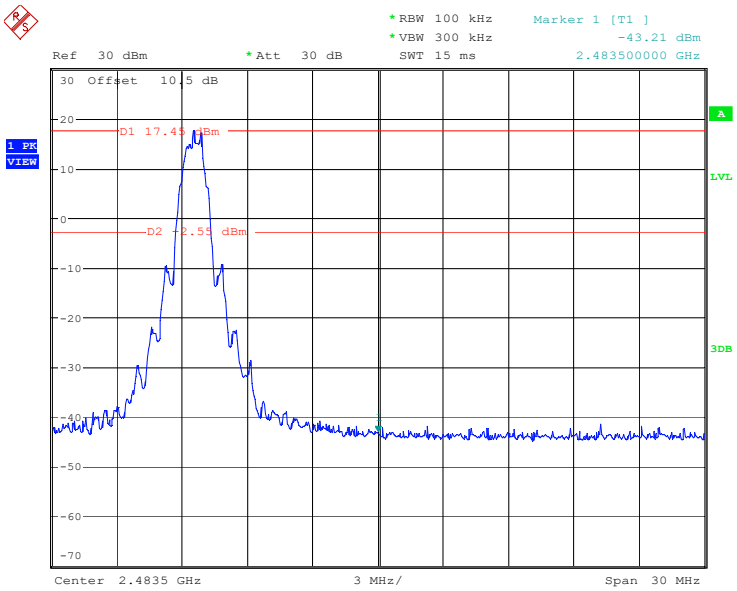
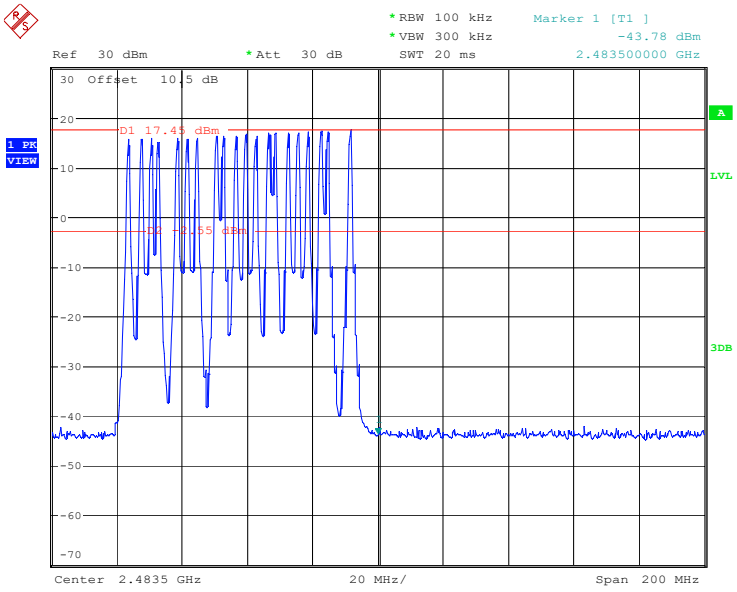
High Channel



ProjectNo.:2401Y98785E-RF Tester:Rainbow Zhu

Date: 23.OCT.2024 13:10:18

Hop_High Channel



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EUT PHOTOGRAPHS

Please refer to the attachment 2401Y98785E-RF External photo and 2401Y98785E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Y98785E-RF Test Setup photo.

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