

# RF TEST REPORT

For

**Yongkang Tao Sang Industry and Trade Co., LTD**

**Product Name: Boxing music machine**

**Test Model(s): QJ-08**

**Report Reference No.** : DACE241216020RL001

**FCC ID** : 2BHICQJ-08

**Applicant's Name** : Yongkang Tao Sang Industry and Trade Co., LTD

**Address** : No.501, Building 8, West Zone, Daoming Security Industrial Park, Huajie Town, Yongkang City, Jinhua City, Zhejiang Province

**Testing Laboratory** : Shenzhen DACE Testing Technology Co., Ltd.

**Address** : 102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China

**Test Specification Standard** : 47 CFR Part 15.247

**Date of Receipt** : December 16, 2024

**Date of Test** : December 16, 2024 to December 25, 2024

**Data of Issue** : December 25, 2024

**Result** : Pass

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## Apply for company information

<b>Applicant's Name</b>	:	Yongkang Tao Sang Industry and Trade Co., LTD
<b>Address</b>	:	No.501, Building 8, West Zone, Daoming Security Industrial Park, Huajie Town, Yongkang City, Jinhua City, Zhejiang Province
<b>Product Name</b>	:	Boxing music machine
<b>Test Model(s)</b>	:	QJ-08
<b>Series Model(s)</b>	:	N/A
<b>Test Specification Standard(s)</b>	:	47 CFR Part 15.247

### NOTE1:

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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December 25, 2024

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December 25, 2024

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December 25, 2024

## Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE241216020RL001	December 25, 2024

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# 1 TEST SUMMARY

## 1.1 Test Standards

The tests were performed according to following standards:

**47 CFR Part 15.247:** Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

## 1.2 Summary of Test Result

Item	Standard	Method	Requirement	Result
Antenna requirement	47 CFR Part 15.247		47 CFR 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.247	ANSI C63.10-2013 section 6.2	47 CFR 15.207(a)	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	ANSI C63.10-2013, section 7.8.5 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(b)(1)	Pass
Channel Separation	47 CFR Part 15.247	ANSI C63.10-2013, section 7.8.2 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(a)(1)	Pass
Number of Hopping Frequencies	47 CFR Part 15.247	ANSI C63.10-2013, section 7.8.3 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(a)(1)(iii)	Pass
Dwell Time	47 CFR Part 15.247	ANSI C63.10-2013, section 7.8.4 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(a)(1)(iii)	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	ANSI C63.10-2013 section 7.8.8 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (below 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass
Emissions in frequency bands (above 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02	47 CFR 15.247(d), 15.209, 15.205	Pass



## 2 GENERAL INFORMATION

### 2.1 Client Information

**Applicant's Name** : Yongkang Tao Sang Industry and Trade Co., LTD  
**Address** : No.501, Building 8, West Zone, Daoming Security Industrial Park, Huajie Town, Yongkang City, Jinhua City, Zhejiang Province

**Manufacturer** : Yongkang Tao Sang Industry and Trade Co., LTD  
**Address** : No.501, Building 8, West Zone, Daoming Security Industrial Park, Huajie Town, Yongkang City, Jinhua City, Zhejiang Province

### 2.2 Description of Device (EUT)

Product Name:	Boxing music machine
Model/Type reference:	QJ-08
Series Model:	N/A
Trade Mark:	N/A
Power Supply:	DC 5V/1A from adapter Battery:DC3.7V 1800mAh
Operation Frequency:	2402MHz to 2480MHz
Number of Channels:	79
Modulation Type:	GFSK, $\pi/4$ DQPSK
Antenna Type:	PCB
Antenna Gain:	1.2dBi
Hardware Version:	V1.0
Software Version:	V1.0

(Remark:The Antenna Gain is supplied by the customer.DACE is not responsible for This data and the related calculations associated with it)

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz

16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	BDR/EDR
Lowest channel	2402MHz
Middle channel	2441MHz
Highest channel	2480MHz

## 2.3 Description of Test Modes

No	Title	Description
TM1	TX-GFSK (Non-Hopping)	Keep the EUT in continuously transmitting mode (non-hopping) with GFSK modulation.
TM2	TX-Pi/4DQPSK (Non-Hopping)	Keep the EUT in continuously transmitting mode (non-hopping) with Pi/4DQPSK modulation.
TM3	TX-GFSK (Hopping)	Keep the EUT in continuously transmitting mode (hopping) with GFSK modulation.
TM4	TX-Pi/4DQPSK (Hopping)	Keep the EUT in continuously transmitting mode (hopping) with Pi/4DQPSK modulation.
Remark: Only the data of the worst mode would be recorded in this report.		

## 2.4 Description of Support Units

Title	Manufacturer	Model No.	Serial No.
AC-DC adapter	HUAWEI	P0005	



## 2.5 Equipments Used During The Test

Conducted Emission at AC power line					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Power absorbing clamp	SCHWARZ BECK	MESS-ELEKTRONIK	/	2024-03-25	2025-03-24
Electric Network	SCHWARZ BECK	CAT5 8158	CAT5 8158#207	/	/
Cable	SCHWARZ BECK	/	/	2024-03-20	2025-03-19
Pulse Limiter	SCHWARZ BECK	VTSD 9561-F Pulse limiter 10dB Attenuation	561-G071	2024-12-06	2025-12-05
50ΩCoaxial Switch	Anritsu	MP59B	M20531	/	/
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K 03-102109-MH	2024-06-12	2025-06-11
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2023-12-12	2025-12-11
L.I.S.N	SCHWARZ BECK	NSLK 8126	05055	2024-06-14	2025-06-13
Pulse Limiter	CYBERTEK	EM5010A	/	2024-09-27	2025-09-26
EMI test software	EZ -EMC	EZ	V1.1.42	/	/

### Dwell Time Emissions in non-restricted frequency bands Maximum Conducted Output Power Channel Separation Number of Hopping Frequencies

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Test Software	Tachoy Information Technology(she nzheng) Co.,Ltd.	RTS-01	V1.0.0	/	/
Power divider	MIDEWEST	PWD-2533	SMA-79	2023-05-11	2026-05-10
RF Sensor Unit	Tachoy Information Technology(she nzheng) Co.,Ltd.	TR1029-2	000001	/	/
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11
Vector Signal Generator	Keysight	N5181A	MY50143455	2024-12-06	2025-12-05
Signal Generator	Keysight	N5182A	MY48180415	2024-12-06	2025-12-05
Spectrum Analyzer	Keysight	N9020A	MY53420323	2024-12-06	2025-12-05

**Band edge emissions (Radiated)**
**Emissions in frequency bands (below 1GHz)**
**Emissions in frequency bands (above 1GHz)**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	MF	MF-7802	/	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2024-06-14	2026-06-13
Cable(LF)#2	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(LF)#1	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2024-03-20	2025-03-19
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2024-03-20	2025-03-19
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2024-06-12	2025-06-11
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2024-06-12	2025-06-11
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11
Spectrum Analyzer	R&S	FSP30	1321.3008K40-101729-jR	2024-06-12	2025-06-11
Test Receiver	R&S	ESCI 3	1166.5950K03-101431-Jq	2024-06-13	2025-06-12
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2024-09-28	2026-09-27

## 2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Disturbance (0.15~30MHz)	±3.41dB
RF conducted power	±0.733dB
Occupied Bandwidth	±3.63%
Duty cycle	±3.1%
Conducted Spurious emissions	±1.98dB
Radiated Emission (Above 1GHz)	±5.46dB
Radiated Emission (Below 1GHz)	±5.79dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

## 2.7 Identification of Testing Laboratory

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

### Identification of the Responsible Testing Location

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
Designation Number:	CN1342
Test Firm Registration Number:	778666
A2LA Certificate Number:	6270.01

## 2.8 Announcement

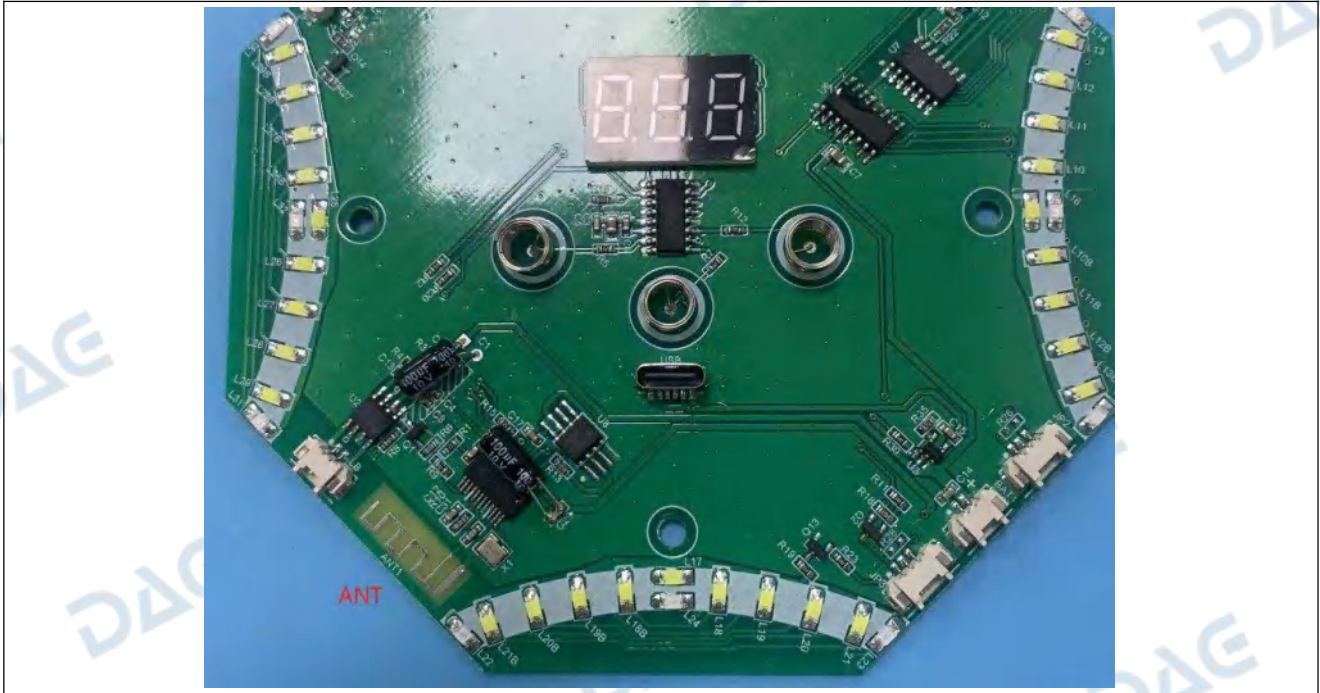
- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
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- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

### 3 Evaluation Results (Evaluation)

#### 3.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 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.
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##### 3.1.1 Conclusion:

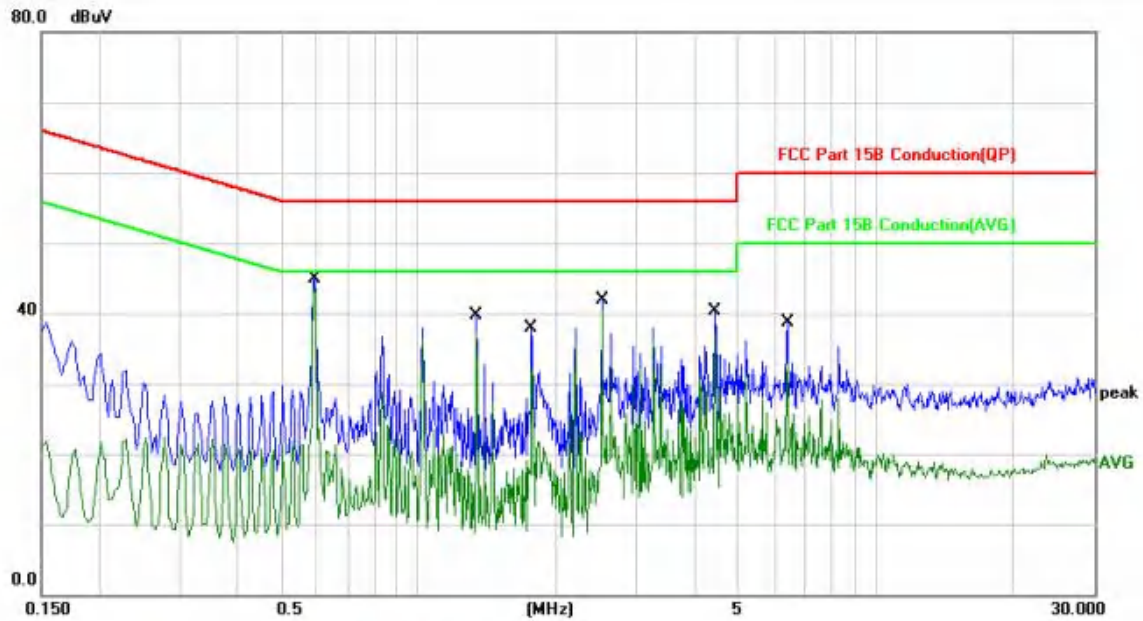






#### 4.1.3 Test Data:

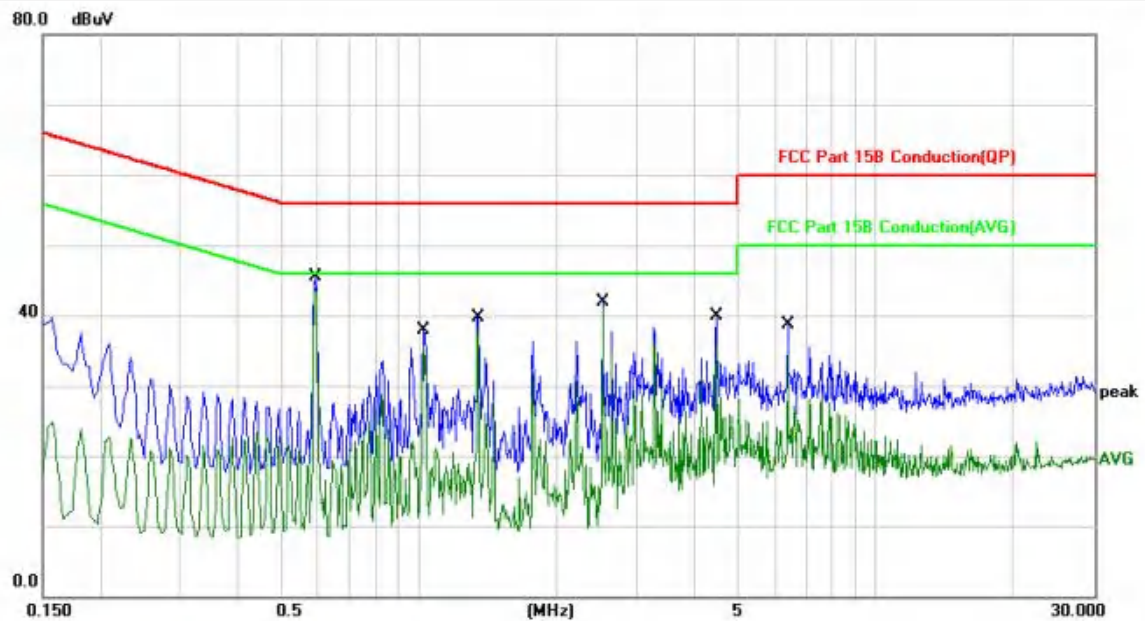
TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.5899	33.46	10.09	43.55	46.00	-2.45	AVG	
2		0.5940	34.83	10.09	44.92	56.00	-11.08	QP	
3		1.3420	29.70	10.08	39.78	56.00	-16.22	QP	
4		1.3420	27.23	10.08	37.31	46.00	-8.69	AVG	
5		1.7700	27.82	10.02	37.84	56.00	-18.16	QP	
6		1.7740	21.80	10.02	31.82	46.00	-14.18	AVG	
7		2.5220	31.87	10.03	41.90	56.00	-14.10	QP	
8		2.5220	30.52	10.03	40.55	46.00	-5.45	AVG	
9		4.4540	30.08	10.17	40.25	56.00	-15.75	QP	
10		4.4540	26.92	10.17	37.09	46.00	-8.91	AVG	
11		6.3859	28.54	10.21	38.75	60.00	-21.25	QP	
12		6.3859	22.81	10.21	33.02	50.00	-16.98	AVG	



TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.5940	35.38	10.09	45.47	56.00	-10.53	QP	
2	*	0.5940	33.72	10.09	43.81	46.00	-2.19	AVG	
3		1.0220	27.80	10.11	37.91	56.00	-18.09	QP	
4		1.0220	25.35	10.11	35.46	46.00	-10.54	AVG	
5		1.3420	28.06	10.08	38.14	46.00	-7.86	AVG	
6		1.3460	29.62	10.08	39.70	56.00	-16.30	QP	
7		2.5260	31.82	10.03	41.85	56.00	-14.15	QP	
8		2.5260	30.86	10.03	40.89	46.00	-5.11	AVG	
9		4.4580	29.77	10.17	39.94	56.00	-16.06	QP	
10		4.4580	25.69	10.17	35.86	46.00	-10.14	AVG	
11		6.3940	28.56	10.21	38.77	60.00	-21.23	QP	
12		6.3940	24.15	10.21	34.36	50.00	-15.64	AVG	

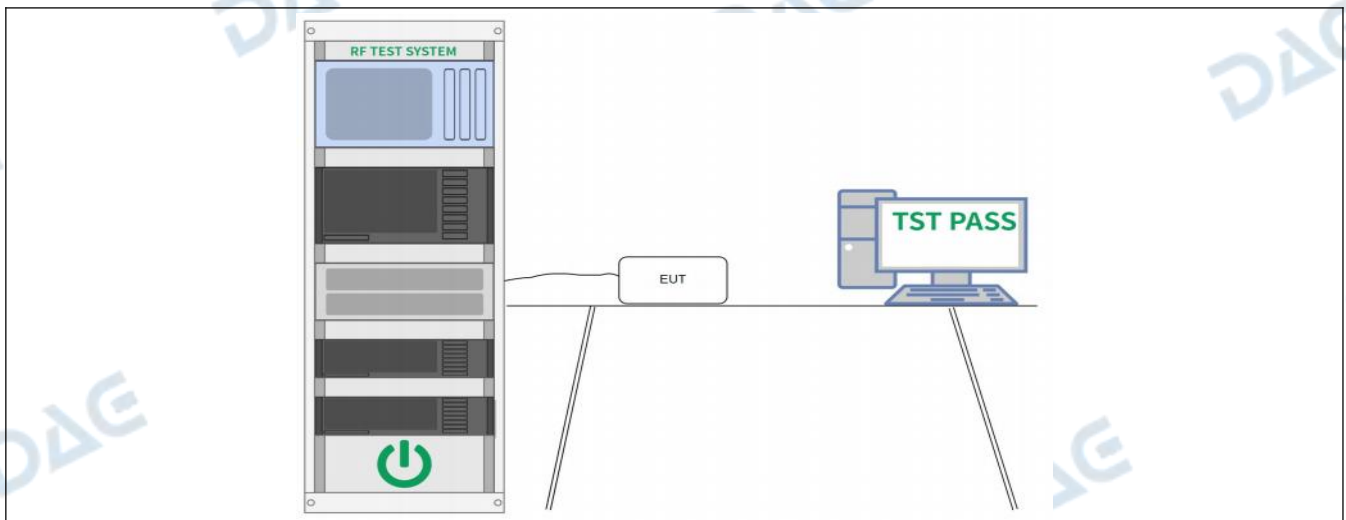
## 4.2 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(1)
Test Limit:	Refer to 47 CFR 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. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.
Test Method:	ANSI C63.10-2013, section 7.8.5 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	<p>This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:</p> <p>a) Use the following spectrum analyzer settings:</p> <ol style="list-style-type: none"> <li>1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.</li> <li>2) RBW &gt; 20 dB bandwidth of the emission being measured.</li> <li>3) VBW &gt;= RBW.</li> <li>4) Sweep: Auto.</li> <li>5) Detector function: Peak.</li> <li>6) Trace: Max hold.</li> </ol> <p>b) Allow trace to stabilize.</p> <p>c) Use the marker-to-peak function to set the marker to the peak of the emission.</p> <p>d) The indicated level is the peak output power, after any corrections for external attenuators and cables.</p> <p>e) A plot of the test results and setup description shall be included in the test report.</p> <p>NOTE—A peak responding power meter may be used, where the power meter and sensor system video bandwidth is greater than the occupied bandwidth of the unlicensed wireless device, rather than a spectrum analyzer.</p>

### 4.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	48 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2				
Final test mode:	TM1, TM2				

### 4.2.2 Test Setup Diagram:



### 4.2.3 Test Data:

Please Refer to Appendix for Details.

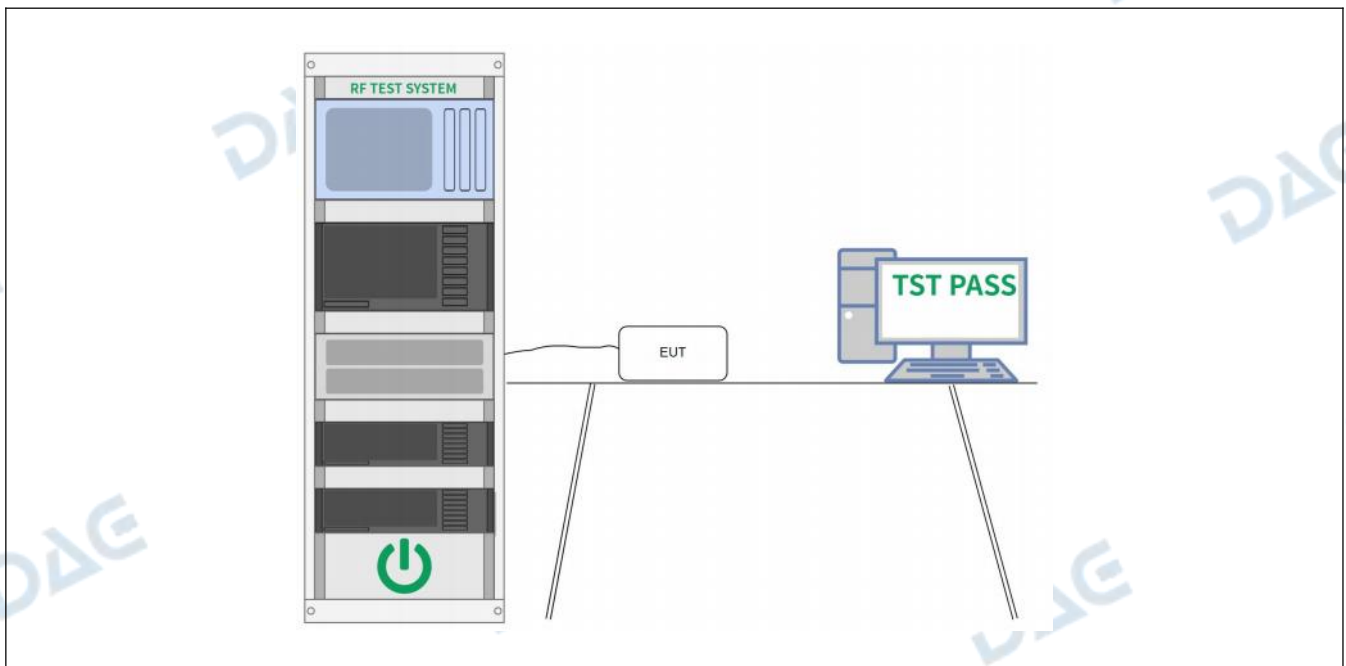
### 4.3 Channel Separation

Test Requirement:	47 CFR 15.247(a)(1)
Test Limit:	Refer to 47 CFR 15.247(a)(1), Frequency hopping systems 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, 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.
Test Method:	ANSI C63.10-2013, section 7.8.2 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings: a) Span: Wide enough to capture the peaks of two adjacent channels. b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel. c) Video (or average) bandwidth (VBW) $\geq$ RBW. d) Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

#### 4.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	48 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM3, TM4				
Final test mode:	TM3, TM4				

#### 4.3.2 Test Setup Diagram:



#### 4.3.3 Test Data:

Please Refer to Appendix for Details.

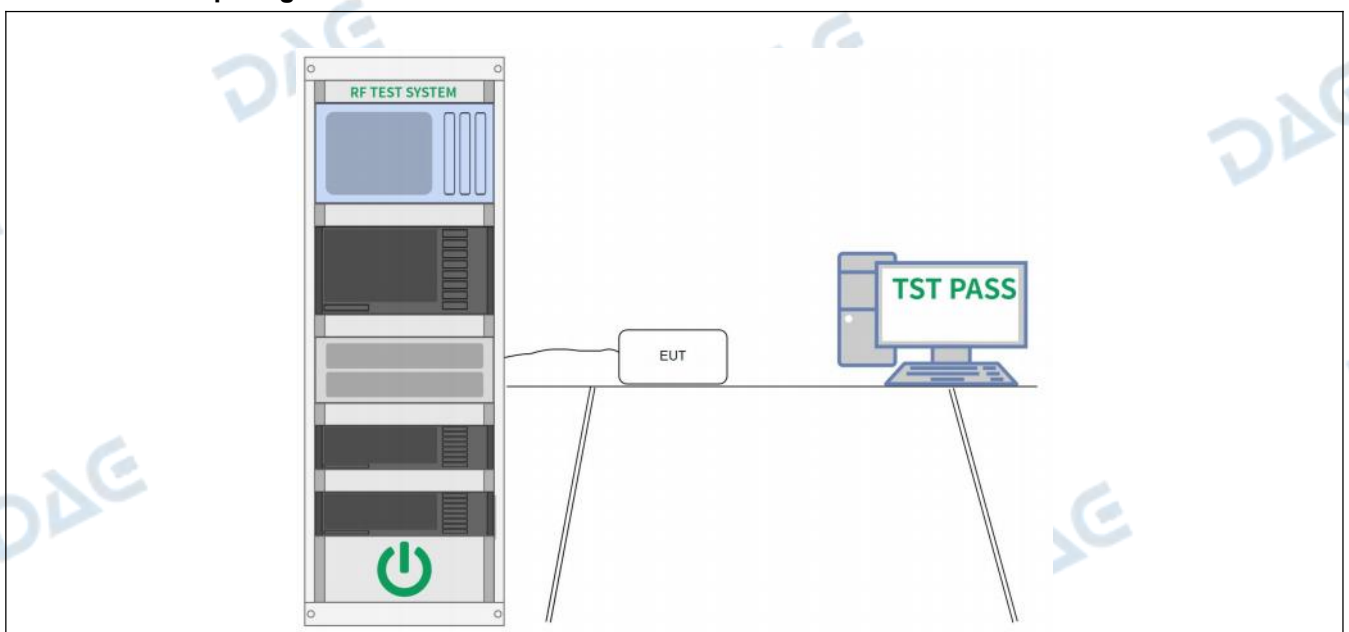
#### 4.4 Number of Hopping Frequencies

Test Requirement:	47 CFR 15.247(a)(1)(iii)
Test Limit:	Refer to 47 CFR 15.247(a)(1)(iii), Frequency hopping systems 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 Method:	ANSI C63.10-2013, section 7.8.3 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings: a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen. b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller. c) VBW $\geq$ RBW. d) Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize. It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

##### 4.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	48 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM3, TM4				
Final test mode:	TM3, TM4				

##### 4.4.2 Test Setup Diagram:



##### 4.4.3 Test Data:

Please Refer to Appendix for Details.



#### 4.5 Dwell Time

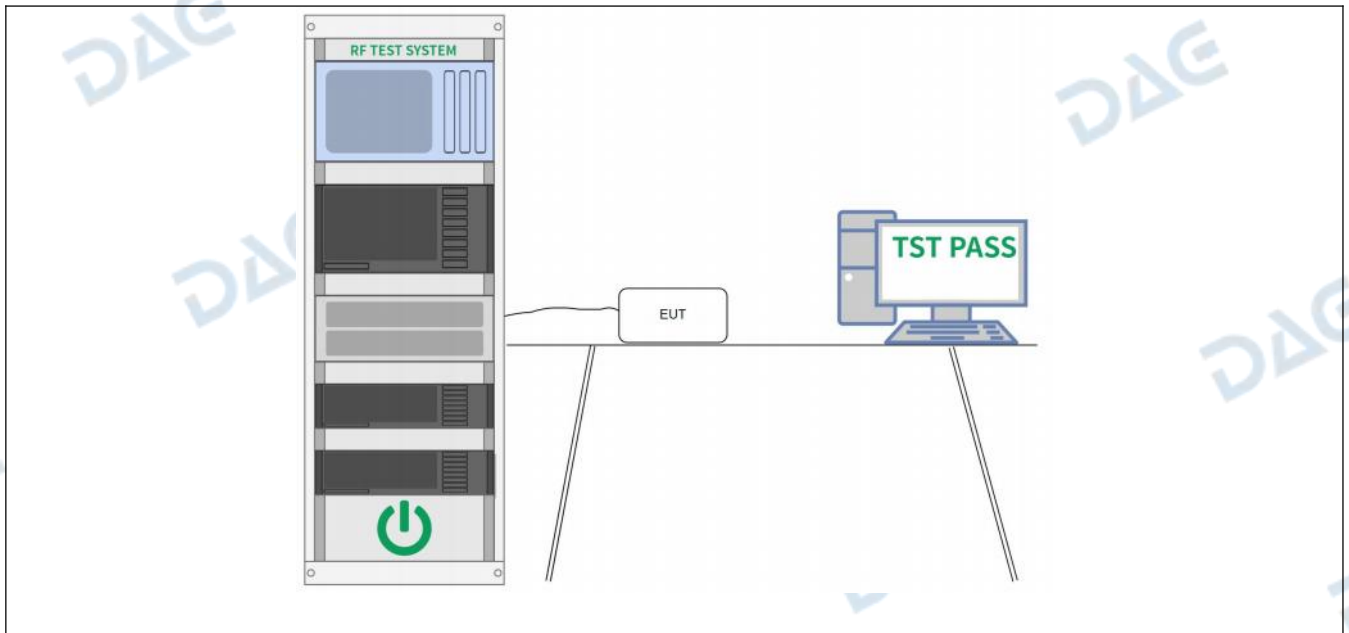
Test Requirement:	47 CFR 15.247(a)(1)(iii)
Test Limit:	Refer to 47 CFR 15.247(a)(1)(iii), Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied 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 Method:	ANSI C63.10-2013, section 7.8.4 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	<p>The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:</p> <p>a) Span: Zero span, centered on a hopping channel.</p> <p>b) RBW shall be <math>\leq</math> channel spacing and where possible RBW should be set <math>\gg 1 / T</math>, where T is the expected dwell time per channel.</p> <p>c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.</p> <p>d) Detector function: Peak.</p> <p>e) Trace: Max hold.</p> <p>Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time.</p> <p>Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:</p> $(\text{Number of hops in the period specified in the requirements}) = (\text{number of hops on spectrum analyzer}) \times (\text{period specified in the requirements} / \text{analyzer sweep time})$ <p>The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation.</p> <p>The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.</p>

##### 4.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	48 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM3, TM4				
Final test mode:	TM3, TM4				

##### 4.5.2 Test Setup Diagram:

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#### 4.5.3 Test Data:

Please Refer to Appendix for Details.



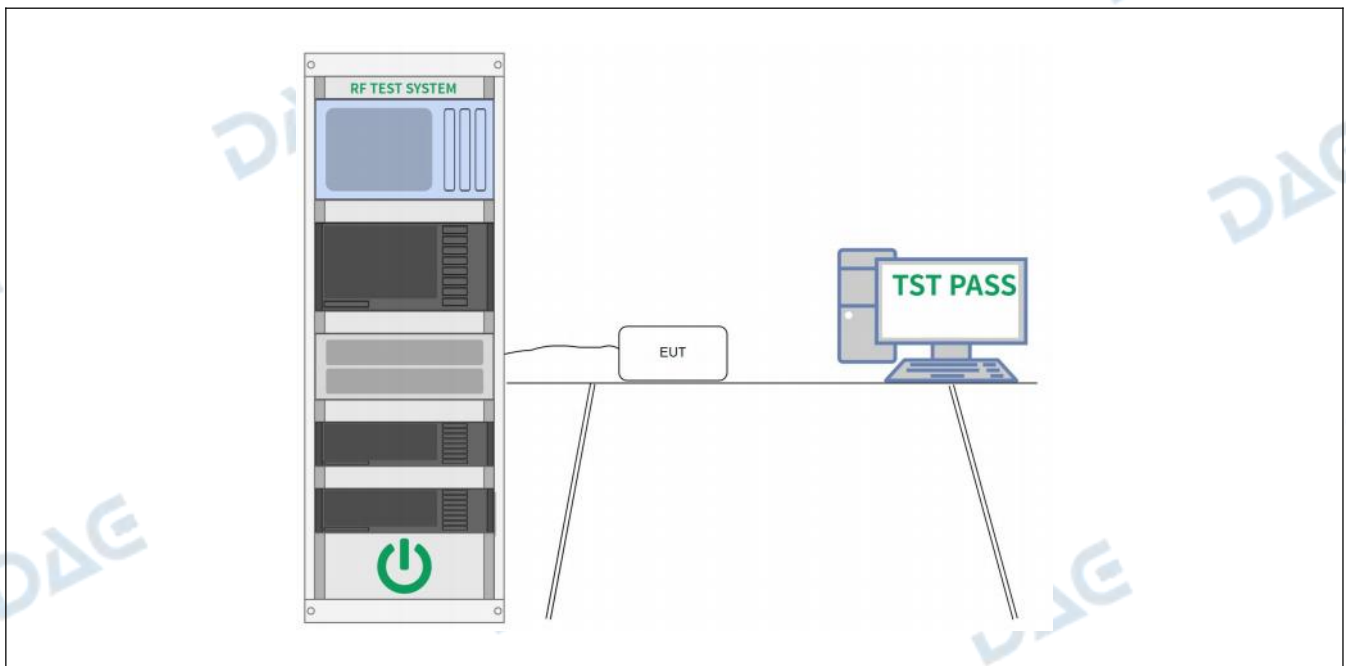
#### 4.6 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d), 15.209, 15.205
Test Limit:	Refer to 47 CFR 15.247(d), 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.
Test Method:	ANSI C63.10-2013 section 7.8.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	Conducted spurious emissions shall be measured for the transmit frequency, per 5.5 and 5.6, and at the maximum transmit powers. Connect the primary antenna port through an attenuator to the spectrum analyzer input; in the results, account for all losses between the unlicensed wireless device output and the spectrum analyzer. The instrument shall span 30 MHz to 10 times the operating frequency in GHz, with a resolution bandwidth of 100 kHz, video bandwidth of 300 kHz, and a coupled sweep time with a peak detector. The band 30 MHz to the highest frequency may be split into smaller spans, as long as the entire spectrum is covered.

##### 4.6.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	48 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2, TM3, TM4				
Final test mode:	TM1, TM2, TM3, TM4				

##### 4.6.2 Test Setup Diagram:



##### 4.6.3 Test Data:

Please Refer to Appendix for Details.

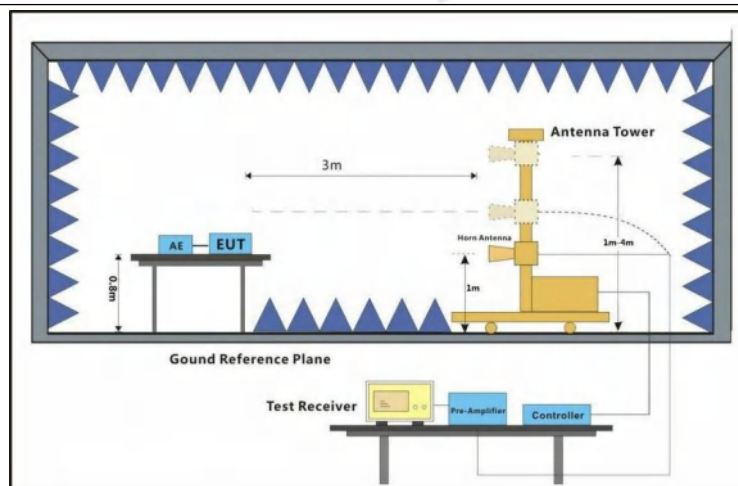
#### 4.7 Band edge emissions (Radiated)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
<p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>			
Test Method:	ANSI C63.10-2013 section 6.10 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	ANSI C63.10-2013 section 6.10.5.2		

##### 4.7.1 E.U.T. Operation:

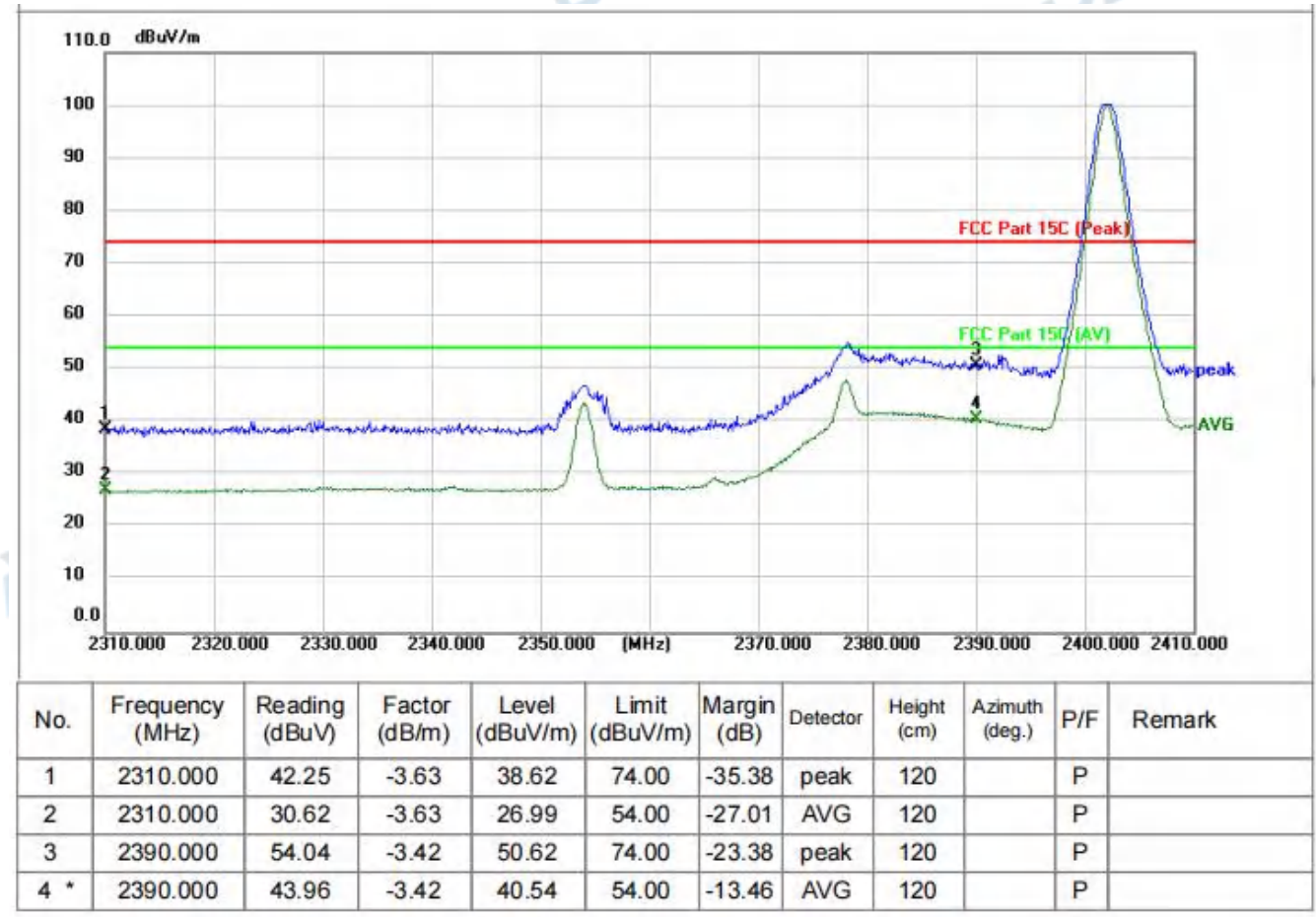
Operating Environment:			
Temperature:	23 °C	Humidity:	48 %
Atmospheric Pressure:	102 kPa		
Pretest mode:	TM1, TM2		
Final test mode:	TM1		

##### 4.7.2 Test Setup Diagram:

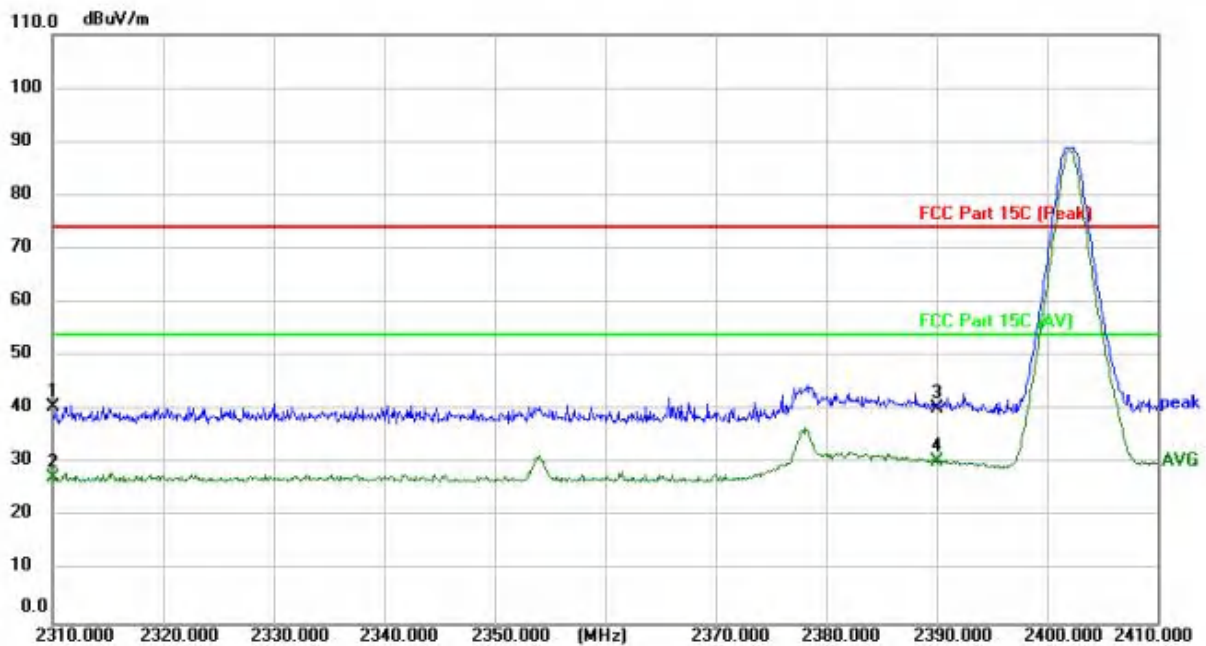


#### 4.7.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



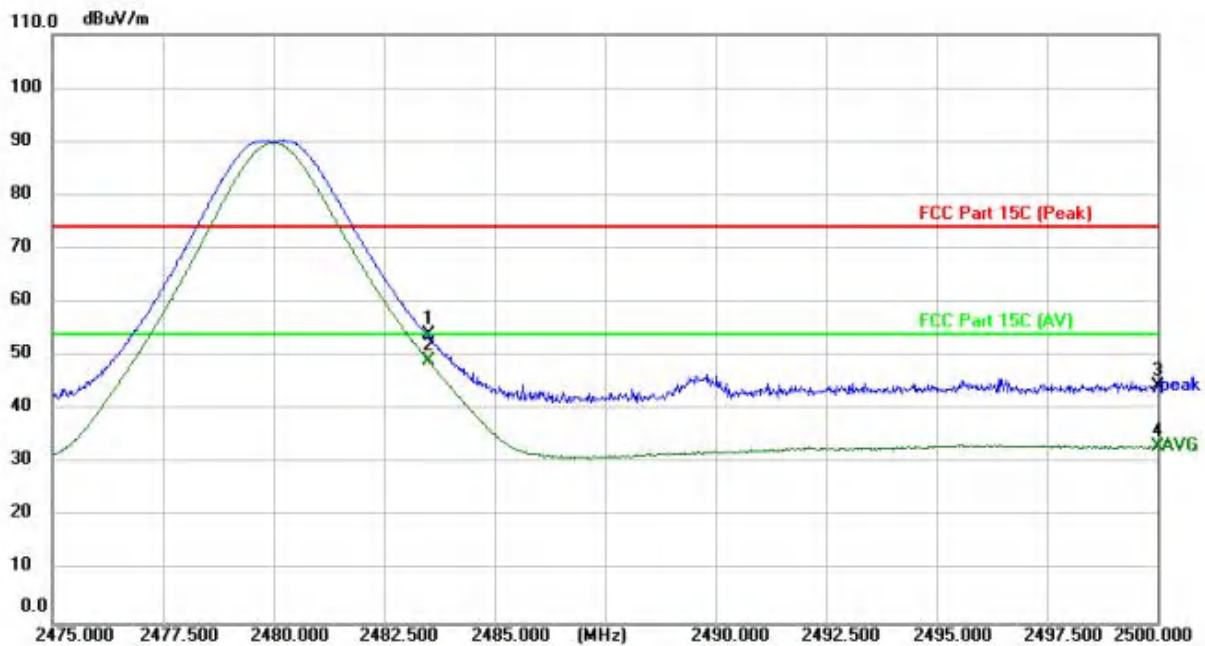
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	44.10	-3.63	40.47	74.00	-33.53	peak	120		P	
2	2310.000	30.93	-3.63	27.30	54.00	-26.70	AVG	120		P	
3	2390.000	43.70	-3.42	40.28	74.00	-33.72	peak	120		P	
4 *	2390.000	33.84	-3.42	30.42	54.00	-23.58	AVG	120		P	

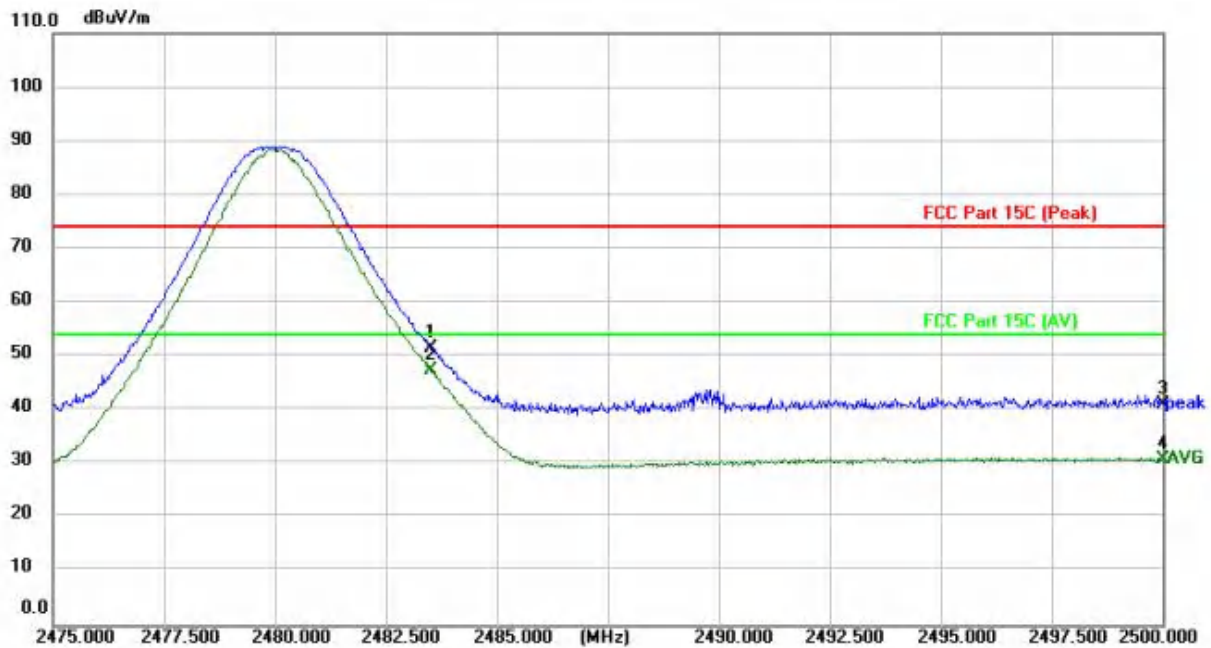


TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	57.27	-3.17	54.10	74.00	-19.90	peak	150		P	
2 *	2483.500	52.33	-3.17	49.16	54.00	-4.84	AVG	150		P	
3	2500.000	47.65	-3.13	44.52	74.00	-29.48	peak	150		P	
4	2500.000	36.18	-3.13	33.05	54.00	-20.95	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2483.500	54.77	-3.17	51.60	74.00	-22.40	peak	150		P	
2 *	2483.500	50.71	-3.17	47.54	54.00	-6.46	AVG	150		P	
3	2500.000	44.25	-3.13	41.12	74.00	-32.88	peak	150		P	
4	2500.000	34.13	-3.13	31.00	54.00	-23.00	AVG	150		P	



#### 4.8 Emissions in frequency bands (below 1GHz)

Test Requirement:	Refer to 47 CFR 15.247(d), 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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
<p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>			
Test Method:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	<p>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>h. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <p>1) For emission below 1GHz, through pre-scan found the worst case is the lowest</p>		

channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.

#### 4.8.1 E.U.T. Operation:

Operating Environment:

Temperature: 23 °C Humidity: 48 % Atmospheric Pressure: 102 kPa

Pretest mode: TM1, TM2

Final test mode: TM1

#### 4.8.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	84.4054	36.00	-11.90	24.10	40.00	-15.90	QP			P	
2	109.4116	38.34	-6.28	32.06	43.50	-11.44	QP			P	
3	137.4202	31.06	-6.17	24.89	43.50	-18.61	QP			P	
4 !	204.9551	46.74	-8.78	37.96	43.50	-5.54	QP			P	
5 *	242.5252	50.07	-8.55	41.52	46.00	-4.48	QP			P	
6	364.2595	37.34	-4.61	32.73	46.00	-13.27	QP			P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	68.8721	34.68	-11.91	22.77	40.00	-17.23	QP			P	
2	83.8155	34.54	-11.85	22.69	40.00	-17.31	QP			P	
3	128.1130	33.17	-5.63	27.54	43.50	-15.96	QP			P	
4 *	206.3975	47.04	-8.71	38.33	43.50	-5.17	QP			P	
5	232.5318	45.93	-8.75	37.18	46.00	-8.82	QP			P	
6	343.1800	29.20	-5.16	24.04	46.00	-21.96	QP			P	



#### 4.9 Emissions in frequency bands (above 1GHz)

Test Requirement:	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)).`		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
<p>** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.</p> <p>In the emission table above, the tighter limit applies at the band edges.</p> <p>The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p>			
Test Method:	ANSI C63.10-2013 section 6.6.4 KDB 558074 D01 15.247 Meas Guidance v05r02		
Procedure:	<p>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>h. Test the EUT in the lowest channel, the middle channel, the Highest channel.</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p> <p>Remark:</p> <p>1) For emission below 1GHz, through pre-scan found the worst case is the lowest</p>		

channel. Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Preamplifier Factor

3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.

#### 4.9.1 E.U.T. Operation:

Operating Environment:

Temperature: 23 °C Humidity: 48 % Atmospheric Pressure: 102 kPa

Pretest mode: TM1, TM2

Final test mode: TM1

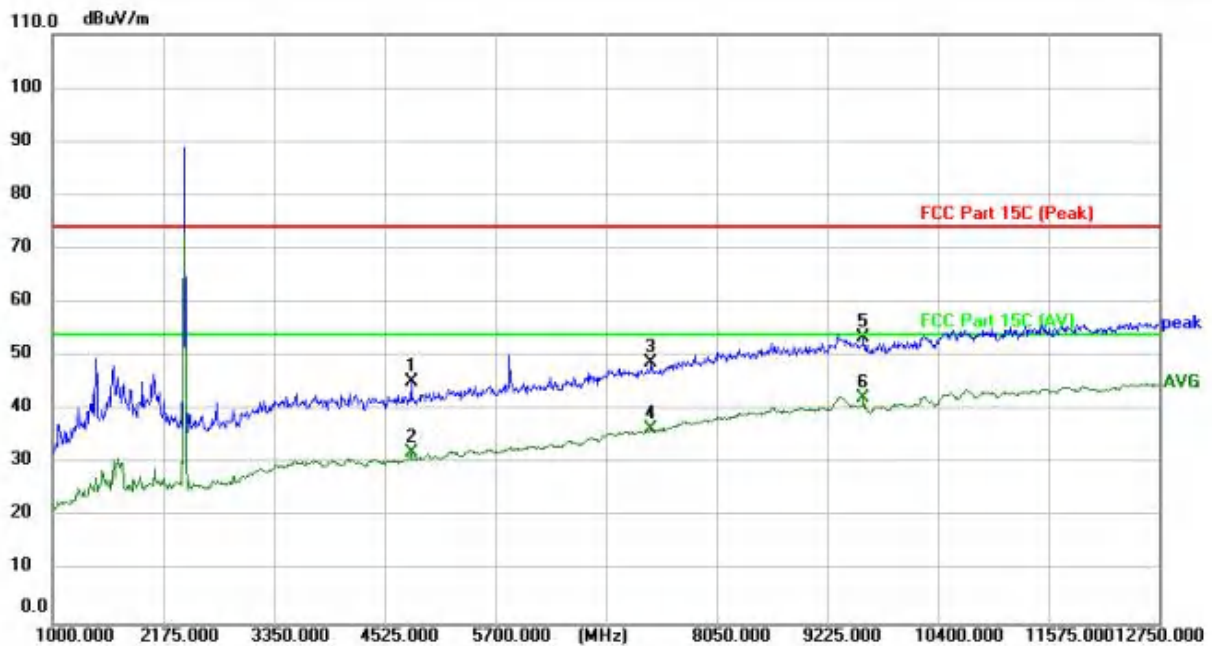
#### 4.9.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4807.000	57.81	3.31	61.12	74.00	-12.88	peak	150		P	
2 *	4807.000	40.71	3.31	44.02	54.00	-9.98	AVG	150		P	
3	7204.000	39.01	10.37	49.38	74.00	-24.62	peak	150		P	
4	7204.000	26.91	10.37	37.28	54.00	-16.72	AVG	150		P	
5	9612.750	42.52	15.10	57.62	74.00	-16.38	peak	150		P	
6	9612.750	28.73	15.10	43.83	54.00	-10.17	AVG	150		P	

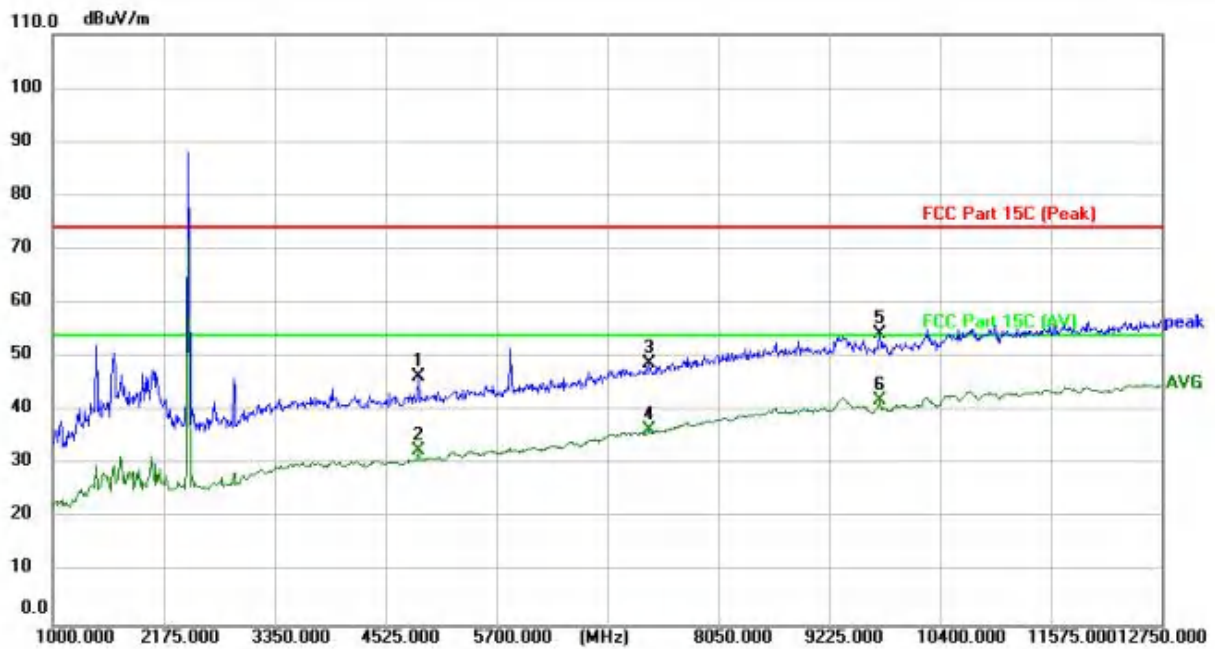
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4807.000	42.03	3.31	45.34	74.00	-28.66	peak	150		P	
2	4807.000	28.72	3.31	32.03	54.00	-21.97	AVG	150		P	
3	7356.750	38.31	10.63	48.94	74.00	-25.06	peak	150		P	
4	7356.750	25.71	10.63	36.34	54.00	-17.66	AVG	150		P	
5	9612.750	38.42	15.10	53.52	74.00	-20.48	peak	150		P	
6 *	9612.750	27.06	15.10	42.16	54.00	-11.84	AVG	150		P	

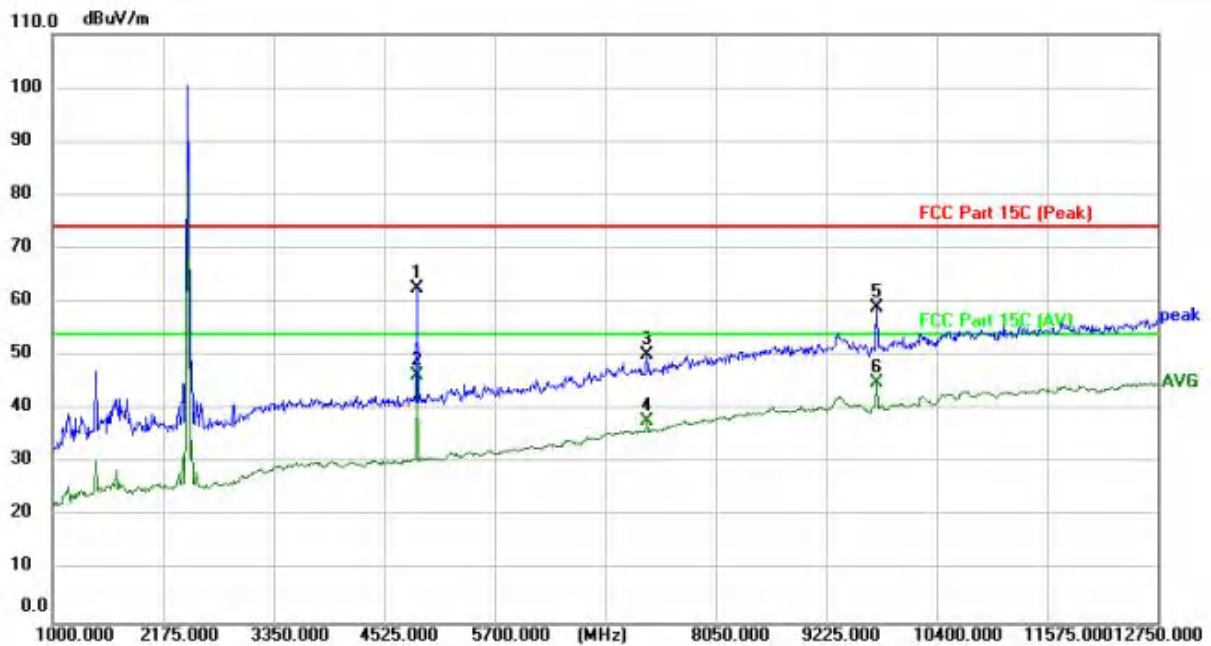


TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: M



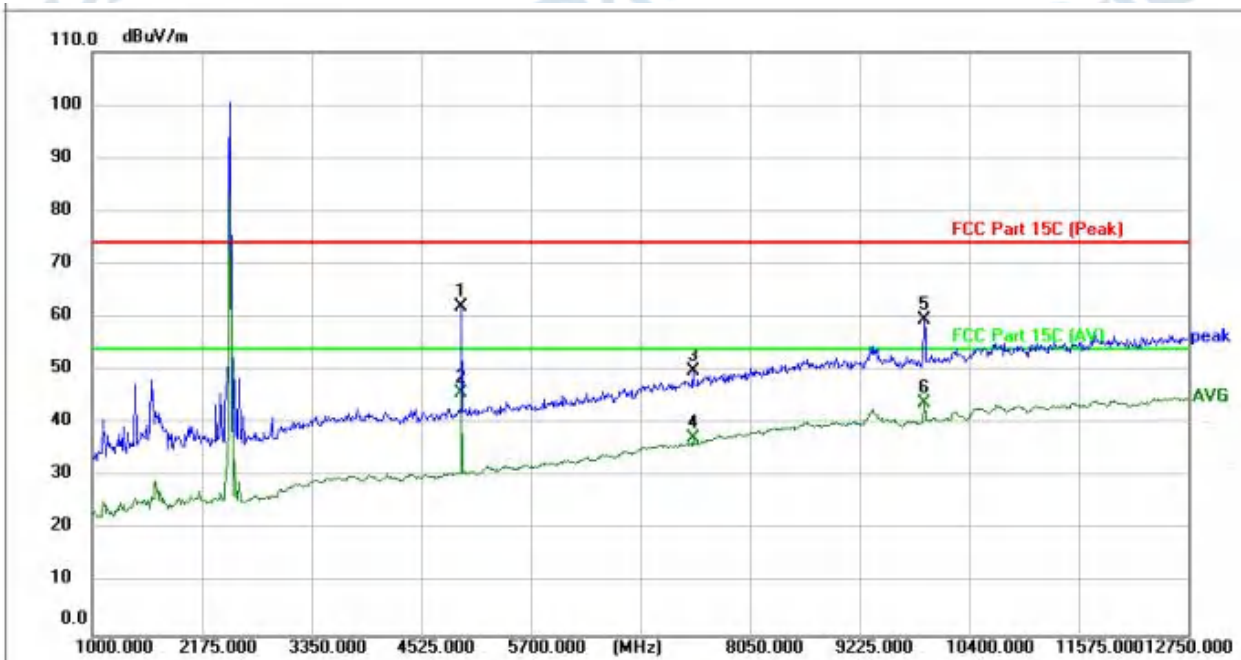
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4877.500	42.67	3.55	46.22	74.00	-27.78	peak	150		P	
2	4877.500	29.02	3.55	32.57	54.00	-21.43	AVG	150		P	
3	7321.500	38.21	10.57	48.78	74.00	-25.22	peak	150		P	
4	7321.500	25.82	10.57	36.39	54.00	-17.61	AVG	150		P	
5	9765.500	39.11	15.09	54.20	74.00	-19.80	peak	150		P	
6 *	9765.500	26.90	15.09	41.99	54.00	-12.01	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: M



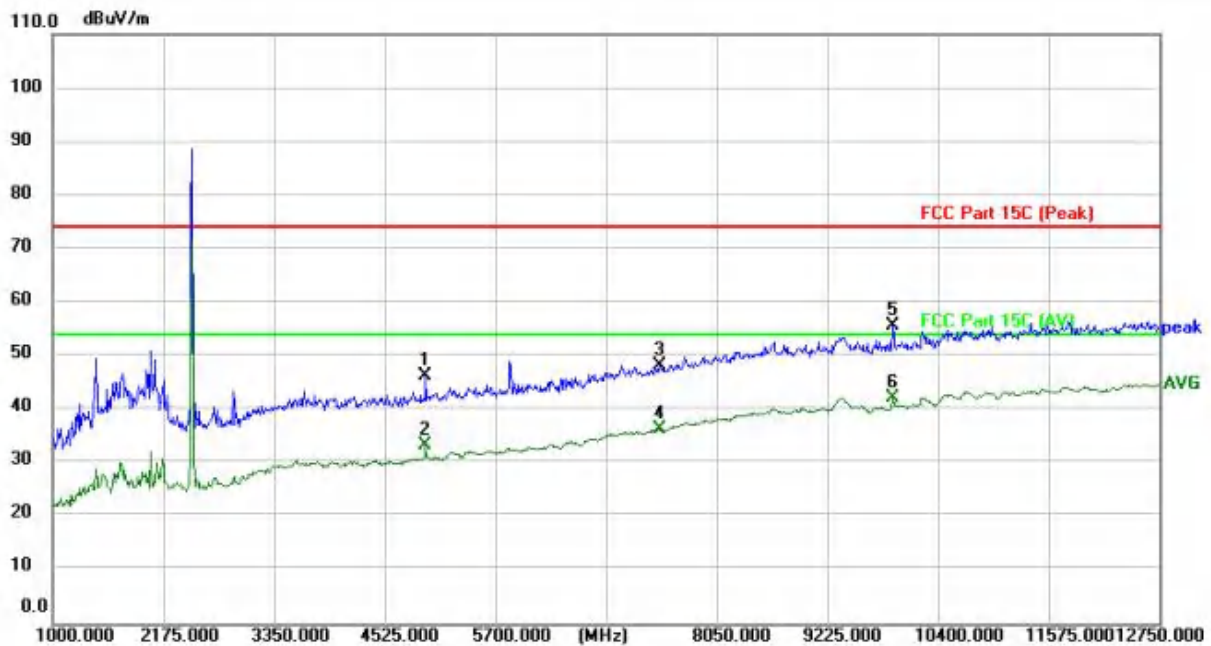
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4877.500	59.04	3.55	62.59	74.00	-11.41	peak	150		P	
2 *	4877.500	42.91	3.55	46.46	54.00	-7.54	AVG	150		P	
3	7321.500	39.60	10.57	50.17	74.00	-23.83	peak	150		P	
4	7321.500	27.24	10.57	37.81	54.00	-16.19	AVG	150		P	
5	9765.500	43.90	15.09	58.99	74.00	-15.01	peak	150		P	
6	9765.500	29.76	15.09	44.85	54.00	-9.15	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4959.750	58.22	3.83	62.05	74.00	-11.95	peak	150		P	
2 *	4959.750	41.96	3.83	45.79	54.00	-8.21	AVG	150		P	
3	7439.000	39.12	10.78	49.90	74.00	-24.10	peak	150		P	
4	7439.000	26.53	10.78	37.31	54.00	-16.69	AVG	150		P	
5	9918.250	44.41	15.08	59.49	74.00	-14.51	peak	150		P	
6	9918.250	28.91	15.08	43.99	54.00	-10.01	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4959.750	42.58	3.83	46.41	74.00	-27.59	peak	150		P	
2	4959.750	29.70	3.83	33.53	54.00	-20.47	AVG	150		P	
3	7439.000	37.39	10.78	48.17	74.00	-25.83	peak	150		P	
4	7439.000	25.73	10.78	36.51	54.00	-17.49	AVG	150		P	
5	9918.250	40.56	15.08	55.64	74.00	-18.36	peak	150		P	
6 *	9918.250	27.15	15.08	42.23	54.00	-11.77	AVG	150		P	

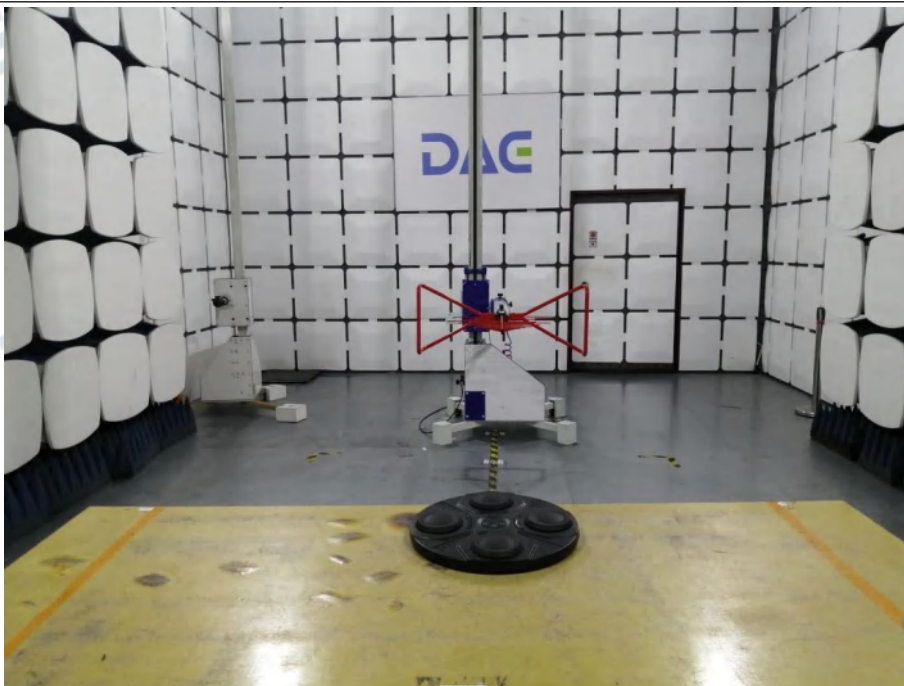


## 5 TEST SETUP PHOTOS

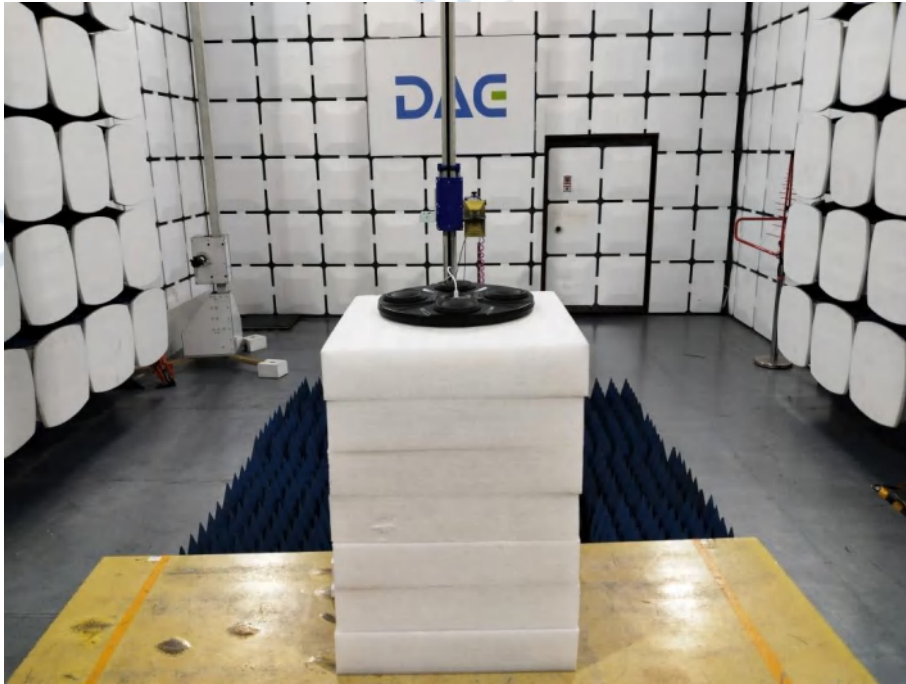
Conducted Emission at AC power line



Emissions in frequency bands (below 1GHz)



**Emissions in frequency bands (above 1GHz)**

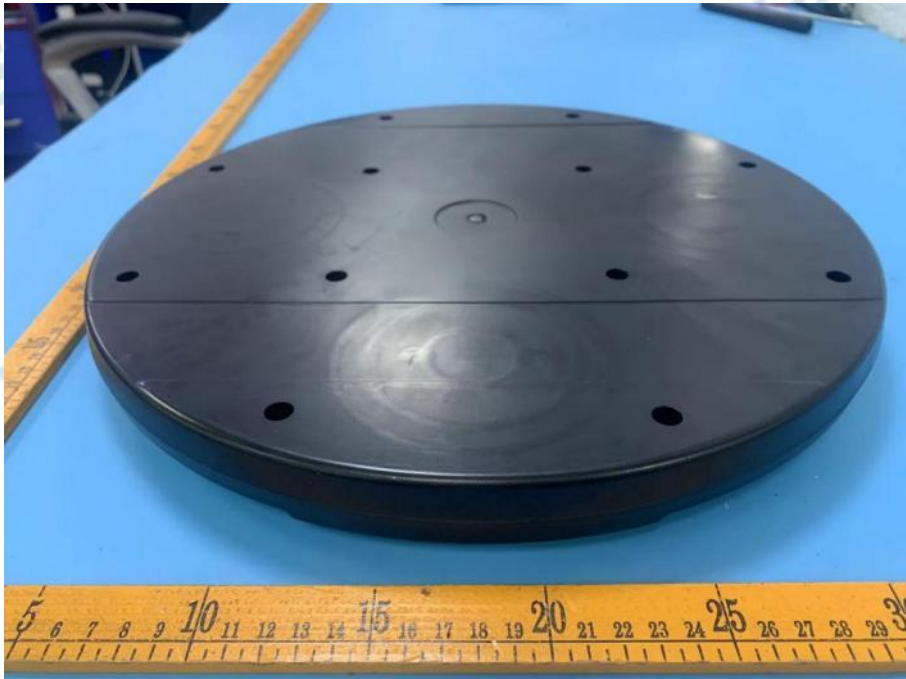
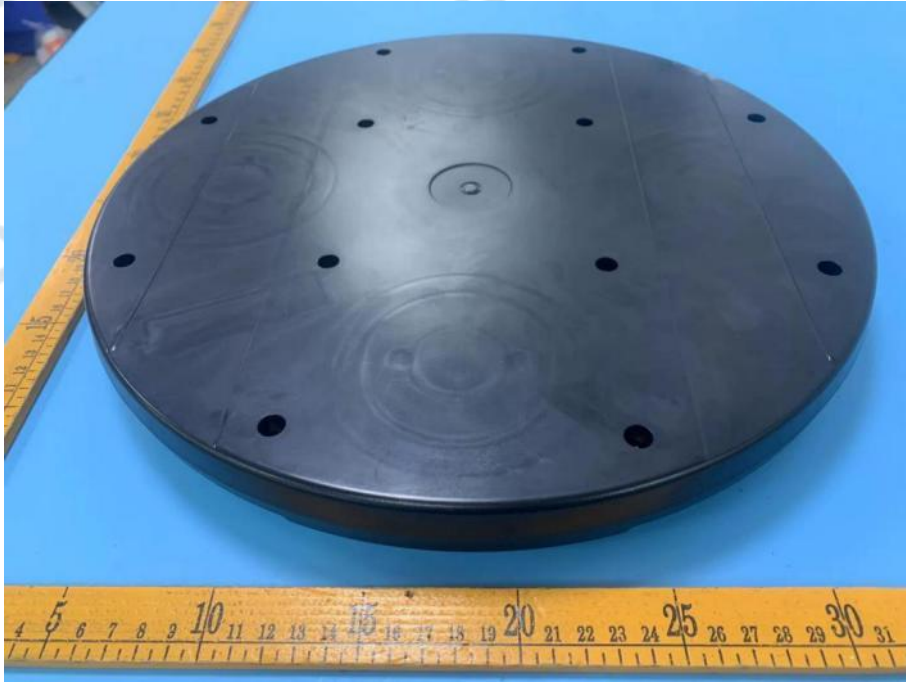


## 6 PHOTOS OF THE EUT

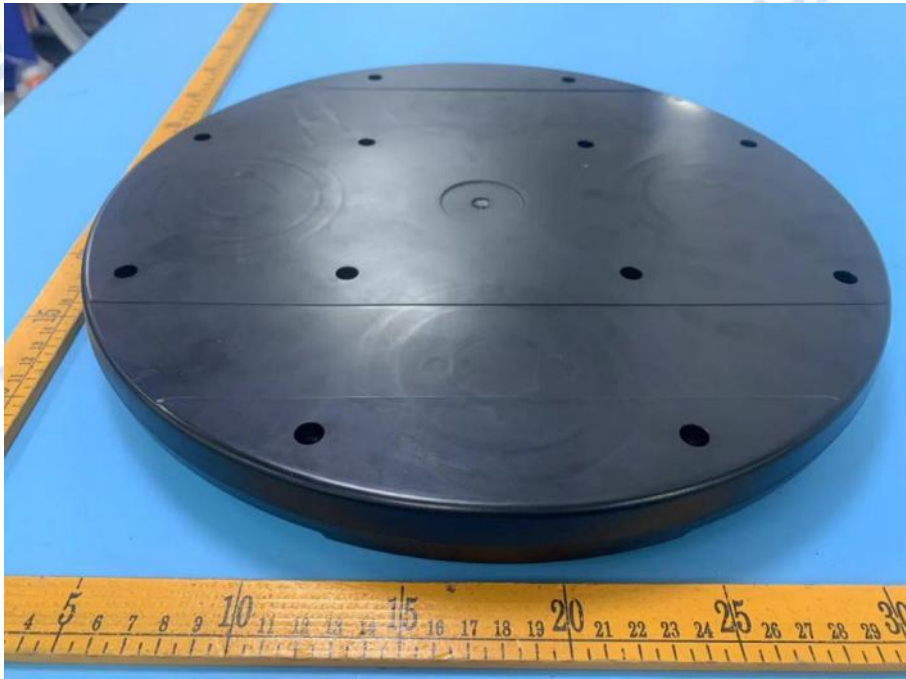
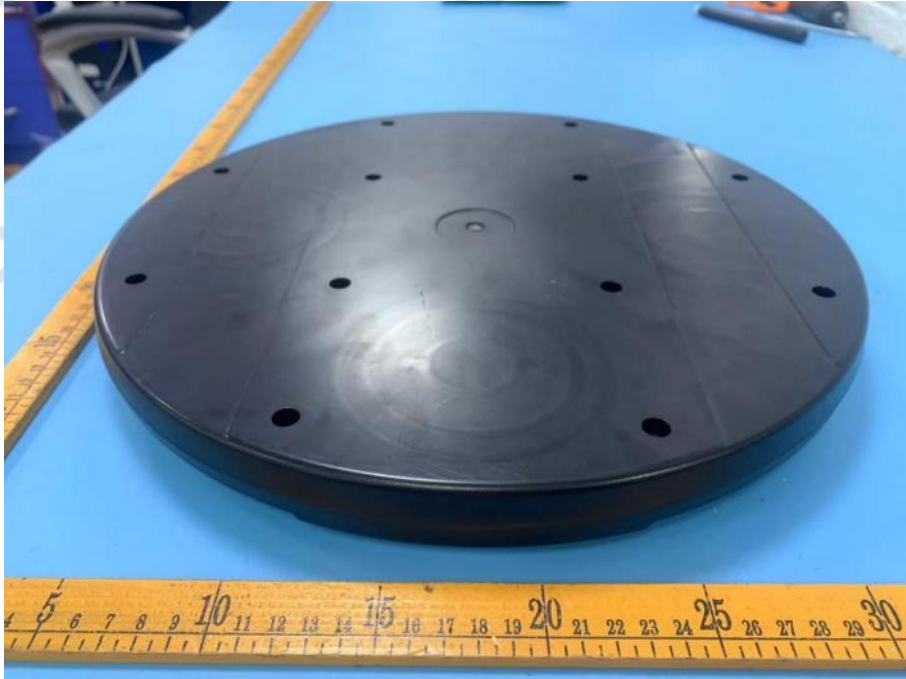
**External**







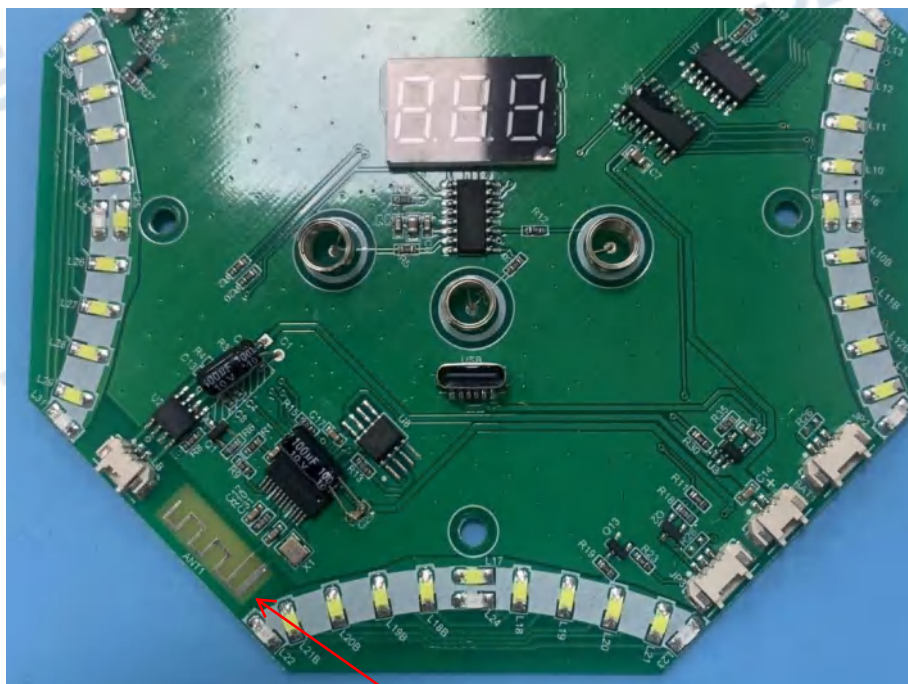






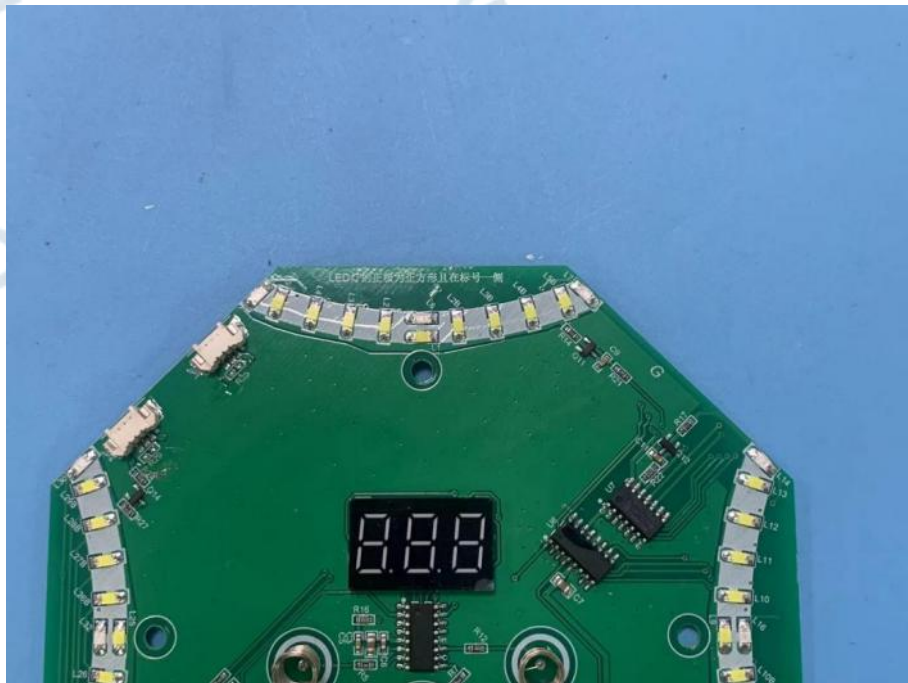
### Internal



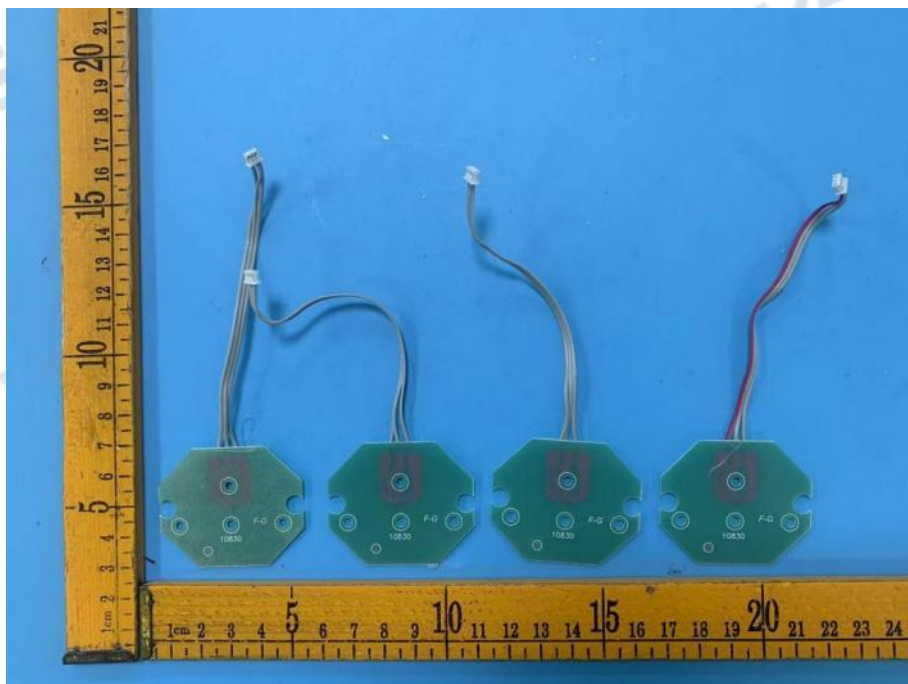
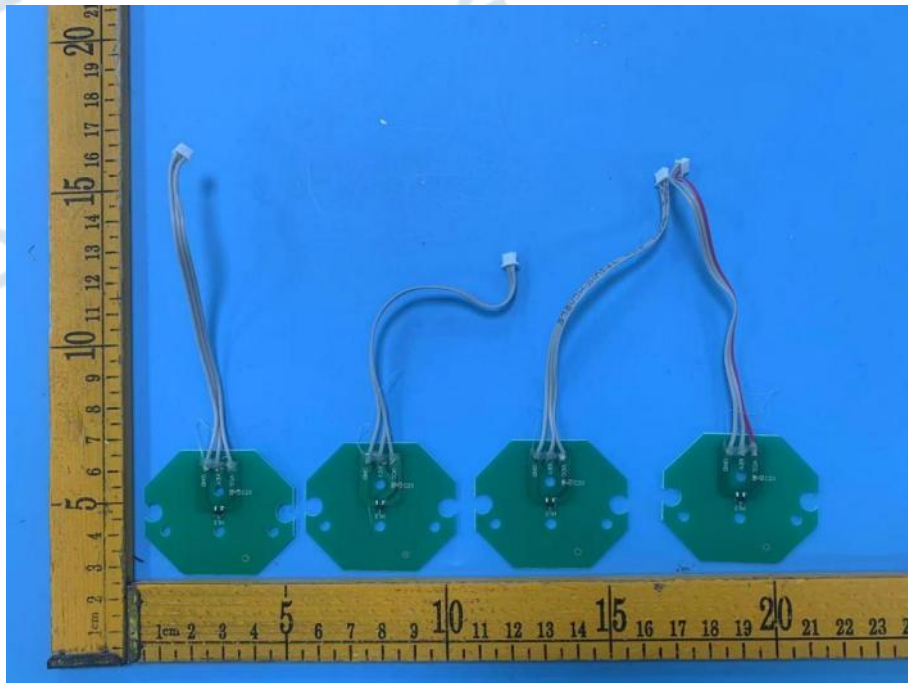


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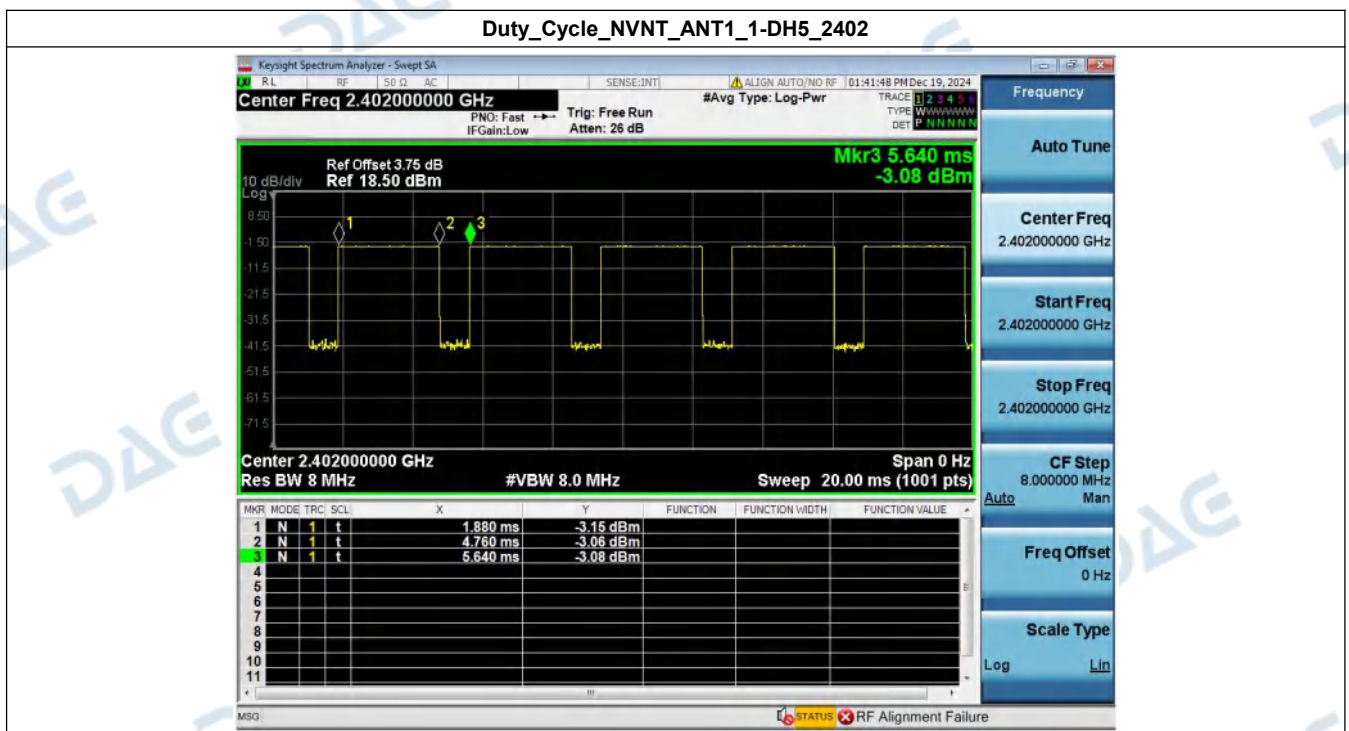


# Appendix

# HT241216011--QJ-08--EDR--FCC FCC\_BT (Part15.247) Test Data

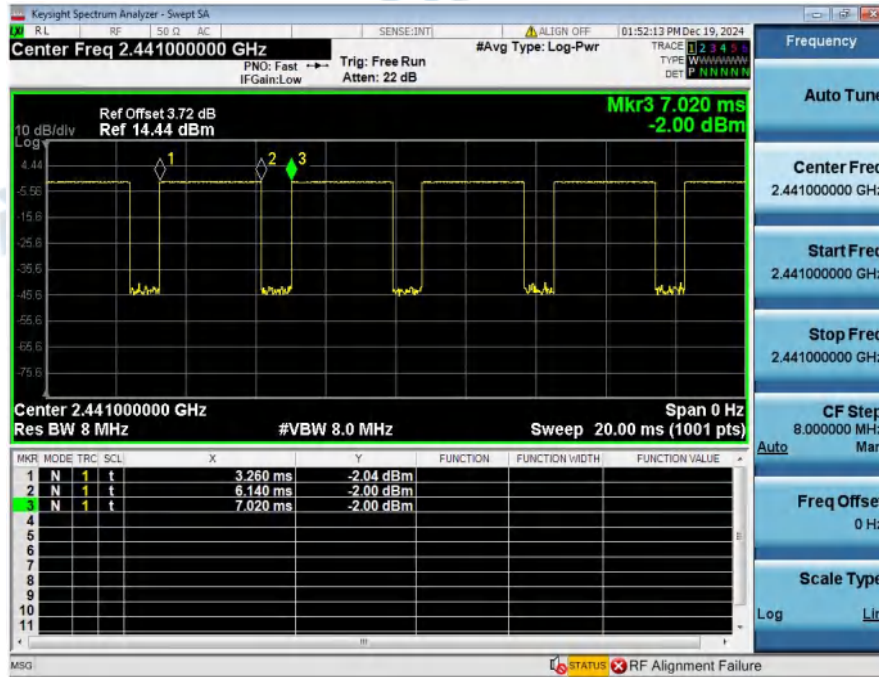
## 1. Duty Cycle

Condition	Antenna	Rate	Frequency (MHz)	Dutycycle(%)	Duty_factor
NVNT	ANT1	1-DH5	2402.00	77.13	1.13
NVNT	ANT1	1-DH5	2441.00	77.13	1.13
NVNT	ANT1	1-DH5	2480.00	77.13	1.13
NVNT	ANT1	2-DH5	2402.00	77.66	1.10
NVNT	ANT1	2-DH5	2441.00	76.60	1.16
NVNT	ANT1	2-DH5	2480.00	77.01	1.13

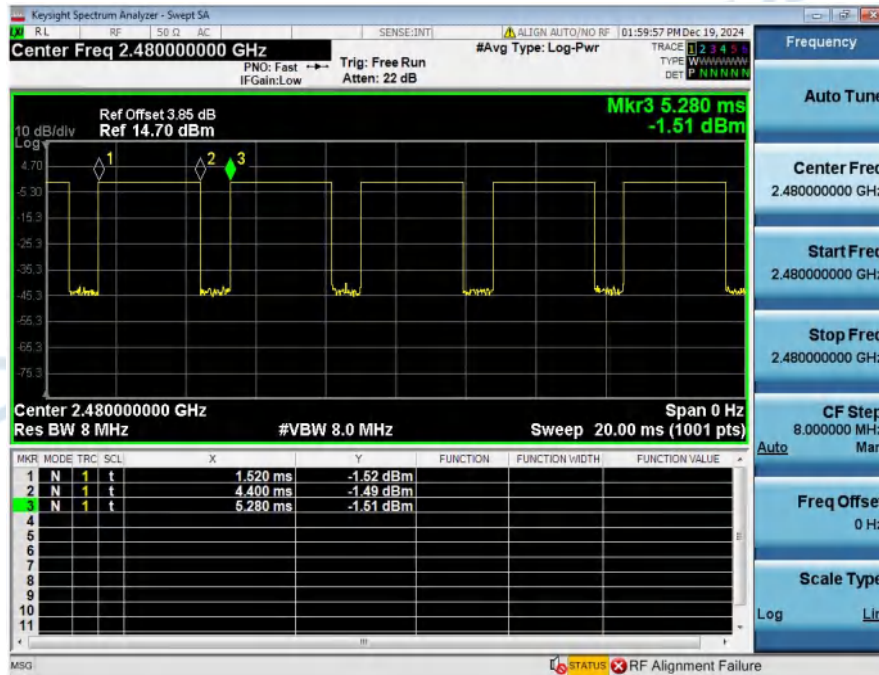




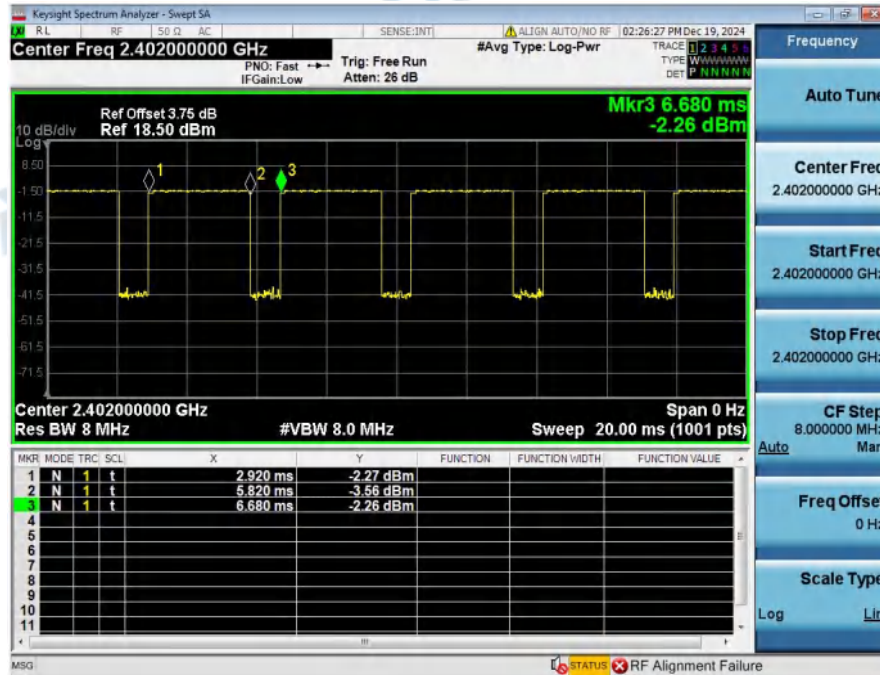
### Duty\_Cycle\_NVNT\_ANT1\_1-DH5\_2441



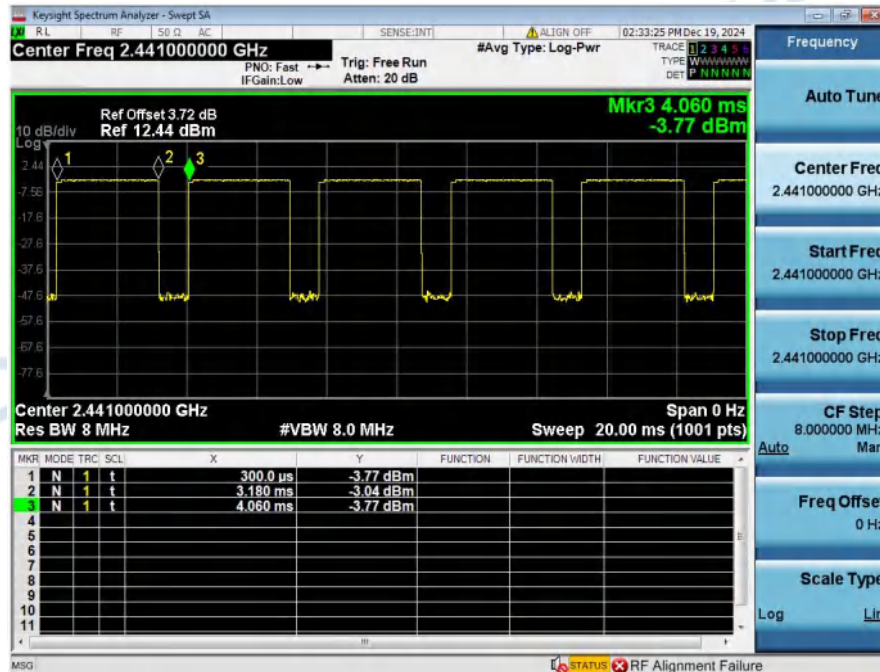
### Duty\_Cycle\_NVNT\_ANT1\_1-DH5\_2480



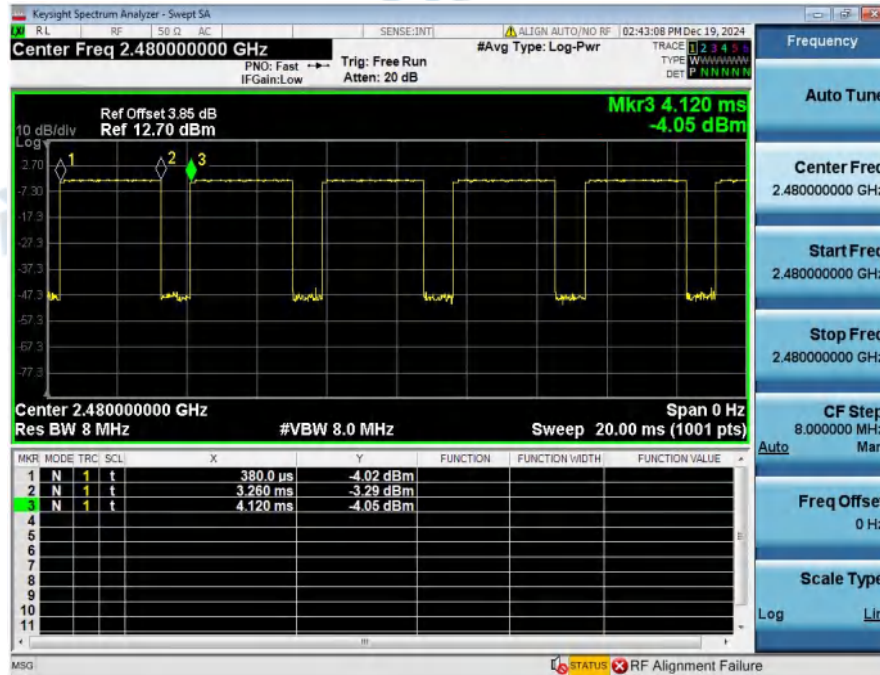
### Duty\_Cycle\_NVNT\_ANT1\_2-DH5\_2402



### Duty\_Cycle\_NVNT\_ANT1\_2-DH5\_2441

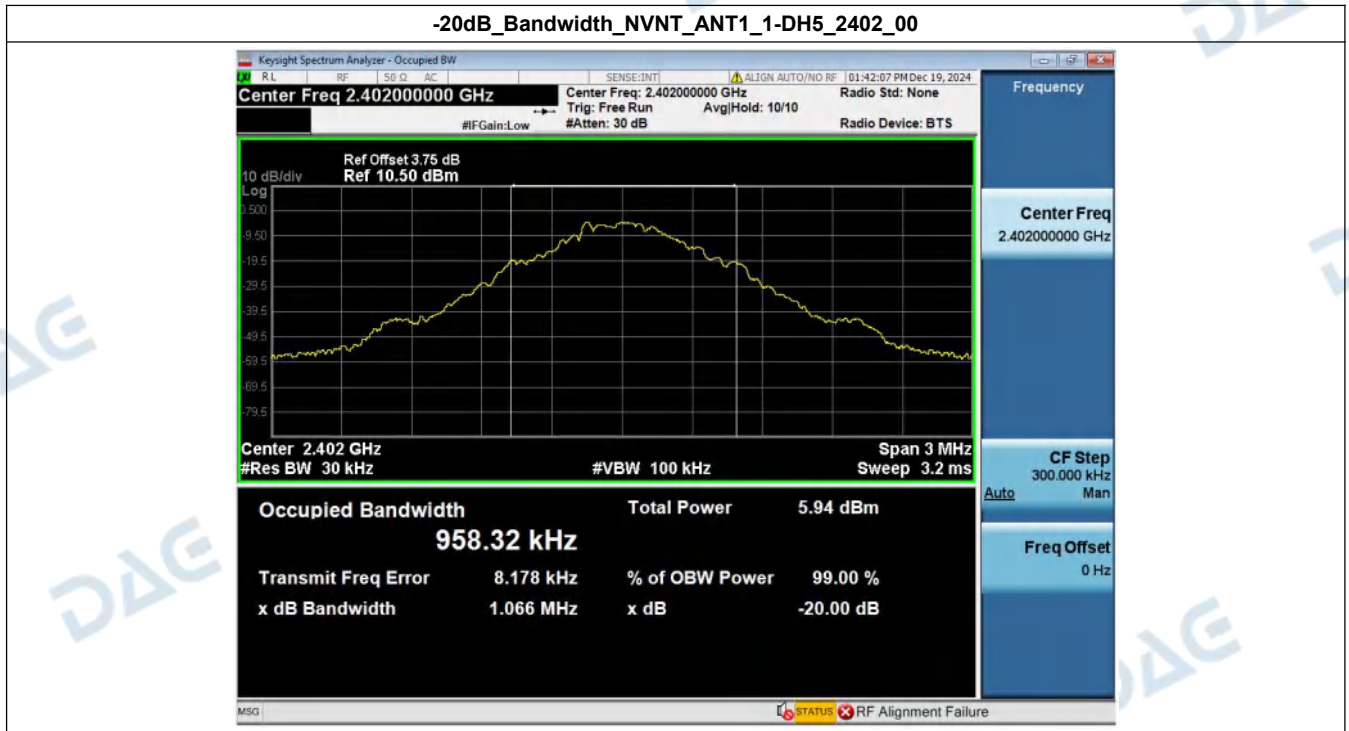


Duty\_Cycle\_NVNT\_ANT1\_2-DH5\_2480



## 2. -20dB Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	-20dB BW(MHz)	if larger than CFS
NVNT	ANT1	1-DH5	2402.00	1.066	Yes
NVNT	ANT1	1-DH5	2441.00	1.063	Yes
NVNT	ANT1	1-DH5	2480.00	1.078	Yes
NVNT	ANT1	2-DH5	2402.00	1.339	Yes
NVNT	ANT1	2-DH5	2441.00	1.343	Yes
NVNT	ANT1	2-DH5	2480.00	1.348	Yes





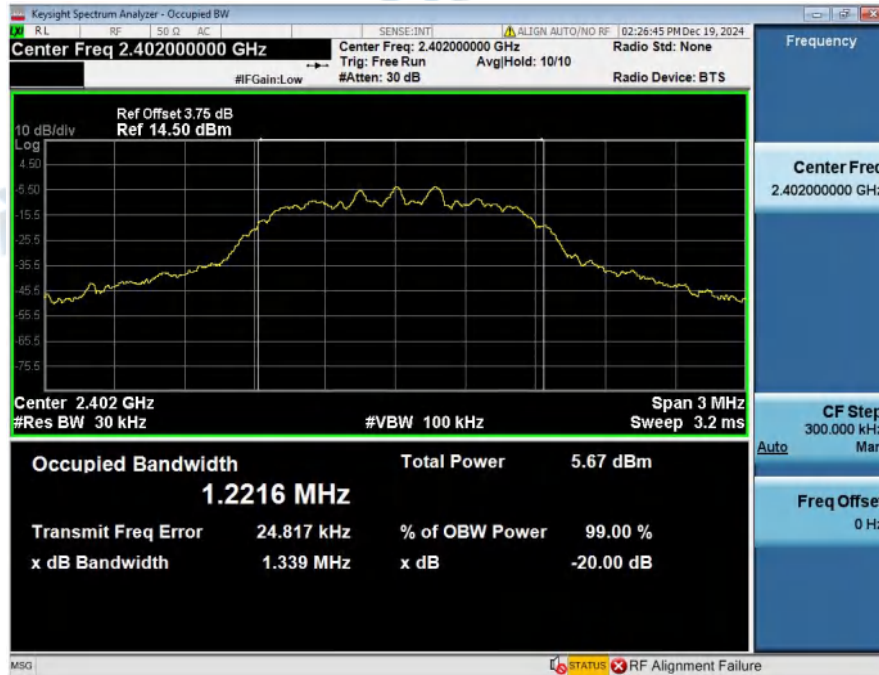
### -20dB\_Bandwidth\_NVNT\_ANT1\_1-DH5\_2441\_00



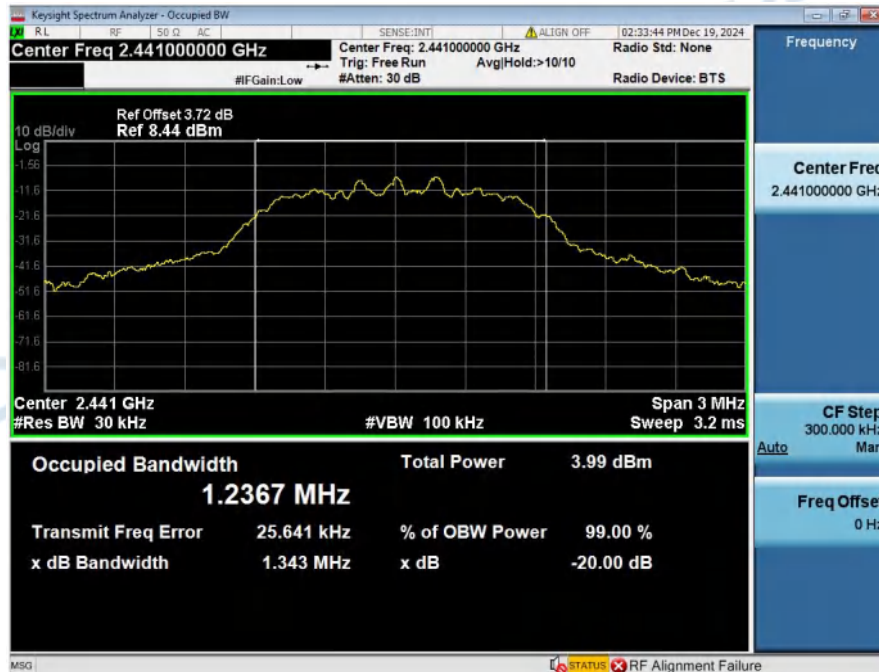
### -20dB\_Bandwidth\_NVNT\_ANT1\_1-DH5\_2480\_00



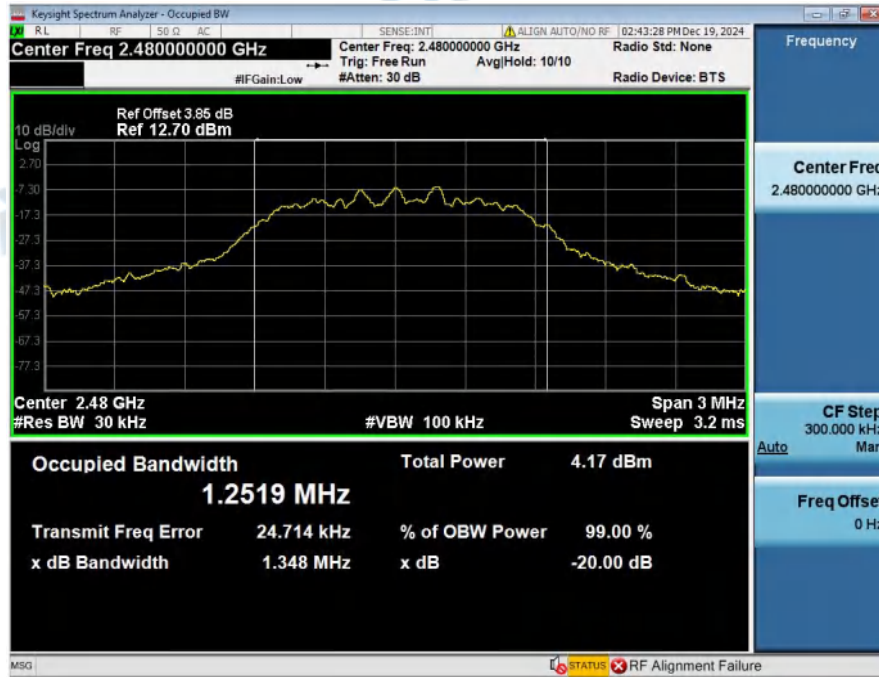
### -20dB\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2402\_00



### -20dB\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2441\_00



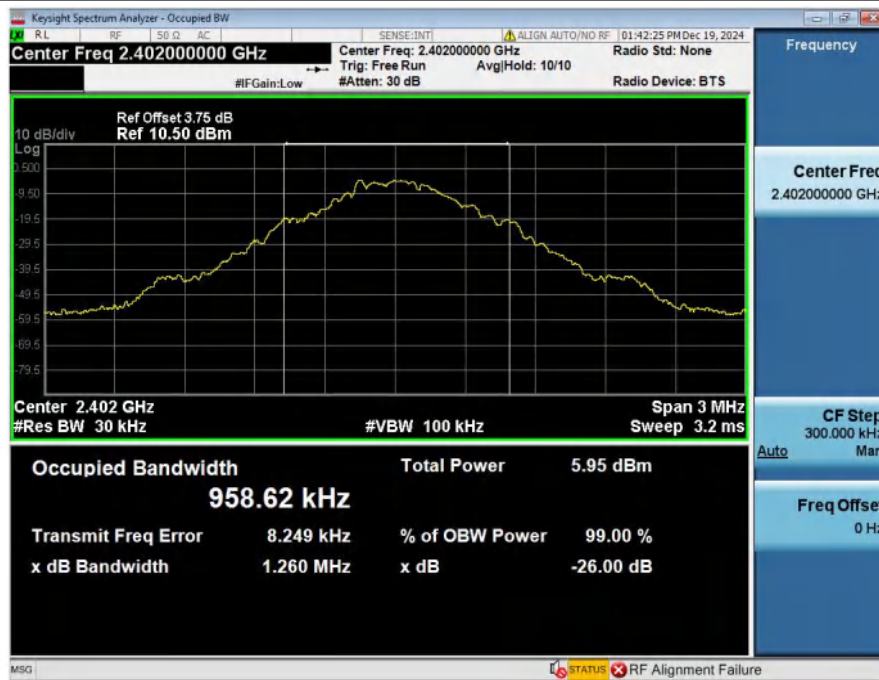
-20dB\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2480\_00



### 3. 99% Occupied Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	99% BW (MHz)
NVNT	ANT1	1-DH5	2402.00	0.959
NVNT	ANT1	1-DH5	2441.00	0.972
NVNT	ANT1	1-DH5	2480.00	0.985
NVNT	ANT1	2-DH5	2402.00	1.222
NVNT	ANT1	2-DH5	2441.00	1.237
NVNT	ANT1	2-DH5	2480.00	1.254

99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_1-DH5\_2402\_00





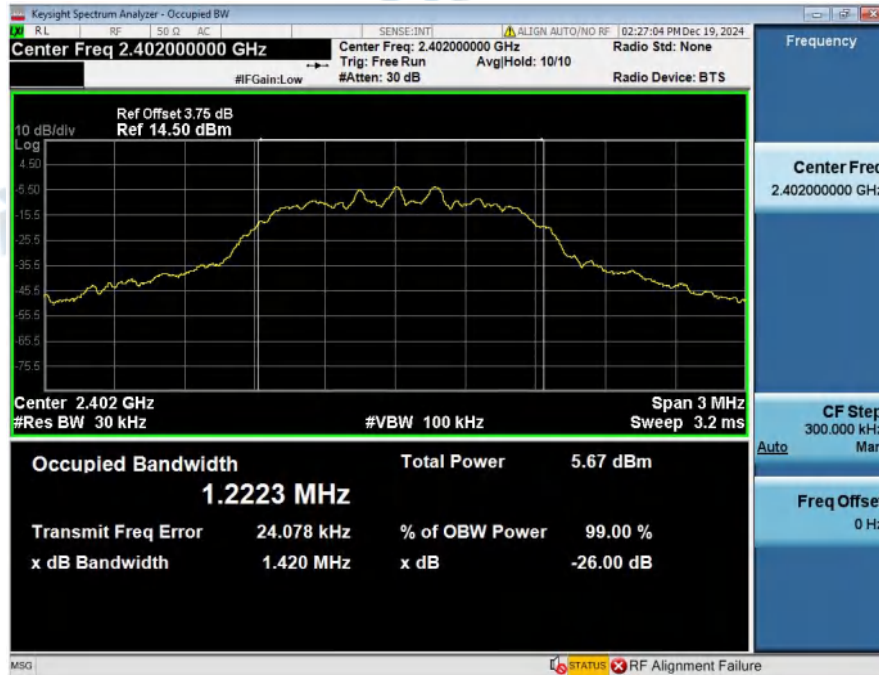
### 99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_1-DH5\_2441\_00



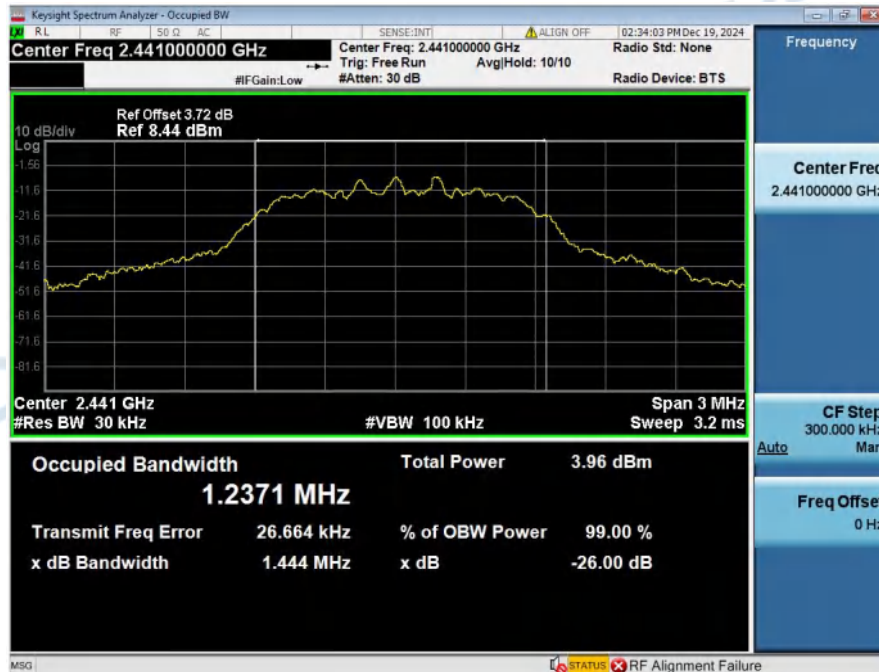
### 99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_1-DH5\_2480\_00



### 99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2402\_00



### 99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2441\_00



99%\_Occupied\_Bandwidth\_NVNT\_ANT1\_2-DH5\_2480\_00



#### 4. Peak Output Power

Condition	Antenna	Modulation	Frequency (MHz)	Max. Conducted Power(dBm)	Max. Conducted Power(mW)	Limit(mW)	Result
NVNT	ANT1	1-DH5	2402.00	-2.24	0.60	125	Pass
NVNT	ANT1	1-DH5	2441.00	-1.69	0.68	125	Pass
NVNT	ANT1	1-DH5	2480.00	-1.53	0.70	125	Pass
NVNT	ANT1	2-DH5	2402.00	-1.52	0.70	125	Pass
NVNT	ANT1	2-DH5	2441.00	-2.75	0.53	125	Pass
NVNT	ANT1	2-DH5	2480.00	-2.91	0.51	125	Pass

Peak\_Output\_Power\_NVNT\_ANT1\_1-DH5\_2402\_00





### Peak\_Output\_Power\_NVNT\_ANT1\_1-DH5\_2441\_00



### Peak\_Output\_Power\_NVNT\_ANT1\_1-DH5\_2480\_00



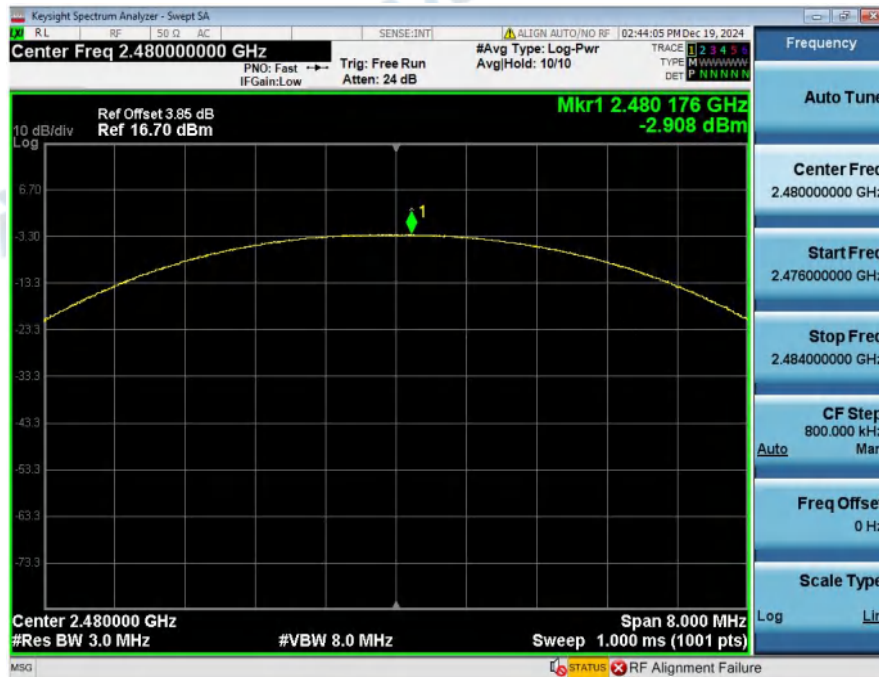
Peak\_Output\_Power\_NVNT\_ANT1\_2-DH5\_2402\_00



Peak\_Output\_Power\_NVNT\_ANT1\_2-DH5\_2441\_00



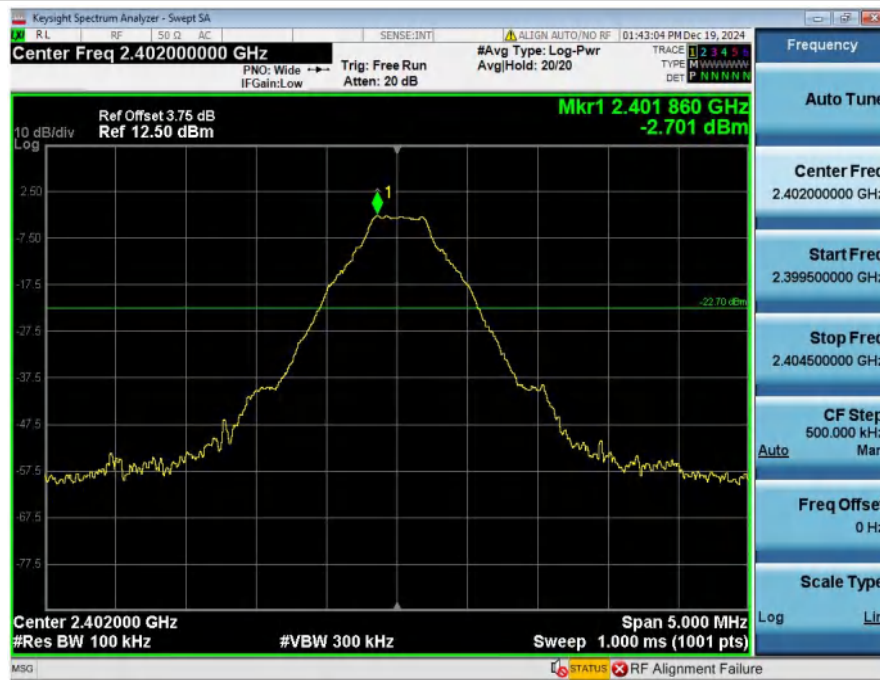
Peak\_Output\_Power\_NVNT\_ANT1\_2-DH5\_2480\_00



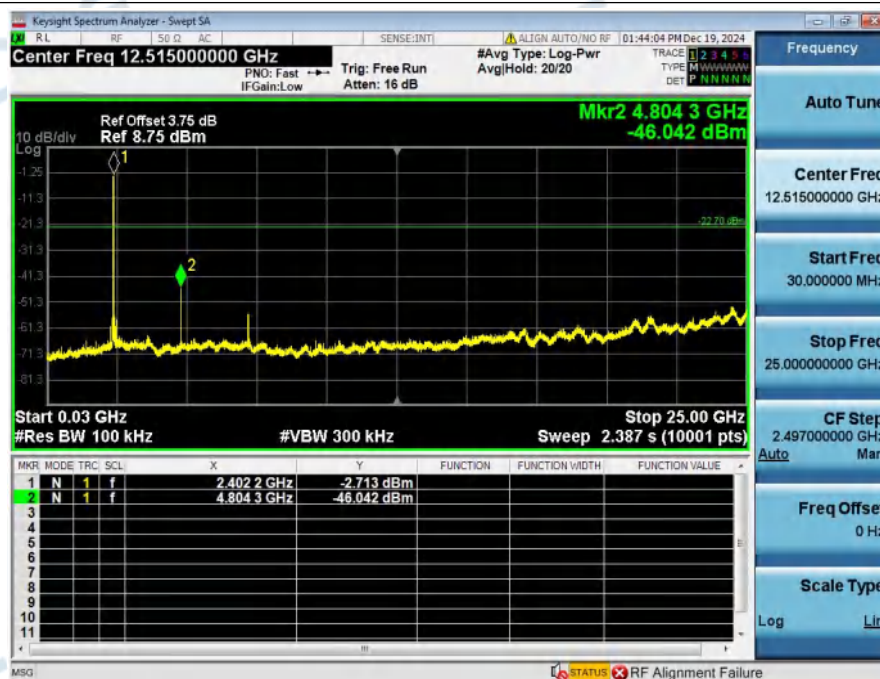
## 5. Spurious Emissions

Condition	Antenna	Modulation	TX Mode	Ref_level(dBm)	Spurious MAX.Value(dBm)	Limit	Result
NVNT	ANT1	1-DH5	2402.00	-2.701	-46.042	-22.701	Pass
NVNT	ANT1	1-DH5	2441.00	-1.990	-46.036	-21.990	Pass
NVNT	ANT1	1-DH5	2480.00	-1.823	-44.517	-21.823	Pass
NVNT	ANT1	2-DH5	2402.00	-3.054	-47.525	-23.054	Pass
NVNT	ANT1	2-DH5	2441.00	-4.325	-45.517	-24.325	Pass
NVNT	ANT1	2-DH5	2480.00	-3.896	-45.727	-23.896	Pass

1\_Reference\_Level\_NVNT\_ANT1\_1-DH5\_2402\_00

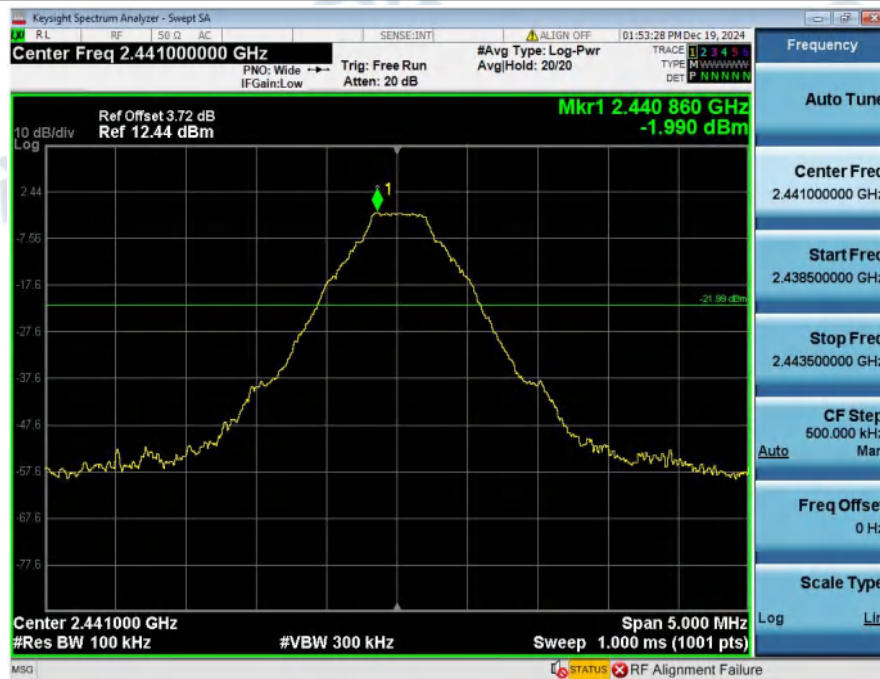


2\_Spurious\_Emissions\_NVNT\_ANT1\_1-DH5\_2402\_00

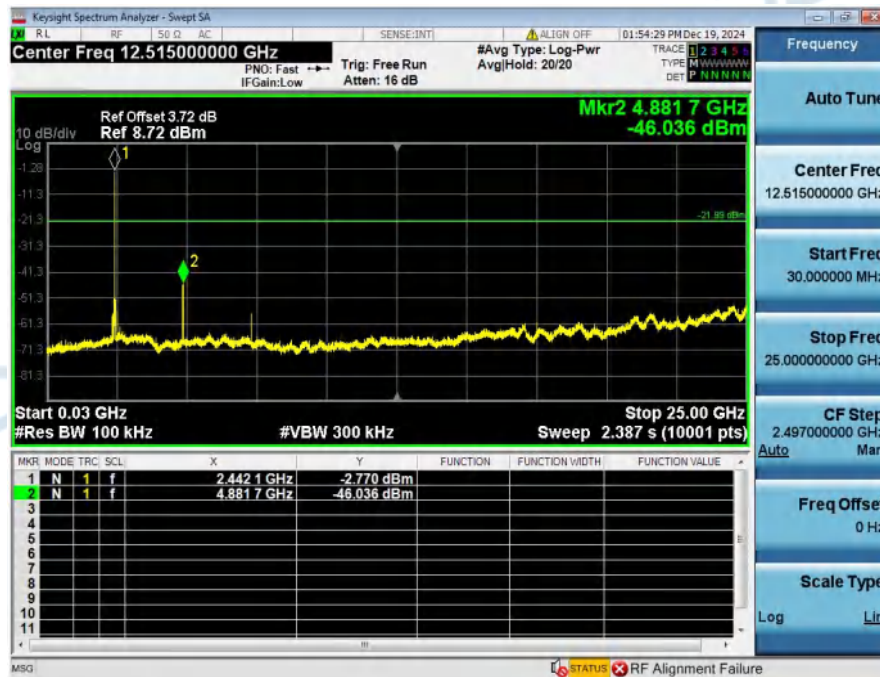




### 1\_Reference\_Level\_NVNT\_ANT1\_1-DH5\_2441\_00



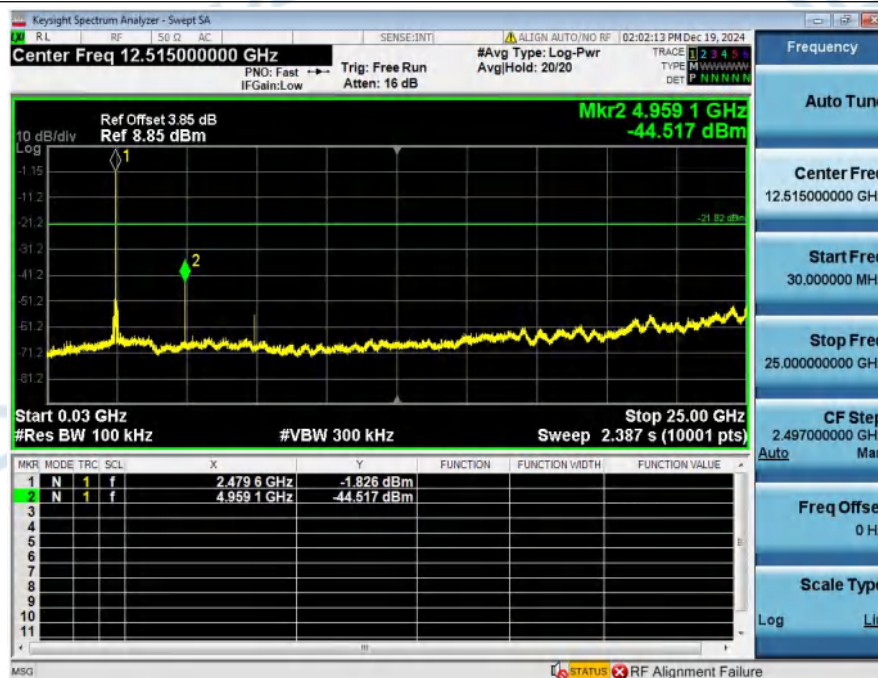
### 2\_Spurious\_Emissions\_NVNT\_ANT1\_1-DH5\_2441\_00



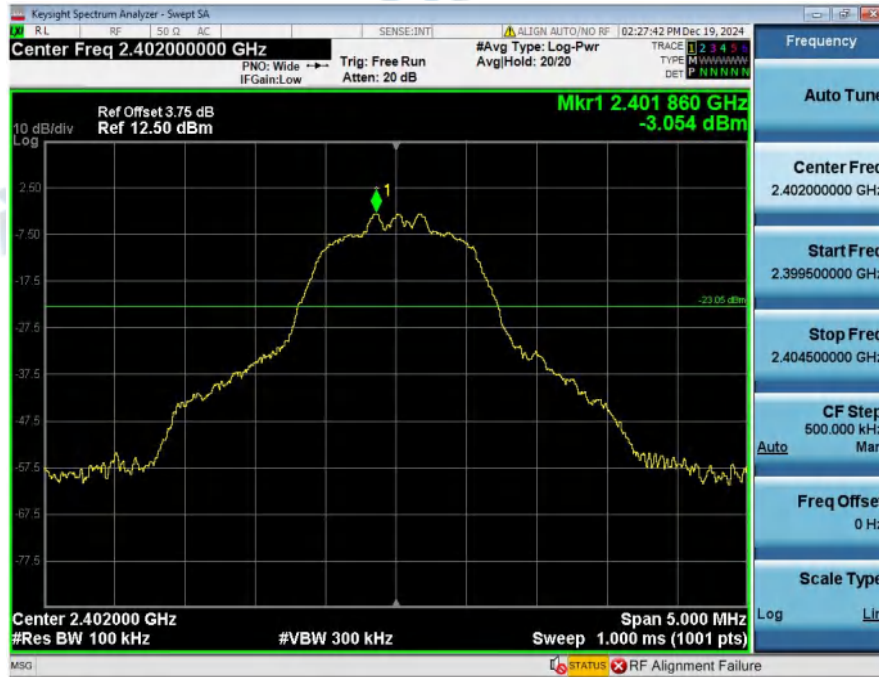
### 1\_Reference\_Level\_NVNT\_ANT1\_1-DH5\_2480\_00



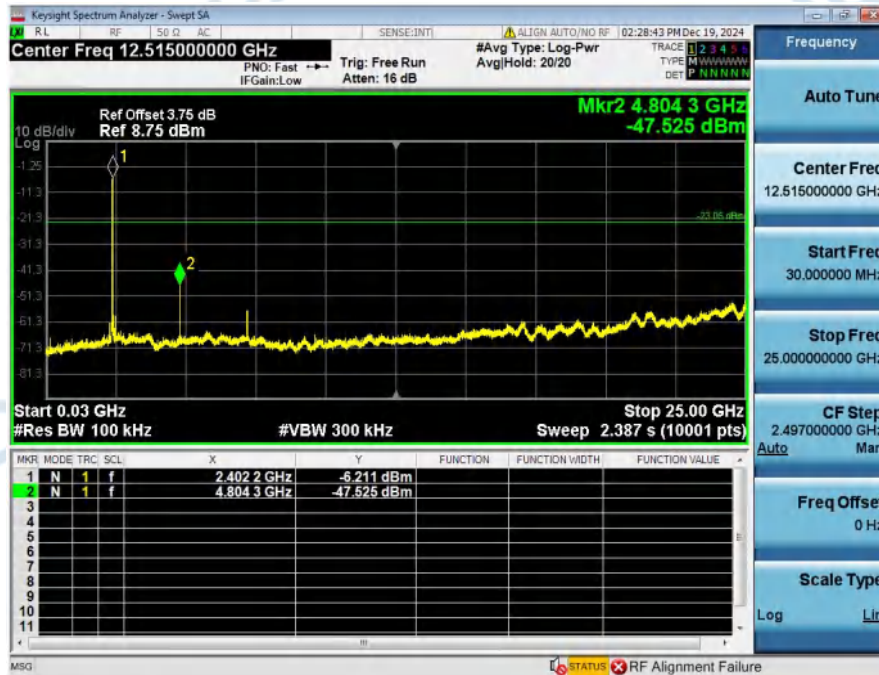
### 2\_Spurious\_Emissions\_NVNT\_ANT1\_1-DH5\_2480\_00



### 1\_Reference\_Level\_NVNT\_ANT1\_2-DH5\_2402\_00

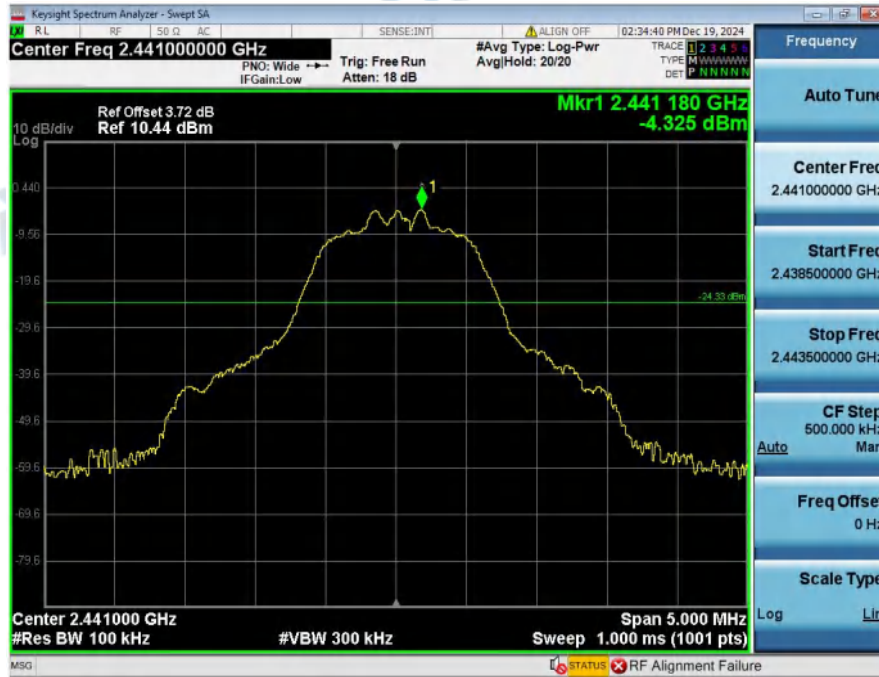


### 2\_Spurious\_Emissions\_NVNT\_ANT1\_2-DH5\_2402\_00

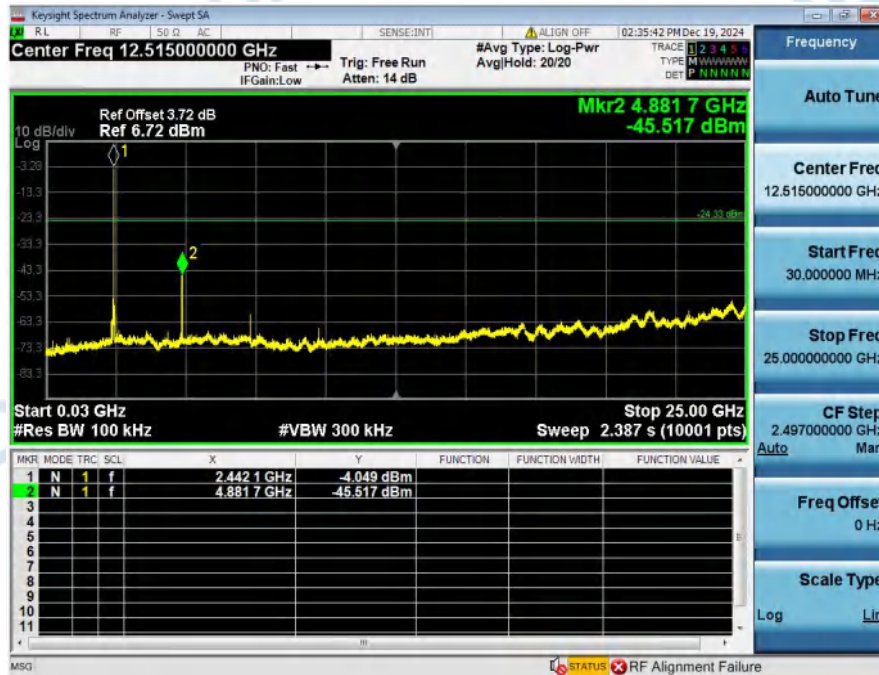




### 1\_Reference\_Level\_NVNT\_ANT1\_2-DH5\_2441\_00



### 2\_Spurious\_Emissions\_NVNT\_ANT1\_2-DH5\_2441\_00

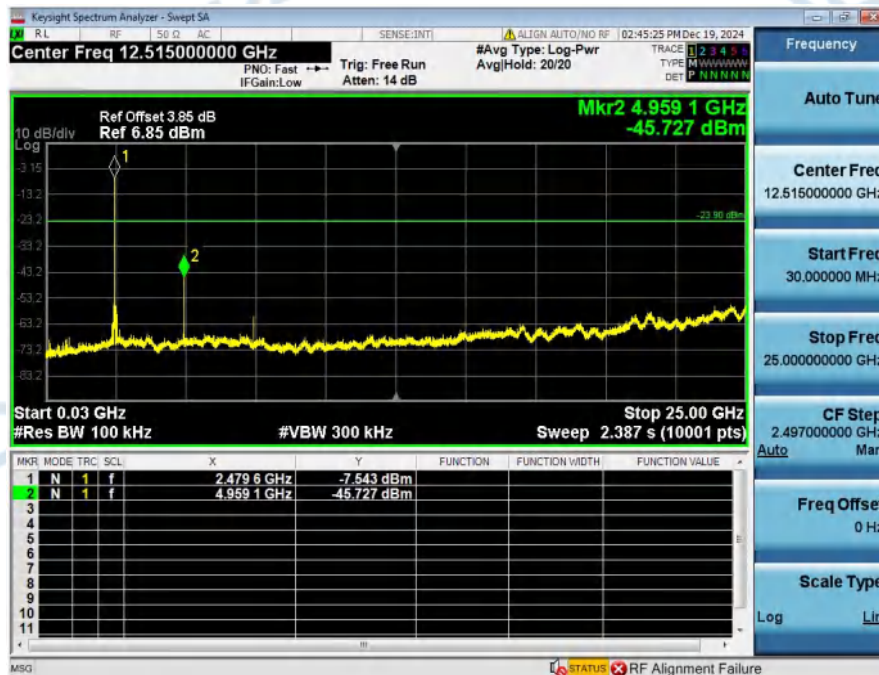




### 1\_Reference\_Level\_NVNT\_ANT1\_2-DH5\_2480\_00



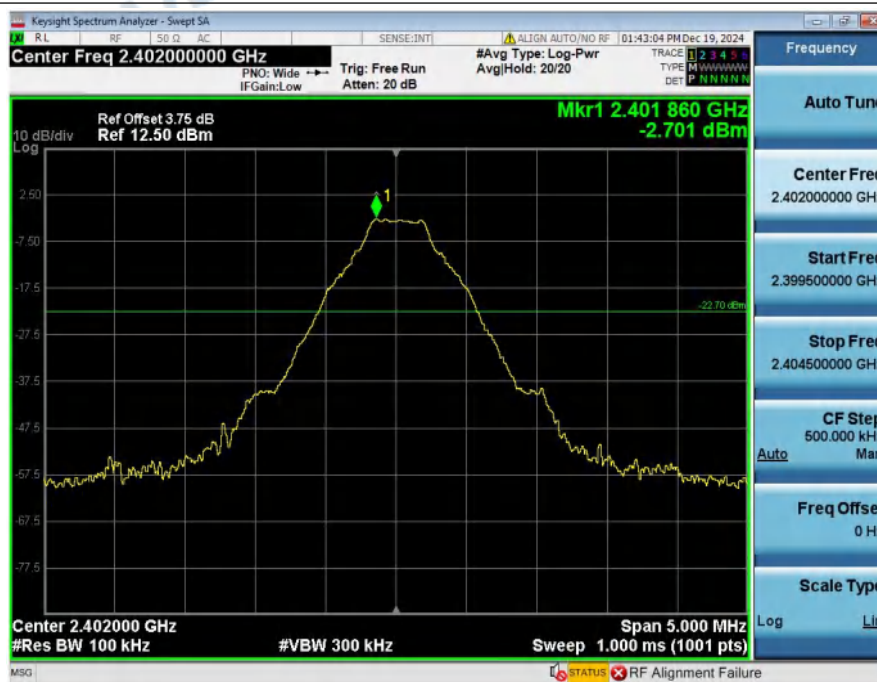
### 2\_Spurious\_Emissions\_NVNT\_ANT1\_2-DH5\_2480\_00



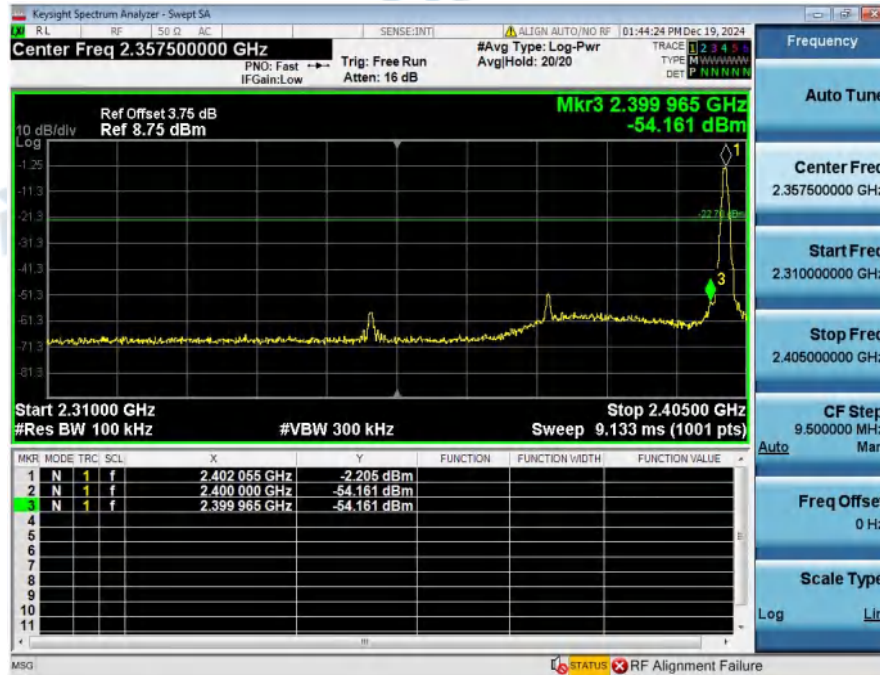
## 6. Bandedge

Condition	Antenna	Modulation	TX Mode	Ref_level(dBm)	Bandedge MAX.Value	Limit	Result
NVNT	ANT1	1-DH5	2402.00	-2.701	-54.161	-22.701	Pass
NVNT	ANT1	1-DH5	Hopping_LCH	-2.660	-51.971	-22.660	Pass
NVNT	ANT1	1-DH5	2480.00	-1.823	-56.475	-21.823	Pass
NVNT	ANT1	1-DH5	Hopping_HCH	-0.780	-49.651	-20.780	Pass
NVNT	ANT1	2-DH5	2402.00	-3.054	-54.231	-23.054	Pass
NVNT	ANT1	2-DH5	Hopping_LCH	-2.353	-52.300	-22.353	Pass
NVNT	ANT1	2-DH5	2480.00	-3.896	-59.418	-23.896	Pass
NVNT	ANT1	2-DH5	Hopping_HCH	-3.325	-52.982	-23.325	Pass

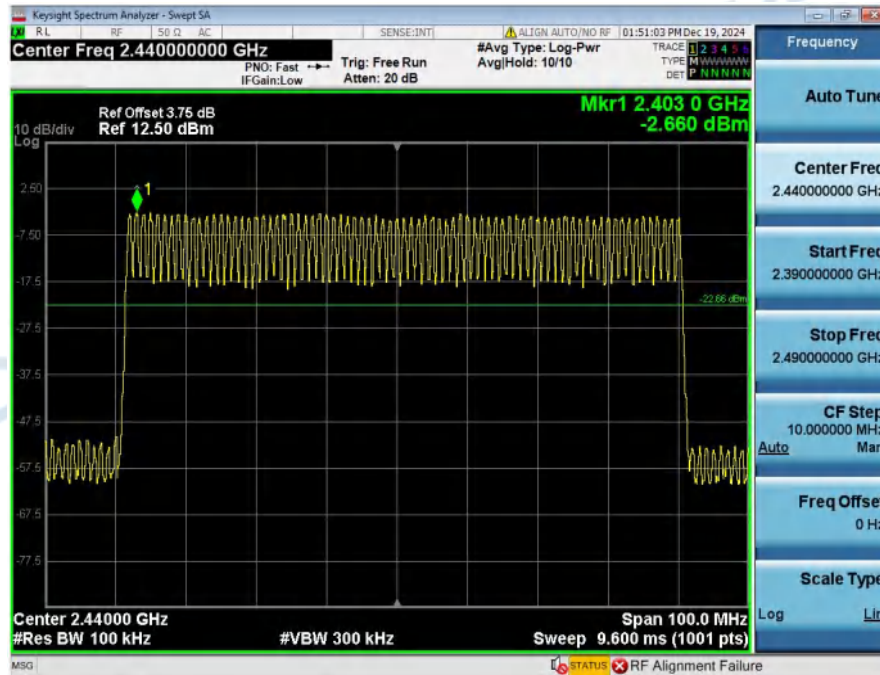
1\_Reference\_Level\_NVNT\_ANT1\_1-DH5\_2402\_00



## 2\_Bandedge\_NVNT\_ANT1\_1-DH5\_2402\_00

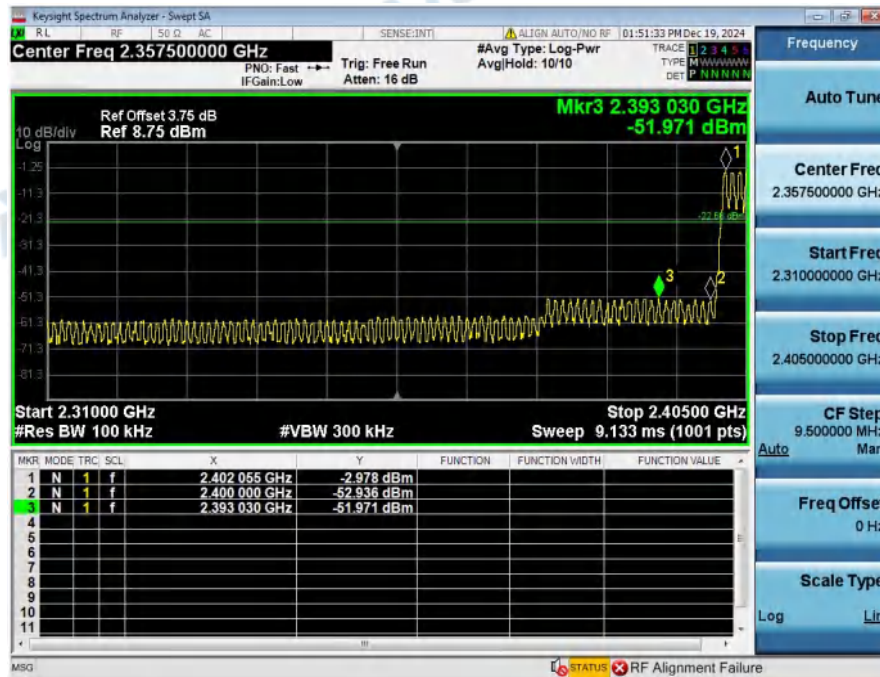


## 1\_Reference\_Level\_Hopping\_NVNT\_ANT1\_1-DH5\_Hopping

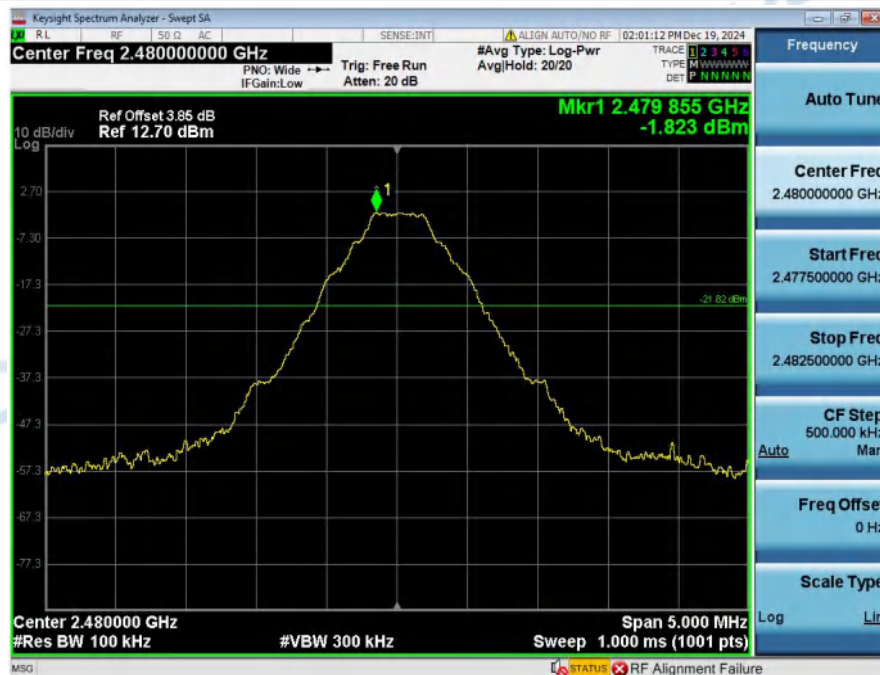




## 2\_Band\_Edge\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping

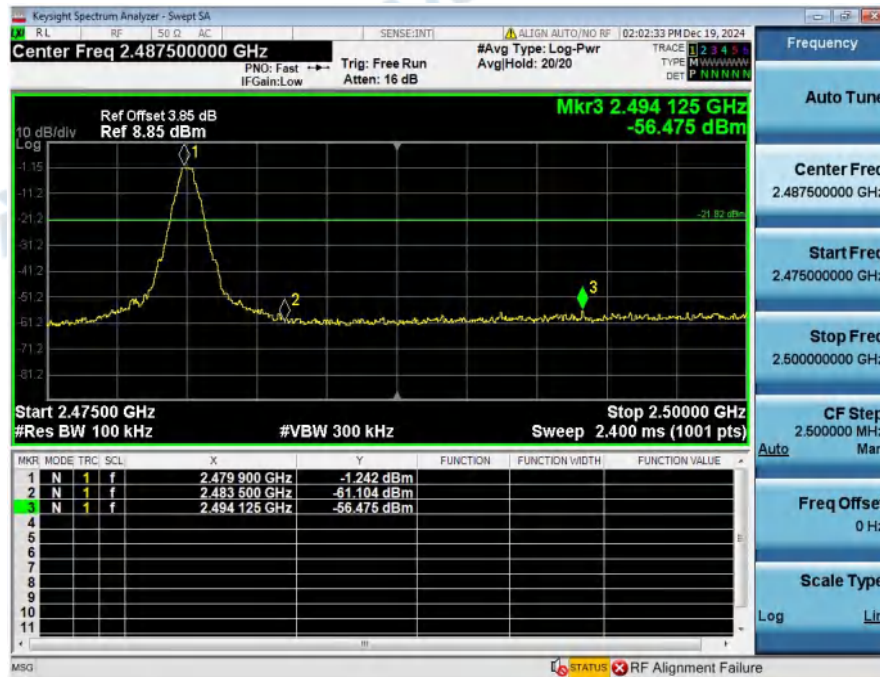


## 1\_Reference\_Level\_NVNT\_ANT1\_1-DH5\_2480\_00

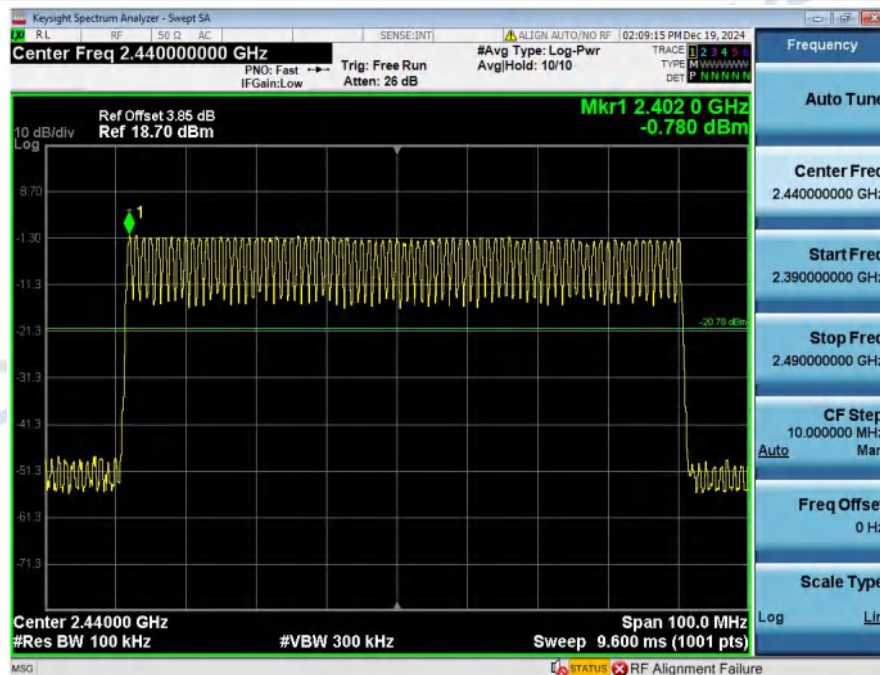




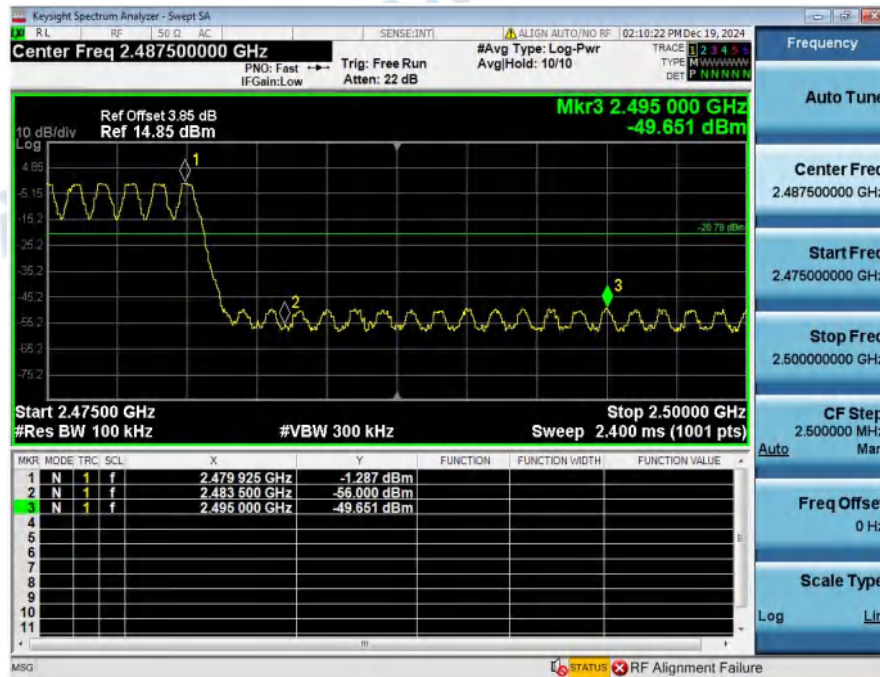
## 2\_Bandedge\_NVNT\_ANT1\_1-DH5\_2480\_00



## 1\_Reference\_Level\_Hopping\_NVNT\_ANT1\_1-DH5\_Hopping



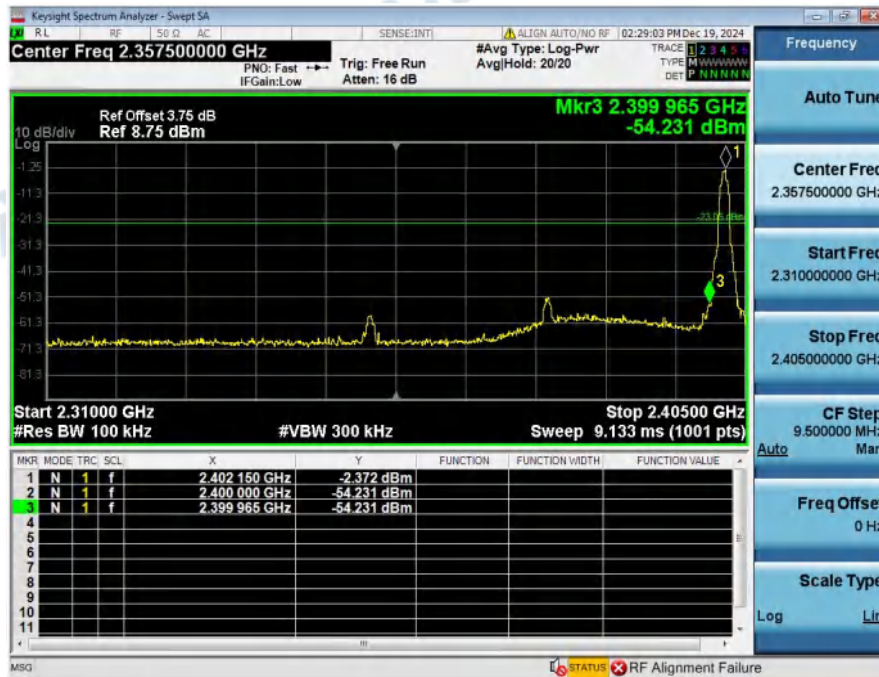
## 2\_Band\_Edge\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping



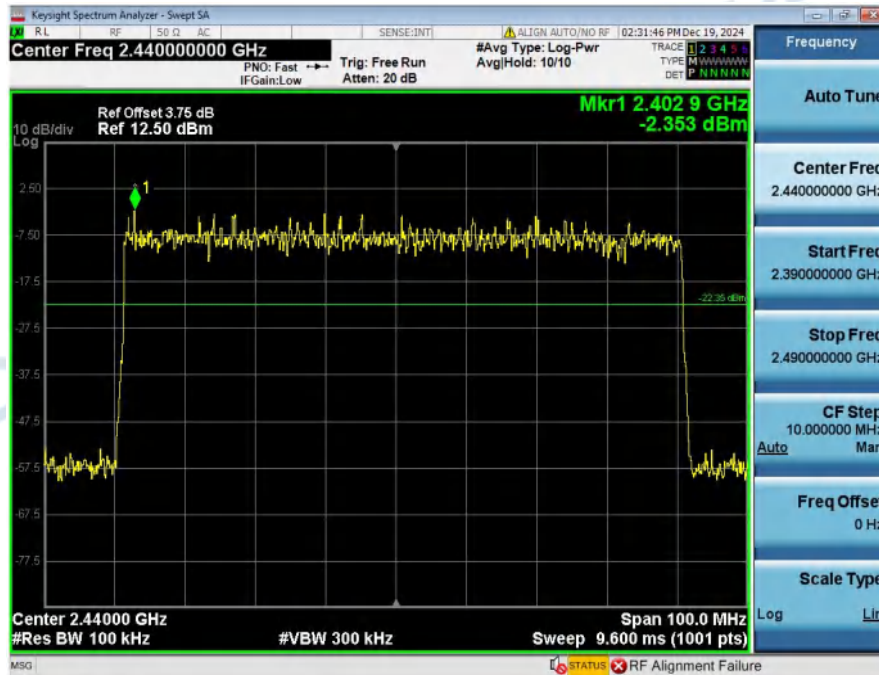
## 1\_Reference\_Level\_NVNT\_ANT1\_2-DH5\_2402\_00



## 2\_Bandedge\_NVNT\_ANT1\_2-DH5\_2402\_00

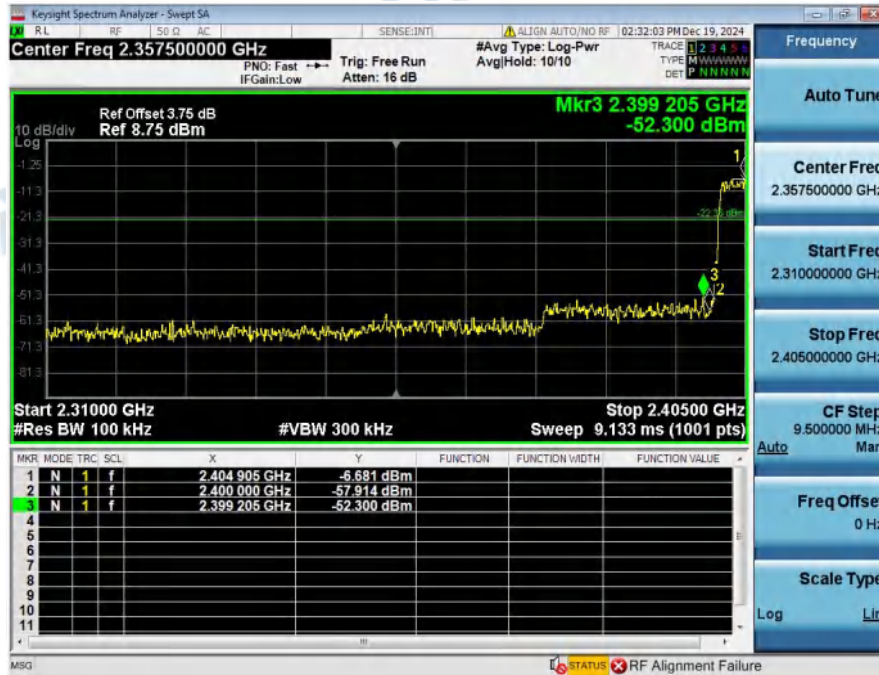


## 1\_Reference\_Level\_Hopping\_NVNT\_ANT1\_2-DH5\_Hopping

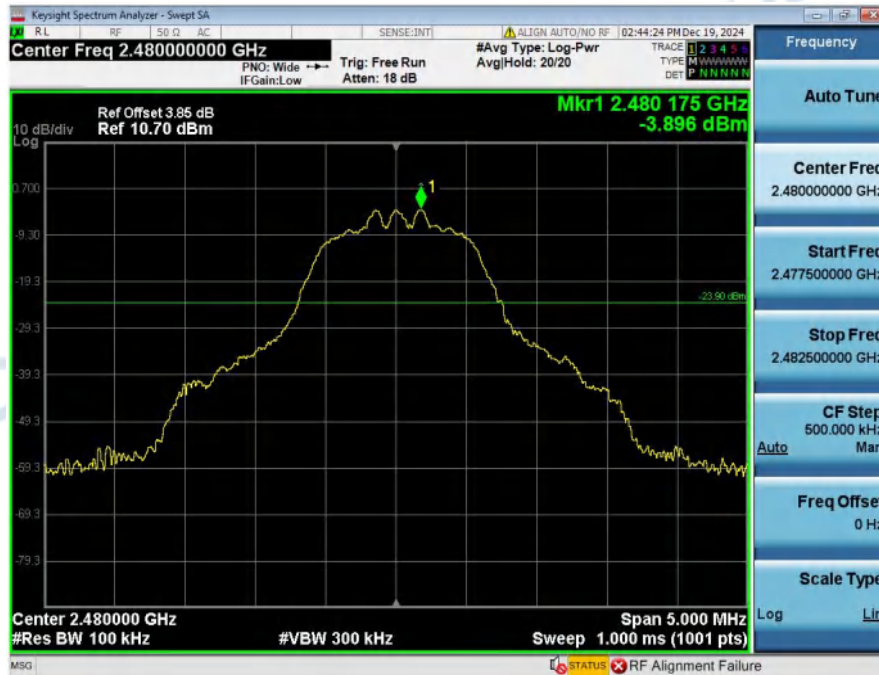




## 2\_Band\_Edge\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping

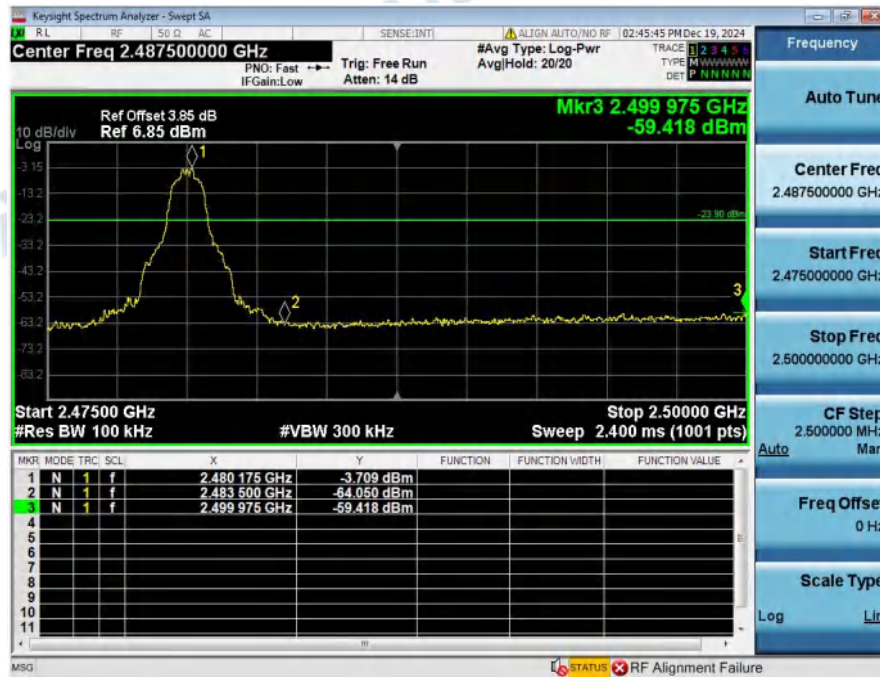


## 1\_Reference\_Level\_NVNT\_ANT1\_2-DH5\_2480\_00

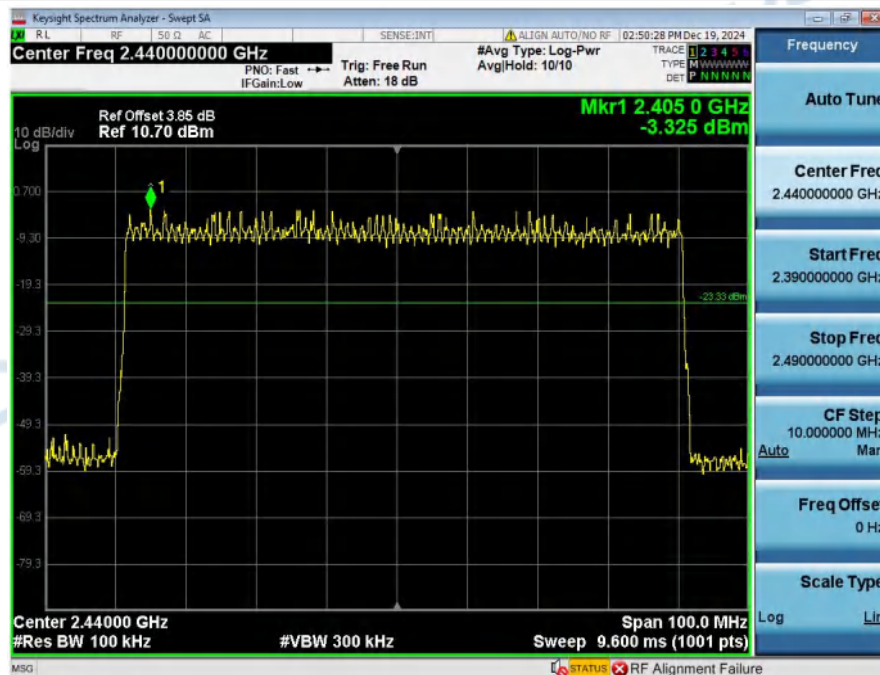




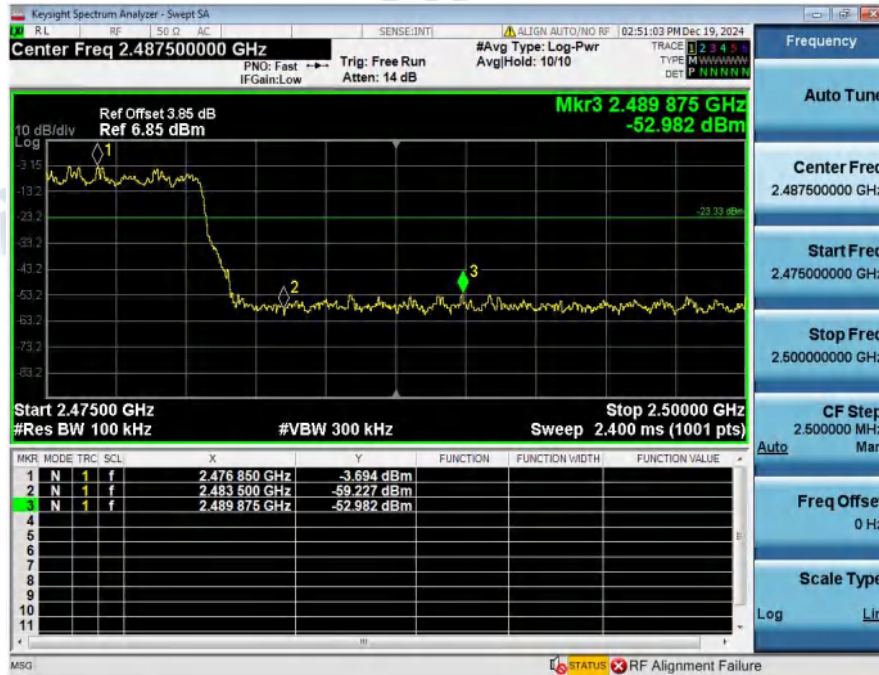
## 2\_Bandedge\_NVNT\_ANT1\_2-DH5\_2480\_00



## 1\_Reference\_Level\_Hopping\_NVNT\_ANT1\_2-DH5\_Hopping



## 2\_Band\_Edge\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



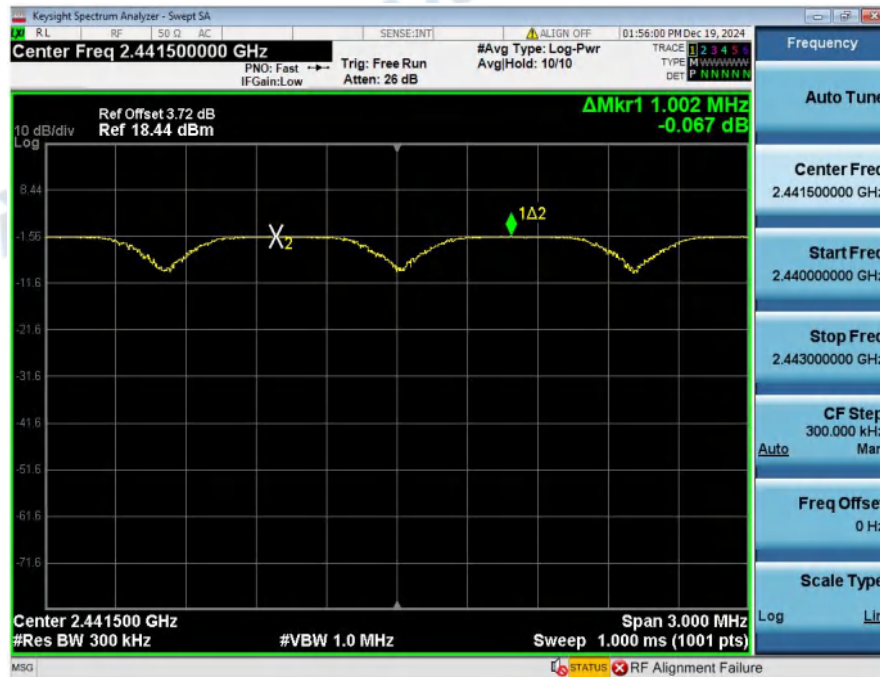
## 7. Carrier Frequencies Separation (Hopping)

Condition	Antenna	Modulation	Frequency(MHz)	Hopping NO.0 (MHz)	Hopping NO.1 (MHz)	Carrier Frequencies Separation(MHz)	Limit(MHz)	Result
NVNT	ANT1	1-DH5	2402.00	2402.071	2402.902	0.83	0.711	Pass
NVNT	ANT1	1-DH5	2441.00	2440.984	2441.986	1.00	0.709	Pass
NVNT	ANT1	1-DH5	2480.00	2479.002	2480.052	1.05	0.719	Pass
NVNT	ANT1	2-DH5	2402.00	2401.840	2403.151	1.31	0.893	Pass
NVNT	ANT1	2-DH5	2441.00	2441.011	2441.974	0.96	0.895	Pass
NVNT	ANT1	2-DH5	2480.00	2478.912	2479.986	1.07	0.899	Pass

Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping



## Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping



## Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping





Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping

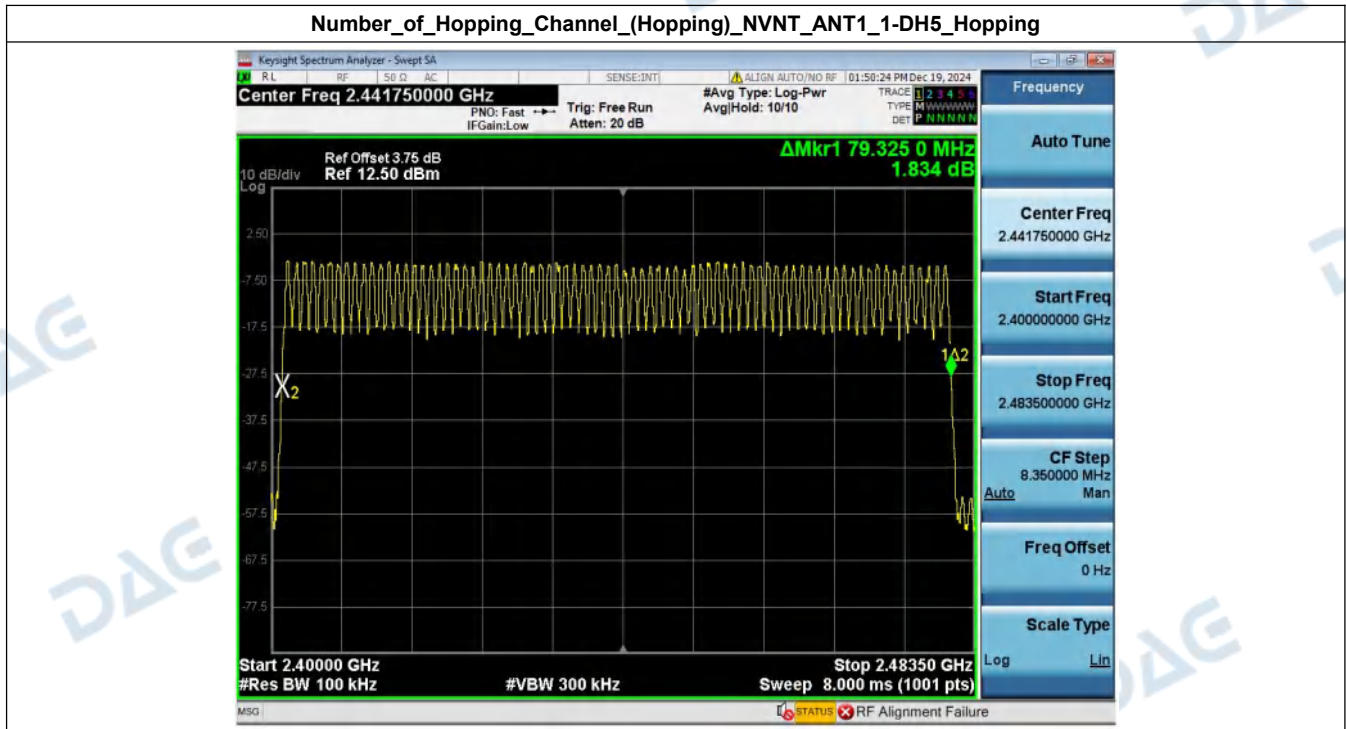


Carrier\_Frequencies\_Separation\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



## 8. Number of Hopping Channel (Hopping)

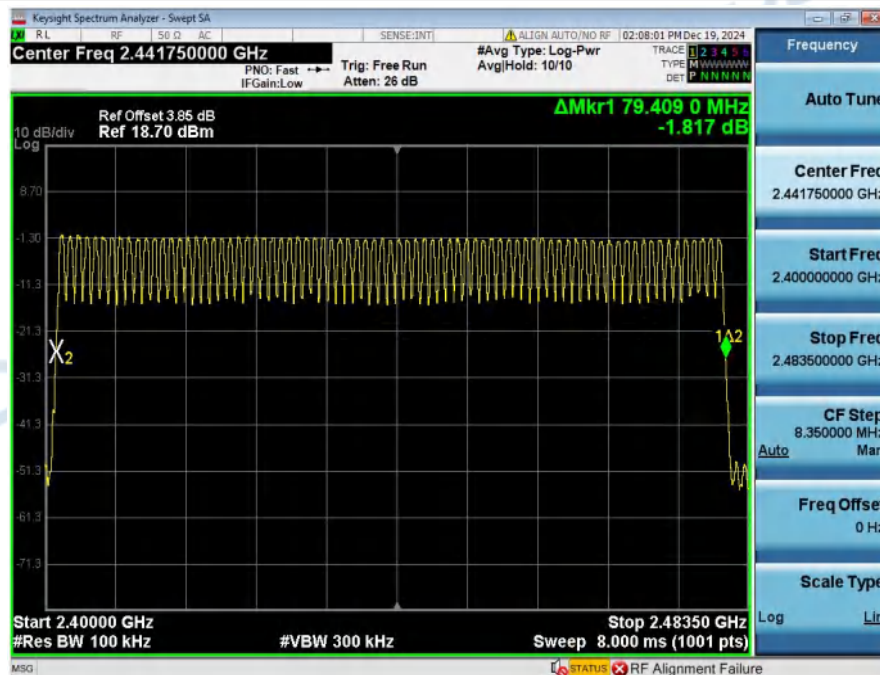
Condition	Antenna	Modulation	Hopping Num	Limit	Result
NVNT	ANT1	1-DH5	79	15	Pass
NVNT	ANT1	1-DH5	79	15	Pass
NVNT	ANT1	1-DH5	79	15	Pass
NVNT	ANT1	2-DH5	79	15	Pass
NVNT	ANT1	2-DH5	79	15	Pass
NVNT	ANT1	2-DH5	79	15	Pass



Number\_of\_Hopping\_Channel\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping

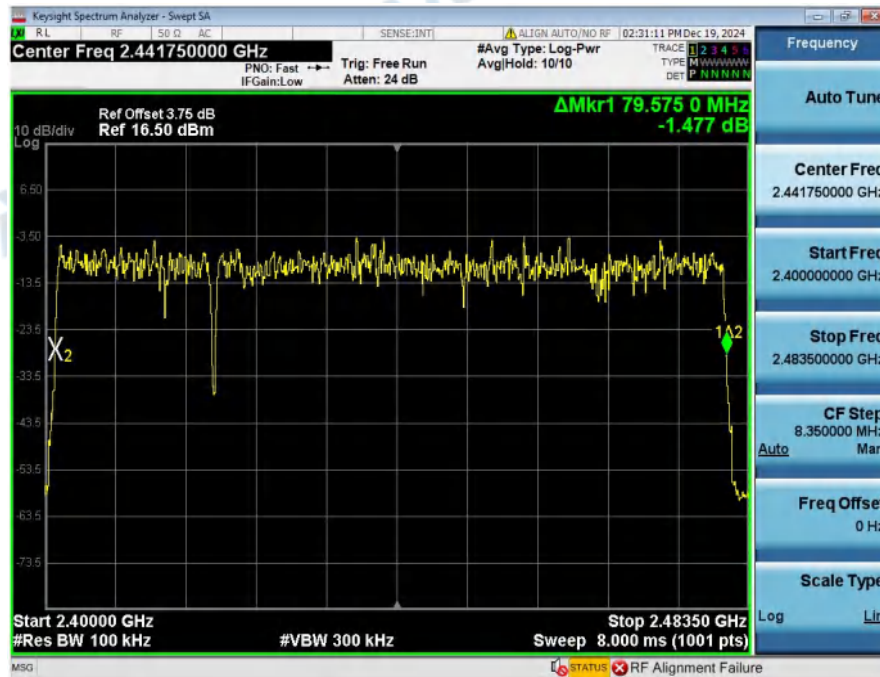


Number\_of\_Hopping\_Channel\_(Hopping)\_NVNT\_ANT1\_1-DH5\_Hopping





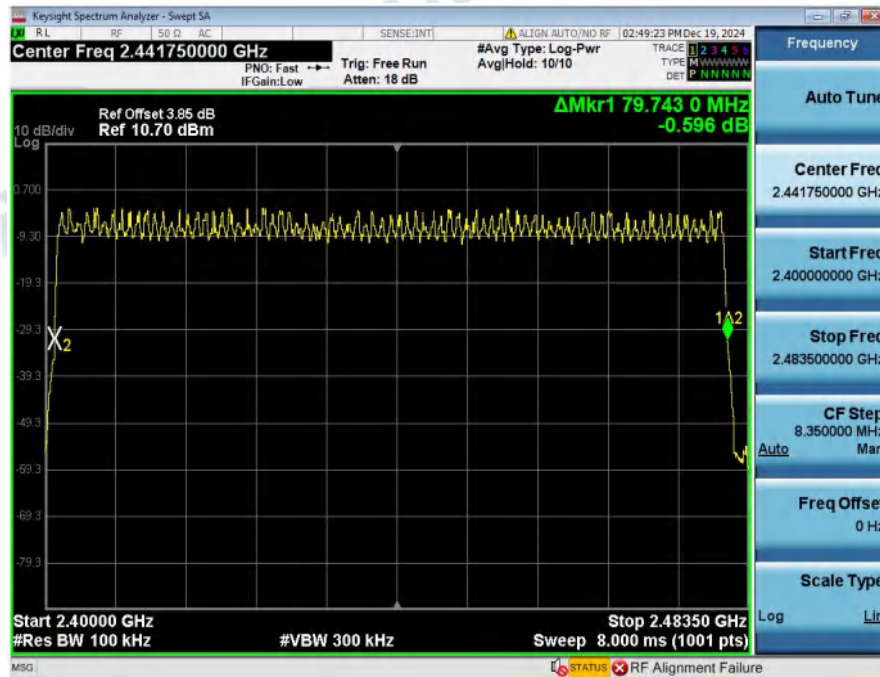
Number\_of\_Hopping\_Channel\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



Number\_of\_Hopping\_Channel\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



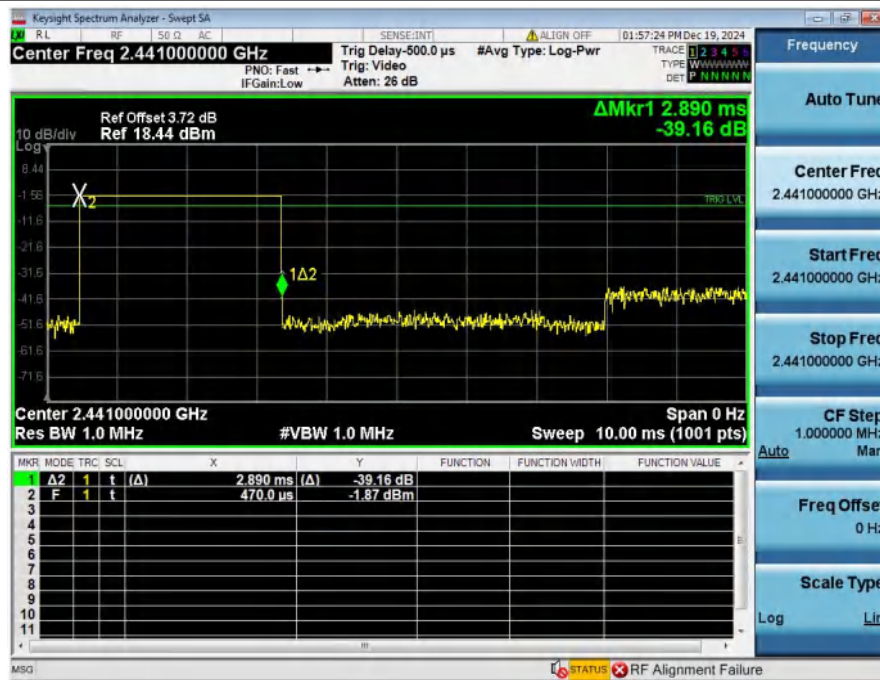
Number\_of\_Hopping\_Channel\_(Hopping)\_NVNT\_ANT1\_2-DH5\_Hopping



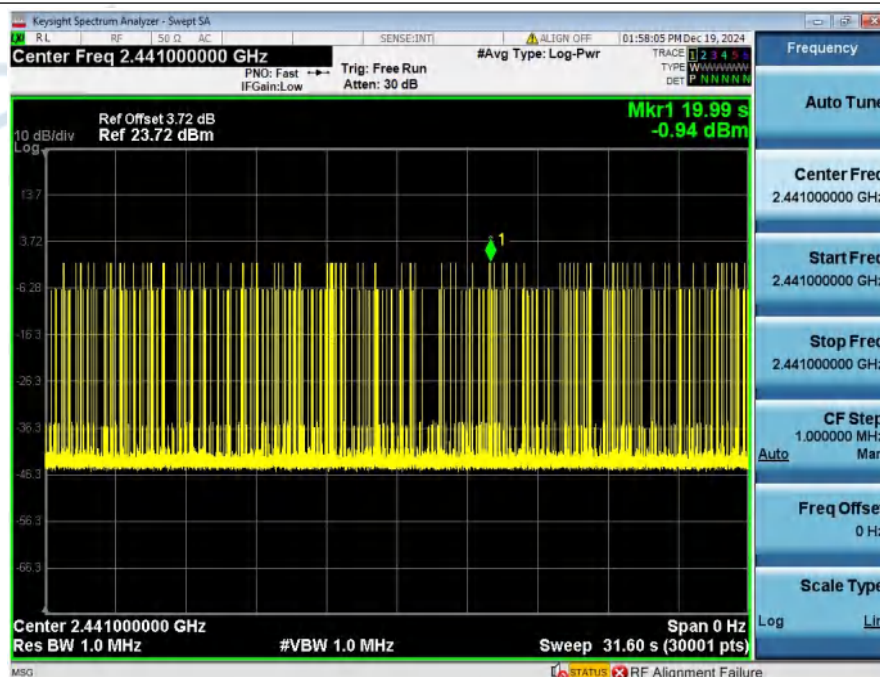
## 9. Dwell Time (Hopping)

Condition	Antenna	Packet Type	Pulse Time(ms)	Hops	Dwell Time(ms)	Limit(s)	Result
NVNT	ANT1	1-DH5	2.890	96.00	277.440	0.40	Pass
NVNT	ANT1	2-DH5	2.900	92.00	266.800	0.40	Pass
NVNT	ANT1	1-DH1	0.390	320.00	124.800	0.40	Pass
NVNT	ANT1	1-DH3	1.640	164.00	268.960	0.40	Pass
NVNT	ANT1	2-DH1	0.400	319.00	127.600	0.40	Pass
NVNT	ANT1	2-DH3	1.650	161.00	265.650	0.40	Pass

Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH5\_2441\_00\_One\_Burst\_Time

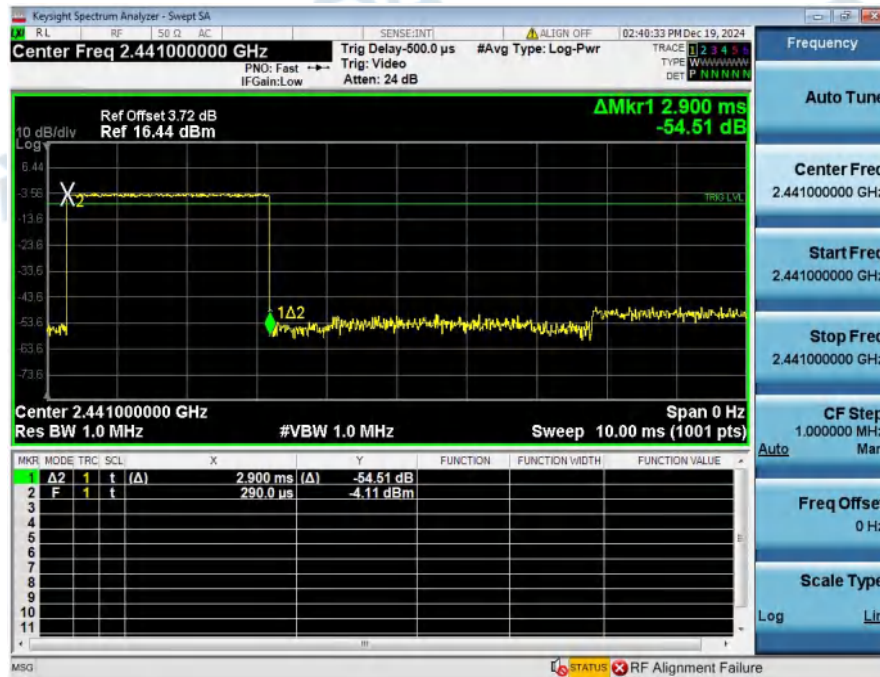


Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH5\_2441\_00\_Accumulated

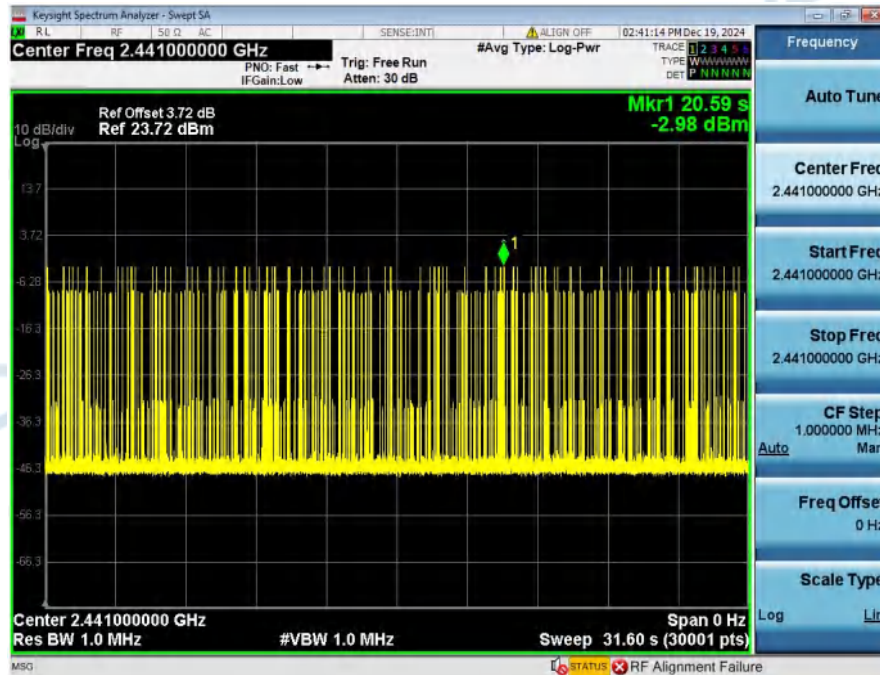




## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH5\_2441\_00\_One\_Burst\_Time

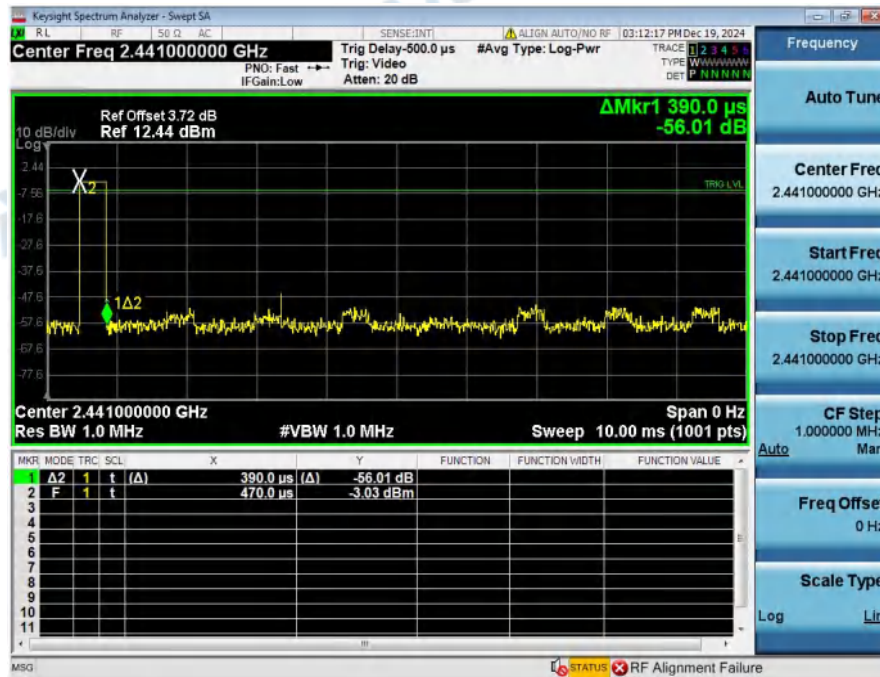


## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH5\_2441\_00\_Accumulated

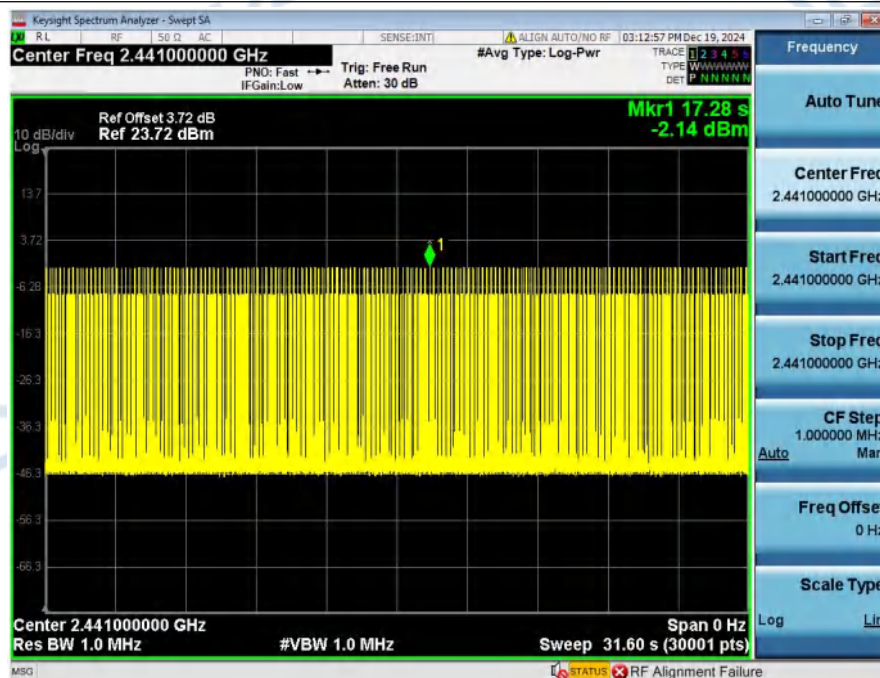




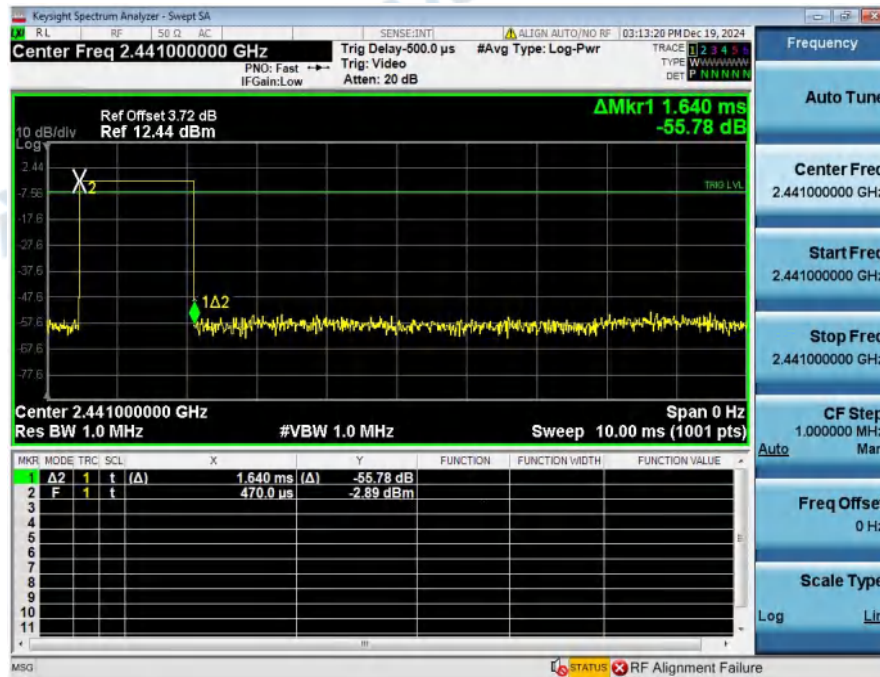
### Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH1\_2441\_00\_One\_Burst\_Time



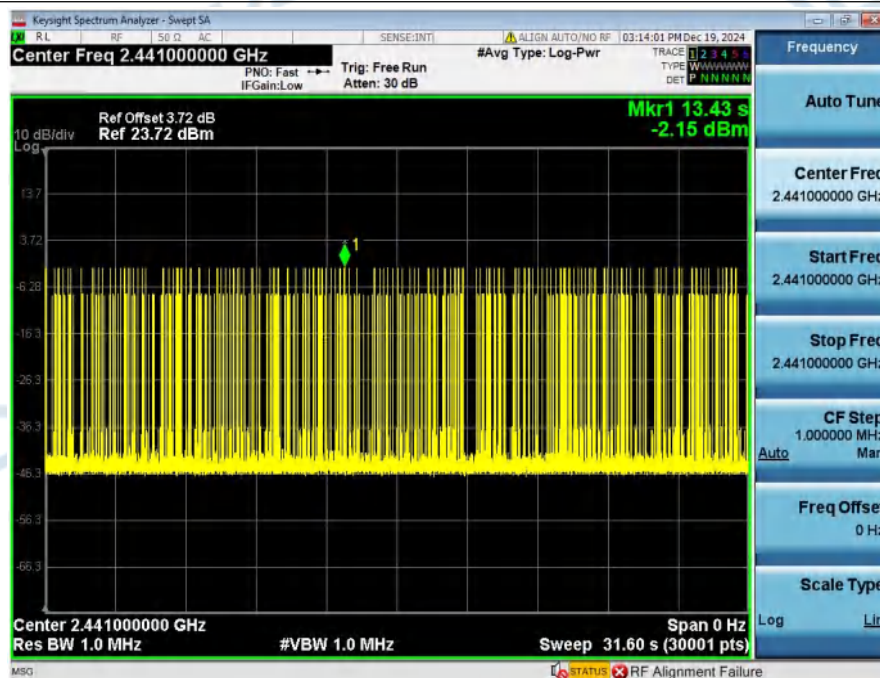
### Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH1\_2441\_00\_Accumulated



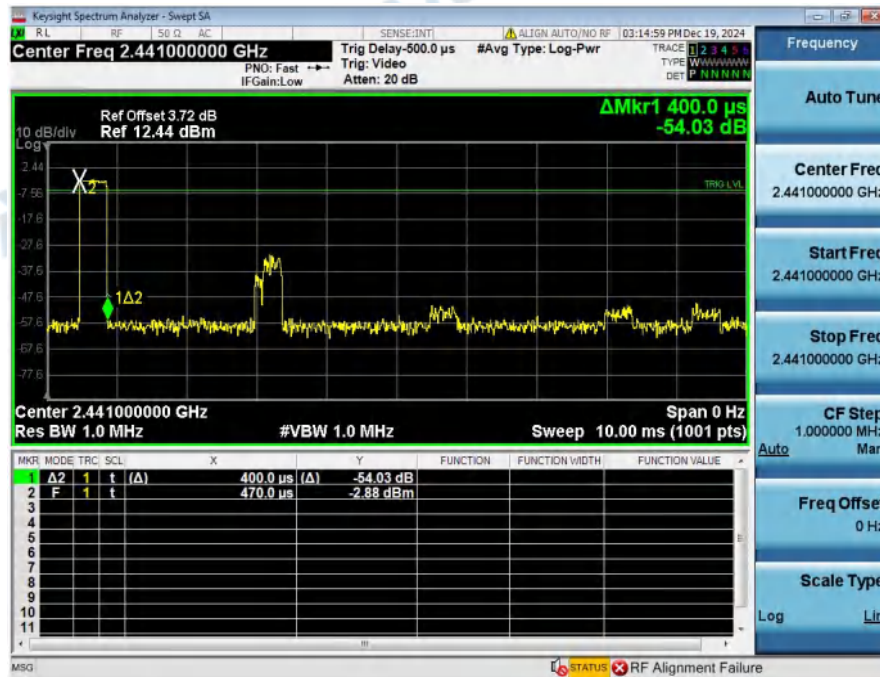
## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH3\_2441\_00\_One\_Burst\_Time



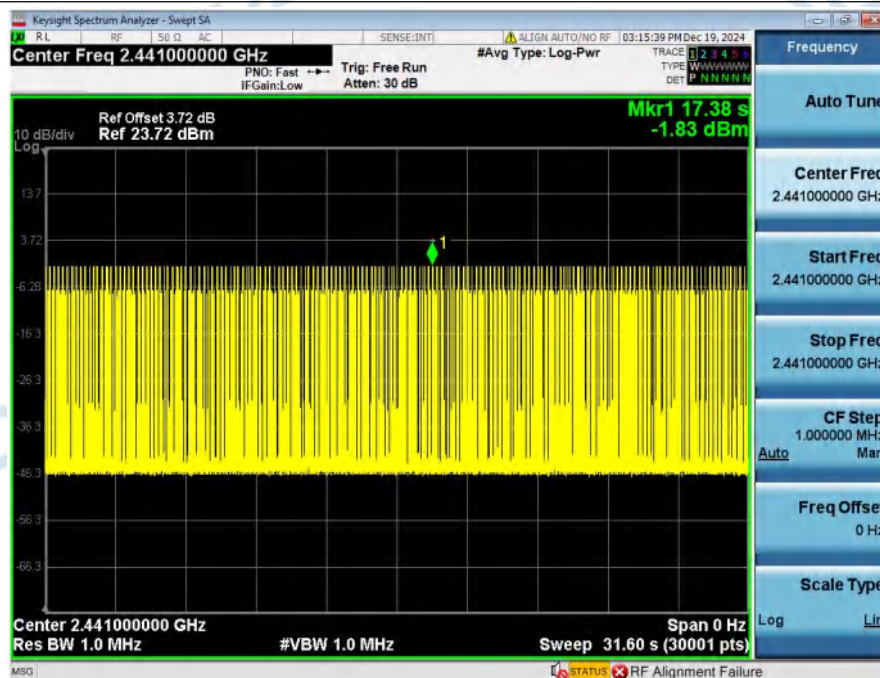
## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_1-DH3\_2441\_00\_Accumulated



## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH1\_2441\_00\_One\_Burst\_Time

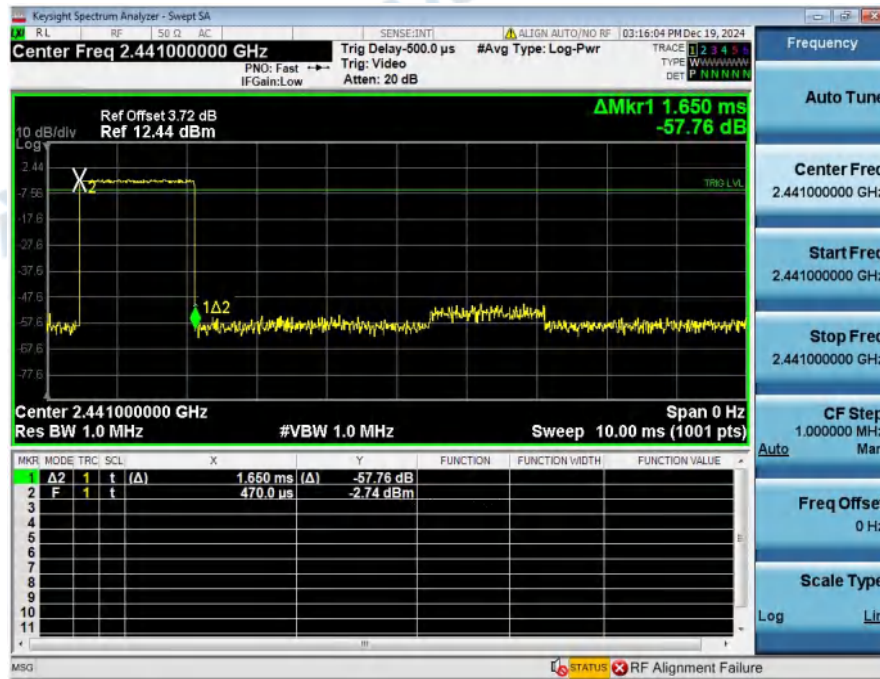


## Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH1\_2441\_00\_Accumulated

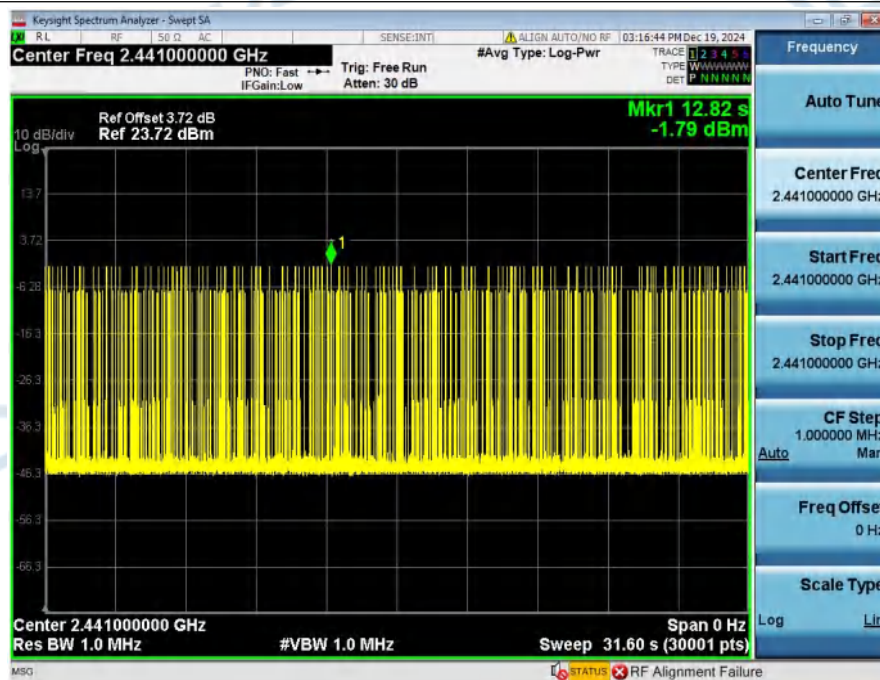




Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH3\_2441\_00\_One\_Burst\_Time



Dwell\_Time\_(Hopping)\_NVNT\_ANT1\_2-DH3\_2441\_00\_Accumulated



\*\*\*\*\* End of Report \*\*\*\*\*