

RF TEST REPORT

For

Shenzhen Weihejia Electronic Technology Co.,LTD

Product Name: BHWW Laptop

Model(s): BaseBook

Report Reference No. : POCE230918001RF002

FCC ID : 2AXKI-WH160BP

Applicant's Name : Shenzhen Weihejia Electronic Technology Co.,LTD

Address : Block 102, Building 9, Xihu Industrial park, Xikeng community, Yuanshan street, Longgang district, Shenzhen, China

Testing Laboratory : Shenzhen POCE Technology Co., Ltd.

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

Test Specification Standard : 47 CFR Part 15.247
ANSI C63.10-2013 & KDB 558074 D01 Meas Guidance v05r02

Date of Receipt : September 18, 2023

Date of Test : September 18, 2023 to October 8, 2023

Data of Issue : October 8, 2023

Result : Pass

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Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	POCE230918001RF002	October 8, 2023

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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CONTENTS

1	TEST SUMMARY	5
	1.1 TEST STANDARDS	5
	1.2 SUMMARY OF TEST RESULT	5
2	GENERAL INFORMATION	6
	2.1 CLIENT INFORMATION	6
	2.2 DESCRIPTION OF DEVICE (EUT)	6
	2.3 DESCRIPTION OF TEST MODES	7
	2.4 DESCRIPTION OF SUPPORT UNITS	7
	2.5 EQUIPMENTS USED DURING THE TEST	8
	2.6 STATEMENT OF THE MEASUREMENT UNCERTAINTY	9
	2.7 AUTHORIZATIONS	9
	2.8 ANNOUNCEMENT	9
3	EVALUATION RESULTS (EVALUATION)	10
	3.1 ANTENNA REQUIREMENT	10
	3.1.1 Conclusion:	10
4	RADIO SPECTRUM MATTER TEST RESULTS (RF)	11
	4.1 CONDUCTED EMISSION AT AC POWER LINE	11
	4.1.1 E.U.T. Operation:	11
	4.1.2 Test Setup Diagram:	11
	4.1.3 Test Data:	12
	4.2 OCCUPIED BANDWIDTH	14
	4.2.1 E.U.T. Operation:	14
	4.2.2 Test Setup Diagram:	14
	4.2.3 Test Data:	14
	4.3 MAXIMUM CONDUCTED OUTPUT POWER	15
	4.3.1 E.U.T. Operation:	15
	4.3.2 Test Setup Diagram:	15
	4.3.3 Test Data:	15
	4.4 POWER SPECTRAL DENSITY	16
	4.4.1 E.U.T. Operation:	16
	4.4.2 Test Setup Diagram:	16
	4.4.3 Test Data:	16
	4.5 EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	17
	4.5.1 E.U.T. Operation:	17
	4.5.2 Test Setup Diagram:	17
	4.5.3 Test Data:	17
	4.6 BAND EDGE EMISSIONS (RADIATED)	18
	4.6.1 E.U.T. Operation:	18
	4.6.2 Test Setup Diagram:	18
	4.6.3 Test Data:	19
	4.7 EMISSIONS IN FREQUENCY BANDS (BELOW 1GHZ)	22
	4.7.1 E.U.T. Operation:	23
	4.7.2 Test Setup Diagram:	23
	4.7.3 Test Data:	23
	4.8 EMISSIONS IN FREQUENCY BANDS (ABOVE 1GHZ)	25
	4.8.1 E.U.T. Operation:	26
	4.8.2 Test Setup Diagram:	26
	4.8.3 Test Data:	26
5	TEST SETUP PHOTOS	29

6	PHOTOS OF THE EUT	30
	APPENDIX	31
1.	-6dB BANDWIDTH	31
2.	99% OCCUPIED BANDWIDTH	35
3.	DUTY CYCLE	38
4.	PEAK OUTPUT POWER	41
5.	POWER SPECTRAL DENSITY	44
6.	BANDEDGE	47
7.	SPURIOUS EMISSION	51

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	Result
Antenna requirement	47 CFR Part 15.247		Pass
Conducted Emission at AC power line	47 CFR Part 15.247	ANSI C63.10-2013 section 6.2	Pass
Occupied Bandwidth	47 CFR Part 15.247	ANSI C63.10-2013, section 11.8	Pass
Maximum Conducted Output Power	47 CFR Part 15.247	ANSI C63.10-2013, section 11.9.1	Pass
Power Spectral Density	47 CFR Part 15.247	ANSI C63.10-2013, section 11.10	Pass
Emissions in non-restricted frequency bands	47 CFR Part 15.247	ANSI C63.10-2013 section 11.11	Pass
Band edge emissions (Radiated)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.10	Pass
Emissions in frequency bands (below 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4	Pass
Emissions in frequency bands (above 1GHz)	47 CFR Part 15.247	ANSI C63.10-2013 section 6.6.4	Pass

Note: 1.N/A -this device(EUT) is not applicable to this testing item
2. RF-conducted test results including cable loss.

2 GENERAL INFORMATION

2.1 Client Information

Applicant's Name : Shenzhen Weihejia Electronic Technology Co.,LTD
Address : Block 102, Building 9, Xihu Industrial park, Xikeng community, Yuanshan street, Longgang district, Shenzhen, China

Manufacturer : Shenzhen Weihejia Electronic Technology Co.,LTD
Address : Block 102, Building 9, Xihu Industrial park, Xikeng community, Yuanshan street, Longgang district, Shenzhen, China

2.2 Description of Device (EUT)

Product Name:	BHWW Laptop
Sample number:	230909009-2
Model/Type reference:	BaseBook
Model Difference:	N/A
Trade Mark:	N/A
Product Description:	Laptop
Power Supply:	DC 19V 3.420A from adapter ; DC11.55V from battery
Operation Frequency:	2402MHz to 2480MHz
Number of Channels:	40
Modulation Type:	GFSK
Antenna Type:	FPC ANT
Antenna Gain:	2.76dBi
Hardware Version:	94-0
Software Version:	V1.0

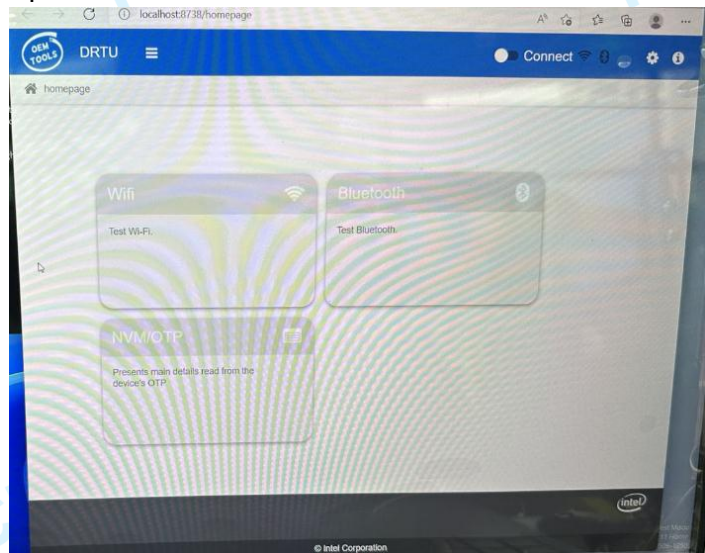
Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

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)
Lowest channel	2402MHz
Middle channel	2440MHz
Highest channel	2480MHz

2.3 Description of Test Modes

No	Title	Description
TM1	TX mode-1Mbps	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK-1Mbps modulation.
TM2	TX mode-2Mbps	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK-2Mbps modulation.
Description		
Keep the EUT works in continuously transmitting mode (100%duty cycle or max duty cycle)with GFSK modulation.		
<input checked="" type="checkbox"/> Special software is used. <input type="checkbox"/> Through engineering command into the engineering mode. engineering command: ***3646633*** <input type="checkbox"/> Other method:		
		<p>Special software:</p> 

2.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Description	Manufacturer	Model No.	Remark	Certification
1	ADAPTER	SHENZHEN BAOCHANGTON G TECHNOLOGY CO.,LTD	BCT190342-105DZ	Provide by client	SDOC
2					

2.5 Equipments Used During The Test

Conducted Emission at AC power line					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal. Due Date
Shielding room	CY	8*4*3	20160102	2023/1/26	2025/1/25
Pulse Limiter	Schwarzbeck	VTSD 9561	561-G071	2023/2/27	2024/2/26
Cable	Schwarzbeck	/	/	2023/2/27	2024/2/26
Test Receiver	Rohde & Schwarz	ESPI	1164.6607K03-102109-MH	2023/6/13	2024/6/12
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2022/12/29	2023/12/28
L.I.S.N	Schwarzbeck	NSLK 8126	NSLK 8126	2023/8/8	2024/8/7
50ΩCoaxial Switch	Anritsu	MP59B	M20531	/	/
EMI Testsoftware	Farad	EZ -EMC	V1.1.42	/	/

Emissions in restricted frequency bands and RF					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Test Receiver	R&S	ESCI	102109	2023/6/13	2024/6/12
Spectrum Analyzer	R&S	FSP30	1321.3008K40-101729-jR	2023/6/14	2024/6/13
966 Chamber	CY	9*6*6	20160101	2023/1/26	2025/1/25
Bore-sighting Antenna rack	PBB	1308503	16033	/	/
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2021/7/5	2024/7/4
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2023/5-21	2025/5-20
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023/5/13	2025/5/12
Horn antenna	COM-POWER	AH-1840(40G)	10100008	2023/4/5	2025/4/4
Power APM(LF)	Schwarzbeck	BBV9743	9743-151	2023/6/13	2024/6/12
Power APM(HF)	Schwarzbeck	BBV9718	9718-282	2023/6/13	2024/6/12
Cable(LF)#2	Schwarzbeck	/	/	2023/2/27	2024/2/26
Cable(LF)#1	Schwarzbeck	/	/	2023/2/27	2024/2/26
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2023/2/28	2024/2/27
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2023/2/27	2024/2/26
Power divider	MIDWEST	PWD-2533	SMA-79	2023/5/11	2026/5/10
signal generator	Keysight	N5181A	MY48180415	2022/12/10	2023/12/9
signal generator	Keysight	N5182A	MY50143455	2022/12/29	2023/12/28
Spectrum Analyzer	Keysight	N9020A	MY53420323	2022/12/29	2023/12/28
RF Sensor Unit	TACHOY	TR1029-2	000001	/	/
RF Control Unit	TACHOY	TR1029-1	000001	/	/
Position Controller	MF	MF-7802	/	/	/
EMI Testsoftware	Farad	EZ -EMC	V1.1.42	/	/
RF TestSoftware	TACHOY	RTS-01	V2.0.0.0	/	/

2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Disturbance (0.15~30MHz)	±3.41dB
Occupied Bandwidth	±3.63%
RF conducted power	±0.733dB
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 Authorizations

Company Name:	Shenzhen POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

Identification of the Responsible Testing Location

Company Name:	Shenzhen POCE Technology Co., Ltd.
Address:	101-102 Building H5 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, 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 No.:	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.
- (4) This document may not be altered or revised in any way unless done so by POCE and all revisions are duly noted in the revisions section.
- (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) We hereby declare that the laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant. the laboratory is not responsible for the accuracy of the information provided by the client. When the information provided by the customer may affect the effectiveness of the results, the responsibility lies with the customer, and the laboratory does not assume any responsibility.

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.

3.1.1 Conclusion:



4 Radio Spectrum Matter Test Results (RF)

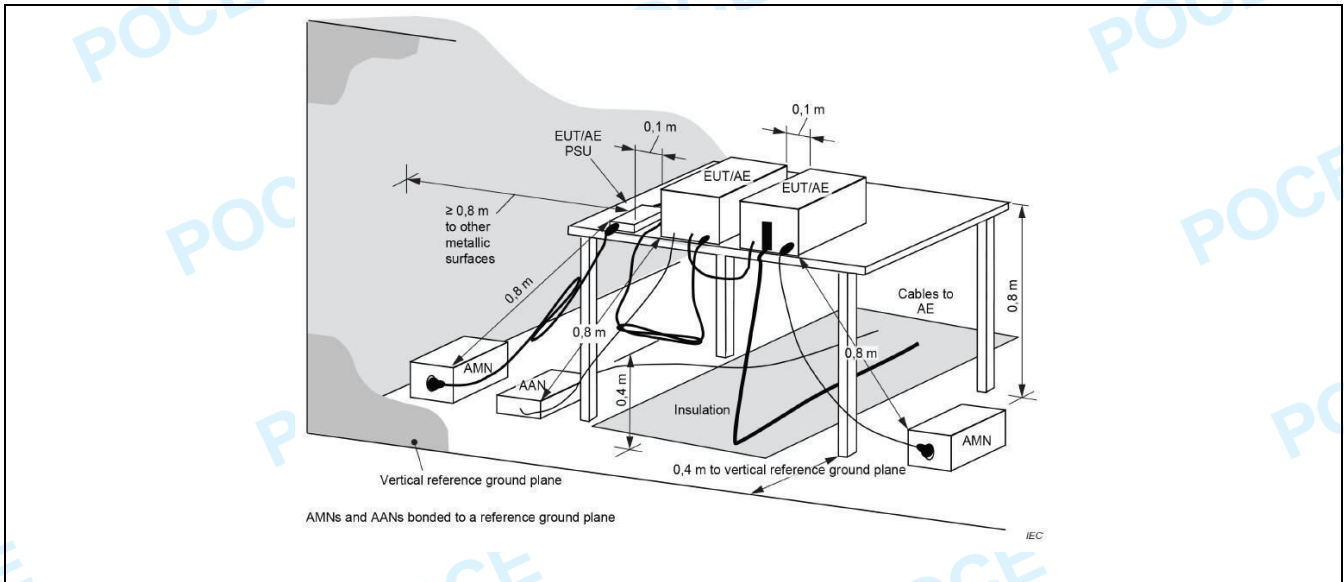
4.1 Conducted Emission at AC power line

Test Requirement:	Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.10-2013 section 6.2		
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices		

4.1.1 E.U.T. Operation:

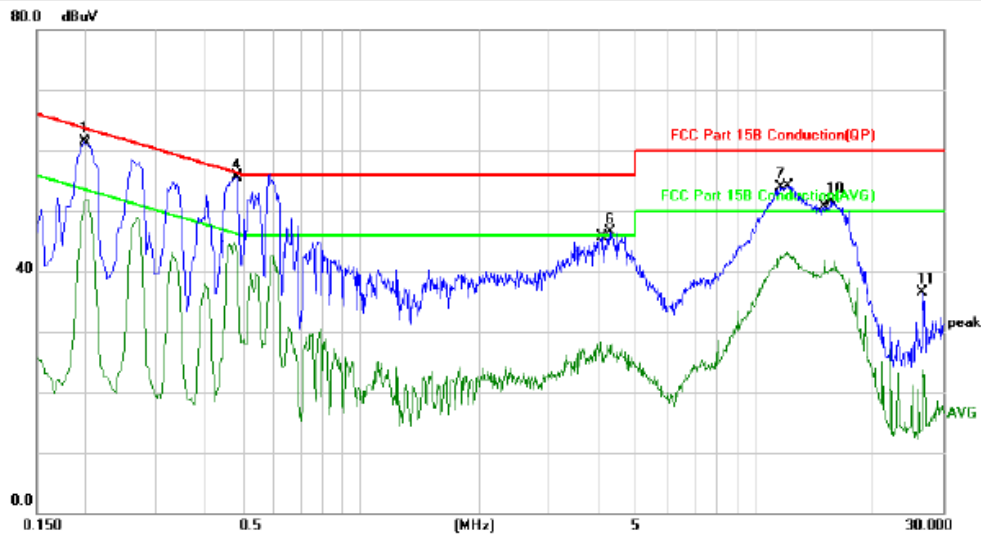
Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM2				
Final test mode:	TM2				

4.1.2 Test Setup Diagram:



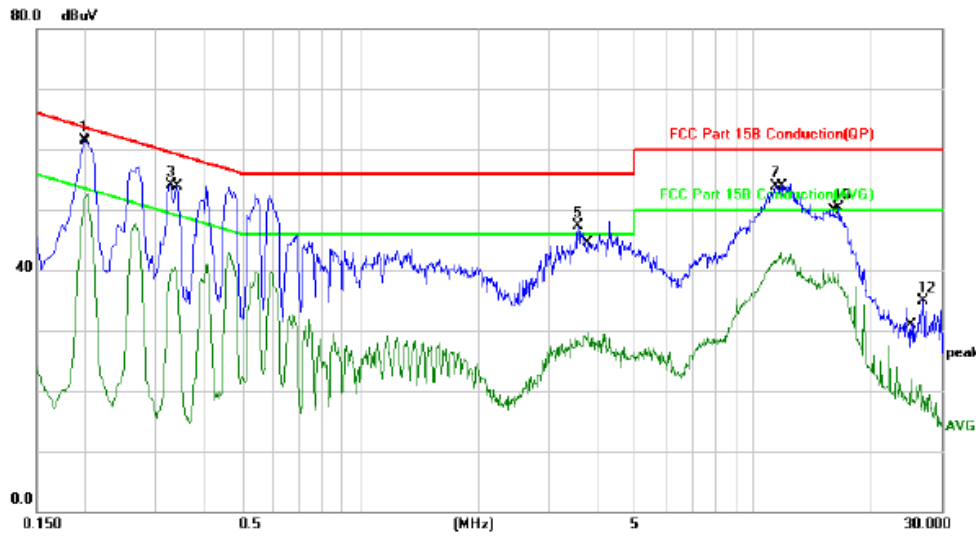
4.1.3 Test Data:

TM2 / Line: Line / Band: 2400-2483.5 MHz / BW: 2 / CH: H



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1980	51.41	10.03	61.44	63.69	-2.25	peak	
2		0.2020	41.80	10.04	51.84	53.52	-1.68	AVG	
3		0.4780	34.64	9.98	44.62	46.37	-1.75	AVG	
4	*	0.4820	45.62	9.98	55.60	56.30	-0.70	peak	
5		4.0658	18.16	10.09	28.25	46.00	-17.75	AVG	
6		4.2899	36.36	10.10	46.46	56.00	-9.54	peak	
7		11.6579	43.50	10.44	53.94	60.00	-6.06	peak	
8		12.0338	32.76	10.44	43.20	50.00	-6.80	AVG	
9		15.0459	31.42	10.45	41.87	50.00	-8.13	AVG	
10		15.5779	41.05	10.46	51.51	60.00	-8.49	peak	
11		26.5860	25.96	10.56	36.52	60.00	-23.48	peak	
12		26.5860	13.22	10.56	23.78	50.00	-26.22	AVG	

TM2 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 2 / CH: H



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1980	51.49	10.03	61.52	63.69	-2.17	peak	
2 *	0.2020	42.64	10.04	52.68	53.52	-0.84	AVG	
3	0.3300	44.04	10.01	54.05	59.45	-5.40	peak	
4	0.3379	30.48	10.01	40.49	49.25	-8.76	AVG	
5	3.5700	37.20	10.06	47.26	56.00	-8.74	peak	
6	3.7900	19.61	10.07	29.68	46.00	-16.32	AVG	
7	11.3419	43.55	10.43	53.98	60.00	-6.02	peak	
8	11.7179	32.39	10.44	42.83	50.00	-7.17	AVG	
9	16.0499	29.25	10.46	39.71	50.00	-10.29	AVG	
10	16.4499	39.94	10.46	50.40	60.00	-9.60	peak	
11	25.0820	11.28	10.52	21.80	50.00	-28.20	AVG	
12	26.8820	24.40	10.57	34.97	60.00	-25.03	peak	

NOTE:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor, Over=Limit- Measurement
4. The test results only show the worst mode or worst channel.

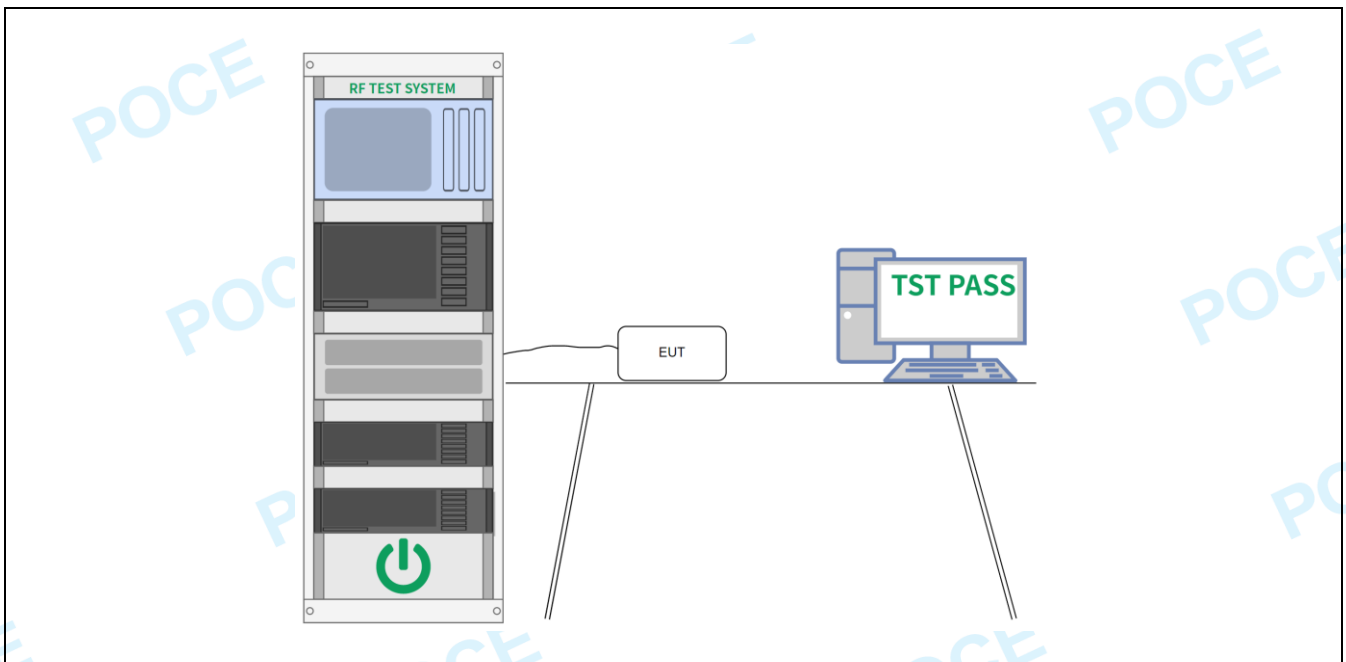
4.2 Occupied Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10-2013, section 11.8
Procedure:	<ul style="list-style-type: none"> a) Set RBW = 100 kHz. b) Set the VBW \geq [3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test 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.

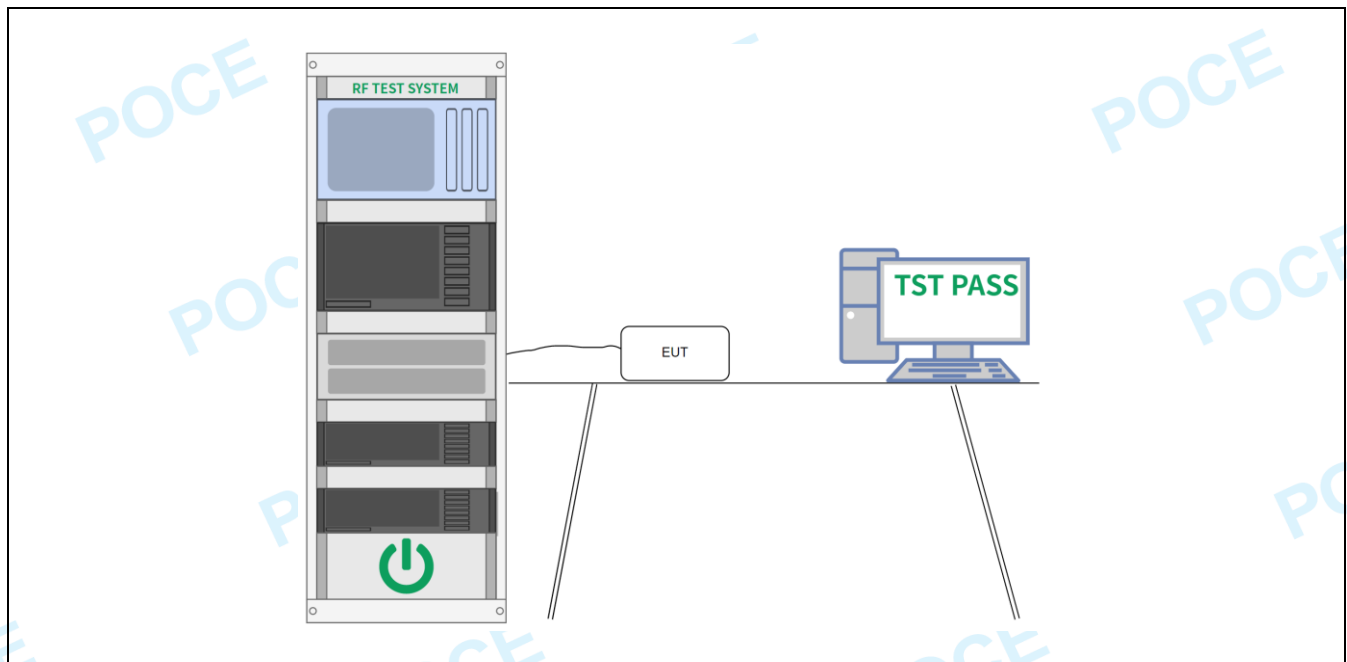
4.3 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
Test Method:	ANSI C63.10-2013, section 11.9.1
Procedure:	ANSI C63.10-2013, section 11.9.1 Maximum peak conducted output power

4.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

4.3.2 Test Setup Diagram:



4.3.3 Test Data:

Please Refer to Appendix for Details.

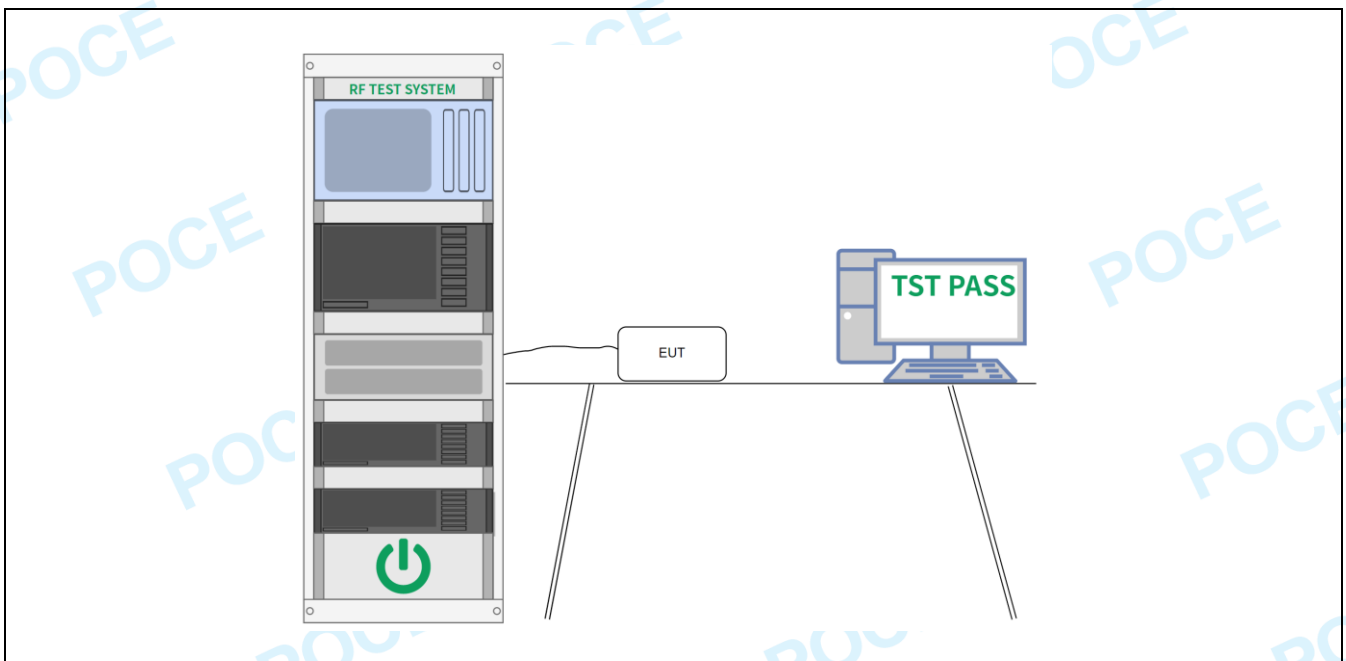
4.4 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.
Test Method:	ANSI C63.10-2013, section 11.10
Procedure:	ANSI C63.10-2013, section 11.10, Maximum power spectral density level in the fundamental emission

4.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

4.4.2 Test Setup Diagram:



4.4.3 Test Data:

Please Refer to Appendix for Details.

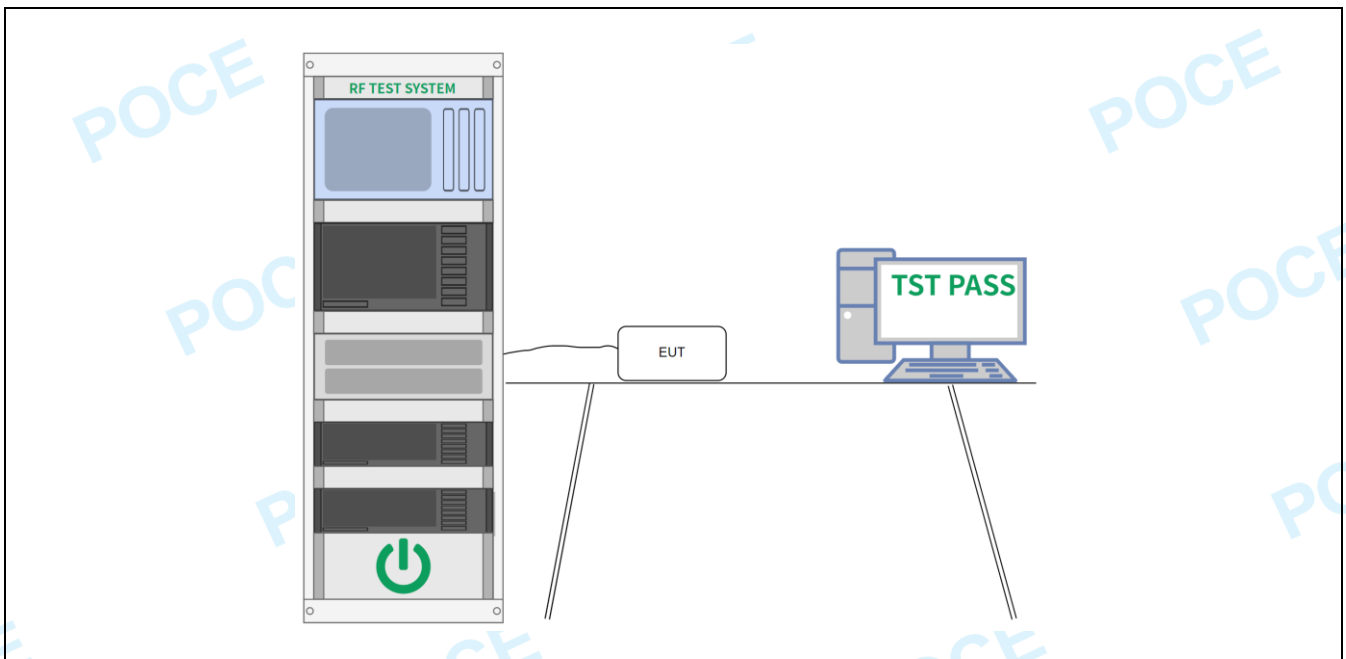
4.5 Emissions in non-restricted frequency bands

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 11.11
Procedure:	ANSI C63.10-2013 Section 11.11.1, Section 11.11.2, Section 11.11.3

4.5.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM1, TM2				
Final test mode:	TM1, TM2				

4.5.2 Test Setup Diagram:



4.5.3 Test Data:

Please Refer to Appendix for Details.

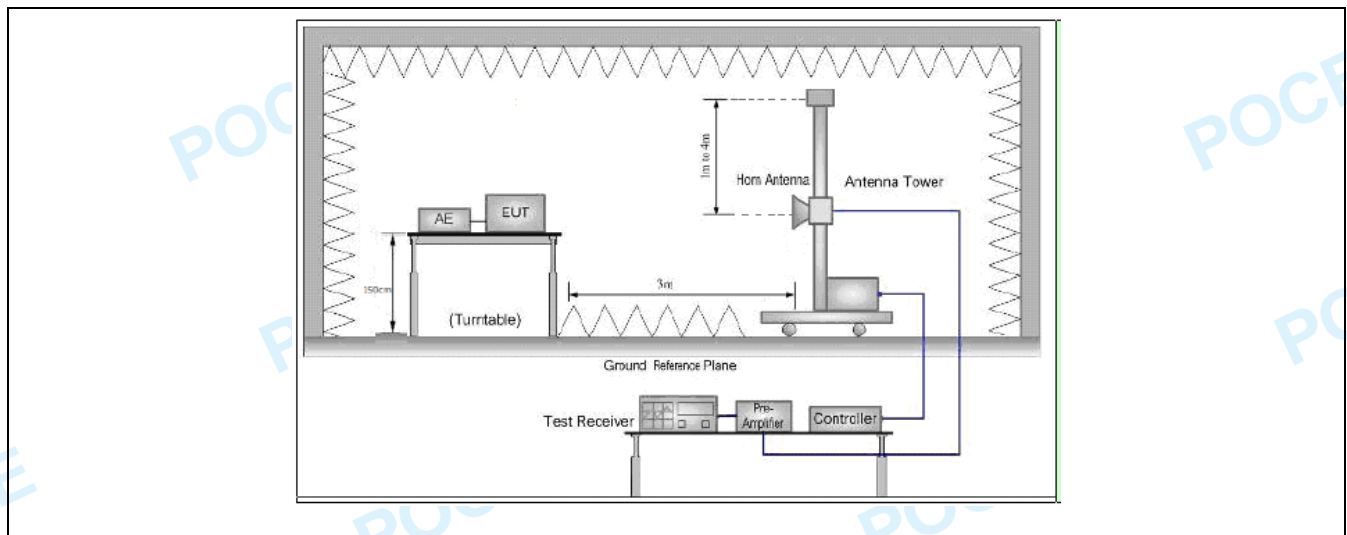
4.6 Band edge emissions (Radiated)

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
	** 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.		
Test Method:	ANSI C63.10-2013 section 6.10		
Procedure:	ANSI C63.10-2013 section 6.10.5.2		

4.6.1 E.U.T. Operation:

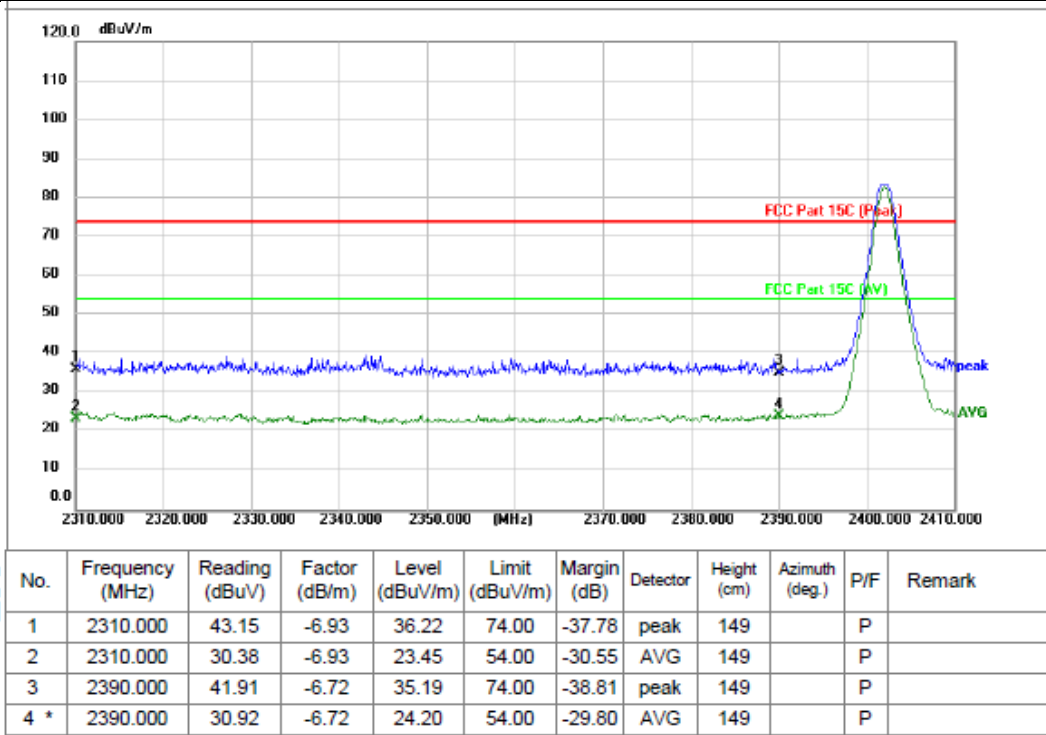
Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM2				
Final test mode:	TM2				

4.6.2 Test Setup Diagram:

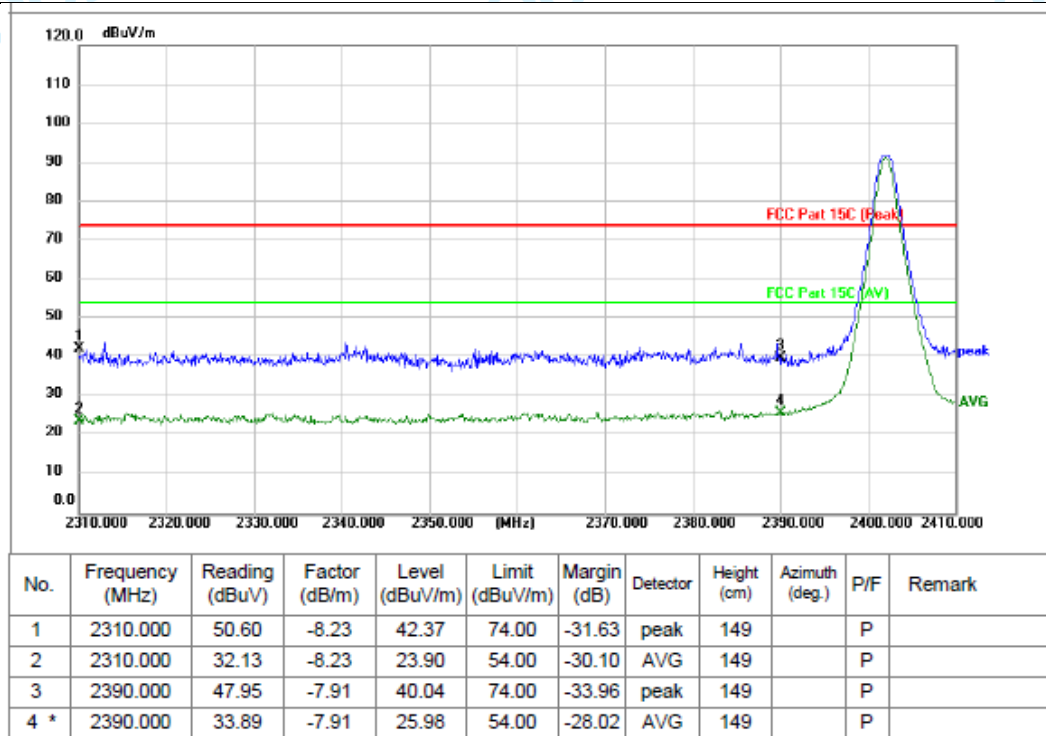


4.6.3 Test Data:

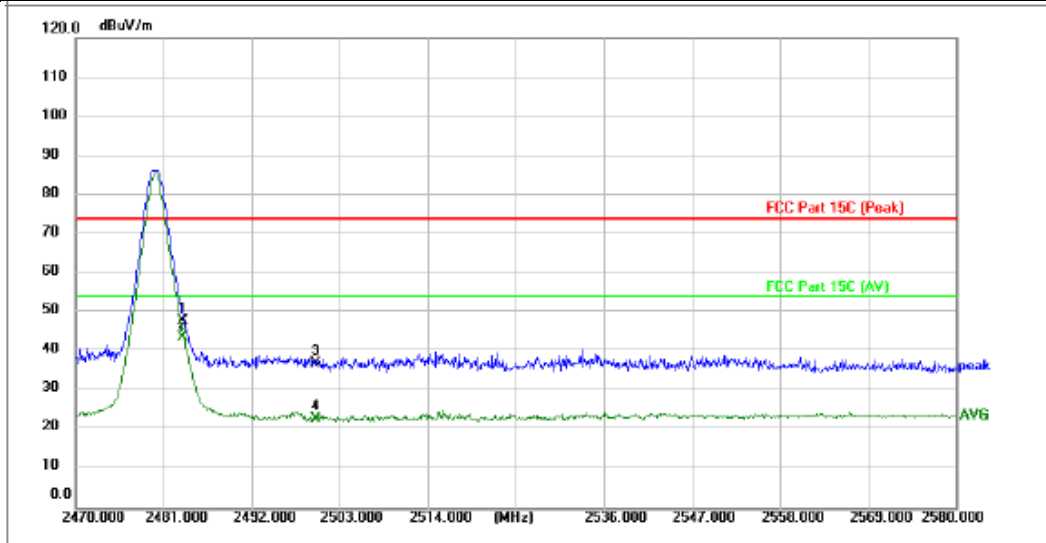
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 2 / CH: L



TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 2 / CH: L

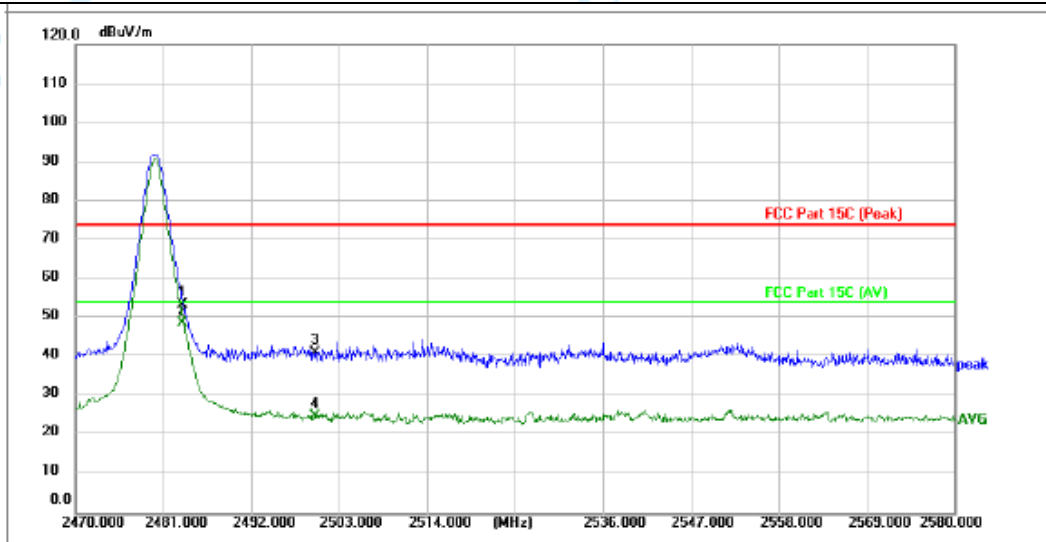


TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 2 / CH: H



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	54.43	-6.47	47.96	74.00	-26.04	peak			P	
2 *	2483.500	50.17	-6.47	43.70	54.00	-10.30	AVG			P	
3	2500.000	43.35	-6.43	36.92	74.00	-37.08	peak			P	
4	2500.000	29.42	-6.43	22.99	54.00	-31.01	AVG			P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 2 / 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	61.06	-7.54	53.52	74.00	-20.48	peak	149		P	
2 *	2483.500	56.44	-7.54	48.90	54.00	-5.10	AVG	149		P	
3	2500.000	48.68	-7.48	41.20	74.00	-32.80	peak	149		P	
4	2500.000	32.50	-7.48	25.02	54.00	-28.98	AVG	149		P	

Measurement Level = Reading level + Correct Factor, Margin=Limit- Measurement

Note:

Per ANSI C63.10-2013, if there are two or more antennas, the conducted powers at Core 0, Core 1, ..., Core i were first measured separately, as shown in the section above (this product only has one antenna). The measured values were then summed in linear power units then converted back to dBm.

Per ANSI C63.10-2013 Section 14.4.3.2.3, the directional gain is calculated using the following formula, where GN is the gain of the nth antenna and NANT, the total number of antennas used.

For correlated unequal antenna gain

$$\text{Directional gain} = 10 \cdot \log\left[\frac{10G_1/20 + 10G_2/20 + \dots + 10G_N/20}{NANT}\right] \text{ dBi}$$

For completely uncorrelated unequal antenna gain

$$\text{Directional gain} = 10 \cdot \log\left[\frac{10G_1/10 + 10G_2/10 + \dots + 10G_N/10}{NANT}\right] \text{ dBi}$$

Sample Multiple antennas Calculation: Core 0 + Core 1 + ... Core i. = MIMO/CDD

(i is the number of antennas)

$$(\# \text{VALUE! mW} + \text{mW}) = \# \text{VALUE! mW} = \text{dBm}$$

Sample e.i.r.p. Calculation:

$$\text{e.i.r.p. (dBm)} = \text{Conducted Power (dBm)} + \text{Ant gain (dBi)}$$

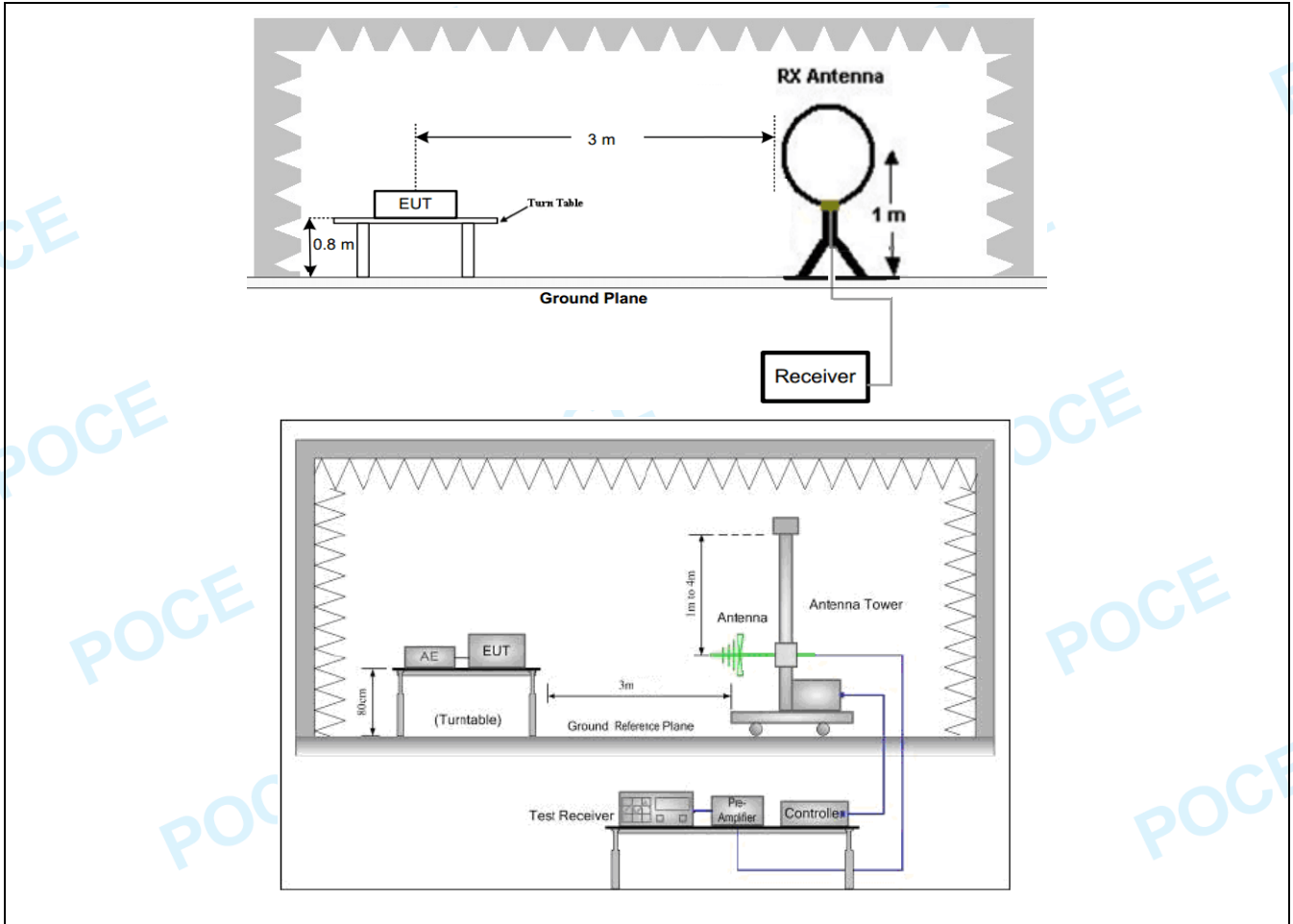
4.7 Emissions in frequency bands (below 1GHz)

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
** 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.			
Test Method:	ANSI C63.10-2013 section 6.6.4		
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 channel. Only the worst case is recorded in the report.</p> <p>2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows: Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +C Pre-amplifier Factor</p> <p>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.</p>		

4.7.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM2				
Final test mode:	TM2				

4.7.2 Test Setup Diagram:



4.7.3 Test Data:

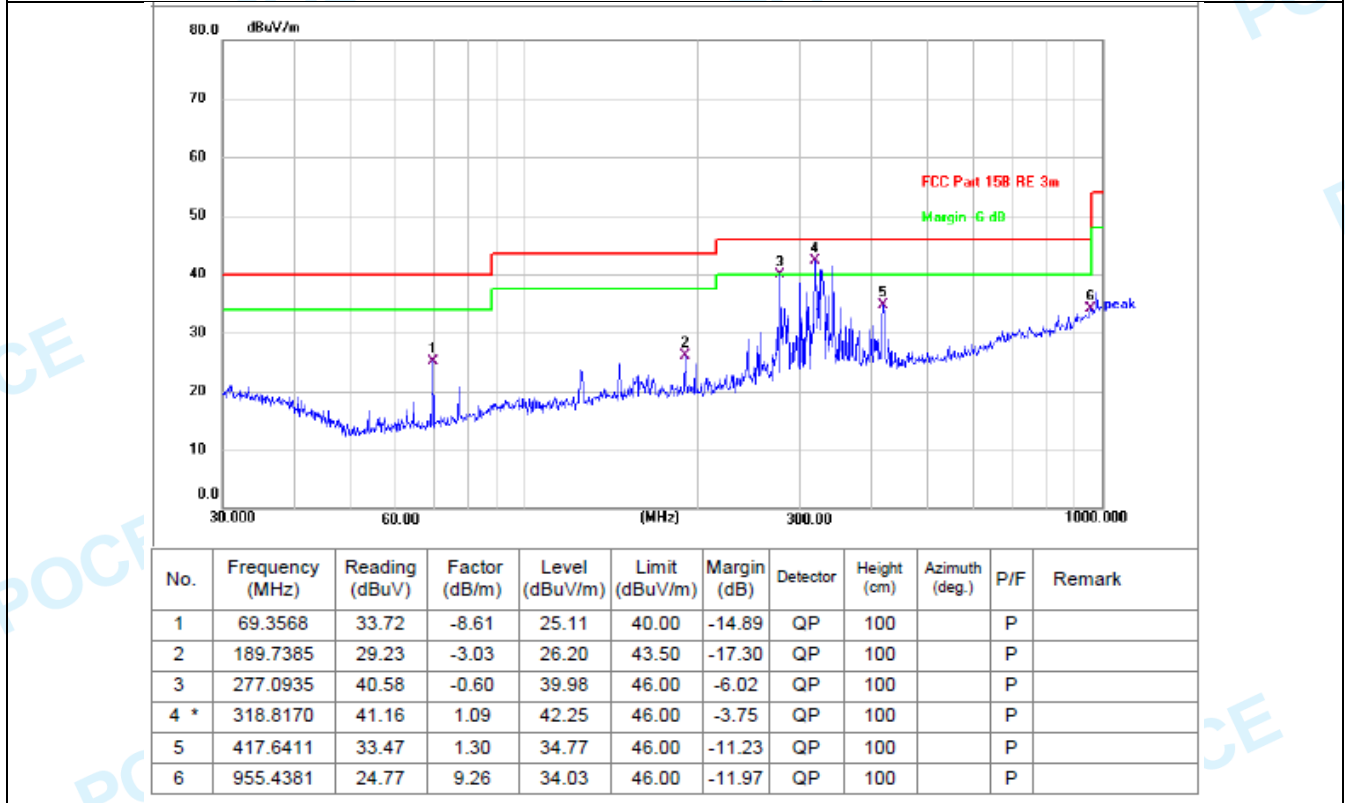
Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

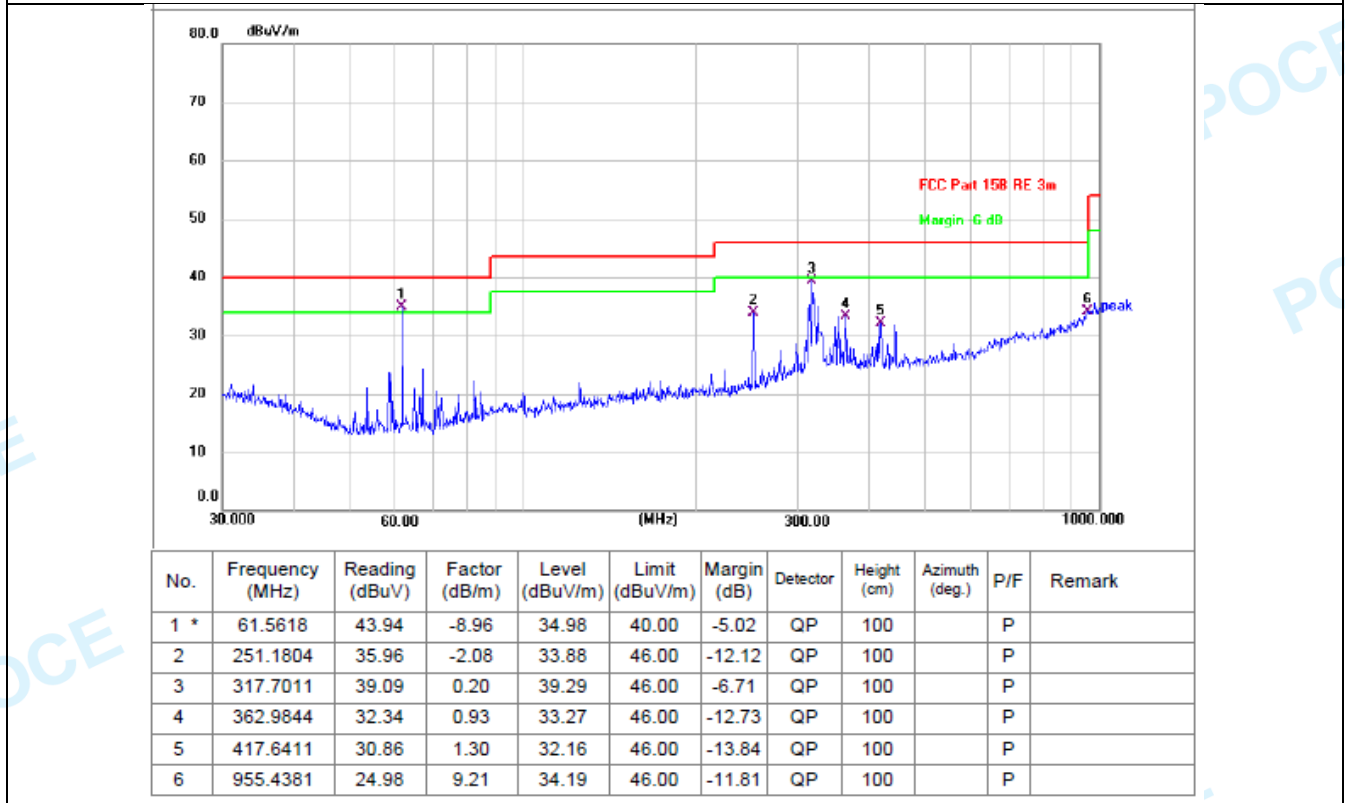
NOTE: The test results only show the worst mode or worst channel.

Between 30MHz – 1000MHz

TM2 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 2 / CH: H



TM2 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 2 / CH: H



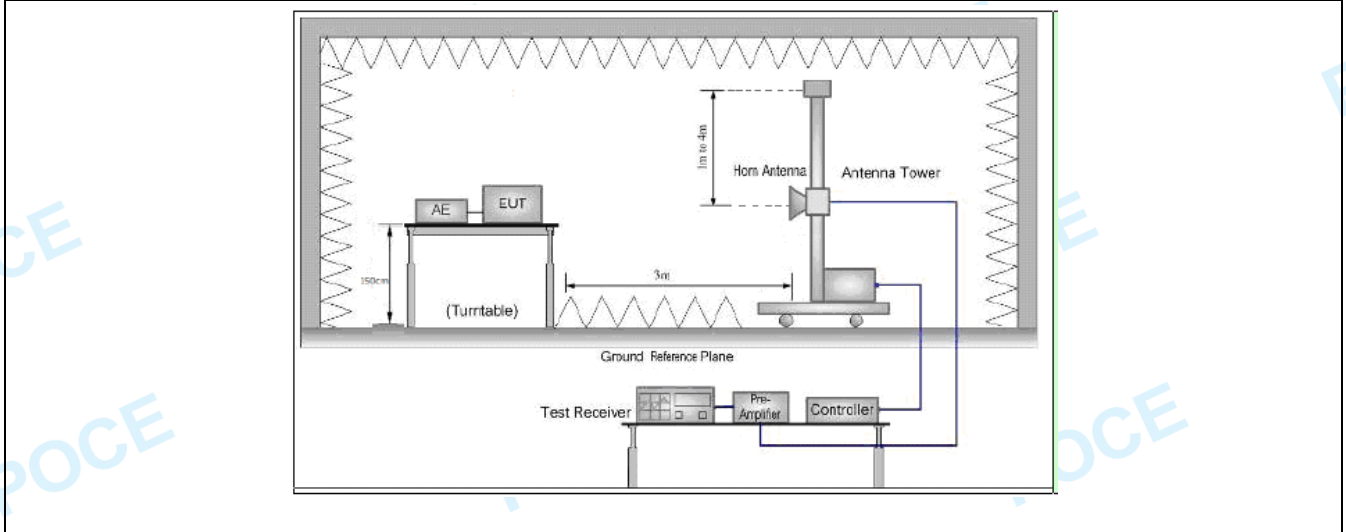
4.8 Emissions in frequency bands (above 1GHz)

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
	** 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.		
Test Method:	ANSI C63.10-2013 section 6.6.4		
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 channel. Only the worst case is recorded in the report.</p> <p>2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows: Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +C Pre-amplifier Factor</p> <p>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.</p>		

4.8.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	50.3 %	Atmospheric Pressure:	101 kPa
Pre test mode:	TM2				
Final test mode:	TM2				

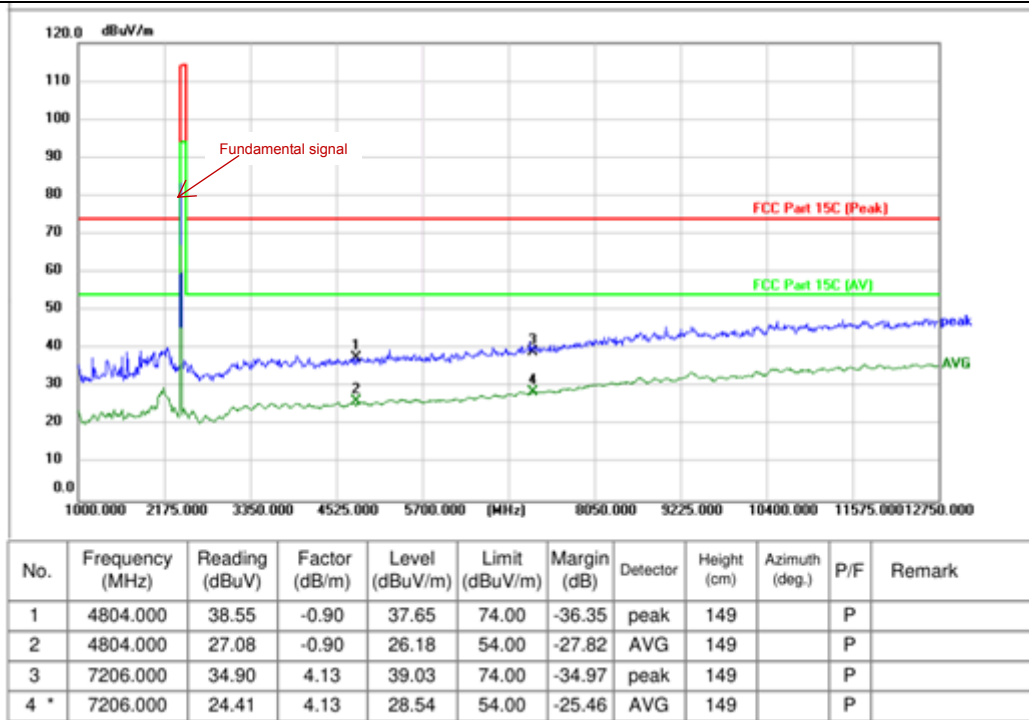
4.8.2 Test Setup Diagram:



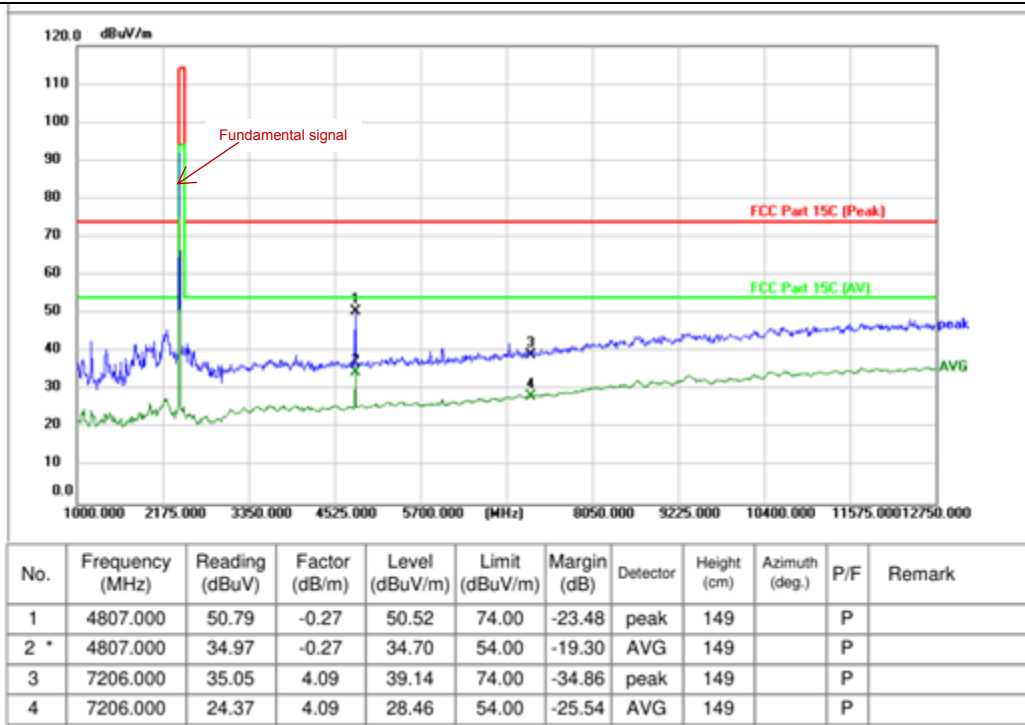
4.8.3 Test Data:

Only the worst mode and channel are recorded, The testing frequency reach up to 25GHz, but 12.75GHz-25GHz has no waveform except for background noise, so it was not recorded in the report.

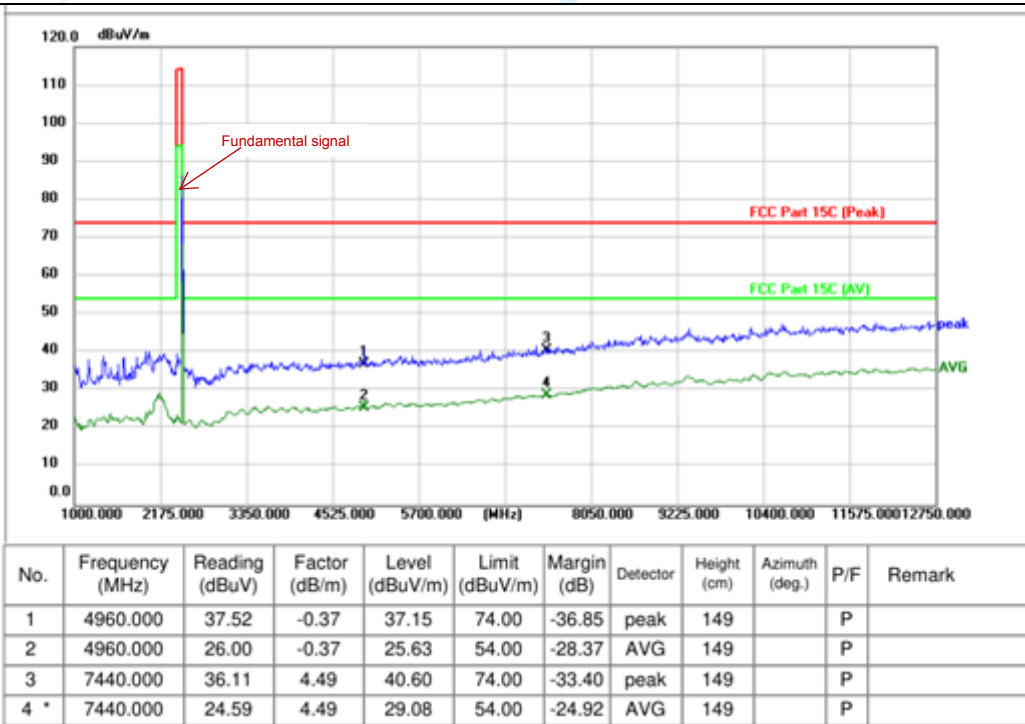
TM2 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 2 / CH: L



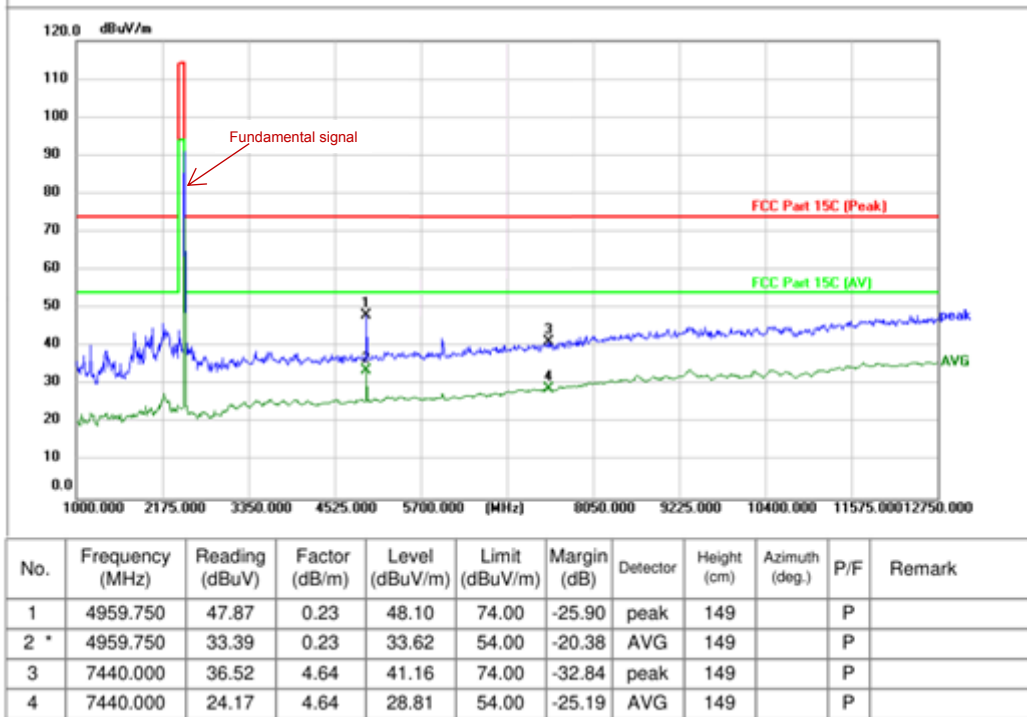
TM2 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 2 / CH: L



TM2 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 2 / CH: H



TM2 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 2 / CH: H



Remark: Margin = Limit – Level

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

Level=Test receiver reading + correction factor

Note:

Per ANSI C63.10-2013, if there are two or more antennas, the conducted powers at Core 0, Core 1,..., Core i were first measured separately, as shown in the section above(this product only have one antenna). The measured values were then summed in linear power units then converted back to dBm.

Sample Multiple antennas Calculation: Core 0 + Core 1 +...Core i. = MIMO/CDD
(i is the number of antennas)

(#VALUE! mW + XX mW) = #VALUE! mW = XX dBm

Sample e.i.r.p. Calculation:

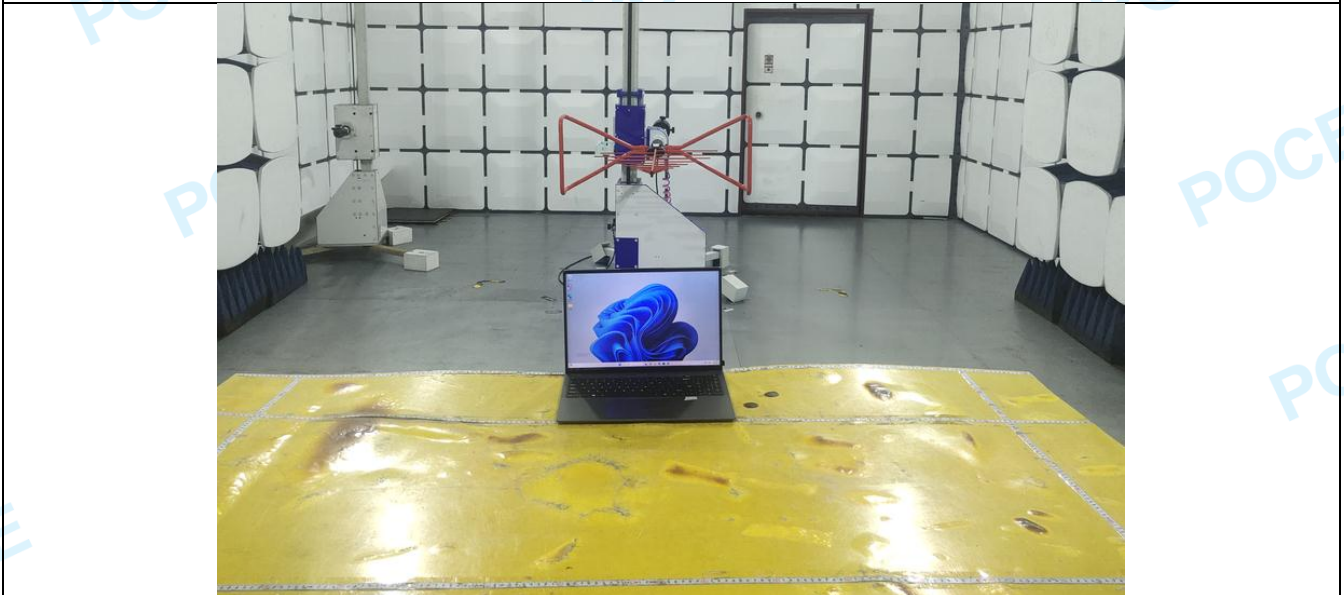
XX dBm= Conducted Power (dBm) + Ant gain (dBi)

5 TEST SETUP PHOTOS

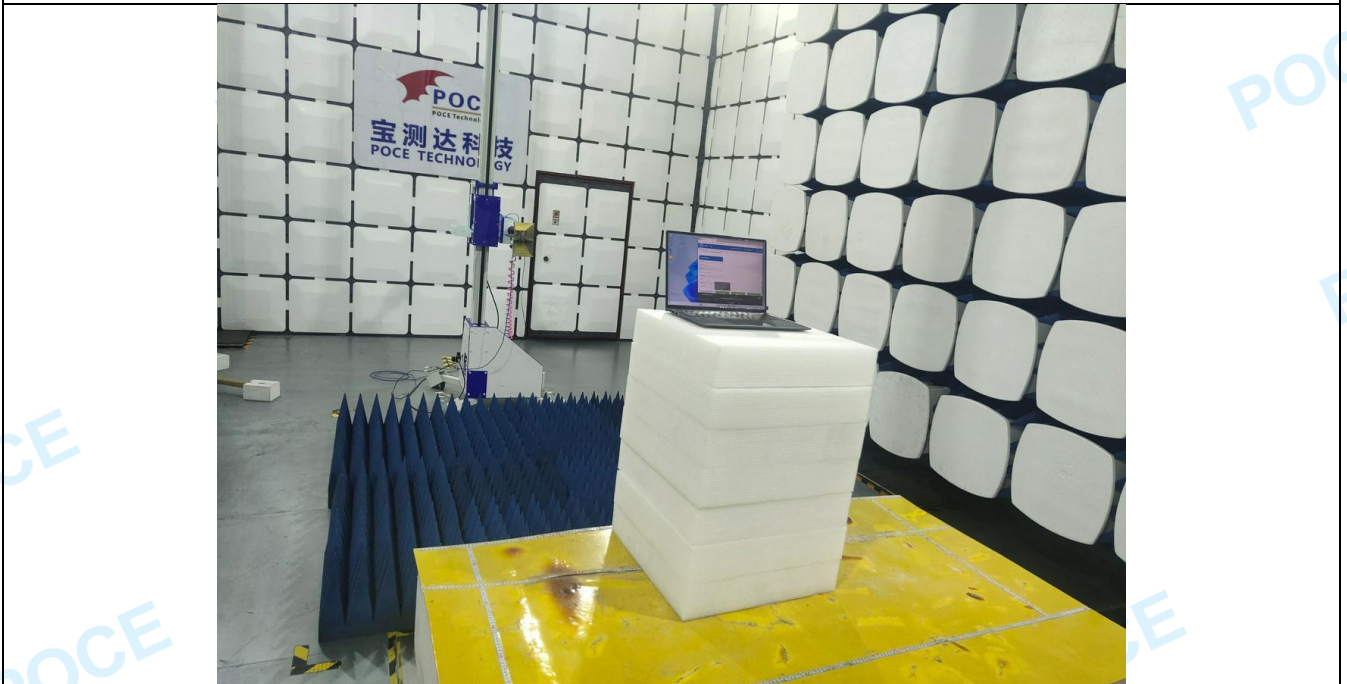
Conducted Emission at AC power line



Emissions in frequency bands (below 1GHz)



Emissions in frequency bands (above 1GHz)



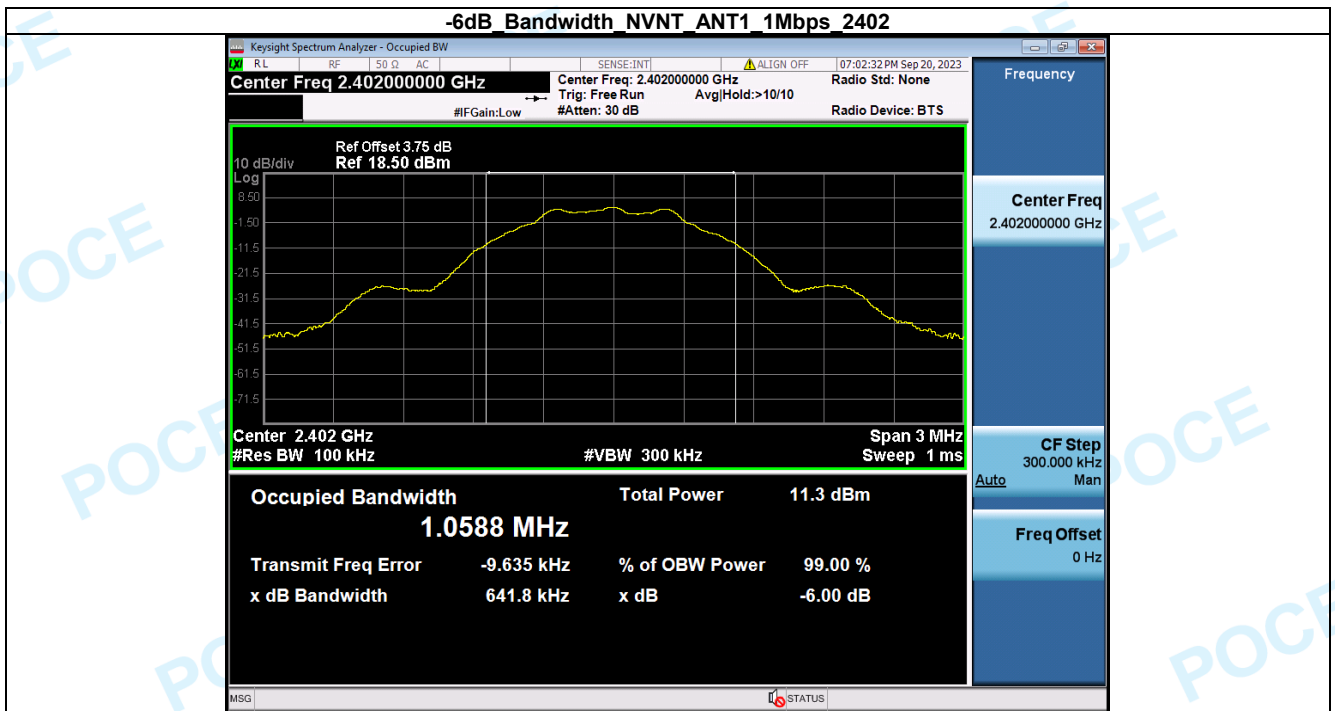
6 PHOTOS OF THE EUT

Please refer to report No.: POCE230918001RF001

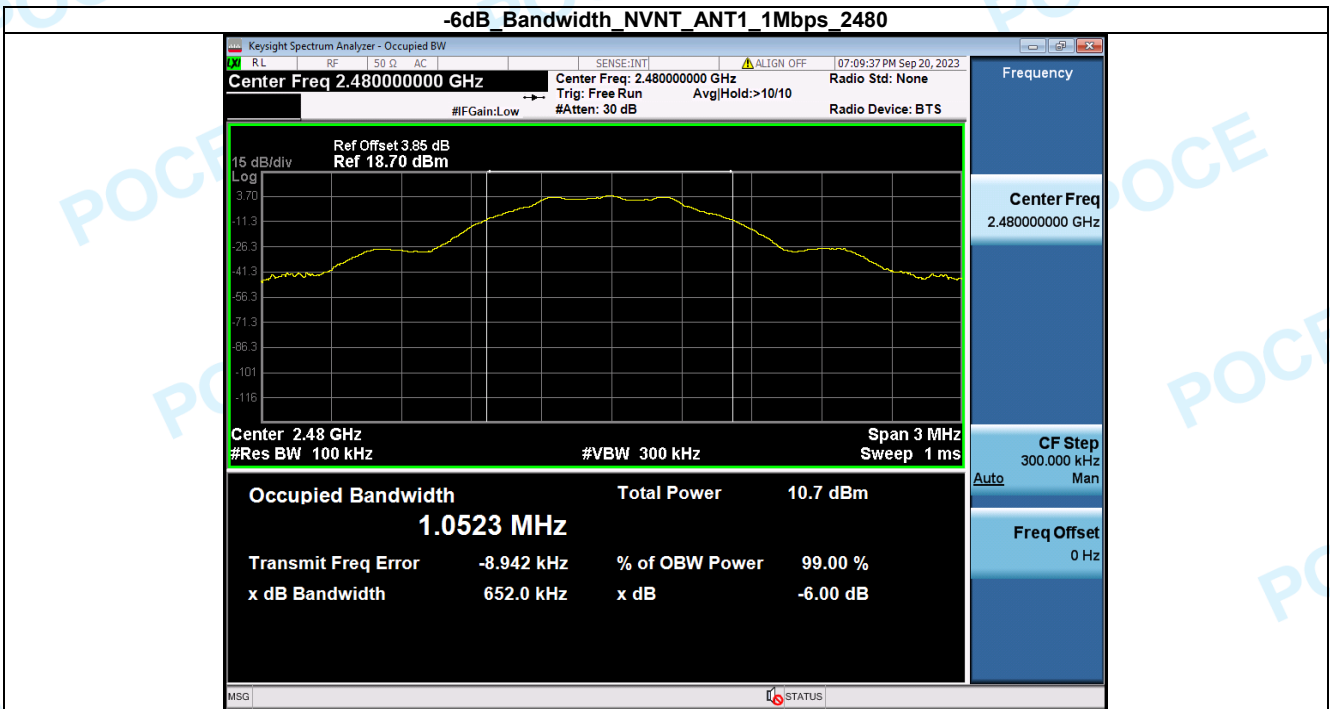
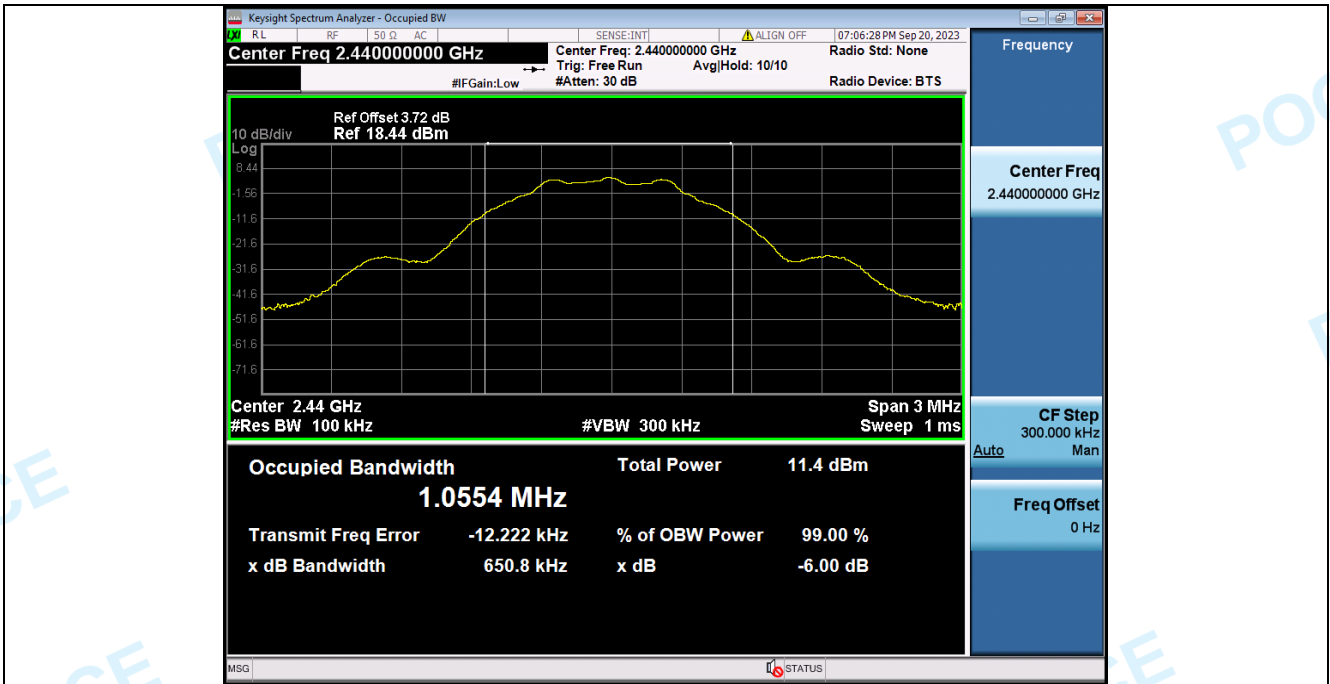
Appendix

1. -6dB Bandwidth

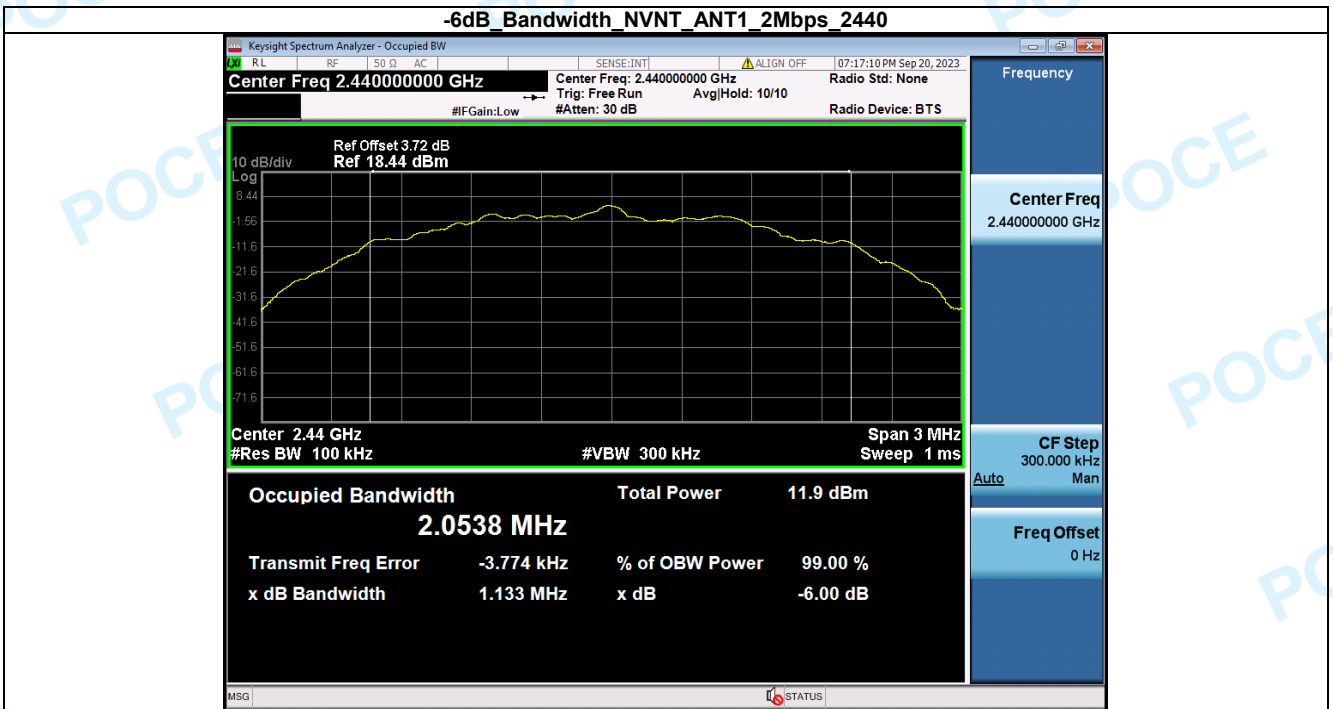
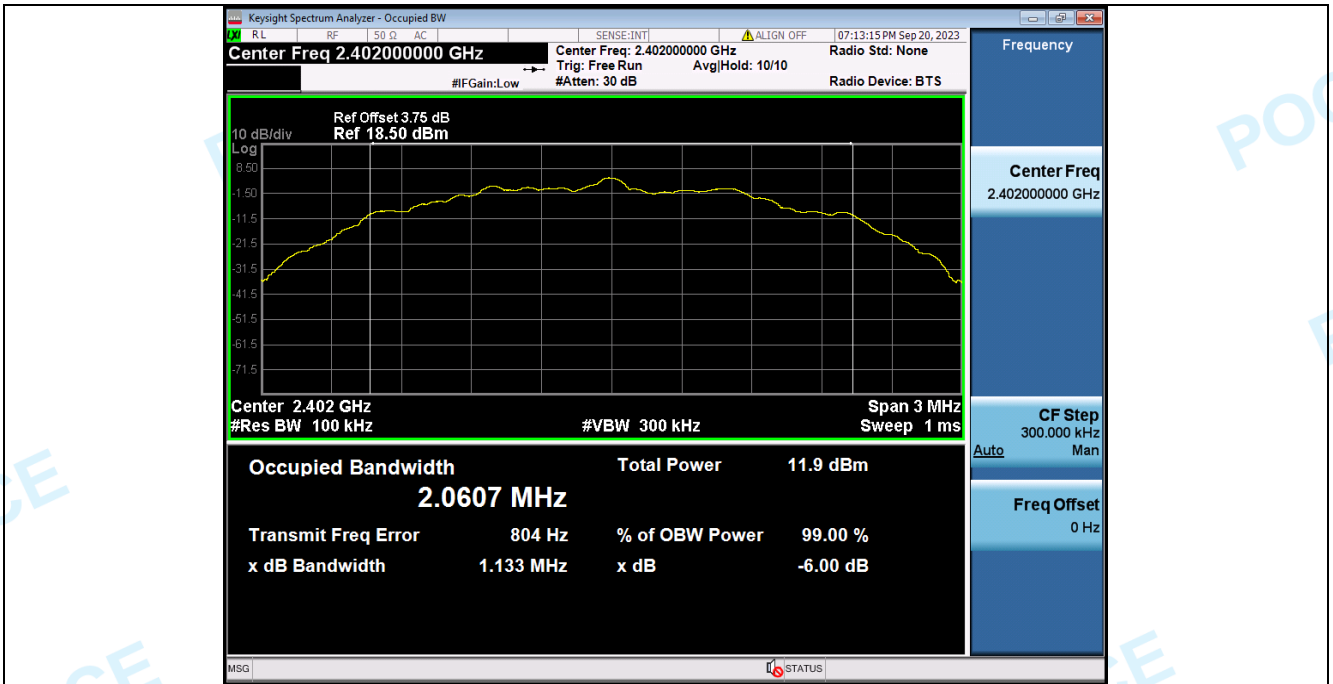
Condition	Antenna	Rate	Frequency (MHz)	-6dB BW(kHz)	limit(kHz)	Result
NVNT	ANT1	1Mbps	2402	641.85	500	Pass
NVNT	ANT1	1Mbps	2440.00	650.79	500	Pass
NVNT	ANT1	1Mbps	2480	652.00	500	Pass
NVNT	ANT1	2Mbps	2402	1133.32	500	Pass
NVNT	ANT1	2Mbps	2440.00	1133.42	500	Pass
NVNT	ANT1	2Mbps	2480	1149.64	500	Pass



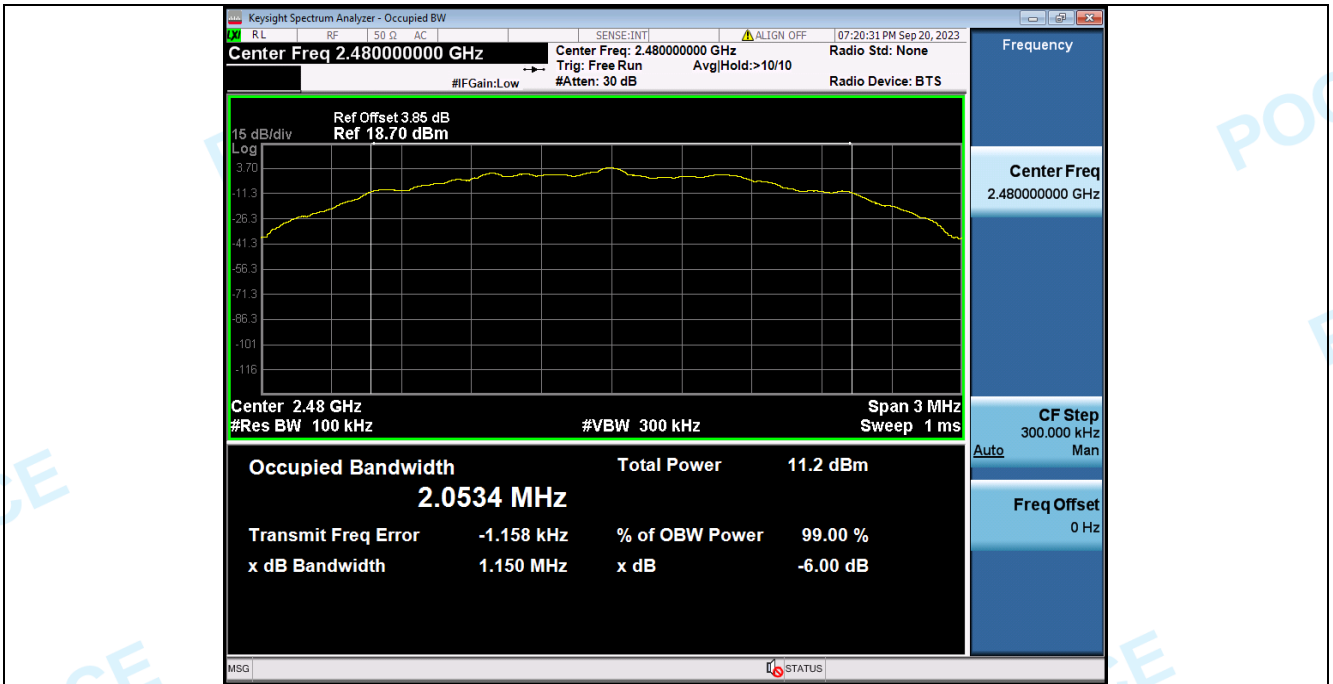
-6dB Bandwidth NVNT ANT1 1Mbps 2440



-6dB Bandwidth_NVNT_ANT1_2Mbps_2402

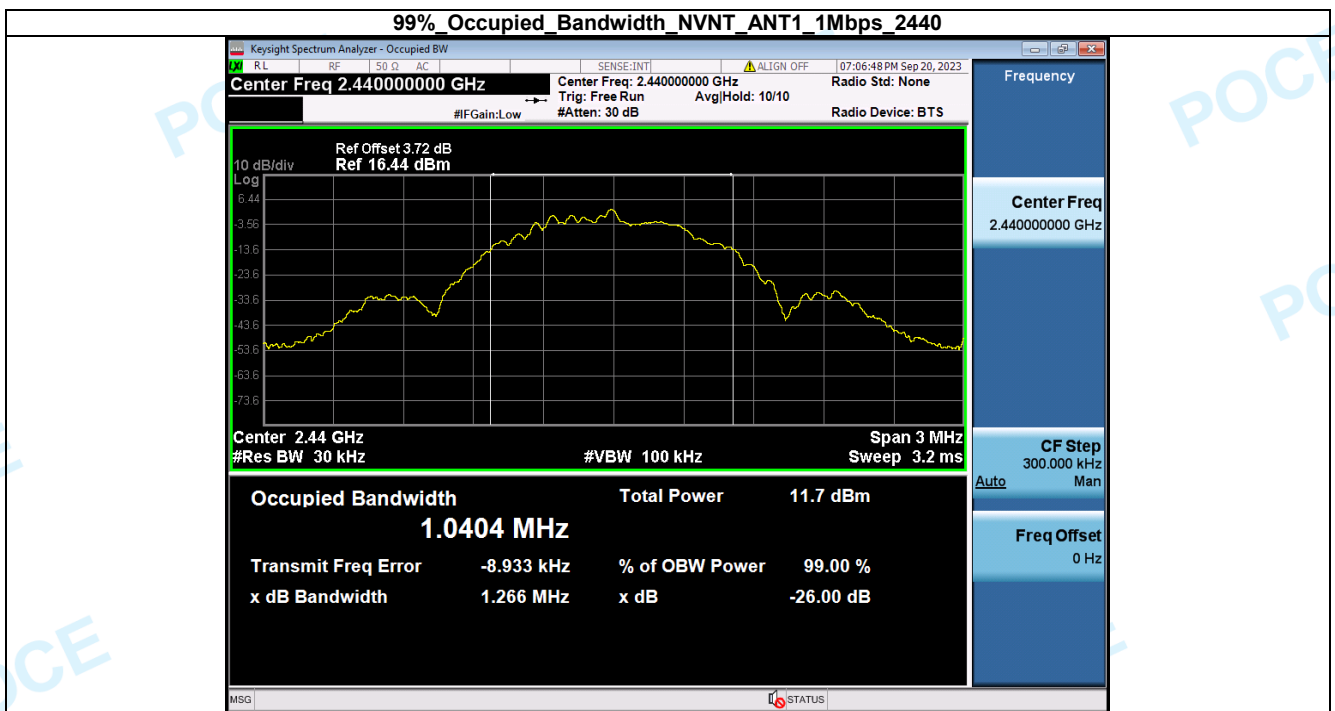
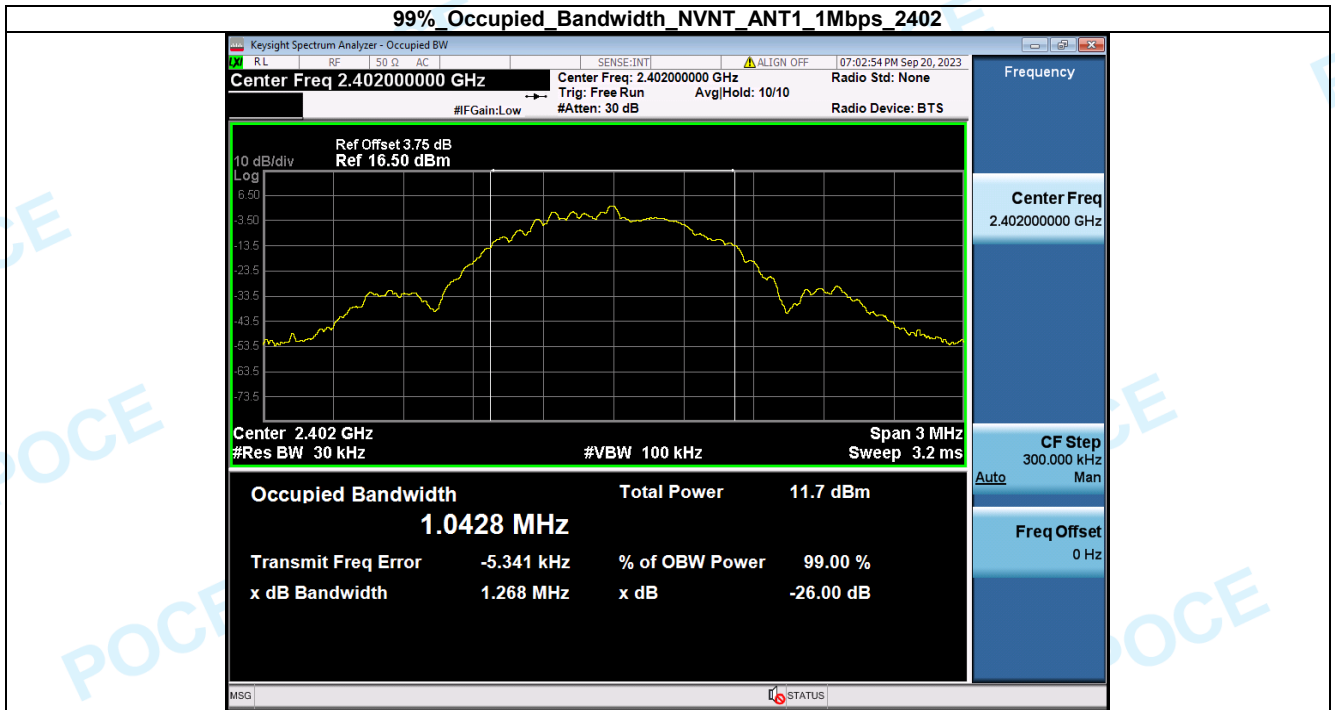


-6dB Bandwidth_NVNT_ANT1_2Mbps_2480

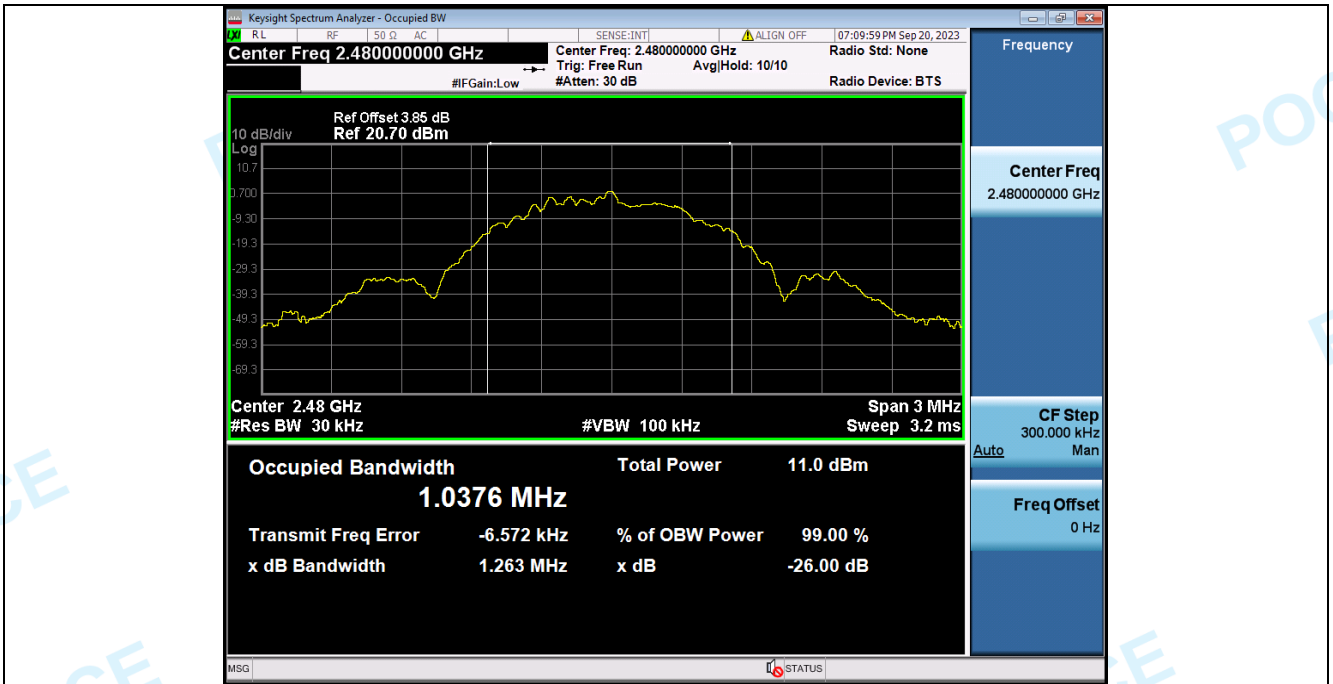


2. 99% Occupied Bandwidth

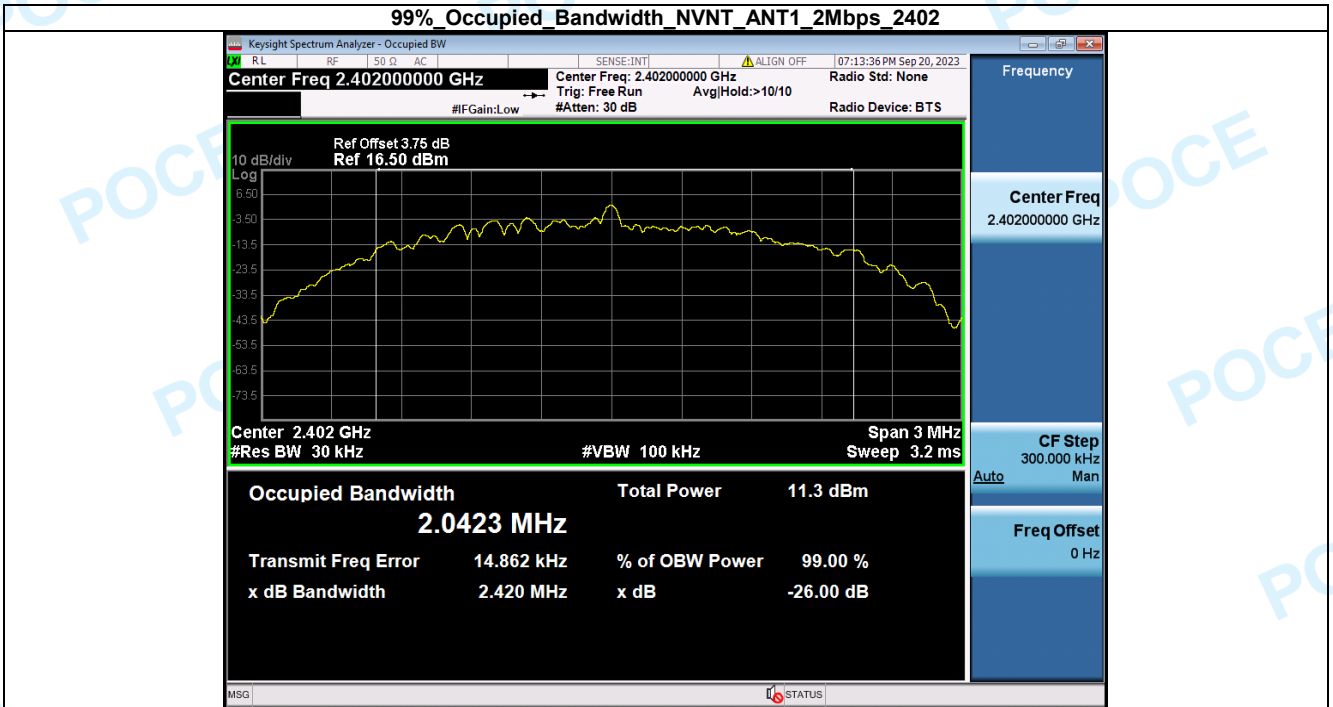
Condition	Antenna	Rate	Frequency (MHz)	99% BW (MHz)
NVNT	ANT1	1Mbps	2402	1.043
NVNT	ANT1	1Mbps	2440.00	1.040
NVNT	ANT1	1Mbps	2480	1.038
NVNT	ANT1	2Mbps	2402	2.042
NVNT	ANT1	2Mbps	2440.00	2.038
NVNT	ANT1	2Mbps	2480	2.036



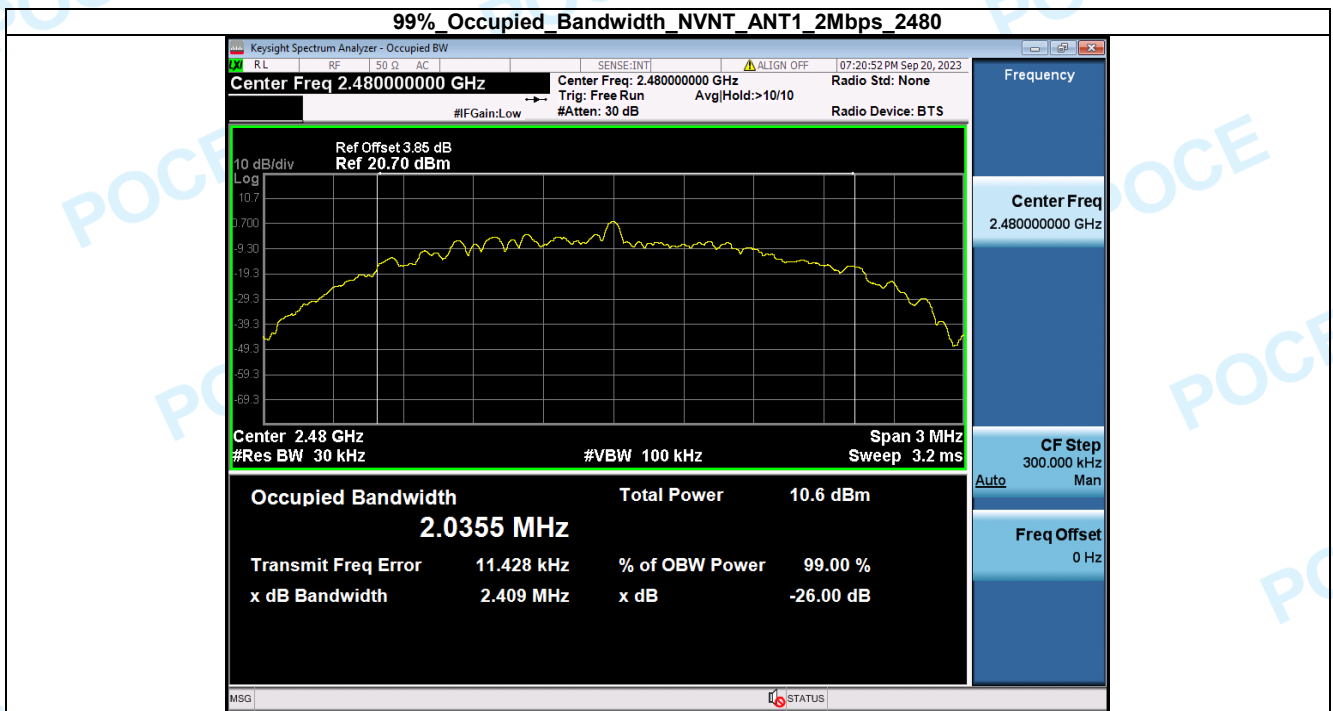
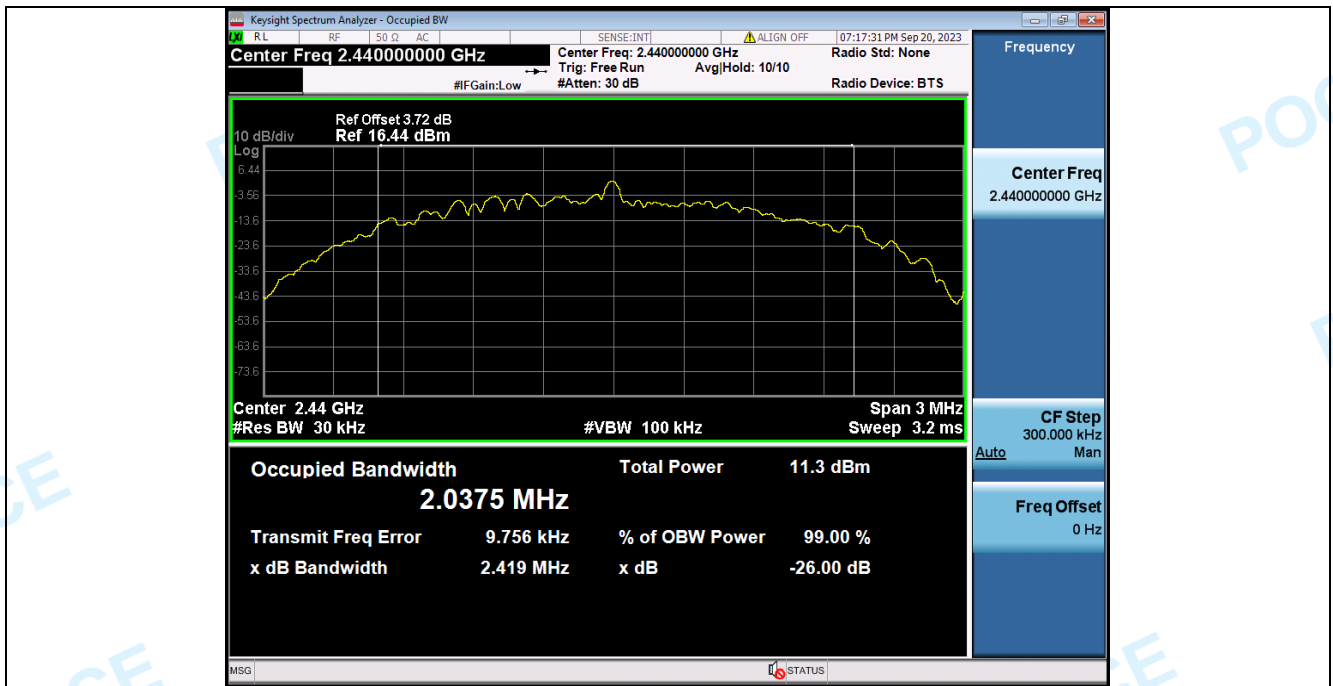
99%_Occupied_Bandwidth_NVNT_ANT1_1Mbps_2480



99% Occupied Bandwidth NVNT ANT1 2Mbps 2402

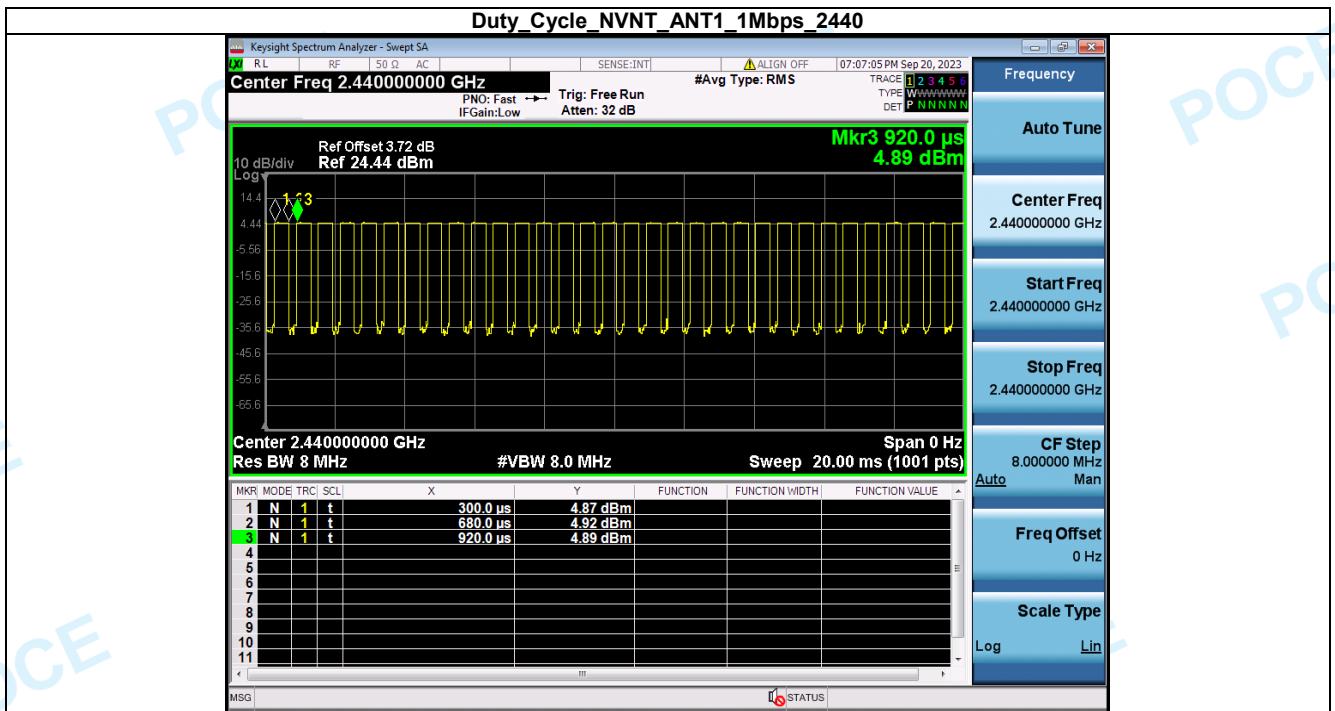
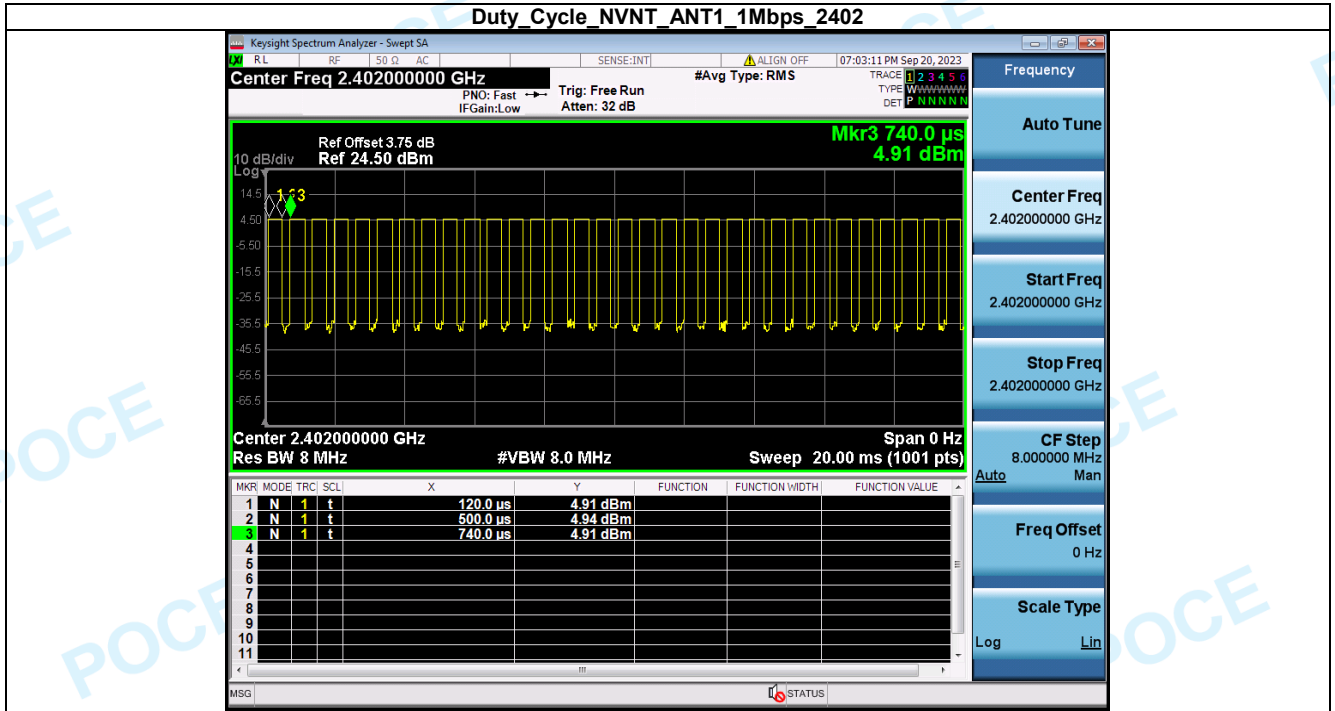


99% Occupied Bandwidth NVNT ANT1 2Mbps 2440

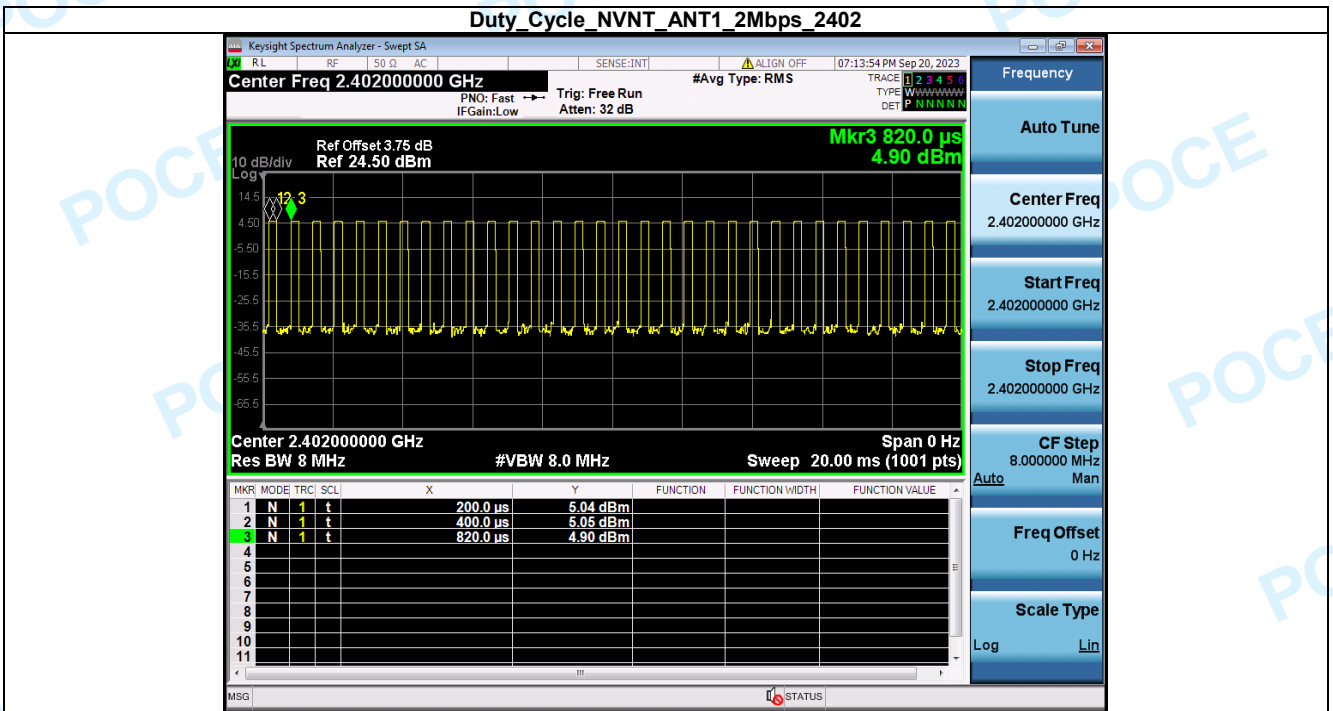
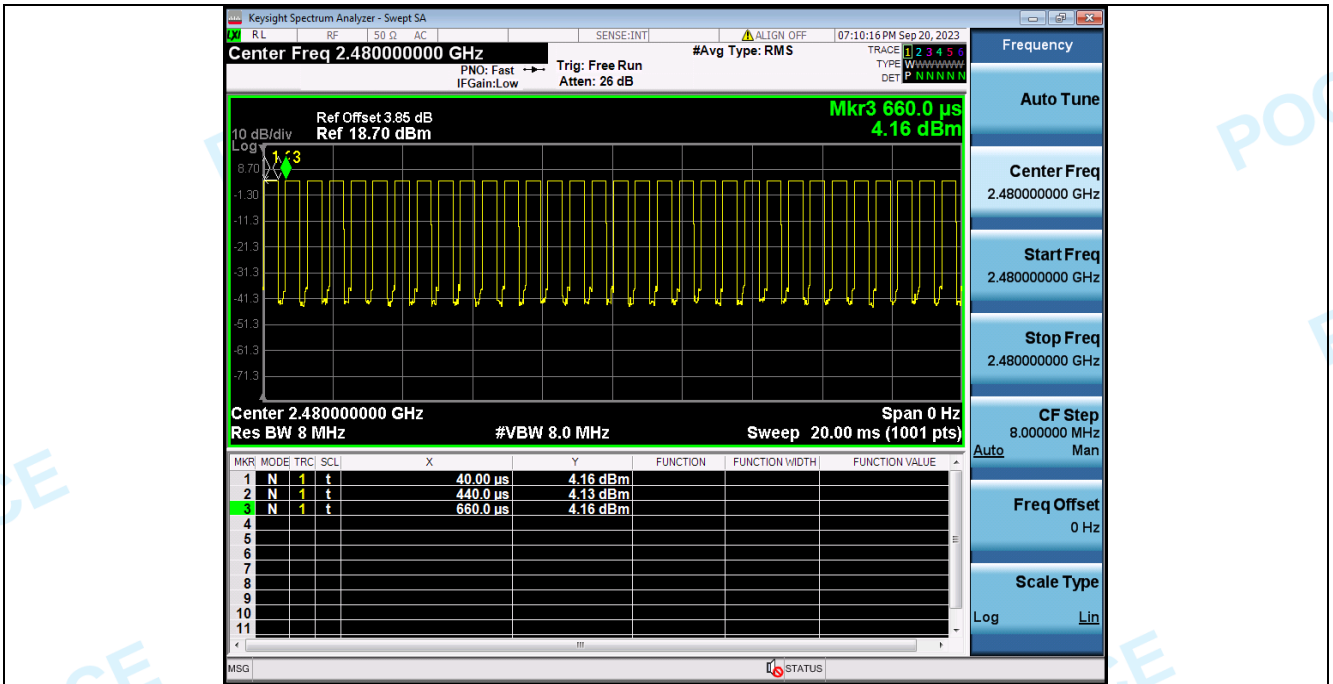


3. Duty Cycle

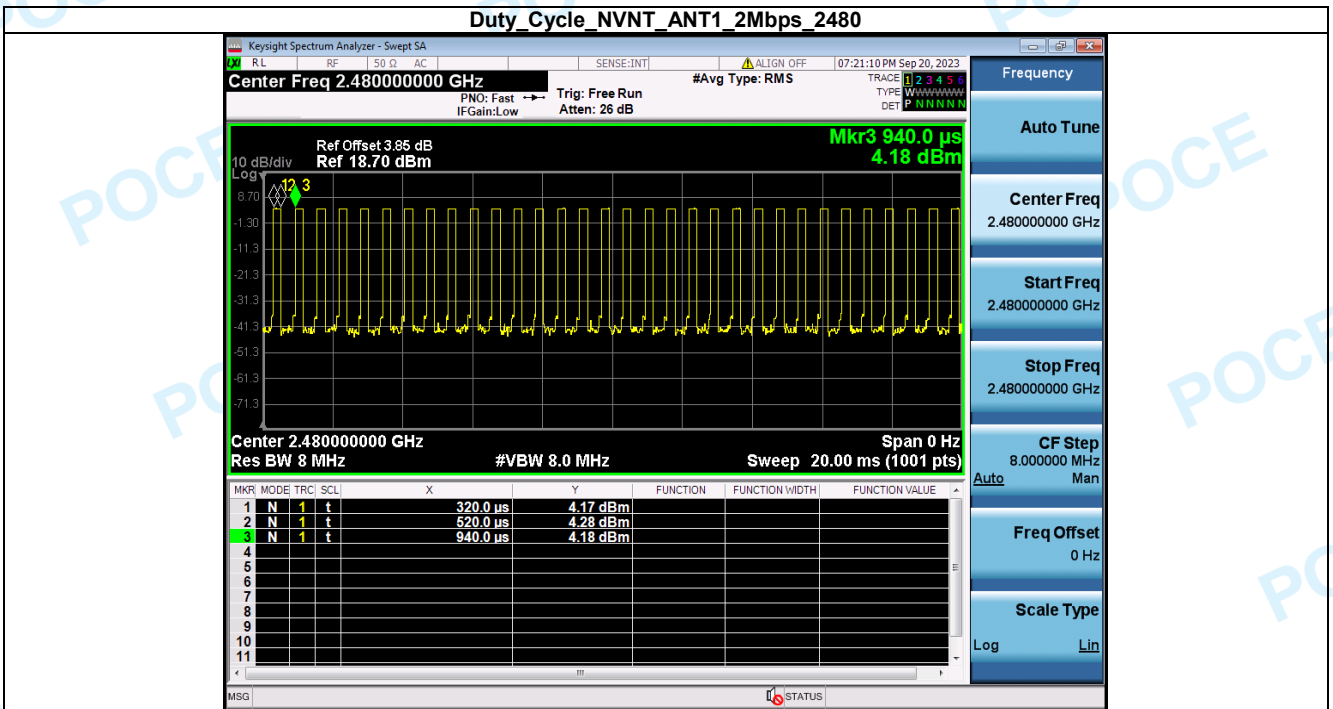
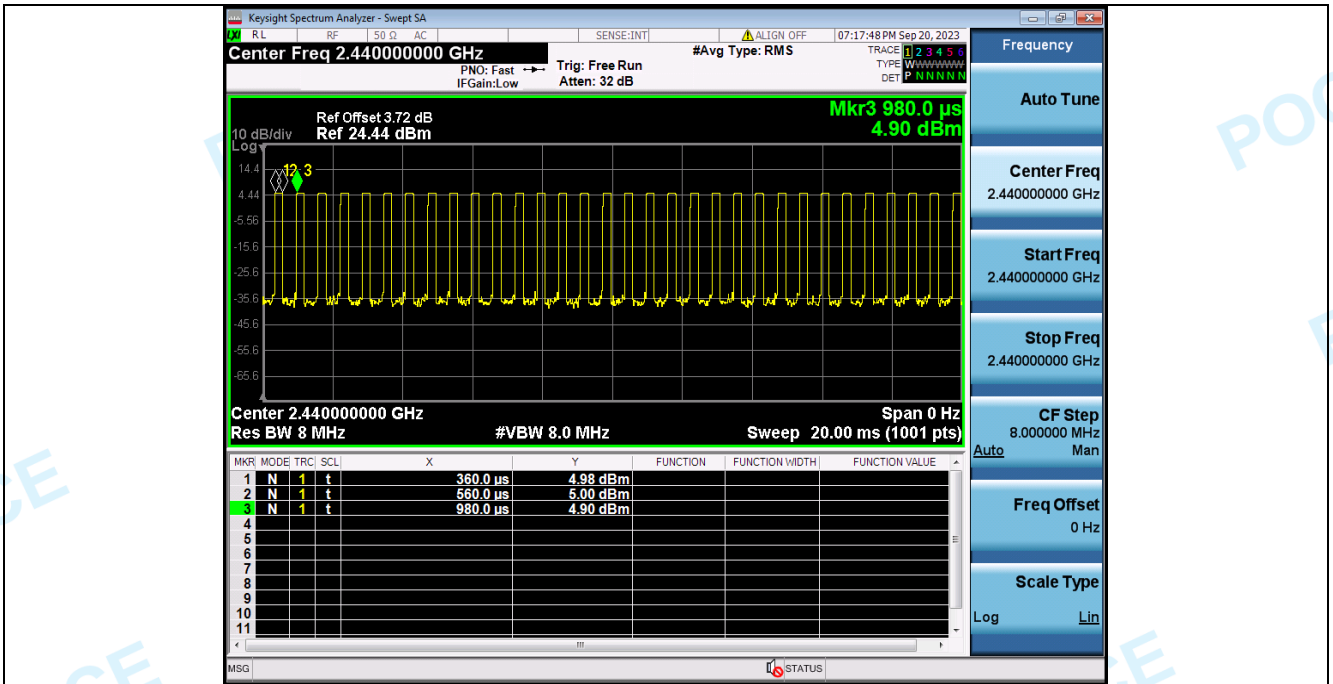
Condition	Antenna	Rate	Frequency (MHz)	Dutycycle(%)	Duty_factor
NVNT	ANT1	1Mbps	2402	61.29	2.13
NVNT	ANT1	1Mbps	2440.00	64.52	1.90
NVNT	ANT1	1Mbps	2480	64.52	1.90
NVNT	ANT1	2Mbps	2402	32.26	4.91
NVNT	ANT1	2Mbps	2440.00	32.26	4.91
NVNT	ANT1	2Mbps	2480	32.26	4.91



Duty Cycle_NVNT_ANT1_1Mbps_2480

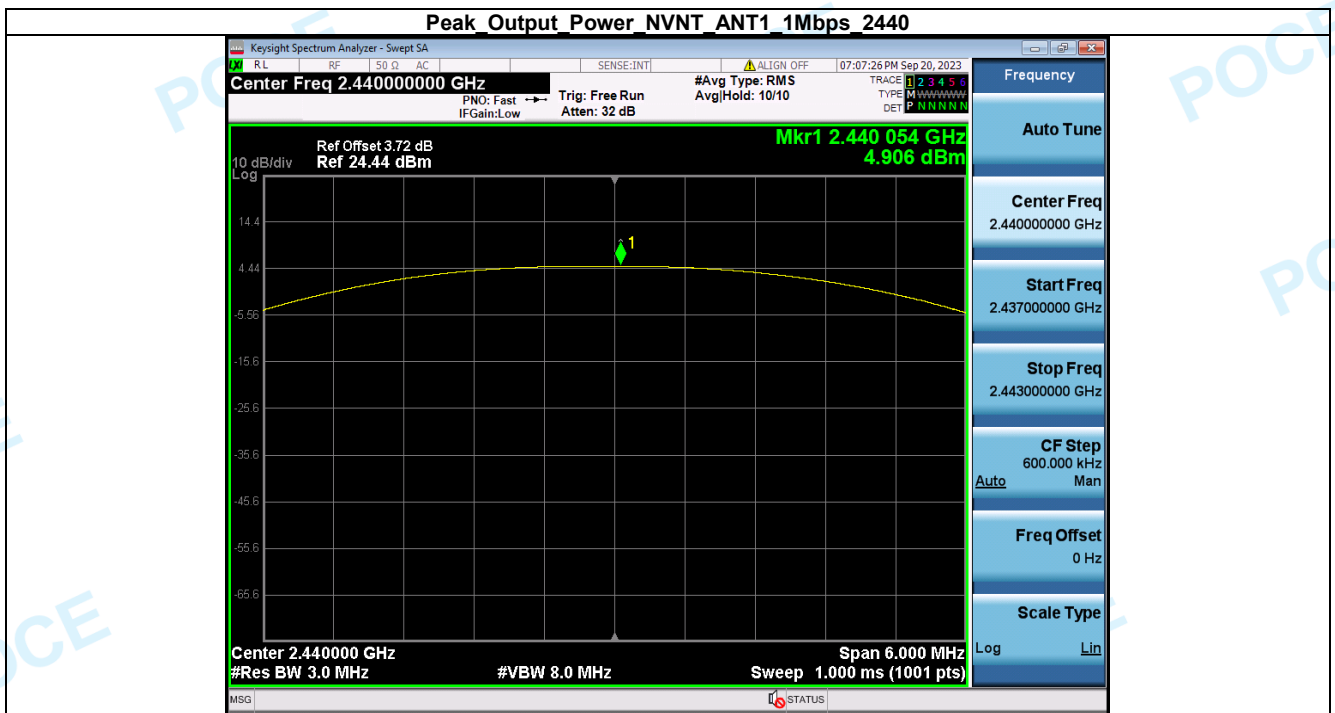
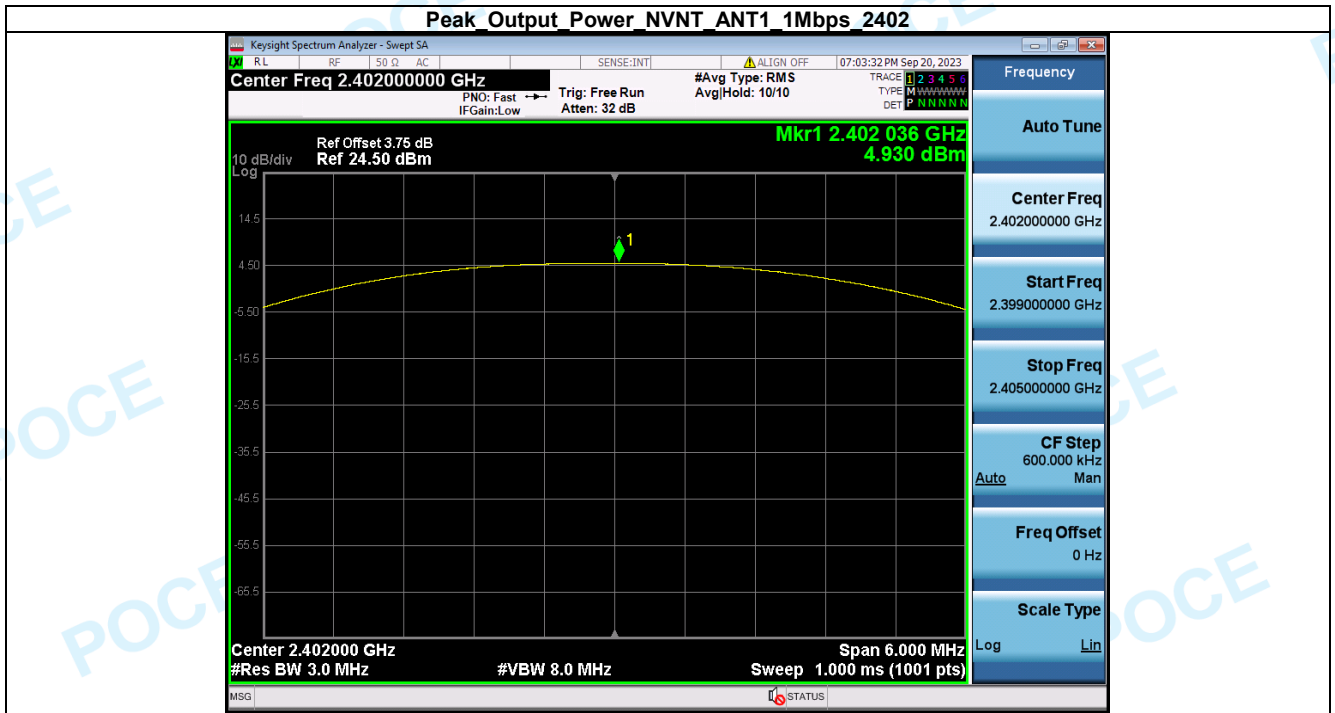


Duty Cycle NVNT_ANT1_2Mbps_2440

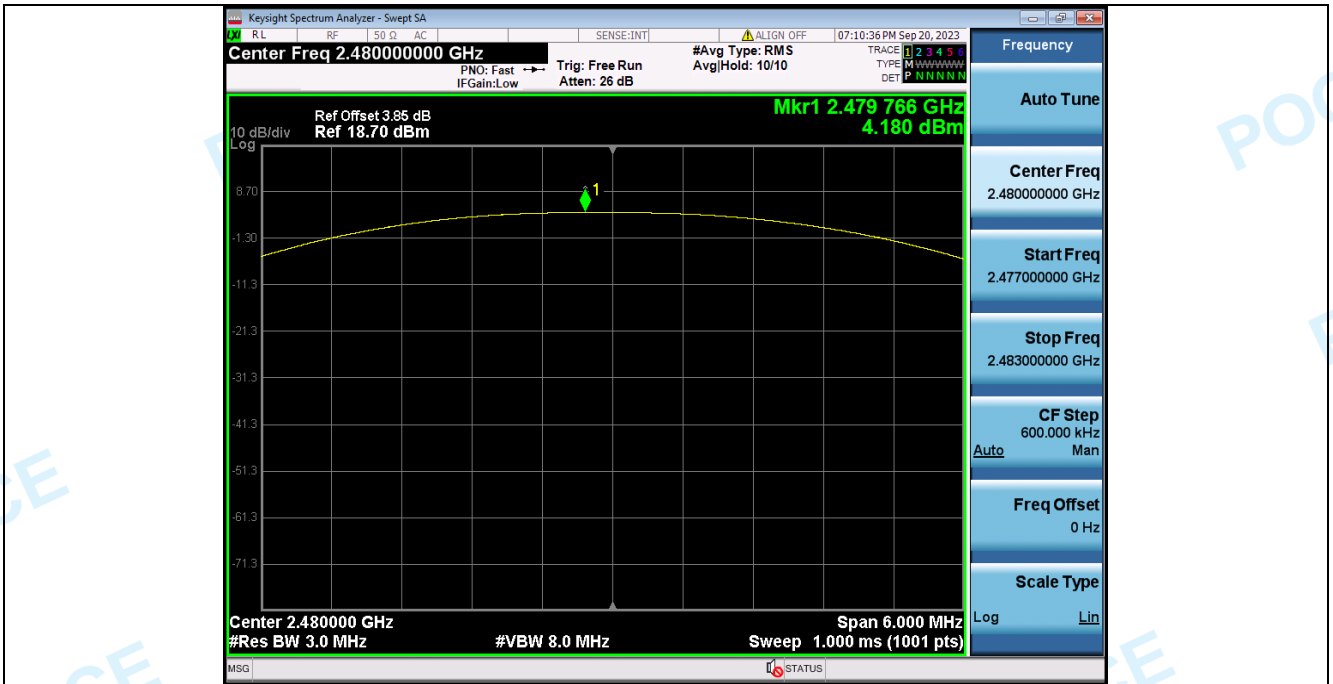


4. Peak Output Power

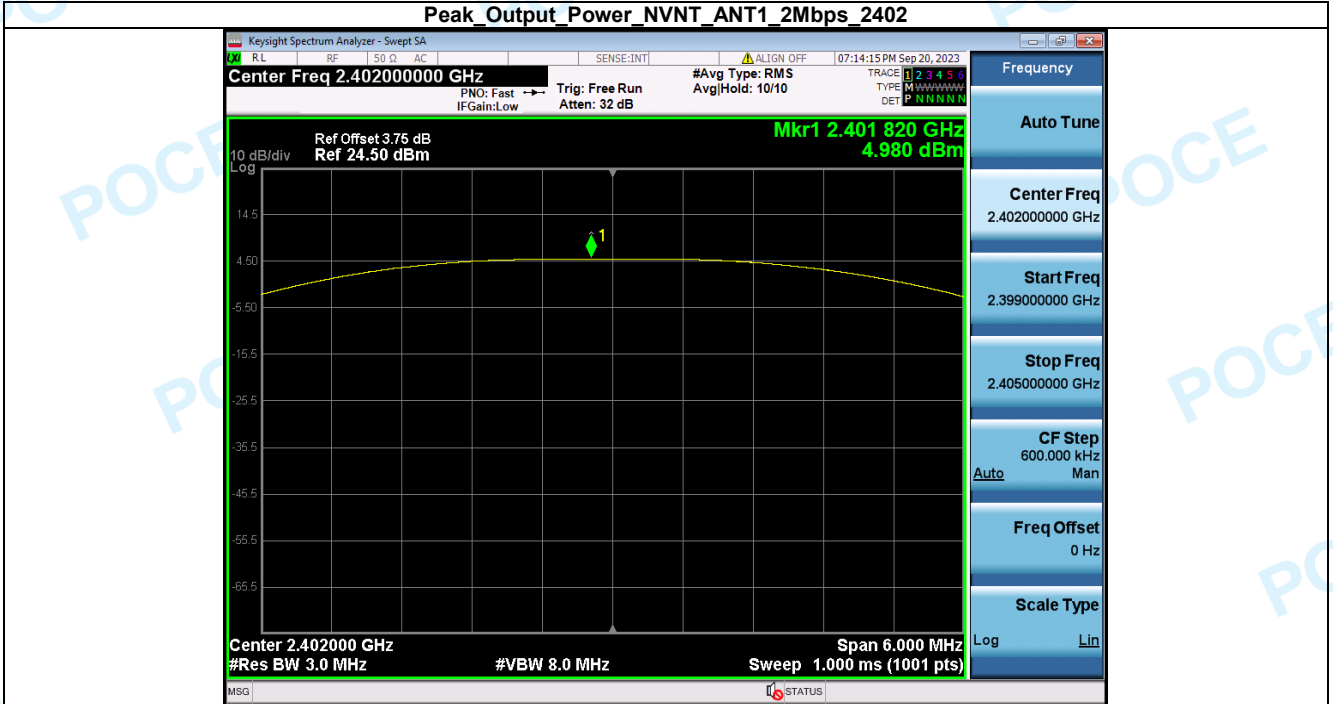
Condition	Antenna	Rate	Frequency (MHz)	Max. Conducted Power(dBm)	Max. Conducted Power(mW)	Limit(mW)	Result
NVNT	ANT1	1Mbps	2402	4.93	3.11	1000	Pass
NVNT	ANT1	1Mbps	2440	4.91	3.09	1000	Pass
NVNT	ANT1	1Mbps	2480	4.18	2.62	1000	Pass
NVNT	ANT1	2Mbps	2402	4.98	3.15	1000	Pass
NVNT	ANT1	2Mbps	2440	4.96	3.13	1000	Pass
NVNT	ANT1	2Mbps	2480	4.24	2.66	1000	Pass



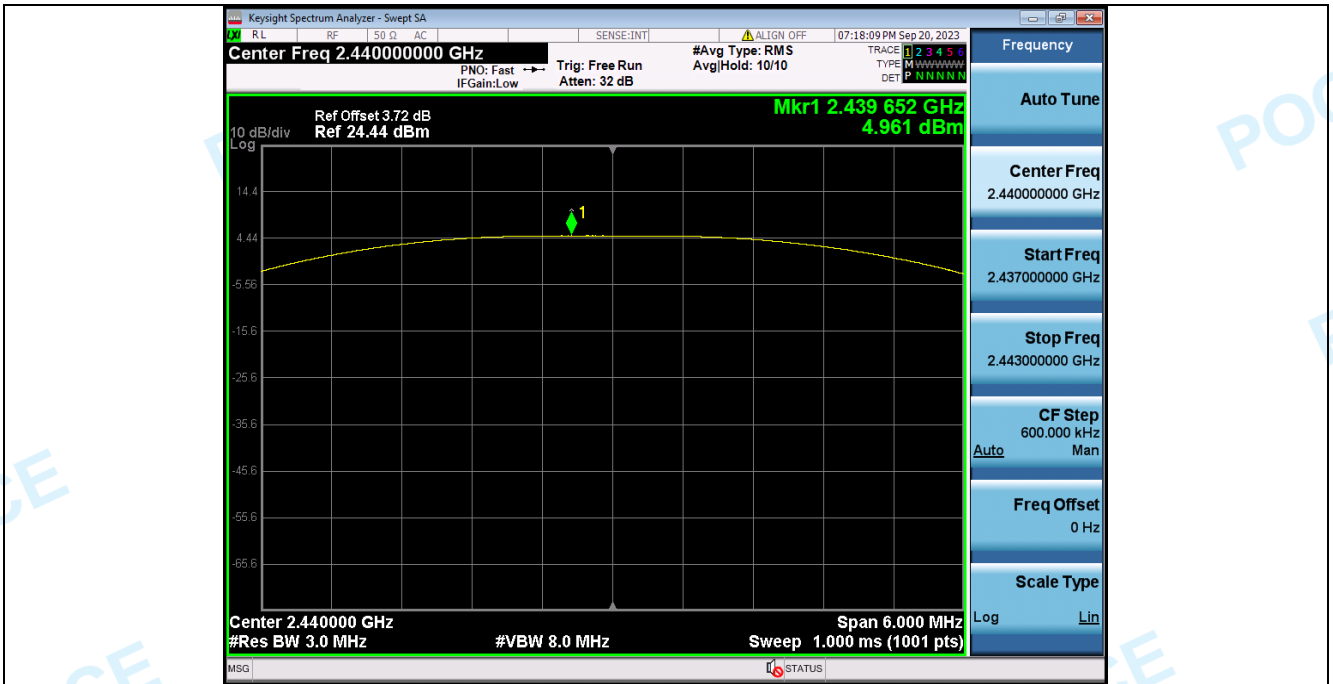
Peak Output Power NVNT ANT1 1Mbps 2480



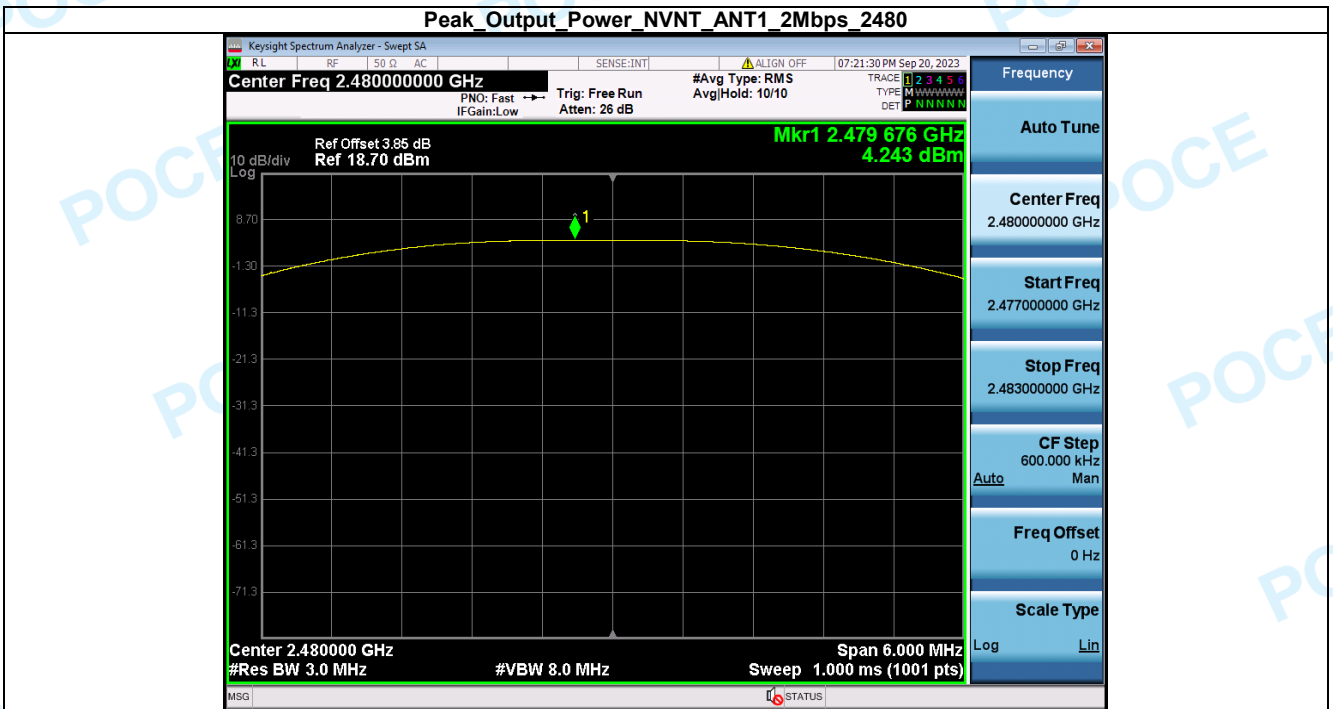
Peak Output Power_NVNT_ANT1_2Mbps_2402



Peak Output Power_NVNT_ANT1_2Mbps_2440

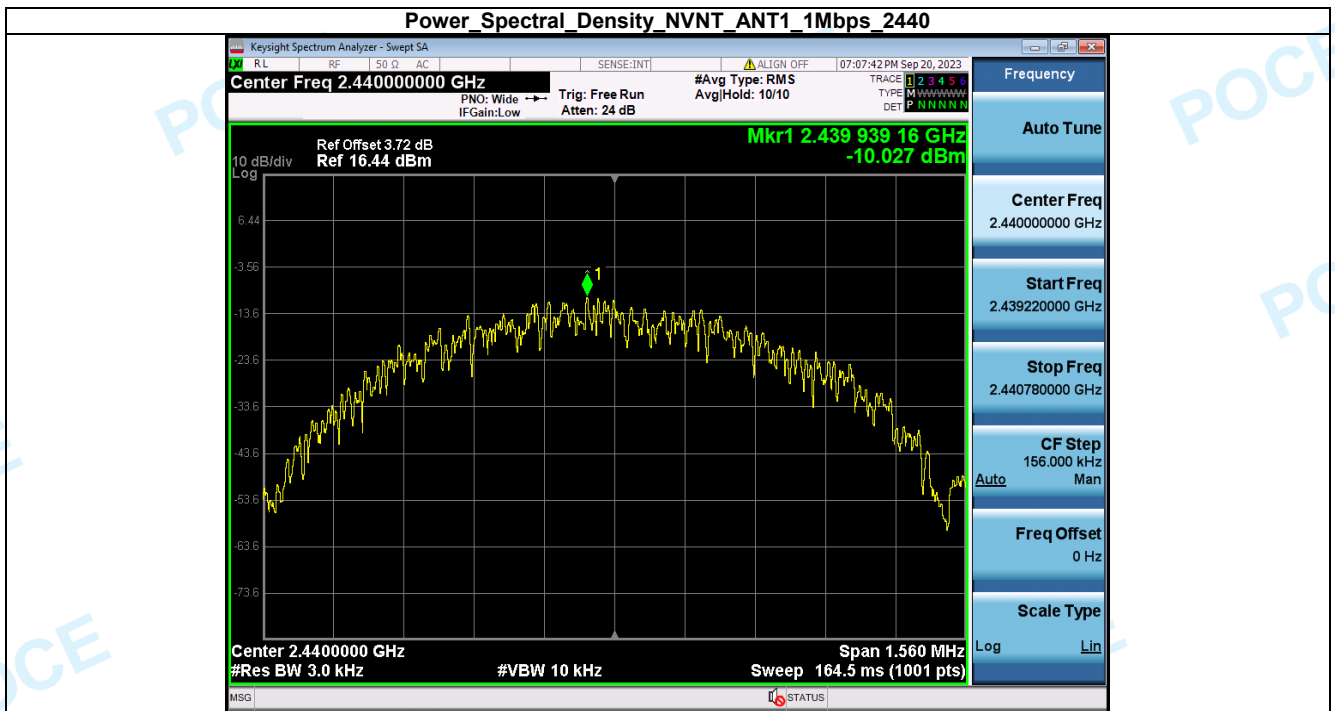
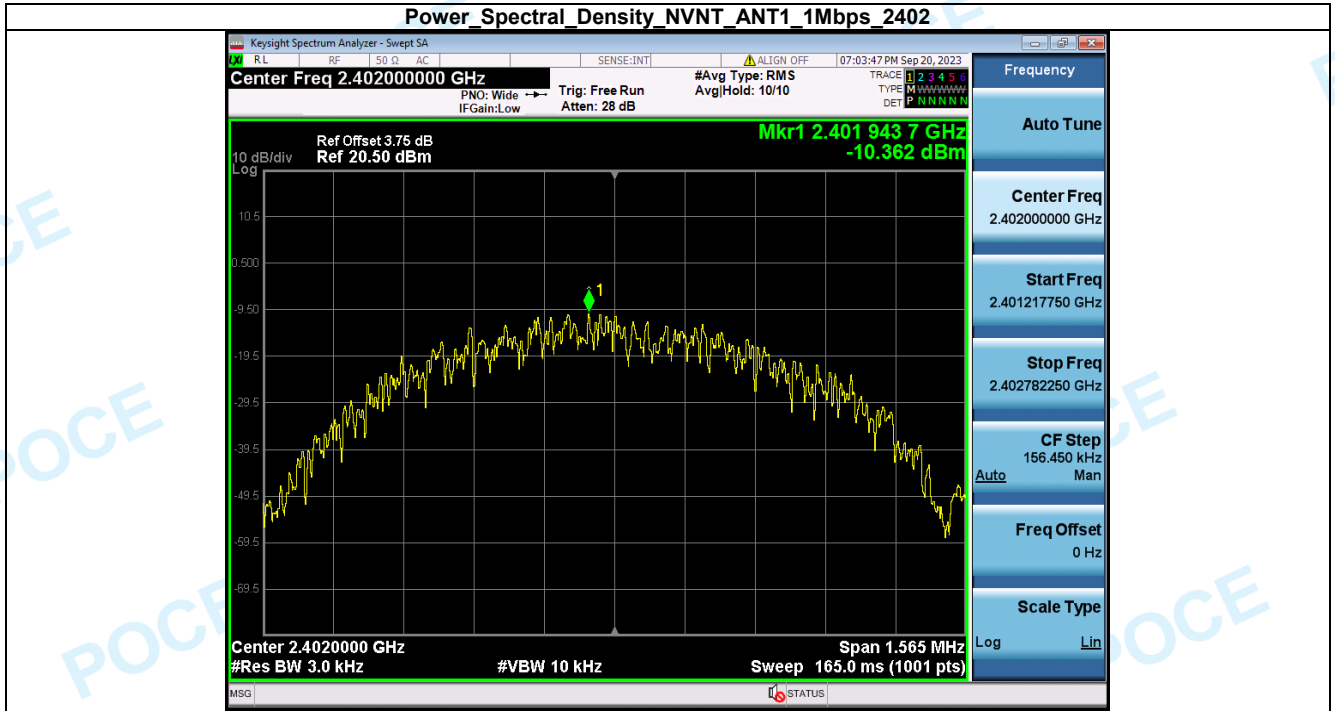


Peak Output Power_NVNT_ANT1_2Mbps_2480

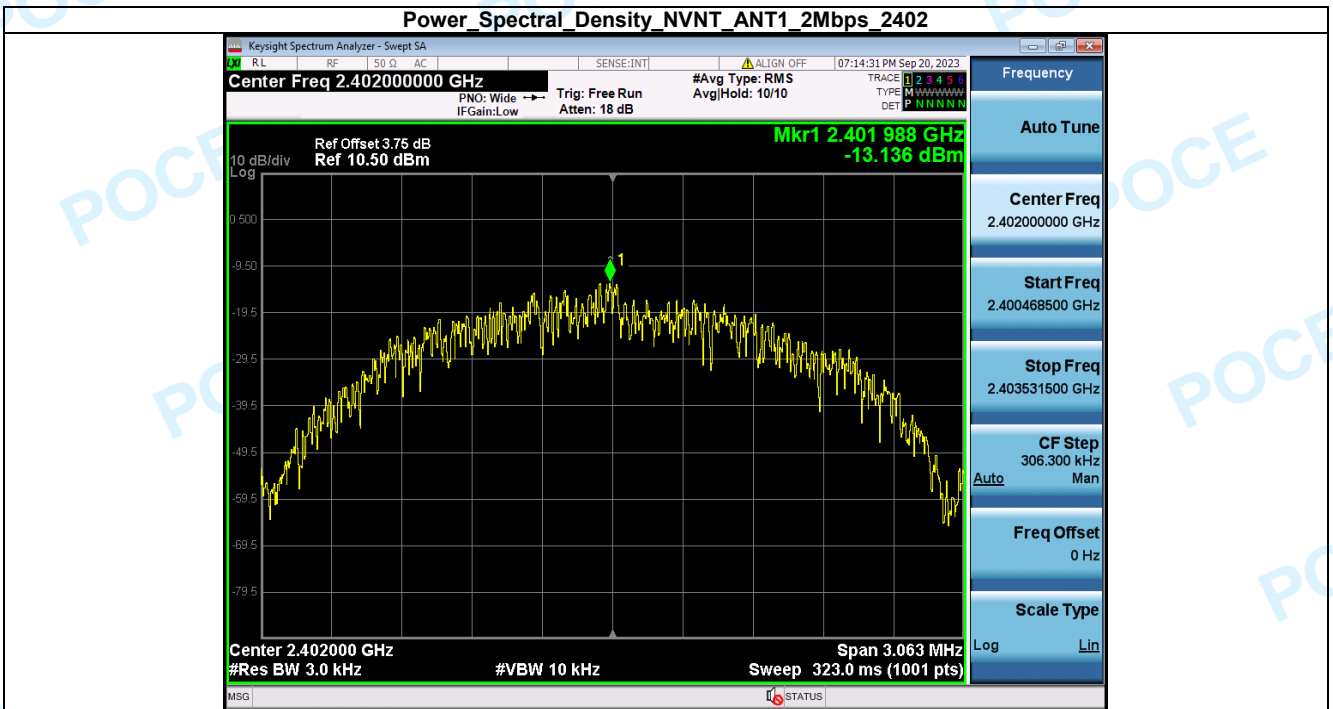
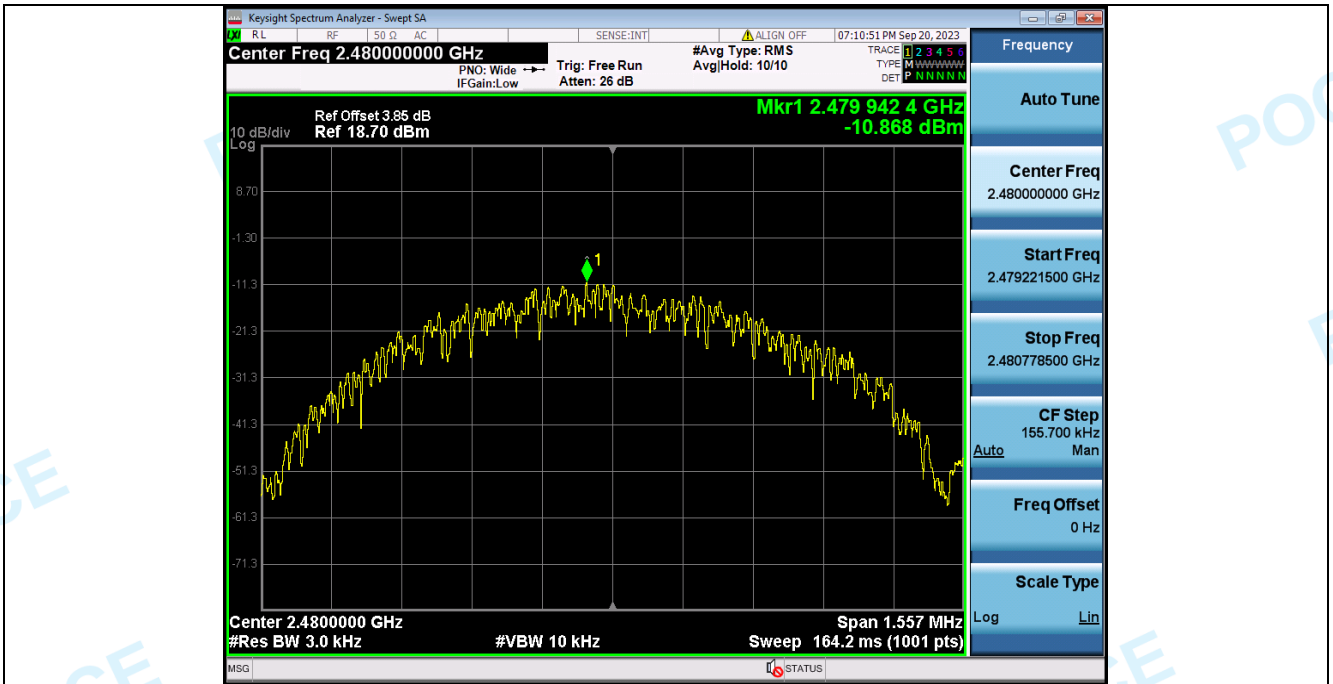


5. Power Spectral Density

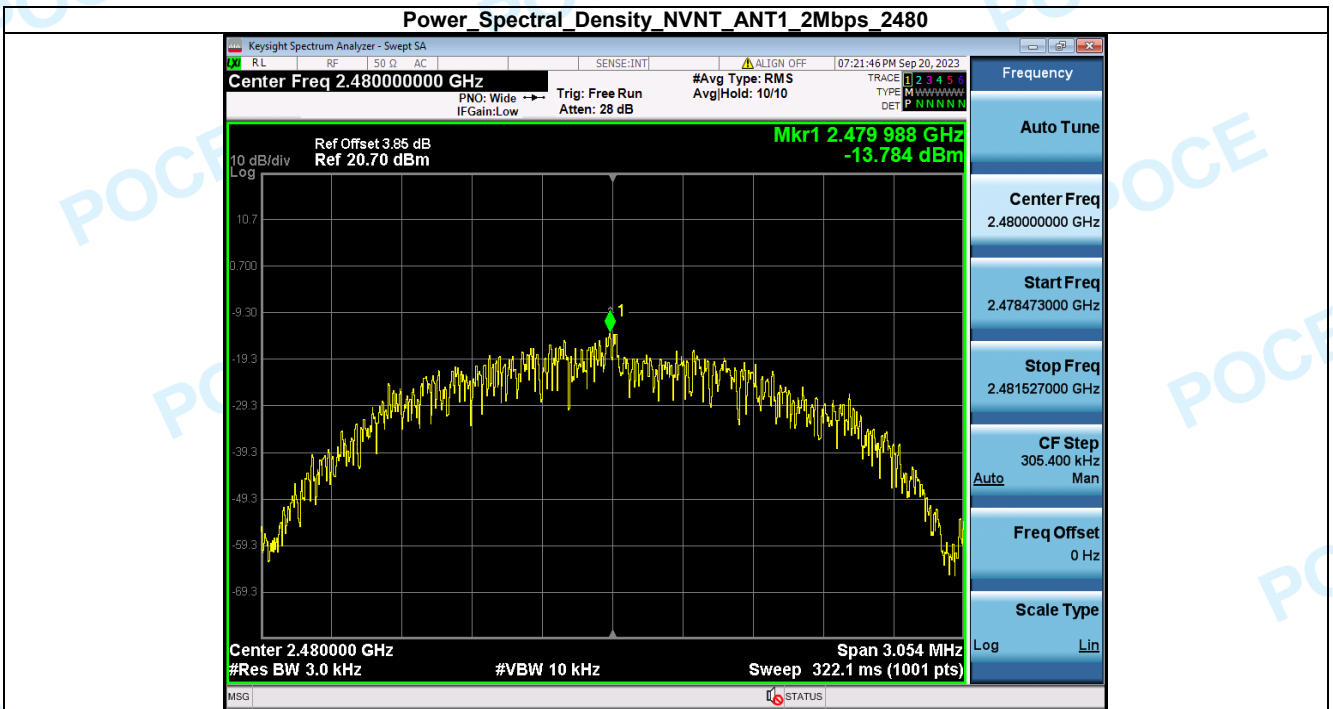
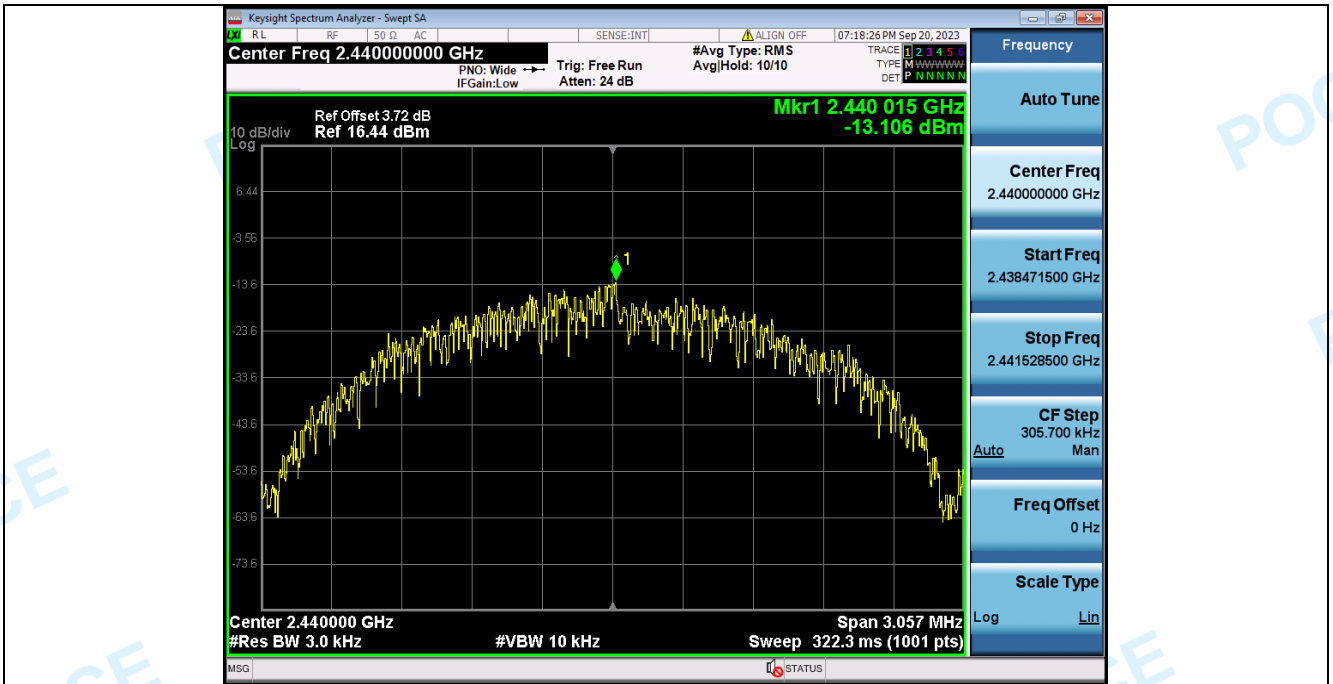
Condition	Antenna	Rate	Frequency (MHz)	Power Spectral Density(dBm)	Limit(dBm/3kHz)	Result
NVNT	ANT1	1Mbps	2402	-10.36	8	Pass
NVNT	ANT1	1Mbps	2440.00	-10.03	8	Pass
NVNT	ANT1	1Mbps	2480	-10.87	8	Pass
NVNT	ANT1	2Mbps	2402	-13.14	8	Pass
NVNT	ANT1	2Mbps	2440.00	-13.11	8	Pass
NVNT	ANT1	2Mbps	2480	-13.78	8	Pass



Power_Spectral_Density_NVNT_ANT1_1Mbps_2480



Power Spectral Density NVNT_ANT1_2Mbps_2440



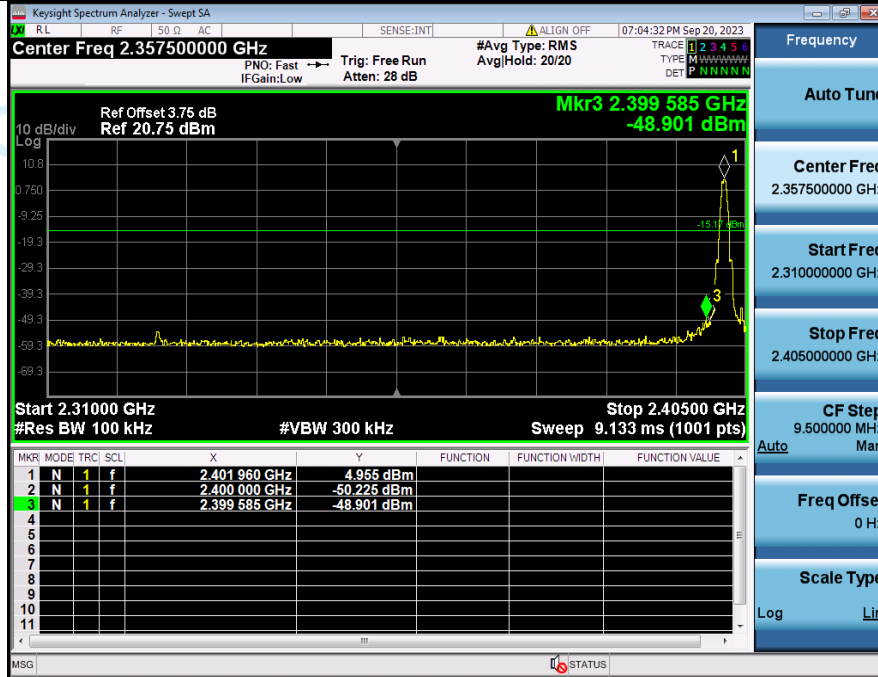
6. Bandedge

Condition	Antenna	Rate	TX_Frequency (MHz)	Max. Mark Frequency (MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	1Mbps	2402	2399.585	-48.901	-15.174	Pass
NVNT	ANT1	1Mbps	2480	2489.600	-42.862	-15.908	Pass
NVNT	ANT1	2Mbps	2402	2399.965	-27.434	-15.167	Pass
NVNT	ANT1	2Mbps	2480	2489.600	-43.231	-15.912	Pass

1 Reference Level NVNT ANT1 1Mbps 2402



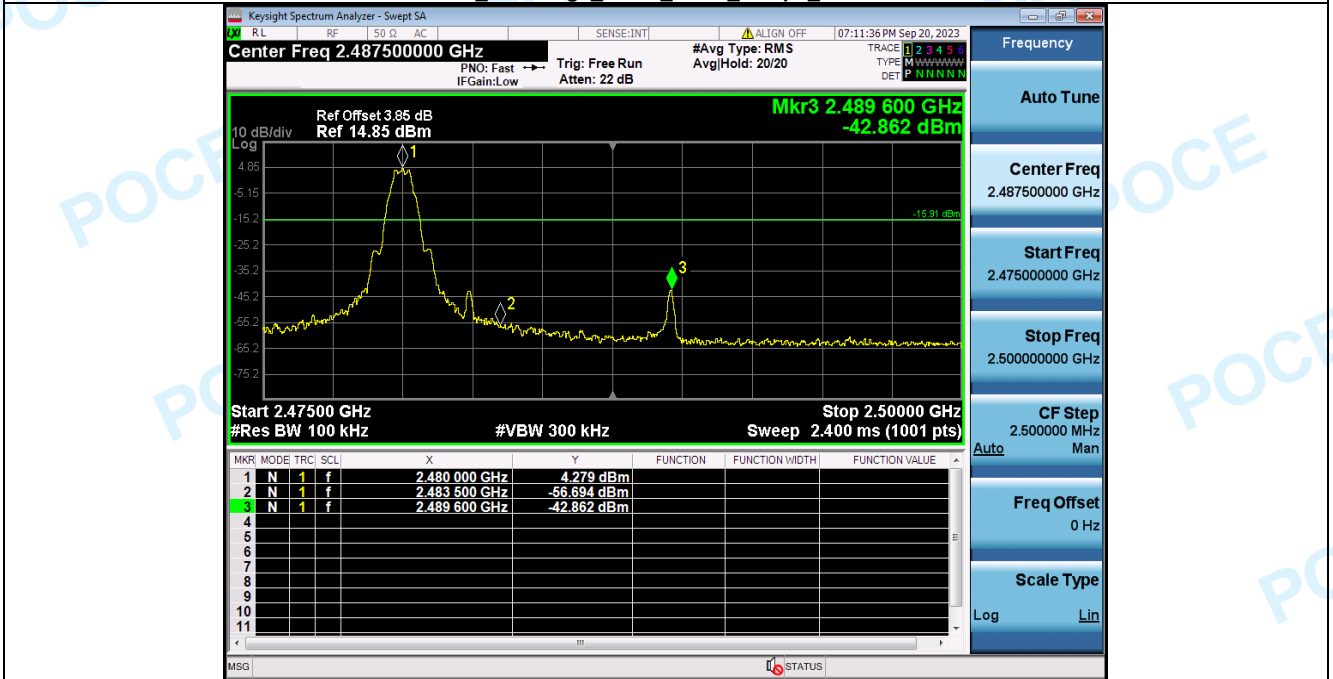
2 Bandedge NVNT ANT1 1Mbps 2402



1 Reference Level NVNT ANT1 1Mbps 2480



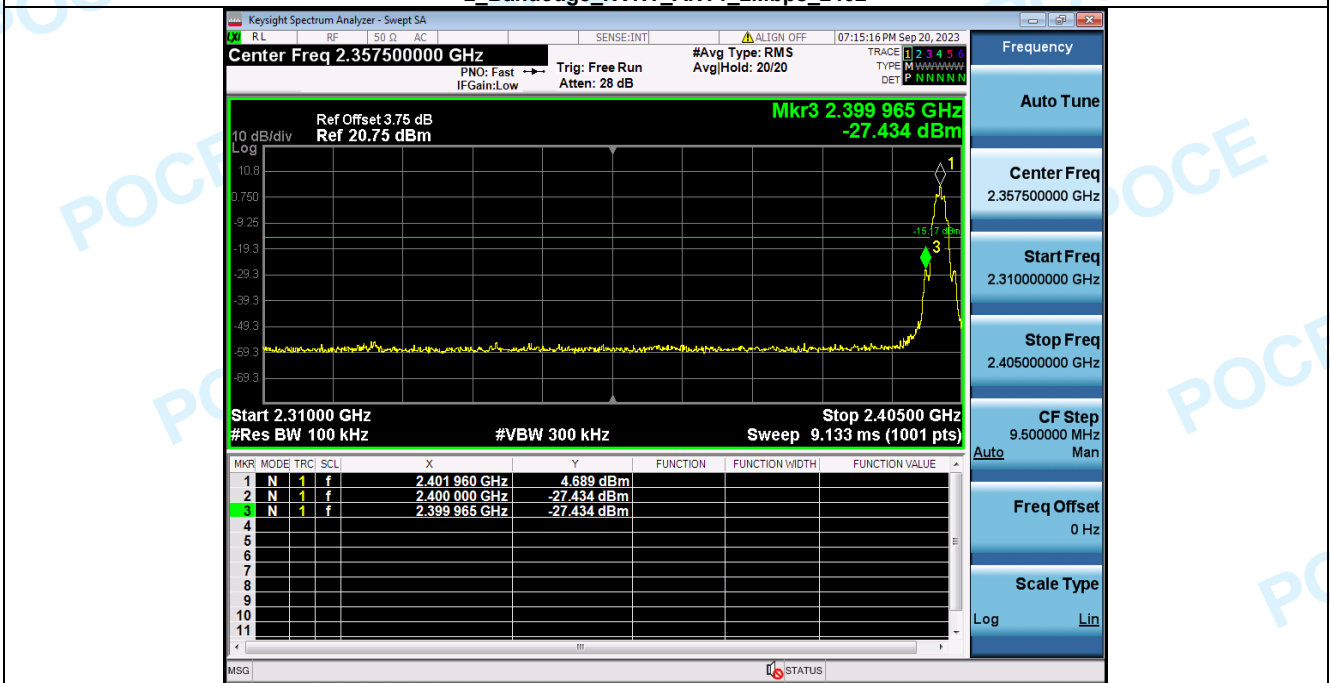
2 Bandedge_NVNT_ANT1_1Mbps_2480



1 Reference Level_NVNT_ANT1_2Mbps_2402



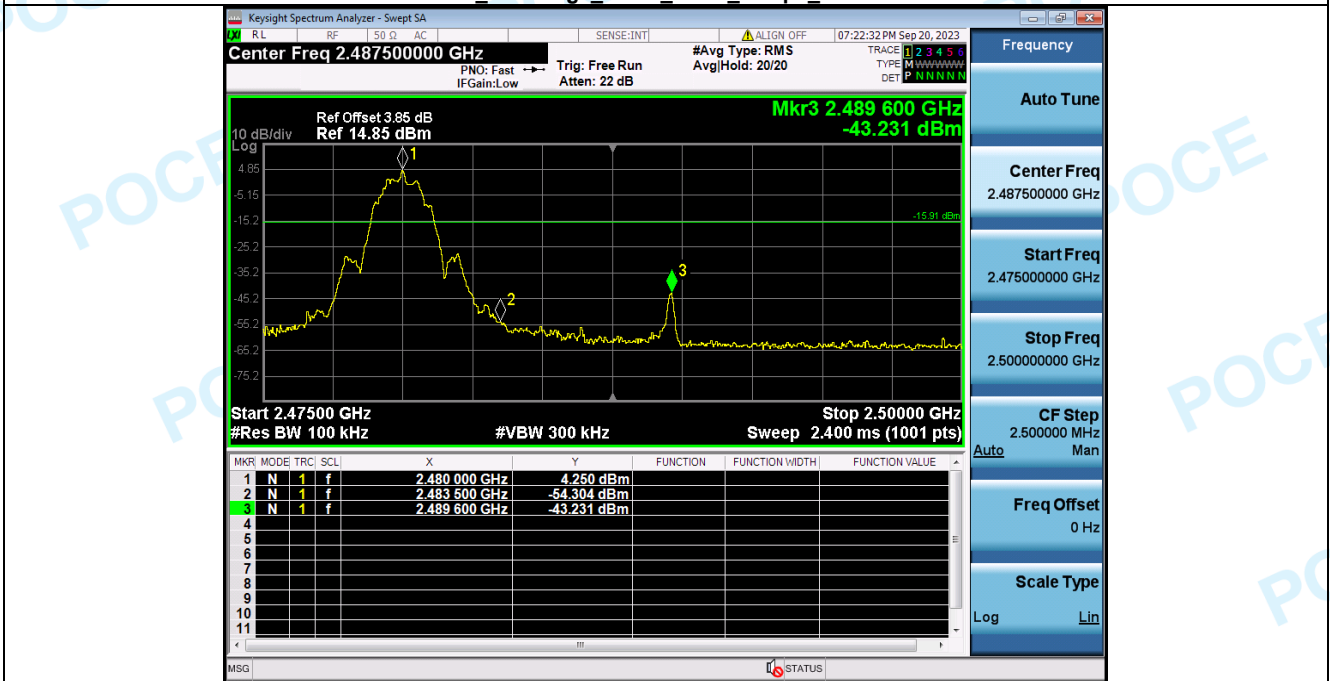
2 Bandedge_NVNT_ANT1_2Mbps_2402



1 Reference Level_NVNT_ANT1_2Mbps_2480



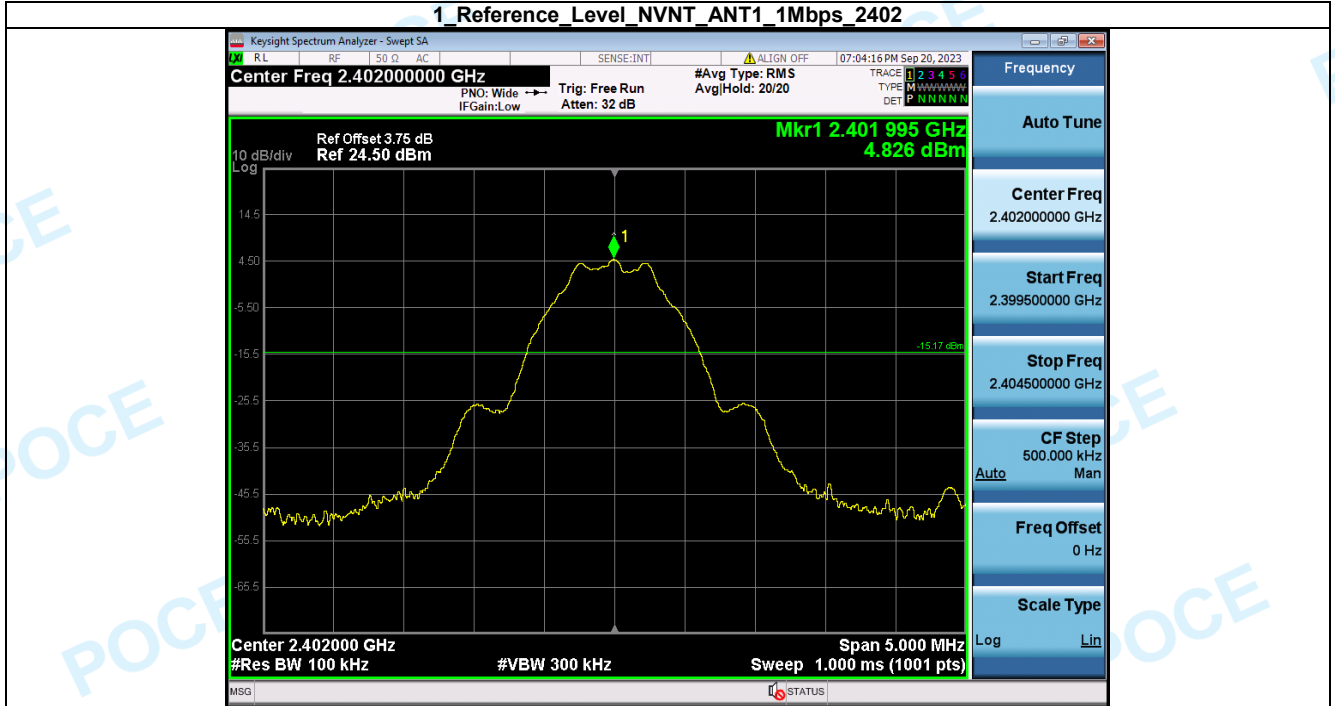
2 Bandedge_NVNT_ANT1_2Mbps_2480



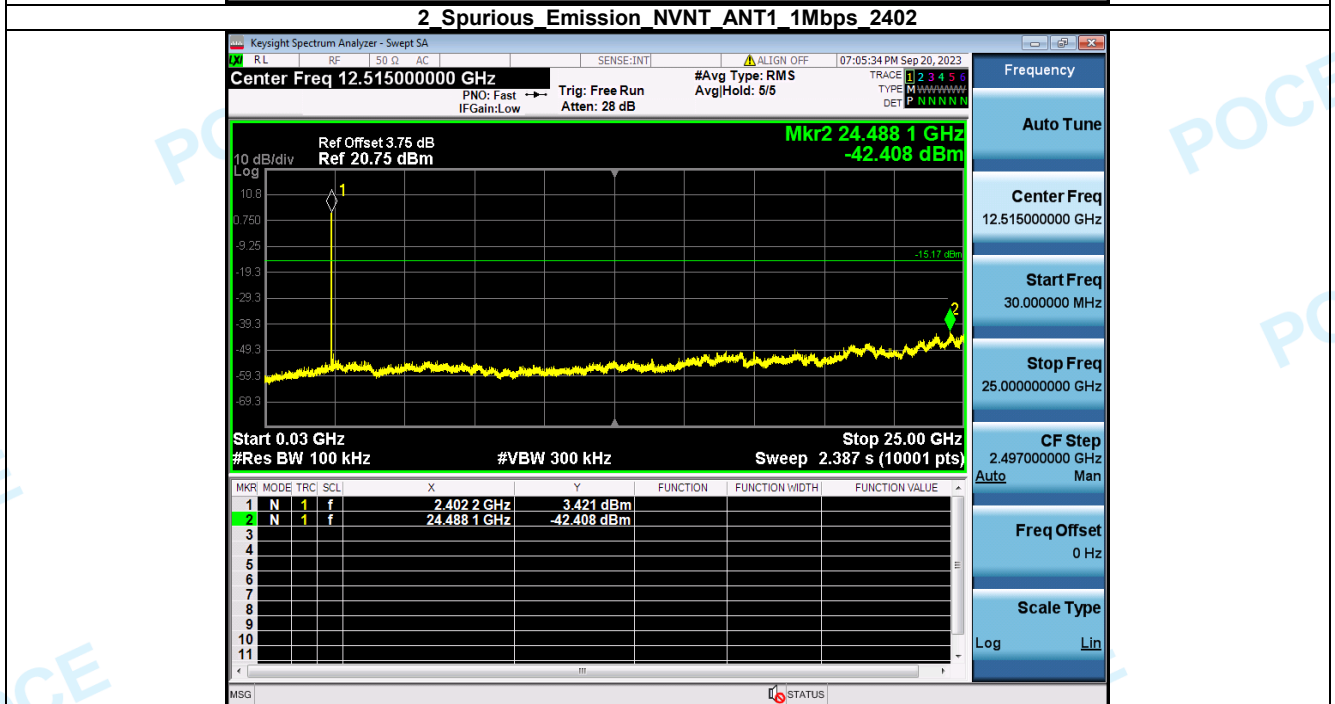
7. Spurious Emission

Condition	Antenna	Rate	TX_Frequency(MHz)	Spurious MAX.Value(dBm)	Limit	Result
NVNT	ANT1	1Mbps	2402	-42.408	-15.174	Pass
NVNT	ANT1	1Mbps	2440.00	-49.222	-15.181	Pass
NVNT	ANT1	1Mbps	2480	-48.955	-15.908	Pass
NVNT	ANT1	2Mbps	2402	-43.199	-15.167	Pass
NVNT	ANT1	2Mbps	2440.00	-42.999	-15.193	Pass
NVNT	ANT1	2Mbps	2480	-48.632	-15.912	Pass

1 Reference Level NVNT ANT1 1Mbps 2402



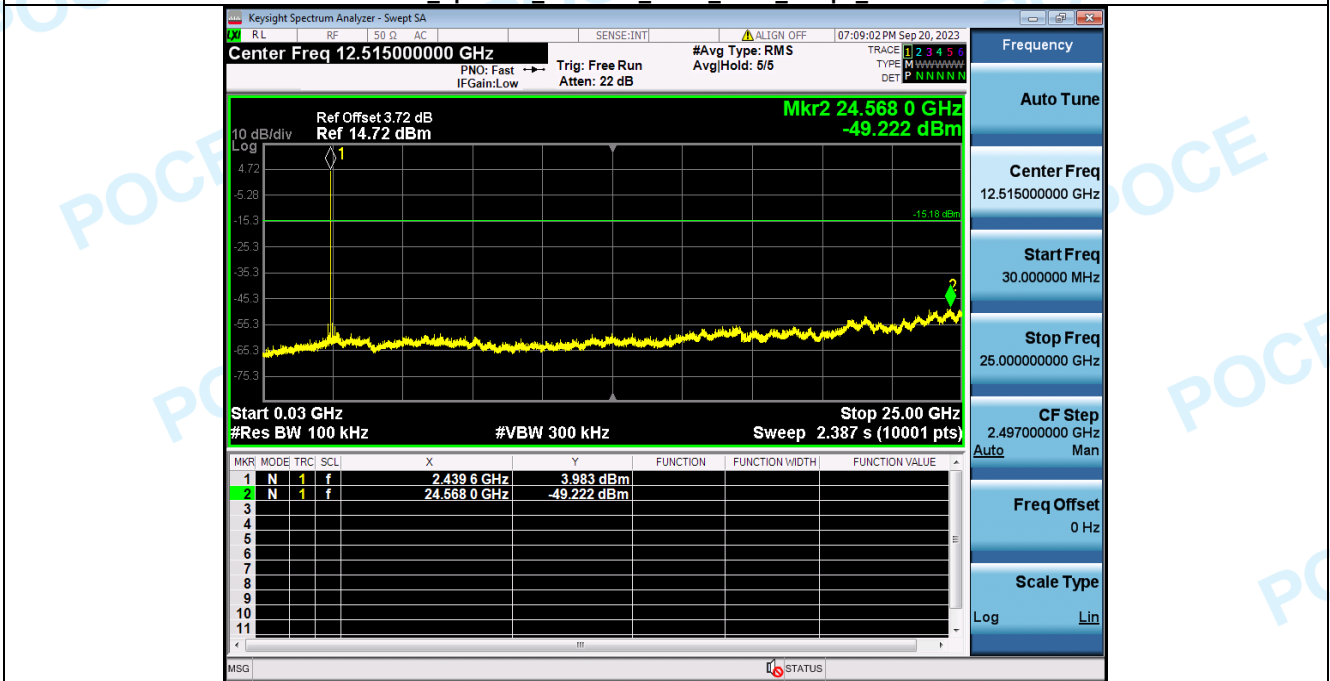
2 Spurious Emission NVNT ANT1 1Mbps 2402



1 Reference Level NVNT ANT1 1Mbps 2440



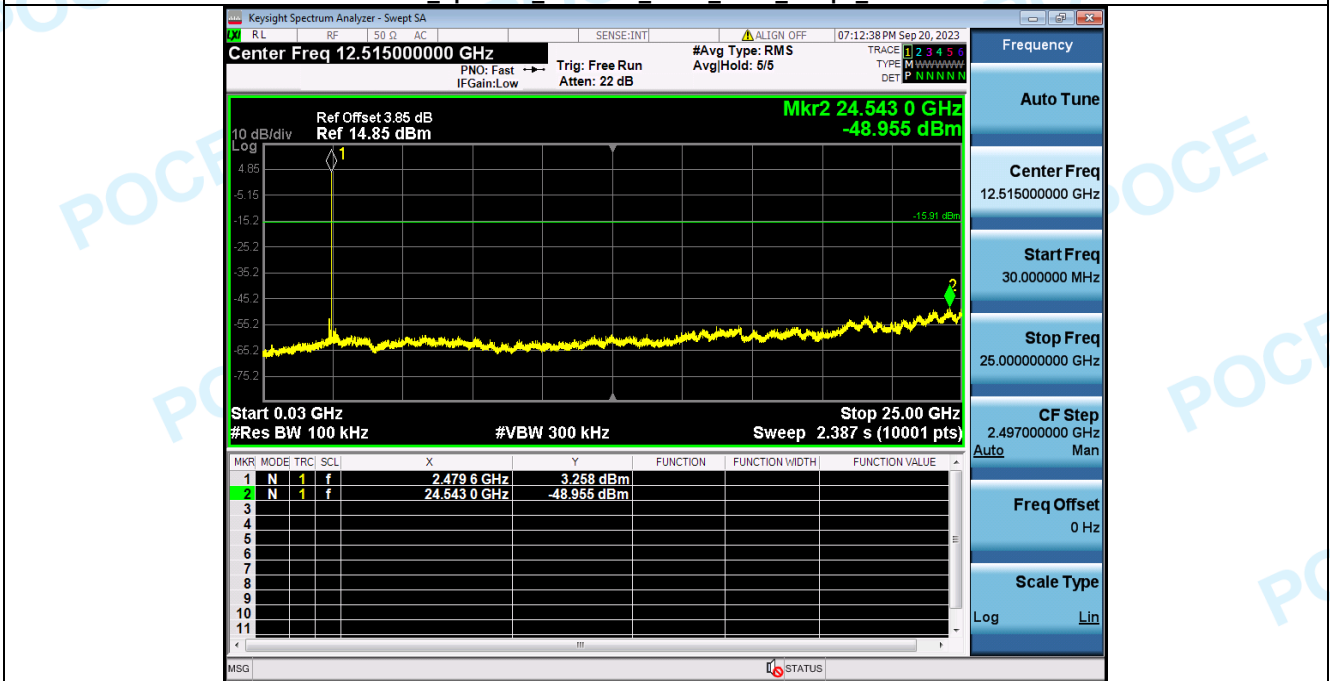
2 Spurious Emission NVNT_ANT1_1Mbps_2440



1 Reference Level NVNT_ANT1_1Mbps_2480



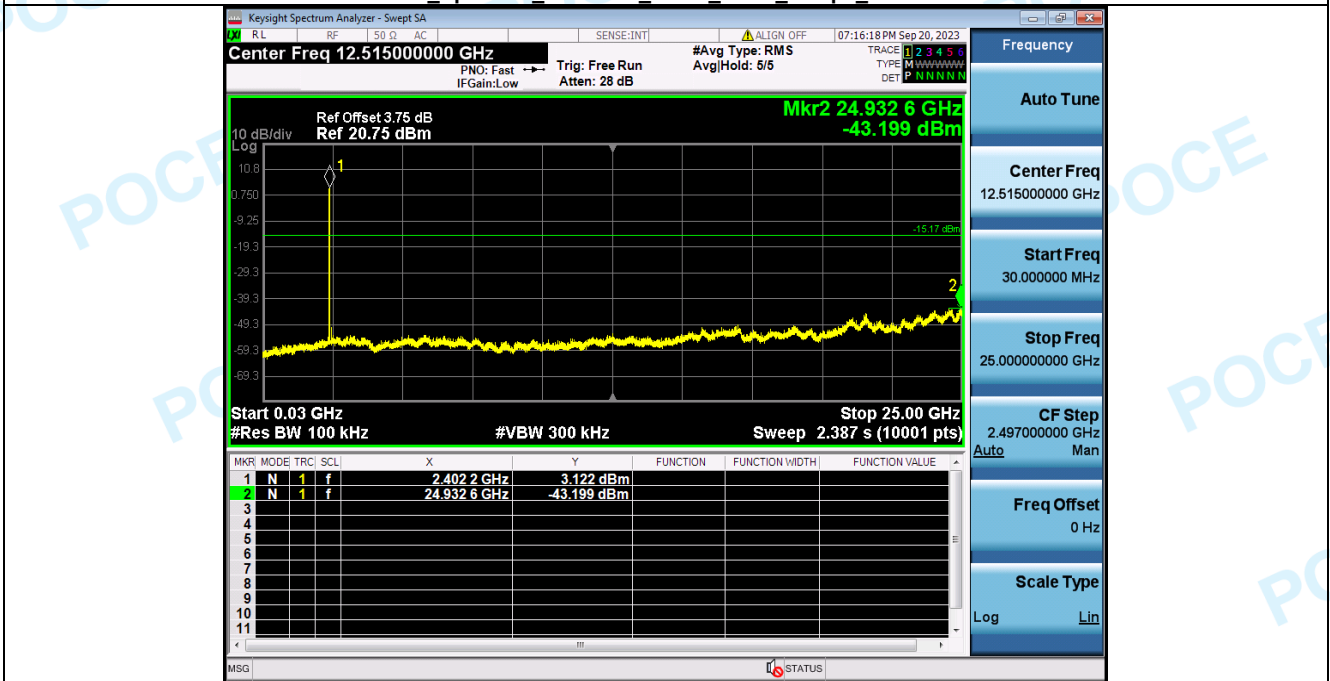
2 Spurious Emission_NVNT_ANT1_1Mbps_2480



1 Reference Level_NVNT_ANT1_2Mbps_2402



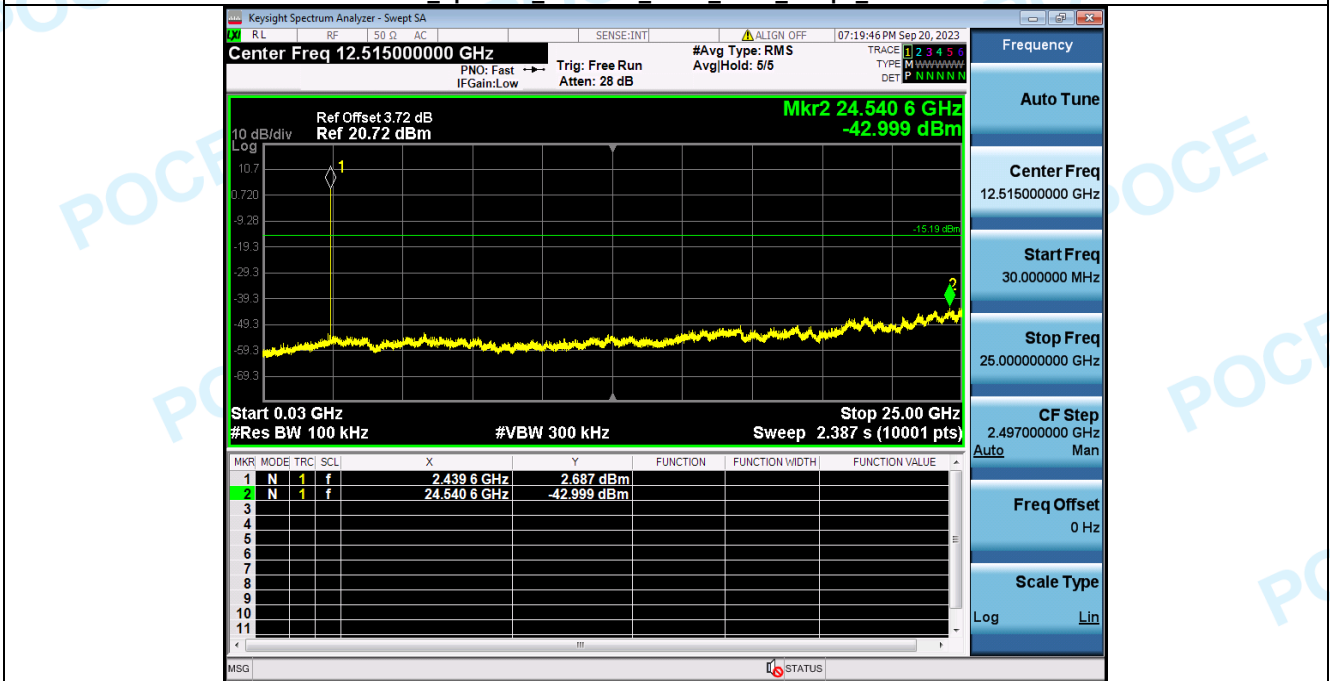
2 Spurious Emission NVNT_ANT1_2Mbps_2402



1 Reference Level NVNT_ANT1_2Mbps_2440



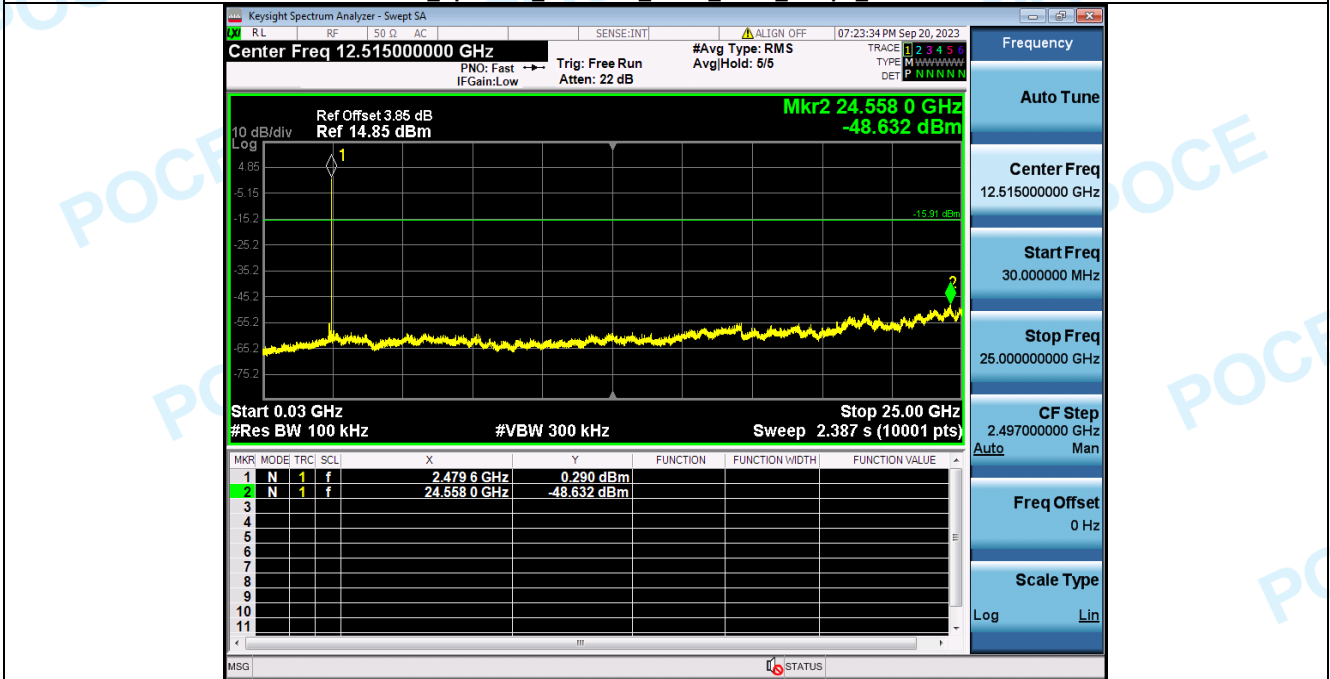
2 Spurious Emission_NVNT_ANT1_2Mbps_2440



1 Reference Level_NVNT_ANT1_2Mbps_2480



2 Spurious Emission_NVNT_ANT1_2Mbps_2480



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