TEST REPORT

FCC ID: 2AXYP-V8001

Product: Tablet

Model No.: VILLAON

Trade Mark: V8001

Report No.: WSCT-A2LA-R&E231200026A-Wi-Fi

Issued Date: 28 December 2023

Issued for:

ORAIMO TECHNOLOGY LIMITED
FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG

Issued By:

World Standardization Certification & Testing Group(Shenzhen) Co.,Ltd.
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1. Test Certification

Product:	Tablet
Model No.:	VILLAON
Trade Mark:	V8001
Applicant:	ORAIMO TECHNOLOGY LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHA N MEI STREET FOTAN NT HONGKONG
Manufacturer:	ORAIMO TECHNOLOGY LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHA N MEI STREET FOTAN NT HONGKONG
Date of Test:	08 December 2023 ~ 27 December 2023
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247

The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang *(Wang Xiang)*

Checked By: Li Huaibi *(Li Huaibi)*

Approved By: Liu Fuxin *(Liu Fuxin)*

Date: 28 December 2023

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3) §2.1046	PASS
6dB Emission Bandwidth	§15.247 (a)(2) §2.1049	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	1§5.247(d) §2.1051, §2.1057	PASS
Spurious Emission	§15.205/§15.209 §2.1053, §2.1057	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

3. EUT Description

Product:	Tablet
Model No.:	VILLAON
Trade Mark:	V8001
Operation Frequency:	2412MHz~2462MHz (802.11b/g/n(HT20)) 2422MHz~2452MHz (802.11n(HT40))
Channel Separation:	5MHz
Modulation type:	DSSS(DBPSK, DQPSK, CCK) for IEEE 802.11b OFDM(BPSK,QPSK,16QAM,64QAM) for IEEE 802.11g/n
Antenna Type:	Integral Antenna
Antenna Gain	1.31dBi
Power supply:	Rechargeable Li-ion Polymer Battery :BL-40PV Rated Voltage: 3.8V Rated Cpacity:4000mAh/15.2Wh Typical Capacity:4100mAh/15.58Wh Limited Charge Voltage: 4.35V
Adapter:	Adapter: A18A-050100U-US2 Input: 100-240V~50/60Hz Max. 0.2A Output:5V⎓1A
Remark:	N/A.

Operation Frequency each of channel For 802.11b/g/n(HT20)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency each of channel For 802.11n (HT40)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
--	--	4	2427MHz	7	2442MHz	--	--
--	--	5	2432MHz	8	2447MHz	--	--
3	2422MHz	6	2437MHz	9	2452MHz		

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:

802.11b/g/n (HT20)

Channel	Frequency
The lowest channel	2412MHz
The middle channel	2437MHz
The Highest channel	2462MHz

802.11n (HT40)

Channel	Frequency
The lowest channel	2422MHz
The middle channel	2437MHz
The Highest channel	2452MHz

4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)
The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.
Mode
802.11b
802.11g
802.11n(H20)
802.11n(H40)

Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation
1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.2.According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup” 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20).Duty cycle setting during the transmission is 98.5% with maximum power setting for all modulations.	

4.2. 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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	Adapter	/	/	ADAPTER

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.2. ACCREDITATIONS

CNAS - Registration Number: L3732

China National Accreditation Service for Conformity Assessment, The test firm Registration Number: L3732

FCC - Designation Number: CN1303

World Standardization Certification & Testing Group(Shenzhen) CO., LTD. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Designation Number: CN1303.

A2LA - Certificate Number: 5768.01

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA).Certification Number: 5768.01

5.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission Test	±3.2dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1GHz)	±4.7dB
5	All emissions, radiated(>1GHz)	±4.7dB
6	Temperature	±0.5°C
7	Humidity	±2.0%

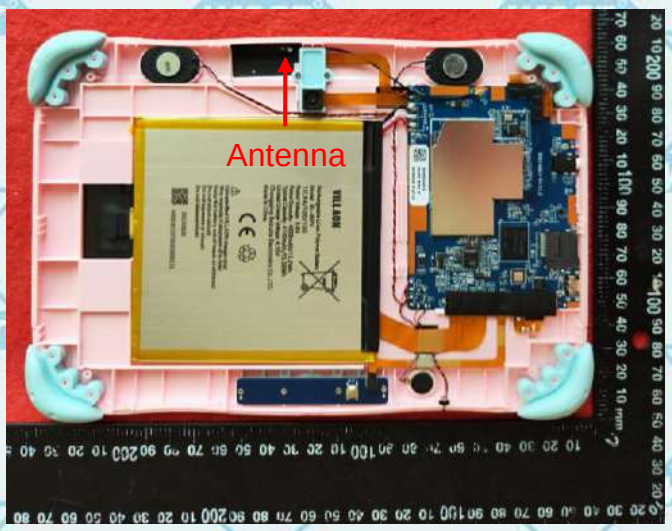
5.4.MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
Test software	--	EZ-EMC	CON-03A	-	-
Test software	--	MTS8310	-	-	-
EMI Test Receiver	R&S	ESCI	100005	11/05/2023	11/04/2024
LISN	AFJ	LS16	16010222119	11/05/2023	11/04/2024
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2023	11/04/2024
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	11/05/2023	11/04/2024
Coaxial cable	Megalon	LMR400	N/A	11/05/2023	11/04/2024
GPIB cable	Megalon	GPIB	N/A	11/05/2023	11/04/2024
Spectrum Analyzer	R&S	FSU	100114	11/05/2023	11/04/2024
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2023	11/04/2024
Pre-Amplifier	CDSI	PAP-1G18-38	--	11/05/2023	11/04/2024
Bi-log Antenna	SUNOL Sciences	JB3	A021907	11/05/2023	11/04/2024
9*6*6 Anechoic	--	--	--	11/05/2023	11/04/2024
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	11/05/2023	11/04/2024
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	11/05/2023	11/04/2024
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	11/05/2023	11/04/2024
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	-	11/05/2023	11/04/2024
Loop Antenna	EMCO	6502	00042960	11/05/2023	11/04/2024
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	11/05/2023	11/04/2024
Power meter	Anritsu	ML2487A	6K00003613	11/05/2023	11/04/2024
Power sensor	Anritsu	MX248XD	--	11/05/2023	11/04/2024
Spectrum Analyzer	Keysight	N9010B	MY60241089	11/05/2023	11/04/2024

6. Test Results and Measurement Data

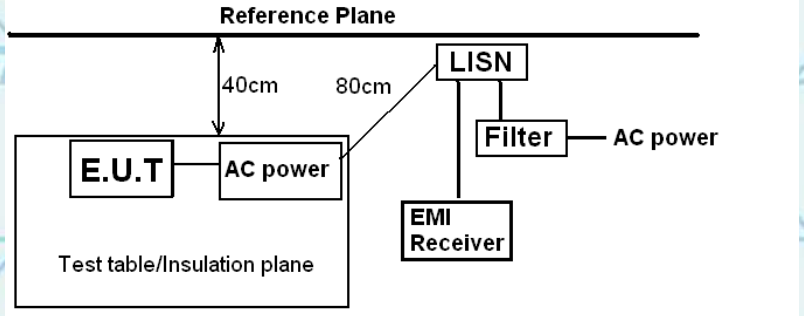
6.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
E.U.T Antenna:	
The WiFi antenna1.31dBi.	



6.2. Conducted Emission

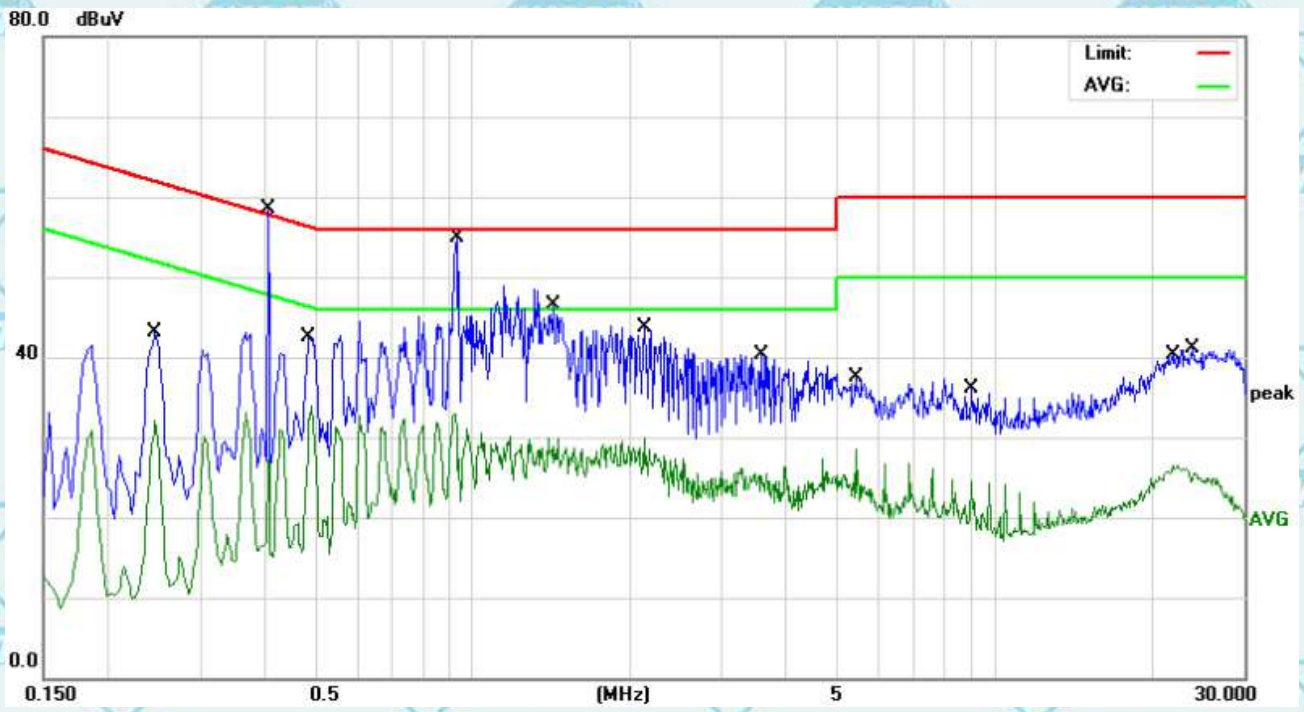
6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2014
Frequency Range:	150 kHz to 30 MHz
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto
Limits:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50
Test Setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test Mode:	Charging + transmitting with modulation
Test Procedure:	1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2014 on conducted measurement.
Test Result:	PASS

6.2.2. Test data

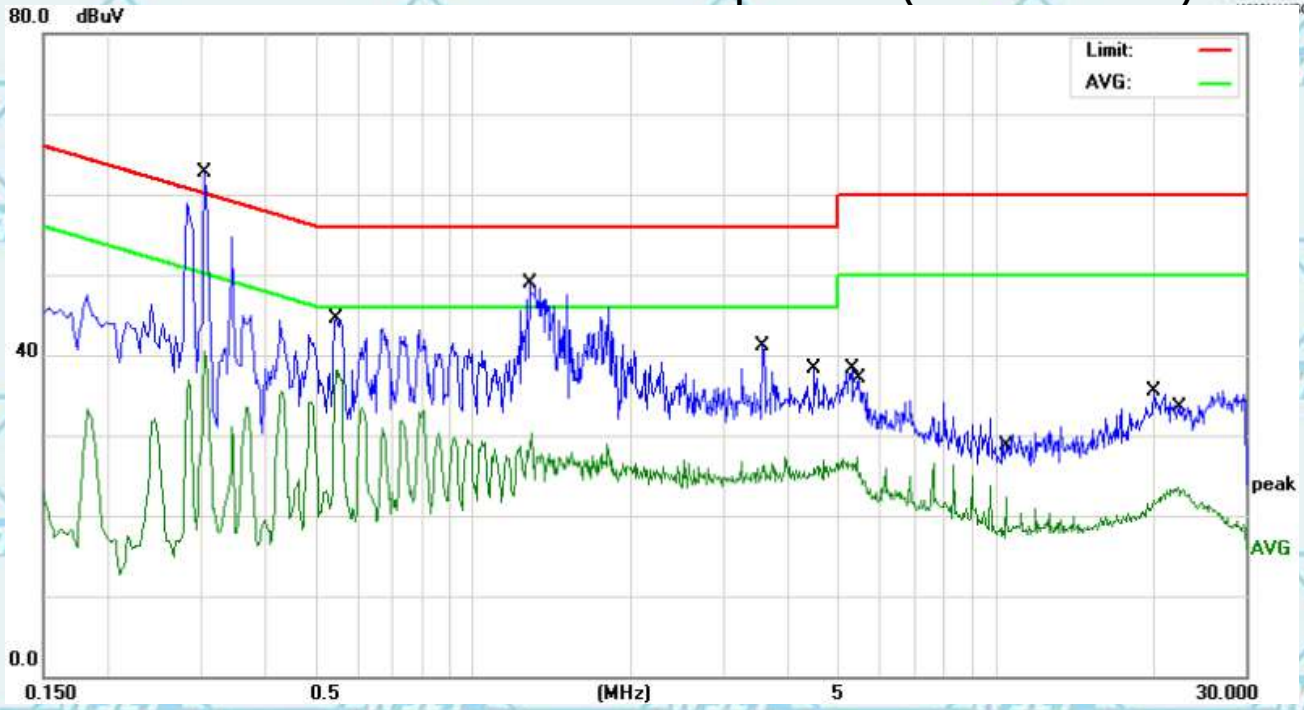
Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2460	21.57	10.46	32.03	51.89	-19.86	AVG
2		0.4060	26.32	10.50	36.82	57.73	-20.91	QP
3		0.4900	23.29	10.52	33.81	46.17	-12.36	AVG
4		0.9260	22.33	10.55	32.88	46.00	-13.12	AVG
5		0.9300	26.44	10.55	36.99	56.00	-19.01	QP
6	*	1.4220	35.93	10.62	46.55	56.00	-9.45	QP
7		2.1300	19.21	10.71	29.92	46.00	-16.08	AVG
8		3.5740	29.62	10.73	40.35	56.00	-15.65	QP
9		5.4060	17.82	10.75	28.57	50.00	-21.43	AVG
10		9.0180	25.20	10.81	36.01	60.00	-23.99	QP
11		21.8779	15.47	11.08	26.55	50.00	-23.45	AVG
12		23.9380	30.00	11.11	41.11	60.00	-18.89	QP

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3060	29.31	10.47	39.78	60.08	-20.30	QP
2		0.3060	30.07	10.47	40.54	50.08	-9.54	AVG
3		0.5460	27.67	10.52	38.19	46.00	-7.81	AVG
4	*	1.2780	38.31	10.59	48.90	56.00	-7.10	QP
5		1.2900	19.69	10.60	30.29	46.00	-15.71	AVG
6		3.5780	30.44	10.73	41.17	56.00	-14.83	QP
7		4.4940	27.61	10.73	38.34	56.00	-17.66	QP
8		5.2819	27.51	10.75	38.26	60.00	-21.74	QP
9		5.4020	16.58	10.75	27.33	50.00	-22.67	AVG
10		10.4460	11.49	10.86	22.35	50.00	-27.65	AVG
11		19.9980	24.41	11.05	35.46	60.00	-24.54	QP
12		22.1860	12.33	11.08	23.41	50.00	-26.59	AVG

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

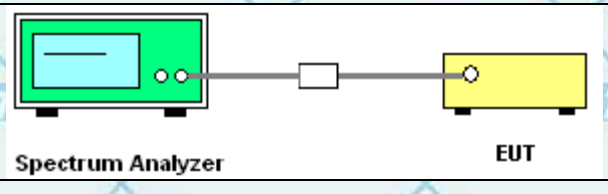
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

6.2.3. Maximum Conducted (Average) Output Power

6.2.4. Test Specification

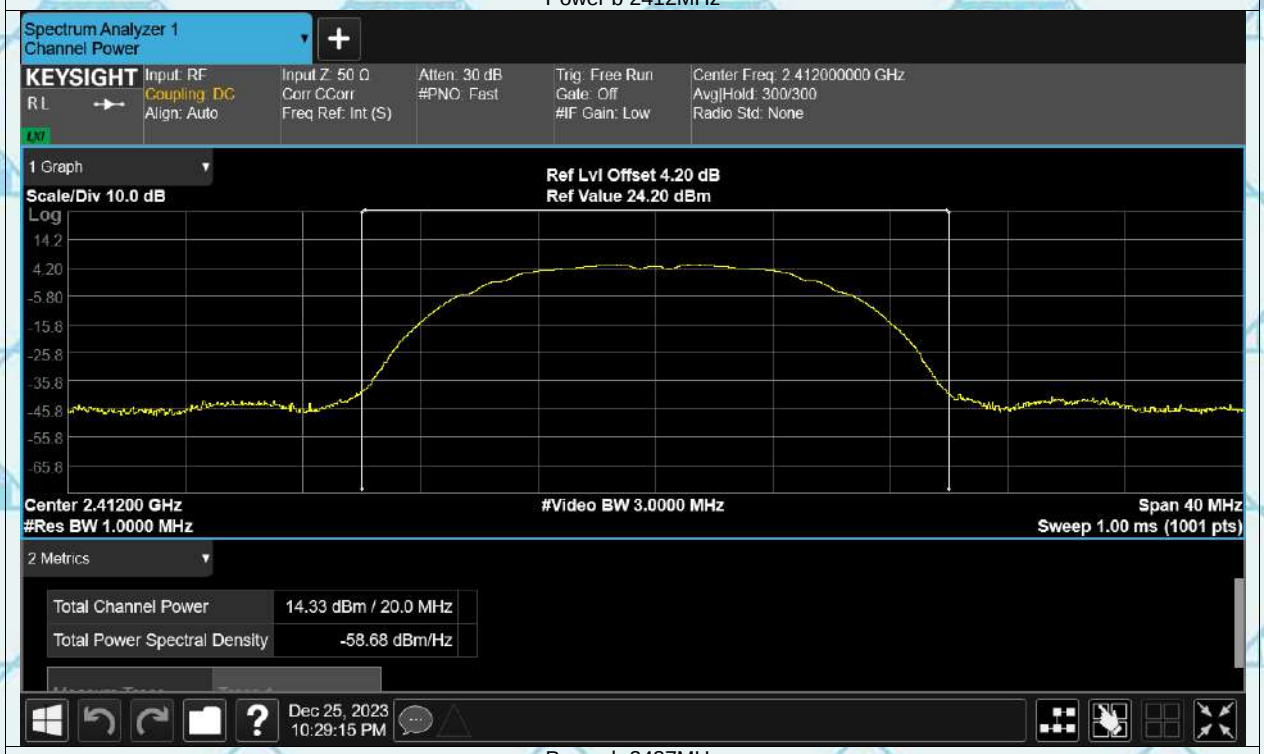
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB 558074
Limit:	30dBm
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04. 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Measure the conducted output power and record the results in the test report.
Test Result:	PASS

6.2.5. Test Data

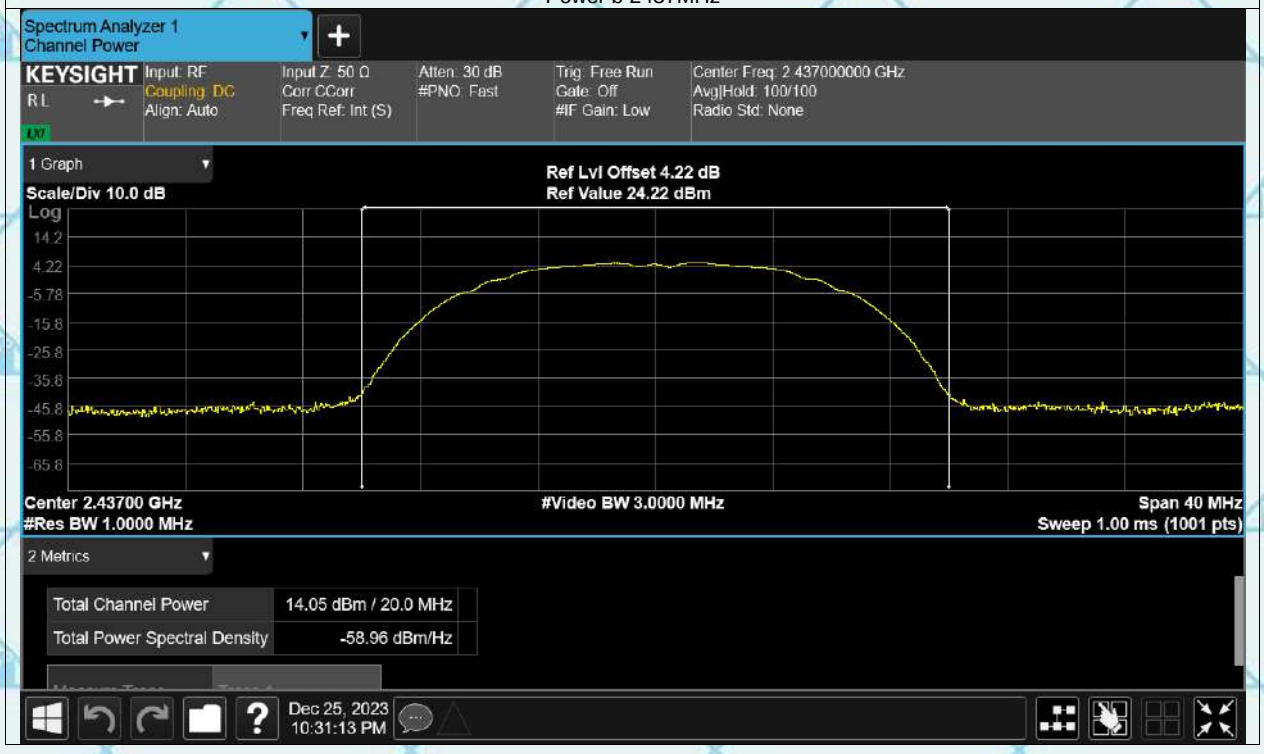
Mode	Frequency (MHz)	Total Power (dBm)	Limit (dBm)	Verdict
b	2412	**14.33**	30	Pass
b	2437	14.05	30	Pass
b	2462	14.13	30	Pass
g	2412	13.39	30	Pass
g	2437	13.05	30	Pass
g	2462	13.23	30	Pass
n20	2412	13.26	30	Pass
n20	2437	12.89	30	Pass
n20	2462	13.13	30	Pass
n40	2422	13.31	30	Pass
n40	2437	13.24	30	Pass
n40	2452	13.23	30	Pass

Test Graphs

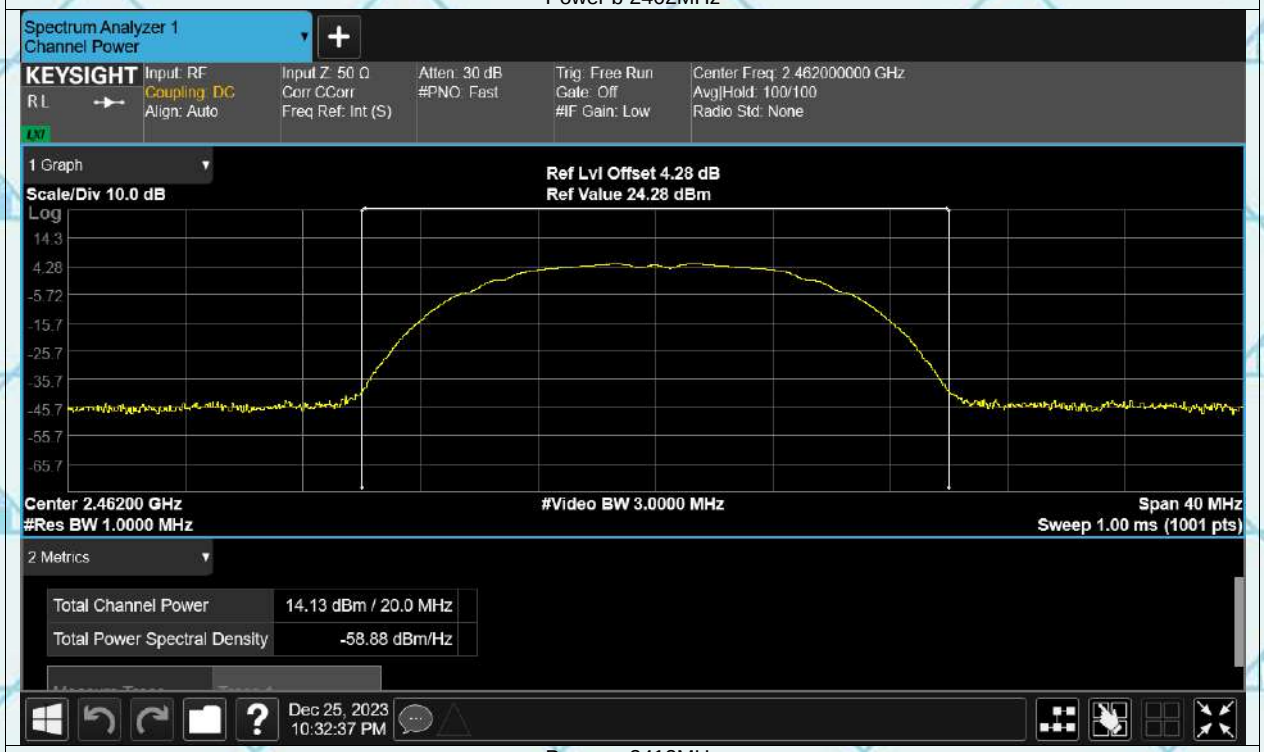
Power b 2412MHz



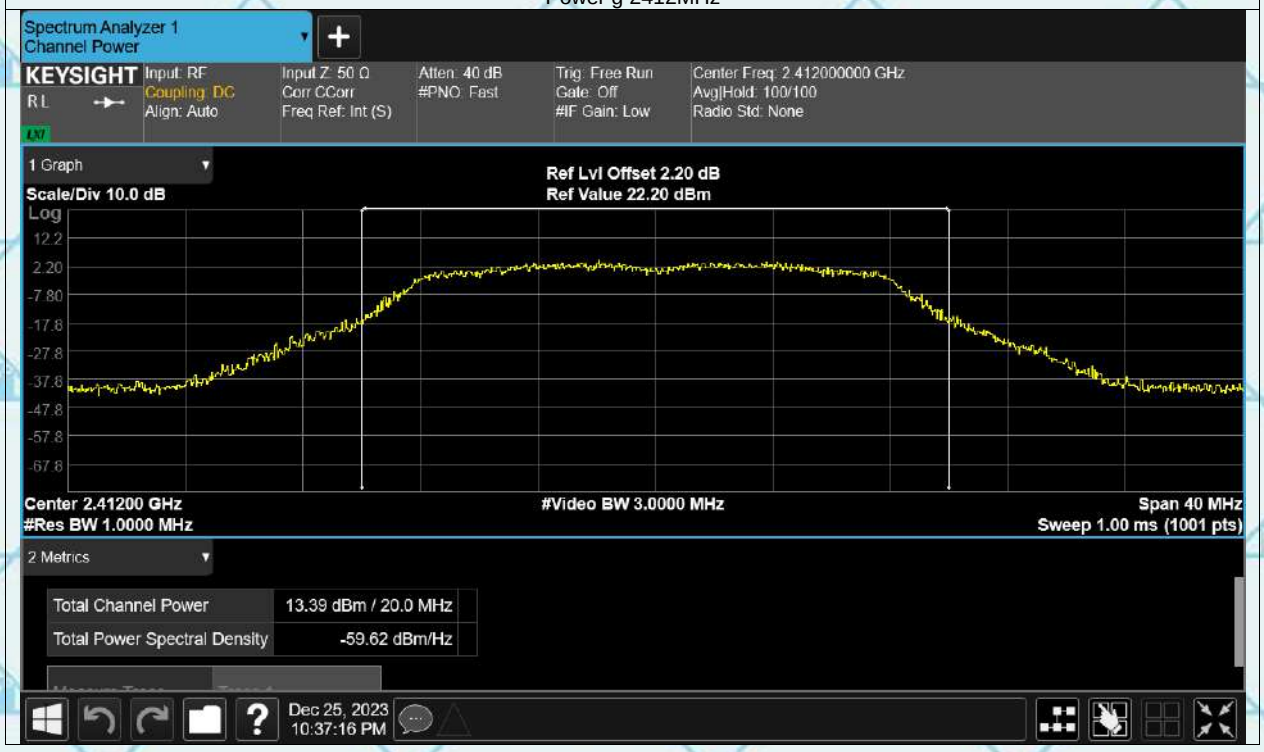
Power b 2437MHz



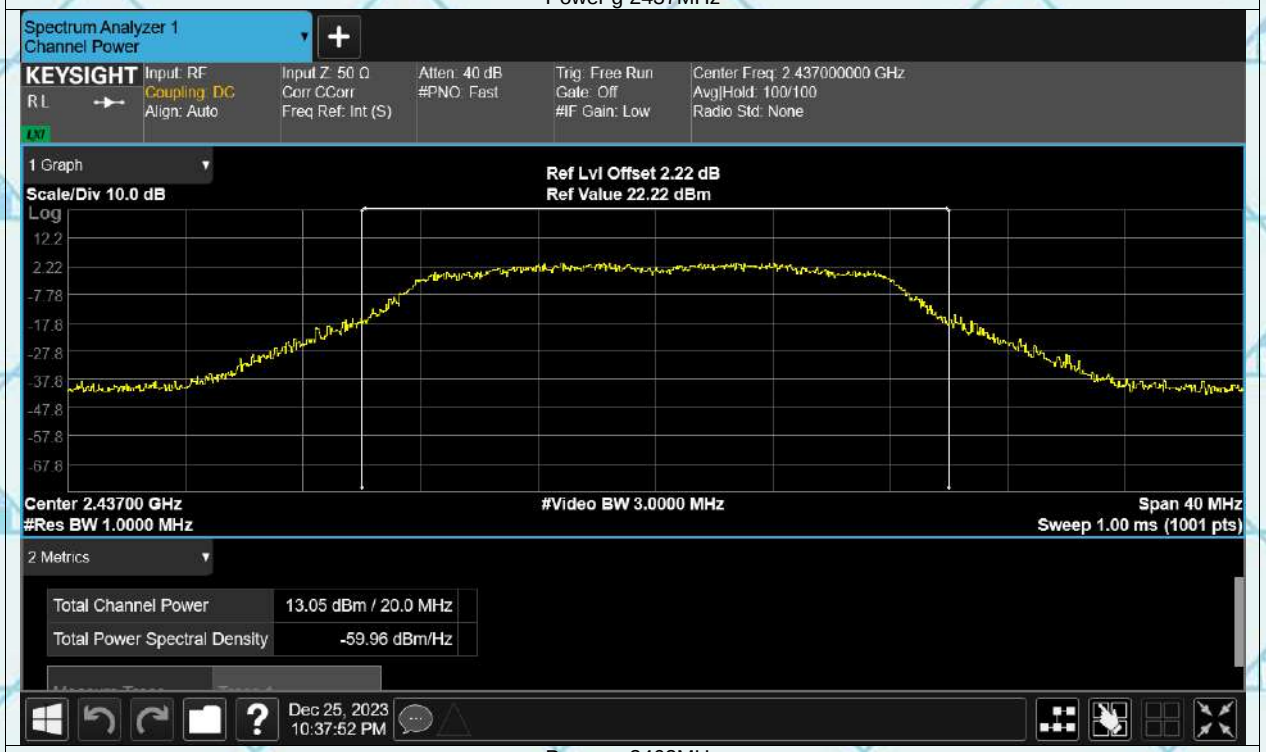
Power b 2462MHz



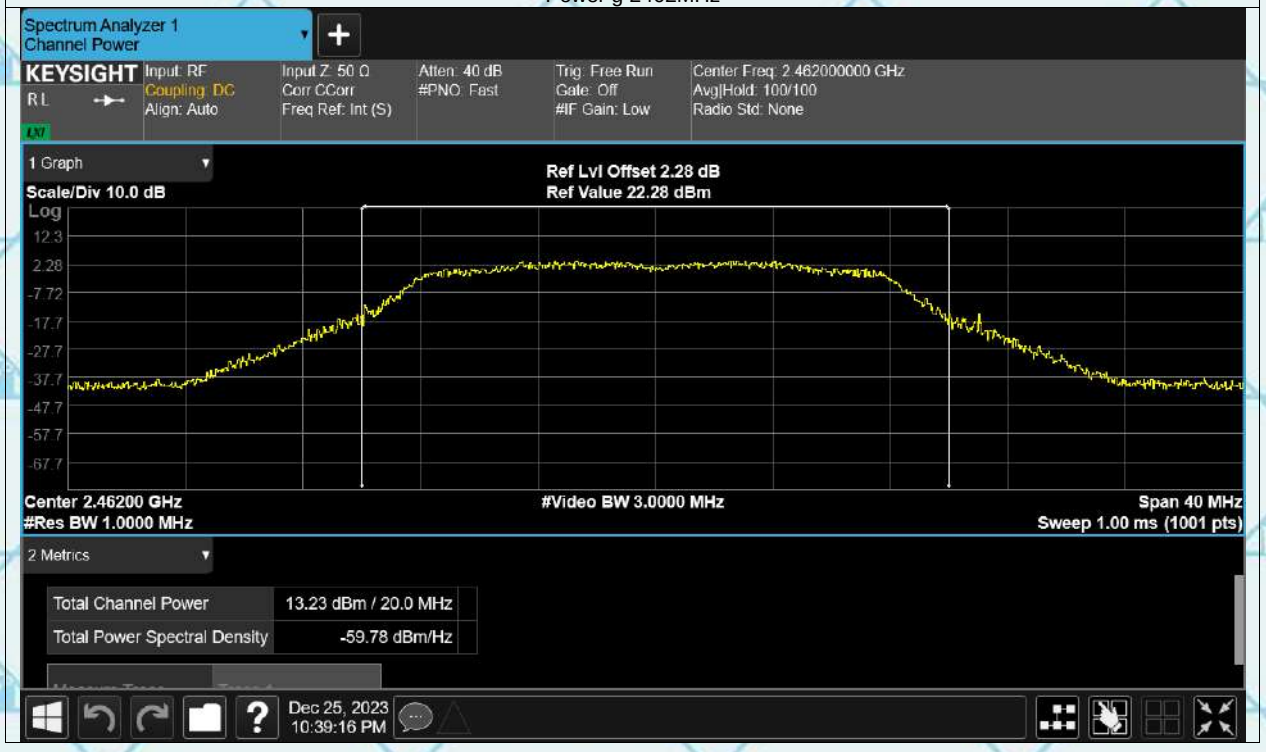
Power g 2412MHz



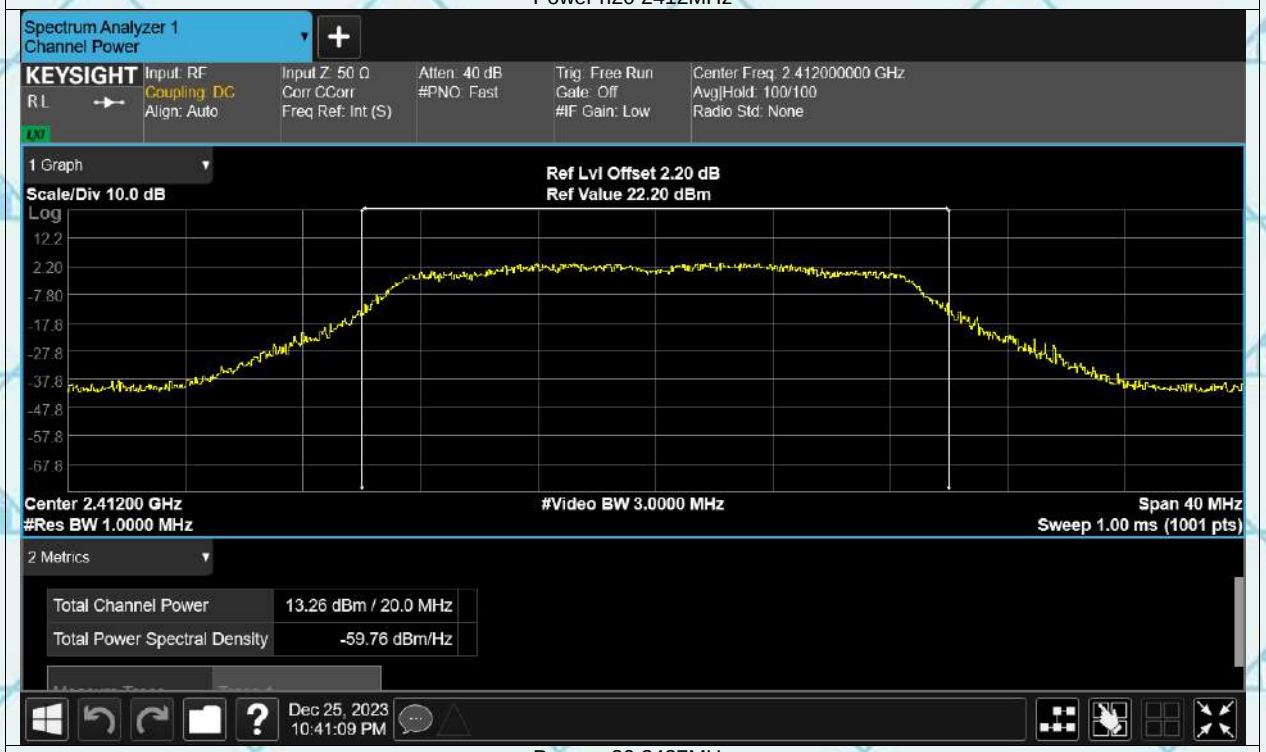
Power g 2437MHz



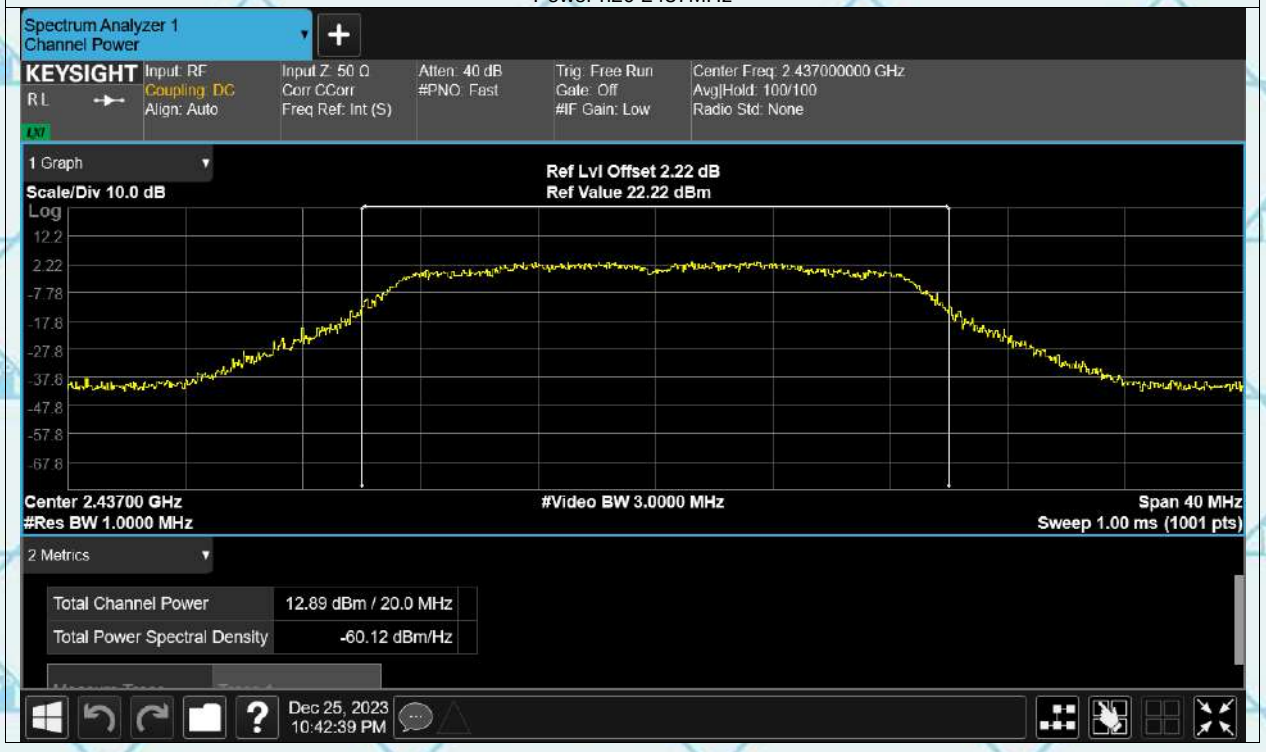
Power g 2462MHz



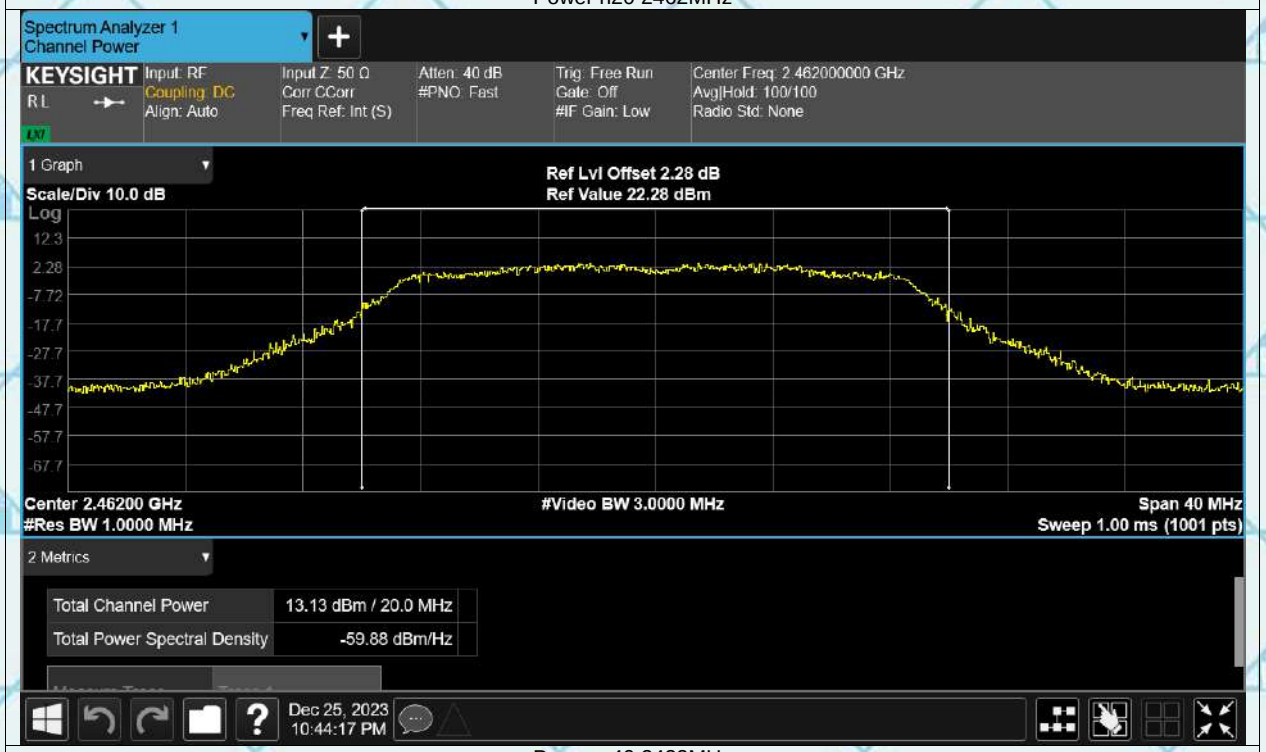
Power n20 2412MHz



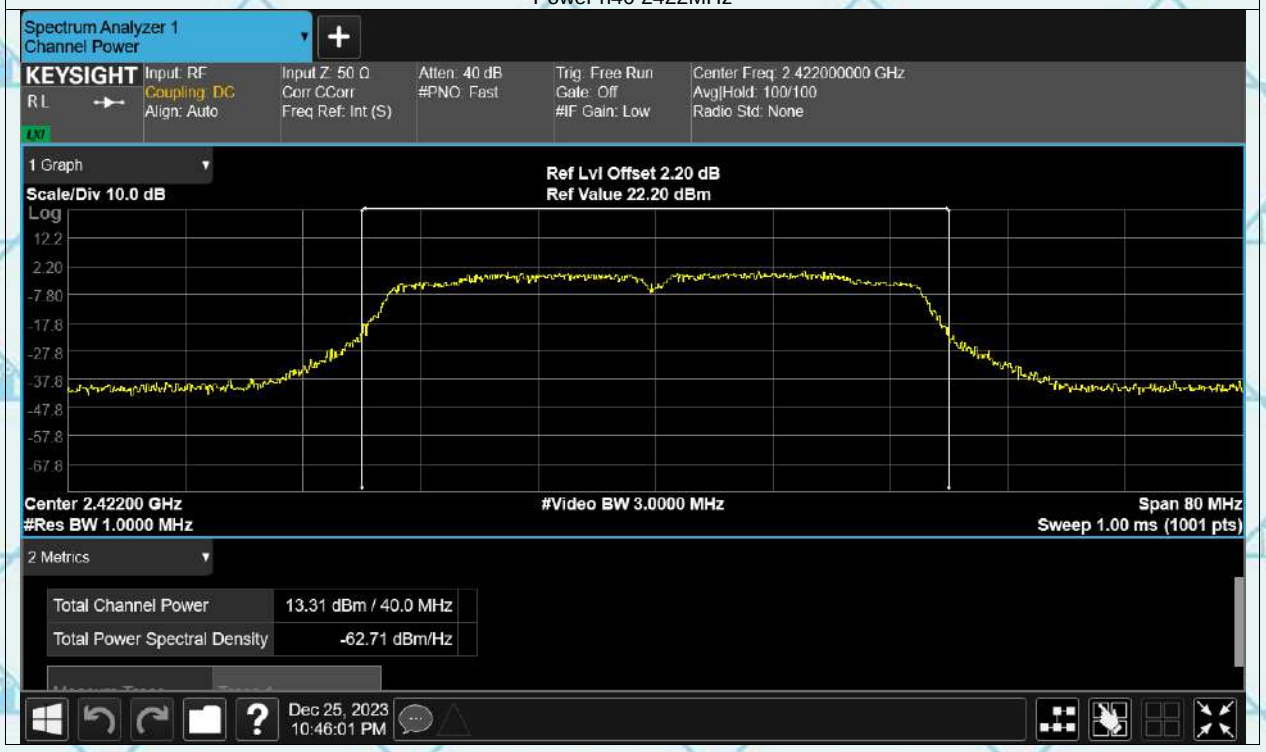
Power n20 2437MHz



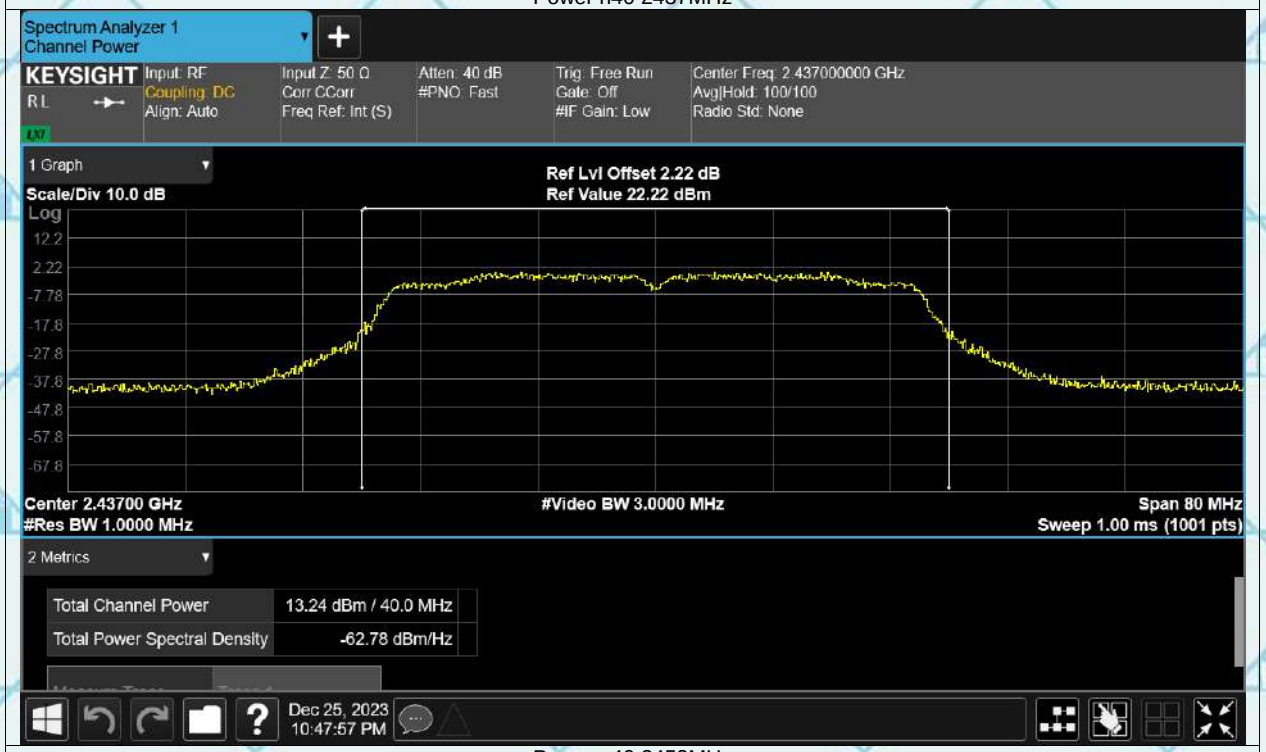
Power n20 2462MHz



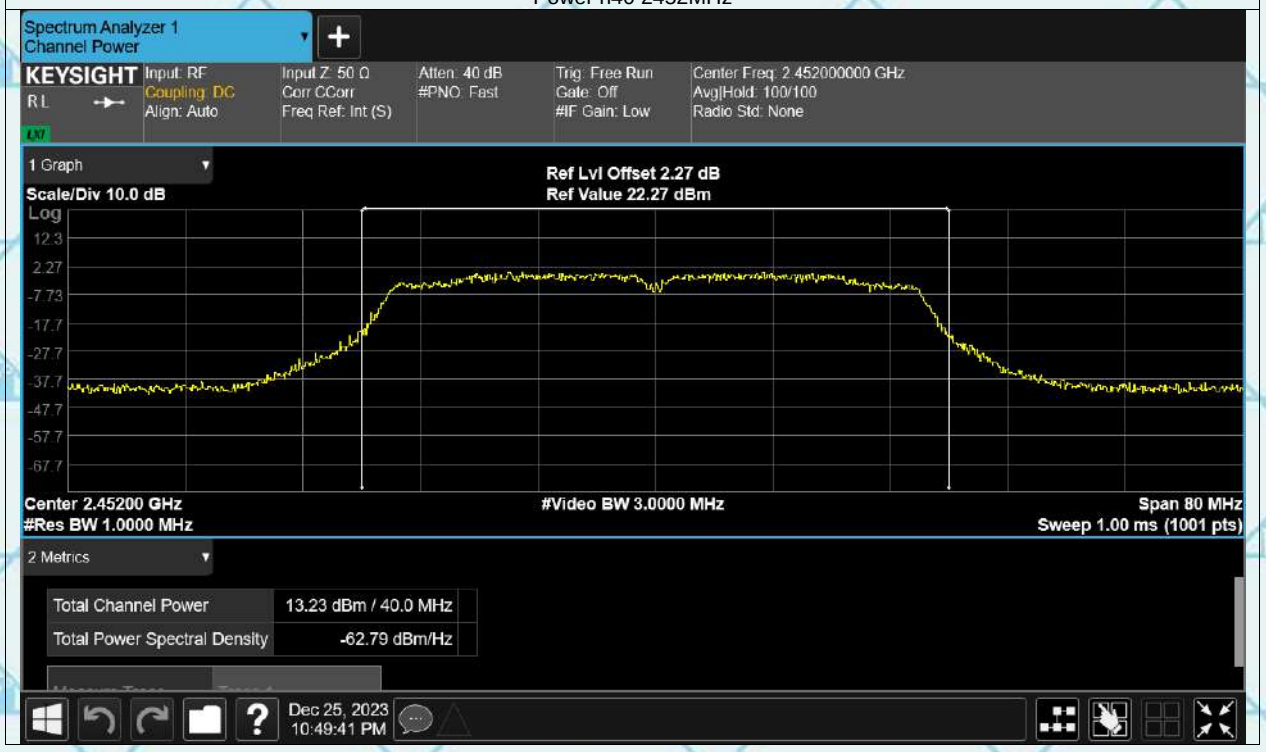
Power n40 2422MHz



Power n40 2437MHz

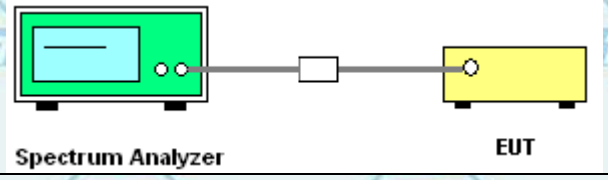


Power n40 2452MHz



6.3. Emission Bandwidth

6.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

6.3.2. Test data(worst)

Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
b	2412	10.082	0.5	Pass
b	2437	10.045	0.5	Pass
b	2462	10.035	0.5	Pass
g	2412	15.019	0.5	Pass
g	2437	15.278	0.5	Pass
g	2462	11.885	0.5	Pass
n20	2412	13.885	0.5	Pass
n20	2437	14.087	0.5	Pass
n20	2462	15.694	0.5	Pass
n40	2422	33.842	0.5	Pass
n40	2437	35.002	0.5	Pass
n40	2452	35.014	0.5	Pass

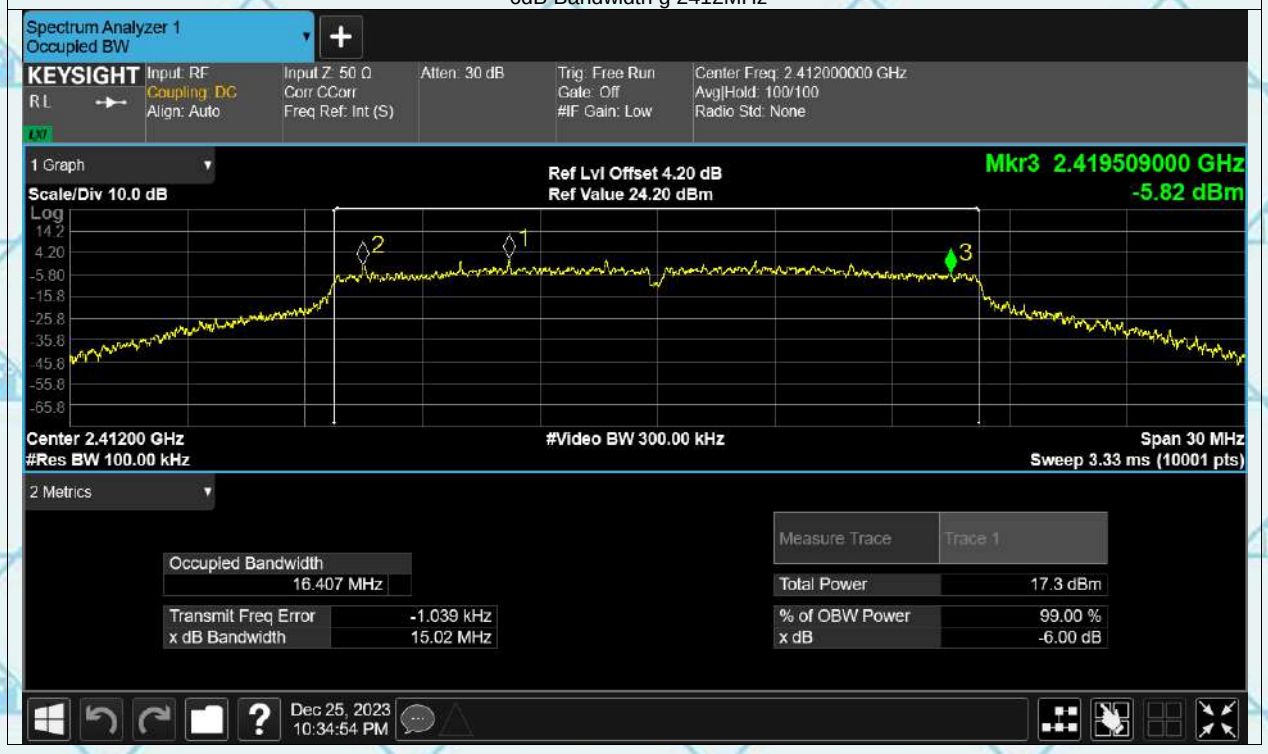
Test Graphs

-6dB Bandwidth b 2412MHz

-6dB Bandwidth b 2437MHz

-6dB Bandwidth b 2462MHz

-6dB Bandwidth g 2412MHz

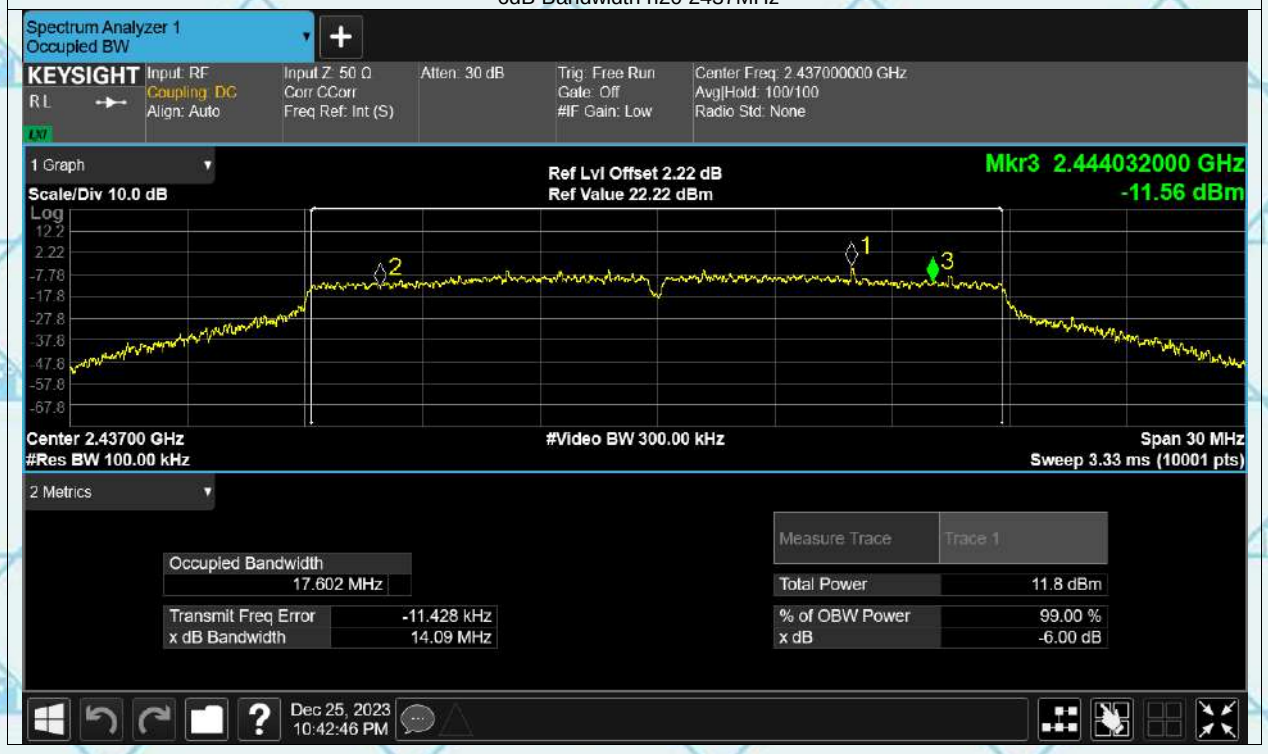


-6dB Bandwidth g 2437MHz

-6dB Bandwidth g 2462MHz

-6dB Bandwidth n20 2412MHz

-6dB Bandwidth n20 2437MHz



-6dB Bandwidth n20 2462MHz

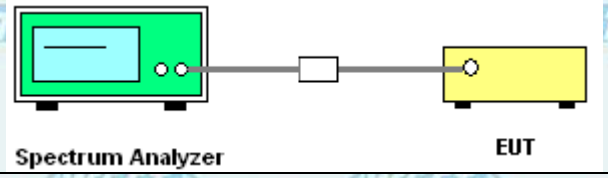
-6dB Bandwidth n40 2422MHz

-6dB Bandwidth n40 2437MHz

-6dB Bandwidth n40 2452MHz

6.4. Power Spectral Density

6.4.1. Test Specification

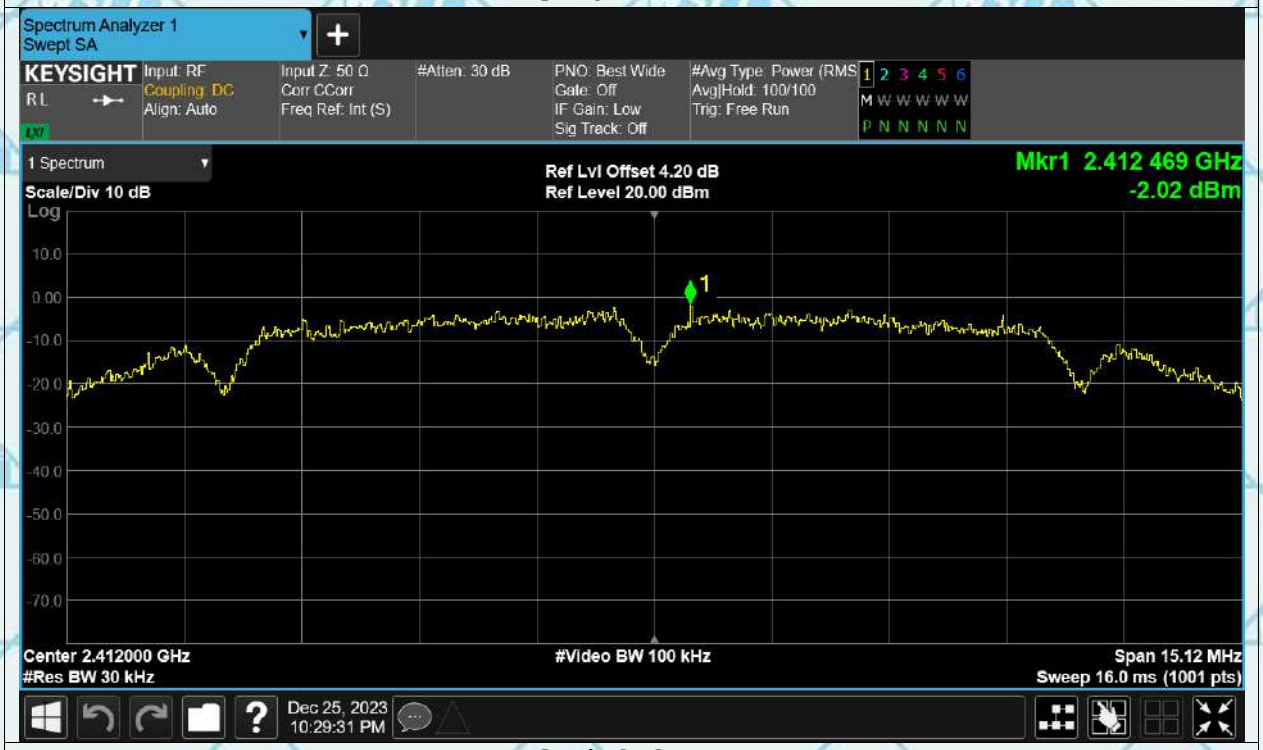
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows Measurement Procedure 10.3 Method AVGPSD of FCC KDB Publication No.558074 D01 DTS Meas. Guidance v04 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): 3 kHz ≤ RBW ≤ 100 kHz. Video bandwidth VBW ≥ 3 x RBW. Set the span to at least 1.5 times the OBW. 5. Detector = RMS, Sweep time = auto couple. 6. Employ trace averaging (RMS) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level. 6. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test data(worst)

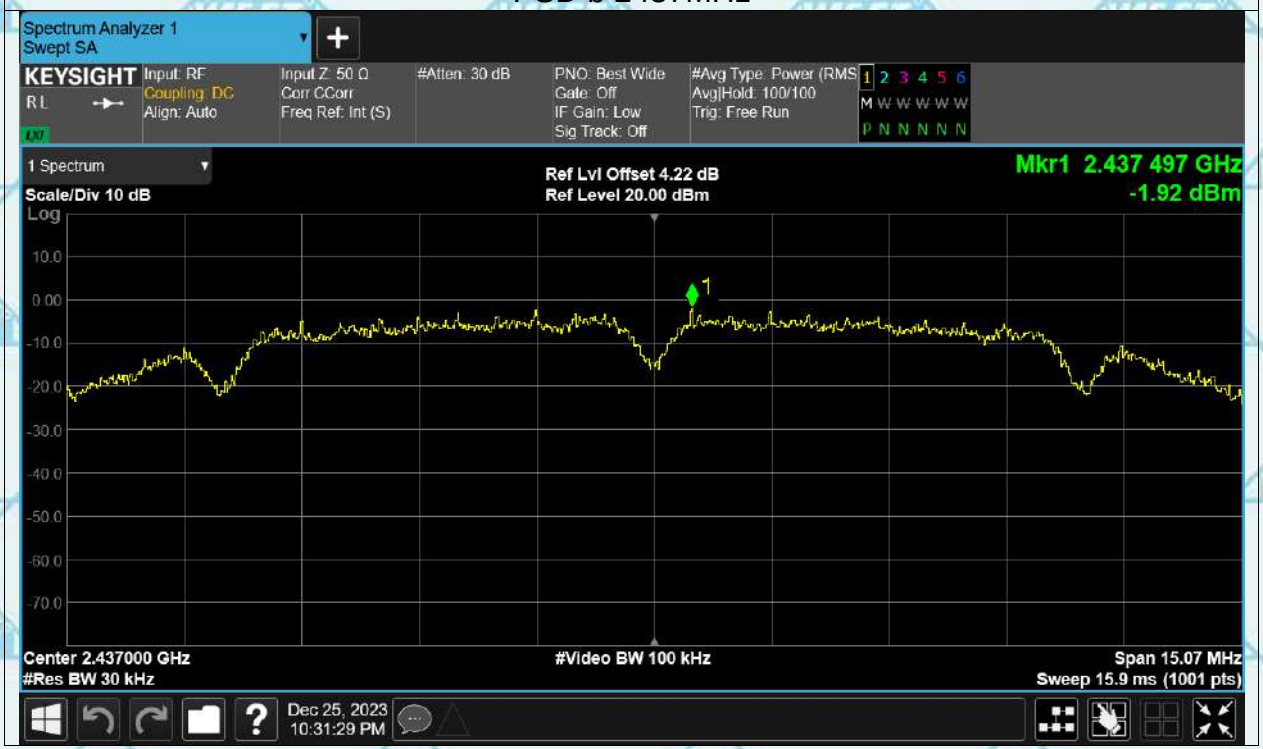
Mode	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
b	2412	-12.02	8	Pass
b	2437	-11.92	8	Pass
b	2462	-12.22	8	Pass
g	2412	-18.54	8	Pass
g	2437	-18.01	8	Pass
g	2462	-18.95	8	Pass
n20	2412	-18.9	8	Pass
n20	2437	-19.48	8	Pass
n20	2462	-18.77	8	Pass
n40	2422	-22.22	8	Pass
n40	2437	-22.35	8	Pass
n40	2452	-21.49	8	Pass

Test Graphs

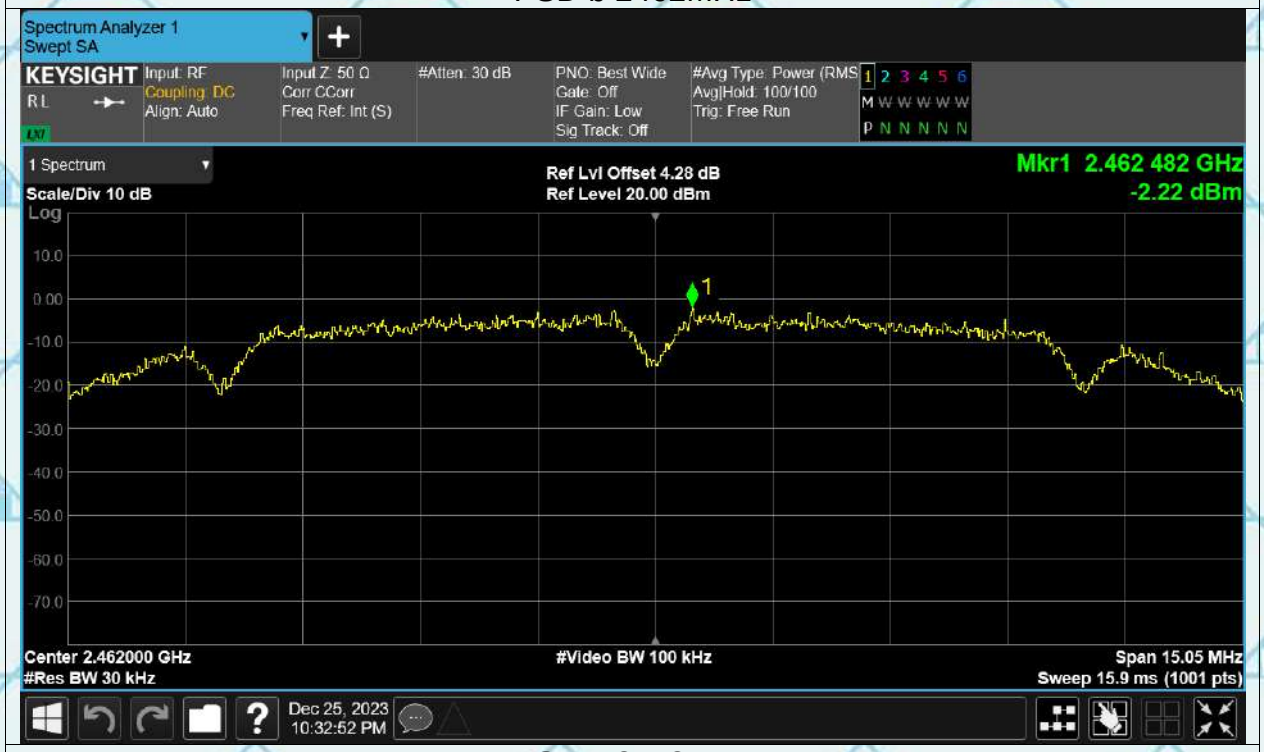
PSD b 2412MHz



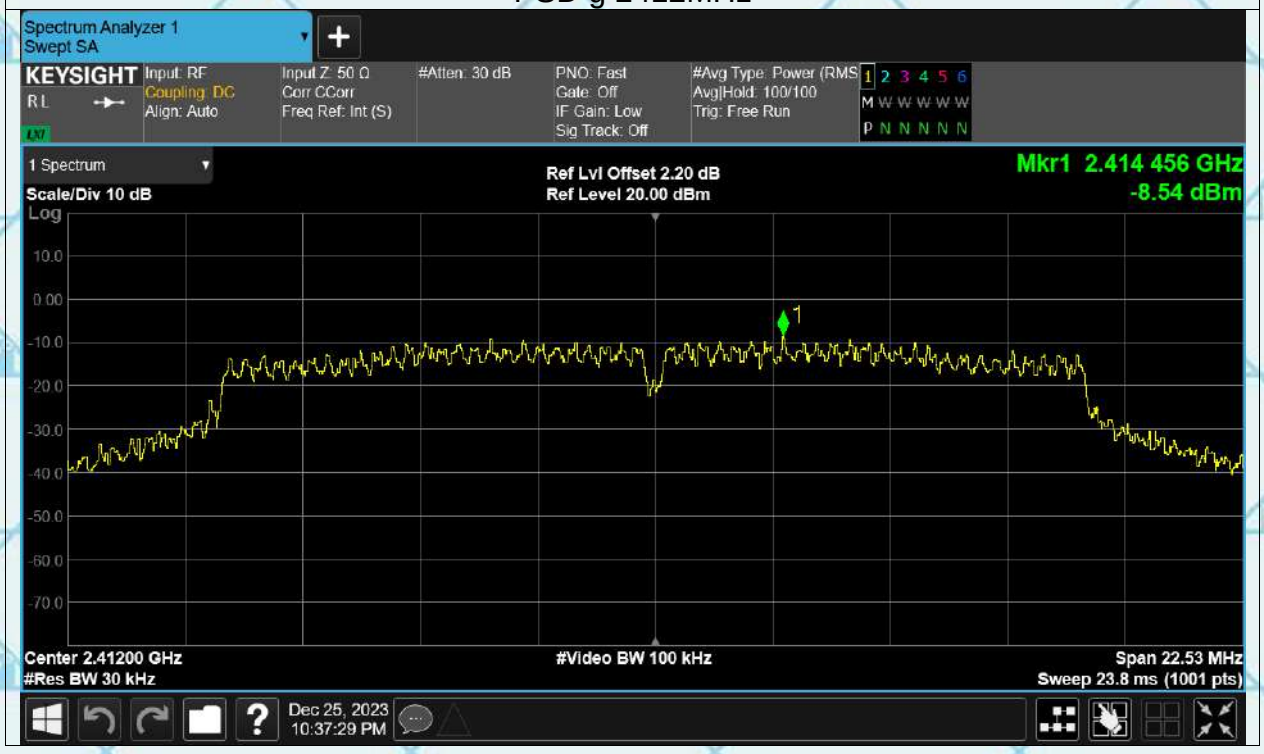
PSD b 2437MHz



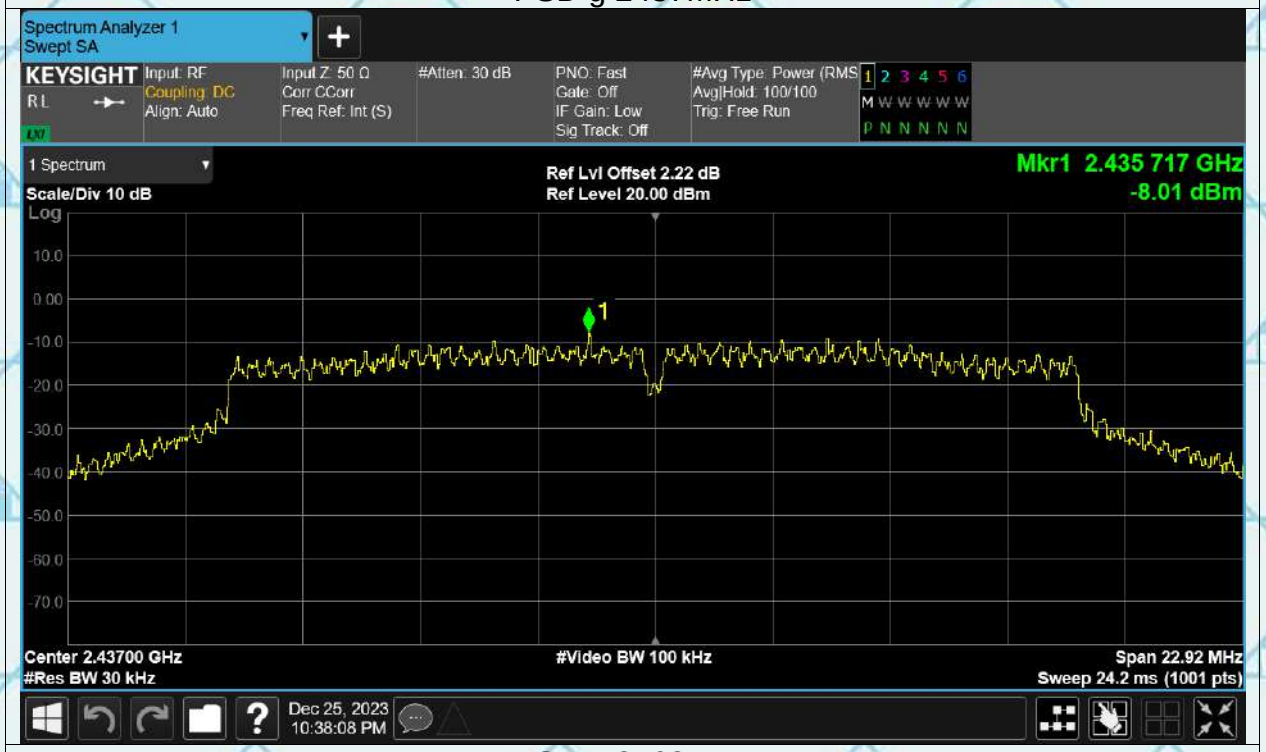
PSD b 2462MHz



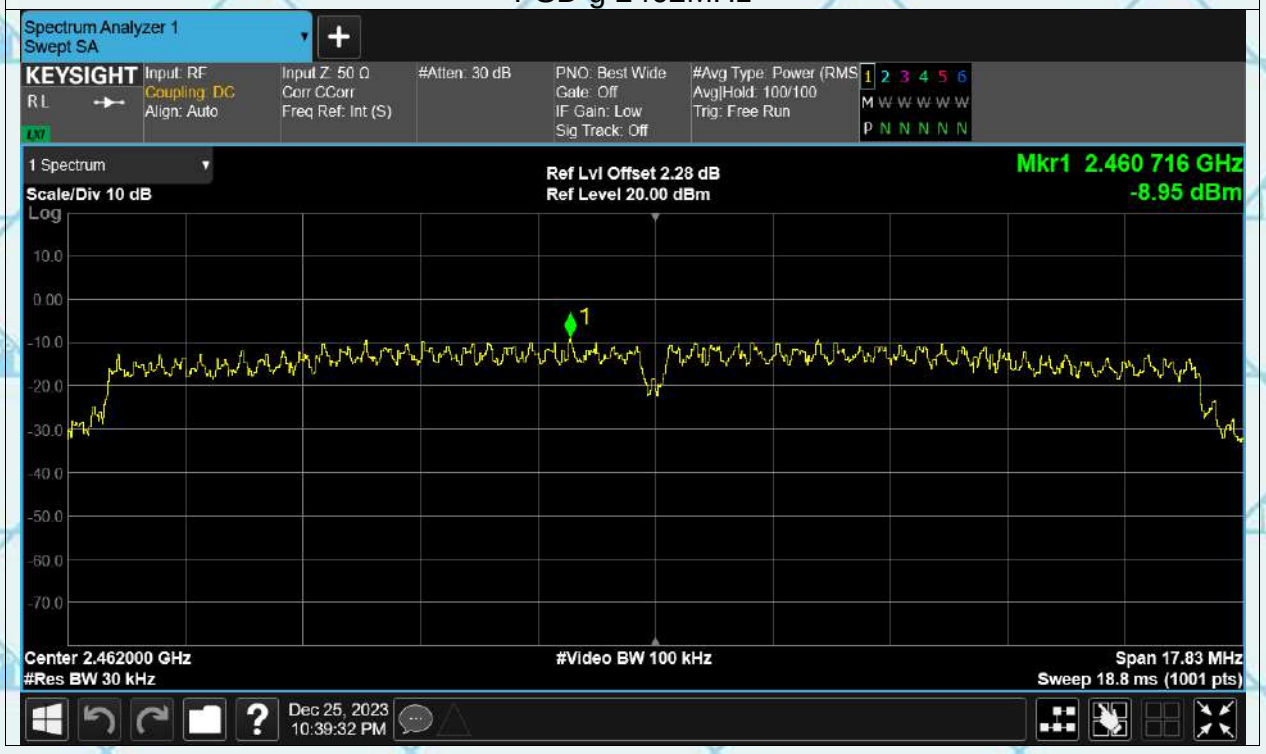
PSD g 2412MHz



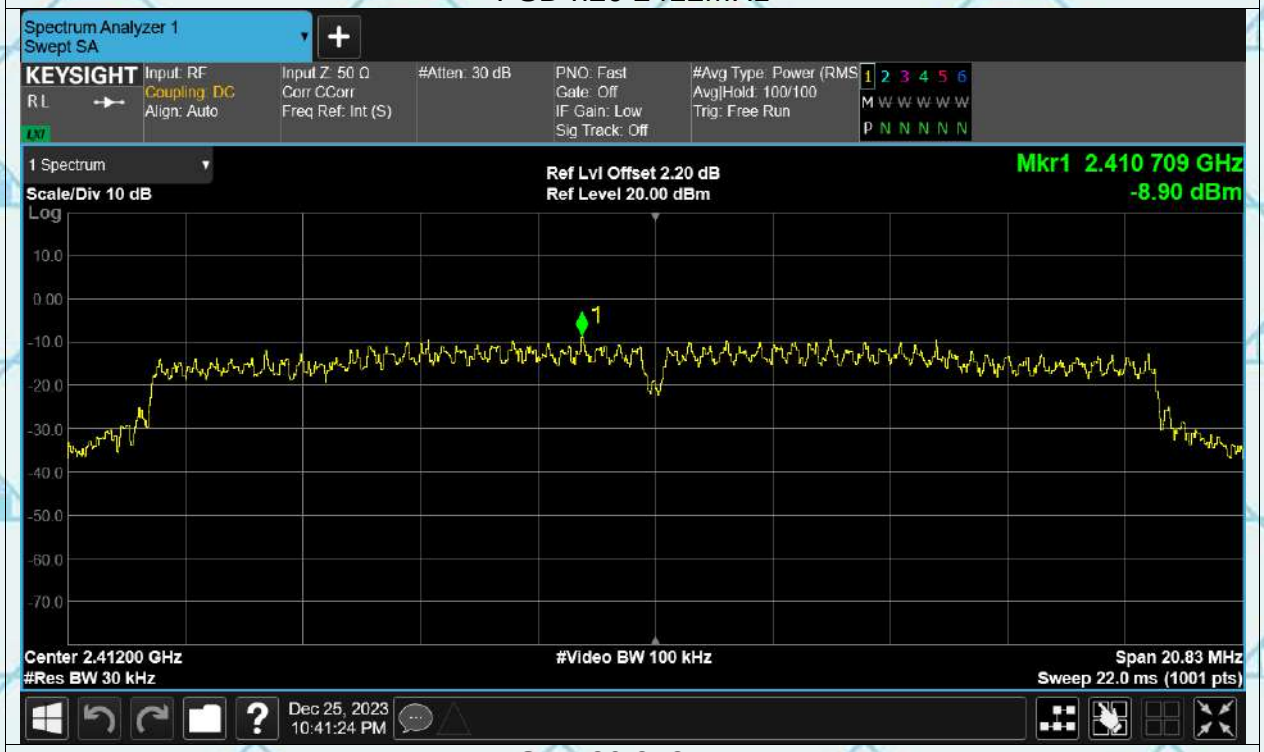
PSD g 2437MHz



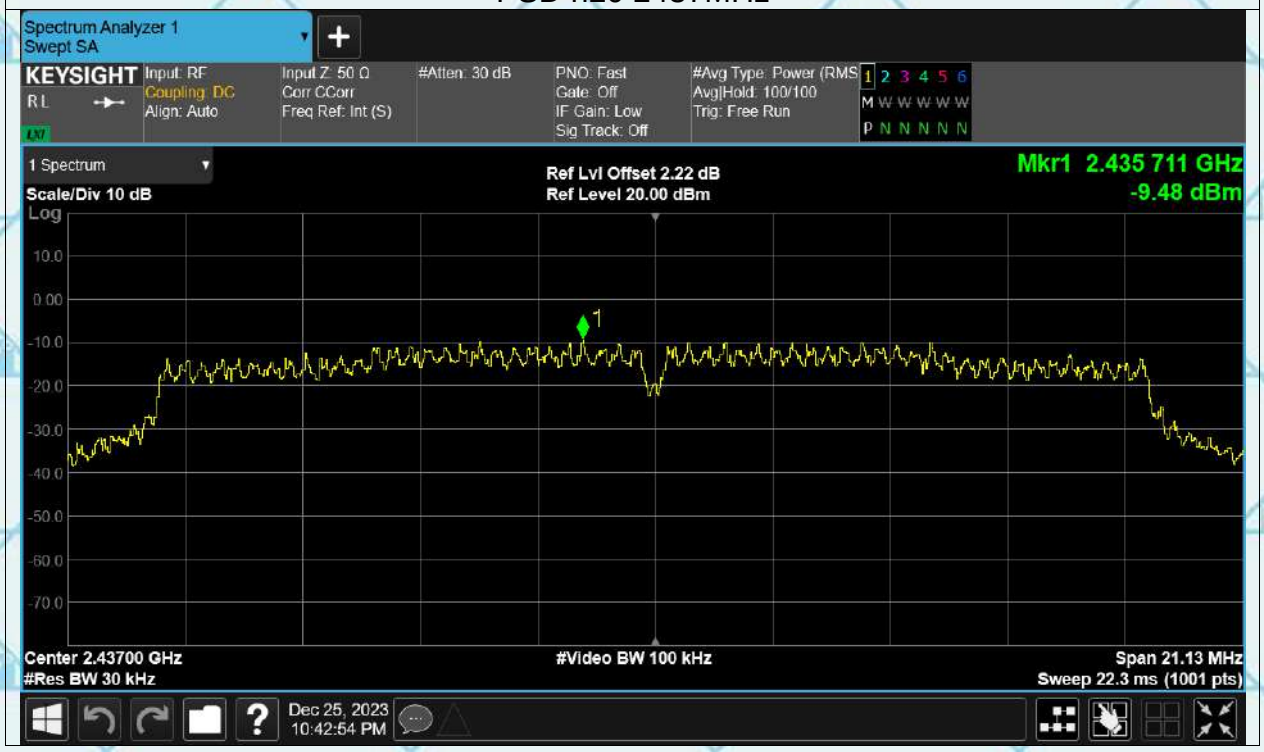
PSD g 2462MHz



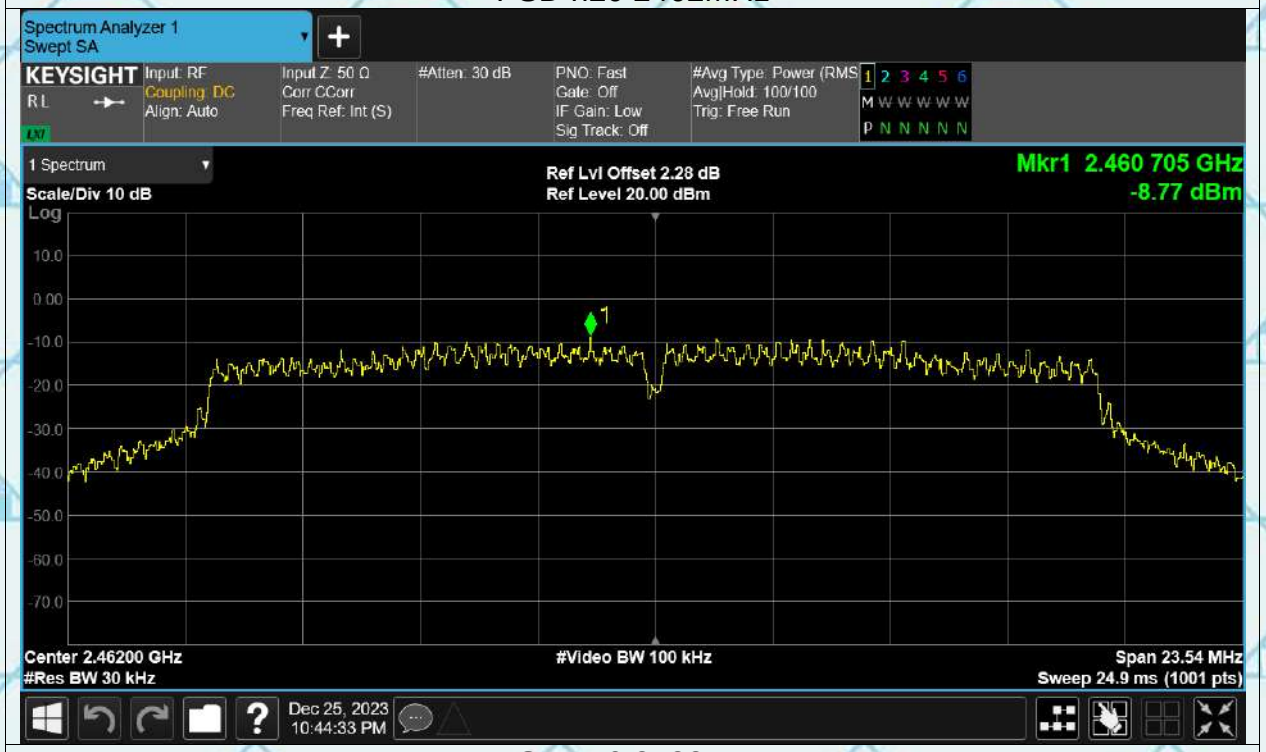
PSD n20 2412MHz



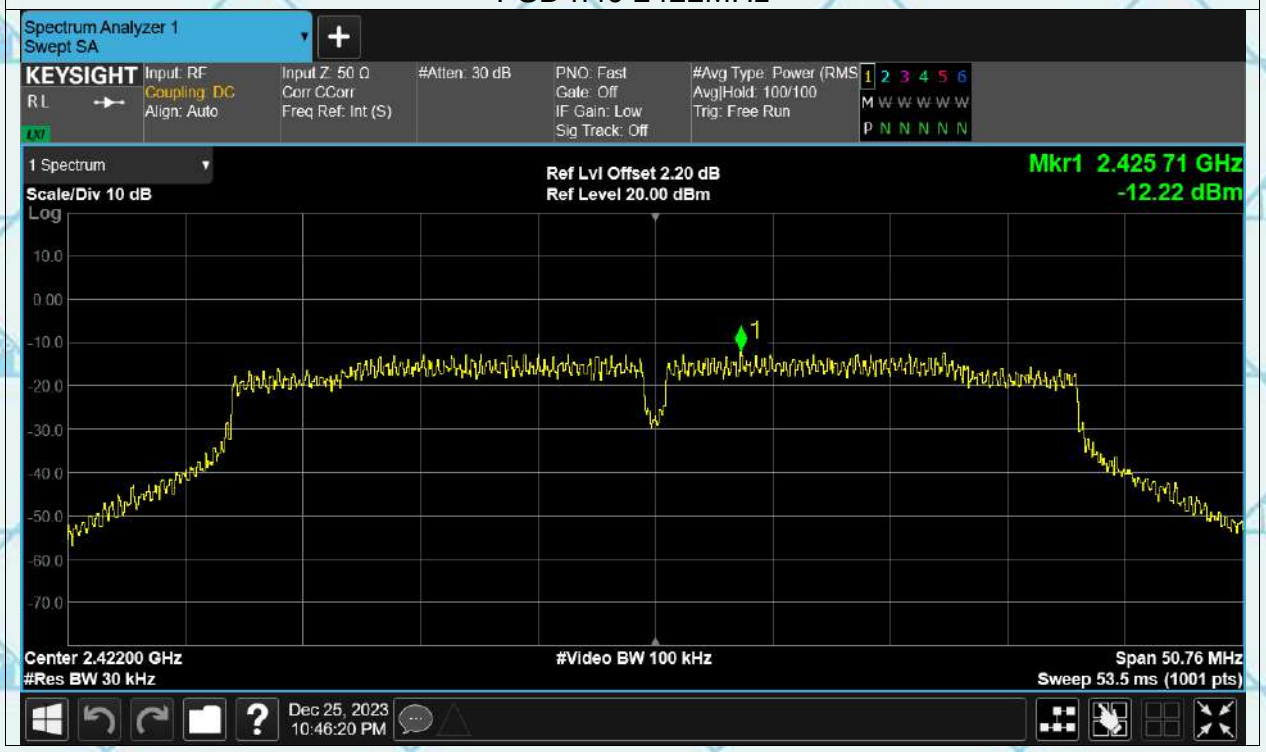
PSD n20 2437MHz



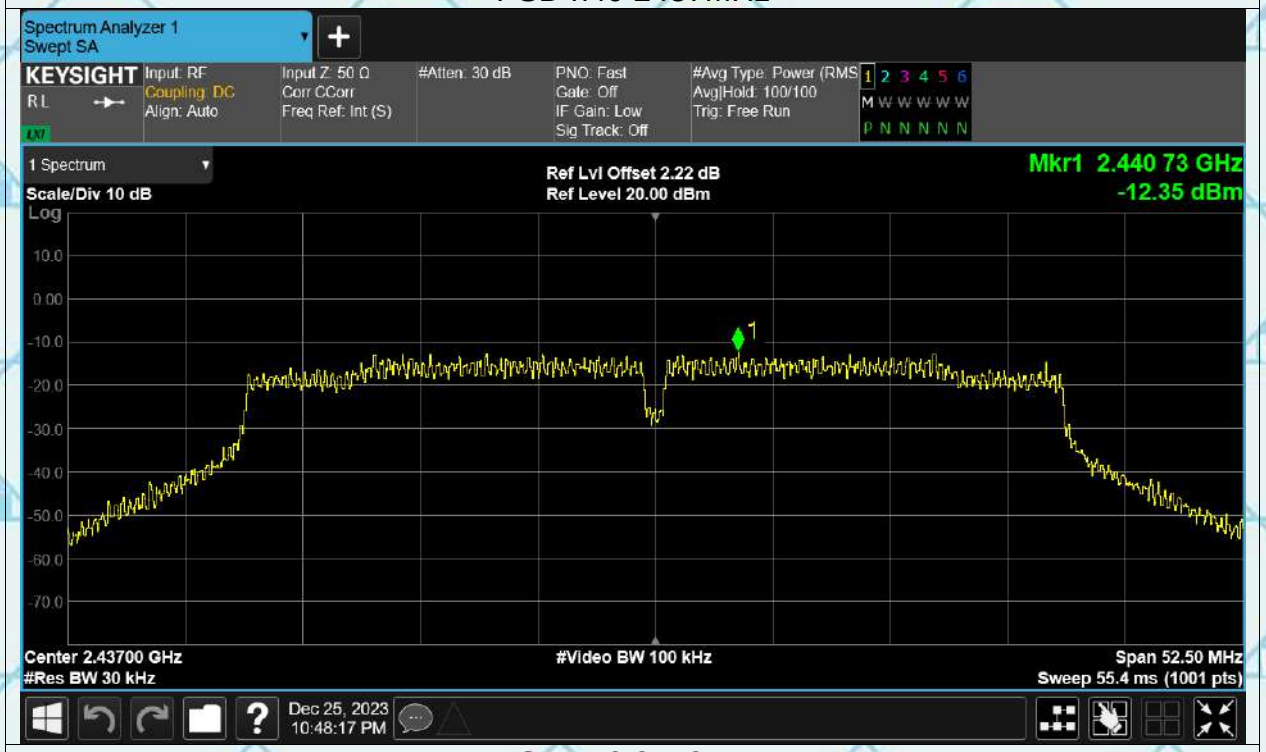
PSD n20 2462MHz



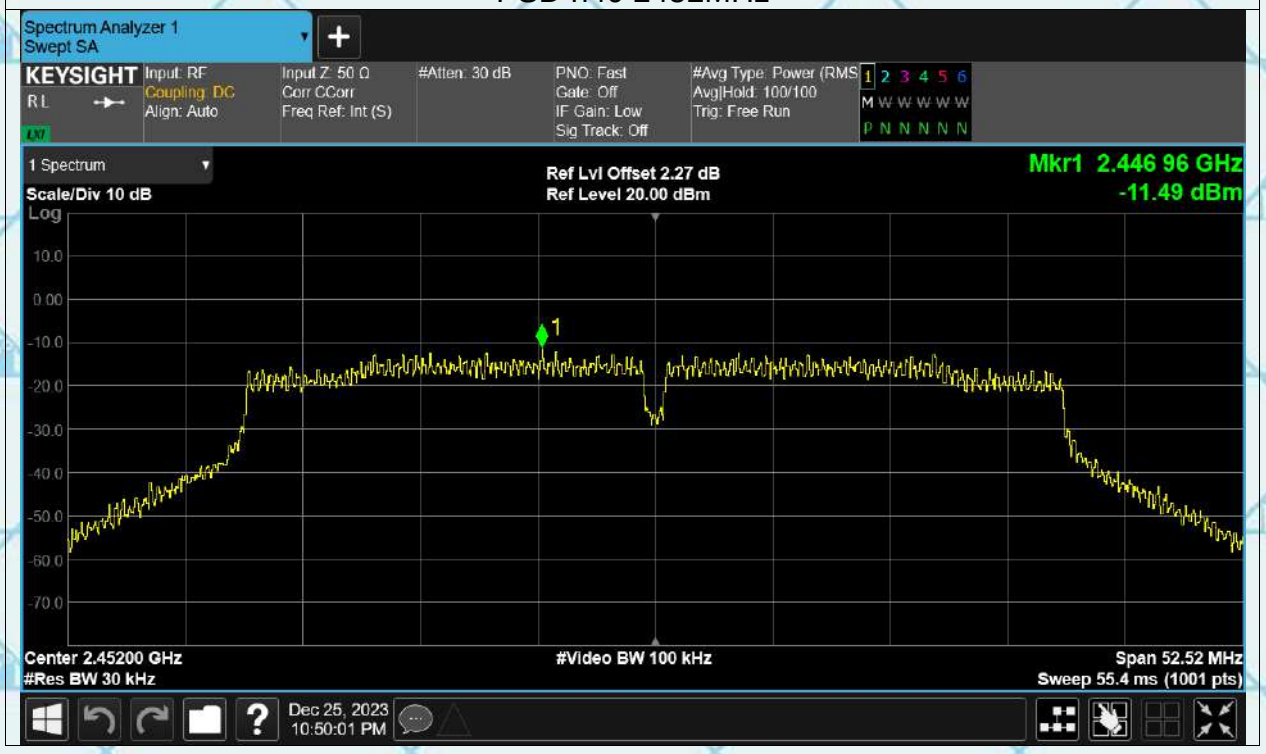
PSD n40 2422MHz



PSD n40 2437MHz

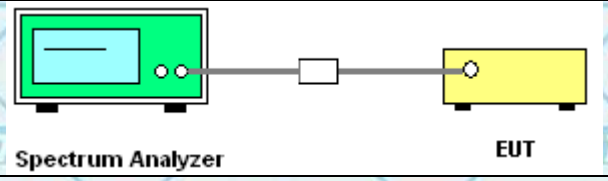


PSD n40 2452MHz



6.5. Conducted Band Edge and Spurious Emission Measurement

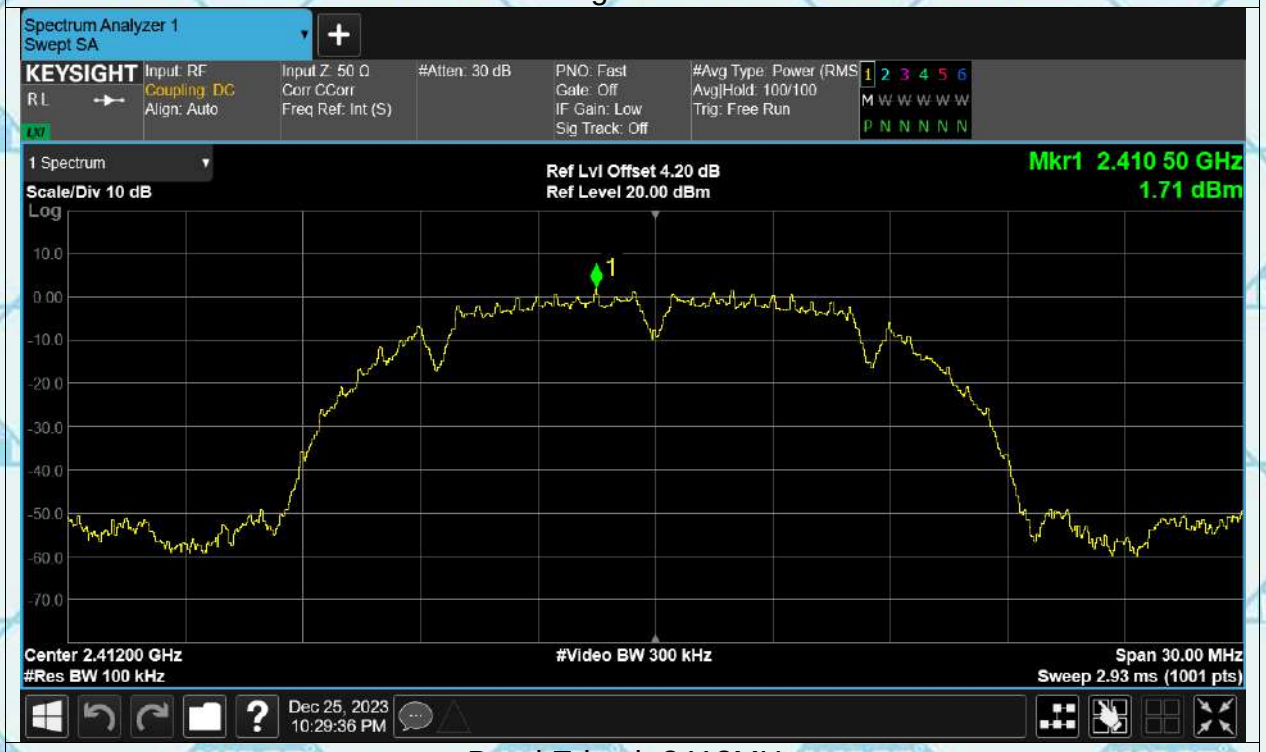
6.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04. 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 4. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d). 5. Measure and record the results in the test report. 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
Test Result:	PASS

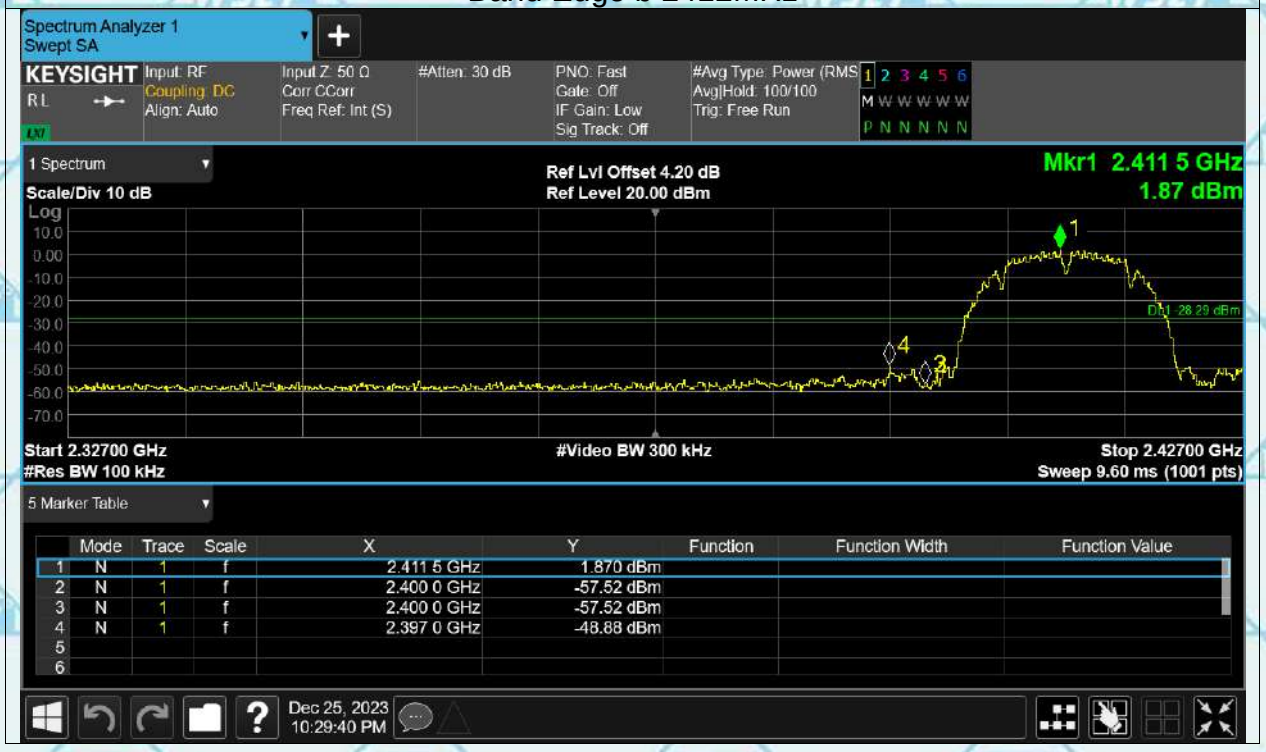
6.5.2. Test Data

Band Edge

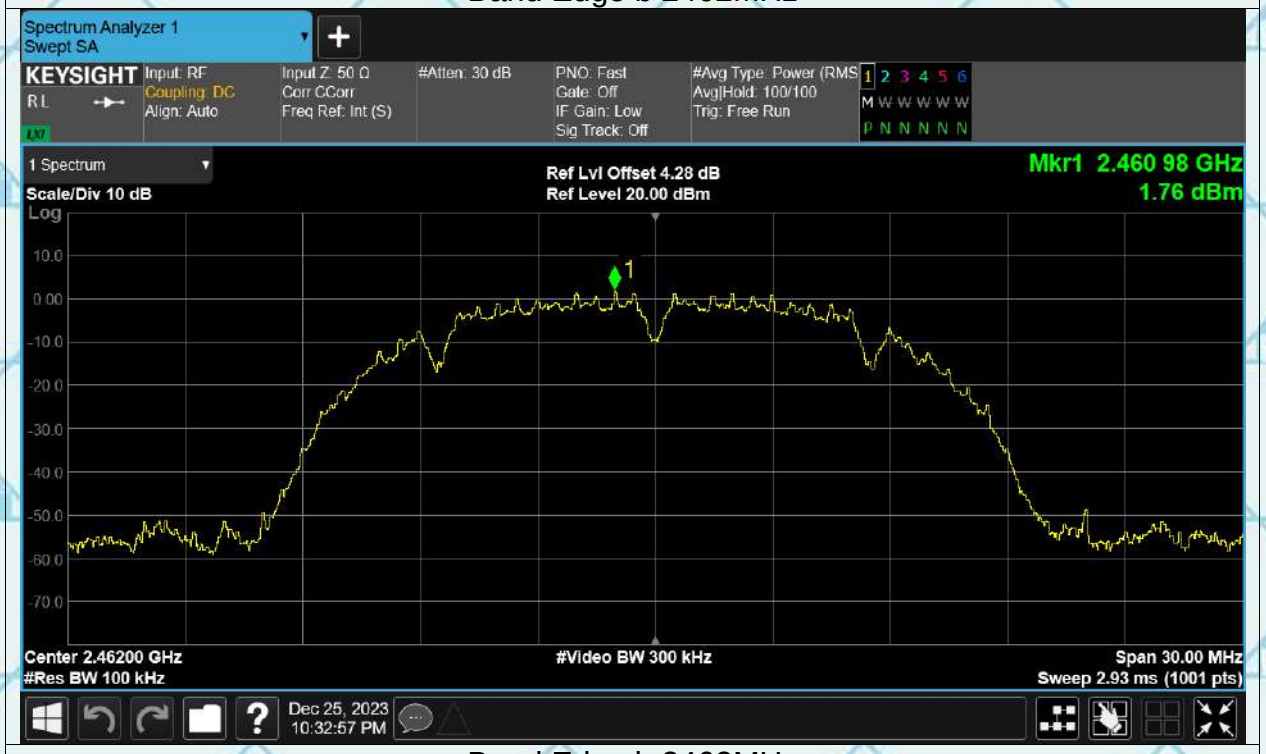
Band Edge b 2412MHz



Band Edge b 2412MHz



Band Edge b 2462MHz

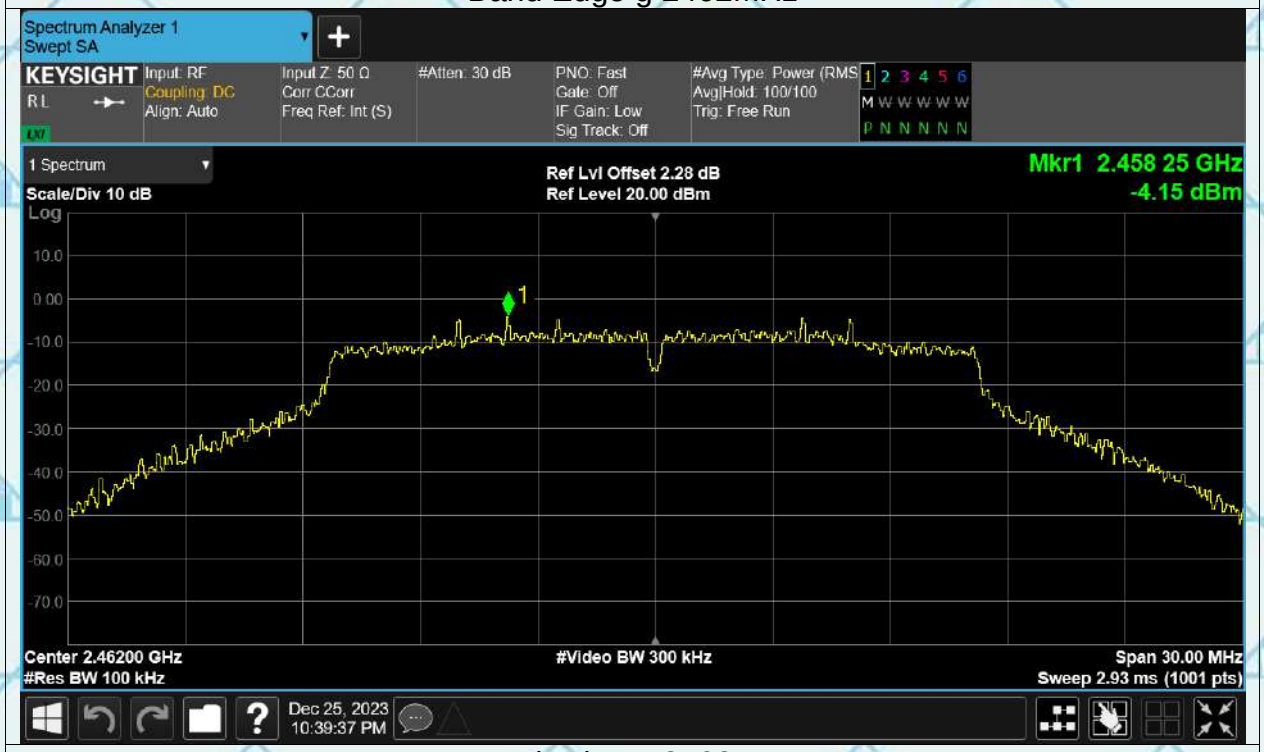


Band Edge b 2462MHz

Band Edge g 2412MHz

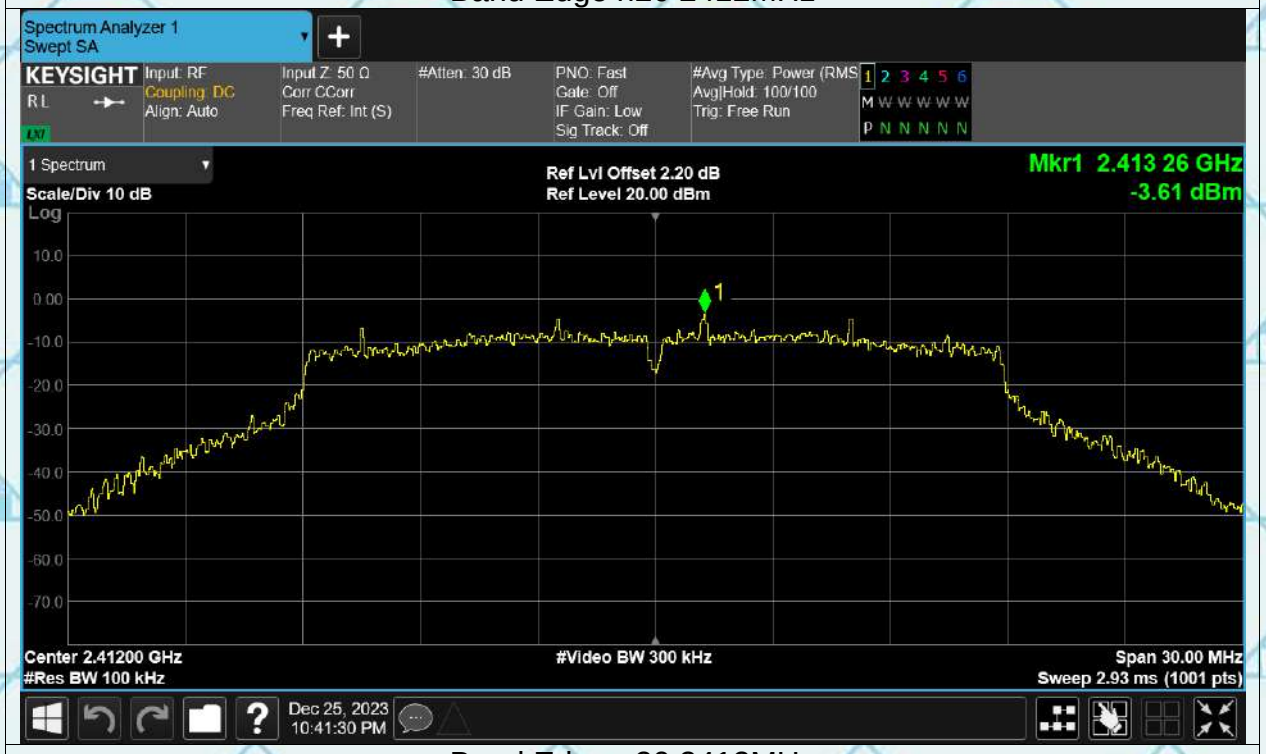
Band Edge g 2412MHz

Band Edge g 2462MHz



Band Edge g 2462MHz

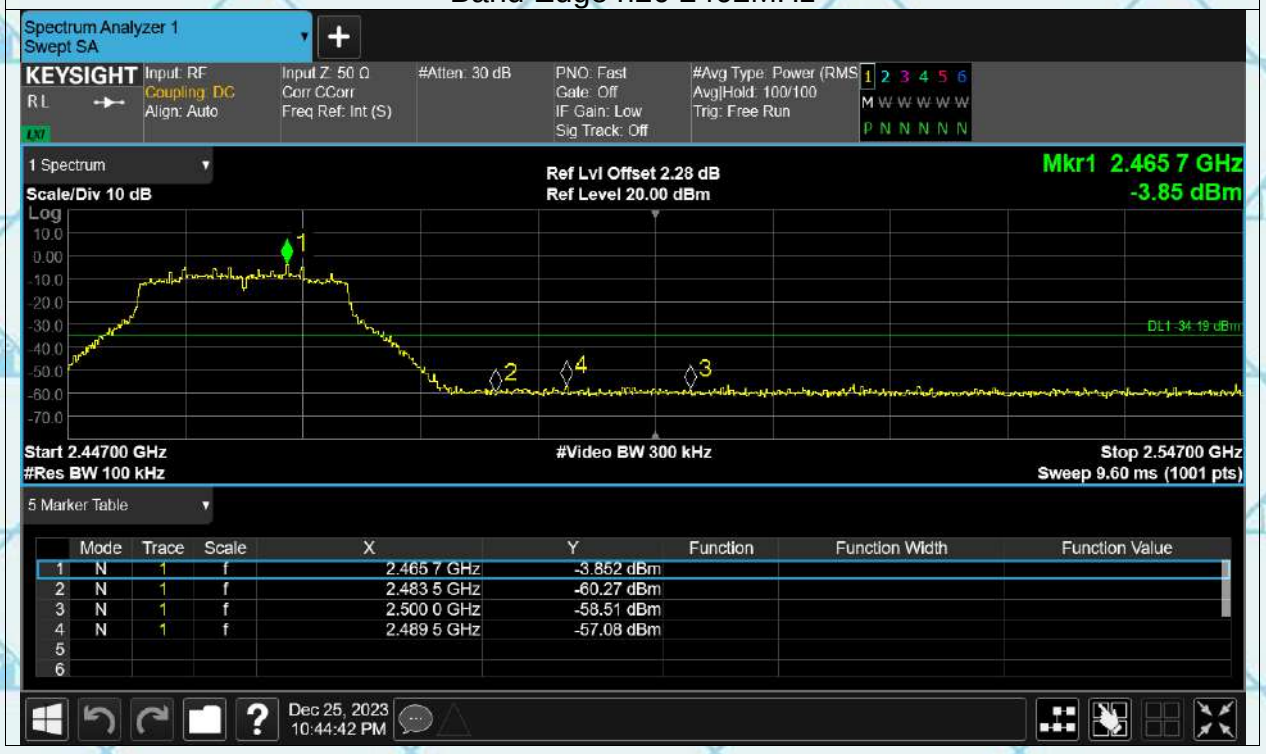
Band Edge n20 2412MHz



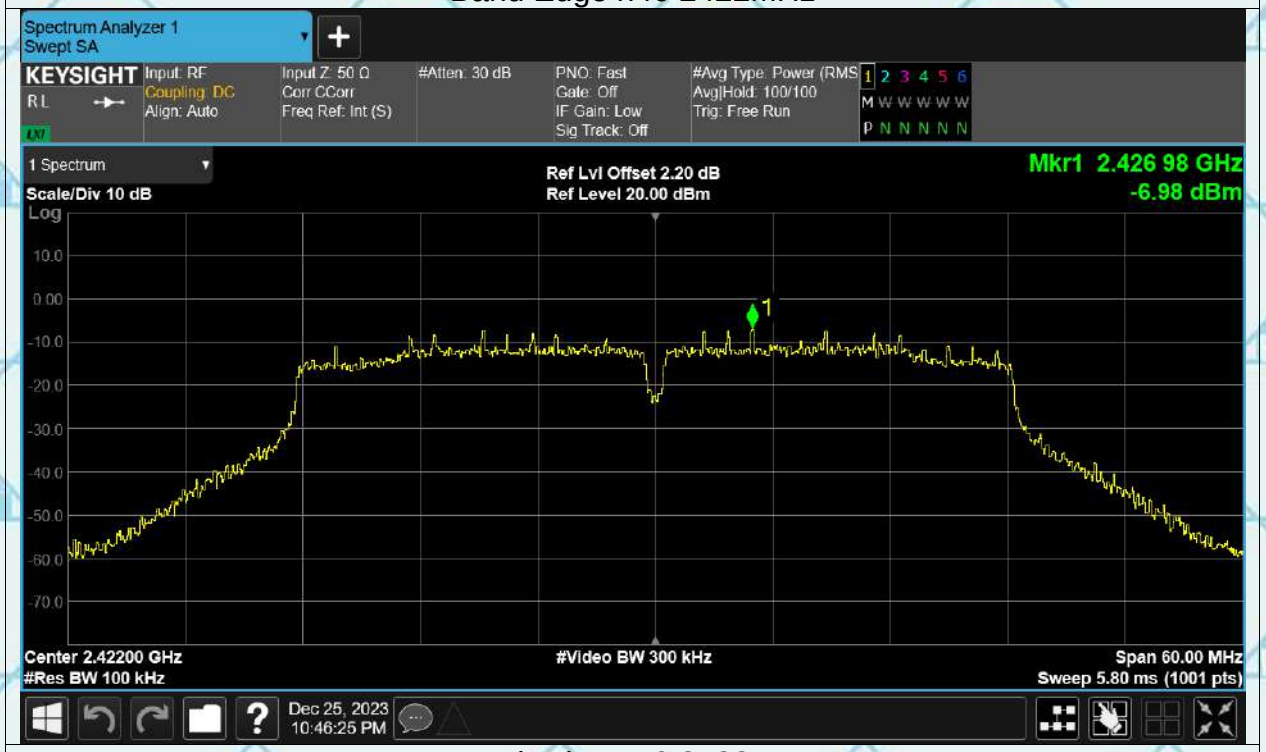
Band Edge n20 2412MHz

Band Edge n20 2462MHz

Band Edge n20 2462MHz

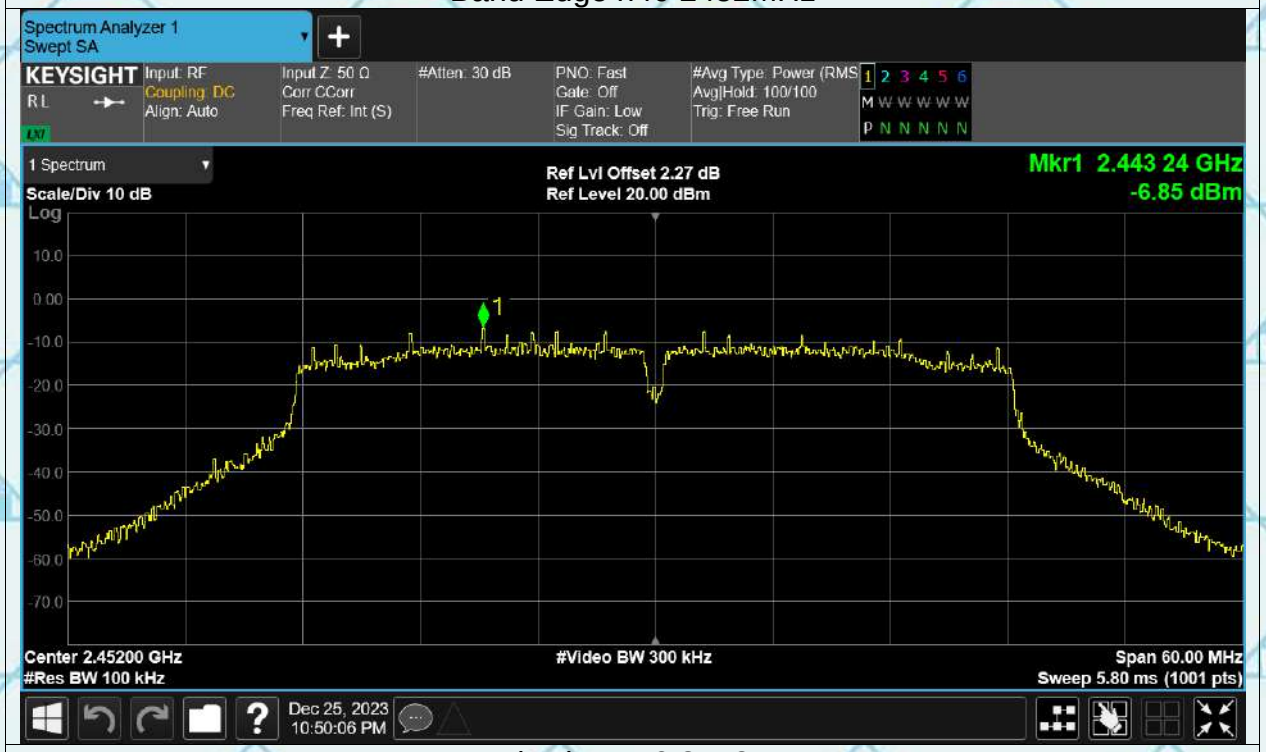


Band Edge n40 2422MHz



Band Edge n40 2422MHz

Band Edge n40 2452MHz

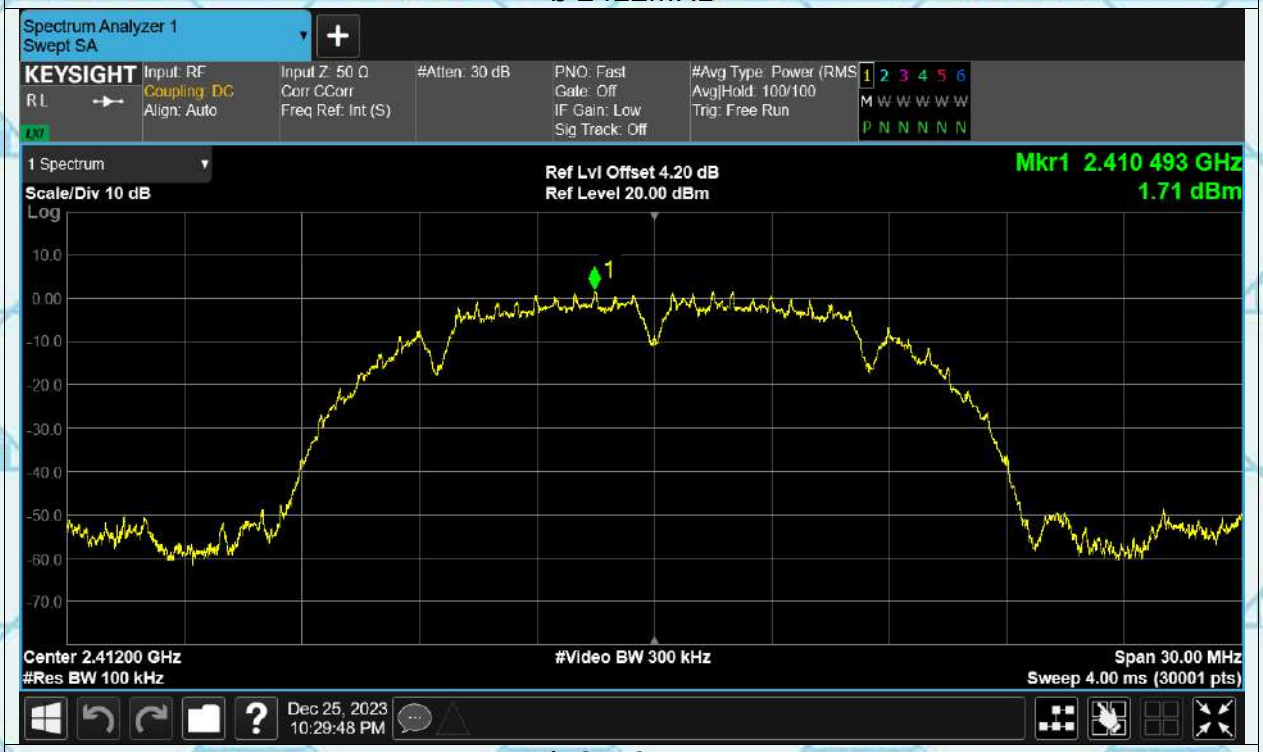


Band Edge n40 2452MHz

Conducted RF Spurious Emission

Test Graphs

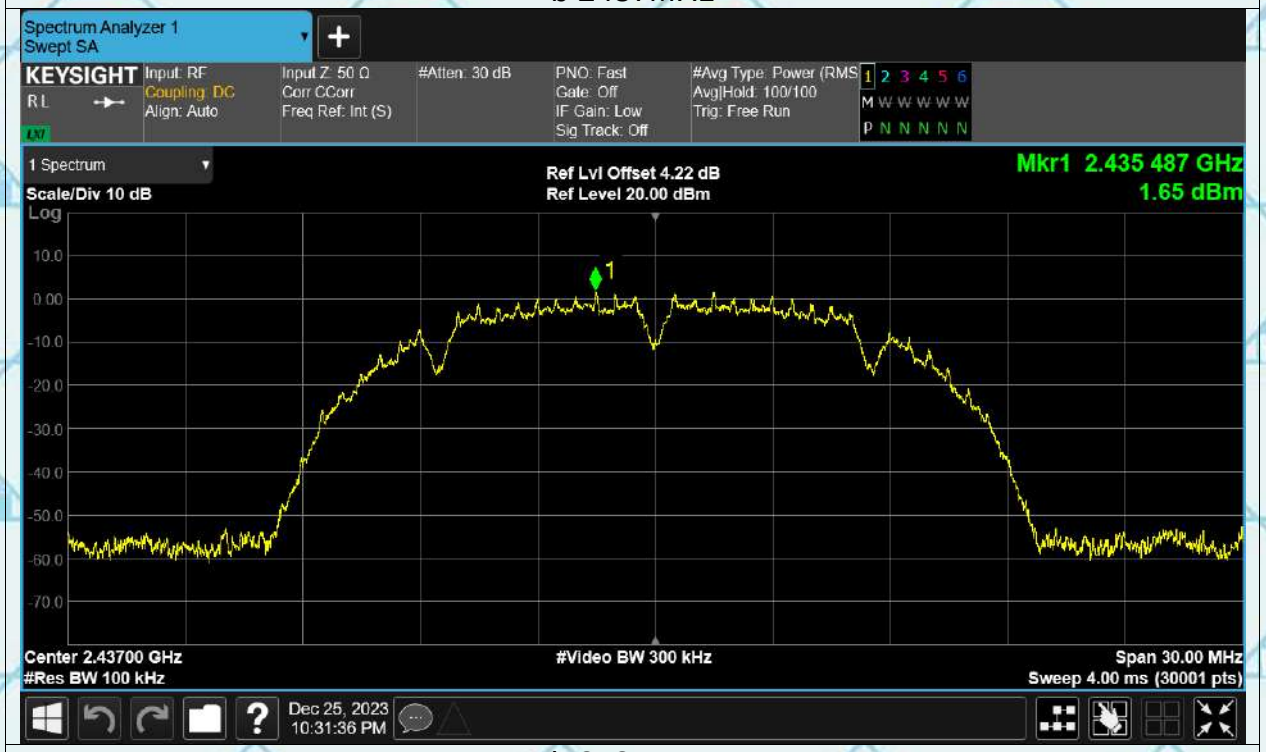
b 2412MHz



b 2412MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.413 2 GHz	1.537 dBm			
2	N	1	f	26.229 1 GHz	-47.32 dBm			
3	N	1	f	5.016 1 GHz	-53.28 dBm			
4	N	1	f	7.191 9 GHz	-52.52 dBm			
5	N	1	f	9.768 3 GHz	-52.99 dBm			
6								

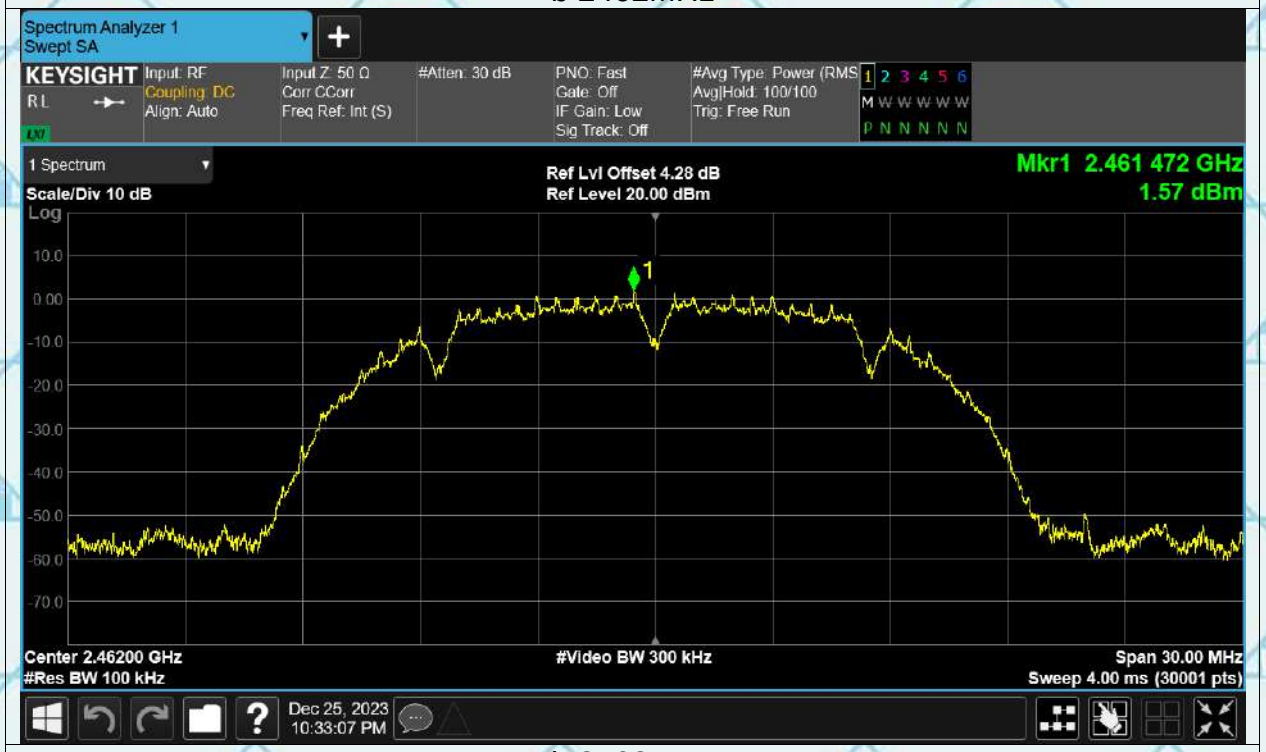
b 2437MHz



b 2437MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.437 9 GHz	1.327 dBm			
2	N	1	f	25.999 7 GHz	-47.17 dBm			
3	N	1	f	5.073 4 GHz	-51.89 dBm			
4	N	1	f	7.256 3 GHz	-52.96 dBm			
5	N	1	f	9.661 6 GHz	-52.25 dBm			
6								

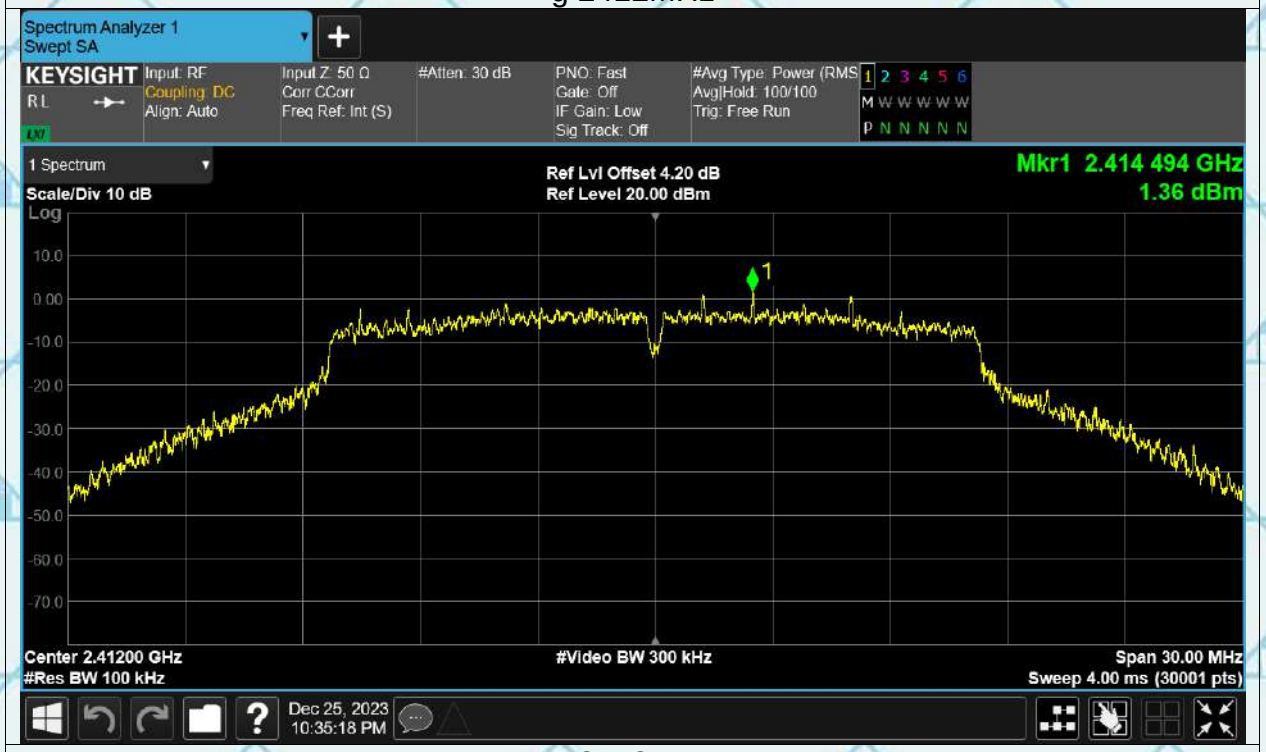
b 2462MHz



b 2462MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.462 6 GHz	1.288 dBm			
2	N	1	f	26.282 9 GHz	-46.73 dBm			
3	N	1	f	4.729 3 GHz	-52.22 dBm			
4	N	1	f	7.306 6 GHz	-51.99 dBm			
5	N	1	f	9.711 0 GHz	-52.45 dBm			
6								

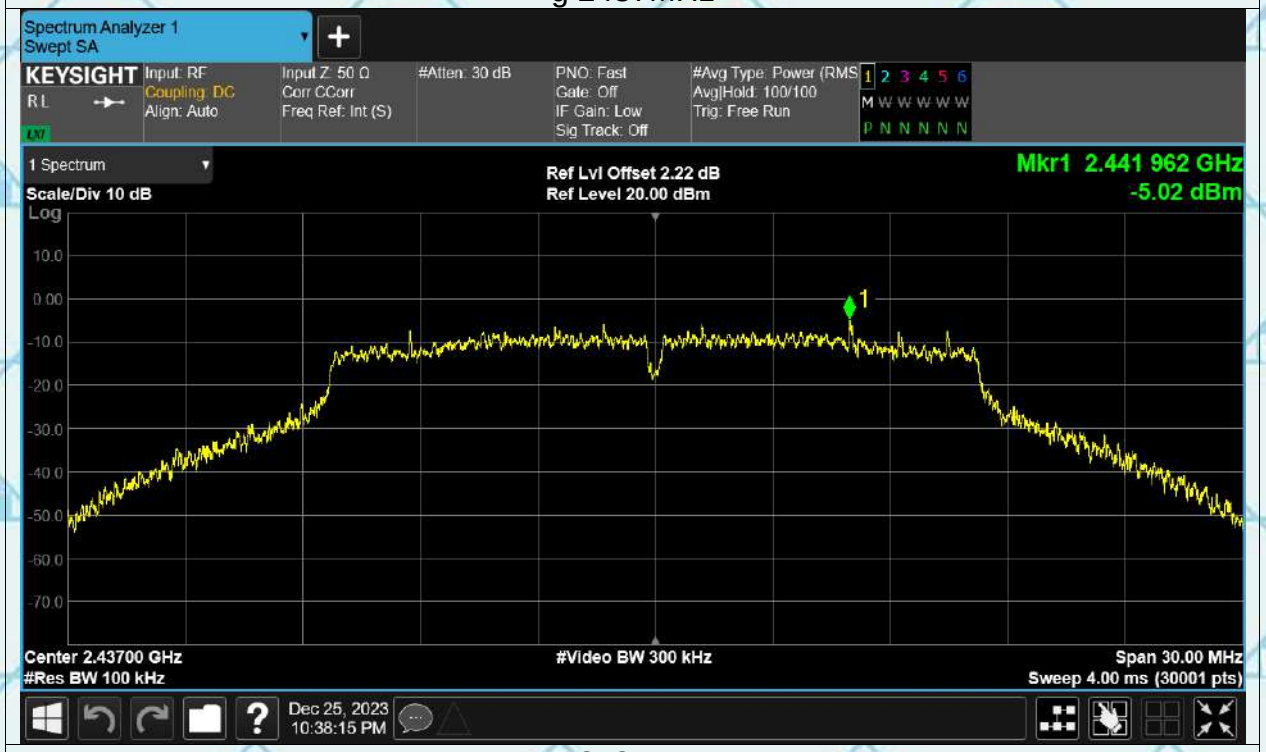
g 2412MHz



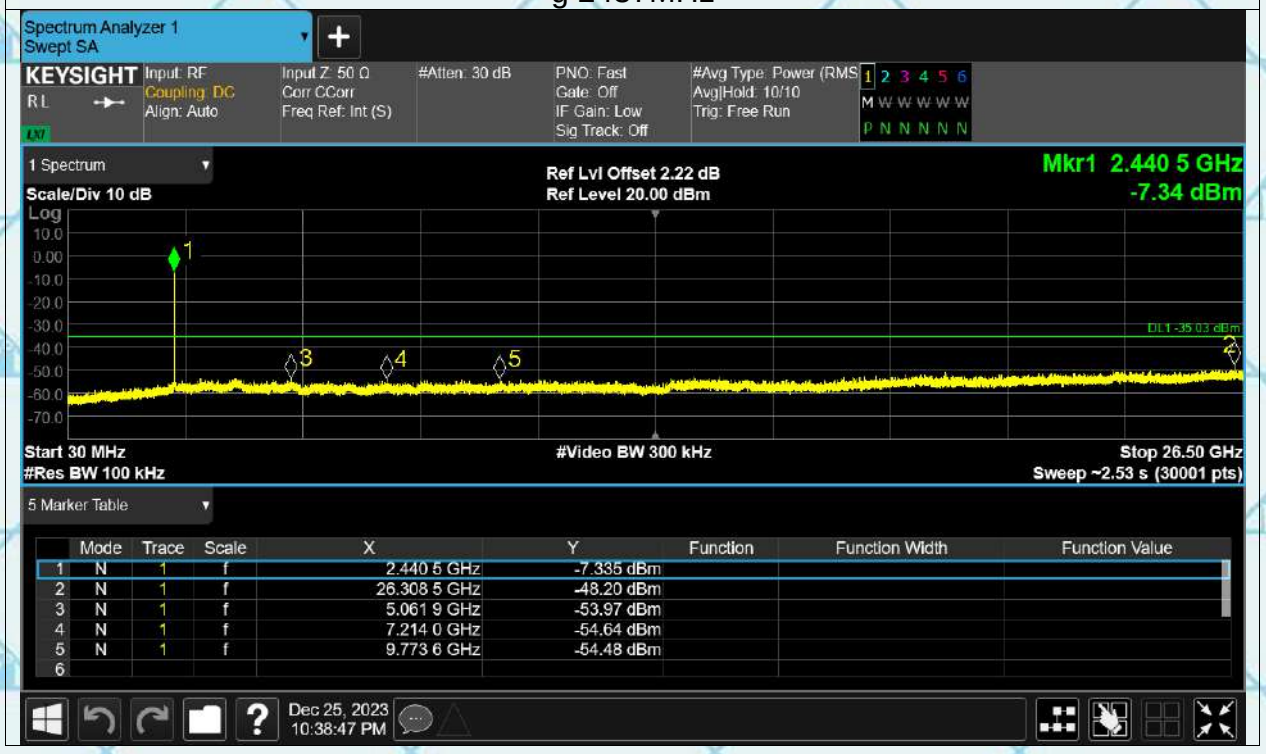
g 2412MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.407 9 GHz	0.4763 dBm			
2	N	1	f	26.276 8 GHz	-46.73 dBm			
3	N	1	f	4.694 0 GHz	-52.51 dBm			
4	N	1	f	7.236 0 GHz	-52.04 dBm			
5	N	1	f	9.721 5 GHz	-52.48 dBm			
6								

g 2437MHz

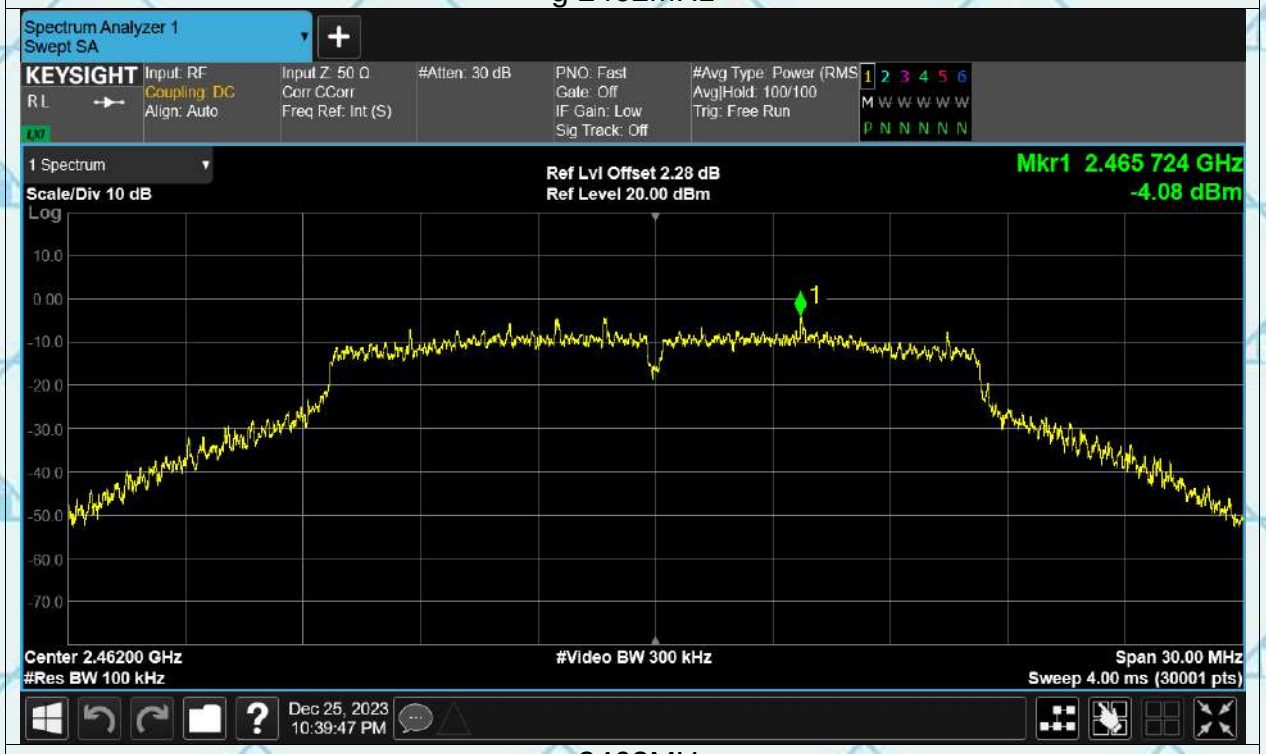


g 2437MHz

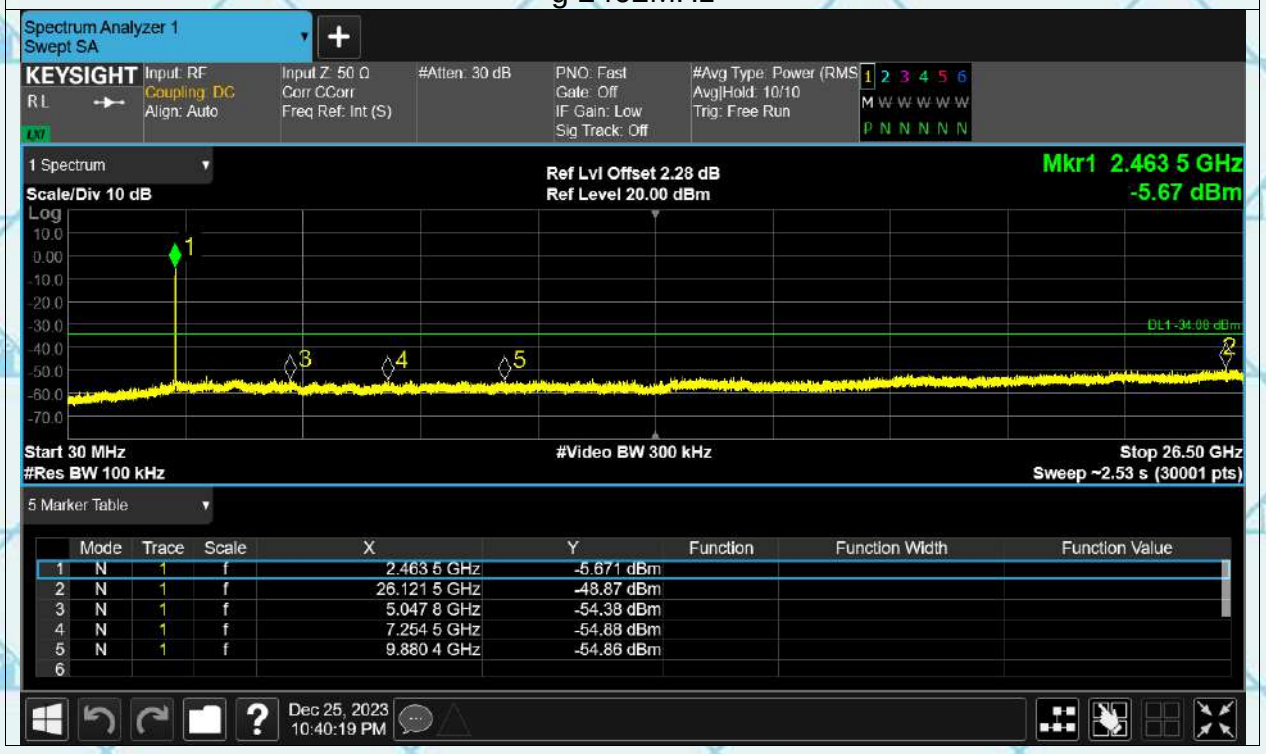


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.440 5 GHz	-7.335 dBm			
2	N	1	f	26.308 5 GHz	-48.20 dBm			
3	N	1	f	5.061 9 GHz	-53.97 dBm			
4	N	1	f	7.214 0 GHz	-54.64 dBm			
5	N	1	f	9.773 6 GHz	-54.48 dBm			
6								

g 2462MHz

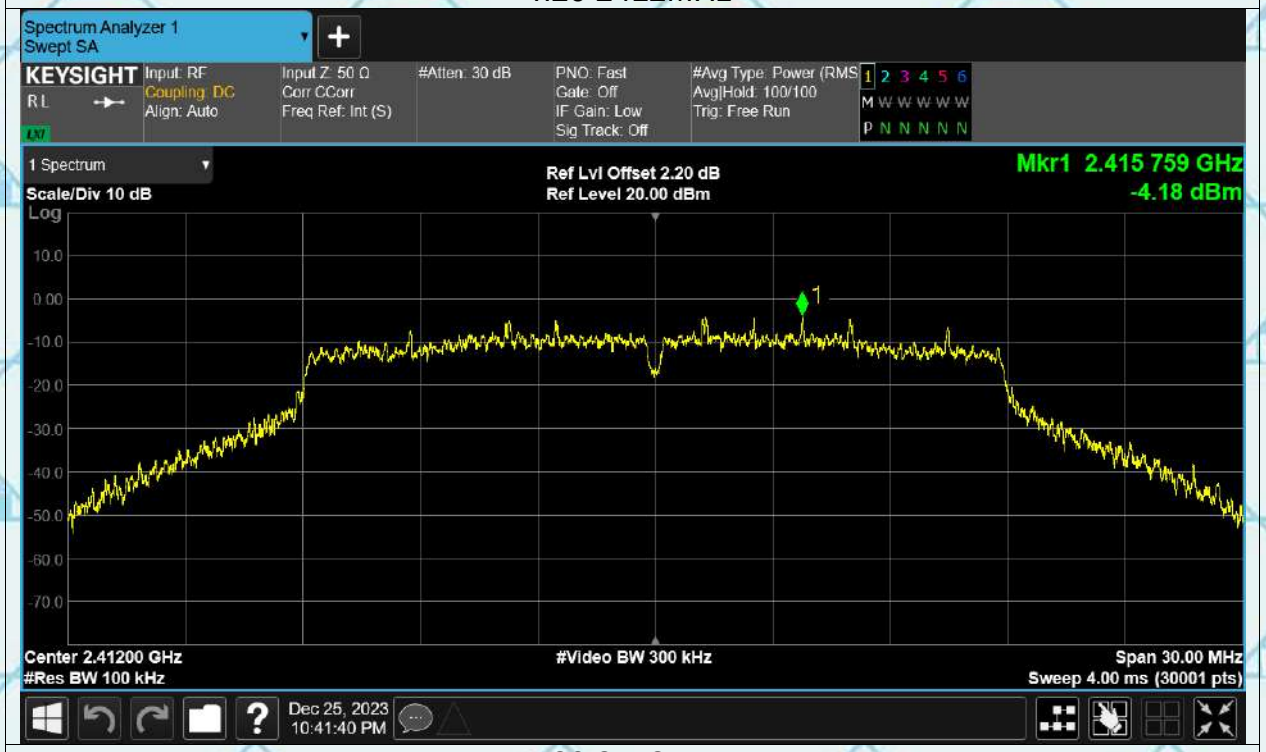


g 2462MHz



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.463 5 GHz	-5.671 dBm			
2	N	1	f	26.121 5 GHz	-48.87 dBm			
3	N	1	f	5.047 8 GHz	-54.38 dBm			
4	N	1	f	7.254 5 GHz	-54.88 dBm			
5	N	1	f	9.880 4 GHz	-54.86 dBm			
6								

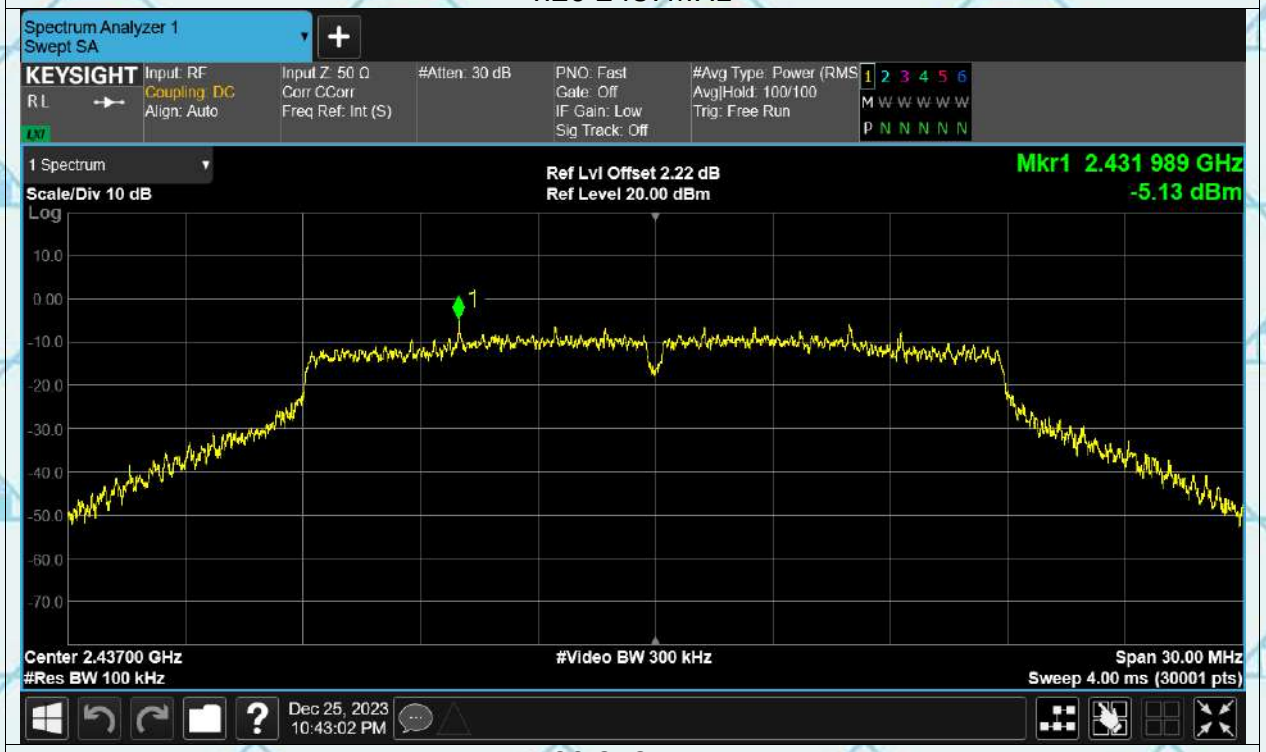
n20 2412MHz



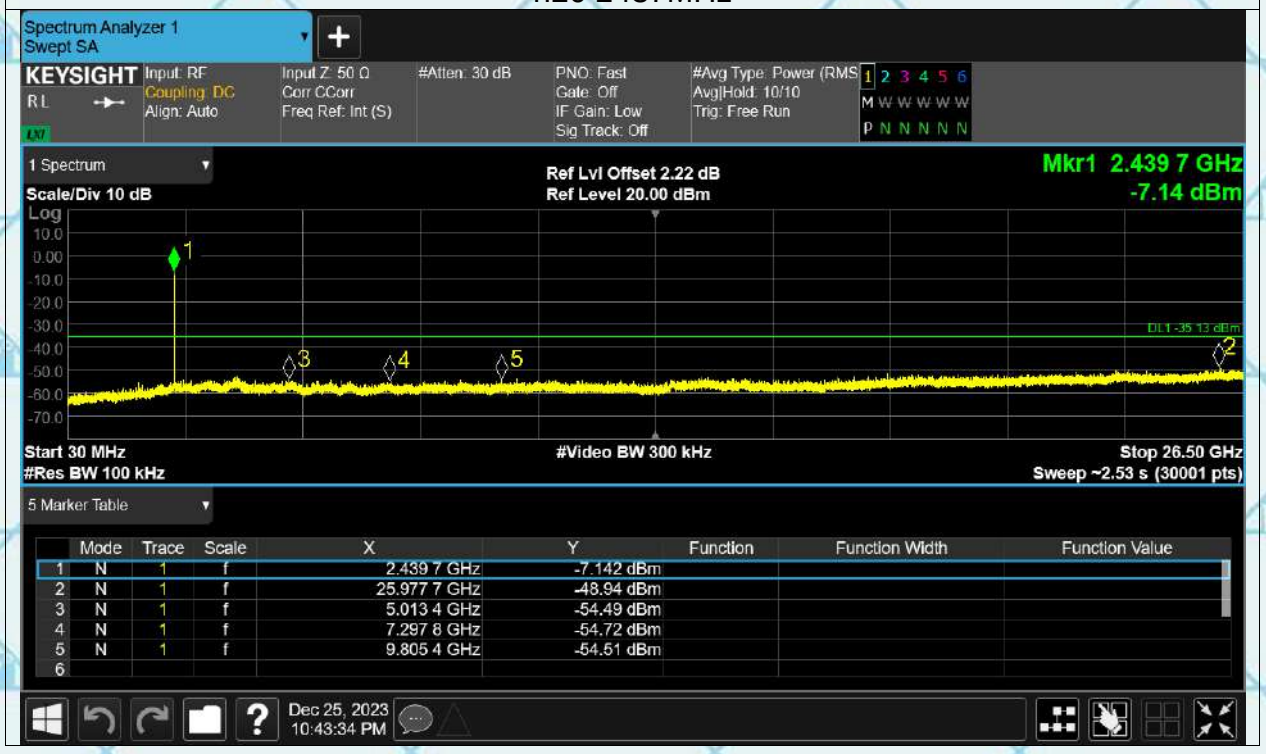
n20 2412MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.414 9 GHz	-7.530 dBm			
2	N	1	f	25.891 2 GHz	-49.18 dBm			
3	N	1	f	4.712 5 GHz	-54.58 dBm			
4	N	1	f	7.185 7 GHz	-55.57 dBm			
5	N	1	f	9.791 3 GHz	-54.50 dBm			
6								

n20 2437MHz

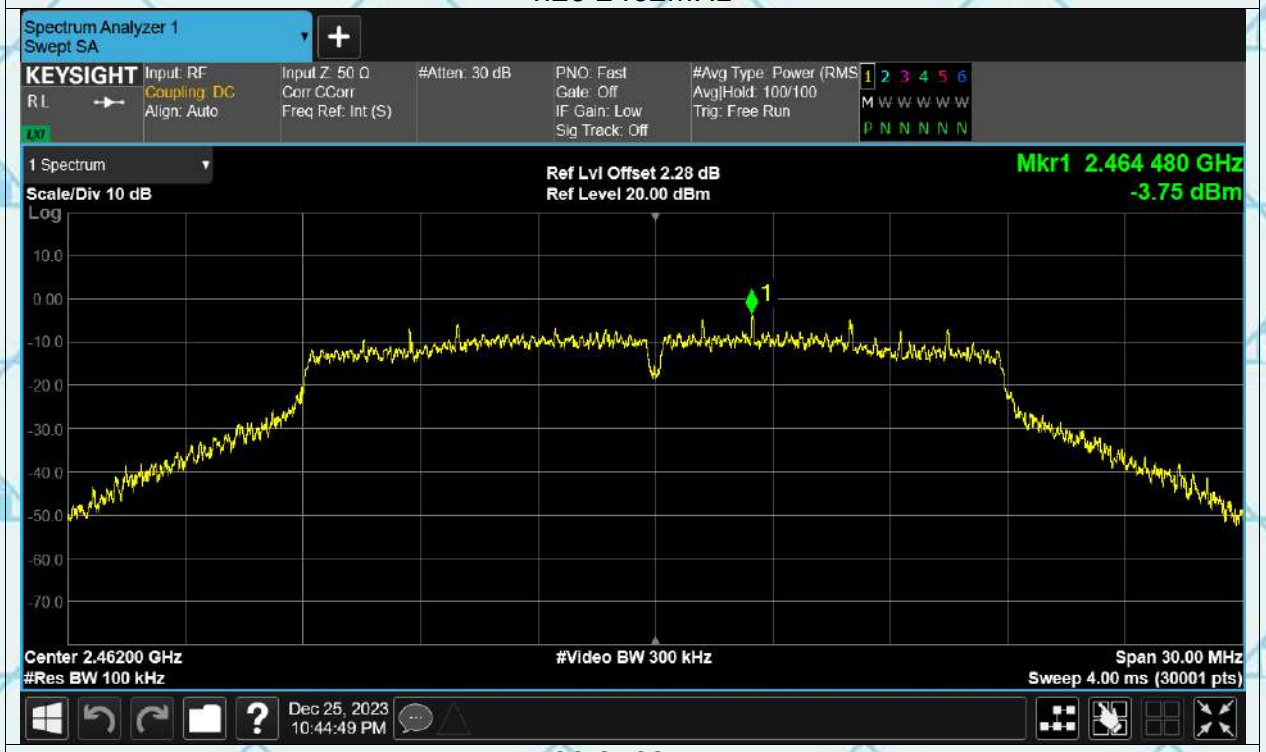


n20 2437MHz

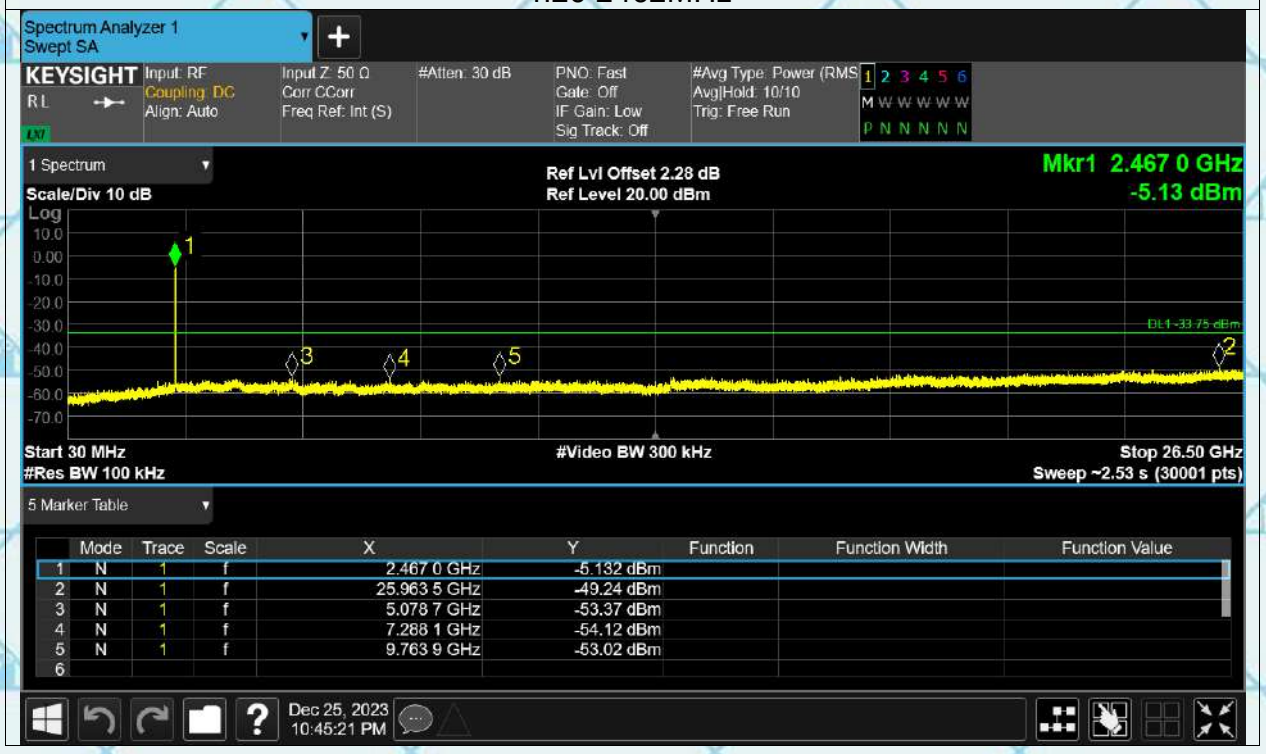


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.439 7 GHz	-7.142 dBm			
2	N	1	f	25.977 7 GHz	-48.94 dBm			
3	N	1	f	5.013 4 GHz	-54.49 dBm			
4	N	1	f	7.297 8 GHz	-54.72 dBm			
5	N	1	f	9.805 4 GHz	-54.51 dBm			
6								

n20 2462MHz

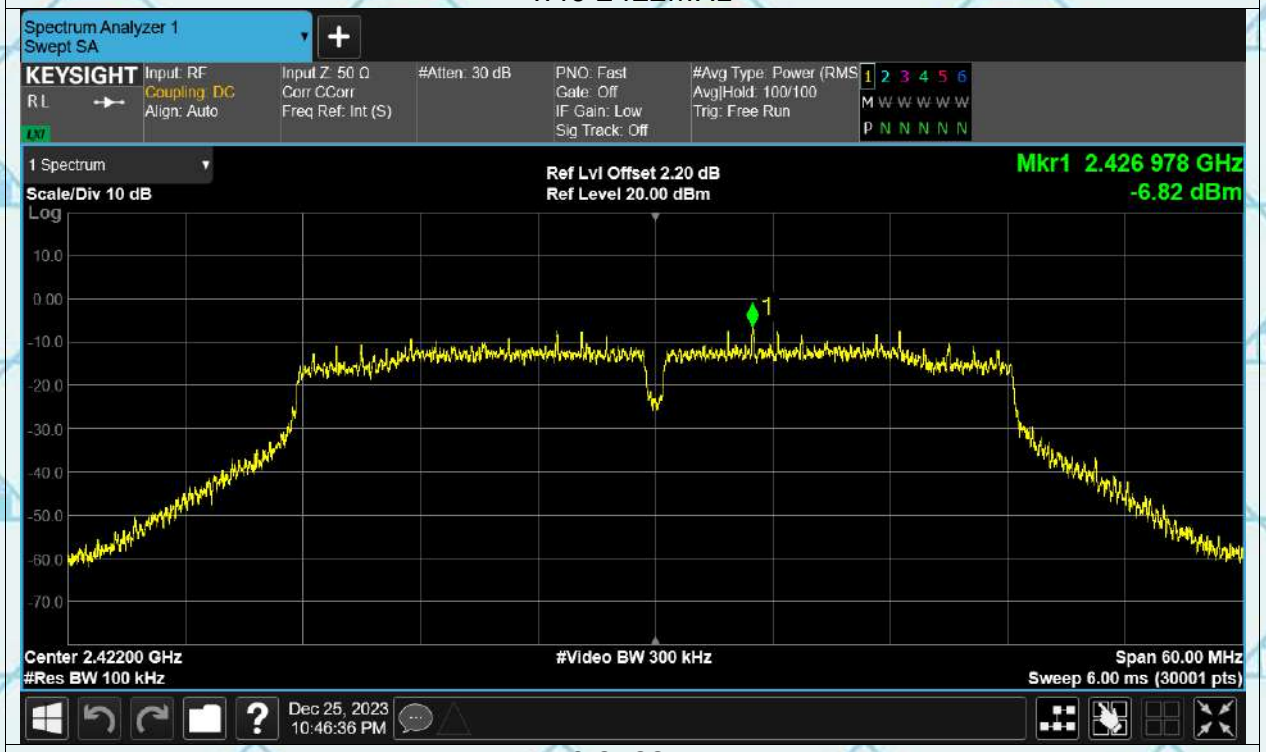


n20 2462MHz



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.467 0 GHz	-5.132 dBm			
2	N	1	f	25.963 5 GHz	-49.24 dBm			
3	N	1	f	5.078 7 GHz	-53.37 dBm			
4	N	1	f	7.288 1 GHz	-54.12 dBm			
5	N	1	f	9.763 9 GHz	-53.02 dBm			
6								

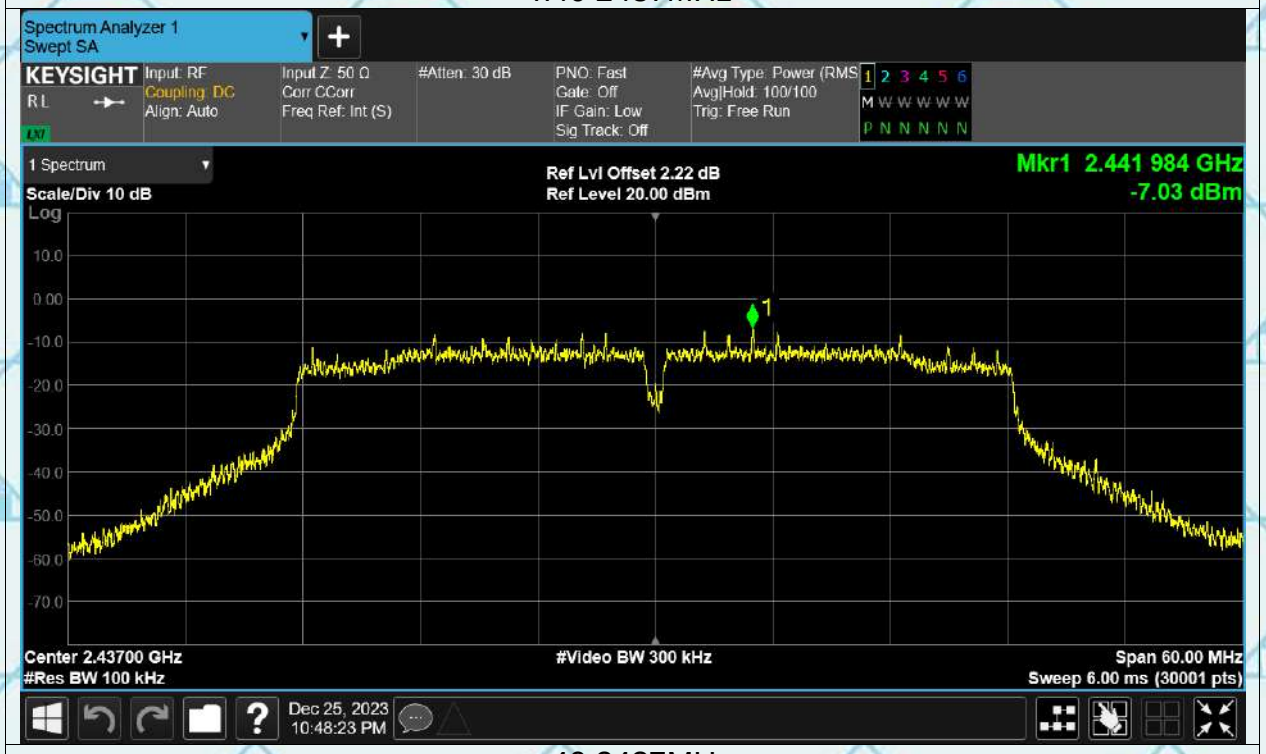
n40 2422MHz



n40 2422MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.433 5 GHz	-6.988 dBm			
2	N	1	f	26.253 8 GHz	-48.79 dBm			
3	N	1	f	4.653 4 GHz	-54.23 dBm			
4	N	1	f	7.286 3 GHz	-54.45 dBm			
5	N	1	f	9.772 7 GHz	-55.22 dBm			
6								

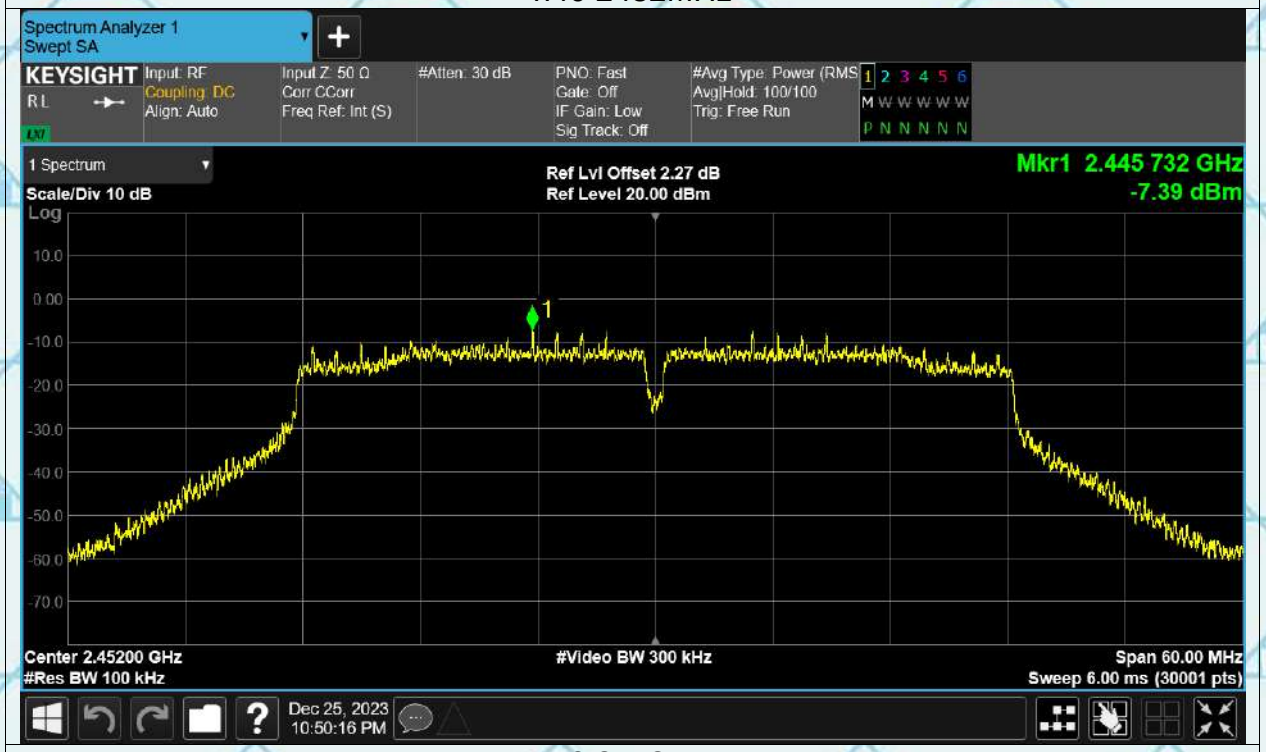
n40 2437MHz



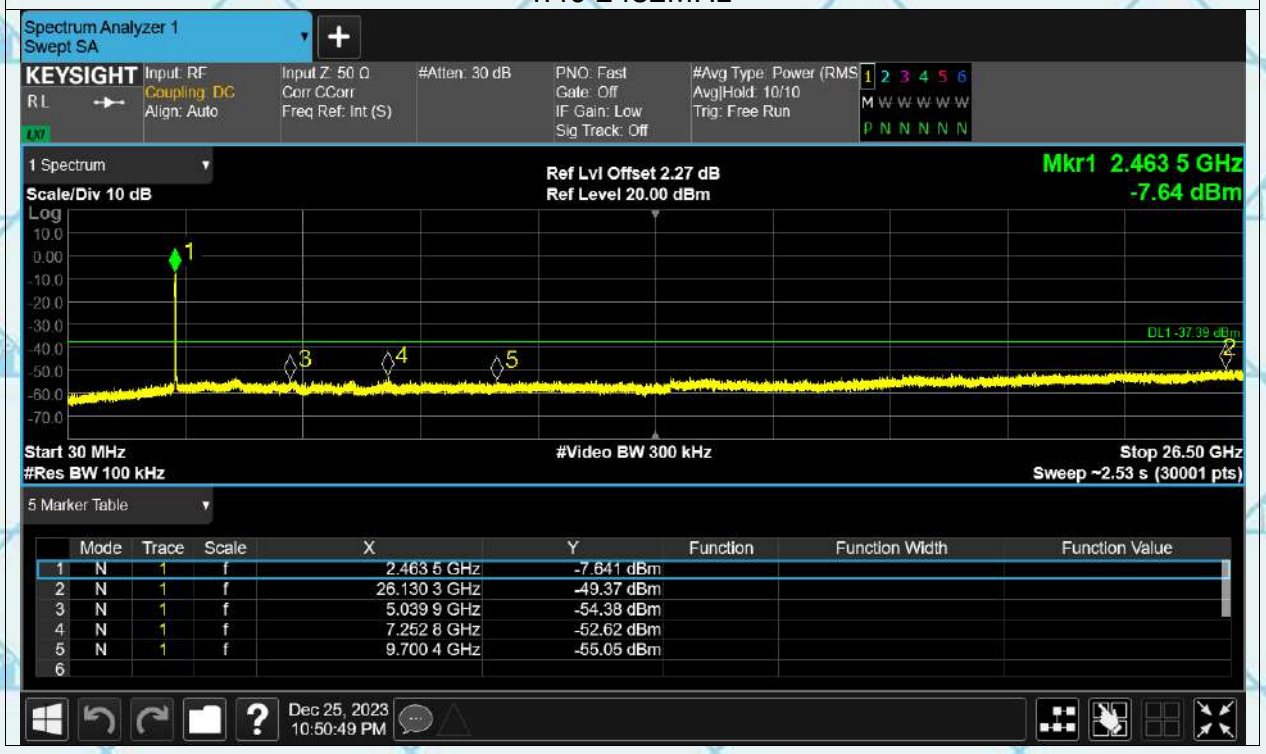
n40 2437MHz

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.433 5 GHz	-7.893 dBm			
2	N	1	f	26.368 5 GHz	-48.53 dBm			
3	N	1	f	4.936 7 GHz	-54.18 dBm			
4	N	1	f	7.244 8 GHz	-55.24 dBm			
5	N	1	f	9.729 5 GHz	-54.23 dBm			
6								

n40 2452MHz



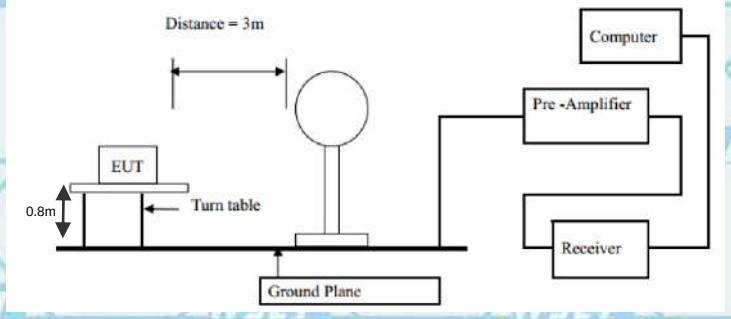
n40 2452MHz



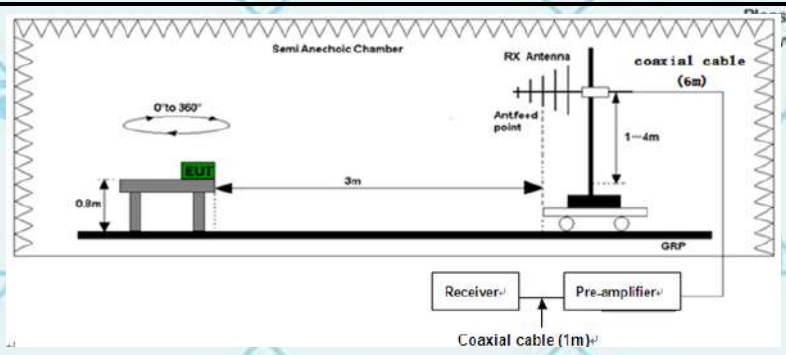
	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	2.463 5 GHz	-7.641 dBm			
2	N	1	f	26.130 3 GHz	-49.37 dBm			
3	N	1	f	5.039 9 GHz	-54.38 dBm			
4	N	1	f	7.252 8 GHz	-52.62 dBm			
5	N	1	f	9.700 4 GHz	-55.05 dBm			
6								

6.6. Radiated Spurious Emission Measurement

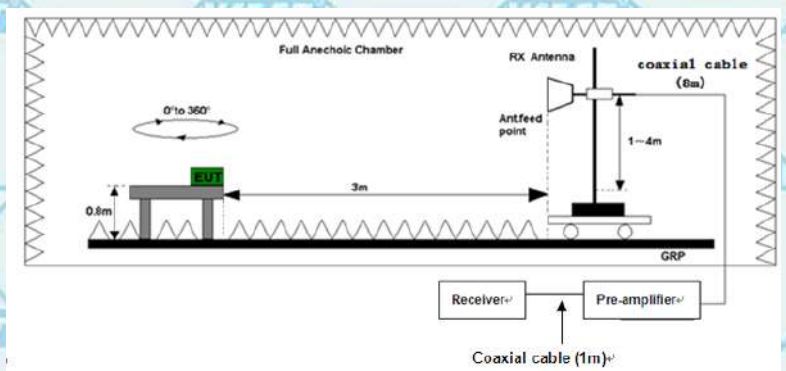
6.6.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2014</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Field Strength (microvolts/meter)</th><th>Measurement Distance (meters)</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><th>Frequency</th><th>Field Strength (microvolts/meter)</th><th>Measurement Distance (meters)</th><th>Detector</th></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>3</td><td>Average</td></tr>
<tr><td>5000</td><td>3</td><td>Peak</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

30MHz to 1GHz</td></tr>
</table>



Above 1GHz



Test Procedure:

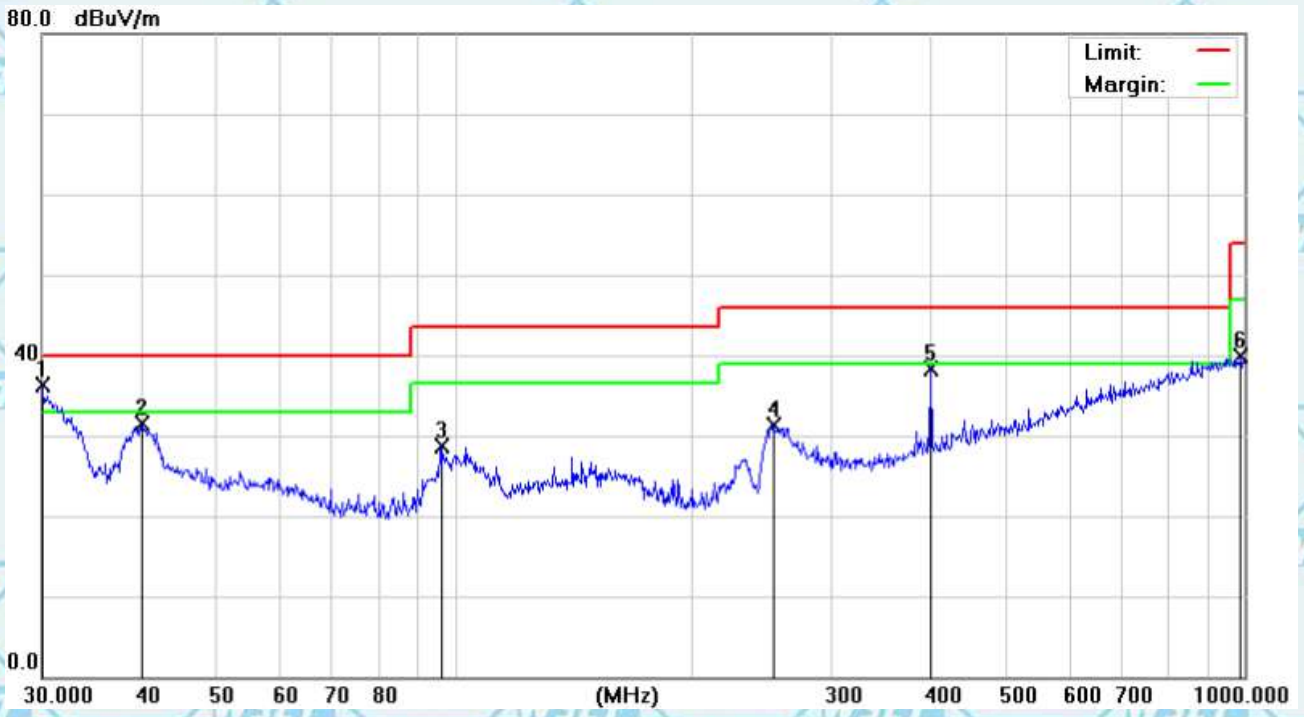
1. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

	3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test results:	PASS

6.6.2. Test Data(worst)

Please refer to following diagram for individual
Below 1GHz

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	30.0000	37.94	-1.73	36.21	40.00	-3.79	QP
2		40.1347	32.08	-0.53	31.55	40.00	-8.45	QP
3		96.0986	33.03	-4.30	28.73	43.50	-14.77	QP
4		252.9482	32.91	-1.60	31.31	46.00	-14.69	QP
5		400.4319	35.63	2.66	38.29	46.00	-7.71	QP
6		989.5355	25.54	14.35	39.89	54.00	-14.11	QP

Vertical:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	30.0000	37.07	-1.73	35.34	40.00	-4.66	QP
2	!	31.7313	36.66	-1.73	34.93	40.00	-5.07	QP
3		38.8878	32.76	-0.64	32.12	40.00	-7.88	QP
4		96.0986	35.13	-4.30	30.83	43.50	-12.67	QP
5		400.4319	33.08	2.66	35.74	46.00	-10.26	QP
6		972.3374	26.87	14.08	40.95	54.00	-13.05	QP

Note: *1.The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported*

2. Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Middle channel) was submitted only.

Above 1GHz

20MHz(802.11b/g/n)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	65.00	42.48	74	54	-9.00	-11.52
7236	V	68.58	43.97	74	54	-5.42	-10.03
4824	H	62.11	42.03	74	54	-11.89	-11.97
7236	H	70.73	45.05	74	54	-3.27	-8.95

Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	64.52	43.28	74	54	-9.48	-10.72
7311	V	66.14	48.44	74	54	-7.86	-5.56
4874	H	63.80	45.86	74	54	-10.20	-8.14
7311	H	67.93	40.05	74	54	-6.07	-13.95

Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	67.55	50.16	74	54	-6.45	-3.84
7386	V	68.48	49.41	74	54	-5.52	-4.59
4924	H	67.72	47.61	74	54	-6.28	-6.39
7386	H	71.41	44.78	74	54	-2.59	-9.22

Note:

1. *All emissions not reported were more than 20dB below the specified limit or in the noise floor.*
2. *Emission Level= Reading Level+ Probe Factor +Cable Loss.*

Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

40MHz(802.11n)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	71.09	48.12	74	54	-2.91	-5.88
7236	V	63.52	48.26	74	54	-10.48	-5.74
4824	H	65.68	50.57	74	54	-8.32	-3.43
7236	H	65.68	44.53	74	54	-8.32	-9.47

Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	62.13	51.52	74	54	-11.87	-2.48
7311	V	68.44	50.59	74	54	-5.56	-3.41
4874	H	69.00	46.21	74	54	-5.00	-7.79
7311	H	67.37	46.09	74	54	-6.63	-7.91

Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	71.12	49.55	74	54	-2.88	-4.45
7386	V	71.20	51.54	74	54	-2.80	-2.46
4924	H	63.50	42.60	74	54	-10.50	-11.40
7386	H	68.48	41.05	74	54	-5.52	-12.95

Restricted Bands Requirements

Test result for 802.11b Mode (the worst case)

Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel							
2390	67.36	-8.73	58.63	74	-15.37	H	PK
2390	49.06	-8.73	40.33	54	-13.67	H	AV
2390	68.07	-8.73	59.34	74	-14.66	V	PK
2390	46.64	-8.73	37.91	54	-16.09	V	AV
High Channel							
2483.5	66.28	-8.17	58.11	74	-15.89	H	PK
2483.5	47.67	-8.17	39.50	54	-14.50	H	AV
2483.5	65.80	-8.17	57.63	74	-16.37	V	PK
2483.5	49.73	-8.17	41.56	54	-12.44	V	AV

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