TEST REPORT

FCC ID: 2ADYY-T14RA-1

Product: Laptop Computer

Model No.: T14RA

Trade Mark: TECNO

Report No.: WSCT-ANAB-R&E240900045A-Wi-Fi1

Issued Date: 14 October 2024

Issued for:

TECNO MOBILE 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:	Laptop Computer
Model No.:	T14RA
Trade Mark:	TECNO
Applicant:	**TECNO MOBILE LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	**TECNO MOBILE LIMITED**
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Date of Test:	29 August 2024 to 11 October 2024
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:** Qin Shuiquan **(Qin Shuiquan)**

Approved By: Li Huaibi **(Li Huaibi)** **Date:** 14 October 2024

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:	Laptop Computer
Model No.:	T14RA
Trade Mark:	TECNO
Operation Frequency:	2412MHz~2462MHz (802.11b/g/n/ax(HT20)) 2422MHz~2452MHz (802.11n/ax(HT40))
Channel Separation:	5MHz
Modulation type:	DSSS (DBPSK, DQPSK, CCK) for IEEE 802.11b OFDM/OFDMA(BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM) for IEEE 802.11g/n/ax
Antenna Type:	Integral Antenna
Antenna Gain	MAIN:1.86dBi ,AUX:1.70 dBi
EUT Power Rating	Adapter: FC498U INPUT: 100-240V~50/60Hz 1.5A MAX OUTPUT: PD:5V⎓3A 9V⎓3A 12V⎓3A 20V⎓3.25A PPS:3.3—11V⎓5A MAX Rechargeable Li-ion Polymer Battery: 528282-3S1P Nominal Voltage: 11.61V Rated Capacity:6460mAh/75Wh Typical Capacity: 6550mAh/76.04Wh Limited Charge Voltage: 13.35V
Remark:	N/A.

Configuration differences

Configuration/ Processor	TDP
T14RA (i5-1335U)	15W
T14RA (i7-1355U)	15W
T14RA (i5-13420H)	30W
T14RA (i7-13620H)	30W
T14RA (i7-13700H)	30W
Note: These models of TDP are different, and the T14RA (i7-13620H) is the main test model reported	

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

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

802.11n/ax (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/ax(H20)
802.11n/ax(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	FC498U		/	TECNO

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
World Standardization Certification & Testing Group (Shenzhen) Co., Ltd.
Building A-B,Baoli'an Industrial Park,No.58 and 60,Tangtou Avenue, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. 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.

ANAB - Certificate Number: AT-3951

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (ANAB).Certification Number: AT-3951

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	SCHWARZBECK	VULB9168	01488	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 Wi-Fi antenna is a Integral Antenna. it meets the standards, and the best case gain of the antenna is “MAIN:1.86dBi ,AUX:1.70dBi”

<CDD Modes >
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
For CDD transmissions, directional gain is calculated as
Directional gain = GANT + Array Gain, where Array Gain is as follows.
For power spectral density (PSD) measurements on all devices,
Array Gain = 10 log(NANT/NSS=1) dB.
For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.
Directional gain may be calculated by using the formulas applicable to equal gain antennas with
GANT set equal to the gain of the antenna having the highest gain;
The EUT supports CDD mode.
For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,
F)2)f)i).
For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

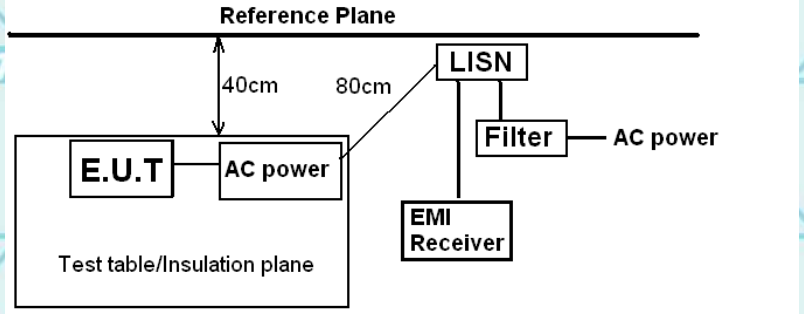
The directional gain “DG” is calculated as following table.

<CDD Modes>	Ant1 (dBi)	Ant2 (dBi)	DG for power (dBi)	DG for PSD (dBi)
2412~2462MHz	1.86	1.70	1.86	4.79

Power limit reduction = Composite gain – 6dBi, (min = 0)
PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

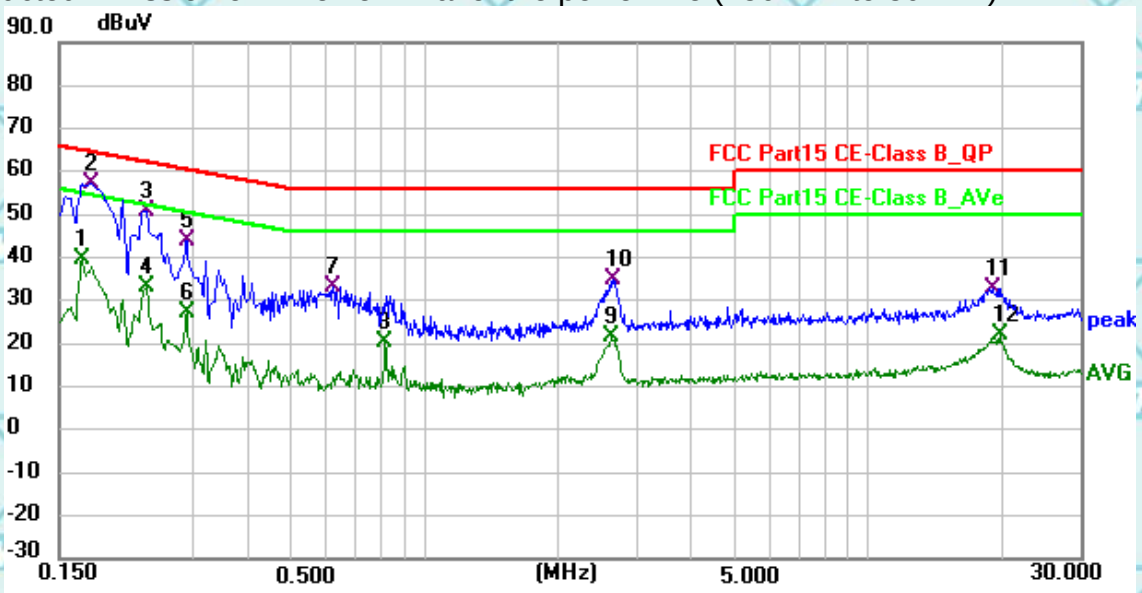
6.2. Conducted Emission

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

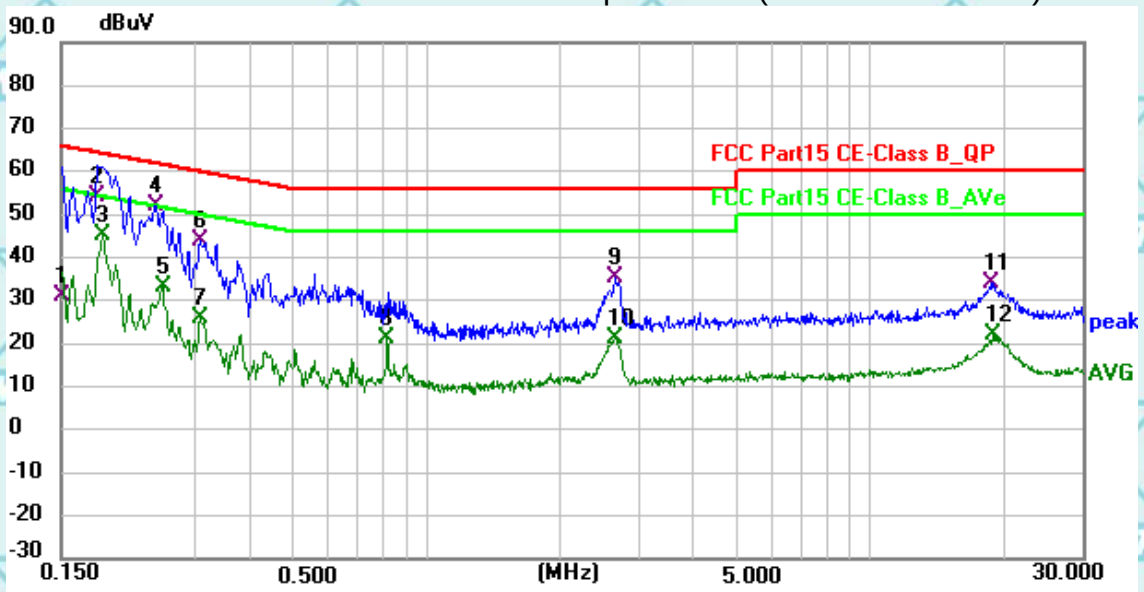
6.2.2. Test data(worst case)

Please refer to following diagram for individual
The worst mode is 11b
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1680	19.11	20.72	39.83	55.06	-15.23	AVG
2 *	0.1770	36.58	20.71	57.29	64.63	-7.34	QP
3	0.2355	30.21	20.67	50.88	62.25	-11.37	QP
4	0.2355	12.67	20.67	33.34	52.25	-18.91	AVG
5	0.2895	23.42	20.64	44.06	60.54	-16.48	QP
6	0.2895	6.58	20.64	27.22	50.54	-23.32	AVG
7	0.6225	12.69	20.53	33.22	56.00	-22.78	QP
8	0.8160	-0.13	20.59	20.46	46.00	-25.54	AVG
9	2.6430	0.86	20.60	21.46	46.00	-24.54	AVG
10	2.6745	14.12	20.60	34.72	56.00	-21.28	QP
11	19.0904	12.70	20.24	32.94	60.00	-27.06	QP
12	19.7655	1.97	20.26	22.23	50.00	-27.77	AVG

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



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	10.51	20.73	31.24	66.00	-34.76	QP
2	0.1815	33.61	20.70	54.31	64.42	-10.11	QP
3 *	0.1860	24.69	20.70	45.39	54.21	-8.82	AVG
4	0.2445	31.55	20.66	52.21	61.94	-9.73	QP
5	0.2535	12.68	20.66	33.34	51.64	-18.30	AVG
6	0.3075	23.32	20.63	43.95	60.04	-16.09	QP
7	0.3075	5.22	20.63	25.85	50.04	-24.19	AVG
8	0.8160	0.70	20.59	21.29	46.00	-24.71	AVG
9	2.6610	14.55	20.60	35.15	56.00	-20.85	QP
10	2.6700	0.62	20.60	21.22	46.00	-24.78	AVG
11	18.6944	13.92	20.24	34.16	60.00	-25.84	QP
12	18.9465	1.86	20.24	22.10	50.00	-27.90	AVG

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

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

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

Limit (dBμV) = Limit stated in standard

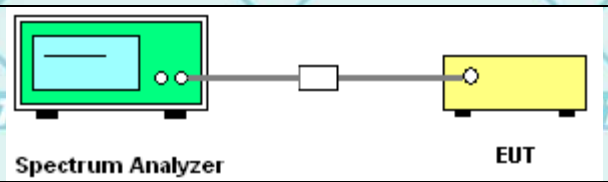
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

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 Data

MAIN Ant1

Mode	Frequency (MHz)	Total Power (dBm)	Limit (dBm)	Verdict
b	2412	16.04	30	Pass
b	2437	16.8	30	Pass
b	2462	16.78	30	Pass
g	2412	19.69	30	Pass
g	2437	**19.93**	30	Pass
g	2462	19.91	30	Pass
n20	2412	18.88	30	Pass
n20	2437	19.03	30	Pass
n20	2462	18.92	30	Pass
n40	2422	18.59	30	Pass
n40	2437	18.72	30	Pass
n40	2452	18.45	30	Pass
ax20	2412	18.48	30	Pass
ax20	2437	18.77	30	Pass
ax20	2462	18.69	30	Pass
ax40	2422	19.02	30	Pass
ax40	2437	19.23	30	Pass
ax40	2452	19.02	30	Pass

AUX Ant2

Mode	Frequency (MHz)	Total Power (dBm)	Limit (dBm)	Verdict
b	2412	18.55	30	Pass
b	2437	18.66	30	Pass
b	2462	18.57	30	Pass
g	2412	21.61	30	Pass
g	2437	21.83	30	Pass
g	2462	**21.84**	30	Pass
n20	2412	20.86	30	Pass
n20	2437	20.94	30	Pass
n20	2462	20.87	30	Pass
n40	2422	21.09	30	Pass
n40	2437	21.35	30	Pass
n40	2452	21.11	30	Pass
ax20	2412	20.57	30	Pass
ax20	2437	20.8	30	Pass
ax20	2462	20.47	30	Pass
ax40	2422	21.07	30	Pass
ax40	2437	21.05	30	Pass
ax40	2452	20.99	30	Pass

MiMO Mode

Mode	Frequency (MHz)	Total Power (dBm)	Limit (dBm)	Verdict
n20	2412	22.99	30	Pass
n20	2437	23.10	30	Pass
n20	2462	23.01	30	Pass
n40	2422	23.03	30	Pass
n40	2437	**23.24**	30	Pass
n40	2452	22.99	30	Pass
ax20	2412	22.66	30	Pass
ax20	2437	22.91	30	Pass
ax20	2462	22.68	30	Pass
ax40	2422	23.18	30	Pass
ax40	2437	23.24	30	Pass
ax40	2452	23.13	30	Pass

Test Graphs

Power NVNT b 2412MHz Ant1

Power NVNT b 2437MHz Ant1

Power NVNT b 2462MHz Ant1

Power NVNT g 2412MHz Ant1

Power NVNT g 2437MHz Ant1

Power NVNT g 2462MHz Ant1

Power NVNT n20 2412MHz Ant1

Power NVNT n20 2437MHz Ant1

Power NVNT n20 2462MHz Ant1

Power NVNT n40 2422MHz Ant1

Power NVNT n40 2437MHz Ant1

Power NVNT n40 2452MHz Ant1

Power NVNT ax20 2412MHz Ant1

Power NVNT ax20 2437MHz Ant1

Power NVNT ax20 2462MHz Ant1

Power NVNT ax40 2422MHz Ant1

Power NVNT ax40 2437MHz Ant1

Power NVNT ax40 2452MHz Ant1

Test Graphs

Power NVNT b 2412MHz Ant2

Power NVNT b 2437MHz Ant2

Power NVNT b 2462MHz Ant2

Power NVNT g 2412MHz Ant2

Power NVNT g 2437MHz Ant2

Power NVNT g 2462MHz Ant2

Power NVNT n20 2412MHz Ant2

Power NVNT n20 2437MHz Ant2

Power NVNT n20 2462MHz Ant2

Power NVNT n40 2422MHz Ant2

Power NVNT n40 2437MHz Ant2

Power NVNT n40 2452MHz Ant2

Power NVNT ax20 2412MHz Ant2

Power NVNT ax20 2437MHz Ant2

Power NVNT ax20 2462MHz Ant2

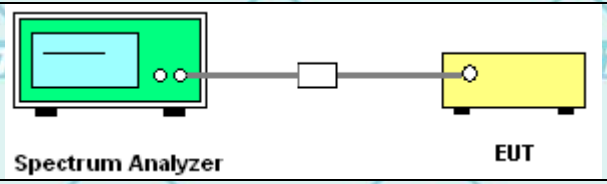
Power NVNT ax40 2422MHz Ant2

Power NVNT ax40 2437MHz Ant2

Power NVNT ax40 2452MHz Ant2

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

Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
b	2412	7.555	0.5	Pass
b	2437	7.071	0.5	Pass
b	2462	8.077	0.5	Pass
g	2412	16.33	0.5	Pass
g	2437	16.07	0.5	Pass
g	2462	16.30	0.5	Pass
n20	2412	17.56	0.5	Pass
n20	2437	17.54	0.5	Pass
n20	2462	16.55	0.5	Pass
n40	2422	35.07	0.5	Pass
n40	2437	30.11	0.5	Pass
n40	2452	33.85	0.5	Pass
ax20	2412	17.70	0.5	Pass
ax20	2437	16.54	0.5	Pass
ax20	2462	17.46	0.5	Pass
ax40	2422	36.29	0.5	Pass
ax40	2437	35.08	0.5	Pass
ax40	2452	35.01	0.5	Pass

Test Graphs

-6dB Bandwidth NVNT b 2412MHz Ant1

-6dB Bandwidth NVNT b 2437MHz Ant1

-6dB Bandwidth NVNT b 2462MHz Ant1

-6dB Bandwidth NVNT g 2412MHz Ant1

-6dB Bandwidth NVNT g 2437MHz Ant1

-6dB Bandwidth NVNT g 2462MHz Ant1

-6dB Bandwidth NVNT n20 2412MHz Ant1

-6dB Bandwidth NVNT n20 2437MHz Ant1

-6dB Bandwidth NVNT n20 2462MHz Ant1

-6dB Bandwidth NVNT n40 2422MHz Ant1

-6dB Bandwidth NVNT n40 2437MHz Ant1

-6dB Bandwidth NVNT n40 2452MHz Ant1

-6dB Bandwidth NVNT ax20 2412MHz Ant1

-6dB Bandwidth NVNT ax20 2437MHz Ant1

-6dB Bandwidth NVNT ax20 2462MHz Ant1

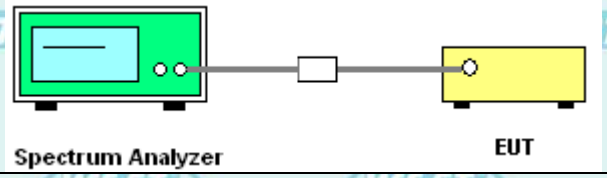
-6dB Bandwidth NVNT ax40 2422MHz Ant1

-6dB Bandwidth NVNT ax40 2437MHz Ant1

-6dB Bandwidth NVNT ax40 2452MHz Ant1

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

MAIN Ant1

Mode	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
b	2412	1.03	8	Pass
b	2437	**2.71**	8	Pass
b	2462	1.07	8	Pass
g	2412	-2.64	8	Pass
g	2437	-3.09	8	Pass
g	2462	-2.64	8	Pass
n20	2412	-3.2	8	Pass
n20	2437	-2.57	8	Pass
n20	2462	-2.88	8	Pass
n40	2422	-6.59	8	Pass
n40	2437	-6.86	8	Pass
n40	2452	-6.57	8	Pass
ax20	2412	-4.42	8	Pass
ax20	2437	-4.24	8	Pass
ax20	2462	-4.25	8	Pass
ax40	2422	-5.01	8	Pass
ax40	2437	-4.71	8	Pass
ax40	2452	-4.67	8	Pass

AUX Ant2

Mode	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
b	2412	3.04	8	Pass
b	2437	**3.79**	8	Pass
b	2462	3.52	8	Pass
g	2412	-0.86	8	Pass
g	2437	-0.77	8	Pass
g	2462	-0.65	8	Pass
n20	2412	-1.37	8	Pass
n20	2437	-0.83	8	Pass
n20	2462	-0.69	8	Pass
n40	2422	-4.55	8	Pass
n40	2437	-3.39	8	Pass
n40	2452	-4.03	8	Pass
ax20	2412	-2.56	8	Pass
ax20	2437	-2.29	8	Pass
ax20	2462	-2.51	8	Pass
ax40	2422	-3.13	8	Pass
ax40	2437	-2.79	8	Pass
ax40	2452	-2.99	8	Pass

MIMO

Mode	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
n20	2412	0.82	8	Pass
n20	2437	**1.40**	8	Pass
n20	2462	1.36	8	Pass
n40	2422	-2.44	8	Pass
n40	2437	-1.78	8	Pass
n40	2452	-2.11	8	Pass
ax20	2412	-0.38	8	Pass
ax20	2437	-0.15	8	Pass
ax20	2462	-0.28	8	Pass
ax40	2422	-0.96	8	Pass
ax40	2437	-0.63	8	Pass
ax40	2452	-0.74	8	Pass

Test Graphs

PSD NVNT b 2412MHz Ant1

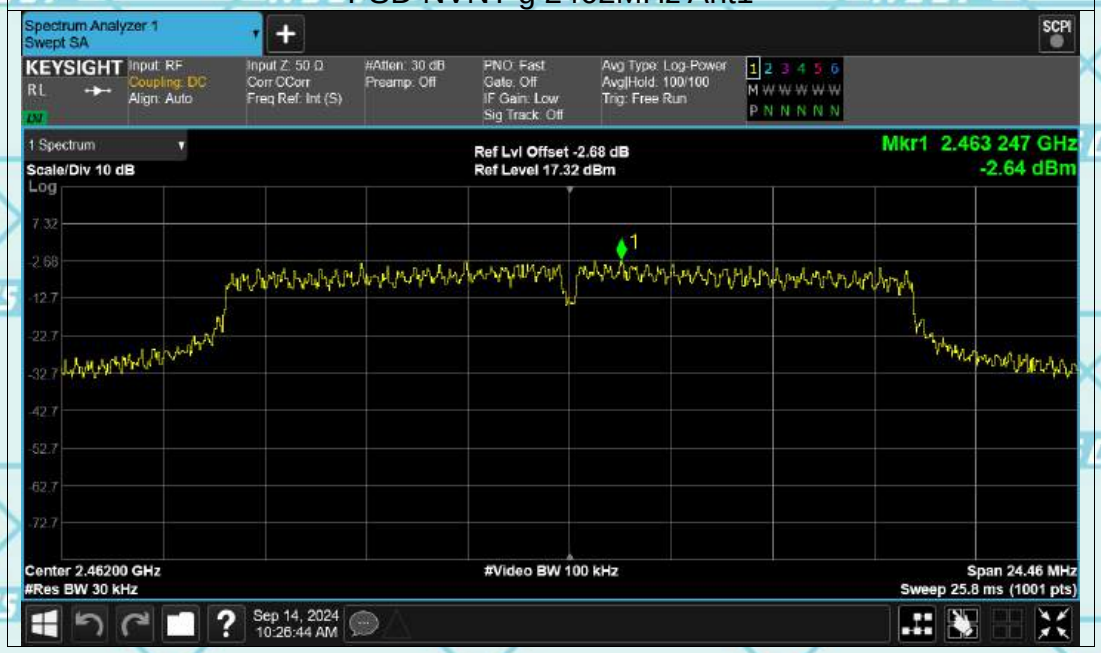
PSD NVNT b 2437MHz Ant1

PSD NVNT b 2462MHz Ant1

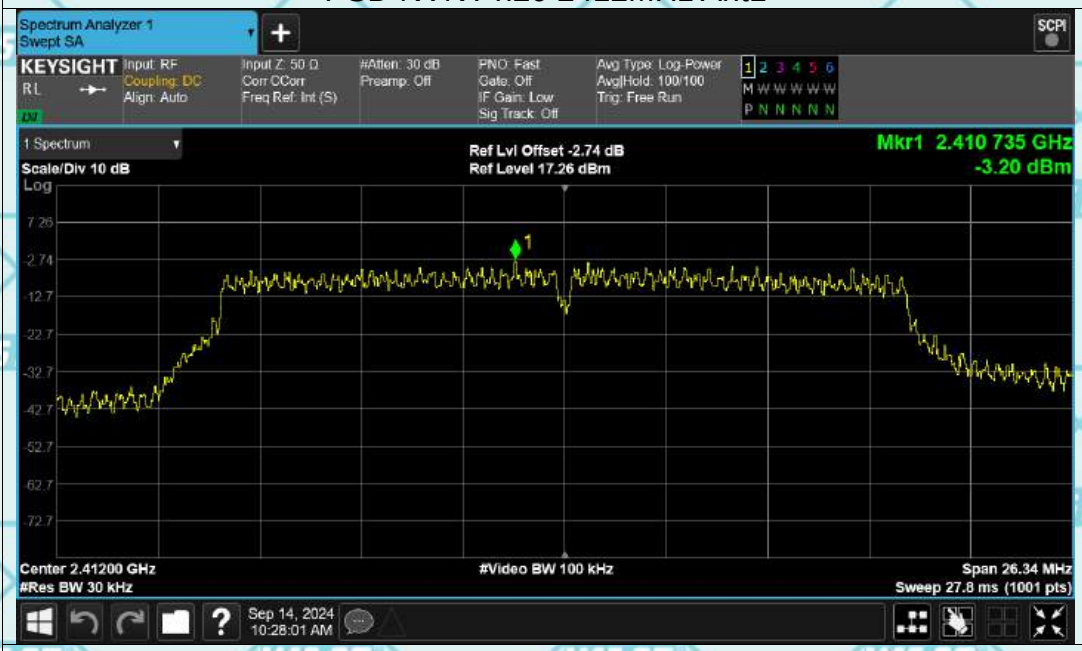
PSD NVNT g 2412MHz Ant1

PSD NVNT g 2437MHz Ant1

PSD NVNT g 2462MHz Ant1

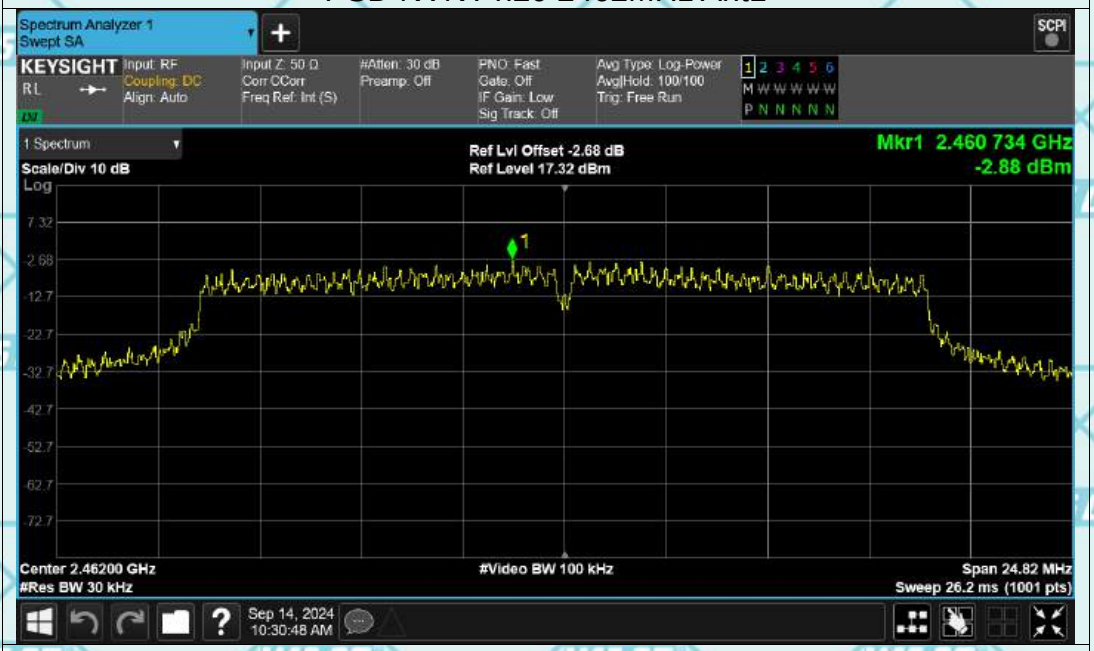


PSD NVNT n20 2412MHz Ant1



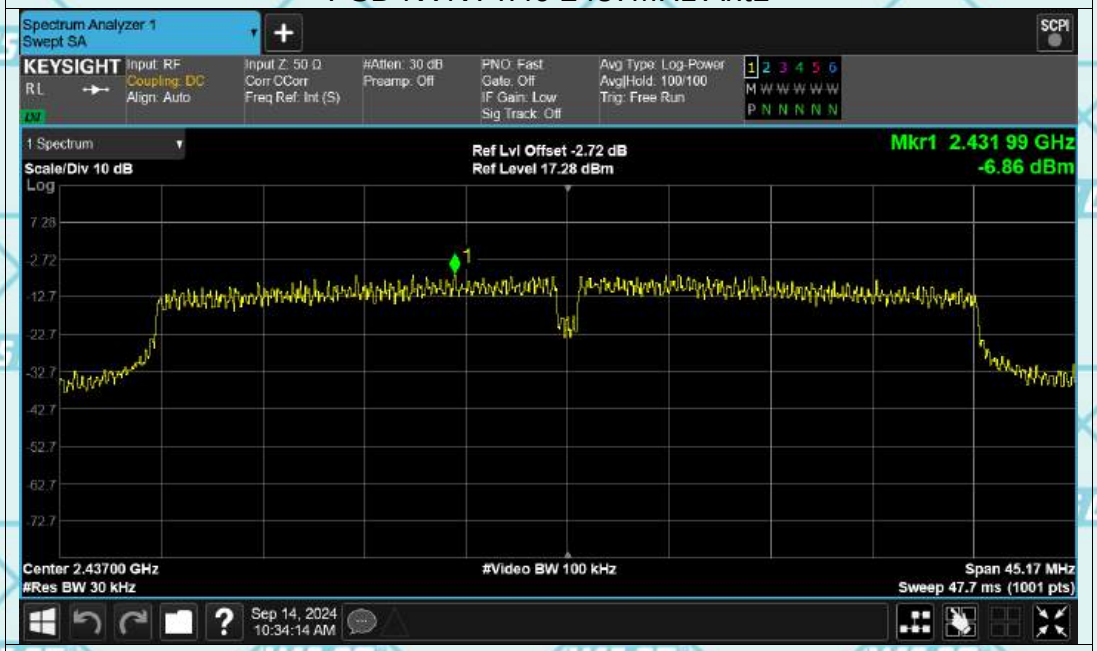
PSD NVNT n20 2437MHz Ant1

PSD NVNT n20 2462MHz Ant1

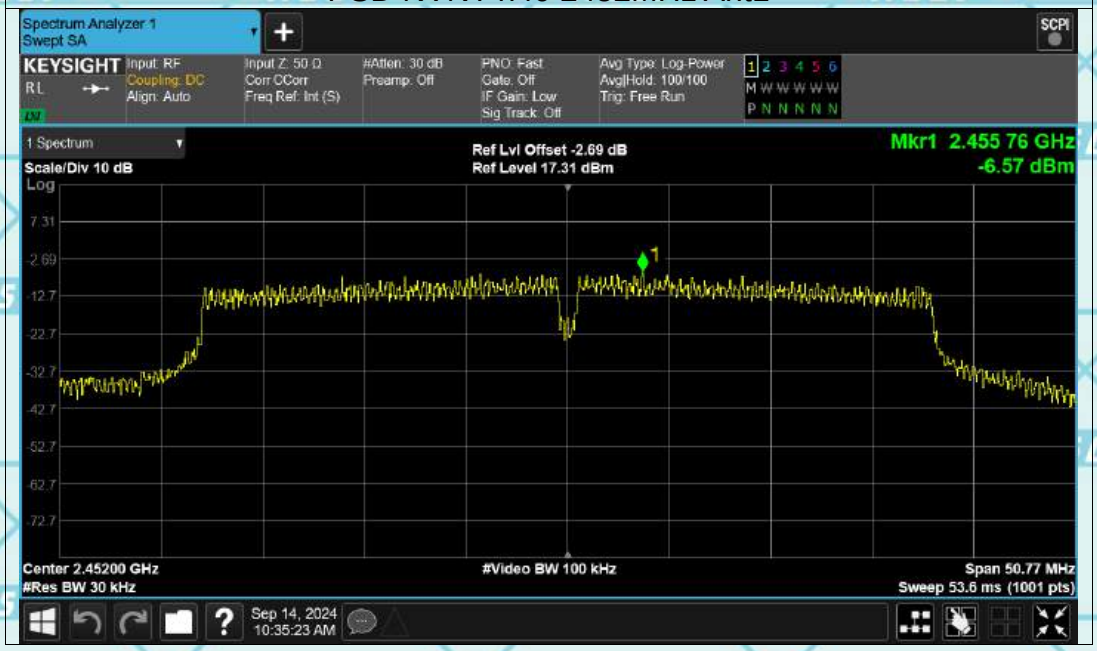


PSD NVNT n40 2422MHz Ant1

PSD NVNT n40 2437MHz Ant1



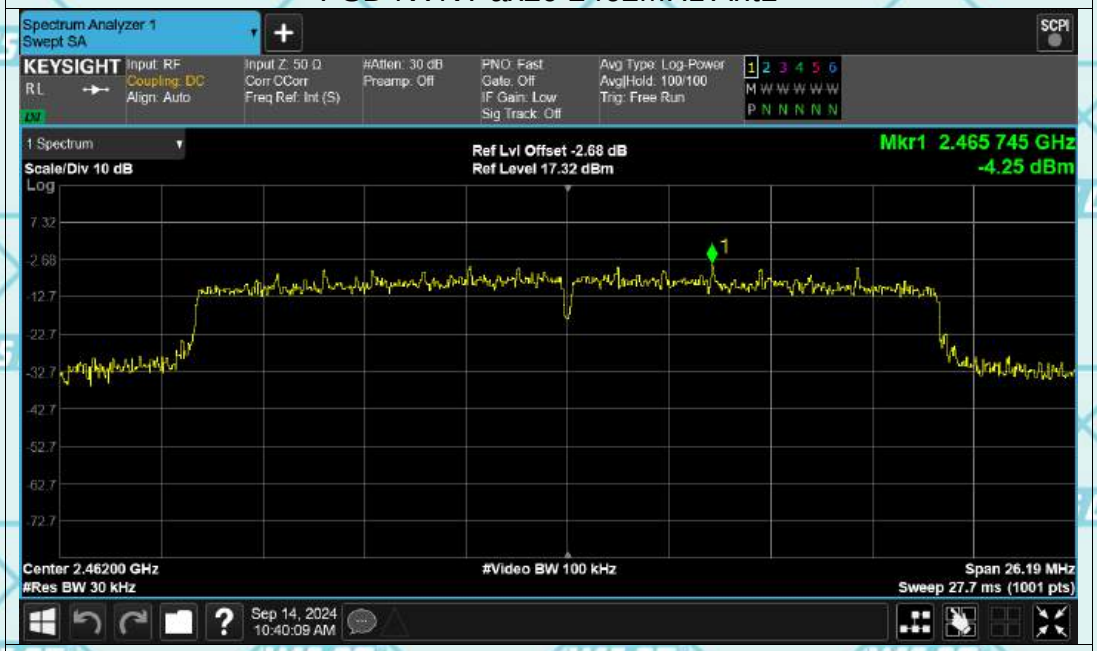
PSD NVNT n40 2452MHz Ant1



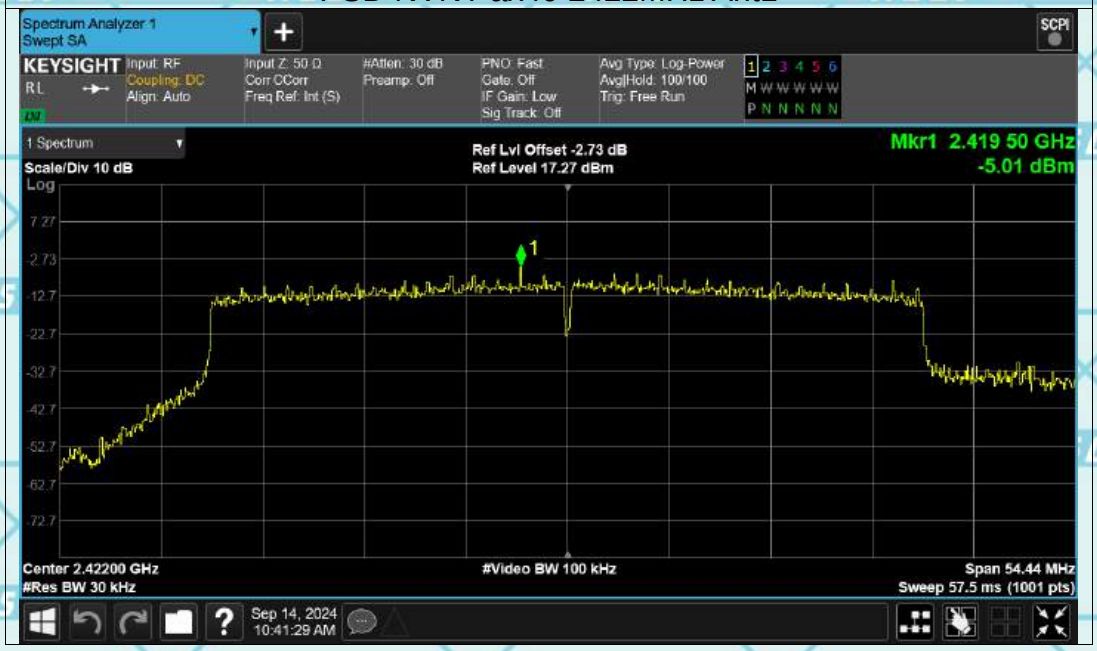
PSD NVNT ax20 2412MHz Ant1

PSD NVNT ax20 2437MHz Ant1

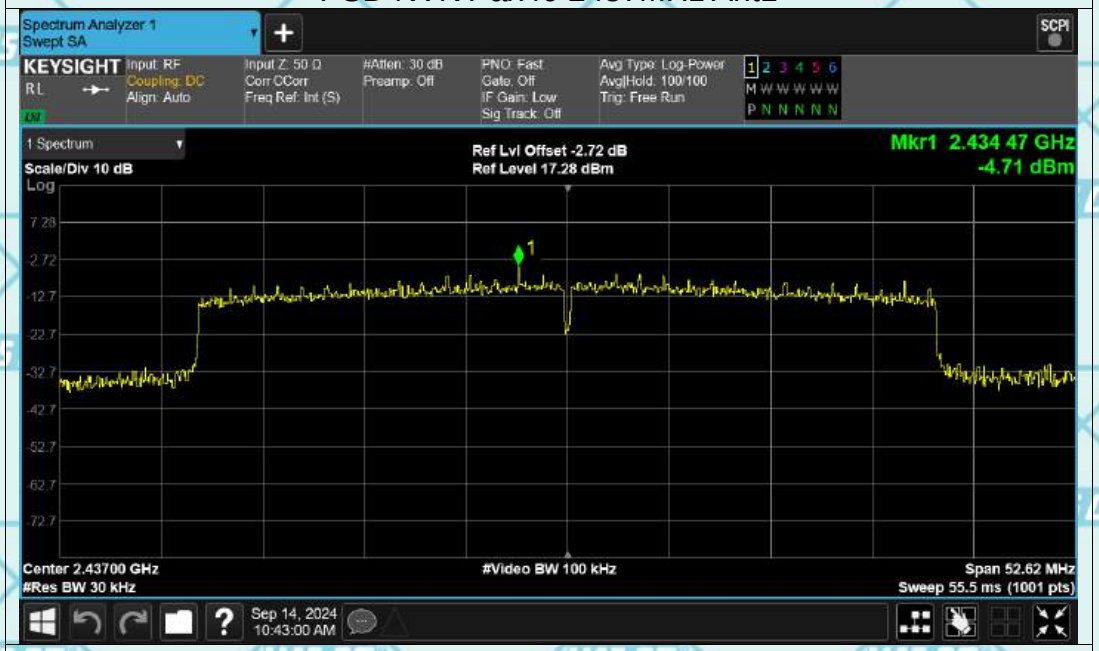
PSD NVNT ax20 2462MHz Ant1



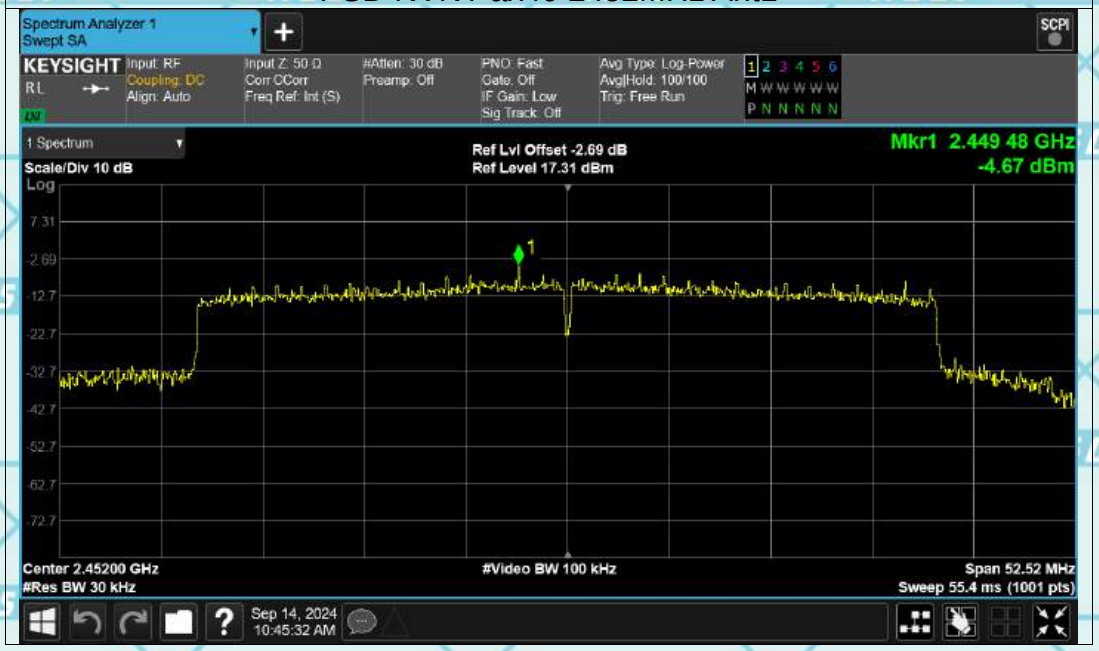
PSD NVNT ax40 2422MHz Ant1



PSD NVNT ax40 2437MHz Ant1

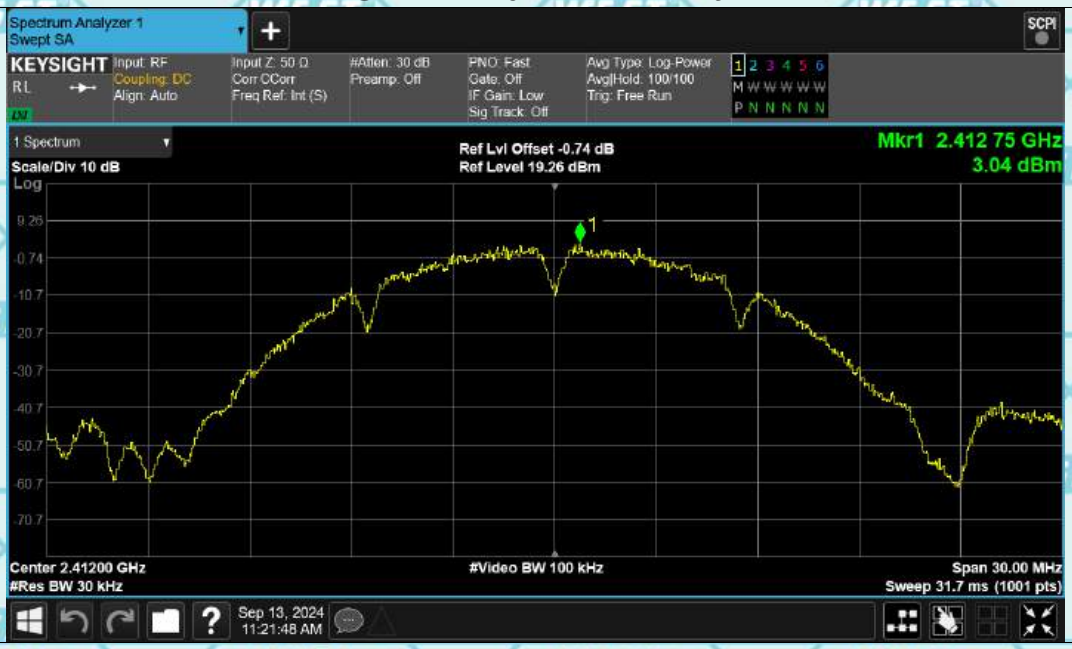


PSD NVNT ax40 2452MHz Ant1

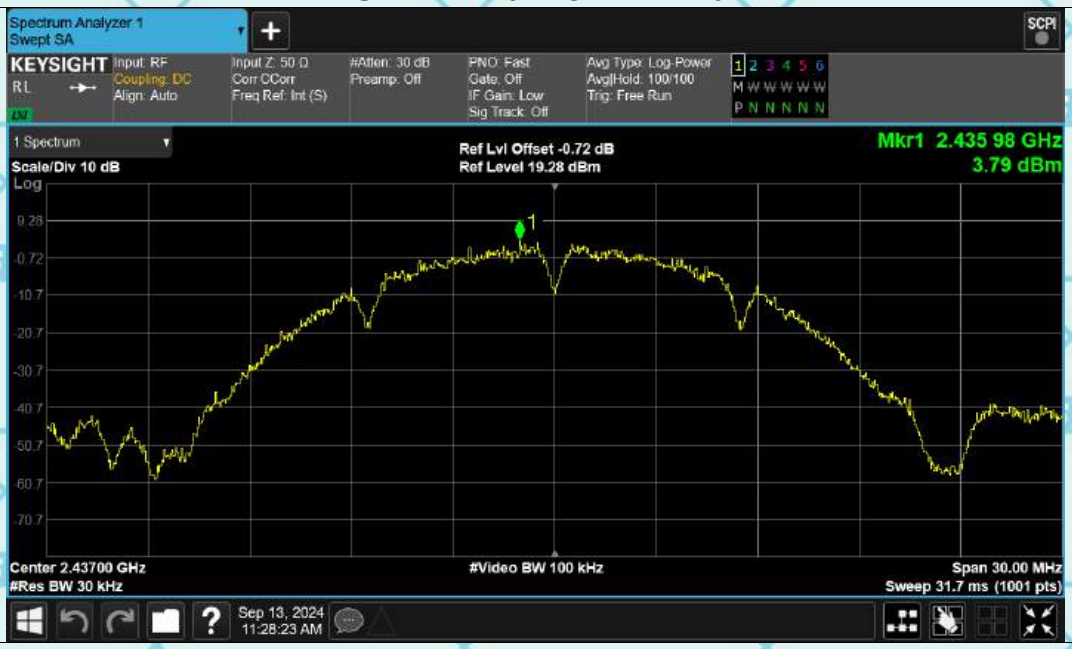


Test Graphs

PSD NVNT b 2412MHz Ant2



PSD NVNT b 2437MHz Ant2



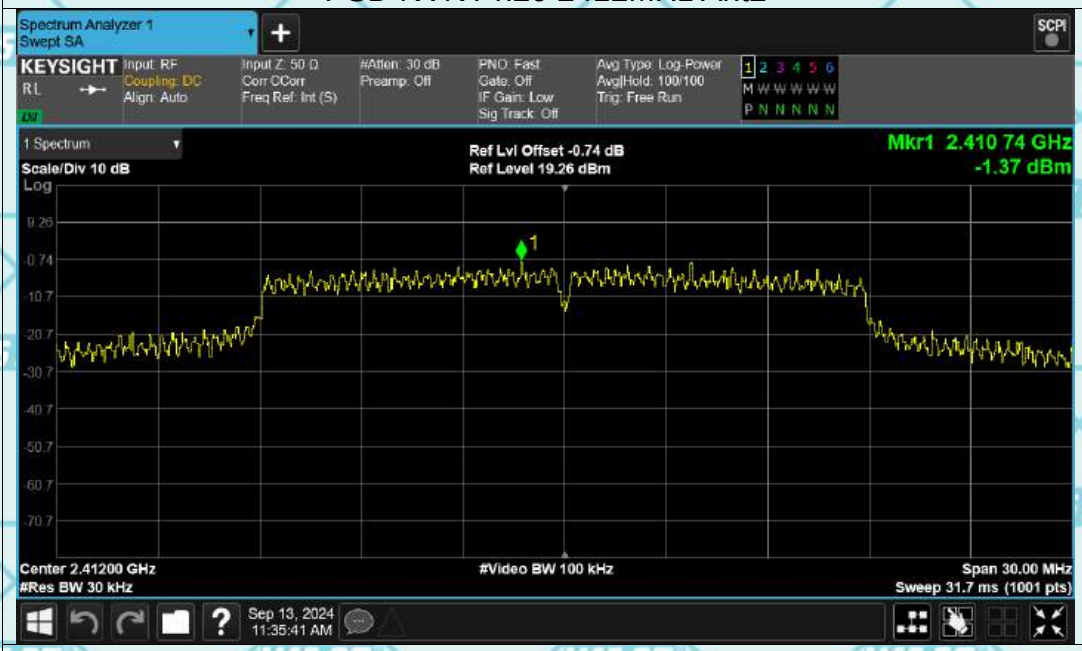
PSD NVNT b 2462MHz Ant2

PSD NVNT g 2412MHz Ant2

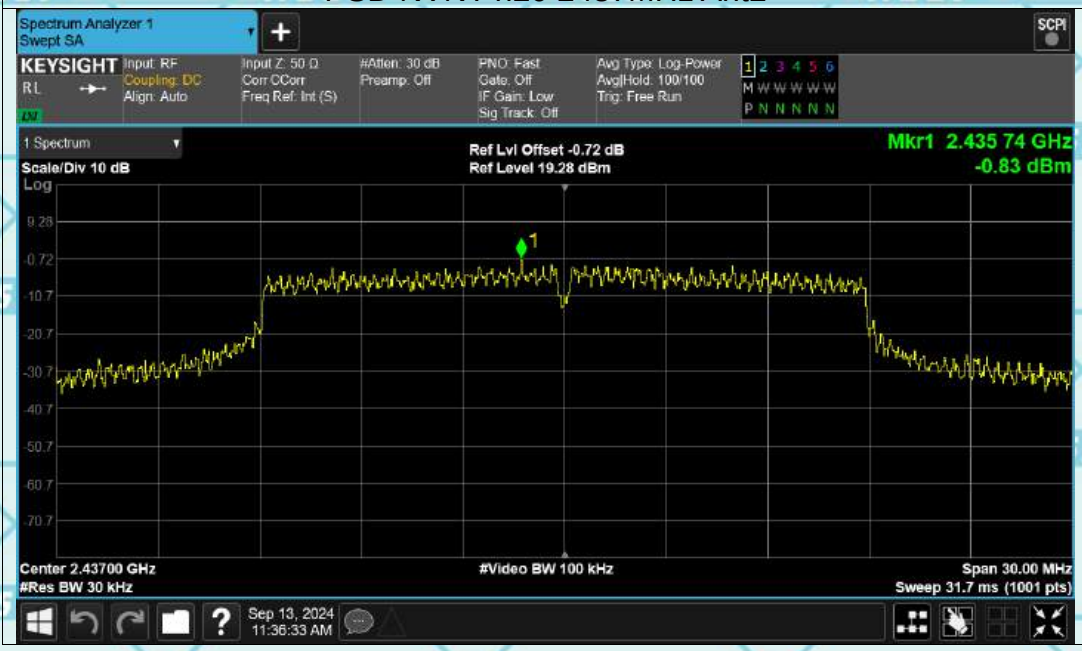
PSD NVNT g 2437MHz Ant2

PSD NVNT g 2462MHz Ant2

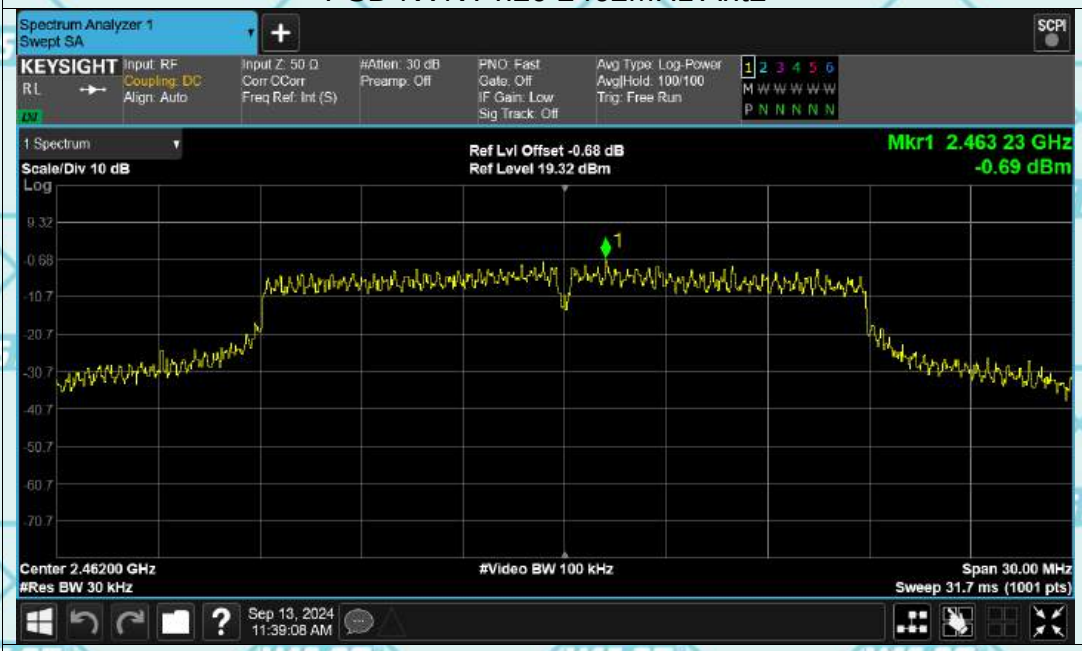
PSD NVNT n20 2412MHz Ant2



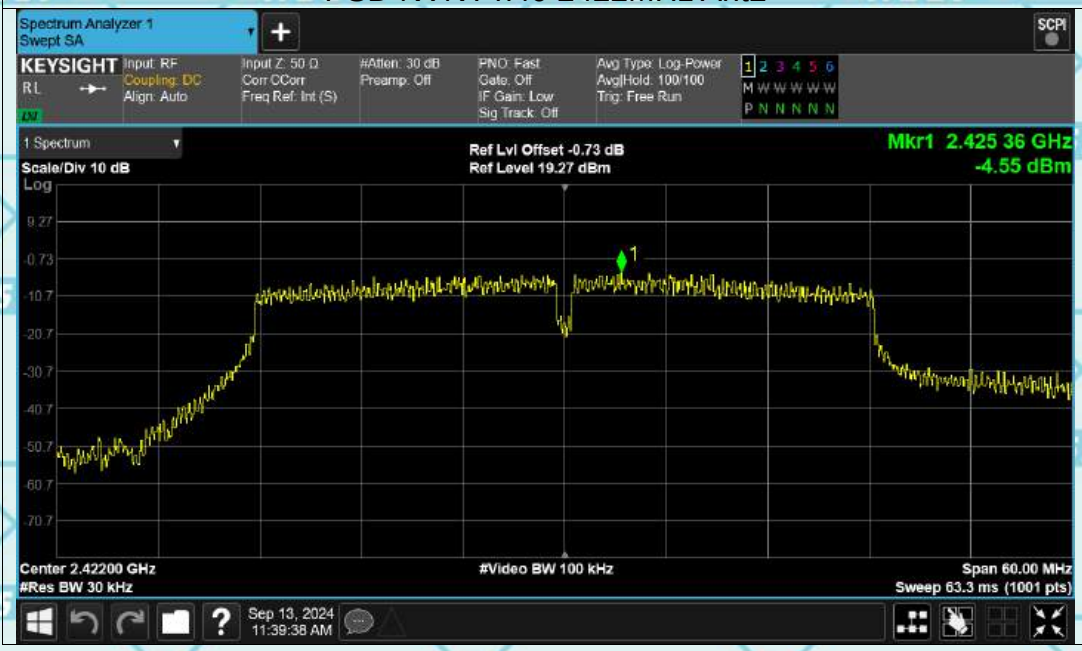
PSD NVNT n20 2437MHz Ant2



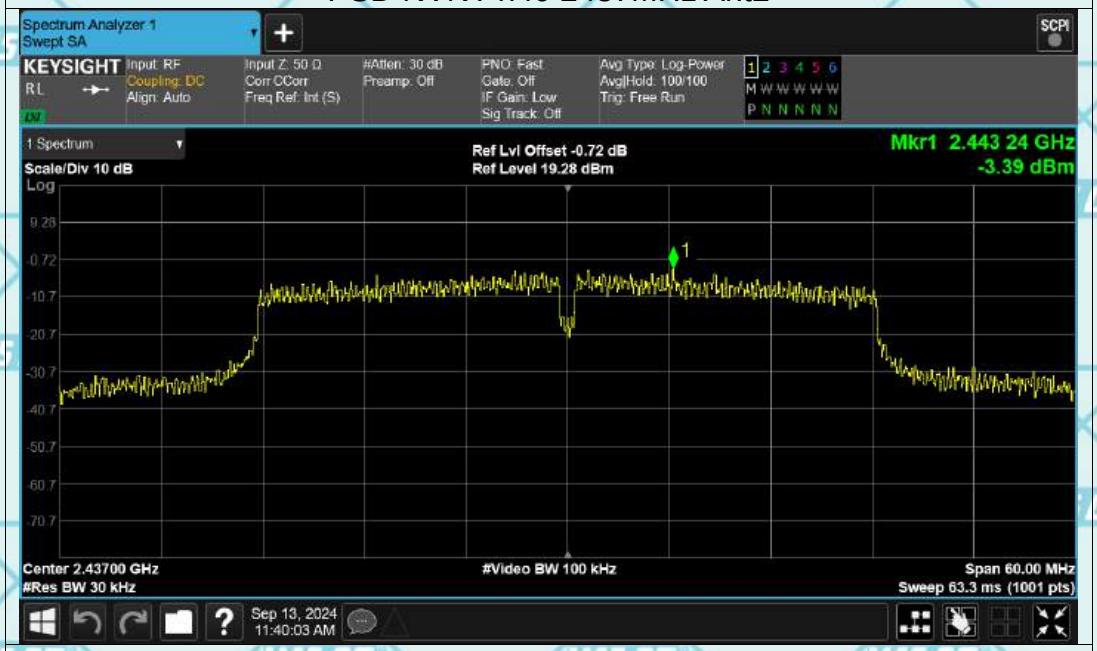
PSD NVNT n20 2462MHz Ant2



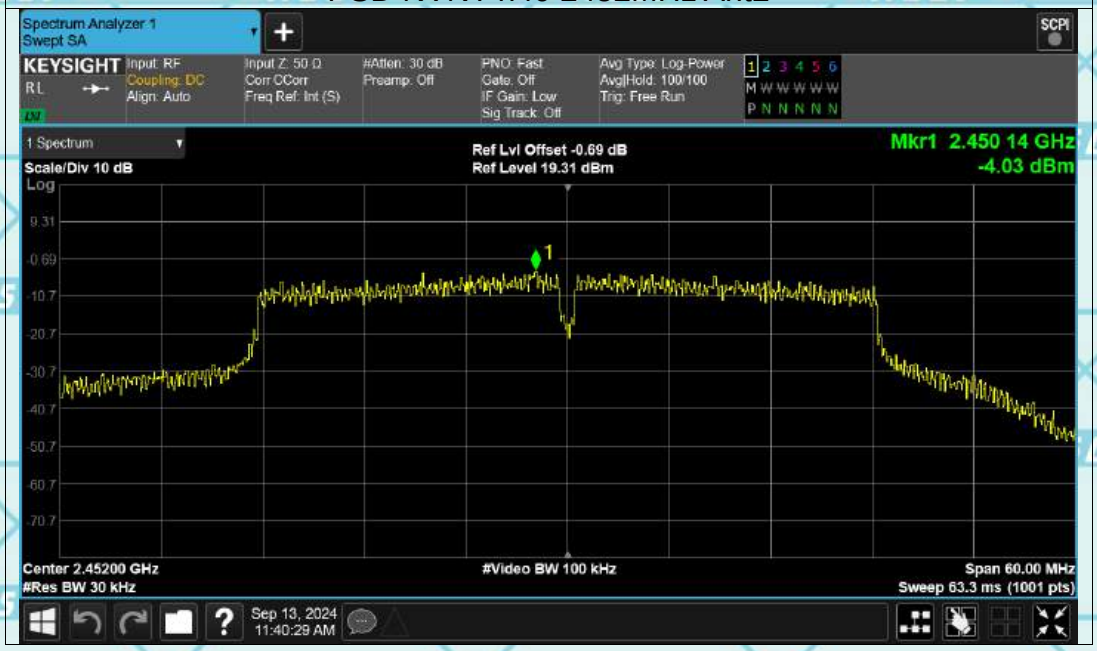
PSD NVNT n40 2422MHz Ant2



PSD NVNT n40 2437MHz Ant2

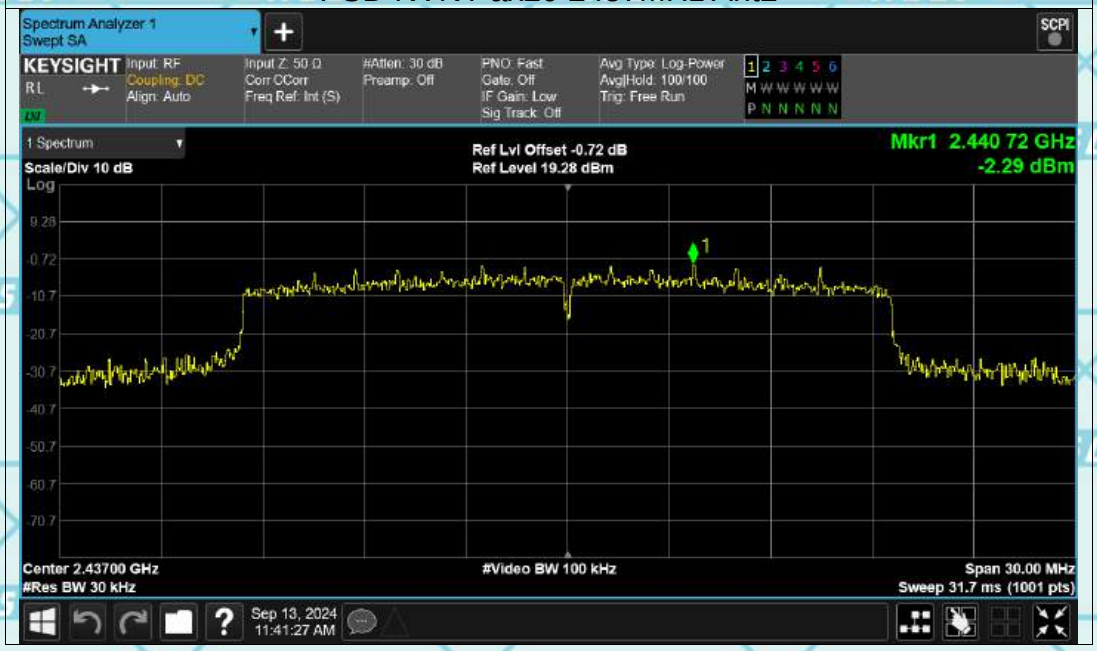


PSD NVNT n40 2452MHz Ant2



PSD NVNT ax20 2412MHz Ant2

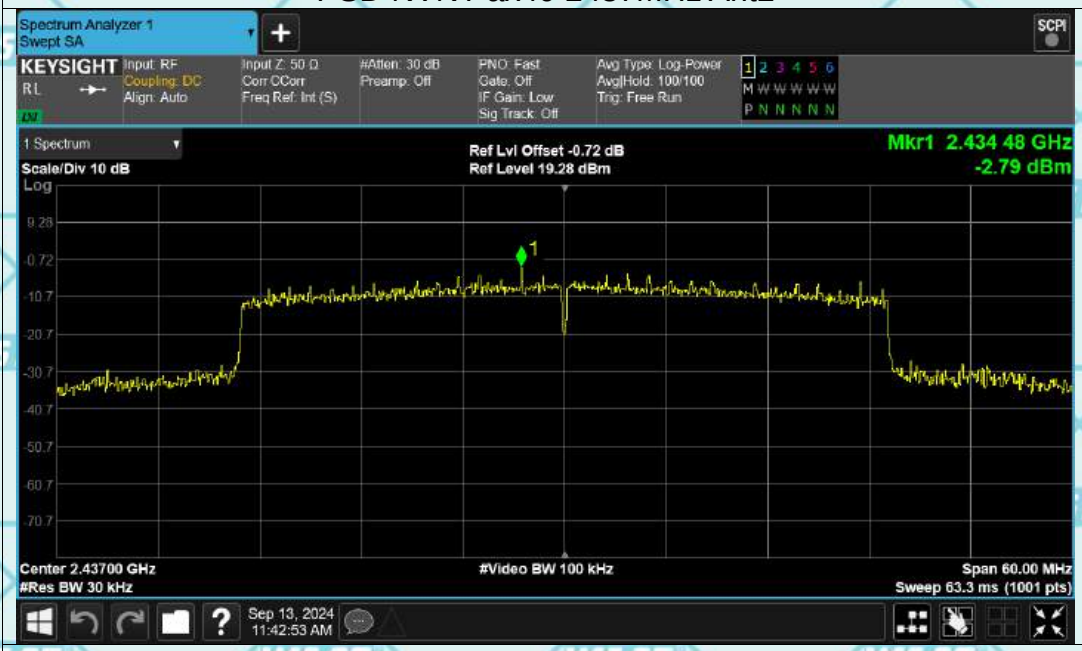
PSD NVNT ax20 2437MHz Ant2



PSD NVNT ax20 2462MHz Ant2

PSD NVNT ax40 2422MHz Ant2

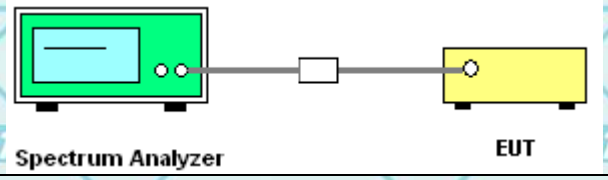
PSD NVNT ax40 2437MHz Ant2



PSD NVNT ax40 2452MHz Ant2

6.5. Conducted Band Edge and Spurious Emission Measurement

6.5.1. Test Specification

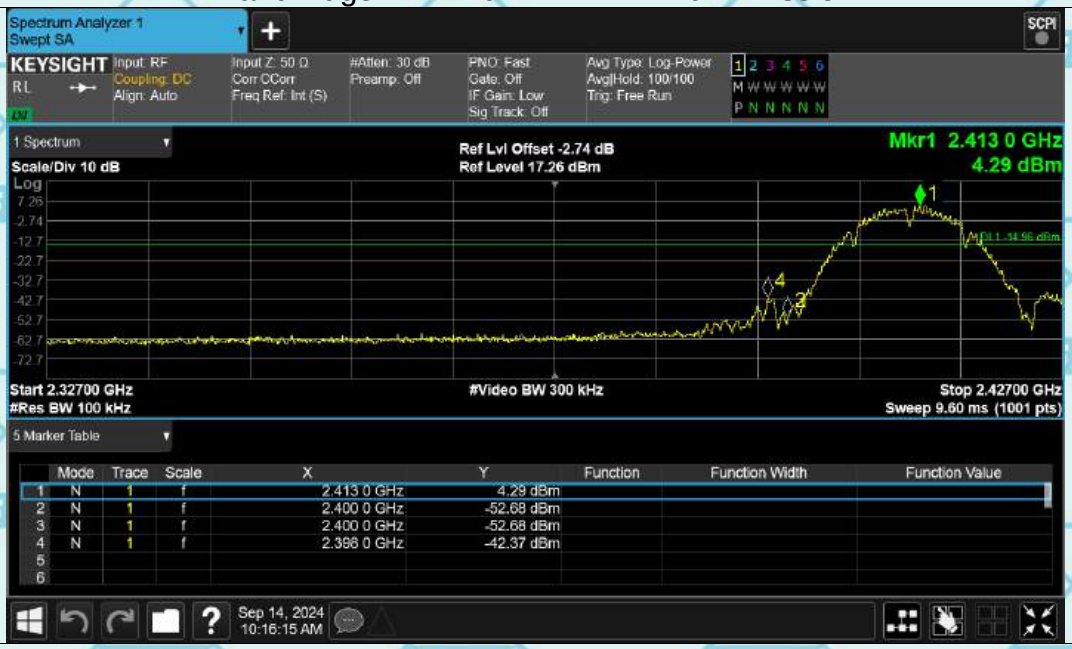
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted 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(worst)

Band Edge

Test Graphs
Band Edge NVNT b 2412MHz Ant1 Ref

Band Edge NVNT b 2412MHz Ant1 Emission



Band Edge NVNT b 2462MHz Ant1 Ref

Band Edge NVNT b 2462MHz Ant1 Emission

Band Edge NVNT g 2412MHz Ant1 Ref

Band Edge NVNT g 2412MHz Ant1 Emission

Band Edge NVNT g 2462MHz Ant1 Ref

Band Edge NVNT g 2462MHz Ant1 Emission

Band Edge NVNT n20 2412MHz Ant1 Ref

Band Edge NVNT n20 2412MHz Ant1 Emission

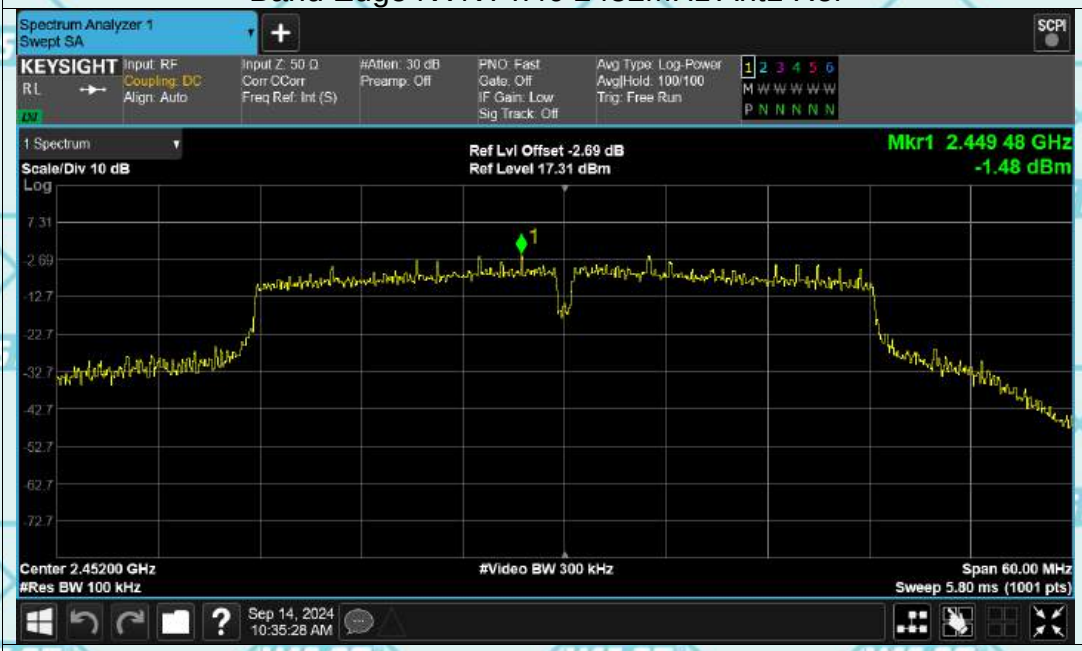
Band Edge NVNT n20 2462MHz Ant1 Ref

Band Edge NVNT n20 2462MHz Ant1 Emission

Band Edge NVNT n40 2422MHz Ant1 Ref

Band Edge NVNT n40 2422MHz Ant1 Emission

Band Edge NVNT n40 2452MHz Ant1 Ref



Band Edge NVNT n40 2452MHz Ant1 Emission

Band Edge NVNT ax20 2412MHz Ant1 Ref

Band Edge NVNT ax20 2412MHz Ant1 Emission

Band Edge NVNT ax20 2462MHz Ant1 Ref

Band Edge NVNT ax20 2462MHz Ant1 Emission