

ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT

Applicant: Raytac Corp.
8F, No.788-1, Zhongzheng Rd., Zhonghe Dist., New Taipei City, 235, Taiwan

Manufacturer: Raytac Corp.
8F, No.788-1, Zhongzheng Rd., Zhonghe Dist., New Taipei City, 235, Taiwan

Product Name: WiFi Low Energy & IEEE 802.11 a/b/g/n/ac/ax Module

Brand Name: Raytac

Model No.: AN7002Q-U

/ISED HVIN:

Family Model No.: AN7002Q-P, AN7002Q

/ Family ISED HVIN:

Model Difference: Refer to section1.2

ISED PMN: AN7002Q-U

Report Number: TERF2409002668ER

FCC ID SH6AN7002Q

IC: 8017A-AN7002Q

Date of EUT Received: September 5, 2025

Date of Test: September 6, 2024 ~ February 19, 2025

Issue Date: April 23, 2025

Approved By

Jay Lin

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2409002668ER	00	Original	April 14, 2025	Yuri Tsai	
TERF2409002668ER	01	Update section1.3	April 23, 2025	Yuri Tsai	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.

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Table of Contents

1	GENERAL INFORMATION.....	4
2	SYSTEM TEST CONFIGURATION.....	8
3	SUMMARY OF TEST RESULTS	11
4	DESCRIPTION OF TEST MODES	12
5	MEASUREMENT UNCERTAINTY	15
6	MEASUREMENT EQUIPMENT USED	16
7	CONDUCTED EMISSION TEST	18
8	PEAK OUTPUT POWER MEASUREMENT	22
9	EMISSION BANDWIDTH MEASUREMENT	31
10	CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT	38
11	RADIATED BANDEDGE AND SPURIOUS EMISSION MEASUREMENT	48
12	POWER SPECTRAL DENSITY	316
13	ANTENNA REQUIREMENT.....	321
14	PHOTOGRAPHS OF SET UP.....	322
15	PHOTOGRAPHS OF EUT	322

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	WiFi Low Energy & IEEE 802.11 a/b/g/n/ac/ax Module
Brand Name:	Raytac
Model No.: /ISED HVIN:	AN7002Q-U
Family Model No.: / Family ISED HVIN:	AN7002Q-P, AN7002Q
Hardware Version:	v0.9
Firmware Version:	v2.5.2
EUT Series No.:	DUT11
Power Supply:	3.6 Vdc
Test Software (Name/Version)	PuTTY Version 0.79

1.2 Model Difference

Diversity Description	Original Model	Series Model	Series Model
	AN7002Q-U	AN7002Q-P	AN7002Q
Components	External Antenna (Dipole, Monopole)	On board Antenna (PIFA)	On board Antenna (Monopole)
Size	16.4 x10.8x2.1mm	17.1x10.8x2.1mm	17.1x10.8x2.1mm

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1.3 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	14.98	12.70	DSSS
802.11g	2412~2462	11	22.36	12.90	OFDM
802.11n_HT20	2412~2462	11	21.89	12.70	OFDM
802.11ax_HE20	2412~2462	11	22.28	13.11	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS in 802.11b			
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g,11n			
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax			
Data Rate:		802.11b: 1/2/5.5/11 Mbps			
		802.11g: 6/9/12/18/24/36/48/54 Mbps			
		802.11n_HT20: up to 72.2Mbps			
		802.11ax_HE20: up to 143.4Mbps			

WLAN 2.4GHz for IC

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Rated Power in dBm (EIRP)	Modulation Technology
			Peak	Avg.		
802.11b	2412~2462	11	14.98	12.70	15.80	DSSS
802.11g	2412~2462	11	22.36	12.90	16.00	OFDM
802.11n_HT20	2412~2462	11	21.89	12.70	15.80	OFDM
802.11ax_HE20	2412~2462	11	22.28	13.11	16.21	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS in 802.11b				
		64QAM, 16QAM, QPSK, BPSK for OFDM in 802.11g,11n				
		1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA in 802.11ax				
Data Rate:		802.11b: 1/2/5.5/11 Mbps				
		802.11g: 6/9/12/18/24/36/48/54 Mbps				
		802.11n_HT20: up to 72.2Mbps				
		802.11ax_HE20: up to 143.4Mbps				

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1.4 Antenna Designation

External Antenna:

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)
Dipole	2412~2462	3.1
Dipole	2412~2462	2.22
Dipole	2412~2462	2.9
Monopole	2412~2462	1.4

On Board Antenna:

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)
Monopole	2412~2462	0.94
PIFA	2412~2462	2.2

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. Antenna information is provided by the applicant.

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1.5 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

RSS-247 issue 3 Aug. 2023

RSS-Gen, Issue 5 April 2018, Amendment 2 (February 2021)

ANSI C63.10:2013

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.7 Special Accessories

There are no special accessories used while test was conducted.

1.8 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

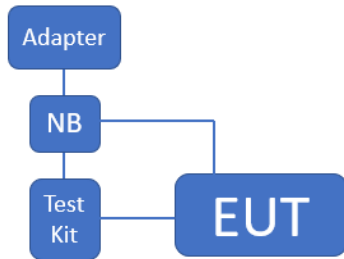
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

2.5 Test Configuration

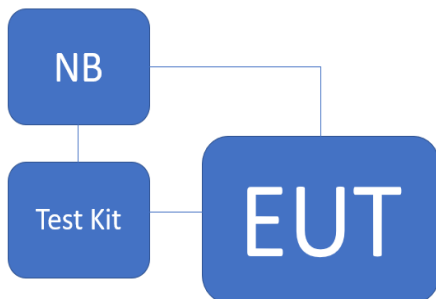
Conduction Setup



Conducted Setup



Radiated Setup



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2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
USB Cable	FONG HUA	USB-C18	128342	N/A	N/A
Test Kit	Waveshare	FT232	N/A	N/A	N/A
Notebook	Lenovo	L440	P0000367	N/A	N/A
NB Adapter	Lenovo	ADLX45DLC3A	8SSA10E75791L1CZ 76P12D3	N/A	N/A
Conducted Emission Test Site: Conducted F					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Notebook	Lenovo	T14	P0003332	N/A	N/A
Type C Cable	MI	SJX10ZM	N/A	N/A	N/A
TestKit	Silicon Lab	CP2102	N/A	N/A	N/A
Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
USB Cable	FONG HUA	USB-C18	128342	N/A	N/A
Test Kit	Waveshare	FT232	N/A	N/A	N/A
Notebook	Lenovo	L440	P0000367	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4 d	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.209 §15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.209 §15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.205	RSS-Gen § 8.10	Restricted Bands	Compliant
§15.247(e)	RSS-247 §5.2 b	Power Spectral Density	Compliant
§15.203	N/A	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operating Frequencies

2400~2483.5 MHz

20MHz	
CH	Freq. (MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

The given UE is pre-scanned among below modes.

Modulation		Transmission Chain								Single Transmission Spatial		Multi Transmission Spatial	
V	802.11 b	V	Ch0		Ch1		Ch2		Ch3	V	1TX		1TX
V	802.11 g	V	Ch0		Ch1		Ch2		Ch3	V	1TX		1TX
V	802.11 n	V	Ch0		Ch1		Ch2		Ch3	V	1TX		1TX
	802.11 ac		Ch0		Ch1		Ch2		Ch3		1TX		1TX
V	802.11 ax	V	Ch0		Ch1		Ch2		Ch3	V	1TX		1TX
	802.11 be		Ch0		Ch1		Ch2		Ch3		1TX		1TX

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	Ch0
802.11g	1 to 11	1,6,11	OFDM	6	Ch0
802.11n_HT20	1 to 11	1,6,11	OFDM	MCS0	Ch0

CONDUCTED TEST						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	1 to 11	1,6,11	OFDMA	FULL RU 26/0,26/8 52/37,52/40 106/53,106/54	MCS0	Ch0

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TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 13	1,6,11	DSSS	1	ch0
802.11g	1 to 13	1,6,11	OFDM	6	ch0
802.11n_HT20	1 to 13	1,6,11	OFDM	MCS0	ch0

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	1 to 11	1,6,11	OFDMA	FULL RU 26/0,26/8 52/37,52/40 106/53,106/54	MCS0	ch0

Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.54 dB
Output Power measurement	+/- 0.97 dB
Emission Bandwidth	+/- 1.38 Hz
Conducted emission measurement	+/- 0.77 dB
Peak Power Density	+/- 0.61 dB
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	1.89 dB	9kHz~30MHz
	+/-	4.15 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89 dB	9kHz~30MHz
	+/-	4.02 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2 dB	33GHz-50GHz
	+/-	1.59 dB	50GHz-60GHz
	+/-	1.7 dB	60GHz-90GHz
	+/-	1.64 dB	90GHz-140GHz
	+/-	3.83 dB	140GHz-220GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 MEASUREMENT EQUIPMENT USED

6.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2024	03/26/2025
EMI Test Receiver	R&S	ESCI	101342	04/29/2024	04/28/2025
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/22/2024	04/21/2025
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2024	03/26/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

6.2 Conducted Measurement

Conducted Emission Test Site: Conducted F					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Woken	WATT-218FS-10	RF12	11/14/2024	11/13/2025
Attenuator	Woken	WATT-218FS-10	RF24	11/14/2024	11/13/2025
DC Block	Marvelous	MVE6114	RF41	11/14/2024	11/13/2025
Power Meter	Anritsu	ML2496A	2138002	08/28/2024	08/27/2025
Power Sensor	Anritsu	MA2411B	1911390	08/28/2024	08/27/2025
Power Sensor	Anritsu	MA2411B	1911398	08/28/2024	08/27/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	06/28/2024	06/27/2025
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

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6.3 Radiated Measurement

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3m Site NSA	SGS	966 chamber C	N/A	03/02/2024	03/01/2025
3m Site NSA	SGS	966 chamber G	N/A	03/30/2024	03/29/2025
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/11/2024	12/10/2025
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	11/06/2024	11/05/2025
Coaxial Cable	EMCI+Huber Suhner	EMCCFD400-NM- NM- 8000+EMCCFD400- NM-NM- 5000+SUCOFLEX100 +EMC104-SM-SM- 2000+EMC104-SM- SM-8000+EMC104- SM-SM-5000	210216+210217+84 103701/15+160105+ 210217+210220	11/14/2024	11/13/2025
Highpass Filter	R&S	F13 HPF 3GHz	RF167	11/14/2024	11/13/2025
Horn Antenna	RF SPIN	DRH18-E	210105A18E	04/12/2024	04/11/2025
Horn Antenna	Schwarzbeck	BBHA9170	184	12/20/2024	12/19/2025
Pre-Amplifier	EMC Instruments	EMC118A45SE	980815	05/08/2024	05/07/2025
Pre-Amplifier	EMC Instruments	EMC184945SEE	980938	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC330N	980781	03/13/2024	03/12/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071574	06/28/2024	06/27/2025
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

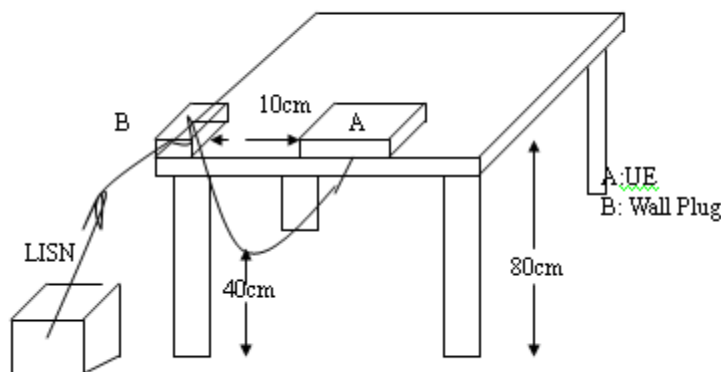
Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

7.2 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

7.3 Test Setup



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7.4 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

7.5 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closest to the limit.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2409002668ER

Test Site :Conduction C

Test Mode :2.4G

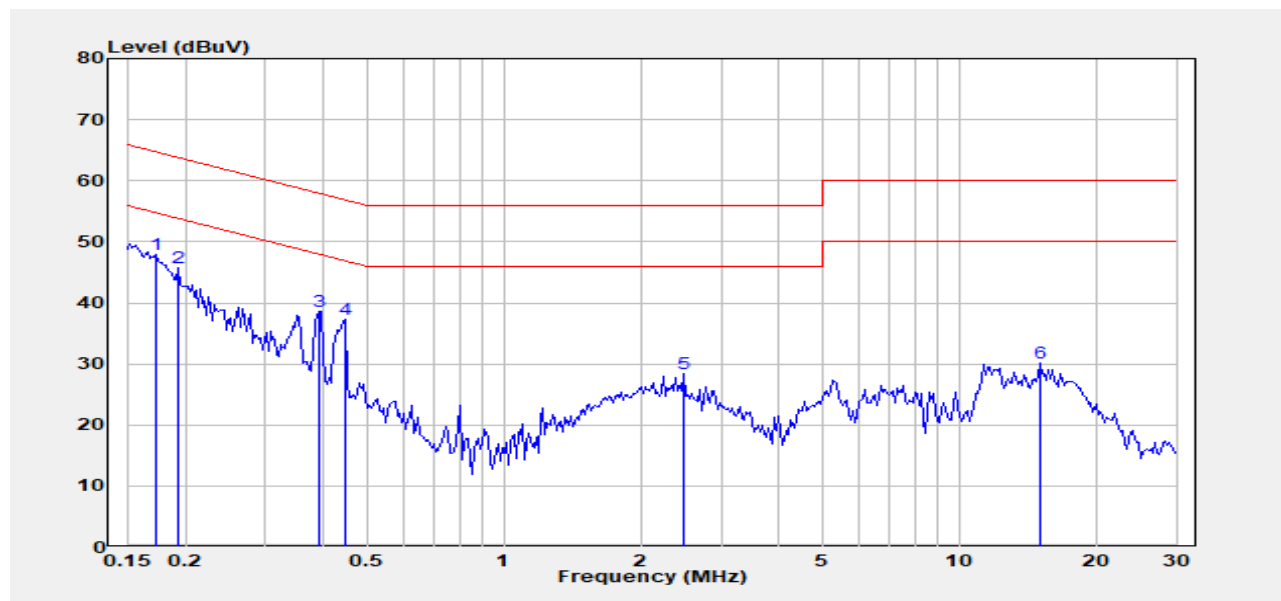
Test Date :2025-02-18

Power :120V/60Hz

Temp./Humi :21.5°C/53%

Probe :L1

Engineer :Temo Chen



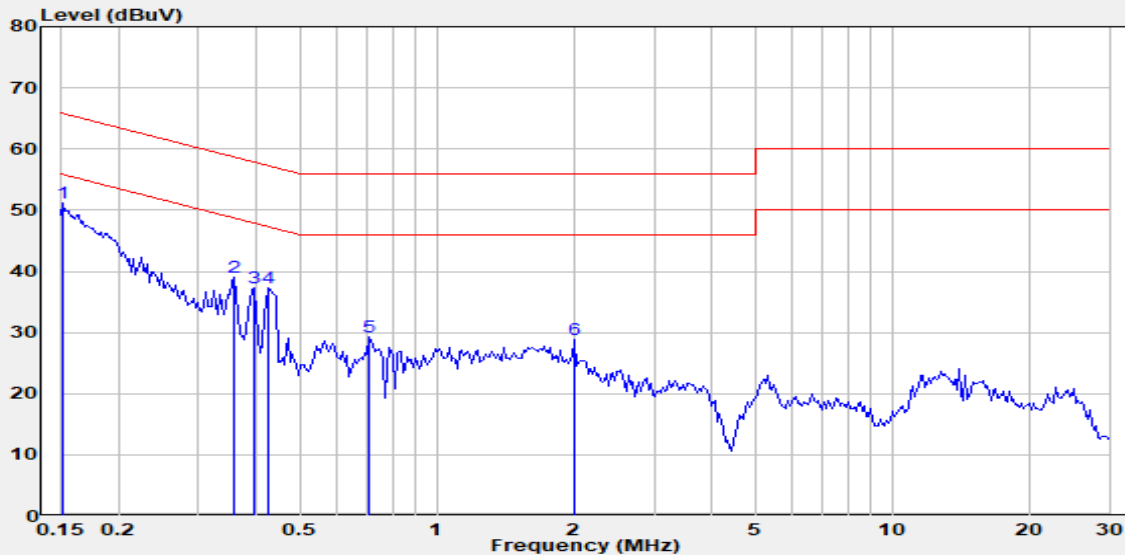
Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
Mode		Reading Level		FS		
MHz	PK/QP/AV	dBμV	dB	dBμV	dBμV	dB
0.172	Peak	37.31	10.65	47.96	64.86	-16.89
0.193	Peak	35.01	10.65	45.66	63.89	-18.23
0.393	Peak	27.97	10.62	38.59	57.99	-19.40
0.447	Peak	26.60	10.62	37.22	56.93	-19.71
2.487	Peak	17.52	10.81	28.33	56.00	-27.67
15.066	Peak	18.98	11.08	30.05	60.00	-29.95

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Report Number :TERF2409002668ER
Test Mode :2.4G
Power :120V/60Hz
Probe :N

Test Site :Conduction C
Test Date :2025-02-18
Temp./Humi :21.5°C/53%
Engineer :Temo Chen



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
Mode	Reading Level			FS		
MHz	PK/QP/AV	dBμV	dB	dBμV	dBμV	dB
0.152	Peak	40.44	10.66	51.10	65.91	-14.81
0.358	Peak	28.37	10.62	38.99	58.78	-19.80
0.398	Peak	26.69	10.61	37.30	57.90	-20.60
0.428	Peak	26.73	10.61	37.34	57.29	-19.95
0.712	Peak	18.70	10.64	29.34	56.00	-26.66
2.012	Peak	18.04	10.75	28.79	56.00	-27.21

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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

8.1.1 Duty Cycle

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

8.1.2 FCC

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

8.1.3 ISED

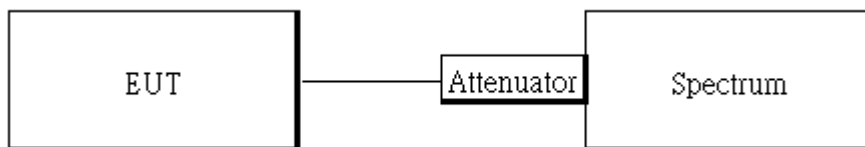
For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W.

Note:

When the antenna gain is greater than 6 dBi, the power limit attenuated accordingly.

8.2 Test Setup

8.2.1 Duty Cycle

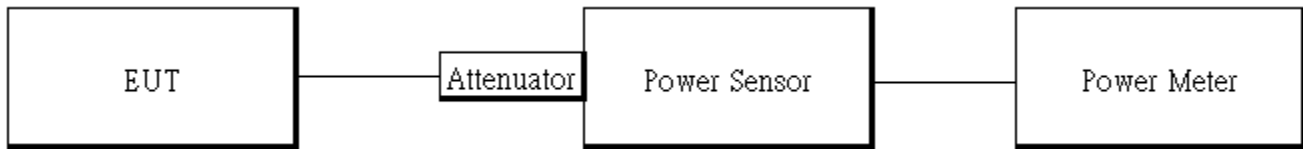


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8.2.2 Output Power:



8.3 Measurement Procedure

8.3.1 Duty Cycle:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

8.3.2 Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.

*** Note: The duty cycle factor and below is compensated to obtain the maximum value of measurement in average.**

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8.4 Measurement Result

8.4.1 Duty Cycle:

Mode		Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)
802.11b		98.41	0.07
802.11g		91.68	0.38
802.11n_20		96.12	0.17
Mode	RU Config	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)
802.11ax_20	Full	95.06	0.22
	26 RU	92.10	0.36
	52 RU	91.16	0.40
	106 RU	91.16	0.40

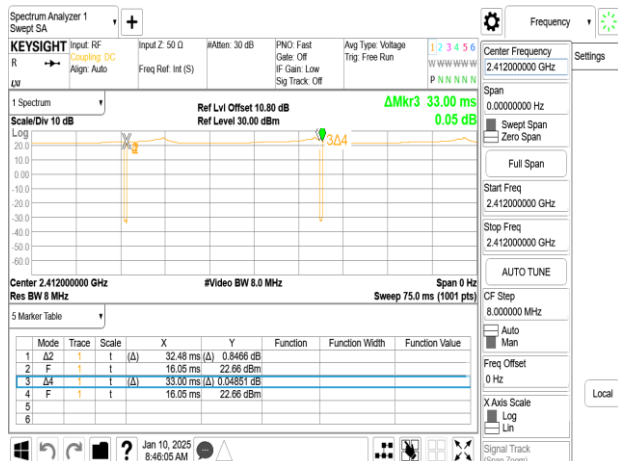
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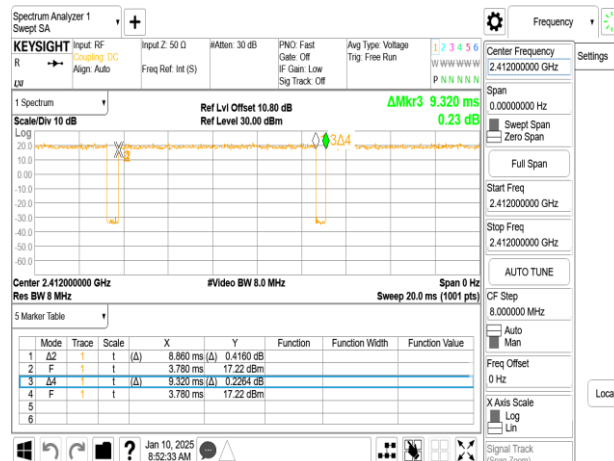
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8.4.2 Duty Cycle test plots

802.11b_20MHz_Chain0_2412MHz



802.11ax_20MHz_Chain0_2412MHz



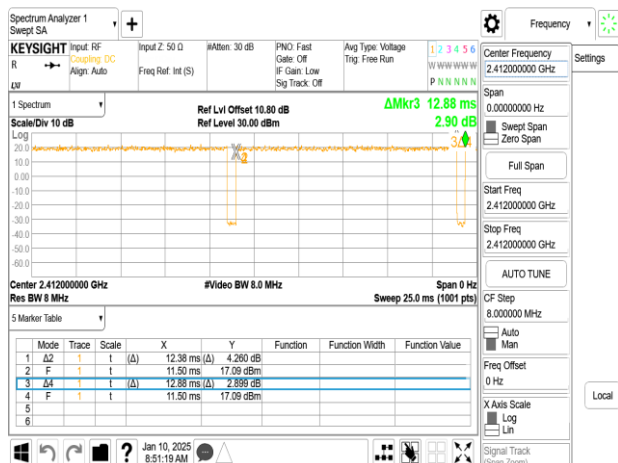
802.11g_20MHz_Chain0_2412MHz



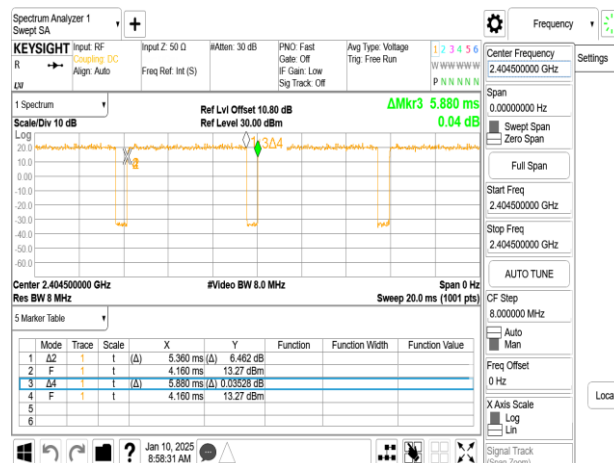
802.11ax_20MHz_Chain0_2412MHz_RU26_0



802.11n_20MHz_Chain0_2412MHz



802.11ax_20MHz_Chain0_2412MHz_RU52_37



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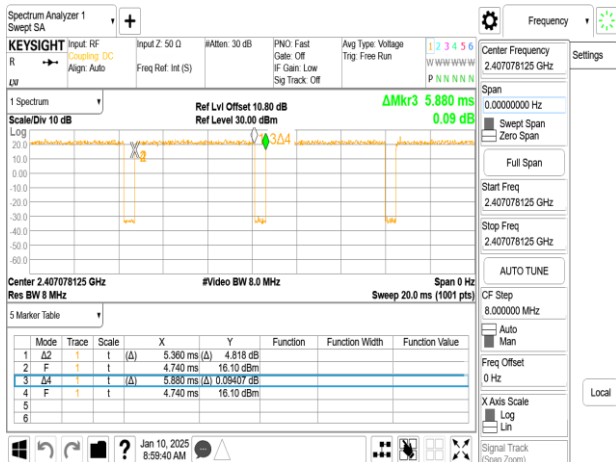
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802.11ax_20MHz_Chain0_2412MHz_RU106_53



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8.4.3 Output Power

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	18	31.48	14.98	30.00	PASS
6	2437	1	18	30.62	14.86	30.00	PASS
11	2462	1	18	31.26	14.95	30.00	PASS

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	18	18.62	12.70	30.00	PASS
6	2437	1	18	18.15	12.59	30.00	PASS
11	2462	1	18	18.53	12.68	30.00	PASS

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	18	172.19	22.36	30.00	PASS
6	2437	6	18	170.22	22.31	30.00	PASS
11	2462	6	18	171.40	22.34	30.00	PASS

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	18	19.49	12.90	30.00	PASS
6	2437	6	18	19.22	12.84	30.00	PASS
11	2462	6	18	19.35	12.87	30.00	PASS

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802.11n_HT_20M Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	18	153.82	21.87	30.00	PASS
6	2437	MCS0	18	153.46	21.86	30.00	PASS
11	2462	MCS0	18	154.53	21.89	30.00	PASS
802.11n_HT_20M Ch0							
CH	Freq. (MHz)	Data Rate	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	18	18.37	12.64	30.00	PASS
6	2437	MCS0	18	18.12	12.58	30.00	PASS
11	2462	MCS0	18	18.63	12.70	30.00	PASS

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802.11ax_HE_20M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Peak Output Power (mW)	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	18	157.40	21.97	30.00	PASS
			26/0	18	132.13	21.21	30.00	PASS
			52/37	18	151.01	21.79	30.00	PASS
			106/53	18	153.82	21.87	30.00	PASS
6	2437	MCS0	full	18	156.68	21.95	30.00	PASS
11	2462	MCS0	full	18	169.04	22.28	30.00	PASS
			26/8	18	139.64	21.45	30.00	PASS
			52/40	18	152.41	21.83	30.00	PASS
			106/54	18	161.06	22.07	30.00	PASS

802.11ax_HE_20M Ch0

CH	Freq. (MHz)	Data Rate	RU Config	Power Setting	Avg. Output Power (mW)	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	18	19.95	13.00	30.00	PASS
			26/0	18	14.25	11.54	30.00	PASS
			52/37	18	16.08	12.06	30.00	PASS
			106/53	18	18.59	12.69	30.00	PASS
6	2437	MCS0	full	18	19.72	12.95	30.00	PASS
11	2462	MCS0	full	18	20.46	13.11	30.00	PASS
			26/8	18	15.37	11.87	30.00	PASS
			52/40	18	17.19	12.35	30.00	PASS
			106/54	18	20.05	13.02	30.00	PASS

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8.4.4 EIRP

802.11b Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	12.70	3.10	15.80	36	PASS
6	2437	1	12.59	3.10	15.69	36	PASS
11	2462	1	12.68	3.10	15.78	36	PASS

802.11g Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	12.90	3.10	16.00	36	PASS
6	2437	6	12.84	3.10	15.94	36	PASS
11	2462	6	12.87	3.10	15.97	36	PASS

802.11n_HT_20M Ch0							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	12.64	3.10	15.74	36	PASS
6	2437	MCS0	12.58	3.10	15.68	36	PASS
11	2462	MCS0	12.70	3.10	15.80	36	PASS

802.11ax_HE_20M Ch0								
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
1	2412	MCS0	full	13.00	3.10	16.10	36	PASS
			26/0	11.54	3.10	14.64	36	PASS
			52/37	12.06	3.10	15.16	36	PASS
			106/53	12.69	3.10	15.79	36	PASS
6	2437	MCS0	full	12.95	3.10	16.05	36	PASS
11	2462	MCS0	full	13.11	3.10	16.21	36	PASS
			26/8	11.87	3.10	14.97	36	PASS
			52/40	12.35	3.10	15.45	36	PASS
			106/54	13.02	3.10	16.12	36	PASS

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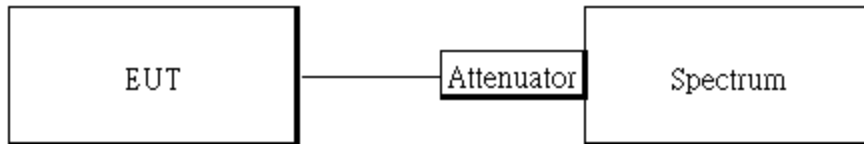
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9 EMISSION BANDWIDTH MEASUREMENT

9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Test Setup



9.3 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

9.3.1 6dB BW measurements

1. The testing follows the Measurement Procedure of the KDB 558074 D01.
2. Set the spectrum analyzer as
RBW= 100 kHz ,
VBW = 3 X RBW,
Span= 2 to 5 times of the OBW,
Sweep=auto, Detector = Peak, and Max hold.
3. Mark the upper and lower frequencies of -6dB.
4. Repeat above procedures until all test default channel is completed.

9.3.2 99% BW measurements

1. The testing follows the Measurement Procedure of the RSS-Gen section 6.7.
2. Set the spectrum analyzer as
RBW= 1 % to 5% of 99%,
VBW $\geq$ 3 X RBW,
Span= large enough to capture all products of the modulation process
Sweep=auto, Detector = Peak, and Max hold.
3. Mark the upper and lower frequencies of 99%.
4. Repeat above procedures until all test default channel is completed.

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9.4 Measurement Result:

9.4.1 6dB BW measurements

802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	9072	≥ 500	PASS
2437	9035	≥ 500	PASS
2462	9065	≥ 500	PASS

802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15120	≥ 500	PASS
2437	15150	≥ 500	PASS
2462	15110	≥ 500	PASS

802.11n_HT_20M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15160	≥ 500	PASS
2437	15100	≥ 500	PASS
2462	14450	≥ 500	PASS

802.11ax_HE_20M Ch0

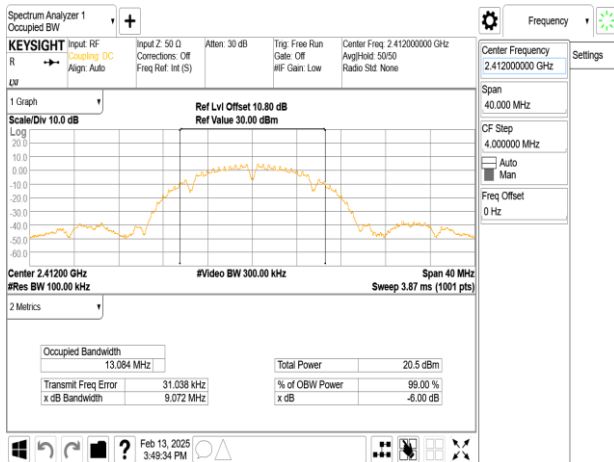
Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	18310	≥ 500	PASS
2437	full	18550	≥ 500	PASS
2462	full	18620	≥ 500	PASS

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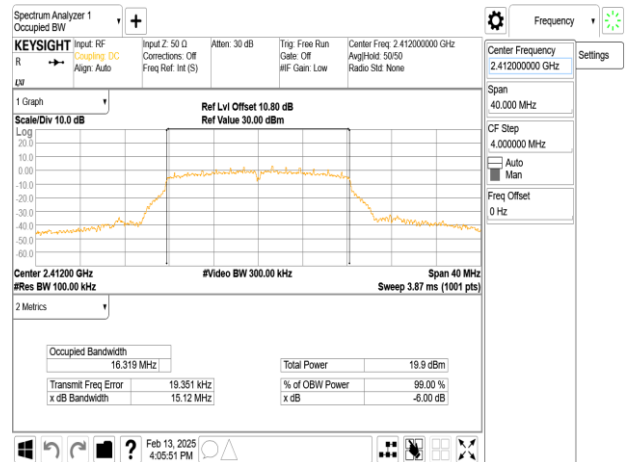
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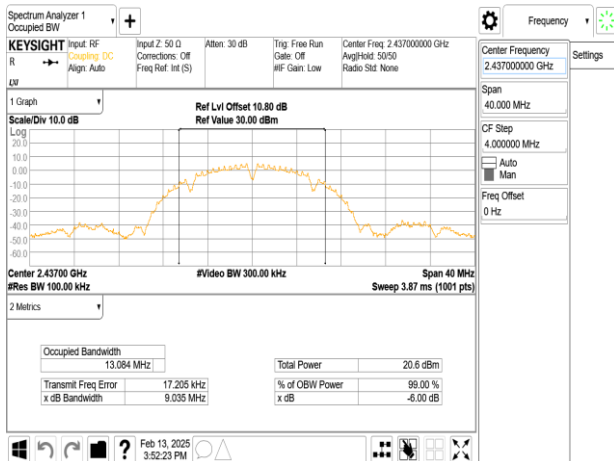
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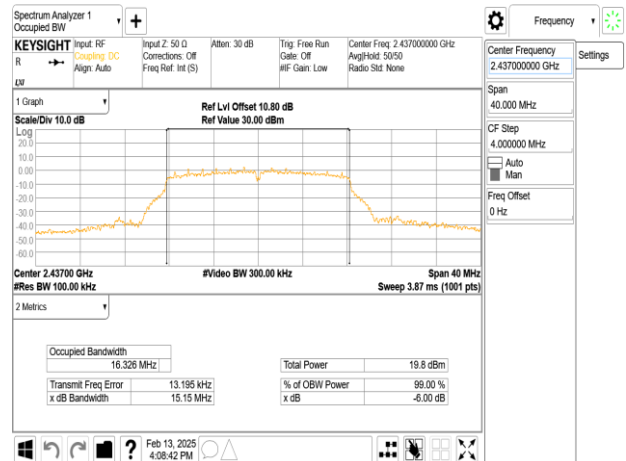
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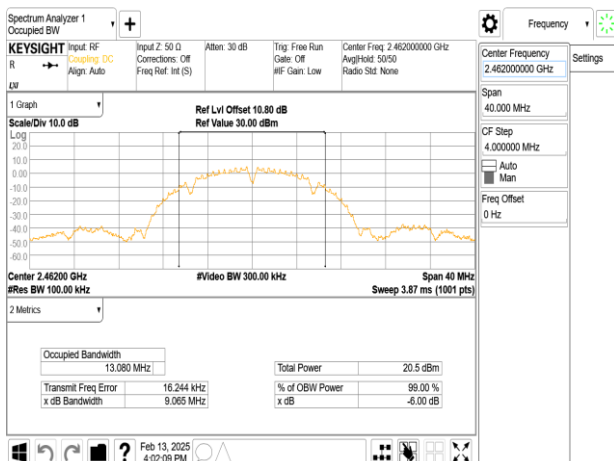
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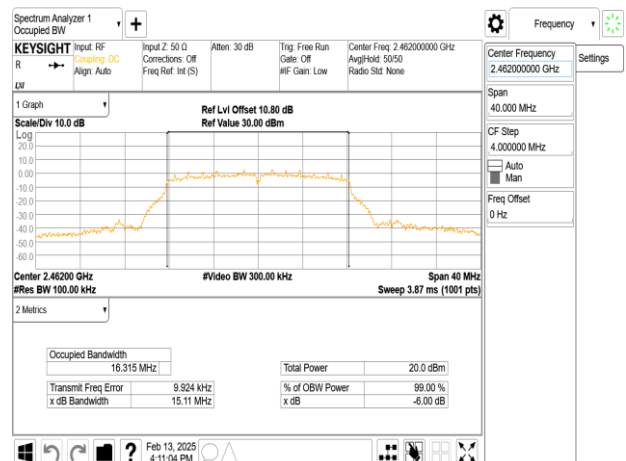
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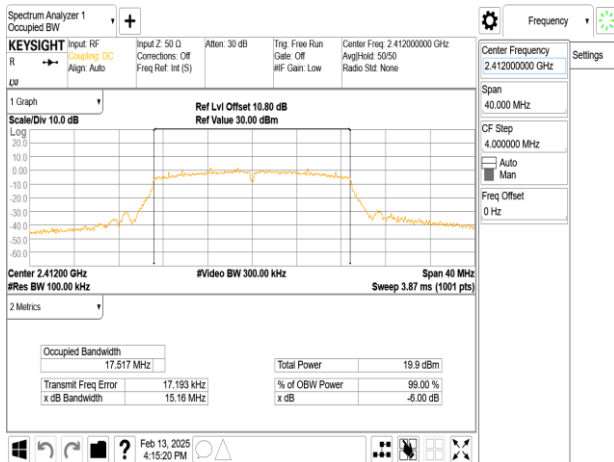


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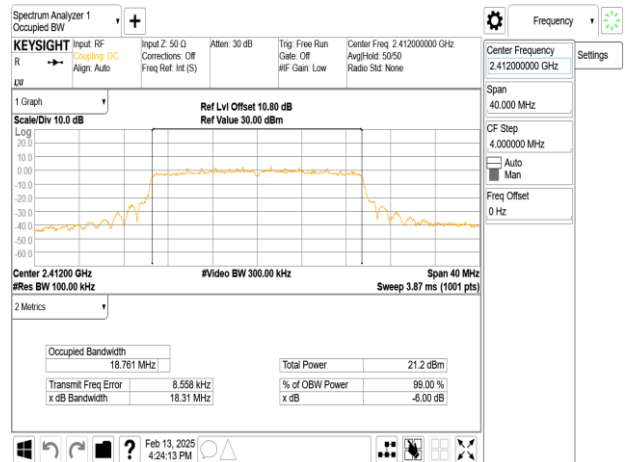
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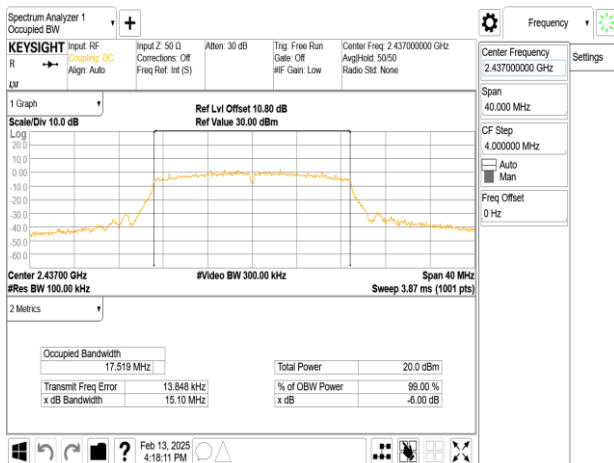
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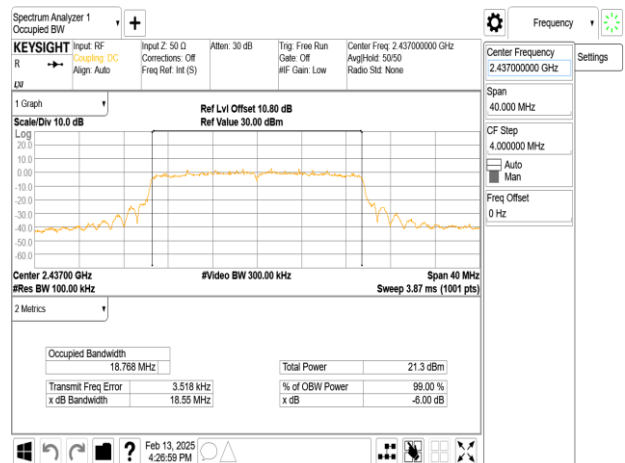
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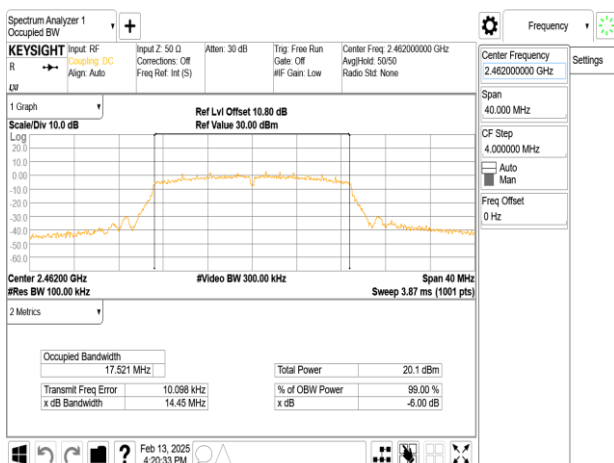
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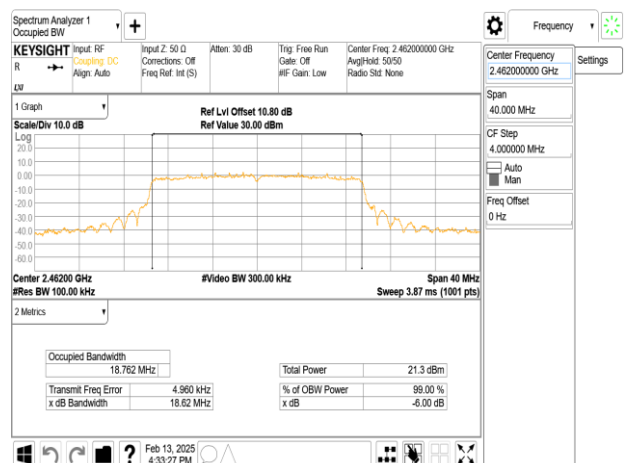
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802.11n_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain0_2462MHz



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9.4.2 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.13
2437	13.136
2462	13.139

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.713
2437	16.723
2462	16.724

802.11n_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	17.573
2437	17.579
2462	17.562

802.11ax_HE20M Ch0

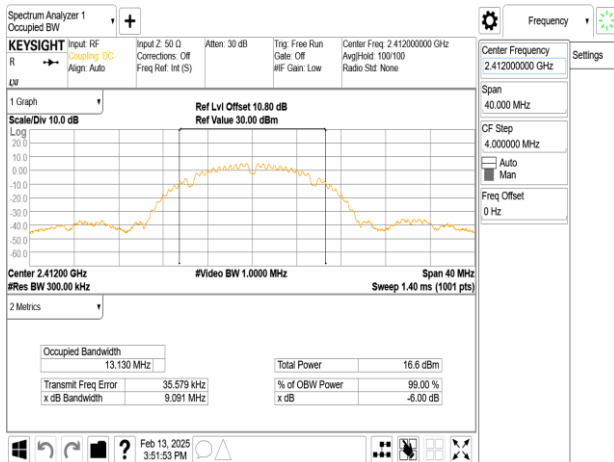
Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.817
2437	full	18.807
2462	full	18.822

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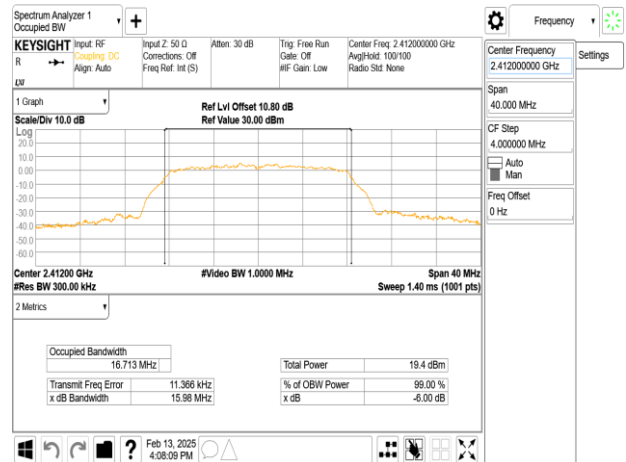
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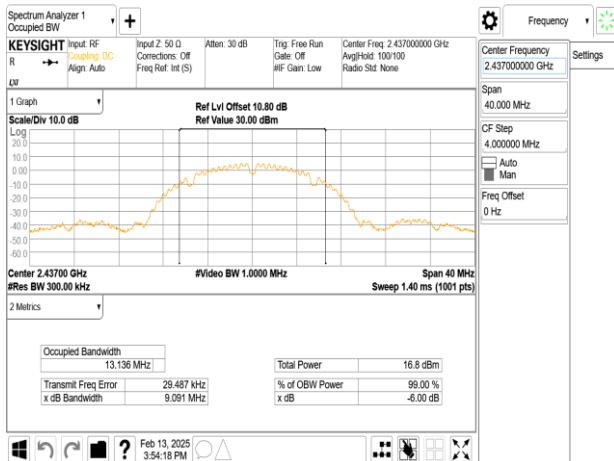
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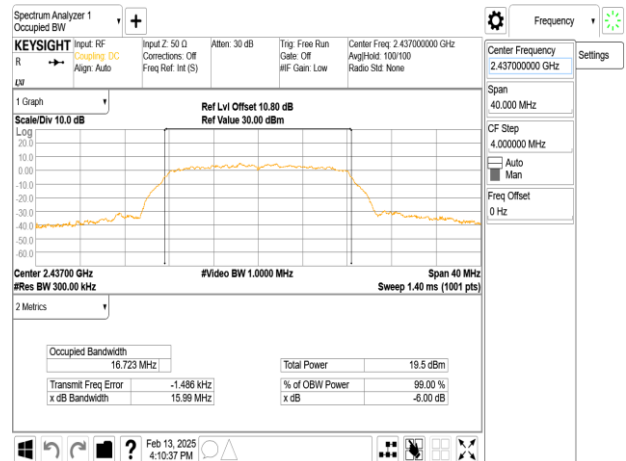
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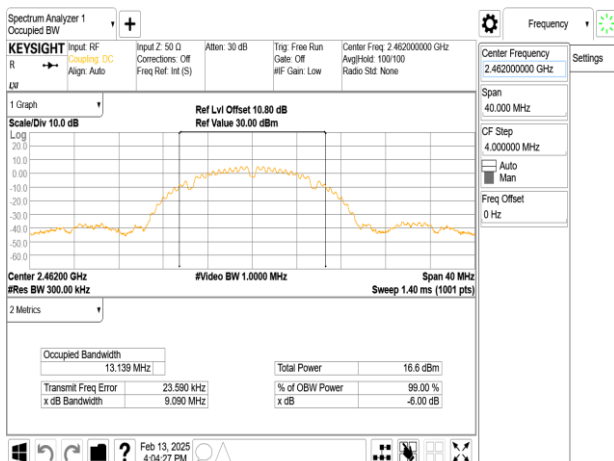
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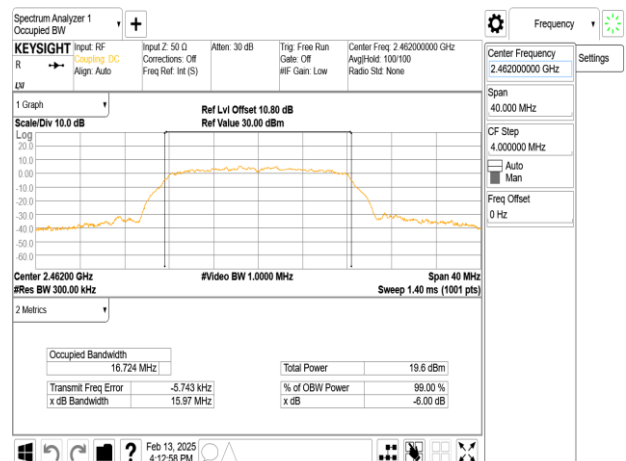
802.11g_20MHz_Chain0_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain0_2462MHz

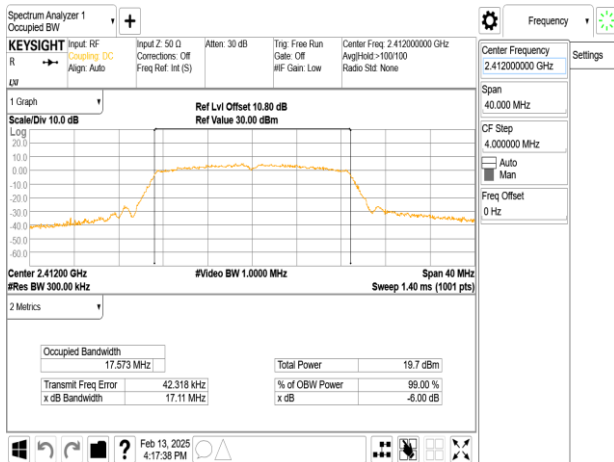


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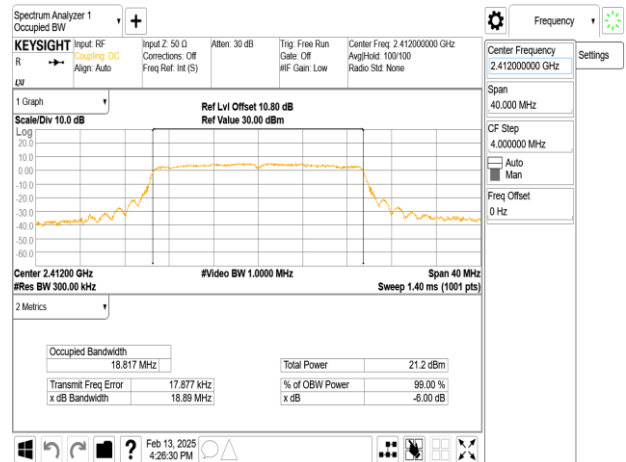
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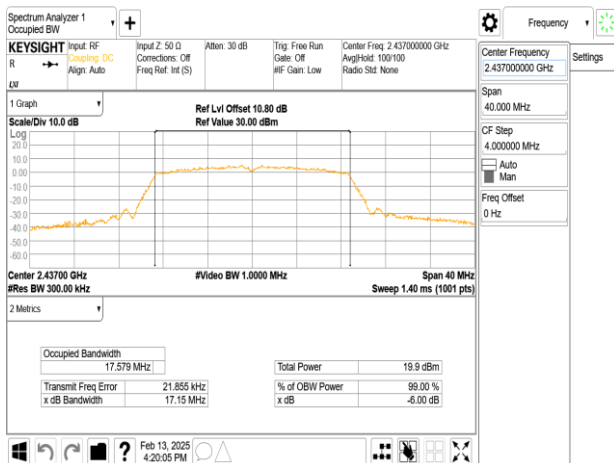
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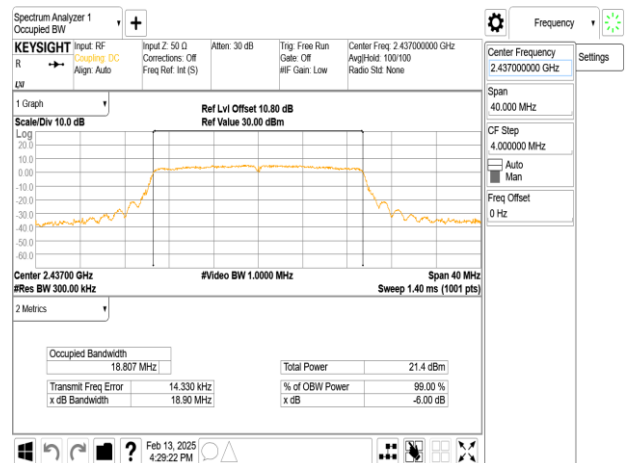
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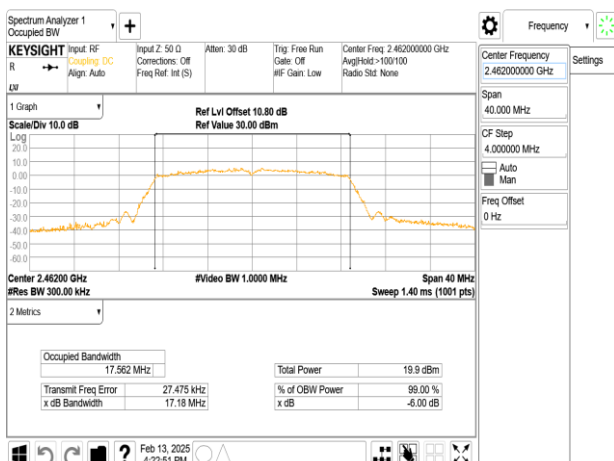
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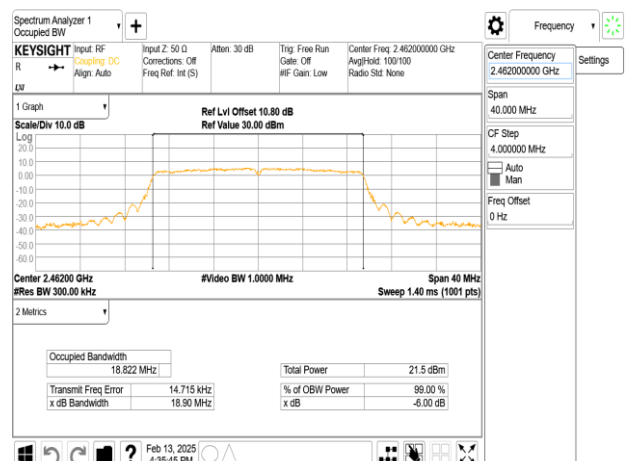
802.11ax_20MHz_Chain0_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain0_2462MHz



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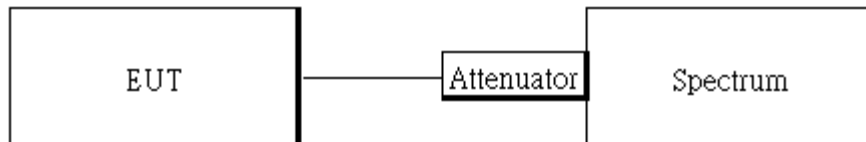
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10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9.

10.2 Test Setup



10.3 Measurement Procedure

10.3.1 Reference Level of Emission Limit:

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 100kHz & VBW = 300 kHz.
5. Detector = peak
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

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10.3.2 Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Mark the highest reading of the emission as the reference level measurement.
7. Set DL as the limit = reading on marker of reference level measurement -20
8. Mark the highest readings of the emissions outside of 2400MHz~2483.5MHz.
9. Repeat above procedures until all default test channel (low, middle, and high) was complete.

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Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.

10.4 Measurement Result

802.11b Ch0

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	4.60	-15.40
2437	4.73	-15.27
2462	4.62	-15.38

802.11g Ch0

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.90	-17.10
2437	3.29	-16.71
2462	3.39	-16.61

802.11n_HT_20M Ch0

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	1.94	-18.06
2437	2.13	-17.87
2462	2.08	-17.92

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802.11ax_HE_20M Ch0

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.74	-17.26
2437	2.20	-17.80
2462	2.22	-17.78

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802.11b_20MHz_Chain0_2412MHz



802.11g_20MHz_Chain0_2412MHz



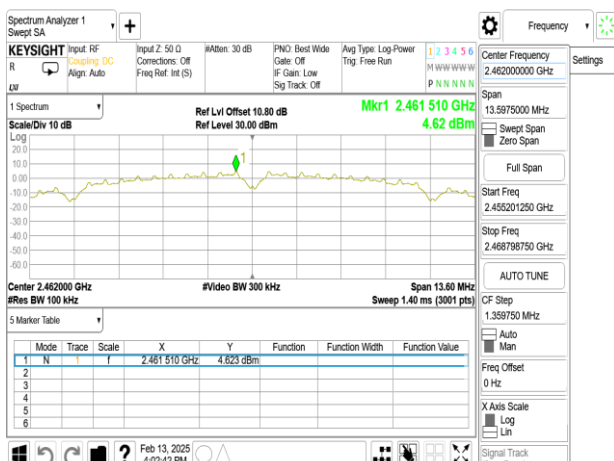
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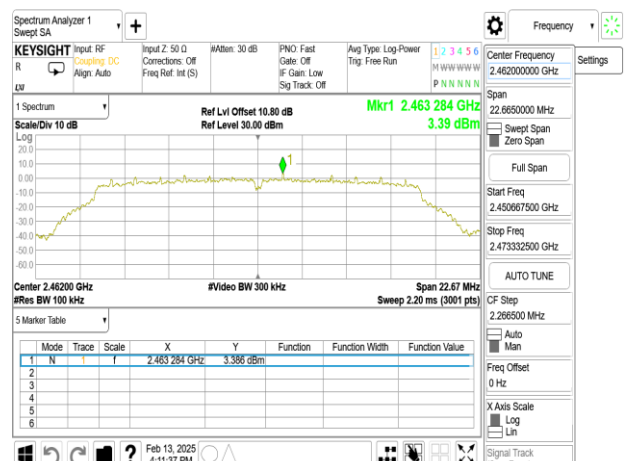
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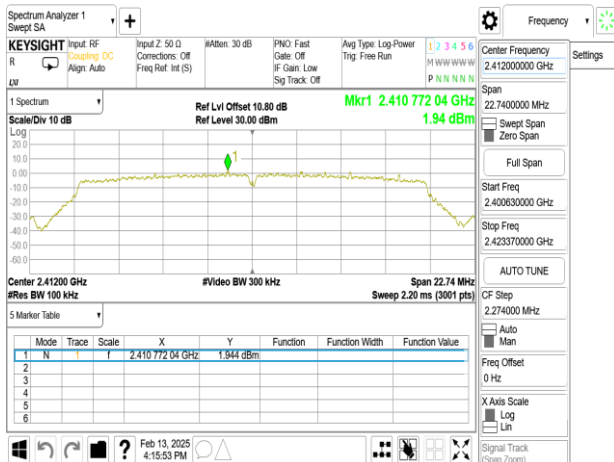


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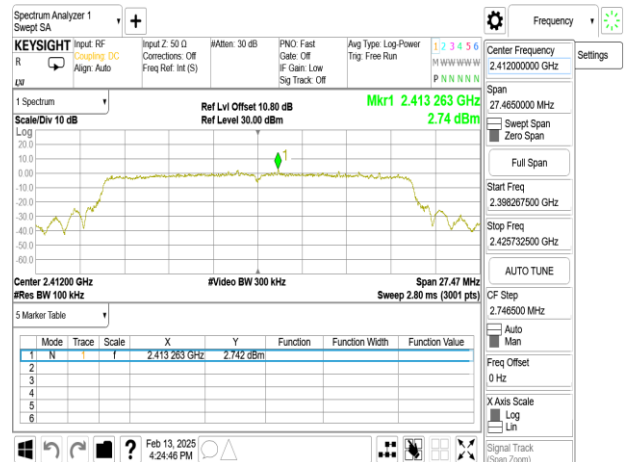
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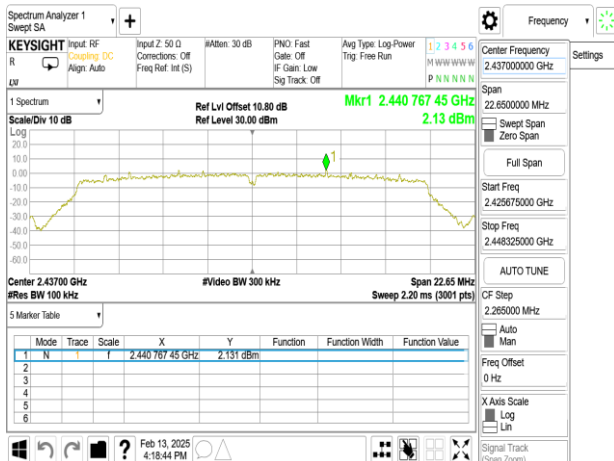
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802.11ax_20MHz_Chain0_2412MHz



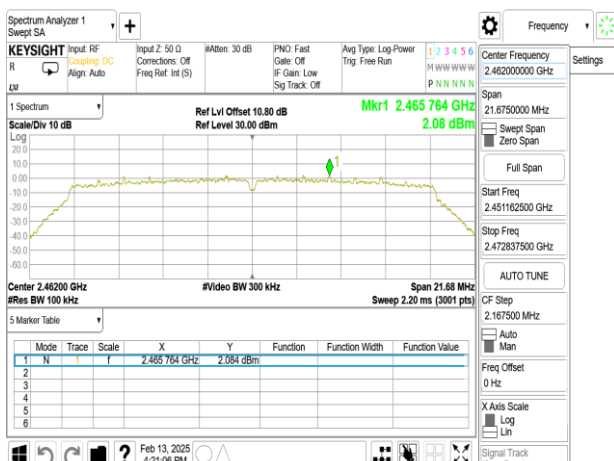
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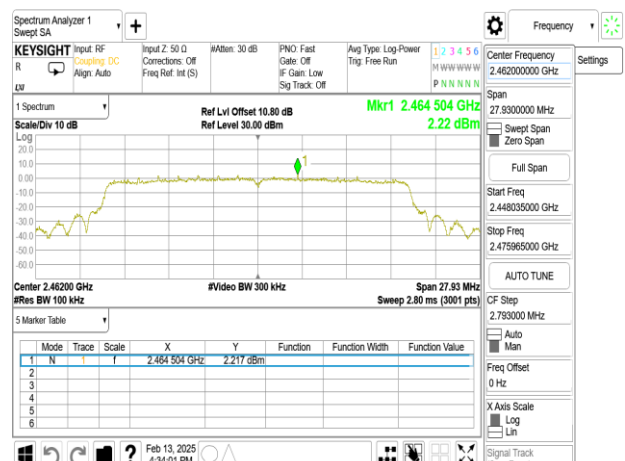
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802.11n_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain0_2462MHz

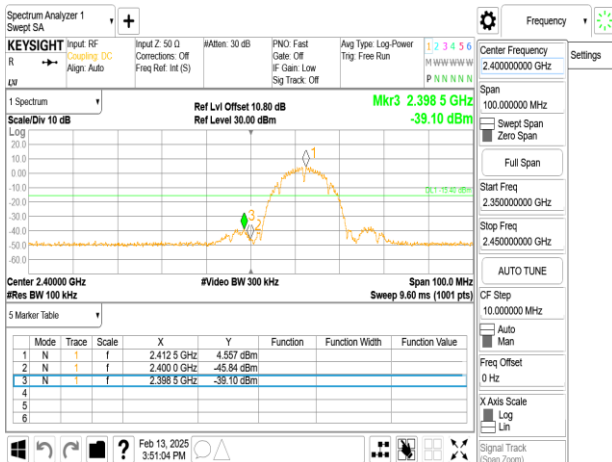


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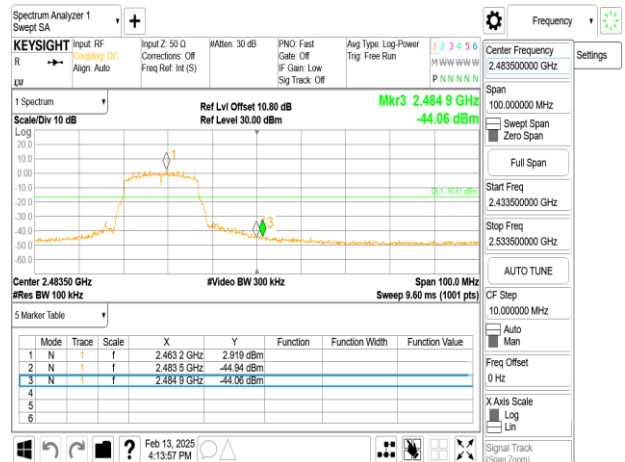
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802.11b_20MHz_Chain0_2412MHz



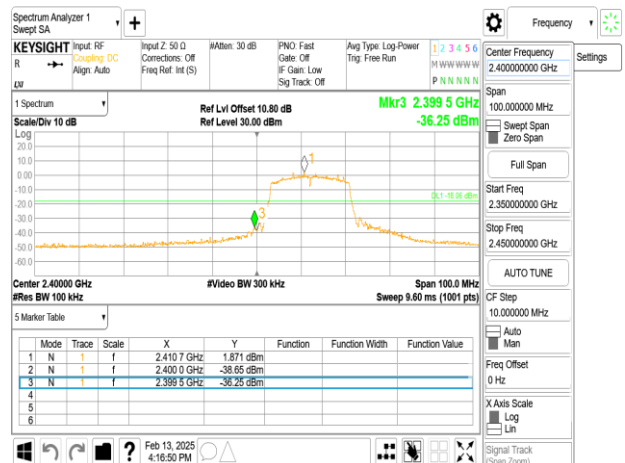
802.11g_20MHz_Chain0_2462MHz



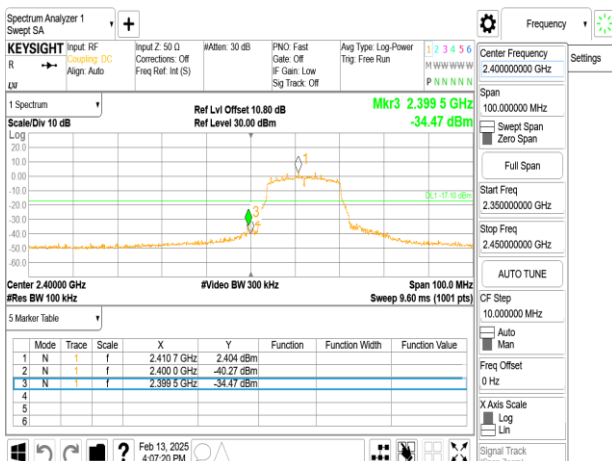
802.11b_20MHz_Chain0_2462MHz



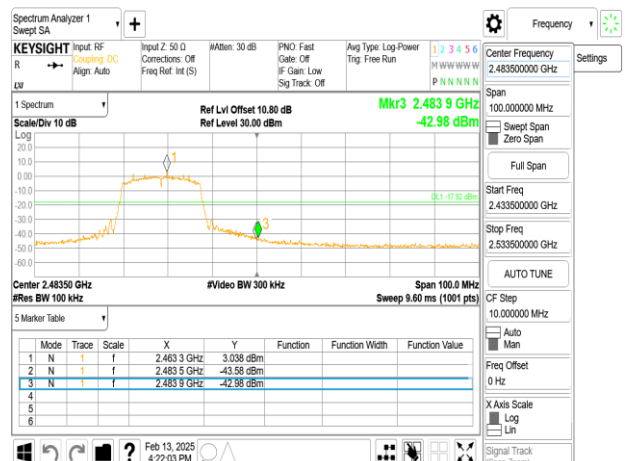
802.11n_20MHz_Chain0_2412MHz



802.11g_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain0_2462MHz

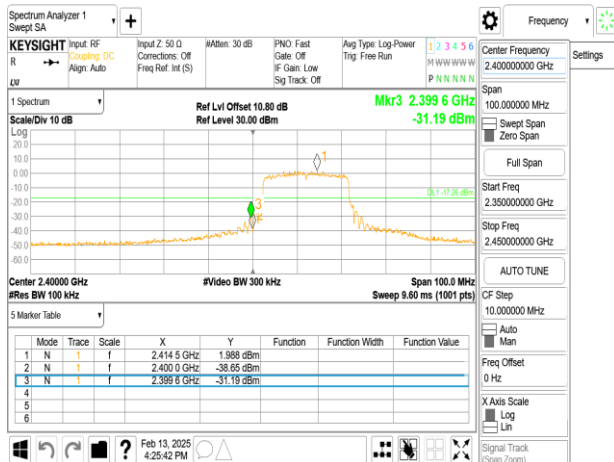


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802.11ax_20MHz_Chain0_2412MHz



802.11ax_20MHz_Chain0_2462MHz

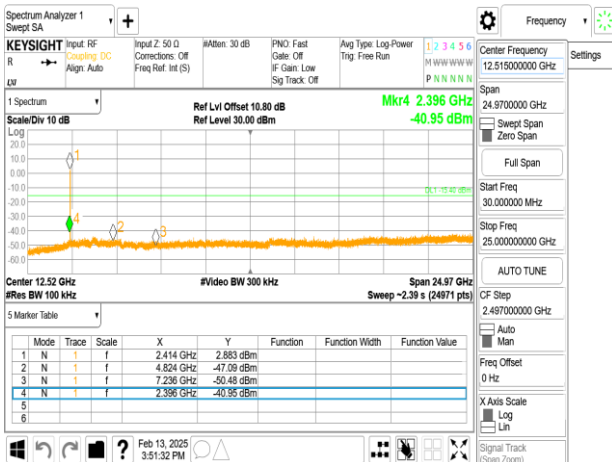


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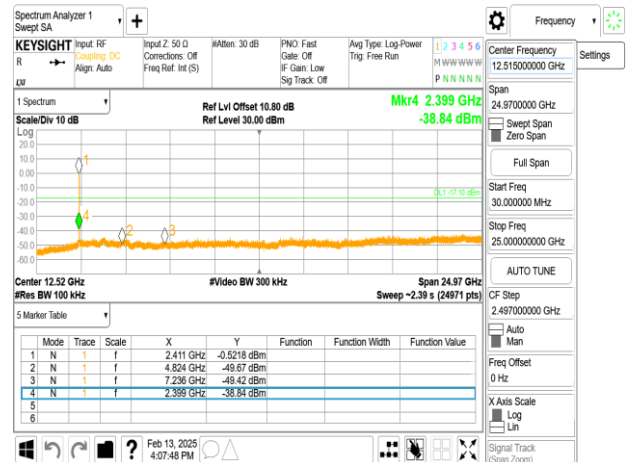
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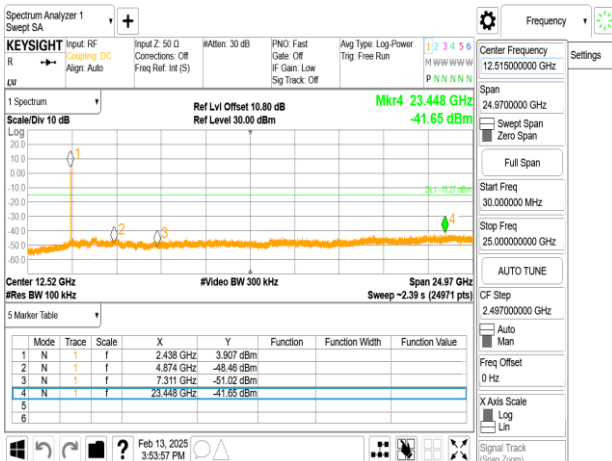
802.11b_20MHz_Chain0_2412MHz



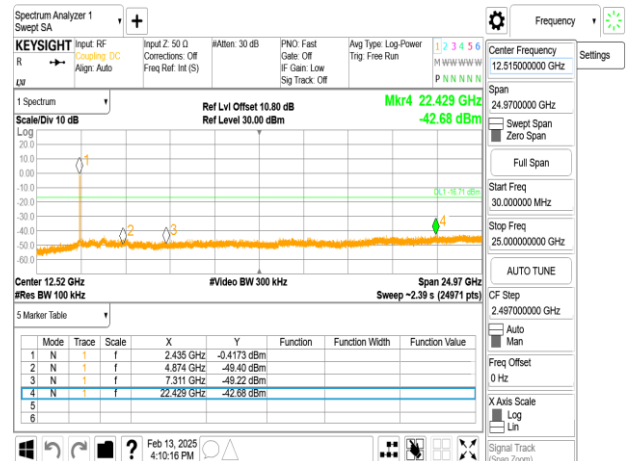
802.11g_20MHz_Chain0_2412MHz



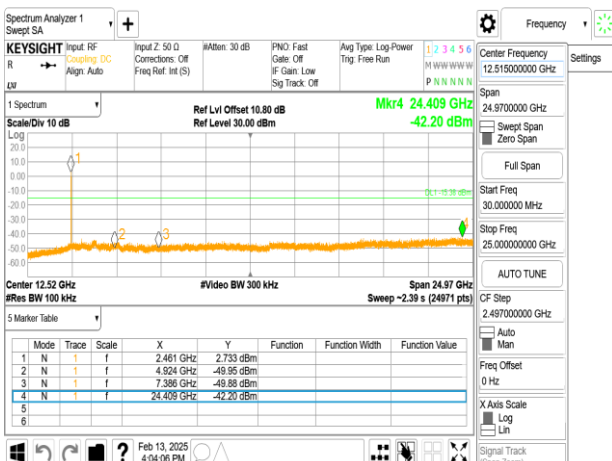
802.11b_20MHz_Chain0_2437MHz



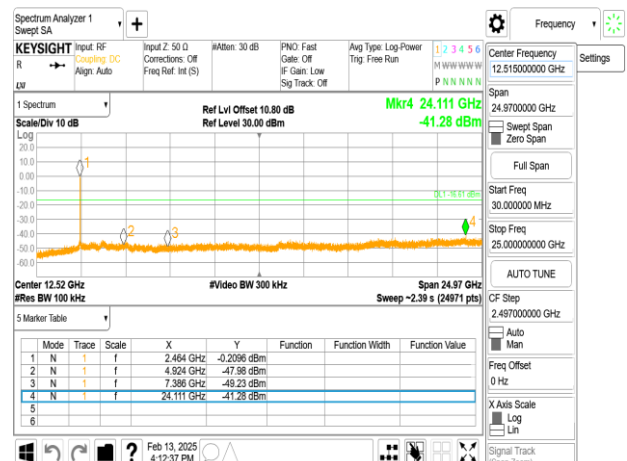
802.11g_20MHz_Chain0_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain0_2462MHz

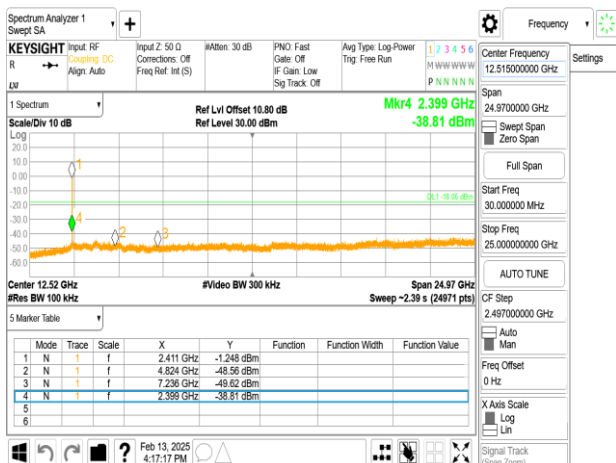


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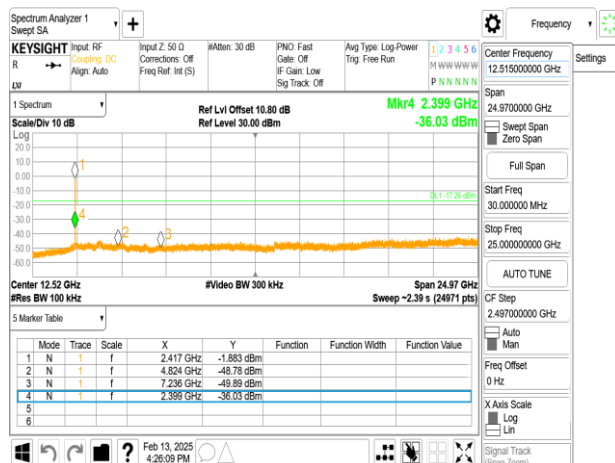
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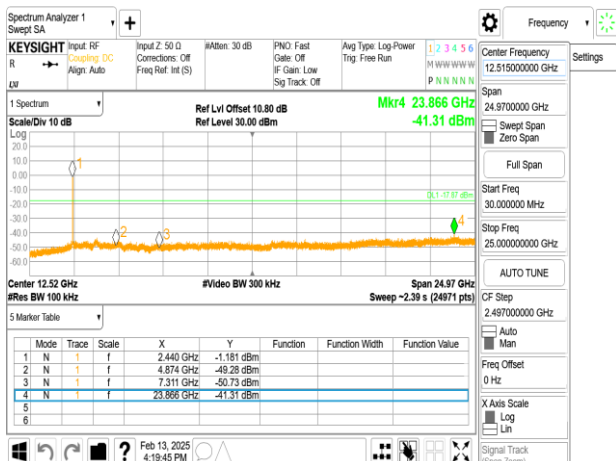
802.11n_20MHz_Chain0_2412MHz



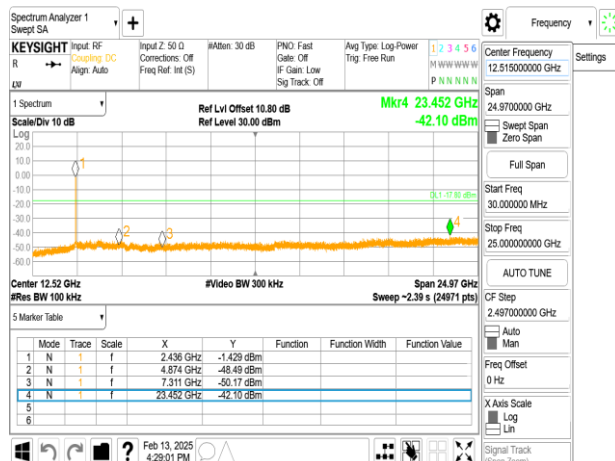
802.11ax_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain0_2437MHz



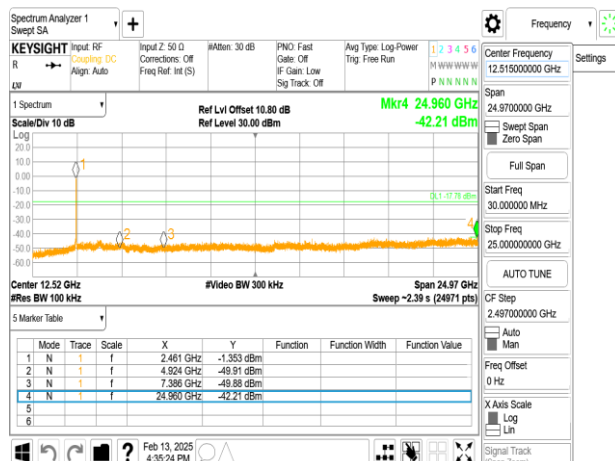
802.11ax_20MHz_Chain0_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain0_2462MHz



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