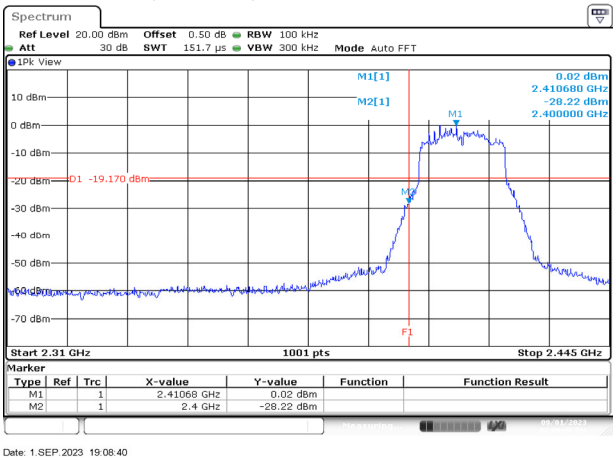
Product : Notebook Computer
Test Item : Band Edge
Test Mode : Transmit (802.11ax-20 MHz)-MIMO
Test Date : 2023/09/01

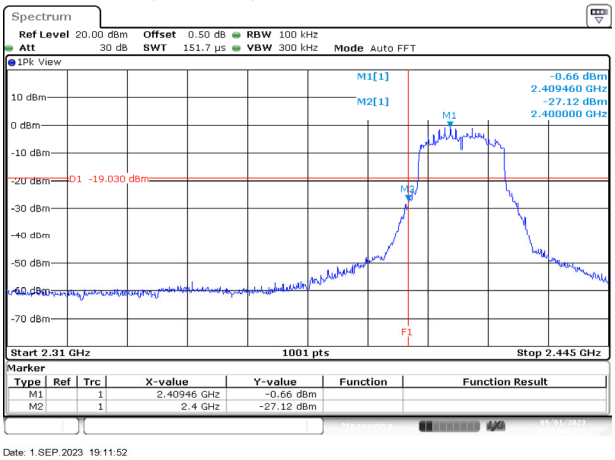
Measurement Level Δ (dB)	Result
> 20	PASS

Channel 01 (Chain A)



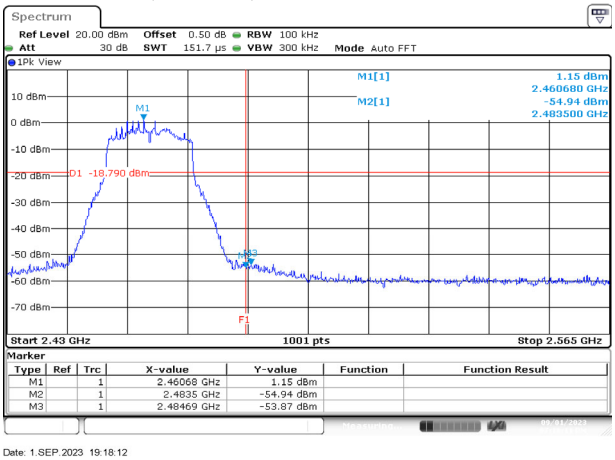
Date: 1.SEP.2023 19:08:40

Channel 01 (Chain B)



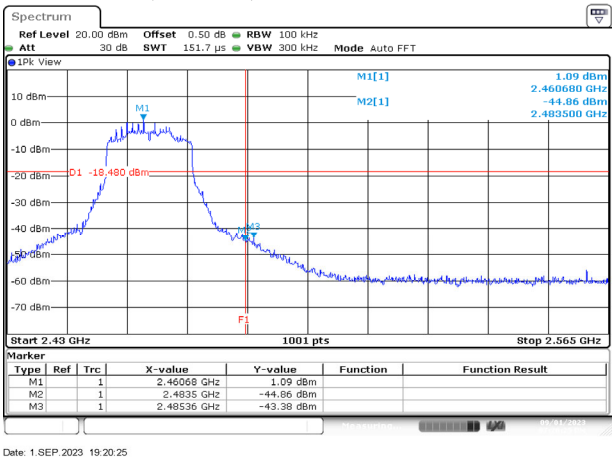
Date: 1.SEP.2023 19:11:52

Channel 11 (Chain A)



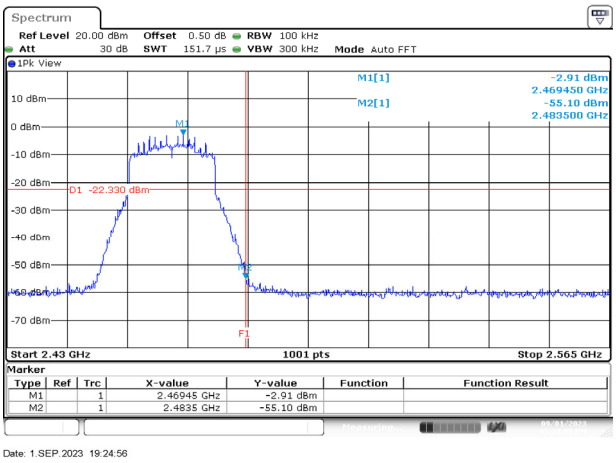
Date: 1.SEP.2023 19:18:12

Channel 11 (Chain B)



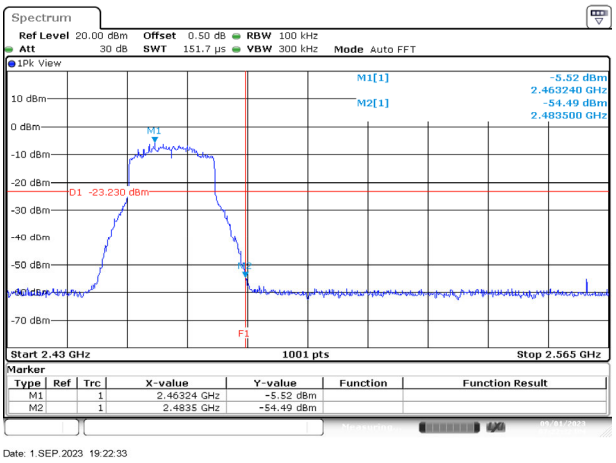
Date: 1.SEP.2023 19:20:25

Channel 12 (Chain A)



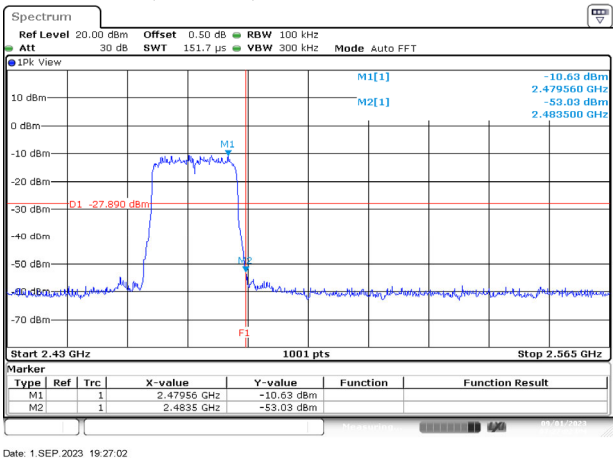
Date: 1.SEP.2023 19:24:56

Channel 12 (Chain B)



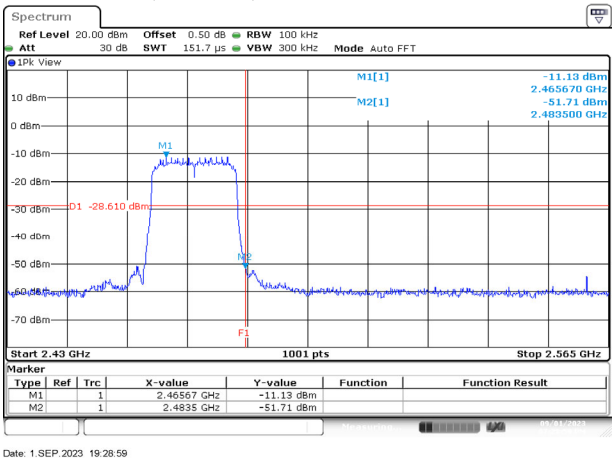
Date: 1.SEP.2023 19:22:33

Channel 13 (Chain A)



Date: 1.SEP.2023 19:27:02

Channel 13 (Chain B)

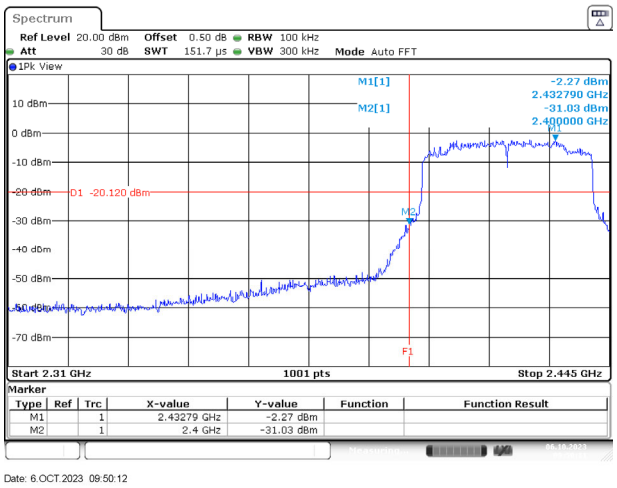


Date: 1.SEP.2023 19:28:59

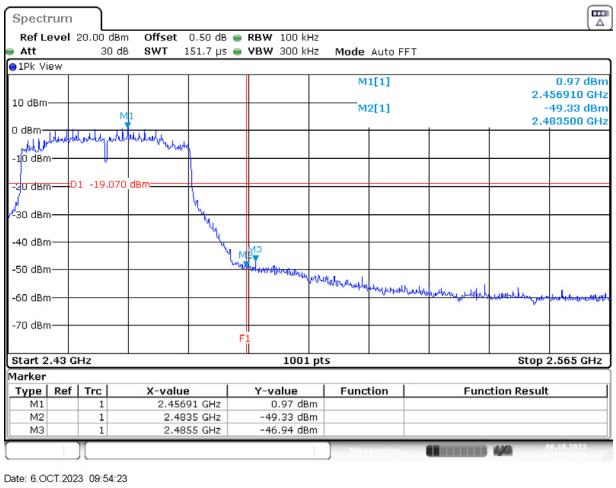
Product : Notebook Computer
Test Item : Band Edge
Test Mode : Transmit (802.11ax-40 MHz)-SISO A
Test Date : 2023/10/06

Measurement Level Δ (dB)	Result
> 20	PASS

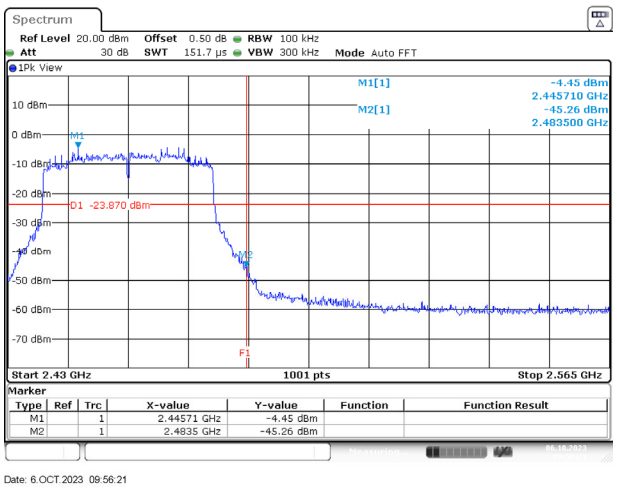
Channel 03



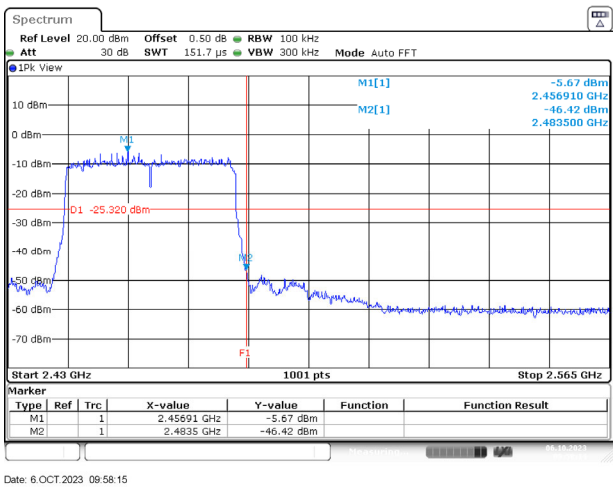
Channel 09



Channel 10



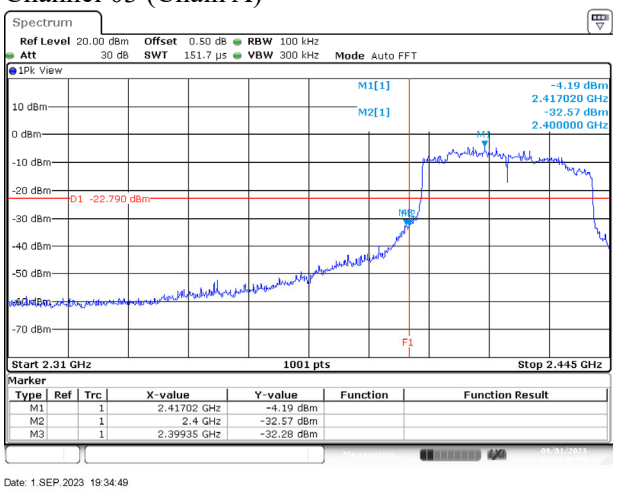
Channel 11



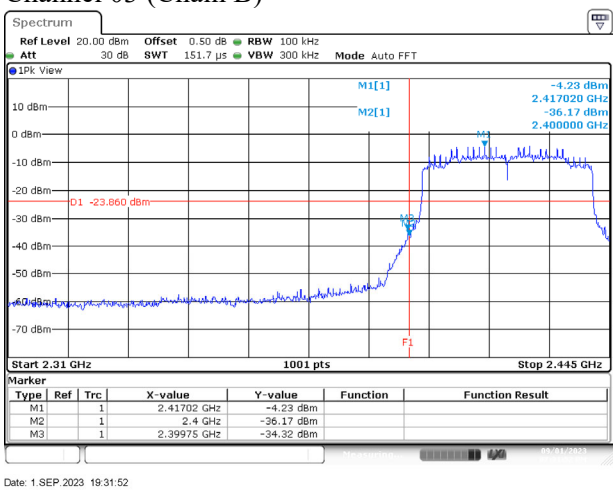
Product : Notebook Computer
Test Item : Band Edge
Test Mode : Transmit (802.11ax-40 MHz)-MIMO
Test Date : 2023/09/01

Measurement Level Δ (dB)	Result
> 20	PASS

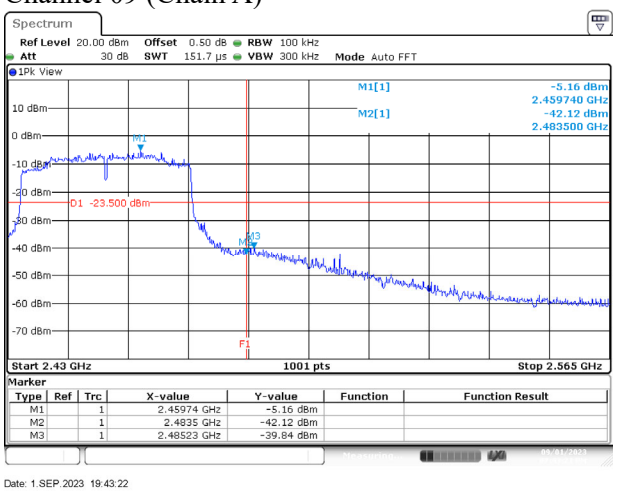
Channel 03 (Chain A)



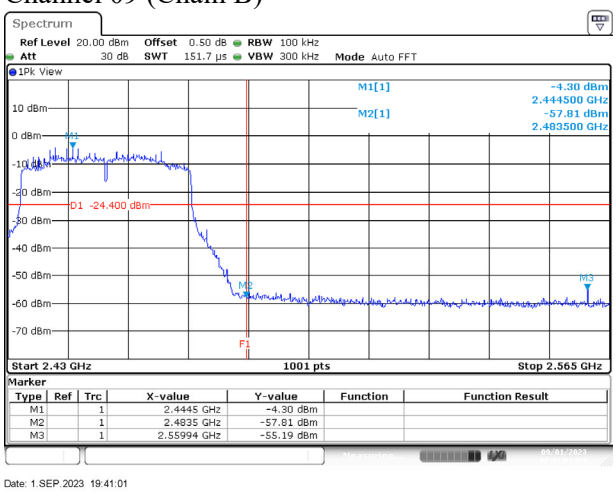
Channel 03 (Chain B)



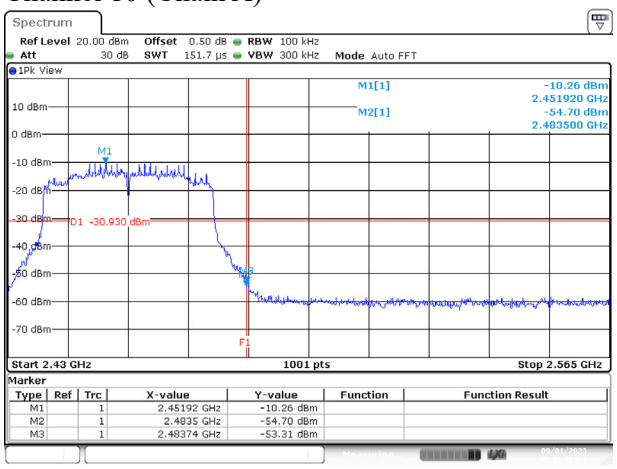
Channel 09 (Chain A)



Channel 09 (Chain B)

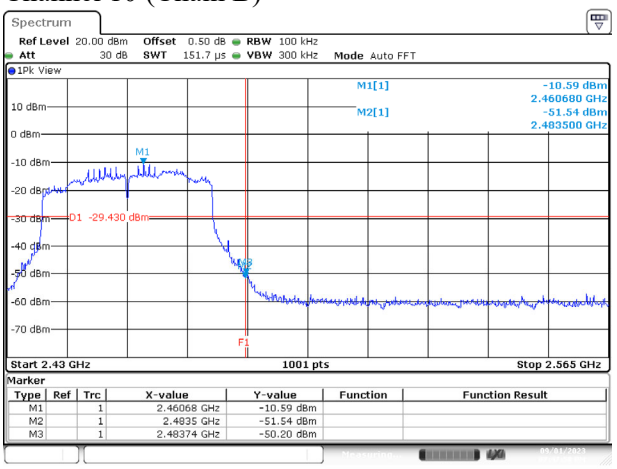


Channel 10 (Chain A)



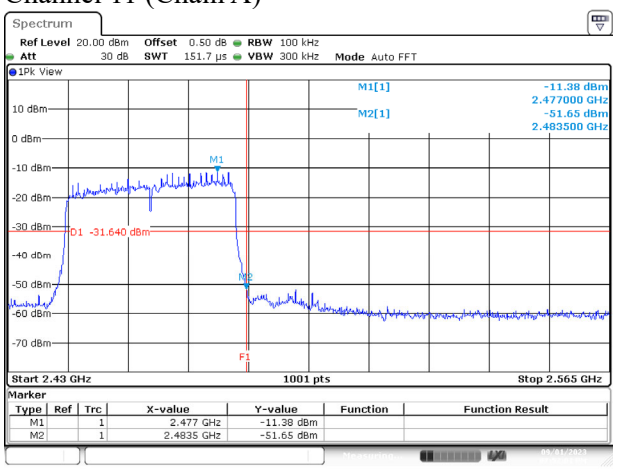
Date: 1.SEP.2023 19:45:46

Channel 10 (Chain B)



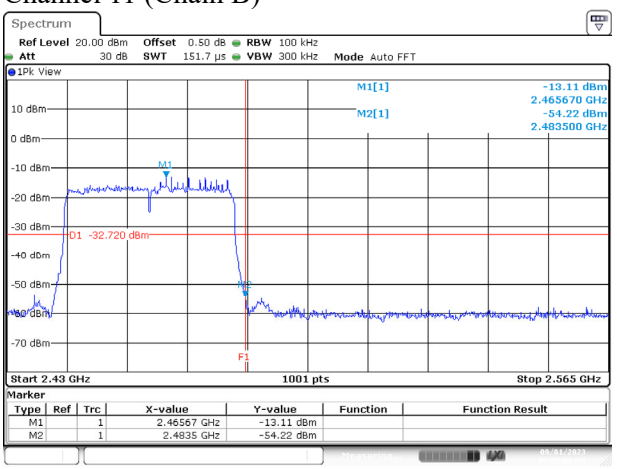
Date: 1.SEP.2023 19:47:58

Channel 11 (Chain A)



Date: 1.SEP.2023 19:52:02

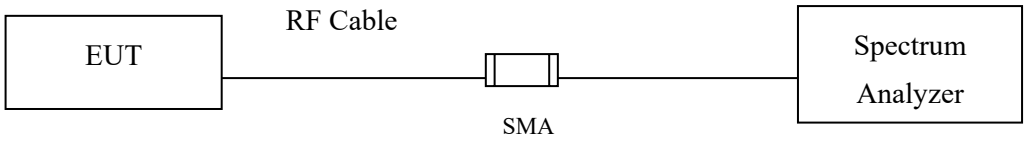
Channel 11 (Chain B)



Date: 1.SEP.2023 19:50:00

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

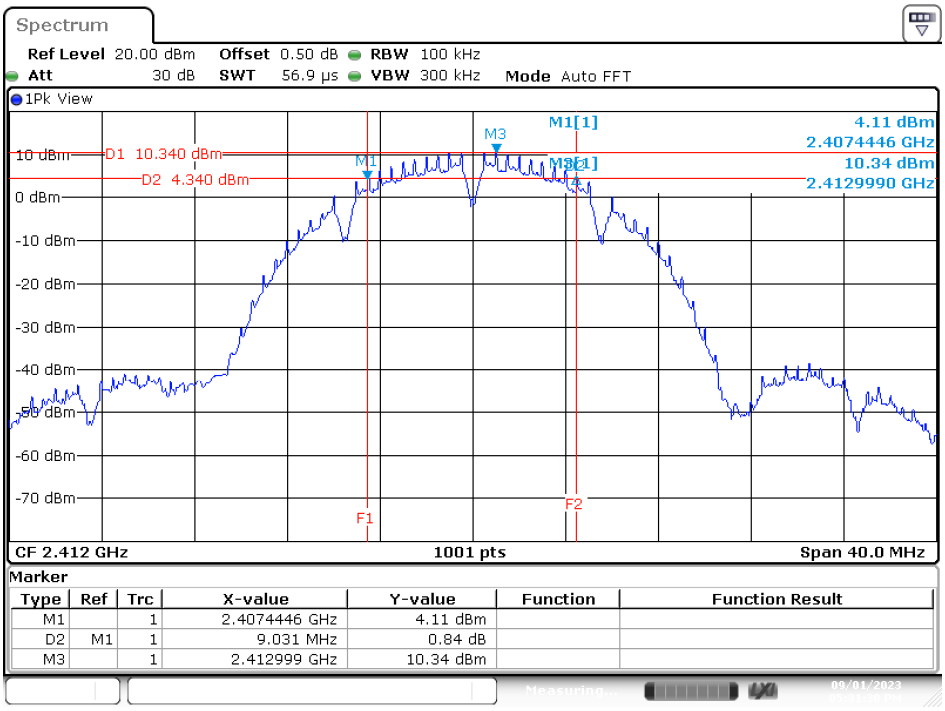
The EUT was setup according to ANSI C63.4, 2014; tested according to ANSI C63.10 Section 11.8 for compliance to FCC 47CFR 15.247 requirements.

7.4. Test Result of 6dB Bandwidth

Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11b)-SISO A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	9031	>500	Pass
07	2442	9031	>500	Pass
11	2462	9031	>500	Pass
12	2467	9031	>500	Pass
13	2472	9031	>500	Pass

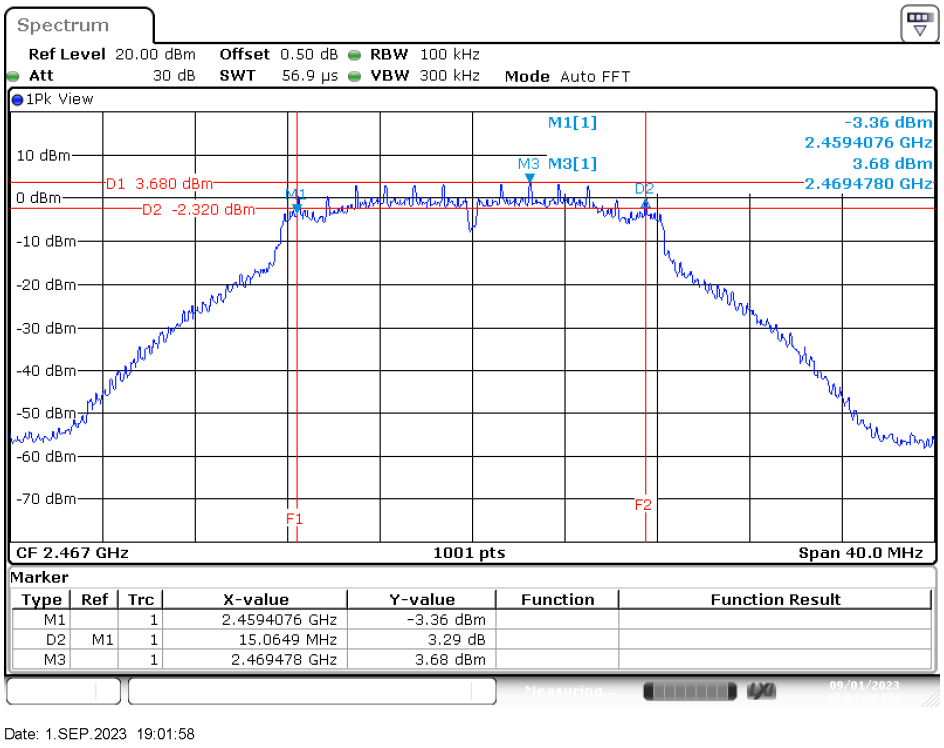
Channel 01



Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11g)-SISO A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	15105	>500	Pass
07	2442	15105	>500	Pass
11	2462	15105	>500	Pass
12	2467	15065	>500	Pass
13	2472	16304	>500	Pass

Channel 12

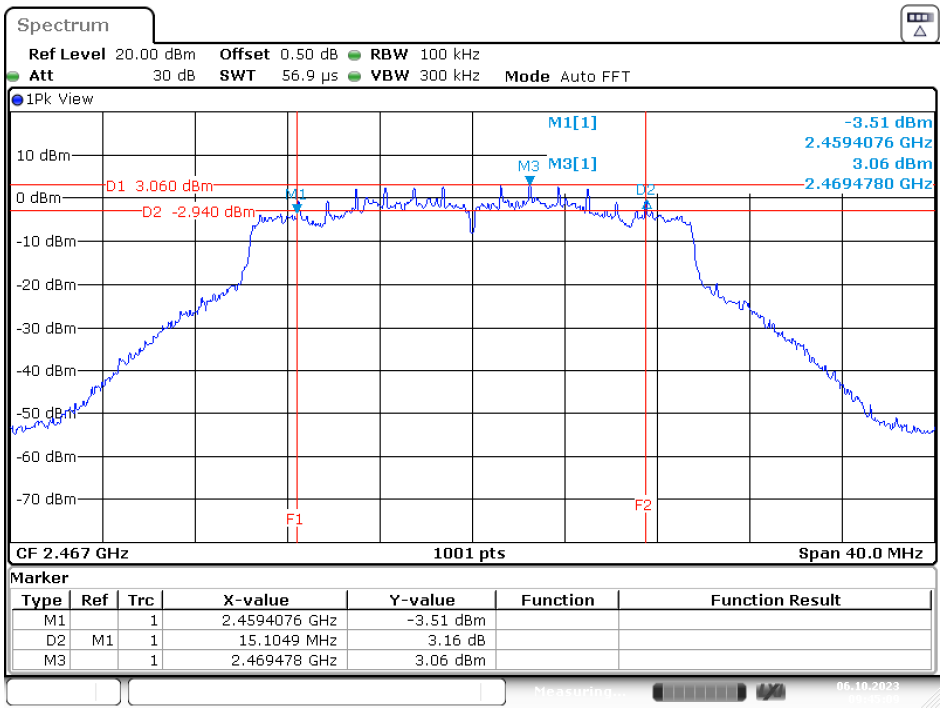


Date: 1.SEP.2023 19:01:58

Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11ax-20 MHz)-SISO A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	18502	>500	Pass
07	2442	17423	>500	Pass
11	2462	15385	>500	Pass
12	2467	15105	>500	Pass
13	2472	18581	>500	Pass

Channel 12

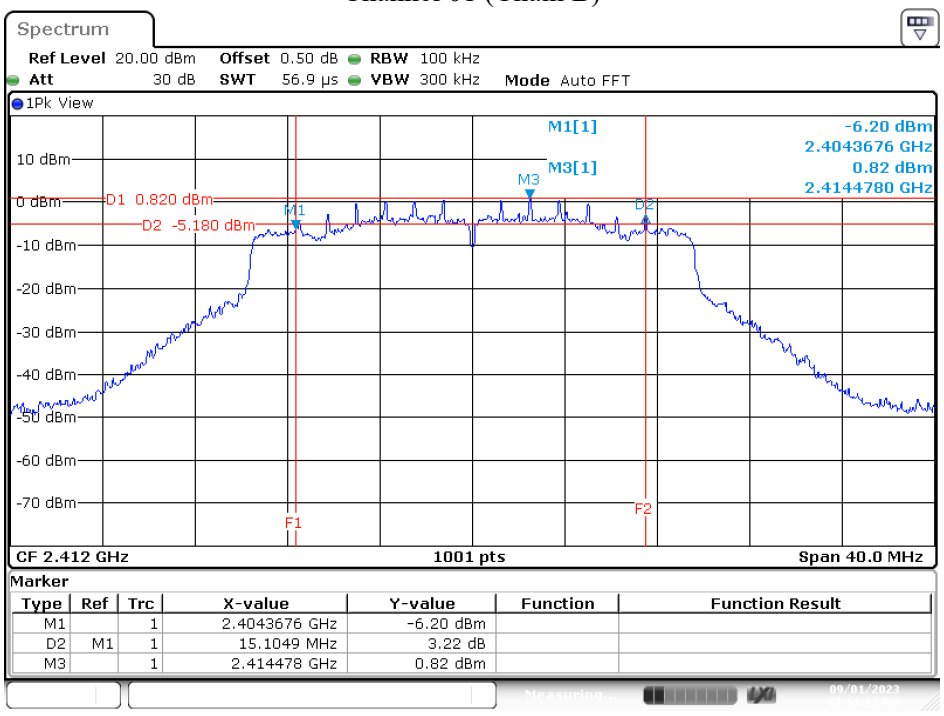


Date: 6.OCT.2023 09:45:10

Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11ax-20 MHz)-MIMO

Channel No.	Frequency (MHz)	Chain	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	A	18542	>500	Pass
07	2442	A	15265	>500	Pass
11	2462	A	16583	>500	Pass
12	2467	A	16104	>500	Pass
13	2472	A	17862	>500	Pass
01	2412	B	15105	>500	Pass
07	2442	B	18182	>500	Pass
11	2462	B	18182	>500	Pass
12	2467	B	16224	>500	Pass
13	2472	B	17622	>500	Pass

Channel 01 (Chain B)

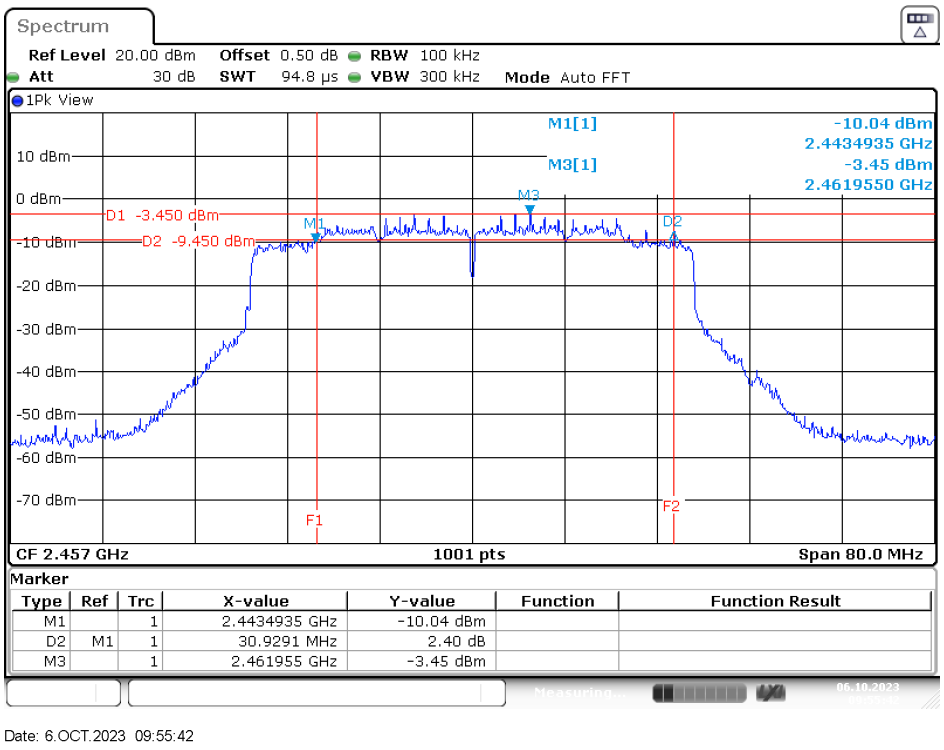


Date: 1.SEP.2023 19:11:13

Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11ax-40 MHz)-SISO A

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
03	2422	35964	>500	Pass
07	2442	33806	>500	Pass
09	2452	35005	>500	Pass
10	2457	30929	>500	Pass
11	2462	37243	>500	Pass

Channel 10

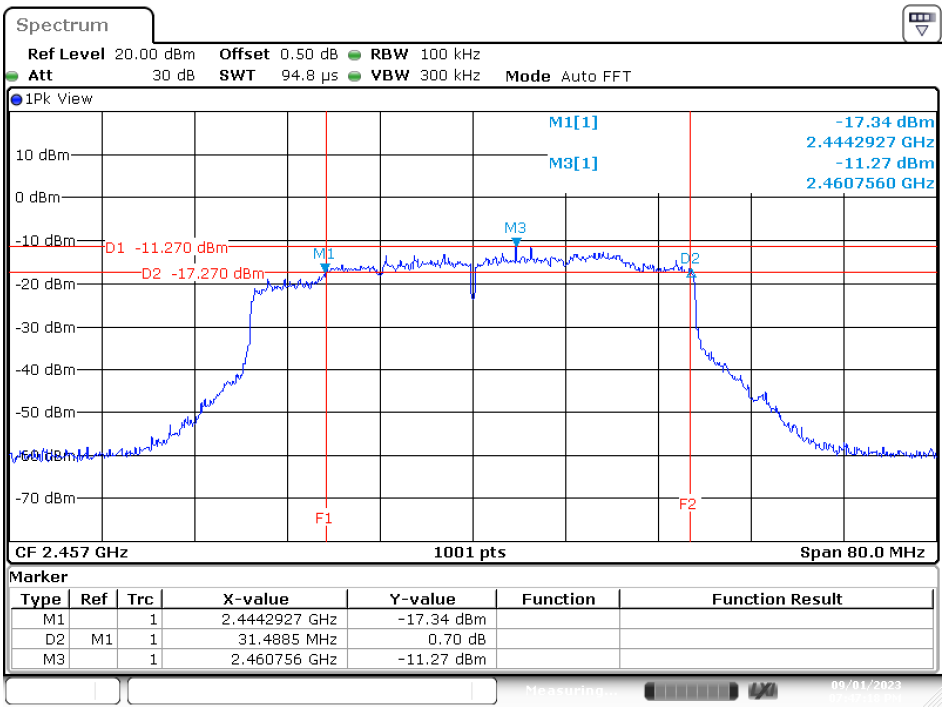


Date: 6.OCT.2023 09:55:42

Product : Notebook Computer
Test Item : 6dB Bandwidth Data
Test Mode : Transmit (802.11ax-40 MHz)-MIMO

Channel No.	Frequency (MHz)	Chain	Measurement Level (kHz)	Required Limit (kHz)	Result
03	2422	A	33886	>500	Pass
07	2442	A	36044	>500	Pass
09	2452	A	34126	>500	Pass
10	2457	A	35085	>500	Pass
11	2462	A	36124	>500	Pass
03	2422	B	35085	>500	Pass
07	2442	B	33806	>500	Pass
09	2452	B	35165	>500	Pass
10	2457	B	31489	>500	Pass
11	2462	B	37243	>500	Pass

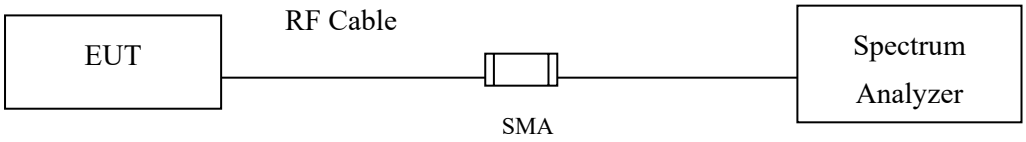
Channel 10 (Chain B)



Date: 1.SEP.2023 19:47:19

8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3 kHz bandwidth.

8.3. Test Procedure

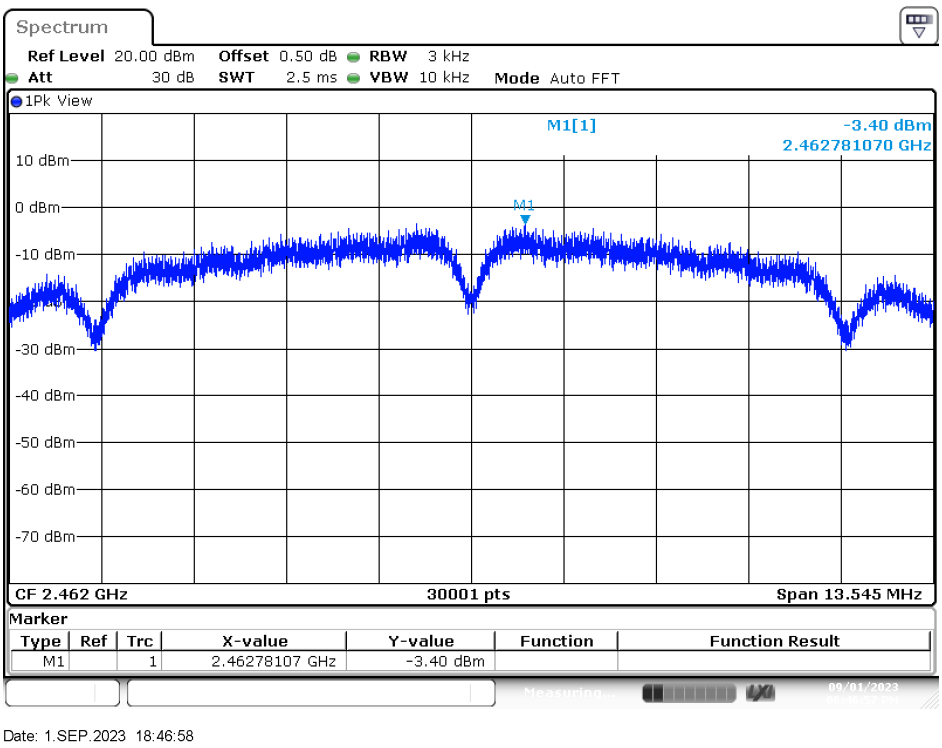
The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.
The maximum power spectral density using C63.10 Section 11.10.2 Method PKPSD (peak PSD)

8.4. Test Result of Power Density

Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11b)-SISO A

Channel No.	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
01	2412	-3.58	8	Pass
07	2442	-3.74	8	Pass
11	2462	-3.40	8	Pass
12	2467	-4.39	8	Pass
13	2472	-6.74	8	Pass

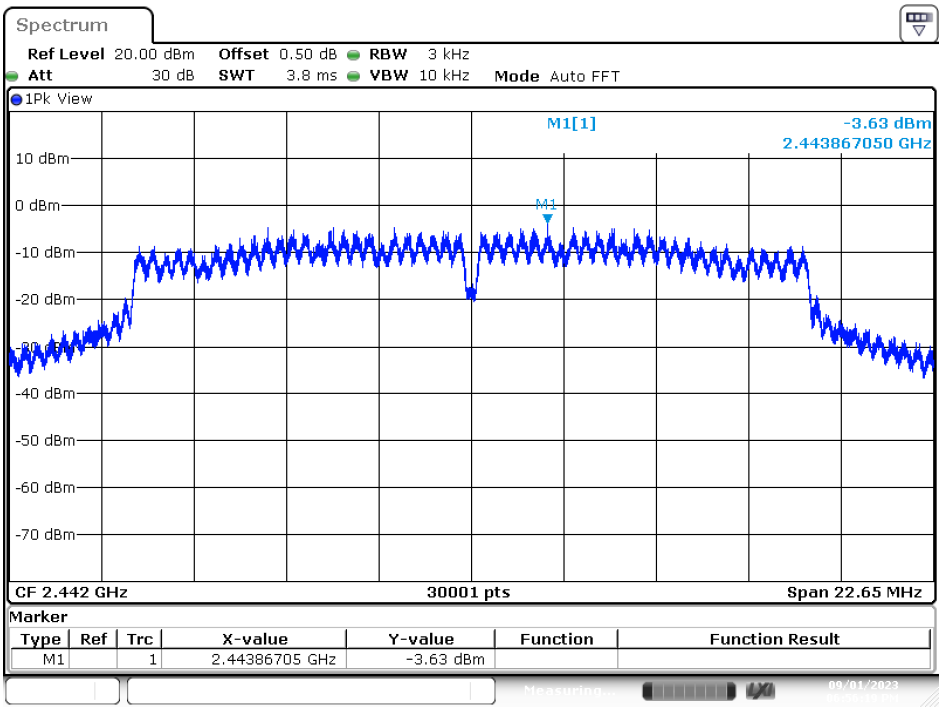
Channel 11



Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11g)-SISO A

Channel No.	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
01	2412	-7.86	8	Pass
07	2442	-3.63	8	Pass
11	2462	-7.85	8	Pass
12	2467	-10.39	8	Pass
13	2472	-13.74	8	Pass

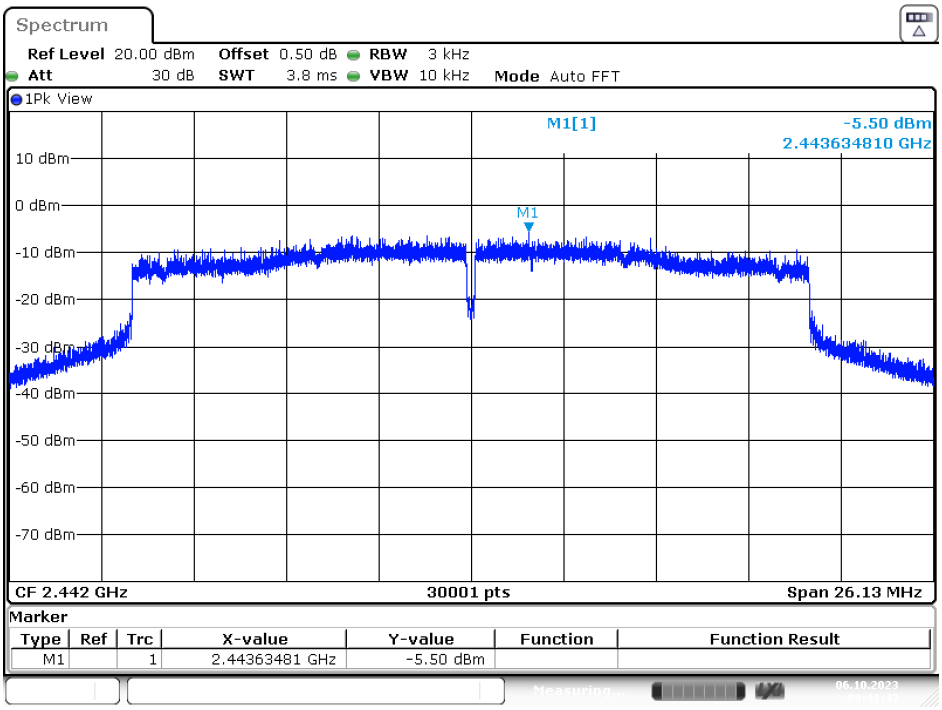
Channel 07



Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-20 MHz)-SISO A

Channel No.	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
01	2412	-8.77	8	Pass
07	2442	-5.50	8	Pass
11	2462	-9.50	8	Pass
12	2467	-12.30	8	Pass
13	2472	-14.12	8	Pass

Channel 07

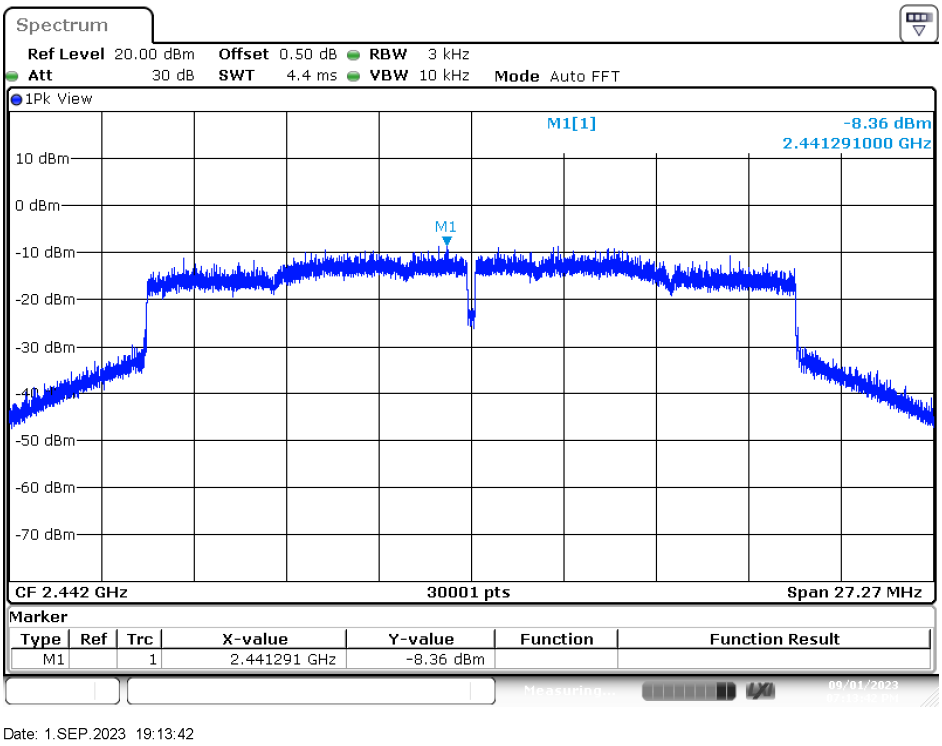


Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-20 MHz)-MIMO

Channel No.	Frequency (MHz)	Chain	PPSD (dBm)	10*log(2) (dB)	Total PPSD (dBm)	Limit (dBm)	Result
01	2412	A	-13.85	3.01	-10.84	8	Pass
		B	-13.87	3.01	-10.86		
07	2442	A	-8.49	3.01	-5.48	8	Pass
		B	-8.36	3.01	-5.35		
11	2462	A	-13.14	3.01	-10.13	8	Pass
		B	-12.47	3.01	-9.46		
12	2467	A	-16.55	3.01	-13.54	8	Pass
		B	-17.25	3.01	-14.24		
13	2472	A	-22.29	3.01	-19.28	8	Pass
		B	-22.54	3.01	-19.53		

Note: The quantity 10*log(2) (two antennas) is added to the spectrum peak value according to document 662911 D01.

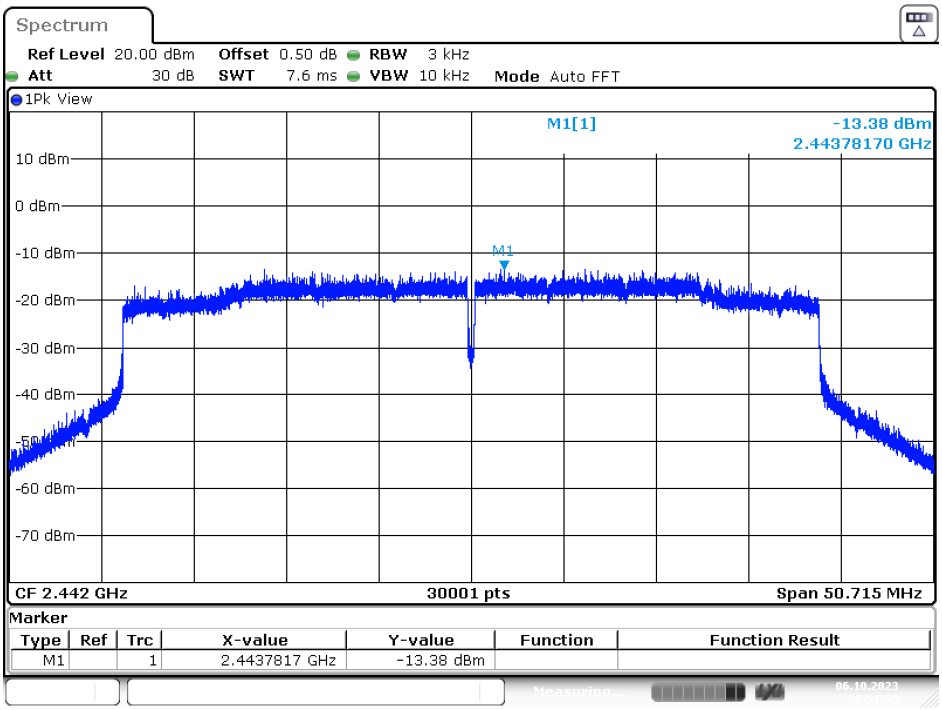
Channel 07 (Chain B)



Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-40 MHz)-SISO A

Channel No.	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
03	2422	-13.73	8	Pass
07	2442	-13.38	8	Pass
09	2452	-13.49	8	Pass
10	2457	-17.08	8	Pass
11	2462	-19.85	8	Pass

Channel 07

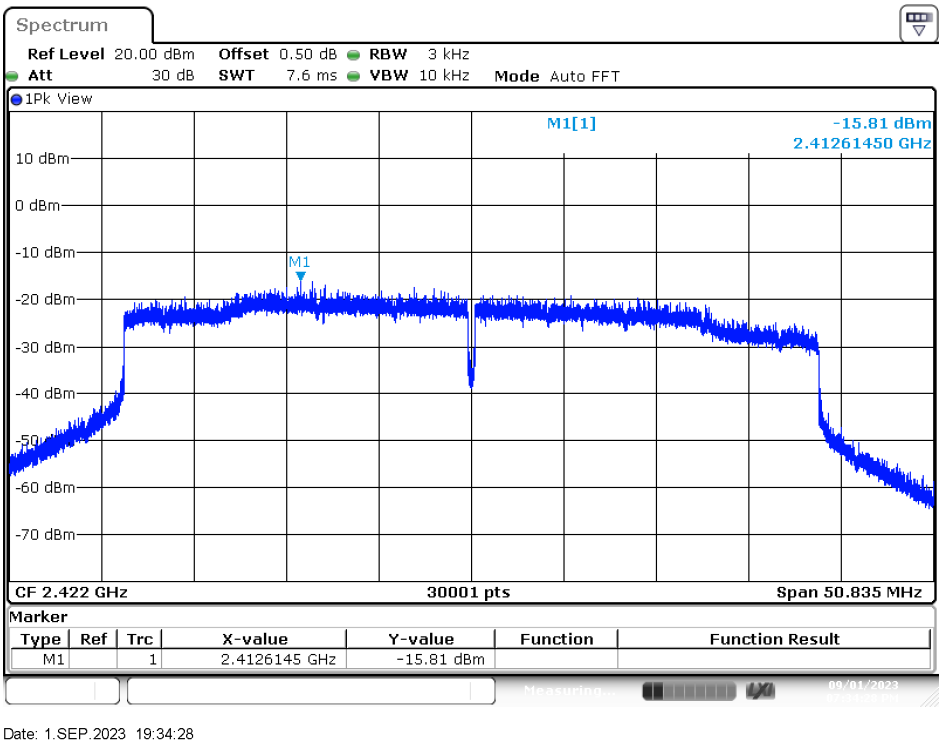


Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-40 MHz)-MIMO

Channel No.	Frequency (MHz)	Chain	PPSD (dBm)	10*log(2) (dB)	Total PPSD (dBm)	Limit (dBm)	Result
03	2422	A	-15.81	3.01	-12.80	8	Pass
		B	-17.96	3.01	-14.95		
07	2442	A	-16.21	3.01	-13.20	8	Pass
		B	-16.40	3.01	-13.39		
09	2452	A	-17.30	3.01	-14.29	8	Pass
		B	-17.67	3.01	-14.66		
10	2457	A	-23.75	3.01	-20.74	8	Pass
		B	-23.17	3.01	-20.16		
11	2462	A	-25.44	3.01	-22.43	8	Pass
		B	-26.37	3.01	-23.36		

Note: The quantity 10*log(2) (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 03 (Chain A)

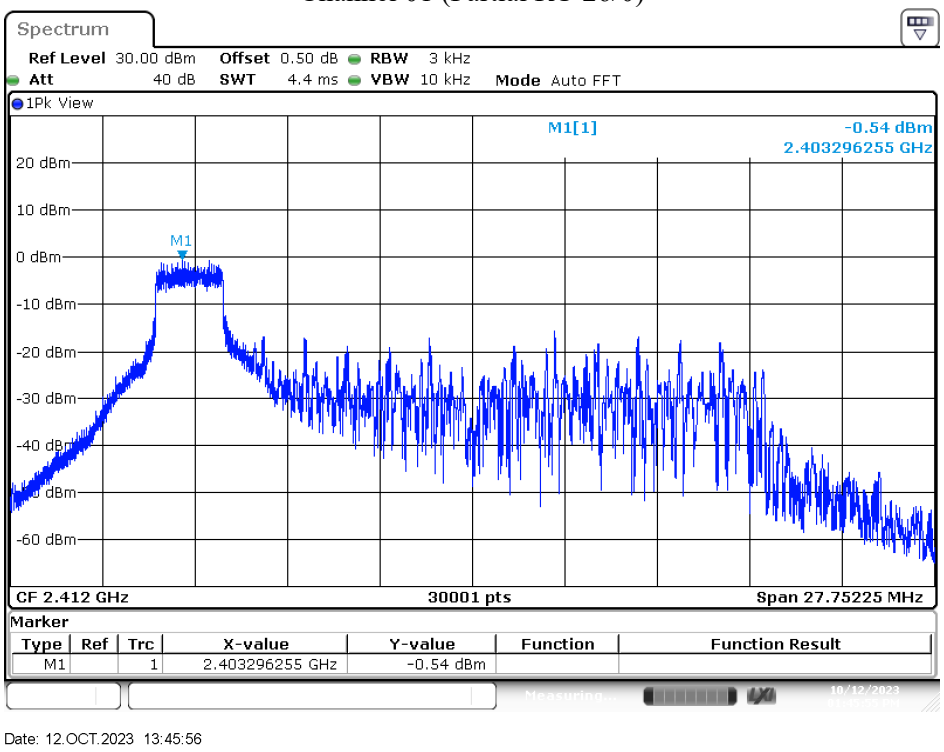


Date: 1.SEP.2023 19:34:28

Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-20 MHz) (Partial RU)-SISO A

Channel No.	Frequency (MHz)	RU Config	PPSD (dBm)	Limit (dBm)	Result
01	2412	26/0	-0.54	8	Pass
		52/37	-2.21	8	Pass
		106/53	-5.51	8	Pass
13	2472	26/8	-6.34	8	Pass
		52/40	-7.40	8	Pass
		106/54	-11.15	8	Pass

Channel 01 (Partial RU 26/0)



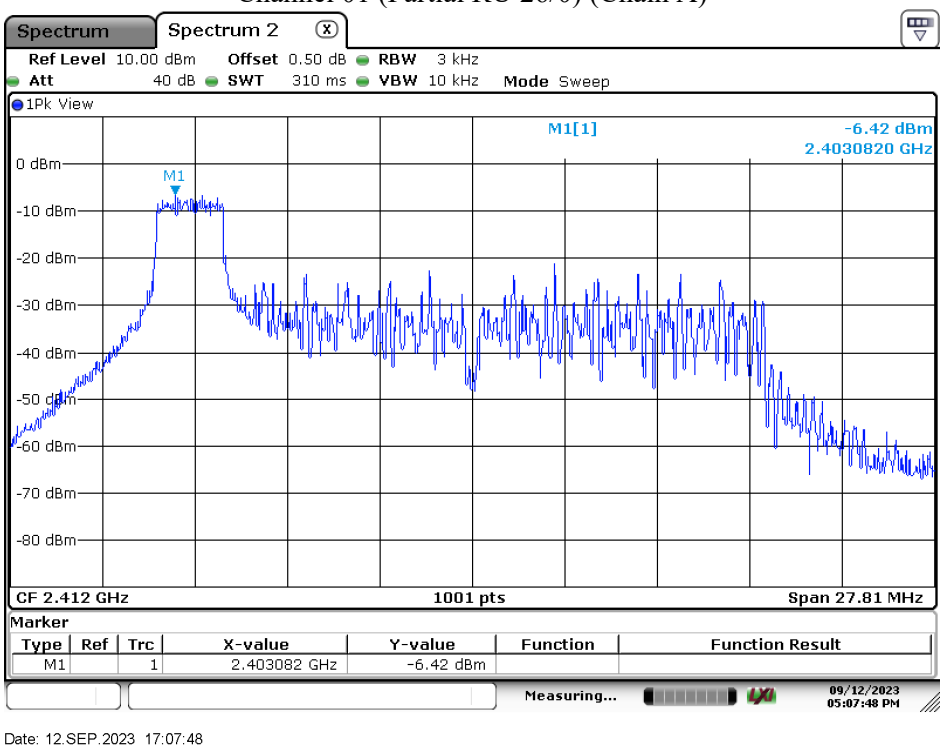
Date: 12.OCT.2023 13:45:56

Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-20 MHz) (Partial RU)-MIMO

Channel No.	Frequency (MHz)	RU Config	Chain	PPSD (dBm)	10*log(2) (dB)	Total PPSD (dBm)	Limit (dBm)	Result
01	2412	26/0	A	-6.42	3.01	-3.41	8	Pass
			B	-5.39	3.01	-2.38		
		52/37	A	-7.66	3.01	-4.65	8	Pass
			B	-7.28	3.01	-4.27		
		106/53	A	-10.65	3.01	-7.64	8	Pass
			B	-11.26	3.01	-8.25		
13	2472	26/8	A	-14.08	3.01	-11.07	8	Pass
			B	-14.05	3.01	-11.04		
		52/40	A	-16.34	3.01	-13.33	8	Pass
			B	-17.07	3.01	-14.06		
		106/54	A	-20.11	3.01	-17.10	8	Pass
			B	-19.54	3.01	-16.53		

Note: The quantity 10*log(2) (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 01 (Partial RU 26/0) (Chain A)

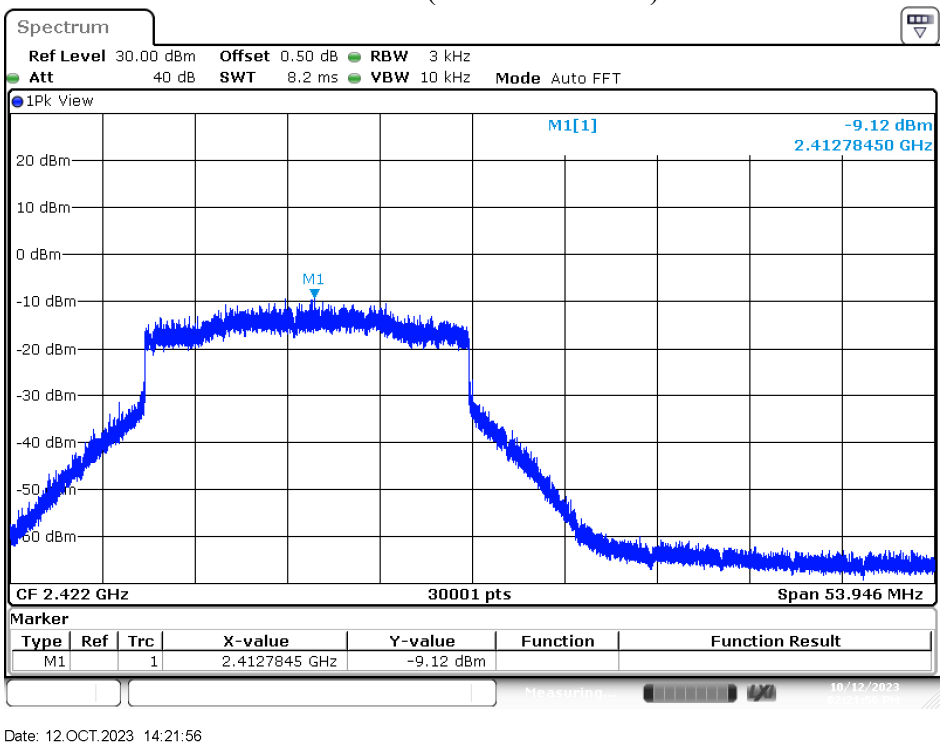


Date: 12.SEP.2023 17:07:48

Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-40 MHz) (Partial RU)-SISO A

Channel No.	Frequency (MHz)	RU Config	PPSD (dBm)	Limit (dBm)	Result
03	2422	242/61	-9.12	8	Pass
11	2462	242/62	-14.44	8	Pass

Channel 03 (Partial RU 242/61)



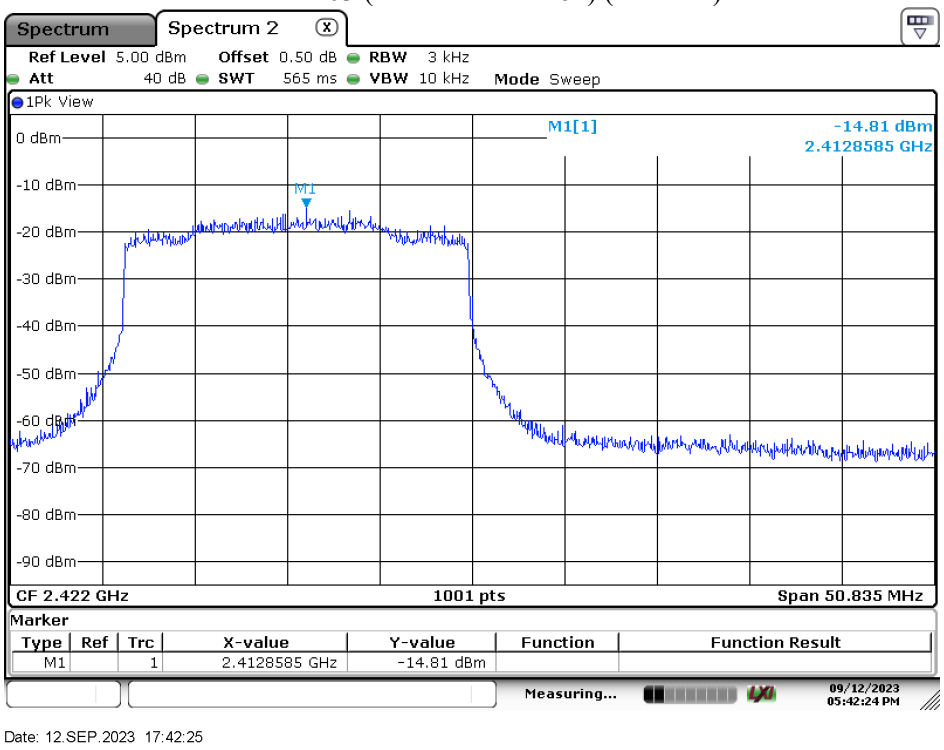
Date: 12.OCT.2023 14:21:56

Product : Notebook Computer
Test Item : Power Density Data
Test Mode : Transmit (802.11ax-40 MHz) (Partial RU)-MIMO

Channel No.	Frequency (MHz)	RU Config	Chain	PPSD (dBm)	10*log(2) (dB)	Total PPSD (dBm)	Limit (dBm)	Result
03	2422	242/61	A	-10.65	3.01	-7.64	8	Pass
			B	-11.26	3.01	-8.25		
11	2462	242/62	A	-14.08	3.01	-11.07	8	Pass
			B	-14.05	3.01	-11.04		

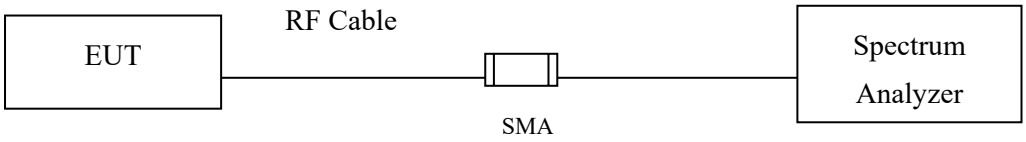
Note: The quantity 10*log(2) (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 03 (Partial RU 242/61) (Chain A)



9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to ANSI C63.10 2013 for compliance to FCC 47CFR 15.247 requirements.

9.3. Test Result of Duty Cycle

Product : Notebook Computer
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:

Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

Results:

SISO A

2.4 GHz band	Time On (ms)	Time On + Time Off (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	8.3400	8.4200	99.05	0.04
802.11g	2.0850	2.1400	97.43	0.11
802.11ax-20 MHz	2.5942	2.6377	98.35	0.07
802.11ax-40 MHz	3.9610	4.0290	98.31	0.07
802.11ax-20 MHz (Partial RU)	2.5800	2.6400	97.73	0.10
802.11ax-40 MHz (Partial RU)	2.5800	2.6300	98.10	0.08

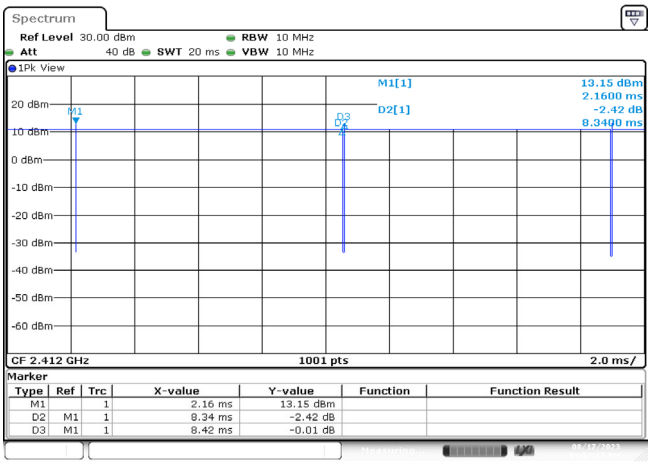
SISO B

2.4 GHz band	Time On (ms)	Time On + Time Off (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11b	8.3380	8.4040	99.21	0.03
802.11g	2.0800	2.1360	97.38	0.12
802.11ax-20 MHz	3.9750	4.0350	98.51	0.07
802.11ax-40 MHz	3.9750	4.0350	98.51	0.07
802.11ax-20 MHz (Partial RU)	2.5900	2.6300	98.48	0.07
802.11ax-40 MHz (Partial RU)	2.5800	2.6300	98.10	0.08

MIMO

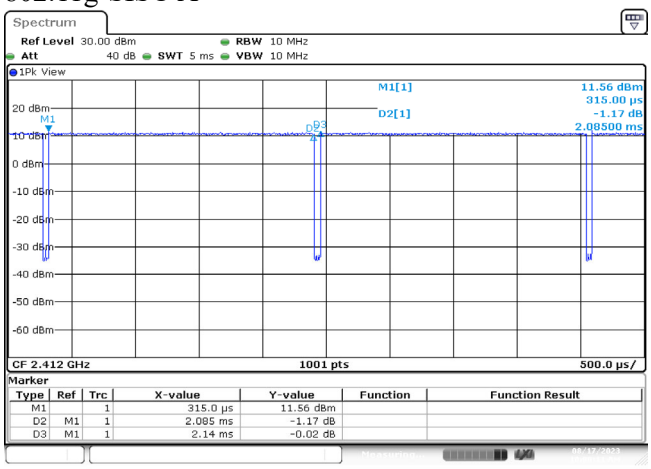
2.4 GHz band	Time On (ms)	Time On + Time Off (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11ax-20 MHz	3.9700	4.0300	98.51	0.07
802.11ax-40 MHz	3.9800	4.0300	98.76	0.05
802.11ax-20 MHz (Partial RU)	2.5942	2.6377	98.35	0.07
802.11ax-40 MHz (Partial RU)	2.5942	2.6522	97.81	0.10

802.11b-SISO A



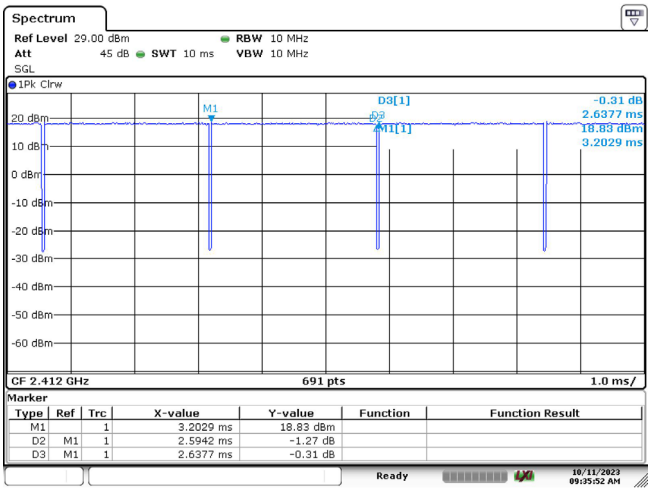
Date: 17.AUG.2023 09:57:17

802.11g-SISO A



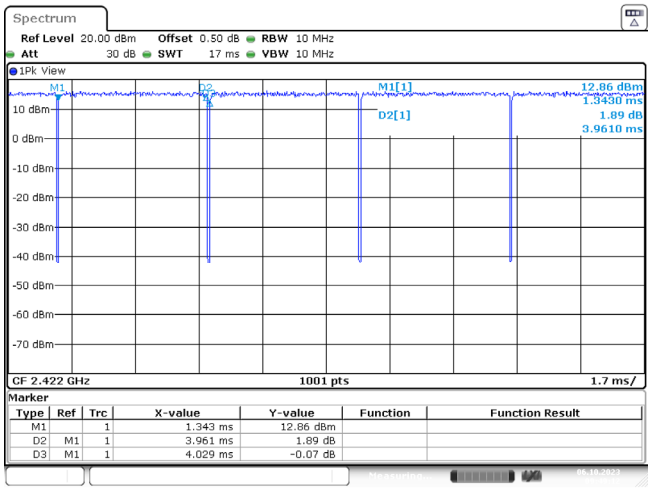
Date: 17.AUG.2023 10:00:12

802.11ax-20 MHz-SISO A



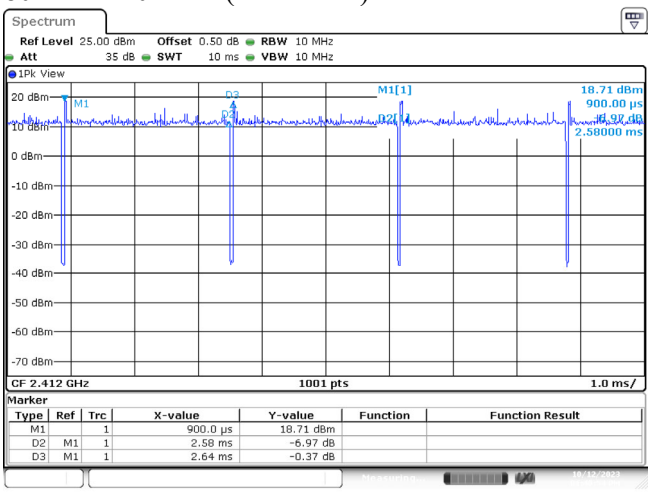
Date: 11.OCT.2023 09:35:52

802.11ax-40 MHz-SISO A



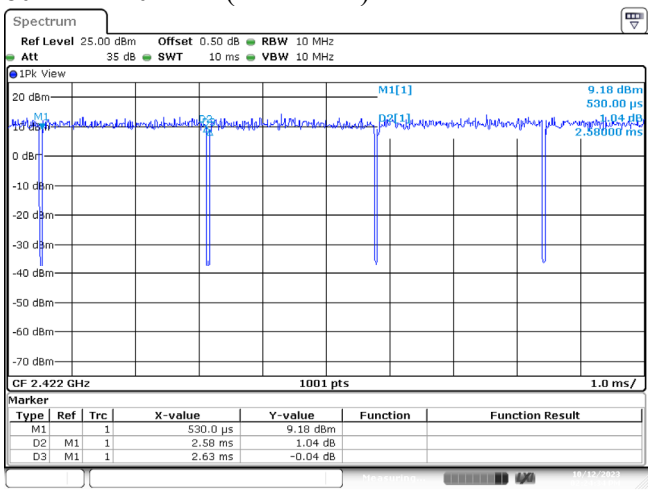
Date: 6.OCT.2023 09:49:12

802.11ax-20 MHz (Partial RU)-SISO A



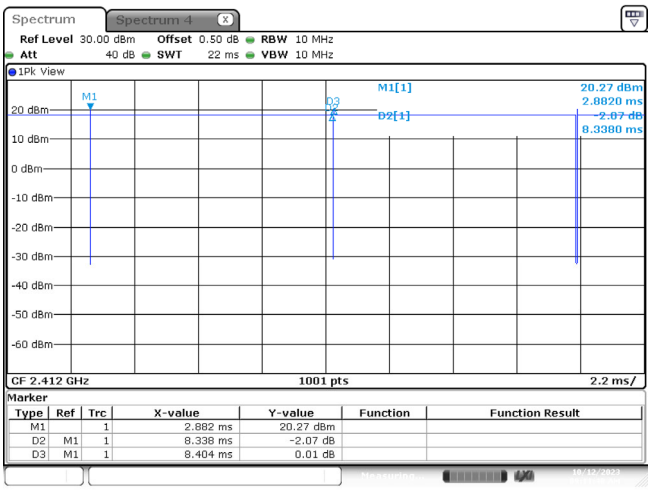
Date: 12.OCT.2023 13:40:55

802.11ax-40 MHz (Partial RU)-SISO A



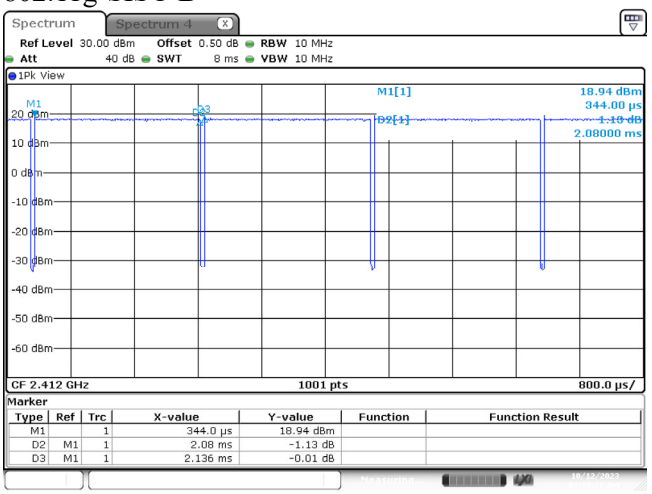
Date: 12.OCT.2023 14:24:34

802.11b-SISO B



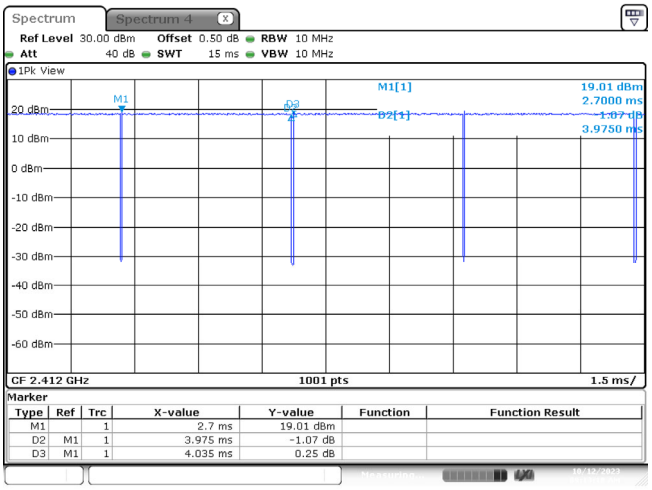
Date: 12.OCT.2023 09:11:48

802.11g-SISO B



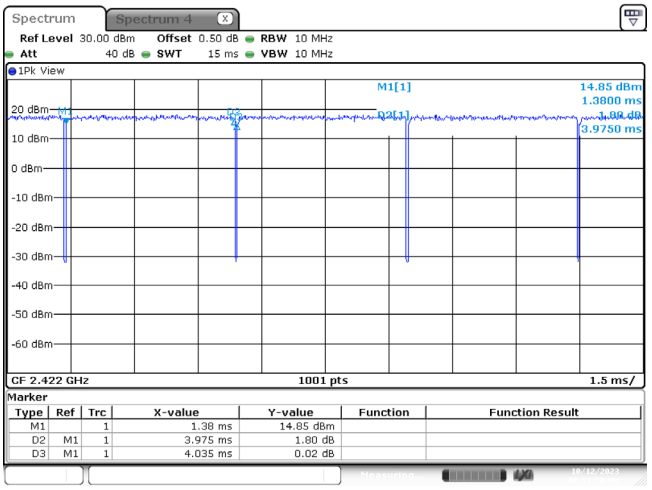
Date: 12.OCT.2023 09:12:38

802.11ax-20 MHz-SISO B



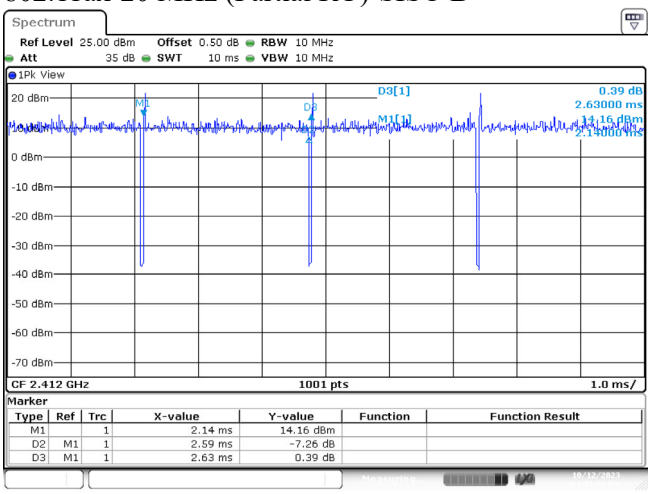
Date: 12.OCT.2023 09:13:18

802.11ax-40 MHz-SISO B



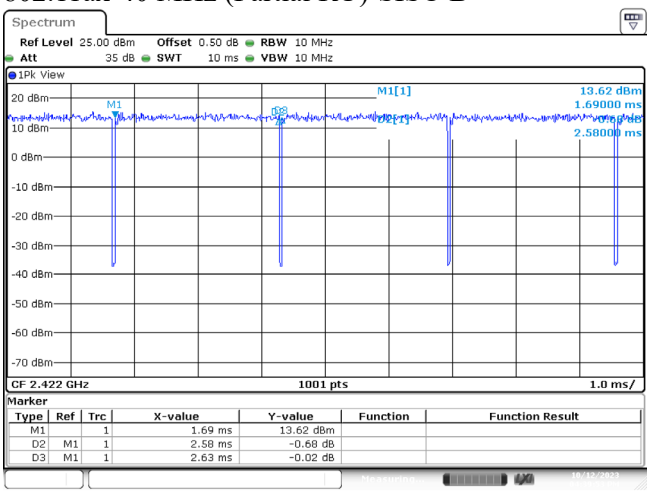
Date: 12.OCT.2023 09:13:51

802.11ax-20 MHz (Partial RU)-SISO B



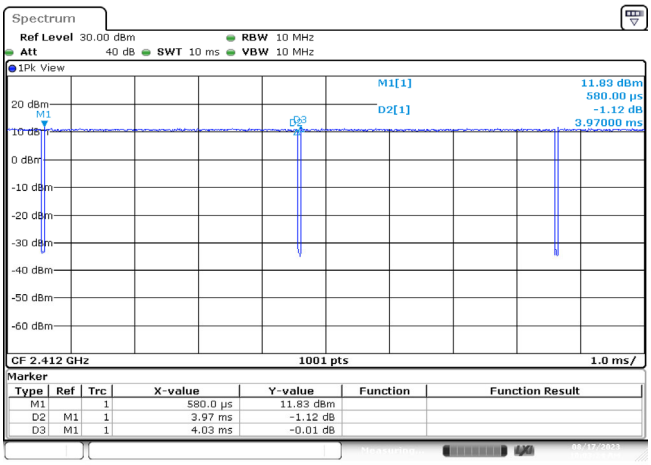
Date: 12.OCT.2023 16:43:59

802.11ax-40 MHz (Partial RU)-SISO B



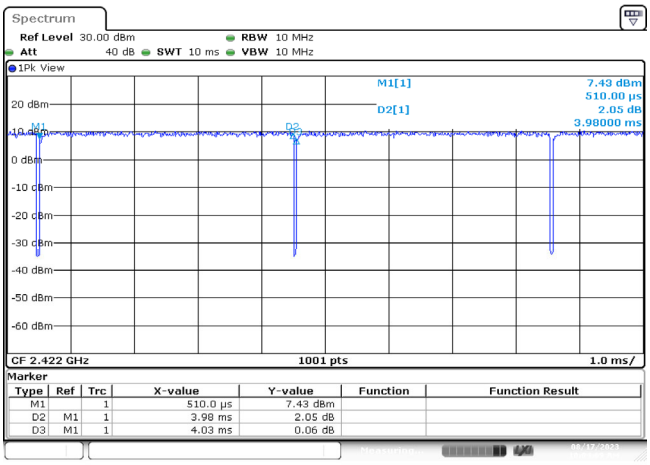
Date: 12.OCT.2023 16:39:53

802.11ax-20 MHz-MIMO



Date: 17.AUG.2023 10:03:25

802.11ax-40 MHz-MIMO



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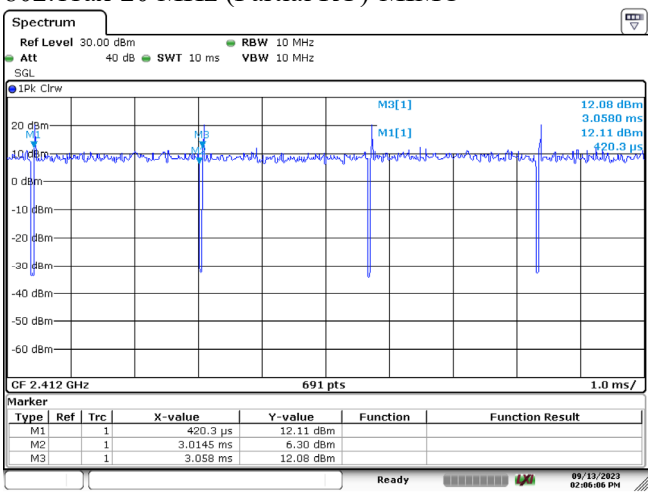
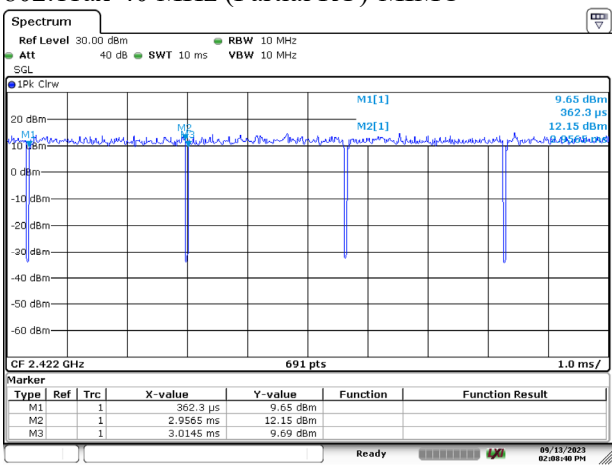
802.11ax-20 MHz (Partial RU)-MIMO



Date: 13.SEP.2023 14:06:07

802.11ax-40 MHz (Partial RU)-MIMO



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