Annex C

WLAN 802.11b/g/n/ax Test Result

Model No.: APEX0677

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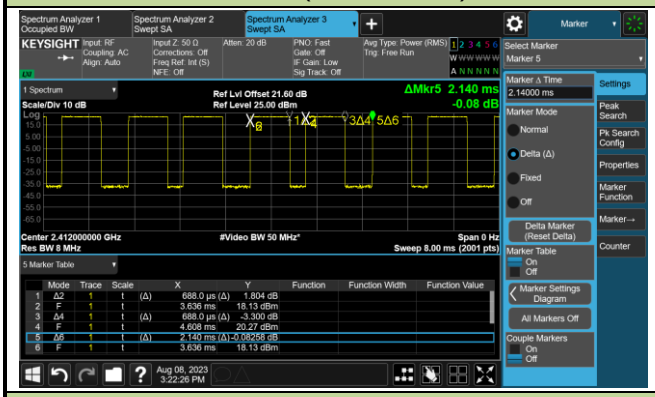
1. Duty Cycle Measurement Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08 ~ 2023-08-20		

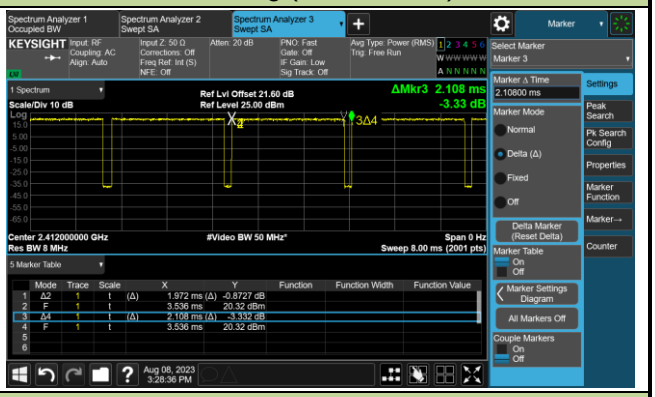
Test Mode	Duty Cycle
802.11b	64.30%
802.11g	93.55%
802.11n-HT20	93.77%
802.11n-HT40	94.76%
802.11ax-HE20	93.79%
802.11ax-HE40	94.78%

Duty Cycle (T = Transmission Duration)

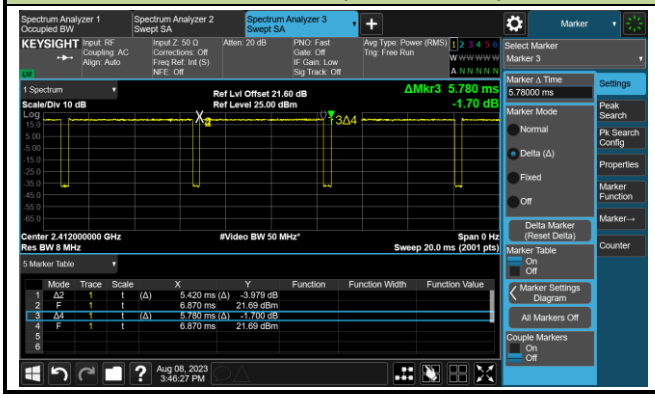
802.11b (T = 1.376ms)



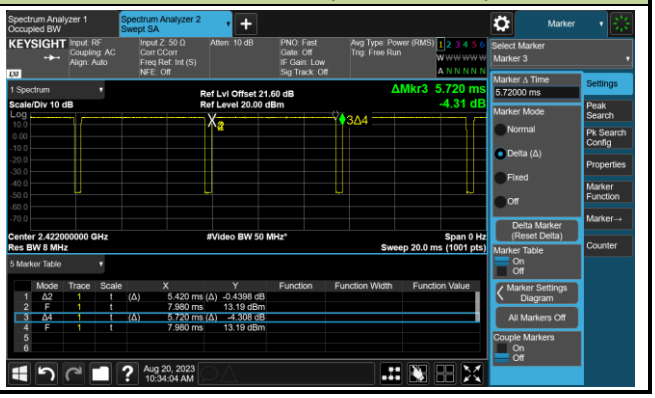
802.11g (T = 1.972ms)

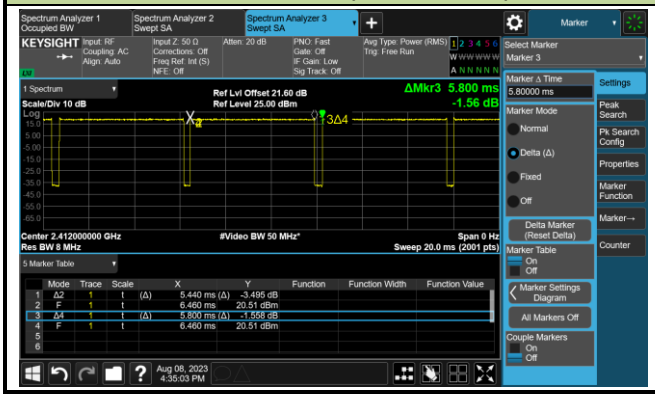
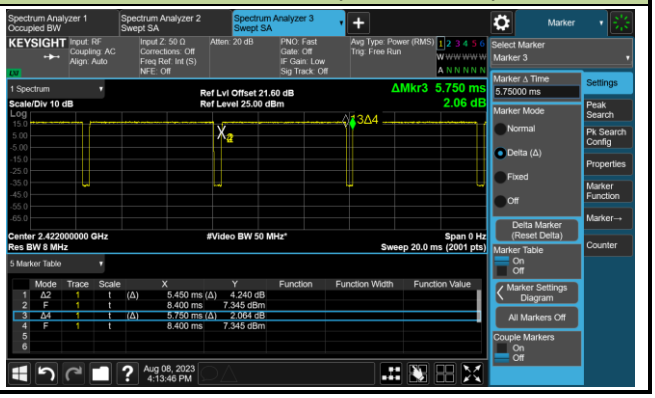


802.11n-HT20 (T = 5.420ms)



802.11n-HT40 (T = 5.420ms)



Duty Cycle (T = Transmission Duration)	
802.11ax-HE20 (T = 5.440ms)	802.11ax-HE40 (T = 5.450ms)
	

2. 6dB Bandwidth Measurement Test Result

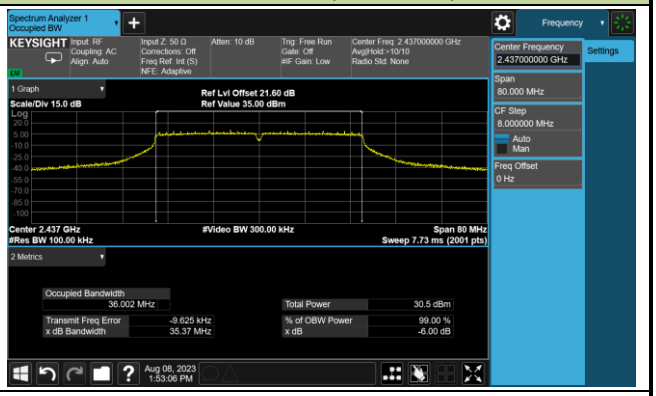
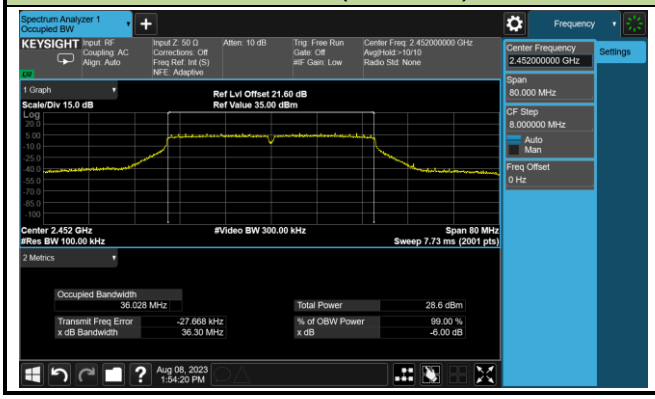
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08		

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
11b	1Mbps	01	2412	8.061	≥ 0.5
11b	1Mbps	06	2437	8.068	≥ 0.5
11b	1Mbps	11	2462	8.064	≥ 0.5
11g	6Mbps	01	2412	15.740	≥ 0.5
11g	6Mbps	06	2437	15.930	≥ 0.5
11g	6Mbps	11	2462	15.160	≥ 0.5
11n-HT20	MCS0	01	2412	16.320	≥ 0.5
11n-HT20	MCS0	06	2437	16.780	≥ 0.5
11n-HT20	MCS0	11	2462	15.480	≥ 0.5
11n-HT40	MCS0	03	2422	35.370	≥ 0.5
11n-HT40	MCS0	06	2437	35.370	≥ 0.5
11n-HT40	MCS0	09	2452	36.300	≥ 0.5
11ax-HE20	MCS0	01	2412	18.160	≥ 0.5
11ax-HE20	MCS0	06	2437	18.450	≥ 0.5
11ax-HE20	MCS0	11	2462	17.740	≥ 0.5
11ax-HE40	MCS0	03	2422	37.760	≥ 0.5
11ax-HE40	MCS0	06	2437	37.600	≥ 0.5
11ax-HE40	MCS0	09	2452	37.850	≥ 0.5

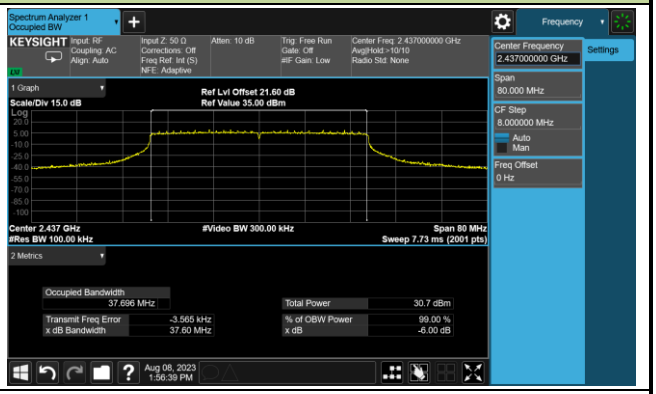
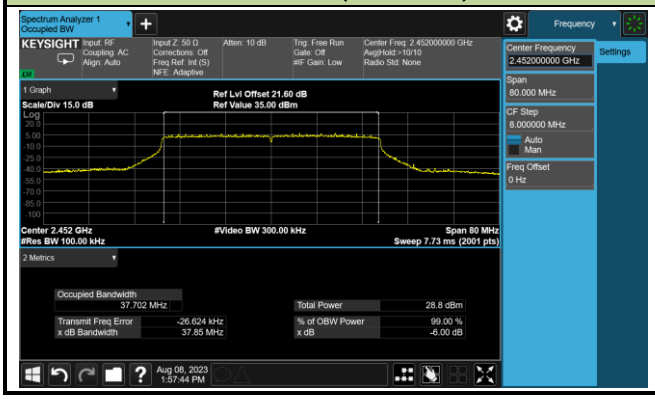
802.11b 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
Channel 11 (2462MHz)	

802.11g 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
Channel 11 (2462MHz)	

802.11n-HT20 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
Channel 11 (2462MHz)	

802.11n-HT40 6dB Bandwidth	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

802.11ax-HE20 6dB Bandwidth	
Channel 01 (2412MHz)	Channel 06 (2437MHz)
Channel 11 (2462MHz)	

802.11ax-HE40 6dB Bandwidth	
Channel 03 (2422MHz)	Channel 06 (2437MHz)
	
Channel 09 (2452MHz)	
	

3. Output Power Measurement Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08 ~ 2023-12-29	Filter Configuration	Filter 1#

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Power (dBm)	Limit (dBm)
				Ant 0	Ant 1		
11b	1Mbps	01	2412	22.67	22.75	25.72	≤ 30.00
11b	1Mbps	06	2437	22.66	22.22	25.46	≤ 30.00
11b	1Mbps	11	2462	22.63	22.70	25.68	≤ 30.00
11g	6Mbps	01	2412	22.38	22.36	25.38	≤ 30.00
11g	6Mbps	06	2437	22.24	22.32	25.29	≤ 30.00
11g	6Mbps	10	2457	21.43	21.56	24.51	≤ 30.00
11g	6Mbps	11	2462	18.41	18.68	21.56	≤ 30.00
11n-HT20	MCS0	01	2412	22.76	22.30	25.55	≤ 30.00
11n-HT20	MCS0	06	2437	22.77	22.88	25.84	≤ 30.00
11n-HT20	MCS0	10	2457	21.25	21.58	24.43	≤ 30.00
11n-HT20	MCS0	11	2462	17.97	17.93	20.96	≤ 30.00
11n-HT40	MCS0	03	2422	21.62	21.65	24.65	≤ 30.00
11n-HT40	MCS0	06	2437	19.28	19.31	22.31	≤ 30.00
11n-HT40	MCS0	08	2447	16.36	16.53	19.46	≤ 30.00
11n-HT40	MCS0	09	2452	14.02	14.05	17.05	≤ 30.00
11ax-HE20	MCS0	01	2412	21.43	21.59	24.52	≤ 30.00
11ax-HE20	MCS0	06	2437	22.44	22.22	25.34	≤ 30.00
11ax-HE20	MCS0	10	2457	20.68	20.85	23.78	≤ 30.00
11ax-HE20	MCS0	11	2462	17.33	17.25	20.30	≤ 30.00
11ax-HE40	MCS0	03	2422	21.41	21.09	24.26	≤ 30.00
11ax-HE40	MCS0	06	2437	18.38	18.28	21.34	≤ 30.00
11ax-HE40	MCS0	08	2447	15.78	15.99	18.90	≤ 30.00
11ax-HE40	MCS0	09	2452	13.70	13.68	16.70	≤ 30.00

Note: Total Power (dBm) = $10*\log \{10^{(\text{Ant 0 Average Power /10})} + 10^{(\text{Ant 1 Average Power /10})}\}$ (dBm).

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08	Filter Configuration	Filter 2#

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Power (dBm)	Limit (dBm)
				Ant 0	Ant 1		
11b	1Mbps	01	2412	22.12	22.23	25.19	≤ 30.00
11b	1Mbps	06	2437	21.78	21.94	24.87	≤ 30.00
11g	6Mbps	01	2412	21.66	21.74	24.71	≤ 30.00
11g	6Mbps	06	2437	21.83	21.91	24.88	≤ 30.00
11n-HT20	MCS0	01	2412	21.57	21.55	24.57	≤ 30.00
11n-HT20	MCS0	06	2437	21.78	21.79	24.80	≤ 30.00
11n-HT40	MCS0	03	2422	21.07	20.94	24.02	≤ 30.00
11ax-HE20	MCS0	01	2412	21.22	21.20	24.22	≤ 30.00
11ax-HE20	MCS0	06	2437	21.62	21.85	24.75	≤ 30.00
11ax-HE40	MCS0	03	2422	20.61	21.03	23.84	≤ 30.00

Note: Total Power (dBm) = $10*\log\{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)}\}$ (dBm).

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08	Filter Configuration	Filter 3#

Test Mode	Data Rate / MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Power (dBm)	Limit (dBm)
				Ant 0	Ant 1		
11b	1Mbps	11	2462	21.95	22.07	25.02	≤ 30.00
11g	6Mbps	11	2462	18.37	18.14	21.27	≤ 30.00
11n-HT20	MCS0	11	2462	17.39	17.73	20.57	≤ 30.00
11ax-HE20	MCS0	11	2462	17.04	16.79	19.93	≤ 30.00

Note: Total Power (dBm) = $10*\log \{10^{(\text{Ant 0 Average Power}/10)} + 10^{(\text{Ant 1 Average Power}/10)}\}$ (dBm).

4. Power Spectral Density Measurement Test Result

Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08 ~ 2023-09-09		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	PSD (dBm/ 10kHz)		Duty Cycle (%)	10*log (1/x)	Total PSD (dBm/10kHz)	Limit (dBm/3kHz)
				Ant 0	Ant 1				
11b	1Mbps	01	2412	-4.037	-3.860	64.30	1.92	0.981	≤ 8.00
11b	1Mbps	06	2437	-3.847	-3.914	64.30	1.92	1.048	≤ 8.00
11b	1Mbps	11	2462	-3.714	-3.254	64.30	1.92	1.450	≤ 8.00
11g	6Mbps	01	2412	-6.323	-6.460	93.55	0.29	-3.091	≤ 8.00
11g	6Mbps	06	2437	-6.469	-5.834	93.55	0.29	-2.840	≤ 8.00
11g	6Mbps	11	2462	-9.890	-9.891	93.55	0.29	-6.591	≤ 8.00
11n-HT20	MCS0	01	2412	-6.891	-7.088	93.77	0.28	-3.699	≤ 8.00
11n-HT20	MCS0	06	2437	-6.974	-6.828	93.77	0.28	-3.611	≤ 8.00
11n-HT20	MCS0	11	2462	-11.187	-11.138	93.77	0.28	-7.873	≤ 8.00
11n-HT40	MCS0	03	2422	-10.852	-10.900	94.76	0.23	-7.632	≤ 8.00
11n-HT40	MCS0	06	2437	-13.320	-13.334	94.76	0.23	-10.083	≤ 8.00
11n-HT40	MCS0	09	2452	-18.308	-18.449	94.76	0.23	-15.134	≤ 8.00
11ax-HE20	MCS0	01	2412	-9.089	-9.337	93.79	0.28	-5.922	≤ 8.00
11ax-HE20	MCS0	06	2437	-8.591	-8.624	93.79	0.28	-5.319	≤ 8.00
11ax-HE20	MCS0	11	2462	-13.769	-13.149	93.79	0.28	-10.159	≤ 8.00
11ax-HE40	MCS0	03	2422	-12.246	-12.387	94.78	0.23	-9.073	≤ 8.00
11ax-HE40	MCS0	06	2437	-15.379	-15.324	94.78	0.23	-12.108	≤ 8.00
11ax-HE40	MCS0	09	2452	-20.454	-20.207	94.78	0.23	-17.086	≤ 8.00

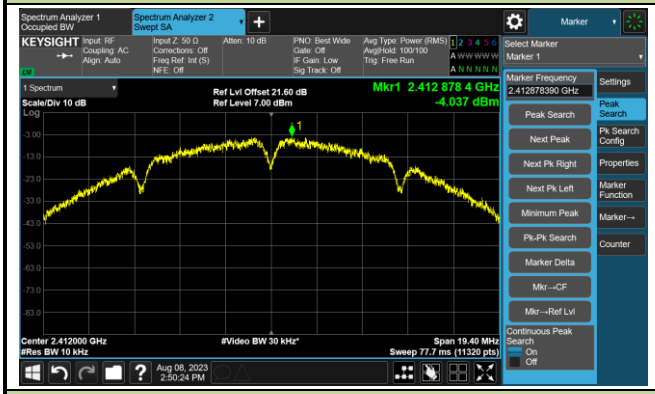
Note 1:

When EUT duty cycle ≥ 98%, Total PSD (dBm / 10kHz) = 10*log {$10^{(\text{Ant 0 PSD}/10)}$ + $10^{(\text{Ant 1 PSD}/10)}$} (dBm / 10kHz).

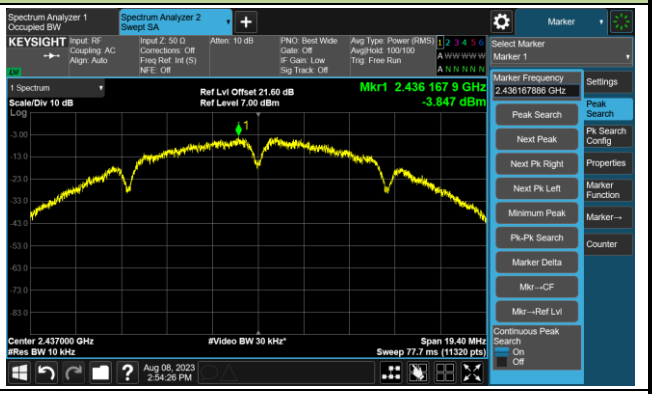
When EUT duty cycle < 98%, Total PSD (dBm / 10kHz) = 10*log {$10^{(\text{Ant 0 PSD}/10)}$ + $10^{(\text{Ant 1 PSD}/10)}$} (dBm / 10kHz) + 10*log (1/Duty Cycle).

802.11b - AVGPSD - Ant 0

Channel 01 (2412MHz)



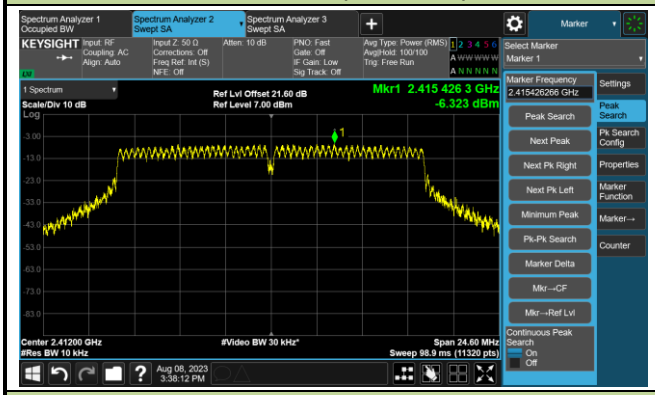
Channel 06 (2437MHz)



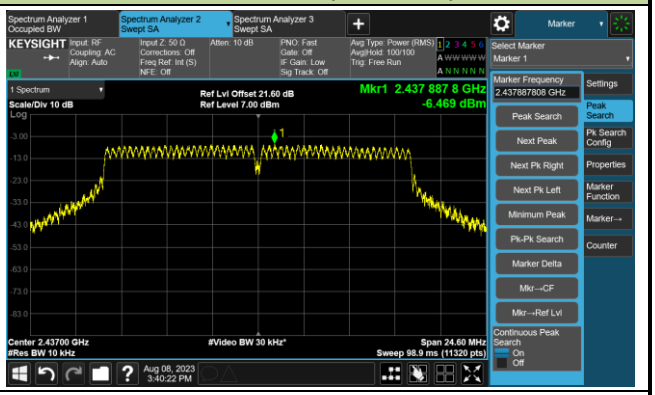
Channel 11 (2462MHz)

802.11g - AVGPSD - Ant 0

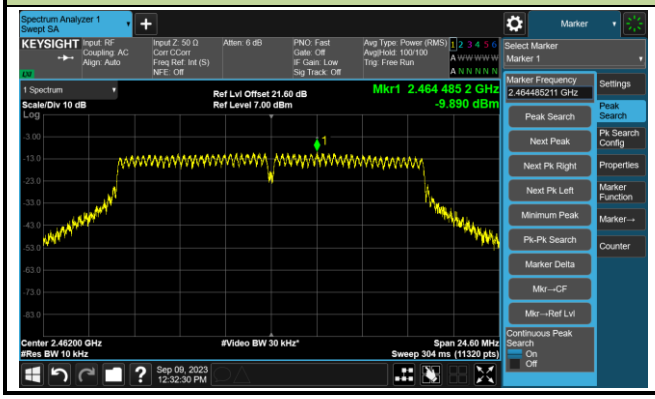
Channel 01 (2412MHz)



Channel 06 (2437MHz)

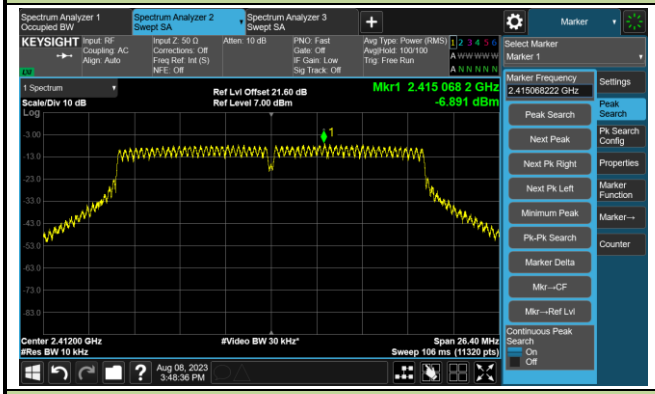


Channel 11 (2462MHz)

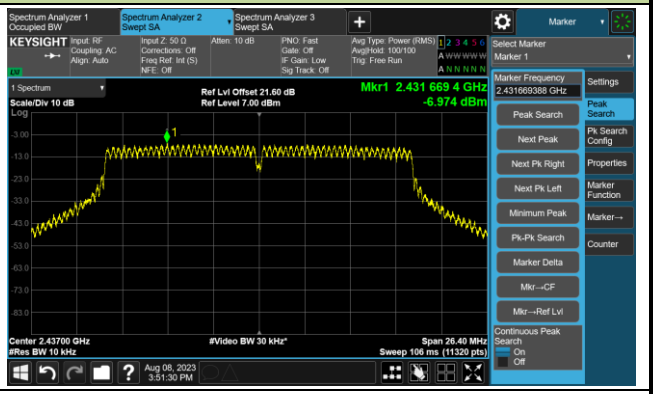


802.11n-HT20 - AVGPSD - Ant 0

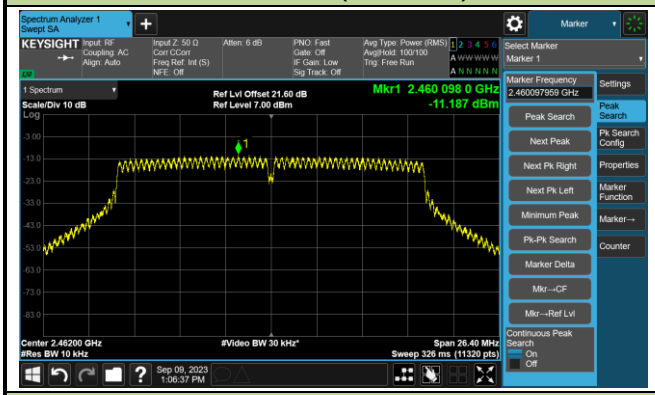
Channel 01 (2412MHz)



Channel 06 (2437MHz)

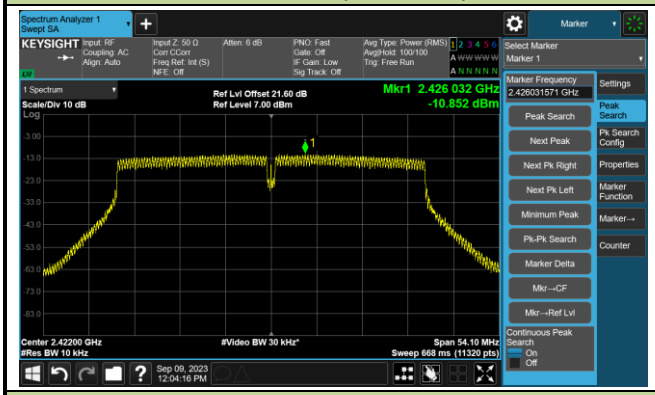


Channel 11 (2462MHz)



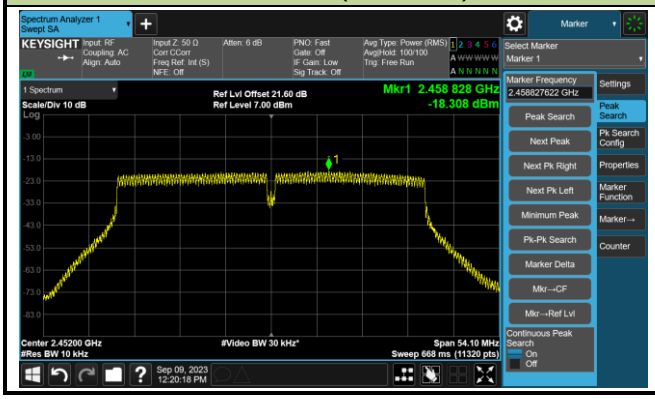
802.11n-HT40 - AVGPSD - Ant 0

Channel 03 (2422MHz)



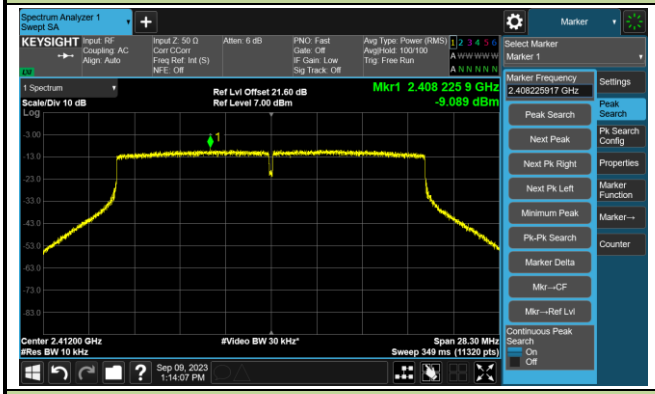
Channel 06 (2437MHz)

Channel 09 (2452MHz)

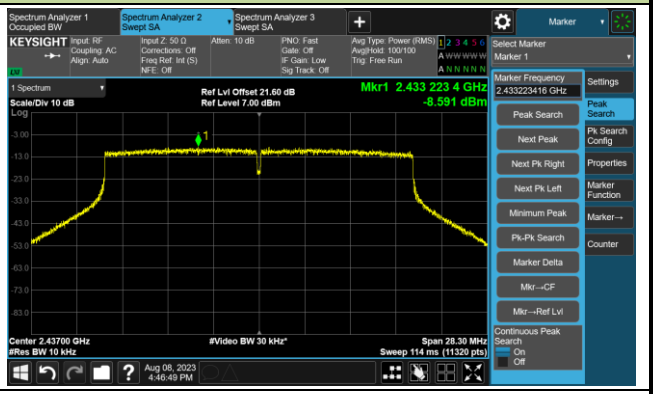


802.11ax-HE20 - AVGPSD - Ant 0

Channel 01 (2412MHz)



Channel 06 (2437MHz)



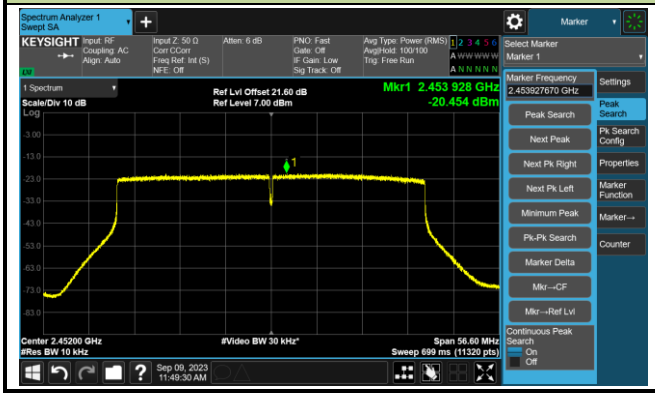
Channel 11 (2462MHz)

802.11ax-HE40 - AVGPSD - Ant 0

Channel 03 (2422MHz)

Channel 06 (2437MHz)

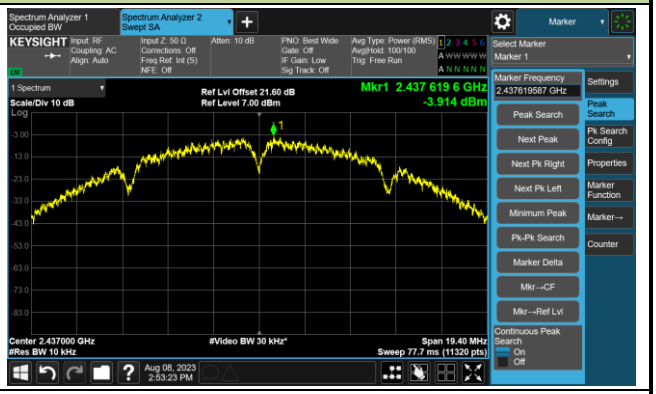
Channel 09 (2452MHz)



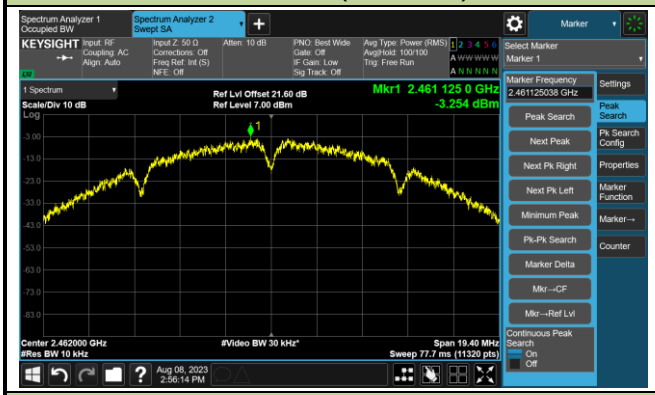
802.11b - AVGPSD - Ant 1

Channel 01 (2412MHz)

Channel 06 (2437MHz)

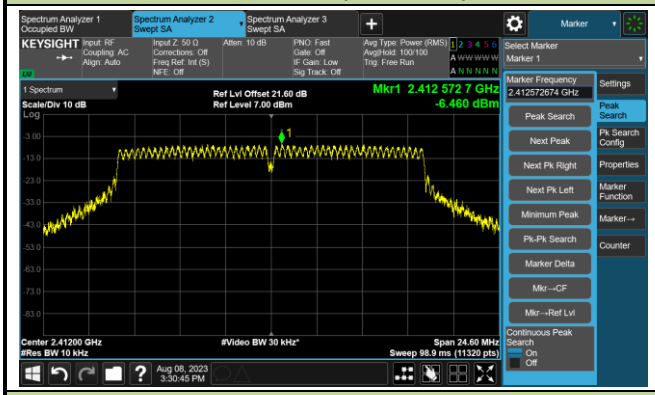


Channel 11 (2462MHz)

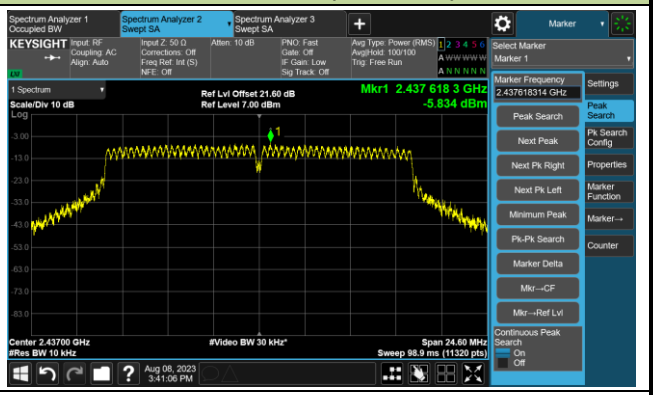


802.11g - AVGPSD - Ant 1

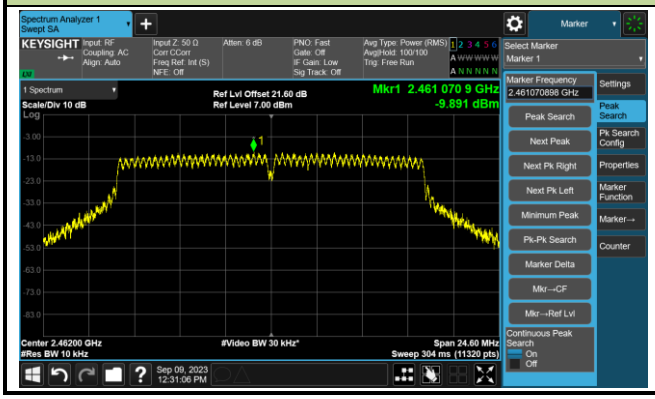
Channel 01 (2412MHz)



Channel 06 (2437MHz)

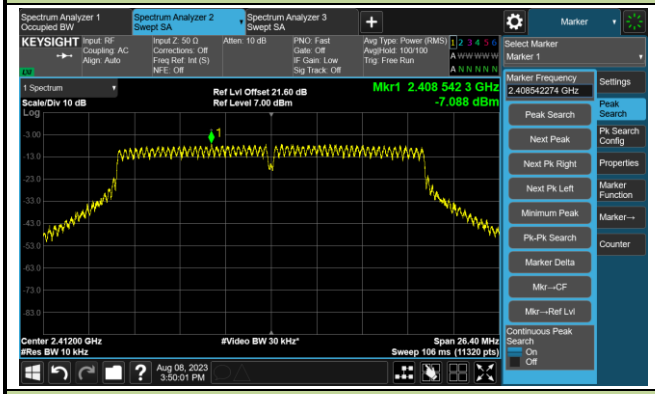


Channel 11 (2462MHz)

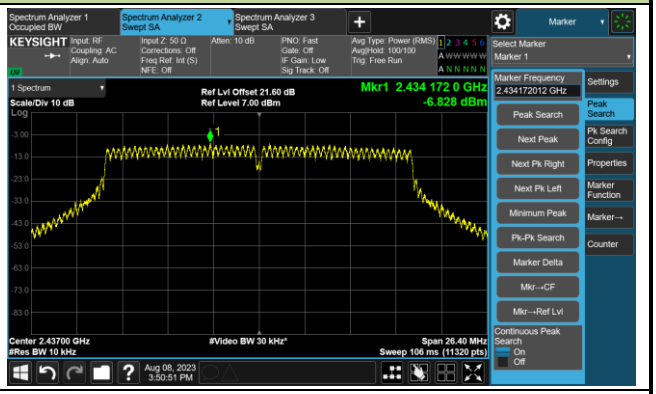


802.11n-HT20 - AVGPSD - Ant 1

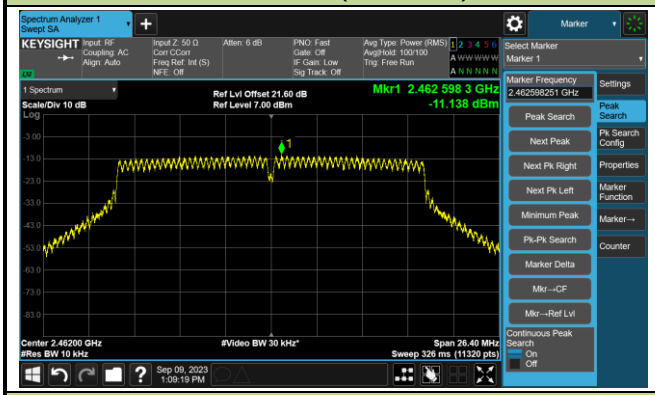
Channel 01 (2412MHz)



Channel 06 (2437MHz)

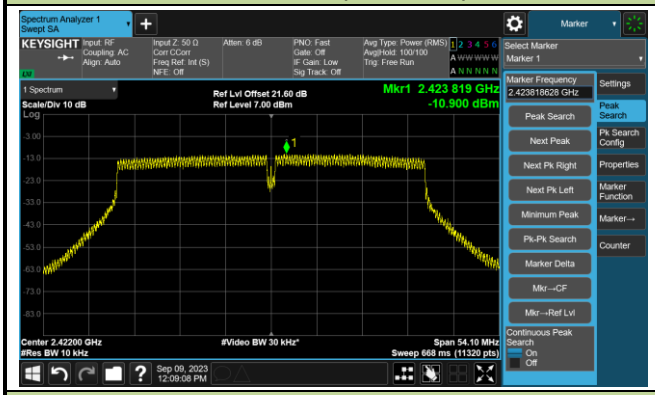


Channel 11 (2462MHz)

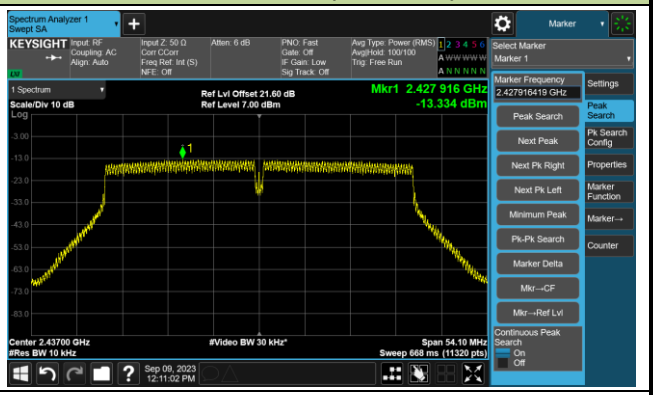


802.11n-HT40 - AVGPSD - Ant 1

Channel 03 (2422MHz)



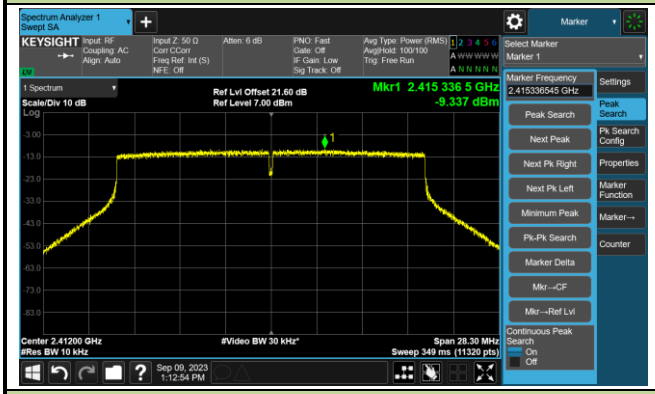
Channel 06 (2437MHz)



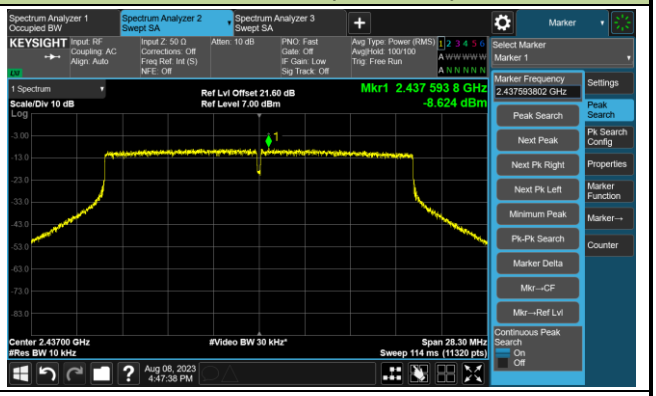
Channel 09 (2452MHz)

802.11ax-HE20 - AVGPSD - Ant 1

Channel 01 (2412MHz)



Channel 06 (2437MHz)

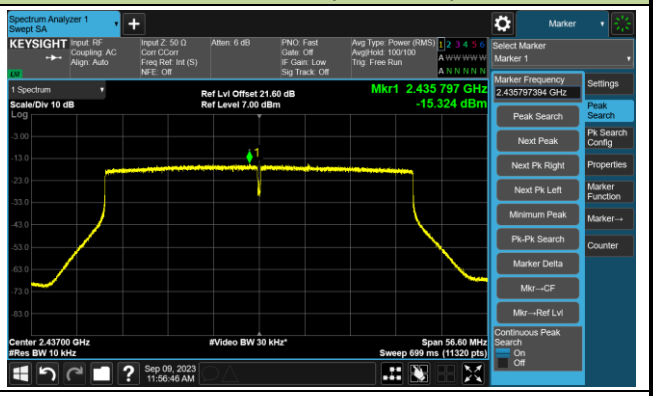


Channel 11 (2462MHz)

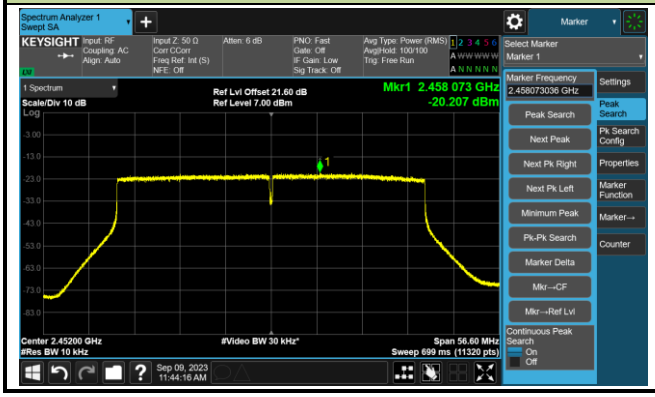
802.11ax-HE40 - AVGPSD - Ant 1

Channel 03 (2422MHz)

Channel 06 (2437MHz)



Channel 09 (2452MHz)



5. Conducted Band Edge and Out-of-Band Emissions Test Result

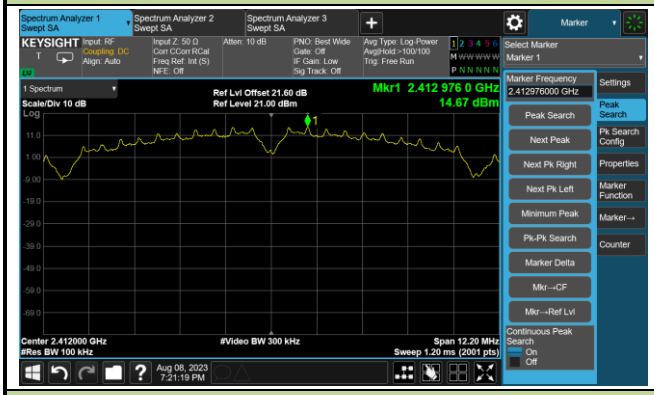
Test Site	WZ-SR5	Test Engineer	Lynn Yang
Test Date	2023-08-08 ~ 2023-09-14	Filter Configuration	Filter 1#

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit
11b	1Mbps	01	2412	30dBc
11b	1Mbps	06	2437	30dBc
11b	1Mbps	11	2462	30dBc
11g	6Mbps	01	2412	30dBc
11g	6Mbps	06	2437	30dBc
11g	6Mbps	11	2462	30dBc
11n-HT20	MCS0	01	2412	30dBc
11n-HT20	MCS0	06	2437	30dBc
11n-HT20	MCS0	11	2462	30dBc
11n-HT40	MCS0	03	2422	30dBc
11n-HT40	MCS0	06	2437	30dBc
11n-HT40	MCS0	09	2452	30dBc
11ax-HE20	MCS0	01	2412	30dBc
11ax-HE20	MCS0	06	2437	30dBc
11ax-HE20	MCS0	11	2462	30dBc
11ax-HE40	MCS0	03	2422	30dBc
11ax-HE40	MCS0	06	2437	30dBc
11ax-HE40	MCS0	09	2452	30dBc

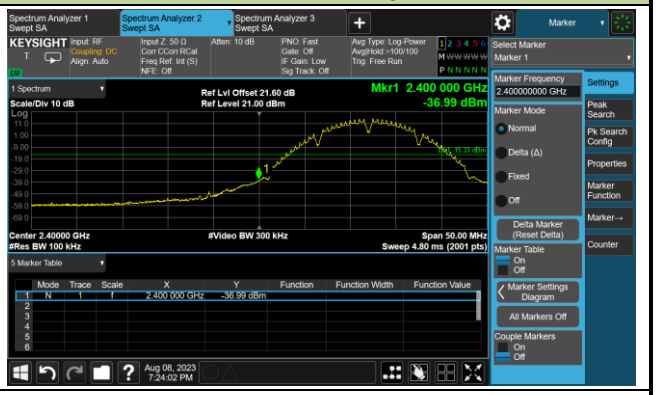
802.11b Out-of-Band Emissions – Ant 0

Channel 01 (2412MHz)

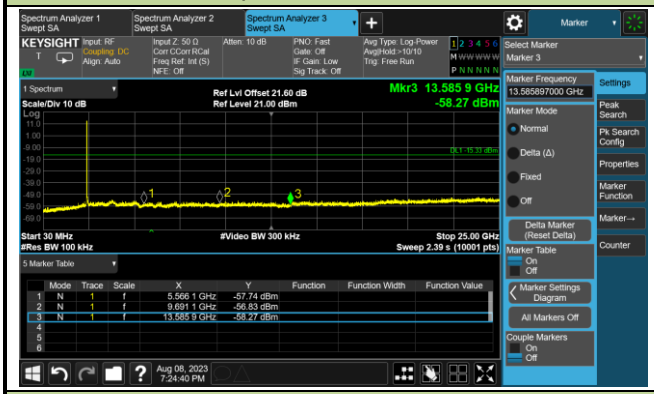
100kHz PSD Reference Level



Low Band Edge

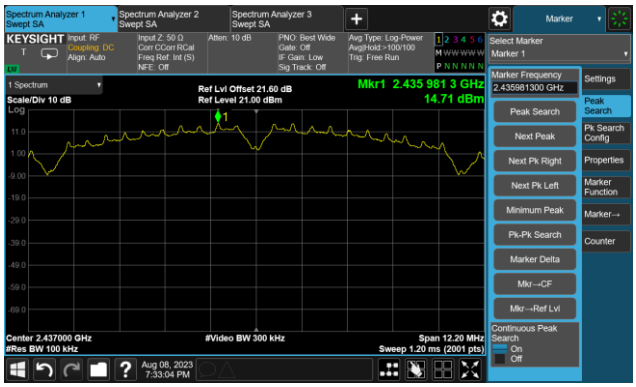


Spurious Emission

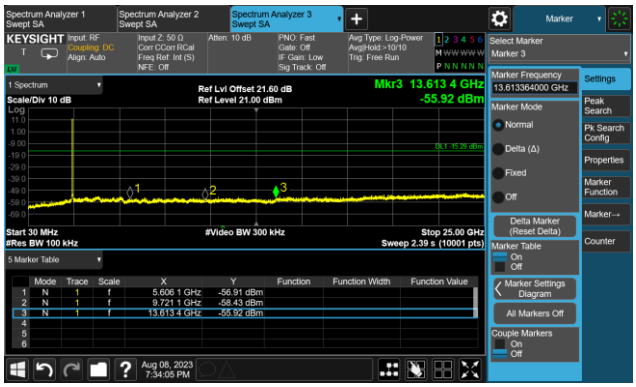


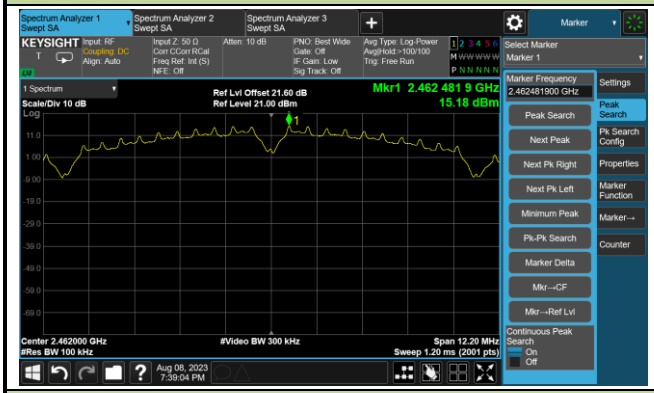
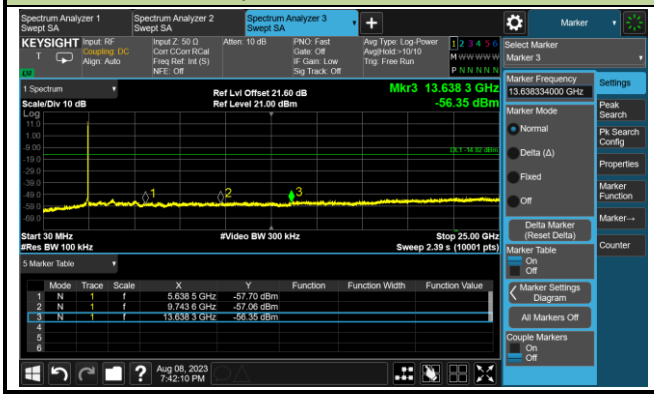
Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

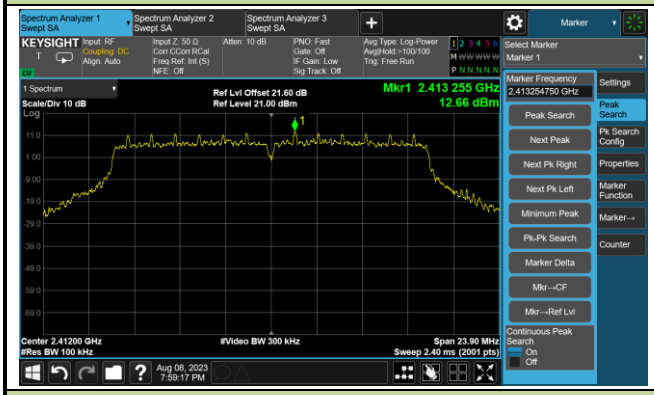


802.11b Out-of-Band Emissions – Ant 0	
Channel 11 (2462MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

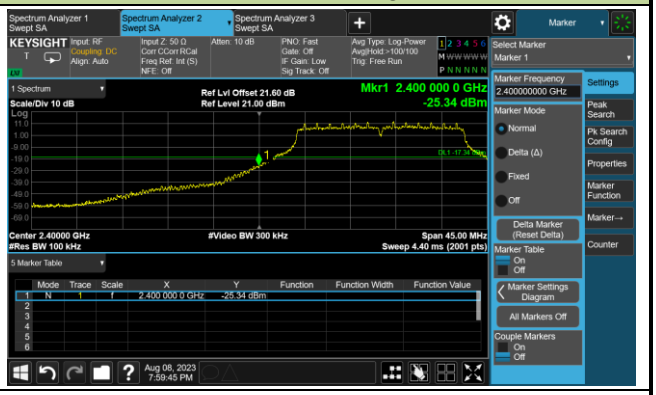
802.11g Out-of-Band Emissions – Ant 0

Channel 01 (2412MHz)

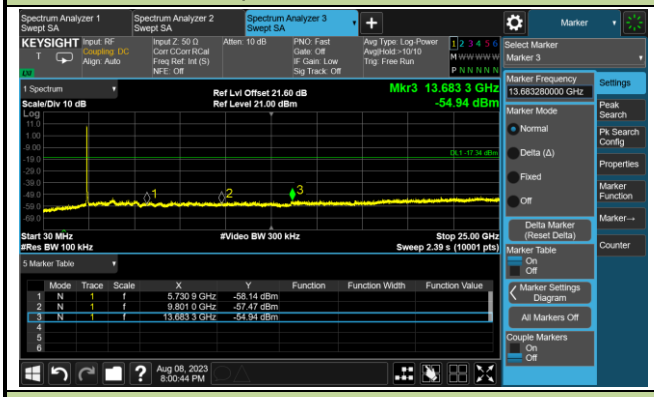
100kHz PSD Reference Level



Low Band Edge

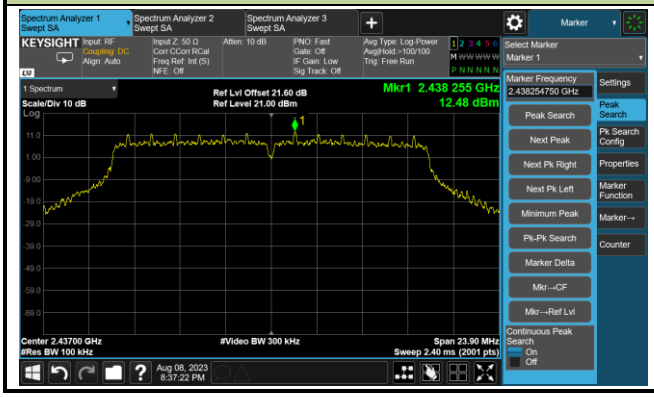


Spurious Emission



Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

802.11g Out-of-Band Emissions – Ant 0	
Channel 11 (2462MHz)	
100kHz PSD Reference Level	High Band Edge
Spurious Emission	