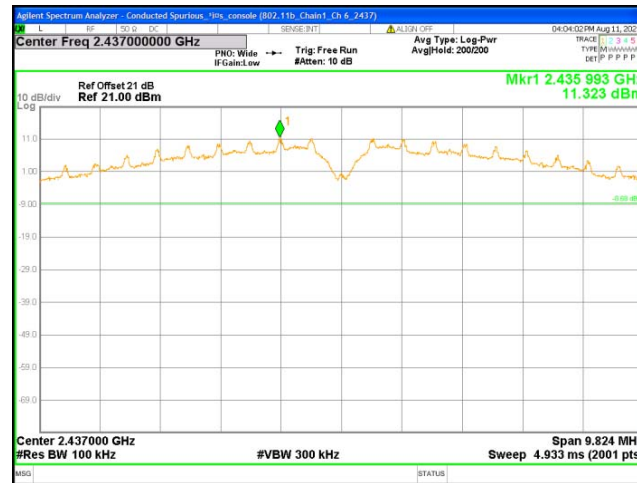
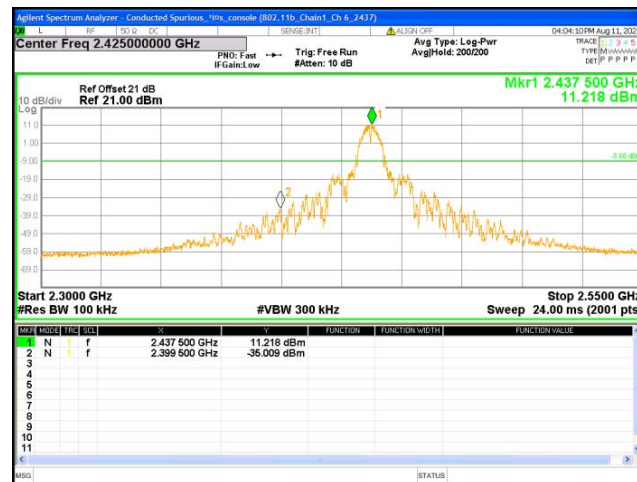


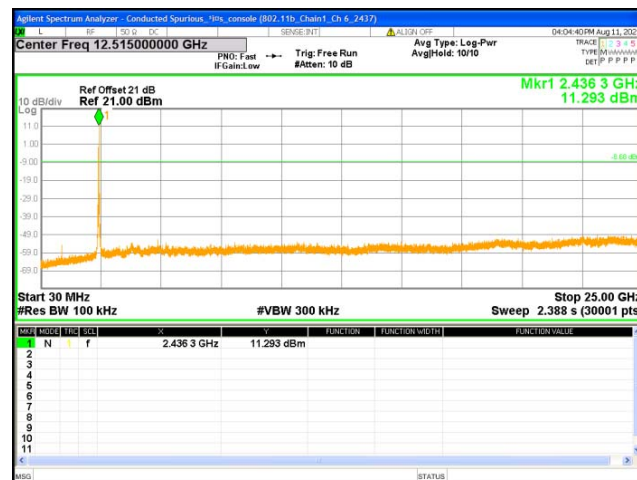
Chain1 : Conducted Spurious @ 802.11b Mode Ch 6



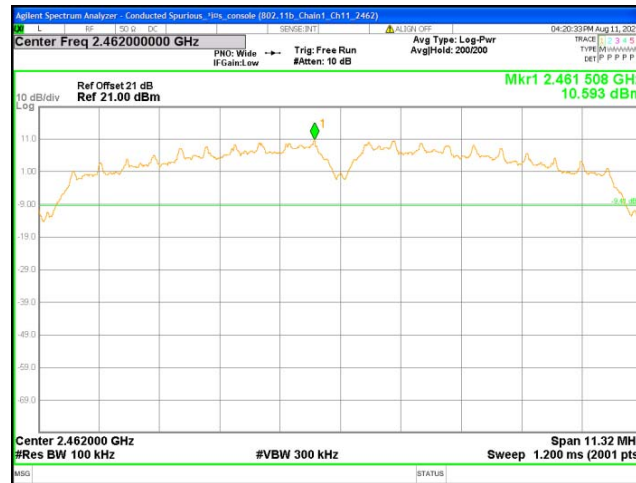
Chain1 : Conducted Spurious @ 802.11b Mode Ch 6



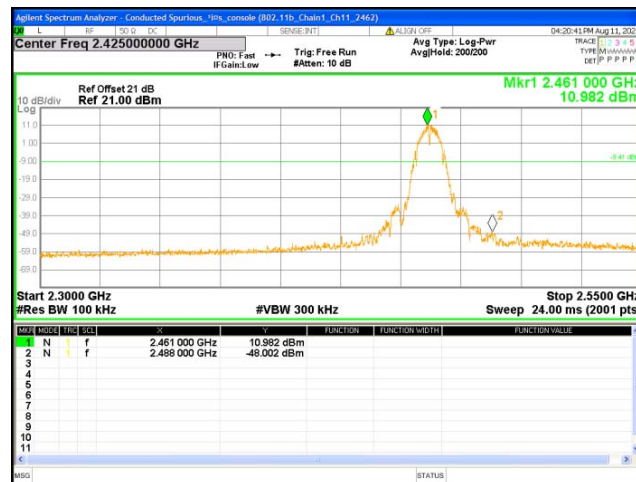
Chain1 : Conducted Spurious @ 802.11b Mode Ch 6



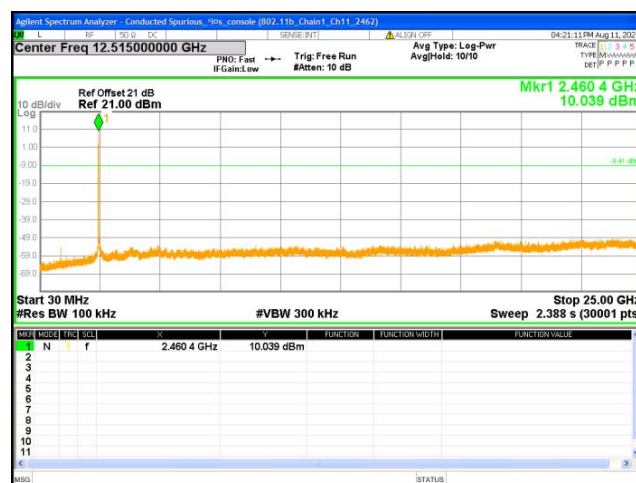
Chain1 : Conducted Spurious @ 802.11b Mode Ch11



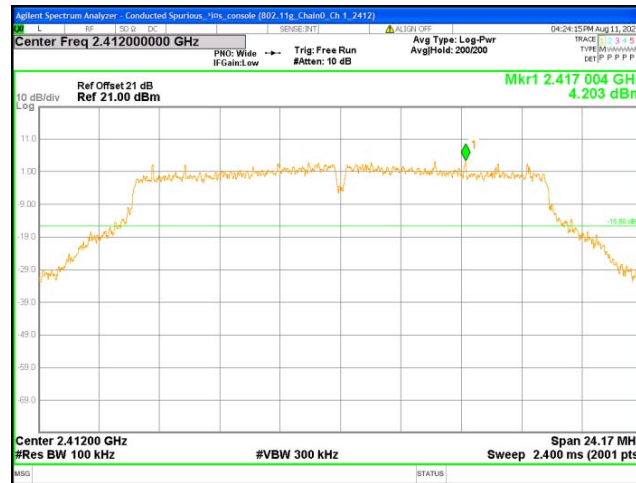
Chain1 : Conducted Spurious @ 802.11b Mode Ch11



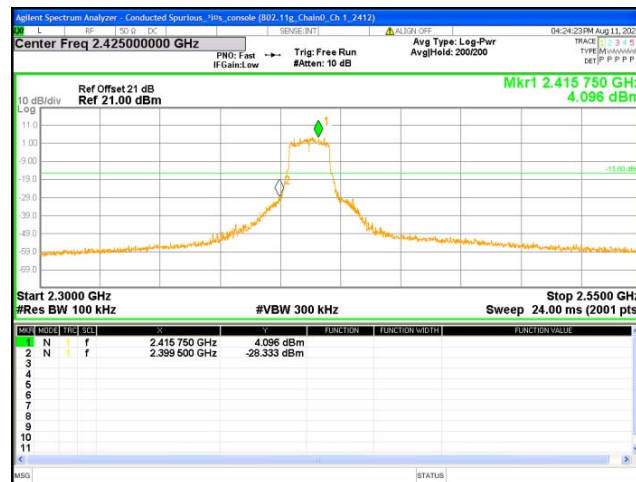
Chain1 : Conducted Spurious @ 802.11b Mode Ch11



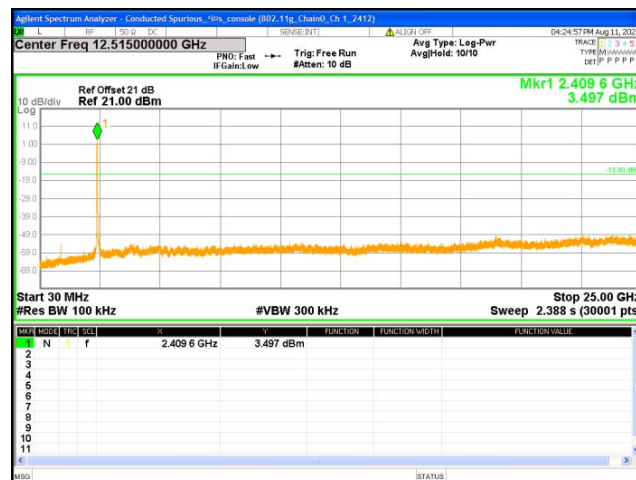
Chain0 : Conducted Spurious @ 802.11g Mode Ch 1



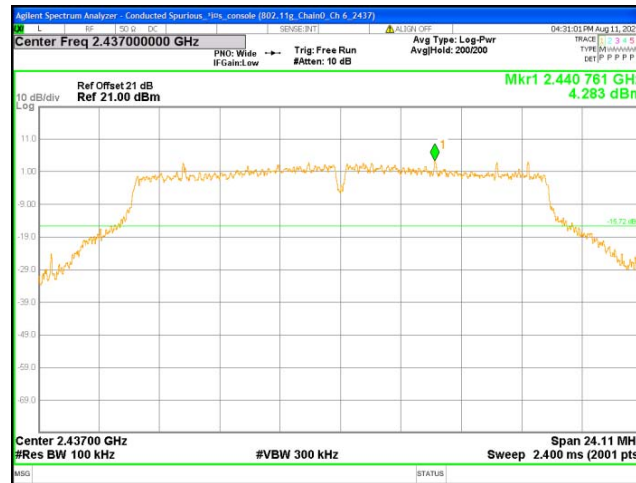
Chain0 : Conducted Spurious @ 802.11g Mode Ch 1



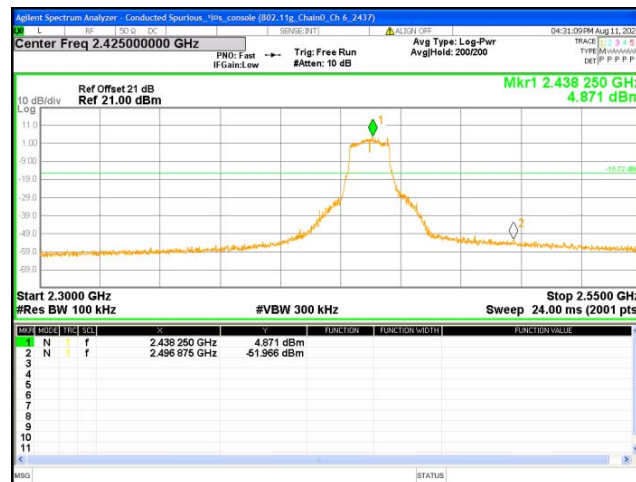
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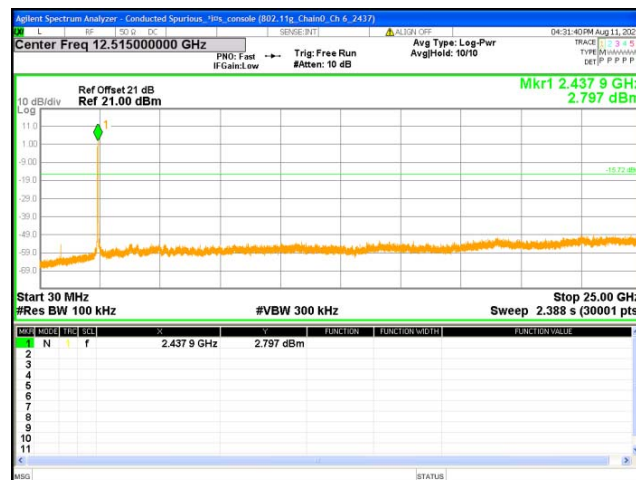
Chain0 : Conducted Spurious @ 802.11g Mode Ch 6



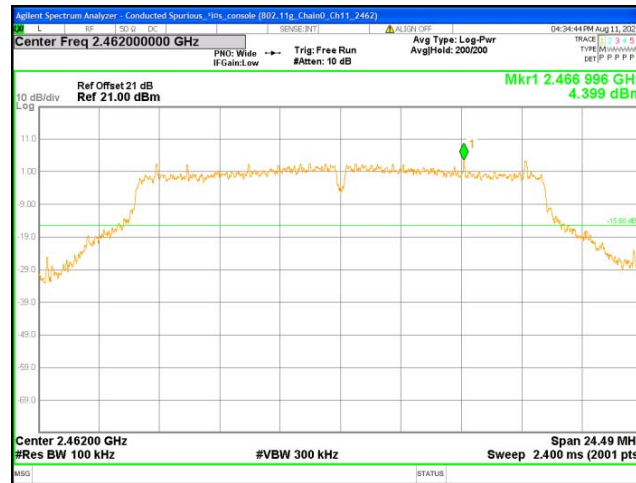
Chain0 : Conducted Spurious @ 802.11g Mode Ch 6



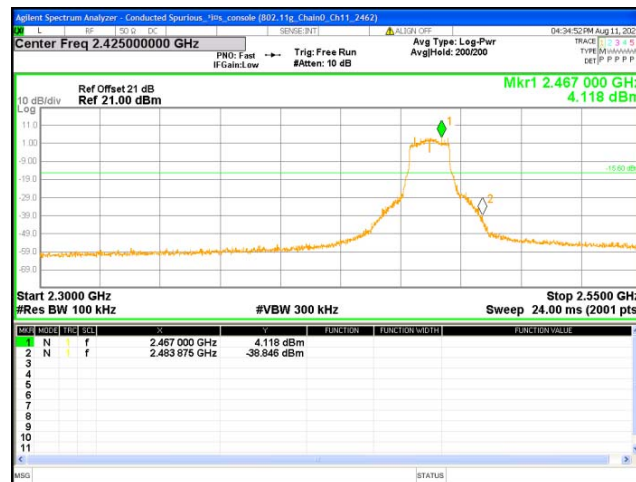
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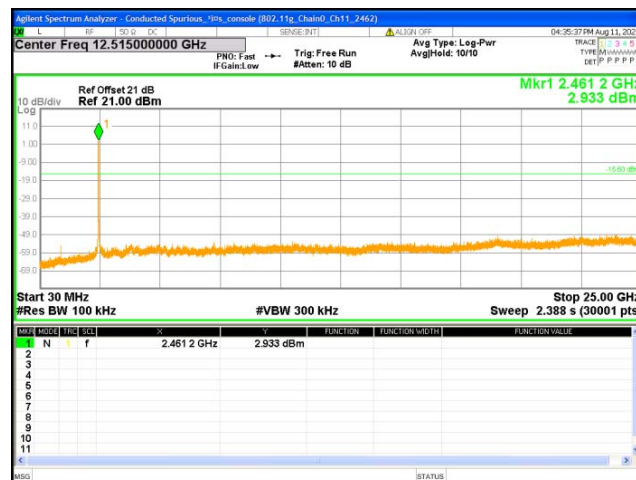
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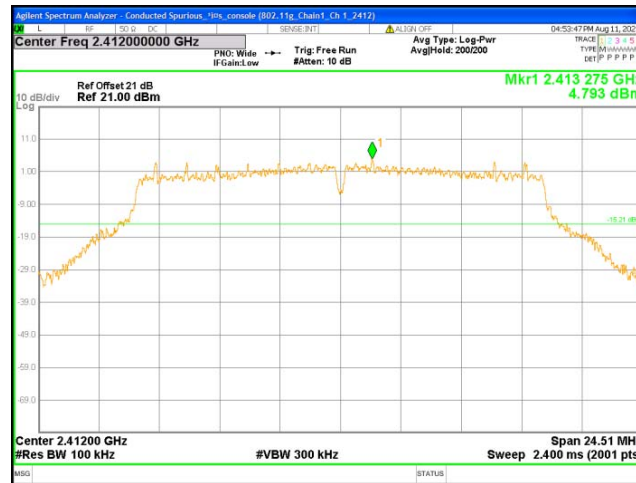
Chain0 : Conducted Spurious @ 802.11g Mode Ch11



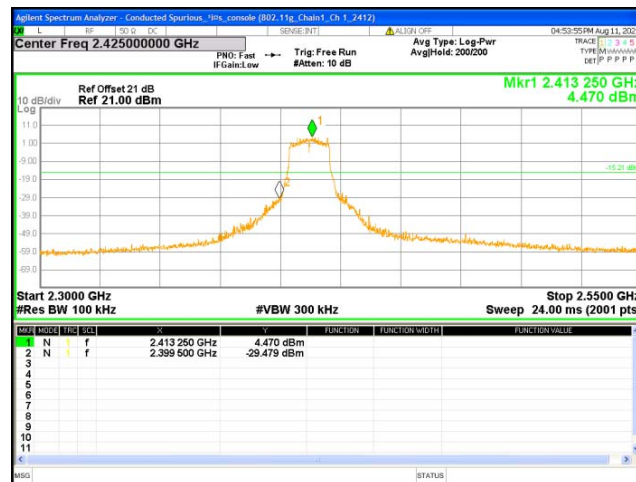
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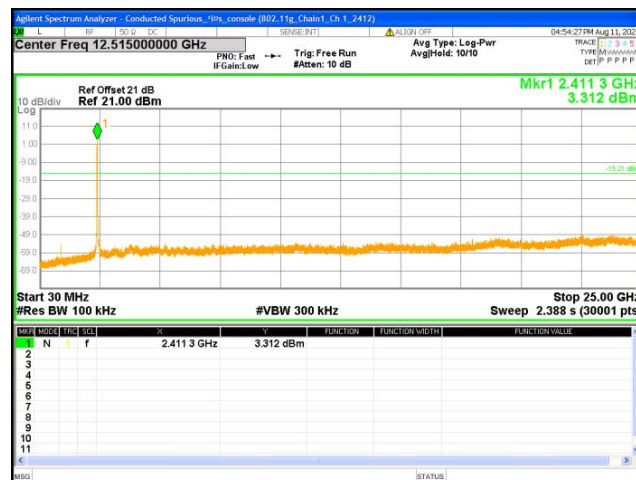
Chain1 : Conducted Spurious @ 802.11g Mode Ch 1



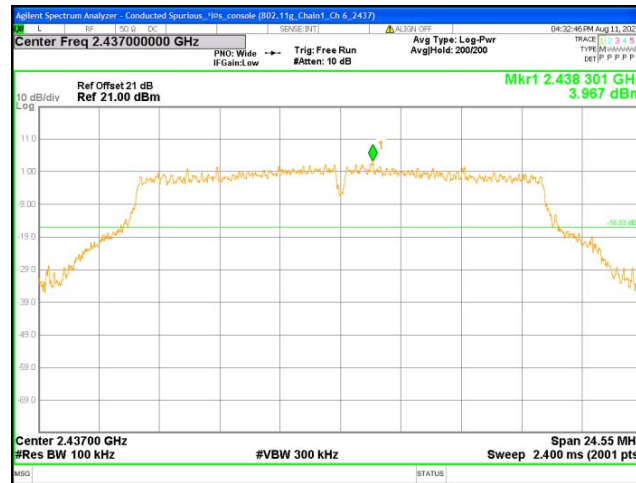
Chain1 : Conducted Spurious @ 802.11g Mode Ch 1



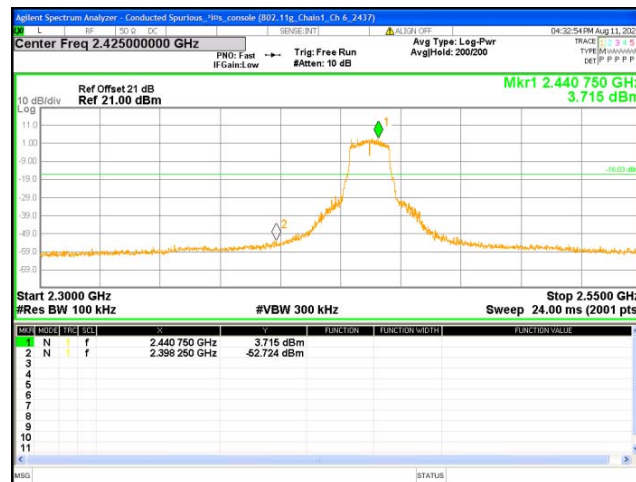
Chain1 : Conducted Spurious @ 802.11g Mode Ch 1



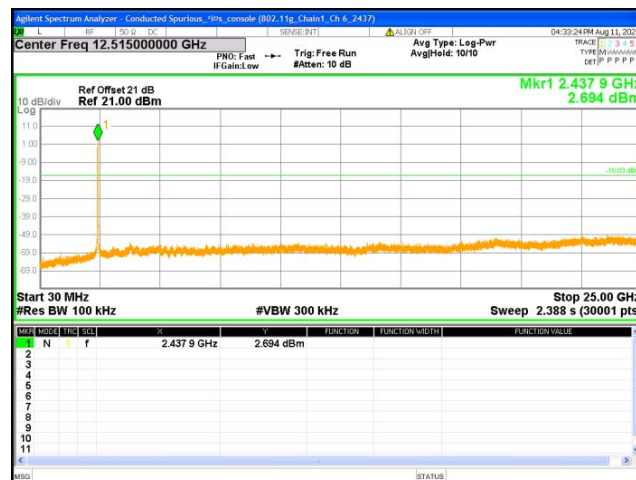
Chain1 : Conducted Spurious @ 802.11g Mode Ch 6



Chain1 : Conducted Spurious @ 802.11g Mode Ch 6



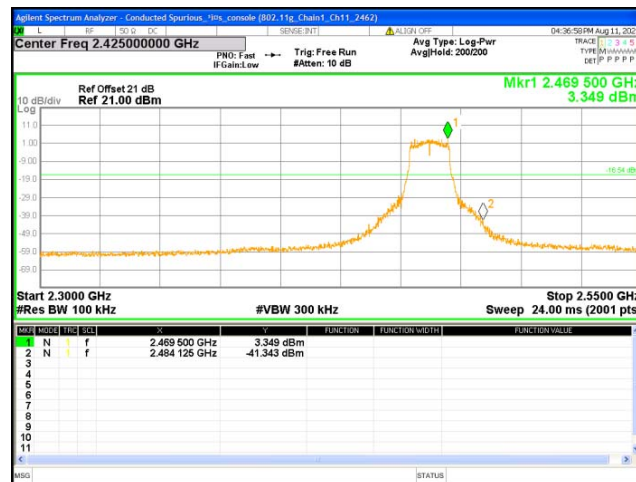
Chain1 : Conducted Spurious @ 802.11g Mode Ch 6



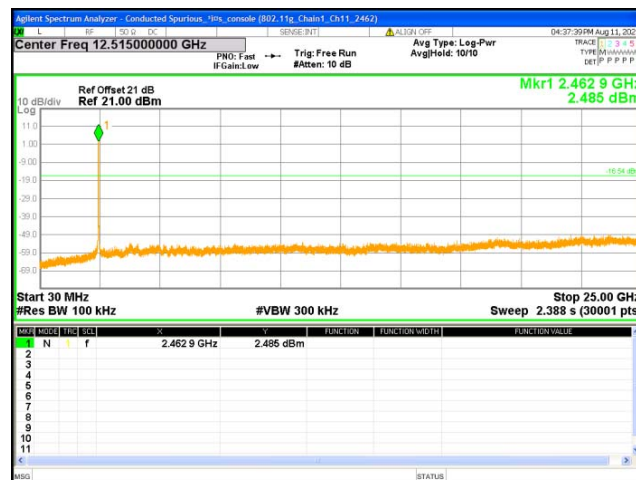
Chain1 : Conducted Spurious @ 802.11g Mode Ch11



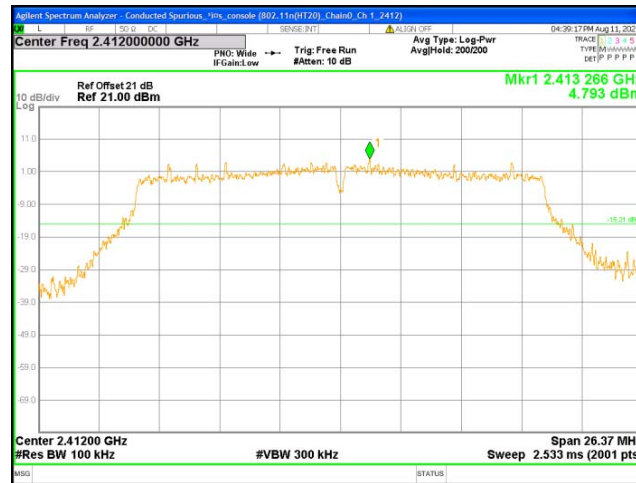
Chain1 : Conducted Spurious @ 802.11g Mode Ch11



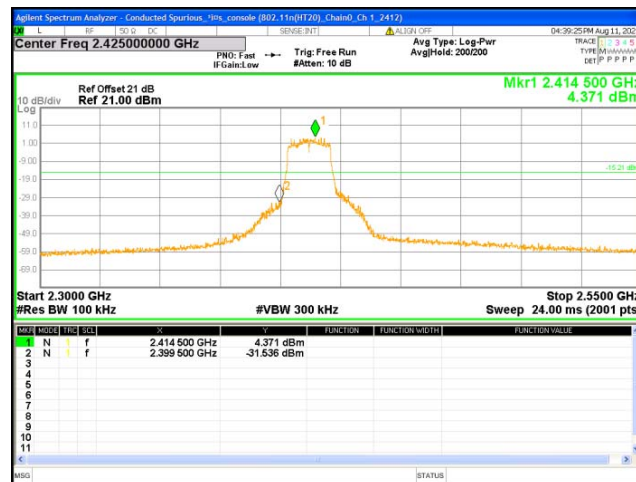
Chain1 : Conducted Spurious @ 802.11g Mode Ch11



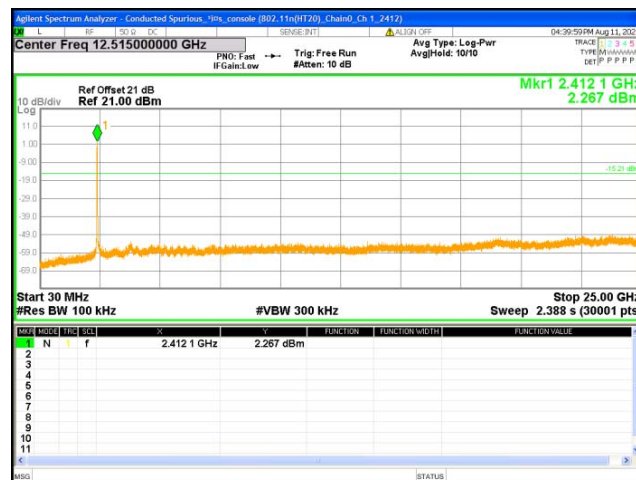
Chain0 : Conducted Spurious @ 802.11n(HT20) Mode Ch 1



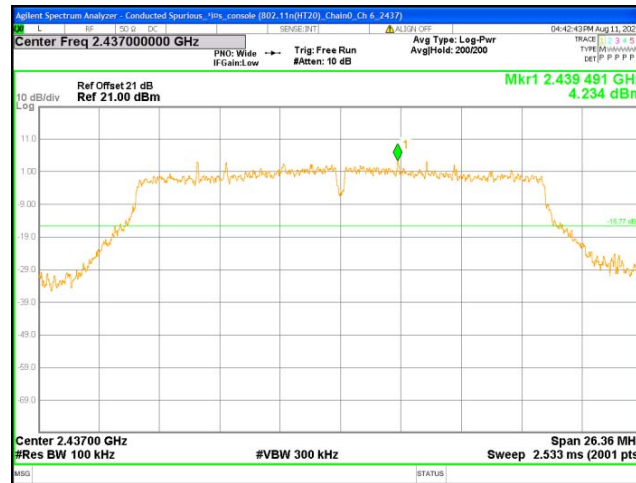
Chain0 : Conducted Spurious @ 802.11n(HT20) Mode Ch 1



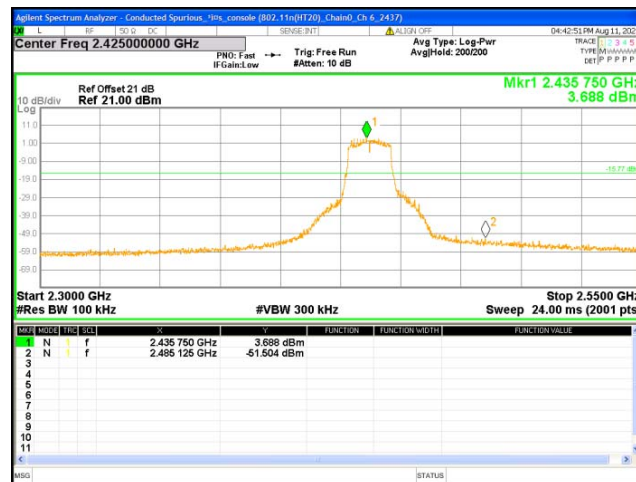
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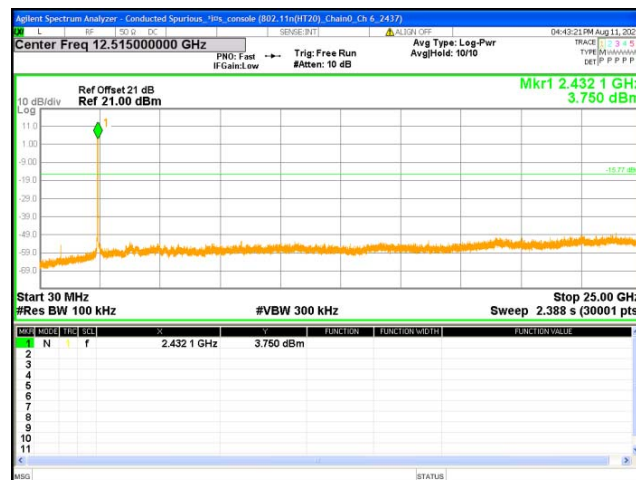
Chain0 : Conducted Spurious @ 802.11n(HT20) Mode Ch 6



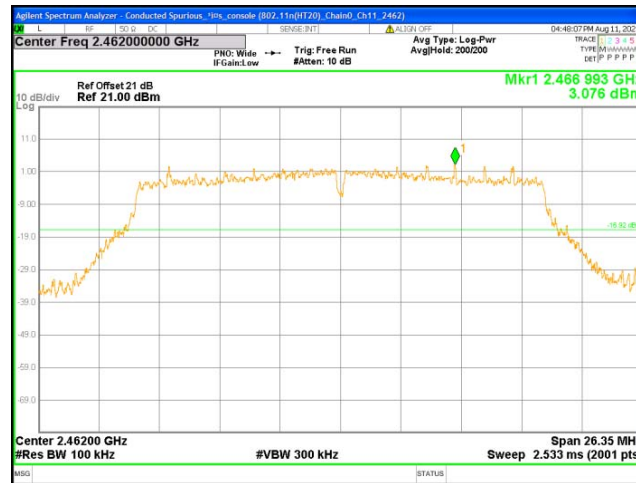
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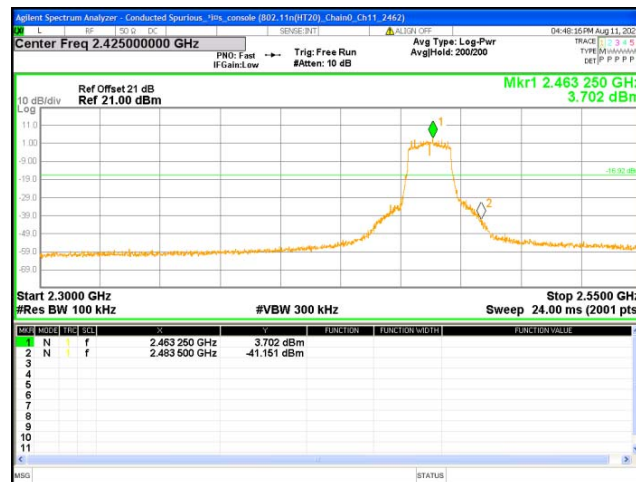
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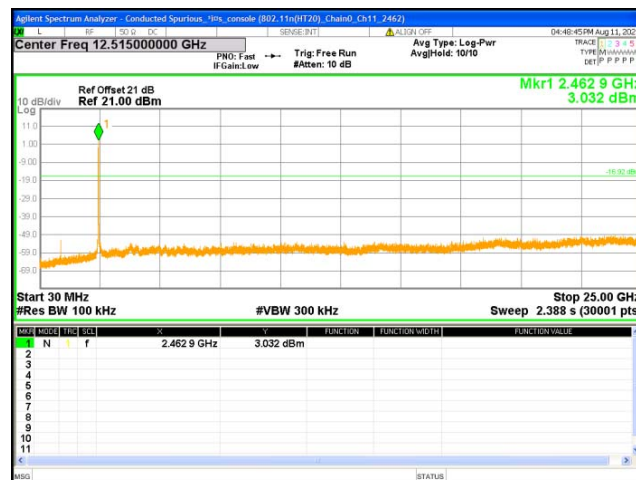
Chain0 : Conducted Spurious @ 802.11n(HT20) Mode Ch11



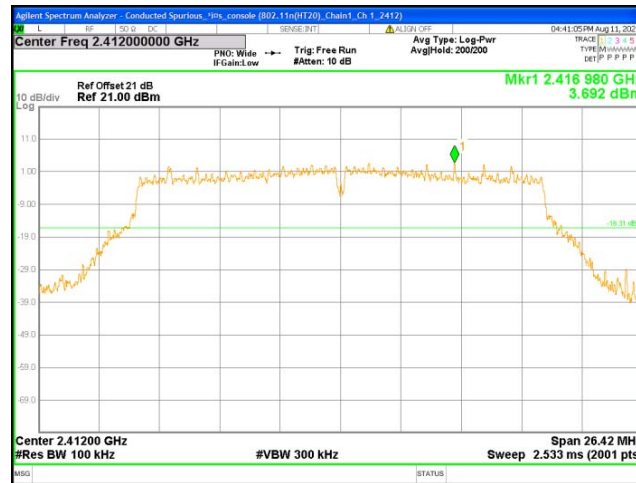
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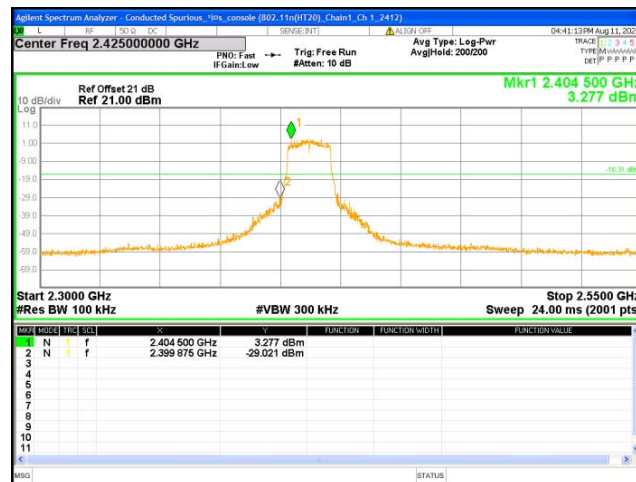
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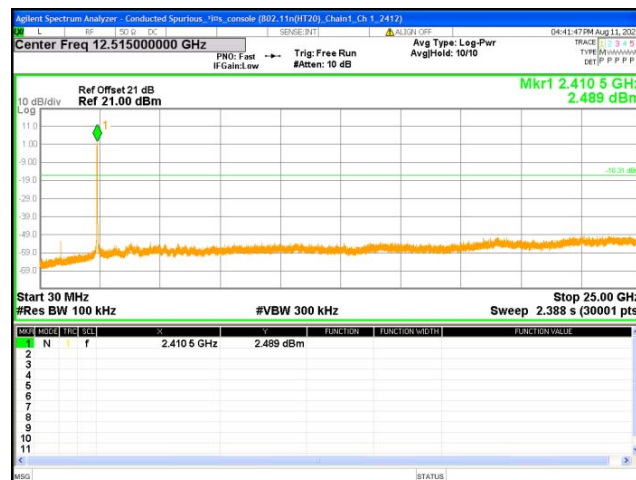
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 1



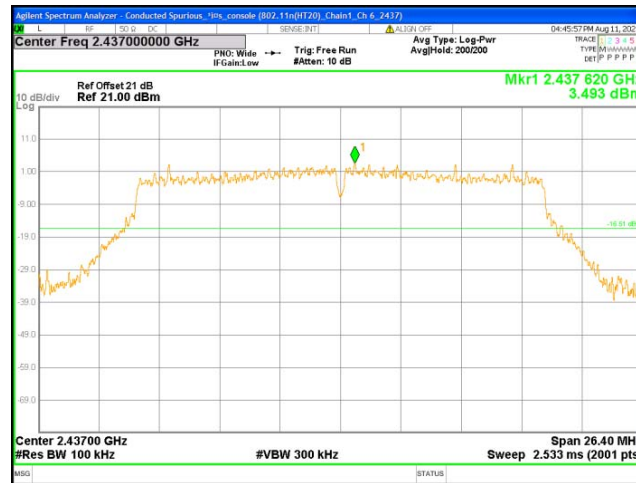
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 1



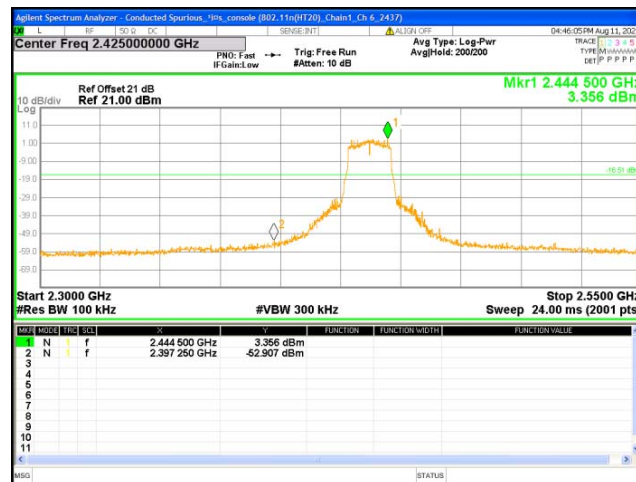
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 1



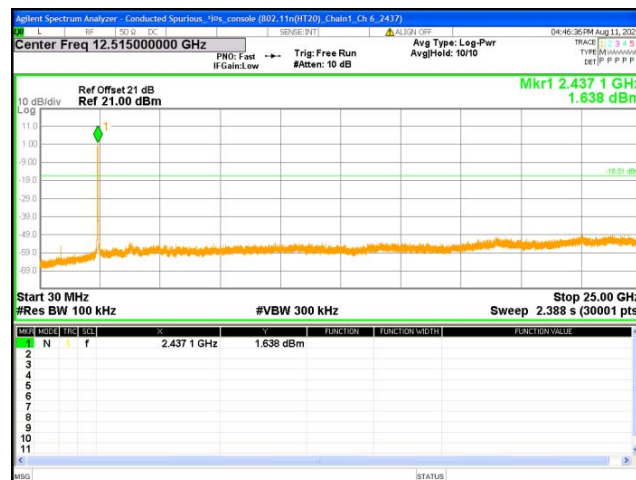
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 6



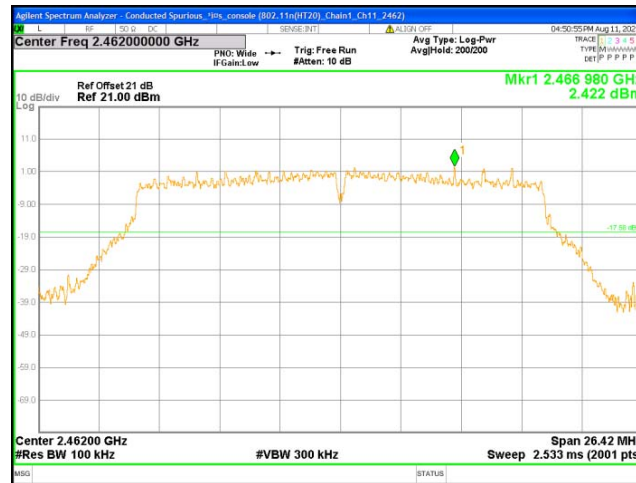
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 6



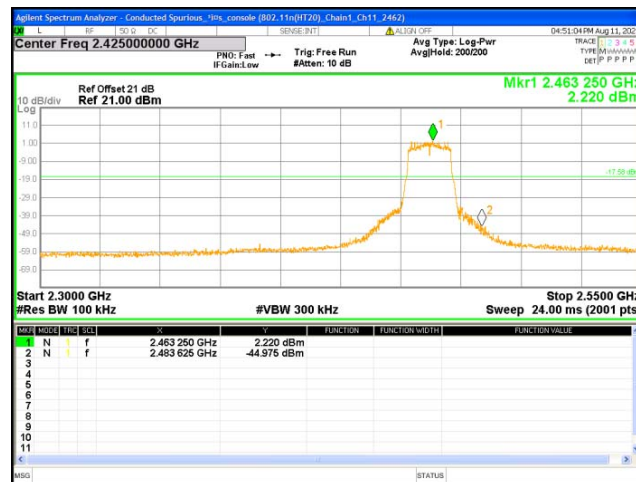
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch 6



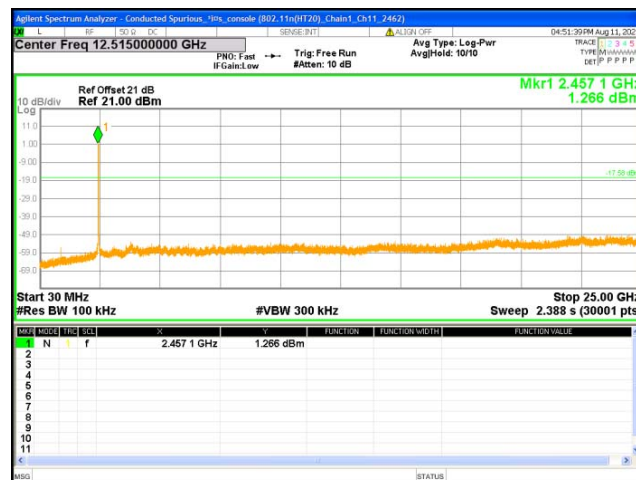
Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch11



Chain1 : Conducted Spurious @ 802.11n(HT20) Mode Ch11



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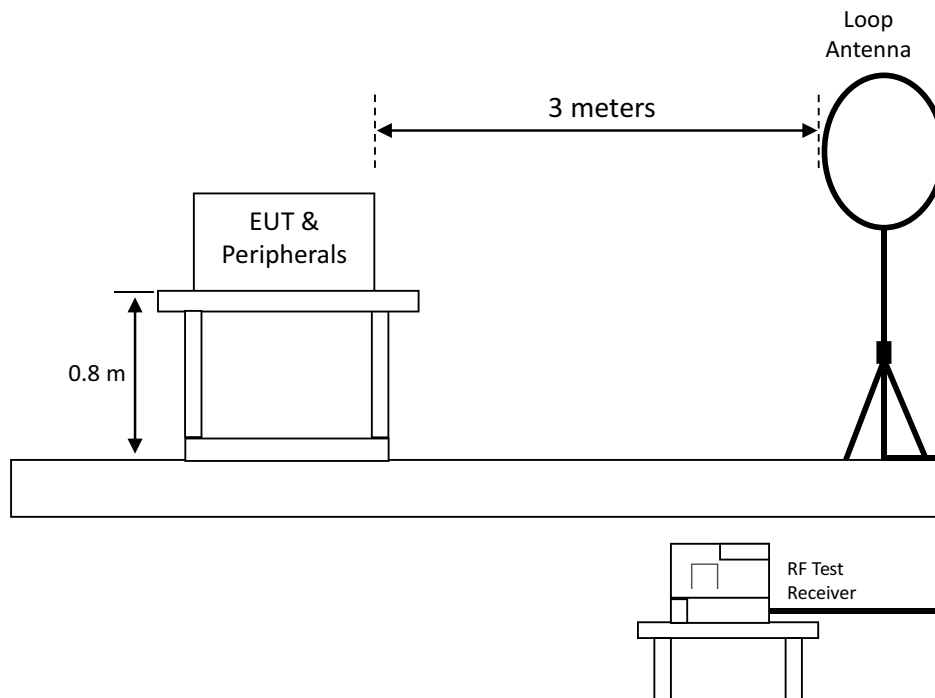
6. Emissions in Restricted Frequency Bands (Radiated emission measurements)

6.1 Instrument Setting

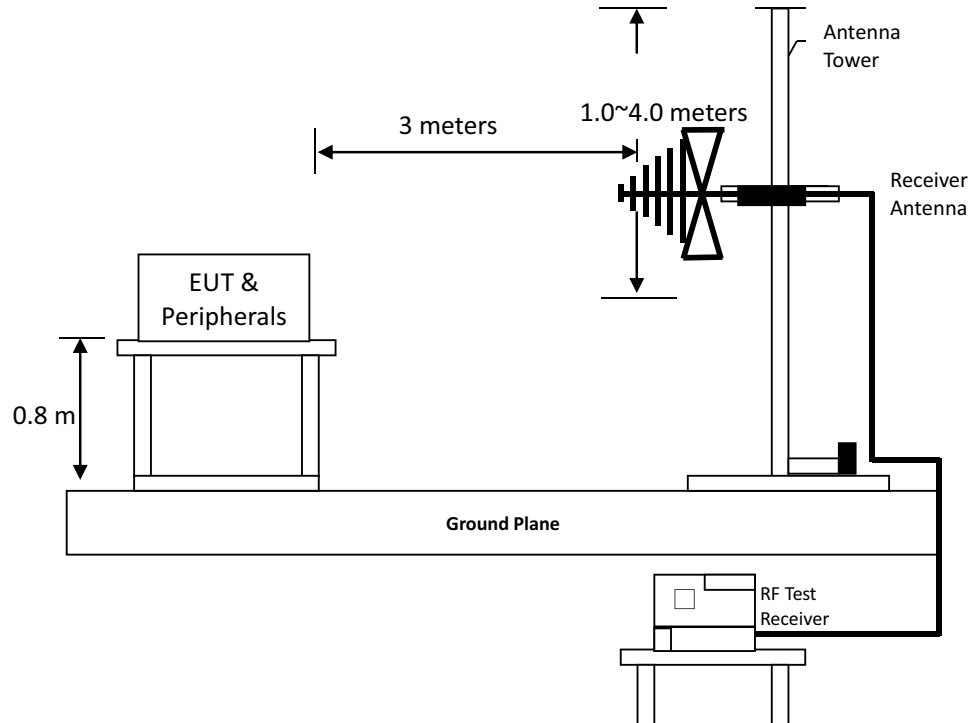
Receiver Function	Setting (Below 1GHz)	Setting (Above 1GHz)
Detector	QP	Peak and Average
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz	1MHz
VBW	$\geq 3 \times \text{RBW}$	3MHz & 1/T minimum kHz
Sweep	Auto couple	Auto couple
Start Frequency	9 kHz	1GHz
Stop Frequency	1 GHz	Tenth harmonic
Attenuation	Auto	Auto

6.2 Test setup & procedure

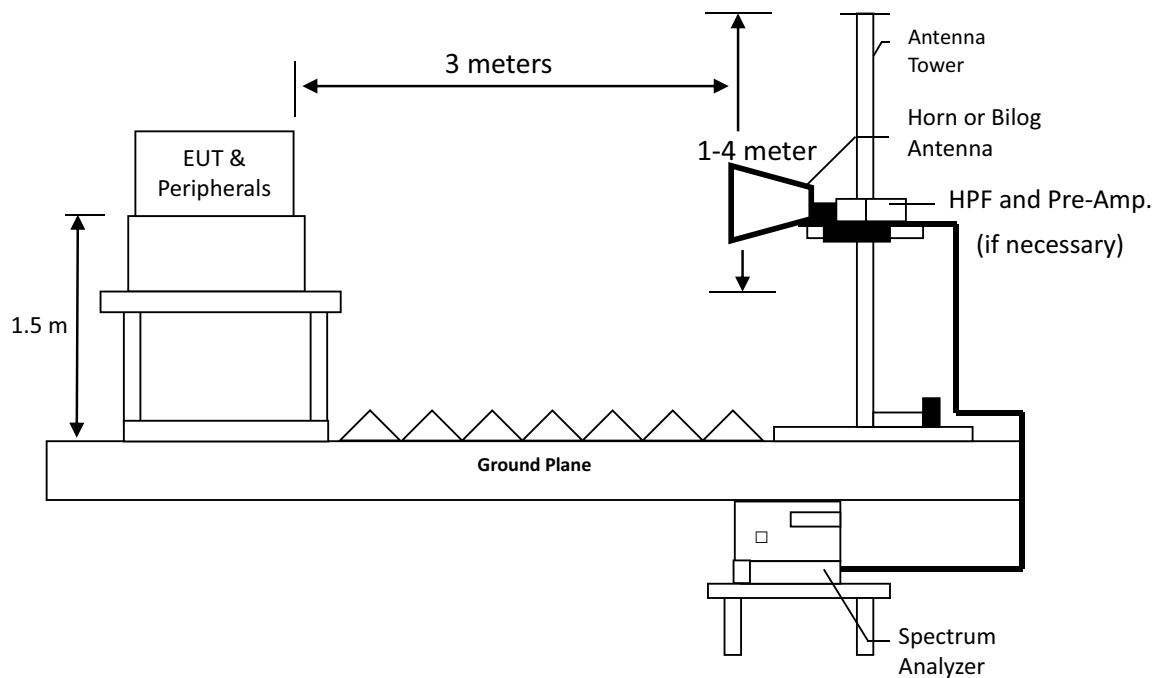
Radiated emission from 9kHz to 30MHz uses Loop Antenna:



Radiated emission below 1GHz using Bilog Antenna



Radiated emission above 1GHz using Horn Antenna



Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 1/T minimum kHz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/ 3 MHz VBW) recorded also on the report.

The EUT for testing is arranged on a turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

6.3 Limit

Frequency(MHz)	Field Strength(uV/m)	Measurement distance(m)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

6.4 Test Result

6.4.1 Measurement results: frequencies 9kHz to 30MHz

Temperature (°C) :	27
Relative Humidity (%) :	63
Test date :	2021/8/7

The test was performed on EUT under continuously transmitting mode. The worst case occurred at 802.11n(HT20)_Chain0+1_Ch1.

Antenna polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Perpendicular	0.14	AV	18.49	51.70	70.19	104.83	-34.64
Perpendicular	0.23	AV	18.75	47.73	66.48	100.56	-34.08
Perpendicular	0.36	AV	18.79	40.41	59.20	96.56	-37.36
Perpendicular	0.44	AV	19.09	38.86	57.95	94.67	-36.72
Perpendicular	0.53	QP	19.38	35.68	55.06	73.15	-18.09
Perpendicular	0.79	QP	19.65	29.45	49.10	69.65	-20.55

Antenna polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Parallel	0.14	AV	18.49	51.25	69.74	104.83	-35.09
Parallel	0.23	AV	18.75	49.11	67.86	100.56	-32.70
Parallel	0.31	AV	18.73	41.91	60.64	97.70	-37.06
Parallel	0.44	AV	19.09	38.73	57.82	94.67	-36.85
Parallel	0.79	QP	19.65	29.82	49.47	69.65	-20.18
Parallel	1.01	QP	19.50	17.34	36.84	67.53	-30.69

Antenna polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Ground-parallel	0.14	AV	18.49	51.57	70.06	104.83	-34.77
Ground-parallel	0.23	AV	18.75	49.50	68.25	100.56	-32.31
Ground-parallel	0.44	AV	19.09	40.05	59.14	94.67	-35.53
Ground-parallel	0.53	QP	19.38	36.36	55.74	73.15	-17.41
Ground-parallel	0.79	QP	19.65	28.50	48.15	69.65	-21.50
Ground-parallel	0.97	QP	19.54	19.74	39.28	67.94	-28.66

6.5.2 Measurement results: frequencies below 1 GHz

Temperature (°C) :	27
Relative Humidity (%) :	63
Test date :	2021/8/7

The test was performed on EUT under continuously transmitting mode. The worst case occurred at 802.11n(HT20)_Chain0+1_Ch1.

Antenna polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Vertical	150.28	QP	20.78	17.74	38.52	43.50	-4.98
Vertical	211.39	QP	18.24	20.54	38.78	43.50	-4.72
Vertical	227.88	QP	18.90	24.13	43.03	46.00	-2.97
Vertical	236.61	QP	19.87	23.13	43.00	46.00	-3.00
Vertical	250.19	QP	20.49	15.28	35.77	46.00	-10.23
Vertical	600.36	QP	29.34	12.35	41.69	46.00	-4.31

Antenna polarity	Frequency (MHz)	Spectrum Analyzer Detector	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Horizontal	102.75	QP	16.81	19.01	35.82	43.50	-7.68
Horizontal	201.69	QP	17.90	18.00	35.90	43.50	-7.60
Horizontal	213.33	QP	18.36	21.05	39.41	43.50	-4.09
Horizontal	231.76	QP	19.20	22.72	41.92	46.00	-4.08
Horizontal	239.52	QP	20.27	21.62	41.89	46.00	-4.11
Horizontal	335.55	QP	22.95	15.27	38.22	46.00	-7.78

Remark: Corr. Factor = Antenna Factor + Cable Loss

6.5.3 Measurement results: frequency above 1GHz to 25GHz

Temperature (°C) :	27
Relative Humidity (%) :	63
Test date :	2021/8/7

Chain0+1

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
802.11b_Ch1	4824	PK	V	17.62	28.00	45.62	74.00	-28.38
	4824	PK	H	17.62	27.82	45.44	74.00	-28.56
802.11b_Ch6	4874	PK	V	17.67	28.71	46.38	74.00	-27.62
	4874	PK	H	17.67	27.35	45.02	74.00	-28.98
802.11b_Ch11	4924	PK	V	17.78	29.56	47.34	74.00	-26.66
	4924	PK	H	17.78	30.02	47.80	74.00	-26.20
802.11g_Ch1	4824	PK	V	17.62	25.13	42.75	74.00	-31.25
	4824	PK	H	17.62	25.62	43.24	74.00	-30.76
802.11g_Ch6	4874	PK	V	17.67	25.28	42.95	74.00	-31.05
	4874	PK	H	17.67	25.19	42.86	74.00	-31.14
802.11g_Ch11	4924	PK	V	17.78	23.35	41.13	74.00	-32.87
	4924	PK	H	17.78	25.61	43.39	74.00	-30.61
802.11n20_Ch1	4824	PK	V	17.62	23.76	41.38	74.00	-32.62
	4824	PK	H	17.62	24.86	42.48	74.00	-31.52
802.11n20_Ch6	4874	PK	V	17.67	24.17	41.84	74.00	-32.16
	4874	PK	H	17.67	25.78	43.45	74.00	-30.55
802.11n20_Ch11	4924	PK	V	17.78	23.82	41.60	74.00	-32.40
	4924	PK	H	17.78	24.56	42.34	74.00	-31.66

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

7. Emission on Band Edge**7.1 Instrument Setting**

Spectrum Function	Setting
Detector	Peak and Average
RBW	1MHz
VBW	3MHz & 1/T minimum kHz
Sweep	Auto couple
Restrict bands	2310 MHz ~ 2390 MHz 2483.5 MHz ~ 2500 MHz
Attenuation	Auto

7.2 Test Procedure

The test procedure is the same as Emissions in Restricted Frequency Bands (Radiated emission measurements).

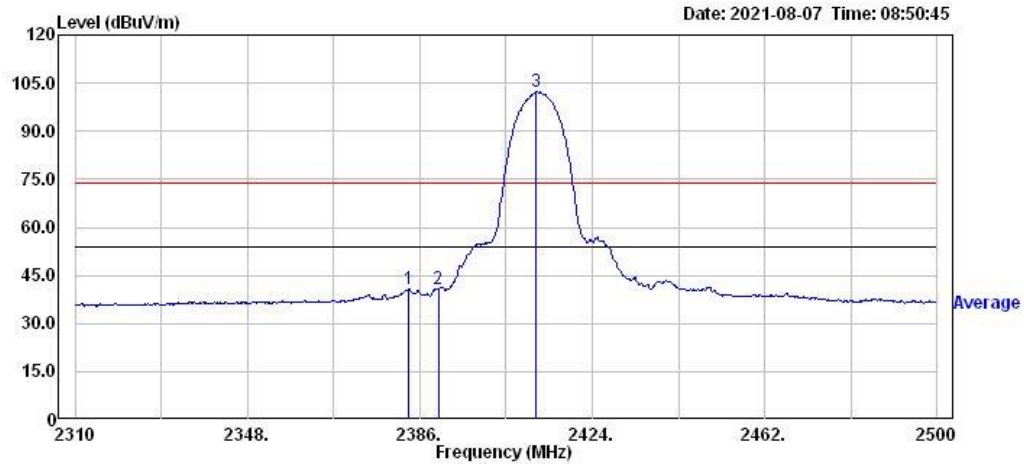
7.3 Test Results

Temperature (°C) :	27
Relative Humidity (%) :	63
Test date :	2021/8/7

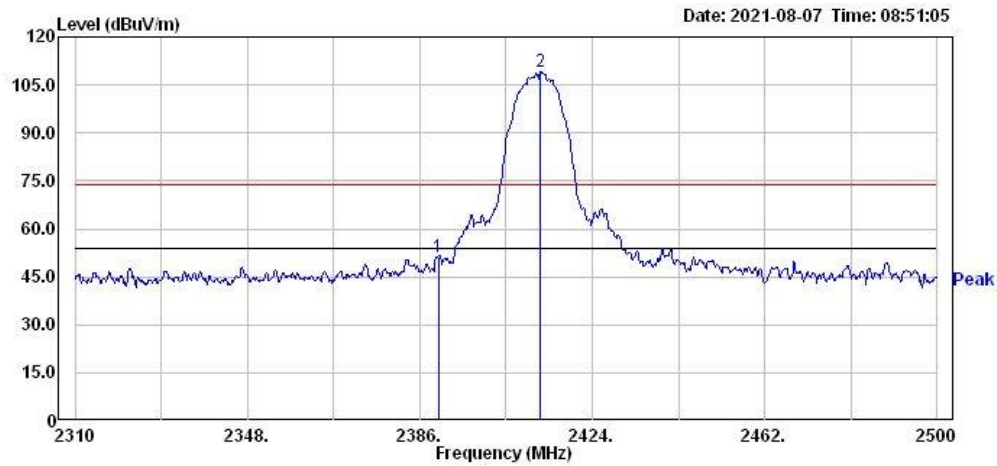
Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
802.11b Chain0+1	2390.00	PK	V	34.86	16.49	51.35	74	-22.65	2310~2390
	2383.53	AV	V	34.86	5.99	40.85	54	-13.15	
	2488.79	PK	V	34.80	16.26	51.06	74	-22.94	2483.5~2500
	2483.50	AV	V	34.80	5.77	40.57	54	-13.43	
802.11g Chain0+1	2390.00	PK	V	34.86	26.68	61.54	74	-12.46	2310~2390
	2390.00	AV	V	34.86	15.22	50.08	54	-3.92	
	2483.50	PK	V	34.80	28.45	63.25	74	-10.75	2483.5~2500
	2483.50	AV	V	34.80	16.69	51.49	54	-2.51	
802.11n(HT20) Chain0+1	2390.00	PK	V	34.86	31.21	66.07	74	-7.93	2310~2390
	2390.00	AV	V	34.86	17.35	52.21	54	-1.79	
	2483.50	PK	V	34.80	30.59	65.39	74	-8.61	2483.5~2500
	2483.50	AV	V	34.80	15.53	50.33	54	-3.67	

Remark: Correction Factor = Antenna Factor + Cable Loss

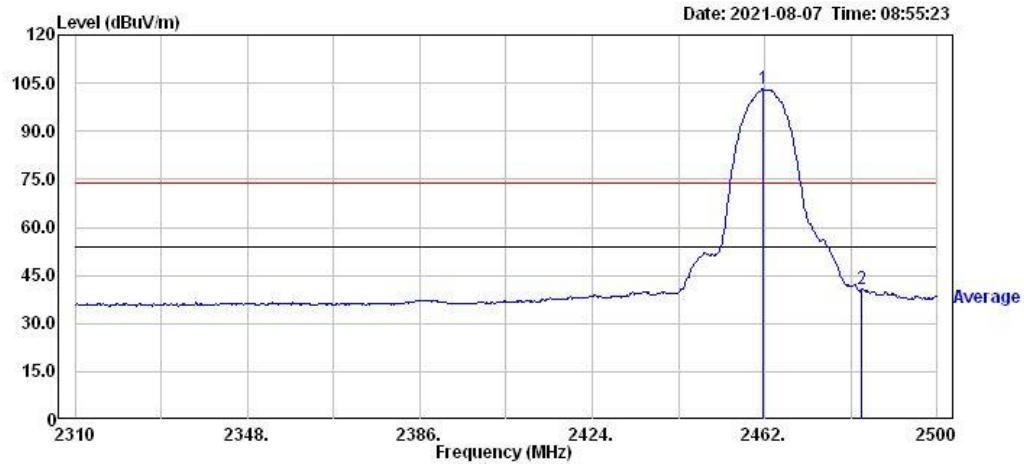
Chain0+1 : Restricted Band Bandedge @ 802.11b Mode Ch1 PK



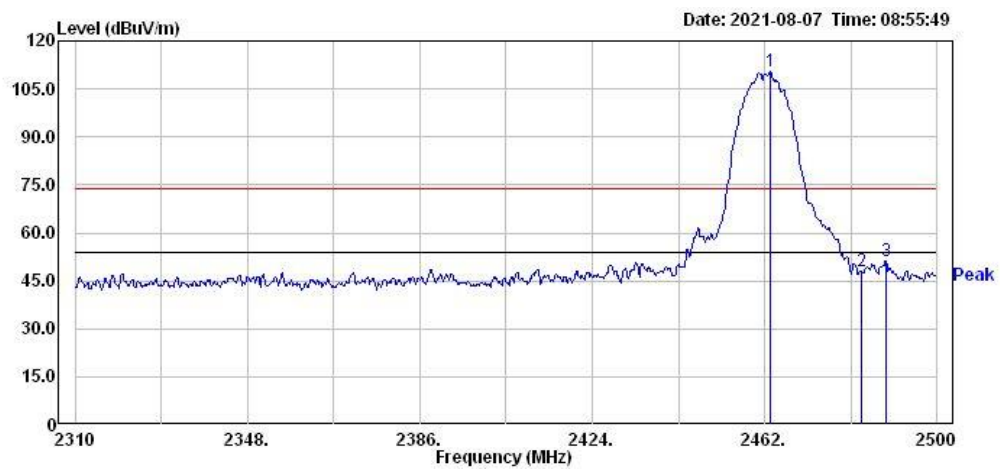
Chain0+1 : Restricted Band Bandedge @ 802.11b Mode Ch1 AV



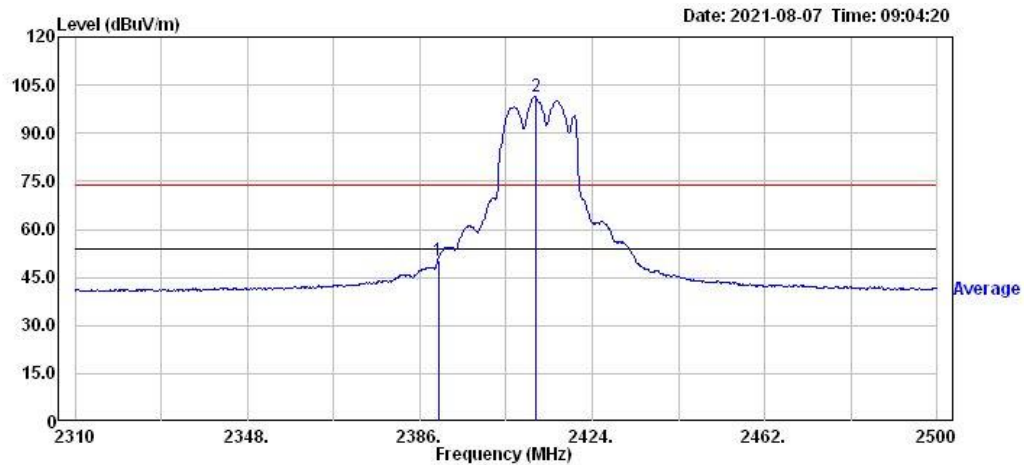
Chain0+1 : Restricted Band Bandedge @ 802.11b Mode Ch11 PK



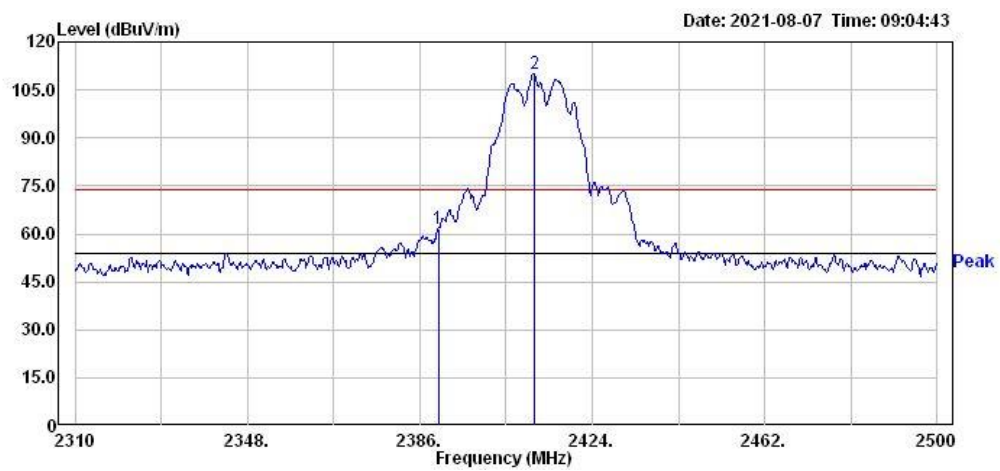
Chain0+1 : Restricted Band Bandedge @ 802.11b Mode Ch11 AV



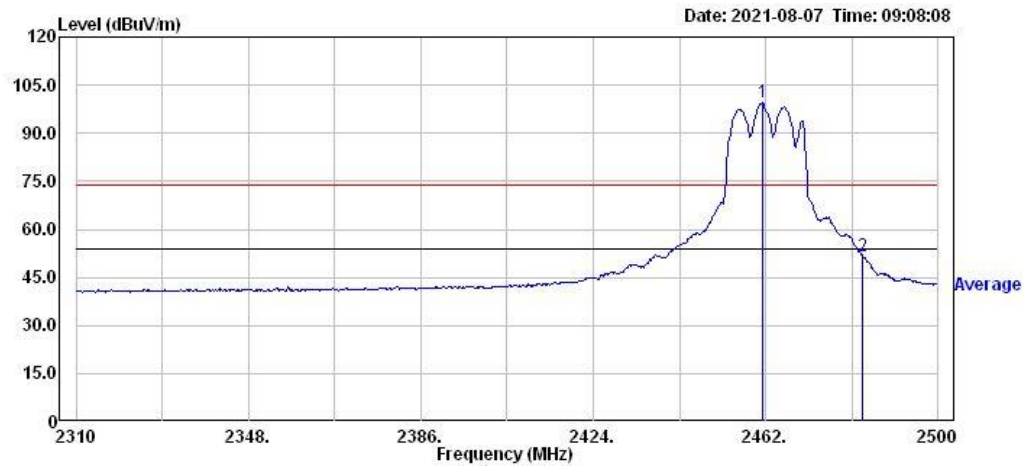
Chain0+1 : Restricted Band Bandedge @ 802.11g Mode Ch1 PK



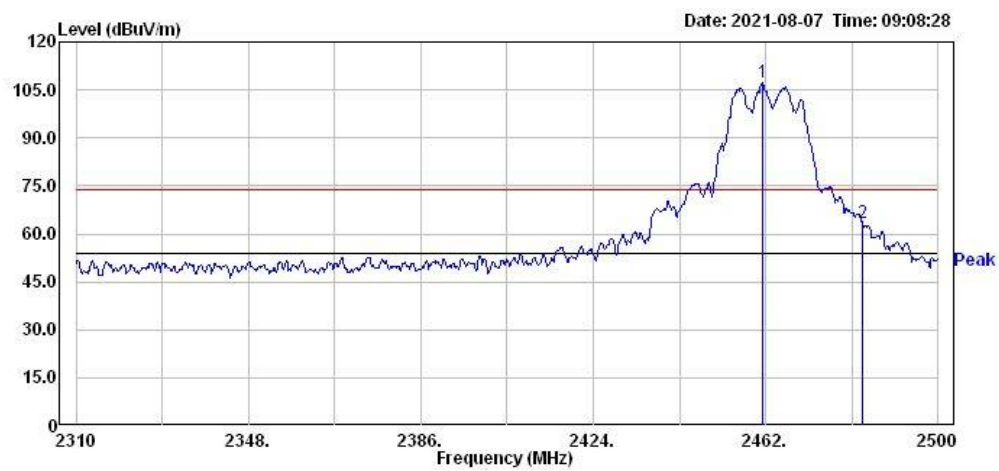
Chain0+1 : Restricted Band Bandedge @ 802.11g Mode Ch1 AV



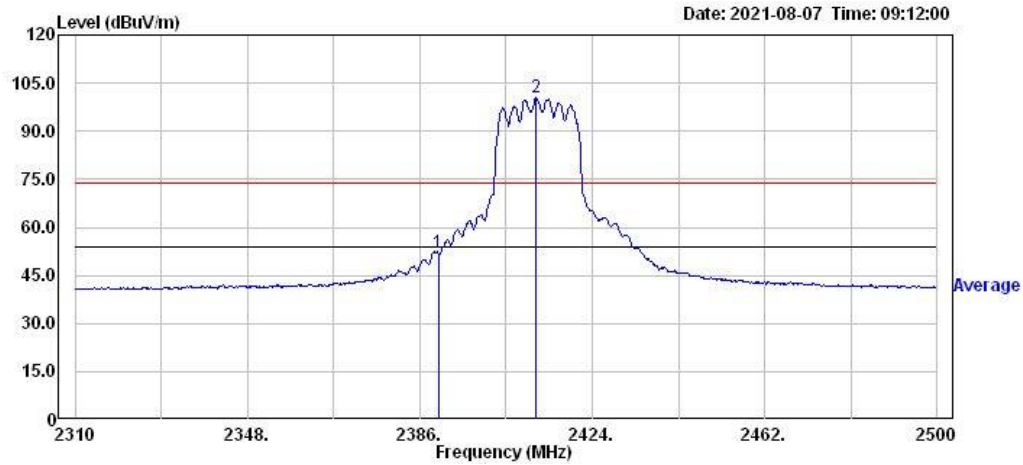
Chain0+1 : Restricted Band Bandedge @ 802.11g Mode Ch11 PK



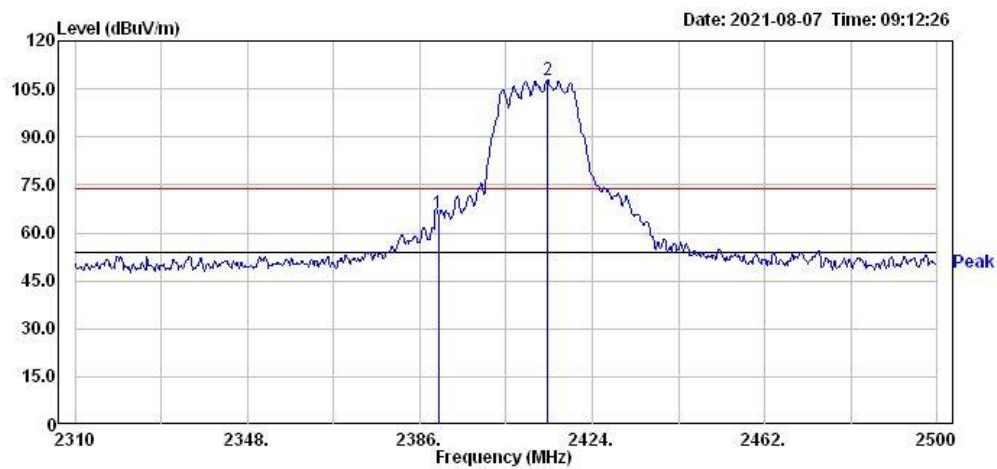
Chain1 : Restricted Band Bandedge @ 802.11g Mode Ch11 AV



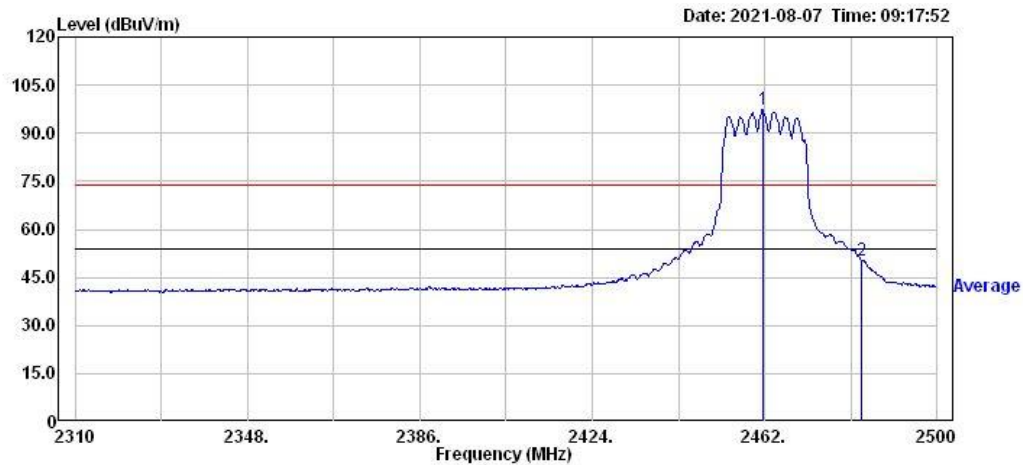
Chain0+1 : Restricted Band Bandedge @ 802.11n(HT20) Mode Ch1 PK



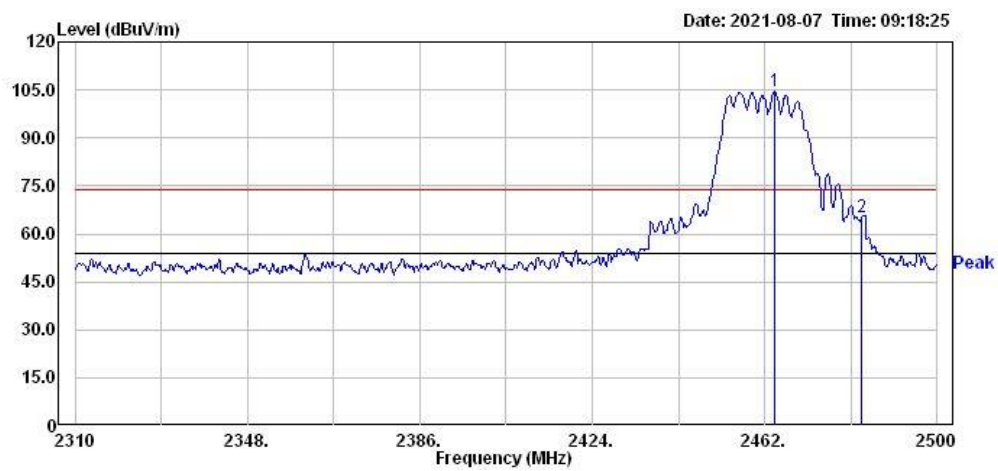
Chain0+1 : Restricted Band Bandedge @ 802.11n(HT20) Mode Ch1 AV



Chain0+1 : Restricted Band Bandedge @ 802.11 n(HT20) Mode Ch11 PK



Chain0+1 : Restricted Band Bandedge @ 802.11 n(HT20) Mode Ch11 AV



8. AC Power Line Conducted Emission

Since the EUT is not connected to AC source, therefore, the test can be waived.

Appendix A: Test equipment list

Test Equipment/ Test site	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESR7	101822	2020/08/18	2021/08/17
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2020/08/25	2021/08/24
Signal Analyzer	Agilent	N9030A	MY51380492	2020/08/17	2021/08/16
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2021/04/14	2022/04/13
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2021/01/29	2022/01/28
Horn Antenna	SHWARZBECK	BBHA 9120 D	9120D-456	2021/01/11	2022/01/10
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170159	2020/08/20	2023/08/19
Pre-Amplifier	AML	AML0120L3401	0419-114	2020/12/16	2021/12/15
Pre-amplifier	SGH	SGH184	20201124-1	2020/12/16	2021/12/15
Power Meter	Anritsu	ML2495A	0844001	2020/10/28	2021/10/27
Power Sensor	Anritsu	MA2411B	0738452	2020/10/28	2021/10/27
966-2(A) Cable	SUHNER	SUCOLEX 104	295105/4	2021/03/08	2022/03/07
966-2(B) Cable	SUHNER	SUCOFLEX 104P	CB0005	2021/03/08	2022/03/07
RF Cable	SUHNER	SUCOFLEX 104P	CB0006	2021/04/29	2022/04/28
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2021/01/15	2022/01/14
Hight Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2021/05/26	2022/05/25
20dB Attenuator	Mini-Circuits	BW-S20W5+	N/A	2021/05/26	2022/05/25
Test software	Audix	e3	V9	NCR	NCR

Note: No Calibration Required (NCR).

Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of $k=2$.

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.16 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.02 dB
Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	5.17 dB
Vertically polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Horizontally polarized Radiated disturbances from 18GHz~26.5GHz in a semi-anechoic chamber at a distance of 1m	2.39 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.70 dB
Emission on the Band Edge Test	4.32 dB
Occupied Bandwidth	7.78 %
Maximum Peak Conducted Output Power	0.44 dB
Power Spectral Density	1.27 dB
Emissions In Non-Restricted Frequency Bands	1.27 dB
AC Power Line Conducted Emission	3.08 dB