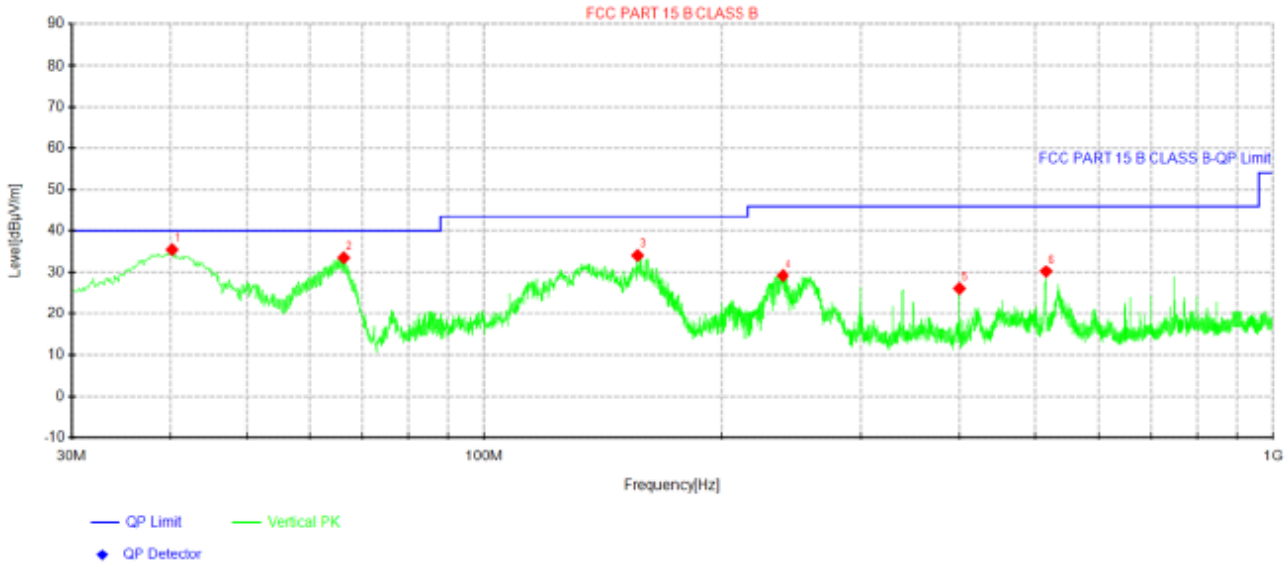
Vertical



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.185	52.65	35.52	-17.13	40.00	4.48	100	291	Vertical
2	66.375	53.51	33.60	-19.91	40.00	6.40	100	334	Vertical
3	156.342	55.81	34.14	-21.67	43.50	9.36	100	119	Vertical
4	239.035	47.44	29.15	-18.29	46.00	16.85	100	6	Vertical
5	400.055	41.60	26.09	-15.51	46.00	19.91	100	188	Vertical
6	515.363	44.26	30.20	-14.06	46.00	15.80	100	1	Vertical

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

For 1GHz to 25GHz

Note: 802.11b/802.11g/802.11n (H20) Mode all have been tested, only worse case 802.11b mode is reported

(above 1GHz)

Frequency(MHz):			2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	61.31	PK	74	12.69	65.67	32.4	5.11	41.87	-4.36
4824.00	45.64	AV	54	8.36	50.00	32.4	5.11	41.87	-4.36
7236.00	55.67	PK	74	18.33	56.30	36.58	6.43	43.64	-0.63
7236.00	43.53	AV	54	10.47	44.16	36.58	6.43	43.64	-0.63

Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	58.93	PK	74	15.07	63.29	32.4	5.11	41.87	-4.36
4824.00	43.26	AV	54	10.74	47.62	32.4	5.11	41.87	-4.36
7236.00	53.29	PK	74	20.71	53.92	36.58	6.43	43.64	-0.63
7236.00	41.16	AV	54	12.85	41.79	36.58	6.43	43.64	-0.63

Frequency(MHz):			2437		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	61.00	PK	74	13.00	64.95	32.56	5.34	41.85	-3.95
4874.00	46.31	AV	54	7.69	50.26	32.56	5.34	41.85	-3.95
7311.00	54.73	PK	74	19.27	55.09	36.54	6.81	43.71	-0.36
7311.00	43.60	AV	54	10.40	43.96	36.54	6.81	43.71	-0.36

Frequency(MHz):			2437		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	58.62	PK	74	15.38	62.57	32.56	5.34	41.85	-3.95
4874.00	43.93	AV	54	10.07	47.88	32.56	5.34	41.85	-3.95
7311.00	52.35	PK	74	21.65	52.71	36.54	6.81	43.71	-0.36
7311.00	41.22	AV	54	12.78	41.58	36.54	6.81	43.71	-0.36

Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	61.67	PK	74	12.33	65.13	32.73	5.64	41.83	-3.46
4924.00	45.70	AV	54	8.30	49.16	32.73	5.64	41.83	-3.46
7386.00	54.91	PK	74	19.09	54.97	36.5	7.23	43.79	-0.06
7386.00	44.11	PK	54	9.89	44.17	36.5	7.23	43.79	-0.06

Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	59.29	PK	74	14.71	62.75	32.73	5.64	41.83	-3.46
4924.00	43.32	AV	54	10.68	46.78	32.73	5.64	41.83	-3.46
7386.00	52.53	PK	74	21.47	52.59	36.5	7.23	43.79	-0.06
7386.00	41.73	PK	54	12.27	41.79	36.5	7.23	43.79	-0.06

1) Emission level (dBuV/m) = Meter Reading+ antenna Factor+ cable loss- preamp factor.
2) Margin value = Limits-Emission level.
3) -- Mean the PK detector measured value is below average limit.
4) The other emission levels were very low against the limit.
5) RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Results of Band Edges Test (Radiated)

Note: 802.11b/802.11g/802.11n (H20) Mode all have been tested, only worse case 802.11b mode is reported

Frequency(MHz):			**2412**		**Polarity:**		**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	61.42	PK	74	12.58	71.84	27.42	4.31	42.15	-10.42
2390.00	44.74	AV	54	9.26	55.16	27.42	4.31	42.15	-10.42
Frequency(MHz):			**2412**		**Polarity:**		**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	59.04	PK	74	14.96	69.46	27.42	4.31	42.15	-10.42
2390.00	42.36	AV	54	11.64	52.78	27.42	4.31	42.15	-10.42
Frequency(MHz):			**2462**		**Polarity:**		**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	61.65	PK	74	12.35	71.76	27.7	4.47	42.28	-10.11
2483.50	43.95	AV	54	10.05	54.06	27.7	4.47	42.28	-10.11
Frequency(MHz):			**2462**		**Polarity:**		**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	59.27	PK	74	14.73	69.38	27.7	4.47	42.28	-10.11
2483.50	41.39	AV	54	12.61	51.50	27.7	4.47	42.28	-10.11

Note：

1) Emission level (dBuV/m) = Meter Reading+ antenna Factor+ cable loss- preamp factor.
2) Margin value = Limits-Emission level.
3) -- Mean the PK detector measured value is below average limit.
4) The other emission levels were very low against the limit.
5) RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

4.3 Maximum Peak Conducted Output Power

Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration

Test Results

Type	Channel	Output power PK (dBm)	Limit (dBm)	Result
802.11b	01	13.05	30.00	Pass
	06	13.33		
	11	13.20		
802.11g	01	12.45	30.00	Pass
	06	12.95		
	11	12.89		
802.11n(HT20)	01	12.27	30.00	Pass
	06	12.79		
	11	12.77		

Note:
1) Measured output power at difference data rate for each mode and recorded worst case for each mode.
2) Test results including cable loss.
3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20;

4.4 Power Spectral Density

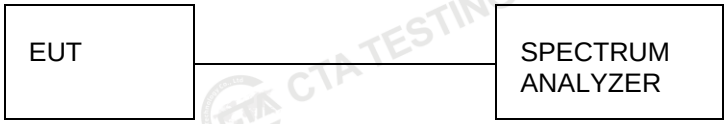
Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
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 power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration

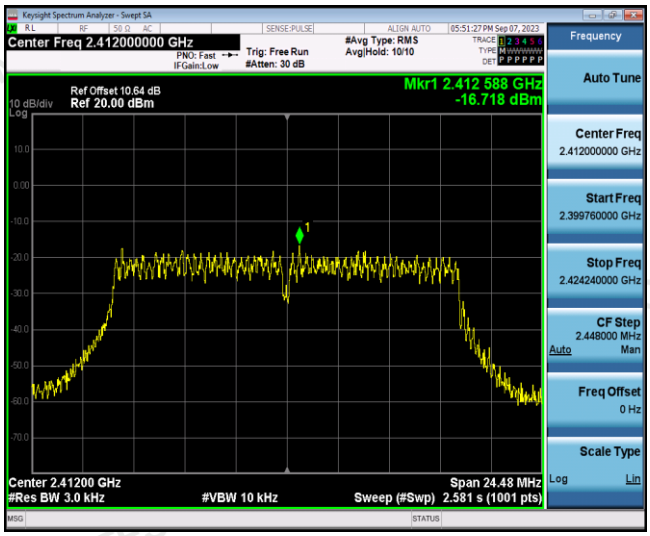
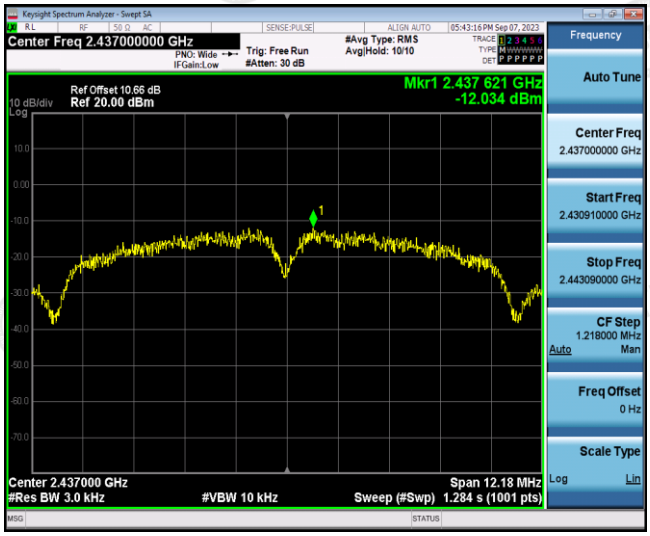
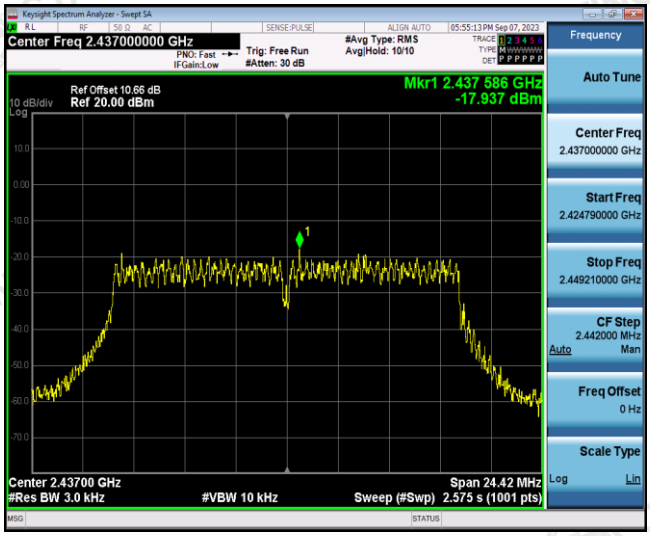
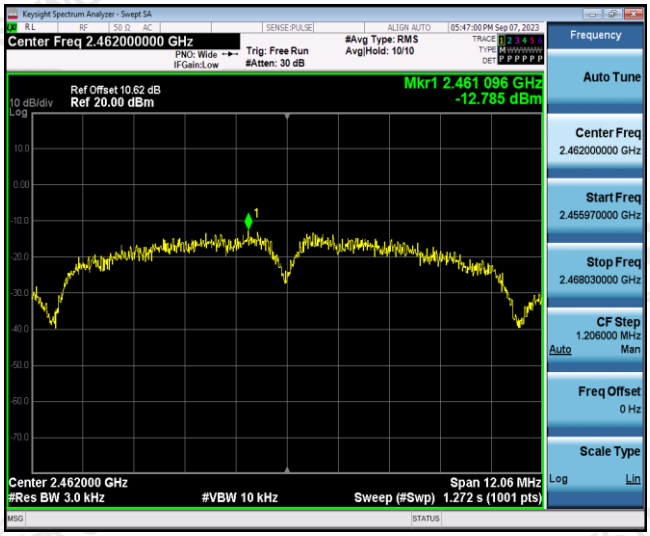
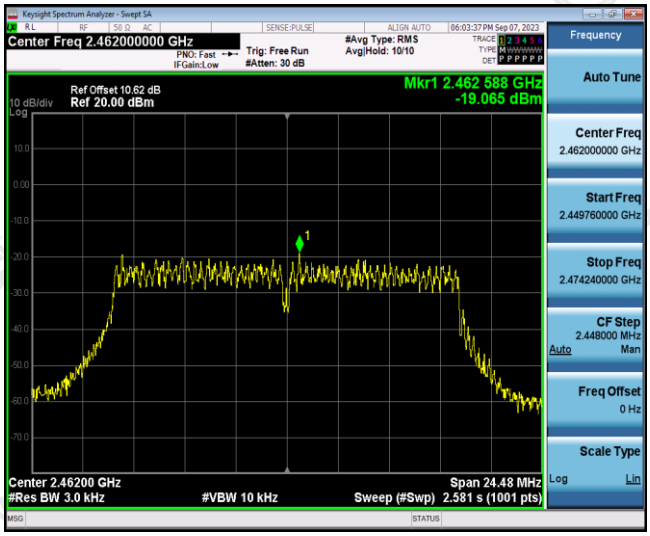


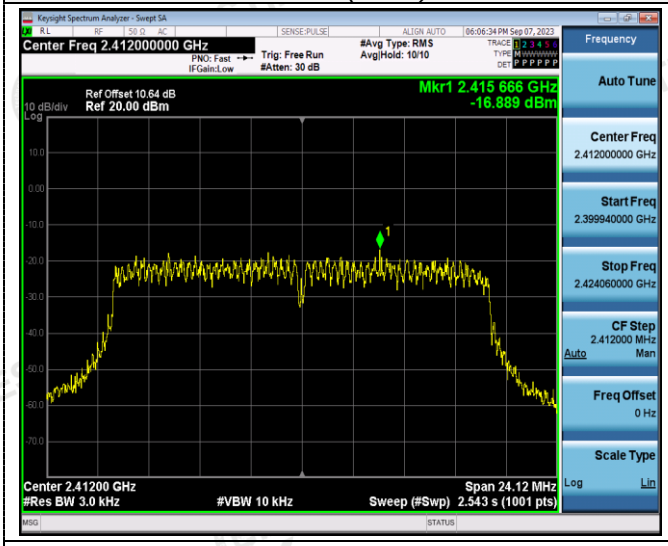
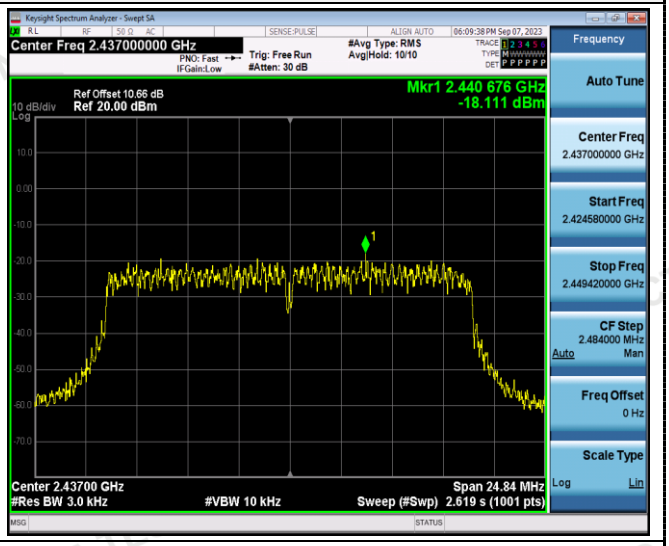
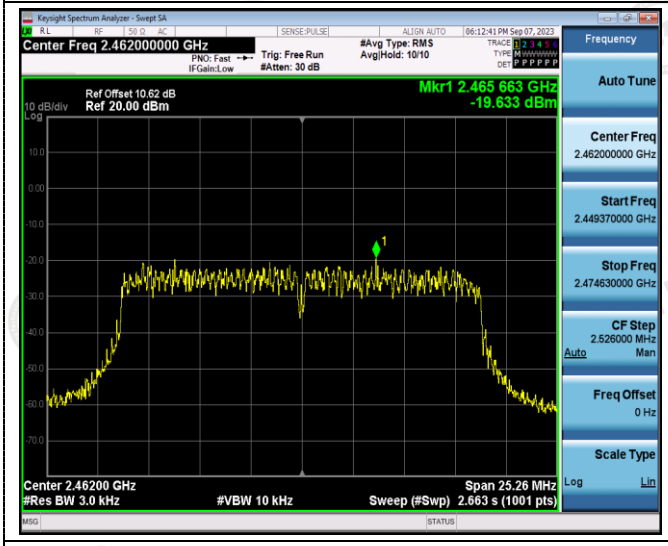
Test Results

Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-10.01	8.00	Pass
	06	-12.03		
	11	-12.79		
802.11g	01	-16.72	8.00	Pass
	06	-17.94		
	11	-19.07		
802.11n(HT20)	01	-16.89	8.00	Pass
	06	-18.11		
	11	-19.63		

Note:
1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
2) Test results including cable loss;
3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20;

Please refer to following plots;

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

802.11n(HT20)	
	
CH01	CH06
	
CH11	

4.5 6dB Bandwidth

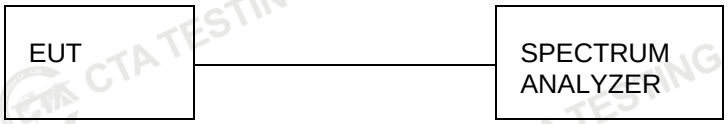
Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration

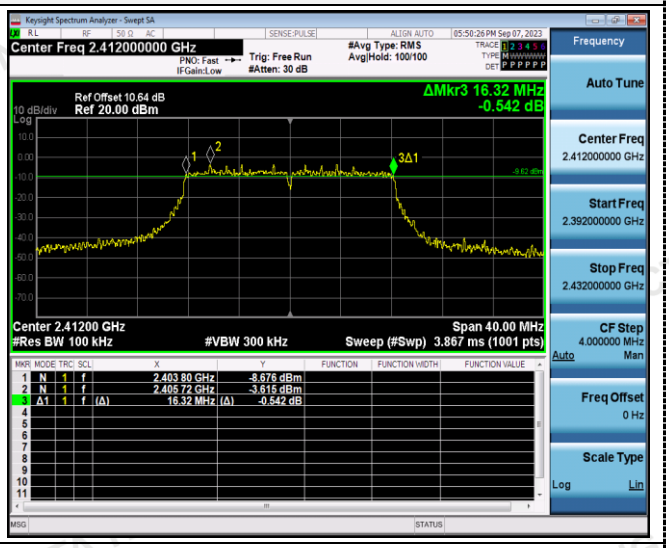
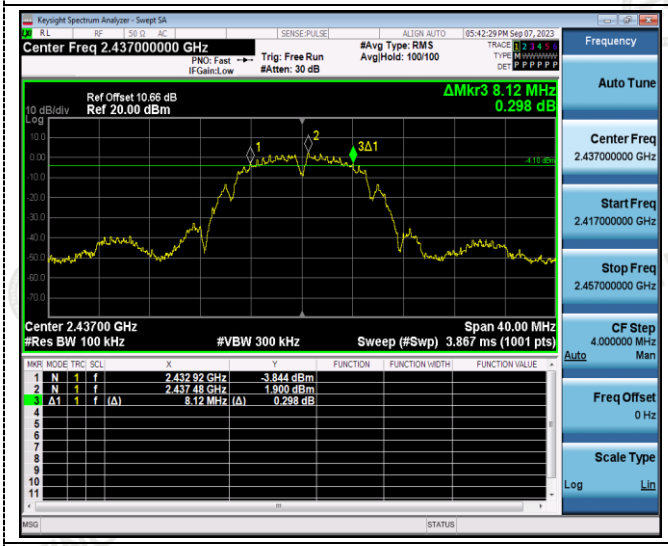
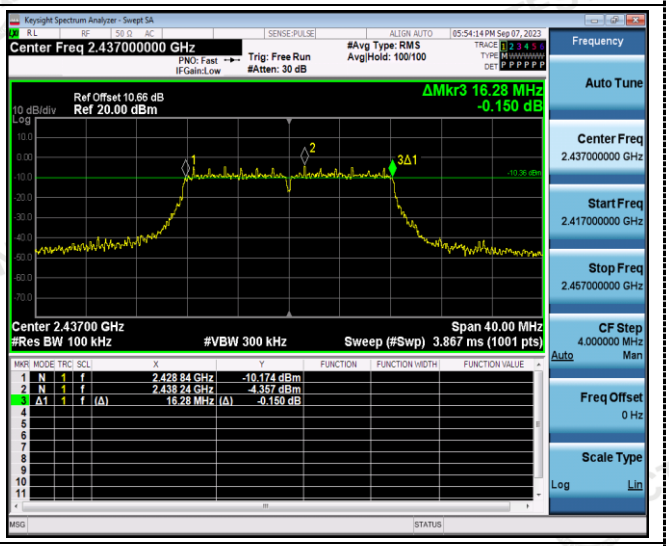
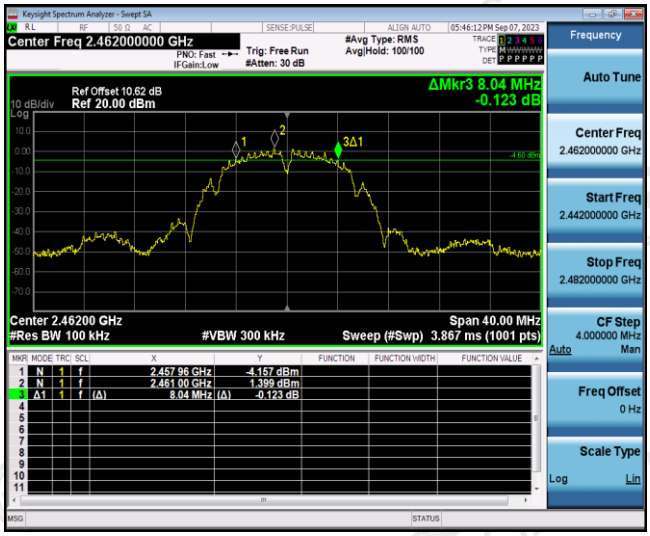
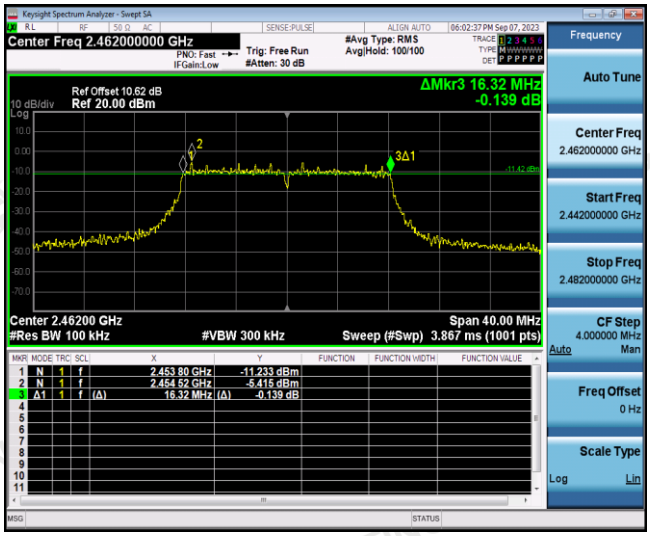


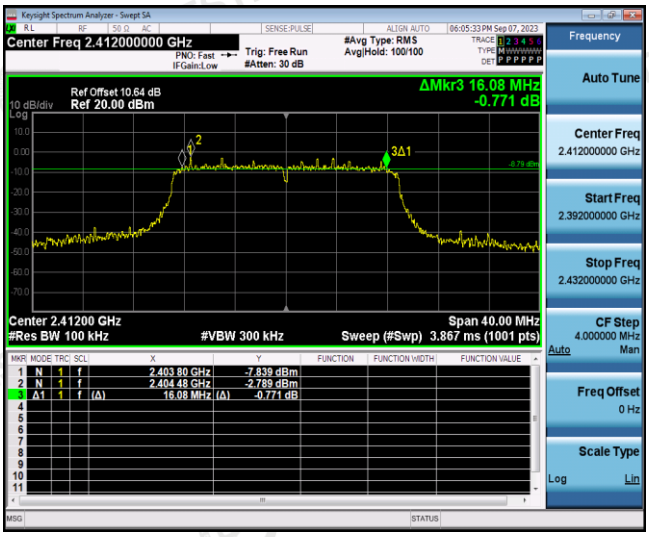
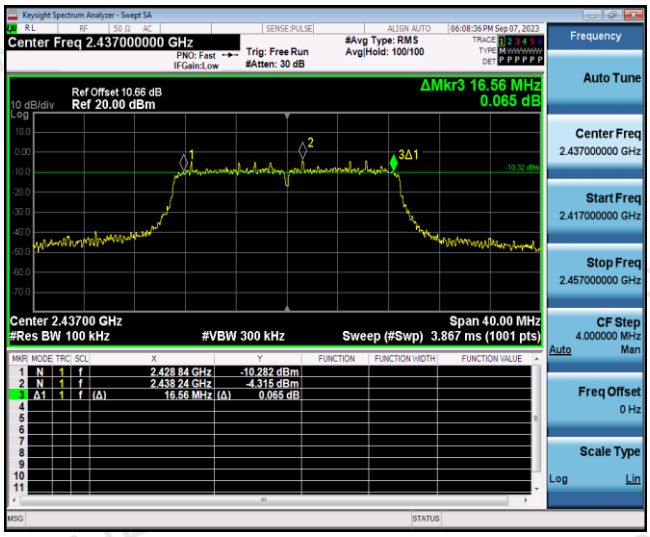
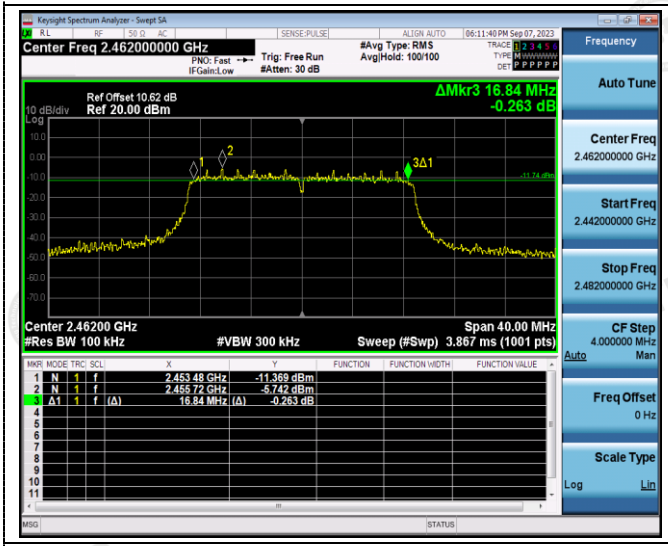
Test Results

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	8.040	≥500	Pass
	06	8.120		
	11	8.040		
802.11g	01	16.320	≥500	Pass
	06	16.280		
	11	16.320		
802.11n(HT20)	01	16.080	≥500	Pass
	06	16.560		
	11	16.840		

Note:
1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
2) Test results including cable loss;
3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20;

Please refer to following plots;

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

802.11n(HT20)	802.11n(HT20)
	
CH01	CH06
	/
CH11	

4.6 Out-of-band Emissions

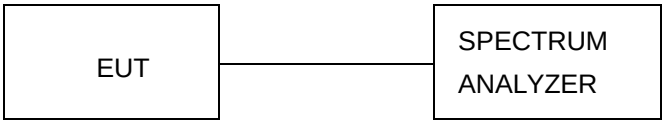
Limit

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 con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector , and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

Test Configuration



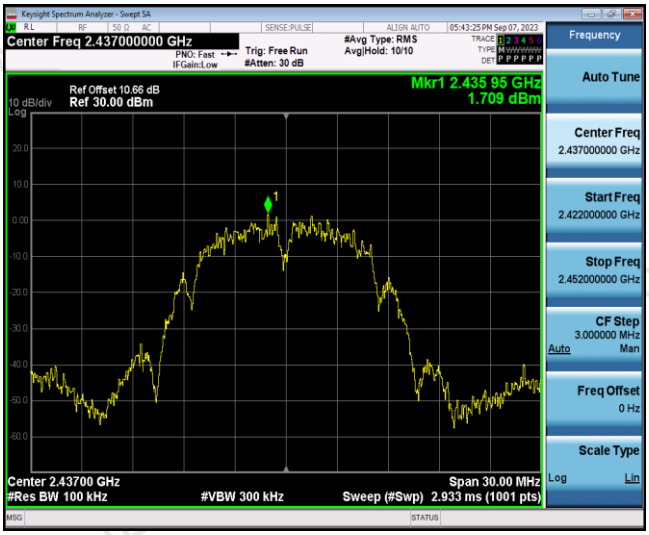
Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data. And record the worst data in the report.

Test plot as follows:

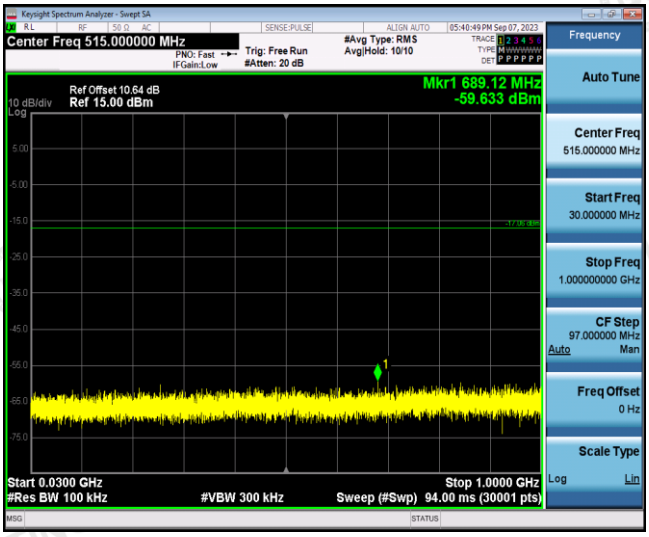
802.11b

Reference



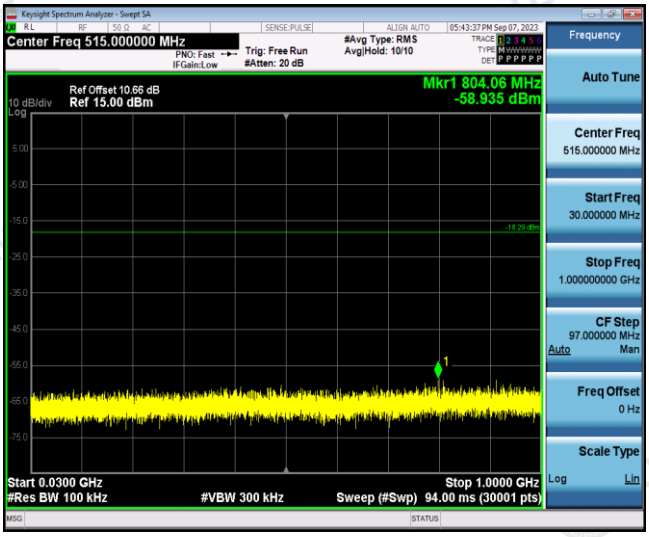
Reference

CH01

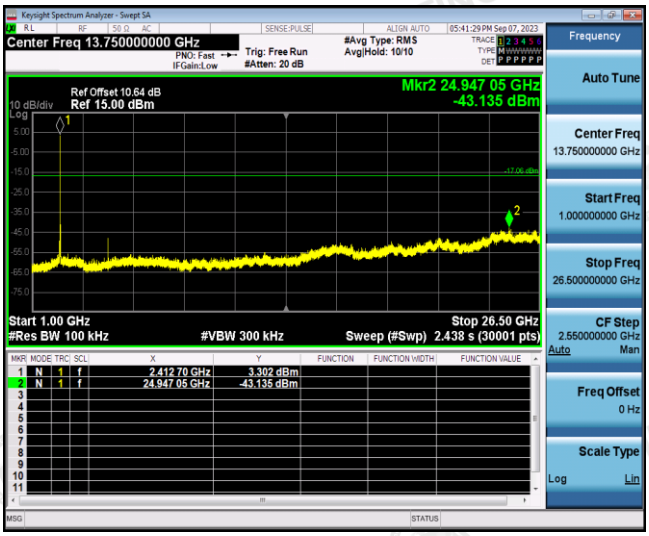


30MHz-3GHz

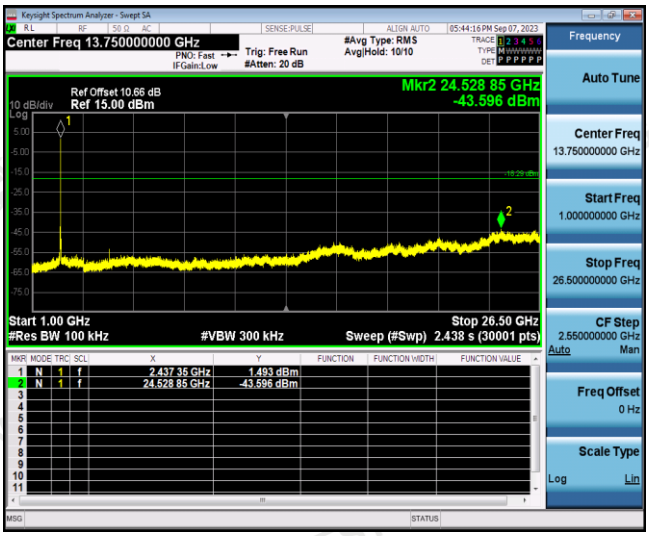
CH06



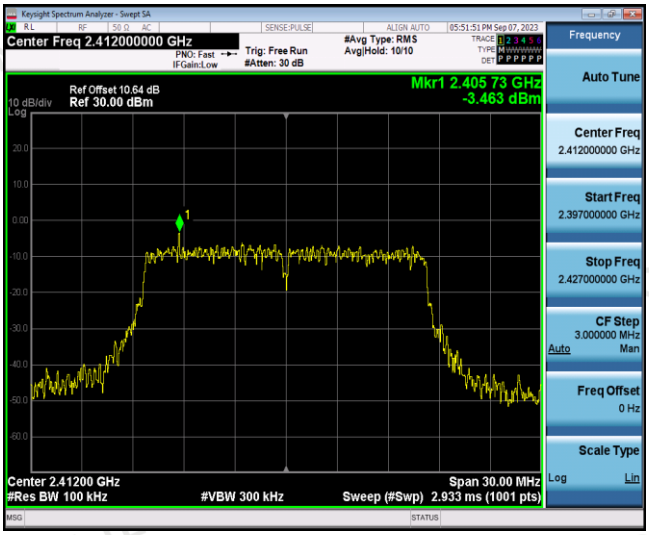
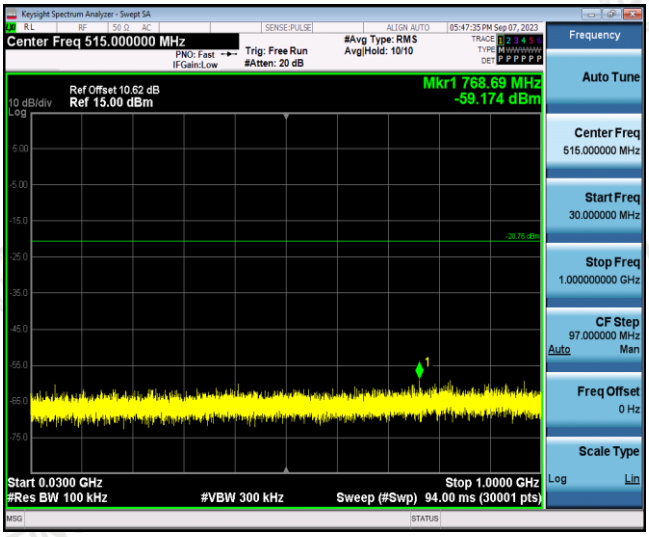
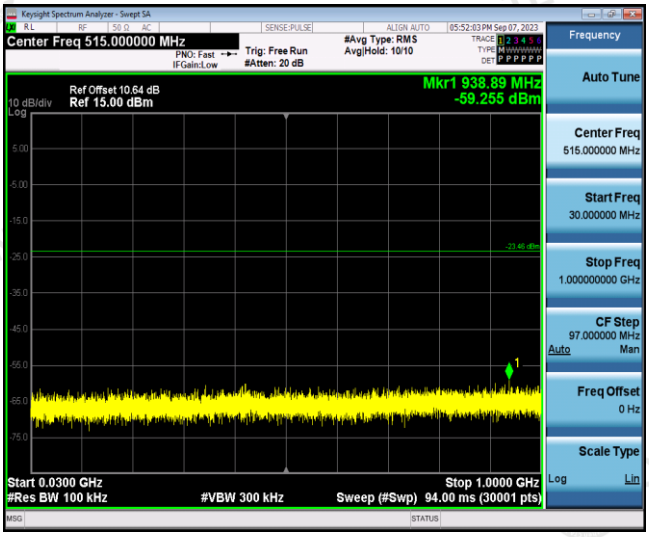
30MHz-3GHz



3GHz -25GHz



3GHz -25GHz

802.11b	802.11g
	
Reference	Reference
CH011	***CH01***
	
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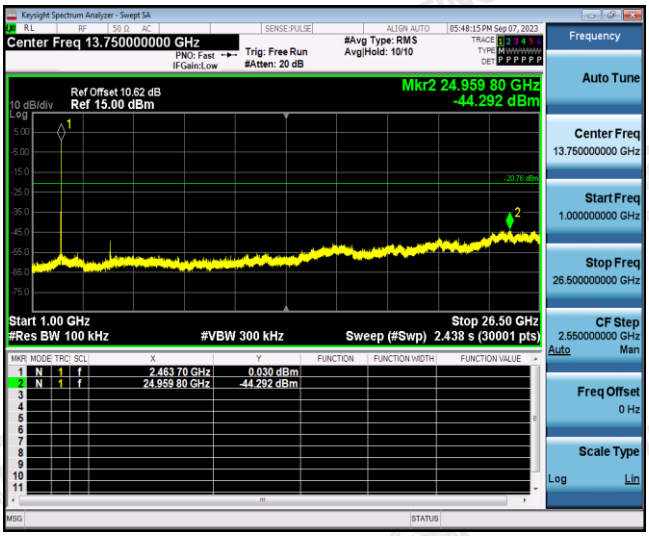
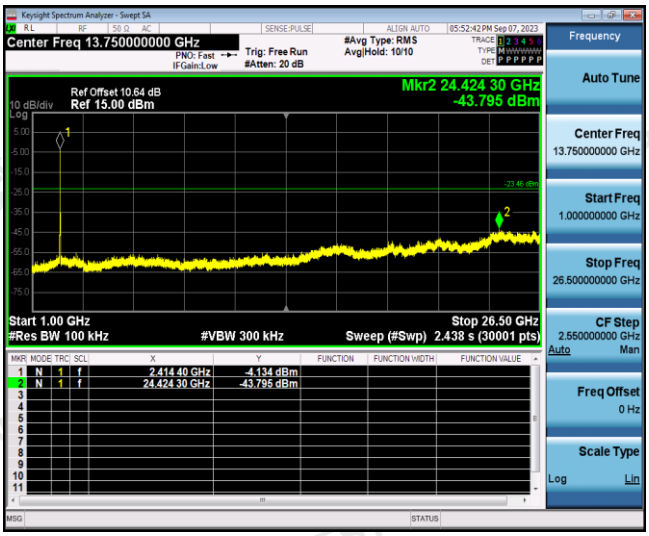
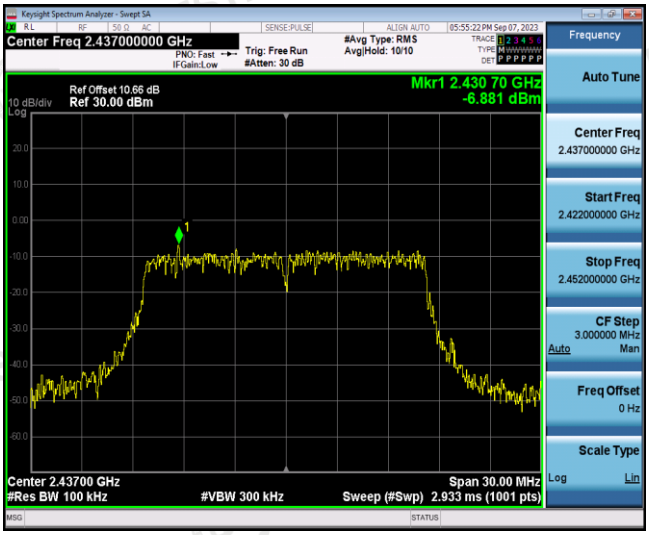
	
3GHz -25GHz	3GHz -25GHz

802.11g



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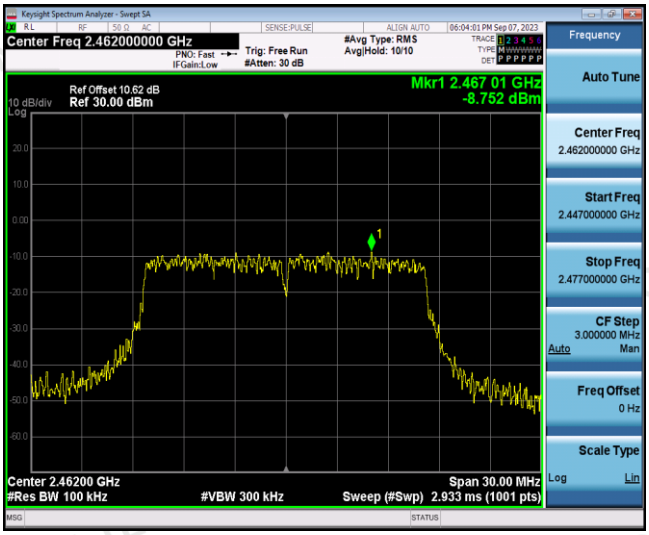

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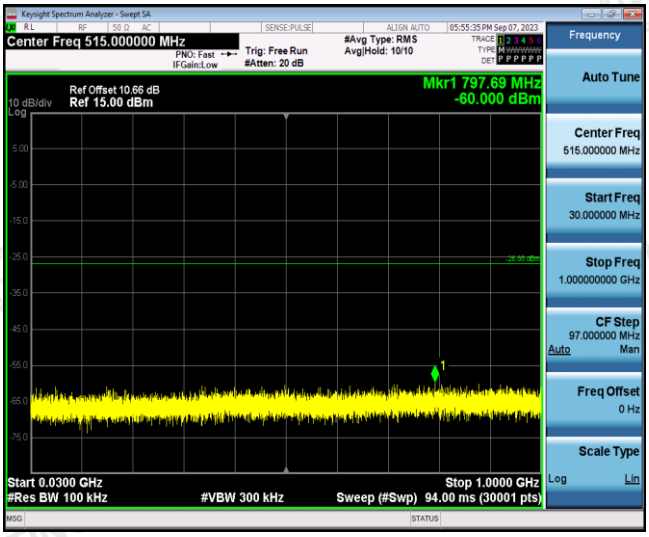
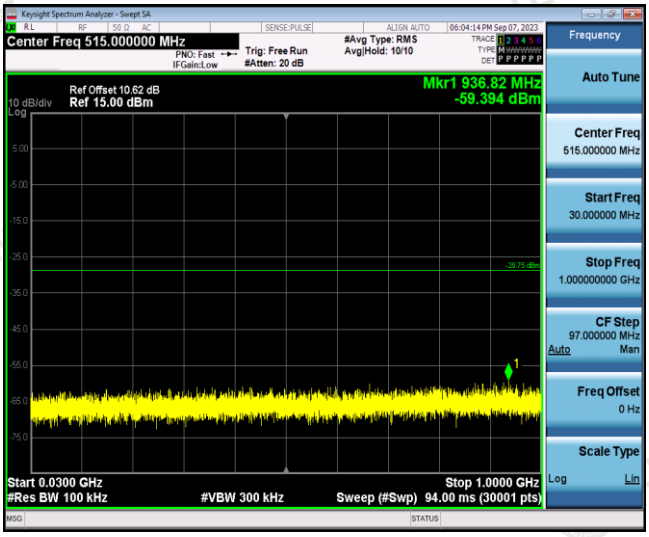
CH06

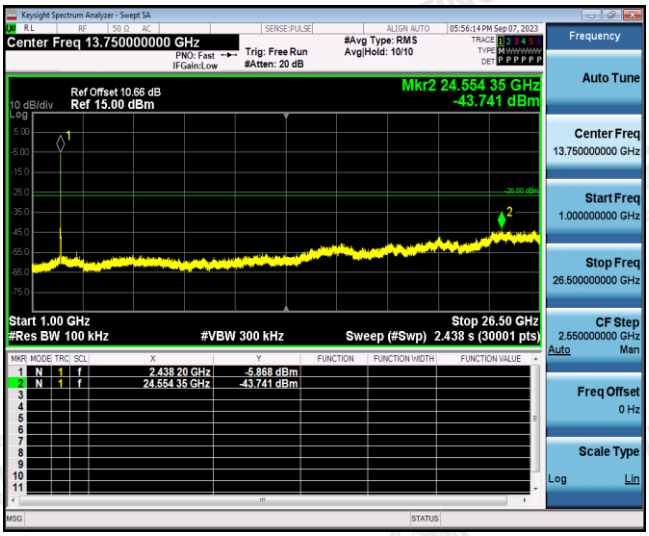


30MHz-3GHz

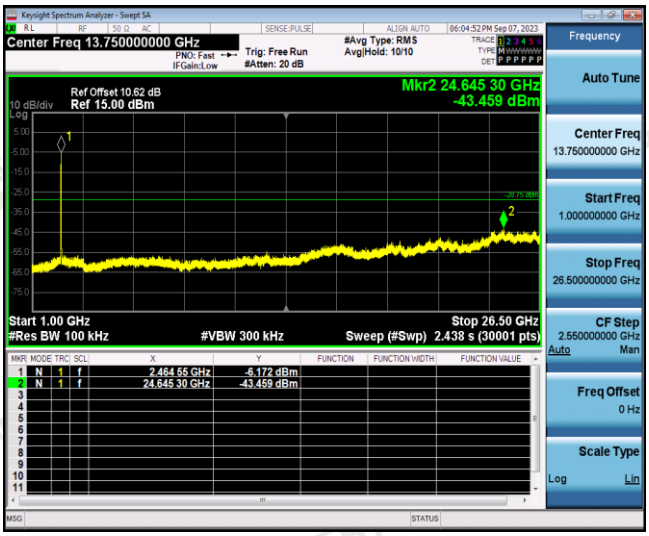
CH11



30MHz-3GHz

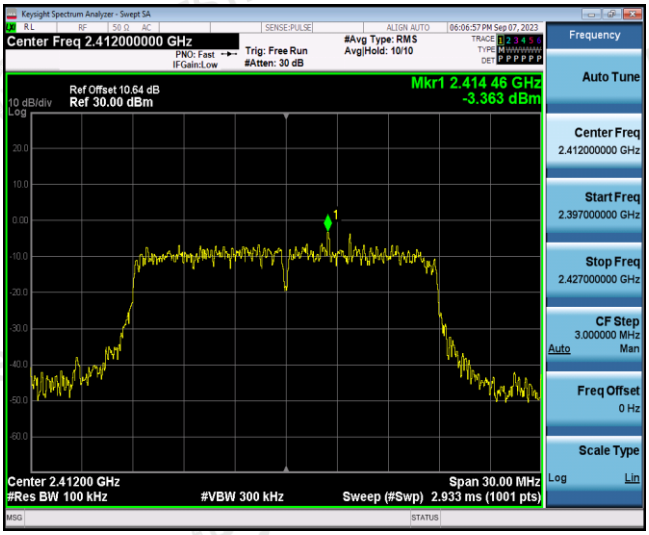


3GHz -25GHz



3GHz -25GHz

802.11n20



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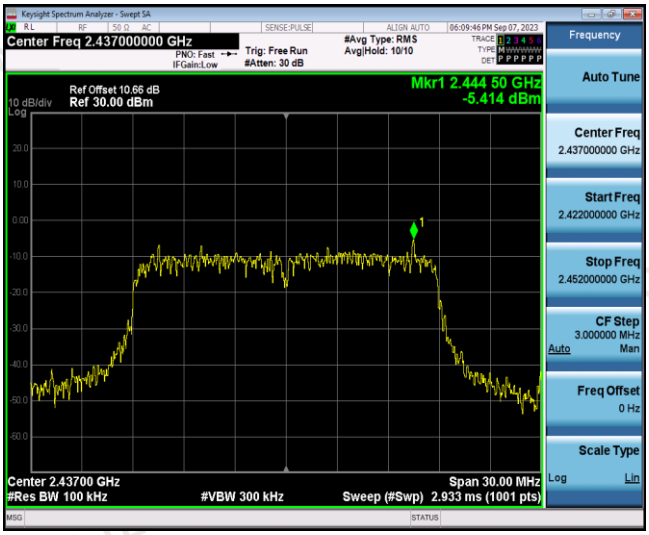

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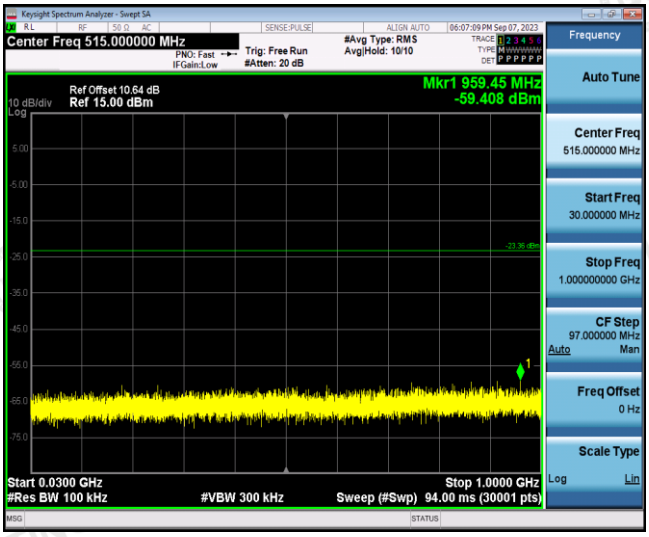
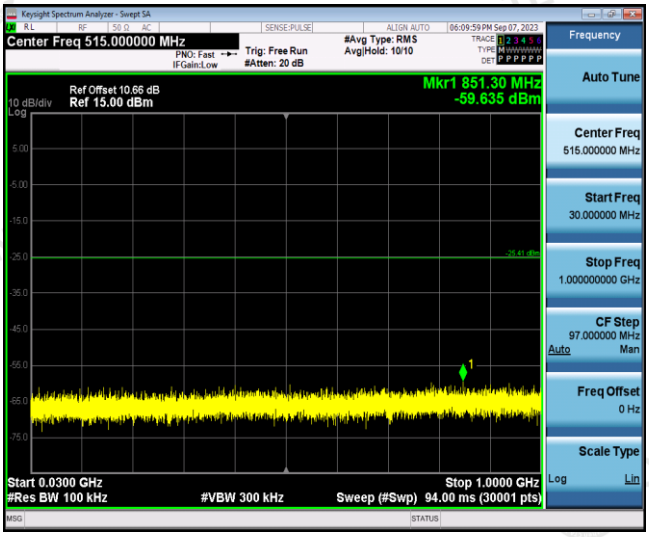
CH01

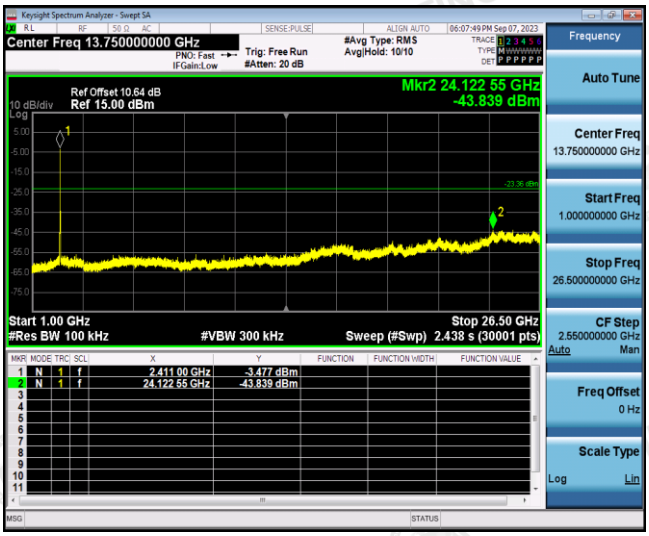


30MHz-3GHz

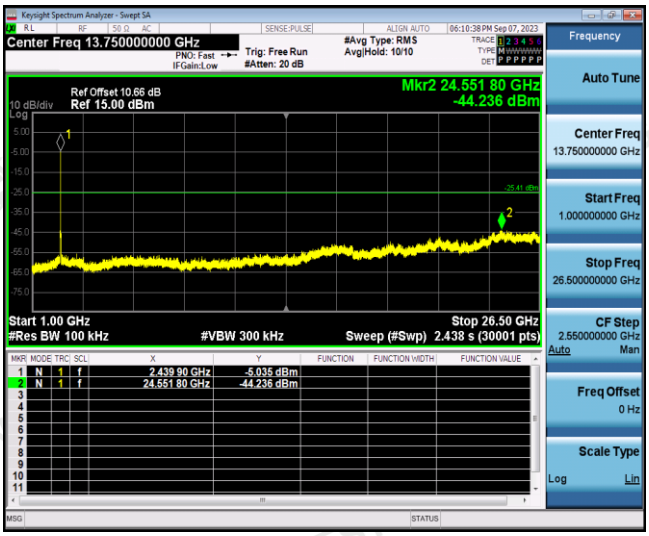
CH06



30MHz-3GHz



3GHz -25GHz



3GHz -25GHz