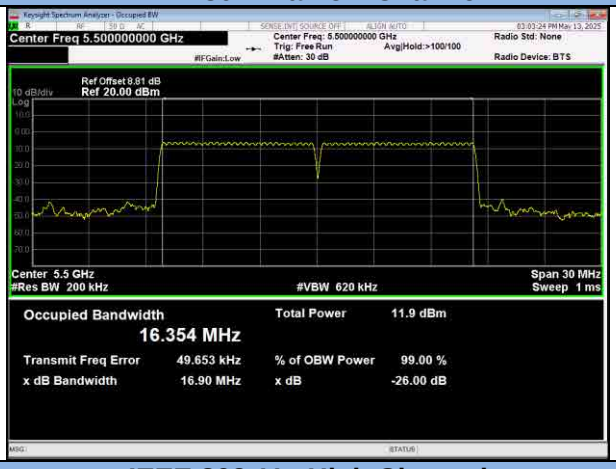
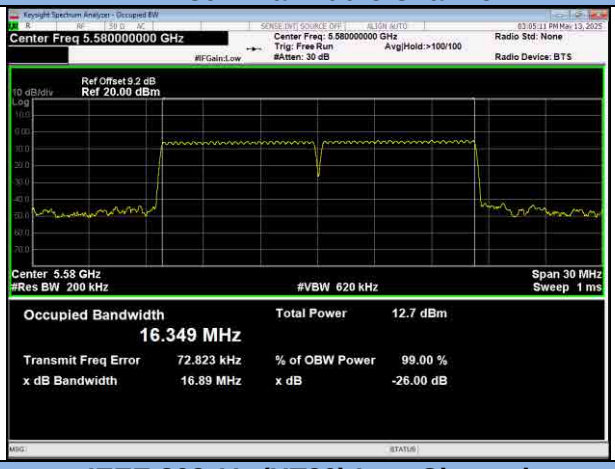
U-NII-2C Band 26dB Bandwidth

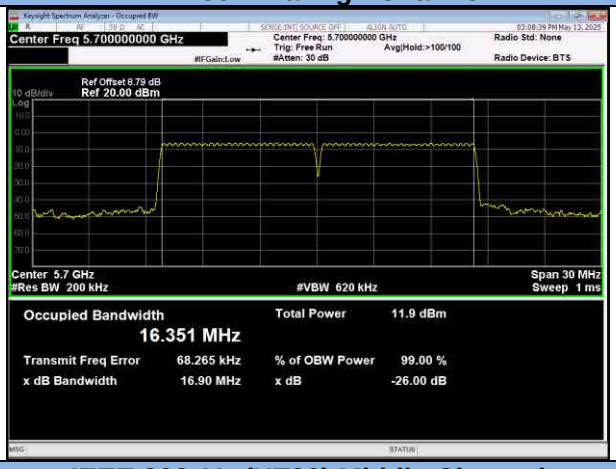
IEEE 802.11a Low Channel



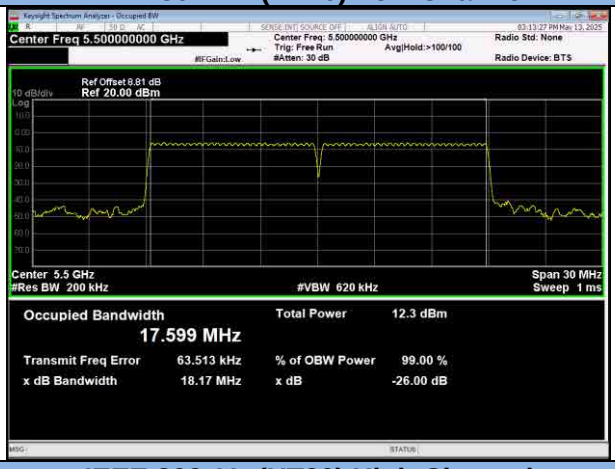
IEEE 802.11a Middle Channel



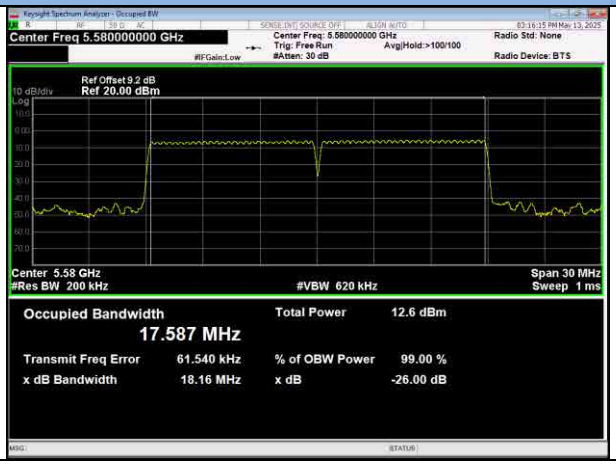
IEEE 802.11a High Channel



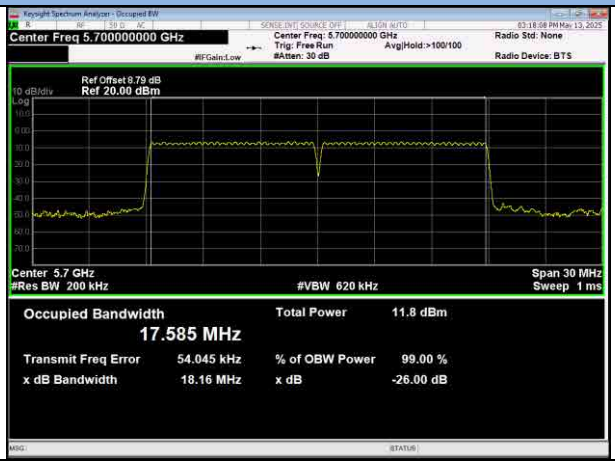
IEEE 802.11n(HT20) Low Channel



IEEE 802.11n(HT20) Middle Channel

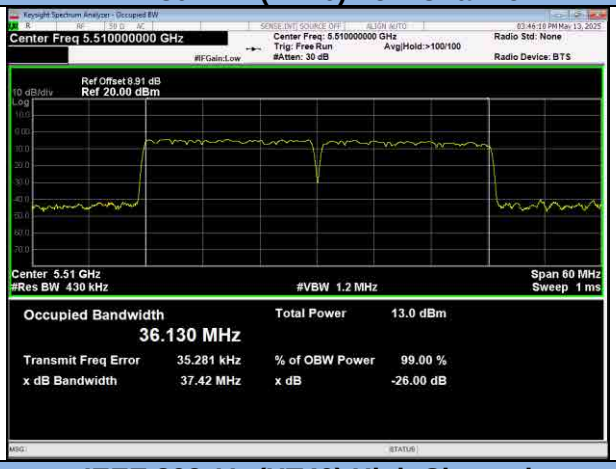


IEEE 802.11n(HT20) High Channel

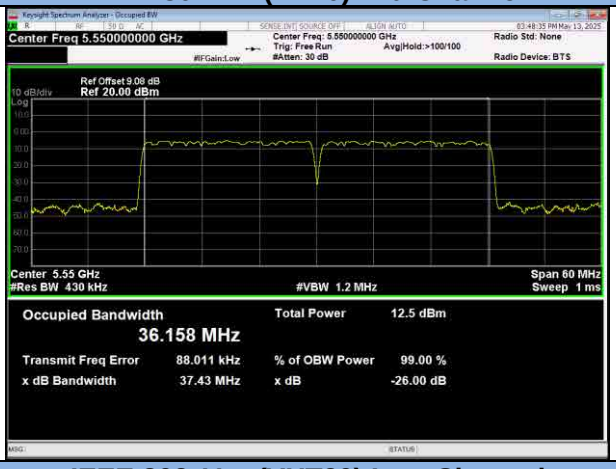


U-NII-2C Band 26dB Bandwidth

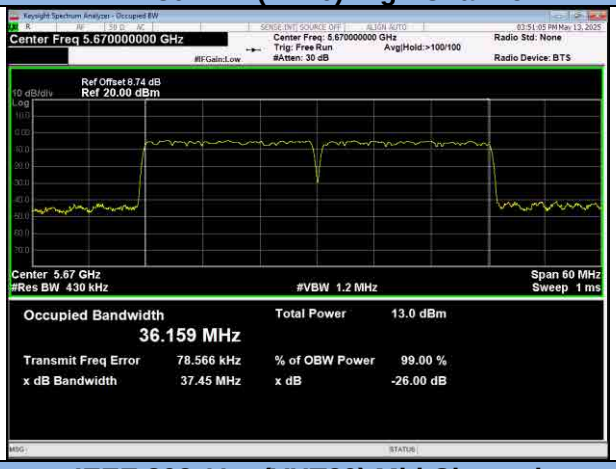
IEEE 802.11n(HT40) Low Channel



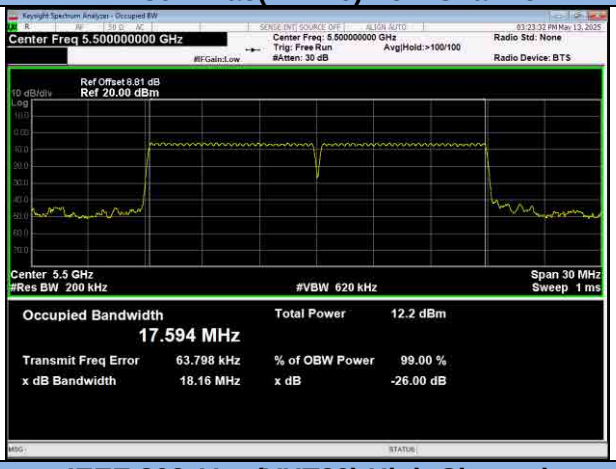
IEEE 802.11n(HT40) Mid Channel



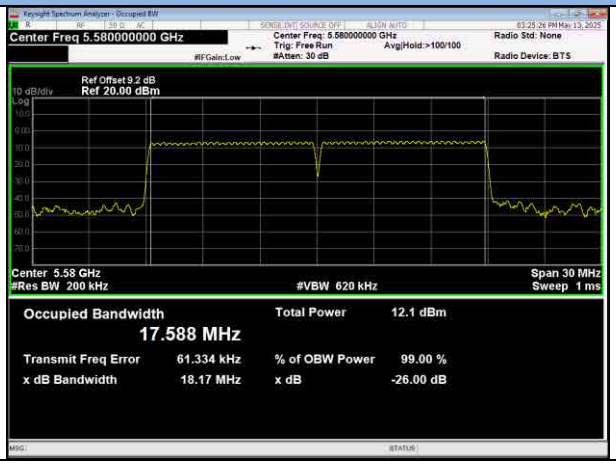
IEEE 802.11n(HT40) High Channel



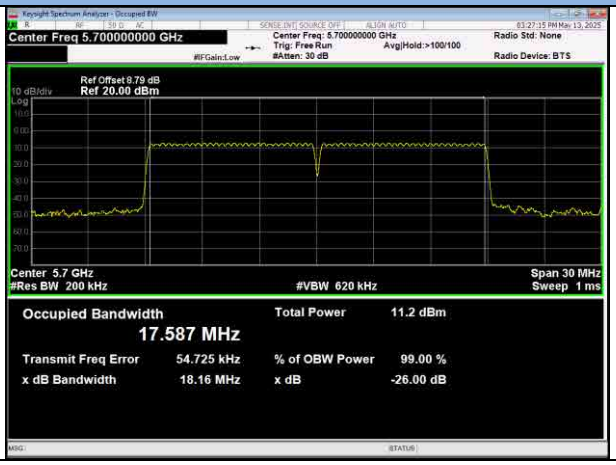
IEEE 802.11ac(VHT20) Low Channel



IEEE 802.11ac(VHT20) Mid Channel

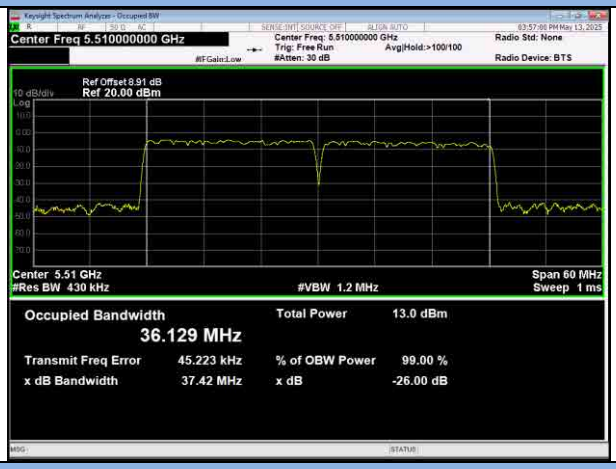


IEEE 802.11ac(VHT20) High Channel

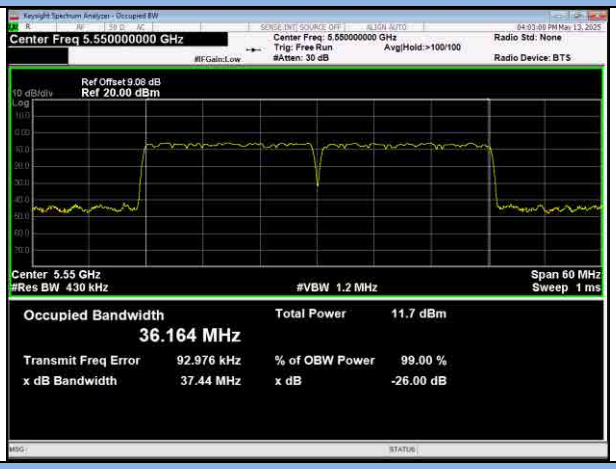


U-NII-2C Band 26dB Bandwidth

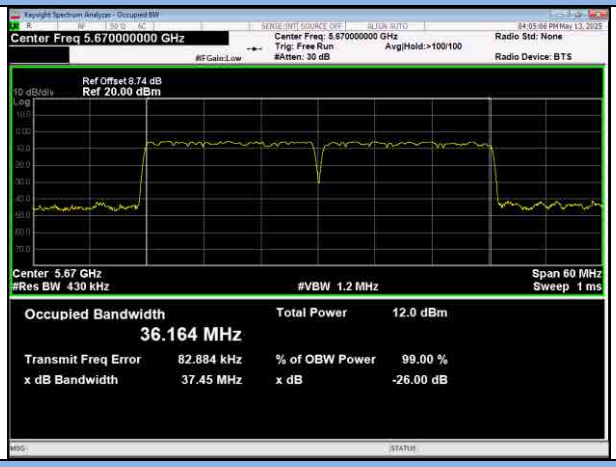
IEEE 802.11ac(VHT40) Low Channel



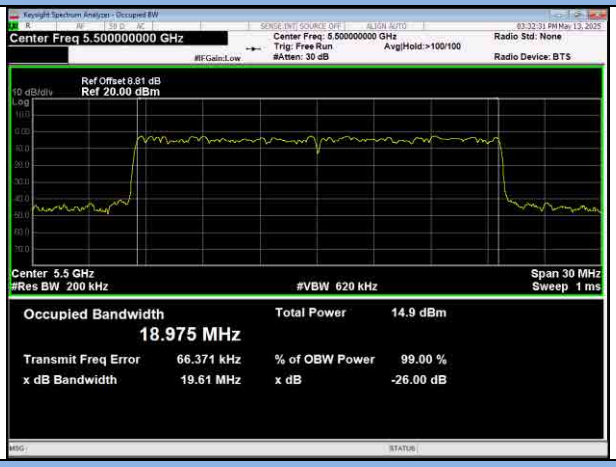
IEEE 802.11ac(VHT40) Mid Channel



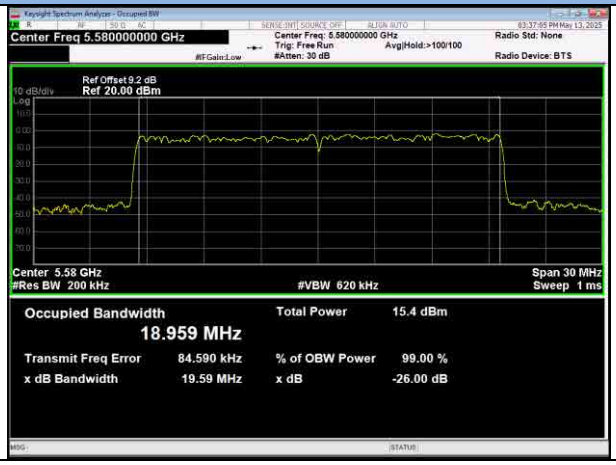
IEEE 802.11ac(VHT40) High Channel



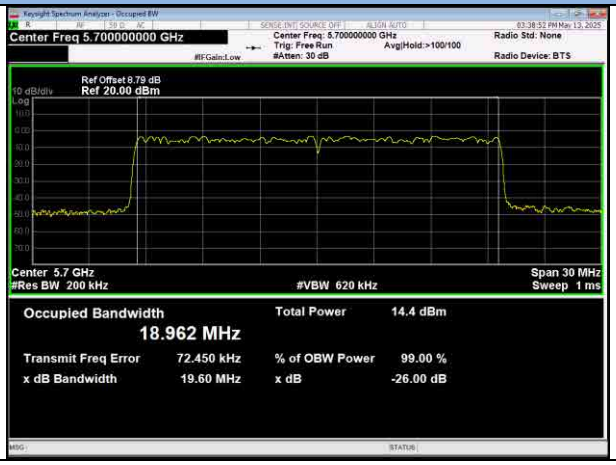
IEEE 802.11ax(HE20) Low Channel

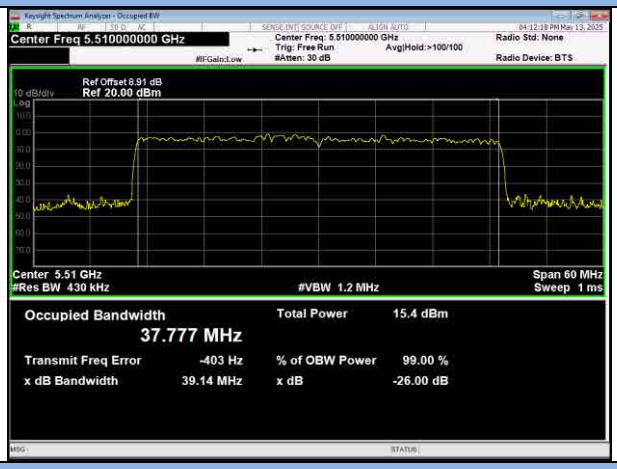
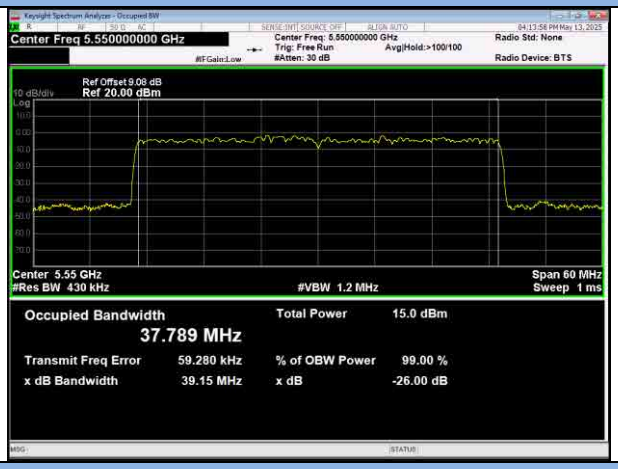
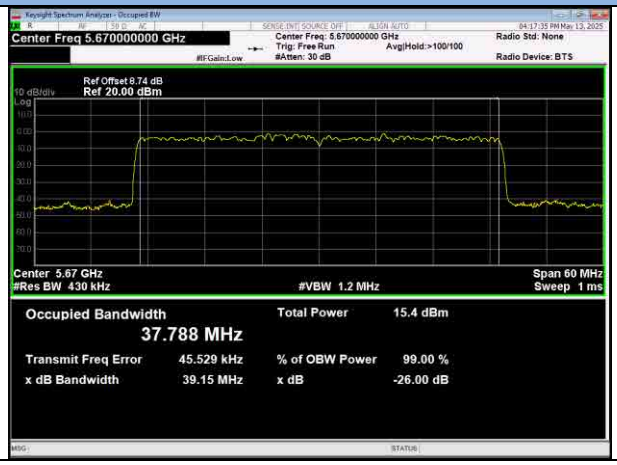


IEEE 802.11ax(HE20) Middle Channel



IEEE 802.11ax(HE20) High Channel



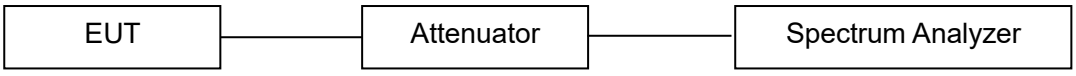
U-NII-2C Band 26dB Bandwidth	
IEEE 802.11ax(HE40) Low Channel	**IEEE 802.11ax(HE40) Mid Channel**
	
IEEE 802.11ax(HE40) High Channel	**---**
	---

14.5 Power Spectral Density

LIMITS

Operation Band		Limit
☒5180~5240MHz	☐Outdoor access point	17 dBm/MHz
	☐Indoor access point	17 dBm/MHz
	☐Fixed point-to-point access points	17 dBm/MHz
	☒Client devices	11 dBm/MHz
☒5260~5320MHz	-	11 dBm/MHz
☒5500~5700MHz	-	11 dBm/MHz
☒5745~5825MHz	-	30 dBm/500kHz

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

The antenna port of the EUT was connected to the input of a spectrum analyzer.
Analyzer was set as below according to FCC KDB789033 (v02r01):
a. Set analyzer center frequency to center frequency
b. Set the RBW to: 1MHz
c. Set the VBW to: 3MHz
d. Detector = RMS
e. Sweep time = auto couple
f. Trace Average = 100 times
g. If measured bandwidth of Maximum PSD is specified in 500kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (<500kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement. Allow trace to fully stabilize.

TEST RESULTS

PASS

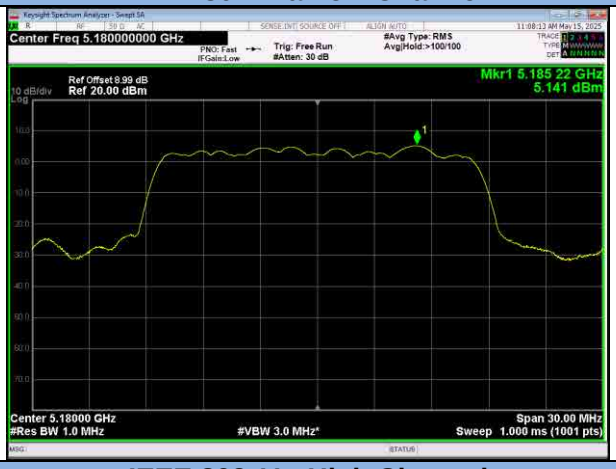
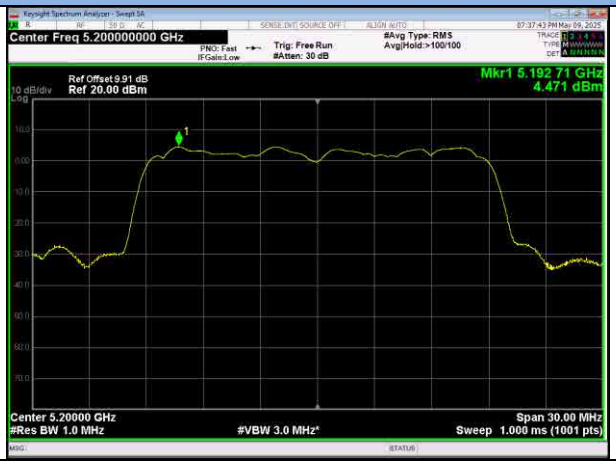
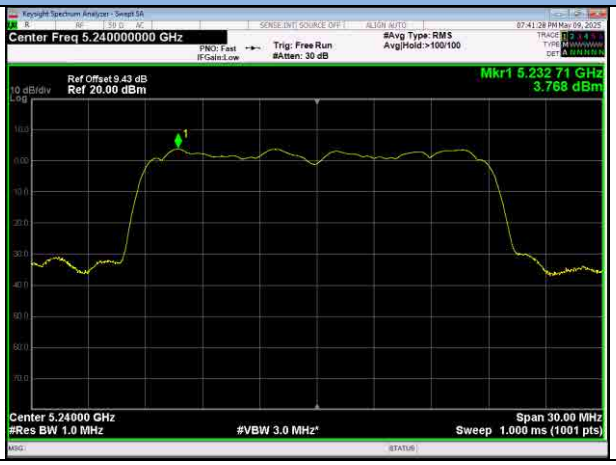
Please refer to the following test plots.

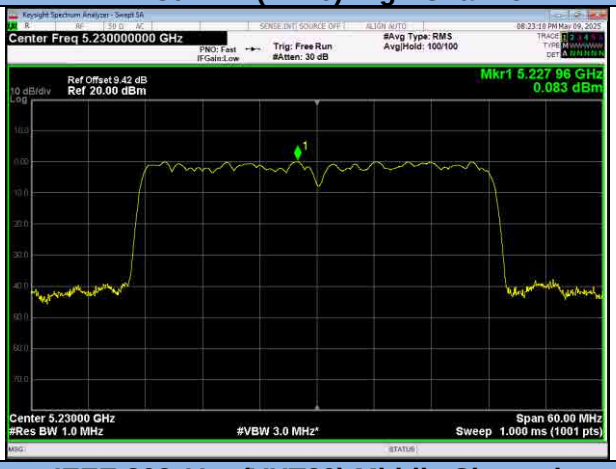
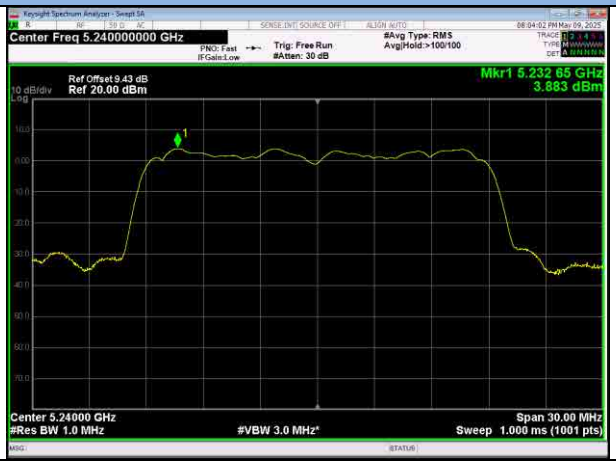
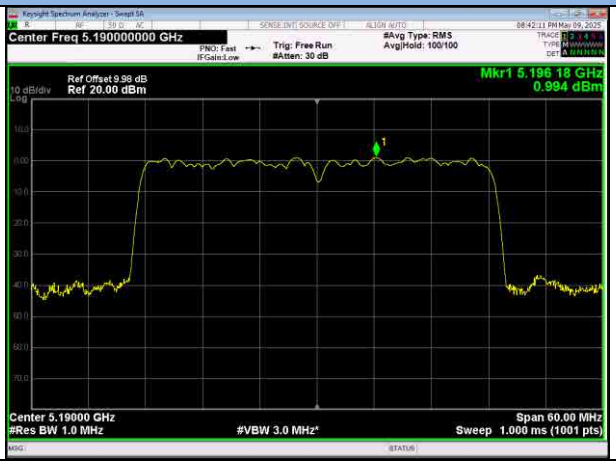
U-NII-1					
Frequency MHz	Data Rate Mbps	Duty Cycle Factor (dB)	PSD dBm	Total PSD with duty cycle factor	Limit dBm/ MHz
IEEE 802.11a Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5180	6	0	5.141	5.14	10.97
Channel: 5200	6		4.746	4.75	10.97
Channel: 5240	6		4.739	4.74	10.97
IEEE 802.11n(HT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5180	MCS 0	0	4.353	4.35	10.97
Channel: 5200	MCS 0		4.471	4.47	10.97
Channel: 5240	MCS 0		3.768	3.77	10.97
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5190	MCS 0	0	1.049	1.05	10.97
Channel: 5230	MCS 0		0.083	0.08	10.97
IEEE 802.11ac(VHT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5180	MCS 0	0	4.962	4.96	10.97
Channel: 5200	MCS 0		4.634	4.63	10.97
Channel: 5240	MCS 0		3.883	3.88	10.97
IEEE 802.11ac(VHT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5190	MCS 0	0	0.994	0.99	10.97
Channel: 5230	MCS 0		0.127	0.13	10.97
IEEE 802.11ax(HE20) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5180	MCS 0	0	6.818	6.82	10.97
Channel: 5200	MCS 0		6.504	6.50	10.97
Channel: 5240	MCS 0		6.167	6.17	10.97
IEEE 802.11 ax(HE40) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5190	MCS 0	0	3.555	3.56	10.97
Channel: 5230	MCS 0		2.629	3.56	10.97
Note: Please refer to section 13 for duty cycle factor.					

U-NII-2A					
Frequency MHz	Data Rate Mbps	Duty Cycle Factor (dB)	PSD dBm	Total PSD with duty cycle factor	Limit dBm/ MHz
IEEE 802.11a Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5260	6	0	5.169	5.17	10.97
Channel: 5300	6		4.292	4.29	10.97
Channel: 5320	6		4.006	4.01	10.97
IEEE 802.11n(HT20)Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5260	MCS 0	0	4.303	4.30	10.97
Channel: 5300	MCS 0		3.888	3.89	10.97
Channel: 5320	MCS 0		3.943	3.94	10.97
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5270	MCS 0	0	-0.384	-0.38	10.97
Channel: 5310	MCS 0		-0.859	-0.86	10.97
IEEE 802.11ac(VHT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5260	MCS 0	0	4.577	4.58	10.97
Channel: 5300	MCS 0		3.758	3.76	10.97
Channel: 5320	MCS 0		3.887	3.89	10.97
IEEE 802.11ac(VHT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5270	MCS 0	0	-0.402	-0.40	10.97
Channel: 5310	MCS 0		-0.982	-0.98	10.97
IEEE 802.11ax(HE20) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5260	MCS 0	0	6.193	6.19	10.97
Channel: 5300	MCS 0		5.567	5.57	10.97
Channel: 5320	MCS 0		4.9	4.90	10.97
IEEE 802.11 ax(HE40) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5270	MCS 0	0	2.256	2.26	10.97
Channel: 5310	MCS 0		1.686	2.26	10.97
Note: Please refer to section 13 for duty cycle factor.					

U-NII-2C					
Frequency MHz	Data Rate Mbps	Duty Cycle Factor (dB)	PSD dBm	Total PSD with duty cycle factor	Limit dBm/ MHz
IEEE 802.11a Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5500	6	0	3.368	3.37	10.97
Channel: 5580	6		4.075	4.08	10.97
Channel: 5700	6		2.851	2.85	10.97
IEEE 802.11n(HT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5500	MCS 0	0	3.013	3.01	10.97
Channel: 5580	MCS 0		3.273	3.27	10.97
Channel: 5700	MCS 0		2.488	2.49	10.97
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5510	MCS 0	0	-0.779	-0.78	10.97
Channel: 5550	MCS 0		-1.562	-1.56	10.97
Channel: 5670	MCS 0		-1.112	-1.112	10.97
IEEE 802.11ac(VHT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5500	MCS 0	0	3.462	3.46	10.97
Channel: 5580	MCS 0		2.719	2.72	10.97
Channel: 5700	MCS 0		1.855	1.86	10.97
IEEE 802.11ac(VHT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5510	MCS 0	0	-0.698	-0.70	10.97
Channel: 5550	MCS 0		-2.319	-2.32	10.97
Channel: 5670	MCS 0		-2.037	-2.04	10.97
IEEE 802.11ax(HE20) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5500	MCS 0	0	4.417	4.42	10.97
Channel: 5580	MCS 0		5.169	5.17	10.97
Channel: 5700	MCS 0		3.855	3.86	10.97
IEEE 802.11 ax(HE40) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5510	MCS 0	0	2.111	2.11	10.97
Channel: 5550	MCS 0		1.528	1.53	10.97
Channel: 5670	MCS 0		1.884	1.88	10.97
Note: Please refer to section 13 for duty cycle factor.					

U-NII-3					
Frequency MHz	Data Rate Mbps	Duty Cycle Factor (dB)	PSD dBm/500KHz	Total PSD with duty cycle factor	Limit dBm/ 500KHz
IEEE 802.11a Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5745	6	0	1.55	1.55	29.97
Channel: 5785	6		1.544	1.54	29.97
Channel: 5825	6		0.676	0.68	29.97
IEEE 802.11n(HT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5745	MCS 0	0	1.513	1.51	29.97
Channel: 5785	MCS 0		0.563	0.56	29.97
Channel: 5825	MCS 0		0.224	0.22	29.97
IEEE 802.11n(HT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5755	MCS 0	0	-1.909	-1.91	29.97
Channel: 5795	MCS 0		-2.341	-2.34	29.97
IEEE 802.11ac(VHT20) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5745	MCS 0	0	1.493	1.49	29.97
Channel: 5785	MCS 0		0.523	0.52	29.97
Channel: 5825	MCS 0		0.205	0.21	29.97
IEEE 802.11ac(VHT40) Mode (OFDM, Antenna Gain=6.03dBi)					
Channel: 5755	MCS 0	0	-1.952	-1.95	29.97
Channel: 5795	MCS 0		-2.367	-2.37	29.97
IEEE 802.11ax(HE20) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5745	MCS 0	0	4.403	4.40	29.97
Channel: 5785	MCS 0		4.233	4.23	29.97
Channel: 5825	MCS 0		3.45	3.45	29.97
IEEE 802.11ax(HE40) Mode (OFDMA, Antenna Gain=6.03dBi)					
Channel: 5755	MCS 0	0	0.817	0.82	29.97
Channel: 5795	MCS 0		0.701	0.70	29.97
Note: Please refer to section 13 for duty cycle factor.					

U-NII-1 Band	
IEEE 802.11a Low Channel	IEEE 802.11a Middle Channel
	
IEEE 802.11a High Channel	IEEE 802.11n(HT20) Low Channel
	
IEEE 802.11n(HT20) Middle Channel	IEEE 802.11n(HT20) High Channel
	

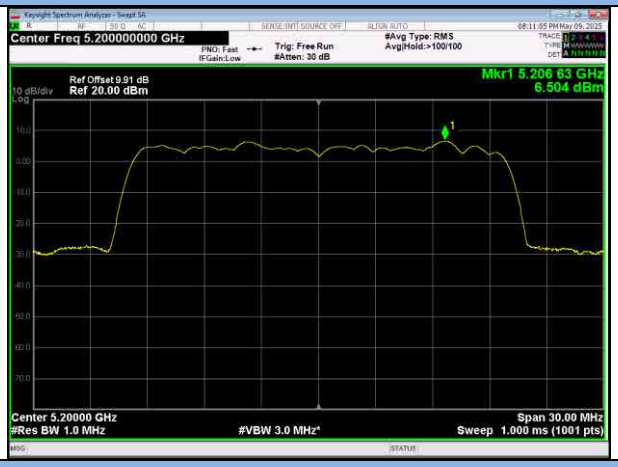
U-NII-1 Band	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) Middle Channel
	
IEEE 802.11ac(VHT20) High Channel	IEEE 802.11ac(VHT40) Low Channel
	

U-NII-1 Band

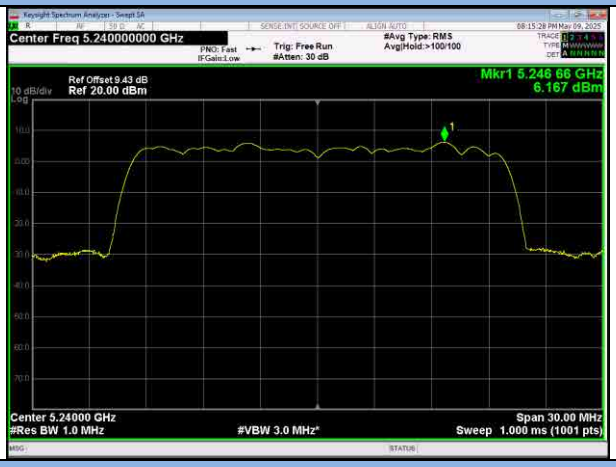
IEEE 802.11ac(VHT40) High Channel

IEEE 802.11ax(HE20) Low Channel

IEEE 802.11ax(HE20) Middle Channel

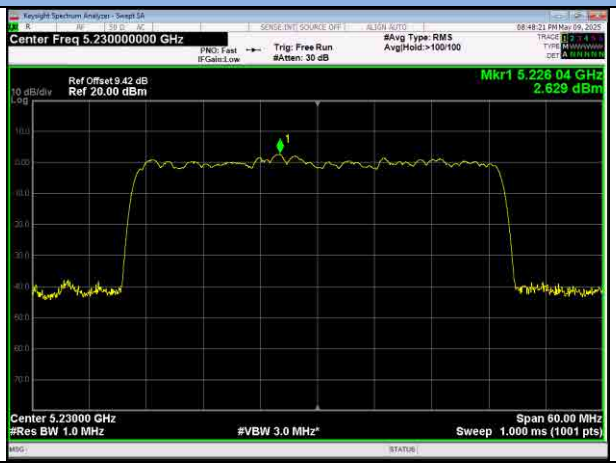


IEEE 802.11ax(HE20) High Channel



IEEE 802.11ax(HE40) Low Channel

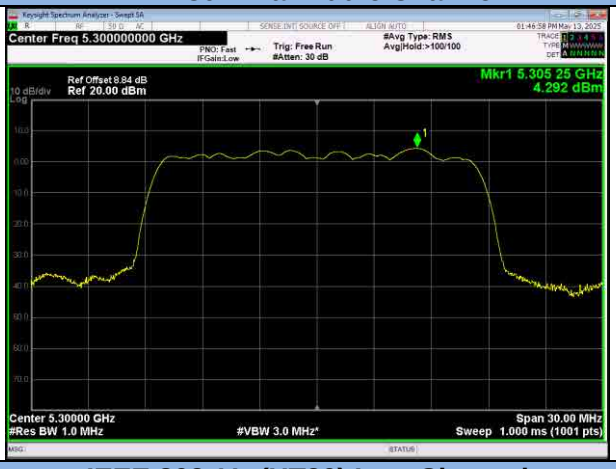
IEEE 802.11ax(HE40) High Channel



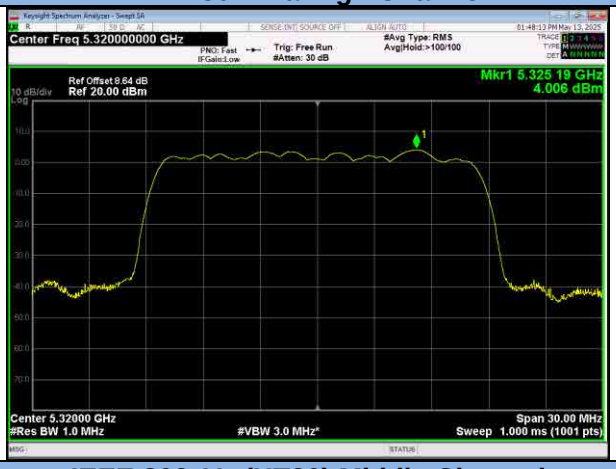
U-NII-2A Band

IEEE 802.11a Low Channel

IEEE 802.11a Middle Channel



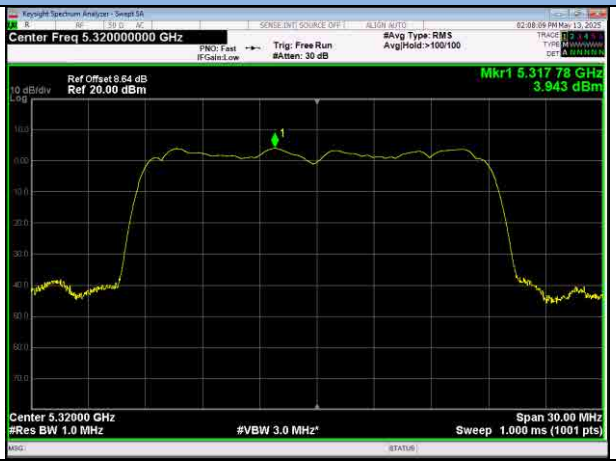
IEEE 802.11a High Channel

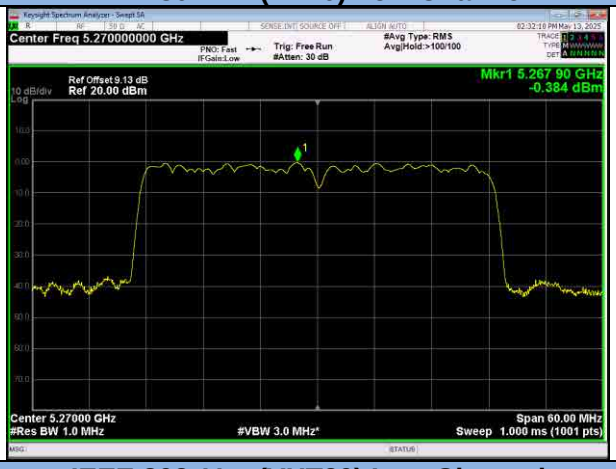
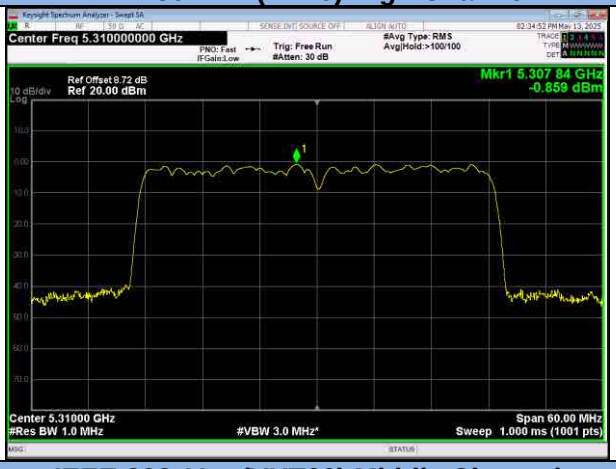
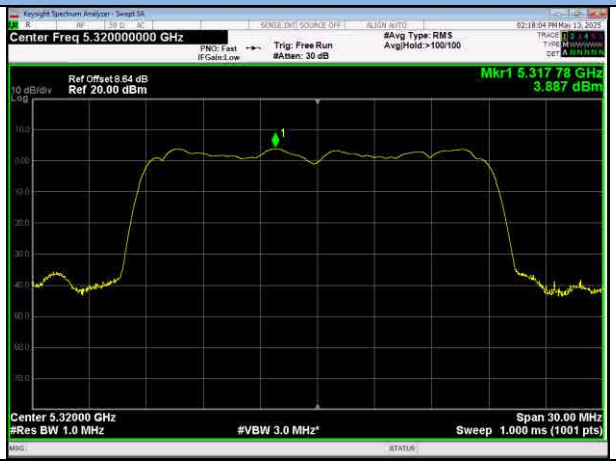
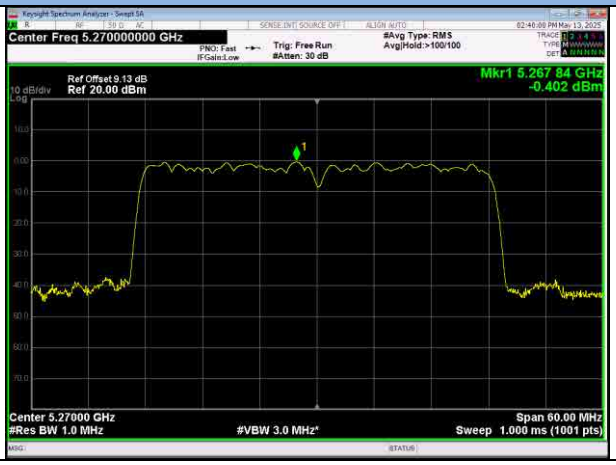


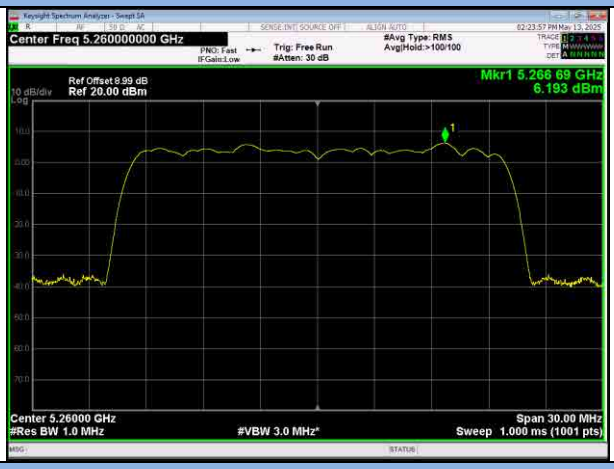
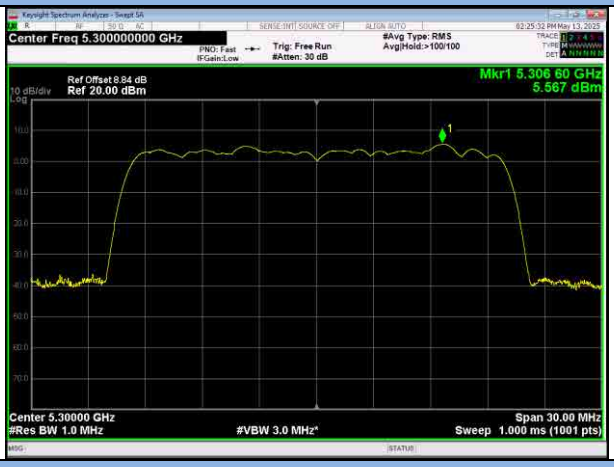
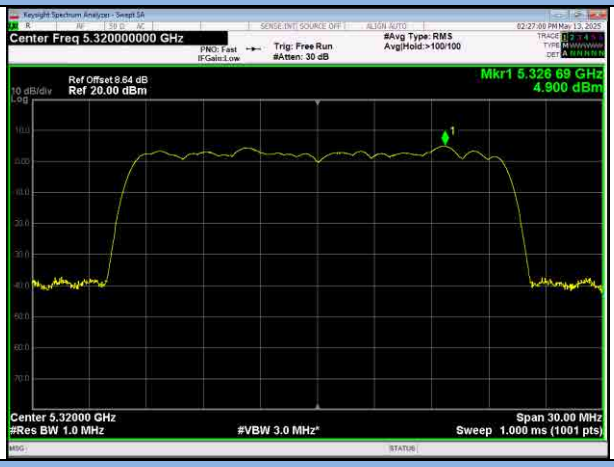
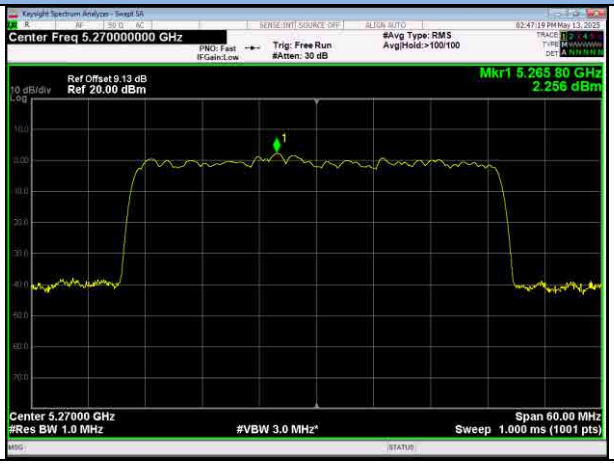
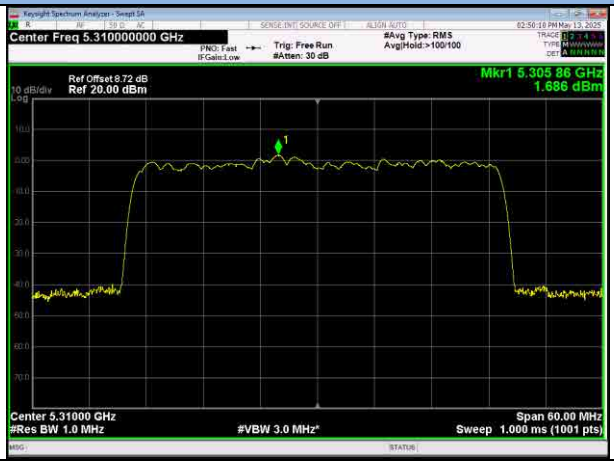
IEEE 802.11n(HT20) Low Channel

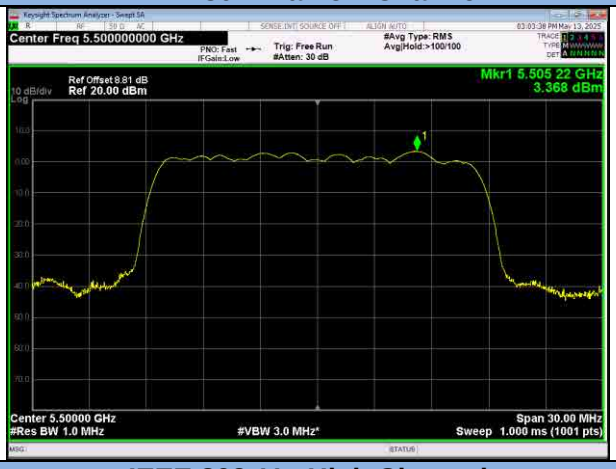
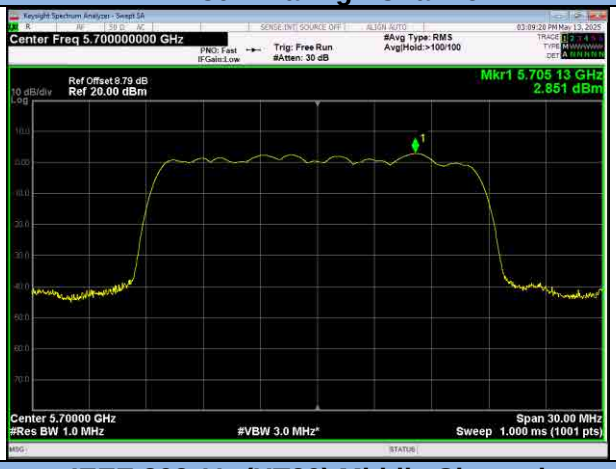
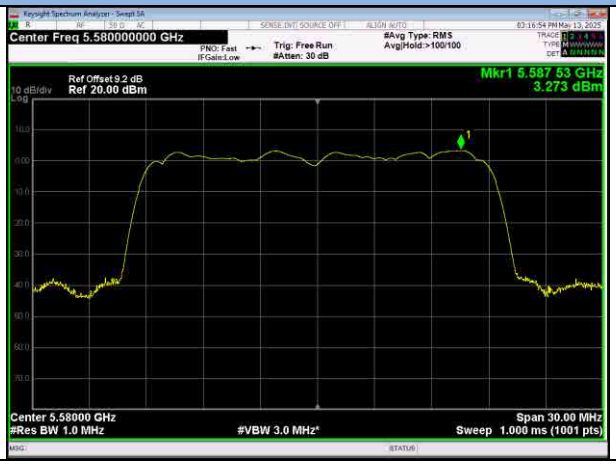
IEEE 802.11n(HT20) Middle Channel

IEEE 802.11n(HT20) High Channel



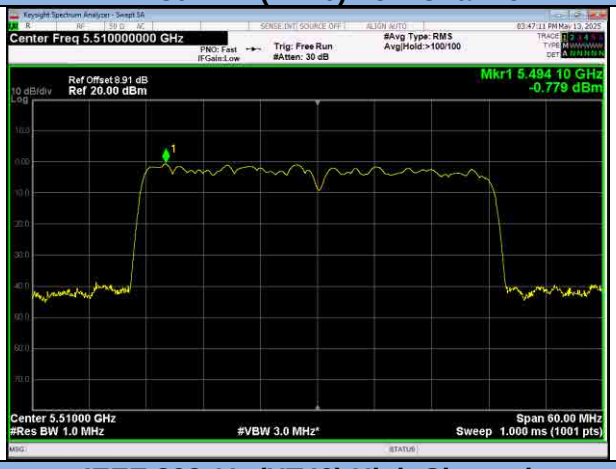
U-NII-2A Band	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) Middle Channel
	
IEEE 802.11ac(VHT20) High Channel	IEEE 802.11ac(VHT40) Low Channel
	

U-NII-2A Band	
IEEE 802.11ac(VHT40) High Channel	**IEEE 802.11ax(HE20) Low Channel**
	
IEEE 802.11ax(HE20) Middle Channel	**IEEE 802.11ax(HE20) High Channel**
	
IEEE 802.11ax(HE40) Low Channel	**IEEE 802.11ax(HE40) High Channel**
	

U-NII-2C Band	
IEEE 802.11a Low Channel	IEEE 802.11a Middle Channel
	
IEEE 802.11a High Channel	IEEE 802.11n(HT20) Low Channel
	
IEEE 802.11n(HT20) Middle Channel	IEEE 802.11n(HT20) High Channel
	

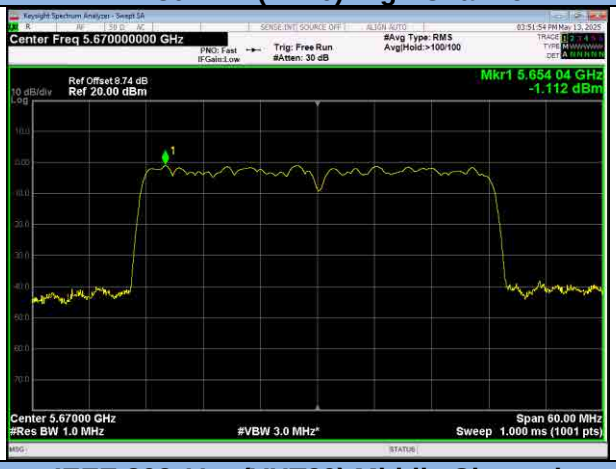
U-NII-2C Band

IEEE 802.11n(HT40) Low Channel



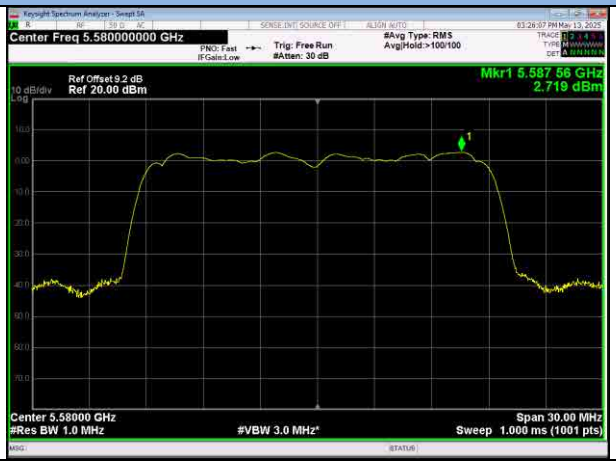
IEEE 802.11n(HT40) Mid Channel

IEEE 802.11n(HT40) High Channel



IEEE 802.11ac(VHT20) Low Channel

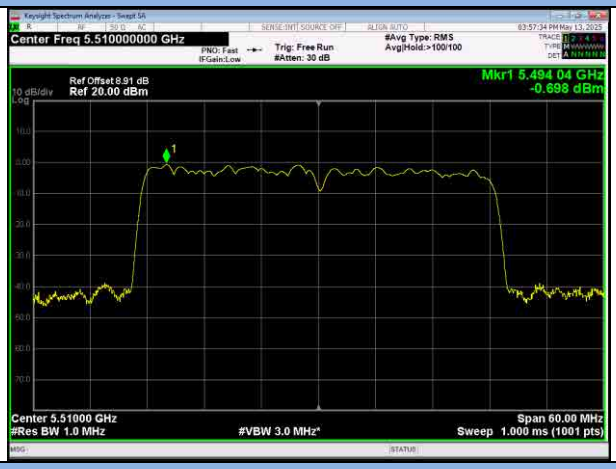
IEEE 802.11ac(VHT20) Middle Channel



IEEE 802.11ac(VHT20) High Channel

U-NII-2C Band

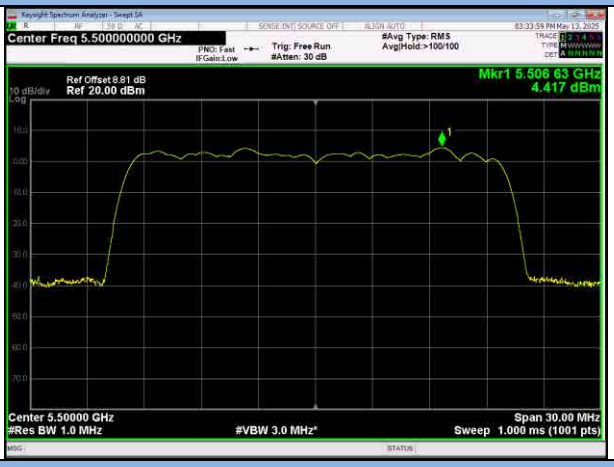
IEEE 802.11ac(VHT40) Low Channel



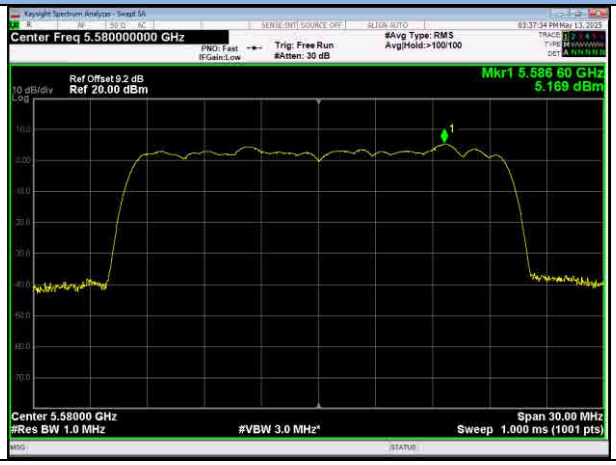
IEEE 802.11ac(VHT40) Mid Channel

IEEE 802.11ac(VHT40) High Channel

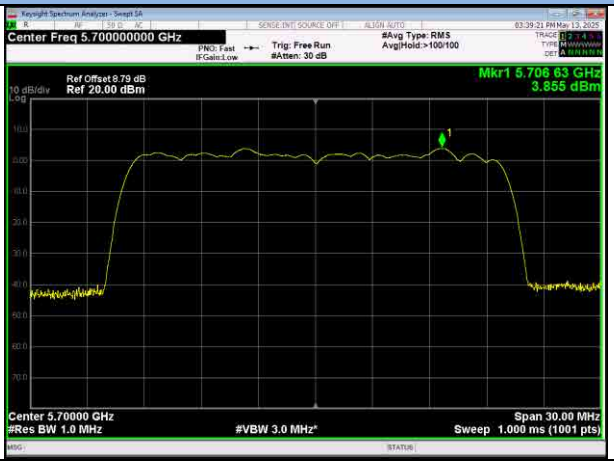
IEEE 802.11ax(HE20) Low Channel

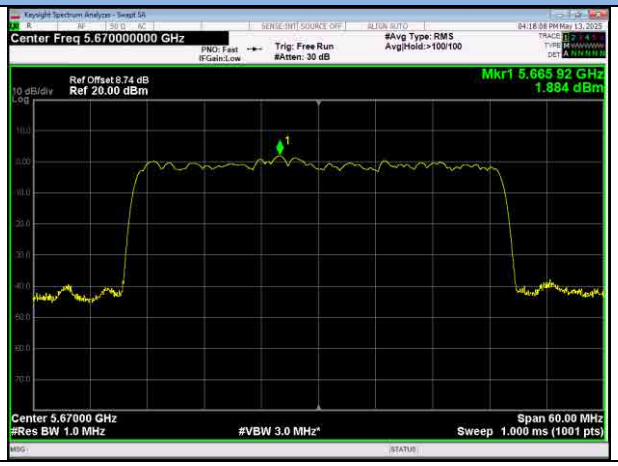


IEEE 802.11ax(HE20) Middle Channel

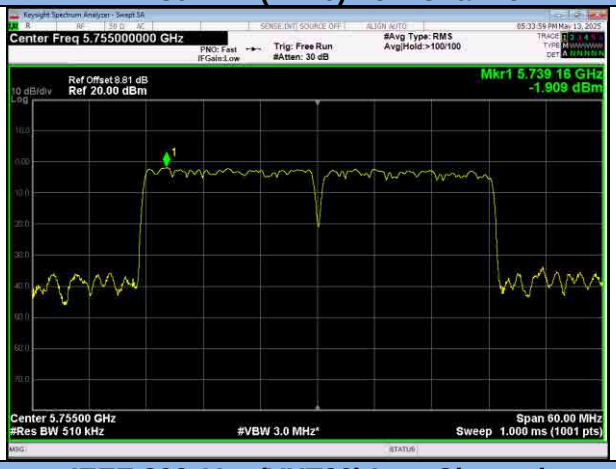
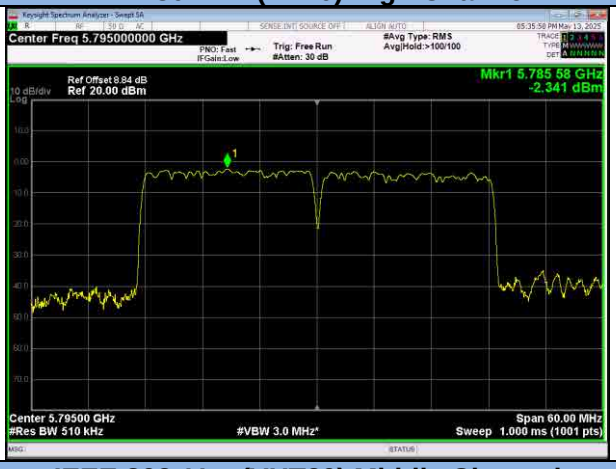
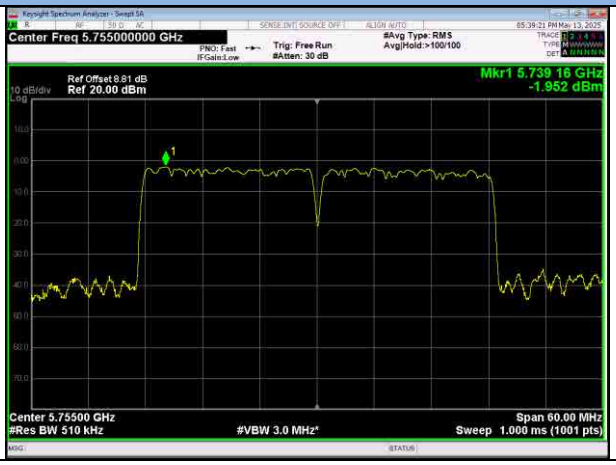


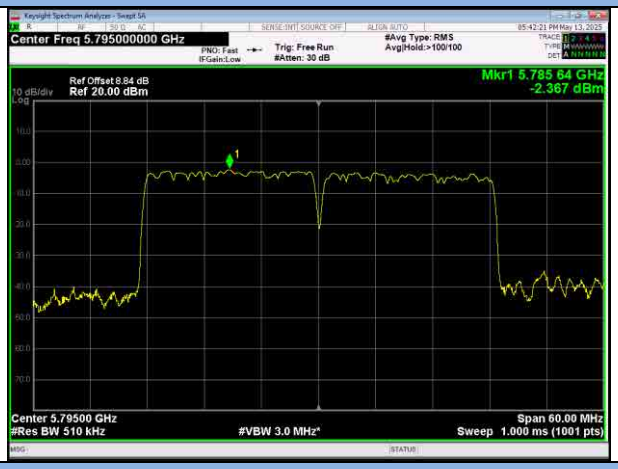
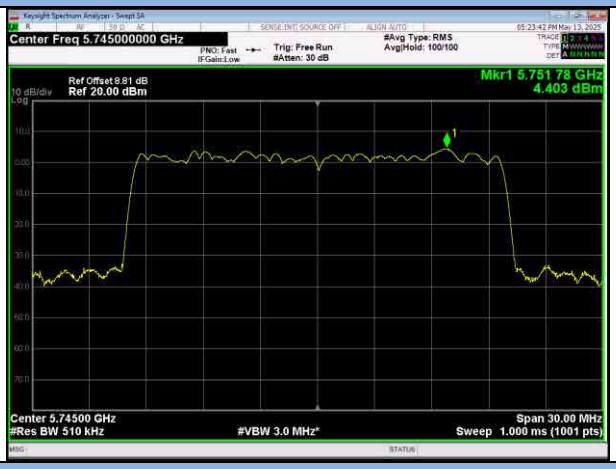
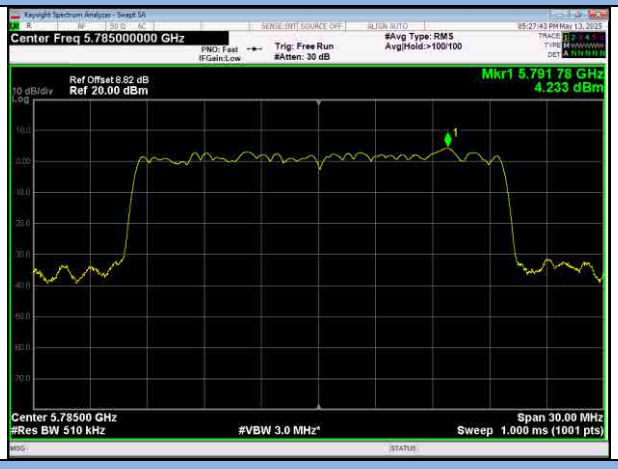
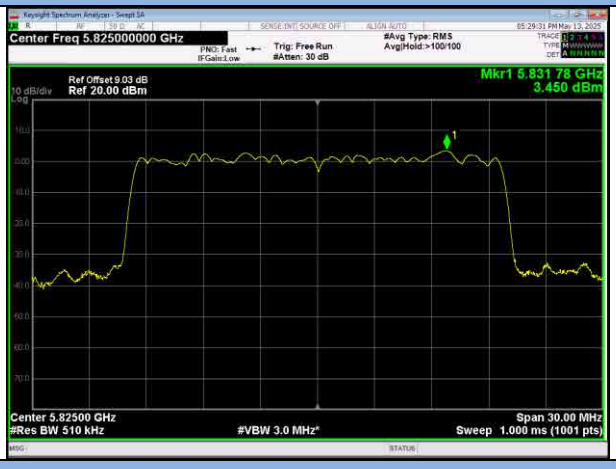
IEEE 802.11ax(HE20) High Channel



IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) Mid Channel
	
IEEE 802.11ax(HE40) High Channel	**---**
	---

U-NII-3 Band	
IEEE 802.11a Low Channel	IEEE 802.11a Middle Channel
	
IEEE 802.11a High Channel	IEEE 802.11n(HT20) Low Channel
	
IEEE 802.11n(HT20) Middle Channel	IEEE 802.11n(HT20) High Channel
	

U-NII-3 Band	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) Middle Channel
	
IEEE 802.11ac(VHT20) High Channel	IEEE 802.11ac(VHT40) Low Channel
	

U-NII-3 Band	
IEEE 802.11ac(VHT40) High Channel	IEEE 802.11ax(HE20) Low Channel
	
IEEE 802.11ax(HE20) Middle Channel	IEEE 802.11ax(HE20) High Channel
	
IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) High Channel
	

14.6 Band Edge

LIMITS

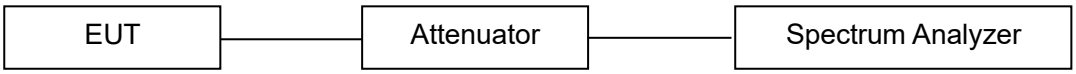
For transmitters operating in the 5.15-5.25 GHz band:
All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band:
All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band:
All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

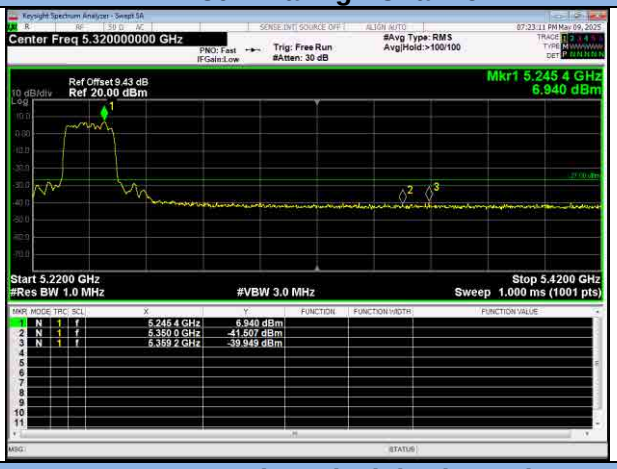
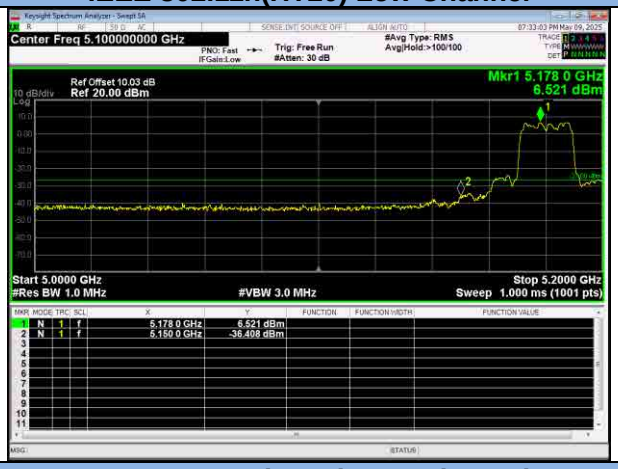
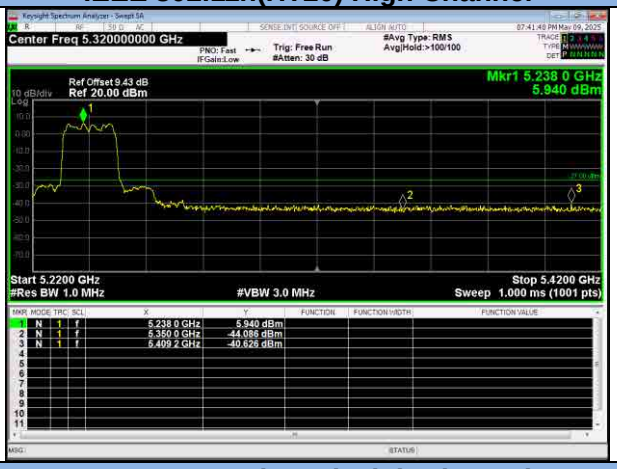
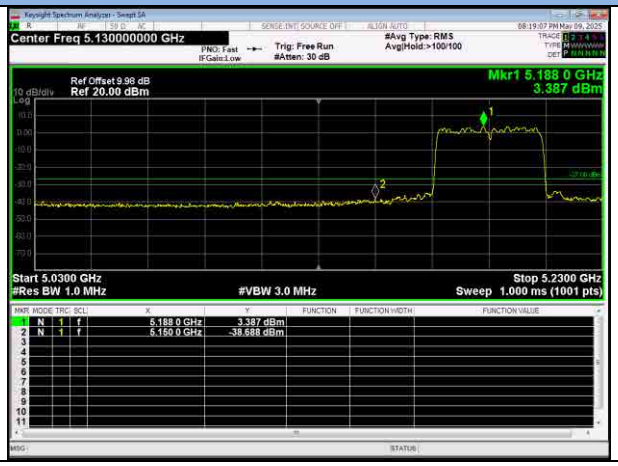
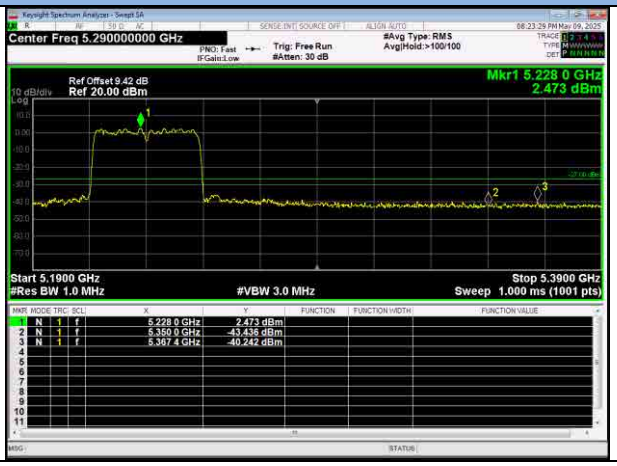
a.Check the calibration of the measuring instrument using either an internal calibration or a known signal from an external generator.
b. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
c. Set RBW to 1MHz and VBW to 3MHz of spectrum analyzer.
d. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
e. Repeat above procedures until all measured frequencies were complete.

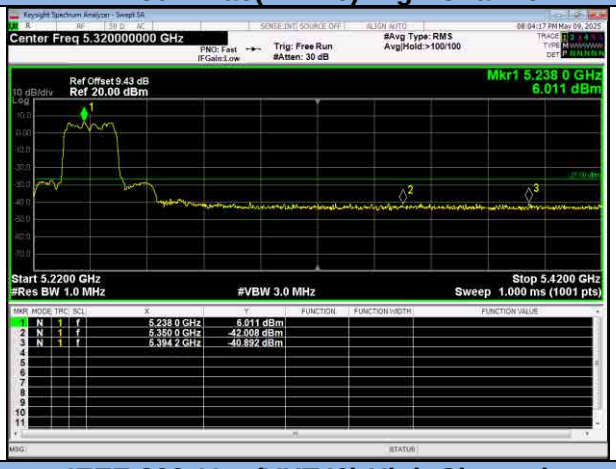
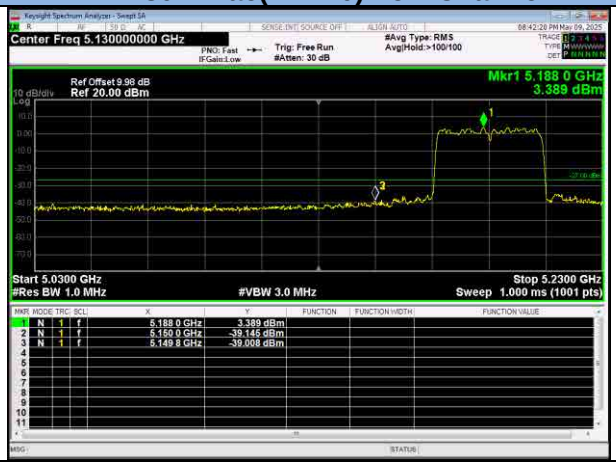
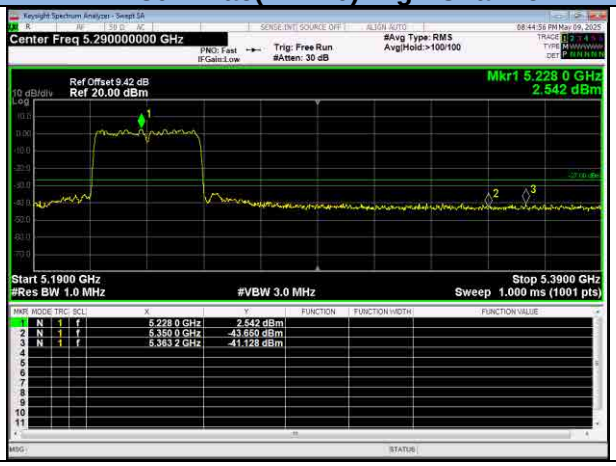
TEST RESULTS

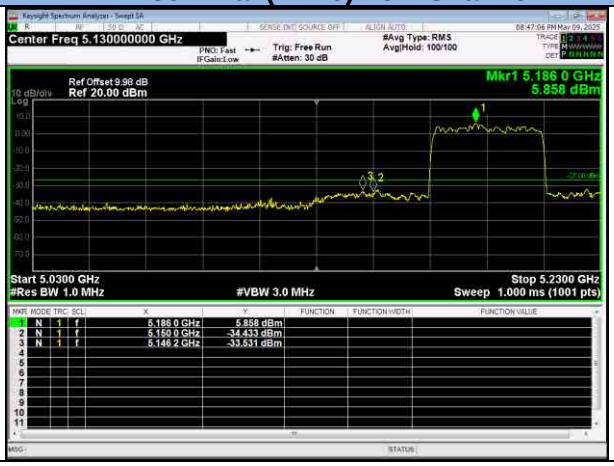
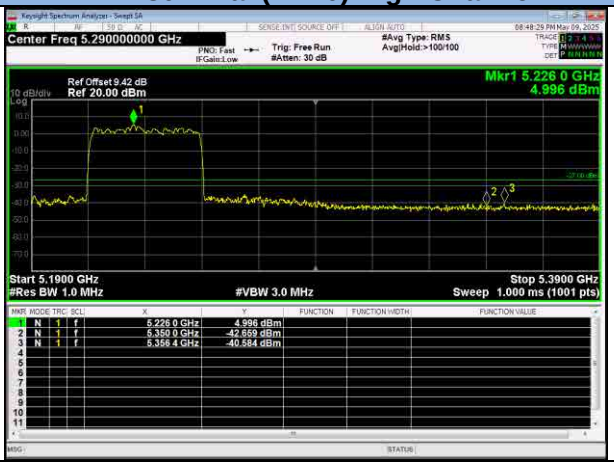
PASS

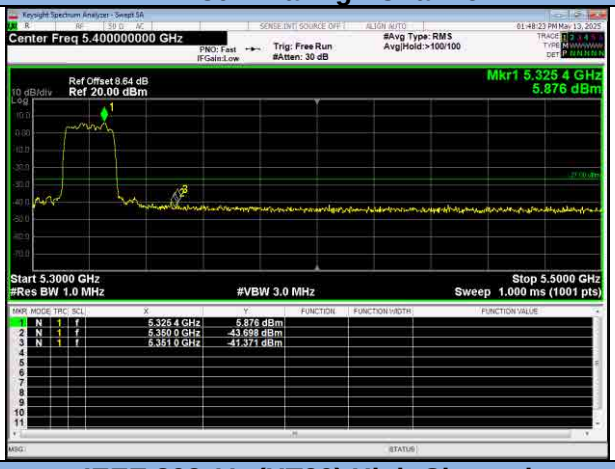
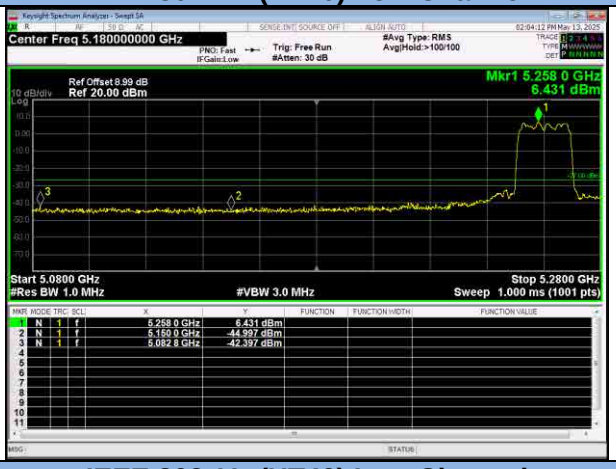
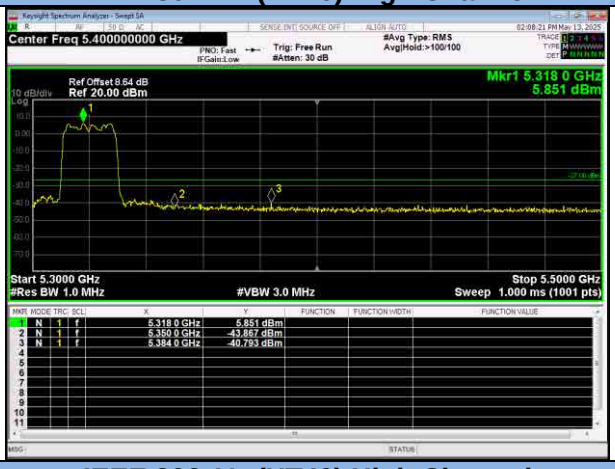
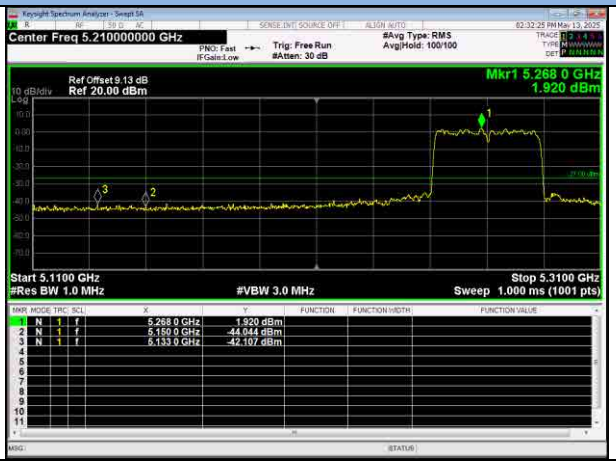
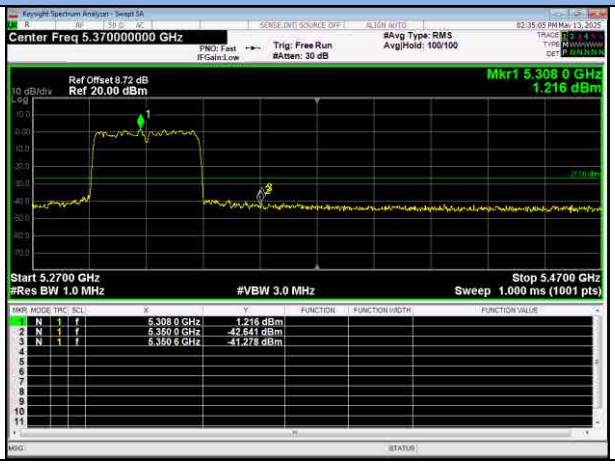
Please refer to following pages.

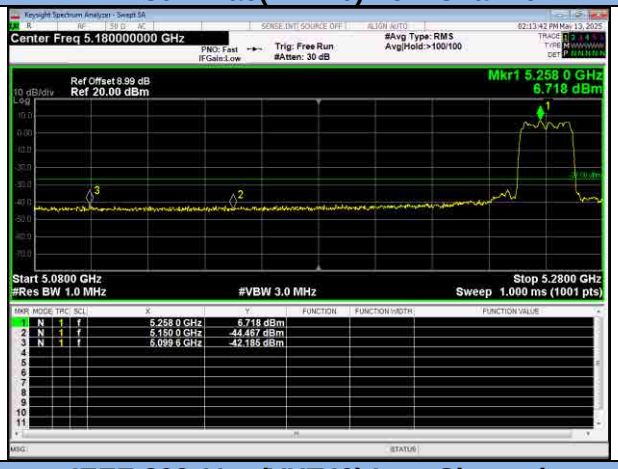
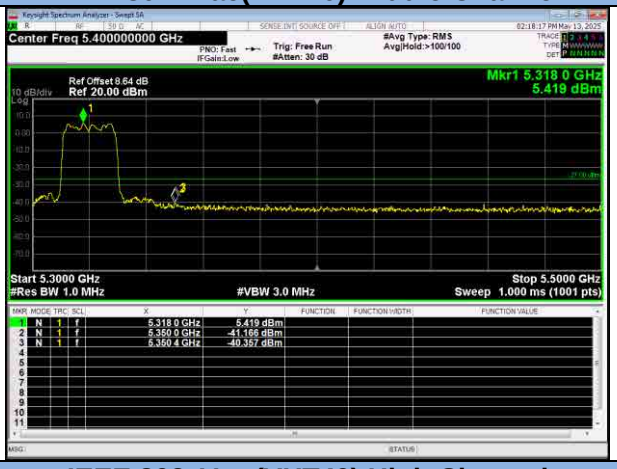
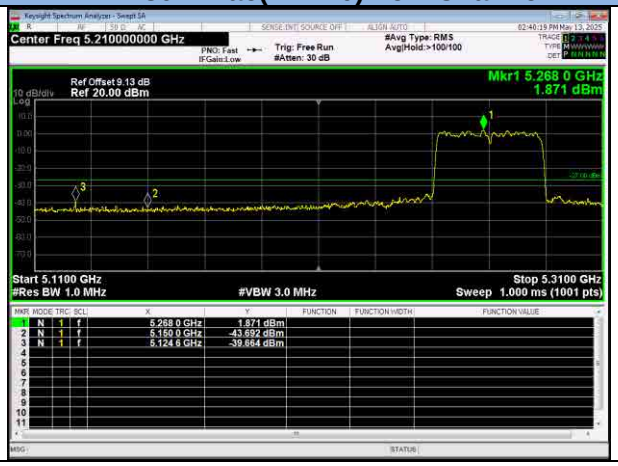
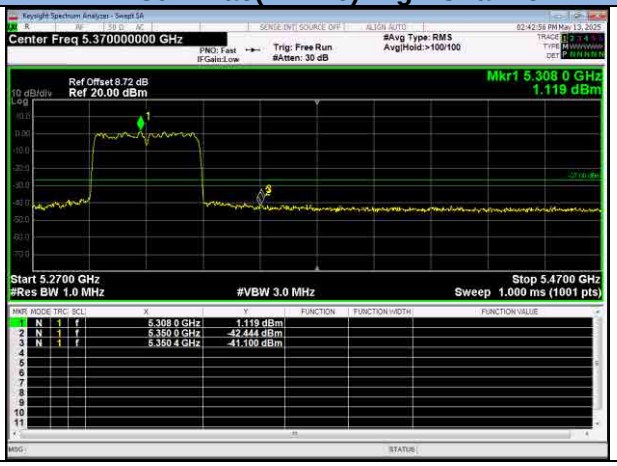
Note: Antenna gain was considered during the test.

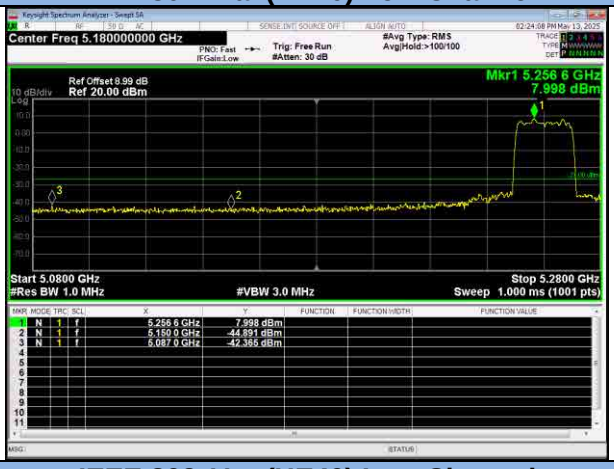
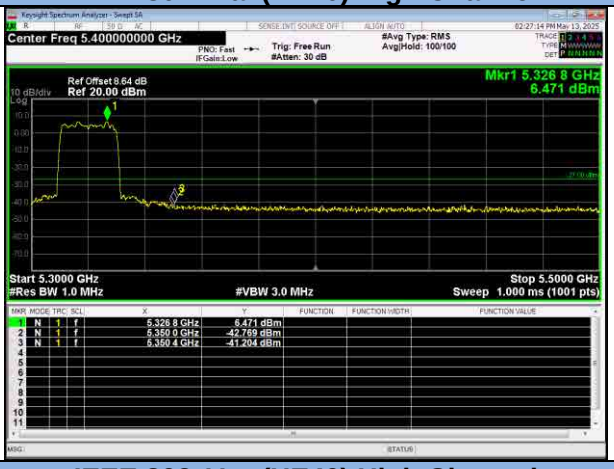
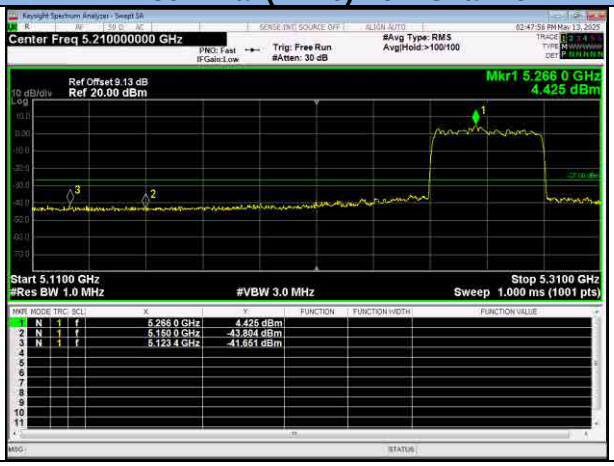
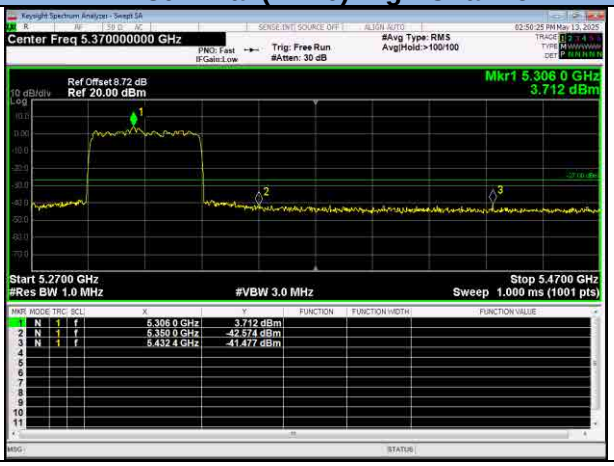
U-NII-1 Band	
IEEE 802.11a Low Channel	IEEE 802.11a High Channel
	
IEEE 802.11n(HT20) Low Channel	IEEE 802.11n(HT20) High Channel
	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	

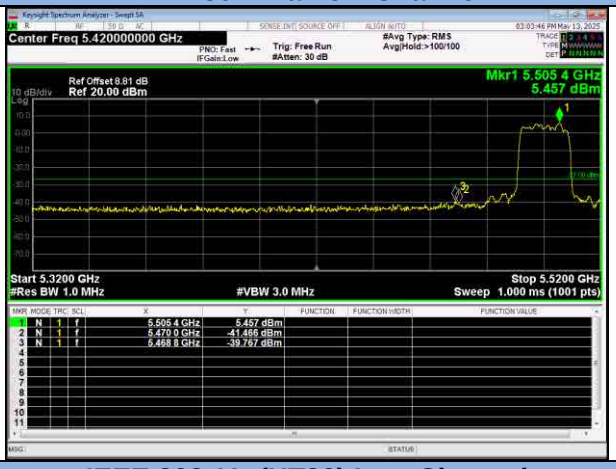
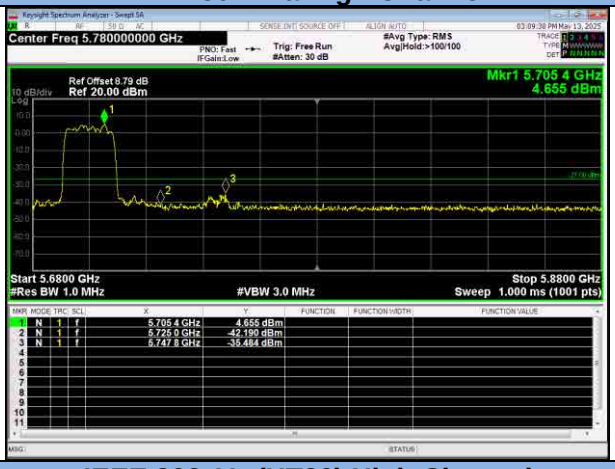
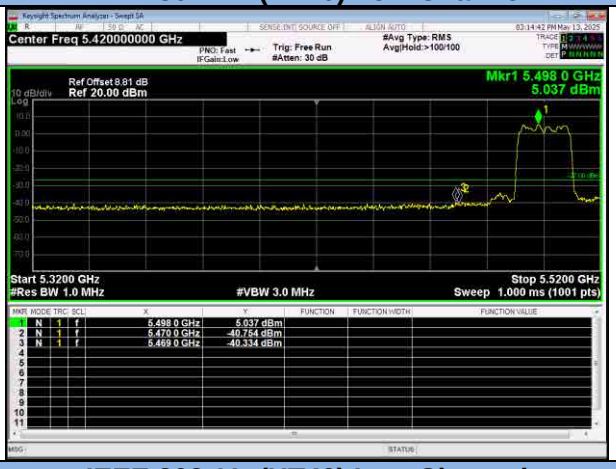
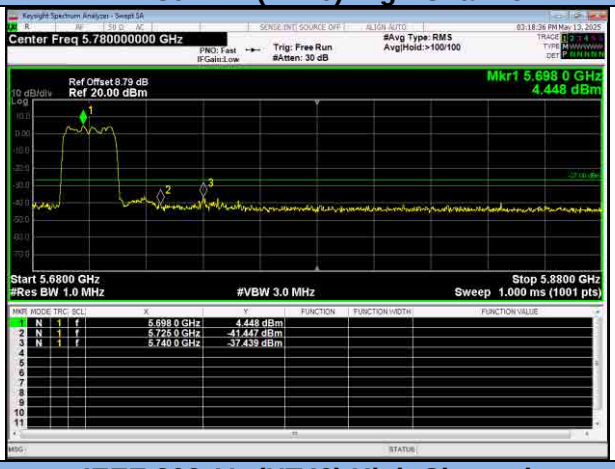
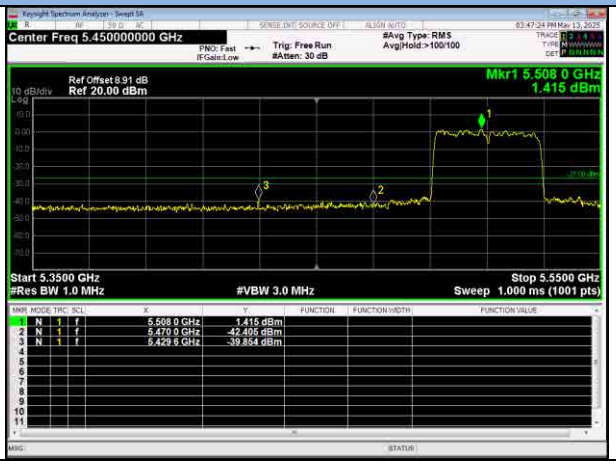
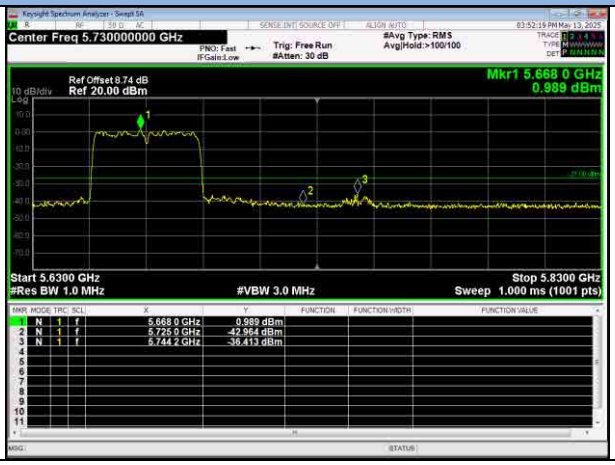
U-NII-1 Band	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) High Channel
	
IEEE 802.11ac(VHT40) Low Channel	IEEE 802.11ac(VHT40) High Channel
	

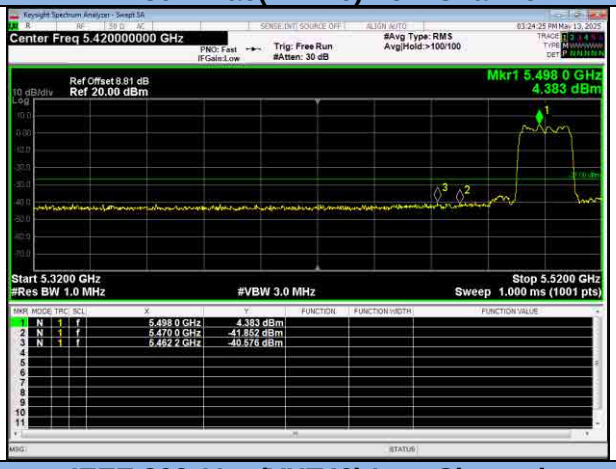
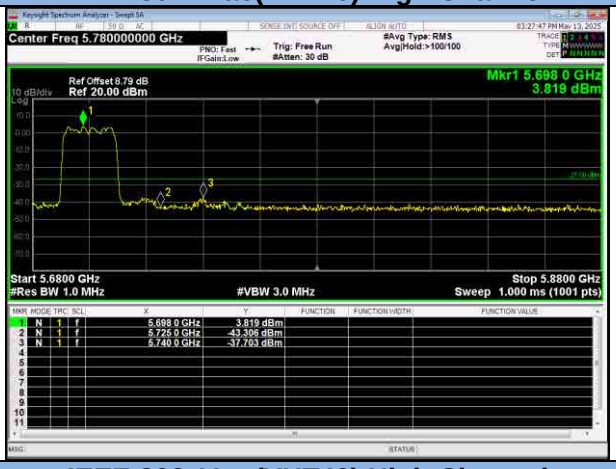
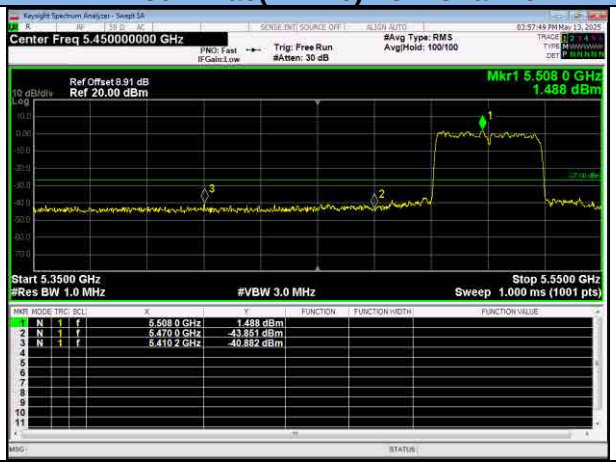
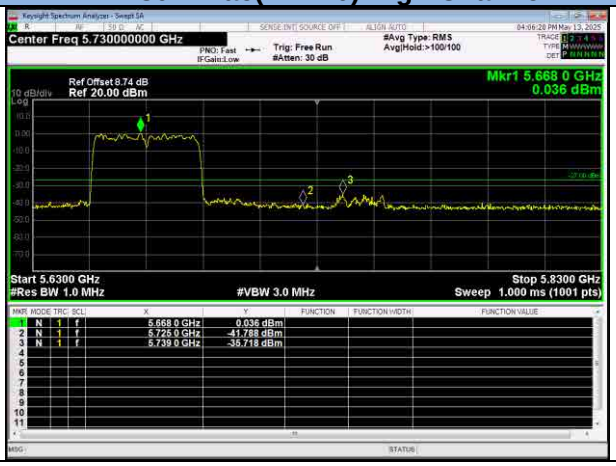
U-NII-1 Band	
IEEE 802.11ax(HE20) Low Channel	IEEE 802.11ax(HE20) High Channel
	
IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) High Channel
	

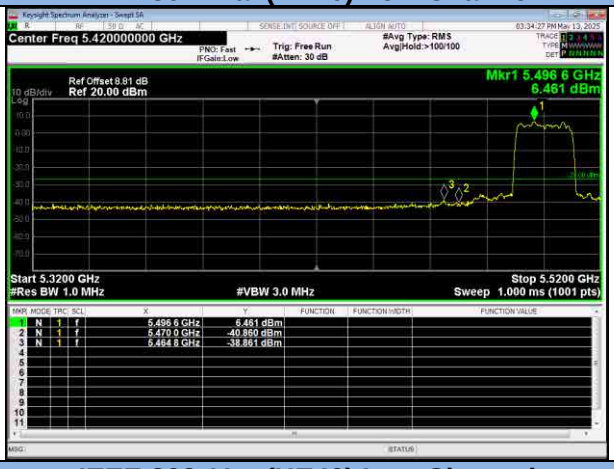
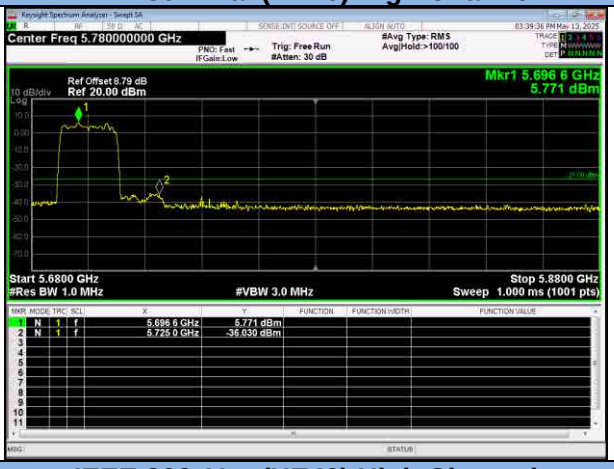
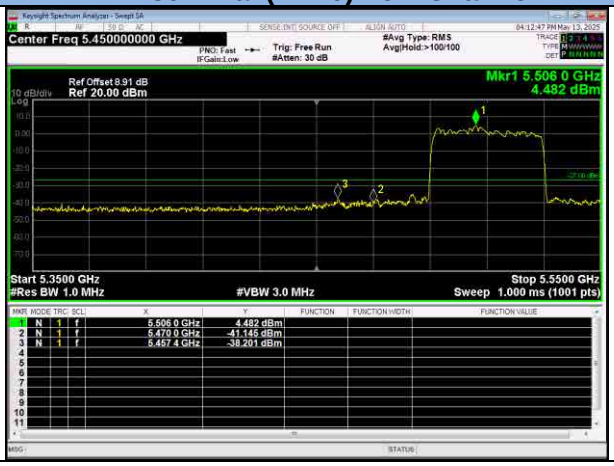
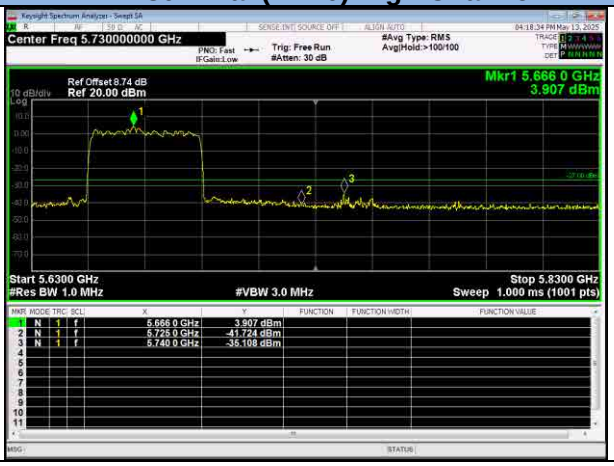
U-NII-2A Band	
IEEE 802.11a Low Channel	IEEE 802.11a High Channel
	
IEEE 802.11n(HT20) Low Channel	IEEE 802.11n(HT20) High Channel
	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	

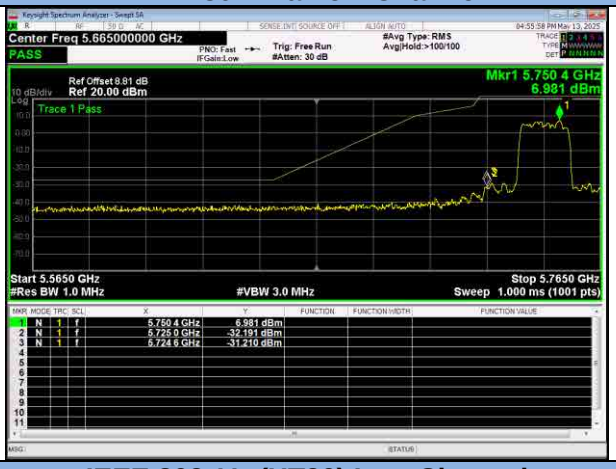
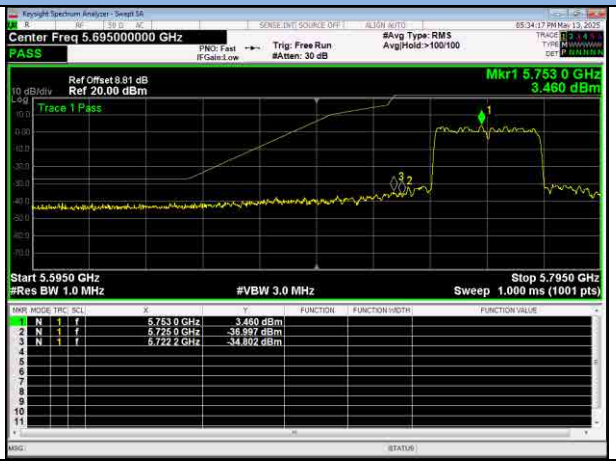
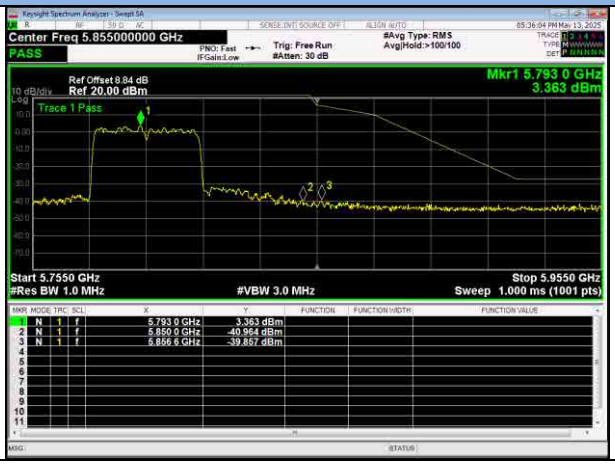
U-NII-2A Band	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) Middle Channel
	
IEEE 802.11ac(VHT40) Low Channel	IEEE 802.11ac(VHT40) High Channel
	

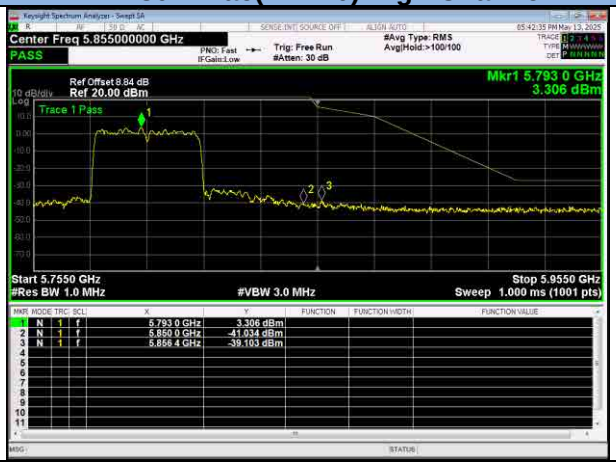
U-NII-2A Band	
IEEE 802.11ax(HE20) Low Channel	IEEE 802.11ax(HE20) High Channel
	
IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) High Channel
	

U-NII-2C Band	
IEEE 802.11a Low Channel	IEEE 802.11a High Channel
	
IEEE 802.11n(HT20) Low Channel	IEEE 802.11n(HT20) High Channel
	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	

U-NII-2C Band	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) High Channel
	
IEEE 802.11ac(VHT40) Low Channel	IEEE 802.11ac(VHT40) High Channel
	

U-NII-2C Band	
IEEE 802.11ax(HE20) Low Channel	IEEE 802.11ax(HE20) High Channel
	
IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) High Channel
	

U-NII-3 Band	
IEEE 802.11a Low Channel	IEEE 802.11a High Channel
	
IEEE 802.11n(HT20) Low Channel	IEEE 802.11n(HT20) High Channel
	
IEEE 802.11n(HT40) Low Channel	IEEE 802.11n(HT40) High Channel
	

U-NII-3 Band	
IEEE 802.11ac(VHT20) Low Channel	IEEE 802.11ac(VHT20) High Channel
	
IEEE 802.11ac(VHT40) Low Channel	IEEE 802.11ac(VHT40) High Channel
	

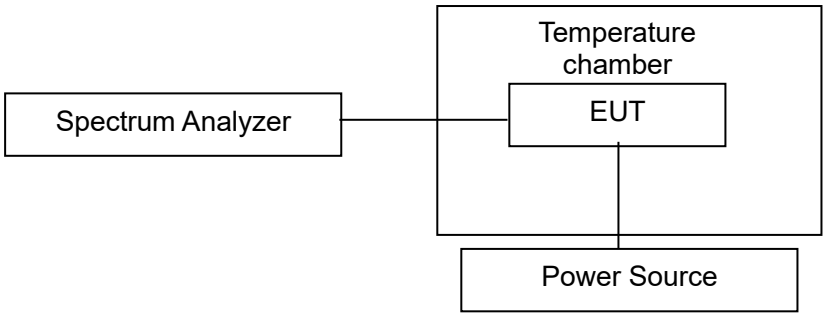
U-NII-3 Band	
IEEE 802.11ax(HE20) Low Channel	IEEE 802.11ax(HE20) High Channel
	
IEEE 802.11ax(HE40) Low Channel	IEEE 802.11ax(HE40) High Channel
	

14.7 Frequency Stability

LIMITS

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

BLOCK DIAGRAM OF TEST SETUP



TEST PROCEDURES

a. The EUT was placed inside the environmental test chamber and powered byPower source.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Note: The EUT set at un-modulation mode during frequency stability test.

TEST RESULTS

PASS

Please refer to the following pages.

U-NII-1 Band						
Lowest channel 5180MHz						
Temperature (℃)	Power Supplied (Vac)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5180.0630	5180.0148	5180.0194	5180.0176	Pass
-5		5180.0350	5180.0157	5180.0115	5180.0184	Pass
0		5180.0230	5180.0147	5180.0136	5180.0113	Pass
5		5180.0390	5180.0184	5180.0154	5180.0145	Pass
20		5180.0420	5180.0127	5180.0146	5180.0144	Pass
35		5180.0410	5180.0151	5180.0156	5180.0155	Pass
50		5180.0340	5180.0145	5180.0112	5180.0134	Pass
25	108	5180.0370	5180.0150	5180.0148	5180.0121	Pass
25	132	5180.0200	5180.0152	5180.0150	5180.0160	Pass
Highest channel 5240MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5240.0370	5240.0215	5240.0162	5240.0184	Pass
-5		5240.0420	5240.0127	5240.0119	5240.0172	Pass
0		5240.0320	5240.0114	5240.0137	5240.0195	Pass
5		5240.0350	5240.0176	5240.0166	5240.0117	Pass
20		5240.0410	5240.0124	5240.0142	5240.0144	Pass
35		5240.0230	5240.0145	5240.0194	5240.0132	Pass
50		5240.0390	5240.0122	5240.0122	5240.0153	Pass
25	108	5239.9560	5240.0195	5240.0174	5240.0174	Pass
25	132	5240.0030	5240.0134	5240.0184	5240.0125	Pass

Note: EUT temperature working range is -20 to 50.

U-NII-2A Band						
Lowest channel 5260MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5260.0280	5260.0130	5260.0146	5260.0151	Pass
-5		5260.0430	5260.0157	5260.0171	5260.0143	Pass
0		5260.0360	5260.0166	5260.0135	5260.0134	Pass
5		5260.0410	5260.0153	5260.0163	5260.0145	Pass
20		5260.0540	5260.0235	5260.0147	5260.0158	Pass
35		5260.0350	5260.0173	5260.0146	5260.0173	Pass
50		5260.0510	5260.0138	5260.0155	5260.0156	Pass
25	108	5260.0330	5260.0186	5260.0146	5260.0122	Pass
25	132	5260.0400	5260.0173	5260.0130	5260.0141	Pass
Highest channel 5320MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5320.0360	5320.0237	5320.0143	5320.0127	Pass
-5		5320.0360	5320.0148	5320.0249	5320.0117	Pass
0		5320.0360	5320.0146	5320.0184	5320.0148	Pass
5		5320.0270	5320.0133	5320.0145	5320.0183	Pass
20		5320.0290	5320.0124	5320.0165	5320.0167	Pass
35		5320.0560	5320.0120	5320.0141	5320.0155	Pass
50		5320.0250	5320.0224	5320.0162	5320.0182	Pass
25	108	5320.0400	5320.0192	5320.0127	5320.0135	Pass
25	132	5320.0280	5320.0226	5320.0126	5320.0257	Pass

Note: EUT temperature working range is -20 to 50.

U-NII-2C Band						
Lowest channel 5500MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5500.0370	5500.0162	5500.0174	5500.0130	Pass
-5		5500.0370	5500.0344	5500.0163	5500.0141	Pass
0		5500.0370	5500.0172	5500.0157	5500.0131	Pass
5		5500.0460	5500.0130	5500.0155	5500.0153	Pass
20		5500.0320	5500.0152	5500.0104	5500.0187	Pass
35		5500.0250	5500.0114	5500.0157	5500.0120	Pass
50		5500.0490	5500.0176	5500.0154	5500.0151	Pass
25	108	5500.0440	5500.0150	5500.0127	5500.0149	Pass
25	132	5500.0460	5500.0126	5500.0143	5500.0145	Pass
Highest channel 5700MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5700.0390	5700.0227	5700.0115	5700.0171	Pass
-5		5700.0380	5700.0121	5700.0194	5700.0162	Pass
0		5700.0470	5700.0147	5700.0162	5700.0177	Pass
5		5700.0190	5700.0137	5700.0148	5700.0115	Pass
20		5700.0270	5700.0186	5700.0127	5700.0254	Pass
35		5700.0240	5700.0124	5700.0249	5700.0312	Pass
50		5700.0330	5700.0235	5700.0145	5700.0174	Pass
25	108	5700.0100	5700.0130	5700.0141	5700.0155	Pass
25	132	5700.0080	5700.0131	5700.0140	5700.0123	Pass

Note: EUT temperature working range is -20 to 50.

U-NII-3 Band						
Lowest channel 5745MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5745.0380	5745.0246	5745.0150	5745.0225	Pass
-5		5745.0460	5745.0217	5745.0178	5745.0215	Pass
0		5745.0350	5745.0165	5745.0184	5745.0125	Pass
5		5745.0220	5745.0144	5745.0135	5745.0184	Pass
20		5745.040	5745.0150	5745.0146	5745.0142	Pass
35		5745.0410	5745.0117	5745.0124	5745.0217	Pass
50		5745.0480	5745.0153	5745.0182	5745.0153	Pass
25	108	5745.0460	5745.0150	5745.0140	5745.0137	Pass
25	132	5745.0290	5745.0173	5745.0234	5745.0125	Pass
Highest channel 5825MHz						
Temperature (℃)	Power Supplied (Vdc)	Measured Frequency (MHz)				Test Result
		0 Minute	2 Minute	5 Minute	10 Minute	
-20	120	5825.0470	5825.0142	5825.0225	5825.0123	Pass
-5		5825.0370	5825.0225	5825.0015	5825.0120	Pass
0		5825.0370	5825.0140	5825.0135	5825.0147	Pass
5		5824.9920	5825.0165	5825.0172	5825.0155	Pass
20		5825.0440	5825.0147	5825.0147	5825.0154	Pass
35		5825.040	5825.0186	5825.0183	5825.0144	Pass
50		5825.0310	5825.0150	5825.0121	5825.0195	Pass
25	108	5825.0050	5825.0151	5825.0144	5825.0126	Pass
25	132	5824.9930	5825.0125	5825.0118	5825.0165	Pass

Note: EUT temperature working range is -20 to 50.

14.8 Radiated Spurious Emissions and Restricted Bands Measurement and Band Edge

LIMITS

Frequency range MHz	Distance Meters	Field Strengths Limit (15.209)
		μV/m
0.009 ~ 0.490	300	2400/F(kHz)
0.490 ~ 1.705	30	24000/F(kHz)
1.705 ~ 30	30	30
30 ~ 88	3	100
88 ~ 216	3	150
216 ~ 960	3	200
Above 960	3	500

Remark: (1) Emission level (dB)μV = 20 log Emission level μV/m.

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

(4) The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

(5) §15.407 specifies that emissions which fall in the restricted bands, as defined in §15.205 comply with radiated emission limits specified in §15.209.

For transmitters operating in the 5.15-5.25 GHz band:
All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

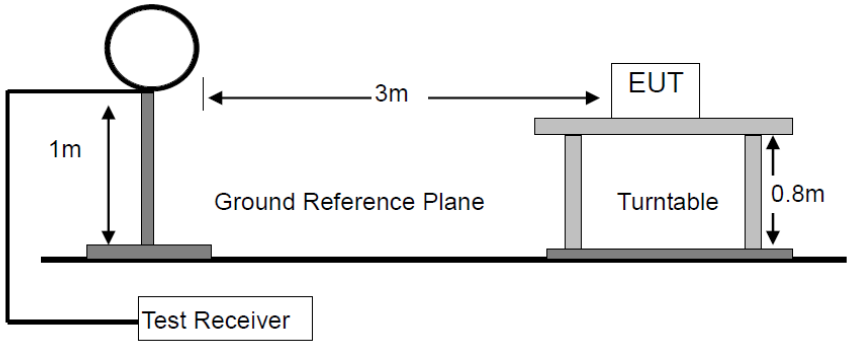
For transmitters operating in the 5.25-5.35 GHz band:
All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band:
All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

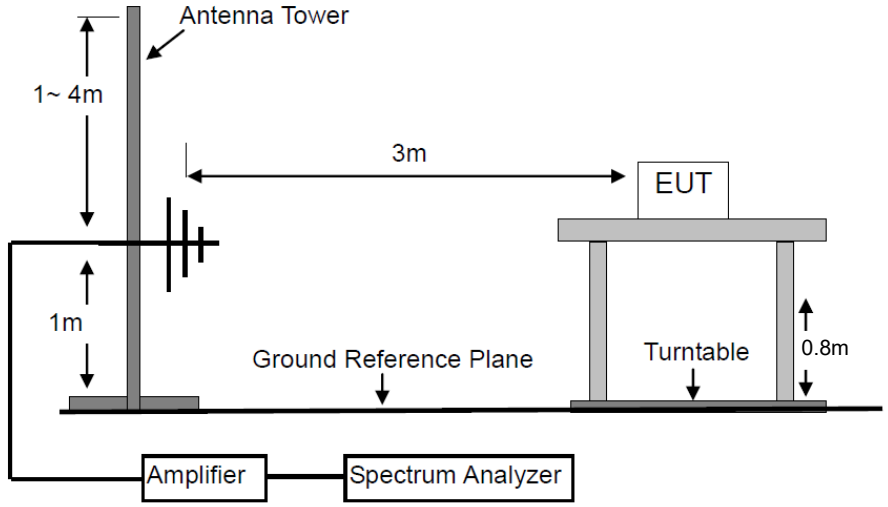
For transmitters operating in the 5.725-5.85 GHz band:
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

BLOCK DIAGRAM OF TEST SETUP

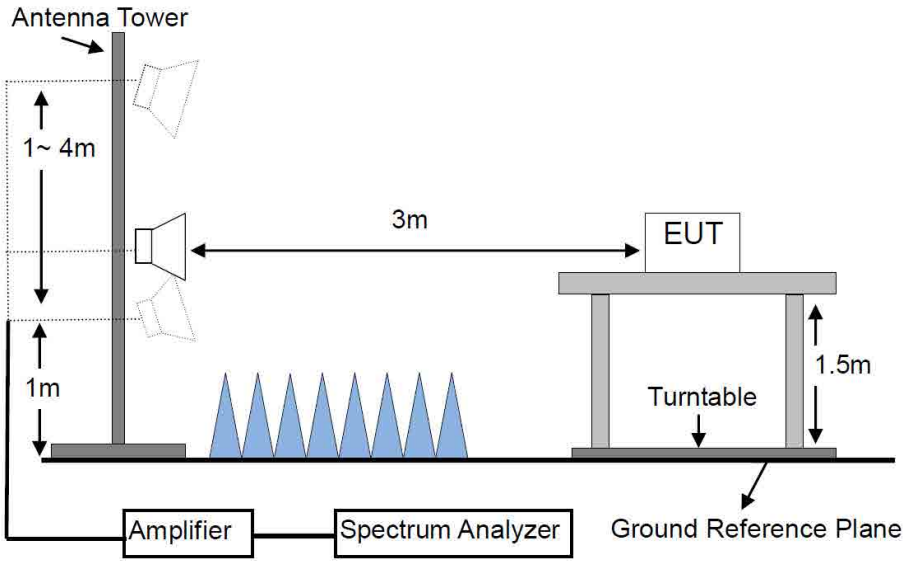
For Radiated Emission below 30MHz



For Radiated Emission 30-1000MHz



For Radiated Emission Above 1000MHz.



TEST PROCEDURES

a. Below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.

b. For the radiated emission test above 1GHz:

The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.

f. A Quasi-peak measurement was then made for that frequency point for below 1GHz test. PK and AV for above 1GHz emission test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency Band (MHz)	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	3 MHz
	Average	1 MHz	10 Hz

TEST RESULTS

PASS

Please refer to the following pages of the worst case.

M/N: SEC5000/CAM2/RP	Testing Voltage: AC 120V/60Hz
Polarization: Horizontal	Detector: QP
Test Mode: 2	Distance: 3m

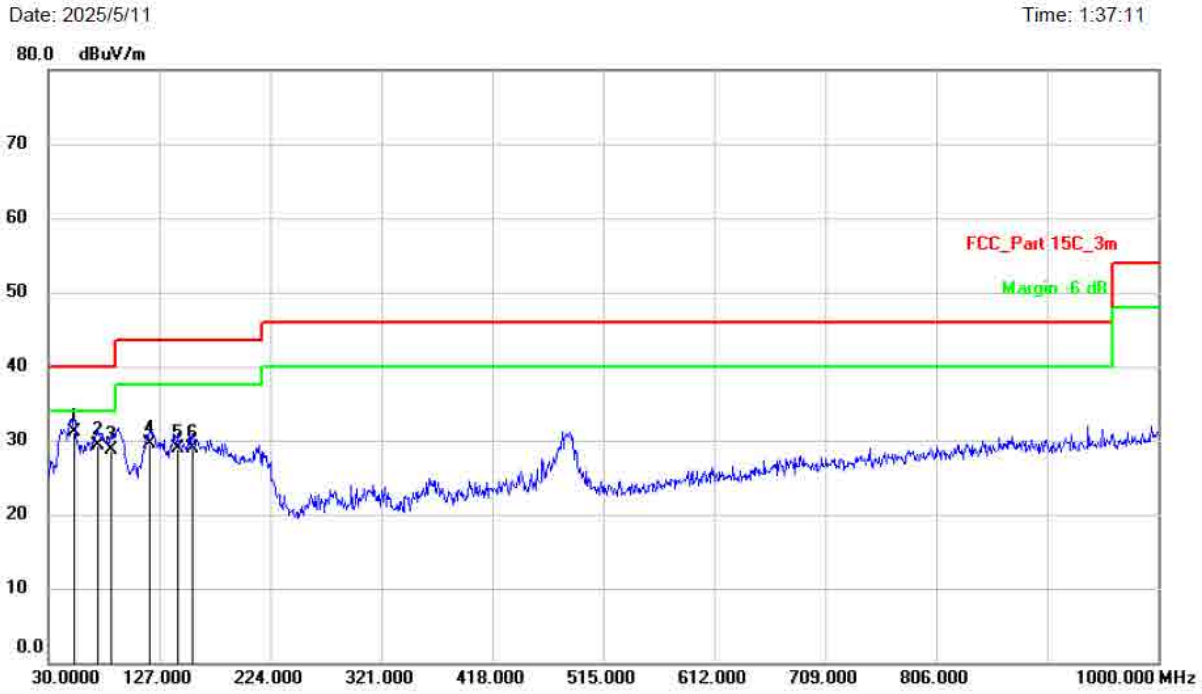
Radiated Emission Measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	161.9200	42.65	-10.35	32.30	43.50	-11.20	QP	
2		172.5900	41.13	-9.83	31.30	43.50	-12.20	QP	
3		183.2600	38.82	-8.92	29.90	43.50	-13.60	QP	
4		206.5399	33.24	-7.64	25.60	43.50	-17.90	QP	
5		482.9900	30.61	-2.01	28.60	46.00	-17.40	QP	
6		948.5900	24.33	6.27	30.60	46.00	-15.40	QP	

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

M/N: SEC5000/CAM2/RP	Testing Voltage: AC 120V/60Hz
Polarization: Vertical	Detector: QP
Test Mode: 2	Distance: 3m

Radiated Emission Measurement



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	52.3100	38.40	-7.30	31.10	40.00	-8.90	QP	
2		72.6800	40.48	-11.08	29.40	40.00	-10.60	QP	
3		84.3200	39.77	-10.97	28.80	40.00	-11.20	QP	
4		118.2700	40.60	-11.00	29.60	43.50	-13.90	QP	
5		143.4900	40.50	-11.60	28.90	43.50	-14.60	QP	
6		156.1000	40.23	-11.33	28.90	43.50	-14.60	QP	

Note: Below 30MHz, the emissions are lower than 20dB below the allowable limit.

Modulation: U-NII-1 (5180-5240 MHz) TX (IEEE 802.11a the worst case)		Test Result: PASS					Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
5150	V	51.01	43.81	6.91	57.92	50.72	68.20	54.00	-10.28	-3.28
10360	V	37.06	---	14.04	51.10	---	68.20	---	-17.10	---
15540	V	37.88	28.40	21.12	59.00	49.52	74.00	54.00	-15.00	-4.48

5150	H	50.81	43.48	6.91	57.72	50.39	68.20	54.00	-10.48	-3.61
10360	H	22.76	---	14.04	36.80	---	68.20	---	-31.40	---
15540	H	37.17	27.91	21.12	58.29	49.03	74.00	54.00	-15.71	-4.97

Operation Mode: TX Mode (Mid)										
10400	V	37.31	---	14.12	51.43	---	68.20	---	-16.77	---
15600	V	39.54	28.58	20.82	60.36	49.40	74.00	54.00	-13.64	-4.60

10400	H	36.72	---	14.12	50.84	---	68.20	---	-17.36	---
15600	H	38.95	28.14	20.82	59.77	48.96	74.00	54.00	-14.23	-5.04

Operation Mode: TX Mode (High)										
10480	V	37.55	---	14.29	51.84	---	68.20	---	-16.36	---
15720	V	39.54	28.71	20.20	59.74	48.91	74.00	54.00	-14.26	-5.09

10480	H	36.73	---	14.29	51.02	---	68.20	---	-17.18	---
15720	H	38.06	28.32	20.20	58.26	48.52	74.00	54.00	-15.74	-5.48

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-1 (5180-5240 MHz) TX (IEEE 802.11a the worst case)				Test Result: PASS			Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
20720	V	38.83	30.53	18.97	57.80	49.50	74.00	54.00	-16.20	-4.50
25900	V	37.32	---	23.18	60.50	---	68.20	---	-7.70	---

20720	H	35.93	24.13	18.97	54.90	43.10	74.00	54.00	-19.10	-10.90
25900	H	34.32	---	23.18	57.50	---	68.20	---	-10.70	---

Operation Mode: TX Mode (Mid)										
20800	V	40.58	28.88	18.92	59.50	47.80	74.00	54.00	-14.50	-6.20
26000	V	37.22	---	23.28	60.50	---	68.20	---	-7.70	---

20800	H	36.88	26.88	18.92	55.80	45.80	74.00	54.00	-18.20	-8.20
26000	H	33.62	---	23.28	56.90	---	68.20	---	-11.30	---

Operation Mode: TX Mode (High)										
20960	V	38.59	24.69	18.81	57.40	43.50	74.00	54.00	-16.60	-10.50
26200	V	33.07	---	23.43	56.50	---	68.20	---	-11.70	---

20960	H	40.99	24.59	18.81	59.80	43.40	74.00	54.00	-14.20	-10.60
26200	H	39.27	---	23.43	62.70	---	68.20	---	-5.50	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-2A (5260-5320 MHz) TX (IEEE 802.11a the worst case)				Test Result: PASS			Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
10520	V	38.87	---	14.39	53.26	---	68.20	---	-14.94	---
15780	V	37.33	27.31	19.75	57.08	47.06	74.00	54.00	-16.92	-6.94

10520	H	38.56	---	14.39	52.95	---	68.20	---	-15.25	---
15780	H	36.37	26.87	19.75	56.12	46.62	74.00	54.00	-17.88	-7.38

Operation Mode: TX Mode (High)										
5350	V	45.65	36.66	6.81	52.46	43.47	68.20	54.00	-15.74	-10.53
10640	V	39.84	28.25	14.51	54.35	42.76	74.00	54.00	-19.65	-11.24
15960	V	38.06	26.88	19.15	57.21	46.03	74.00	54.00	-16.79	-7.97

5350	H	42.60	34.81	6.81	49.41	41.62	68.20	54.00	-18.79	-12.38
10640	H	39.09	27.60	14.51	53.60	42.11	74.00	54.00	-20.40	-11.89
15960	H	37.89	26.82	19.15	57.04	45.97	74.00	54.00	-16.96	-8.03

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-2A (5260-5320 MHz) TX (IEEE 802.11ac 40 the worst case)				Test Result: PASS			Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
21080	V	40.85	30.93	18.67	59.52	49.60	74.00	54.00	-14.48	-4.40
26350	V	37.42	---	23.55	60.97	---	68.20	---	-7.23	---

21080	H	40.08	29.85	18.67	58.75	48.52	74.00	54.00	-15.25	-5.48
26350	H	36.70	---	23.55	60.25	---	68.20	---	-7.95	---

Operation Mode: TX Mode (High)										
21240	V	37.43	28.43	18.44	55.87	46.87	74.00	54.00	-18.13	-7.13
26550	V	33.28	---	23.62	56.90	---	68.20	---	-11.30	---

21240	H	40.51	27.94	18.44	58.95	46.38	74.00	54.00	-15.05	-7.62
26550	H	35.30	---	23.62	58.92	---	68.20	---	-9.28	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-2C (5500-5700 MHz) TX (IEEE 802.11a the worst case)		Test Result: PASS					Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
5470	V	47.43	38.39	6.81	54.24	45.20	68.20	68.20	-13.96	-23.00
11000	V	38.06	25.13	15.11	53.17	40.24	74.00	54.00	-20.83	-13.76
16500	V	37.84	---	19.75	57.59	---	68.20	---	-10.61	---

5470	H	48.81	38.03	6.81	55.62	44.84	68.20	68.20	-12.58	-23.36
11000	H	37.85	24.23	15.11	52.96	39.34	74.00	54.00	-21.04	-14.66
16500	H	36.79	---	19.75	56.54	---	68.20	---	-11.66	---

Operation Mode: TX Mode (Mid)										
11100	V	38.38	25.60	15.40	53.78	41.00	74.00	54.00	-20.22	-13.00
16800	V	32.09	---	20.18	52.27	---	68.20	---	-15.93	---

11100	H	37.61	24.37	15.40	53.01	39.77	74.00	54.00	-20.99	-14.23
16800	H	36.63	---	20.18	56.81	---	68.20	---	-11.39	---

Operation Mode: TX Mode (High)										
11400	V	36.68	25.01	16.29	52.97	41.30	74.00	54.00	-21.03	-12.70
17100	V	35.01	---	21.48	56.49	---	68.20	---	-11.71	---

11400	H	36.25	24.67	16.29	52.54	40.96	74.00	54.00	-21.46	-13.04
17100	H	34.48	---	21.48	55.96	---	68.20	---	-12.24	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.

2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-2C (5500-5700 MHz) TX (IEEE 802.11n40 the worst case)		Test Result: PASS					Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
22040	V	39.90	30.64	18.48	58.38	49.12	74.00	54.00	-15.62	-4.88
27550	V	34.92	---	23.93	58.85	---	68.20	---	-9.35	---

22040	H	38.90	28.07	18.48	57.38	46.55	74.00	54.00	-16.62	-7.45
27550	H	34.33	---	23.93	58.26	---	68.20	---	-9.94	---

Operation Mode: TX Mode (Mid)										
22200	V	39.33	29.46	18.67	58.00	48.13	74.00	54.00	-16.00	-5.87
27750	V	34.74	---	24.11	58.85	---	68.20	---	-9.35	---

22200	H	39.32	29.21	18.67	57.99	47.88	74.00	54.00	-16.01	-6.12
27750	H	34.11	---	24.11	58.22	---	68.20	---	-9.98	---

Operation Mode: TX Mode (High)										
22680	V	38.50	28.67	19.26	57.76	47.93	74.00	54.00	-16.24	-6.07
28350	V	34.34	---	24.66	59.00	---	68.20	---	-9.20	---

22680	H	36.60	28.02	19.26	55.86	47.28	74.00	54.00	-18.14	-6.72
28350	H	32.88	---	24.66	57.54	---	68.20	---	-10.66	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-3 (5745-5825 MHz) TX (IEEE 802.11a the worst case)				Test Result: PASS			Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
11490	V	35.28	23.47	16.86	52.14	40.33	74.00	54.00	-21.86	-13.67
17235	V	34.98	---	22.23	57.21	---	68.20	---	-10.99	---

11490	H	36.05	23.74	16.86	52.91	40.60	74.00	54.00	-21.09	-13.40
17235	H	35.63	---	22.23	57.86	---	68.20	---	-10.34	---

Operation Mode: TX Mode (Mid)										
11570	V	36.46	24.74	17.01	53.47	41.75	74.00	54.00	-20.53	-12.25
17355	V	36.85	---	22.56	59.41	---	68.20	---	-8.79	---

11570	H	35.76	23.70	17.01	52.77	40.71	74.00	54.00	-21.23	-13.29
17355	H	35.86	---	22.56	58.42	---	68.20	---	-9.78	---

Operation Mode: TX Mode (High)										
11650	V	35.56	24.18	17.16	52.72	41.34	74.00	54.00	-21.28	-12.66
17475	V	34.71	---	23.01	57.72	---	68.20	---	-10.48	---

11650	H	35.15	23.90	17.16	52.31	41.06	74.00	54.00	-21.69	-12.94
17475	H	33.89	---	23.01	56.90	---	68.20	---	-11.30	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-3 (5745-5825 MHz) TX (IEEE 802.11a the worst case)		Test Result: PASS					Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Restricted Bands Measurement and Band Edge										
5725	V	57.21	--	6.90	64.11	--	122.20	74.00	-58.09	--
5725	H	57.33	--	6.90	64.23	--	122.20	74.00	-57.97	--

5850	V	45.50	--	6.98	52.48	--	122.20	74.00	-69.72	--
5850	H	44.67	--	6.98	51.65	--	122.20	74.00	-70.55	--

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

Modulation: U-NII-3 (5745-5825 MHz) TX (IEEE 802.11ac20 the worst case)				Test Result: PASS			Test frequency range: 1-40GHz			
Freq. (MHz)	Ant. Pol. (H/V)	Reading Level(dBuV)		Factor (dB/m)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
Operation Mode: TX Mode (Low)										
22980	V	39.23	31.13	19.67	58.90	50.80	74.00	54.00	-15.10	-3.20
28725	V	34.48	---	25.22	59.70	---	68.20	---	-8.50	---

22980	H	39.73	29.83	19.67	59.40	49.50	74.00	54.00	-14.60	-4.50
28725	H	33.28	---	25.22	58.50	---	68.20	---	-9.70	---

Operation Mode: TX Mode (Mid)										
23140	V	39.99	---	19.81	59.80	---	68.20	---	-8.40	---
28925	V	34.60	---	25.60	60.20	---	68.20	---	-8.00	---

23140	H	34.39	---	19.81	54.20	---	68.20	---	-14.00	---
28925	H	30.20	---	25.60	55.80	---	68.20	---	-12.40	---

Operation Mode: TX Mode (High)										
23330	V	39.87	---	19.93	59.80	---	68.20	---	-8.40	---
29125	V	31.06	---	26.14	57.20	---	68.20	---	-11.00	---

23330	H	34.37	---	19.93	54.30	---	68.20	---	-13.90	---
29125	H	29.56	---	26.14	55.70	---	68.20	---	-12.50	---

Remark: 1. All the points within the restricted band are lower than the edge punctuation of the restricted band shown in the data.
2. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits.

14.9 Dynamic Frequency Selection

List of Measurement and Examinations

EUT Operational mode:

DFS Operational mode	Operating Frequency Range	
	U-NII-2A	U-NII-2C
Slave without radar Interference detection function	√	√

Devices with radar detection

Maximum Transmit Power	Value (See Note 1 and 2)
≥200 mw	-64 dBm
EIRP < 200 mw and power spectral density < 10 dBm/MHz	-62 dBm
E IRP < 200 mw that do not meet the power spectral density requirement	-64 dBm

Note:
1. This is the level at the input of the receiver assuming a 0 dBi receive antena.
2. Throughout these test procedures an adtioial 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.
3: EIRP is based on the highest antenna gain. For MIMO dviese reter to KDB Publication 662911 D01.

Applicability of DFS requirements prior to use of a channel

Requirement Radar	Operational Mode		
	Master	Client without Radar Detecion	Client with Radar Detection
Non-Occupancy Period	√	Not required	Yes
DFS Detection Threshold	√	Not required	Yes
Channel Availability Check Time	√	Not required	Not Required
U-NII Detection Bandwidth	√	Not required	Yes

Note: Regarding KDB 905462 D03 Client Without DFS New Rules section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non- occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel.

Applicability of DFS requirements during normal operation

Requirement Radar	Operational Mode		
	Master	Client without Radar Detecion	Client with Radar Detection
DFS Detection Threshold	√	Not required	Yes
Channel Closing Transmission Time	√	Yes	Yes
Channel Move Time	√	Yes	Yes
U-NII Detection Bandwidth	√	Not required	Yes
Note: Regarding KDB 905462 D03 Client Without DFS New Rules section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non- occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel.			
Additional requirements for devices with multiple bandwidth modes	Master or Client with radar detection	Client without radar detection	
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be ested	Not required	
Channel Move Time and Channel Closing Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest Test using the widest BW mode available for the link	
All other	Any single BW mode	Not required	
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.			

DFS Radar Signal Parameter Values:

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60ms over remaining 10 second period (See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth (See Note 3.)
Note: 1. Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. 2. The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. 3. During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

DFS Radar Signal Parameter:
Radar Type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time

Table 1: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A, Test B	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu sec}}\right)\right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a

Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A.

Remark1: A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

Remark2: If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

Remark3: The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

Table 2: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 3: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

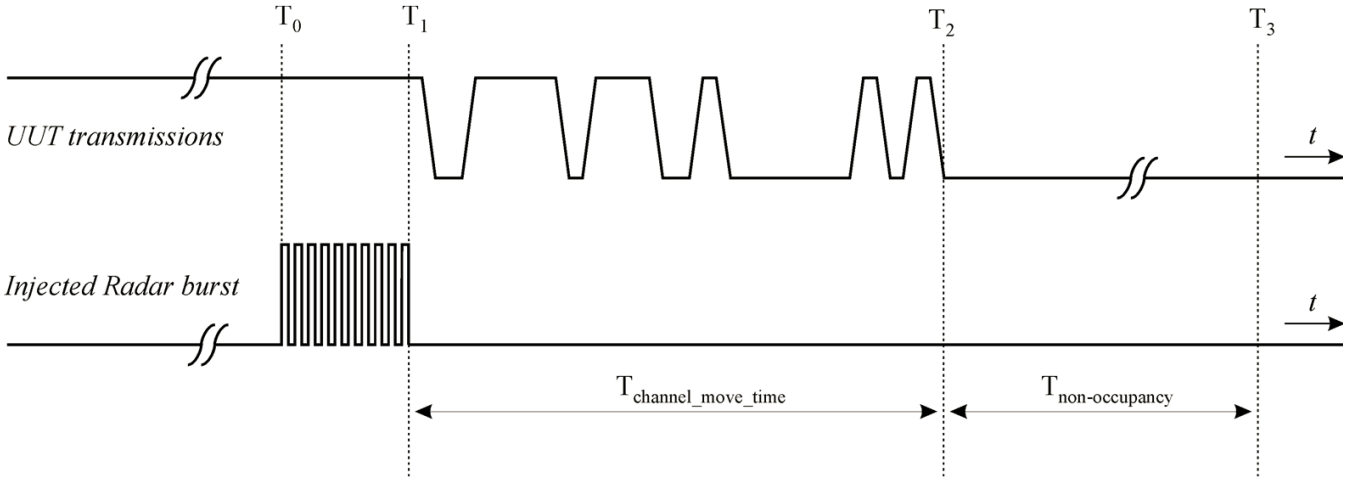
In-Service Monitoring: Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

Limit of In-Service Monitoring

Reference to DFS Radar Signal Parameter Values.

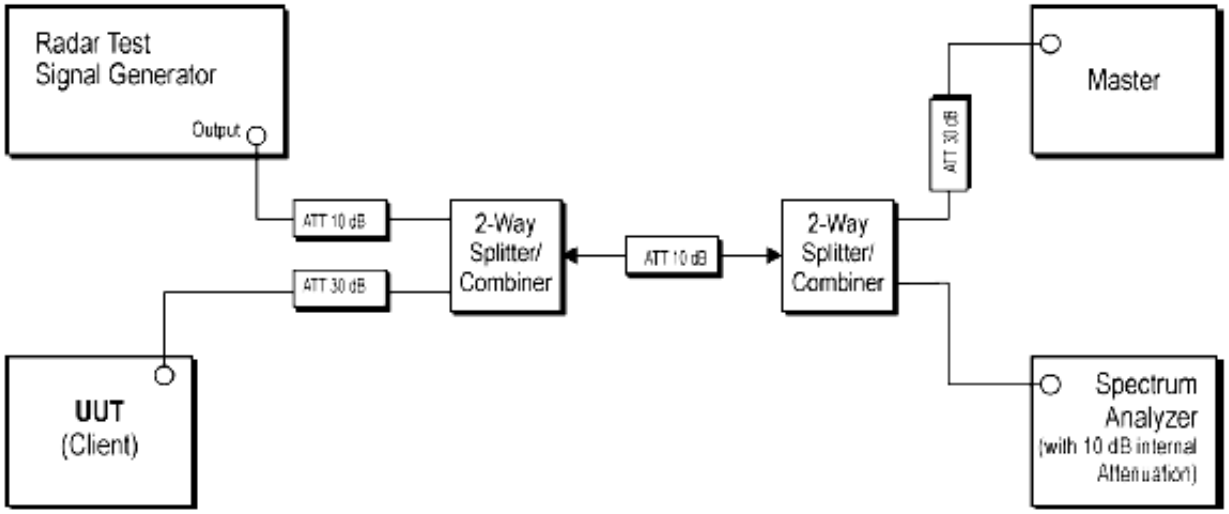
Test Procedures

1. One frequency will be chosen from the Operating Channels of the EUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.
2. In case the EUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will associate with the EUT (Master). For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
3. The TCP protocol unicast data stream was generated by the iperf software command line with at least 17% activity ratio over any 100ms period.
4. Timing plots are reported with calculations demonstrating a minimum channel loading of approximately 17% or greater. For example, channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the Time On/ (Time On + Off Time).
5. At time T0 the Radar Waveform generator sends a Burst of pulses for one of the Short Pulse Radar Types 1-4 at DFS Detection Threshold levels on the Operating Channel. An additional 1dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Measure and record the Channel Move Time and Channel Closing Transmission Time if radar detection occurs.
7. When operating as a Master Device, monitor the EUT for more than 30 minutes following instant T2 to verify that the EUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.



Channel Closing Transmission Time, Channel Move Time and Non-Occupancy Period

Test Set-Up



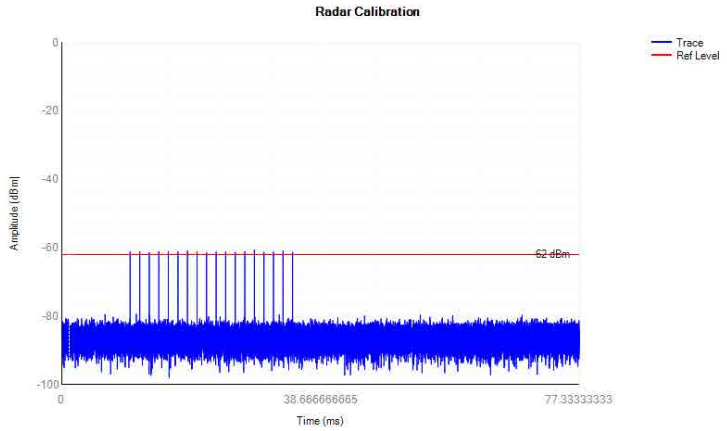
Setup for Client with injection at the Master

Measurement Results

Pass

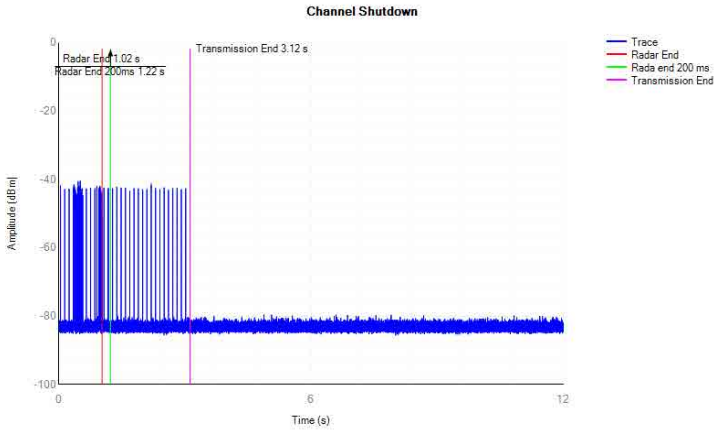
Please refer to following plots of the worst case.

Channel	Test Item	Test Result	Limit	Pass/Fail
5310MHz	Channel Move Time	3.12 s	＜10s	Pass
	Channel Closing Transmission Time	15 ms	＜200+60ms	Pass
	Non-Occupancy Period	No transmission	30 minutes	Pass
Radar Waveform Calibration Plot - 5310MHz				

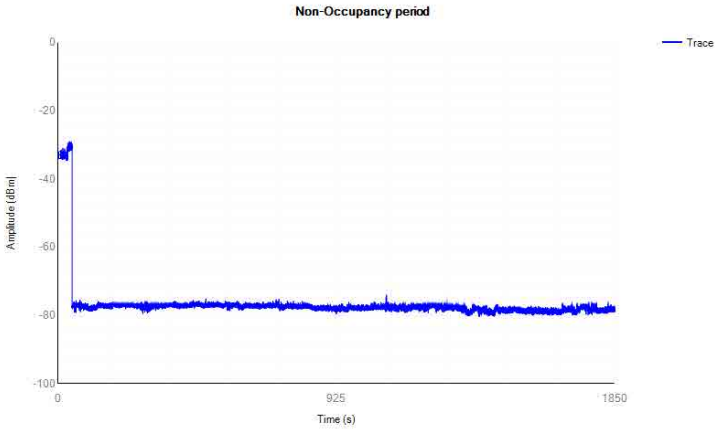


The Worst Case - 5310MHz

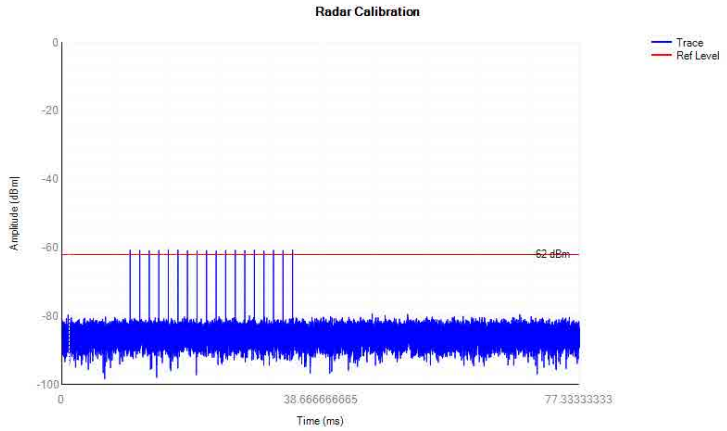
Channel Move Time & Channel Closing Transmission Time Plot



Non-Occupancy Period Plot

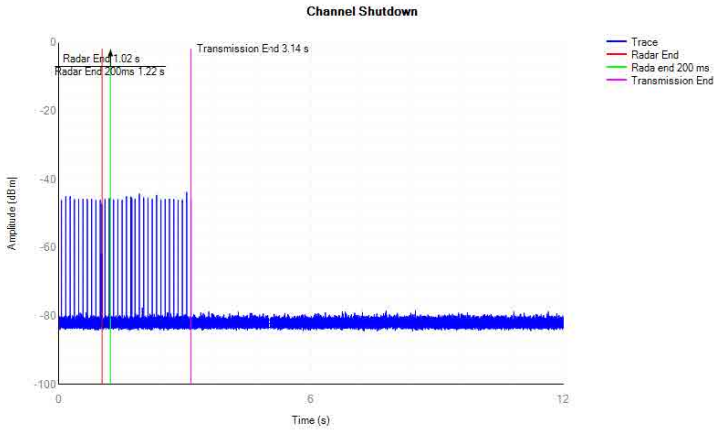


Channel	Test Item	Test Result	Limit	Pass/Fail
5510MHz	Channel Move Time	3.14 s	＜10s	Pass
	Channel Closing Transmission Time	15.6 ms	＜200+60ms	Pass
	Non-Occupancy Period	No transmission	30 minutes	Pass
Radar Waveform Calibration Plot - 5510MHz				

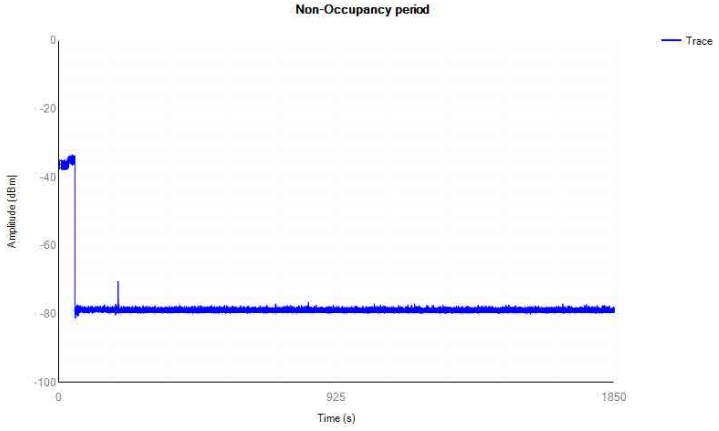


The Worst Case - 5510MHz

Channel Move Time & Channel Closing Transmission Time Plot



Non-Occupancy Period Plot



14.10 Antenna Requirement

STANDARD APPLICABLE

According to of FCC part 15C section 15.203:

furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section 15.203 of the rules.

And according to 47 CFR section 15.407(a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

ANTENNA CONNECTED CONSTRUCTION

The antenna is FPC antenna that no antenna other than furnished by the responsible party shall be used with the device, and the best case gain of the antenna is 6.03dBi, Therefore, the antenna is considered to meet the requirement.

15. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 12, 2025	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Mar. 23, 2024	2 Year
3.	Spectrum Analyzer	Keysight	N9020A	MY54200831	Mar. 12, 2025	1 Year
4.	Spectrum Analyzer	Keysight	N9010B	MY62170254	Aug. 14, 2024	1 Year
5.	Power Sensor	Agilent	N1921A	MY48251036	Mar. 12, 2025	1 Year
6.	Power Meter	Agilent	N1912A	MY41497159	Mar. 12, 2025	1 Year
7.	Horn Antenna	COM-Power	AH-118	071078	Mar. 23, 2024	2 Year
8.	Pre-Amplifier	HP	HP 8449B	3008A00964	Mar. 12, 2025	1 Year
9.	Pre-Amplifier	HP	HP 8447D	1145A00203	Mar. 12, 2025	1 Year
10.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-272	Mar. 23, 2024	2 Year
11.	Horn Antenna	COM-Power	AH-840	10100020	Mar. 23, 2024	2 Year
12.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 12, 2025	1 Year
13.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 12, 2025	1 Year
14.	L.I.S.N	Rohde & Schwarz	ESH2-Z5	893606/014	Mar. 12, 2025	1 Year
15.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 12, 2025	1 Year
16.	Temperature & Humidity Chamber	Wanshun	SS-HWHS-80	N/A	Mar. 12, 2025	1 Year
17.	DC Source	Maynuo	MY8811	N/A	Mar. 12, 2025	1 Year
18.	Temporary antenna connector	TESCOM	SS402	N/A	N/A	N/A
19.	Chamber	SAEMC	9*7*7m	N/A	Apr. 21, 2025	2 Year
20.	Attenuator	Mini-circuits	BW-S10W2+	N/A	N/A	N/A
21.	Test Software	EZ	EZ_EMC, NTC-3A1.1	N/A	N/A	N/A
22.	Test Software	MWRF	MTS 8310, V2.0.0.0	N/A	N/A	N/A

Note: For photographs of EUT and measurement, please refer to appendix in separate documents.

---End---