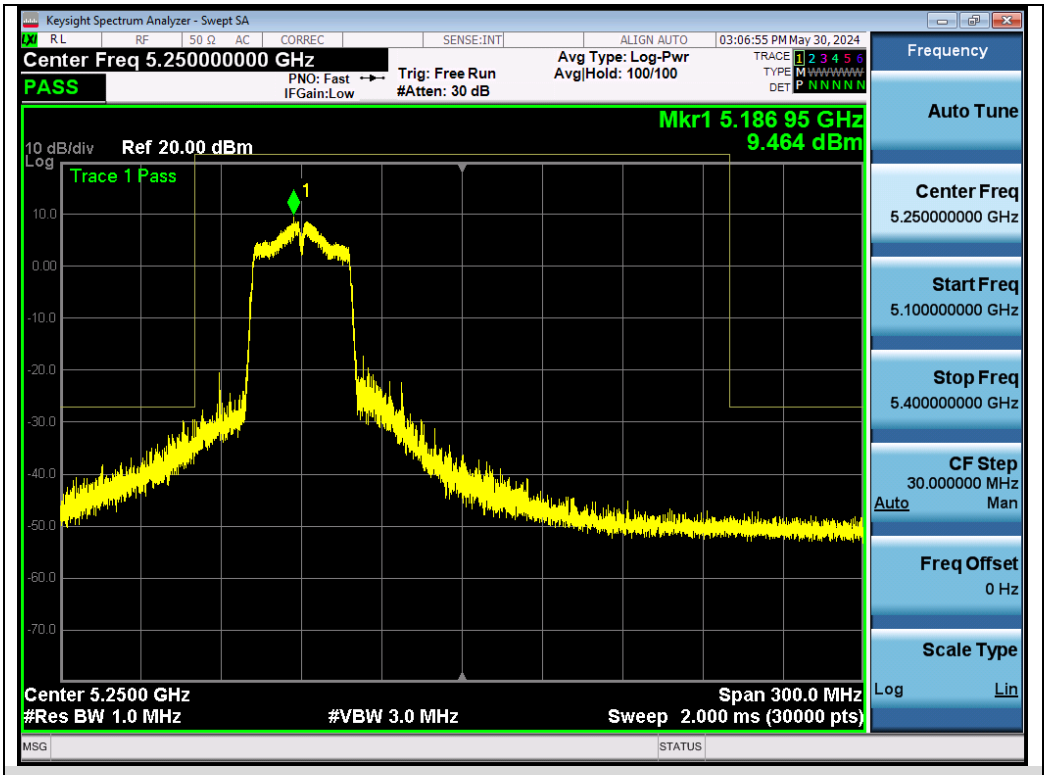
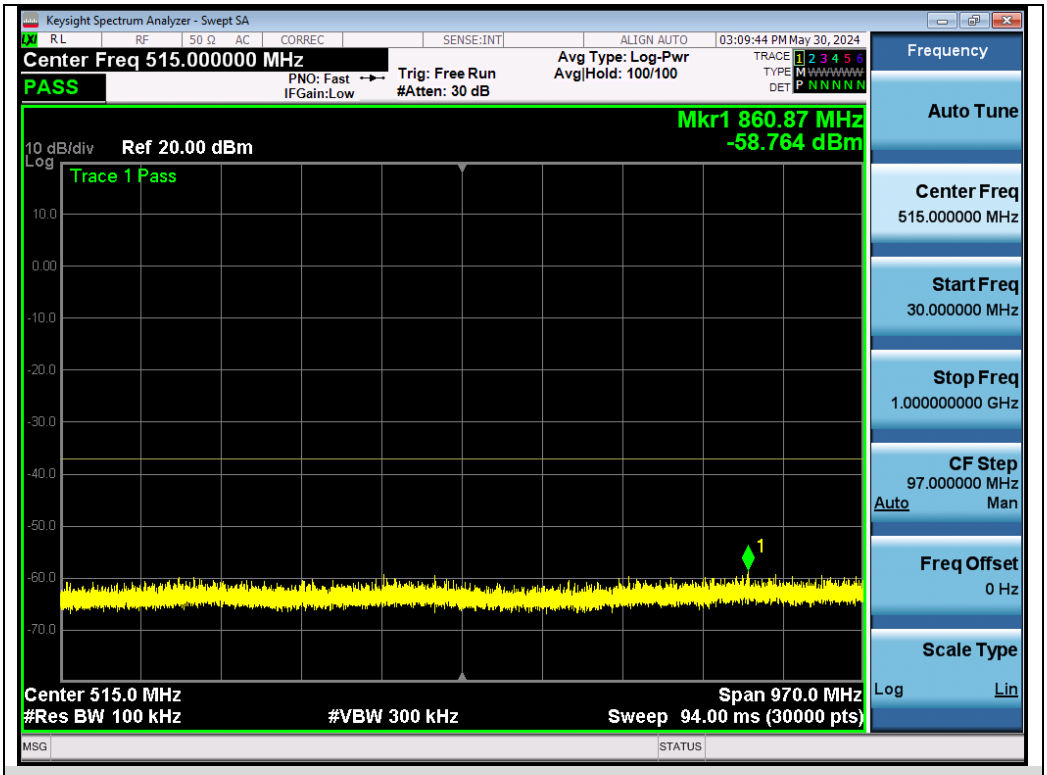
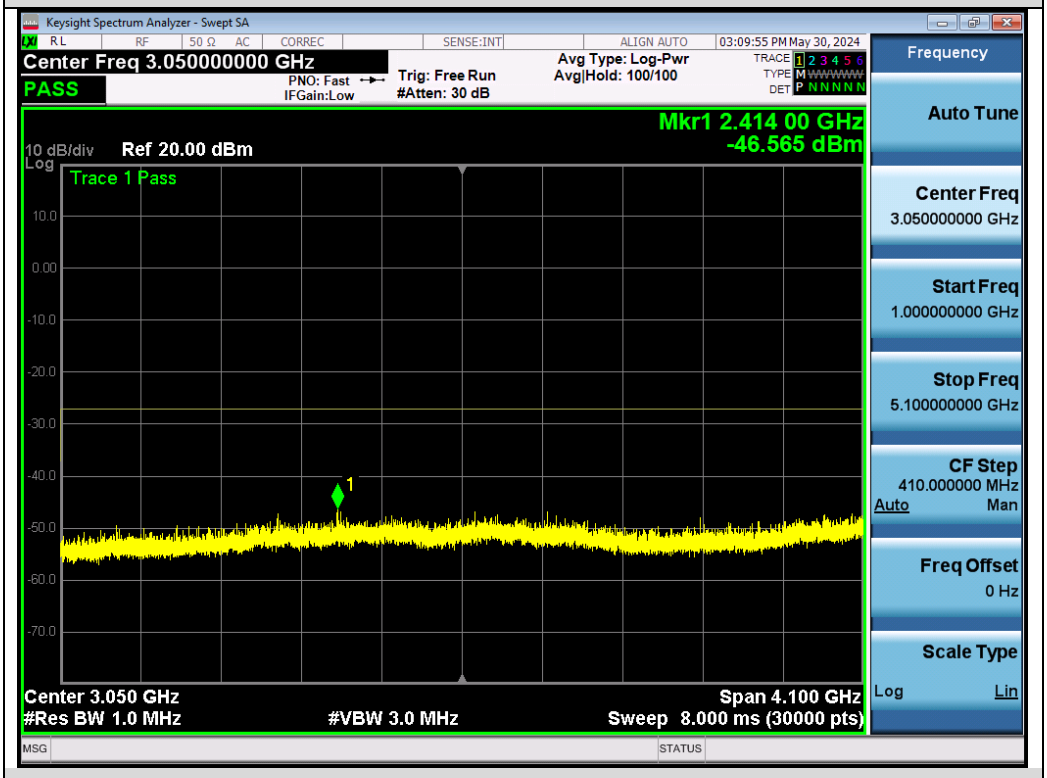


Test_Graph_802.11n40_ANT1_5190_MCS0_Frequency Band 3

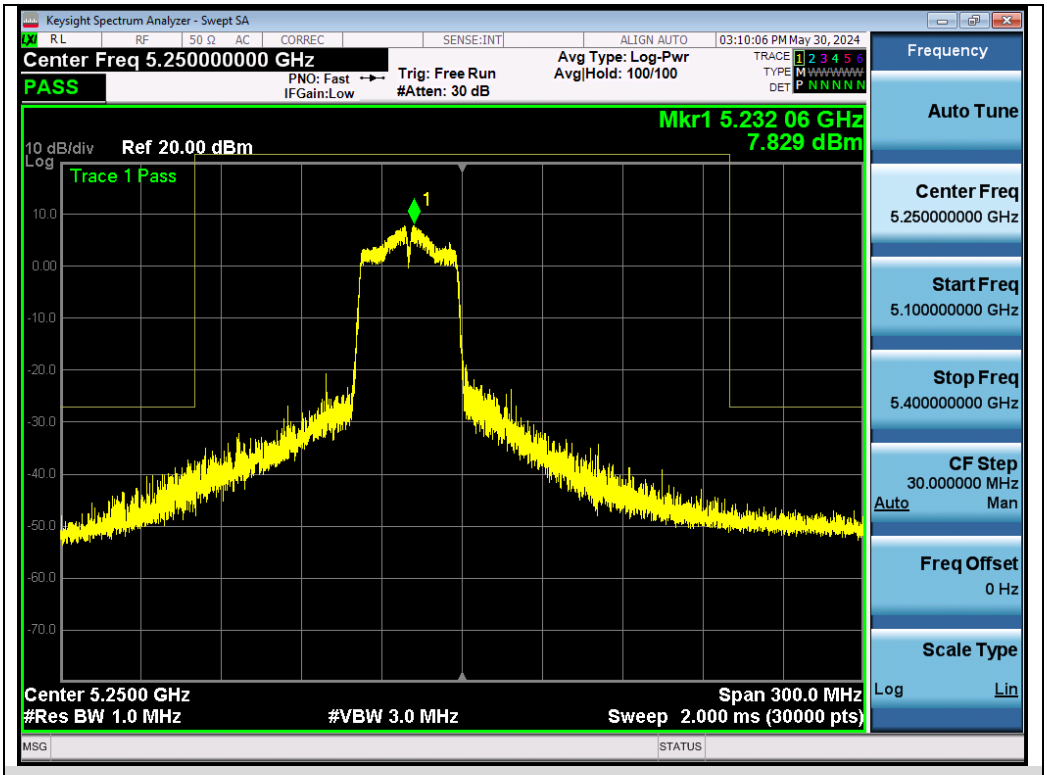
Test_Graph_802.11n40_ANT1_5190_MCS0_Frequency Band 4



Test_Graph_802.11n40_ANT1_5230_MCS0_Frequency Band 1

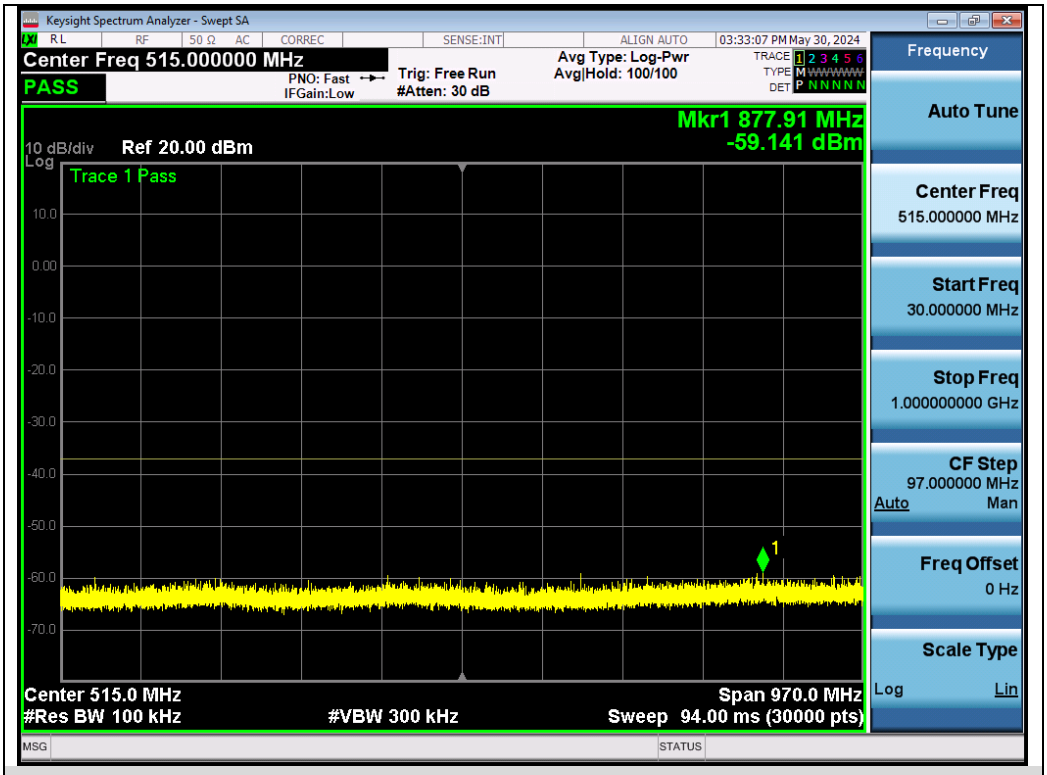


Test_Graph_802.11n40_ANT1_5230_MCS0_Frequency Band 2

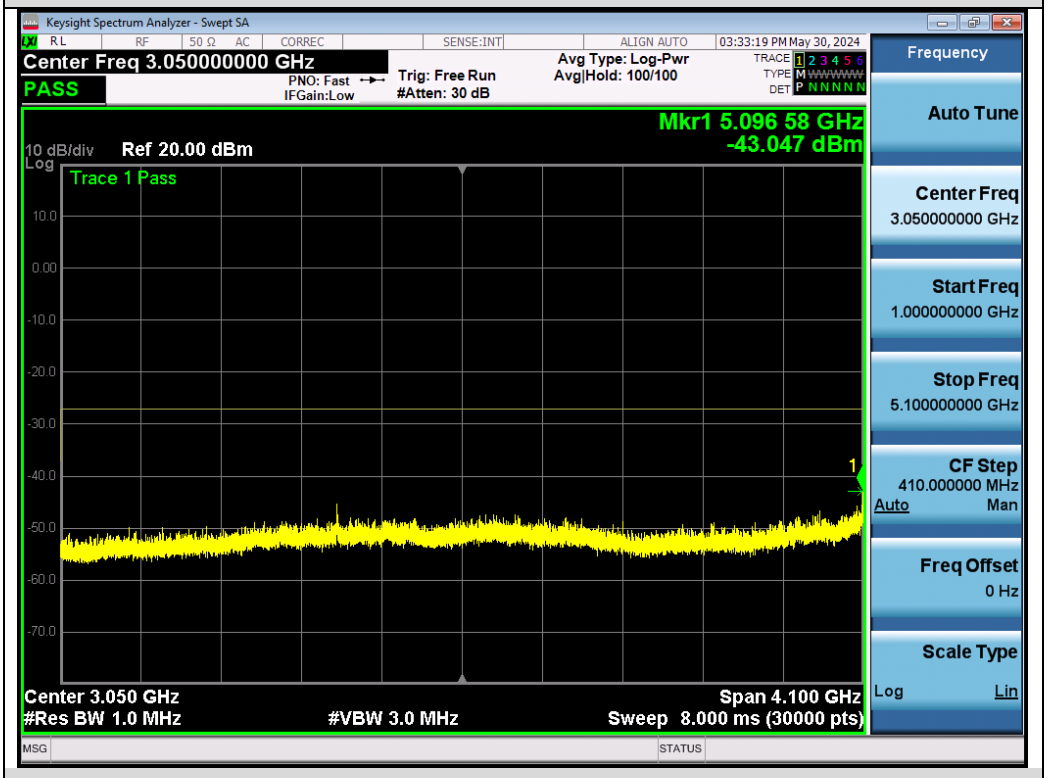


Test_Graph_802.11n40_ANT1_5230_MCS0_Frequency Band 3

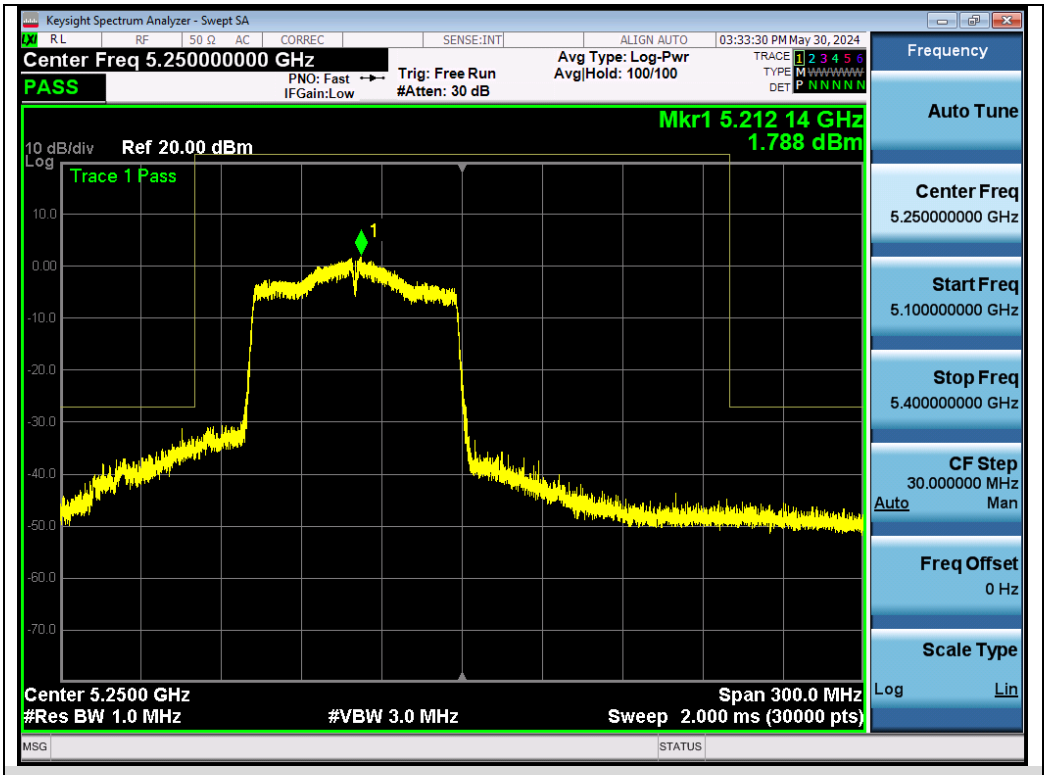
Test_Graph_802.11n40_ANT1_5230_MCS0_Frequency Band 4



Test_Graph_802.11ac80_ANT1_5210_MCS0_Frequency Band 1



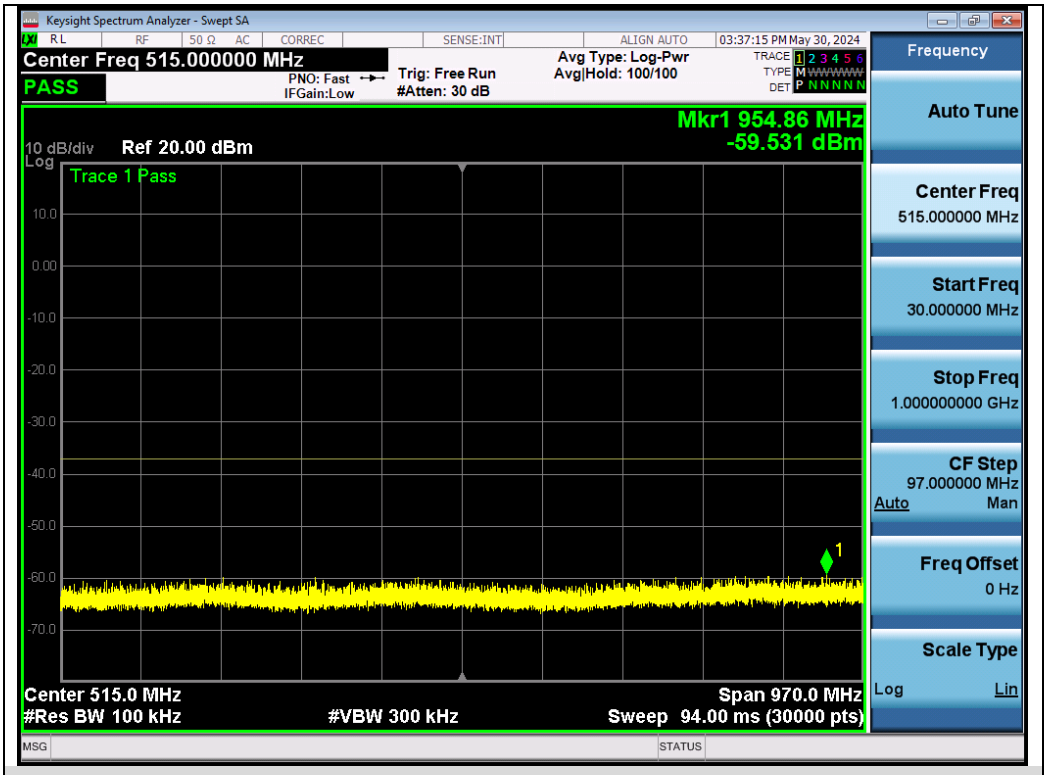
Test_Graph_802.11ac80_ANT1_5210_MCS0_Frequency Band 2



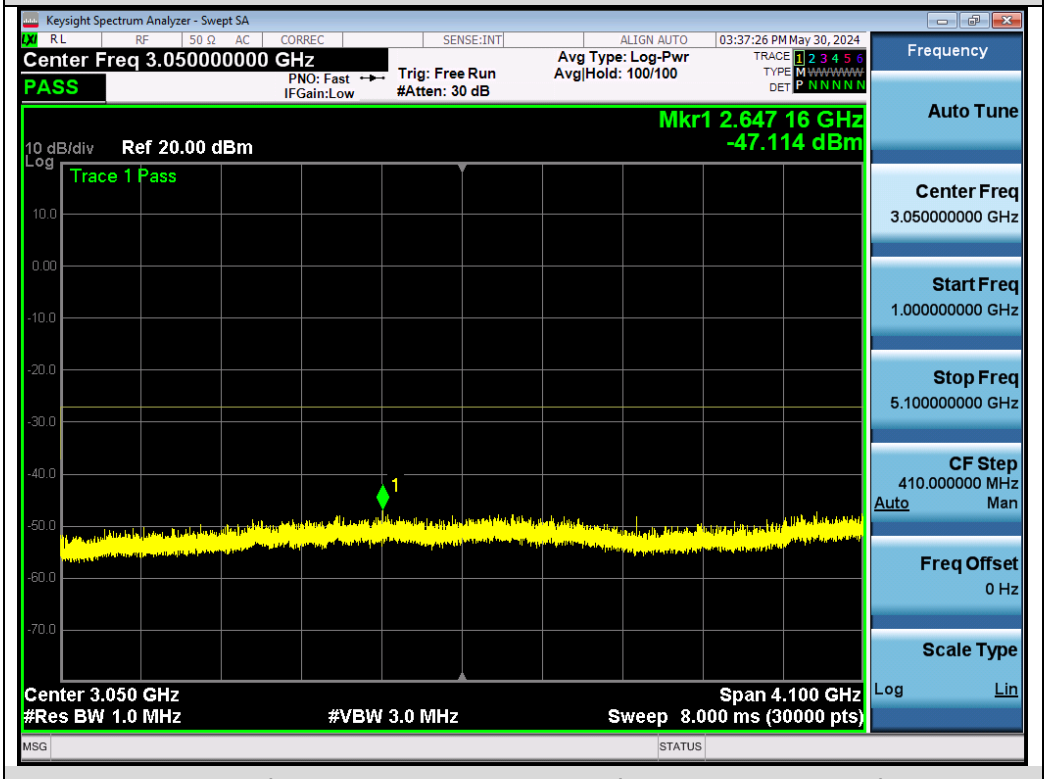
Test_Graph_802.11ac80_ANT1_5210_MCS0_Frequency Band 3

Test_Graph_802.11ac80_ANT1_5210_MCS0_Frequency Band 4

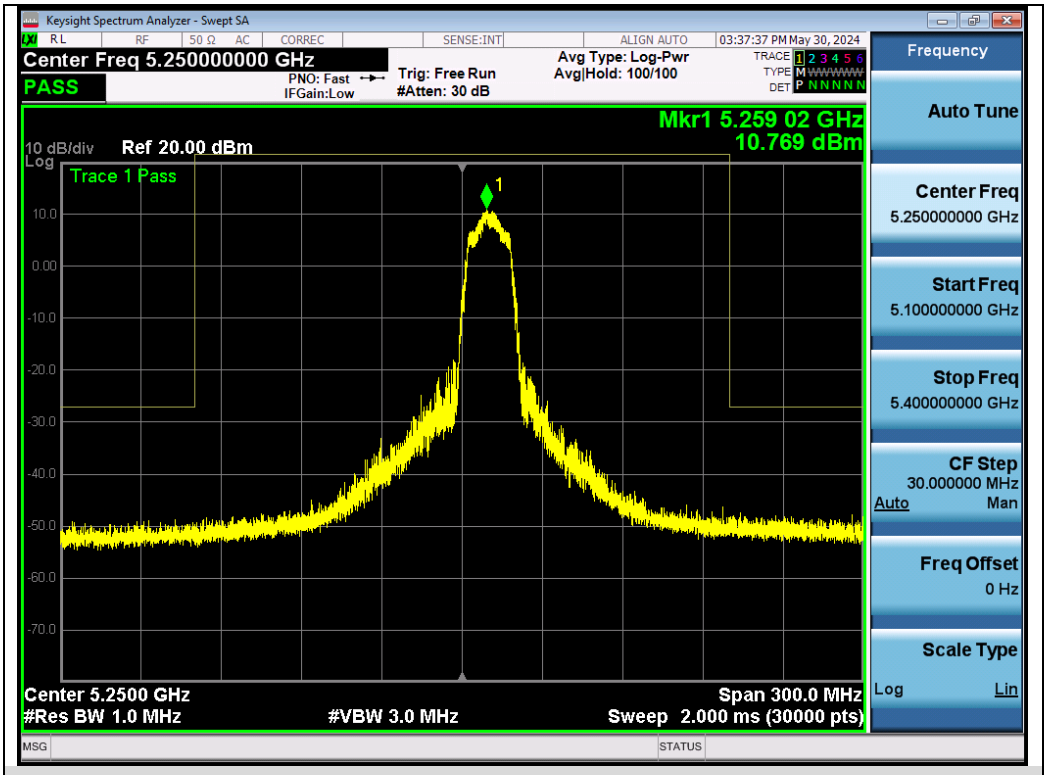
Test Graphs of Spurious Emissions outside of the 5.25-5.35 GHz band for transmitters operating in the 5.25-5.35 GHz band



Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 1

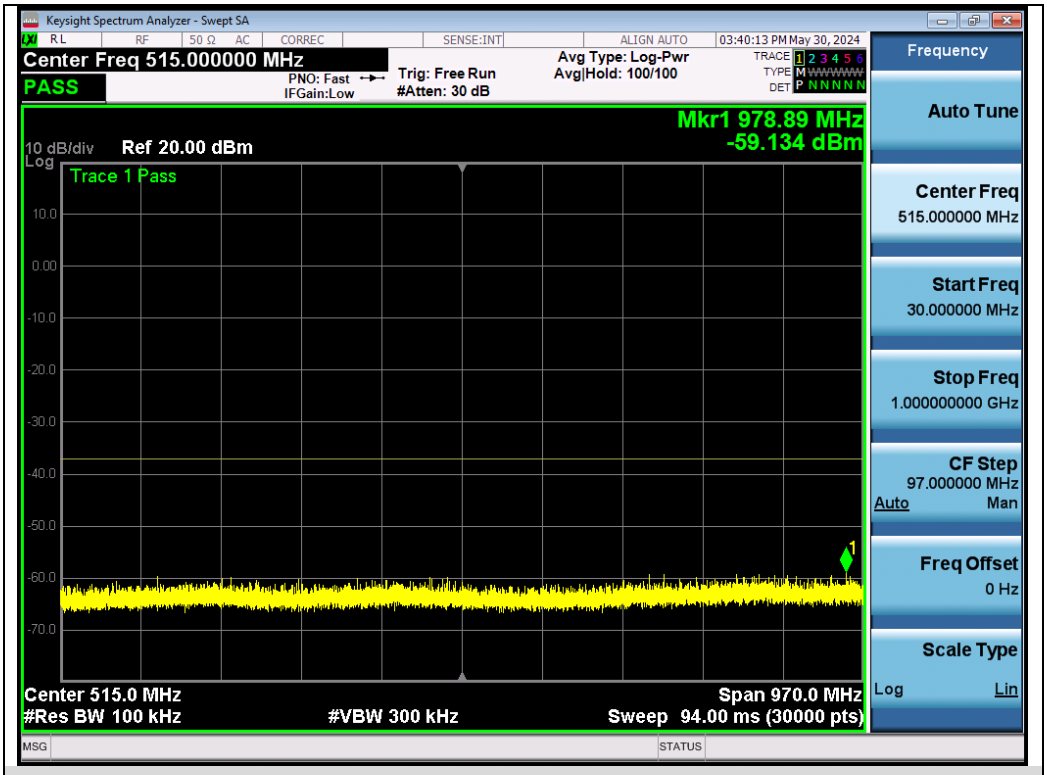


Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 2

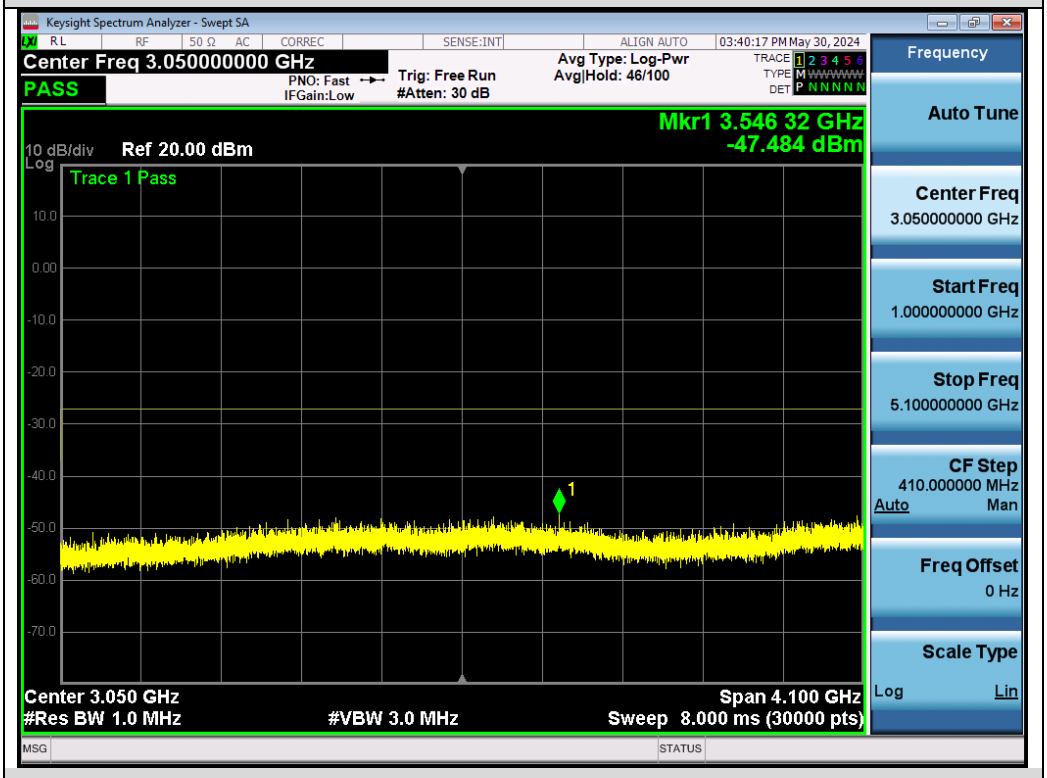


Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 3

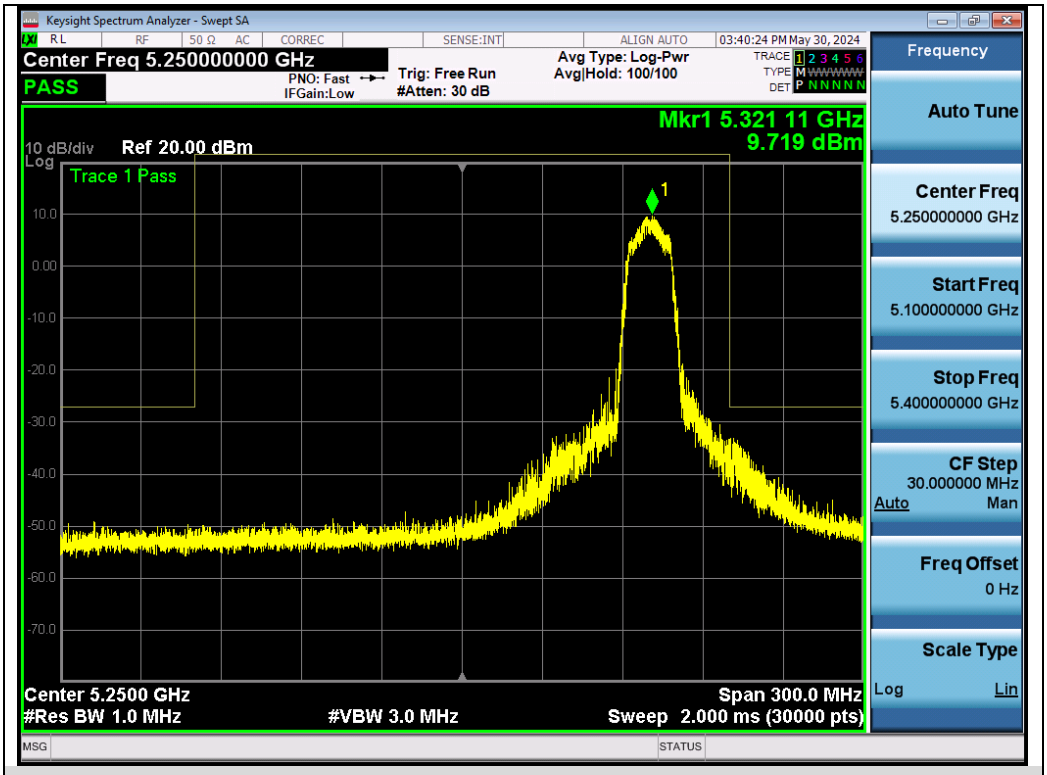
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 4



Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 1

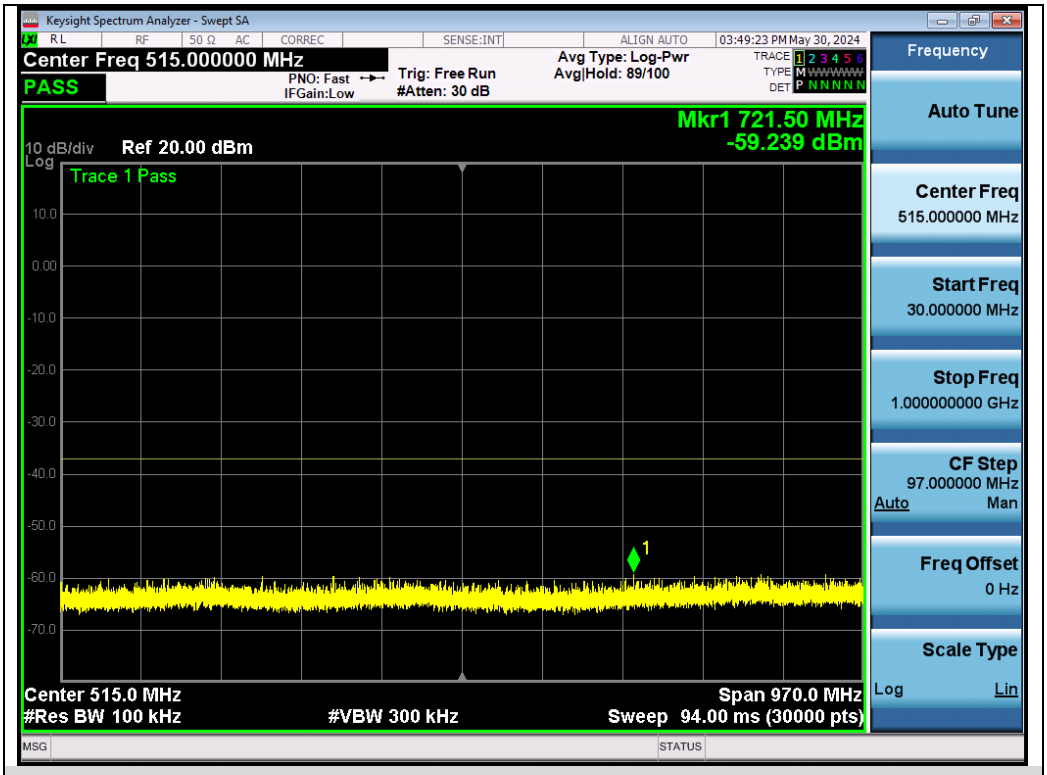


Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 2

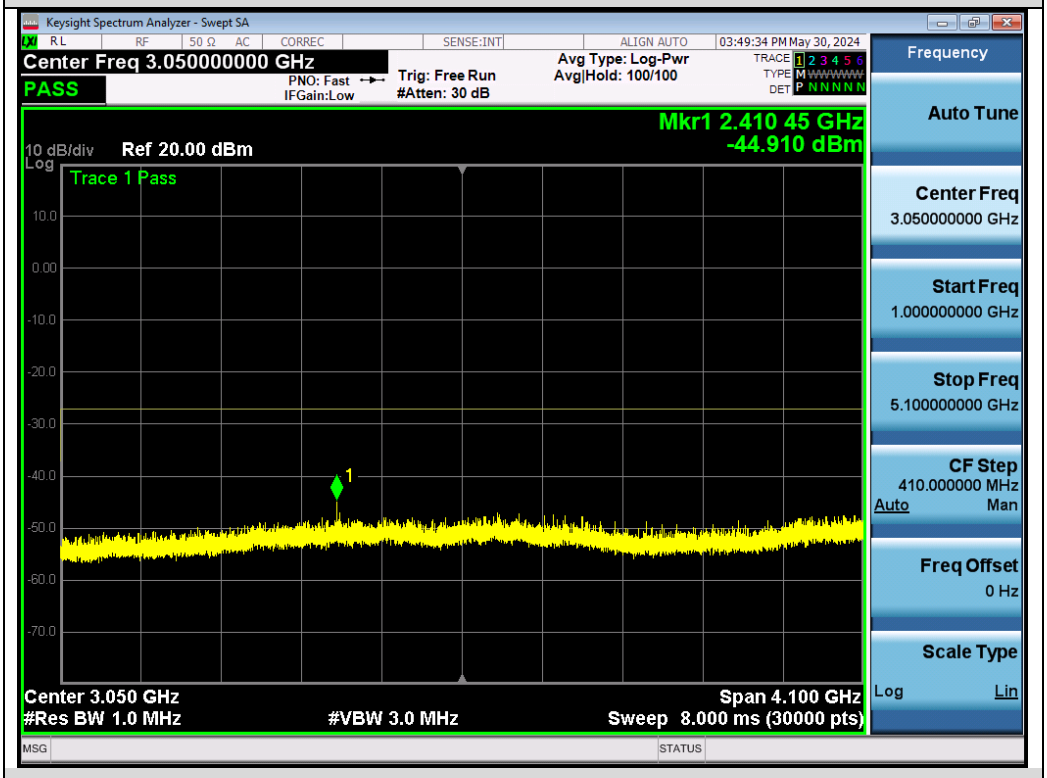


Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 3

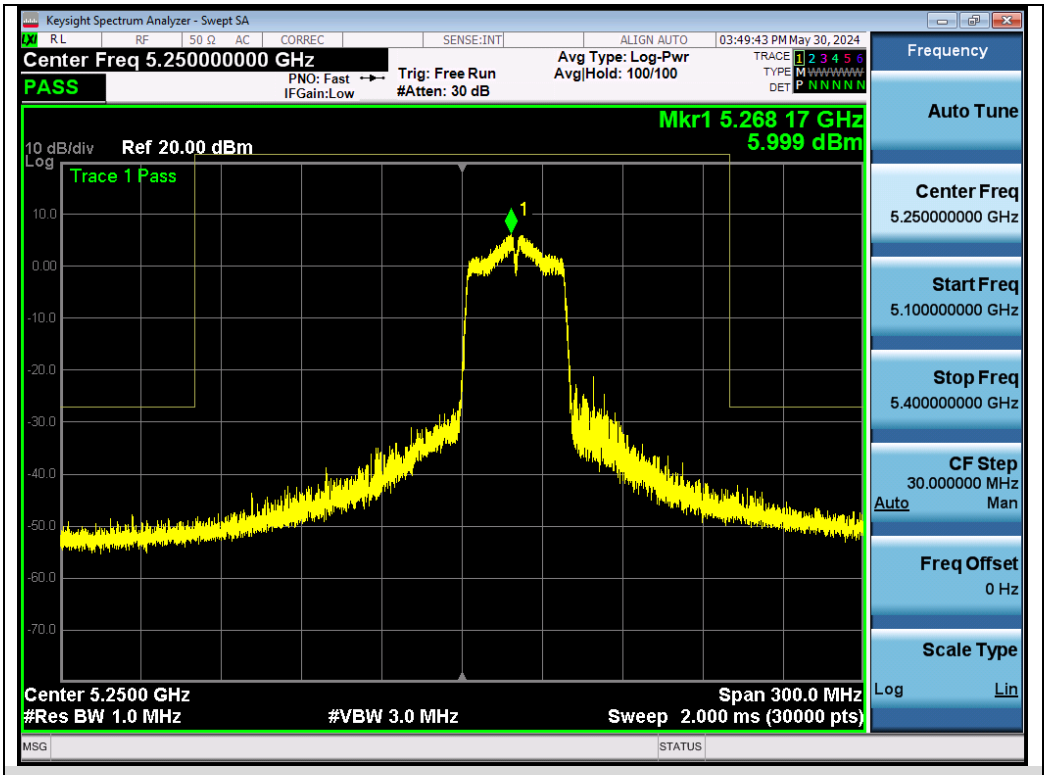
Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 4



Test_Graph_802.11n40_ANT1_5270_MCS0_Frequency Band 1

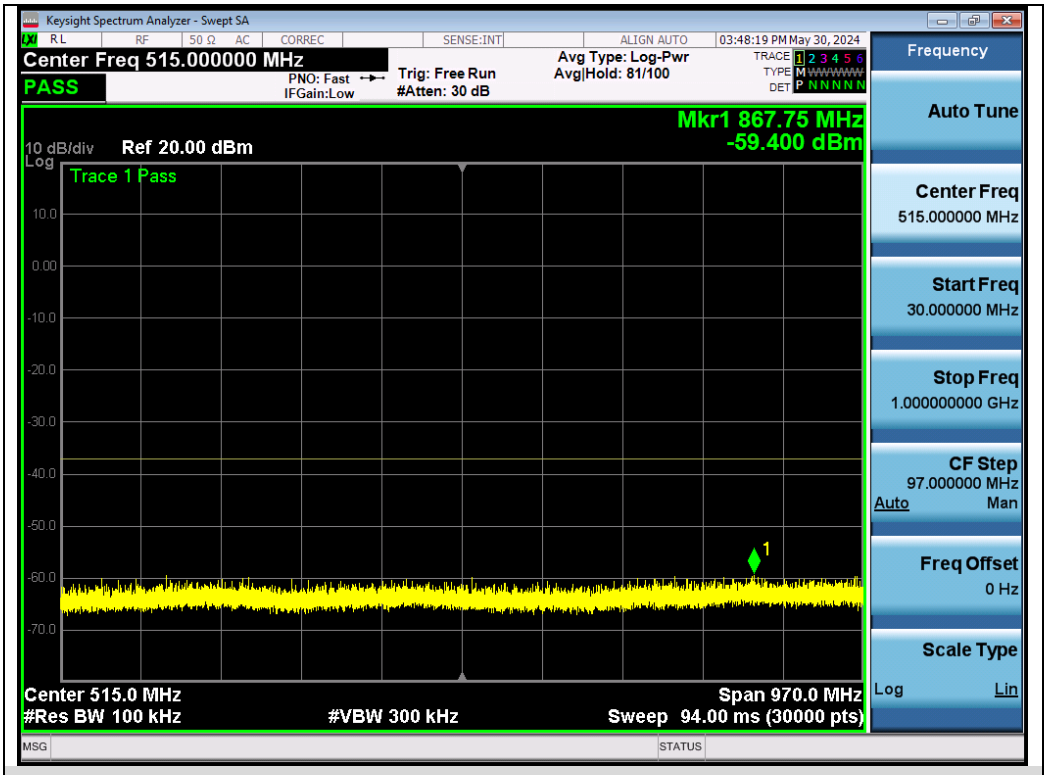


Test_Graph_802.11n40_ANT1_5270_MCS0_Frequency Band 2

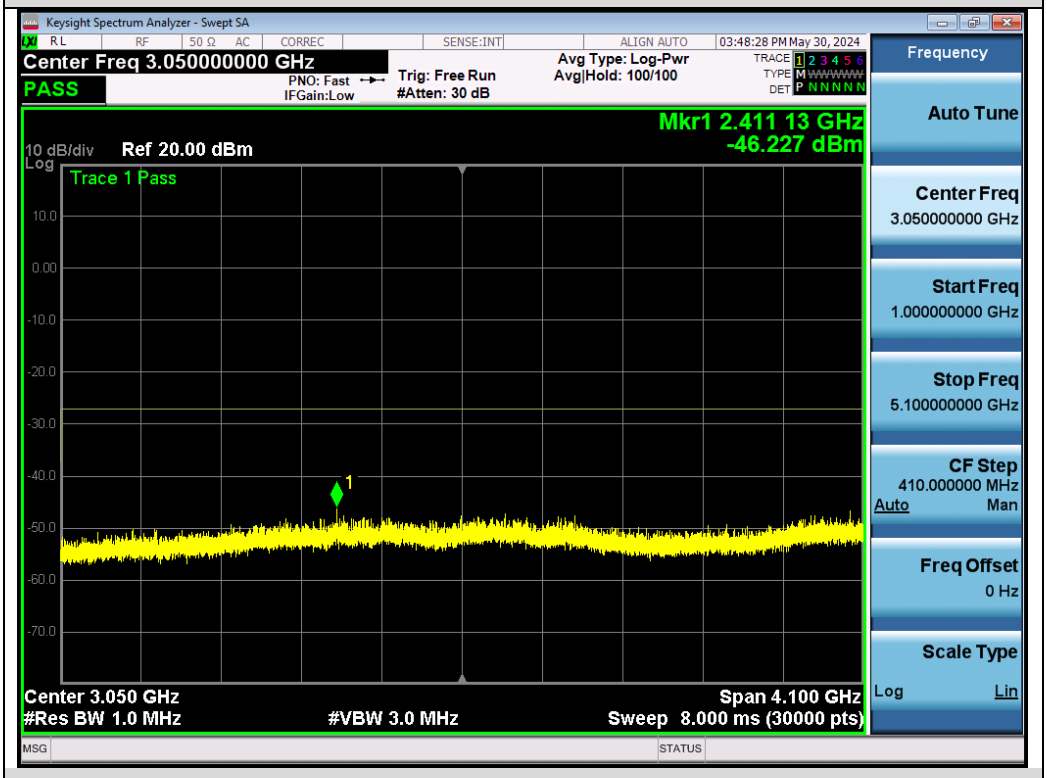


Test_Graph_802.11n40_ANT1_5270_MCS0_Frequency Band 3

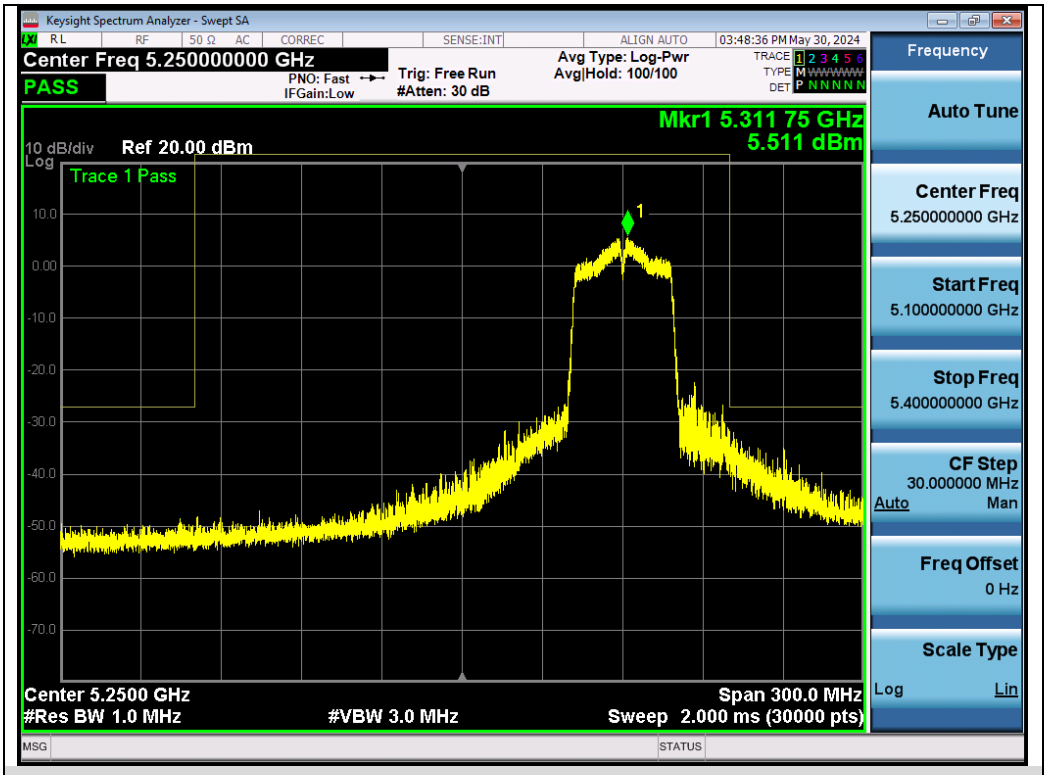
Test_Graph_802.11n40_ANT1_5270_MCS0_Frequency Band 4



Test_Graph_802.11n40_ANT1_5310_MCS0_Frequency Band 1

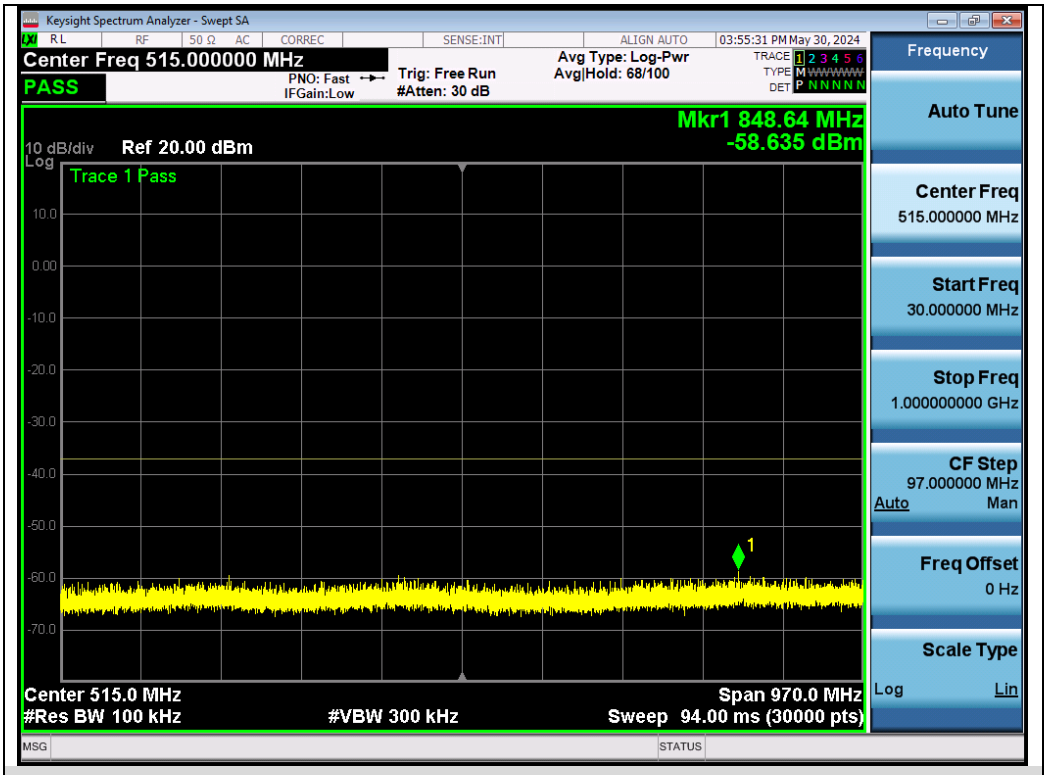


Test_Graph_802.11n40_ANT1_5310_MCS0_Frequency Band 2

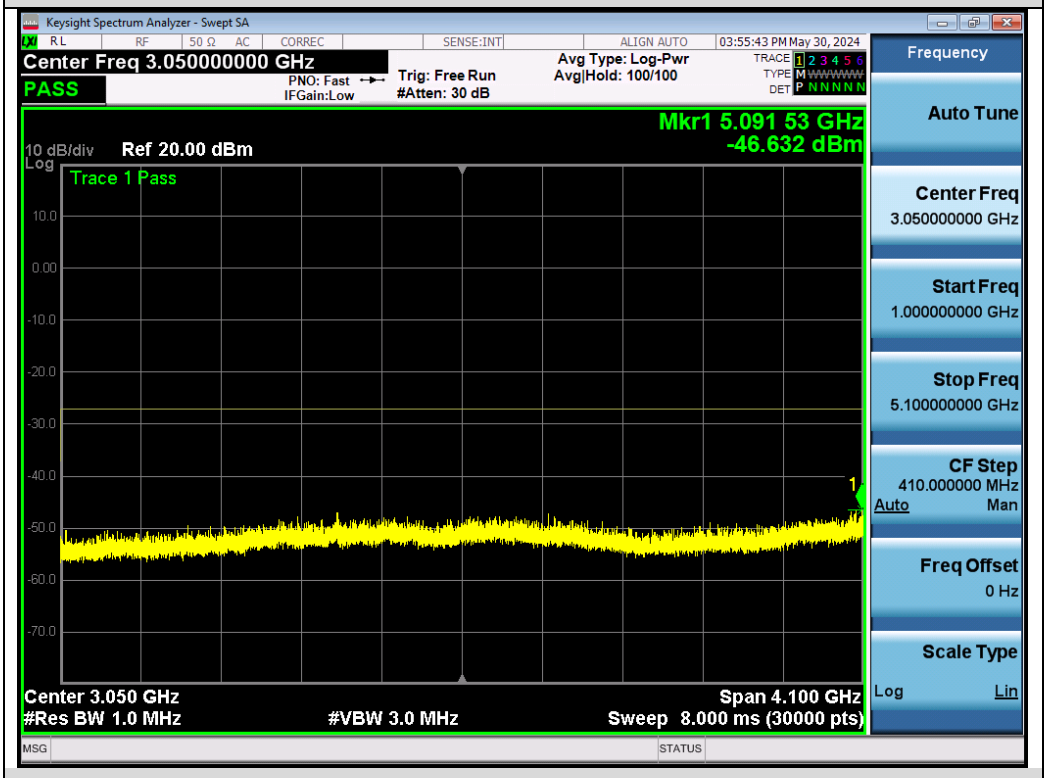


Test_Graph_802.11n40_ANT1_5310_MCS0_Frequency Band 3

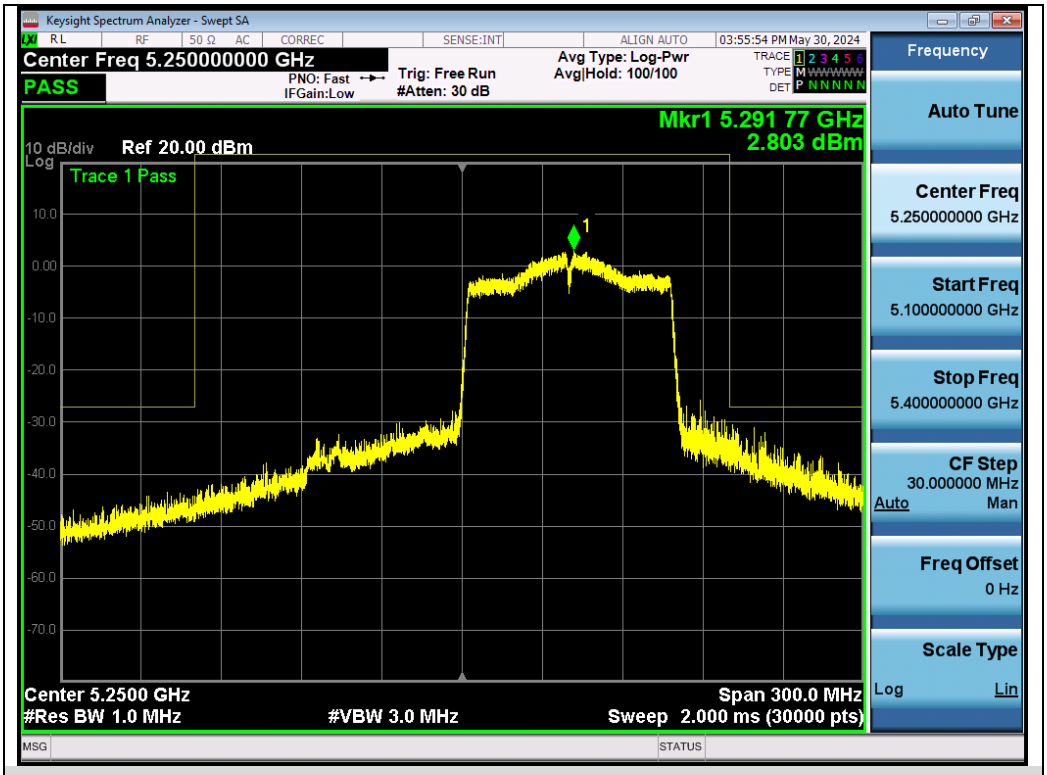
Test_Graph_802.11n40_ANT1_5310_MCS0_Frequency Band 4



Test_Graph_802.11ac80_ANT1_5290_MCS0_Frequency Band 1



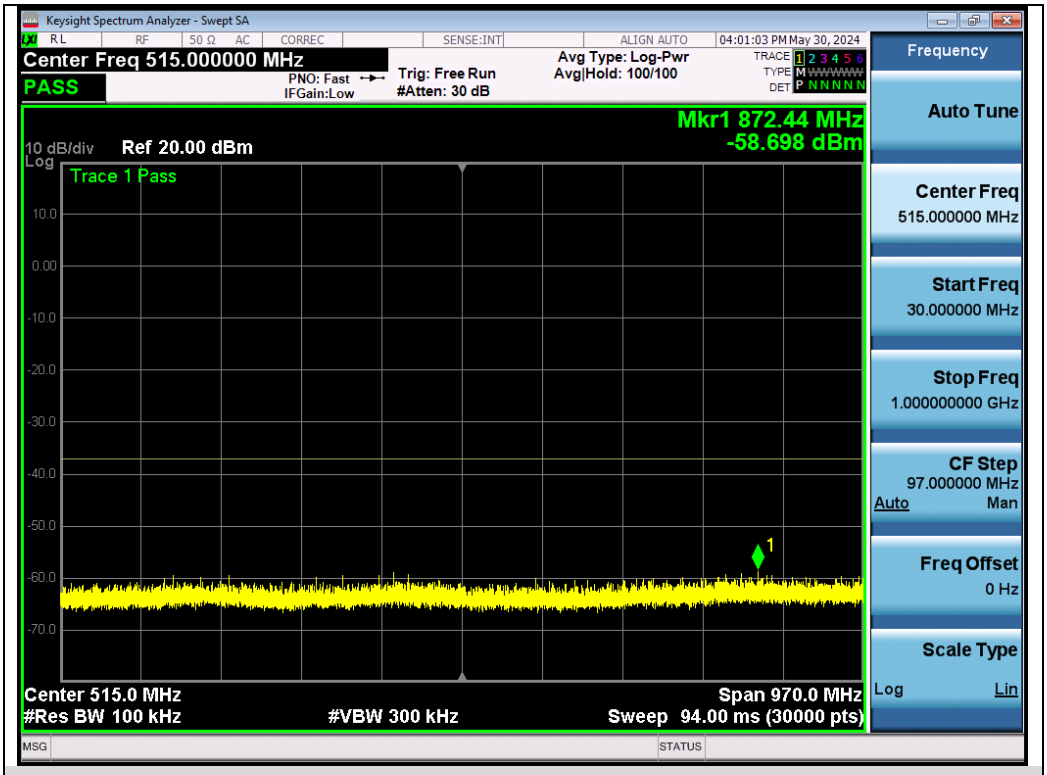
Test_Graph_802.11ac80_ANT1_5290_MCS0_Frequency Band 2



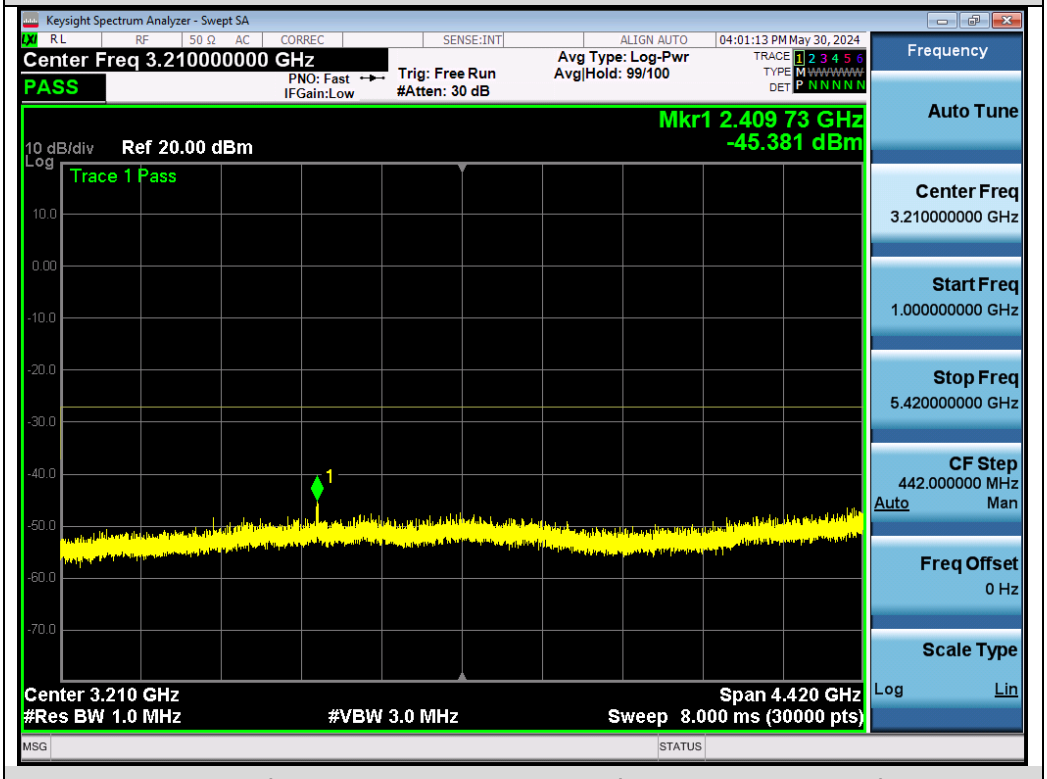
Test_Graph_802.11ac80_ANT1_5290_MCS0_Frequency Band 3

Test_Graph_802.11ac80_ANT1_5290_MCS0_Frequency Band 4

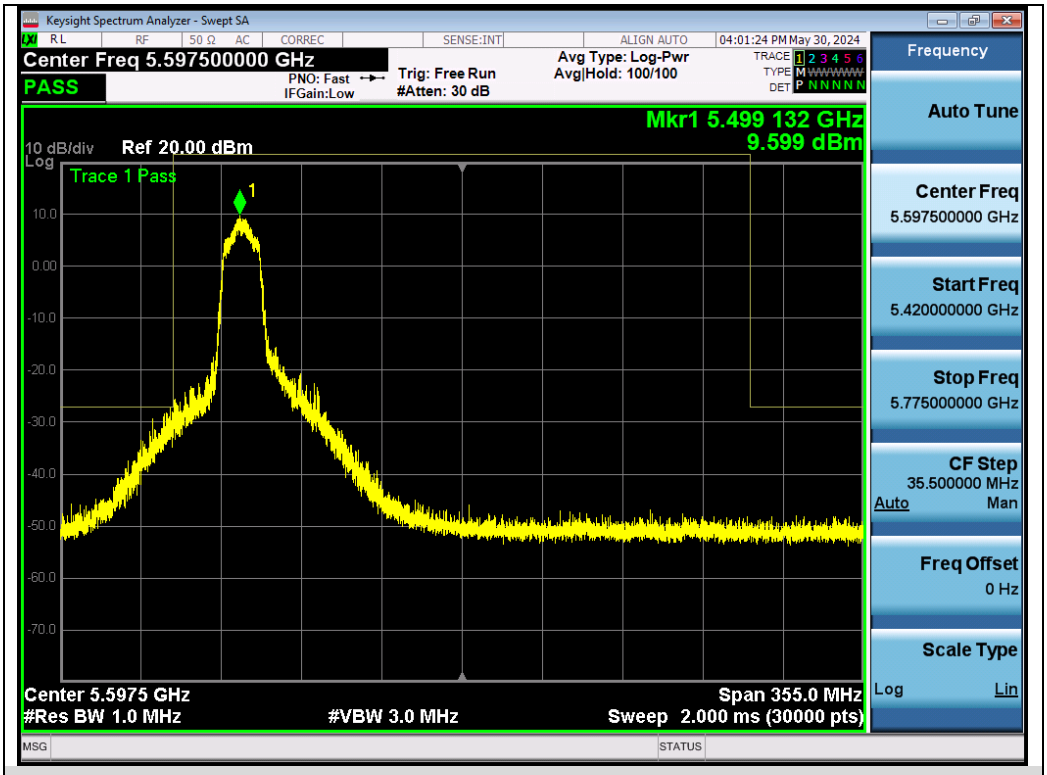
Test Graphs of Spurious Emissions outside of the 5.470-5.725 GHz band for transmitters operating in the 5.470-5.725 GHz band



Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 1

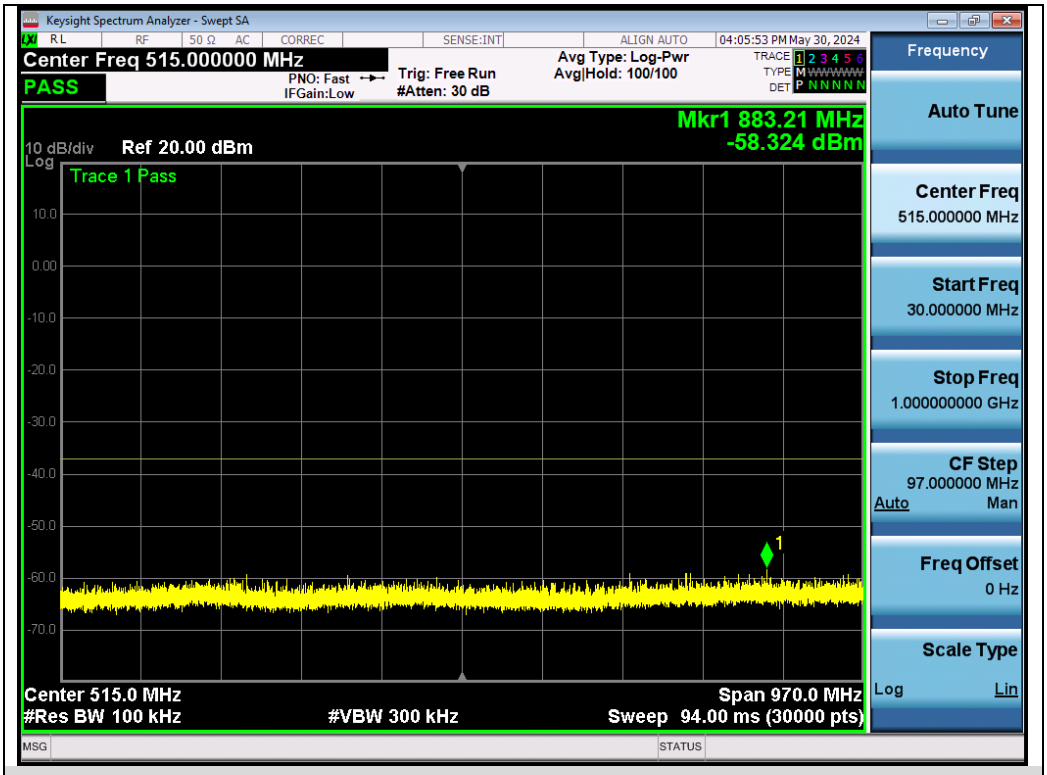


Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 2

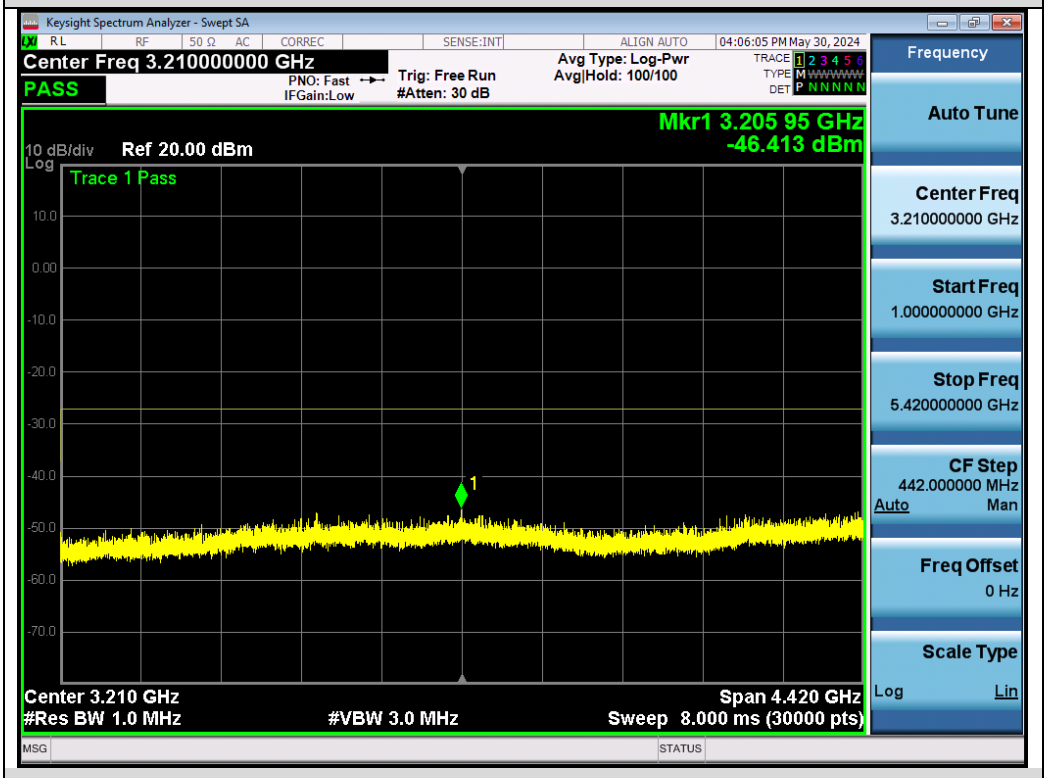


Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 3

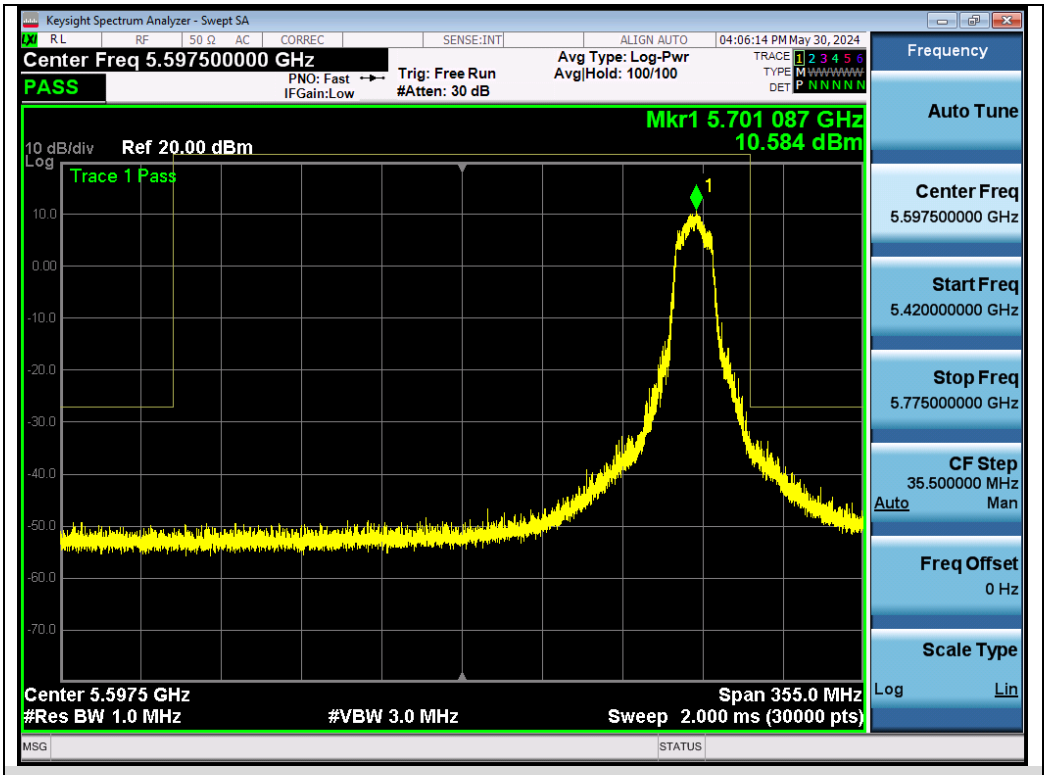
Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 4



Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 1

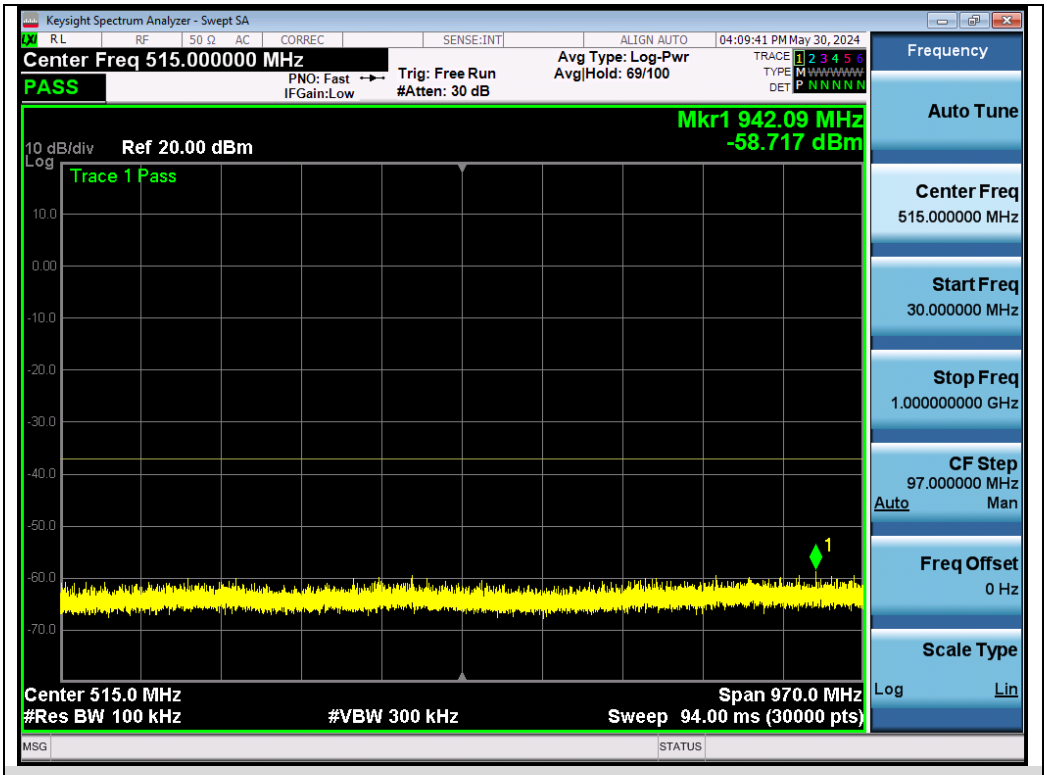


Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 2



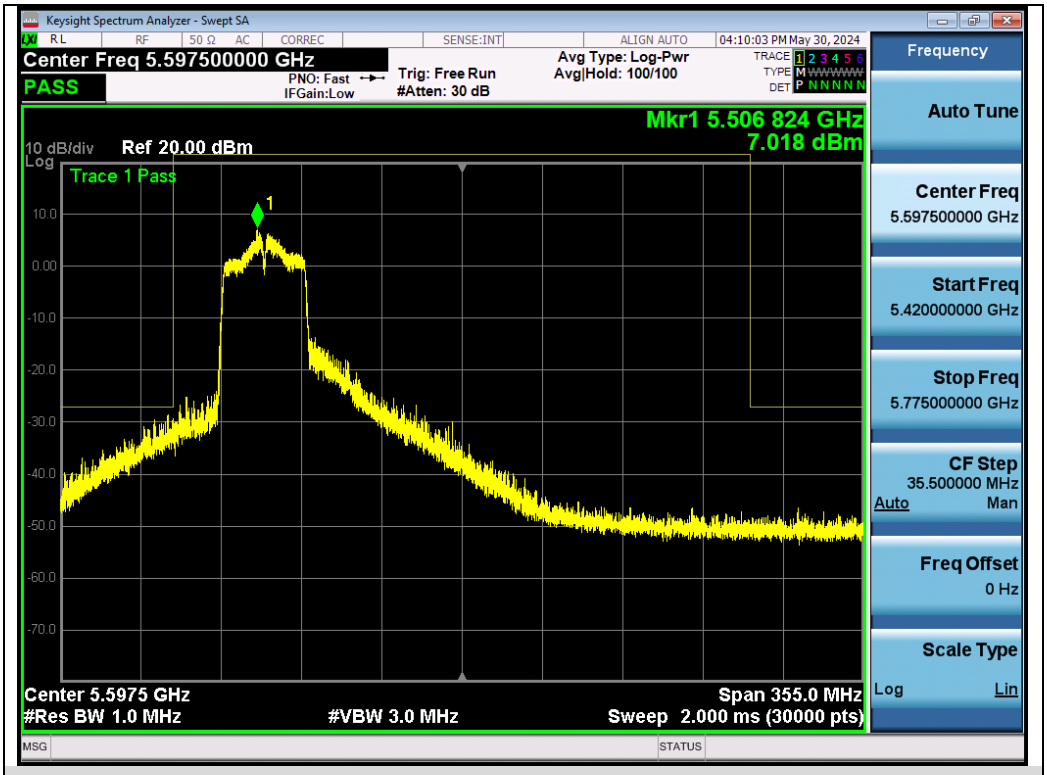
Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 3

Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 4

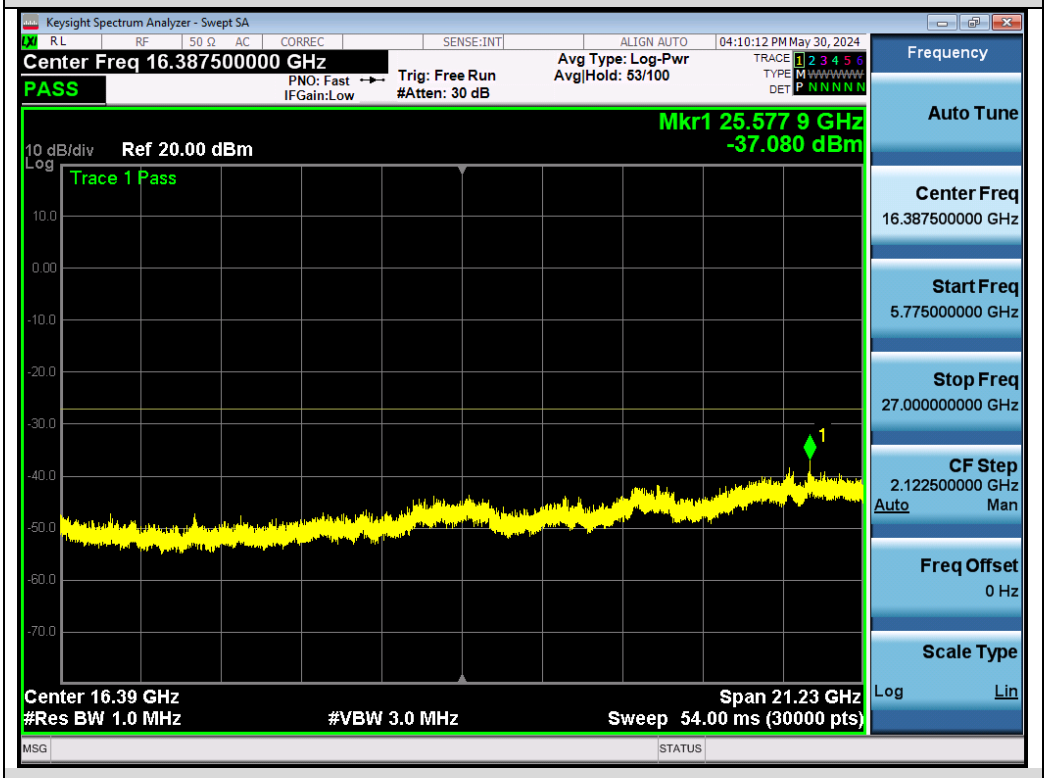


Test_Graph_802.11n40_ANT1_5510_MCS0_Frequency Band 1

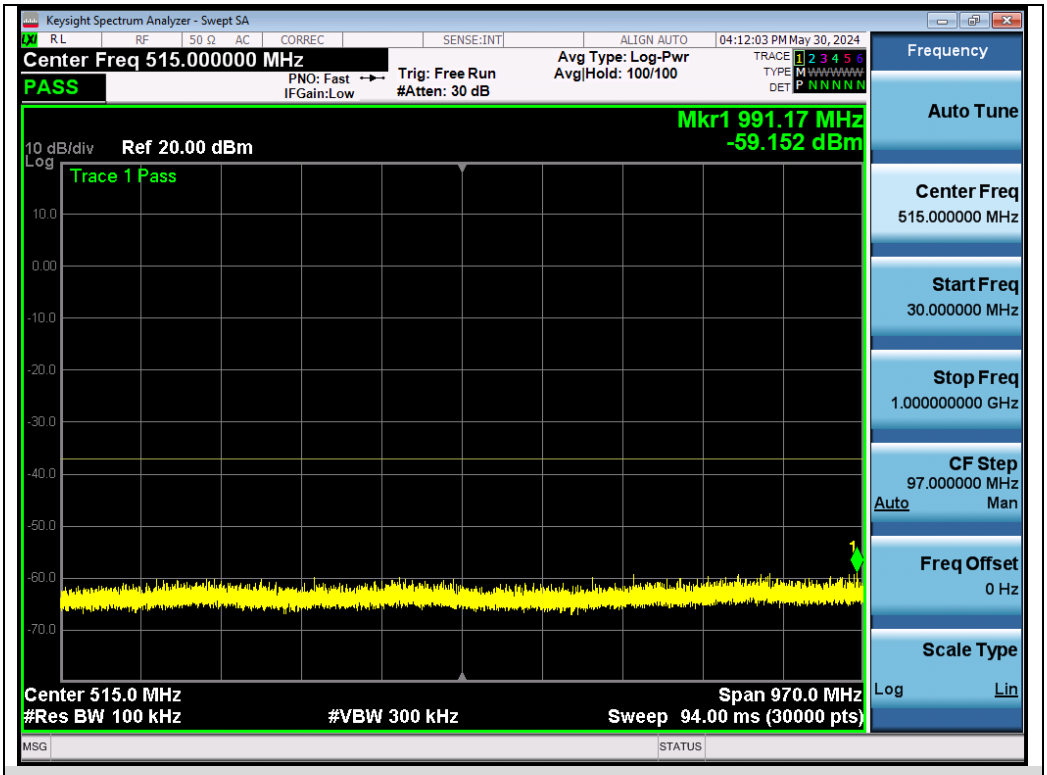
Test_Graph_802.11n40_ANT1_5510_MCS0_Frequency Band 2



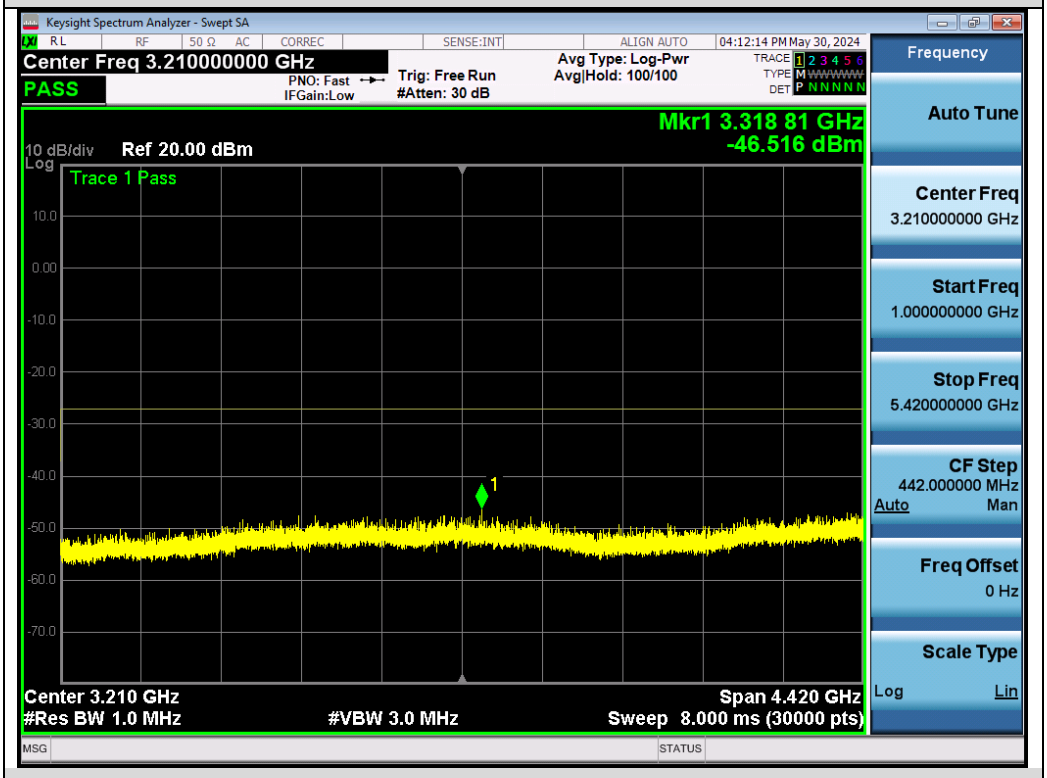
Test_Graph_802.11n40_ANT1_5510_MCS0_Frequency Band 3



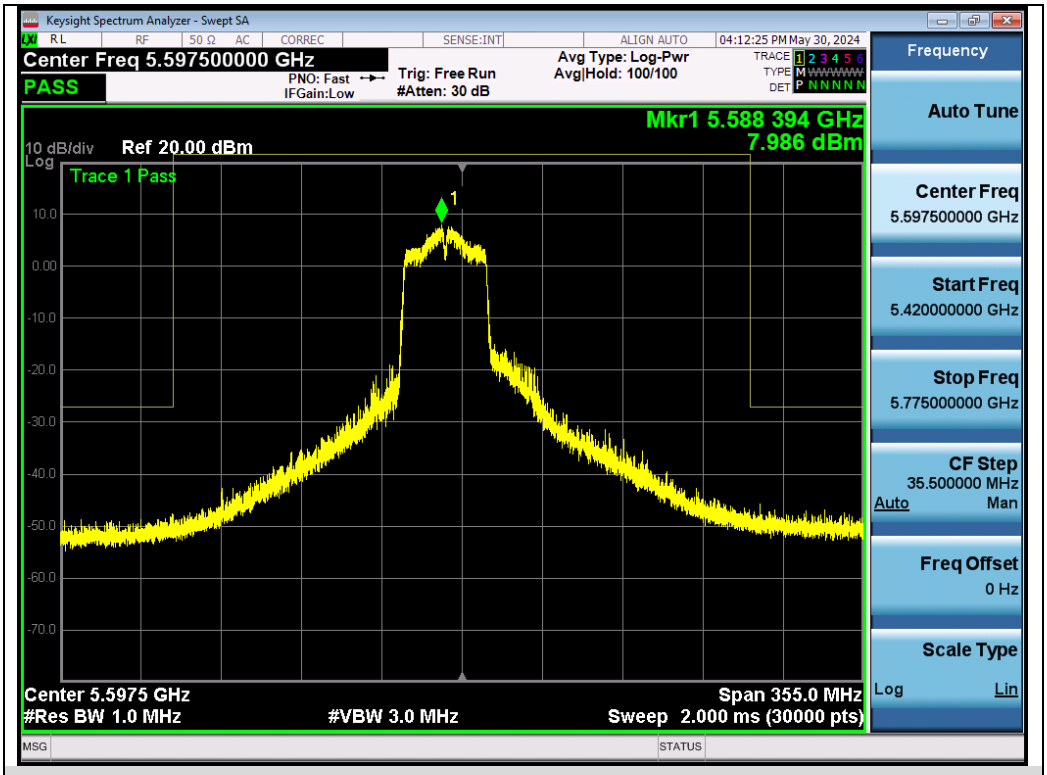
Test_Graph_802.11n40_ANT1_5510_MCS0_Frequency Band 4



Test_Graph_802.11n40_ANT1_5590_MCS0_Frequency Band 1

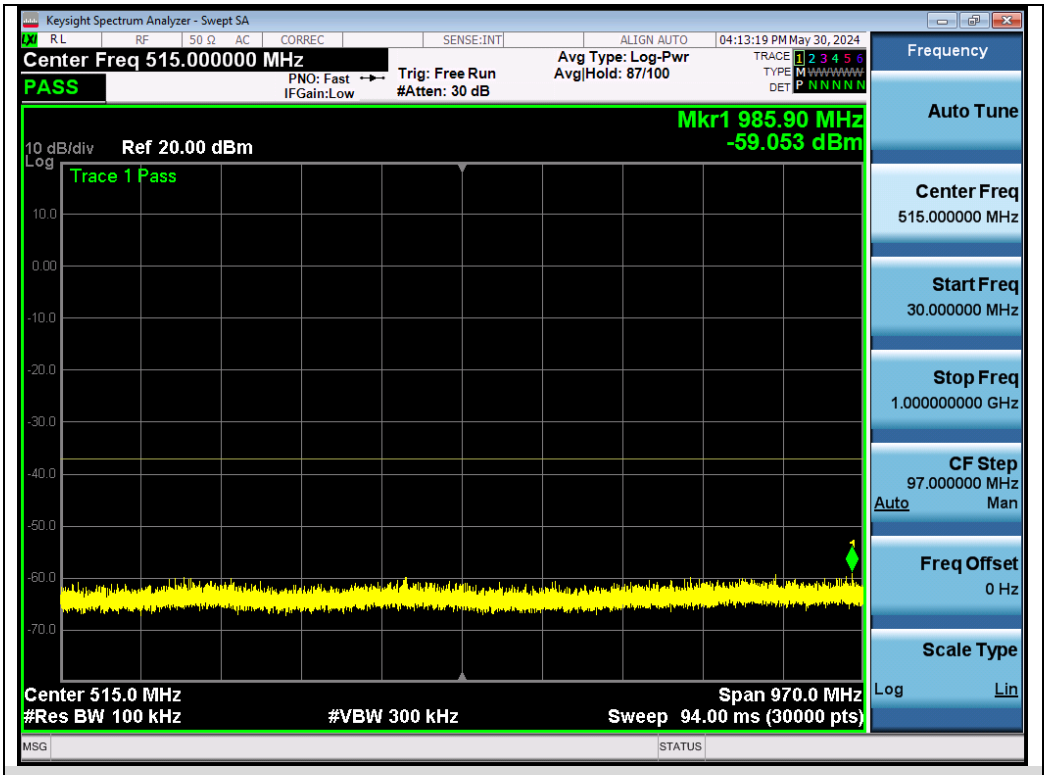


Test_Graph_802.11n40_ANT1_5590_MCS0_Frequency Band 2

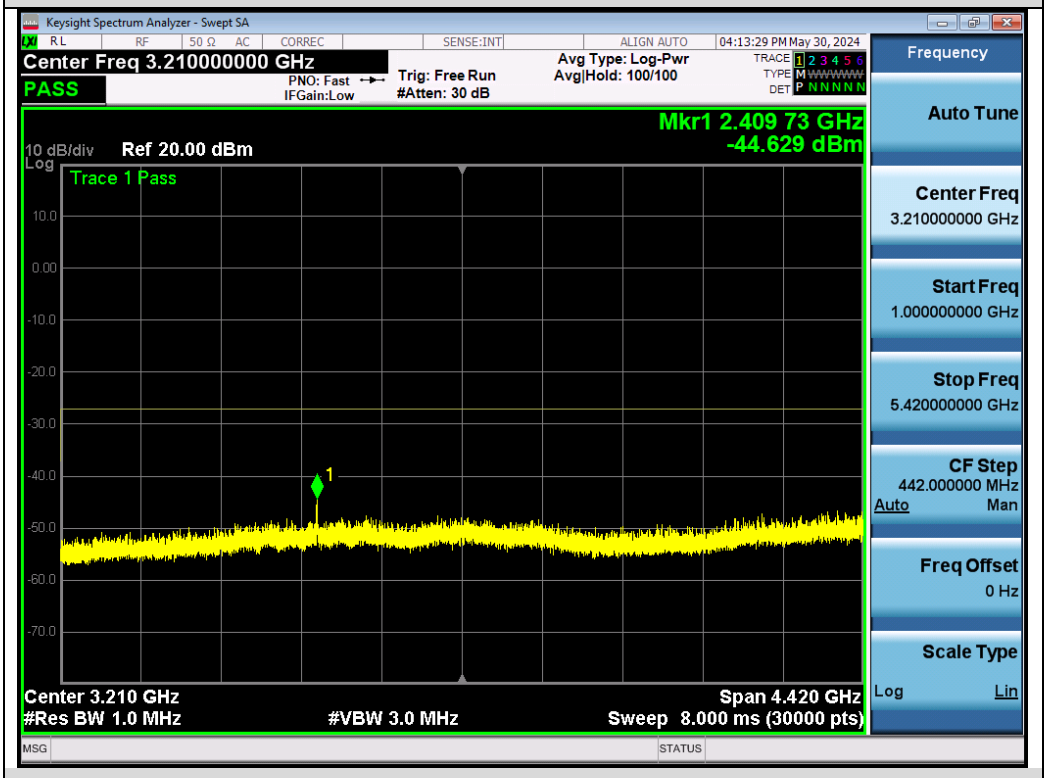


Test_Graph_802.11n40_ANT1_5590_MCS0_Frequency Band 3

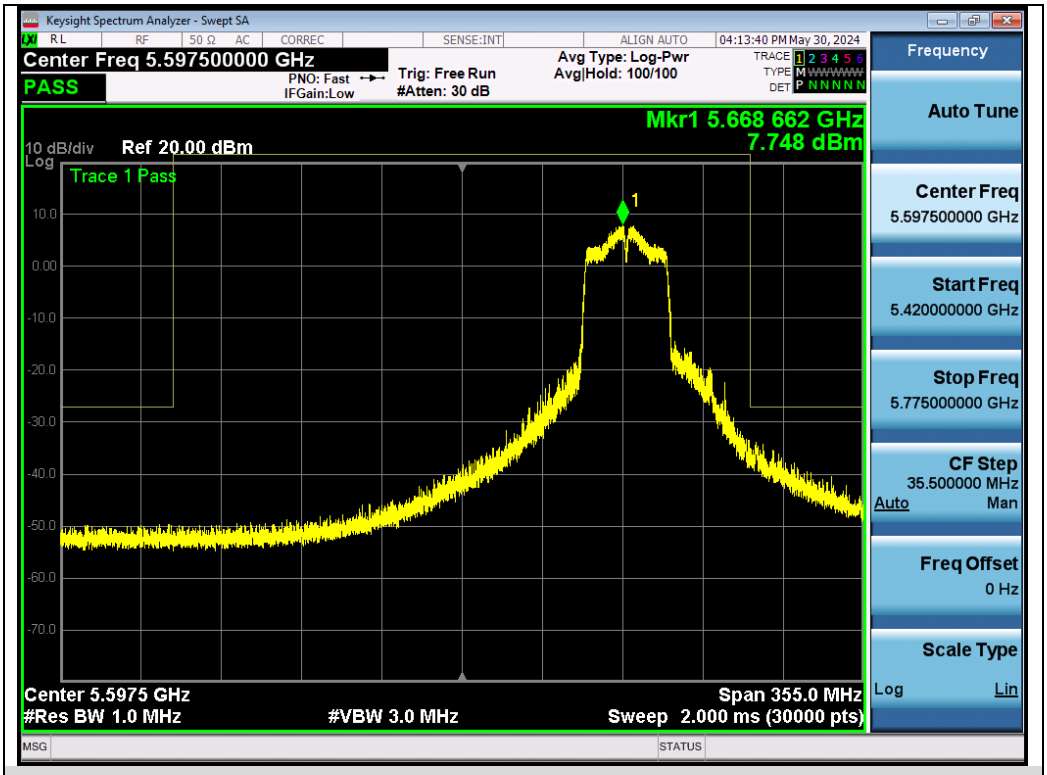
Test_Graph_802.11n40_ANT1_5590_MCS0_Frequency Band 4



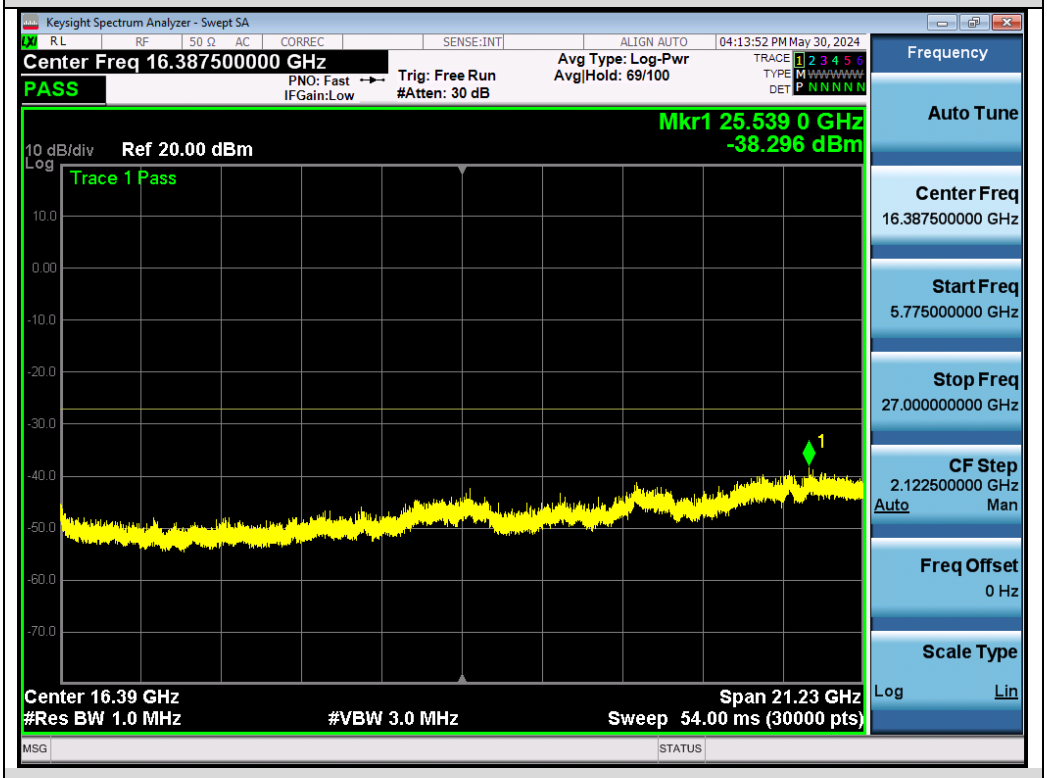
Test_Graph_802.11n40_ANT1_5670_MCS0_Frequency Band 1



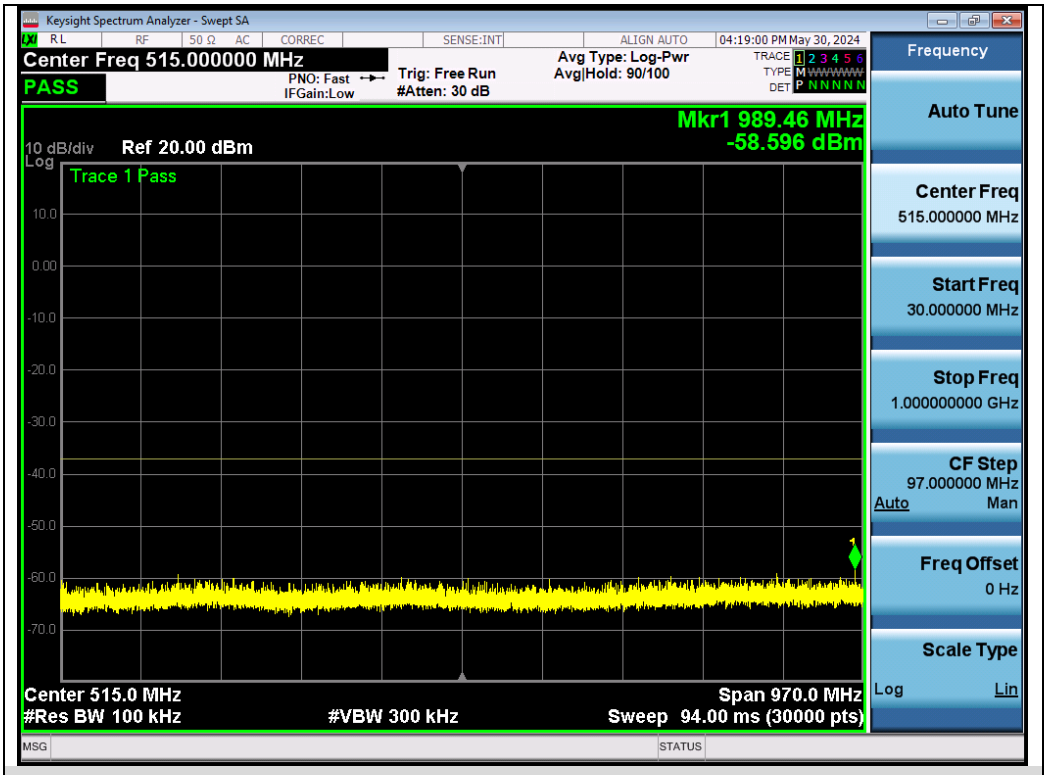
Test_Graph_802.11n40_ANT1_5670_MCS0_Frequency Band 2



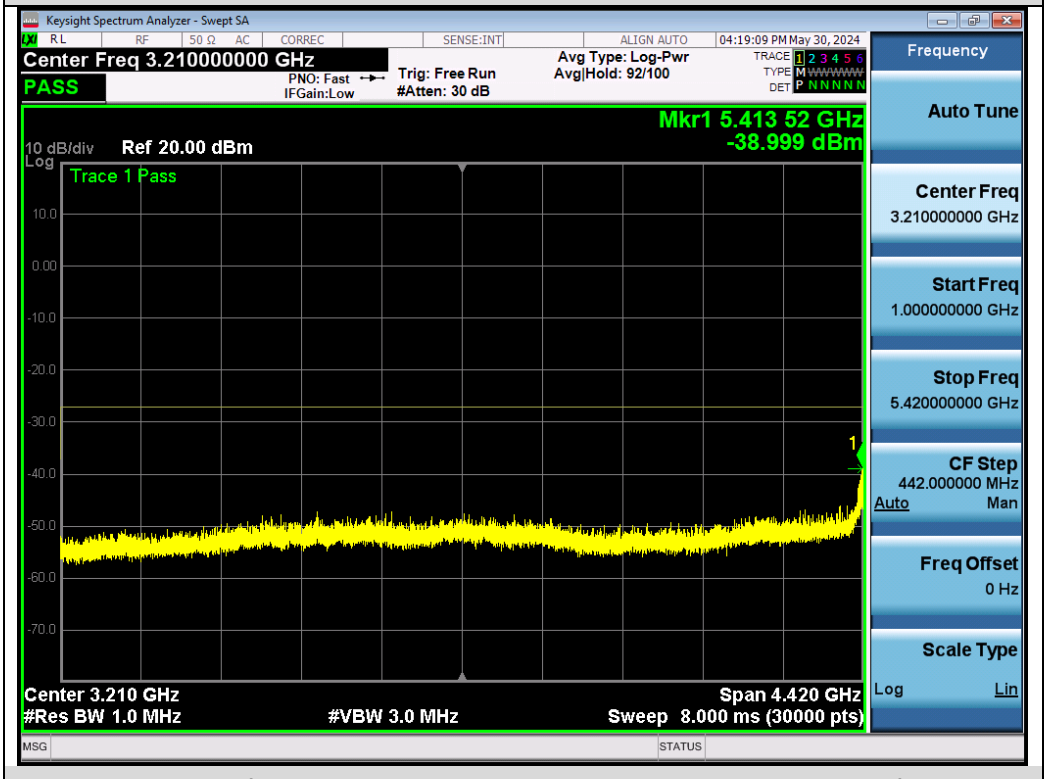
Test_Graph_802.11n40_ANT1_5670_MCS0_Frequency Band 3



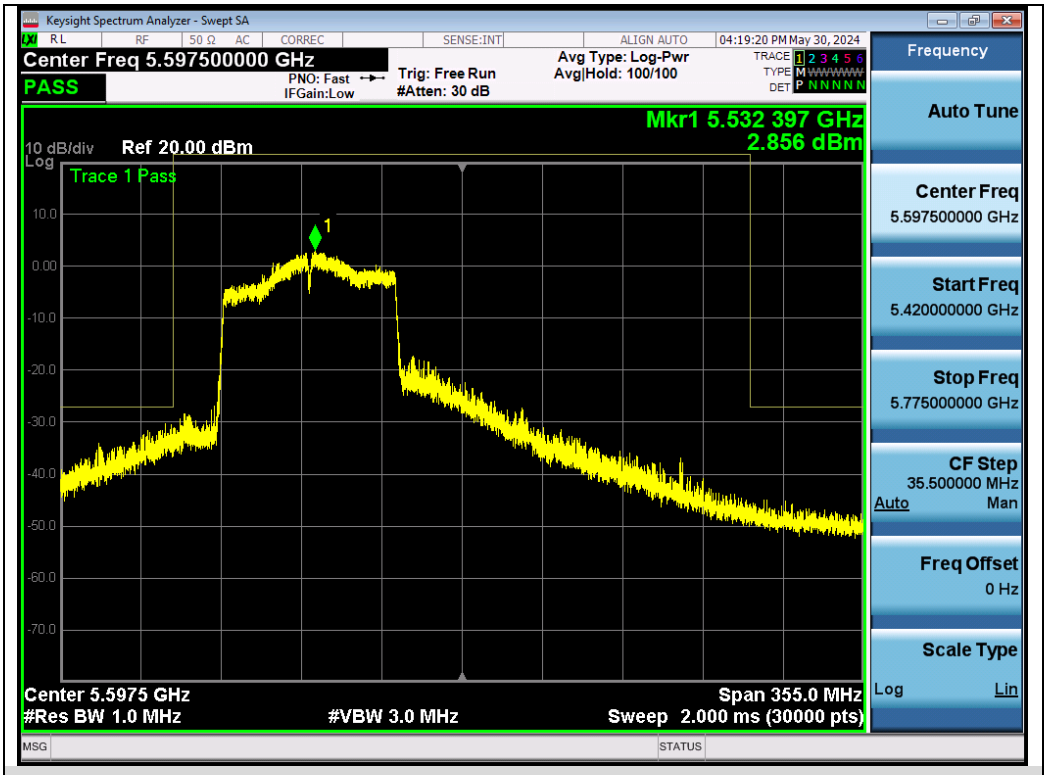
Test_Graph_802.11n40_ANT1_5670_MCS0_Frequency Band 4



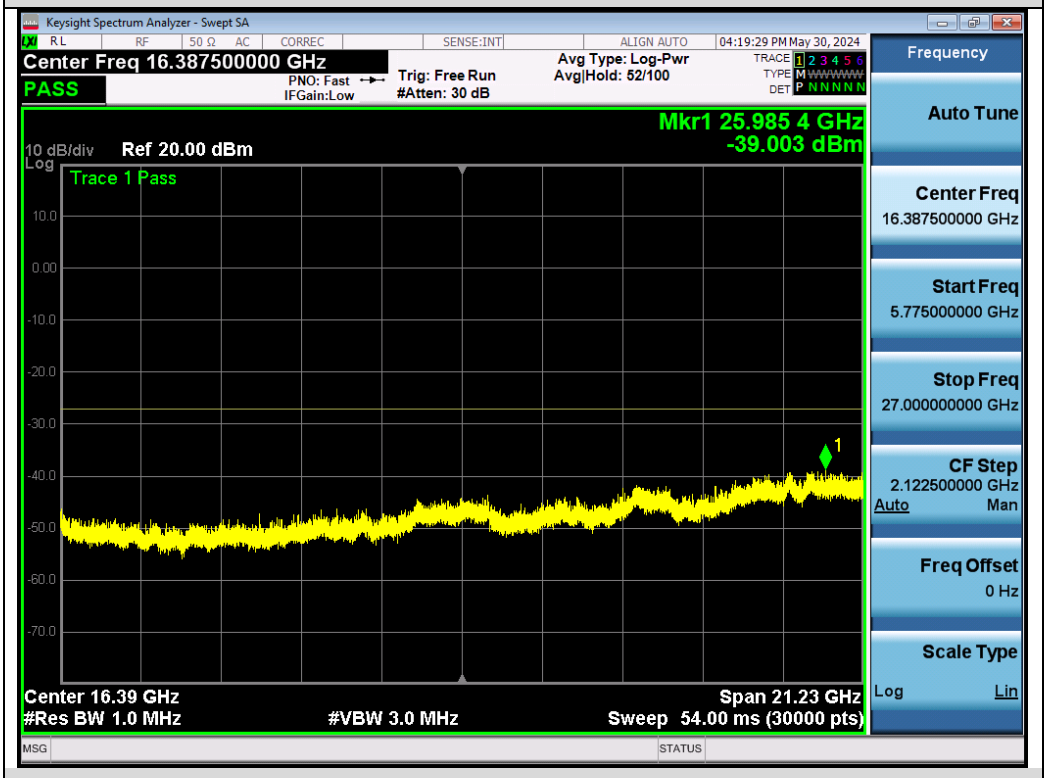
Test_Graph_802.11ac80_ANT1_5530_MCS9_Frequency Band 1



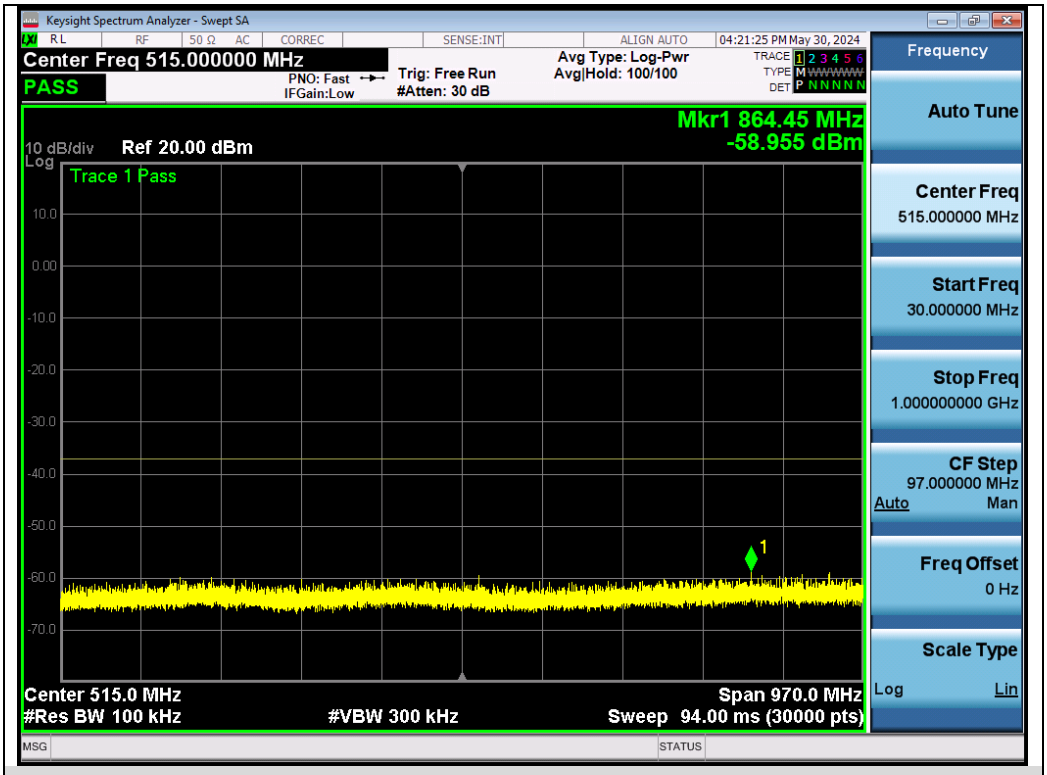
Test_Graph_802.11ac80_ANT1_5530_MCS9_Frequency Band 2



Test_Graph_802.11ac80_ANT1_5530_MCS9_Frequency Band 3

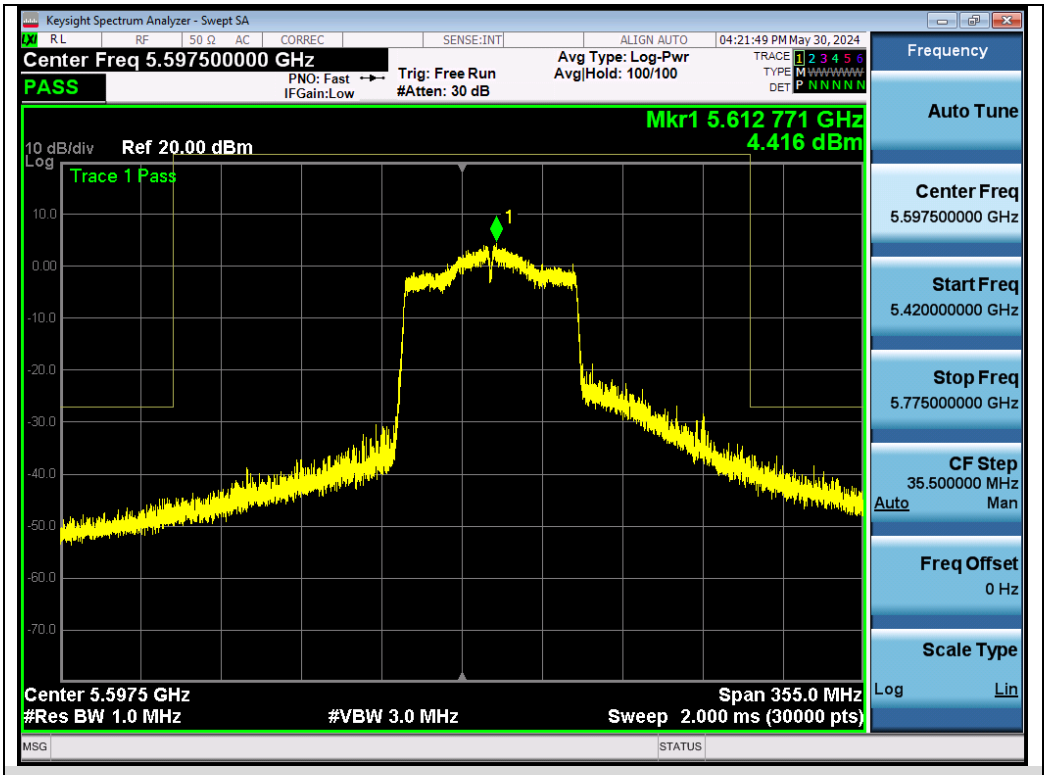


Test_Graph_802.11ac80_ANT1_5530_MCS9_Frequency Band 4



Test_Graph_802.11ac80_ANT1_5610_MCS9_Frequency Band 1

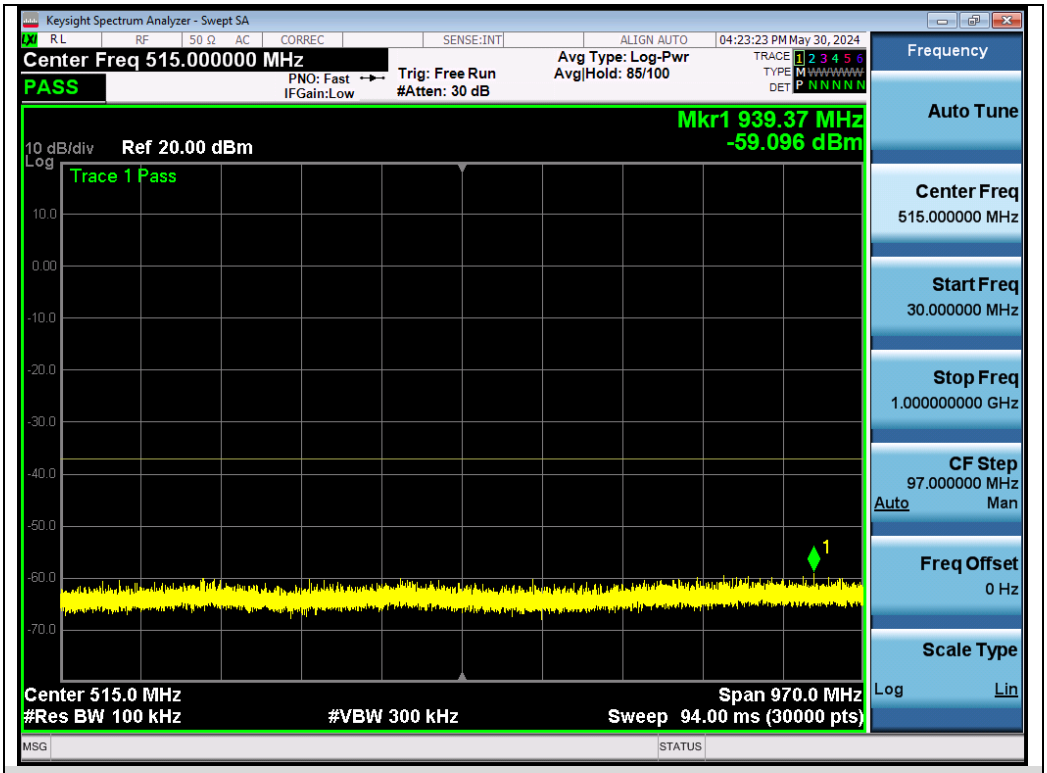
Test_Graph_802.11ac80_ANT1_5610_MCS9_Frequency Band 2



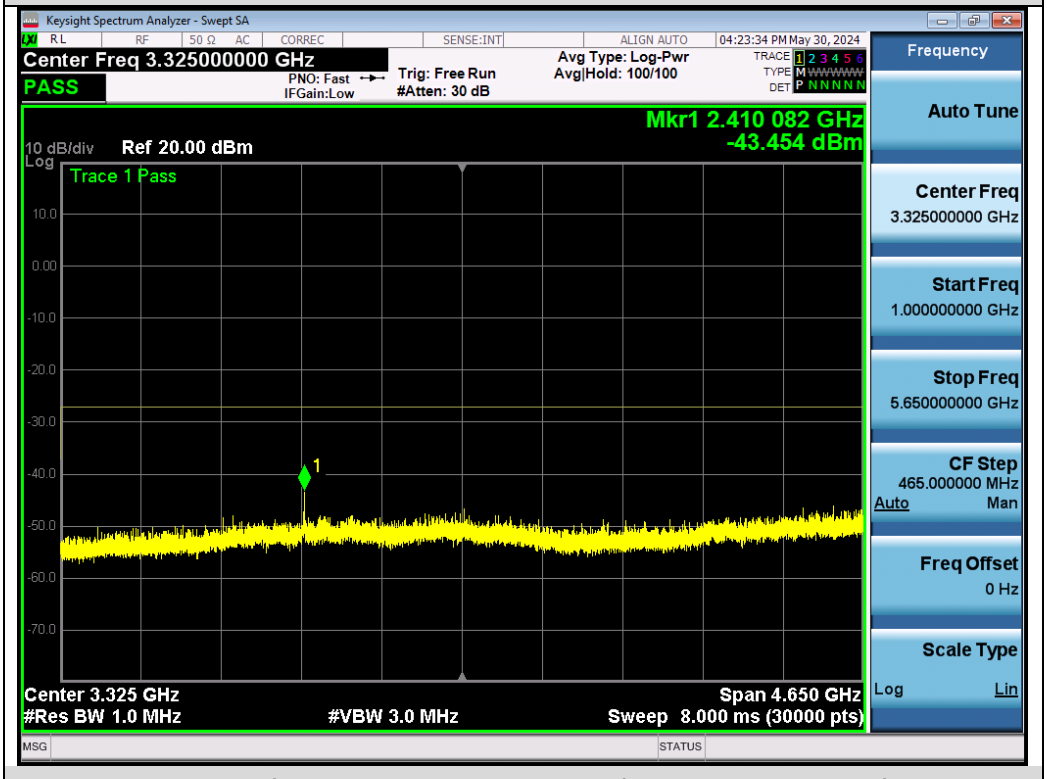
Test_Graph_802.11ac80_ANT1_5610_MCS9_Frequency Band 3

Test_Graph_802.11ac80_ANT1_5610_MCS9_Frequency Band 4

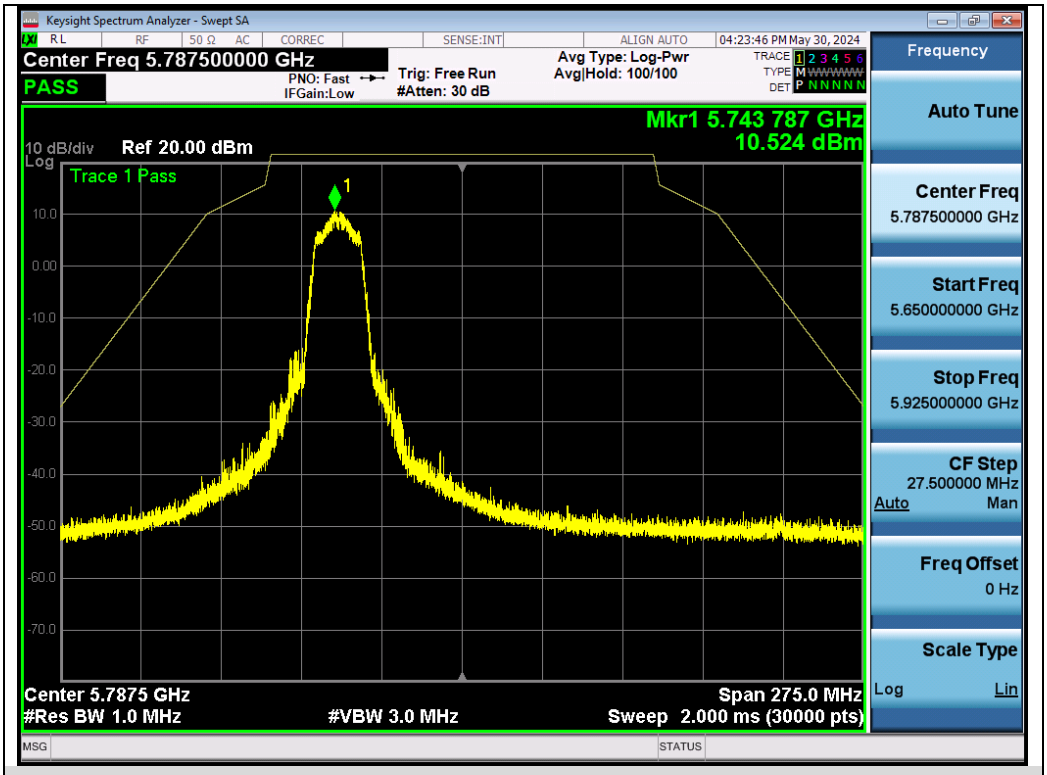
Test Graphs of Spurious Emissions outside of the 5.725-5.85 GHz band for transmitters operating in the 5.725-5.85 GHz band



Test_Graph_802.11a_ANT1_5745_6Mbps_Frequency Band1

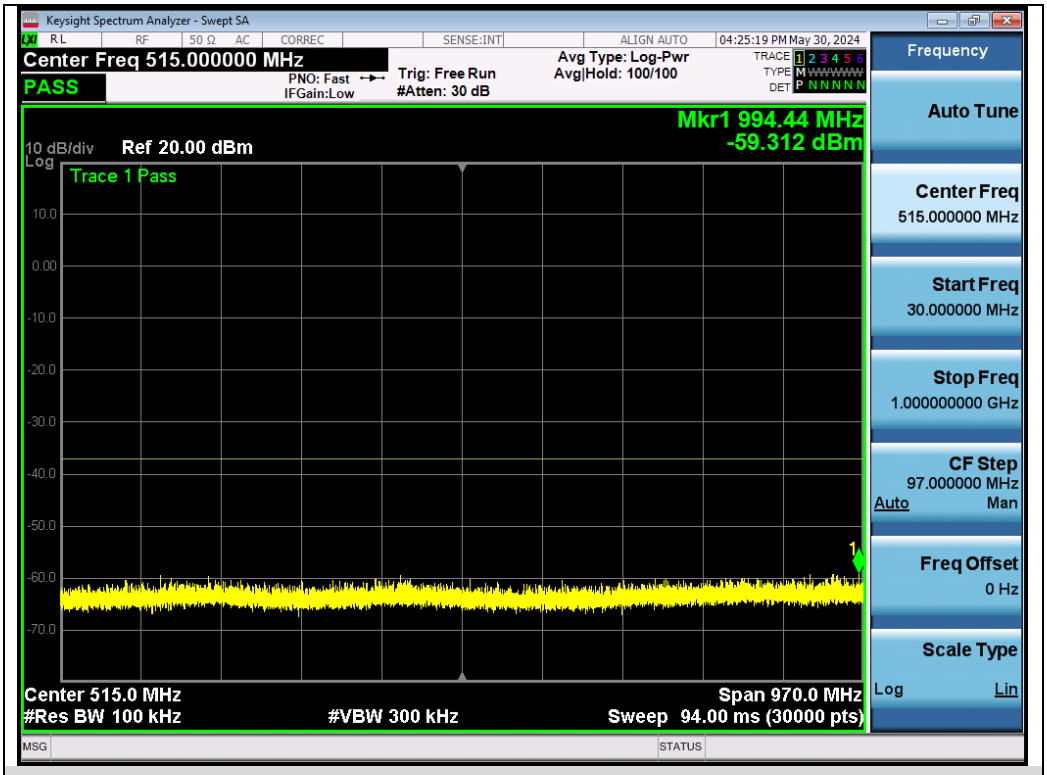


Test_Graph_802.11a_ANT1_5745_6Mbps_Frequency Band2



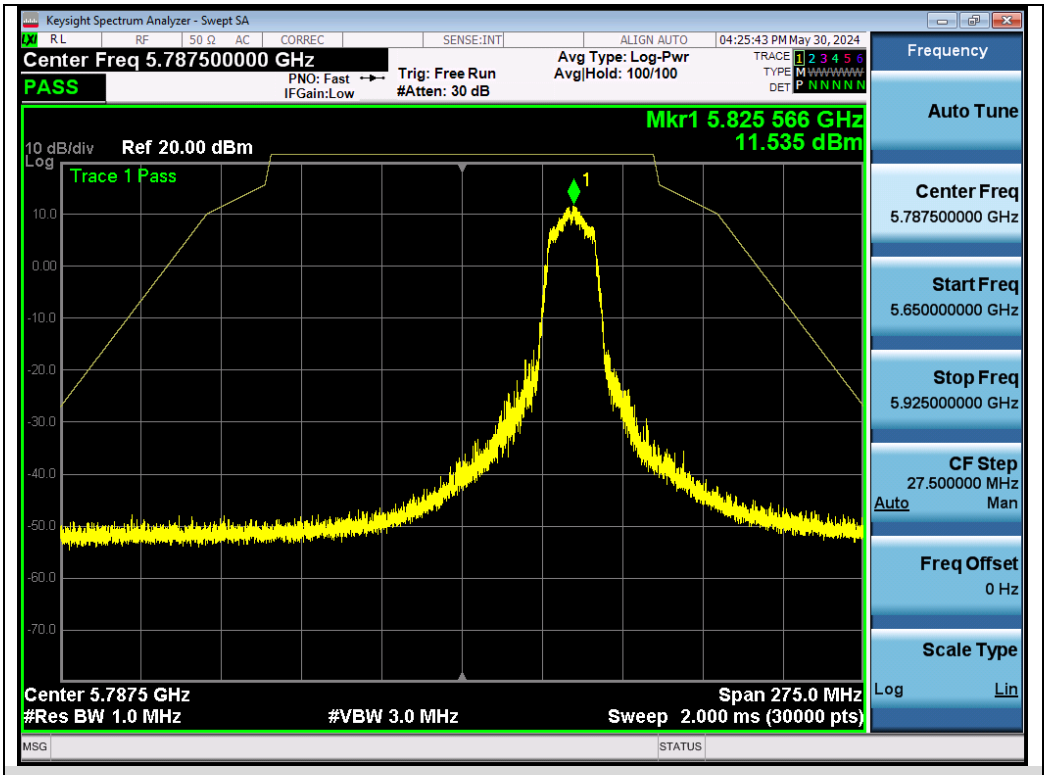
Test_Graph_802.11a_ANT1_5745_6Mbps_Frequency Band3

Test_Graph_802.11a_ANT1_5745_6Mbps_Frequency Band4



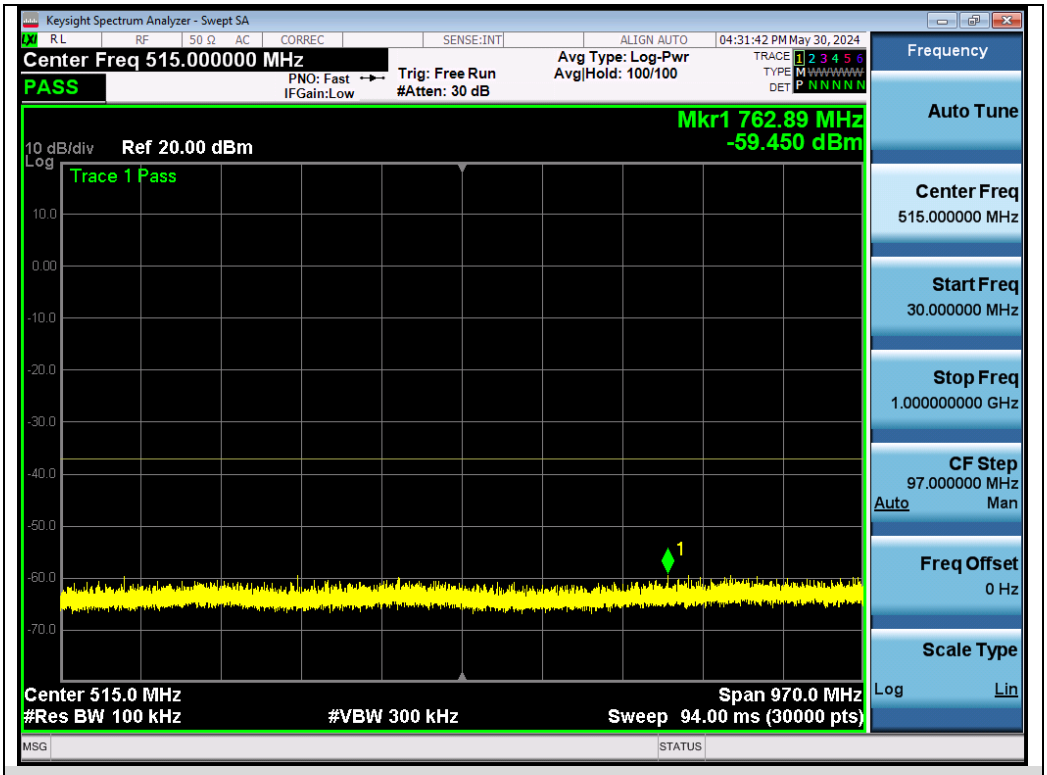
Test_Graph_802.11a_ANT1_5825_6Mbps_Frequency Band1

Test_Graph_802.11a_ANT1_5825_6Mbps_Frequency Band2

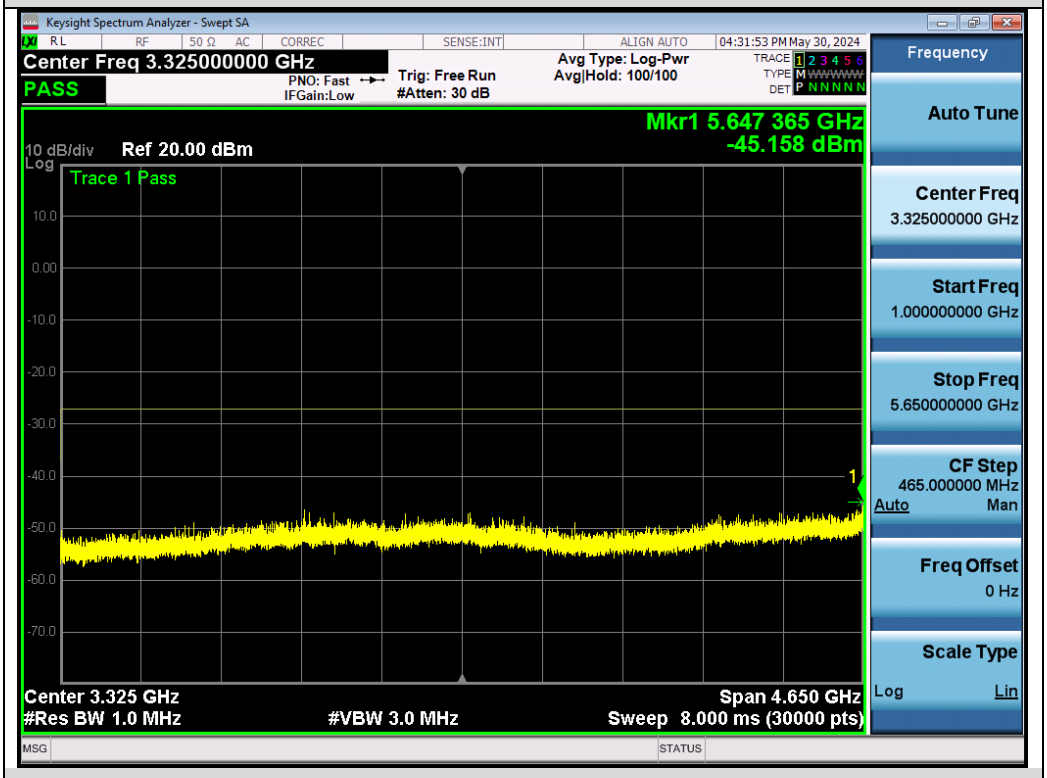


Test_Graph_802.11a_ANT1_5825_6Mbps_Frequency Band3

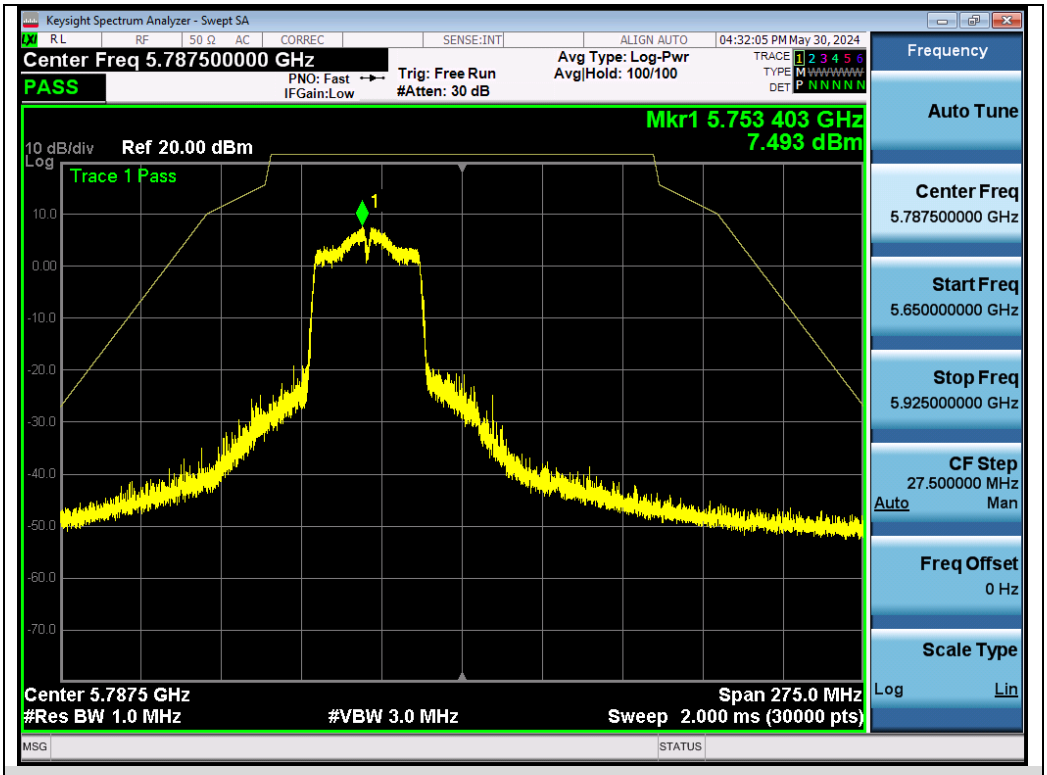
Test_Graph_802.11a_ANT1_5825_6Mbps_Frequency Band4



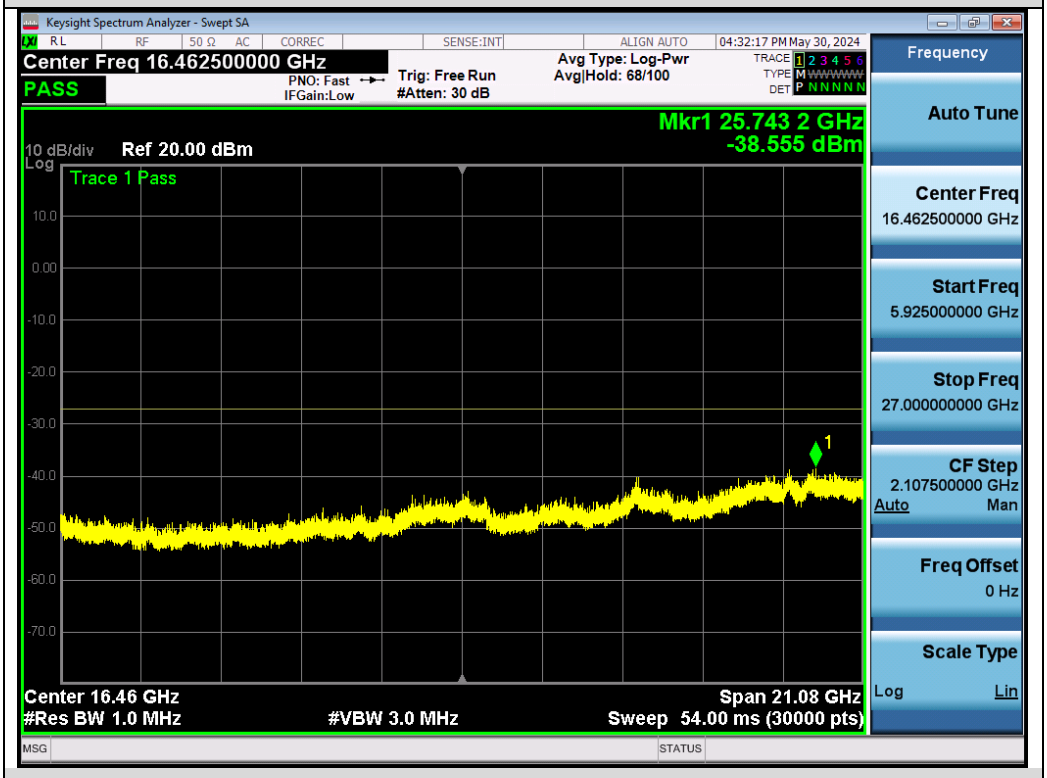
Test_Graph_802.11n40_ANT1_5755_MCS0_Frequency Band1



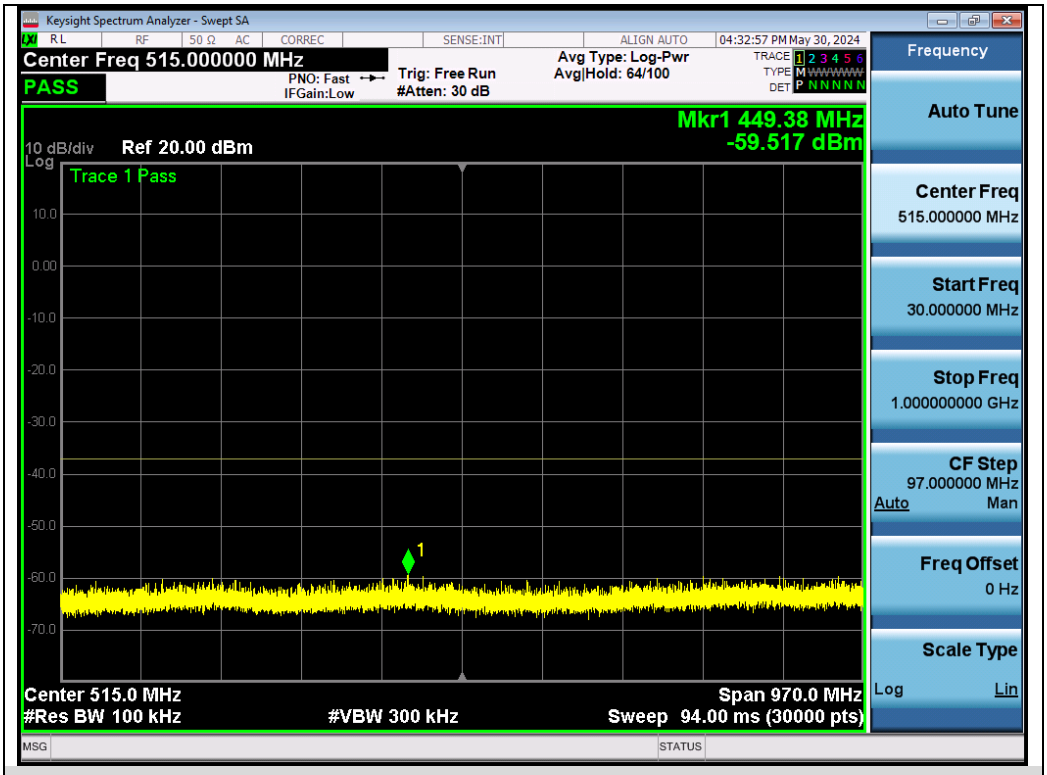
Test_Graph_802.11n40_ANT1_5755_MCS0_Frequency Band2



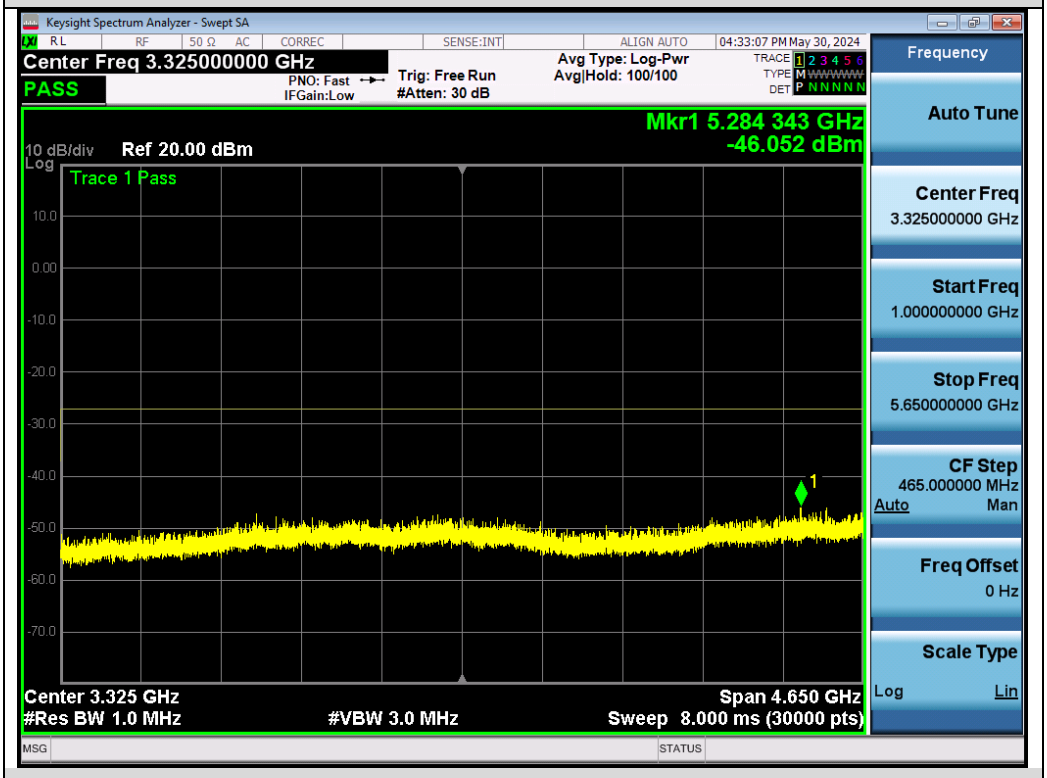
Test_Graph_802.11n40_ANT1_5755_MCS0_Frequency Band3



Test_Graph_802.11n40_ANT1_5755_MCS0_Frequency Band4



Test_Graph_802.11n40_ANT1_5795_MCS0_Frequency Band1



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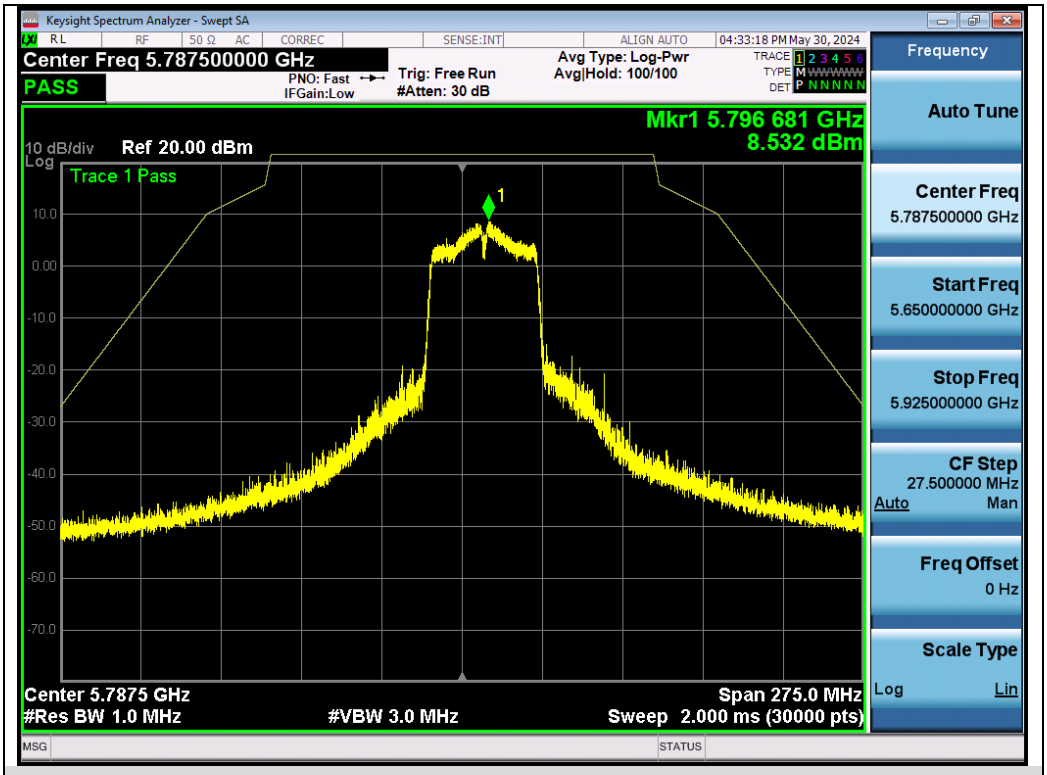
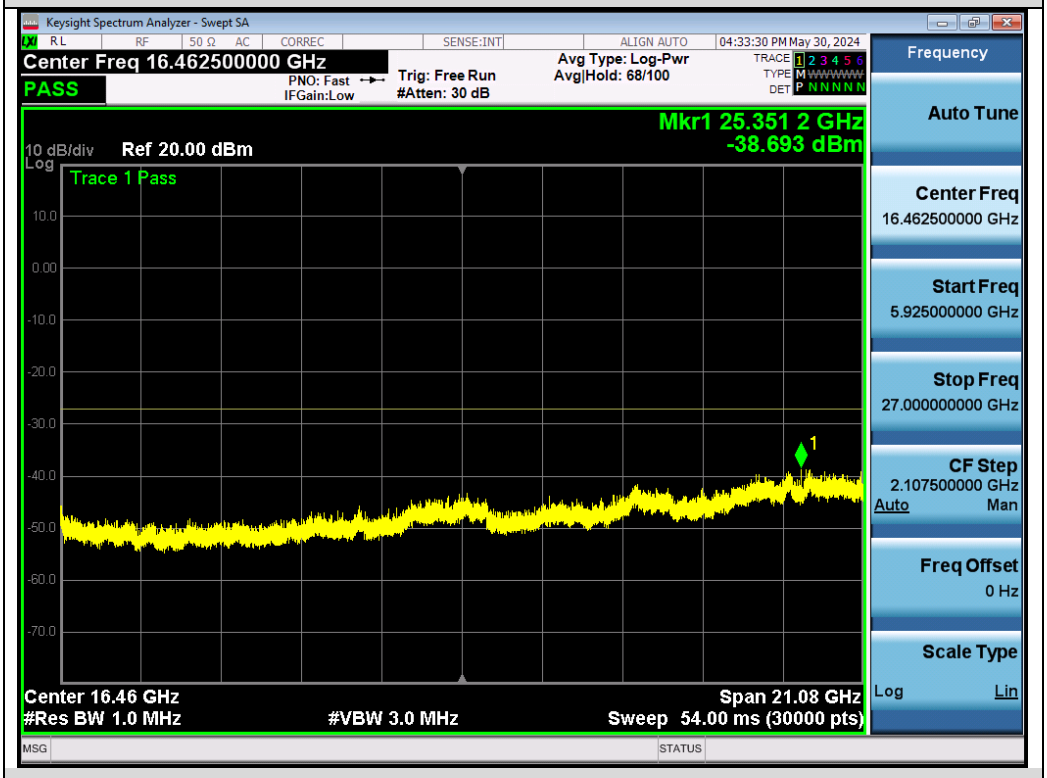
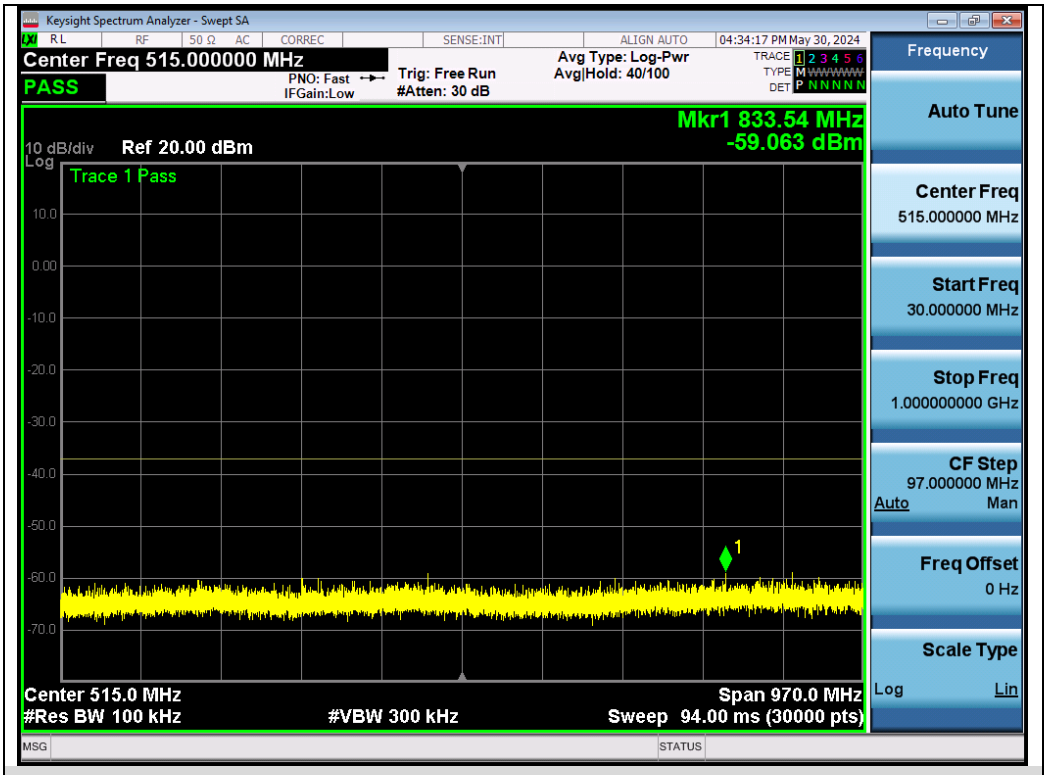


Test_Graph_802.11n40_ANT1_5795_MCS0_Frequency Band3

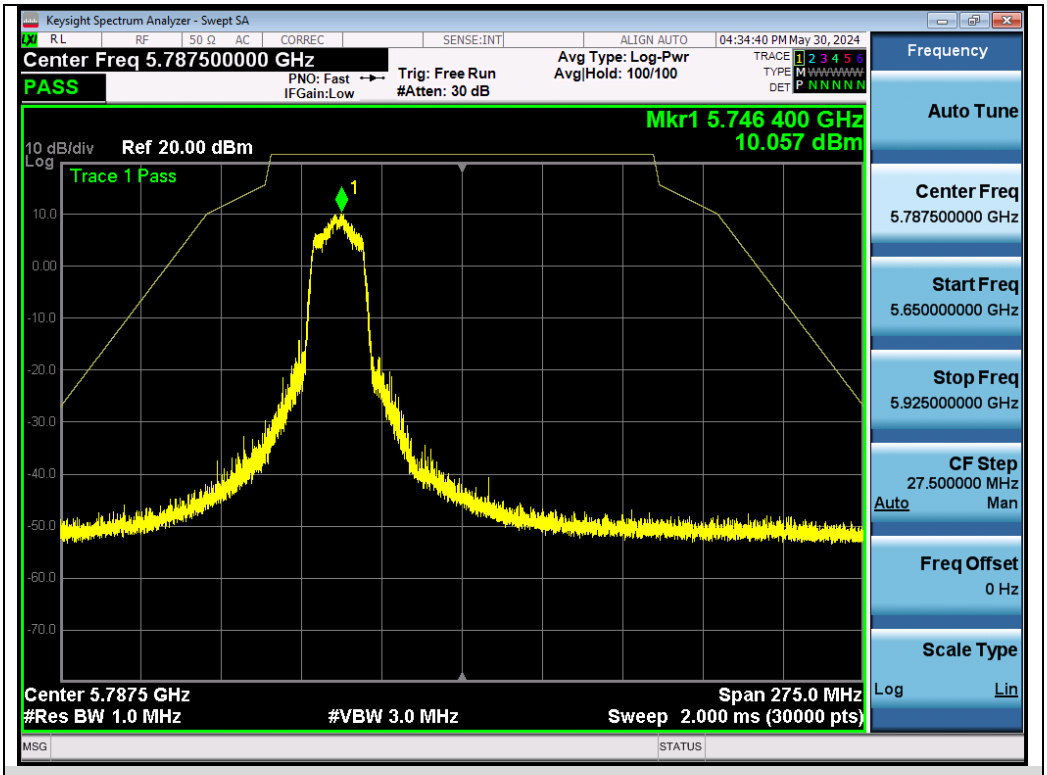


Test_Graph_802.11n40_ANT1_5795_MCS0_Frequency Band4



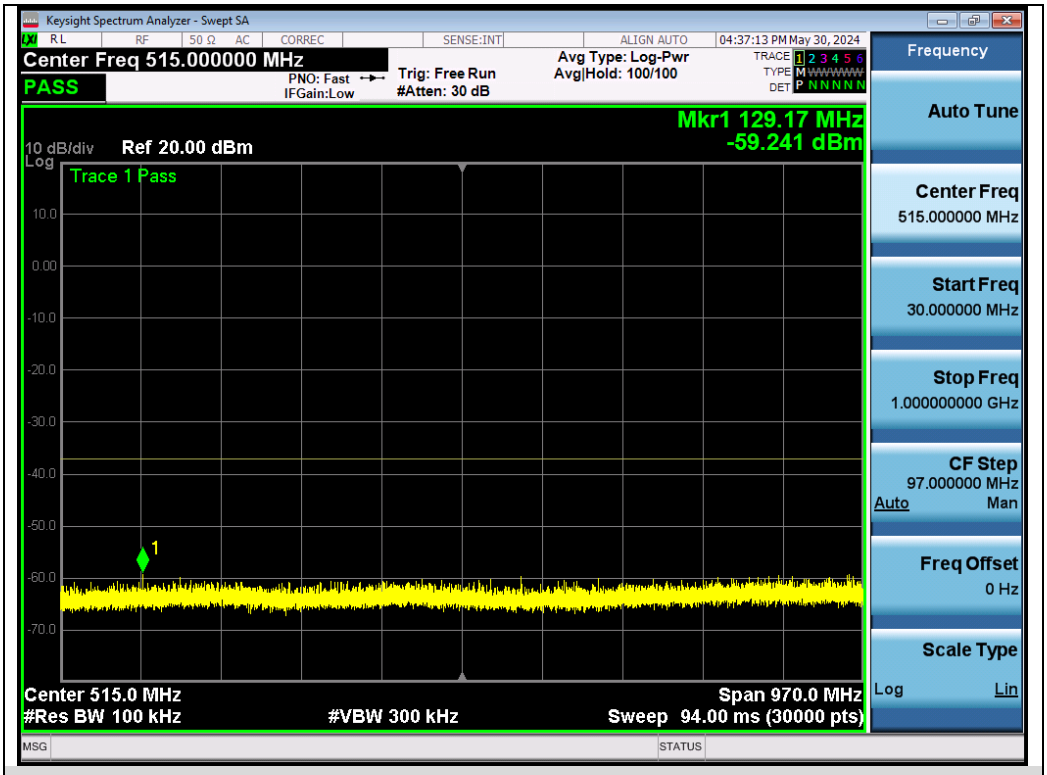
Test_Graph_802.11ac20_ANT1_5745_MCS0_Frequency Band1

Test_Graph_802.11ac20_ANT1_5745_MCS0_Frequency Band2

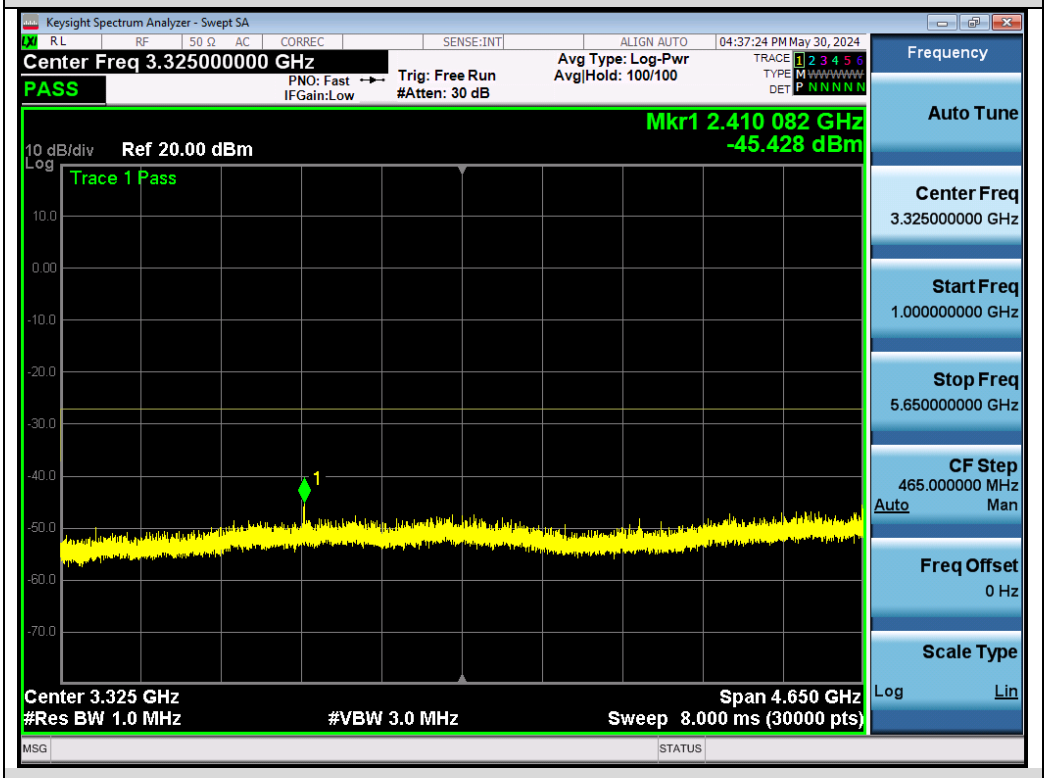


Test_Graph_802.11ac20_ANT1_5745_MCS0_Frequency Band3

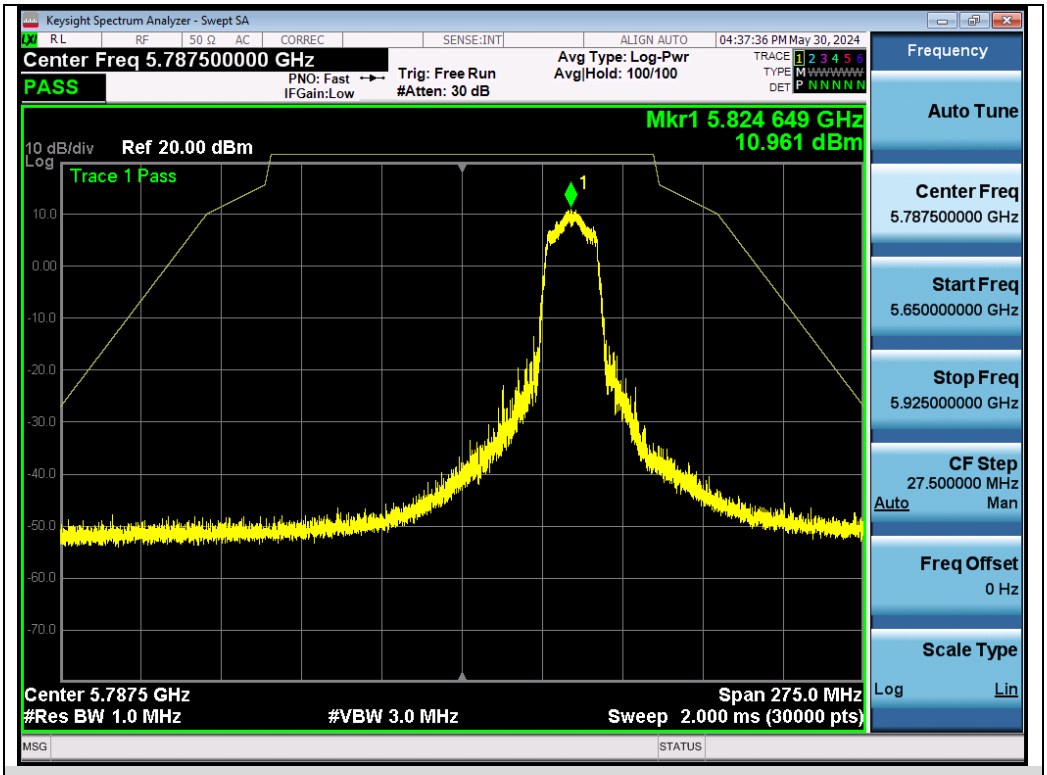
Test_Graph_802.11ac20_ANT1_5745_MCS0_Frequency Band4



Test_Graph_802.11ac20_ANT1_5825_MCS9_Frequency Band1

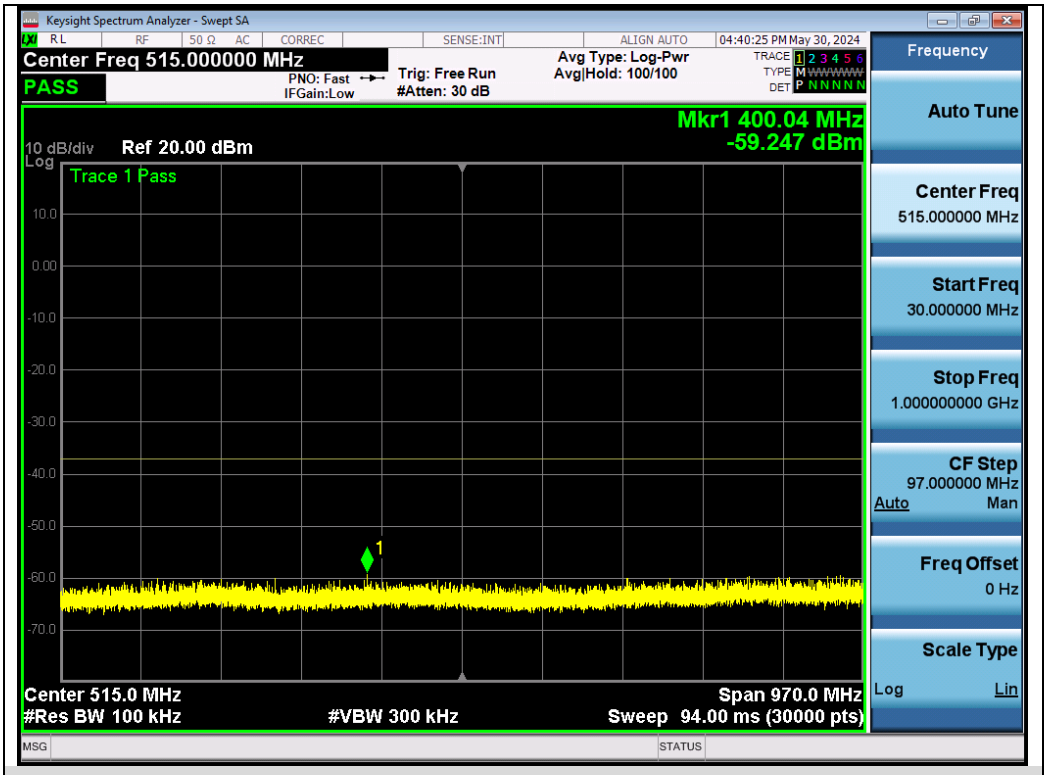


Test_Graph_802.11ac20_ANT1_5825_MCS9_Frequency Band2

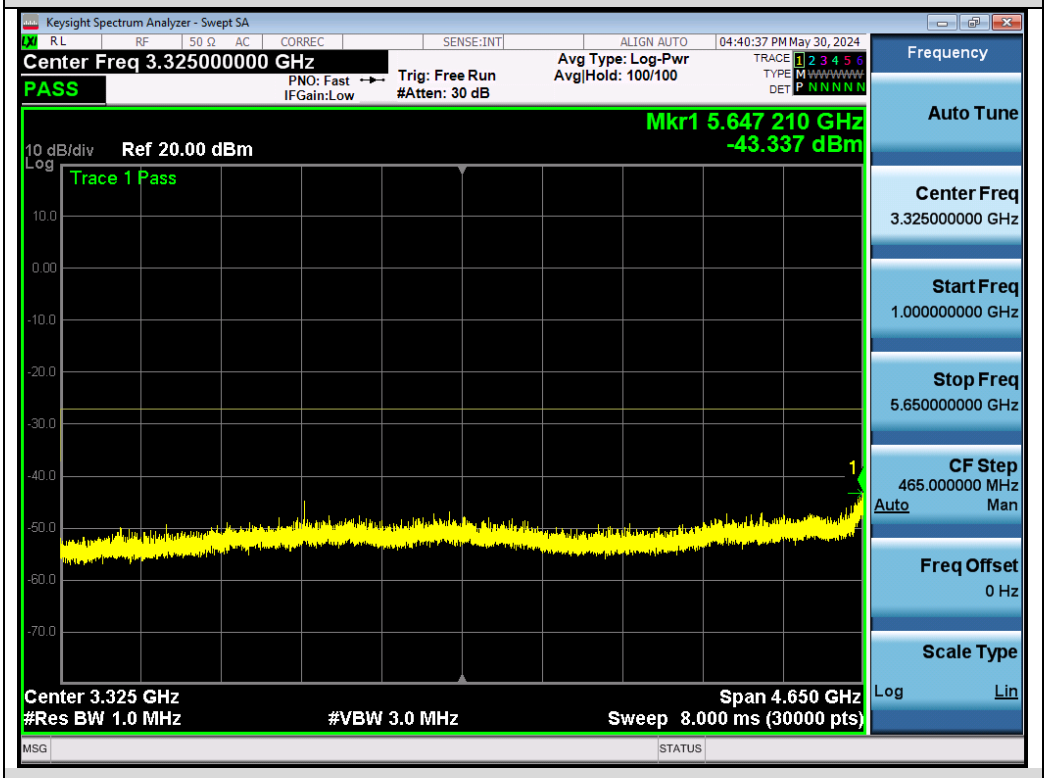


Test_Graph_802.11ac20_ANT1_5825_MCS9_Frequency Band3

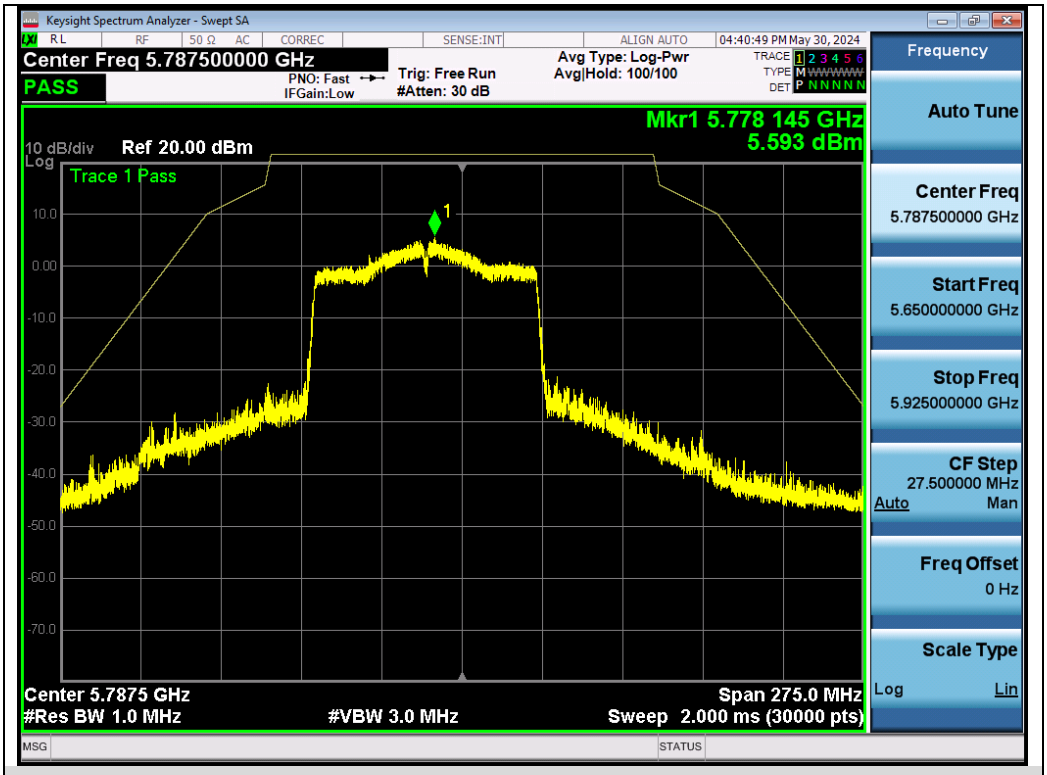
Test_Graph_802.11ac20_ANT1_5825_MCS9_Frequency Band4



Test_Graph_802.11ac80_ANT1_5775_MCS9_Frequency Band1



Test_Graph_802.11ac80_ANT1_5775_MCS9_Frequency Band2



Test_Graph_802.11ac80_ANT1_5775_MCS9_Frequency Band3

Test_Graph_802.11ac80_ANT1_5775_MCS9_Frequency Band4

11. Radiated Spurious Emission

11.1 Measurement Limit

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. 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.

Restricted bands	Applicable to	Limit	
	789033 D02 General UNII Test Procedures New Rules v02r01	Field strength at 3m (dBuV/m)	
		PK: 74	AV: 54
Out of the restricted bands	Applicable to	EIRP Limit (dBm/MHz)	Equivalent field Strength at 3m (dBuV/m)
	FCC 15.407(b)(1)	PK: -27	PK: 68.2
	15.407(b)(2)		
	15.407(b)(3)		
	15.407(b)(4)	See Note 2	

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30 P}}{3}$$ μV/m, where P is the eirp (Watts).

Note 2: 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 25 MHz 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 27 dBm/MHz at the band edge.

11.2 Measurement Procedure

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. 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.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

The following table is the setting of spectrum analyzer and receiver.

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.Section G) Unwanted emissions measurement.

◆ **Procedure for Unwanted Emissions Measurements Below 1000MHz:**

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

◆ **Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz:**

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

◆ **Procedures for Average Unwanted Emissions Measurements Above 1000MHz:**

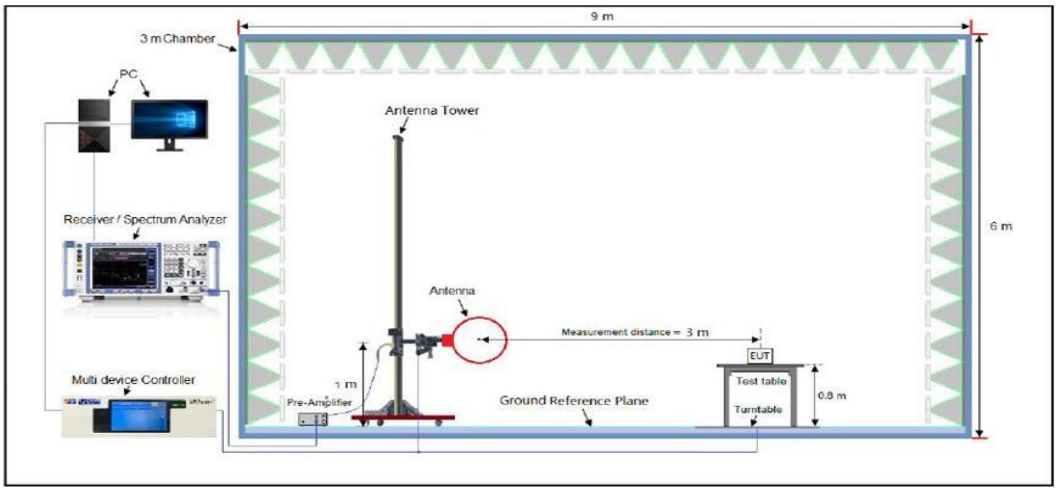
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

◆ **Procedures for Average Unwanted Emissions Measurements Above 1000MHz:**

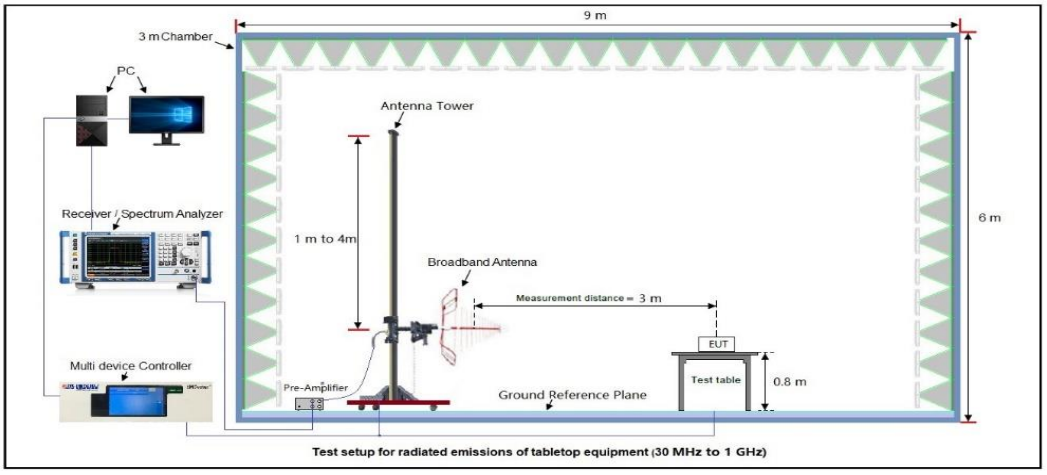
- RBW = 1 MHz
- VBW = 3 MHz • Detector = power averaging (rms), set span/(# of points in sweep) ≥ RBW/2.
- Averaging type = power averaging (RMS)
- The correction factor shall be offset is 10 log (1/x), where x is the duty cycle.

11.3 Measurement Setup (Block Diagram of Configuration)

Radiated Emission Test Setup 9kHz-30MHz

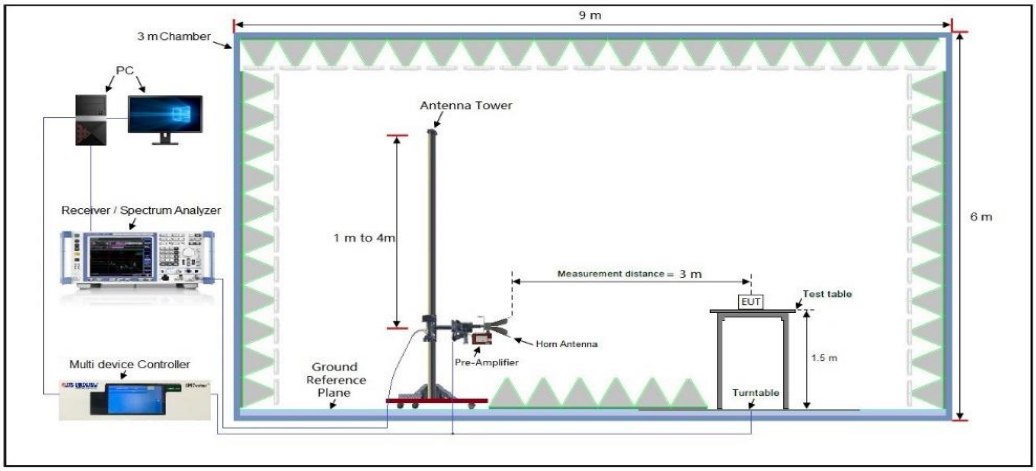


Radiated Emission Test Setup 30MHz-1000MHz



Test setup for radiated emissions of tabletop equipment (30 MHz to 1 GHz)

Radiated Emission Test Setup Above 1000MHz

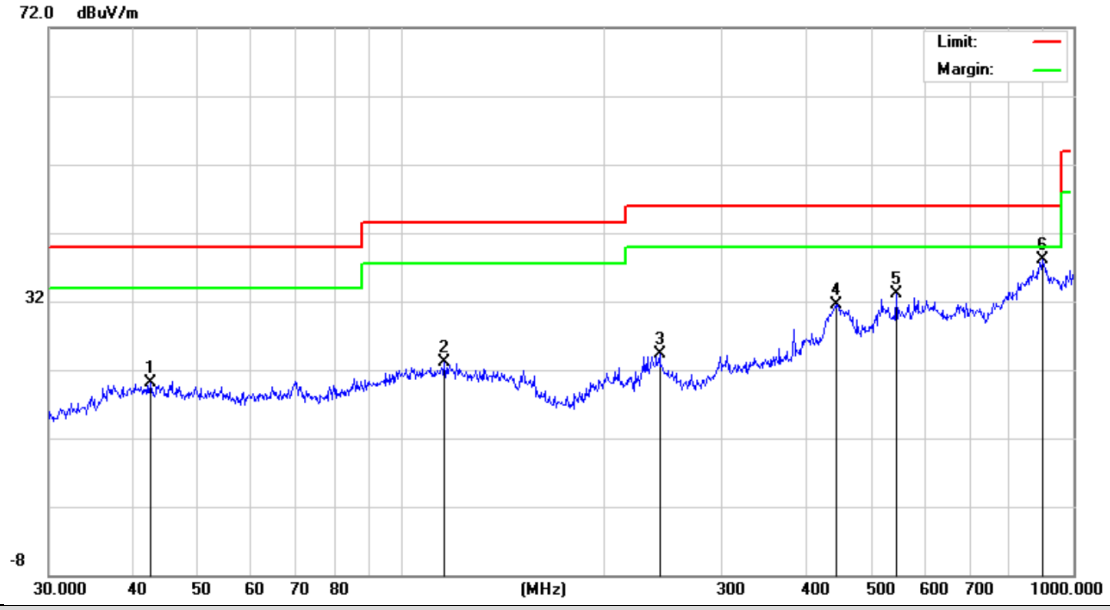


11.4 Measurement Result

Radiated Emission Below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable Wi-Fi Phone	**Model Name**	W601W
Temperature	22.8℃	**Relative Humidity**	57.1%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	802.11n(20MHz)_5180MHz	**Antenna**	Horizontal

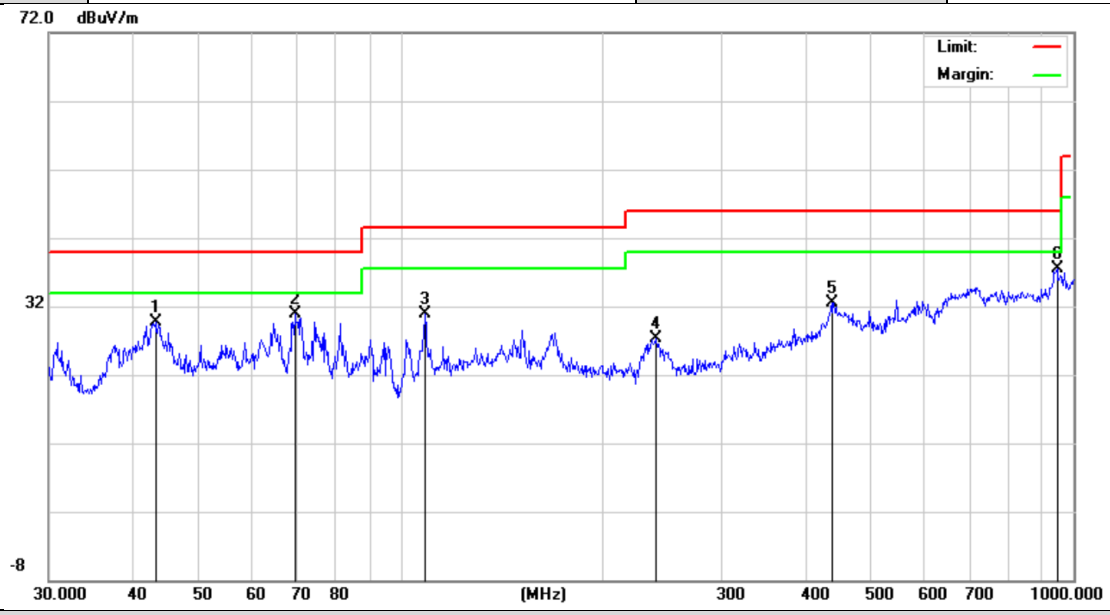


Final Data List _Peak

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.4508	20.14	13.73	40.00	19.86	100	180	Horizontal
2	116.1321	23.18	16.36	43.50	20.32	100	210	Horizontal
3	242.5253	24.23	15.32	46.00	21.77	100	90	Horizontal
4	443.2943	31.59	24.98	46.00	14.41	100	120	Horizontal
5	545.1826	33.02	23.98	46.00	12.98	100	170	Horizontal
6	900.1474	38.13	31.78	46.00	7.87	100	150	Horizontal

Result: Pass

Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable Wi-Fi Phone	**Model Name**	W601W
Temperature	22.8℃	**Relative Humidity**	57.1%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	802.11n(20MHz)_5180MHz	**Antenna**	Vertical

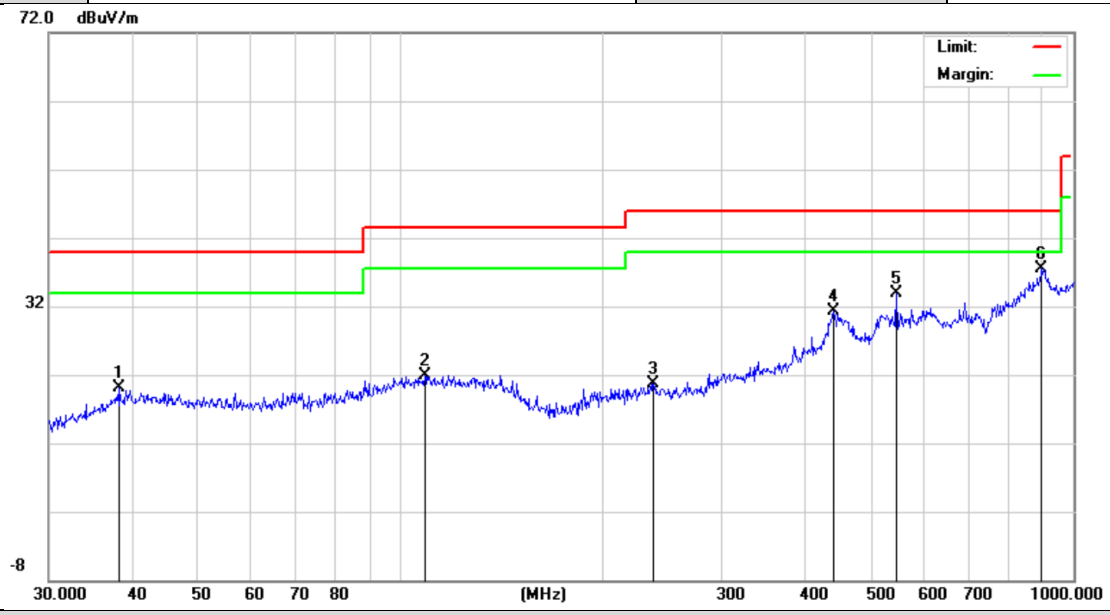


Final Data List _Peak

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	43.2017	29.76	16.93	40.00	10.24	100	220	Vertical
2	69.6005	30.91	17.00	40.00	9.09	100	180	Vertical
3	108.6470	30.91	15.71	43.50	12.59	100	90	Vertical
4	239.9874	27.21	16.23	46.00	18.79	100	200	Vertical
5	437.1199	32.56	25.64	46.00	13.44	100	190	Vertical
6	945.4399	37.42	30.78	46.00	8.58	100	170	Vertical

Result: Pass

Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable Wi-Fi Phone	**Model Name**	W601W
Temperature	22.8℃	**Relative Humidity**	57.1%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 2#
Test Mode	802.11n(20MHz)_5180MHz	**Antenna**	Horizontal

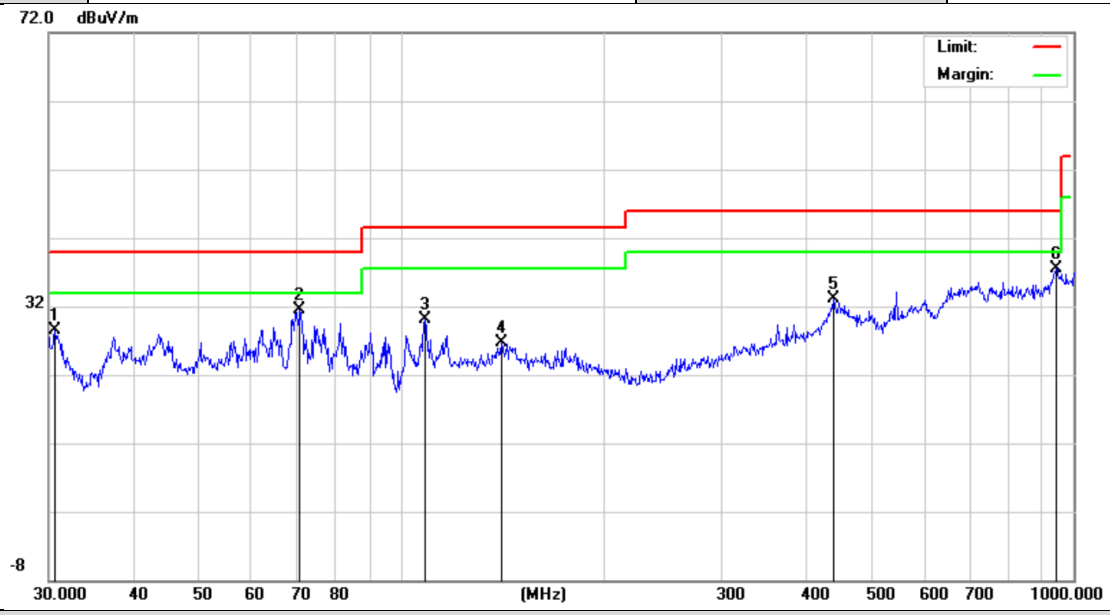


Final Data List _Peak

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	38.2120	20.18	13.13	40.00	19.82	100	170	Horizontal
2	108.6470	21.87	16.29	43.50	21.63	100	180	Horizontal
3	237.4760	20.78	15.27	46.00	25.22	100	100	Horizontal
4	440.1963	31.26	25.09	46.00	14.74	100	200	Horizontal
5	545.1826	33.90	23.98	46.00	12.1	100	190	Horizontal
6	896.9965	37.56	31.42	46.00	8.44	100	220	Horizontal

Result: Pass

Radiated Emission Test Results at 30MHz-1GHz			
EUT Name	Portable Wi-Fi Phone	**Model Name**	W601W
Temperature	22.8℃	**Relative Humidity**	57.1%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 2#
Test Mode	802.11n(20MHz)_5180MHz	**Antenna**	Vertical



Final Data List _Peak

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.6379	28.52	13.81	40.00	11.48	100	220	Vertical
2	70.8315	31.57	16.99	40.00	8.43	100	170	Vertical
3	108.6470	30.11	15.71	43.50	13.39	100	80	Vertical
4	141.3298	26.79	18.20	43.50	16.71	100	90	Vertical
5	440.1963	33.16	26.09	46.00	12.84	100	120	Vertical
6	942.1305	37.41	30.91	46.00	8.59	100	140	Vertical

Result: Pass

Note:

1. Factor=Antenna Factor + Cable loss, Margin= Limit-Measurement.
2. All test modes had been pre-tested, Refer to Chapter 5 of the report for details.

Radiated Emissions Test Results Above 1GHz

EUT Name	Portable Wi-Fi Phone	**Model Name**	W601W
Temperature	22.8℃	**Relative Humidity**	57.1%
Pressure	960hPa	**Test Voltage**	DC 5V by adapter 1#
Test Mode	802.11n20_5180MHz	**Antenna**	Horizontal/Vertical

Radiated Emission Above 1GHz–Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10360.000	48.14	9.14	57.28	68.20	-10.92	peak
15540.000	47.24	10.22	57.46	74.00	-16.54	peak
15540.000	32.98	10.22	43.20	54.00	-10.80	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Radiated Emission Above 1GHz–Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10360.000	47.51	9.14	56.65	68.20	-11.55	peak
15540.000	46.33	10.22	56.55	74.00	-17.45	peak
15540.000	31.05	10.22	41.27	54.00	-12.73	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Result: Pass