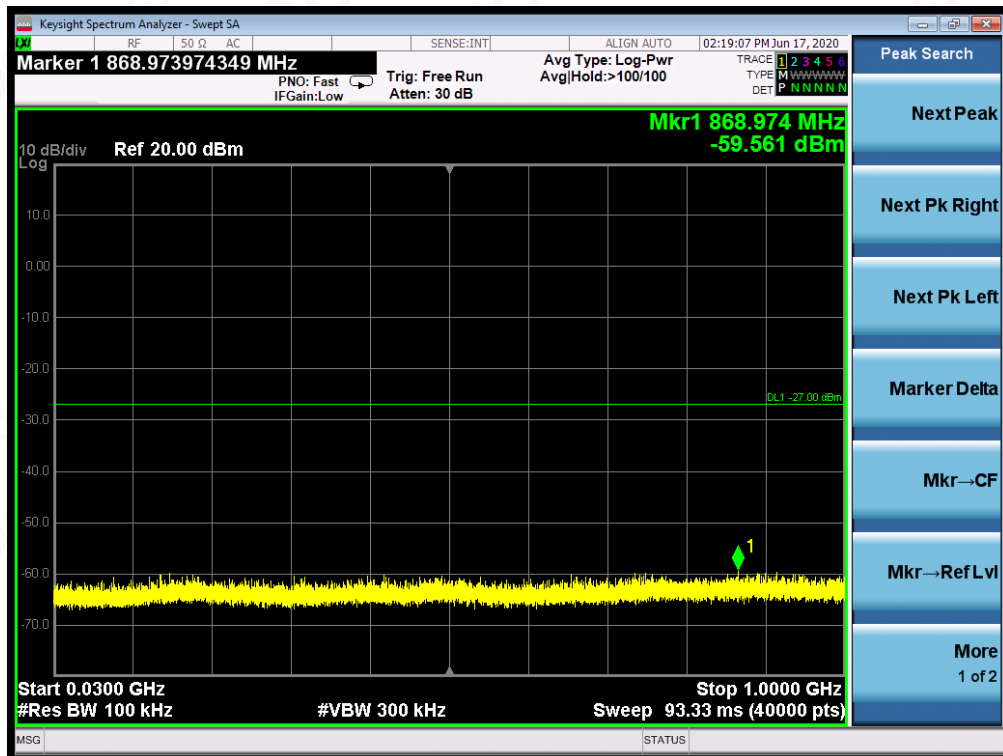
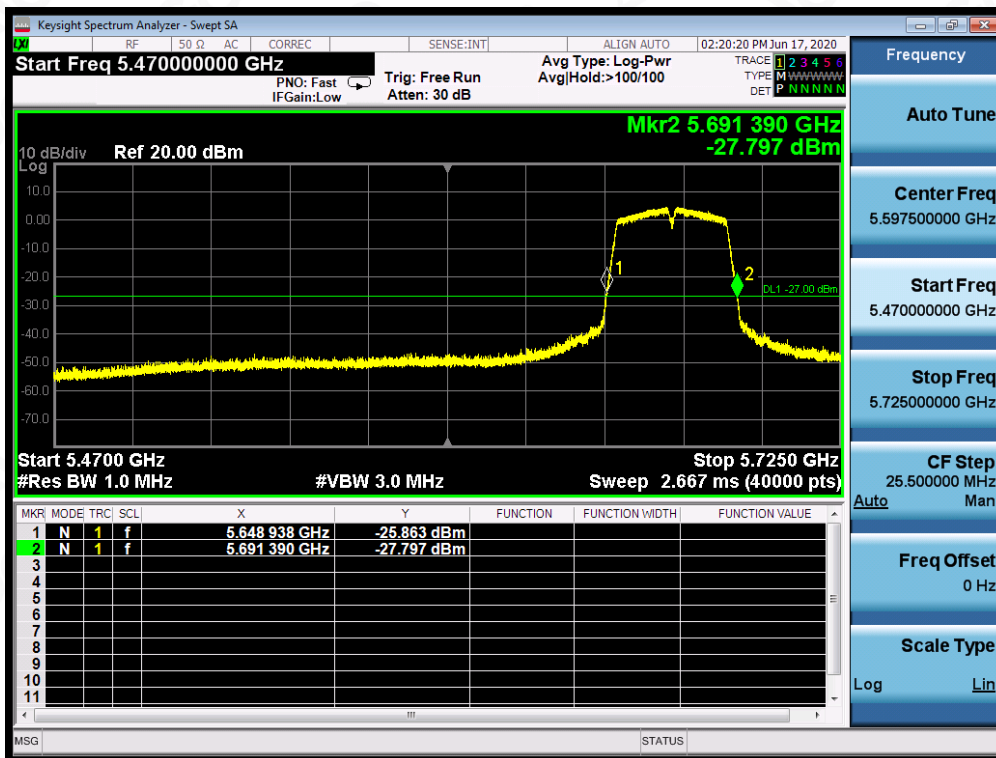
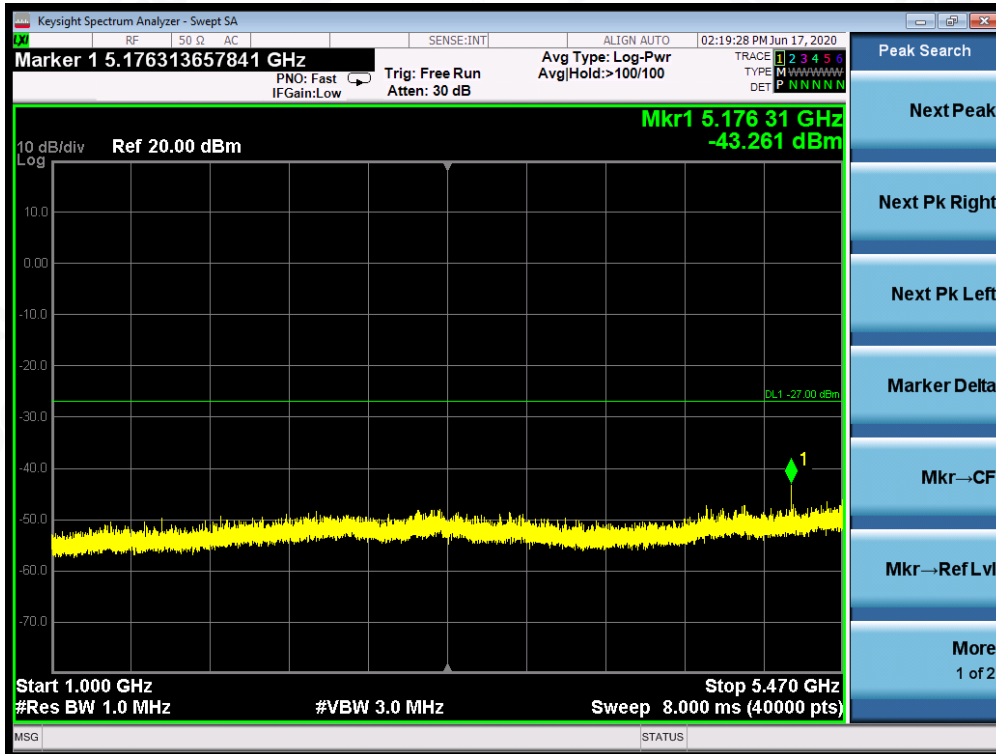
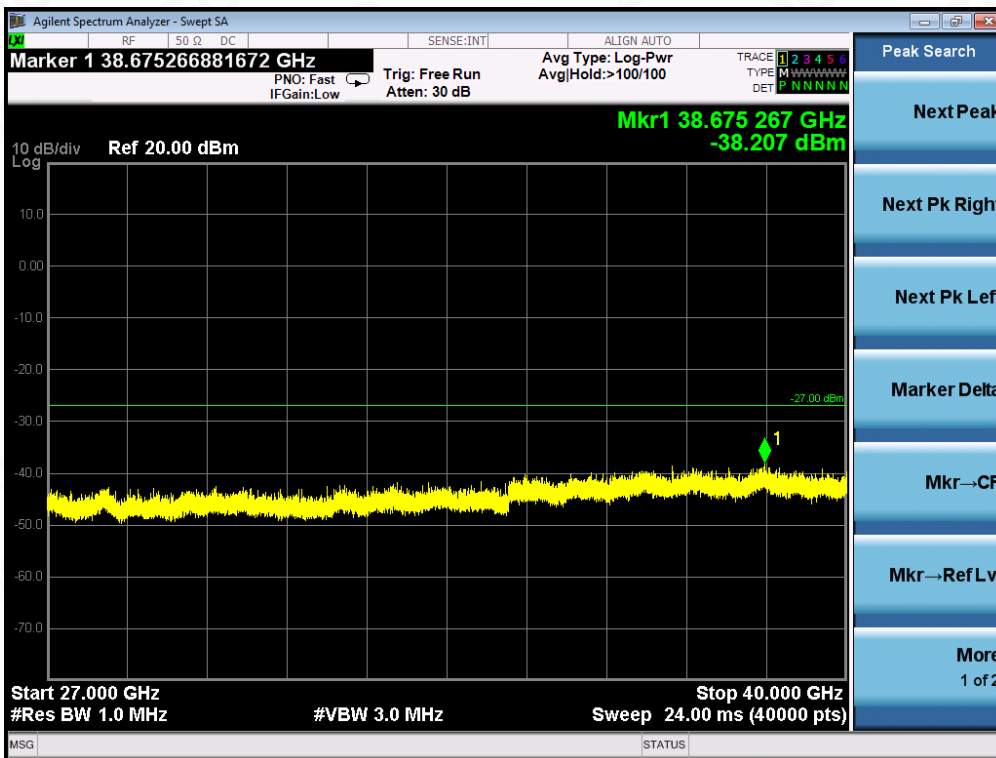


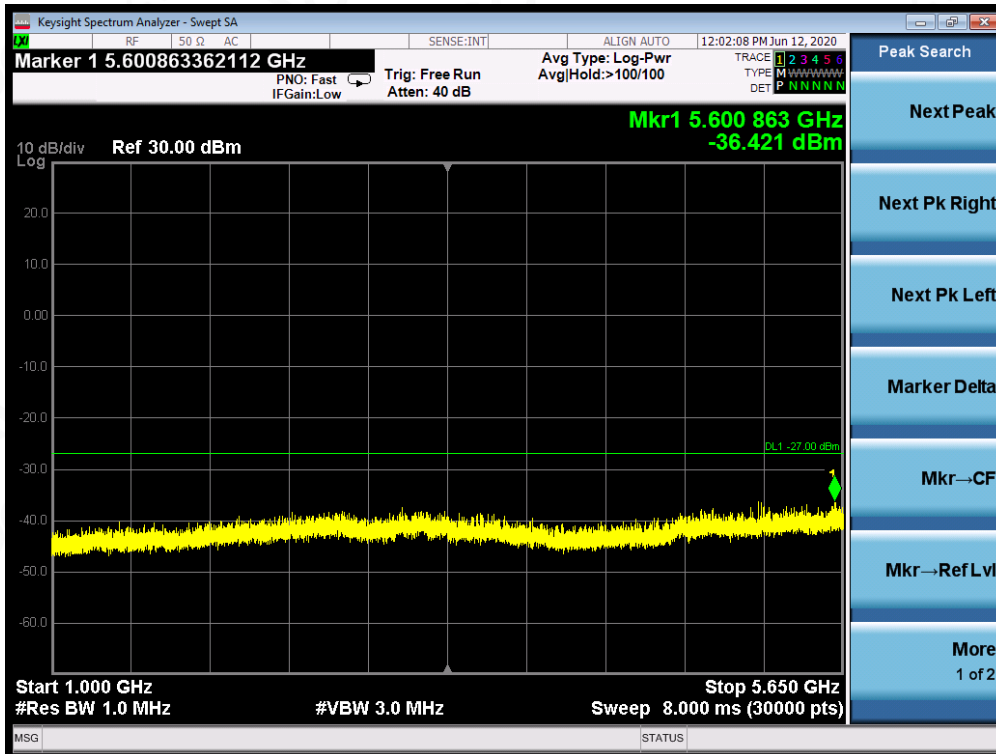
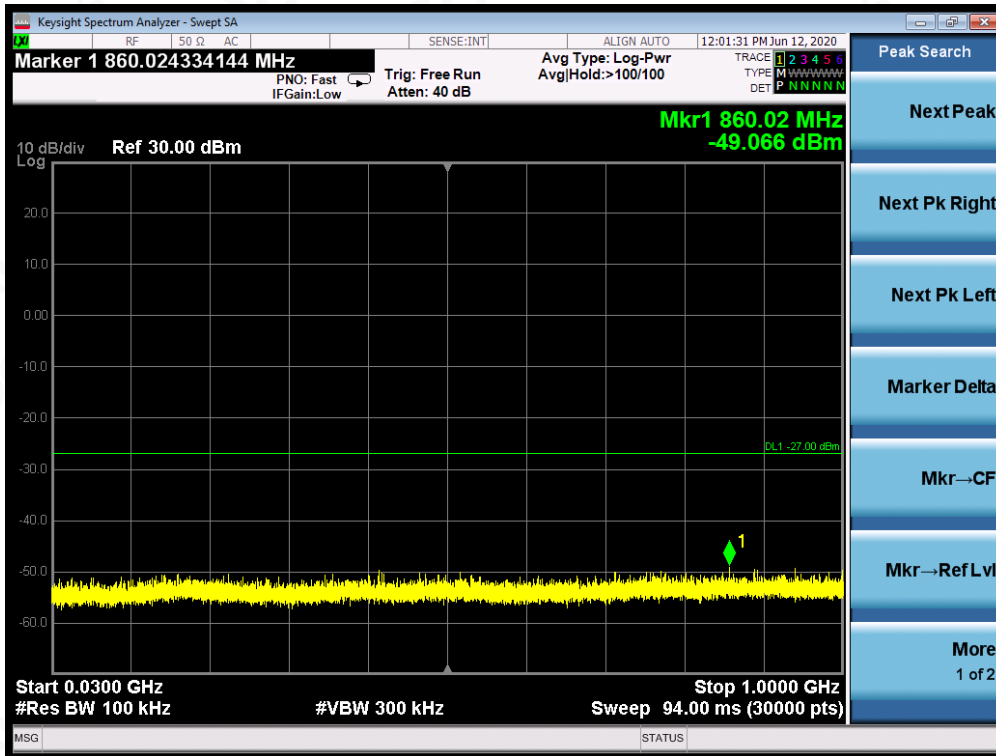
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5670MHz

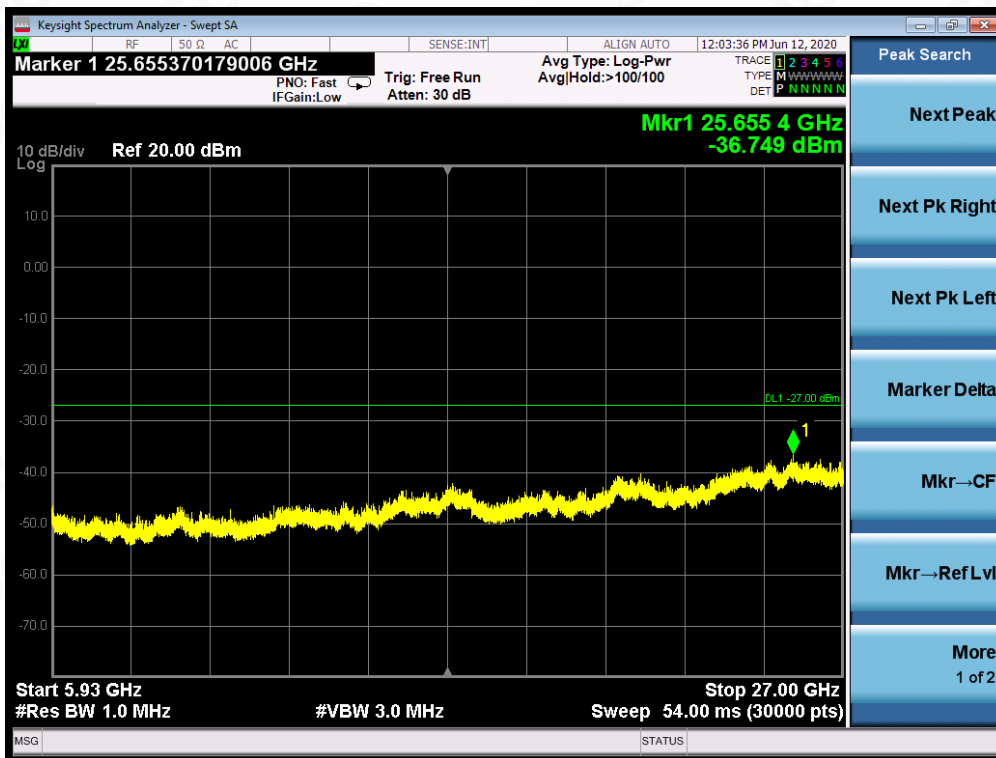
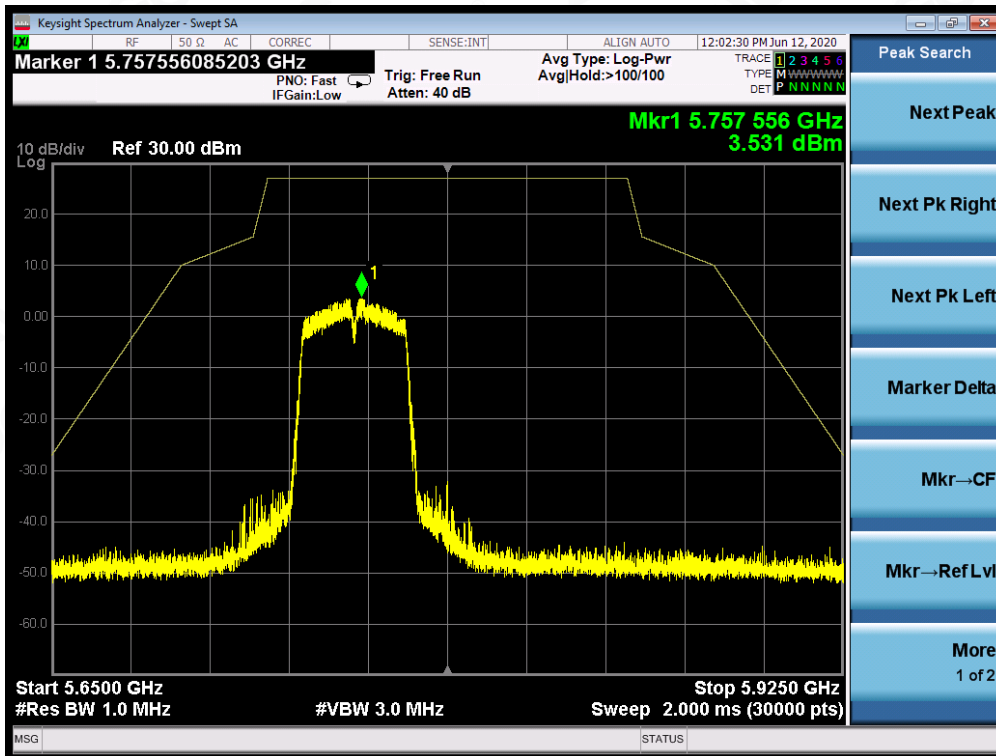


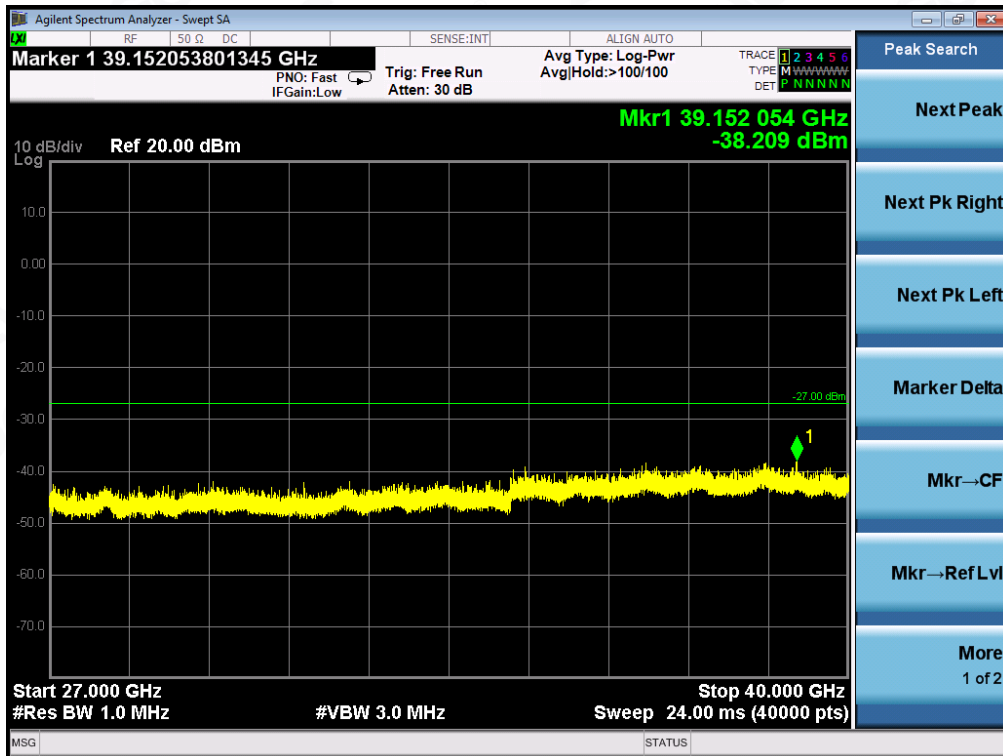




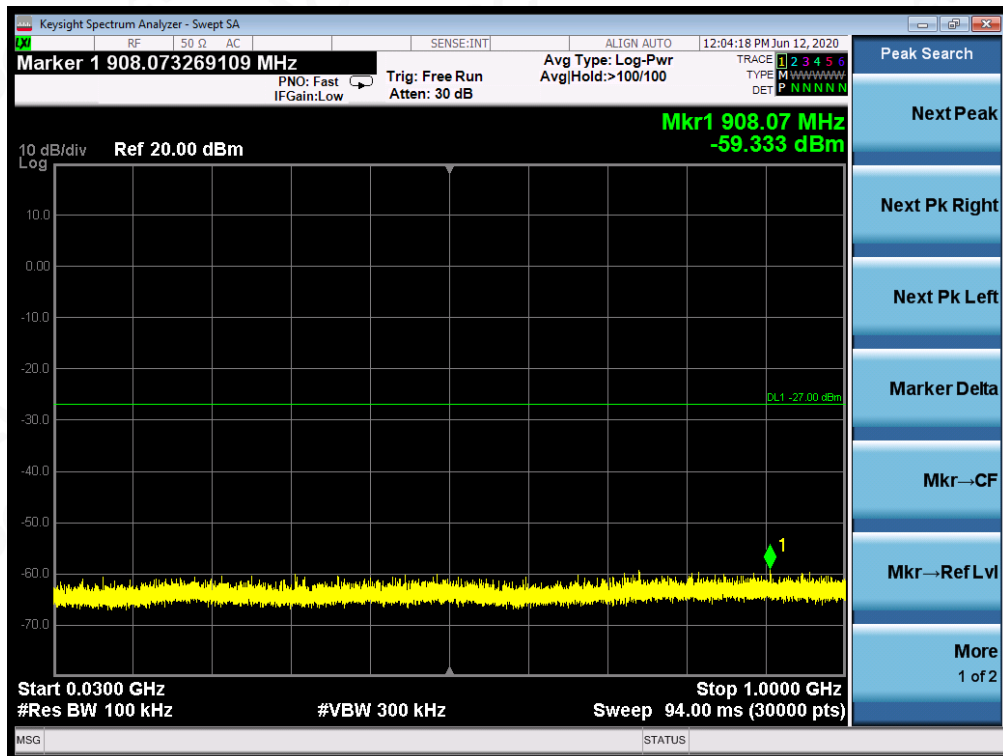
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5755MHz

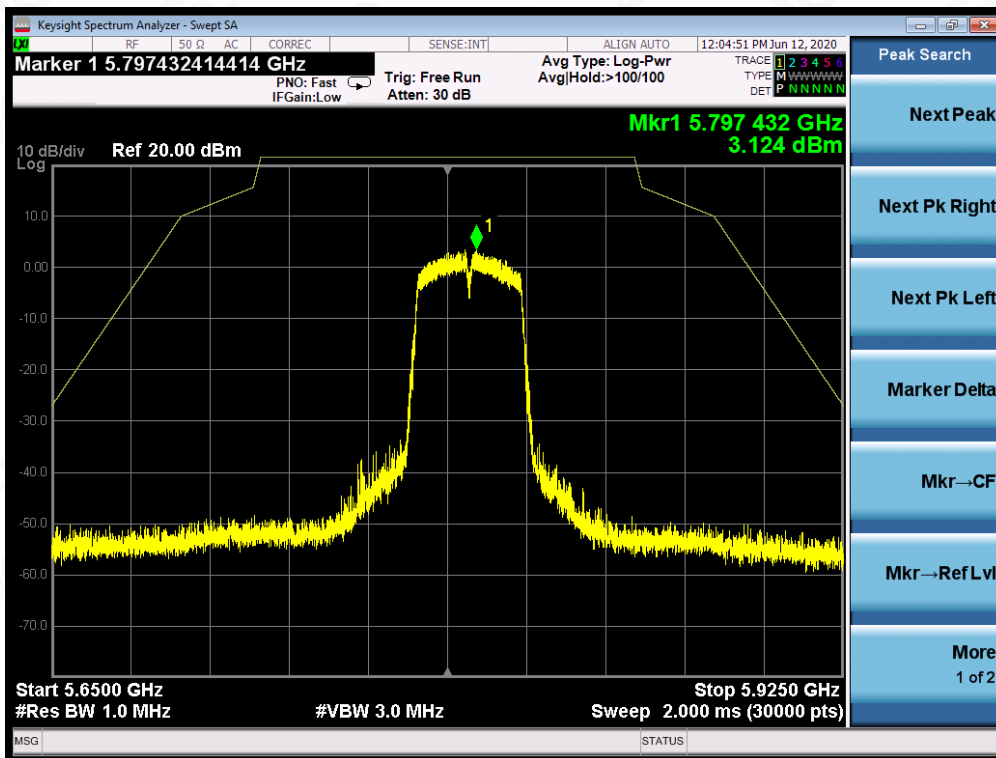
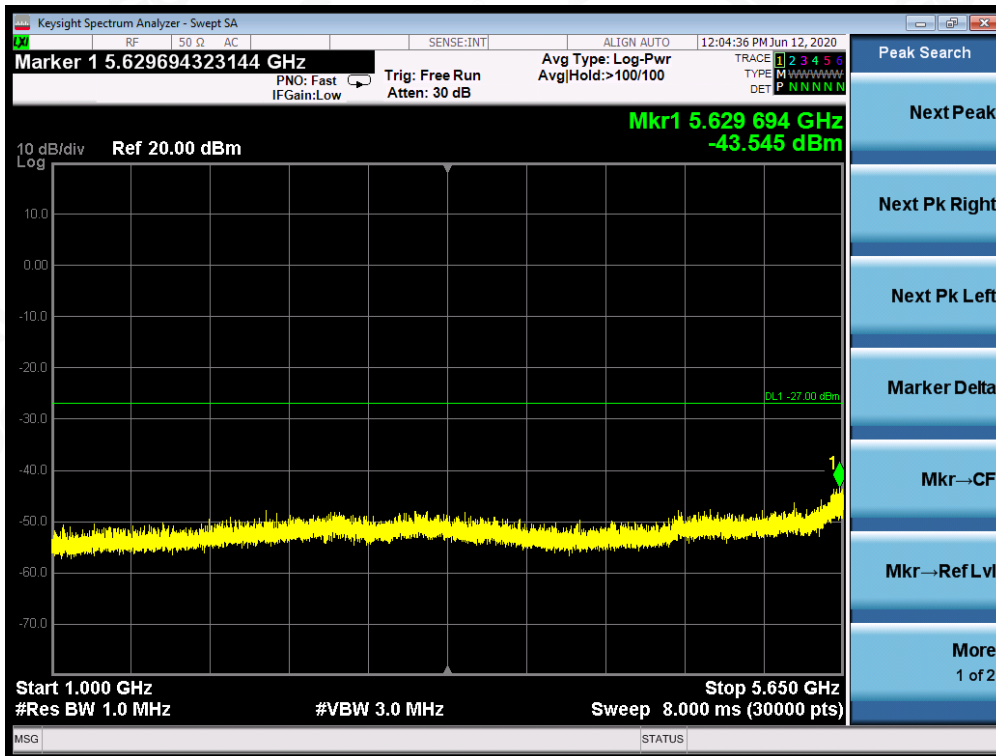


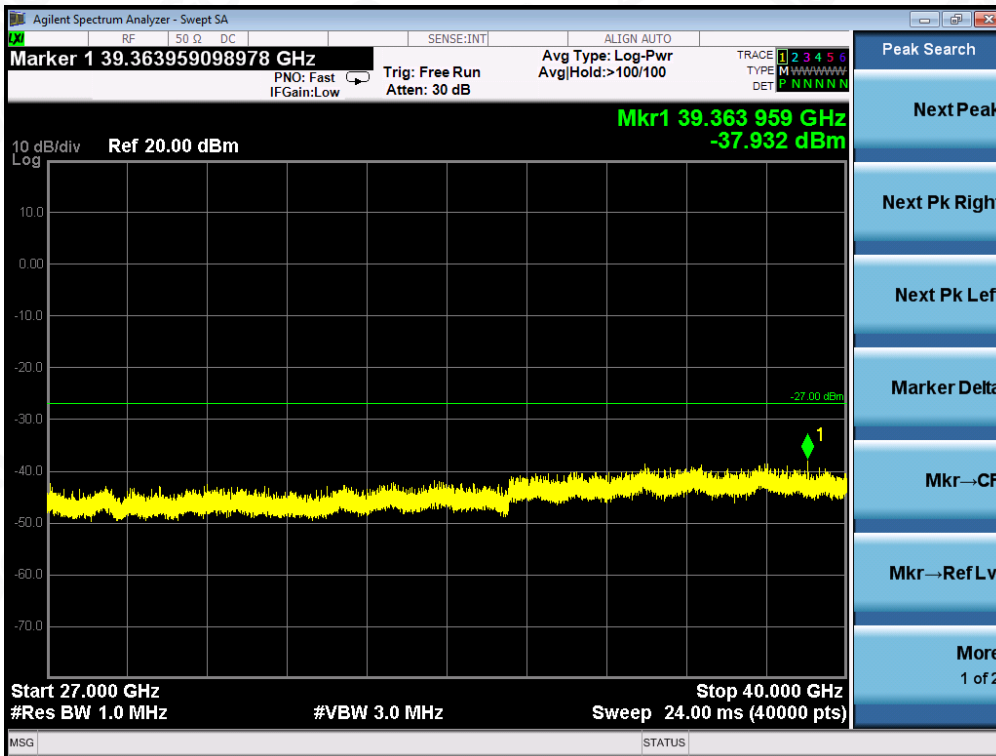
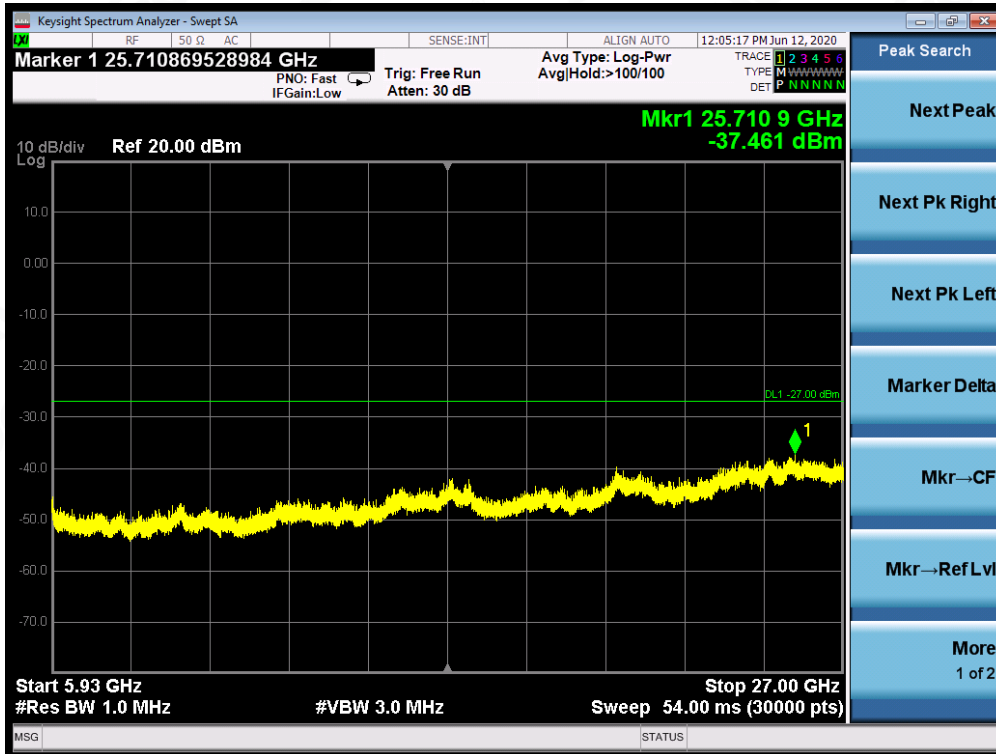




TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5795M

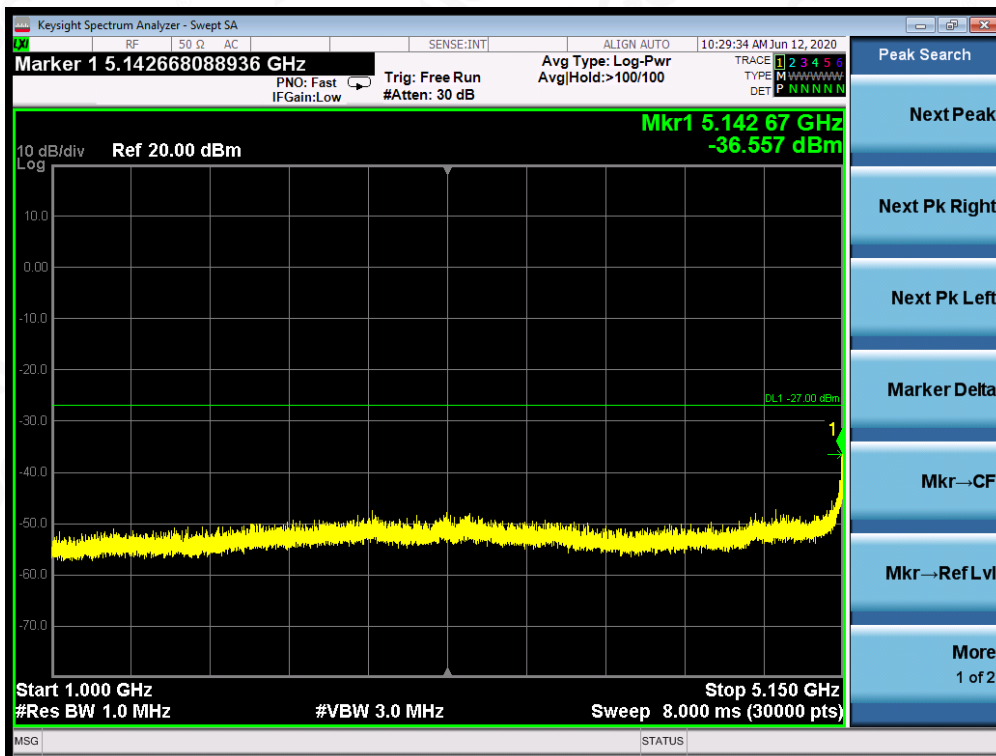
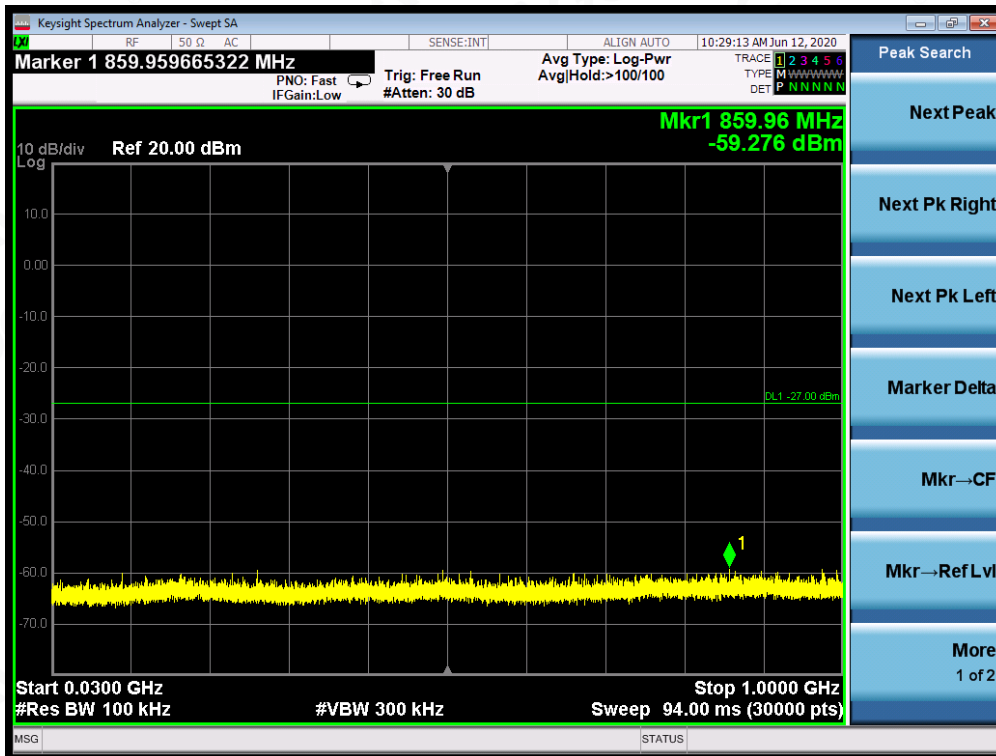


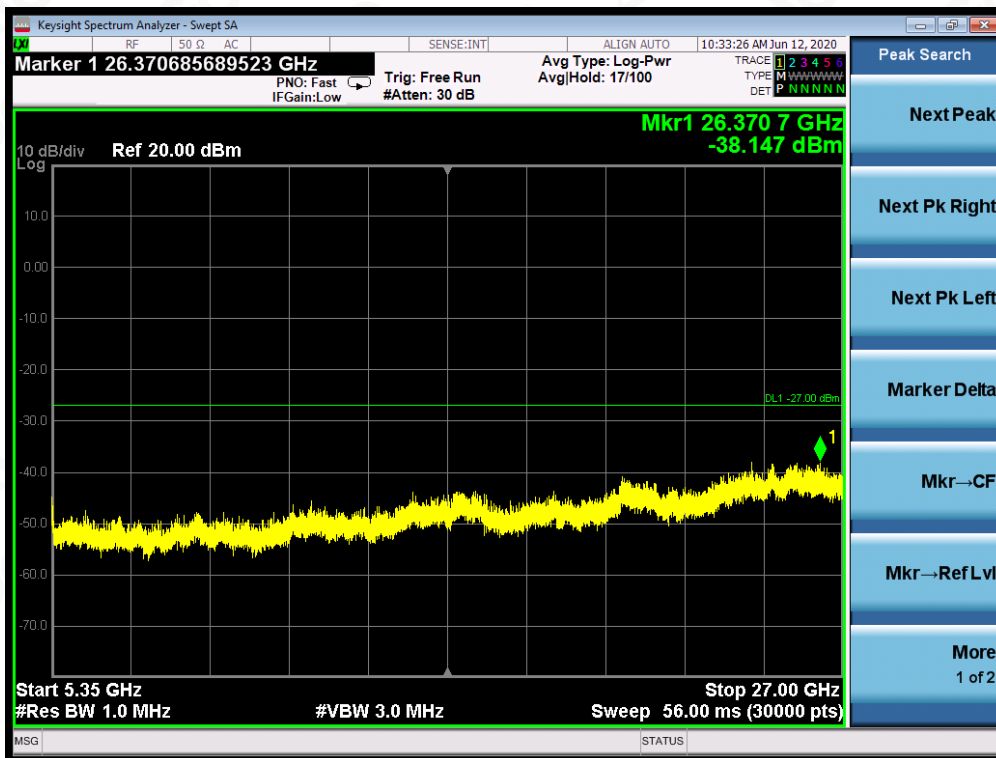
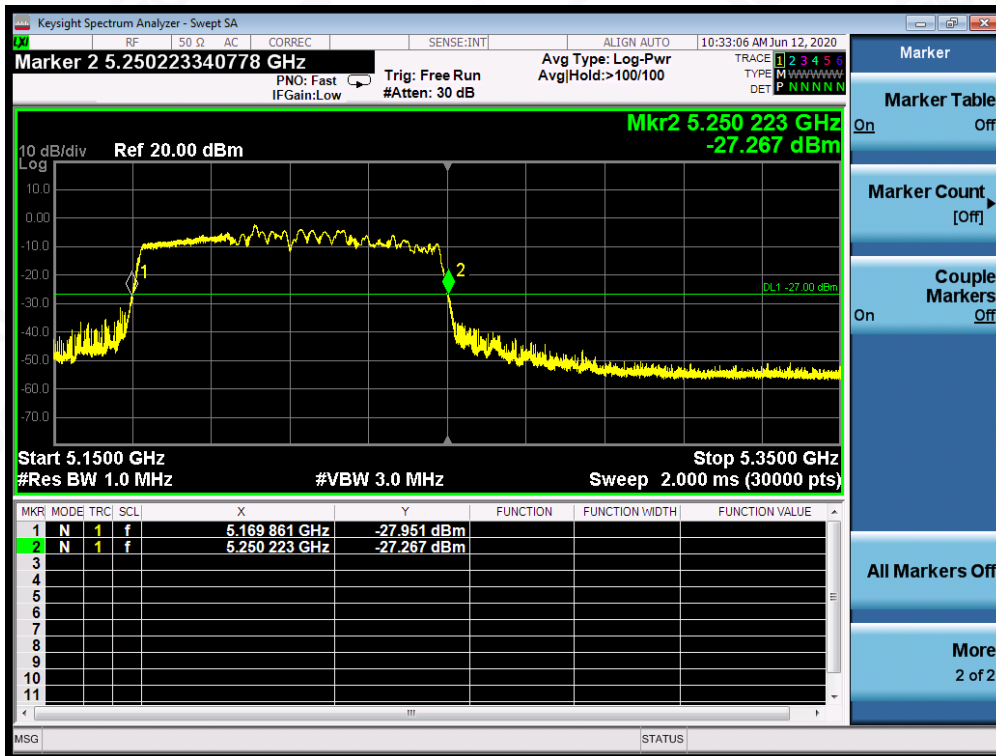


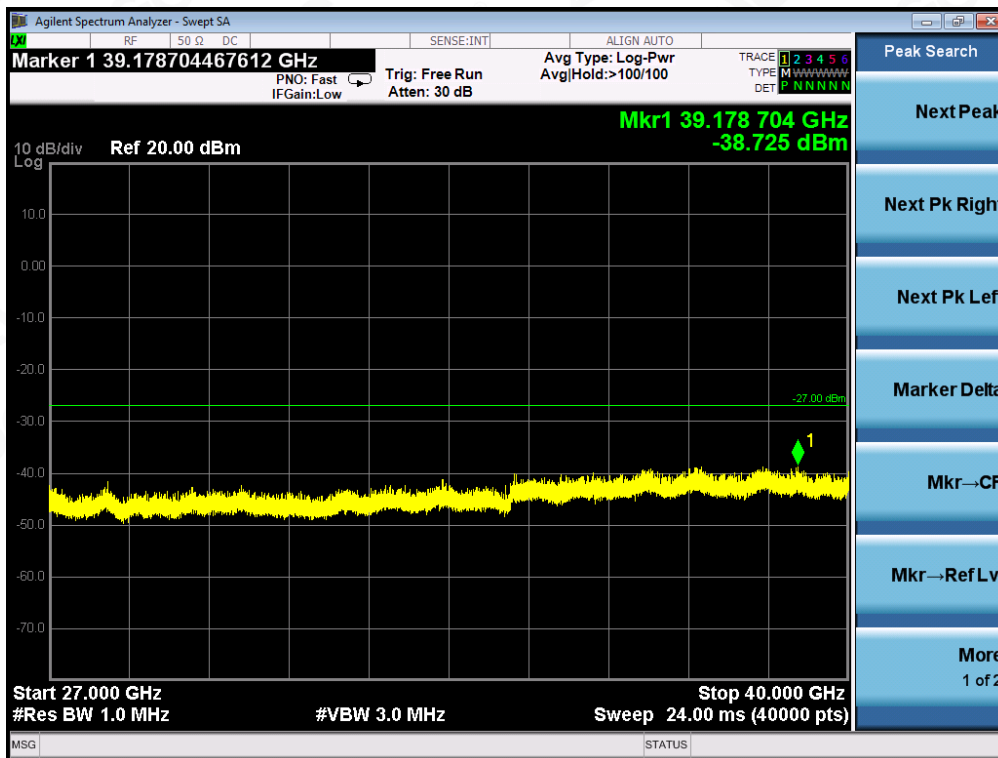


FOR 802.11AC80 MODULATION

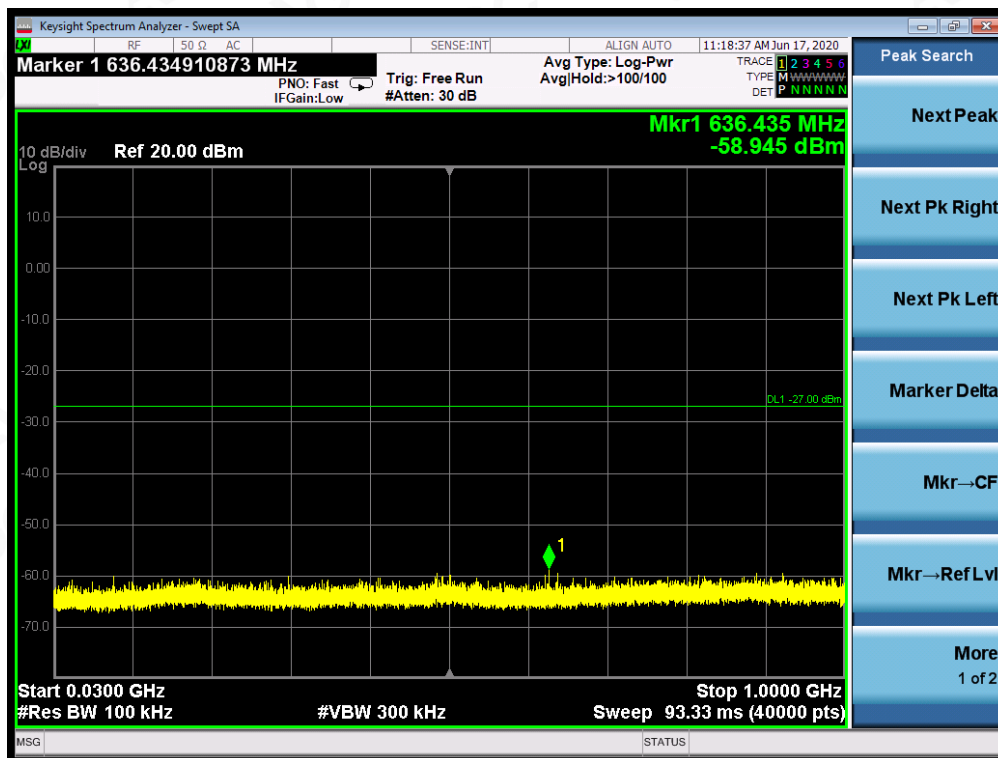
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5210MHz

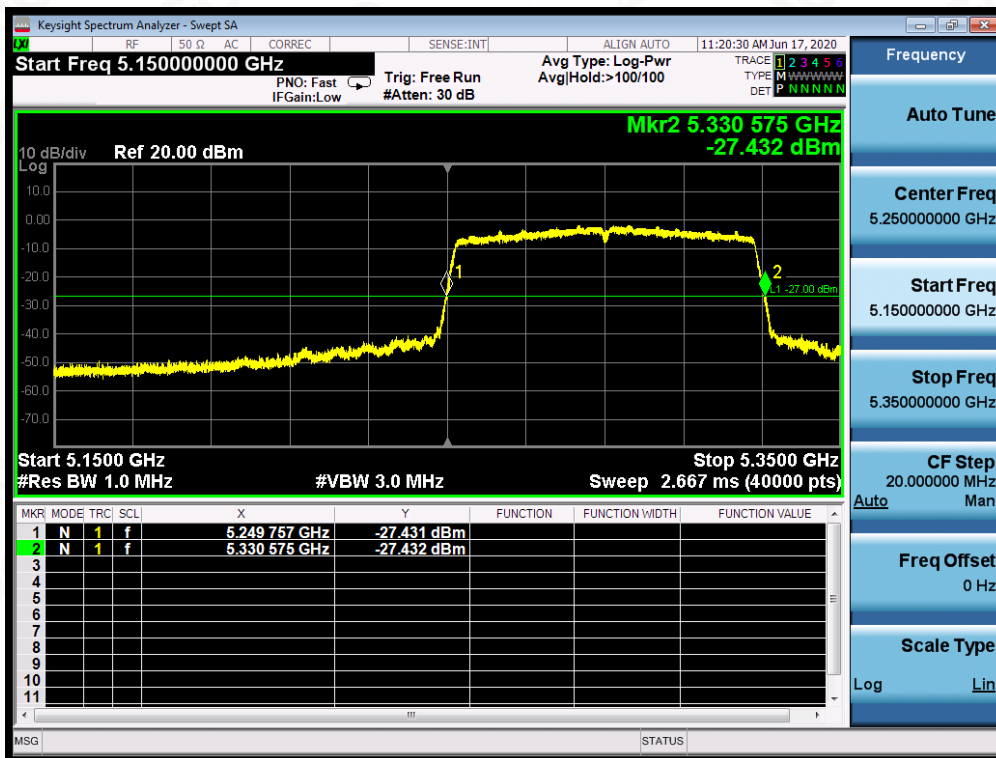
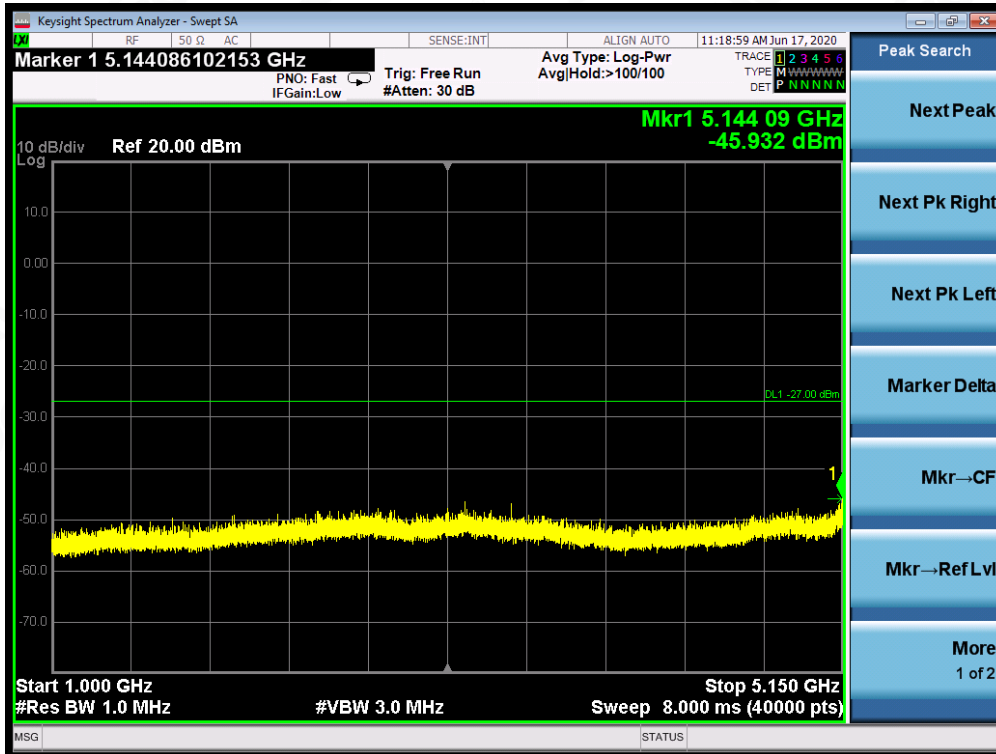


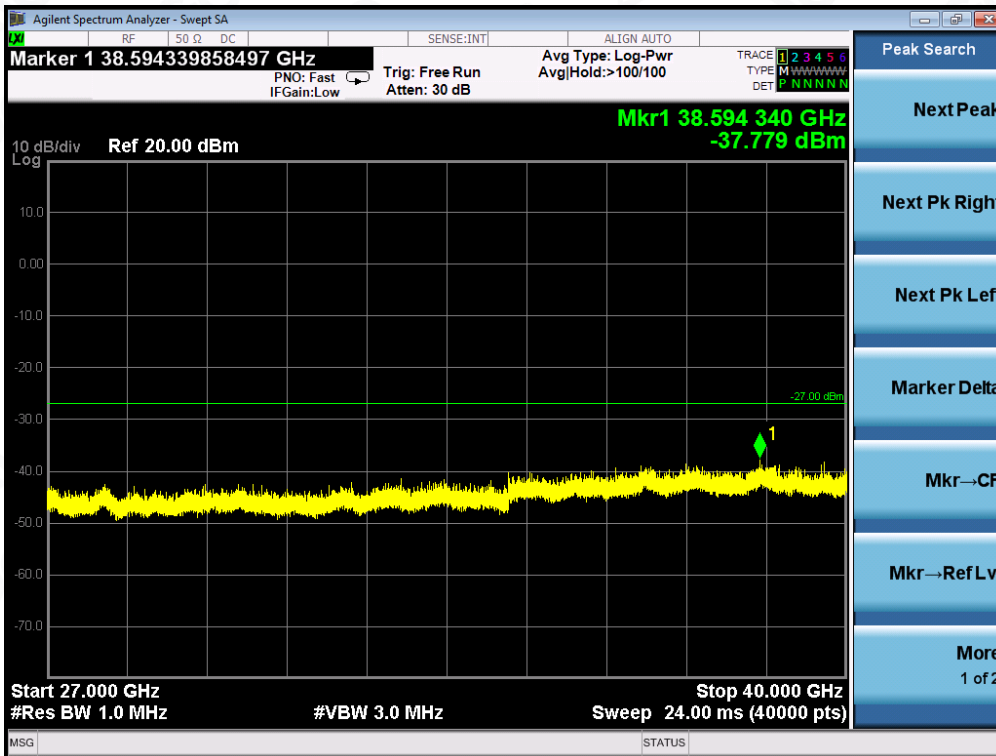
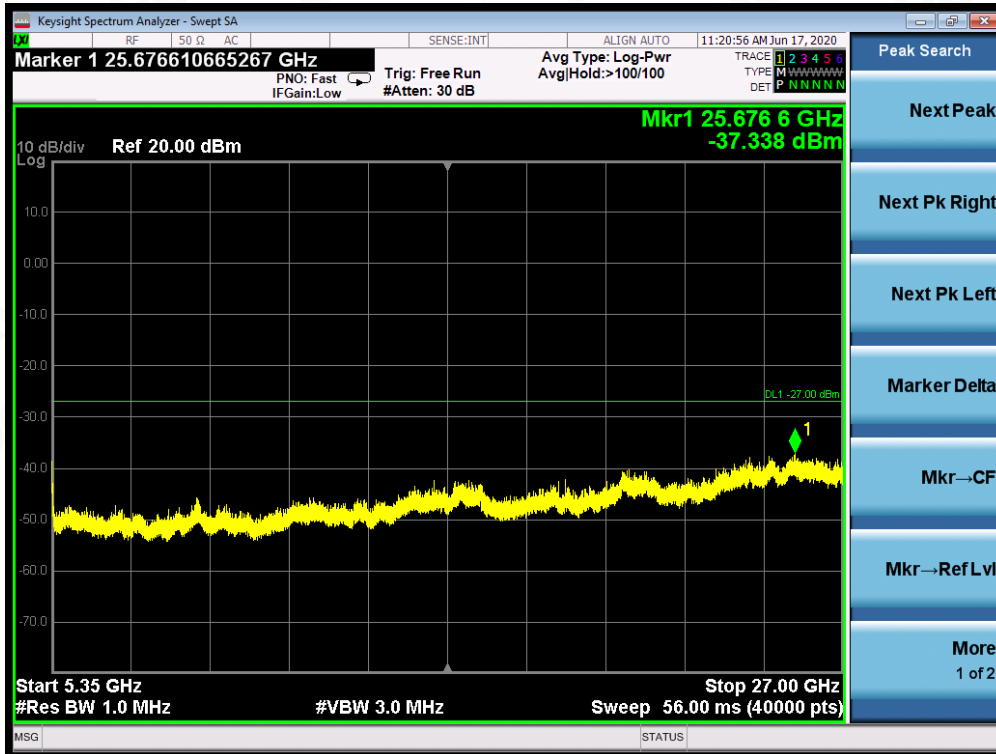




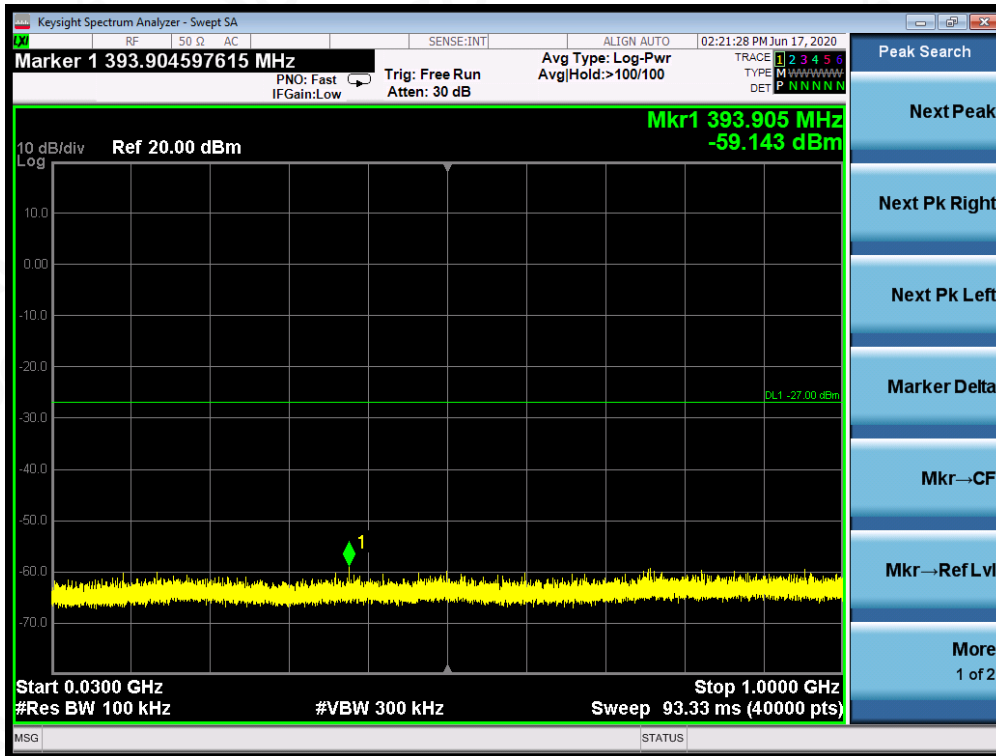
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5290MHz

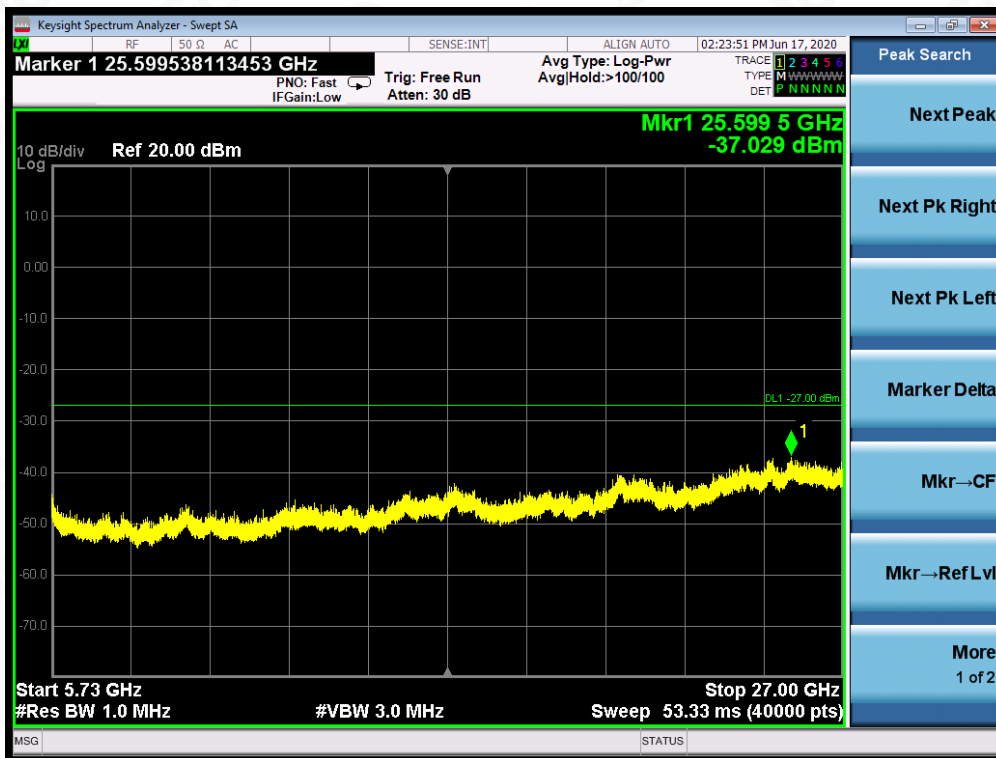
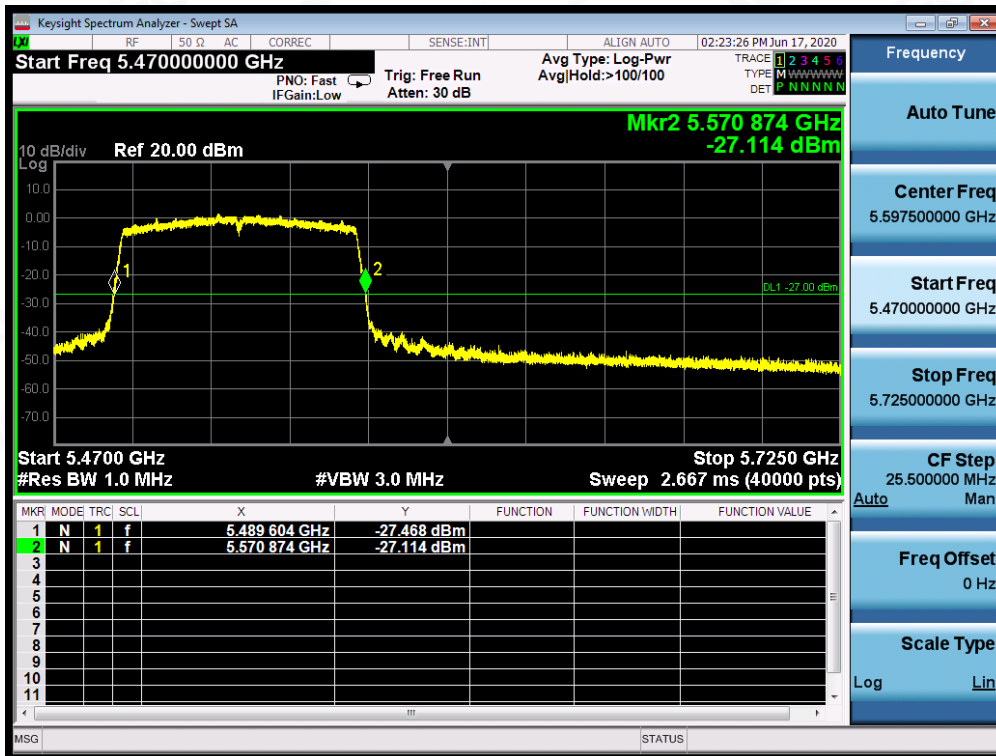


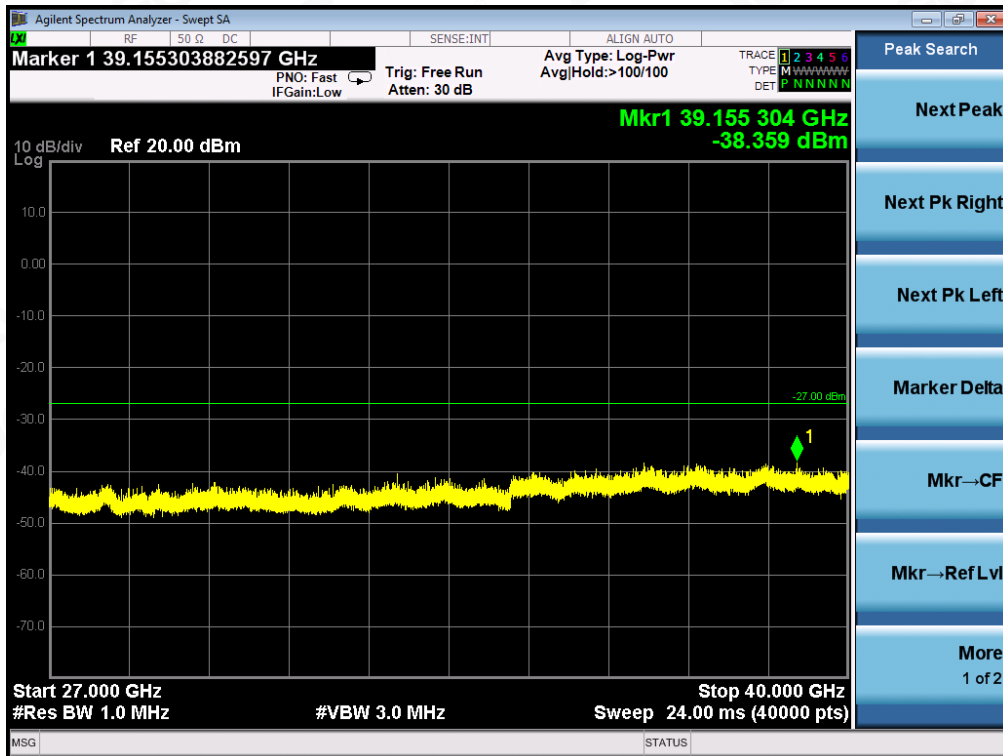




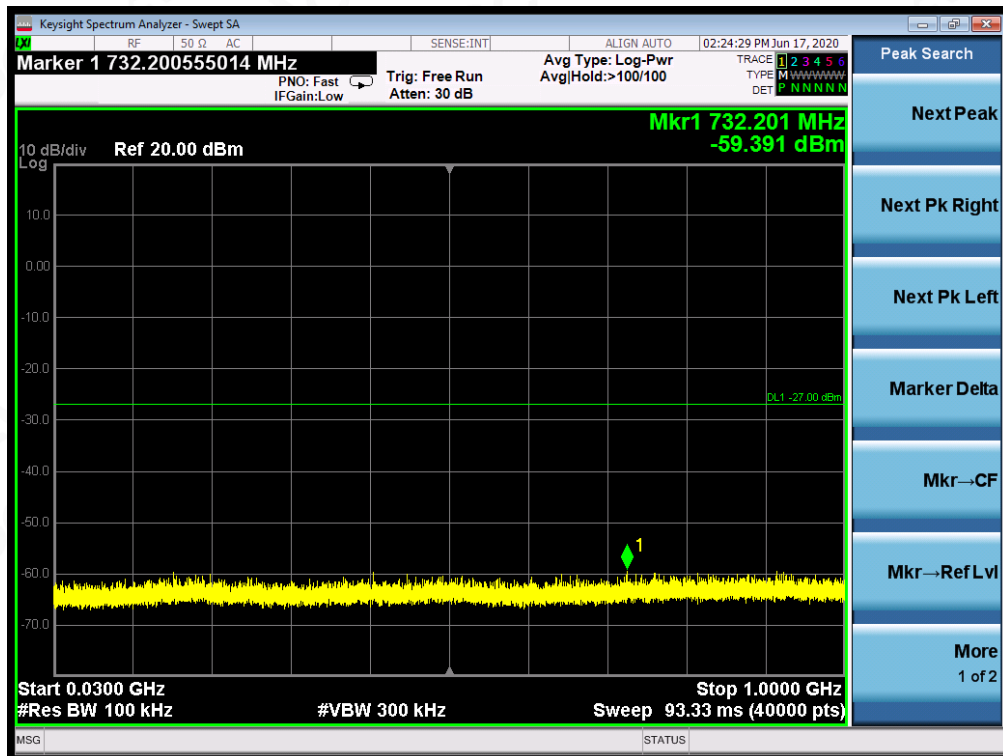
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5530MHz

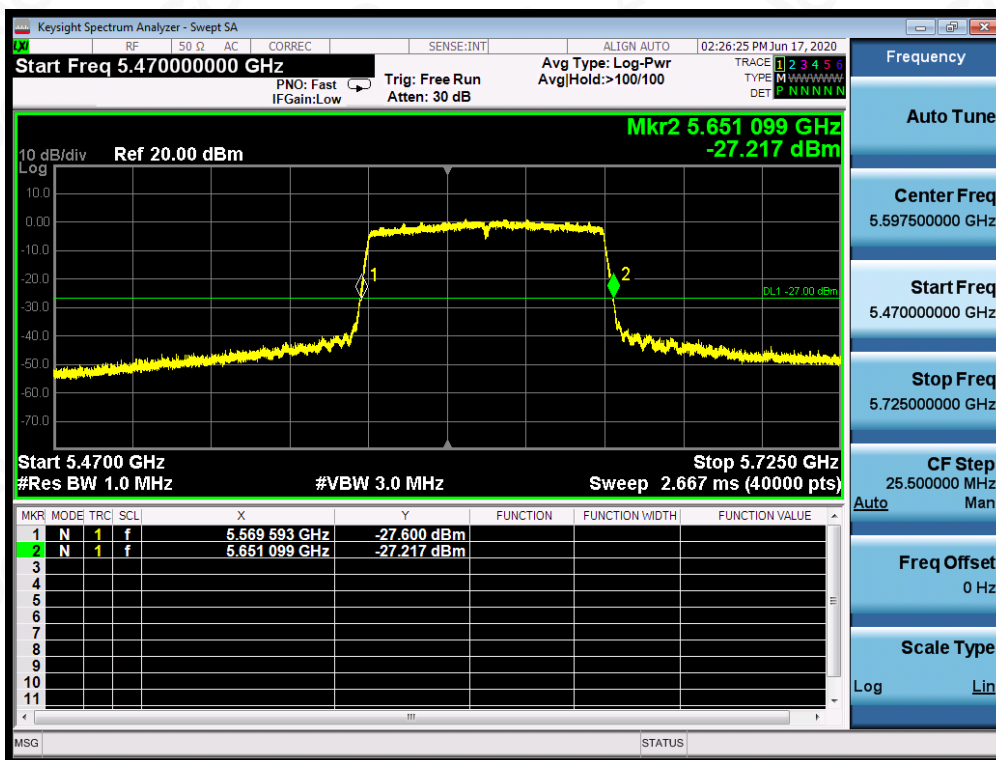
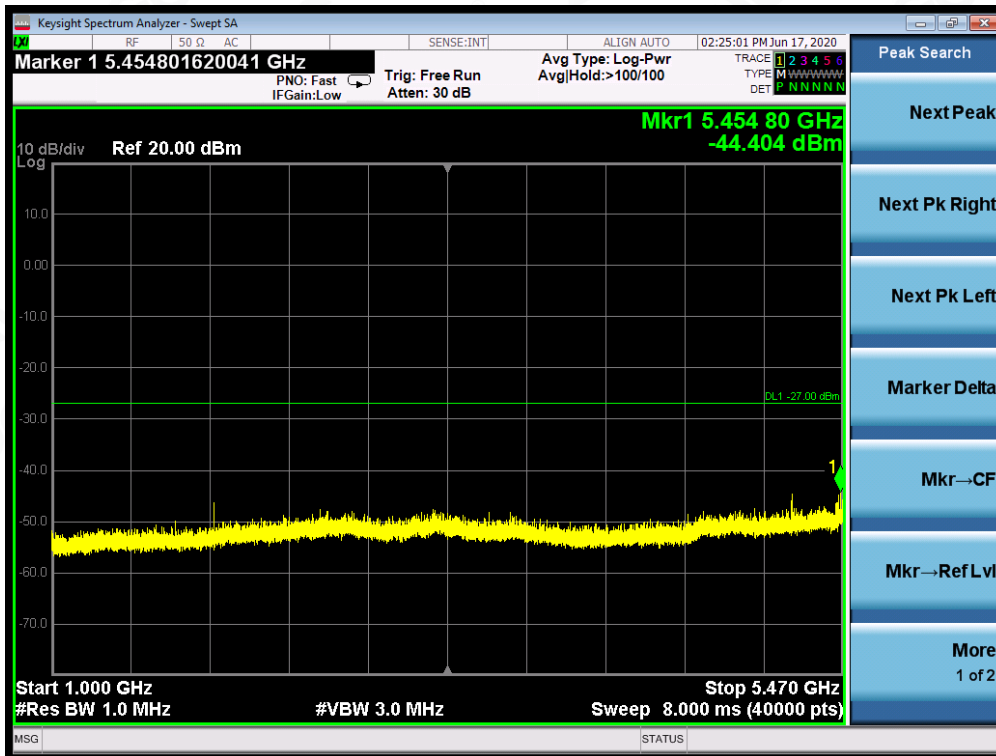


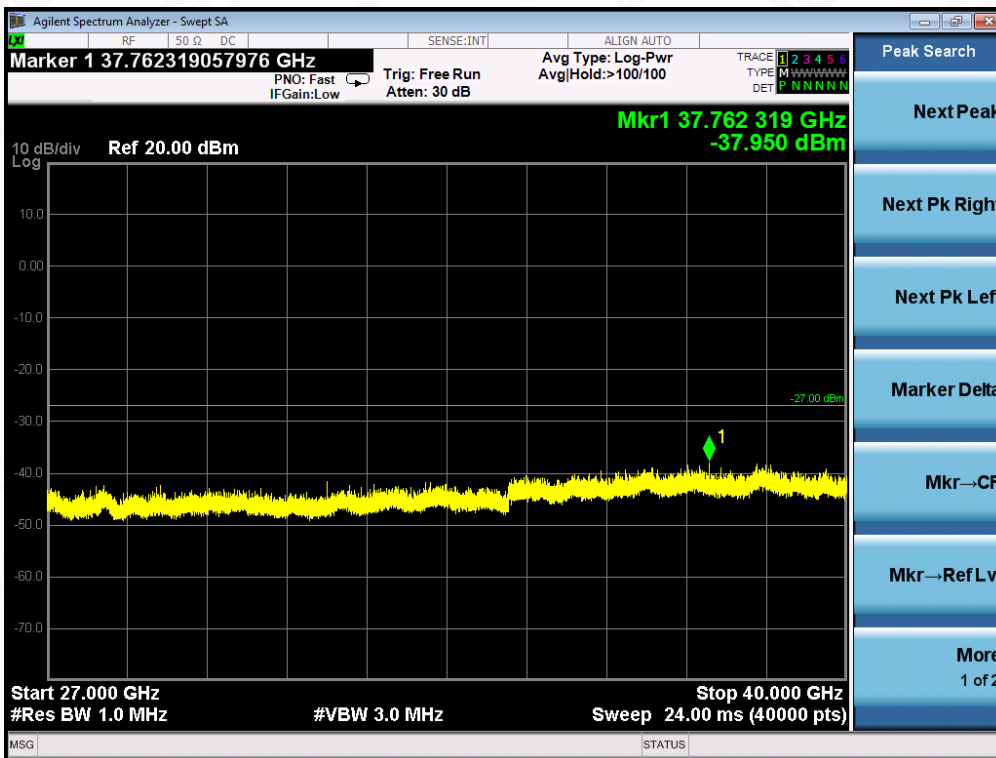
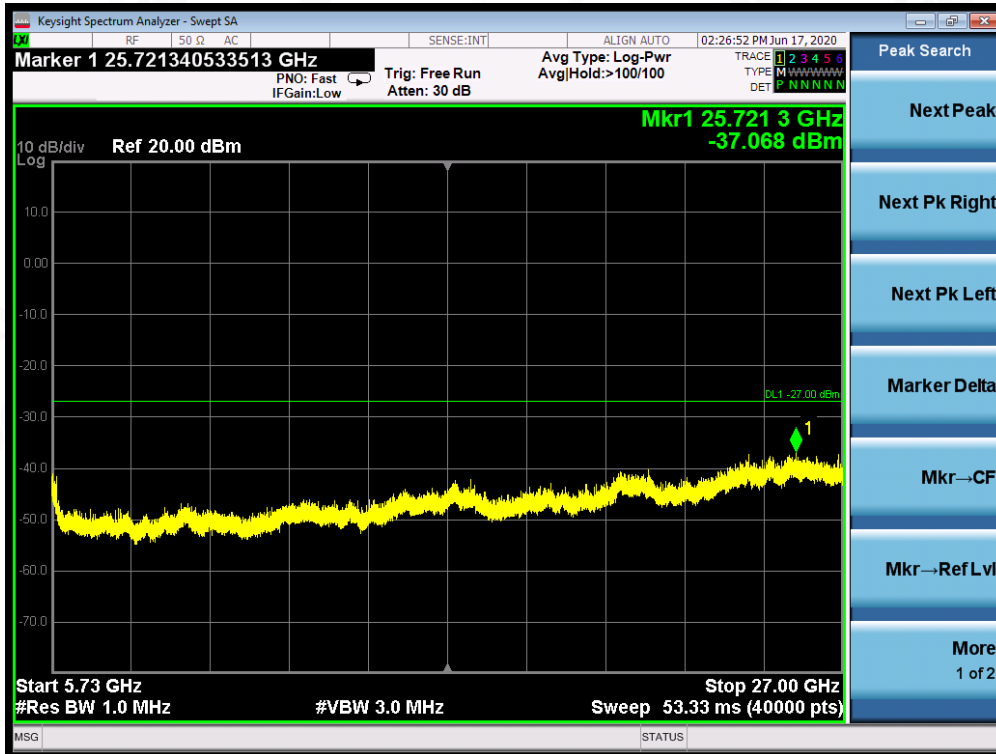




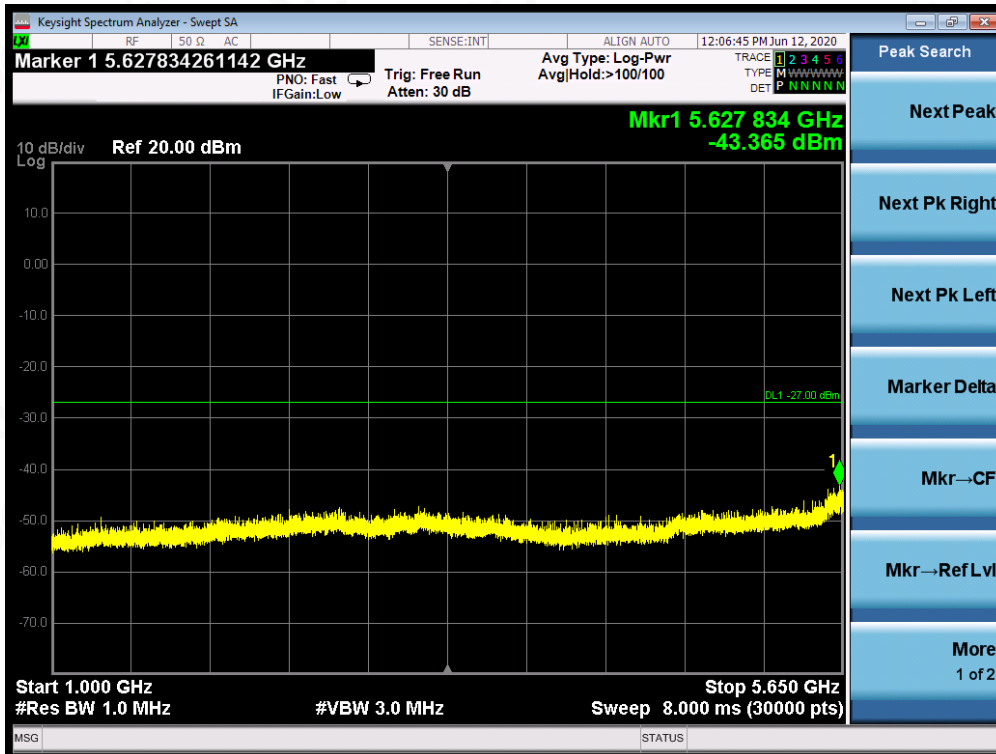
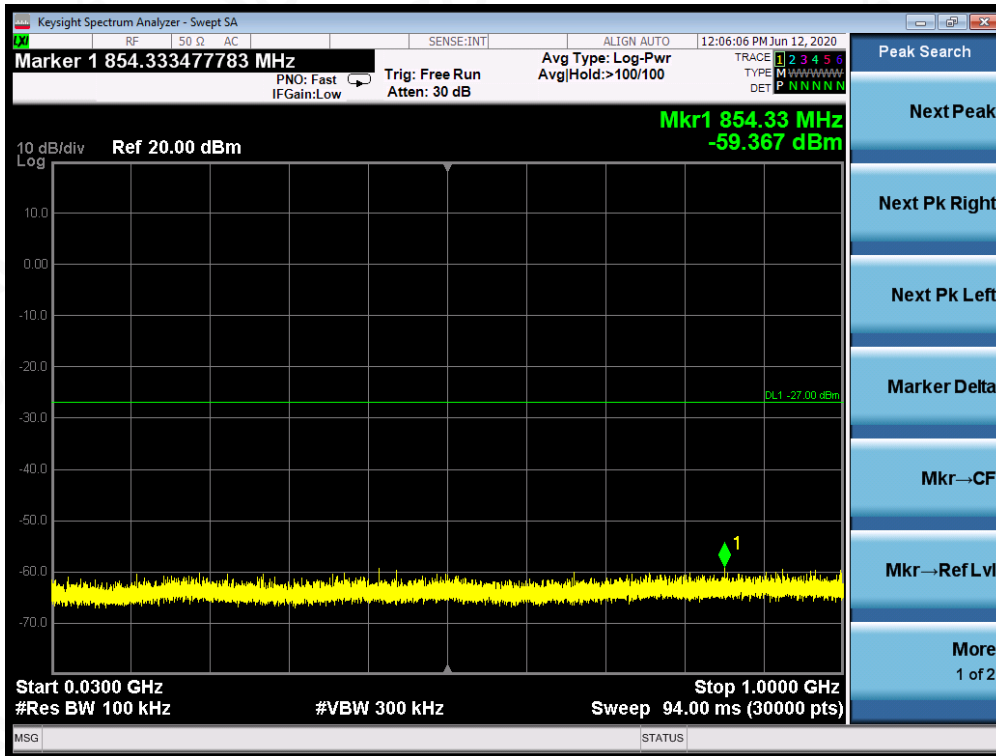
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5610MHz

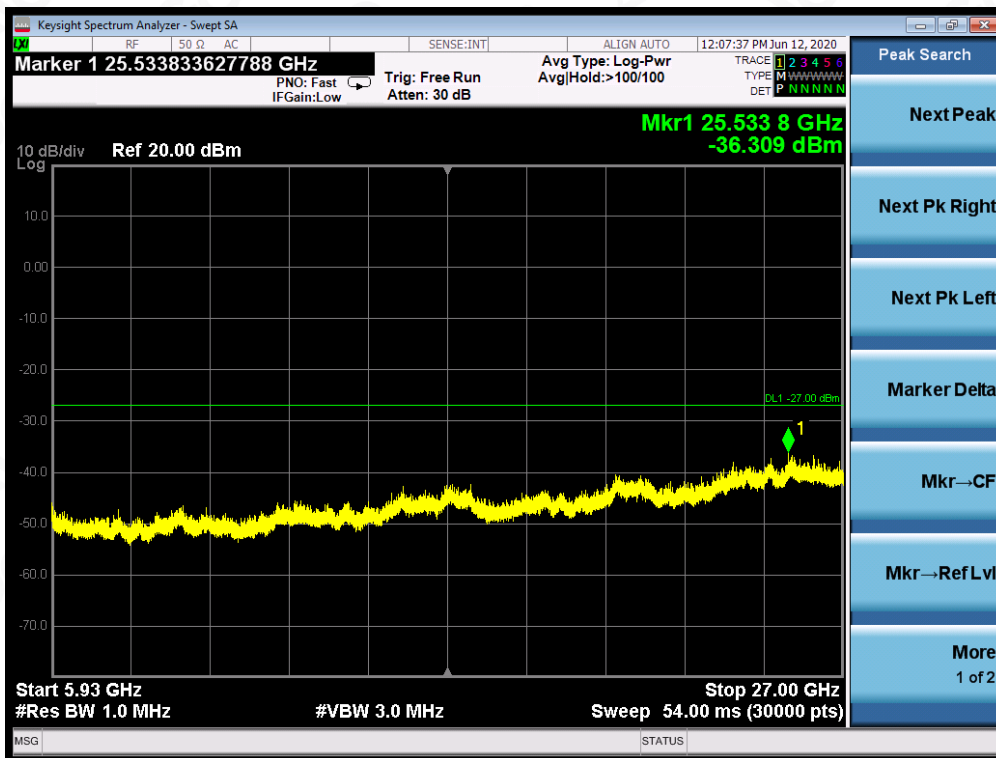
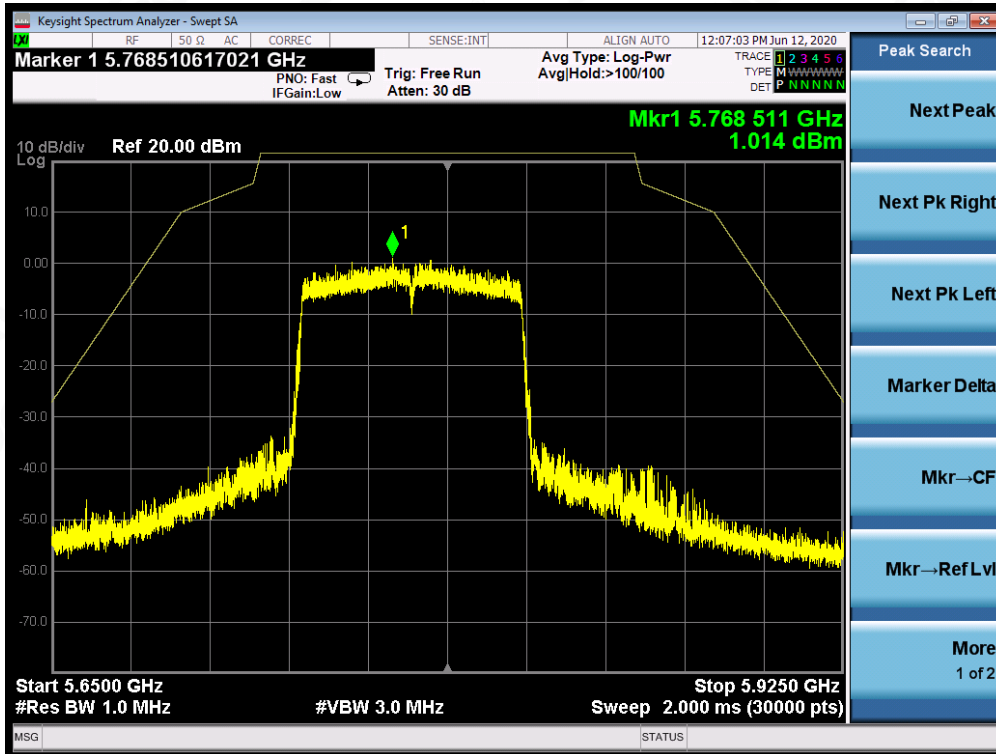


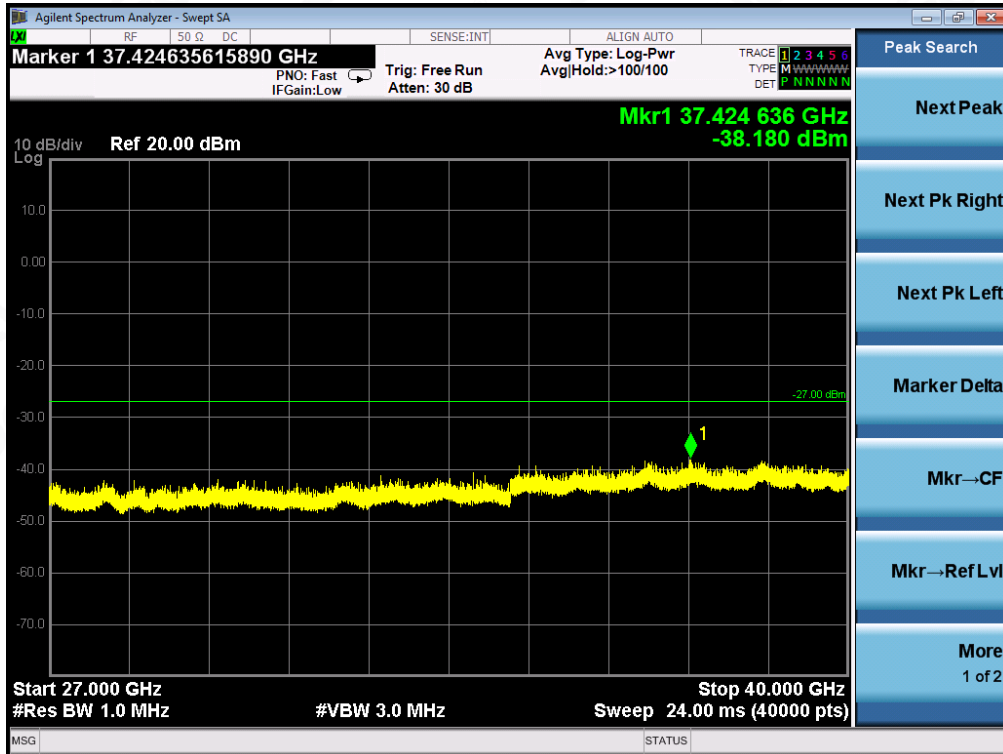




TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5750MHz







Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report.

Two transmit chains had been tested, the chain 1 was the worst case and record in the test report.

The spurious emission at chain 1 is more than 3dB below the limits, so the MIMO results for the spurious emissions are comply with the requirement.



12. RADIATED EMISSION

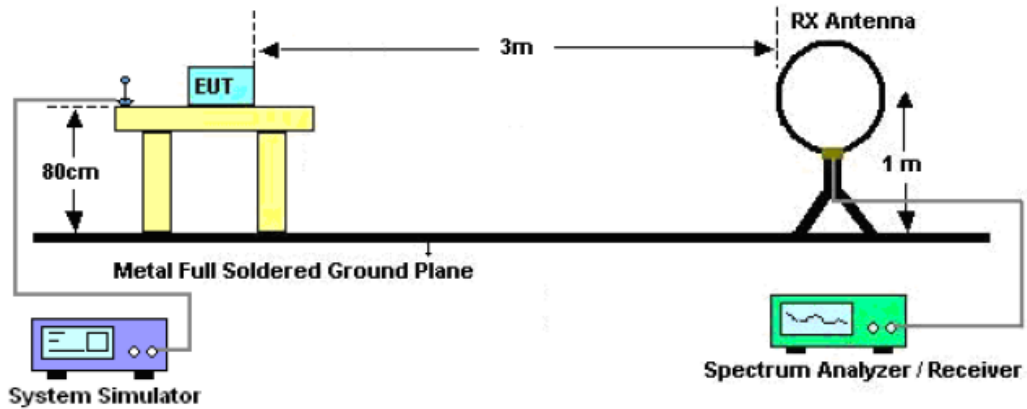
12.1. MEASUREMENT PROCEDURE

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 emissions, 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 3M 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.

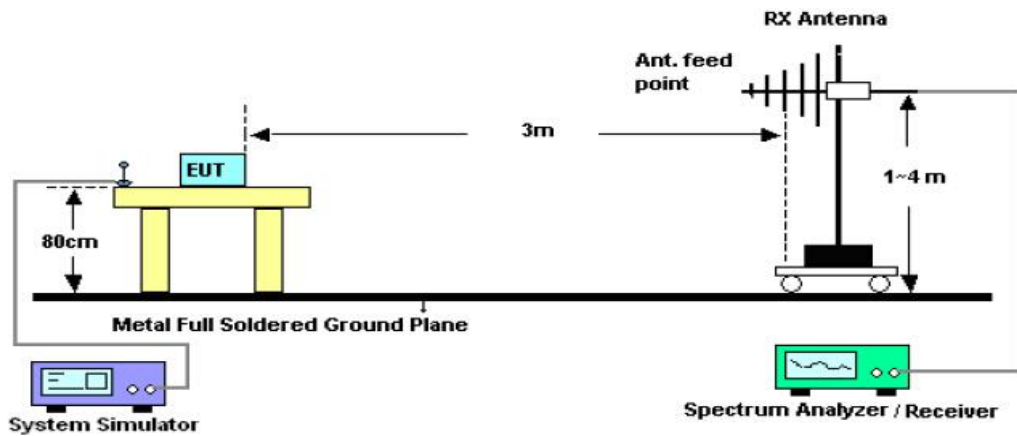


12.2. TEST SETUP

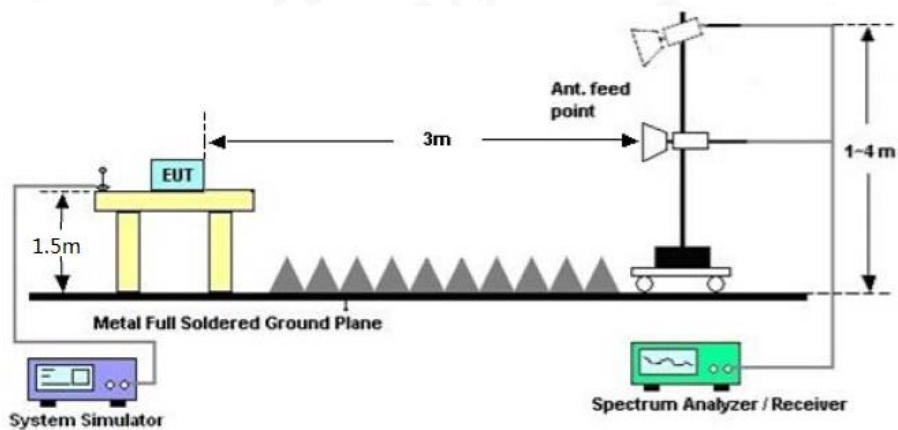
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



12.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/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: All modes were tested For restricted band radiated emission, the test records reported below are the worst result compared to other modes.

12.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

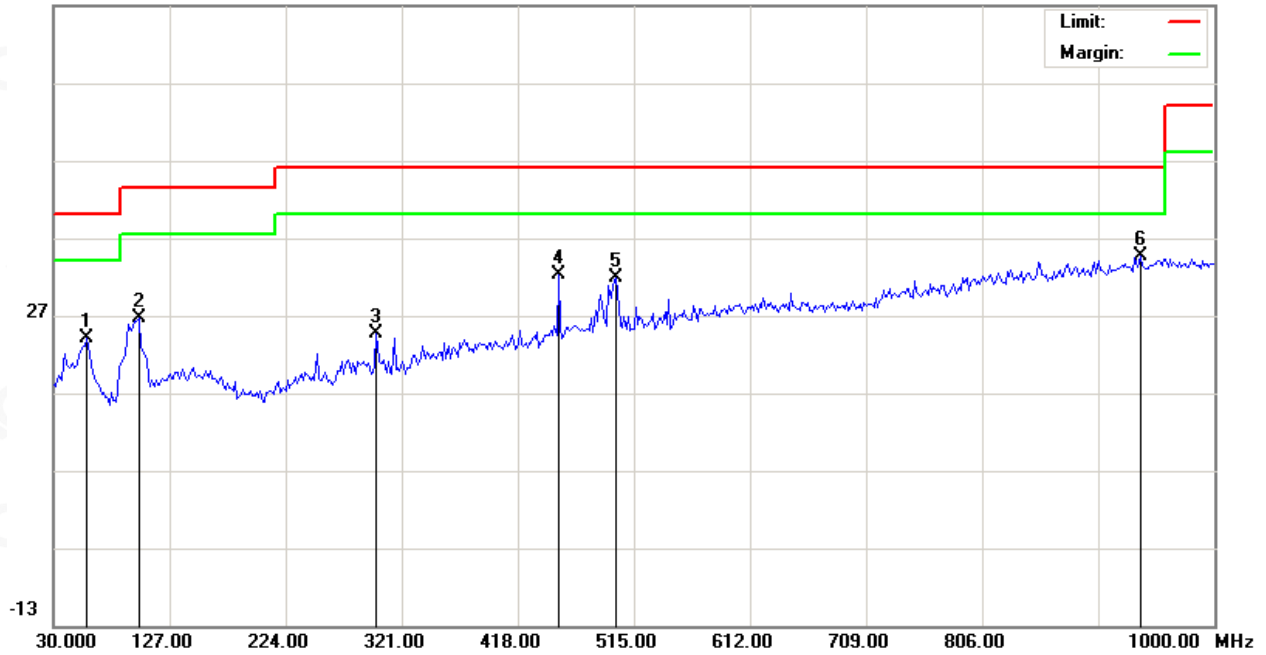
No emission found between lowest internal used/generated frequencies to 30MHz.



RADIATED EMISSION BELOW 1GHZ

EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal

66.9 dBuV/m

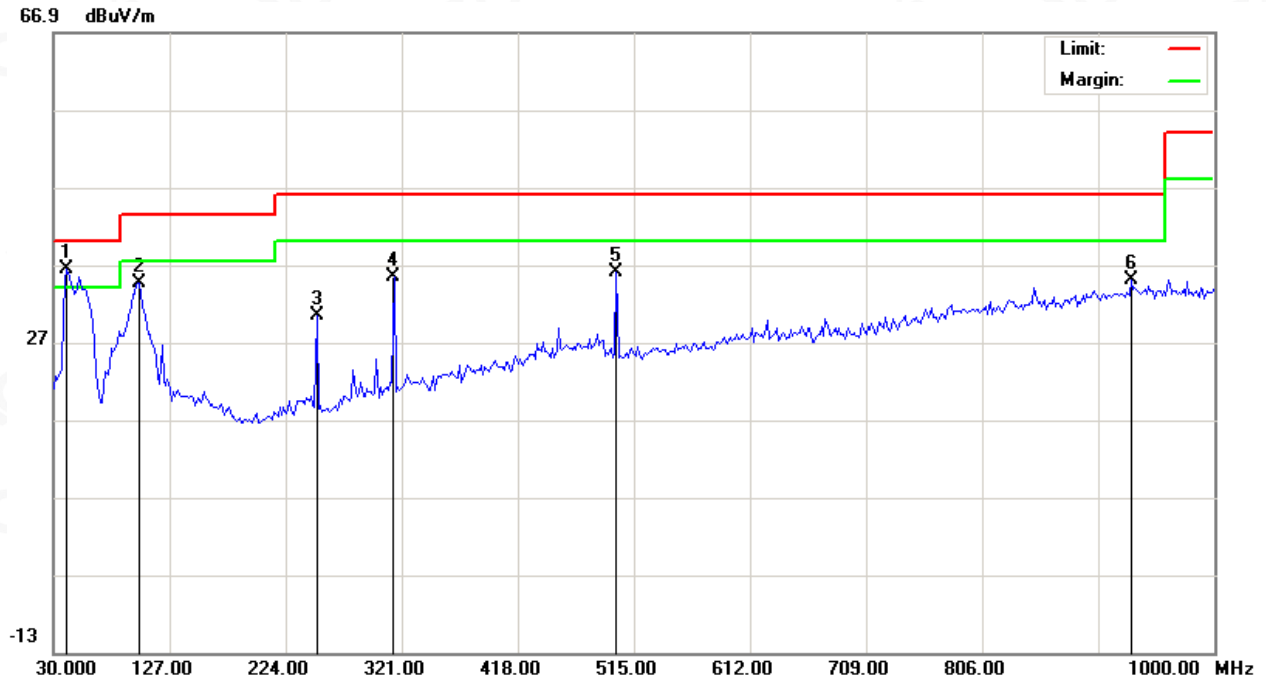


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		57.4831	4.91	19.09	24.00	40.00	-16.00	peak
2		101.1333	10.53	16.12	26.65	43.50	-16.85	peak
3		299.9832	5.07	19.47	24.54	46.00	-21.46	peak
4		451.9499	8.26	24.02	32.28	46.00	-13.72	peak
5		500.4499	6.73	25.00	31.73	46.00	-14.27	peak
6	*	938.5665	2.56	32.03	34.59	46.00	-11.41	peak

RESULT: PASS



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	*	41.3166	16.31	20.04	36.35	40.00	-3.65	peak
2		101.1333	18.45	16.12	34.57	43.50	-8.93	peak
3		249.8667	11.94	18.49	30.43	46.00	-15.57	peak
4		314.5332	15.36	19.98	35.34	46.00	-10.66	peak
5		500.4499	11.09	25.00	36.09	46.00	-9.91	peak
6		930.4832	3.08	31.96	35.04	46.00	-10.96	peak

RESULT: PASS

Note:

- All antennas have been pre-tested, and all modes of each antenna in all test channels had been tested. The antenna 0 in 802.11a20 at 5180MHz is the worst case and recorded in the test report.
- Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.
The "Factor" value can be calculated automatically by software of measurement system.



RADIATED EMISSION ABOVE 1GHZ

EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.044	47.23	9.14	56.37	68.20	-11.83	peak
15540.066	41.27	10.22	51.49	74.00	-22.51	peak
15540.066	32.64	10.22	42.86	54.00	-11.14	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.044	48.71	9.14	57.85	68.20	-10.35	peak
15540.066	42.58	10.22	52.80	74.00	-21.20	peak
15540.066	33.19	10.22	43.41	54.00	-10.59	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5240MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.044	49.34	9.27	58.61	68.20	-9.59	peak
15720.066	42.18	10.38	52.56	74.00	-21.44	peak
15720.066	34.62	10.38	45.00	54.00	-9.00	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.044	46.28	9.27	55.55	68.20	-12.65	peak
15720.066	40.34	10.38	50.72	74.00	-23.28	peak
15720.066	31.56	10.38	41.94	54.00	-12.06	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5260MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10520.044	47.26	9.29	56.55	68.20	-11.65	peak
15780.066	42.47	10.42	52.89	74.00	-21.11	peak
15780.066	33.54	10.42	43.96	54.00	-10.04	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10520.044	48.16	9.29	57.45	68.20	-10.75	peak
15780.066	42.33	10.42	52.75	74.00	-21.25	peak
15780.066	34.61	10.42	45.03	54.00	-8.97	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5320MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10640.044	45.31	9.35	54.66	74.00	-19.34	peak
10640.044	37.23	9.35	46.58	54.00	-7.42	AVG
15960.066	40.28	10.46	50.74	74.00	-23.26	peak
15960.066	31.49	10.46	41.95	54.00	-12.05	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10640.044	48.61	9.35	57.96	74.00	-16.04	peak
10640.044	39.34	9.35	48.69	54.00	-5.31	AVG
15960.066	41.37	10.46	51.83	74.00	-22.17	peak
15960.066	32.19	10.46	42.65	54.00	-11.35	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5500MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11000.044	49.31	9.37	58.68	74.00	-15.32	peak
11000.044	40.84	9.37	50.21	54.00	-3.79	AVG
16500.066	42.37	10.48	52.85	68.20	-15.35	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11000.044	48.34	9.37	57.71	74.00	-16.29	peak
11000.044	40.31	9.37	49.68	54.00	-4.32	AVG
16500.066	42.91	10.48	53.39	68.20	-14.81	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5700MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
11400.044	47.16	9.39	56.55	74.00	-17.45	peak
11400.044	38.46	9.39	47.85	54.00	-6.15	AVG
17100.066	39.61	10.49	50.10	68.20	-18.10	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Value Type
11400.044	49.12	9.39	58.51	74.00	-15.49	peak
11400.044	40.22	9.39	49.61	54.00	-4.39	AVG
17100.066	42.67	10.49	53.16	68.20	-15.04	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	48.34	9.42	57.76	74.00	-16.24	peak
11490.042	39.51	9.42	48.93	54.00	-5.07	AVG
17235.063	42.18	10.51	52.69	68.20	-15.51	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	47.34	9.42	56.76	74.00	-17.24	peak
11490.042	38.25	9.42	47.67	54.00	-6.33	AVG
17235.063	41.34	10.51	51.85	68.20	-16.35	peak

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5825MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	48.96	9.62	58.58	74.00	-15.42	peak
11650.042	40.03	9.62	49.65	54.00	-4.35	AVG
17475.063	42.18	10.75	52.93	68.20	-15.27	peak

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	45.37	9.62	54.99	74.00	-19.01	peak
11650.042	36.15	9.62	45.77	54.00	-8.23	AVG
17475.063	39.54	10.75	50.29	68.20	-17.91	peak

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Note: All the case had been tested. The antenna 0 in 802.11a modulation is the worst case and recorded in the test report.

Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Level-Limit.

The “Factor” value can be calculated automatically by software of measurement system.



13. BAND EDGE EMISSION

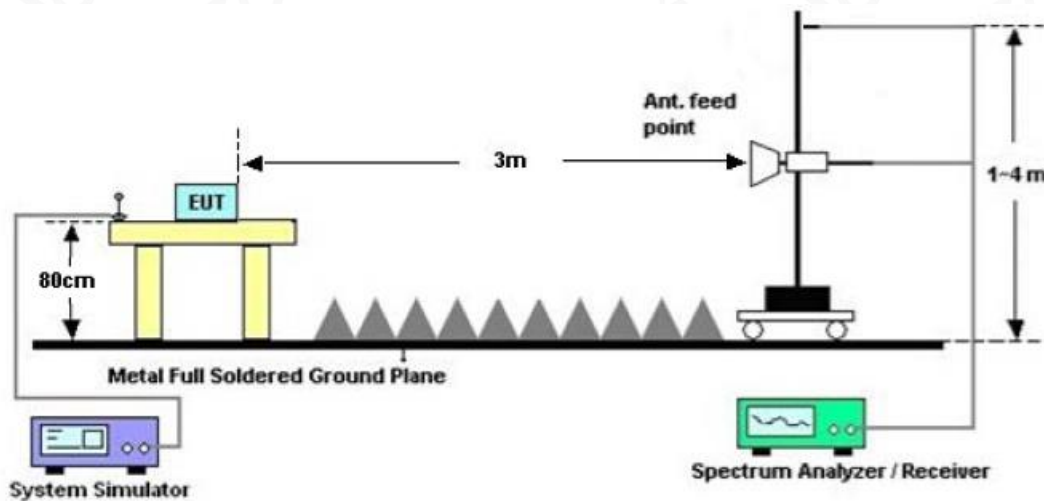
13.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO
3. Other procedures refer to clause 11.2.

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μ V) to represent the Amplitude. Use the F dB(μ V/m) to represent the Field Strength. So A=F.
3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz and 5.35GHz-5.46GHz record in the report. Other restricted band 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

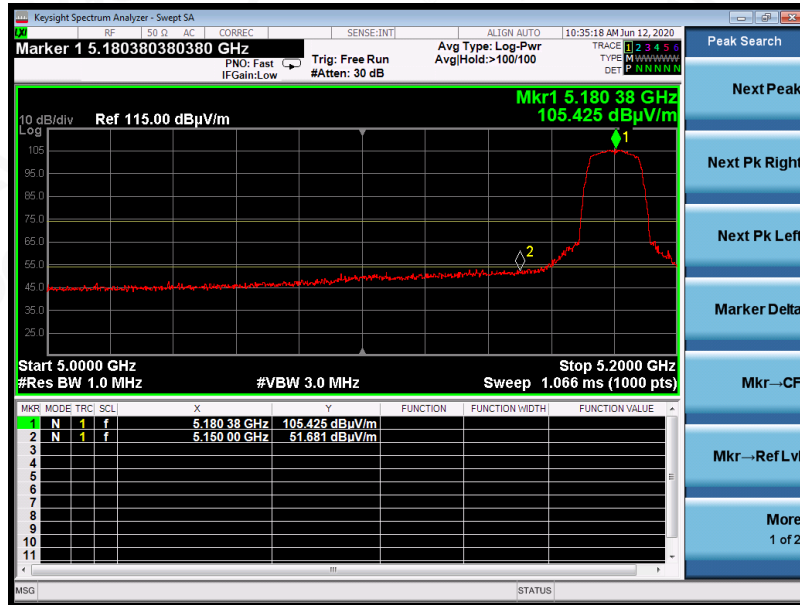
13.2. TEST SET-UP



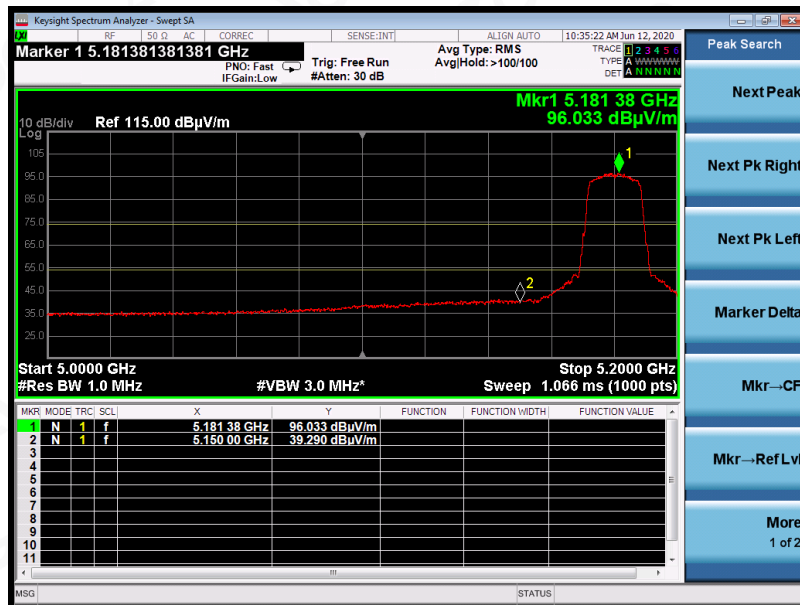
13.3. TEST RESULT

EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal

PK Value

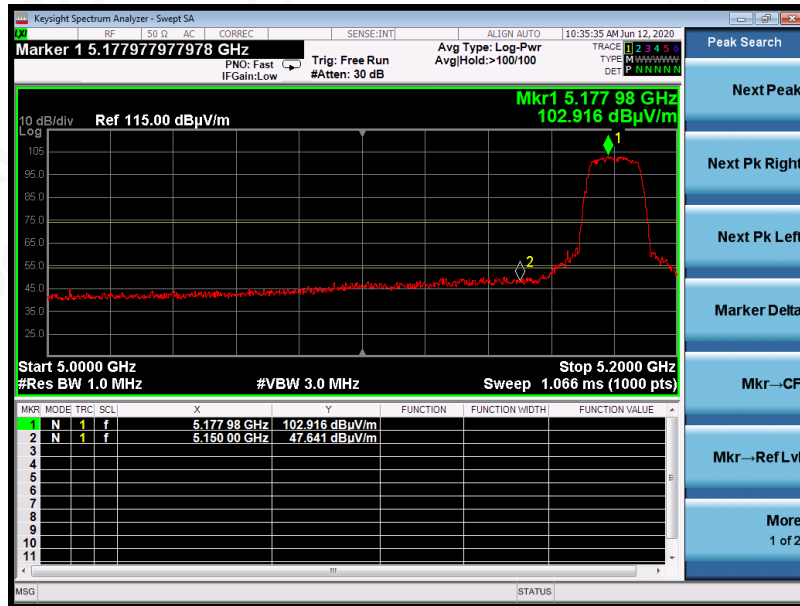


AV Value

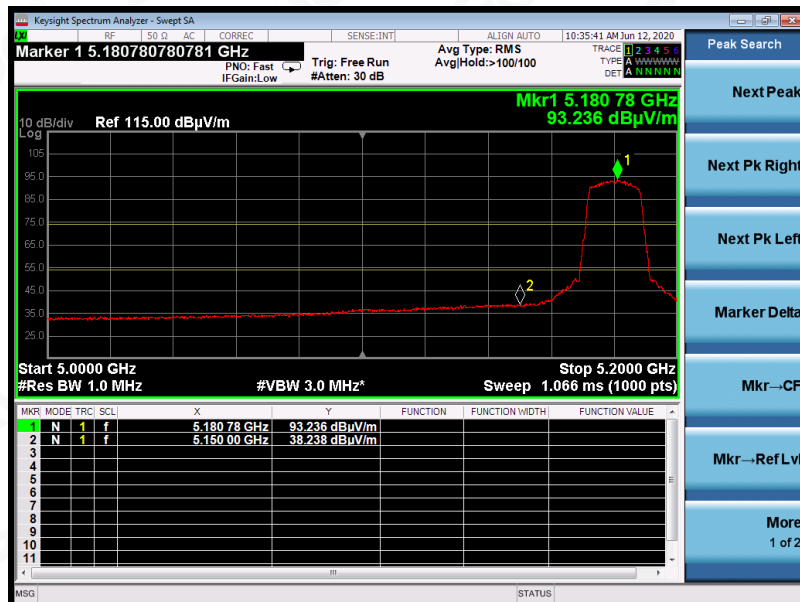


EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical

PK Value

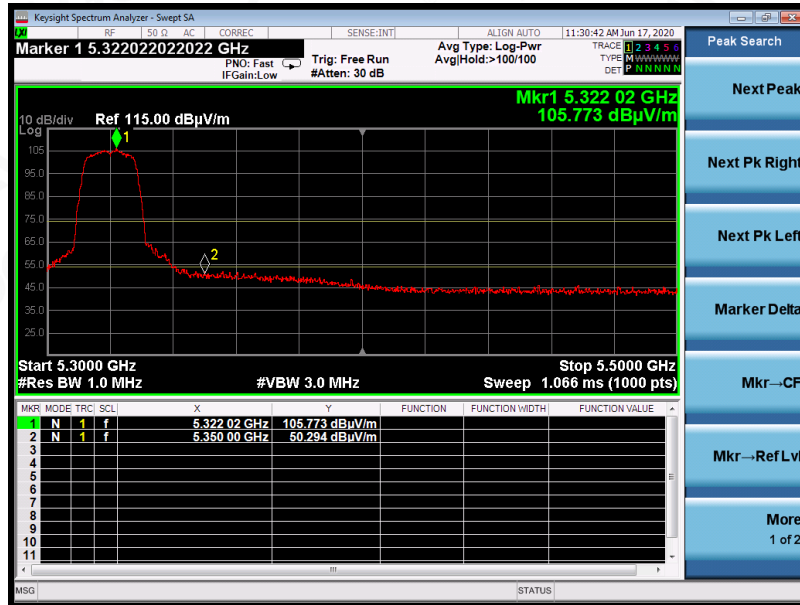


AV Value

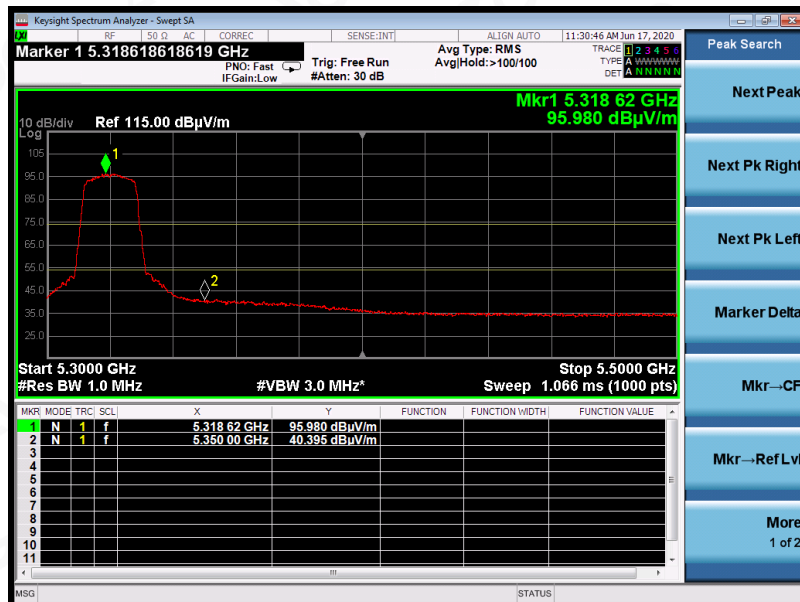


EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5320MHz	Antenna	Horizontal

PK Value

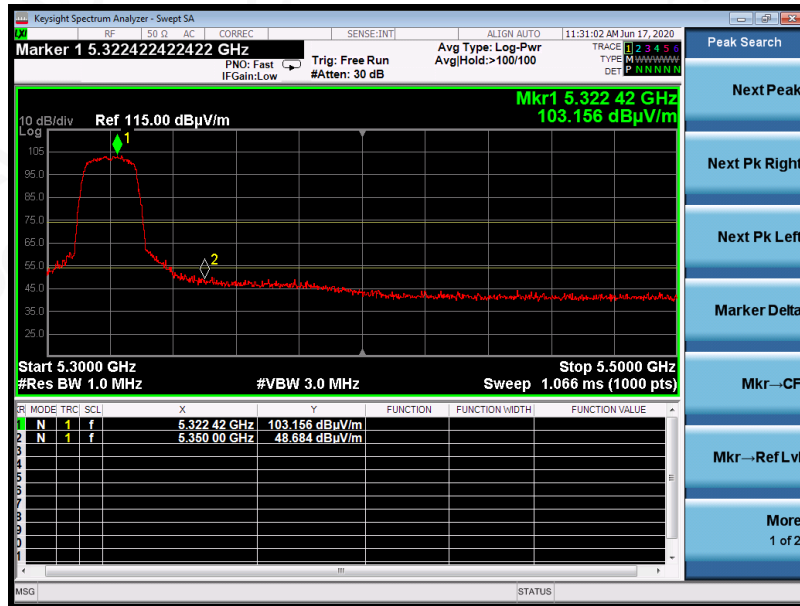


AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5320MHz	Antenna	Vertical

PK Value

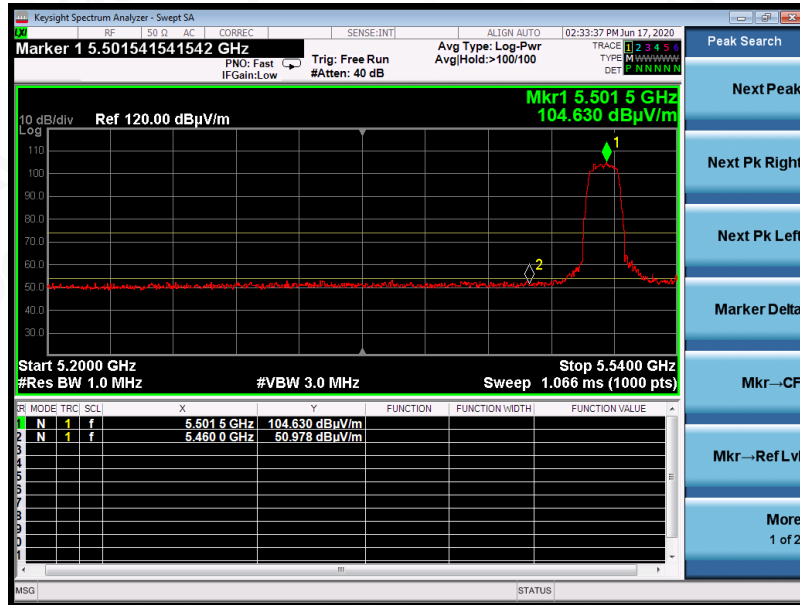


AV Value

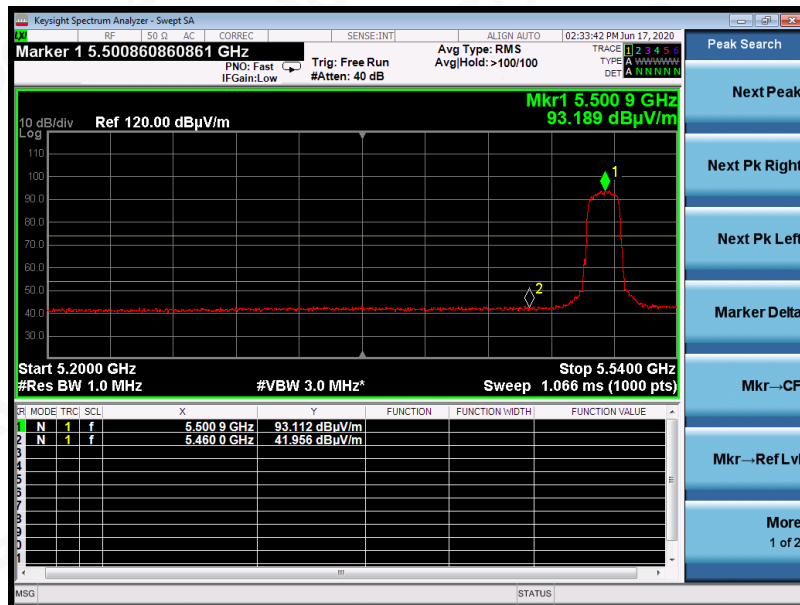


EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5500MHz	Antenna	Horizontal

PK Value

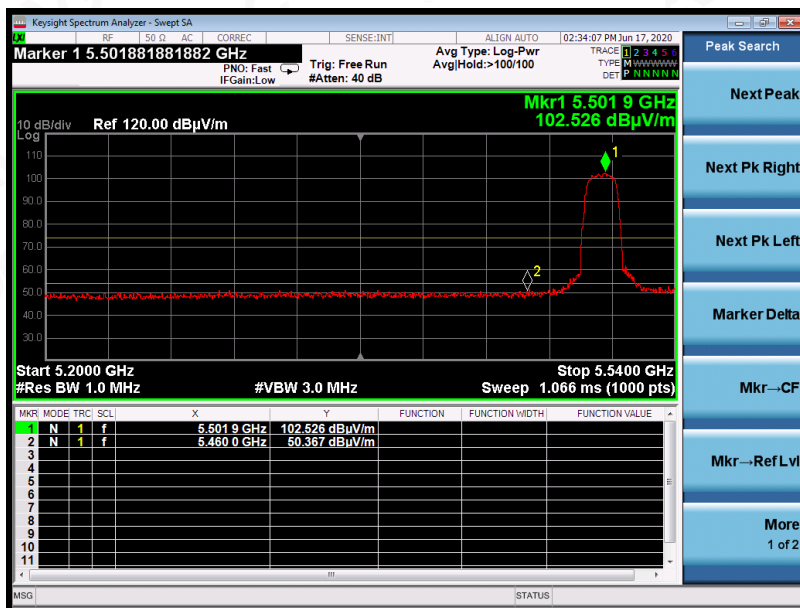


AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5500MHz	Antenna	Vertical

PK Value

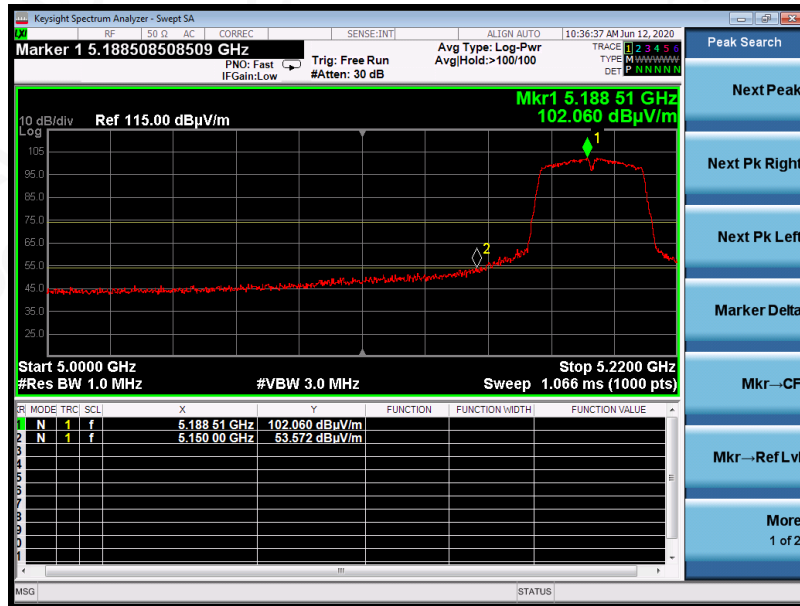


AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz	Antenna	Horizontal

PK Value

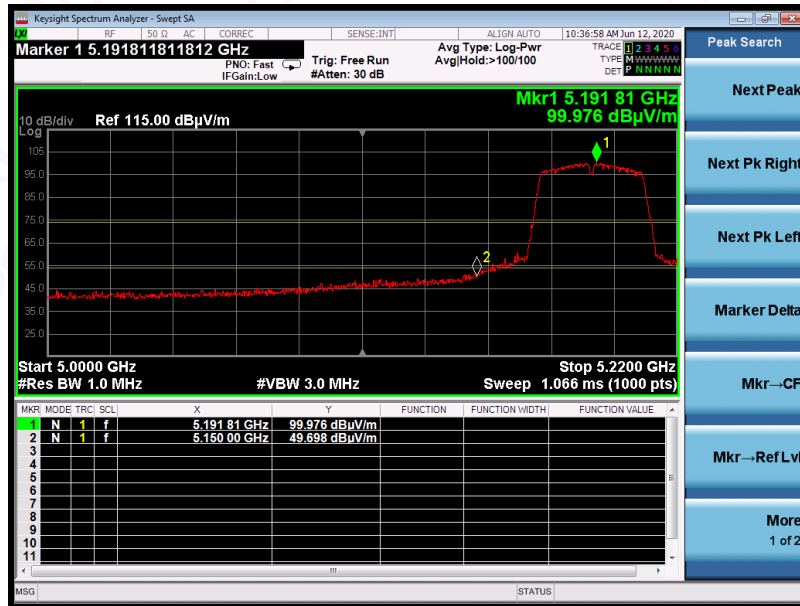


AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz	Antenna	Vertical

PK Value



AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5310MHz	Antenna	Horizontal

PK Value



AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5310MHz	Antenna	Vertical

PK Value

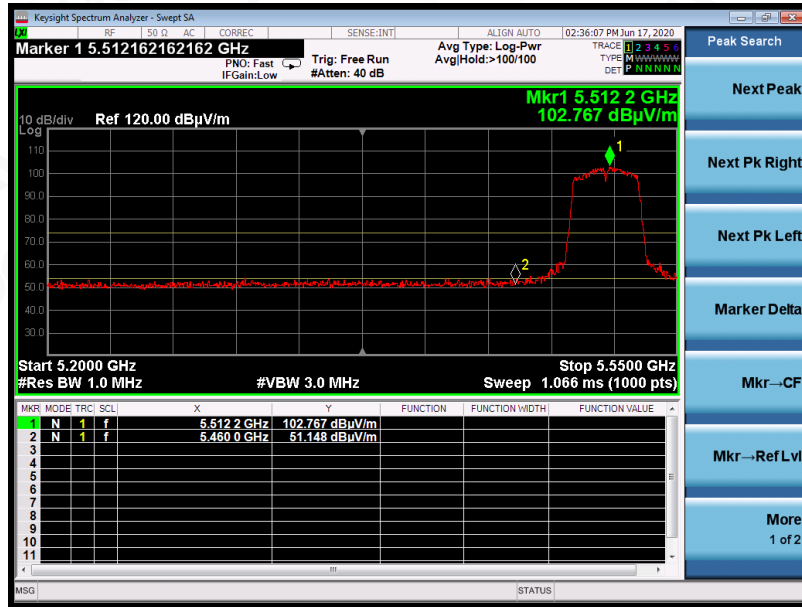


AV Value



EUT	AC3000 Tri-Band Mesh Router	Model Name	TT-ND001
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5510MHz	Antenna	Horizontal

PK Value



AV Value

