10. CONDUCTED SPURIOUS EMISSION

10.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

10.3. MEASUREMENT EQUIPMENT USED

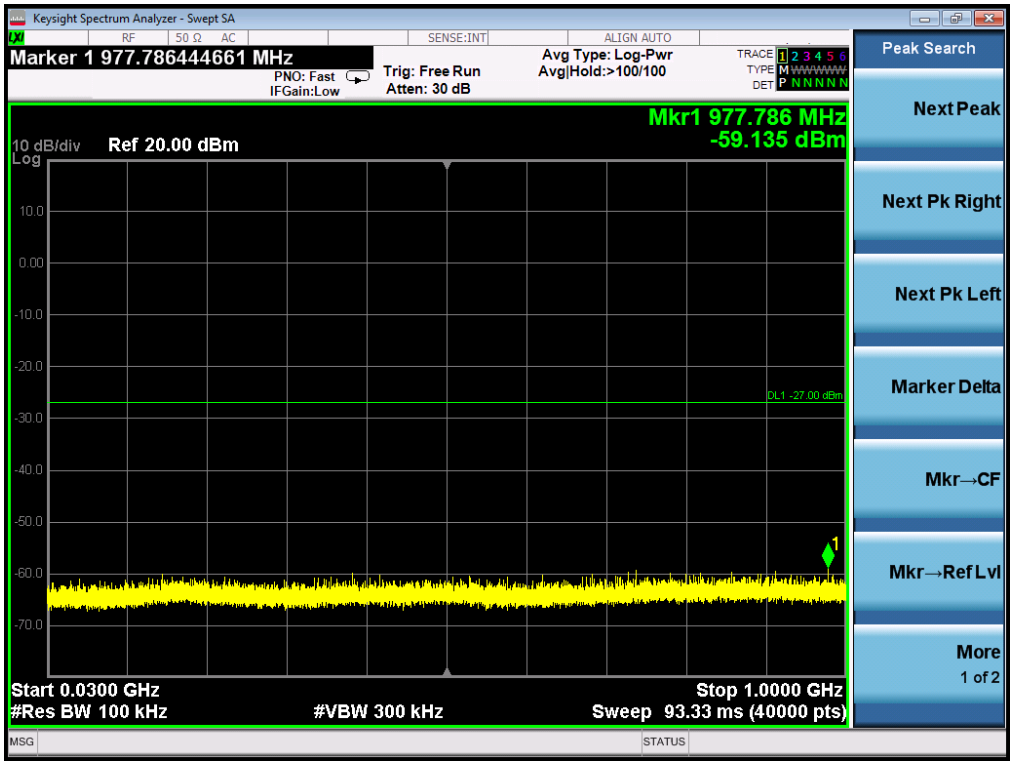
The same as described in section 6.

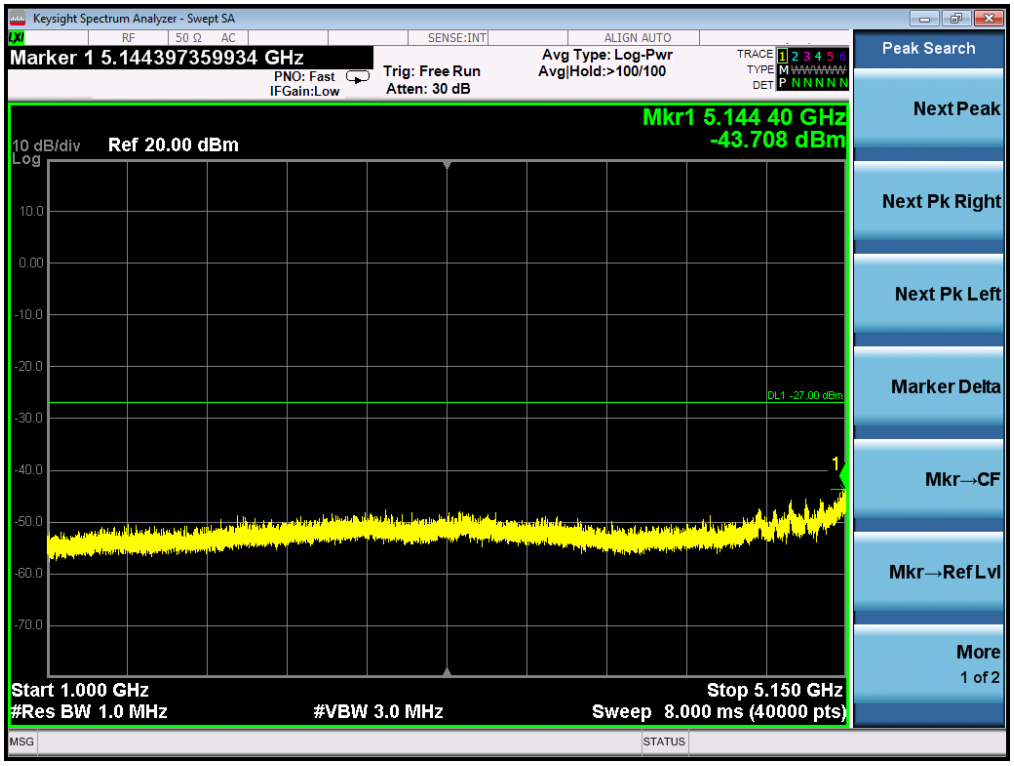
10.4. LIMITS AND MEASUREMENT RESULT

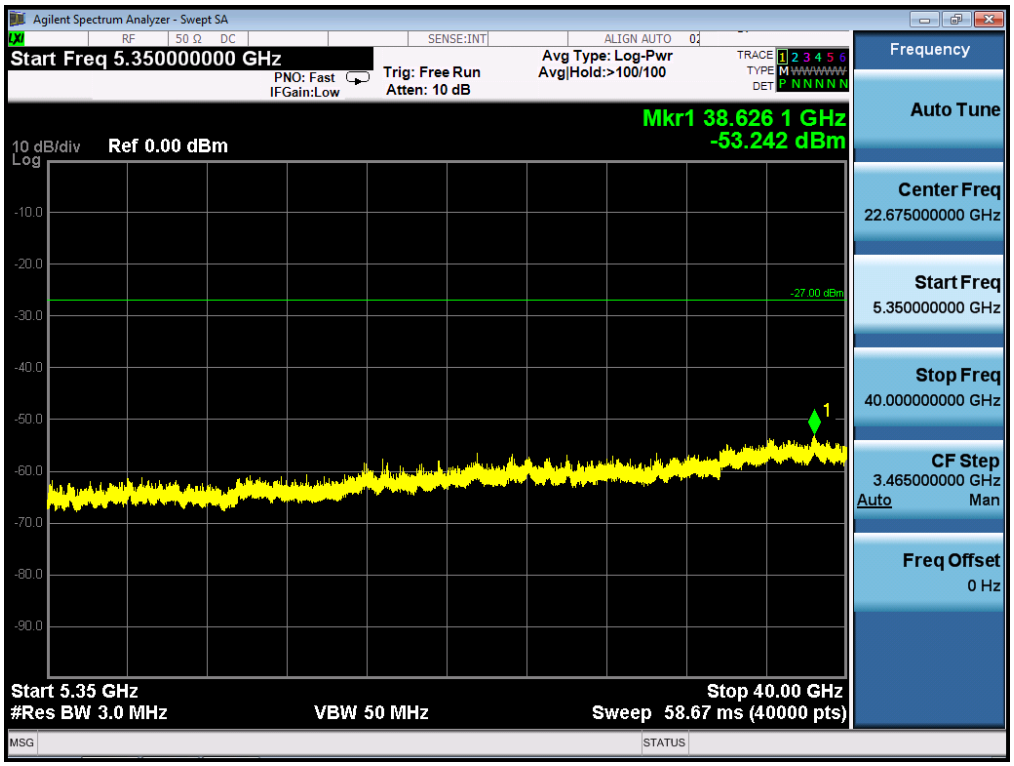
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	**Measurement Result**	
	Test channel	**Criteria**
27dBm	5150MHz-5250MHz	PASS
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edgeincreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above orbelow the bandedge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above orbelow the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	5725MHz-5825MHz	PASS

FOR 802.11A20 MODULATION,

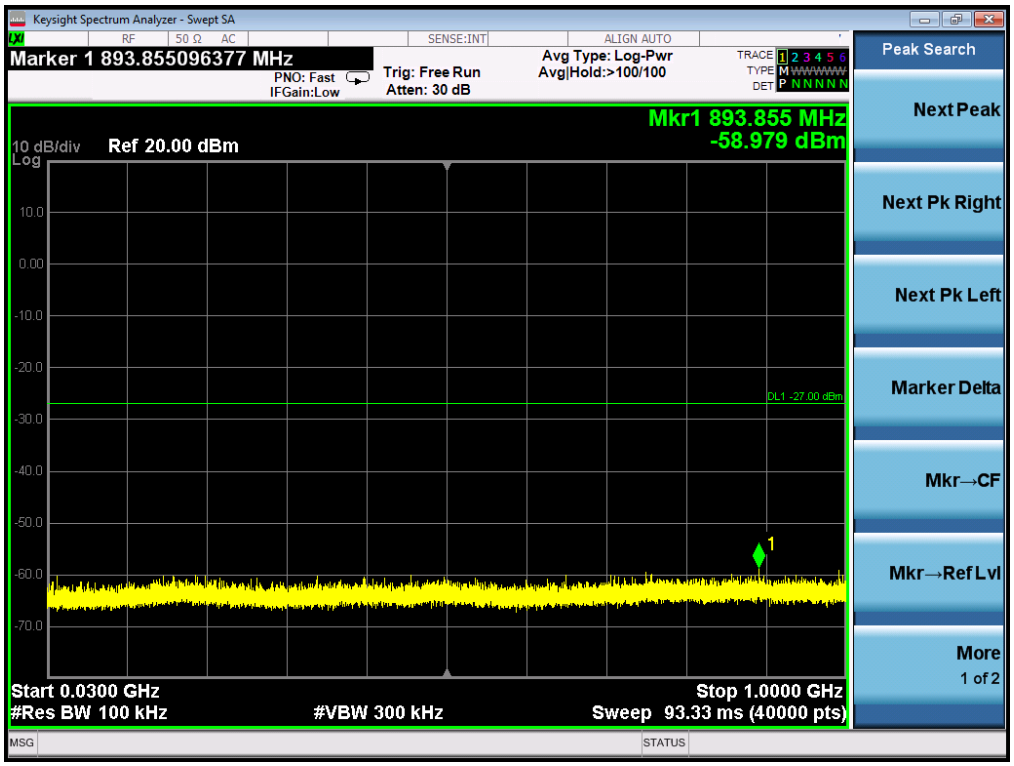
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5180MHz

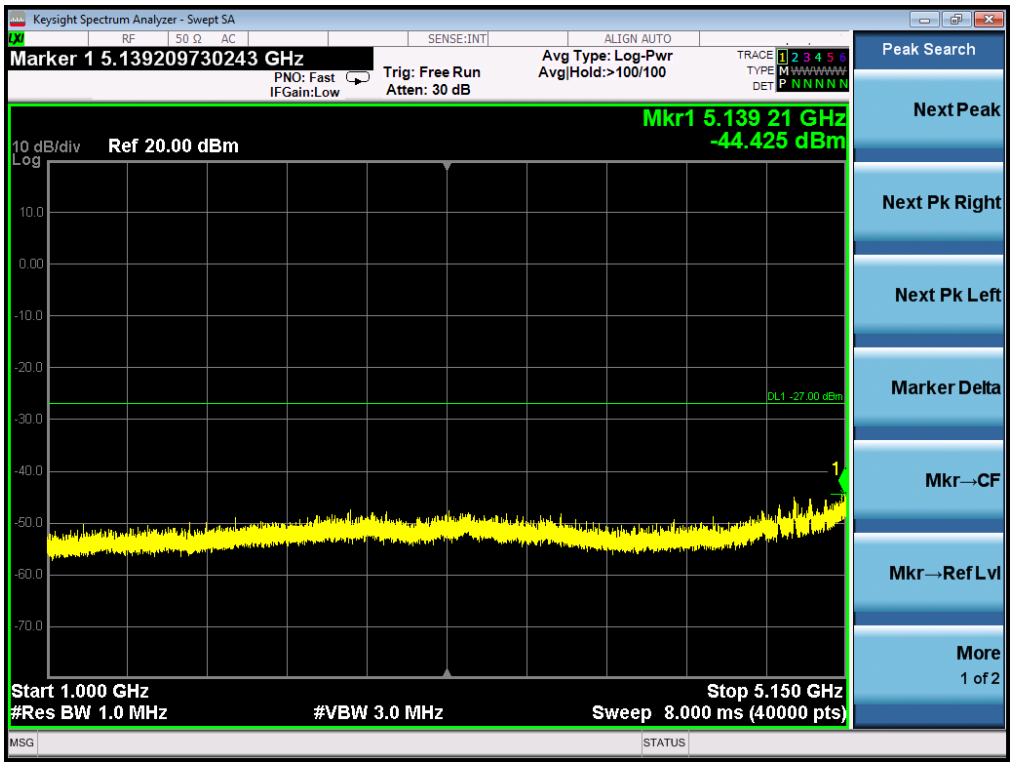


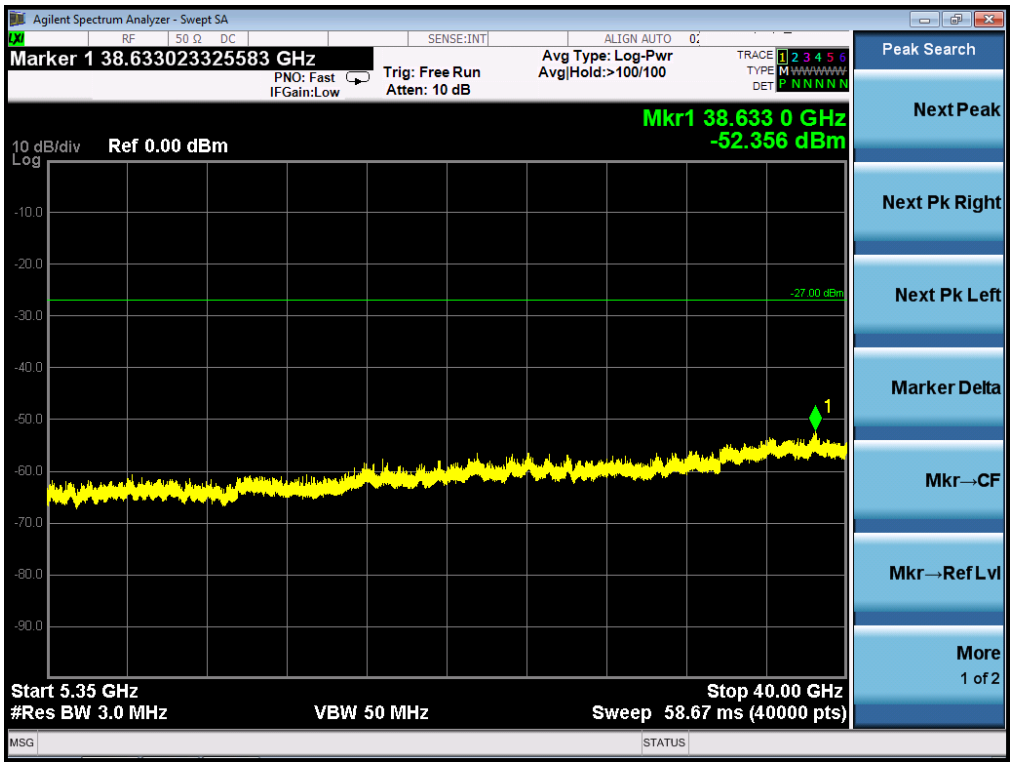




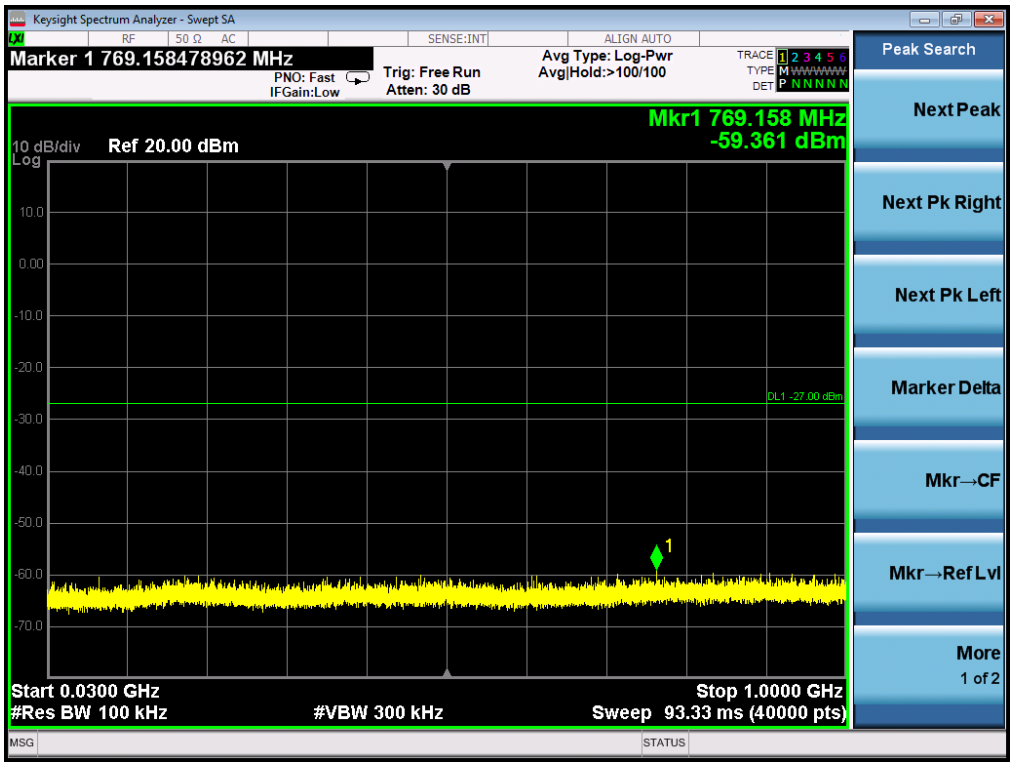
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5200MHz

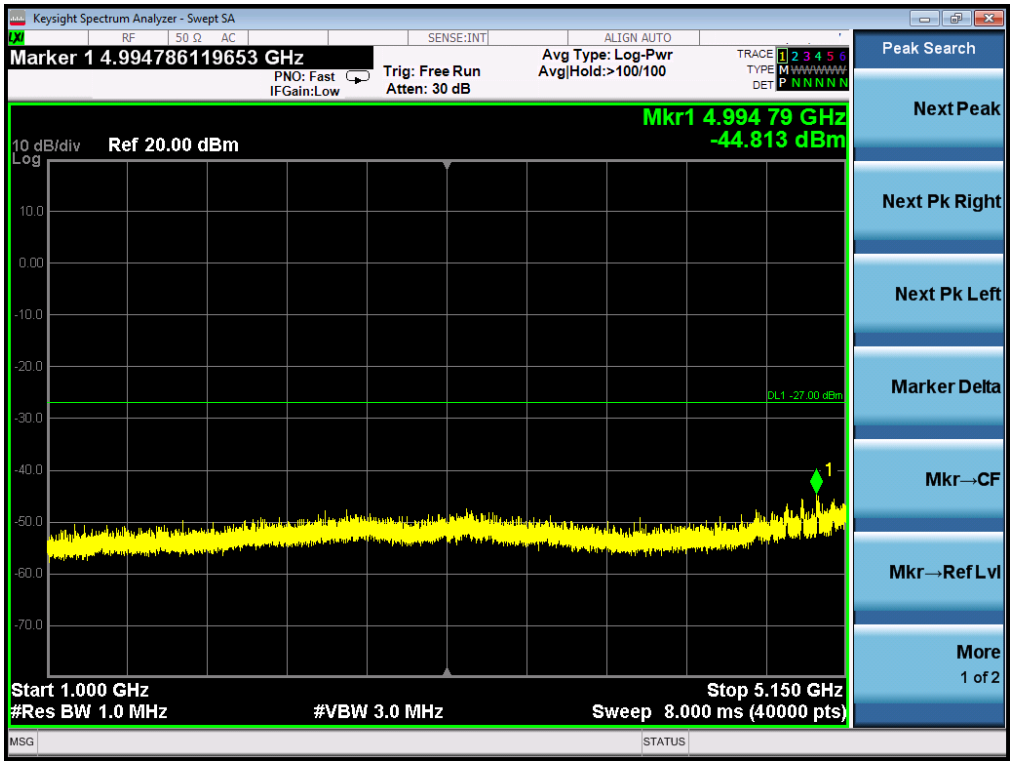


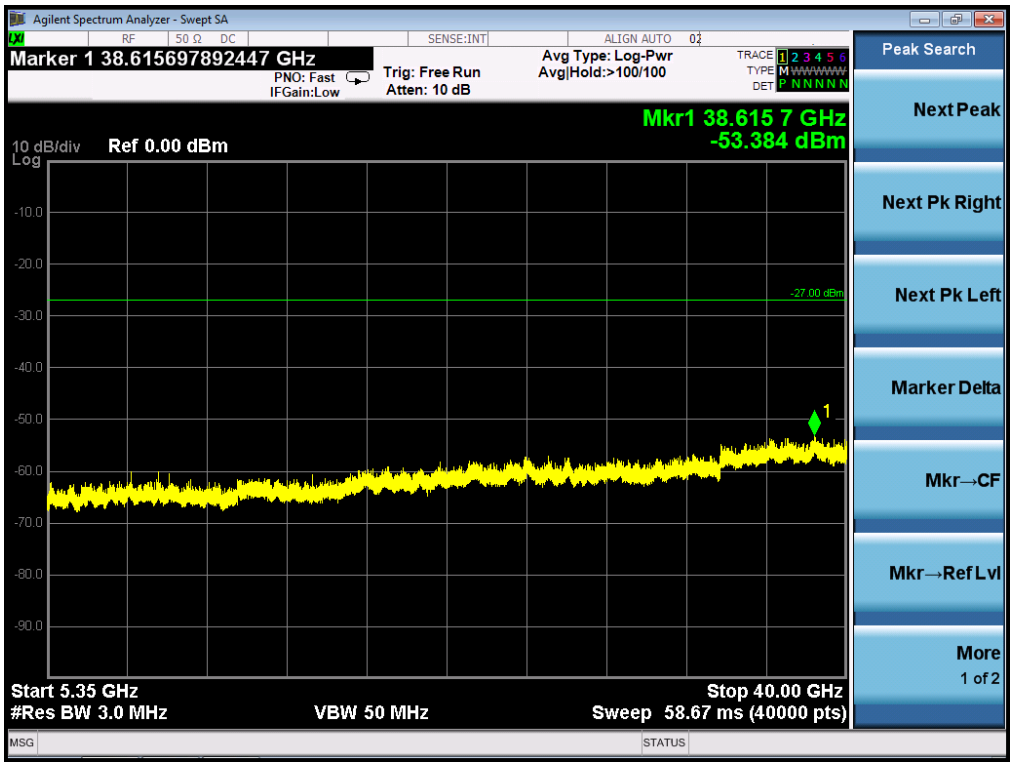

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.139209730243 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.139 21 GHz
-44.425 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
DL1 -27.00 dBm
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.150 GHz
Sweep 8.000 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
Marker 1 38.633023325583 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 38.633 0 GHz
-52.356 dBm
10 dB/div
Log
Ref 0.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-27.00 dBm
1
Start 5.35 GHz
#Res BW 3.0 MHz
VBW 50 MHz
Stop 40.00 GHz
Sweep 58.67 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

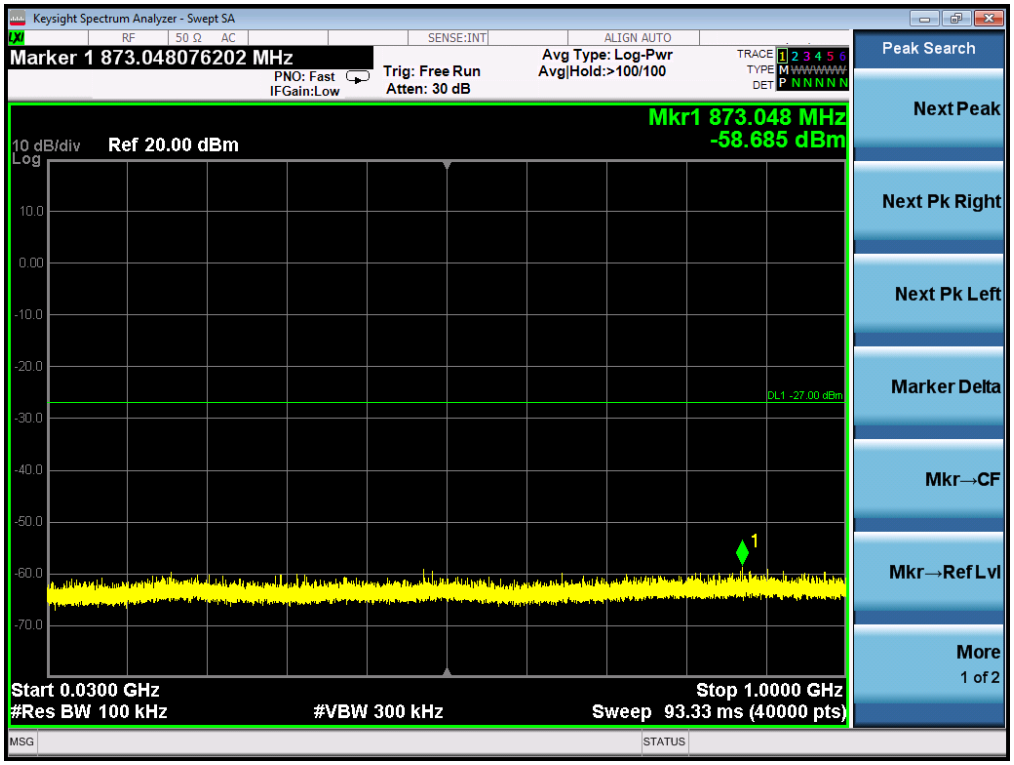
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5240MHz



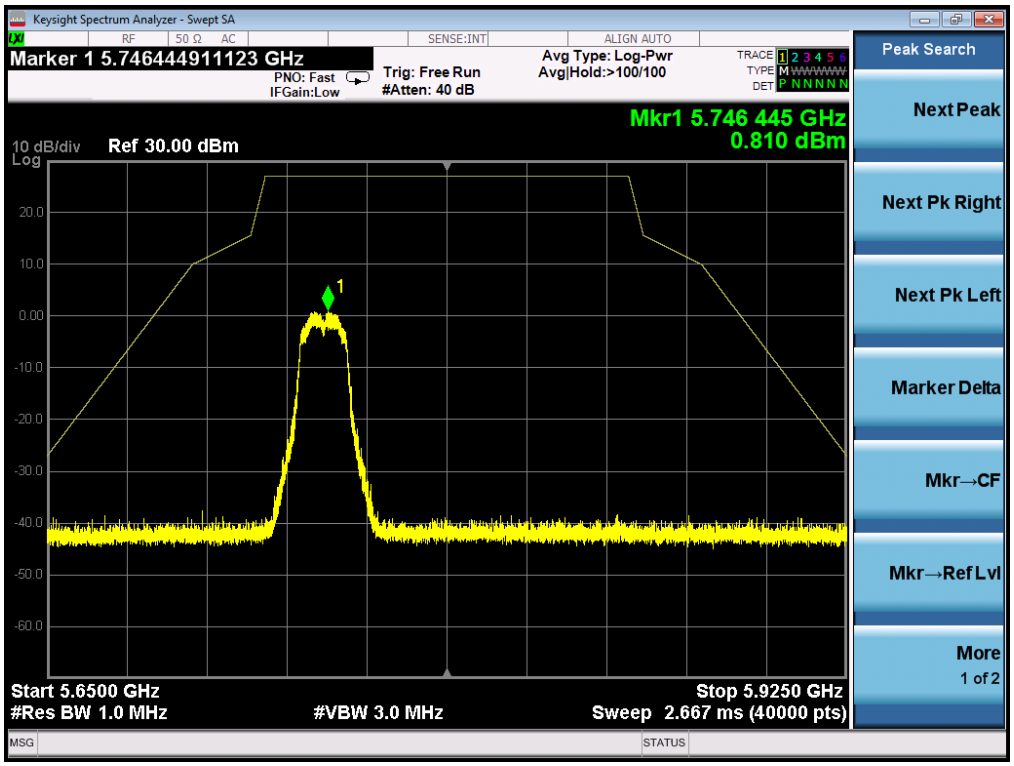


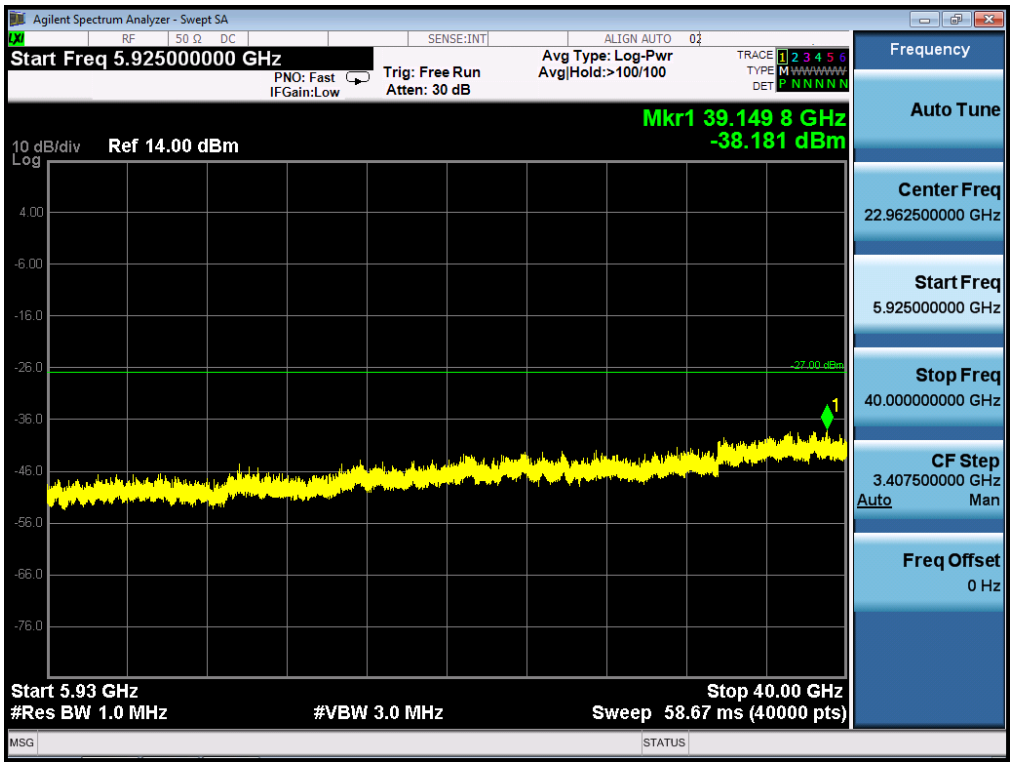


TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5745MHz

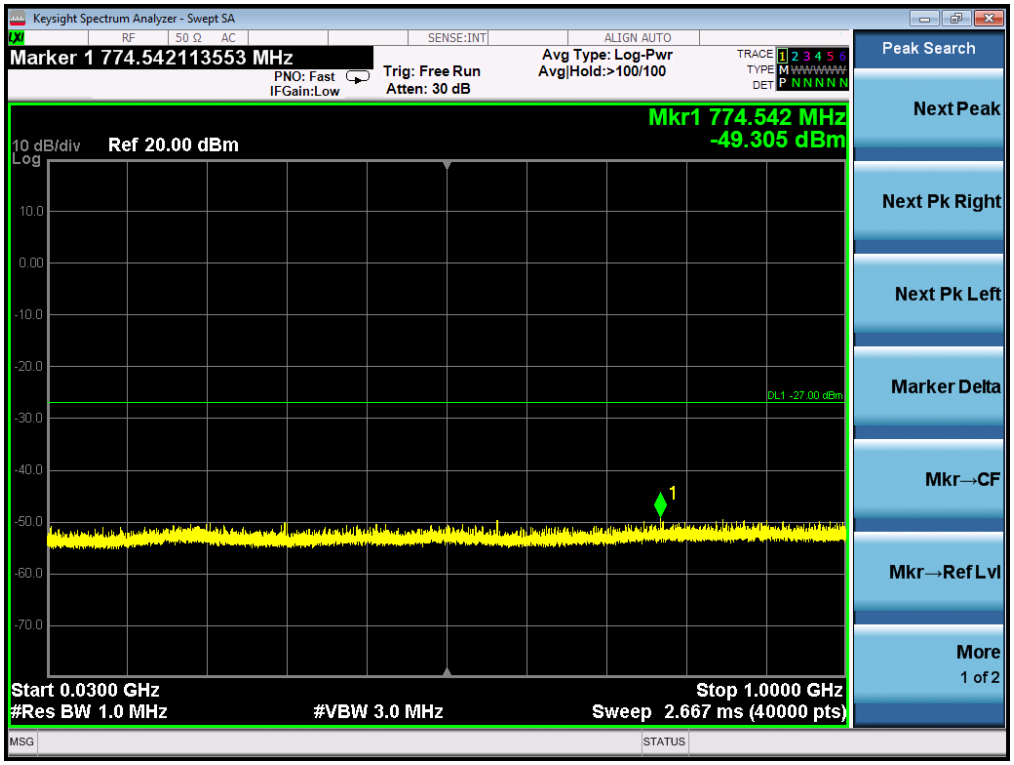



Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.602568814220 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Mkr1 5.602 57 GHz
-36.616 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
DL1 -27.00 dBm
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.650 GHz
Sweep 8.000 ms (40000 pts)
MSG
STATUS

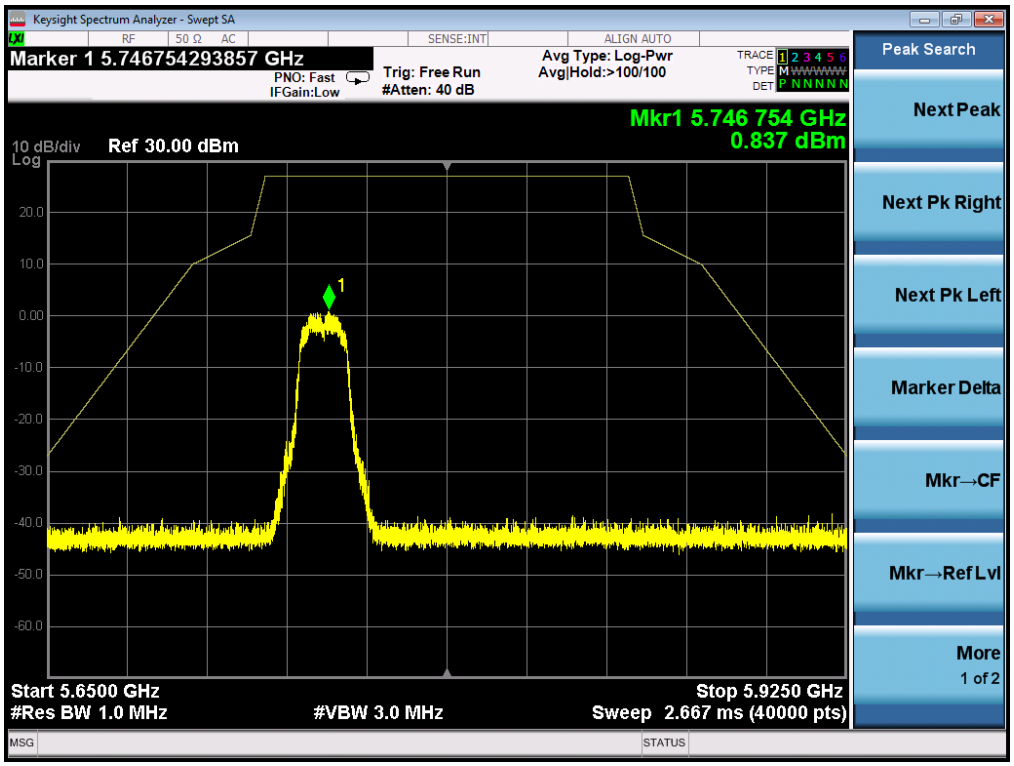

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.746444911123 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Mkr1 5.746 445 GHz
0.810 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
1
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS

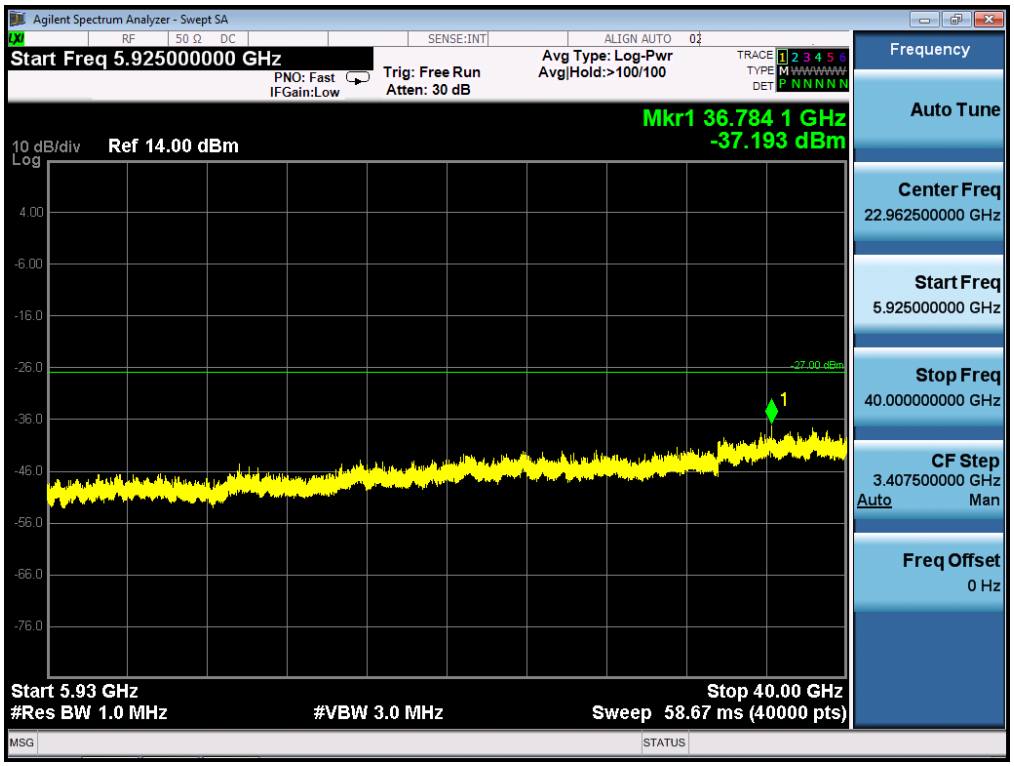


TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5785MHz

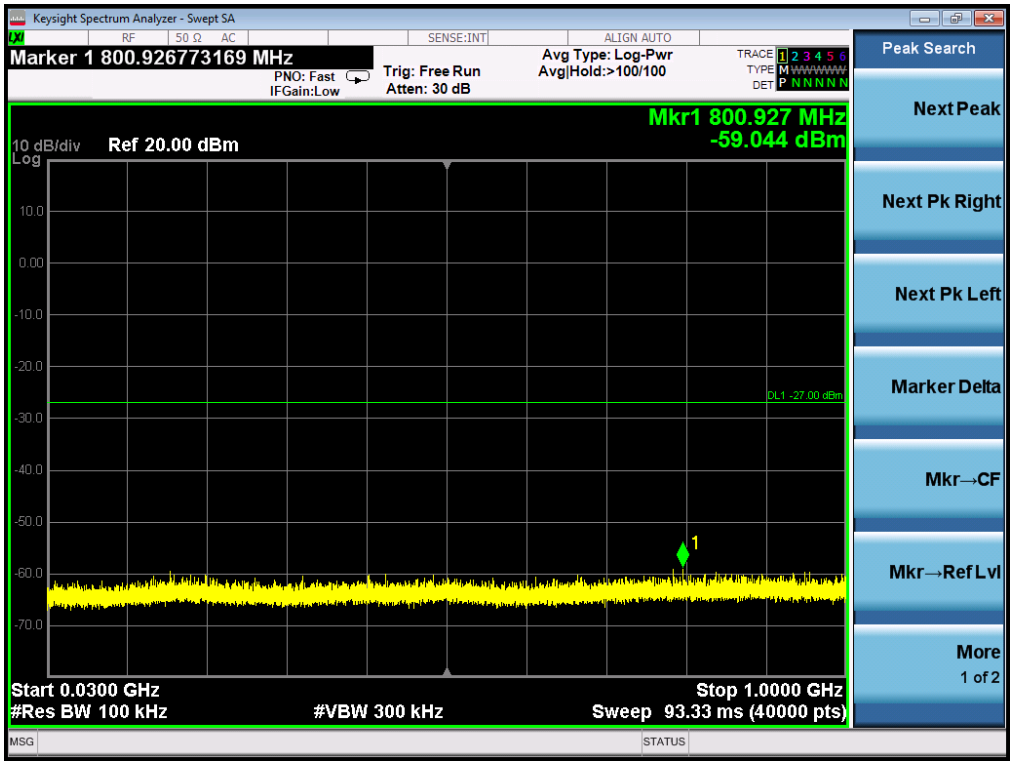


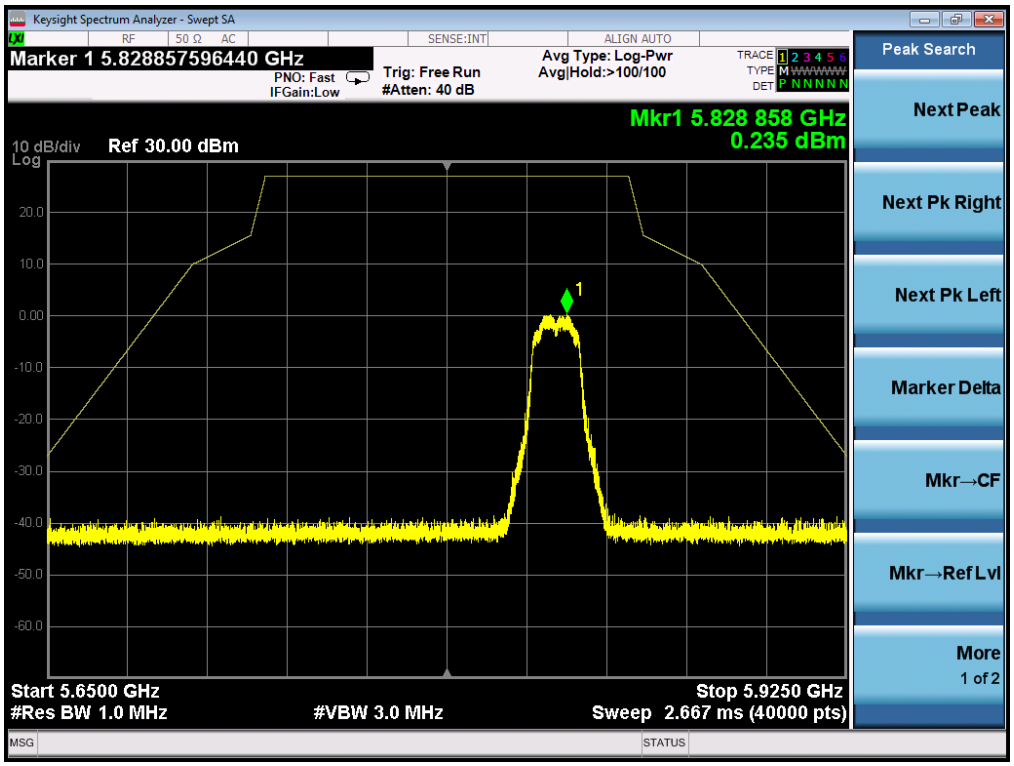

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.371458036451 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 5.371 46 GHz
-36.828 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
DL1 -27.00 dBm
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.650 GHz
Sweep 8.000 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

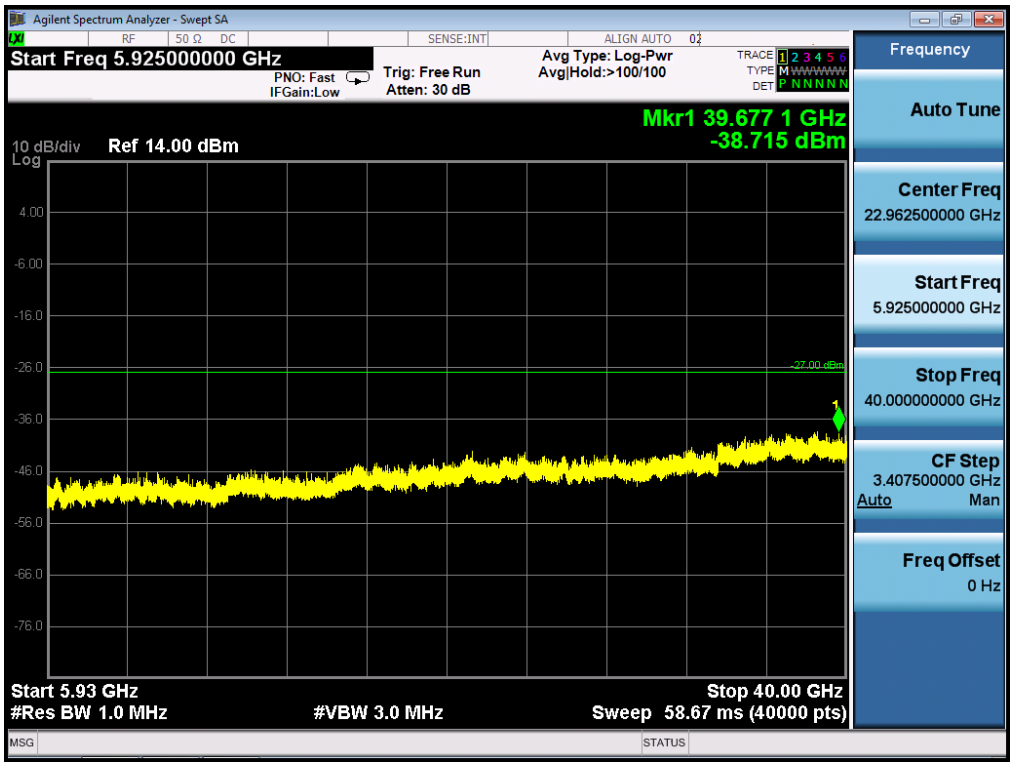

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.746754293857 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 5.746 754 GHz
0.837 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
1
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2



TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5825MHz

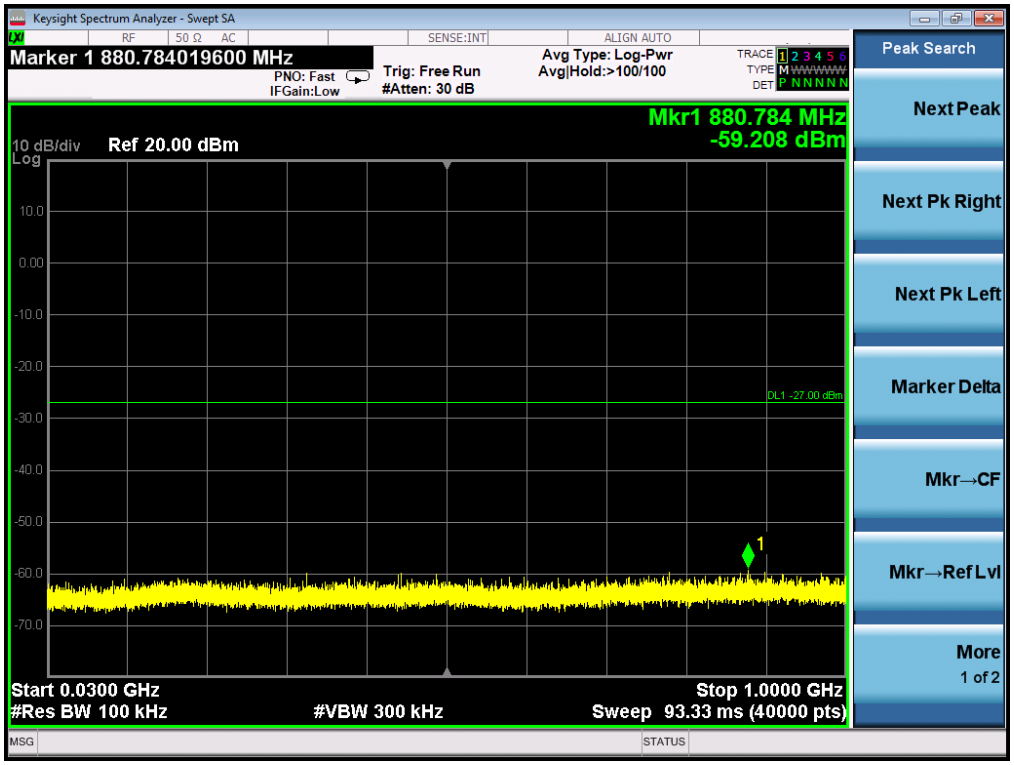


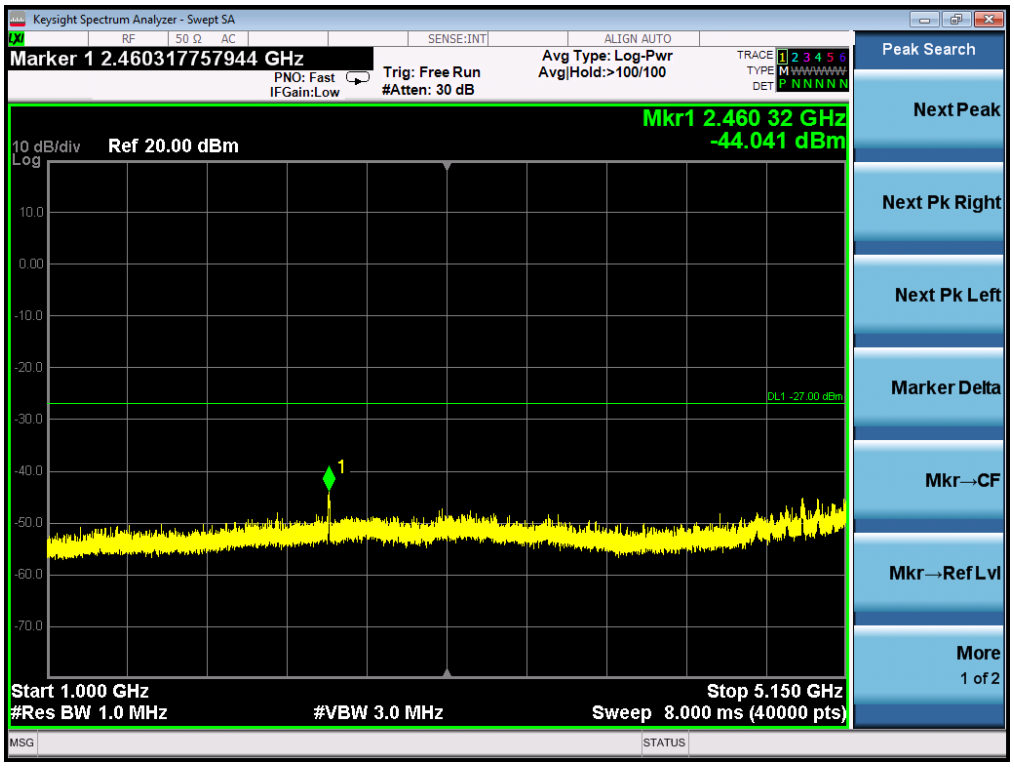

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.828857596440 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.828 858 GHz
0.235 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

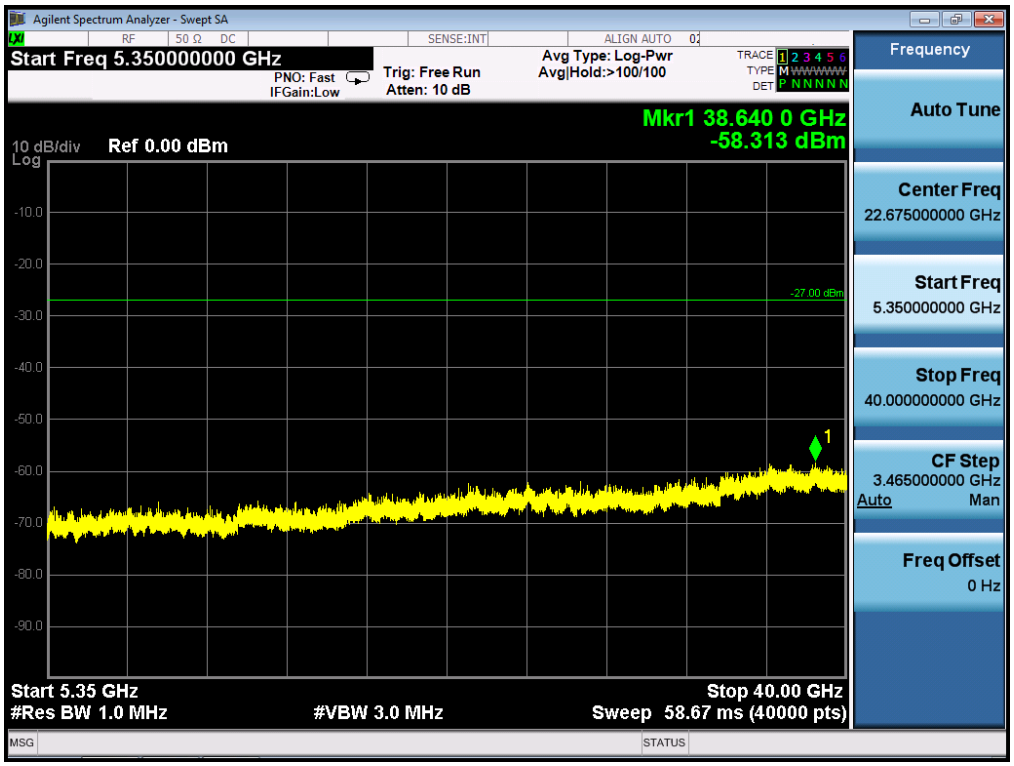

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
Start Freq 5.925000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 39.677 1 GHz
-38.715 dBm
10 dB/div
Log
Ref 14.00 dBm
4.00
-6.00
-16.0
-26.0
-36.0
-46.0
-56.0
-66.0
-76.0
-27.00 dBm
Start 5.93 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.67 ms (40000 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
22.962500000 GHz
Start Freq
5.925000000 GHz
Stop Freq
40.000000000 GHz
CF Step
3.407500000 GHz
Auto
Man
Freq Offset
0 Hz

FOR 802.11N40 MODULATION,

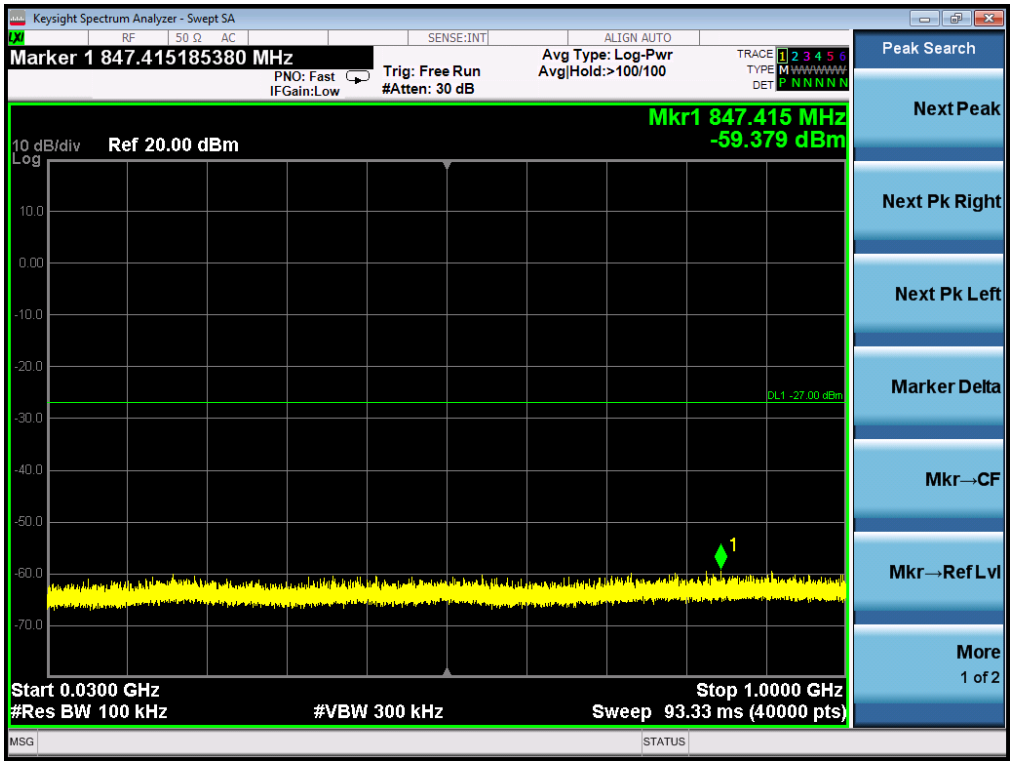
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5190MHz

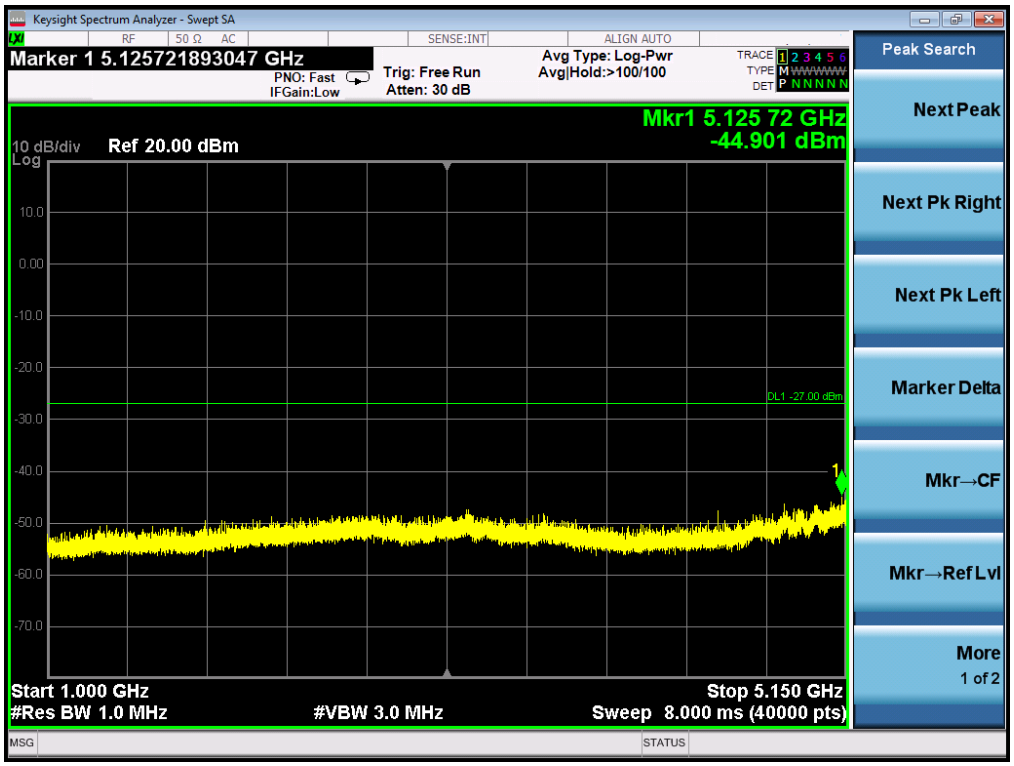


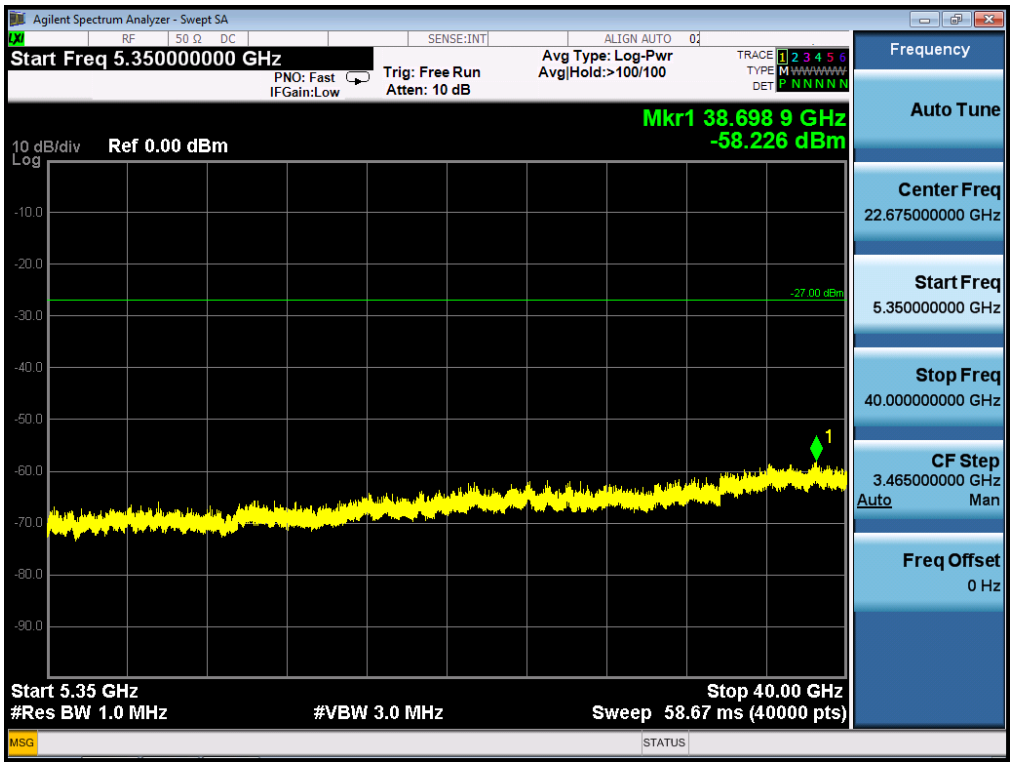




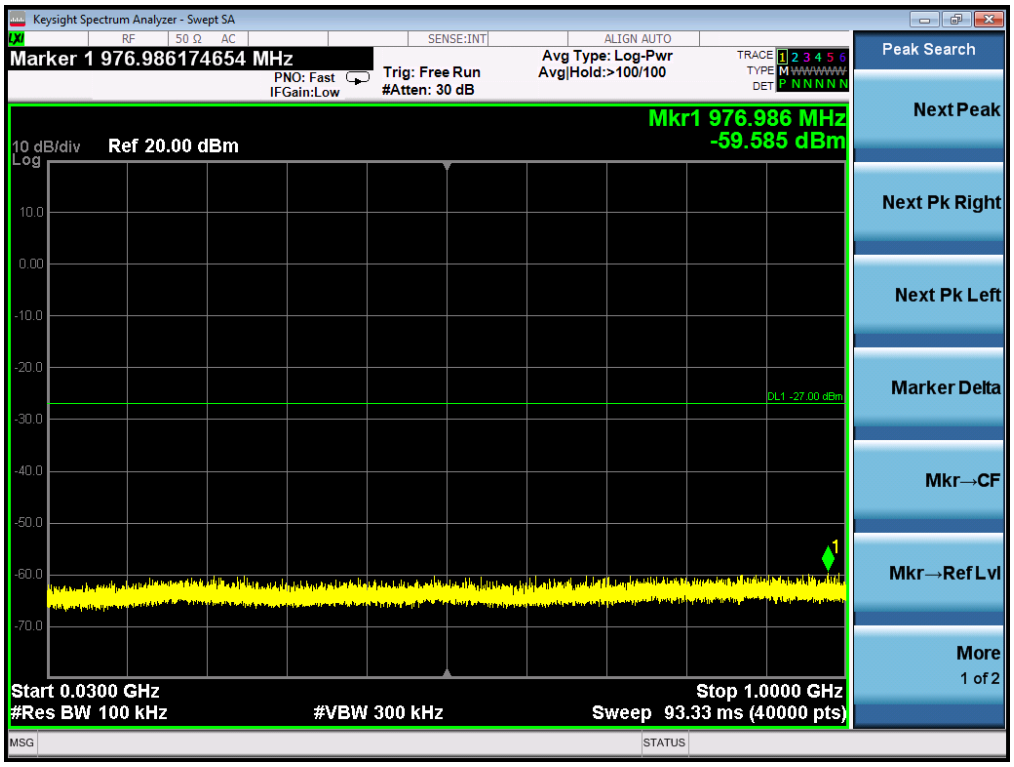
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5230MHz

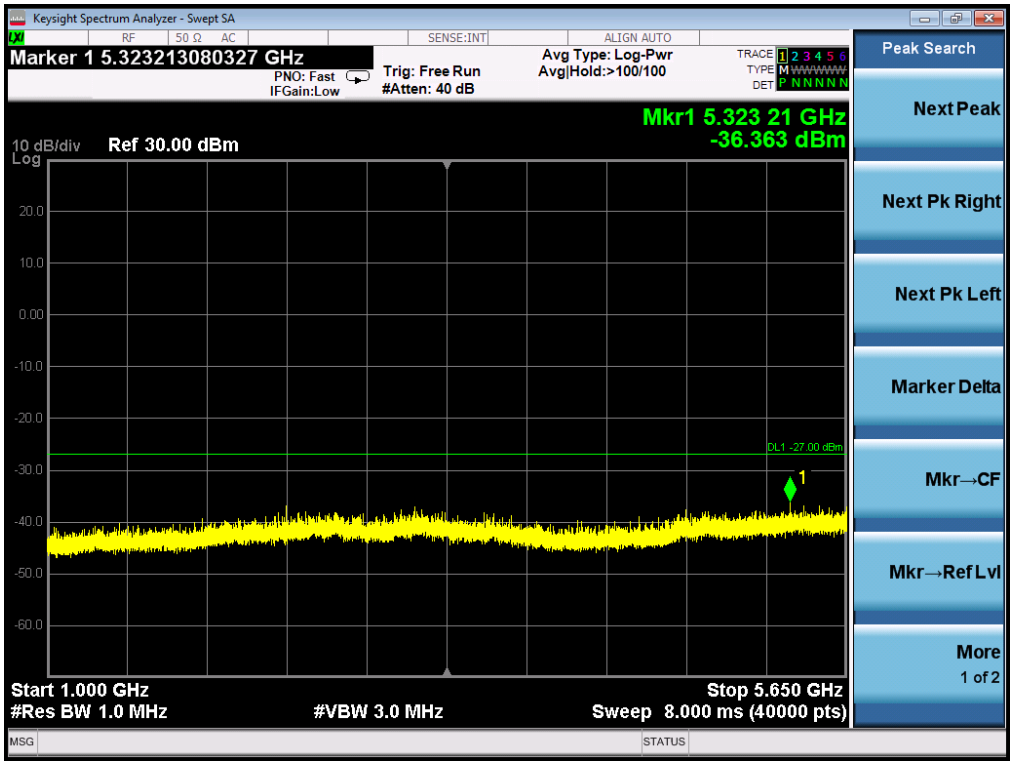


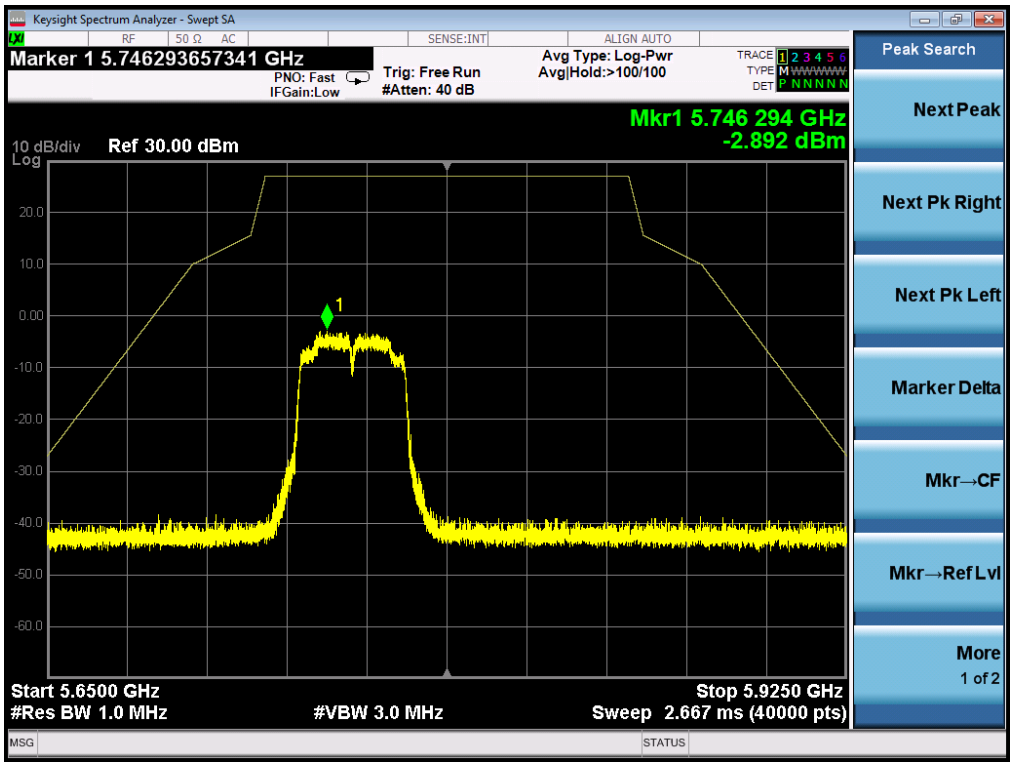

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.125721893047 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.125 72 GHz
-44.901 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
DL1 -27.00 dBm
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.150 GHz
Sweep 8.000 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

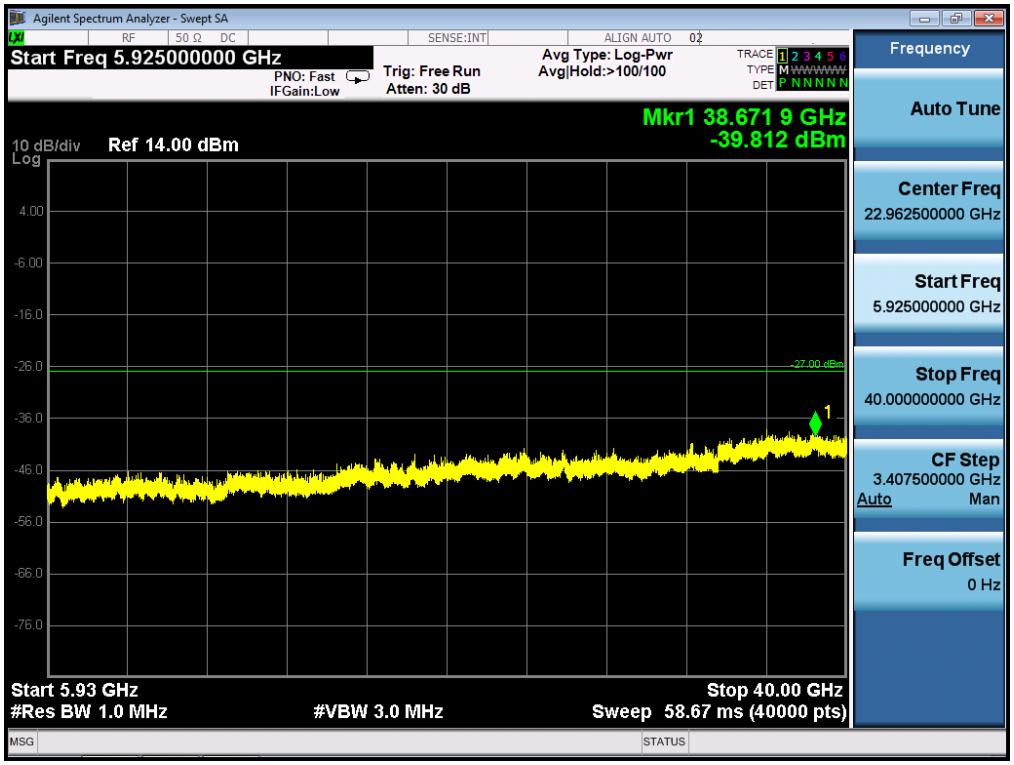

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
Start Freq 5.350000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 38.698 9 GHz
-58.226 dBm
10 dB/div
Log
Ref 0.00 dBm
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-27.00 dBm
1
Start 5.35 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.67 ms (40000 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
22.675000000 GHz
Start Freq
5.350000000 GHz
Stop Freq
40.000000000 GHz
CF Step
3.465000000 GHz
Auto
Man
Freq Offset
0 Hz

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

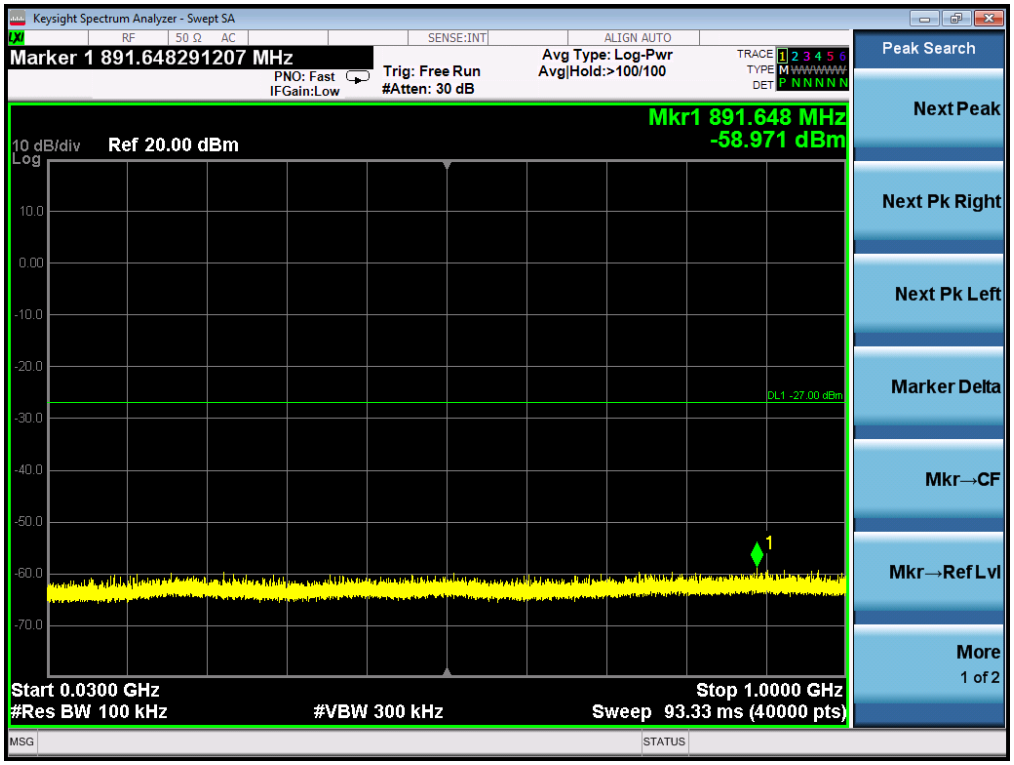


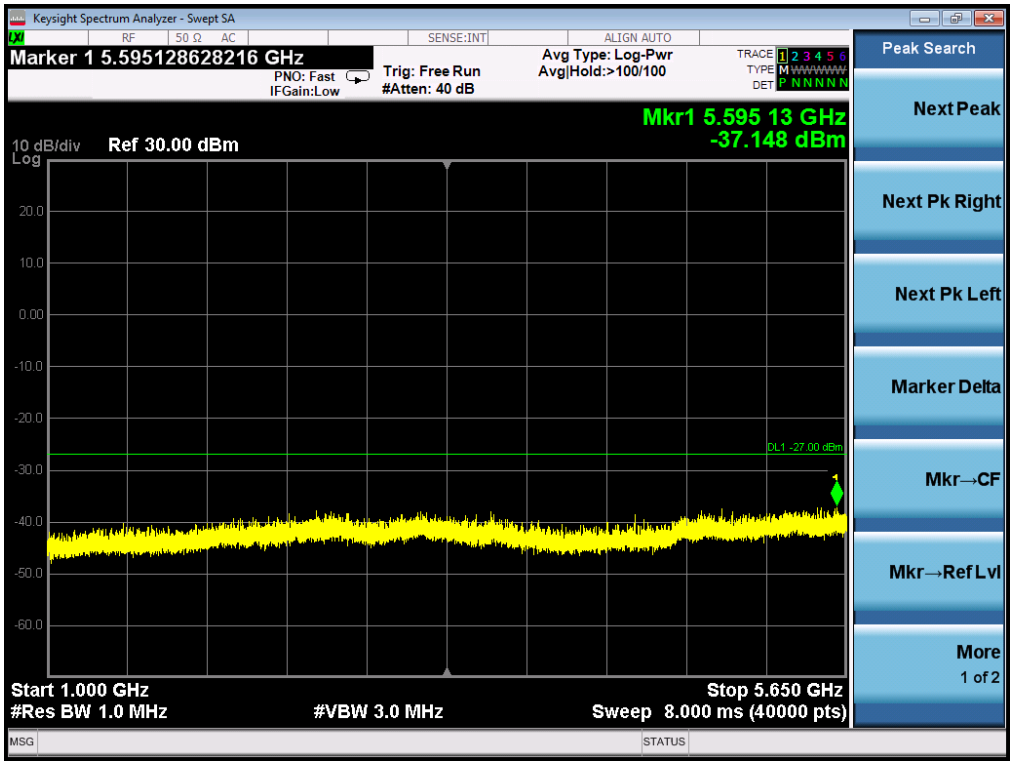


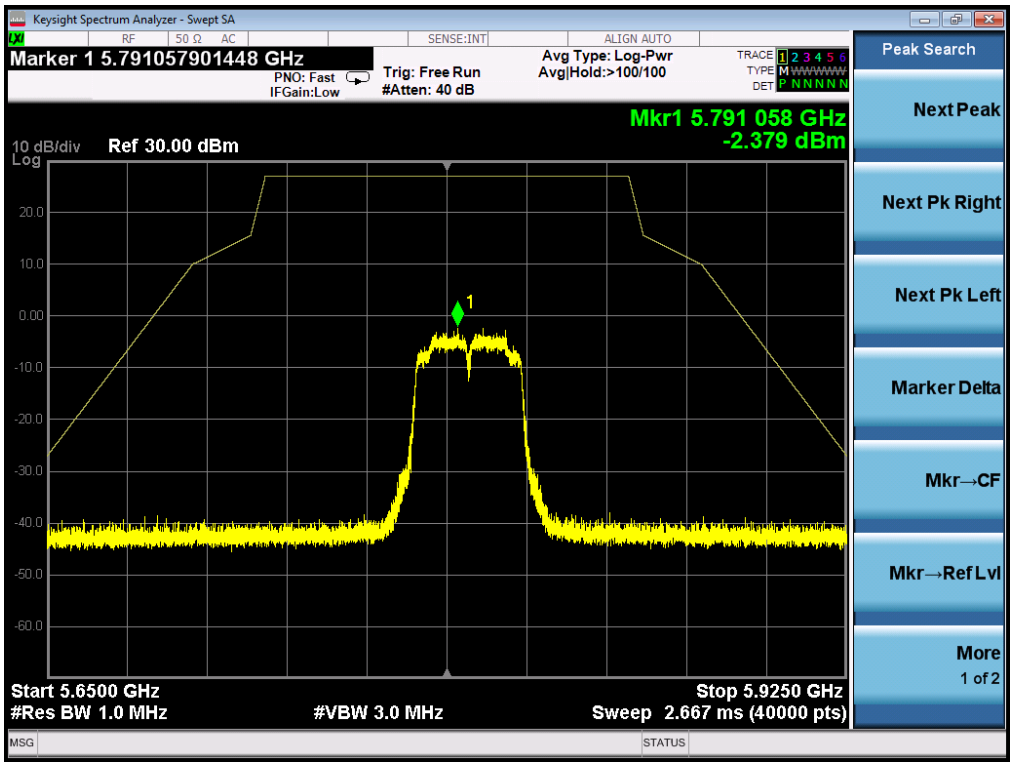

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.746293657341 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.746 294 GHz
-2.892 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

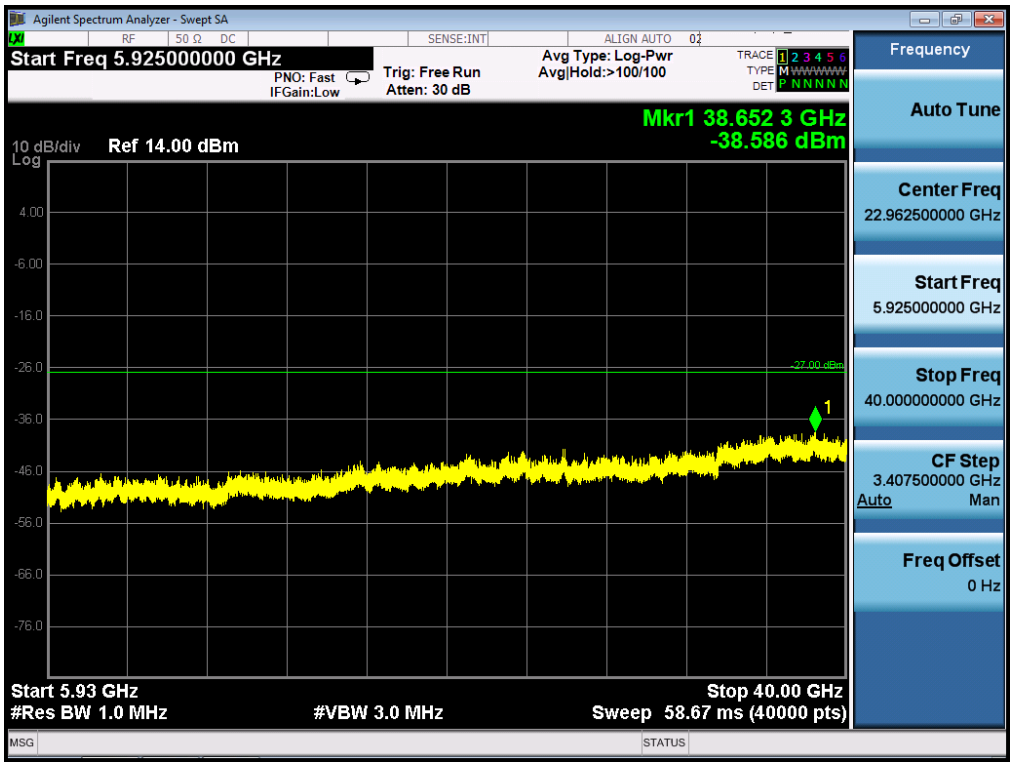

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
Start Freq 5.925000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 38.671 9 GHz
-39.812 dBm
10 dB/div
Log
Ref 14.00 dBm
4.00
-6.00
-16.0
-26.0
-36.0
-46.0
-56.0
-66.0
-76.0
-27.00 dBm
Start 5.93 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.67 ms (40000 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
22.962500000 GHz
Start Freq
5.925000000 GHz
Stop Freq
40.000000000 GHz
CF Step
3.407500000 GHz
Auto
Man
Freq Offset
0 Hz

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



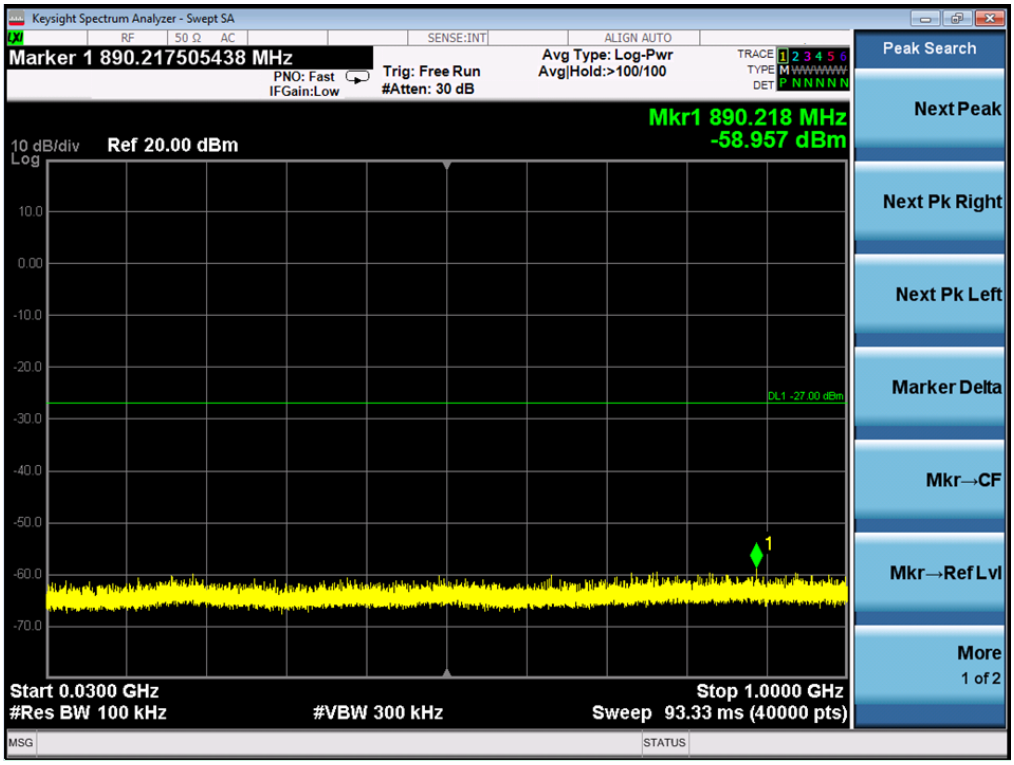


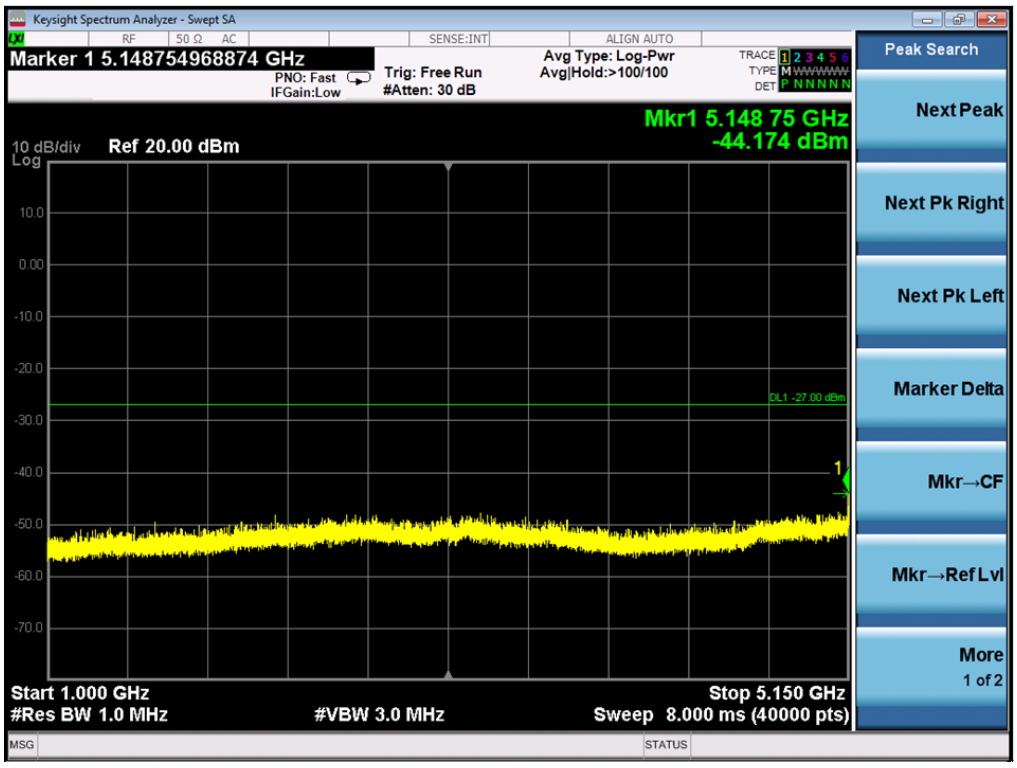

Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.791057901448 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.791 058 GHz
-2.379 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

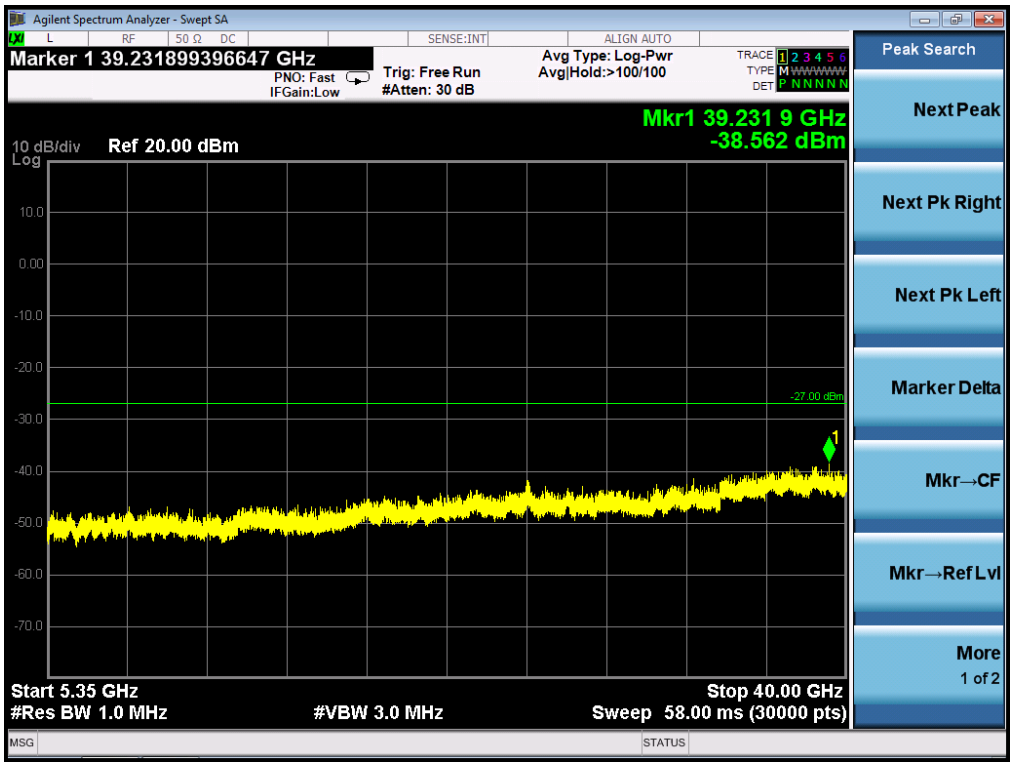

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
Start Freq 5.925000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 38.652 3 GHz
-38.586 dBm
10 dB/div
Log
Ref 14.00 dBm
4.00
-6.00
-16.0
-26.0
-36.0
-46.0
-56.0
-66.0
-76.0
-27.00 dBm
Start 5.93 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.67 ms (40000 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
22.962500000 GHz
Start Freq
5.925000000 GHz
Stop Freq
40.000000000 GHz
CF Step
3.407500000 GHz
Auto
Man
Freq Offset
0 Hz

FOR 802.11AC80 MODULATION,

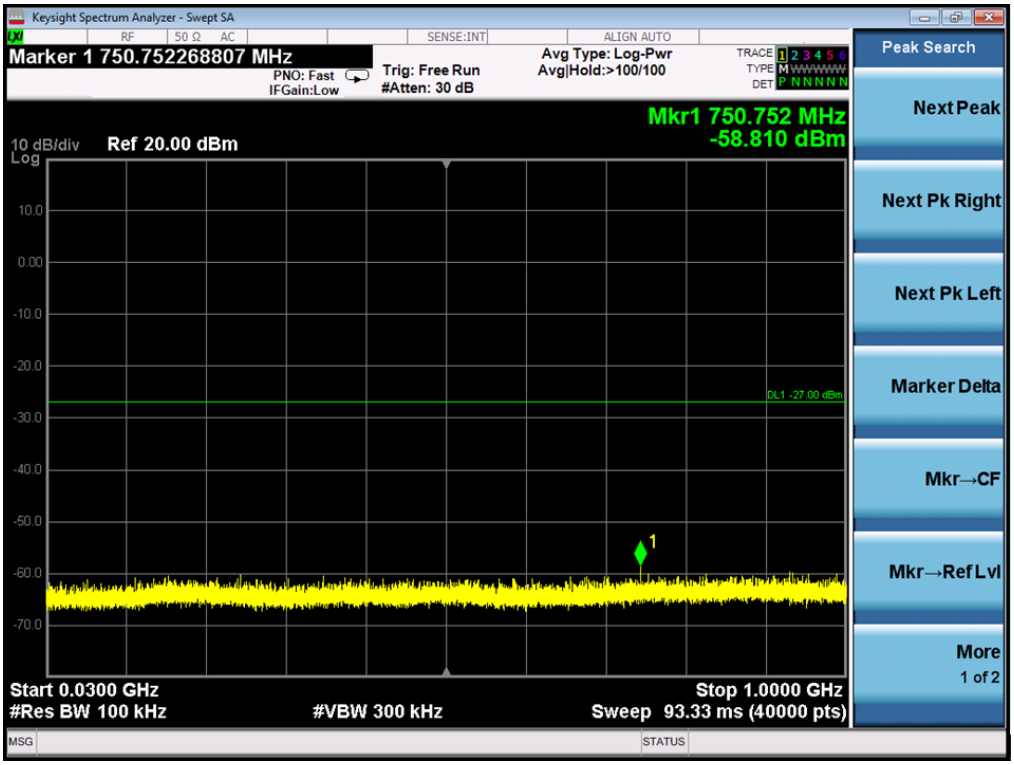
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5210MHz

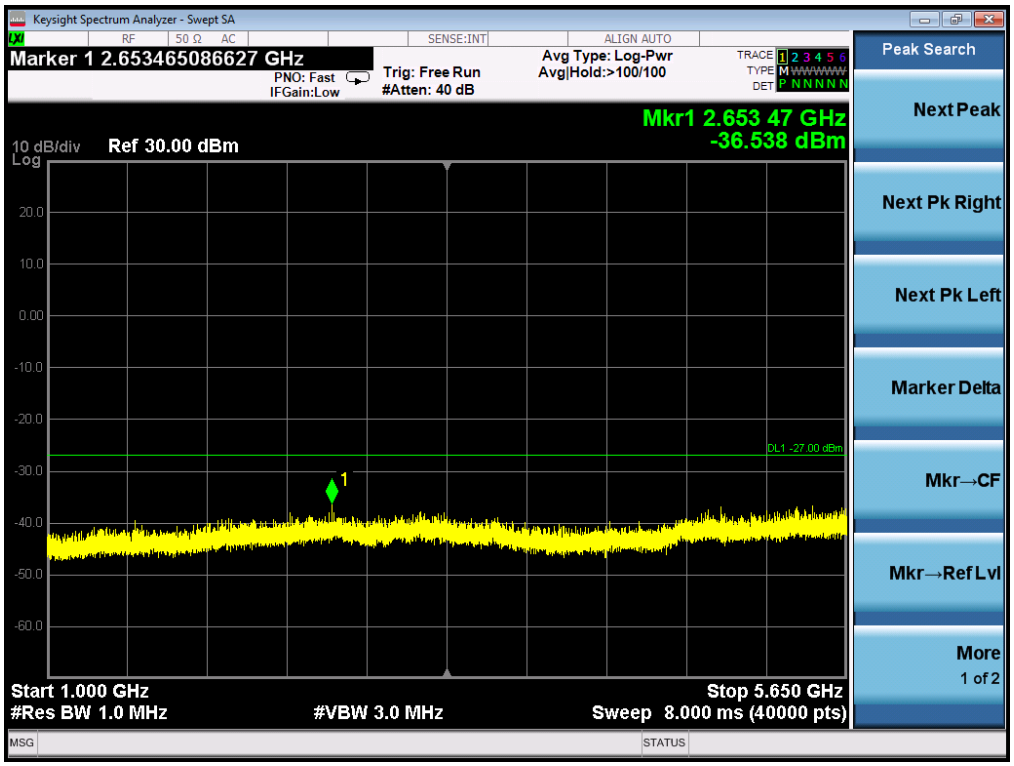


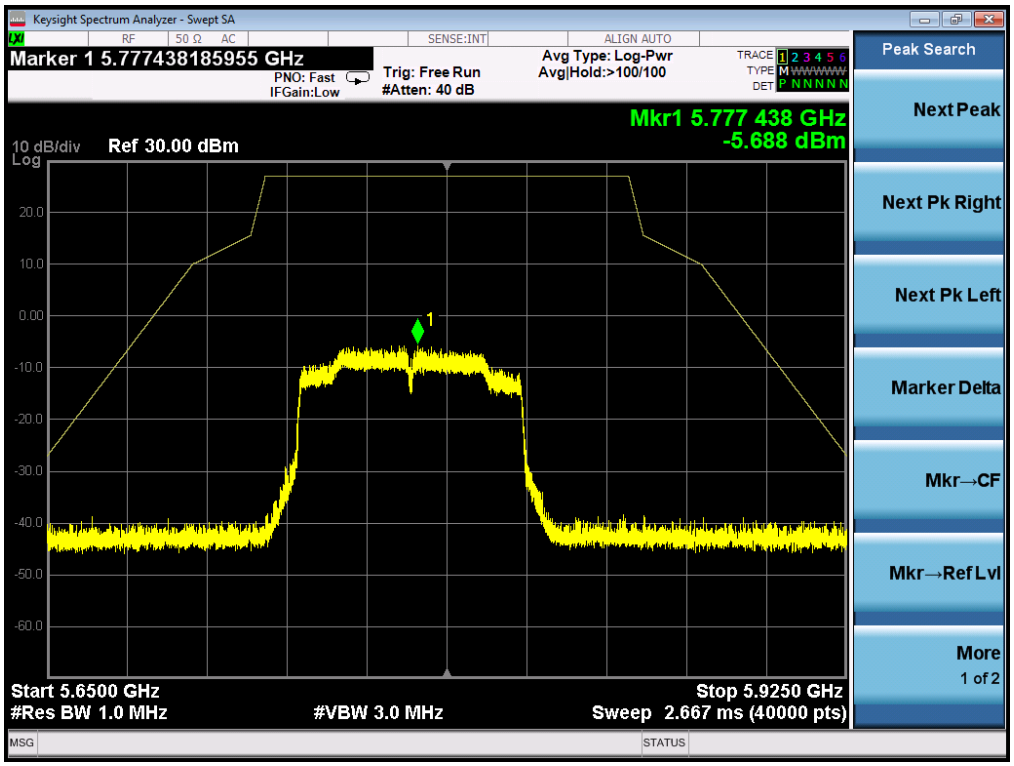


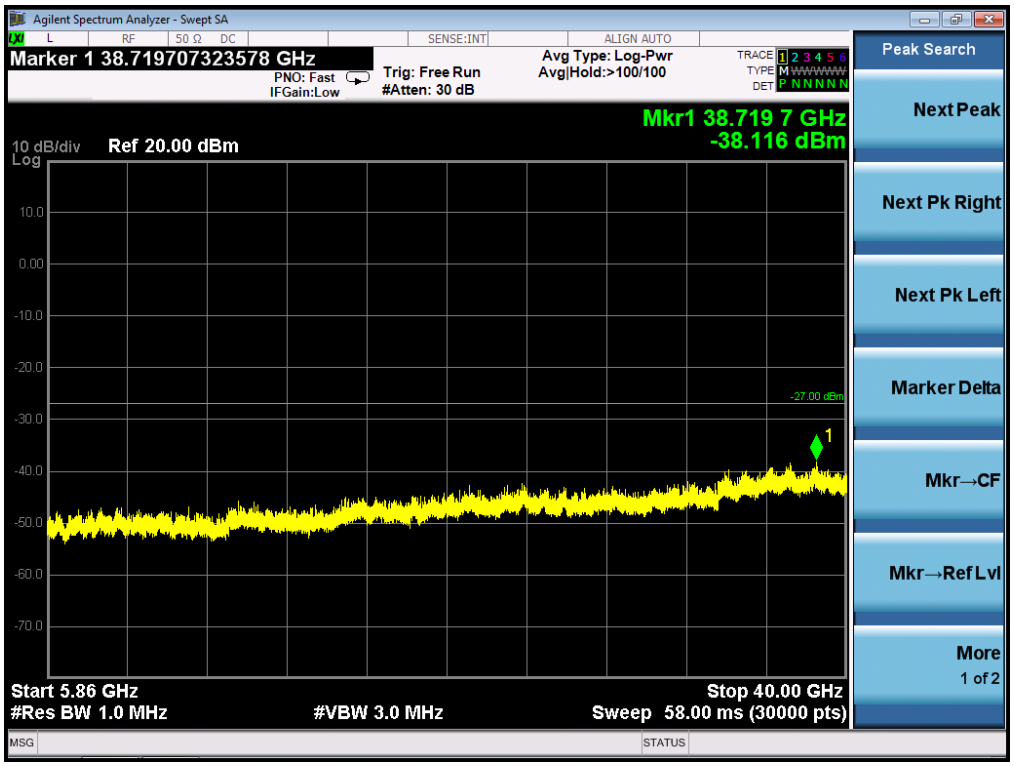


TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5775MHz




Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 2.653465086627 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 2.653 47 GHz
-36.538 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
DL1 -27.00 dBm
1
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.650 GHz
Sweep 8.000 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
Marker 1 5.777438185955 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Mkr1 5.777 438 GHz
-5.688 dBm
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
1
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2



Note: All the 20MHz，40MHz and 80MHz bandwidth modulation had been tested, the 802.11a20/n40/ac80 was the worst case and record in his test report.

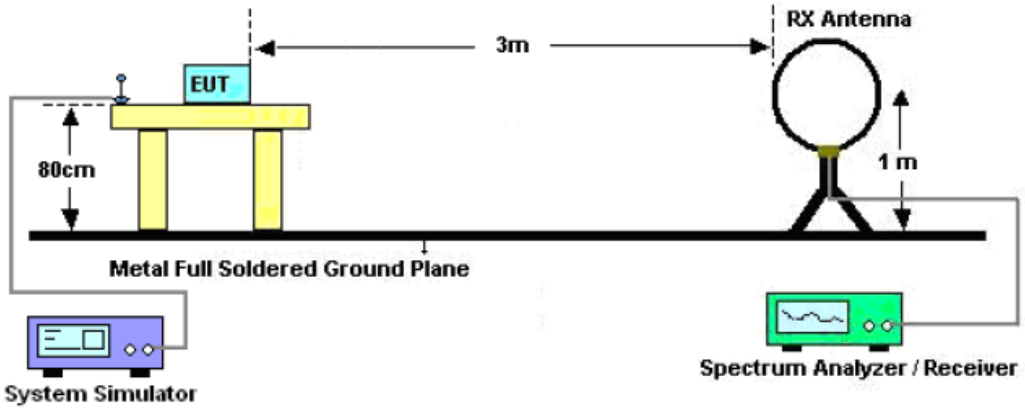
11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

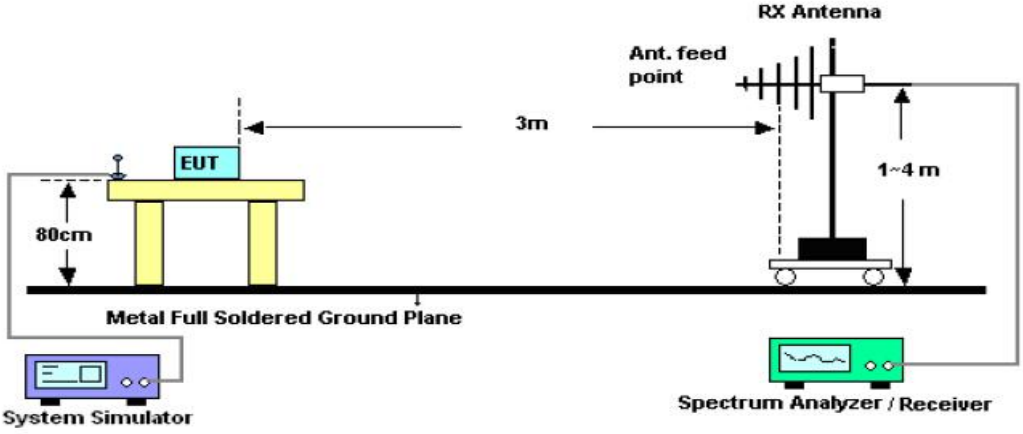
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated 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.

11.2. TEST SETUP

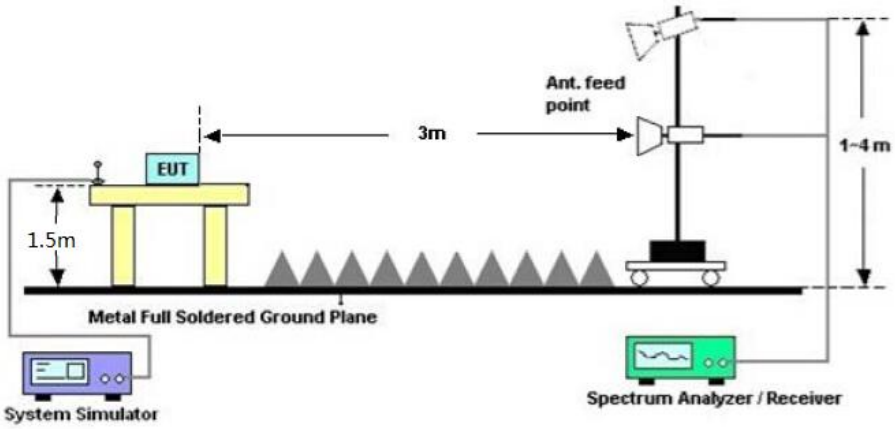
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



11.3. 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.

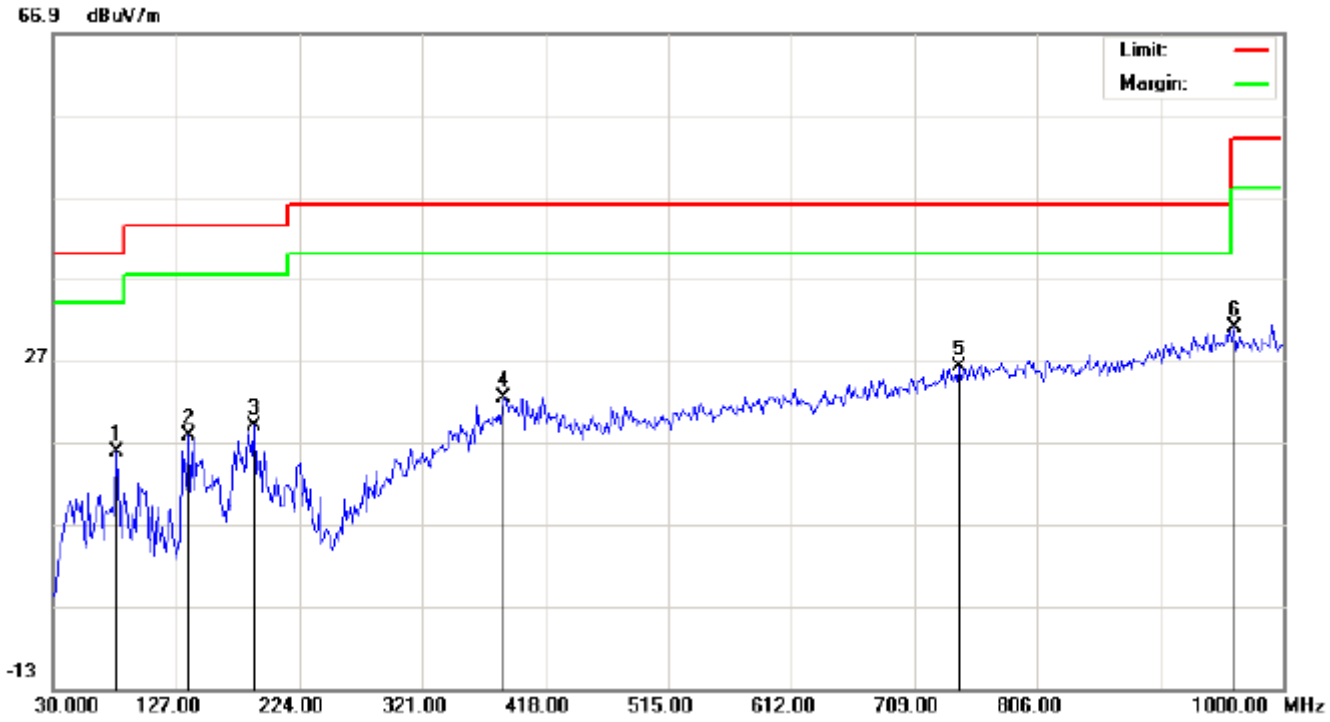
11.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

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

RADIATED EMISSION BELOW 1GHZ

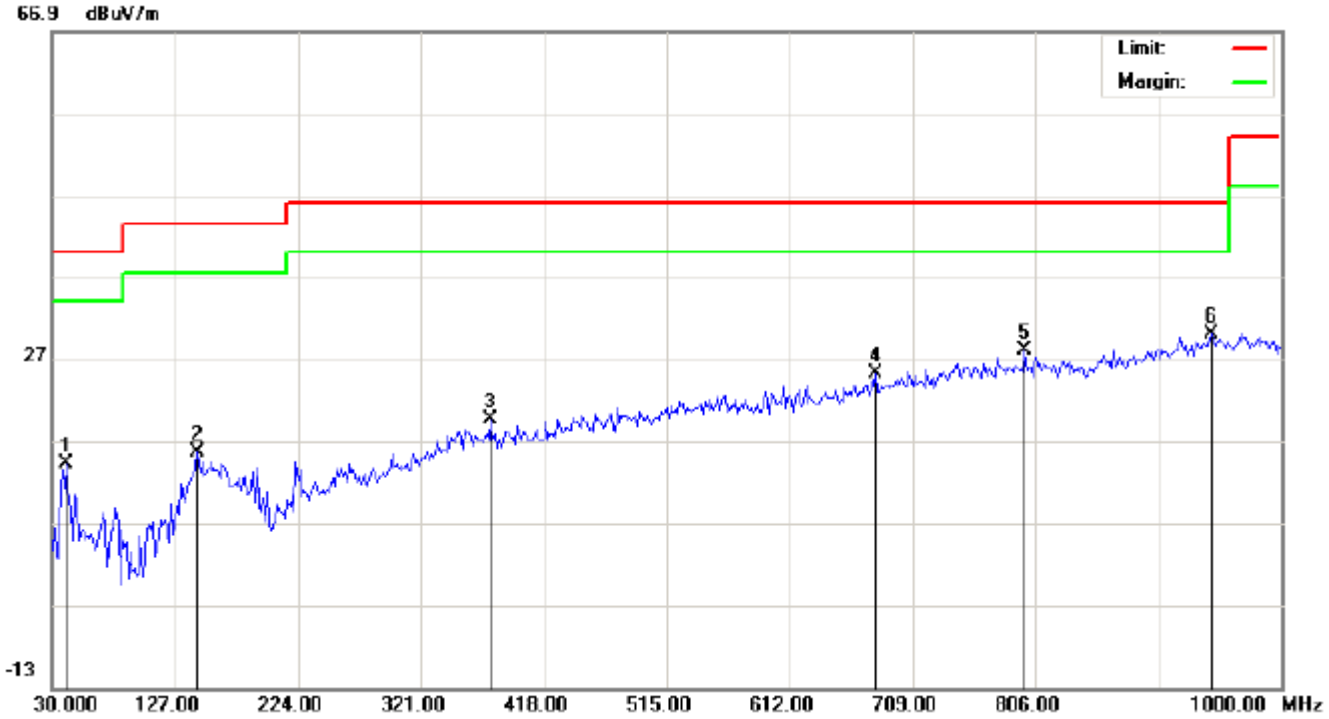
EUT	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a20 5180MHz,	**Antenna**	Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		80.1167	15.31	0.50	15.81	40.00	-24.19	peak			
2		136.7000	4.18	13.66	17.84	43.50	-25.66	peak			
3		188.4333	7.53	11.46	18.99	43.50	-24.51	peak			
4		385.6666	3.41	18.98	22.39	46.00	-23.61	peak			
5	*	744.5667	-0.35	26.47	26.12	46.00	-19.88	peak			
6		961.2000	1.11	29.89	31.00	54.00	-23.00	peak			

RESULT: PASS

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
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	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		41.3167	5.48	8.81	14.29	40.00	-25.71	peak			
2		144.7833	0.45	15.23	15.68	43.50	-27.82	peak			
3		375.9667	0.74	18.91	19.65	46.00	-26.35	peak			
4		679.9000	0.62	24.65	25.27	46.00	-20.73	peak			
5		797.9167	0.77	27.29	28.06	46.00	-17.94	peak			
6	*	945.0333	0.14	29.86	30.00	46.00	-16.00	peak			

RESULT: PASS

Note: All test channels had been tested. The 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	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
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
10360.120	43.22	9.14	52.36	74	-21.64	peak
10360.120	37.31	9.14	46.45	54	-7.55	AVG
15540.180	40.64	10.22	50.86	74	-23.14	peak
15540.180	34.63	10.22	44.85	54	-9.15	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
10360.120	42.53	9.14	51.67	74	-22.33	peak
10360.120	36.22	9.14	45.36	54	-8.64	AVG
15540.180	39.85	10.22	50.07	74	-23.93	peak
15540.180	34.26	10.22	44.48	54	-9.52	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a20 5200MHz,	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	42.76	9.27	52.03	74	-21.97	
10400.120	37.9	9.27	47.17	54	-6.83	peak
10400.120	41.16	10.38	51.54	74	-22.46	AVG
15600.180	34.57	10.38	44.95	54	-9.05	peak
15600.180	34.5	10.38	44.88	54	-9.12	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)	
10400.120	40.67	9.27	49.94	74	-24.06	peak
10400.120	35.79	9.27	45.06	54	-8.94	AVG
15600.180	40.18	10.38	50.56	74	-23.44	peak
15600.180	34.38	10.38	44.76	54	-9.24	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
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
10480.120	42.4	9.27	51.67	74	-22.33	peak
10480.120	37.54	9.27	46.81	54	-7.19	AVG
15720.180	40.8	10.38	51.18	74	-22.82	peak
15720.180	34.21	10.38	44.59	54	-9.41	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
10480.120	40.31	9.27	49.58	74	-24.42	peak
10480.120	35.43	9.27	44.7	54	-9.3	AVG
15720.180	39.82	10.38	50.2	74	-23.8	peak
15720.180	34.02	10.38	44.4	54	-9.6	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
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
11490.120	43.76	3.75	47.51	74	-26.49	peak
11490.120	37.73	3.75	41.48	54	-12.52	AVG
17235.180	41.39	8.16	49.55	74	-24.45	peak
17235.180	35.44	8.16	43.60	54	-10.40	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
11490.120	43.49	3.75	47.24	74.00	-26.76	peak
11490.120	36.68	3.75	40.43	54.00	-13.57	AVG
17235.180	40.78	8.16	48.94	74.00	-25.06	peak
17235.180	34.95	8.16	43.11	54.00	-10.89	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5785MHz,	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
11570.120	43.75	3.75	47.50	74.00	-26.50	peak
11570.120	38.21	3.75	41.96	54.00	-12.04	AVG
17355.180	41.23	8.16	49.39	74.00	-24.61	peak
17355.180	35.19	8.16	43.35	54.00	-10.65	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
11570.120	41.13	3.75	44.88	74.00	-29.12	peak
11570.120	36.63	3.75	40.38	54.00	-13.62	AVG
17355.180	40.42	8.16	48.58	74.00	-25.42	peak
17355.180	35.17	8.16	43.33	54.00	-10.67	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
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
11650.120	42.59	3.75	46.34	74	-27.66	peak
11650.120	37.83	3.75	41.58	54	-12.42	AVG
17475.180	40.88	8.16	49.04	74	-24.96	peak
17475.180	34.56	8.16	42.72	54	-11.28	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
11650.120	40.77	3.75	44.52	74.00	-29.48	peak
11650.120	35.58	3.75	39.33	54.00	-14.67	AVG
17475.180	40.01	8.16	48.17	74.00	-25.83	peak
17475.180	34.13	8.16	42.29	54.00	-11.71	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 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
10360.120	45.68	9.14	54.82	74	-19.18	peak
10360.120	38.62	9.14	47.76	54	-6.24	AVG
15540.180	43.35	10.22	53.57	74	-20.43	peak
15540.180	37.28	10.22	47.5	54	-6.5	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
10360.120	44.51	9.14	53.65	74	-20.35	peak
10360.120	37.87	9.14	47.01	54	-6.99	AVG
15540.180	42.28	10.22	52.5	74	-21.5	peak
15540.180	35.95	10.22	46.17	54	-7.83	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 5200MHz,	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
10400.120	43	9.27	52.27	74	-21.73	peak
10400.120	38.14	9.27	47.41	54	-6.59	AVG
15600.180	41.4	10.38	51.78	74	-22.22	peak
15600.180	34.81	10.38	45.19	54	-8.81	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
10400.120	40.91	9.27	50.18	74	-23.82	peak
10400.120	36.03	9.27	45.3	54	-8.7	AVG
15600.180	40.42	10.38	50.8	74	-23.2	peak
15600.180	34.62	10.38	45	54	-9	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 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
10480.120	44.48	9.27	53.75	74	-20.25	peak
10480.120	39.57	9.27	48.84	54	-5.16	AVG
15720.180	42.94	10.38	53.32	74	-20.68	peak
15720.180	37.75	10.38	48.13	54	-5.87	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
10480.120	43.85	9.27	53.12	74	-20.88	peak
10480.120	38.48	9.27	47.75	54	-6.25	AVG
15720.180	41.69	10.38	52.07	74	-21.93	peak
15720.180	36.51	10.38	46.89	54	-7.11	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	**Model Name**	wsAP ac lite
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11n20 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
11490.120	44.56	3.75	48.31	74	-25.69	peak
11490.120	38.19	3.75	41.94	54	-12.06	AVG
17235.180	41.93	8.16	50.09	74	-23.91	peak
17235.180	35.78	8.16	43.94	54	-10.06	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
11490.120	43.79	3.75	47.54	74.00	-26.46	peak
11490.120	37.34	3.75	41.09	54.00	-12.91	AVG
17235.180	41.09	8.16	49.25	74.00	-24.75	peak
17235.180	35.41	8.16	43.57	54.00	-10.43	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 5785MHz,	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
11570.120	44.64	3.75	48.39	74.00	-25.61	peak
11570.120	38.51	3.75	42.26	54.00	-11.74	AVG
17355.180	41.50	8.16	49.66	74.00	-24.34	peak
17355.180	35.53	8.16	43.69	54.00	-10.31	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
11570.120	41.50	3.75	45.25	74.00	-28.75	peak
11570.120	37.23	3.75	40.98	54.00	-13.02	AVG
17355.180	40.77	8.16	48.93	74.00	-25.07	peak
17355.180	35.75	8.16	43.91	54.00	-10.09	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 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
11650.120	42.89	3.75	46.64	74	-27.36	peak
11650.120	38.39	3.75	42.14	54	-11.86	AVG
17475.180	41.33	8.16	49.49	74	-24.51	peak
17475.180	35.52	8.16	43.68	54	-10.32	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
11650.120	41.30	3.75	45.05	74.00	-28.95	peak
11650.120	35.71	3.75	39.46	54.00	-14.54	AVG
17475.180	40.75	8.16	48.91	74.00	-25.09	peak
17475.180	34.81	8.16	42.97	54.00	-11.03	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: All the case had been tested. The 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= Limit-Level.

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

12. BAND EDGE EMISSION

12.1. 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=VBW=1MHz / Sweep=AUTO

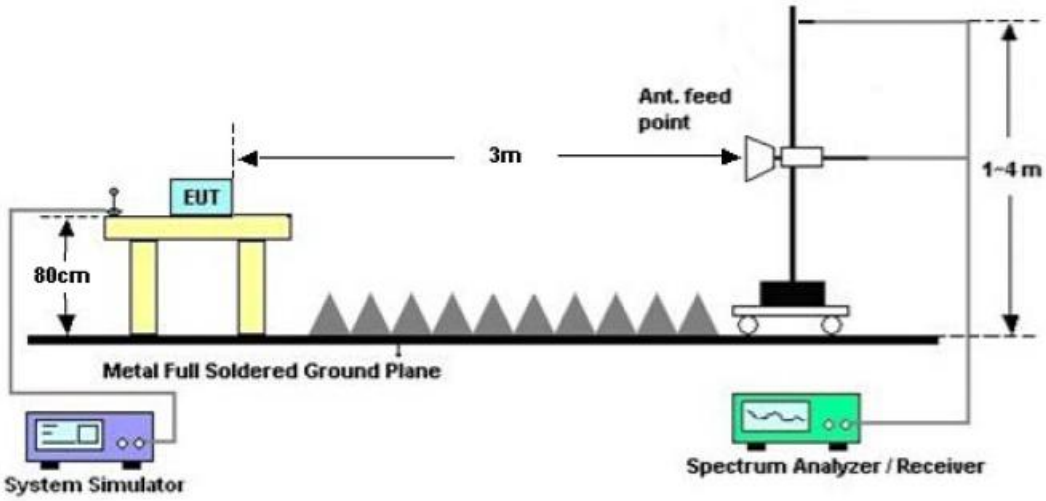
(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

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(μV) to represent the Amplitude. Use the F dB(μV/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 record in the report. Other restricted band 5.35GHz-5.46GHz and 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

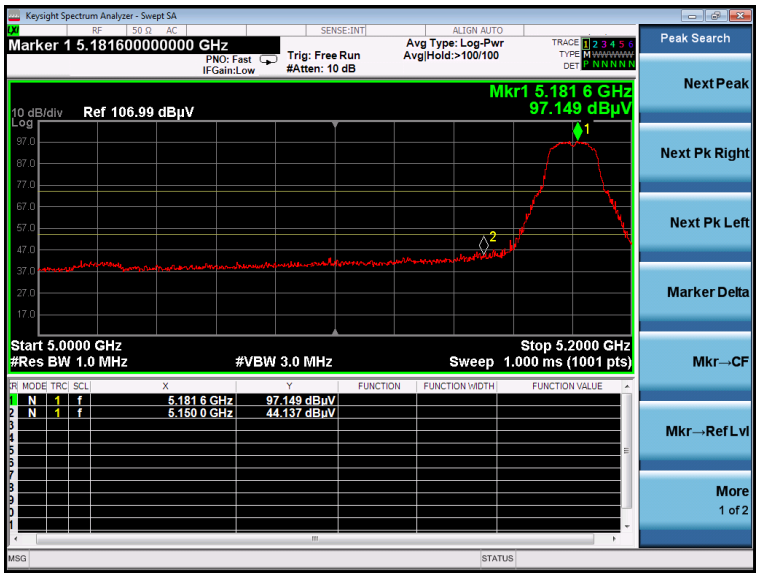
12.2. TEST SET-UP



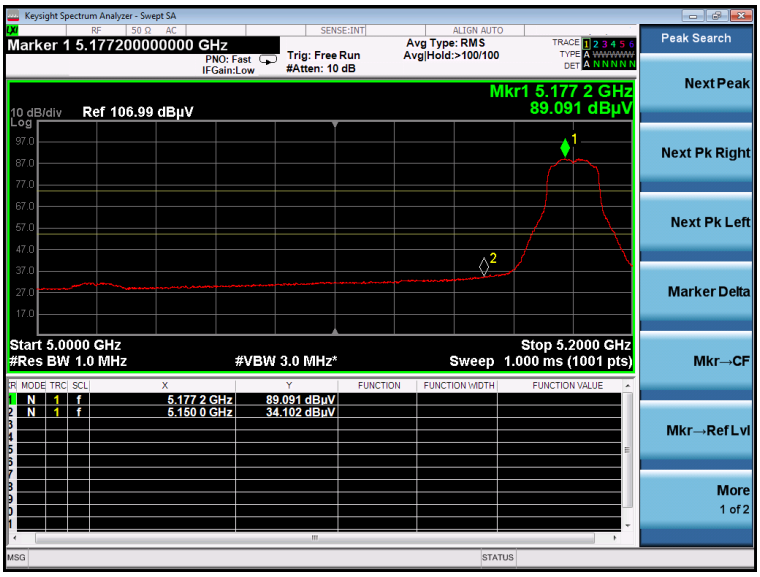
12.3. TEST RESULT

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz,	Antenna	Horizontal

PK Value

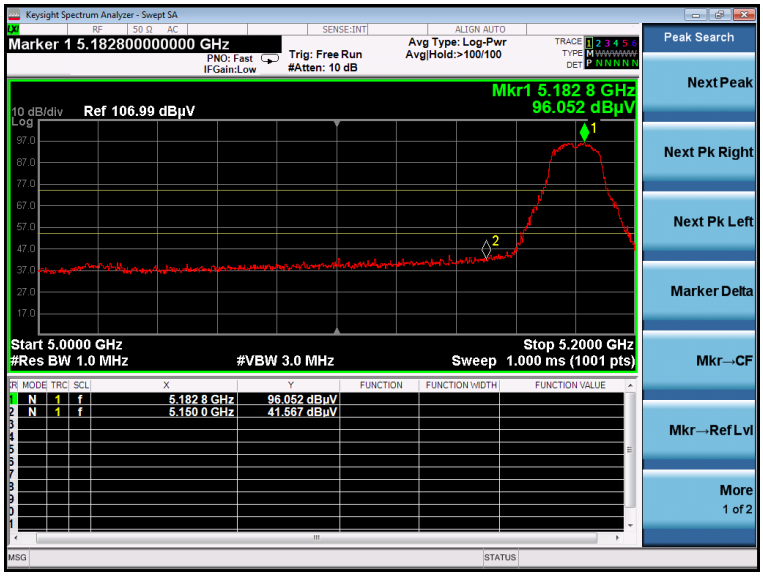


AV Value

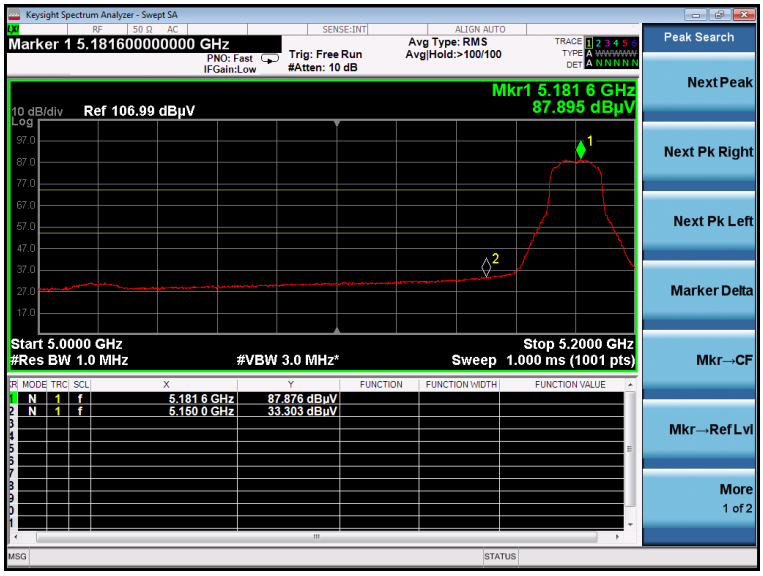


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz,	Antenna	Vertical

PK Value

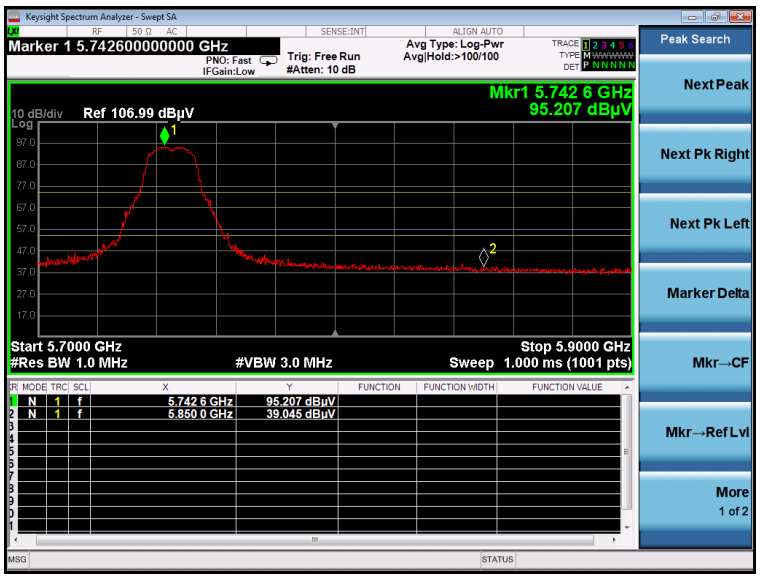


AV Value

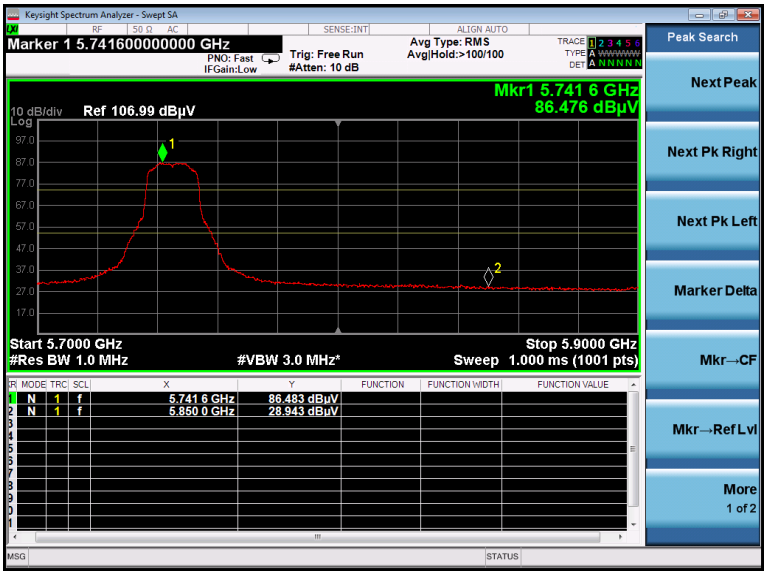


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz,	Antenna	Horizontal

PK Value

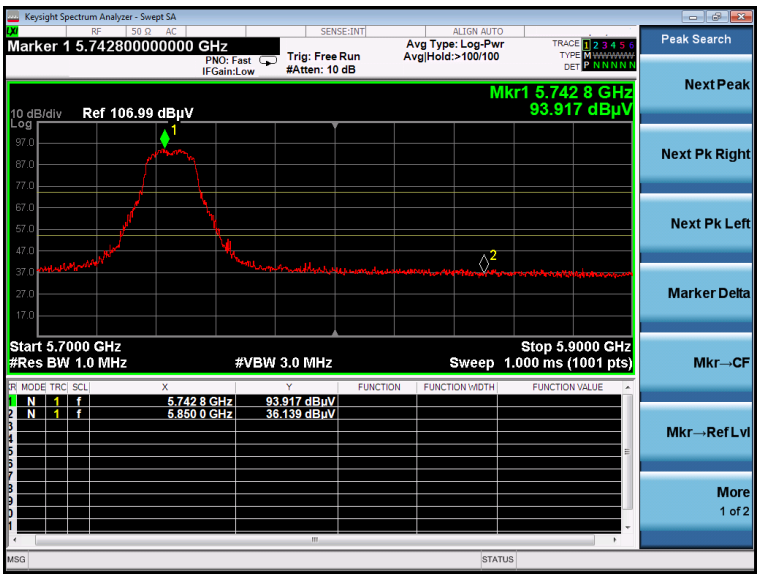


AV Value

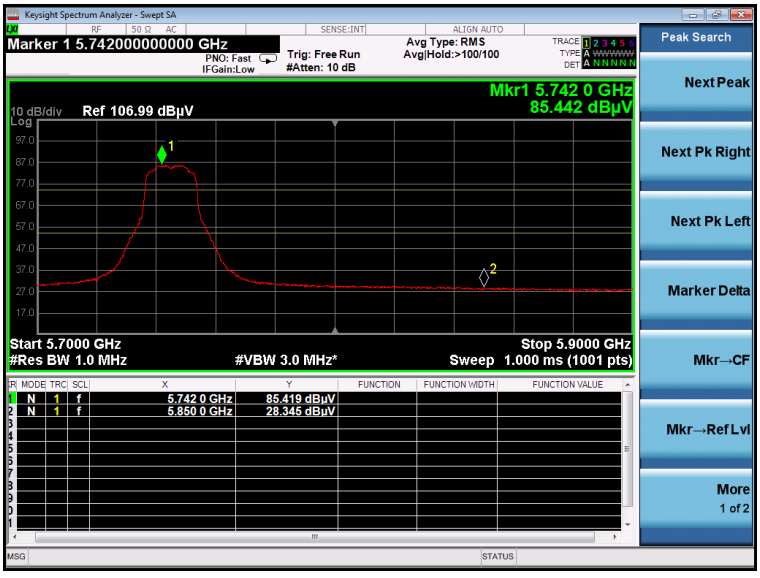


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5745MHz	Antenna	Vertical

PK Value

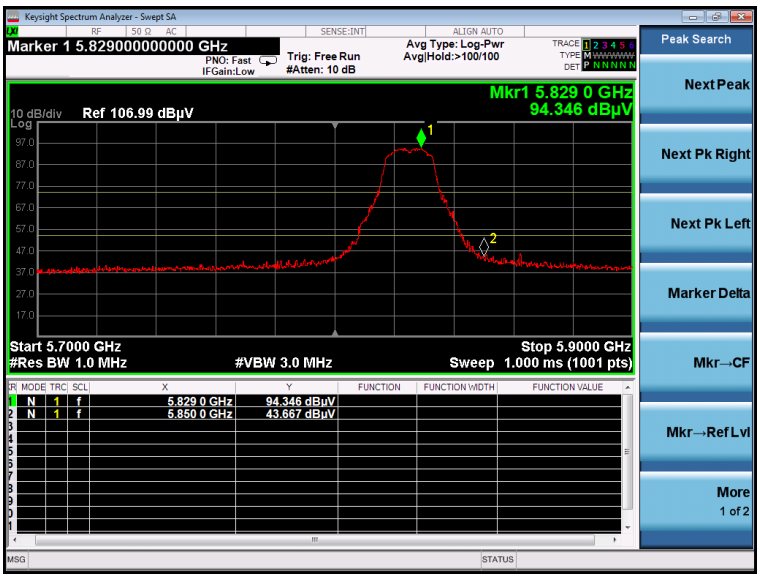


AV Value

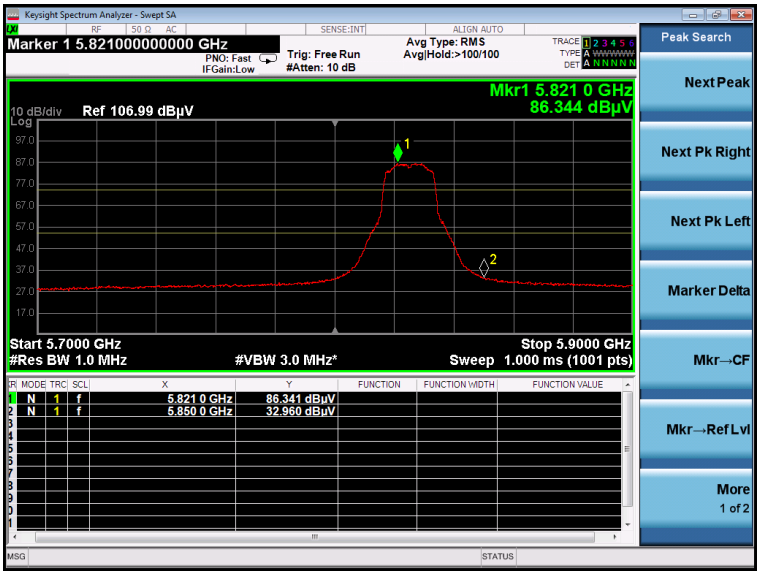


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5825MHz,	Antenna	Horizontal

PK Value

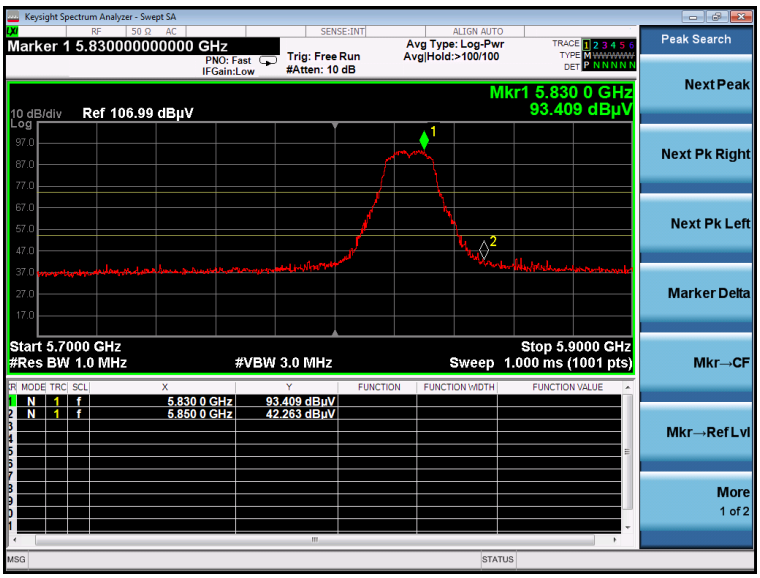


AV Value

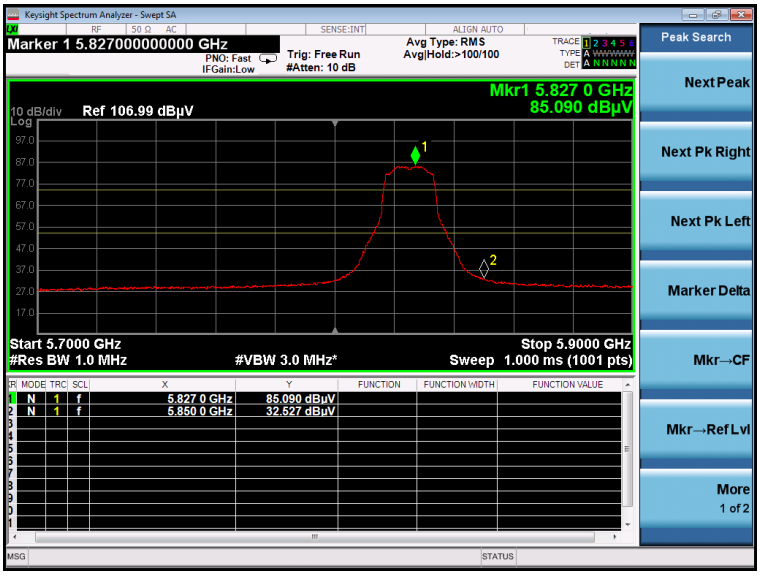


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5825MHz	Antenna	Vertical

PK Value

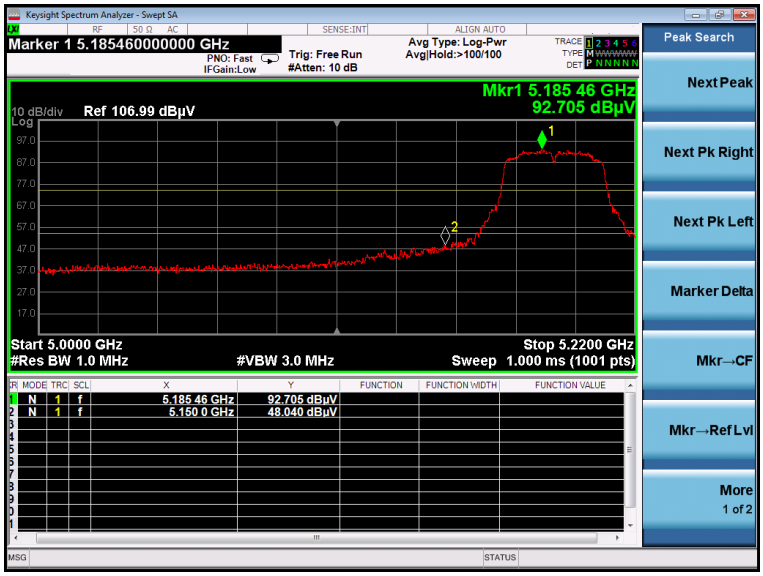


AV Value



EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz,	Antenna	Horizontal

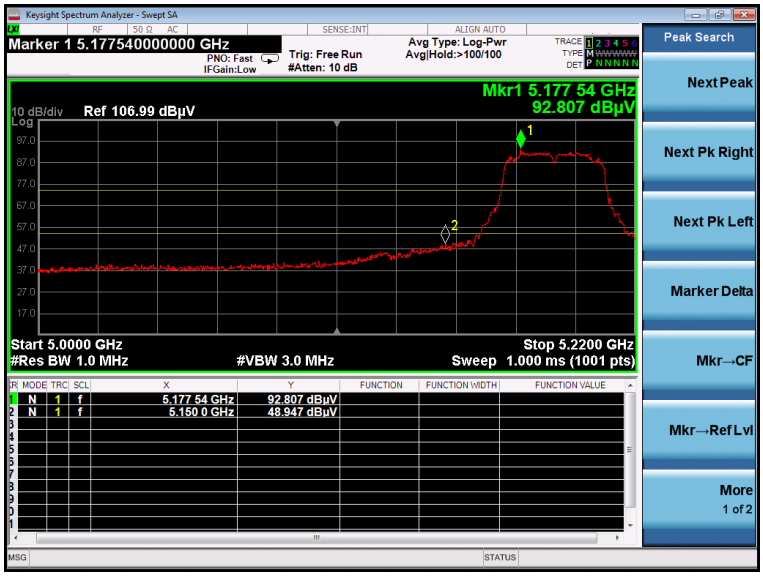
PK Value



AV Value

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5190MHz,	Antenna	Vertical

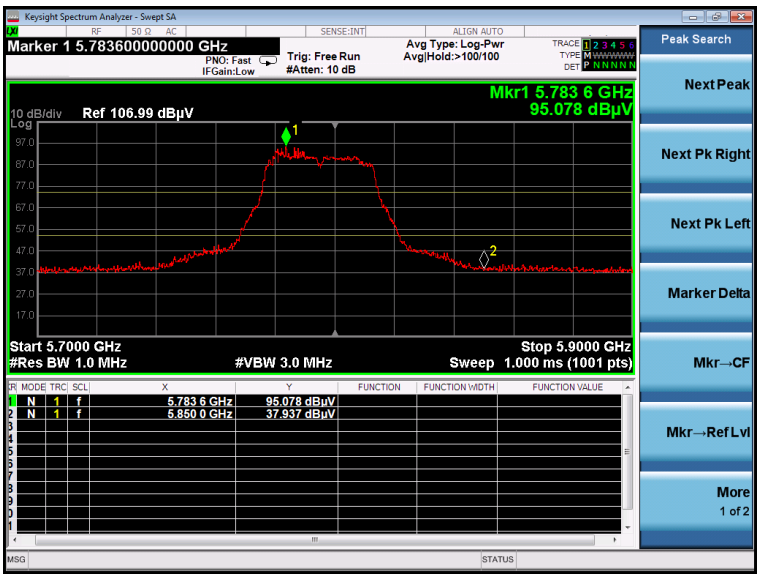
PK Value



AV Value

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5795MHz,	Antenna	Horizontal

PK Value



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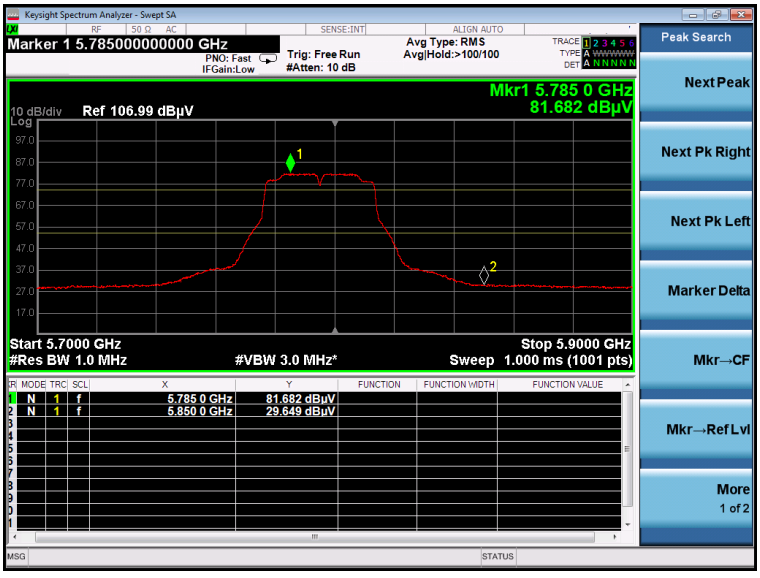
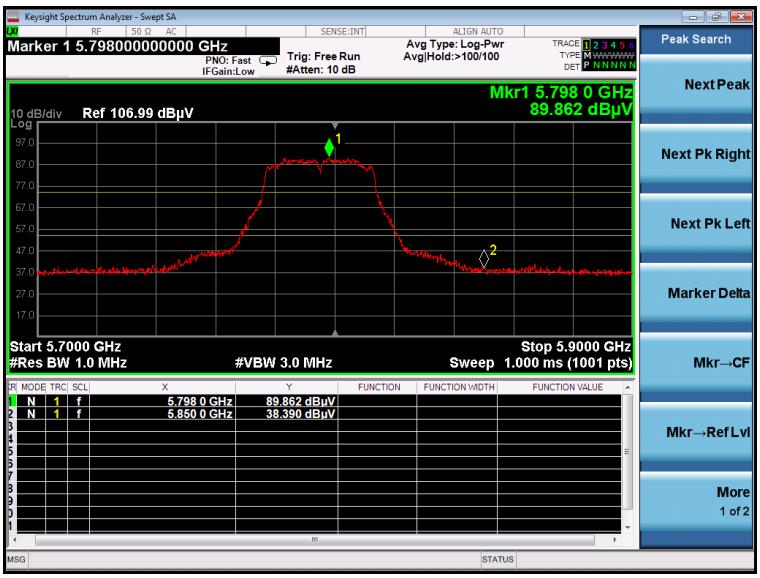


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n40 5795MHz,	Antenna	Vertical

PK Value



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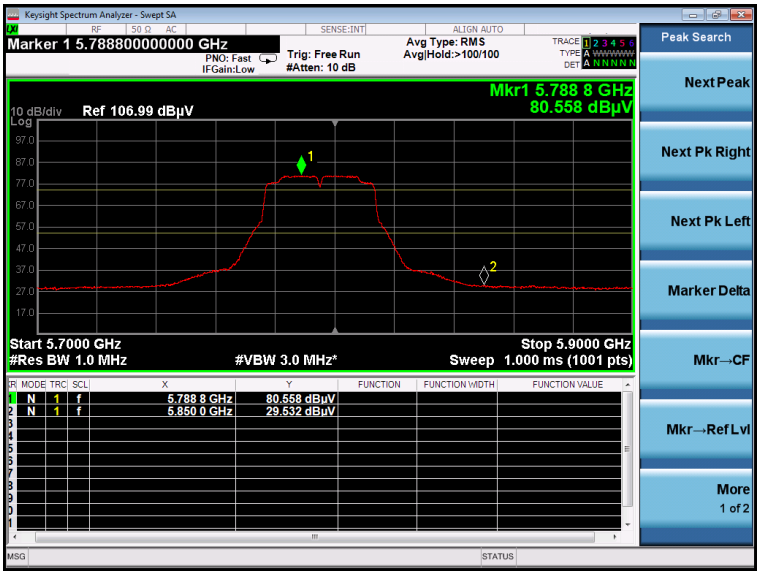
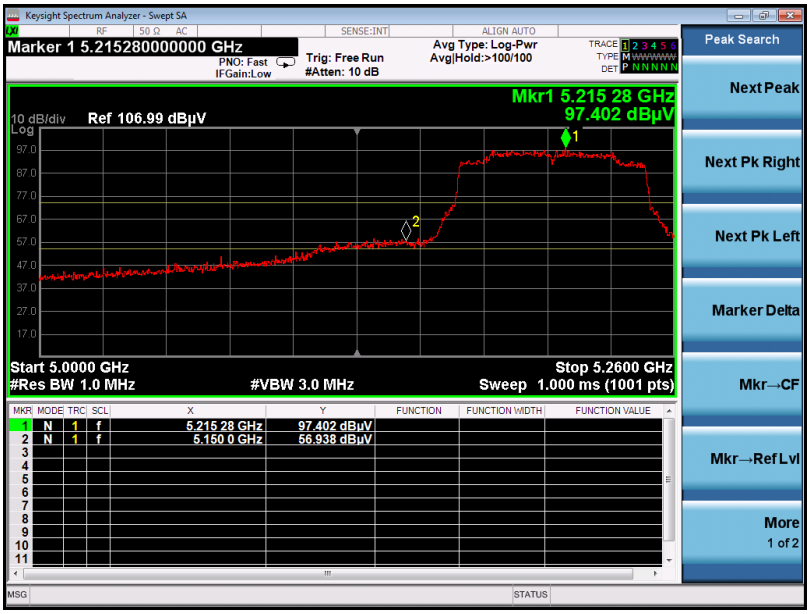


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5210MHz,	Antenna	Horizontal

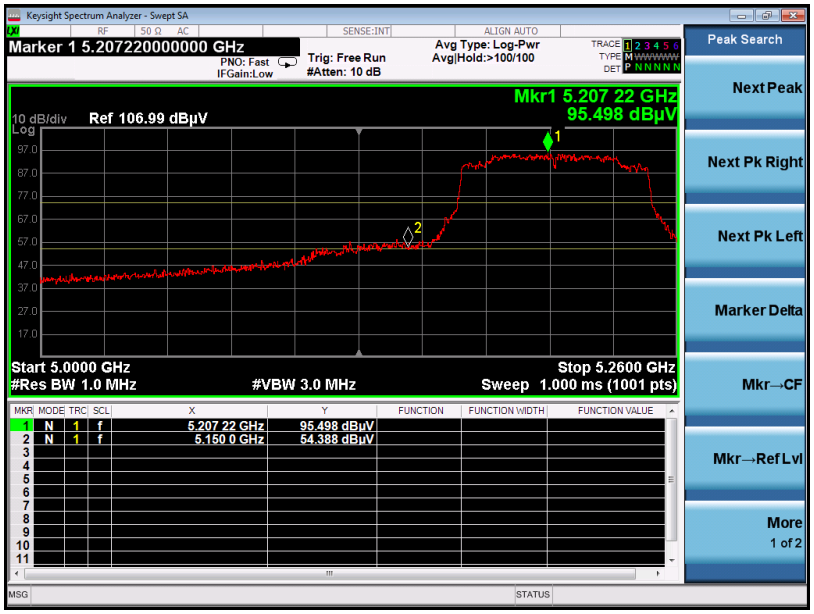
PK Value



AV Value

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5210MHz,	Antenna	Vertical

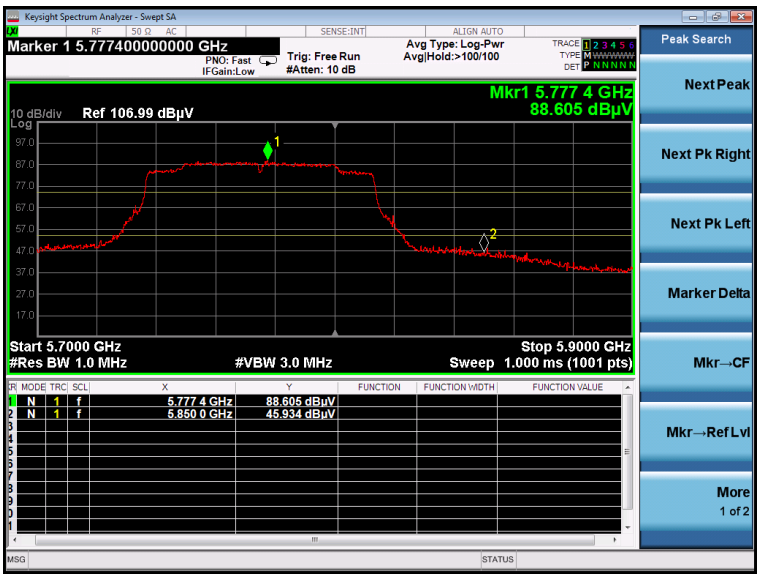
PK Value



AV Value

EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5775MHz,	Antenna	Horizontal

PK Value



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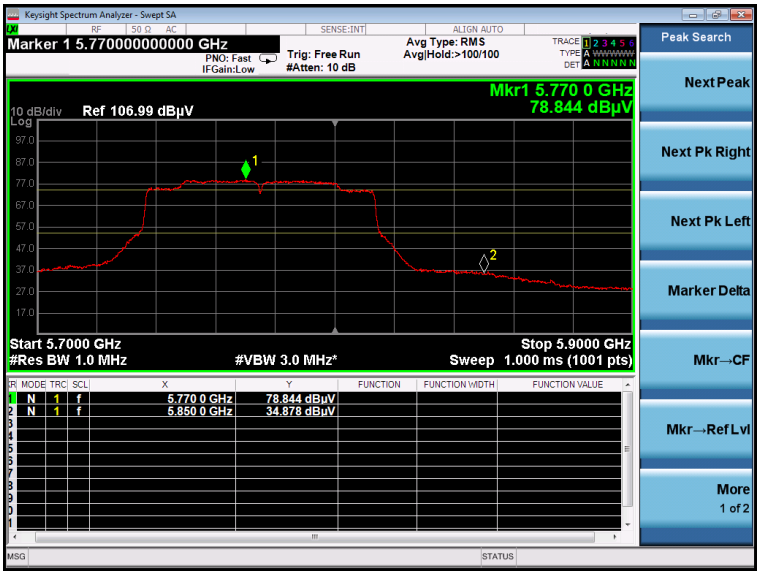
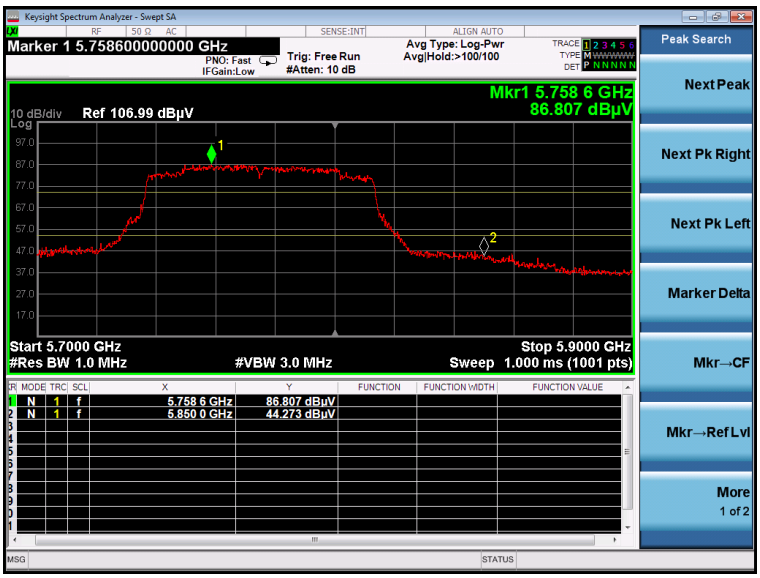
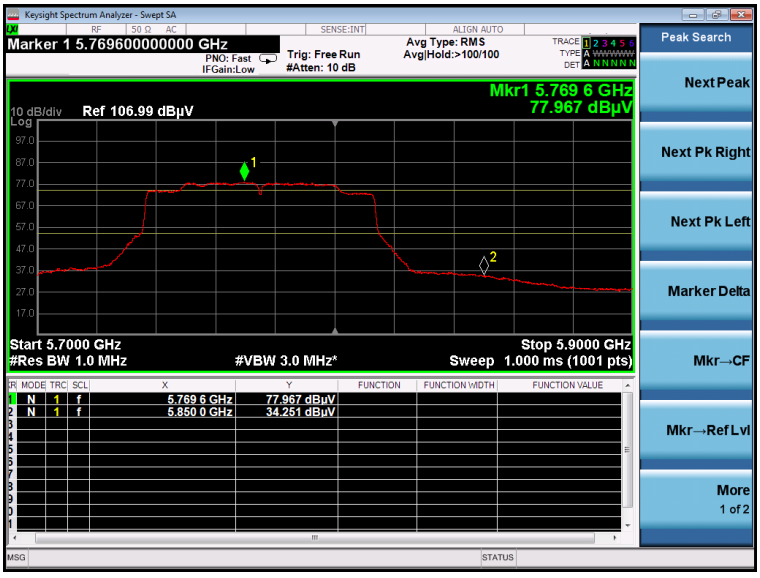


EUT	RouterBOARD wsAP 5Hac2nD	Model Name	wsAP ac lite
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11ac80 5775MHz,	Antenna	Vertical

PK Value



AV Value



RESULT: PASS

Note: All the 20MHz, 40MHz and 80MHz bandwidth modulation had been tested, the 802.11a20//n40/ac80 was the worst case and record in his test report.

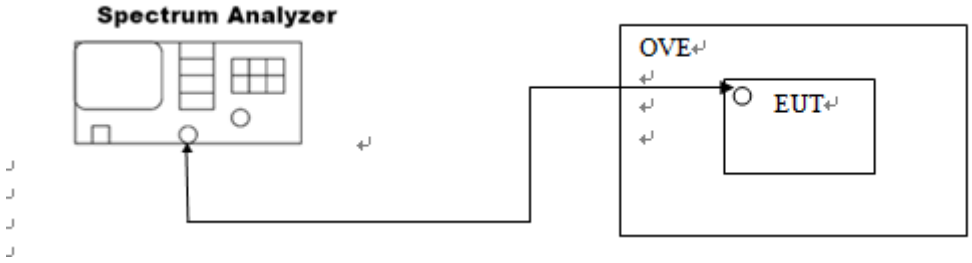
13. FREQUENCY STABILITY

13.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency. SPAN=enough to measure the emission is maintained within the band
4. Set SPA Trace 1 Max hold, then View.
5. ENVIRONMENTAL CONDITIONS

- Temperature: -10-50ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

13.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



13.3. MEASUREMENT RESULTS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11a	- 10℃	5180	within the band	PASS
	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	40℃	5180	within the band	PASS
	50℃	5180	within the band	PASS
	- 10℃	5200	within the band	PASS
	0℃	5200	within the band	PASS
	10℃	5200	within the band	PASS
	20℃	5200	within the band	PASS
	30℃	5200	within the band	PASS
	40℃	5200	within the band	PASS
	50℃	5200	within the band	PASS
	- 10℃	5240	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	40℃	5240	within the band	PASS
	50℃	5240	within the band	PASS
	- 10℃	5745	within the band	PASS
	0℃	5745	within the band	PASS
	10℃	5745	within the band	PASS
	20℃	5745	within the band	PASS
	30℃	5745	within the band	PASS
	40℃	5745	within the band	PASS
	50℃	5745	within the band	PASS
	- 10℃	5785	within the band	PASS
	0℃	5785	within the band	PASS
	10℃	5785	within the band	PASS
	20℃	5785	within the band	PASS
	30℃	5785	within the band	PASS
	40℃	5785	within the band	PASS
	50℃	5785	within the band	PASS
	- 10℃	5825	within the band	PASS
	0℃	5825	within the band	PASS
	10℃	5825	within the band	PASS
	20℃	5825	within the band	PASS
	30℃	5825	within the band	PASS
	40℃	5825	within the band	PASS

	50℃	5825	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11n20	- 10℃	5180	within the band	PASS
	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	40℃	5180	within the band	PASS
	50℃	5180	within the band	PASS
	- 10℃	5200	within the band	PASS
	0℃	5200	within the band	PASS
	10℃	5200	within the band	PASS
	20℃	5200	within the band	PASS
	30℃	5200	within the band	PASS
	40℃	5200	within the band	PASS
	50℃	5200	within the band	PASS
	- 10℃	5240	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	40℃	5240	within the band	PASS
	50℃	5240	within the band	PASS
	- 10℃	5745	within the band	PASS
	0℃	5745	within the band	PASS
	10℃	5745	within the band	PASS
	20℃	5745	within the band	PASS
	30℃	5745	within the band	PASS
	40℃	5745	within the band	PASS
	50℃	5745	within the band	PASS
	- 10℃	5785	within the band	PASS
	0℃	5785	within the band	PASS
	10℃	5785	within the band	PASS
	20℃	5785	within the band	PASS
	30℃	5785	within the band	PASS
	40℃	5785	within the band	PASS
	50℃	5785	within the band	PASS
	- 10℃	5825	within the band	PASS
	0℃	5825	within the band	PASS
	10℃	5825	within the band	PASS
	20℃	5825	within the band	PASS
	30℃	5825	within the band	PASS
	40℃	5825	within the band	PASS

	50℃	5825	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11n40	- 10℃	5190	within the band	PASS
	0℃	5190	within the band	PASS
	10℃	5190	within the band	PASS
	20℃	5190	within the band	PASS
	30℃	5190	within the band	PASS
	40℃	5190	within the band	PASS
	50℃	5190	within the band	PASS
	- 10℃	5230	within the band	PASS
	0℃	5230	within the band	PASS
	10℃	5230	within the band	PASS
	20℃	5230	within the band	PASS
	30℃	5230	within the band	PASS
	40℃	5230	within the band	PASS
	50℃	5230	within the band	PASS
	- 10℃	5755	within the band	PASS
	0℃	5755	within the band	PASS
	10℃	5755	within the band	PASS
	20℃	5755	within the band	PASS
	30℃	5755	within the band	PASS
	40℃	5755	within the band	PASS
	50℃	5755	within the band	PASS
	- 10℃	5795	within the band	PASS
	0℃	5795	within the band	PASS
	10℃	5795	within the band	PASS
	20℃	5795	within the band	PASS
	30℃	5795	within the band	PASS
	40℃	5795	within the band	PASS
	50℃	5795	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac20	- 10℃	5180	within the band	PASS
	0℃	5180	within the band	PASS
	10℃	5180	within the band	PASS
	20℃	5180	within the band	PASS
	30℃	5180	within the band	PASS
	40℃	5180	within the band	PASS
	50℃	5180	within the band	PASS
	- 10℃	5200	within the band	PASS
	0℃	5200	within the band	PASS
	10℃	5200	within the band	PASS

	20℃	5200	within the band	PASS
	30℃	5200	within the band	PASS
	40℃	5200	within the band	PASS
	50℃	5200	within the band	PASS
	- 10℃	5240	within the band	PASS
	0℃	5240	within the band	PASS
	10℃	5240	within the band	PASS
	20℃	5240	within the band	PASS
	30℃	5240	within the band	PASS
	40℃	5240	within the band	PASS
	50℃	5240	within the band	PASS
	- 10℃	5745	within the band	PASS
	0℃	5745	within the band	PASS
	10℃	5745	within the band	PASS
	20℃	5745	within the band	PASS
	30℃	5745	within the band	PASS
	40℃	5745	within the band	PASS
	50℃	5745	within the band	PASS
	- 10℃	5785	within the band	PASS
	0℃	5785	within the band	PASS
	10℃	5785	within the band	PASS
	20℃	5785	within the band	PASS
	30℃	5785	within the band	PASS
	40℃	5785	within the band	PASS
	50℃	5785	within the band	PASS
	- 10℃	5825	within the band	PASS
	0℃	5825	within the band	PASS
	10℃	5825	within the band	PASS
	20℃	5825	within the band	PASS
	30℃	5825	within the band	PASS
	40℃	5825	within the band	PASS
	50℃	5825	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac40	- 10℃	5190	within the band	PASS
	0℃	5190	within the band	PASS
	10℃	5190	within the band	PASS
	20℃	5190	within the band	PASS
	30℃	5190	within the band	PASS
	40℃	5190	within the band	PASS
	50℃	5190	within the band	PASS
	- 10℃	5230	within the band	PASS
	0℃	5230	within the band	PASS

	10℃	5230	within the band	PASS
	20℃	5230	within the band	PASS
	30℃	5230	within the band	PASS
	40℃	5230	within the band	PASS
	50℃	5230	within the band	PASS
	- 10℃	5755	within the band	PASS
	0℃	5755	within the band	PASS
	10℃	5755	within the band	PASS
	20℃	5755	within the band	PASS
	30℃	5755	within the band	PASS
	40℃	5755	within the band	PASS
	50℃	5755	within the band	PASS
	- 10℃	5795	within the band	PASS
	0℃	5795	within the band	PASS
	10℃	5795	within the band	PASS
	20℃	5795	within the band	PASS
	30℃	5795	within the band	PASS
	40℃	5795	within the band	PASS
	50℃	5795	within the band	PASS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
802.11ac80	- 10℃	5210	within the band	PASS
	0℃	5210	within the band	PASS
	10℃	5210	within the band	PASS
	20℃	5210	within the band	PASS
	30℃	5210	within the band	PASS
	40℃	5210	within the band	PASS
	50℃	5210	within the band	PASS
	- 10℃	5775	within the band	PASS
	0℃	5775	within the band	PASS
	10℃	5775	within the band	PASS
	20℃	5775	within the band	PASS
	30℃	5775	within the band	PASS
	40℃	5775	within the band	PASS
	50℃	5775	within the band	PASS

14. FCC LINE CONDUCTED EMISSION TEST

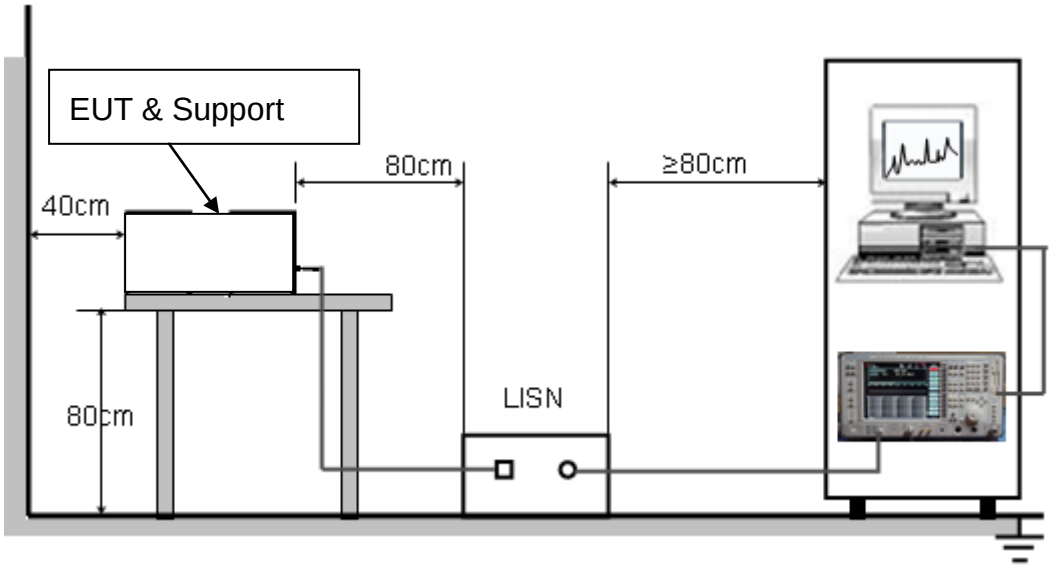
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

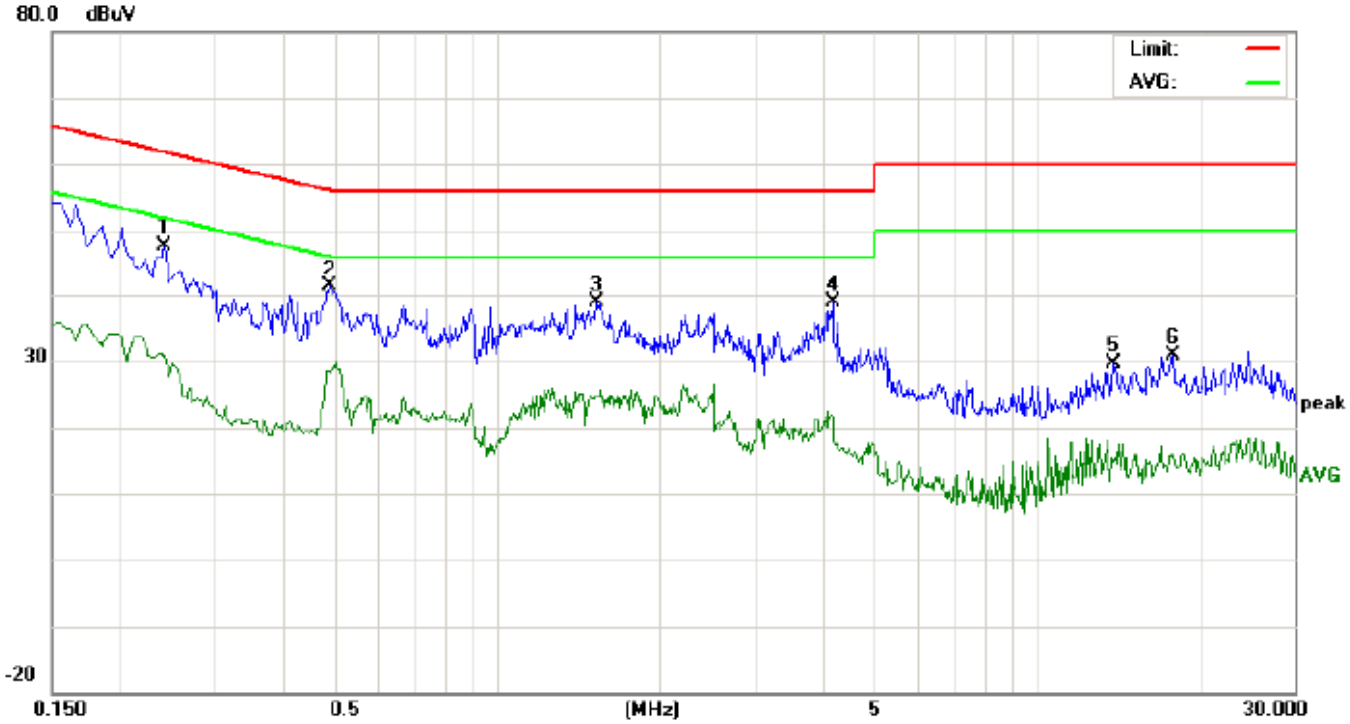
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

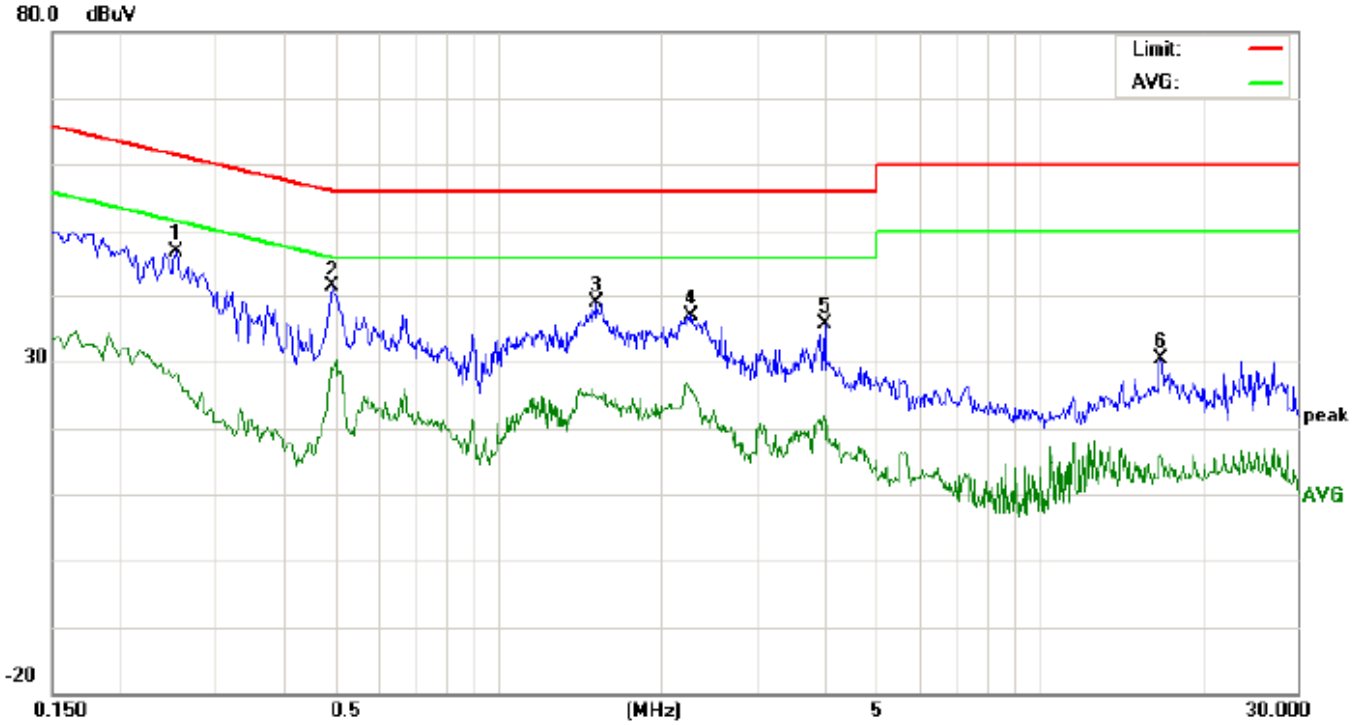
14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2419	37.40		20.56	10.26	47.66		30.82	62.03	52.03	-14.37	-21.21	P	
2	0.4899	31.09		17.89	10.39	41.48		28.28	56.17	46.17	-14.69	-17.89	P	
3	1.5339	28.52		14.45	10.37	38.89		24.82	56.00	46.00	-17.11	-21.18	P	
4	4.1817	28.43		11.32	10.35	38.78		21.67	56.00	46.00	-17.22	-24.33	P	
5	13.9138	19.62		4.95	10.12	29.74		15.07	60.00	50.00	-30.26	-34.93	P	
6	17.8538	20.67		5.82	10.12	30.79		15.94	60.00	50.00	-29.21	-34.06	P	

LINE CONDUCTED EMISSION TEST-N



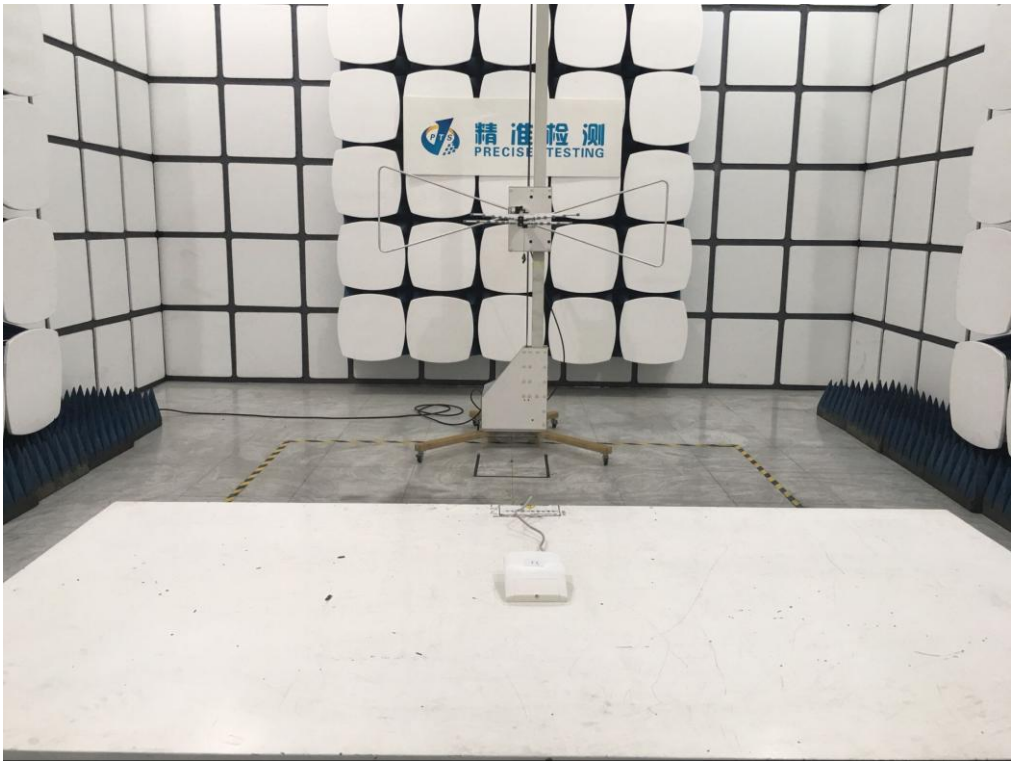
No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2540	36.72		17.85	10.27	46.99		28.12	61.62	51.62	-14.63	-23.50	P	
2	0.4940	30.90		18.41	10.40	41.30		28.81	56.10	46.10	-14.80	-17.29	P	
3	1.5220	28.52		14.34	10.37	38.89		24.71	56.00	46.00	-17.11	-21.29	P	
4	2.2820	26.57		15.20	10.34	36.91		25.54	56.00	46.00	-19.09	-20.46	P	
5	4.0100	25.24		10.71	10.43	35.67		21.14	56.00	46.00	-20.33	-24.86	P	
6	16.7499	20.34		5.75	10.12	30.46		15.87	60.00	50.00	-29.54	-34.13	P	

RESULT: PASS

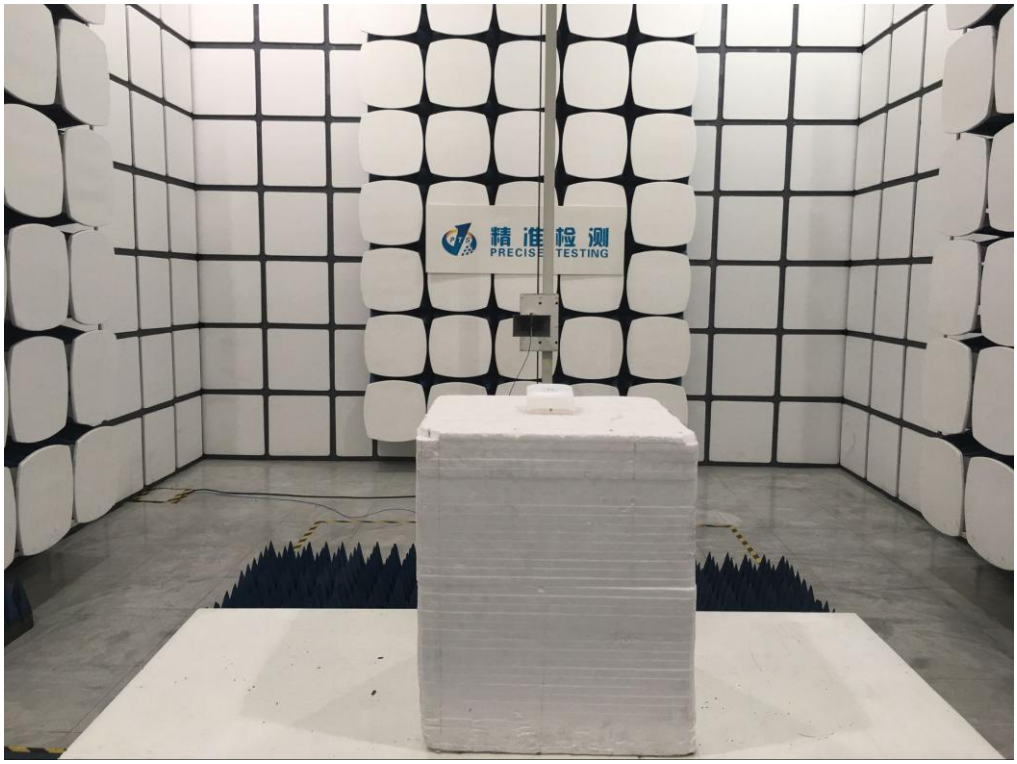
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



----END OF REPORT----