FCC RADIO TEST REPORT

FCC ID: 2A3RT-BRDB01

Sample：	Bird Bar
Trade Name：	BirdAI
Main Model：	BRDB01
Additional Model：	BRDB02, BRDBLX01, BRDBLX02, BRDSK03, BRDSK04, KNGL01, KNETP06
Report No.：	UNIA21092217ER-64

Prepared for

BIRDAI DYNAMICS PRIVATE LIMITED

B 1106, iThum Tower Plot No. A 40, Sector 62 Noida, Gautam Buddha Nagar, India

Prepared by

Shenzhen United Testing Technology Co., Ltd.

2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

TEST RESULT CERTIFICATION

Applicant	:	BIRDAI DYNAMICS PRIVATE LIMITED
Address	:	B 1106, iThum Tower Plot No. A 40, Sector 62 Noida, Gautam Buddha Nagar, India
Manufacturer	:	BIRDAI DYNAMICS PRIVATE LIMITED
Address	:	B 1106, iThum Tower Plot No. A 40, Sector 62 Noida, Gautam Buddha Nagar, India

Product description

Product	:	Bird Bar
Trade Name	:	BirdAI
Model Name	:	BRDB01, BRDB02, BRDBLX01, BRDBLX02, BRDSK03, BRDSK04, KNGL01, KNETP06
Test Methods	:	FCC Rules and Regulations Part 15 Subpart E Section 15.407 ANSI C63.10: 2013 KDB789033 D02 v02r01

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test .....:

Date (s) of performance of tests	:	Sep. 22, 2021 ~ Jan. 12, 2022
Date of Issue	:	Jan. 12, 2022
Test Result	:	Pass

Prepared by: kahn.yang
Kahn yang/Editor

Reviewer: Sky dong
Sky dong/Supervisor

Approved & Authorized Signer: liuze
Liuze/Manager

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

Product:	Bird Bar
Trade Name:	BirdAI
Main Model:	BRDB01
Additional Model:	BRDB02, BRDBLX01, BRDBLX02, BRDSK03, BRDSK04, KNGL01, KNETP06
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: BRDB01.
FCC ID:	2A3RT-BRDB01
Operation Frequency:	5150MHz~5250MHz, 5725MHz~5850MHz
Number of Channels:	20MHz: 9CH
Modulation Type:	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM
Antenna Type:	Internal Antenna
Antenna Gain:	3dBi
Battery:	N/A
Adapter:	M/N: J151-0502500UU Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2.5A
Power Source:	DC 5.0V from adapter with AC 120(240)V/60Hz

Note:

1. The EUT is designed as indoor access point operating without radar detection.
2. The device do not support TPC.

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	Frequency Band	Channel Number	Frequency
5150MHz ~ 5250MHz	36	5180 MHz	5725MHz ~ 5850MHz	149	5745 MHz
	40	5200 MHz		153	5765 MHz
	44	5220 MHz		157	5785 MHz
	48	5240 MHz		161	5805 MHz
	—	—		165	5825 MHz

Note: For 20MHZ bandwidth system use Channel 36,40,44,48,149,153,157,161,165.

2.3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).
Radiated testing was performed at an antenna to EUT distance 3 meters.
Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.407 rules KDB789033 D02 v02r01.

2.4. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		Above 1000MHz	4.13	

4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n/ac20	36,40,44,48,149,153,157,161,165	36,40, 48,149,157,165	OFDM	6Mbps/MCS0

Note:

1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%.
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Operation of EUT during Conducted and Radiation testing:

5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Bird Bar	BRDB01	2A3RT-BRDB01	EUT
2	N/A	N/A	N/A	N/A

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	6dB Bandwidth	Compliant
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

6. TEST FACILITY

Test Laboratory : Shenzhen United Testing Technology Co., Ltd.
Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd,Tiegang Community, XixiangStr, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:
A2LA Certificate Number: 4747.01
The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885
The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 21947
The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2022.09.22
3	AAN	TESEQ	T8-Cat6	38888	2022.09.22
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2022.05.17
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2022.09.22
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2022.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2022.03.01
4	PREAMP	HP	8449B	3008A00160	2022.09.22
5	PREAMP	HP	8447D	2944A07999	2022.05.17
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2022.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2022.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2022.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2022.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2022.05.17
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2022.05.17
13	RF power divider	Anritsu	K241B	992289	2022.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2022.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2022.07.25
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2022.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2022.05.23
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2022.09.27
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2022.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2022.09.22
21	Spctrum Analyzer	Rohde&Schwarz	FSP 40	100501	2022.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2022.09.22

23	Frequency Meter	VICTOR	VC2000	997406086	2022.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2022.09.22

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

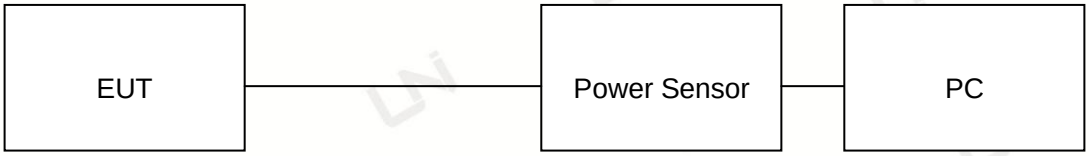
For average power test:

1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note：The EUT was tested according to KDB789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

7.2. TEST SET-UP

AVERAGE POWER SETUP



7.3. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5180	12.23	23.98	Pass
5200	12.90	23.98	Pass
5240	12.22	23.98	Pass
5745	13.30	30	Pass
5785	13.25	30	Pass
5825	12.98	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5180	12.25	23.98	Pass
5200	11.92	23.98	Pass
5240	12.73	23.98	Pass
5745	12.48	30	Pass
5785	11.89	30	Pass
5825	12.55	30	Pass

8. 6dB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

8.1.1 -6dB BANDWIDTH MEASUREMENT PROCEDURE

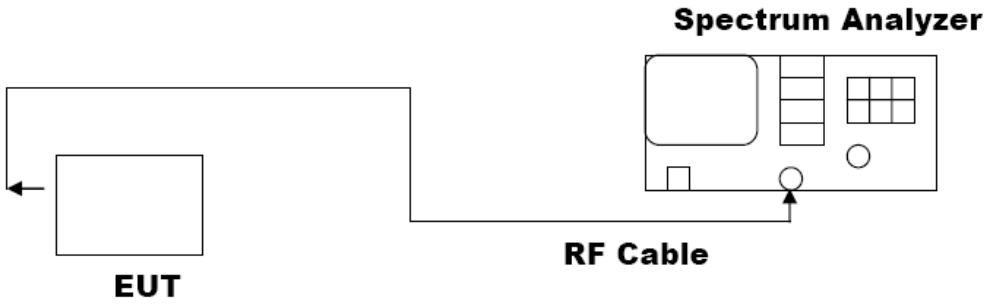
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW ≥3*RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

8.1.2 99% OCCUPIED BANDWIDTH

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 Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

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



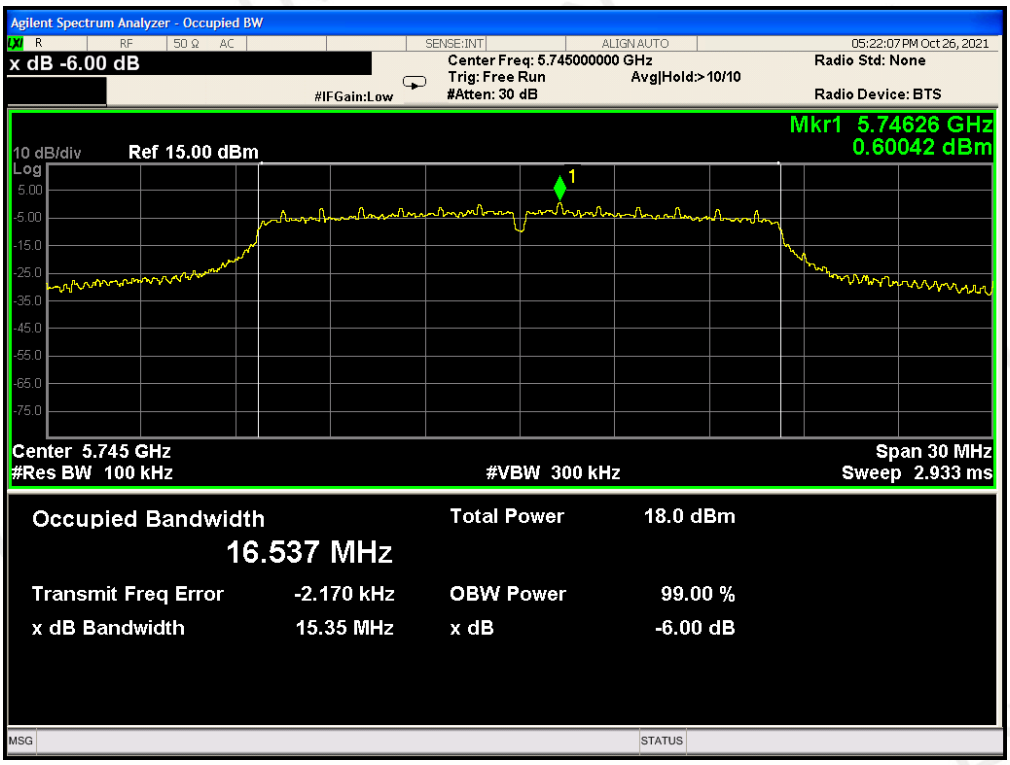
8.3. LIMITS AND MEASUREMENT RESULTS

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-6dB Bandwidth	99.00% Occupied Bandwidth	
>500KHZ	5745MHz	15.35	16.670	PASS
	5785MHz	15.35	16.704	PASS
	5825MHz	15.15	16.730	PASS

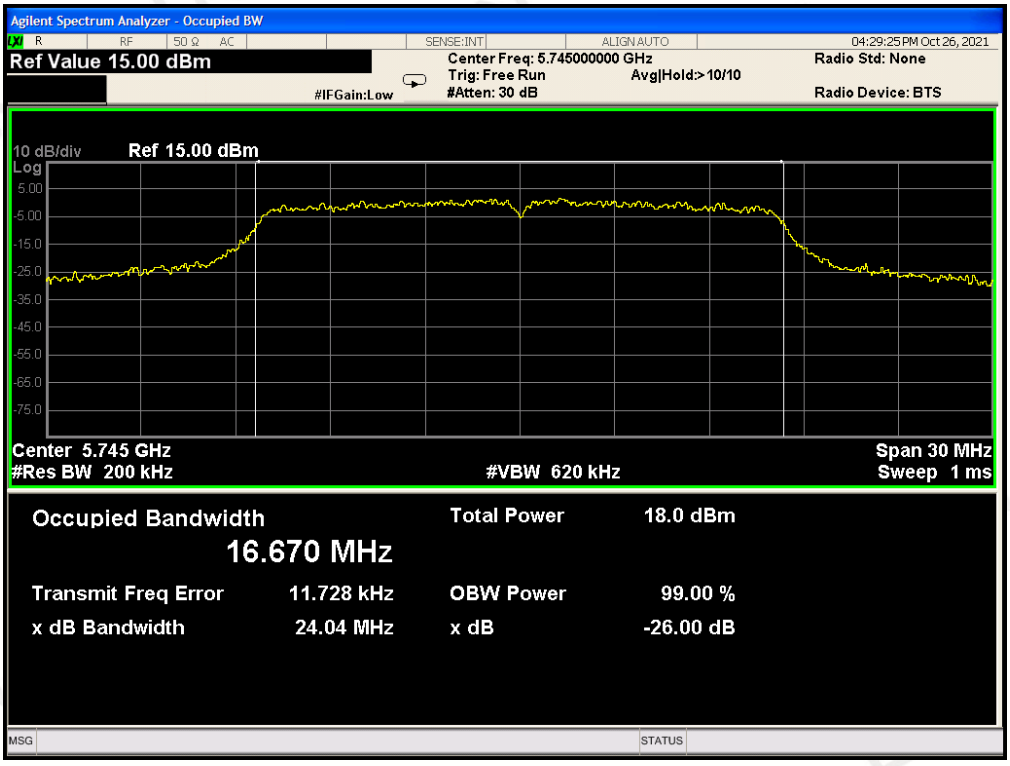
LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-6dB Bandwidth	99.00% Occupied Bandwidth	
>500KHZ	5745MHz	15.16	17.663	PASS
	5785MHz	15.16	17.686	PASS
	5825MHz	15.16	17.706	PASS

802.11a20 TEST RESULT

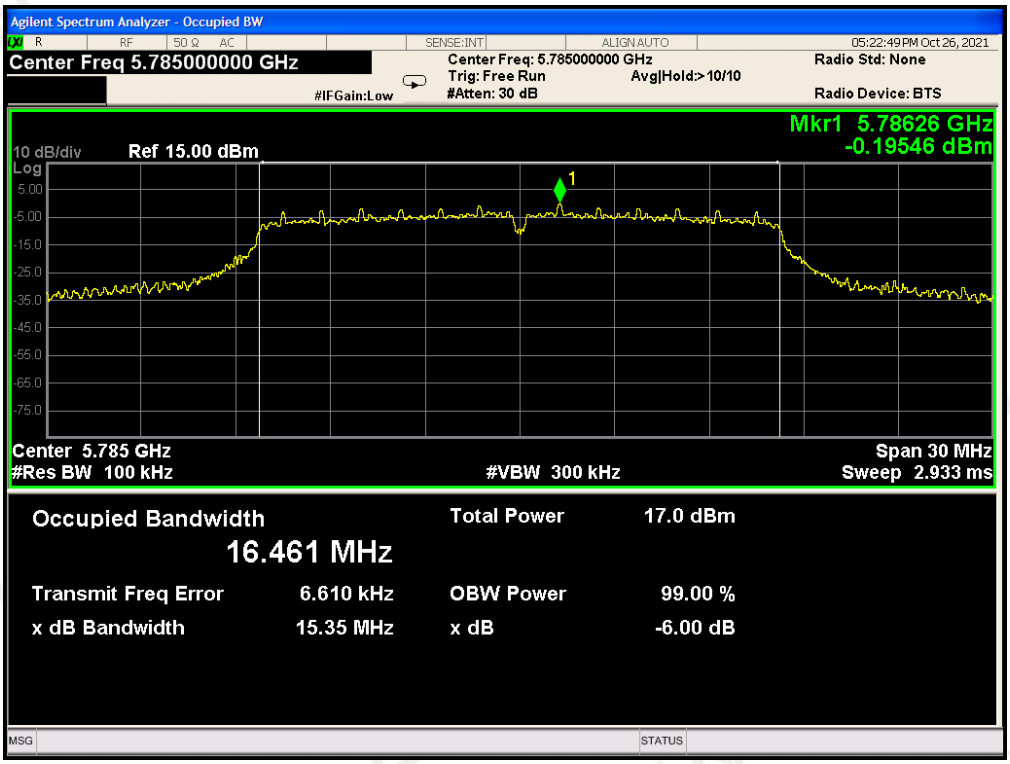
TEST PLOT OF BANDWIDTH FOR 5745MHz（-6dB BANDWIDTH）



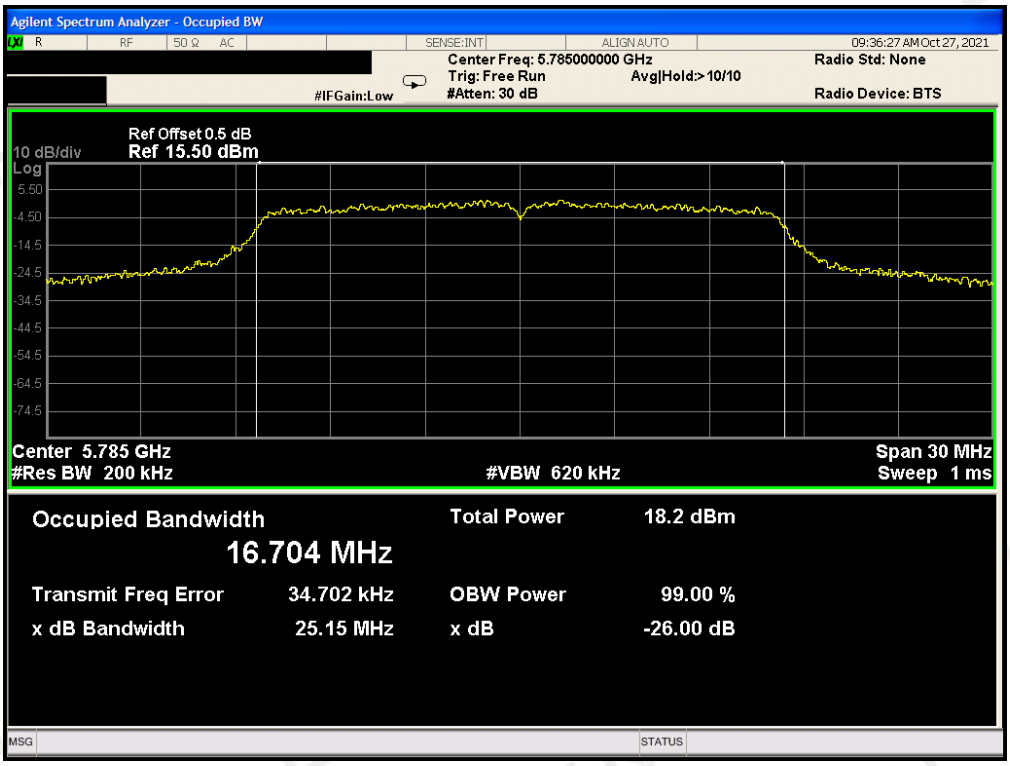
TEST PLOT OF BANDWIDTH FOR 5745MHz（99% BANDWIDTH）



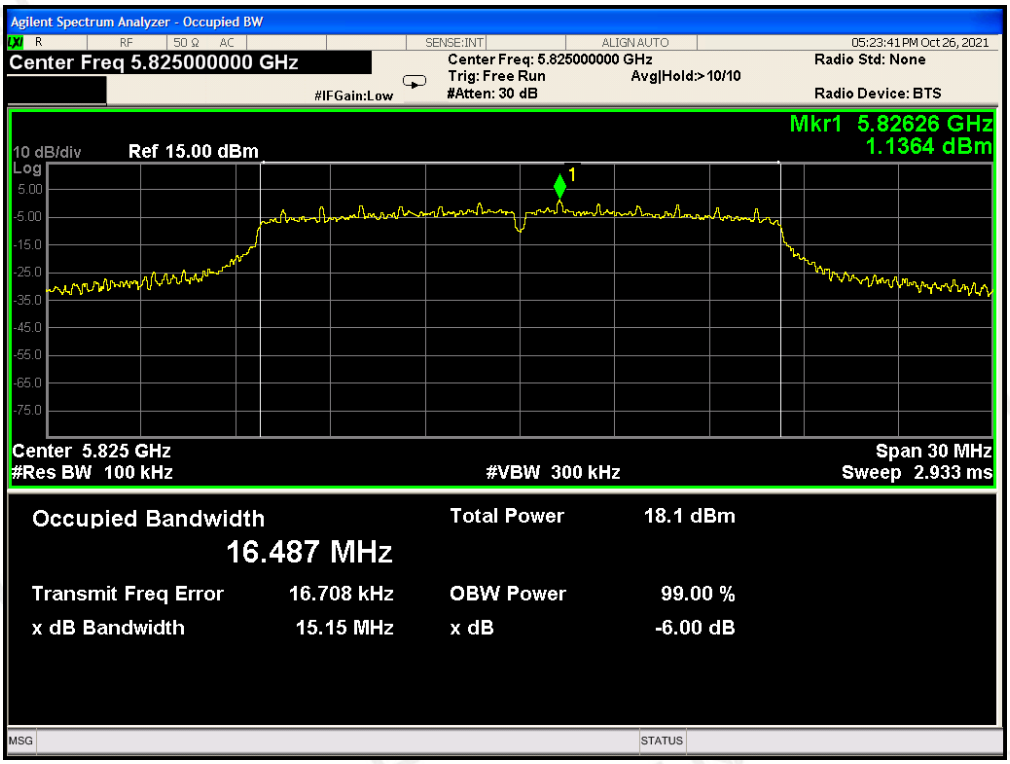
TEST PLOT OF BANDWIDTH FOR 5785MHz（-6dB BANDWIDTH）



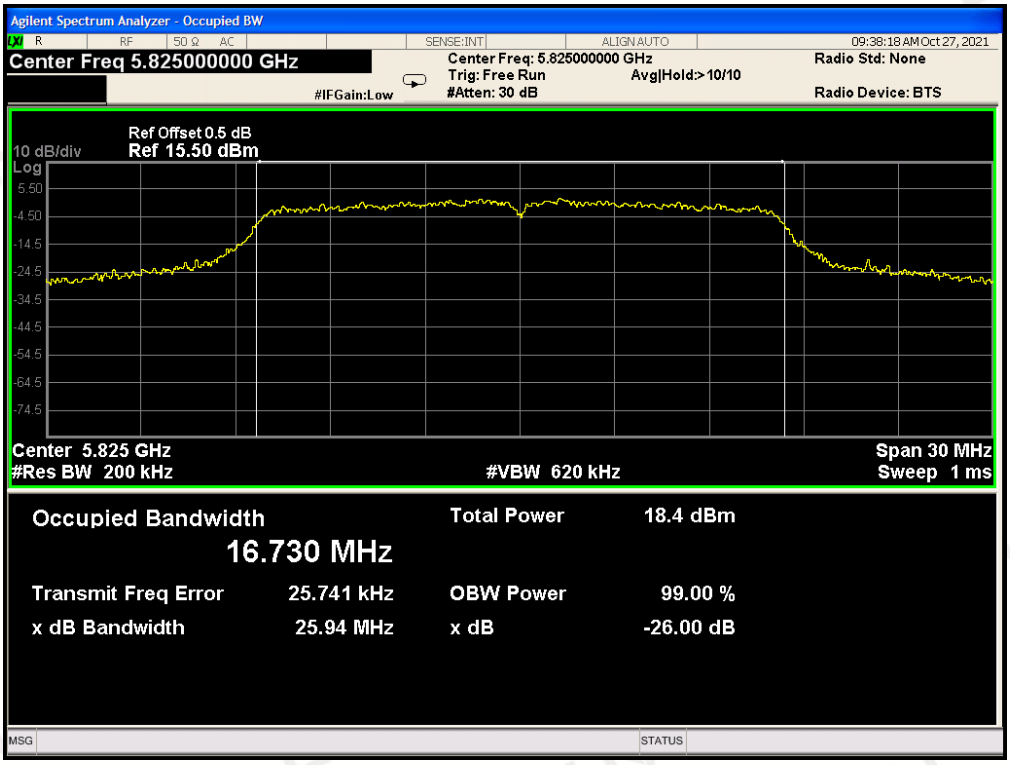
TEST PLOT OF BANDWIDTH FOR 5785MHz（99% BANDWIDTH）



TEST PLOT OF BANDWIDTH FOR 5825MHz（-6dB BANDWIDTH）

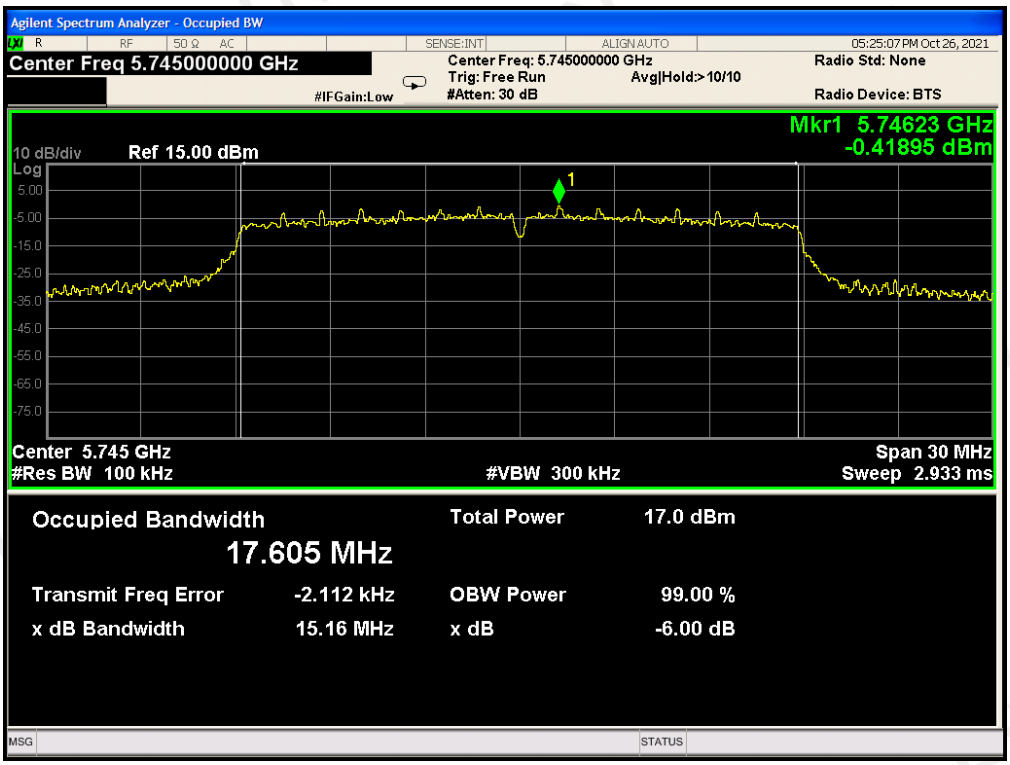


TEST PLOT OF BANDWIDTH FOR 5825MHz（99% BANDWIDTH）

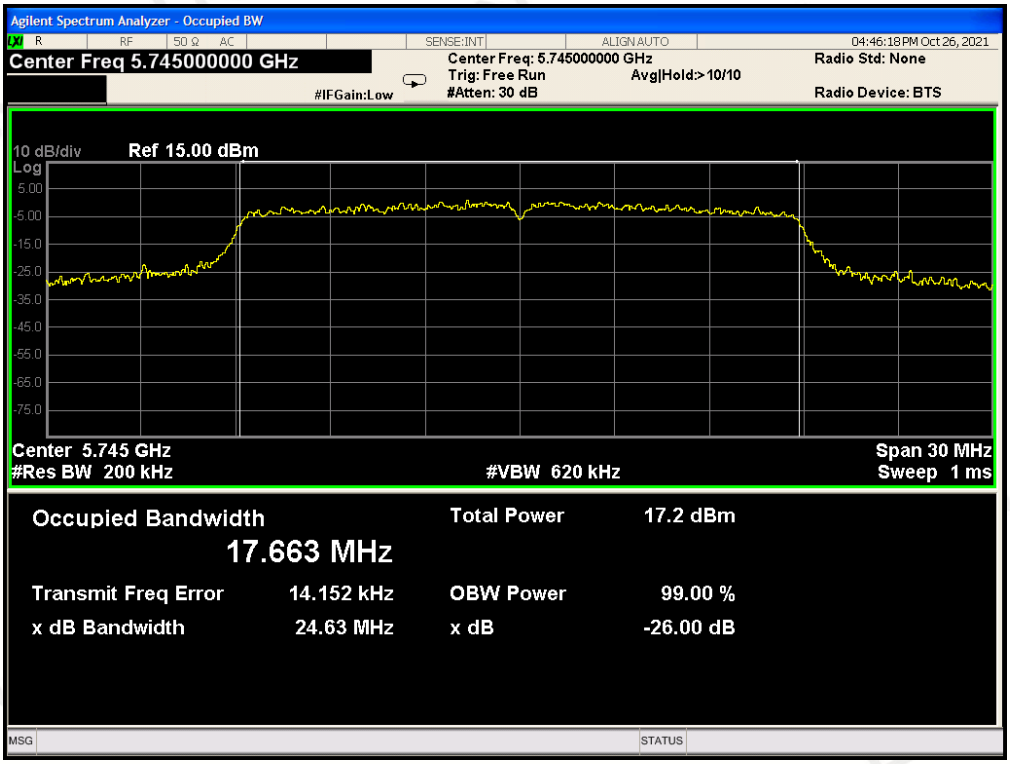


802.11n20 TEST RESULT

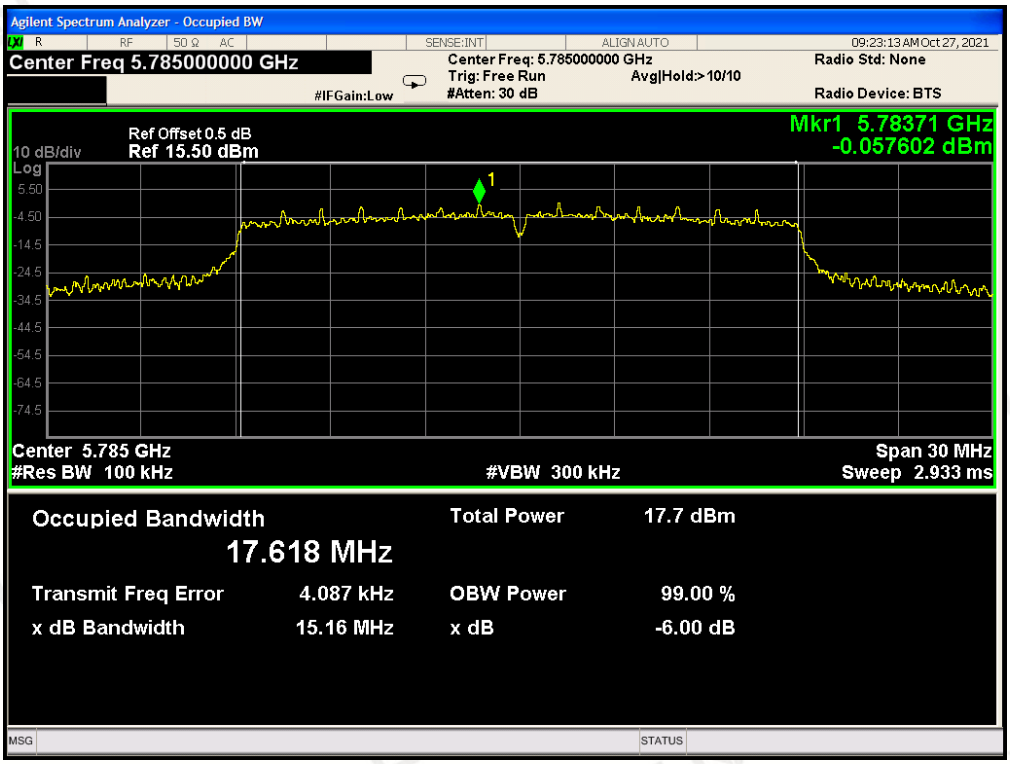
TEST PLOT OF BANDWIDTH FOR 5745MHz（-6dB BANDWIDTH）



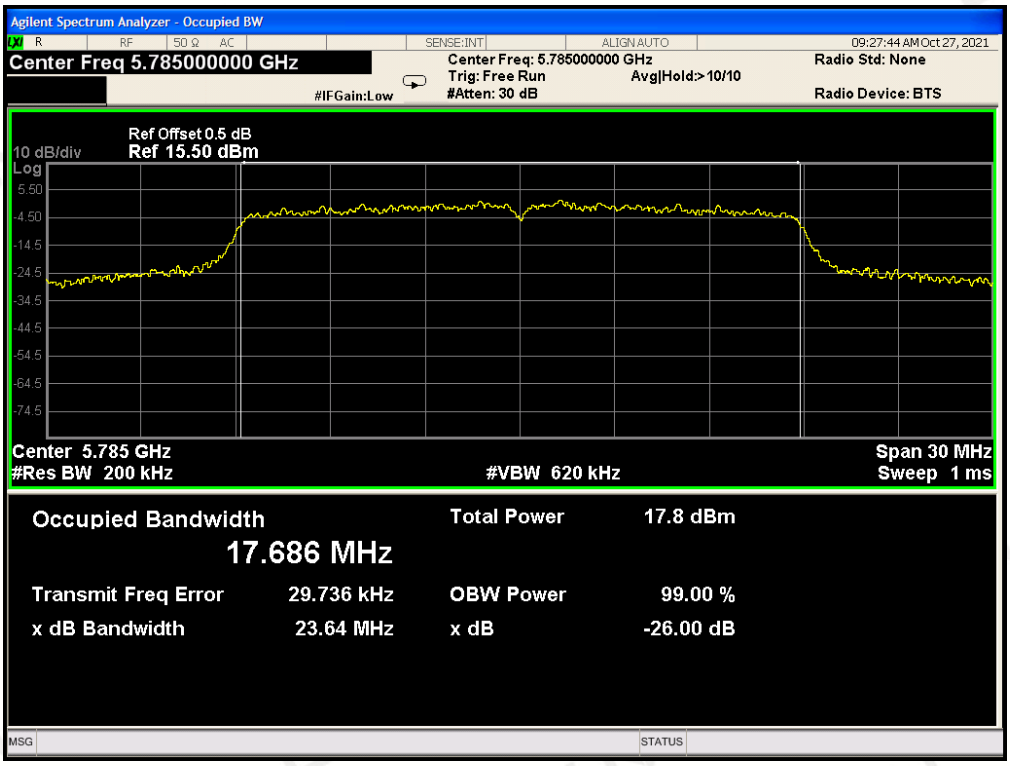
TEST PLOT OF BANDWIDTH FOR 5745MHz（99% BANDWIDTH）



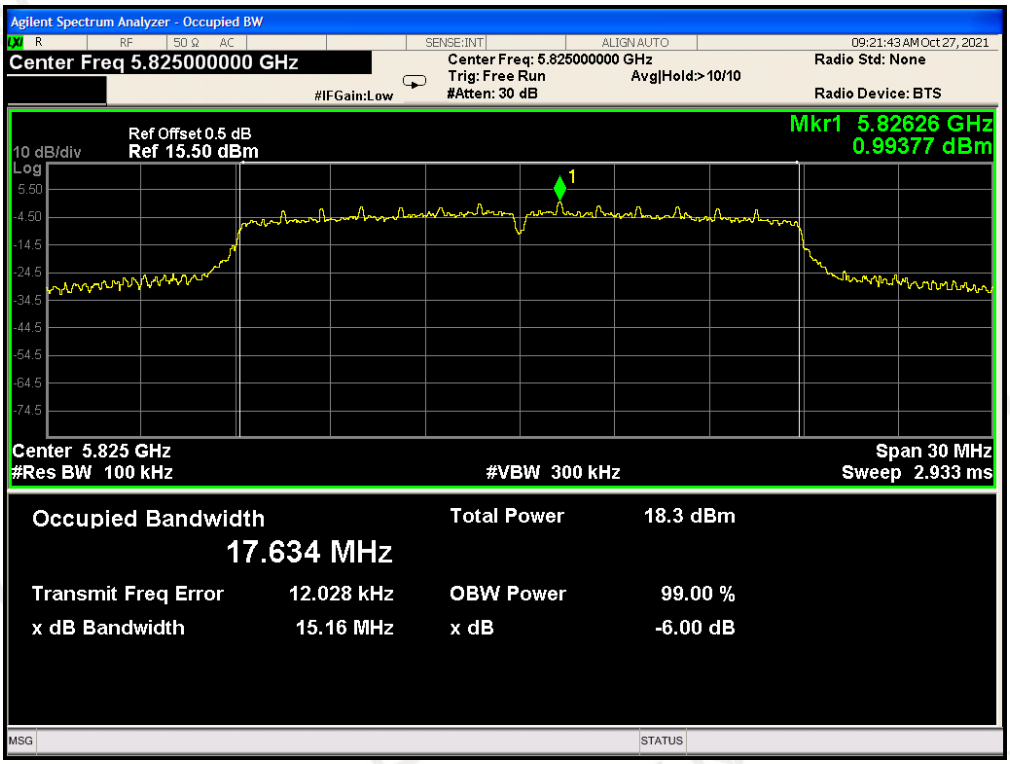
TEST PLOT OF BANDWIDTH FOR 5785MHz（-6dB BANDWIDTH）



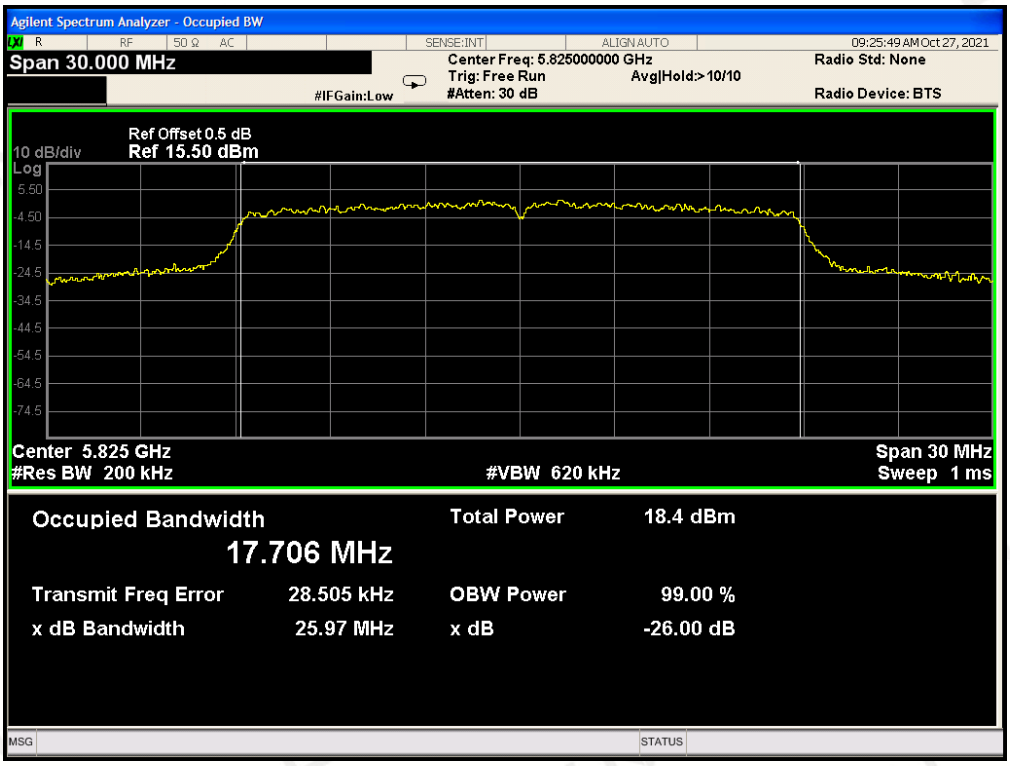
TEST PLOT OF BANDWIDTH FOR 5785MHz（99% BANDWIDTH）



TEST PLOT OF BANDWIDTH FOR 5825MHz（-6dB BANDWIDTH）



TEST PLOT OF BANDWIDTH FOR 5825MHz（99% BANDWIDTH）



9. EMISSION BANDWIDTH

9.1. MEASUREMENT PROCEDURE

9.1.1. -26dB Bandwidth MEASUREMENT PROCEDURE

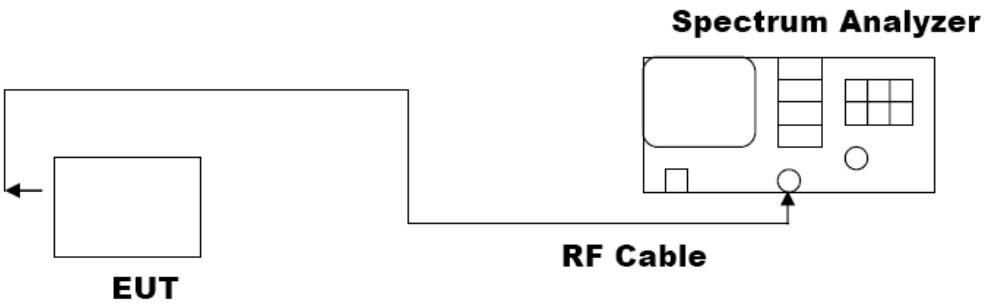
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

9.1.2. 99.00% Occupied Bandwidth MEASUREMENT PROCEDURE

a) Connect the antenna port(s) to the spectrum analyzer input.
b)Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
Center Frequency =Channel center frequency
Span=2 x emission bandwidth
RBW = 1% to 5% of the emission bandwidth
VBW>3 x RBW
Sweep time= auto couple
Detector = Peak
Trace mode = max hold
c)Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
d) Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1% to 5%.

Note: The EUT was tested according to KDB789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

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



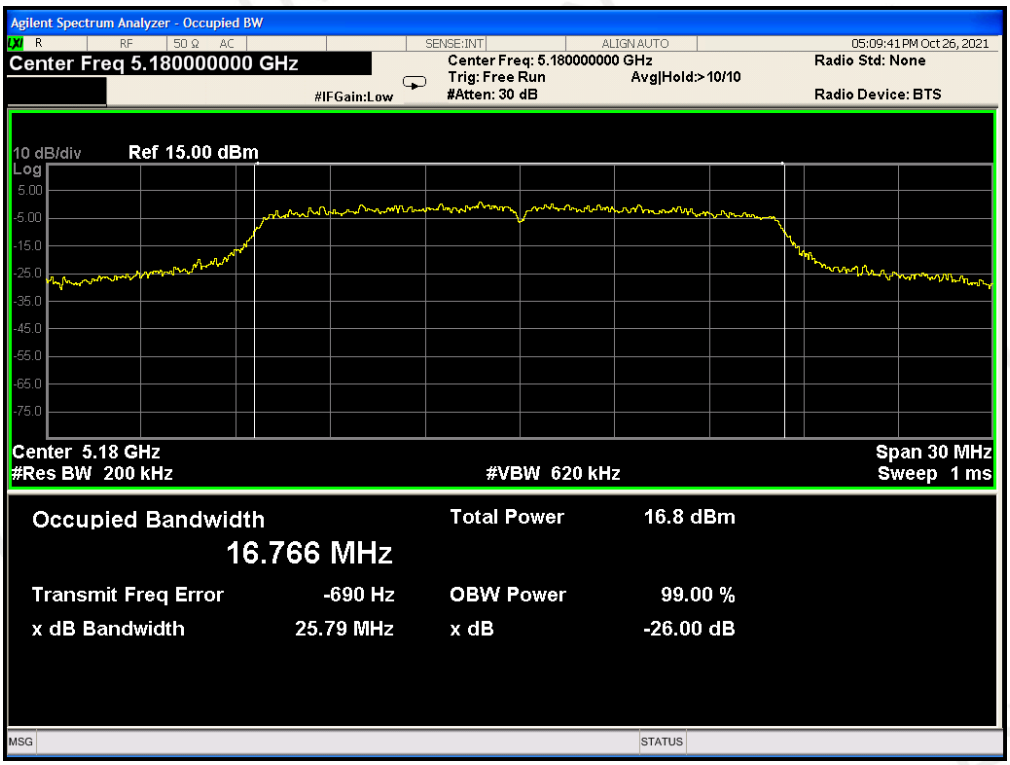
9.3. LIMITS AND MEASUREMENT RESULTS

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	
Within the Band	5180MHz	25.79	16.766	PASS
	5200MHz	26.73	16.810	PASS
	5240MHz	28.84	16.924	PASS

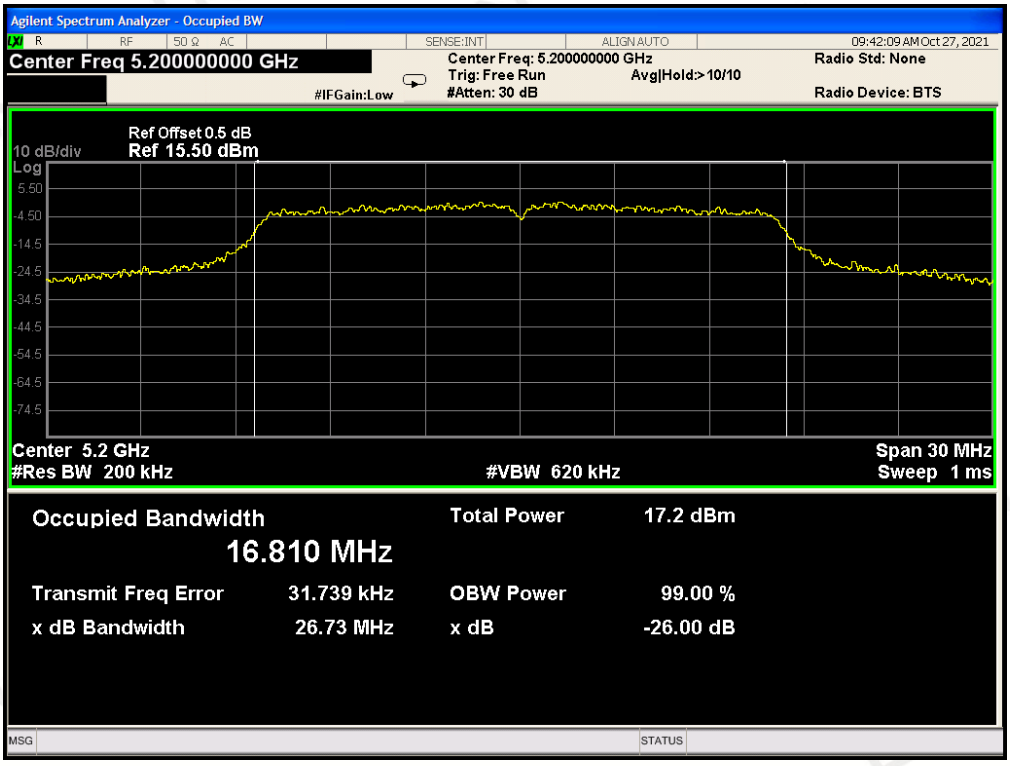
LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	
Within the Band	5180MHz	27.31	17.766	PASS
	5200MHz	28.87	17.812	PASS
	5240MHz	29.47	17.912	PASS

802.11a20 TEST RESULT

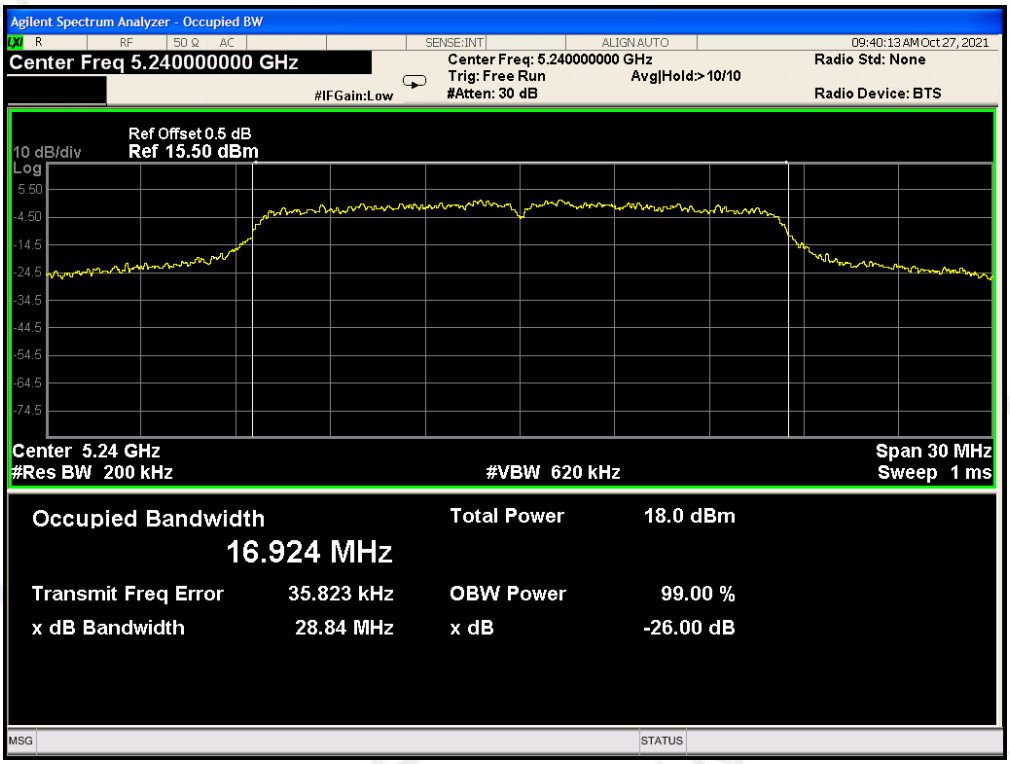
TEST PLOT OF BANDWIDTH FOR 5180MHz



TEST PLOT OF BANDWIDTH FOR 5200MHz

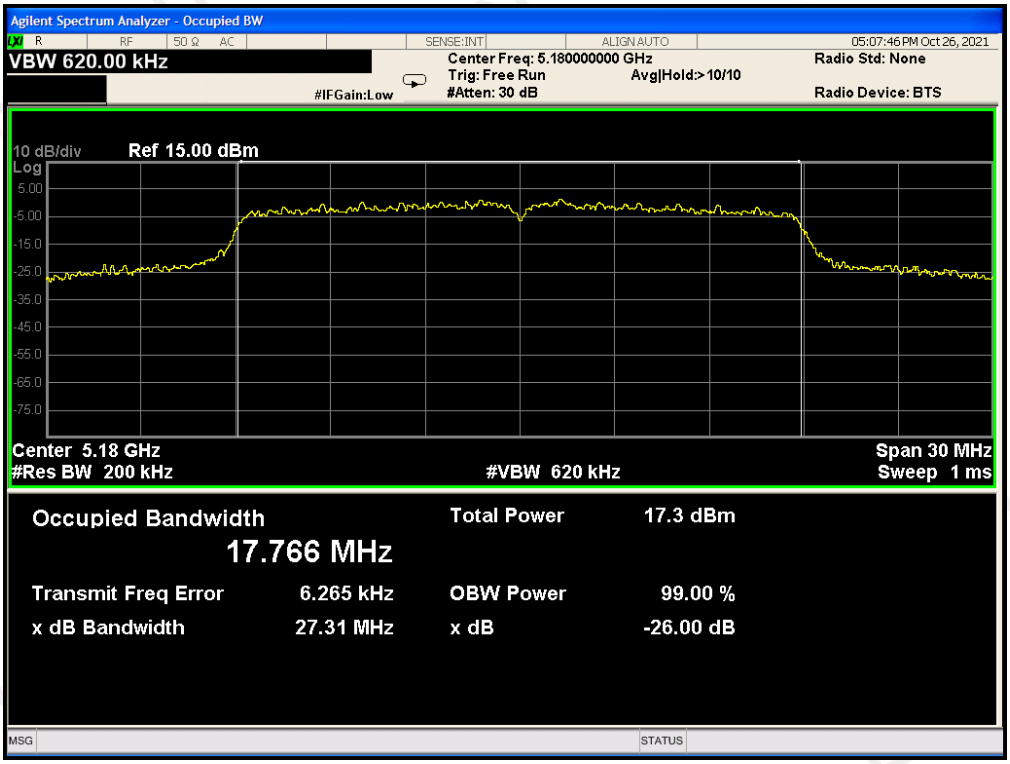


TEST PLOT OF BANDWIDTH FOR 5240MHz

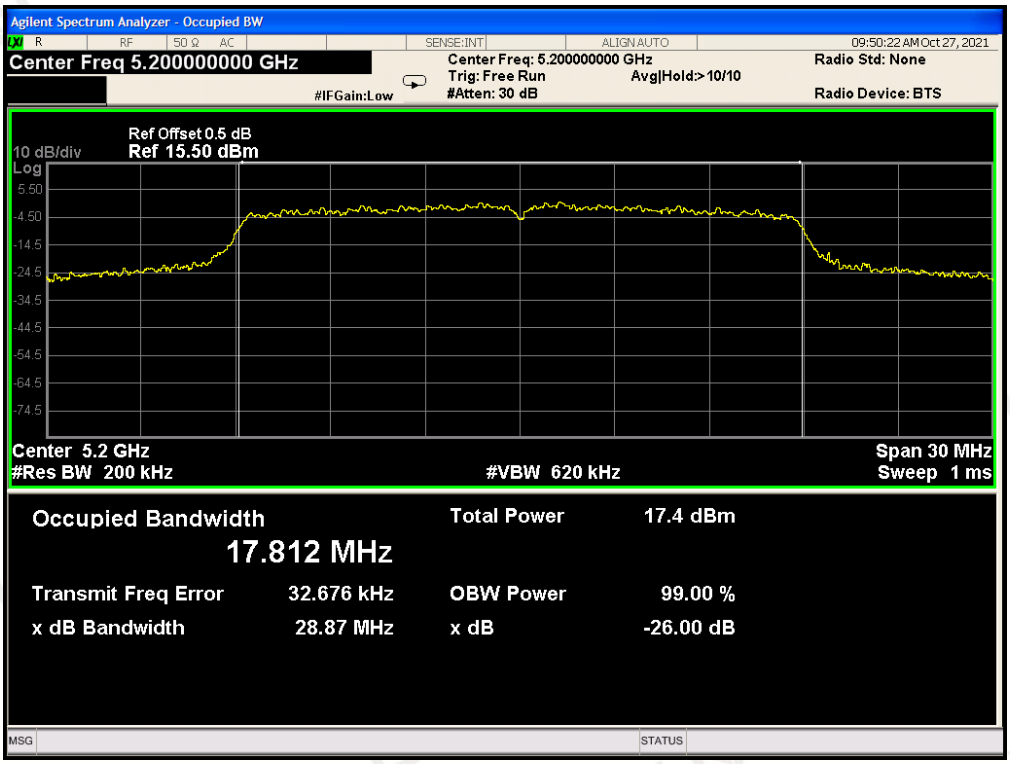


802.11n20 TEST RESULT

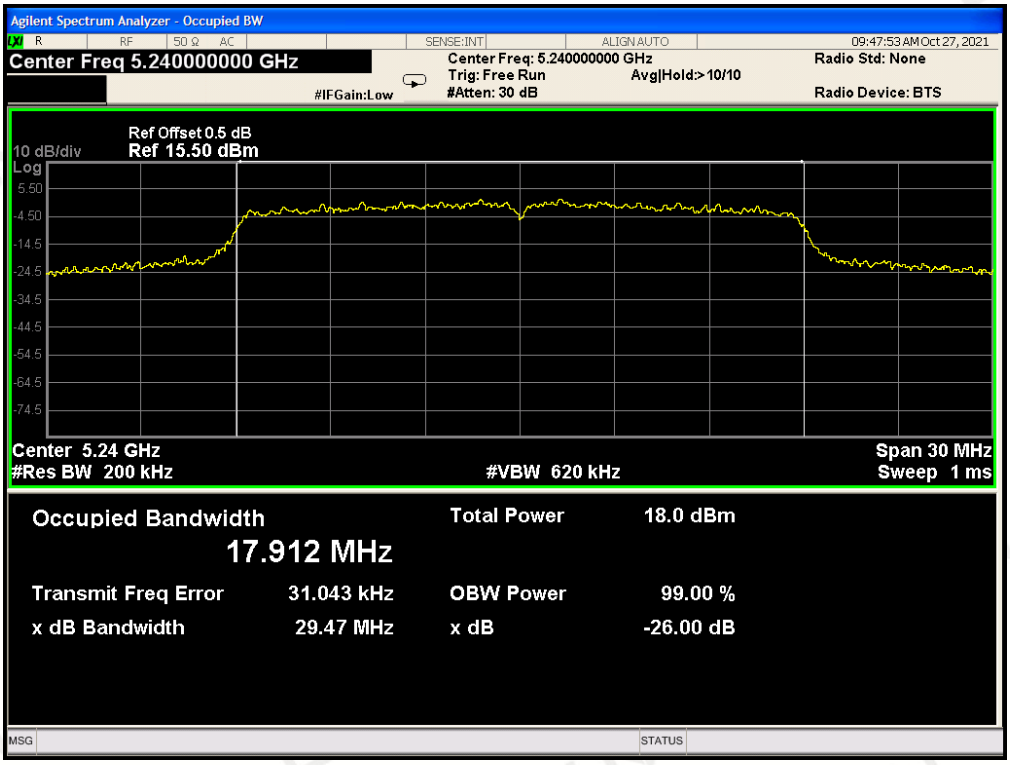
TEST PLOT OF BANDWIDTH FOR 5180MHz



TEST PLOT OF BANDWIDTH FOR 5200MHz



TEST PLOT OF BANDWIDTH FOR 5240MHz



10. MAXIMUM CONDUCTED OUTPUT AVERAGE POWER SPECTRAL DENSITY

10.1 MEASUREMENT PROCEDURE

Refer to KDB789033 D02 v02r01 section F

10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

10.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

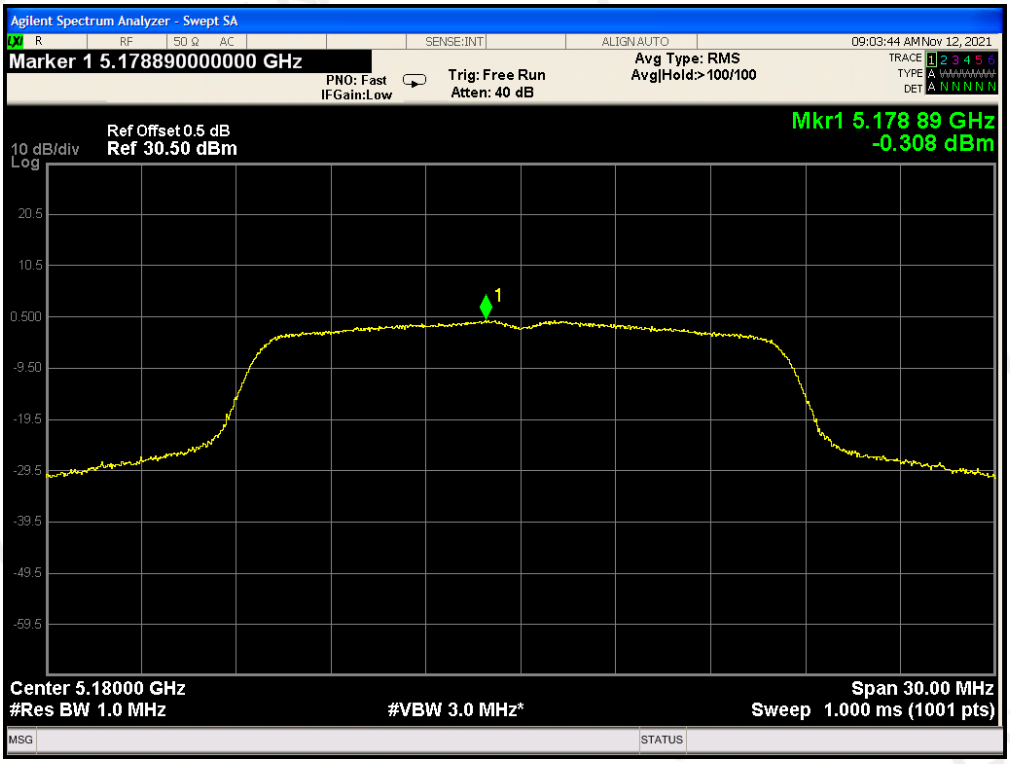
10.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION			
Frequency (MHz)	**Power density (dBm/MHz)**	**Applicable Limits (dBm/MHz)**	**Pass or Fail**
5180	-0.308	11	Pass
5200	-1.046	11	Pass
5240	-0.693	11	Pass
Frequency (MHz)	**Power density (30dBm/500kHz)**	**Applicable Limits (30dBm/500kHz)**	**Pass or Fail**
5745	-2.678	30	Pass
5785	-2.773	30	Pass
5825	-2.451	30	Pass

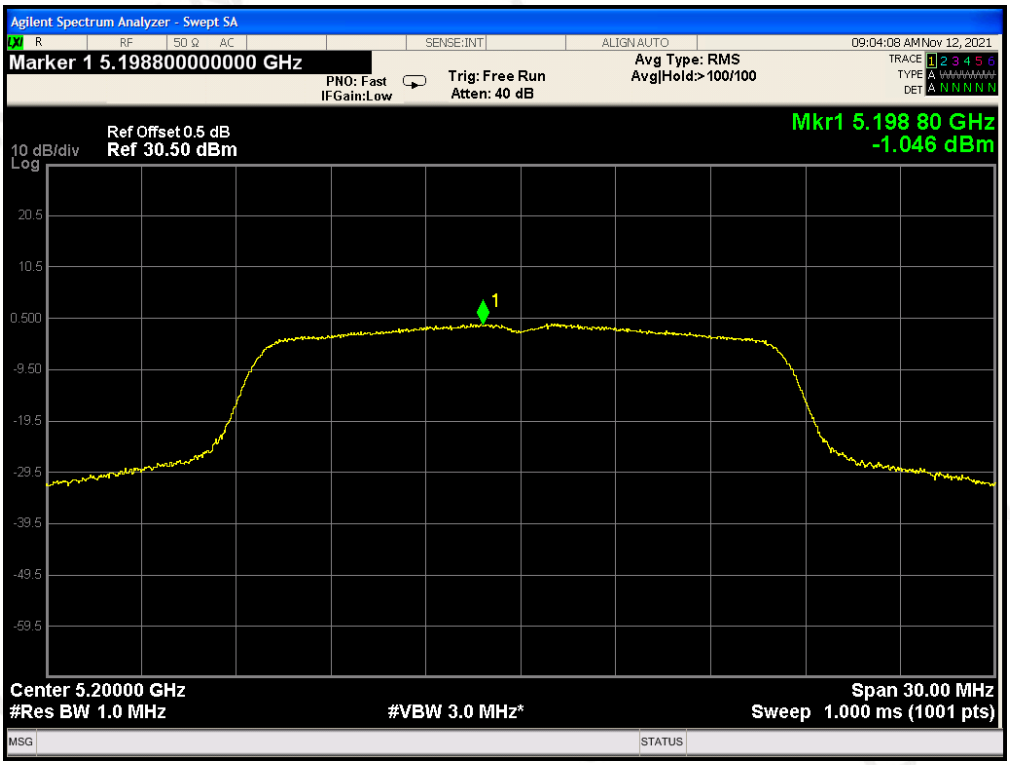
LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION			
Frequency (MHz)	**Power density (dBm/MHz)**	**Applicable Limits (dBm/MHz)**	**Pass or Fail**
5180	-1.122	11	Pass
5200	-1.068	11	Pass
5240	-1.047	11	Pass
Frequency (MHz)	**Power density (30dBm/500kHz)**	**Applicable Limits (30dBm/500kHz)**	**Pass or Fail**
5745	-2.951	30	Pass
5785	-2.460	30	Pass
5825	-2.778	30	Pass

802.11a20 TEST RESULT

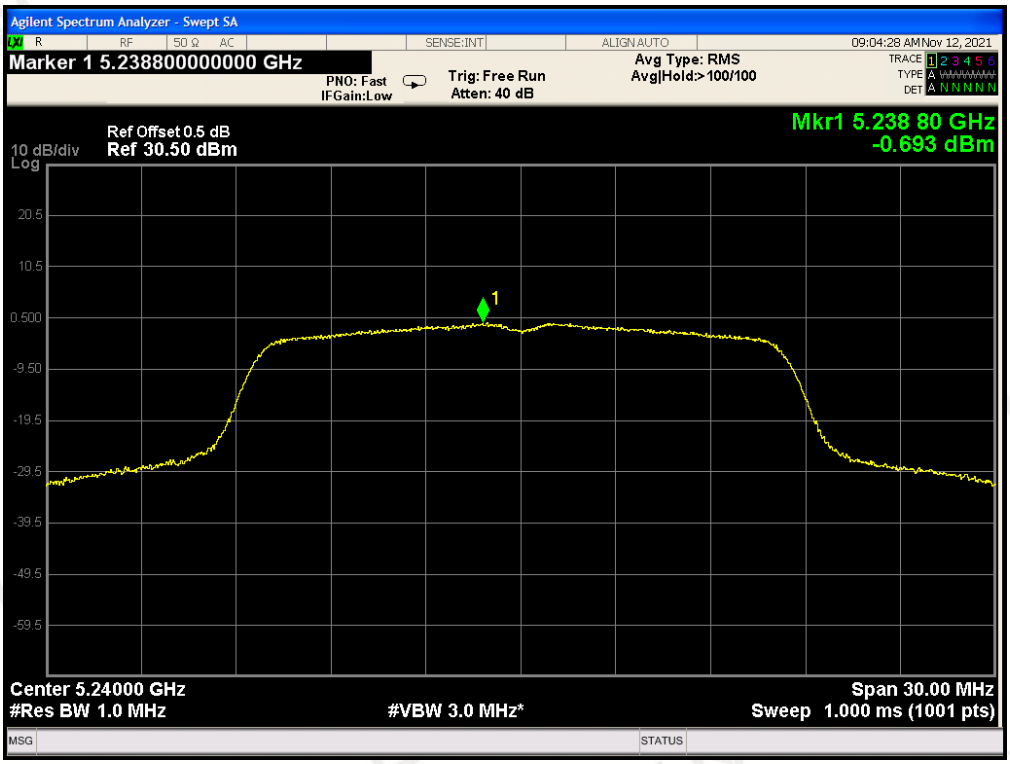
TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz



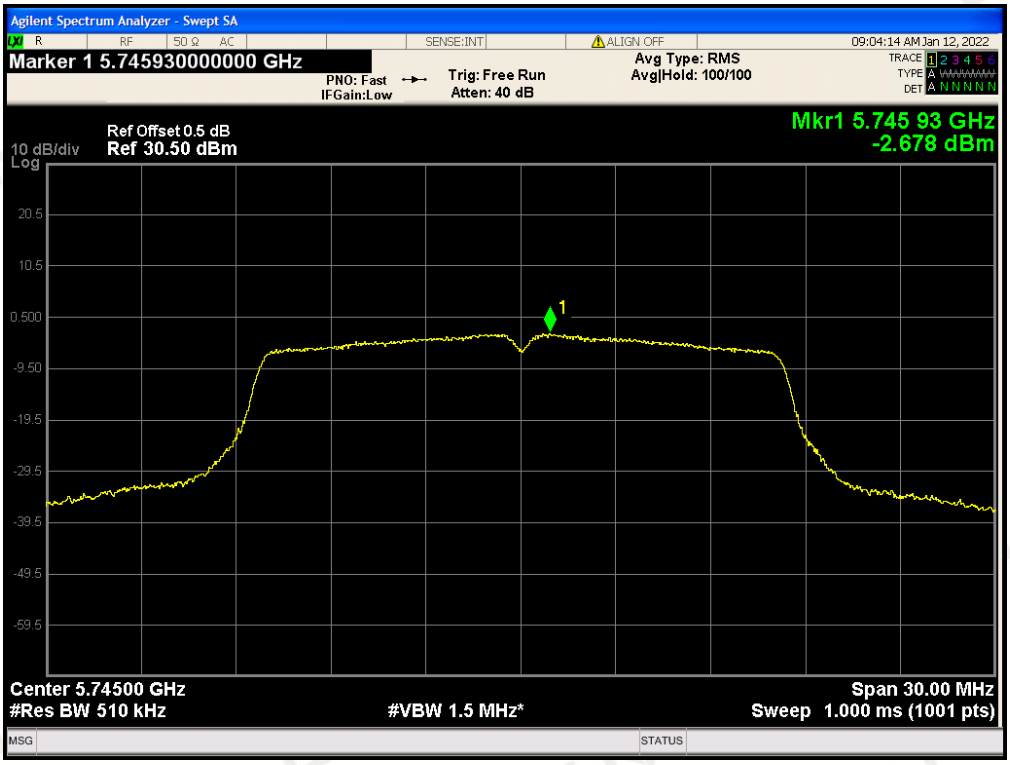
TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz



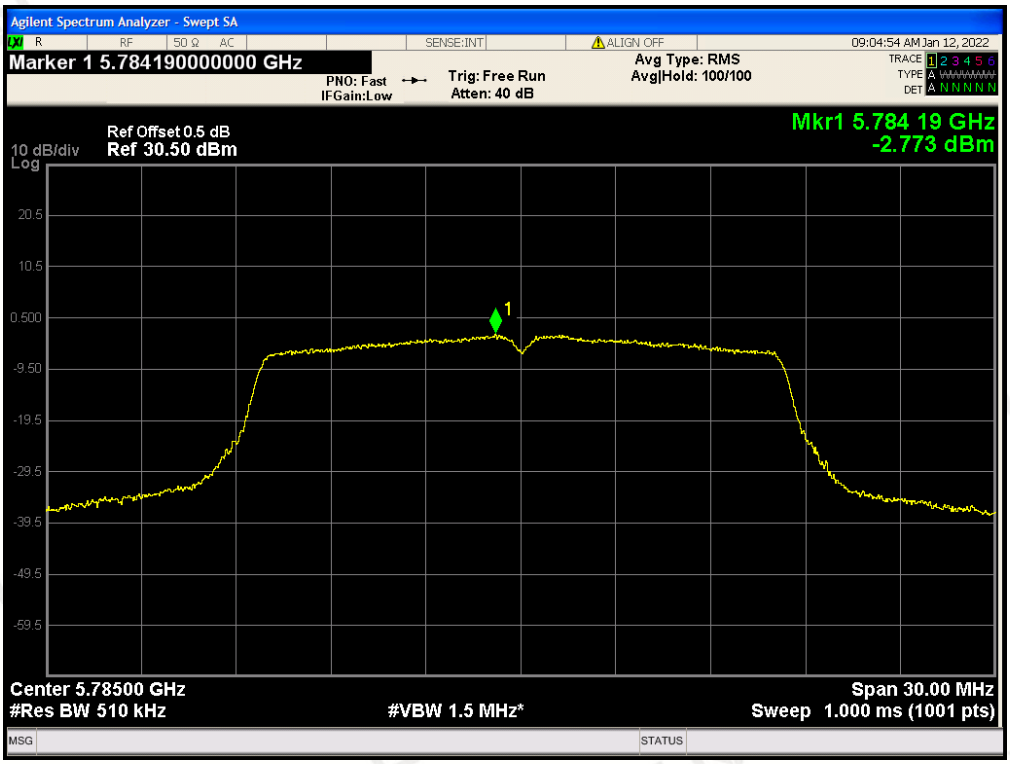
TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz



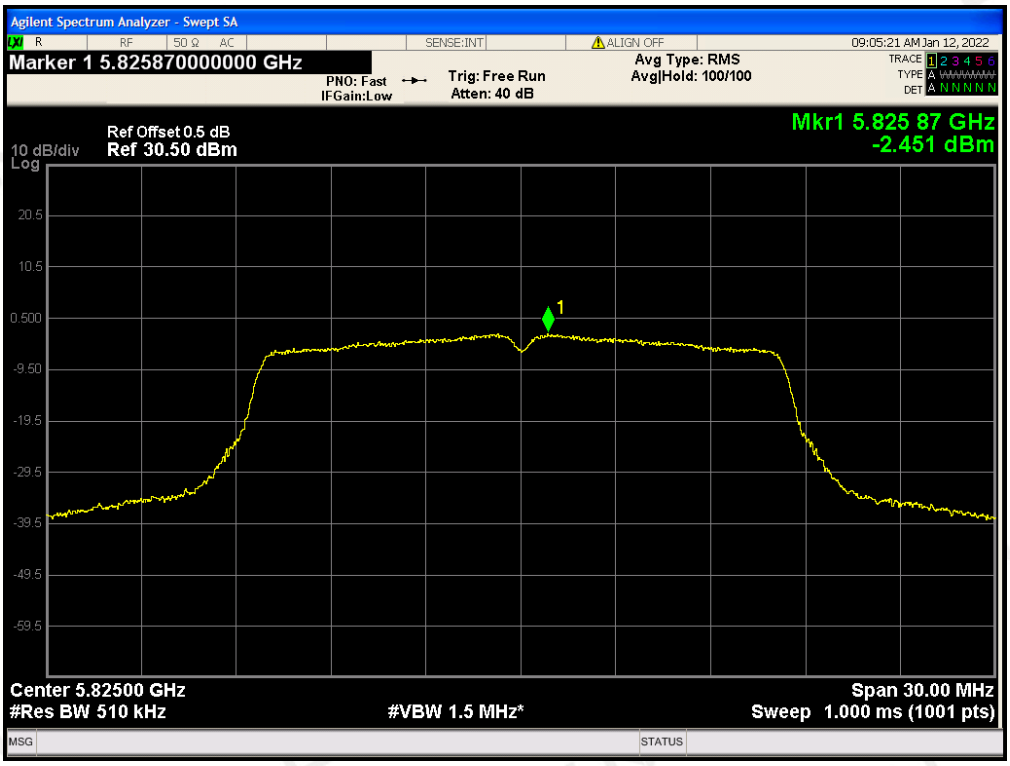
TEST PLOT OF SPECTRAL DENSITY FOR 5745MHz



TEST PLOT OF SPECTRAL DENSITY FOR 5785MHz

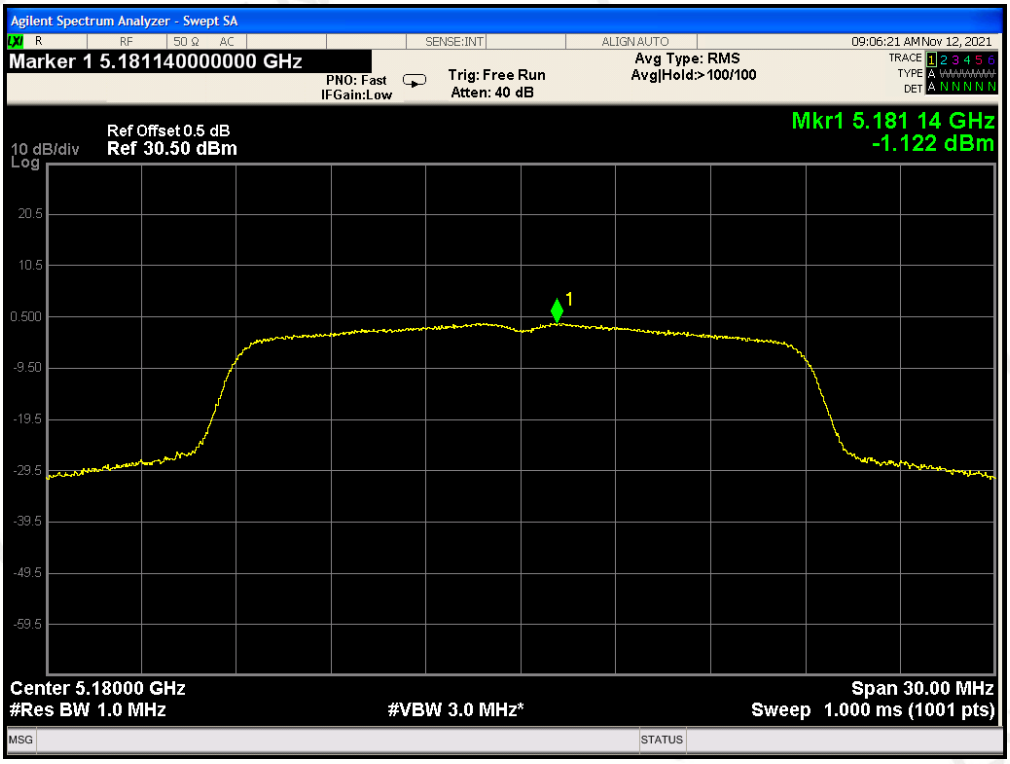


TEST PLOT OF SPECTRAL DENSITY FOR 5825MHz

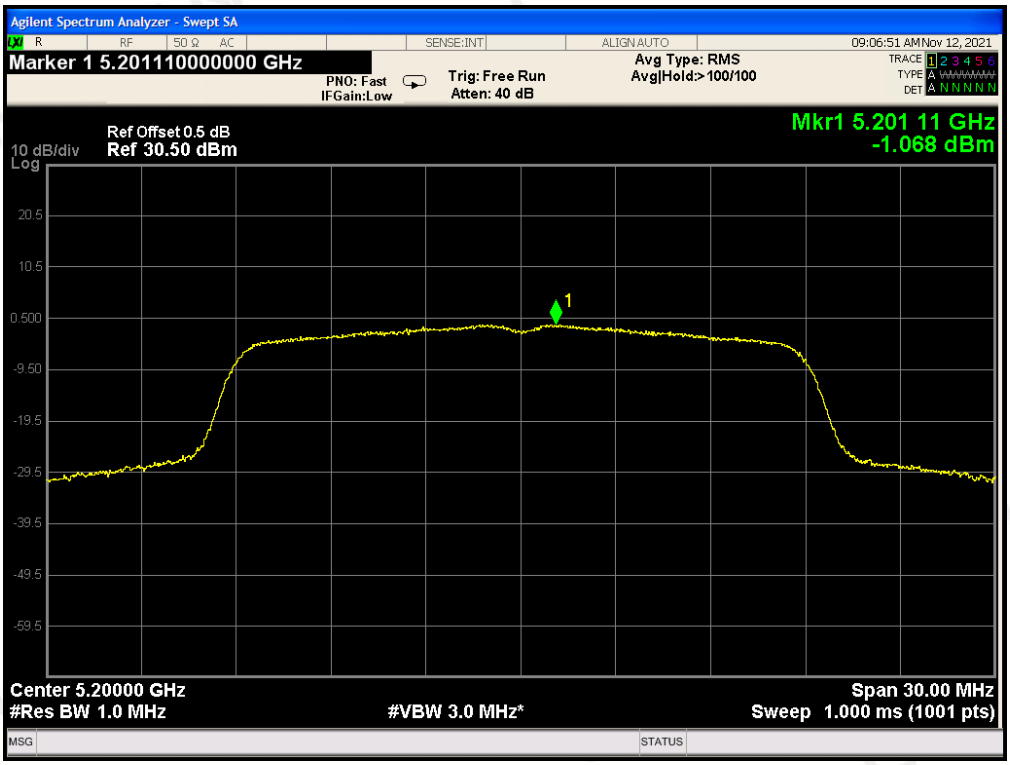


802.11n20 TEST RESULT

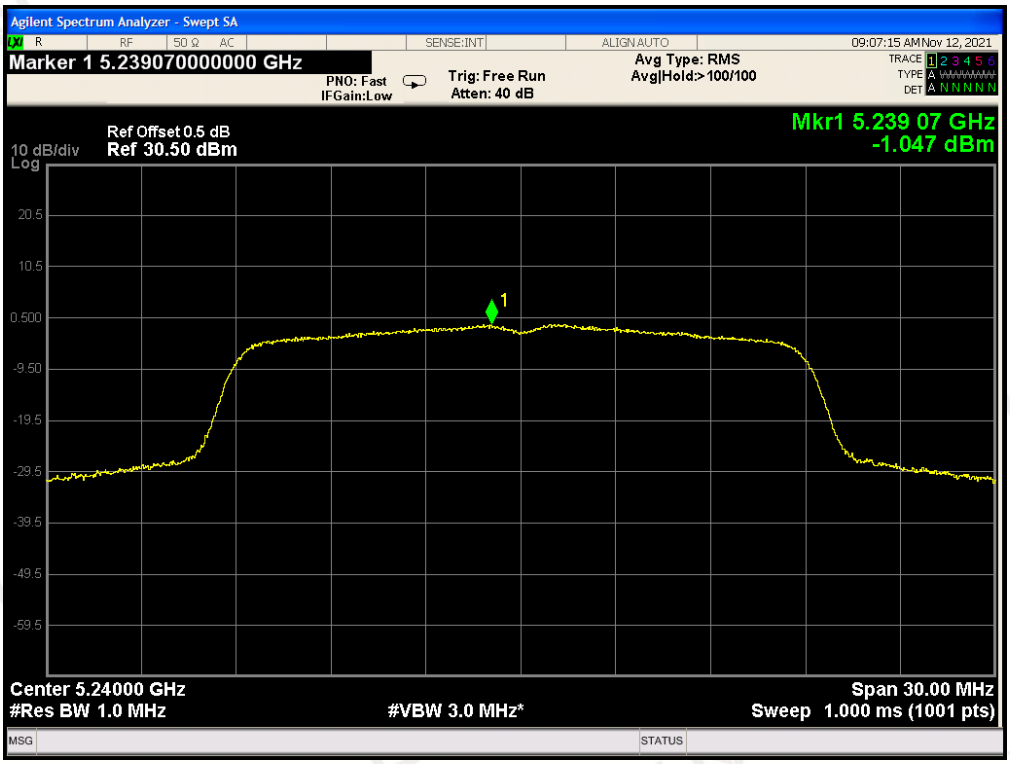
TEST PLOT OF SPECTRAL DENSITY FOR 5180MHz



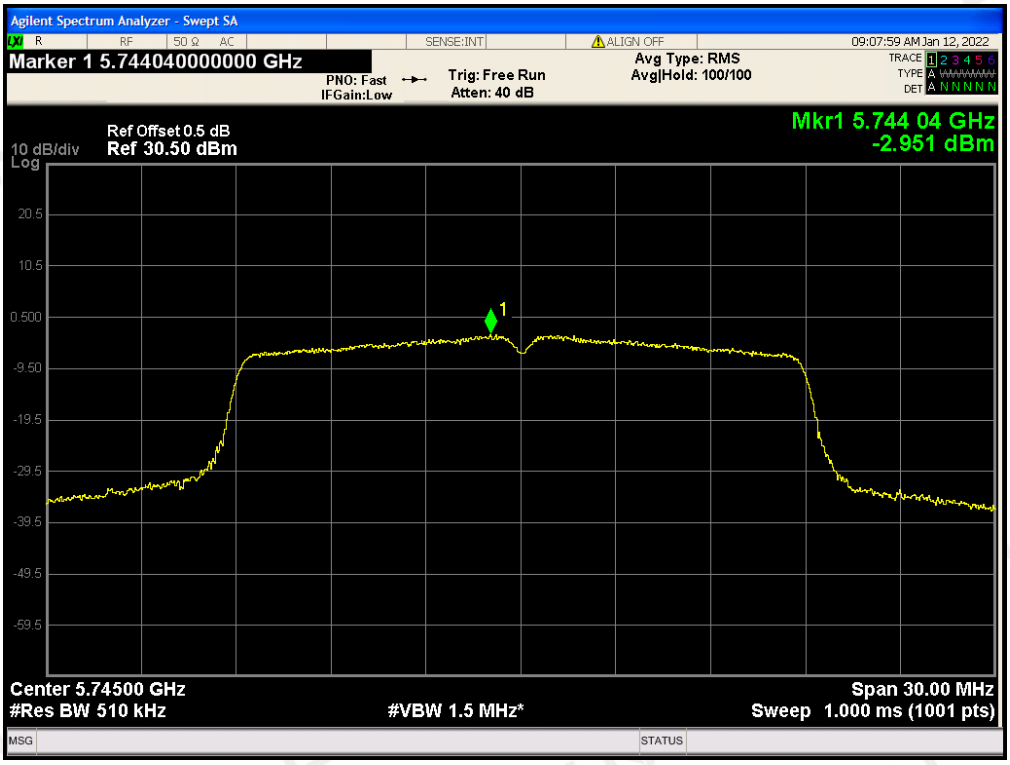
TEST PLOT OF SPECTRAL DENSITY FOR 5200MHz



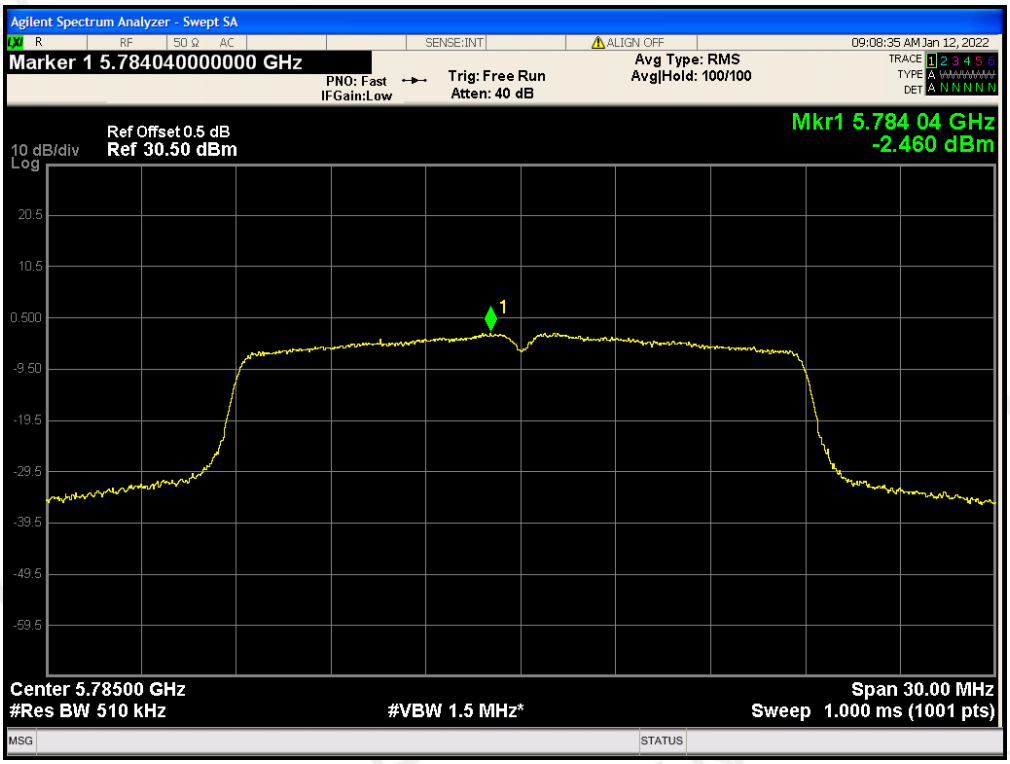
TEST PLOT OF SPECTRAL DENSITY FOR 5240MHz



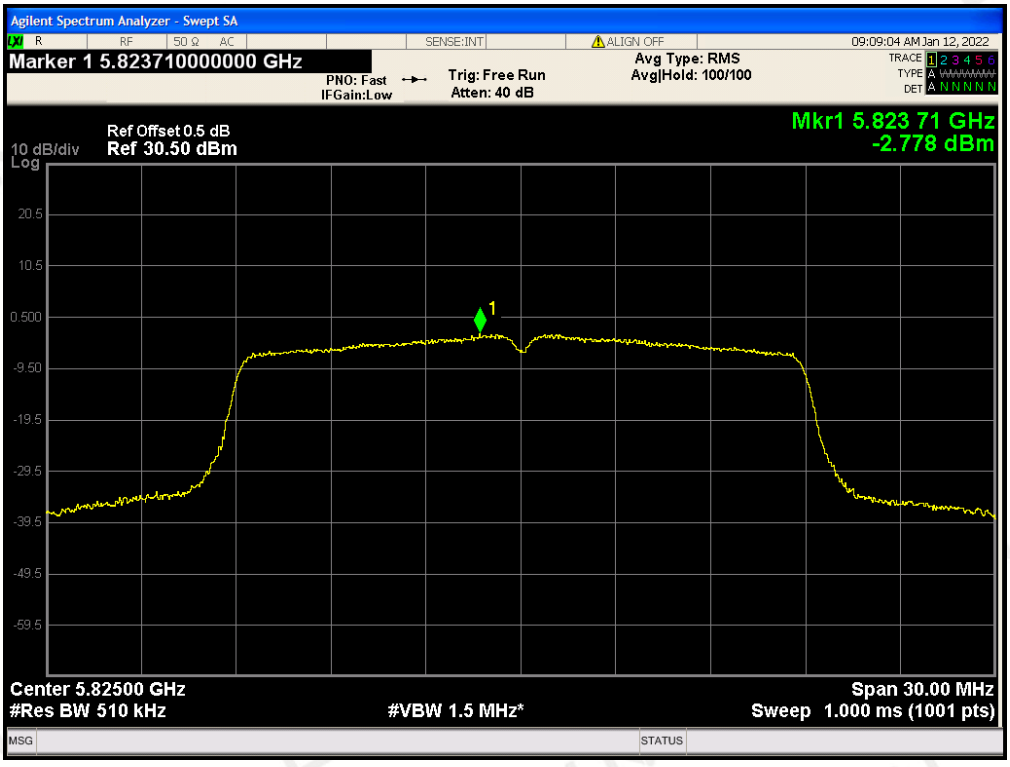
TEST PLOT OF SPECTRAL DENSITY FOR 5745MHz



TEST PLOT OF SPECTRAL DENSITY FOR 5785MHz



TEST PLOT OF SPECTRAL DENSITY FOR 5825MHz



11. CONDUCTED SPURIOUS EMISSION

11.1. 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 KDB789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

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

The same as described in section 8.2.

11.3. MEASUREMENT EQUIPMENT USED

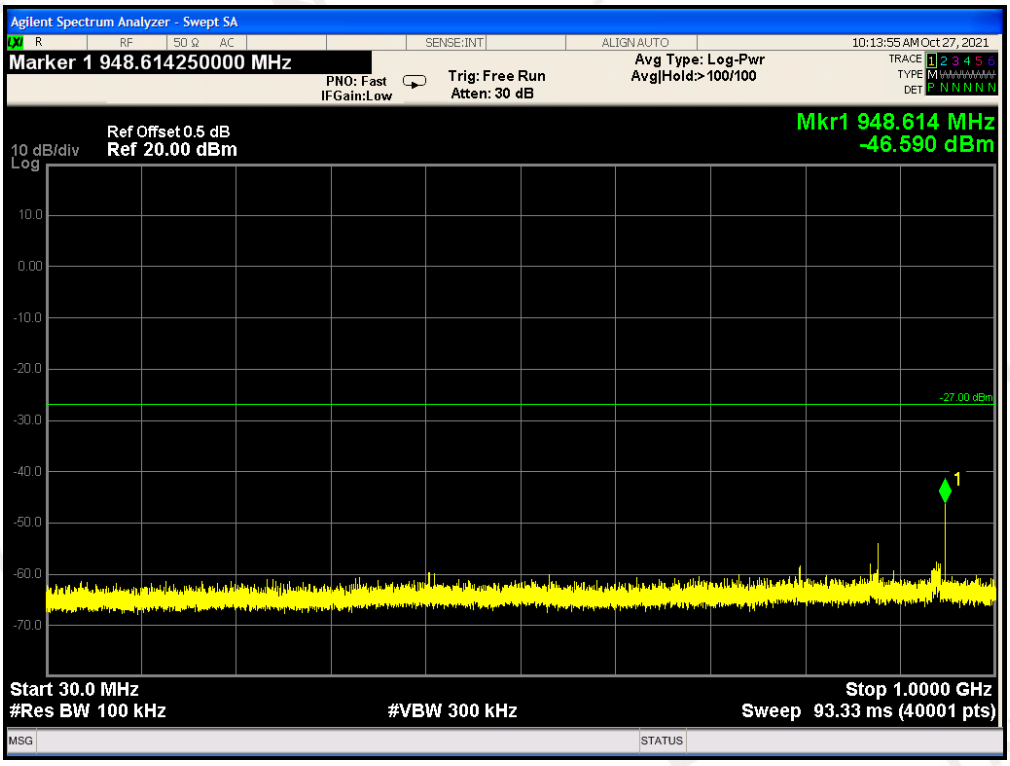
The same as described in section 6.

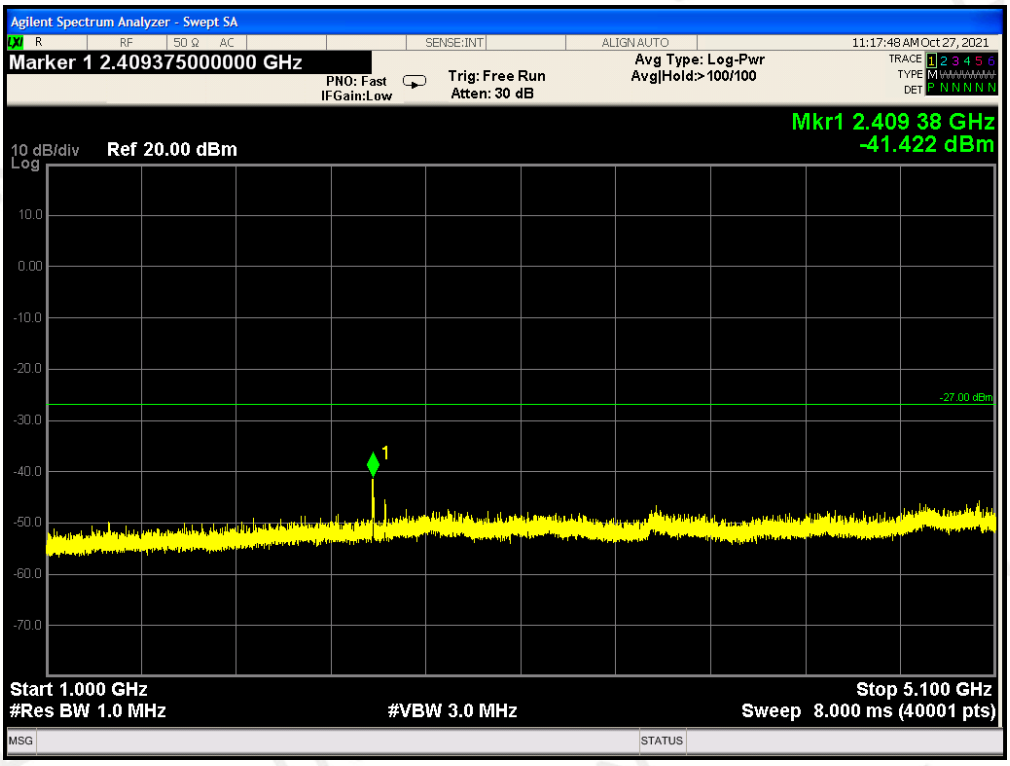
11.4. LIMITS AND MEASUREMENT RESULT

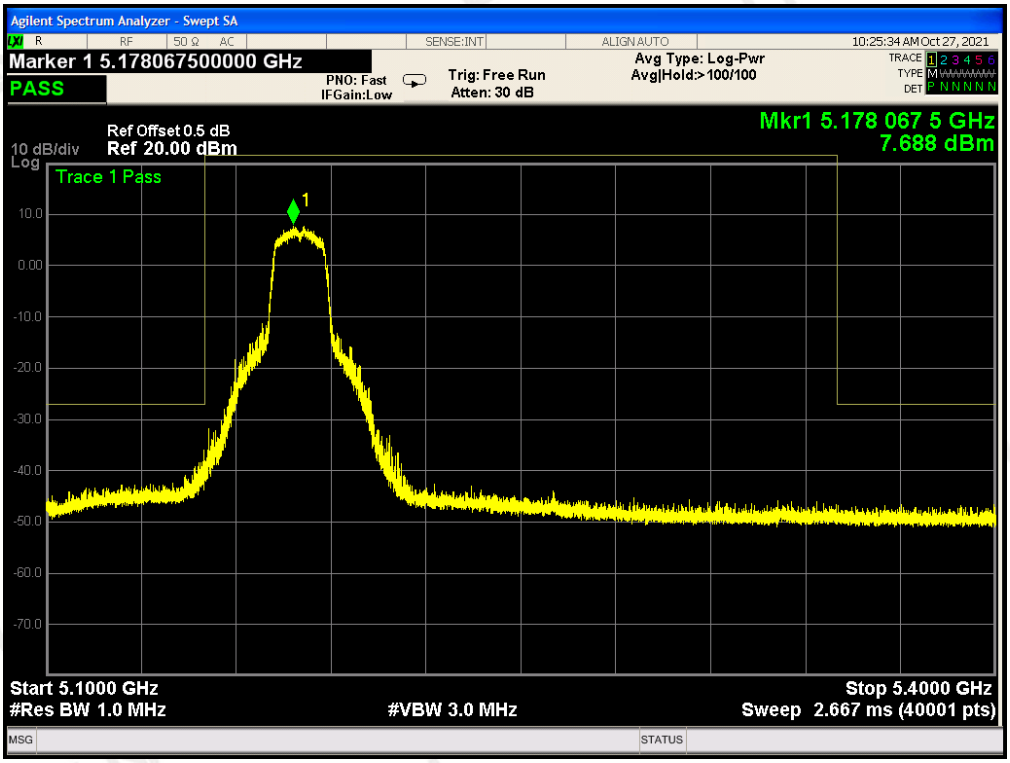
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test channel	Criteria
-27dBm/MHz	5150MHz-5250MHz	PASS
All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	5725MHz-5850MHz	PASS

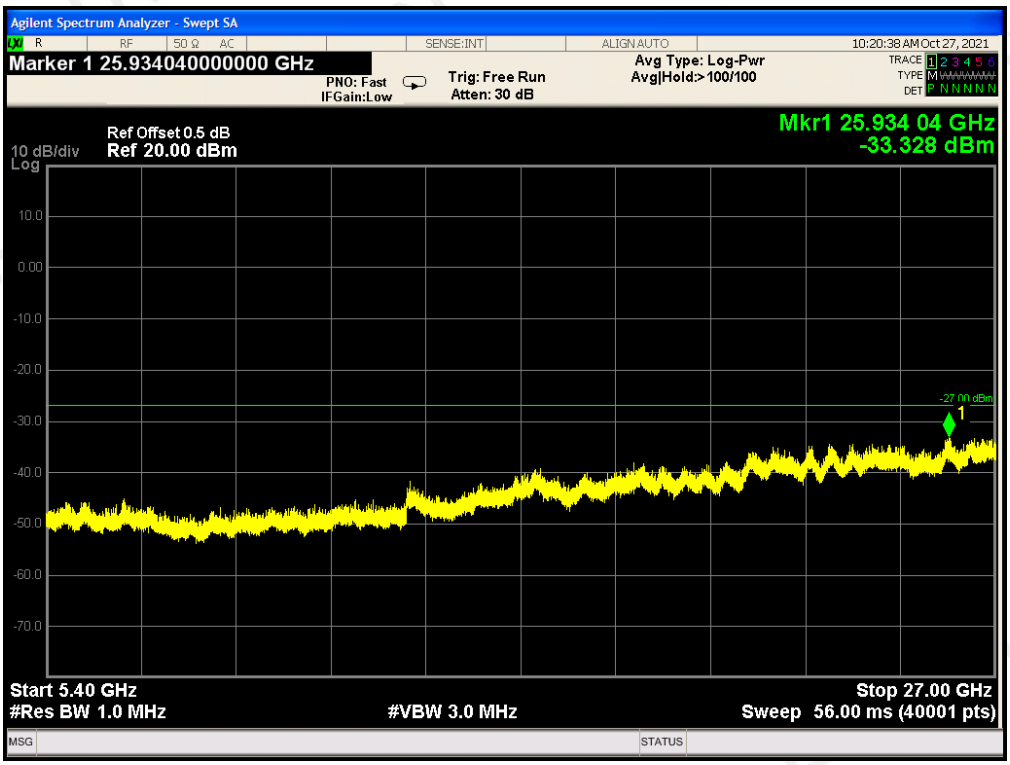
FOR 802.11A20 MODULATION

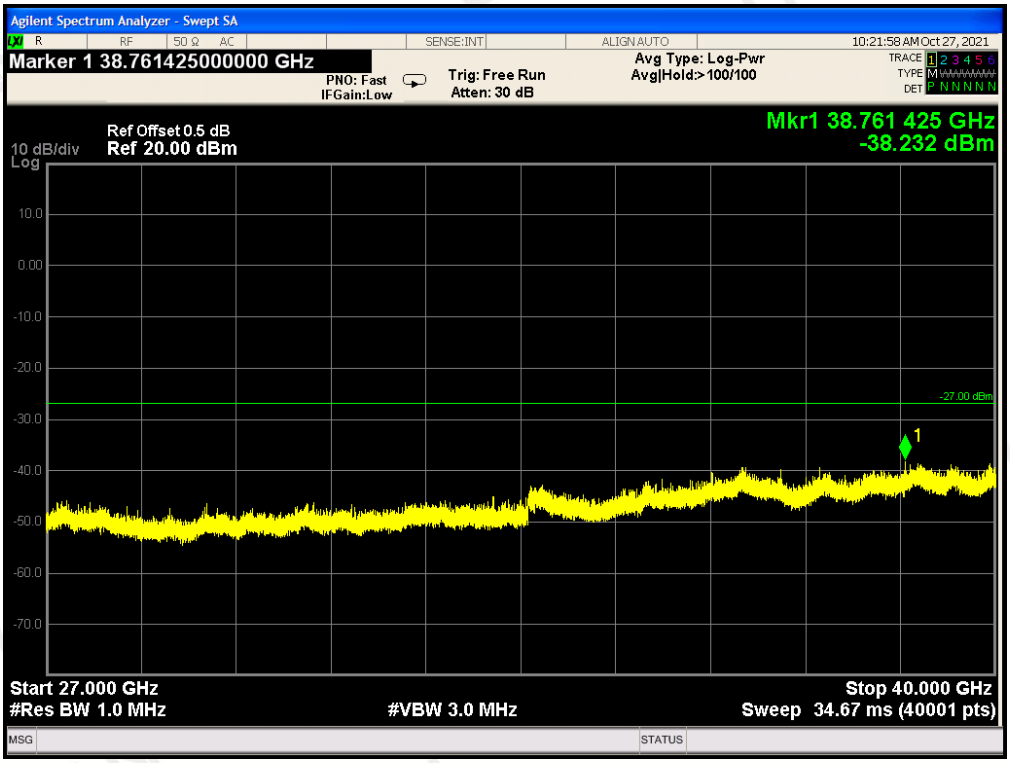
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5180MHz



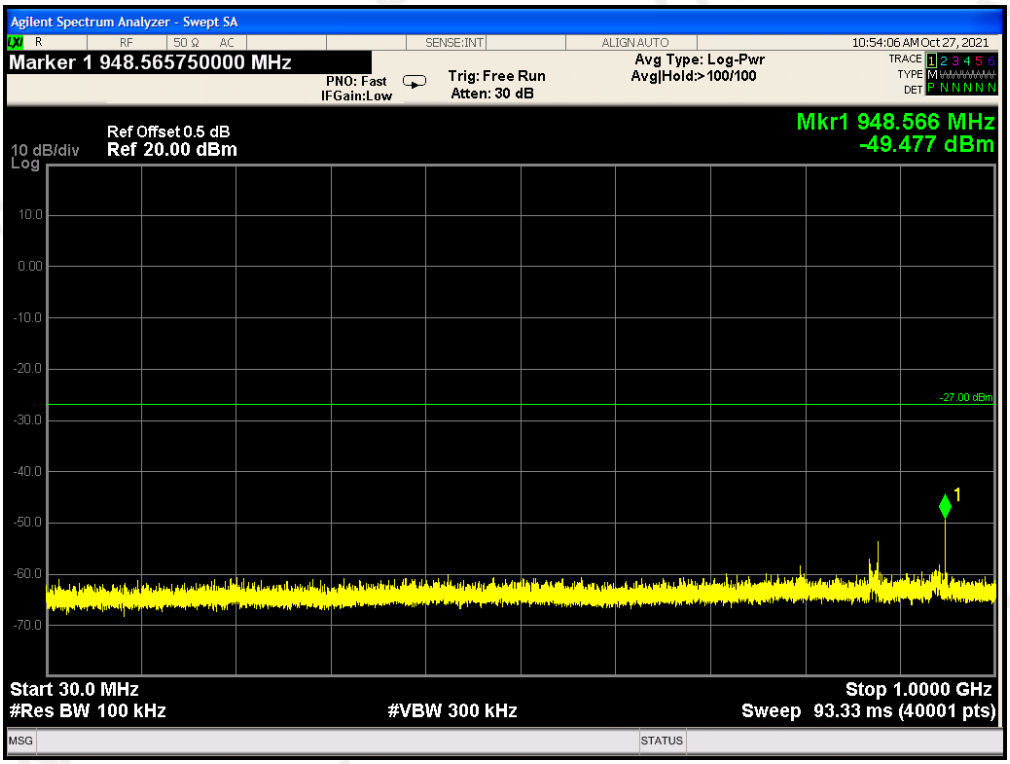


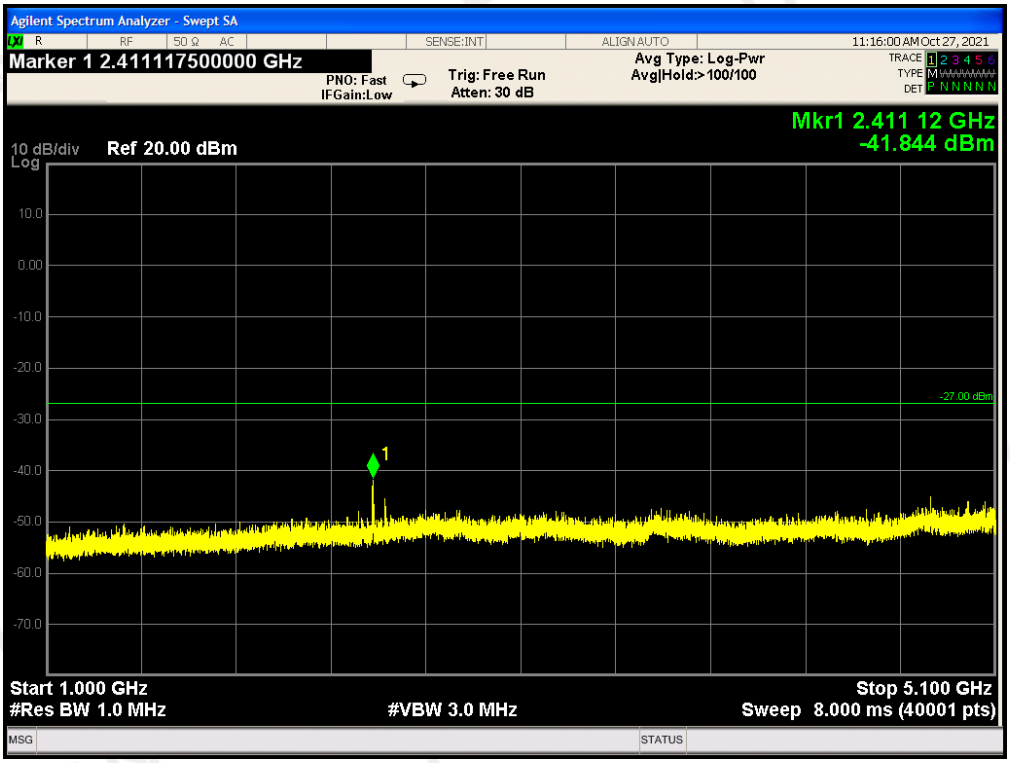

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.178067500000 GHz
PASS
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:25:34 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.178 067 5 GHz
7.688 dBm
Trace 1 Pass
Start 5.1000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.4000 GHz
Sweep 2.667 ms (40001 pts)

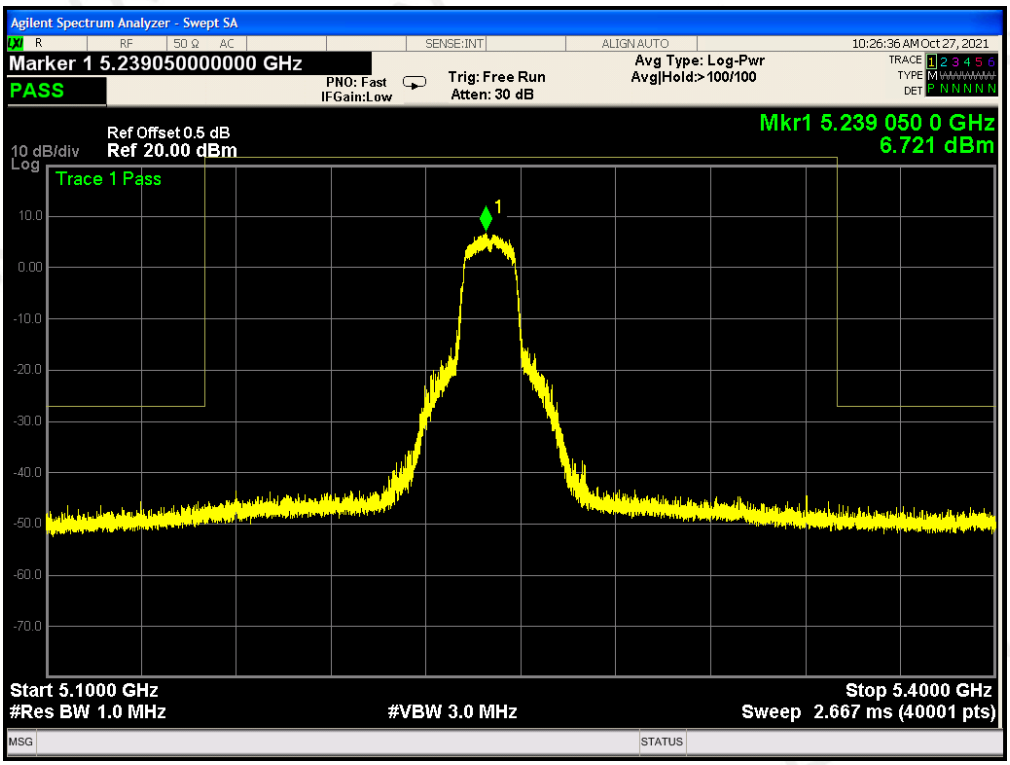

Agilent Spectrum Analyzer - Swept SA
Marker 1 25.934040000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:20:38 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 25.934 04 GHz
-33.328 dBm
-27.00 dBm
Start 5.40 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 56.00 ms (40001 pts)

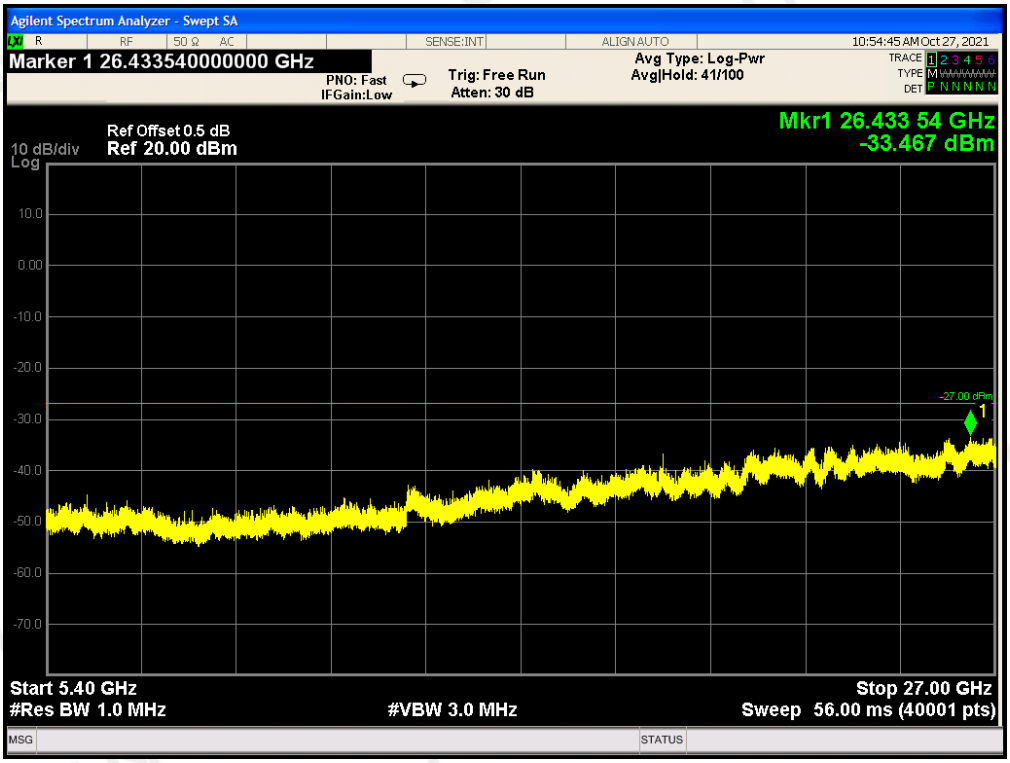


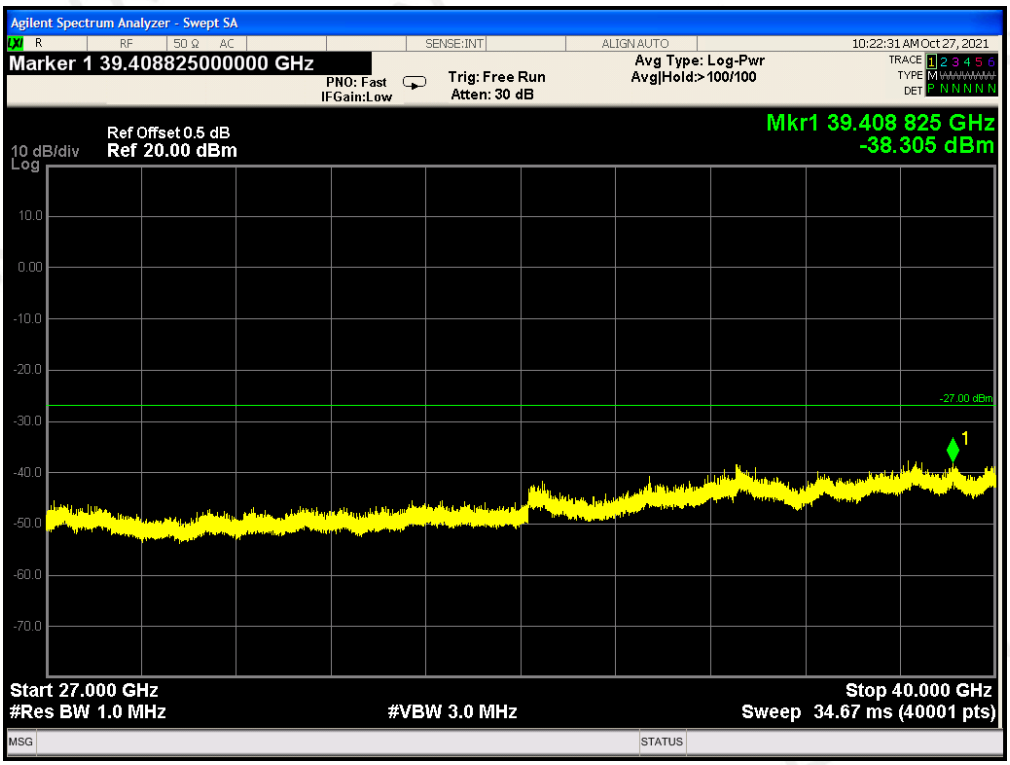
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5240MHz



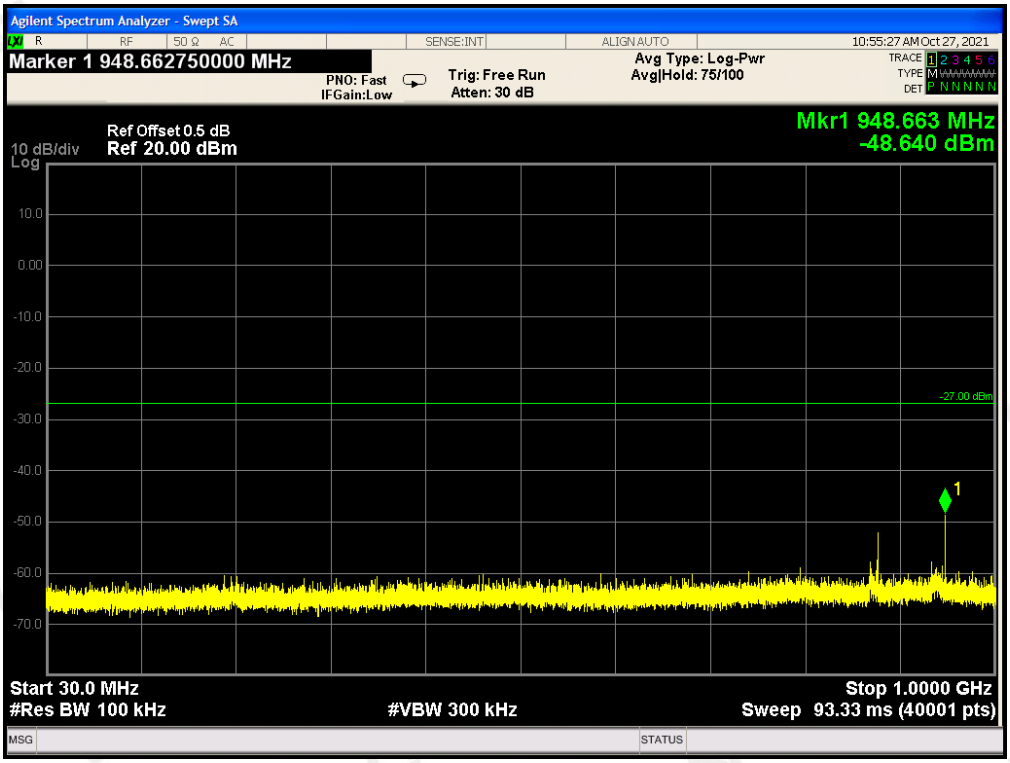

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.411117500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
11:16:00 AM Oct 27, 2021
Mkr1 2.411 12 GHz
-41.844 dBm
10 dB/div
Log
Ref 20.00 dBm
-27.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.100 GHz
Sweep 8.000 ms (40001 pts)

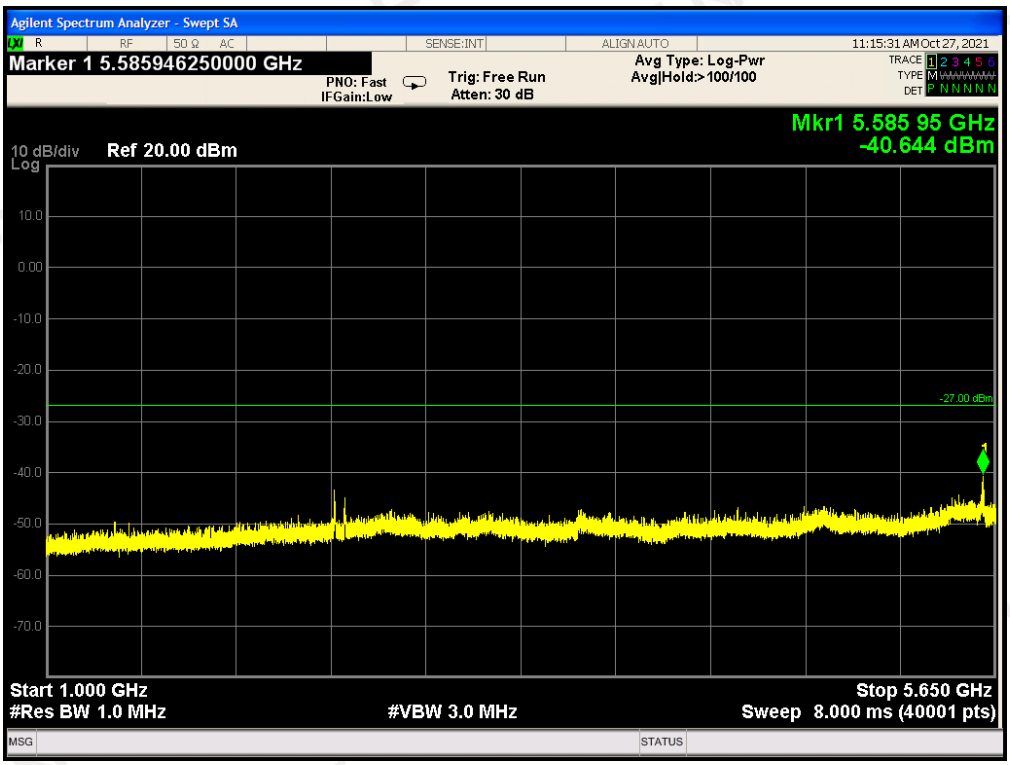

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.239050000000 GHz
PASS
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:26:36 AM Oct 27, 2021
Mkr1 5.239 050 0 GHz
6.721 dBm
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Trace 1 Pass
Start 5.1000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.4000 GHz
Sweep 2.667 ms (40001 pts)

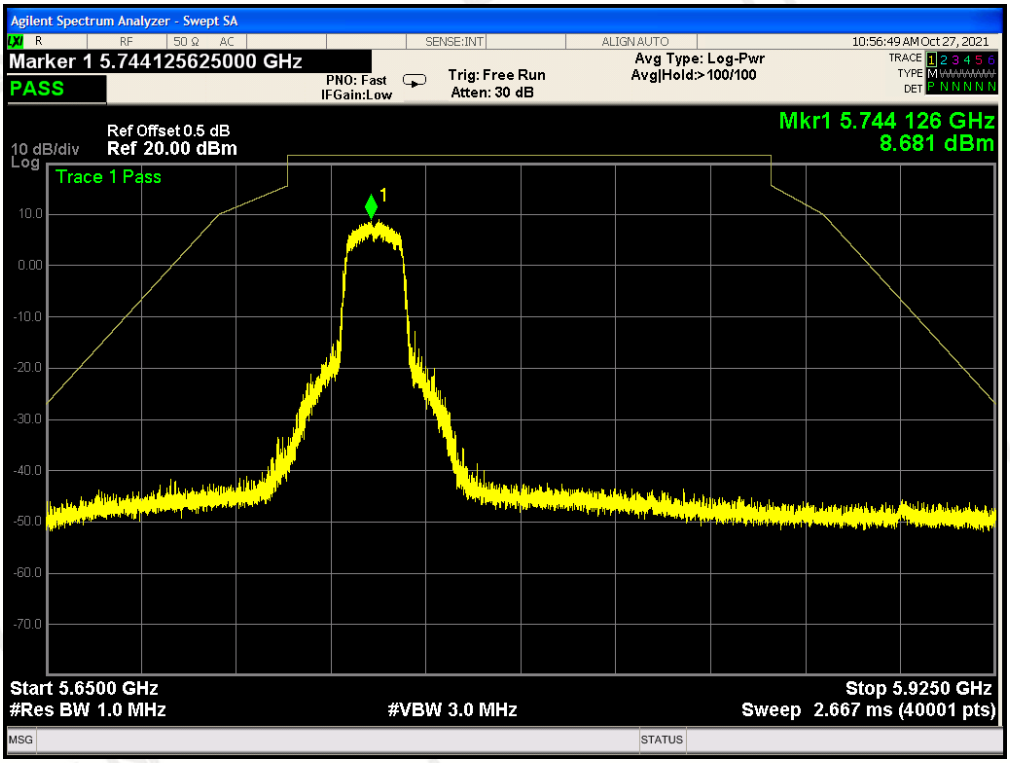

Agilent Spectrum Analyzer - Swept SA
Marker 1 26.433540000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 41/100
10:54:45 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 26.433 54 GHz
-33.467 dBm
-27.00 dBm
Start 5.40 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 56.00 ms (40001 pts)

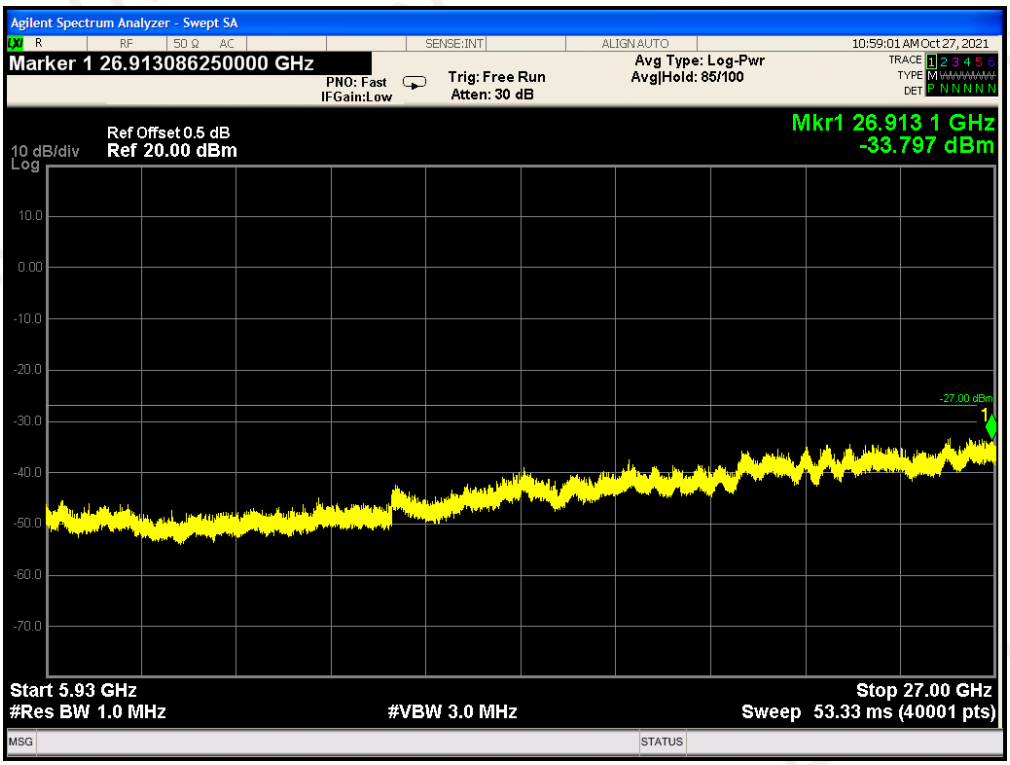

Agilent Spectrum Analyzer - Swept SA
Marker 1 39.408825000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:22:31 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 39.408 825 GHz
-38.305 dBm
-27.00 dBm
Start 27.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.000 GHz
Sweep 34.67 ms (40001 pts)

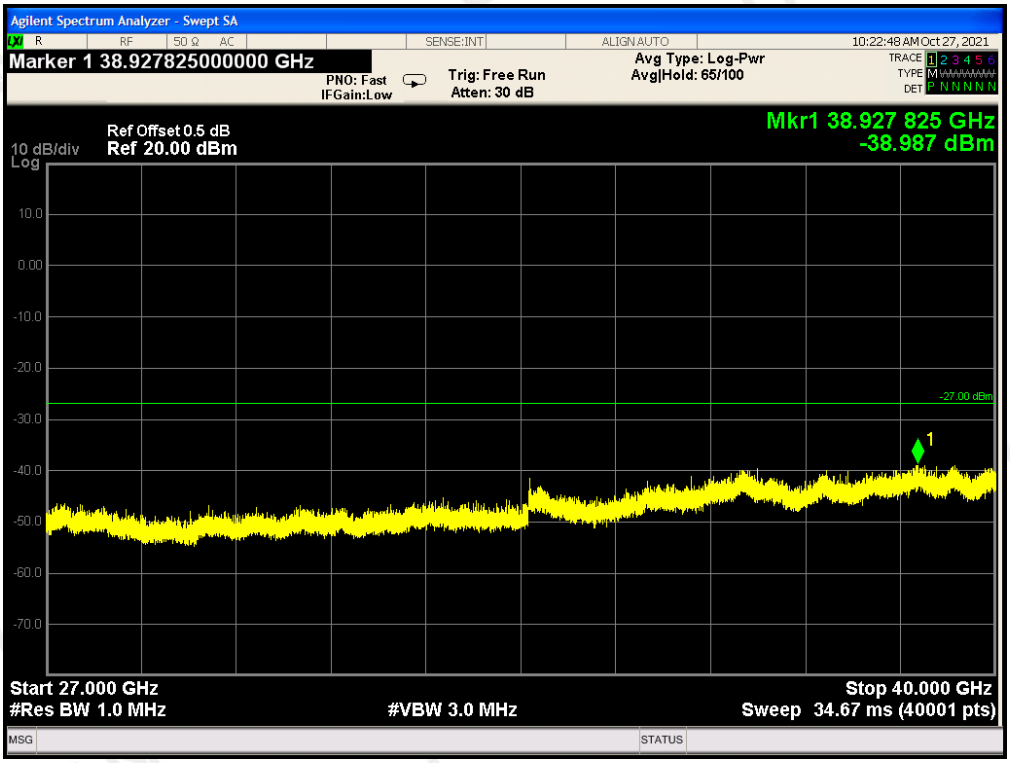
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5745MHz



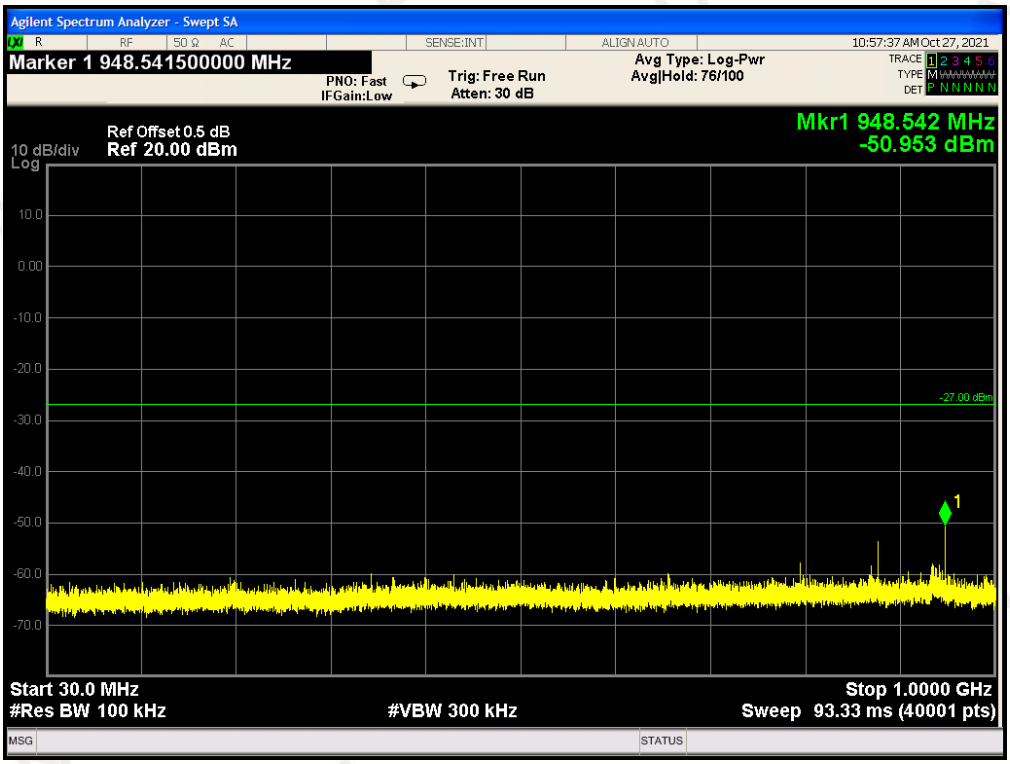


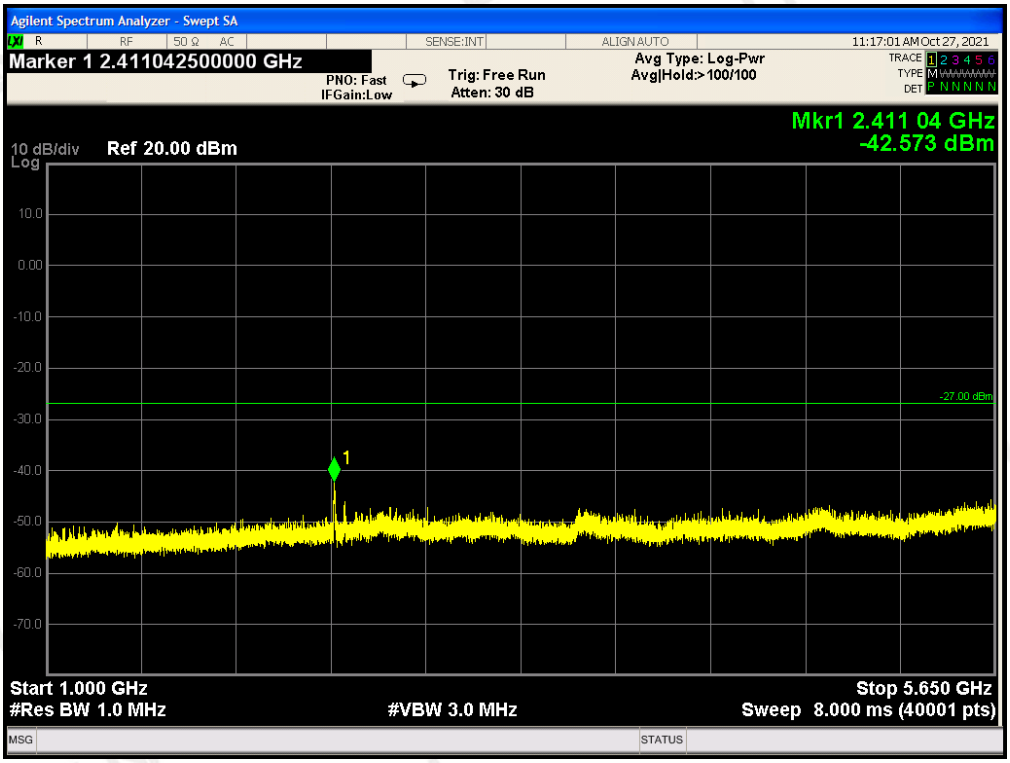

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.744125625000 GHz
PASS
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:56:49 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.744 126 GHz
8.681 dBm
Trace 1 Pass
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40001 pts)

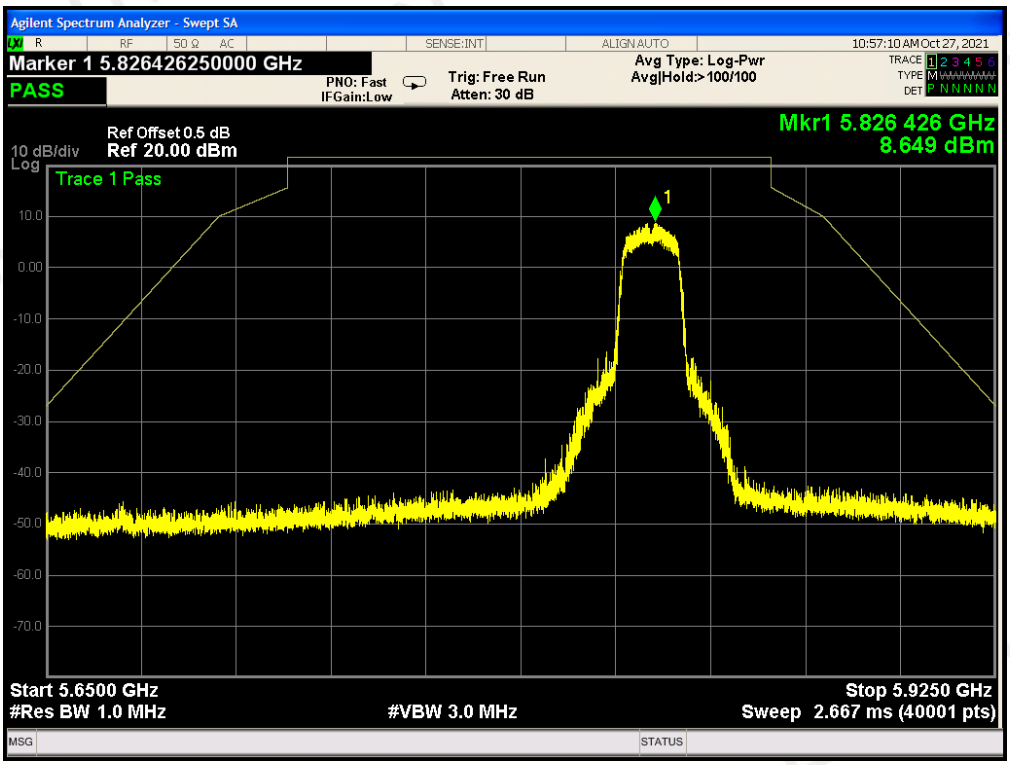

Agilent Spectrum Analyzer - Swept SA
Marker 1 26.913086250000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 85/100
10:59:01 AM Oct 27, 2021
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 26.913 1 GHz
-33.797 dBm
-27.00 dBm
Start 5.93 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 27.00 GHz
Sweep 53.33 ms (40001 pts)

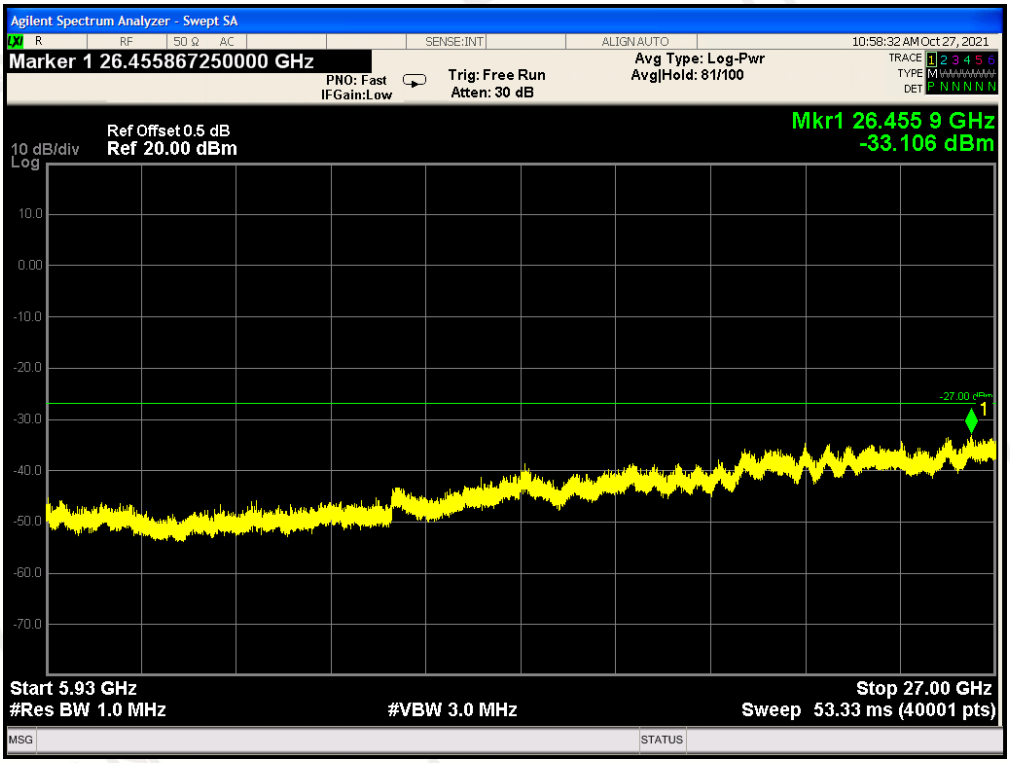


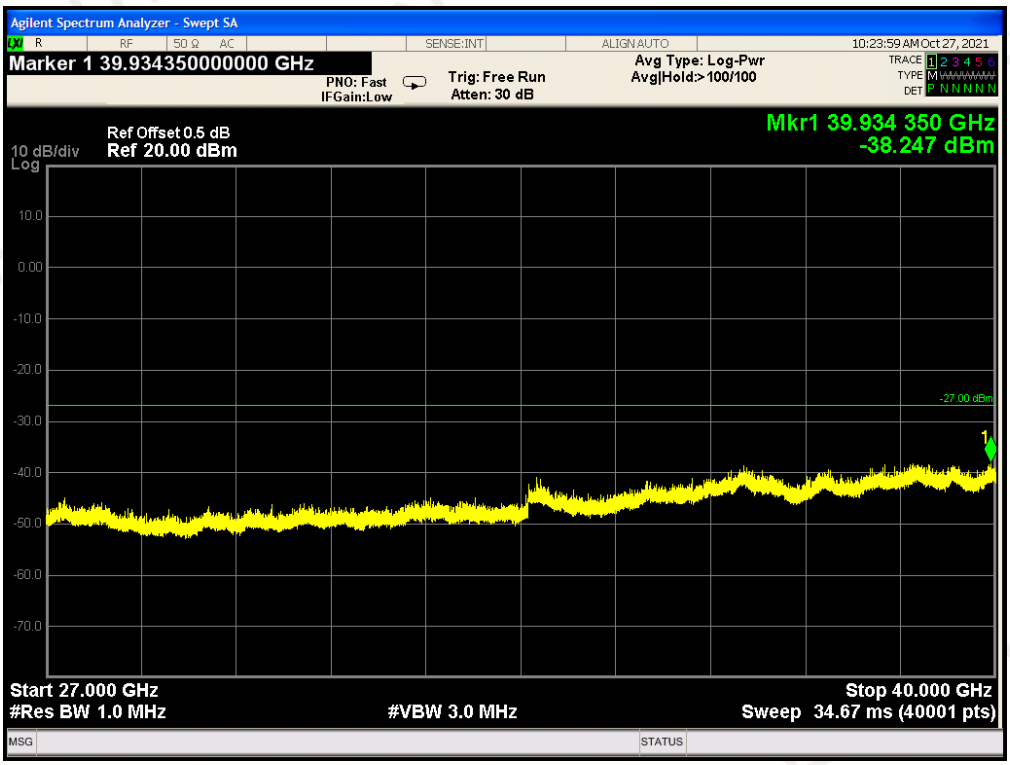
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5825MHz




Agilent Spectrum Analyzer - Swept SA
Marker 1 2.411042500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
11:17:01 AM Oct 27, 2021
Mkr1 2.411 04 GHz
-42.573 dBm
10 dB/div
Log
Ref 20.00 dBm
-27.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.650 GHz
Sweep 8.000 ms (40001 pts)


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.826426250000 GHz
PASS
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:57:10 AM Oct 27, 2021
Mkr1 5.826 426 GHz
8.649 dBm
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Trace 1 Pass
Start 5.6500 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.9250 GHz
Sweep 2.667 ms (40001 pts)





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

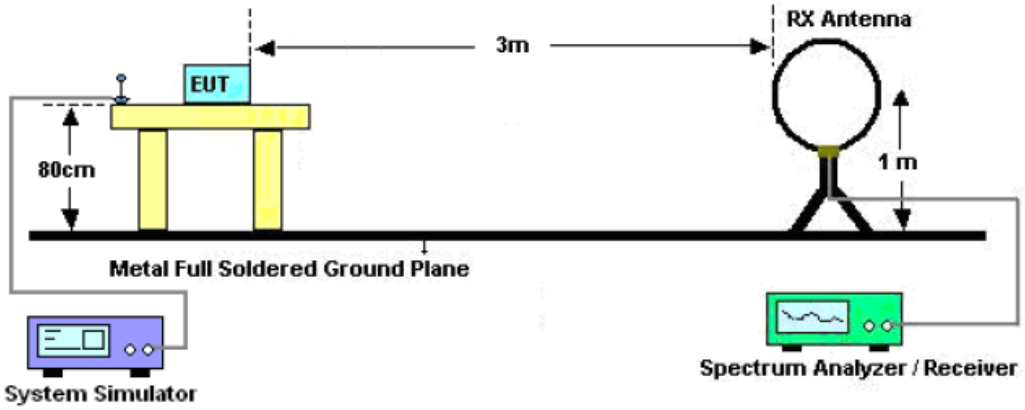
12. RADIATED EMISSION

12.1. MEASUREMENT PROCEDURE

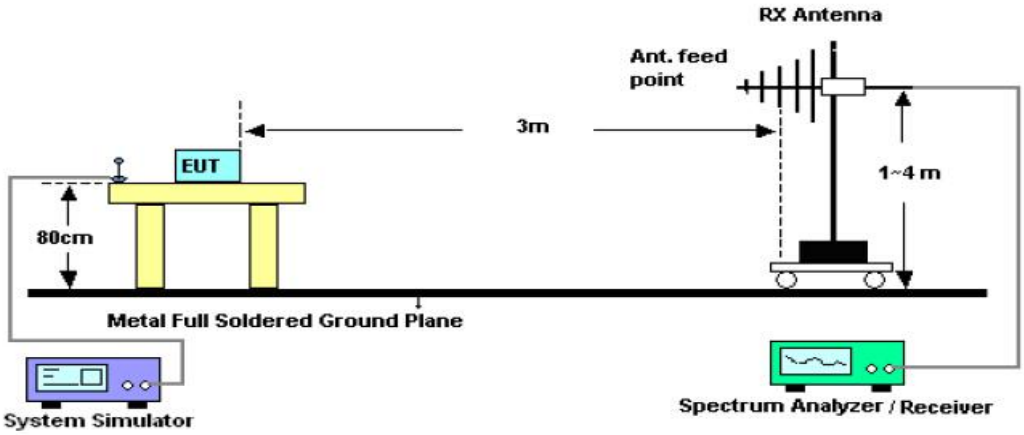
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated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

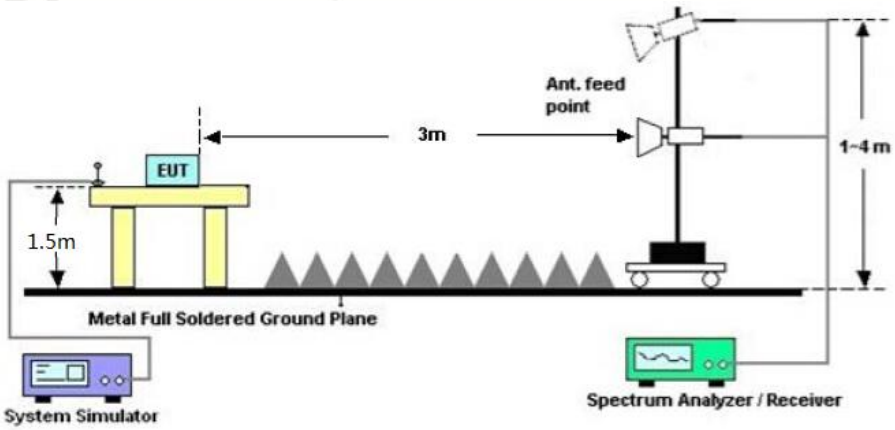
Radiated Emission Test-Setup Frequency Below 30MHz



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.

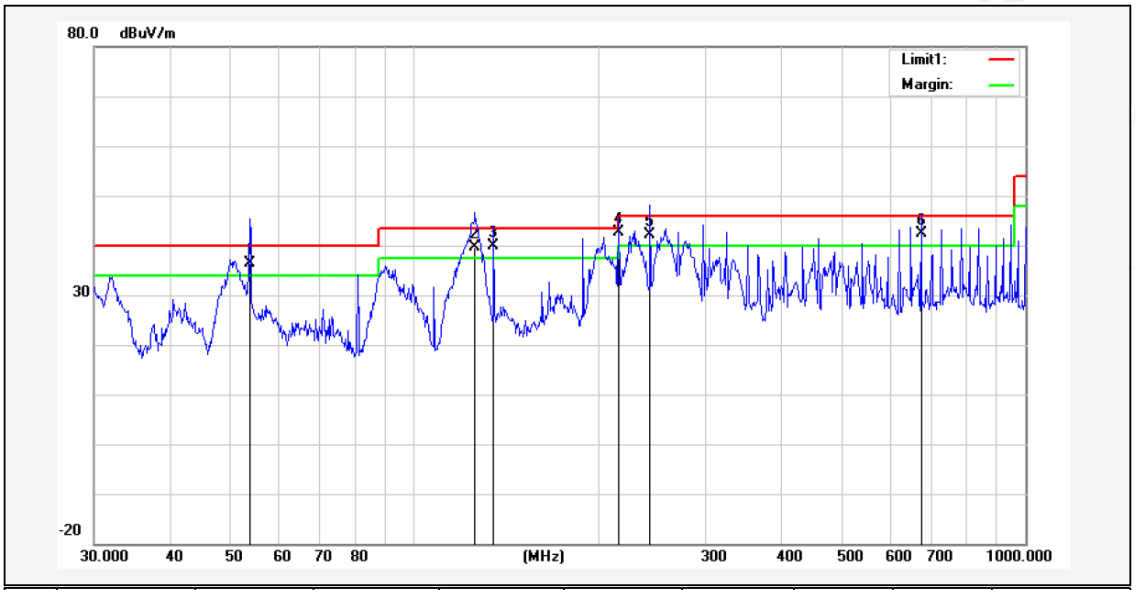
12.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

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

RADIATED EMISSION BELOW 1GHZ

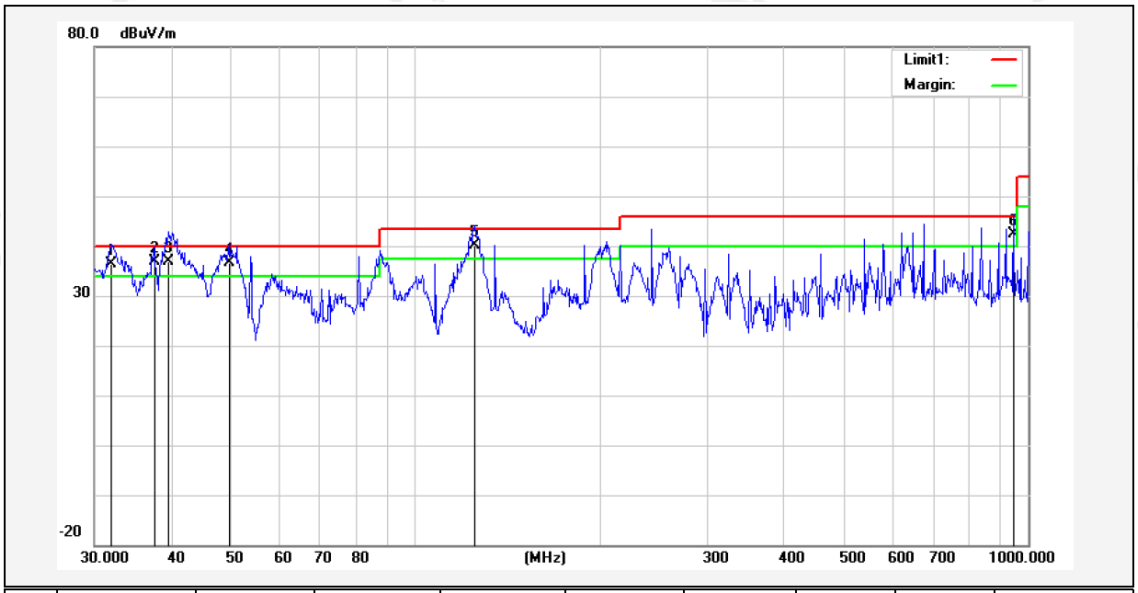
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 15, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1!	53.8818	57.25	-20.92	36.33	40.00	-3.67	70	100	QP
2!	125.8864	55.80	-16.12	39.68	43.50	-3.82	120	100	QP
3!	135.0320	55.88	-16.01	39.87	43.50	-3.63	150	100	QP
4*	216.0240	59.91	-17.28	42.63	46.00	-3.37	180	100	QP
5!	243.3772	58.99	-16.79	42.20	46.00	-3.80	200	100	QP
6!	675.2080	51.14	-8.70	42.44	46.00	-3.56	220	100	QP

RESULT: PASS

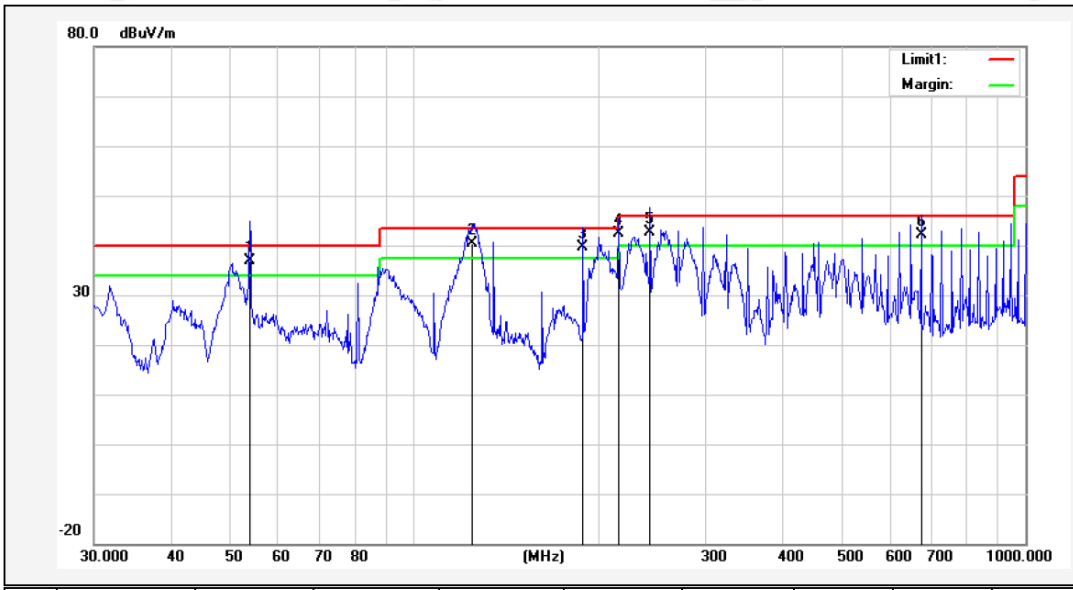
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 15, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1!	31.9546	47.38	-10.94	36.44	40.00	-3.56	80	100	QP
2*	37.5479	55.43	-18.47	36.96	40.00	-3.04	100	100	QP
3!	39.5757	53.74	-16.80	36.94	40.00	-3.06	120	100	QP
4!	49.7068	56.28	-19.69	36.59	40.00	-3.41	130	100	QP
5!	125.0066	55.23	-15.05	40.18	43.50	-3.32	180	100	QP
6!	945.4399	44.11	-1.74	42.37	46.00	-3.63	200	100	QP

RESULT: PASS

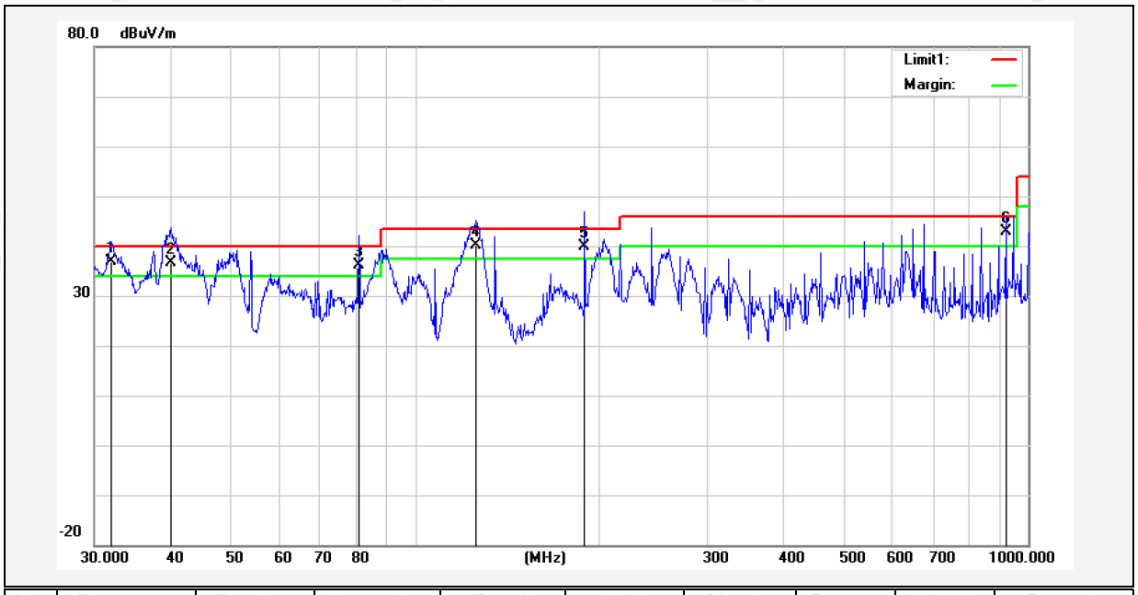
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 15, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 802.11a20 5745MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	53.8818	57.19	-20.23	36.96	40.00	-3.04	50	100	QP
2!	124.5690	55.47	-15.06	40.41	43.50	-3.09	70	100	QP
3!	189.0743	55.81	-16.26	39.55	43.50	-3.95	100	100	QP
4!	216.0240	58.15	-15.76	42.39	46.00	-3.61	120	100	QP
5!	243.3772	57.80	-15.16	42.64	46.00	-3.36	150	100	QP
6!	675.2080	47.99	-5.83	42.16	46.00	-3.84	180	100	QP

RESULT: PASS

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 15, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 802.11a20 5745MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	31.9546	47.87	-10.94	36.93	40.00	-3.07	70	100	QP
2!	39.9942	51.68	-15.07	36.61	40.00	-3.39	90	100	QP
3!	80.9275	56.03	-19.91	36.12	40.00	-3.88	110	100	QP
4!	125.8864	55.02	-15.01	40.01	43.50	-3.49	150	100	QP
5!	189.0743	56.14	-16.26	39.88	43.50	-3.62	180	100	QP
6!	919.2866	44.58	-1.65	42.93	46.00	-3.07	200	100	QP

RESULT: PASS

Note: All test channels had been tested. The 802.11a20 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.

Above 1 GHz Test Results:

802.11a20 5180MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10360	38.38	9.14	47.52	68.2	-20.68	PK
15540	45.22	10.22	55.44	74	-18.56	PK
15540	34.60	10.22	44.82	54	-9.18	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10360	38.86	9.14	48.00	68.2	-20.20	PK
15540	45.90	10.22	56.12	74	-17.88	PK
15540	35.11	10.22	45.33	54	-8.67	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

802.11a20 5200MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10400	38.15	9.14	47.29	68.2	-20.91	PK
15600	44.69	10.22	54.91	74	-19.09	PK
15600	34.55	10.22	44.77	54	-9.23	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10400	38.60	9.14	47.74	68.2	-20.46	PK
15600	45.05	10.22	55.27	74	-18.73	PK
15600	34.97	10.22	45.19	54	-8.81	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

802.11a20 5240MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10480	37.77	9.27	47.04	68.2	-21.16	PK
15720	45.62	10.38	56.00	74	-18.00	PK
15720	34.24	10.38	44.62	54	-9.38	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
10480	38.24	9.27	47.51	68.2	-20.69	PK
15720	46.06	10.38	56.44	74	-17.56	PK
15720	34.62	10.38	45.00	54	-9.00	AV
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

802.11a20 5745MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11490	43.26	9.42	52.68	74	-21.32	PK
11490	34.50	9.42	43.92	54	-10.08	AV
17235	38.63	10.51	49.14	68.2	-19.06	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11490	43.22	9.42	52.64	74	-21.36	PK
11490	34.56	9.42	43.98	54	-10.02	AV
17235	38.87	10.51	49.38	68.2	-18.82	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

802.11a20 5785MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11570	43.35	9.42	52.77	74	-21.23	PK
11570	35.39	9.42	44.81	54	-9.19	AV
17355	38.11	10.51	48.62	68.2	-19.58	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11570	43.96	9.42	53.38	74	-20.62	PK
11570	34.76	9.42	44.18	54	-9.82	AV
17355	38.56	10.51	49.07	68.2	-19.13	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

802.11a20 5825MHz:

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11650	43.45	9.62	53.07	74	-20.93	PK
11650	33.60	9.62	43.22	54	-10.78	AV
17475	38.25	10.75	49.00	68.2	-19.20	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
11650	43.88	9.62	53.50	74	-20.50	PK
11650	34.15	9.62	43.77	54	-10.23	AV
17475	38.67	10.75	49.42	68.2	-18.78	PK
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Margin = Absolute Level – Limit						

Note: All test channels had been tested. The 802.11a20 is the worst case and recorded in the test report. Other frequencies radiation emission from 1 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.

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

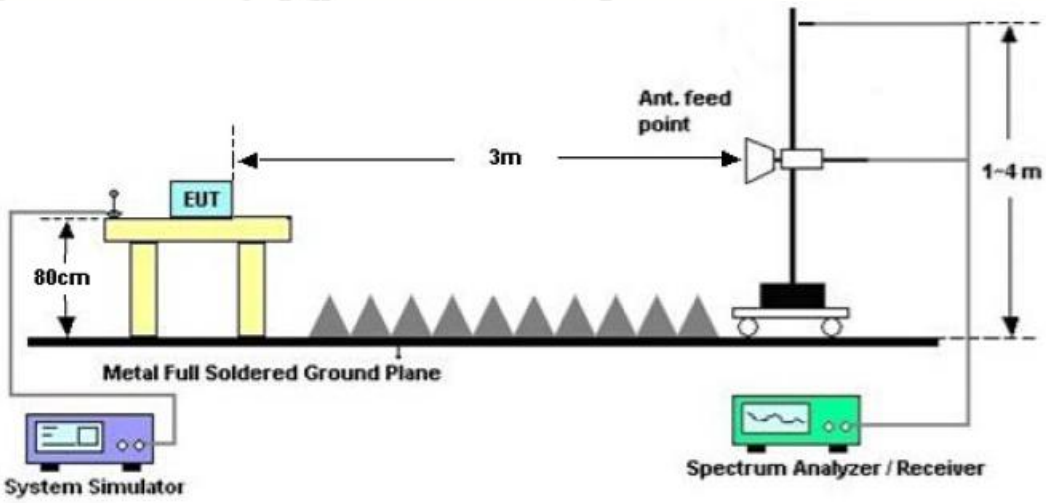
(b) AVERAGE: RBW=1MHz ; VBW=3MHz/ Sweep=AUTO

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 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.

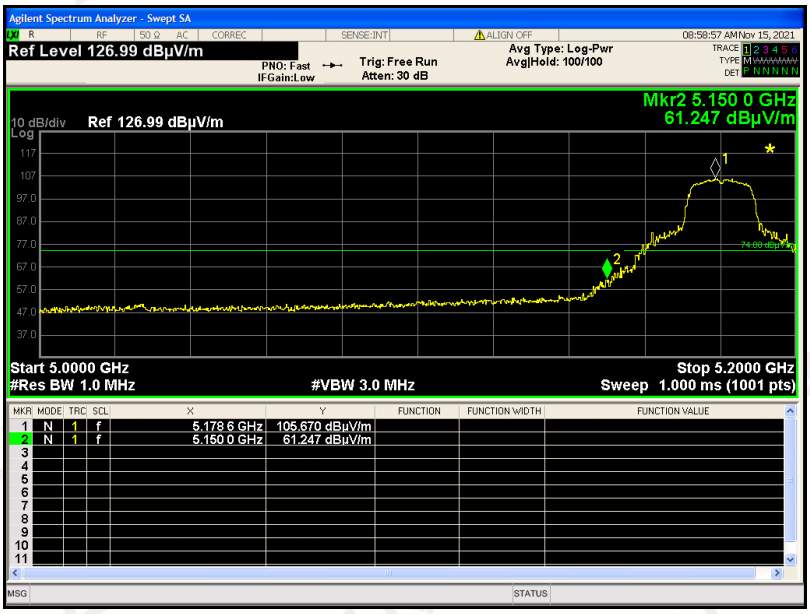
13.2. TEST SET-UP



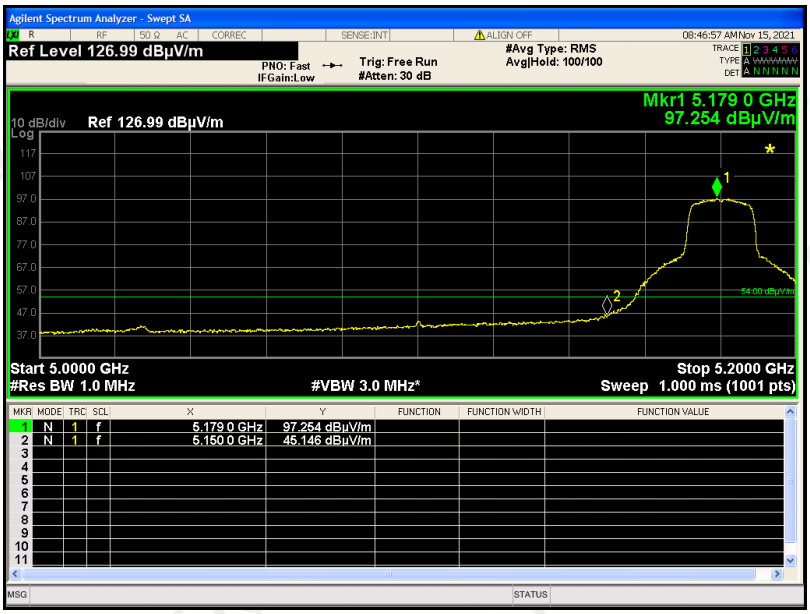
13.3. TEST RESULT

EUT	Bird Bar	Model Name	BRDB01
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Horizontal

PK Value

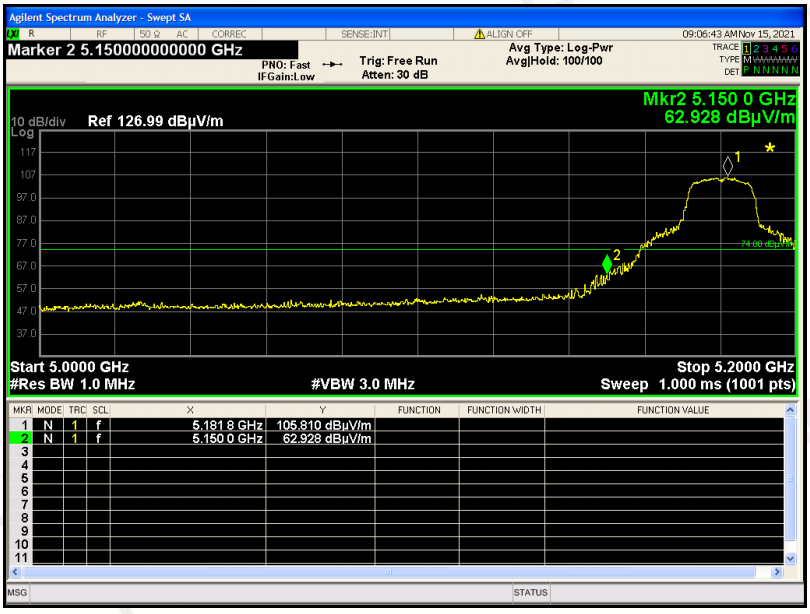


AV Value

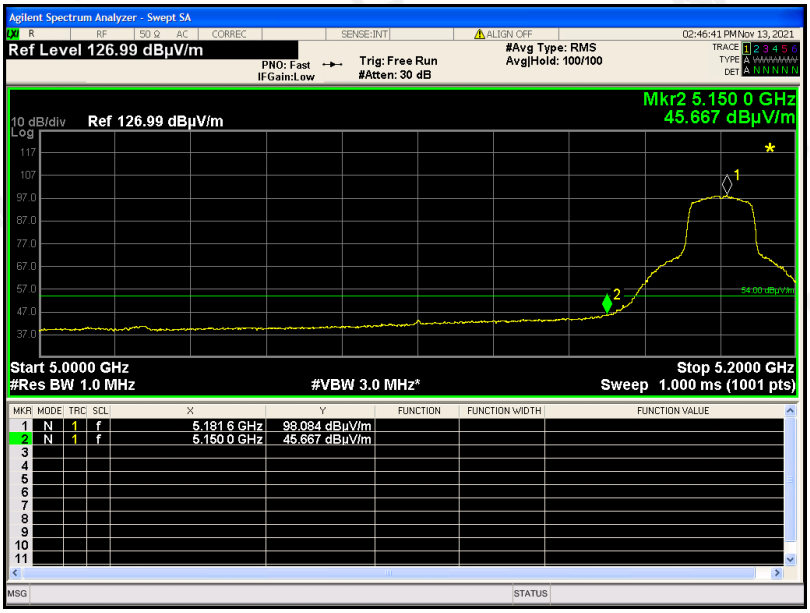


EUT	Bird Bar	Model Name	BRDB01
Temperature	25℃	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11a20 5180MHz	Antenna	Vertical

PK Value



AV Value



RESULT: PASS

Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 at 5180MHz was the worst case and record in his test report.

14. FCC LINE CONDUCTED EMISSION TEST

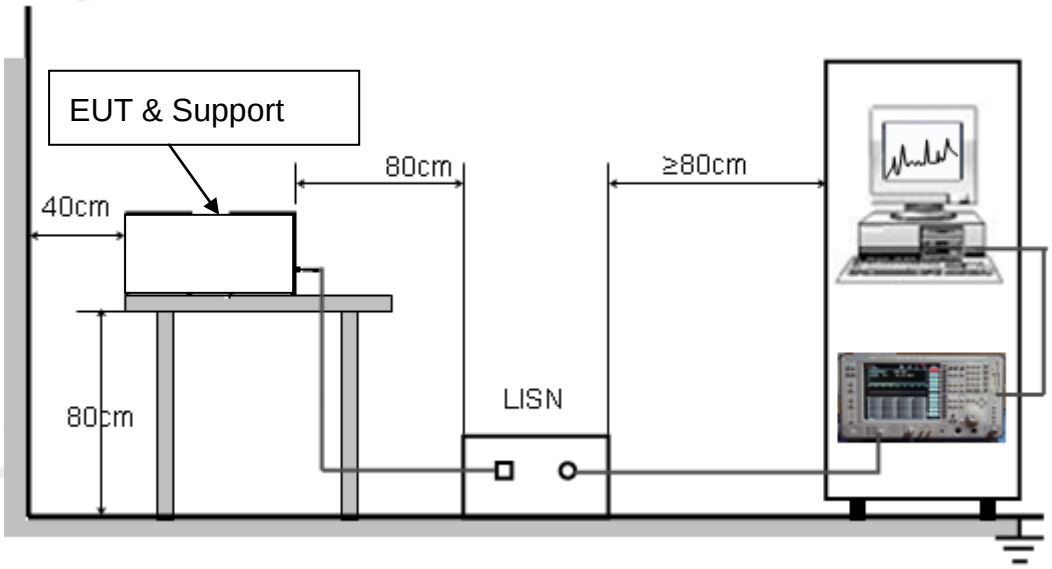
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

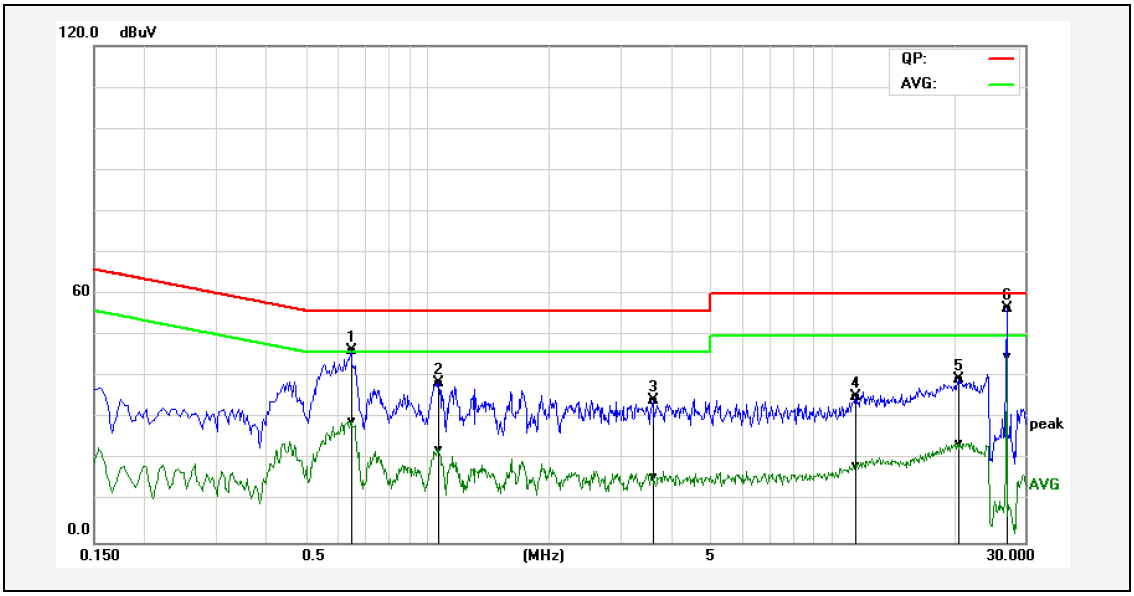
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

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.

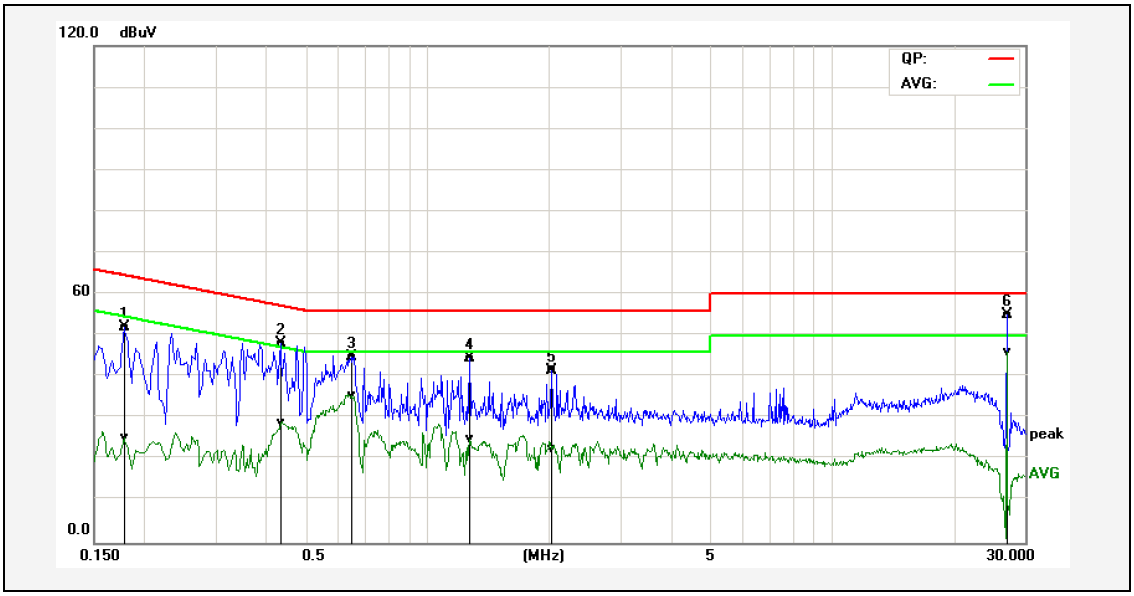
14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 13, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.6500	36.64	19.59	9.80	46.44	29.39	56.00	46.00	-9.56	-16.61	Pass
2P	1.0660	28.68	12.55	9.85	38.53	22.40	56.00	46.00	-17.47	-23.60	Pass
3P	3.6100	24.34	5.73	9.92	34.26	15.65	56.00	46.00	-21.74	-30.35	Pass
4P	11.4740	25.27	8.47	9.95	35.22	18.42	60.00	50.00	-24.78	-31.58	Pass
5P	20.5980	29.19	13.61	10.33	39.52	23.94	60.00	50.00	-20.48	-26.06	Pass
6*	26.9980	46.03	34.28	10.57	56.60	44.85	60.00	50.00	-3.40	-5.15	Pass

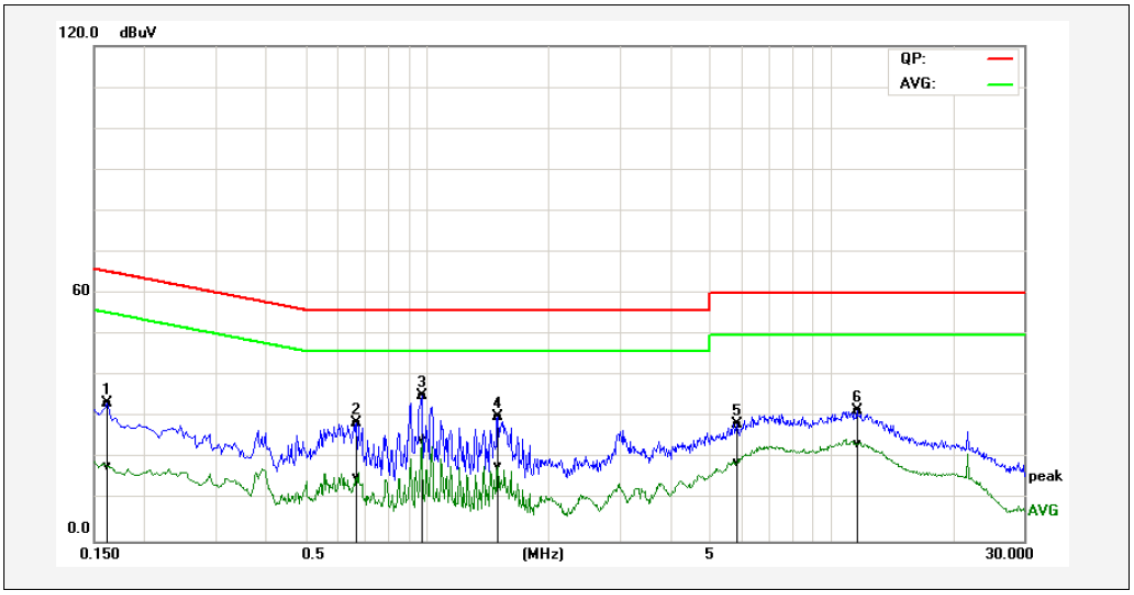
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 13, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1P	0.1780	42.30	15.59	9.69	51.99	25.28	64.58	54.58	-12.59	-29.30	Pass
2P	0.4340	38.33	19.05	9.81	48.14	28.86	57.18	47.18	-9.04	-18.32	Pass
3P	0.6500	35.11	25.75	9.80	44.91	35.55	56.00	46.00	-11.09	-10.45	Pass
4P	1.2740	34.69	15.14	9.84	44.53	24.98	56.00	46.00	-11.47	-21.02	Pass
5P	2.0260	31.82	12.76	9.88	41.70	22.64	56.00	46.00	-14.30	-23.36	Pass
6*	27.0020	44.37	35.59	10.57	54.94	46.16	60.00	50.00	-5.06	-3.84	Pass

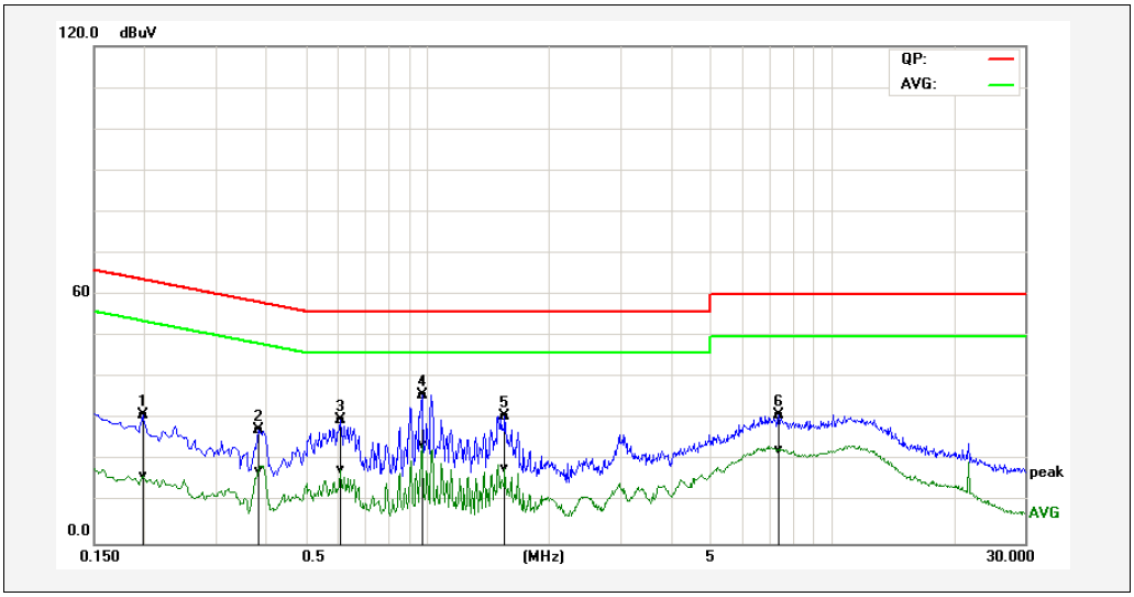
RESULT: PASS

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 13, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of 802.11a20 5745MHz		



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1620	23.35	7.90	10.13	33.48	18.03	65.36	55.36	-31.88	-37.33	Pass
2P	0.6700	18.42	5.31	10.09	28.51	15.40	56.00	46.00	-27.49	-30.60	Pass
3*	0.9700	25.17	14.19	10.12	35.29	24.31	56.00	46.00	-20.71	-21.69	Pass
4P	1.4980	19.92	8.12	10.10	30.02	18.22	56.00	46.00	-25.98	-27.78	Pass
5P	5.8540	18.24	8.86	10.20	28.44	19.06	60.00	50.00	-31.56	-30.94	Pass
6P	11.6060	21.39	13.49	10.18	31.57	23.67	60.00	50.00	-28.43	-26.33	Pass

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Nov. 13, 2021	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of 802.11a20 5745MHz		



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1P	0.1980	20.83	6.33	10.14	30.97	16.47	63.69	53.69	-32.72	-37.22	Pass
2P	0.3820	17.28	7.58	10.10	27.38	17.68	58.24	48.24	-30.86	-30.56	Pass
3P	0.6100	19.74	7.80	10.08	29.82	17.88	56.00	46.00	-26.18	-28.12	Pass
4*	0.9700	25.83	13.81	10.12	35.95	23.93	56.00	46.00	-20.05	-22.07	Pass
5P	1.5580	20.63	8.10	10.11	30.74	18.21	56.00	46.00	-25.26	-27.79	Pass
6P	7.3700	20.75	12.38	10.18	30.93	22.56	60.00	50.00	-29.07	-27.44	Pass

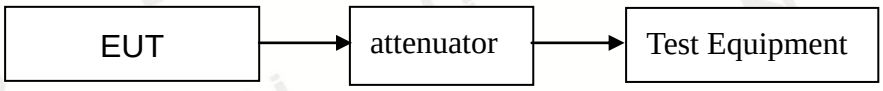
RESULT: PASS

15. Frequency Stability

15.1. TEST LIMIT

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

15.2. BLOCK DIAGRAM OF SETUP



15.3 Test Procedure

Determining compliance with the peak excursion requirement shall be done by confirming that the ratio of the maximum of the peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission does not exceed the regulatory requirement. The procedure for this method is as follows:

a) The following guidance for limiting the number of tests applies only to peak excursion measurements:

1) Testing each modulation mode on a single channel in a single operating band is sufficient to determine compliance with the peak excursion requirement. (If all modulation modes are not available on a single channel in a single band, then testing must be extended to other channels and bands as needed to ensure that all modulation modes are tested.)

2) Tests must include all variations in signal structure, such as:

i) All signal types [e.g., direct sequence spread spectrum (DSSS) and OFDM].

ii) All modulation types [e.g., binary phase-shift keying (BPSK), quadrature phase-shift keying (QPSK), 16-QAM, 64-QAM, and 256-QAM].

iii) All bandwidth modes.

iv) All variations in signal parameters (e.g., changes in subcarrier spacing or number of subcarriers).

3) For a given signal structure, testing of multiple error-correction coding rates is not

required (e.g., 1/2, 2/3, and 3/4).

4) For MIMO devices, testing of a single output port is sufficient to determine compliance with the peak excursion requirement. If a given signal structure can be exercised with various combinations of spatial multiplexing (such as different numbers of spatial streams), beam forming, and cyclic delay diversity, peak excursion tests are not required to include those variations.

b) The procedure is as follows:

1) Set the span of the spectrum analyzer or EMI receiver to view the entire emission bandwidth or occupied bandwidth.

2) Find the maximum of the peak-max-hold spectrum:

i) Set RBW = 1 MHz.

ii) VBW = 3 MHz.

iii) Detector = peak.

iv) Trace mode = max-hold.

v) Allow the sweeps to continue until the trace stabilizes.

vi) Use the peak search function to find the peak of the spectrum.

3) Use the procedure found in 12.5 to measure the PPSD.

4) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

15.4 Deviation From Test Standard

No deviation

15.5. TEST RESULT

801.11a U-NII-1: 5180 MHz

Voltage vs. Frequency Stability	
Voltage (V)	**Measurement Frequency (MHz)**
4.5	5180.0200
5	5180.0400
5.5	5180.0200
Limit Range (MHz)	5150-5250
Result	PASS
Temperature vs. Frequency Stability	
Temperature (℃)	**Measurement Frequency (MHz)**
0	5180.0200
10	5180.0200
20	5180.0100
30	5180.0400
40	5180.0200
50	5180.0200
Limit Range (MHz)	5150-5250
Result	PASS

801.11a U-NII-3: 5745 MHz

Voltage vs. Frequency Stability	
Voltage (V)	**Measurement Frequency (MHz)**
4.5	5745.0100
5	5745.0200
5.5	5745.0300
Limit Range (MHz)	5725-5850
Result	PASS
Temperature vs. Frequency Stability	
Temperature (℃)	**Measurement Frequency (MHz)**
0	5745.0200
10	5745.0400
20	5745.0500
30	5745.0500
40	5745.0200
50	5745.0200
Limit Range (MHz)	5725-5850
Result	PASS

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ

FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ

FCC LINE CONDUCTED EMISSION TEST SETUP

----END OF REPORT----