FCC Test Report

Report No.: AGC12319220502FE06

FCC ID	:	QV7-GC88752-75
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Drone
BRAND NAME	:	N/A
MODEL NAME	:	Please see the page 7.
APPLICANT	:	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
DATE OF ISSUE	:	Jul. 04, 2022
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15.407 KDB 789033 D02 v02r01
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 04, 2022	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China
Manufacturer	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China
Factory	GUANGDONG SYMA MODEL AIRCRAFT INDUSTRIAL CO., LTD
Address	NO.2 WEST XINGYE ROAD LAIMEI INDUSTRIAL AREA CHENGHAI , Shantou, China
Product Designation	Drone
Brand Name	N/A
Test Model	X650
Series Model	Please see the page 7.
Declaration of Difference	Only the color of appearance is different, and others are consistent.
Date of test	May 19, 2022 to Jul. 04, 2022
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By	Alan Duan (Project Engineer)	Jul. 04, 2022
Reviewed By	Calvin Liu (Reviewer)	Jul. 04, 2022
Approved By	Max Zhang (Authorized Officer)	Jul. 04, 2022

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “Drone”. It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Equipment Type	☐ Outdoor access points ☐ Indoor access points ☐ Fixed P2P access points ☒ Client devices
Operation Frequency	☐ U-NII 1:5150MHz~5250MHz ☒ U-NII 2A: 5250MHz~5350MHz ☒ U-NII 2C:5470MHz~5725MHz ☐ U-NII 3: 5725MHz~5850MHz
DFS Design Type	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection
TPC Function	☐ Yes ☒ No
Test Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5250~5350MHz, 5470~5725MHz
Output Power	IEEE 802.11a:12.89dBm; IEEE 802.11n-HT20:12.54dBm;
Output Power_MIMO	IEEE 802.11n(20):15.35dBm
Modulation	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM, OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 400Mbps
Number of channels	7 channels of U-NII 2A Band 21 channels of U-NII 2C Band
Hardware Version	W3RXT
Software Version	iOS system: 1.16 Android system: 22.02.24
Antenna Designation	The brass Antenna (Comply with requirements of the FCC part 15.203)
Number of transmit chain	2(802.a/11n/ac all used two antennas, but 802.11a support SISO and 802.11n/ac support MIMO)
Antenna Gain	Refer to Chapter 2.8 of the report.
Power Supply	DC 7.6V by battery

Test Model	X650
Series Model	X20, X300, X400, X500, X500PRO, X600, X600W, X700, X700W, TF1001, TG1001, X21W, X100, X800, X800W, X200, X200W, X110 , X110W, X220, X220W, X330, X330W, X440, X440W, X550, X550W, X660, X660W, X770, X770W, X880, X880W, X990, X990W, X710W, X720W, X730W, X740W, X750W, X760W, X780W, X790W, X810W, X820W, X830W, X840W, X850W, X860W, X870W, X890W, X900W, X910W, X920W, X930W, X940W, X950W, X960W, X970W, X980W, S100, S107H-E, S39, S37, S40, S50H, S51H, S52H, S53H, S54H, S55H, S56H, S57H, S58H, S59H, S60H, S61H, S62H, S63H, S64H, S65H, Q7, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25

2.2. TABLE OF CARRIER FREQUENCYS

For 5260~5320MHz:

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

For 5500~5720MHz:

12 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: QV7-GC88752-75** filing to comply with the FCC Part 15 requirements.

2.4. 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 KDB 789033 D02

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. 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.

2.8. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna Type	Frequency Band (MHz)	TX Paths	Bandwidth (MHz)	Max Peak Gain (dBi)		Max Directional Gain (dBi)
				Ant 1	Ant 2	
5G WIFI The Brass Antenna List (5GHz 2*2 MIMO)						
The Brass Antenna	5250 ~ 5350	2	20	2	2	5.01
	5470 ~ 5725	2	20	2	2	5.01

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11n mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on devices:

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

- For power measurements on IEEE 802.1devices:

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

  Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any N_{ANT};

  Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20 MHz channel widths with $N_{ANT} \geq 5$.

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

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%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±3.1 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±4.0 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.8 dB
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

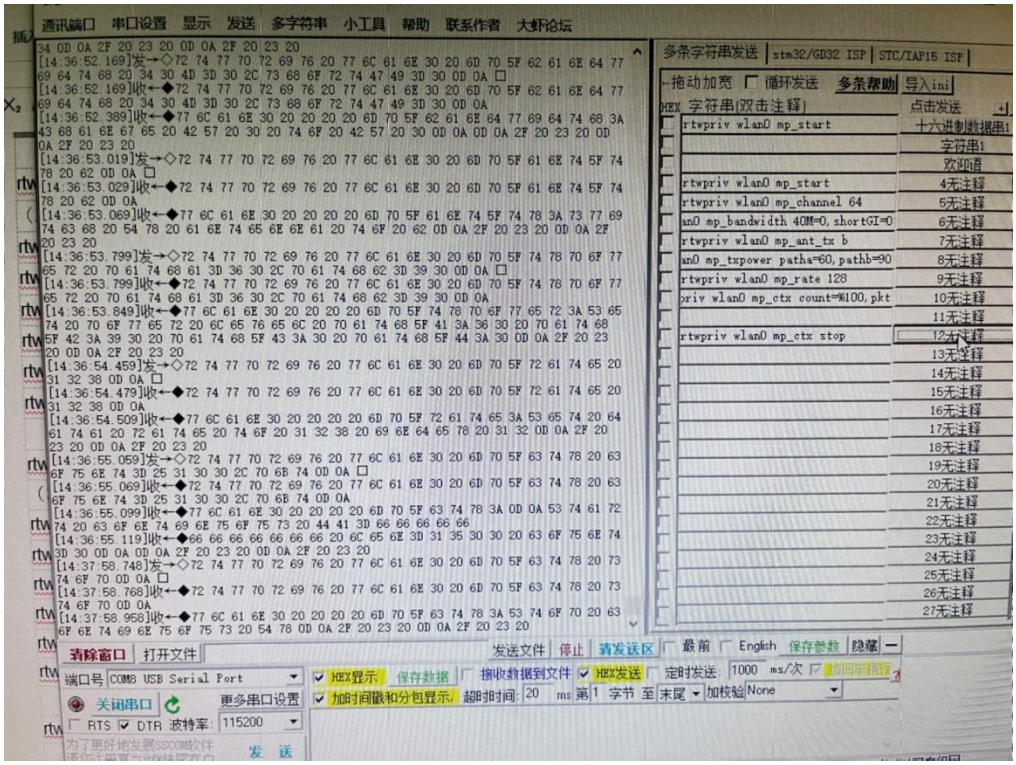
4. DESCRIPTION OF TEST MODES

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.

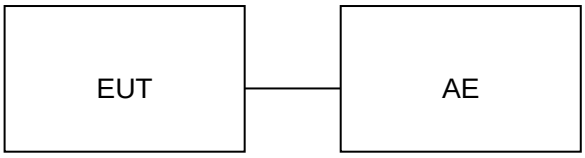
Test software



5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Drone	X650	QV7-GC88752-75	EUT

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	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Mar. 28, 2022	Mar. 27, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023
Test software	R&S	ES-K1 (Ver V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
Power sensor	Aglient	U2021XA	MY54110007	Mar. 04, 2022	Mar. 03, 2023
5GHz Fliter	EM Electronics	5150-5880MHz	N/A	Mar. 22, 2022	Mar. 21, 2024
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 21, 2024
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

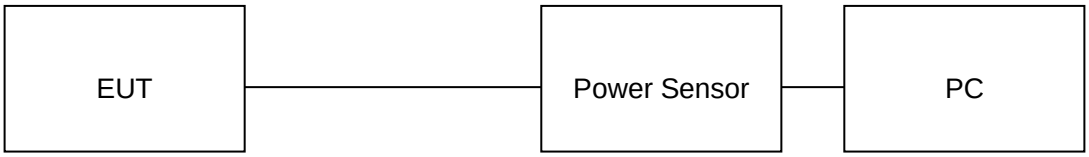
For average power test:

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 KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

7.2. TEST SET-UP

AVERAGE POWER SETUP



7.3. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power for band 5.25-5.35 GHz-antenna 1				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	11.22	23.98	Pass
	5300	10.17	23.98	Pass
	5320	9.44	23.98	Pass
802.11n20	5260	9.46	23.98	Pass
	5300	9.01	23.98	Pass
	5320	8.95	23.98	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz-antenna 2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	10.36	23.98	Pass
	5300	9.55	23.98	Pass
	5320	11.64	23.98	Pass
802.11n20	5260	10.70	23.98	Pass
	5300	10.48	23.98	Pass
	5320	9.82	23.98	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz-antenna 1+2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5260	13.13	23.98	Pass
	5300	12.82	23.98	Pass
	5320	12.42	23.98	Pass

Test Data of Conducted Output Power for band 5.47-5.725 GHz-antenna 1				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5500	12.71	23.98	Pass
	5600	11.31	23.98	Pass
	5700	10.86	23.98	Pass
802.11n20	5500	12.13	23.98	Pass
	5600	11.79	23.98	Pass
	5700	8.50	23.98	Pass

Test Data of Conducted Output Power for band 5.47-5.725 GHz-antenna 2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5500	12.89	23.98	Pass
	5600	11.43	23.98	Pass
	5700	8.97	23.98	Pass
802.11n20	5500	12.54	23.98	Pass
	5600	11.16	23.98	Pass
	5700	8.50	23.98	Pass

Test Data of Conducted Output Power for band 5.47-5.725 GHz-antenna 1+2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5500	15.35	23.98	Pass
	5600	14.50	23.98	Pass
	5700	11.51	23.98	Pass

8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

-6dB bandwidth (DTS bandwidth):

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.

99% occupied bandwidth:

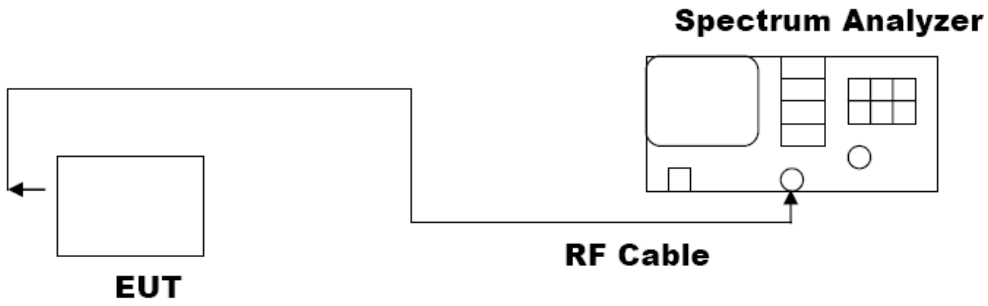
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall 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.

-26dB Bandwidth:

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. 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%.

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

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



8.3. LIMITS AND MEASUREMENT RESULTS

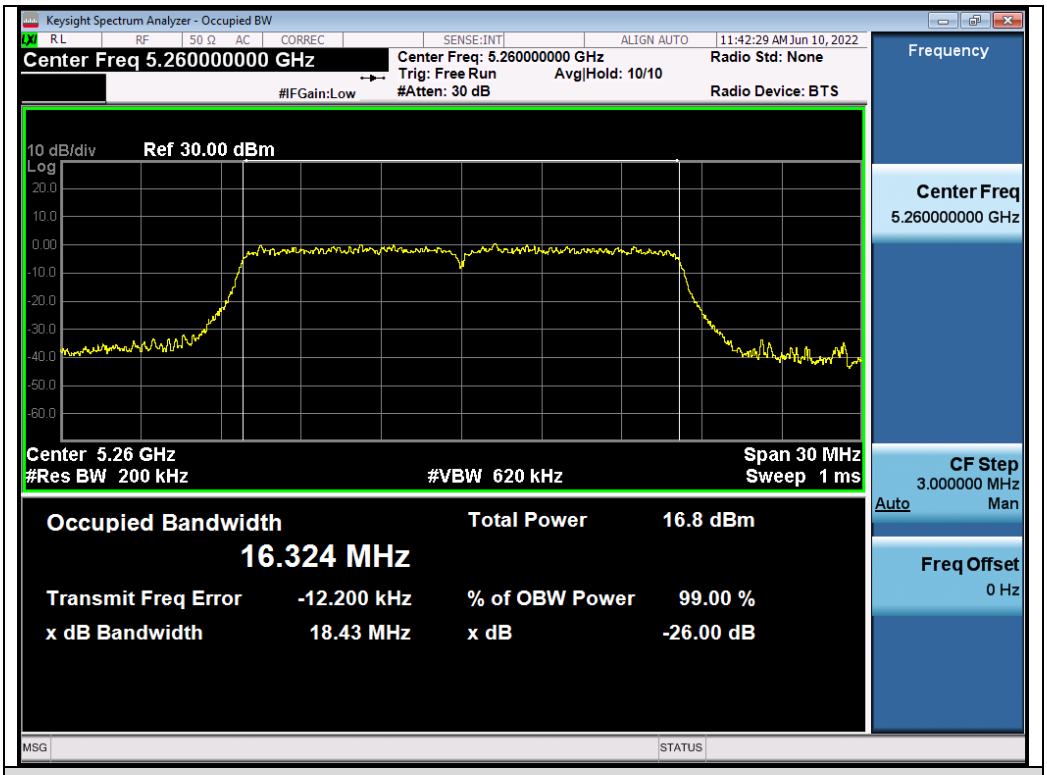
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz-antenna 1				
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Pass or Fail
802.11a	5260	16.324	18.43	Pass
	5300	16.323	18.34	Pass
	5320	16.319	18.46	Pass
802.11n20	5260	17.506	19.34	Pass
	5300	17.517	19.23	Pass
	5320	17.484	19.21	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz-antenna 2				
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Pass or Fail
802.11a	5260	16.330	18.38	Pass
	5300	16.329	18.32	Pass
	5320	16.309	18.32	Pass
802.11n20	5260	17.509	19.32	Pass
	5300	17.493	19.26	Pass
	5320	17.496	19.19	Pass

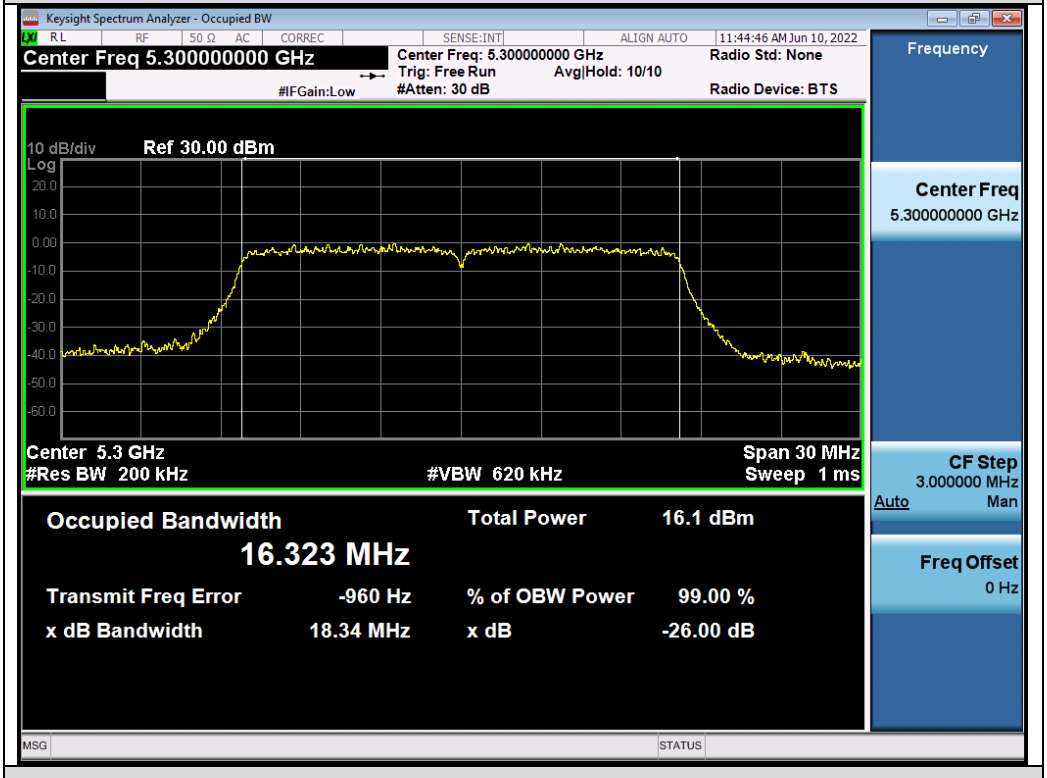
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.47-5.725 GHz-antenna 1				
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Pass or Fail
802.11a	5500	16.330	18.39	Pass
	5600	16.345	18.51	Pass
	5700	16.336	18.41	Pass
802.11n20	5500	17.498	19.28	Pass
	5600	17.499	19.34	Pass
	5700	17.533	19.29	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.47-5.725 GHz-antenna 2				
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Pass or Fail
802.11a	5500	16.317	18.32	Pass
	5600	16.319	18.46	Pass
	5700	16.325	18.34	Pass
802.11n20	5500	17.504	19.35	Pass
	5600	17.509	19.30	Pass
	5700	17.493	19.20	Pass

Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz



Test_Graph_802.11a_ANT1_5260_6Mbps_OBW



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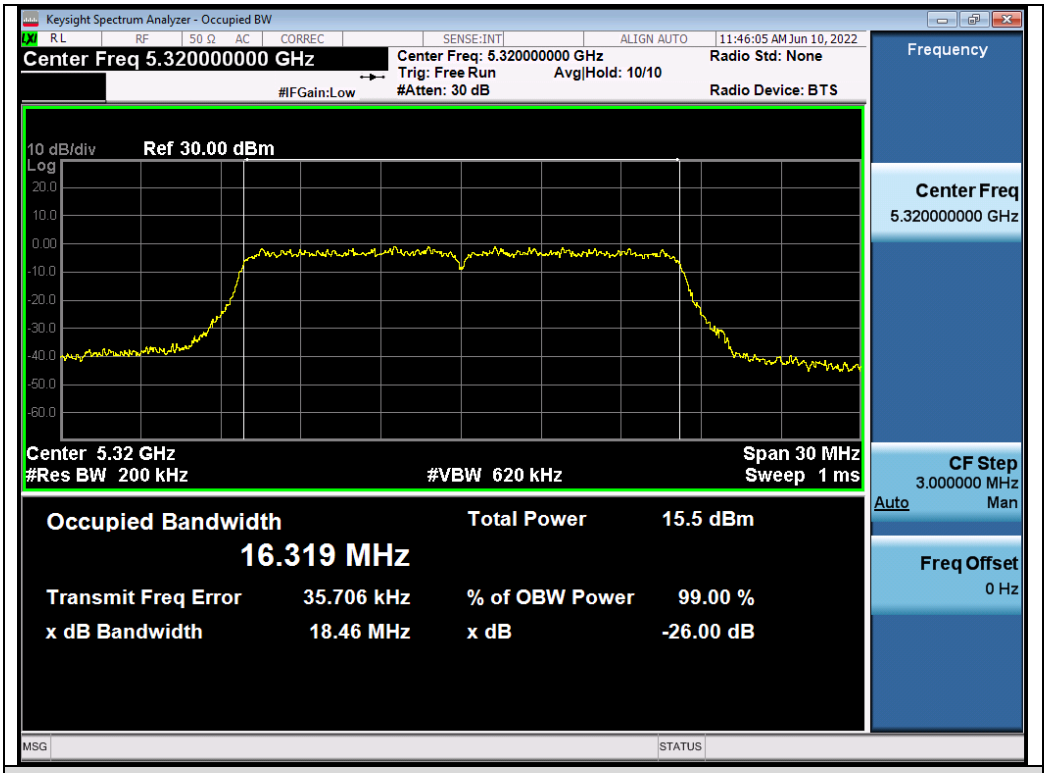

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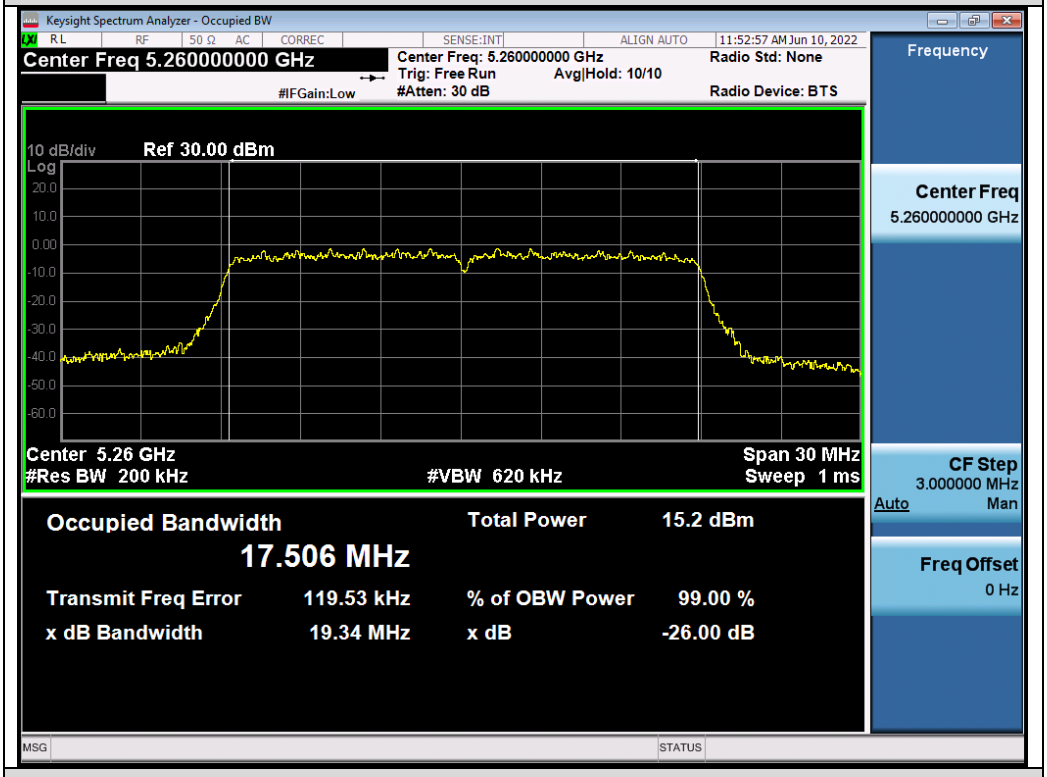

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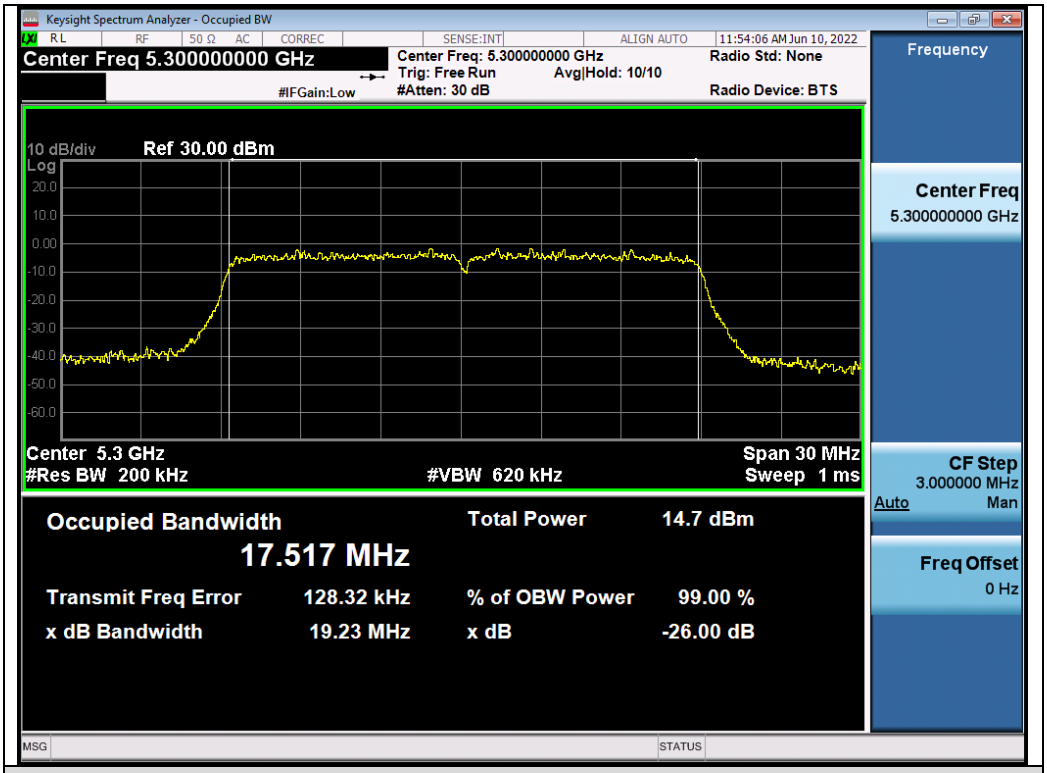

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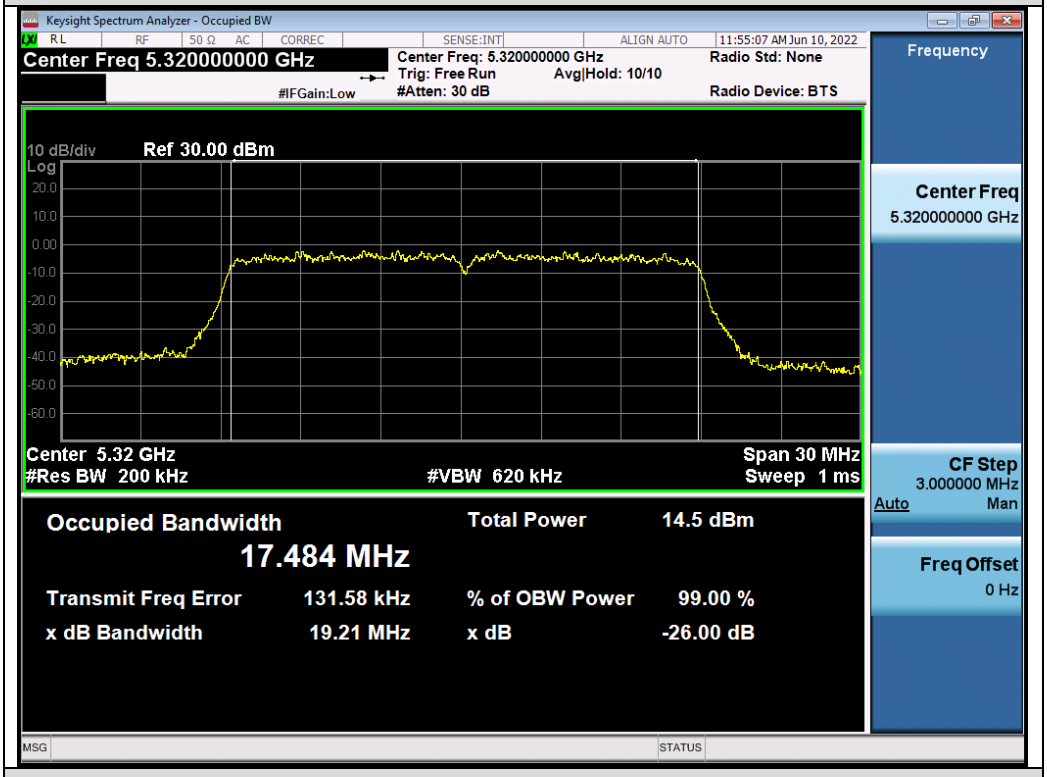

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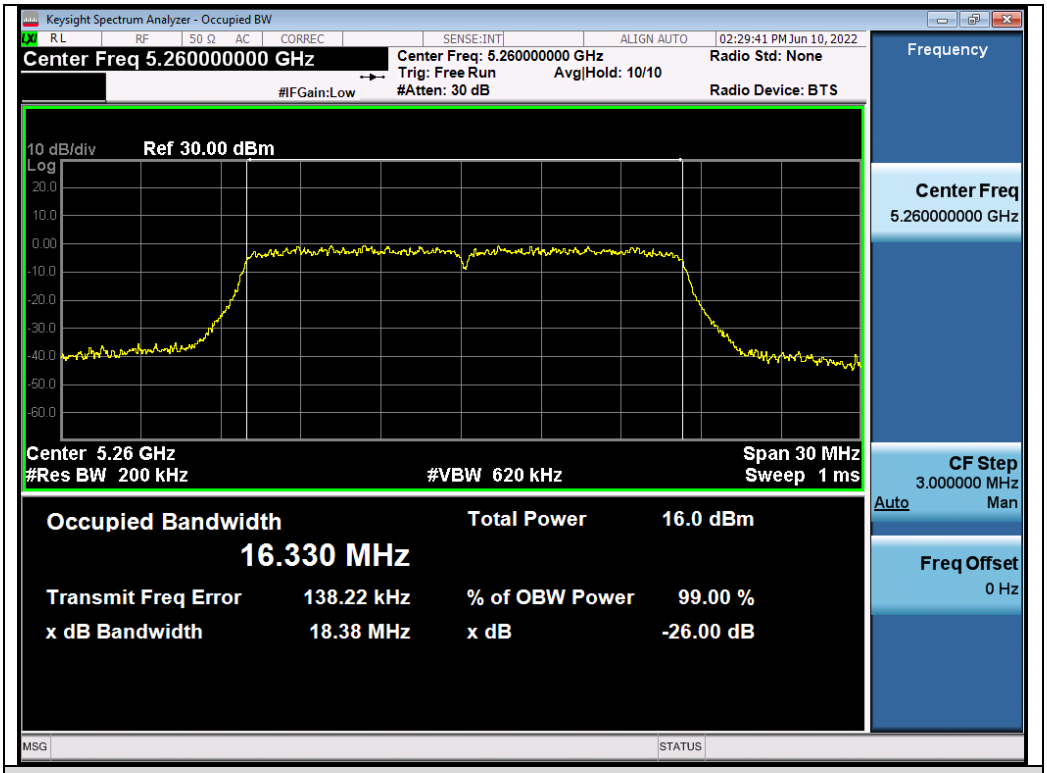

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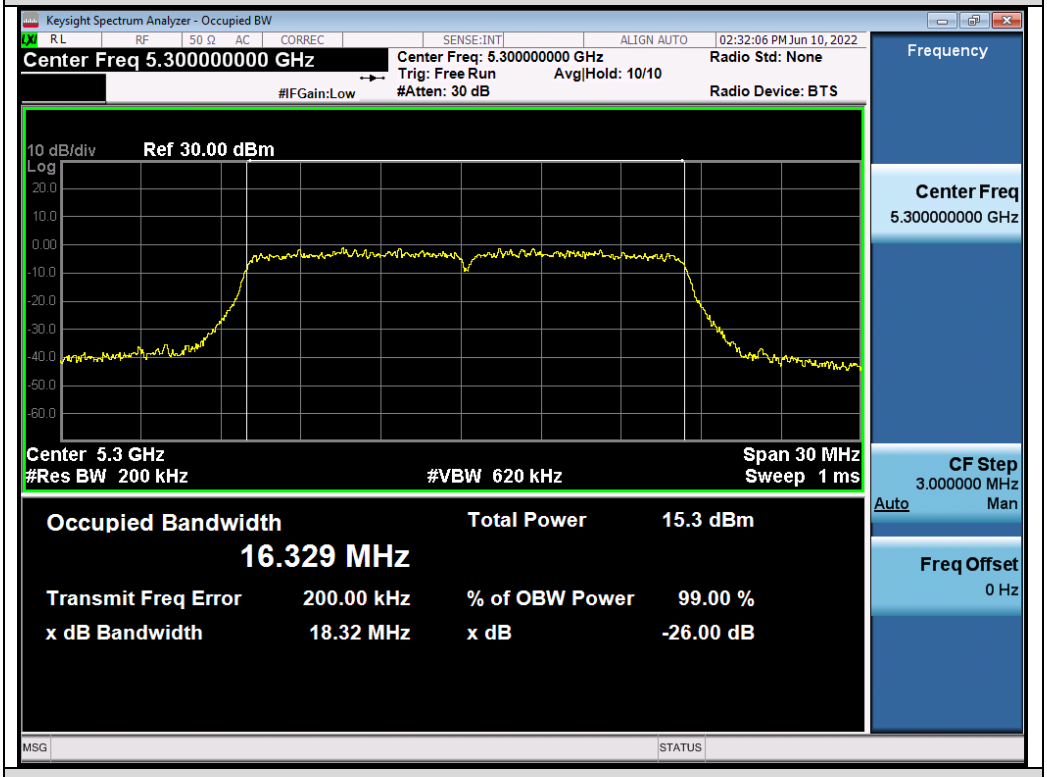

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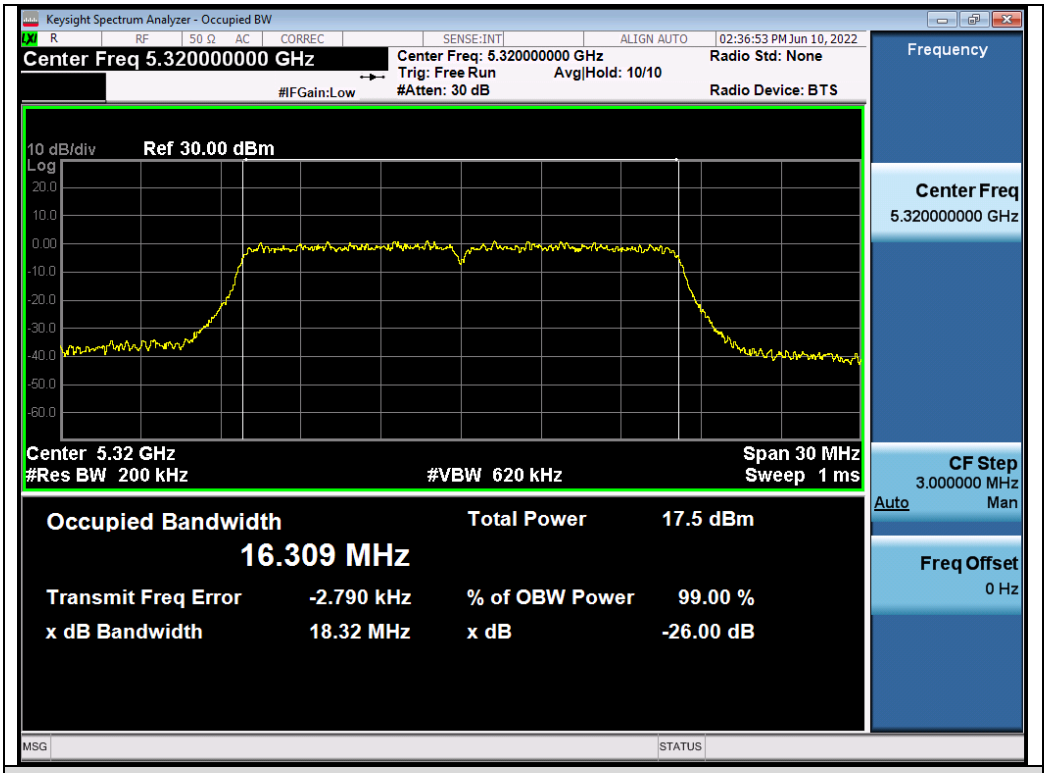

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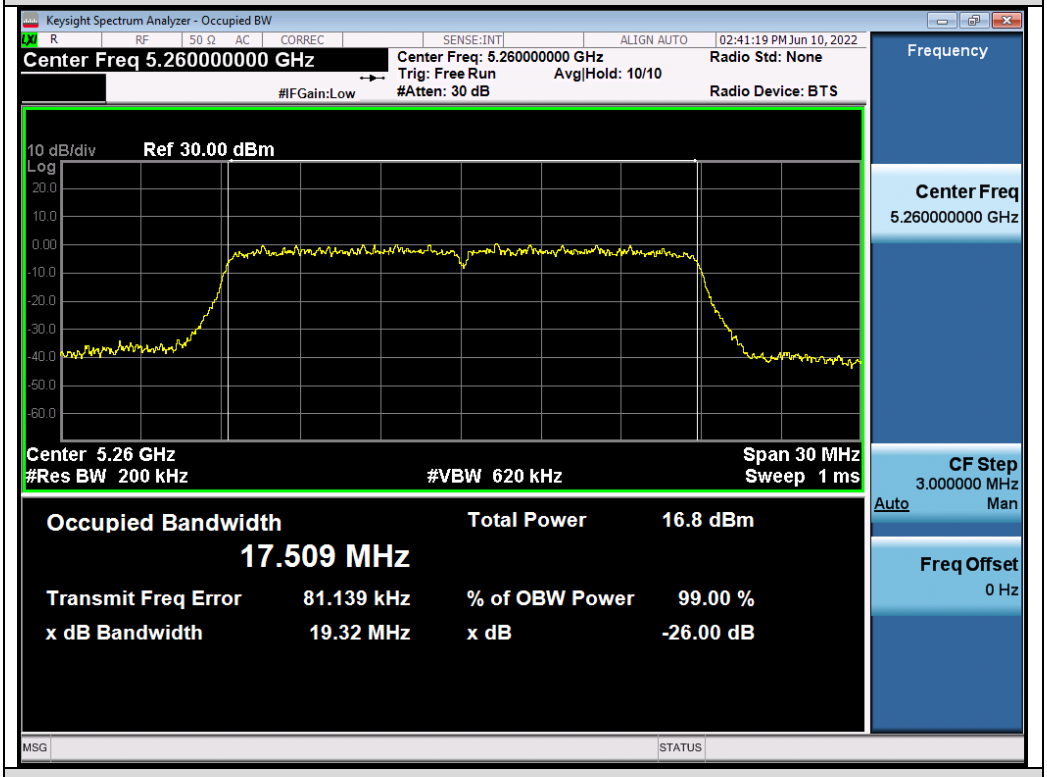

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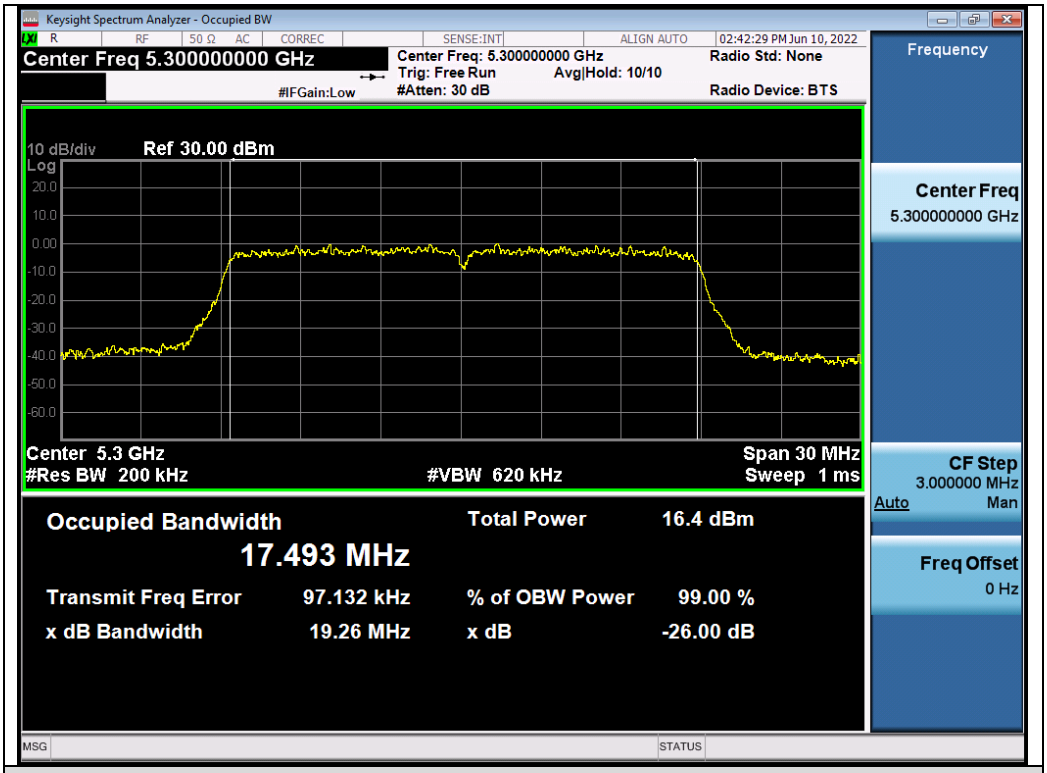

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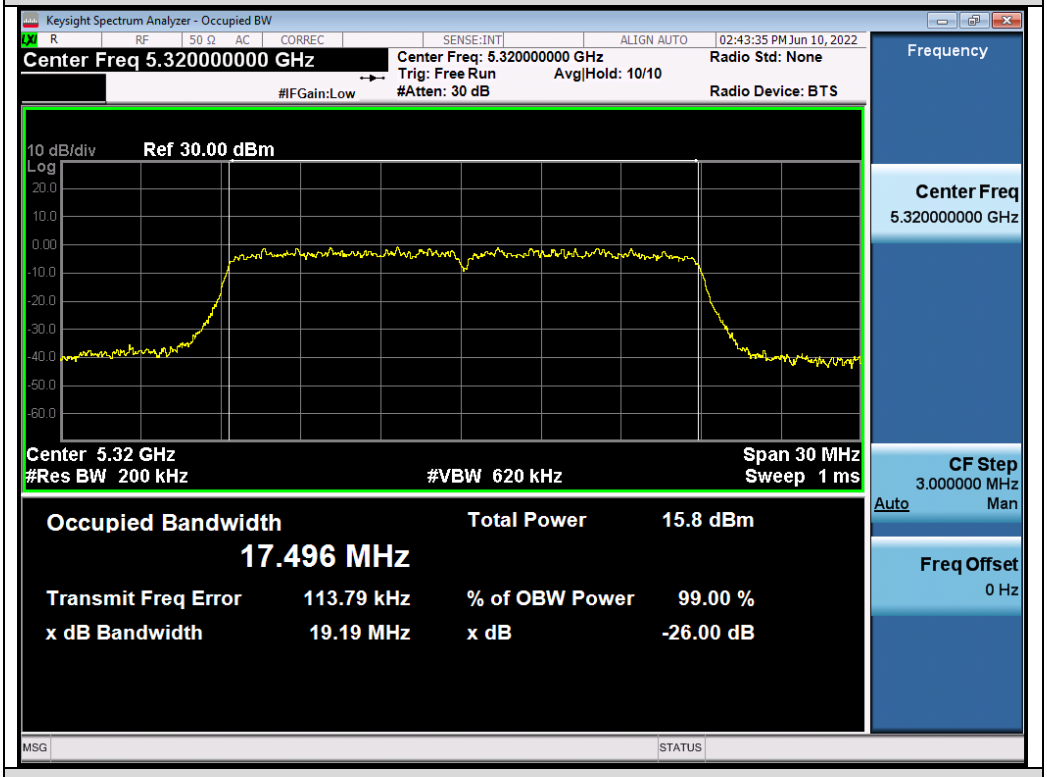
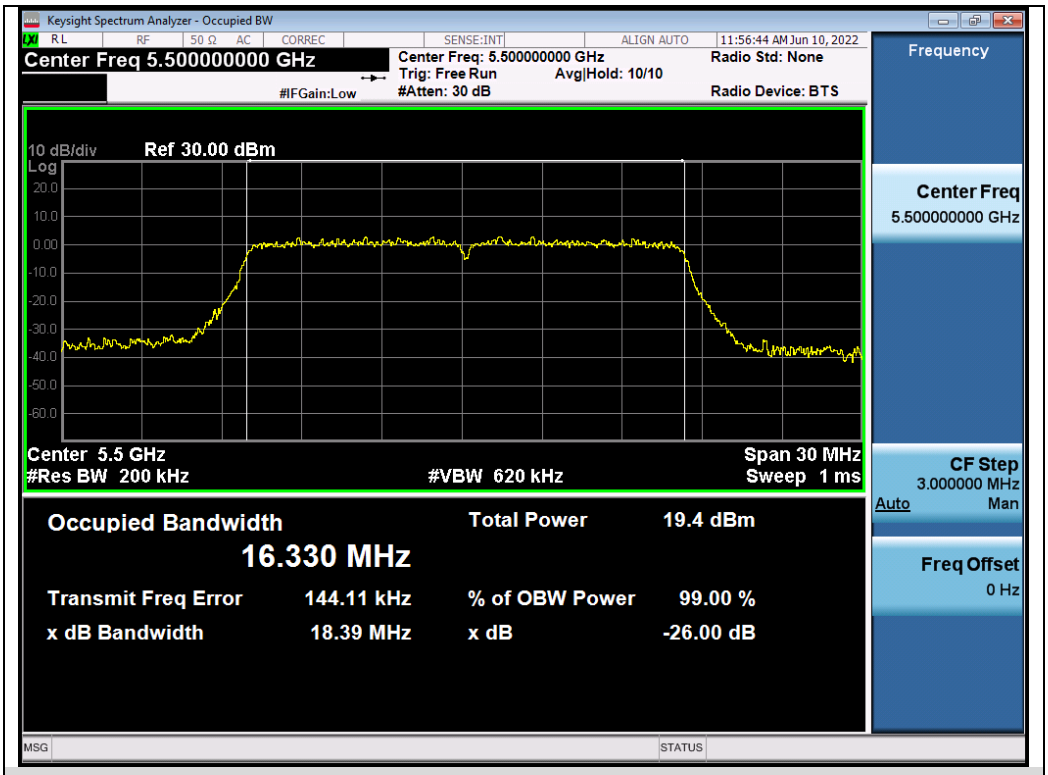
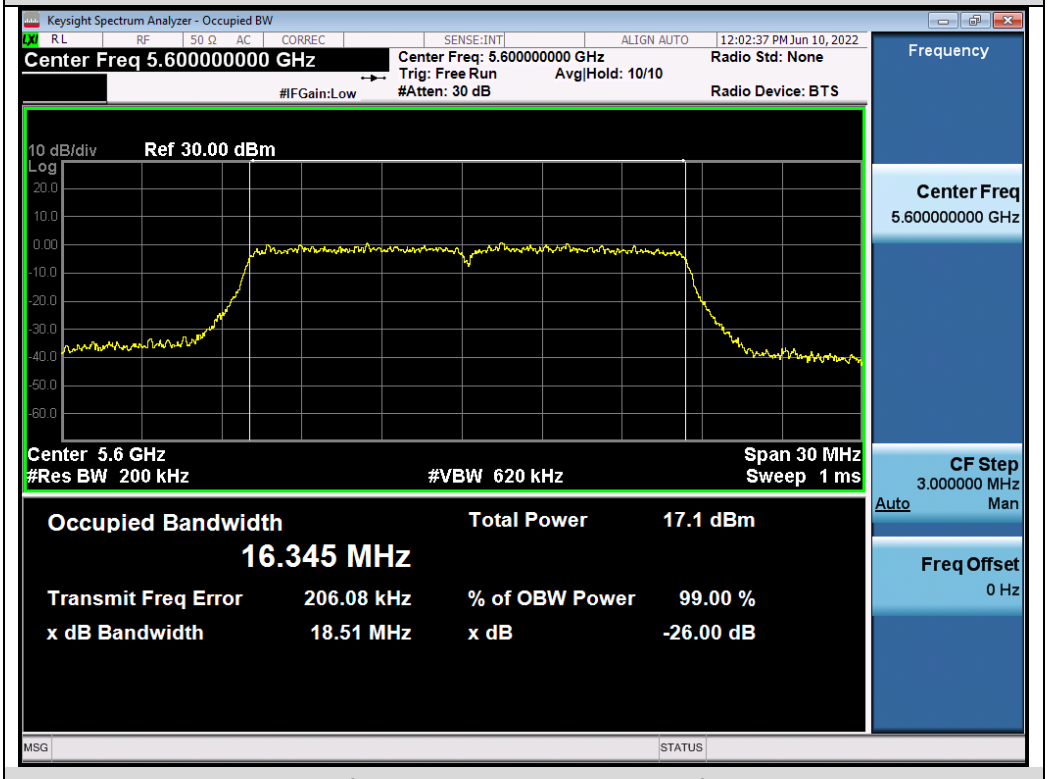


Test_Graph_802.11n20_ANT2_5320_MCS0_OBW

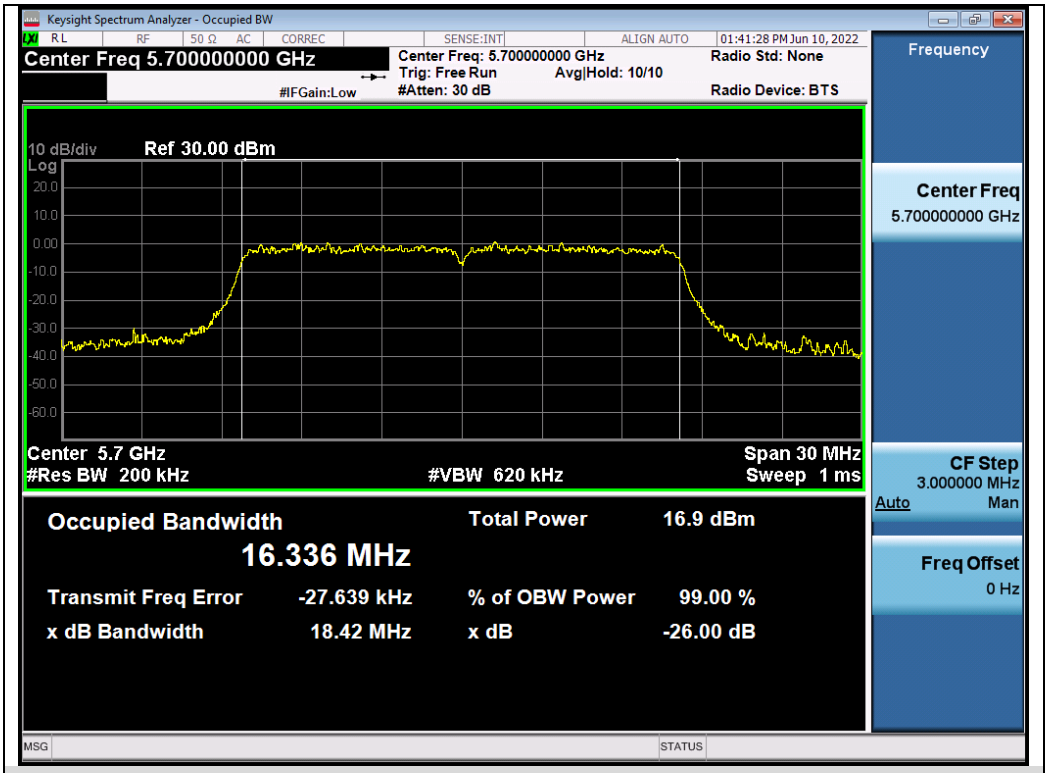
Test Graphs of Occupied Bandwidth for band 5.725-5.85 GHz



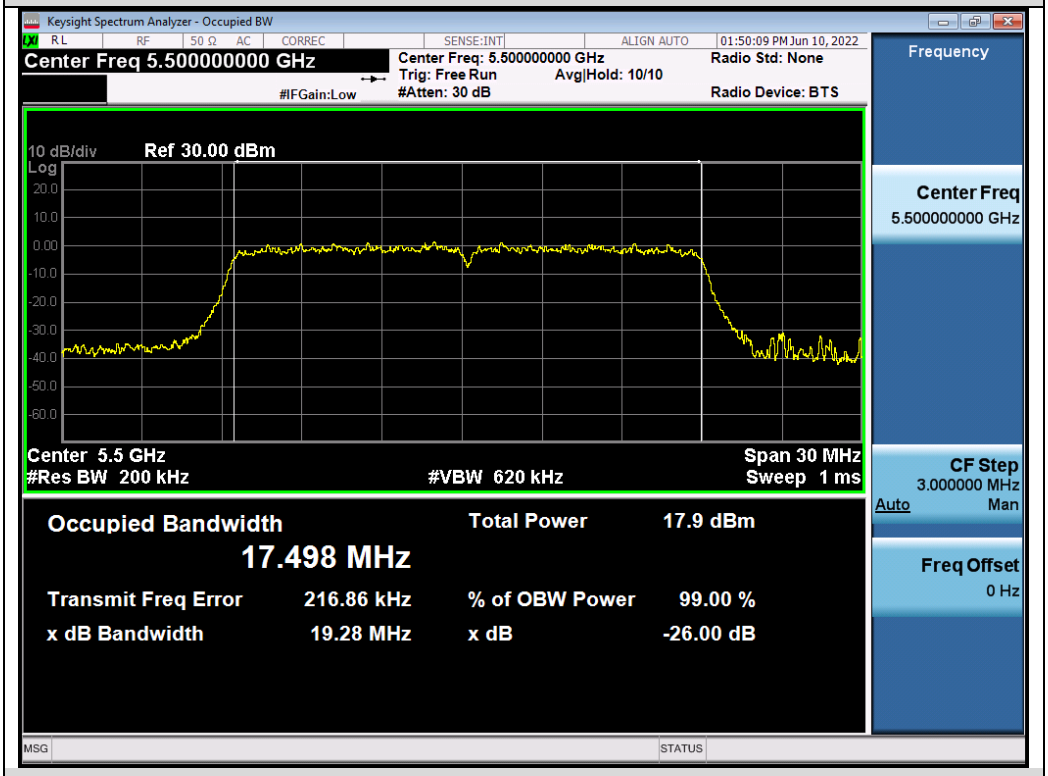
Test_Graph_802.11a_ANT1_5500_6Mbps_OBW



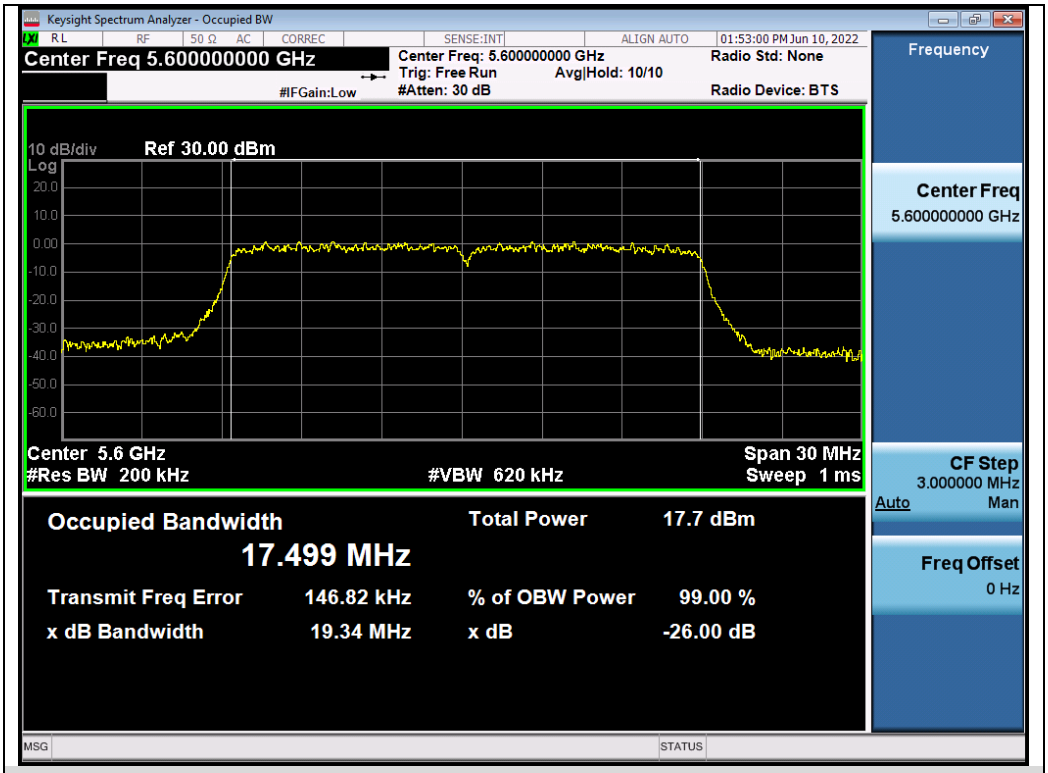
Test_Graph_802.11a_ANT1_5600_6Mbps_OBW



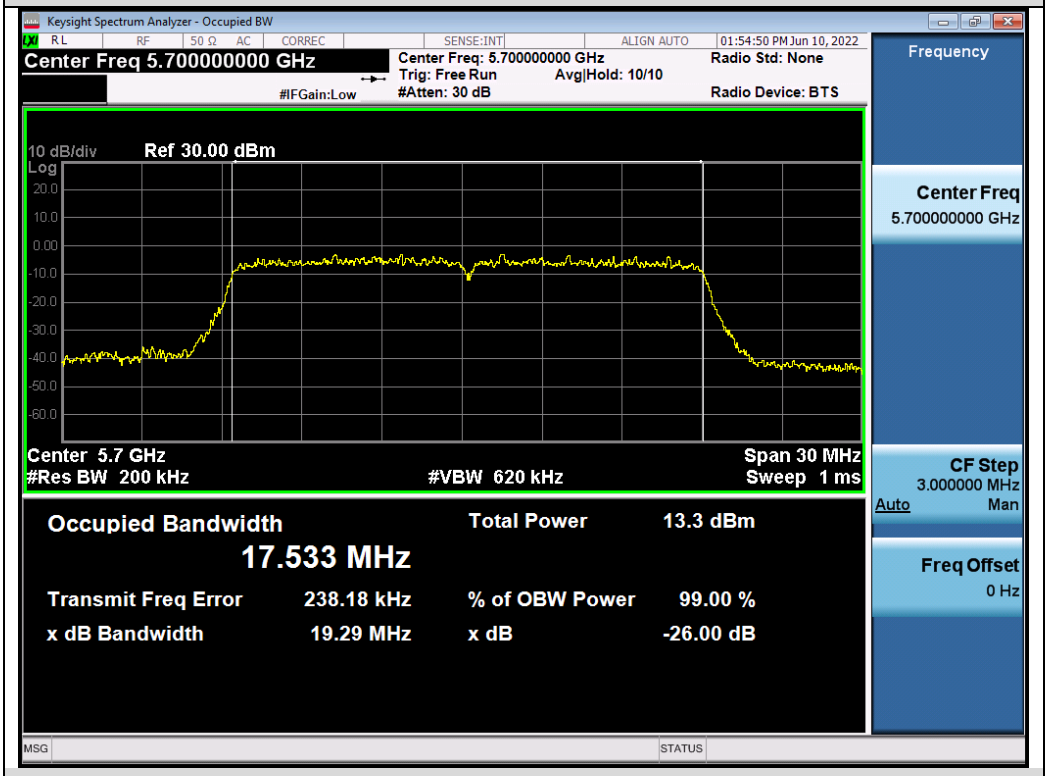
Test_Graph_802.11a_ANT1_5700_6Mbps_OBW



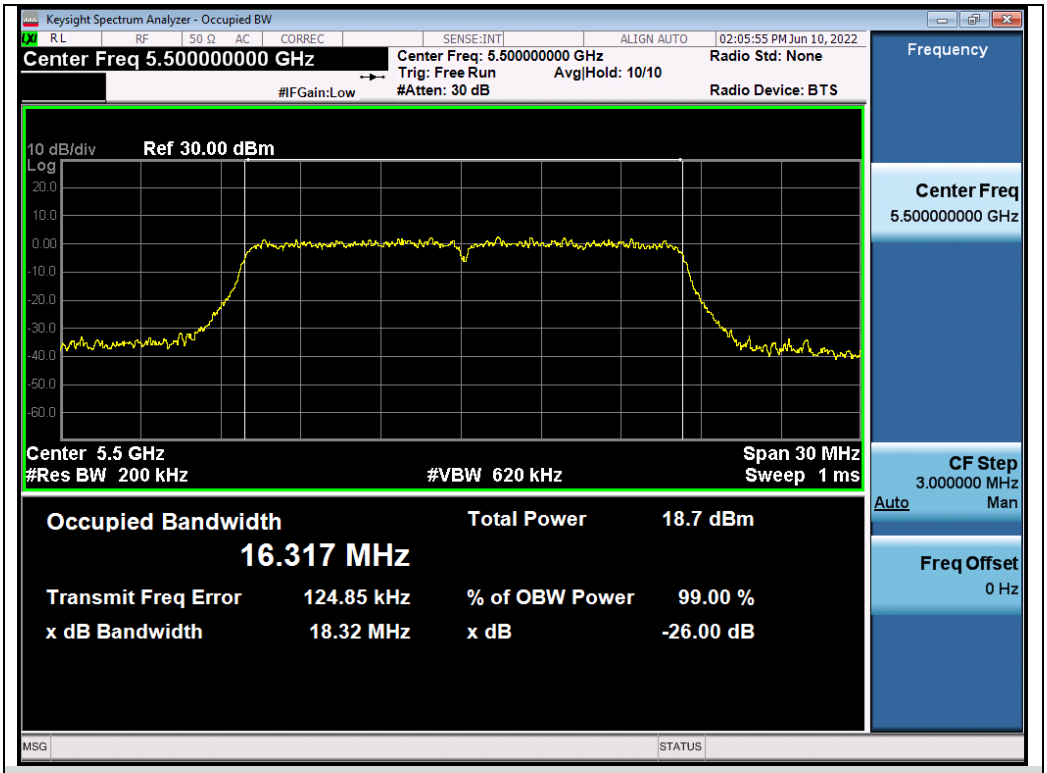
Test_Graph_802.11n20_ANT1_5500_MCS0_OBW



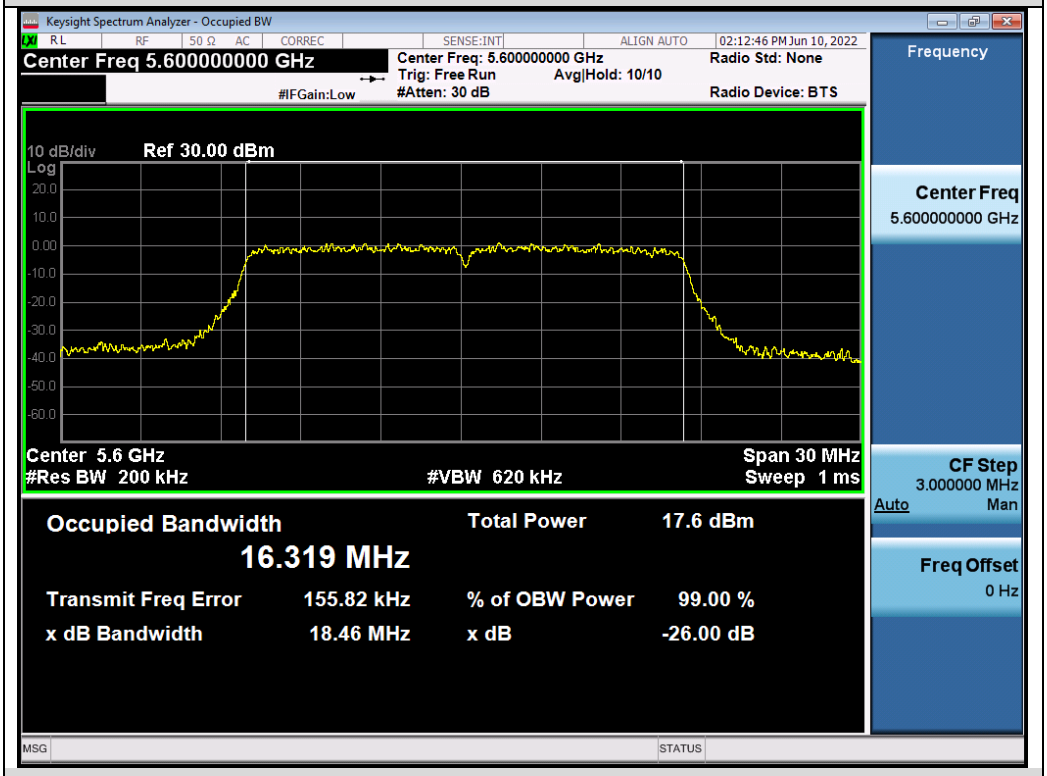
Test_Graph_802.11n20_ANT1_5600_MCS0_OBW



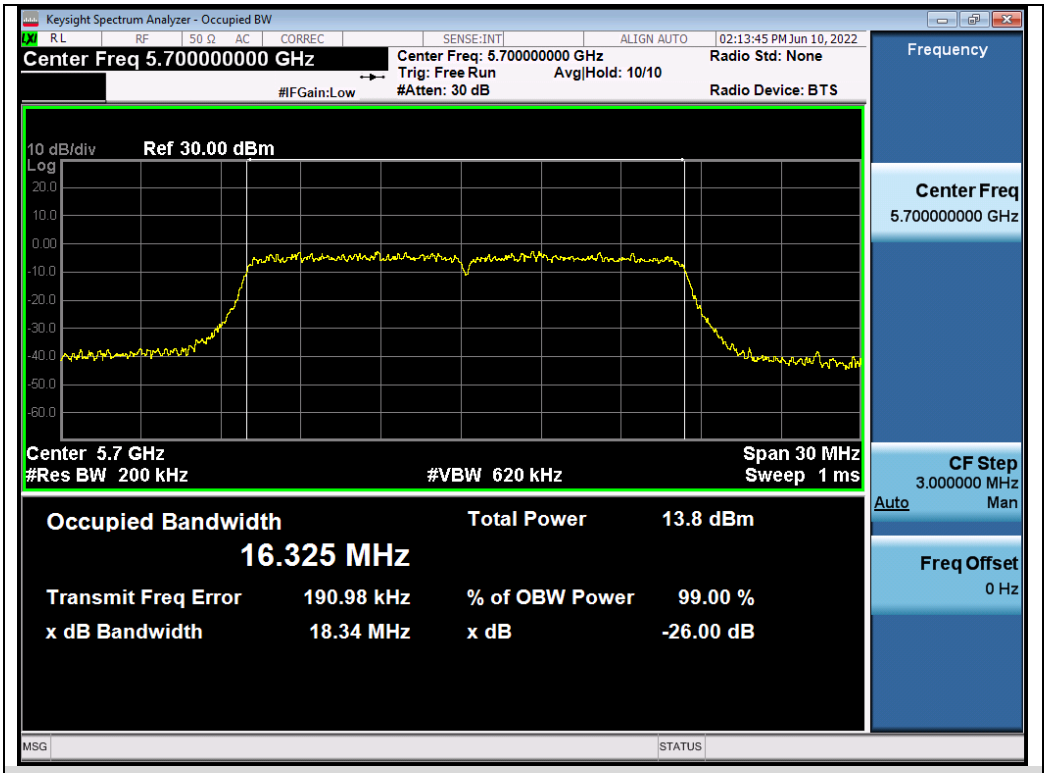
Test_Graph_802.11n20_ANT1_5700_MCS0_OBW



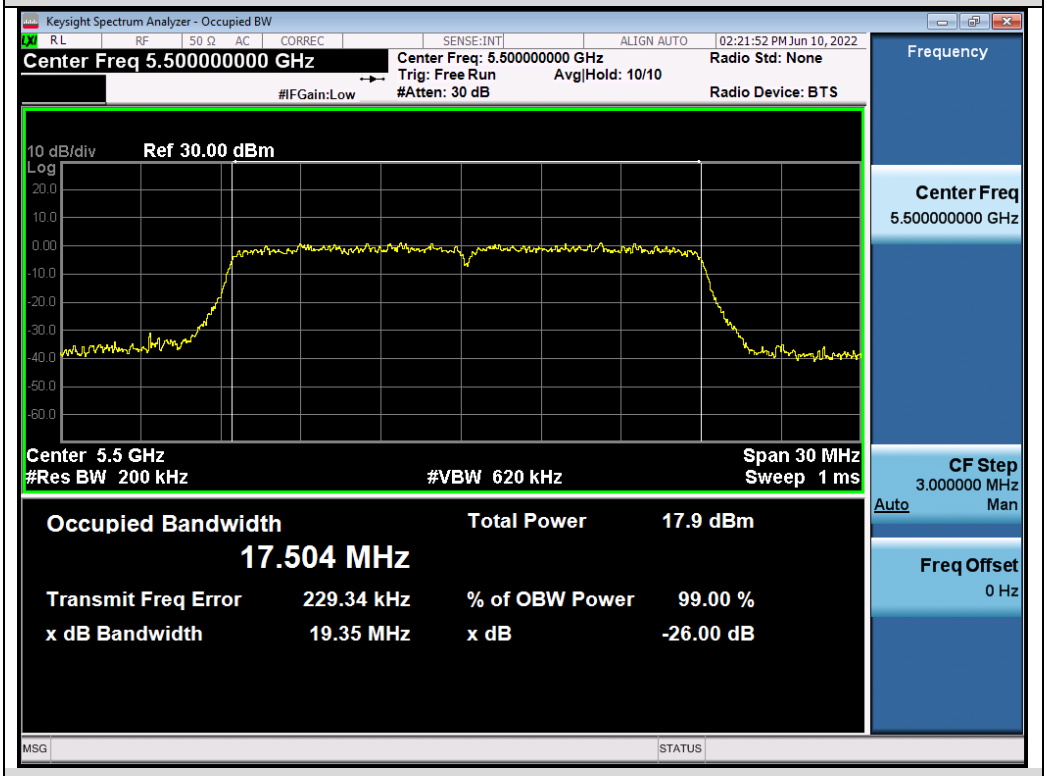
Test_Graph_802.11a_ANT2_5500_6Mbps_OBW



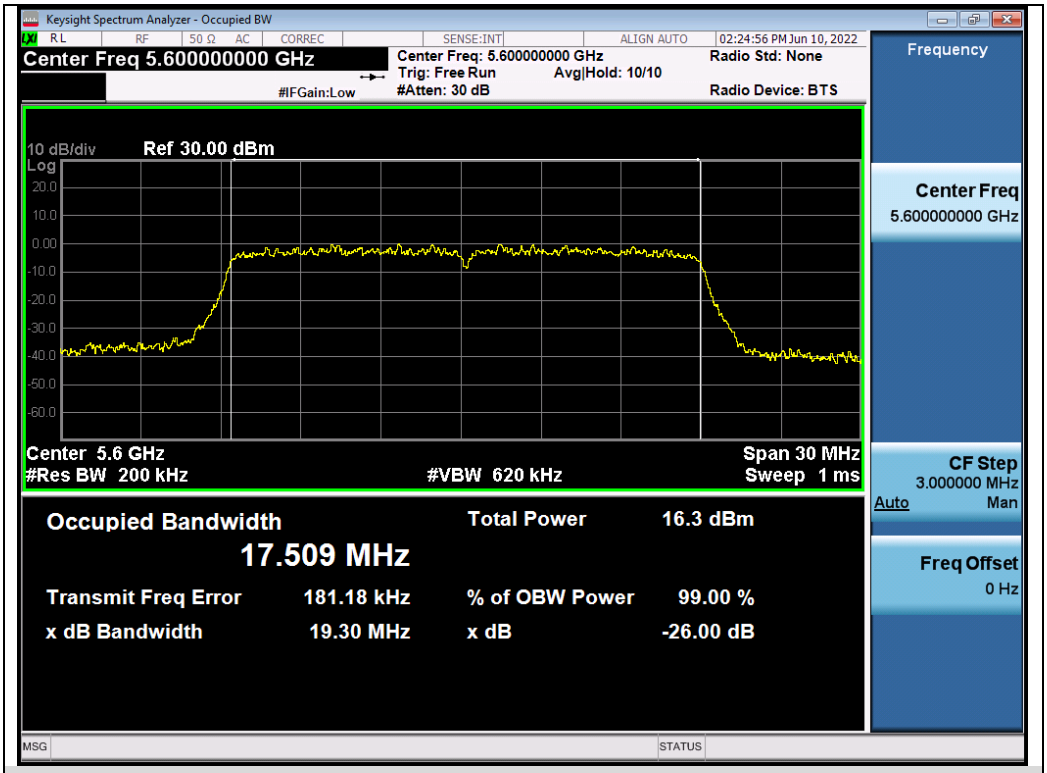
Test_Graph_802.11a_ANT2_5600_6Mbps_OBW



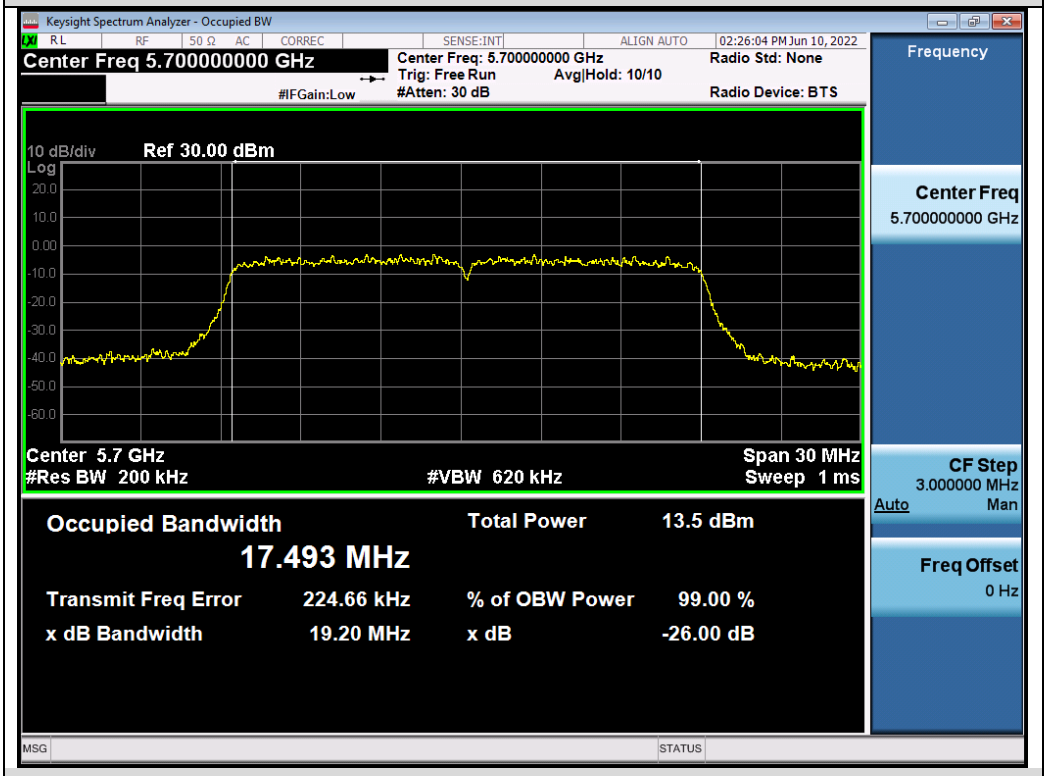
Test_Graph_802.11a_ANT2_5700_6Mbps_OBW



Test_Graph_802.11n20_ANT2_5500_MCS0_OBW



Test_Graph_802.11n20_ANT2_5600_MCS0_OBW



Test_Graph_802.11n20_ANT2_5700_MCS0_OBW

9. MAXIMUM CONDUCTED OUTPUT AVERAGE POWER SPECTRAL DENSITY

9.1. MEASUREMENT PROCEDURE

Refer to KDB 789033 section F

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

Refer to Section 8.2.

9.3. MEASUREMENT EQUIPMENT USED

Refer to Section 6.

9.4. LIMITS AND MEASUREMENT RESULT

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz-antenna 1				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5260	0.208	11	Pass
	5300	-0.930	11	Pass
	5320	-1.666	11	Pass
802.11n20	5260	-1.826	11	Pass
	5300	-2.358	11	Pass
	5320	-2.285	11	Pass

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz-antenna 2				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5260	-0.686	11	Pass
	5300	-1.396	11	Pass
	5320	0.469	11	Pass
802.11n20	5260	-0.633	11	Pass
	5300	-0.762	11	Pass
	5320	-1.551	11	Pass

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz-antenna 1+2				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11n20	5260	1.82	11	Pass
	5300	1.52	11	Pass
	5320	1.11	11	Pass

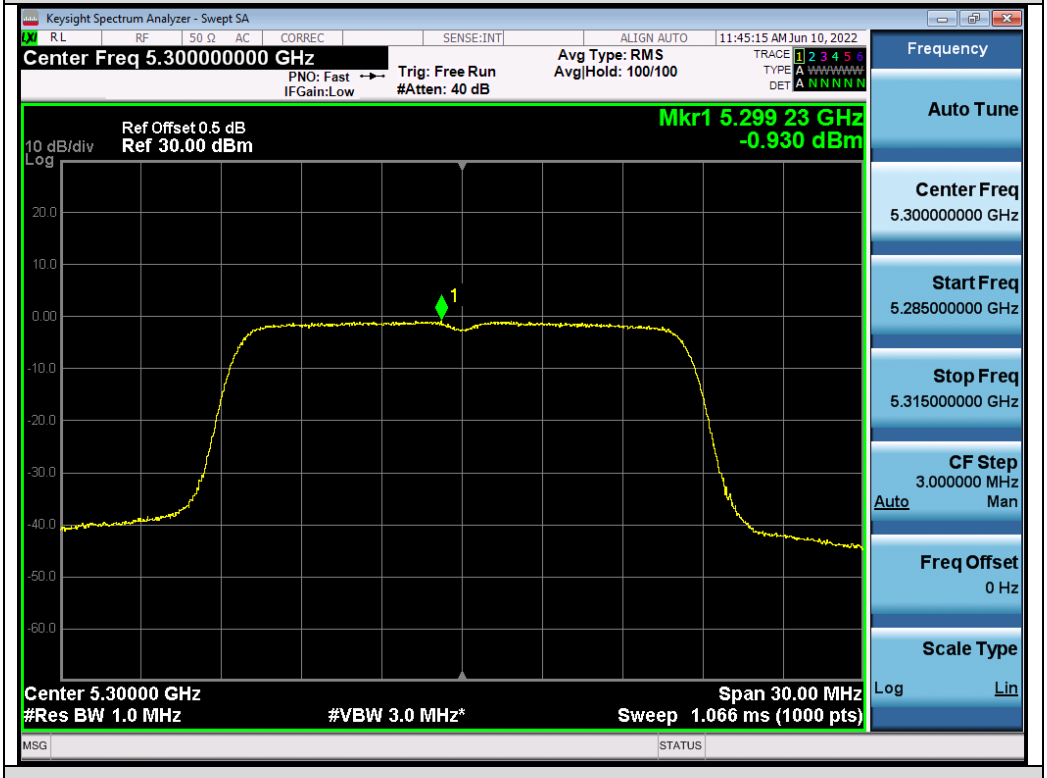
Test Data of Conducted Output Power Density for band 5.47-5.725 GHz-antenna 1				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5500	1.778	11	Pass
	5600	-11.189	11	Pass
	5700	-0.411	11	Pass
802.11n20	5500	0.869	11	Pass
	5600	0.622	11	Pass
	5700	-2.977	11	Pass

Test Data of Conducted Output Power Density for band 5.47-5.725 GHz-antenna 2				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5500	1.901	11	Pass
	5600	0.423	11	Pass
	5700	-2.057	11	Pass
802.11n20	5500	1.061	11	Pass
	5600	-0.207	11	Pass
	5700	-9.952	11	Pass

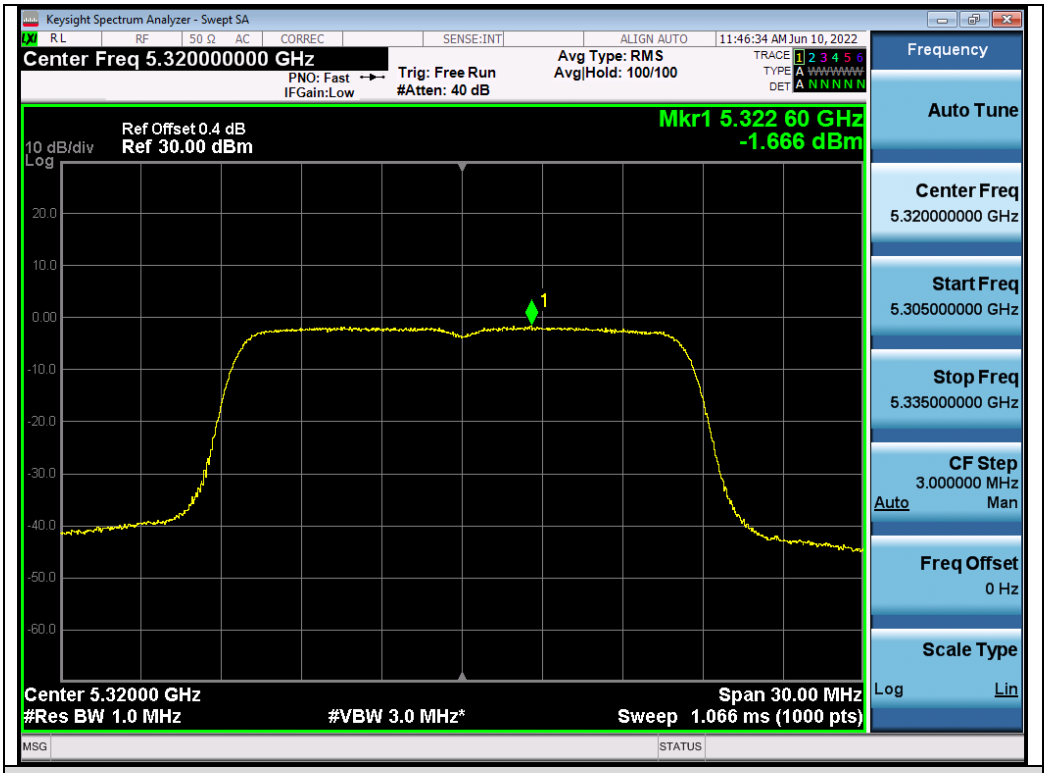
Test Data of Conducted Output Power Density for band 5.47-5.725 GHz-antenna 1+2				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11n20	5500	3.976	11	Pass
	5600	3.238	11	Pass
	5700	-2.183	11	Pass

Test Graphs of Conducted Output Power Spectral Density for band 5.25-5.35 GHz

Test_Graph_802.11a_ANT1_5260_6Mbps_PSD



Test_Graph_802.11a_ANT1_5300_6Mbps_PSD



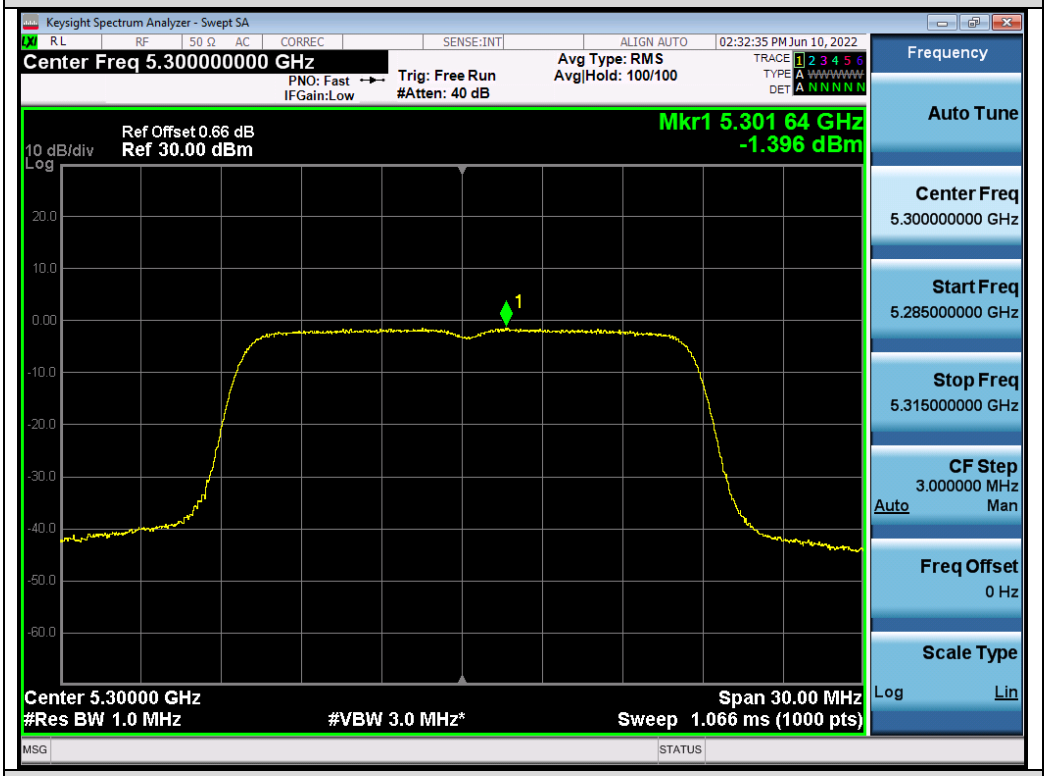
Test_Graph_802.11a_ANT1_5320_6Mbps_PSD

Test_Graph_802.11n20_ANT1_5260_MCS0_PSD

Test_Graph_802.11n20_ANT1_5300_MCS0_PSD

Test_Graph_802.11n20_ANT1_5320_MCS0_PSD

Test_Graph_802.11a_ANT2_5260_6Mbps_PSD



Test_Graph_802.11a_ANT2_5300_6Mbps_PSD

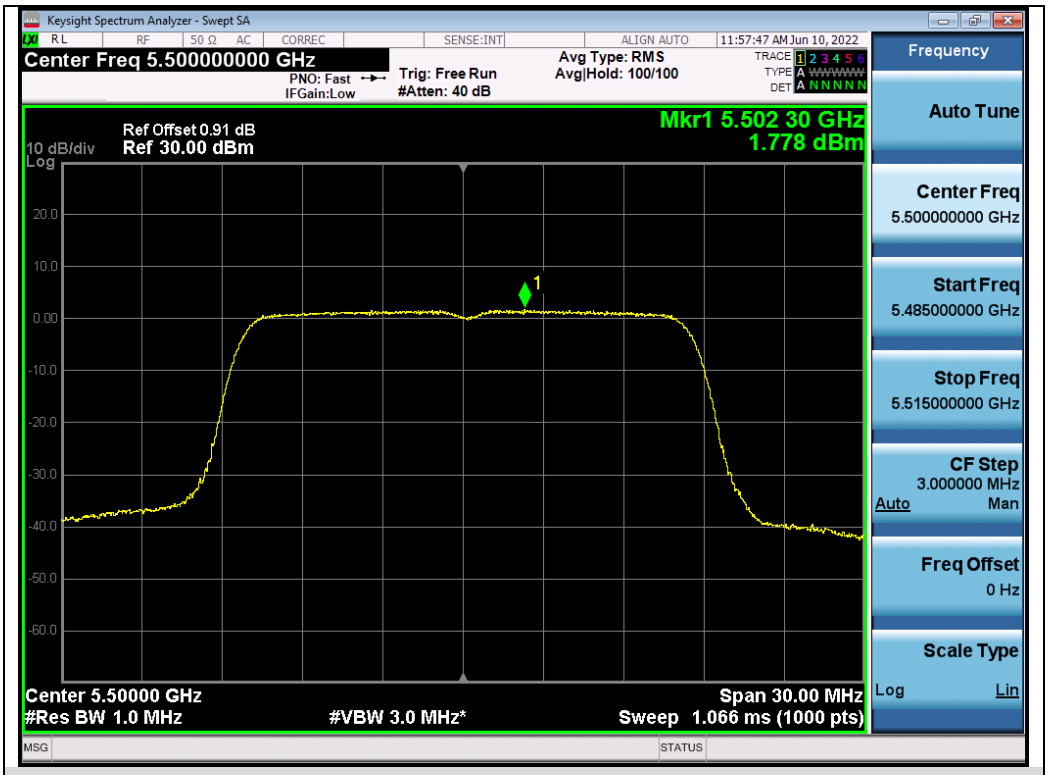
Test_Graph_802.11a_ANT2_5320_6Mbps_PSD

Test_Graph_802.11n20_ANT2_5260_MCS0_PSD

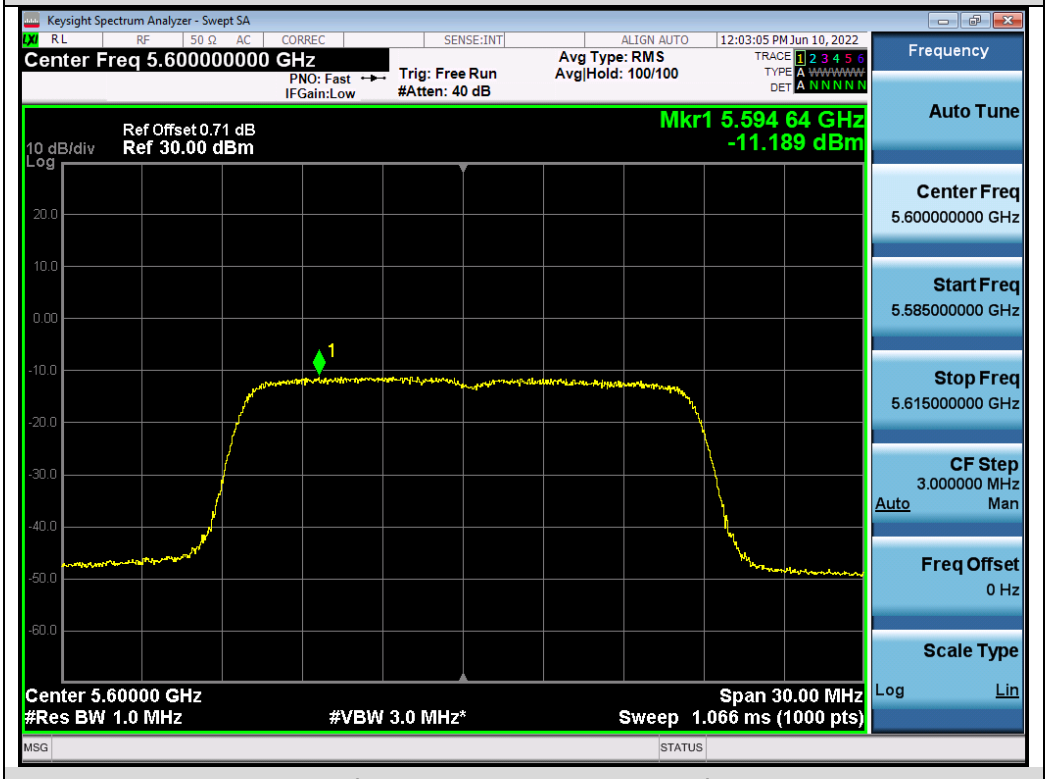
Test_Graph_802.11n20_ANT2_5300_MCS0_PSD

Test_Graph_802.11n20_ANT2_5320_MCS0_PSD

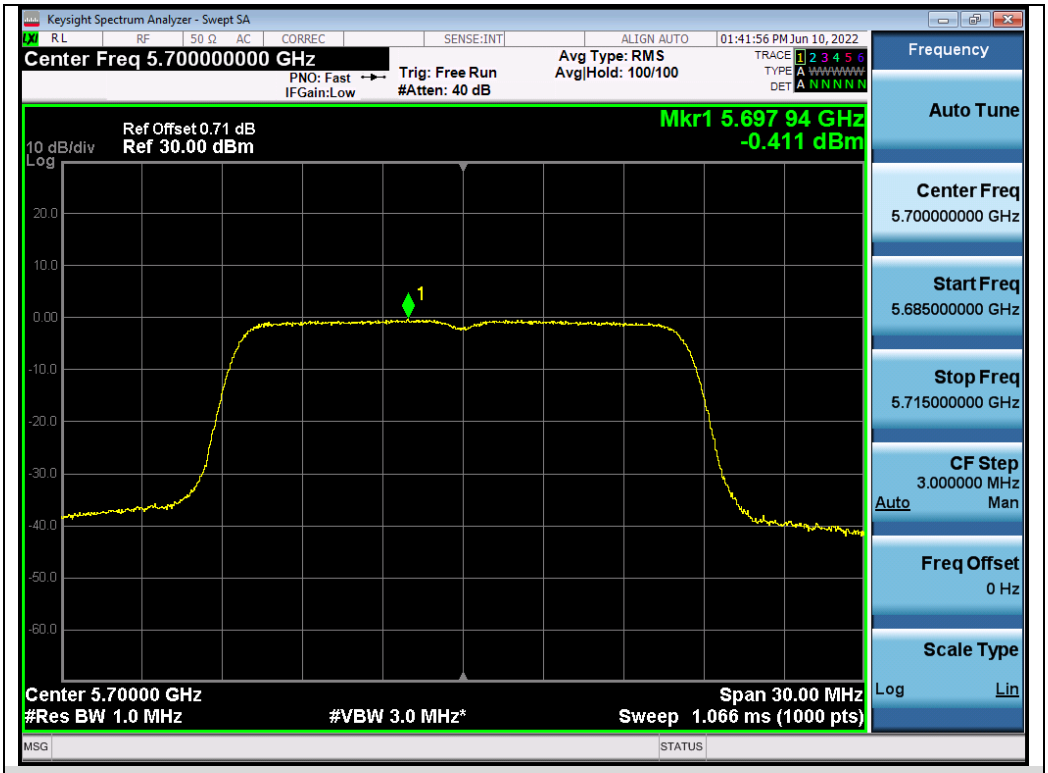
Test Graphs of Conducted Output Power Spectral Density for band 5.47-5.725 GHz



Test_Graph_802.11a_ANT1_5500_6Mbps_PSD

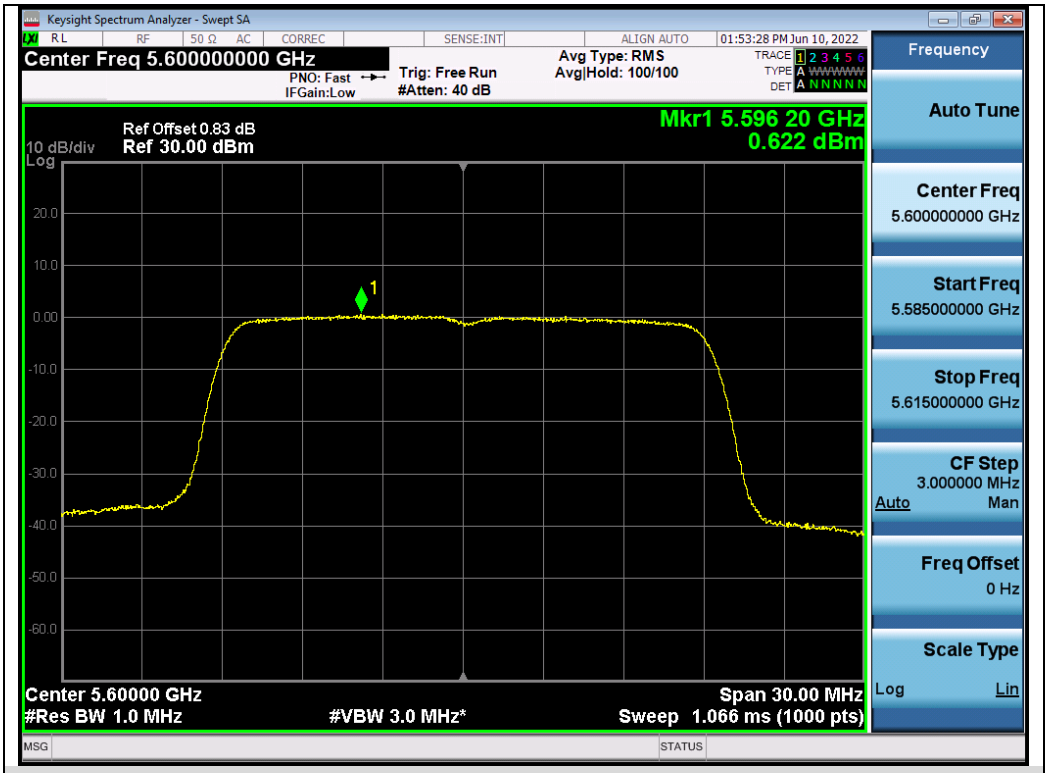


Test_Graph_802.11a_ANT1_5600_6Mbps_PSD

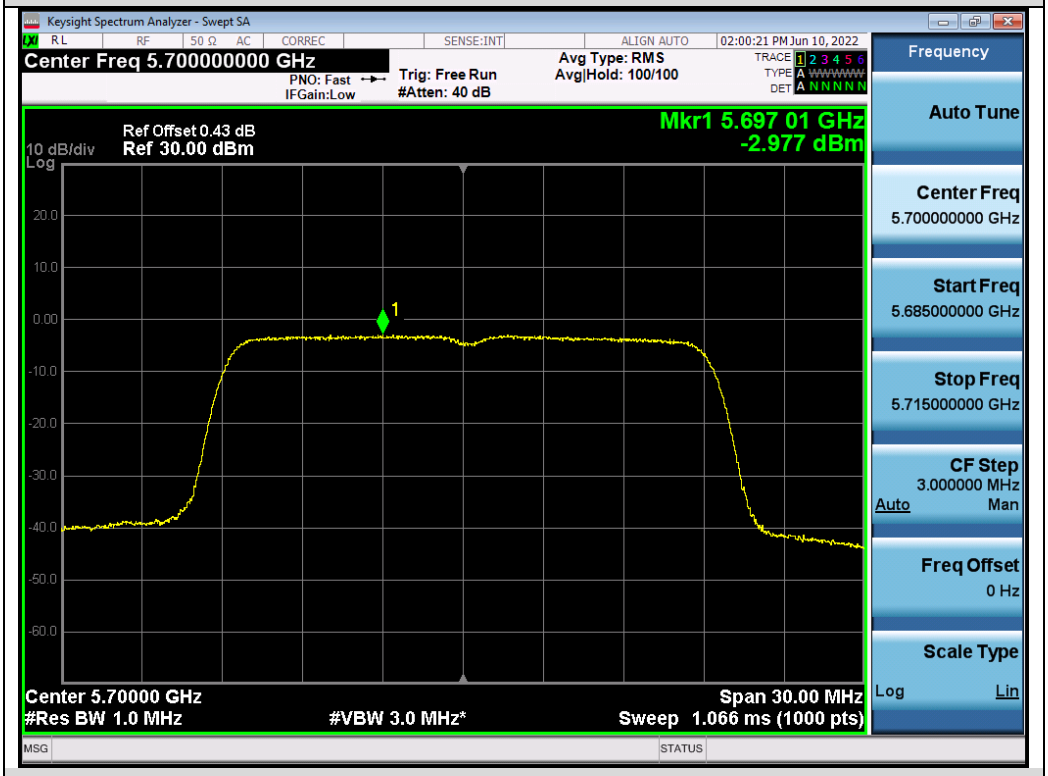


Test_Graph_802.11a_ANT1_5700_6Mbps_PSD

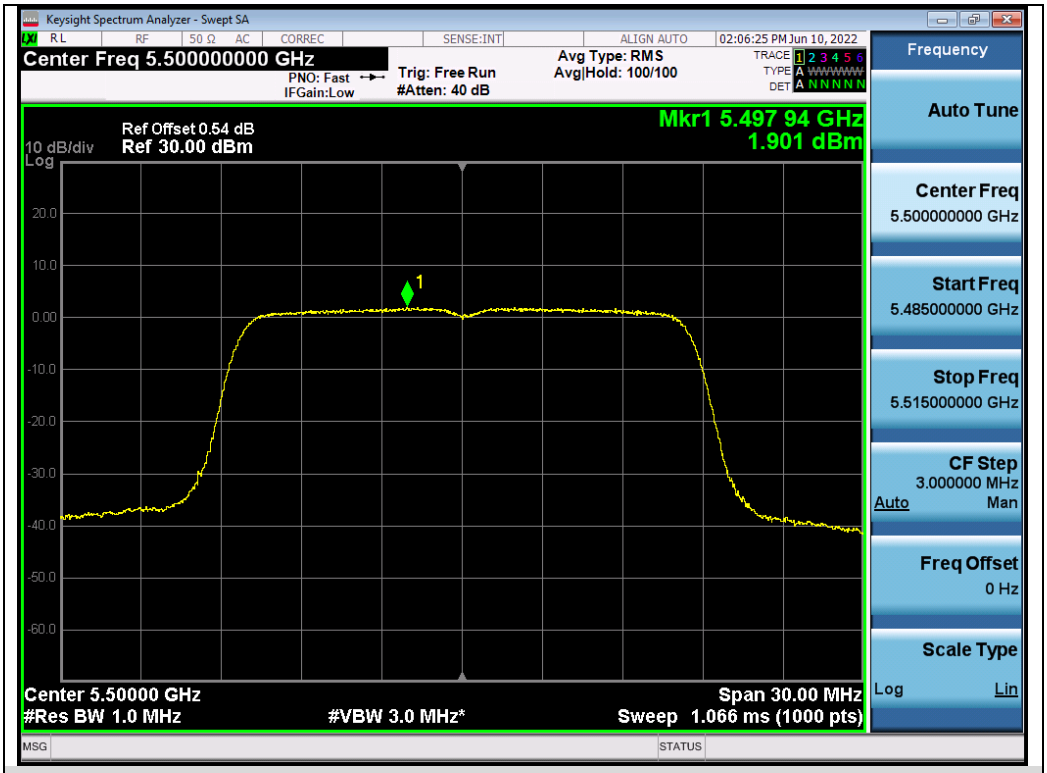
Test_Graph_802.11n20_ANT1_5500_MCS0_PSD



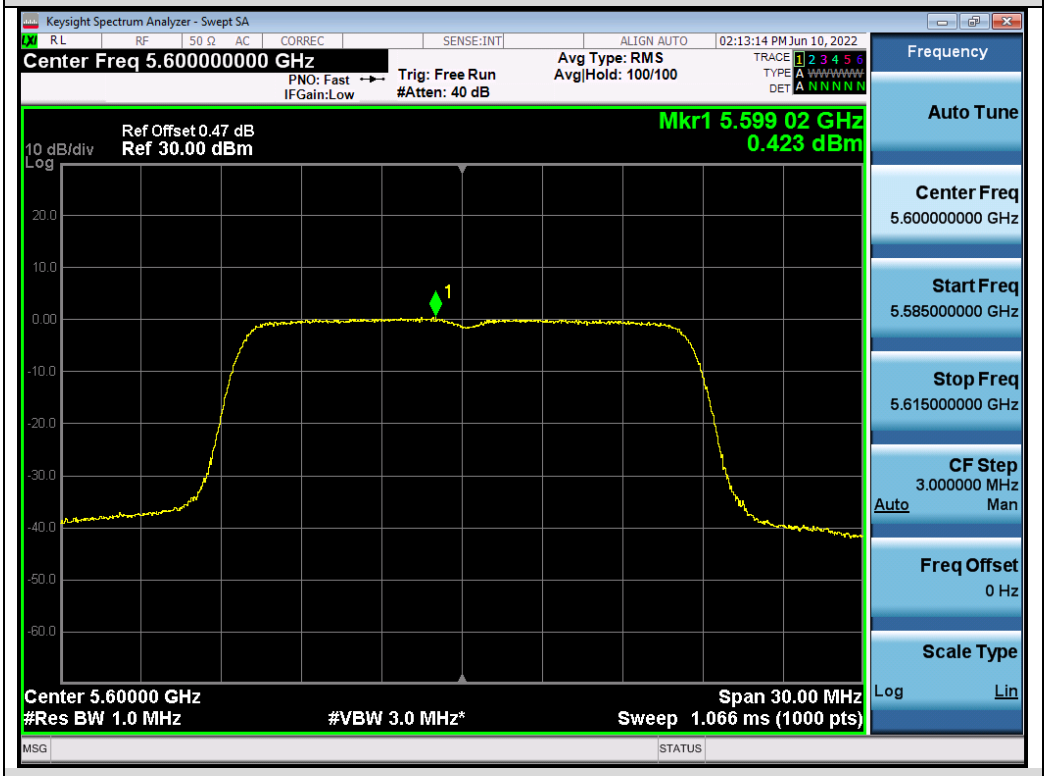
Test_Graph_802.11n20_ANT1_5600_MCS0_PSD



Test_Graph_802.11n20_ANT1_5700_MCS0_PSD



Test_Graph_802.11a_ANT2_5500_6Mbps_PSD

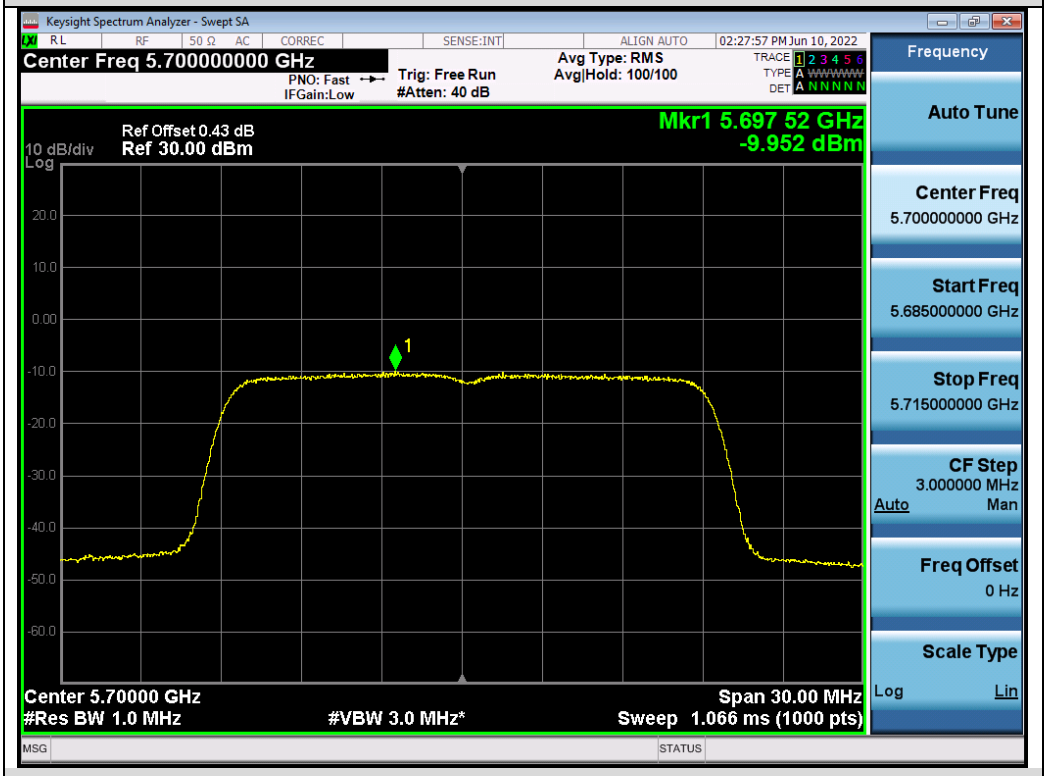


Test_Graph_802.11a_ANT2_5600_6Mbps_PSD

Test_Graph_802.11a_ANT2_5700_6Mbps_PSD

Test_Graph_802.11n20_ANT2_5500_MCS0_PSD

Test_Graph_802.11n20_ANT2_5600_MCS0_PSD



Test_Graph_802.11n20_ANT2_5700_MCS0_PSD

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

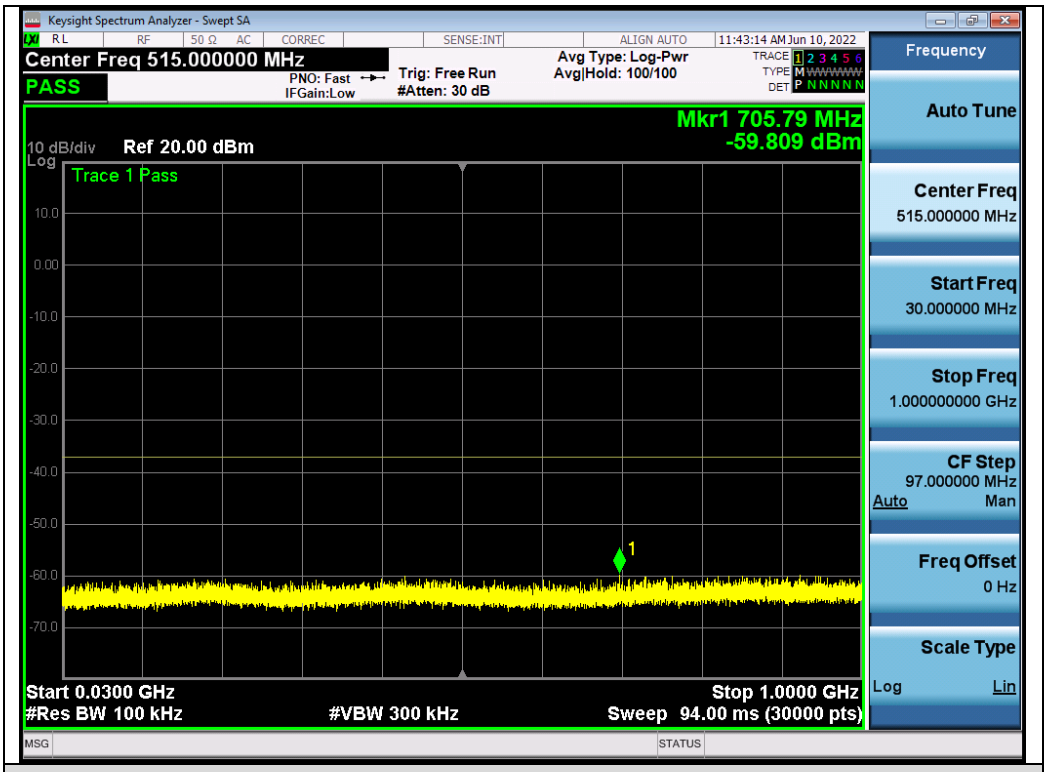
The same as described in section 6.

10.4. LIMITS AND MEASUREMENT RESULT

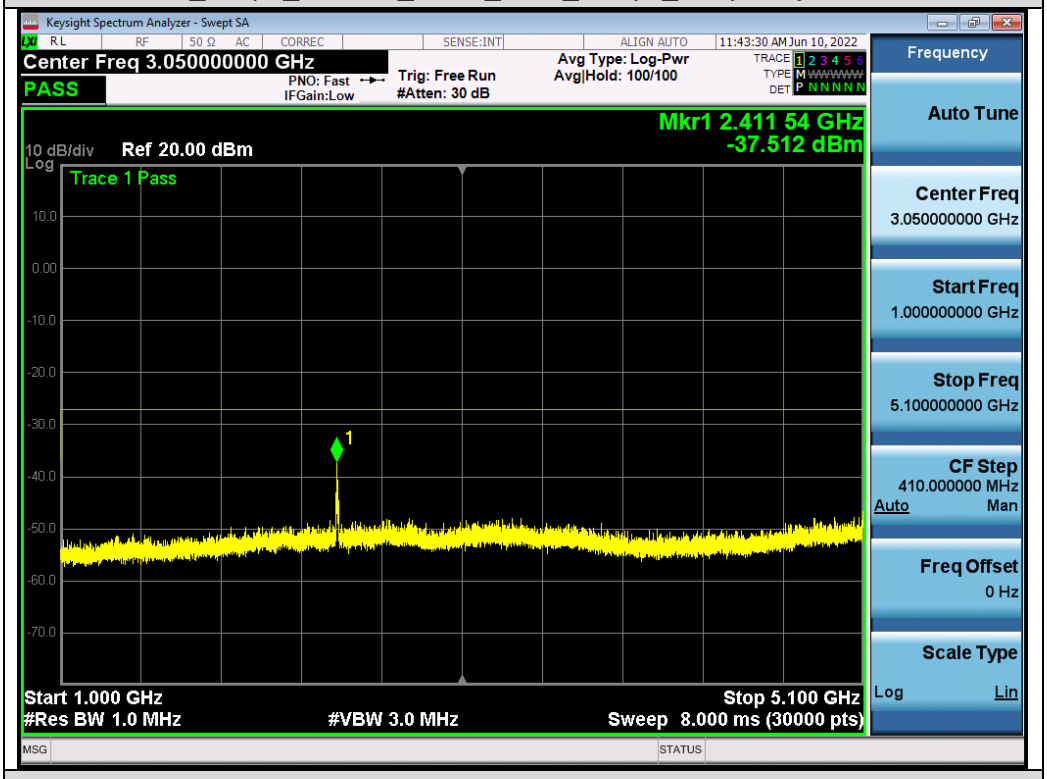
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	**Measurement Result**	
	Test channel	**Criteria**
-27dBm/MHz	5150MHz-5250MHz	PASS
All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band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

Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report. All the 80MHz bandwidth modulation had been tested, the 802.11AC80 was the worst case and record in his test report.

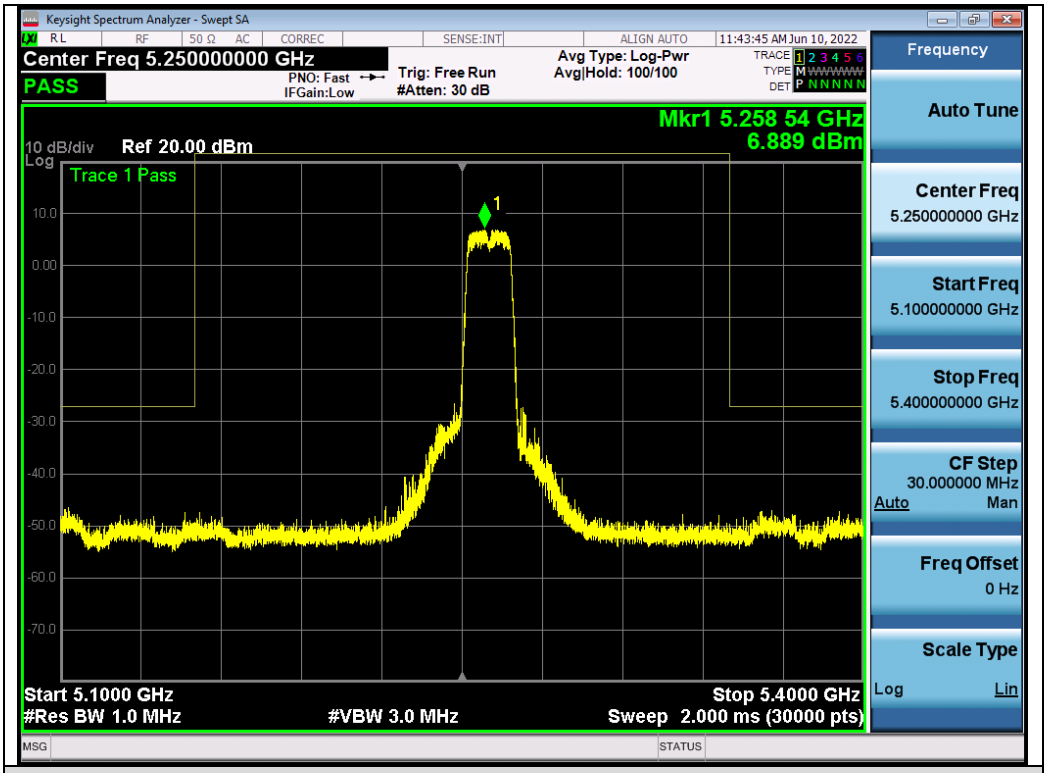
Test Graphs of Spurious Emissions outside of the 5.15-5.35 GHz band for transmitters operating in the 5.25-5.35 GHz band



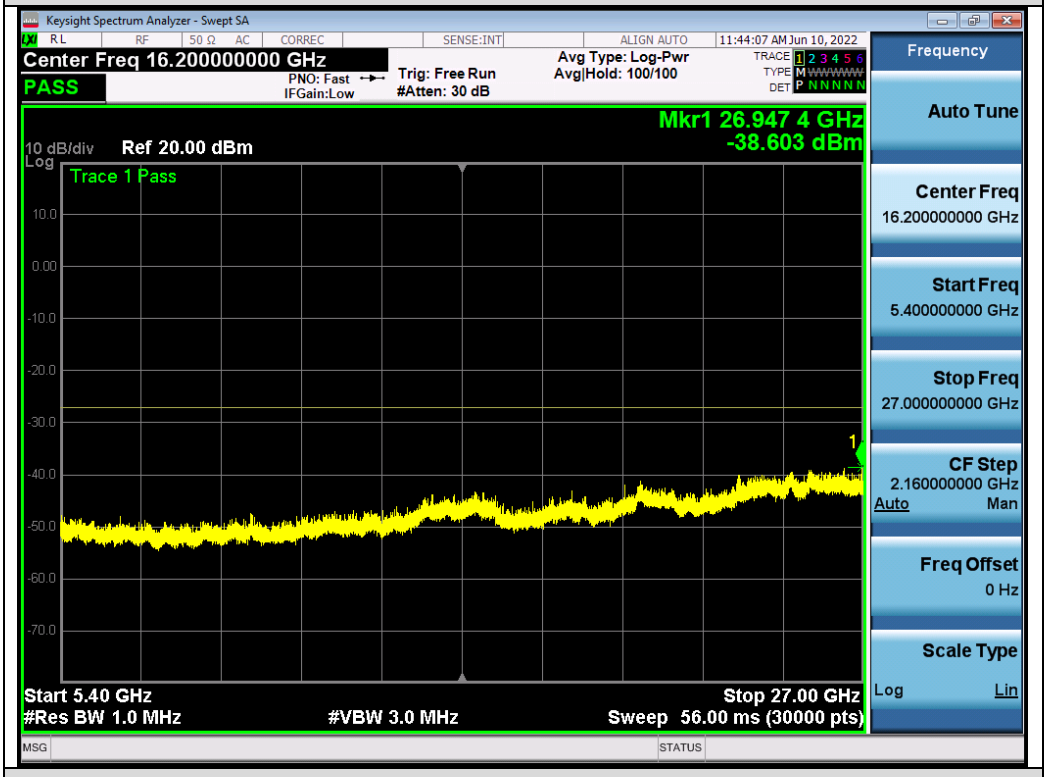
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 1



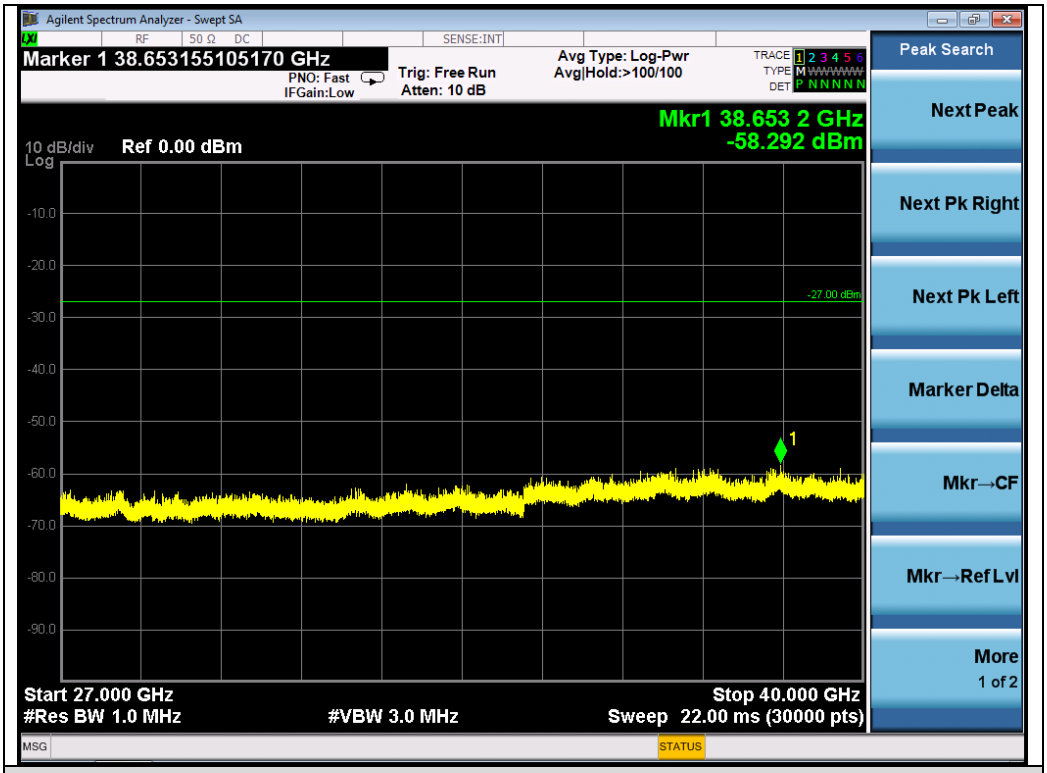
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 2



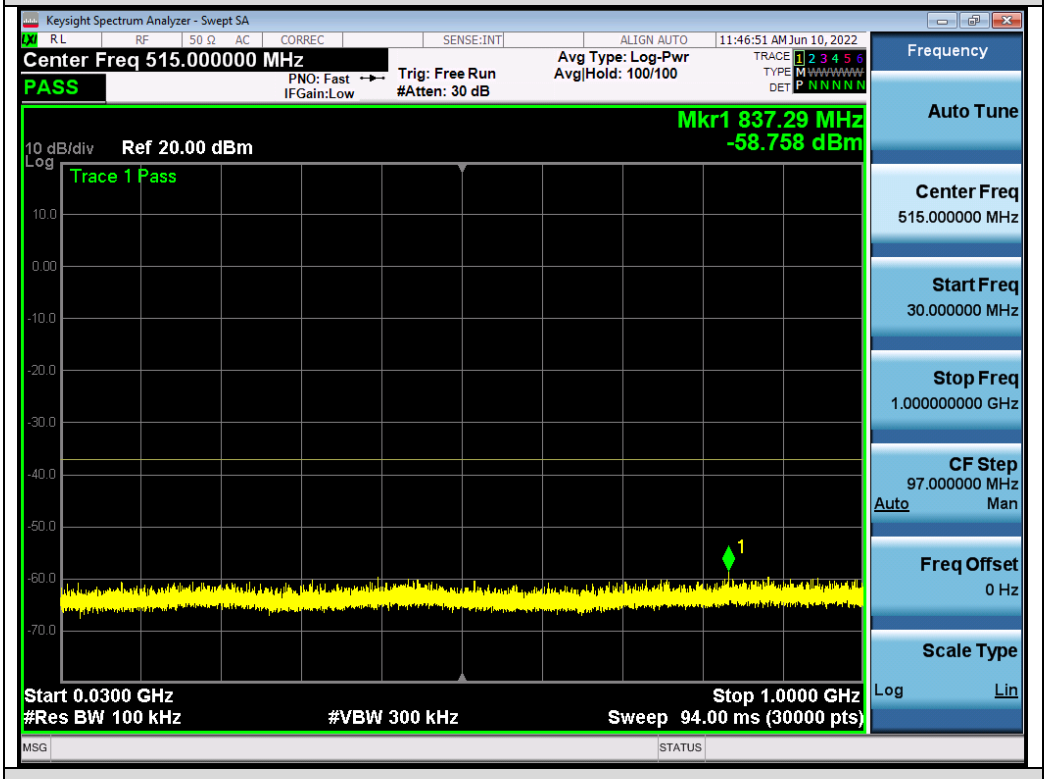
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 3



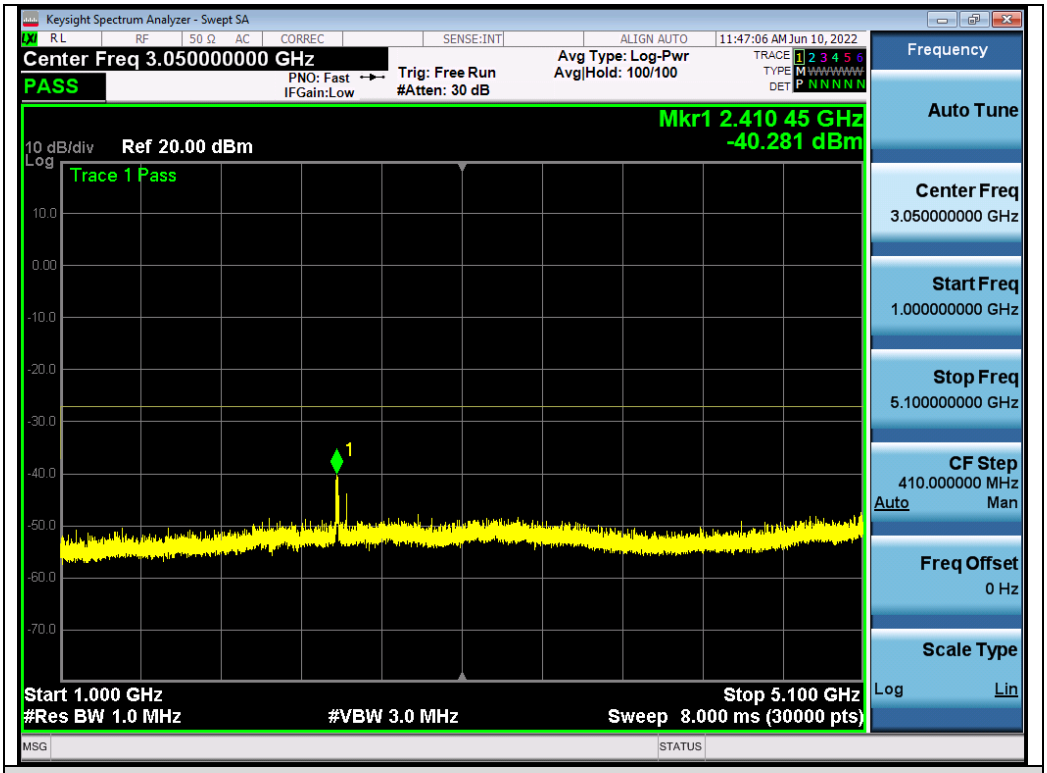
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 4



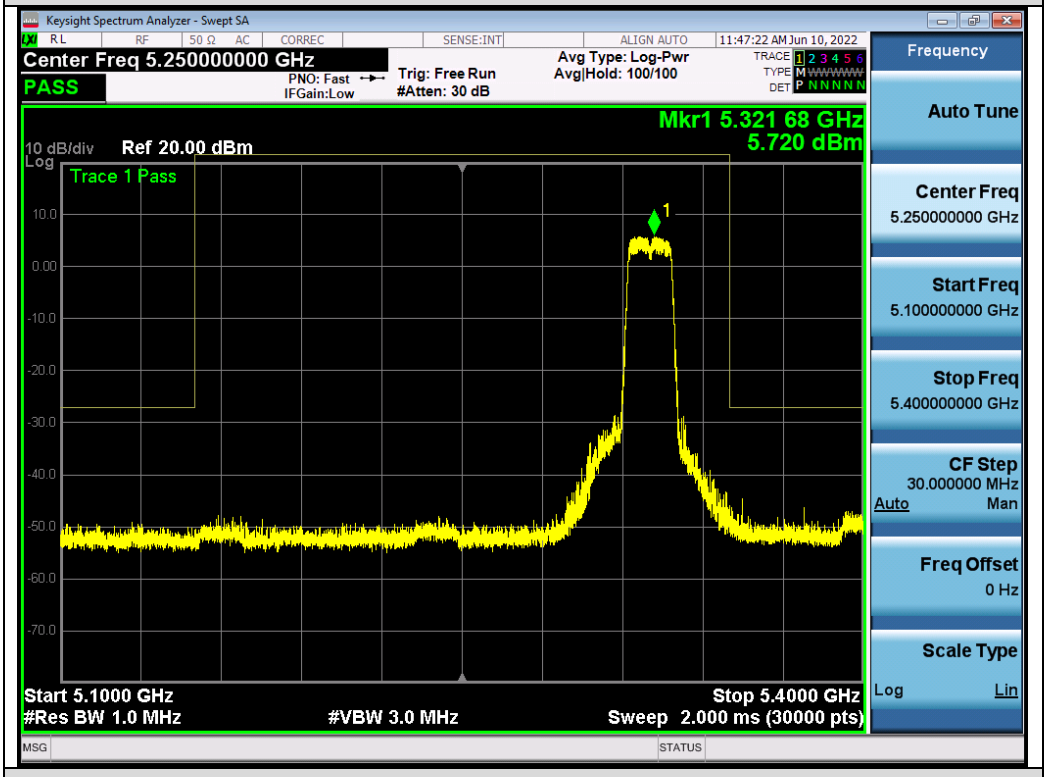
Test_Graph_802.11a_ANT1_5260_6Mbps_Frequency Band 5



Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 1

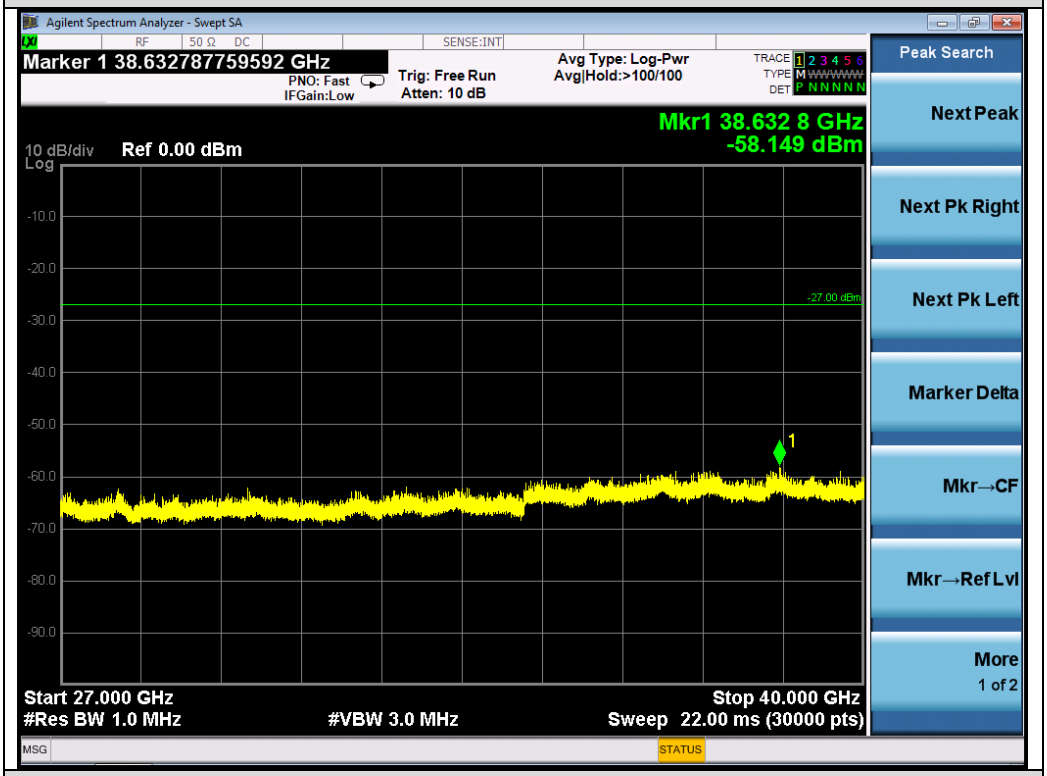


Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 2



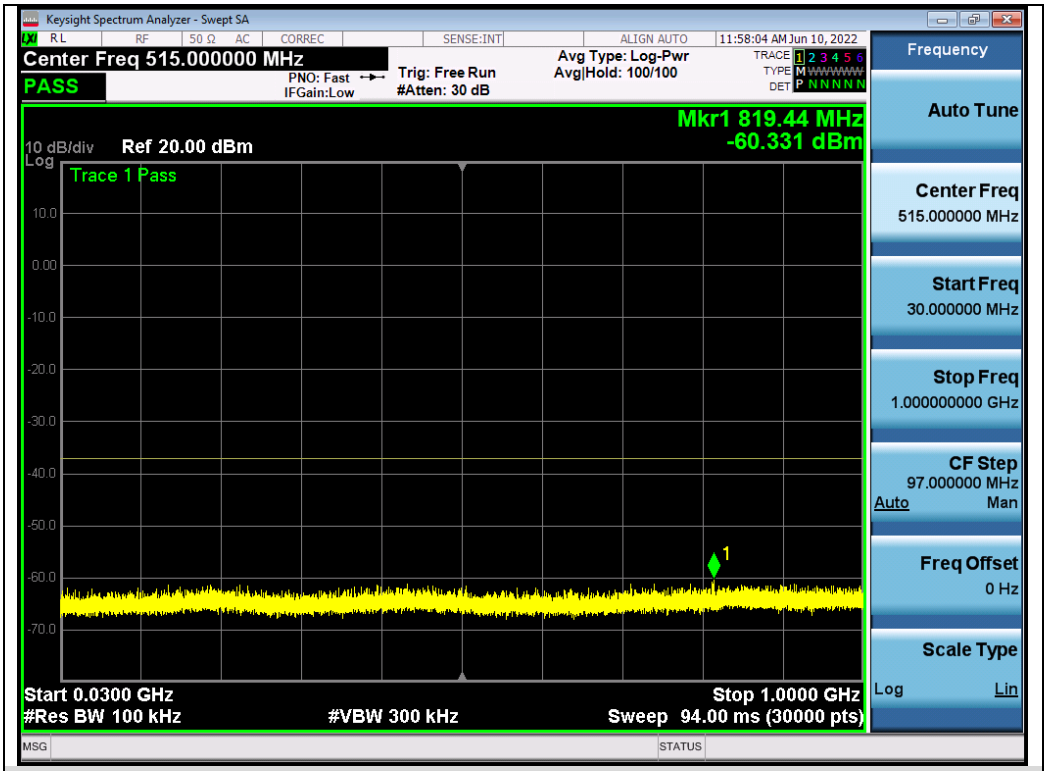
Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 3

Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 4

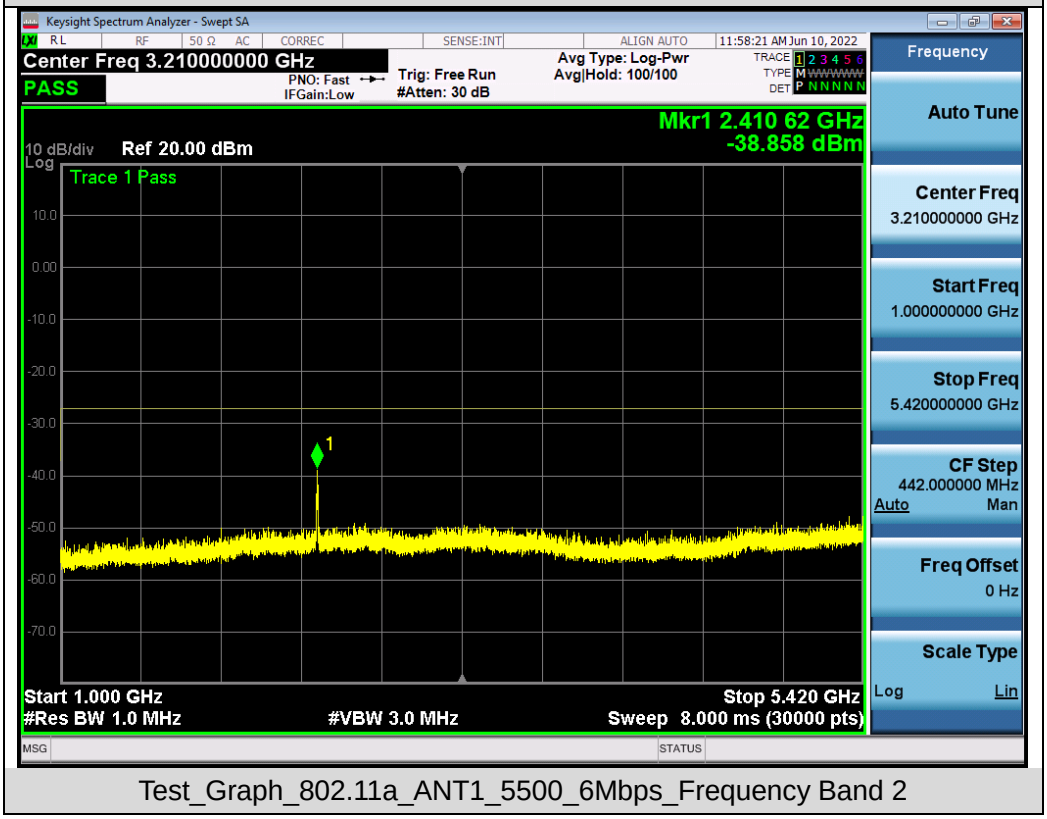


Test_Graph_802.11a_ANT1_5320_6Mbps_Frequency Band 5

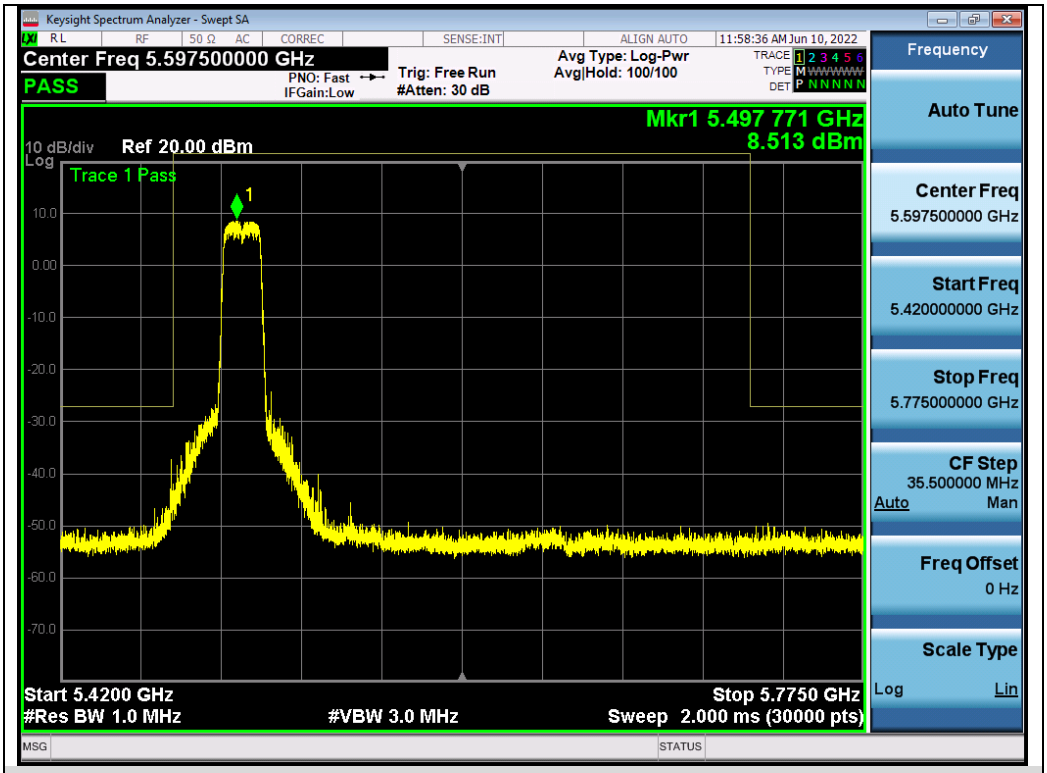
Test Graphs of Spurious Emissions outside of the 5.47-5.725 GHz band for transmitters operating in the 5.47-5.725 GHz band



Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 1

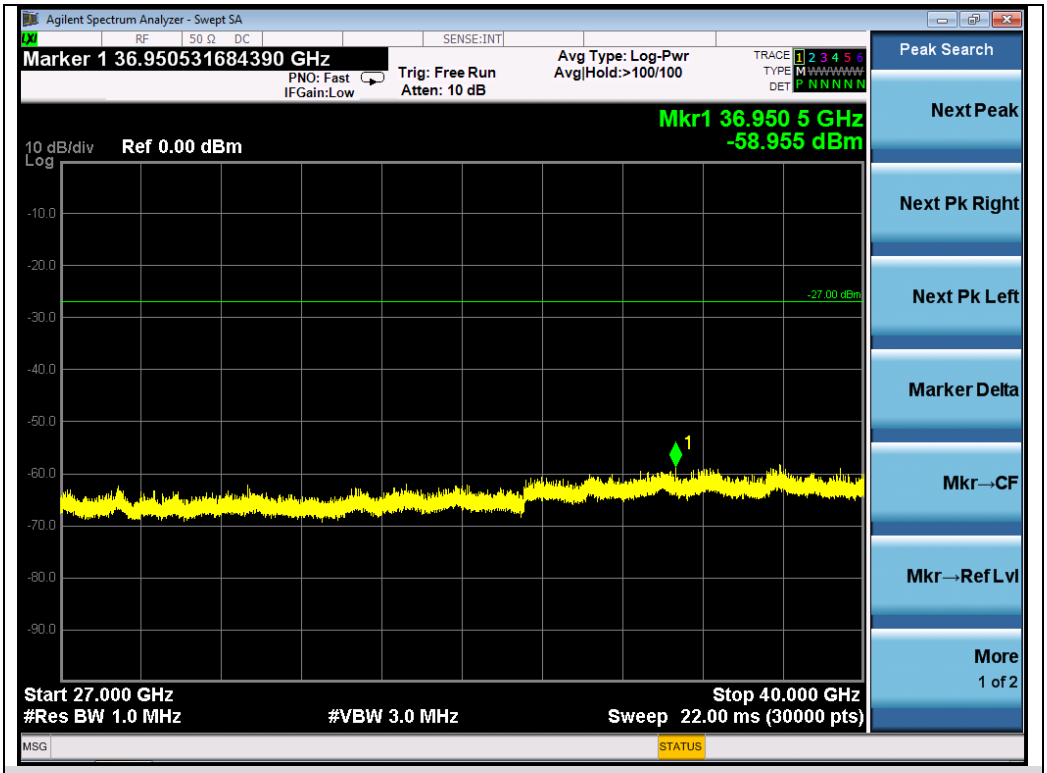


Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 2

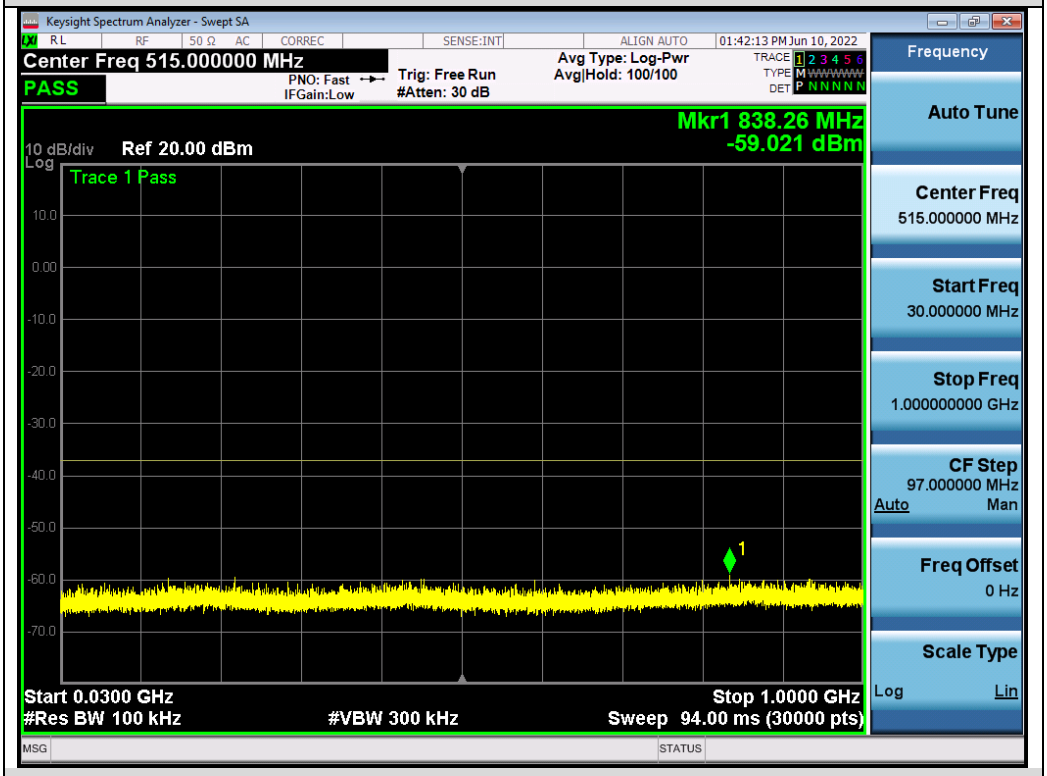


Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 3

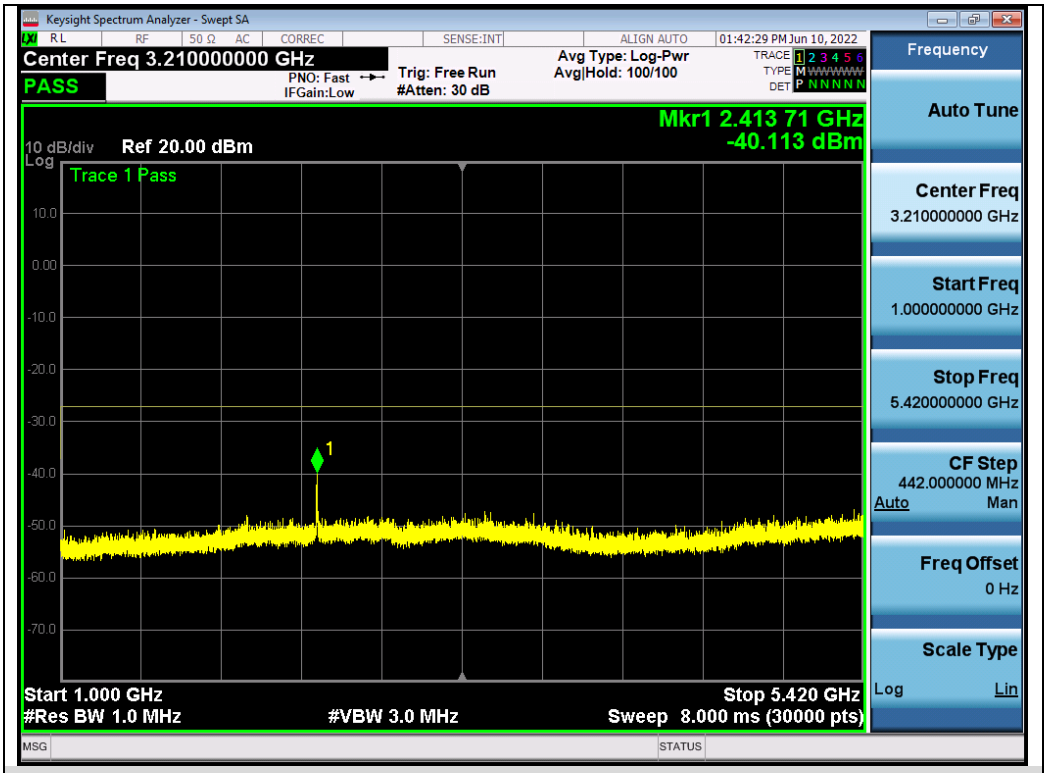
Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 4



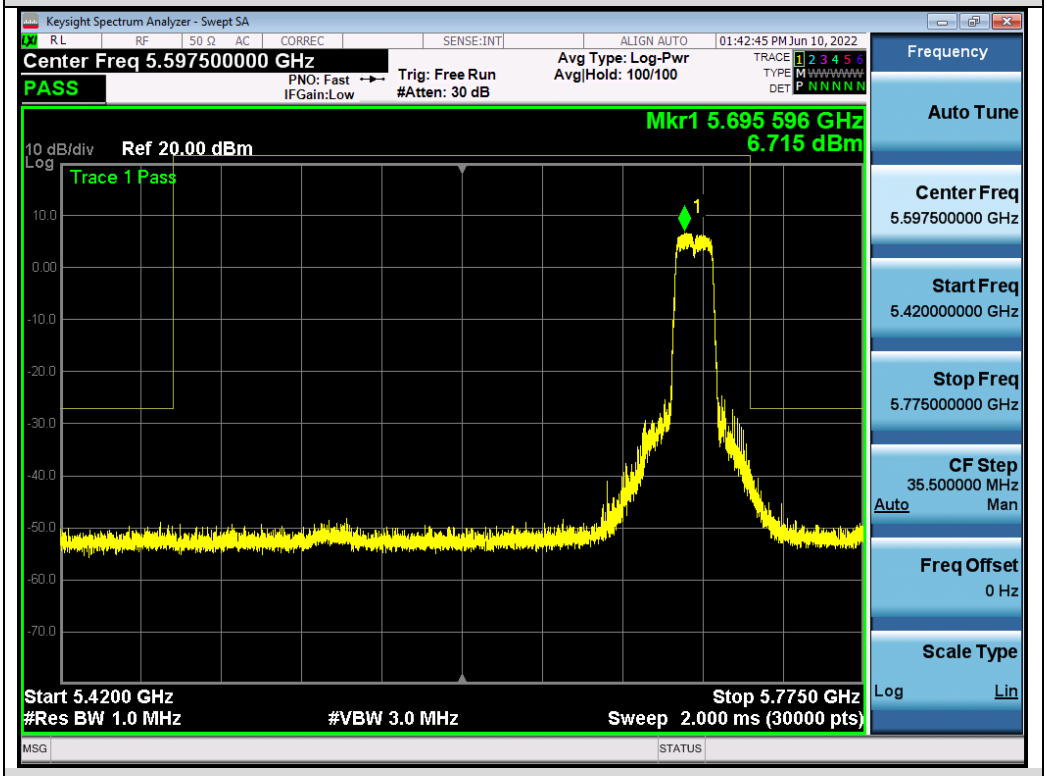
Test_Graph_802.11a_ANT1_5500_6Mbps_Frequency Band 5



Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 1

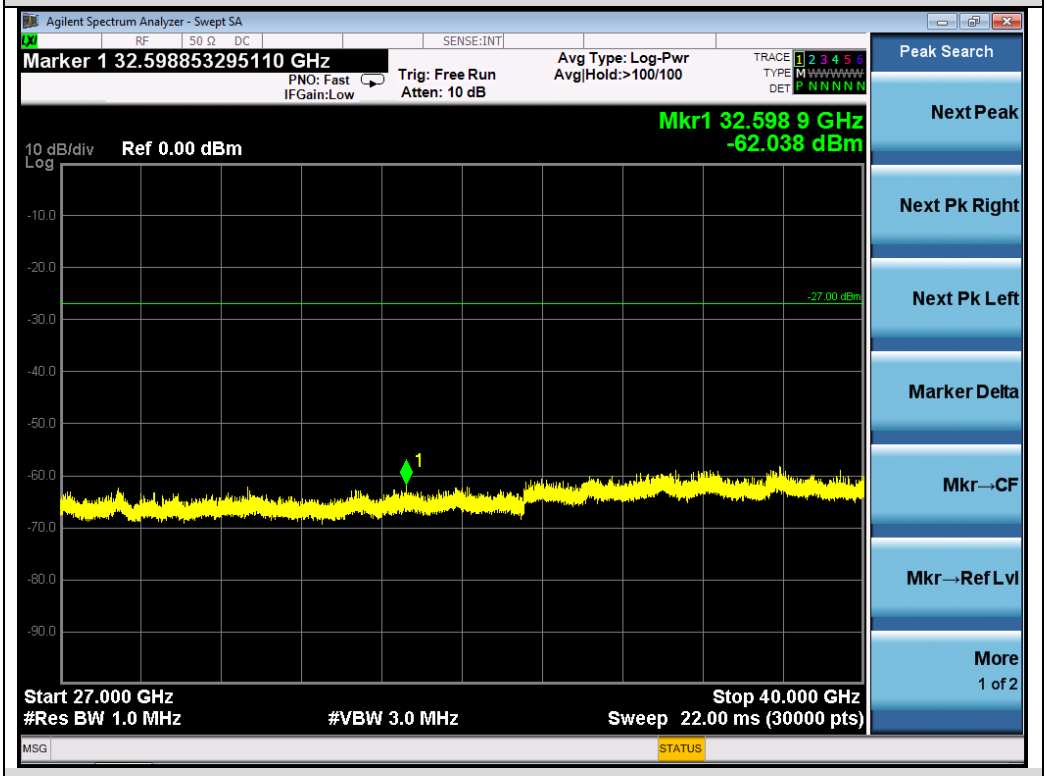


Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 2



Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 3

Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 4



Test_Graph_802.11a_ANT1_5700_6Mbps_Frequency Band 5

Note: All the antennas have been pre-tested, and all modes of each antenna are tested. The antenna 1 in 802.11a mode is the worst case and recorded in the test report. For the 802.11n, the worst case Antenna 1 has more than 3dB margins, so the MIMO mode also compliance the limit.

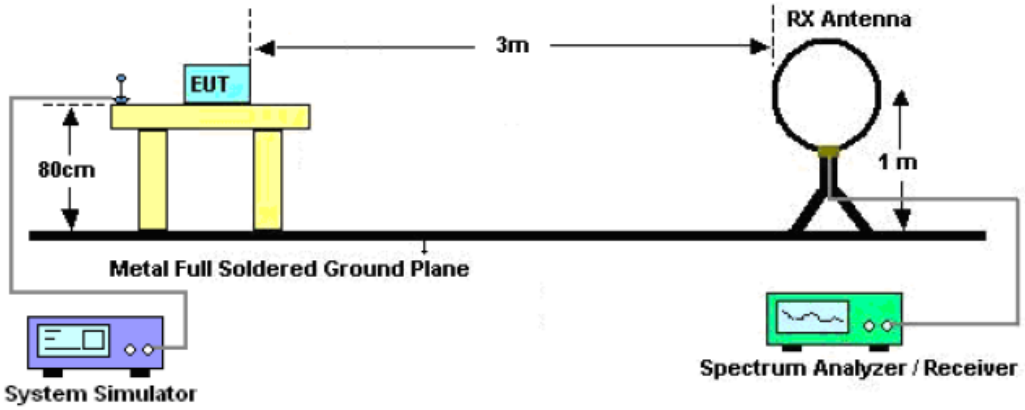
11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

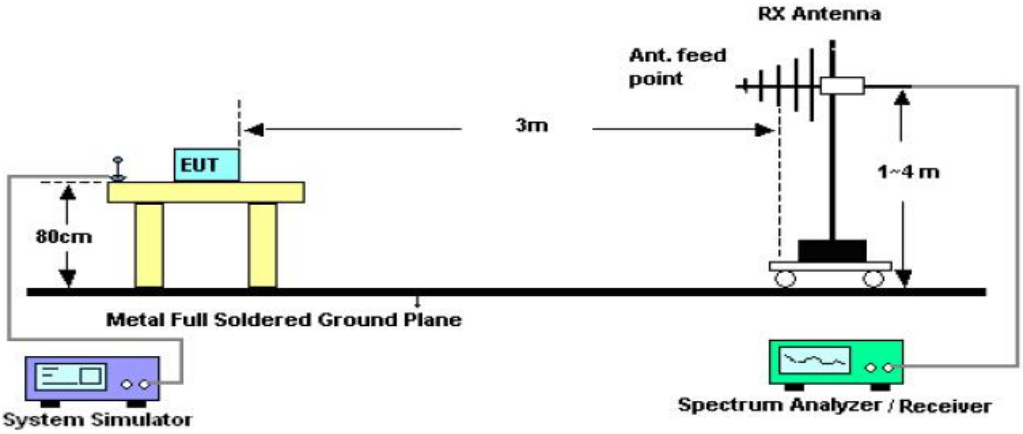
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated 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 emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 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