

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: BIONIME CORPORATION
No.100, Sec.2, Daqing St., South Dist., Taichung City 40242,
Taiwan(R.O.C)
Product Name: Blood Glucose Meter
Brand Name: Rightest / GE
Model No.: GM762, GM700 Pro 2, GlucoCapture Oro POCT
Model Difference: For Marketing different
Report Number: ER/2020/C0058
FCC ID ADU-GM700PRO2
Issue Date: Jul. 05, 2021
Date of Test: May 18, 2021 ~ Jun. 16, 2021
Date of EUT Received: May 18, 2021

Approved By

Jim Chang

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab 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 comply with FCC rule part §15.407.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History

Report Number	Revision	Description	Issue Date	Revised By
ER/2020/C0058	00	Original.	Jul. 05, 2021	Karen Huang

Note:

- 1、Measurement results in the original test report **ER/2020/60011** are leveraged in this test report with adding conduction data and new measurement of U-NII 3 to demonstrate compliance.
- 2、Variant information of model numbers/ brands is provided by the applicant, test results of this report are applicable to the sample EUT(s) received, and are assessed as identical in hardware and firmware to each other.

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Contents

1	GENERAL INFORMATION	4
2	SYSTEM TEST CONFIGURATION	8
3	SUMMARY OF TEST RESULT	11
4	DESCRIPTION OF TEST MODES	12
5	MEASUREMENT UNCERTAINTY	16
6	CONDUCTED EMISSION TEST	17
7	DUTY CYCLE TEST SIGNAL	21
8	EMISSION BANDWIDTH MEASUREMENT	24
9	MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT	35
10	MAXIMUM POWER SPECTRAL DENSITY	39
11	UNDESIRABLE RADIATED EMISSION MEASUREMENT	49
12	TRANSMISSION IN THE ABSENCE OF DATA.....	166
13	ANTENNA REQUIREMENT	167

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	Blood Glucose Meter
Brand Name:	Rightest / GE
Model No.:	GM762, GM700 Pro 2, GlucoCapture Oro POCT
Model Difference:	For Marketing different
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	YASA0290
Power Supply:	3.7Vdc from Rechargeable Li-ion Battery or 5V from AC/DC Adapter

1.2 Modulation & Data Rate

Modulation type:	64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6.5 - 54 Mbps
	802.11 n_20MHz: 6.5 - 72.2 Mbps
	802.11 n_40MHz: 13.5 - 150 Mbps

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1.3 Antenna Designation

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Antenna Gain
FPC	5150~5250	1.97	V
	5250~5350	2.16	V
	5475~5725	2.95	V
	5475~5825	3.35	V

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. Antenna information is provided by the applicant.

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1.4 FCC

WLAN 5 GHz

Wi-Fi	Frequency Range	Channels	Rated Power(Avg) (dBm) (Worst Case)	Modulation Technology
a n_HT 20M	5180~5240	4	14.99	OFDM
	5260~5320	4	14.98	OFDM
	5500~5700	11	14.96	OFDM
	5745~5825	5	13.34	OFDM
n_HT 40M	5190~5230	2	12.84	OFDM
	5270~5310	2	12.91	OFDM
	5510~5710	5	12.90	OFDM
	5755~5795	2	12.95	OFDM

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1.5 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10:2013

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction A	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		
Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.				

1.7 Special Accessories

There are no special accessories used while test was conducted.

1.8 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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2.5 Configuration of Tested System

Fig. 2-1 Conduction (AC Power Line)

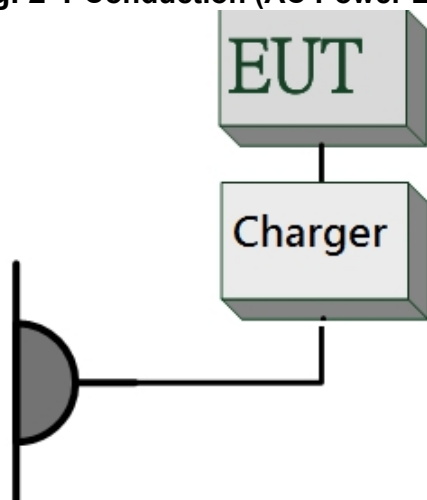


Fig. 2-2 Radiated Emission & Conducted (Antenna Port)

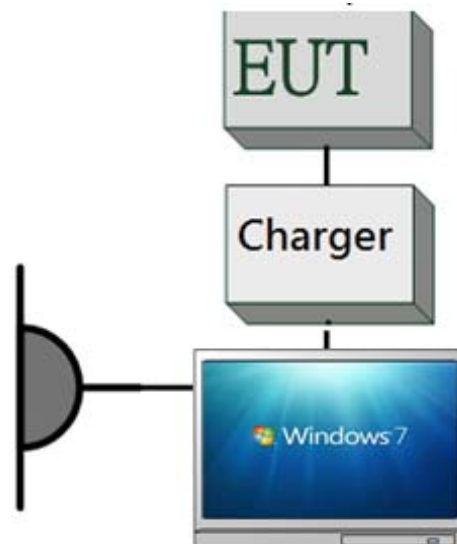


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
1	Qualcomm Radio Control Toolkit	N/A	N/A	N/A
2	Notebook	Lenovo	L430	R9-XFG0X
3	Notebook	Lenovo	L430	R9-X11BG

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3 SUMMARY OF TEST RESULT

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.407(e)	Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.205 §15.209 §15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operating Frequencies

Operated band in 5150 MHz ~5250 MHz:

20 M		40 M	
CH	Freq (MHz)	CH	Freq (MHz)
36	5180	38	5190
40	5200	46	5230
44	5220		
48	5240		

Operated band in 5250 MHz ~5350 MHz

20 M		40 M	
CH	Freq (MHz)	CH	Freq (MHz)
52	5260	54	5270
56	5280	62	5310
60	5300		
64	5320		

Operated band in 5470 MHz ~5725 MHz:

20 M		40 M	
CH	Freq (MHz)	CH	Freq (MHz)
100	5500	102	5510
104	5520	110	5550
108	5540	118	5590
112	5560	126	5630
116	5580	134	5670
120	5600		
124	5620		
128	5640		
132	5660		
136	5680		
140	5700		

Operated band in 5745 MHz ~5850 MHz

20		40	
CH	Freq (MHz)	CH	Freq (MHz)
149	5745	151	5755
153	5765	159	5795
157	5785		
161	5805		
165	5825		

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case. The given UE is pre-scanned among below modes.

Modulation	Transmission Chain				Single Transmission Spatial	Multiple Transmission Spatial
<input checked="" type="checkbox"/> 802.11 a	<input checked="" type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input checked="" type="checkbox"/> 1TX	<input type="checkbox"/> 2TX
<input checked="" type="checkbox"/> 802.11 n	<input checked="" type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input checked="" type="checkbox"/> SISO	<input type="checkbox"/> MIMO
<input type="checkbox"/> 802.11 ac	<input type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> SISO	<input type="checkbox"/> MIMO
<input type="checkbox"/> 802.11 ax	<input type="checkbox"/> Ch0	<input type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> SISO	<input type="checkbox"/> MIMO

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

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4.2.1 RADIATED EMISSION TEST:

RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	44	OFDM	6	ch0
	5260~5320	52 to 64	60			
	5500~5700	100 to 140	116			
	5745~5825	149 to 165	157			
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	ch0
	5260~5320	52 to 64	52,60,64			
	5500~5700	100 to 140	100,116,140			
	5745~5825	149 to 165	149,157,165			
802.11n_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	ch0
	5260~5320	52 to 64	52,60,64			
	5500~5700	100 to 140	100,116,140			
	5745~5825	149 to 165	149,157,165			
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	ch0
	5270~5310	54 to 62	54,62			
	5510~5670	102 to 142	102,110,134,142			
	5755~5795	151 to 159	151,159			

Note:

The field strength of radiation emission was measured as EUT three orthogonal plans, E1 / E2 / H, are positioned to pre-scan the emission generating the highest one. The worst position is tested, and recorded.

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4.2.2 ANTENNA PORT CONDUCTED MEASUREMENT:

CONDUCTED TEST						
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	ch0
	5260~5320	52 to 64	52,60,64			
	5500~5700	100 to 140	100,116,140			
	5745~5825	149 to 165	149,157,165			
802.11n_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	ch0
	5260~5320	52 to 64	52,60,64			
	5500~5700	100 to 140	100,116,140			
	5745~5825	149 to 165	149,157,165			
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	ch0
	5270~5310	54 to 62	54,62			
	5510~5670	102 to 142	102,110,134,142			
	5755~5795	151 to 159	151,159			

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.34 dB
Emission Bandwidth	+/- 1.53 Hz
The Maximum Output Power Measurement	+/- 1 dB
Peak Power Spectral Density Measurement	+/- 1.53 dB
Frequency Stability	+/- 1.53 Hz
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	2.64 dB	9kHz~30MHz
	+/-	4.93 dB	30MHz - 1000MHz
	+/-	4.81 dB	1GHz - 18GHz
	+/-	4.52 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	2.64 dB	9kHz~30MHz
	+/-	4.45 dB	30MHz - 1000MHz
	+/-	4.81 dB	1GHz - 18GHz
	+/-	4.52 dB	18GHz - 40GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 CONDUCTED EMISSION TEST

6.1 Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note

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

6.2 Measurement Equipment Used

Radiated Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI 7	100759	07/13/2020	07/12/2021
LISN	SCHWARZ-BECK	NSLK 8127	8127-465	04/09/2021	04/08/2022
Coaxial Cables	N/A	Coaxial Cable	161207	12/07/2020	12/06/2021
Test Software	audix	e3	Ver. 6.11-20180413	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

6.3 EUT Setup

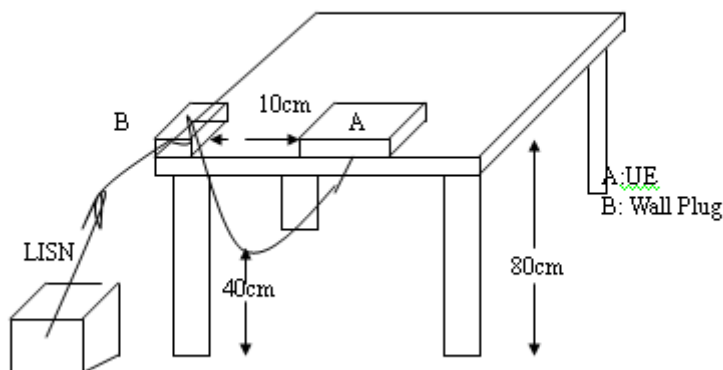
1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

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6.4 Test SET-UP



6.5 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed.

6.6 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closet to the limit.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :ER-2020-C0058

Test Site :Conduction 6F

Test Mode :WLAN 5G

Test Date :2021-05-18

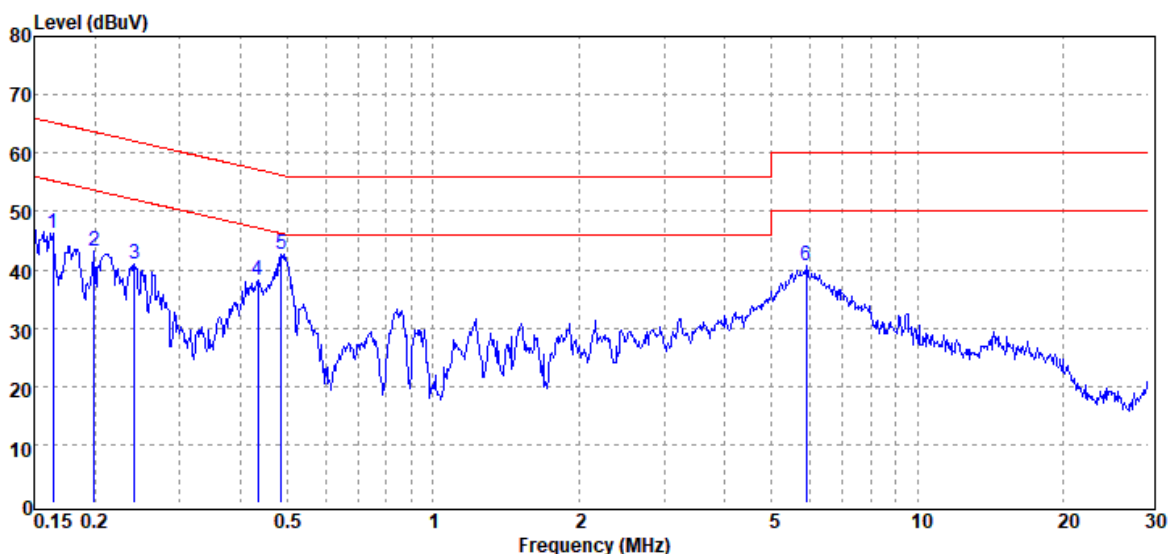
Power :AC 120V/60Hz

Temp./Humi. :26.2/55

Probe :L

Engineer :Ricky Chen

Note :



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.16	Peak	46.17	0.04	46.21	65.25	-19.04
0.20	Peak	43.10	0.04	43.14	63.62	-20.48
0.24	Peak	40.82	0.04	40.86	62.04	-21.18
0.44	Peak	37.96	0.12	38.08	57.15	-19.07
0.49	Peak	42.49	0.15	42.64	56.23	-13.59
5.90	Peak	40.08	0.61	40.69	60.00	-19.31

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Report Number :ER-2020-C0058

Test Mode :WLAN 5G

Power :AC 120V/60Hz

Probe :N

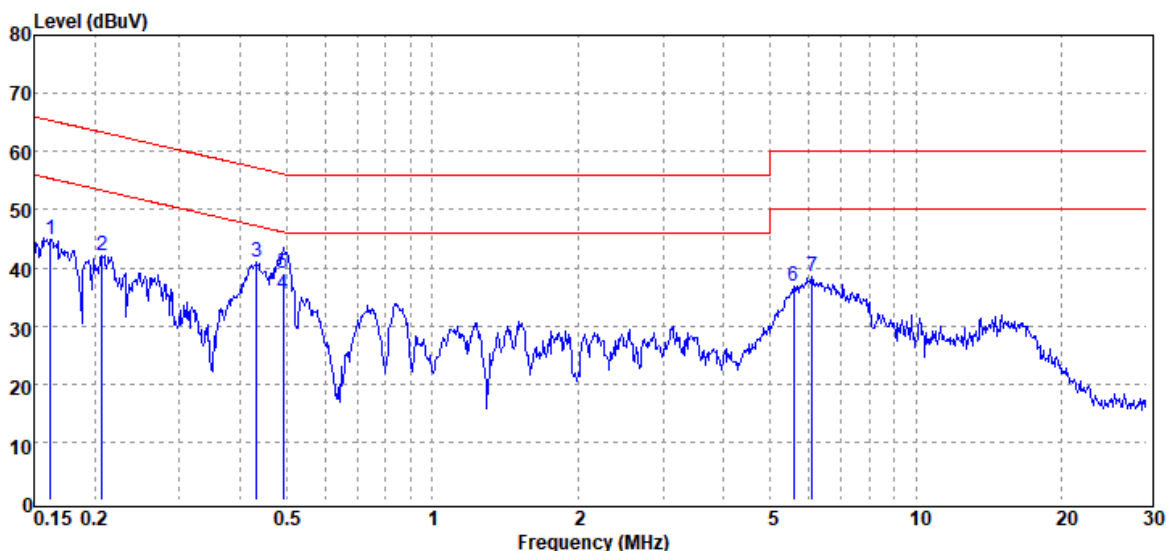
Note: :

Test Site :Conduction 6F

Test Date :2021-05-18

Temp./Humi. :26.2/55

Engineer :Ricky Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.16	Peak	44.82	0.11	44.93	65.34	-20.41
0.21	Peak	42.05	0.11	42.16	63.32	-21.16
0.43	Peak	40.73	0.18	40.91	57.20	-16.29
0.49	Average	35.27	0.22	35.49	46.14	-10.65
0.49	QP	38.73	0.22	38.95	56.14	-17.19
5.59	Peak	36.38	0.51	36.89	60.00	-23.11
6.09	Peak	37.86	0.54	38.40	60.00	-21.60

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7 DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1 Measurement Procedure:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

Duty Cycle:

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	87.00	0.60	0.73	1.00
802.11n_20	86.00	0.66	0.78	1.00
802.11n_40	76.00	1.19	1.57	2.00

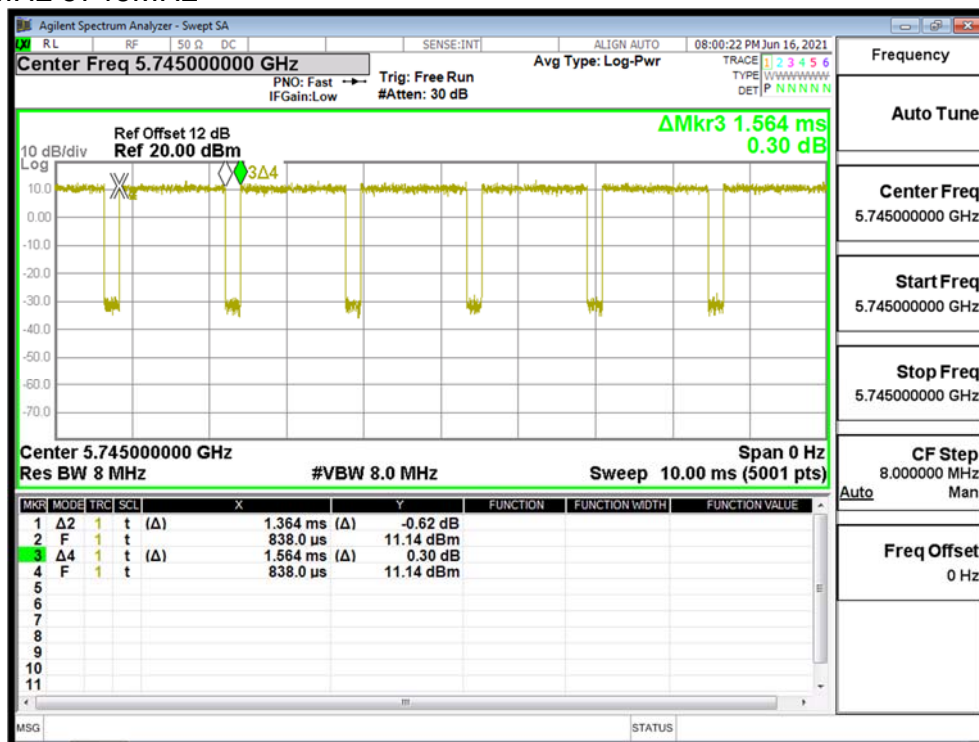
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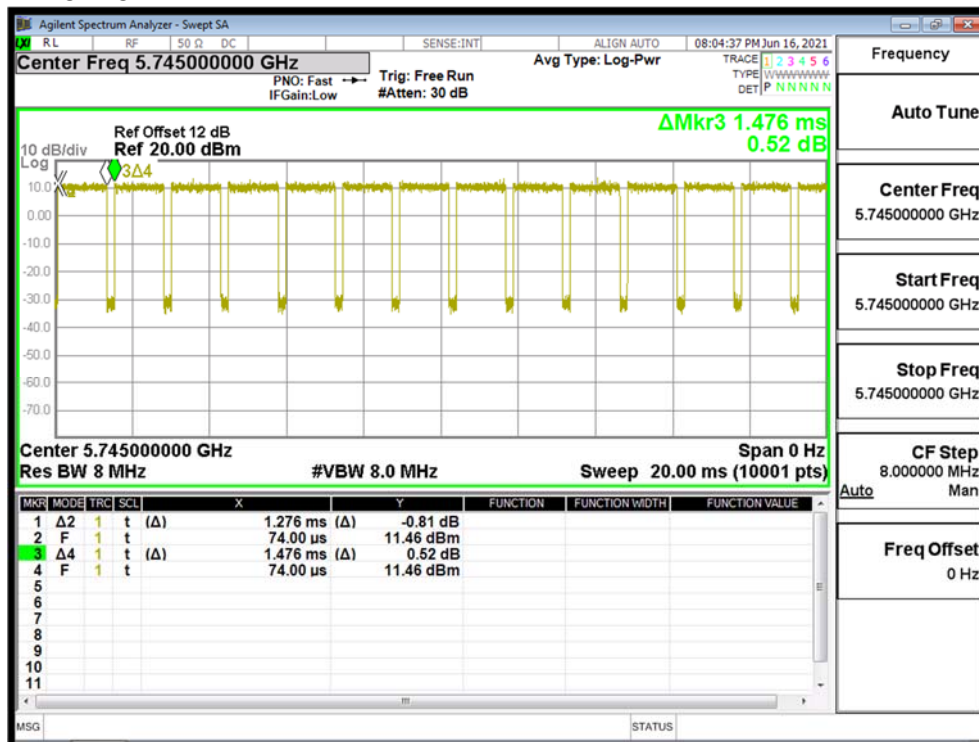
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7.2 DUTY CYCLE TEST SIGNAL MEASUREMENT RESULT

802.11a_20MHz 5745MHz



802.11n_20MHz 5745 MHz

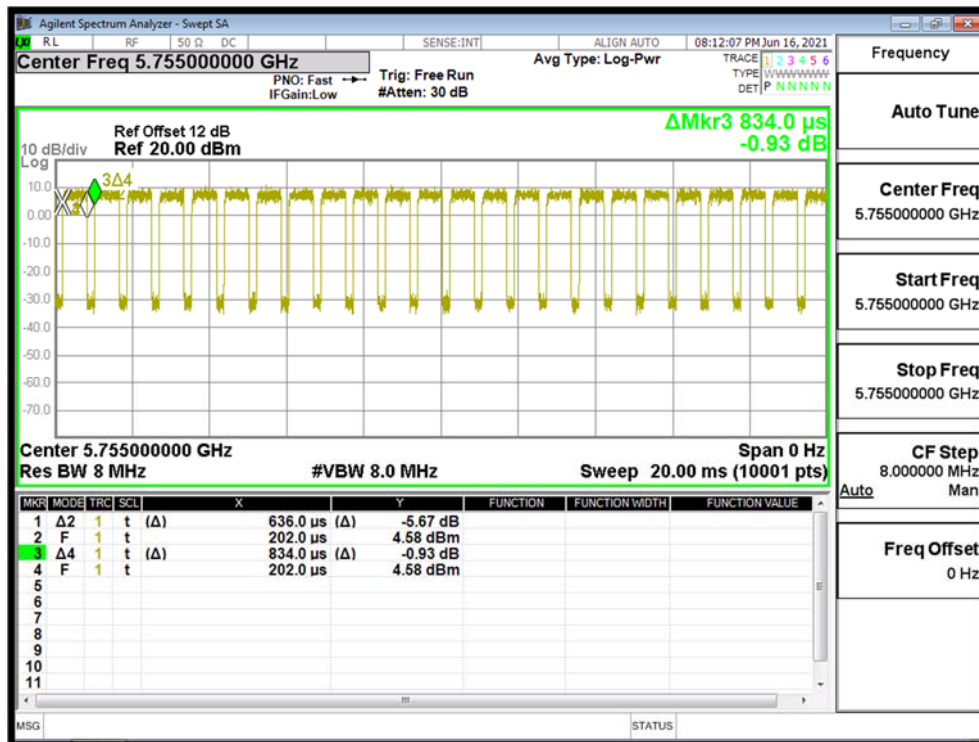


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802.11n_40MHz 5755 MHz



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8 EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - 3.a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW
Sweep=auto,
Detector = Peak,
Trace Mode = Max Hold,
Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - 3.b. Mark the peak frequency and -26dB (upper and lower) frequency.
4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
 - a. Set the spectrum analyzer as
RBW = 100 kHz,
VBW = 3*RBW,
Span = 30M/50MHz,
Detector=Peak,
Sweep=auto
 - b. Mark the peak frequency and -6dB (upper and lower) frequency.
6. Repeat above procedures until all frequency of interest measured was complete.

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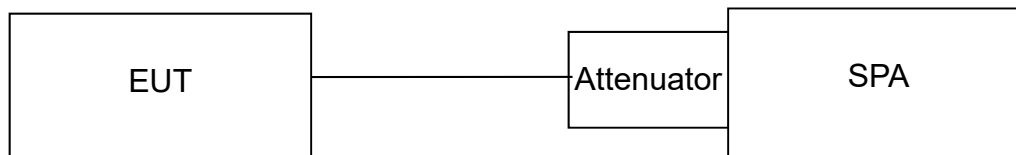
8.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	05/06/2020	05/05/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021

For U-NII 3 measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	05/12/2021	05/11/2022
Attenuator	Mini-Circuit	BW-S10W2+	2	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

8.4 Test Set-up



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8.5 Measurement Result

8.5.1 FCC 26dB Bandwidth

802.11a_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	26.53	14.240
5220	24.41	13.880
5240	25.14	14.000
5260	23.74	13.750
5300	23.08	13.630
5320	22.63	13.550
5500	30.00	14.770
5580	30.00	14.770
5700	30.00	14.770

802.11n_HT20_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	25.73	14.100
5220	22.98	13.610
5240	24.14	13.830
5260	22.49	13.520
5300	22.88	13.590
5320	22.66	13.550
5500	27.92	14.460
5580	28.15	14.490
5700	28.82	14.600

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802.11n_HT40_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	49.07	16.910
5230	46.71	16.690
5270	46.46	16.670
5310	47.82	16.800
5510	50.00	16.990
5550	49.07	16.910
5670	49.70	16.960

8.5.2 6dB Bandwidth (5725 MHz~ 5850 MHz) measure with Peak detector for FCC

802.11a_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	15.77	11.980
5785	16.34	12.130
5825	16.30	12.120

802.11n_HT20_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.56	12.450
5785	17.60	12.460
5825	16.93	12.290

802.11n_HT40_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	33.58	15.260
5795	34.13	15.330

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8.5.3 BW Verification for DFS Function

802.11a_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.62	< 5250

802.11n_HT20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.00	< 5250

802.11n_HT40_Ch0

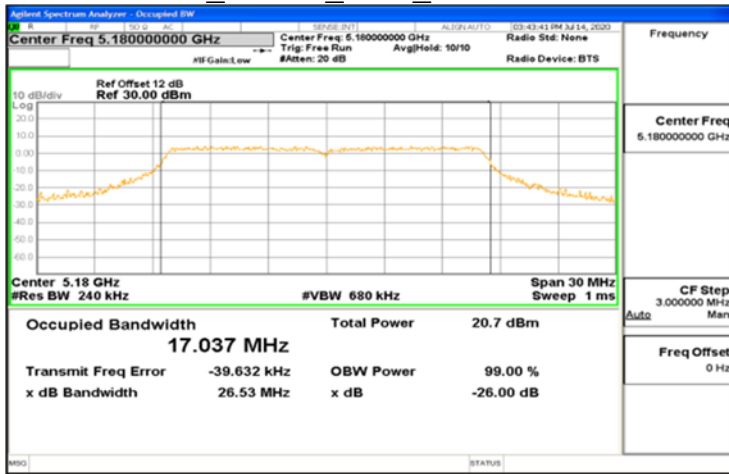
Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.13	< 5250

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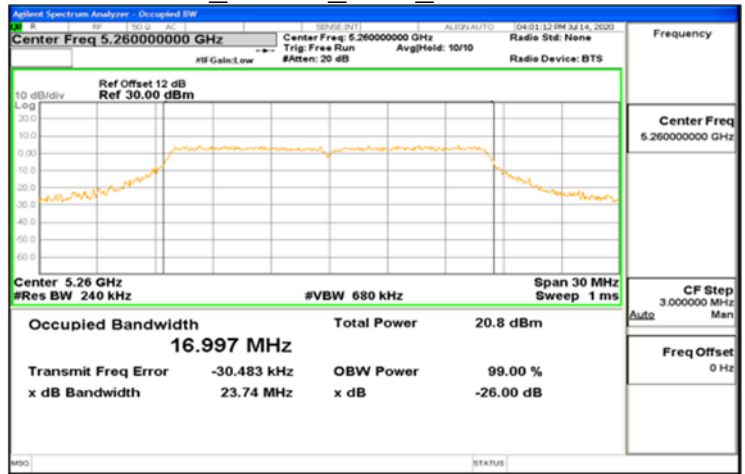
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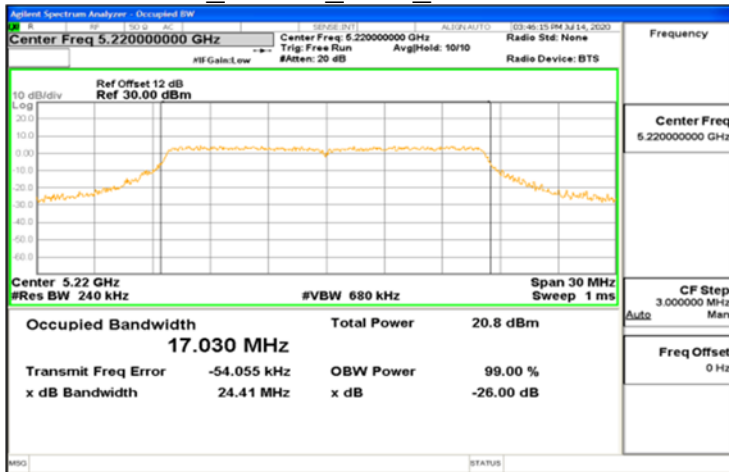
802.11a_20MHz_Main_5180MHz-5180



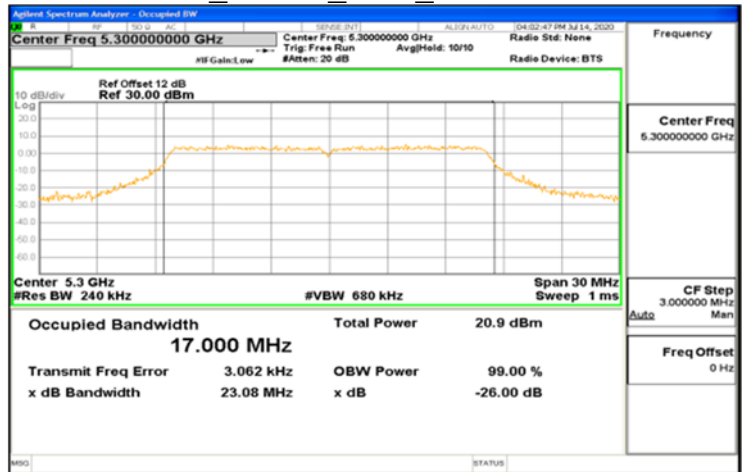
802.11a_20MHz_Main_5260MHz-5260



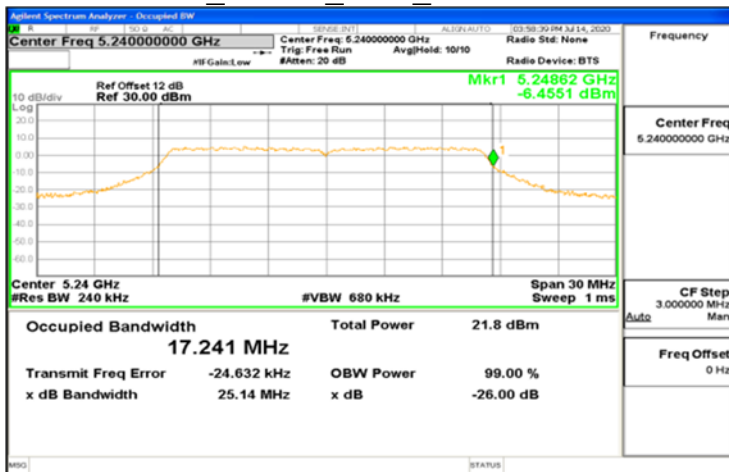
802.11a_20MHz_Main_5220MHz-5220



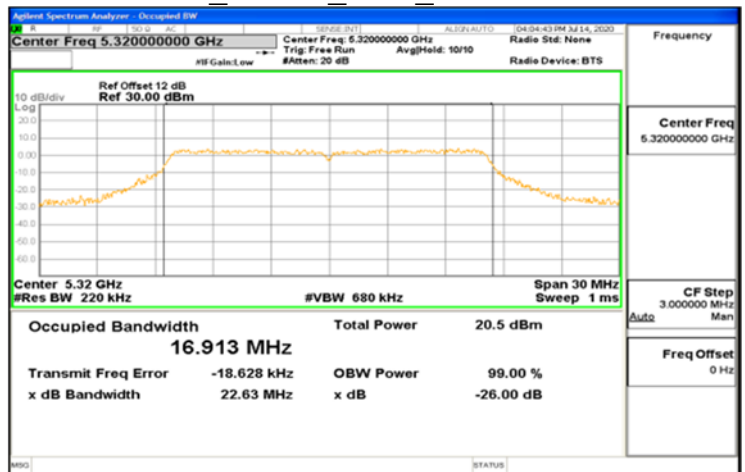
802.11a_20MHz_Main_5300MHz-5300



802.11a_20MHz_Main_5240MHz-5240



802.11a_20MHz_Main_5320MHz-5320

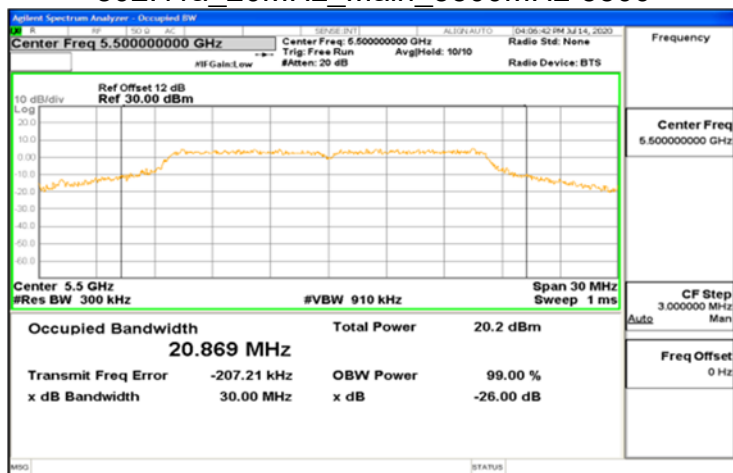


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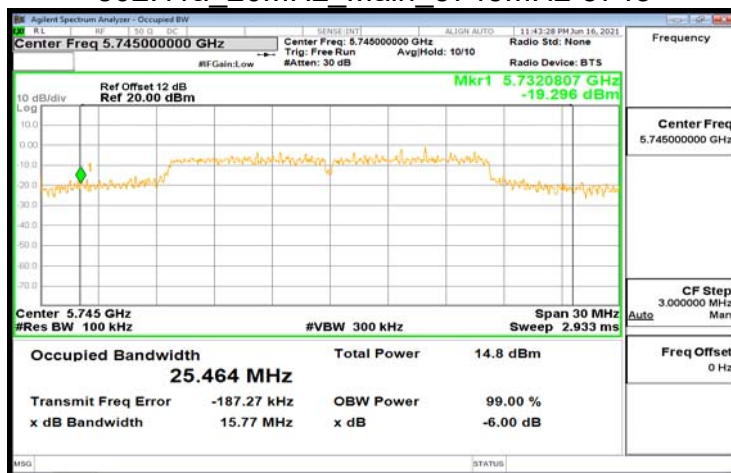
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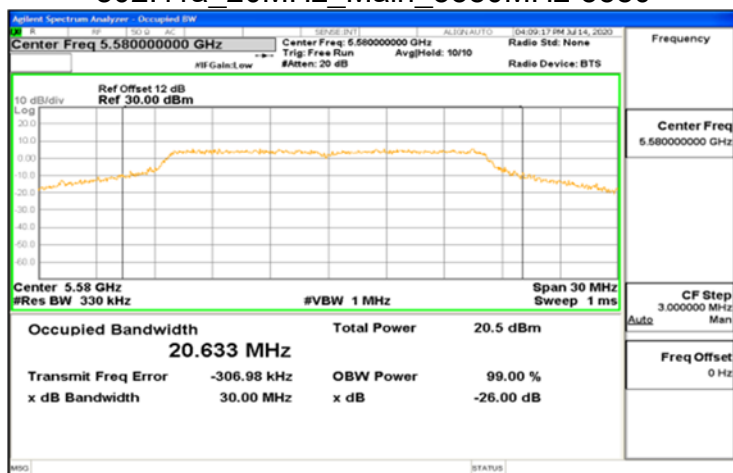
802.11a 20MHz Main 5500MHz-5500



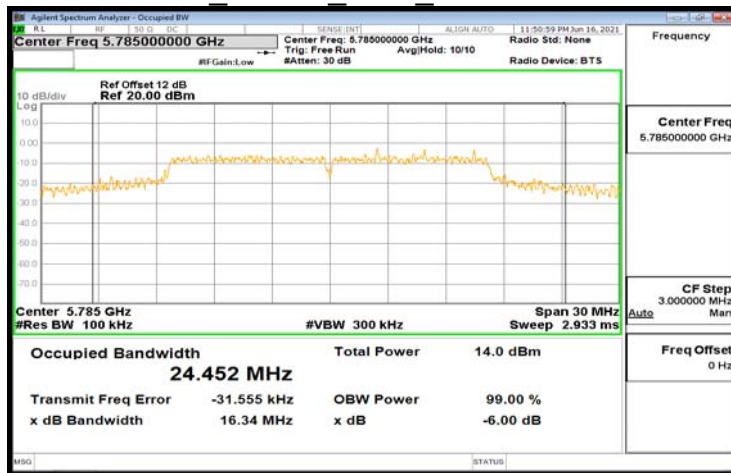
802.11a 20MHz Main 5745MHz-5745



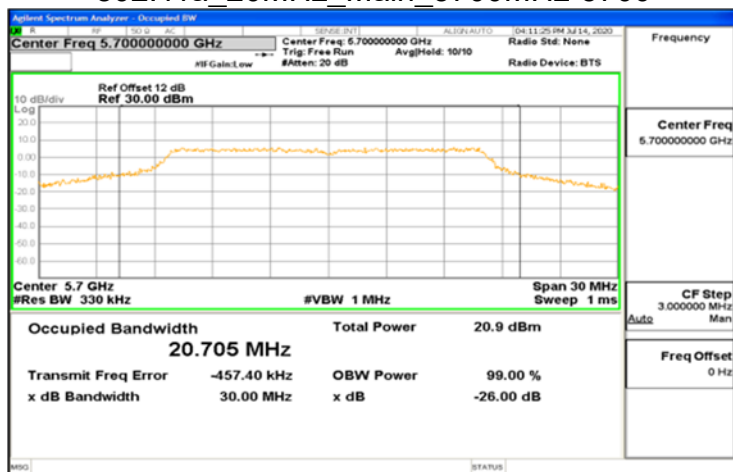
802.11a 20MHz Main 5580MHz-5580



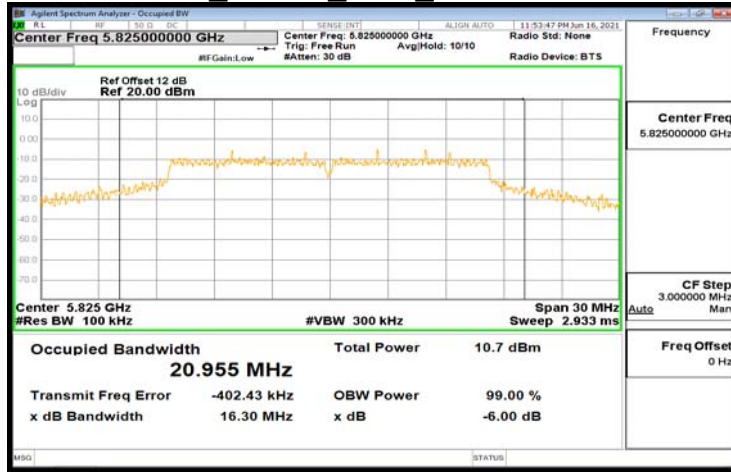
802.11a 20MHz Main 5785MHz-5785



802.11a 20MHz Main 5700MHz-5700



802.11a 20MHz Main 5825MHz-5825

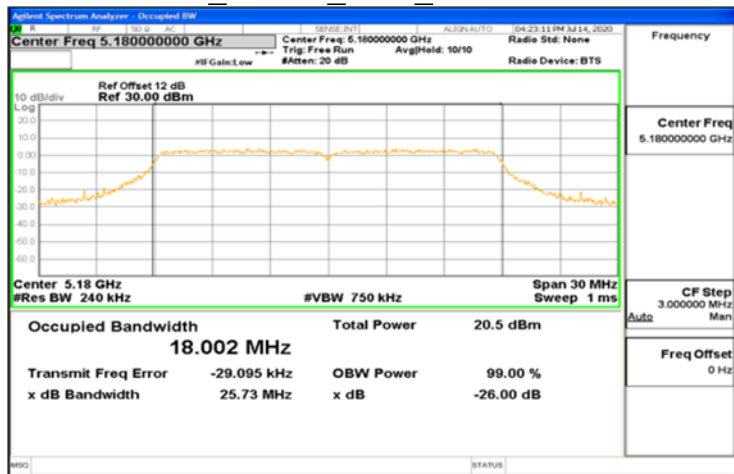


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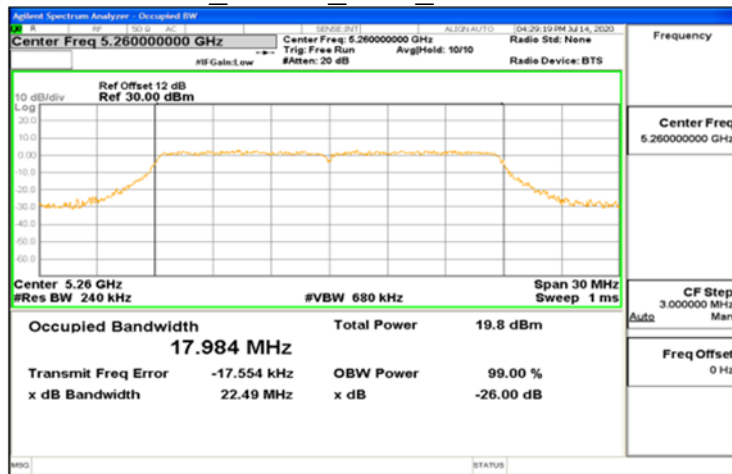
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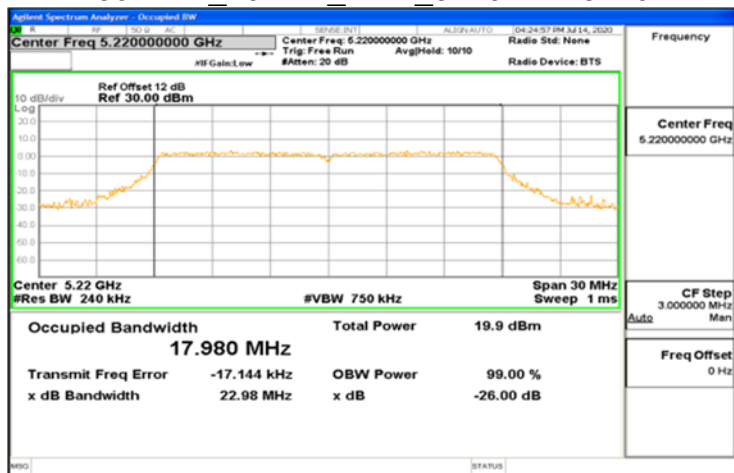
802.11n_20MHz_Main_5180MHz-5180



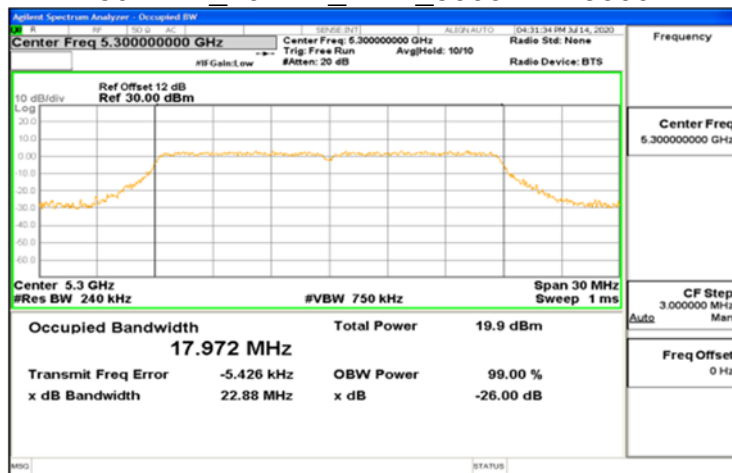
802.11n_20MHz_Main_5260MHz-5260



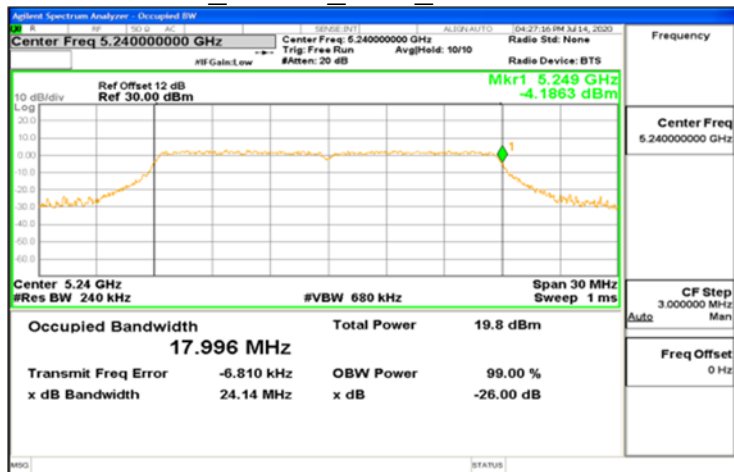
802.11n_20MHz_Main_5220MHz-5220



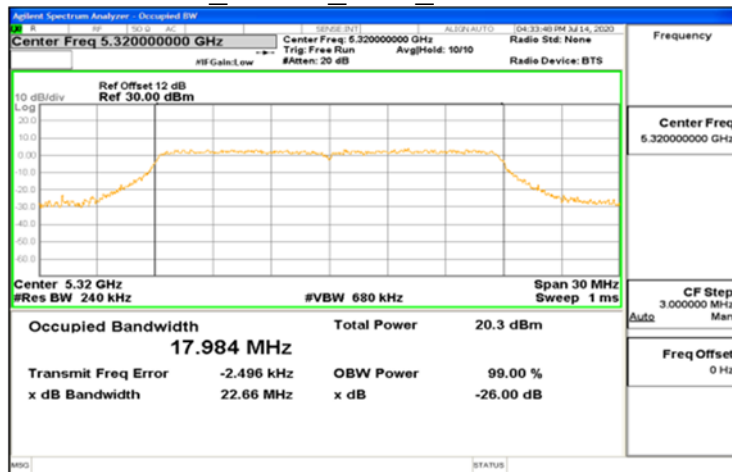
802.11n_20MHz_Main_5300MHz-5300



802.11n_20MHz_Main_5240MHz-5240



802.11n_20MHz_Main_5320MHz-5320

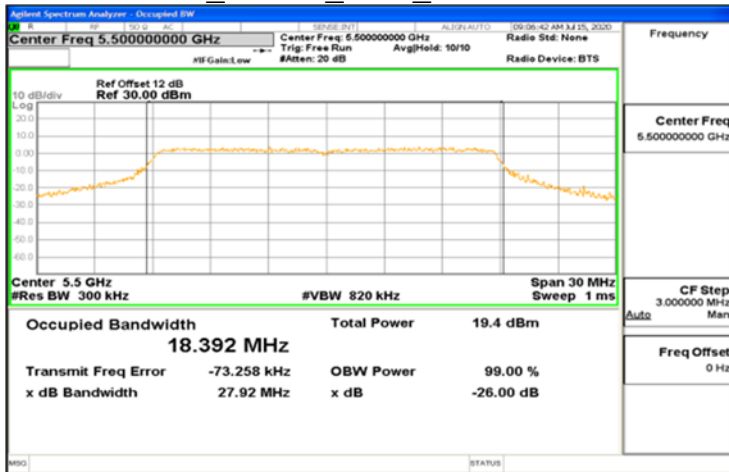


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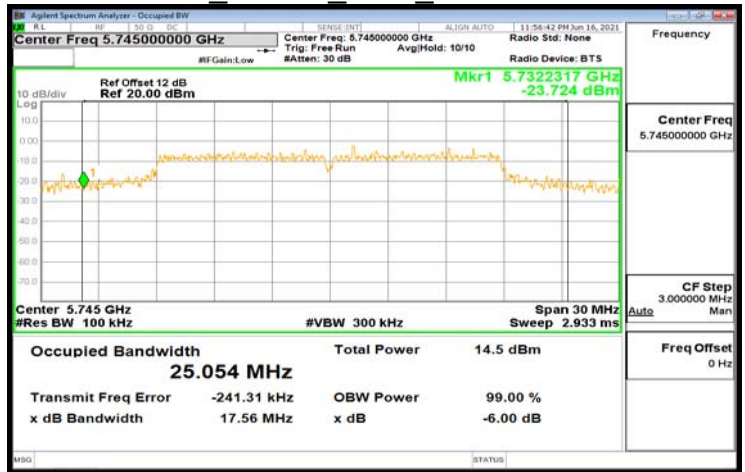
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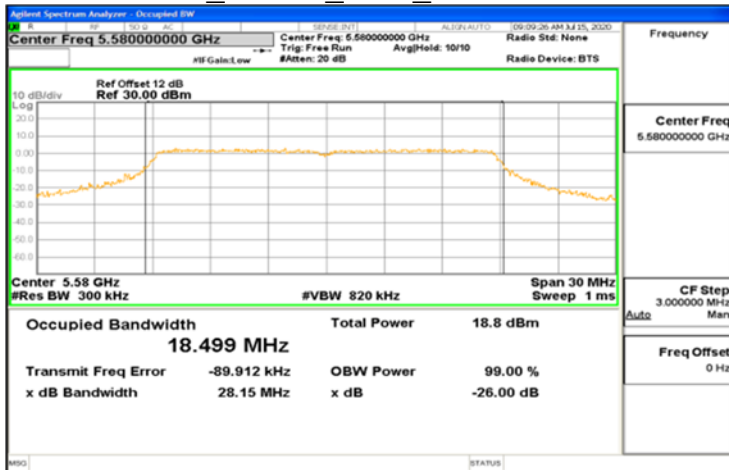
802.11n 20MHz Main 5500MHz-5500



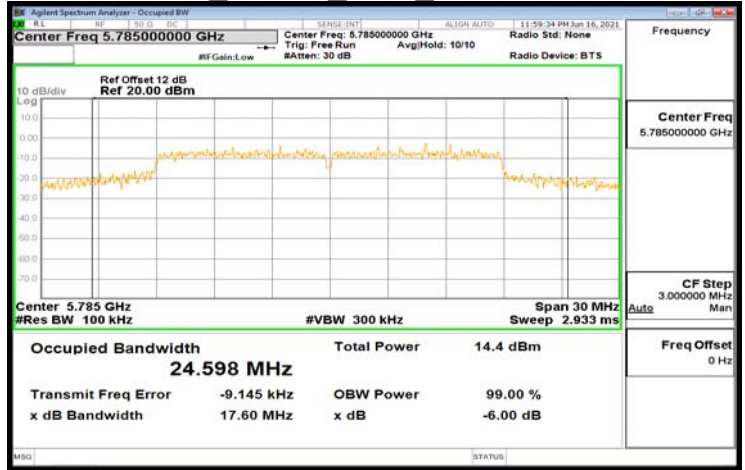
802.11n 20MHz Main 5745MHz-5745



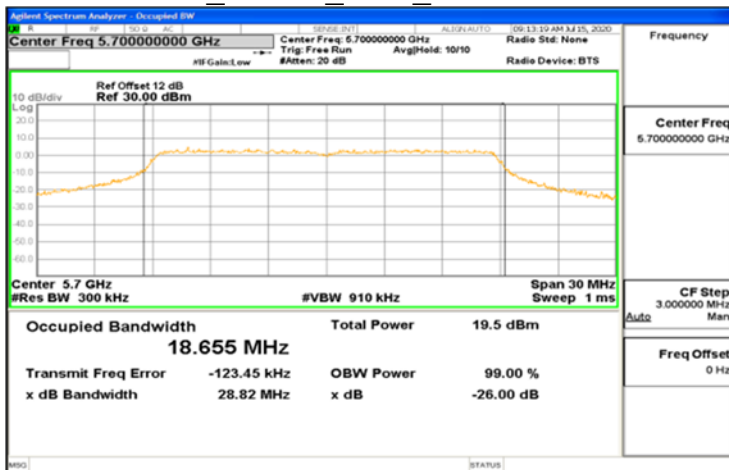
802.11n 20MHz Main 5580MHz-5580



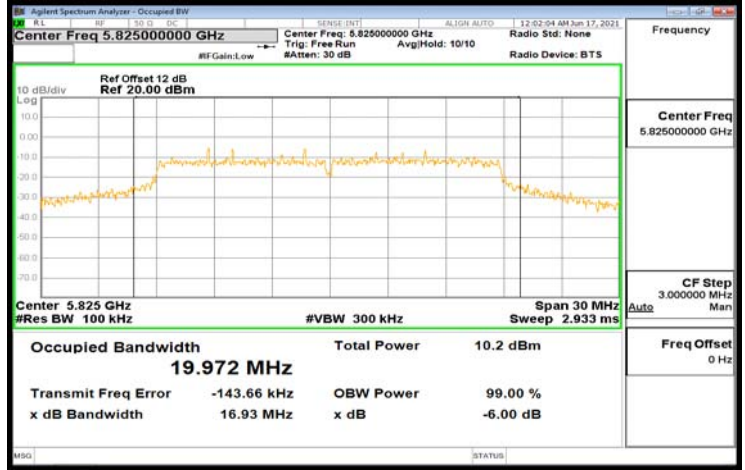
802.11n 20MHz Main 5785MHz-5785



802.11n 20MHz Main 5700MHz-5700



802.11n 20MHz Main 5825MHz-5825

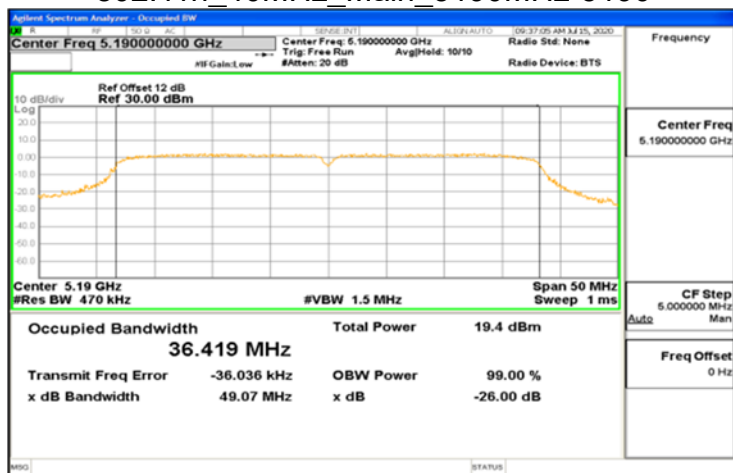


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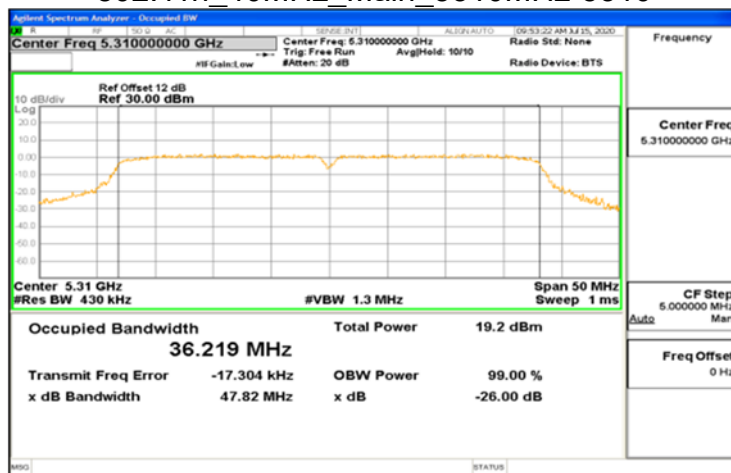
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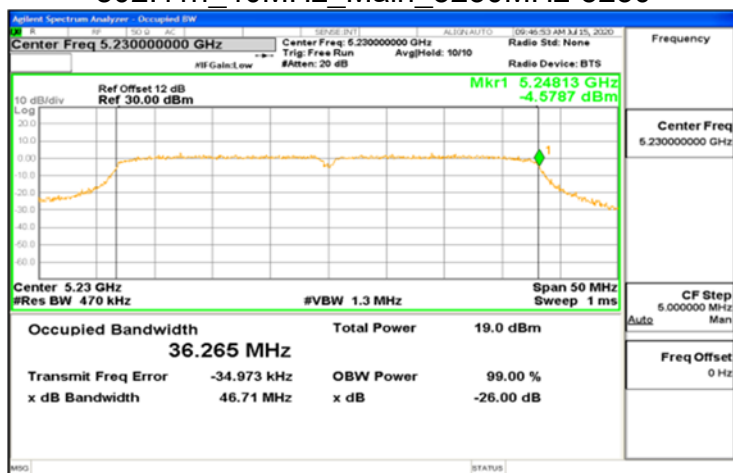
802.11n_40MHz_Main_5190MHz-5190



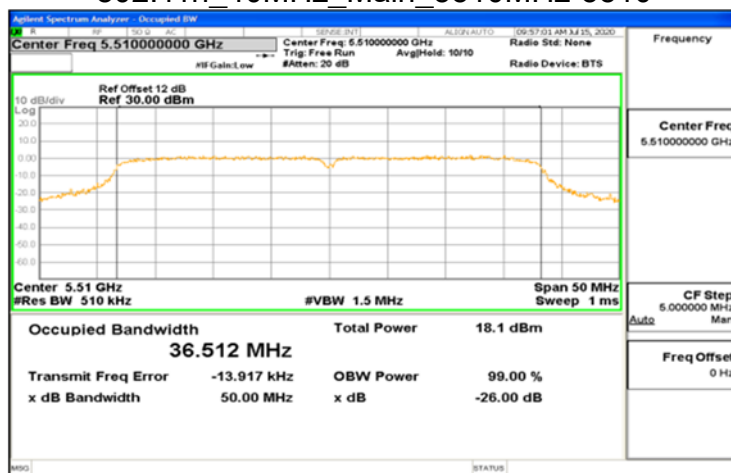
802.11n_40MHz_Main_5310MHz-5310



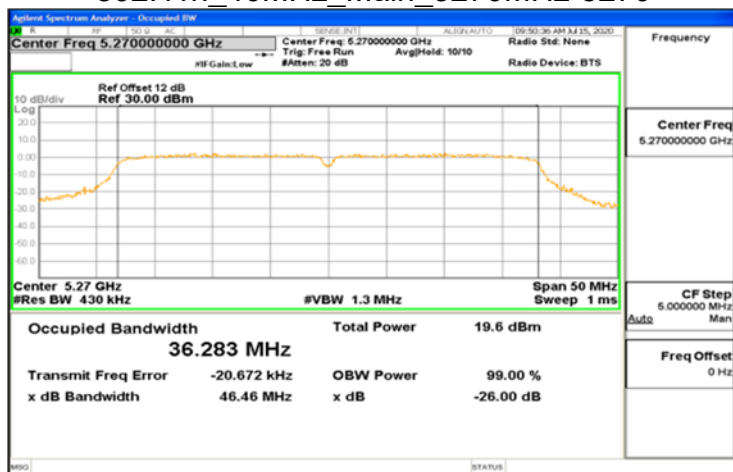
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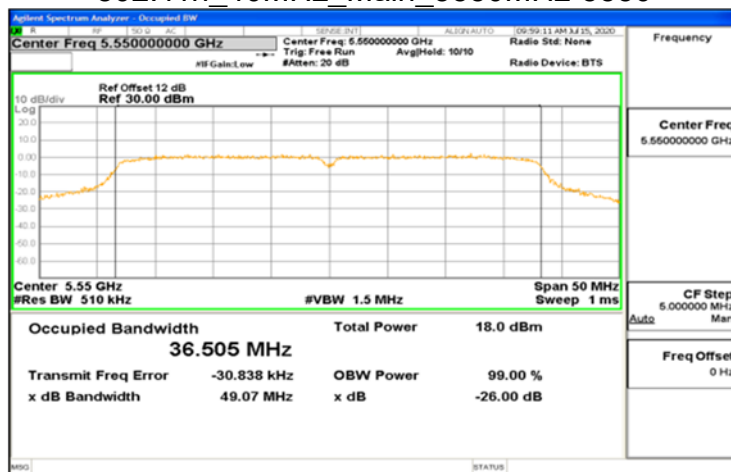
802.11n_40MHz_Main_5510MHz-5510



802.11n_40MHz_Main_5270MHz-5270



802.11n_40MHz_Main_5550MHz-5550

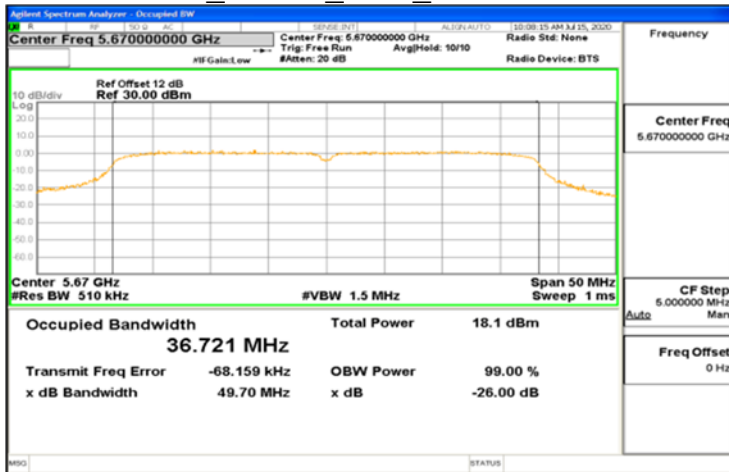


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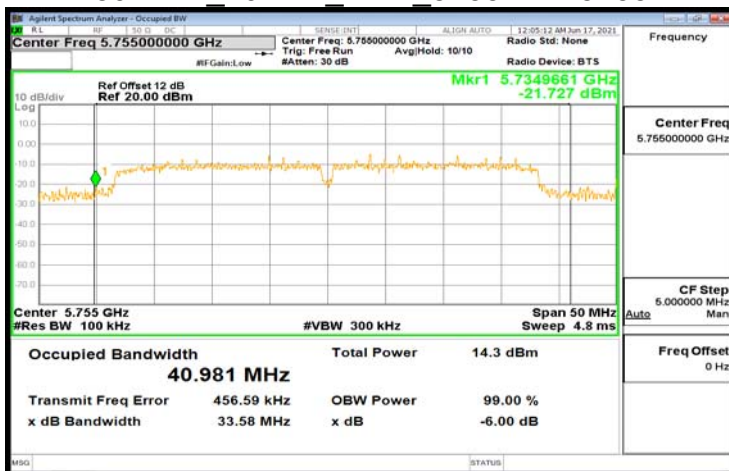
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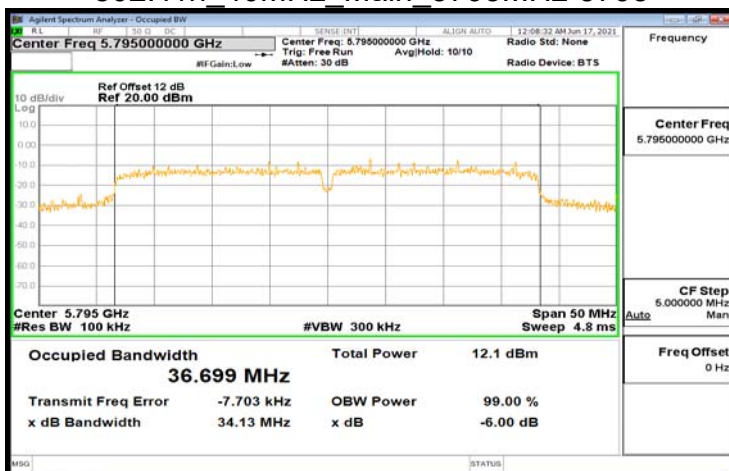
802.11n 40MHz Main 5670MHz-5670



802.11n 40MHz Main 5755MHz-5755



802.11n 40MHz Main 5795MHz-5795



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9 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

9.1 Standard Applicable

FCC

Band	EUT CATEGORY		LIMIT			
			Conducted Output Power	EIRP	TPC	Antenna Directional Gain Requirements
U-NII-1	<input type="checkbox"/>	Fixed point-to-point	1 Watt(30dBm)	Not required	Not required	23dBi
	<input type="checkbox"/>	Out door AP	1 Watt(30dBm)	Elevation angle above 30 degrees 125mW (21dBm)	Not required	6dBi
	<input checked="" type="checkbox"/>	Other	250mW(23.98dBm)	Not required	Not required	6dBi
U-NII-2A	<input checked="" type="checkbox"/>	Other	250mW(23.98dBm) or 11dBm+10 log B	Not required	When EIRP >500mW	6dBi
U-NII-2C	<input checked="" type="checkbox"/>	Other	250mW(23.98dBm) or 11dBm+10 log B	Not required	At least 6dB below EIRP 1W (30dBm)	6dBi
U-NII-3	<input checked="" type="checkbox"/>	Other	1 Watt(30dBm)	Not required	Not required	6dBi
	<input type="checkbox"/>	Fixed point-to-point	1 Watt(30dBm)	Not required	Not required	Not required

If transmitting antennas of directional gain greater than the antenna requirements column, the Maximum transmit power shall be reduced by the amount in dB that the direction-al gain of the antenna.

9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
5. Record the max. reading and add 10 log(1/duty cycle).
6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

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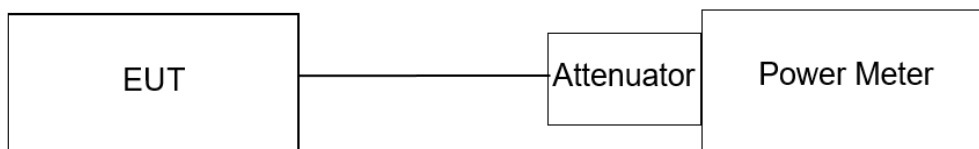
9.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2496A	1804001	02/20/2020	02/19/2021
Power Sensor	Anritsu	MA2411B	1726104	02/20/2020	02/19/2021
Power Sensor	Anritsu	MA2411B	1726107	02/20/2020	02/19/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021

For U-NII 3 measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2496A	1242004	11/06/2020	11/05/2021
Power Sensor	Anritsu	MA2411B	1207365	11/06/2020	11/05/2021
Power Sensor	Anritsu	MA2411B	1207368	11/06/2020	11/05/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	12/16/2020	12/15/2021

9.4 Test Set-up



9.5 Measurement Result

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power limits are the lesser of 250 mW (23.98dBm) or 11 dBm + 10 log B.

- Where B is the 26 dB emission bandwidth in megahertz for FCC compliance.

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9.5.1 Conducted output power (FCC)

802.11a_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RE SULT
36	5180	6	14.97	31.437	23.98	PASS
44	5220	6	14.99	31.582	23.98	PASS
48	5240	6	14.90	30.934	23.98	PASS
52	5260	6	14.84	30.510	23.98 or $11+10\log(B) = 24.75$	PASS
60	5300	6	14.98	31.509	23.98 or $11+10\log(B) = 24.63$	PASS
64	5320	6	14.63	29.070	23.98 or $11+10\log(B) = 24.55$	PASS
100	5500	6	14.69	29.474	23.98 or $11+10\log(B) = 25.77$	PASS
116	5580	6	14.91	31.006	23.98 or $11+10\log(B) = 25.77$	PASS
140	5700	6	14.96	31.365	23.98 or $11+10\log(B) = 25.77$	PASS

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
149	5745	6	13.20	20.916	30	PASS
157	5785	6	12.86	19.341	30	PASS
165	5825	6	12.67	18.513	30	PASS

802.11n_HT20_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RE SULT
36	5180	MCS0	13.91	24.583	23.98	PASS
44	5220	MCS0	13.95	24.810	23.98	PASS
48	5240	MCS0	13.85	24.246	23.98	PASS
52	5260	MCS0	13.86	24.301	23.98 or $11+10\log(B) = 24.52$	PASS
60	5300	MCS0	13.91	24.583	23.98 or $11+10\log(B) = 24.59$	PASS
64	5320	MCS0	13.86	24.301	23.98 or $11+10\log(B) = 24.55$	PASS
100	5500	MCS0	13.68	23.315	23.98 or $11+10\log(B) = 25.46$	PASS
116	5580	MCS0	13.86	24.301	23.98 or $11+10\log(B) = 25.49$	PASS
140	5700	MCS0	13.95	24.810	23.98 or $11+10\log(B) = 25.60$	PASS

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
149	5745	MCS0	13.26	21.159	30	PASS
157	5785	MCS0	13.34	21.553	30	PASS
165	5825	MCS0	13.28	21.257	30	PASS

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802.11n_HT40_Ch0

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
38	5190	MCS0	9.07	8.077	23.98	PASS
46	5230	MCS0	12.84	19.242	23.98	PASS
54	5270	MCS0	12.91	19.554	23.98 or $11+10\log(B) = 27.67$	PASS
62	5310	MCS0	9.27	8.458	23.98 or $11+10\log(B) = 27.80$	PASS
102	5510	MCS0	10.82	12.085	23.98 or $11+10\log(B) = 27.99$	PASS
110	5550	MCS0	12.88	19.420	23.98 or $11+10\log(B) = 27.91$	PASS
134	5670	MCS0	12.90	19.509	23.98 or $11+10\log(B) = 27.96$	PASS

CH	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)	RESULT
151	5755	MCS0	12.95	19.733	30	PASS
159	5795	MCS0	12.87	19.373	30	PASS

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10 MAXIMUM POWER SPECTRAL DENSITY

10.1 Standard Applicable

FCC

OPERZTION Band	EUT CATEGORY		LIMIT
U-NII-1	<input type="checkbox"/>	Access Point (Master device)	17dBm/ MHz
	<input type="checkbox"/>	Fixed point-to-point Access Ponit	
	<input checked="" type="checkbox"/>	Mobile and portable client device	11dBm/ MHz
U-NII-2A	<input checked="" type="checkbox"/>		11dBm/ MHz
U-NII-2C	<input checked="" type="checkbox"/>		11dBm/ MHz
U-NII-3	<input checked="" type="checkbox"/>		30dBm/ 500kHz

If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2 Measurement Procedure

- Place the EUT on the table and set it in transmitting mode.
- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW= approximately 1% of EBW, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto, detector = RMS or sample, traces 100 sweeps of video averaging.
- Use the cursor on spectrum to peak search the highest level of trace
- Record the max. reading and add 10 log(1/duty cycle).
- Repeat above procedures until all default test channel (low, middle, and high) was complete.

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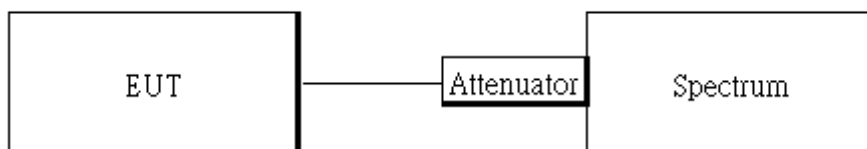
10.3 Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	05/06/2020	05/05/2021
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2020	01/01/2021
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2020	01/01/2021

For U-NII 3 measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	05/12/2021	05/11/2022
Attenuator	Mini-Circuit	BW-S10W2+	2	12/16/2020	12/15/2021
DC Block	Mini-Circuits	BLK-18-S+	1	12/16/2020	12/15/2021

10.4 Test Set-up



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10.5 Measurement Result

10.5.1 Power spectral density

POWER DENSITY 802.11a MODE					
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD(dBm/MHz)	Limit	Margin (dB)
5180.00	2.36	0.58	2.94	11.00 dBm/MHz	-8.06
5220.00	2.65	0.58	3.23	11.00 dBm/MHz	-7.77
5240.00	2.60	0.58	3.18	11.00 dBm/MHz	-7.82
5260.00	1.92	0.58	2.50	11.00 dBm/MHz	-8.50
5300.00	3.06	0.58	3.64	11.00 dBm/MHz	-7.36
5320.00	2.12	0.58	2.70	11.00 dBm/MHz	-8.30
5500.00	1.56	0.58	2.14	11.00 dBm/MHz	-8.86
5580.00	1.70	0.58	2.28	11.00 dBm/MHz	-8.72
5700.00	2.15	0.58	2.73	11.00 dBm/MHz	-8.27

POWER DENSITY 802.11a MODE						
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maximum Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5745	-7.95	0.60	2.22	-5.13	30.00 dBm/500kHz	-35.13
5785	-8.88	0.60	2.22	-6.06	30.00 dBm/500kHz	-36.06
5825	-11.65	0.60	2.22	-8.83	30.00 dBm/500kHz	-38.83

POWER DENSITY 802.11n HT20 MODE					
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD(dBm/MHz)	Limit	Margin (dB)
5180.00	1.08	0.63	1.71	11.00 dBm/MHz	-9.29
5220.00	1.19	0.63	1.82	11.00 dBm/MHz	-9.18
5240.00	0.69	0.63	1.32	11.00 dBm/MHz	-9.68
5260.00	1.25	0.63	1.88	11.00 dBm/MHz	-9.12
5300.00	1.04	0.63	1.67	11.00 dBm/MHz	-9.33
5320.00	1.23	0.63	1.86	11.00 dBm/MHz	-9.14
5500.00	0.60	0.63	1.23	11.00 dBm/MHz	-9.77
5580.00	-0.17	0.63	0.46	11.00 dBm/MHz	-10.54
5700.00	-0.37	0.63	0.26	11.00 dBm/MHz	-10.74

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POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maximum Corr'd PSD(dBm/500kHz)	Limit	Margin (dB)
5745	-8.14	0.66	2.22	-5.26	30.00 dBm/500kHz	-35.26
5785	-8.69	0.66	2.22	-5.81	30.00 dBm/500kHz	-35.81
5825	-12.84	0.66	2.22	-9.96	30.00 dBm/500kHz	-39.96

POWER DENSITY 802.11n HT40 MODE					
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD(dBm/MHz)	Limit	Margin (dB)
5190.00	-7.26	1.19	-6.07	11.00 dBm/MHz	-17.07
5230.00	-3.70	1.19	-2.51	11.00 dBm/MHz	-13.51
5270.00	-3.17	1.19	-1.98	11.00 dBm/MHz	-12.98
5310.00	-6.53	1.19	-5.34	11.00 dBm/MHz	-16.34
5510.00	-5.68	1.19	-4.49	11.00 dBm/MHz	-15.49
5550.00	-4.55	1.19	-3.36	11.00 dBm/MHz	-14.36
5670.00	-5.24	1.19	-4.05	11.00 dBm/MHz	-15.05

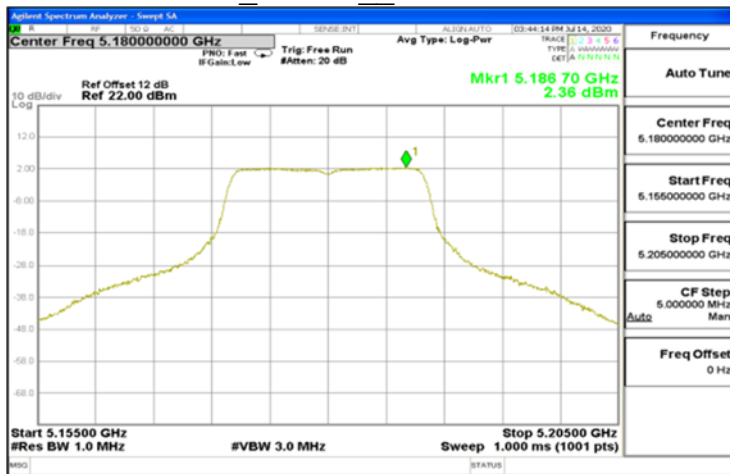
POWER DENSITY 802.11n HT40 MODE						
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	Duty Factor (dB)	Maximum Corr'd PSD(dBm/MHz)		Limit	Margin (dB)
5755	-11.40	1.19	2.22	-7.99	30.00 dBm/500kHz	-37.99
5795	-14.41	1.19	2.22	-11.00	30.00 dBm/500kHz	-41.00

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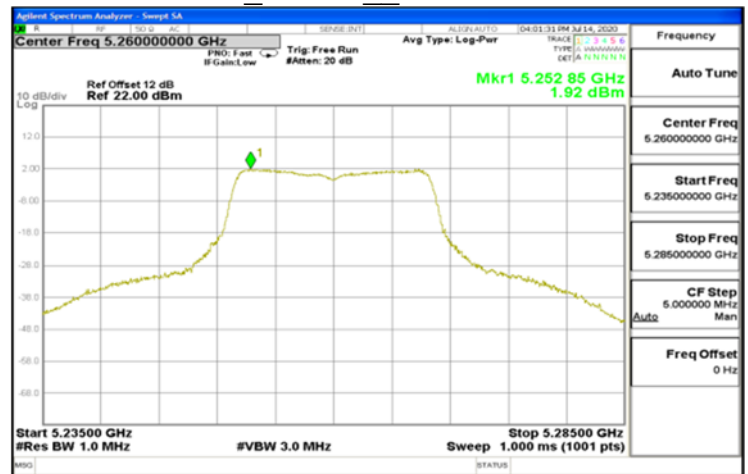
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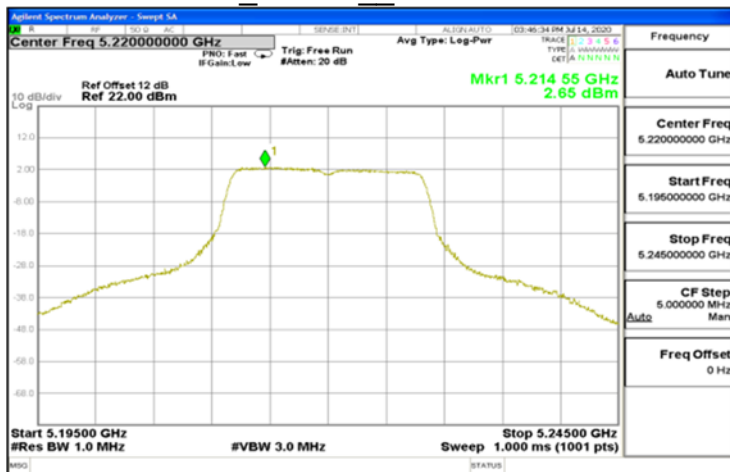
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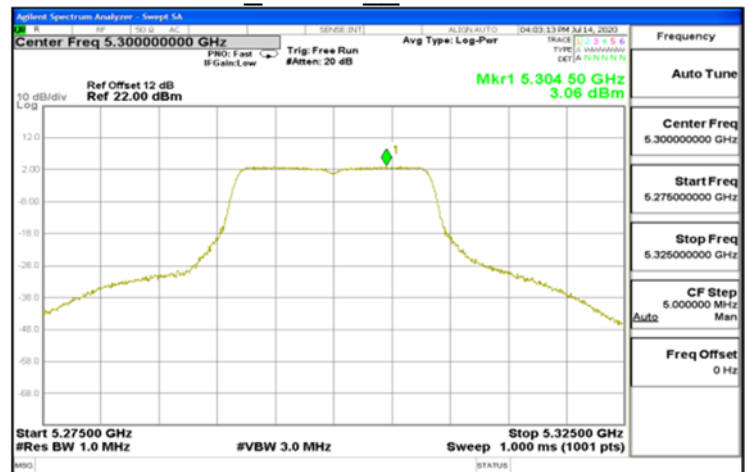
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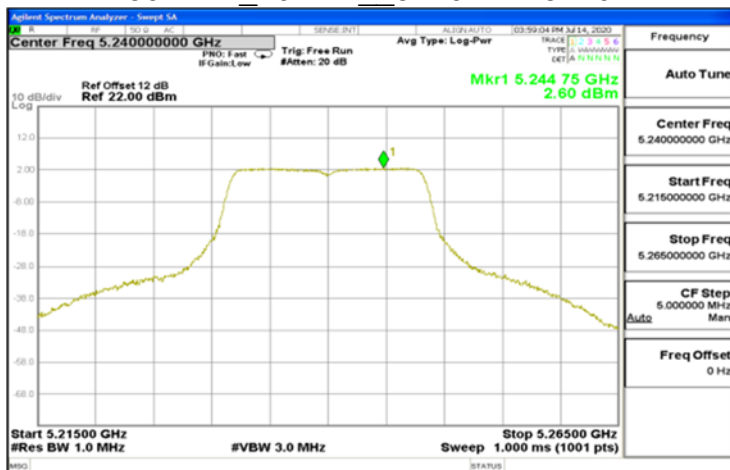
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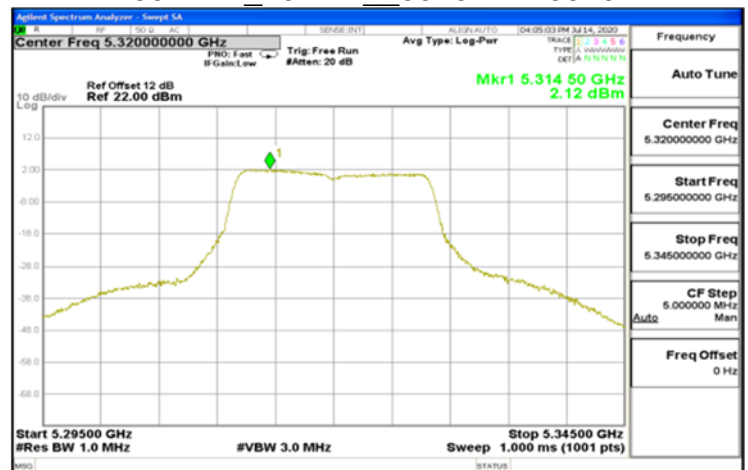
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802.11a_20MHz_5240MHz-5240



802.11a_20MHz_5320MHz-5320

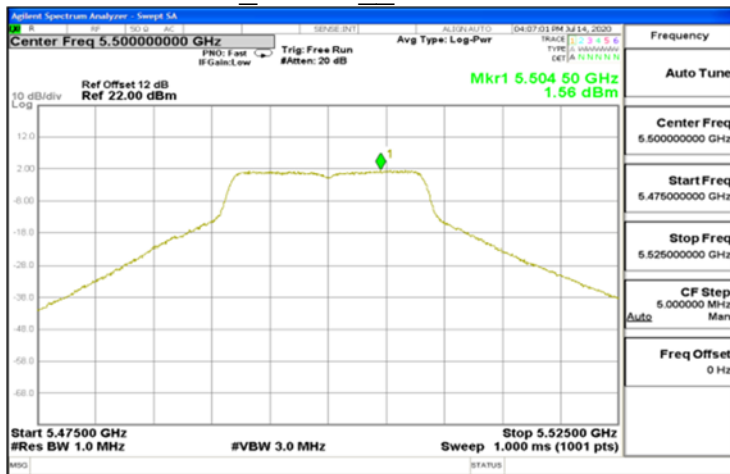


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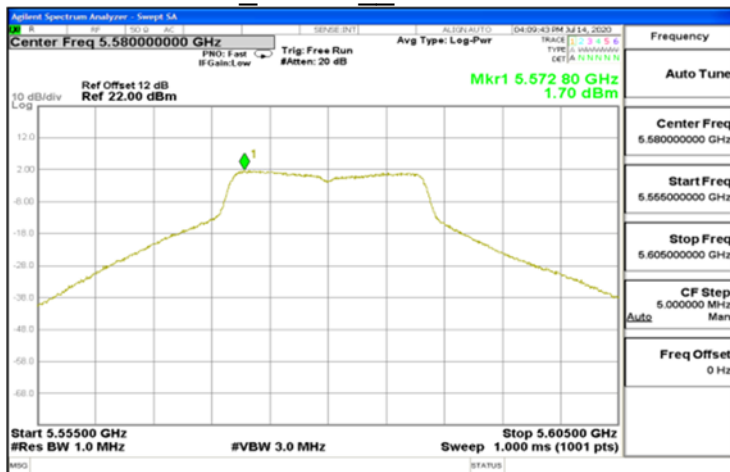
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802.11a_20MHz_5745MHz-5745



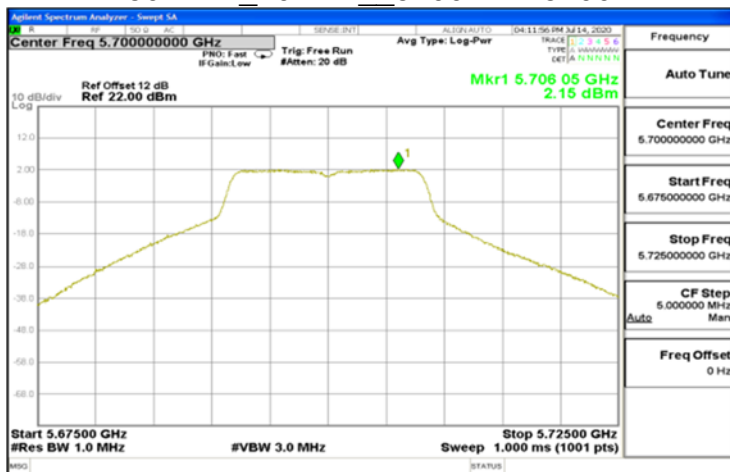
802.11a_20MHz_5580MHz-5580



802.11a_20MHz_5785MHz-5785



802.11a_20MHz_5700MHz-5700



802.11a_20MHz_5825MHz-5825

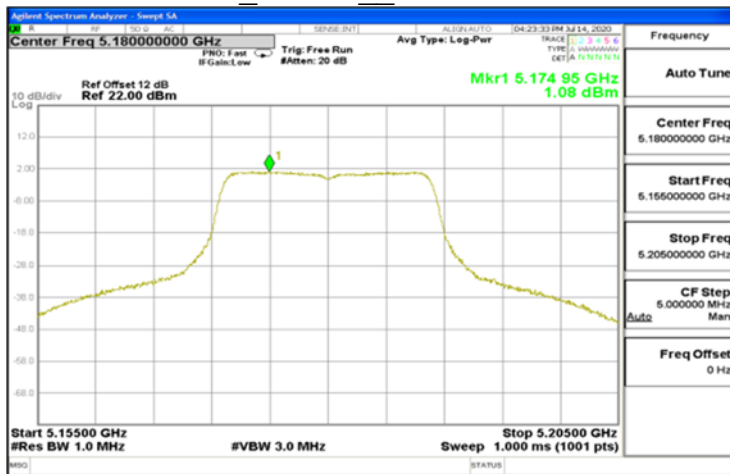


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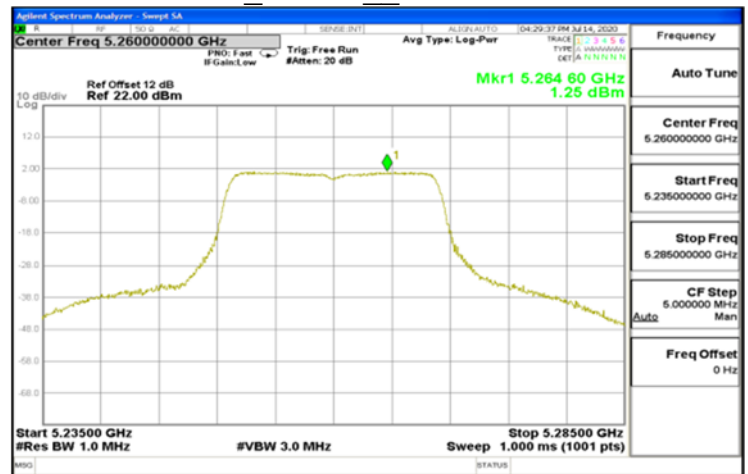
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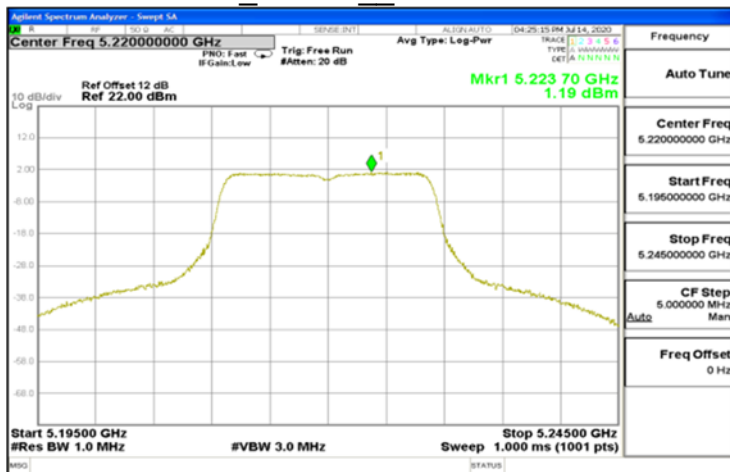
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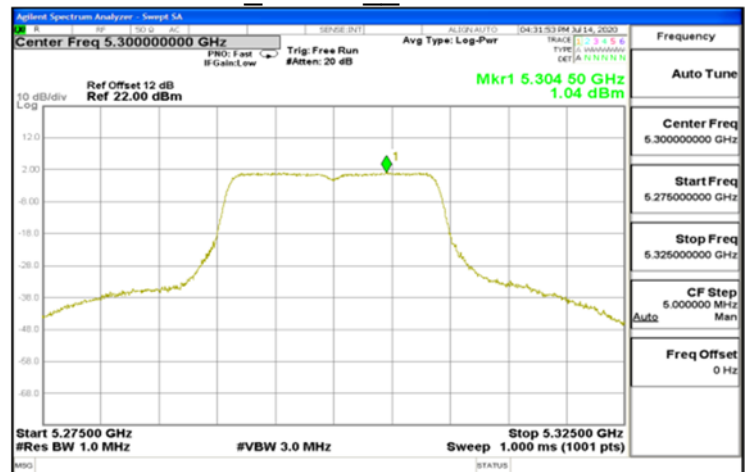
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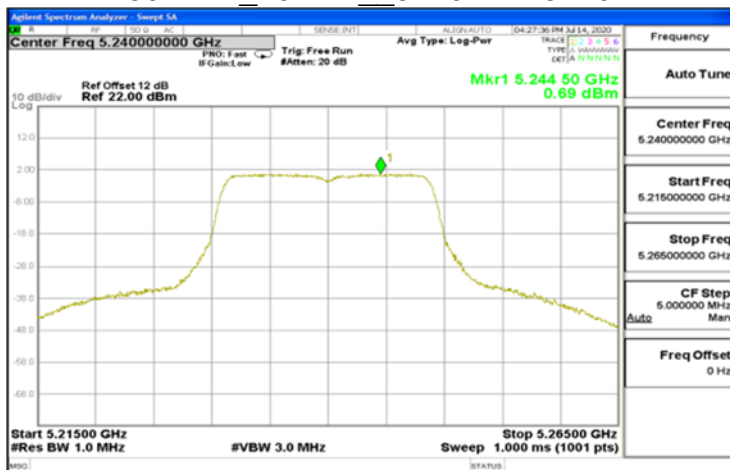
802.11n_20MHz_5220MHz-5220



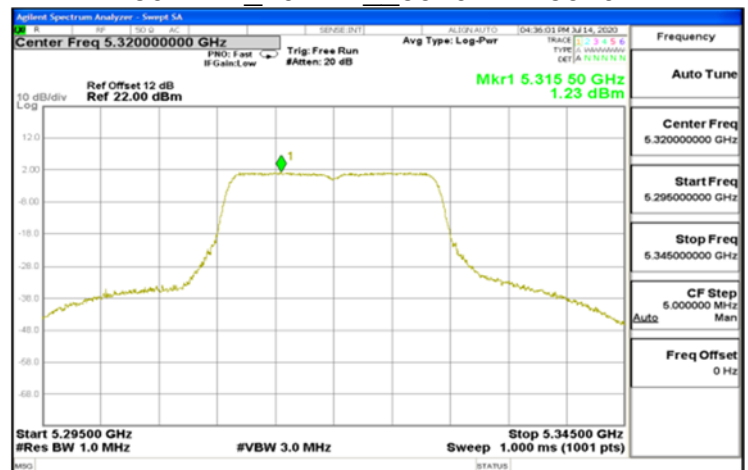
802.11n_20MHz_5300MHz-5300



802.11n_20MHz_5240MHz-5240



802.11n_20MHz_5320MHz-5320

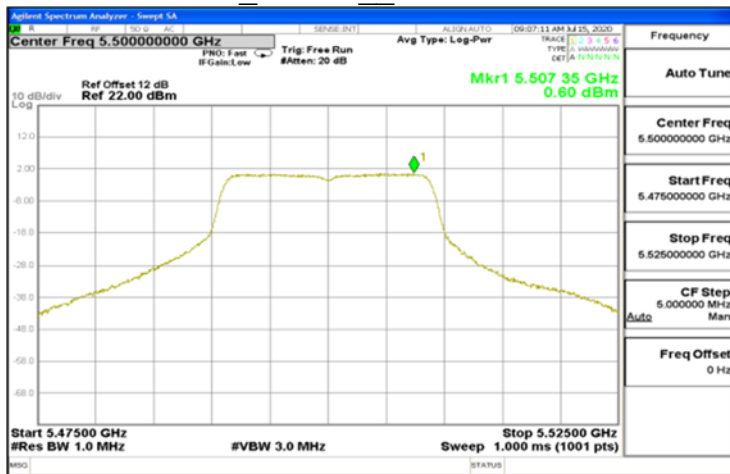


Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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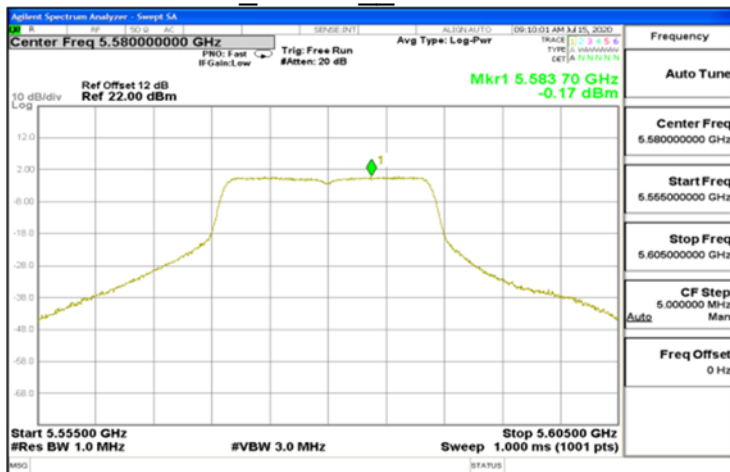
802.11n_20MHz_5500MHz-5500



802.11n_20MHz_5745MHz-5745



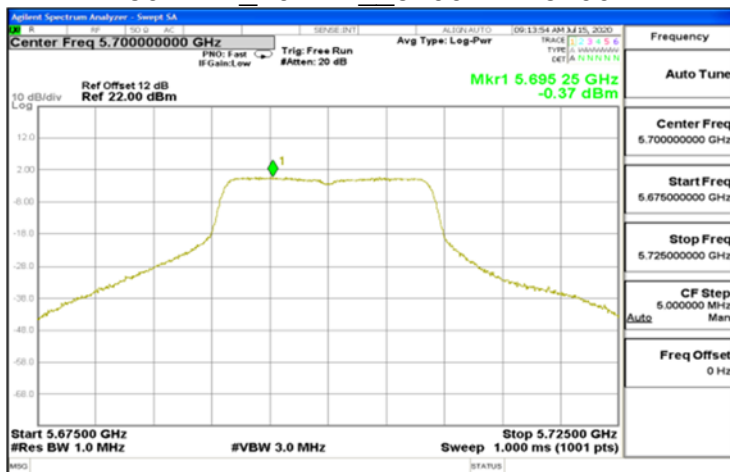
802.11n_20MHz_5580MHz-5580



802.11n_20MHz_5785MHz-5785



802.11n_20MHz_5700MHz-5700



802.11n_20MHz_5825MHz-5825

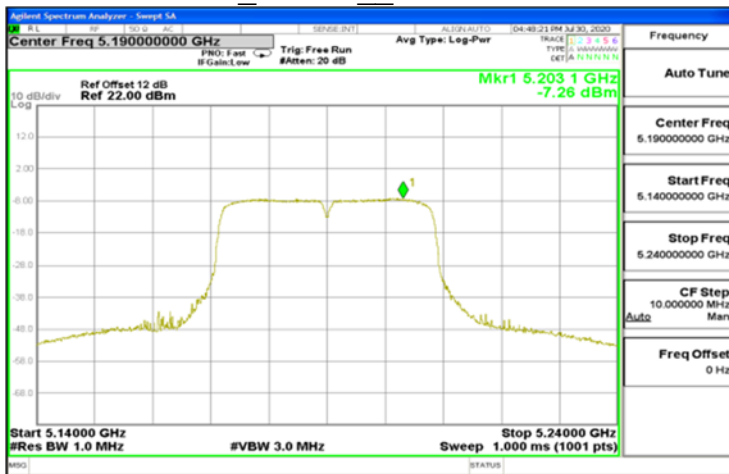


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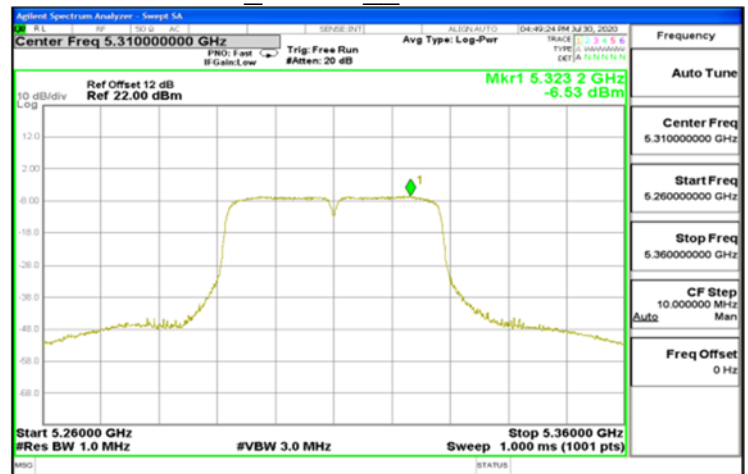
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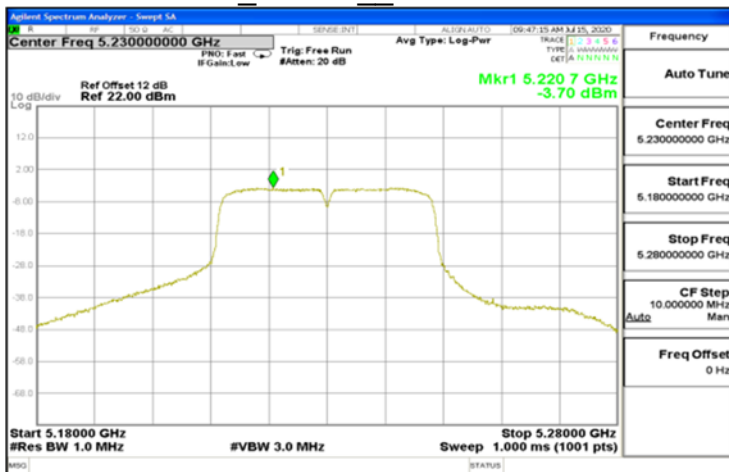
802.11n_40MHz_5190MHz-5190



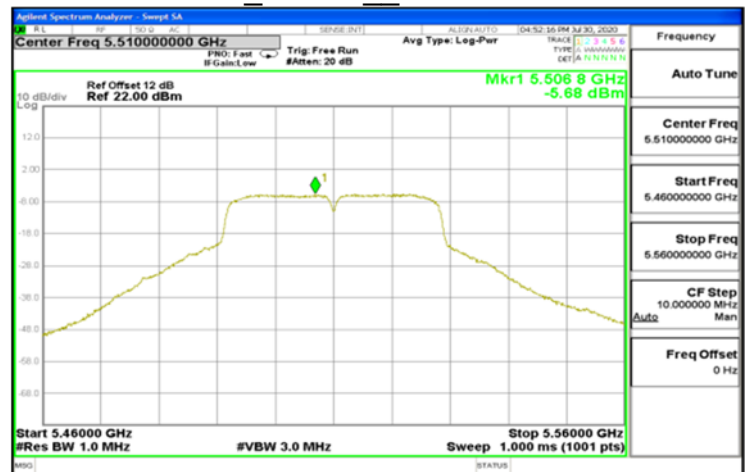
802.11n_40MHz_5310MHz-5310



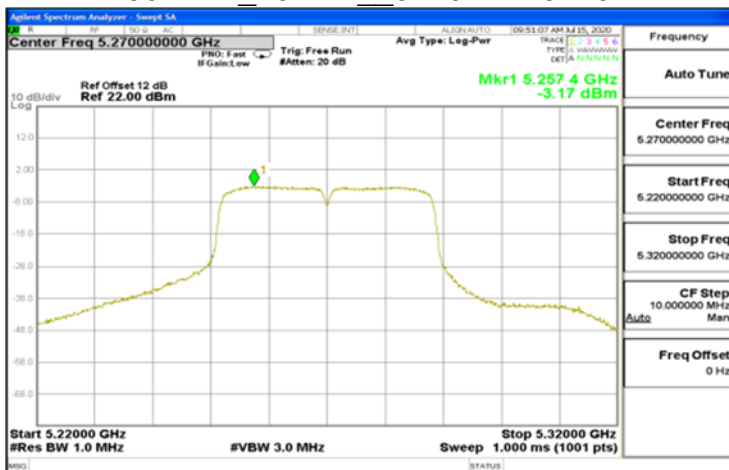
802.11n_40MHz_5230MHz-5230



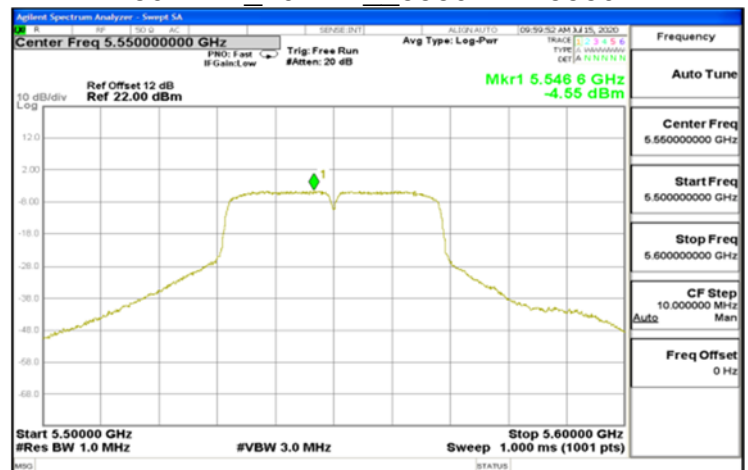
802.11n_40MHz_5510MHz-5510



802.11n_40MHz_5270MHz-5270



802.11n_40MHz_5550MHz-5550



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