



ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Quanta Computer Inc.
 No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
 33377, Taiwan

Manufacturer: Quanta Computer Inc.
 No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City
 33377, Taiwan

Product Name: Kitchen Display System

Brand Name: Clover

Model No.: C700

Model Difference: N/A

Report Number: TERF2212002689E2

FCC ID HFS-C700

IC: 1787B-C700

Date of EUT Received: December 09, 2022

Date of Test: December 14, 2022~December 23, 2022

Issue Date: January 12, 2023

Approved By

Arno Hsieh

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, ISED RSS-247.

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

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2212002689E2	00	Original.	Jan. 12, 2023	Yi-Shan Tsai	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	Kitchen Display System
Brand Name:	Clover
Model No.:	C700
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	C070UQ24650075 (Conducted) TE_SP_20221209466 (Conduction、Radiated)
Power Supply:	Adapter 12Vdc
Test Software (Name/Version)	Qualcomm Radio Control ToolKit v4.0

1.2 Modulation & Data Rate

Modulation type:	64QAM, 16QAM, QPSK, BPSK for OFDM
	256QAM for OFDM in 802.11ac
Transition Rate:	802.11 a: 6 - 54 Mbps
	802.11 n_20MHz: up to 144.4 Mbps
	802.11 n_40MHz: up to 300 Mbps
	802.11 ac_20MHz: up to 173.4 Mbps
	802.11 ac_40MHz: up to 400 Mbps
	802.11 ac_80MHz: up to 866.6 Mbps

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1.3 Antenna Designation

Antenna Type	WIFI 1/2	Freq. (MHz)	Peak Antenna Gain (dBi)	Directional Gain (dBi)
PIFA	WIFI 1	5150~5250	1.83	4.91
		5250~5350	1.83	4.91
		5470~5725	1.83	4.91
		5725~5850	1.83	4.91
	WIFI 2	5150~5250	1.97	4.91
		5250~5350	1.97	4.91
		5470~5725	1.97	4.91
		5725~5850	1.97	4.91

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

Wi-Fi	Frequency Range	Channels	Rated Power(Avg) (dBm) (Worst Case)	Modulation Technology
a/ n_HT/ ac_VHT 20M	5180~5240	4	17.19 dBm	OFDM
	5260~5320	4	19.35 dBm	OFDM
	5500~5720	12	19.39 dBm	OFDM
	5745-5825	5	19.29 dBm	OFDM
n_HT/ ac_VHT 40M	5190~5230	2	15.40 dBm	OFDM
	5270~5310	2	15.38 dBm	OFDM
	5510~5710	6	15.13 dBm	OFDM
	5755-5795	2	15.26 dBm	OFDM
ac_VHT 80M	5210	1	15.31 dBm	OFDM
	5290	1	15.29 dBm	OFDM
	5530~5690	3	15.27 dBm	OFDM
	5775	1	15.24 dBm	OFDM

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1.5 ISED

Wi-Fi	Frequency Range	Channels	EIRP/Avg	Rated Power(EIRP/Avg) (dBm) (Worst Case)	Modulation Technology
a/ n_HT/ ac_VHT 20M	5180~5240	4	EIRP	22.10 dBm	OFDM
	5260~5320	4	Avg	19.35 dBm	OFDM
	5500~5700	11	Avg	19.39 dBm	OFDM
	5720 (U-NII 2C)	1	Avg	18.00 dBm	OFDM
	5720 (U-NII 3)	1	Avg	14.09 dBm	OFDM
	5745-5825	5	Avg	19.29 dBm	OFDM
n_HT/ ac_VHT 40M	5190~5230	2	EIRP	20.31 dBm	OFDM
	5270~5310	2	Avg	15.38 dBm	OFDM
	5510~5670	5	Avg	15.13 dBm	OFDM
	5710 (U-NII 2C)	1	Avg	14.66 dBm	OFDM
	5710 (U-NII 3)	1	Avg	6.66 dBm	OFDM
	5755-5795	2	Avg	15.26 dBm	OFDM
ac_VHT 80M	5210	1	EIRP	20.22 dBm	OFDM
	5290	1	Avg	15.29 dBm	OFDM
	5530~5610	2	Avg	15.27 dBm	OFDM
	5690 (U-NII 2C)	1	Avg	15.14 dBm	OFDM
	5690 (U-NII 3)	1	Avg	4.38 dBm	OFDM
	5775	1	Avg	15.24 dBm	OFDM

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1.6 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

FCC KDB 291074 D02 EMC Measurement v01

RSS-247 issue 2 Feb. 2017

RSS-Gen, issue 5 April, 2018

ANSI C63.10:2013

1.7 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 2		
		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 C	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.

1.8 Special Accessories

There are no special accessories used while test was conducted.

1.9 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*6m*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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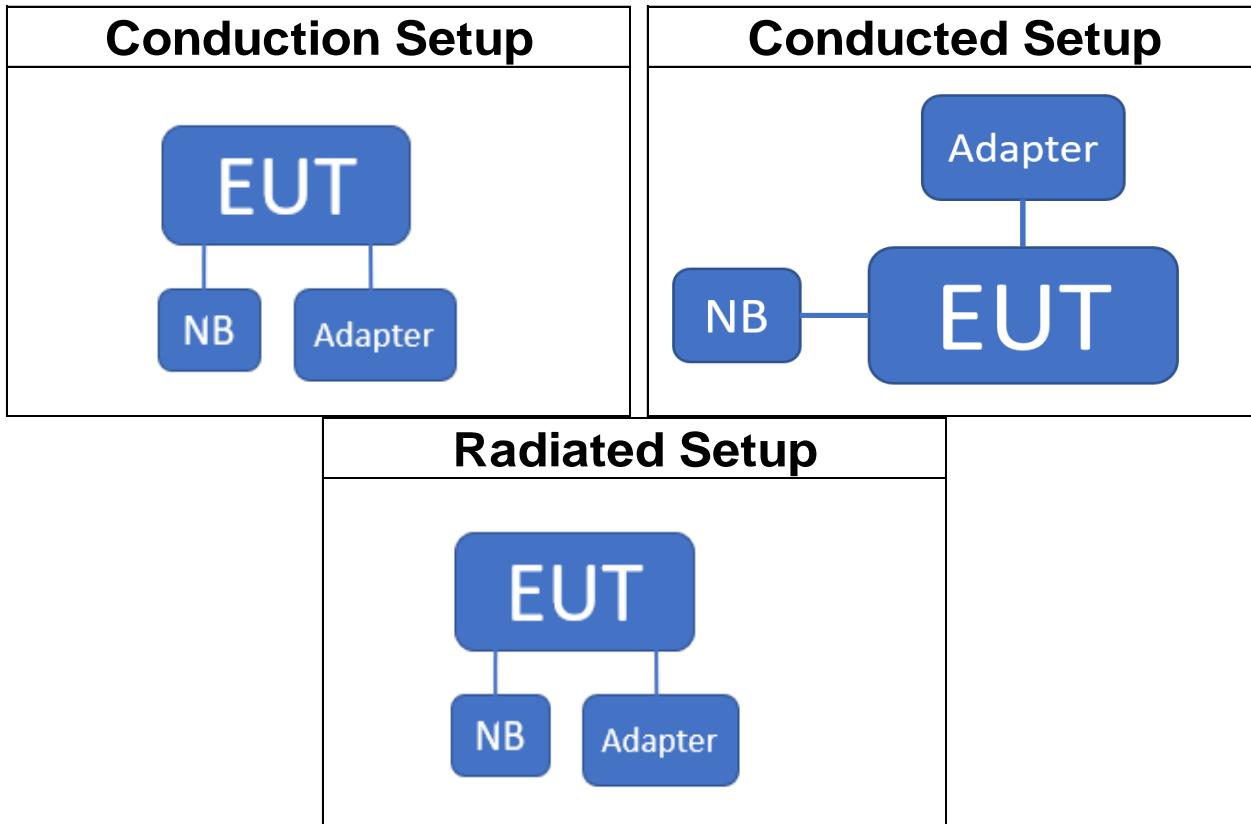
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2.5 Test Configuration



2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
adapter	clover	FSP040-RHBN3	N/A	N.C.R	N.C.R
Notebook	Lenovo	L430	P0000195	N.C.R	N.C.R
Conducted Emission Test Site: Conducted G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T470	P0001293	N/A	N/A
Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
adapter	clover	FSP040-RHBN3	N/A	N.C.R	N.C.R
Notebook	Lenovo	L430	P0000195	N.C.R	N.C.R

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3 SUMMARY OF TEST RESULT

FCC Rules	ISED Rules	Description Of Test	Result
§15.207	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.407(e)	RSS-Gen §6.7 RSS-247 §6.2.4.1	Emission Bandwidth	Compliant
§15.407(a)	RSS-247 §6.2.1~4 (1)	Maximum Conducted Output Power	Compliant
§15.407(a)	RSS-247 §6.2.1~4 (1)	Power Spectral Density	Compliant
§15.205 §15.209 §15.407(b)	RSS-247 §6.2.1~4 (2)	Undesirable Radiated Emissions	Compliant
§15.407(c)	RSS-247 §6.4	Transmission in case of Absence of Information	Compliant
§15.203	N/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		80 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

Operated band in 5250 MHz ~5350 MHz:

20 M		40 M		80 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

Operated band in 5470 MHz ~5725 MHz:

20 M		40 M		80 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690
112	5560	126	5630		
116	5580	134	5670		
120	5600	142	5710		
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				
144	5720				

Operated band in 5725 MHz ~5850 MHz:

20 M		40 M		80 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
149	5745				
153	5765				
157	5785				
161	5805				
165	5825				
151	5755				
155	5775				
159	5795				

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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 checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	
<input checked="" type="checkbox"/> 802.11 n	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	
<input checked="" type="checkbox"/> 802.11 ac	<input checked="" type="checkbox"/> Ch0	<input checked="" type="checkbox"/> Ch1	<input type="checkbox"/> Ch2	<input type="checkbox"/> Ch3	<input type="checkbox"/> 1TX	<input checked="" type="checkbox"/> 2TX	

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.

CONDUCTED TEST						
MODE	FREQUENCY BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	2TX
	5260~5320	52 to 64	52,60,64			
	5500~5720	100 to 144	100,116,140,144			
	5745~5825	149 to 165	149,157,165			
802.11n_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	2TX
	5260~5320	52 to 64	52,60,64			
	5500~5720	100 to 144	100,116,140,144			
	5745~5825	149 to 165	149,157,165			
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	2TX
	5270~5310	54 to 62	54,62			
	5510~5670	102 to 142	102,110,134,142			
	5755~5795	151 to 159	151,159			
802.11ac_VHT80	5210	42	42	OFDM	MCS0	2TX
	5290	58	58			
	5530~5610	106 to 138	106,122,138			
	5775	155	155			

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RADIATED EMISSION TEST (BELOW 1 GHz)						
MODE	FREQUENCY BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	44	OFDM	6	2TX
	5260~5320	52 to 64	60			
	5500~5720	100 to 144	116			
	5745~5825	149 to 165	157			
RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	FREQUENCY BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11a	5180~5240	36 to 48	36,44,48	OFDM	6	2TX
	5260~5320	52 to 64	52,60,64			
	5500~5720	100 to 144	100,116,140,144			
	5745~5825	149 to 165	149,157,165			
802.11n_HT20	5180~5240	36 to 48	36,44,48	OFDM	MCS0	2TX
	5260~5320	52 to 64	52,60,64			
	5500~5720	100 to 144	100,116,140,144			
	5745~5825	149 to 165	149,157,165			
802.11n_HT40	5190~5230	38 to 46	38,46	OFDM	MCS0	2TX
	5270~5310	54 to 62	54,62			
	5510~5710	102 to 142	102,110,134,142			
	5755~5795	151 to 159	151,159			
802.11ac_VHT80	5210	42	42	OFDM	MCS0	2TX
	5290	58	58			
	5530~5690	106 to 138	106,122,138			
	5775	155	155			

Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.32 dB
Output Power measurement	+/- 1 dB
Emission Bandwidth	+/- 1.53 Hz
Undesignable radiated emission measurement	+/- 1.68 dB
Peak Power Density	+/- 2.16 dB
Temperature	+/- 0.7 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/- 2.8 dB	9kHz~30MHz	
	+/- 4.82 dB	30MHz - 1000MHz	
	+/- 4.37 dB	1GHz - 18GHz	
	+/- 4.21 dB	18GHz - 40GHz	
Polarization: Horizontal	+/- 2.8 dB	9kHz~30MHz	
	+/- 4.54 dB	30MHz - 1000MHz	
	+/- 4.37 dB	1GHz - 18GHz	
	+/- 4.21 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 MEASUREMENT EQUIPMENT USED

6.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	973	04/13/2022	04/12/2023
EMI Test Receiver	R&S	ESCI	101342	04/25/2022	04/24/2023
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2022	03/26/2023
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2022	03/26/2023

6.2 Condacted Measurement

Conducted Emission Test Site: Conducted G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010B	MY60240506	06/08/2022	06/07/2023
Power Meter	Anritsu	ML2496A	1804002	04/27/2022	04/26/2023
Power Sensor	Anritsu	MA2411B	1726105	04/27/2022	04/26/2023
Power Sensor	Anritsu	MA2411B	1726106	04/27/2022	04/26/2023
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R
Attenuator	Woken	WATT-218FS-10	RF22	11/16/2022	11/15/2023
DC Block	PASTERNACK	PE8210	RF158	11/16/2022	11/15/2023

6.3 Radiated Measurement

Radiated Emission Test Site: SAC G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	SCHWARZBECK	VULB 9168	1206	02/15/2022	02/14/2023
Horn Antenna	Schwarzbeck	BBHA9170	184	12/15/2022	12/14/2023
Horn Antenna	RF SPIN	DRH18-E	210105A18E	04/08/2022	04/07/2023
Loop Antenna	ETS.LINDGREN	6502	143303	05/06/2022	05/07/2023
3m Site NSA	SGS	966 chamber G	N/A	03/30/2022	03/29/2023
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	07/13/2022	07/14/2023
Pre-Amplifier	EMC Instruments	EMC18405SEE	980881	10/25/2022	10/24/2023
Pre-Amplifier	EMC Instruments	EMC330N	980781	03/15/2022	03/14/2023
Pre-Amplifier	EMC Instruments	EMC118A45SE	980815	03/15/2022	03/14/2023
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM-8000-5000-2000	210216、210217、210218	03/15/2022	03/14/2023
Coaxial Cable	EMC Instruments	EMC104-SM-SM-8000-5000-5000	210219、210220、210221	03/15/2022	03/14/2023
Coaxial Cable	EMC Instruments	EMC105-NM-NM-5000-15000	210224、210306	03/15/2022	03/14/2023

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

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable

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

Frequency range MHz	Limits (dBuV)	
	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

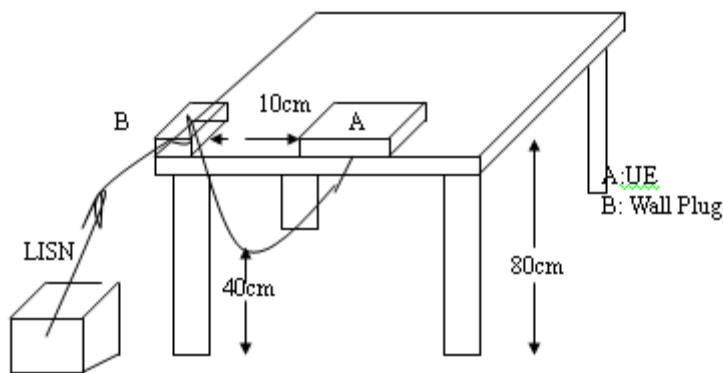
Note

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.

7.2 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.

7.3 Test SET-UP



7.4 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.

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7.5 Measurement Result

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

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

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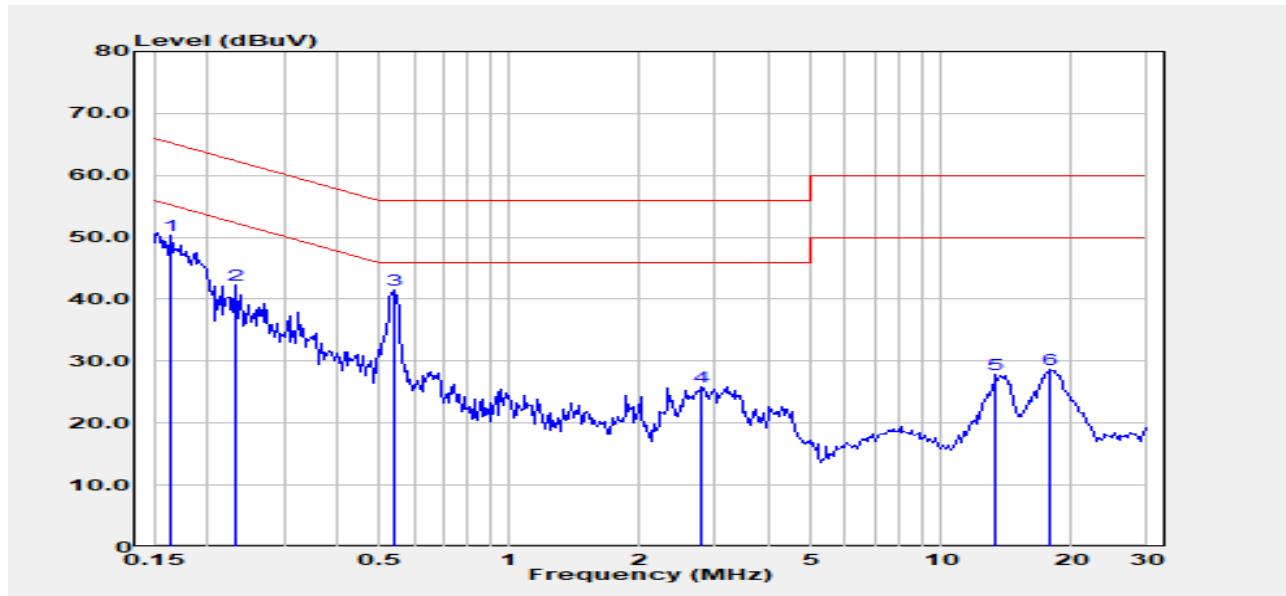
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2212002689E2
 Test Mode :5G
 Power :120V/60Hz
 Probe :L1

Test Site :Conduction C
 Test Date :2022-12-20
 Temp./Humi. :20.4/63
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.163	Peak	39.97	10.30	50.27	65.30	-15.02
0.232	Peak	32.08	10.31	42.39	62.39	-20.01
0.541	Peak	31.14	10.34	41.48	56.00	-14.52
2.794	Peak	14.91	10.99	25.90	56.00	-30.10
13.408	Peak	17.13	10.80	27.93	60.00	-32.07
17.849	Peak	17.79	10.89	28.68	60.00	-31.32

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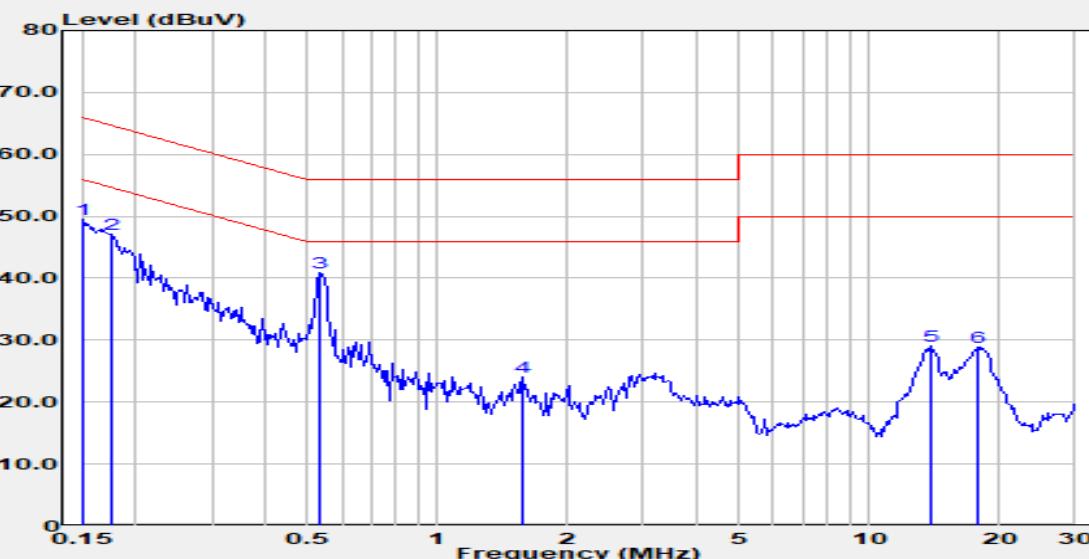
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Report Number :TERF2212002689E2
 Test Mode :5G
 Power :120V/60Hz
 Probe :N

Test Site :Conduction C
 Test Date :2022-12-20
 Temp./Humi. :20.4/63
 Engineer :Temo Chen



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.152	Peak	39.21	10.31	49.52	65.91	-16.40
0.176	Peak	36.78	10.30	47.09	64.68	-17.59
0.535	Peak	30.56	10.33	40.89	56.00	-15.11
1.577	Peak	13.20	10.90	24.09	56.00	-31.91
13.841	Peak	18.22	10.77	28.99	60.00	-31.01
17.849	Peak	17.96	10.85	28.82	60.00	-31.18

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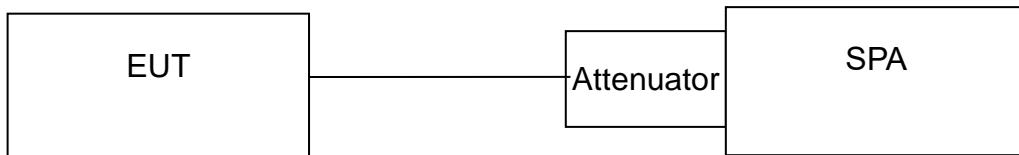
8 EMISSION BANDWIDTH MEASUREMENT

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 Test Setup



8.3 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 = large enough to capture all products of the modulation process,
Detector=Peak,
Sweep=auto
 - b. Mark the peak frequency and –6dB (upper and lower) frequency.
6. For 99% Bandwidth: Set the spectrum analyzer as
RBW = 1%,
VBW = 3*RBW,
Span = large enough to capture all products of the modulation process,
Detector=Sample,
Sweep=auto.
7. Turn on the 99% bandwidth function, max reading.
8. Repeat above procedures until all frequency of interest measured was complete.

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8.4 Measurement Result

8.4.1 FCC Occupied Bandwidth

802.11a_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.53	13.530
5220	22.71	13.560
5240	21.98	13.420
5260	23.90	13.780
5300	23.34	13.680
5320	21.76	13.380
5500	21.47	13.320
5580	23.76	13.760
5700	24.31	13.860
5720(U-NII 2C)	17.02	12.310
5720(U-NII 3)	7.02	8.460

802.11a_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.31	12.120
5785	16.36	12.140
5825	16.38	12.140

802.11a_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.368502	< 5250
5745	5736.807867	> 5725

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802.11a_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.91	13.600
5220	22.58	13.540
5240	23.35	13.680
5260	22.04	13.430
5300	22.91	13.600
5320	22.64	13.550
5500	22.93	13.600
5580	22.96	13.610
5700	22.79	13.580
5720(U-NII 2C)	16.71	12.230
5720(U-NII 3)	6.71	8.270

802.11a_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	15.55	11.920
5785	13.20	11.210
5825	16.12	12.070

802.11a_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.356584	< 5250
5745	5736.807257	> 5725

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802.11n_HT20_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.88	13.590
5220	23.51	13.710
5240	24.22	13.840
5260	22.20	13.460
5300	21.49	13.320
5320	23.16	13.650
5500	22.59	13.540
5580	22.68	13.560
5700	22.35	13.490
5720(U-NII 2C)	16.23	12.100
5720(U-NII 3)	6.23	7.940

802.11n_HT20_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	14.48	11.610
5785	14.99	11.760
5825	13.84	11.410

802.11n_HT20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.916512	< 5250
5745	5736.191931	> 5725

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802.11n_HT20_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	22.76	13.570
5220	22.49	13.520
5240	23.29	13.670
5260	22.50	13.520
5300	22.44	13.510
5320	21.50	13.320
5500	23.64	13.740
5580	22.02	13.430
5700	23.22	13.660
5720(U-NII 2C)	16.23	12.100
5720(U-NII 3)	6.23	7.940

802.11n_HT20_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	15.69	11.960
5785	13.88	11.420
5825	16.40	12.150

802.11n_HT20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.000928	< 5250
5745	5736.176996	> 5725

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802.11n_HT40_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	42.57	16.290
5230	40.72	16.100
5270	40.64	16.090
5310	40.31	16.050
5510	40.66	16.090
5550	40.72	16.100
5670	41.27	16.160
5710(U-NII 2C)	35.74	15.530
5710(U-NII 3)	5.74	7.590

802.11n_HT40_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.79	15.540
5795	35.76	15.530

802.11n_HT40_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.204670	< 5250
5755	5736.959803	> 5725

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802.11n_HT40_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	40.95	16.120
5230	41.20	16.150
5270	41.51	16.180
5310	40.90	16.120
5510	41.28	16.160
5550	40.59	16.080
5670	41.29	16.160
5710(U-NII 2C)	35.55	15.510
5710(U-NII 3)	5.55	7.440

802.11n_HT40_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.13	15.460
5795	36.02	15.570

802.11n_HT40_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.215522	< 5250
5755	5736.961897	> 5725

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802.11ac_VHT80_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	83.16	19.200
5290	81.42	19.110
5530	82.57	19.170
5610	84.18	19.250
5690(U-NII 2C)	76.43	18.830
5690(U-NII 3)	6.43	8.080

802.11ac_VHT80_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	74.50	18.720

802.11ac_VHT80_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.038434	< 5250
5775	5737.390371	> 5725

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802.11ac_VHT80_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	84.51	19.270
5290	82.92	19.190
5530	83.82	19.230
5610	83.15	19.200
5690(U-NII 2C)	76.43	18.830
5690(U-NII 3)	6.43	8.080

802.11ac_VHT80_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	74.29	18.710

802.11ac_VHT80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.087199	< 5250
5775	5737.462432	> 5725

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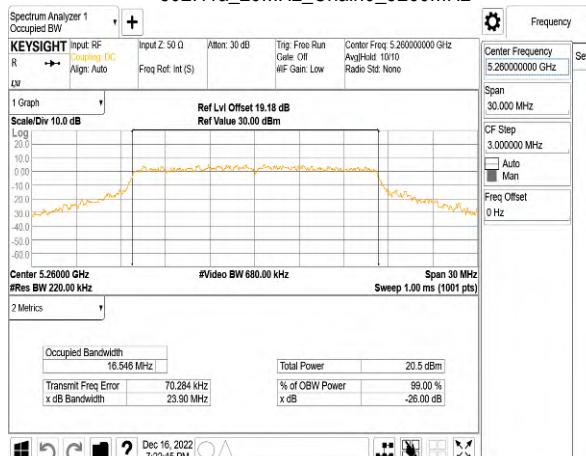
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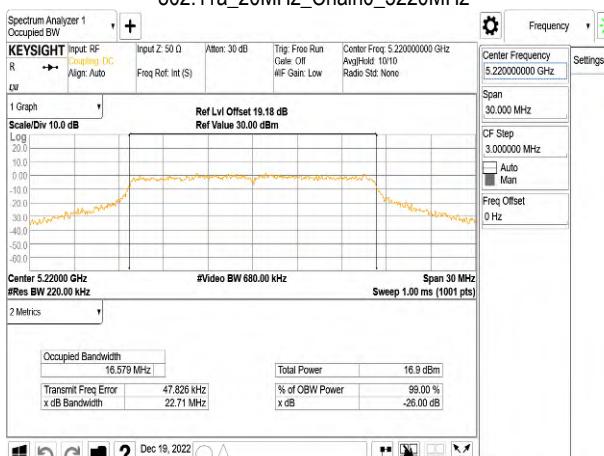
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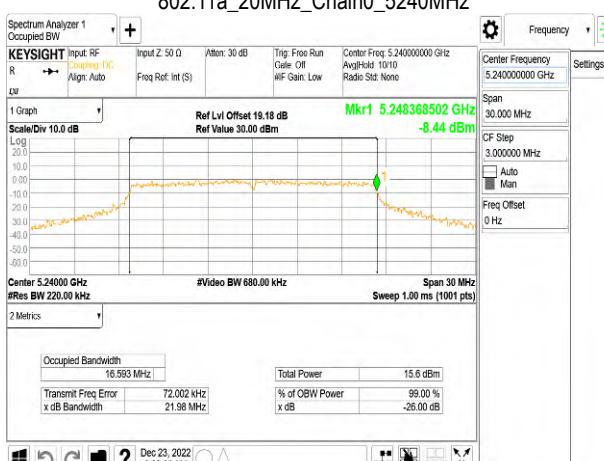
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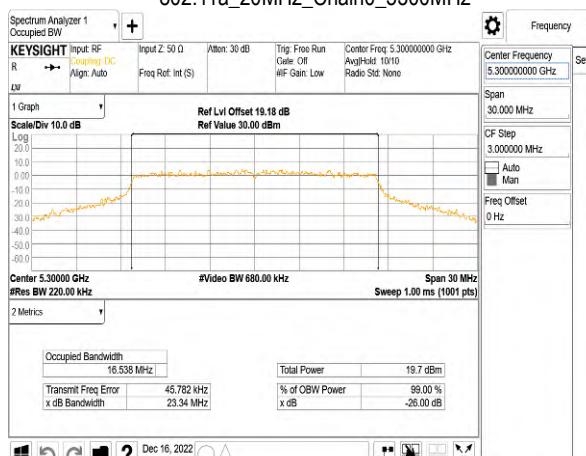
802.11a_20MHz_Chain0_5220MHz



802.11a_20MHz_Chain0_5240MHz



802.11a_20MHz_Chain0_5300MHz



802.11a_20MHz_Chain0_5320MHz



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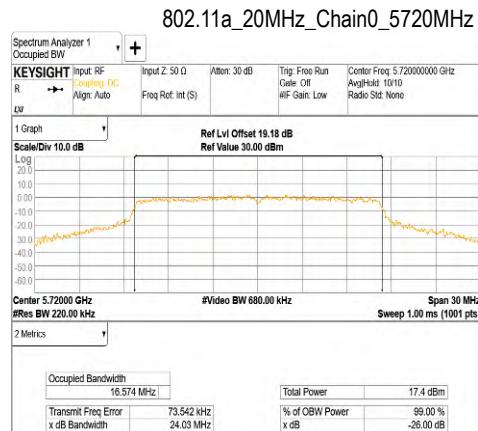
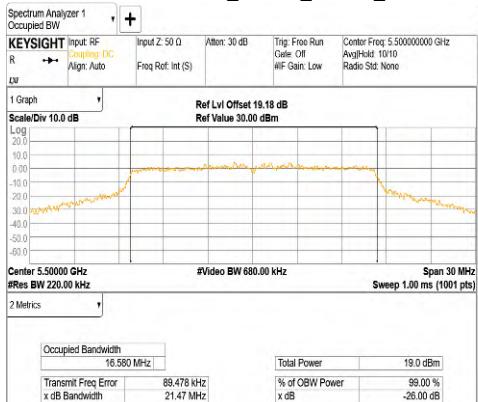
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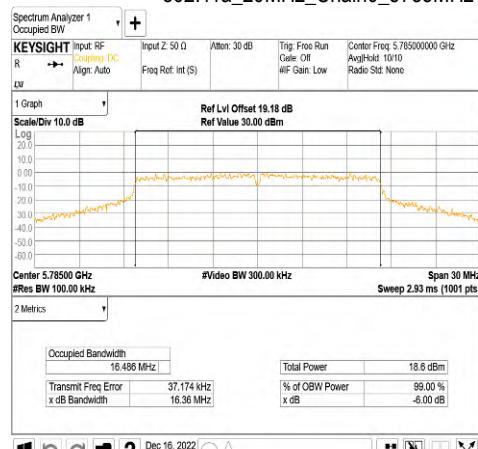
802.11a_20MHz_Chain0_5500MHz



802.11a 20MHz Chain0 5580MHz



802.11a 20MHz Chain0 5700MHz



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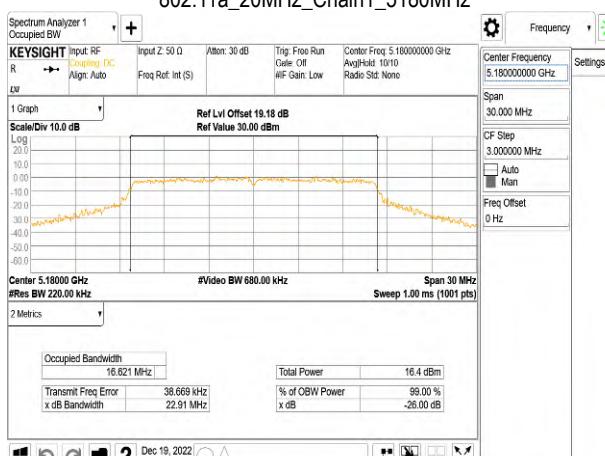
802.11a_20MHz_Chain0_5825MHz



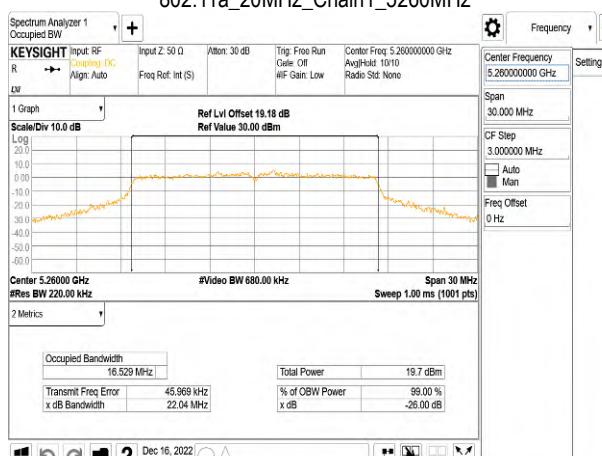
802.11a_20MHz_Chain1_5240MHz



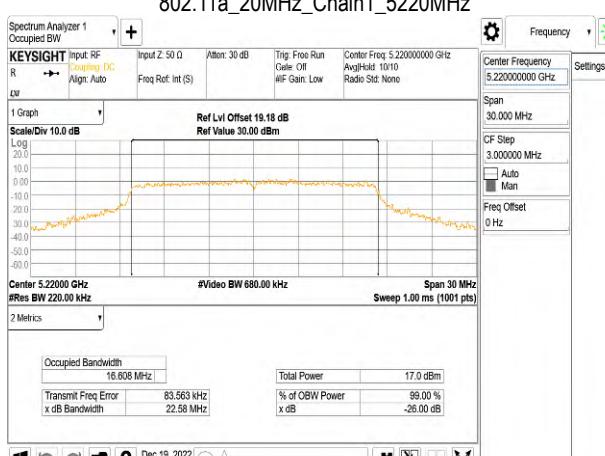
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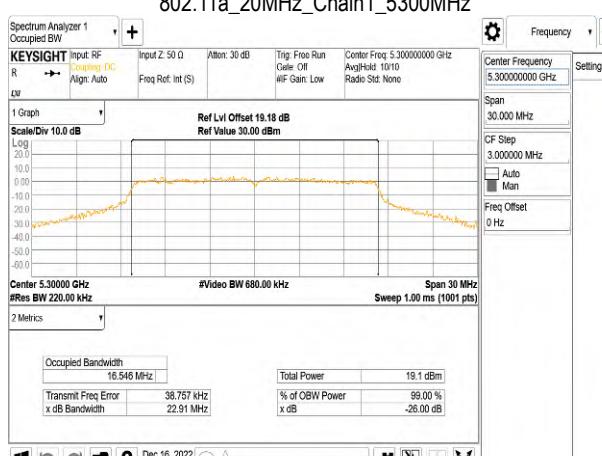
802.11a_20MHz_Chain1_5260MHz



802.11a_20MHz_Chain1_5220MHz



802.11a_20MHz_Chain1_5300MHz



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802.11a_20MHz_Chain1_5320MHz



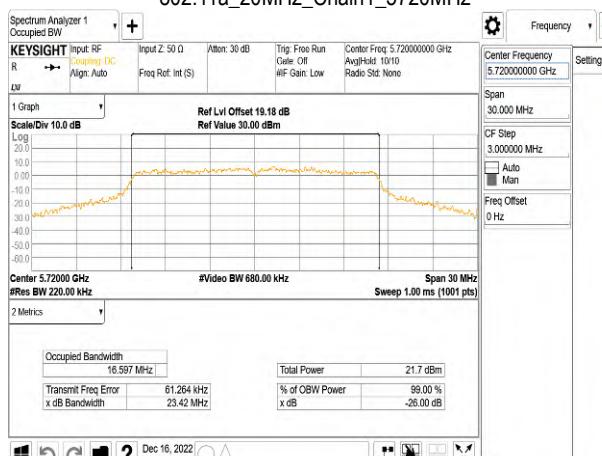
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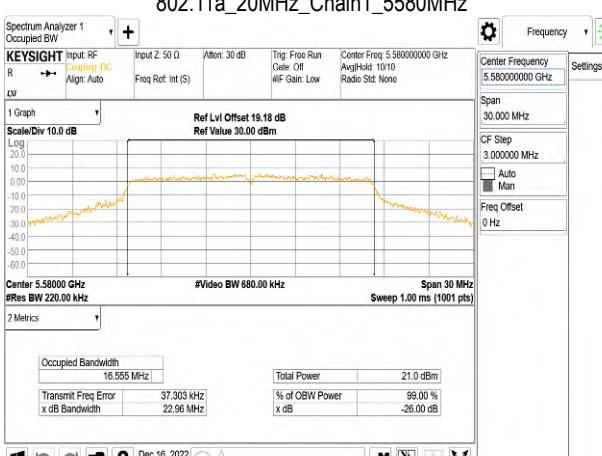
802.11a_20MHz_Chain1_5500MHz



802.11a_20MHz_Chain1_5720MHz



802.11a_20MHz_Chain1_5580MHz



802.11a_20MHz_Chain1_5745MHz



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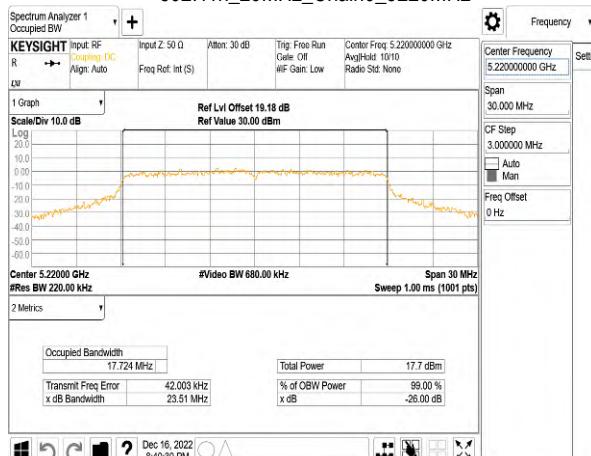
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802.11a_20MHz_Chain1_5785MHz



802.11n_20MHz_Chain0_5220MHz



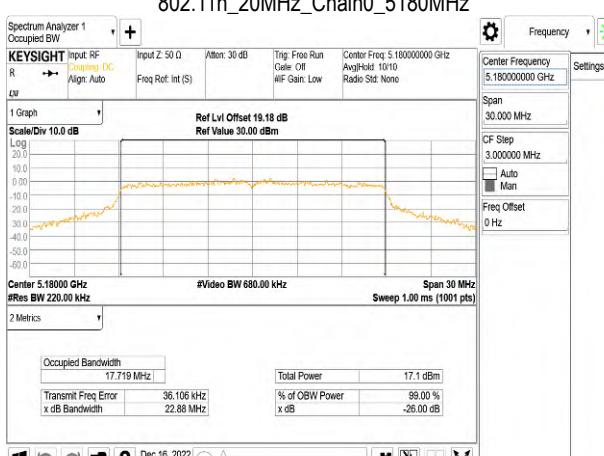
802.11a_20MHz_Chain1_5825MHz



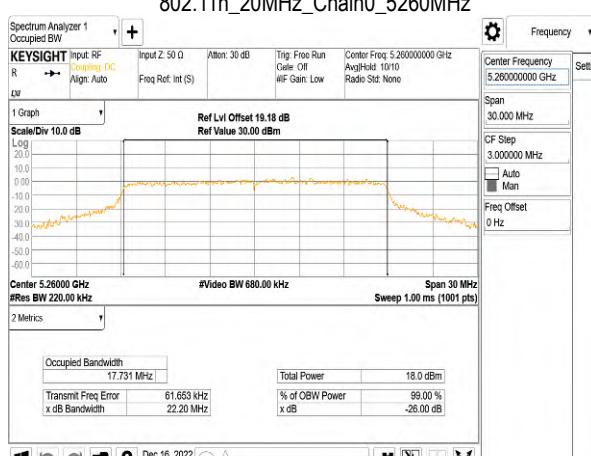
802.11n_20MHz_Chain0_5240MHz



802.11n_20MHz_Chain0_5180MHz



802.11n_20MHz_Chain0_5260MHz



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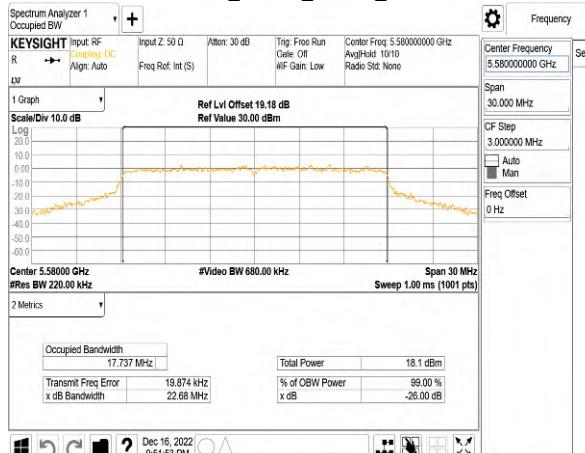
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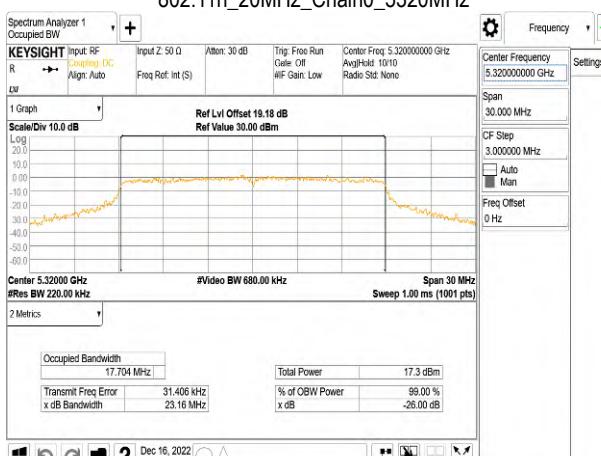
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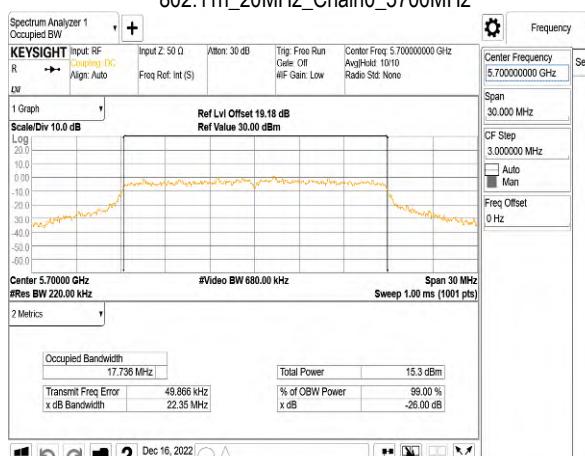
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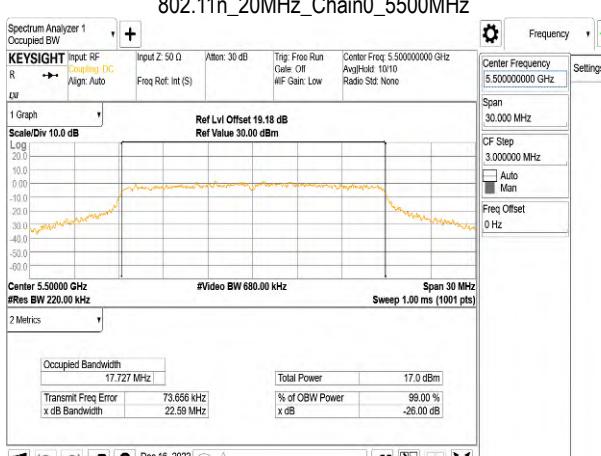
802.11n_20MHz_Chain0_5320MHz



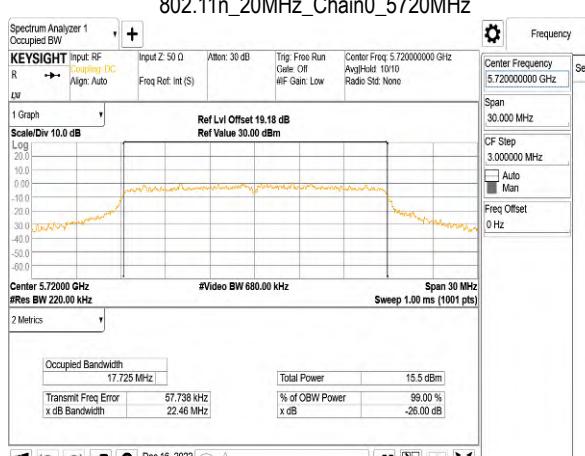
802.11n_20MHz_Chain0_5700MHz



802.11n_20MHz_Chain0_5500MHz



802.11n_20MHz_Chain0_5720MHz



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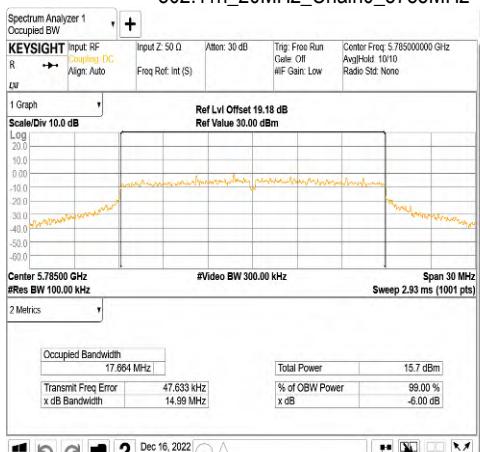
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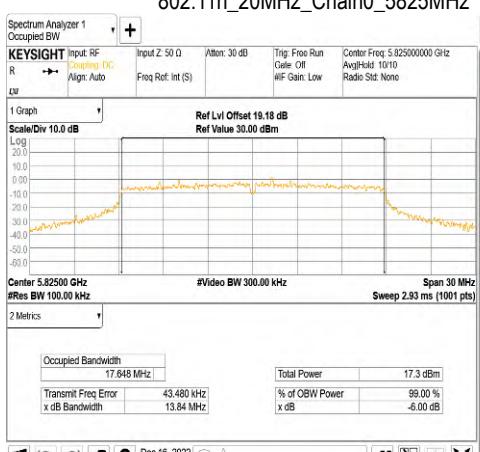
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802.11n 20MHz Chain0 5785MHz



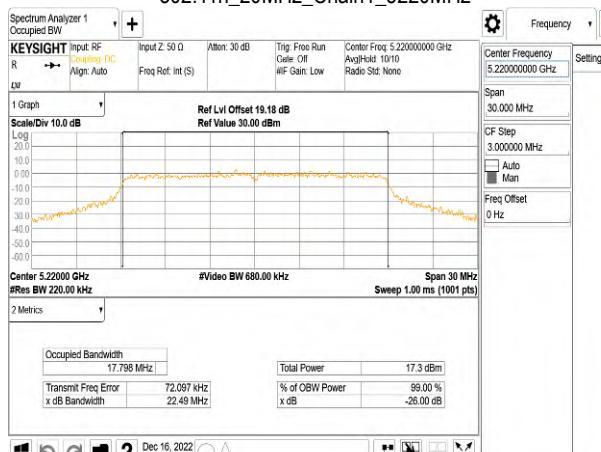
802.11n, 20MHz, Chain0, 5825MHz



802.11n_20MHz_Chain1_5180MHz



802.11n 20MHz Chain1 5220MHz



802.11p, 20MHz, Chain1, 5240MHz



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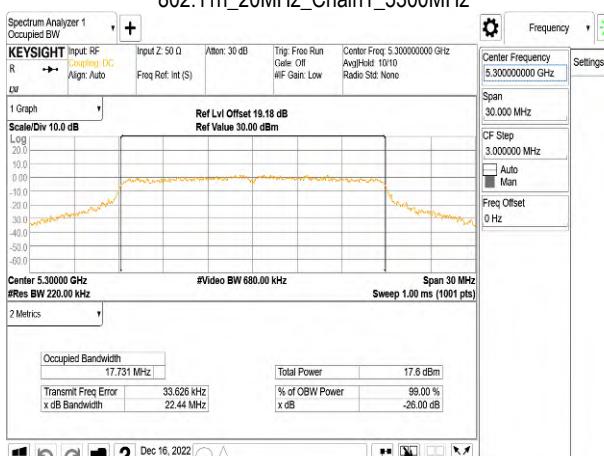
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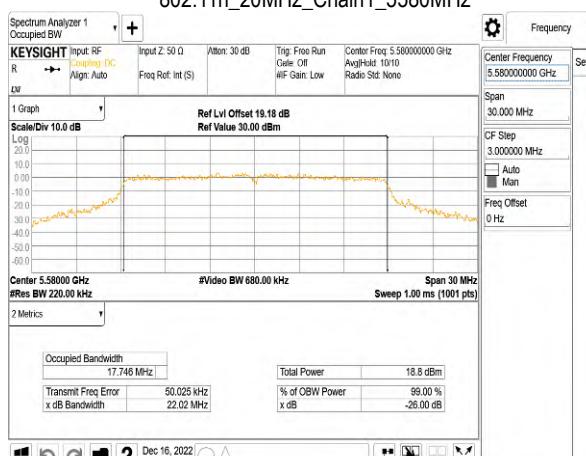
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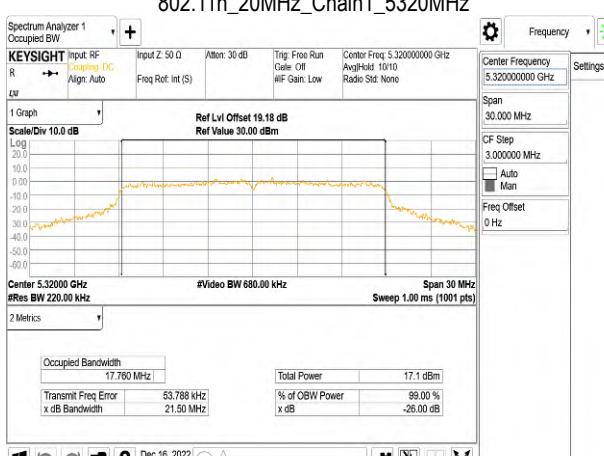
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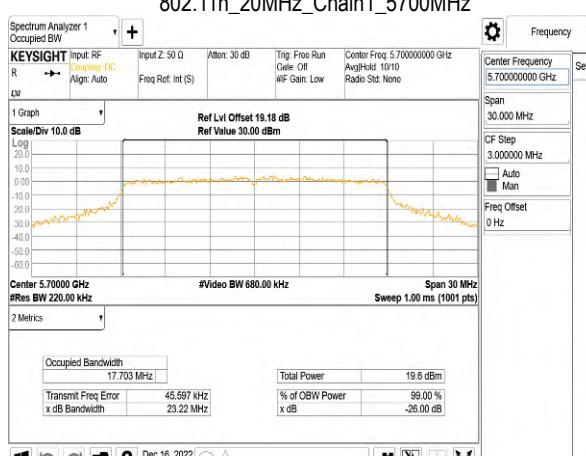
802.11n_20MHz_Chain1_5580MHz



802.11n_20MHz_Chain1_5320MHz



802.11n_20MHz_Chain1_5700MHz



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802.11n_20MHz_Chain1_5720MHz



802.11n_20MHz_Chain1_5825MHz



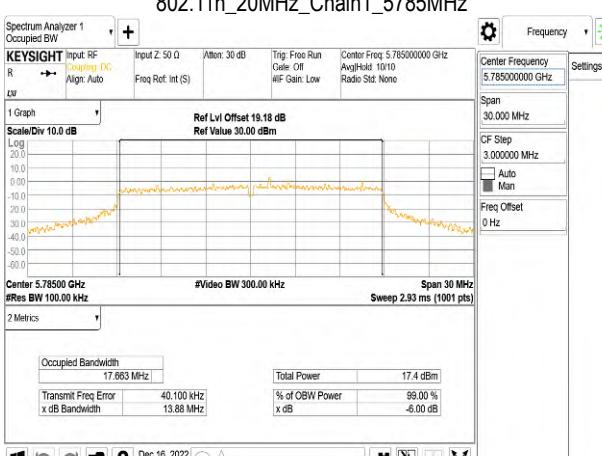
802.11n_20MHz_Chain1_5745MHz



802.11n_40MHz_Chain0_5190MHz



802.11n_20MHz_Chain1_5785MHz



802.11n_40MHz_Chain0_5230MHz



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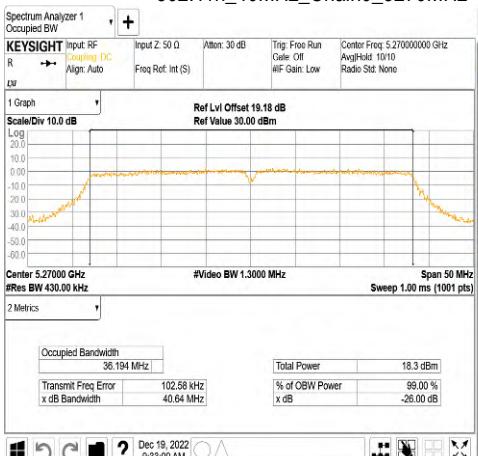
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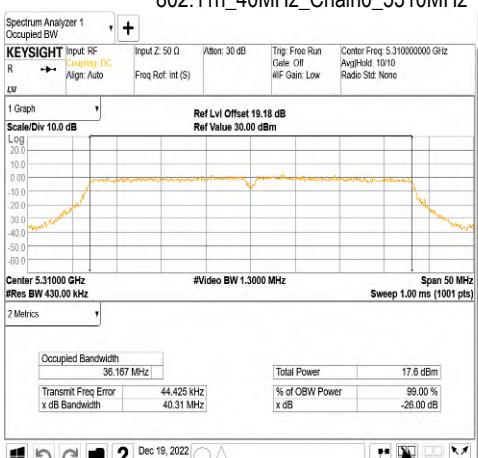
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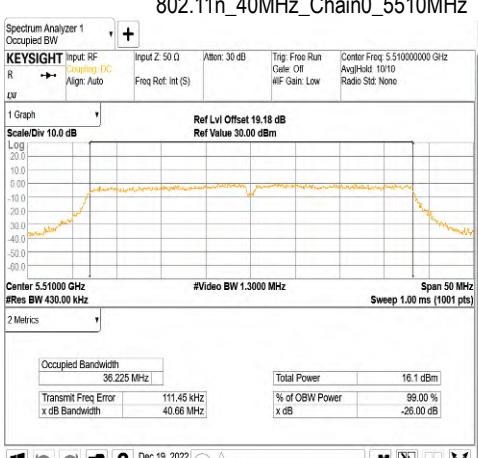
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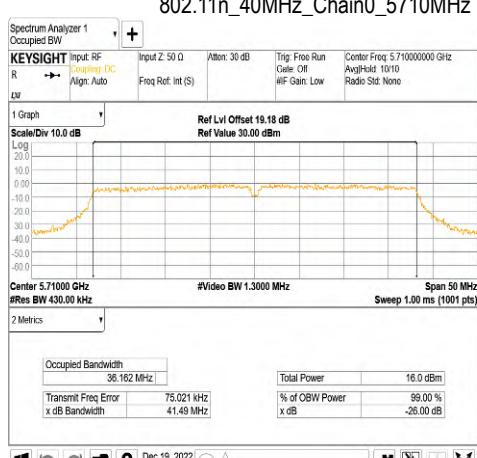
802.11n_40MHz_Chain0_5670MHz



802.11n_40MHz_Chain0_5510MHz



802.11n_40MHz_Chain0_5710MHz



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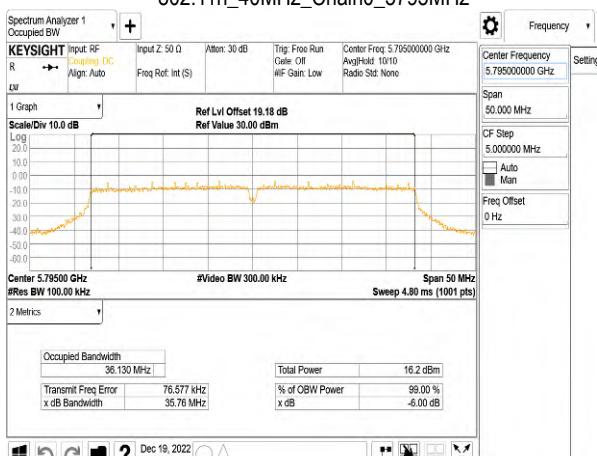
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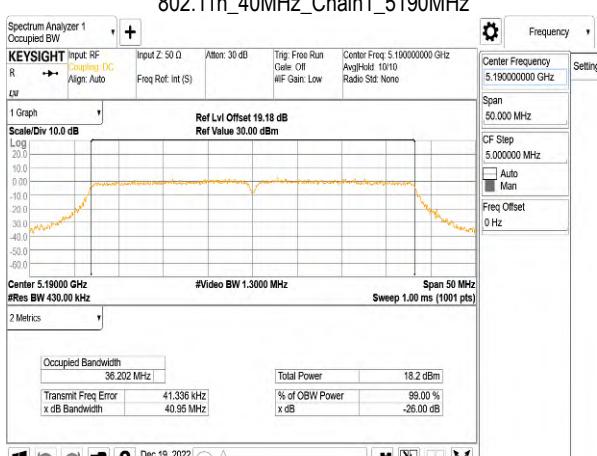
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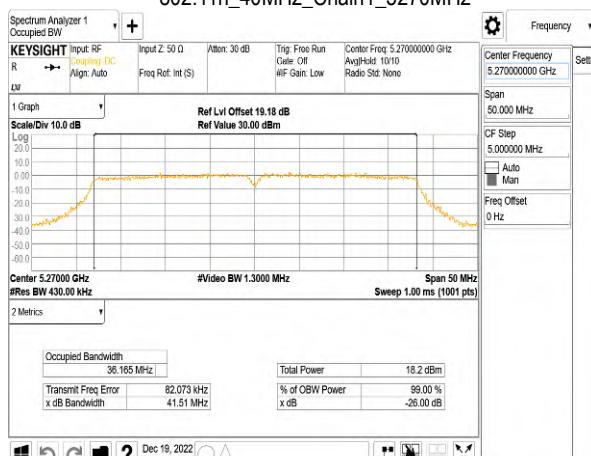
802.11n_40MHz_Chain0_5795MHz



802.11n_40MHz_Chain1_5190MHz



802.11n_40MHz_Chain1_5270MHz



802.11n_40MHz_Chain1_5190MHz



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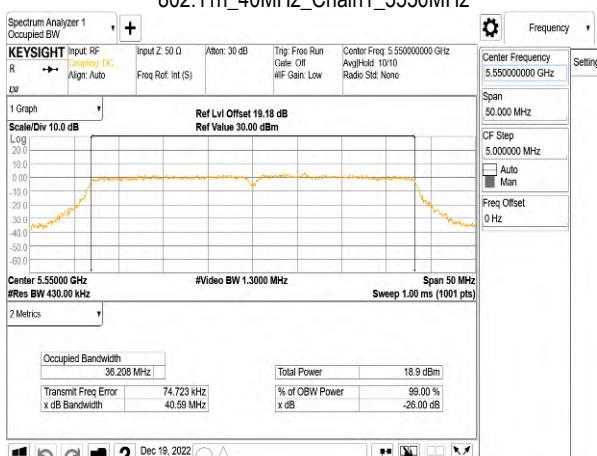
802.11n_40MHz_Chain1_5510MHz



802.11n_40MHz_Chain1_5710MHz



802.11n_40MHz_Chain1_5550MHz



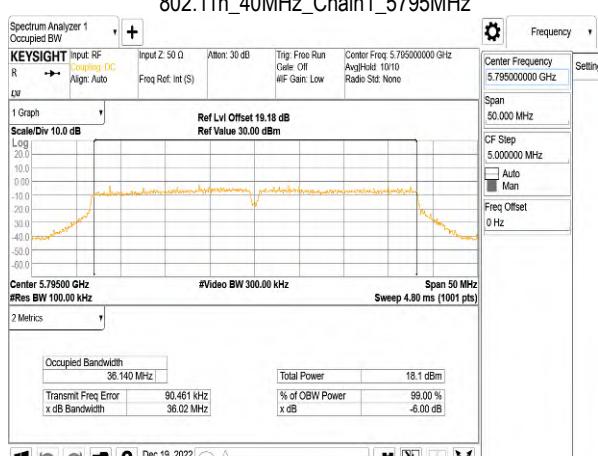
802.11n_40MHz_Chain1_5755MHz



802.11n_40MHz_Chain1_5670MHz



802.11n_40MHz_Chain1_5795MHz



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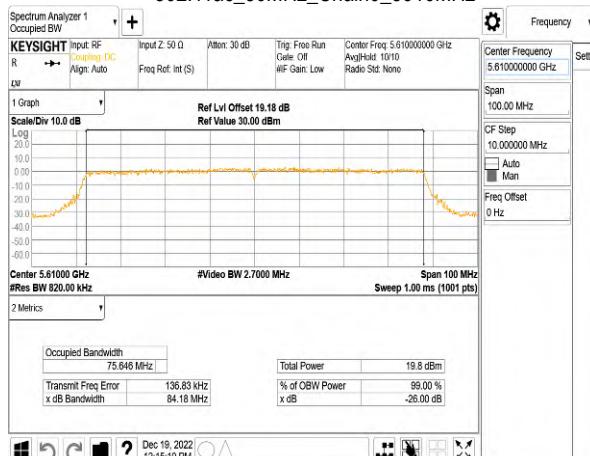
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802.11ac_80MHz_Chain0_5210MHz



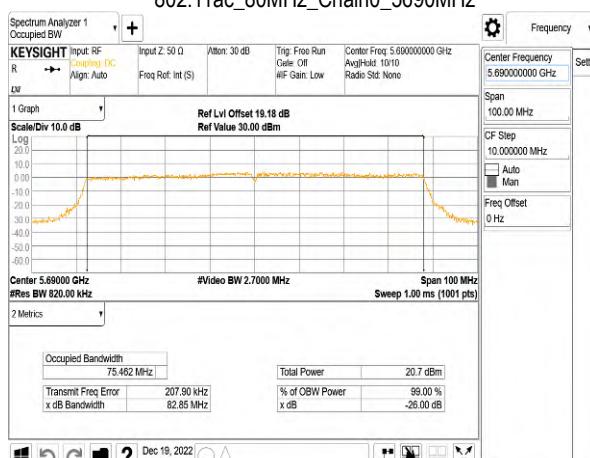
802.11ac_80MHz_Chain0_5610MHz



802.11ac_80MHz_Chain0_5290MHz



802.11ac_80MHz_Chain0_5690MHz



802.11ac_80MHz_Chain0_5530MHz



802.11ac_80MHz_Chain0_5775MHz



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802.11ac_80MHz_Chain1_5210MHz



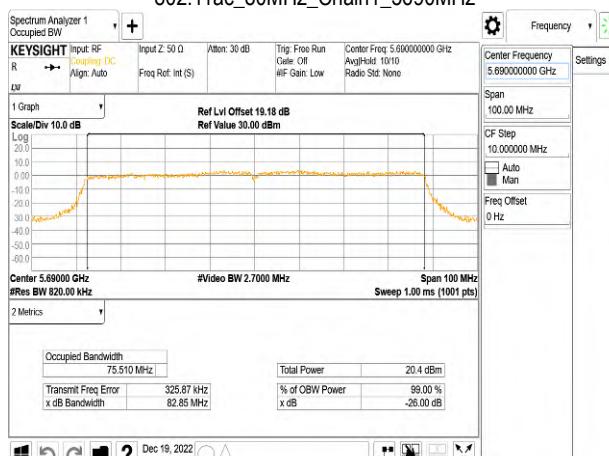
802.11ac_80MHz_Chain1_5610MHz



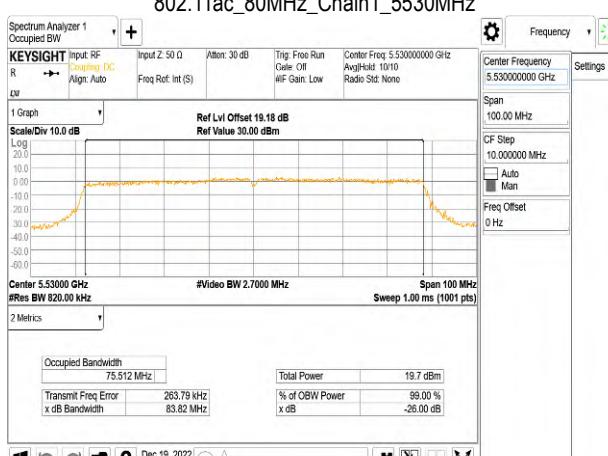
802.11ac 80MHz Chain1 5290MHz



802.11ac 80MHz Chain1 5690MHz



802.11ac 80MHz Chain1 5530MHz



802.11ac 80MHz Chain1 5775MHz



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8.4.2 ISED Occupied Bandwidth

802.11a_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.578	12.200
5220	16.567	12.190
5240	16.586	12.200
5260	16.554	12.190
5300	16.529	12.180
5320	16.559	12.190
5500	16.553	12.190
5580	16.529	12.180
5700	16.584	12.200
5720(U-NII 2C)	13.283	11.230
5720(U-NII 3)	3.283	5.160

802.11a_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	16.559	16.060
5785	16.573	16.340
5825	16.585	16.330

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802.11a_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.564	12.190
5220	16.524	12.180
5240	16.580	12.200
5260	16.525	12.180
5300	16.540	12.190
5320	16.516	12.180
5500	16.537	12.180
5580	16.533	12.180
5700	16.548	12.190
5720(U-NII 2C)	13.266	11.230
5720(U-NII 3)	3.266	5.140

802.11a_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	16.592	16.310
5785	16.574	16.250
5825	16.571	16.310

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802.11n_HT20_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.699	12.480
5220	17.729	12.490
5240	17.737	12.490
5260	17.710	12.480
5300	17.706	12.480
5320	17.686	12.480
5500	17.717	12.480
5580	17.750	12.490
5700	17.708	12.480
5720(U-NII 2C)	13.868	11.420
5720(U-NII 3)	3.868	5.870

802.11n_HT20_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	17.717	17.420
5785	17.721	17.330
5825	17.683	17.530

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802.11n_HT20_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.801	12.500
5220	17.767	12.500
5240	17.777	12.500
5260	17.666	12.470
5300	17.714	12.480
5320	17.691	12.480
5500	17.786	12.500
5580	17.693	12.480
5700	17.724	12.490
5720(U-NII 2C)	13.850	11.410
5720(U-NII 3)	3.850	5.850

802.11n_HT20_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	17.751	17.200
5785	17.746	17.340
5825	17.743	17.580

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802.11n_HT40_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	36.230	15.590
5230	36.164	15.580
5270	36.154	15.580
5310	36.180	15.580
5510	36.168	15.580
5550	36.193	15.590
5670	36.234	15.590
5710(U-NII 2C)	33.103	15.200
5710(U-NII 3)	3.103	4.920

802.11n_HT40_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5755	36.273	36.370
5795	36.139	36.210

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802.11n_HT40_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	36.205	15.590
5230	36.232	15.590
5270	36.150	15.580
5310	36.198	15.590
5510	36.181	15.580
5550	36.131	15.580
5670	36.203	15.590
5710(U-NII 2C)	33.070	15.190
5710(U-NII 3)	3.070	4.870

802.11n_HT40_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5755	36.186	36.140
5795	36.179	36.120

802.11ac_VHT80_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.587	18.780
5290	75.560	18.780
5530	75.352	18.770
5610	75.671	18.790
5690(U-NII 2C)	72.770	18.620
5690(U-NII 3)	2.770	4.420

802.11ac_VHT80_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5775	75.581	75.820

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802.11ac_VHT80_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.783	18.800
5290	75.575	18.780
5530	75.636	18.790
5610	75.647	18.790
5690(U-NII 2C)	72.775	18.620
5690(U-NII 3)	2.775	4.430

802.11ac_VHT80_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5775	75.576	75.560

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802.11a_20MHz_Chain0_5180MHz



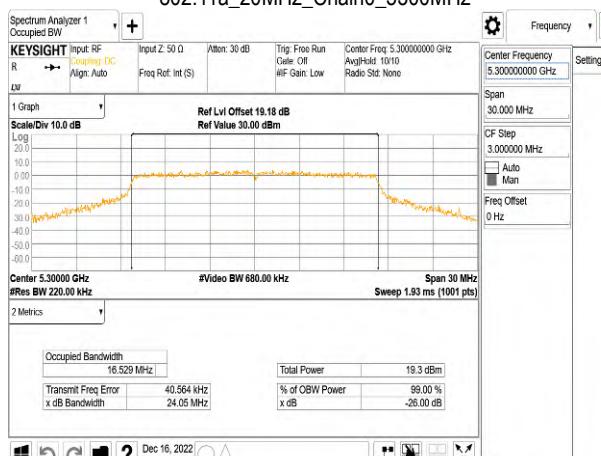
802.11a_20MHz_Chain0_5260MHz



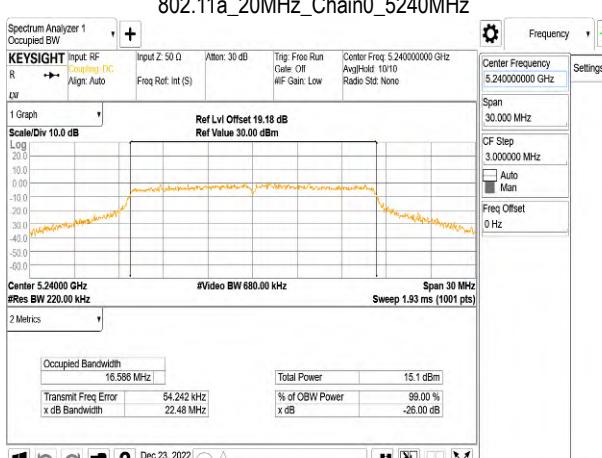
802.11a_20MHz_Chain0_5220MHz



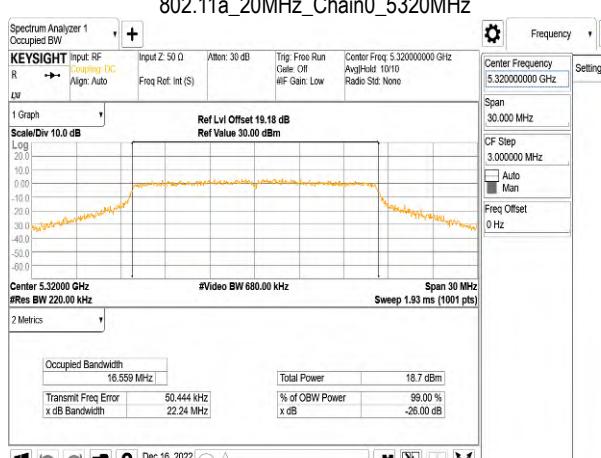
802.11a_20MHz_Chain0_5300MHz



802.11a_20MHz_Chain0_5240MHz



802.11a_20MHz_Chain0_5320MHz



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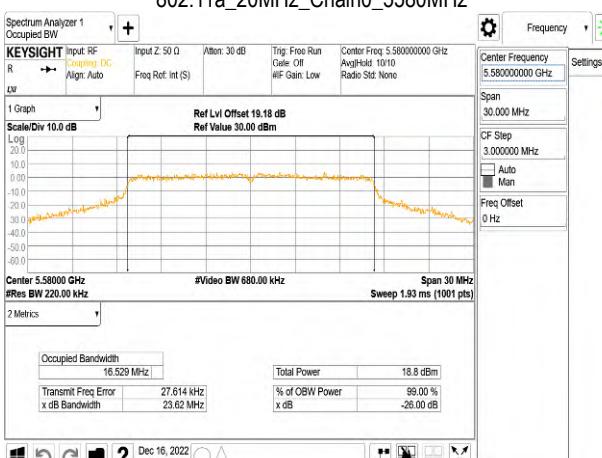
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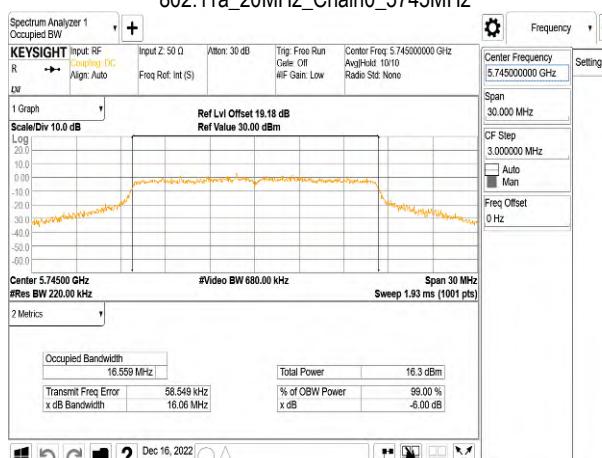
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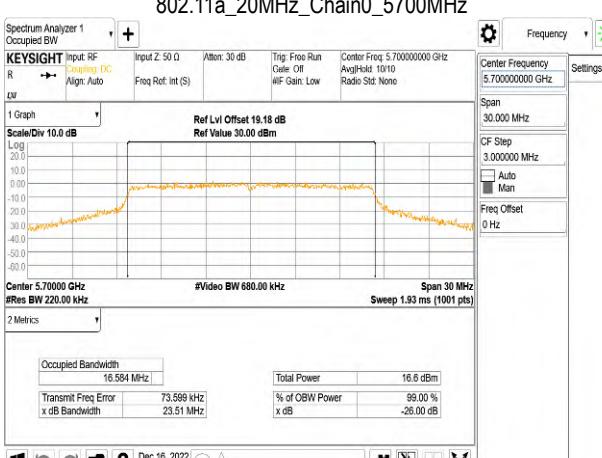
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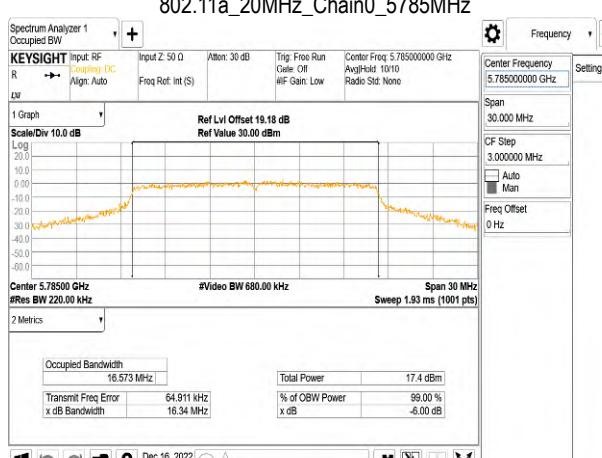
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802.11a_20MHz_Chain0_5700MHz



802.11a_20MHz_Chain0_5785MHz



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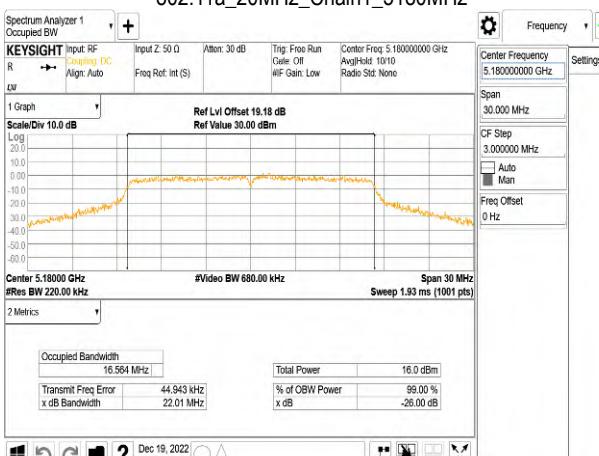
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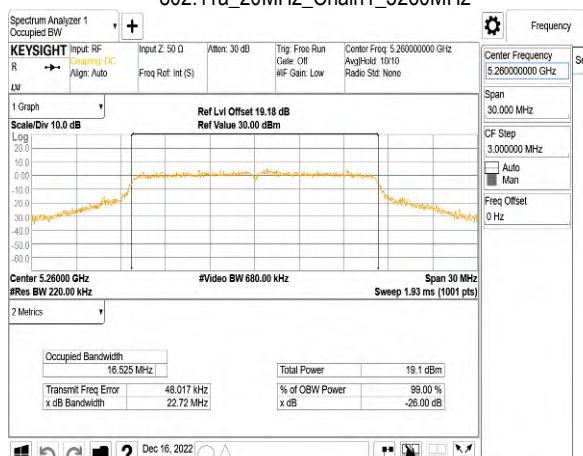
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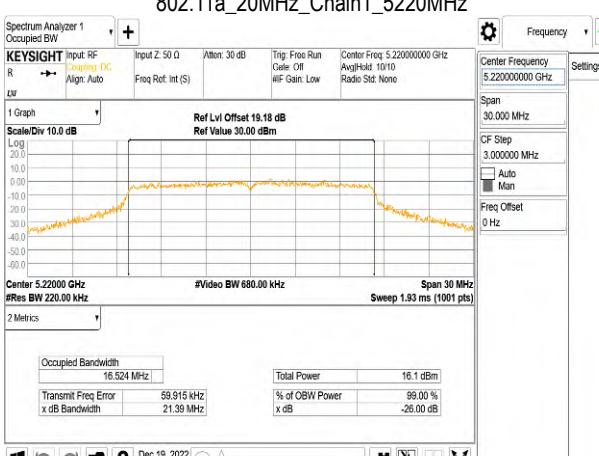
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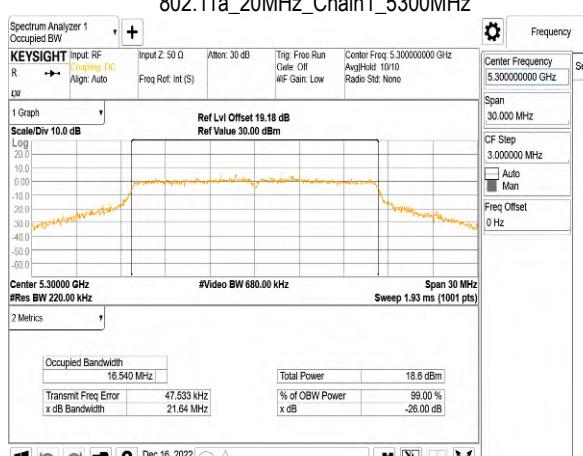
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802.11a_20MHz_Chain1_5220MHz



802.11a_20MHz_Chain1_5300MHz



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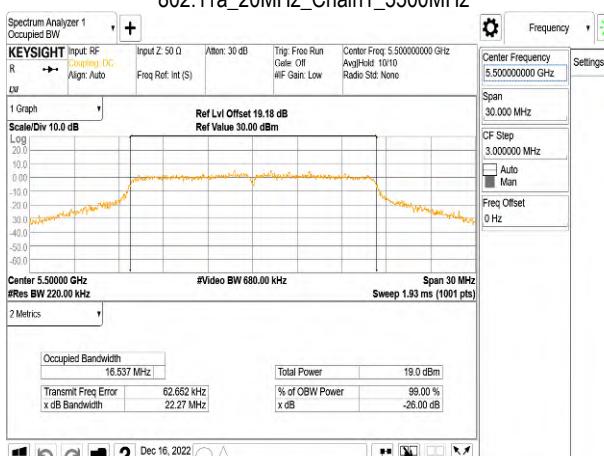
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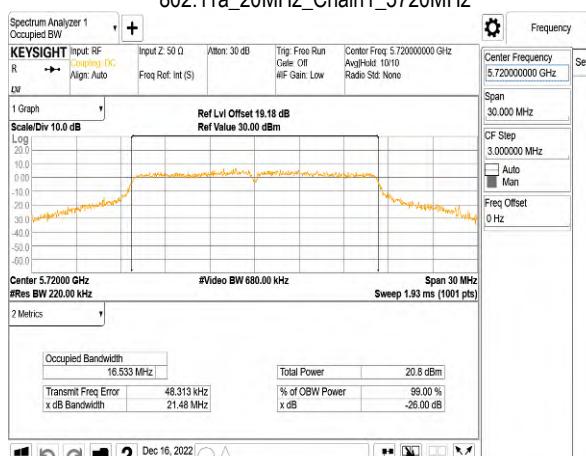
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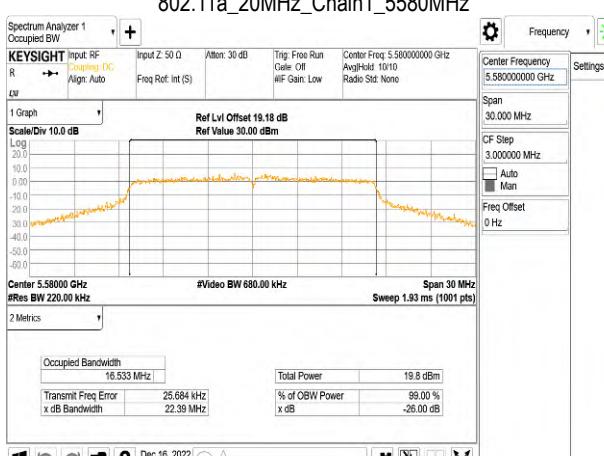
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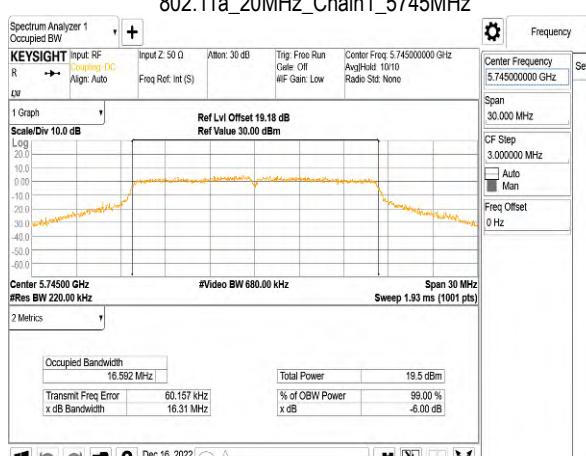
802.11a_20MHz_Chain1_5720MHz



802.11a_20MHz_Chain1_5580MHz



802.11a_20MHz_Chain1_5745MHz



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802.11a_20MHz_Chain1_5785MHz



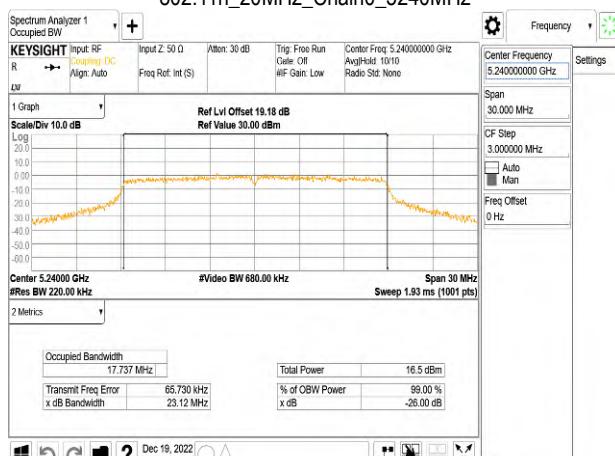
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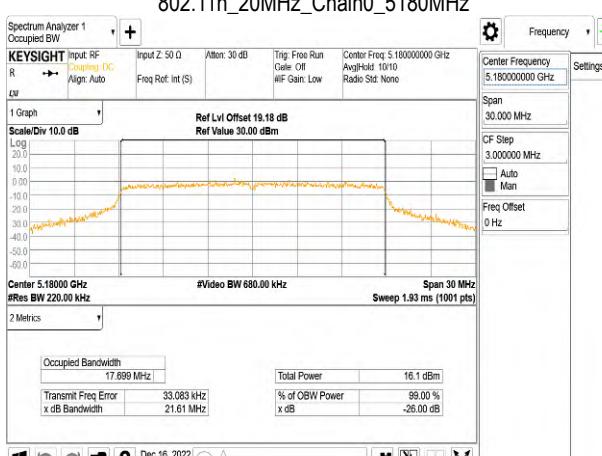
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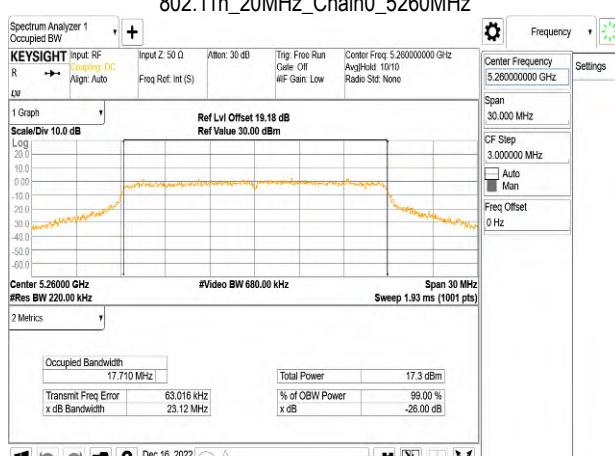
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802.11n_20MHz_Chain0_5180MHz



802.11n_20MHz_Chain0_5260MHz



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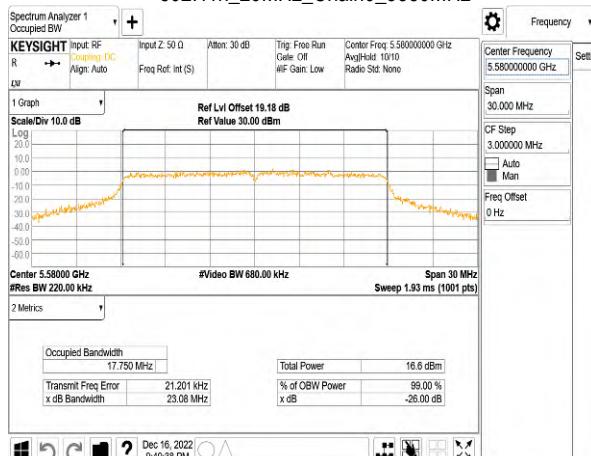
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802.11n_20MHz_Chain0_5300MHz



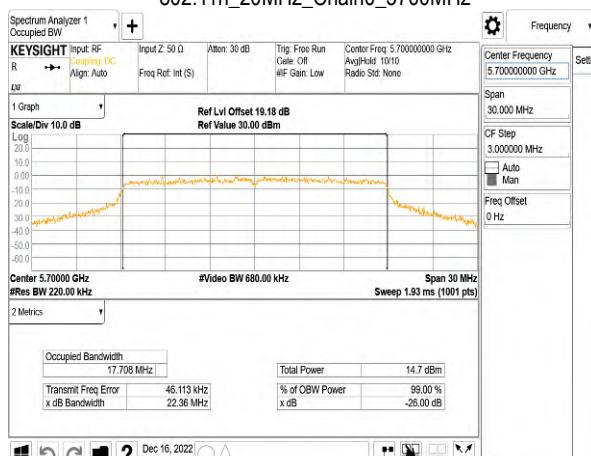
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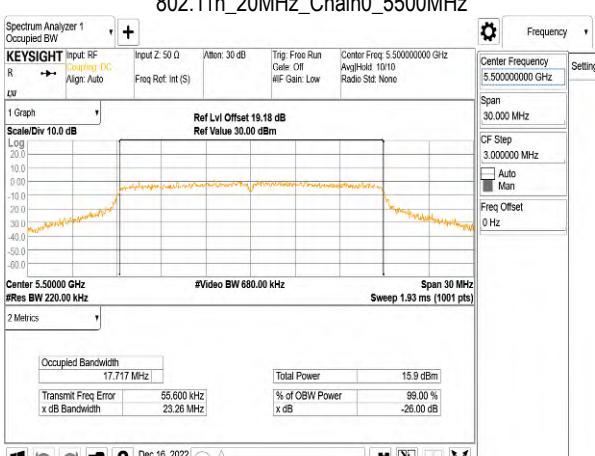
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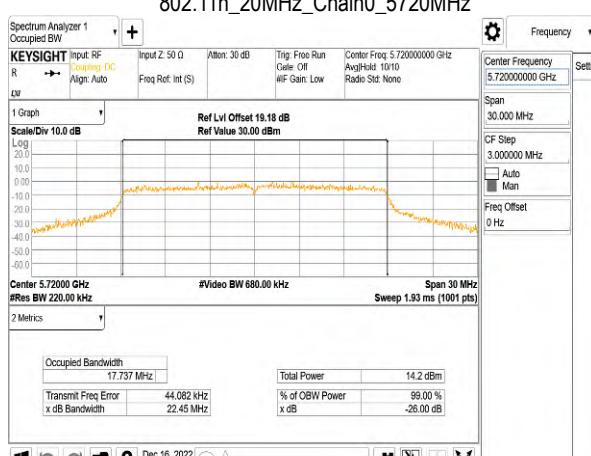
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802.11n_20MHz_Chain0_5500MHz



802.11n_20MHz_Chain0_5720MHz



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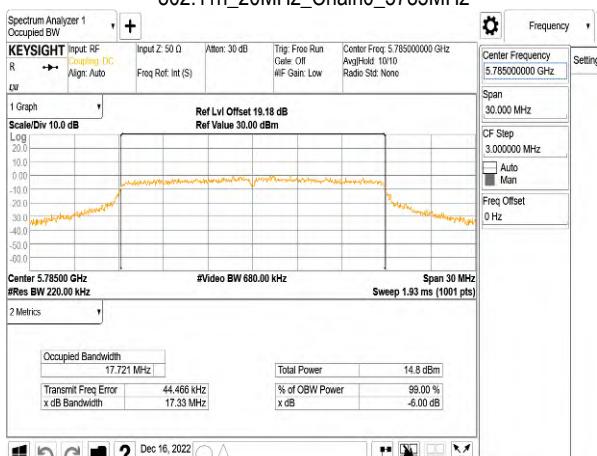
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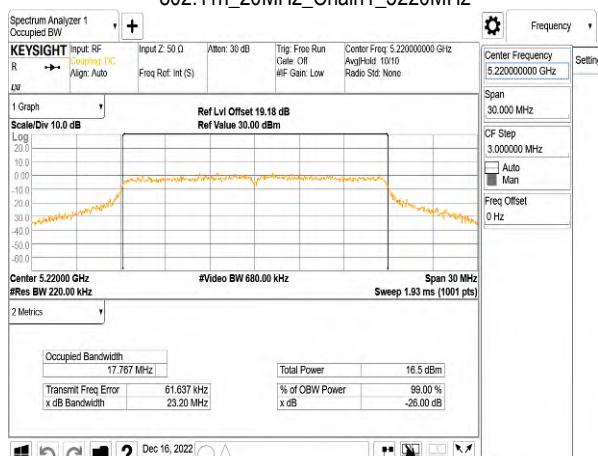
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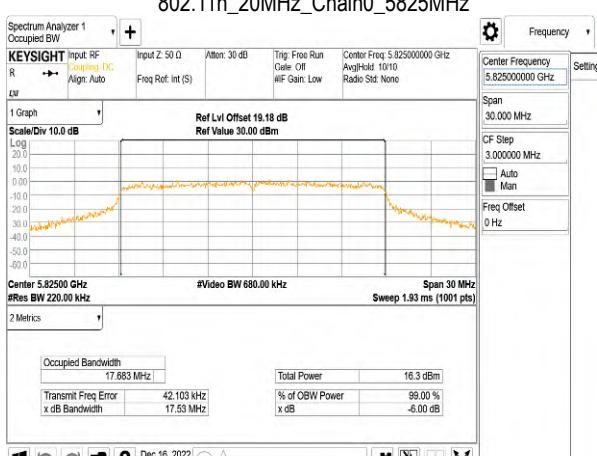
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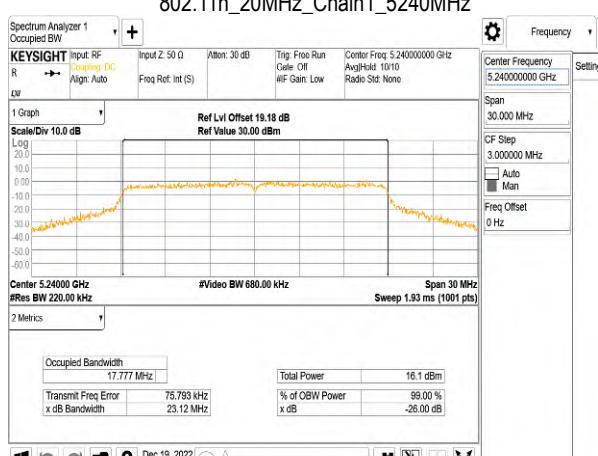
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802.11n_20MHz_Chain0_5825MHz



802.11n_20MHz_Chain1_5240MHz



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