

**ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT**

Applicant: HTC Corporation
No. 88, Section 3, Zhongxing Rd. Xindian Dist., New Taipei
City 231, Taiwan

Manufacturer: HTC Corporation
No. 88, Section 3, Zhongxing Rd. Xindian Dist., New Taipei
City 231, Taiwan

Product Name: Headset

Brand Name: VIVE

Model No.: 2QBB100

Model Difference: N/A

Report Number: TERF2207001115E2

FCC ID NM82QBB100

Date of EUT Received: Jul. 19, 2022

Date of Test: Jul. 27, 2022~Sep. 28, 2022

Issue Date: Nov. 25, 2022

Approved By _____

Vito Pei

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.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2207001115E2	00	Original.	Nov. 16, 2022	Yi-Shan Tsai	
TERF2207001115E2	01	Update Brand of Adapter	Nov. 25, 2022	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:	Headset
Brand Name:	VIVE
Model No.:	2QBB100
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	TE-2207000102P M1 E2 (Conducted) TE_SP_20220905591 (Conduction 、Radiated)
Power Supply:	Battery Cradle 5V 3A, 9V 1.57A, 12V 1.5A
Test Software (Name/Version)	QRCT V4.0.00163.0 / QSPR V5.0.00188 (Conducted) adb tool / V6.1 & QRCT / V4.0 & QSPR / V5.0 (Conduction 、Radiated)

1.2 Modulation & Data Rate

Modulation type:	64QAM, 16QAM, QPSK, BPSK for OFDM
	256QAM for OFDM in 802.11ac
	256QAM, 1024QAM for OFDMA in 802.11ax
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
	802.11 ac_160MHz: up to 1733.4 Mbps
	802.11 ax_20MHz: up to 286.8 Mbps
	802.11 ax_40MHz: up to 573.6 Mbps
	802.11 ax_80MHz: up to 1201 Mbps
	802.11 ax_160MHz: up to 2402 Mbps

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1.3 Antenna Designation

Antenna Type	Freq. (MHz)	Peak Antenna Gain (dBi)	Direction Gain(dBi)
Dipole	5150~5250	2.56	5.33
	5250~5350	2.56	5.33
	5470~5725	2.83	4.34
	5725~5850	2.68	4.30
Dipole	5150~5250	2.08	5.33
	5250~5350	2.08	5.33
	5470~5725	-0.48	4.34
	5725~5850	-0.36	4.30

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.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}] \text{ dBi}$$

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SGS Taiwan Ltd. No.134,Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan/新北市五股區新北產業園區五工路 134 號

1.4 FCC

Wi-Fi	Frequency Range	Channels	Rated Power(Avg) (dBm) (Worst Case)	Modulation Technology
a/ n_HT/ ac_VHT/ ax_HE 20M	5180~5240	4	17.54 dBm	OFDMA
	5260~5320	4	19.96 dBm	OFDM
	5500~5720	12	19.92 dBm	OFDM
	5745-5825	5	19.95 dBm	OFDM
n_HT ac_VHT/ ax_HE 40M	5190~5230	2	17.45 dBm	OFDM
	5270~5310	2	19.91 dBm	OFDM
	5510~5710	6	19.89 dBm	OFDM
	5755-5795	2	19.93 dBm	OFDMA
ac_VHT/ ax_HE 80M	5210	1	17.44 dBm	OFDMA
	5290	1	19.50 dBm	OFDM
	5530~5690	3	19.82 dBm	OFDM
	5775	1	19.94 dBm	OFDMA
ac_VHT/ ax_HE 160M	5250	1	18.43 dBm	OFDMA
	5570	1	17.90 dBm	OFDMA

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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
 FCC KDB 291074 D02 EMC Measurement v01
 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 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.

1.7 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*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.

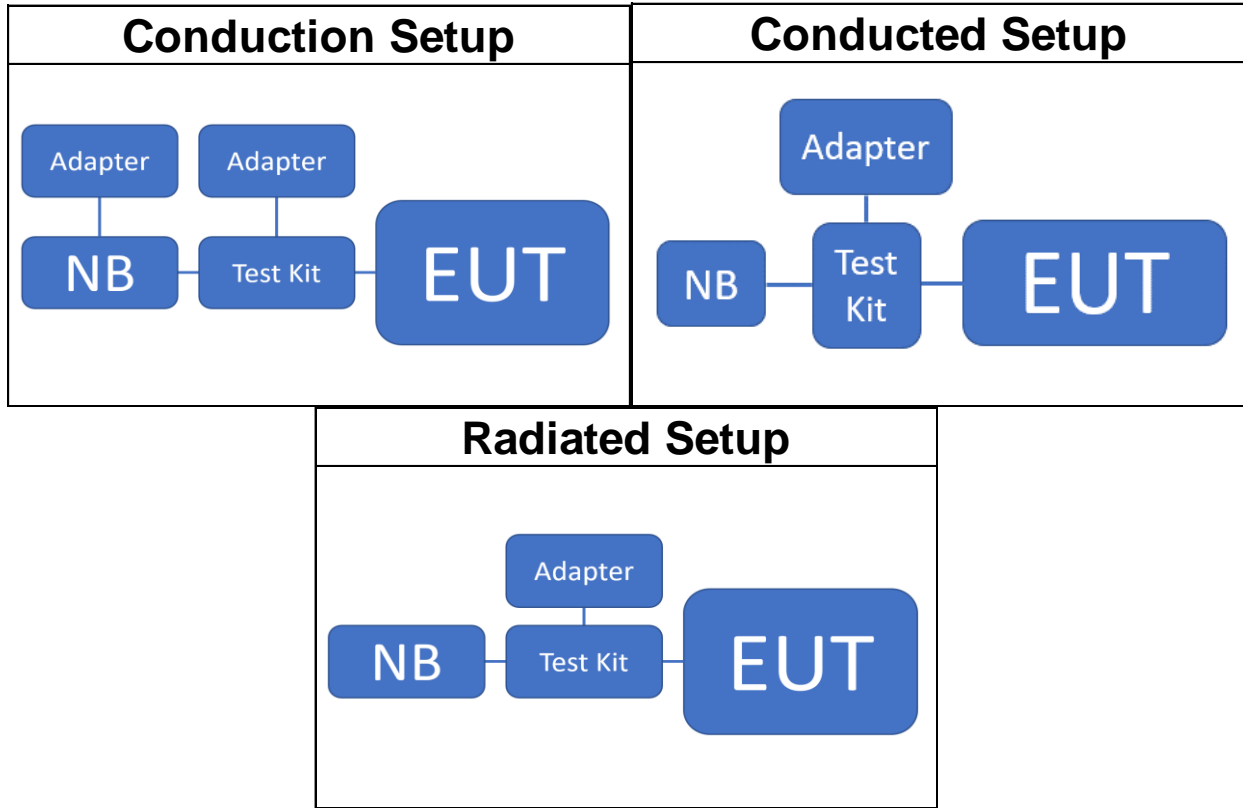
2.4.2 For all conducted test items:

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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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.
Notebook	Lenovo	T440p	P0000665	N/A	N/A
Adapter	Lenovo	ADLX90NLC3A	N/A	N/A	N/A
1.2M C-to-C cable	VIVE	C807M3A03E1M2	N/A	N/A	N/A
USB Cable	Hawk	CAD150	N/A	N/A	N/A
PD adapter	HTC	TC PD30W-WW	N/A	N/A	N/A
Test kit	VIVE	2QBB100-TB	N/A	N/A	N/A
Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
USB Cable	Hawk	CAD150	N/A	N/A	N/A
PD adapter	HTC	TC PD30W-WW	N/A	N/A	N/A
Test kit	VIVE	2QBB100-TB	N/A	N/A	N/A
Notebook	Lenovo	T420	S0012599	N/A	N/A
Radiated Emission Test Site: SAC D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T440p	P0000665	N/A	N/A
USB Cable	Hawk	CAD150	N/A	N/A	N/A
PD adapter	HTC	TC PD30W-WW	N/A	N/A	N/A
Test kit	VIVE	2QBB100-TB	N/A	N/A	N/A

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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	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		160 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
52	5260	54	5270	58	5290	50	5250
56	5280	62	5310				
60	5300						
64	5320						

Operated band in 5470 MHz ~5725 MHz:

20 M		40 M		80 M		160 M	
CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)	CH	Freq (MHz)
100	5500	102	5510	106	5530	114	5570
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	151	5755	155	5775
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		
v	802.11 a	v	Ch0	v	Ch1		Ch2		Ch3	1TX	v	2TX
v	802.11 n	v	Ch0	v	Ch1		Ch2		Ch3	1TX	v	2TX
v	802.11 ac	v	Ch0	v	Ch1		Ch2		Ch3	1TX	v	2TX
v	802.11 ax	v	Ch0	v	Ch1		Ch2		Ch3	1TX	v	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.

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	2TX
	5260~5320	52 to 64	60			
	5500~5720	100 to 144	116			
	5745~5825	149 to 165	157			

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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	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			
802.11ac_VHT160	5250	50	50	OFDM	MCS0	2TX
	5570	114	114			

RADIATED EMISSION TEST (ABOVE 1 GHz)							
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATI	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	5180~5240	36 to 48	36,44,48	OFDMA	FULL RU 26/0,26/8 52/37,52/40 106/53,106/54	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				
802.11ax_HE40	5190~5230	38 to 46	38,46	OFDMA	FULL RU 242/61,242/62	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				
802.11ax_HE80	5210	42	42	OFDMA	FULL RU 484/65,484/66	MCS0	2TX
	5290	58	58				
	5530~5610	106 to 138	106,122,138				
	5775	155	155				
802.11ax_HE160	5250	50	50	OFDMA	FULL RU 996/67,996/S6	MCS0	2TX
	5570	114	114				

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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	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			
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	5290	58	58			
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802.11ac_VHT160	5250	50	50	OFDM	MCS0	2TX
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802.11ax_HE20	5180~5240	36 to 48	36,44,48	OFDMA	FULL RU 26/0,26/8 52/37,52/40 106/53,106/54	MCS0	2TX
	5260~5320	52 to 64	52,60,64				
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	5290	58	58				
	5530~5610	106 to 138	106,122,138				
	5775	155	155				
802.11ax_HE160	5250	50	50	OFDMA	FULL RU 996/67,996/S6	MCS0	2TX
	5570	114	114				

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	+/- 2.34 dB
Output Power measurement	+/- 1 dB
Emission Bandwidth	+/- 1.53 Hz
Undesignable radiated emission measurement	+/- 1.68 dB
Peak Power Density	+/- 1.62 dB
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	2.57 dB	9kHz~30MHz
	+/-	4.85 dB	30MHz - 1000MHz
	+/-	4.45 dB	1GHz - 18GHz
	+/-	4.24 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	2.57 dB	9kHz~30MHz
	+/-	4.37 dB	30MHz - 1000MHz
	+/-	4.45 dB	1GHz - 18GHz
	+/-	4.24 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
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
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

6.2 Conducted Measurement

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	05/16/2022	05/15/2023
Power Meter	Anritsu	ML2496A	1512003	07/26/2022	07/25/2023
Power Sensor	Anritsu	MA2411B	1339378	07/26/2022	07/25/2023
Power Sensor	Anritsu	MA2411B	1339379	07/26/2022	07/25/2023
Attenuator	Marvelous	WATT-218FS-10	RF16	11/18/2021	11/17/2022
Attenuator	Marvelous	WATT-218FS-10	RF23	11/18/2021	11/17/2022
DC Block	PASTERNAK	PE8210	RF158	11/18/2021	11/17/2022

6.3 Radiated Measurement

Radiated Emission Test Site: SAC D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-617	11/12/2021	11/11/2022
Horn Antenna	Schwarzbeck	BBHA9170	185	08/22/2022	08/21/2023
Horn Antenna	Schwarzbeck	BBHA9170	184	12/16/2021	12/15/2022
Horn Antenna	Schwarzbeck	BBHA9120D	1341	05/31/2022	05/30/2023
Loop Antenna	ETS.LINDGREN	6502	143303	05/14/2022	05/13/2023
3m Site NSA	SGS	966 chamber D	N/A	04/30/2022	04/29/2023
Spectrum Analyzer	KEYSIGHT	N9010A	MY57120200	03/24/2022	03/23/2023
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R
Pre-Amplifier	EMC Instruments	EMC184045B	980135	10/27/2021	10/26/2022
Pre-Amplifier	EMC Instruments	EMC9135	980234	11/18/2021	11/17/2022
Pre-Amplifier	EMC Instruments	EMC12630SE	980273	11/18/2021	11/17/2022
Attenuator	Marvelous	MVE2213-10	RF05	11/18/2021	11/17/2022
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	11/18/2021	11/17/2022
Coaxial Cable	Huber Suhner	EMC106-SM-SM-7200	150703	11/18/2021	11/17/2022
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17413/4	11/18/2021	11/17/2022

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

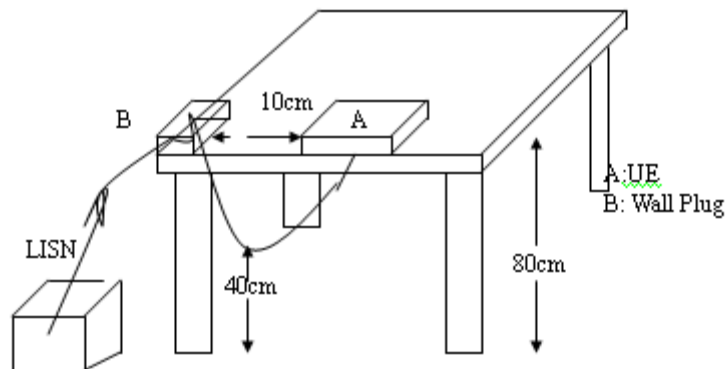
Note

- 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



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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.

7.5 Measurement Result

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

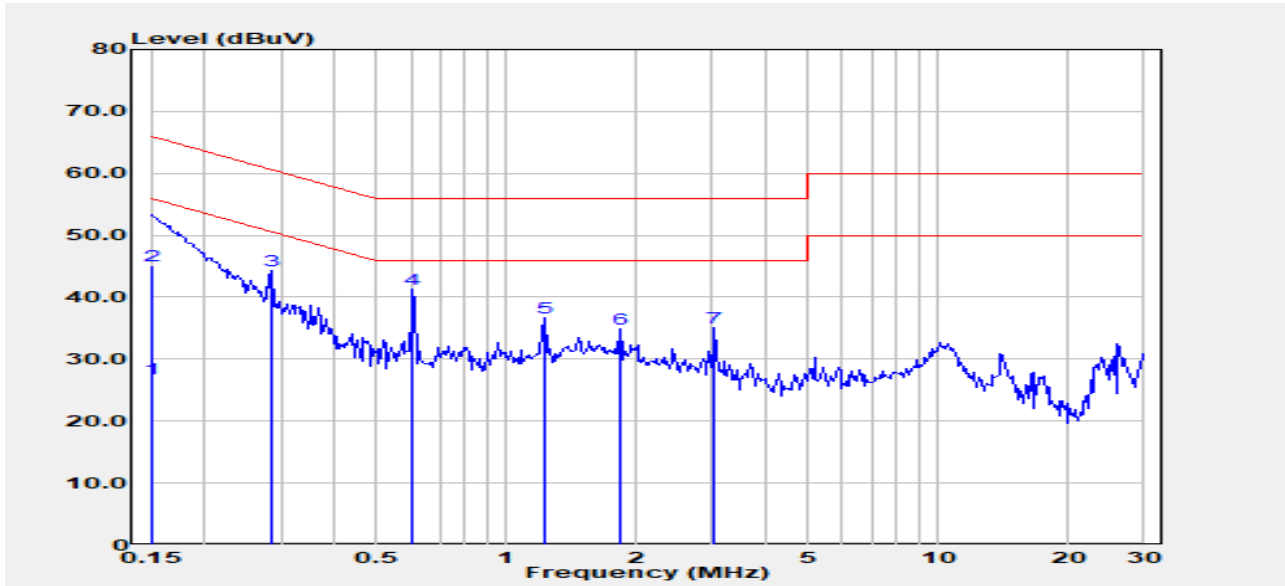
Note2: The * reveals the worst-case results that closest to the limit.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:TERF2207001115E2	Test Site	:Conduction C
Test Mode	:802.11a	Test Date	:2022-09-28
Power	:120V/60Hz	Temp./Humi.	:24.7/54
Probe	:L1	Engineer	:Howard Huang



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.152	Average	16.50	10.30	26.80	55.91	-29.11
0.152	QP	34.80	10.30	45.10	65.91	-20.81
0.286	Peak	33.97	10.30	44.28	60.63	-16.35
0.608	Peak	31.08	10.32	41.40	56.00	-14.60
1.223	Peak	26.04	10.58	36.62	56.00	-19.38
1.829	Peak	23.90	11.06	34.96	56.00	-21.04
3.041	Peak	24.30	10.88	35.18	56.00	-20.82

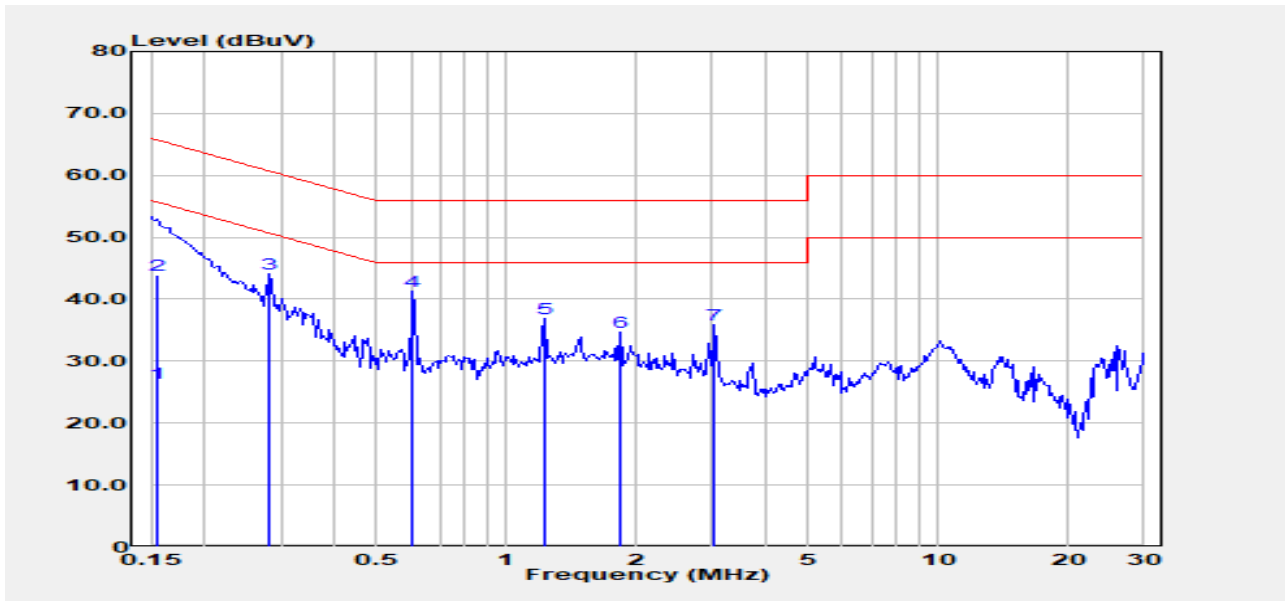
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Report Number :TERF2207001115E2
 Test Mode :802.11a
 Power :120V/60Hz
 Probe :N

Test Site :Conduction C
 Test Date :2022-09-28
 Temp./Humi. :24.7/54
 Engineer :Howard Huang



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
0.155	Average	16.10	10.31	26.41	55.74	-29.33
0.155	QP	33.60	10.31	43.91	65.74	-21.83
0.283	Peak	33.88	10.31	44.19	60.72	-16.53
0.608	Peak	30.97	10.33	41.30	56.00	-14.70
1.223	Peak	26.31	10.59	36.90	56.00	-19.10
1.829	Peak	23.65	11.07	34.72	56.00	-21.28
3.041	Peak	25.04	10.89	35.93	56.00	-20.07

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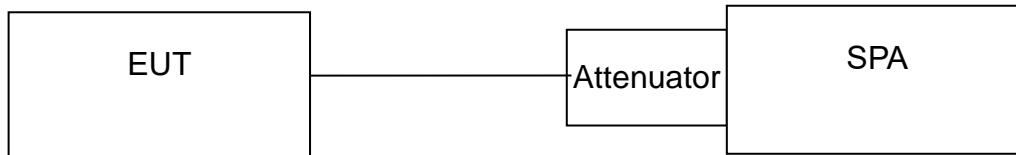
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8 EMISSION BANDWIDTH MEASUREMENT

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. 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	18.85	12.750
5220	18.84	12.750
5240	18.90	12.760
5260	18.54	12.680
5300	18.78	12.740
5320	18.95	12.780
5500	18.67	12.710
5580	18.75	12.730
5700	18.92	12.770
5720(U-NII 2C)	14.41	11.590
5720(U-NII 3)	4.41	6.440

802.11a_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.36	12.140
5785	16.35	12.140
5825	16.36	12.140

802.11a_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.13	< 5250
5745	5736.76	> 5725

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802.11a_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	18.66	12.710
5220	18.65	12.710
5240	18.62	12.700
5260	18.51	12.670
5300	18.80	12.740
5320	18.59	12.690
5500	18.75	12.730
5580	18.59	12.690
5700	18.85	12.750
5720(U-NII 2C)	14.55	11.630
5720(U-NII 3)	4.55	6.580

802.11a_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.36	12.140
5785	16.33	12.130
5825	16.38	12.140

802.11a_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.14	< 5250
5745	5736.75	> 5725

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802.11n_HT20_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	20.02	13.010
5220	20.06	13.020
5240	19.90	12.990
5260	19.99	13.010
5300	19.66	12.940
5320	19.90	12.990
5500	19.89	12.990
5580	19.75	12.960
5700	20.11	13.030
5720(U-NII 2C)	15.06	11.780
5720(U-NII 3)	5.06	7.050

802.11n_HT20_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.56	12.450
5785	17.69	12.480
5825	17.60	12.460

802.11n_HT20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.718626	< 5250
5745	5736.150212	> 5725

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802.11n_HT20_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	19.66	12.940
5220	19.85	12.980
5240	19.85	12.980
5260	19.74	12.950
5300	19.94	13.000
5320	20.04	13.020
5500	19.93	13.000
5580	19.86	12.980
5700	19.97	13.000
5720(U-NII 2C)	15.02	11.770
5720(U-NII 3)	5.02	7.010

802.11n_HT20_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.60	12.460
5785	17.57	12.450
5825	17.63	12.460

802.11n_HT20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.753304	< 5250
5745	5736.151534	> 5725

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802.11n_HT40_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	39.72	15.990
5230	39.95	16.020
5270	39.53	15.970
5310	40.18	16.040
5510	39.62	15.980
5550	40.02	16.020
5670	39.86	16.010
5710(U-NII 2C)	34.95	15.440
5710(U-NII 3)	4.95	6.950

802.11n_HT40_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.77	15.540
5795	35.67	15.520

802.11n_HT40_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.00	< 5250
5755	5736.90	> 5725

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802.11n_HT40_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	39.42	15.960
5230	39.80	16.000
5270	39.58	15.970
5310	39.73	15.990
5510	39.75	15.990
5550	39.79	16.000
5670	39.53	15.970
5710(U-NII 2C)	34.83	15.420
5710(U-NII 3)	4.83	6.840

802.11n_HT40_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.89	15.550
5795	36.55	15.630

802.11n_HT40_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.06	< 5250
5755	5736.85	> 5725

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802.11ac_VHT80_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	81.13	19.090
5290	80.97	19.080
5530	80.93	19.080
5610	80.70	19.070
5690(U-NII 2C)	75.35	18.770
5690(U-NII 3)	5.35	7.280

802.11ac_VHT80_Ch0

Freq. (MHz)	40.36	10 Log (B) (dB)
5775	72.86	18.620

802.11ac_VHT80_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5247.738782	163
5775	5737.230119	164

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802.11ac_VHT80_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	81.58	19.120
5290	81.21	19.100
5530	81.39	19.110
5610	80.60	19.060
5690(U-NII 2C)	75.53	18.780
5690(U-NII 3)	5.53	7.430

802.11ac_VHT80_Ch1

Freq. (MHz)	40.13	10 Log (B) (dB)
5775	76.45	18.830

802.11ac_VHT80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5247.611604	165
5775	5737.264278	165

802.11ac_VHT160_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5250	163.50	22.140
5570	164.40	22.160

802.11ac_VHT160_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5250	164.90	22.170
5570	165.30	22.180

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802.11ax_HE20_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5180	full	21.15	13.250
5220	full	21.06	13.230
5240	full	20.47	13.110
5260	full	20.83	13.190
5300	full	20.69	13.160
5320	full	20.67	13.150
5500	full	20.55	13.130
5580	full	20.51	13.120
5700	full	20.62	13.140
5720 (U-NII 2C)	full	15.27	11.840
5720 (U-NII 3)	full	5.27	7.210

802.11ax_HE20_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5745	full	18.85	12.750
5785	full	18.98	12.780
5825	full	18.94	12.770

802.11ax_HE20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.392323	< 5250
5745	5735.499804	> 5725

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802.11ax_HE20_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5180	full	20.88	13.200
5220	full	20.53	13.120
5240	full	20.81	13.180
5260	full	20.90	13.200
5300	full	20.59	13.140
5320	full	21.10	13.240
5500	full	20.50	13.120
5580	full	20.52	13.120
5700	full	20.88	13.200
5720 (U-NII 2C)	full	15.30	11.850
5720 (U-NII 3)	full	5.30	7.240

802.11ax_HE20_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5745	full	19.01	12.790
5785	full	19.10	12.810
5825	full	18.84	12.750

802.11ax_HE20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.387400	< 5250
5745	5735.492389	> 5725

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802.11ax_HE40_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5190	full	39.82	16.000
5230	full	40.36	16.060
5270	full	40.04	16.020
5310	full	39.84	16.000
5510	full	40.47	16.070
5550	full	40.17	16.040
5670	full	39.89	16.010
5710 (U-NII 2C)	full	34.97	15.440
5710 (U-NII 3)	full	4.97	6.960

802.11ax_HE40_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5755	full	37.98	15.800
5795	full	36.39	15.610

802.11ax_HE40_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.836129	< 5250
5755	5736.090131	> 5725

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802.11ax_HE40_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5190	full	39.91	16.010
5230	full	40.13	16.030
5270	full	40.56	16.080
5310	full	40.06	16.030
5510	full	40.07	16.030
5550	full	39.57	15.970
5670	full	40.13	16.030
5710 (U-NII 2C)	full	35.07	15.450
5710 (U-NII 3)	full	5.07	7.050

802.11ax_HE40_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5755	full	37.78	15.770
5795	full	37.54	15.740

802.11ax_HE40_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.843521	< 5250
5755	5736.122477	> 5725

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802.11ax_HE80_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5210	full	81.08	19.090
5290	full	81.48	19.110
5530	full	81.33	19.100
5610	full	81.71	19.120
5690 (U-NII 2C)	full	75.90	18.800
5690 (U-NII 3)	full	5.90	7.700

802.11ax_HE80_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5775	full	77.89	18.910

802.11ax_HE80_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.540706	< 5250
5775	5736.351935	> 5725

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802.11ax_HE80_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5210	full	81.13	19.090
5290	full	80.77	19.070
5530	full	81.00	19.080
5610	full	80.88	19.080
5690 (U-NII 2C)	full	75.34	18.770
5690 (U-NII 3)	full	5.34	7.270

802.11ax_HE80_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5775	full	77.34	18.880

802.11ax_HE80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.496210	< 5250
5775	5736.474893	> 5725

802.11ax_HE160_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5250	full	164.80	22.170
5570	full	165.50	22.190

802.11ax_HE160_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5250	full	164.40	22.160
5570	full	165.10	22.180

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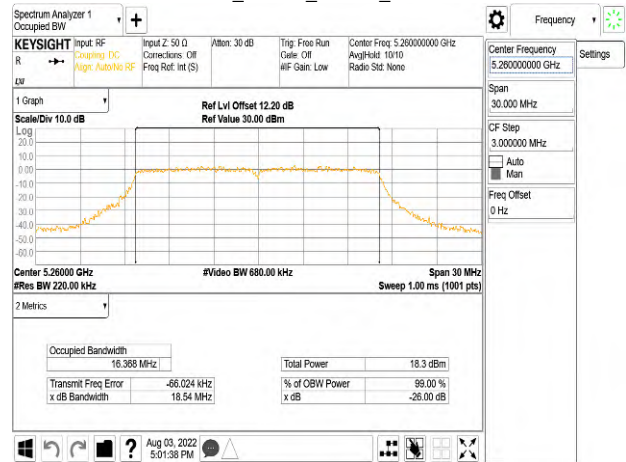
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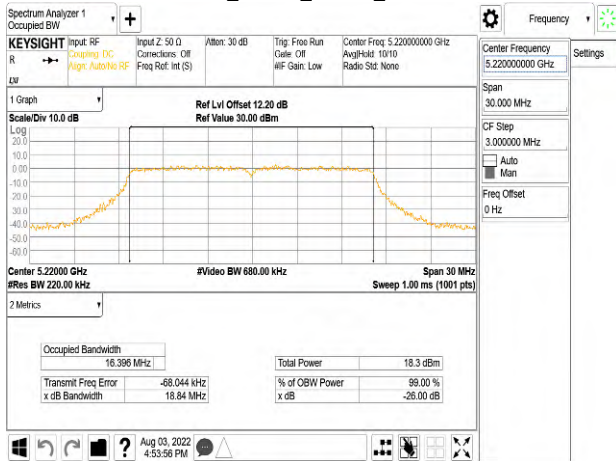
802.11a_20MHz_Chain0_5180MHz



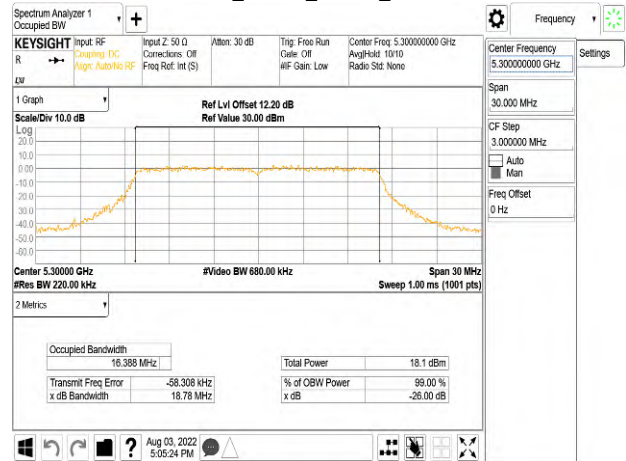
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802.11a_20MHz_Chain0_5220MHz



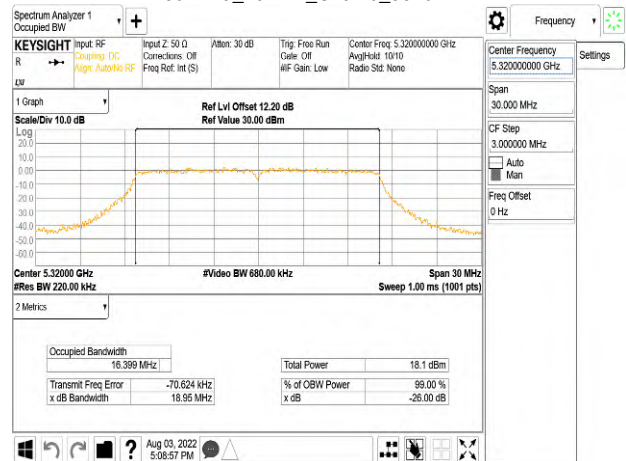
802.11a_20MHz_Chain0_5300MHz



802.11a_20MHz_Chain0_5240MHz



802.11a_20MHz_Chain0_5320MHz

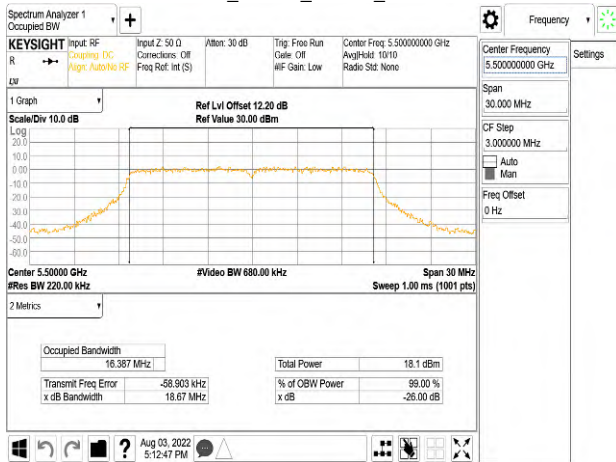


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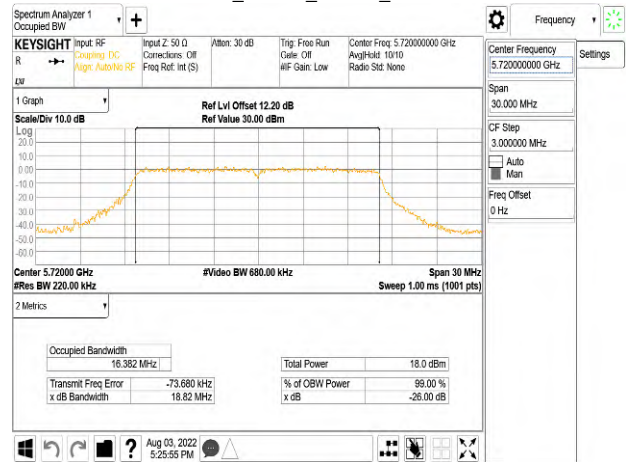
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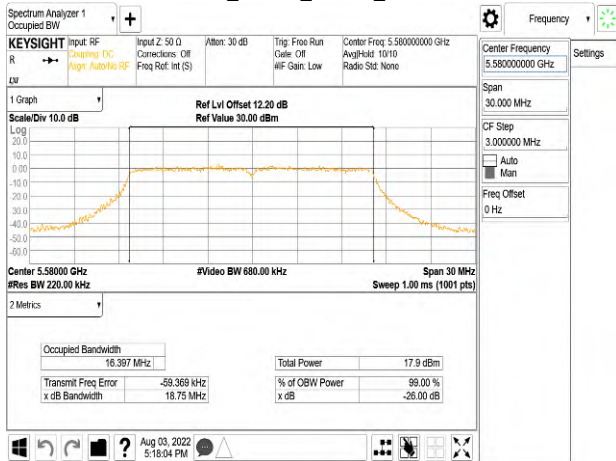
802.11a_20MHz_Chain0_5500MHz



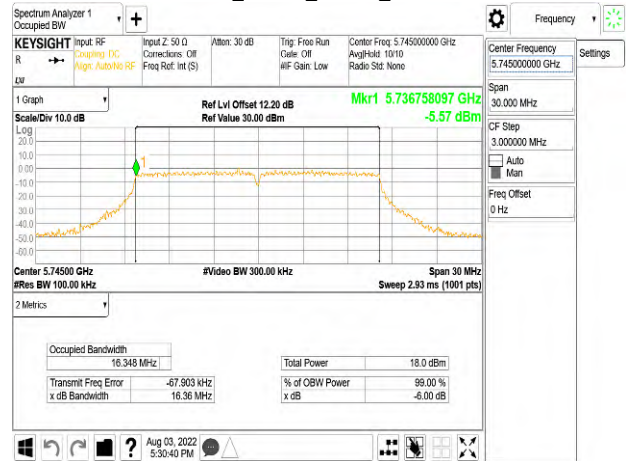
802.11a_20MHz_Chain0_5720MHz



802.11a_20MHz_Chain0_5580MHz



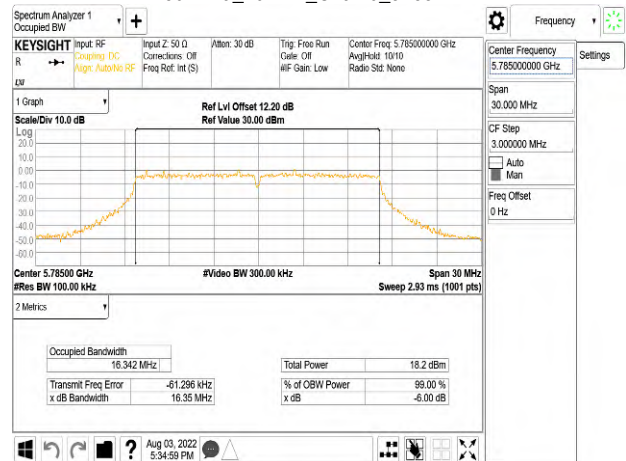
802.11a_20MHz_Chain0_5745MHz



802.11a_20MHz_Chain0_5700MHz



802.11a_20MHz_Chain0_5785MHz

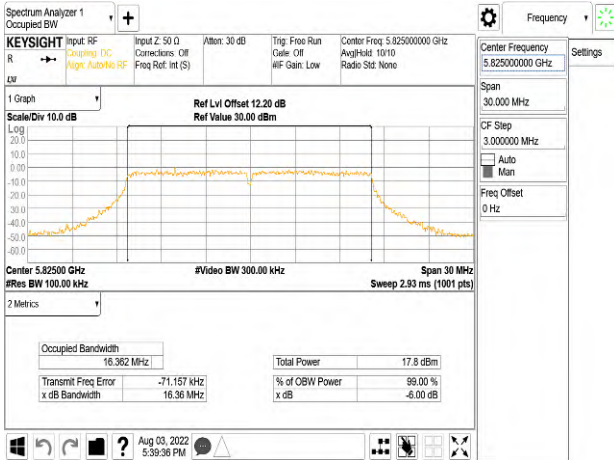


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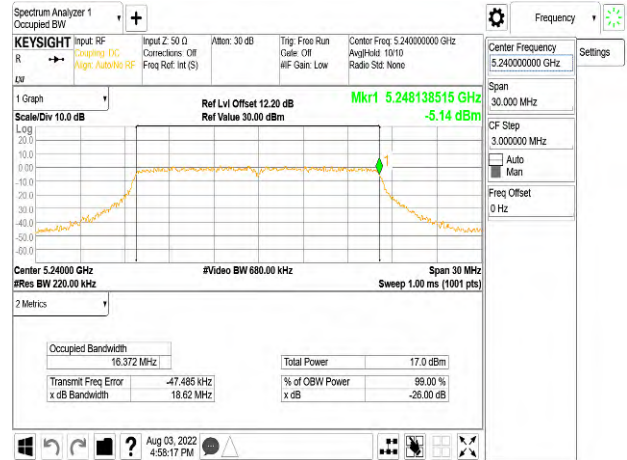
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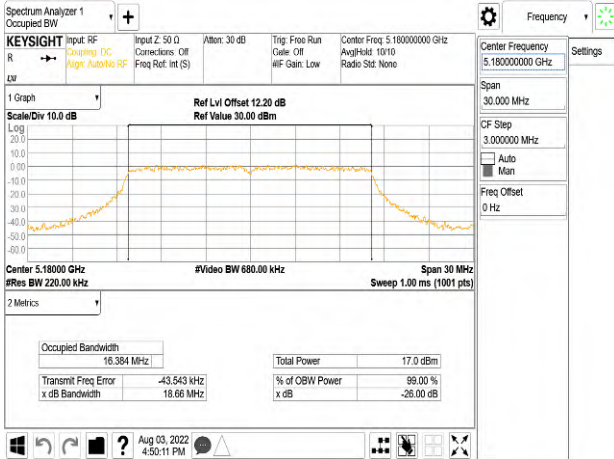
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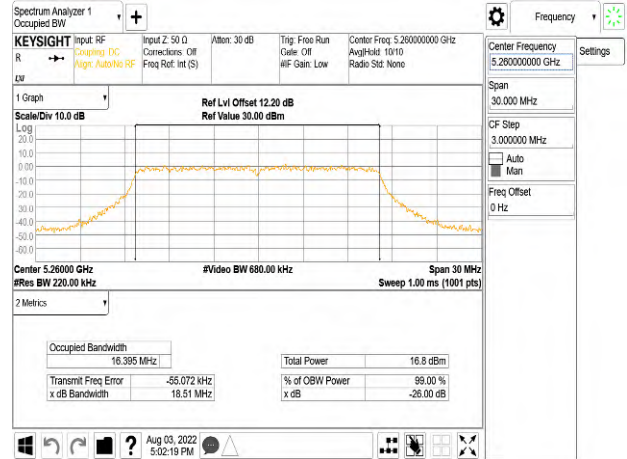
802.11a_20MHz_Chain1_5240MHz



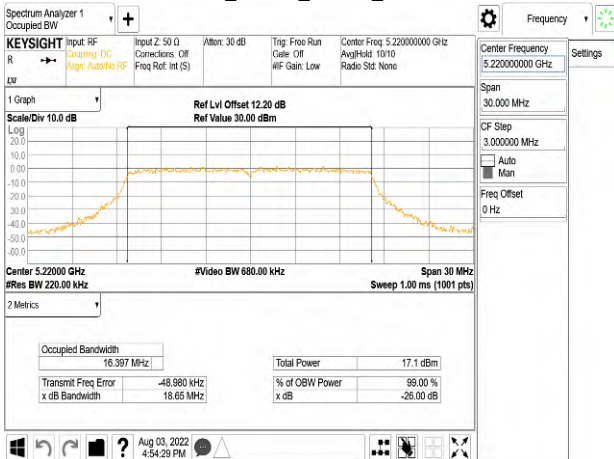
802.11a_20MHz_Chain1_5180MHz



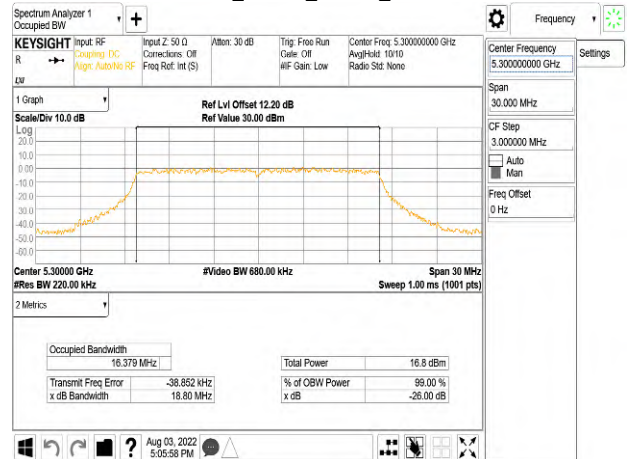
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802.11a_20MHz_Chain1_5220MHz



802.11a_20MHz_Chain1_5300MHz

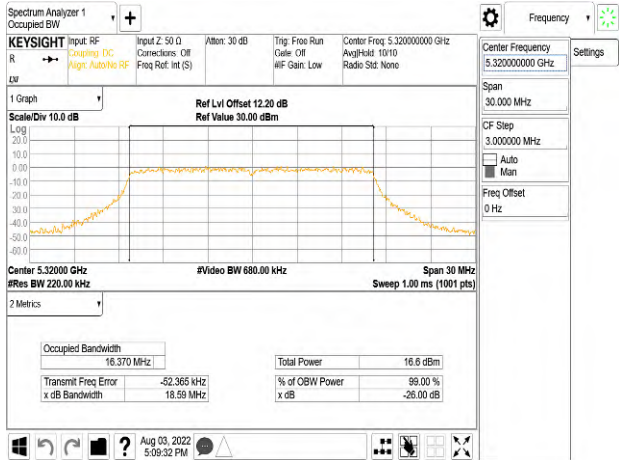


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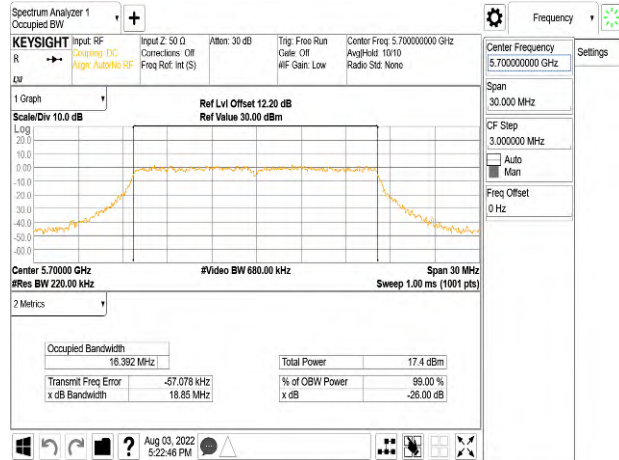
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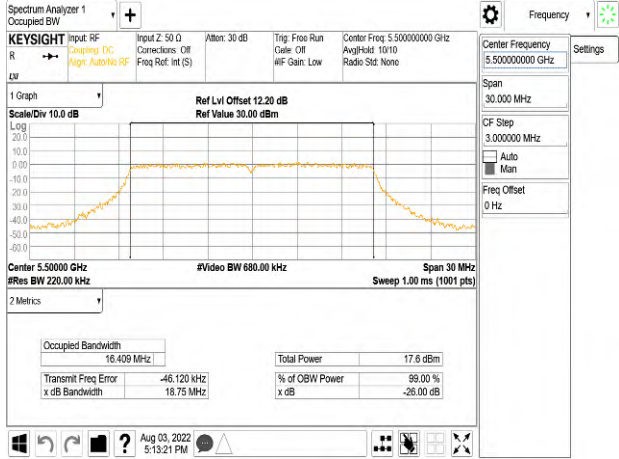
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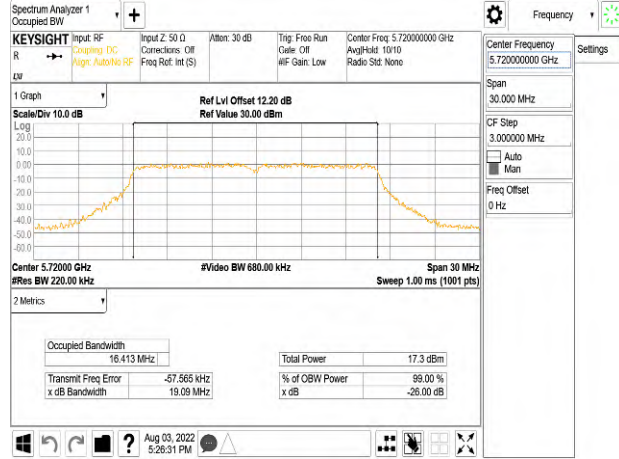
802.11a_20MHz_Chain1_5700MHz



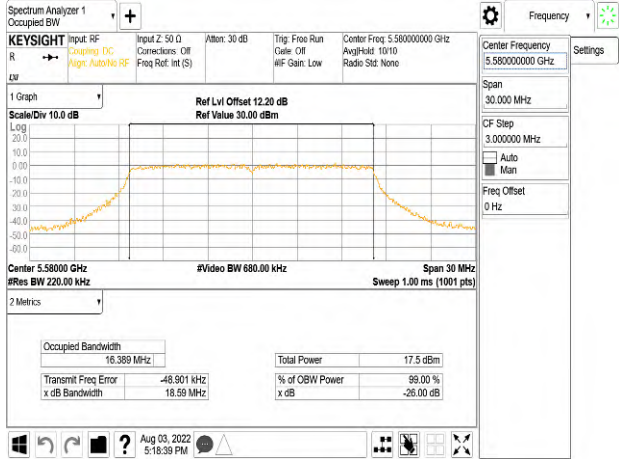
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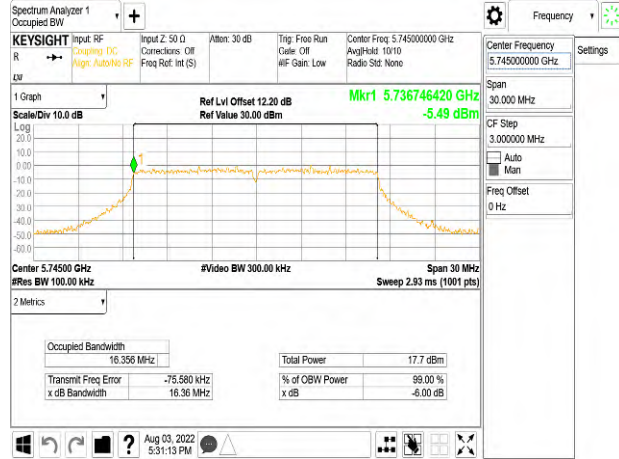
802.11a_20MHz_Chain1_5720MHz



802.11a_20MHz_Chain1_5580MHz



802.11a_20MHz_Chain1_5745MHz

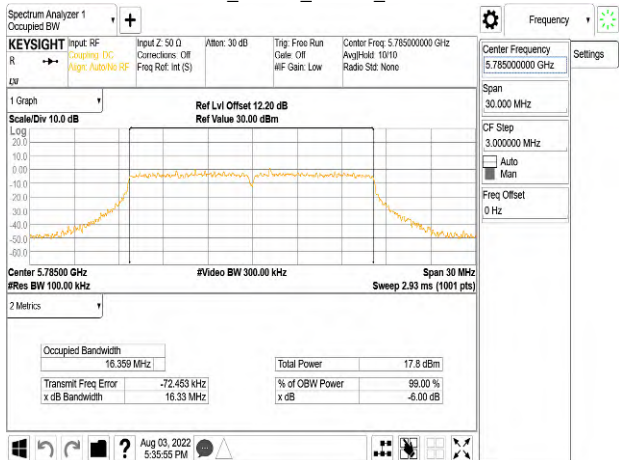


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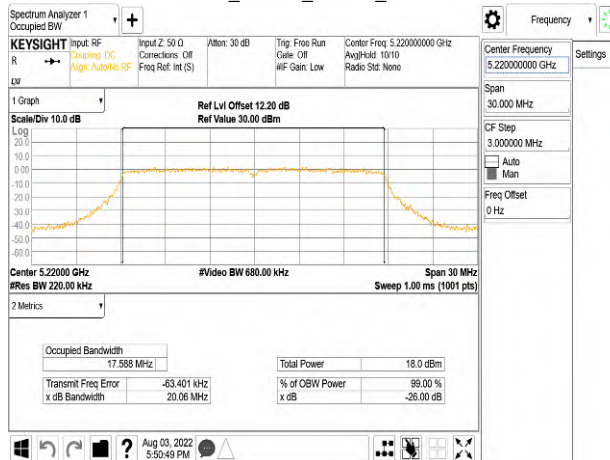
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802.11a_20MHz_Chain1_5785MHz



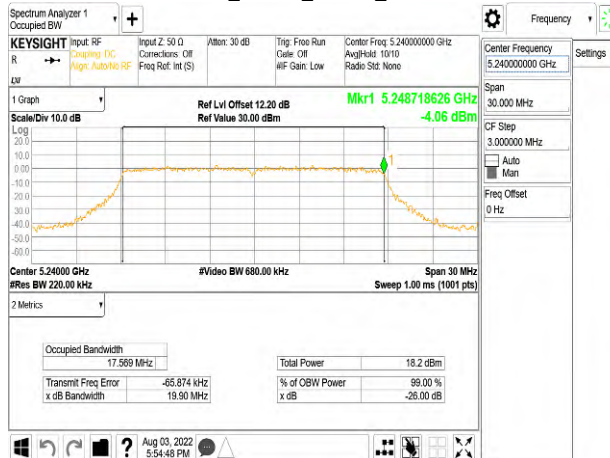
802.11n_20MHz_Chain0_5220MHz



802.11a_20MHz_Chain1_5825MHz



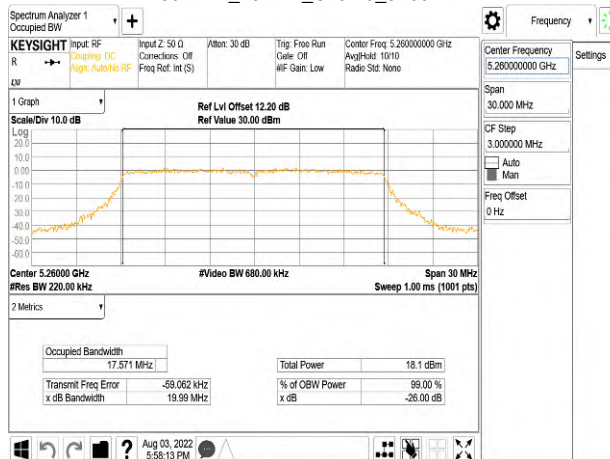
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802.11n_20MHz_Chain0_5180MHz



802.11n_20MHz_Chain0_5260MHz

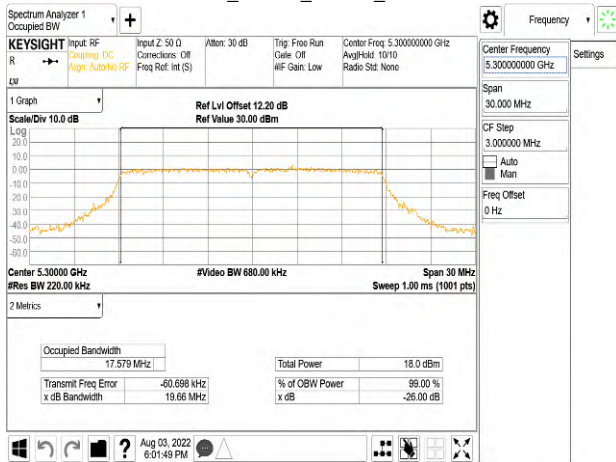


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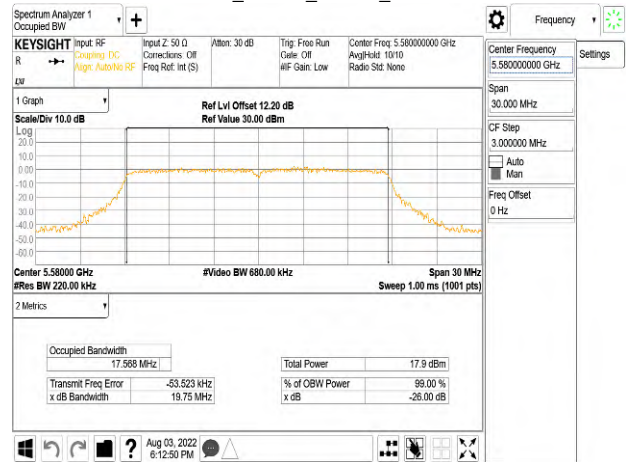
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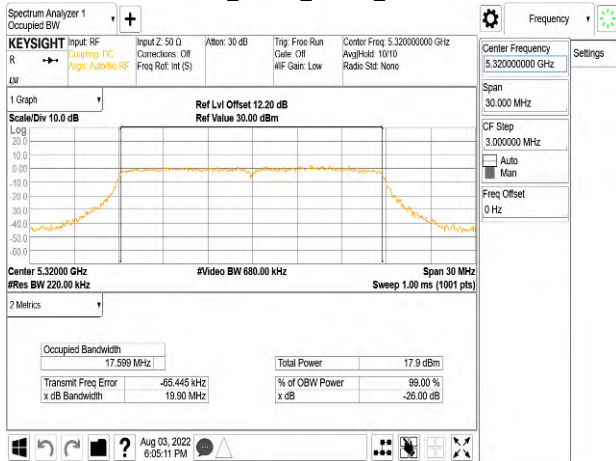
802.11n_20MHz_Chain0_5300MHz



802.11n_20MHz_Chain0_5580MHz



802.11n_20MHz_Chain0_5320MHz



802.11n_20MHz_Chain0_5700MHz



802.11n_20MHz_Chain0_5500MHz



802.11n_20MHz_Chain0_5720MHz



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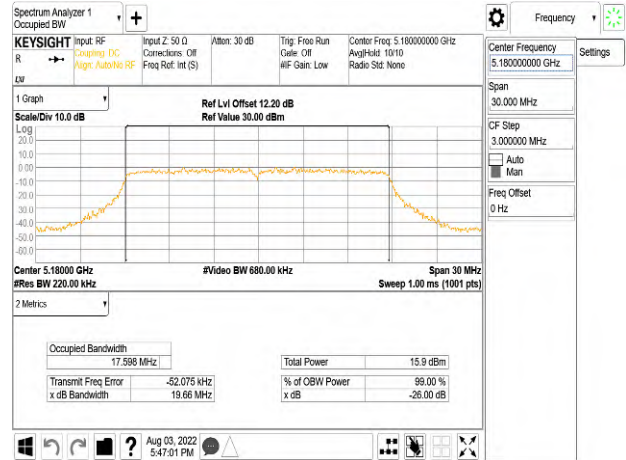
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802.11n_20MHz_Chain0_5745MHz



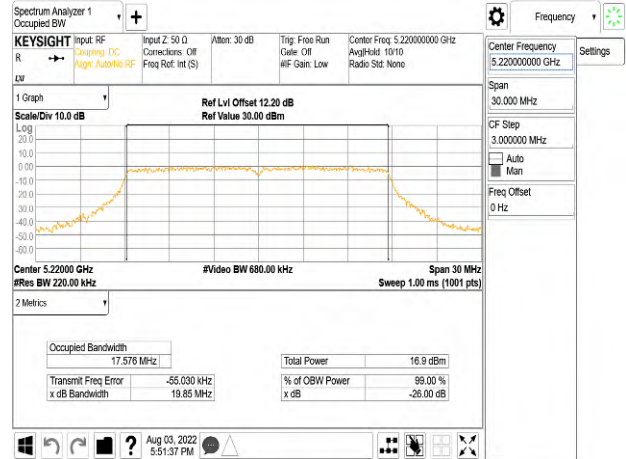
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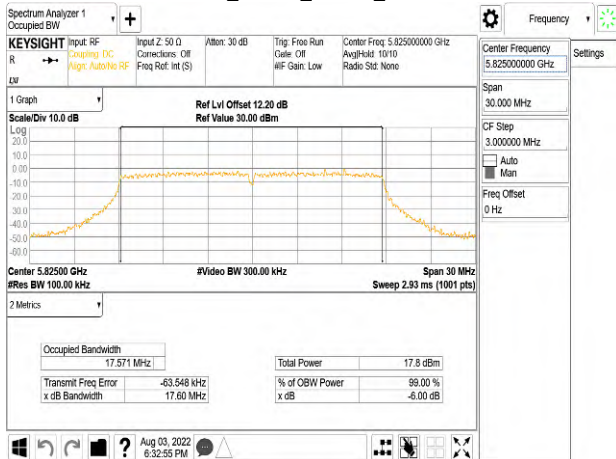
802.11n_20MHz_Chain0_5785MHz



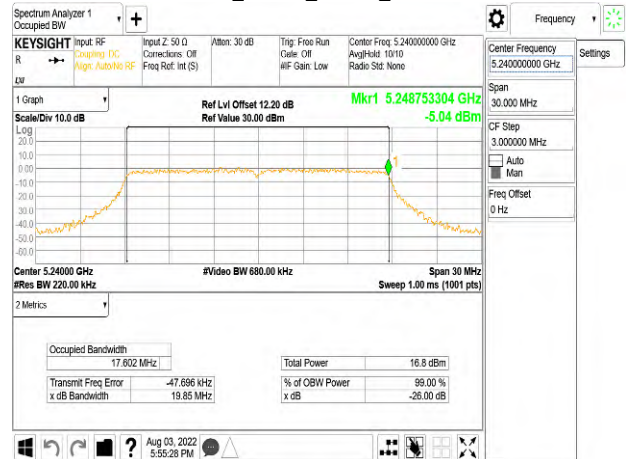
802.11n_20MHz_Chain1_5220MHz



802.11n_20MHz_Chain0_5825MHz



802.11n_20MHz_Chain1_5240MHz

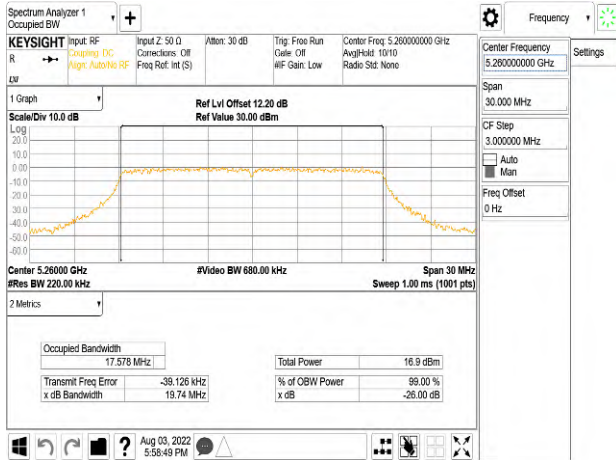


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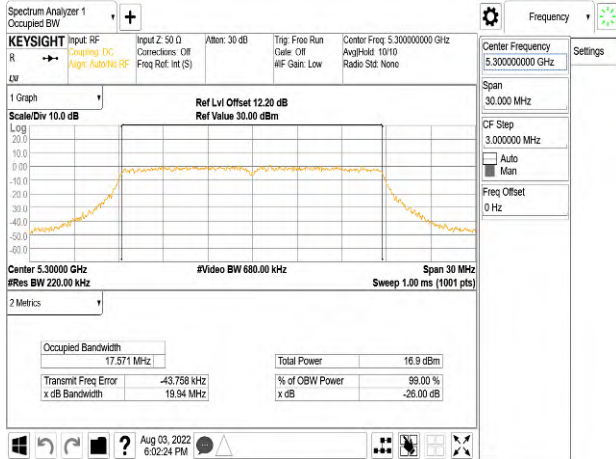
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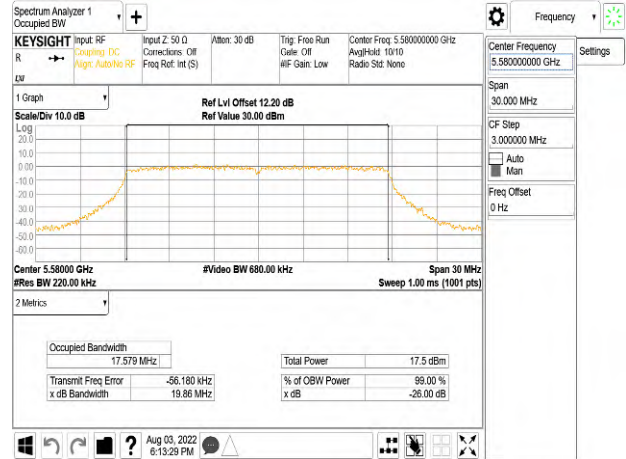
802.11n_20MHz_Chain1_5500MHz



802.11n_20MHz_Chain1_5300MHz



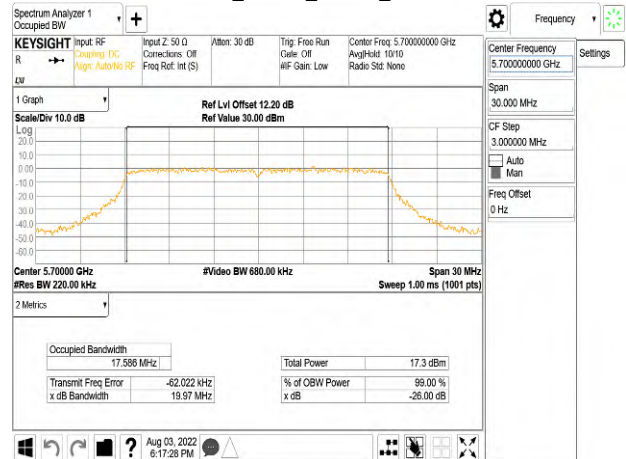
802.11n_20MHz_Chain1_5580MHz



802.11n_20MHz_Chain1_5320MHz



802.11n_20MHz_Chain1_5700MHz

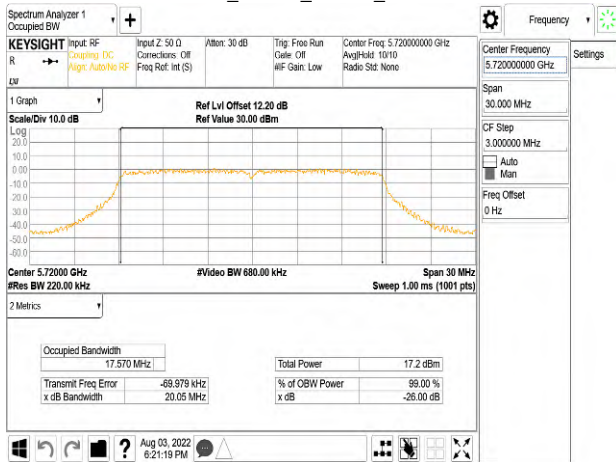


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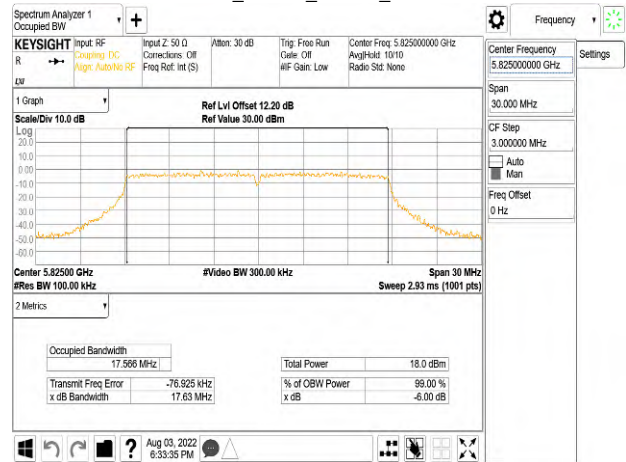
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802.11n_20MHz_Chain1_5720MHz



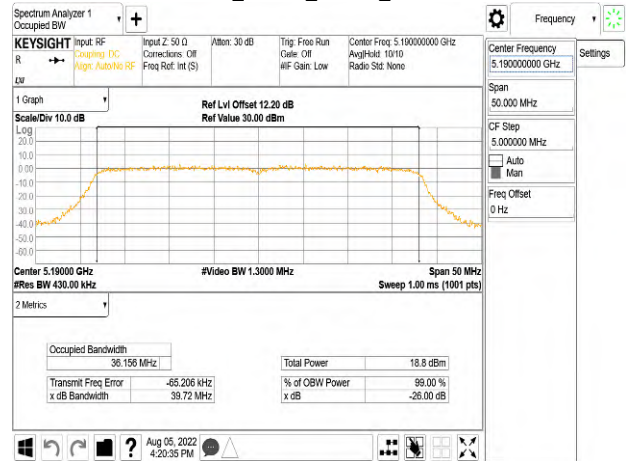
802.11n_20MHz_Chain1_5825MHz



802.11n_20MHz_Chain1_5745MHz



802.11n_40MHz_Chain0_5190MHz



802.11n_20MHz_Chain1_5785MHz



802.11n_40MHz_Chain0_5230MHz

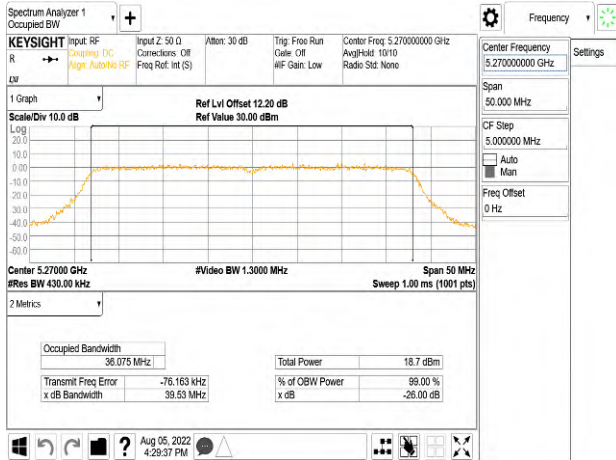


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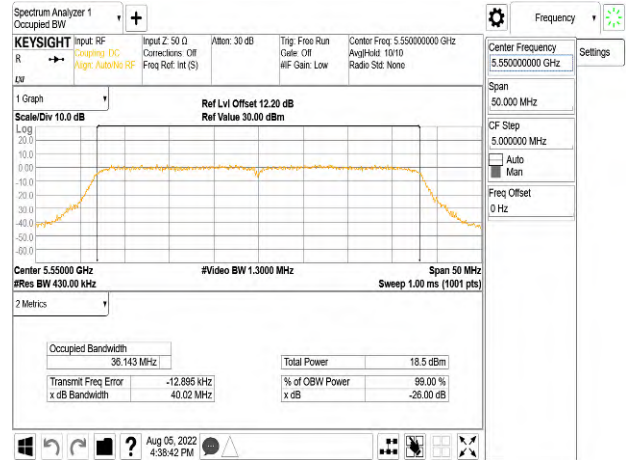
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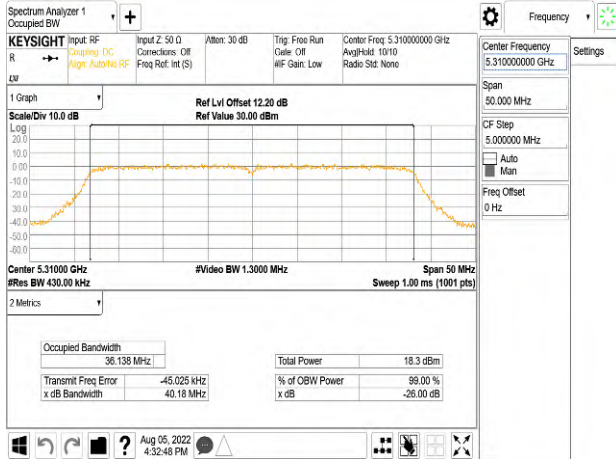
802.11n_40MHz_Chain0_5270MHz



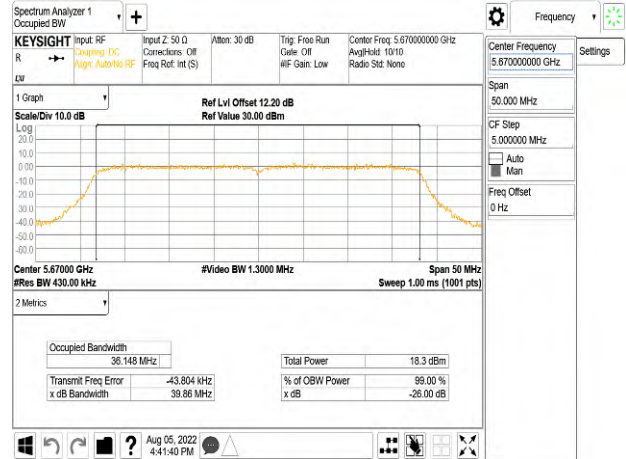
802.11n_40MHz_Chain0_5550MHz



802.11n_40MHz_Chain0_5310MHz



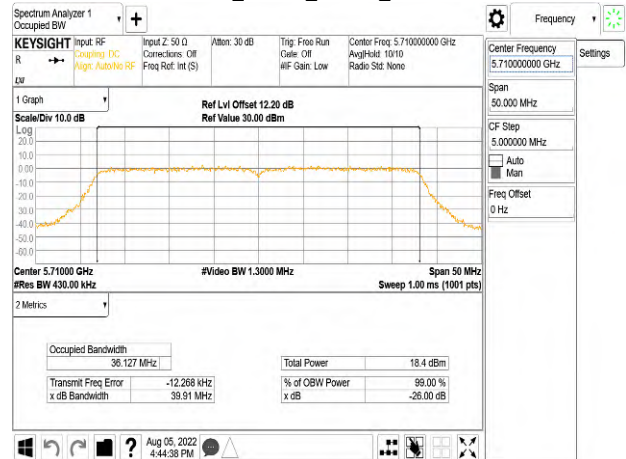
802.11n_40MHz_Chain0_5670MHz



802.11n_40MHz_Chain0_5510MHz



802.11n_40MHz_Chain0_5710MHz

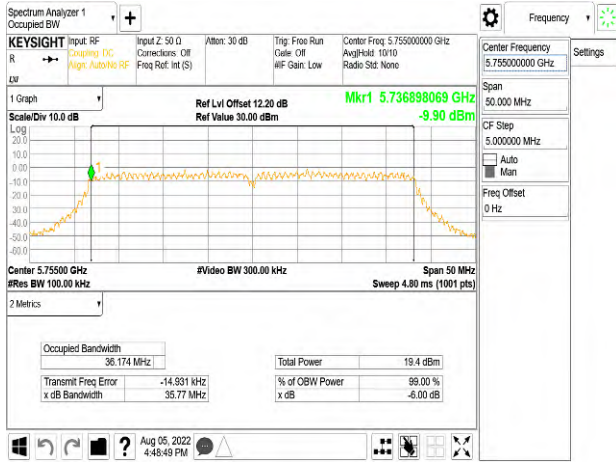


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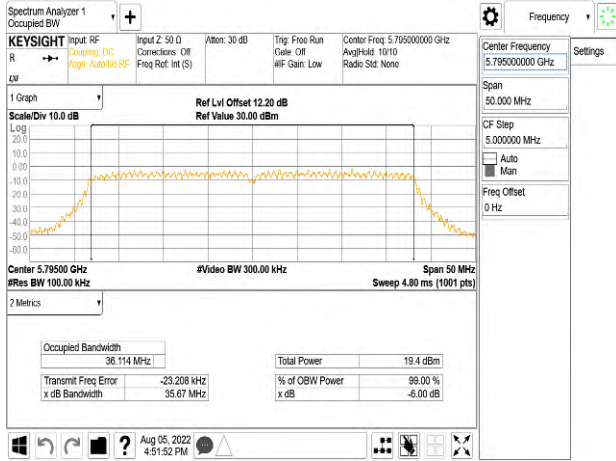
802.11n_40MHz_Chain0_5755MHz



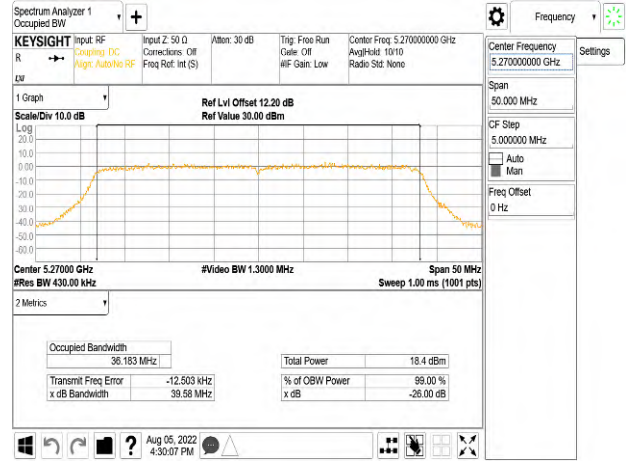
802.11n_40MHz_Chain1_5230MHz



802.11n_40MHz_Chain0_5795MHz



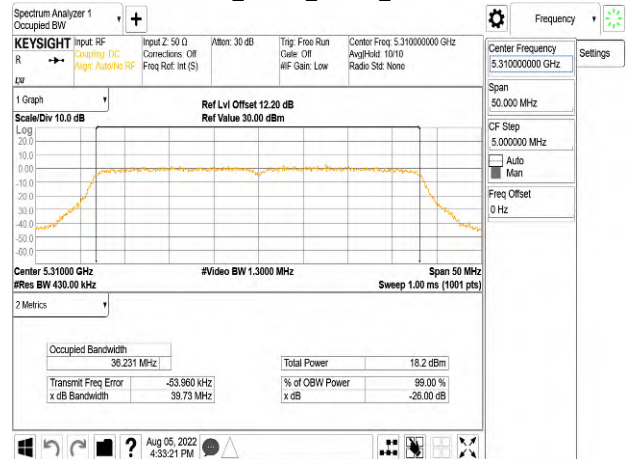
802.11n_40MHz_Chain1_5270MHz



802.11n_40MHz_Chain1_5190MHz



802.11n_40MHz_Chain1_5310MHz

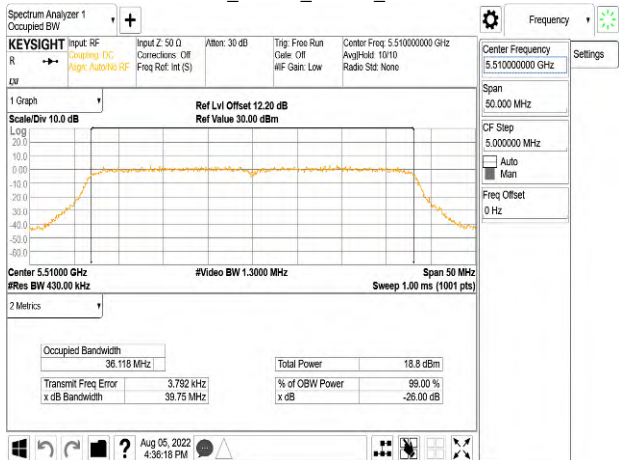


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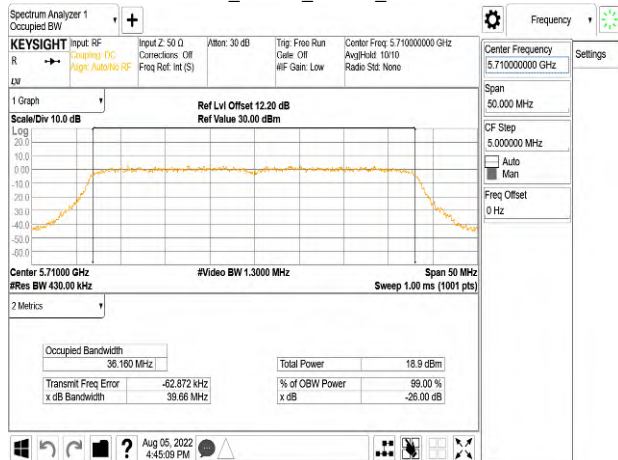
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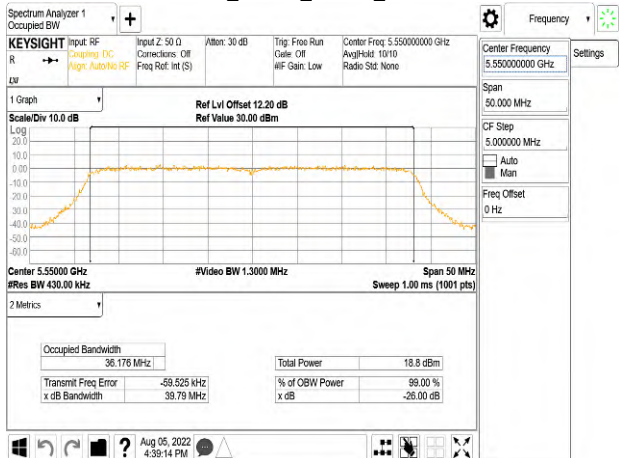
802.11n_40MHz_Chain1_5510MHz



802.11n_40MHz_Chain1_5710MHz



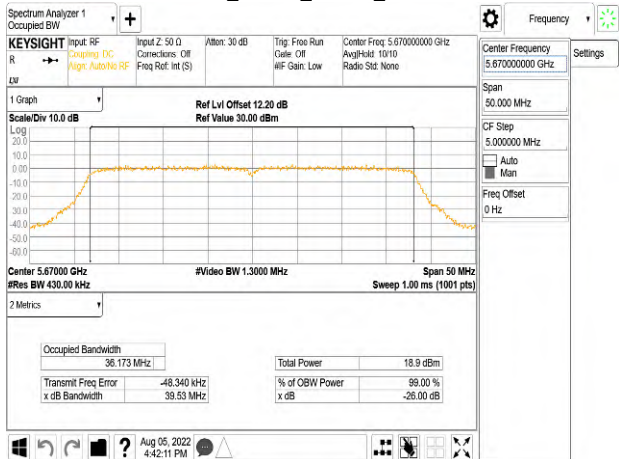
802.11n_40MHz_Chain1_5550MHz



802.11n_40MHz_Chain1_5755MHz



802.11n_40MHz_Chain1_5670MHz



802.11n_40MHz_Chain1_5795MHz



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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



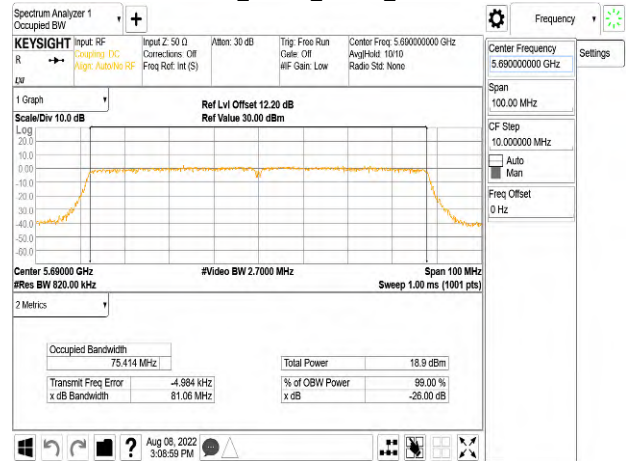
802.11ac_80MHz_Chain1_5610MHz



802.11ac_80MHz_Chain1_5290MHz



802.11ac_80MHz_Chain1_5690MHz



802.11ac_80MHz_Chain1_5530MHz



802.11ac_80MHz_Chain1_5775MHz



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802.11ac_160MHz_Chain0_5250MHz



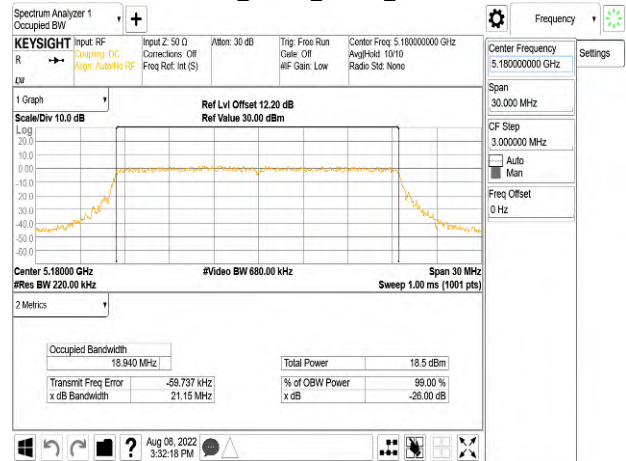
802.11ac_160MHz_Chain1_5570MHz



802.11ac_160MHz_Chain0_5570MHz



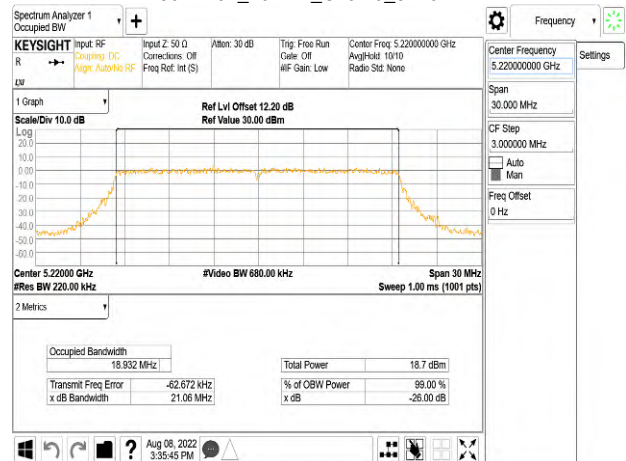
802.11ax_20MHz_Chain0_5180MHz



802.11ac_160MHz_Chain1_5250MHz



802.11ax_20MHz_Chain0_5220MHz



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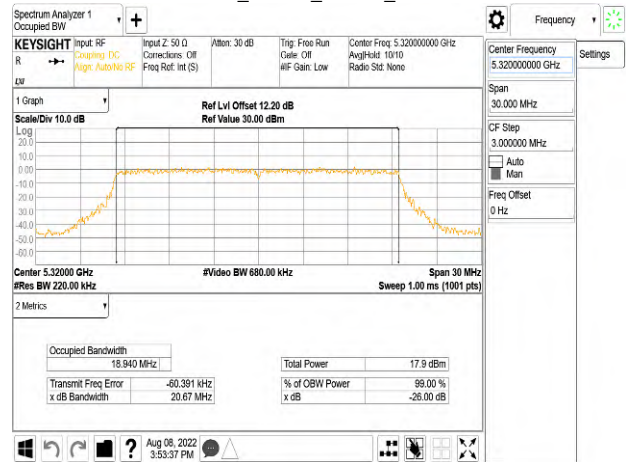
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802.11ax_20MHz_Chain0_5240MHz



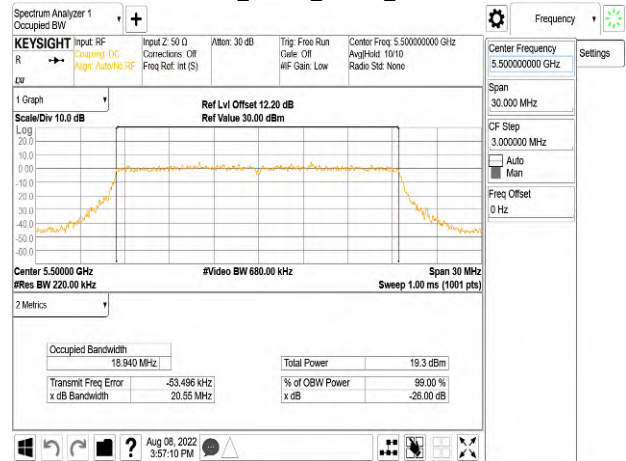
802.11ax_20MHz_Chain0_5320MHz



802.11ax_20MHz_Chain0_5260MHz



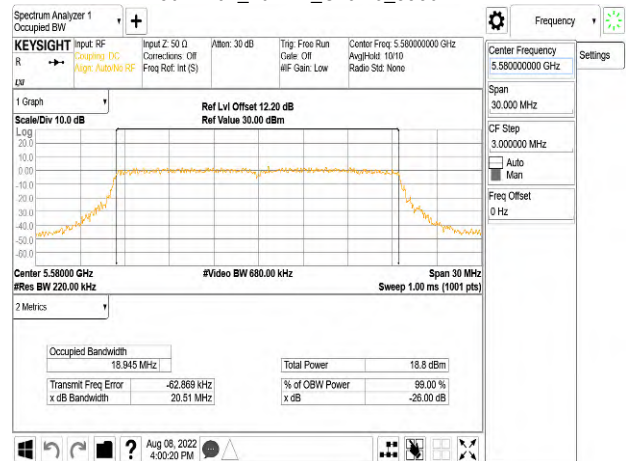
802.11ax_20MHz_Chain0_5500MHz



802.11ax_20MHz_Chain0_5300MHz



802.11ax_20MHz_Chain0_5580MHz

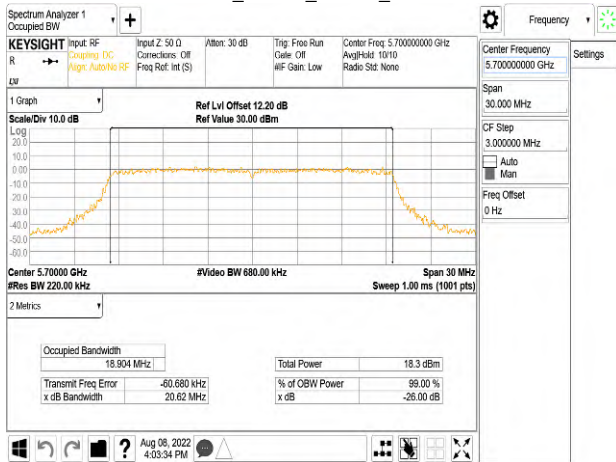


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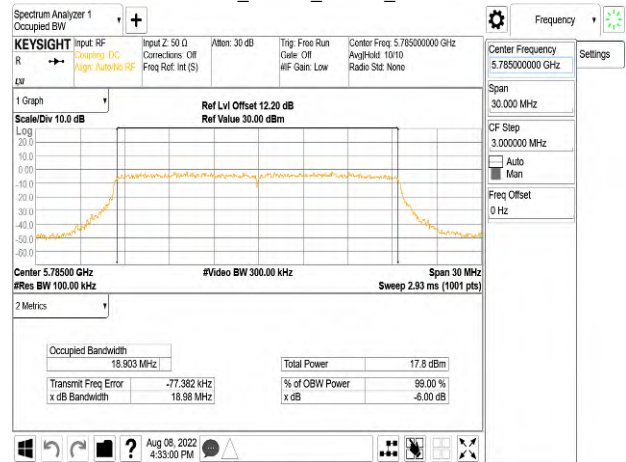
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802.11ax_20MHz_Chain0_5700MHz



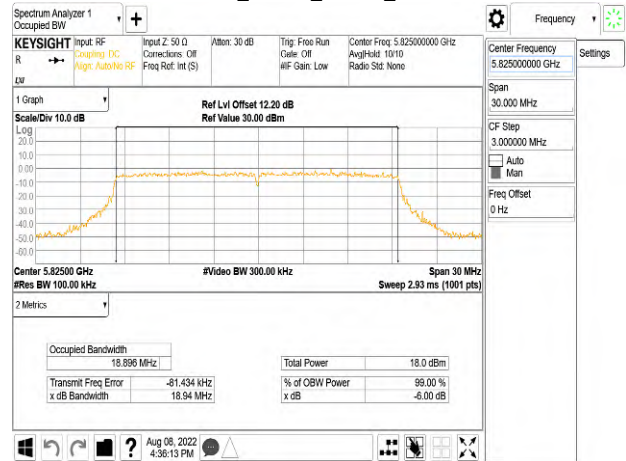
802.11ax_20MHz_Chain0_5785MHz



802.11ax_20MHz_Chain0_5720MHz



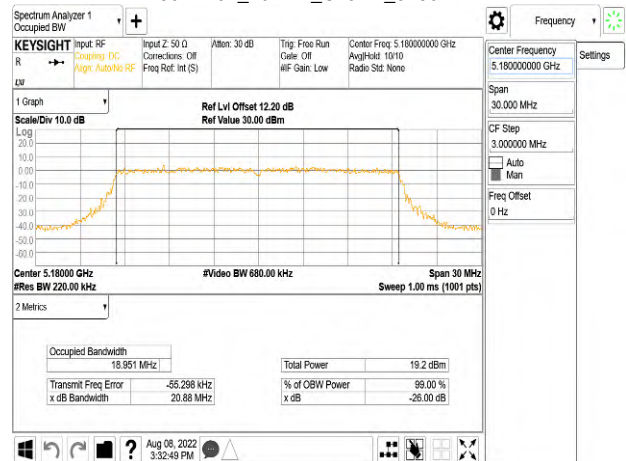
802.11ax_20MHz_Chain0_5825MHz



802.11ax_20MHz_Chain0_5745MHz



802.11ax_20MHz_Chain1_5180MHz

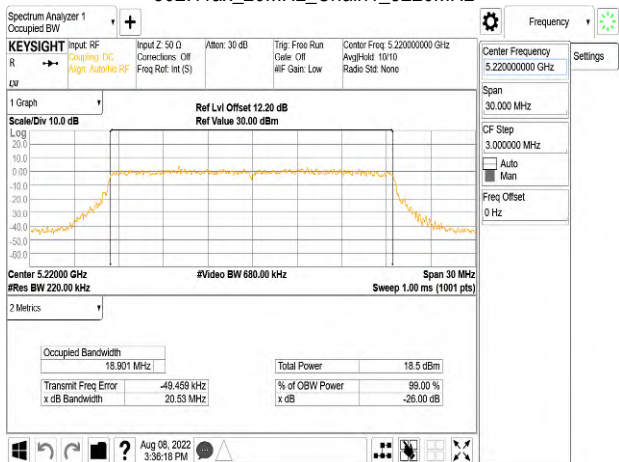


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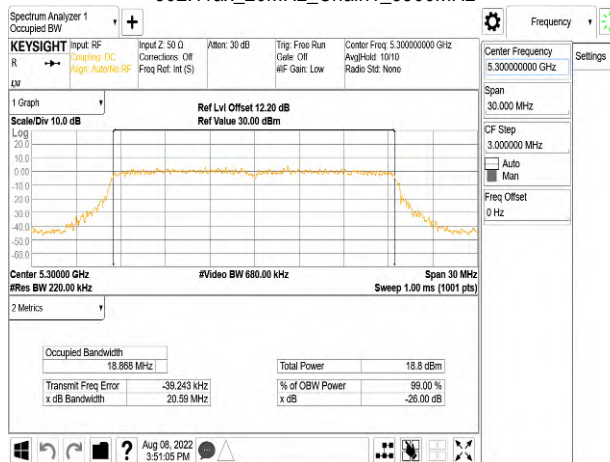
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802.11ax_20MHz_Chain1_5220MHz



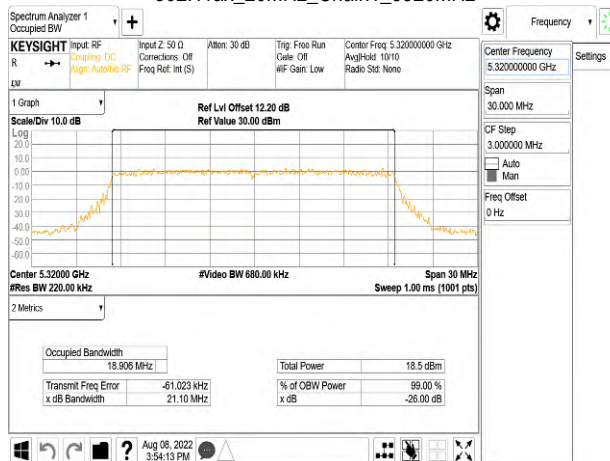
802.11ax_20MHz_Chain1_5300MHz



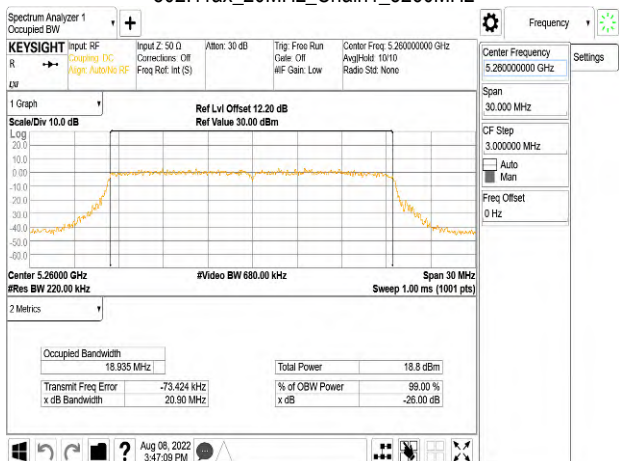
802.11ax_20MHz_Chain1_5240MHz



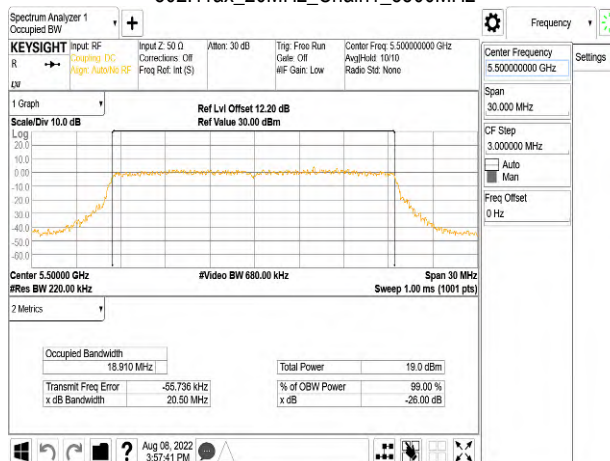
802.11ax_20MHz_Chain1_5320MHz



802.11ax_20MHz_Chain1_5260MHz



802.11ax_20MHz_Chain1_5500MHz

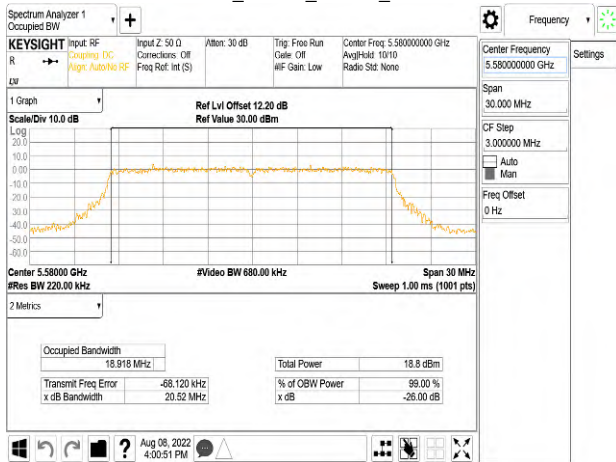


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802.11ax_20MHz_Chain1_5580MHz



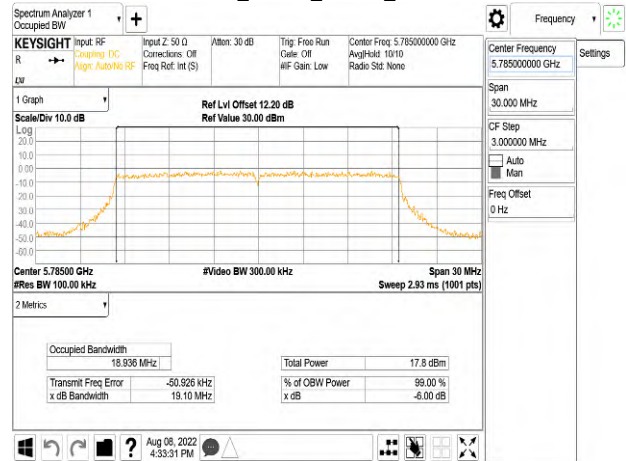
802.11ax_20MHz_Chain1_5745MHz



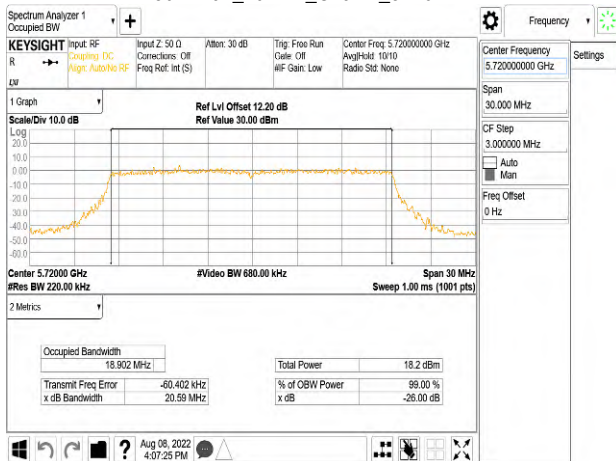
802.11ax_20MHz_Chain1_5700MHz



802.11ax_20MHz_Chain1_5785MHz



802.11ax_20MHz_Chain1_5720MHz



802.11ax_20MHz_Chain1_5825MHz

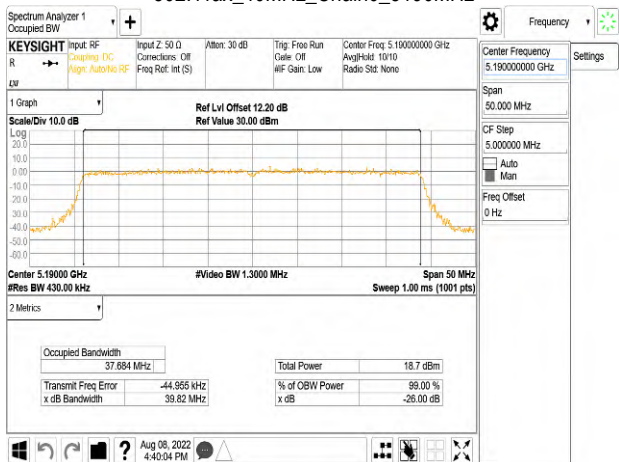


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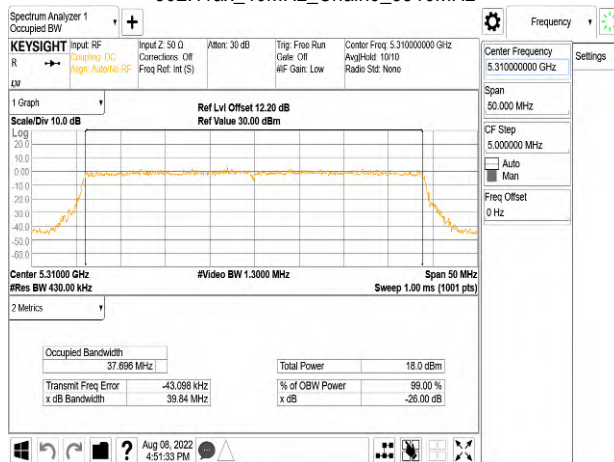
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802.11ax_40MHz_Chain0_5190MHz



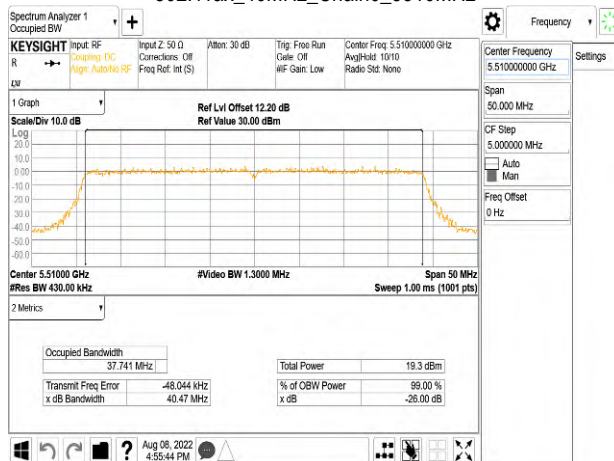
802.11ax_40MHz_Chain0_5310MHz



802.11ax_40MHz_Chain0_5230MHz



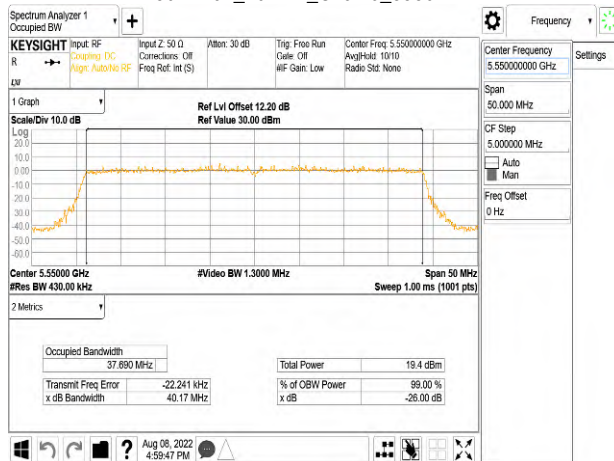
802.11ax_40MHz_Chain0_5510MHz



802.11ax_40MHz_Chain0_5270MHz



802.11ax_40MHz_Chain0_5550MHz



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802.11ax_40MHz_Chain0_5670MHz



802.11ax_40MHz_Chain0_5795MHz



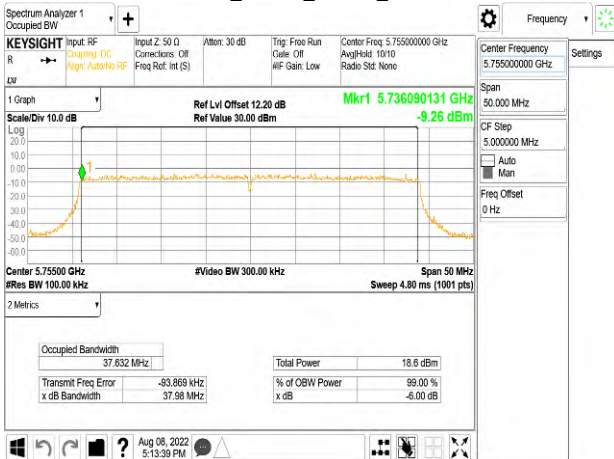
802.11ax_40MHz_Chain0_5710MHz



802.11ax_40MHz_Chain1_5190MHz



802.11ax_40MHz_Chain0_5755MHz



802.11ax_40MHz_Chain1_5230MHz



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