

MEASUREMENT REPORT

FCC PART 15.407 / WLAN 802.11a/n/ac

FCC ID: LDK-ONT4TVCW

Applicant: Cisco Systems, Inc.

Application Type: Certification

Product: GPON ONT

Model No.: CGP-ONT-4TVCW

Brand Name: CISCO

FCC Classification: Unlicensed National Information Infrastructure (NII)

FCC Rule Part(s): Part15 Subpart E (Section 15.407)

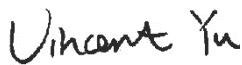
Test Procedure(s): ANSI C63.10-2013

KDB 789033 D02v02r01

KDB 662911 D01v02r01

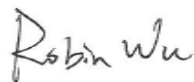
Test Date: September 09, 2020 ~ January 14, 2021

Reviewed By:



Vincent Yu

Approved By:



Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported here in relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2009RSU002-U2	Rev. 01	Initial Report	06-01-2021	Valid

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1. GENERAL INFORMATION

1.1. Applicant

Cisco Systems, Inc.

125 West Tasman Drive, San Jose, California, United States 95134-1706

1.2. Manufacturer

Cisco Systems, Inc.

125 West Tasman Drive, San Jose, California, United States 95134-1706

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory
	Laboratory Location (Suzhou – Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	Laboratory Location (Suzhou – SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	Laboratory Accreditations
	A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: R-20025, G-20034, C-20020, T-20020
☐	Test Site – MRT Shenzhen Laboratory
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	Laboratory Accreditations
	A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory
	Laboratory Location (Taiwan) No. 38, Fuxing 2 nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	Laboratory Accreditations
	TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	GPON ONT
Model No.	CGP-ONT-4TVCW
Wi-Fi Specification	802.11a/b/g/n/ac
Operating Temp.	-5 ~ 45°C
Power Supply	External Power Adapter
Firmware Version	1.1.3.3_03
Accessories	
Adapter	MODEL: DSA-18PFR-12 FUS 120150 INPUT: 100-240V~50/60Hz 0.6A OUTPUT: 12VDC, 1.5A, 18.0W

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530MHz, 5610MHz, 5690MHz, 5775MHz
Type of Modulation:	802.11a/n/ac: OFDM
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps
Maximum Average Output Power:	802.11a: 15.14dBm 802.11n-HT20: 15.24dBm 802.11n-HT40: 15.06dBm 802.11ac-VHT20: 15.08dBm 802.11ac-VHT40: 15.11dBm 802.11ac-VHT80: 15.02dBm

Note: For other features of this EUT, test report will be issued separately.

2.3. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T _x Paths	Number of spatial streams	Max Antenna Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
PCB Antenna	2412 ~ 2462	2	1	3.80	3.80	6.81
	5180 ~ 5825	2	1	3.34	3.34	6.35

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

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

- For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log_{10} (N_{ANT} / N_{SS})$ dB;
- For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;

2.4. Working Frequencies for this Report

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	144	5720 MHz	149	5745 MHz
153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz	--	--	--	--

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
142	5710 MHz	151	5755 MHz	159	5795 MHz

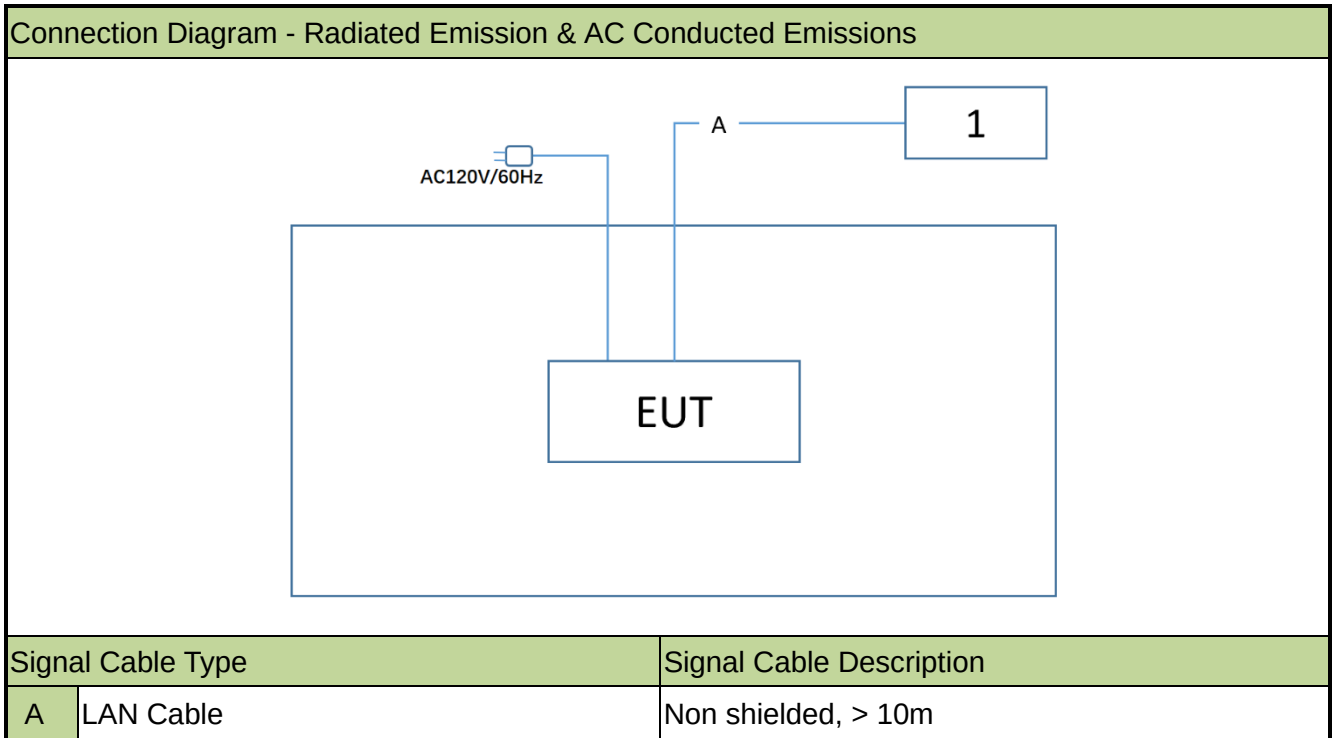
802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	138	5690 MHz	155	5775 MHz

2.5. Test Mode

Test Mode	Mode 1: Transmit by 802.11a (6Mbps) (SISO Mode)
	Mode 2: Transmit by 802.11n-HT20 (MCS0) (SISO Mode)
	Mode 3: Transmit by 802.11n-HT40 (MCS0) (SISO Mode)
	Mode 4: Transmit by 802.11ac-VHT20 (MCS0) (SISO Mode)
	Mode 5: Transmit by 802.11ac-VHT40 (MCS0) (SISO Mode)
	Mode 6: Transmit by 802.11ac-VHT80 (MCS0) (SISO Mode)
	Mode 7: Transmit by 802.11a (6Mbps) (CDD Mode)
	Mode 8: Transmit by 802.11n-HT20 (MCS0) (CDD Mode)
	Mode 9: Transmit by 802.11n-HT40 (MCS0) (CDD Mode)
	Mode 10: Transmit by 802.11ac-VHT20 (MCS0) (CDD Mode)
	Mode 11: Transmit by 802.11ac-VHT40 (MCS0) (CDD Mode)
	Mode 12: Transmit by 802.11ac-VHT80 (MCS0) (CDD Mode)

2.6. Configuration of Test System



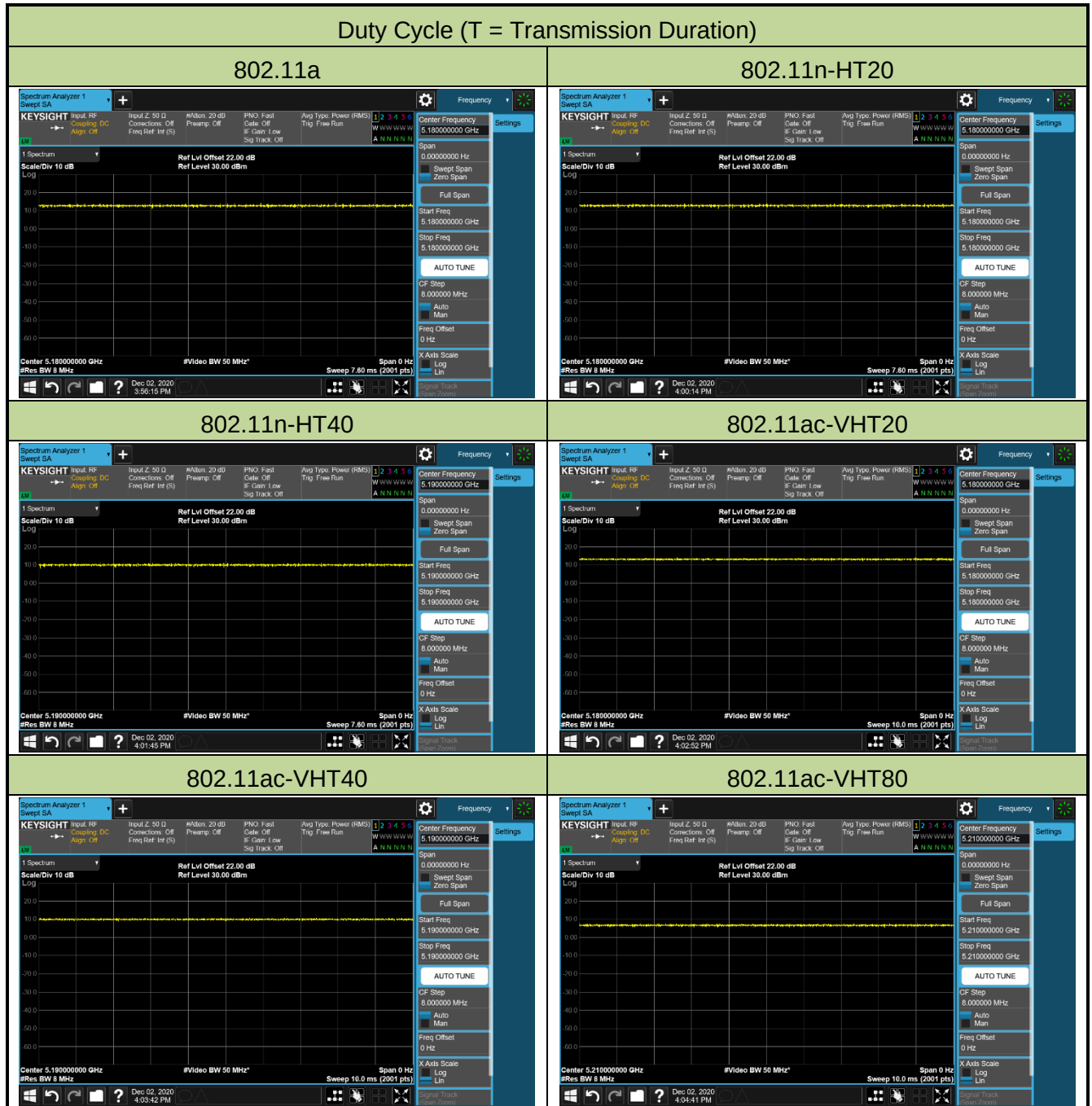
2.7. Test System Details

Product	Manufacturer	Model No.
1	Notebook	Lenovo
		E495

2.8. Duty Cycle

5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than $50/T$, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
802.11a	100%
802.11n-HT20	100%
802.11n-HT40	100%
802.11ac-VHT20	100%
802.11ac-VHT40	100%
802.11ac-VHT80	100%



2.9. Description of Test Software

The test utility software used during testing was “MP_Test.exe”, and the version was 3.6. Power parameter value refers to operation description.

2.10. Test Environment Condition

Ambient Temperature	15°C~35°C
Relative Humidity	20%RH ~75%RH

3. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (WZ-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022/01/12
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2021/07/26
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Conducted Emission (SIP-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06621	1 year	2021/12/03

Radiated Emission (WZ-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2022/01/04
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/08/08
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/09/27
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2021/07/26
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission (WZ-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Keysight	N9038A	MRTSUE06125	1 year	2021/07/02
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2021/05/26
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2021/10/25
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermal Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2021/12/08
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Radiated Emission (SIP-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06645	1 year	2021/08/30
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2021/08/30
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2021/11/12
Thermal Hygrometer	testo	608-H1	MRTSUE06620	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2021/12/24

Radiated Emission (SIP-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2021/07/02
MXA Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2021/09/26
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06646	1 year	2021/08/30
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06648	1 year	2021/11/26
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06599	1 year	2021/11/26
Preamplifier	EMCI	EMC051845SE	MRTSUE06644	1 year	2021/11/12
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2021/10/13
Thermal Hygrometer	testo	608-H1	MRTSUE06624	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2021/12/24

Radiated Emission (SIP-AC3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2021/07/02
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2021/07/23
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06647	1 year	2021/08/08
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2021/09/13
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06598	1 year	2021/11/26
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2022/01/14
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2022/01/14
Thermal Hygrometer	testo	608-H1	MRTSUE06622	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2021/12/24

Conducted Test Equipment (WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022/01/07
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/22
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/08/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/08/08
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/10/22
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2021/07/26

Conducted Test Equipment (SIP-SR5)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
USB wideband power sensor	Agilent	U2021XA	MRTSUE06595	1 year	2021/09/26
USB wideband power sensor	Agilent	U2021XA	MRTSUE06596	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Temperature Chamber	BAOYT	BYG-408CS	MRTSUE06847	1 year	2022/02/23
Thermal Hygrometer	testo	622	MRTSUE06629	1 year	2021/11/25

Software	Version	Function
EMI Software	V3	EMI Test Software

5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 0.28%

6. TEST RESULT

6.1. Summary

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 6.2
15.407(e)	6dB Bandwidth	$\geq 500\text{kHz}$		Pass	Section 6.3
15.407(a)(1)(ii), (2), (3)	Maximum Conducted Output Power	Refer to Section 6.4		Pass	Section 6.4
15.407(h)(1)	Transmit Power Control	$\leq 24\text{dBm}$		N/A	Section 6.5
15.407(a)(1)(ii), (2), (3), (5)	Power Spectral Density	Refer to section 6.6		Pass	Section 6.6
15.407(g)	Frequency Stability	N/A		Pass	Section 6.7
15.407(b)(1), (2), (3), (4)(i)	Undesirable Emissions	Refer to section 6.8	Radiated	Pass	Section 6.8 Section 6.9
15.205, 15.209 15.407(b)(7), (8), (9)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz-30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 6.10

Notes:

- The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
- Test Items "26 dB Bandwidth" & "6dB Bandwidth" showed the worst test data in this report.
- All modes were evaluated in the RF Output Power items, and only CDD mode was evaluated for all other items.
- "N/A" means that the test item is not applicable, and the details refer to relevant section.

6.2. 26dB Bandwidth Measurement

6.2.1. Test Limit

N/A

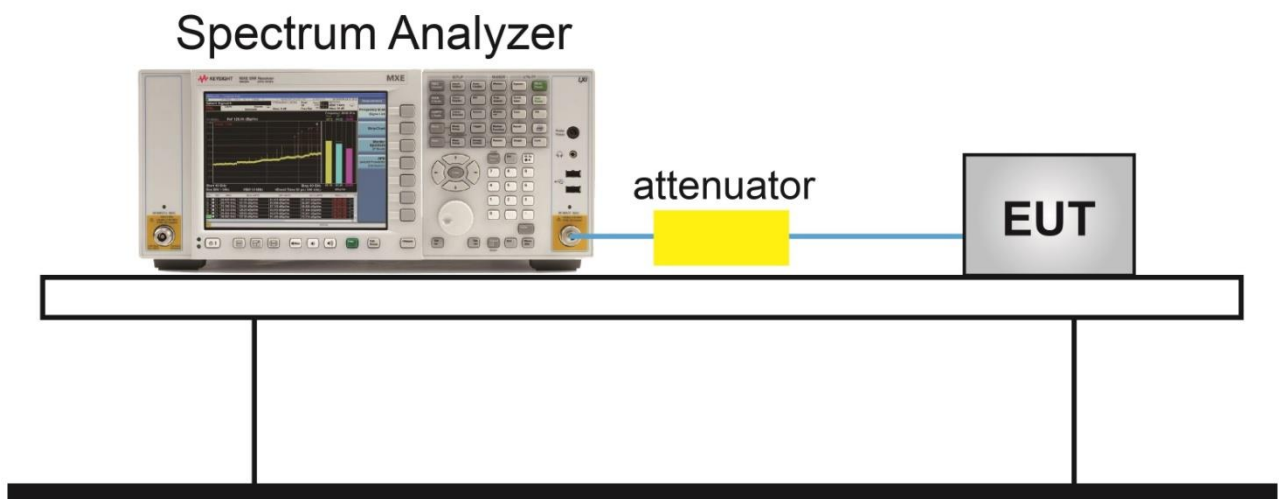
6.2.2. Test Procedure Used

KDB 789033 D02v02r01 -Section C.1

6.2.3. Test Setting

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

6.2.4. Test Setup



6.2.5.Test Result

Test Site	WZ-TR3	Test Engineer	Amy Zhang
Test Date	2020/09/21		

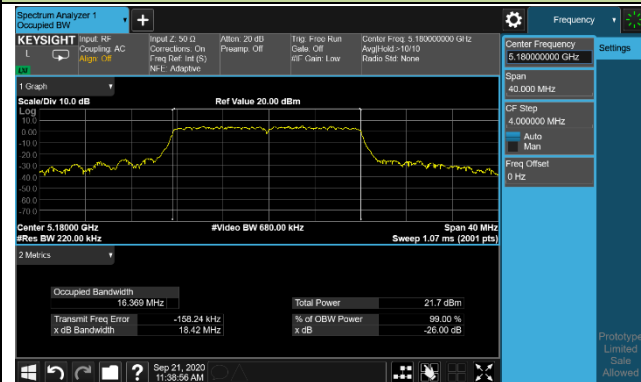
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)
Ant 0 / Ant 0 + 1				
802.11a	6Mbps	36	5180	18.42
802.11a	6Mbps	44	5220	18.42
802.11a	6Mbps	48	5240	18.50
802.11a	6Mbps	52	5260	18.52
802.11a	6Mbps	60	5300	18.47
802.11a	6Mbps	64	5320	18.48
802.11a	6Mbps	100	5500	18.53
802.11a	6Mbps	116	5580	18.48
802.11a	6Mbps	140	5700	18.53
802.11a	6Mbps	144	5720	18.48
802.11a	6Mbps	149	5745	18.48
802.11a	6Mbps	157	5785	18.48
802.11a	6Mbps	165	5825	18.46
802.11n-HT20	MCS0	36	5180	19.50
802.11n-HT20	MCS0	44	5220	19.47
802.11n-HT20	MCS0	48	5240	19.50
802.11n-HT20	MCS0	52	5260	19.47
802.11n-HT20	MCS0	60	5300	19.46
802.11n-HT20	MCS0	64	5320	19.44
802.11n-HT20	MCS0	100	5500	19.49
802.11n-HT20	MCS0	116	5580	19.49
802.11n-HT20	MCS0	140	5700	19.46
802.11n-HT20	MCS0	144	5720	19.48
802.11n-HT20	MCS0	149	5745	19.55
802.11n-HT20	MCS0	157	5785	19.50
802.11n-HT20	MCS0	165	5825	19.45

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)
Ant 0 / Ant 0 + 1				
802.11n-HT40	MCS0	38	5190	41.22
802.11n-HT40	MCS0	46	5230	41.33
802.11n-HT40	MCS0	54	5270	41.13
802.11n-HT40	MCS0	62	5310	41.13
802.11n-HT40	MCS0	102	5510	46.57
802.11n-HT40	MCS0	110	5550	41.02
802.11n-HT40	MCS0	134	5670	41.06
802.11n-HT40	MCS0	142	5710	41.13
802.11n-HT40	MCS0	151	5755	41.37
802.11n-HT40	MCS0	159	5795	41.02
802.11ac-VHT20	MCS0	36	5180	19.35
802.11ac-VHT20	MCS0	44	5220	19.36
802.11ac-VHT20	MCS0	48	5240	19.38
802.11ac-VHT20	MCS0	52	5260	19.30
802.11ac-VHT20	MCS0	60	5300	19.41
802.11ac-VHT20	MCS0	64	5320	19.32
802.11ac-VHT20	MCS0	100	5500	19.36
802.11ac-VHT20	MCS0	116	5580	19.38
802.11ac-VHT20	MCS0	140	5700	19.34
802.11ac-VHT20	MCS0	144	5720	19.44
802.11ac-VHT20	MCS0	149	5745	19.28
802.11ac-VHT20	MCS0	157	5785	19.39
802.11ac-VHT20	MCS0	165	5825	19.37
802.11ac-VHT40	MCS0	38	5190	40.14
802.11ac-VHT40	MCS0	46	5230	40.01
802.11ac-VHT40	MCS0	54	5270	40.33
802.11ac-VHT40	MCS0	62	5310	40.30
802.11ac-VHT40	MCS0	102	5510	40.08
802.11ac-VHT40	MCS0	110	5550	39.92
802.11ac-VHT40	MCS0	134	5670	40.21
802.11ac-VHT40	MCS0	142	5710	40.11
802.11ac-VHT40	MCS0	151	5755	40.45
802.11ac-VHT40	MCS0	159	5795	40.28

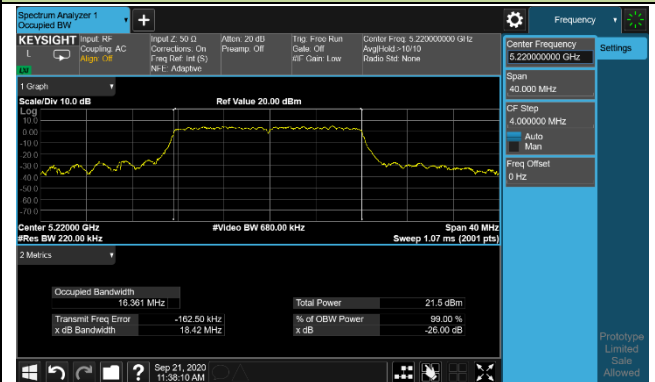
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)
Ant 0 / Ant 0 + 1				
802.11ac-VHT80	MCS0	42	5210	81.00
802.11ac-VHT80	MCS0	58	5290	81.01
802.11ac-VHT80	MCS0	106	5530	106.4
802.11ac-VHT80	MCS0	122	5610	81.66
802.11ac-VHT80	MCS0	138	5690	81.65
802.11ac-VHT80	MCS0	155	5775	81.73

802.11a 26dB Bandwidth - Ant 0 / Ant 0 + 1

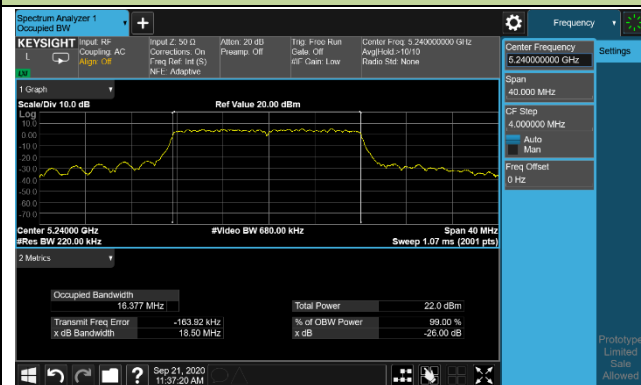
Channel 36 (5180MHz)



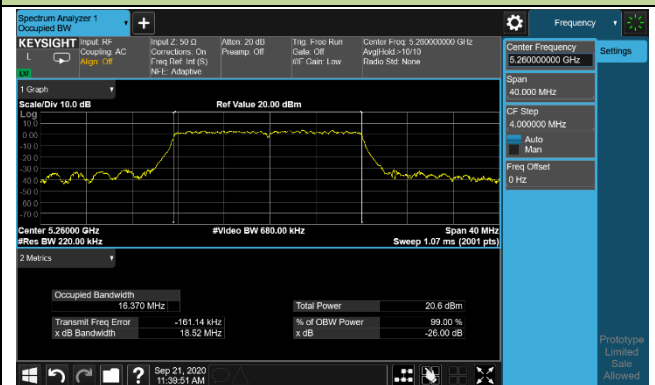
Channel 44 (5220MHz)



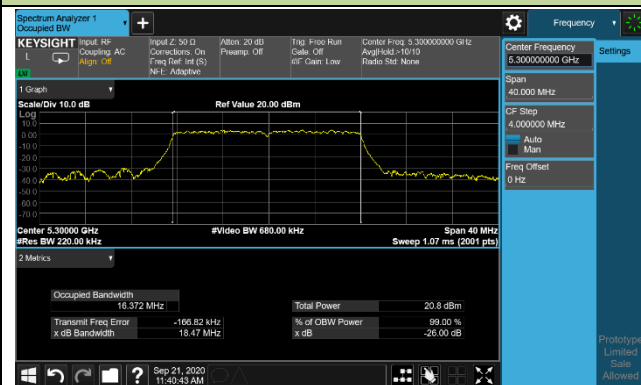
Channel 48 (5240MHz)



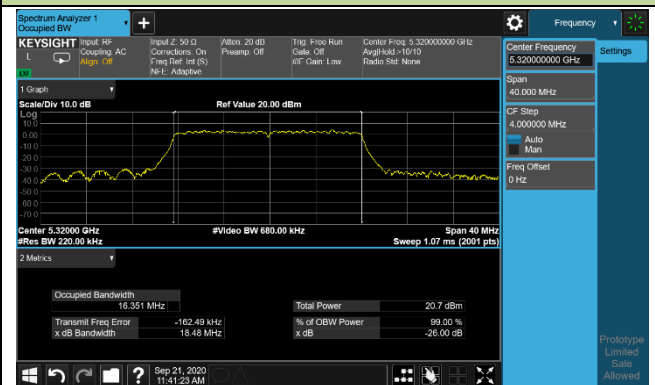
Channel 52 (5260MHz)



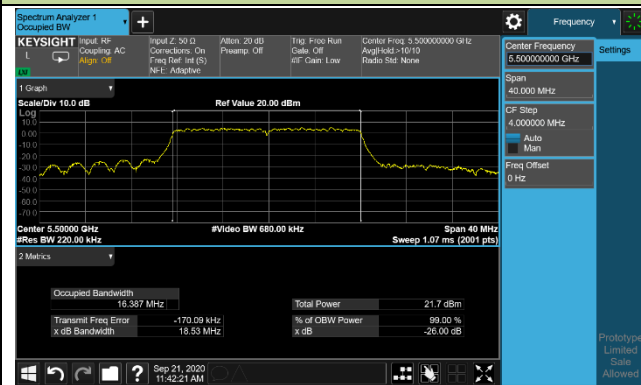
Channel 60 (5300MHz)



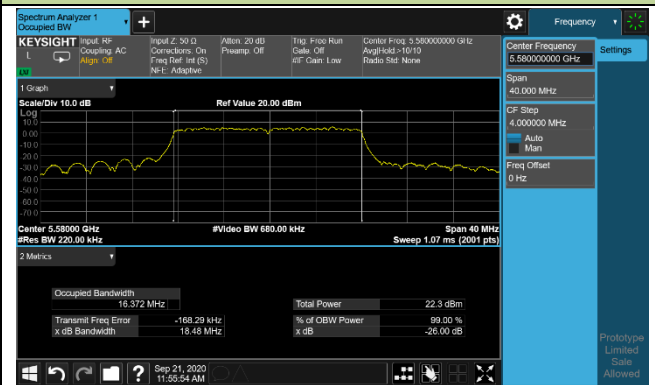
Channel 64 (5320MHz)



Channel 100 (5500MHz)

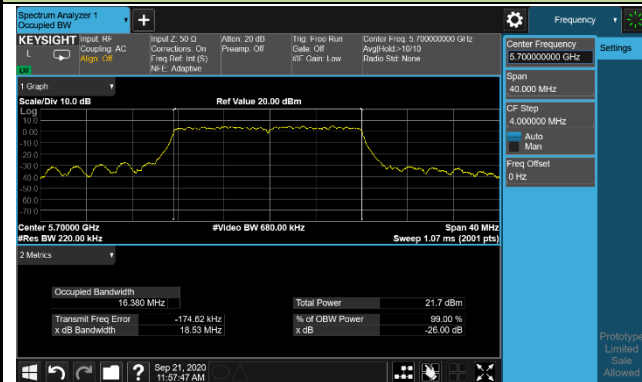


Channel 116 (5580MHz)

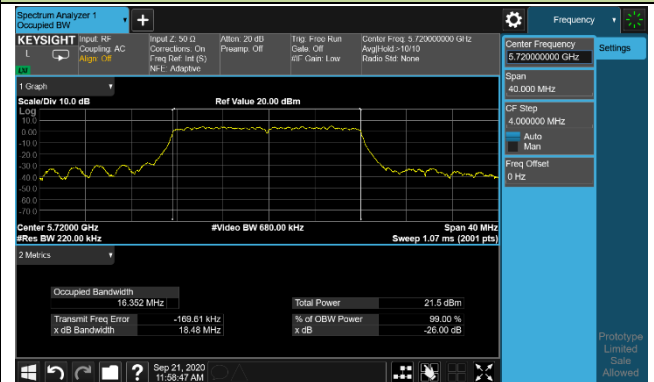


802.11a 26dB Bandwidth - Ant 0 / Ant 0 + 1

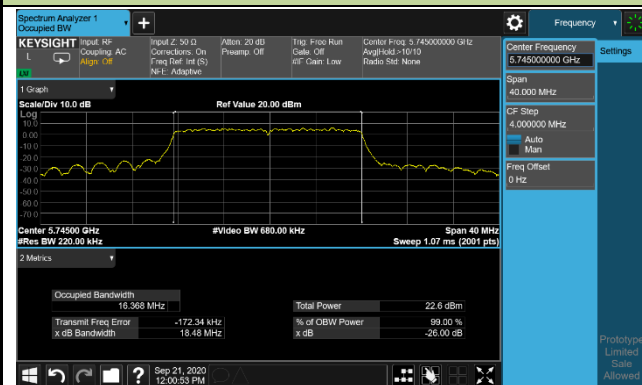
Channel 140 (5700MHz)



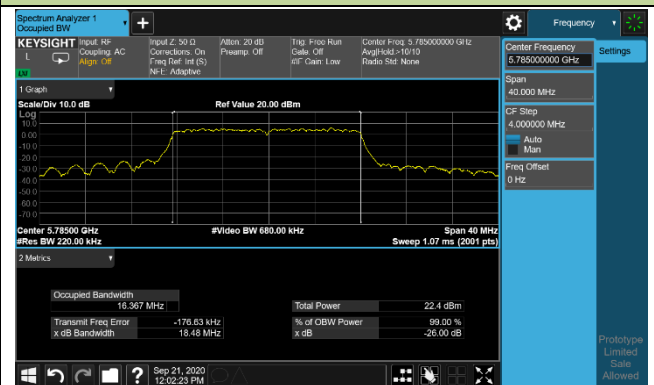
Channel 144 (5720MHz)



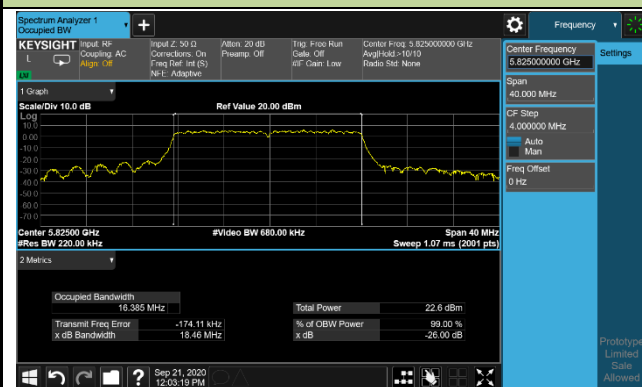
Channel 149 (5745MHz)



Channel 157 (5785MHz)

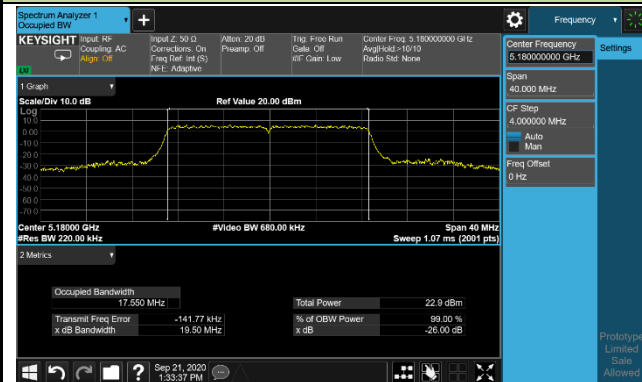


Channel 165 (5825MHz)

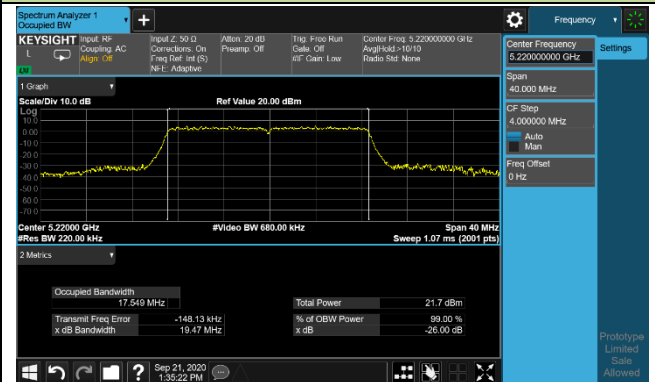


802.11n-HT20 26dB Bandwidth - Ant 0 / Ant 0 + 1

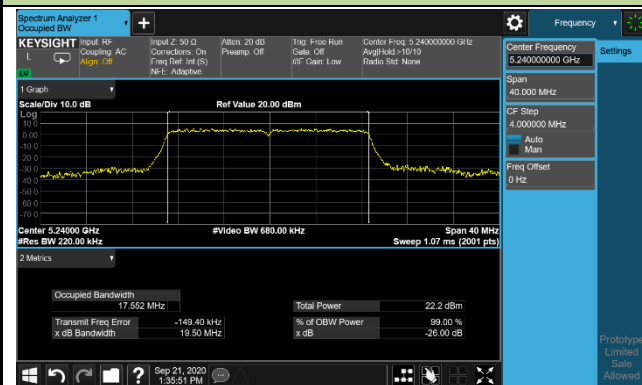
Channel 36 (5180MHz)



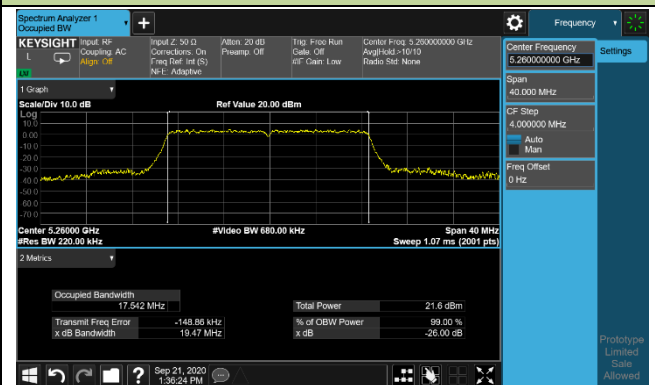
Channel 44 (5220MHz)



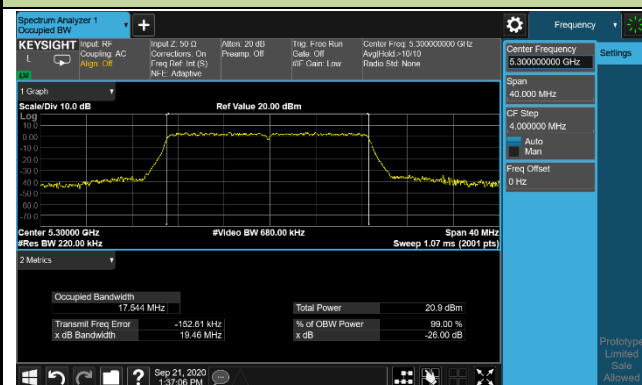
Channel 48 (5240MHz)



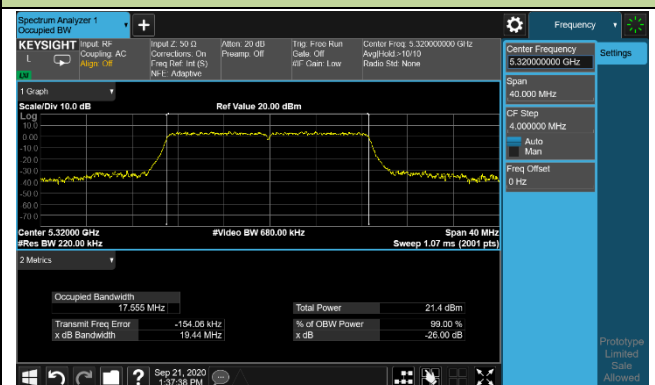
Channel 52 (5260MHz)



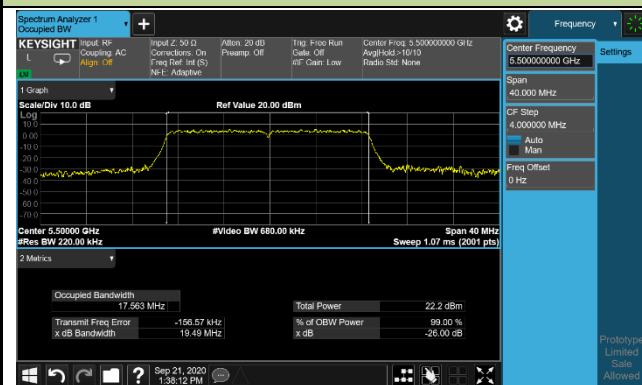
Channel 60 (5300MHz)



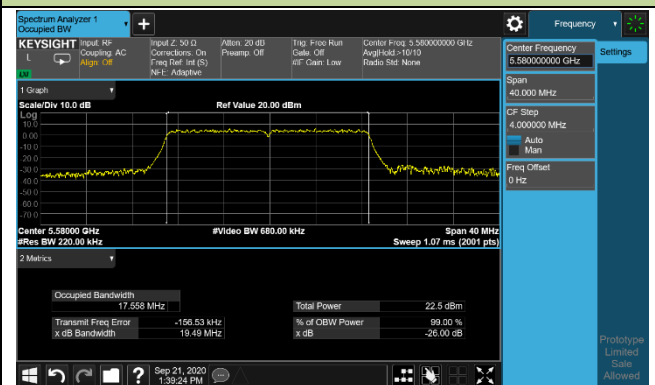
Channel 64 (5320MHz)



Channel 100 (5500MHz)

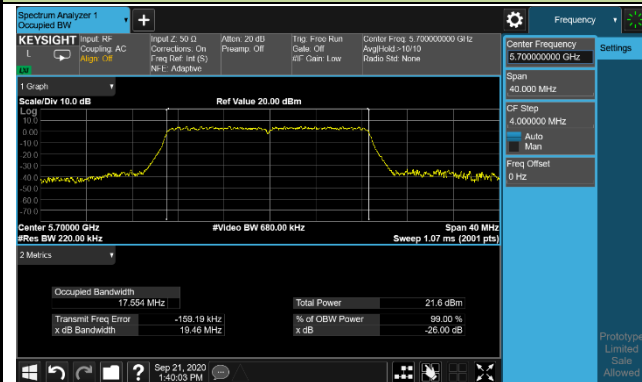


Channel 116 (5580MHz)

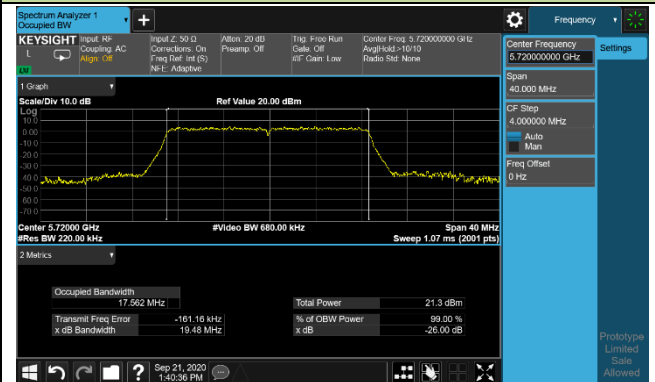


802.11n-HT20 26dB Bandwidth - Ant 0 / Ant 0 + 1

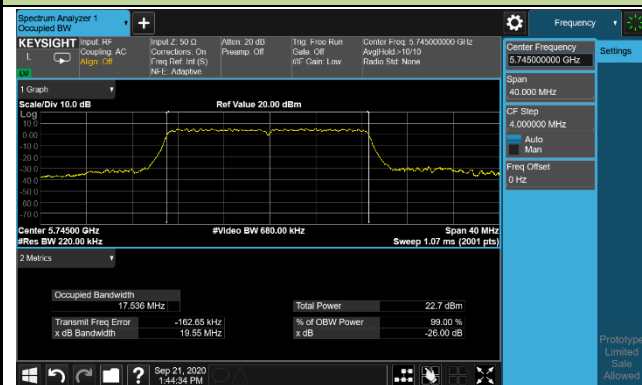
Channel 140 (5700MHz)



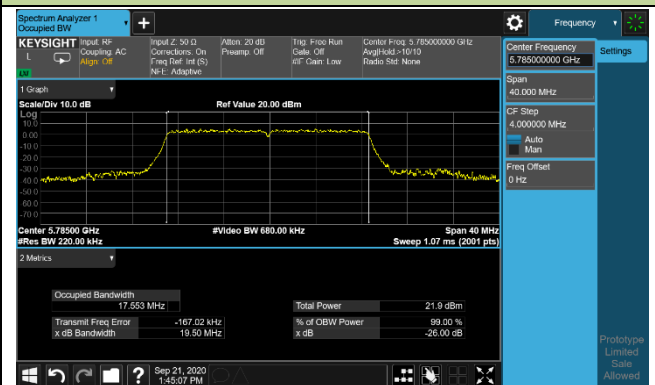
Channel 144 (5720MHz)



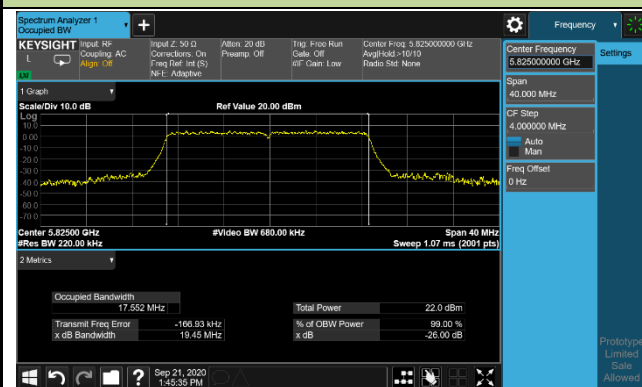
Channel 149 (5745MHz)



Channel 157 (5785MHz)

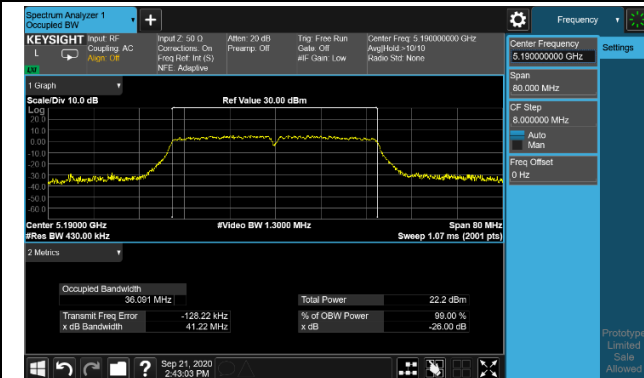


Channel 165 (5825MHz)

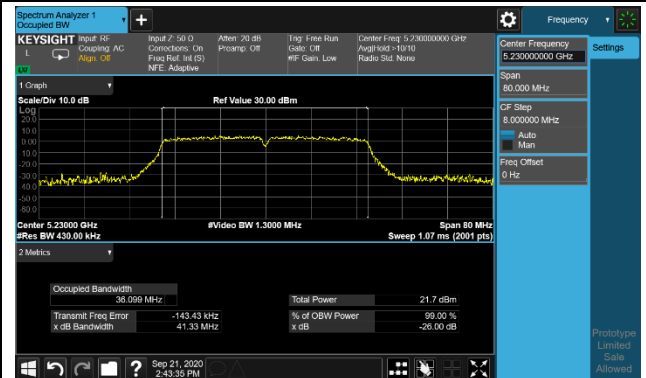


802.11n-HT40 26dB Bandwidth - Ant 0 / Ant 0 + 1

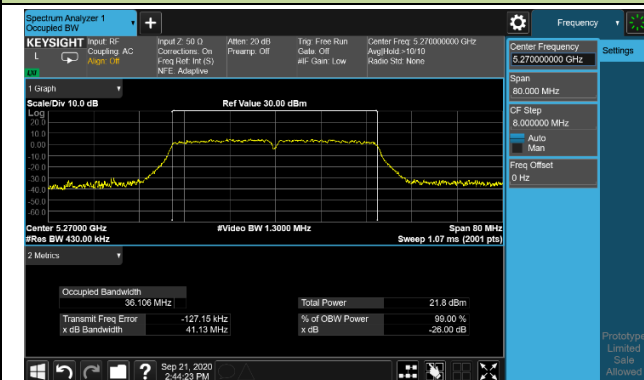
Channel 38 (5190MHz)



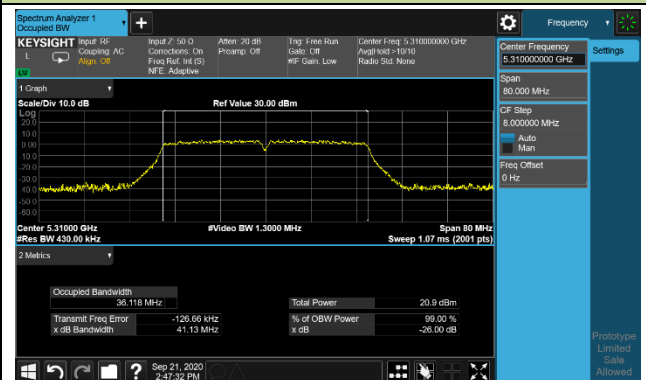
Channel 46 (5230MHz)



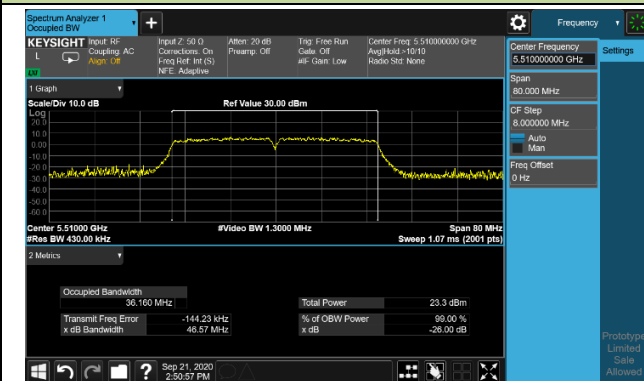
Channel 54 (5270MHz)



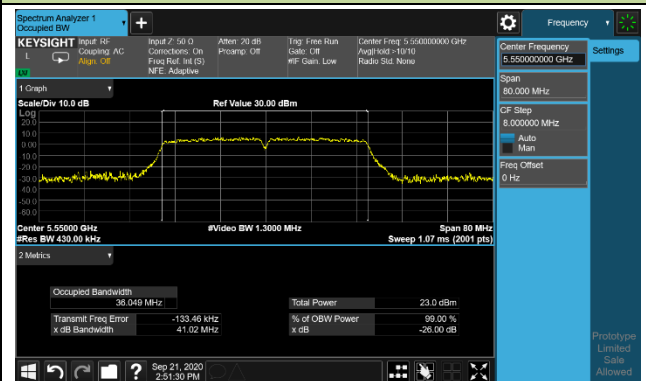
Channel 62 (5310MHz)



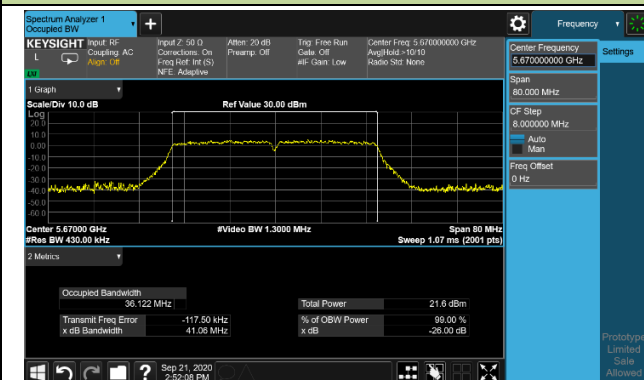
Channel 102 (5510MHz)



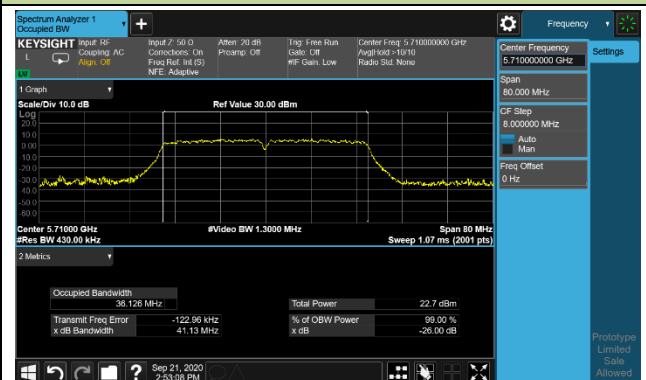
Channel 110 (5550MHz)



Channel 134 (5670MHz)

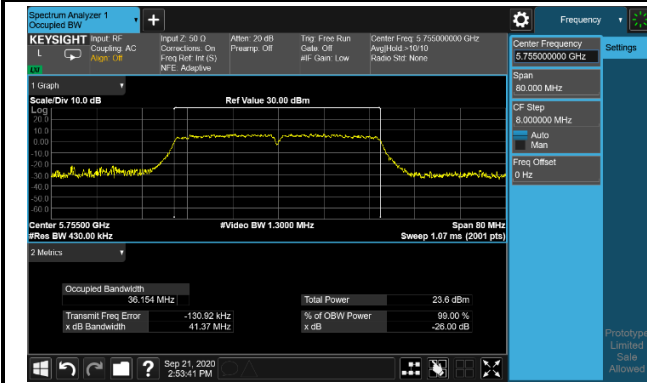


Channel 142 (5710MHz)

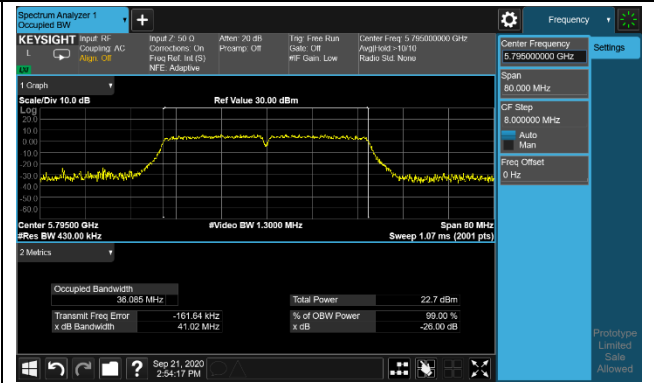


802.11n-HT40 26dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)

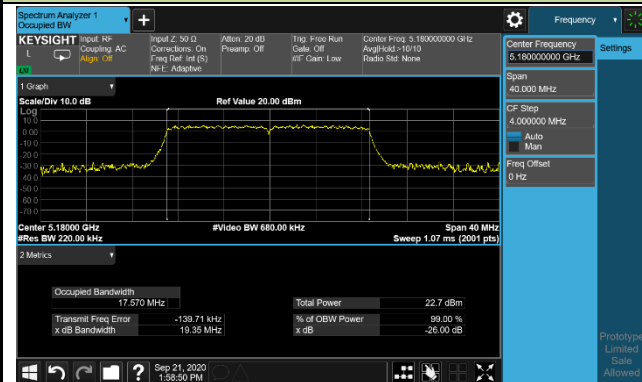


Channel 159 (5795MHz)

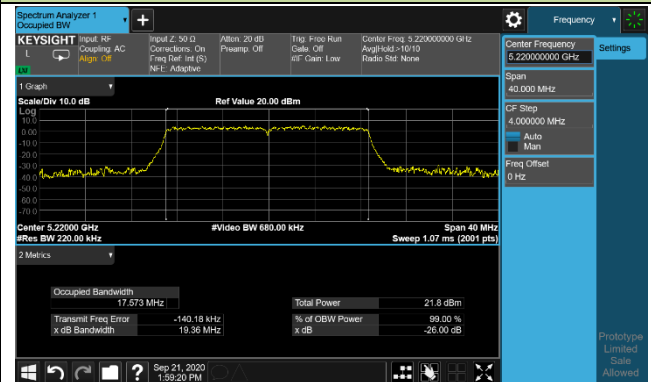


802.11ac-VHT20 26dB Bandwidth - Ant 0 / Ant 0 + 1

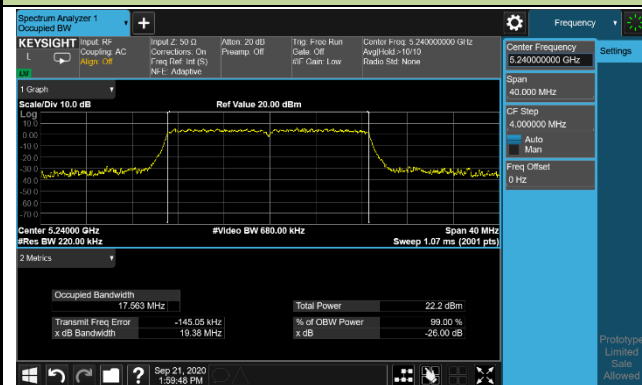
Channel 36 (5180MHz)



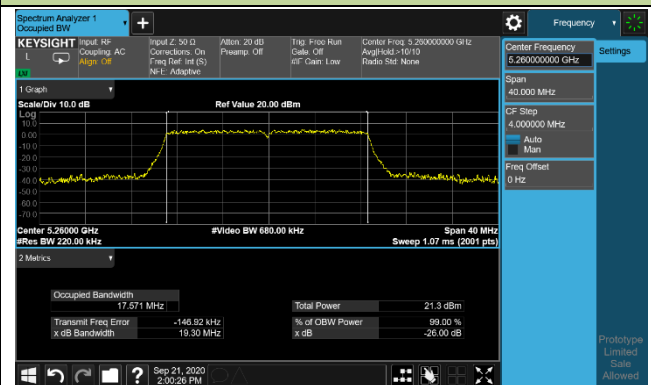
Channel 44 (5220MHz)



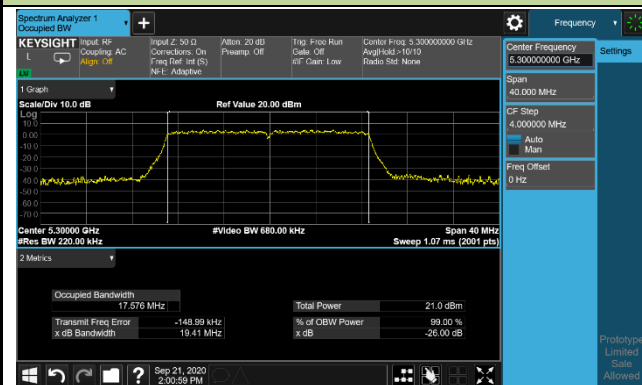
Channel 48 (5240MHz)



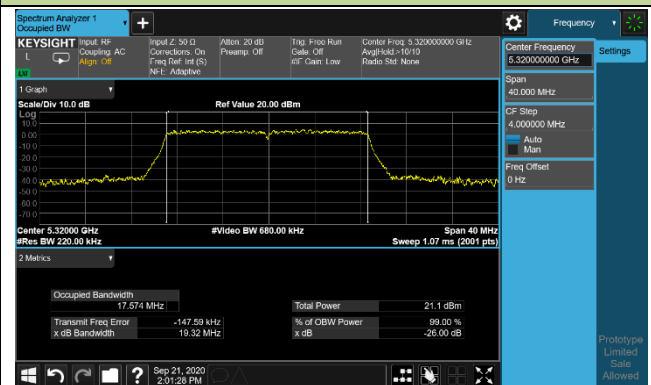
Channel 52 (5260MHz)



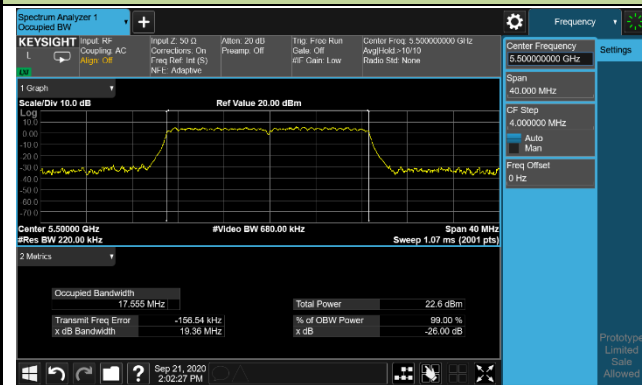
Channel 60 (5300MHz)



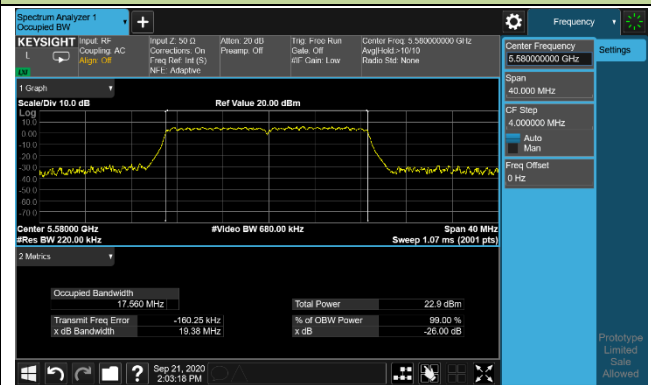
Channel 64 (5320MHz)



Channel 100 (5500MHz)

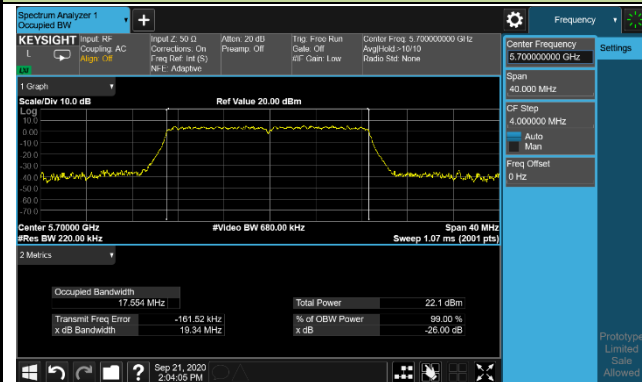


Channel 116 (5580MHz)

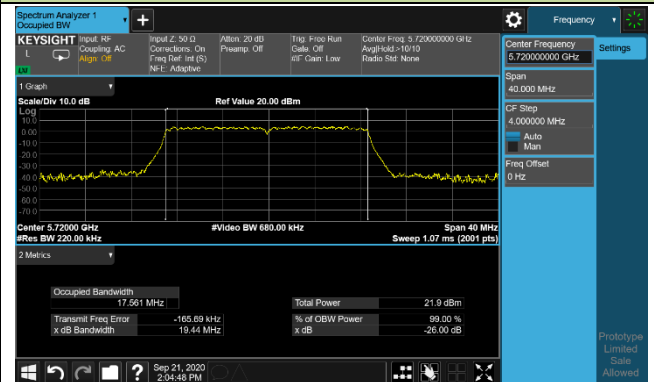


802.11ac-VHT20 26dB Bandwidth - Ant 0 / Ant 0 + 1

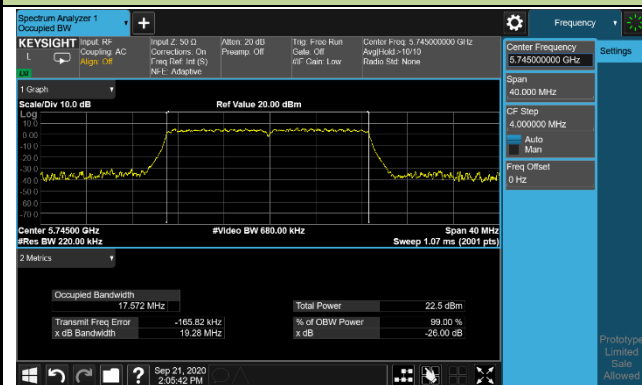
Channel 140 (5700MHz)



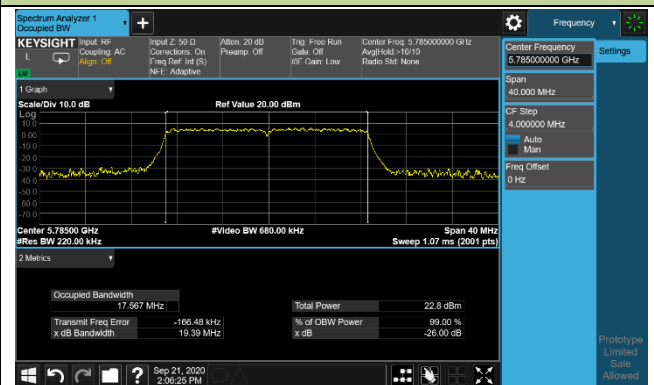
Channel 144 (5720MHz)



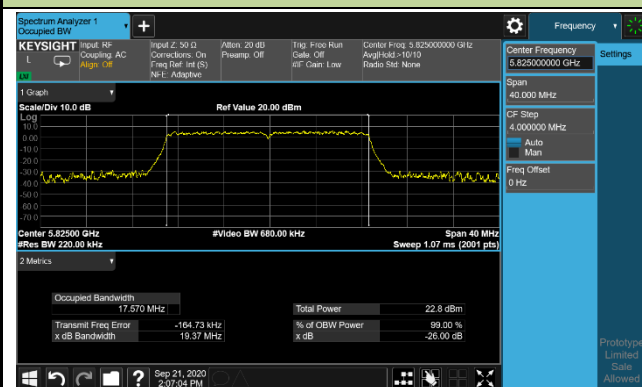
Channel 149 (5745MHz)



Channel 157 (5785MHz)

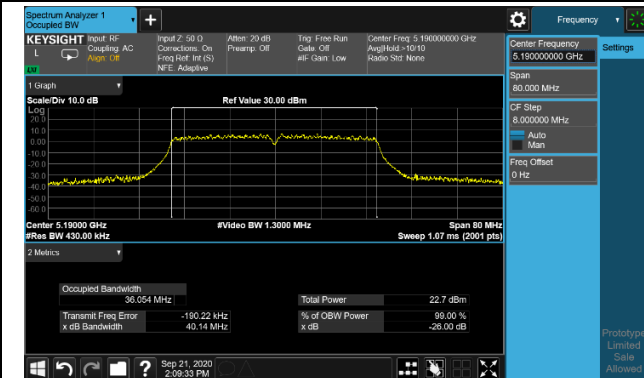


Channel 165 (5825MHz)

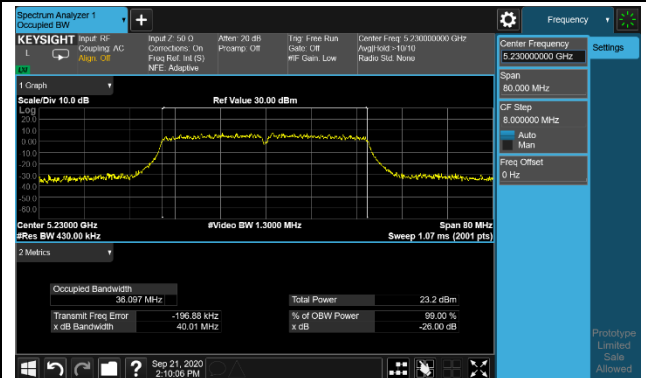


802.11ac-VHT40 26dB Bandwidth - Ant 0 / Ant 0 + 1

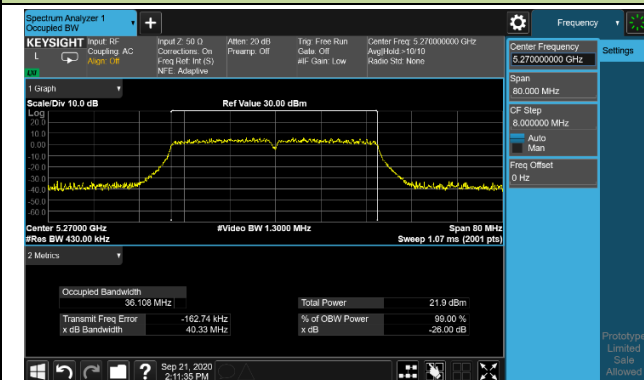
Channel 38 (5190MHz)



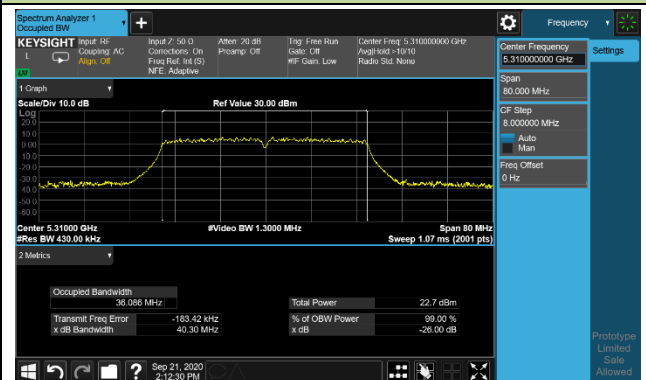
Channel 46 (5230MHz)



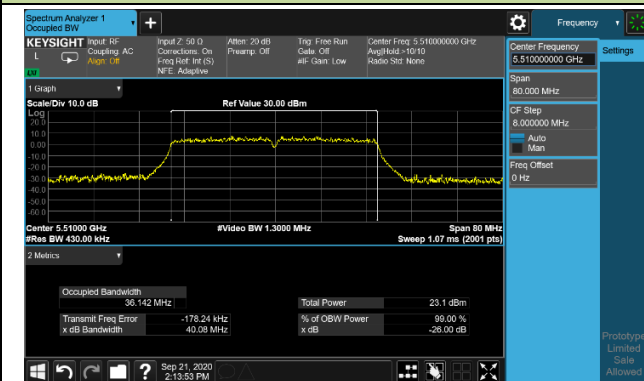
Channel 54 (5270MHz)



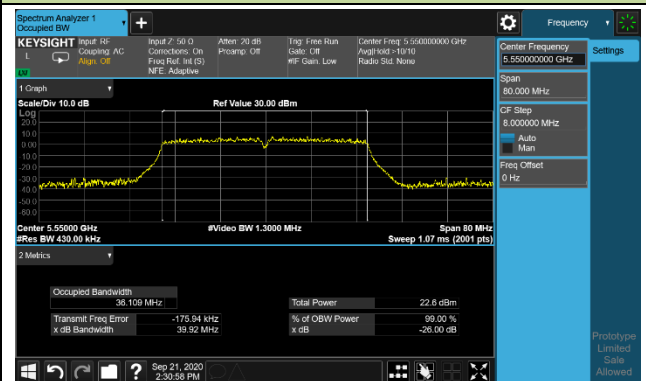
Channel 62 (5310MHz)



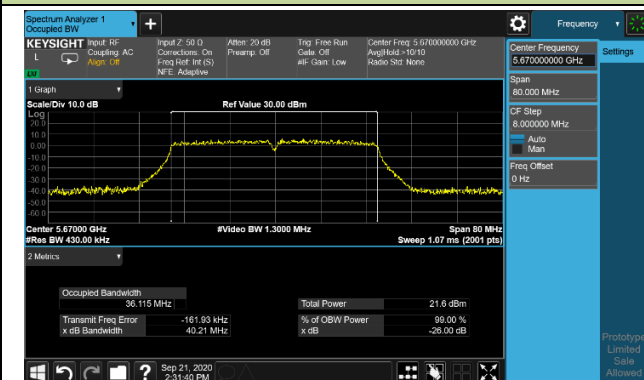
Channel 102 (5510MHz)



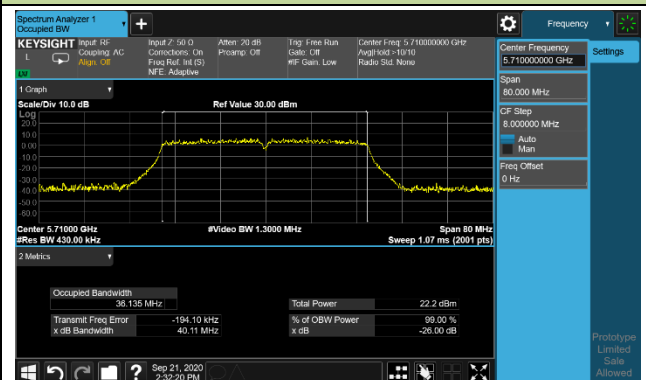
Channel 110 (5550MHz)



Channel 134 (5670MHz)

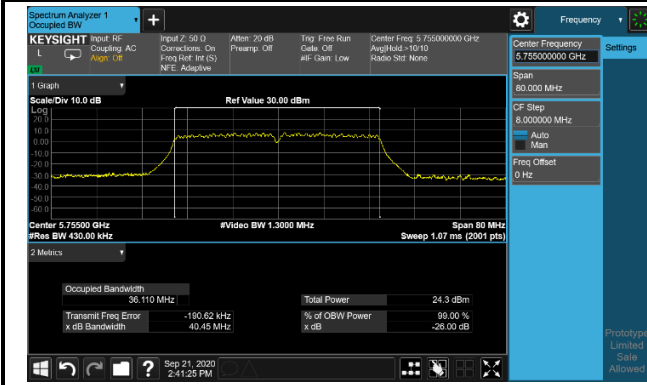


Channel 142 (5710MHz)



802.11ac-VHT40 26dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)

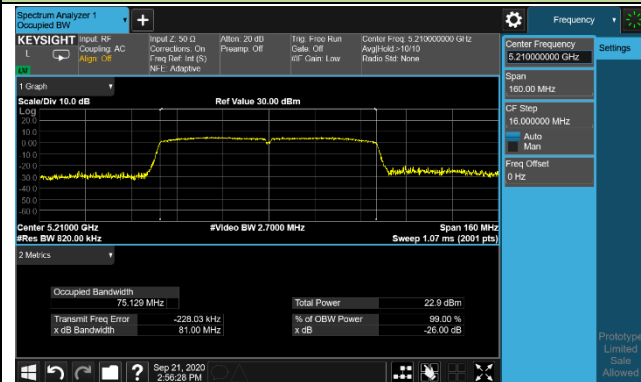


Channel 159 (5795MHz)

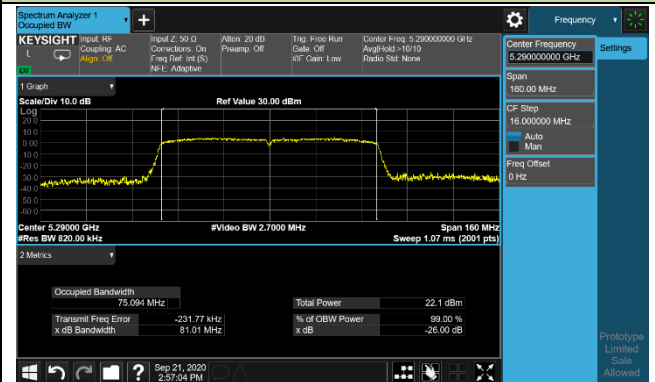


802.11ac-VHT80 26dB Bandwidth - Ant 0 / Ant 0 + 1

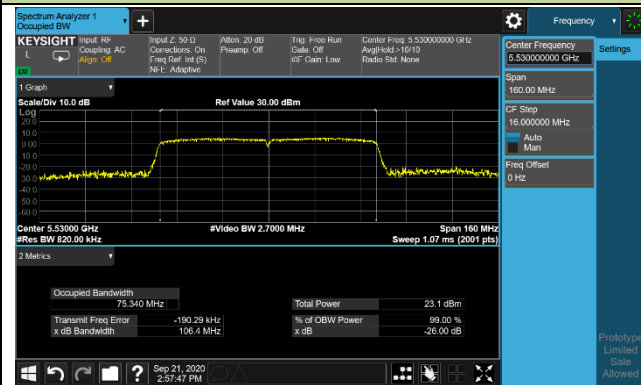
Channel 42 (5210MHz)



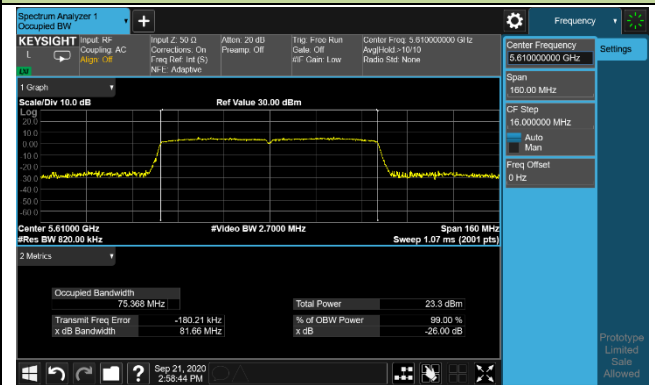
Channel 58 (5290MHz)



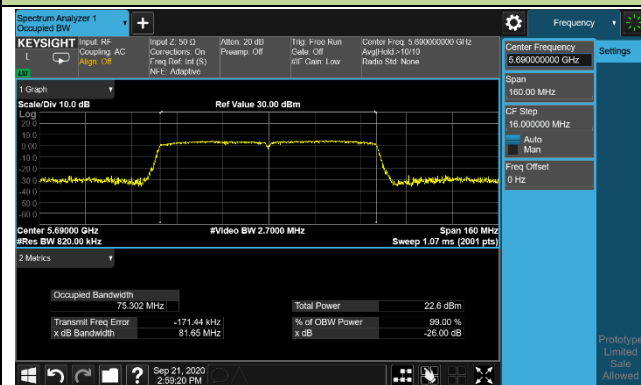
Channel 106 (5530MHz)



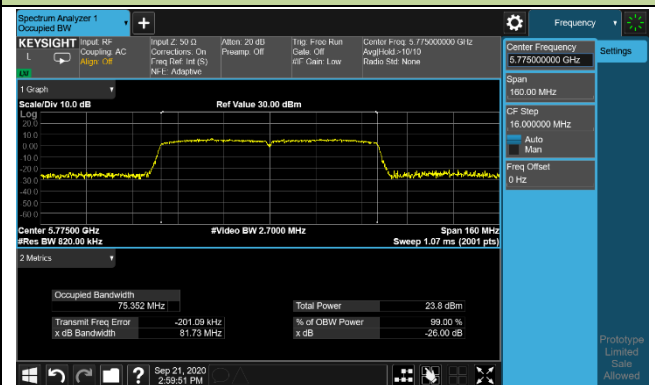
Channel 122 (5610MHz)



Channel 138 (5690MHz)



Channel 155 (5775MHz)



6.3. 6dB Bandwidth Measurement

6.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

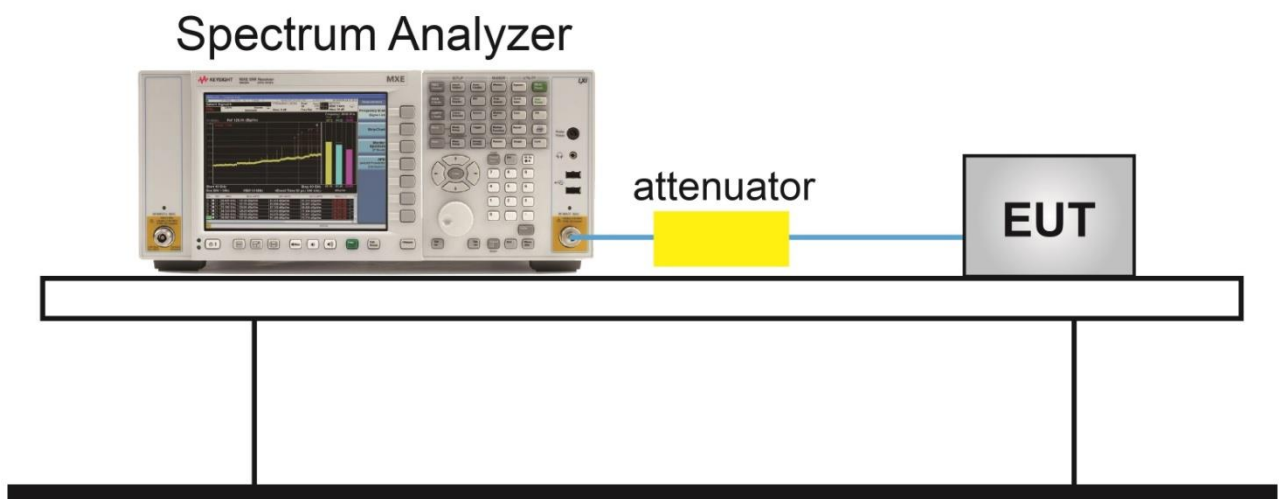
6.3.2. Test Procedure Used

KDB 789033 D02v02r01 - Section C.2

6.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = Max hold.
6. Sweep = Auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.4. Test Setup



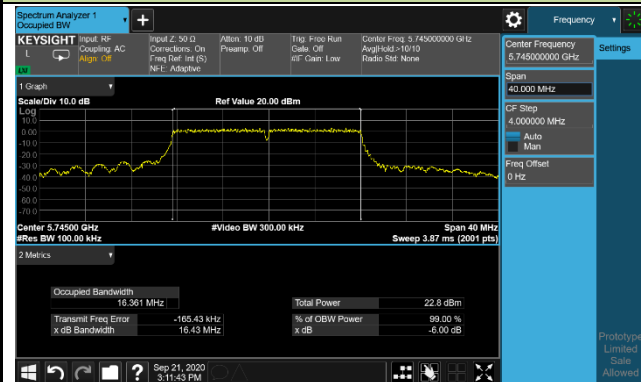
6.3.5. Test Result

Test Site	WZ-TR3	Test Engineer	Amy Zhang
Test Date	2020/09/21		

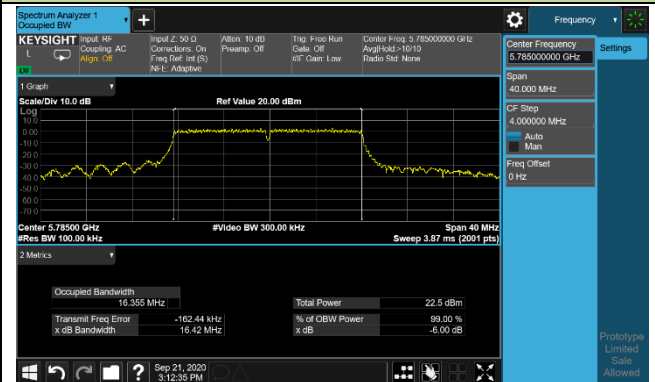
Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11a	6Mbps	149	5745	16.43	≥ 0.5	Pass
802.11a	6Mbps	157	5785	16.42	≥ 0.5	Pass
802.11a	6Mbps	165	5825	16.41	≥ 0.5	Pass
802.11n-HT20	MCS0	149	5745	17.64	≥ 0.5	Pass
802.11n-HT20	MCS0	157	5785	17.64	≥ 0.5	Pass
802.11n-HT20	MCS0	165	5825	17.73	≥ 0.5	Pass
802.11n-HT40	MCS0	151	5755	36.37	≥ 0.5	Pass
802.11n-HT40	MCS0	159	5795	36.37	≥ 0.5	Pass
802.11ac-VHT20	MCS0	149	5745	17.63	≥ 0.5	Pass
802.11ac-VHT20	MCS0	157	5785	17.63	≥ 0.5	Pass
802.11ac-VHT20	MCS0	165	5825	17.65	≥ 0.5	Pass
802.11ac-VHT40	MCS0	151	5755	36.36	≥ 0.5	Pass
802.11ac-VHT40	MCS0	159	5795	36.38	≥ 0.5	Pass
802.11ac-VHT80	MCS0	155	5775	76.42	≥ 0.5	Pass

802.11a 6dB Bandwidth - Ant 0 / Ant 0 + 1

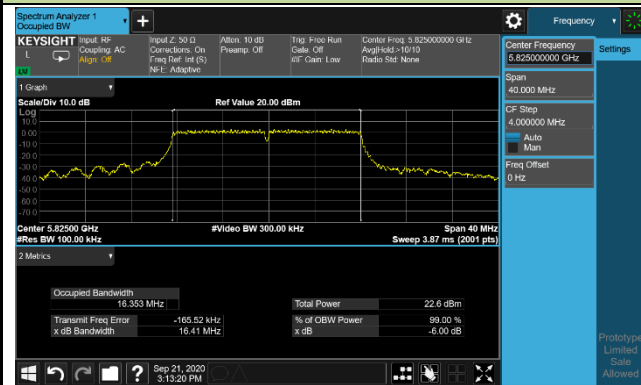
Channel 149 (5745MHz)



Channel 157 (5785MHz)

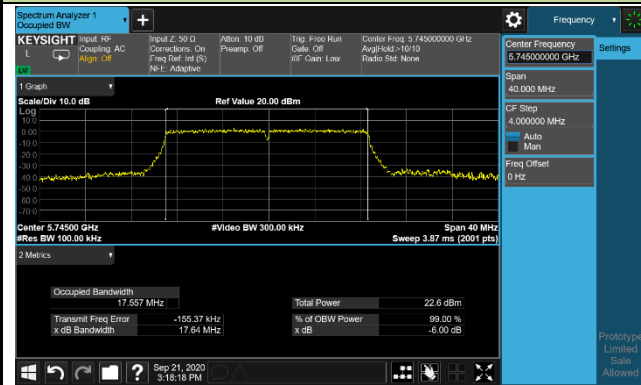


Channel 165 (5825MHz)

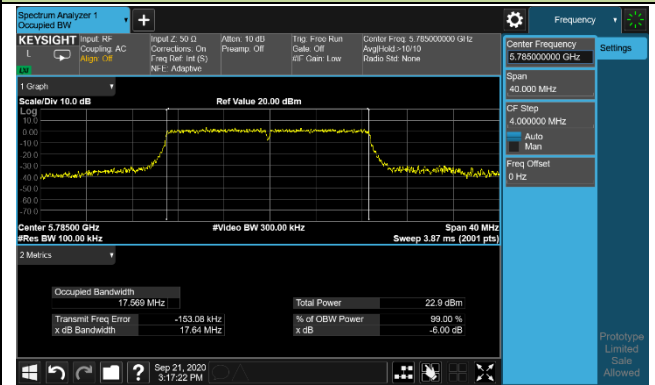


802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

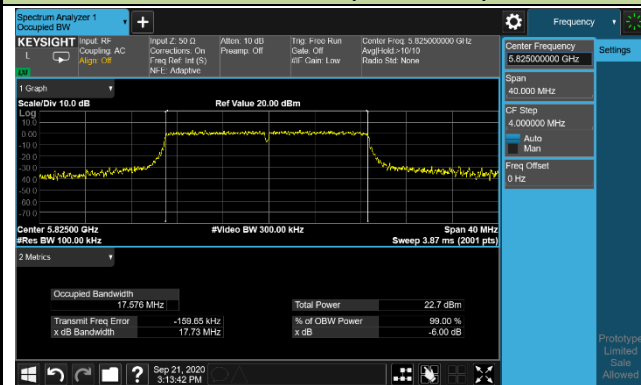
Channel 149 (5745MHz)



Channel 157 (5785MHz)

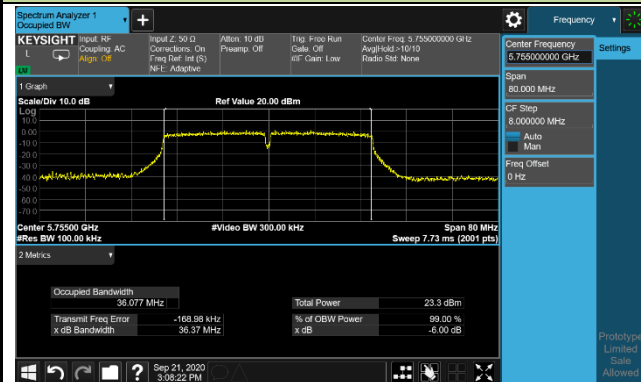


Channel 165 (5825MHz)

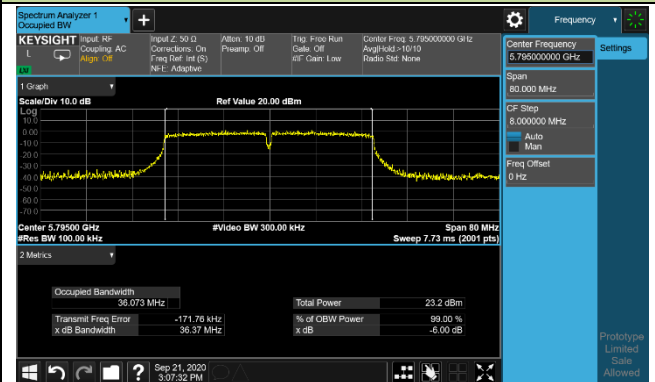


802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

Channel 151 (5755MHz)

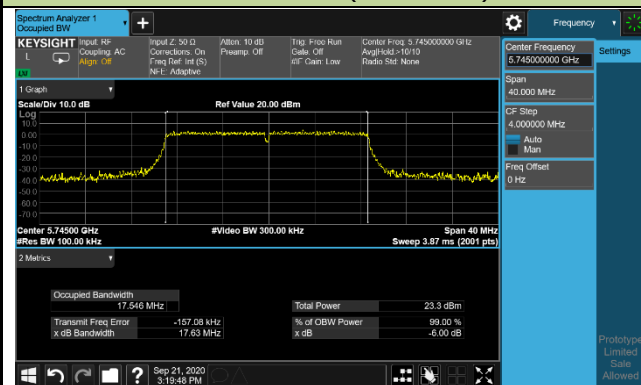


Channel 159 (5795MHz)

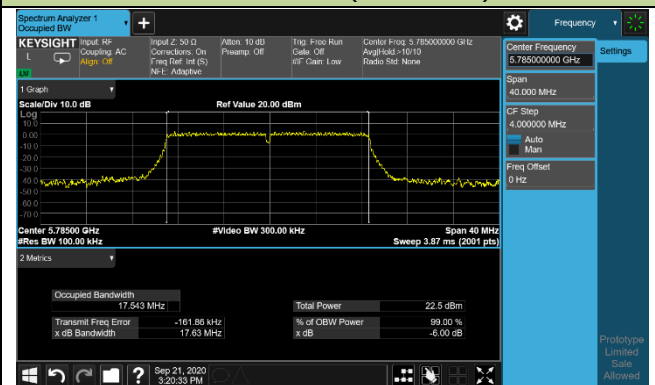


802.11ac-VHT20 6dB Bandwidth

Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

