



FCC TEST REPORT

FCC ID: 2A9DQ-ALPHA

On Behalf of

ALPHA OPTIK(SHENZHEN) CO.,LTD

Smart Portable Projector

Model No.: L18, L18P, L18T, L18T Plus, L28, L28P, L28T, L28T Pro, L36, L36P, L36P Pro, L36T, L36T Pro, L38, L38P, L38P Pro, L40, L40P, L40P Pro, S18P Pro

Prepared for : ALPHA OPTIK(SHENZHEN) CO.,LTD
Address : Room 801, 8th Floor, Building 1, Hengtaiyu Building, Tonghui Road, Fenghuang Street, Guangming District, Shenzhen

Prepared By : Shenzhen PSI Testing Co., Ltd.
Address : 1-2F, Building 5, Yudafu Industrial Park, No. 10, Xingye West Road, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518104

Report Number : psi2403119-C01-R12
Date of Receipt : April 2, 2024
Date of Test : April 3, 2024-April 8, 2024
Date of Report : April 9, 2024
Version Number : V0

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TEST REPORT DECLARATION

Applicant : ALPHA OPTIK(SHENZHEN) CO.,LTD
Address : Room 801, 8th Floor, Building 1, Hengtaiyu Building, Tonghui Road, Fenghuang Street, Guangming District, Shenzhen
Manufacturer : ALPHA OPTIK(SHENZHEN) CO.,LTD
Address : Room 801, 8th Floor, Building 1, Hengtaiyu Building, Tonghui Road, Fenghuang Street, Guangming District, Shenzhen
EUT Description : Smart Portable Projector
(A) Model No. : L18, L18P, L18T, L18T Plus, L28, L28P, L28T, L28T Pro, L36, L36P, L36P Pro, L36T, L36T Pro, L38, L38P, L38P Pro, L40, L40P, L40P Pro, S18P Pro
(B) Trademark : N/A

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart E

ANSI C63.4:2014, ANSI C63.10:2013

The device described above is tested by Shenzhen PSI Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart E limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen PSI Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen PSI Testing Co., Ltd.

Tested by (name + signature).....:

Felix Pang

Test Engineer

Felix Pang

Approved by (name + signature).....:

Simple Guan

Project Manager

Simple Guan

Date of issue.....:

April 9, 2024

Revision History

Revision	Issue Date	Revisions	Revised By
V0	April 9, 2024	Initial released Issue	Felix Pang



1 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	Section 15.203 Section 7.1.4 RSS-Gen Issue 5	PASS
AC Power Line Conducted Emission	Section 15.207 Section 7.2.4 RSS-GEN(8.8), ANSI C63.10	PASS
occupied bandwidth	Section 15.407 (e)	PASS
Peak Transmit Power	Section 15.407(a), RSS-247 5.4(2)	PASS
Power Spectral Density	Section 15.407(a), RSS-247 5.2(2)	PASS
Undesirable Emission	Section 15.407(b), RSS-247 5.5	PASS
Radiated Emission	Section 15.407(b)&15.209 Section 5.5 RSS-Gen(8.9), RSS-247(5.5), ANSI C63.10	PASS
Band Edge	15.205, RSS-247 Issue 2, ANSI C63.10	PASS
Frequency Stability	15.407(f), RSS-GEN(6.11)	PASS

Remark:

1. Pass: The EUT complies with the essential requirements in the standard.
2. Frequency Stability: The manufacturer stated in the user's manual.
3. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

1.1 Measurement Uncertainty

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.17dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	2.74dB(Polarize: V)
	2.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 18GHz)	4.29dB(Polarize: V)
	4.82dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz)	4.31dB(Polarize: V)
	4.30dB(Polarize: H)
Uncertainty for radio frequency	48.24KHz
Uncertainty for conducted RF Power	0.41dB
Uncertainty for Power Spectral Density	0.39 dB

2 General Information

2.1 General Description of EUT

EUT Name : Smart Portable Projector
Model : L18, L18P, L18T, L18T Plus, L28, L28P, L28T, L28T Pro, L36, L36P, L36P Pro, L36T, L36T Pro, L38, L38P, L38P Pro, L40, L40P, L40P Pro, S18P Pro
Diff : There is no difference except the name of the model. All tests are made with the L36P model.
Test Voltage : AC 120V/60Hz

Radio Technology : 5G WIFI

Operation frequency : 802.11a/802.11n(HT20): 5180-5240MHz, 5745~5825MHz
802.11n(HT40): 5190-5230MHz, 5755~5795MHz

Channel separation : 20MHz for 802.11a/802.11n(HT20)
40MHz for 802.11n(HT40)

Modulation technology: : 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK)
802.11a: OFDM (64QAM, 16QAM,QPSK,BPSK)

Antenna Type : Internal antenna, Maximum Gain is 3.13dBi.

Software version : V1.0

Hardware version : V1.0

Note : Antenna information is provided by applicant.
Testing lab is not responsible for the accuracy of the information.

2.2 Test mode

Transmitting mode Keep the EUT in transmitting with modulation.
EUT was test with 99% duty cycle at its maximum power control level.

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.3 Test Facility

Shenzhen PSI Testing Co., Ltd.
1-2F, Building 5, Yudafu Industrial Park, No. 10, Xingye West Road, Shajing Street, Bao'an District,
Shenzhen, Guangdong, China 518104

September 13, 2023 File on Federal Communication Commission
Registration Number: 916281

2.4 Description of Support Units

Accessories : N/A
Manufacturer : N/A
Model : N/A
Ratings : N/A

2.5 Deviation from Standards

None.

2.6 Abnormalities from Standard Conditions

None.

2.7 Other Information Requested by the Customer

None.

2.8 Additional instructions

Software (Used for test) from client

Channel	Power level
Lowest	Default
Middle	Default
Highest	Default

3 Test Instruments list

Item	Equipment	Manufacturer	Model No.	Serial No.	Firmware Version	Last Cal.	Cal. Interval
1.	9*6*6 anechoic chamber	SKET	9*6*6	N/A	/	2022.12.20	3 Year
2.	Test Receiver	Rohde&Schwarz	ESCI 7	101032/003	4.42 SP3	2023.12.19	1 Year
3.	L.I.S.N.#1	Rohde&Schwarz	ENV216	102282	/	2023.12.19	1 Year
4.	L.I.S.N.#2	RFT	NNB111	13835240	/	2023.12.19	1 Year
5.	Loop Antenna	Schwarz beck	FMZB 1519B	00128	/	2023.04.03	2 Year
6.	Bilog Antenna	Schwarz beck	VULB 9168	01448	/	2022.12.26	2 Year
7.	Spectrum Analyzer	Rohde&Schwarz	FSV-40N	101648	3.70	2023.12.19	1 Year
8.	Horn Antenna	Schwarz beck	BBHA 9120 D	02706	/	2022.12.26	2 Year
9.	Amplifier	SKET	LAPA_01G18G-45dB	SK2022032901	/	2023.12.19	1 Year
10.	Horn Antenna	Schwarz beck	BBHA 9170	00946	/	2022.12.25	2 Year
11.	Amplifier	SKET	LNPA_0118G-45	SK2020010801	/	2023.12.19	1 Year
12.	RF Power Probe	Rohde&Schwarz	NRP-Z11	1138.3004.02-1111533-Fz	/	2023.12.19	1 Year
13.	RF Sensor Unit	Tachoy	TR1029-2	20220428P008	/	2023.12.19	1 Year
For Test Software Information							
Item	Software Name	Manufacturer			Version		
RE	EMC-I	SKET			V1.5.0.3		
CE	EMC-I	SKET			V1.5.0.3		
RF	RTS	TACHOY			V1.0.0		

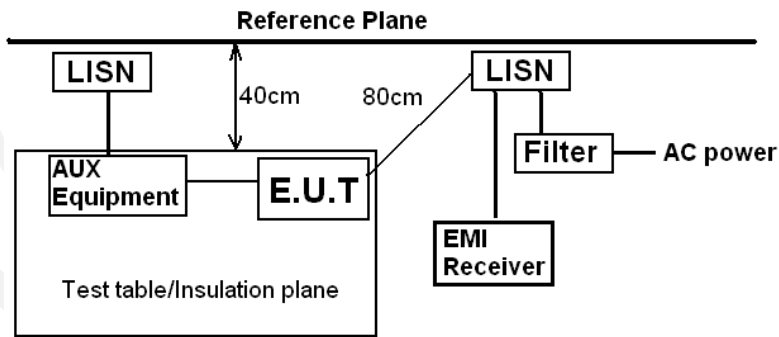
4 Test results and Measurement Data

4.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	
Internal antenna, max gain 3.13dBi, for 5180~5240MHz; 5745~5825MHz	



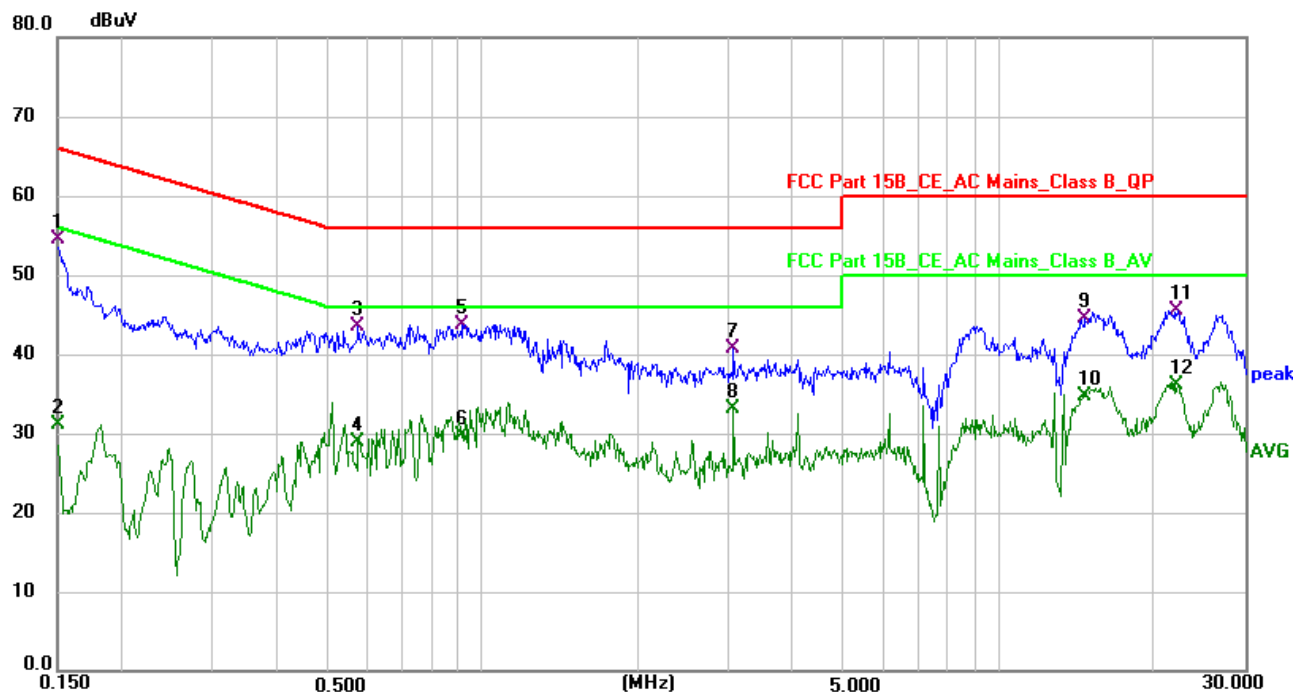
4.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10:2013		
Test Frequency Range:	150KHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9KHz, VBW=30KHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test procedure	The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.		
Test setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.10 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

Measurement Data

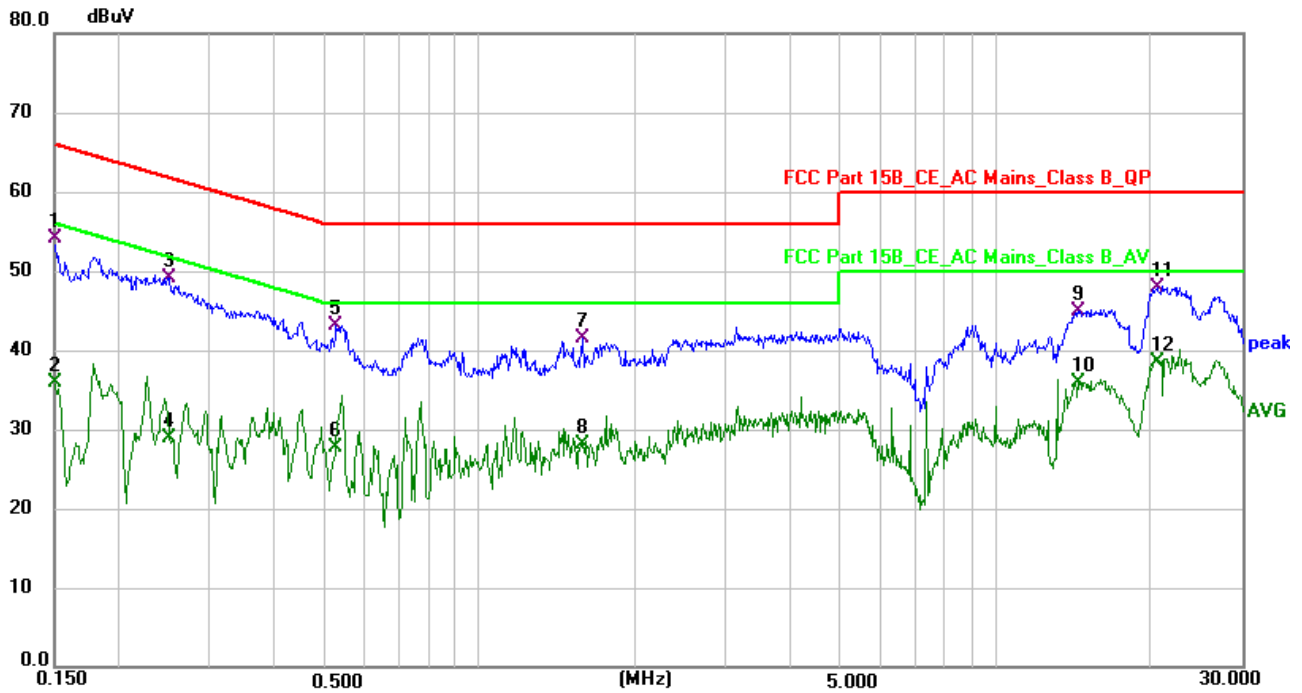
An initial pre-scan was performed on the line and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Line:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1 *	0.1500	44.63	9.94	54.57	66.00	-11.43	QP	P
2	0.1500	21.21	9.94	31.15	56.00	-24.85	AVG	P
3	0.5740	33.84	9.73	43.57	56.00	-12.43	QP	P
4	0.5740	19.26	9.73	28.99	46.00	-17.01	AVG	P
5	0.9140	34.35	9.42	43.77	56.00	-12.23	QP	P
6	0.9140	20.24	9.42	29.66	46.00	-16.34	AVG	P
7	3.0620	31.36	9.38	40.74	56.00	-15.26	QP	P
8	3.0620	23.79	9.38	33.17	46.00	-12.83	AVG	P
9	14.6740	34.94	9.56	44.50	60.00	-15.50	QP	P
10	14.6740	25.11	9.56	34.67	50.00	-15.33	AVG	P
11	22.2939	35.40	10.09	45.49	60.00	-14.51	QP	P
12	22.2939	26.04	10.09	36.13	50.00	-13.87	AVG	P

Note: *:Maximum data x:Over limit !:over margin Level = Reading + Factor Margin = Level - Limit

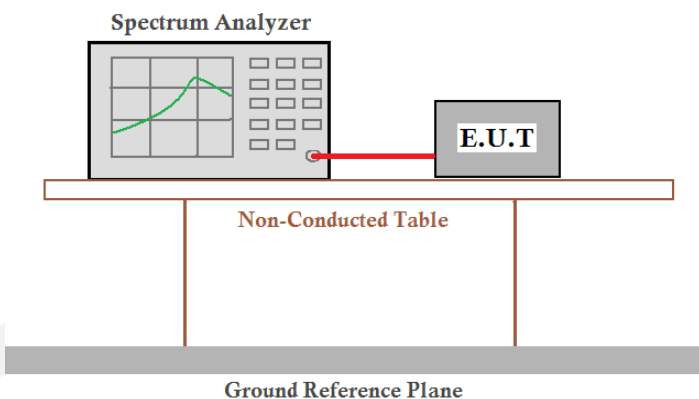
Neutral:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1500	44.26	9.77	54.03	66.00	-11.97	QP	P
2	0.1500	26.22	9.77	35.99	56.00	-20.01	AVG	P
3	0.2500	39.17	9.91	49.08	61.76	-12.68	QP	P
4	0.2500	19.02	9.91	28.93	51.76	-22.83	AVG	P
5	0.5260	33.37	9.78	43.15	56.00	-12.85	QP	P
6	0.5260	17.87	9.78	27.65	46.00	-18.35	AVG	P
7	1.5859	32.15	9.36	41.51	56.00	-14.49	QP	P
8	1.5859	18.80	9.36	28.16	46.00	-17.84	AVG	P
9	14.5060	35.09	9.87	44.96	60.00	-15.04	QP	P
10	14.5060	26.06	9.87	35.93	50.00	-14.07	AVG	P
11	20.5580	37.78	10.07	47.85	60.00	-12.15	QP	P
12 *	20.5580	28.39	10.07	38.46	50.00	-11.54	AVG	P

Note: *:Maximum data x:Over limit !:over margin Level = Reading + Factor Margin = Level - Limit

All modes and channels have been tested and only the A 5180MHz mode with the worst data is listed.

4.3 Emission Bandwidth and 99% Occupied Bandwidth

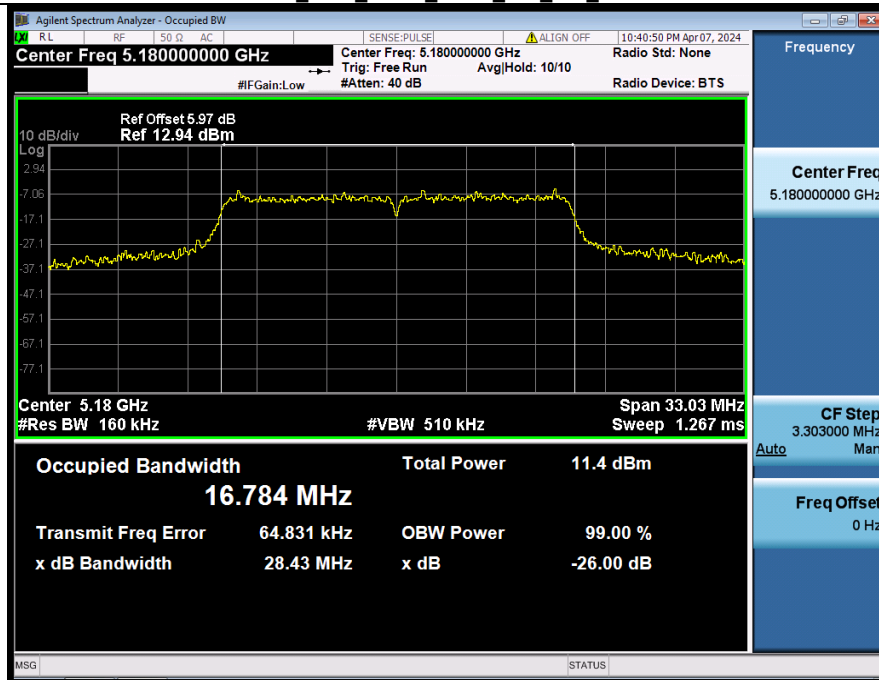
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	N/A
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a grid and a green trace, is connected to an E.U.T. (Equipment Under Test) box by a red cable. Both the Spectrum Analyzer and the E.U.T. are positioned on a table labeled 'Non-Conducted Table'. This table is supported by two vertical legs that rest on a thick horizontal bar labeled 'Ground Reference Plane'.
Test procedure:	According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data:

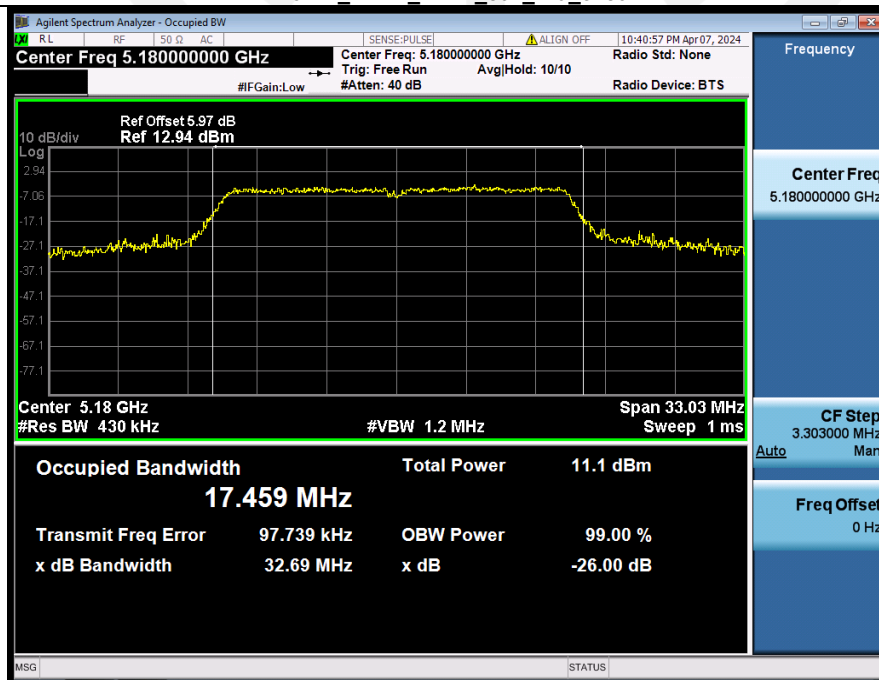
Band 1 (5150-5250 MHz):

Condition	Antenna	Modulation	Frequency(MHz)	26dB_Emission_Bandwidth(MHz)	Occupied Bandwidth(MHz)
HVNT	ANT1	802.11a	5180.00	32.69	16.78
HVNT	ANT1	802.11a	5200.00	32.75	16.71
HVNT	ANT1	802.11a	5240.00	33.06	16.88
HVNT	ANT1	802.11n(HT20)	5180.00	34.62	17.79
HVNT	ANT1	802.11n(HT20)	5200.00	33.85	17.81
HVNT	ANT1	802.11n(HT20)	5240.00	34.97	17.88
HVNT	ANT1	802.11n(HT40)	5190.00	70.68	36.47
HVNT	ANT1	802.11n(HT40)	5230.00	72.23	36.60

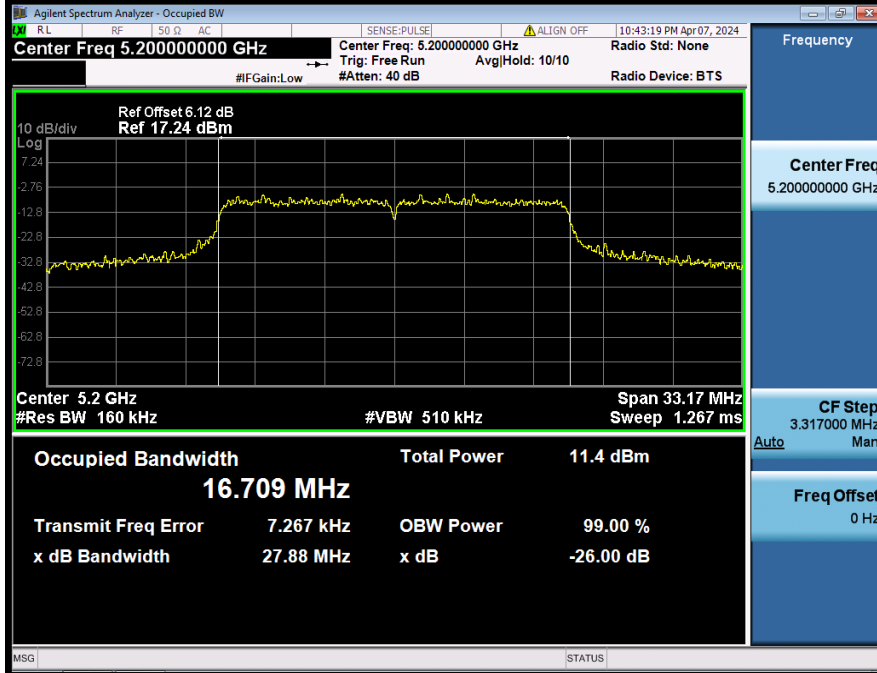
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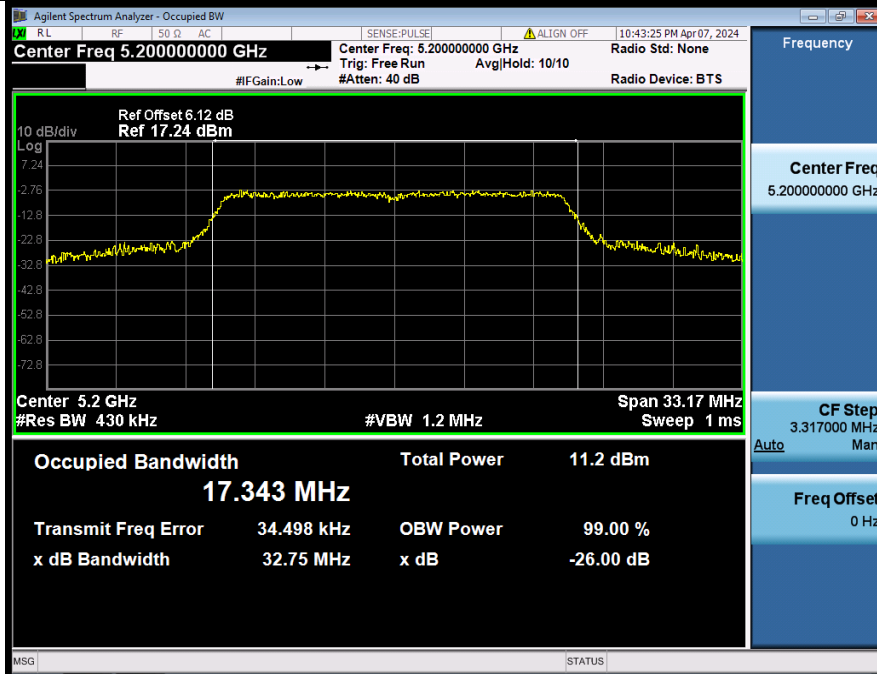
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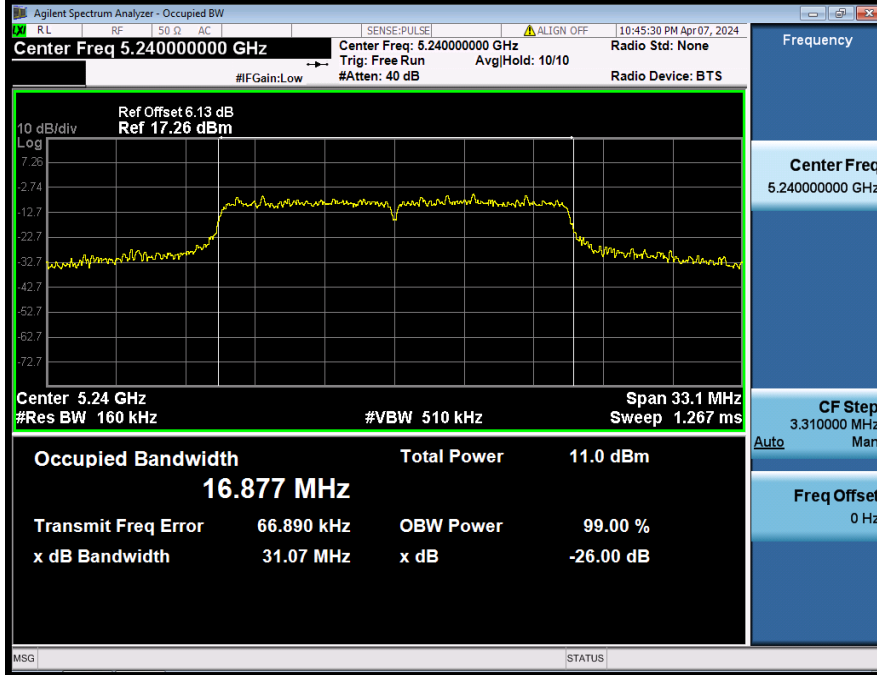
99%_OCB_HVNT_ANT1_802_11a_5200



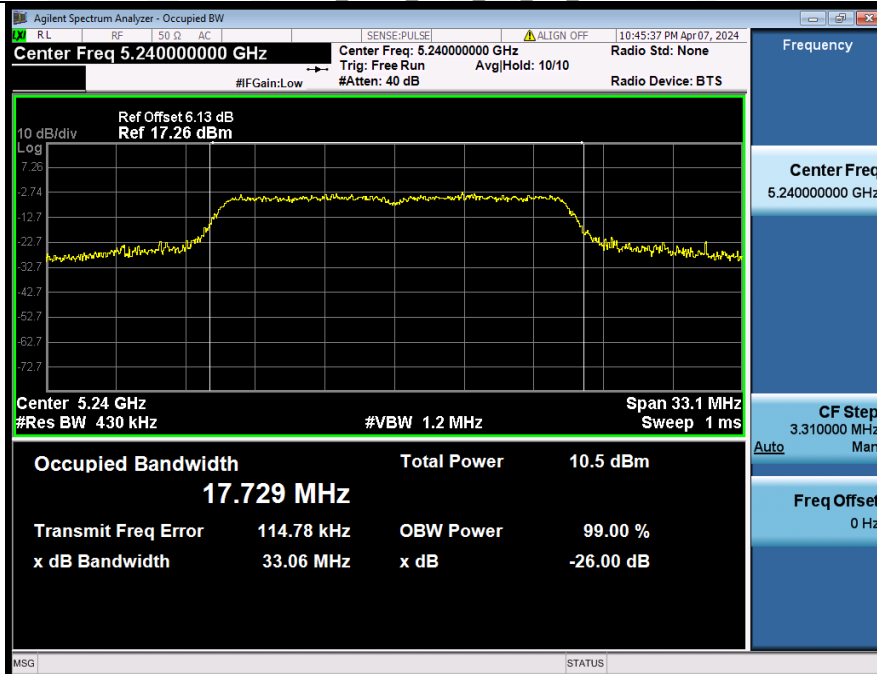
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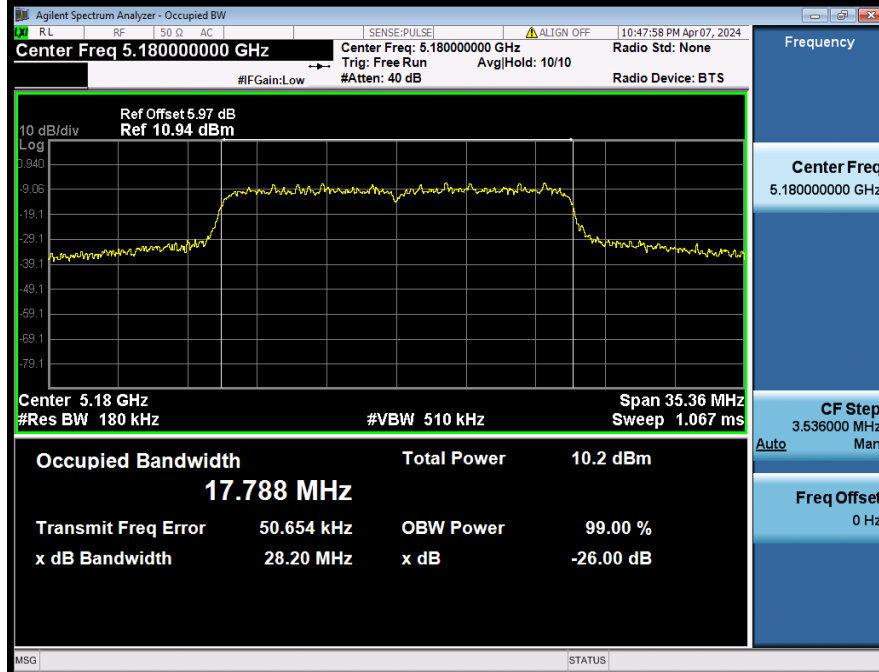
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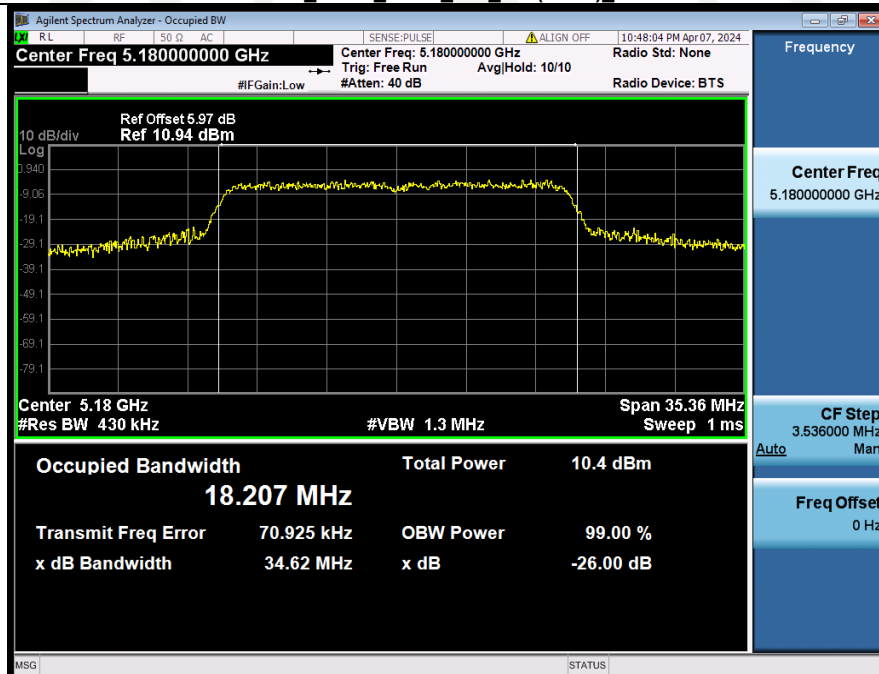
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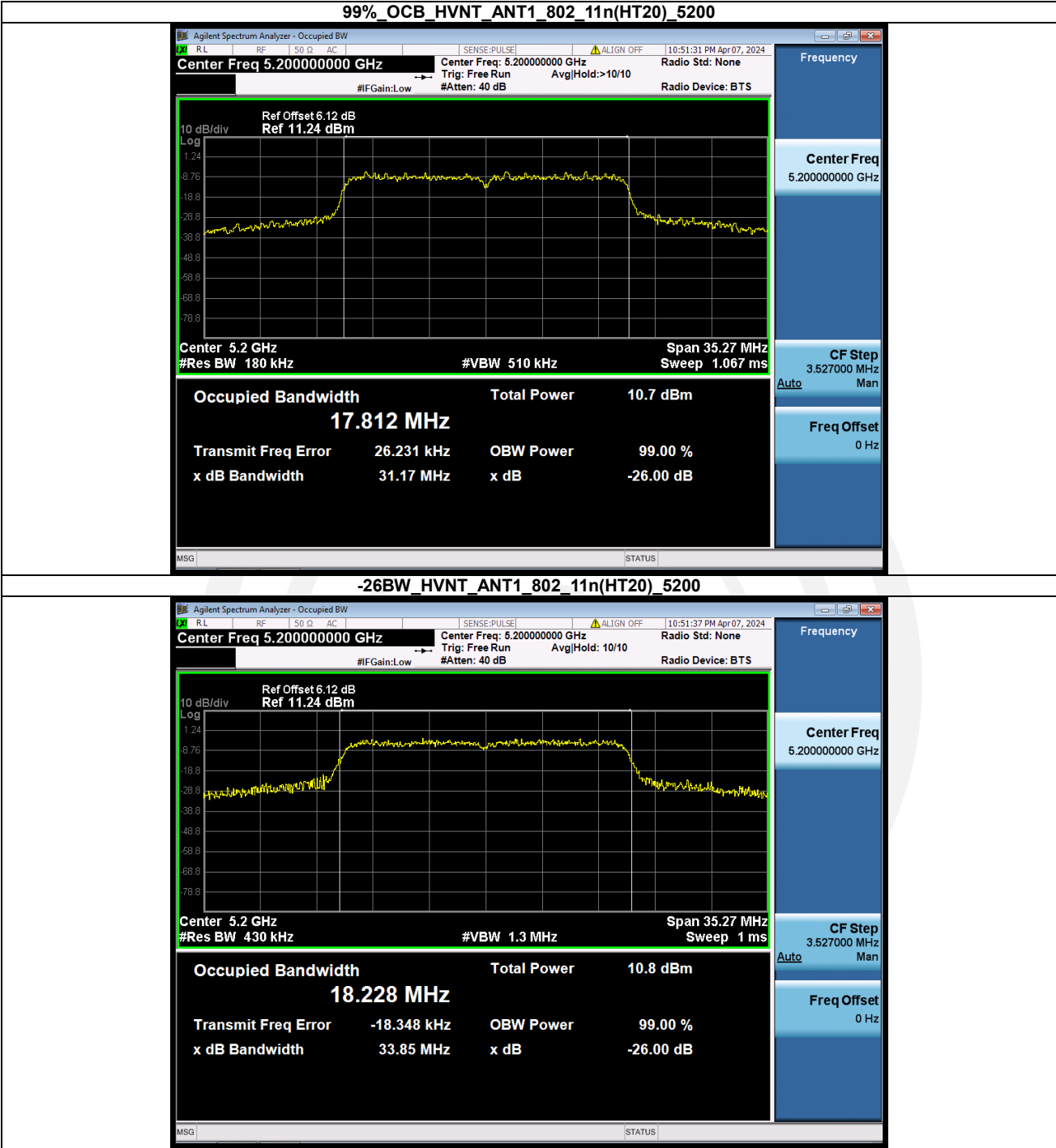


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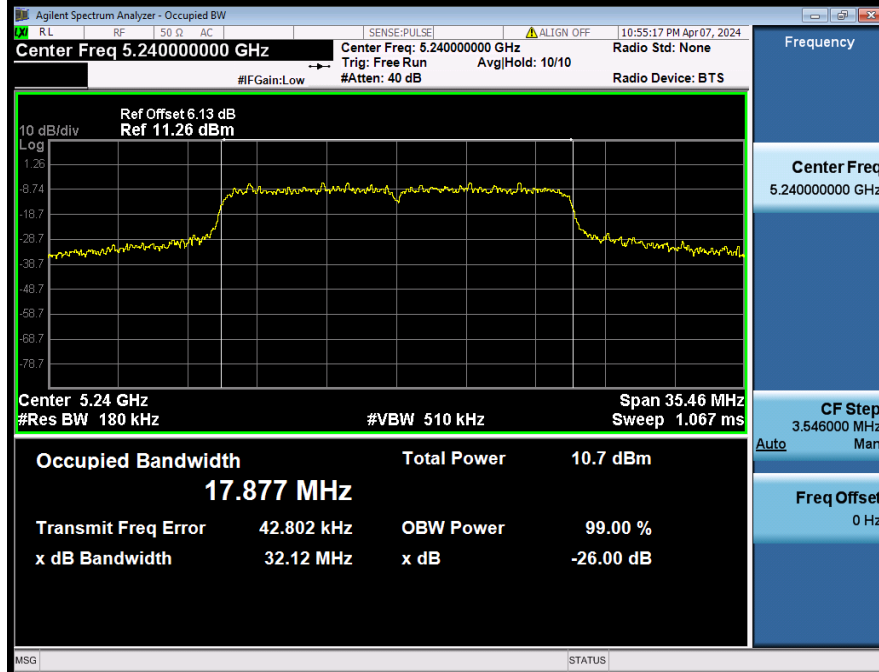


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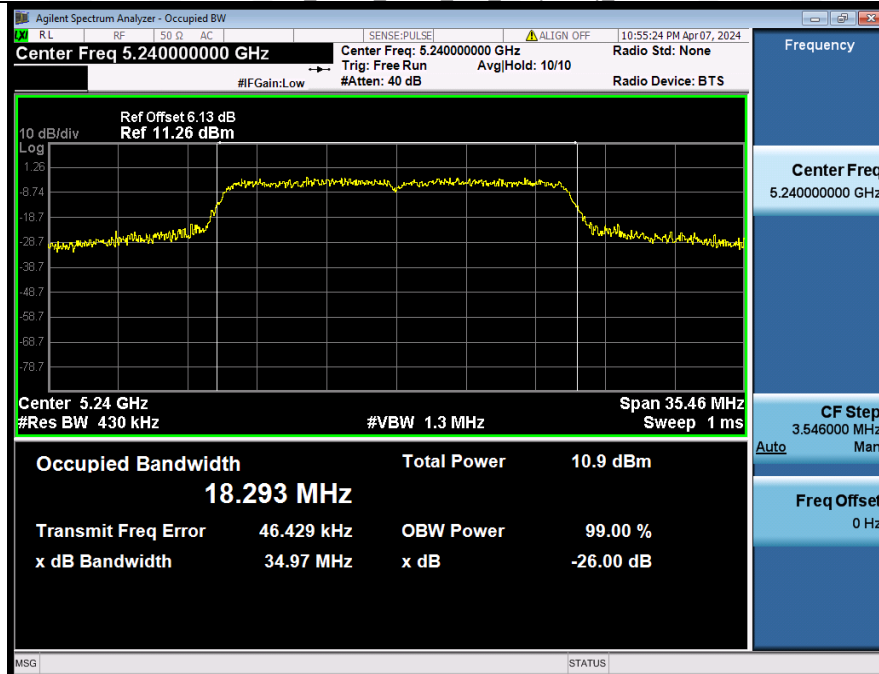


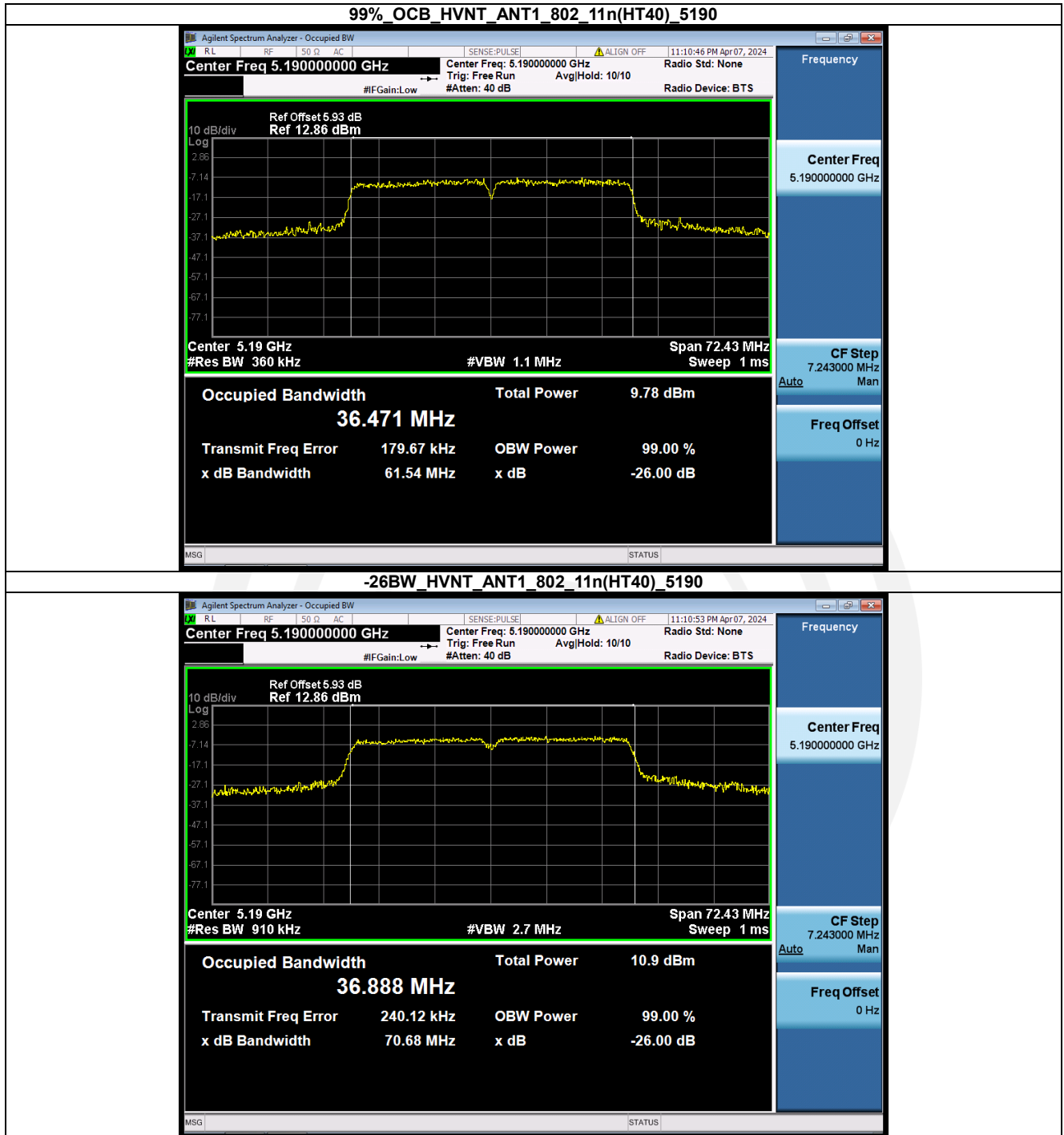


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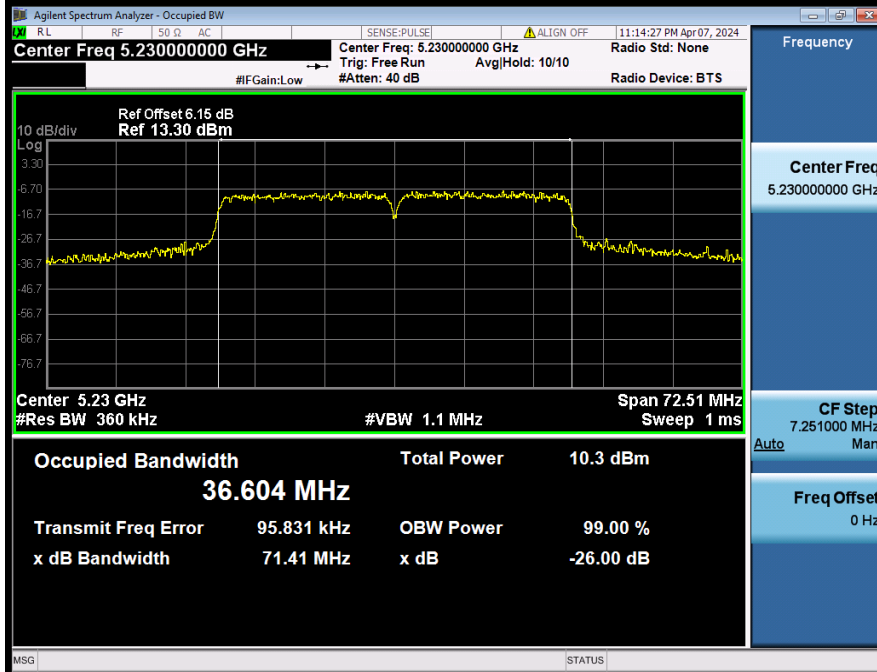


-26BW_HVNT_ANT1_802_11n(HT20)_5240

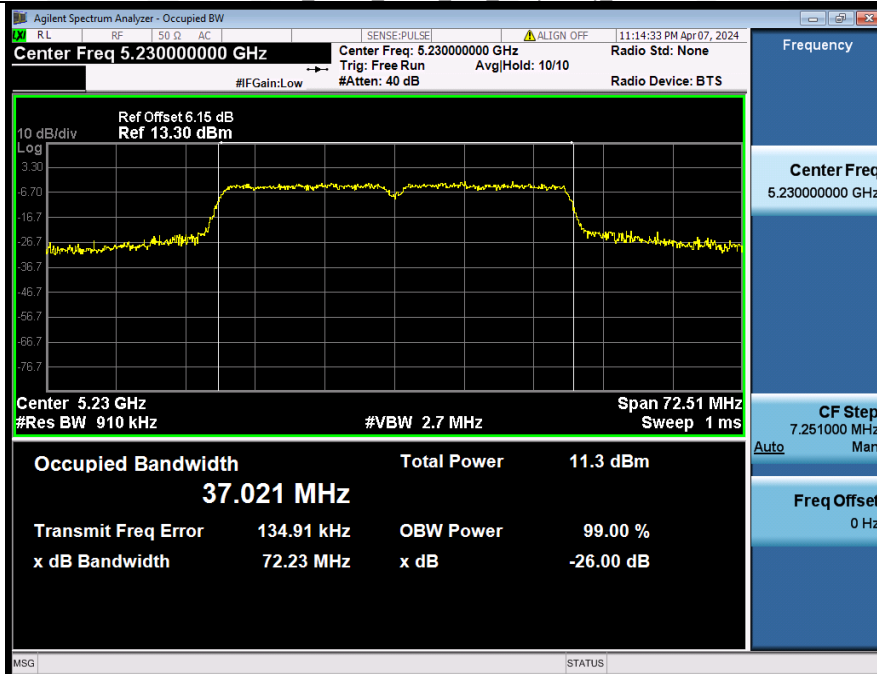




99%_OCB_HVNT_ANT1_802_11n(HT40)_5230

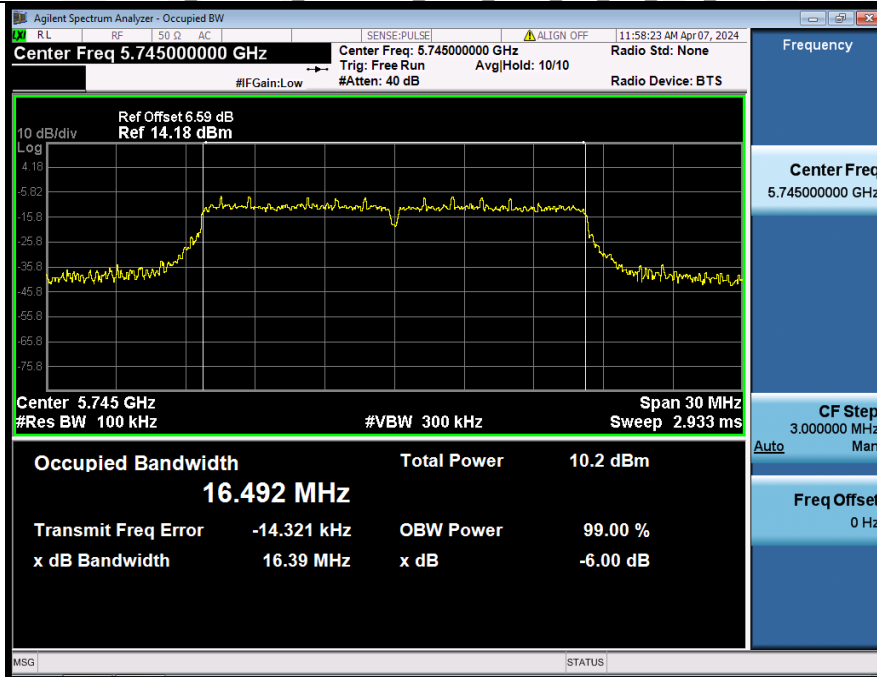


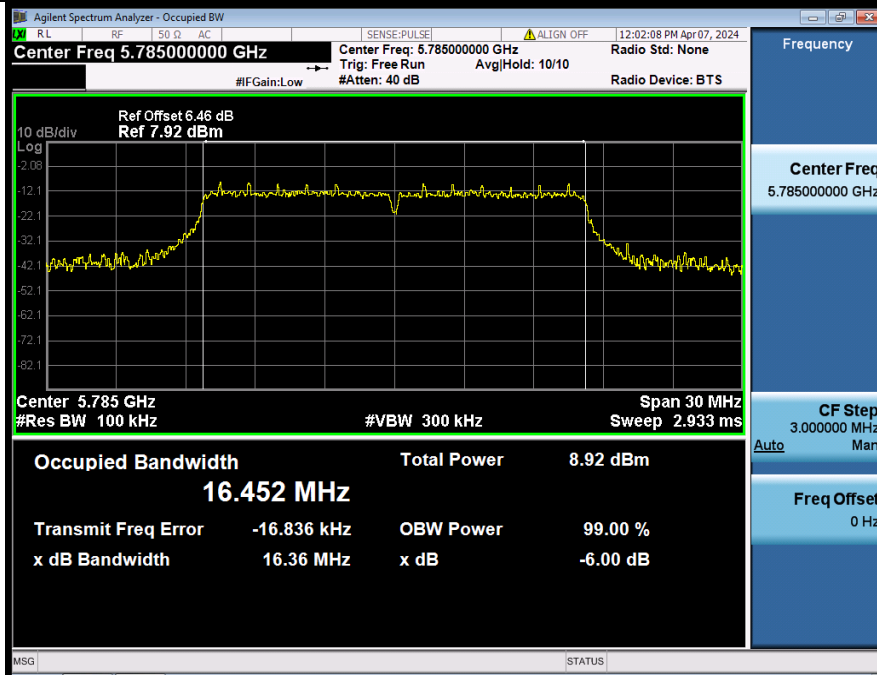
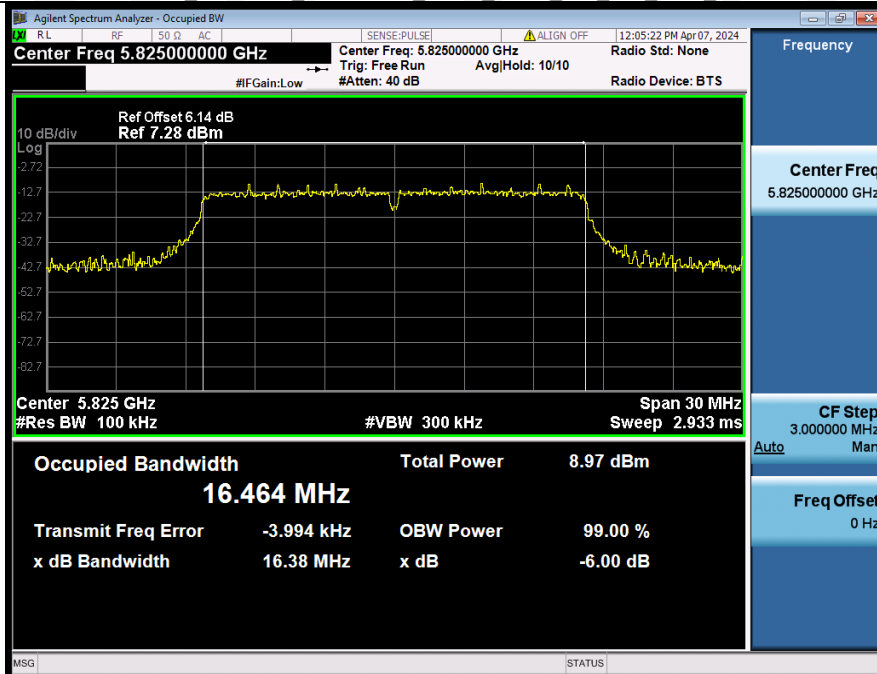
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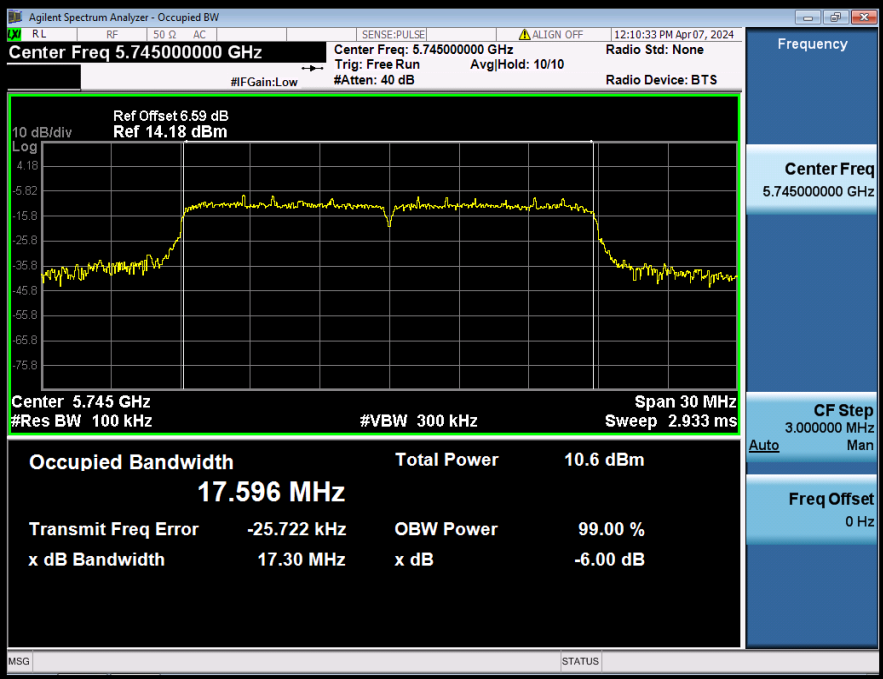
Band 4 (5725-5850 MHz):**-6dB Bandwidth**

Condition	Antenna	Mode	Frequency(MHz)	6dB_Emission_Bandwidth(MHz)	Limit(MHz)	Result
NVNT	ANT1	802.11a	5745.00	16.386	0.500	Pass
NVNT	ANT1	802.11a	5785.00	16.356	0.500	Pass
NVNT	ANT1	802.11a	5825.00	16.382	0.500	Pass
NVNT	ANT1	802.11n(HT20)	5745.00	17.300	0.500	Pass
NVNT	ANT1	802.11n(HT20)	5785.00	17.282	0.500	Pass
NVNT	ANT1	802.11n(HT20)	5825.00	17.259	0.500	Pass
NVNT	ANT1	802.11n(HT40)	5755.00	35.704	0.500	Pass
NVNT	ANT1	802.11n(HT40)	5795.00	35.803	0.500	Pass

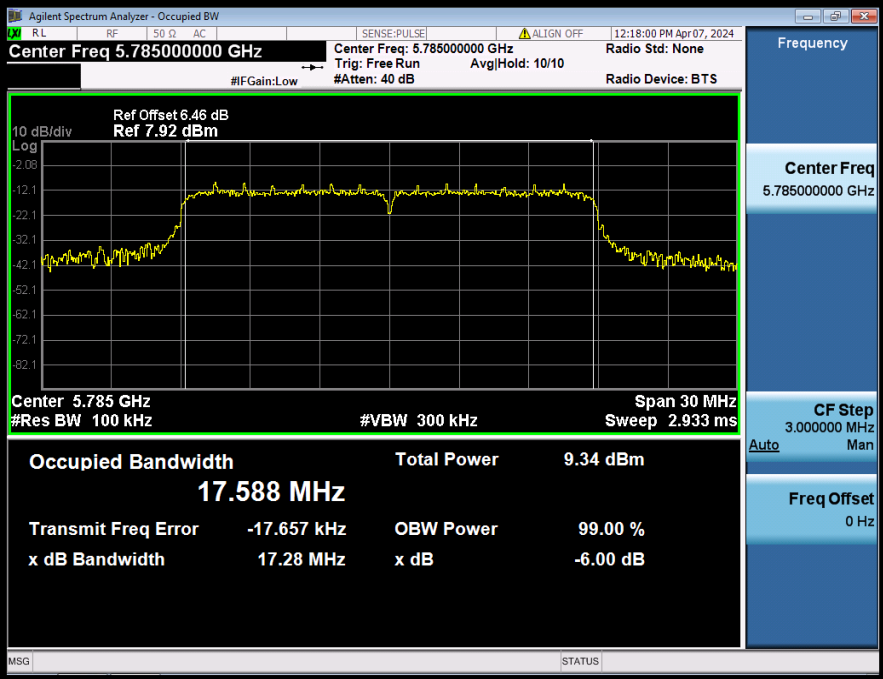
-6dB_Emission_Bandwidth_NVNT_ANT1_802_11a_5745_20M

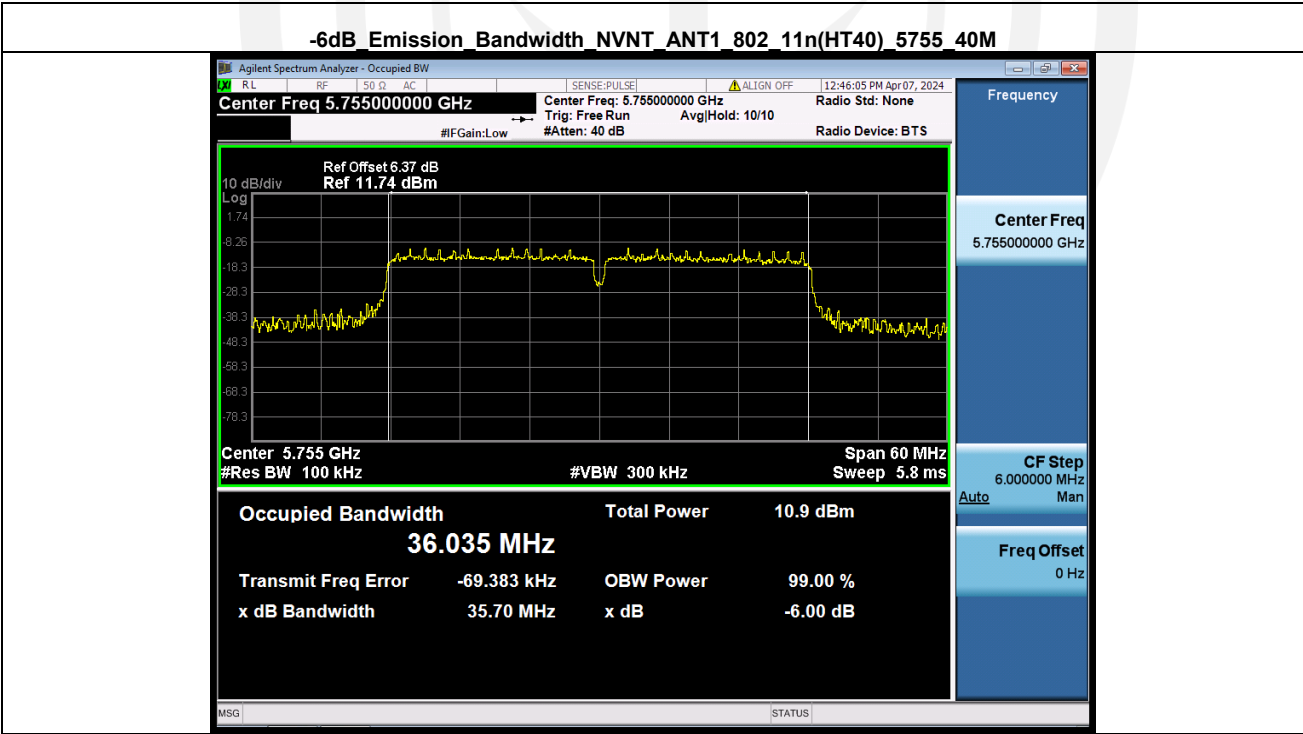
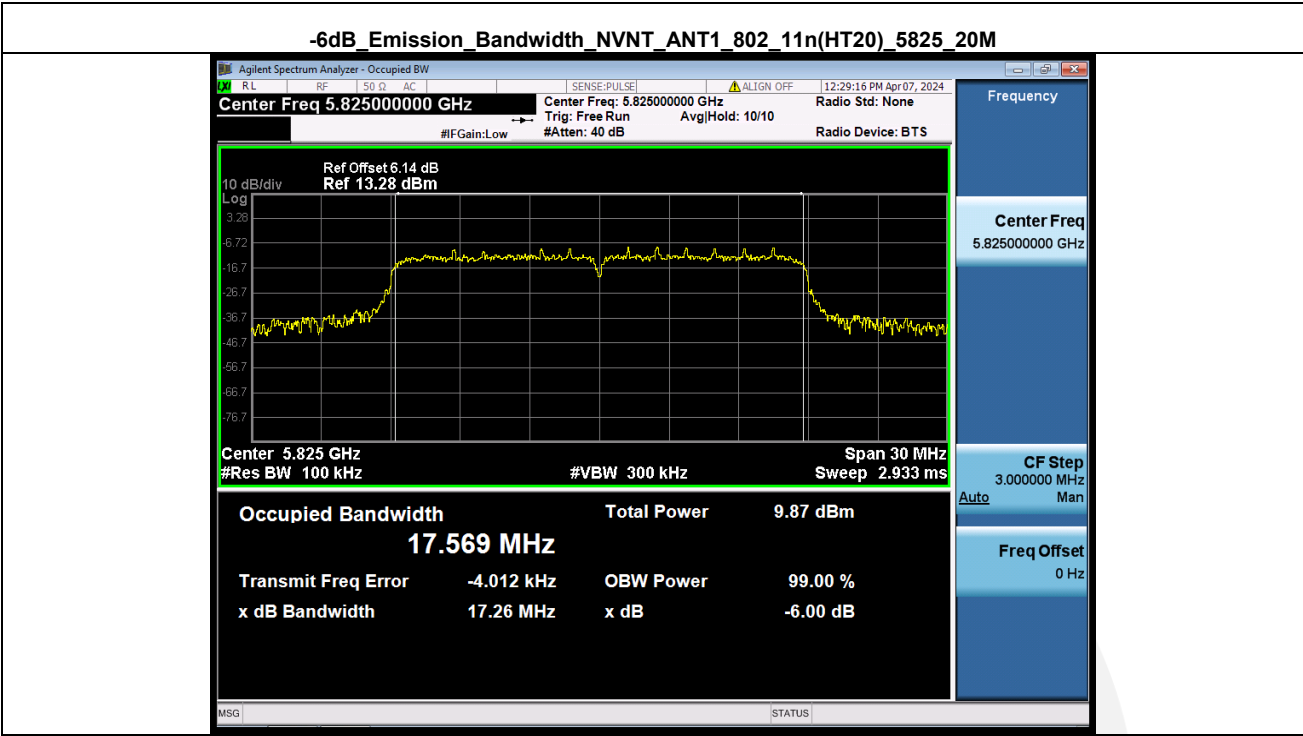
-6dB Emission Bandwidth_NVNT_ANT1_802_11a_5785_20M**-6dB Emission Bandwidth_NVNT_ANT1_802_11a_5825_20M**

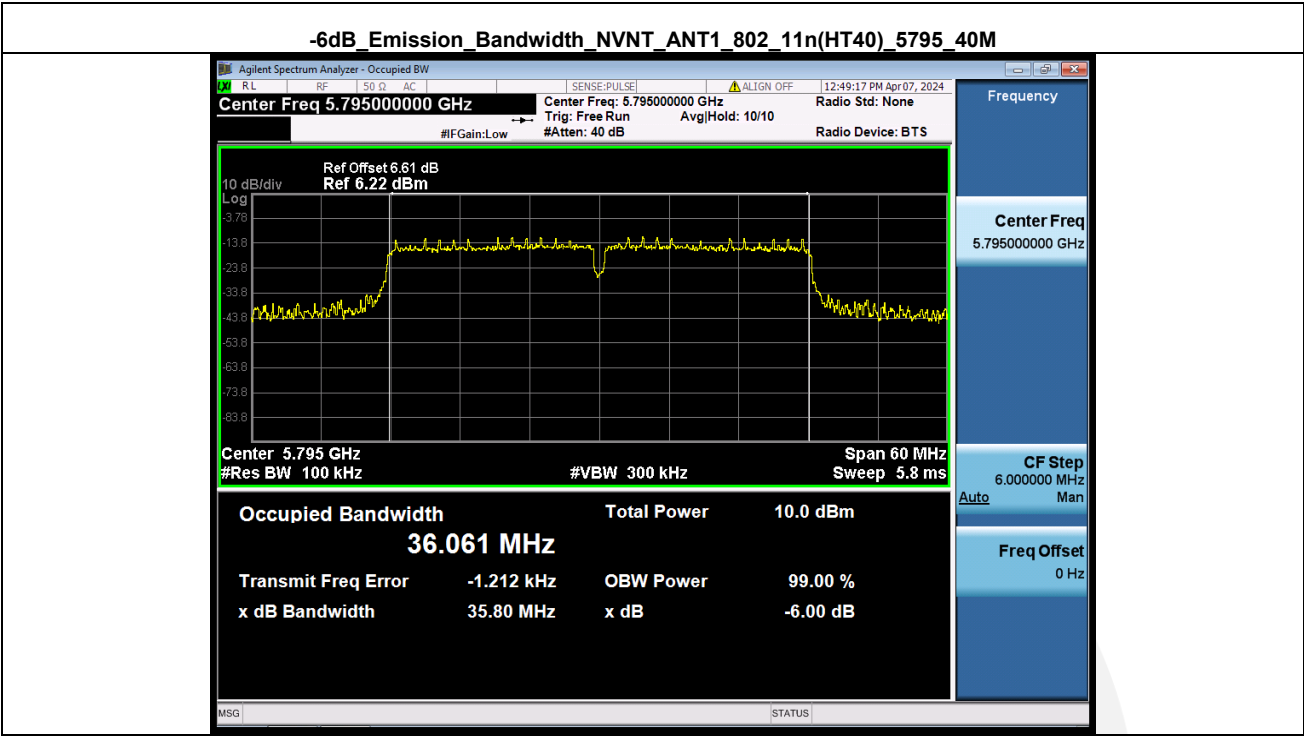
-6dB Emission Bandwidth NVNT_ANT1_802_11n(HT20)_5745_20M



-6dB Emission Bandwidth NVNT_ANT1_802_11n(HT20)_5785_20M



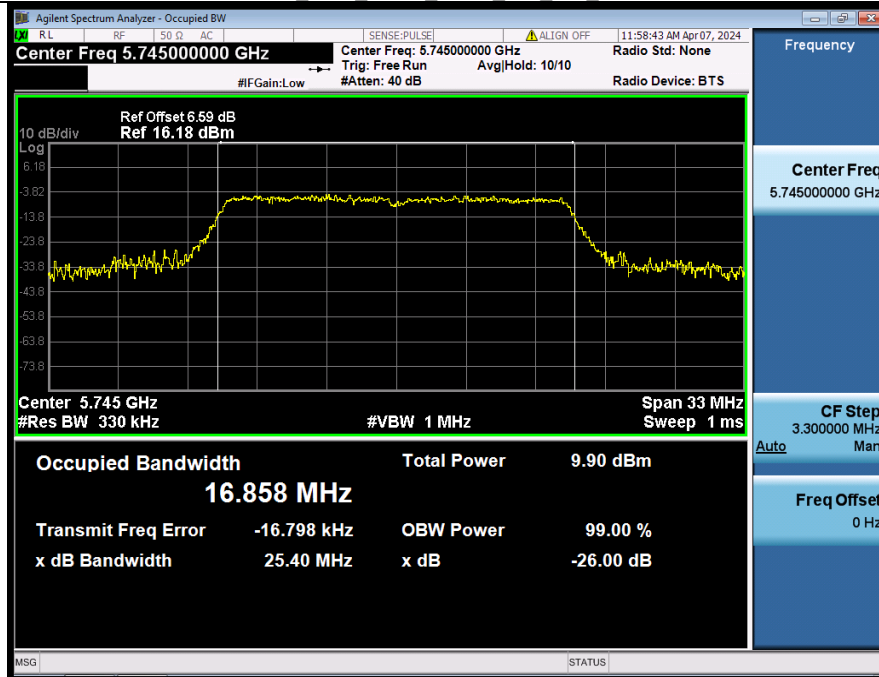




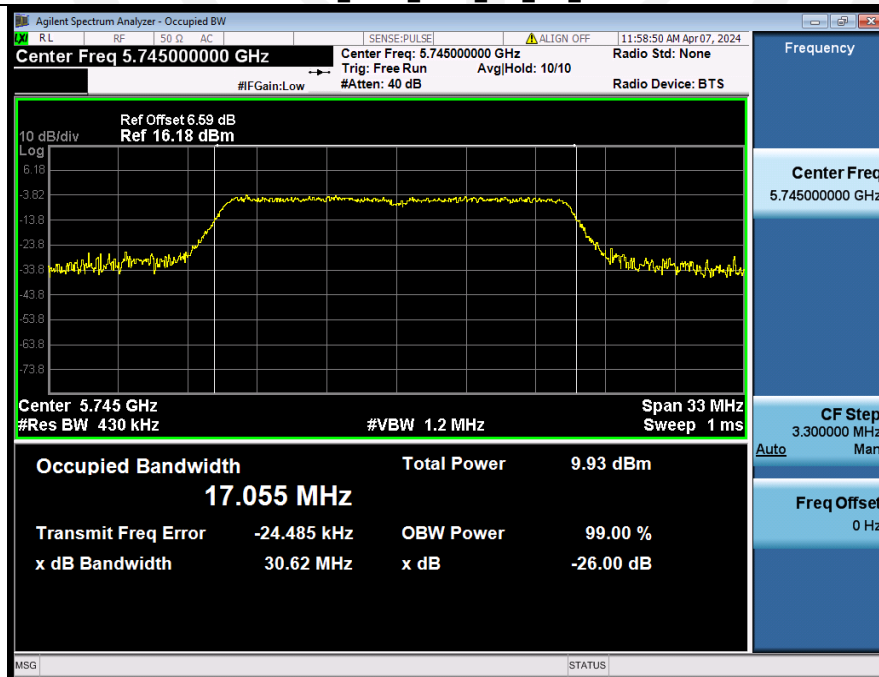
Occupied Channel Bandwidth

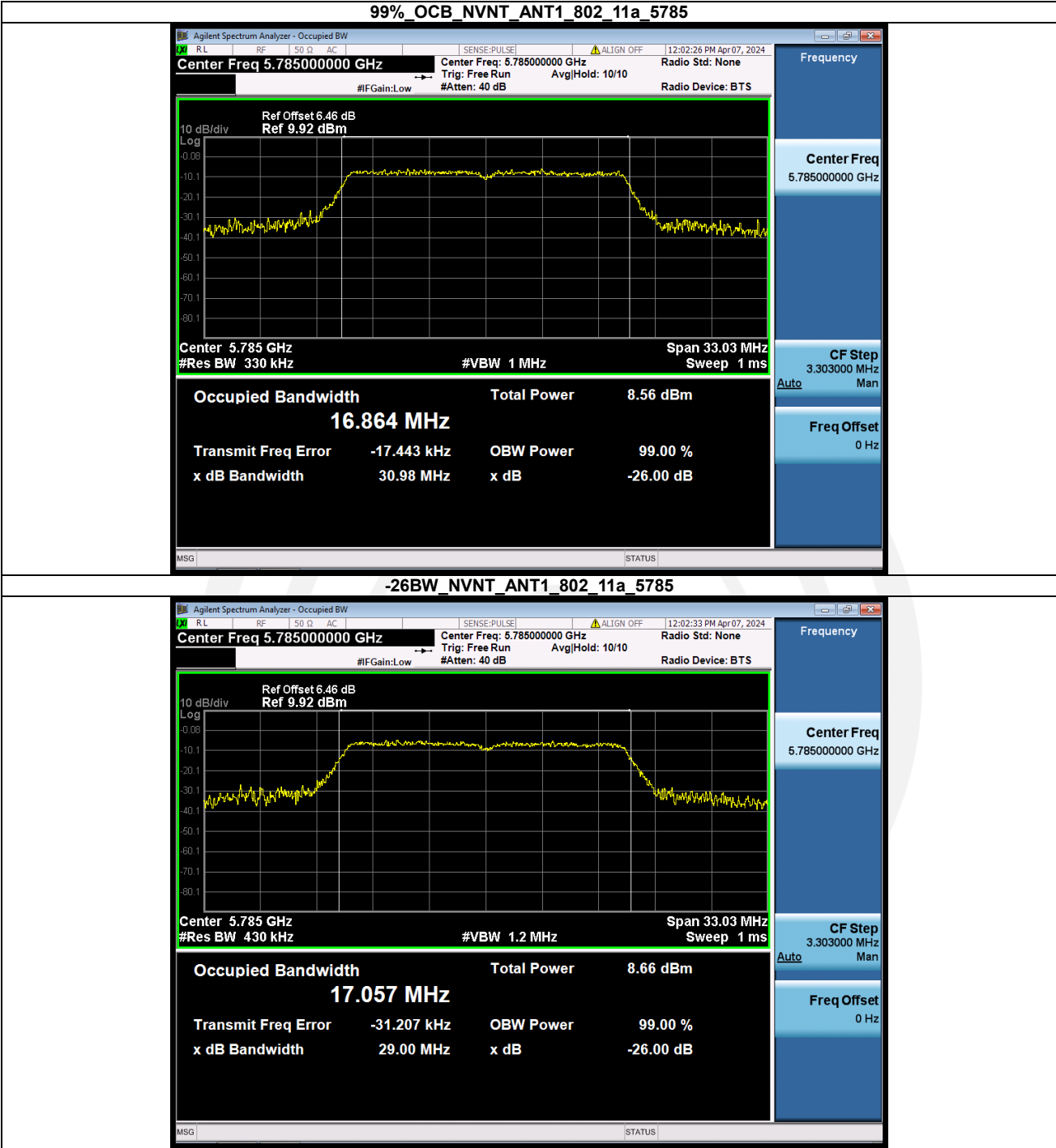
Condition	Antenna	Modulation	Frequency(MHz)	26dB_Emission_Bandwidth(MHz)	Occupied Bandwidth(MHz)
NVNT	ANT1	802.11a	5745.00	30.62	16.86
NVNT	ANT1	802.11a	5785.00	29.00	16.86
NVNT	ANT1	802.11a	5825.00	30.78	16.82
NVNT	ANT1	802.11n(HT20)	5745.00	30.74	17.95
NVNT	ANT1	802.11n(HT20)	5785.00	32.26	17.95
NVNT	ANT1	802.11n(HT20)	5825.00	31.91	17.91
NVNT	ANT1	802.11n(HT40)	5755.00	65.69	36.52
NVNT	ANT1	802.11n(HT40)	5795.00	67.06	36.50

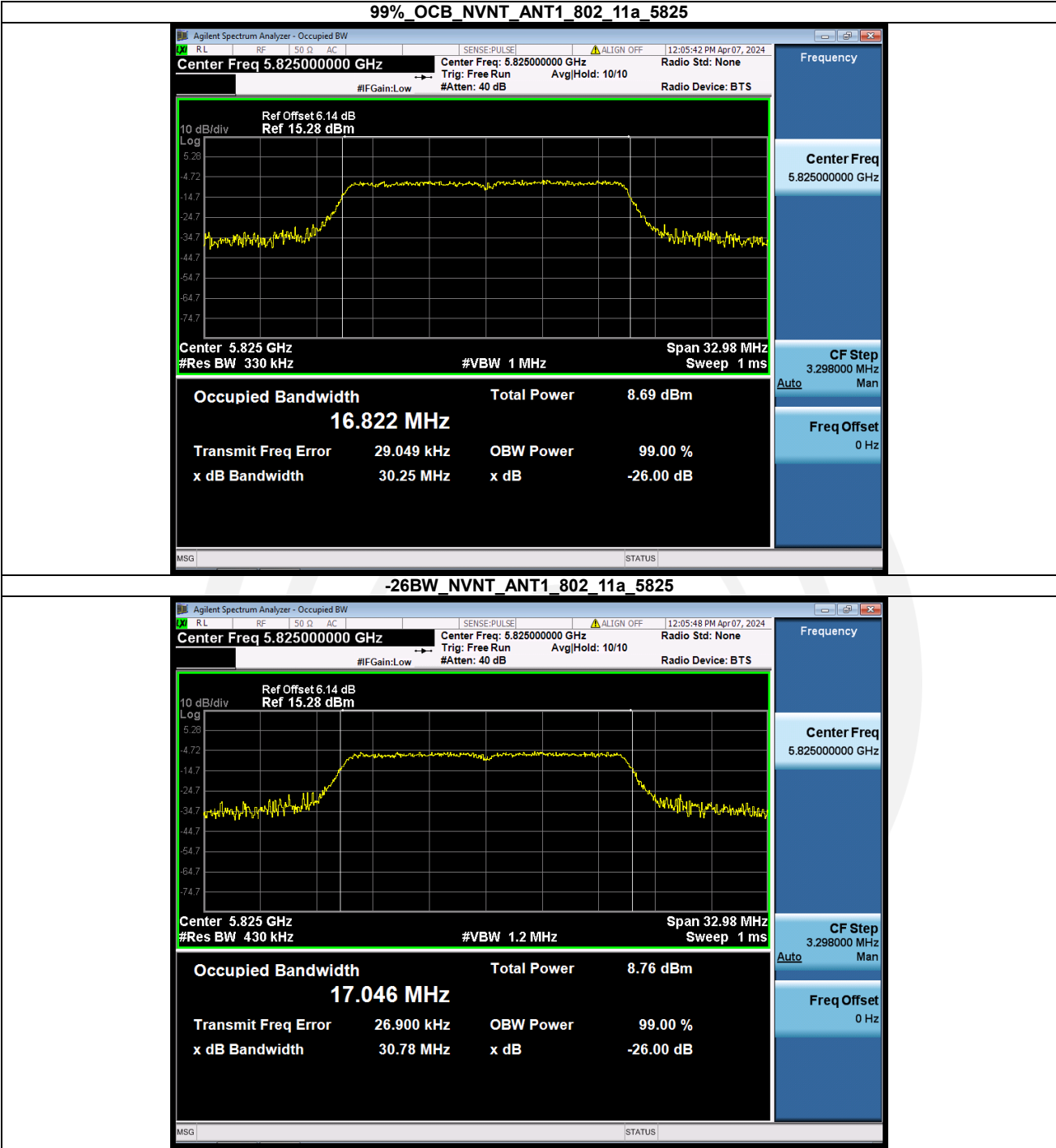
99%_OCB_NVNT_ANT1_802_11a_5745



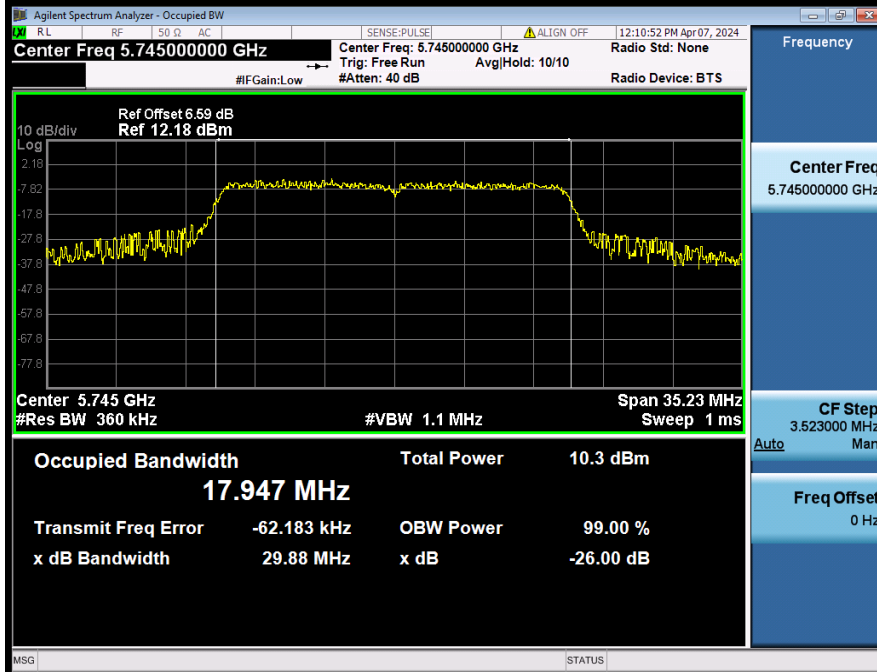
-26BW_NVNT_ANT1_802_11a_5745



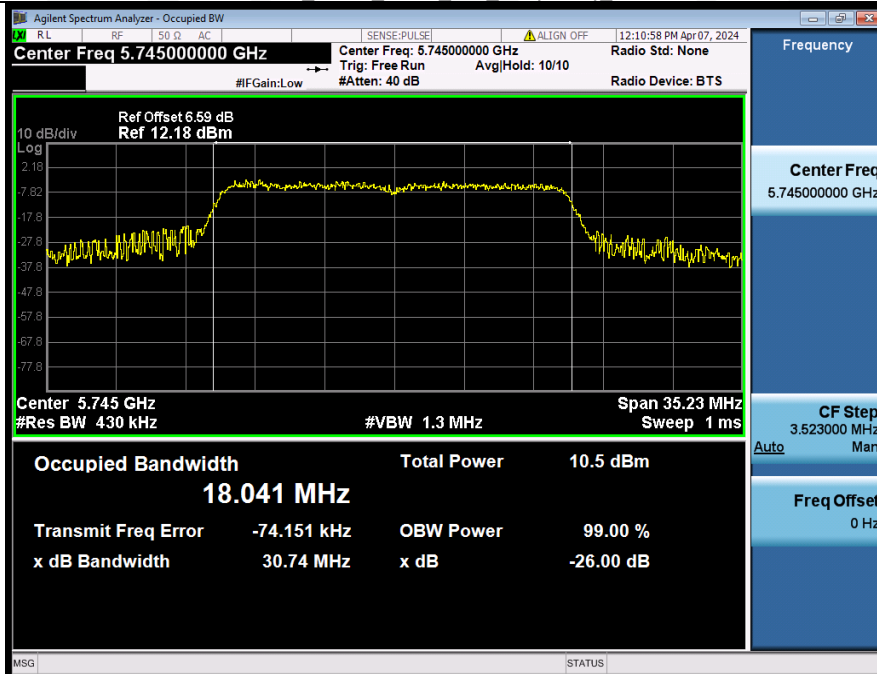




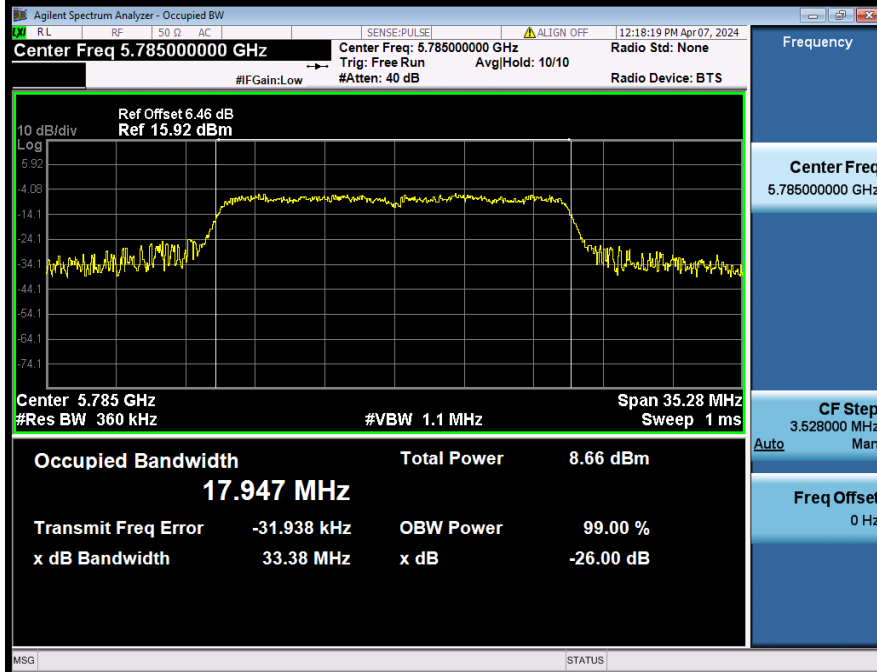
99%_OCB_NVNT_ANT1_802_11n(HT20)_5745



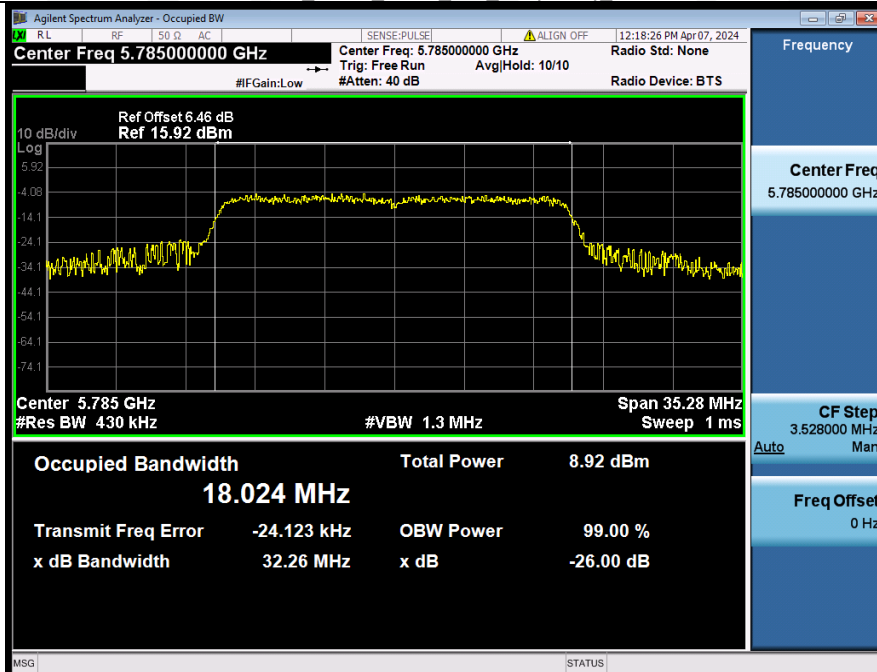
-26BW_NVNT_ANT1_802_11n(HT20)_5745



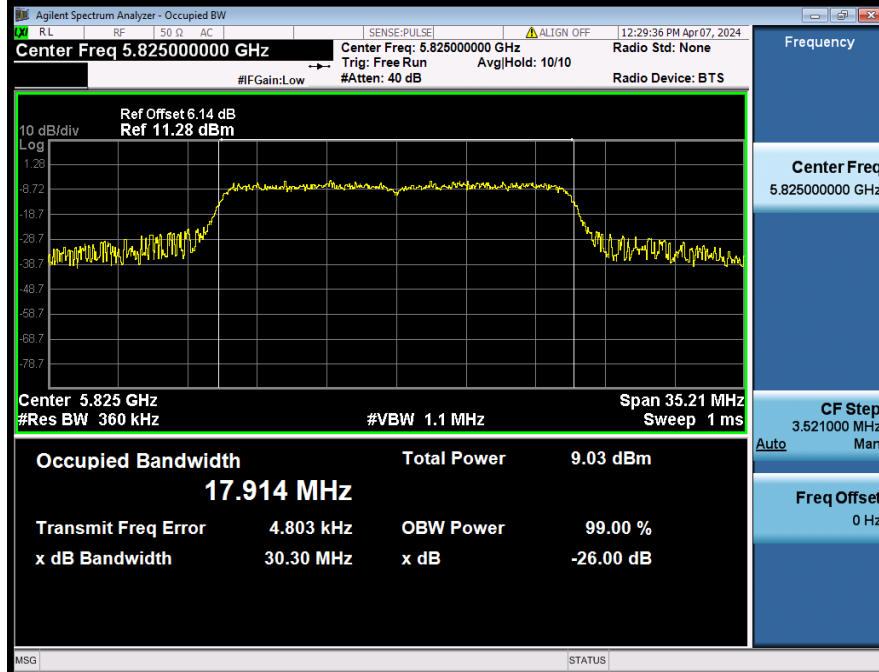
99%_OCB_NVNT_ANT1_802_11n(HT20)_5785



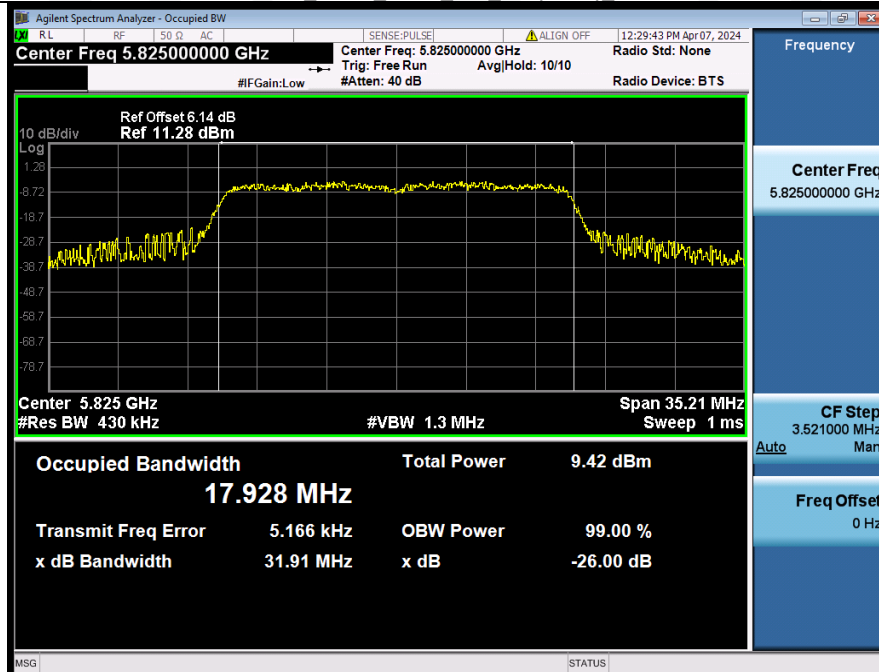
-26BW_NVNT_ANT1_802_11n(HT20)_5785



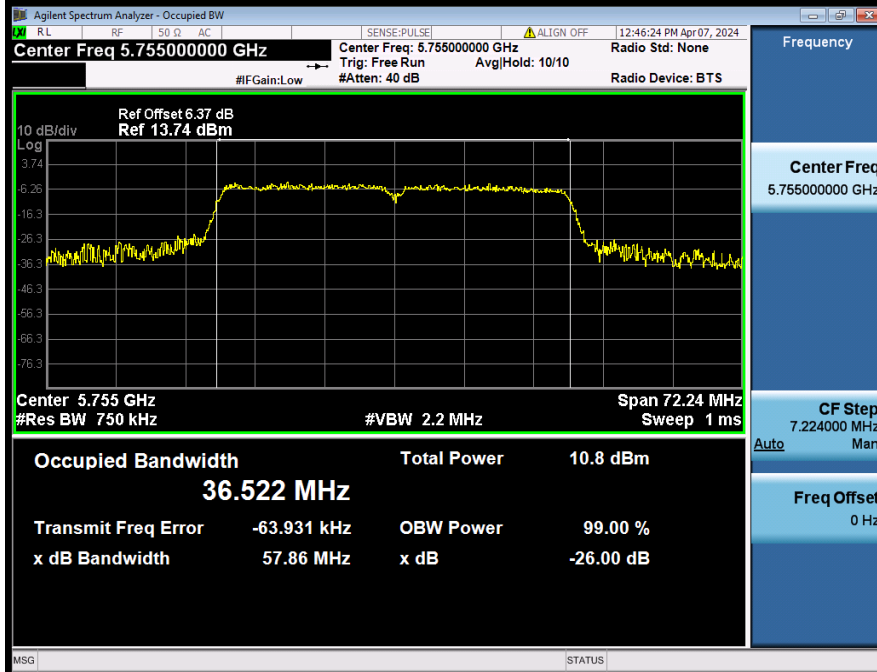
99%_OCB_NVNT_ANT1_802_11n(HT20)_5825



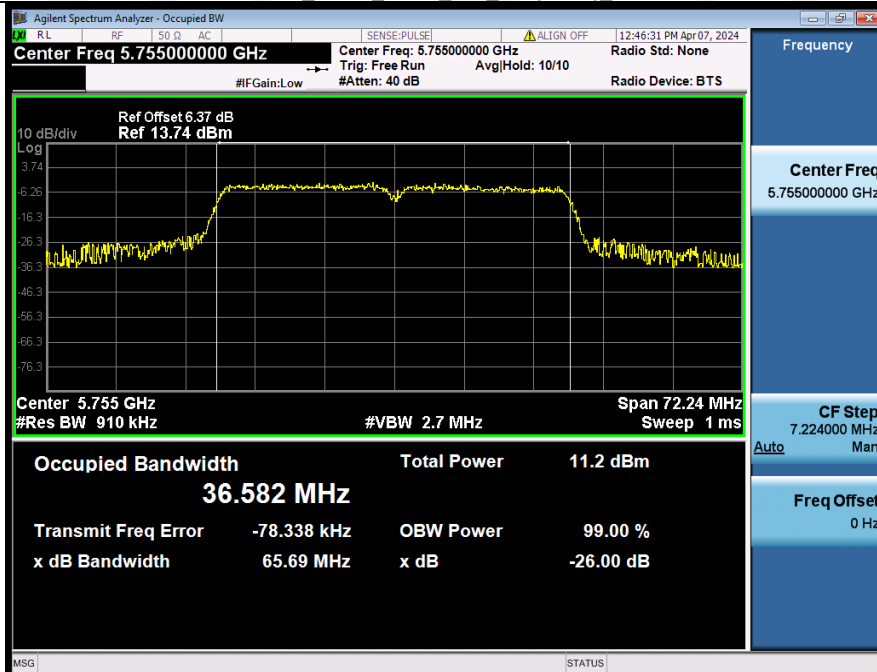
-26BW_NVNT_ANT1_802_11n(HT20)_5825



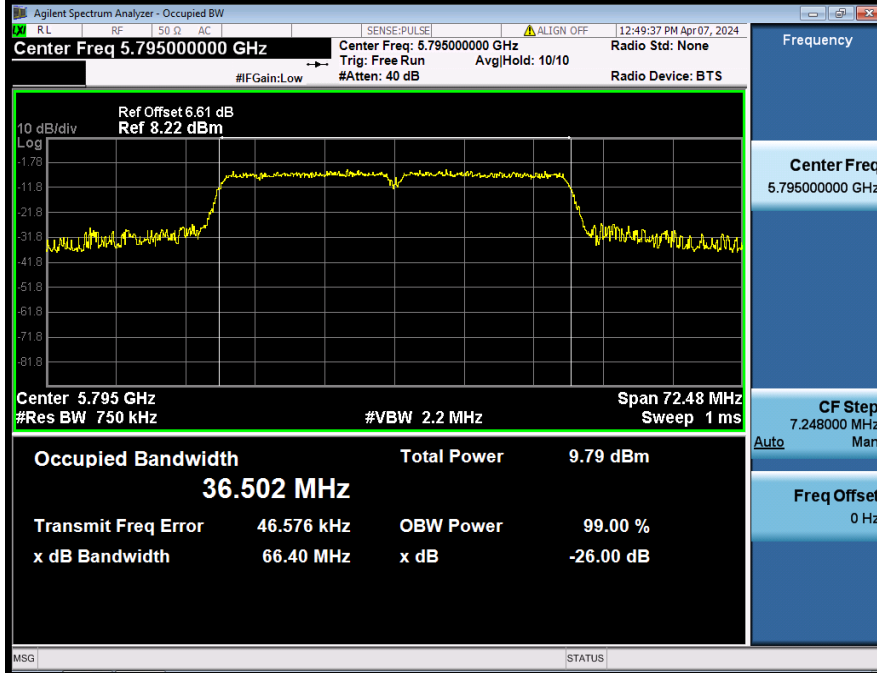
99%_OCB_NVNT_ANT1_802_11n(HT40)_5755



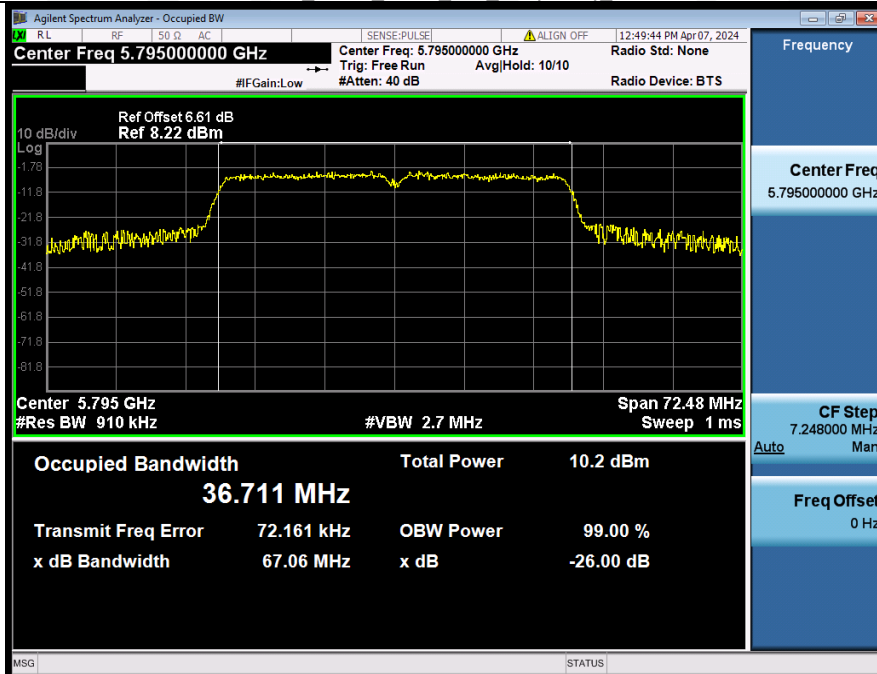
-26BW_NVNT_ANT1_802_11n(HT40)_5755



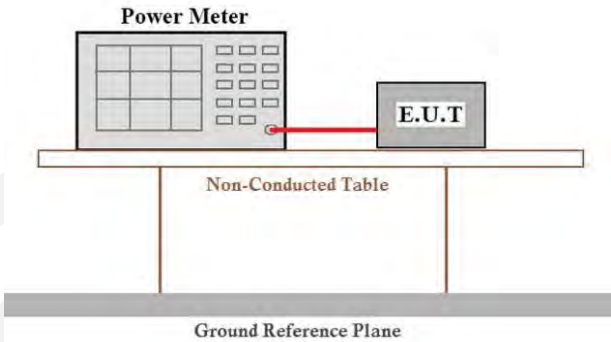
99%_OCB_NVNT_ANT1_802_11n(HT40)_5795



-26BW_NVNT_ANT1_802_11n(HT40)_5795



4.4 Peak Transmit Power

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	For the band 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW. For the band 5.725-5.85GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 1W.
Test setup:	 The diagram illustrates the test setup. A 'Power Meter' is connected to an 'E.U.T.' (Equipment Under Test) via a red cable. Both components are placed on a 'Non-Conducted Table'. This table is supported by a 'Ground Reference Plane'.
Test procedure:	Measurement using an RF average power meter (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle. b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level. c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five. (ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B). (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding $10 \log(1/x)$ where x is the duty cycle (e.g., $10 \log(1/0.25)$ if the duty cycle is 25 percent).
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data**Band 1 (5150-5250 MHz)**

Condition	Antenna	Modulation	Frequency (MHz)	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
HVNT	ANT1	802.11a	5180.00	12.51	0.41	12.92	24	Pass
HVNT	ANT1	802.11a	5200.00	12.10	0.48	12.58	24	Pass
HVNT	ANT1	802.11a	5240.00	11.59	0.48	12.07	24	Pass
HVNT	ANT1	802.11n(HT20)	5180.00	11.30	0.55	11.85	24	Pass
HVNT	ANT1	802.11n(HT20)	5200.00	11.30	0.56	11.86	24	Pass
HVNT	ANT1	802.11n(HT20)	5240.00	11.32	0.49	11.81	24	Pass
HVNT	ANT1	802.11n(HT40)	5190.00	10.08	0.91	10.99	24	Pass
HVNT	ANT1	802.11n(HT40)	5230.00	10.85	1.06	11.91	24	Pass

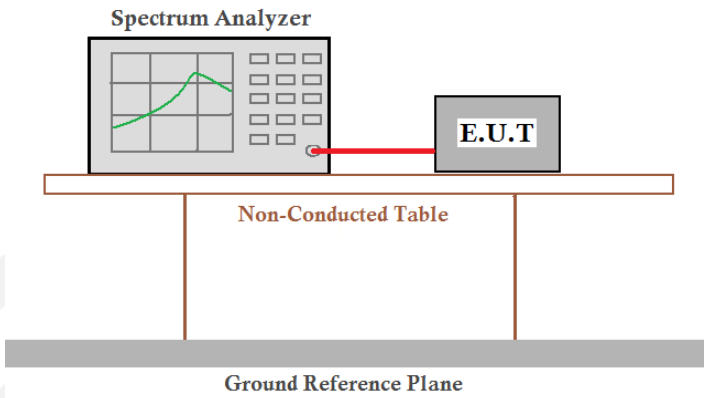
Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty_factor
HVNT	ANT1	802.11a	5180.00	90.91	0.41
HVNT	ANT1	802.11a	5200.00	89.61	0.48
HVNT	ANT1	802.11a	5240.00	89.61	0.48
HVNT	ANT1	802.11n(HT20)	5180.00	88.06	0.55
HVNT	ANT1	802.11n(HT20)	5200.00	87.88	0.56
HVNT	ANT1	802.11n(HT20)	5240.00	89.39	0.49
HVNT	ANT1	802.11n(HT40)	5190.00	81.08	0.91
HVNT	ANT1	802.11n(HT40)	5230.00	78.38	1.06

Band 4 (5725 – 5850 MHz)

Condition	Antenna	Modulation	Frequency (MHz)	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11a	5745.00	11.17	0.48	11.65	30	Pass
NVNT	ANT1	802.11a	5785.00	9.67	0.42	10.09	30	Pass
NVNT	ANT1	802.11a	5825.00	9.76	0.47	10.23	30	Pass
NVNT	ANT1	802.11n(HT20)	5745.00	11.36	0.49	11.85	30	Pass
NVNT	ANT1	802.11n(HT20)	5785.00	9.64	0.49	10.13	30	Pass
NVNT	ANT1	802.11n(HT20)	5825.00	9.80	0.49	10.29	30	Pass
NVNT	ANT1	802.11n(HT40)	5755.00	10.19	0.94	11.13	30	Pass
NVNT	ANT1	802.11n(HT40)	5795.00	8.80	0.94	9.74	30	Pass

Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty_factor
NVNT	ANT1	802.11a	5745.00	89.61	0.48
NVNT	ANT1	802.11a	5785.00	90.79	0.42
NVNT	ANT1	802.11a	5825.00	89.74	0.47
NVNT	ANT1	802.11n(HT20)	5745.00	89.39	0.49
NVNT	ANT1	802.11n(HT20)	5785.00	89.39	0.49
NVNT	ANT1	802.11n(HT20)	5825.00	89.39	0.49
NVNT	ANT1	802.11n(HT40)	5755.00	80.56	0.94
NVNT	ANT1	802.11n(HT40)	5795.00	80.56	0.94

4.5 Power Spectral Density

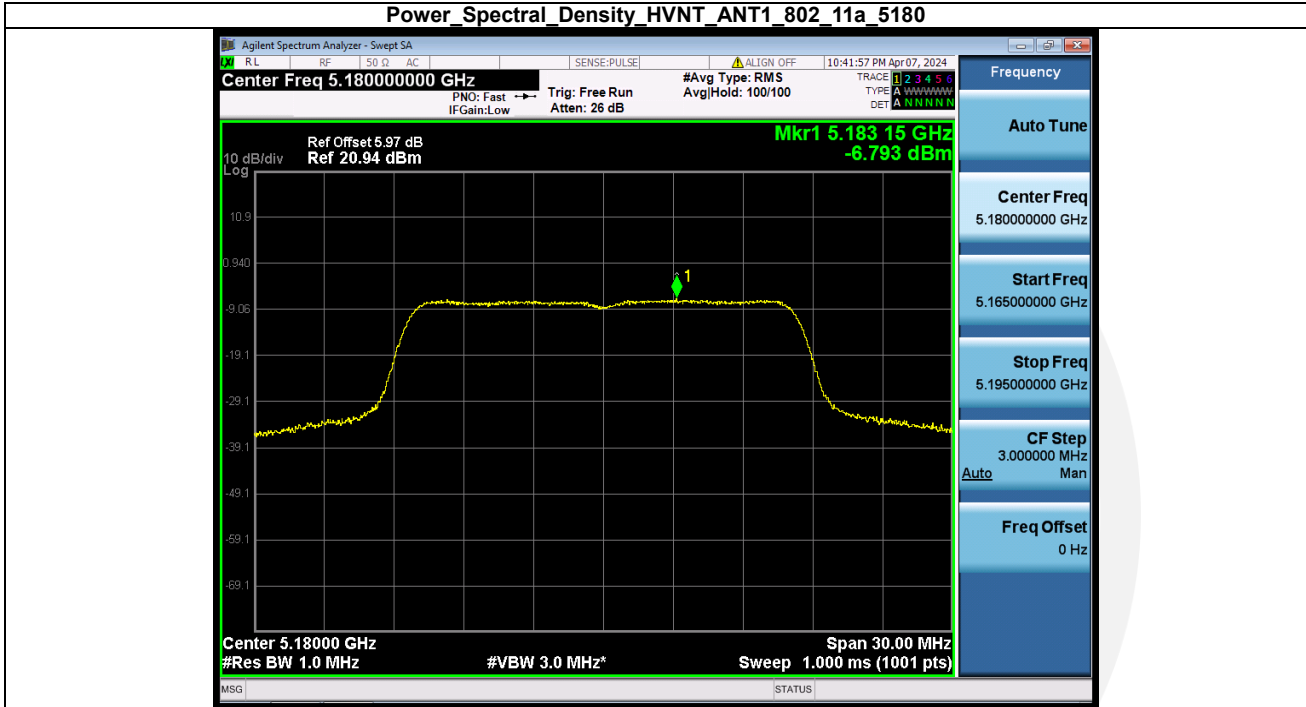
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	$\leq 11.00\text{dBm/MHz}$ for 5150MHz-5250MHz, 5250-5350MHz and 5470-5725 MHz $\leq 30.00\text{dBm/500KHz}$ for 5725MHz-5850MHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test procedure:	1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power..." 2) Use the peak search function on the instrument to find the peak of the spectrum. 3) Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum. b) If Method SA-3 Alternative was used and the linear mode was used in step E2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging. 4) The result is the PSD.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

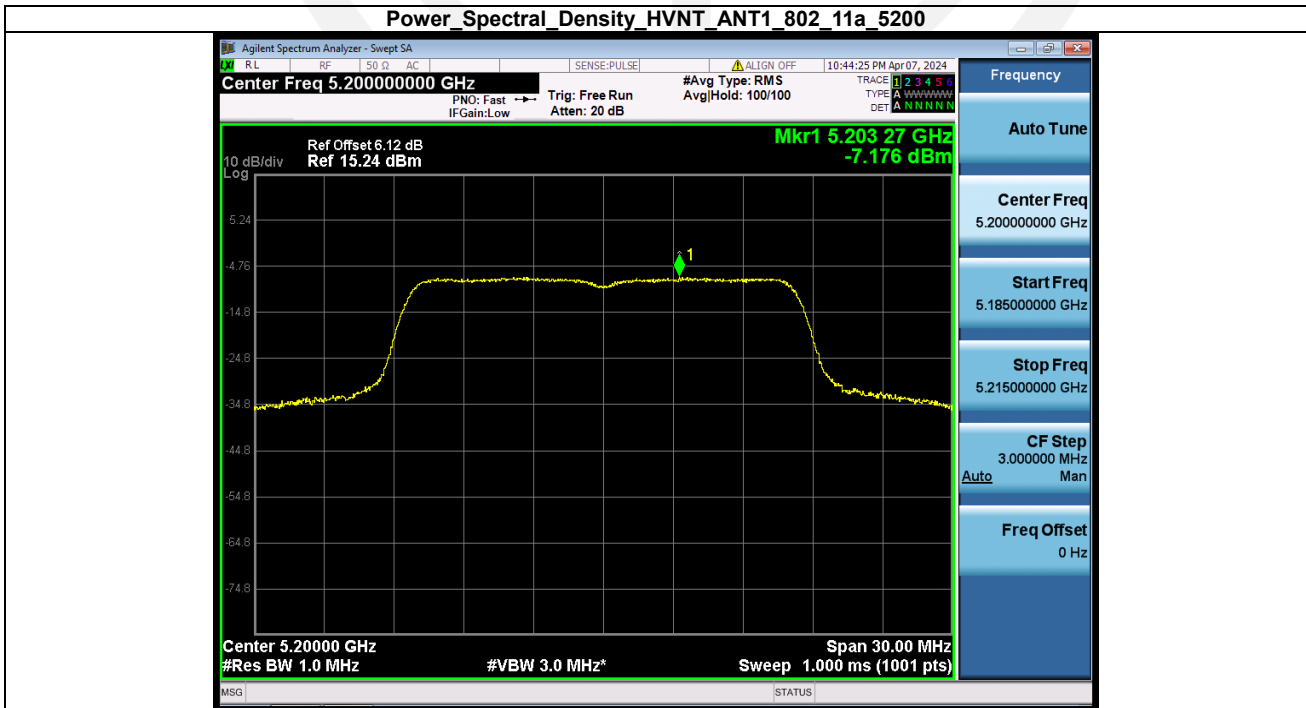
Band 1 (5150-5250 MHz)

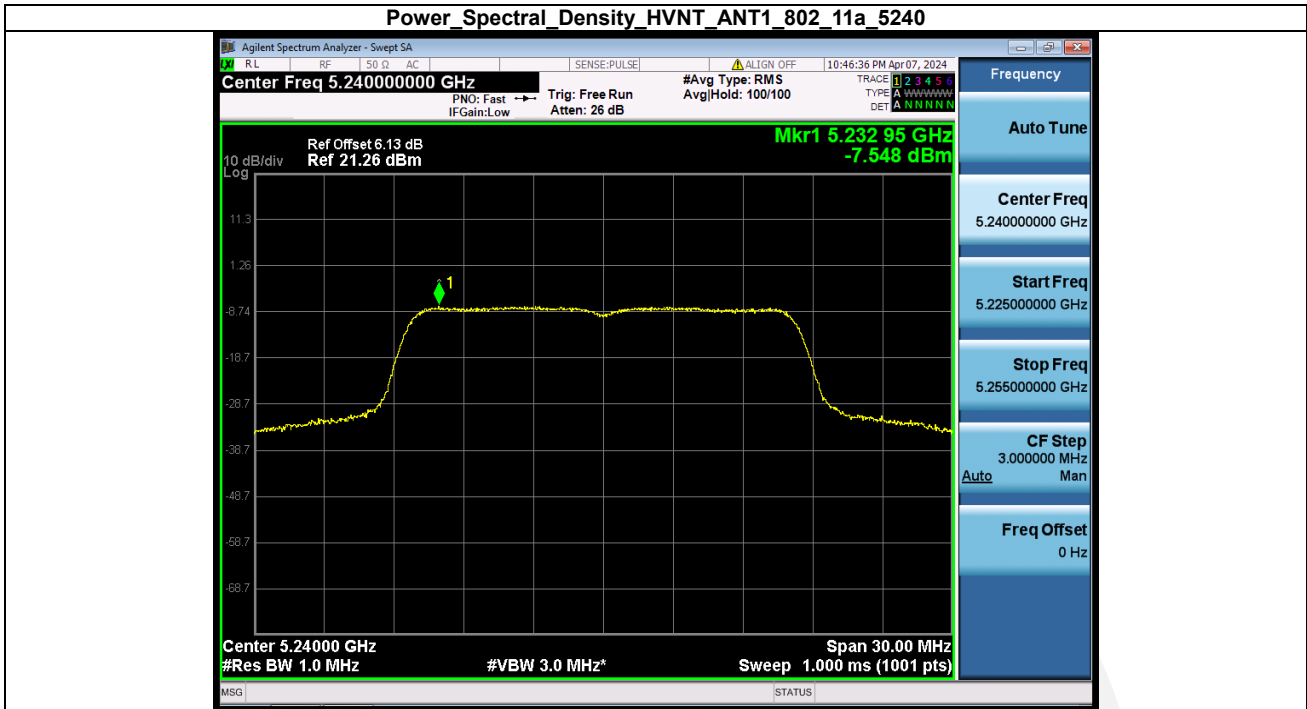
Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/MHz)	Duty factor(dB)	Total PSD(dBm/MHz)	limit(dBm)	Result
HVNT	ANT1	802.11a	5180.00	-6.79	0.41	-6.38	11	Pass
HVNT	ANT1	802.11a	5200.00	-7.18	0.48	-6.70	11	Pass
HVNT	ANT1	802.11a	5240.00	-7.55	0.48	-7.07	11	Pass
HVNT	ANT1	802.11n(HT20)	5180.00	-8.13	0.55	-7.58	11	Pass
HVNT	ANT1	802.11n(HT20)	5200.00	-8.09	0.56	-7.53	11	Pass
HVNT	ANT1	802.11n(HT20)	5240.00	-7.95	0.49	-7.46	11	Pass
HVNT	ANT1	802.11n(HT40)	5190.00	-12.09	0.91	-11.18	11	Pass
HVNT	ANT1	802.11n(HT40)	5230.00	-11.35	1.06	-10.29	11	Pass

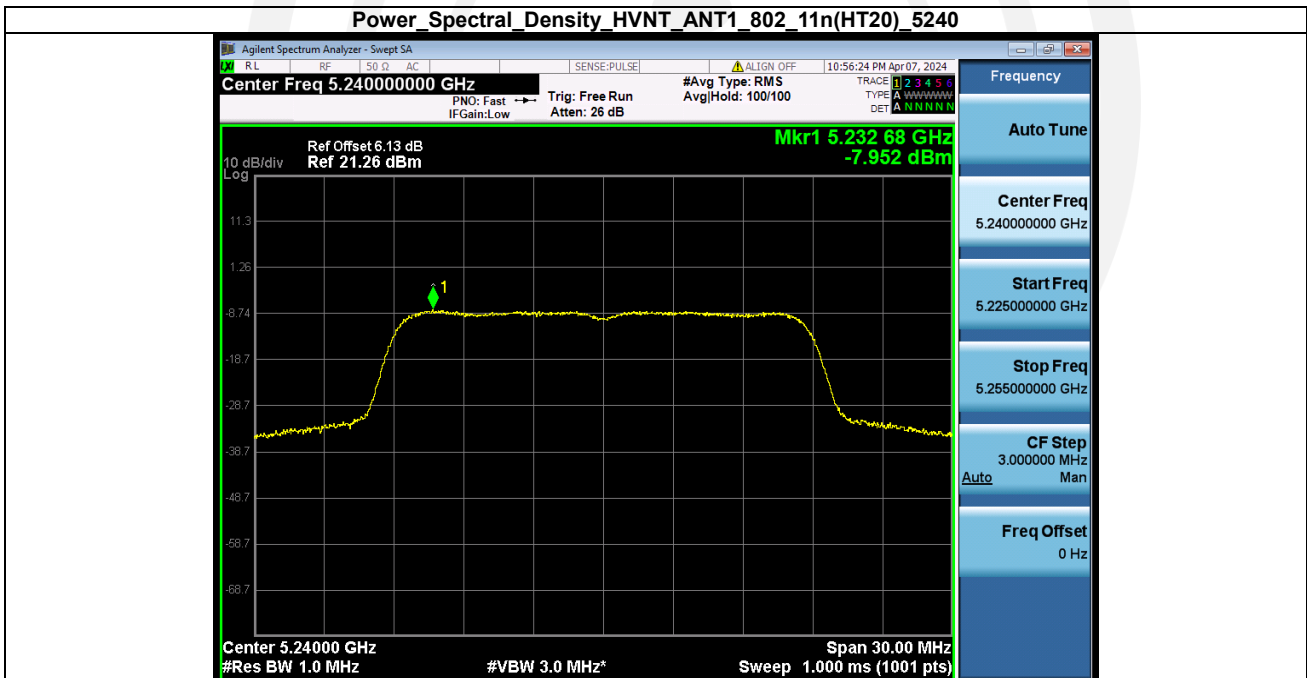
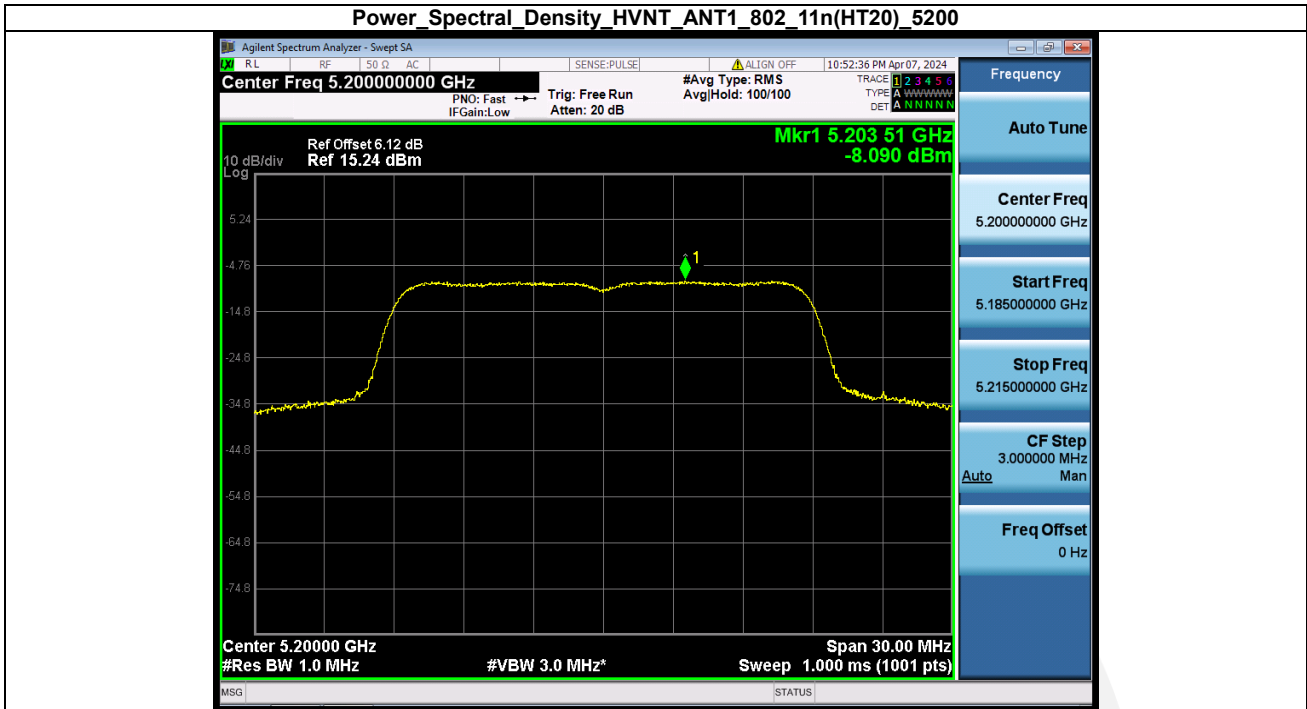
Power Spectral Density_HVNT_ANT1_802_11a_5180



Power Spectral Density_HVNT_ANT1_802_11a_5200



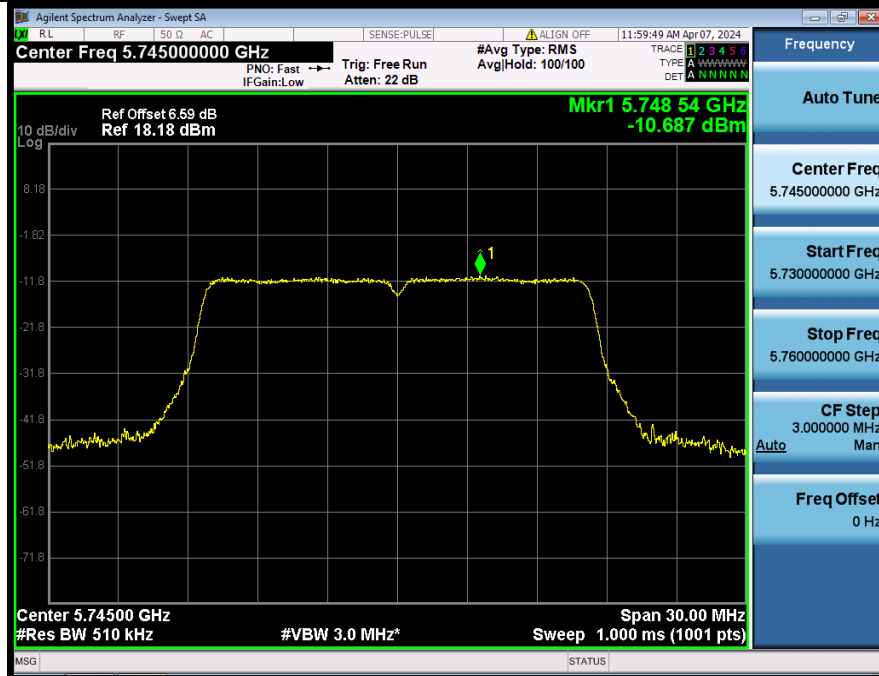
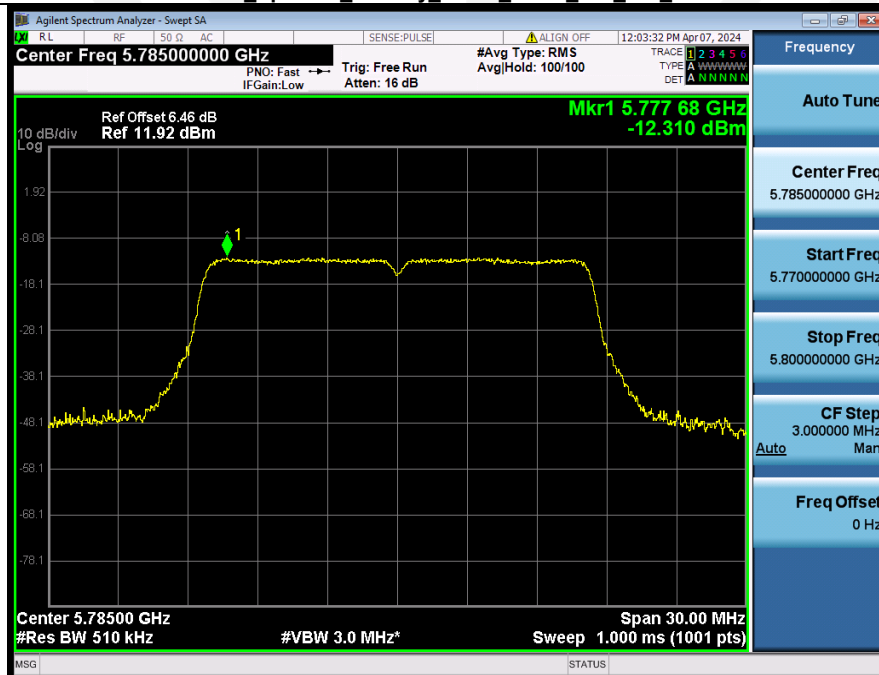


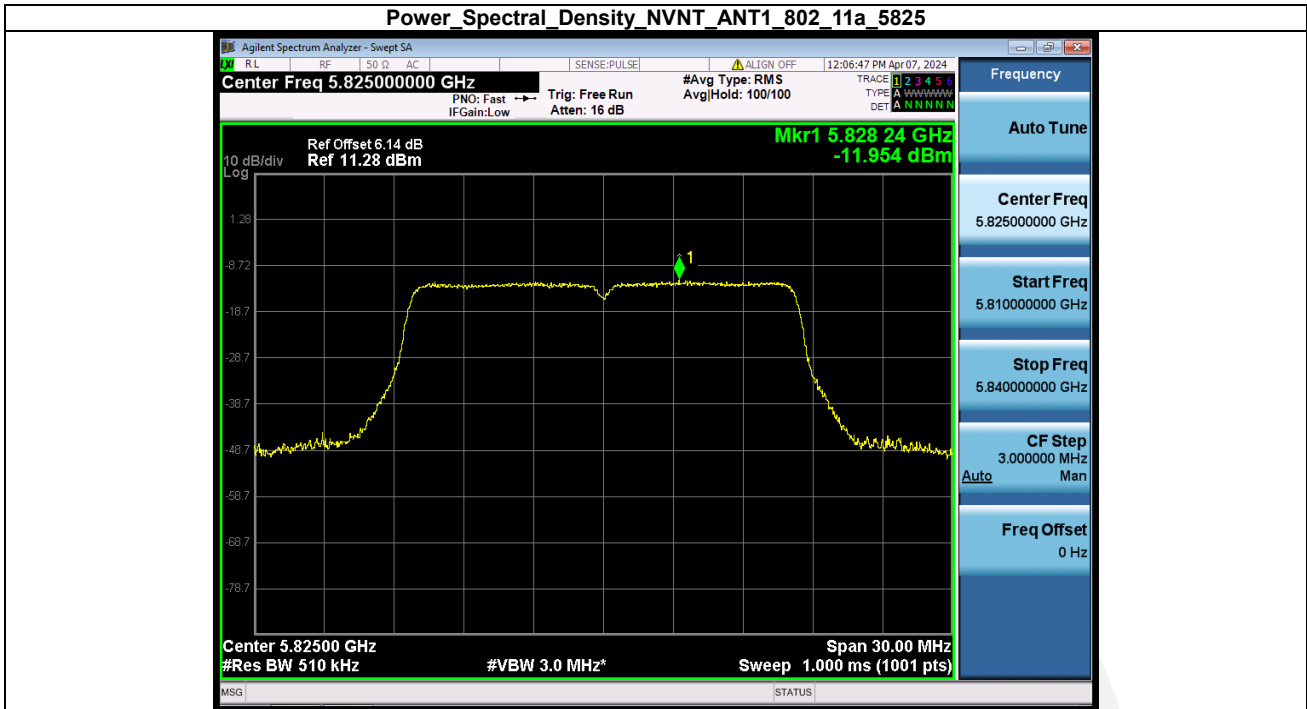




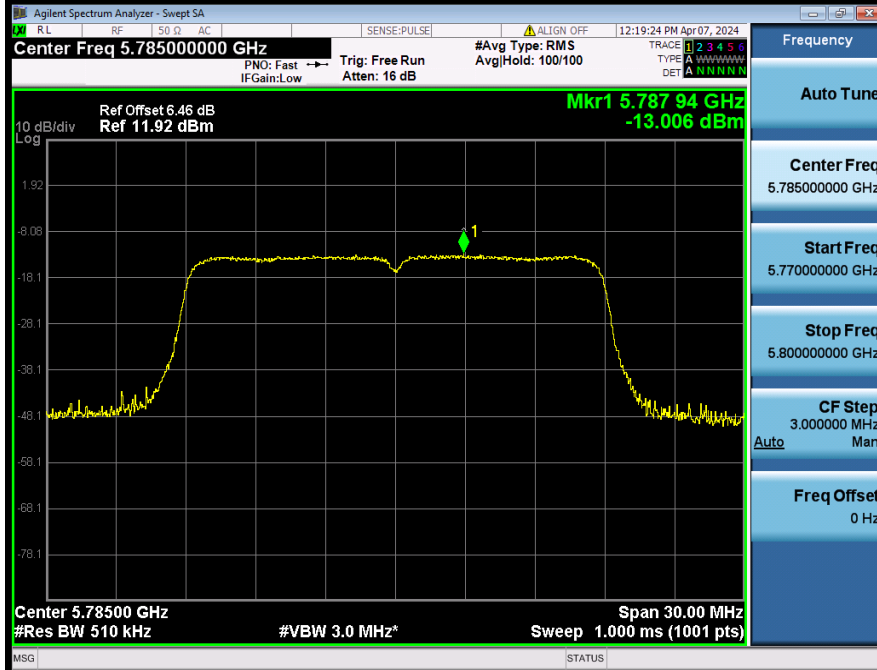
Band 4 (5725 – 5850 MHz)

Modulation	Frequency (MHz)	PSD_SA(dBm/RBW)	Duty factor(dB)	RB factor(dB)	PSD(dBm/500kHz)	limit(dBm/500kHz)	Result
802.11a	5745.00	-10.69	0.48	-0	-10.29	30	Pass
802.11a	5785.00	-12.31	0.42	-0	-11.98	30	Pass
802.11a	5825.00	-11.95	0.47	-0	-11.57	30	Pass
802.11n(HT20)	5745.00	-10.77	0.49	-0	-10.36	30	Pass
802.11n(HT20)	5785.00	-13.01	0.49	-0	-12.60	30	Pass
802.11n(HT20)	5825.00	-12.16	0.49	-0	-11.76	30	Pass
802.11n(HT40)	5755.00	-14.37	0.94	-0	-13.51	30	Pass
802.11n(HT40)	5795.00	-15.02	0.94	-0	-14.17	30	Pass

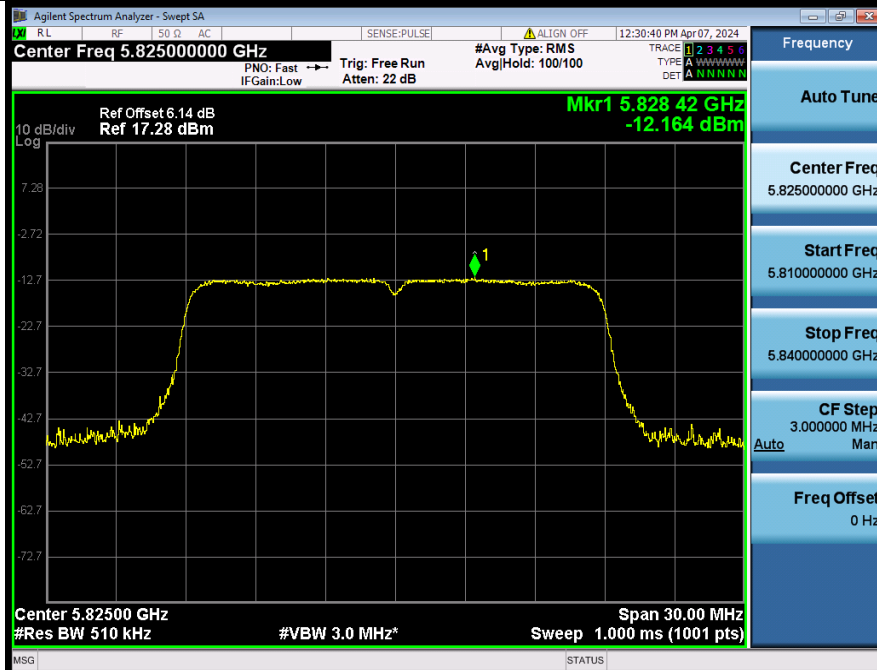
Power_Spectral_Density_NVNT_ANT1_802_11a_5745**Power_Spectral_Density_NVNT_ANT1_802_11a_5785**



Power Spectral Density NVNT_ANT1_802_11n(HT20)_5785



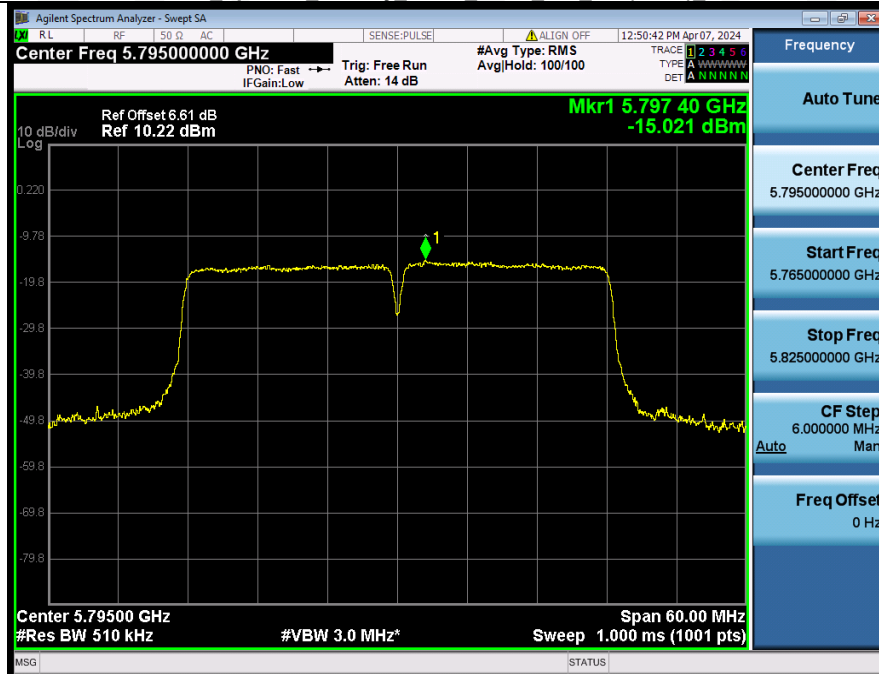
Power Spectral Density NVNT_ANT1_802_11n(HT20)_5825



Power Spectral Density_NVNT_ANT1_802_11n(HT40)_5755

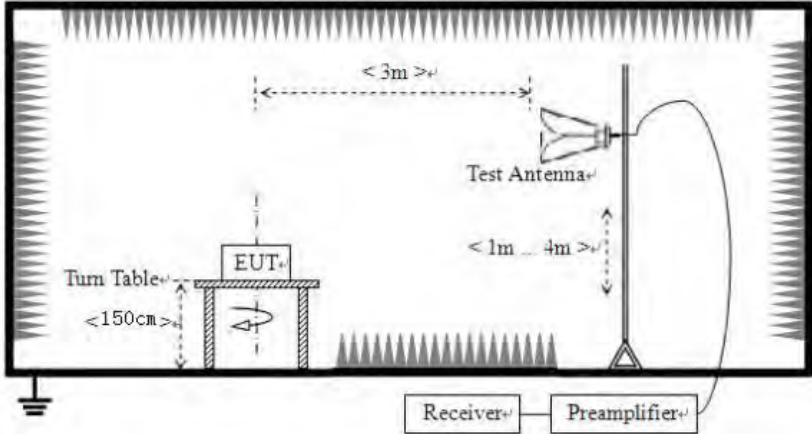


Power Spectral Density_NVNT_ANT1_802_11n(HT40)_5795



4.6 Band Edge

Test Requirement:	FCC Part15 E Section 15.407 and 15.205																								
Test Method:	ANSI C63.10:2013																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	AV	1MHz	3MHz	Average Value	
Frequency	Detector	RBW	VBW	Remark																					
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value																					
Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
	AV	1MHz	3MHz	Average Value																					
Limit:	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>68.2</td><td>Peak Value</td></tr></table> Undesirable emission limits: (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value	68.2	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark																							
30MHz-88MHz	40.0	Quasi-peak Value																							
88MHz-216MHz	43.5	Quasi-peak Value																							
216MHz-960MHz	46.0	Quasi-peak Value																							
960MHz-1GHz	54.0	Quasi-peak Value																							
Above 1GHz	54.0	Average Value																							
	68.2	Peak Value																							
Test Procedure:	a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.																								
Test setup:	Above 1GHz																								

	
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Remark:

According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

$E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2,$

For example, if $\text{EIRP} = -27\text{dBm}$

$E[\text{dBuV/m}] = -27 + 95.2 = 68.2\text{dBuV/m}.$

Measurement Data:**Band1**

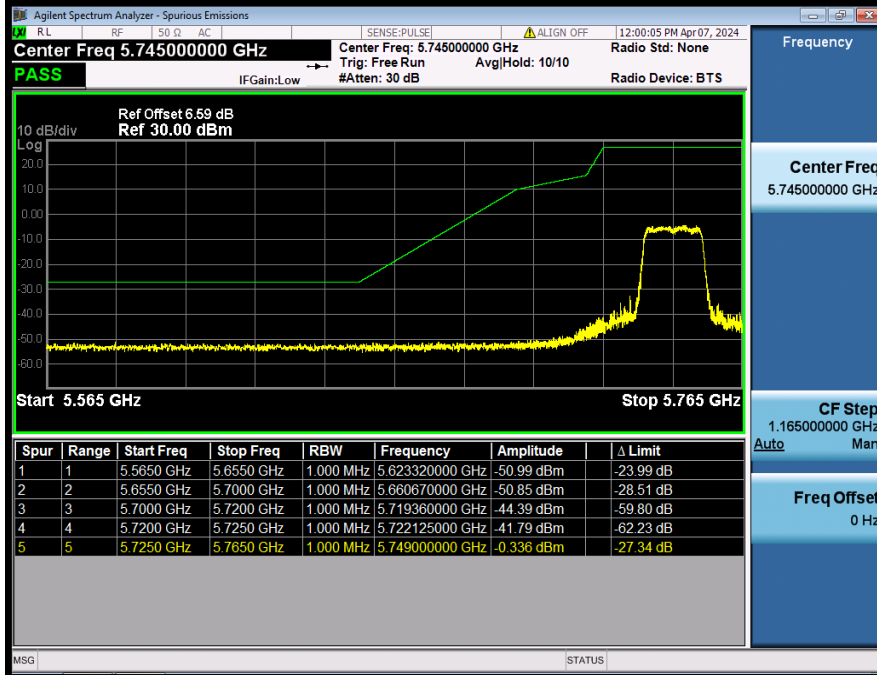
Mode:		802.11a		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	34.75	17.18	51.93	68.20	-16.27	PK
V	5150.00	32.76	17.18	49.94	68.20	-18.26	PK
Mode:		802.11a		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	25.48	17.18	42.66	54.00	-11.34	AV
V	5150.00	26.49	17.18	43.67	54.00	-10.33	AV
Mode:		802.11a		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	38.11	17.18	55.29	68.20	-12.91	PK
V	5350.00	36.32	17.18	53.50	68.20	-14.70	PK
Mode:		802.11a		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	27.13	17.18	44.31	54.00	-9.69	AV
V	5350.00	24.65	17.18	41.83	54.00	-12.17	AV

Mode:		802.11n(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	37.38	17.18	54.56	68.20	-13.64	PK
V	5150.00	33.05	17.18	50.23	68.20	-17.97	PK
Mode:		802.11n(HT20)		Frequency:		5180MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	25.00	17.18	42.18	54.00	-11.82	AV
V	5150.00	23.66	17.18	40.84	54.00	-13.16	AV
Mode:		802.11n(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	35.70	17.18	52.88	68.20	-15.32	PK
V	5350.00	37.27	17.18	54.45	68.20	-13.75	PK
Mode:		802.11n(HT20)		Frequency:		5240MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	25.38	17.18	42.56	54.00	-11.44	AV
V	5350.00	26.19	17.18	43.37	54.00	-10.63	AV

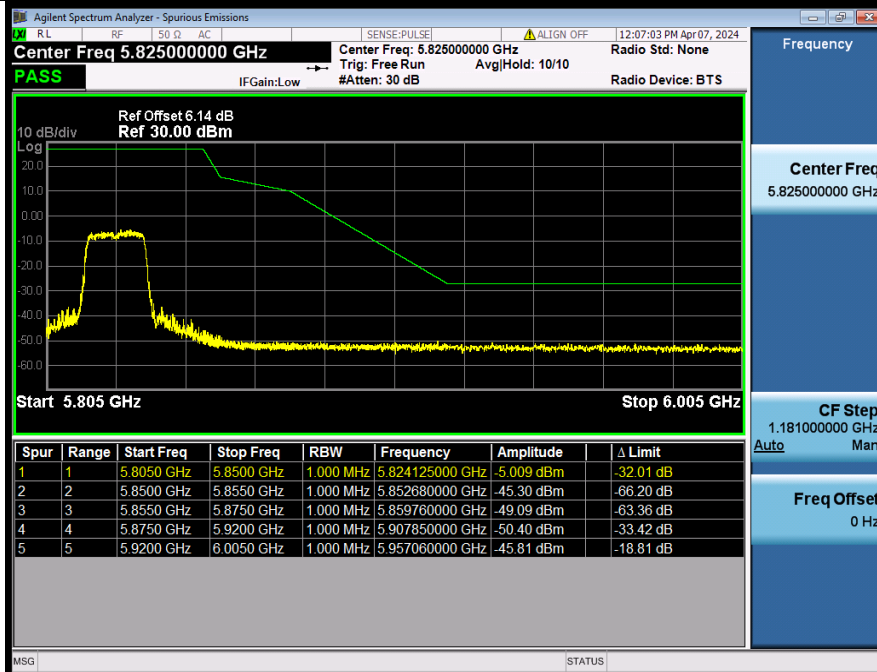
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Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	34.63	17.18	51.81	68.20	-16.39	PK
V	5150.00	34.53	17.18	51.71	68.20	-16.49	PK
Mode:		802.11n(HT40)		Frequency:		5190MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	27.09	17.18	44.27	54.00	-9.73	AV
V	5150.00	27.16	17.18	44.34	54.00	-9.66	AV
Mode:		802.11n(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	35.69	17.18	52.87	68.20	-15.33	PK
V	5350.00	33.75	17.18	50.93	68.20	-17.27	PK
Mode:		802.11n(HT40)		Frequency:		5230MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	27.55	17.18	44.73	54.00	-9.27	AV
V	5350.00	24.36	17.18	41.54	54.00	-12.46	AV

Band4

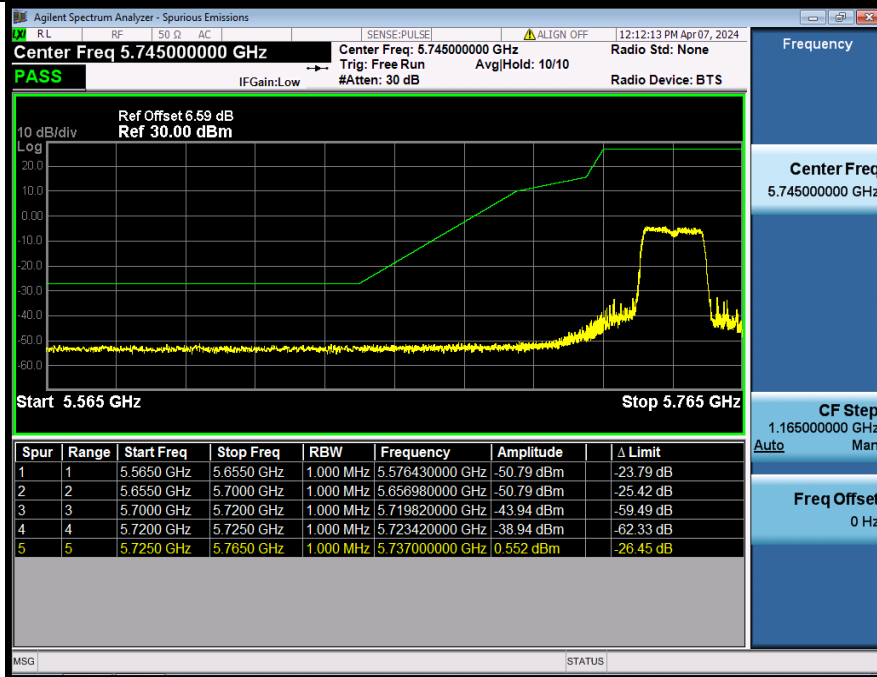
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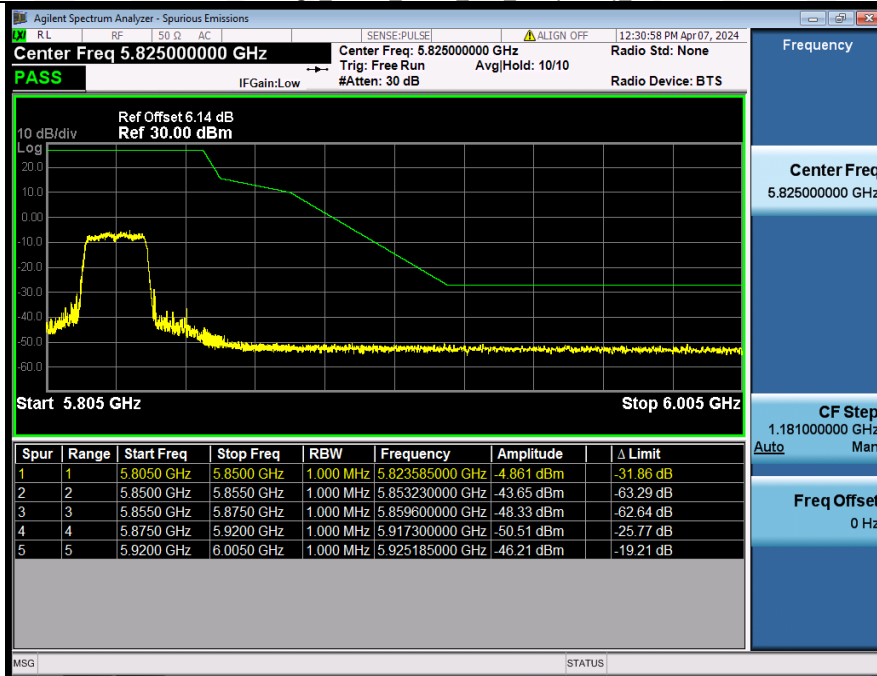
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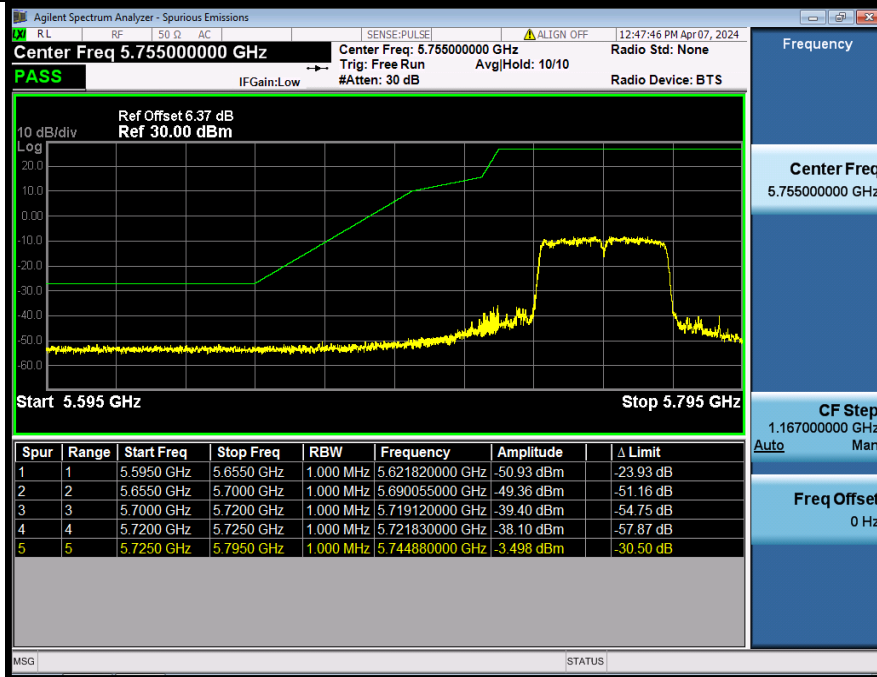
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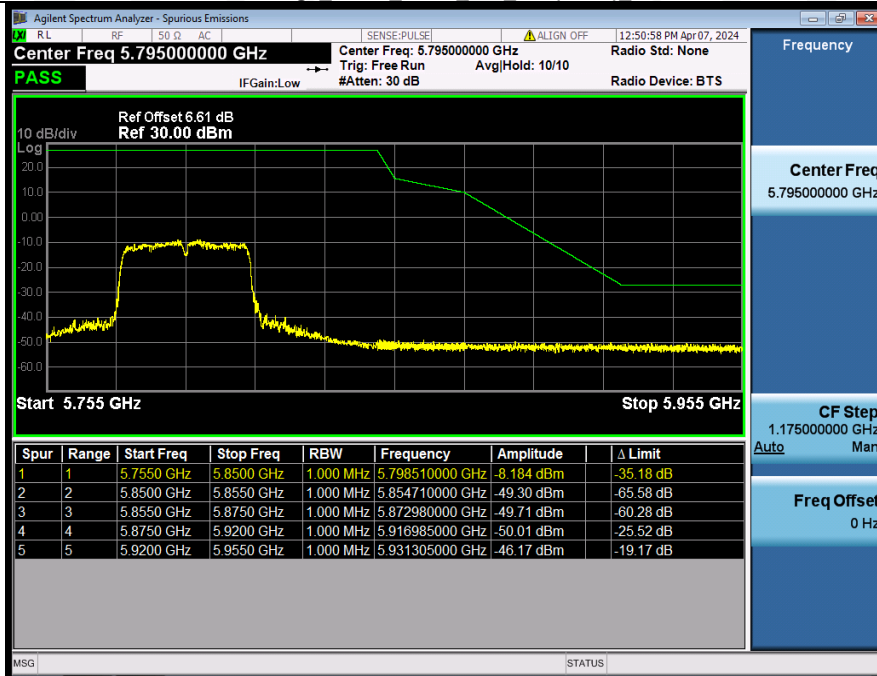
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Bandedge_NVNT_ANT1_802_11n(HT40)_5755

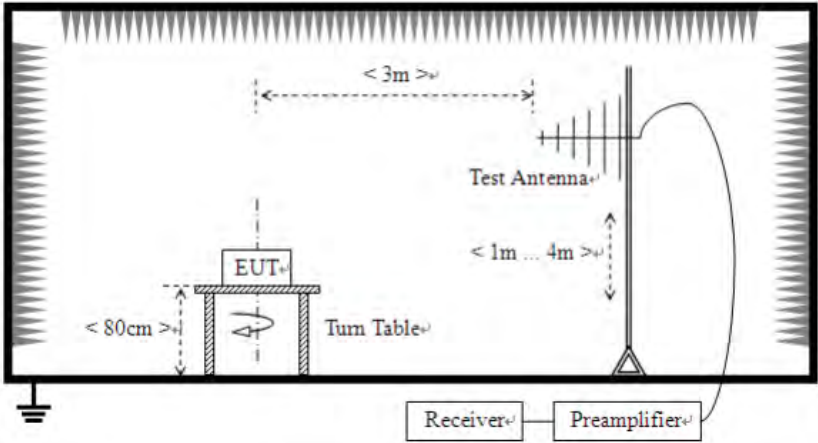


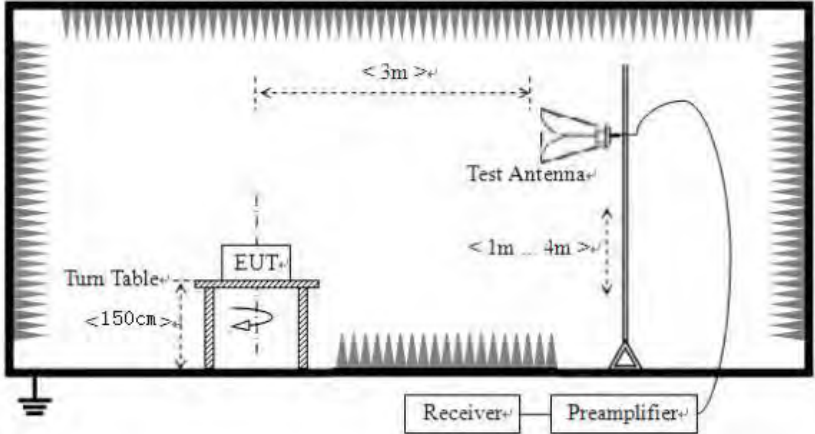
Bandedge_NVNT_ANT1_802_11n(HT40)_5795



4.7 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	30MHz to 40GHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		AV	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		74.0		Peak Value
			54.0		Average Value
Test Procedure:	Substitution method was performed to determine the actual ERP emission levels of the EUT. The following test procedure as below: 1>.Below 1GHz test procedure: 1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 2>.Above 1GHz test procedure: 1. On the test site as test setup graph above,the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the				

	transmitter under test. - The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. - Repeat step 4 for test frequency with the test antenna polarized horizontally. - Remove the transmitter and replace it with a substitution antenna - Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. - Repeat step 7 with both antennas horizontally polarized for each test frequency. - Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ where: Pg is the generator output power into the substitution antenna.
Test setup:	Below 1GHz  Above 1GHz

	
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data:**Below 1GHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
33.63	48.21	11.49	0.83	30.32	30.21	40	-9.79	Vertical
55.06	41.50	12.11	0.99	30.14	24.46	40	-15.54	Vertical
120.72	46.32	9.58	1.54	29.75	27.69	43.5	-15.81	Vertical
172.96	42.95	8.58	1.78	29.39	23.92	43.5	-19.58	Vertical
440.95	37.52	16.30	3.06	29.42	27.46	46	-18.54	Vertical
860.42	33.20	21.87	4.73	29.18	30.62	46	-15.38	Vertical
64.46	36.42	8.87	1.04	30.03	16.30	40	-23.70	Horizontal
99.67	33.40	11.99	1.45	29.96	16.88	43.5	-26.62	Horizontal
269.95	45.62	12.64	2.33	29.90	30.69	46	-15.31	Horizontal
351.11	36.84	14.81	2.93	30.04	24.54	46	-21.46	Horizontal
627.67	36.39	19.80	4.20	29.64	30.75	46	-15.25	Horizontal
955.62	40.81	22.96	5.48	29.52	39.73	46	-6.27	Horizontal

Above 1GHz:**802.11a(HT20) 5180MHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.03	50.15	11.62	14.88	33.13	43.52	74	-30.48	Vertical
15540.65	51.45	12.13	17.88	34.90	46.56	74	-27.44	Vertical
10360.92	52.37	9.84	14.90	33.02	44.09	74	-29.91	Horizontal
15540.75	53.14	8.68	18.10	34.59	45.32	74	-28.68	Horizontal

802.11a(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.85	50.88	11.38	15.11	32.69	44.68	74	-29.32	Vertical
15540.05	51.45	12.00	17.95	34.79	46.61	74	-27.39	Vertical
10360.17	52.35	9.87	14.65	32.91	43.96	74	-30.04	Horizontal
15540.46	53.29	8.80	17.84	34.46	45.47	74	-28.53	Horizontal

802.11a(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.27	50.57	11.68	14.83	32.73	44.35	74	-29.65	Vertical
15540.66	51.94	12.12	18.07	34.47	47.67	74	-26.33	Vertical
10360.57	52.23	9.41	14.78	33.14	43.29	74	-30.71	Horizontal
15540.19	53.97	8.56	17.70	34.73	45.50	74	-28.50	Horizontal

802.11n(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.29	50.68	11.58	15.00	32.99	44.27	74	-29.73	Vertical
15540.91	51.82	12.22	17.85	34.71	47.17	74	-26.83	Vertical
10360.15	52.71	9.81	14.86	32.89	44.49	74	-29.51	Horizontal
15540.77	53.14	8.98	17.66	34.68	45.11	74	-28.89	Horizontal

802.11n(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.19	50.12	11.69	14.87	32.70	43.98	74	-30.02	Vertical
15540.97	51.71	12.23	18.12	34.63	47.43	74	-26.57	Vertical
10360.54	52.21	9.90	14.86	32.75	44.22	74	-29.78	Horizontal
15540.81	53.91	8.63	17.92	34.95	45.52	74	-28.48	Horizontal

802.11n(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.42	50.69	11.43	14.93	33.00	44.06	74	-29.94	Vertical
15540.90	51.28	11.91	17.82	34.89	46.12	74	-27.88	Vertical
10360.51	52.88	9.60	15.05	32.72	44.81	74	-29.19	Horizontal
15540.15	53.11	9.00	17.91	34.67	45.35	74	-28.65	Horizontal

802.11n(HT40) 5190MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.99	50.42	11.37	14.91	32.94	43.76	74	-30.24	Vertical
15540.56	51.89	12.26	18.00	34.94	47.21	74	-26.79	Vertical
10360.32	52.74	9.78	14.82	33.02	44.32	74	-29.68	Horizontal
15540.99	53.37	8.91	17.77	34.64	45.40	74	-28.60	Horizontal

802.11n(HT40) 5230MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.82	50.29	11.40	14.80	32.98	43.51	74	-30.49	Vertical
15540.53	51.63	12.05	17.88	34.78	46.78	74	-27.22	Vertical
10360.95	52.16	9.83	15.03	32.98	44.04	74	-29.96	Horizontal
15540.59	53.26	8.94	17.81	34.54	45.48	74	-28.52	Horizontal

Note:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.
2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. This Report only show the test plots of the worst case (U-NII-1).

4.8 Frequency stability

Test limit	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
Test results:	Pass

Measurement Data:

Mode	Voltage (V)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
Band 1 (5150-5250 MHz)	DC 3.0V	5179.997	3	5239.991	9
	DC 3.3V	5179.996	4	5239.994	6
	DC 3.6V	5179.994	6	5239.996	4
Mode	Voltage (V)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
Band 4 (5725-5850 MHz)	DC 3.0V	5744.995	5	5824.997	3
	DC 3.3V	5744.995	5	5824.997	3
	DC 3.6V	5744.992	8	5824.992	8

Mode	Temperature (°C)	FHL (5180MHz)	Deviation (KHz)	FHH (5240MHz)	Deviation (KHz)
Band 1 (5150-5250 MHz)	0°C	5179.993	7	5239.995	5
	+10°C	5179.994	6	5239.996	4
	+20°C	5179.994	6	5239.994	6
	+30°C	5179.998	2	5239.992	8
	+40°C	5179.995	5	5239.992	8
	+50°C	5179.997	3	5239.992	8
	+60°C	5179.996	4	5239.995	5
Mode	Temperature (°C)	FHL (5745MHz)	Deviation (KHz)	FHH (5825MHz)	Deviation (KHz)
Band 4 (5725-5850 MHz)	0°C	5744.996	4	5824.997	3
	+10°C	5744.994	6	5824.994	6
	+20°C	5744.995	5	5824.991	9
	+30°C	5744.994	6	5824.995	5
	+40°C	5744.998	2	5824.991	9
	+50°C	5744.995	5	5824.997	3
	+60°C	5744.993	7	5824.995	5

-----END OF REPORT-----