

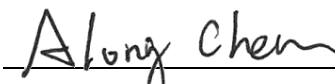
FCC Test Report

FCC ID : HDC-17600070F1
Equipment : WiFi 6 2.5G Router
(Refer to item 1.1.1 for more details)
Model No. : SDG-8612
(Refer to item 1.1.1 for more details)
Brand Name : Adtran
Applicant : Adtran
Address : 901 Explorer Boulevard, Huntsville, Alabama,
United States, 35806-2807
Standard : 47 CFR FCC Part 15.407
Received Date : Apr. 18, 2023
Tested Date : Apr. 19 ~ May 05, 2023

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:


Along Chen / Assistant Manager


Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
FR341804AN	Rev. 01	Initial issue	Jun. 02, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	[dBuV]: 0.426MHz 44.22 (Margin -3.11dB) - AV	Pass
15.407(b) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 5150.00MHz 53.60 (Margin -0.40dB) - AV	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	Conducted Output Power	Max Power [dBm]: Non-beamforming mode 5150~5250MHz: 27.50 5250~5350MHz: 21.63 5470~5725MHz: 23.69 5725~5850MHz: 29.53 Beamforming mode 5150~5250MHz: 26.37 5250~5350MHz: 19.91 5470~5725MHz: 20.26 5725~5850MHz: 25.98	Pass
15.407(a)	Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Adtran	SDG-8612	WiFi 6 2.5G Router	2.5G RJ45 WAN port
	SDG-8614	WiFi 6 SFP Router	2.5G SFP WAN port

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5150-5250 5250-5350 5470-5725 5725-5850	a	5180-5240 5260-5320 5500-5720 5745-5825	36-48 [4] 52-64 [4] 100-144 [12] 149-165 [5]	4	6-54 Mbps
5150-5250 5250-5350 5470-5725 5725-5850	n (HT20)	5180-5240 5260-5320 5500-5720 5745-5825	36-48 [4] 52-64 [4] 100-144 [12] 149-165 [5]	4	MCS 0-31
5150-5250 5250-5350 5470-5725 5725-5850	n (HT40)	5190-5230 5270-5310 5510-5710 5755-5795	38-46 [2] 54-62 [2] 102-142 [6] 151-159 [2]	4	MCS 0-31
5150-5250 5250-5350 5470-5725 5725-5850	ac (VHT20)	5180-5240 5260-5320 5500-5720 5745-5825	36-48 [4] 52-64 [4] 100-144 [12] 149-165 [5]	4	MCS 0-9
5150-5250 5250-5350 5470-5725 5725-5850	ac (VHT40)	5190-5230 5270-5310 5510-5710 5755-5795	38-46 [2] 54-62 [2] 102-142 [6] 151-159 [2]	4	MCS 0-9
5150-5250 5250-5350 5470-5725 5725-5850	ac (VHT80)	5210 5290 5530~5690 5775	42 [1] 58 [1] 106-138 [3] 155 [1]	4	MCS 0-9
5150-5250 5250-5350 5500-5700	ac (VHT160)	5250 5570	50 [1] 114 [1]	4	MCS 0-11
5150-5250 5250-5350 5470-5725 5725-5850	ax (HE20)	5180-5240 5260-5320 5500-5720 5745-5825	36-48 [4] 52-64 [4] 100-144 [12] 149-165 [5]	4	MCS 0-11
5150-5250 5250-5350 5470-5725 5725-5850	ax (HE40)	5190-5230 5270-5310 5510-5710 5755-5795	38-46 [2] 54-62 [2] 102-142 [6] 151-159 [2]	4	MCS 0-11
5150-5250 5250-5350 5470-5725 5725-5850	ax (HE80)	5210 5290 5530~5690 5775	42 [1] 58 [1] 106-138 [3] 155 [1]	4	MCS 0-11
5150-5250 5250-5350 5500-5700	ax (HE160)	5250 5570	50 [1] 114 [1]	4	MCS 0-11
Note 1: BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024QAM modulation. Note 2: 802.11n/ac/ax supports beamforming function. Note 3: TPC function is supported.					

1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	Antenna_LB1	PIFA	UFL	3.698	--	--	--	--
2	Antenna_LB2	PIFA	UFL	4.22	--	--	--	--
3	Antenna_LB3	PIFA	UFL	3.516	--	--	--	--
4	Antenna_LB4	PIFA	UFL	4.661	--	--	--	--
5	Antenna_5G1	PIFA	UFL	--	3.664	3.749	2.763	2.649
6	Antenna_5G2	PIFA	UFL	--	2.81	3.951	3.35	3.759
7	Antenna_5G3	PIFA	UFL	--	3.587	3.956	4.111	3.986
8	Antenna_5G4	PIFA	UFL	--	4.053	4.053	4.12	4.789

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	15Vdc from AC adapter
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1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: LUCENT TRANS Model: 1A78 I/P: 100-240Vac, 50/60Hz, 1.2A O/P: 15V--3.0A, 45.0W Power Line: USB 1.8m non-shielded without core
2	RJ45 cable	2m non-shielded without core

1.1.6 Channel List

802.11a / n HT20 / ac VHT20 / ax HE20		802.11n HT40 / ac VHT40 / ax HE40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	54	5270
48	5240	62	5310
52	5260	102	5510
56	5280	110	5550
60	5300	118	5590
64	5320	126	5630
100	5500	134	5670
104	5520	142	5710
108	5540	151	5755
112	5560	159	5795
116	5580	802.11ac VHT80 / ax HE80	
120	5600	42	5210
124	5620	58	5290
128	5640	106	5530
132	5660	122	5610
136	5680	138	5690
140	5700	155	5775
144	5720	ac VHT160 / ax HE160	
149	5745	50	5250
153	5765	114	5570
157	5785	---	---
161	5805	---	---
165	5825	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	Non-beamforming: QATool_Dbg, Version: 0.0.2.88 Beamforming: Putty, Version: 0.60.0.0				
Duty Cycle and Duty Factor	Mode	Non-beamforming		Beamforming	
		Duty cycle (%)	Duty factor (dB)	Duty cycle (%)	Duty factor (dB)
	11a	98.98%	0.04	---	---
	ax HE20	98.01%	0.09	95.23%	0.21
	ax HE40	95.97%	0.18	91.44%	0.39
	ax HE80	91.04%	0.41	76.69%	1.15
	ax HE160	85.31%	0.69	63.41%	1.98

1.1.8 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index	
		Non-Beamforming	Beamforming
11a	5180	16.5	---
11a	5200	16.5	---
11a	5240	17	---
11a	5260	11.5	---
11a	5300	11	---
11a	5320	11	---
11a	5500	11.5	---
11a	5580	11	---
11a	5700	11.5	---
11a	5720	12	---
11a	5745	21.5	---
11a	5785	21.5	---
11a	5825	21.5	---
ax HE20	5180	19	38
ax HE20	5200	19	38
ax HE20	5240	19.5	39
ax HE20	5260	13.5	26
ax HE20	5300	13.5	26
ax HE20	5320	13.5	27
ax HE20	5500	13.5	27
ax HE20	5580	13	26
ax HE20	5700	13.5	27

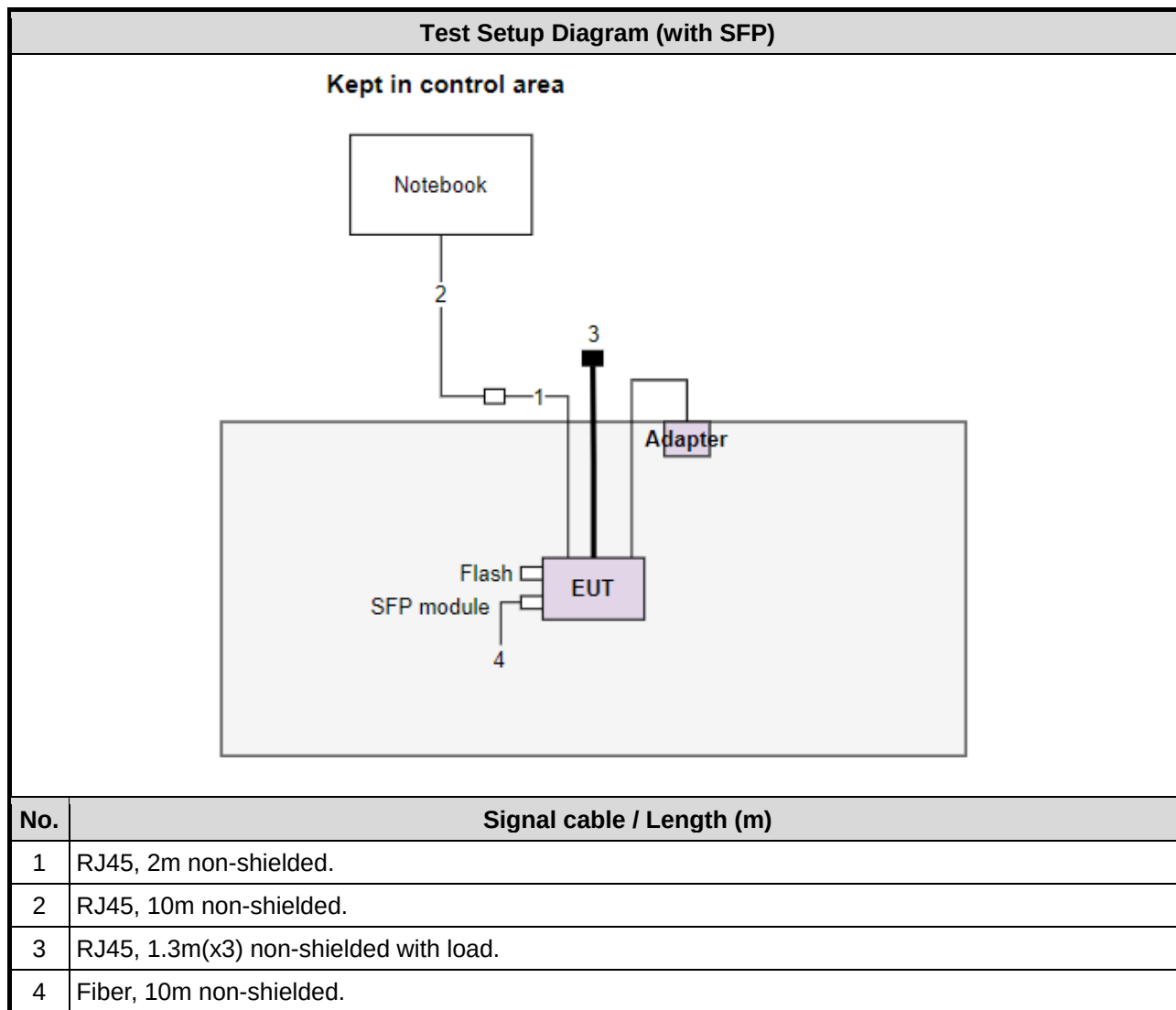
ax HE20	5720	14	26
ax HE20	5745	22.5	38
ax HE20	5785	22.5	38
ax HE20	5825	22.5	39
ax HE40	5190	18.5	36
ax HE40	5230	20.5	38
ax HE40	5270	14.5	25
ax HE40	5310	14.5	26
ax HE40	5510	15.5	26
ax HE40	5590	14.5	25
ax HE40	5670	15	26
ax HE40	5710	16	26
ax HE40	5755	22.5	38
ax HE40	5795	22.5	38
ax HE80	5210	13.5	26
ax HE80	5290	14	25
ax HE80	5530	14.5	26
ax HE80	5610	16	24
ax HE80	5690	16.5	23
ax HE80	5775	19	37
ax HE160	5250	15	26
ax HE160	5570	16	29

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
With SFP					
1	Laptop	DELL	Latitude 5400	DoC	---
2	USB 3.0 Flash	Transcend	JetFlash 700	---	---
3	SFP module	---	LTE3680M-BH2 0-RA	---	Provided by applicant.
4	RJ 45 Load	ICC	---	---	---
5	Laptop	DELL	Latitude E5470	DoC	For Beamforming mode only.
6	BF Client	Gemtek	WRTM-381AX	---	For Beamforming mode only.
Without SFP					
1	Laptop	DELL	Latitude 5400	DoC	---
2	Laptop	DELL	Latitude E5470	DoC	---
3	USB 3.0 Flash	Transcend	JetFlash 700	---	Provided by applicant.
4	RJ 45 Load	ICC	---	---	---
5	Laptop	DELL	Latitude E5470	DoC	For Beamforming mode only.
6	BF Client	Gemtek	WRTM-381AX	---	For Beamforming mode only.

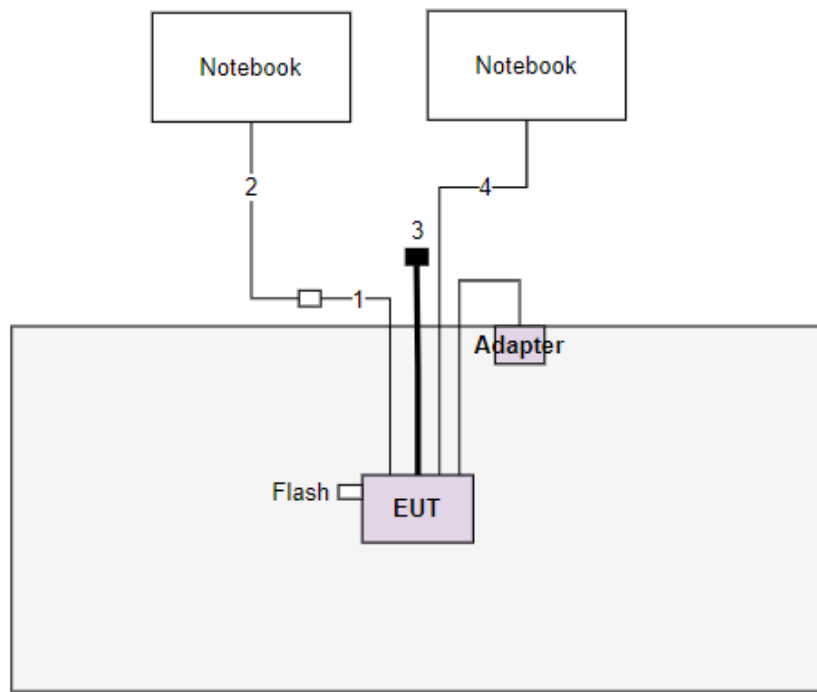
1.3 Test Setup Chart

Non-beamforming mode



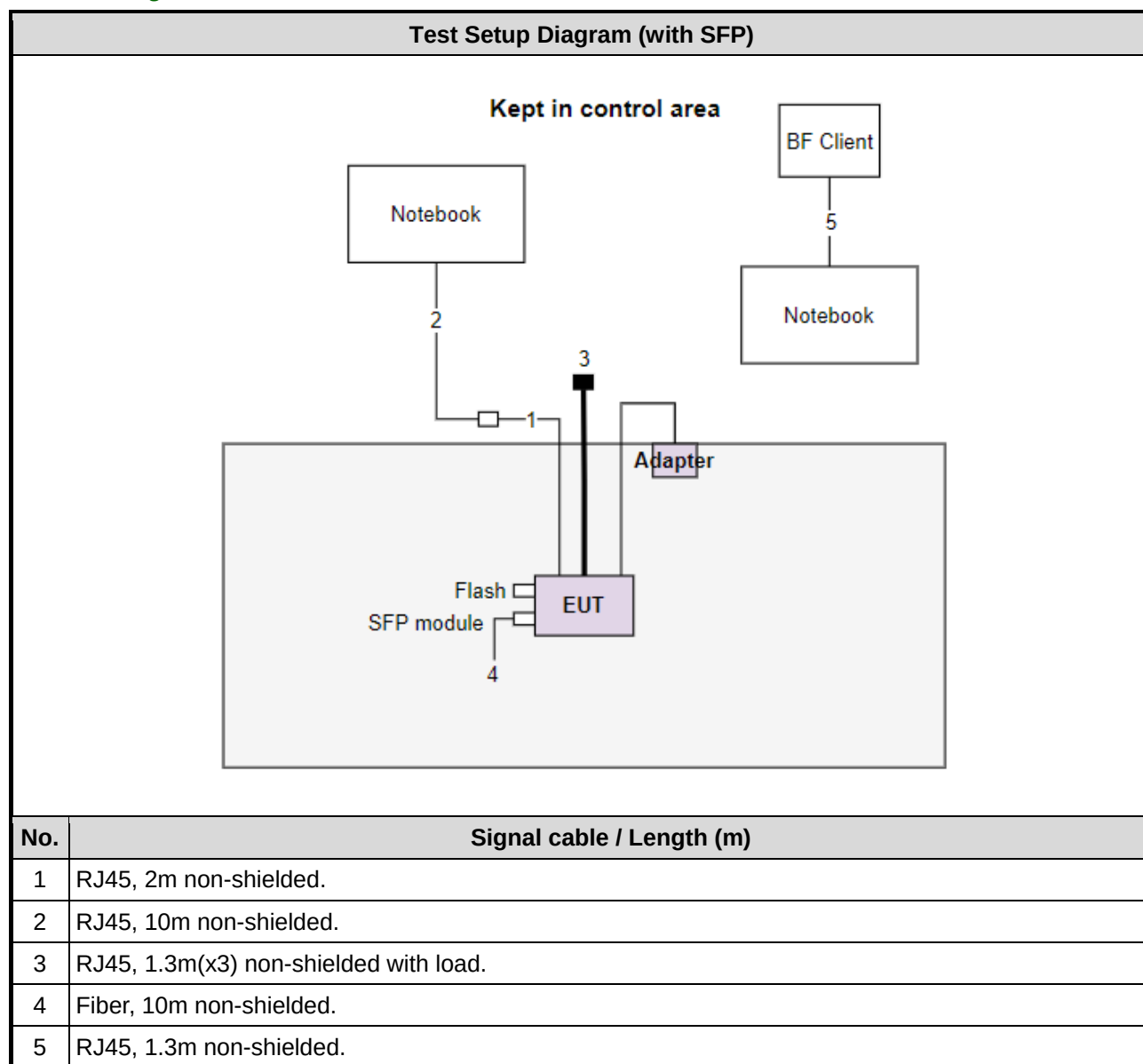
Test Setup Diagram (without SFP)

Kept in control area

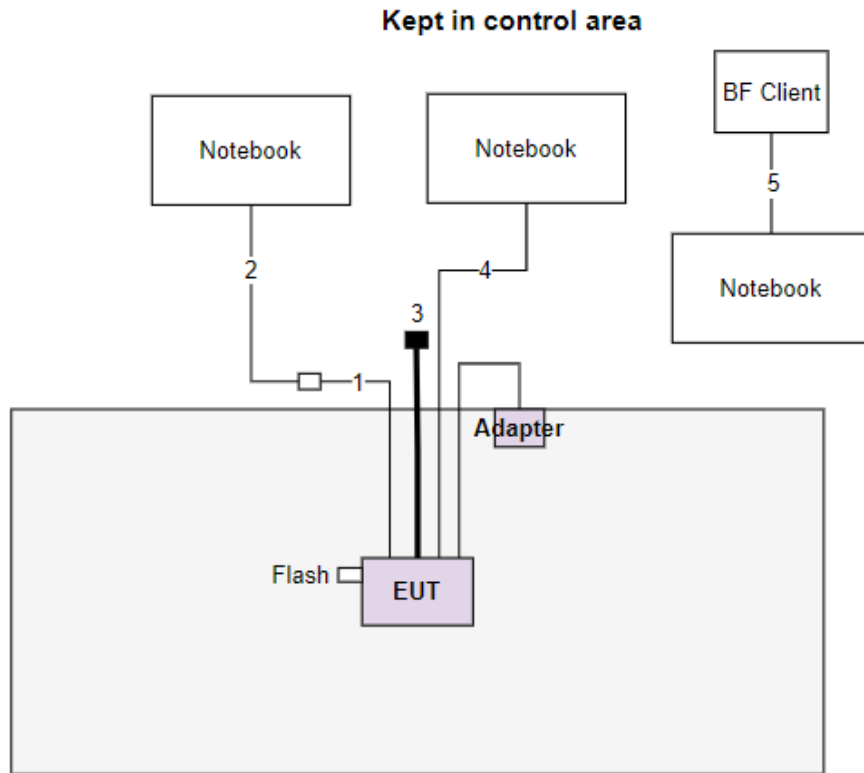


No.	Signal cable / Length (m)
1	RJ45, 2m non-shielded.
2	RJ45, 10m non-shielded.
3	RJ45, 1.3m(x3) non-shielded with load.
4	RJ45, 10m non-shielded.

Beamforming mode



Test Setup Diagram (without SFP)



No.	Signal cable / Length (m)
1	RJ45, 2m non-shielded.
2	RJ45, 10m non-shielded.
3	RJ45, 1.3m(x3) non-shielded with load.
4	RJ45, 10m non-shielded.
5	RJ45, 1.3m non-shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	May 04, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 17, 2023	Feb. 16, 2024
LISN	R&S	ENV216	101295	Jan. 31, 2023	Jan. 30, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan. 03, 2023	Jan. 02, 2024
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 17, 2022	Oct. 16, 2023
50 ohm terminal (Support Unit)	NA	50	01	May 10, 2022	May 09, 2023
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Apr. 19 ~ Apr. 28, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Spectrum Analyzer	R&S	FSV40	101498	Nov. 21, 2022	Nov. 20, 2023
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 03, 2022	Aug. 02, 2023
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 25, 2022	Nov. 24, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 27, 2022	Oct. 26, 2023
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2022	Jun. 27, 2023
Preamplifier	EMC	EMC118A45SE	980898	Jul. 16, 2022	Jul. 15, 2023
Preamplifier	EMC	EMC184045SE	980903	Jul. 16, 2022	Jul. 15, 2023
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 04, 2022	Oct. 03, 2023
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 04, 2022	Oct. 03, 2023
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 04, 2022	Oct. 03, 2023
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 04, 2022	Oct. 03, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	May 02 ~ May 05, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 09, 2022	Dec. 08, 2023
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Jun. 22, 2022	Jun. 21, 2023
Measurement Software	Sporton	SENSE-15247_DTS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.407
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 412172 D01 Determining ERP and EIRP v01r01
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Frequency error	$\pm 1 \times 10^{-9}$
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Unwanted Emission ≤ 1 GHz	± 3.41 dB
Unwanted Emission > 1 GHz	± 4.59 dB
Time	$\pm 0.1\%$
Temperature	± 0.4 °C

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Non-beamforming mode

Frequency band 5150~5350 MHz / 5470~5725 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emissions	ax HE40	5230	MCS 0	1, 2
Unwanted Emissions ≤1GHz	ax HE40	5230	MCS 0	1, 2
Unwanted Emissions >1GHz Conducted Output Power Emission Bandwidth Power Spectral Density	11a	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700 / 5720	6 Mbps	2
	ax HE20	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700 / 5720	MCS 0	
	ax HE40	5190 / 5230 / 5270 / 5310 / 5510 5590 / 5670 / 5710	MCS 0	
	ax HE80	5210 / 5290 / 5530 / 5610 / 5690	MCS 0	
	ax HE160	5250 / 5570	MCS 0	
Frequency Stability	Un-modulation	5300	---	2
Frequency band 5725-5850 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emissions	11a	5745	6 Mbps	1, 2
Unwanted Emissions ≤1GHz	11a	5745	6 Mbps	1, 2
Unwanted Emissions >1GHz Conducted Output Power Emission Bandwidth 6dB bandwidth Power Spectral Density	11a	5745 / 5785 / 5825	6 Mbps	2
	ax HE20	5745 / 5785 / 5825	MCS 0	
	ax HE40	5755 / 5795	MCS 0	
	ax HE80	5775	MCS 0	
Frequency Stability	Un-modulation	5785	---	2
NOTE: 1. Test configurations are listed as follows: 1) Test configuration 1: Without SFP, model: SDG-8612 2) Test configuration 2: With SFP, model: SDG-8614				

Beamforming mode

Frequency band 5150~5350 MHz / 5470~5725 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emissions	ax HE20	5180	MCS 0	1, 2
Unwanted Emissions ≤1GHz	ax HE20	5180	MCS 0	1, 2
Unwanted Emissions >1GHz Conducted Output Power Emission Bandwidth Power Spectral Density	ax HE20	5180 / 5200 / 5240 / 5260 / 5300 5320 / 5500 / 5580 / 5700	MCS 0	2
	ax HE40	5190 / 5230/ 5270 / 5310 / 5510 5590 / 5670	MCS 0	
	ax HE80	5210 / 5290 / 5530 / 5610	MCS 0	
	ax HE160	5250 / 5570	MCS 0	
Frequency band 5725-5850 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emissions	ax HE80	5775	MCS 0	1, 2
Unwanted Emissions ≤1GHz	ax HE80	5775	MCS 0	1, 2
Unwanted Emissions >1GHz Conducted Output Power Emission Bandwidth 6dB bandwidth Power Spectral Density	ax HE20	5745 / 5785 / 5825	MCS 0	2
	ax HE40	5755 / 5795	MCS 0	
	ax HE80	5775	MCS 0	
NOTE: 1. Test configurations are listed as follows: 1) Test configuration 1: Without SFP, model: SDG-8612 2) Test configuration 2: With SFP, model: SDG-8614				

3 Transmitter Test Results

3.1 Emission Bandwidth

3.1.1 Limit of Emission Bandwidth

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

3.1.2 Test Procedures

26dB Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW, Detector = Peak.
3. Trace mode = max hold.
4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

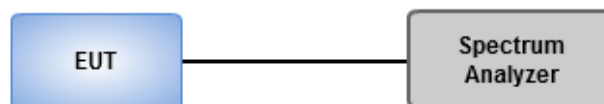
Occupied Bandwidth

1. Set RBW = 1 % to 5 % of the OBW.
2. Set VBW $\geq$ 3 RBW.
3. Sample detection and single sweep mode shall be used.
4. Use the 99 % power bandwidth function of the instrument.

6dB Bandwidth

1. Set RBW = 100kHz, VBW = 300kHz.
2. Detector = Peak, Trace mode = max hold.
3. Allow the trace to stabilize.
4. 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.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	23-24°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	Conducted Power: 1 W The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)
☒	Indoor access point	Conducted Power: 1 W
☐	Fixed point-to-point access points	Conducted Power: 1 W
☐	Client devices	Conducted Power: 250 mW

Frequency Band (MHz)		Limit
☒	5250 ~ 5350	Conducted Power: 250mW or 11dBm+10 log B
☒	5470 ~ 5725	Conducted Power: 250mW or 11dBm+10 log B
☒	5725 ~ 5850	Conducted Power: 1 W
Note: "B" is the 26dB emission bandwidth in MHz.		

3.2.2 Test Procedures

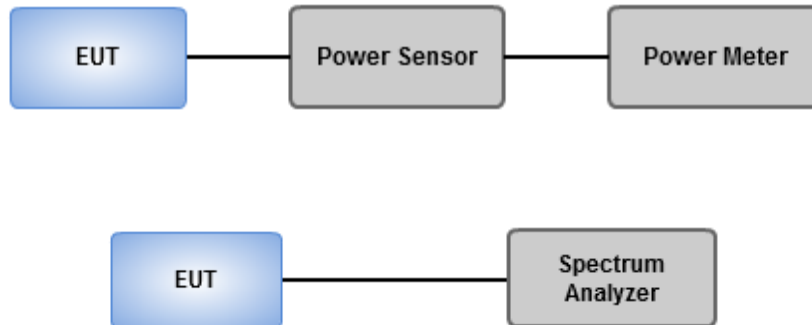
Method PM-G (Measurement using a gated RF average power meter)

Measurements is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Spectrum analyzer (For channel that extends across the 5.725 GHz boundary)

1. Set RBW = 1MHz, VBW = 3MHz, Sweep time = Auto, Detector = RMS.
2. Trace average at least 100 traces in power averaging mode.
3. Compute power by integrating the spectrum across the 26 dB EBW.
4. Add 10 log(1/X, X:duty cycle) if duty cycle is <98%.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	23-24°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix B.

3.3 Power Spectral Density

3.3.1 Limit of Power Spectral Density

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	17 dBm / MHz
☒	Indoor access point	17 dBm / MHz
☐	Fixed point-to-point access points	17 dBm / MHz
☐	Client devices	11 dBm / MHz

Frequency Band (MHz)		Limit
☒	5250 ~ 5350	11 dBm / MHz
☒	5470 ~ 5725	11 dBm / MHz
☒	5725 ~ 5850	30 dBm /500 kHz

3.3.2 Test Procedures

For 5150 ~ 5250 MHz / 5250 ~ 5350 MHz / 5470 ~ 5725 MHz

Duty cycle $\geq 98\%$

1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

Duty cycle $< 98\%$

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

For 5725 ~ 5850 MHz

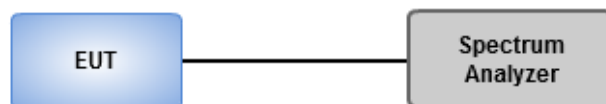
Duty cycle $\geq 98\%$

1. Set RBW = 500 kHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

Duty cycle $< 98\%$

1. Set RBW = 500 kHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	23-24°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix C.

3.4 Unwanted Emissions

3.4.1 Limit of Unwanted Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.850 GHz	All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

3.4.2 Test Procedures

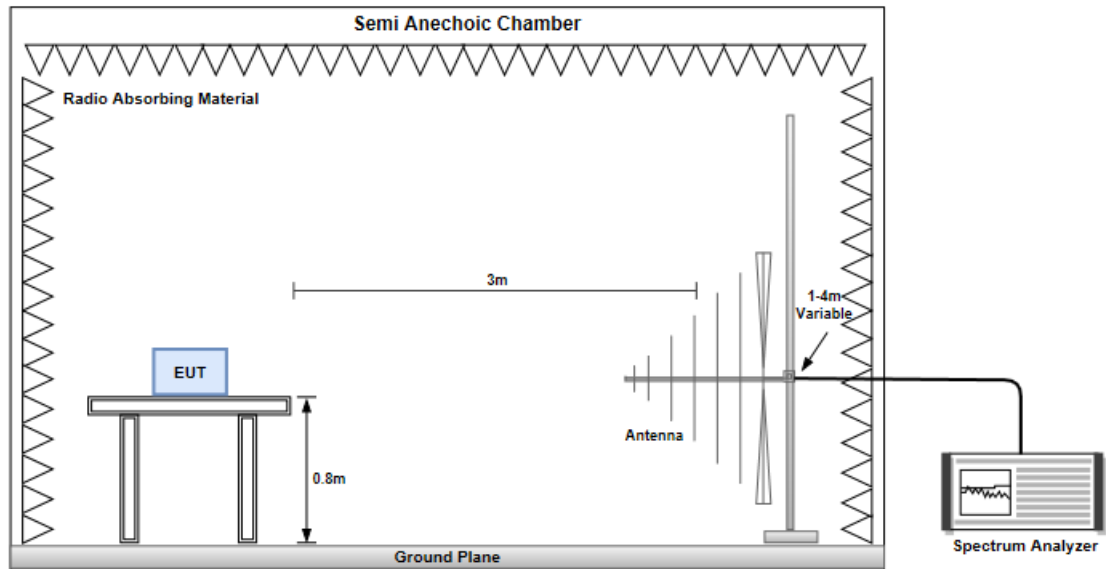
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

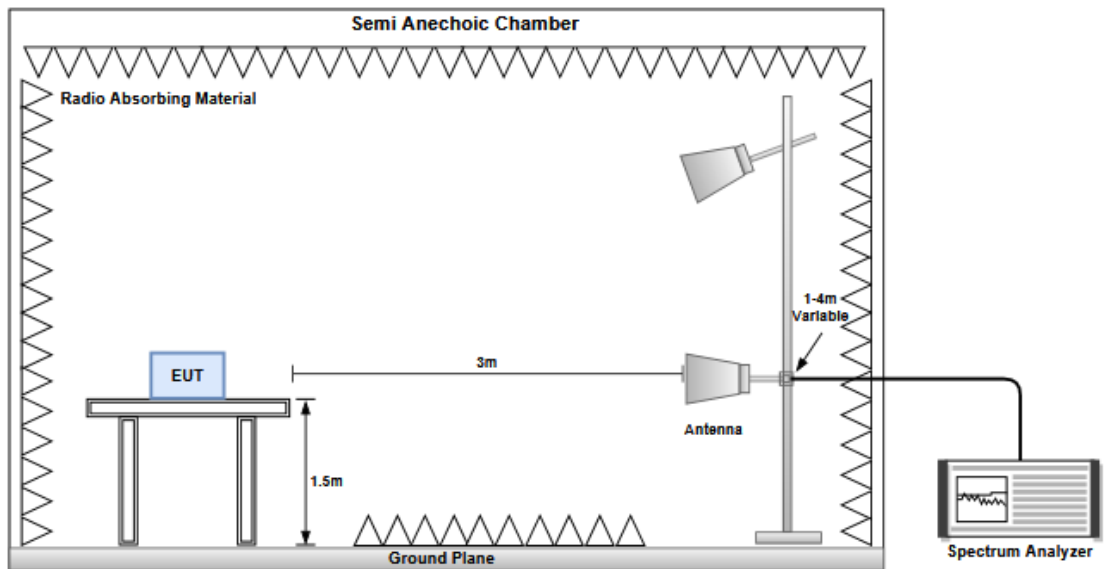
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.4.3 Test Setup

Unwanted Emissions below 1 GHz



Unwanted Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Frequency Stability

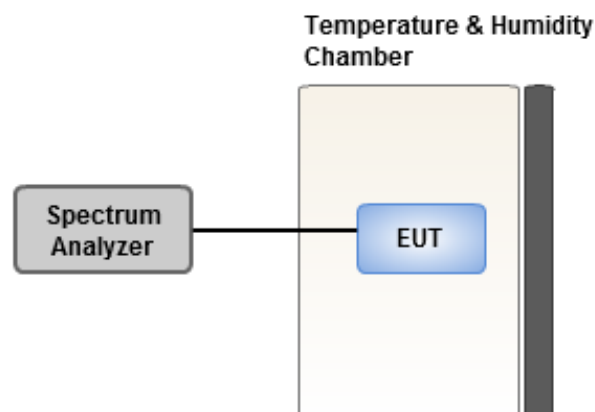
3.5.1 Limit of Frequency Stability

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.

3.5.2 Test Procedures

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 20 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under normal and extreme condition for temperature and voltage.

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	23-24°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

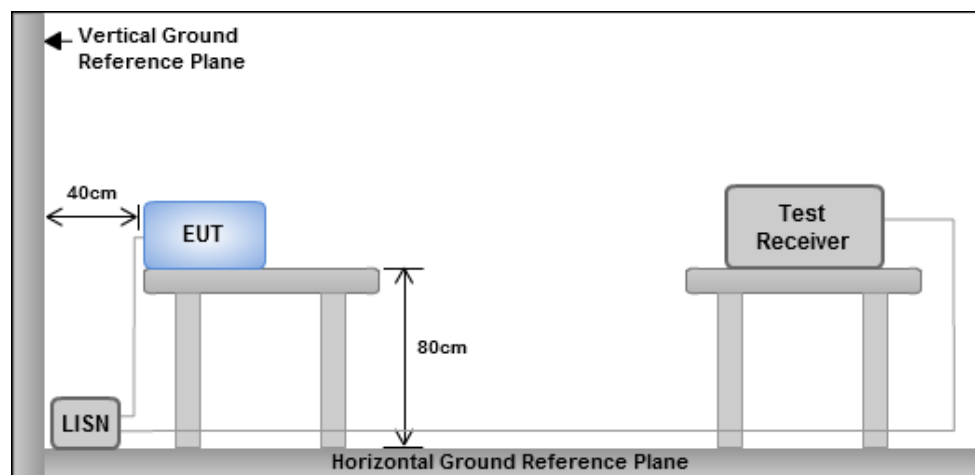
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.6.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

3.6.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.6.4 Test Results

Refer to Appendix F.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==

Non-beamforming mode
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	29.832M	16.861M	16M9D1D	22.44M	16.729M
802.11ax HEW20_Nss1,(MCS0)_4TX	33.396M	19.22M	19M2D1D	20.856M	18.981M
802.11ax HEW40_Nss1,(MCS0)_4TX	57.552M	37.901M	37M9D1D	42.9M	37.661M
802.11ax HEW80_Nss1,(MCS0)_4TX	89.496M	77.121M	77M1D1D	85.8M	77.001M
802.11ax HEW160_Nss1,(MCS0)_4TX	80.24M	77.561M	77M6D1D	80.08M	77.481M
5.25-5.35GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	29.568M	16.888M	16M9D1D	20.724M	16.624M
802.11ax HEW20_Nss1,(MCS0)_4TX	31.152M	19.22M	19M2D1D	21.978M	19.07M
802.11ax HEW40_Nss1,(MCS0)_4TX	45.54M	37.661M	37M7D1D	39.336M	37.541M
802.11ax HEW80_Nss1,(MCS0)_4TX	86.856M	77.121M	77M1D1D	81.312M	77.001M
802.11ax HEW160_Nss1,(MCS0)_4TX	80.32M	77.641M	77M6D1D	80.24M	77.401M
5.47-5.725GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	28.116M	16.835M	16M8D1D	15.435M	13.313M
802.11ax HEW20_Nss1,(MCS0)_4TX	29.832M	19.22M	19M2D1D	16.065M	14.513M
802.11ax HEW40_Nss1,(MCS0)_4TX	50.688M	37.781M	37M8D1D	34.615M	33.548M
802.11ax HEW80_Nss1,(MCS0)_4TX	88.704M	77.121M	77M1D1D	74.775M	72.789M
802.11ax HEW160_Nss1,(MCS0)_4TX	165.792M	155.682M	156MD1D	162.096M	155.442M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	16.5M	26.572M	26M6D1D	3.16M	3.718M
802.11ax HEW20_Nss1,(MCS0)_4TX	19.008M	23.838M	23M8D1D	4.48M	4.598M
802.11ax HEW40_Nss1,(MCS0)_4TX	36.3M	43.778M	43M8D1D	3.94M	4.098M
802.11ax HEW80_Nss1,(MCS0)_4TX	73.92M	77.241M	77M2D1D	3.96M	4.118M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Max-OBW = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Minimum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	27.654M	16.835M	28.38M	16.835M	28.116M	16.782M	28.314M	16.835M
5200MHz	Pass	Inf	29.502M	16.861M	29.832M	16.861M	28.314M	16.808M	27.654M	16.861M
5240MHz	Pass	Inf	24.486M	16.861M	24.09M	16.808M	23.958M	16.782M	22.44M	16.729M
5260MHz	Pass	Inf	21.186M	16.65M	20.988M	16.624M	20.79M	16.624M	20.724M	16.624M
5300MHz	Pass	Inf	28.71M	16.888M	28.908M	16.888M	27.918M	16.861M	27.72M	16.861M
5320MHz	Pass	Inf	27.126M	16.835M	29.04M	16.808M	29.568M	16.835M	28.71M	16.782M
5500MHz	Pass	Inf	26.994M	16.835M	26.334M	16.756M	27.39M	16.756M	27.852M	16.782M
5580MHz	Pass	Inf	21.45M	16.65M	21.054M	16.703M	21.12M	16.597M	20.856M	16.597M
5700MHz	Pass	Inf	26.928M	16.808M	28.116M	16.808M	27.126M	16.808M	26.862M	16.782M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.765M	13.328M	15.735M	13.328M	15.435M	13.328M	15.75M	13.313M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.16M	3.758M	3.18M	3.738M	3.18M	3.718M	3.2M	3.738M
5745MHz	Pass	500k	16.368M	21.769M	16.5M	22.666M	16.368M	22.957M	16.368M	21.875M
5785MHz	Pass	500k	16.368M	24.329M	16.368M	24.461M	16.302M	25.701M	16.368M	24.012M
5825MHz	Pass	500k	16.368M	26.572M	16.368M	22.007M	16.368M	25.516M	16.368M	25.701M
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	26.928M	19.19M	28.842M	19.19M	29.634M	19.19M	27.06M	19.16M
5200MHz	Pass	Inf	25.146M	19.22M	28.908M	19.22M	33.396M	19.19M	27.522M	19.19M
5240MHz	Pass	Inf	31.614M	19.04M	26.73M	19.04M	21.45M	18.981M	20.856M	18.981M
5260MHz	Pass	Inf	22.374M	19.07M	21.978M	19.07M	22.242M	19.07M	22.044M	19.07M
5300MHz	Pass	Inf	26.268M	19.16M	30.624M	19.19M	29.37M	19.19M	31.152M	19.19M
5320MHz	Pass	Inf	25.542M	19.22M	27.126M	19.16M	27.984M	19.19M	25.014M	19.16M
5500MHz	Pass	Inf	27.39M	19.19M	29.832M	19.22M	29.106M	19.19M	27.324M	19.16M
5580MHz	Pass	Inf	22.572M	19.1M	21.78M	19.07M	21.912M	19.1M	22.11M	19.07M
5700MHz	Pass	Inf	27.258M	19.13M	25.014M	19.13M	26.994M	19.19M	27.72M	19.13M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	16.065M	14.558M	16.185M	14.528M	16.17M	14.513M	16.365M	14.543M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	4.5M	4.598M	4.48M	4.618M	4.52M	4.618M	4.5M	4.618M
5745MHz	Pass	500k	18.81M	20.87M	18.81M	20.87M	18.876M	21.979M	19.008M	21.979M
5785MHz	Pass	500k	18.876M	20.66M	18.876M	21.469M	19.008M	22.339M	19.008M	22.399M
5825MHz	Pass	500k	18.876M	22.669M	18.942M	20.42M	18.942M	22.519M	18.81M	23.838M
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	42.9M	37.721M	49.764M	37.721M	44.088M	37.661M	45.012M	37.721M
5230MHz	Pass	Inf	56.232M	37.781M	56.76M	37.901M	57.552M	37.781M	43.692M	37.721M
5270MHz	Pass	Inf	39.468M	37.601M	39.336M	37.601M	39.336M	37.541M	39.336M	37.601M
5310MHz	Pass	Inf	45.144M	37.661M	43.032M	37.661M	40.656M	37.661M	45.54M	37.661M
5510MHz	Pass	Inf	41.316M	37.721M	46.464M	37.781M	46.464M	37.661M	47.52M	37.661M

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
5590MHz	Pass	Inf	39.336M	37.541M	39.336M	37.541M	39.468M	37.541M	39.336M	37.601M
5670MHz	Pass	Inf	43.164M	37.721M	50.028M	37.781M	50.688M	37.781M	49.104M	37.721M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	34.685M	33.548M	34.615M	33.548M	34.685M	33.548M	34.755M	33.618M
5710MHz Straddle 5.725-5.85GHz	Pass	500k	3.98M	4.098M	4M	4.098M	3.94M	4.118M	4.02M	4.098M
5755MHz	Pass	500k	36.3M	39.94M	35.112M	41.139M	35.112M	42.039M	32.868M	40.06M
5795MHz	Pass	500k	32.604M	40.96M	35.112M	40.48M	36.036M	43.778M	35.64M	41.379M
802.11ax HEW80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	89.496M	77.121M	87.384M	77.121M	85.8M	77.121M	85.8M	77.001M
5290MHz	Pass	Inf	83.688M	77.001M	84.744M	77.001M	81.312M	77.121M	86.856M	77.001M
5530MHz	Pass	Inf	88.704M	77.121M	83.688M	77.121M	83.688M	77.001M	83.16M	77.001M
5610MHz	Pass	Inf	80.256M	76.882M	80.256M	76.882M	80.256M	76.882M	80.256M	77.001M
5690MHz Straddle 5.47-5.725GHz	Pass	Inf	74.775M	72.789M	74.775M	73.013M	75M	72.864M	74.85M	73.013M
5690MHz Straddle 5.725-5.85GHz	Pass	500k	4M	4.338M	3.98M	4.118M	3.96M	4.138M	4M	4.218M
5775MHz	Pass	500k	70.488M	77.121M	73.92M	77.241M	73.656M	77.121M	67.584M	77.241M
802.11ax HEW160_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5250MHz Straddle 5.15-5.25GHz	Pass	Inf	80.08M	77.481M	80.24M	77.561M	80.24M	77.561M	80.16M	77.481M
5250MHz Straddle 5.25-5.35GHz	Pass	Inf	80.32M	77.641M	80.32M	77.561M	80.24M	77.481M	80.24M	77.401M
5570MHz	Pass	Inf	162.624M	155.442M	162.096M	155.442M	165.792M	155.682M	162.624M	155.682M

Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band

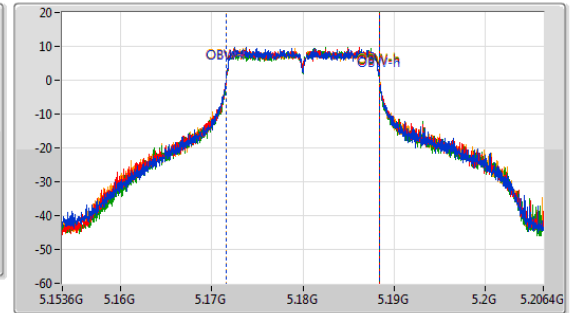
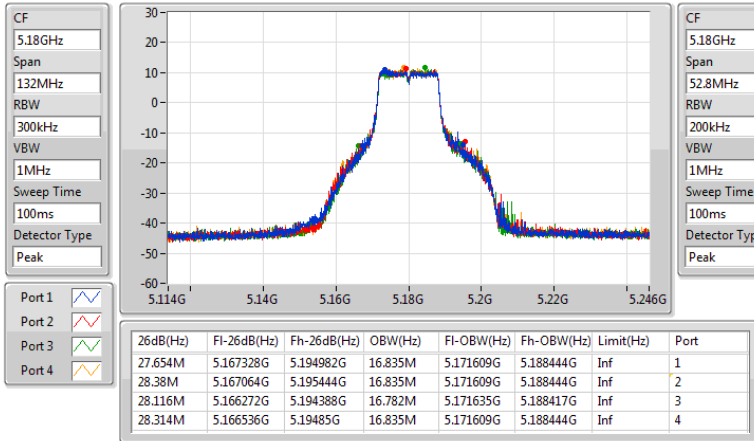
Port X-OBW = Port X 99% occupied bandwidth



5.15-5.25GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

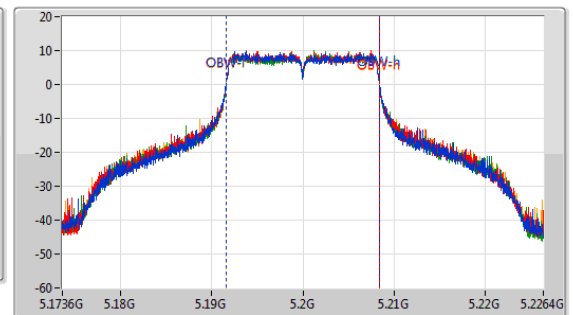
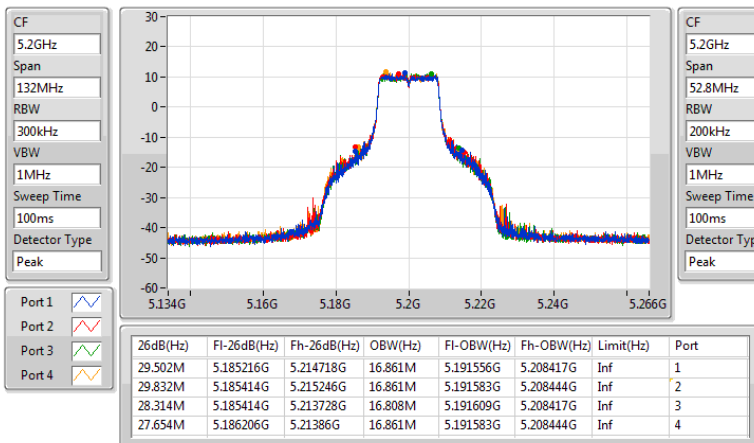
5180MHz



5.15-5.25GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

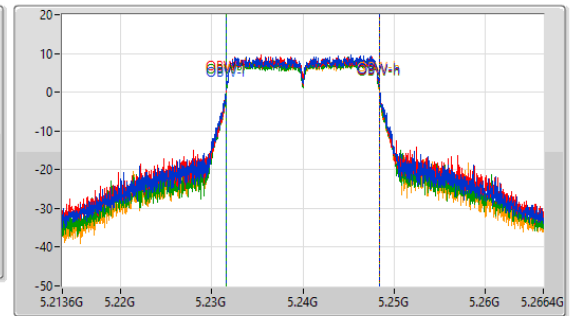
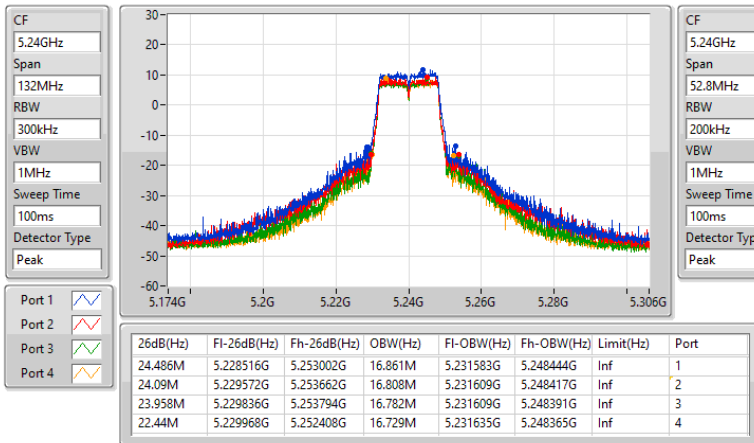
5200MHz



5.15-5.25GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

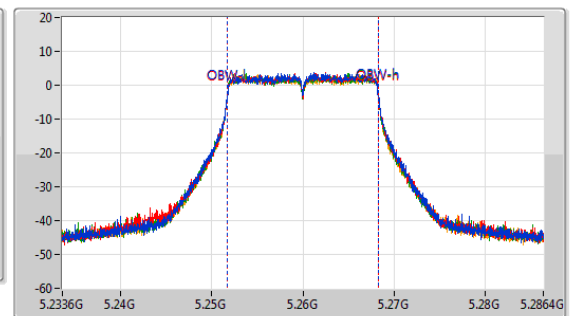
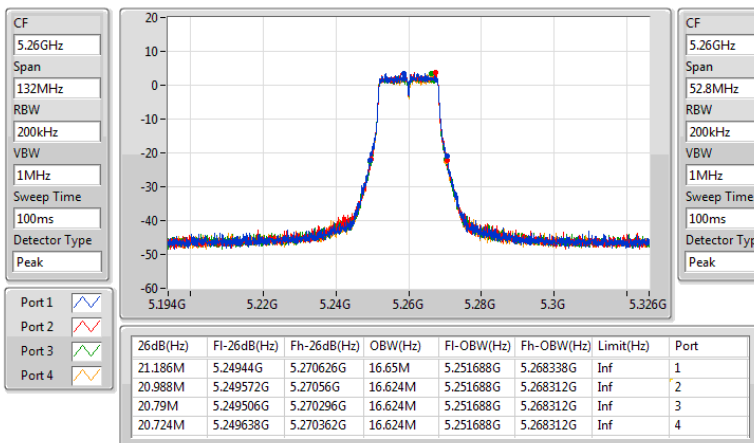
5240MHz



5.25-5.35GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

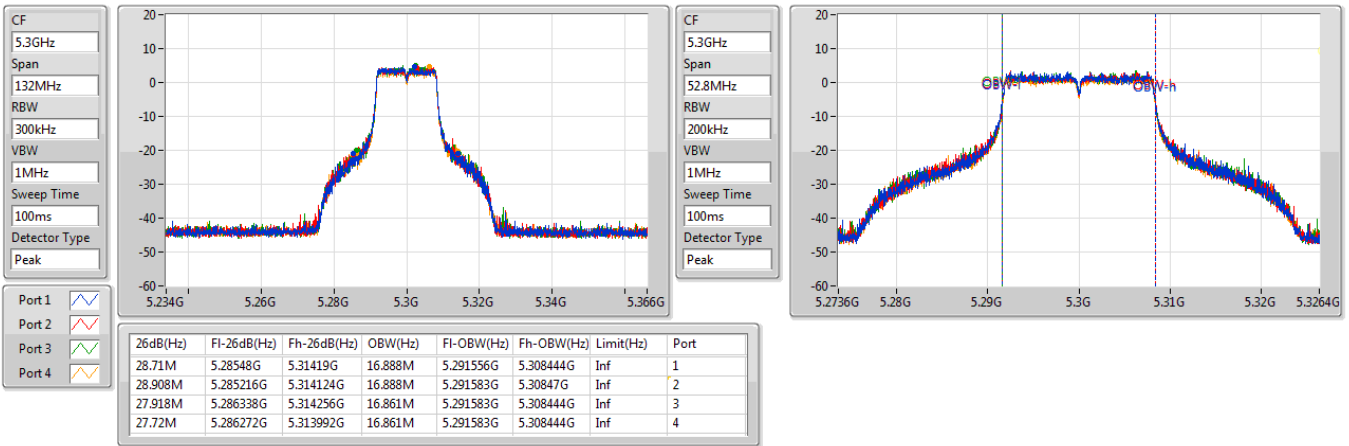
5260MHz



5.25-5.35GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

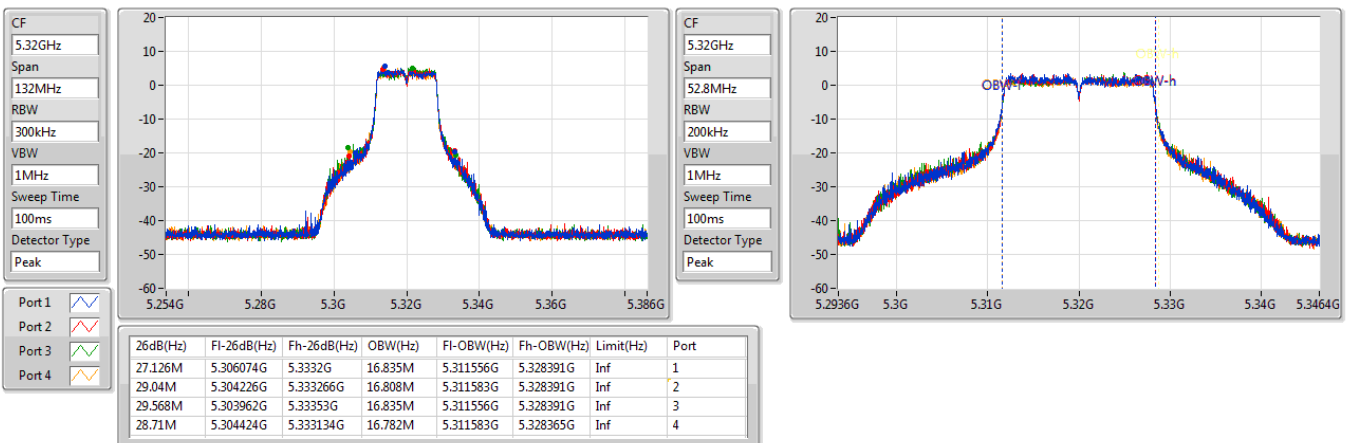
5300MHz



5.25-5.35GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5320MHz

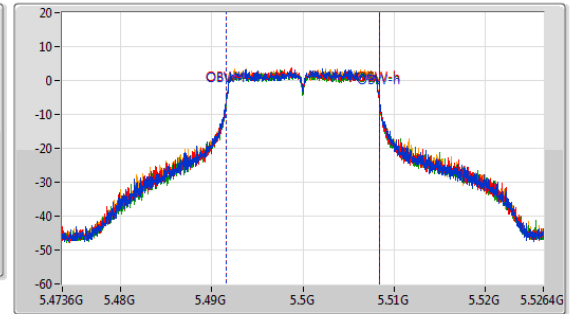
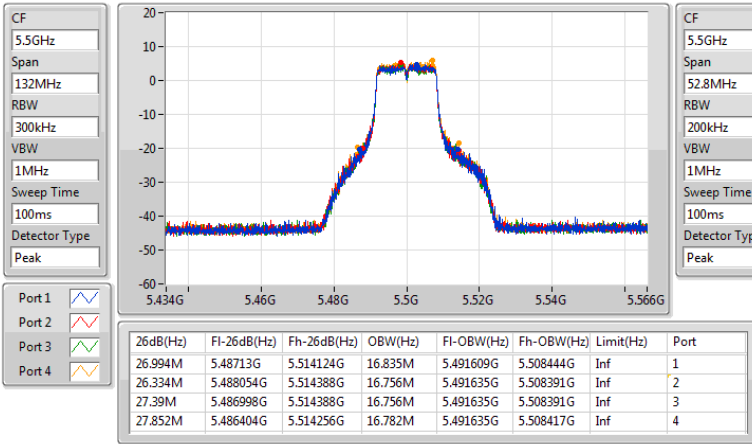




5.47-5.725GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

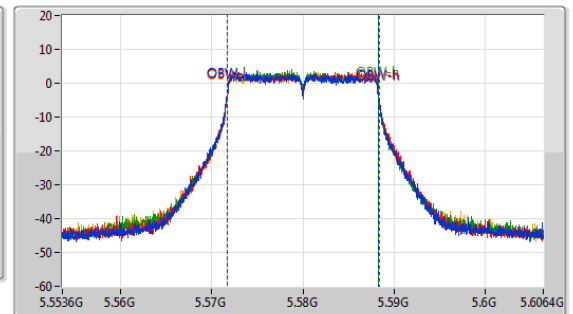
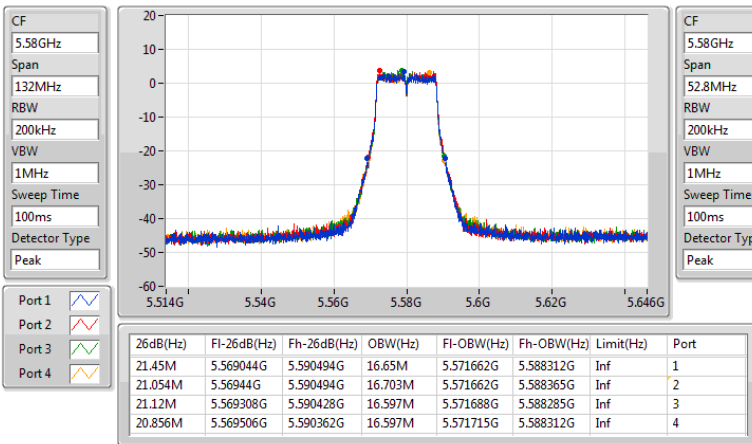
5500MHz



5.47-5.725GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5580MHz

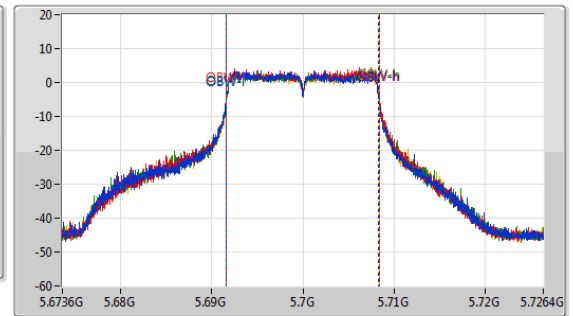
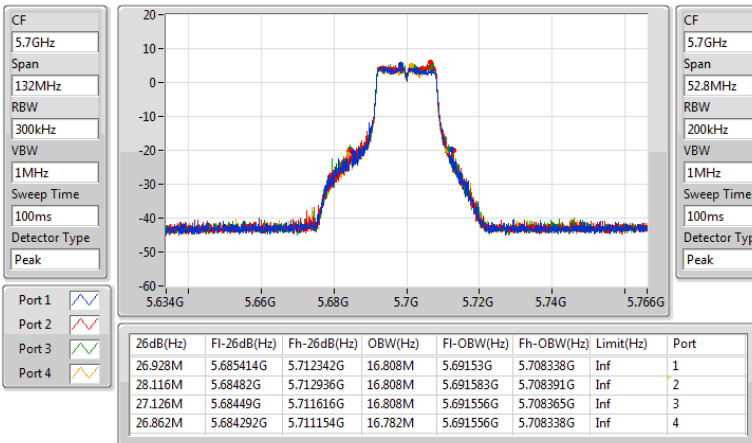




5.47-5.725GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

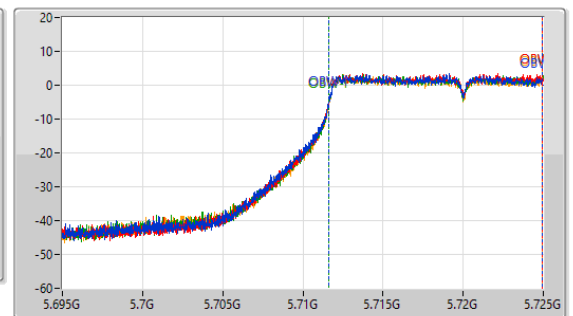
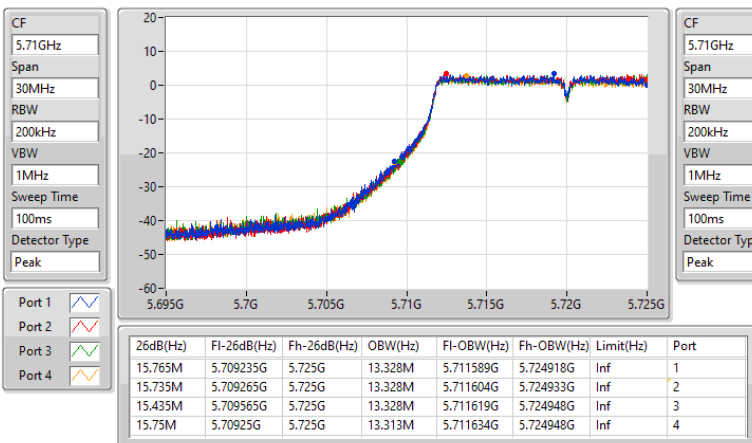
5700MHz



5.47-5.725GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

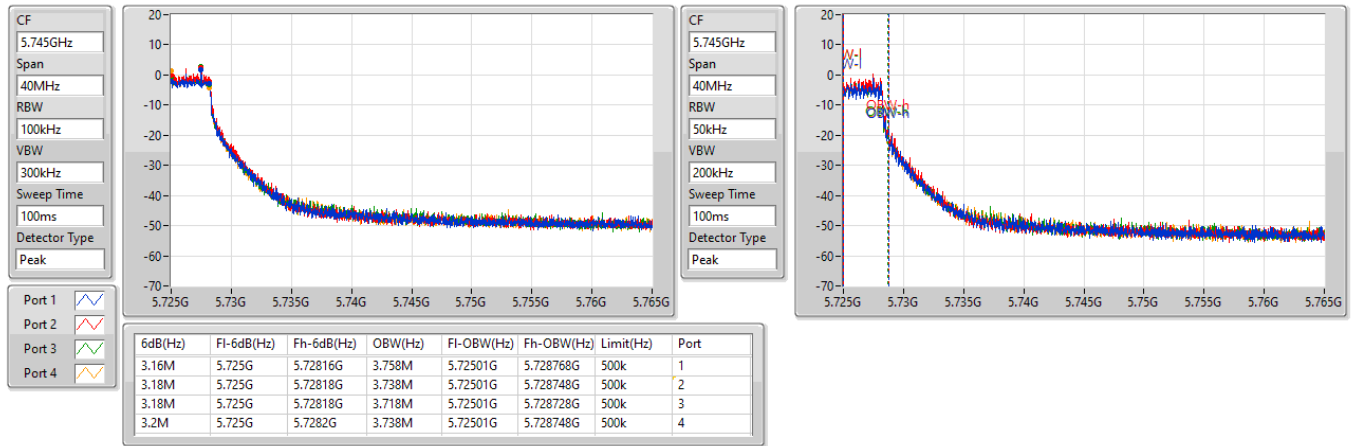
5720MHz Straddle 5.47-5.725GHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

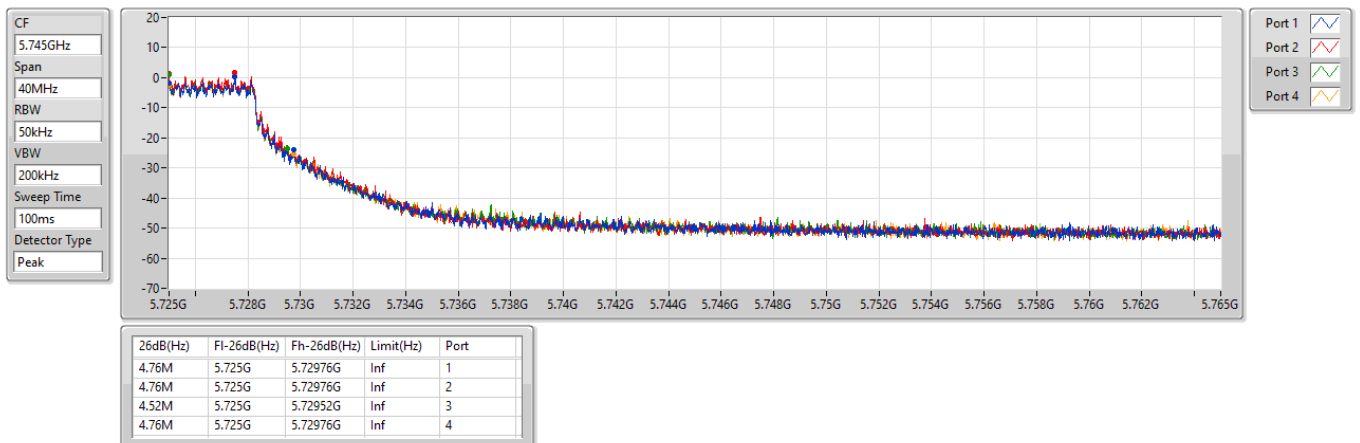
5720MHz Straddle 5.725-5.85GHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5720MHz Straddle 5.725-5.85GHz

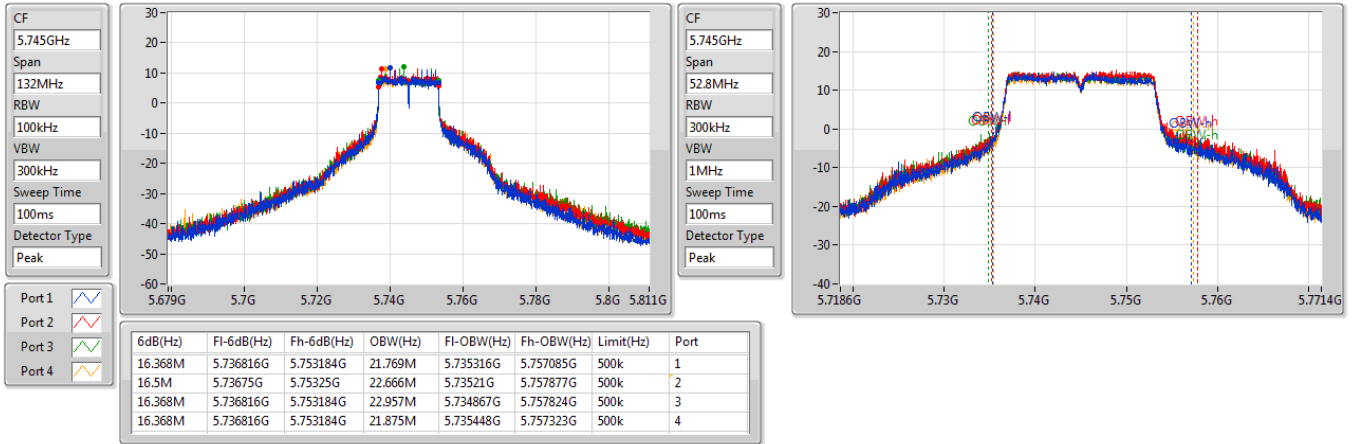




5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

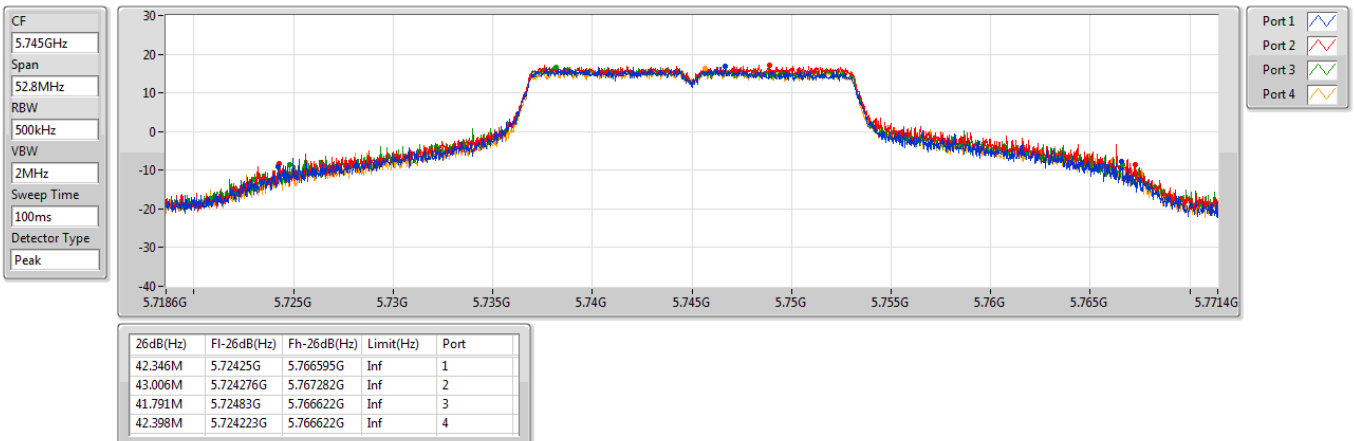
5745MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5745MHz

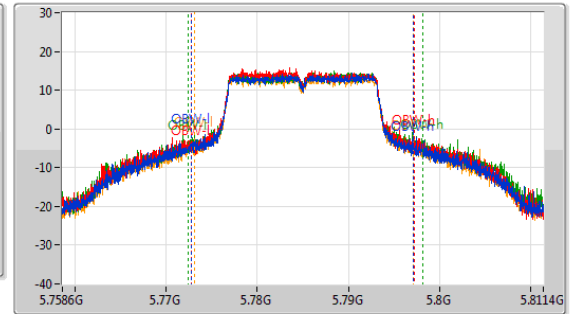
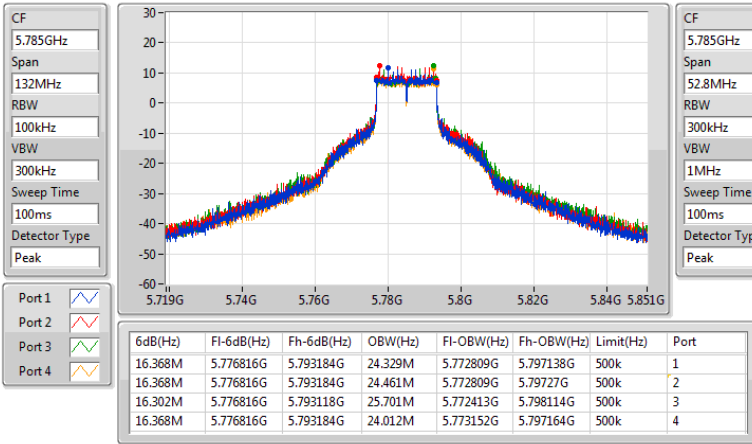




5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

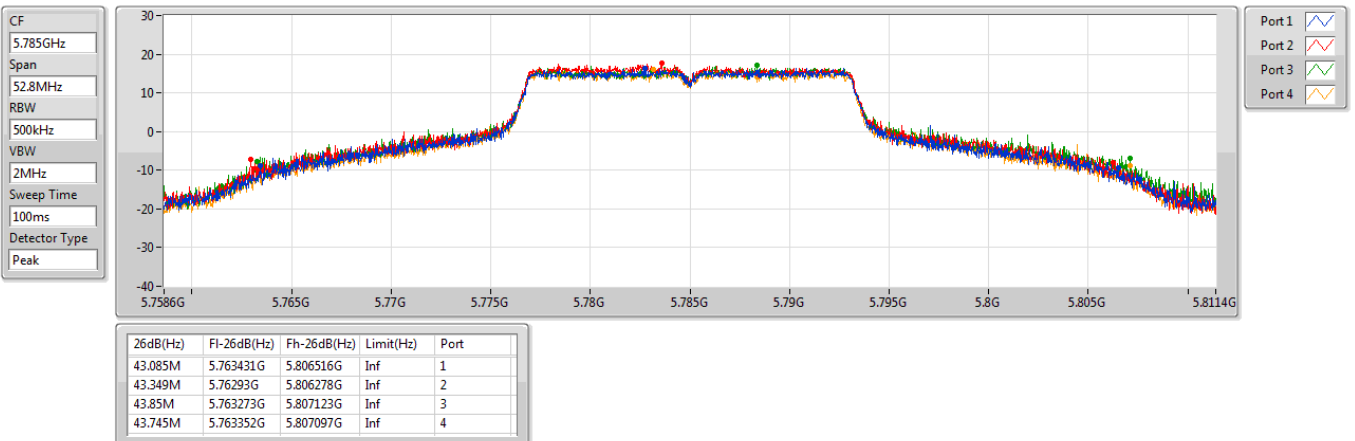
5785MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5785MHz

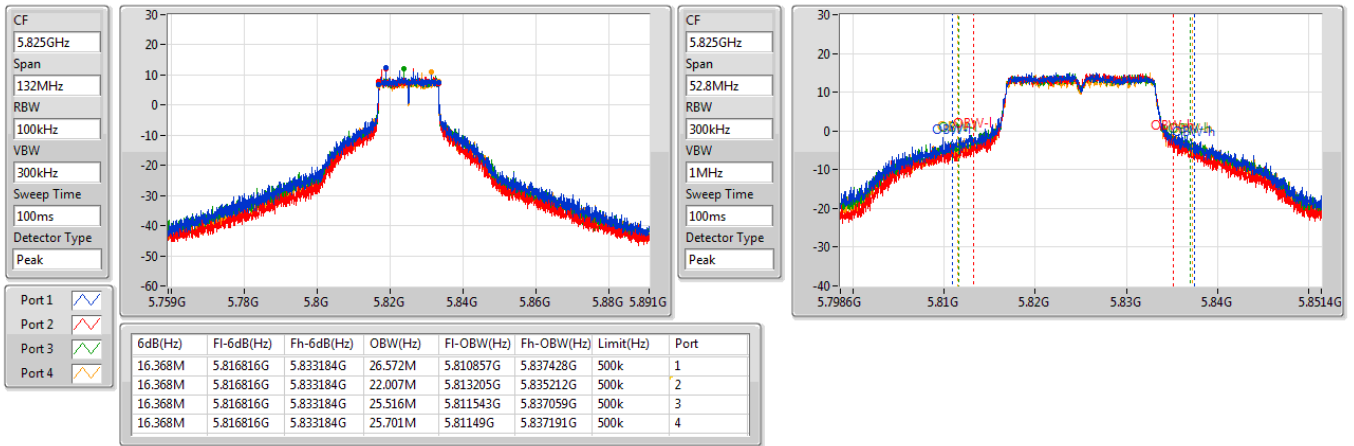




5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

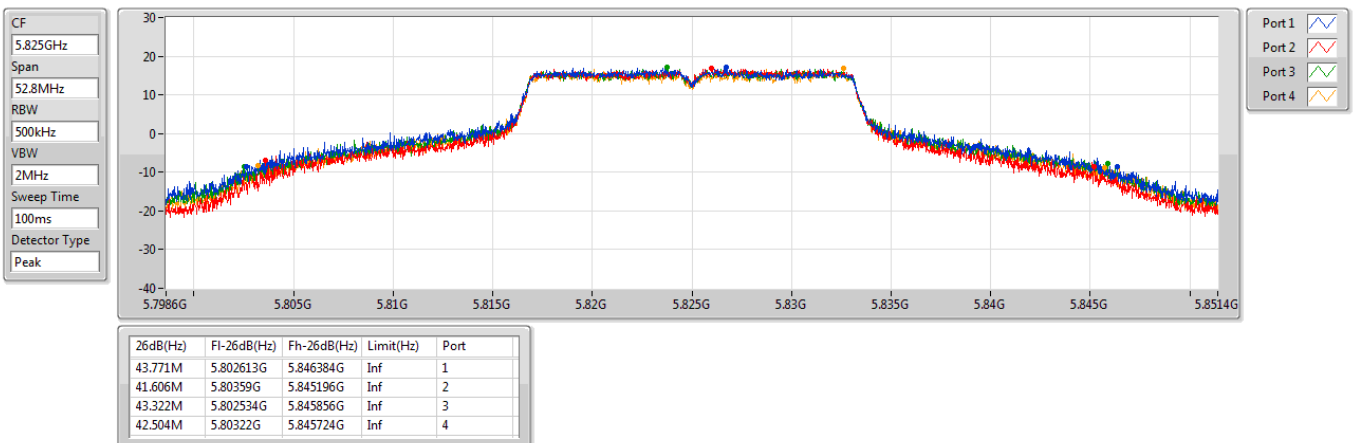
5825MHz



5.725-5.85GHz_802.11a_Nss1,(6Mbps)_4TX

EBW

5825MHz

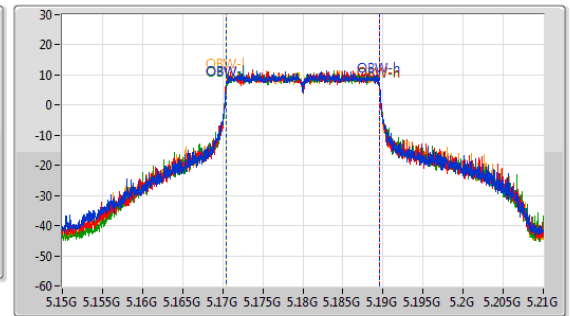
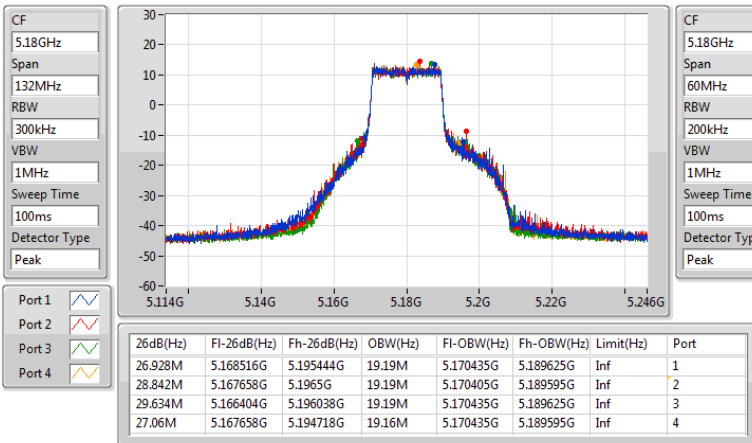




5.15-5.25GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

EBW

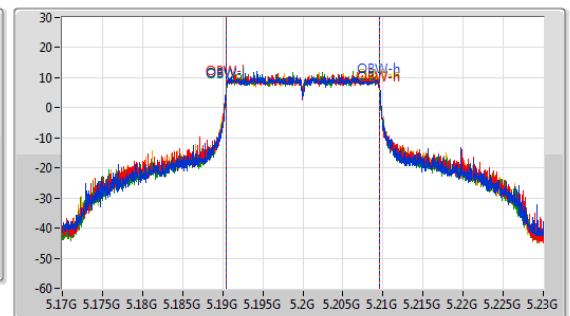
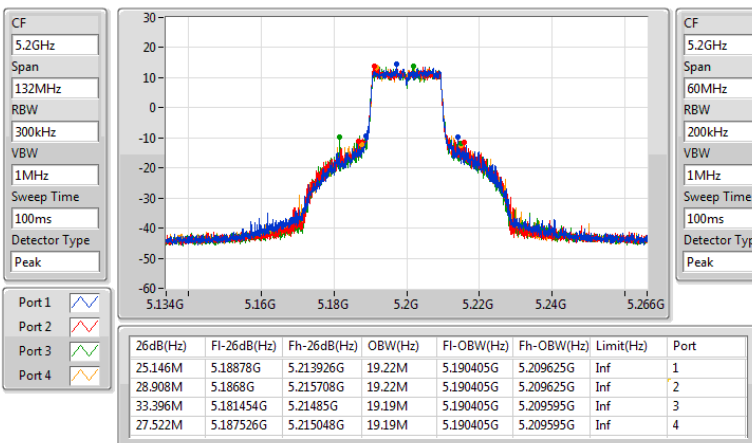
5180MHz



5.15-5.25GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

EBW

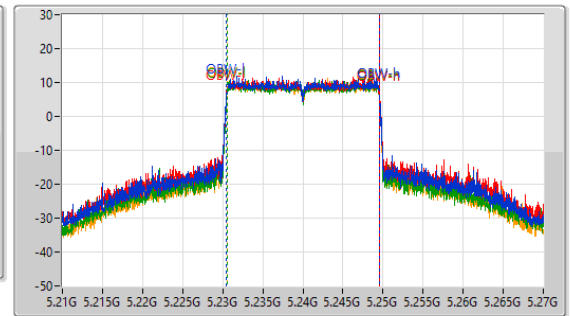
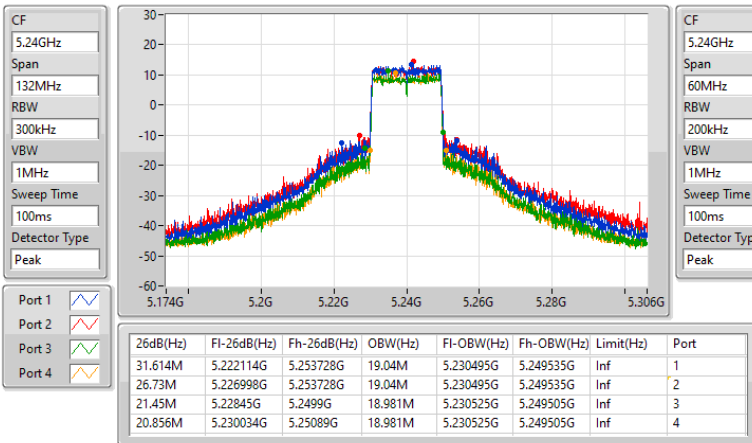
5200MHz



5.15-5.25GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

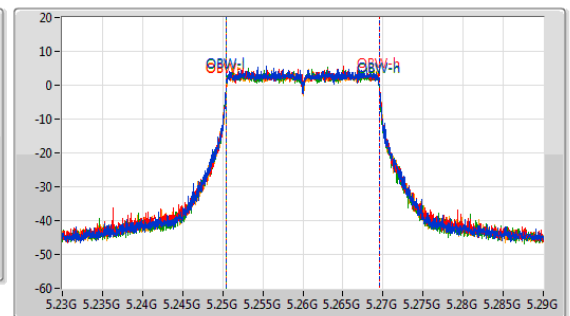
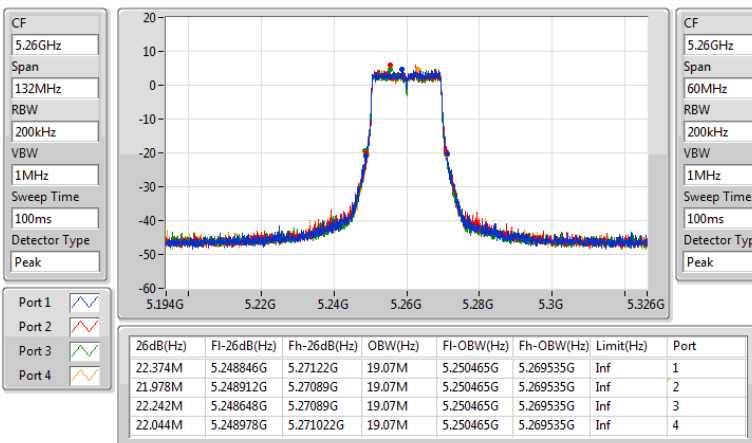
5240MHz



5.25-5.35GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

5260MHz

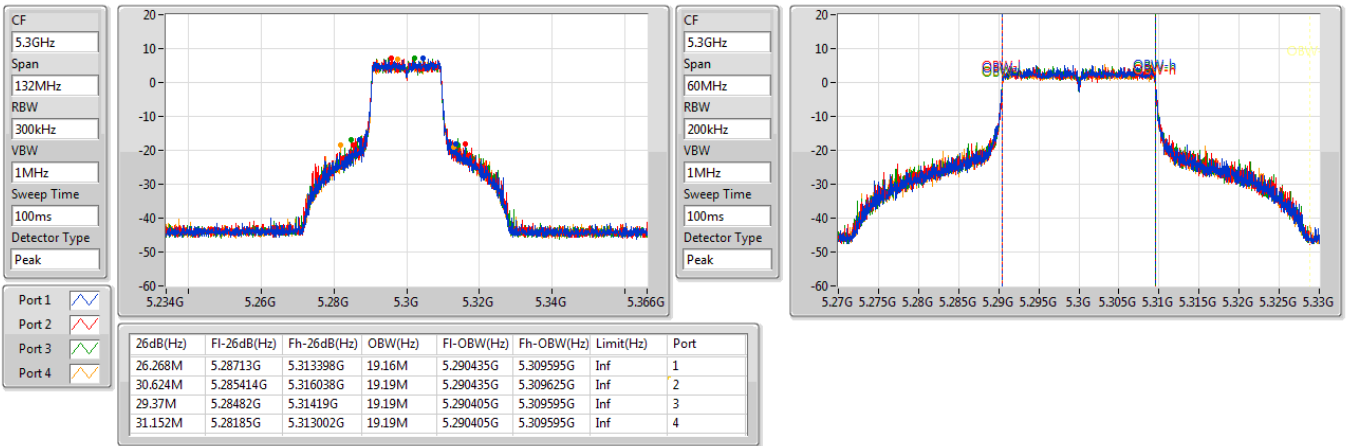




5.25-5.35GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

EBW

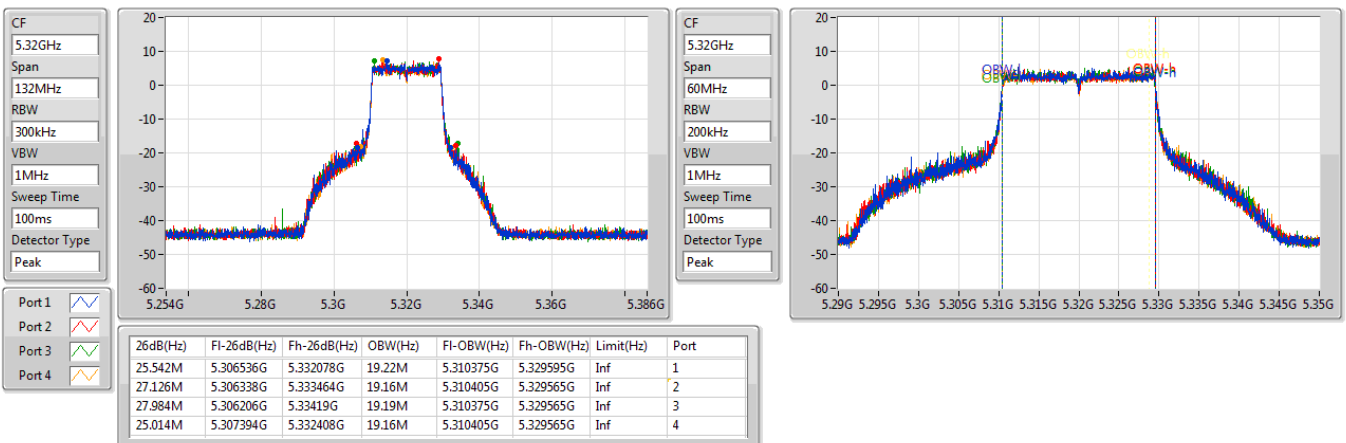
5300MHz



5.25-5.35GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

EBW

5320MHz

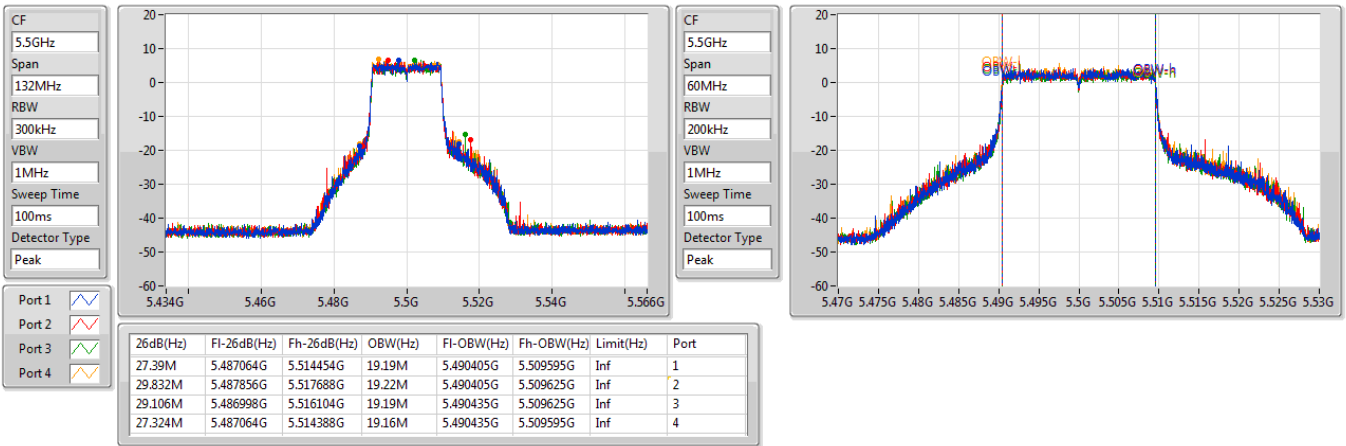




5.47-5.725GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

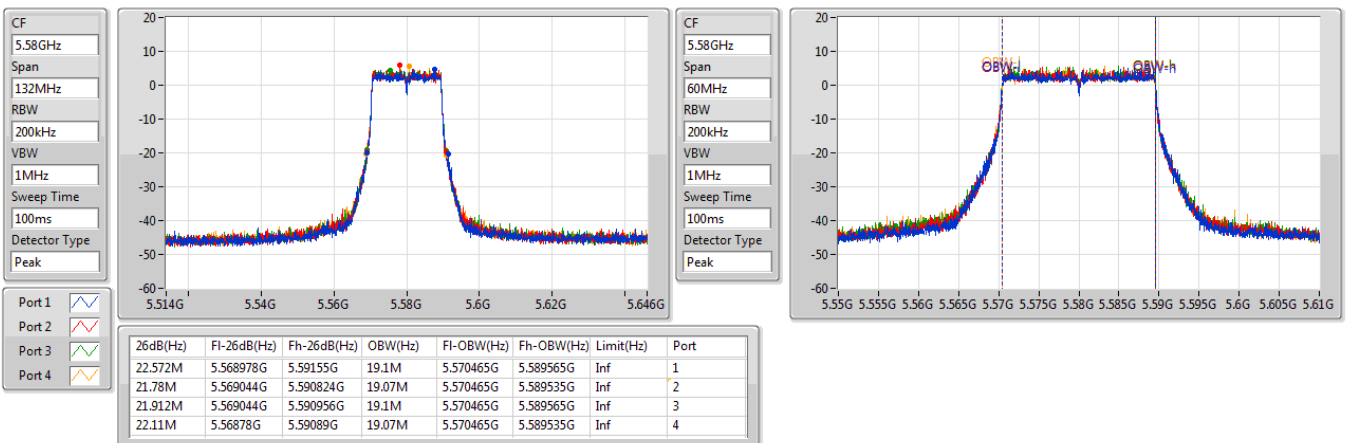
5500MHz



5.47-5.725GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

5580MHz

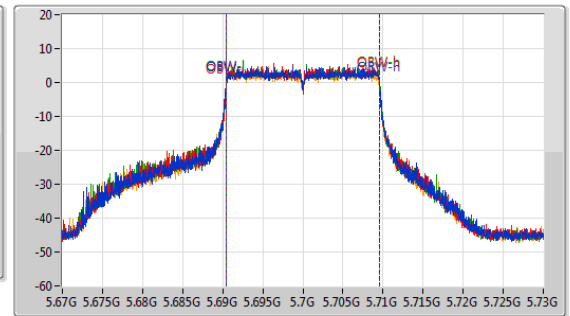
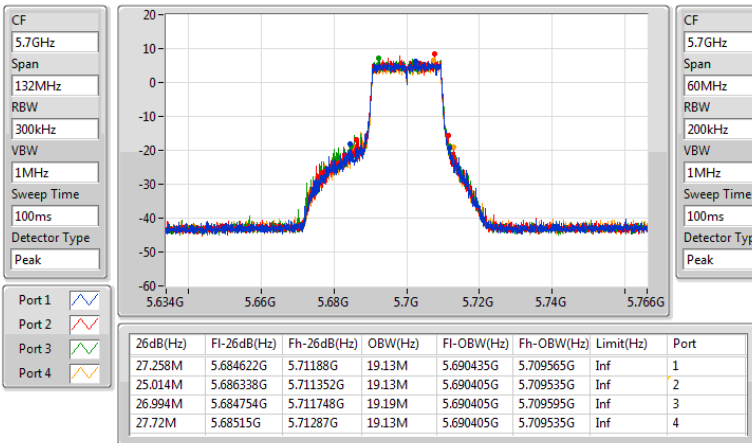




5.47-5.725GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

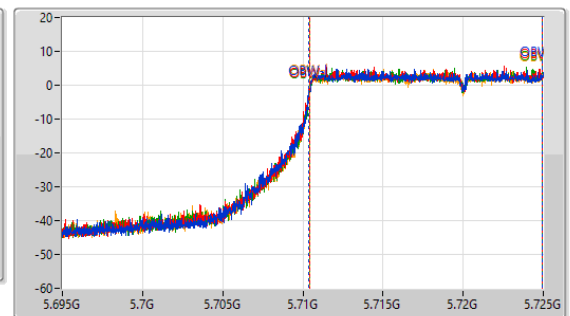
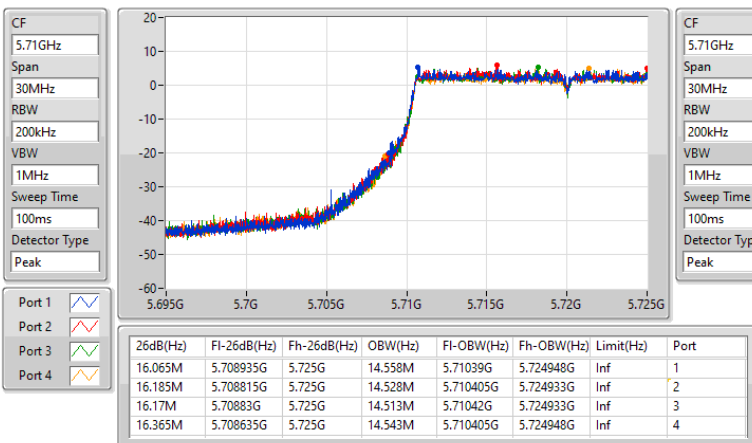
5700MHz



5.47-5.725GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

5720MHz Straddle 5.47-5.725GHz

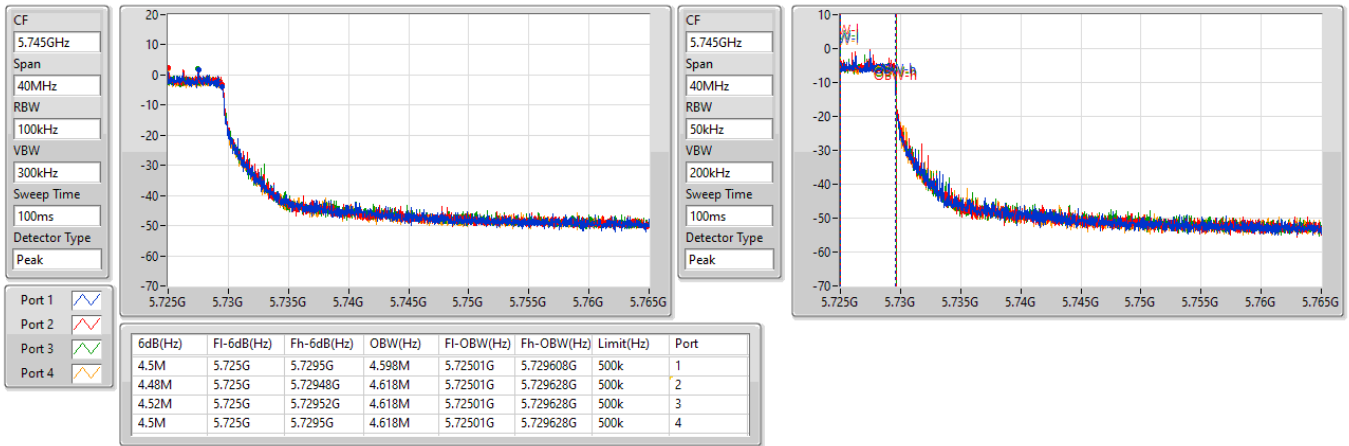




5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

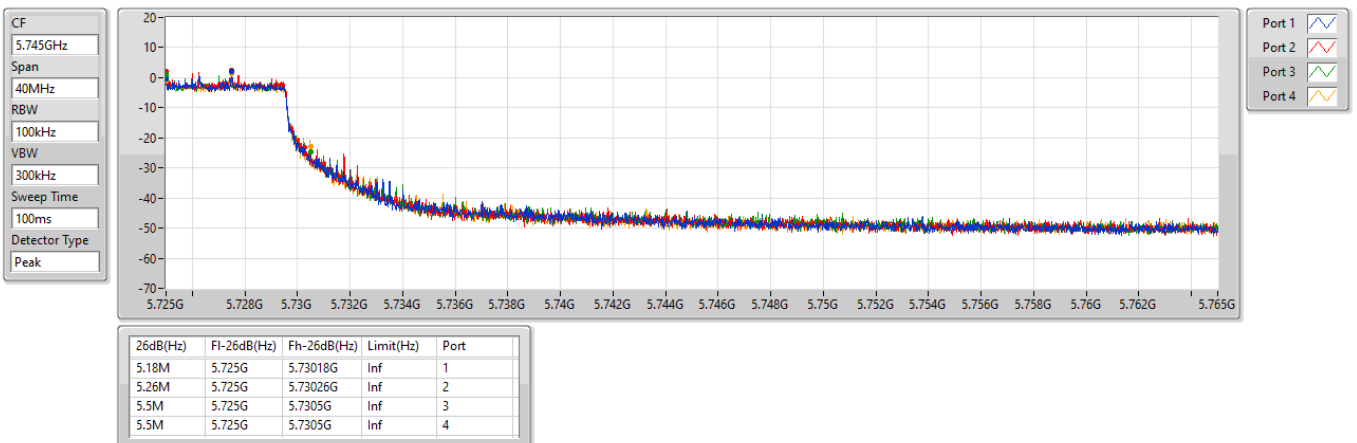
5720MHz Straddle 5.725-5.85GHz



5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

5720MHz Straddle 5.725-5.85GHz

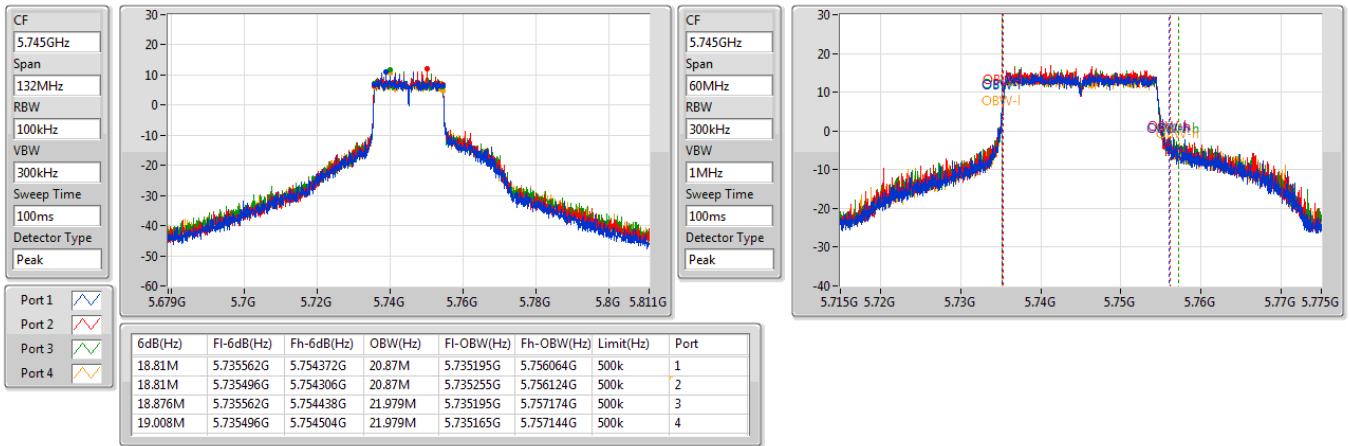




5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

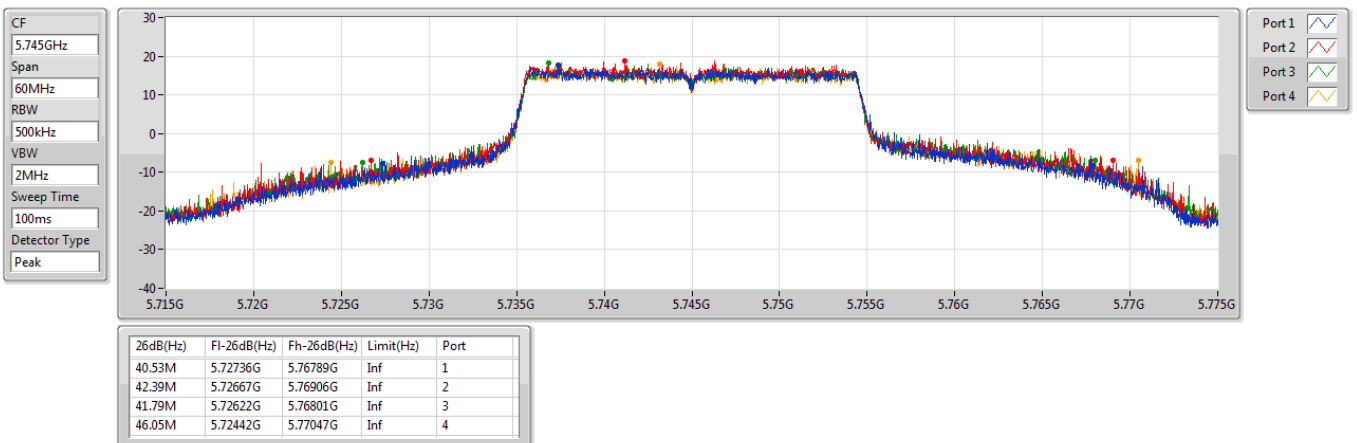
5745MHz



5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

5745MHz

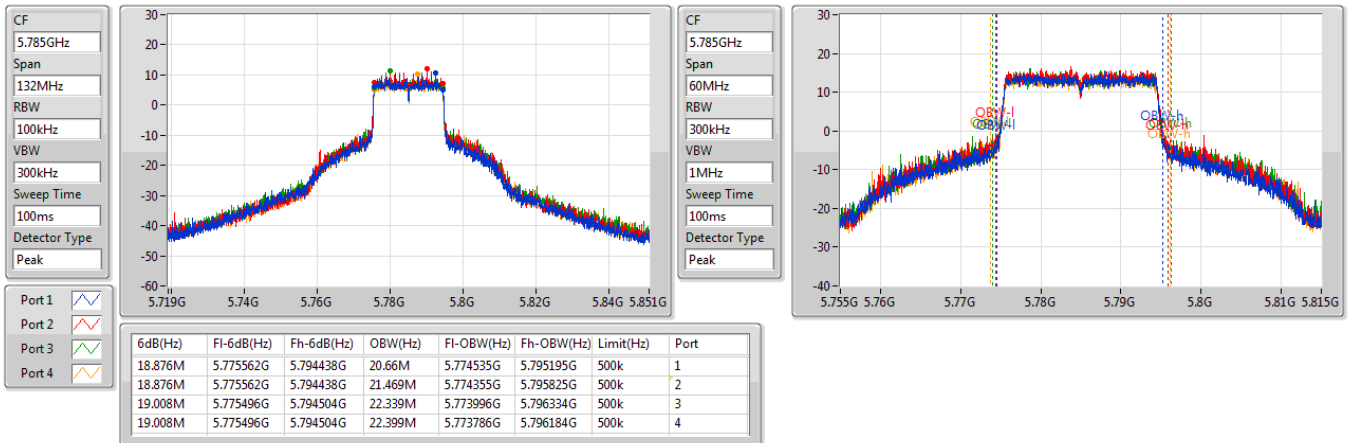




5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

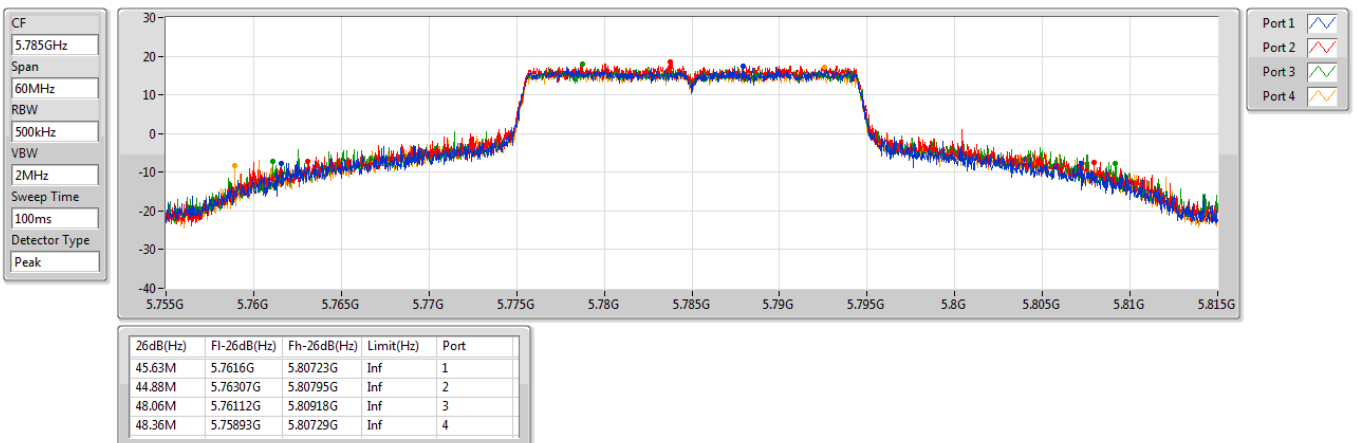
5785MHz



5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

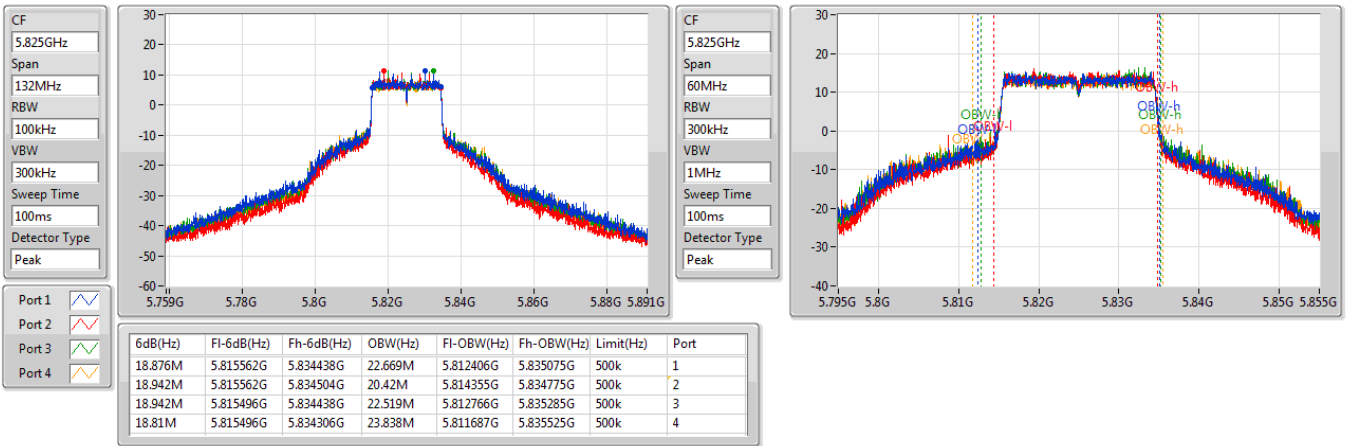
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5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

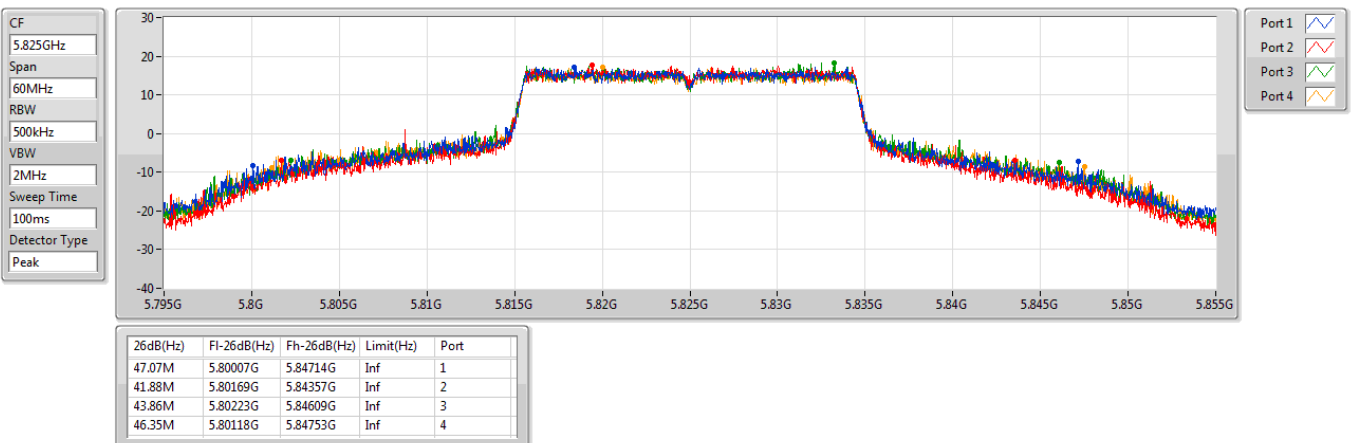
5825MHz



5.725-5.85GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

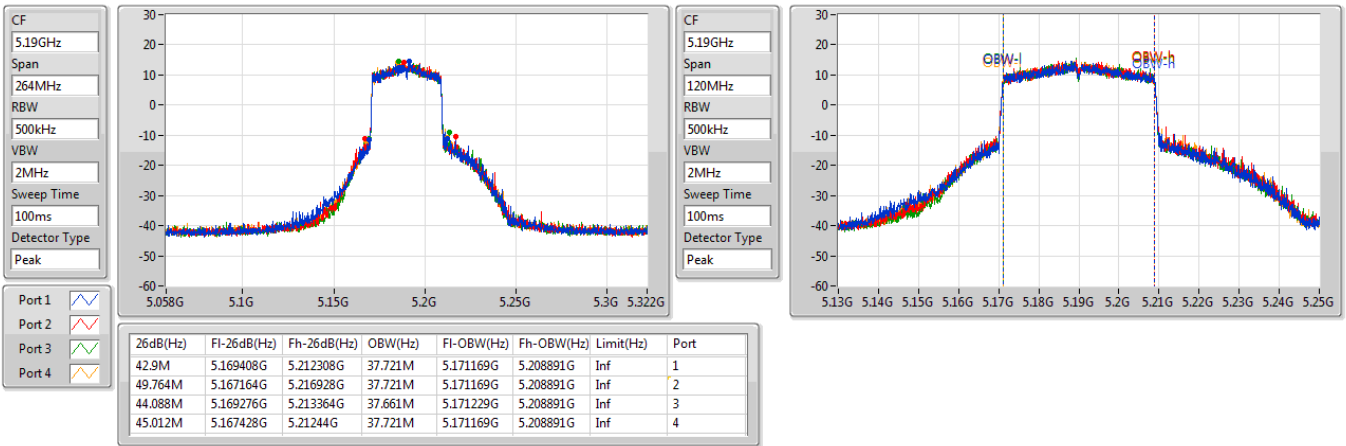
5825MHz



5.15-5.25GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

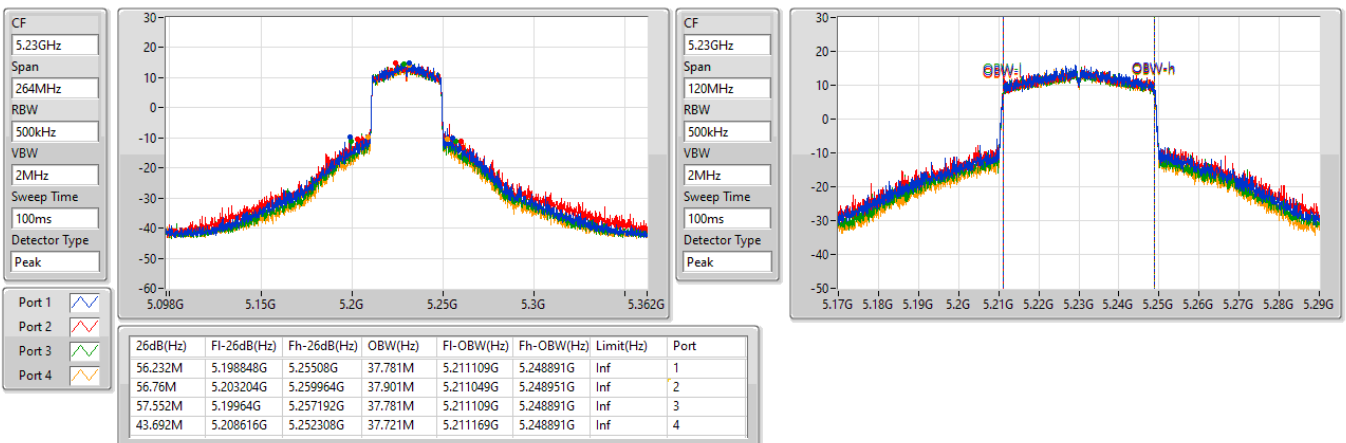
5190MHz



5.15-5.25GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

5230MHz

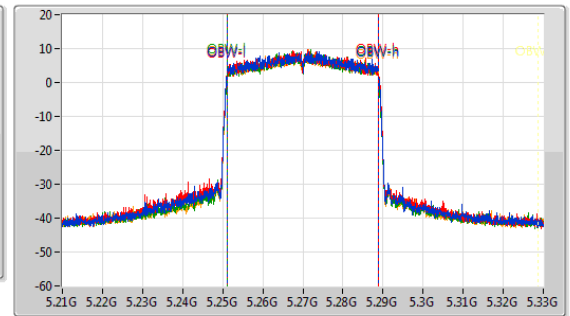
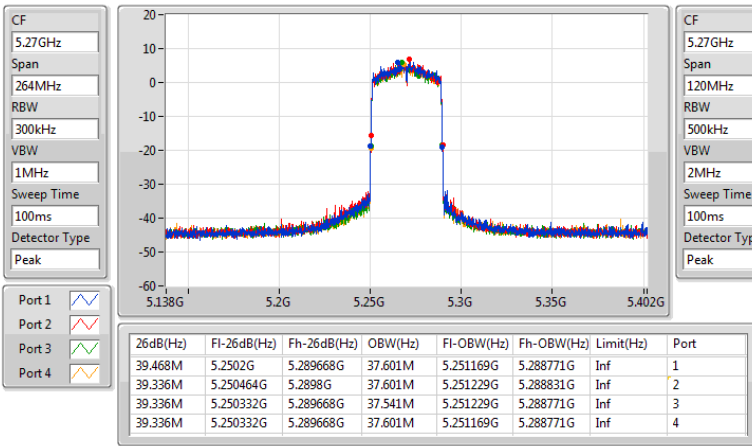




5.25-5.35GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

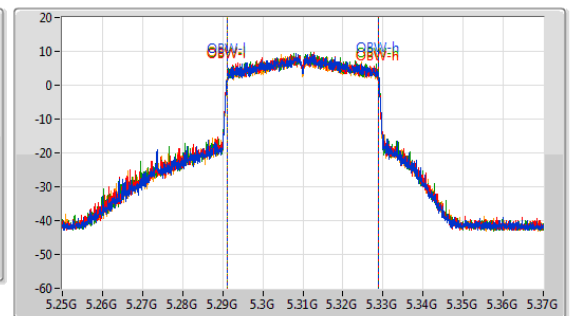
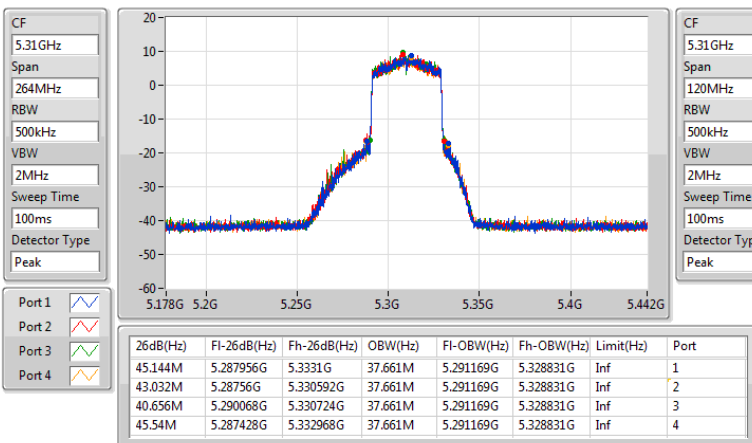
5270MHz



5.25-5.35GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

5310MHz

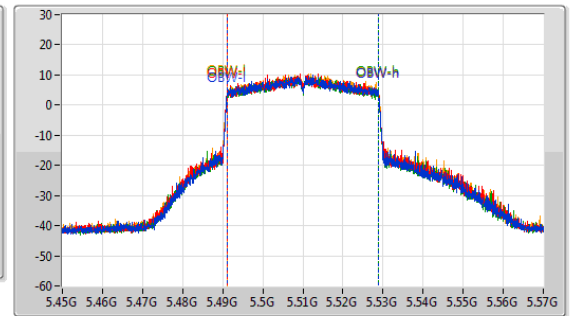
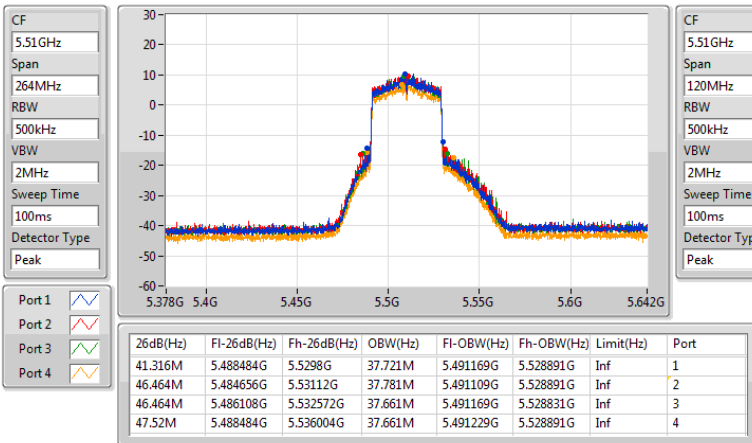




5.47-5.725GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

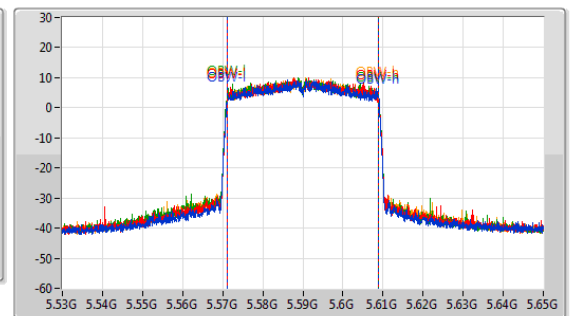
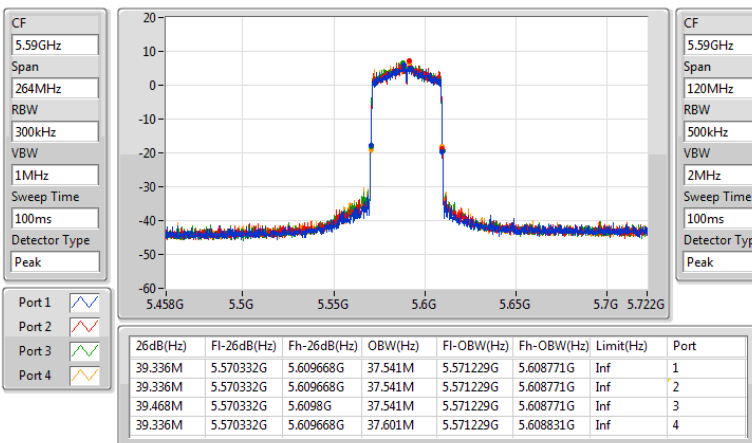
5510MHz



5.47-5.725GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

5590MHz

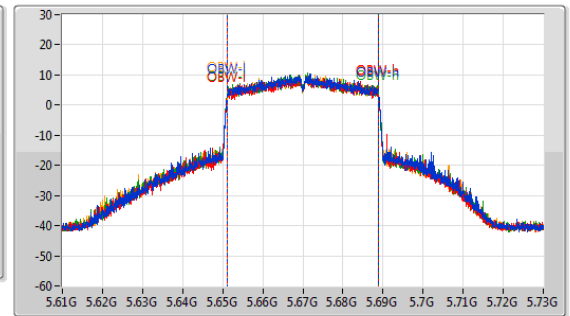
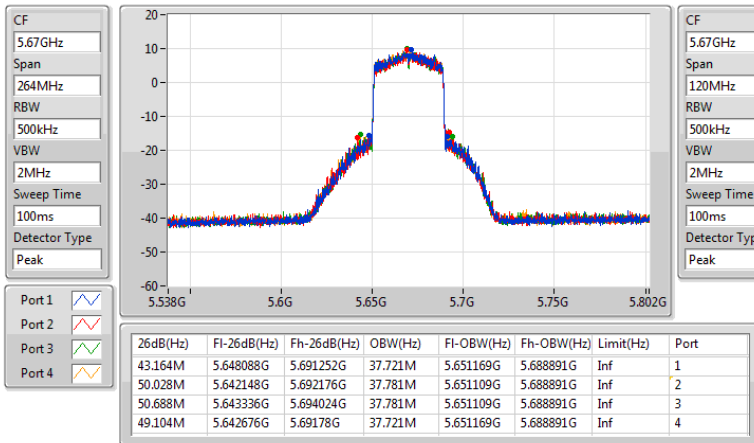




5.47-5.725GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

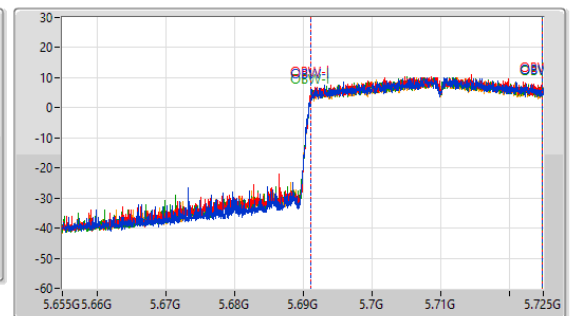
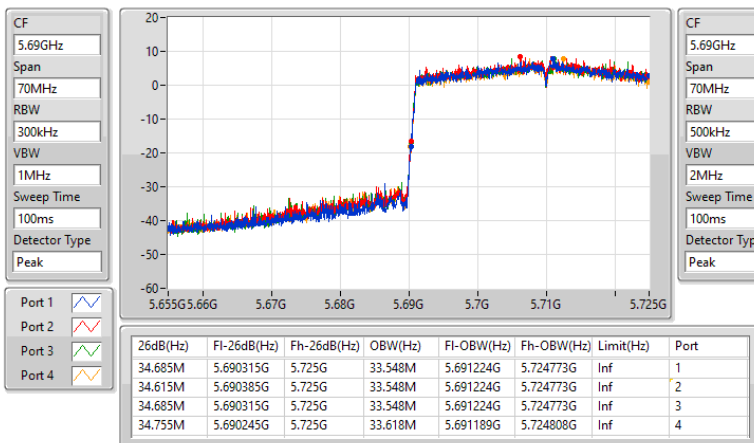
5670MHz



5.47-5.725GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

5710MHz Straddle 5.47-5.725GHz

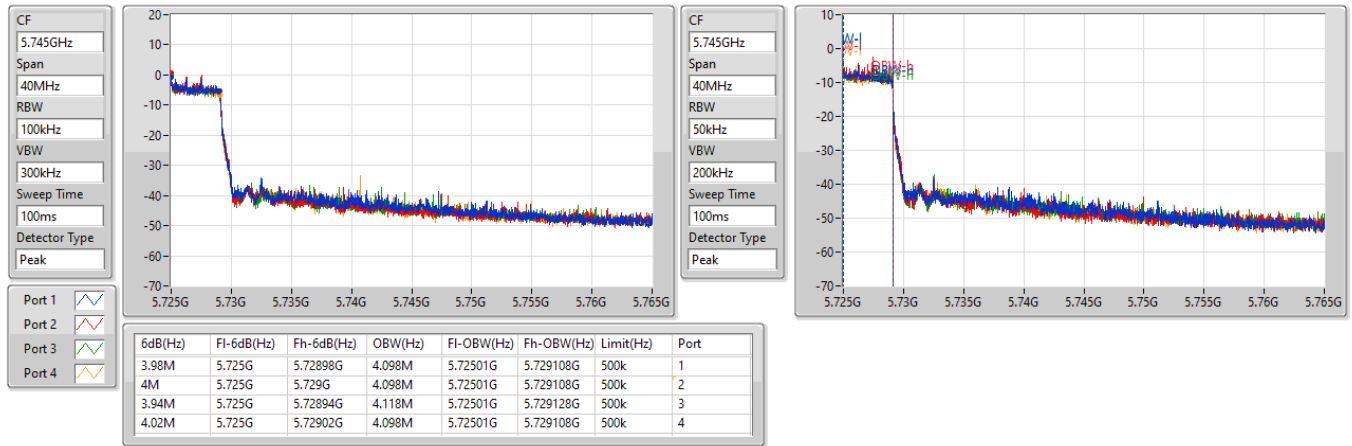




5.725-5.85GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

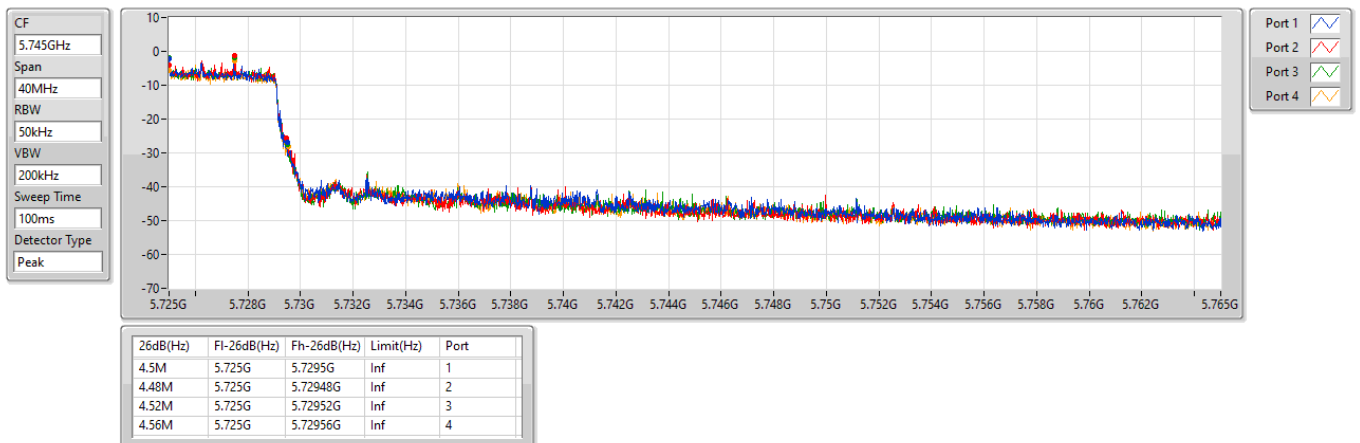
5710MHz Straddle 5.725-5.85GHz



5.725-5.85GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

5710MHz Straddle 5.725-5.85GHz

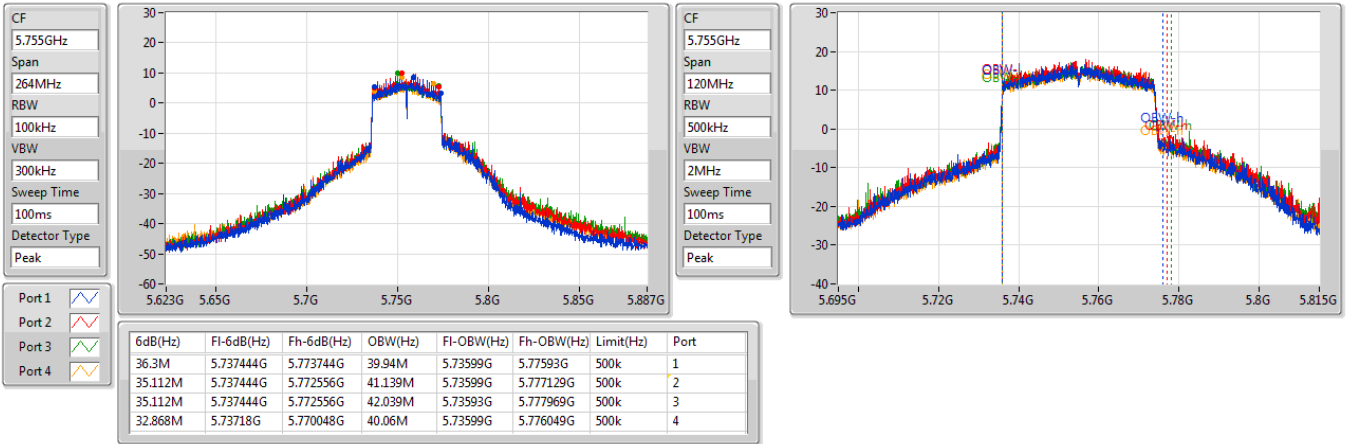




5.725-5.85GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

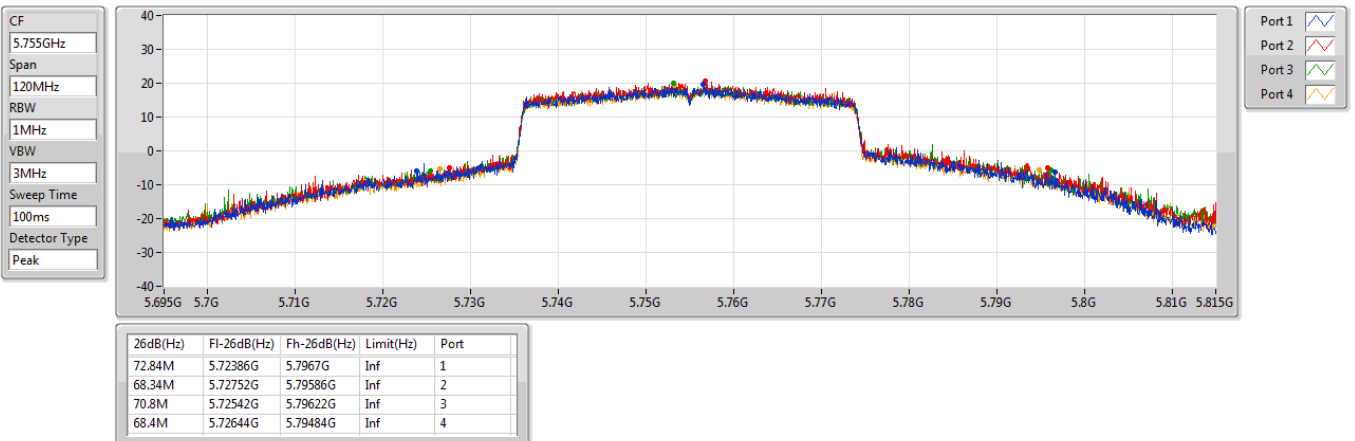
5755MHz



5.725-5.85GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

5755MHz

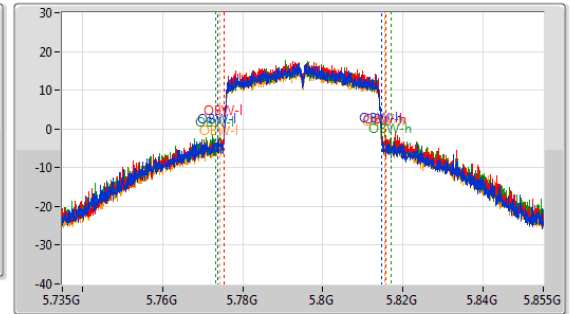
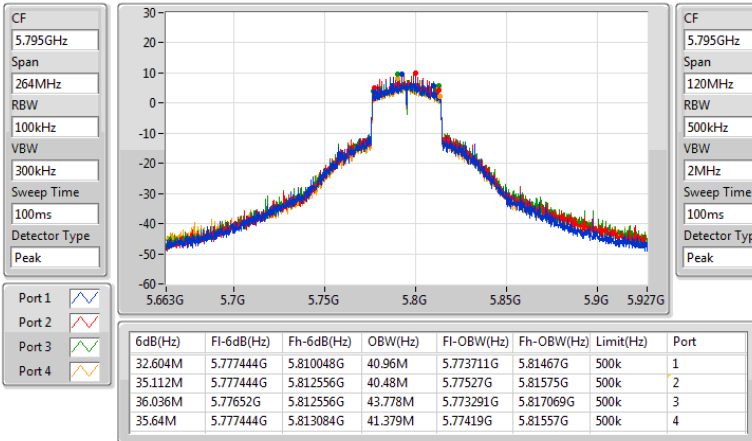




5.725-5.85GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

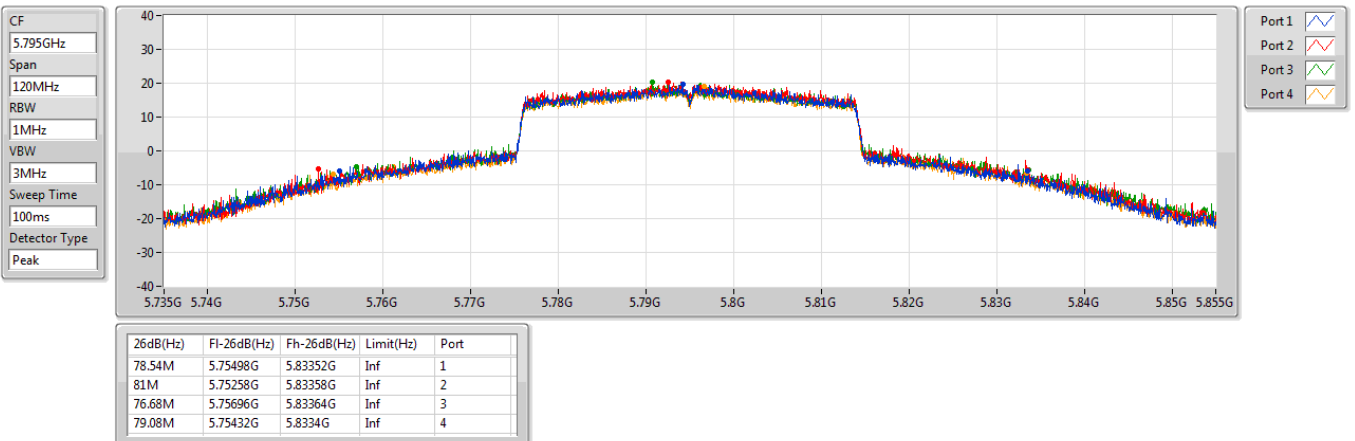
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5.725-5.85GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

EBW

5795MHz

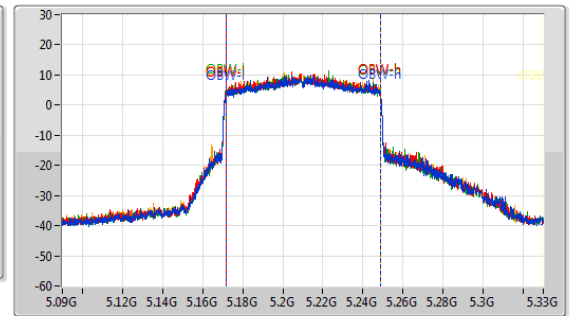
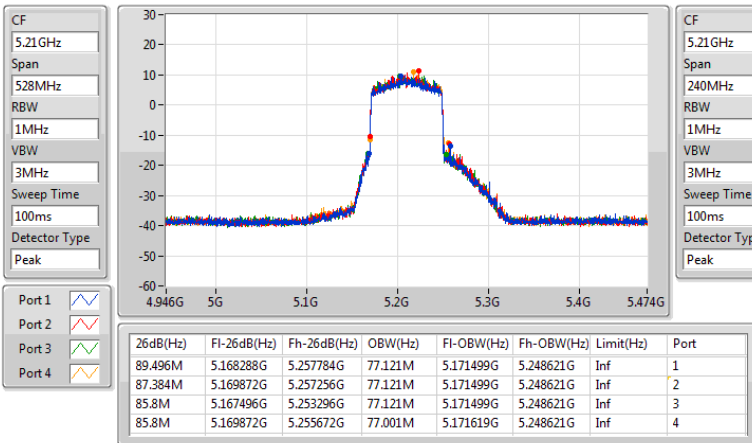




5.15-5.25GHz_802.11ax_HEW80_Nss1,(MCS0)_4TX

EBW

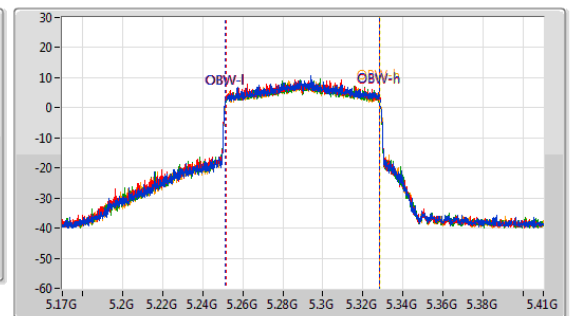
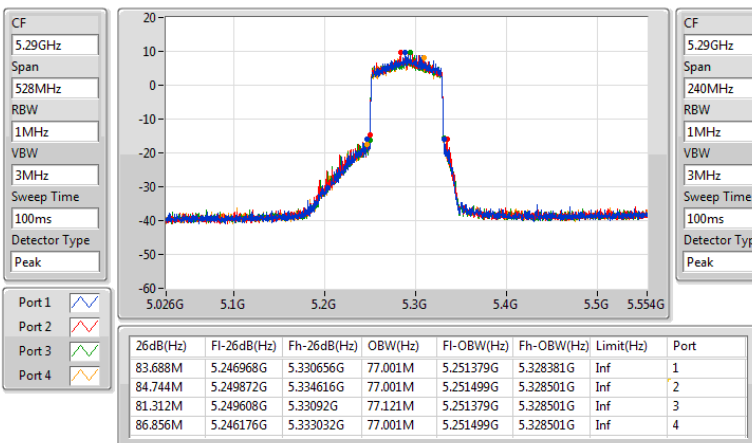
5210MHz



5.25-5.35GHz_802.11ax_HEW80_Nss1,(MCS0)_4TX

EBW

5290MHz

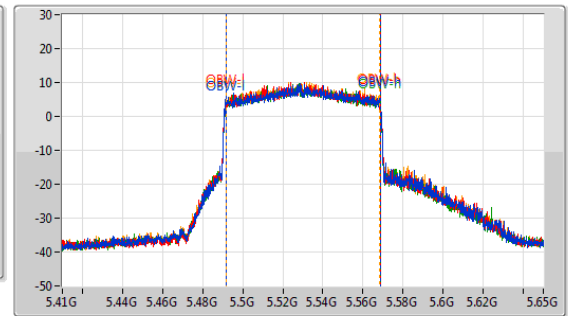
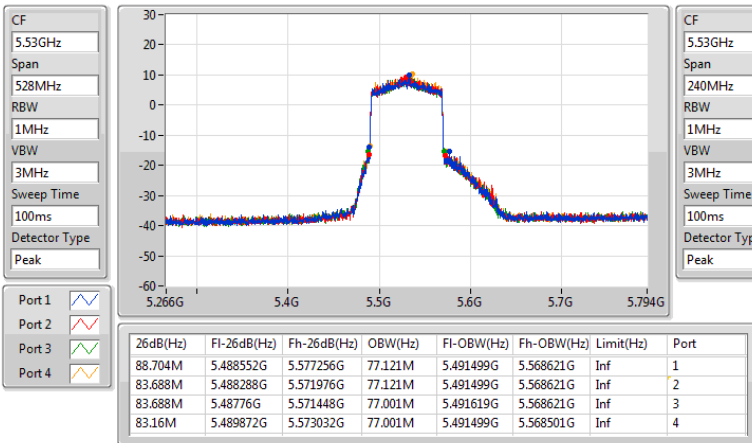




5.47-5.725GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

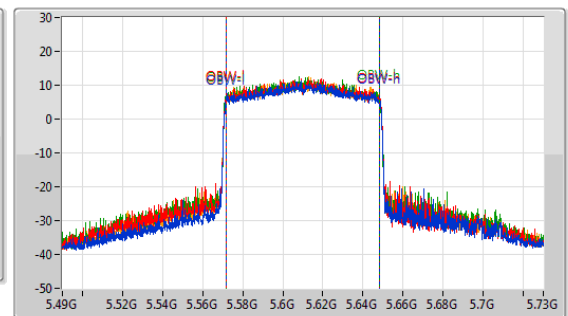
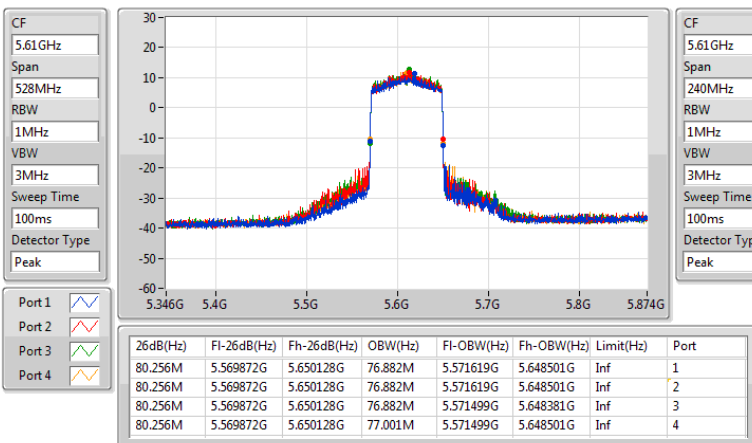
5530MHz



5.47-5.725GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

5610MHz

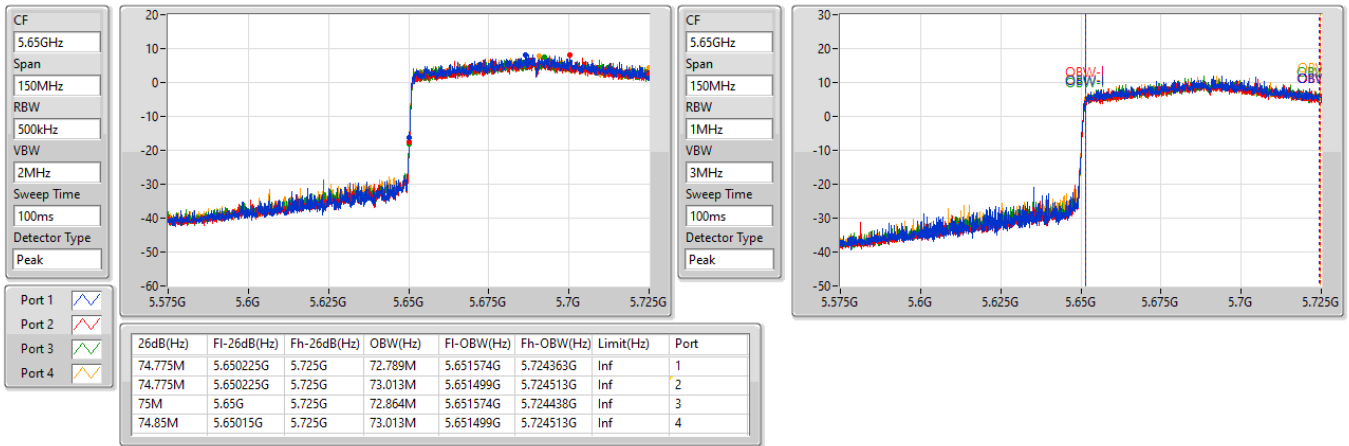




5.47-5.725GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

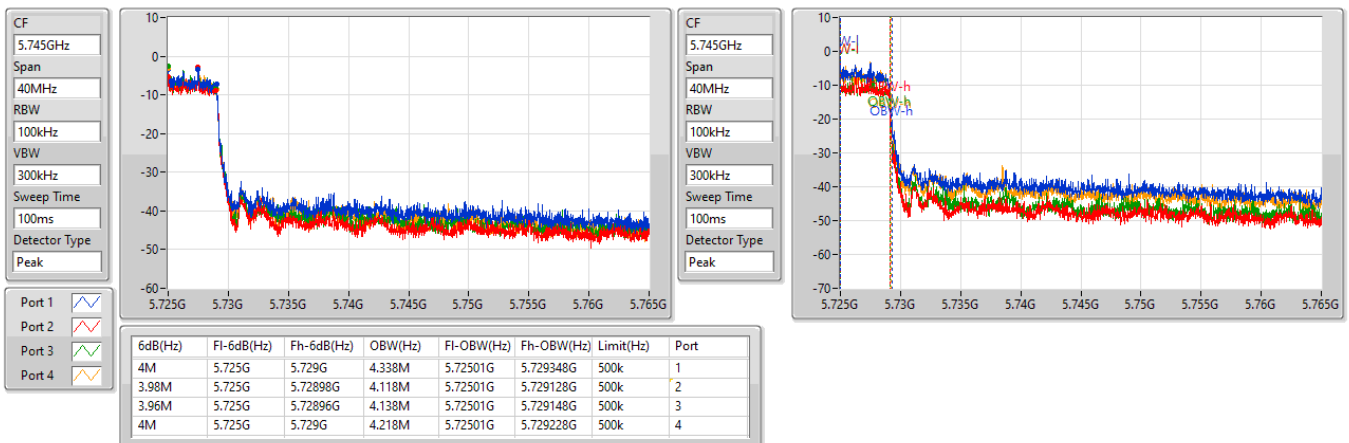
5690MHz Straddle 5.47-5.725GHz



5.725-5.85GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

5690MHz Straddle 5.725-5.85GHz

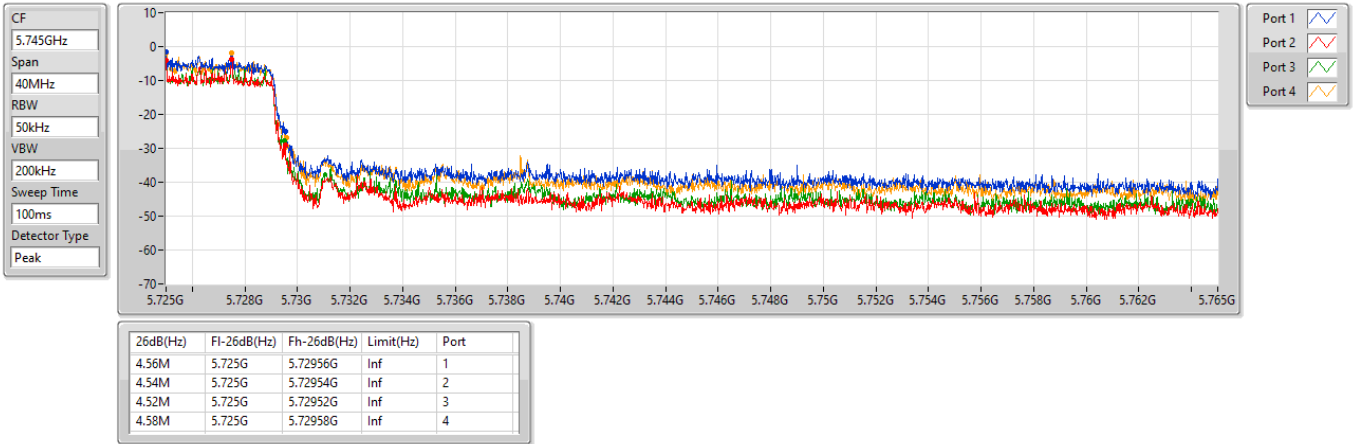




5.725-5.85GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

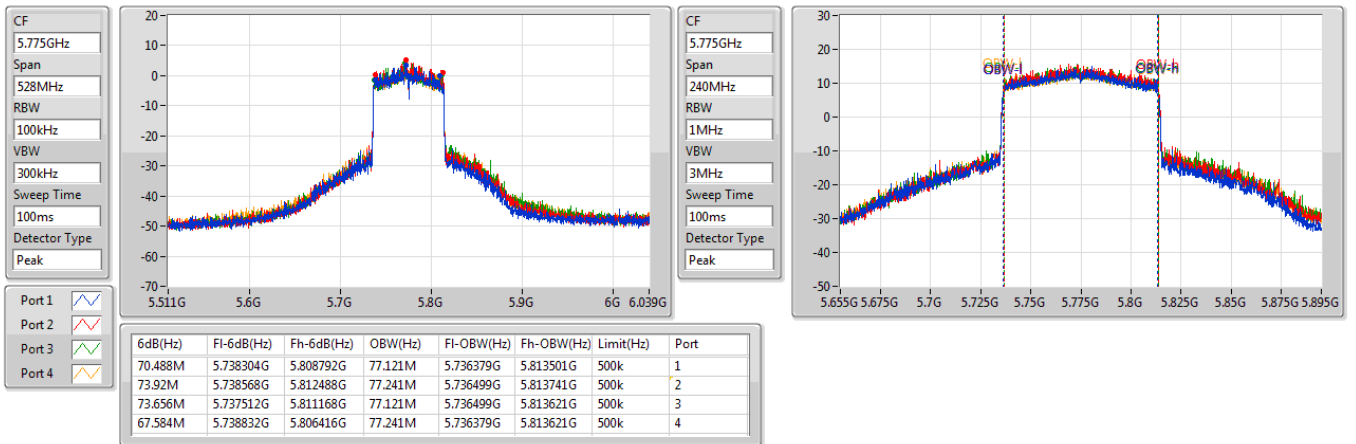
5690MHz Straddle 5.725-5.85GHz



5.725-5.85GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

5775MHz



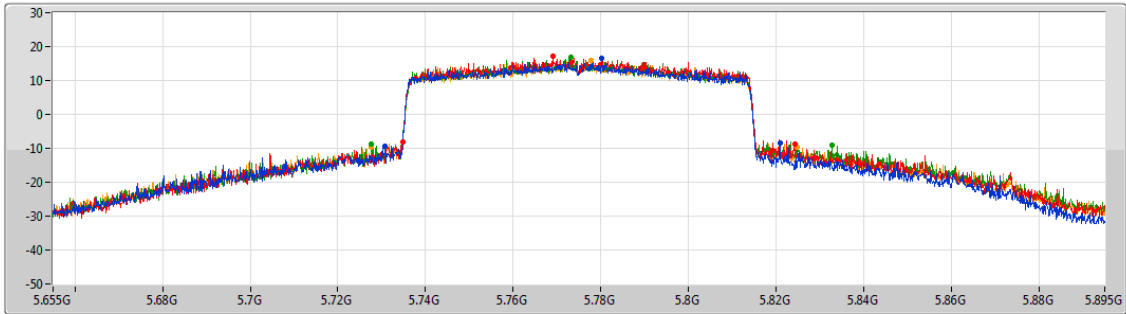


5.725-5.85GHz_802.11ax HEW80_Nss1,(MCS0)_4TX

EBW

5775MHz

CF
5.775GHz
Span
240MHz
RBW
2MHz
VBW
10MHz
Sweep Time
100ms
Detector Type
Peak



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	Limit(Hz)	Port
90M	5.73084G	5.82084G	Inf	1
89.52M	5.7348G	5.82432G	Inf	2
105.12M	5.72772G	5.83284G	Inf	3
97.2M	5.72772G	5.82492G	Inf	4

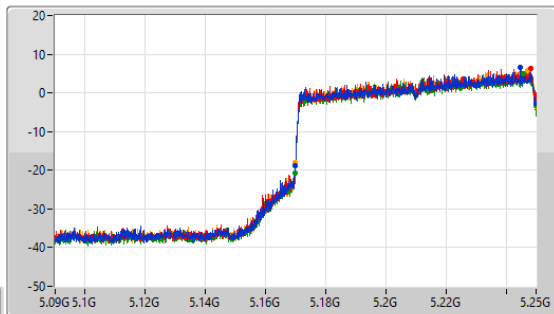
Port 1
Port 2
Port 3
Port 4

5.15-5.25GHz_802.11ax HEW160_Nss1,(MCS0)_4TX

EBW

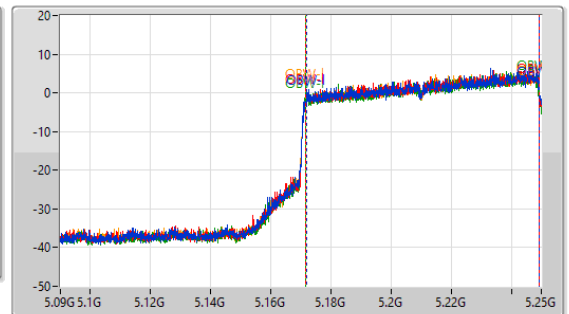
5250MHz Straddle 5.15-5.25GHz

CF
5.17GHz
Span
160MHz
RBW
1MHz
VBW
3MHz
Sweep Time
100ms
Detector Type
Peak



26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
80.08M	5.16992G	5.25G	77.481M	5.171759G	5.24924G	Inf	1
80.24M	5.16976G	5.25G	77.561M	5.171679G	5.24924G	Inf	2
80.24M	5.16976G	5.25G	77.561M	5.171599G	5.24916G	Inf	3
80.16M	5.16984G	5.25G	77.481M	5.171679G	5.24916G	Inf	4

CF
5.17GHz
Span
160MHz
RBW
1MHz
VBW
3MHz
Sweep Time
100ms
Detector Type
Peak

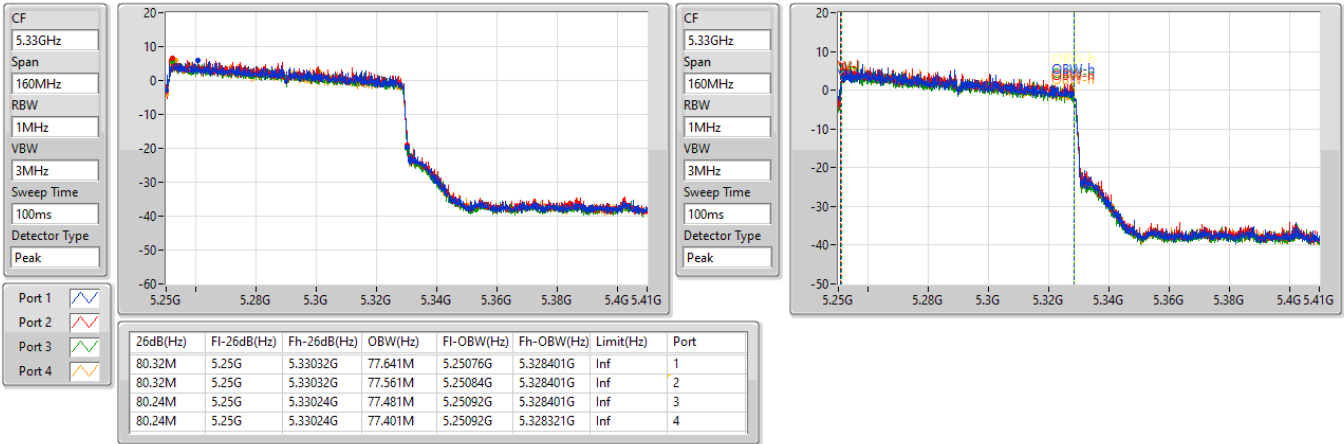




5.25-5.35GHz_802.11ax HEW160_Nss1,(MCS0)_4TX

EBW

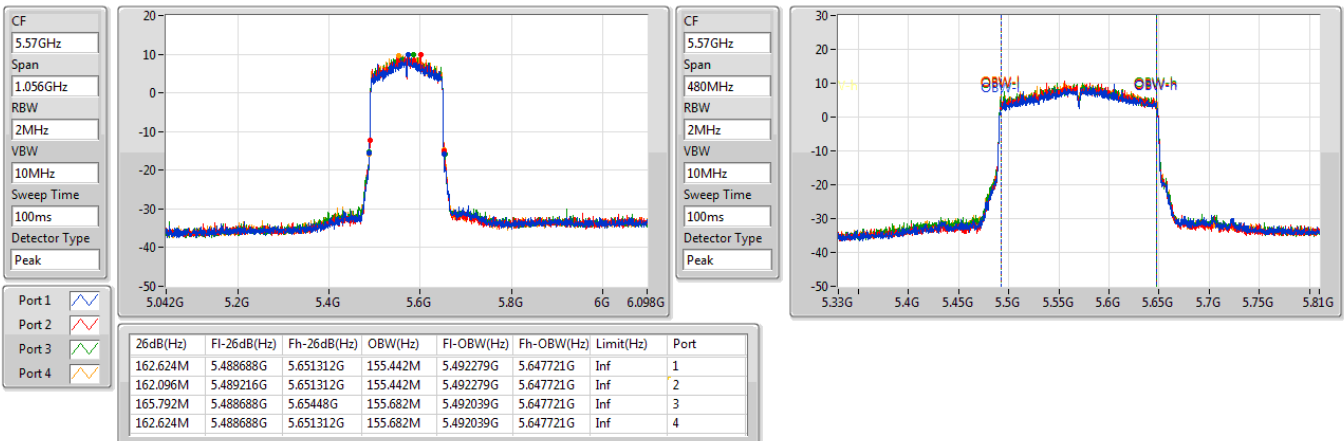
5250MHz Straddle 5.25-5.35GHz



5.47-5.725GHz_802.11ax HEW160_Nss1,(MCS0)_4TX

EBW

5570MHz



Beamforming mode
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	29.7M	19.1M	19M1D1D	19.866M	18.891M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	50.028M	37.841M	37M8D1D	39.336M	37.541M
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	100.584M	77.841M	77M8D1D	90.288M	77.361M
802.11ax HEW160-BF_Nss1,(MCS0)_4TX	80.32M	77.641M	77M6D1D	80.08M	77.401M
5.25-5.35GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	30.228M	19.13M	19M1D1D	21.45M	18.951M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	47.784M	37.781M	37M8D1D	39.204M	37.541M
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	99.792M	77.481M	77M5D1D	80.784M	77.121M
802.11ax HEW160-BF_Nss1,(MCS0)_4TX	81.84M	77.641M	77M6D1D	80.24M	77.561M
5.47-5.725GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	26.994M	19.13M	19M1D1D	15.735M	14.333M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	56.496M	37.961M	38M0D1D	34.615M	33.513M
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	94.776M	77.481M	77M5D1D	74.7M	72.864M
802.11ax HEW160-BF_Nss1,(MCS0)_4TX	166.32M	156.402M	156MD1D	162.624M	155.682M
5.725-5.85GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	18.942M	19.1M	19M1D1D	4.46M	4.558M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	38.016M	38.021M	38M0D1D	3.96M	4.078M
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	77.88M	77.601M	77M6D1D	3.88M	4.098M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Max-OBW = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Minimum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth



Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	24.156M	19.1M	28.446M	19.04M	26.136M	19.07M	29.7M	19.07M
5200MHz	Pass	Inf	28.116M	19.1M	29.106M	19.07M	26.268M	19.04M	26.862M	19.1M
5240MHz	Pass	Inf	19.866M	18.981M	23.496M	18.891M	19.866M	18.921M	19.998M	18.891M
5260MHz	Pass	Inf	21.516M	18.951M	21.846M	18.981M	21.45M	18.981M	21.978M	18.981M
5300MHz	Pass	Inf	28.776M	19.01M	30.228M	19.04M	28.116M	19.07M	29.634M	19.13M
5320MHz	Pass	Inf	27.39M	19.04M	23.694M	19.04M	27.192M	19.07M	26.73M	18.981M
5500MHz	Pass	Inf	23.496M	19.13M	25.41M	19.07M	25.476M	19.04M	26.994M	19.04M
5580MHz	Pass	Inf	21.516M	18.981M	21.582M	18.981M	21.582M	18.951M	21.846M	19.01M
5700MHz	Pass	Inf	22.836M	19.04M	24.486M	19.04M	24.024M	19.04M	24.222M	19.07M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.75M	14.363M	15.75M	14.333M	15.735M	14.363M	15.93M	14.483M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	4.46M	4.578M	4.56M	4.558M	4.5M	4.598M	4.54M	4.578M
5745MHz	Pass	500k	18.876M	19.01M	18.876M	19.07M	18.744M	19.07M	18.942M	19.07M
5785MHz	Pass	500k	18.744M	19.01M	18.612M	18.951M	18.876M	19.04M	18.744M	19.04M
5825MHz	Pass	500k	18.612M	19.04M	18.546M	19.04M	18.414M	19.04M	18.744M	19.1M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	47.52M	37.841M	49.368M	37.841M	50.028M	37.781M	46.596M	37.841M
5230MHz	Pass	Inf	39.468M	37.661M	39.336M	37.661M	39.336M	37.601M	39.336M	37.541M
5270MHz	Pass	Inf	39.204M	37.661M	39.204M	37.541M	39.336M	37.541M	39.468M	37.541M
5310MHz	Pass	Inf	44.88M	37.781M	42.504M	37.721M	47.784M	37.661M	41.184M	37.661M
5510MHz	Pass	Inf	48.444M	37.841M	51.48M	37.781M	51.348M	37.841M	46.464M	37.841M
5590MHz	Pass	Inf	39.6M	37.721M	39.468M	37.781M	39.468M	37.781M	39.336M	37.601M
5670MHz	Pass	Inf	56.496M	37.901M	49.236M	37.961M	43.296M	37.901M	55.176M	37.901M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	34.685M	33.618M	34.685M	33.513M	34.615M	33.548M	34.685M	33.583M
5710MHz Straddle 5.725-5.85GHz	Pass	500k	4.02M	4.098M	3.98M	4.078M	3.96M	4.098M	4.12M	4.118M
5755MHz	Pass	500k	37.884M	37.901M	37.884M	37.901M	37.752M	37.961M	38.016M	37.901M
5795MHz	Pass	500k	37.884M	38.021M	37.752M	37.901M	38.016M	37.961M	38.016M	37.901M
802.11ax HEW80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	95.304M	77.361M	90.288M	77.841M	100.584M	77.361M	100.056M	77.481M
5290MHz	Pass	Inf	80.784M	77.121M	99.792M	77.361M	96.888M	77.241M	96.624M	77.481M
5530MHz	Pass	Inf	80.784M	77.361M	80.52M	77.481M	94.776M	77.361M	80.52M	77.361M
5610MHz	Pass	Inf	80.256M	77.121M	80.52M	77.121M	80.52M	77.361M	80.256M	77.241M
5690MHz Straddle 5.47-5.725GHz	Pass	Inf	74.775M	72.864M	74.775M	72.864M	74.775M	72.864M	74.7M	72.864M
5690MHz Straddle 5.725-5.85GHz	Pass	500k	4.02M	4.098M	3.88M	4.138M	4M	4.138M	4M	4.138M

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
5775MHz	Pass	500k	76.56M	77.361M	77.352M	77.481M	77.088M	77.601M	77.88M	77.481M
802.11ax HEW160-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5250MHz Straddle 5.15-5.25GHz	Pass	Inf	80.24M	77.641M	80.08M	77.561M	80.16M	77.481M	80.32M	77.401M
5250MHz Straddle 5.25-5.35GHz	Pass	Inf	80.24M	77.641M	81.84M	77.641M	81.12M	77.561M	80.32M	77.641M
5570MHz	Pass	Inf	163.68M	155.682M	162.624M	156.402M	163.152M	156.402M	166.32M	155.922M

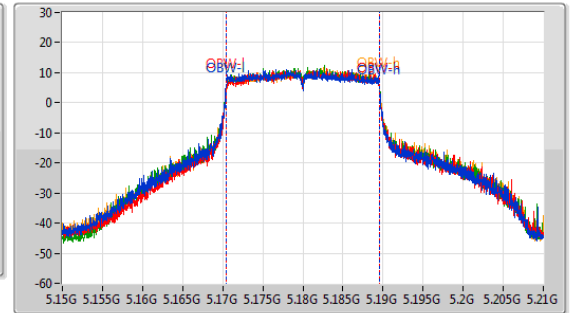
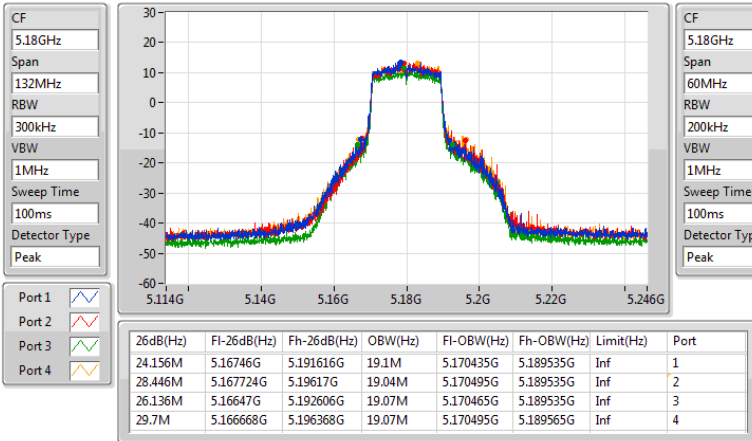
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band
Port X-OBW = Port X 99% occupied bandwidth



5.15-5.25GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

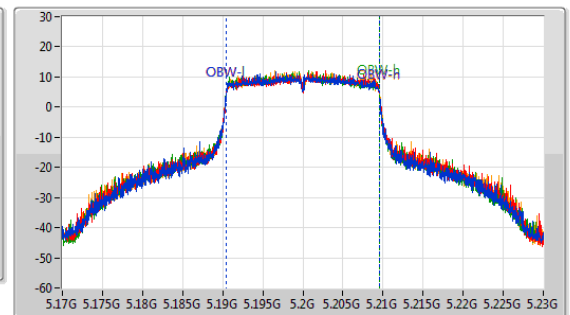
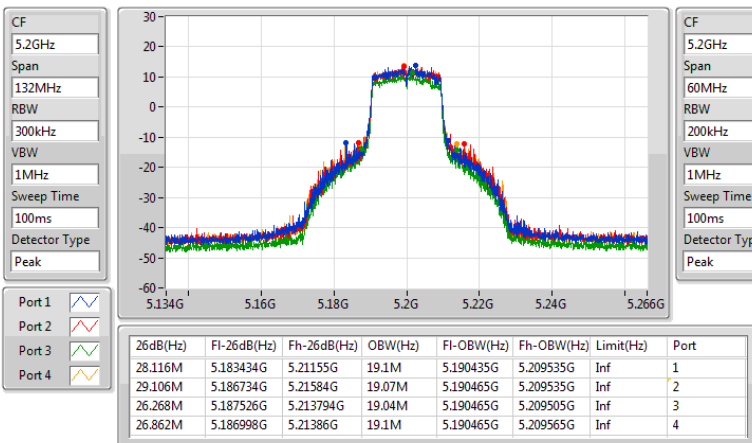
5180MHz



5.15-5.25GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5200MHz

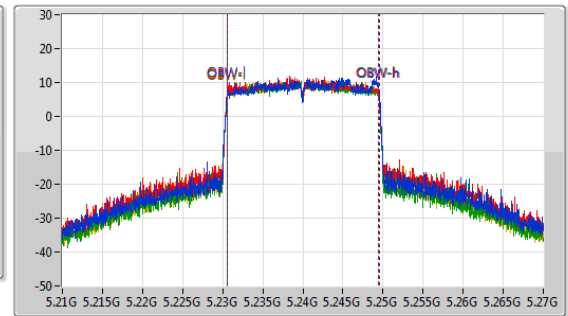
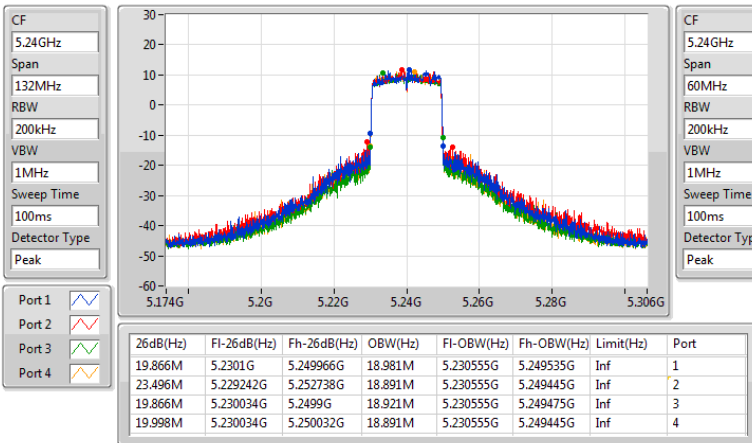




5.15-5.25GHz_802.11ax_HEW20-BF_Nss1,(MCS0)_4TX

EBW

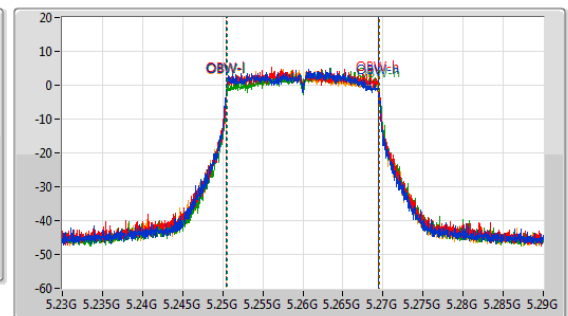
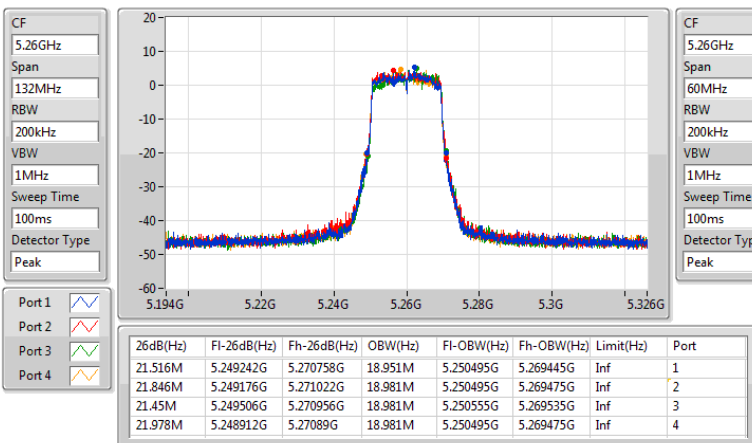
5240MHz



5.25-5.35GHz_802.11ax_HEW20-BF_Nss1,(MCS0)_4TX

EBW

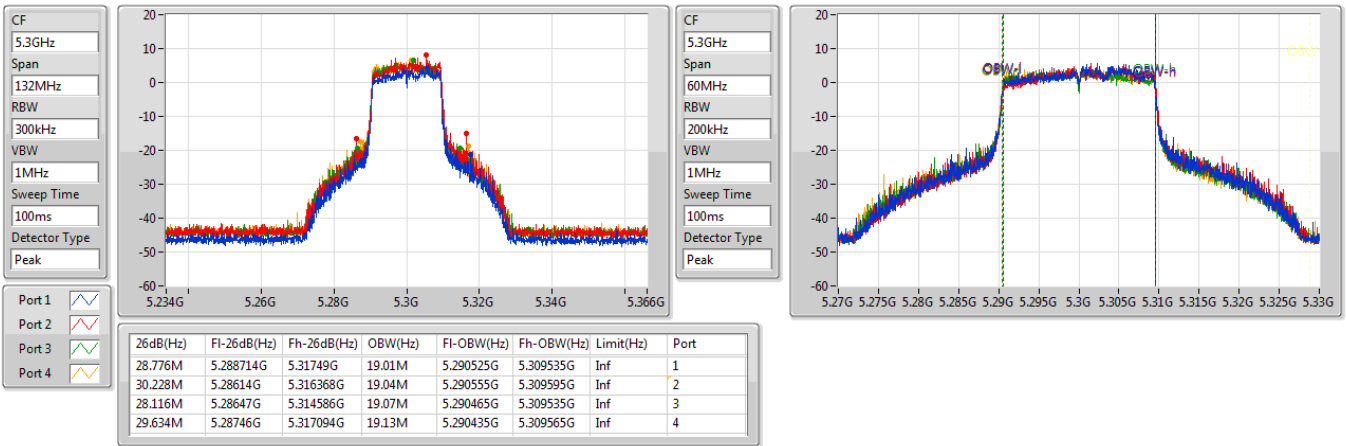
5260MHz



5.25-5.35GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

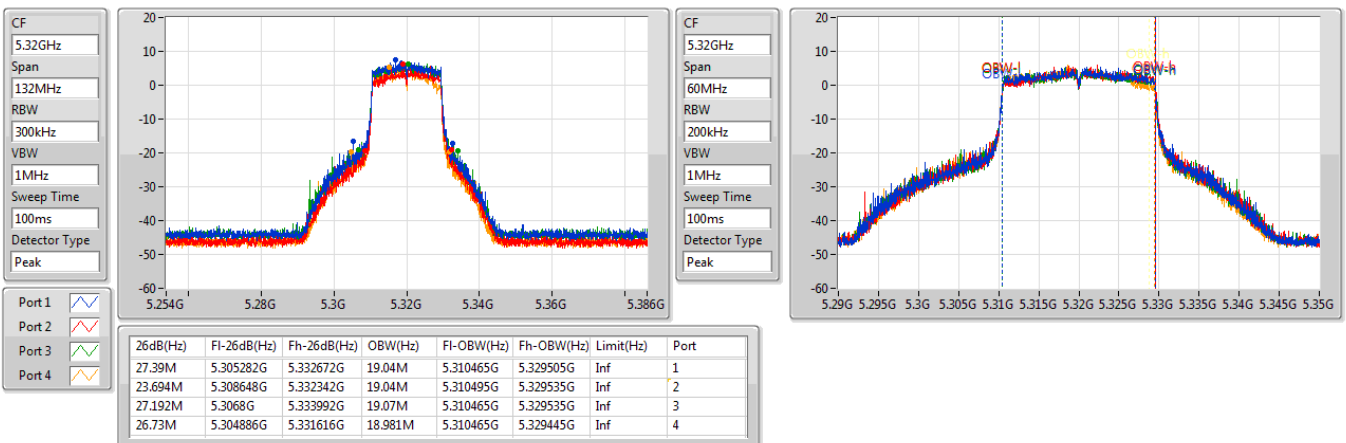
5300MHz



5.25-5.35GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5320MHz

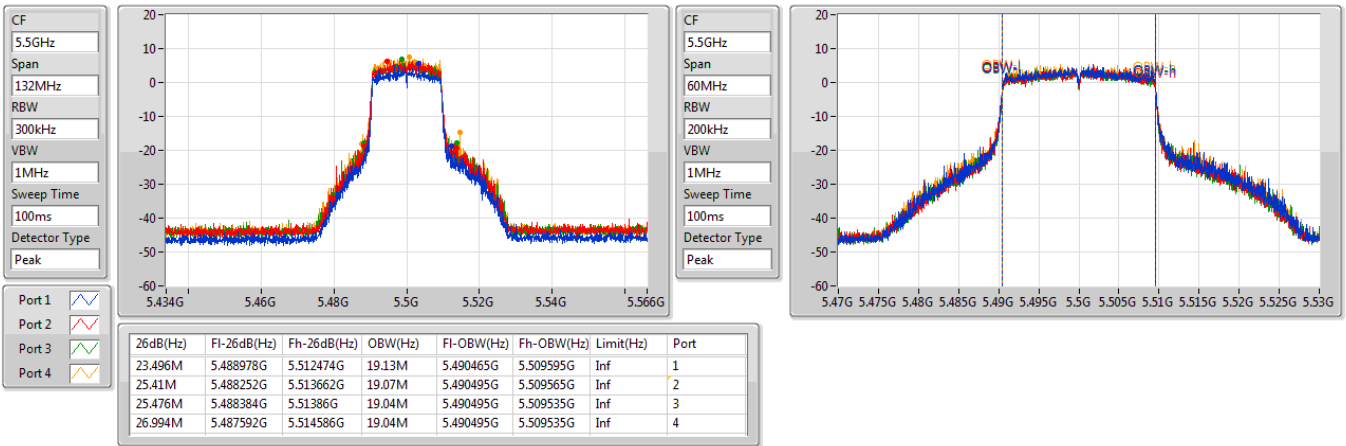




5.47-5.725GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

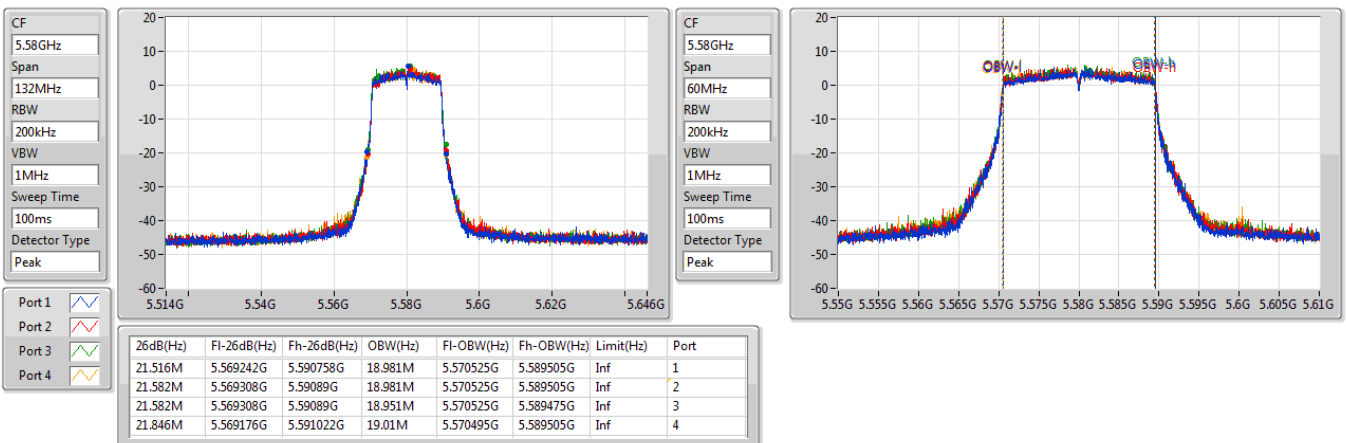
5500MHz



5.47-5.725GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5580MHz

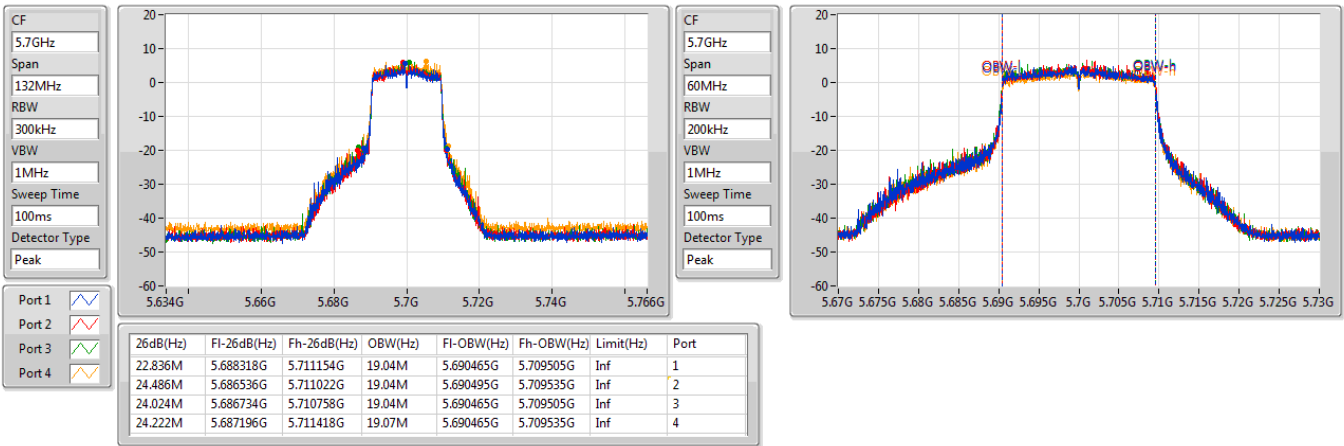




5.47-5.725GHz_802.11ax_HEW20-BF_Nss1,(MCS0)_4TX

EBW

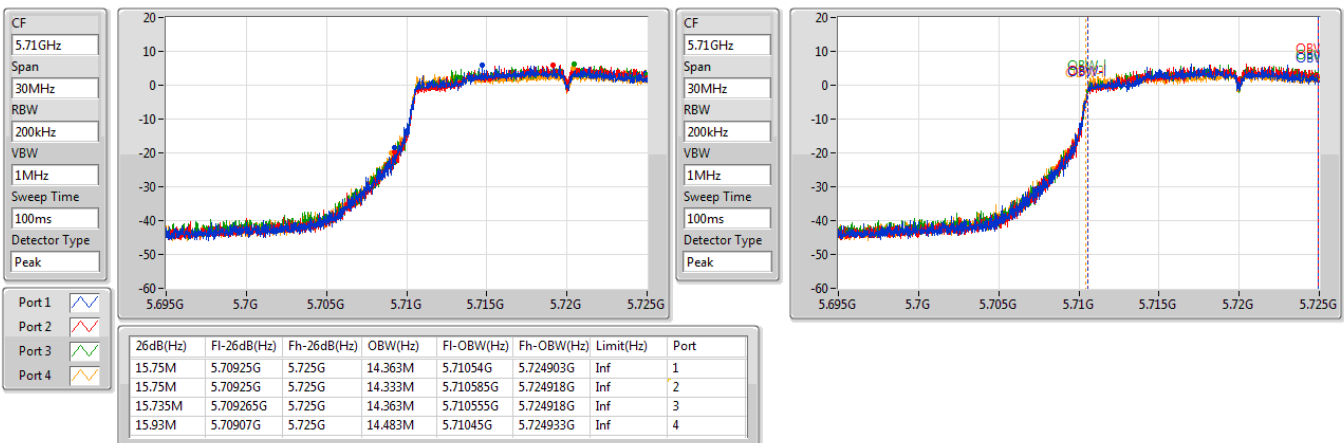
5700MHz



5.47-5.725GHz_802.11ax_HEW20-BF_Nss1,(MCS0)_4TX

EBW

5720MHz Straddle 5.47-5.725GHz

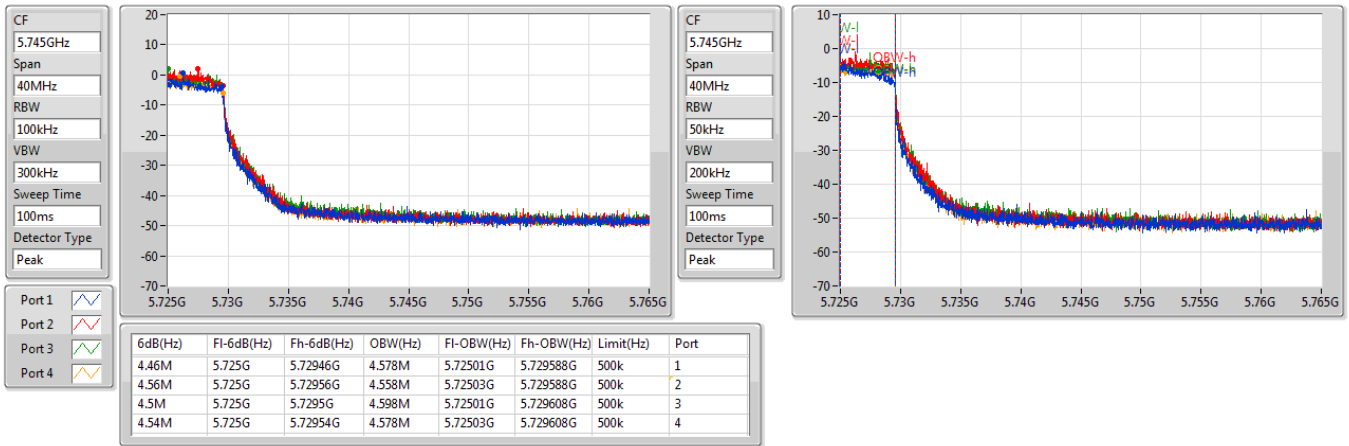




5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

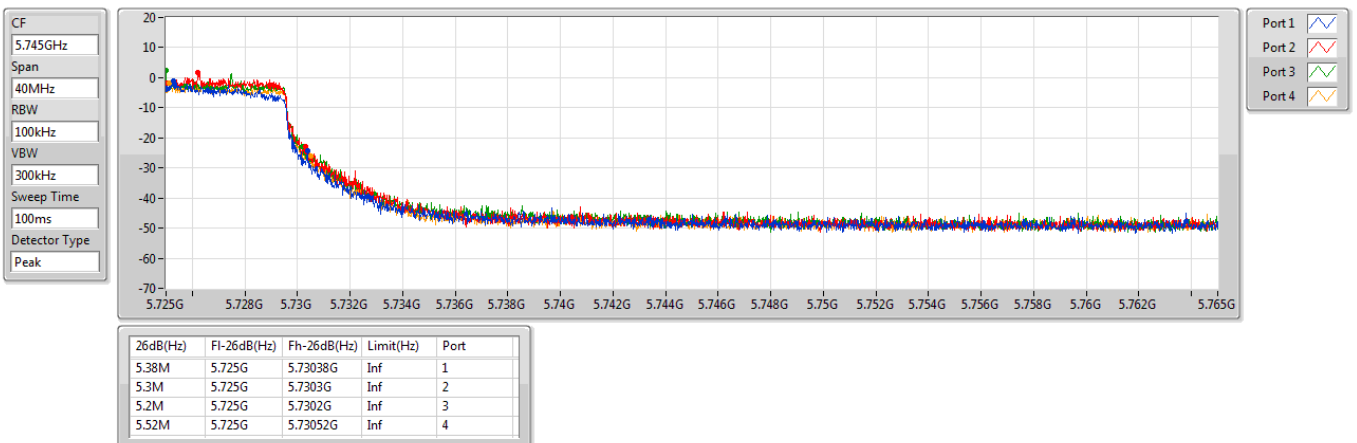
5720MHz Straddle 5.725-5.85GHz



5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5720MHz Straddle 5.725-5.85GHz

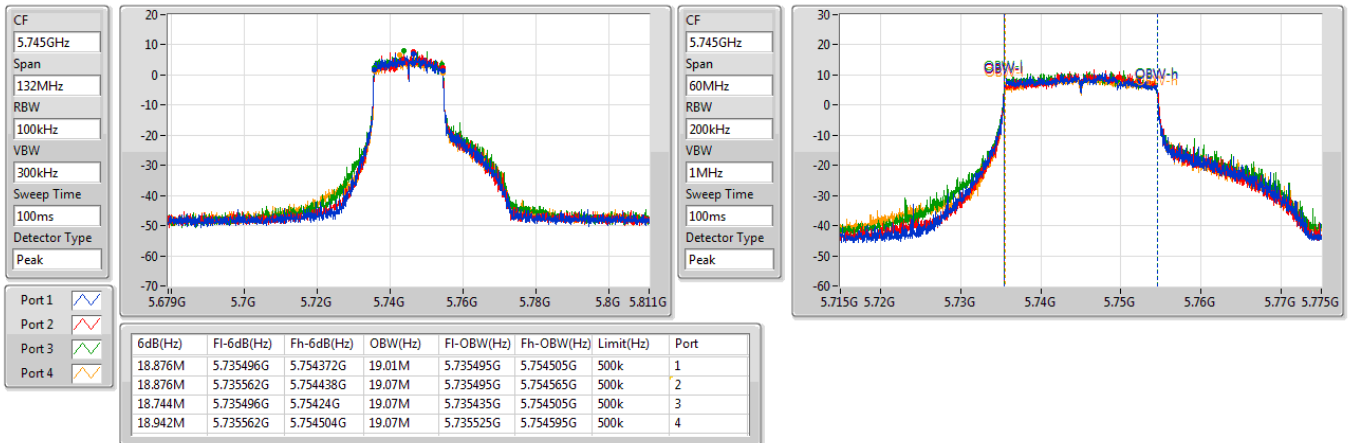




5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

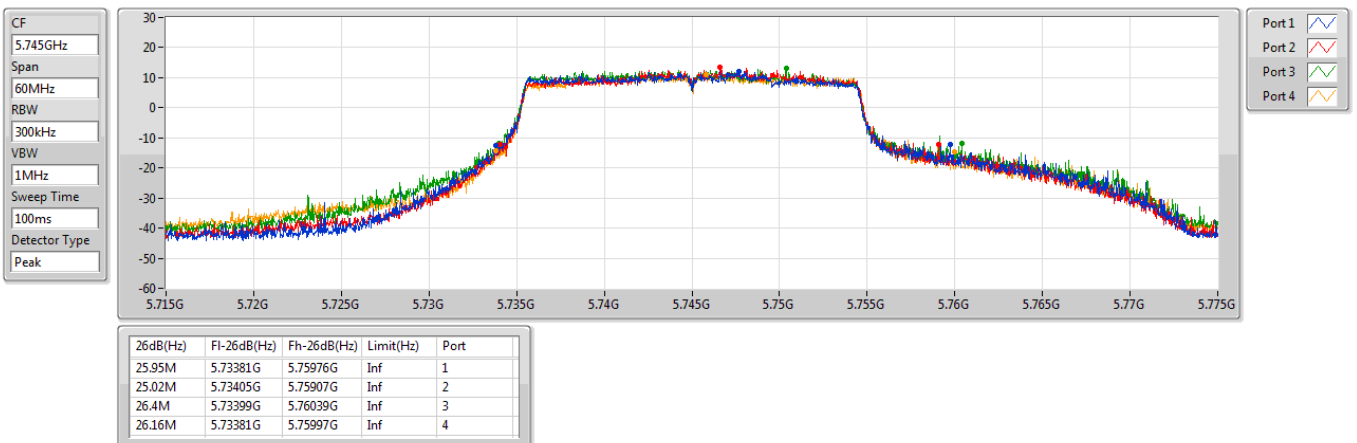
5745MHz



5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5745MHz





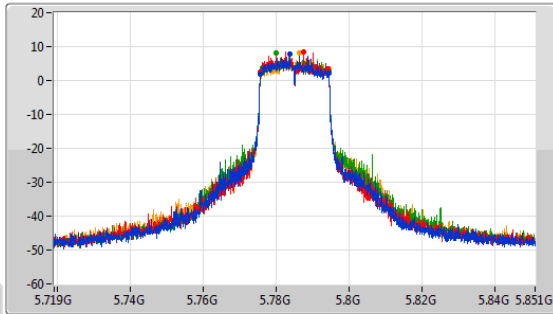
5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5785MHz

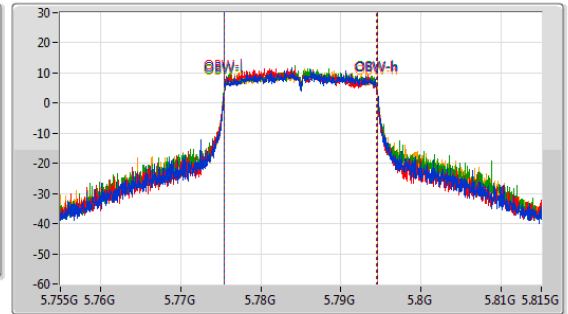
CF
5.785GHz
Span
132MHz
RBW
100kHz
VBW
300kHz
Sweep Time
100ms
Detector Type
Peak

Port 1
Port 2
Port 3
Port 4



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
18.744M	5.775562G	5.794306G	19.01M	5.775495G	5.794505G	500k	1
18.612M	5.775628G	5.79424G	18.951M	5.775495G	5.794445G	500k	2
18.876M	5.775496G	5.794372G	19.04M	5.775465G	5.794505G	500k	3
18.744M	5.775628G	5.794372G	19.04M	5.775495G	5.794535G	500k	4

CF
5.785GHz
Span
60MHz
RBW
200kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak

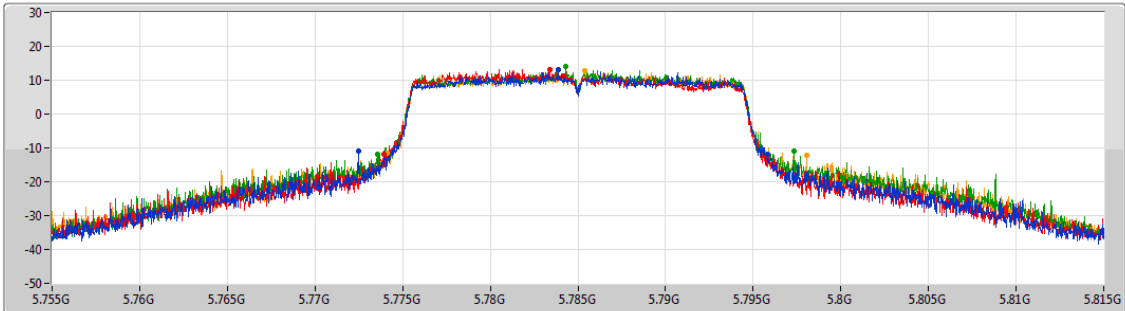


5.725-5.85GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

5785MHz

CF
5.785GHz
Span
60MHz
RBW
300kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak



Port 1
Port 2
Port 3
Port 4

26dB(Hz)	Fl-26dB(Hz)	Fh-26dB(Hz)	Limit(Hz)	Port
23.34M	5.77249G	5.79583G	Inf	1
21.9M	5.77393G	5.79583G	Inf	2
23.76M	5.77357G	5.79733G	Inf	3
23.91M	5.77414G	5.79805G	Inf	4