



FCC RADIO TEST REPORT

FCC ID : NKR-ATTC71KW
Equipment : Wireless STB
Brand Name : AT&T
Model Name : C71KW-400, C71KWBP-400
Applicant : Wistron NeWeb Corporation
20 Park Avenue II Hsinchu Science Park Hsinchu,
308 Taiwan
Manufacturer : Wistron NeWeb Corporation
20 Park Avenue II Hsinchu Science Park Hsinchu,
308 Taiwan
Standard : 47 CFR FCC Part 15.407

The product was received on May 09, 2019, and testing was started from Nov. 08, 2019 and completed on Nov. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A12_1 Ver1.0

Page Number : 3 of 33
Issued Date : Jan. 20, 2020
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.407(a)	Emission Bandwidth	PASS	-
3.2	15.407(a)	Maximum Conducted Output Power	PASS	-
3.3	15.407(a)	Peak Power Spectral Density	PASS	-
3.4	15.407(b)	Unwanted Emissions	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.

Reviewed by: Sam Chen

Report Producer: Vicky Huang



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20)	5180-5240	36-48 [4]
5250-5350		5260-5320	52-64 [4]
5470-5725		5500-5720	100-144 [12]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5250-5350		5270-5310	54-62 [2]
5470-5725		5510-5710	102-142 [6]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5250-5350		5290	58 [1]
5470-5725		5530-5690	106-138 [3]
5725-5850		5775	155 [1]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	4TX
5.15-5.25GHz	802.11n HT20	20	4TX
5.15-5.25GHz	802.11ac VHT20	20	4TX
5.15-5.25GHz	802.11ac VHT20-BF	20	4TX
5.15-5.25GHz	802.11n HT40	40	4TX
5.15-5.25GHz	802.11ac VHT40	40	4TX
5.15-5.25GHz	802.11ac VHT40-BF	40	4TX
5.15-5.25GHz	802.11ac VHT80	80	4TX
5.15-5.25GHz	802.11ac VHT80-BF	80	4TX
5.25-5.35GHz	802.11a	20	4TX
5.25-5.35GHz	802.11n HT20	20	4TX
5.25-5.35GHz	802.11ac VHT20	20	4TX
5.25-5.35GHz	802.11ac VHT20-BF	20	4TX
5.25-5.35GHz	802.11n HT40	40	4TX
5.25-5.35GHz	802.11ac VHT40	40	4TX
5.25-5.35GHz	802.11ac VHT40-BF	40	4TX
5.25-5.35GHz	802.11ac VHT80	80	4TX
5.25-5.35GHz	802.11ac VHT80-BF	80	4TX



Band	Mode	BWch (MHz)	Nant
5.47-5.725GHz	802.11a	20	4TX
5.47-5.725GHz	802.11n HT20	20	4TX
5.47-5.725GHz	802.11ac VHT20	20	4TX
5.47-5.725GHz	802.11ac VHT20-BF	20	4TX
5.47-5.725GHz	802.11n HT40	40	4TX
5.47-5.725GHz	802.11ac VHT40	40	4TX
5.47-5.725GHz	802.11ac VHT40-BF	40	4TX
5.47-5.725GHz	802.11ac VHT80	80	4TX
5.47-5.725GHz	802.11ac VHT80-BF	80	4TX
5.725-5.85GHz	802.11a	20	4TX
5.725-5.85GHz	802.11n HT20	20	4TX
5.725-5.85GHz	802.11ac VHT20	20	4TX
5.725-5.85GHz	802.11ac VHT20-BF	20	4TX
5.725-5.85GHz	802.11n HT40	40	4TX
5.725-5.85GHz	802.11ac VHT40	40	4TX
5.725-5.85GHz	802.11ac VHT40-BF	40	4TX
5.725-5.85GHz	802.11ac VHT80	80	4TX
5.725-5.85GHz	802.11ac VHT80-BF	80	4TX

Note:

- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.


1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		
						2.4GHz	5GHz	BT
A	1	Airgain	N2425DWA7	PCB Antenna	I-PEX	Note	Note	-
B	2	Airgain	N2410DWB7	PCB Antenna	I-PEX			
C	3	Airgain	N2425DWC7	PCB Antenna	I-PEX			
D	4	Airgain	N2410DWD7	PCB Antenna	I-PEX			
E	1	N/A	N/A	Printed Antenna	N/A	-	-	1.11

Note:

2.4 GHz Antenna gain (dBi)				
Ant. Frequency	A	B	C	D
2412MHz	4.30	2.20	3.90	2.80
2422MHz	4.30	2.40	4.00	2.90
2437MHz	4.50	3.10	4.20	3.20
2452MHz	4.50	3.30	4.20	3.30
2462MHz	4.70	3.50	4.20	3.20

Frequency	2.4 GHz Directional gain (dBi)
2412MHz	5.70
2422MHz	5.90
2437MHz	6.30
2452MHz	6.40
2462MHz	6.40

5 GHz Antenna gain (dBi)				
Ant. Band	A	B	C	D
Band 1	5.50	2.30	4.30	4.30
Band 2	5.30	1.90	4.00	4.20
Band 3	5.80	1.80	3.90	2.50
Band 4	5.70	2.00	3.70	2.00



Band	5 GHz Directional gain (dBi)
Band 1	7.60
Band 2	7.50
Band 3	7.00
Band 4	7.10

Note1: The above information was declared by manufacturer.

Note2: The EUT has five antennas.

For WLAN function (4TX, 4RX):

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For Bluetooth function (1TX, 1RX):

Only Port 1 can be used as transmitting/receiving antenna

1.1.3 Mode Test Duty Cycle

For Mode 1:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a	0.988	0.05	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT20	0.954	0.2	372.3u	3k
802.11ac VHT20-BF	0.951	0.22	4.048m	300
802.11ac VHT40	0.917	0.38	208.333u	10k
802.11ac VHT40-BF	0.958	0.19	3.905m	300
802.11ac VHT80	0.871	0.6	124.267u	10k
802.11ac VHT80-BF	0.969	0.14	5.305m	300

For Mode 2:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a	0.988	0.05	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT20	0.958	0.19	375u	3k
802.11ac VHT20-BF	0.935	0.29	4.385m	300
802.11ac VHT40	0.924	0.34	210u	10k
802.11ac VHT40-BF	0.937	0.28	3.693m	300
802.11ac VHT80	0.888	0.52	127.5u	10k
802.11ac VHT80-BF	0.958	0.19	5.09m	300

Note:

- ◆ DC is Duty Cycle.
- ◆ DCF is Duty Cycle Factor.

**1.1.4 EUT Operational Condition**

EUT Power Type	From Power Adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for VHT20, VHT40 in 2.4G and 802.11ac in 5GHz.			
Weather Band	☒	With 5600~5650MHz	☐	Without 5600~5650MHz
Function	☐	Outdoor P2M	☒	Indoor P2M
	☐	Fixed P2P	☒	Client
TPC Function	☒	With TPC	☐	Without TPC
Test Software Version	4.75			

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
AT&T	C71KW-400	There is nothing different of two models, just for different marketing use.
	C71KWBP-400	

From the above models, model: C71KW-400 was selected as representative model for the test and its data was recorded in this report.

1.1.6 Table for FEM Information

FEM	Brand name	Model Name
Original	SKYWORKS	SKY85809
New	SKYWORKS	SKY85818
New	QORVO	QPF4800

1.1.7 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR791514AB

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Changing FEM (Front-end Module) of WLAN for this device. (Please refer to section 1.1.6 for detail FEM information.)	1. Emission Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Unwanted Emissions above 1GHz



1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 789033 D02 v02r01
- ♦ FCC KDB 662911 D01 v02r01
- ♦ FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

Testing Location		
☐	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Lucas Huang	23.7~25.3°C / 52~54%	Nov. 14, 2019~Nov. 23, 2019
Radiated	03CH04-CB	Paul Chen	24.2~25.7°C / 52~53%	Nov. 08, 2019~Nov. 16, 2019

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

For Mode 1:

For Master Mode Band 1~4 and Client Mode Band 2~4:

Mode	Power Setting
802.11a_Nss1,(6Mbps)_4TX	-
5180MHz	22
5200MHz	23
5240MHz	23
5260MHz	17
5300MHz	17
5320MHz	17
5500MHz	17
5580MHz	17
5700MHz	17
5720MHz Straddle 5.47-5.725GHz	17.5
5720MHz Straddle 5.725-5.85GHz	17.5
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	21.5
5200MHz	23
5240MHz	23
5260MHz	17.5
5300MHz	17.5
5320MHz	17.5
5500MHz	17.5
5580MHz	17.5
5700MHz	17.5
5720MHz Straddle 5.47-5.725GHz	17.5
5720MHz Straddle 5.725-5.85GHz	17.5
5745MHz	22
5785MHz	22
5825MHz	22.5
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	17
5230MHz	22.5
5270MHz	18.5



Mode	Power Setting
5310MHz	17
5510MHz	17
5550MHz	18
5670MHz	18
5710MHz Straddle 5.47-5.725GHz	18
5710MHz Straddle 5.725-5.85GHz	18
5755MHz	22
5795MHz	22
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	15.5
5290MHz	15
5530MHz	15
5610MHz	18
5690MHz Straddle 5.47-5.725GHz	18
5690MHz Straddle 5.725-5.85GHz	18
5775MHz	20
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5180MHz	20
5200MHz	22
5240MHz	22
5260MHz	16
5300MHz	16
5320MHz	16
5500MHz	16
5580MHz	16
5700MHz	16
5720MHz Straddle 5.47-5.725GHz	17
5720MHz Straddle 5.725-5.85GHz	17
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5190MHz	16
5230MHz	22
5270MHz	16
5310MHz	16
5510MHz	16
5550MHz	16
5670MHz	16
5710MHz Straddle 5.47-5.725GHz	17



Mode	Power Setting
5710MHz Straddle 5.725-5.85GHz	17
5755MHz	22
5795MHz	22
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-
5210MHz	15
5290MHz	14
5530MHz	14
5610MHz	16
5690MHz Straddle 5.47-5.725GHz	16
5690MHz Straddle 5.725-5.85GHz	16
5775MHz	20

**For Client Mode Band 1:**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_4TX	-
5180MHz	16
5200MHz	16
5240MHz	16
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	16
5200MHz	16.5
5240MHz	16
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	17
5230MHz	17.5
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	15
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5180MHz	16
5200MHz	16
5240MHz	16
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5190MHz	16
5230MHz	16
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-
5210MHz	15

**For Mode 2:****For Master Mode Band 1~4 and Client Mode Band 2~4:**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_4TX	-
5180MHz	19
5200MHz	22.5
5240MHz	22.5
5260MHz	16.5
5300MHz	16
5320MHz	16
5500MHz	16.5
5580MHz	16.5
5700MHz	17
5720MHz Straddle 5.47-5.725GHz	17
5720MHz Straddle 5.725-5.85GHz	17
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	19.5
5200MHz	22.5
5240MHz	22.5
5260MHz	16.5
5300MHz	16.5
5320MHz	16.5
5500MHz	16.5
5580MHz	16.5
5700MHz	17
5720MHz Straddle 5.47-5.725GHz	17
5720MHz Straddle 5.725-5.85GHz	17
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	17
5230MHz	21.5
5270MHz	18
5310MHz	17.5
5510MHz	16.5
5550MHz	18
5670MHz	18



Mode	Power Setting
5710MHz Straddle 5.47-5.725GHz	18.5
5710MHz Straddle 5.725-5.85GHz	18.5
5755MHz	22.5
5795MHz	22.5
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	17.5
5290MHz	18
5530MHz	17
5610MHz	18.5
5690MHz Straddle 5.47-5.725GHz	18.5
5690MHz Straddle 5.725-5.85GHz	18.5
5775MHz	20.5
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5180MHz	19
5200MHz	22.5
5240MHz	22.5
5260MHz	16.5
5300MHz	16.5
5320MHz	16.5
5500MHz	16.5
5580MHz	16.5
5700MHz	17
5720MHz Straddle 5.47-5.725GHz	17
5720MHz Straddle 5.725-5.85GHz	17
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5190MHz	17
5230MHz	23
5270MHz	16.5
5310MHz	16.5
5510MHz	15
5550MHz	17
5670MHz	17
5710MHz Straddle 5.47-5.725GHz	17.5
5710MHz Straddle 5.725-5.85GHz	17.5
5755MHz	22.5
5795MHz	22.5
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-



Mode	Power Setting
5210MHz	17
5290MHz	17
5530MHz	17
5610MHz	17.5
5690MHz Straddle 5.47-5.725GHz	17.5
5690MHz Straddle 5.725-5.85GHz	17.5
5775MHz	22

**For Client Mode Band 1:**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_4TX	-
5180MHz	16
5200MHz	16
5240MHz	16
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5180MHz	16
5200MHz	16
5240MHz	16
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5190MHz	17
5230MHz	18.5
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5210MHz	17.5
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5180MHz	16
5200MHz	16
5240MHz	16
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5190MHz	16.5
5230MHz	16.5
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-
5210MHz	16.5

Note:

- 1.VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
2. There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for VHT20, VHT40 in 2.4G and 802.11ac in 5GHz. All test results were recorded in the report.



2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item	Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density	
Test Condition	Conducted measurement at transmit chains	
Operating Mode	1	EUT - FEW Model name: SKY85818
	2	EUT - FEW Model name: QPF4800

The Worst Case Mode for Following Conformance Tests	
Tests Item	Unwanted Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode > 1GHz	CTX
The EUT was performed at Y axis and Z axis position for Radiated emission above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.	
1	EUT in Z axis - FEW Model name: SKY85818
2	EUT in Z axis - FEW Model name: QPF4800

Note: The adapter is for measurement only, would not be marketed

Support Unit	Brand	Model	FCC ID
Adapter	DIRECTV	EPS10R1-16	N/A

2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under TeraTerm.
3. Executed "Iperf" to link with the remote workstation to transmit and receive packet by RX Device and transmit duty cycle no less than 98%.



2.4 Accessories

N/A

2.5 Support Equipment

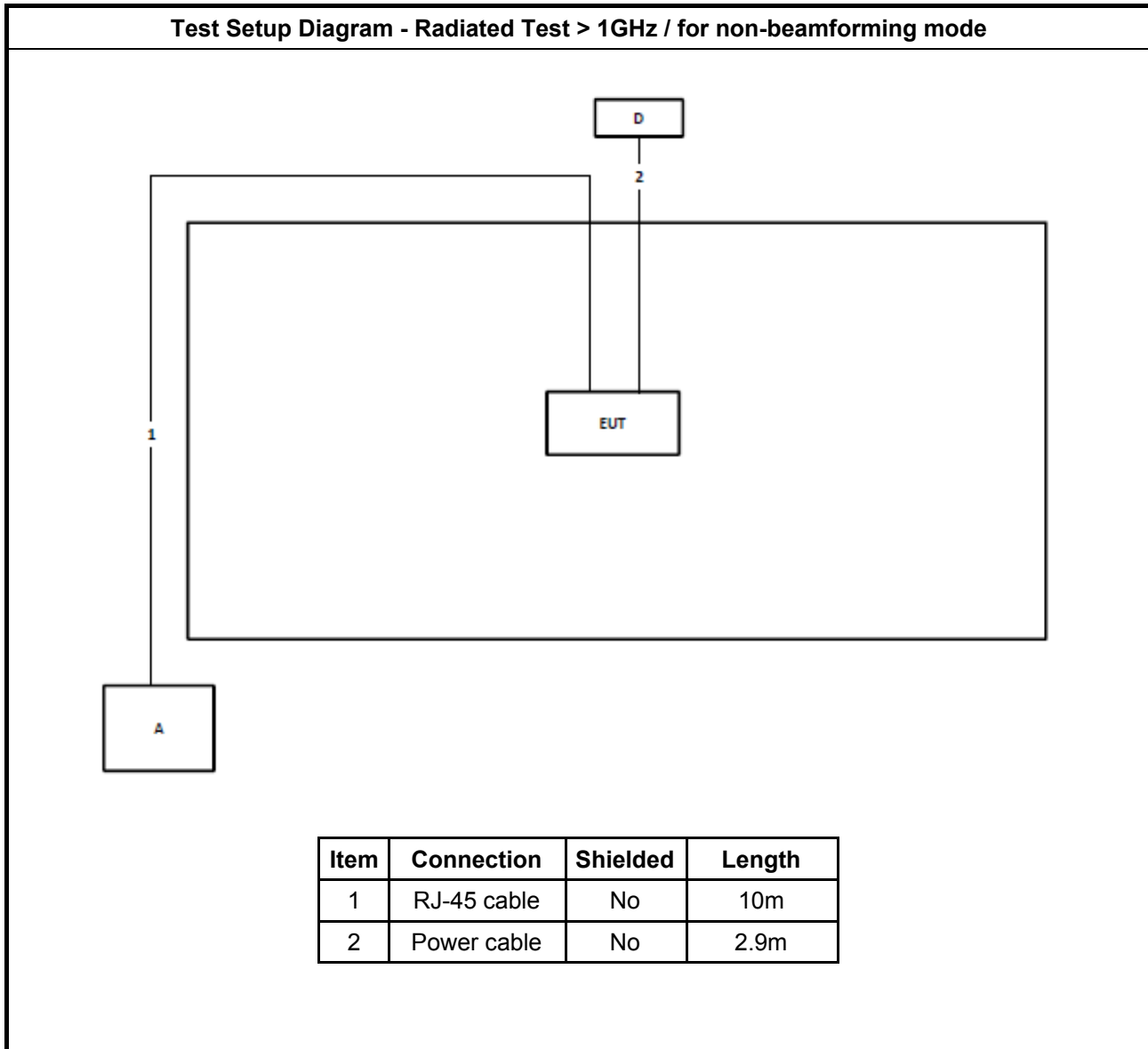
<For Non-Beamforming Mode>

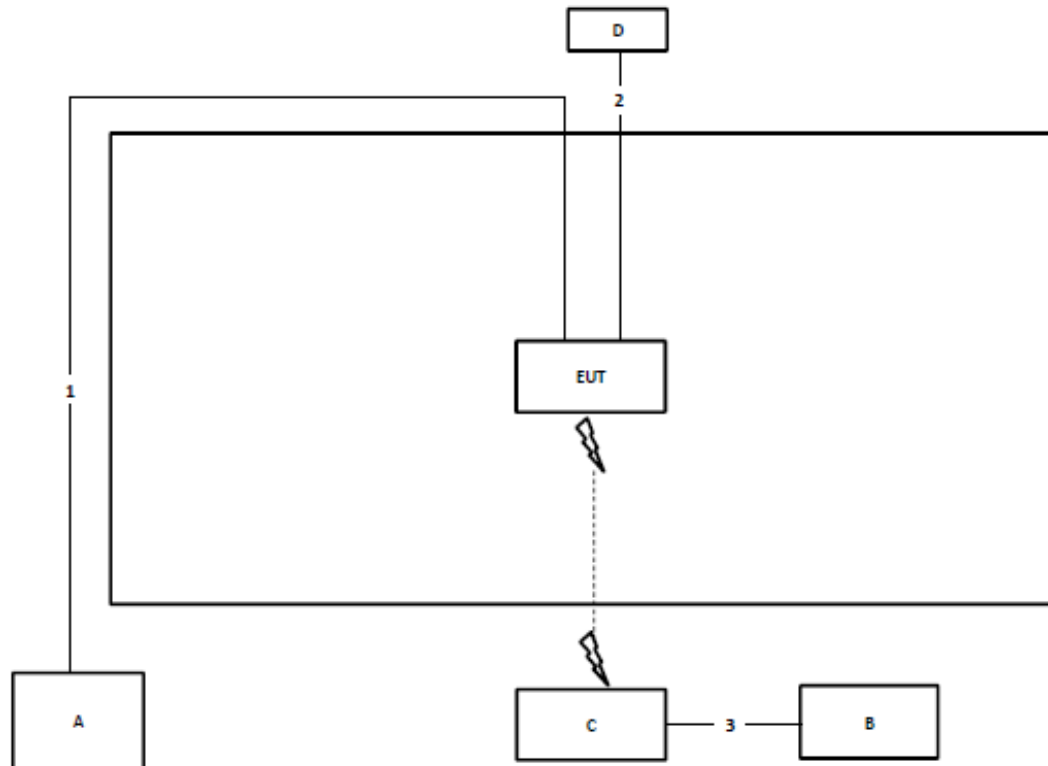
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
D	Adapter	DIRECTV	EPS10R1-16	N/A

<For Beamforming Mode>

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	NA
B	Notebook	DELL	E4300	N/A
C	Rx Device	AT&T	C71KW-400	NKR-ATTC71KW
D	Adapter	DIRECTV	EPS10R1-16	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test > 1GHz / for beamforming mode


Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.9m
3	RJ-45 cable	No	1.5m

3 Transmitter Test Result

3.1 Emission Bandwidth

3.1.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band, N/A
☒	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☒	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
☒	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq$ 500kHz.
LE-LAN Devices	
☐	For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq$ 500kHz.

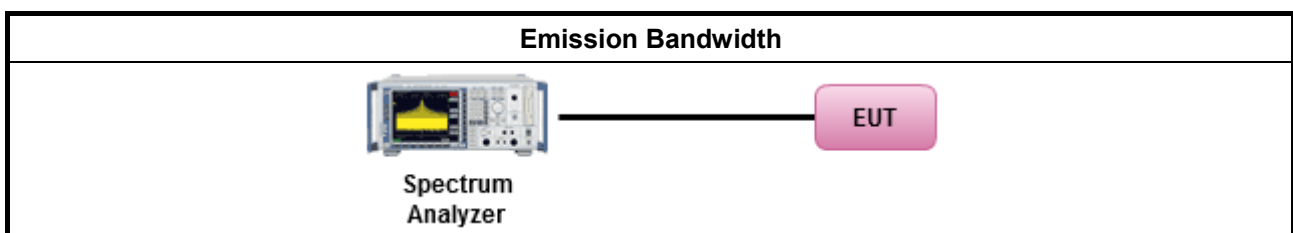
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☐	Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.

3.1.4 Test Setup





3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
☒	For the 5.15-5.25 GHz band:
☐	- Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm] - Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ - Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$. - Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☒	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☒	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☒	For the 5.725-5.85 GHz band:
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
LE-LAN Devices	
☐	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
☐	For the 5.725-5.85 GHz band:
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

3.2.2 Measuring Instruments

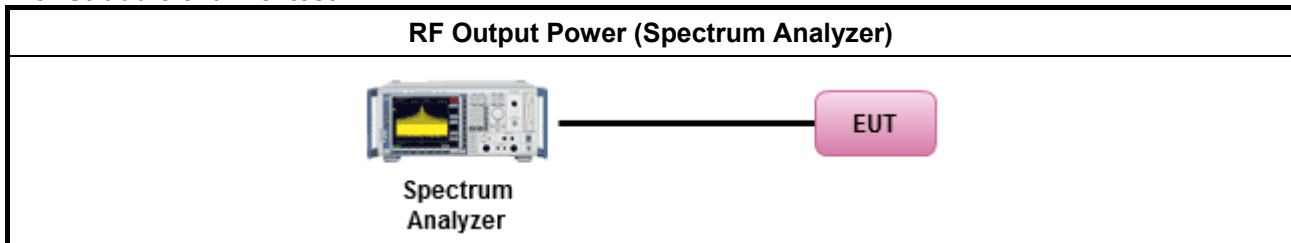
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

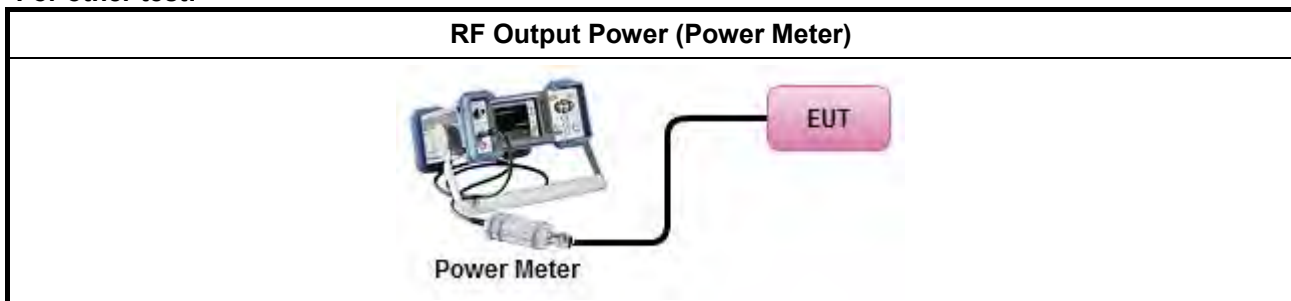
Test Method	
Maximum Conducted Output Power	
	Average over on/off periods with duty factor
☒	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
☒	Refer as FCC KDB 789033, clause E Method PM-G (using an RF average power meter).
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.2.4 Test Setup

For Straddle channel test:



For other test:



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B



3.3 Peak Power Spectral Density

3.3.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
	- Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$. - Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.
☒ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☒ For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☒ For the 5.725-5.85 GHz band:	
	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-LAN Devices	
☐ For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.	
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.	
	e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for $0^\circ \leq \theta < 8^\circ$; -13 - 0.716 (θ-8) dBW/MHz for $8^\circ \leq \theta < 40^\circ$ -35.9 - 1.22 (θ-40) dBW/MHz for $40^\circ \leq \theta \leq 45^\circ$; -42 dBW/MHz for $\theta > 45^\circ$
☐ For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.	
☐ For the 5.725-5.85 GHz band:	
	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

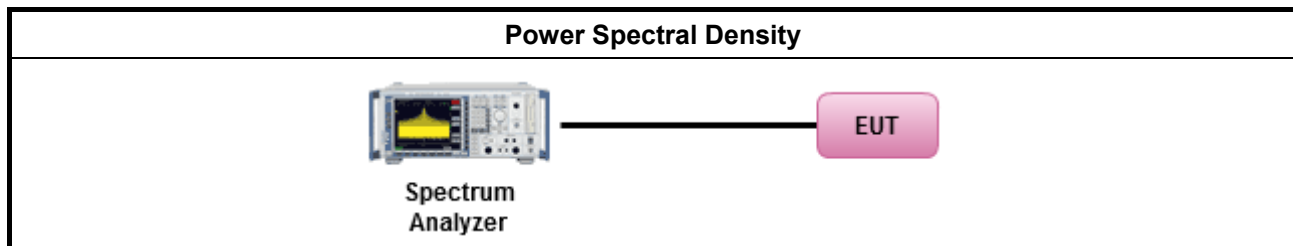
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
☐	Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth [duty cycle ≥ 98% or external video / power trigger]
☒	Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).
☐	Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed) duty cycle < 98% and average over on/off periods with duty factor
☒	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below:	
☒	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐	Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
☐	Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
☐	If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$

3.3.4 Test Setup



3.3.5 Test Result of Peak Power Spectral Density

Refer as Appendix C



3.4 Unwanted Emissions

3.4.1 Transmitter Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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: Test distance for frequencies at or above 30 MHz, 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).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

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 - 5.85 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).

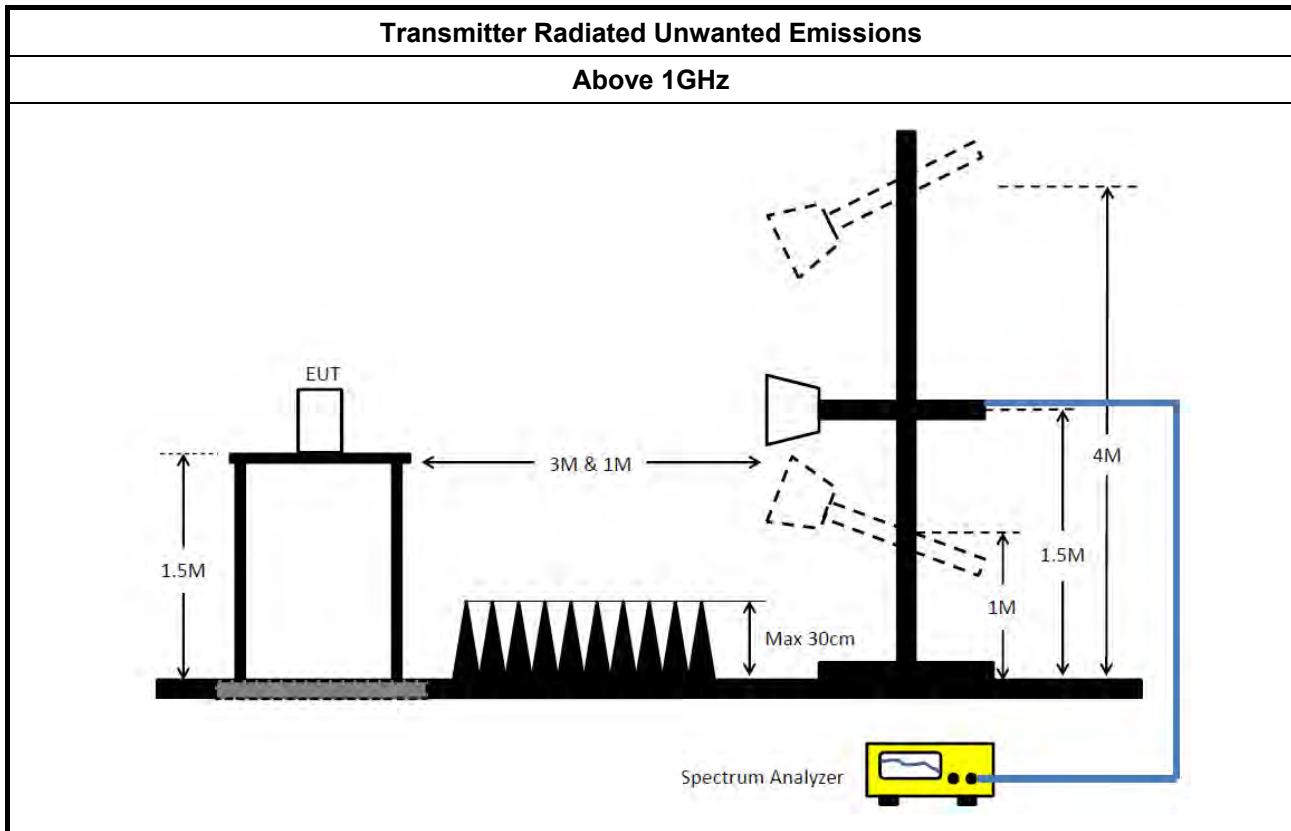
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method	
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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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).	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
	Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
	☒ Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
	☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
	☒ Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.
☐ Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.	
For radiated measurement.	
	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
The any unwanted emissions level shall not exceed the fundamental emission level.	
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.	

3.4.4 Test Setup



3.4.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.4.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix D



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	ETS • Lindgren	3115	00143147	750MHz~18GHz	Oct. 22, 2019	Oct. 21, 2020	Radiation (03CH04-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	83017A	MY53270063	0.5GHz ~ 26.5GHz	Mar. 19, 2019	Mar. 18, 2020	Radiation (03CH04-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Dec. 26, 2018	Dec. 25, 2019	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+22	1GHz - 18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH04-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)

Note: Calibration Interval of instruments listed above is one year.

For Master Mode Band 1~4 and Client Mode Band 2~4:

For 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	22.59M	16.672M	16M7D1D	21.72M	16.582M
802.11ac VHT20_Nss1,(MCS0)_4TX	33.27M	17.901M	17M9D1D	22.2M	17.751M
802.11ac VHT40_Nss1,(MCS0)_4TX	75.54M	36.402M	36M4D1D	39.66M	36.162M
802.11ac VHT80_Nss1,(MCS0)_4TX	81.6M	75.802M	75M8D1D	81.24M	75.562M
5.25-5.35GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	21.63M	16.642M	16M6D1D	21.39M	16.522M
802.11ac VHT20_Nss1,(MCS0)_4TX	22.05M	17.781M	17M8D1D	21.54M	17.661M
802.11ac VHT40_Nss1,(MCS0)_4TX	40.08M	36.342M	36M3D1D	39.6M	36.162M
802.11ac VHT80_Nss1,(MCS0)_4TX	82.08M	75.802M	75M8D1D	81.48M	75.562M
5.47-5.725GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	21.66M	16.672M	16M7D1D	15.63M	13.298M
802.11ac VHT20_Nss1,(MCS0)_4TX	22.05M	17.781M	17M8D1D	15.75M	13.913M
802.11ac VHT40_Nss1,(MCS0)_4TX	40.26M	36.402M	36M4D1D	34.86M	32.989M
802.11ac VHT80_Nss1,(MCS0)_4TX	81.96M	76.042M	76M0D1D	75.375M	72.264M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	16.35M	16.702M	16M7D1D	3.12M	3.838M
802.11ac VHT20_Nss1,(MCS0)_4TX	17.58M	17.841M	17M8D1D	3.74M	4.158M
802.11ac VHT40_Nss1,(MCS0)_4TX	36.3M	36.462M	36M5D1D	3.12M	3.438M
802.11ac VHT80_Nss1,(MCS0)_4TX	75.84M	75.922M	75M9D1D	2.88M	3.638M

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 / Maximum 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	21.75M	16.642M	21.75M	16.612M	21.72M	16.612M	21.99M	16.612M
5200MHz	Pass	Inf	21.81M	16.582M	22.02M	16.672M	21.93M	16.672M	21.99M	16.642M
5240MHz	Pass	Inf	21.72M	16.612M	22.59M	16.612M	21.99M	16.672M	22.08M	16.642M
5260MHz	Pass	Inf	21.54M	16.552M	21.39M	16.582M	21.54M	16.582M	21.51M	16.582M
5300MHz	Pass	Inf	21.48M	16.612M	21.42M	16.582M	21.63M	16.612M	21.51M	16.612M
5320MHz	Pass	Inf	21.48M	16.612M	21.39M	16.522M	21.6M	16.642M	21.42M	16.582M
5500MHz	Pass	Inf	21.45M	16.612M	21.42M	16.582M	21.66M	16.642M	21.45M	16.582M
5580MHz	Pass	Inf	21.45M	16.642M	21.48M	16.582M	21.57M	16.672M	21.48M	16.612M
5700MHz	Pass	Inf	21.45M	16.612M	21.33M	16.612M	21.6M	16.672M	21.48M	16.612M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.63M	13.358M	15.69M	13.298M	15.705M	13.343M	15.645M	13.388M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.14M	3.918M	3.12M	3.838M	3.14M	3.918M	3.12M	3.878M
5745MHz	Pass	500k	16.32M	16.582M	16.35M	16.612M	16.32M	16.672M	16.32M	16.642M
5785MHz	Pass	500k	16.32M	16.642M	16.32M	16.612M	16.32M	16.702M	16.32M	16.672M
5825MHz	Pass	500k	16.32M	16.642M	16.32M	16.612M	16.32M	16.672M	16.32M	16.702M
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	24.57M	17.781M	22.2M	17.781M	24.75M	17.781M	24.84M	17.811M
5200MHz	Pass	Inf	26.22M	17.781M	26.79M	17.781M	27.66M	17.781M	29.37M	17.841M
5240MHz	Pass	Inf	28.59M	17.751M	29.16M	17.811M	33.27M	17.841M	30.36M	17.901M
5260MHz	Pass	Inf	21.72M	17.751M	21.78M	17.751M	21.69M	17.721M	21.6M	17.781M
5300MHz	Pass	Inf	21.54M	17.751M	21.75M	17.661M	21.75M	17.751M	21.6M	17.721M
5320MHz	Pass	Inf	21.57M	17.721M	21.6M	17.721M	22.05M	17.721M	21.69M	17.751M
5500MHz	Pass	Inf	21.6M	17.751M	21.6M	17.691M	21.99M	17.721M	21.54M	17.781M
5580MHz	Pass	Inf	21.66M	17.751M	21.69M	17.721M	22.05M	17.751M	21.75M	17.751M
5700MHz	Pass	Inf	21.75M	17.751M	21.78M	17.691M	21.87M	17.721M	21.66M	17.751M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.765M	13.913M	15.75M	13.913M	15.87M	13.928M	15.75M	13.913M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.74M	4.298M	3.76M	4.158M	3.76M	4.158M	3.76M	4.298M
5745MHz	Pass	500k	17.58M	17.721M	17.58M	17.751M	17.55M	17.781M	17.58M	17.751M
5785MHz	Pass	500k	17.58M	17.781M	17.58M	17.781M	17.58M	17.841M	17.58M	17.811M
5825MHz	Pass	500k	17.58M	17.781M	17.58M	17.751M	17.55M	17.841M	17.58M	17.811M
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	39.78M	36.162M	39.66M	36.282M	40.5M	36.162M	39.96M	36.282M
5230MHz	Pass	Inf	51.24M	36.402M	69.84M	36.402M	75.54M	36.402M	70.74M	36.402M
5270MHz	Pass	Inf	40.02M	36.162M	39.72M	36.282M	40.08M	36.282M	39.72M	36.342M
5310MHz	Pass	Inf	39.6M	36.222M	39.9M	36.222M	39.96M	36.162M	39.96M	36.342M
5510MHz	Pass	Inf	39.66M	36.282M	39.66M	36.222M	40.2M	36.222M	39.9M	36.282M
5550MHz	Pass	Inf	39.72M	36.222M	40.02M	36.222M	40.26M	36.282M	39.78M	36.342M
5670MHz	Pass	Inf	39.66M	36.162M	39.9M	36.282M	39.96M	36.282M	39.9M	36.402M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	34.93M	33.058M	34.93M	33.023M	35.14M	32.989M	34.86M	33.023M
5710MHz Straddle 5.725-5.85GHz	Pass	500k	3.12M	3.438M	3.12M	3.438M	3.12M	3.478M	3.14M	3.558M
5755MHz	Pass	500k	36.3M	36.282M	36.06M	36.222M	36.3M	36.342M	36.3M	36.462M
5795MHz	Pass	500k	36.24M	36.282M	35.94M	36.162M	36.3M	36.342M	36.3M	36.342M
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.6M	75.562M	81.6M	75.802M	81.48M	75.802M	81.24M	75.802M

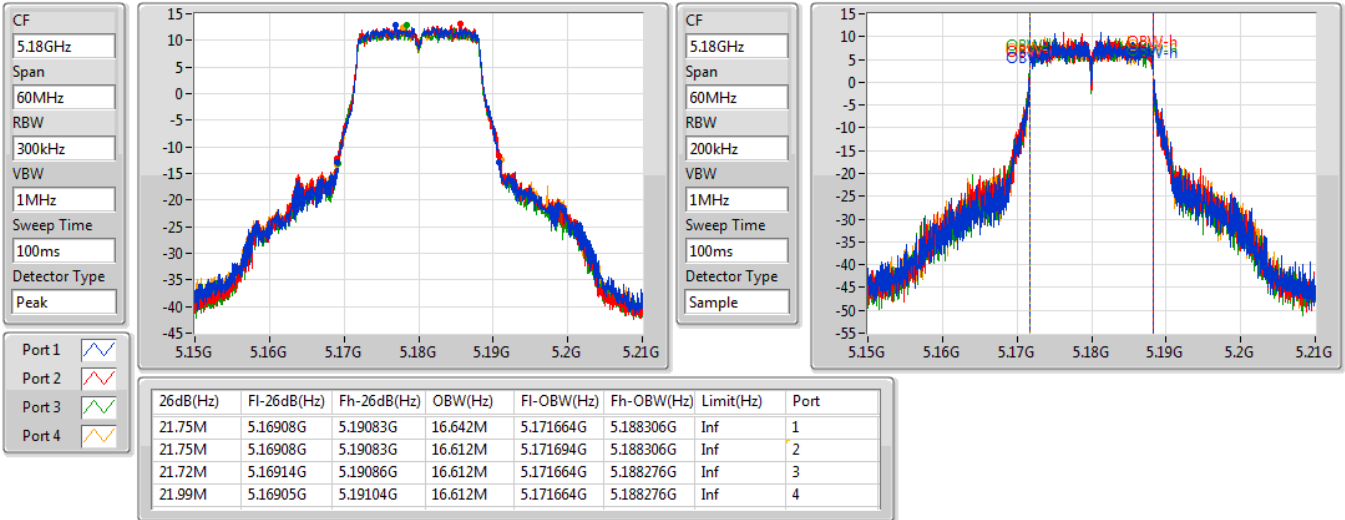
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
5290MHz	Pass	Inf	81.96M	75.562M	81.84M	75.802M	81.48M	75.562M	82.08M	75.802M
5530MHz	Pass	Inf	81.6M	75.802M	81.6M	75.682M	81.6M	75.682M	81.48M	76.042M
5610MHz	Pass	Inf	81.36M	75.682M	81.96M	75.802M	81.84M	76.042M	81.36M	75.682M
5690MHz Straddle 5.47-5.725GHz	Pass	Inf	75.375M	72.264M	75.825M	72.414M	75.6M	72.489M	75.975M	72.489M
5690MHz Straddle 5.725-5.85GHz	Pass	500k	3.12M	3.738M	2.88M	3.638M	3.1M	3.638M	3.14M	3.658M
5775MHz	Pass	500k	75.12M	75.922M	75.24M	75.922M	75.12M	75.802M	75.84M	75.922M

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

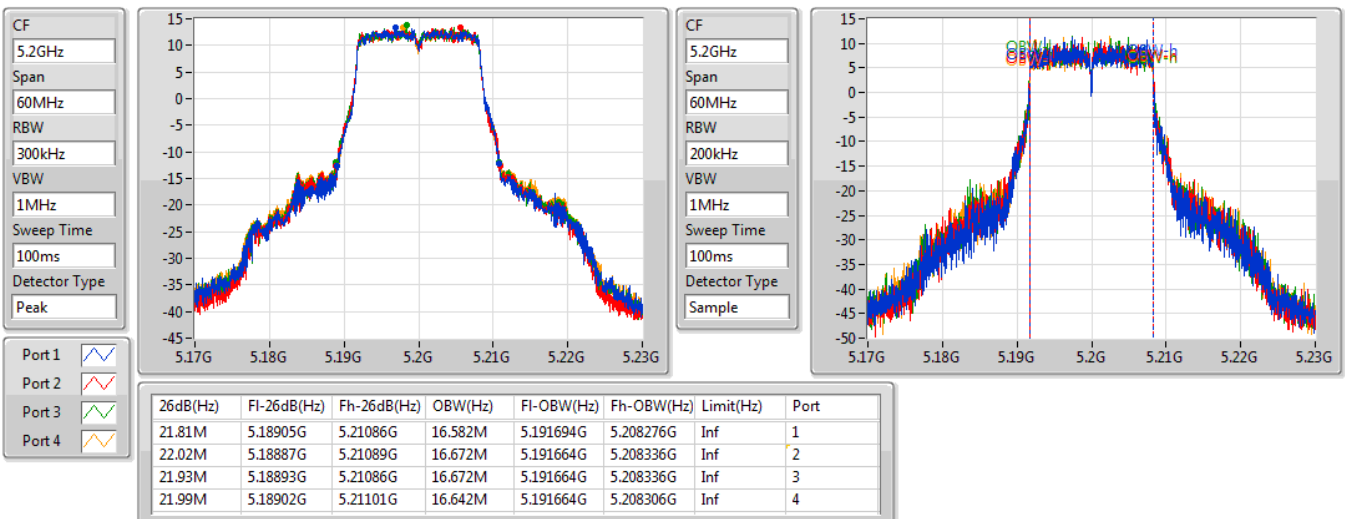
Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_4TX
EBW
5180MHz

18/11/2019

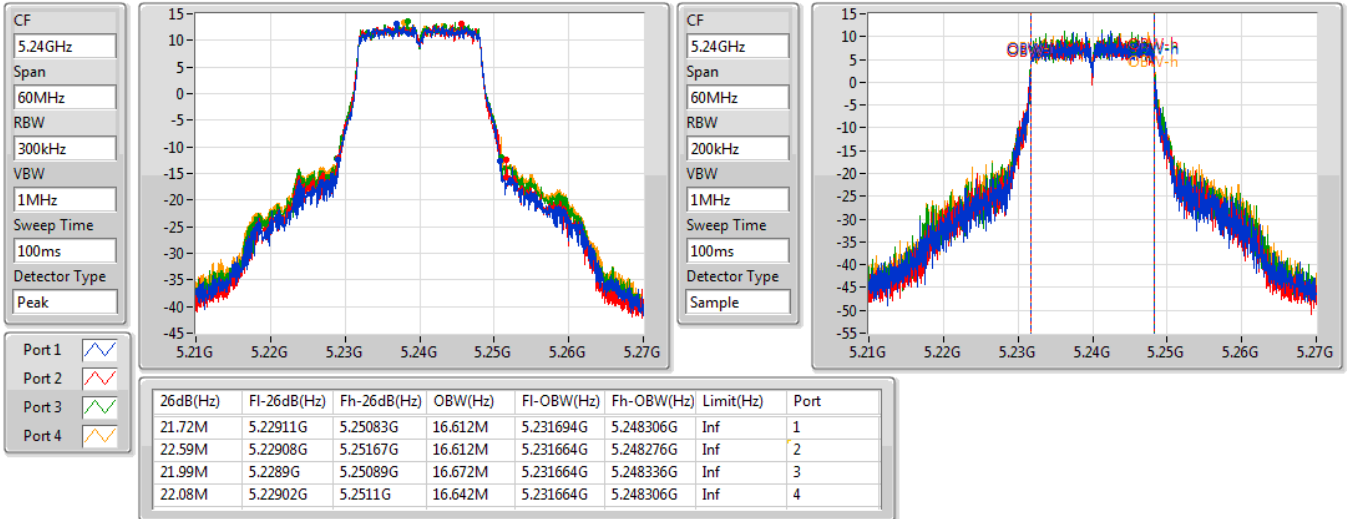

802.11a_Nss1,(6Mbps)_4TX
EBW
5200MHz

18/11/2019

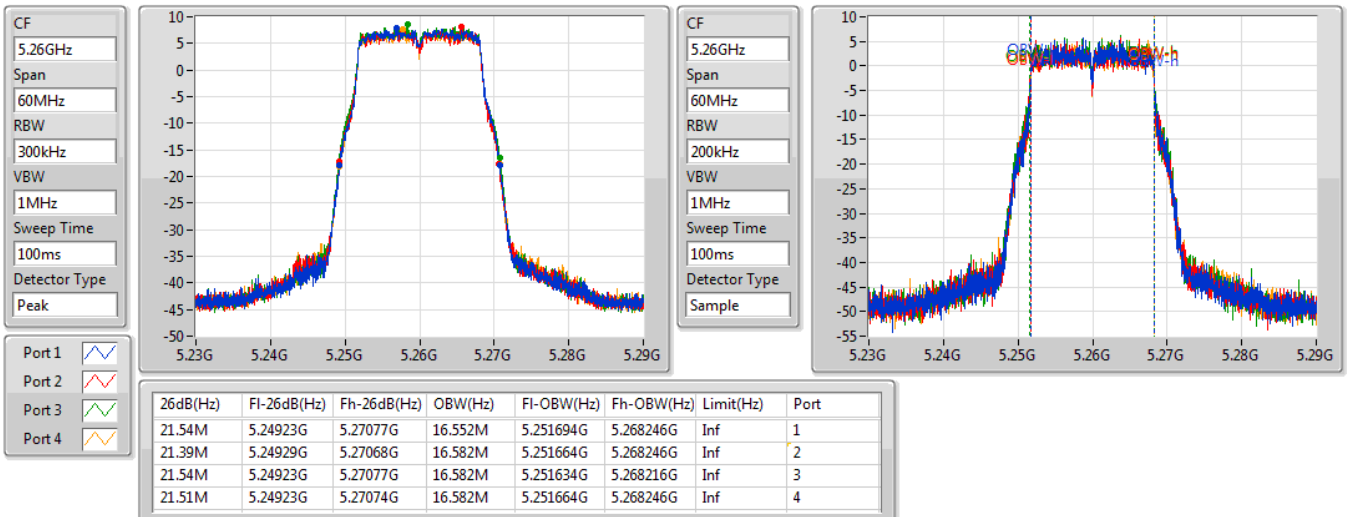


802.11a_Nss1,(6Mbps)_4TX
EBW
5240MHz

18/11/2019

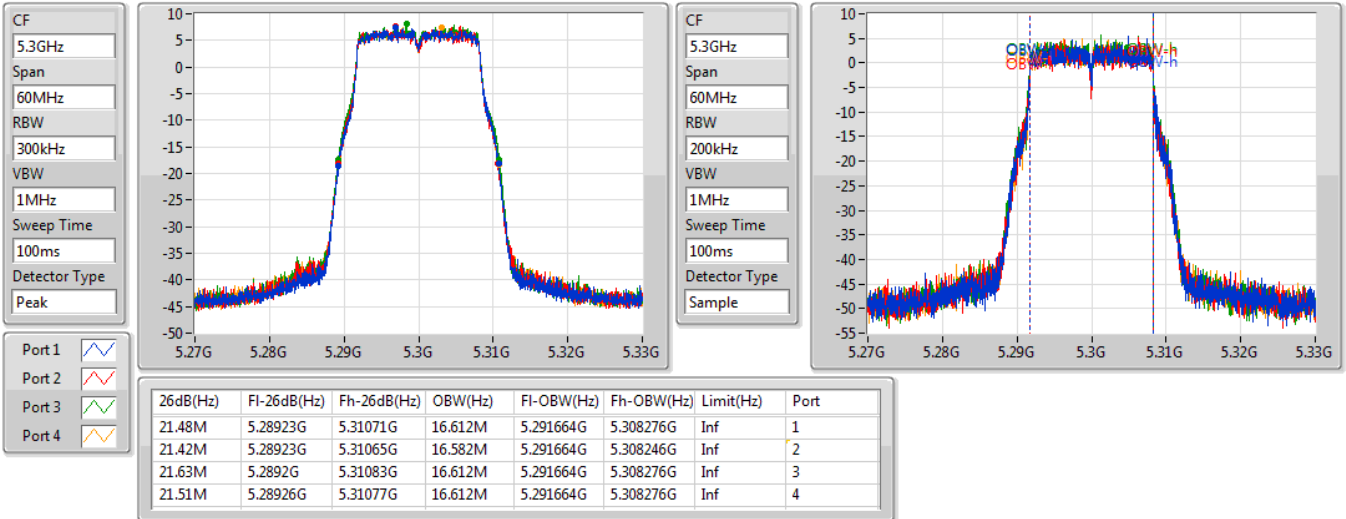

802.11a_Nss1,(6Mbps)_4TX
EBW
5260MHz

18/11/2019

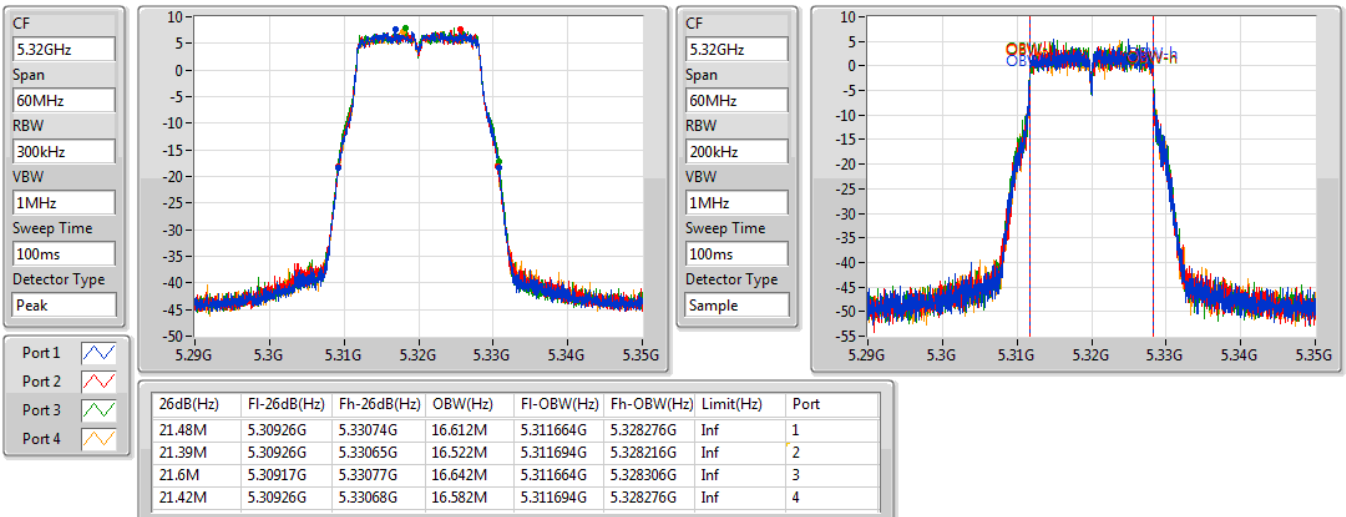


802.11a_Nss1,(6Mbps)_4TX
EBW
5300MHz

18/11/2019

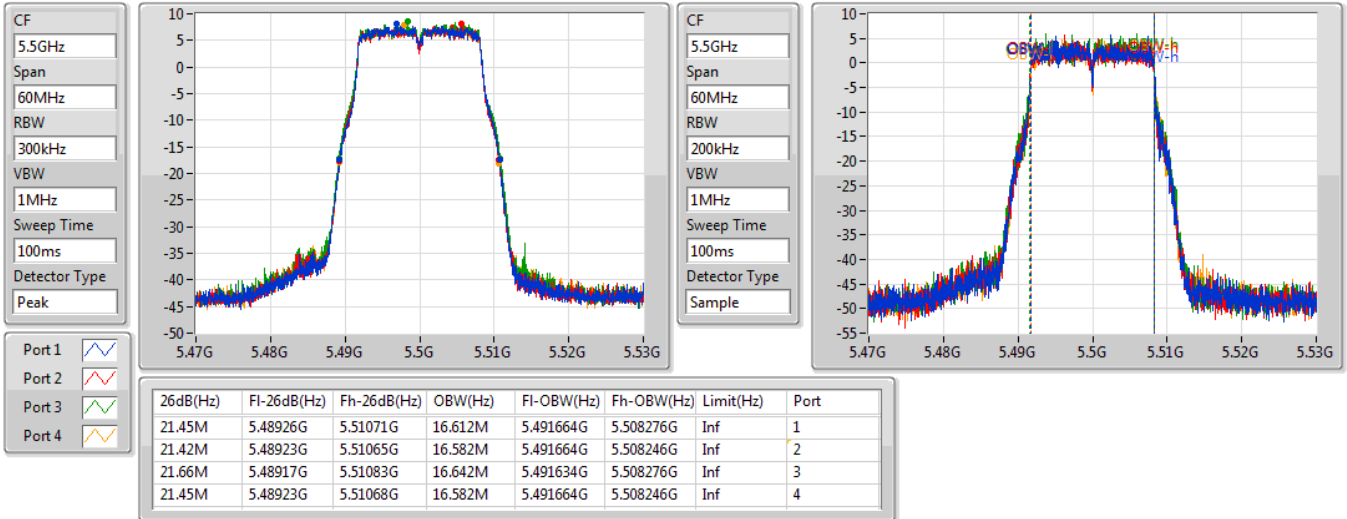

802.11a_Nss1,(6Mbps)_4TX
EBW
5320MHz

18/11/2019

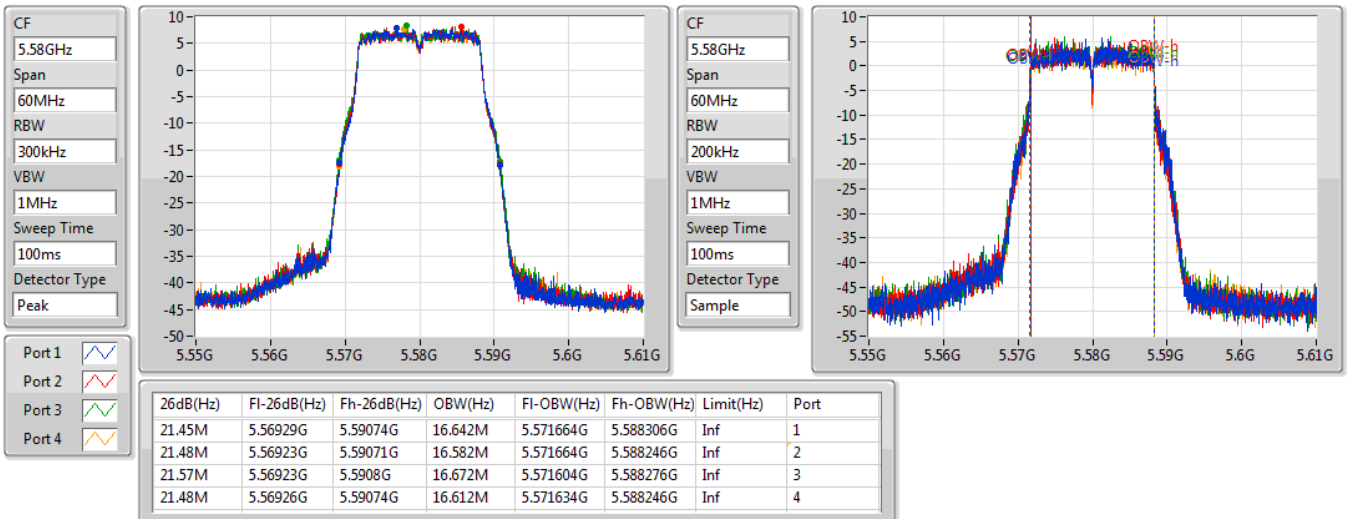


802.11a_Nss1,(6Mbps)_4TX
EBW
5500MHz

18/11/2019

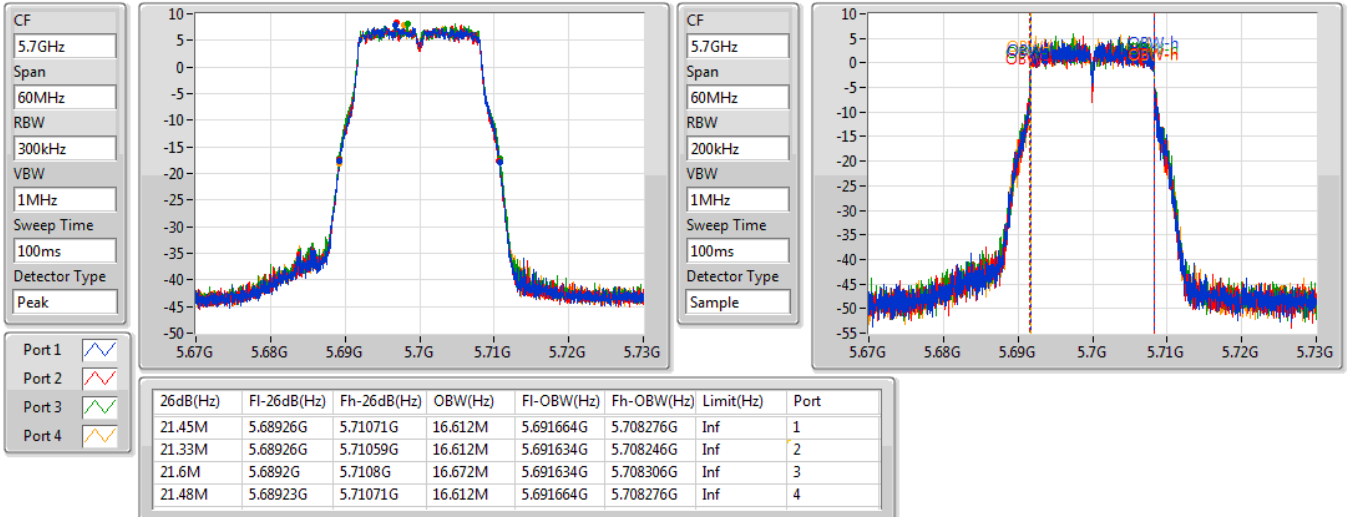

802.11a_Nss1,(6Mbps)_4TX
EBW
5580MHz

18/11/2019

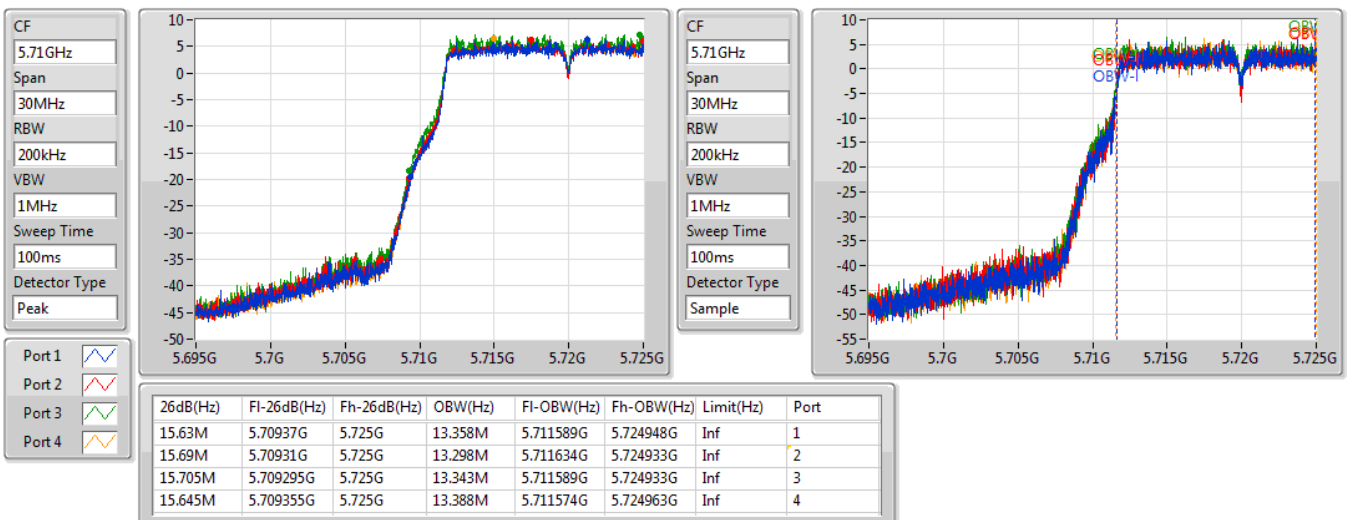


802.11a_Nss1,(6Mbps)_4TX
EBW
5700MHz

18/11/2019

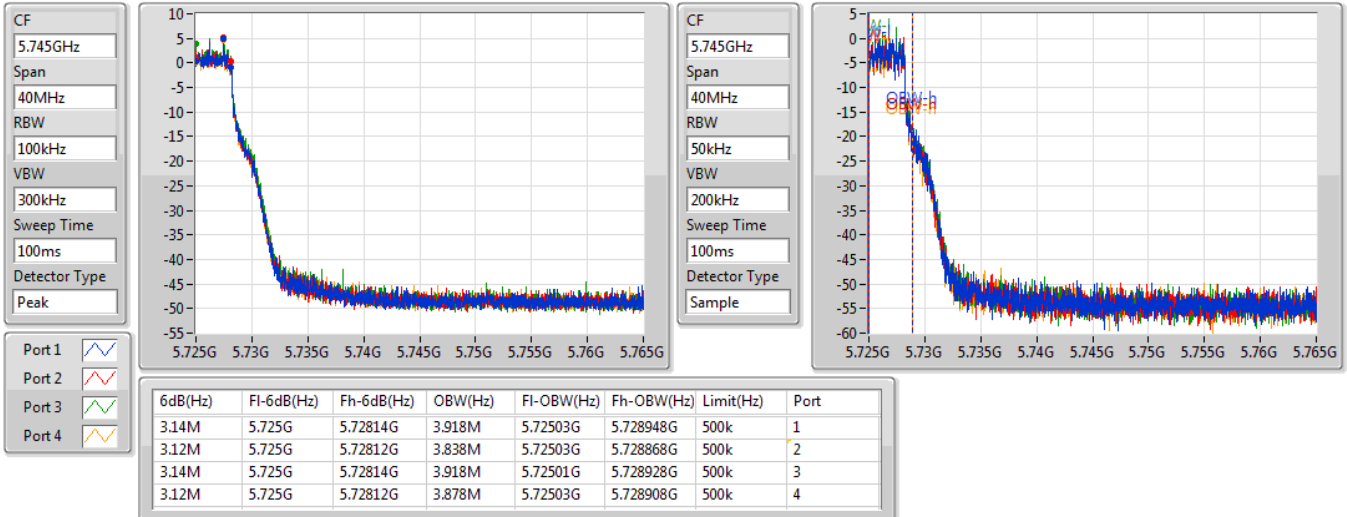

802.11a_Nss1,(6Mbps)_4TX
EBW
5720MHz Straddle 5.47-5.725GHz

18/11/2019

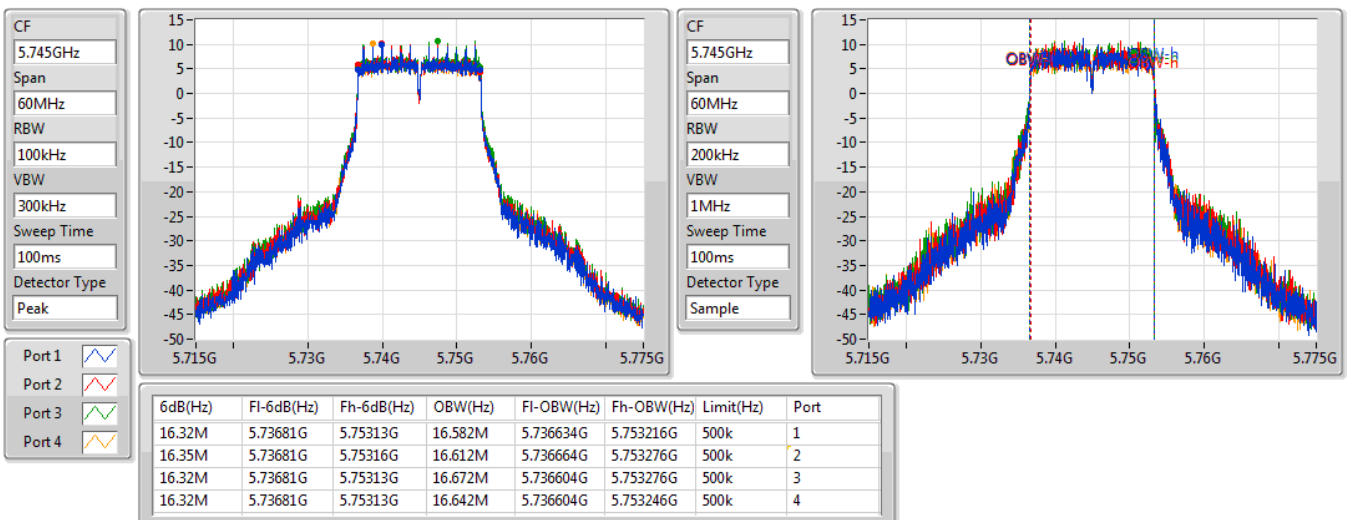


802.11a_Nss1,(6Mbps)_4TX
EBW
5720MHz Straddle 5.725-5.85GHz

18/11/2019

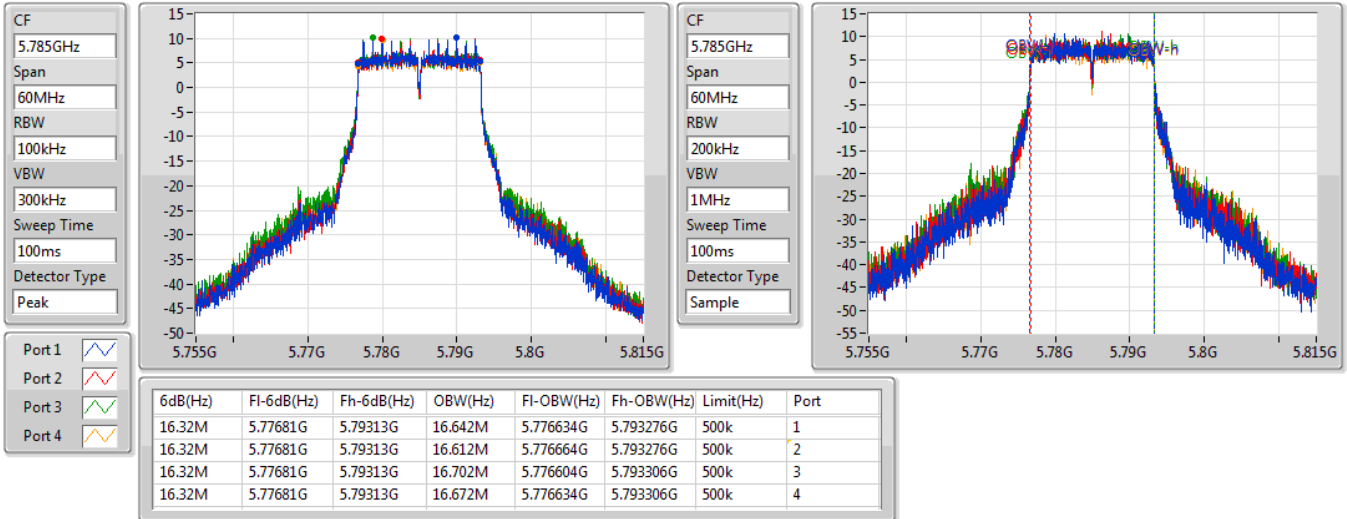

802.11a_Nss1,(6Mbps)_4TX
EBW
5745MHz

18/11/2019

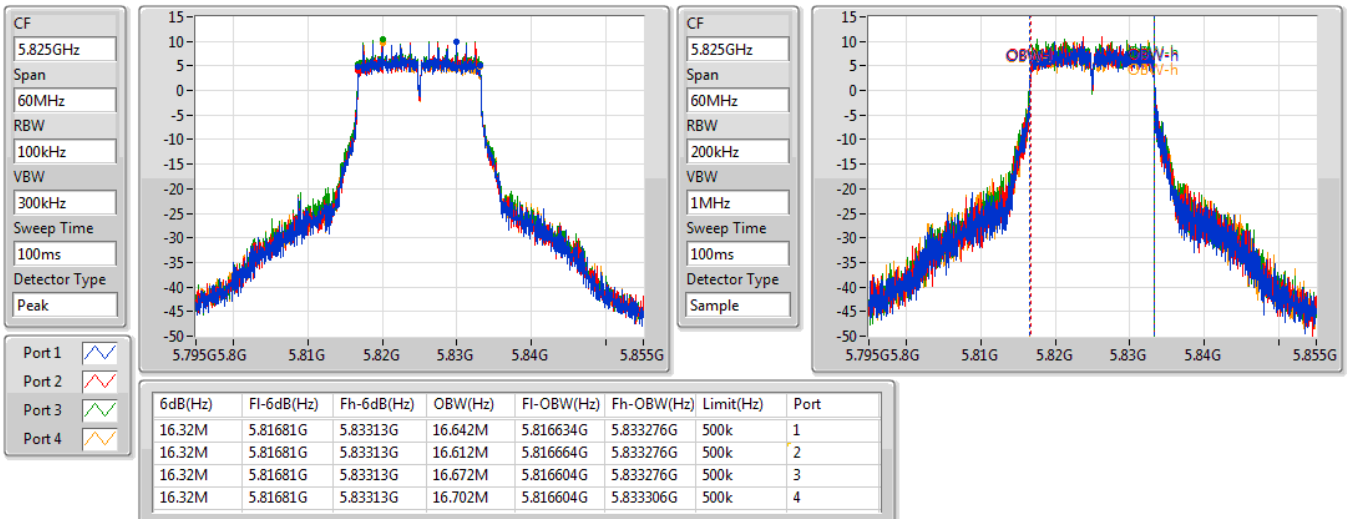


802.11a_Nss1,(6Mbps)_4TX
EBW
5785MHz

18/11/2019

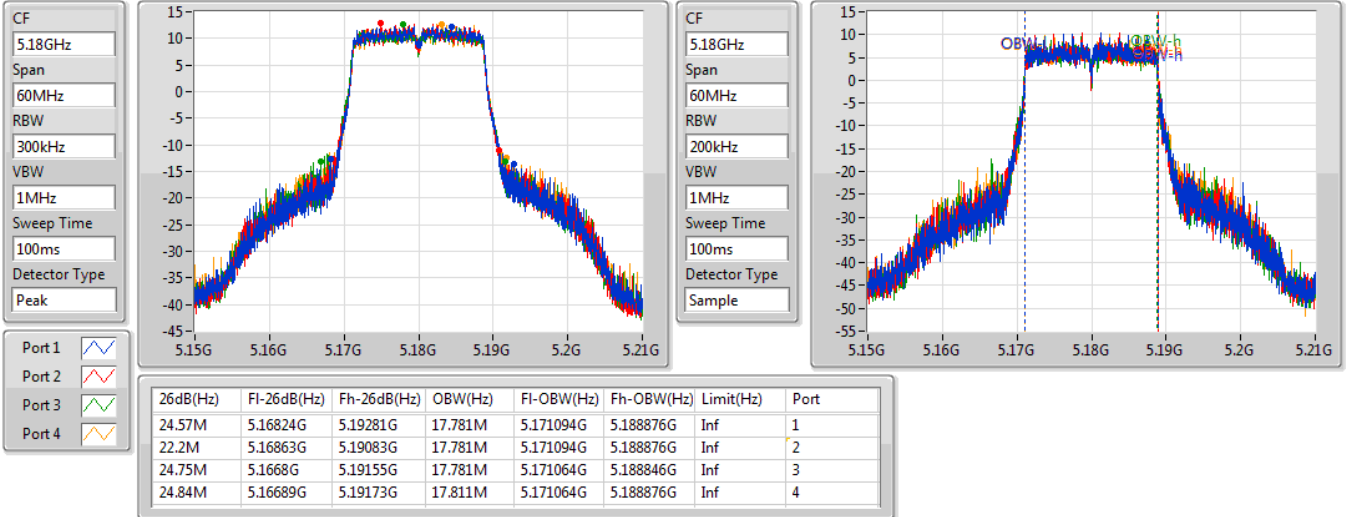

802.11a_Nss1,(6Mbps)_4TX
EBW
5825MHz

18/11/2019

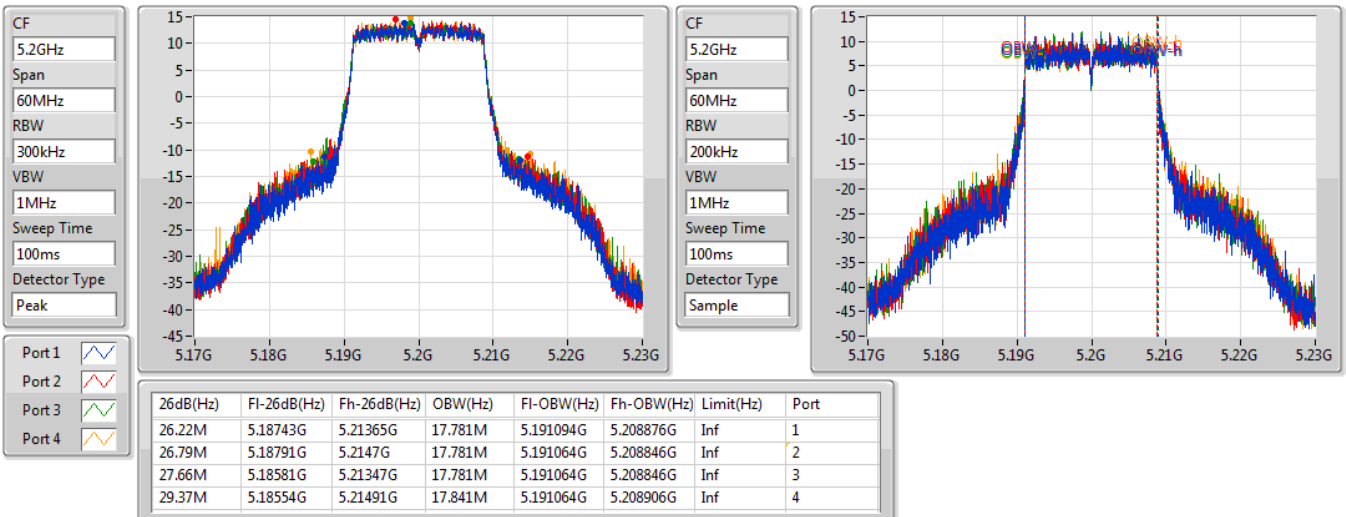


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5180MHz

18/11/2019

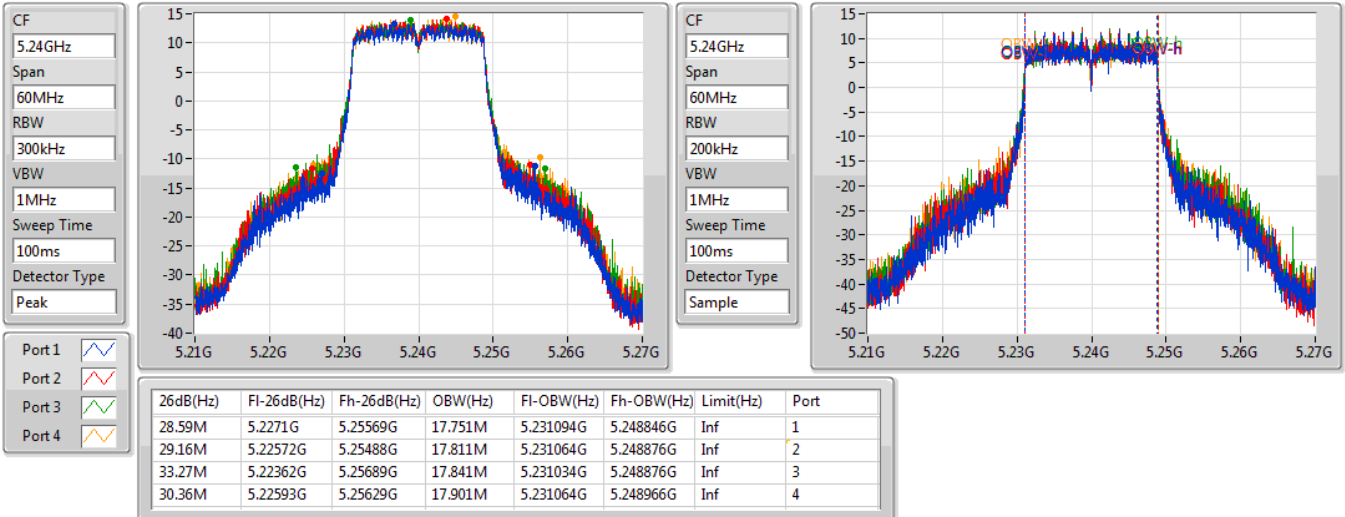

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5200MHz

18/11/2019

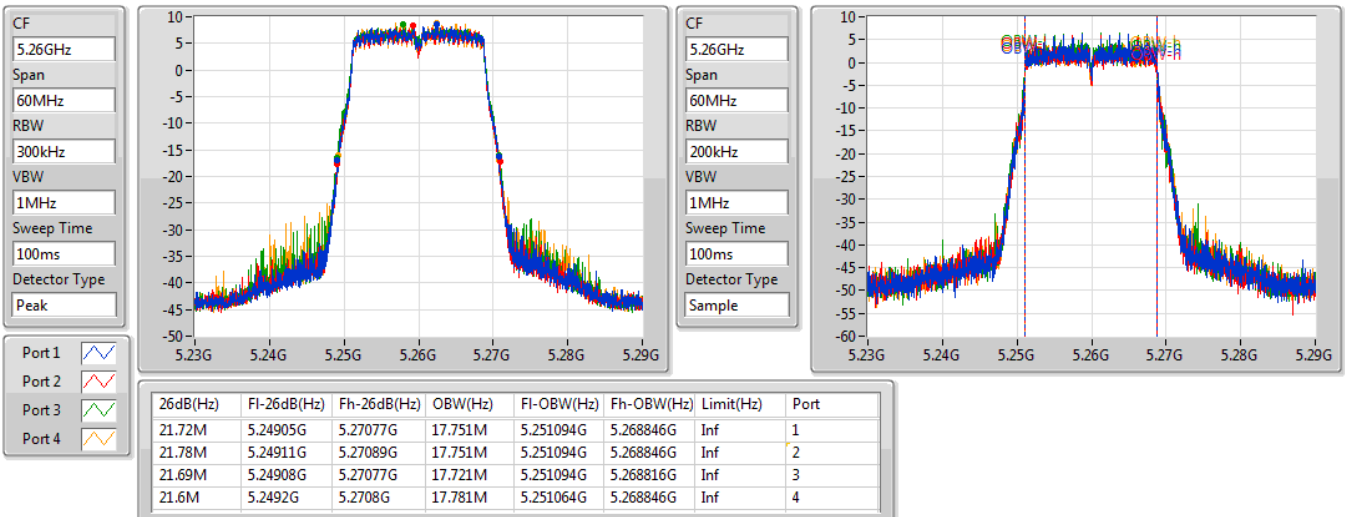


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5240MHz

18/11/2019

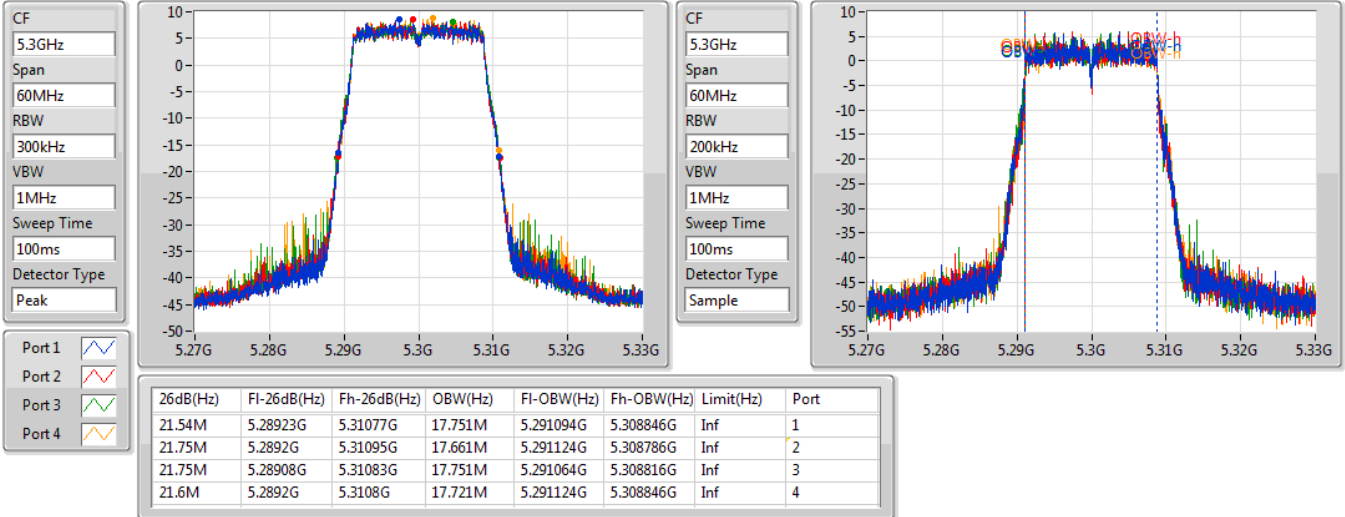

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5260MHz

18/11/2019

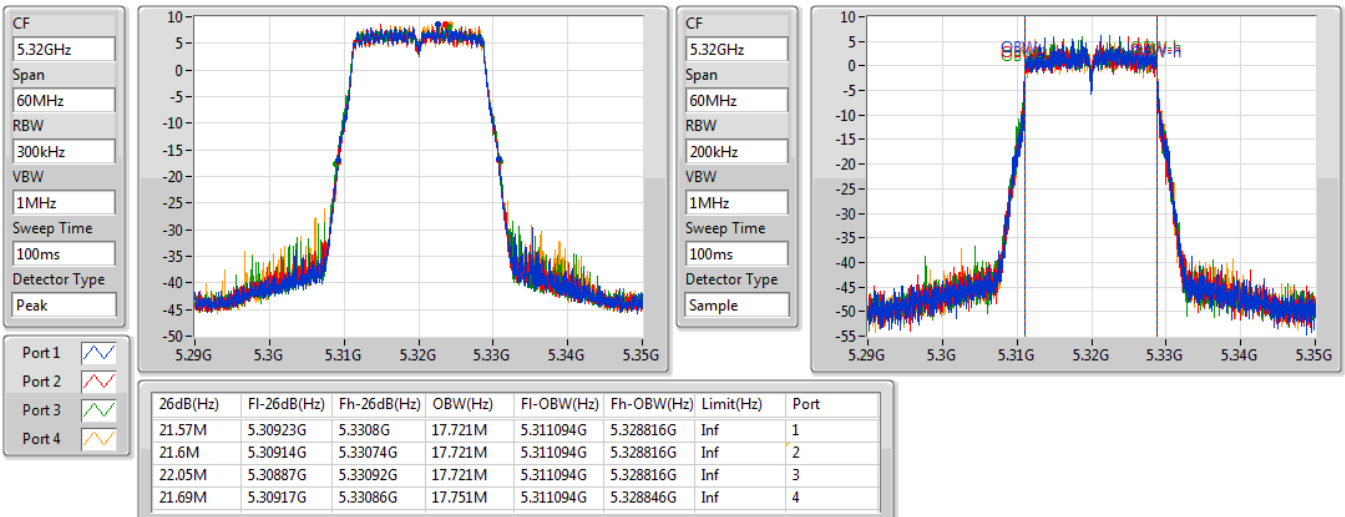


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5300MHz

18/11/2019

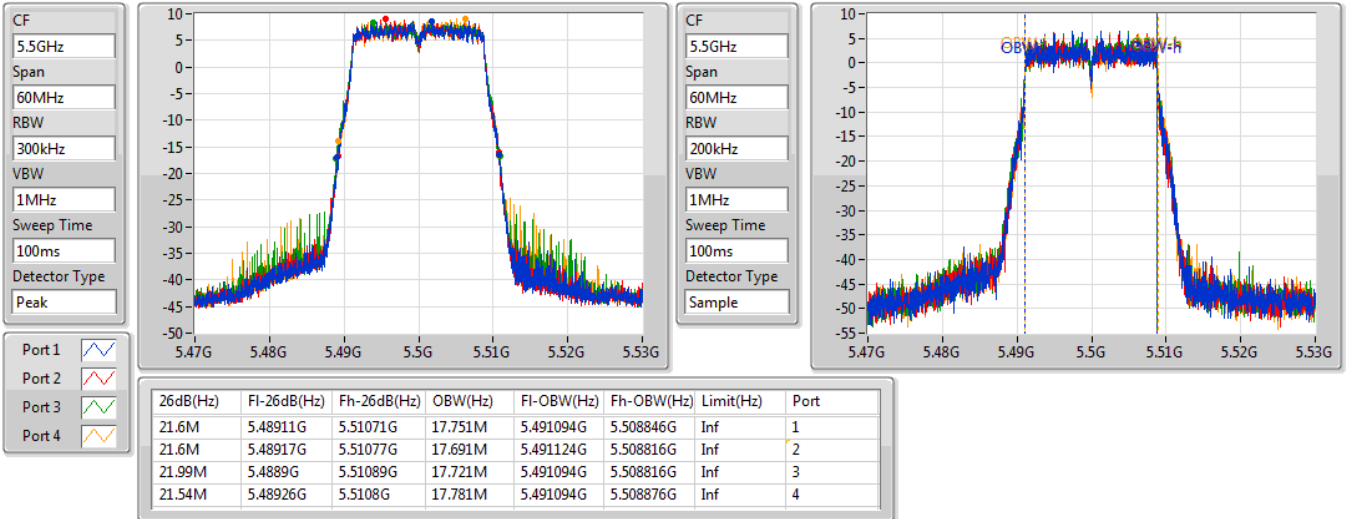

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5320MHz

18/11/2019

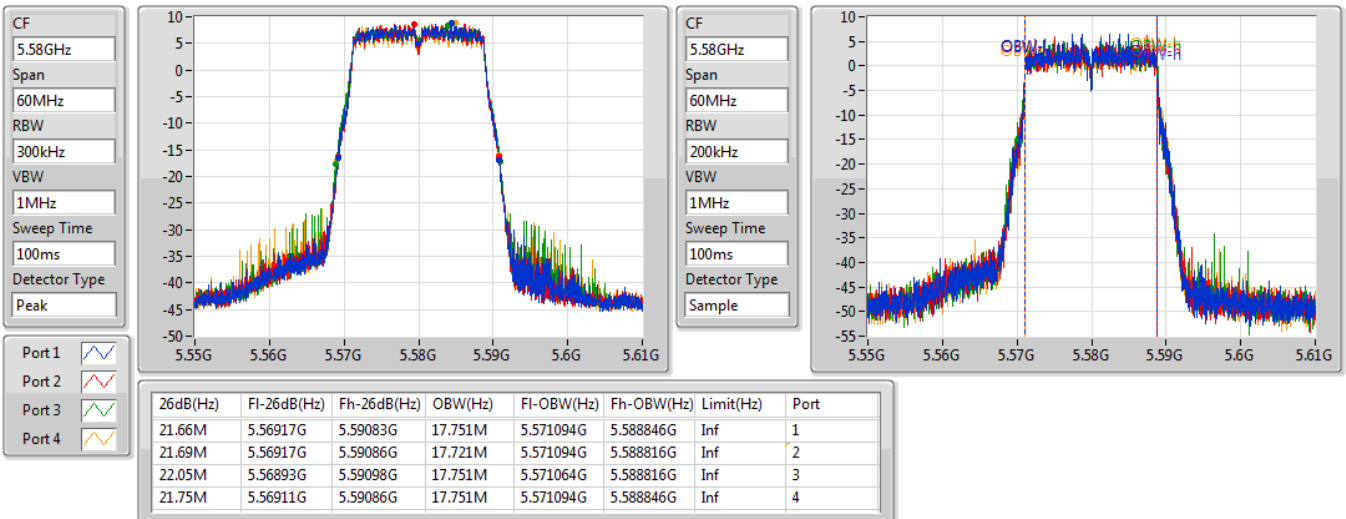


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5500MHz

18/11/2019

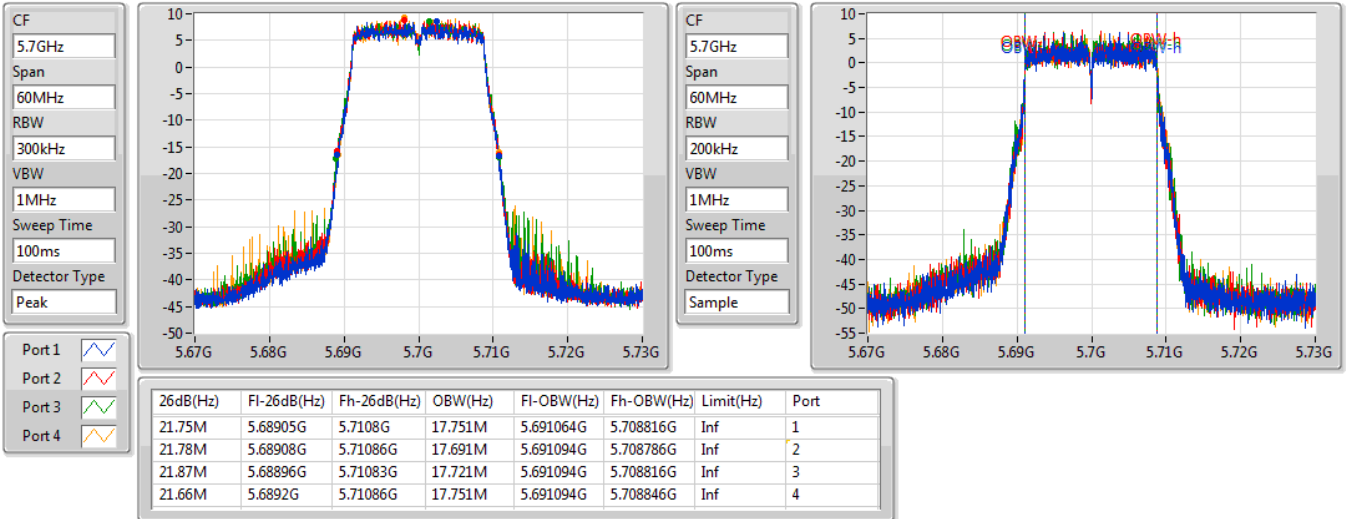

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5580MHz

18/11/2019

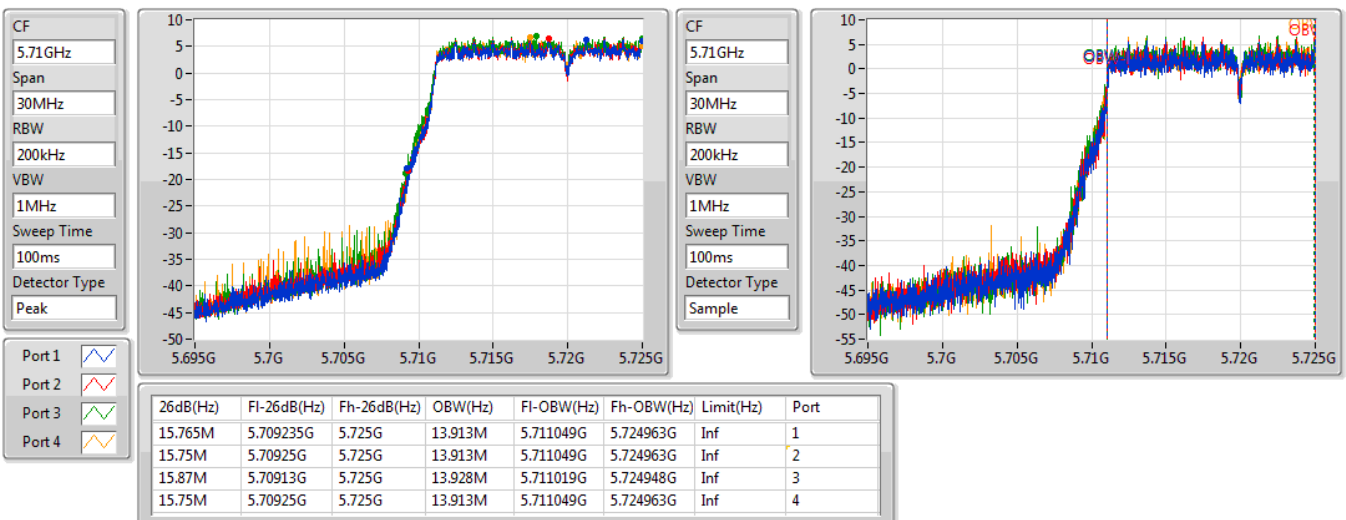


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5700MHz

18/11/2019

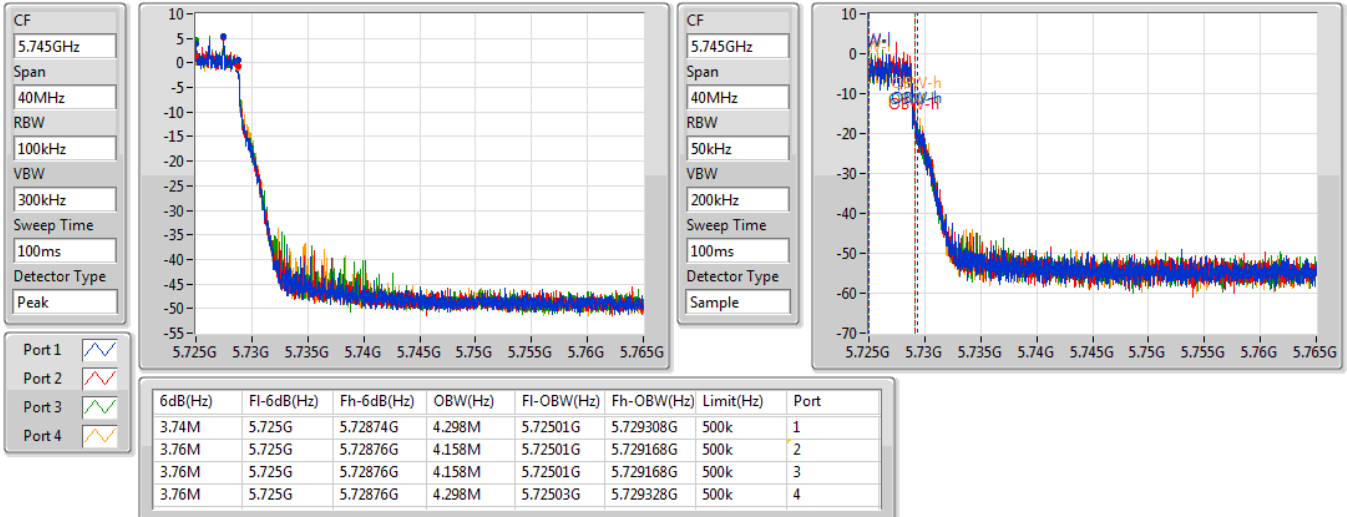

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.47-5.725GHz

18/11/2019

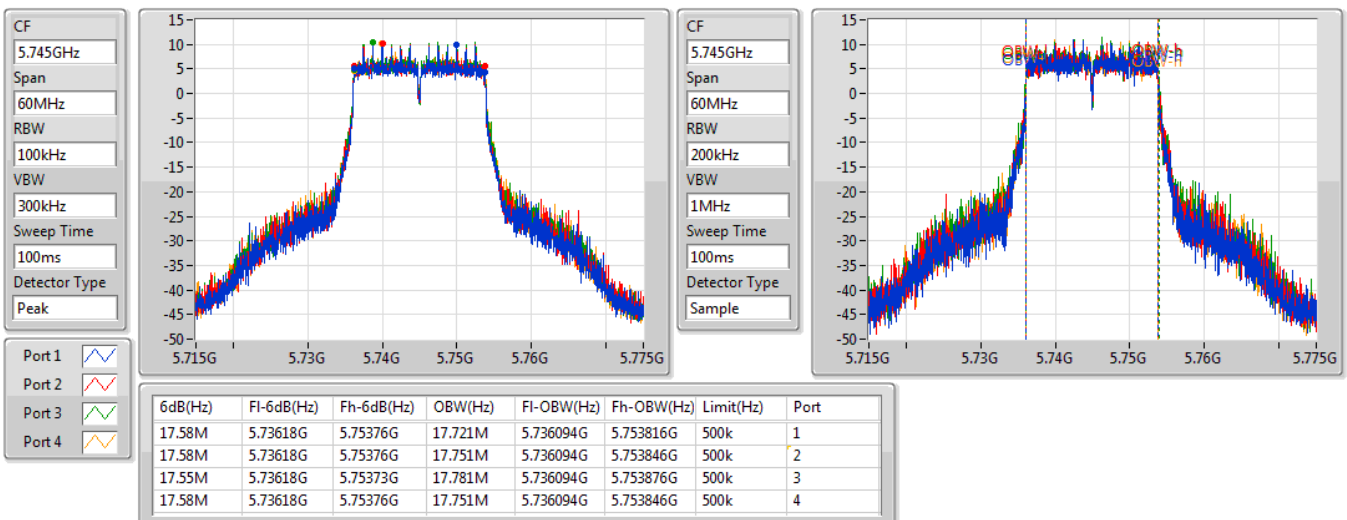


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.725-5.85GHz

18/11/2019

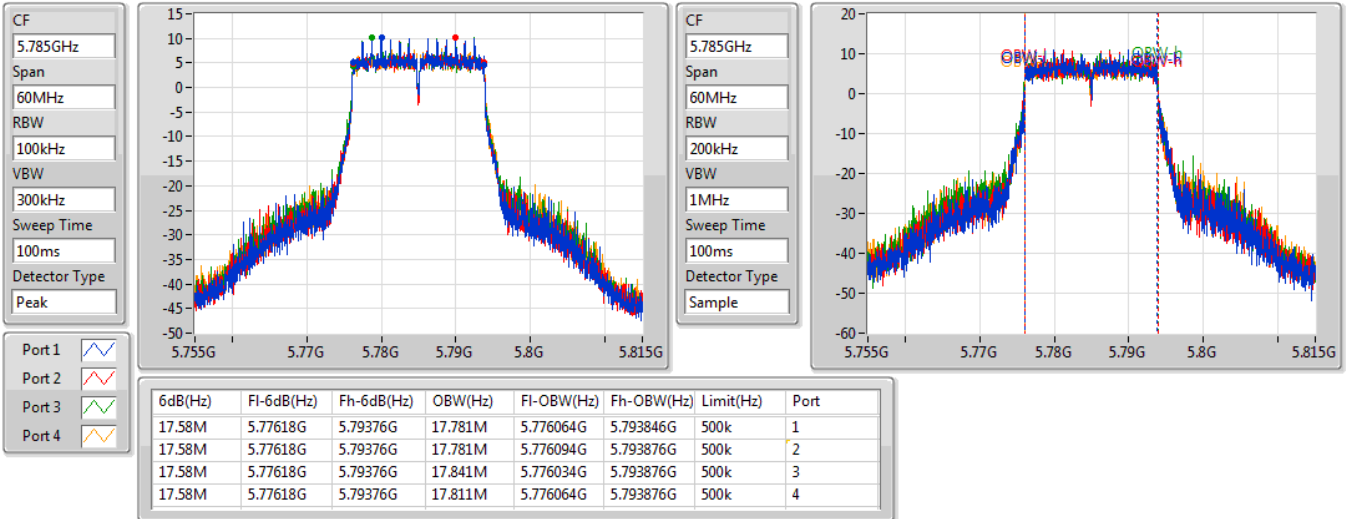

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5745MHz

18/11/2019

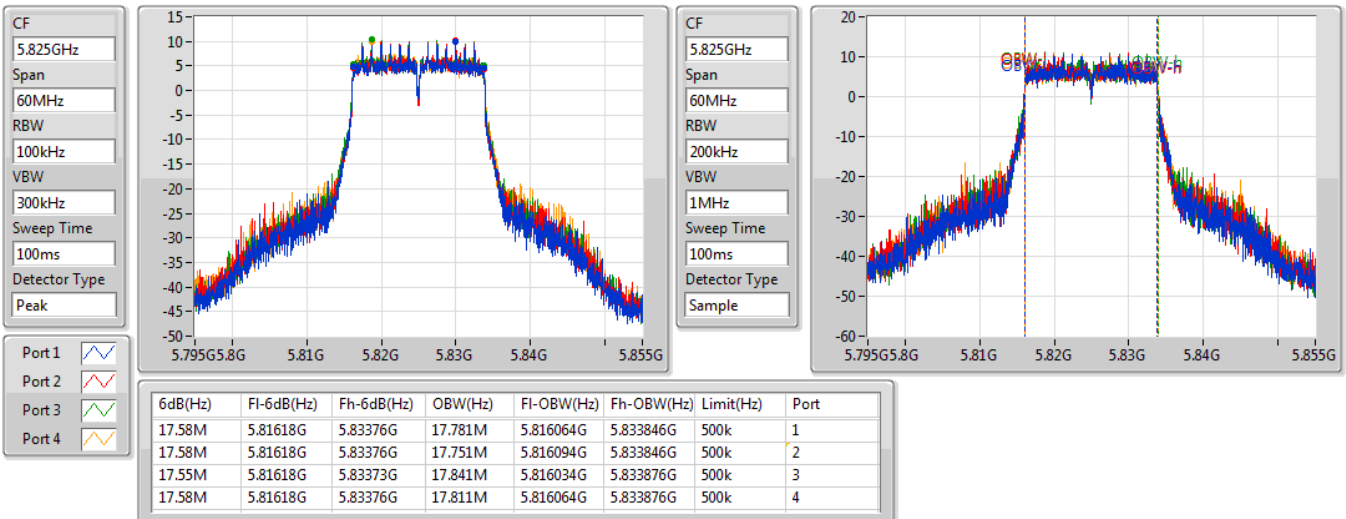


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5785MHz

18/11/2019

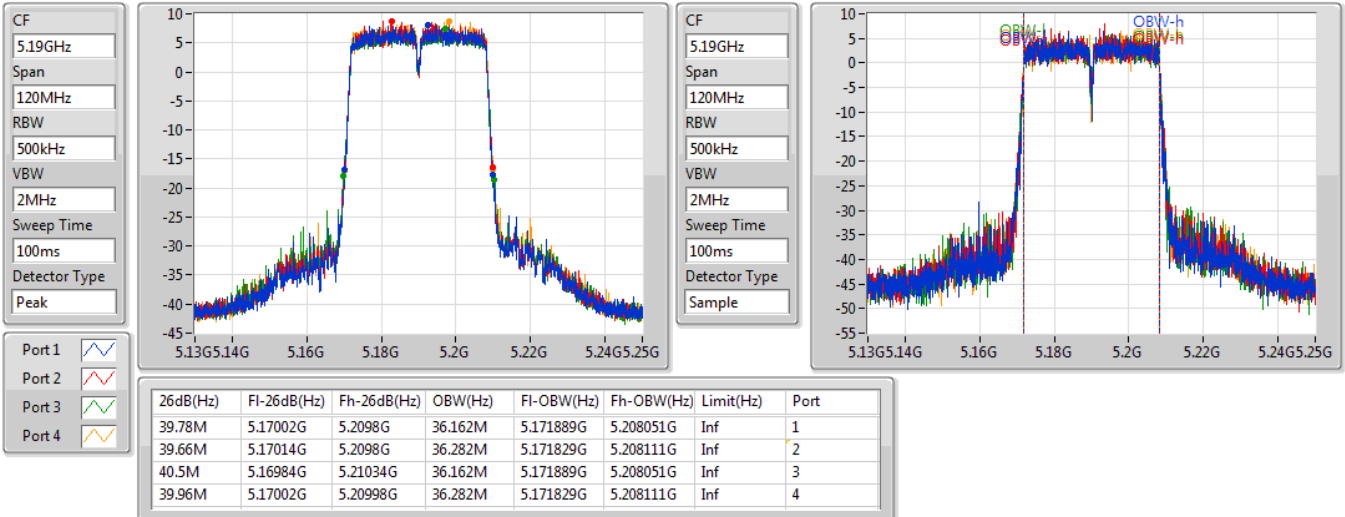

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5825MHz

18/11/2019

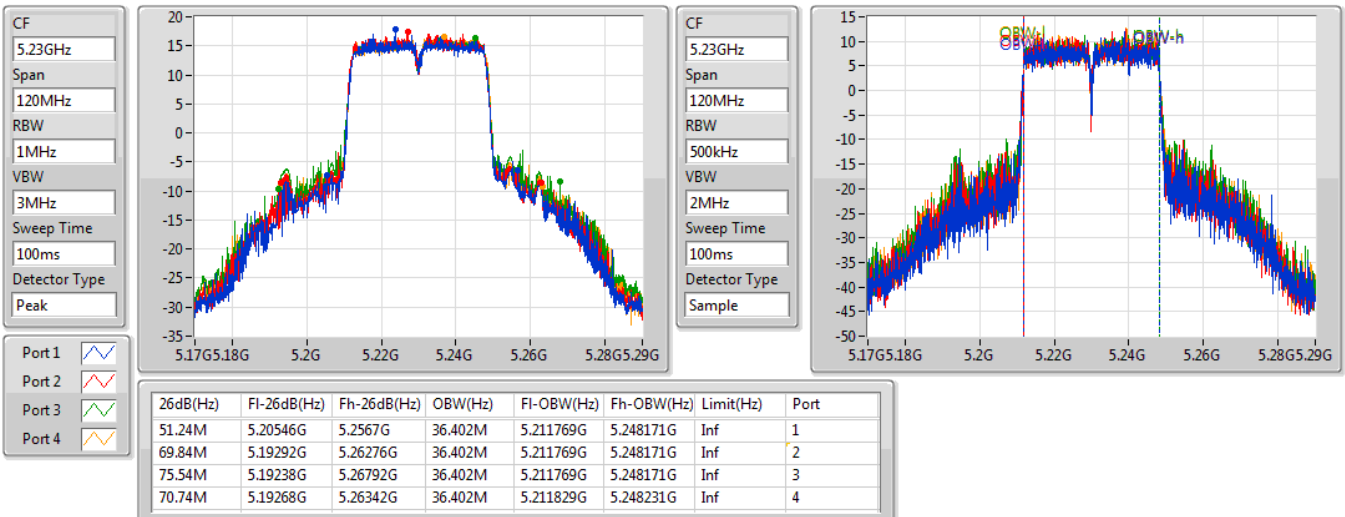


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5190MHz

18/11/2019

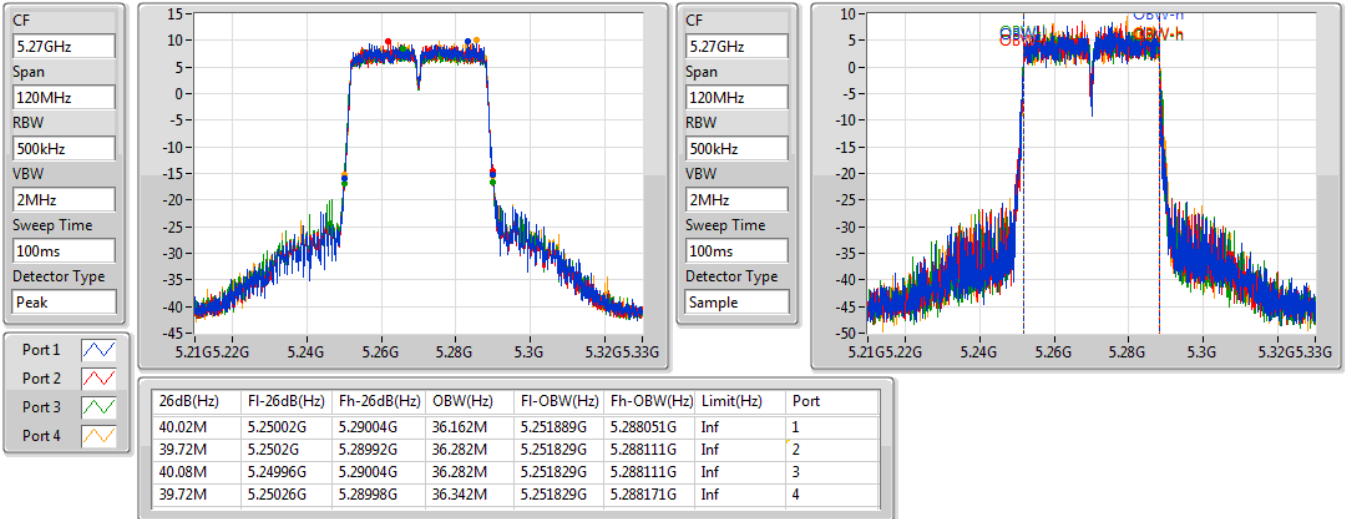

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5230MHz

18/11/2019

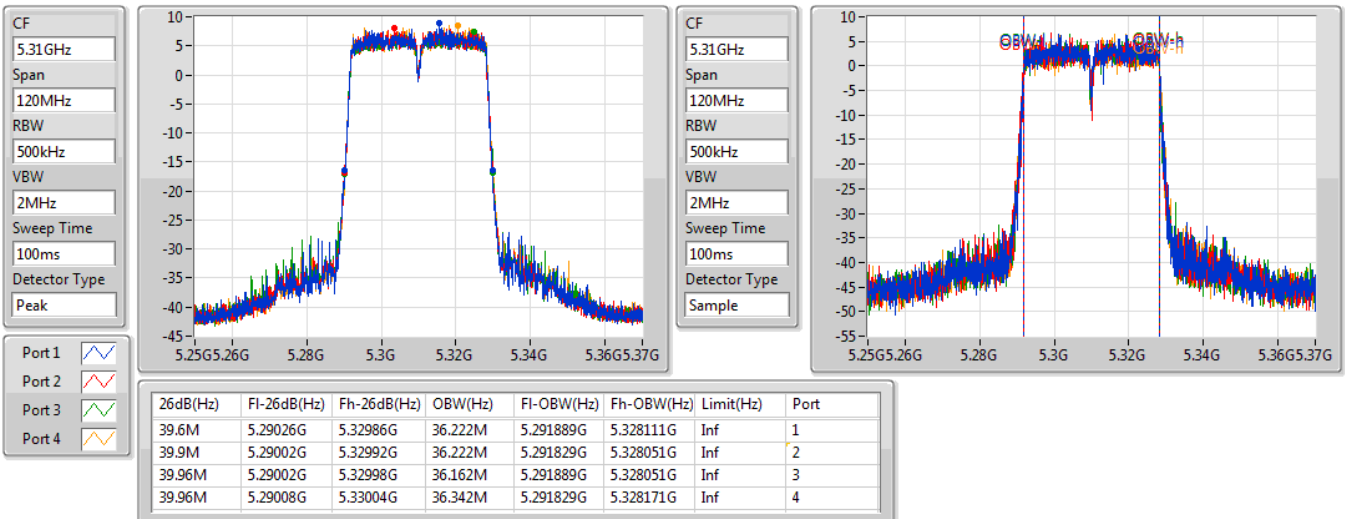


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5270MHz

18/11/2019

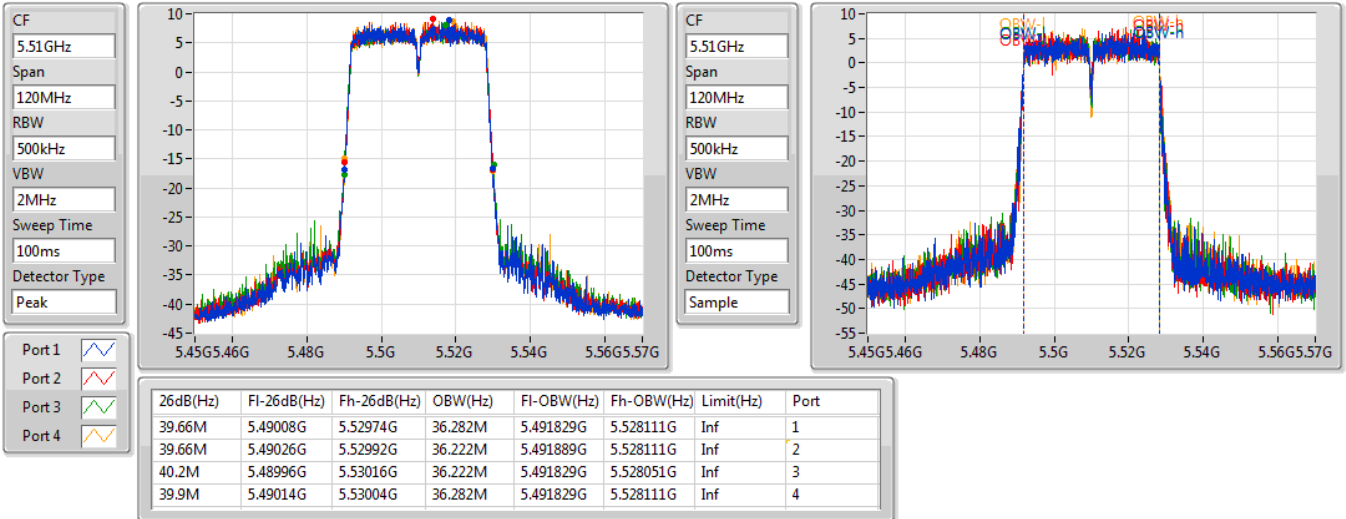

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5310MHz

18/11/2019

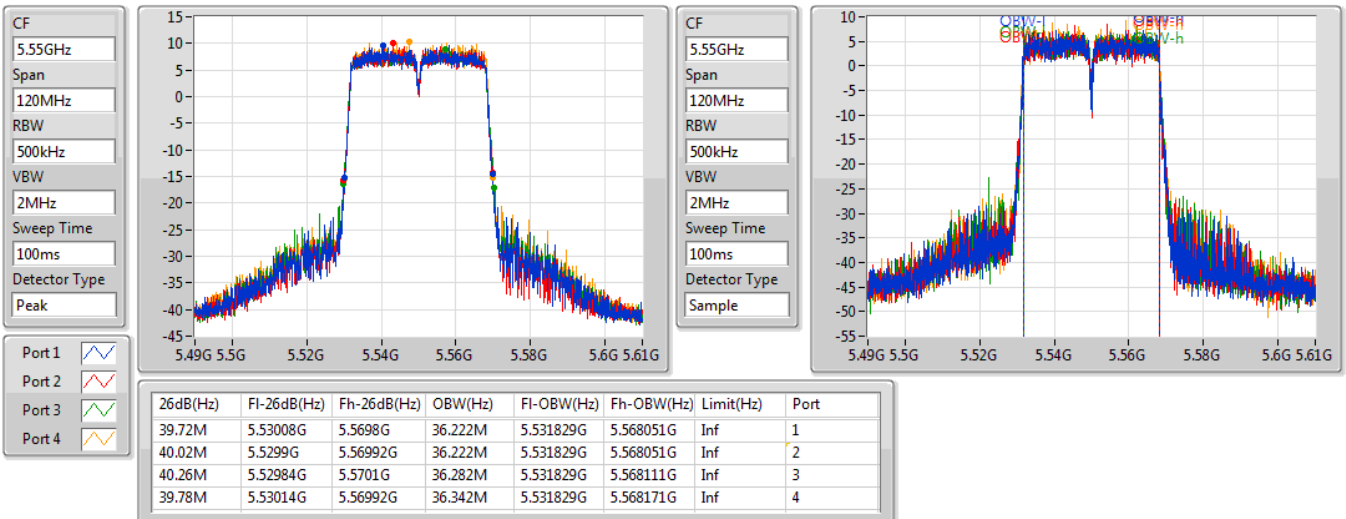


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5510MHz

18/11/2019

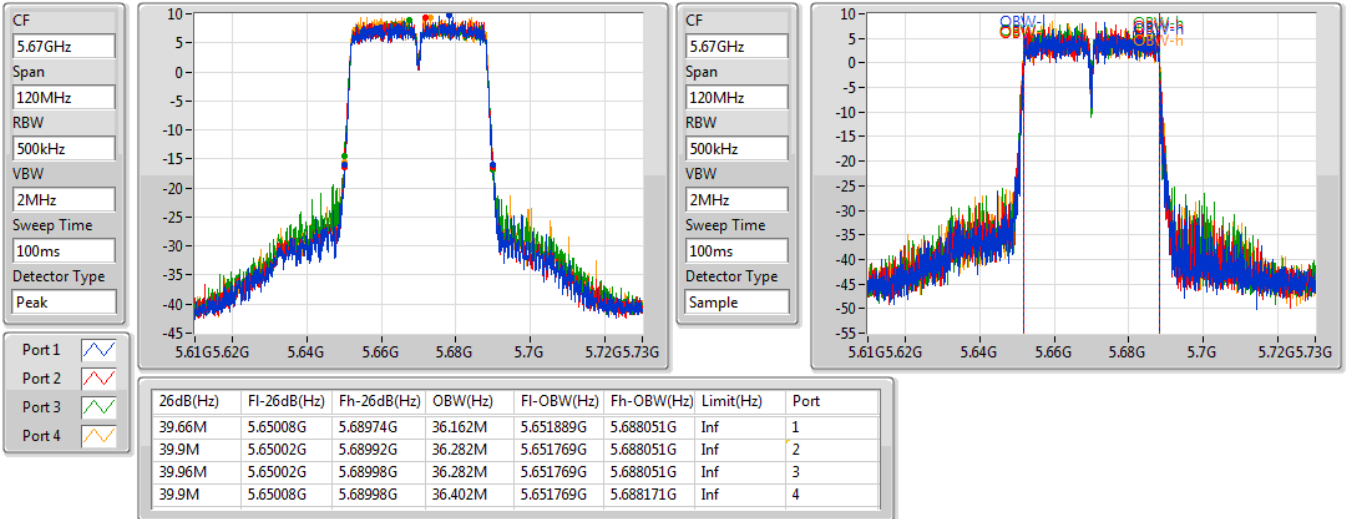

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5550MHz

18/11/2019

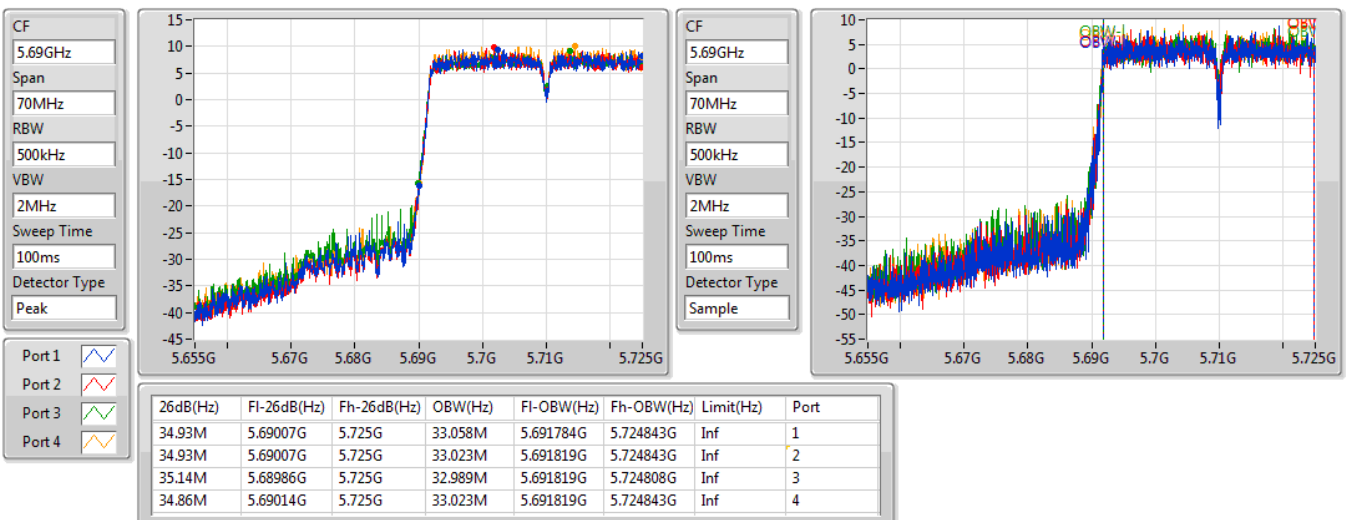


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5670MHz

18/11/2019

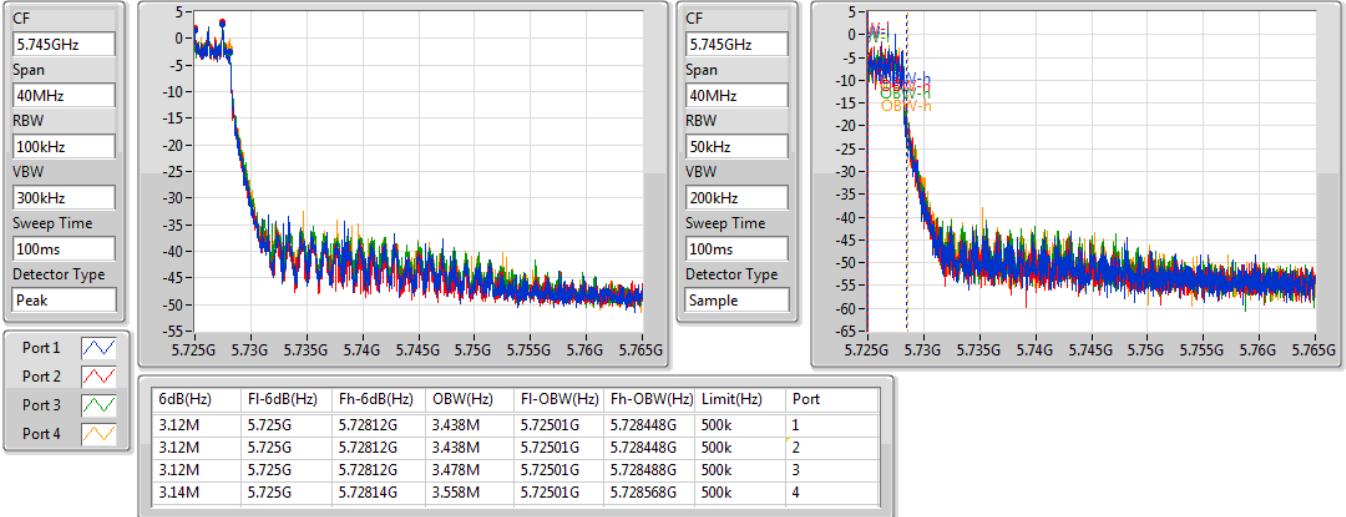

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5710MHz Straddle 5.47-5.725GHz

18/11/2019

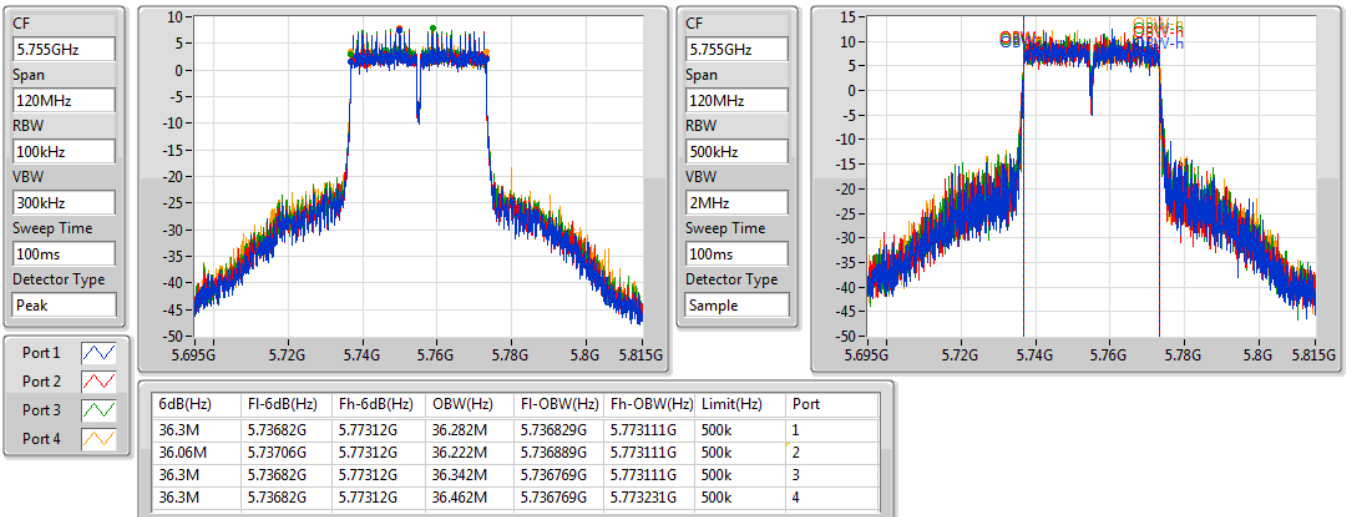


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5710MHz Straddle 5.725-5.85GHz

18/11/2019

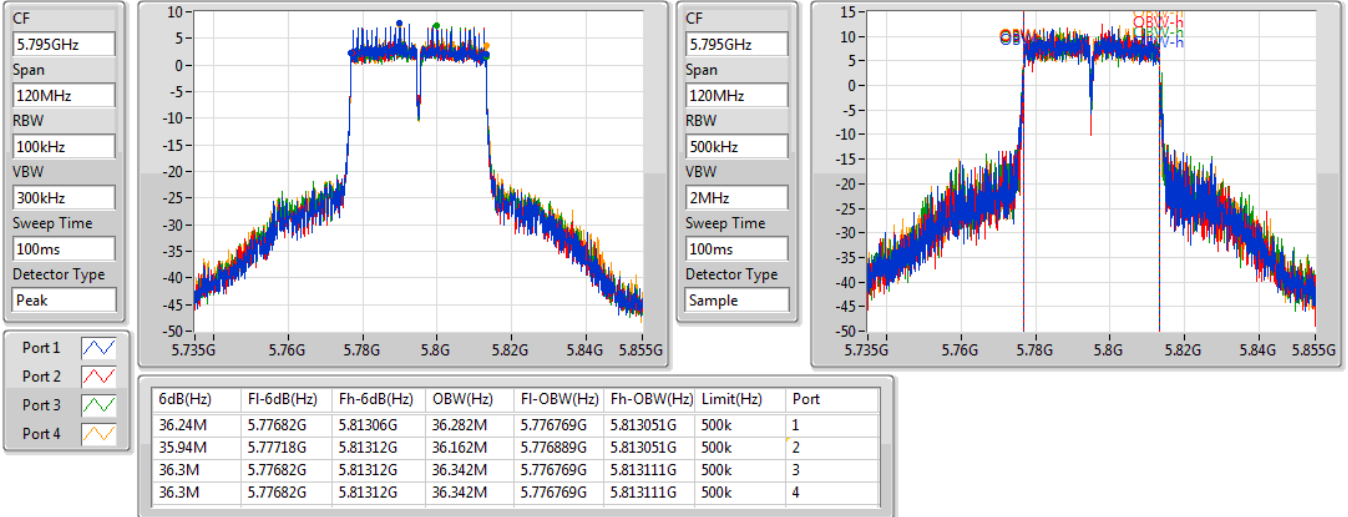

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5755MHz

18/11/2019

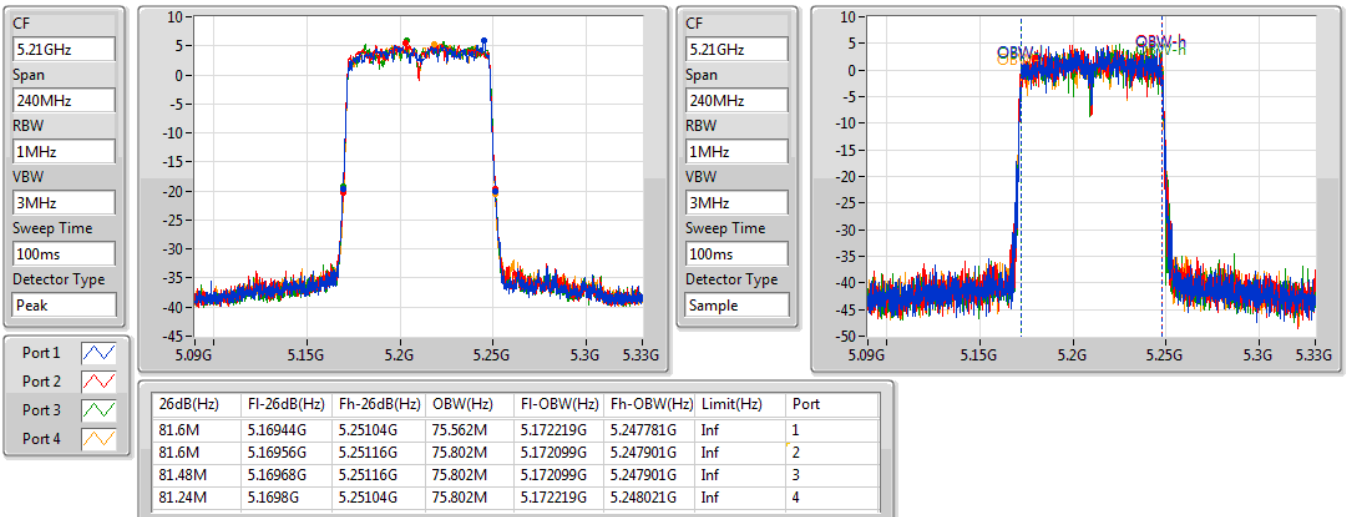


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5795MHz

18/11/2019

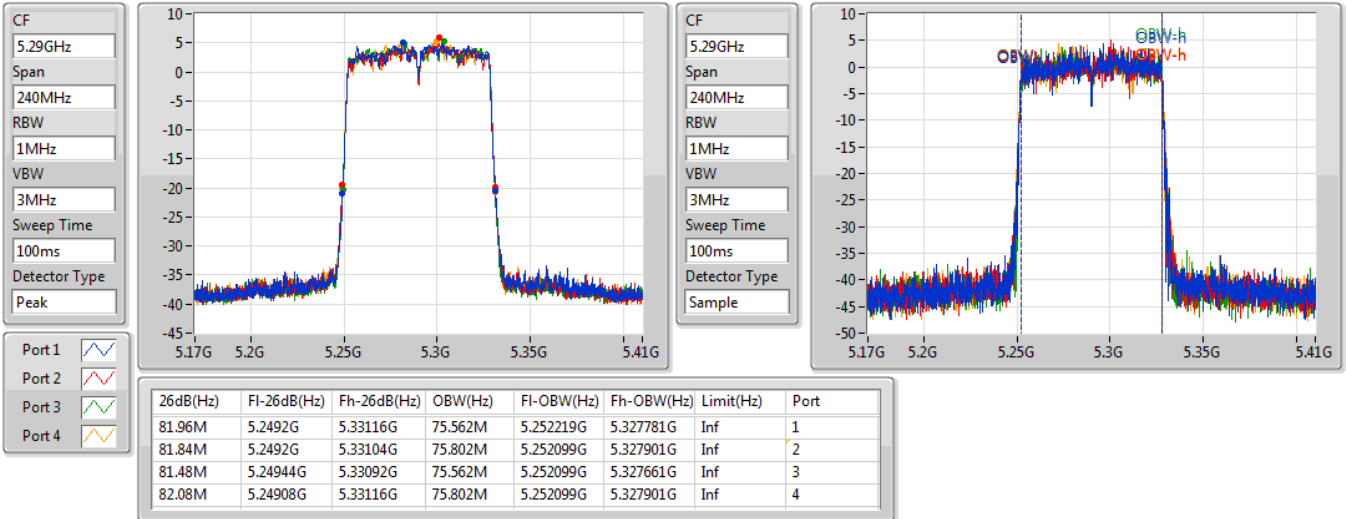

802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5210MHz

18/11/2019

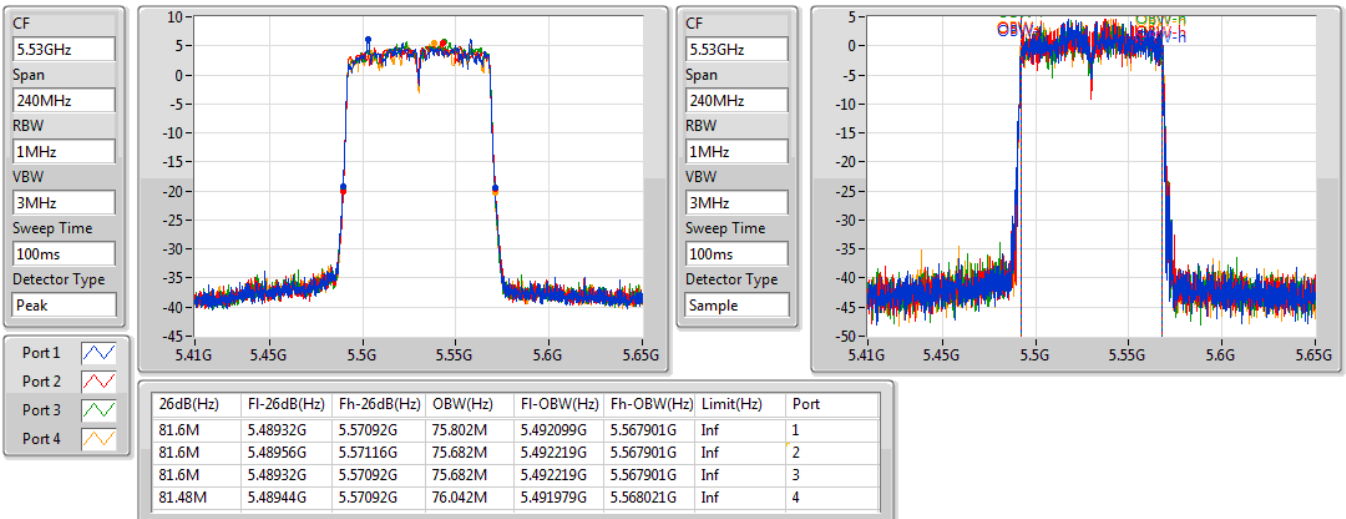


802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5290MHz

18/11/2019

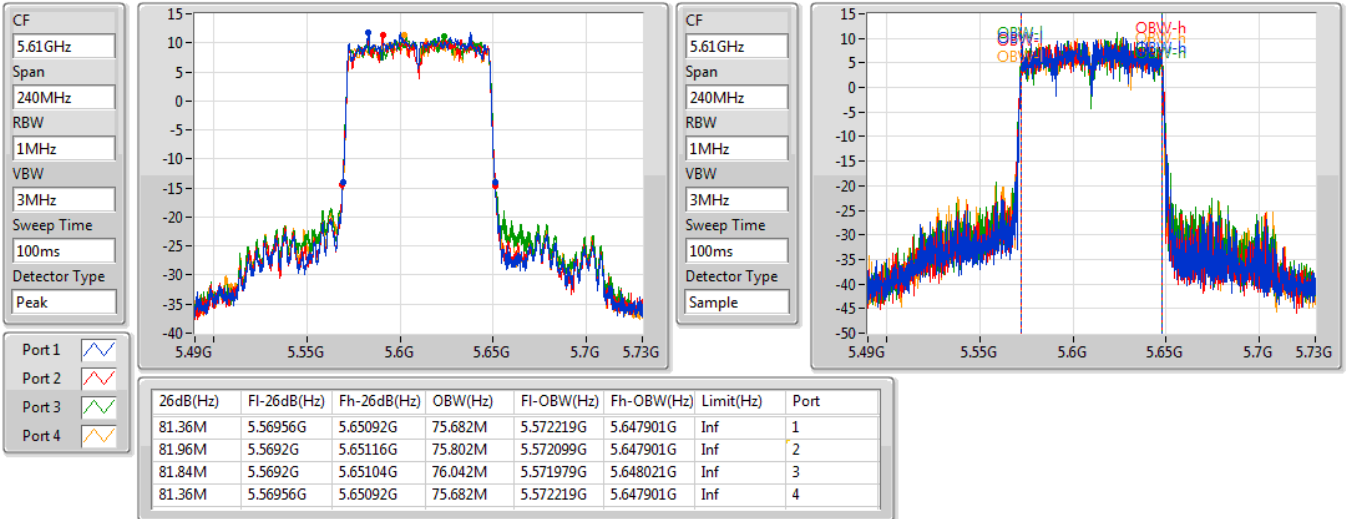

802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5530MHz

18/11/2019

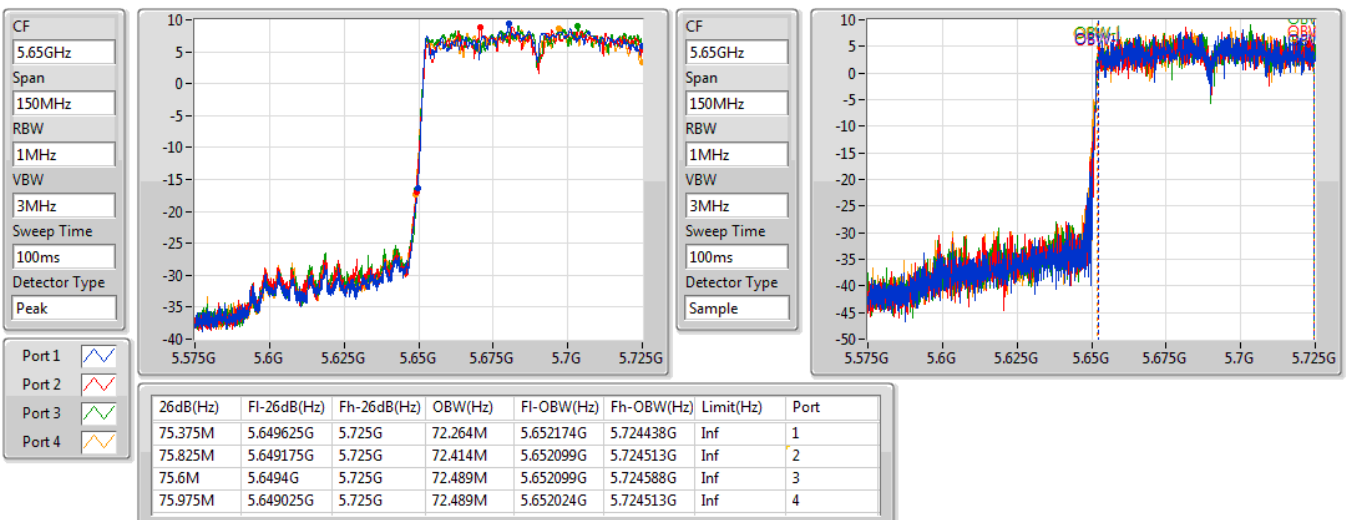


802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5610MHz

18/11/2019

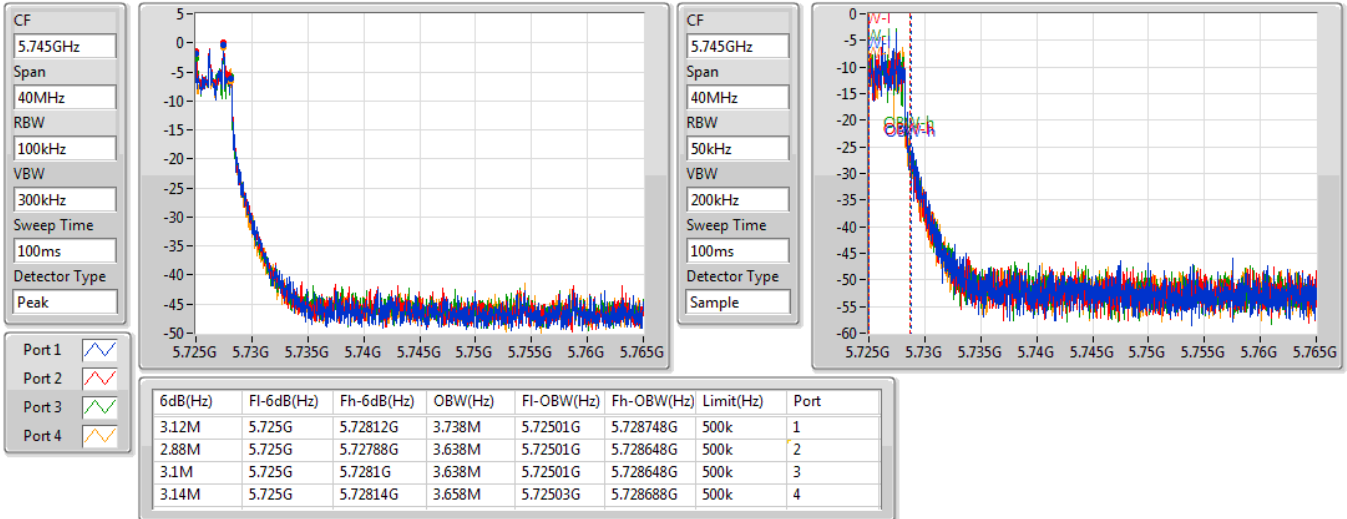

802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5690MHz Straddle 5.47-5.725GHz

18/11/2019

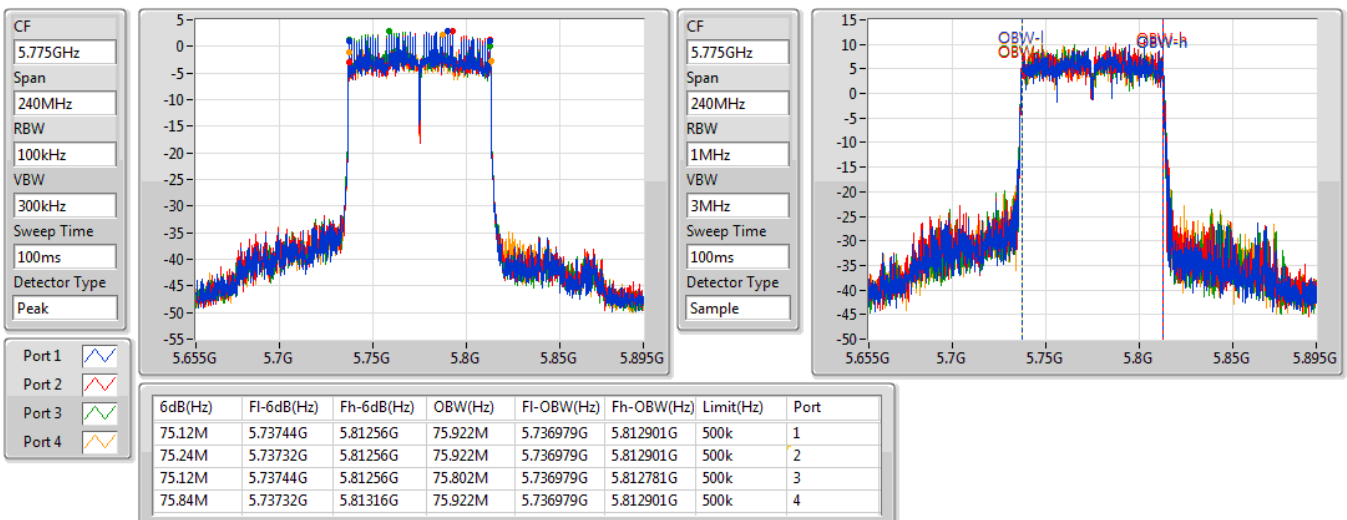


802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5690MHz Straddle 5.725-5.85GHz

18/11/2019


802.11ac VHT80_Nss1,(MCS0)_4TX
EBW
5775MHz

18/11/2019



**For beamforming mode:
Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	25.45M	17.841M	17M8D1D	21.6M	17.691M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	72.6M	36.332M	36M3D1D	39.65M	36.182M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	82.2M	75.962M	76M0D1D	81.2M	75.762M
5.25-5.35GHz	-	-	-	-	-
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	21.9M	17.766M	17M8D1D	21.5M	17.691M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	40.25M	36.282M	36M3D1D	39.65M	36.182M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	82.2M	75.962M	76M0D1D	81.4M	75.662M
5.47-5.725GHz	-	-	-	-	-
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	21.975M	17.791M	17M8D1D	15.66M	13.868M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	40.55M	36.332M	36M3D1D	34.895M	33.023M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	82M	75.962M	76M0D1D	75.375M	72.339M
5.725-5.85GHz	-	-	-	-	-
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	17.6M	17.816M	17M8D1D	3.74M	4.158M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	36.35M	36.432M	36M4D1D	3.12M	3.438M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	76.3M	75.962M	76M0D1D	2.9M	3.578M

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 / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

Result

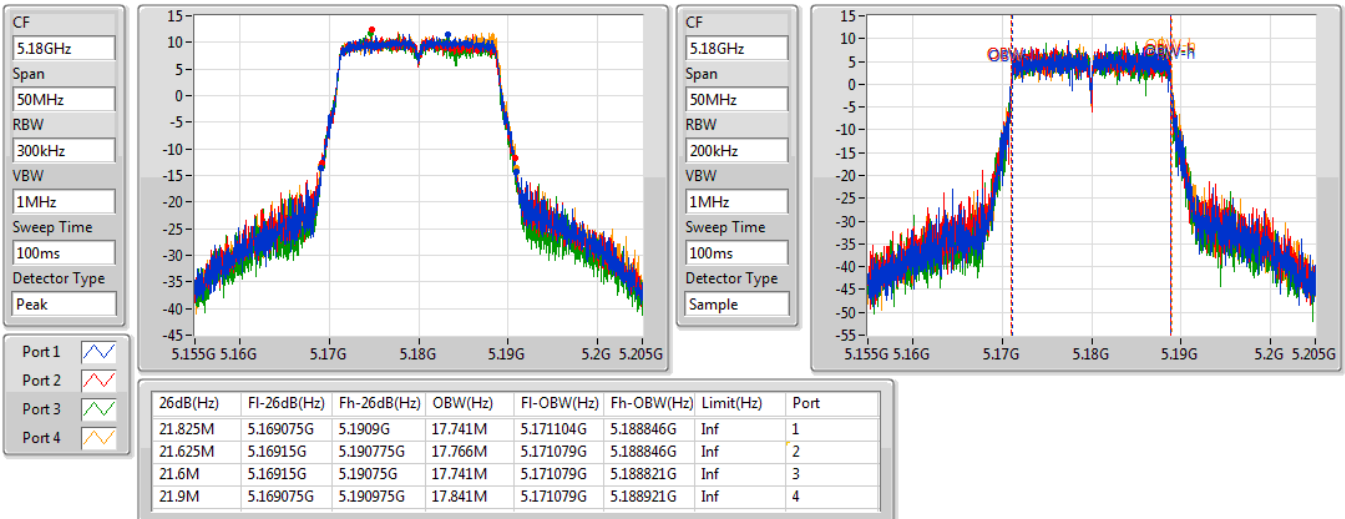
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.825M	17.741M	21.625M	17.766M	21.6M	17.741M	21.9M	17.841M
5200MHz	Pass	Inf	23.95M	17.741M	25.45M	17.741M	23.2M	17.766M	23.25M	17.716M
5240MHz	Pass	Inf	23.825M	17.791M	22.675M	17.766M	22.225M	17.691M	23.725M	17.741M
5260MHz	Pass	Inf	21.825M	17.766M	21.65M	17.766M	21.675M	17.691M	21.55M	17.716M
5300MHz	Pass	Inf	21.7M	17.766M	21.65M	17.716M	21.55M	17.741M	21.5M	17.716M
5320MHz	Pass	Inf	21.9M	17.766M	21.625M	17.766M	21.575M	17.741M	21.625M	17.716M
5500MHz	Pass	Inf	21.975M	17.766M	21.55M	17.791M	21.475M	17.716M	21.55M	17.691M
5580MHz	Pass	Inf	21.85M	17.716M	21.65M	17.741M	21.75M	17.741M	21.775M	17.716M
5700MHz	Pass	Inf	21.625M	17.741M	21.725M	17.716M	21.5M	17.691M	21.65M	17.741M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.81M	13.928M	15.72M	13.898M	15.69M	13.913M	15.66M	13.868M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.74M	4.158M	3.76M	4.278M	3.76M	4.218M	3.76M	4.178M
5745MHz	Pass	500k	17.55M	17.766M	17.575M	17.766M	17.55M	17.716M	17.575M	17.816M
5785MHz	Pass	500k	17.575M	17.741M	17.575M	17.766M	17.575M	17.766M	17.55M	17.766M
5825MHz	Pass	500k	17.575M	17.816M	17.6M	17.816M	17.6M	17.716M	17.55M	17.741M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	39.9M	36.232M	39.9M	36.282M	39.65M	36.182M	39.85M	36.232M
5230MHz	Pass	Inf	72.6M	36.282M	46.8M	36.332M	49.3M	36.282M	48.05M	36.232M
5270MHz	Pass	Inf	40.05M	36.232M	39.75M	36.282M	39.7M	36.232M	39.85M	36.232M
5310MHz	Pass	Inf	40.25M	36.182M	39.9M	36.282M	39.65M	36.282M	39.75M	36.232M
5510MHz	Pass	Inf	40.1M	36.232M	39.85M	36.282M	39.8M	36.282M	39.65M	36.232M
5550MHz	Pass	Inf	40.55M	36.282M	39.85M	36.182M	39.75M	36.232M	39.7M	36.282M
5670MHz	Pass	Inf	40M	36.282M	39.85M	36.332M	39.75M	36.232M	39.7M	36.232M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	35.175M	33.093M	34.895M	33.023M	34.965M	33.023M	35M	33.023M
5710MHz Straddle 5.725-5.85GHz	Pass	500k	3.12M	3.498M	3.14M	3.538M	3.14M	3.438M	3.12M	3.458M
5755MHz	Pass	500k	36.35M	36.332M	36.35M	36.332M	36.35M	36.282M	36.25M	36.282M
5795MHz	Pass	500k	36.3M	36.332M	36.35M	36.432M	36.3M	36.332M	36.05M	36.182M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.7M	75.762M	82.2M	75.962M	81.8M	75.762M	81.2M	75.862M
5290MHz	Pass	Inf	81.7M	75.762M	81.7M	75.962M	81.4M	75.862M	82.2M	75.662M
5530MHz	Pass	Inf	82M	75.862M	81.2M	75.762M	81.3M	75.762M	81.8M	75.862M
5610MHz	Pass	Inf	81.6M	75.662M	81.3M	75.862M	81.6M	75.962M	82M	75.962M
5690MHz Straddle 5.47-5.725GHz	Pass	Inf	75.675M	72.339M	75.6M	72.564M	75.375M	72.564M	75.9M	72.564M
5690MHz Straddle 5.725-5.85GHz	Pass	500k	3.1M	3.638M	3.12M	3.778M	2.9M	3.738M	3.12M	3.578M
5775MHz	Pass	500k	75.1M	75.762M	76.3M	75.862M	75.3M	75.962M	75.4M	75.862M

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

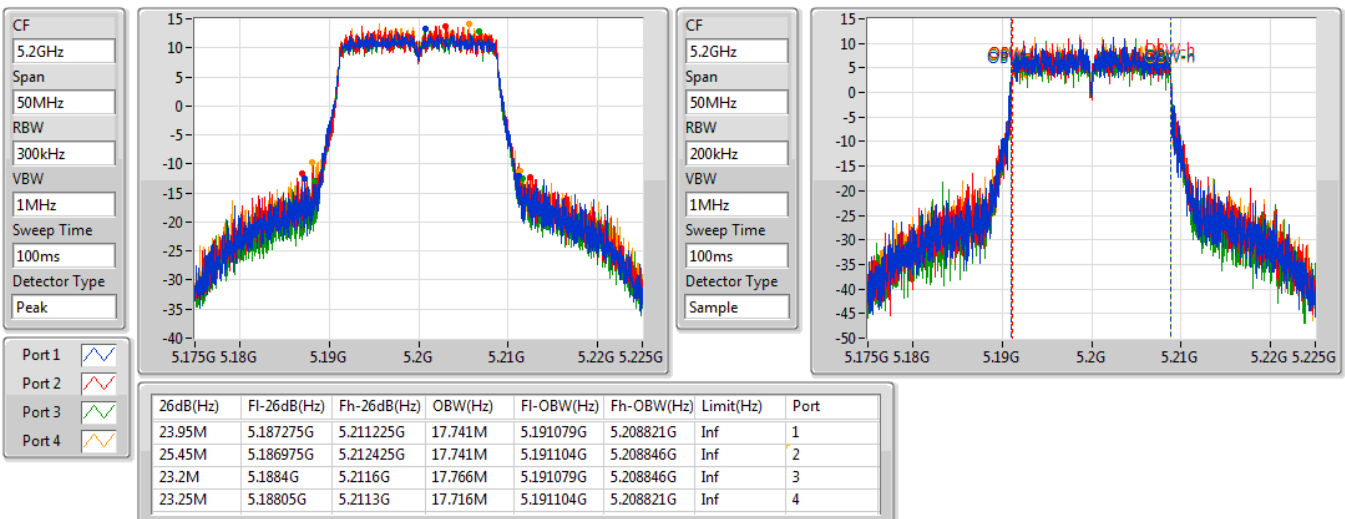
Port X-OBW = Port X 99% occupied bandwidth;

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5180MHz

18/11/2019

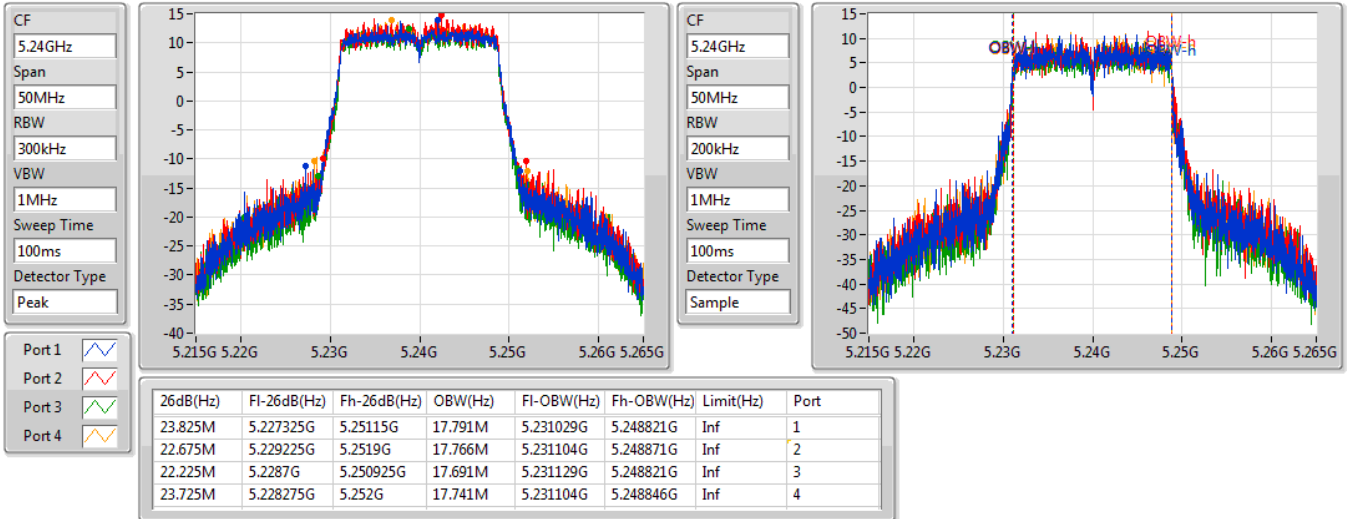

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5200MHz

18/11/2019

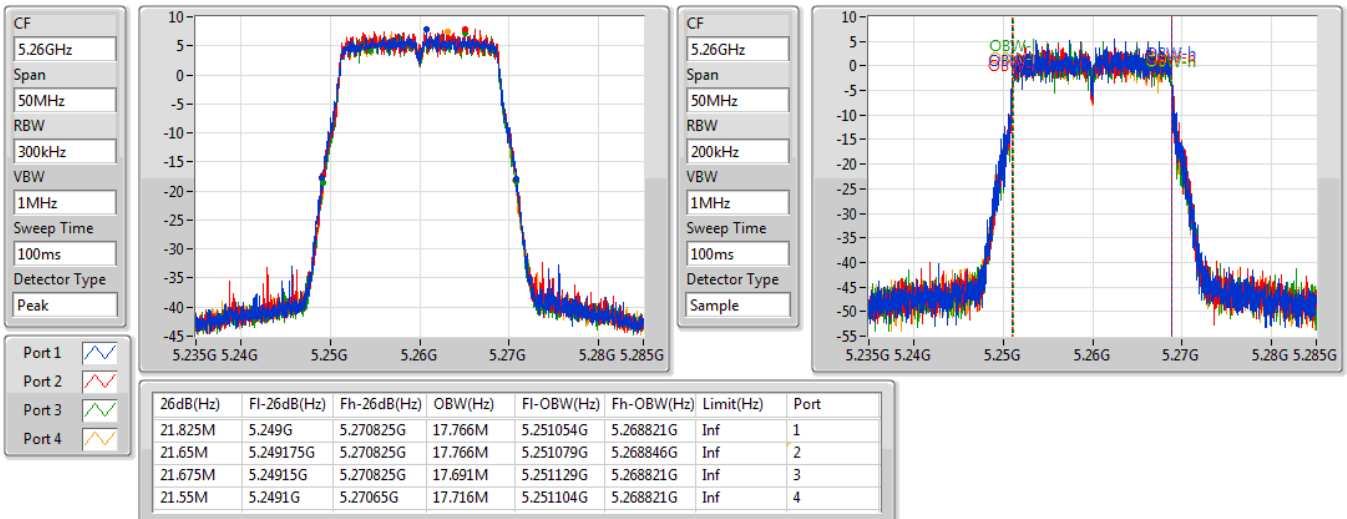


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5240MHz

18/11/2019

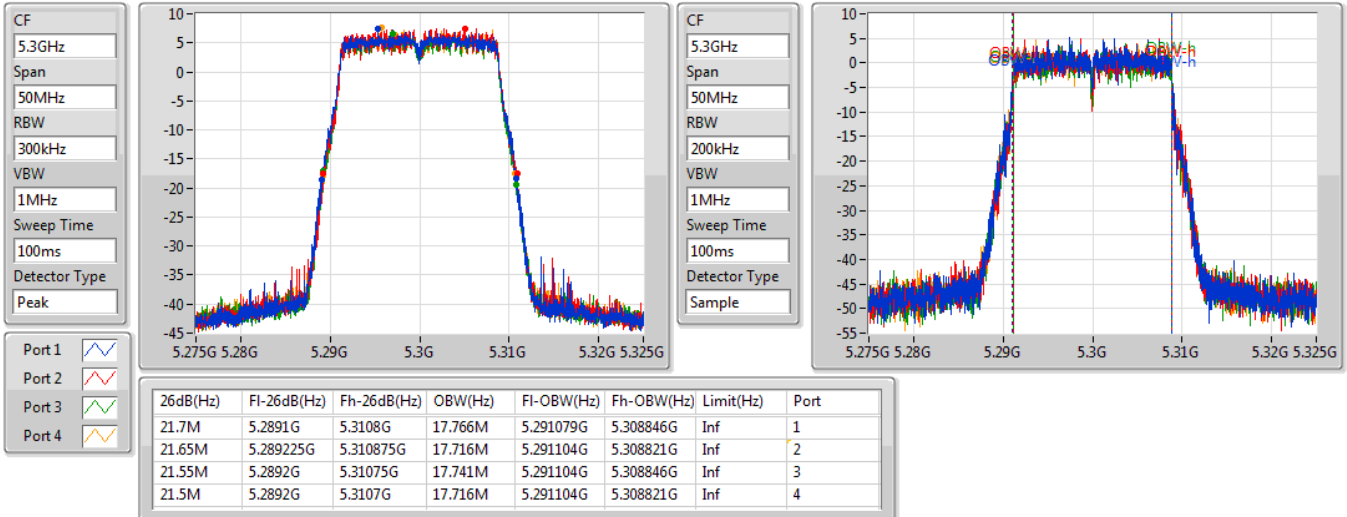

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5260MHz

18/11/2019

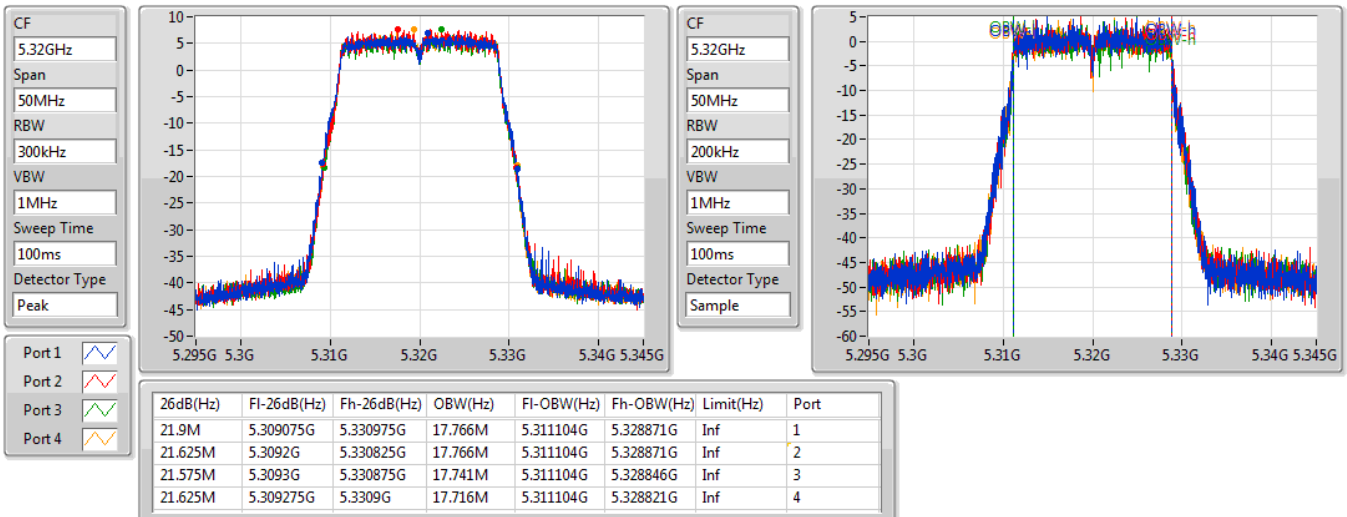


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5300MHz

18/11/2019

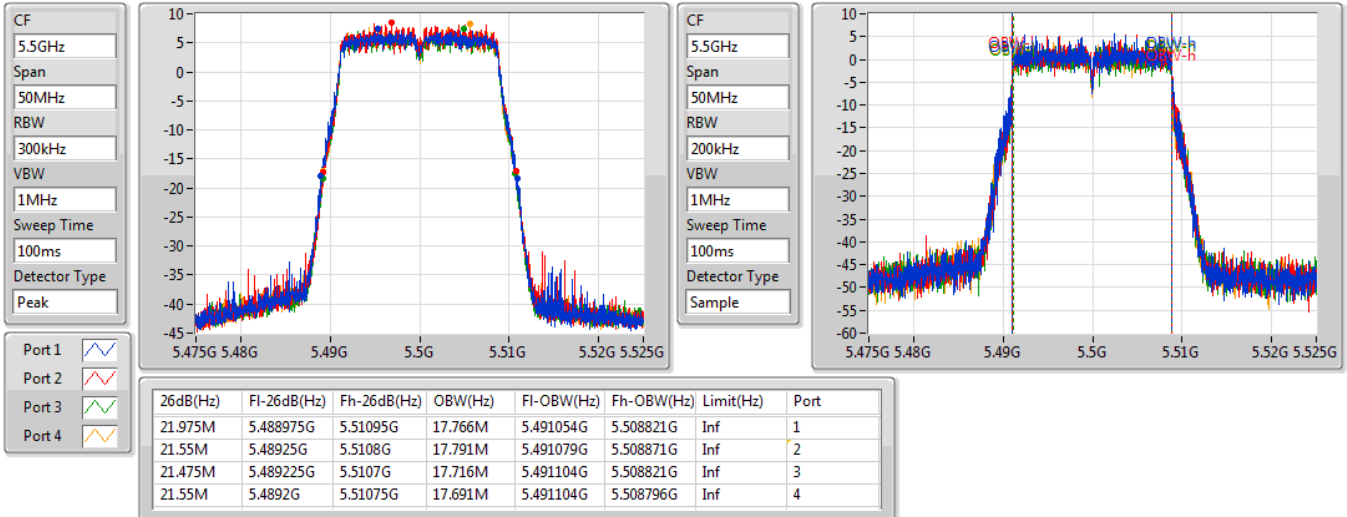

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5320MHz

18/11/2019

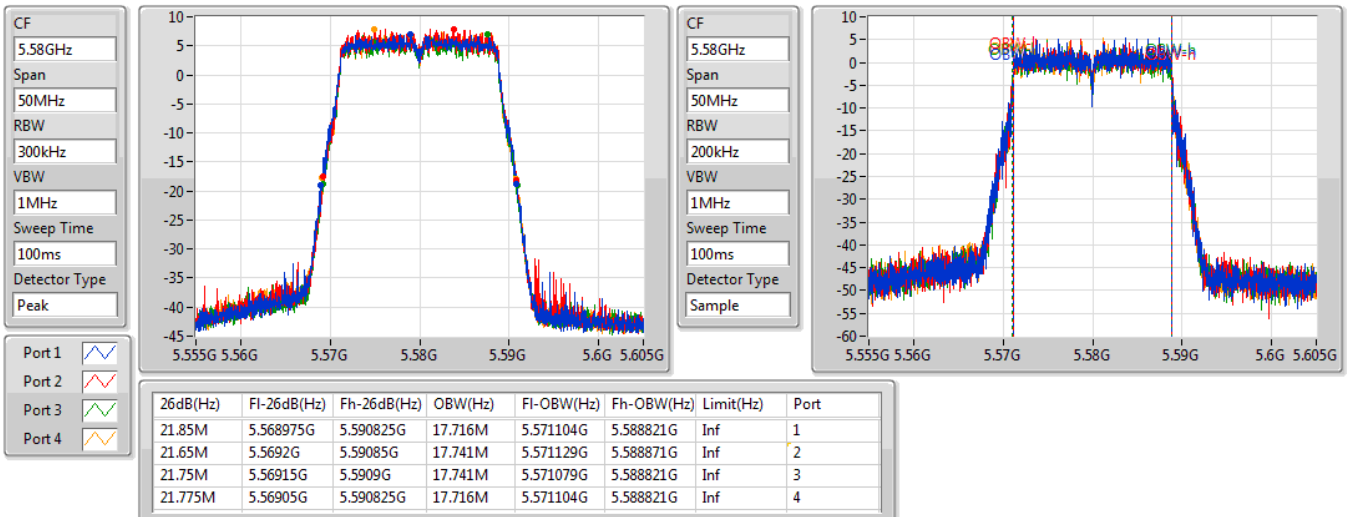


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5500MHz

18/11/2019

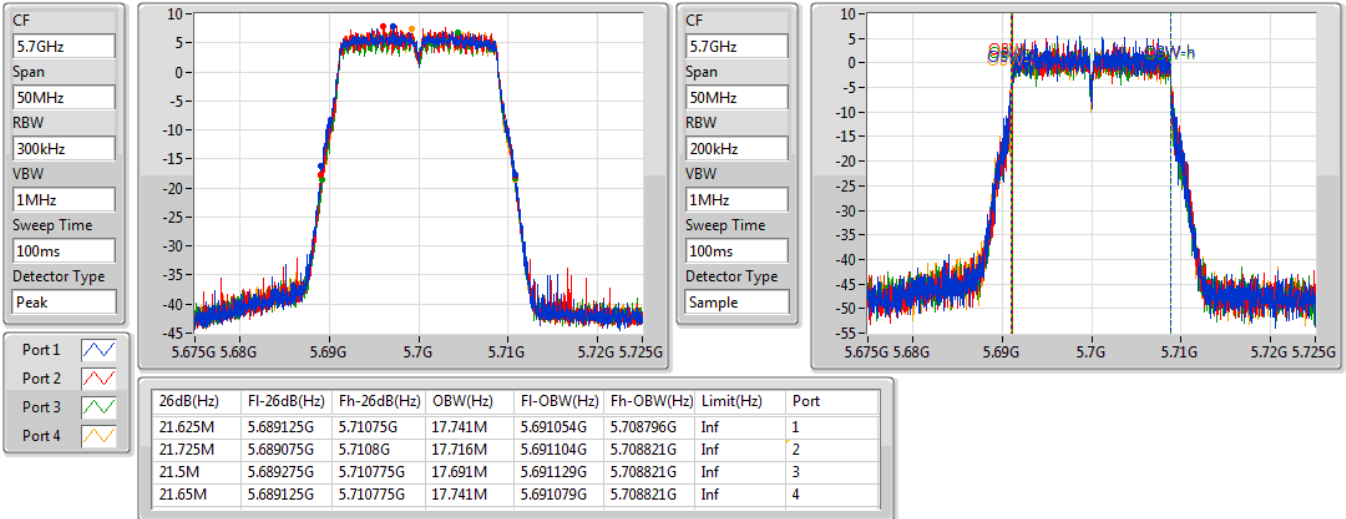

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5580MHz

18/11/2019

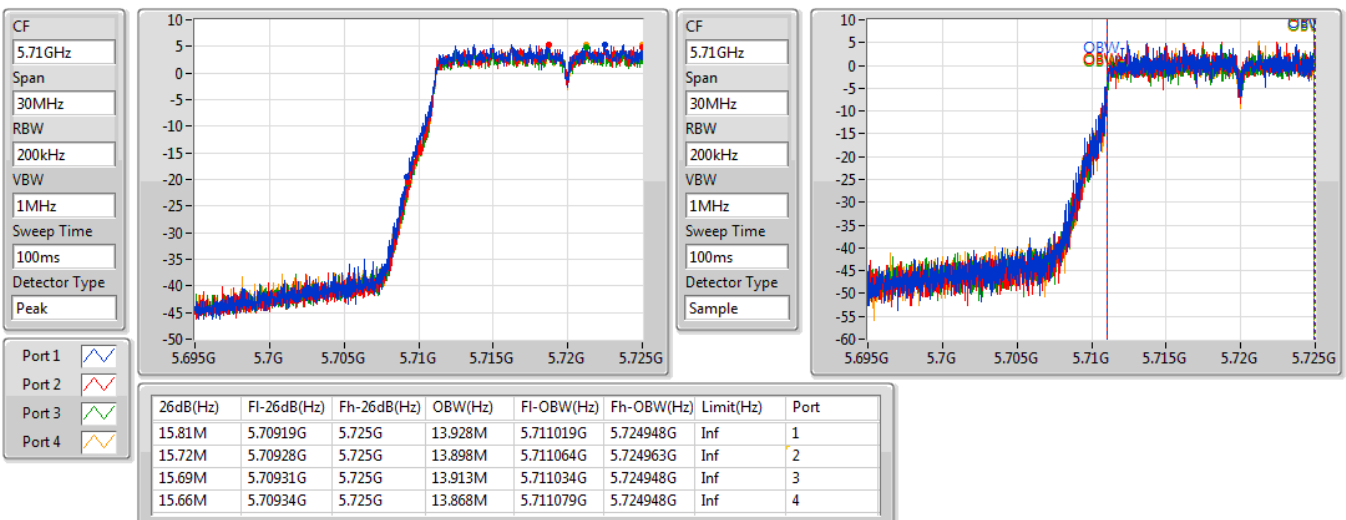


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5700MHz

18/11/2019

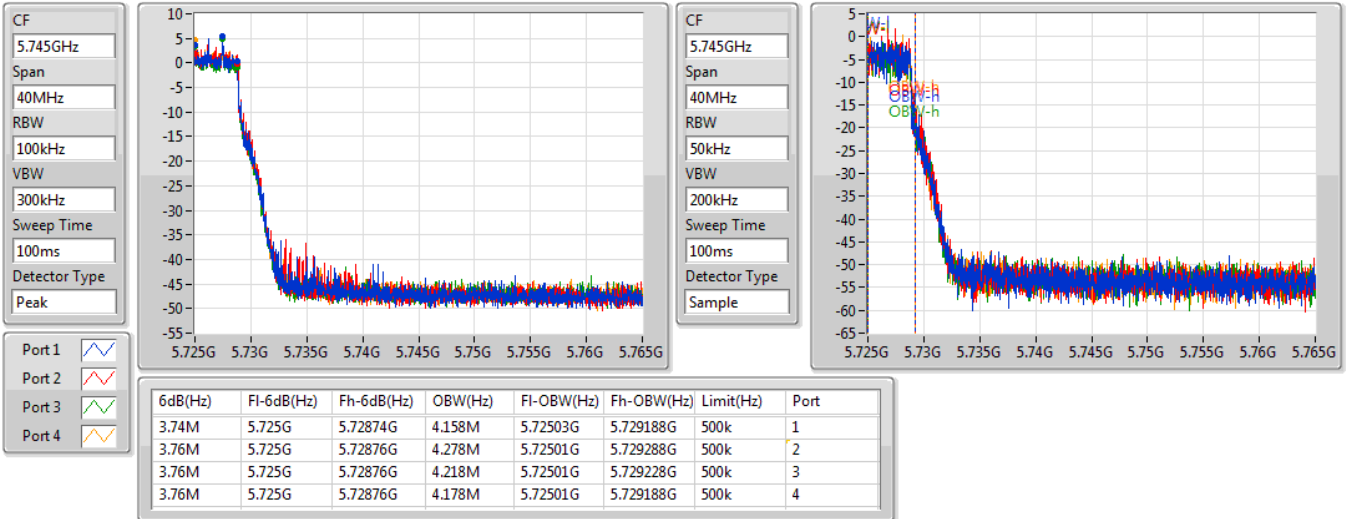

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.47-5.725GHz

18/11/2019

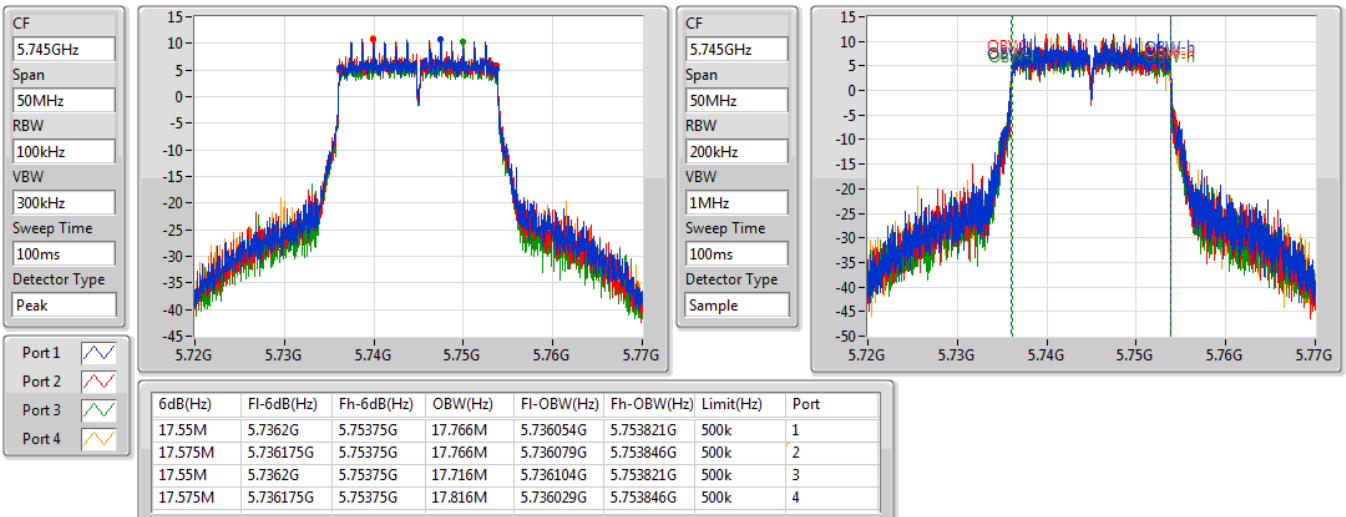


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.725-5.85GHz

18/11/2019

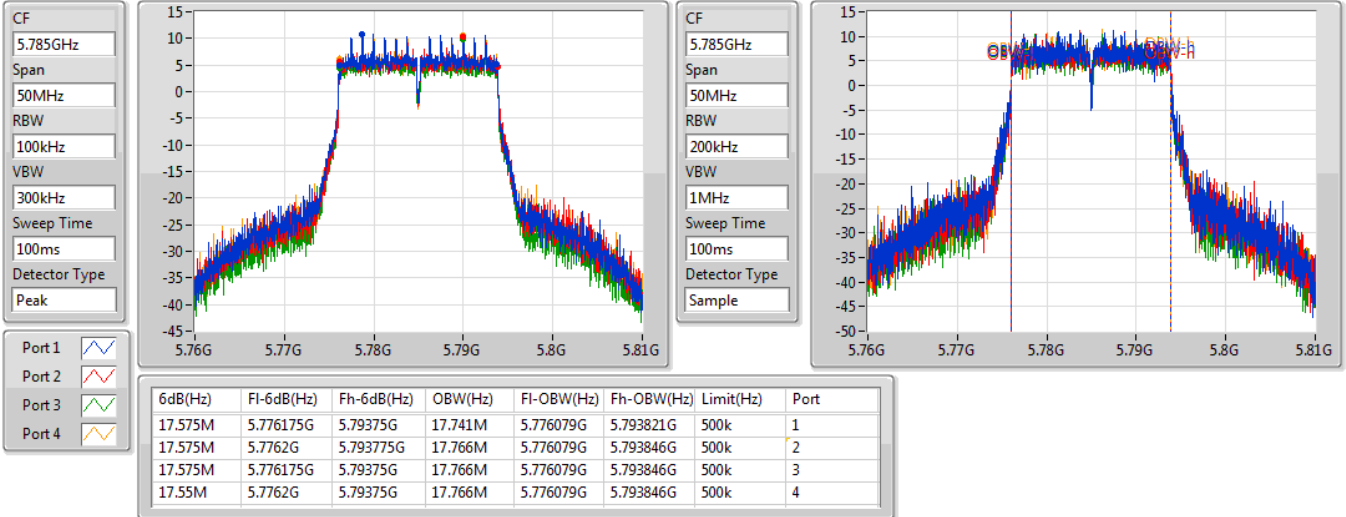

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5745MHz

18/11/2019

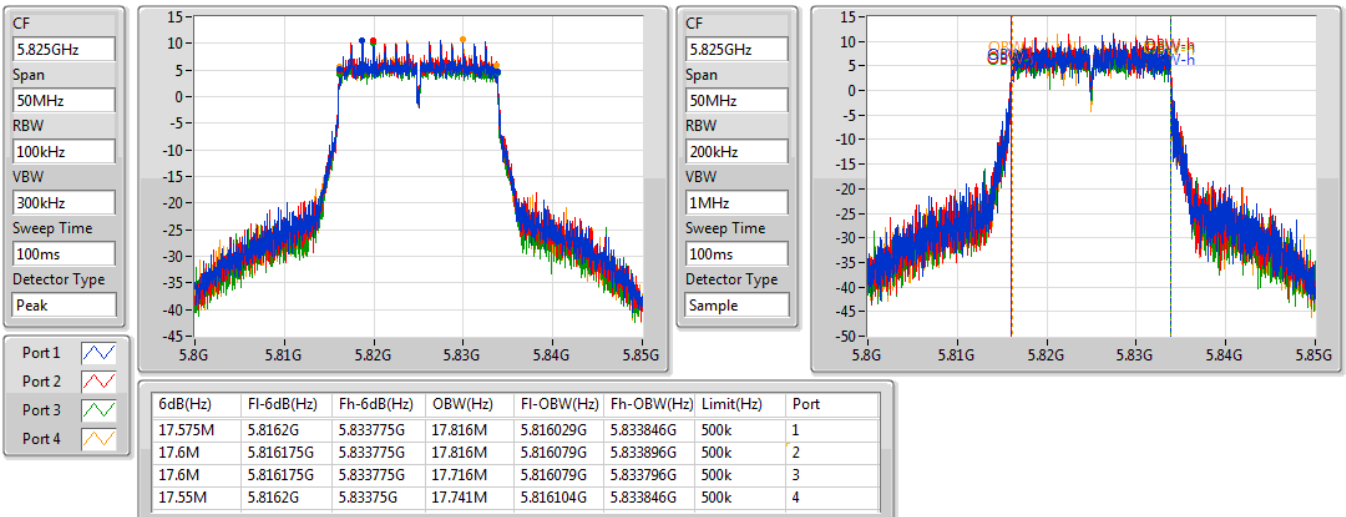


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5785MHz

18/11/2019

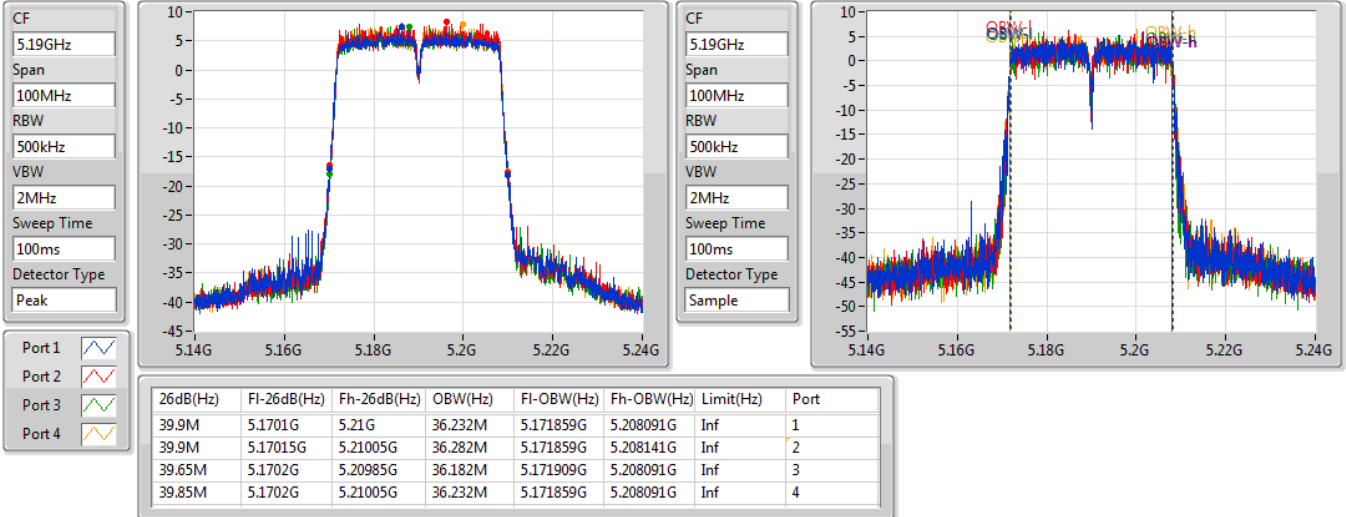

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5825MHz

18/11/2019

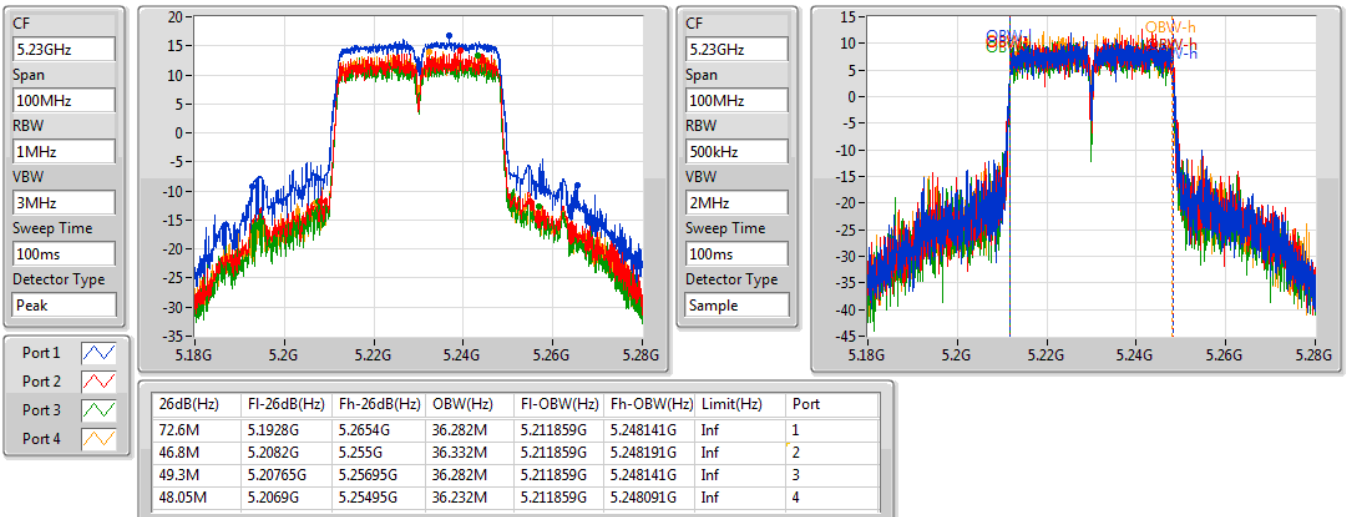


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5190MHz

18/11/2019

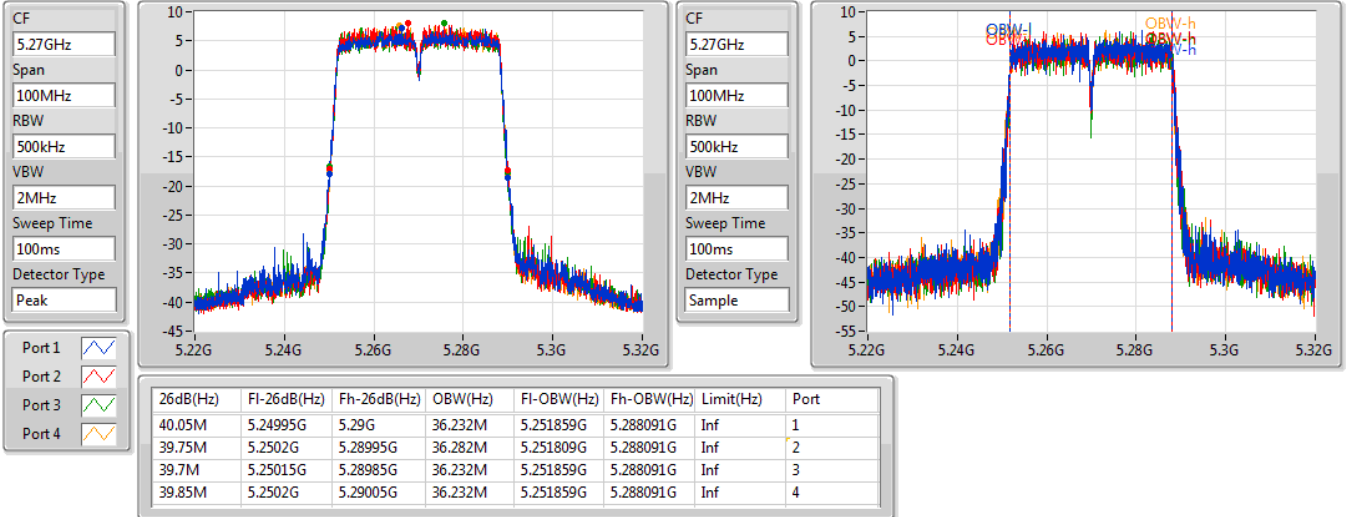

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5230MHz

18/11/2019

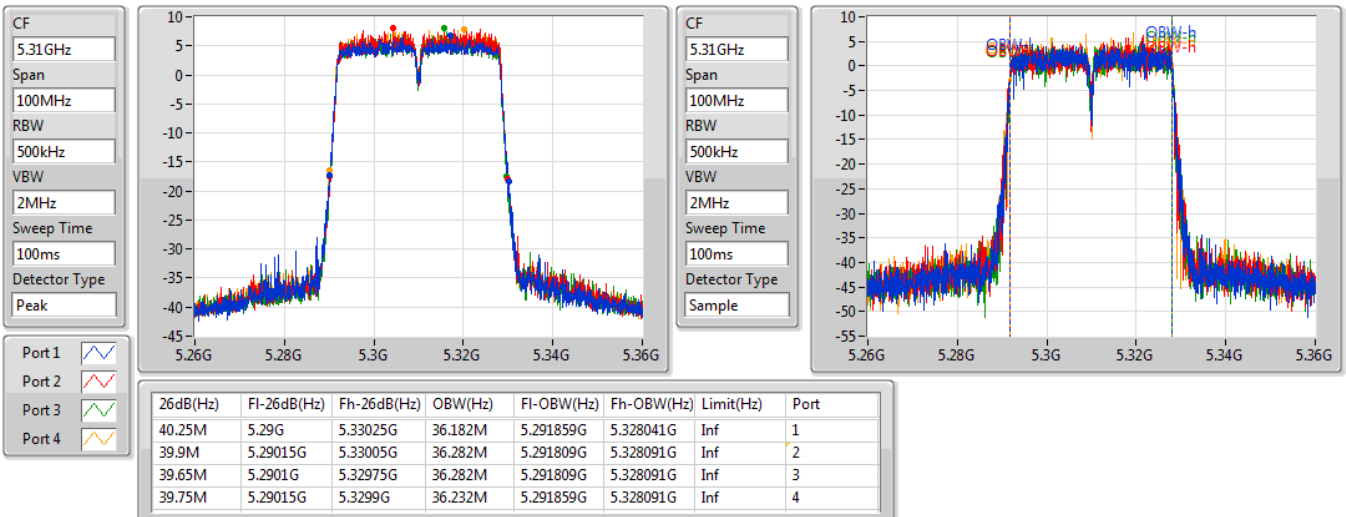


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5270MHz

18/11/2019

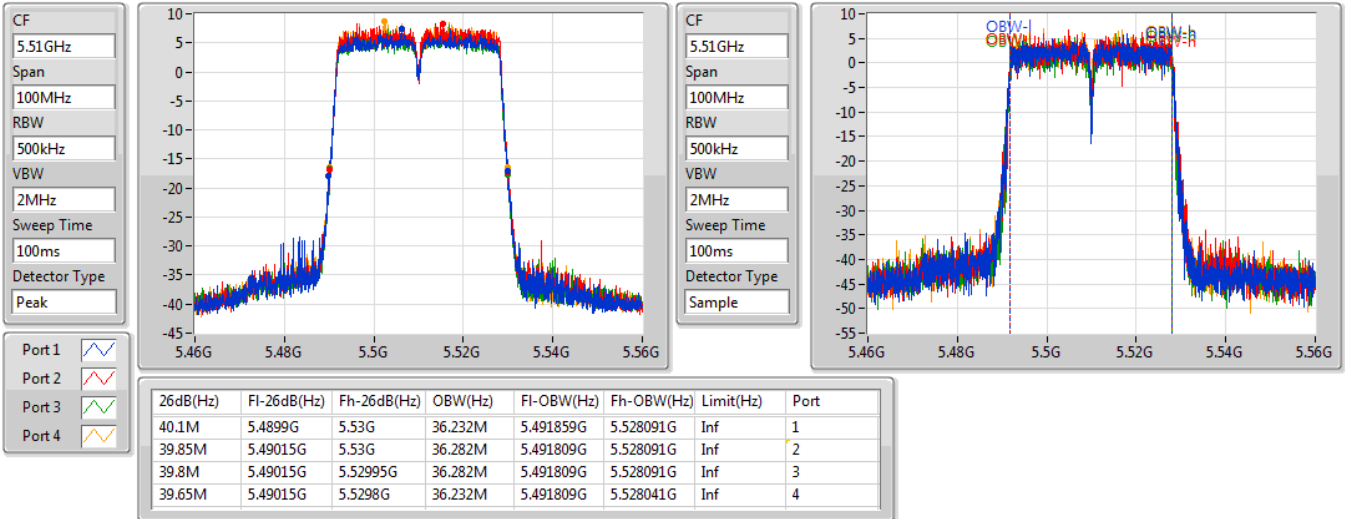

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5310MHz

18/11/2019

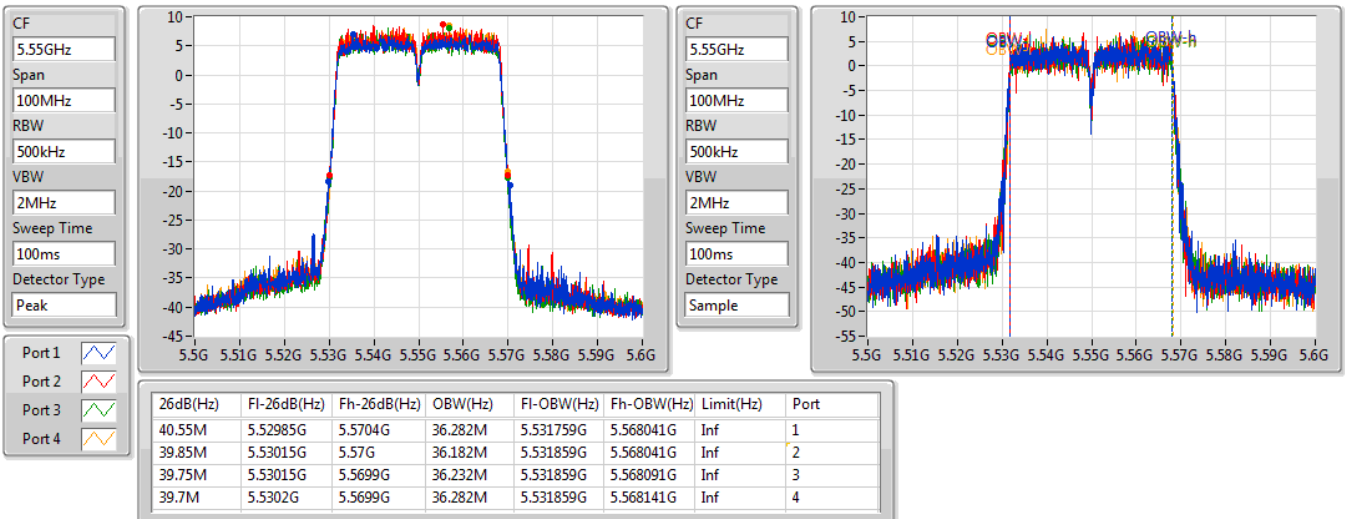


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5510MHz

18/11/2019

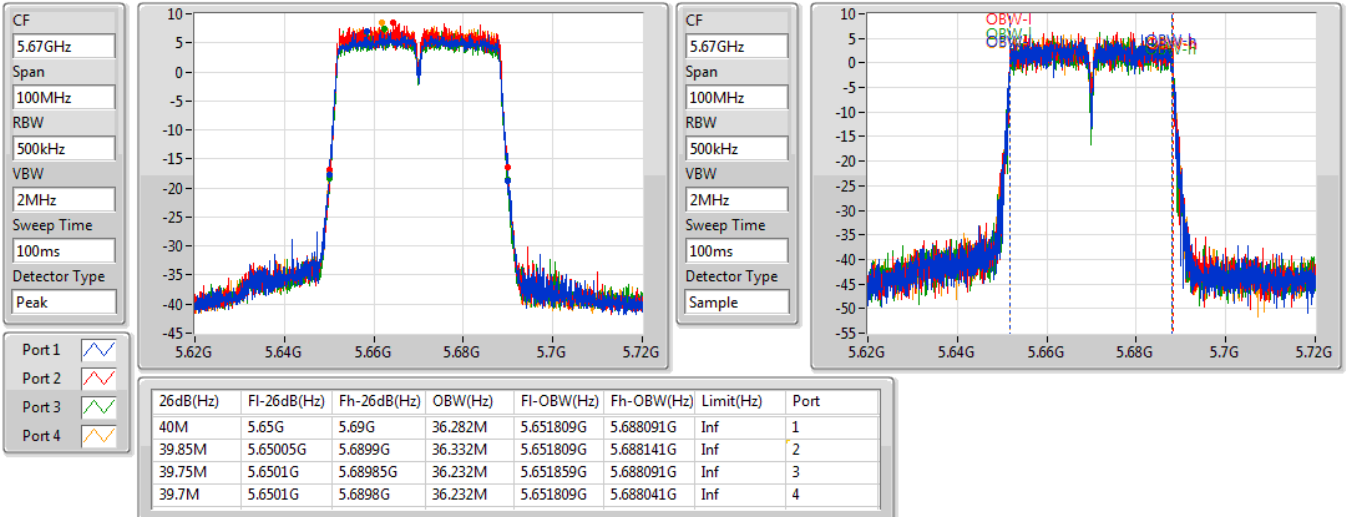

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5550MHz

18/11/2019

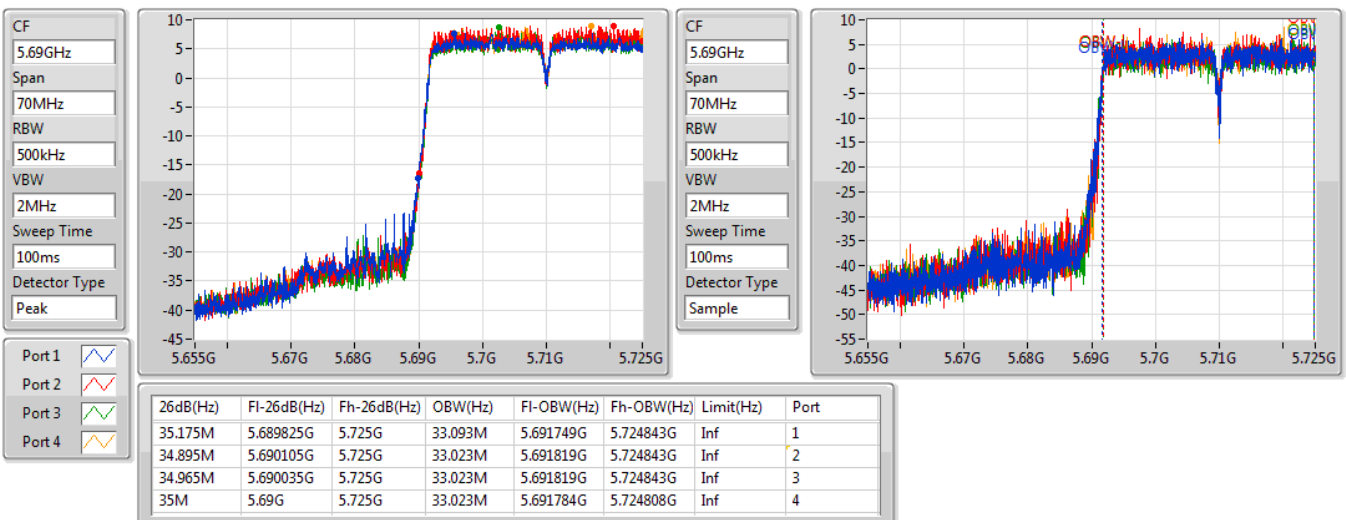


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5670MHz

18/11/2019

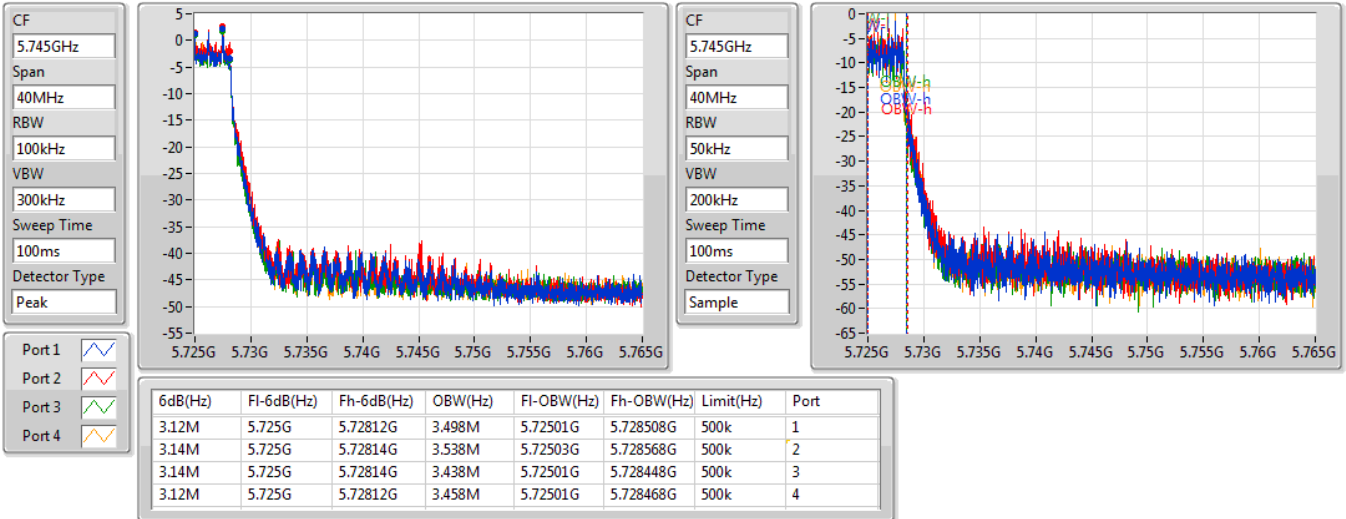

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5710MHz Straddle 5.47-5.725GHz

18/11/2019

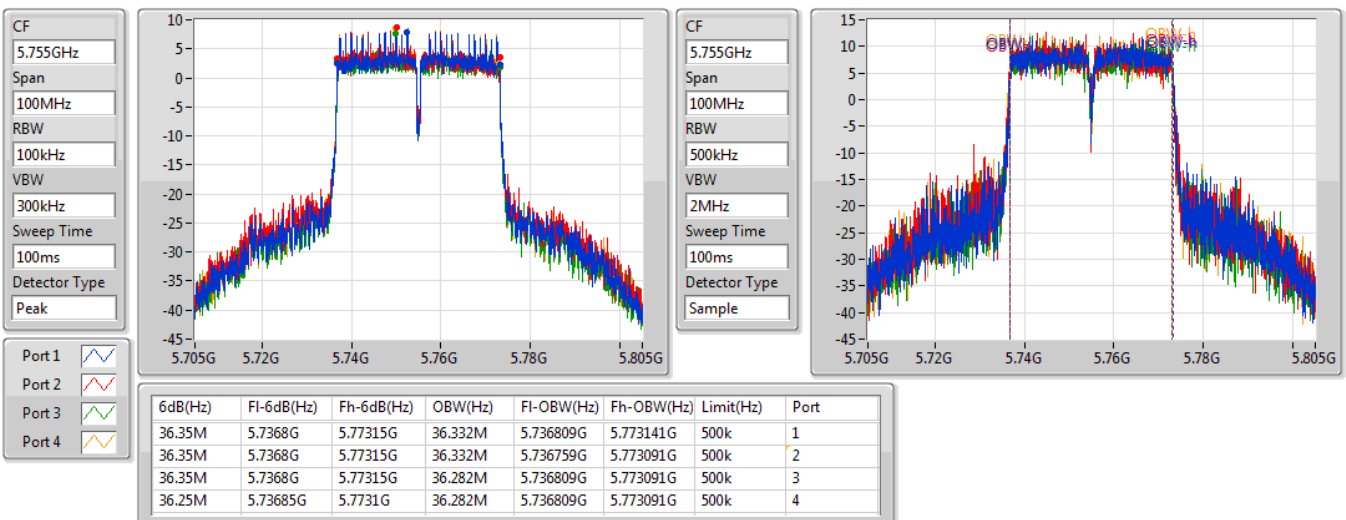


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5710MHz Straddle 5.725-5.85GHz

18/11/2019

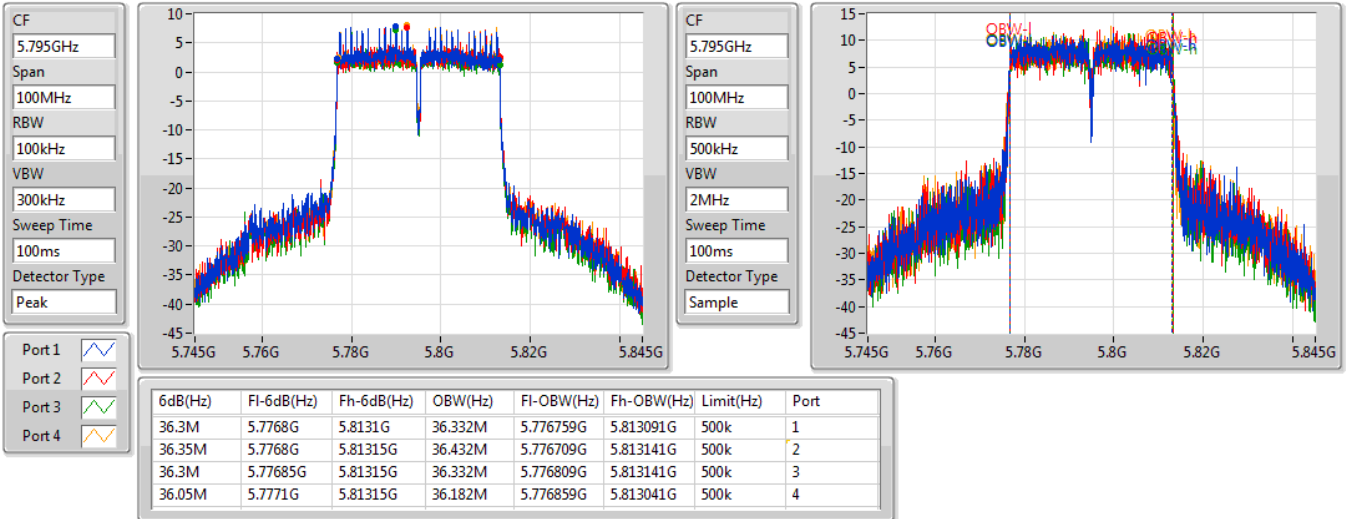

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5755MHz

18/11/2019

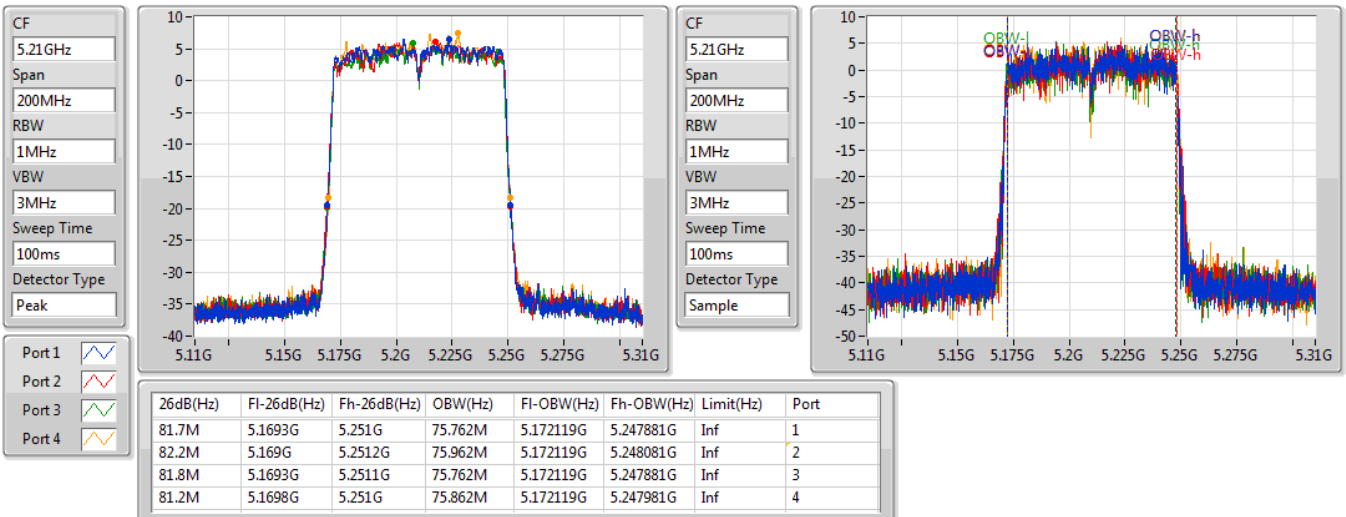


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5795MHz

18/11/2019

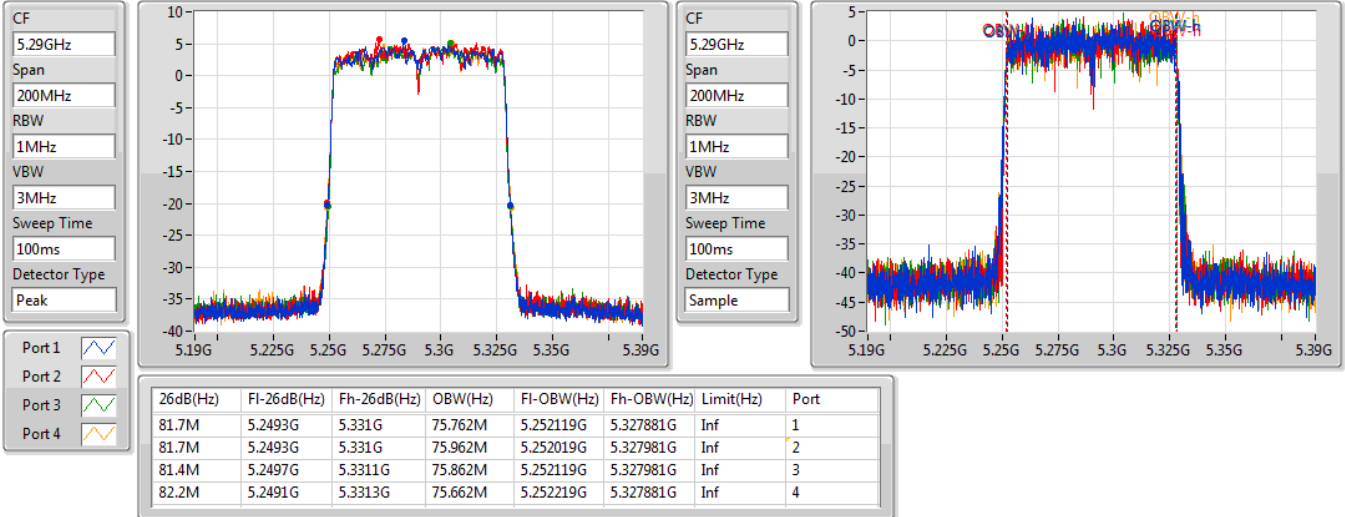

802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5210MHz

18/11/2019

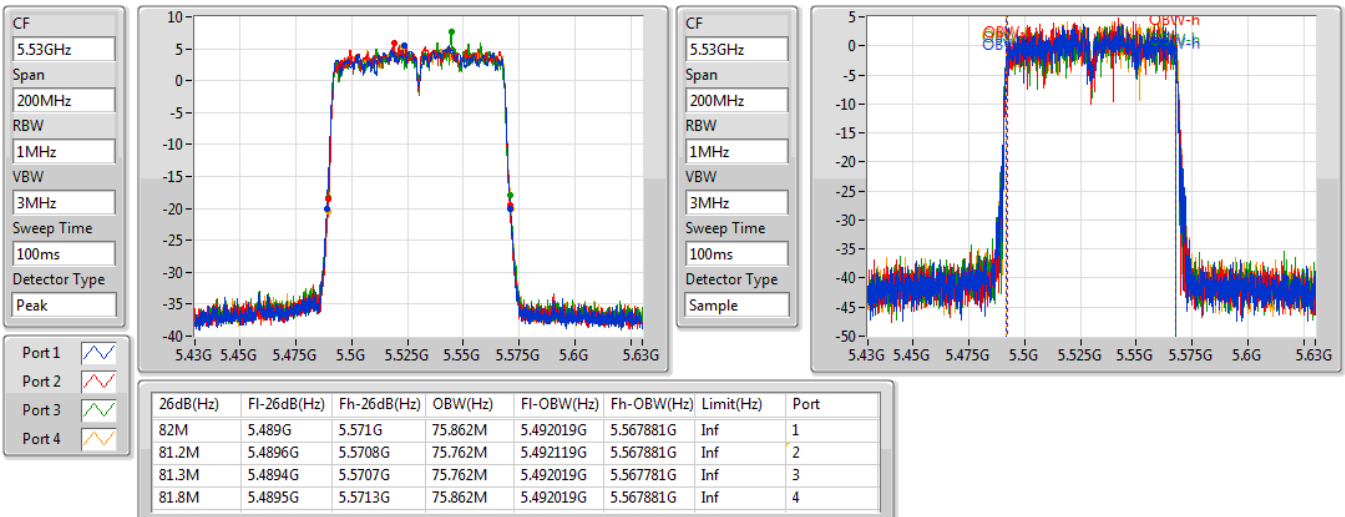


802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5290MHz

18/11/2019

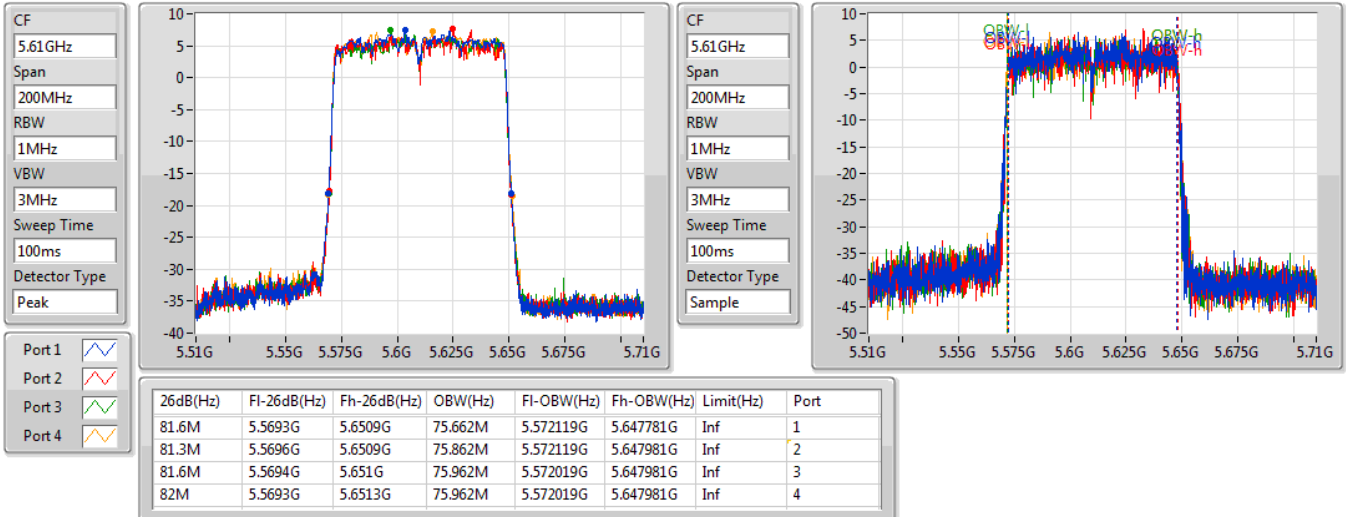

802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5530MHz

18/11/2019

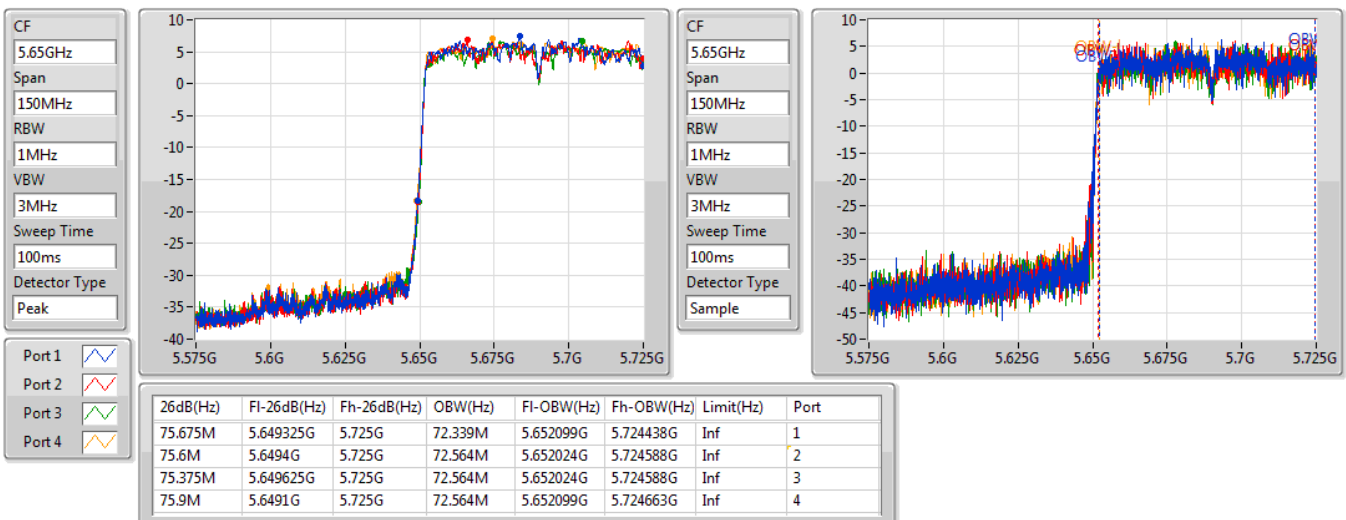


802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5610MHz

18/11/2019

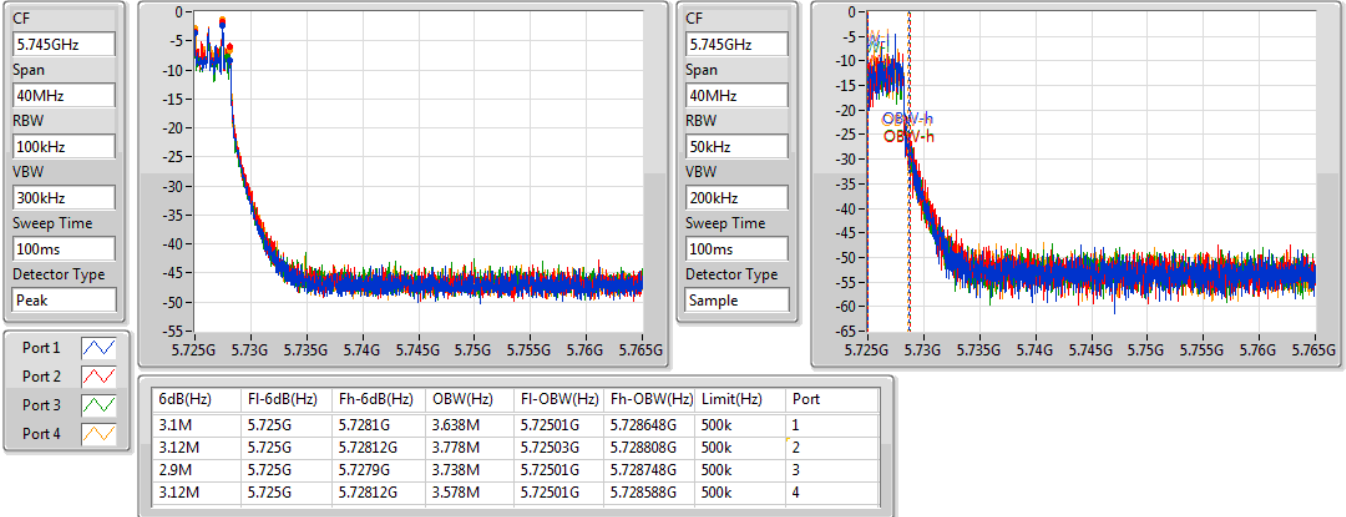

802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5690MHz Straddle 5.47-5.725GHz

18/11/2019

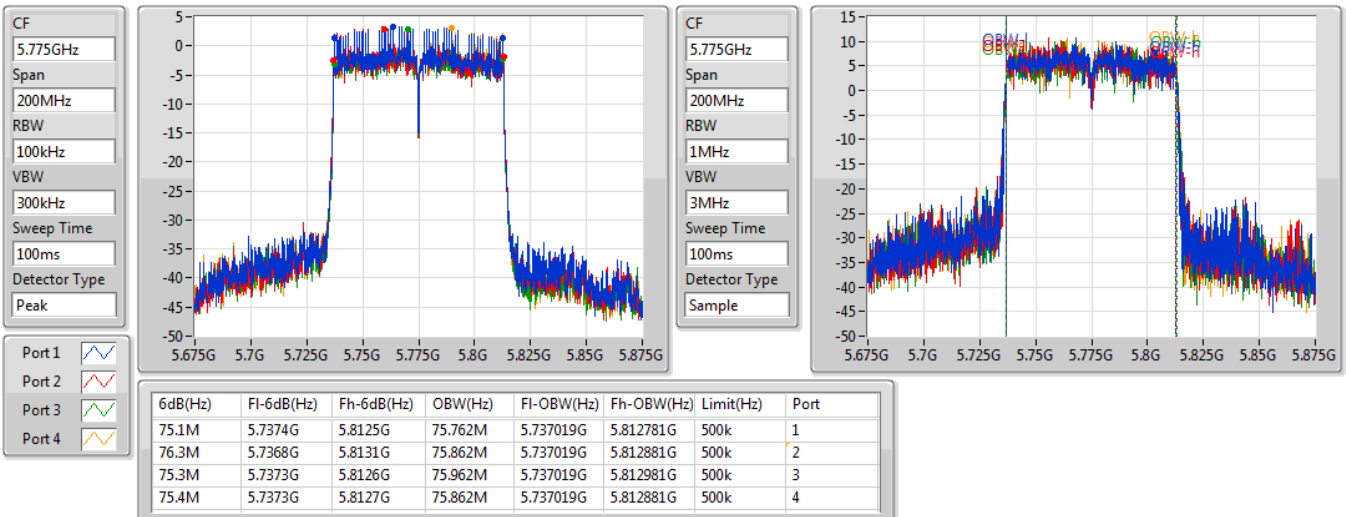


802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5690MHz Straddle 5.725-5.85GHz

18/11/2019


802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5775MHz

18/11/2019





For Client Mode Band 1:
For 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	21.63M	16.642M	16M6D1D	21.3M	16.522M
802.11ac VHT20_Nss1,(MCS0)_4TX	21.87M	17.781M	17M8D1D	21.51M	17.691M
802.11ac VHT40_Nss1,(MCS0)_4TX	40.26M	36.402M	36M4D1D	39.66M	36.162M
802.11ac VHT80_Nss1,(MCS0)_4TX	81.6M	75.922M	75M9D1D	81.24M	75.682M

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 / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

Result

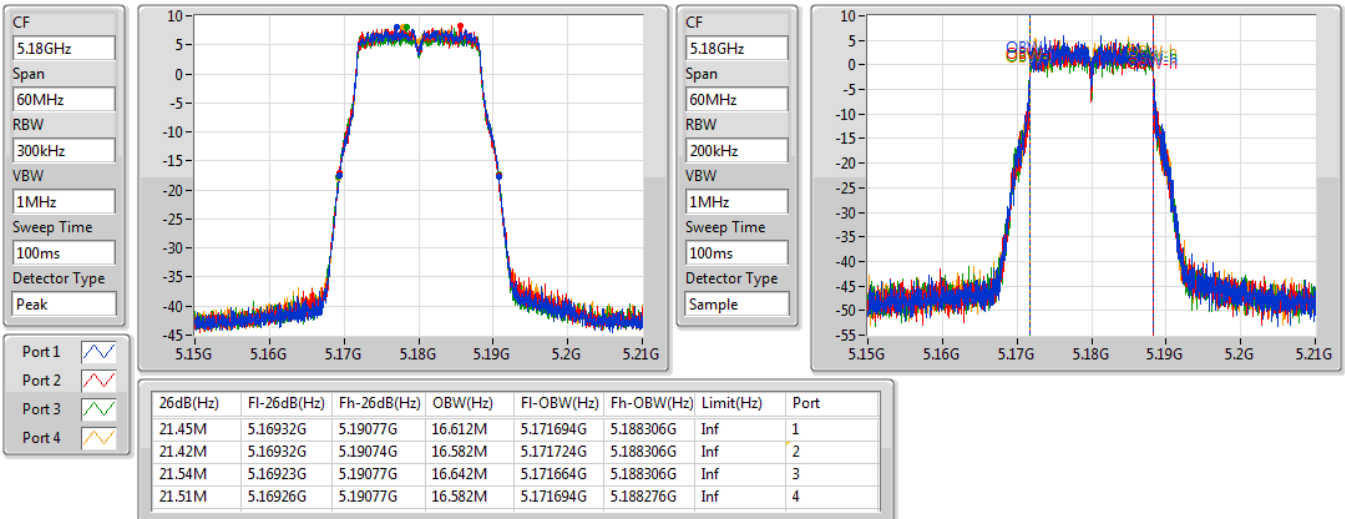
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.45M	16.612M	21.42M	16.582M	21.54M	16.642M	21.51M	16.582M
5200MHz	Pass	Inf	21.51M	16.552M	21.39M	16.522M	21.54M	16.642M	21.51M	16.612M
5240MHz	Pass	Inf	21.51M	16.612M	21.3M	16.582M	21.63M	16.642M	21.45M	16.612M
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.63M	17.691M	21.51M	17.751M	21.84M	17.721M	21.66M	17.781M
5200MHz	Pass	Inf	21.6M	17.751M	21.6M	17.751M	21.75M	17.751M	21.51M	17.751M
5240MHz	Pass	Inf	21.63M	17.691M	21.66M	17.721M	21.87M	17.721M	21.72M	17.721M
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	39.9M	36.162M	39.78M	36.162M	40.26M	36.282M	39.9M	36.342M
5230MHz	Pass	Inf	39.72M	36.222M	39.72M	36.222M	40.08M	36.162M	39.66M	36.402M
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.48M	75.922M	81.24M	75.922M	81.6M	75.682M	81.24M	75.802M

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

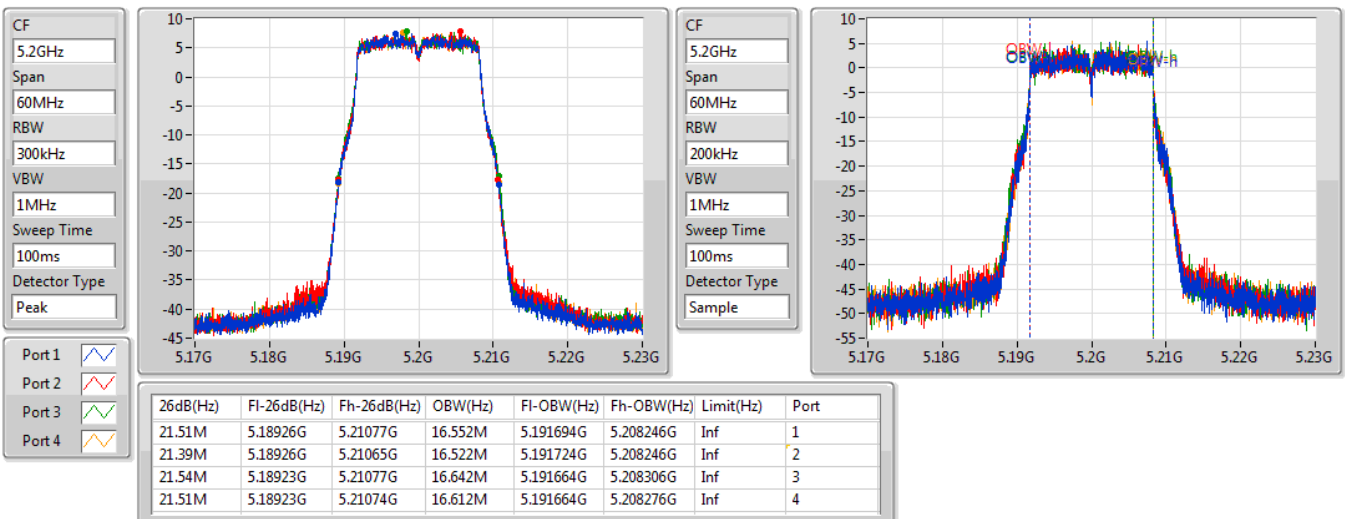
Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_4TX
EBW
5180MHz

19/11/2019

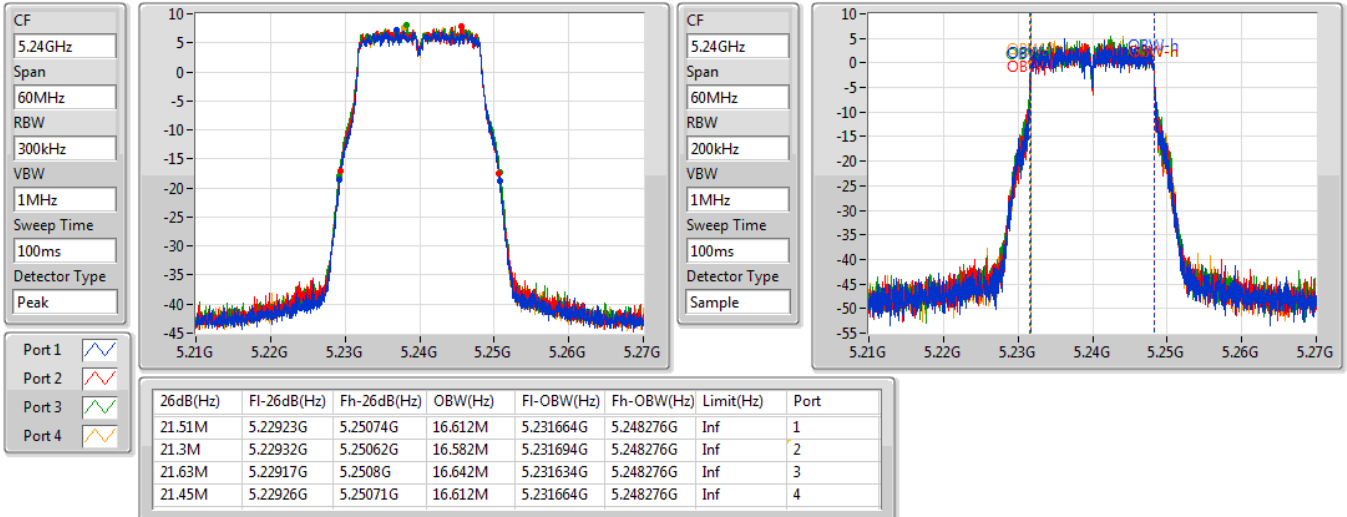

802.11a_Nss1,(6Mbps)_4TX
EBW
5200MHz

18/11/2019

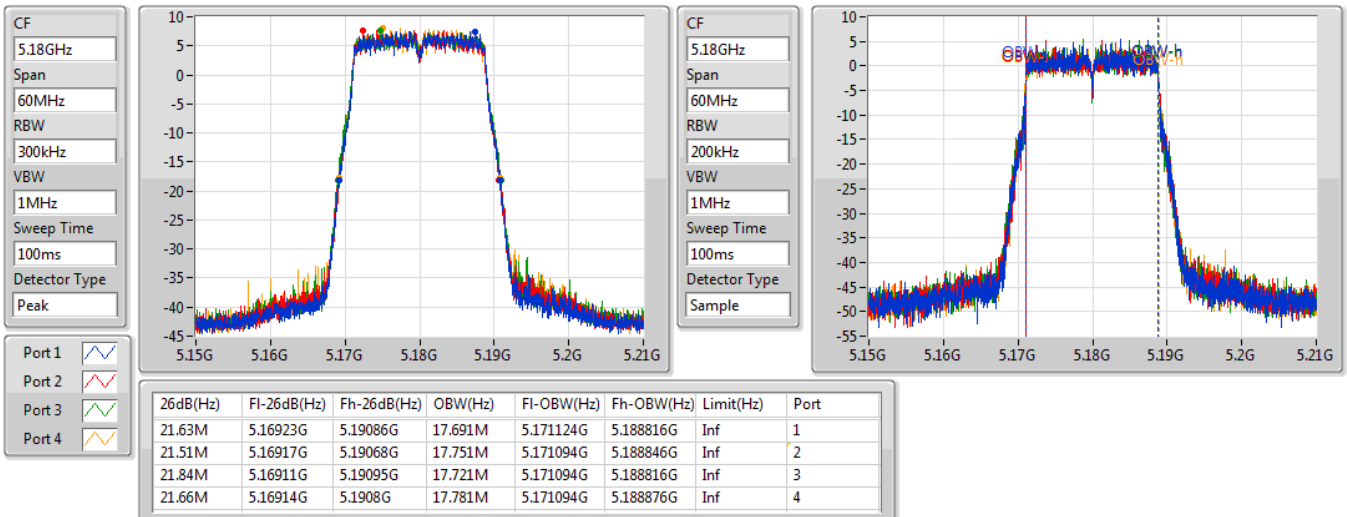


802.11a_Nss1,(6Mbps)_4TX
EBW
5240MHz

18/11/2019

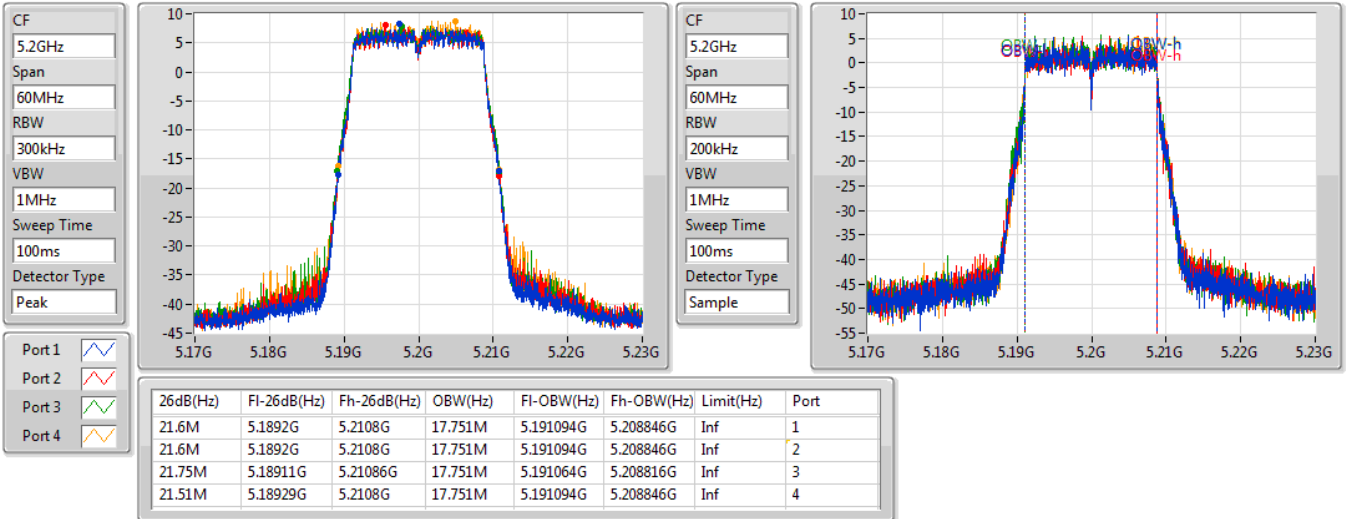

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5180MHz

18/11/2019

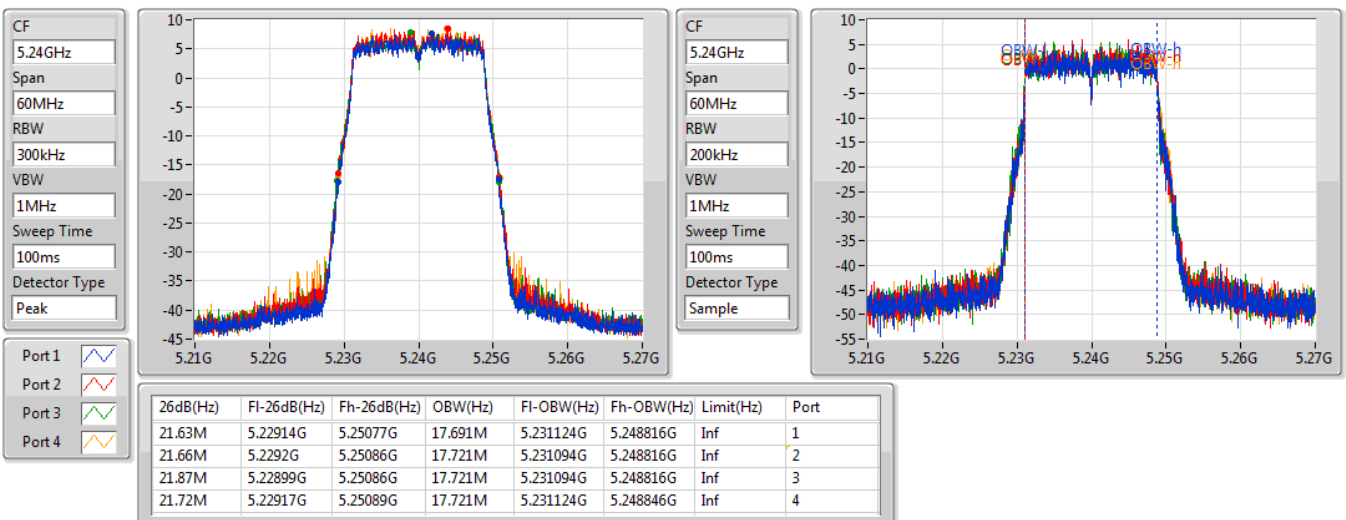


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5200MHz

18/11/2019

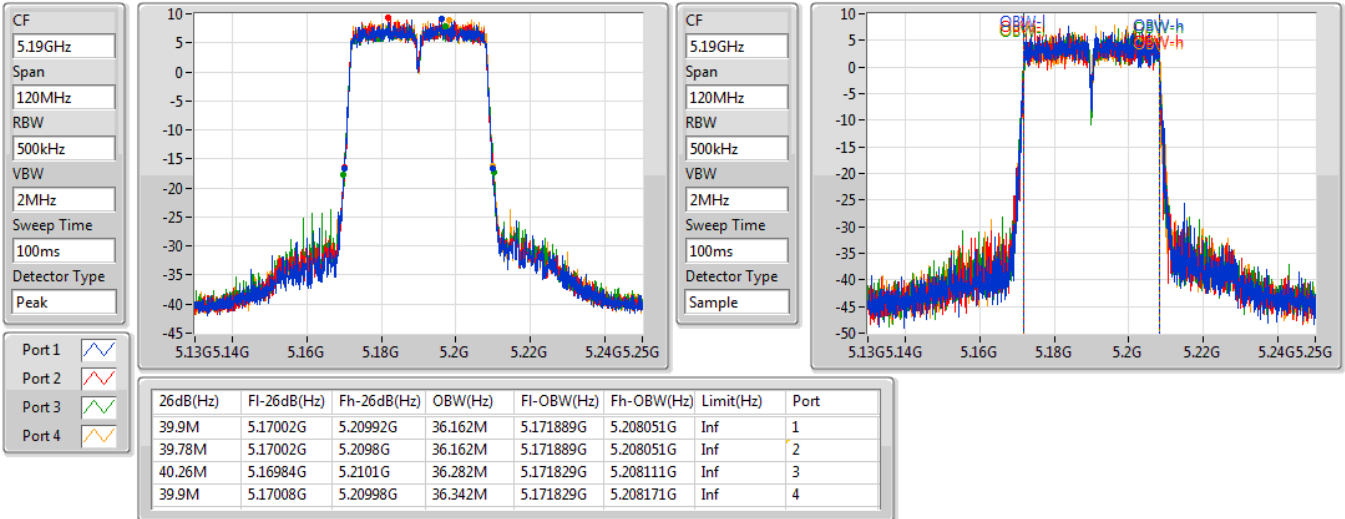

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5240MHz

19/11/2019

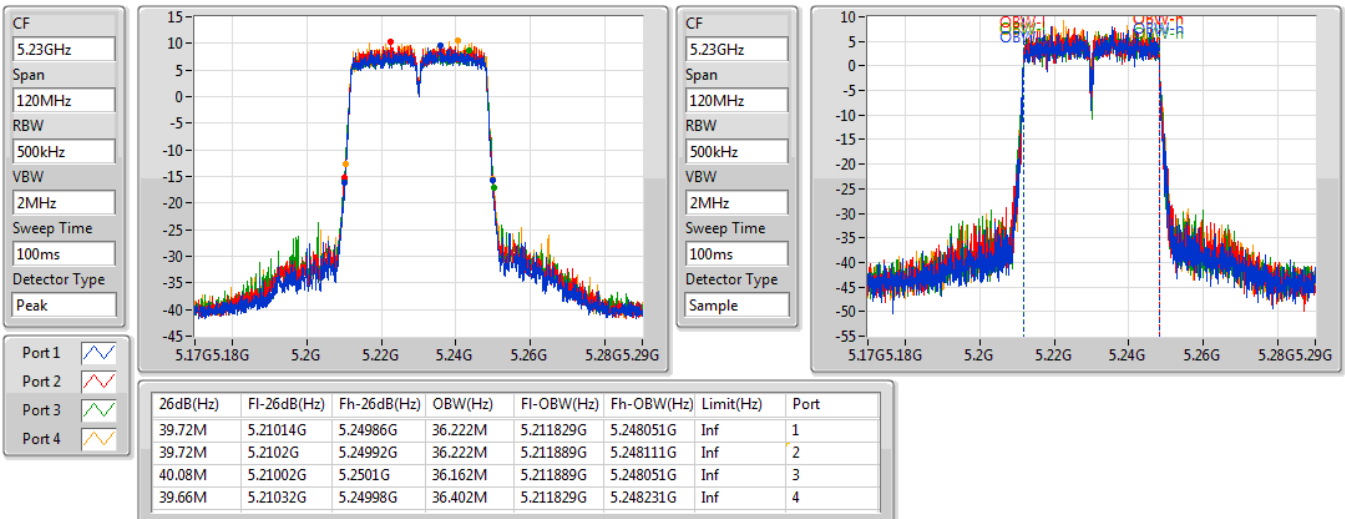


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5190MHz

19/11/2019


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5230MHz

19/11/2019

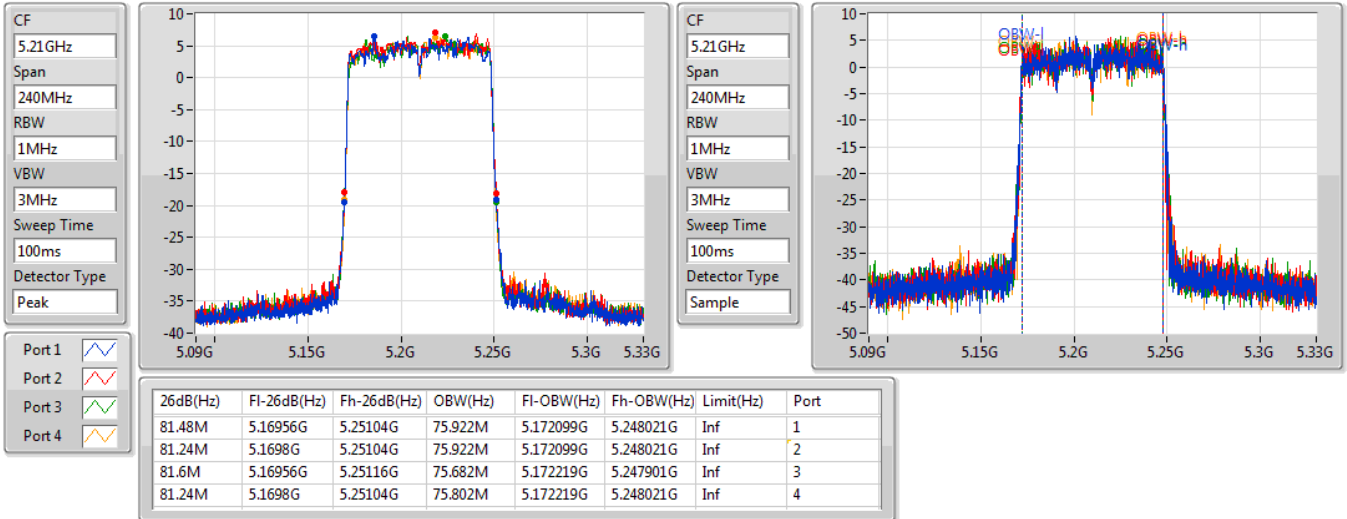


802.11ac VHT80_Nss1,(MCS0)_4TX

EBW

5210MHz

19/11/2019



**For beamforming mode:****Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	21.875M	17.791M	17M8D1D	21.5M	17.716M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	40.25M	36.332M	36M3D1D	39.65M	36.182M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	81.7M	75.962M	76M0D1D	81.3M	75.562M

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 / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

Result

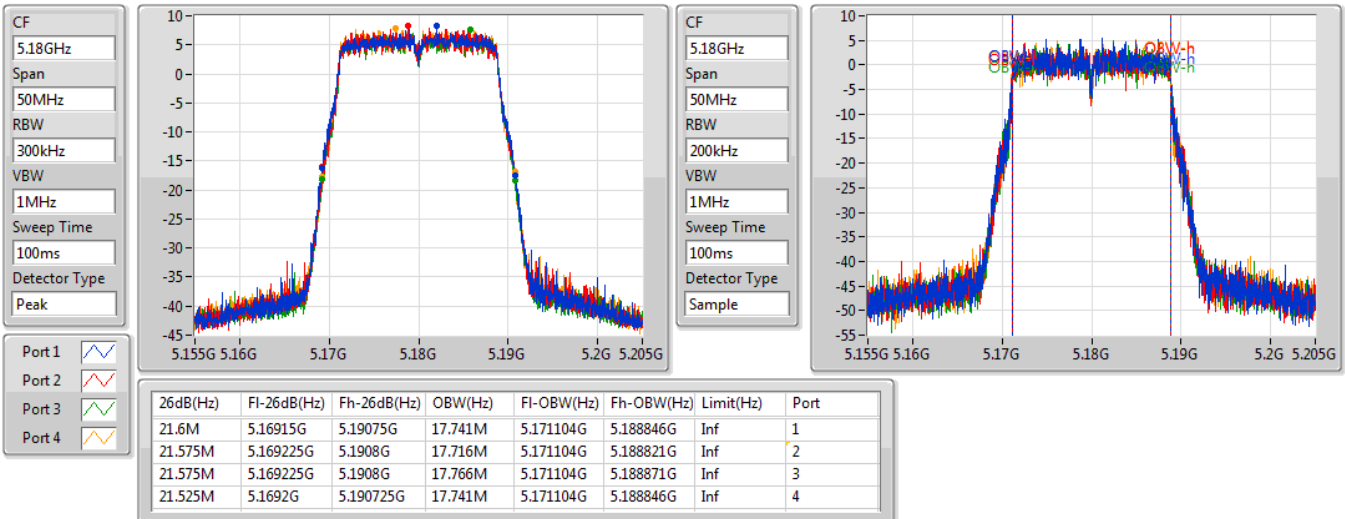
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.6M	17.741M	21.575M	17.716M	21.575M	17.766M	21.525M	17.741M
5200MHz	Pass	Inf	21.825M	17.766M	21.725M	17.741M	21.575M	17.766M	21.6M	17.741M
5240MHz	Pass	Inf	21.875M	17.766M	21.6M	17.766M	21.55M	17.791M	21.5M	17.741M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	40.15M	36.232M	39.9M	36.282M	39.85M	36.182M	39.95M	36.232M
5230MHz	Pass	Inf	40.25M	36.182M	39.85M	36.182M	39.65M	36.332M	39.7M	36.232M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.6M	75.562M	81.3M	75.762M	81.3M	75.762M	81.7M	75.962M

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

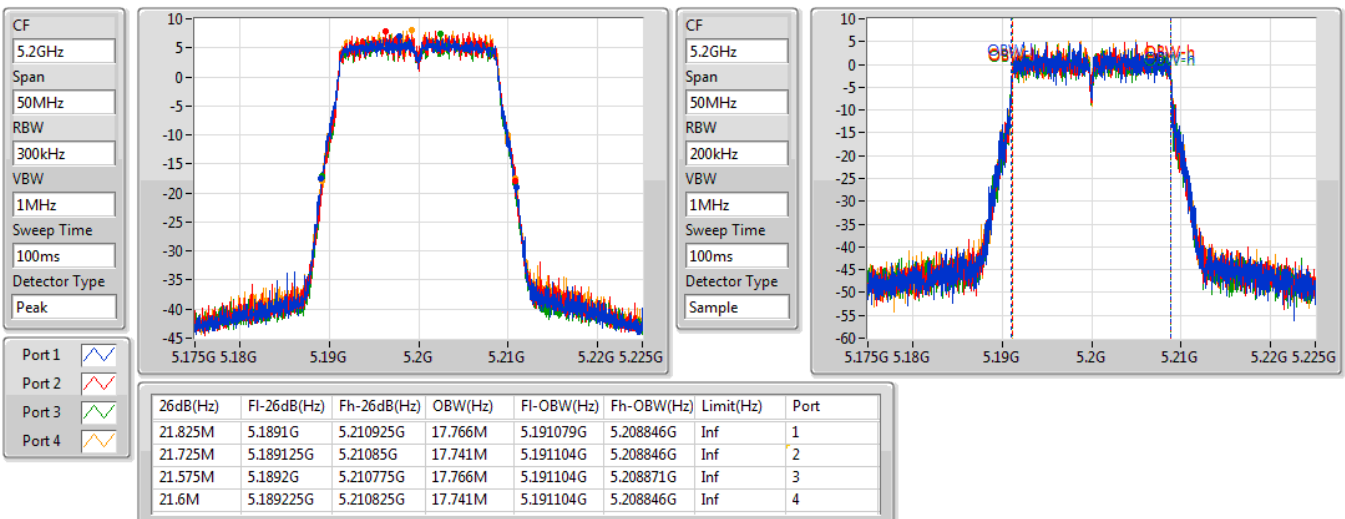
Port X-OBW = Port X 99% occupied bandwidth;

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5180MHz

18/11/2019

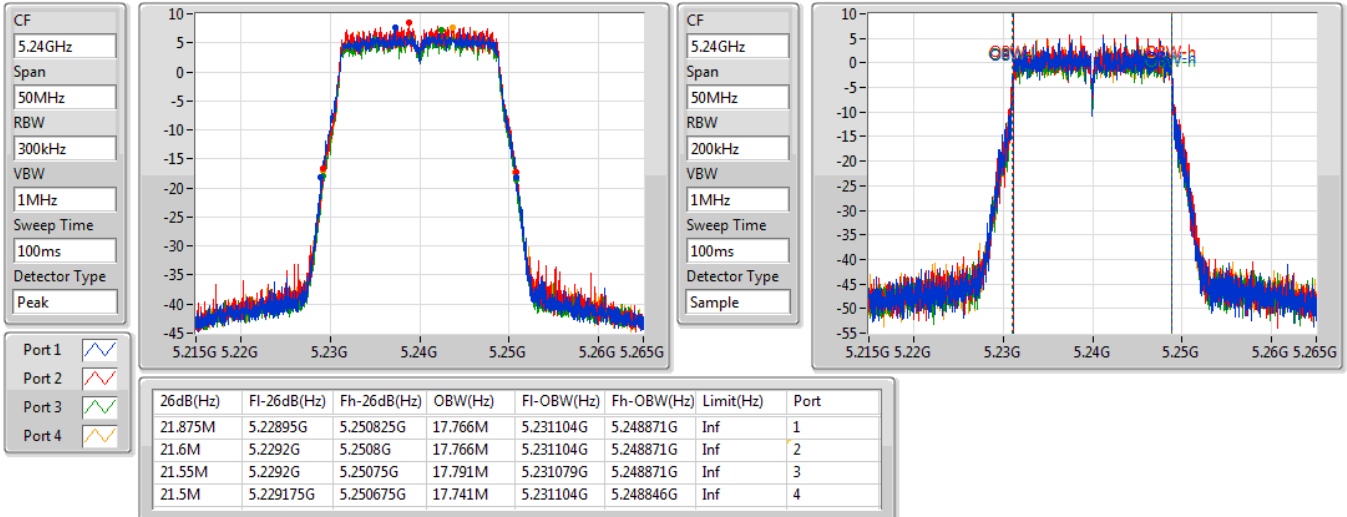

802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5200MHz

18/11/2019

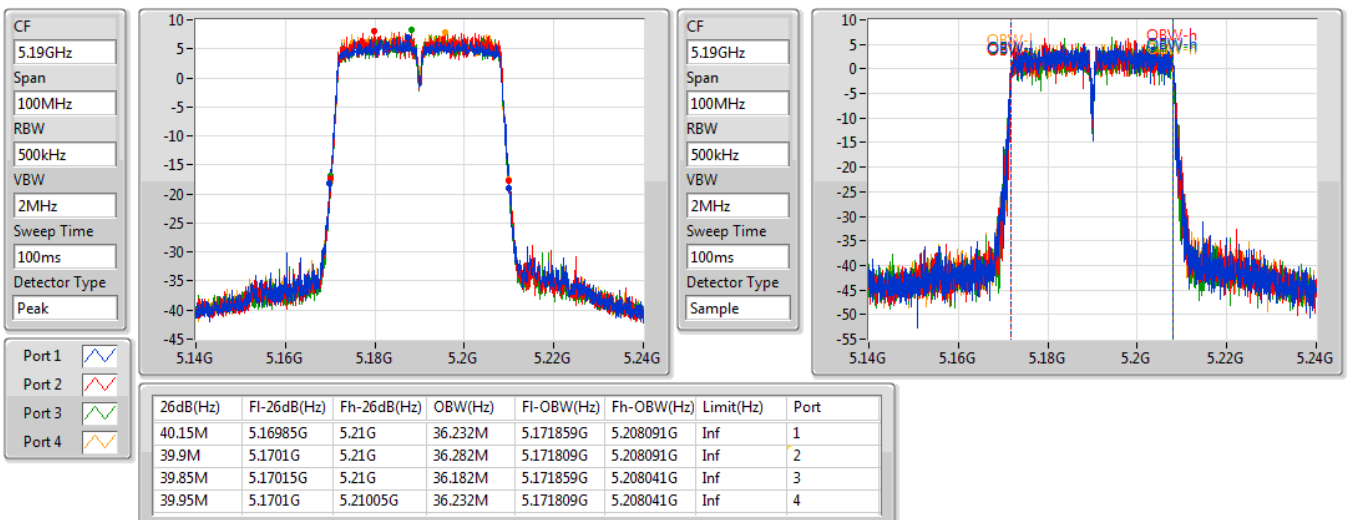


802.11ac VHT20-BF_Nss1,(MCS0)_4TX
EBW
5240MHz

18/11/2019

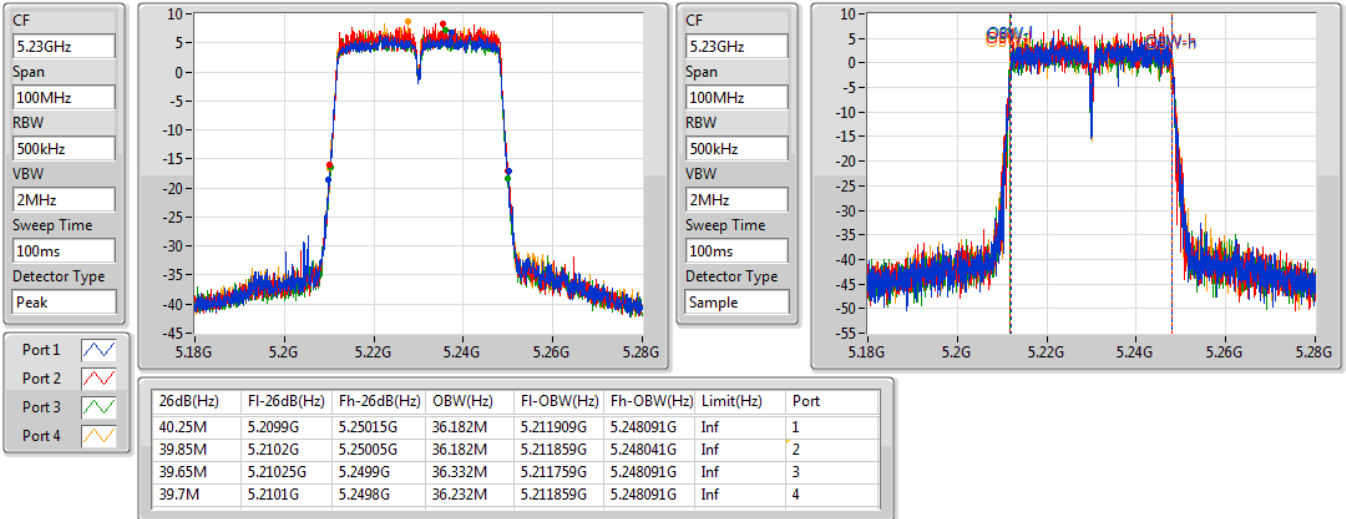

802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5190MHz

18/11/2019

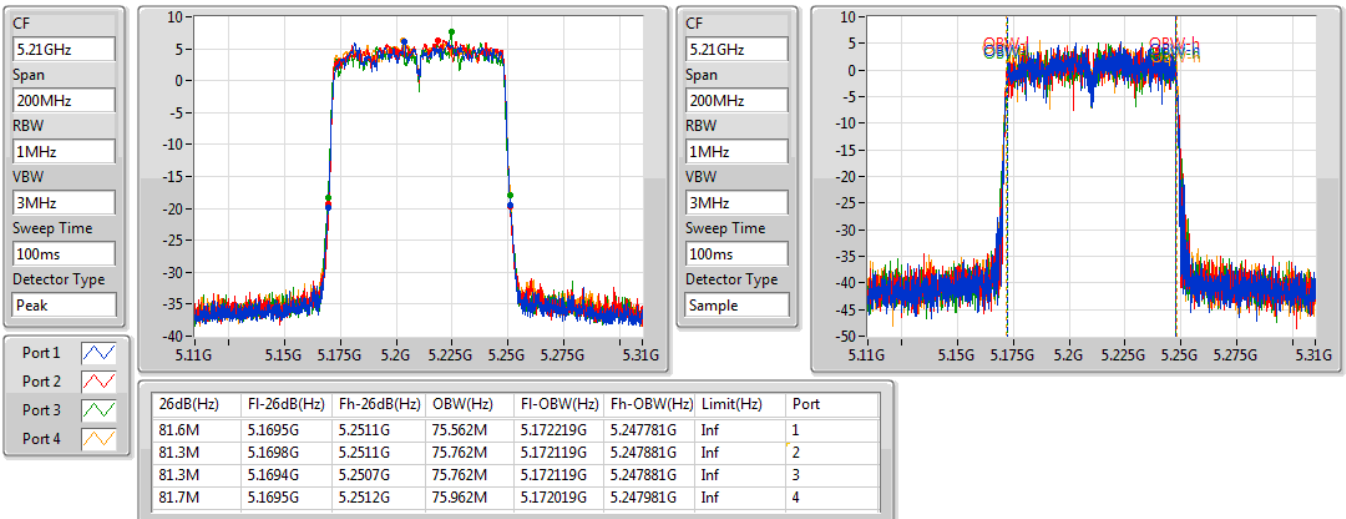


802.11ac VHT40-BF_Nss1,(MCS0)_4TX
EBW
5230MHz

18/11/2019


802.11ac VHT80-BF_Nss1,(MCS0)_4TX
EBW
5210MHz

18/11/2019



For Master Mode Band 1~4 and Client Mode Band 2~4:

For 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	35.625M	16.742M	16M7D1D	21.4M	16.517M
802.11ac VHT20_Nss1,(MCS0)_4TX	34.9M	17.866M	17M9D1D	21.45M	17.691M
802.11ac VHT40_Nss1,(MCS0)_4TX	69.65M	36.432M	36M4D1D	39.7M	36.182M
802.11ac VHT80_Nss1,(MCS0)_4TX	82.2M	75.862M	75M9D1D	81.4M	75.462M
5.25-5.35GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	21.6M	16.642M	16M6D1D	21.375M	16.517M
802.11ac VHT20_Nss1,(MCS0)_4TX	21.85M	17.766M	17M8D1D	21.425M	17.691M
802.11ac VHT40_Nss1,(MCS0)_4TX	40.2M	36.282M	36M3D1D	39.7M	36.182M
802.11ac VHT80_Nss1,(MCS0)_4TX	81.6M	75.862M	75M9D1D	81.4M	75.662M
5.47-5.725GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	21.65M	16.617M	16M6D1D	15.57M	13.253M
802.11ac VHT20_Nss1,(MCS0)_4TX	22M	17.791M	17M8D1D	15.69M	13.868M
802.11ac VHT40_Nss1,(MCS0)_4TX	40.1M	36.332M	36M3D1D	34.86M	32.919M
802.11ac VHT80_Nss1,(MCS0)_4TX	82.3M	75.962M	76M0D1D	75.15M	72.414M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_4TX	16.35M	16.642M	16M6D1D	3.14M	3.818M
802.11ac VHT20_Nss1,(MCS0)_4TX	17.6M	17.791M	17M8D1D	3.78M	4.178M
802.11ac VHT40_Nss1,(MCS0)_4TX	36.35M	36.432M	36M4D1D	3.14M	3.478M
802.11ac VHT80_Nss1,(MCS0)_4TX	75.8M	75.862M	75M9D1D	2.92M	3.578M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

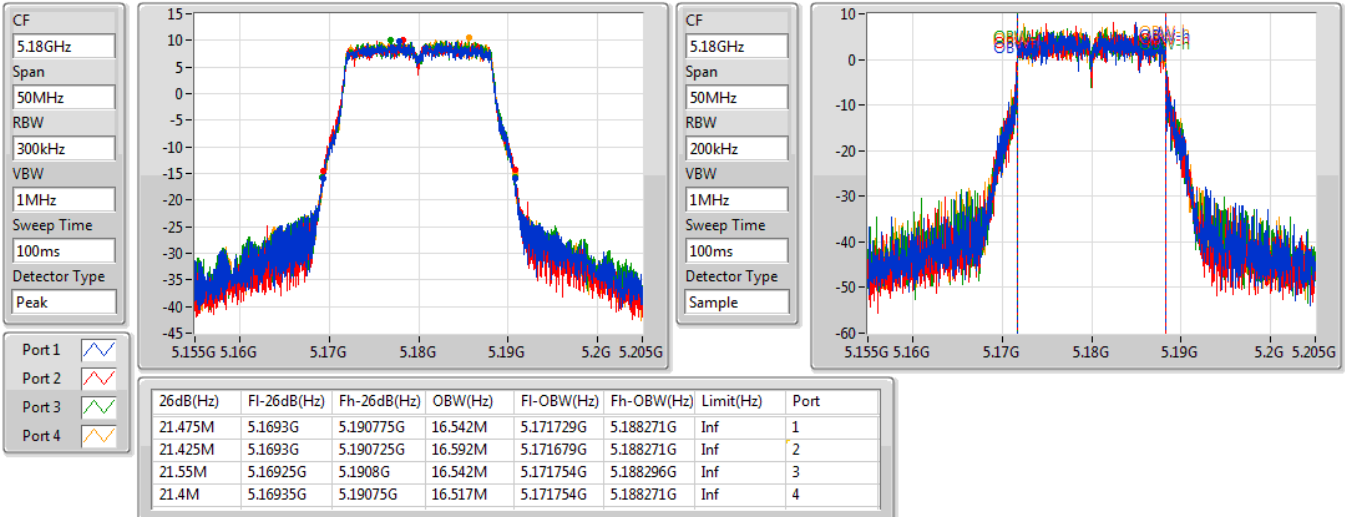
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.475M	16.542M	21.425M	16.592M	21.55M	16.542M	21.4M	16.517M
5200MHz	Pass	Inf	31.675M	16.667M	27.125M	16.642M	31.05M	16.642M	29.2M	16.567M
5240MHz	Pass	Inf	35.625M	16.742M	29.075M	16.667M	31.4M	16.692M	28.8M	16.592M
5260MHz	Pass	Inf	21.5M	16.617M	21.45M	16.517M	21.5M	16.567M	21.375M	16.542M
5300MHz	Pass	Inf	21.6M	16.617M	21.5M	16.567M	21.425M	16.542M	21.425M	16.567M
5320MHz	Pass	Inf	21.6M	16.642M	21.425M	16.592M	21.45M	16.567M	21.425M	16.592M
5500MHz	Pass	Inf	21.55M	16.592M	21.5M	16.592M	21.5M	16.542M	21.425M	16.592M
5580MHz	Pass	Inf	21.65M	16.617M	21.525M	16.567M	21.5M	16.567M	21.4M	16.542M
5700MHz	Pass	Inf	21.625M	16.592M	21.475M	16.567M	21.45M	16.567M	21.5M	16.592M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.6M	13.313M	15.57M	13.313M	15.57M	13.253M	15.57M	13.268M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.18M	3.878M	3.16M	3.818M	3.16M	3.818M	3.14M	3.818M
5745MHz	Pass	500k	16.325M	16.592M	16.325M	16.592M	16.325M	16.617M	16.3M	16.617M
5785MHz	Pass	500k	16.3M	16.617M	16.325M	16.642M	16.325M	16.617M	16.325M	16.592M
5825MHz	Pass	500k	16.35M	16.617M	16.35M	16.567M	16.325M	16.567M	16.35M	16.592M
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.95M	17.741M	21.75M	17.716M	21.45M	17.716M	21.625M	17.716M
5200MHz	Pass	Inf	33.175M	17.866M	34.9M	17.791M	34.425M	17.766M	30.575M	17.741M
5240MHz	Pass	Inf	21.725M	17.716M	21.825M	17.741M	21.575M	17.716M	21.65M	17.691M
5260MHz	Pass	Inf	21.85M	17.741M	21.575M	17.741M	21.475M	17.716M	21.575M	17.741M
5300MHz	Pass	Inf	21.75M	17.741M	21.6M	17.766M	21.65M	17.691M	21.425M	17.716M
5320MHz	Pass	Inf	21.775M	17.741M	21.675M	17.691M	21.65M	17.716M	21.625M	17.716M
5500MHz	Pass	Inf	22M	17.766M	21.625M	17.716M	21.65M	17.741M	21.475M	17.716M
5580MHz	Pass	Inf	21.875M	17.741M	21.575M	17.691M	21.725M	17.741M	21.75M	17.716M
5700MHz	Pass	Inf	21.825M	17.741M	21.625M	17.791M	21.675M	17.716M	21.65M	17.741M
5720MHz Straddle 5.47-5.725GHz	Pass	Inf	15.885M	13.928M	15.795M	13.898M	15.72M	13.868M	15.69M	13.868M
5720MHz Straddle 5.725-5.85GHz	Pass	500k	3.78M	4.278M	3.78M	4.258M	3.78M	4.178M	3.78M	4.198M
5745MHz	Pass	500k	17.575M	17.791M	17.55M	17.741M	17.6M	17.716M	17.575M	17.716M
5785MHz	Pass	500k	17.575M	17.766M	17.575M	17.791M	17.575M	17.766M	17.55M	17.766M
5825MHz	Pass	500k	17.55M	17.791M	17.575M	17.766M	17.6M	17.766M	17.575M	17.766M
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	39.7M	36.182M	39.95M	36.282M	39.7M	36.232M	39.7M	36.232M
5230MHz	Pass	Inf	69.65M	36.432M	69.6M	36.282M	57.95M	36.282M	68.6M	36.282M
5270MHz	Pass	Inf	40.2M	36.182M	39.9M	36.282M	40M	36.232M	39.85M	36.232M
5310MHz	Pass	Inf	40.05M	36.232M	39.7M	36.282M	39.8M	36.182M	39.95M	36.182M
5510MHz	Pass	Inf	40.05M	36.282M	40M	36.232M	39.8M	36.232M	39.7M	36.182M
5550MHz	Pass	Inf	40.1M	36.332M	39.95M	36.232M	39.65M	36.232M	39.8M	36.332M
5670MHz	Pass	Inf	39.85M	36.282M	40.05M	36.182M	39.9M	36.332M	39.8M	36.232M
5710MHz Straddle 5.47-5.725GHz	Pass	Inf	35.14M	32.989M	34.86M	32.989M	35M	32.919M	34.965M	33.023M
5710MHz Straddle 5.725-5.85GHz	Pass	500k	3.14M	3.498M	3.16M	3.598M	3.14M	3.478M	3.14M	3.498M
5755MHz	Pass	500k	36.3M	36.382M	36.3M	36.332M	36.3M	36.332M	36.3M	36.382M
5795MHz	Pass	500k	36.35M	36.432M	36.3M	36.332M	36.3M	36.332M	35.95M	36.282M
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.4M	75.662M	81.6M	75.462M	82.2M	75.862M	81.6M	75.762M

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)
5290MHz	Pass	Inf	81.6M	75.862M	81.4M	75.862M	81.6M	75.762M	81.6M	75.662M
5530MHz	Pass	Inf	82M	75.662M	82.3M	75.962M	81.8M	75.862M	81.6M	75.862M
5610MHz	Pass	Inf	81.8M	75.862M	81.8M	75.962M	81.4M	75.662M	81.5M	75.662M
5690MHz Straddle 5.47-5.725GHz	Pass	Inf	75.6M	72.489M	75.15M	72.414M	75.45M	72.564M	75.525M	72.639M
5690MHz Straddle 5.725-5.85GHz	Pass	500k	3.12M	3.718M	3.14M	3.658M	2.92M	3.678M	3.1M	3.578M
5775MHz	Pass	500k	75.8M	75.862M	75.2M	75.862M	75.8M	75.862M	75.5M	75.762M

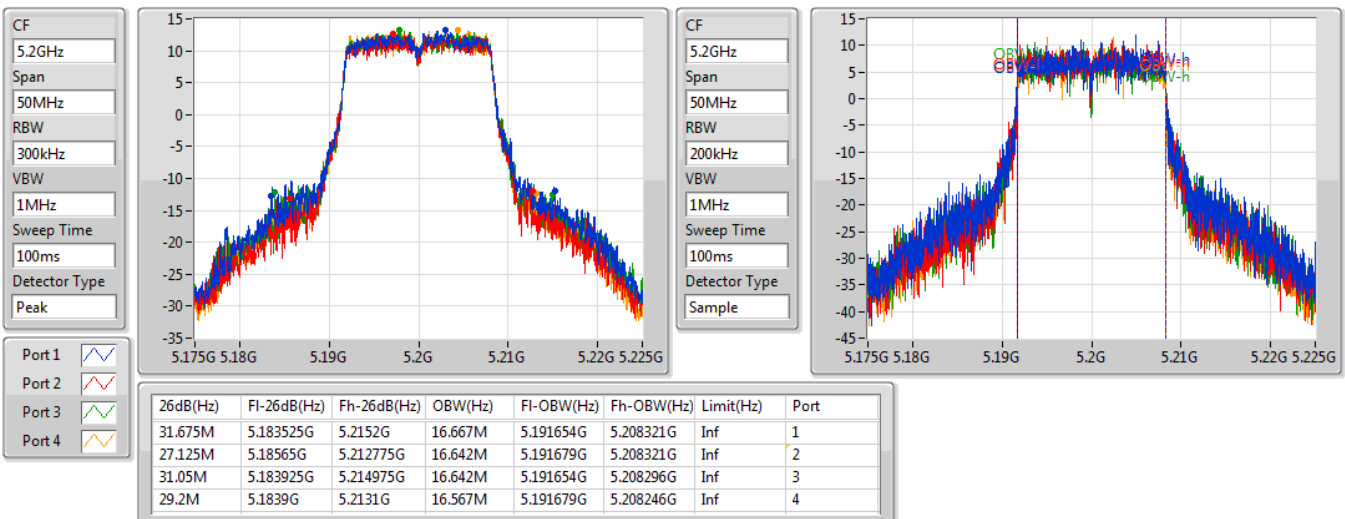
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_4TX
EBW
5180MHz

16/11/2019

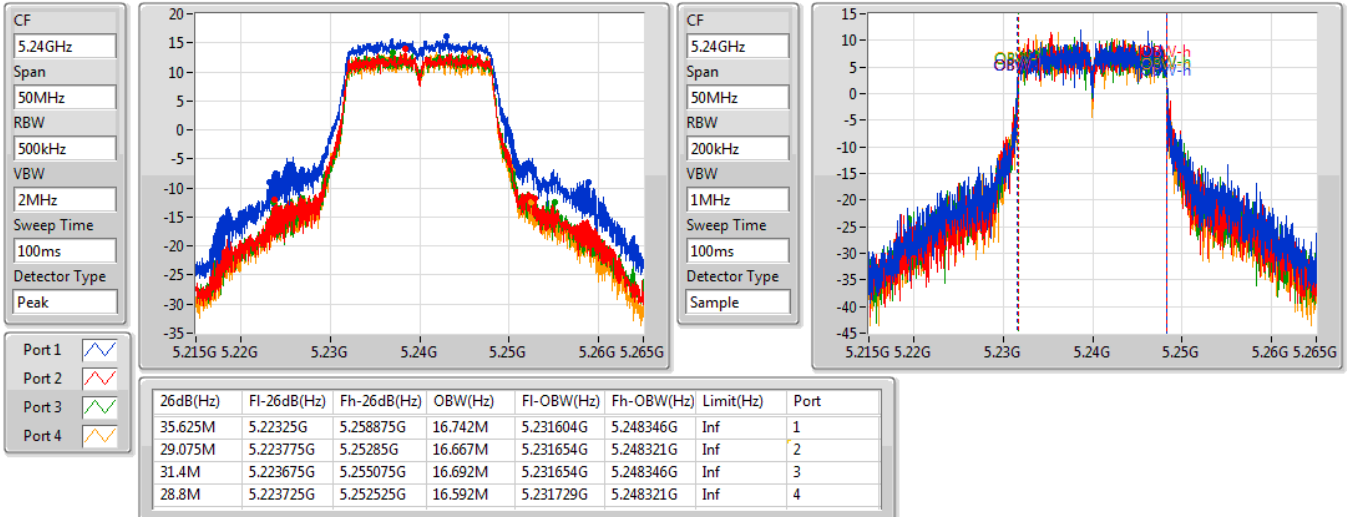

802.11a_Nss1,(6Mbps)_4TX
EBW
5200MHz

16/11/2019

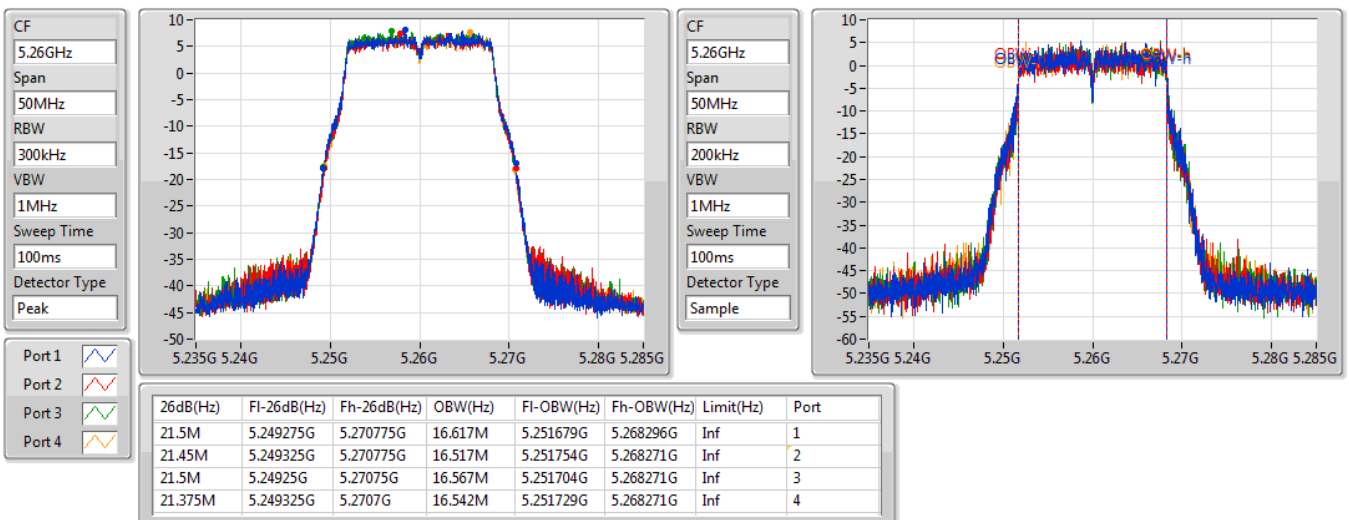


802.11a_Nss1,(6Mbps)_4TX
EBW
5240MHz

16/11/2019

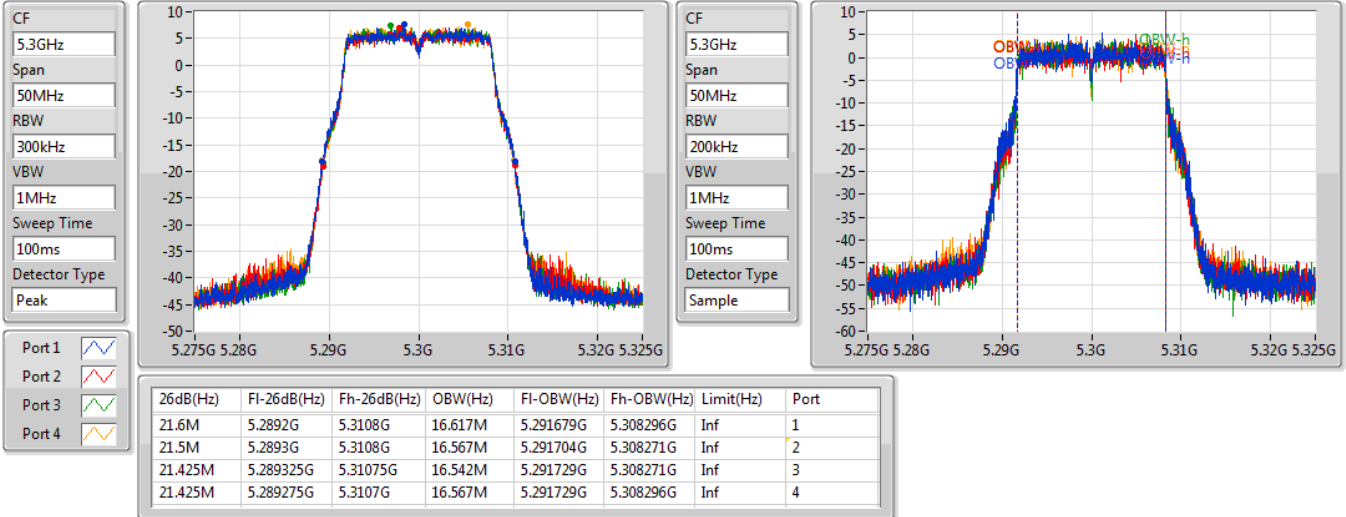

802.11a_Nss1,(6Mbps)_4TX
EBW
5260MHz

22/11/2019

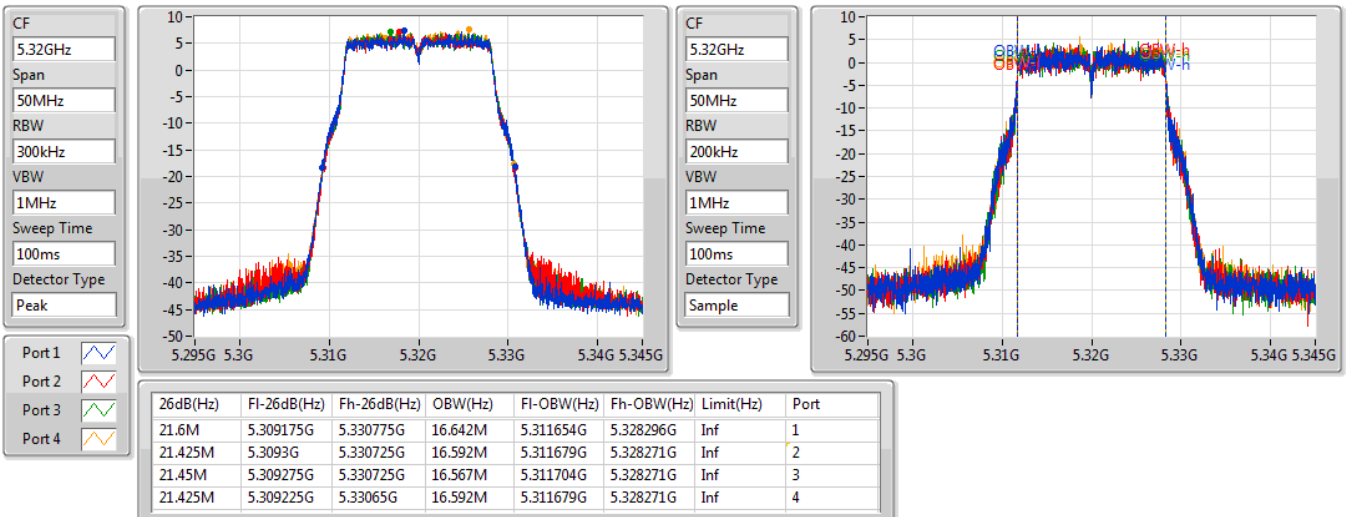


802.11a_Nss1,(6Mbps)_4TX
EBW
5300MHz

22/11/2019

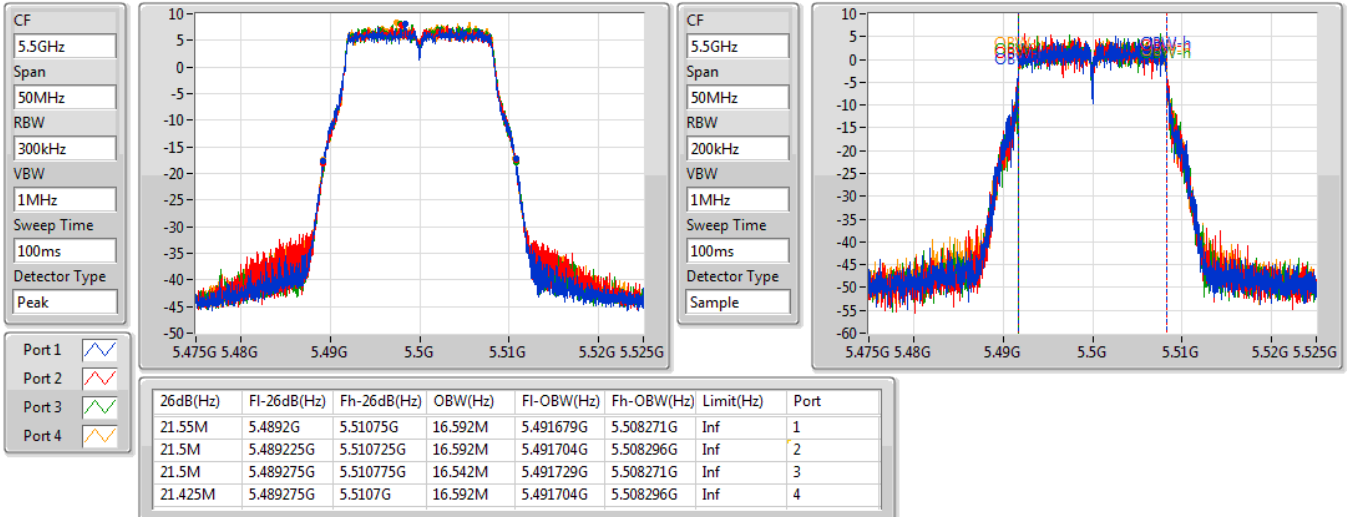

802.11a_Nss1,(6Mbps)_4TX
EBW
5320MHz

22/11/2019

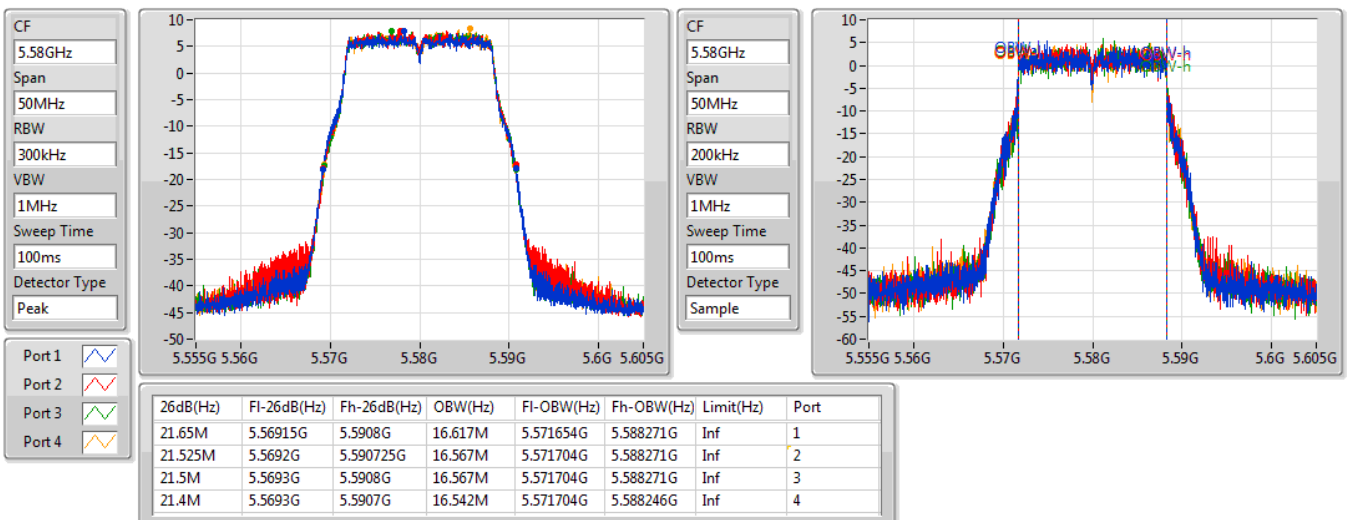


802.11a_Nss1,(6Mbps)_4TX
EBW
5500MHz

22/11/2019

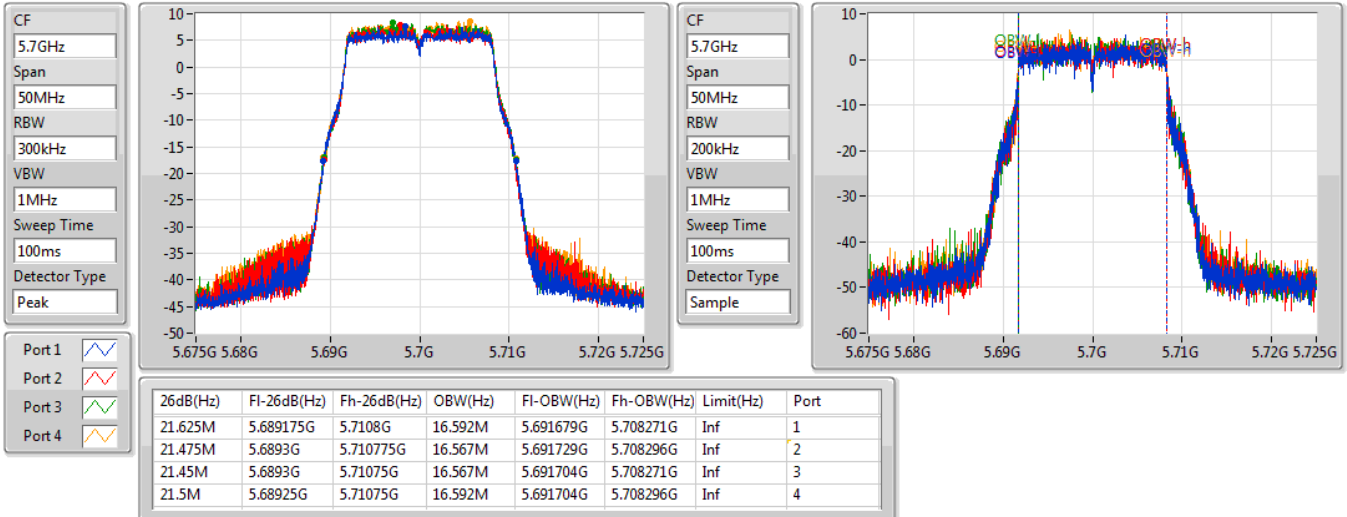

802.11a_Nss1,(6Mbps)_4TX
EBW
5580MHz

22/11/2019

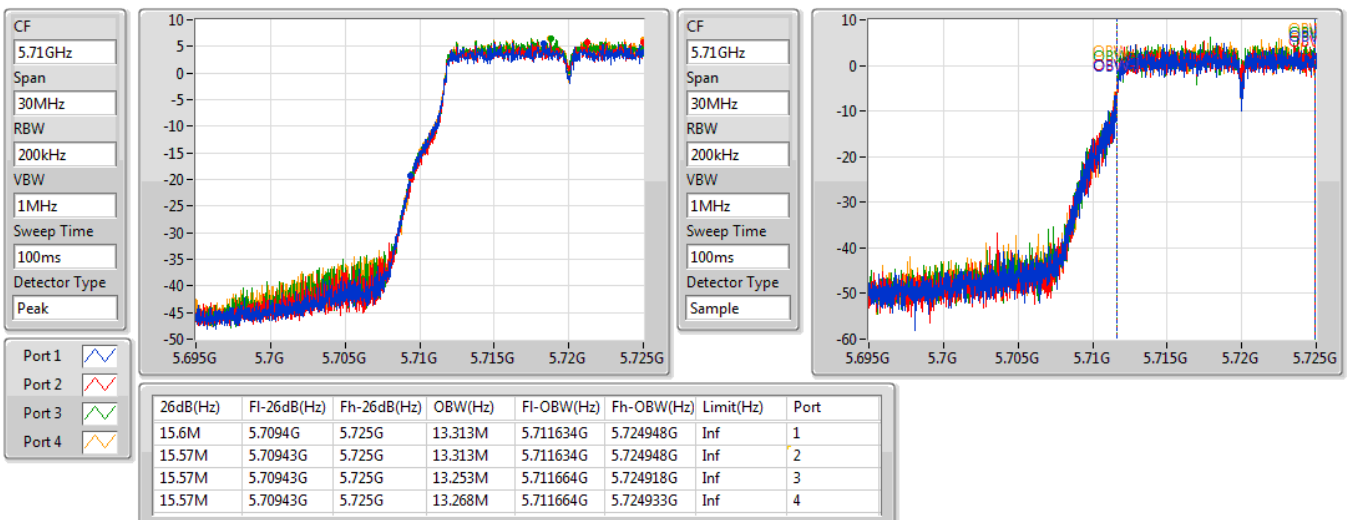


802.11a_Nss1,(6Mbps)_4TX
EBW
5700MHz

22/11/2019

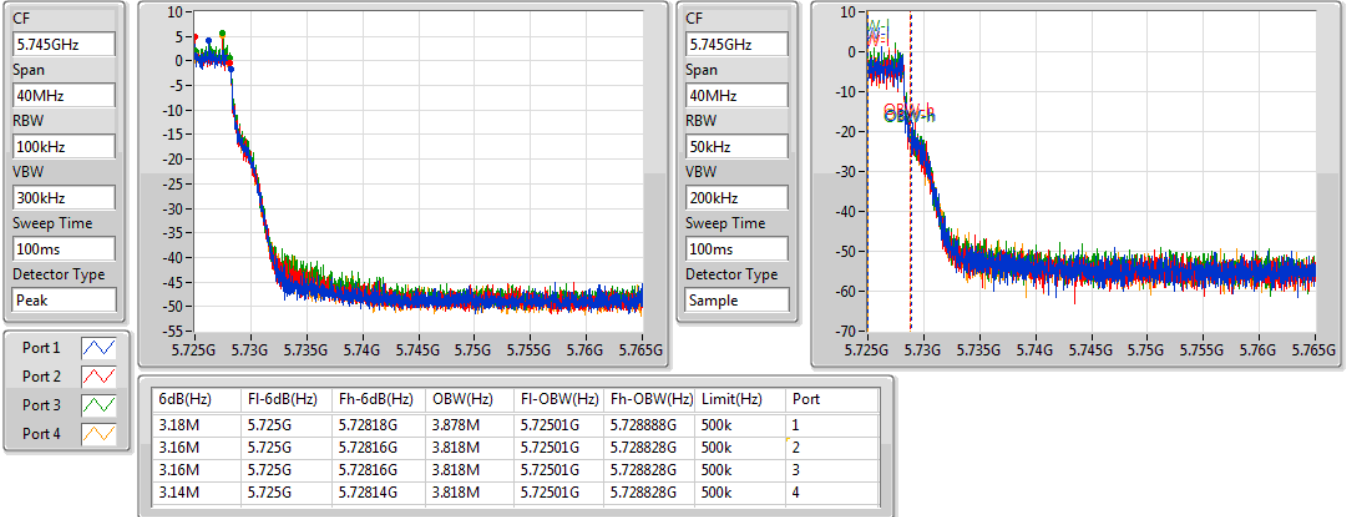

802.11a_Nss1,(6Mbps)_4TX
EBW
5720MHz Straddle 5.47-5.725GHz

22/11/2019

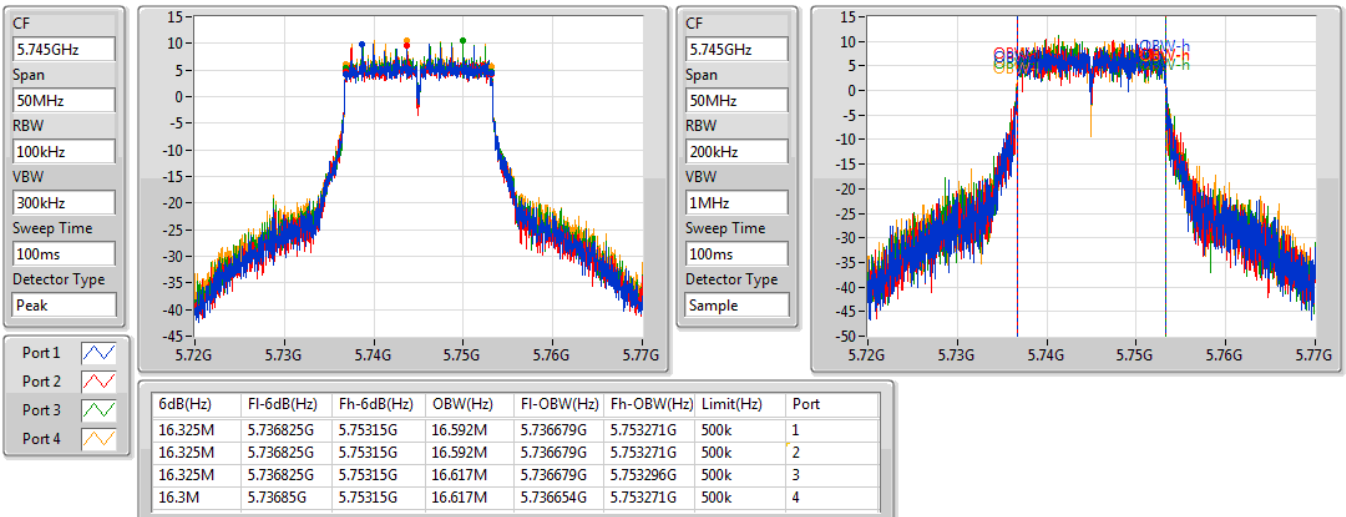


802.11a_Nss1,(6Mbps)_4TX
EBW
5720MHz Straddle 5.725-5.85GHz

22/11/2019

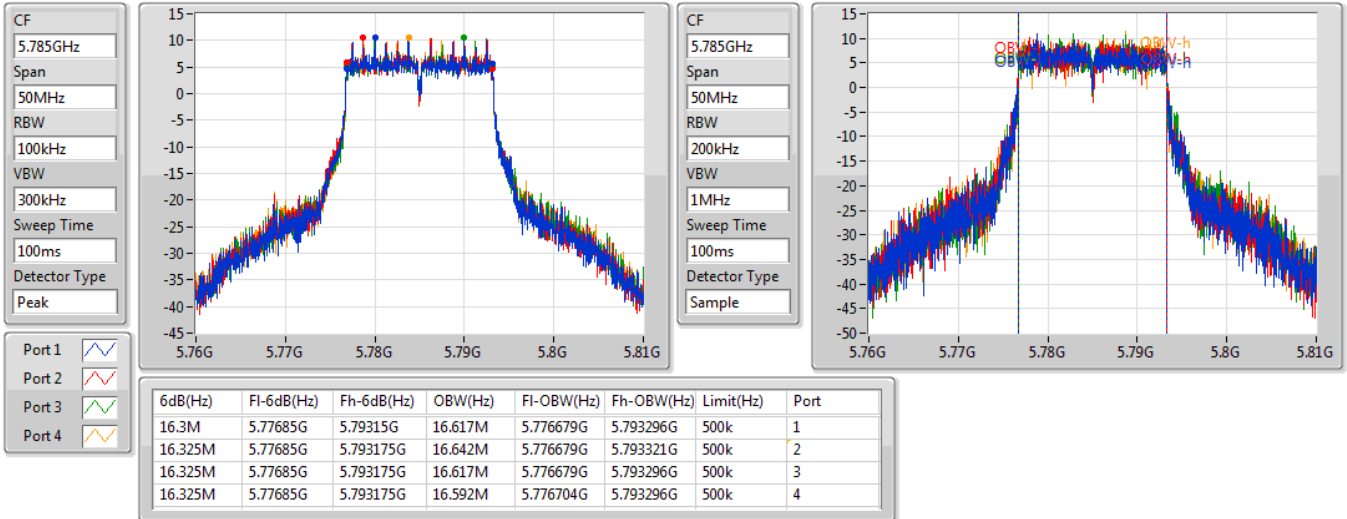

802.11a_Nss1,(6Mbps)_4TX
EBW
5745MHz

16/11/2019

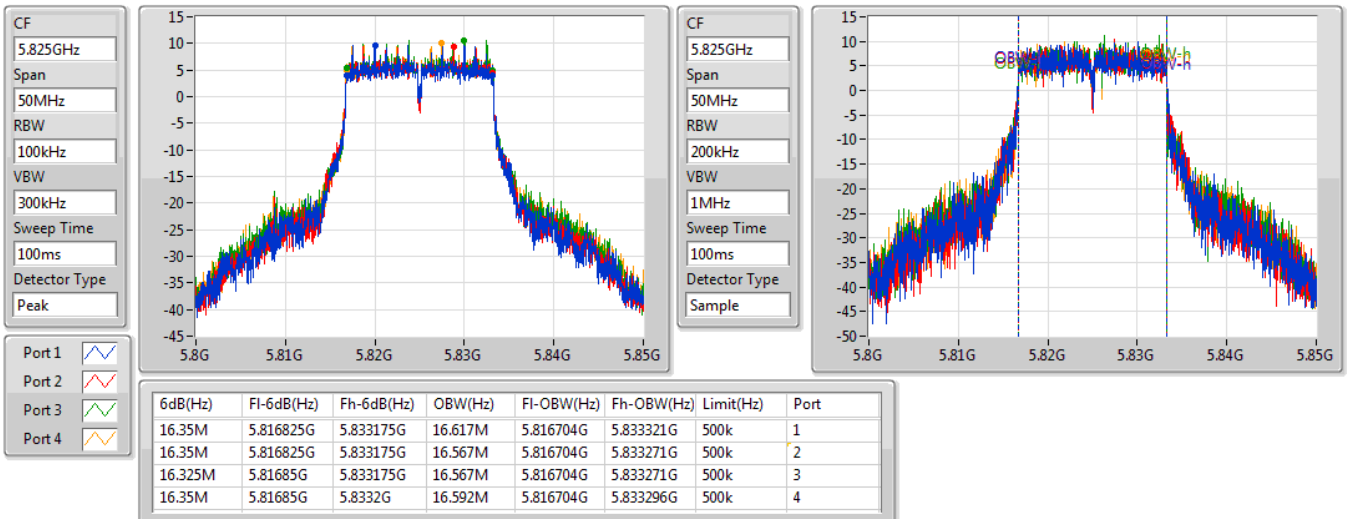


802.11a_Nss1,(6Mbps)_4TX
EBW
5785MHz

16/11/2019

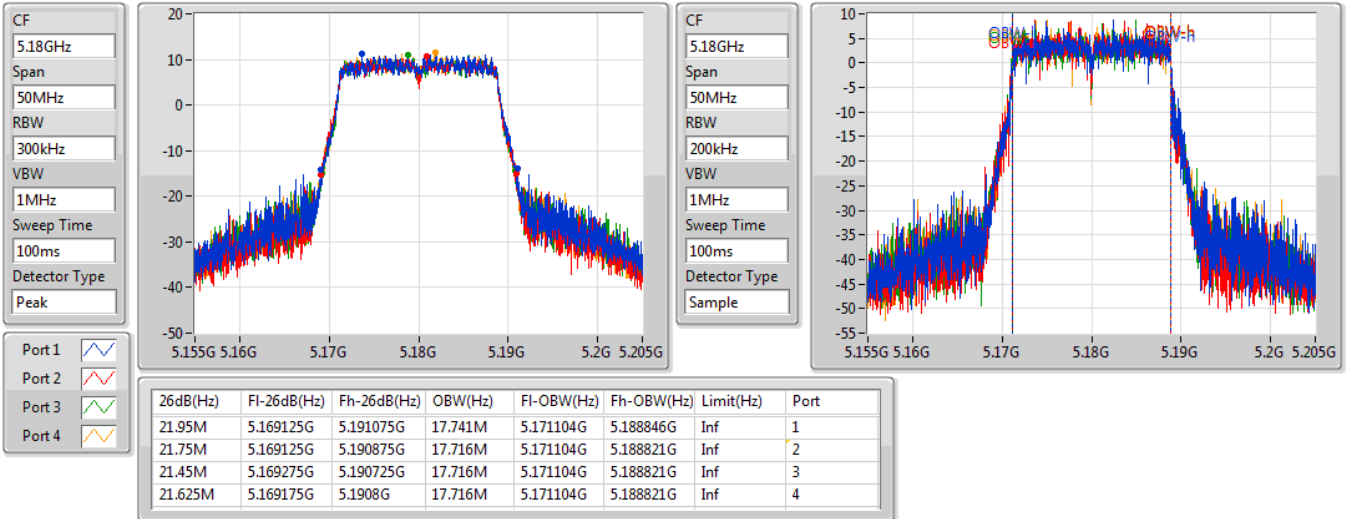

802.11a_Nss1,(6Mbps)_4TX
EBW
5825MHz

16/11/2019

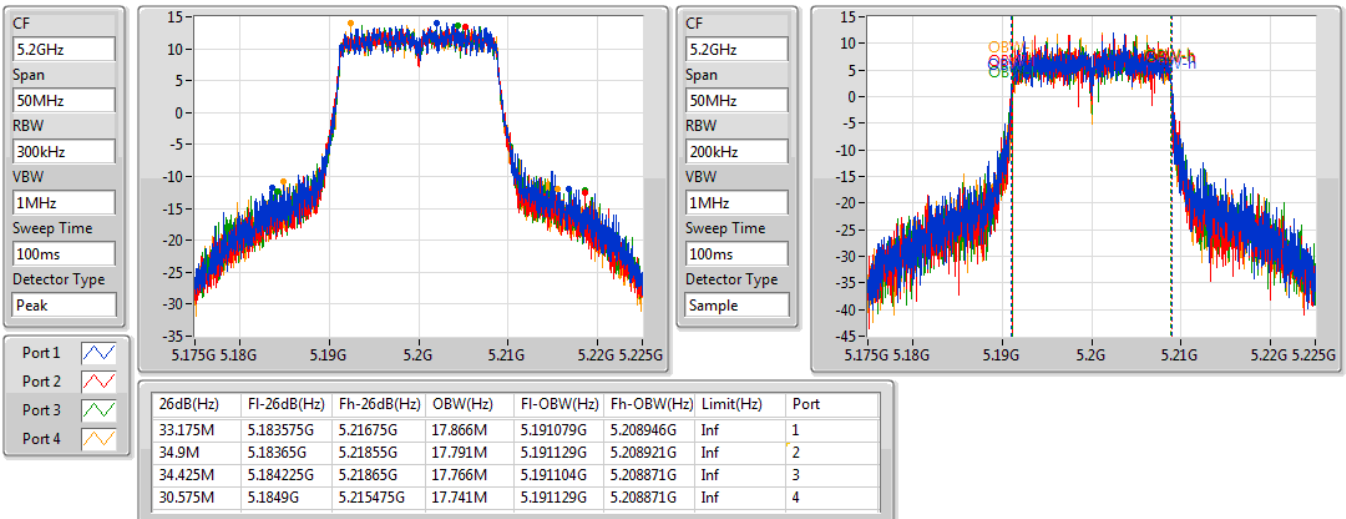


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5180MHz

16/11/2019

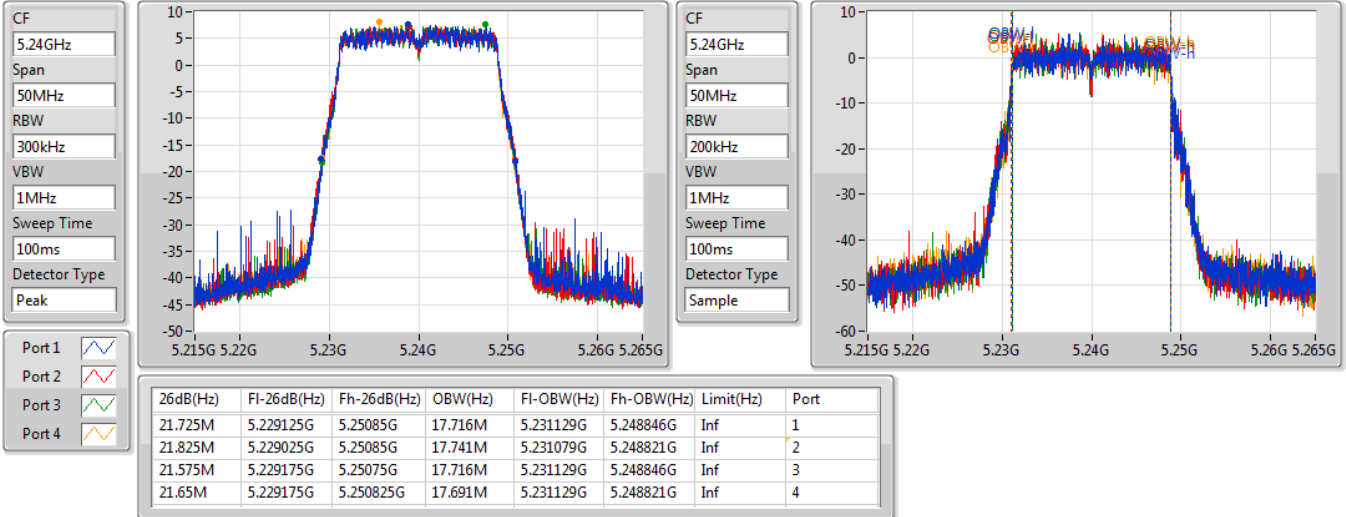

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5200MHz

16/11/2019

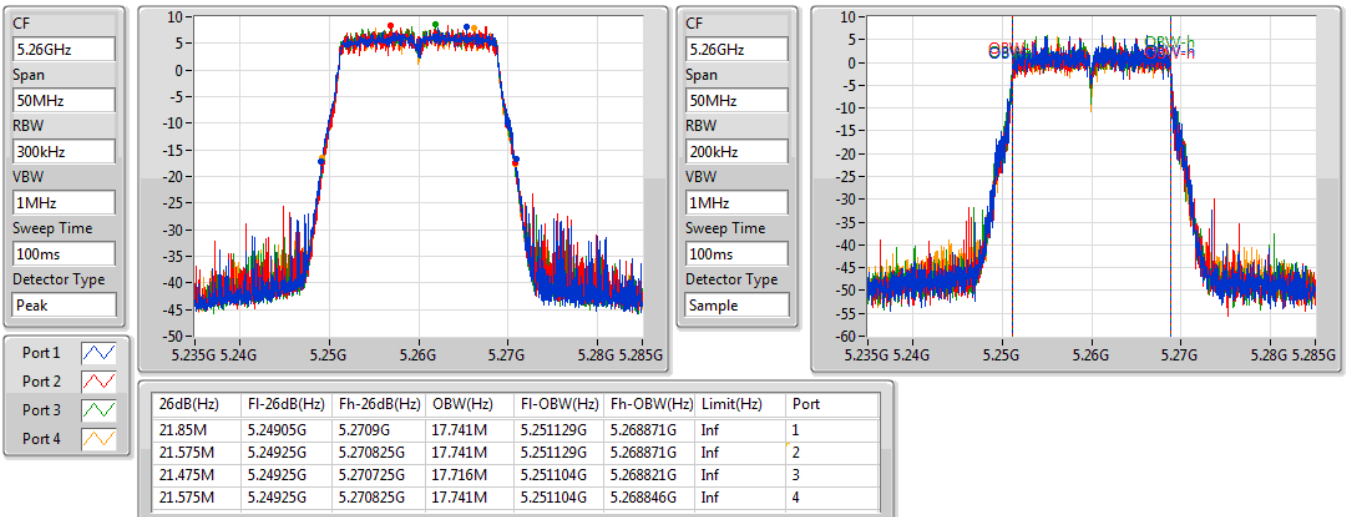


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5240MHz

16/11/2019

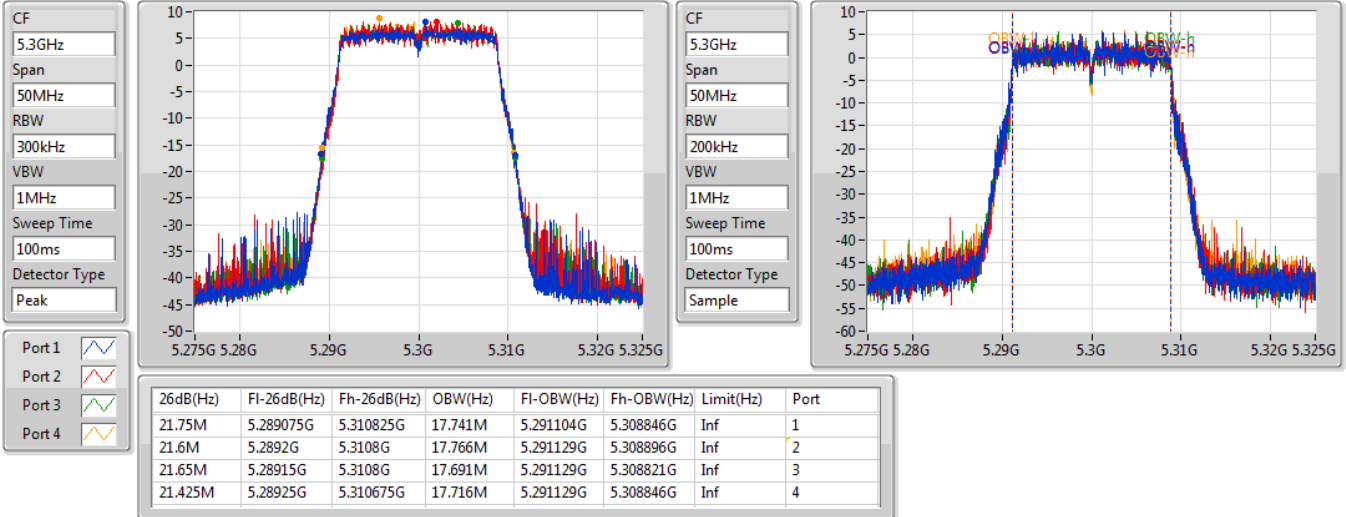

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5260MHz

22/11/2019

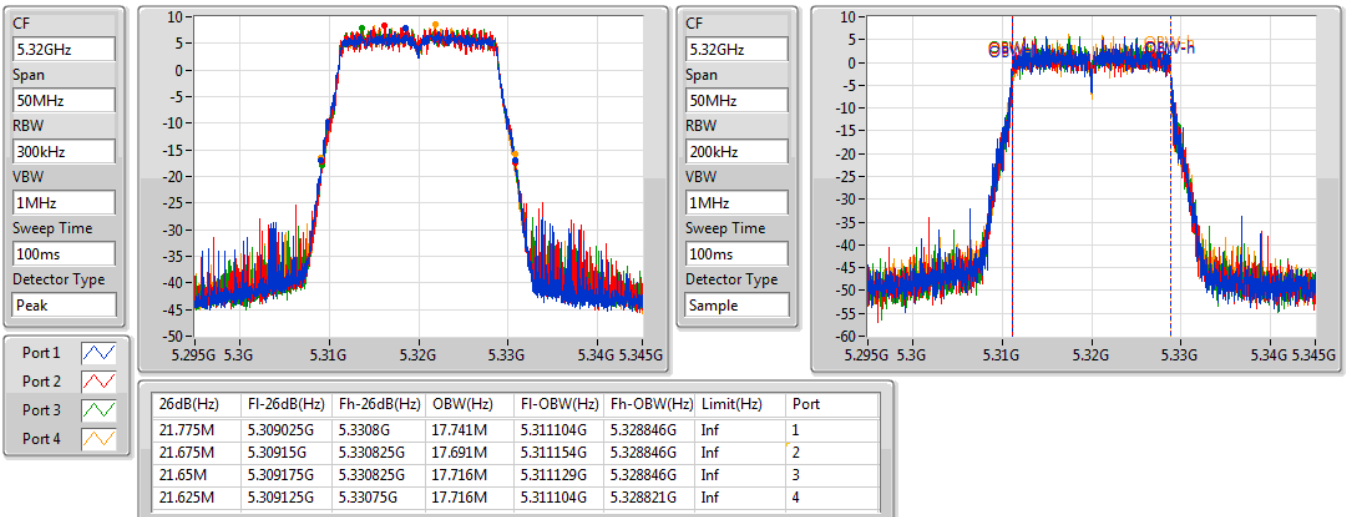


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5300MHz

22/11/2019

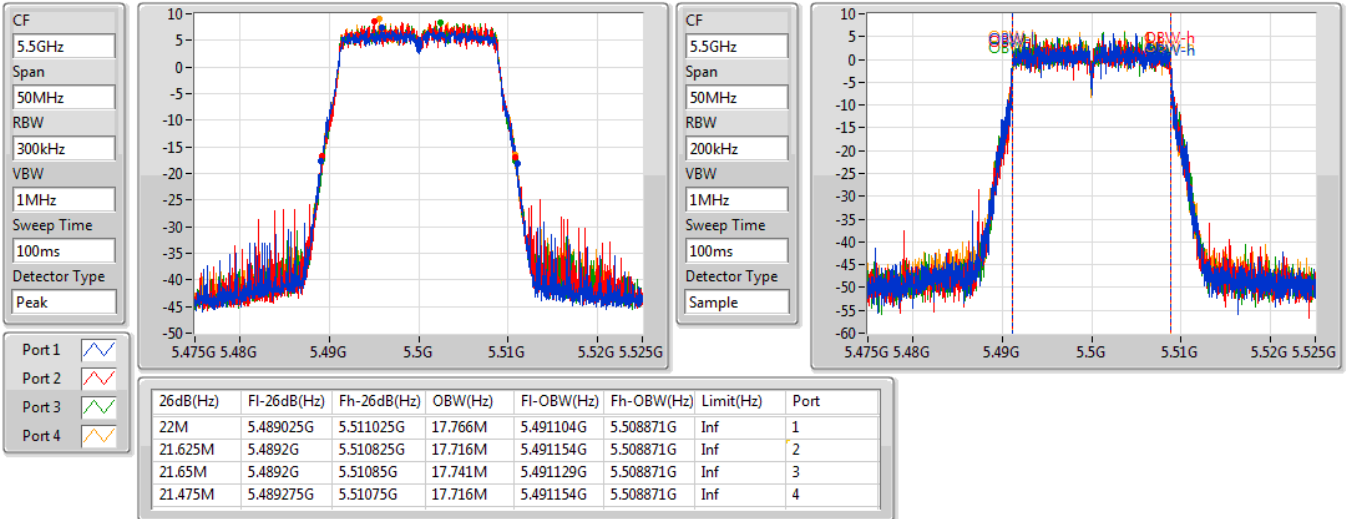

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5320MHz

22/11/2019

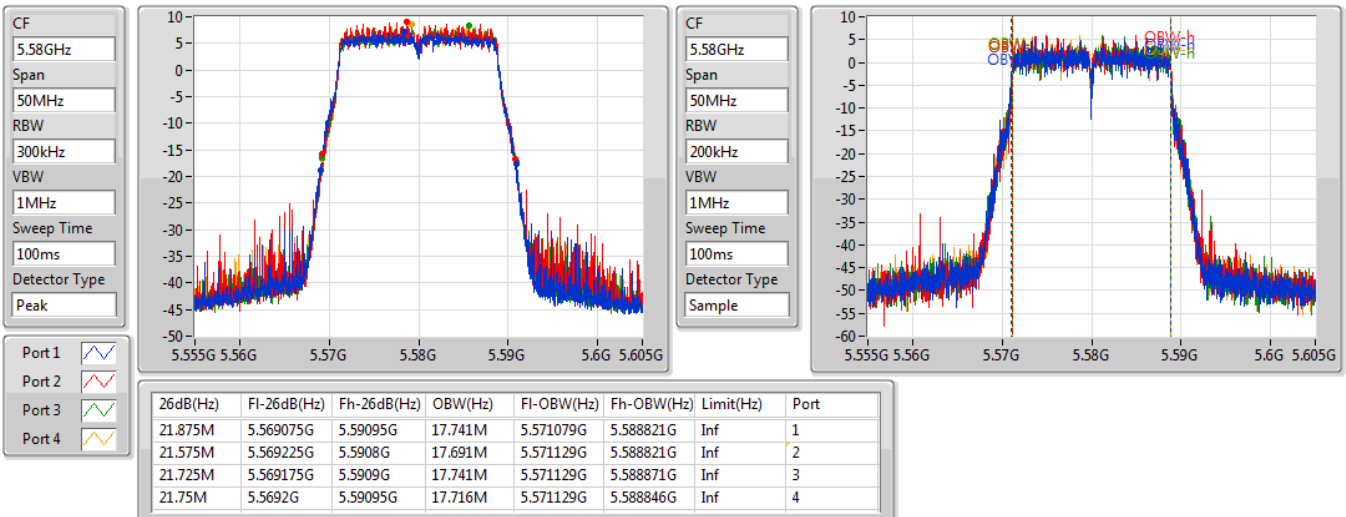


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5500MHz

22/11/2019

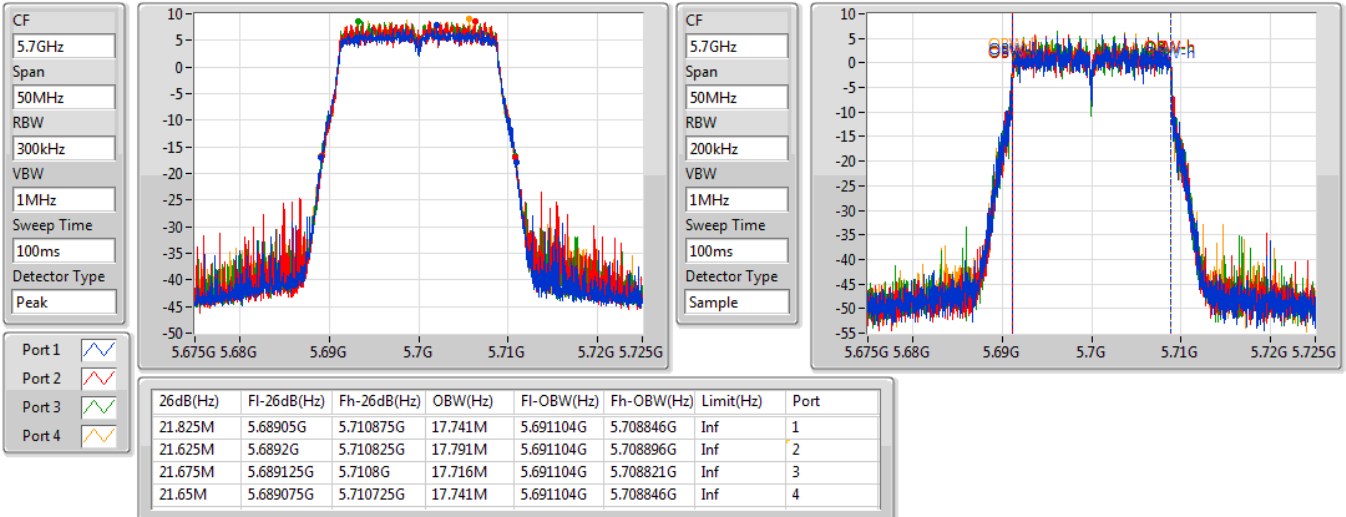

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5580MHz

22/11/2019

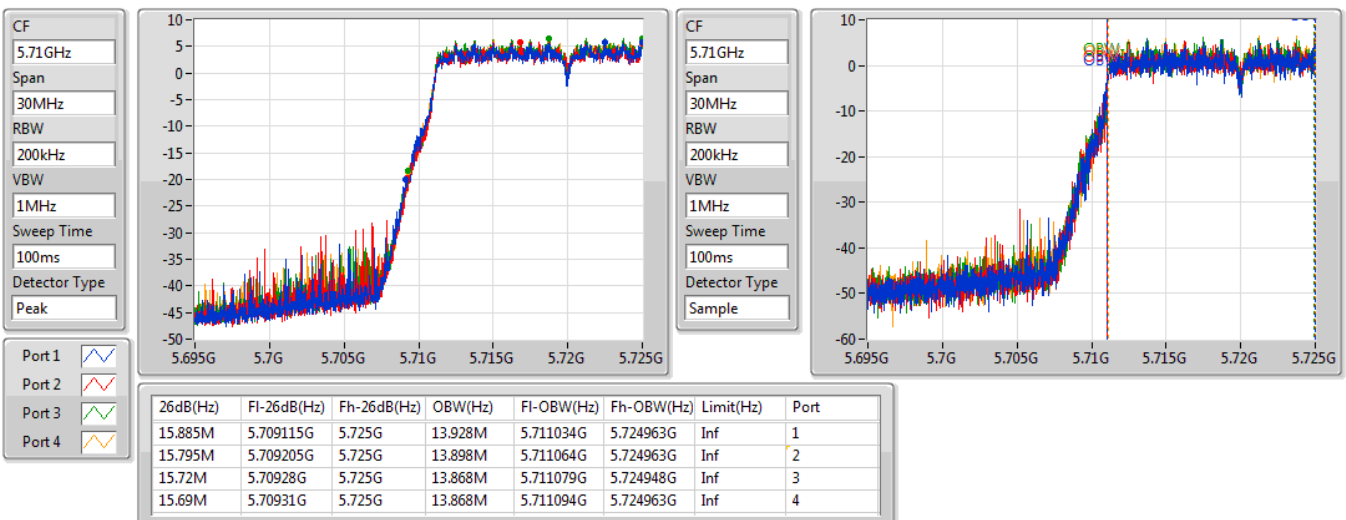


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5700MHz

22/11/2019

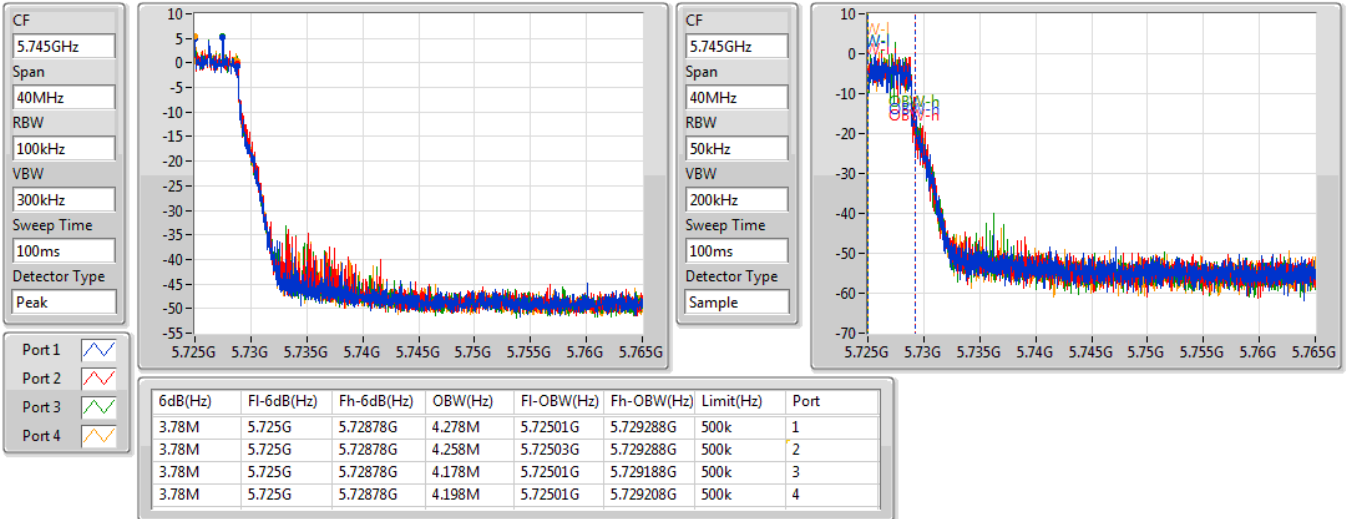

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.47-5.725GHz

22/11/2019

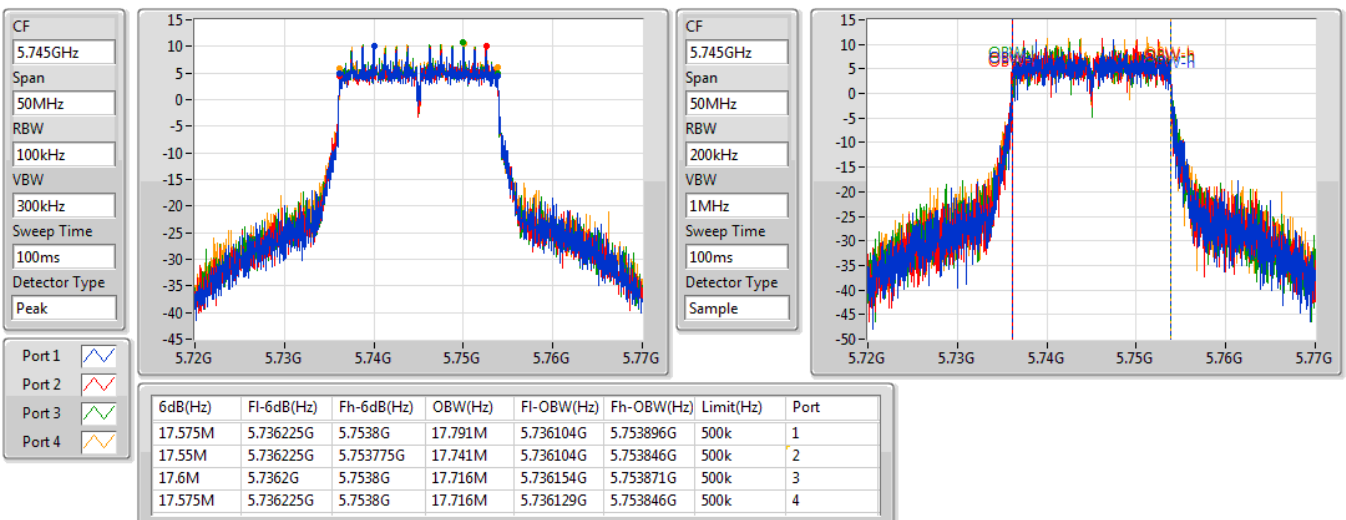


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5720MHz Straddle 5.725-5.85GHz

22/11/2019

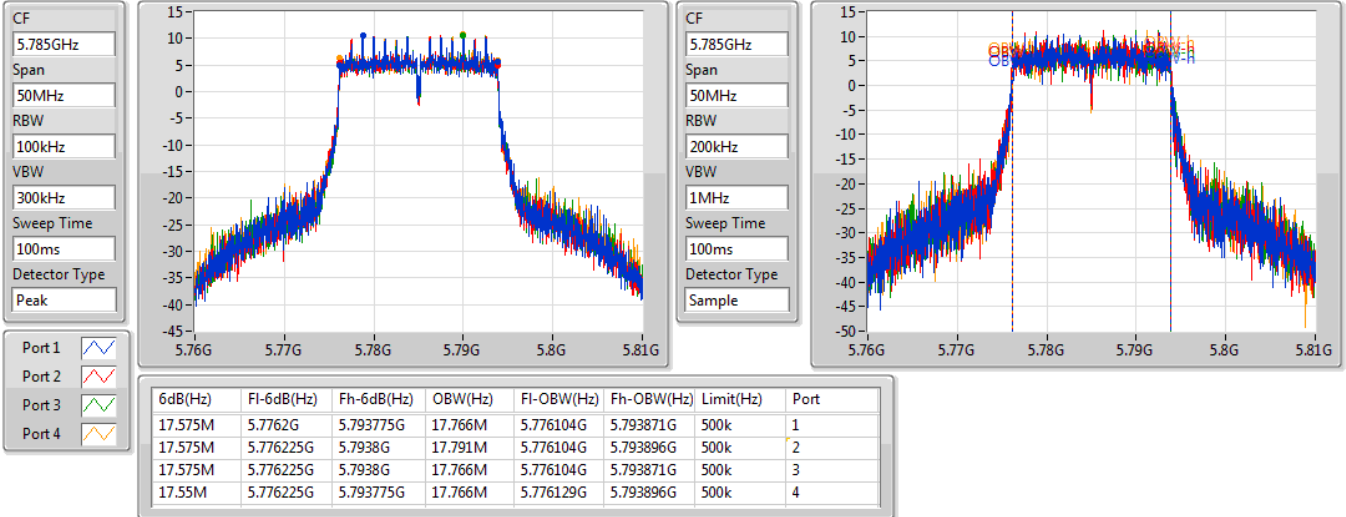

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5745MHz

16/11/2019

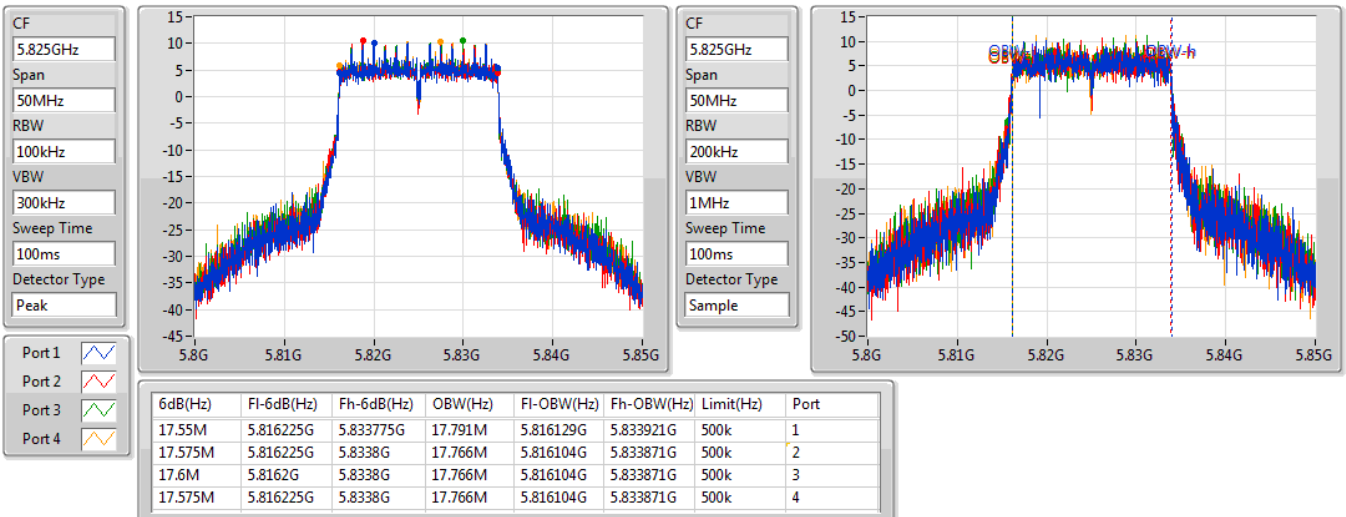


802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5785MHz

16/11/2019

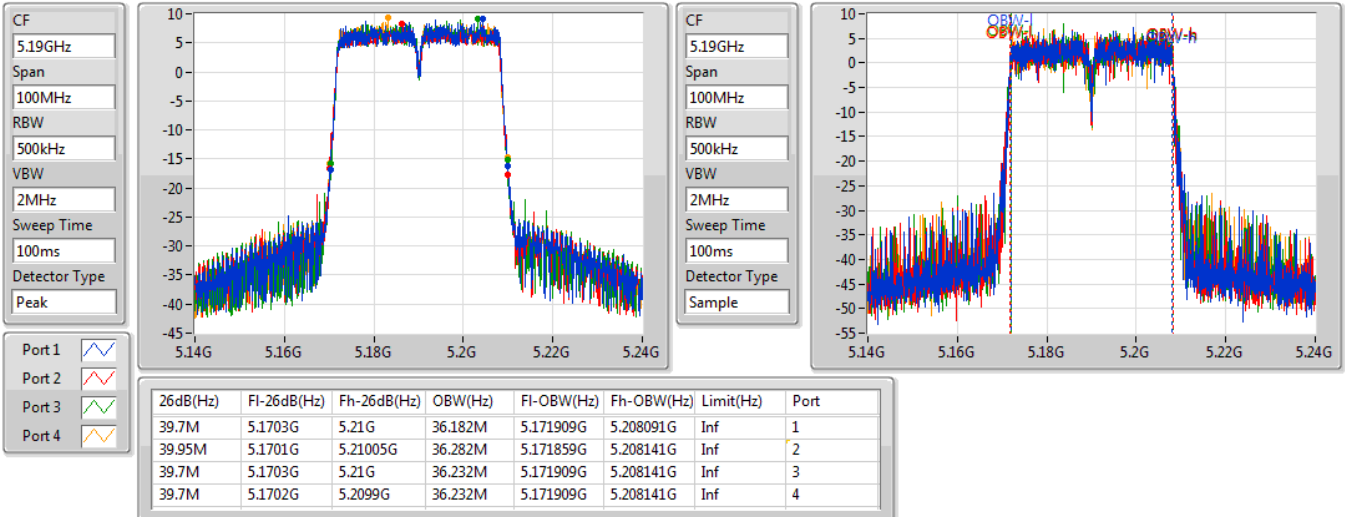

802.11ac VHT20_Nss1,(MCS0)_4TX
EBW
5825MHz

16/11/2019

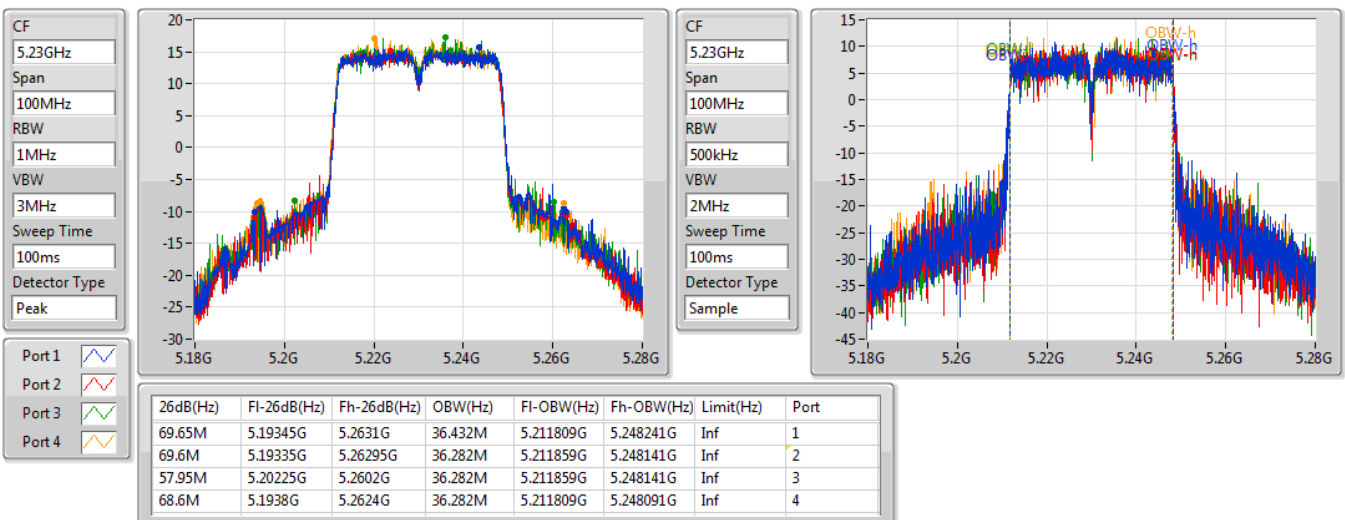


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5190MHz

16/11/2019

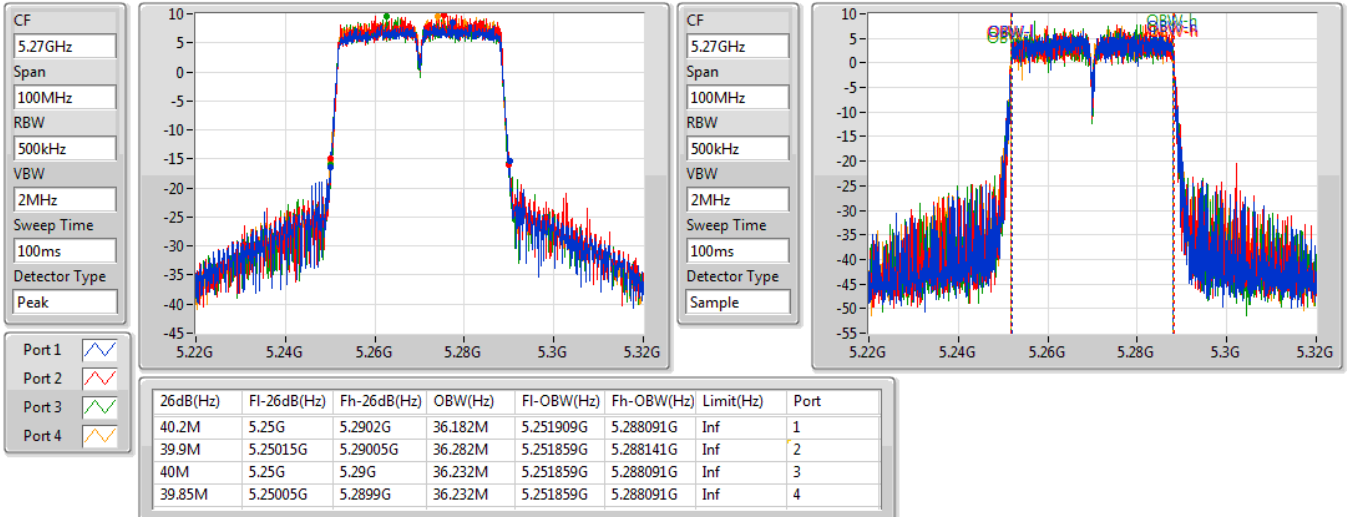

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5230MHz

16/11/2019

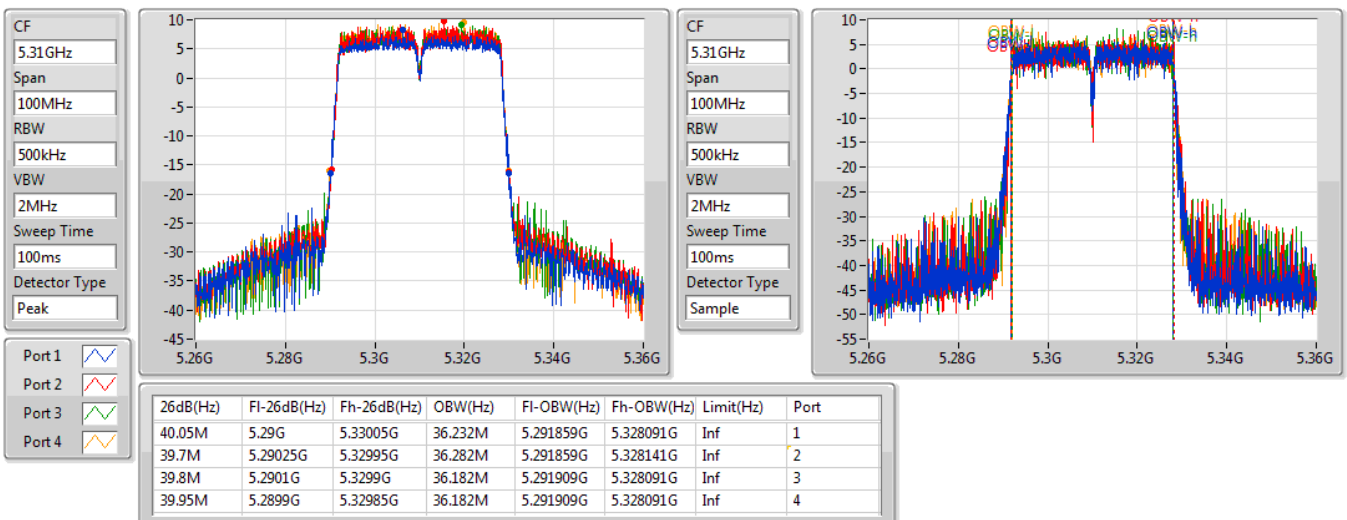


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5270MHz

22/11/2019

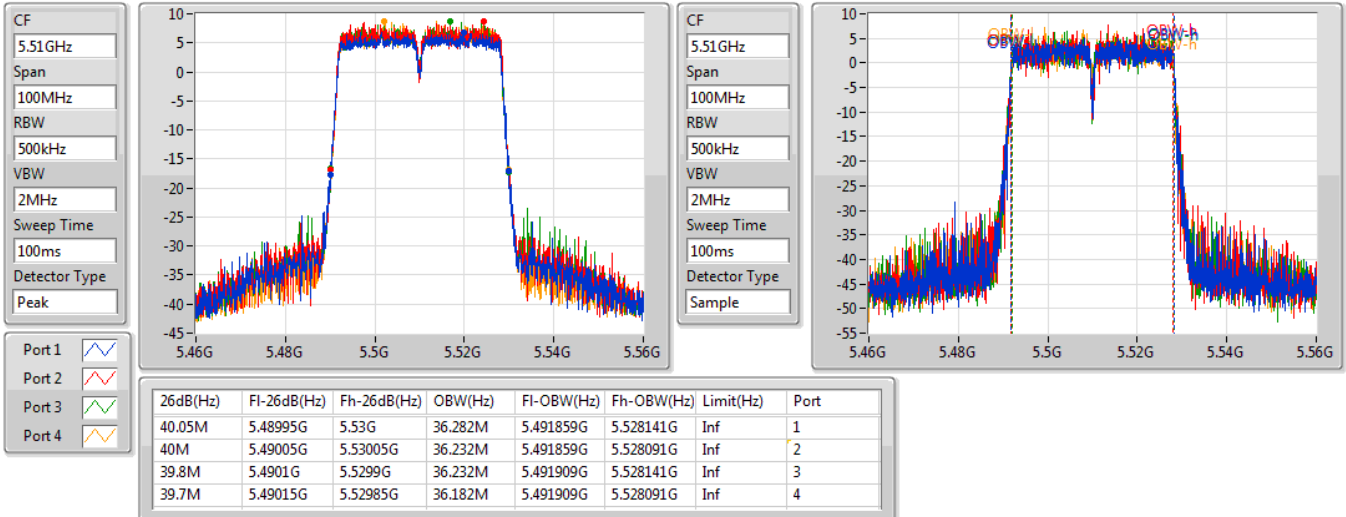

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5310MHz

22/11/2019

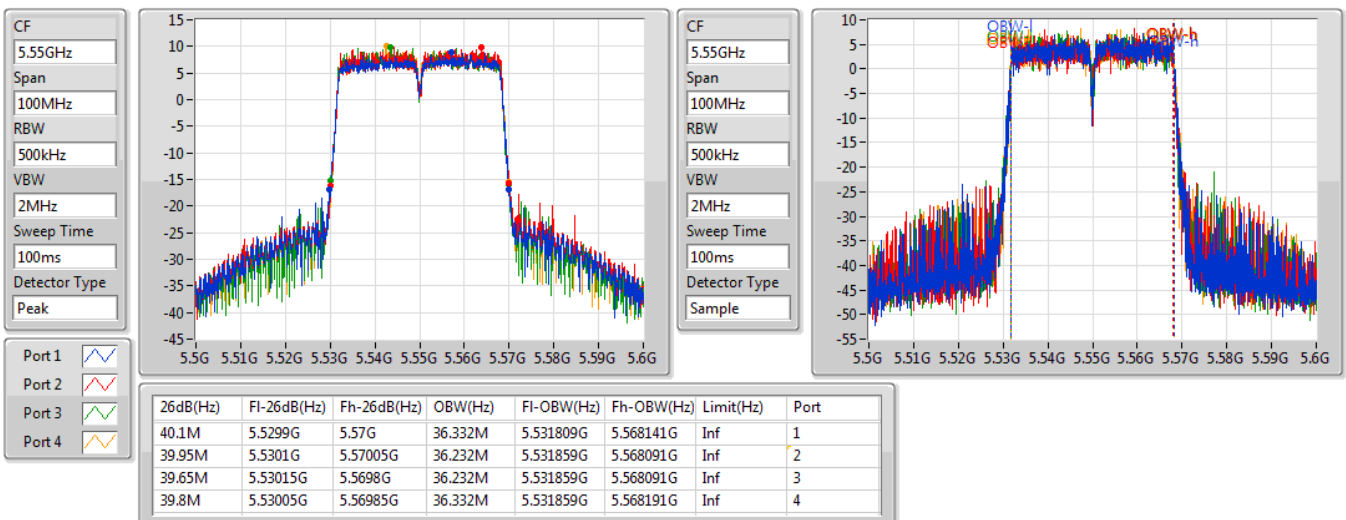


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5510MHz

22/11/2019

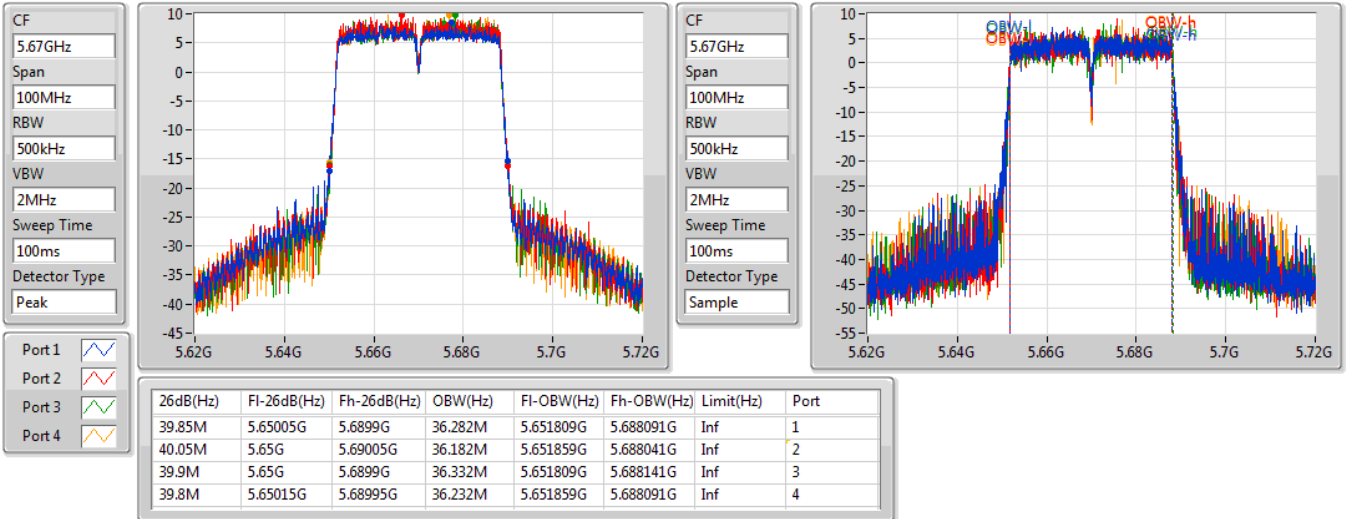

802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5550MHz

22/11/2019



802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5670MHz

22/11/2019


802.11ac VHT40_Nss1,(MCS0)_4TX
EBW
5710MHz Straddle 5.47-5.725GHz

22/11/2019

