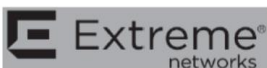


FCC Test Report

FCC ID : QXO-AP310NB
Equipment : Wireless Access Point
Brand Name :  or Extreme Networks
Model Name : AP310i, AP310e
Applicant : Extreme Networks, Inc.
6480 Via Del Oro, San Jose, CA 95119, United States
Manufacturer : Extreme Networks, Inc.
6480 Via Del Oro, San Jose, CA 95119, United States
Standard : 47 CFR FCC Part 15.407

The product was received on Oct. 18, 2019, and testing was started from Nov. 01, 2019 and completed on Oct. 22, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua 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 test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



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History of this test report

TEL : 886-3-3273456
FAX : 886-3-3270973
Report Template No.: HE1-D1 Ver4.2
FCC ID: QXO-AP310NB

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	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.407(a)	Emission Bandwidth	PASS	-
3.3	15.407(a)	Maximum Conducted Output Power	PASS	-
3.4	15.407(a)	Peak Power Spectral Density	PASS	-
3.5	15.407(b)	Unwanted Emissions	PASS	-

Note 1: From Sproton Project No.: FR992608AN.

Note 2: This is a variant report by removing the BT/Thread module. AC Conduction and Unwanted Emission below 1GHz was verified.

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:
None

Reviewed by: Sam Tsai

Report Producer: Debby Hung

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), ax(HEW 20)	5180-5240	36-48 [4]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40), ax(HEW 40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80), ax(HEW 80)	5210	42 [1]
5725-5850		5775	155 [1]

Non-Beamforming

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	1TX
5.725-5.85GHz	802.11a	20	1TX
5.15-5.25GHz	802.11ac VHT20	20	1TX
5.725-5.85GHz	802.11ac VHT20	20	1TX
5.15-5.25GHz	802.11ac VHT40	40	1TX
5.725-5.85GHz	802.11ac VHT40	40	1TX
5.15-5.25GHz	802.11ac VHT80	80	1TX
5.725-5.85GHz	802.11ac VHT80	80	1TX
5.15-5.25GHz	802.11ax HEW20	20	1TX
5.725-5.85GHz	802.11ax HEW20	20	1TX
5.15-5.25GHz	802.11ax HEW40	40	1TX
5.725-5.85GHz	802.11ax HEW40	40	1TX
5.15-5.25GHz	802.11ax HEW80	80	1TX
5.725-5.85GHz	802.11ax HEW80	80	1TX
5.15-5.25GHz	802.11a	20	2TX
5.725-5.85GHz	802.11a	20	2TX
5.15-5.25GHz	802.11ac VHT20	20	2TX
5.725-5.85GHz	802.11ac VHT20	20	2TX
5.15-5.25GHz	802.11ac VHT40	40	2TX
5.725-5.85GHz	802.11ac VHT40	40	2TX
5.15-5.25GHz	802.11ac VHT80	80	2TX

Band	Mode	BWch (MHz)	Nant
5.725-5.85GHz	802.11ac VHT80	80	2TX
5.15-5.25GHz	802.11ax HEW20	20	2TX
5.725-5.85GHz	802.11ax HEW20	20	2TX
5.15-5.25GHz	802.11ax HEW40	40	2TX
5.725-5.85GHz	802.11ax HEW40	40	2TX
5.15-5.25GHz	802.11ax HEW80	80	2TX
5.725-5.85GHz	802.11ax HEW80	80	2TX

Beamforming

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11ac VHT20-BF	20	2TX
5.725-5.85GHz	802.11ac VHT20-BF	20	2TX
5.15-5.25GHz	802.11ac VHT40-BF	40	2TX
5.725-5.85GHz	802.11ac VHT40-BF	40	2TX
5.15-5.25GHz	802.11ac VHT80-BF	80	2TX
5.725-5.85GHz	802.11ac VHT80-BF	80	2TX
5.15-5.25GHz	802.11ax HEW20-BF	20	2TX
5.725-5.85GHz	802.11ax HEW20-BF	20	2TX
5.15-5.25GHz	802.11ax HEW40-BF	40	2TX
5.725-5.85GHz	802.11ax HEW40-BF	40	2TX
5.15-5.25GHz	802.11ax HEW80-BF	80	2TX
5.725-5.85GHz	802.11ax HEW80-BF	80	2TX

Note:

- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ HEW20, HEW40, HEW80 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ The resource unit of HEW 20, HEW 40, HEW 80 only support full loading.

1.1.2 Antenna Information

(AP310i) Internal Antenna

Ant.	Brand	Model Number (P/N)	Antenna Type	Connector	Antenna Gain (dBi)		Remark
					2.4GHz	5GHz	
1	SENAO	5718A0485300	PIFA	IPEX	4.5	5.17	Radio 1
2	SENAO	5718A0487300	PIFA	IPEX	4.53	5.07	Radio 1
3	SENAO	5718A0486300	PIFA	IPEX	-	4.81	Radio 2
4	SENAO	5718A0488300	PIFA	IPEX	-	4.75	Radio 2

(AP310e) External Antenna

Group	Brand	Model Number (P/N)	Antenna Type	Connector	Antenna Gain (dBi)	
					2.4GHz	5GHz
1	Extreme	ML-2452-APA2-01	Omni	Reverse SMA	3.17	4.85
2	Extreme	ML-2452-HPA5-036	Omni	Reverse SMA	3.9	5.7
3	Extreme	ML-2452-HPAG4A6-01	Omni	N-type	4	7.3
4	Extreme	ML-2452-PTA4M4-036	Omni	Reverse SMA	5	6.6
5	Extreme	ML-2452-HPAG5A8-01	Omni	N-type	5	8
6	Extreme	30724 WS-AO-DQ04360N	Omni	N-type	5.5	6
7	Extreme	AI-DQ04360S	Omni	Reverse SMA	5.5	6
8	Extreme	ML-2452-PNA5-01R	Panel	N-type	4.5	5
9	Extreme	ML-2452-SEC6M4-036, WS-AI-DQ05120 (30702)	Panel	Reverse SMA	6.92	7.23
10	Extreme	30705 WS-AI-DE07025	Panel	Reverse SMA	7.5	6.5
11	Extreme	ML-2452-PNA7-01R	Panel	N-type	7.8	10.7
12	Extreme	30707 WS-AI-DE10055	Panel	Reverse SMA	10.5	7.5
13	Extreme	ML-2452-APA2-02	Omni	Reverse SMA	3.17	4.85

Note 1: Group 5, 11,12 were measured during the test for WLAN 2.4G Mode.

Note 2: Group 5,11 were measured during the test for WLAN 5G Mode.

Note 3: The External antenna mentioned above will not be sold with the EUT in the market.

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax mode (1TX/1RX)

Only port 1 can be used as transmitting/receiving antenna.

For IEEE 802.11 b/g/n/VHT/ax mode (2TX/2RX)

Port 1 and port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax mode (1TX/1RX)

Only port 1 can be used as transmitting/receiving antenna.

For IEEE 802.11 a/n/ac/ax mode (2TX/2RX)

Port 1 and port 2 could transmit/receive simultaneously.

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From PoE		
EUT Function	☐ Outdoor AP	☒ Indoor AP	
	☐ Fixed P2P AP	☐ Outdoor/Indoor Client	
Beamforming Function	☒ With beamforming	☐ Without beamforming	
Type of EUT			
☒	Stand-alone		
☐	Combined (EUT where the radio part is fully integrated within another device)		
	Combined Equipment - Brand Name / Model No.: ...		
☐	Plug-in radio (EUT intended for a variety of host systems)		
	Host System - Brand Name / Model No.: ...		
☐	Other: ...		

1.1.4 Table for Multiple Listing

Sample Number	Model Name	Description
1	AP310i (Internal SKU)	The "i" in AP310i indicates that it comes with internal antennas and the "e" in AP310e indicates that the access point comes with external antenna connectors.
2	AP310e (External SKU)	

1.1.5 Mode Test Duty Cycle

Non-Beamforming

Sample 1_1T1S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a_Nss1,(6Mbps)_1TX	0.952	0.21	2.067m	1k
802.11ac VHT20_Nss1,(MCS0)_1TX	0.986	0.06	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT40_Nss1,(MCS0)_1TX	0.973	0.12	955.938u	3k
802.11ac VHT80_Nss1,(MCS0)_1TX	0.945	0.25	463.75u	3k
802.11ax HEW20_Nss1,(MCS0)_1TX	0.98	0.09	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ax HEW40_Nss1,(MCS0)_1TX	0.964	0.16	774.375u	3k
802.11ax HEW80_Nss1,(MCS0)_1TX	0.931	0.31	404.688u	3k

Sample 1_2T2S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a_Nss1,(6Mbps)_2TX	0.95	0.22	2.066m	1k
802.11ac VHT20_Nss2,(MCS0)_2TX	0.973	0.12	990.625u	3k
802.11ac VHT40_Nss2,(MCS0)_2TX	0.947	0.24	501.563u	3k
802.11ac VHT80_Nss2,(MCS0)_2TX	0.903	0.44	257.813u	10k
802.11ax HEW20_Nss2,(MCS0)_2TX	0.964	0.16	781.25u	3k
802.11ax HEW40_Nss2,(MCS0)_2TX	0.932	0.31	423.438u	3k
802.11ax HEW80_Nss2,(MCS0)_2TX	0.892	0.5	242.187u	10k

Sample 2_1T1S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a_Nss1,(6Mbps)_1TX	0.951	0.22	2.066m	1k
802.11ac VHT20_Nss1,(MCS0)_1TX	0.986	0.06	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ac VHT40_Nss1,(MCS0)_1TX	0.971	0.13	954.688u	3k
802.11ac VHT80_Nss1,(MCS0)_1TX	0.944	0.25	462.5u	3k
802.11ax HEW20_Nss1,(MCS0)_1TX	0.98	0.09	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ax HEW40_Nss1,(MCS0)_1TX	0.963	0.16	775u	3k
802.11ax HEW80_Nss1,(MCS0)_1TX	0.929	0.32	403.125u	3k

Sample 2_2T2S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11a_Nss1,(6Mbps)_2TX	0.95	0.22	2.066m	1k
802.11ac VHT20_Nss2,(MCS0)_2TX	0.973	0.12	990.625u	3k
802.11ac VHT40_Nss2,(MCS0)_2TX	0.947	0.24	501.563u	3k
802.11ac VHT80_Nss2,(MCS0)_2TX	0.903	0.44	257.813u	10k
802.11ax HEW20_Nss2,(MCS0)_2TX	0.964	0.16	781.25u	3k
802.11ax HEW40_Nss2,(MCS0)_2TX	0.932	0.31	423.438u	3k
802.11ax HEW80_Nss2,(MCS0)_2TX	0.892	0.5	242.187u	10k

**Beamforming****Sample 1_Radio 1**

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	0.902	0.45	1.95m	1k
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	0.906	0.43	2.798m	1k
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	0.915	0.39	3.43m	300
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	0.879	0.56	1.503m	1k
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	0.882	0.55	2.223m	1k
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	0.917	0.38	3.844m	300

Sample 1_Radio 2

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	0.9	0.46	1.95m	1k
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	0.903	0.44	2.798m	1k
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	0.909	0.41	3.43m	300
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	0.869	0.61	1.503m	1k
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	0.88	0.56	2.223m	1k
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	0.918	0.37	3.844m	300

Sample 2_Radio 1

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	0.899	0.46	1.95m	1k
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	0.903	0.44	2.798m	1k
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	0.913	0.4	3.43m	300
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	0.872	0.59	1.503m	1k
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	0.884	0.54	2.223m	1k
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	0.911	0.4	3.844m	300

Sample 2_Radio 2

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	0.896	0.48	1.95m	1k
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	0.899	0.46	2.798m	1k
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	0.917	0.38	3.43m	300
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	0.877	0.57	1.503m	1k
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	0.882	0.55	2.223m	1k
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	0.913	0.4	3.844m	300

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

1.2 Testing Applied 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
- ♦ KDB 789033 D02 v02r01

The following reference test guidance is not within the scope of accreditation of TAF:

- ♦ KDB 662911 D01 v02r01
- ♦ KDB 414788 D01 v01r01

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward	20.3~23.1°C/55.6~67.2%	26/Dec/2019~27/Dec/2019
AC Conduction	CO04-HY	Billy	21.1~21.4°C/60~62%	22/Oct/2021
RF Conducted	TH01-HY	Alan	23.1~25°C/61~67%	01/Nov/2019~02/Jan/2020
Radiated	03CH02-HY	Dexter	22.3~24.6°C/52~56%	06/Nov/2019~26/Dec/2019
Radiated	03CH03-HY	Terry	24.3~25.8°C/49~52%	06/Nov/2019~26/Dec/2019
Radiated below 1GHz	03CH02-HY	Jack	21.5~24.3°C/51~55%	21/Oct/2021
☒ Wen 33 rd .St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33 rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
	TEL: 886-3-318-0787		FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH09-HY	Daniel	23.2~24.8°C/51~58%	06/Nov/2019~26/Dec/2019

Laboratory number TAF 3785 is a spin-off from the original Laboratory number TAF 1190.

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
Conducted Emission (150kHz ~ 30MHz)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

AC Conducted Emissions and Radiated Emissions below 1GHz

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
TnomVnom	Tnom	20°C
	Vnom	120V

2.2 Test Channel Mode

Test Software Version	accessMTool_REL_3_1_0_1
-----------------------	-------------------------

Non-Beamforming

Sample 1_Radio 1_1T1S

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	20.5
5200MHz	23.5
5240MHz	21.25
5745MHz	23.75
5785MHz	21.25
5825MHz	21.25
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	19.25
5200MHz	22.75
5240MHz	21
5745MHz	23.75
5785MHz	21.5
5825MHz	22.25
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	17.5
5230MHz	21
5755MHz	23.25
5795MHz	24
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	17
5775MHz	21.25
802.11ax HEW20_Nss1,(MCS0)_1TX	-



Mode	Power Setting
5180MHz	19.25
5200MHz	22.75
5240MHz	21
5745MHz	23.75
5785MHz	21.5
5825MHz	22.25
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	17.5
5230MHz	21
5755MHz	23.25
5795MHz	24
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	17
5775MHz	21.25

**Sample 1 Radio 1 2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	20
5200MHz	23.5
5240MHz	20
5745MHz	23.75
5785MHz	21
5825MHz	21.5
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	19
5200MHz	22.75
5240MHz	21.25
5745MHz	23.5
5785MHz	22
5825MHz	22.25
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	20.75
5755MHz	23
5795MHz	23.5
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	16.75
5775MHz	21.75
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	19
5200MHz	22.75
5240MHz	21.25
5745MHz	23.5
5785MHz	22
5825MHz	22.25
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	20.75
5755MHz	23
5795MHz	23.5



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	16.75
5775MHz	21.75

**Sample 1_Radio 2_1T1S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	21
5200MHz	24.25
5240MHz	22.5
5745MHz	25.25
5785MHz	30
5825MHz	30
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	20
5200MHz	23.25
5240MHz	22.5
5745MHz	24.75
5785MHz	30
5825MHz	25
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	17
5230MHz	22
5755MHz	24
5795MHz	24.5
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	16.75
5775MHz	21.75
802.11ax HEW20_Nss1,(MCS0)_1TX	-
5180MHz	20
5200MHz	23.25
5240MHz	22.5
5745MHz	24.75
5785MHz	30
5825MHz	25
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	17
5230MHz	22
5755MHz	24
5795MHz	24.5



Mode	Power Setting
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	16.75
5775MHz	21.75

**Sample 1_Radio 2_2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	20
5200MHz	23.5
5240MHz	22
5745MHz	23.75
5785MHz	30
5825MHz	25.25
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	18.75
5200MHz	22.5
5240MHz	21.75
5745MHz	23.75
5785MHz	30
5825MHz	30
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	21.75
5755MHz	23.75
5795MHz	24.75
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	17.25
5775MHz	22.5
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	18.75
5200MHz	22.5
5240MHz	21.75
5745MHz	23.75
5785MHz	30
5825MHz	30
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	21.75
5755MHz	23.75
5795MHz	24.75



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	17.25
5775MHz	22.5

**Sample 2 Radio 1 Omni_1T1S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	16.75
5200MHz	21.75
5240MHz	20.75
5745MHz	22.75
5785MHz	22.5
5825MHz	22.5
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	17.5
5200MHz	21.25
5240MHz	20.5
5745MHz	22
5785MHz	21.25
5825MHz	22.25
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	13.5
5230MHz	19.5
5755MHz	21.75
5795MHz	21.75
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	14
5775MHz	19.5
802.11ax HEW20_Nss1,(MCS0)_1TX	-
5180MHz	17.5
5200MHz	21.25
5240MHz	20.5
5745MHz	22
5785MHz	21.25
5825MHz	22.25
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	13.5
5230MHz	19.75
5755MHz	21.75
5795MHz	21.75



Mode	Power Setting
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	14
5775MHz	19.5

**Sample 2 Radio 1 Omni_2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	16.25
5200MHz	20.5
5240MHz	20.25
5745MHz	22.5
5785MHz	22.25
5825MHz	22.5
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	15.75
5200MHz	20
5240MHz	20
5745MHz	23.25
5785MHz	23.75
5825MHz	23.25
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	13.75
5230MHz	19.25
5755MHz	19.75
5795MHz	21.25
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	13
5775MHz	17.25
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	15.75
5200MHz	20
5240MHz	20
5745MHz	23.25
5785MHz	23.75
5825MHz	23.25
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	13.75
5230MHz	19.25
5755MHz	19.75
5795MHz	21.25



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	13
5775MHz	17.25

Sample 2_Radio 1_Panel 1_1T1S

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	17.25
5200MHz	21.5
5240MHz	20.25
5745MHz	22.25
5785MHz	22
5825MHz	23.75
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	16.75
5200MHz	20.75
5240MHz	20.25
5745MHz	23
5785MHz	24
5825MHz	23.5
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	13.5
5230MHz	19.25
5755MHz	21.75
5795MHz	22
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	13.75
5775MHz	18.75
802.11ax HEW20_Nss1,(MCS0)_1TX	-
5180MHz	16.75
5200MHz	20.75
5240MHz	20.25
5745MHz	23
5785MHz	24
5825MHz	23.5
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	13.5
5230MHz	19.5
5755MHz	21.75
5795MHz	22



Mode	Power Setting
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	13.75
5775MHz	18.75

**Sample 2 Radio 1 Panel 1 2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	16.25
5200MHz	20
5240MHz	20
5745MHz	22
5785MHz	21
5825MHz	21
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	15.5
5200MHz	19.75
5240MHz	20
5745MHz	22
5785MHz	22
5825MHz	22
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	13
5230MHz	18.75
5755MHz	20.25
5795MHz	21
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	12
5775MHz	15.75
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	15.5
5200MHz	19.75
5240MHz	20
5745MHz	22
5785MHz	22
5825MHz	22
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	13
5230MHz	18.75
5755MHz	20.25
5795MHz	21



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	12
5775MHz	15.75

**Sample 2_Radio 2_Omni_1T1S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	21
5200MHz	24
5240MHz	22.25
5745MHz	24.5
5785MHz	30
5825MHz	22.25
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	19.5
5200MHz	23
5240MHz	22
5745MHz	24.5
5785MHz	30
5825MHz	22.25
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	16
5230MHz	21.5
5755MHz	23
5795MHz	24.25
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	16.25
5775MHz	20.75
802.11ax HEW20_Nss1,(MCS0)_1TX	-
5180MHz	19.5
5200MHz	23
5240MHz	22
5745MHz	24.5
5785MHz	30
5825MHz	22.25
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	16
5230MHz	21.5
5755MHz	23
5795MHz	24.25



Mode	Power Setting
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	16.25
5775MHz	20.75

**Sample 2_Radio 2_Omni_2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	18.75
5200MHz	22.5
5240MHz	21
5745MHz	24
5785MHz	25.75
5825MHz	22
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	17.75
5200MHz	22
5240MHz	21
5745MHz	24.25
5785MHz	25
5825MHz	22
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	15.5
5230MHz	20.5
5755MHz	20.75
5795MHz	22.25
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	14
5775MHz	18
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	17.75
5200MHz	22
5240MHz	21
5745MHz	24.25
5785MHz	25
5825MHz	22
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	15.5
5230MHz	20.5
5755MHz	20.75
5795MHz	22.25



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	14
5775MHz	18

**Sample 2_Radio 2_Panel 1_1T1S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_1TX	-
5180MHz	18.75
5200MHz	23.75
5240MHz	22.25
5745MHz	24.5
5785MHz	24
5825MHz	24.25
802.11ac VHT20_Nss1,(MCS0)_1TX	-
5180MHz	18.75
5200MHz	23
5240MHz	22
5745MHz	24.5
5785MHz	24
5825MHz	24
802.11ac VHT40_Nss1,(MCS0)_1TX	-
5190MHz	15.5
5230MHz	21.75
5755MHz	23.5
5795MHz	24
802.11ac VHT80_Nss1,(MCS0)_1TX	-
5210MHz	15.25
5775MHz	20
802.11ax HEW20_Nss1,(MCS0)_1TX	-
5180MHz	18.75
5200MHz	23
5240MHz	22
5745MHz	24.5
5785MHz	24
5825MHz	24
802.11ax HEW40_Nss1,(MCS0)_1TX	-
5190MHz	15.5
5230MHz	21.75
5755MHz	23.5
5795MHz	24



Mode	Power Setting
802.11ax HEW80_Nss1,(MCS0)_1TX	-
5210MHz	15.25
5775MHz	20

**Sample 2_Radio 2_Panel 1_2T2S**

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	16.75
5200MHz	17.75
5240MHz	17.75
5745MHz	21.75
5785MHz	21.75
5825MHz	21.75
802.11ac VHT20_Nss2,(MCS0)_2TX	-
5180MHz	16.75
5200MHz	21.25
5240MHz	21.25
5745MHz	21.5
5785MHz	21.5
5825MHz	21.5
802.11ac VHT40_Nss2,(MCS0)_2TX	-
5190MHz	14
5230MHz	20.5
5755MHz	21
5795MHz	21.25
802.11ac VHT80_Nss2,(MCS0)_2TX	-
5210MHz	13.5
5775MHz	19.5
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	16.75
5200MHz	21.25
5240MHz	21.25
5745MHz	21.5
5785MHz	21.5
5825MHz	21.5
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	14
5230MHz	20.5
5755MHz	21
5795MHz	21.25



Mode	Power Setting
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	13.5
5775MHz	19.5

**Beamforming**

Test Software Version	Dos
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Sample 1_Radio 1_2T1S

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	19.75
5200MHz	23.5
5240MHz	20.75
5745MHz	21.25
5785MHz	25
5825MHz	25
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	17
5230MHz	20.25
5755MHz	22.25
5795MHz	23.75
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15.25
5775MHz	21
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	19.75
5200MHz	23.5
5240MHz	20.75
5745MHz	21.25
5785MHz	25
5825MHz	25
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	17
5230MHz	20.25
5755MHz	22.25
5795MHz	23.75
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15.25
5775MHz	21

**Sample 1 Radio 2 2T1S**

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	18.25
5200MHz	23
5240MHz	21.75
5745MHz	23.75
5785MHz	23.75
5825MHz	19.5
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	17
5230MHz	21
5755MHz	23
5795MHz	24.5
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	17
5775MHz	22.25
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	18.25
5200MHz	23
5240MHz	21.75
5745MHz	23.75
5785MHz	23.75
5825MHz	19.5
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	17
5230MHz	21
5755MHz	23
5795MHz	24.5
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	17
5775MHz	22.25

**Sample 2 Radio 1 Omni_2T1S**

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.5
5200MHz	19.75
5240MHz	20.75
5745MHz	21.25
5785MHz	21.25
5825MHz	21.25
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	14.25
5230MHz	18.75
5755MHz	20.75
5795MHz	21.25
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	13.25
5775MHz	17.75
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.5
5200MHz	19.75
5240MHz	20.75
5745MHz	21.25
5785MHz	21.25
5825MHz	21.25
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	14.25
5230MHz	18.75
5755MHz	20.75
5795MHz	21.25
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	13.25
5775MHz	17.75

**Sample 2 Radio 1 Panel 1 2T1S**

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.25
5200MHz	18.75
5240MHz	18.75
5745MHz	18.5
5785MHz	18.5
5825MHz	18.5
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	14
5230MHz	19
5755MHz	18.75
5795MHz	18.75
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	13.5
5775MHz	18
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.25
5200MHz	18.75
5240MHz	18.75
5745MHz	18.5
5785MHz	18.5
5825MHz	18.5
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	14
5230MHz	19
5755MHz	18.75
5795MHz	18.75
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	13.5
5775MHz	18

**Sample 2 Radio 2 Omni_2T1S**

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	17.5
5200MHz	22
5240MHz	21
5745MHz	21.75
5785MHz	21.75
5825MHz	21.75
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	20.25
5755MHz	21.75
5795MHz	21.75
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15.75
5775MHz	18.75
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	17.5
5200MHz	22
5240MHz	21
5745MHz	21.75
5785MHz	21.75
5825MHz	21.75
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	16.25
5230MHz	20.25
5755MHz	21.75
5795MHz	21.75
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15.75
5775MHz	18.75

**Sample 2 Radio 2 Panel 1 2T1S**

Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.75
5200MHz	19
5240MHz	19
5745MHz	19
5785MHz	19
5825MHz	19
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	15.5
5230MHz	19
5755MHz	19
5795MHz	19
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15
5775MHz	18
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	16.75
5200MHz	19
5240MHz	19
5745MHz	19
5785MHz	19
5825MHz	19
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	15.5
5230MHz	19
5755MHz	19
5795MHz	19
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	15
5775MHz	18

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	PoE mode (Non-Beamforming_Sample 1)
2	PoE mode (Non-Beamforming_Sample 2)
3	PoE mode (Beamforming_Sample 1)
4	PoE mode (Beamforming_Sample 2)

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

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
1	PoE Mode (Non-Beamforming_Sample 1_Radio 1_1T1S)
2	PoE Mode (Non-Beamforming_Sample 1_Radio 1_2T2S)
3	PoE Mode (Non-Beamforming_Sample 1_Radio 2_1T1S)
4	PoE Mode (Non-Beamforming_Sample 1_Radio 2_2T2S)
5	PoE Mode (Non-Beamforming_Sample 2_Radio 1_Omni_1T1S)
6	PoE Mode (Non-Beamforming_Sample 2_Radio 1_Omni_2T2S)
7	PoE Mode (Non-Beamforming_Sample 2_Radio 1_Panel 1_1T1S)
8	PoE Mode (Non-Beamforming_Sample 2_Radio 1_Panel 1_2T2S)
9	PoE Mode (Non-Beamforming_Sample 2_Radio 2_Omni_1T1S)
10	PoE Mode (Non-Beamforming_Sample 2_Radio 2_Omni_2T2S)
11	PoE Mode (Non-Beamforming_Sample 2_Radio 2_Panel 1_1T1S)
12	PoE Mode (Non-Beamforming_Sample 2_Radio 2_Panel 1_2T2S)
13	PoE Mode (Beamforming_Sample 1_Radio 1_2T1S)
14	PoE Mode (Beamforming_Sample 1_Radio 2_2T1S)

15	PoE Mode (Beamforming_Sample 2_Radio 1_Omni_2T1S)		
16	PoE Mode (Beamforming_Sample 2_Radio 1_Panel 1_2T1S)		
17	PoE Mode (Beamforming_Sample 2_Radio 2_Omni_2T1S)		
18	PoE Mode (Beamforming_Sample 2_Radio 2_Panel 1_2T1S)		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V	V	V

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Radio 1 WLAN 2.4G+ Radio 2 WLAN 5G
2	Radio 1 WLAN 5G+ Radio 2 WLAN 5G
Refer to Sporton Test Report No.: FA992608-08 for Co-location RF Exposure Evaluation.	

2.4 Accessories

Accessories				
Mounting bracket	Brand Name	Extreme Networks	Model Name	3PRAAB003S3

Reminder: Regarding to more detail and other information, please refer to user manual.

2.5 Support Equipment

Support Equipment – AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	LAN Cable	Power Sync	CAT-6E-10	-
2	PoE	EnGenius	EPA5006GP	-
3	AC Power Cable	-	-	-
4	PoE for Beamforming	EnGenius	EPA5006GP	-
5	AC Power Cable	-	-	-
6	Notebook	DELL	PP13S	-
7	LAN Cable	Power Sync	CAT-6E-01	-
8	Adapter for NB	DELL	AA90PM111	-
9	AC Power Cable for NB	Power sync	PW-GPC180-3	-
10	Omni Antenna	Extreme	ML-2452-HPAG5A8-01	-
11	Panel1 Antenna	Extreme	ML-2452-PNA7-01R	-
12	Panel2 Antenna	Extreme	30707 WS-AI-DE10055	-
13	PoE	EnGenius	EPA5006GP	-

Note: Support equipment No.2,3,4,5,10,11,12,13 were provided by customer.

Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	PP13S	DOC
2	Adapter for NB	DELL	AA90PM111	DOC
3	Notebook	DELL	PP13S	DOC
4	Adapter for NB	DELL	AA90PM111	DOC
5	PoE	EnGenius	EPA5006GP	-

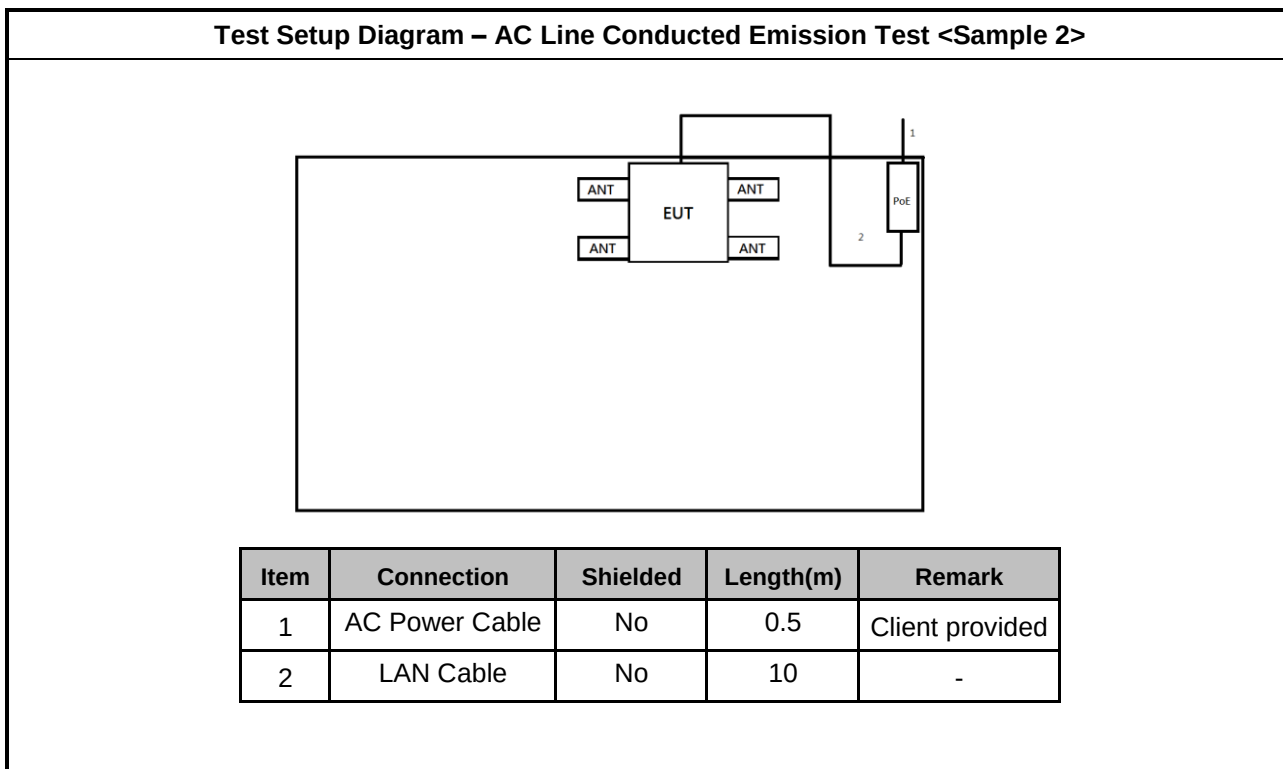
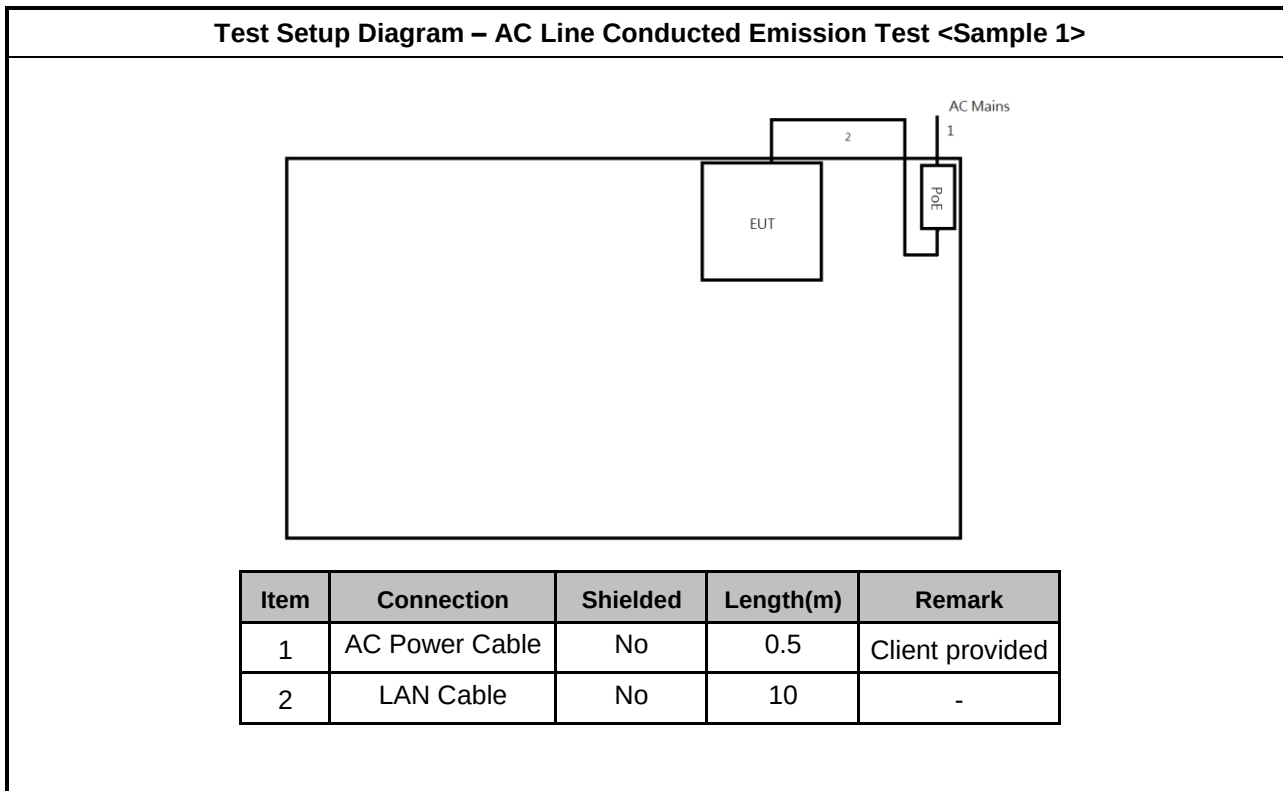
Note: Support equipment No.5 was provided by customer.

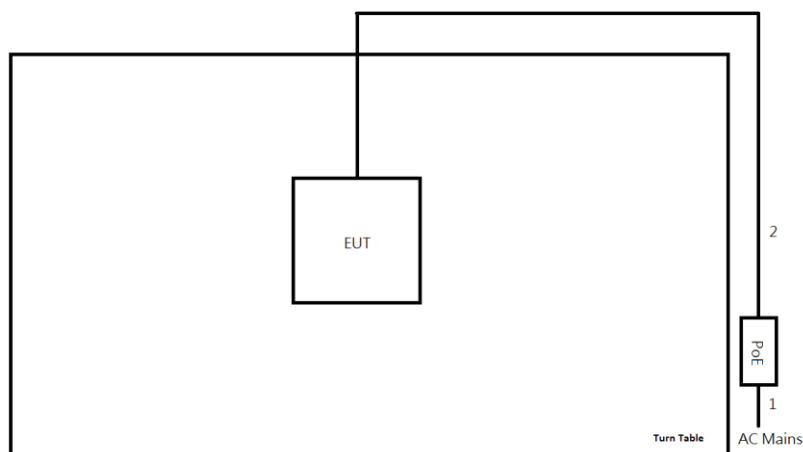


Support Equipment – Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	LAN Cable	Power Sync	CAT-6E-10	-
2	PoE	EnGenius	EPA5006GP	-
3	AC Power Cable	-	-	-
4	Notebook	DELL	M-S69	-
5	LAN Cable	Power Sync	CAT-6E-01	-
6	Adapter for Notebook	DELL	M-S69	-
7	Omni Antenna	Extreme	ML-2452-HPAG5A8-01	-
8	Panel1 Antenna	Extreme	ML-2452-PNA7-01R	-
9	Panel2 Antenna	Extreme	30707 WS-AI-DE10055	-

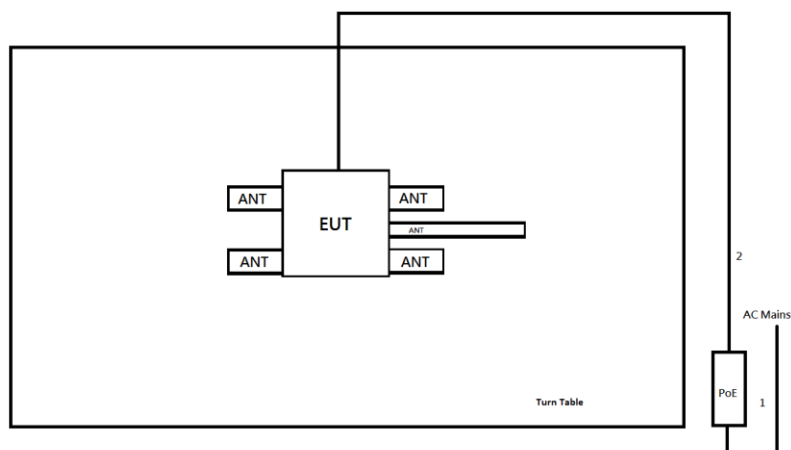
Note: Support equipment No.2,3,7,8,9 were provided by customer.

2.6 Test Setup Diagram

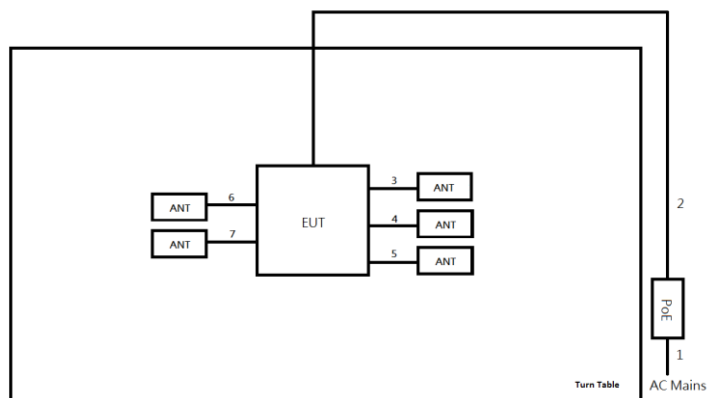


Test Setup Diagram - Radiated Test (Sample 1)


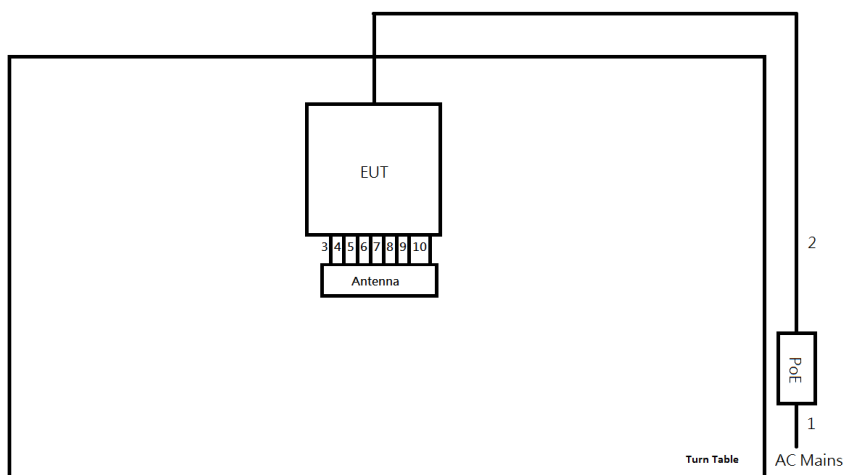
Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	0.5	Client provided
2	LAN Cable	No	10	-

Test Setup Diagram - Radiated Test (Sample 2_Omni)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	0.5	Client provided
2	LAN Cable	No	10	-

Test Setup Diagram - Radiated Test (Sample 2_Panel 1)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	0.5	Client provided
2	LAN Cable	No	10	-
3	Antenna Cable	No	0.3	-
4	Antenna Cable	No	0.3	-
5	Antenna Cable	No	0.3	-
6	Antenna Cable	No	0.3	-
7	Antenna Cable	No	0.3	-

Test Setup Diagram - Radiated Test (Sample 2_Panel 2)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	0.5	Client provided
2	LAN Cable	No	10	-
3	Antenna Cable	No	1.6	-
4	Antenna Cable	No	1.6	-
5	Antenna Cable	No	1.6	-
6	Antenna Cable	No	1.6	-
7	Antenna Cable	No	1.6	-
8	Antenna Cable	No	1.6	-
9	Antenna Cable	No	1.6	-
9	Antenna Cable	No	1.6	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line 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.		

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

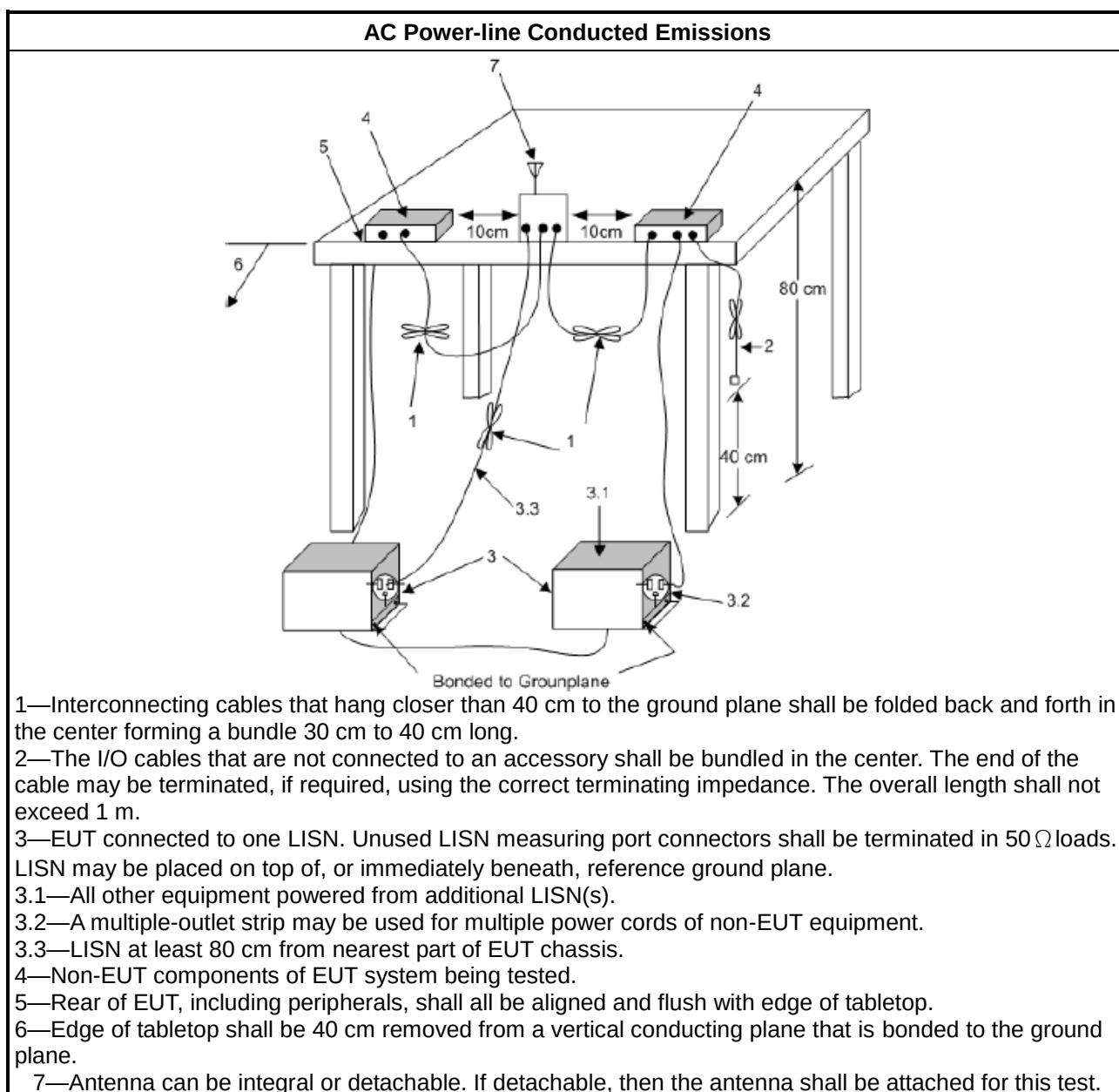
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup



3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 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, N/A
☐	For the 5.47-5.725 GHz band, N/A
☒	For the 5.725-5.85 GHz band, 6 dB emission bandwidth $\geq$ 500kHz.

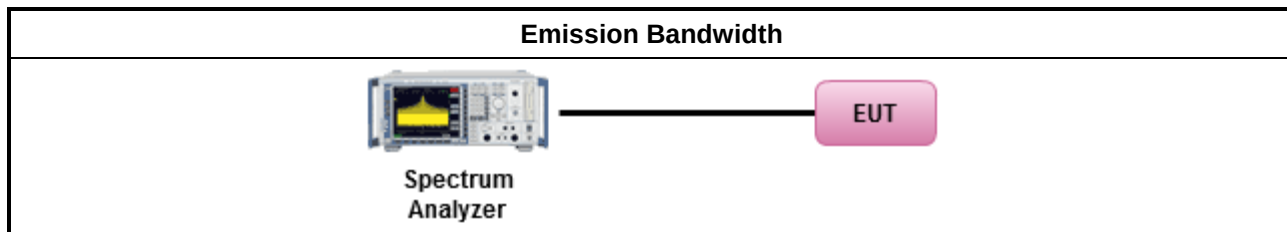
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as KDB 789033, clause C for EBW and clause D for OBW measurement.
☐	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
☐	Refer as IC RSS-Gen, clause 6.7 for bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 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.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

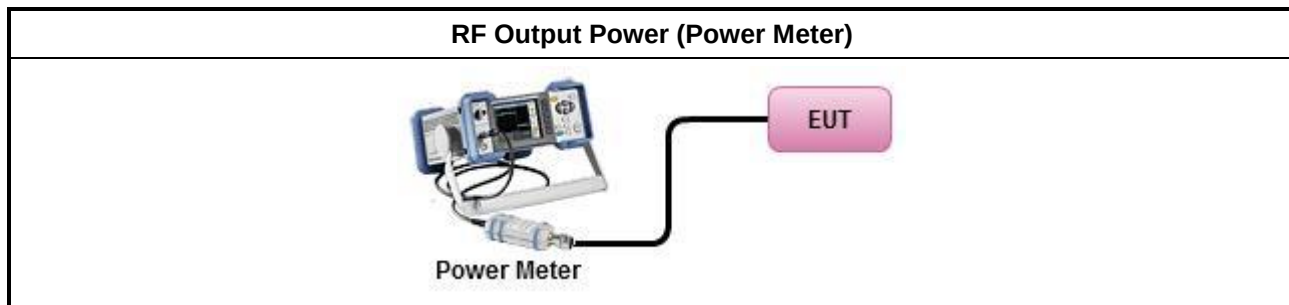
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Maximum Conducted Output Power	
	Duty cycle $\geq 98\%$
☐	Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).
	Duty cycle $< 98\%$
☐	Refer as 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 KDB 789033, clause E Method PM (using an RF average power meter).
For conducted measurement.	
	If the EUT supports multiple transmit chains using options given below: Refer as 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]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Peak Power Spectral Density

3.4.1 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.
PPSD = peak power spectral density that the 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.	

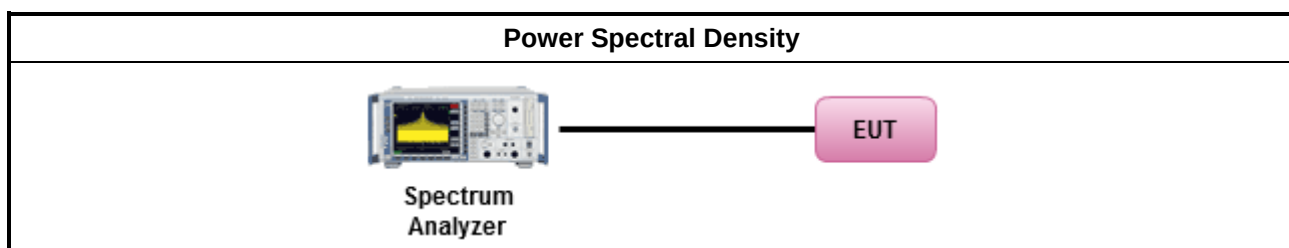
3.4.2 Measuring Instruments

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

3.4.3 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 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%	
☐ Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).	
Duty cycle < 98%	
☒ Refer as 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:	
☐ Measure and sum the spectra across the outputs. Refer as 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.	
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]) $EIRP_{total} = PPSD_{total} + DG$	

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

3.5 Unwanted Emissions

3.5.1 Transmitter Radiated 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	5.650-5700 GHz: e.i.r.p. -27 ~ 10 dBm [68.2 ~ 105.2 dBuV/m@3m] 5.700-5720 GHz: e.i.r.p. 10 ~ 15.6 dBm [105.2 ~ 110.8 dBuV/m@3m] 5.720-5725 GHz: e.i.r.p. 15.6 ~ 27 dBm [110.8 ~ 122.2 dBuV/m@3m] 5.850-5.855 GHz: e.i.r.p. 27 ~ 15.6 dBm [122.2 ~ 110.8 dBuV/m@3m] 5.855-5.875 GHz: e.i.r.p. 15.6 ~ 10 dBm [110.8 ~ 105.2 dBuV/m@3m] 5.875-5.925 GHz: e.i.r.p. 10 ~ -27 dBm [105.2 ~ 68.2dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
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).	

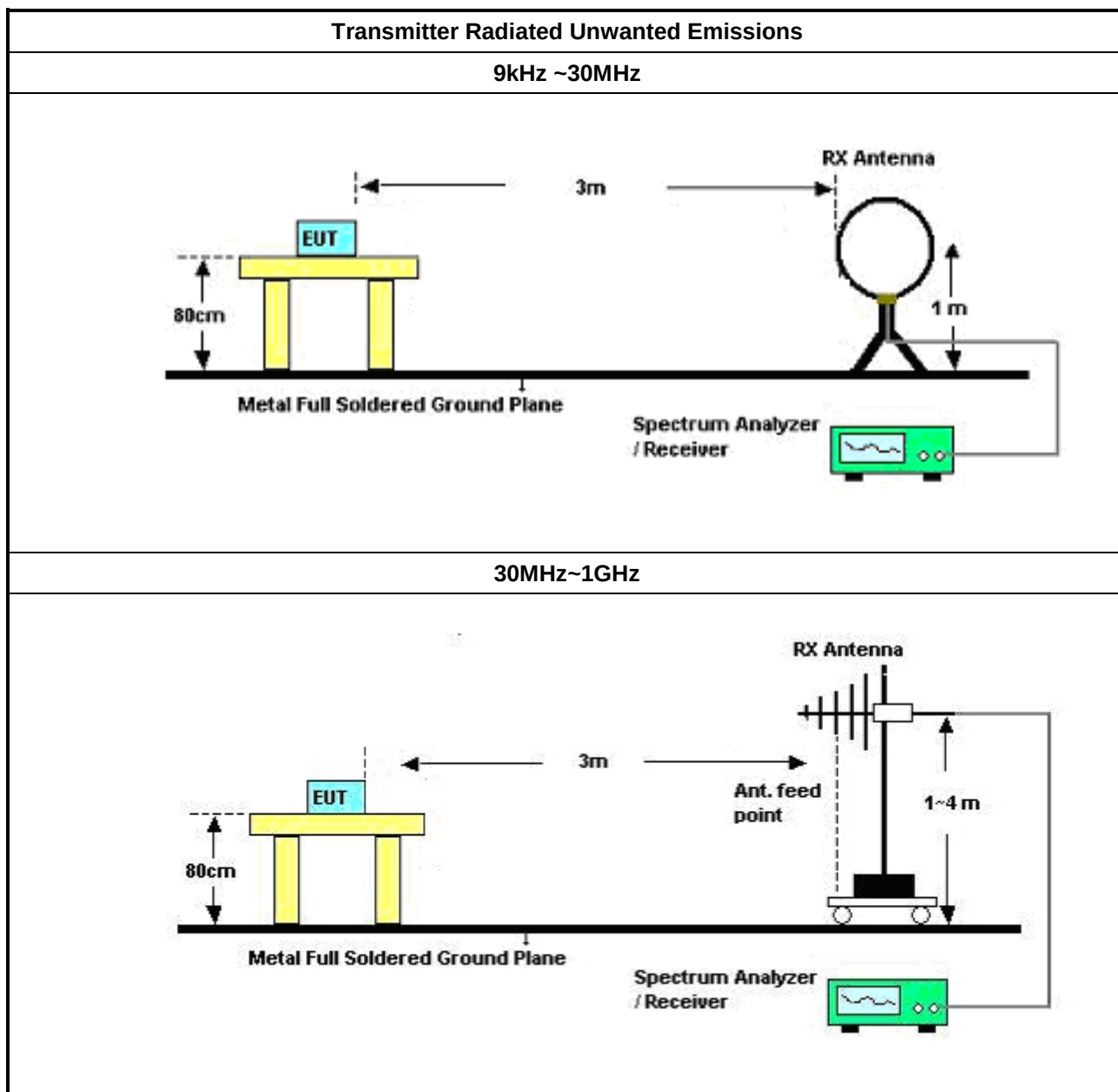
3.5.2 Measuring Instruments

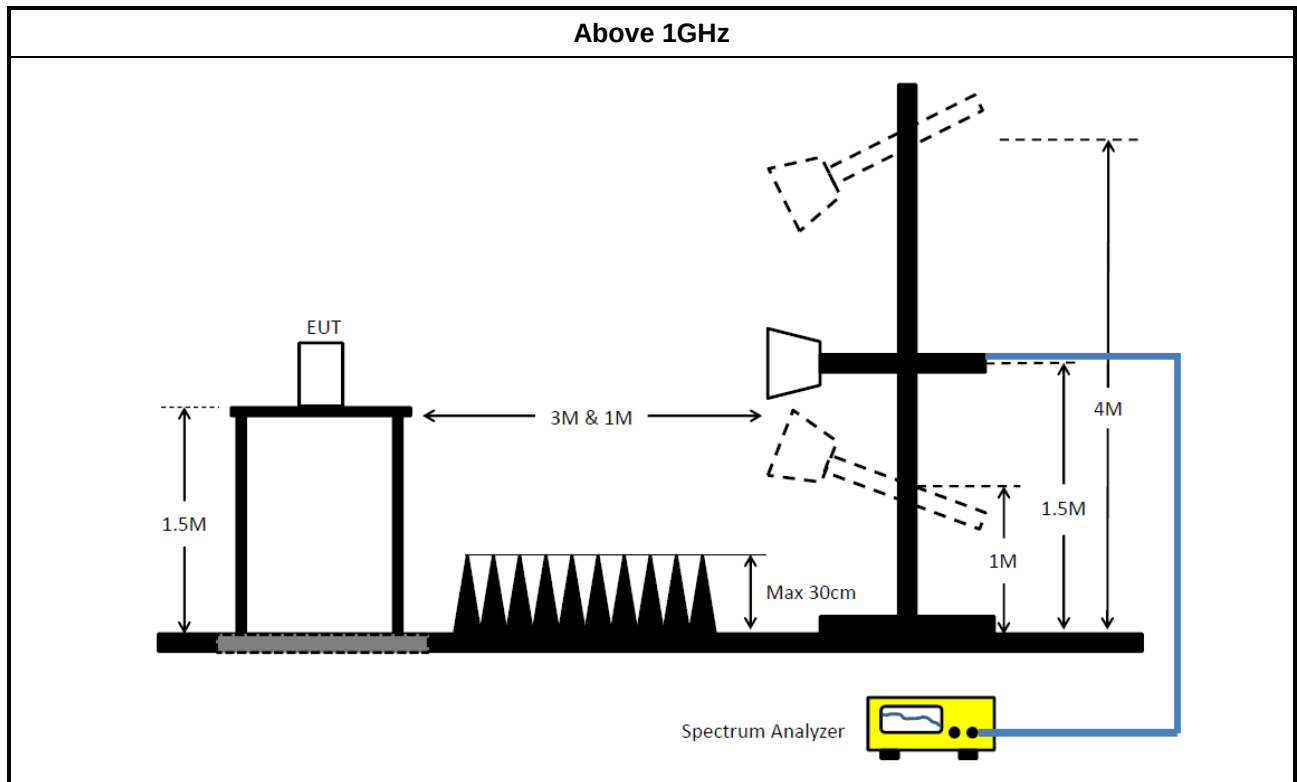
Refer a test equipment and calibration data table in this test report.

3.5.3 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 KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
	Refer as KDB 789033, clause G)1) for unwanted emissions into restricted bands.
	☒ Refer as KDB 789033, G)6) Method VB (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW.
	☒ Refer as KDB 789033, clause G)5) (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.	

3.5.4 Test Setup





3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	21/May/2021	20/May/2022
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	11/Nov/2020	10/Nov/2021
RF Cable 5m	TITAN	TITAN	CO04-cable-01	0.1MHz~200MHz	03/Mar/2021	02/Mar/2022
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	15/Sep/2021	14/Sep/2022

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	05/Nov/2019	04/Nov/2020
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	23/Sep/2019	22/Sep/2020
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	24/Sep/2019	23/Sep/2020

NCR : Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz~18G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz~18G	11/Jan/2019	10/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable - 05	30MHz~1G	11/Jan/2019	10/Jan/2020

Instrument for Radiated Test (03CH02-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz ~ 18GHz 3m	29/Aug/2019	28/Aug/2020
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz ~ 26.5GHz	16/Oct/2019	15/Oct/2020
Spectrum Analyzer	Rohde & Schwarz	FSP40	100593	9KHz - 40GHz	27/Dec/2018	26/Dec/2019
RF Cable-high 6m	SUHNER	SUCOFLEX1 04	SN805193	1GHz~40GHz	09/Apr/2019	08/Apr/2020
RF Cable-high 7m	SUHNER	SUCOFLEX1 04	SN805192	1GHz~40GHz	09/Apr/2019	08/Apr/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz ~ 40GHz	22/Mar/2019	21/Mar/2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	05/Aug/2019	04/Aug/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 01543	1GHz ~ 18GHz	03/Jun/2019	02/Jun/2020

Instrument for Radiated Test (03CH09-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz	20/Mar/2019	19/Mar/2020
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	04/Sep/2019	03/Sep/2020
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	07/Aug/2019	06/Aug/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	22/May/2019	21/May/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz ~ 40GHz	22/Mar/2019	21/Mar/2020
Preamplifier	MITEQ	TTA1840-35-H G	1864481	18GHz~40GHz	05/Aug/2019	04/Aug/2020
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	324530/4+17173/4	1GHz~40GHz	03/Jul/2019	02/Jul/2020
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	556626/4+552627	1GHz~40GHz	07/Jul/2019	06/Jul/2020

Instrument for Radiated Test (03CH03-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	30/Aug/2019	29/Aug/2020
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Aug/2019	29/Aug/2020
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	22/Apr/2019	21/Apr/2020
EMC Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	28/May/2019	27/May/2020
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz ~ 1GHz	08/Sep/2019	07/Sep/2020
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	09/Sep/2019	08/Sep/2020
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	15/Aug/2019	14/Aug/2020
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	22/Mar/2019	21/Mar/2020
RF CABLE 6m	HUBER+SUHNER	SUOFLEX 104	SN 805801/4	1GHz ~ 40GHz	21/Mar/2019	20/Mar/2020
RF CABLE 5m	HUBER+SUHNER	SUOFLEX 104	SN 804300/4	1GHz ~ 40GHz	17/Jun/2019	16/Jun/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz ~ 40GHz	22/Mar/2019	21/Mar/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	09/Mar/2019	08/Mar/2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	05/Aug/2019	04/Aug/2020
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	15/Mar/2019	14/Mar/2020

Instrument for Radiated Test (03CH02-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	02/Aug/2021	01/Aug/2022
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	12/Mar/2021	11/Mar/2022
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	29/Jun/2021	28/Jun/2022
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	04/Sep/2021	03/Sep/2022
RF Cable	MVE	400LL	MVE-1-0802	9kHz~30MHz	05/May/2021	04/May/2022
RF Cable	MVE	400LL	MVE-1-0802	30MHz~1GHz	05/May/2021	04/May/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022



**Conducted Emissions at Powerline
_Non Beamforming_Sample 1**

Appendix A.1

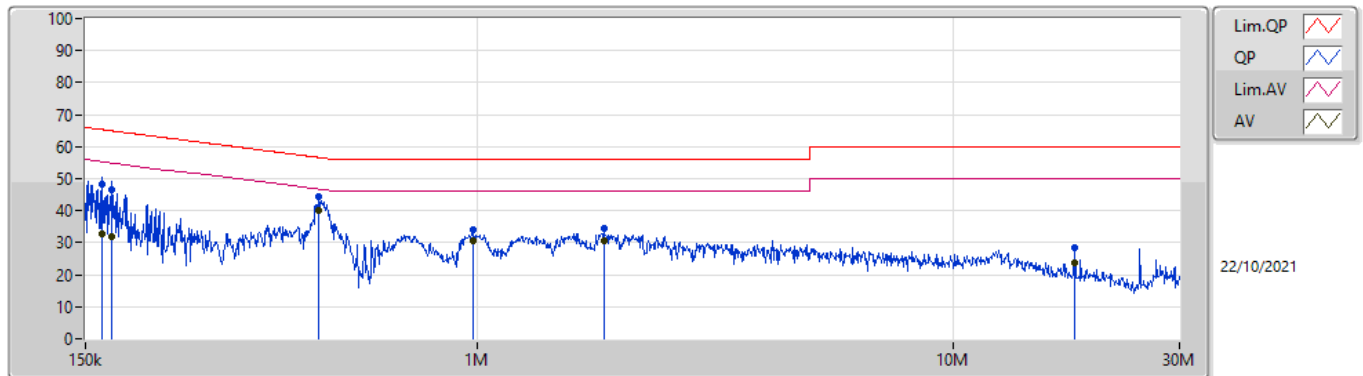
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	467.95k	39.99	46.55	-6.56	Neutral

Mode config

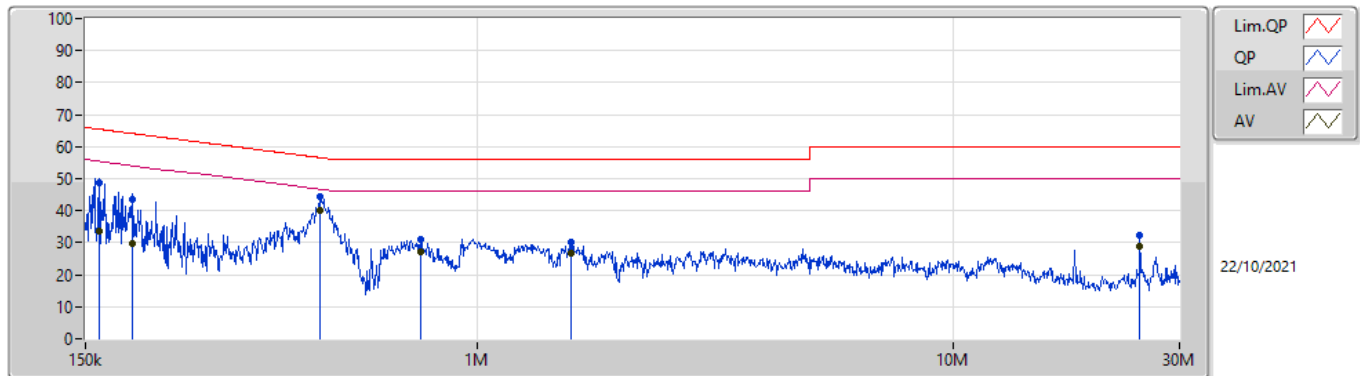
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	162.467k	48.20	65.33	-17.13	Line	-
Mode 1	Pass	AV	162.467k	32.95	55.33	-22.38	Line	-
Mode 1	Pass	QP	170.439k	46.36	64.93	-18.57	Line	-
Mode 1	Pass	AV	170.439k	31.93	54.93	-23.00	Line	-
Mode 1	Pass	QP	464.229k	44.39	56.61	-12.22	Line	-
Mode 1	Pass	AV	464.229k	39.94	46.61	-6.67	Line	-
Mode 1	Pass	QP	983.264k	34.06	56.00	-21.94	Line	-
Mode 1	Pass	AV	983.264k	30.75	46.00	-15.25	Line	-
Mode 1	Pass	QP	1.848M	34.63	56.00	-21.37	Line	-
Mode 1	Pass	AV	1.848M	30.61	46.00	-15.39	Line	-
Mode 1	Pass	QP	18.053M	28.58	60.00	-31.42	Line	-
Mode 1	Pass	AV	18.053M	23.83	50.00	-26.17	Line	-
Mode 1	Pass	QP	159.893k	48.79	65.46	-16.67	Neutral	-
Mode 1	Pass	AV	159.893k	33.72	55.46	-21.74	Neutral	-
Mode 1	Pass	QP	188.327k	43.63	64.11	-20.48	Neutral	-
Mode 1	Pass	AV	188.327k	29.65	54.11	-24.46	Neutral	-
Mode 1	Pass	QP	467.95k	44.39	56.55	-12.16	Neutral	-
Mode 1	Pass	AV	467.95k	39.99	46.55	-6.56	Neutral	-
Mode 1	Pass	QP	758.54k	30.96	56.00	-25.04	Neutral	-
Mode 1	Pass	AV	758.54k	27.12	46.00	-18.88	Neutral	-
Mode 1	Pass	QP	1.575M	30.07	56.00	-25.93	Neutral	-
Mode 1	Pass	AV	1.575M	26.58	46.00	-19.42	Neutral	-
Mode 1	Pass	QP	24.746M	32.30	60.00	-27.70	Neutral	-
Mode 1	Pass	AV	24.746M	29.08	50.00	-20.92	Neutral	-

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	162.467k	48.20	65.33	-17.13	19.62	Line	-	28.58	9.69	0.04	9.89			
AV	162.467k	32.95	55.33	-22.38	19.62	Line	-	13.33	9.69	0.04	9.89			
QP	170.439k	46.36	64.93	-18.57	19.62	Line	-	26.74	9.69	0.04	9.89			
AV	170.439k	31.93	54.93	-23.00	19.62	Line	-	12.31	9.69	0.04	9.89			
QP	464.229k	44.39	56.61	-12.22	19.62	Line	-	24.77	9.67	0.06	9.89			
AV	464.229k	39.94	46.61	-6.67	19.62	Line	-	20.32	9.67	0.06	9.89			
QP	983.264k	34.06	56.00	-21.94	19.64	Line	-	14.42	9.67	0.08	9.89			
AV	983.264k	30.75	46.00	-15.25	19.64	Line	-	11.11	9.67	0.08	9.89			
QP	1.848M	34.63	56.00	-21.37	19.66	Line	-	14.97	9.68	0.10	9.88			
AV	1.848M	30.61	46.00	-15.39	19.66	Line	-	10.95	9.68	0.10	9.88			
QP	18.053M	28.58	60.00	-31.42	19.85	Line	-	8.73	9.68	0.28	9.89			
AV	18.053M	23.83	50.00	-26.17	19.85	Line	-	3.98	9.68	0.28	9.89			

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	159.893k	48.79	65.46	-16.67	19.62	Neutral	-	29.17	9.69	0.04	9.89			
AV	159.893k	33.72	55.46	-21.74	19.62	Neutral	-	14.10	9.69	0.04	9.89			
QP	188.327k	43.63	64.11	-20.48	19.61	Neutral	-	24.02	9.68	0.04	9.89			
AV	188.327k	29.65	54.11	-24.46	19.61	Neutral	-	10.04	9.68	0.04	9.89			
QP	467.95k	44.39	56.55	-12.16	19.62	Neutral	-	24.77	9.67	0.06	9.89			
AV	467.95k	39.99	46.55	-6.56	19.62	Neutral	-	20.37	9.67	0.06	9.89			
QP	758.54k	30.96	56.00	-25.04	19.63	Neutral	-	11.33	9.67	0.07	9.89			
AV	758.54k	27.12	46.00	-18.88	19.63	Neutral	-	7.49	9.67	0.07	9.89			
QP	1.575M	30.07	56.00	-25.93	19.65	Neutral	-	10.42	9.68	0.09	9.88			
AV	1.575M	26.58	46.00	-19.42	19.65	Neutral	-	6.93	9.68	0.09	9.88			
QP	24.746M	32.30	60.00	-27.70	19.93	Neutral	-	12.37	9.72	0.32	9.89			
AV	24.746M	29.08	50.00	-20.92	19.93	Neutral	-	9.15	9.72	0.32	9.89			



Conducted Emissions at Powerline _Non Beamforming_Sample 2

Appendix A.2

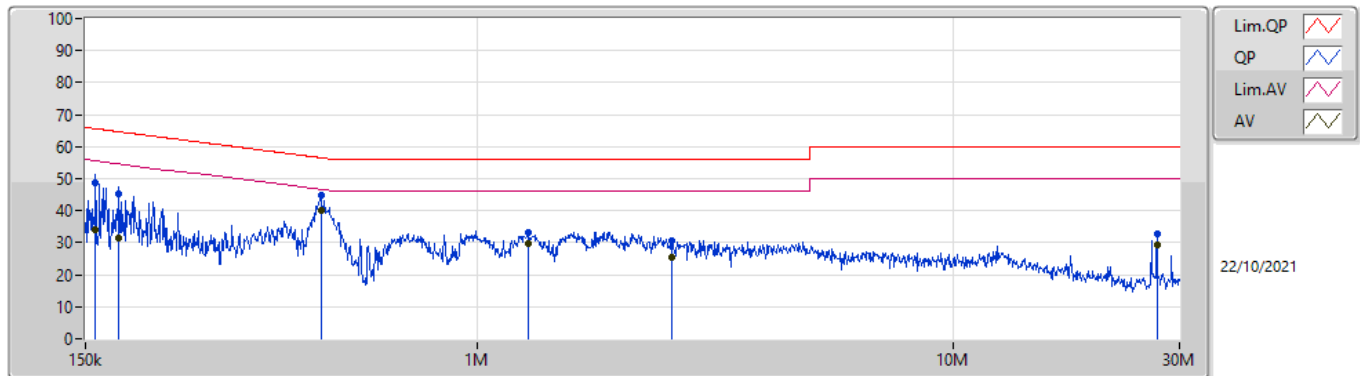
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	469.822k	39.98	46.52	-6.54	Line

Mode config

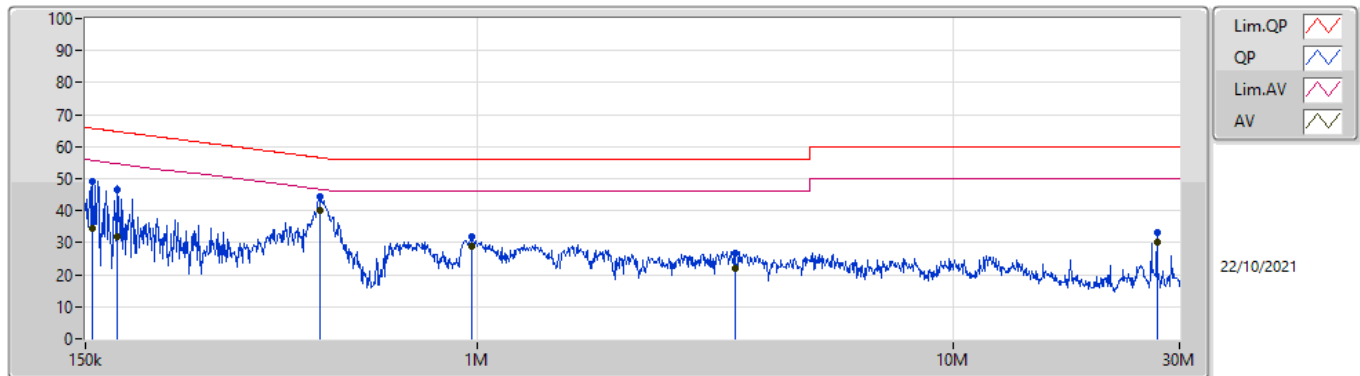
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	157.361k	48.60	65.60	-17.00	Line	-
Mode 1	Pass	AV	157.361k	34.24	55.60	-21.36	Line	-
Mode 1	Pass	QP	176.674k	45.29	64.64	-19.35	Line	-
Mode 1	Pass	AV	176.674k	31.62	54.64	-23.02	Line	-
Mode 1	Pass	QP	469.822k	44.88	56.52	-11.64	Line	-
Mode 1	Pass	AV	469.822k	39.98	46.52	-6.54	Line	-
Mode 1	Pass	QP	1.285M	33.11	56.00	-22.89	Line	-
Mode 1	Pass	AV	1.285M	29.59	46.00	-16.41	Line	-
Mode 1	Pass	QP	2.563M	30.55	56.00	-25.45	Line	-
Mode 1	Pass	AV	2.563M	25.23	46.00	-20.77	Line	-
Mode 1	Pass	QP	26.91M	32.84	60.00	-27.16	Line	-
Mode 1	Pass	AV	26.91M	29.39	50.00	-20.61	Line	-
Mode 1	Pass	QP	155.487k	49.27	65.69	-16.42	Neutral	-
Mode 1	Pass	AV	155.487k	34.31	55.69	-21.38	Neutral	-
Mode 1	Pass	QP	174.571k	46.39	64.74	-18.35	Neutral	-
Mode 1	Pass	AV	174.571k	31.77	54.74	-22.97	Neutral	-
Mode 1	Pass	QP	466.086k	44.36	56.59	-12.23	Neutral	-
Mode 1	Pass	AV	466.086k	40.04	46.59	-6.55	Neutral	-
Mode 1	Pass	QP	971.558k	31.98	56.00	-24.02	Neutral	-
Mode 1	Pass	AV	971.558k	28.73	46.00	-17.27	Neutral	-
Mode 1	Pass	QP	3.485M	26.87	56.00	-29.13	Neutral	-
Mode 1	Pass	AV	3.485M	21.78	46.00	-24.22	Neutral	-
Mode 1	Pass	QP	26.91M	33.04	60.00	-26.96	Neutral	-
Mode 1	Pass	AV	26.91M	30.34	50.00	-19.66	Neutral	-

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	157.361k	48.60	65.60	-17.00	19.62	Line	-	28.98	9.69	0.04	9.89			
AV	157.361k	34.24	55.60	-21.36	19.62	Line	-	14.62	9.69	0.04	9.89			
QP	176.674k	45.29	64.64	-19.35	19.61	Line	-	25.68	9.68	0.04	9.89			
AV	176.674k	31.62	54.64	-23.02	19.61	Line	-	12.01	9.68	0.04	9.89			
QP	469.822k	44.88	56.52	-11.64	19.62	Line	-	25.26	9.67	0.06	9.89			
AV	469.822k	39.98	46.52	-6.54	19.62	Line	-	20.36	9.67	0.06	9.89			
QP	1.285M	33.11	56.00	-22.89	19.65	Line	-	13.46	9.67	0.09	9.89			
AV	1.285M	29.59	46.00	-16.41	19.65	Line	-	9.94	9.67	0.09	9.89			
QP	2.563M	30.55	56.00	-25.45	19.67	Line	-	10.88	9.68	0.11	9.88			
AV	2.563M	25.23	46.00	-20.77	19.67	Line	-	5.56	9.68	0.11	9.88			
QP	26.91M	32.84	60.00	-27.16	19.79	Line	-	13.05	9.57	0.33	9.89			
AV	26.91M	29.39	50.00	-20.61	19.79	Line	-	9.60	9.57	0.33	9.89			

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	155.487k	49.27	65.69	-16.42	19.62	Neutral	-	29.65	9.69	0.04	9.89			
AV	155.487k	34.31	55.69	-21.38	19.62	Neutral	-	14.69	9.69	0.04	9.89			
QP	174.571k	46.39	64.74	-18.35	19.61	Neutral	-	26.78	9.68	0.04	9.89			
AV	174.571k	31.77	54.74	-22.97	19.61	Neutral	-	12.16	9.68	0.04	9.89			
QP	466.086k	44.36	56.59	-12.23	19.62	Neutral	-	24.74	9.67	0.06	9.89			
AV	466.086k	40.04	46.59	-6.55	19.62	Neutral	-	20.42	9.67	0.06	9.89			
QP	971.558k	31.98	56.00	-24.02	19.64	Neutral	-	12.34	9.67	0.08	9.89			
AV	971.558k	28.73	46.00	-17.27	19.64	Neutral	-	9.09	9.67	0.08	9.89			
QP	3.485M	26.87	56.00	-29.13	19.71	Neutral	-	7.16	9.69	0.13	9.89			
AV	3.485M	21.78	46.00	-24.22	19.71	Neutral	-	2.07	9.69	0.13	9.89			
QP	26.91M	33.04	60.00	-26.96	19.93	Neutral	-	13.11	9.71	0.33	9.89			
AV	26.91M	30.34	50.00	-19.66	19.93	Neutral	-	10.41	9.71	0.33	9.89			



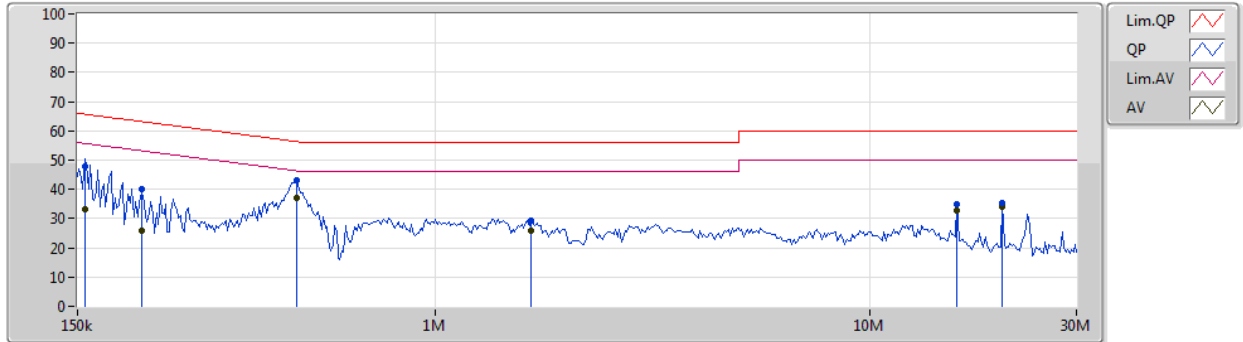
AC Power-line Conducted Emissions _ Beamforming_Sample 1

Appendix A.3

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	Sample 1; PoE mode; WIFI 5G TX		

26/12/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	156.091k	47.82	65.67	-17.85	19.63	Neutral	-	28.19	9.65	0.11	9.87			
AV	156.091k	33.33	55.67	-22.34	19.63	Neutral	-	13.70	9.65	0.11	9.87			
QP	210.387k	40.04	63.19	-23.15	19.62	Neutral	-	20.42	9.64	0.11	9.87			
AV	210.387k	25.85	53.19	-27.34	19.62	Neutral	-	6.23	9.64	0.11	9.87			
QP	480.498k	42.93	56.33	-13.40	19.63	Neutral	-	23.30	9.63	0.13	9.87			
AV	480.498k	37.11	46.33	-9.22	19.63	Neutral	"Worst"	17.48	9.63	0.13	9.87			
QP	1.667M	29.52	56.00	-26.48	19.64	Neutral	-	9.88	9.64	0.13	9.87			
AV	1.667M	25.79	46.00	-20.21	19.64	Neutral	-	6.15	9.64	0.13	9.87			
QP	15.952M	34.76	60.00	-25.24	19.91	Neutral	-	14.85	9.71	0.32	9.88			
AV	15.952M	32.80	50.00	-17.20	19.91	Neutral	-	12.89	9.71	0.32	9.88			
QP	20.255M	35.29	60.00	-24.71	19.97	Neutral	-	15.32	9.72	0.36	9.89			
AV	20.255M	34.18	50.00	-15.82	19.97	Neutral	-	14.21	9.72	0.36	9.89			



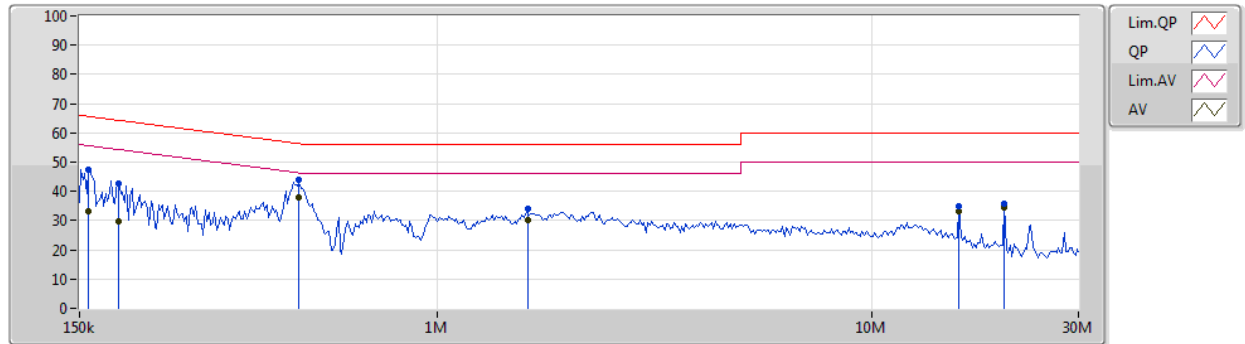
AC Power-line Conducted Emissions _ Beamforming_Sample 1

Appendix A.3

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Sample 1; PoE mode; WIFI 5G TX		

26/12/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	157.652k	47.36	65.58	-18.22	19.64	Line	-	27.72	9.66	0.11	9.87			
AV	157.652k	33.28	55.58	-22.30	19.64	Line	-	13.64	9.66	0.11	9.87			
QP	184.859k	42.74	64.26	-21.52	19.63	Line	-	23.11	9.65	0.11	9.87			
AV	184.859k	29.62	54.26	-24.64	19.63	Line	-	9.99	9.65	0.11	9.87			
QP	480.498k	43.76	56.33	-12.57	19.64	Line	-	24.12	9.64	0.13	9.87			
AV	480.498k	37.93	46.33	-8.40	19.64	Line	"Worst"	18.29	9.64	0.13	9.87			
QP	1.618M	33.87	56.00	-22.13	19.65	Line	-	14.22	9.65	0.13	9.87			
AV	1.618M	30.10	46.00	-15.90	19.65	Line	-	10.45	9.65	0.13	9.87			
QP	15.952M	35.12	60.00	-24.88	19.86	Line	-	15.26	9.66	0.32	9.88			
AV	15.952M	32.99	50.00	-17.01	19.86	Line	-	13.13	9.66	0.32	9.88			
QP	20.255M	35.57	60.00	-24.43	19.89	Line	-	15.68	9.64	0.36	9.89			
AV	20.255M	34.41	50.00	-15.59	19.89	Line	-	14.52	9.64	0.36	9.89			



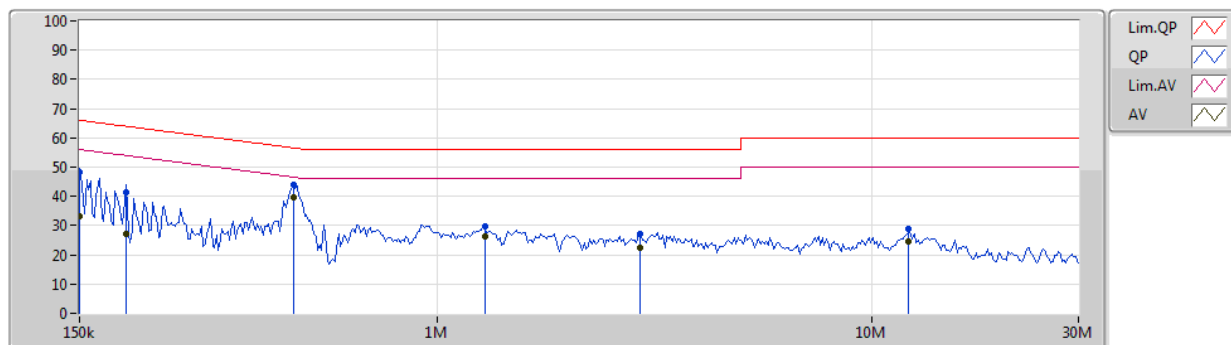
AC Power-line Conducted Emissions _ Beamforming_Sample 2

Appendix A.4

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	Sample 2; PoE mode; WIFI 5G TX		

27/12/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	150k	48.47	66.00	-17.53	19.63	Neutral	-	28.84	9.65	0.11	9.87			
AV	150k	33.13	56.00	-22.87	19.63	Neutral	-	13.50	9.65	0.11	9.87			
QP	192.365k	41.30	63.93	-22.63	19.62	Neutral	-	21.68	9.64	0.11	9.87			
AV	192.365k	27.30	53.93	-26.63	19.62	Neutral	-	7.68	9.64	0.11	9.87			
QP	466.367k	44.14	56.57	-12.43	19.63	Neutral	-	24.51	9.63	0.13	9.87			
AV	466.367k	39.83	46.57	-6.74	19.63	Neutral	"Worst"	20.20	9.63	0.13	9.87			
QP	1.287M	29.60	56.00	-26.40	19.64	Neutral	-	9.96	9.64	0.12	9.88			
AV	1.287M	26.36	46.00	-19.64	19.64	Neutral	-	6.72	9.64	0.12	9.88			
QP	2.939M	27.26	56.00	-28.74	19.70	Neutral	-	7.56	9.66	0.16	9.88			
AV	2.939M	22.52	46.00	-23.48	19.70	Neutral	-	2.82	9.66	0.16	9.88			
QP	12.194M	28.95	60.00	-31.05	19.88	Neutral	-	9.07	9.71	0.29	9.88			
AV	12.194M	24.44	50.00	-25.56	19.88	Neutral	-	4.56	9.71	0.29	9.88			



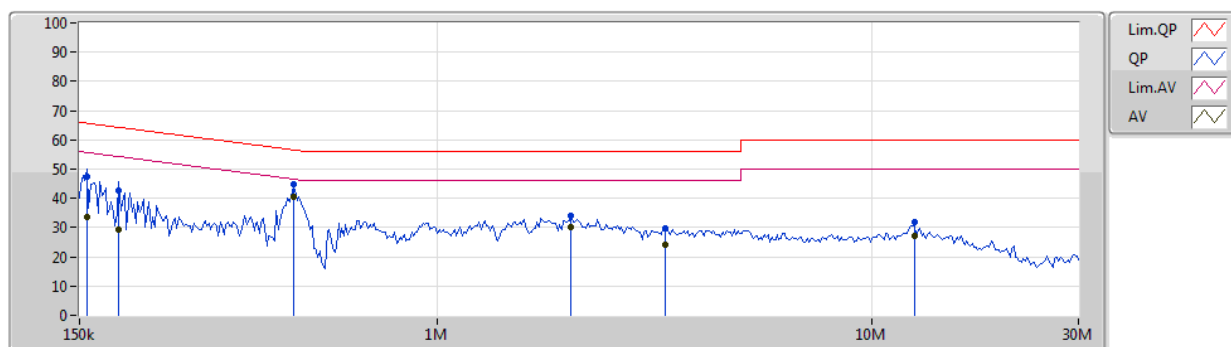
AC Power-line Conducted Emissions _ Beamforming_Sample 2

Appendix A.4

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Sample 2; PoE mode; WIFI 5G TX		

27/12/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	156.091k	47.62	65.67	-18.05	19.64	Line	-	27.98	9.66	0.11	9.87			
AV	156.091k	33.53	55.67	-22.14	19.64	Line	-	13.89	9.66	0.11	9.87			
QP	184.859k	42.53	64.26	-21.73	19.63	Line	-	22.90	9.65	0.11	9.87			
AV	184.859k	29.45	54.26	-24.81	19.63	Line	-	9.82	9.65	0.11	9.87			
QP	466.367k	44.68	56.57	-11.89	19.64	Line	-	25.04	9.64	0.13	9.87			
AV	466.367k	40.33	46.57	-6.24	19.64	Line	"Worst"	20.69	9.64	0.13	9.87			
QP	2.034M	34.07	56.00	-21.93	19.66	Line	-	14.41	9.65	0.14	9.87			
AV	2.034M	30.37	46.00	-15.63	19.66	Line	-	10.71	9.65	0.14	9.87			
QP	3.345M	29.53	56.00	-26.47	19.71	Line	-	9.82	9.66	0.17	9.88			
AV	3.345M	24.06	46.00	-21.94	19.71	Line	-	4.35	9.66	0.17	9.88			
QP	12.563M	32.06	60.00	-27.94	19.84	Line	-	12.22	9.67	0.29	9.88			
AV	12.563M	27.29	50.00	-22.71	19.84	Line	-	7.45	9.67	0.29	9.88			

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)_1TX	43.41M	28.996M	29M0D1D	33.48M	17.211M
802.11ac VHT20_Nss1,(MCS0)_1TX	43.02M	25.697M	25M7D1D	23.31M	17.931M
802.11ac VHT40_Nss1,(MCS0)_1TX	75.24M	37.301M	37M3D1D	39.9M	36.342M
802.11ac VHT80_Nss1,(MCS0)_1TX	81.48M	75.802M	75M8D1D	81.48M	75.802M
802.11ax HEW20_Nss1,(MCS0)_1TX	45.6M	27.256M	27M3D1D	24.18M	19.19M
802.11ax HEW40_Nss1,(MCS0)_1TX	73.98M	39.1M	39M1D1D	39.96M	37.601M
802.11ax HEW80_Nss1,(MCS0)_1TX	81.36M	77.121M	77M1D1D	81.36M	77.121M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	16.32M	34.423M	34M4D1D	16.29M	17.571M
802.11ac VHT20_Nss1,(MCS0)_1TX	17.58M	33.133M	33M1D1D	17.55M	18.591M
802.11ac VHT40_Nss1,(MCS0)_1TX	36.36M	61.709M	61M7D1D	36.36M	52.114M
802.11ac VHT80_Nss1,(MCS0)_1TX	76.32M	76.402M	76M4D1D	76.32M	76.402M
802.11ax HEW20_Nss1,(MCS0)_1TX	18.9M	37.751M	37M8D1D	18.51M	19.43M
802.11ax HEW40_Nss1,(MCS0)_1TX	37.38M	60.45M	60M4D1D	37.32M	51.394M
802.11ax HEW80_Nss1,(MCS0)_1TX	75.84M	77.721M	77M7D1D	75.84M	77.721M

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)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-
5180MHz	Pass	Inf	33.48M	17.211M
5200MHz	Pass	Inf	43.41M	28.996M
5240MHz	Pass	Inf	38.28M	18.981M
5745MHz	Pass	500k	16.29M	34.423M
5785MHz	Pass	500k	16.32M	17.571M
5825MHz	Pass	500k	16.32M	17.691M
802.11ac VHT20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz	Pass	Inf	23.31M	17.931M
5200MHz	Pass	Inf	43.02M	25.697M
5240MHz	Pass	Inf	35.79M	18.441M
5745MHz	Pass	500k	17.55M	33.133M
5785MHz	Pass	500k	17.58M	18.591M
5825MHz	Pass	500k	17.58M	21.679M
802.11ac VHT40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz	Pass	Inf	39.9M	36.342M
5230MHz	Pass	Inf	75.24M	37.301M
5755MHz	Pass	500k	36.36M	52.114M
5795MHz	Pass	500k	36.36M	61.709M
802.11ac VHT80_Nss1,(MCS0)_1TX	-	-	-	-
5210MHz	Pass	Inf	81.48M	75.802M
5775MHz	Pass	500k	76.32M	76.402M
802.11ax HEW20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz	Pass	Inf	24.18M	19.19M
5200MHz	Pass	Inf	45.6M	27.256M
5240MHz	Pass	Inf	38.97M	19.55M
5745MHz	Pass	500k	18.51M	37.751M
5785MHz	Pass	500k	18.9M	19.43M
5825MHz	Pass	500k	18.81M	22.549M
802.11ax HEW40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz	Pass	Inf	39.96M	37.601M
5230MHz	Pass	Inf	73.98M	39.1M
5755MHz	Pass	500k	37.32M	51.394M
5795MHz	Pass	500k	37.38M	60.45M
802.11ax HEW80_Nss1,(MCS0)_1TX	-	-	-	-
5210MHz	Pass	Inf	81.36M	77.121M
5775MHz	Pass	500k	75.84M	77.721M

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

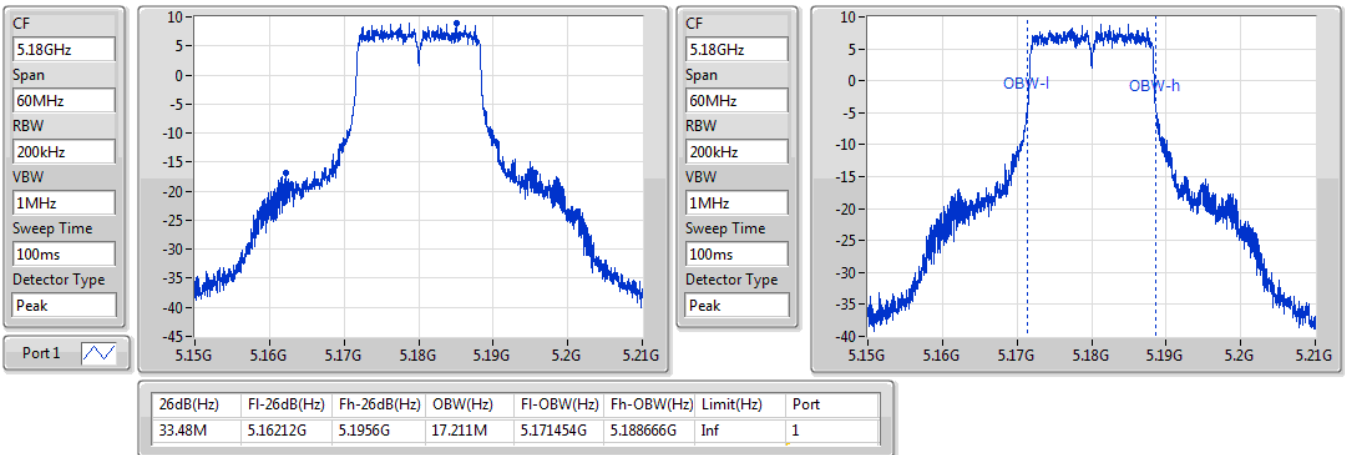
Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_1TX

EBW

5180MHz

18/12/2019

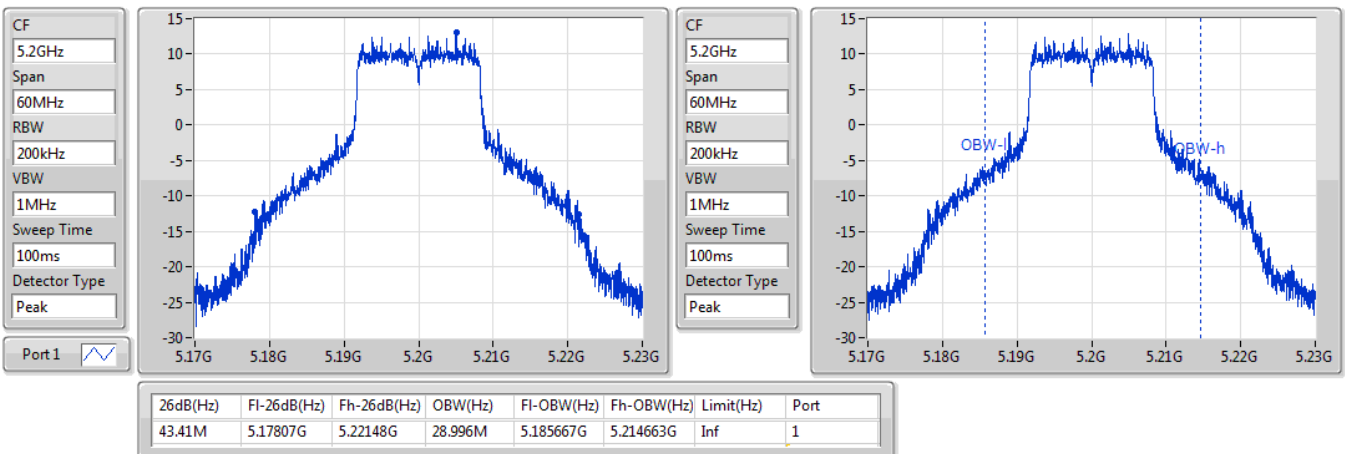


802.11a_Nss1,(6Mbps)_1TX

EBW

5200MHz

18/12/2019

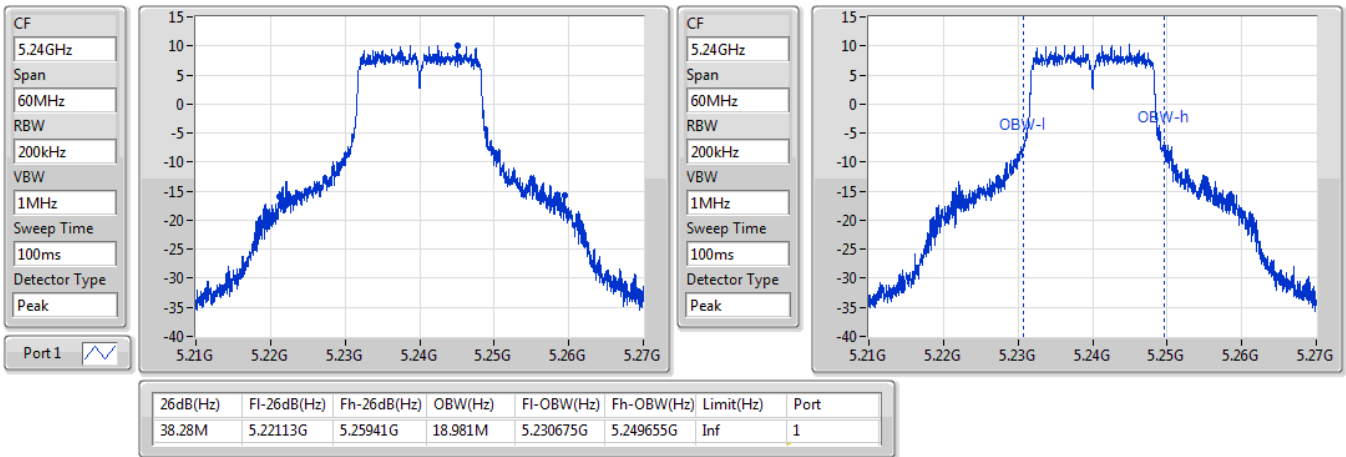


802.11a_Nss1,(6Mbps)_1TX

EBW

5240MHz

18/12/2019

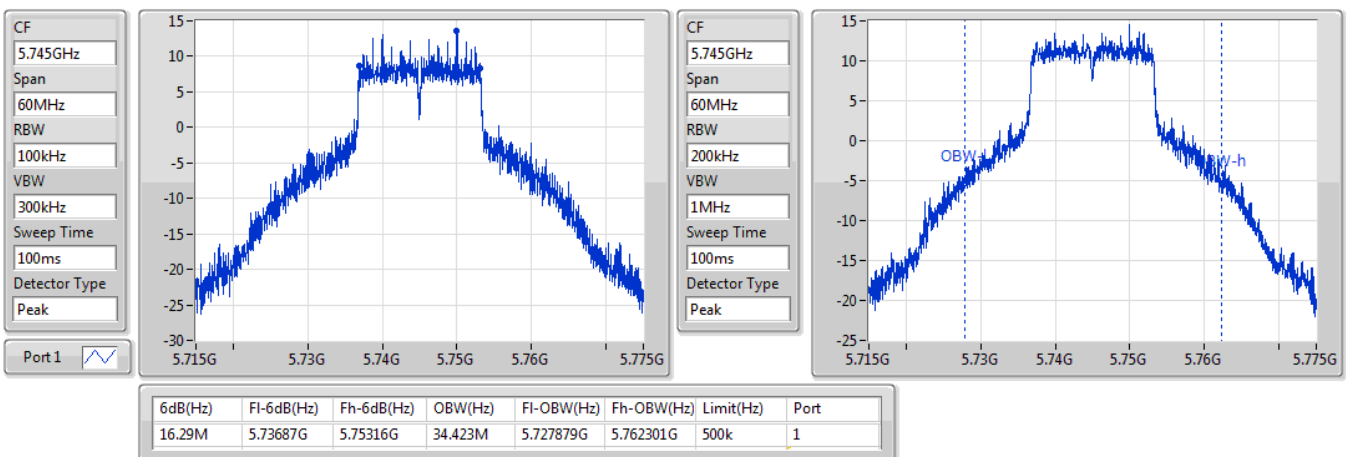


802.11a_Nss1,(6Mbps)_1TX

EBW

5745MHz

18/12/2019

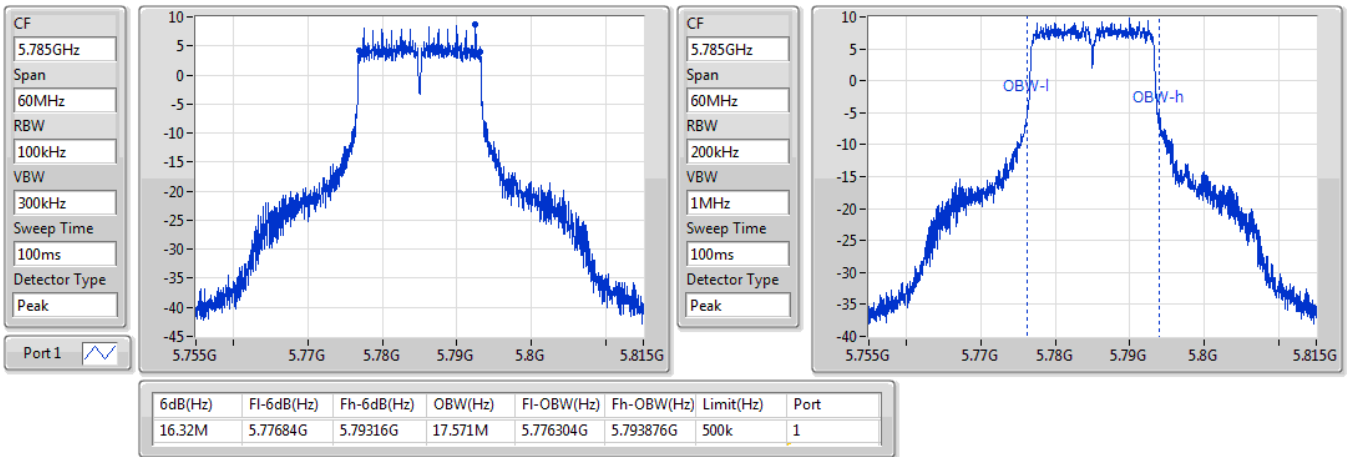


802.11a_Nss1,(6Mbps)_1TX

EBW

5785MHz

18/12/2019

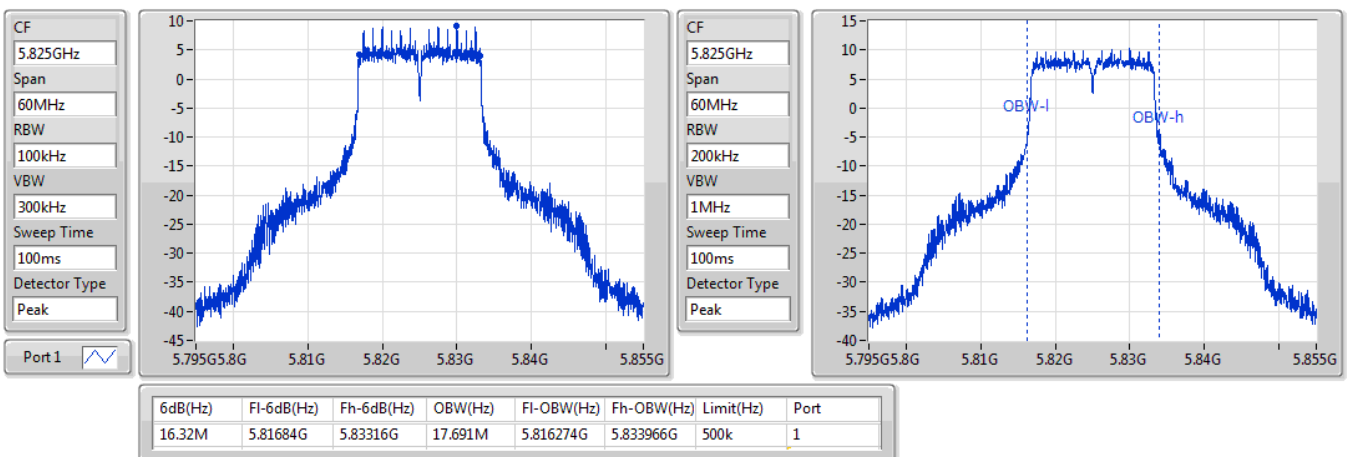


802.11a_Nss1,(6Mbps)_1TX

EBW

5825MHz

18/12/2019

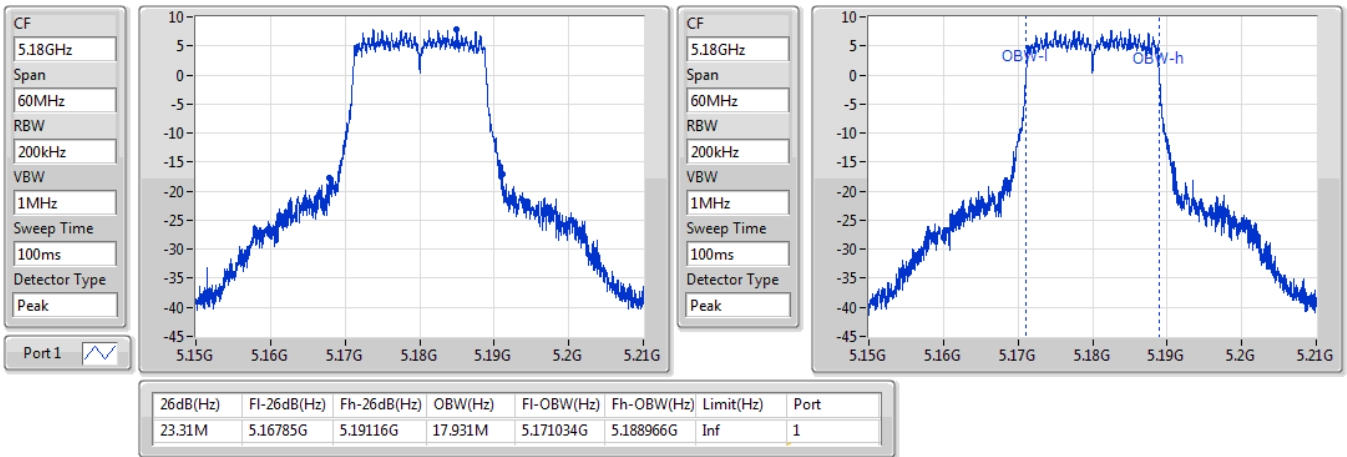


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5180MHz

18/12/2019

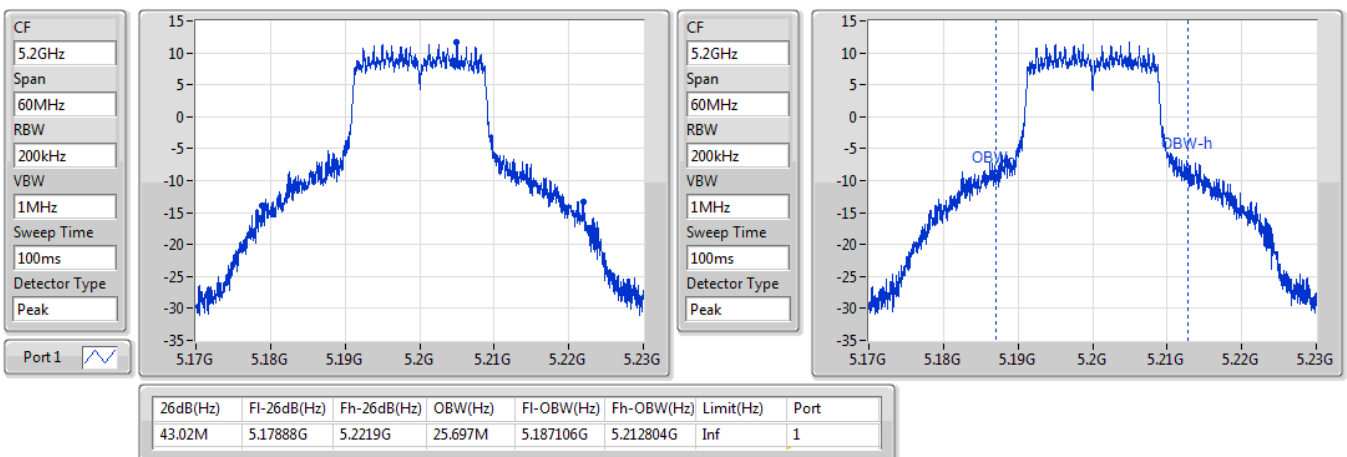


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5200MHz

18/12/2019

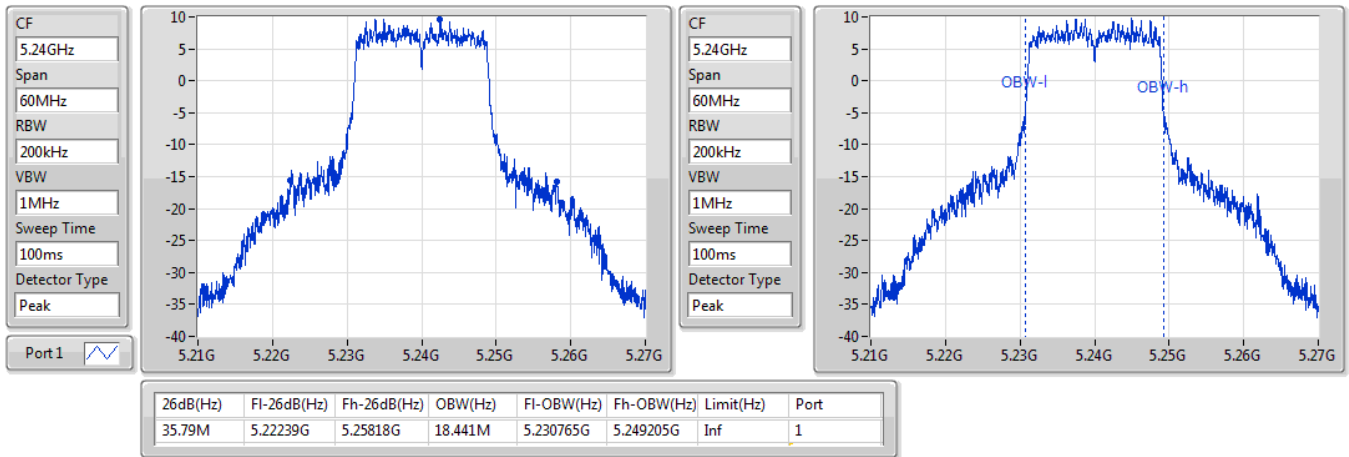


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5240MHz

18/12/2019

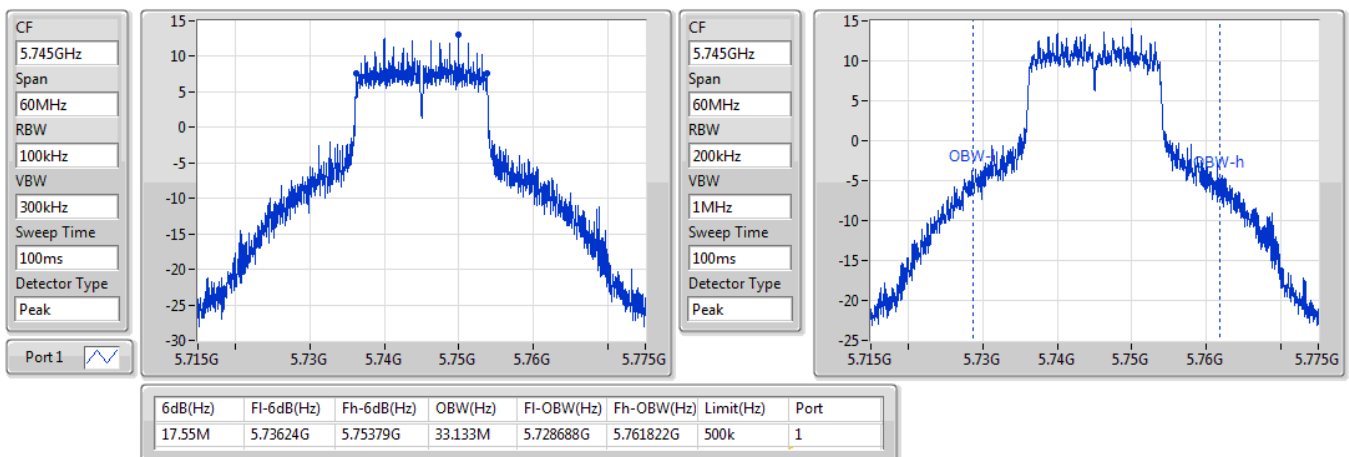


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5745MHz

18/12/2019

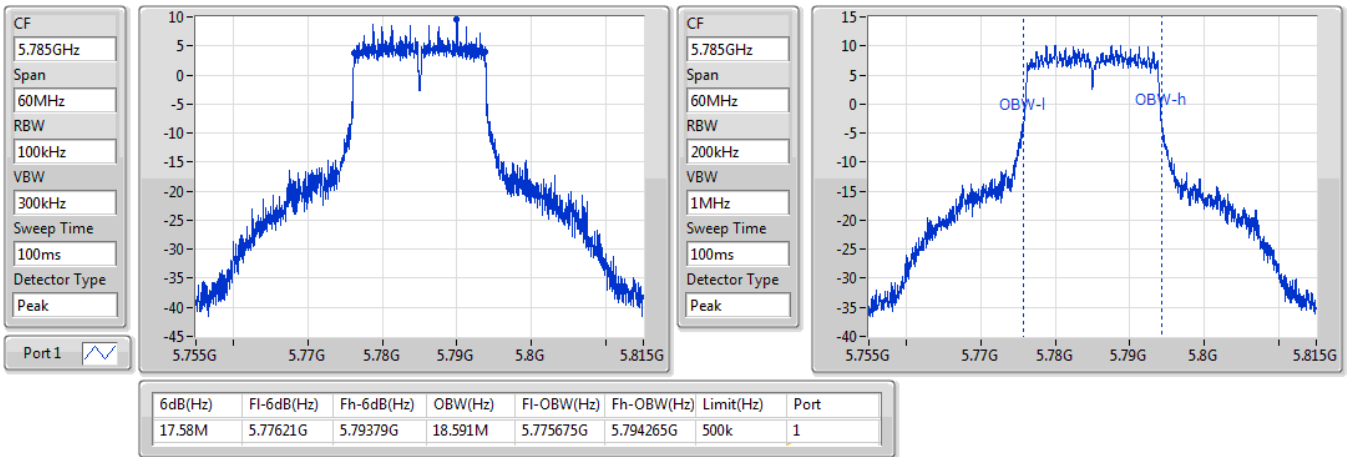


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5785MHz

18/12/2019

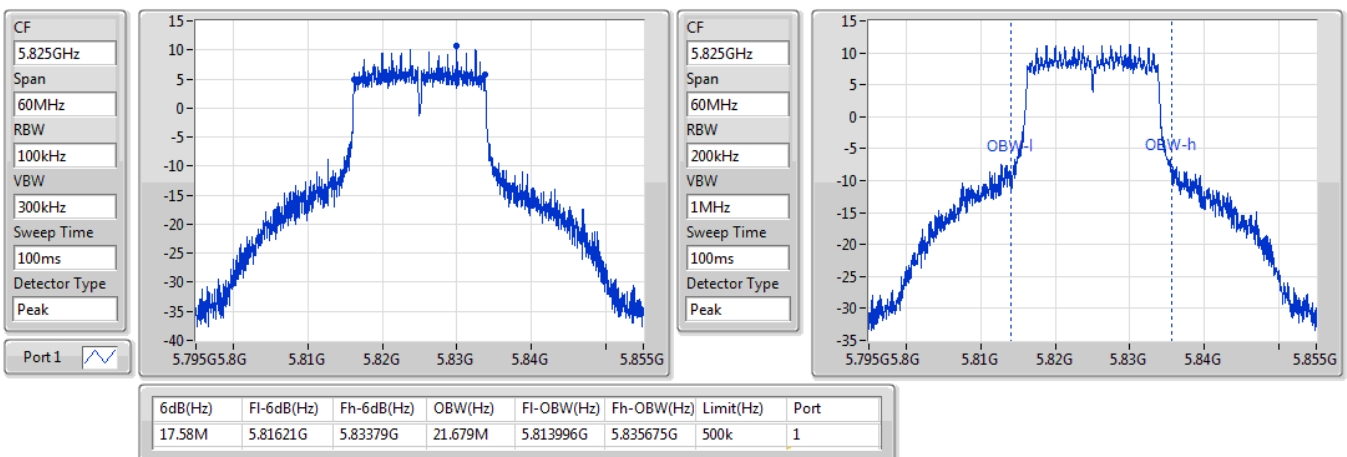


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5825MHz

18/12/2019

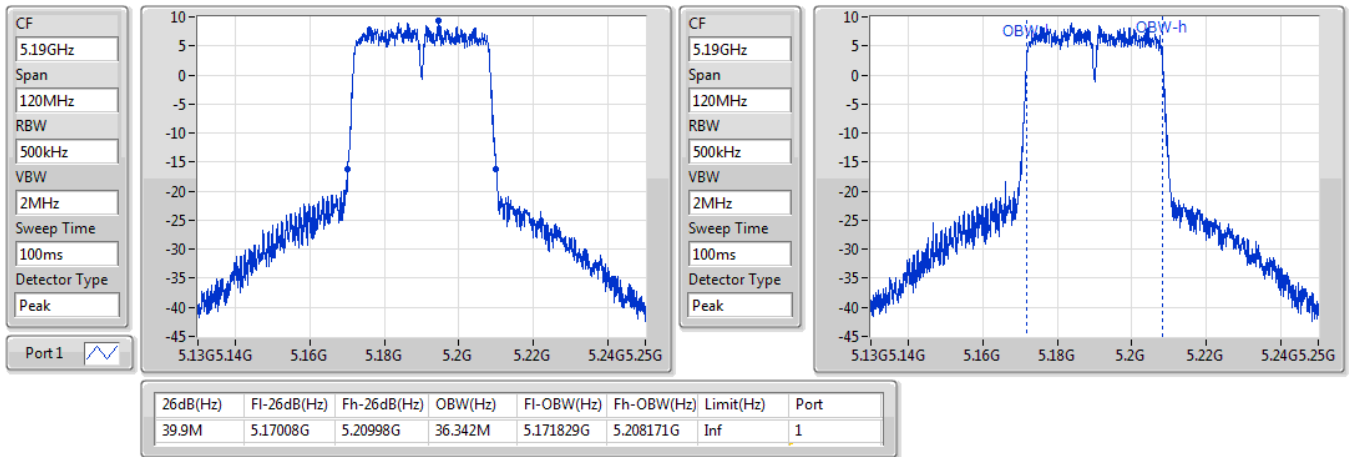


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

5190MHz

18/12/2019

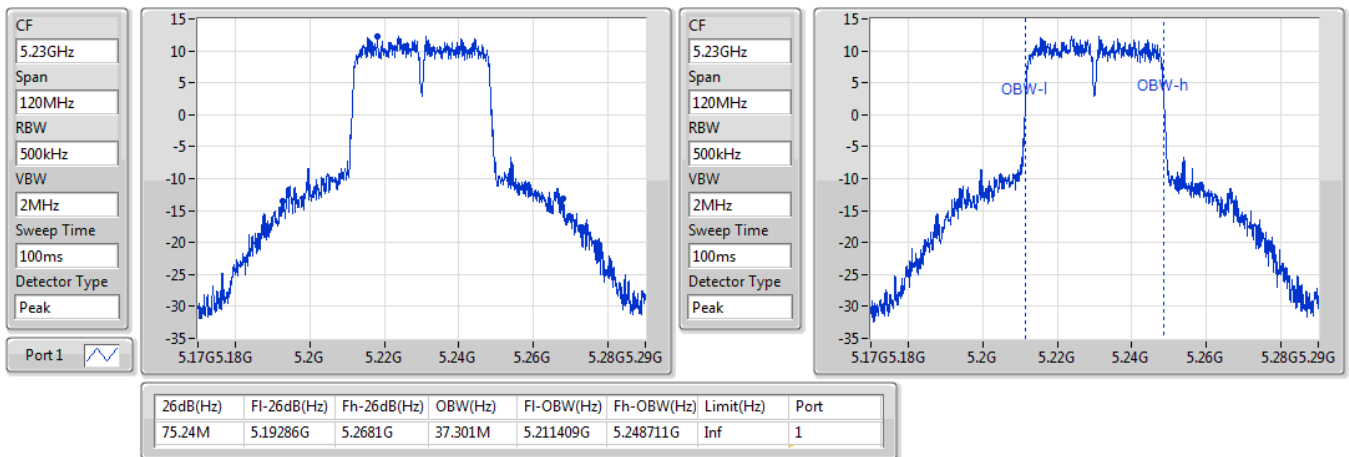


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

5230MHz

18/12/2019

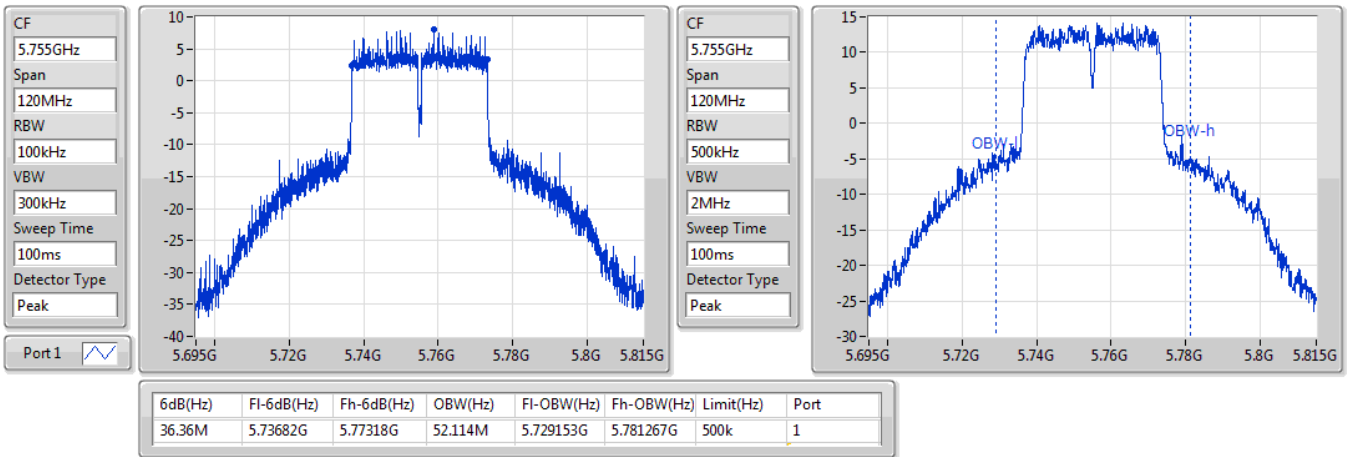


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

5755MHz

18/12/2019

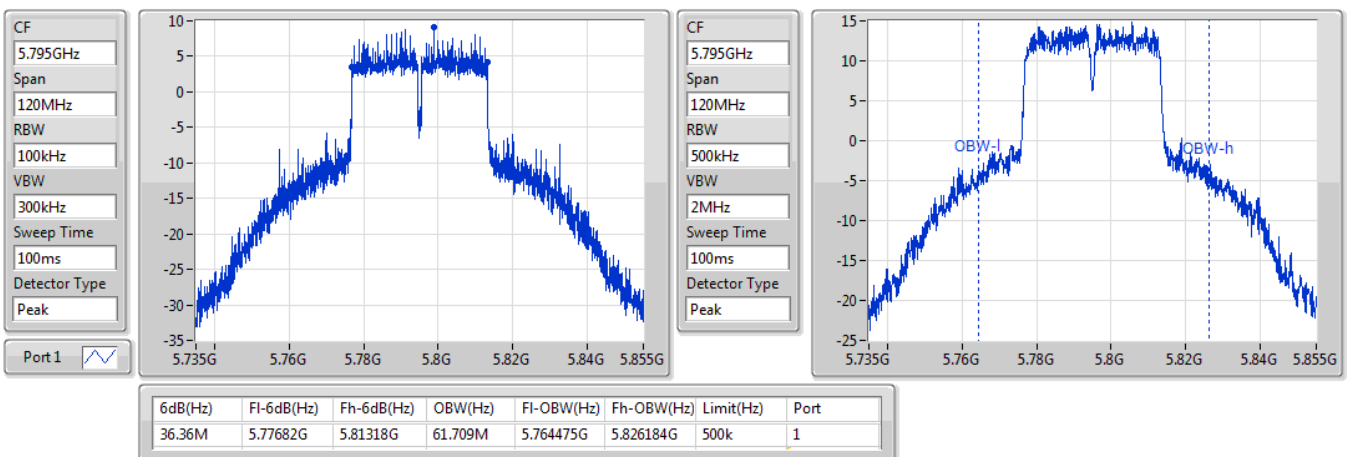


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

5795MHz

18/12/2019

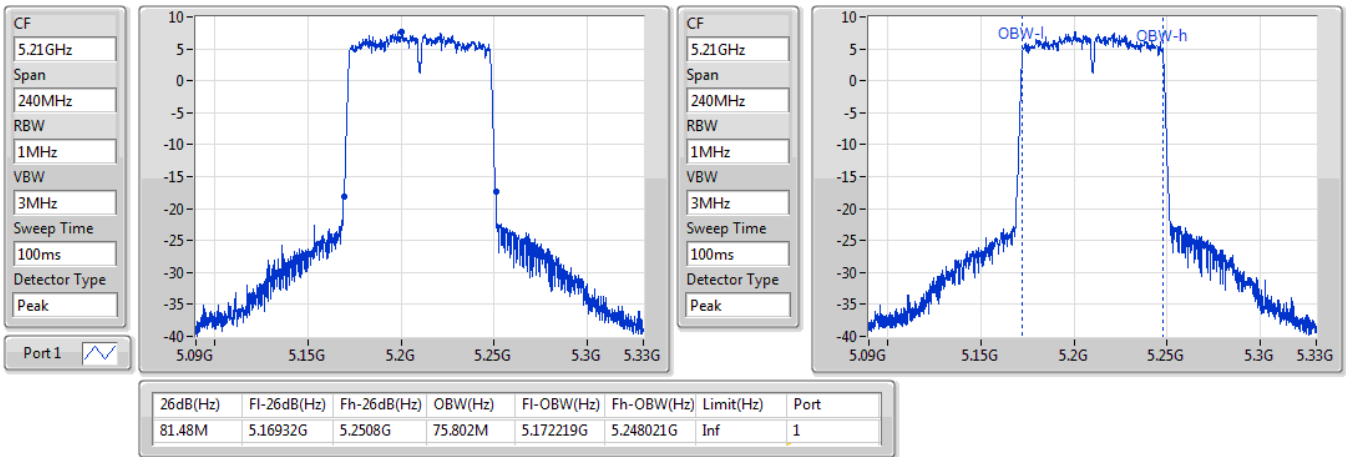


802.11ac VHT80_Nss1,(MCS0)_1TX

EBW

5210MHz

18/12/2019

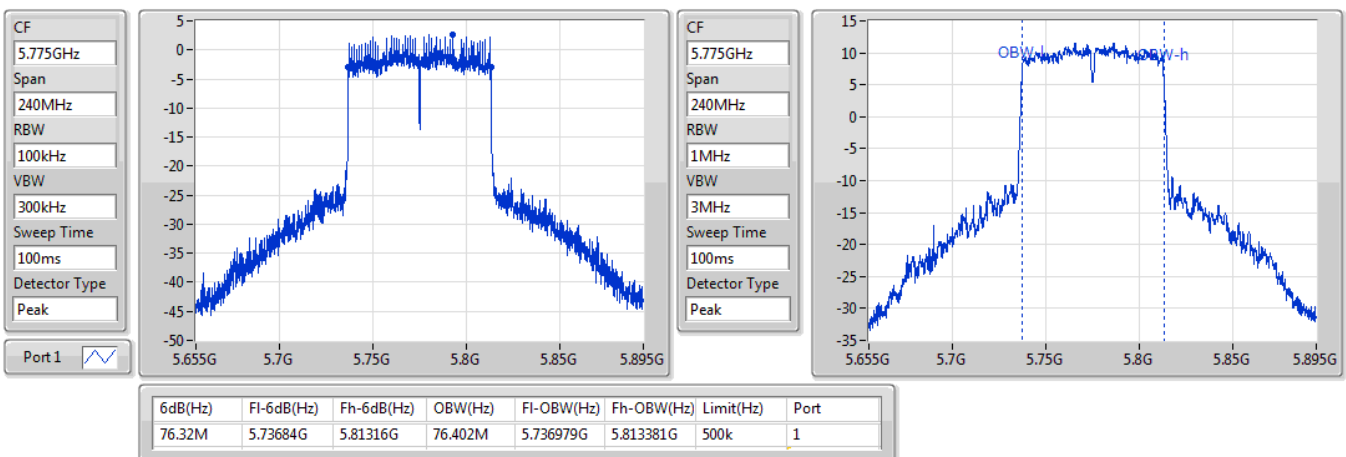


802.11ac VHT80_Nss1,(MCS0)_1TX

EBW

5775MHz

18/12/2019

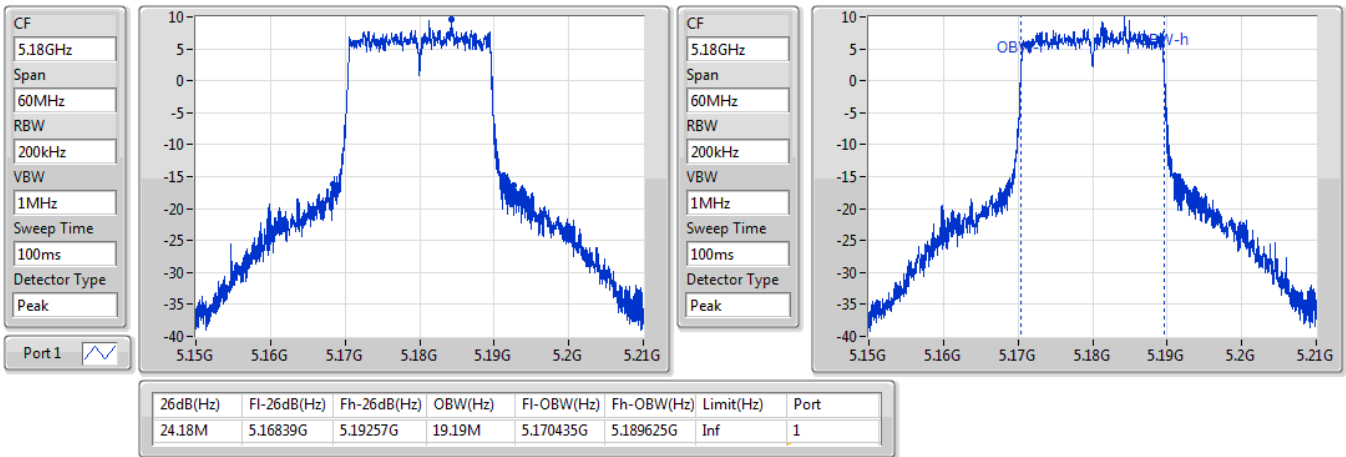


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5180MHz

18/12/2019

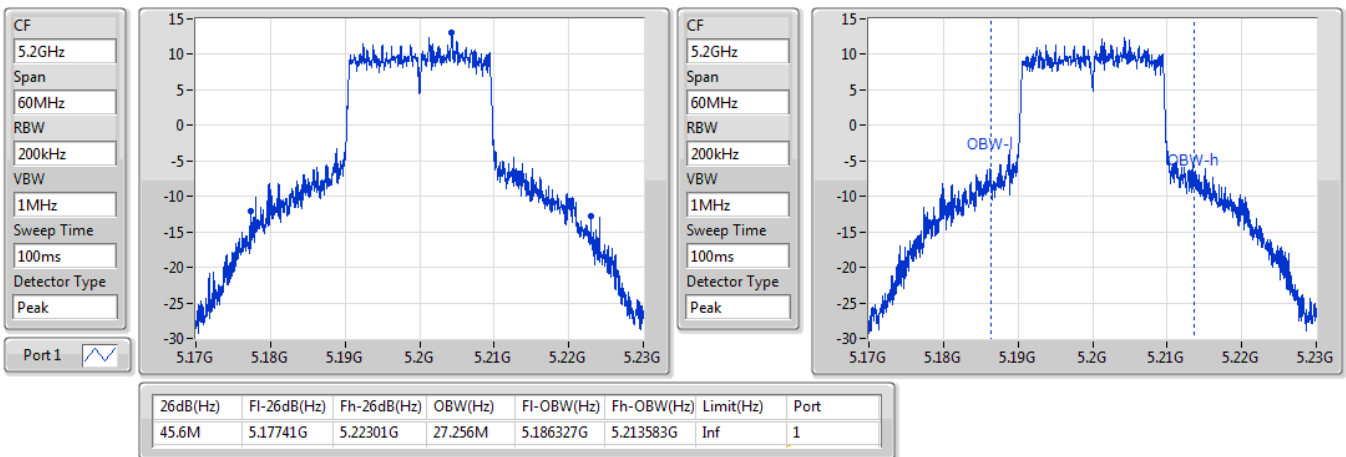


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5200MHz

18/12/2019

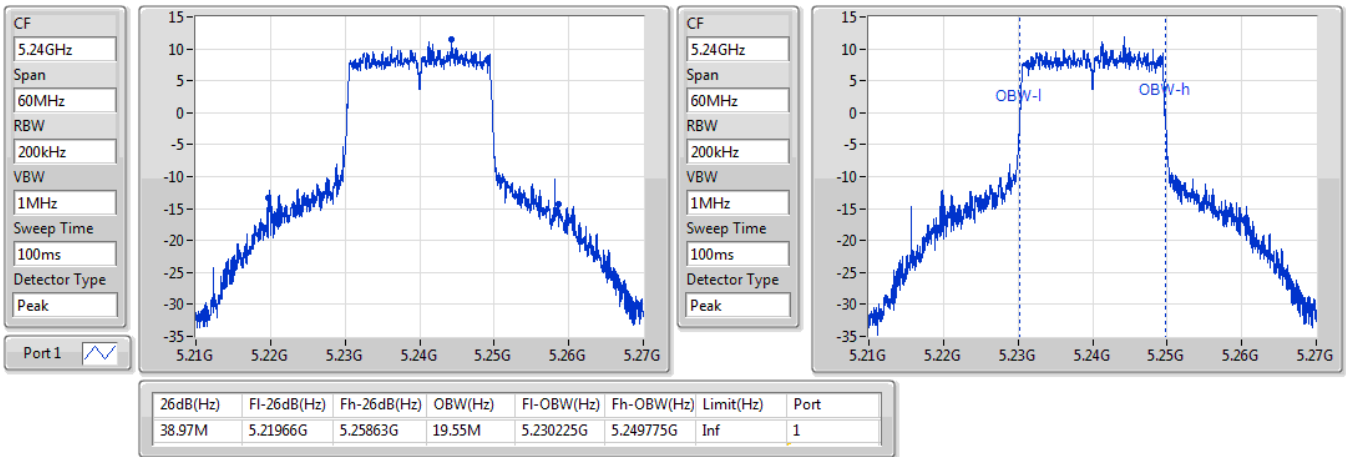


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5240MHz

18/12/2019

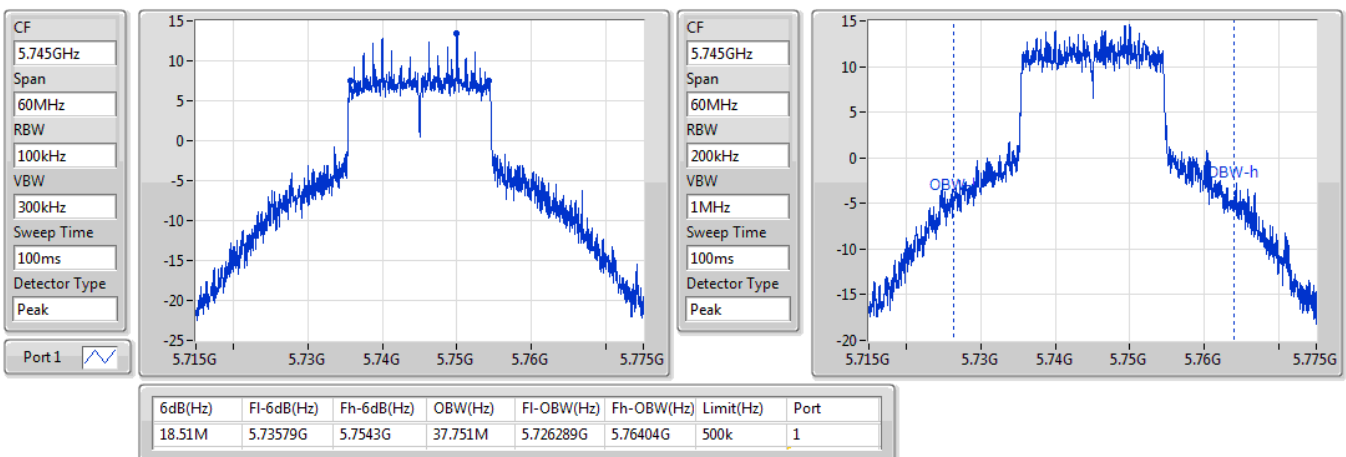


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5745MHz

18/12/2019

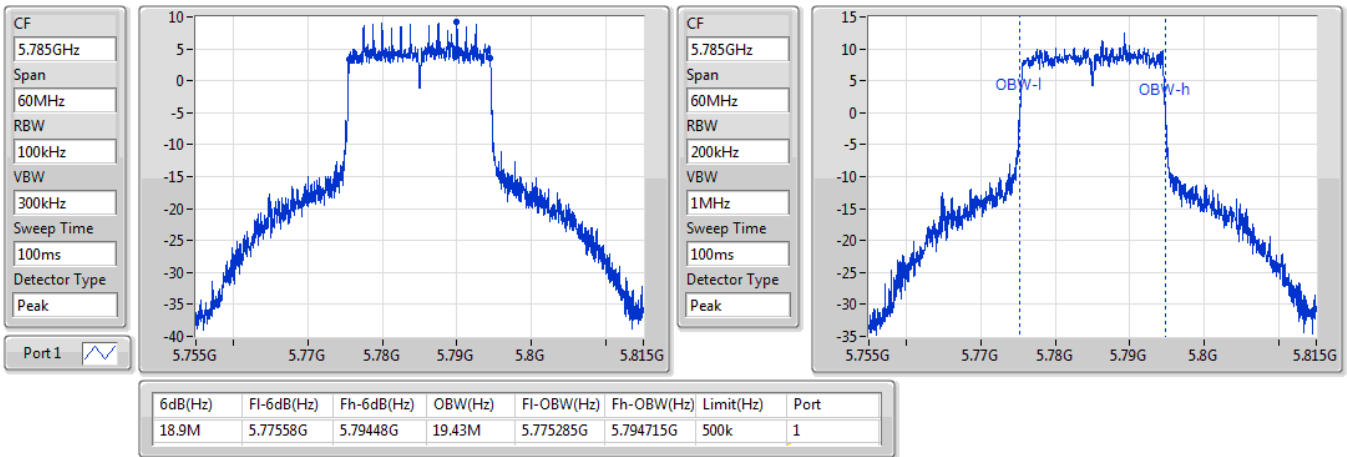


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5785MHz

18/12/2019

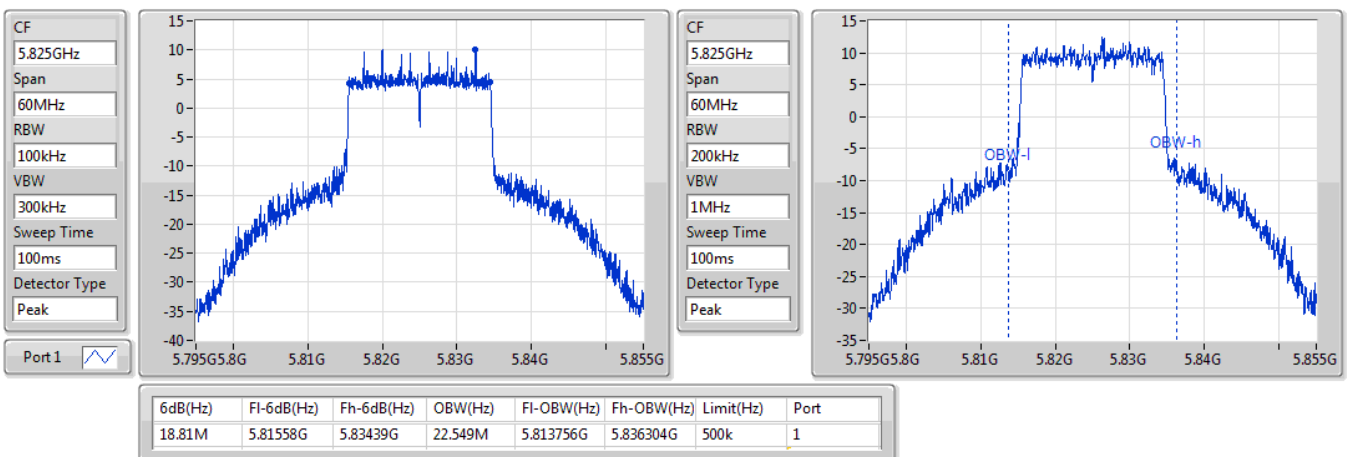


802.11ax HEW20_Nss1,(MCS0)_1TX

EBW

5825MHz

18/12/2019

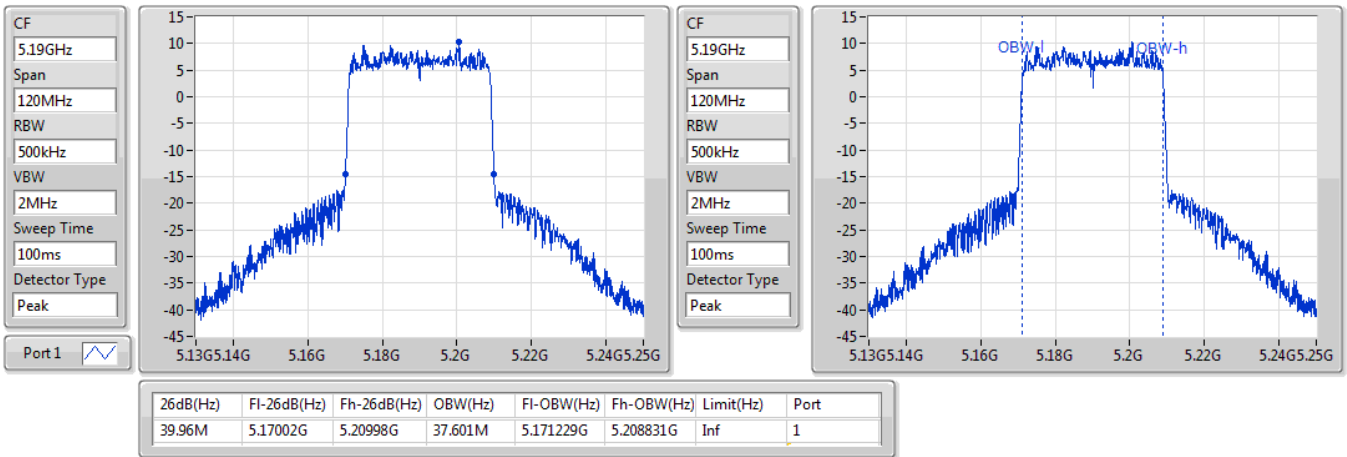


802.11ax HEW40_Nss1,(MCS0)_1TX

EBW

5190MHz

18/12/2019

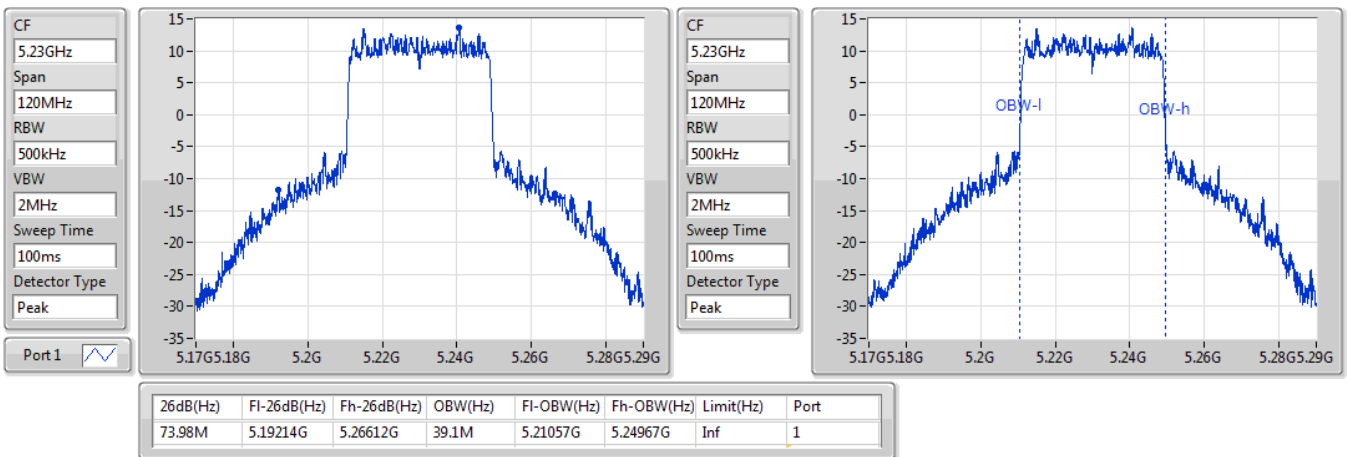


802.11ax HEW40_Nss1,(MCS0)_1TX

EBW

5230MHz

18/12/2019

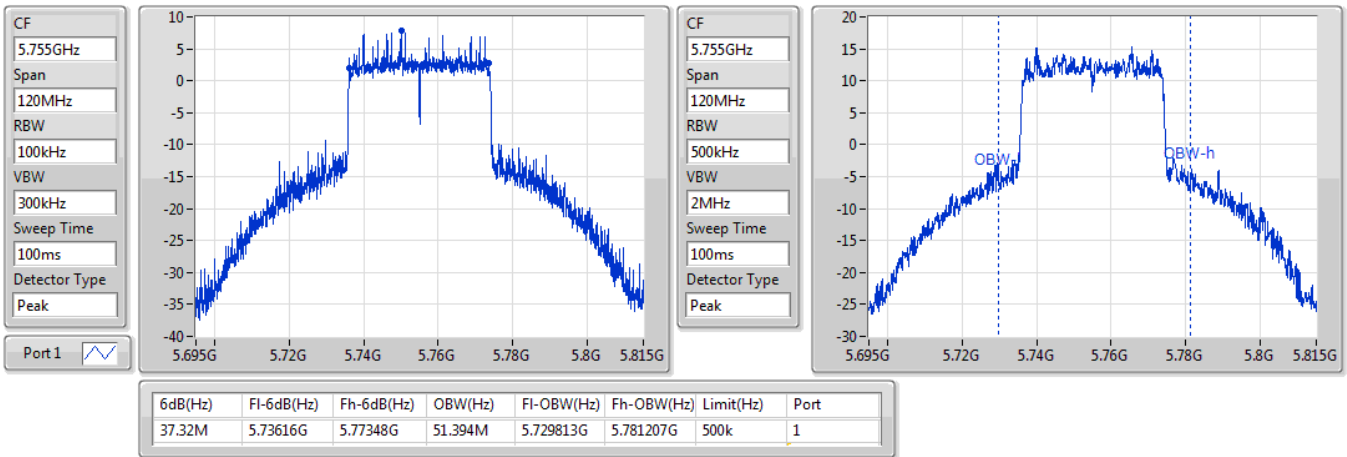


802.11ax HEW40_Nss1,(MCS0)_1TX

EBW

5755MHz

18/12/2019

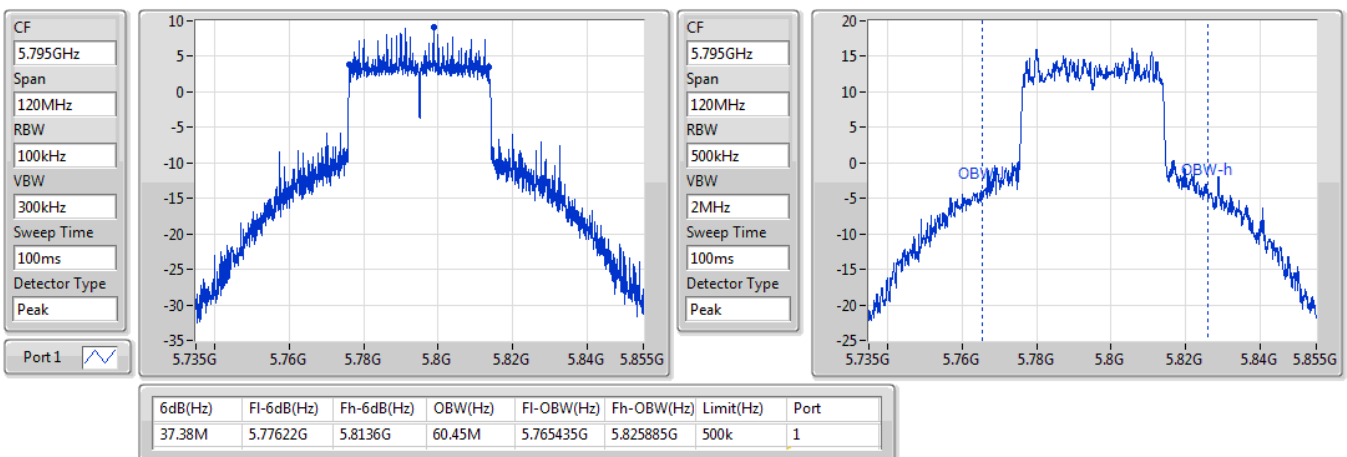


802.11ax HEW40_Nss1,(MCS0)_1TX

EBW

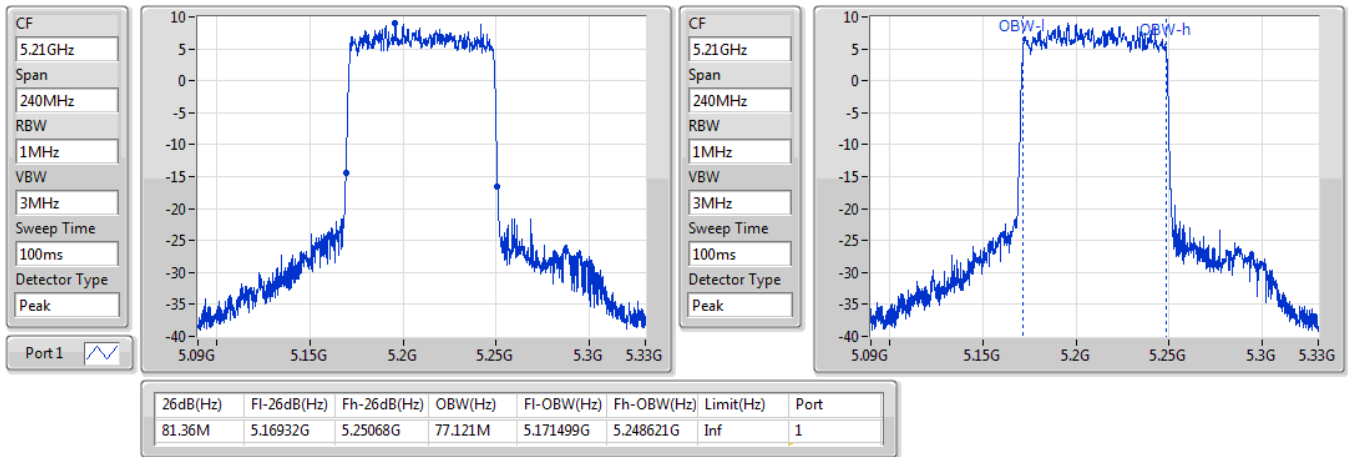
5795MHz

18/12/2019

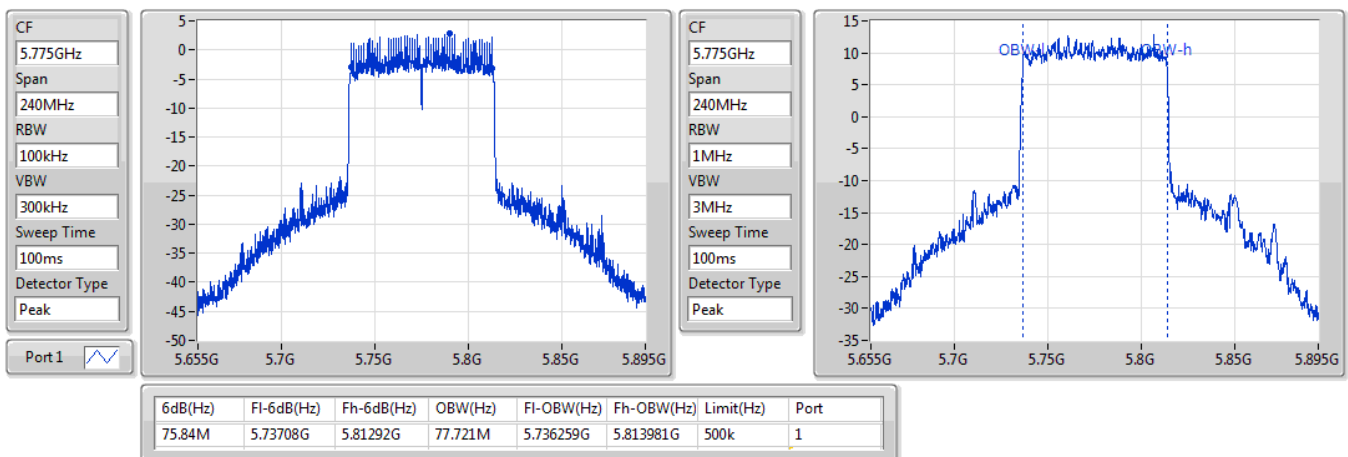


802.11ax HEW80_Nss1,(MCS0)_1TX
EBW
5210MHz

18/12/2019


802.11ax HEW80_Nss1,(MCS0)_1TX
EBW
5775MHz

18/12/2019



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)_2TX	45.27M	34.273M	34M3D1D	27.15M	17.061M
802.11ac VHT20_Nss2,(MCS0)_2TX	44.43M	26.657M	26M7D1D	22.47M	17.931M
802.11ac VHT40_Nss2,(MCS0)_2TX	71.64M	37.061M	37M1D1D	39.78M	36.282M
802.11ac VHT80_Nss2,(MCS0)_2TX	81.72M	75.802M	75M8D1D	81.6M	75.802M
802.11ax HEW20_Nss2,(MCS0)_2TX	44.85M	26.447M	26M4D1D	21.6M	19.07M
802.11ax HEW40_Nss2,(MCS0)_2TX	76.5M	38.381M	38M4D1D	39.96M	37.541M
802.11ax HEW80_Nss2,(MCS0)_2TX	81.24M	77.121M	77M1D1D	81.12M	77.121M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	16.38M	35.142M	35M1D1D	16.32M	17.121M
802.11ac VHT20_Nss2,(MCS0)_2TX	17.58M	31.724M	31M7D1D	17.55M	19.04M
802.11ac VHT40_Nss2,(MCS0)_2TX	36.3M	59.13M	59M1D1D	36.24M	47.916M
802.11ac VHT80_Nss2,(MCS0)_2TX	75.84M	77.001M	77M0D1D	75.72M	76.642M
802.11ax HEW20_Nss2,(MCS0)_2TX	18.96M	35.832M	35M8D1D	17.73M	19.58M
802.11ax HEW40_Nss2,(MCS0)_2TX	37.62M	55.892M	55M9D1D	37.5M	46.657M
802.11ax HEW80_Nss2,(MCS0)_2TX	76.56M	77.961M	78M0D1D	75.96M	77.841M

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)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	36.87M	17.721M	27.15M	17.061M
5200MHz	Pass	Inf	45.27M	34.273M	43.23M	29.205M
5240MHz	Pass	Inf	38.22M	18.891M	37.59M	17.511M
5745MHz	Pass	500k	16.35M	35.022M	16.32M	35.142M
5785MHz	Pass	500k	16.38M	17.451M	16.32M	17.121M
5825MHz	Pass	500k	16.32M	18.171M	16.32M	17.541M
802.11ac VHT20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	22.8M	17.931M	22.47M	17.961M
5200MHz	Pass	Inf	44.43M	26.657M	39.06M	22.159M
5240MHz	Pass	Inf	38.55M	19.13M	28.83M	18.321M
5745MHz	Pass	500k	17.58M	31.724M	17.55M	30.375M
5785MHz	Pass	500k	17.58M	20M	17.58M	19.04M
5825MHz	Pass	500k	17.58M	21.499M	17.58M	20.27M
802.11ac VHT40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	40.02M	36.282M	39.78M	36.402M
5230MHz	Pass	Inf	71.64M	36.942M	69.96M	37.061M
5755MHz	Pass	500k	36.24M	48.936M	36.3M	47.916M
5795MHz	Pass	500k	36.3M	56.012M	36.24M	59.13M
802.11ac VHT80_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	81.6M	75.802M	81.72M	75.802M
5775MHz	Pass	500k	75.72M	76.642M	75.84M	77.001M
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	26.07M	19.13M	21.6M	19.07M
5200MHz	Pass	Inf	44.85M	26.447M	42.06M	21.409M
5240MHz	Pass	Inf	41.73M	19.67M	36.06M	19.22M
5745MHz	Pass	500k	17.73M	35.832M	18.51M	34.723M
5785MHz	Pass	500k	18.81M	19.94M	18.96M	19.58M
5825MHz	Pass	500k	18.57M	21.619M	18.93M	20.78M
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	39.96M	37.541M	40.02M	37.661M
5230MHz	Pass	Inf	71.34M	38.381M	76.5M	38.321M
5755MHz	Pass	500k	37.56M	49.835M	37.5M	46.657M
5795MHz	Pass	500k	37.56M	55.232M	37.62M	55.892M
802.11ax HEW80_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	81.12M	77.121M	81.24M	77.121M
5775MHz	Pass	500k	75.96M	77.841M	76.56M	77.961M

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

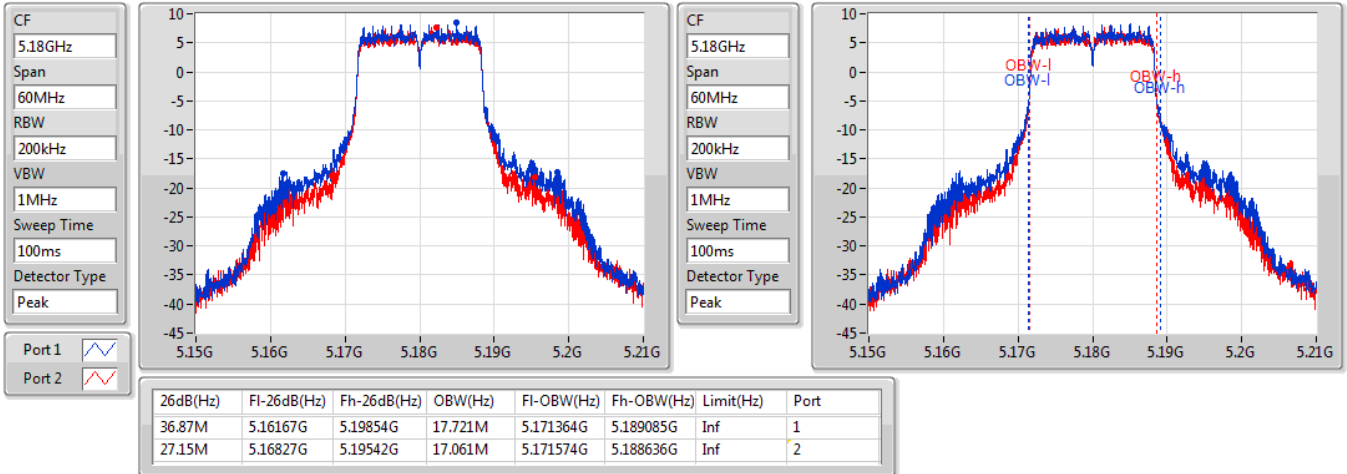
Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_2TX

EBW

5180MHz

17/12/2019

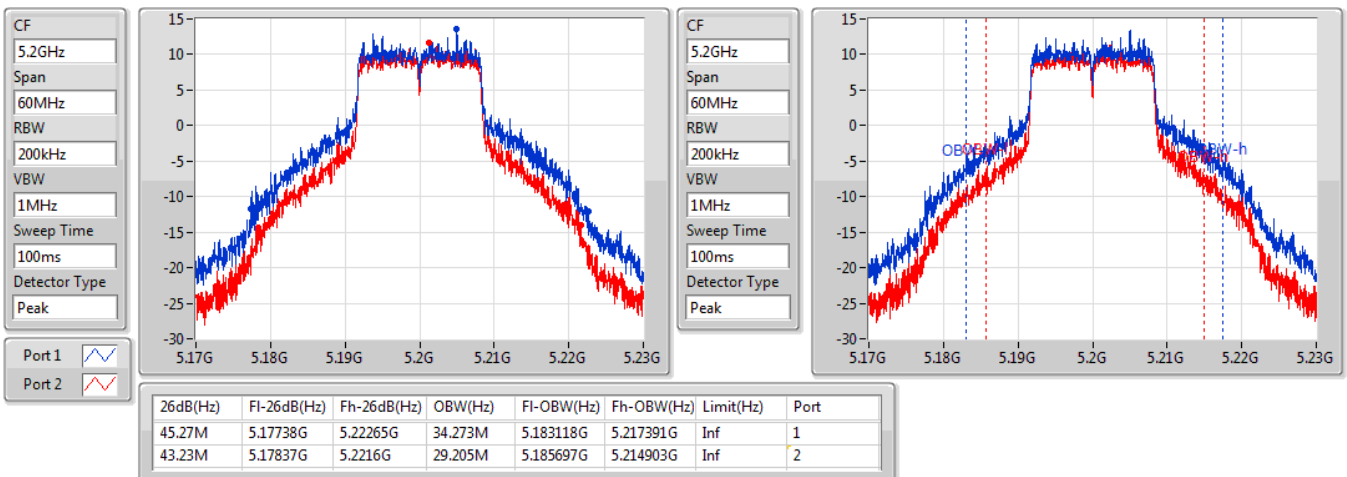


802.11a_Nss1,(6Mbps)_2TX

EBW

5200MHz

17/12/2019

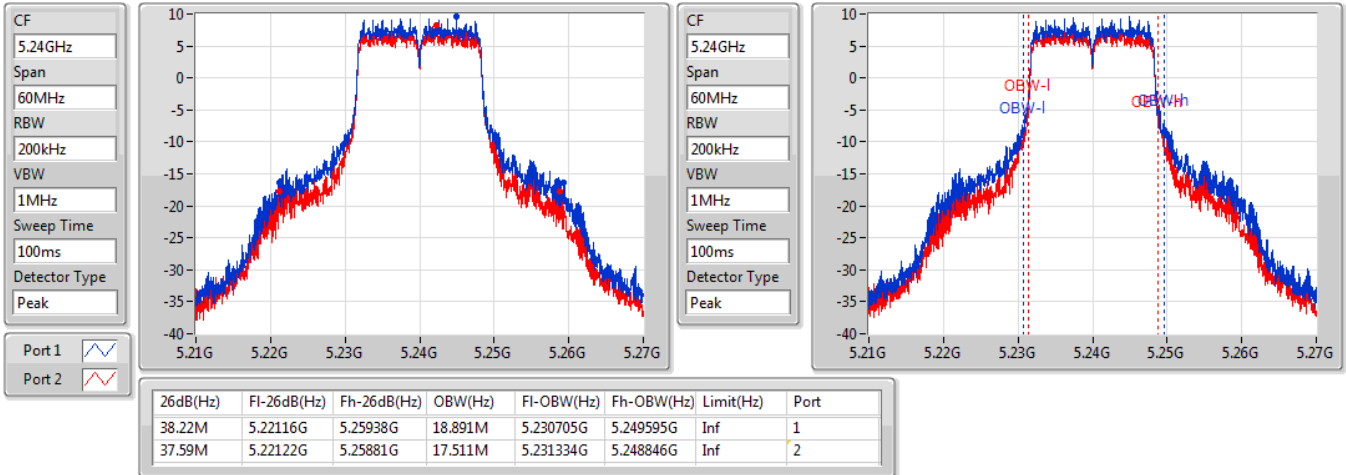


802.11a_Nss1,(6Mbps)_2TX

EBW

5240MHz

17/12/2019

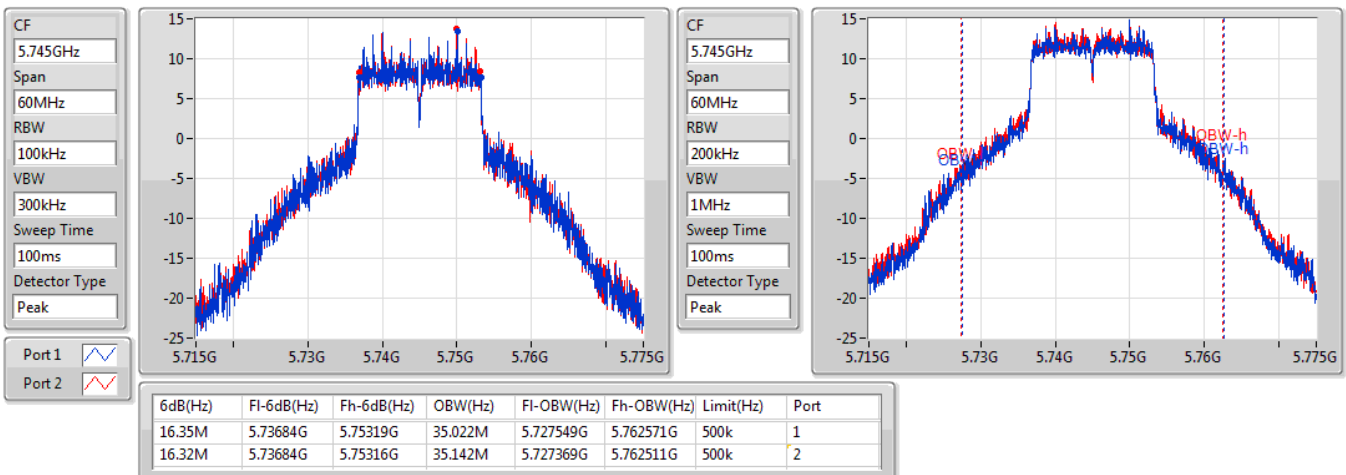


802.11a_Nss1,(6Mbps)_2TX

EBW

5745MHz

17/12/2019

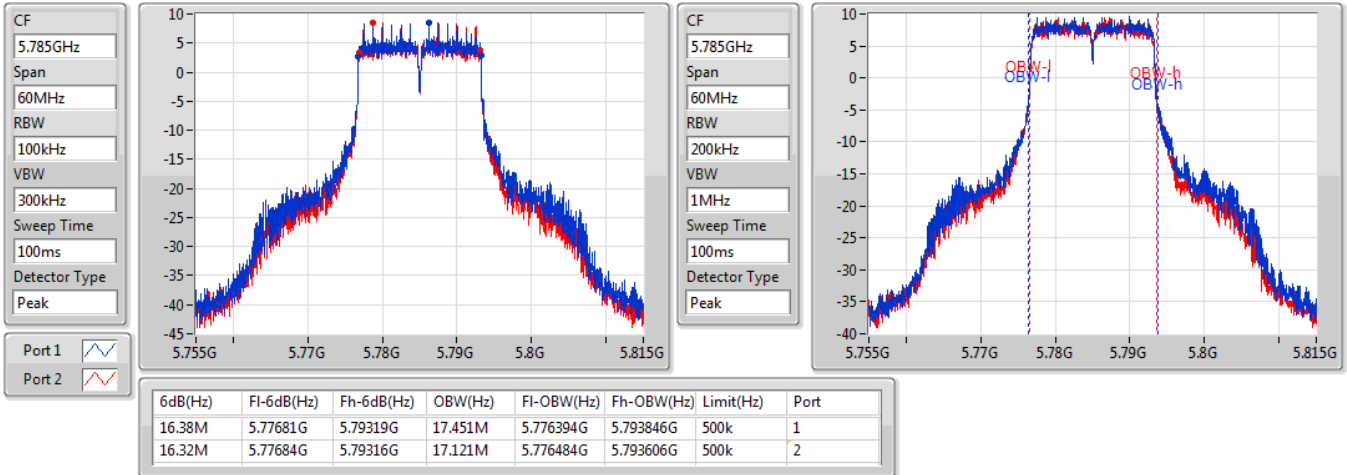


802.11a_Nss1,(6Mbps)_2TX

EBW

5785MHz

17/12/2019

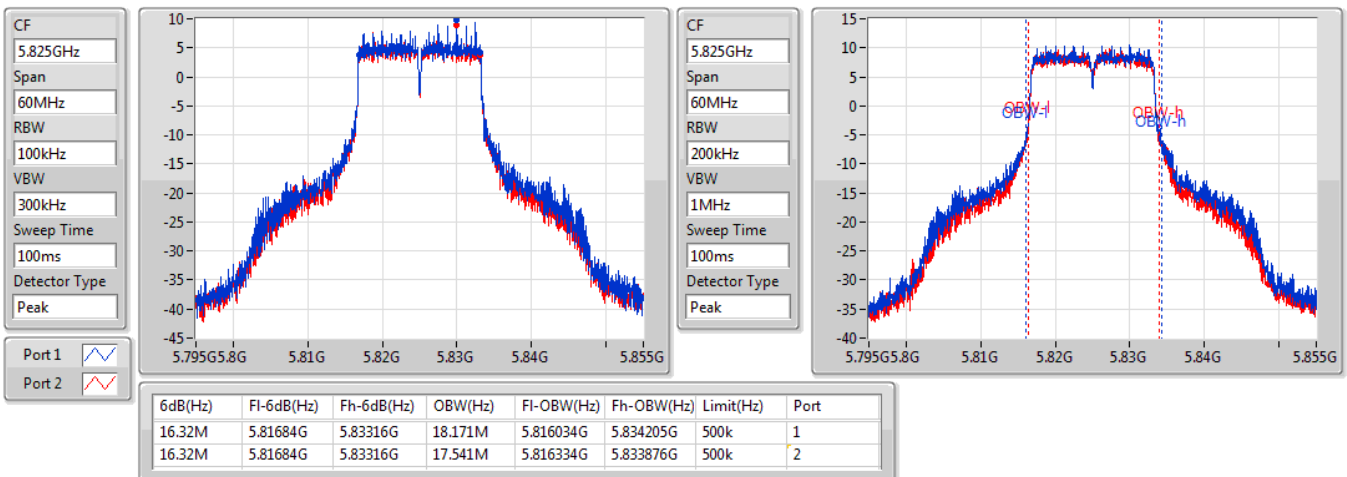


802.11a_Nss1,(6Mbps)_2TX

EBW

5825MHz

17/12/2019

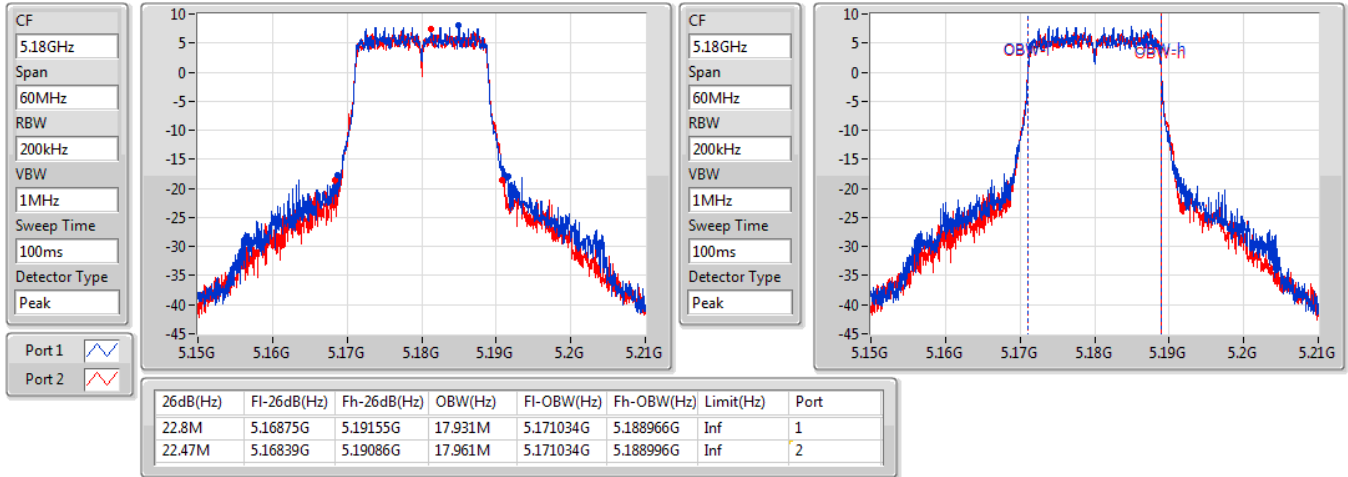


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5180MHz

17/12/2019

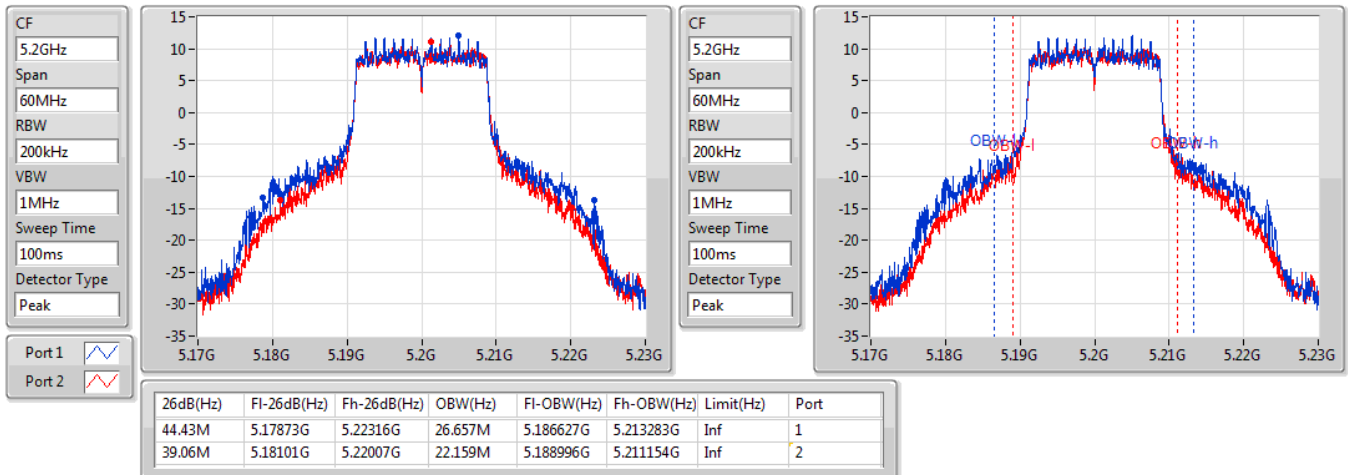


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5200MHz

17/12/2019

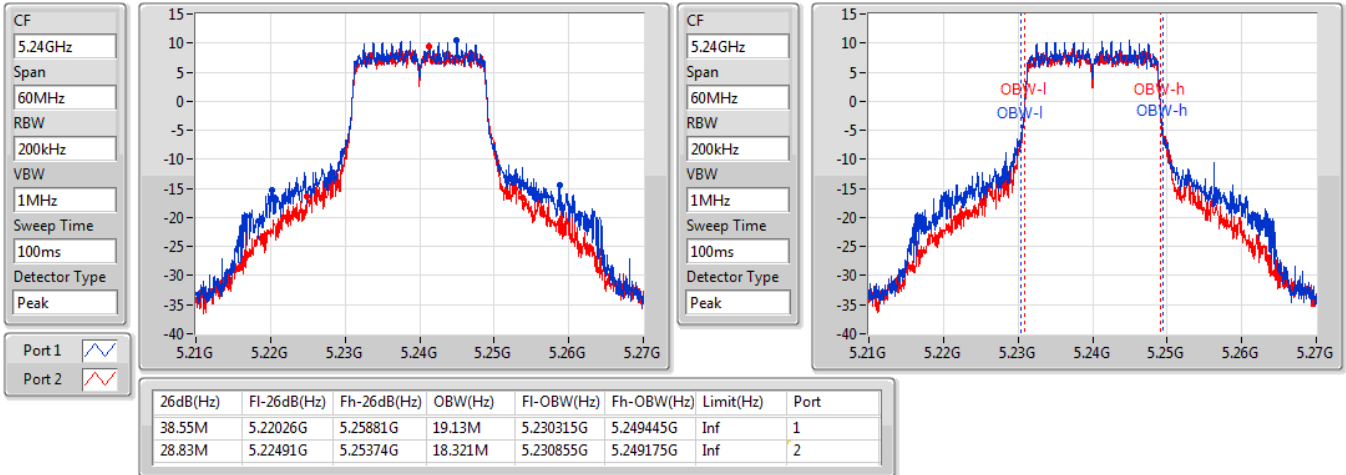


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5240MHz

17/12/2019

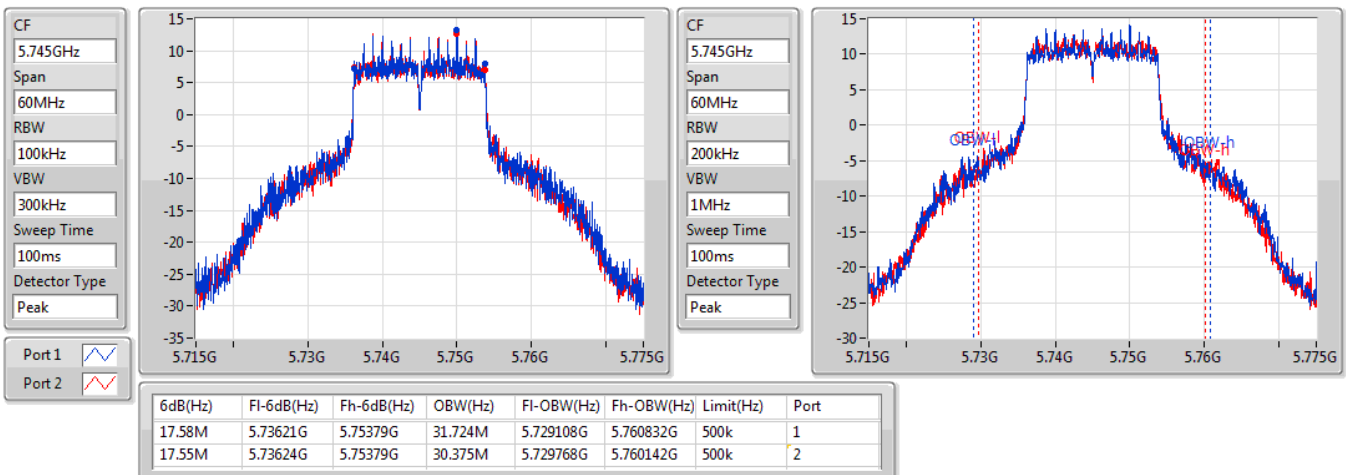


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5745MHz

17/12/2019

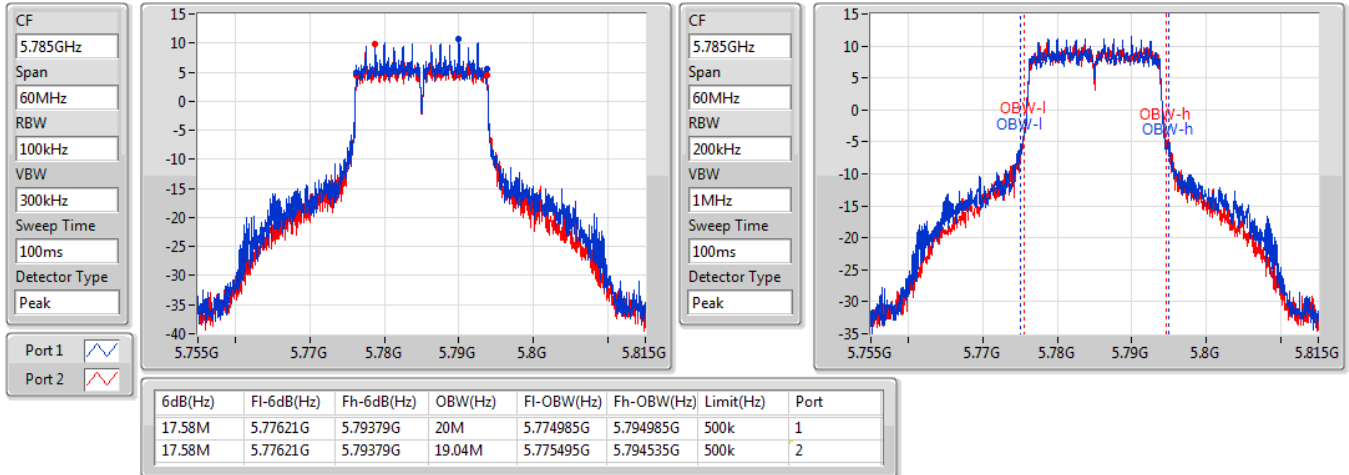


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5785MHz

17/12/2019

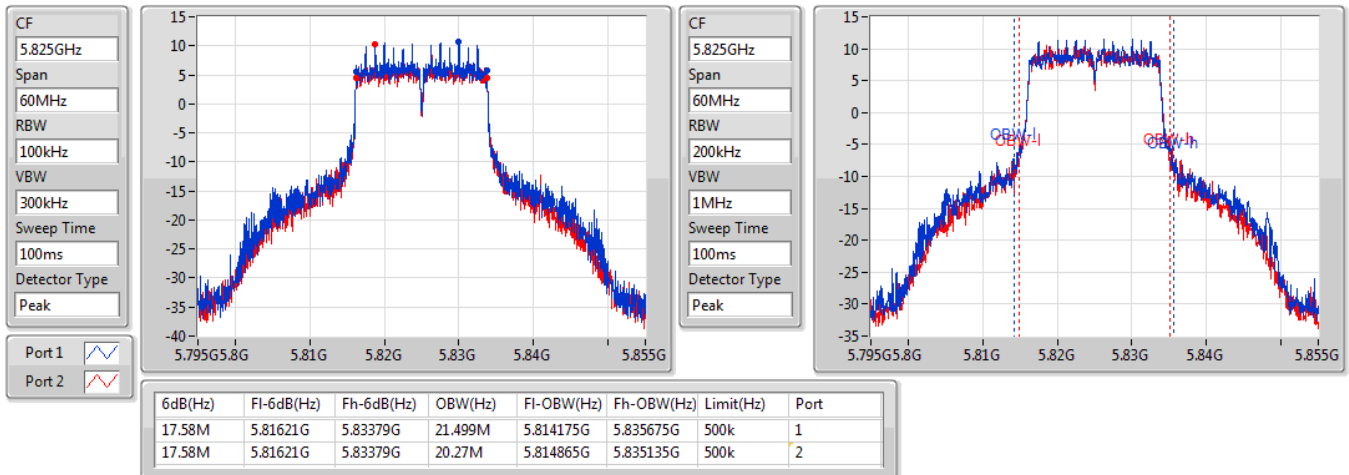


802.11ac VHT20_Nss2,(MCS0)_2TX

EBW

5825MHz

17/12/2019

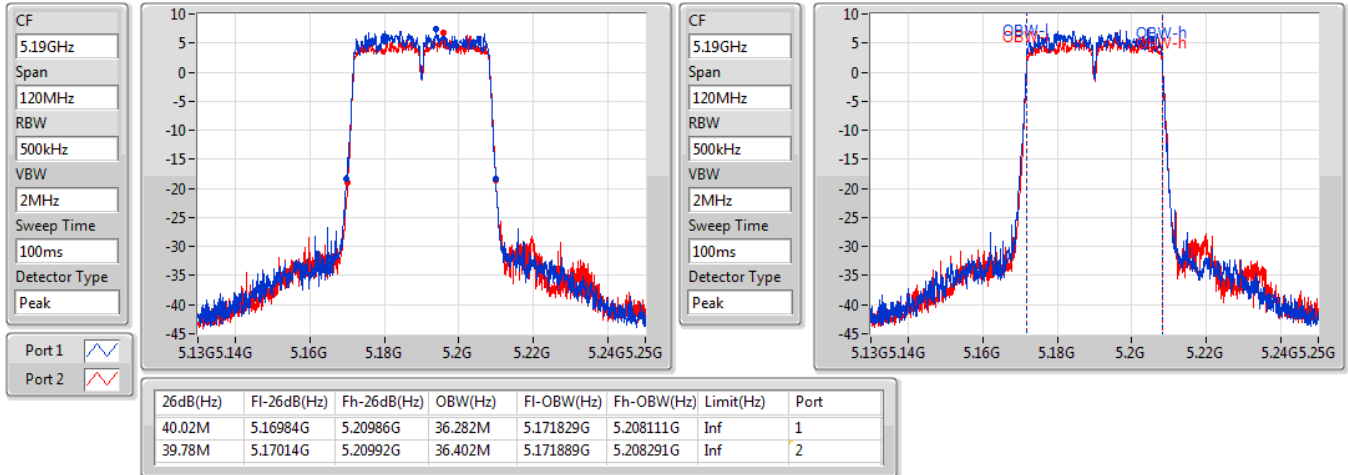


802.11ac VHT40_Nss2,(MCS0)_2TX

EBW

5190MHz

17/12/2019

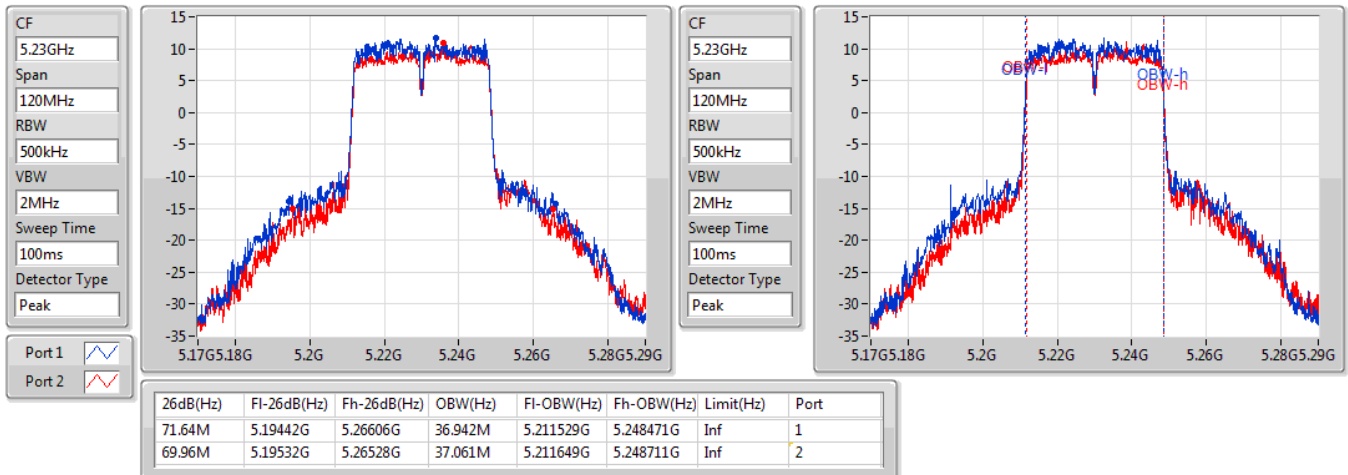


802.11ac VHT40_Nss2,(MCS0)_2TX

EBW

5230MHz

17/12/2019

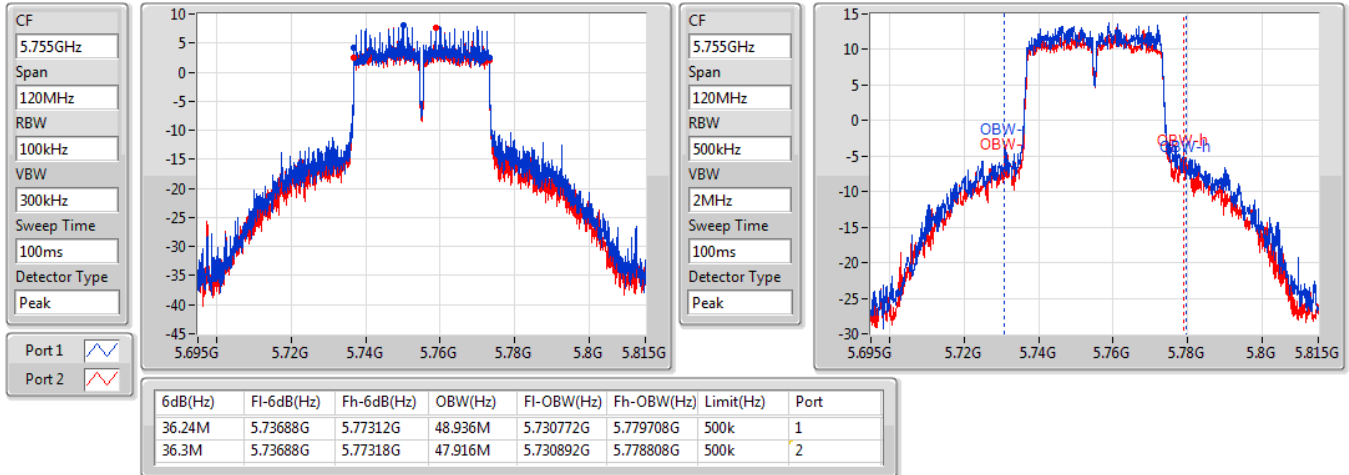


802.11ac VHT40_Nss2,(MCS0)_2TX

EBW

5755MHz

17/12/2019

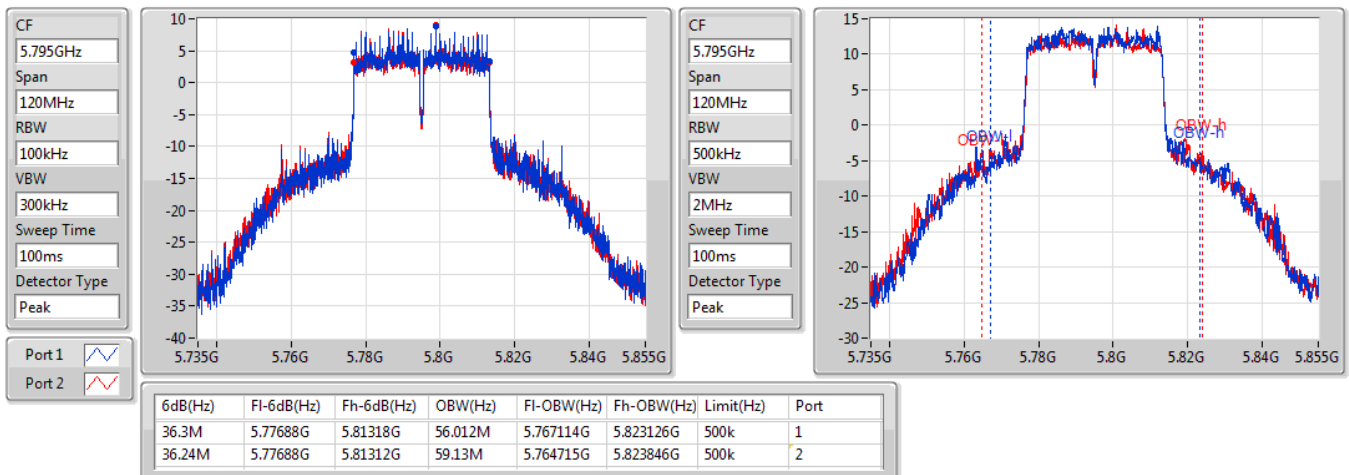


802.11ac VHT40_Nss2,(MCS0)_2TX

EBW

5795MHz

17/12/2019

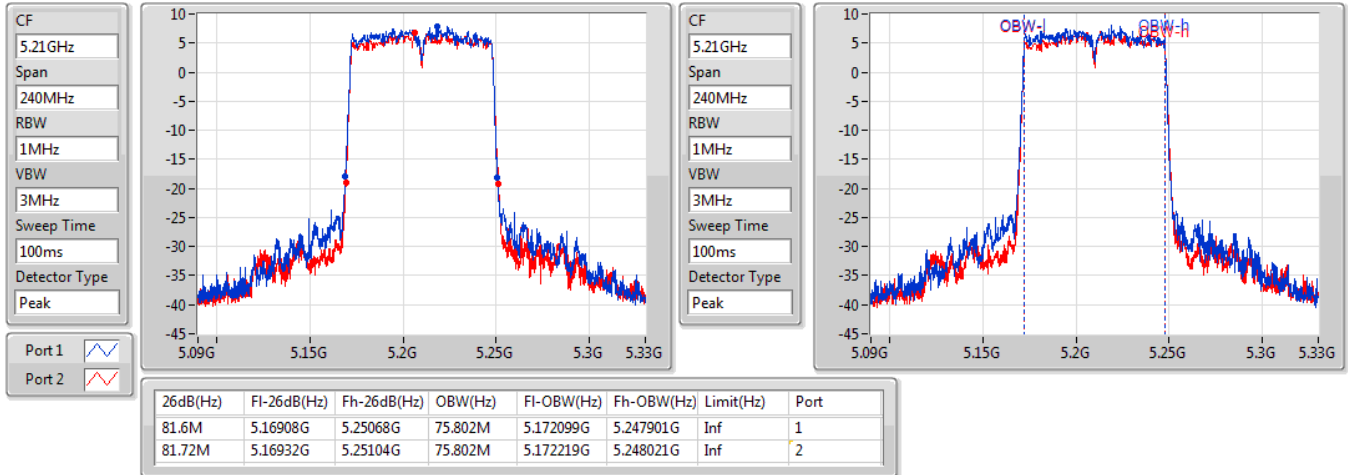


802.11ac VHT80_Nss2,(MCS0)_2TX

EBW

5210MHz

17/12/2019

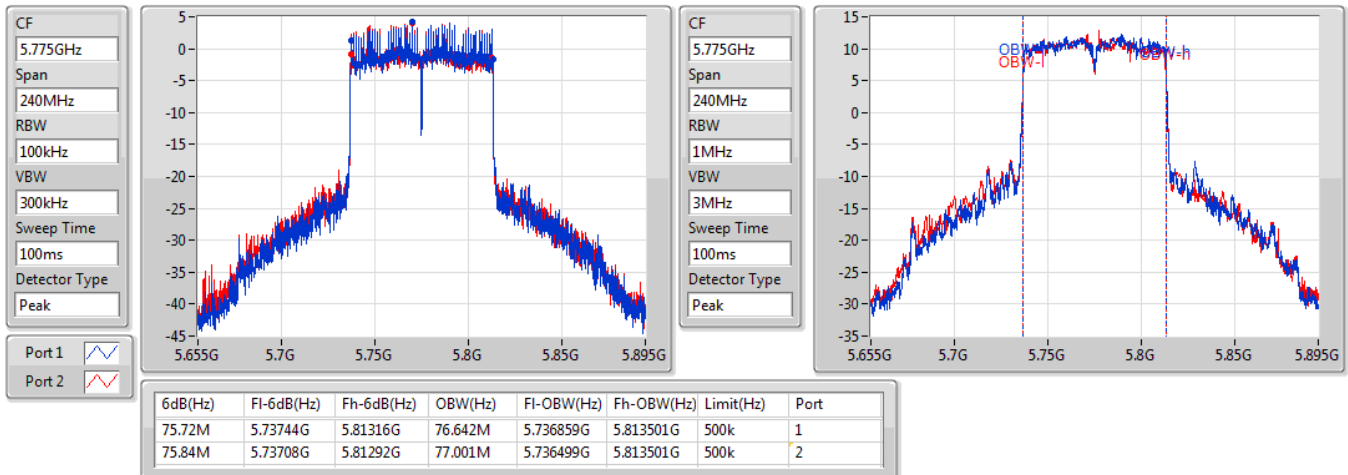


802.11ac VHT80_Nss2,(MCS0)_2TX

EBW

5775MHz

17/12/2019

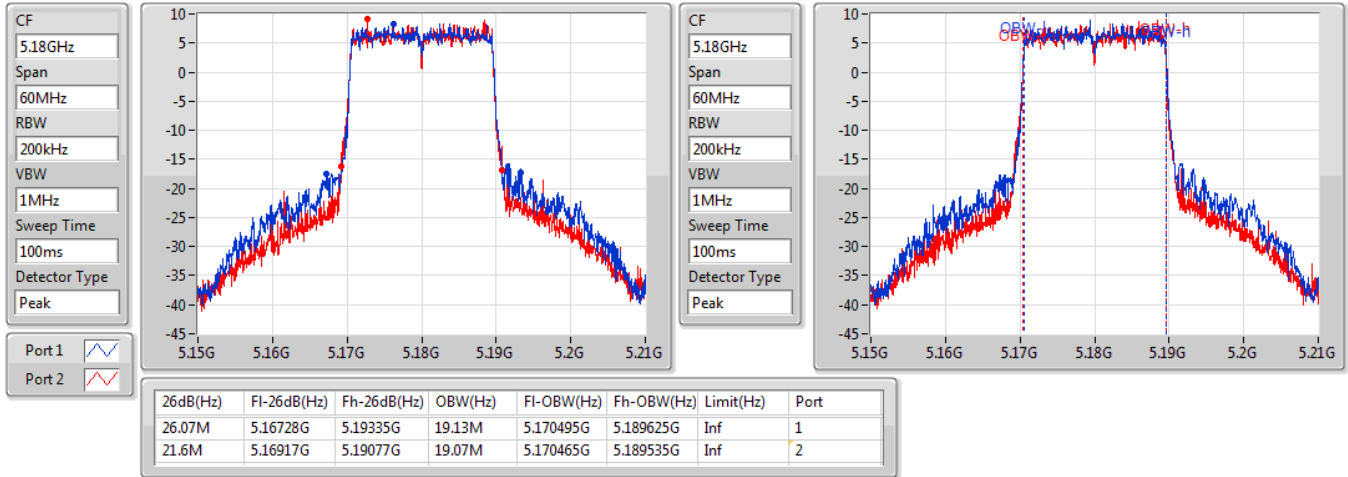


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5180MHz

17/12/2019

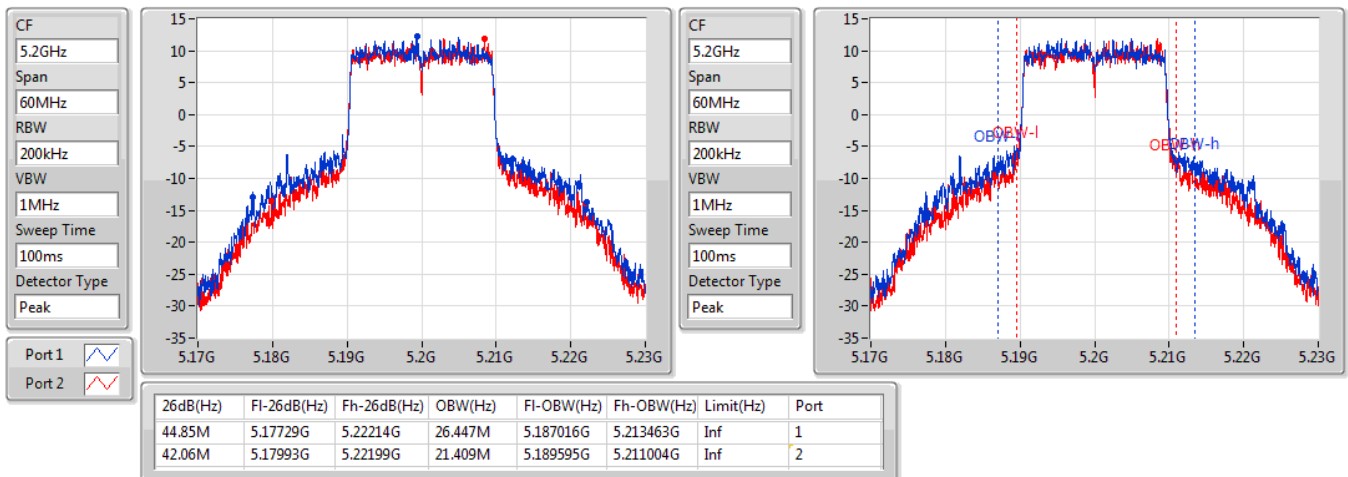


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5200MHz

17/12/2019

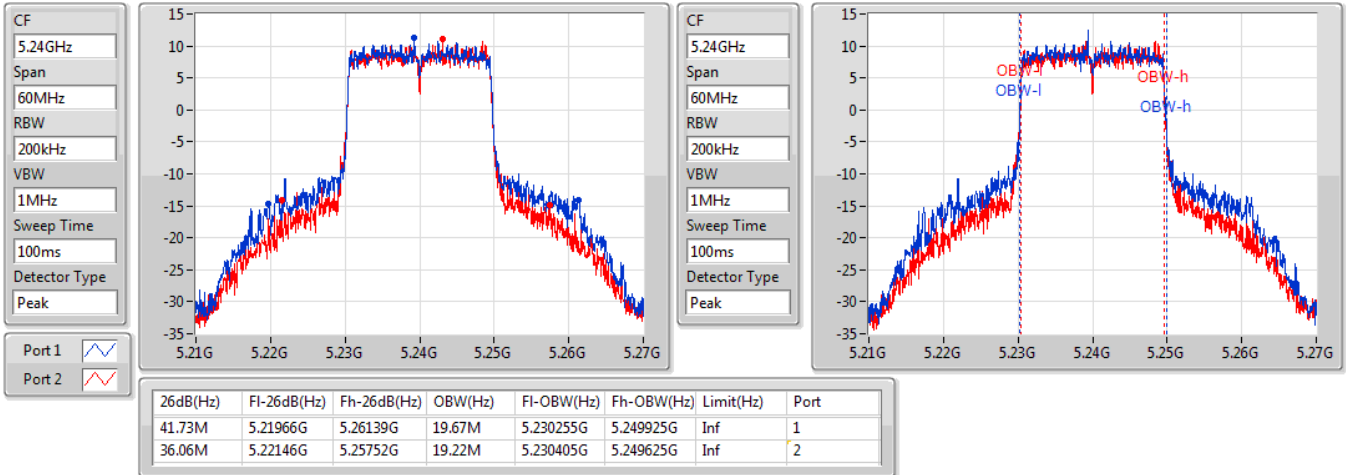


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5240MHz

17/12/2019

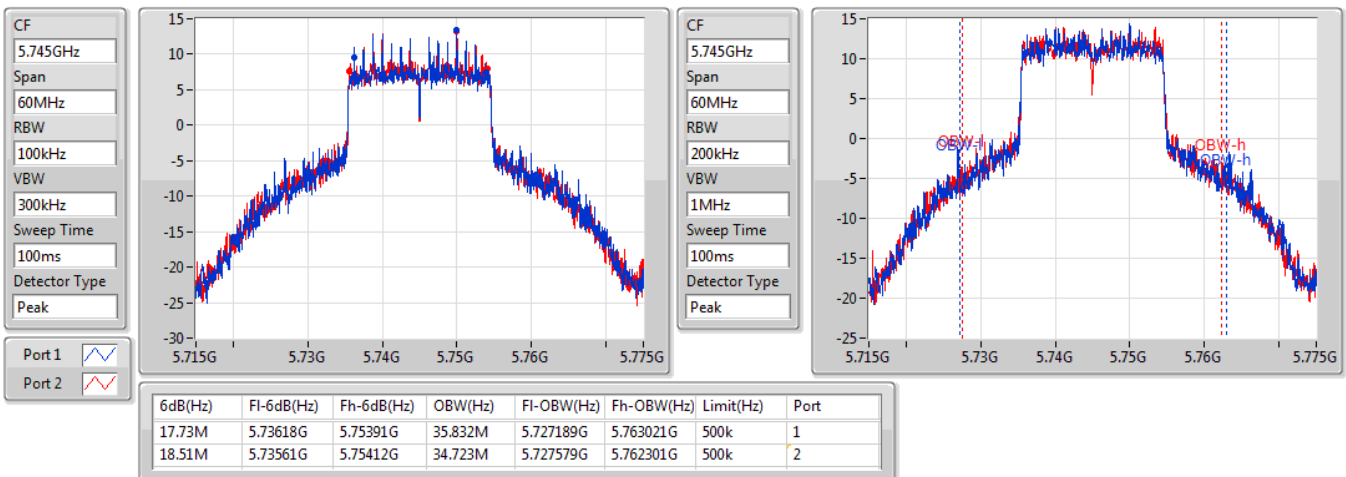


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5745MHz

17/12/2019

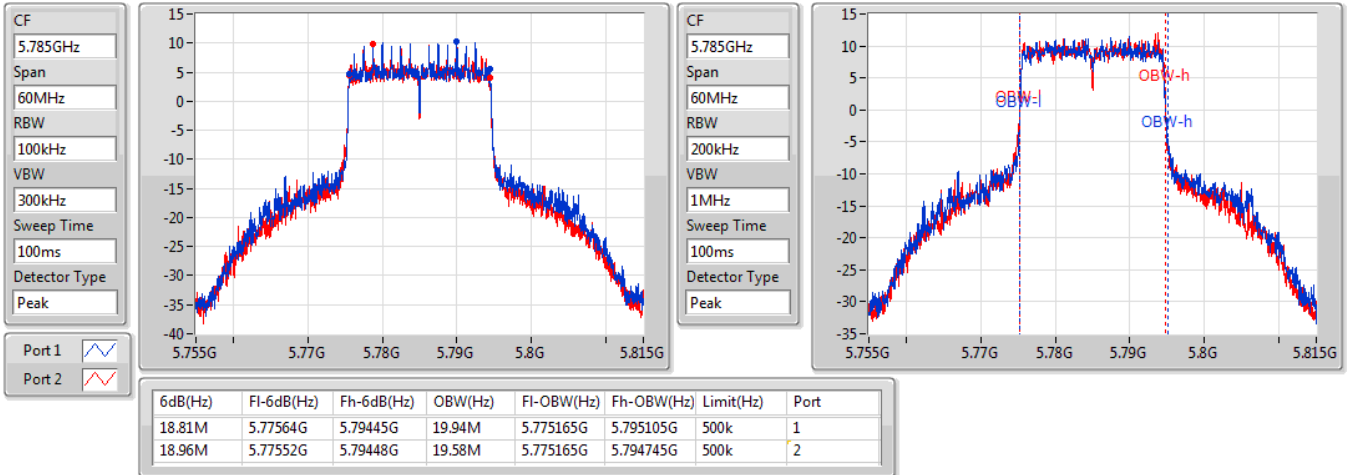


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5785MHz

17/12/2019

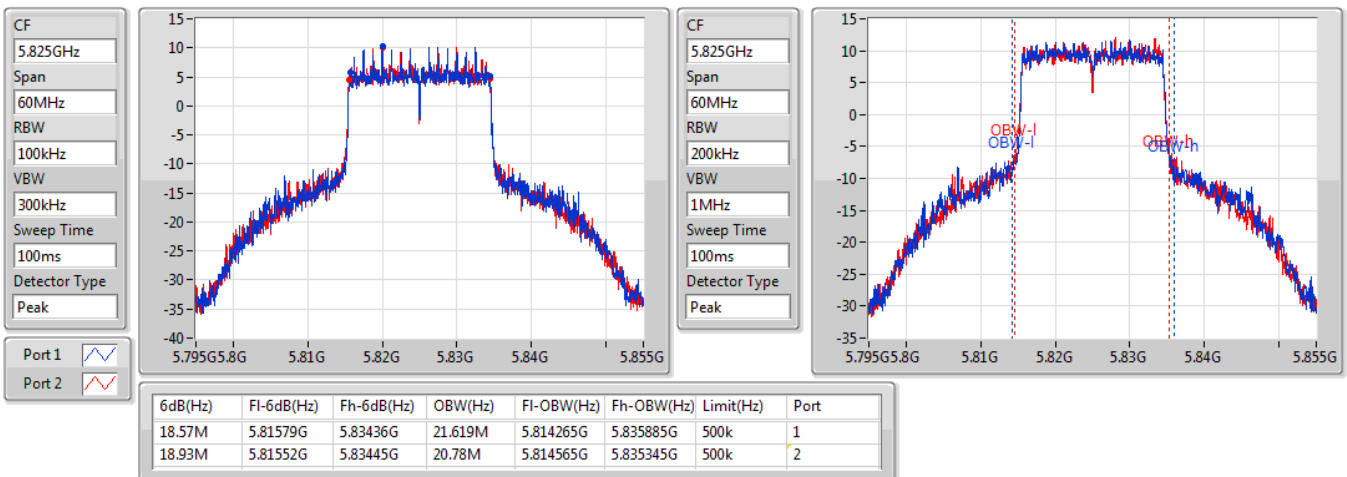


802.11ax HEW20_Nss2,(MCS0)_2TX

EBW

5825MHz

17/12/2019

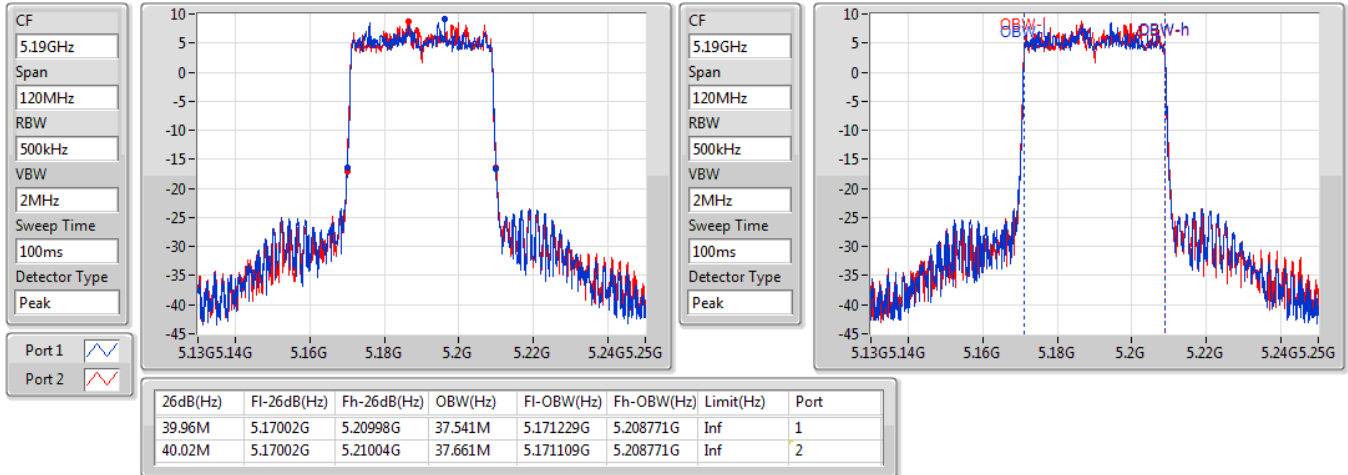


802.11ax HEW40_Nss2,(MCS0)_2TX

EBW

5190MHz

17/12/2019

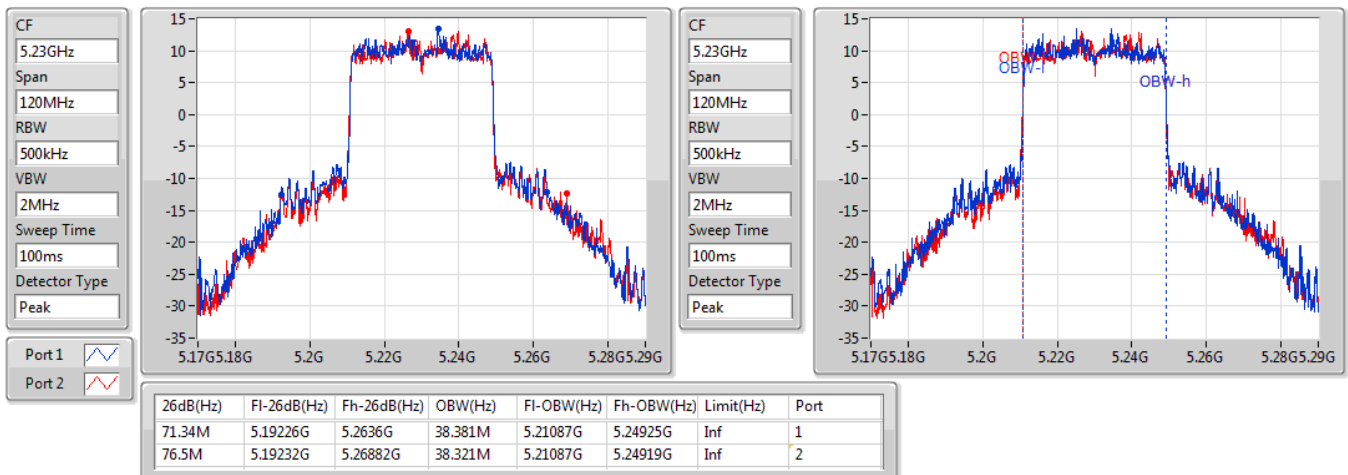


802.11ax HEW40_Nss2,(MCS0)_2TX

EBW

5230MHz

17/12/2019

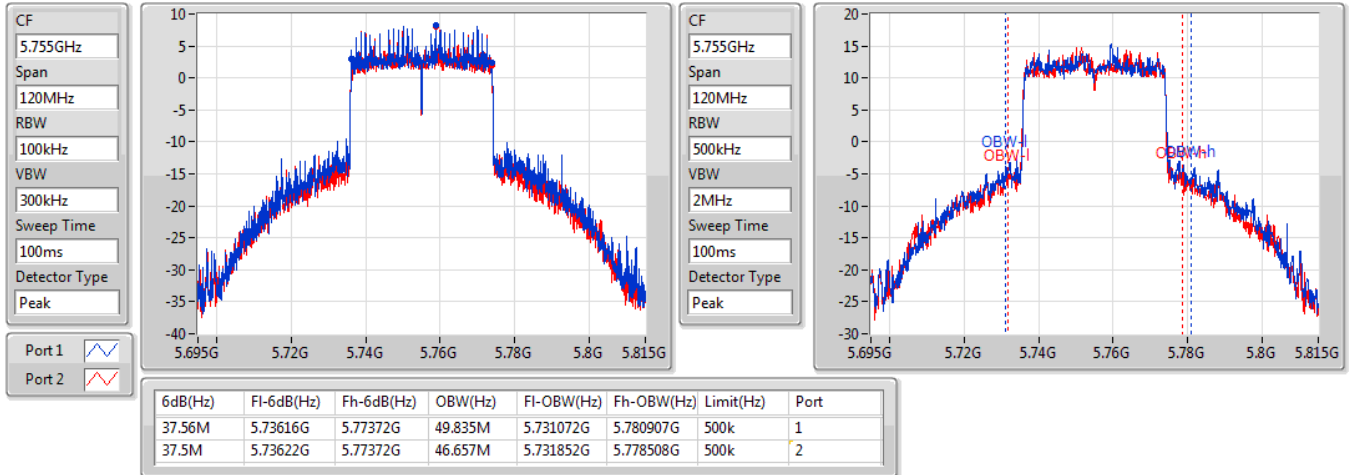


802.11ax HEW40_Nss2,(MCS0)_2TX

EBW

5755MHz

17/12/2019

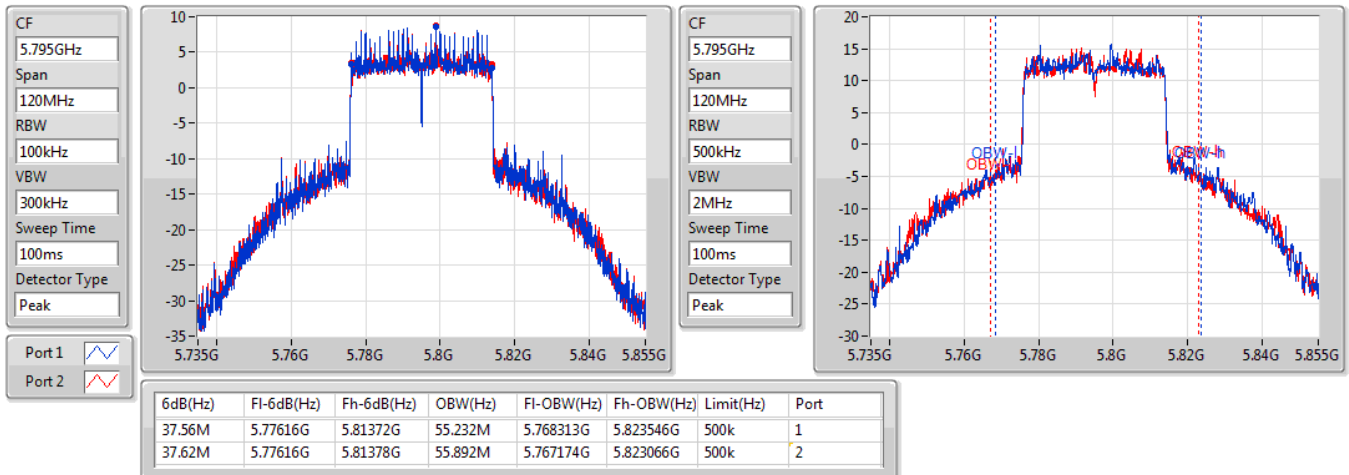


802.11ax HEW40_Nss2,(MCS0)_2TX

EBW

5795MHz

17/12/2019

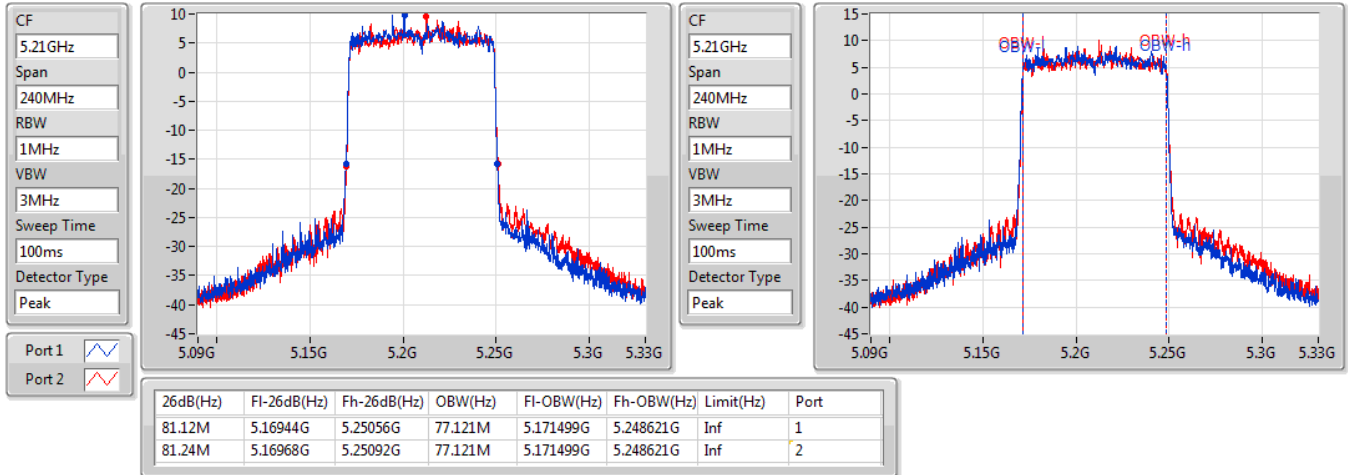


802.11ax HEW80_Nss2,(MCS0)_2TX

EBW

5210MHz

17/12/2019

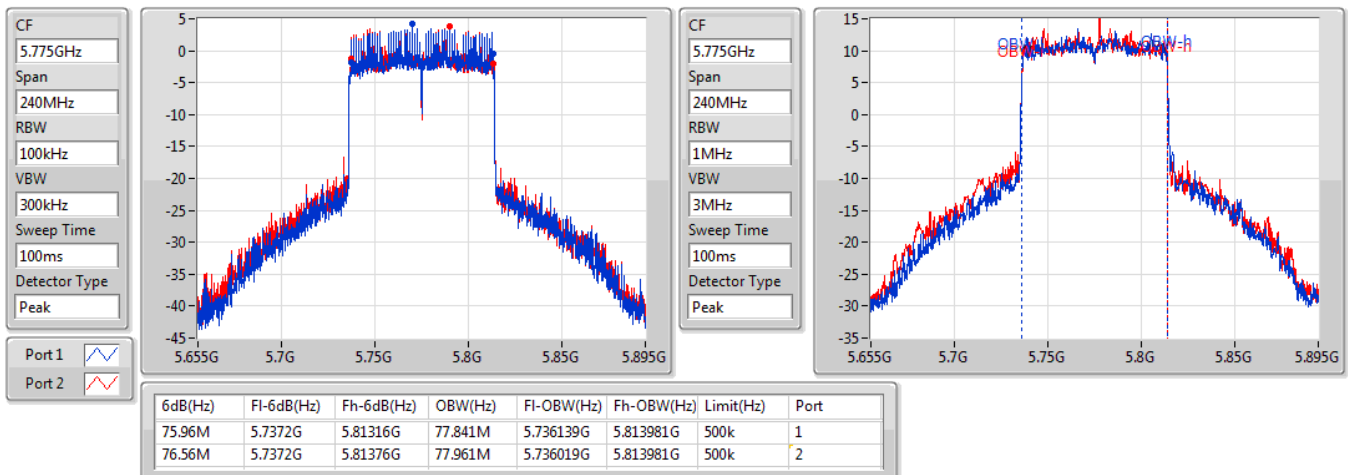


802.11ax HEW80_Nss2,(MCS0)_2TX

EBW

5775MHz

17/12/2019



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)_1TX	42.18M	27.766M	27M8D1D	30.87M	17.121M
802.11ac VHT20_Nss1,(MCS0)_1TX	41.91M	22.429M	22M4D1D	22.95M	17.991M
802.11ac VHT40_Nss1,(MCS0)_1TX	75.48M	37.421M	37M4D1D	40.26M	36.402M
802.11ac VHT80_Nss1,(MCS0)_1TX	81.84M	75.802M	75M8D1D	81.84M	75.802M
802.11ax HEW20_Nss1,(MCS0)_1TX	47.4M	24.378M	24M4D1D	25.8M	19.13M
802.11ax HEW40_Nss1,(MCS0)_1TX	63.18M	38.021M	38M0D1D	40.02M	37.541M
802.11ax HEW80_Nss1,(MCS0)_1TX	81.96M	77.121M	77M1D1D	81.96M	77.121M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	16.35M	40.81M	40M8D1D	16.32M	35.052M
802.11ac VHT20_Nss1,(MCS0)_1TX	17.55M	43.208M	43M2D1D	17.52M	28.426M
802.11ac VHT40_Nss1,(MCS0)_1TX	36.36M	64.108M	64M1D1D	36.3M	59.13M
802.11ac VHT80_Nss1,(MCS0)_1TX	75.12M	76.522M	76M5D1D	75.12M	76.522M
802.11ax HEW20_Nss1,(MCS0)_1TX	18.87M	44.378M	44M4D1D	18.03M	30.555M
802.11ax HEW40_Nss1,(MCS0)_1TX	37.5M	62.309M	62M3D1D	37.38M	55.052M
802.11ax HEW80_Nss1,(MCS0)_1TX	76.56M	77.721M	77M7D1D	76.56M	77.721M

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

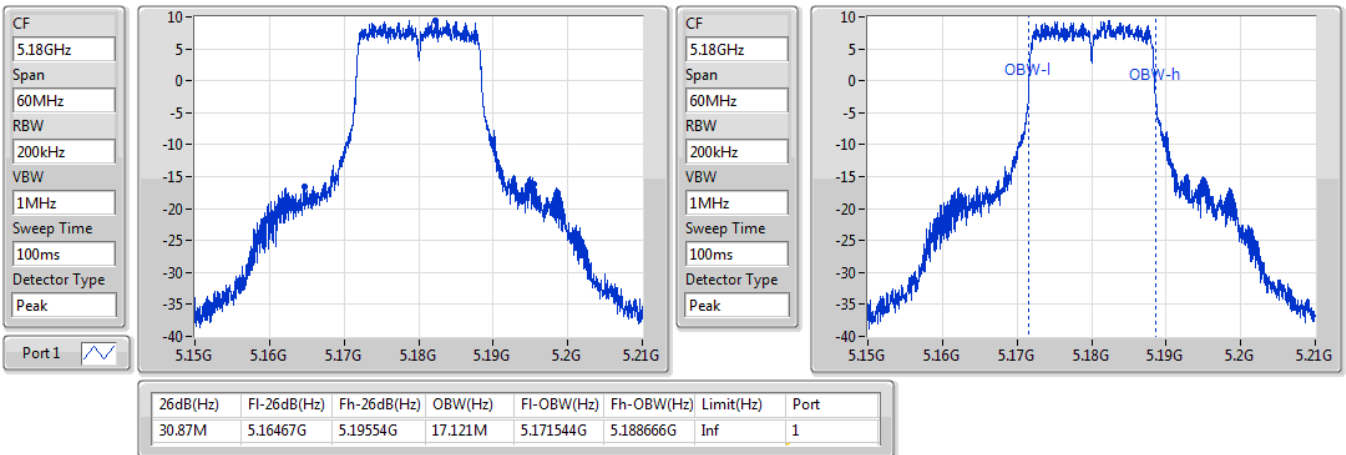
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-
5180MHz	Pass	Inf	30.87M	17.121M
5200MHz	Pass	Inf	42.18M	27.766M
5240MHz	Pass	Inf	37.65M	19.16M
5745MHz	Pass	500k	16.32M	35.052M
5785MHz	Pass	500k	16.32M	40.81M
5825MHz	Pass	500k	16.35M	40.3M
802.11ac VHT20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz	Pass	Inf	22.95M	17.991M
5200MHz	Pass	Inf	41.91M	22.429M
5240MHz	Pass	Inf	37.17M	18.891M
5745MHz	Pass	500k	17.55M	28.426M
5785MHz	Pass	500k	17.52M	43.208M
5825MHz	Pass	500k	17.55M	31.064M
802.11ac VHT40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz	Pass	Inf	40.26M	36.402M
5230MHz	Pass	Inf	75.48M	37.421M
5755MHz	Pass	500k	36.36M	59.13M
5795MHz	Pass	500k	36.3M	64.108M
802.11ac VHT80_Nss1,(MCS0)_1TX	-	-	-	-
5210MHz	Pass	Inf	81.84M	75.802M
5775MHz	Pass	500k	75.12M	76.522M
802.11ax HEW20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz	Pass	Inf	25.8M	19.13M
5200MHz	Pass	Inf	47.4M	24.378M
5240MHz	Pass	Inf	41.16M	19.82M
5745MHz	Pass	500k	18.87M	30.555M
5785MHz	Pass	500k	18.03M	44.378M
5825MHz	Pass	500k	18.45M	31.244M
802.11ax HEW40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz	Pass	Inf	40.02M	37.541M
5230MHz	Pass	Inf	63.18M	38.021M
5755MHz	Pass	500k	37.38M	55.052M
5795MHz	Pass	500k	37.5M	62.309M
802.11ax HEW80_Nss1,(MCS0)_1TX	-	-	-	-
5210MHz	Pass	Inf	81.96M	77.121M
5775MHz	Pass	500k	76.56M	77.721M

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

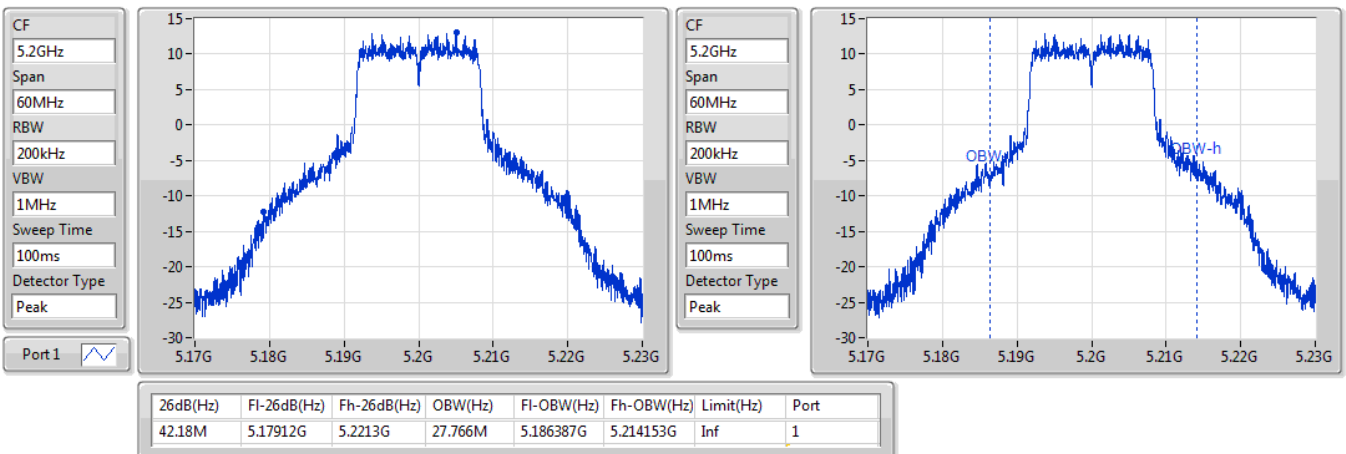
Port X-OBW = Port X 99% occupied bandwidth;

802.11a_Nss1,(6Mbps)_1TX
EBW
5180MHz

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802.11a_Nss1,(6Mbps)_1TX
EBW
5200MHz

18/12/2019

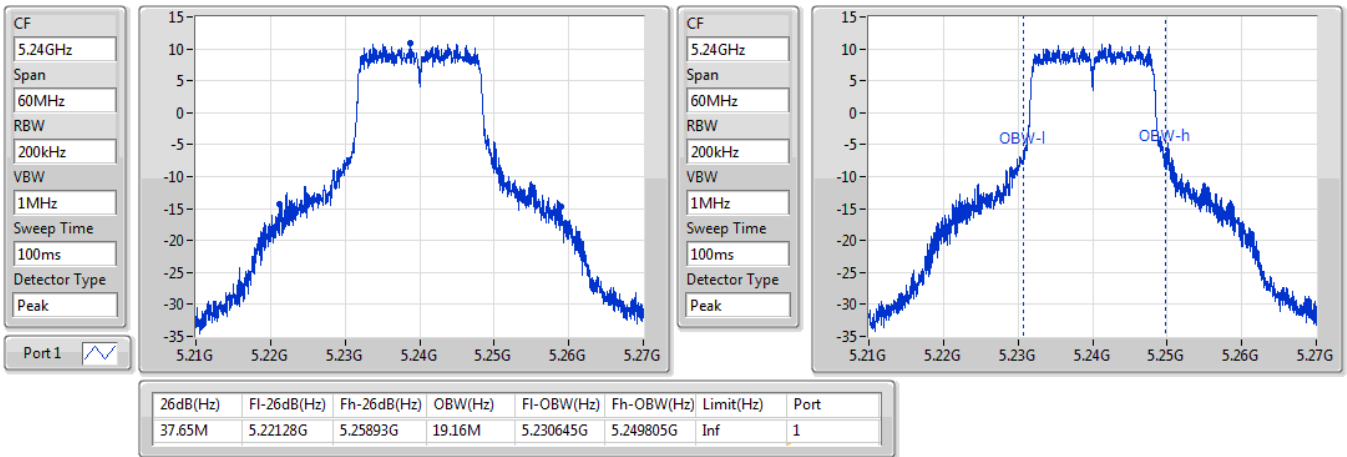


802.11a_Nss1,(6Mbps)_1TX

EBW

5240MHz

18/12/2019

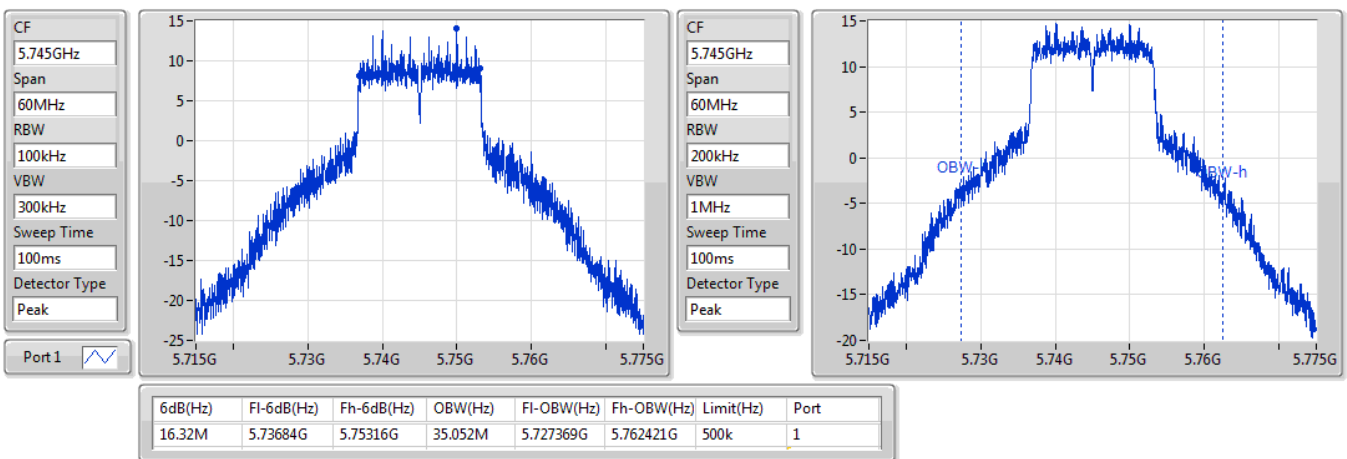


802.11a_Nss1,(6Mbps)_1TX

EBW

5745MHz

18/12/2019

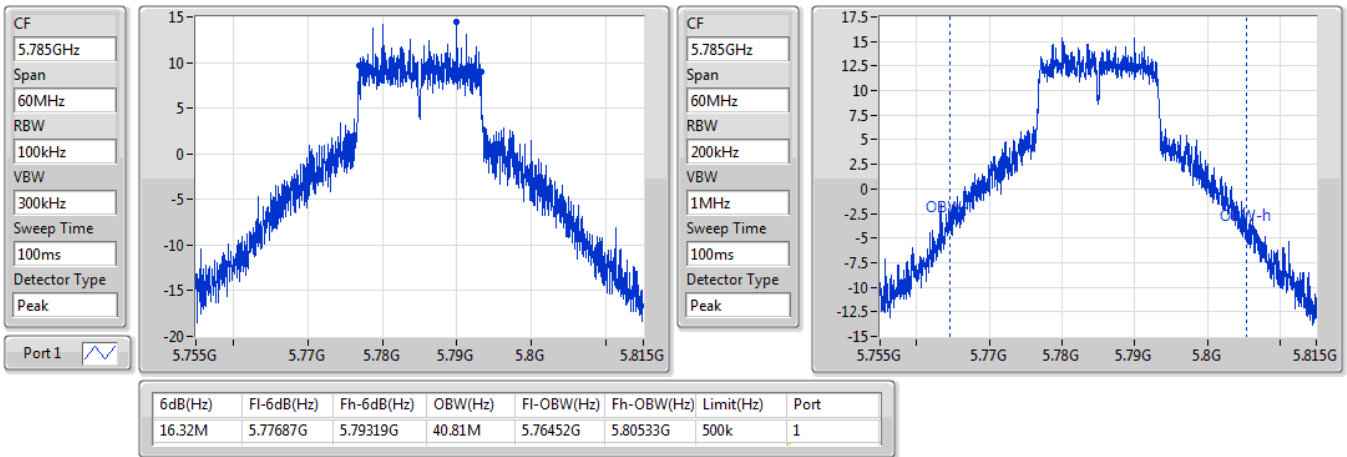


802.11a_Nss1,(6Mbps)_1TX

EBW

5785MHz

18/12/2019

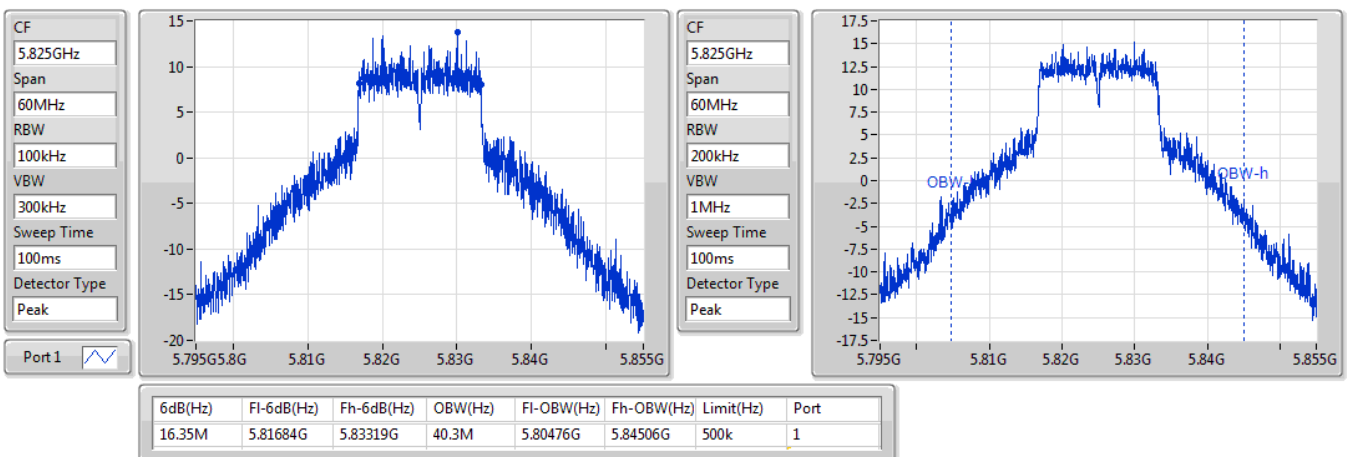


802.11a_Nss1,(6Mbps)_1TX

EBW

5825MHz

18/12/2019

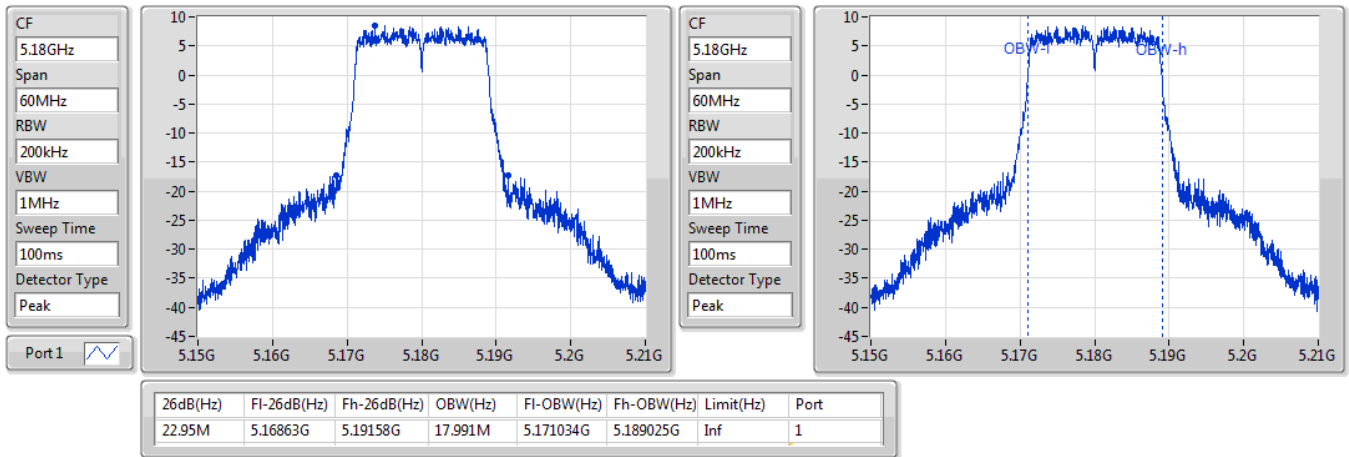


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5180MHz

18/12/2019

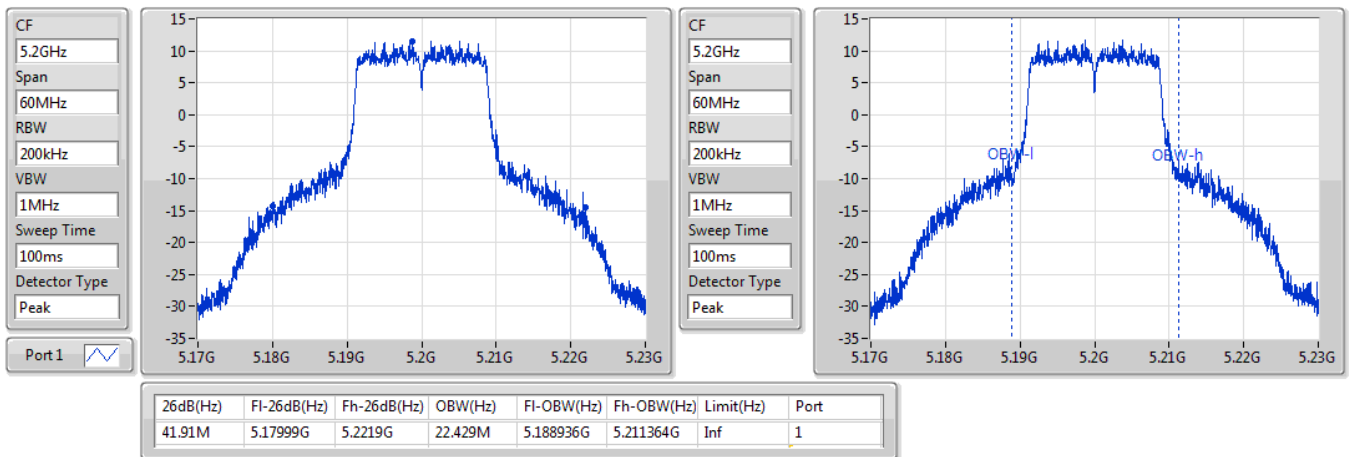


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5200MHz

18/12/2019

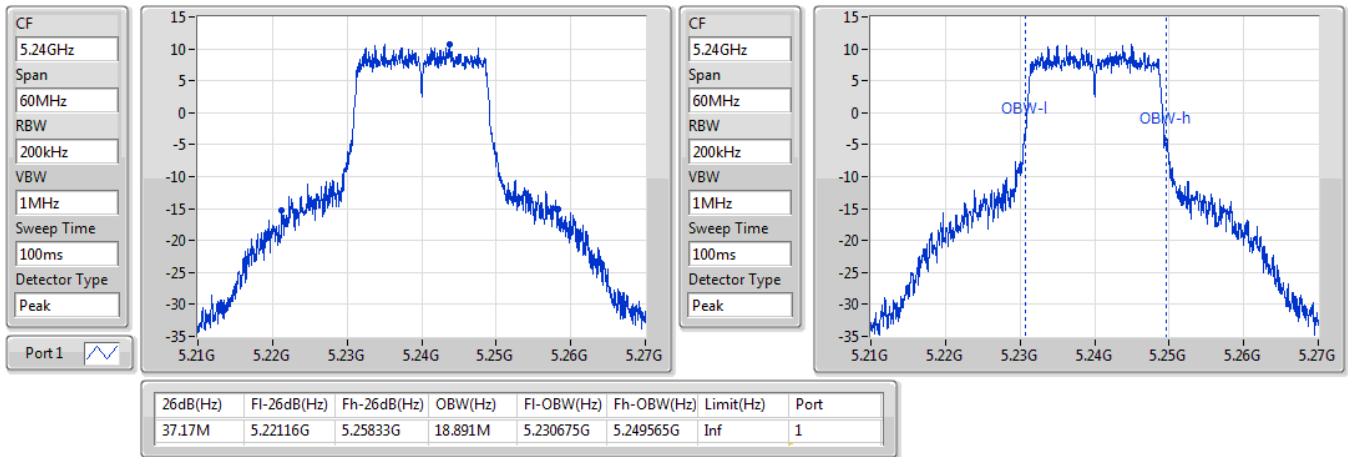


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5240MHz

18/12/2019

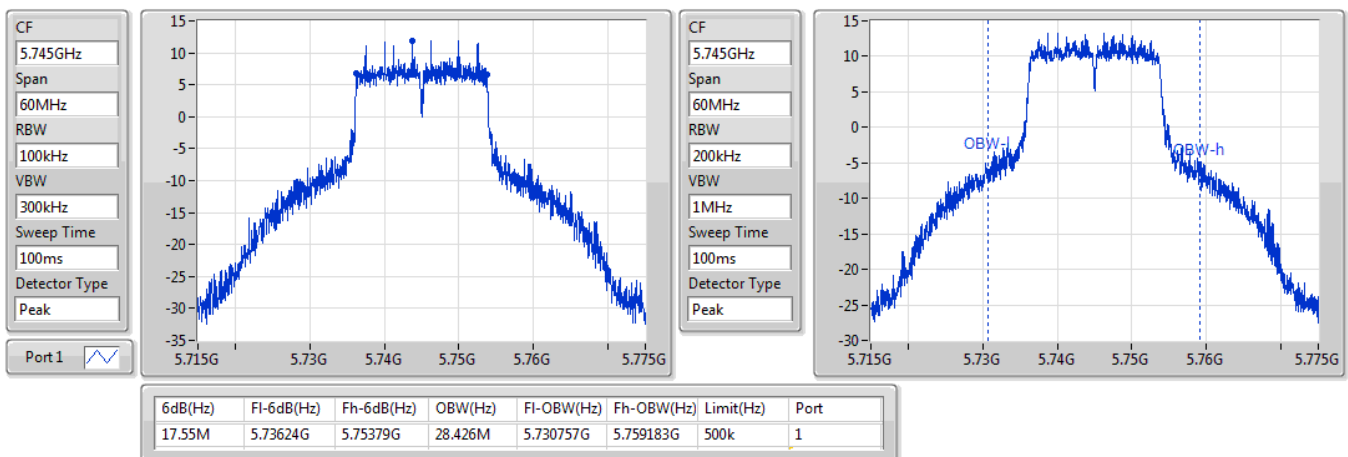


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5745MHz

18/12/2019

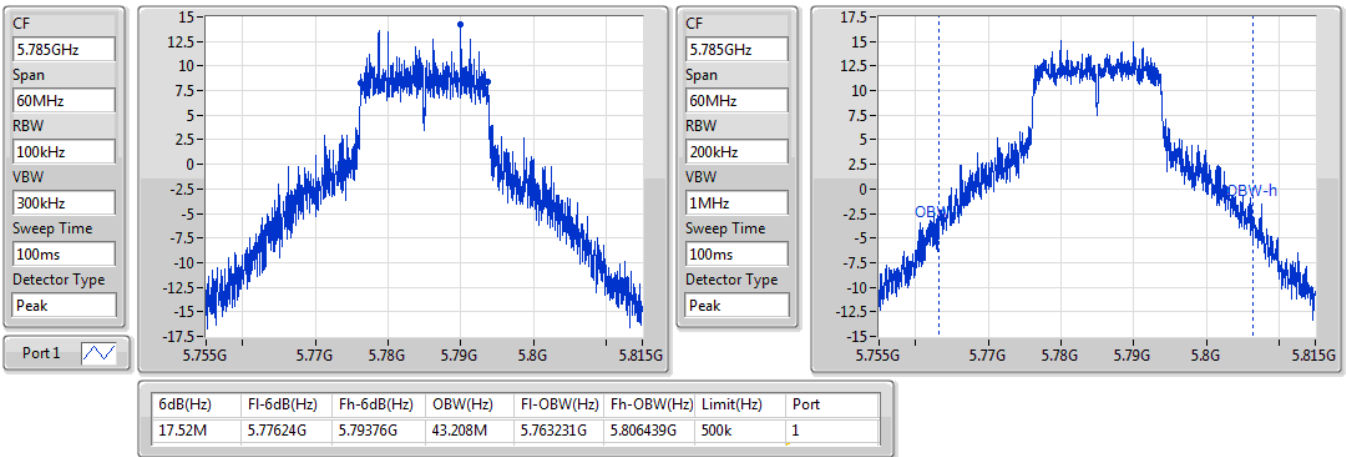


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5785MHz

18/12/2019

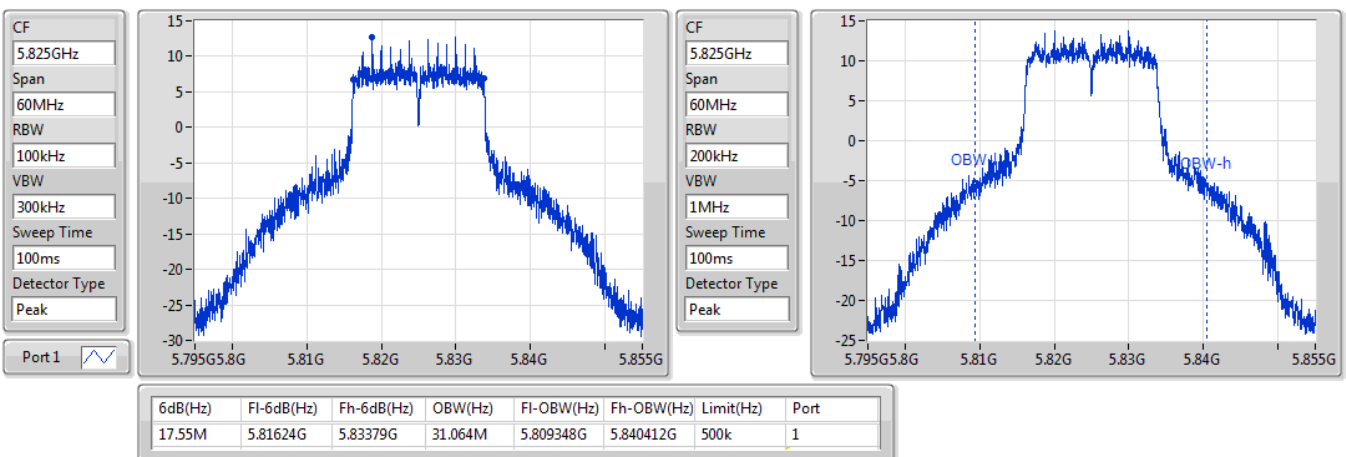


802.11ac VHT20_Nss1,(MCS0)_1TX

EBW

5825MHz

18/12/2019

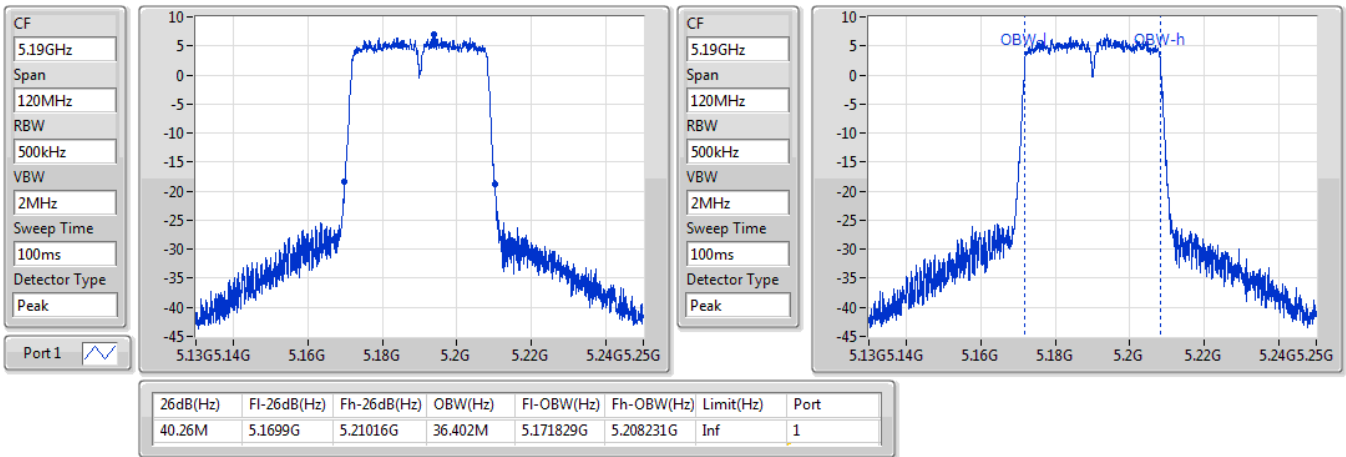


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

5190MHz

18/12/2019

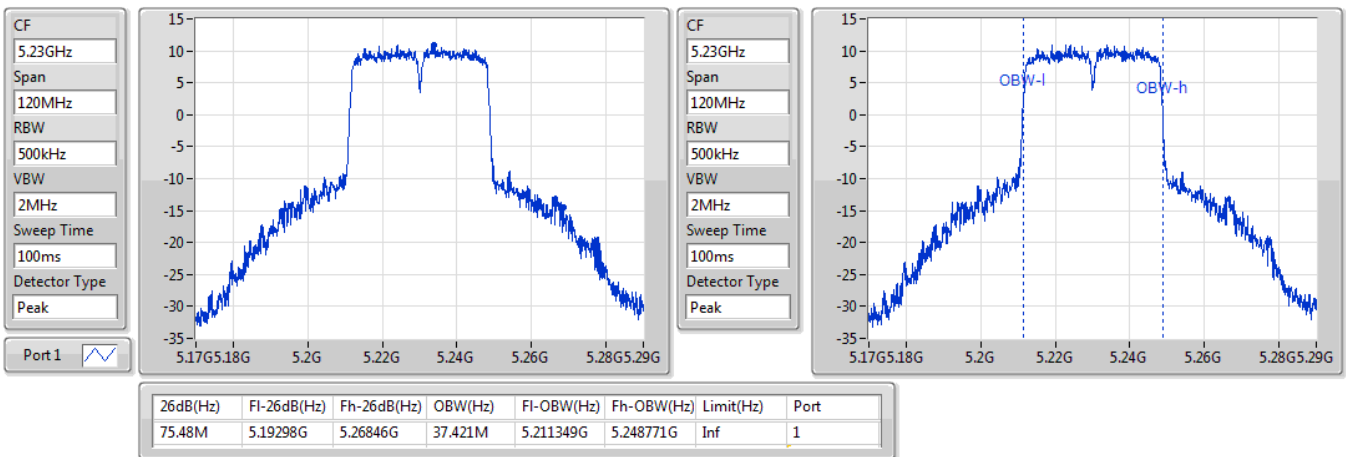


802.11ac VHT40_Nss1,(MCS0)_1TX

EBW

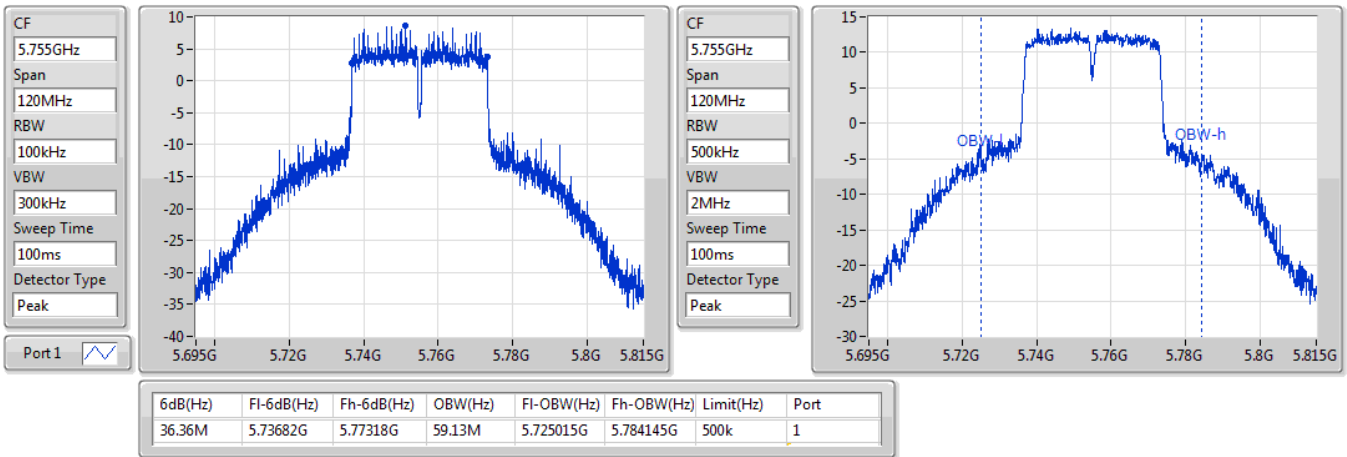
5230MHz

18/12/2019



802.11ac VHT40_Nss1,(MCS0)_1TX
EBW
5755MHz

18/12/2019


802.11ac VHT40_Nss1,(MCS0)_1TX
EBW
5795MHz

18/12/2019

