



FCC Test Report

FCC ID : TVE-3417T0966

Equipment : Secured Wireless Access Point

Brand Name : FORTINET

Model Name : FortiAP 23JFxxxxxx, FAP-23JFxxxxxx,
FORTIAP-23JFxxxxxx
(where "x" can be "A-Z", or "0-9", or "-", or blank for
software purposes or marketing purposes only)

Applicant : Fortinet, Inc.
899 Kifer Road, Sunnyvale, CA 94086, USA

Manufacturer : Fortinet, Inc.
899 Kifer Road, Sunnyvale, CA 94086, USA

Standard : 47 CFR FCC Part 15.247

The product was received on Oct. 27, 2020, and testing was started from Nov. 03, 2020 and completed on Jan. 21, 2021. 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 test results in this 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: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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[illegible]

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	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	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 EUT supports beamforming and CDD modes, and the CDD mode is the worse case. Therefore, all test items are evaluated in the report. The beamforming mode only evaluateds the output power.

Reviewed by: Sam Tsai

Report Producer: Debby Hung

1 General Description

1.1 Information

Radio	Function	Beamforming Mode
0	2.4G	Support
1	5G	Support
2	2.4G & 5G(Scanning Radio)	N/A
3	Bluetooth & Zigbee	N/A

1.1.1 RF General Information

Radio 0

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20, ax(HEW20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40, ax(HEW40)	2422-2452	3-9 [7]

Radio 2

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40)	2422-2452	3-9 [7]

Non-Beamforming

Radio 0

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX
2.4-2.4835GHz	VHT20	20	2TX
2.4-2.4835GHz	VHT40	40	2TX
2.4-2.4835GHz	802.11ax HEW20	20	2TX
2.4-2.4835GHz	802.11ax HEW40	40	2TX

Radio 2

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	1TX
2.4-2.4835GHz	802.11g	20	1TX
2.4-2.4835GHz	802.11n HT20	20	1TX
2.4-2.4835GHz	802.11n HT40	40	1TX

**Beamforming
Radio 0**

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11ax HEW20-BF	20	2TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	2TX

Note:

- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	Senao	5718A0566300	Dipole	I-PEX
2	Senao	5718A0567300	Dipole	I-PEX
3	Senao	5718A0568300	Dipole	I-PEX
4	Senao	5718A0569300	Dipole	I-PEX

Ant.	2.4GHz		5GHz		BTLE/Zigbee	Remark
	Antenna Gain(dBi)	Beamforming Gain(dBi)	Antenna Gain(dBi)	Beamforming Gain(dBi)	Antenna Gain(dBi)	
1	4.17	3.01	4.35	3.01	-	Radio 0,1
2	3.74		3.84		-	Radio 0,1
3	3.99	-	4.16	-	-	Radio 2
4	-	-	-	-	3.63	Radio 3

For 2.4 GHz function:

Radio 0

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

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

Radio 2

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

Ant. 3 could transmit/receive.

For 5 GHz function:

Radio 1

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

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

Radio 2

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

Ant. 3 could transmit/receive.

For Bluetooth/Zigbee function:

Radio 3

For Bluetooth/Zigbee mode (1TX/1RX)

Only Ant. 4 can be used as transmitting/receiving.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From PoE / Adapter			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point
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 Mode Test Duty Cycle

Non-Beamforming Radio 0

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b_Nss1,(1Mbps)_2TX	0.641	1.93	689.375u	3k
802.11g_Nss1,(6Mbps)_2TX	0.943	0.25	1.978m	1k
802.11n HT20_Nss1,(MCS0)_2TX	0.948	0.23	5.429m	300
802.11n HT40_Nss1,(MCS0)_2TX	0.906	0.43	5.43m	300
VHT20_Nss1,(MCS0)_2TX	0.947	0.24	5.429m	300
VHT40_Nss1,(MCS0)_2TX	0.851	0.7	5.429m	300
802.11ax HEW20_Nss1,(MCS0)_2TX	0.959	0.18	5.448m	300
802.11ax HEW40_Nss1,(MCS0)_2TX	0.943	0.25	5.448m	300

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

Non-Beamforming Radio 2

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b_Nss1,(1Mbps)_1TX	0.984	0.07	12.209m	10
802.11g_Nss1,(6Mbps)_1TX	0.95	0.22	2.029m	1k
802.11n HT20_Nss1,(MCS0)_1TX	0.942	0.26	1.889m	1k
802.11n HT40_Nss1,(MCS0)_1TX	0.885	0.53	929.375u	3k

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

1.1.5 Table for Multiple Listing

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

Brand Name	Model Name	Description
FORTINET	FortiAP 23JFxxxxxx	All the models are identical, the difference model for difference brand served as marketing strategy.
	FAP-23JFxxxxxx	
	FORTIAP-23JFxxxxxx	

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

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

- ♦ KDB 558074 D01 v05r02
- ♦ KDB 662911 D01 v02r01
- ♦ KDB 414788 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
Test site Designation No. TW1190 with FCC.			
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			
☐	Wen Shan	ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
		TEL : 886-3-318-0787	FAX : 886-3-318-0287
Test site Designation No. TW1097 with FCC.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward	21.2~23.5°C / 59~63%	21/Nov/2020
RF Conducted	TH06-HY	Alan	20.1~26.9°C / 50~60%	05/Nov/2020~21/Jan/2021
Radiated	03CH02-HY	Daniel	20.7~26.1°C / 51~66%	03/Nov/2020~13/Jan/2021
Radiated (Co-location)	03CH02-HY	Daniel	20.3~25.8°C / 53~68%	18/Jan/2021

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)	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%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	120V

2.2 Test Channel Mode

Test Software Version	QSPR V5.0-00188
-----------------------	-----------------

Non-Beamforming Radio 0

Mode	Power Setting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	26
2437MHz	24
2462MHz	24
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	23.5
2417MHz	24.5
2437MHz	24
2457MHz	23
2462MHz	22.5
802.11n HT20_Nss1,(MCS0)_2TX	-
2412MHz	22
2417MHz	24
2437MHz	24
2457MHz	23
2462MHz	22.5
802.11n HT40_Nss1,(MCS0)_2TX	-
2422MHz	22
2437MHz	21.5
2447MHz	20
2452MHz	19.5
VHT20_Nss1,(MCS0)_2TX	-
2412MHz	22
2417MHz	24



Mode	Power Setting
2437MHz	24
2457MHz	23
2462MHz	22.5
VHT40_Nss1,(MCS0)_2TX	-
2422MHz	22
2437MHz	21.5
2447MHz	20
2452MHz	19.5
802.11ax HEW20_Nss1,(MCS0)_2TX	-
2412MHz	22
2417MHz	24
2437MHz	24
2457MHz	23
2462MHz	22.5
802.11ax HEW40_Nss1,(MCS0)_2TX	-
2422MHz	22
2437MHz	21.5
2447MHz	20
2452MHz	19.5

**Non-Beamforming
Radio 2**

Mode	Power Setting
802.11b_Nss1,(1Mbps)_1TX	-
2412MHz	23
2437MHz	23
2462MHz	23
802.11g_Nss1,(6Mbps)_1TX	-
2412MHz	19
2417MHz	23
2437MHz	23
2457MHz	22.5
2462MHz	19
802.11n HT20_Nss1,(MCS0)_1TX	-
2412MHz	18.5
2417MHz	23
2437MHz	23
2457MHz	22.5
2462MHz	18.5
802.11n HT40_Nss1,(MCS0)_1TX	-
2422MHz	15.5
2427MHz	19.5
2437MHz	19.5
2447MHz	18
2452MHz	16.5

**Beamforming
Radio 0**

Mode	Power Setting
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
2412MHz	22
2417MHz	24
2437MHz	24
2457MHz	23
2462MHz	22.5
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
2422MHz	22
2437MHz	21.5
2447MHz	20
2452MHz	19.5

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	Adapter mode
2	PoE mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
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	Adapter mode		
2	PoE mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	



The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	CTX
1	Radio 0 :2.4G + Radio 1:5G
Refer to Appendix G for Radiated Emission Co-location.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	CTX
1	Radio 0:2.4G + Radio 1:5G + Radio 2:2.4G + Bluetooth
2	Radio 0:2.4G + Radio 1:5G + Radio 2:5G + Bluetooth
3	Radio 0:2.4G + Radio 1:5G + Radio 2:2.4G + Zigbee
4	Radio 0:2.4G + Radio 1:5G + Radio 2:5G + Zigbee
Refer to Sporton Test Report No.: FA002618 for Co-location RF Exposure Evaluation.	

2.4 Accessories

Accessories					
BRACKET WALL JACK	Brand Name	Enrack	Model Name	6002Ad953000	

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

2.5 Support Equipment

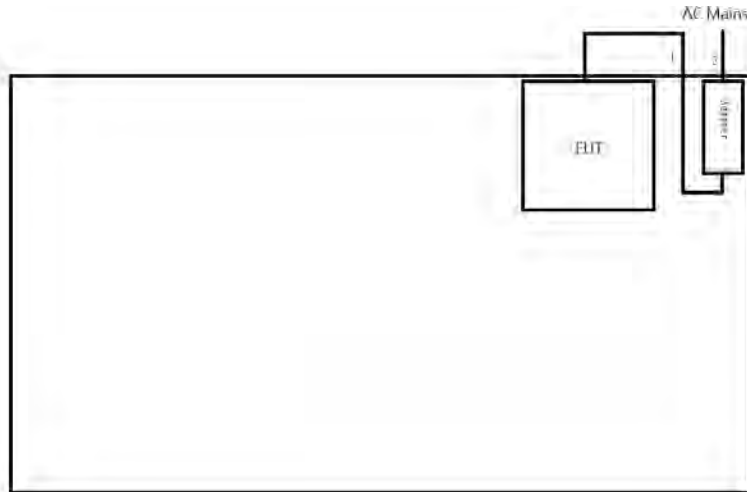
Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	RJ45 Cable	Power Sync	CAT-6E-10	-	-
2	Adapter	FSP	FSP065-DWAN3	-	Client provided
3	PoE	SENAO	EWS511AP_CE W/O DFS	-	Client provided
4	AC Power Cable	Power Sync	TPCPHN0006	-	-
5	AC Power Cable	Power Sync	PW-GPC180-3	-	-

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	RJ45 Cable	Power Sync	CAT-6E-10	-	-
2	Adapter	FSP	FSP065-DWAN3	-	Client provided
3	PoE	SENAO	EWS511AP_CE W/O DFS	-	Client provided
4	AC Power Cable	Power Sync	TPCPHN0006	-	-
5	AC Power Cable	Power Sync	PW-GPC180-3	-	-

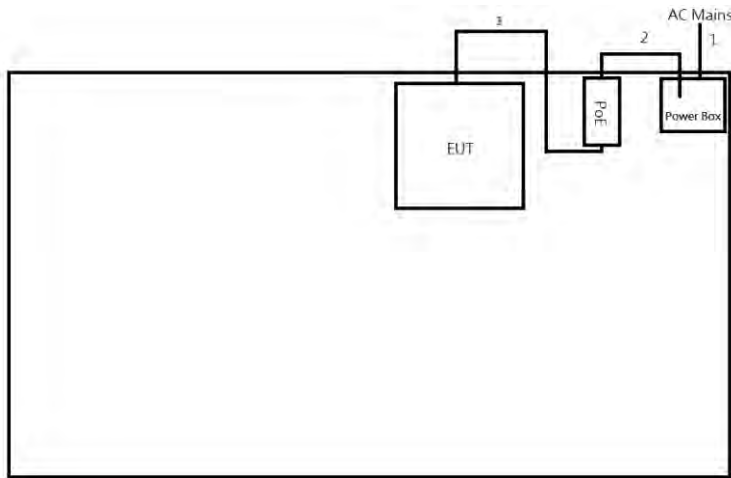
Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	AC Adapter	FSP	FSP065-DWAN3	-	-

2.6 Test Setup Diagram

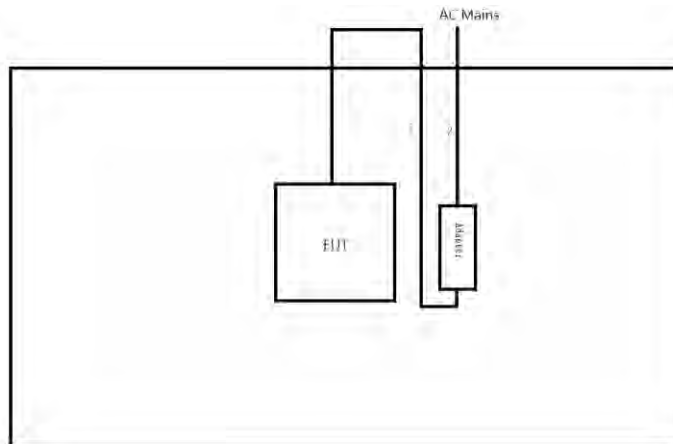
Test Setup Diagram – AC Line Conducted Emission Test (Mode 1)



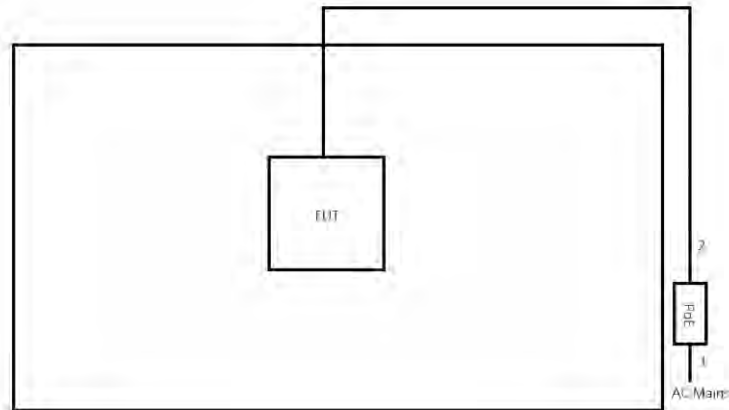
Item	Connection	Shielded	Length(m)	Remark
1	DC Power cable	No	1.2	-
2	AC Power cable	No	1.8	-

Test Setup Diagram – AC Line Conducted Emission Test (Mode 2)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.5	-
2	AC Power cable	No	0.63	-
3	RJ45 cable	No	10.0	-

Test Setup Diagram - Radiated Test (Mode 1)


Item	Connection	Shielded	Length(m)	Remark
1	DC Power cable	No	1.2	-
2	AC Power cable	No	1.8	-

Test Setup Diagram - Radiated Test (Mode 2)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	0.6	-
2	RJ45 cable	No	10.0	-

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

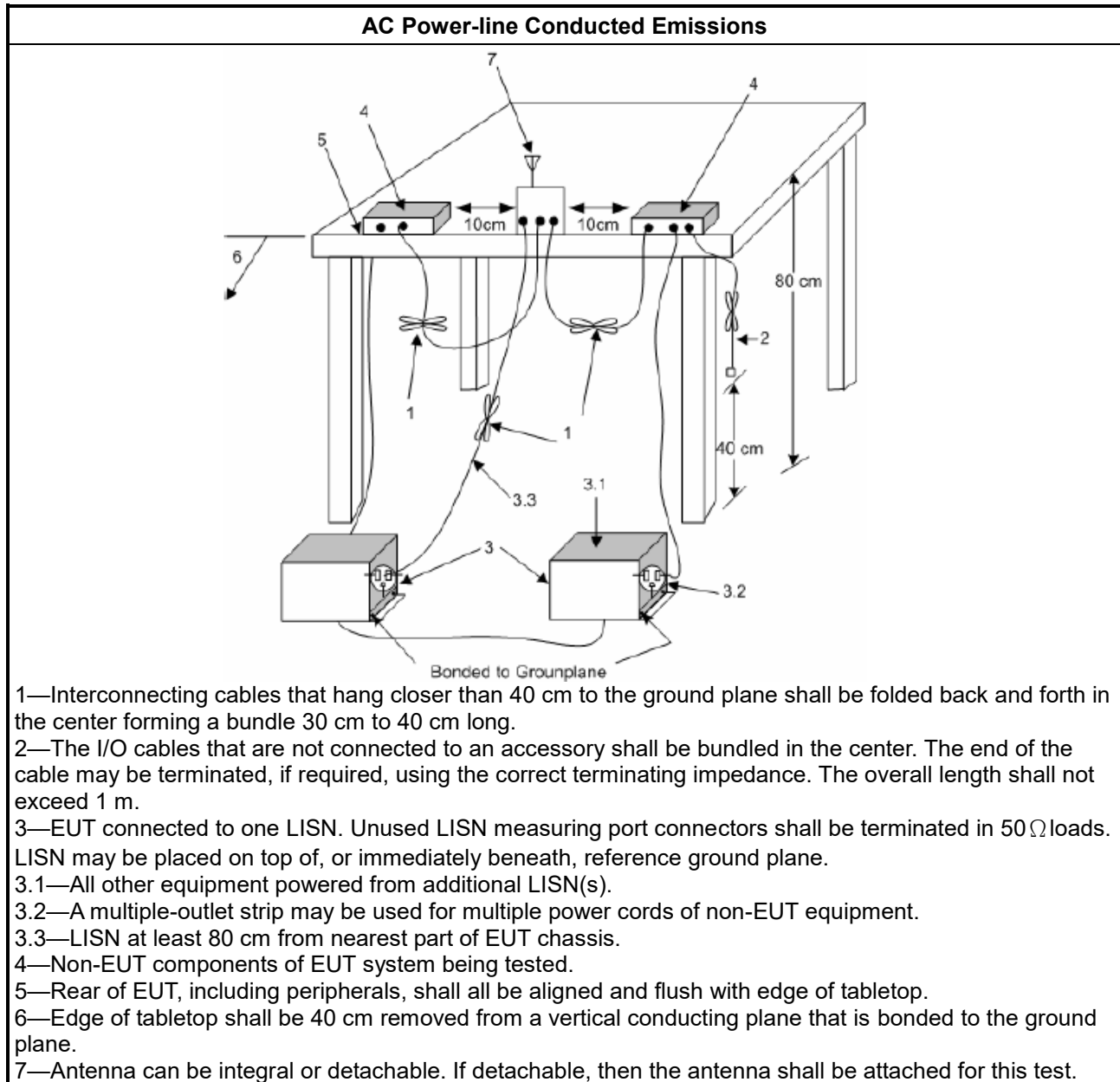
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

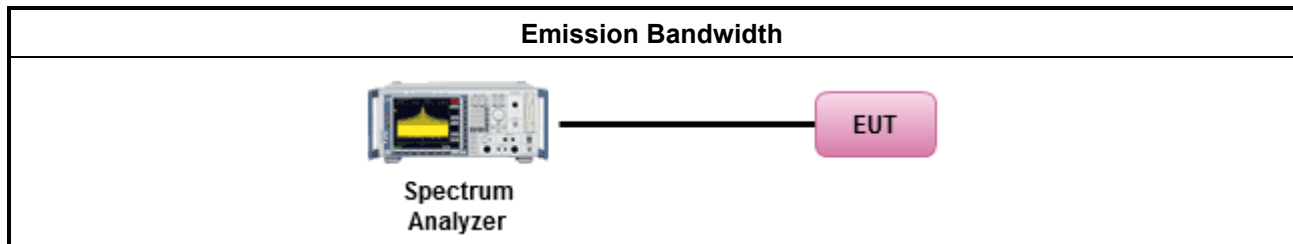
3.2.2 Measuring Instruments

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 558074. clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
☐	Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
☐	Refer as ANSI C63.10, clause 6.9.3 for occupied 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		
	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm	
	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm	
	Smart antenna system (SAS):	
	- Single beam:	If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam:	If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams:	If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
e.i.r.p. Power Limit:		
	2400-2483.5 MHz Band	
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)	
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm	
	Smart antenna system (SAS)	
	- Single beam:	$P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam:	$P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams:	$P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.		

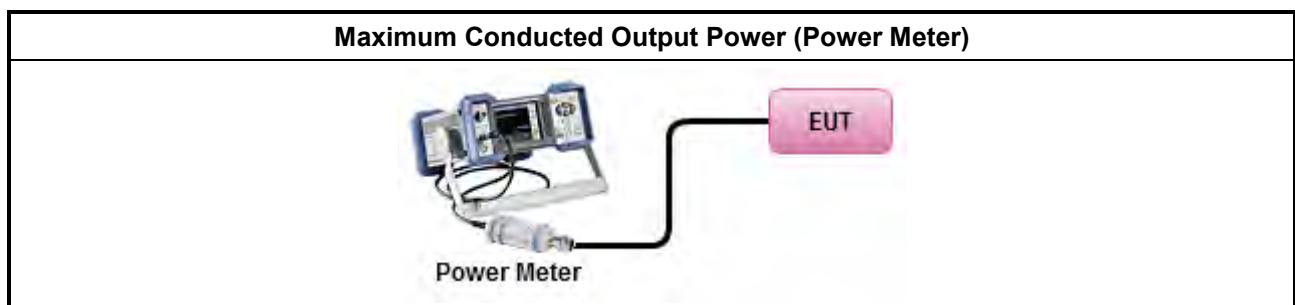
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Maximum Peak Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
☐	Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
☐	Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
Maximum Average Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
☒	Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a 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 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit	
▪	Power Spectral Density (PSD) ≤ 8 dBm/3kHz

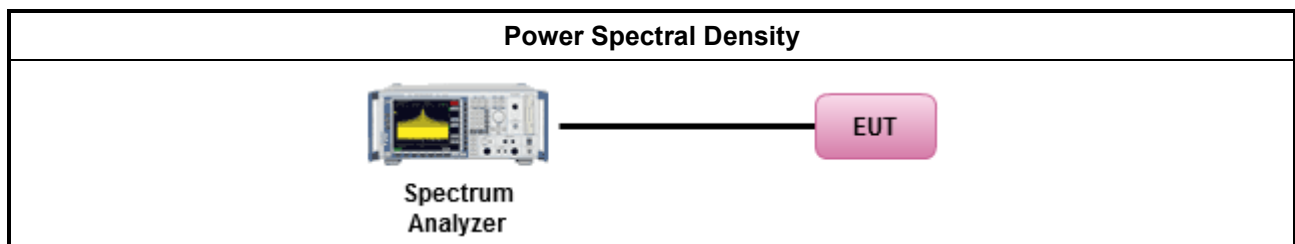
3.4.2 Measuring Instruments

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. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒	Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.
▪	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.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

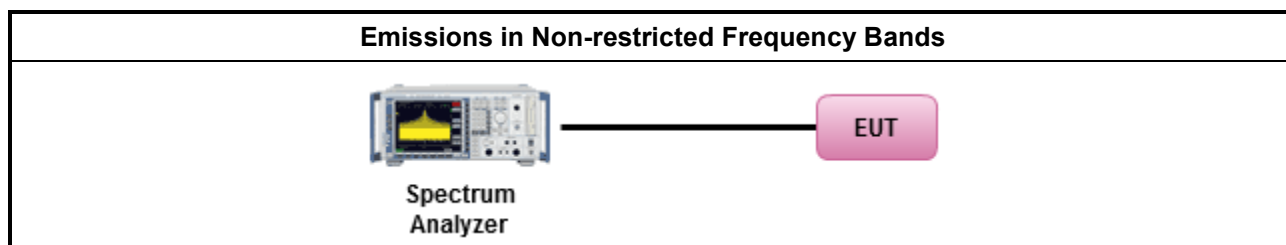
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

Note 1: 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.

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

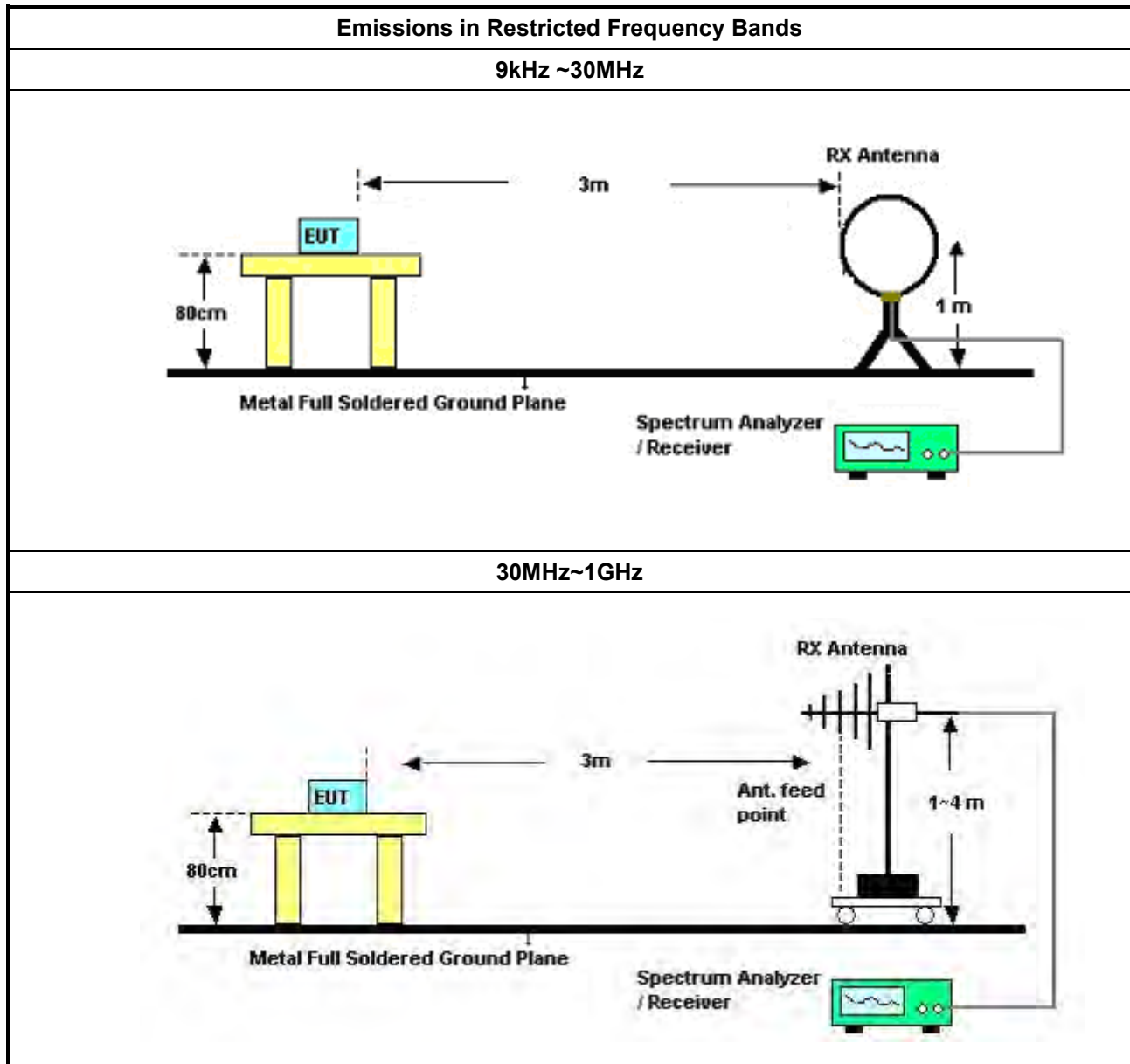
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
For the transmitter band-edge emissions shall be measured using following options below:	
	Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
Use the following spectrum analyzer settings:	
	Set RBW=100 kHz for $f < 1$ GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.
KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

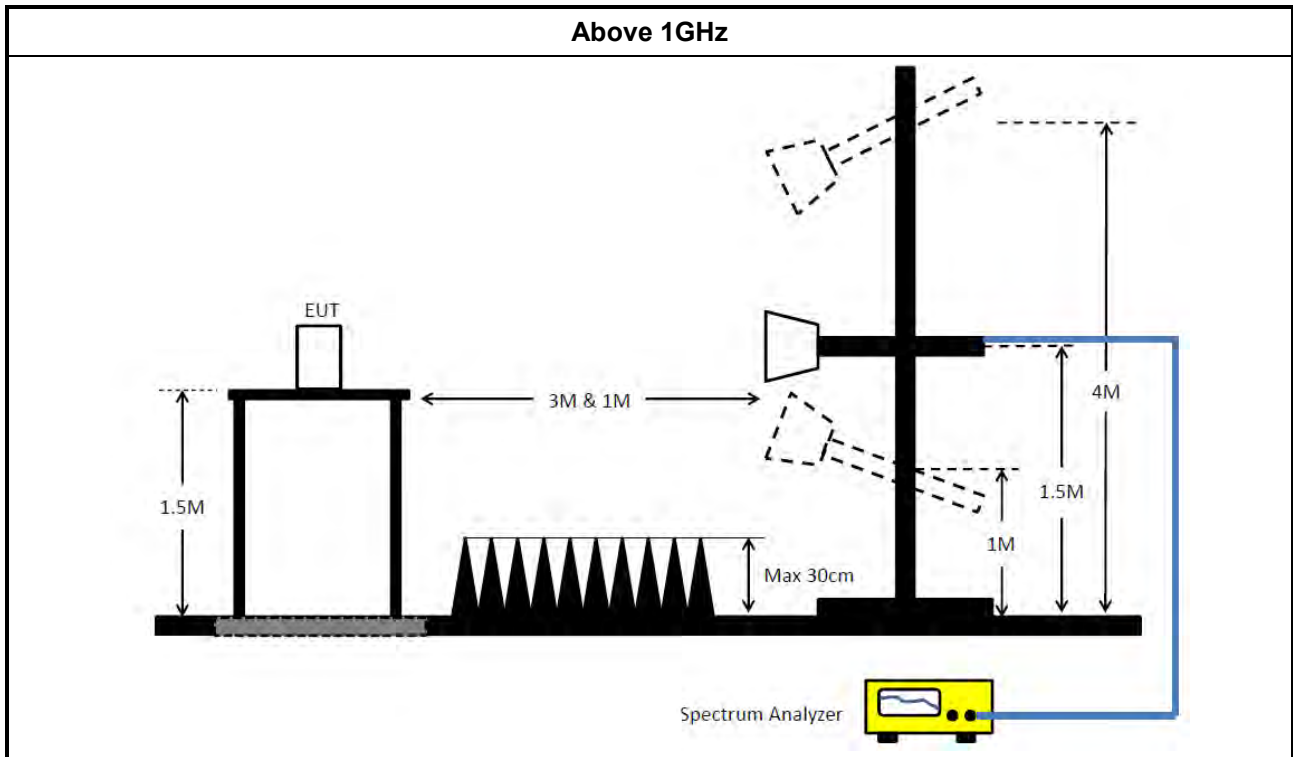
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.6.5 Test Setup





3.6.6 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

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

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	11/Nov/2020	10/Nov/2021
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	31/Aug/2020	30/Aug/2021
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	21/Sep/2020	20/Sep/2021

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10Hz~40GHz	19/Oct/2020	18/Oct/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	20/Oct/2020	19/Oct/2022
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	18/Mar/2020	17/Mar/2021
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	18/Mar/2020	17/Mar/2021

Instrument for Radiated Test – Co-location

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	02/Aug/2020	01/Aug/2021
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	27/Feb/2020	26/Feb/2021
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~18GHz	23/Oct/2020	22/Oct/2021
Double Ridged Guide Horn Antenna	SCHWARZBEC	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	09/Jun/2020	08/Jun/2021
RF Cable-R03m	HUBER+SUHN ER	SUCOFLEX104	805193/4+8051 92/4	1GHz~40GHz	08/Apr/2020	07/Apr/2021
Broadband Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	10/Mar/2020	09/Mar/2021

**Instrument for Radiated Test**

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	04/Aug/2020	03/Aug/2021
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	02/Aug/2020	01/Aug/2021
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	27/Feb/2020	26/Feb/2021
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	30/Jun/2020	29/Jun/2021
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~18GHz	23/Oct/2020	22/Oct/2021
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	06/Sep/2020	05/Sep/2021
Double Ridged Guide Horn Antenna	SCHWARZBEC	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	09/Jun/2020	08/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz~30MHz	20/Jun/2020	19/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB017	30MHz~1GHz	25/Mar/2020	24/Mar/2021
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX1 04	805193/4+8051 92/4	1GHz~40GHz	08/Apr/2020	07/Apr/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	10/Mar/2020	09/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2020	15/Mar/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	29/May/2020	28/May/2021



Conducted Emissions at Powerline_Non-Beamforming_Radio 0 Appendix A.1

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	458.702k	34.38	46.71	-12.33	Neutral
Mode 2	Pass	AV	479.294k	37.87	46.34	-8.47	Line

Mode Configure

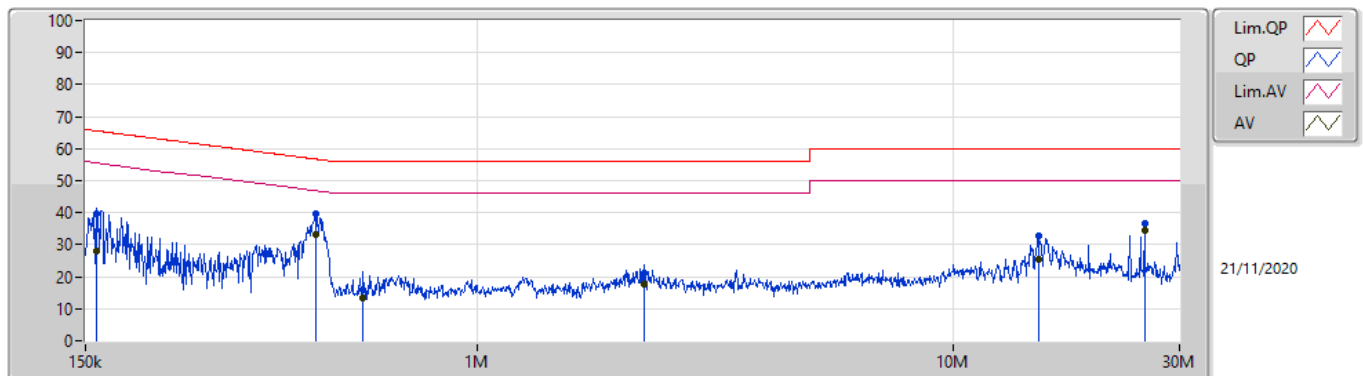
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	158.622k	39.68	65.54	-25.86	Line	-
Mode 1	Pass	AV	158.622k	28.18	55.54	-27.36	Line	-
Mode 1	Pass	QP	456.875k	39.79	56.75	-16.96	Line	-
Mode 1	Pass	AV	456.875k	33.03	46.75	-13.72	Line	"Worst"
Mode 1	Pass	QP	575.907k	15.78	56.00	-40.22	Line	-
Mode 1	Pass	AV	575.907k	13.18	46.00	-32.82	Line	-
Mode 1	Pass	QP	2.247M	21.31	56.00	-34.69	Line	-
Mode 1	Pass	AV	2.247M	17.70	46.00	-28.30	Line	-
Mode 1	Pass	QP	15.145M	32.68	60.00	-27.32	Line	-
Mode 1	Pass	AV	15.145M	25.60	50.00	-24.40	Line	-
Mode 1	Pass	QP	25.346M	36.72	60.00	-23.28	Line	-
Mode 1	Pass	AV	25.346M	34.55	50.00	-15.45	Line	-
Mode 1	Pass	QP	156.109k	42.29	65.67	-23.38	Neutral	-
Mode 1	Pass	AV	156.109k	29.31	55.67	-26.36	Neutral	-
Mode 1	Pass	QP	458.702k	41.32	56.71	-15.39	Neutral	-
Mode 1	Pass	AV	458.702k	34.38	46.71	-12.33	Neutral	"Worst"
Mode 1	Pass	QP	711.605k	21.38	56.00	-34.62	Neutral	-
Mode 1	Pass	AV	711.605k	16.01	46.00	-29.99	Neutral	-
Mode 1	Pass	QP	3.513M	22.21	56.00	-33.79	Neutral	-
Mode 1	Pass	AV	3.513M	18.03	46.00	-27.97	Neutral	-
Mode 1	Pass	QP	15.205M	34.74	60.00	-25.26	Neutral	-
Mode 1	Pass	AV	15.205M	27.55	50.00	-22.45	Neutral	-
Mode 1	Pass	QP	25.346M	37.25	60.00	-22.75	Neutral	-
Mode 1	Pass	AV	25.346M	35.45	50.00	-14.55	Neutral	-
Mode 2	Pass	QP	154.251k	50.99	65.77	-14.78	Line	-
Mode 2	Pass	AV	154.251k	36.30	55.77	-19.47	Line	-
Mode 2	Pass	QP	479.294k	43.74	56.34	-12.60	Line	-
Mode 2	Pass	AV	479.294k	37.87	46.34	-8.47	Line	"Worst"
Mode 2	Pass	QP	571.327k	35.77	56.00	-20.23	Line	-
Mode 2	Pass	AV	571.327k	31.41	46.00	-14.59	Line	-
Mode 2	Pass	QP	2.274M	34.52	56.00	-21.48	Line	-
Mode 2	Pass	AV	2.274M	29.60	46.00	-16.40	Line	-
Mode 2	Pass	QP	5.216M	31.68	60.00	-28.32	Line	-
Mode 2	Pass	AV	5.216M	26.68	50.00	-23.32	Line	-
Mode 2	Pass	QP	18.053M	38.63	60.00	-21.37	Line	-
Mode 2	Pass	AV	18.053M	37.33	50.00	-12.67	Line	-
Mode 2	Pass	QP	153.636k	51.43	65.81	-14.38	Neutral	-
Mode 2	Pass	AV	153.636k	36.51	55.81	-19.30	Neutral	-
Mode 2	Pass	QP	477.384k	43.32	56.38	-13.06	Neutral	-
Mode 2	Pass	AV	477.384k	37.31	46.38	-9.07	Neutral	"Worst"
Mode 2	Pass	QP	609.01k	33.60	56.00	-22.40	Neutral	-
Mode 2	Pass	AV	609.01k	29.46	46.00	-16.54	Neutral	-
Mode 2	Pass	QP	1.003M	32.91	56.00	-23.09	Neutral	-



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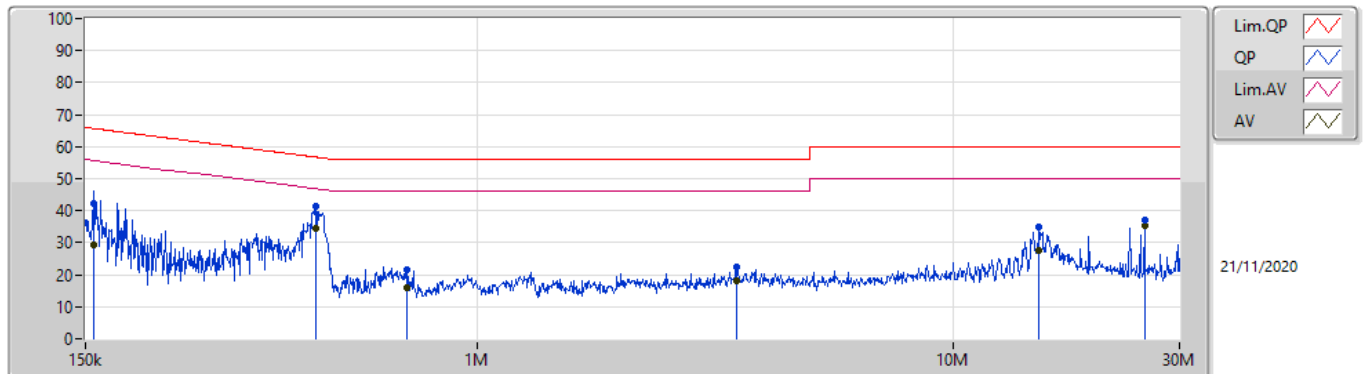
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 2	Pass	AV	1.003M	29.22	46.00	-16.78	Neutral	-
Mode 2	Pass	QP	12.858M	30.41	60.00	-29.59	Neutral	-
Mode 2	Pass	AV	12.858M	25.88	50.00	-24.12	Neutral	-
Mode 2	Pass	QP	18.053M	38.07	60.00	-21.93	Neutral	-
Mode 2	Pass	AV	18.053M	36.87	50.00	-13.13	Neutral	-

Conducted Emissions at Powerline_Mode 1



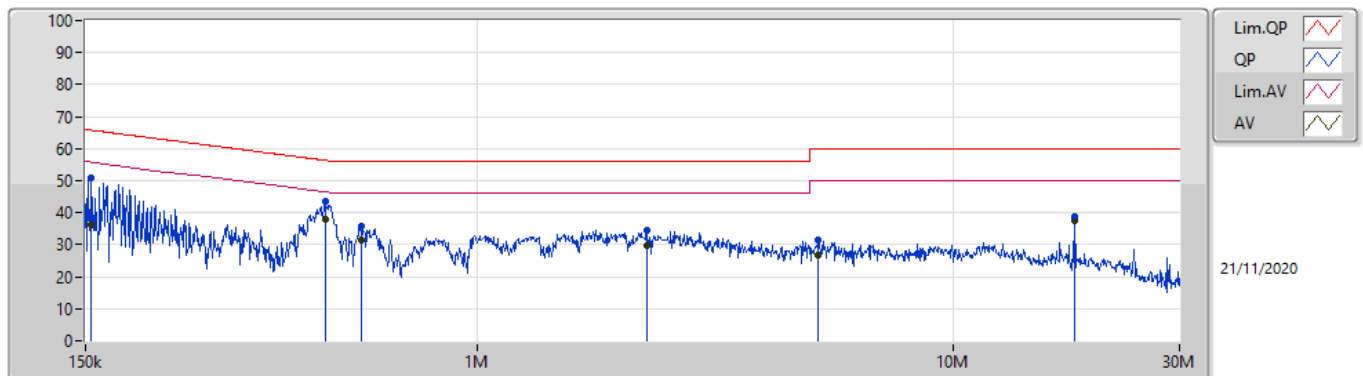
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	158.622k	39.68	65.54	-25.86	19.60	Line	-	20.08	9.69	0.01	9.90			
AV	158.622k	28.18	55.54	-27.36	19.60	Line	-	8.58	9.69	0.01	9.90			
QP	456.875k	39.79	56.75	-16.96	19.58	Line	-	20.21	9.67	0.02	9.89			
AV	456.875k	33.03	46.75	-13.72	19.58	Line	"Worst"	13.45	9.67	0.02	9.89			
QP	575.907k	15.78	56.00	-40.22	19.56	Line	-	-3.78	9.67	0.03	9.86			
AV	575.907k	13.18	46.00	-32.82	19.56	Line	-	-6.38	9.67	0.03	9.86			
QP	2.247M	21.31	56.00	-34.69	19.59	Line	-	1.72	9.68	0.09	9.82			
AV	2.247M	17.70	46.00	-28.30	19.59	Line	-	-1.89	9.68	0.09	9.82			
QP	15.145M	32.68	60.00	-27.32	19.84	Line	-	12.84	9.69	0.25	9.90			
AV	15.145M	25.60	50.00	-24.40	19.84	Line	-	5.76	9.69	0.25	9.90			
QP	25.346M	36.72	60.00	-23.28	19.84	Line	-	16.88	9.59	0.35	9.90			
AV	25.346M	34.55	50.00	-15.45	19.84	Line	-	14.71	9.59	0.35	9.90			

Conducted Emissions at Powerline_Mode 1



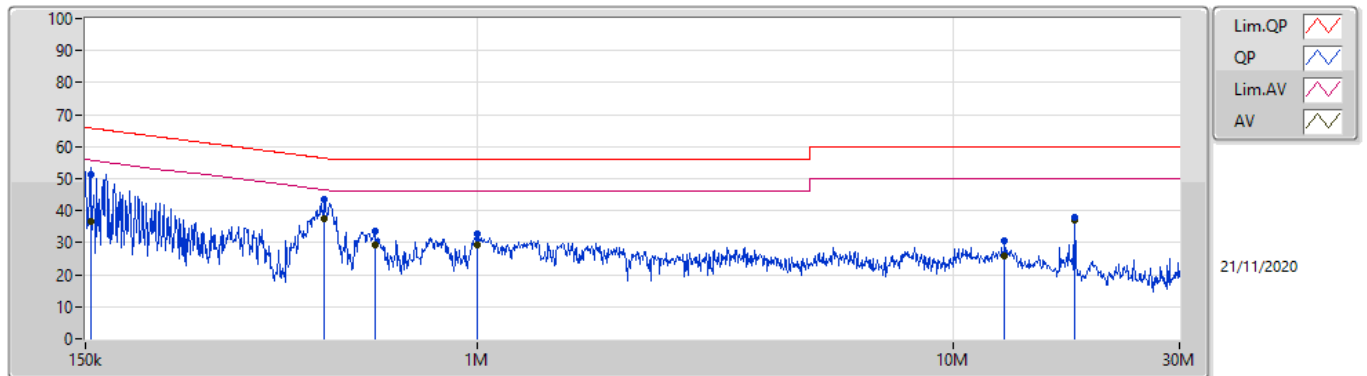
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	156.109k	42.29	65.67	-23.38	19.60	Neutral	-	22.69	9.69	0.01	9.90			
AV	156.109k	29.31	55.67	-26.36	19.60	Neutral	-	9.71	9.69	0.01	9.90			
QP	458.702k	41.32	56.71	-15.39	19.57	Neutral	-	21.75	9.67	0.02	9.88			
AV	458.702k	34.38	46.71	-12.33	19.57	Neutral	"Worst"	14.81	9.67	0.02	9.88			
QP	711.605k	21.38	56.00	-34.62	19.55	Neutral	-	1.83	9.67	0.04	9.84			
AV	711.605k	16.01	46.00	-29.99	19.55	Neutral	-	-3.54	9.67	0.04	9.84			
QP	3.513M	22.21	56.00	-33.79	19.68	Neutral	-	2.53	9.69	0.11	9.88			
AV	3.513M	18.03	46.00	-27.97	19.68	Neutral	-	-1.65	9.69	0.11	9.88			
QP	15.205M	34.74	60.00	-25.26	19.89	Neutral	-	14.85	9.74	0.25	9.90			
AV	15.205M	27.55	50.00	-22.45	19.89	Neutral	-	7.66	9.74	0.25	9.90			
QP	25.346M	37.25	60.00	-22.75	19.97	Neutral	-	17.28	9.72	0.35	9.90			
AV	25.346M	35.45	50.00	-14.55	19.97	Neutral	-	15.48	9.72	0.35	9.90			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	154.251k	50.99	65.77	-14.78	19.60	Line	-	31.39	9.69	0.01	9.90			
AV	154.251k	36.30	55.77	-19.47	19.60	Line	-	16.70	9.69	0.01	9.90			
QP	479.294k	43.74	56.34	-12.60	19.58	Line	-	24.16	9.67	0.03	9.88			
AV	479.294k	37.87	46.34	-8.47	19.58	Line	"Worst"	18.29	9.67	0.03	9.88			
QP	571.327k	35.77	56.00	-20.23	19.56	Line	-	16.21	9.67	0.03	9.86			
AV	571.327k	31.41	46.00	-14.59	19.56	Line	-	11.85	9.67	0.03	9.86			
QP	2.274M	34.52	56.00	-21.48	19.59	Line	-	14.93	9.68	0.09	9.82			
AV	2.274M	29.60	46.00	-16.40	19.59	Line	-	10.01	9.68	0.09	9.82			
QP	5.216M	31.68	60.00	-28.32	19.75	Line	-	11.93	9.70	0.15	9.90			
AV	5.216M	26.68	50.00	-23.32	19.75	Line	-	6.93	9.70	0.15	9.90			
QP	18.053M	38.63	60.00	-21.37	19.86	Line	-	18.77	9.68	0.28	9.90			
AV	18.053M	37.33	50.00	-12.67	19.86	Line	-	17.47	9.68	0.28	9.90			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	153.636k	51.43	65.81	-14.38	19.60	Neutral	-	31.83	9.69	0.01	9.90			
AV	153.636k	36.51	55.81	-19.30	19.60	Neutral	-	16.91	9.69	0.01	9.90			
QP	477.384k	43.32	56.38	-13.06	19.58	Neutral	-	23.74	9.67	0.03	9.88			
AV	477.384k	37.31	46.38	-9.07	19.58	Neutral	"Worst"	17.73	9.67	0.03	9.88			
QP	609.01k	33.60	56.00	-22.40	19.55	Neutral	-	14.05	9.67	0.03	9.85			
AV	609.01k	29.46	46.00	-16.54	19.55	Neutral	-	9.91	9.67	0.03	9.85			
QP	1.003M	32.91	56.00	-23.09	19.52	Neutral	-	13.39	9.67	0.05	9.80			
AV	1.003M	29.22	46.00	-16.78	19.52	Neutral	-	9.70	9.67	0.05	9.80			
QP	12.858M	30.41	60.00	-29.59	19.87	Neutral	-	10.54	9.74	0.23	9.90			
AV	12.858M	25.88	50.00	-24.12	19.87	Neutral	-	6.01	9.74	0.23	9.90			
QP	18.053M	38.07	60.00	-21.93	19.93	Neutral	-	18.14	9.75	0.28	9.90			
AV	18.053M	36.87	50.00	-13.13	19.93	Neutral	-	16.94	9.75	0.28	9.90			



Conducted Emissions at Powerline_Non-Beamforming_Radio 2 Appendix A.2

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	464.229k	33.69	46.61	-12.92	Neutral
Mode 2	Pass	AV	483.136k	38.31	46.29	-7.98	Line

Mode Configure

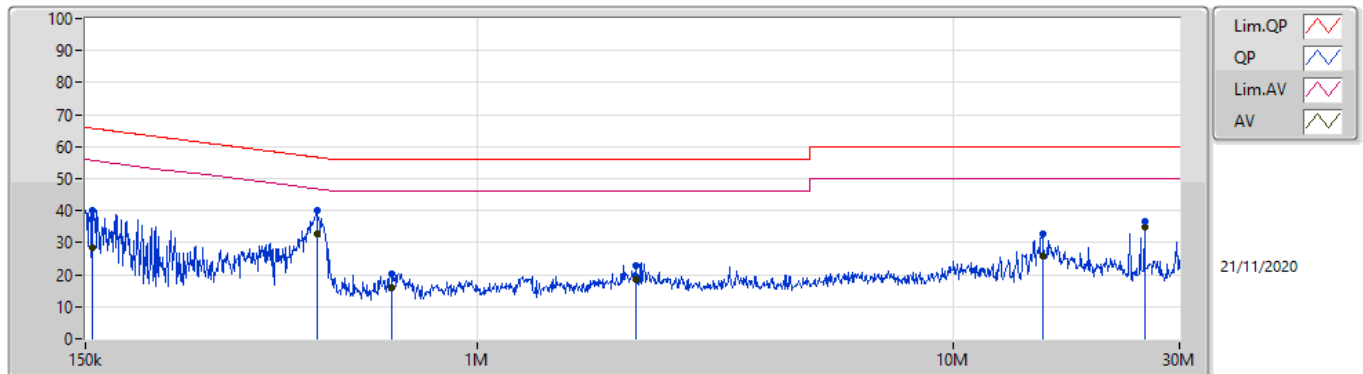
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	155.487k	39.99	65.69	-25.70	Line	-
Mode 1	Pass	AV	155.487k	28.50	55.69	-27.19	Line	-
Mode 1	Pass	QP	462.379k	39.88	56.65	-16.77	Line	-
Mode 1	Pass	AV	462.379k	32.69	46.65	-13.96	Line	"Worst"
Mode 1	Pass	QP	662.266k	20.29	56.00	-35.71	Line	-
Mode 1	Pass	AV	662.266k	16.13	46.00	-29.87	Line	-
Mode 1	Pass	QP	2.15M	22.75	56.00	-33.25	Line	-
Mode 1	Pass	AV	2.15M	18.35	46.00	-27.65	Line	-
Mode 1	Pass	QP	15.45M	32.63	60.00	-27.37	Line	-
Mode 1	Pass	AV	15.45M	25.93	50.00	-24.07	Line	-
Mode 1	Pass	QP	25.346M	36.78	60.00	-23.22	Line	-
Mode 1	Pass	AV	25.346M	34.99	50.00	-15.01	Line	-
Mode 1	Pass	QP	151.807k	42.80	65.90	-23.10	Neutral	-
Mode 1	Pass	AV	151.807k	29.71	55.90	-26.19	Neutral	-
Mode 1	Pass	QP	464.229k	41.10	56.61	-15.51	Neutral	-
Mode 1	Pass	AV	464.229k	33.69	46.61	-12.92	Neutral	"Worst"
Mode 1	Pass	QP	711.605k	21.24	56.00	-34.76	Neutral	-
Mode 1	Pass	AV	711.605k	15.94	46.00	-30.06	Neutral	-
Mode 1	Pass	QP	3.556M	21.00	56.00	-35.00	Neutral	-
Mode 1	Pass	AV	3.556M	17.29	46.00	-28.71	Neutral	-
Mode 1	Pass	QP	14.727M	33.01	60.00	-26.99	Neutral	-
Mode 1	Pass	AV	14.727M	25.84	50.00	-24.16	Neutral	-
Mode 1	Pass	QP	25.346M	36.96	60.00	-23.04	Neutral	-
Mode 1	Pass	AV	25.346M	35.24	50.00	-14.76	Neutral	-
Mode 2	Pass	QP	150k	51.09	66.00	-14.91	Line	-
Mode 2	Pass	AV	150k	36.03	56.00	-19.97	Line	-
Mode 2	Pass	QP	483.136k	43.72	56.29	-12.57	Line	-
Mode 2	Pass	AV	483.136k	38.31	46.29	-7.98	Line	"Worst"
Mode 2	Pass	QP	542.434k	34.13	56.00	-21.87	Line	-
Mode 2	Pass	AV	542.434k	28.85	46.00	-17.15	Line	-
Mode 2	Pass	QP	1.754M	34.98	56.00	-21.02	Line	-
Mode 2	Pass	AV	1.754M	30.68	46.00	-15.32	Line	-
Mode 2	Pass	QP	5.012M	31.79	60.00	-28.21	Line	-
Mode 2	Pass	AV	5.012M	26.73	50.00	-23.27	Line	-
Mode 2	Pass	QP	18.053M	38.65	60.00	-21.35	Line	-
Mode 2	Pass	AV	18.053M	37.19	50.00	-12.81	Line	-
Mode 2	Pass	QP	153.024k	51.25	65.83	-14.58	Neutral	-
Mode 2	Pass	AV	153.024k	36.51	55.83	-19.32	Neutral	-
Mode 2	Pass	QP	477.384k	43.37	56.38	-13.01	Neutral	-
Mode 2	Pass	AV	477.384k	37.41	46.38	-8.97	Neutral	"Worst"
Mode 2	Pass	QP	587.518k	34.19	56.00	-21.81	Neutral	-
Mode 2	Pass	AV	587.518k	30.29	46.00	-15.71	Neutral	-
Mode 2	Pass	QP	991.146k	32.67	56.00	-23.33	Neutral	-



Conducted Emissions at Powerline_Non-Beamforming_Radio 2 Appendix A.2

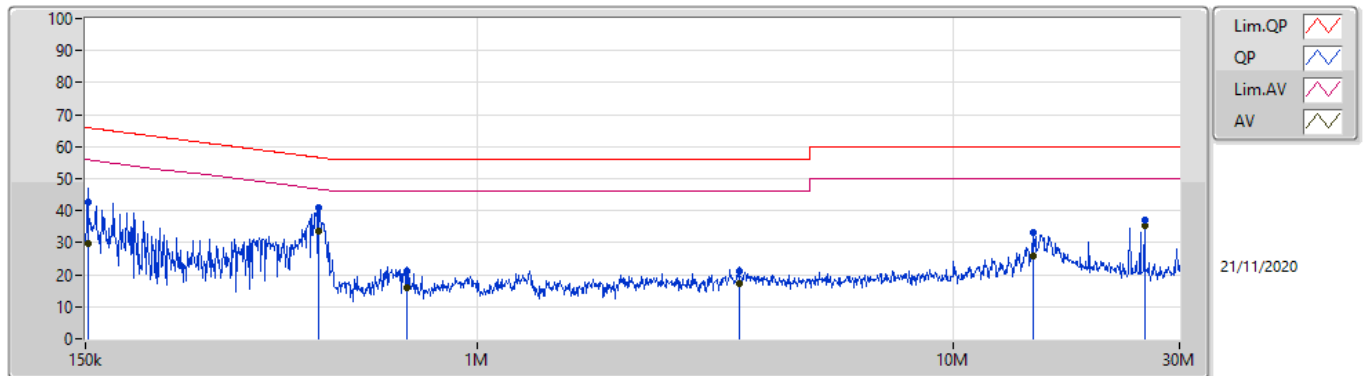
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 2	Pass	AV	991.146k	29.12	46.00	-16.88	Neutral	-
Mode 2	Pass	QP	8.255M	28.76	60.00	-31.24	Neutral	-
Mode 2	Pass	AV	8.255M	24.20	50.00	-25.80	Neutral	-
Mode 2	Pass	QP	18.053M	38.13	60.00	-21.87	Neutral	-
Mode 2	Pass	AV	18.053M	36.78	50.00	-13.22	Neutral	-

Conducted Emissions at Powerline_Mode 1



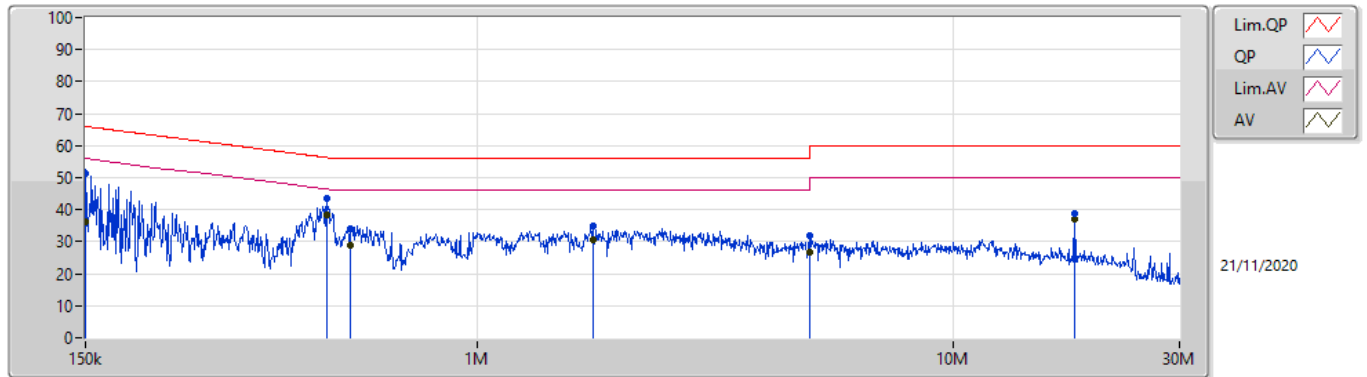
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	155.487k	39.99	65.69	-25.70	19.60	Line	-	20.39	9.69	0.01	9.90			
AV	155.487k	28.50	55.69	-27.19	19.60	Line	-	8.90	9.69	0.01	9.90			
QP	462.379k	39.88	56.65	-16.77	19.57	Line	-	20.31	9.67	0.02	9.88			
AV	462.379k	32.69	46.65	-13.96	19.57	Line	"Worst"	13.12	9.67	0.02	9.88			
QP	662.266k	20.29	56.00	-35.71	19.55	Line	-	0.74	9.67	0.04	9.84			
AV	662.266k	16.13	46.00	-29.87	19.55	Line	-	-3.42	9.67	0.04	9.84			
QP	2.15M	22.75	56.00	-33.25	19.57	Line	-	3.18	9.68	0.08	9.81			
AV	2.15M	18.35	46.00	-27.65	19.57	Line	-	-1.22	9.68	0.08	9.81			
QP	15.45M	32.63	60.00	-27.37	19.84	Line	-	12.79	9.69	0.25	9.90			
AV	15.45M	25.93	50.00	-24.07	19.84	Line	-	6.09	9.69	0.25	9.90			
QP	25.346M	36.78	60.00	-23.22	19.84	Line	-	16.94	9.59	0.35	9.90			
AV	25.346M	34.99	50.00	-15.01	19.84	Line	-	15.15	9.59	0.35	9.90			

Conducted Emissions at Powerline_Mode 1



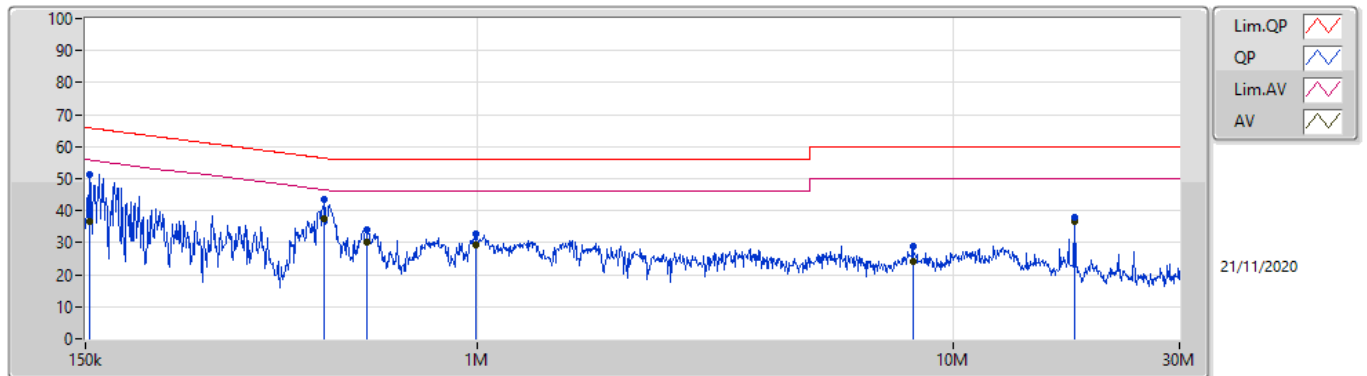
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	151.807k	42.80	65.90	-23.10	19.60	Neutral	-	23.20	9.69	0.01	9.90			
AV	151.807k	29.71	55.90	-26.19	19.60	Neutral	-	10.11	9.69	0.01	9.90			
QP	464.229k	41.10	56.61	-15.51	19.57	Neutral	-	21.53	9.67	0.02	9.88			
AV	464.229k	33.69	46.61	-12.92	19.57	Neutral	"Worst"	14.12	9.67	0.02	9.88			
QP	711.605k	21.24	56.00	-34.76	19.55	Neutral	-	1.69	9.67	0.04	9.84			
AV	711.605k	15.94	46.00	-30.06	19.55	Neutral	-	-3.61	9.67	0.04	9.84			
QP	3.556M	21.00	56.00	-35.00	19.68	Neutral	-	1.32	9.69	0.11	9.88			
AV	3.556M	17.29	46.00	-28.71	19.68	Neutral	-	-2.39	9.69	0.11	9.88			
QP	14.727M	33.01	60.00	-26.99	19.89	Neutral	-	13.12	9.74	0.25	9.90			
AV	14.727M	25.84	50.00	-24.16	19.89	Neutral	-	5.95	9.74	0.25	9.90			
QP	25.346M	36.96	60.00	-23.04	19.97	Neutral	-	16.99	9.72	0.35	9.90			
AV	25.346M	35.24	50.00	-14.76	19.97	Neutral	-	15.27	9.72	0.35	9.90			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	150k	51.09	66.00	-14.91	19.60	Line	-	31.49	9.69	0.01	9.90			
AV	150k	36.03	56.00	-19.97	19.60	Line	-	16.43	9.69	0.01	9.90			
QP	483.136k	43.72	56.29	-12.57	19.58	Line	-	24.14	9.67	0.03	9.88			
AV	483.136k	38.31	46.29	-7.98	19.58	Line	"Worst"	18.73	9.67	0.03	9.88			
QP	542.434k	34.13	56.00	-21.87	19.57	Line	-	14.56	9.67	0.03	9.87			
AV	542.434k	28.85	46.00	-17.15	19.57	Line	-	9.28	9.67	0.03	9.87			
QP	1.754M	34.98	56.00	-21.02	19.55	Line	-	15.43	9.68	0.07	9.80			
AV	1.754M	30.68	46.00	-15.32	19.55	Line	-	11.13	9.68	0.07	9.80			
QP	5.012M	31.79	60.00	-28.21	19.74	Line	-	12.05	9.70	0.14	9.90			
AV	5.012M	26.73	50.00	-23.27	19.74	Line	-	6.99	9.70	0.14	9.90			
QP	18.053M	38.65	60.00	-21.35	19.86	Line	-	18.79	9.68	0.28	9.90			
AV	18.053M	37.19	50.00	-12.81	19.86	Line	-	17.33	9.68	0.28	9.90			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	153.024k	51.25	65.83	-14.58	19.60	Neutral	-	31.65	9.69	0.01	9.90			
AV	153.024k	36.51	55.83	-19.32	19.60	Neutral	-	16.91	9.69	0.01	9.90			
QP	477.384k	43.37	56.38	-13.01	19.58	Neutral	-	23.79	9.67	0.03	9.88			
AV	477.384k	37.41	46.38	-8.97	19.58	Neutral	"Worst"	17.83	9.67	0.03	9.88			
QP	587.518k	34.19	56.00	-21.81	19.56	Neutral	-	14.63	9.67	0.03	9.86			
AV	587.518k	30.29	46.00	-15.71	19.56	Neutral	-	10.73	9.67	0.03	9.86			
QP	991.146k	32.67	56.00	-23.33	19.52	Neutral	-	13.15	9.67	0.05	9.80			
AV	991.146k	29.12	46.00	-16.88	19.52	Neutral	-	9.60	9.67	0.05	9.80			
QP	8.255M	28.76	60.00	-31.24	19.81	Neutral	-	8.95	9.72	0.19	9.90			
AV	8.255M	24.20	50.00	-25.80	19.81	Neutral	-	4.39	9.72	0.19	9.90			
QP	18.053M	38.13	60.00	-21.87	19.93	Neutral	-	18.20	9.75	0.28	9.90			
AV	18.053M	36.78	50.00	-13.22	19.93	Neutral	-	16.85	9.75	0.28	9.90			

**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	8.025M	13.613M	13M6G1D	7.025M	13.213M
802.11g_Nss1,(6Mbps)_2TX	16.275M	16.512M	16M5D1D	15.4M	16.352M
802.11ax HEW20_Nss1,(MCS0)_2TX	18.4M	18.991M	19M0D1D	16.7M	18.871M
802.11ax HEW40_Nss1,(MCS0)_2TX	37.95M	37.821M	37M8D1D	35.5M	37.541M

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

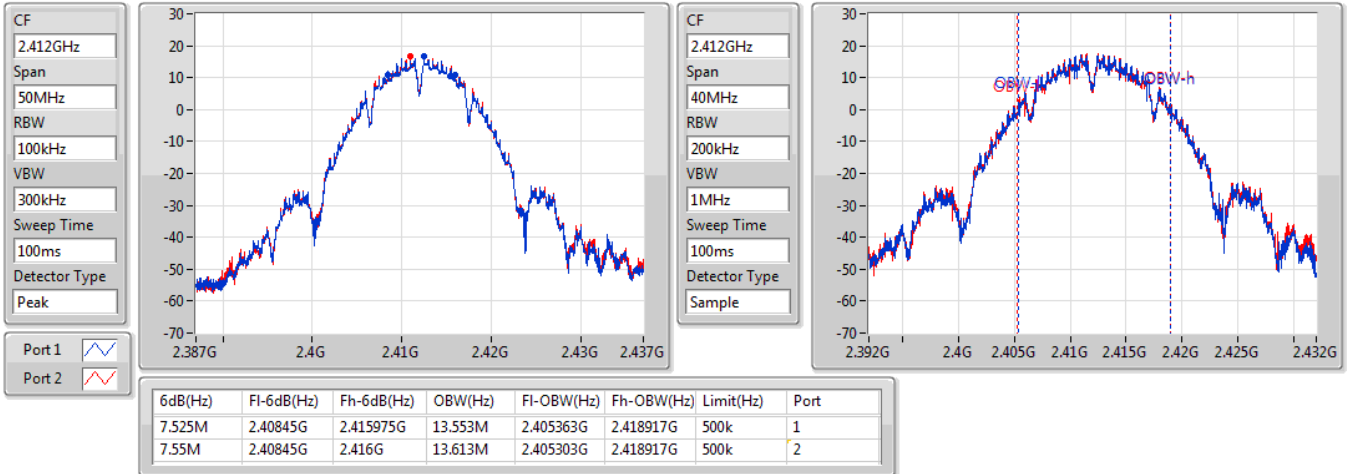
**Result**

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	7.525M	13.553M	7.55M	13.613M
2437MHz	Pass	500k	8.025M	13.353M	7.075M	13.213M
2462MHz	Pass	500k	7.025M	13.293M	7.5M	13.233M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	15.7M	16.352M	15.4M	16.412M
2437MHz	Pass	500k	16.05M	16.512M	16.275M	16.432M
2462MHz	Pass	500k	15.45M	16.372M	15.675M	16.372M
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.225M	18.931M	16.95M	18.911M
2437MHz	Pass	500k	18.4M	18.991M	18.05M	18.931M
2462MHz	Pass	500k	16.7M	18.891M	17.65M	18.871M
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	36.7M	37.541M	37.75M	37.661M
2437MHz	Pass	500k	37.95M	37.821M	37.75M	37.701M
2452MHz	Pass	500k	35.5M	37.581M	37.25M	37.661M

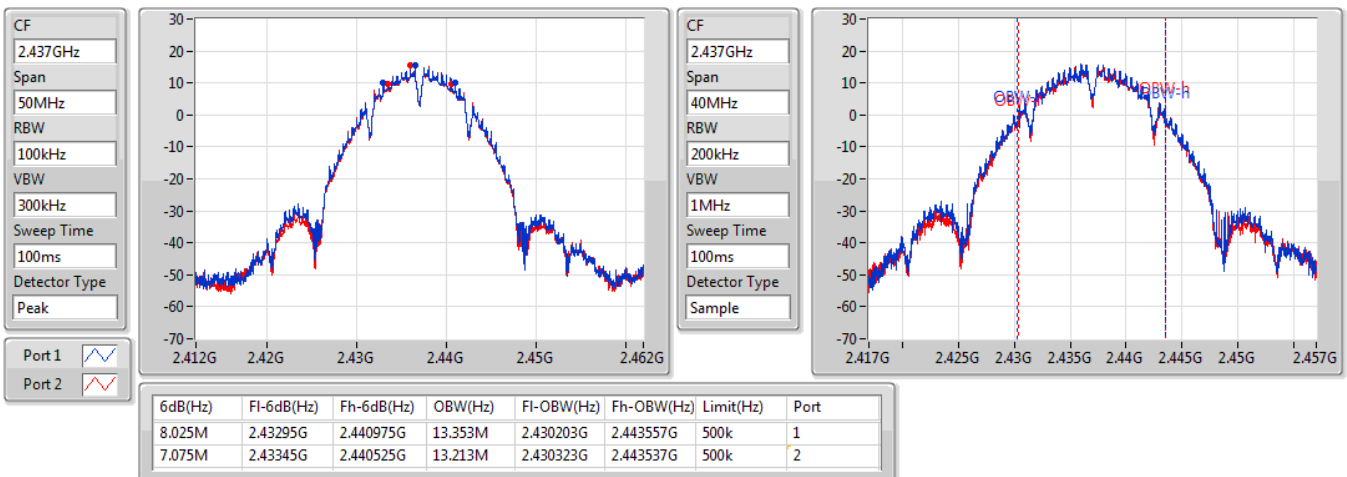
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

802.11b_Nss1,(1Mbps)_2TX
EBW
2412MHz

09/11/2020

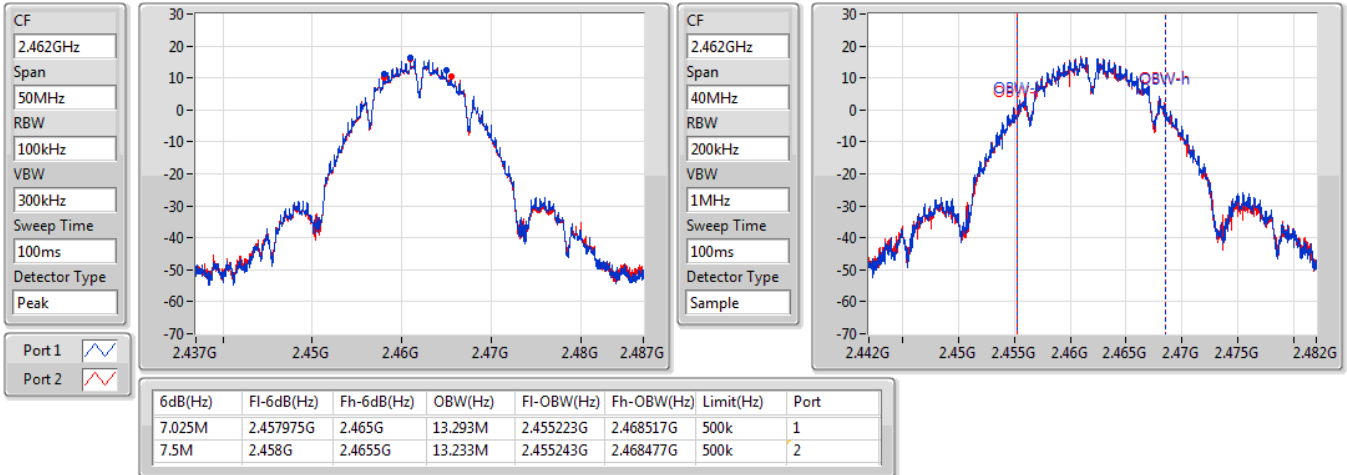

802.11b_Nss1,(1Mbps)_2TX
EBW
2437MHz

09/11/2020

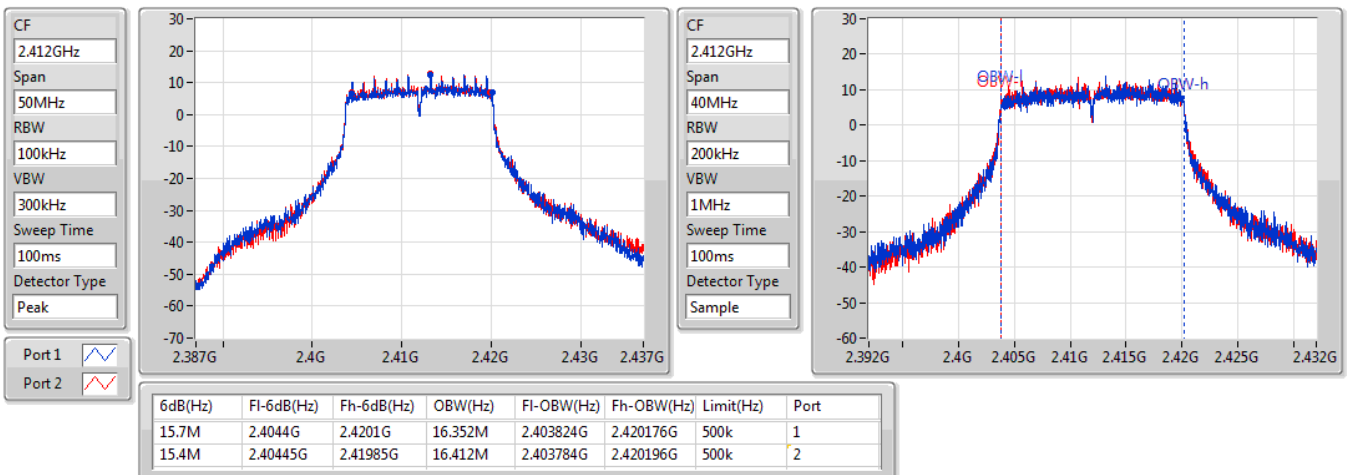


802.11b_Nss1,(1Mbps)_2TX
EBW
2462MHz

09/11/2020

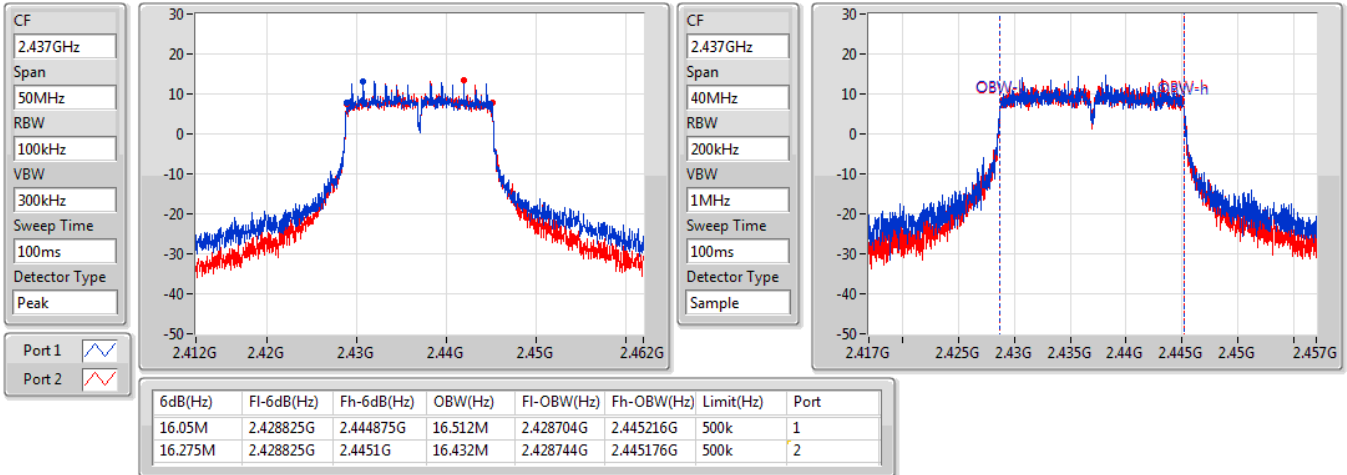

802.11g_Nss1,(6Mbps)_2TX
EBW
2412MHz

09/11/2020

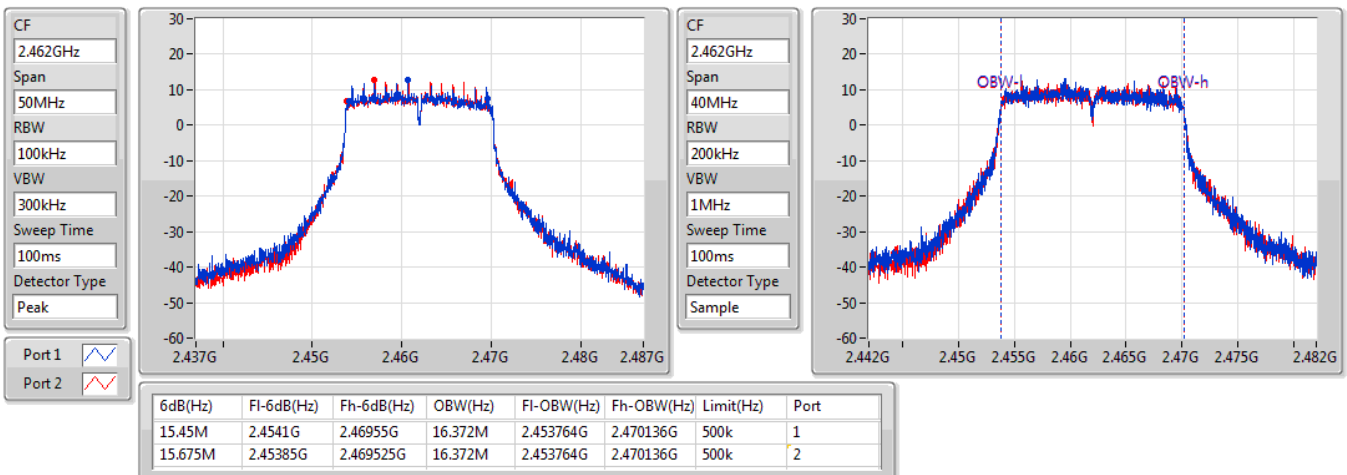


802.11g_Nss1,(6Mbps)_2TX
2437MHz

09/11/2020


802.11g_Nss1,(6Mbps)_2TX
2462MHz

09/11/2020

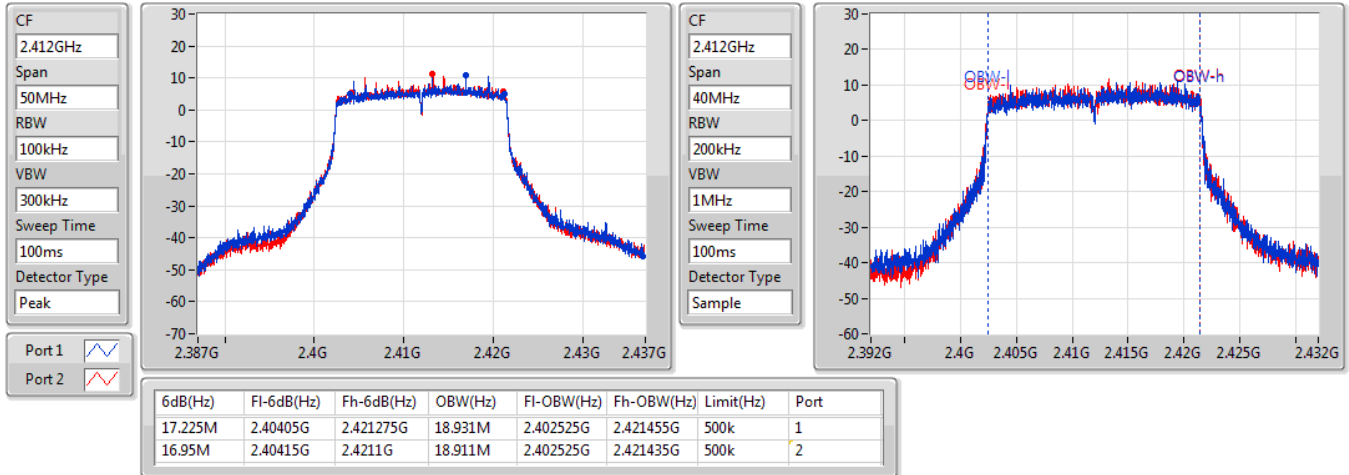


802.11ax HEW20_Nss1,(MCS0)_2TX

EBW

2412MHz

09/11/2020

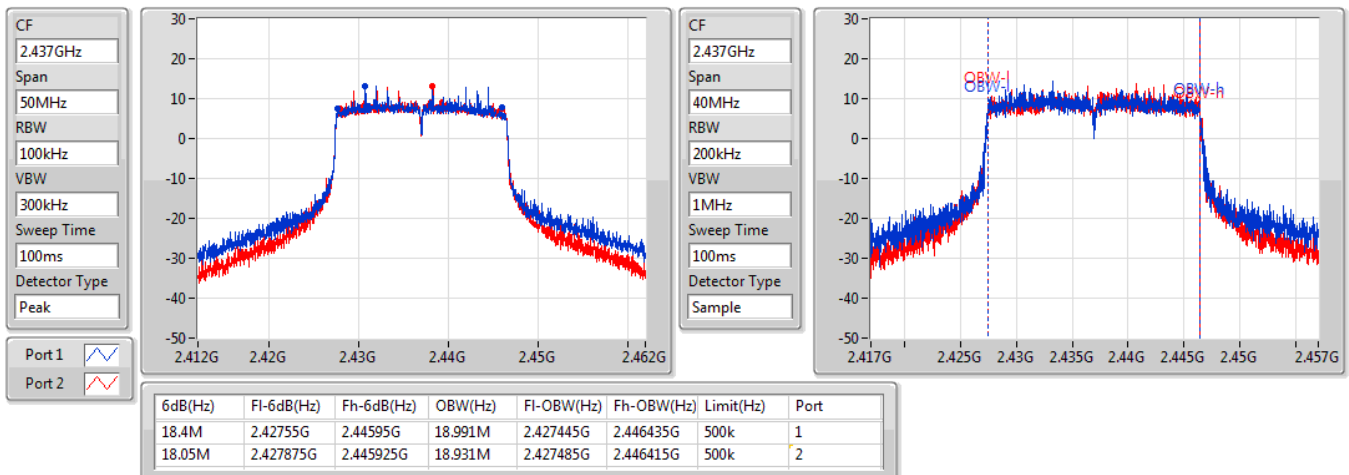


802.11ax HEW20_Nss1,(MCS0)_2TX

EBW

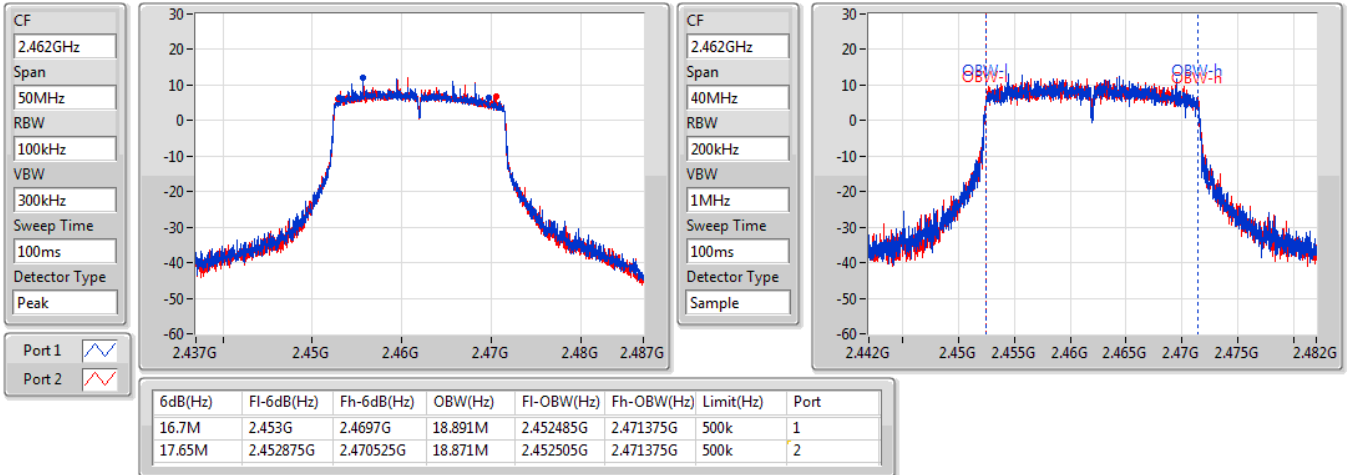
2437MHz

09/11/2020

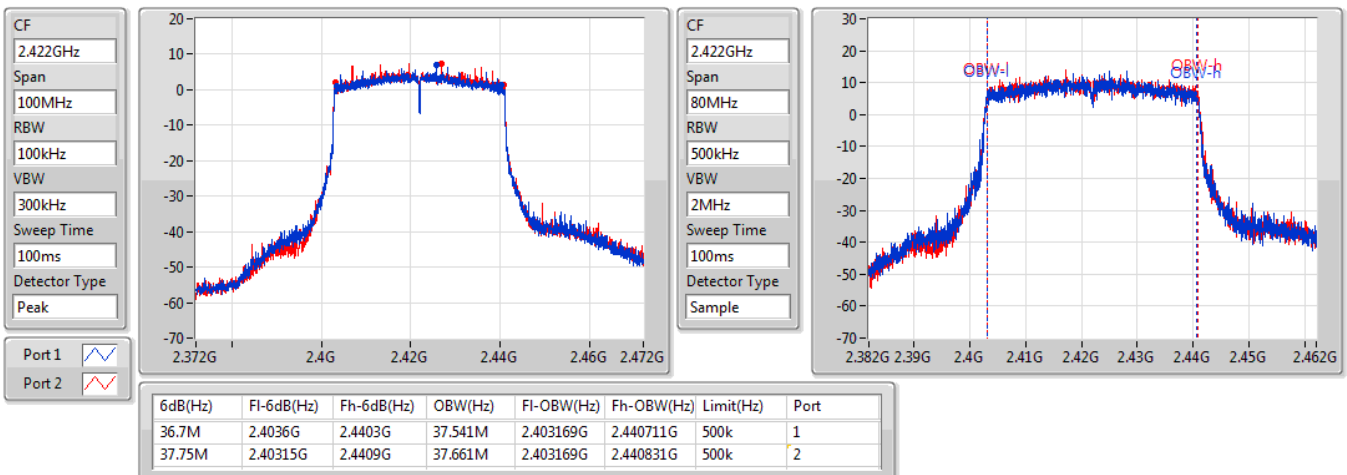


802.11ax HEW20_Nss1,(MCS0)_2TX
EBW
2462MHz

09/11/2020

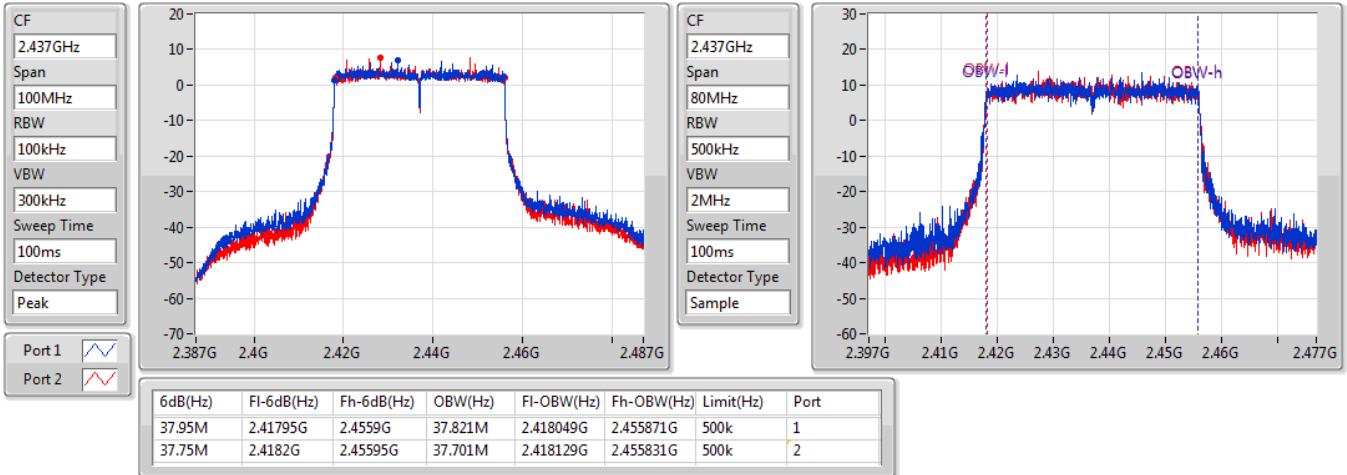

802.11ax HEW40_Nss1,(MCS0)_2TX
EBW
2422MHz

09/11/2020

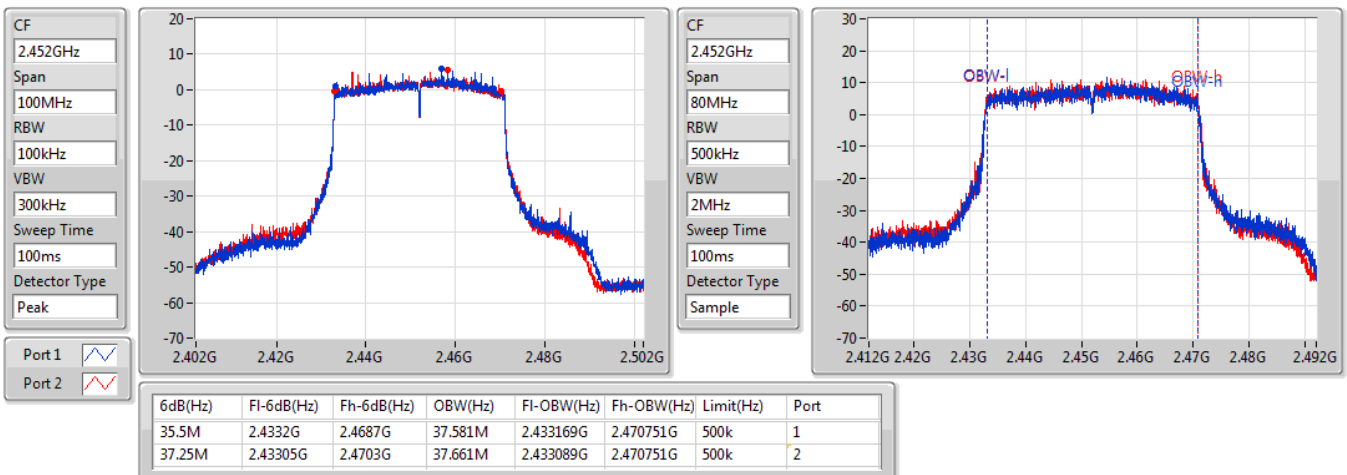


802.11ax HEW40_Nss1,(MCS0)_2TX
EBW
2437MHz

09/11/2020


802.11ax HEW40_Nss1,(MCS0)_2TX
EBW
2452MHz

09/11/2020



**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_1TX	8.025M	13.493M	13M5G1D	7.075M	13.268M
802.11g_Nss1,(6Mbps)_1TX	16.275M	19.965M	20M0D1D	15.8M	16.767M
802.11n HT20_Nss1,(MCS0)_1TX	17.15M	20.465M	20M5D1D	16.65M	17.816M
802.11n HT40_Nss1,(MCS0)_1TX	35.4M	36.632M	36M6D1D	33.8M	36.432M

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

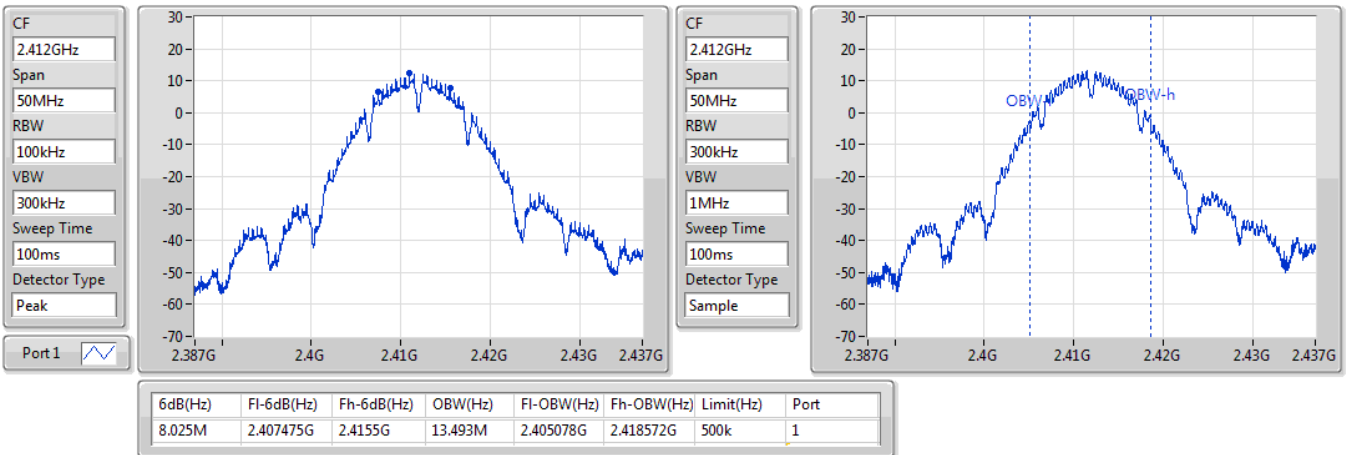
**Result**

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	8.025M	13.493M
2437MHz	Pass	500k	7.575M	13.493M
2462MHz	Pass	500k	7.075M	13.268M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	15.9M	16.867M
2437MHz	Pass	500k	15.8M	19.965M
2462MHz	Pass	500k	16.275M	16.767M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	17.15M	17.916M
2437MHz	Pass	500k	16.875M	20.465M
2462MHz	Pass	500k	16.65M	17.816M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	500k	35.3M	36.632M
2437MHz	Pass	500k	33.8M	36.432M
2452MHz	Pass	500k	35.4M	36.532M

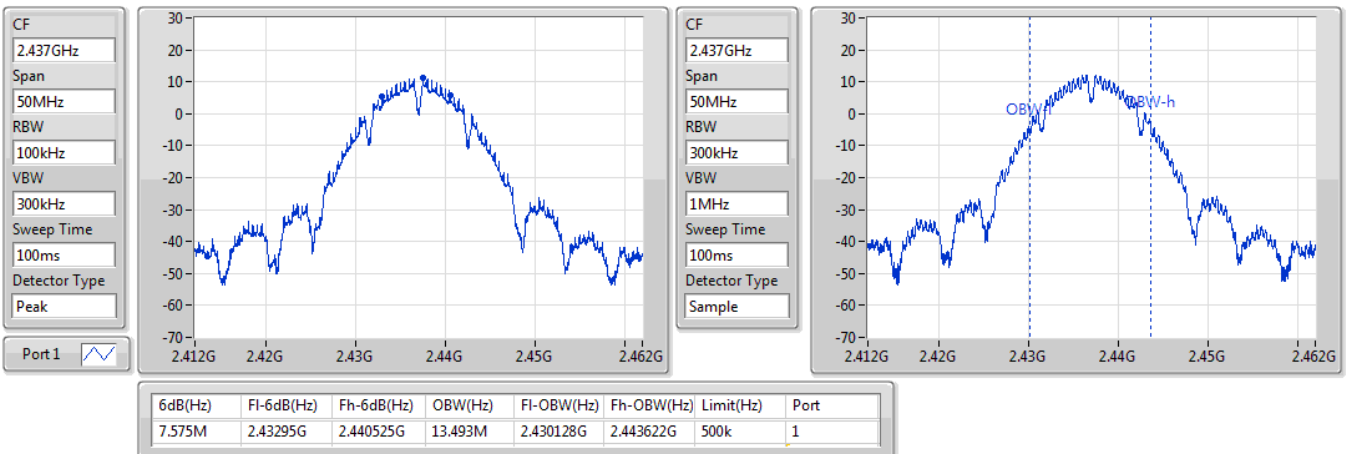
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

802.11b_Nss1,(1Mbps)_1TX
EBW
2412MHz

13/01/2021

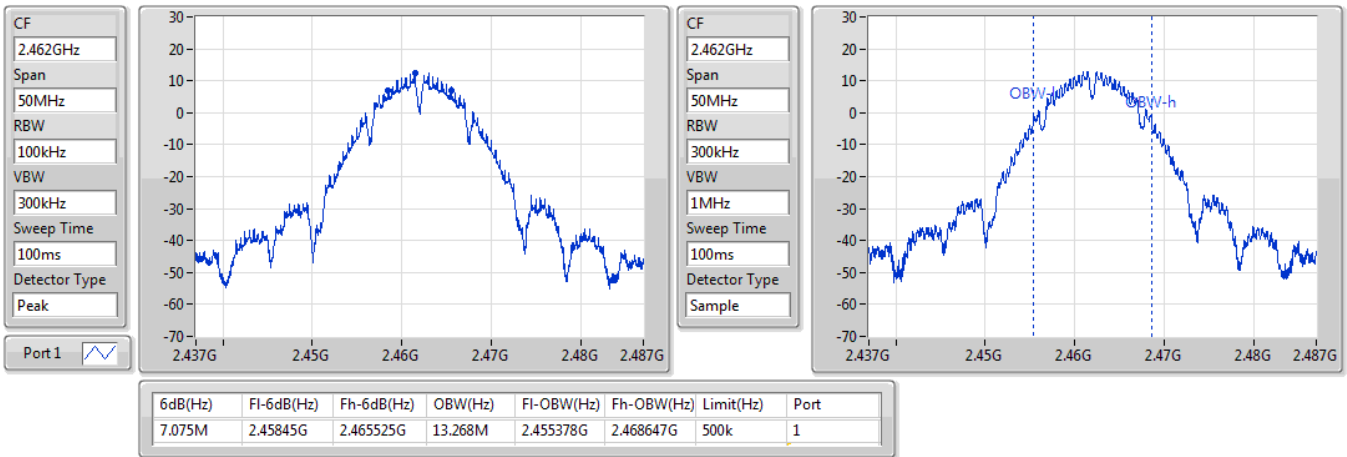

802.11b_Nss1,(1Mbps)_1TX
EBW
2437MHz

13/01/2021

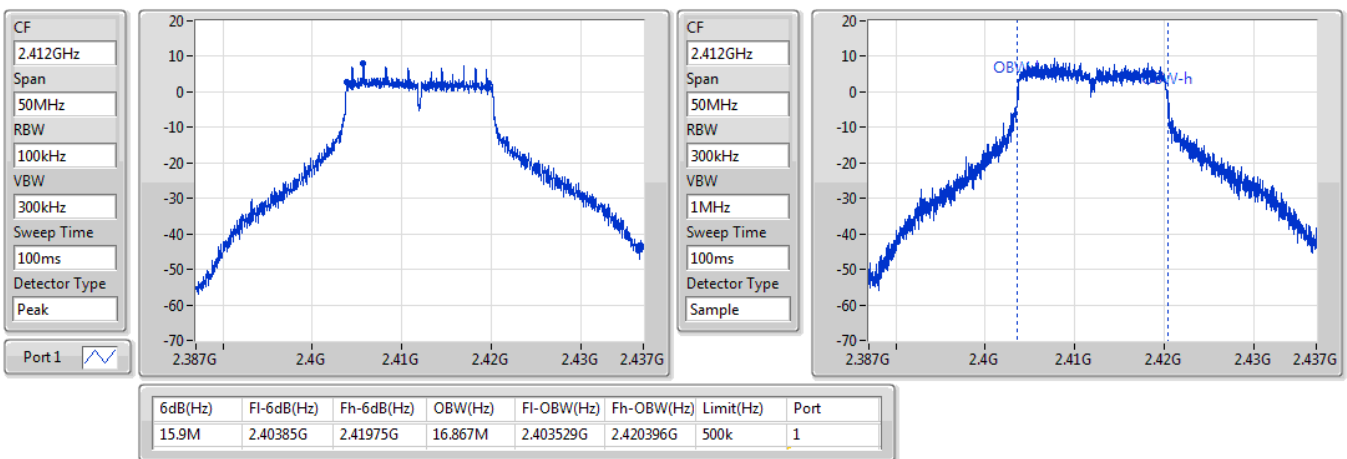


802.11b_Nss1,(1Mbps)_1TX
EBW
2462MHz

13/01/2021

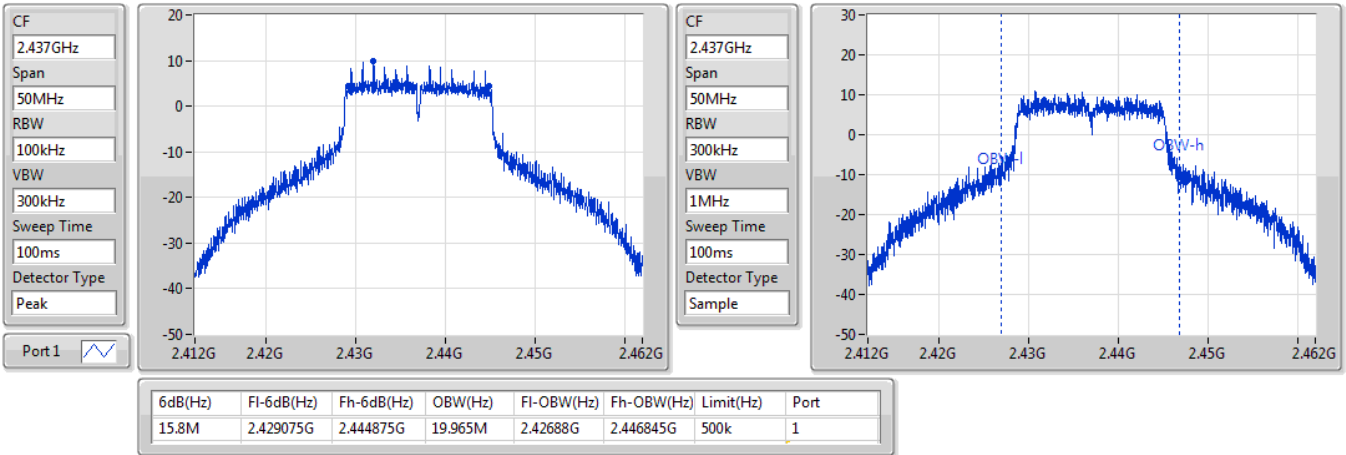

802.11g_Nss1,(6Mbps)_1TX
EBW
2412MHz

13/01/2021

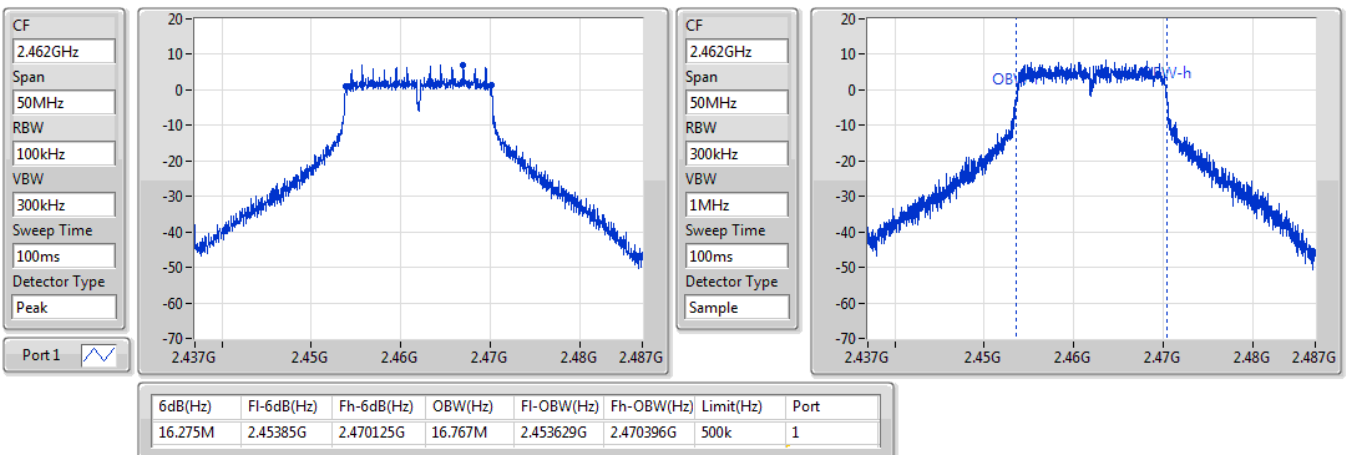


802.11g_Nss1,(6Mbps)_1TX
EBW
2437MHz

13/01/2021

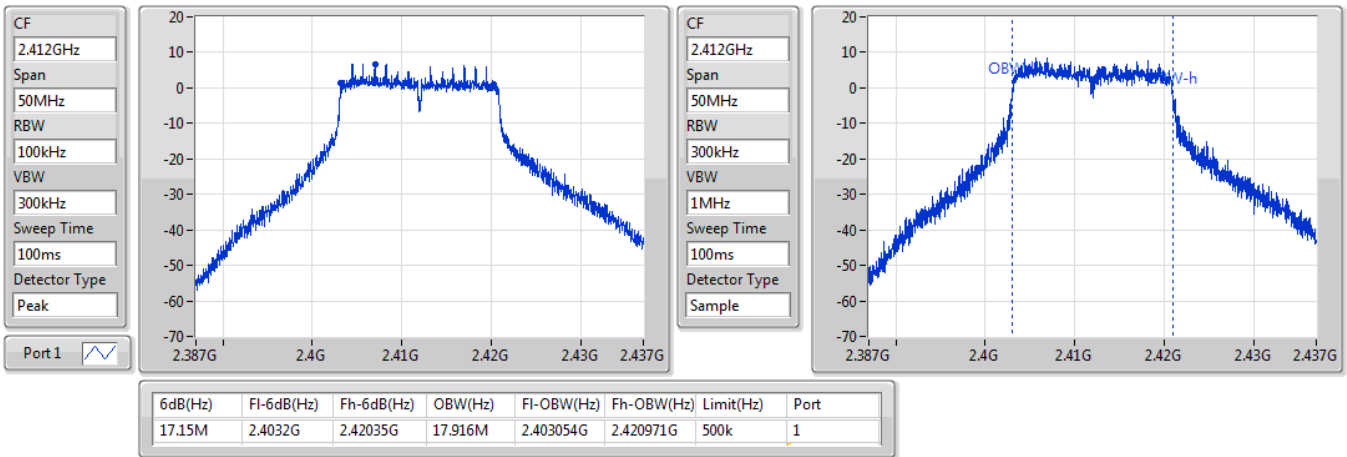

802.11g_Nss1,(6Mbps)_1TX
EBW
2462MHz

13/01/2021

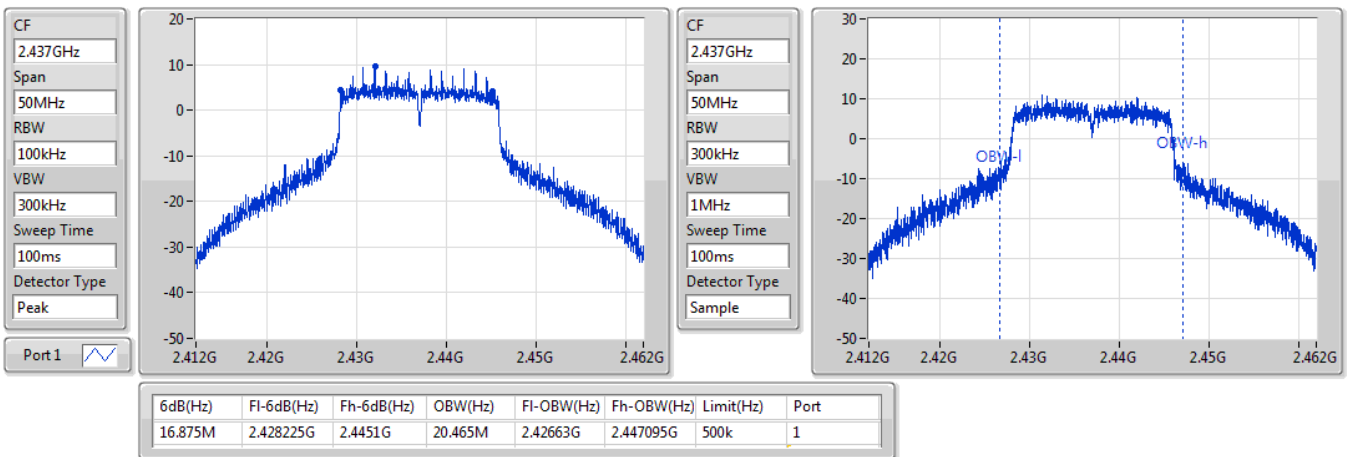


802.11n HT20_Nss1,(MCS0)_1TX
EBW
2412MHz

13/01/2021

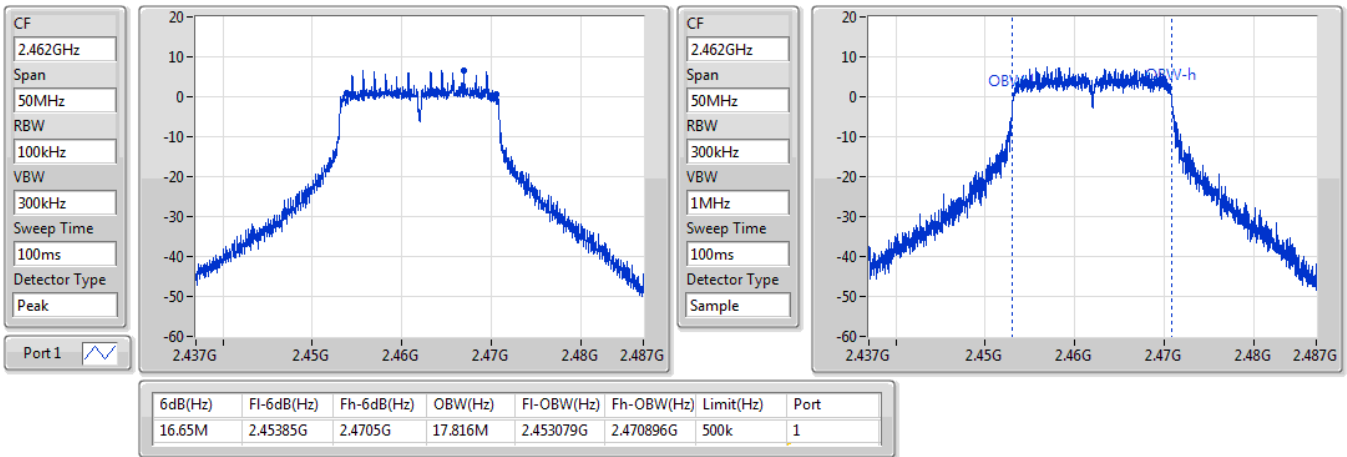

802.11n HT20_Nss1,(MCS0)_1TX
EBW
2437MHz

13/01/2021

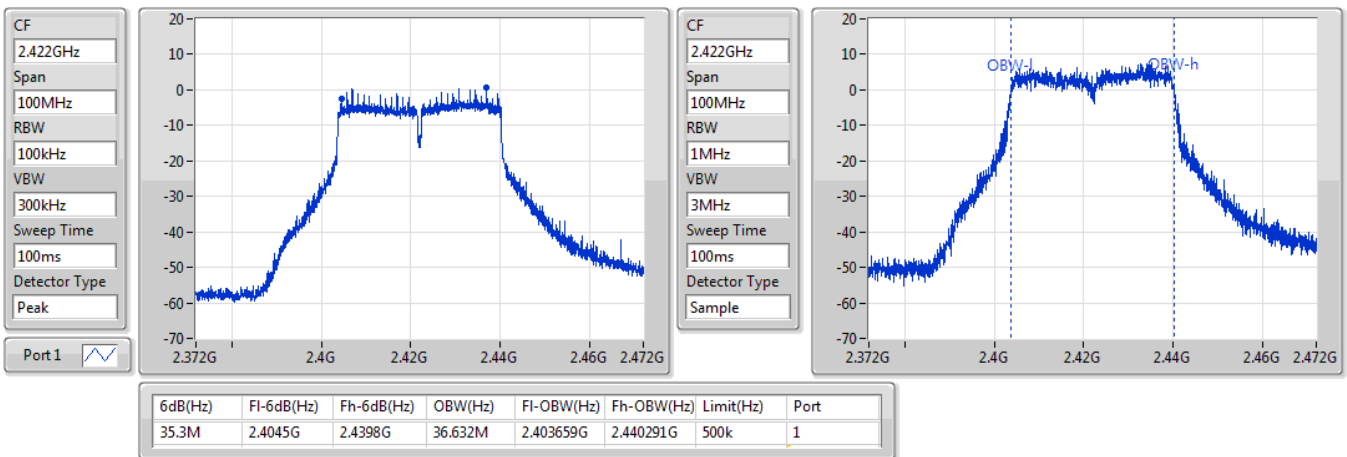


802.11n HT20_Nss1,(MCS0)_1TX
EBW
2462MHz

13/01/2021

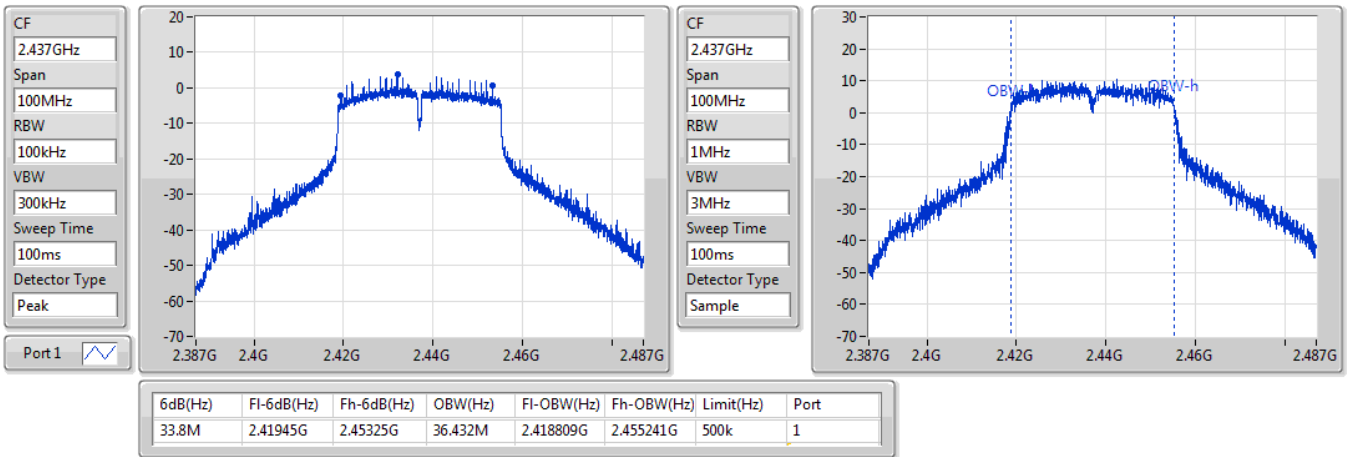

802.11n HT40_Nss1,(MCS0)_1TX
EBW
2422MHz

13/01/2021

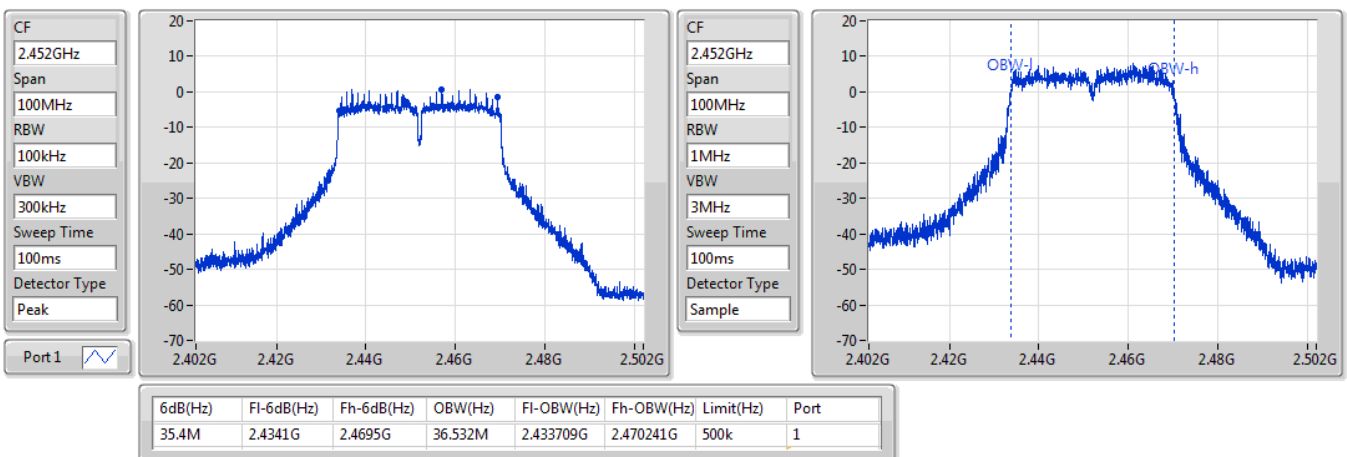


802.11n HT40_Nss1,(MCS0)_1TX
EBW
2437MHz

13/01/2021


802.11n HT40_Nss1,(MCS0)_1TX
EBW
2452MHz

13/01/2021



**Summary**

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	28.32	0.67920
802.11g_Nss1,(6Mbps)_2TX	26.89	0.48865
802.11n HT20_Nss1,(MCS0)_2TX	25.83	0.38282
802.11n HT40_Nss1,(MCS0)_2TX	24.43	0.27733
VHT20_Nss1,(MCS0)_2TX	26.03	0.40087
VHT40_Nss1,(MCS0)_2TX	24.45	0.27861
802.11ax HEW20_Nss1,(MCS0)_2TX	26.13	0.41020
802.11ax HEW40_Nss1,(MCS0)_2TX	24.46	0.27925



Average Power_Non-Beamforming_Radio 0

Appendix C.1

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.17	25.19	25.43	28.32	30.00
2437MHz	Pass	4.17	23.56	23.59	26.59	30.00
2462MHz	Pass	4.17	24.19	24.21	27.21	30.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.17	22.55	22.98	25.78	30.00
2417MHz	Pass	4.17	23.76	24.00	26.89	30.00
2437MHz	Pass	4.17	23.40	23.49	26.46	30.00
2457MHz	Pass	4.17	23.01	23.15	26.09	30.00
2462MHz	Pass	4.17	22.56	22.48	25.53	30.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.17	20.60	20.95	23.79	30.00
2417MHz	Pass	4.17	22.48	23.02	25.77	30.00
2437MHz	Pass	4.17	22.81	22.82	25.83	30.00
2457MHz	Pass	4.17	22.42	22.61	25.53	30.00
2462MHz	Pass	4.17	22.01	21.97	25.00	30.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.17	21.29	21.54	24.43	30.00
2437MHz	Pass	4.17	21.30	21.39	24.36	30.00
2447MHz	Pass	4.17	20.09	20.07	23.09	30.00
2452MHz	Pass	4.17	19.48	19.50	22.50	30.00
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.17	20.72	21.01	23.88	30.00
2417MHz	Pass	4.17	22.62	23.11	25.88	30.00
2437MHz	Pass	4.17	23.01	23.02	26.03	30.00
2457MHz	Pass	4.17	22.48	22.64	25.57	30.00
2462MHz	Pass	4.17	22.05	22.03	25.05	30.00
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.17	21.54	21.33	24.45	30.00
2437MHz	Pass	4.17	21.38	21.42	24.41	30.00
2447MHz	Pass	4.17	20.12	20.10	23.12	30.00
2452MHz	Pass	4.17	19.47	19.53	22.51	30.00
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.17	20.73	21.09	23.92	30.00
2417MHz	Pass	4.17	22.79	23.23	26.03	30.00
2437MHz	Pass	4.17	23.10	23.13	26.13	30.00
2457MHz	Pass	4.17	22.58	22.70	25.65	30.00
2462MHz	Pass	4.17	22.08	22.07	25.09	30.00
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.17	21.41	21.48	24.46	30.00
2437MHz	Pass	4.17	21.48	21.37	24.44	30.00
2447MHz	Pass	4.17	20.12	20.11	23.13	30.00
2452MHz	Pass	4.17	19.49	19.56	22.54	30.00

DG = Directional Gain; Port X = Port X output power



Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	20.58	0.11429
802.11g_Nss1,(6Mbps)_1TX	20.40	0.10965
802.11n HT20_Nss1,(MCS0)_1TX	20.31	0.10740
802.11n HT40_Nss1,(MCS0)_1TX	17.34	0.05420



Average Power_Non-Beamforming_Radio 2

Appendix C.2

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	20.58	20.58	30.00
2437MHz	Pass	3.99	19.72	19.72	30.00
2462MHz	Pass	3.99	20.49	20.49	30.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	17.76	17.76	30.00
2417MHz	Pass	3.99	20.40	20.40	30.00
2437MHz	Pass	3.99	19.67	19.67	30.00
2457MHz	Pass	3.99	20.03	20.03	30.00
2462MHz	Pass	3.99	17.55	17.55	30.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	17.27	17.27	30.00
2417MHz	Pass	3.99	20.31	20.31	30.00
2437MHz	Pass	3.99	19.57	19.57	30.00
2457MHz	Pass	3.99	19.92	19.92	30.00
2462MHz	Pass	3.99	16.98	16.98	30.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2422MHz	Pass	3.99	13.80	13.80	30.00
2427MHz	Pass	3.99	17.34	17.34	30.00
2437MHz	Pass	3.99	16.82	16.82	30.00
2447MHz	Pass	3.99	15.84	15.84	30.00
2452MHz	Pass	3.99	14.60	14.60	30.00

DG = Directional Gain; Port X = Port X output power



Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	26.13	0.41020
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	24.46	0.27925

**Result**

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	20.73	21.09	23.92	28.82
2417MHz	Pass	7.18	22.79	23.23	26.03	28.82
2437MHz	Pass	7.18	23.1	23.13	26.13	28.82
2457MHz	Pass	7.18	22.58	22.7	25.65	28.82
2462MHz	Pass	7.18	22.08	22.07	25.09	28.82
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	7.18	21.41	21.48	24.46	28.82
2437MHz	Pass	7.18	21.48	21.37	24.44	28.82
2447MHz	Pass	7.18	20.12	20.11	23.13	28.82
2452MHz	Pass	7.18	19.49	19.56	22.54	28.82

DG = Directional Gain; Port X = Port X output power



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	4.21
802.11g_Nss1,(6Mbps)_2TX	-0.82
802.11n HT20_Nss1,(MCS0)_2TX	-0.89
802.11n HT40_Nss1,(MCS0)_2TX	-5.16
VHT20_Nss1,(MCS0)_2TX	-0.51
VHT40_Nss1,(MCS0)_2TX	-4.60
802.11ax HEW20_Nss1,(MCS0)_2TX	-1.27
802.11ax HEW40_Nss1,(MCS0)_2TX	-5.43

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	2.63	2.40	4.21	6.82
2437MHz	Pass	7.18	0.77	1.57	2.65	6.82
2462MHz	Pass	7.18	1.64	0.74	2.47	6.82
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	-4.99	-4.52	-2.76	6.82
2437MHz	Pass	7.18	-4.50	-1.87	-0.82	6.82
2462MHz	Pass	7.18	-4.55	-5.08	-3.09	6.82
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	-5.43	-4.46	-2.17	6.82
2437MHz	Pass	7.18	-2.53	-2.37	-0.89	6.82
2462MHz	Pass	7.18	-3.01	-2.43	-1.73	6.82
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	7.18	-6.87	-6.18	-5.16	6.82
2437MHz	Pass	7.18	-7.16	-7.10	-5.43	6.82
2452MHz	Pass	7.18	-8.84	-8.11	-6.06	6.82
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	-5.14	-4.50	-2.77	6.82
2437MHz	Pass	7.18	-1.52	-2.77	-0.51	6.82
2462MHz	Pass	7.18	-3.05	-3.79	-1.74	6.82
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	7.18	-6.87	-6.62	-4.60	6.82
2437MHz	Pass	7.18	-7.34	-7.07	-5.12	6.82
2452MHz	Pass	7.18	-8.45	-8.94	-6.23	6.82
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	7.18	-5.45	-5.23	-3.90	6.82
2437MHz	Pass	7.18	-3.32	-2.51	-1.27	6.82
2462MHz	Pass	7.18	-4.24	-3.80	-2.60	6.82
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	7.18	-6.15	-6.92	-5.43	6.82
2437MHz	Pass	7.18	-7.74	-7.57	-6.25	6.82
2452MHz	Pass	7.18	-9.46	-10.07	-7.18	6.82

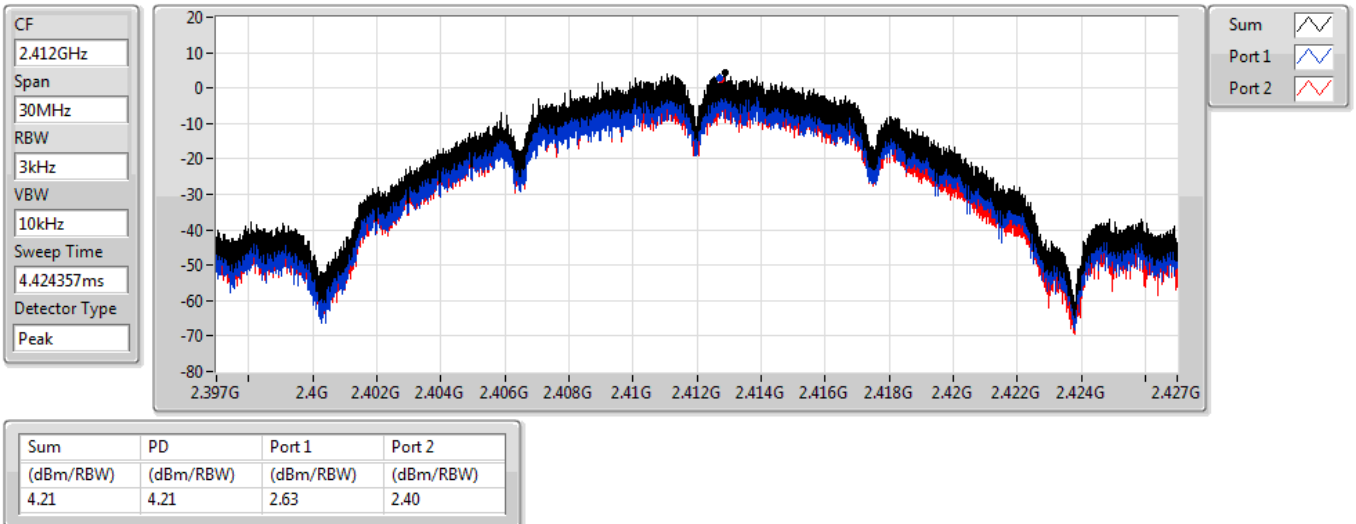
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

802.11b_Nss1,(1Mbps)_2TX

PSD

2412MHz

09/11/2020

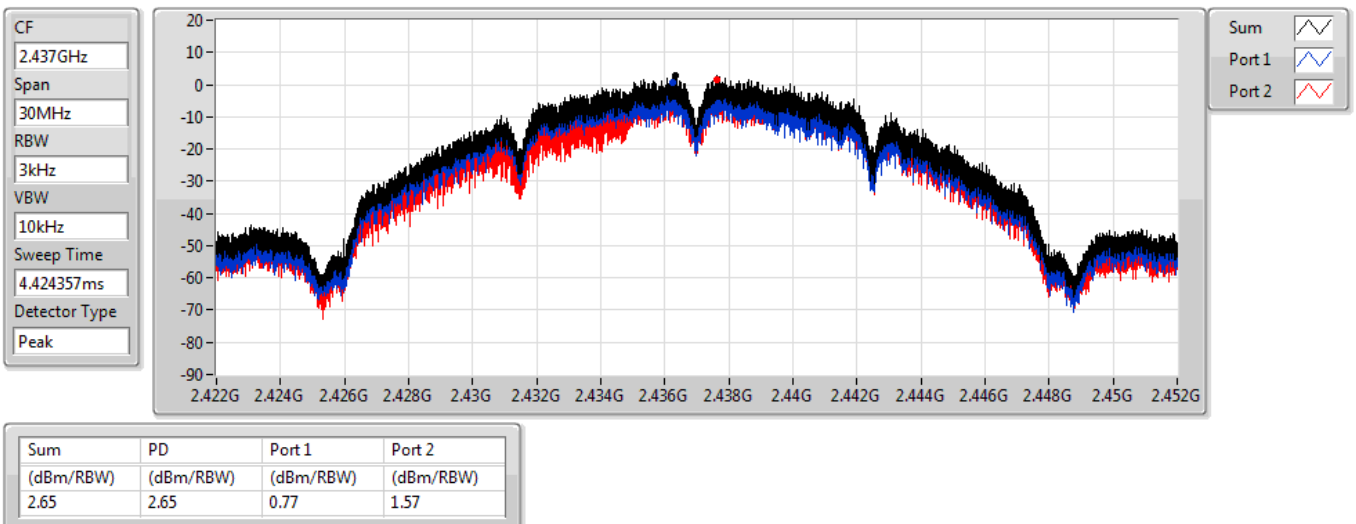


802.11b_Nss1,(1Mbps)_2TX

PSD

2437MHz

09/11/2020



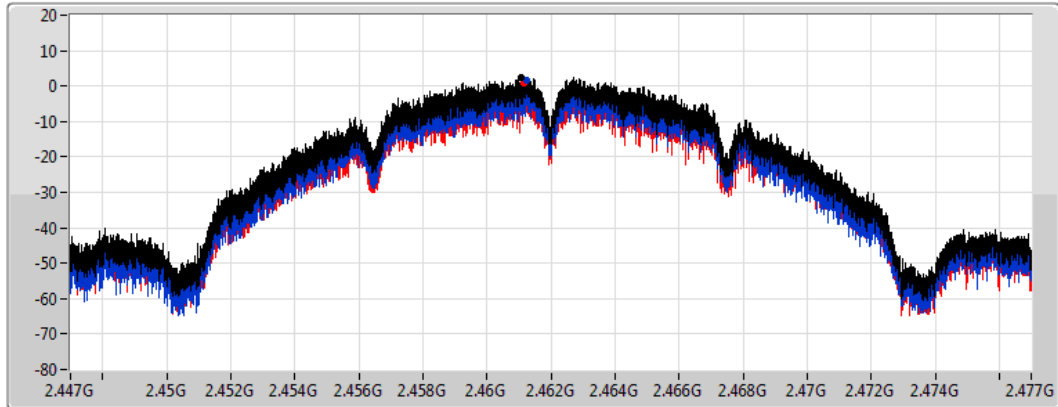
802.11b_Nss1,(1Mbps)_2TX

2462MHz

PSD

09/11/2020

CF
2.462GHz
Span
30MHz
RBW
3kHz
VBW
10kHz
Sweep Time
4.424357ms
Detector Type
Peak



Sum ☒
Port 1 ☒
Port 2 ☒

Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.47	2.47	1.64	0.74

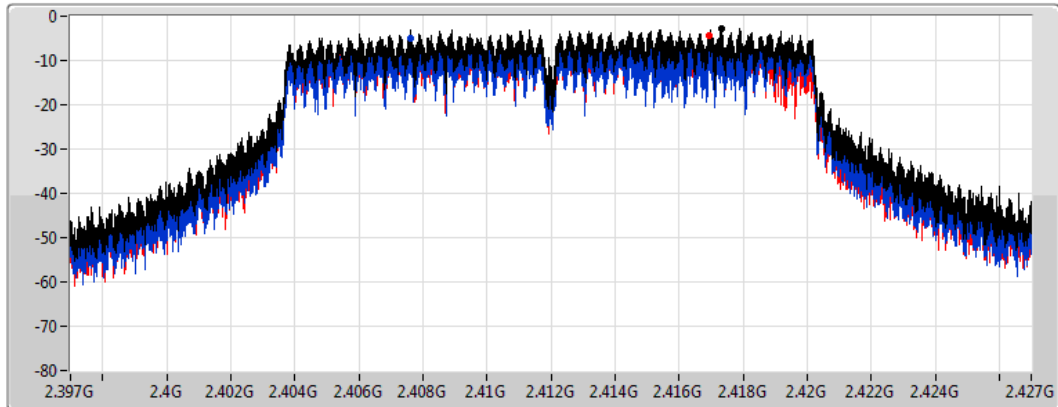
802.11g_Nss1,(6Mbps)_2TX

2412MHz

PSD

09/11/2020

CF
2.412GHz
Span
30MHz
RBW
3kHz
VBW
10kHz
Sweep Time
4.424357ms
Detector Type
Peak



Sum ☒
Port 1 ☒
Port 2 ☒

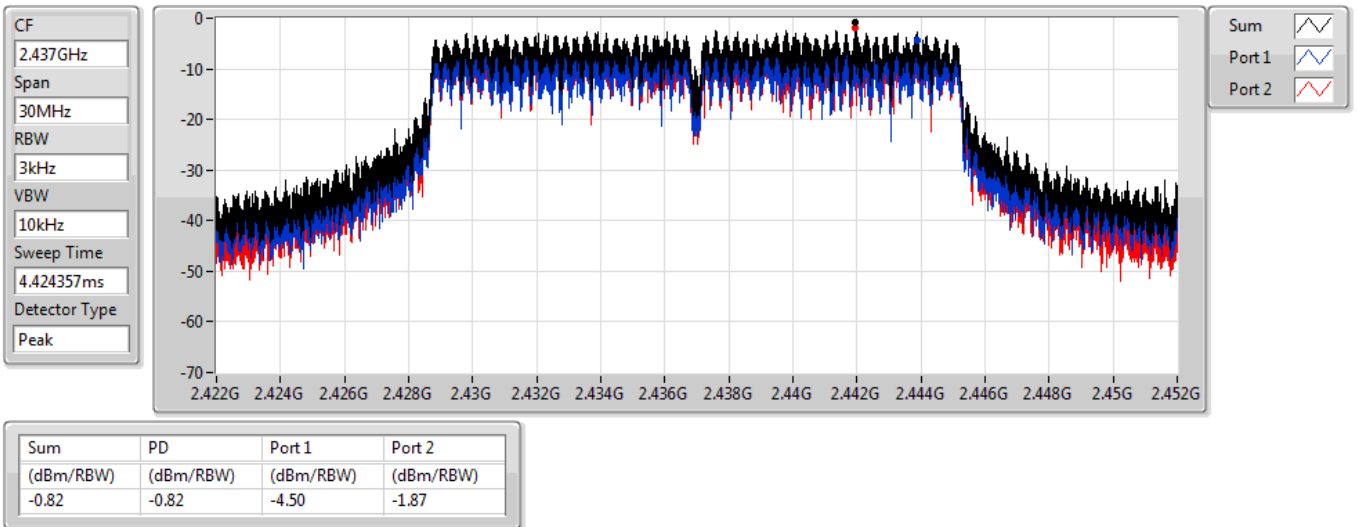
Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.76	-2.76	-4.99	-4.52

802.11g_Nss1,(6Mbps)_2TX

2437MHz

PSD

09/11/2020

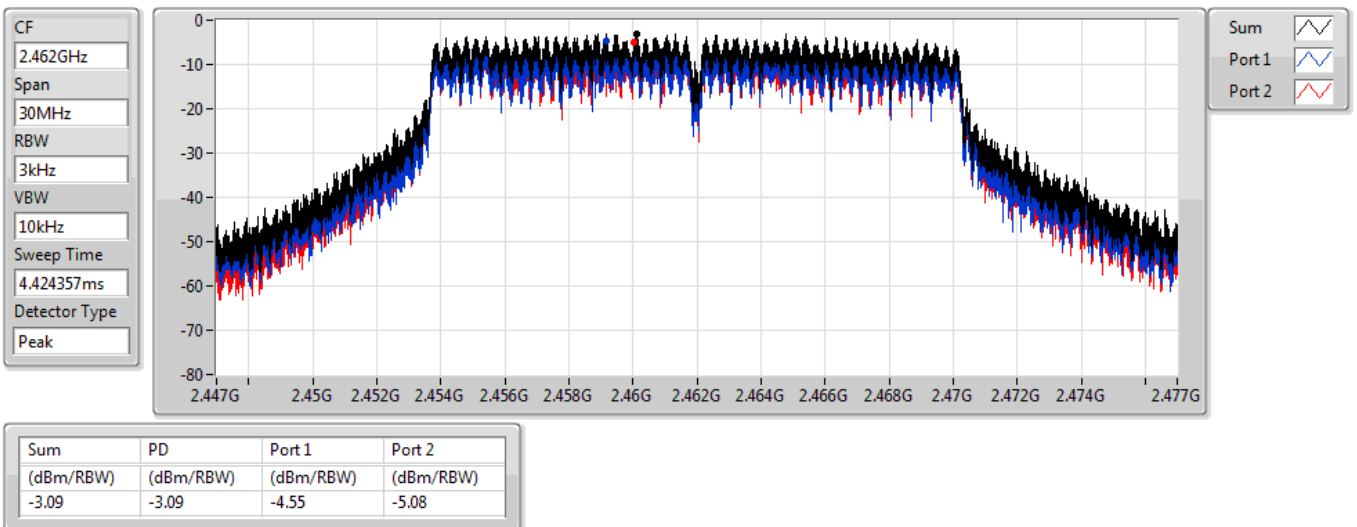


802.11g_Nss1,(6Mbps)_2TX

2462MHz

PSD

09/11/2020

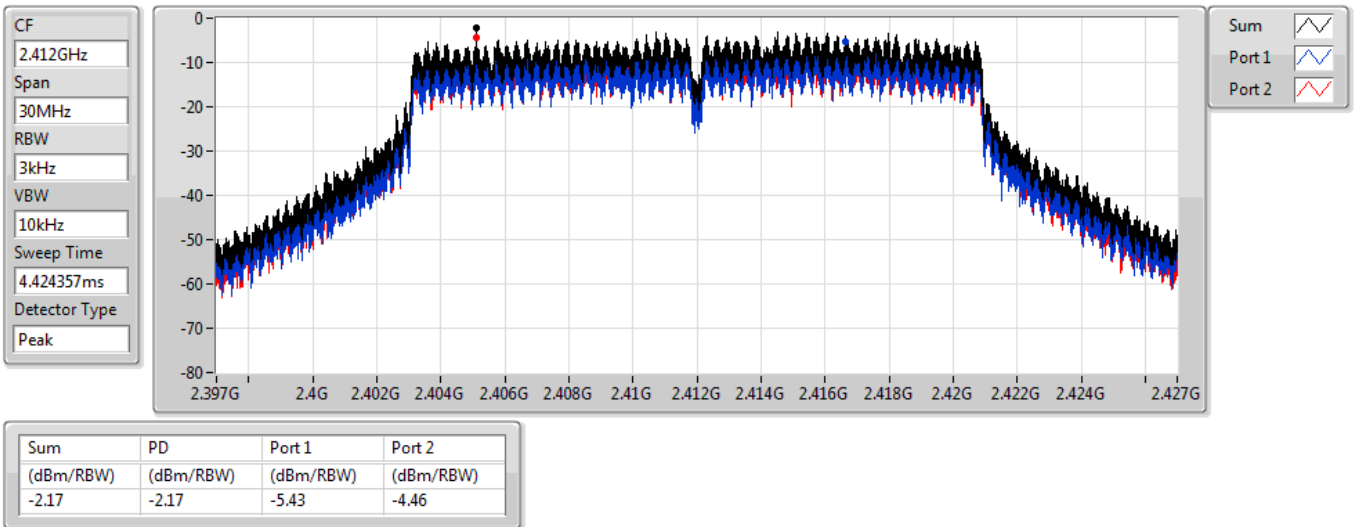


802.11n HT20_Nss1,(MCS0)_2TX

PSD

2412MHz

23/12/2020

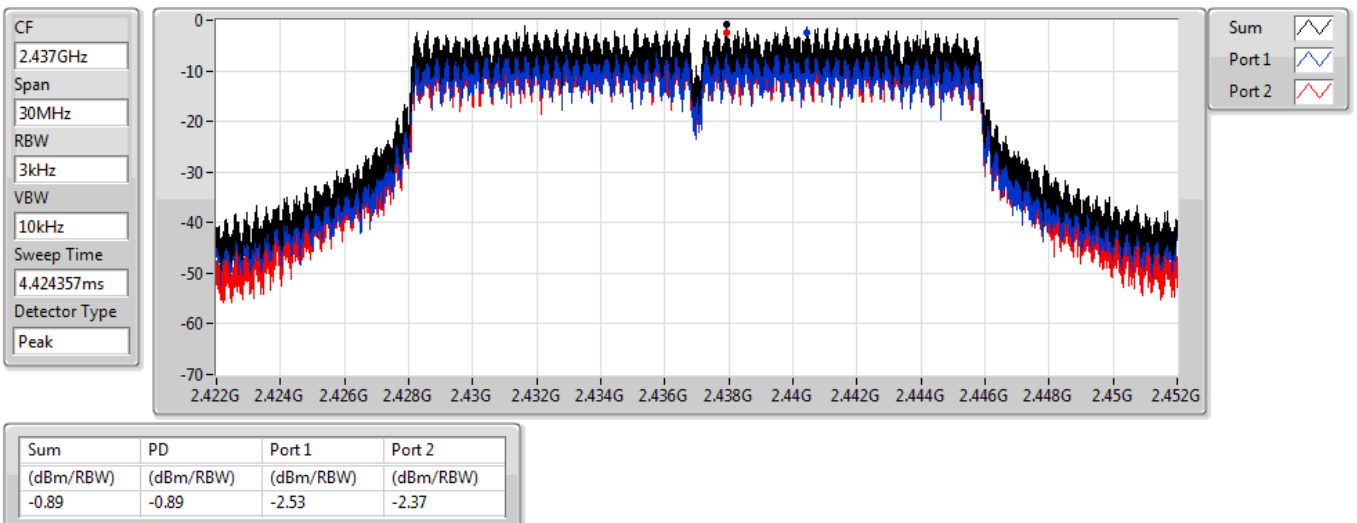


802.11n HT20_Nss1,(MCS0)_2TX

PSD

2437MHz

23/12/2020

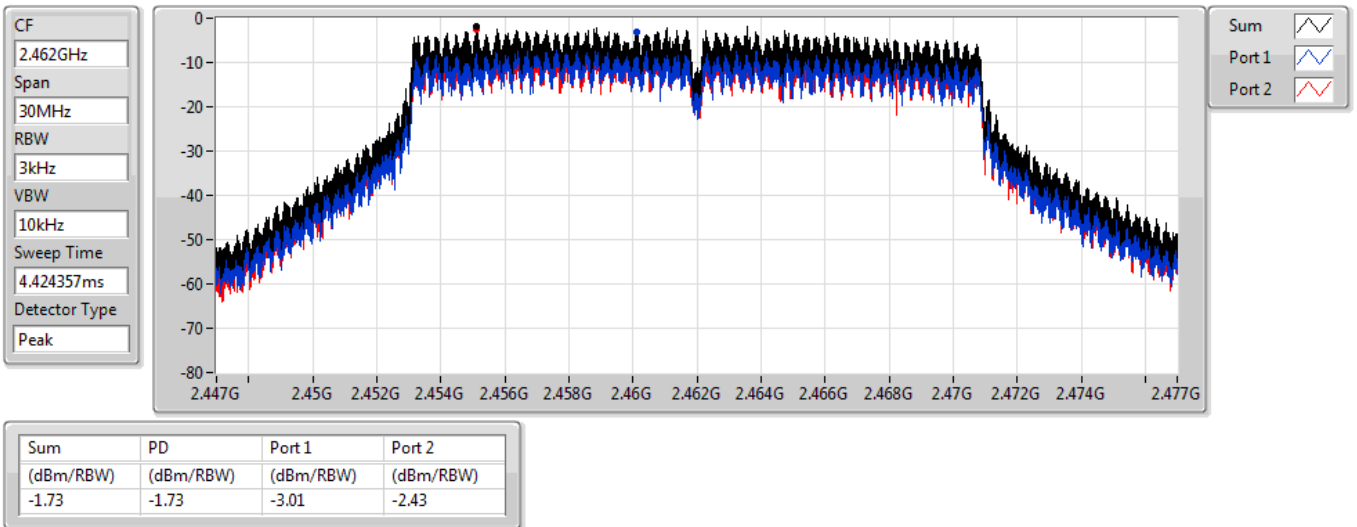


802.11n HT20_Nss1,(MCS0)_2TX

PSD

2462MHz

23/12/2020

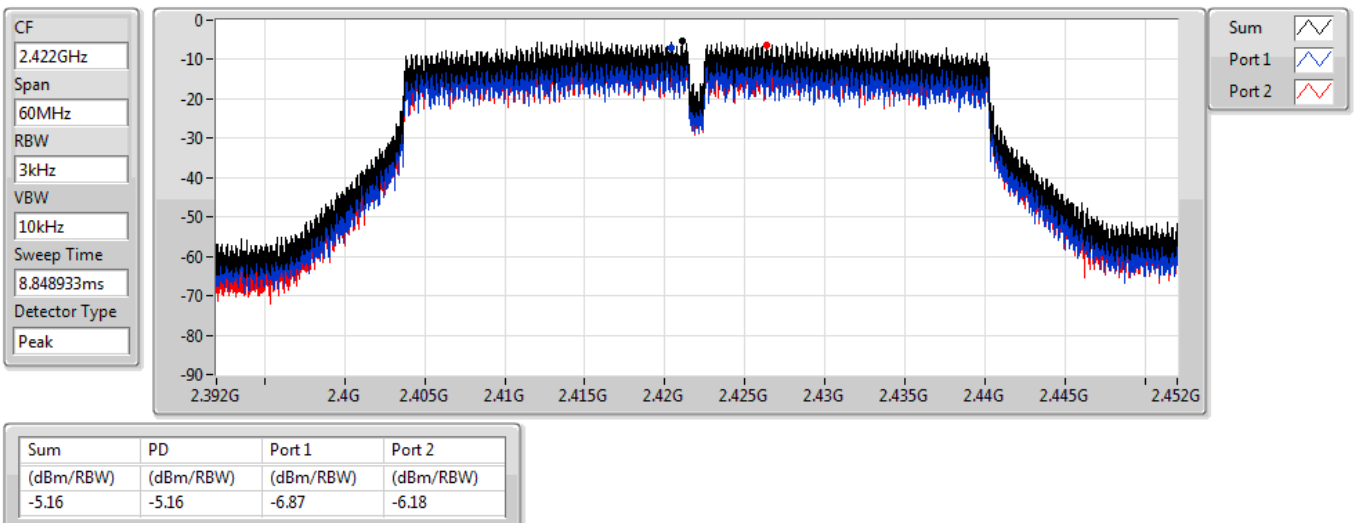


802.11n HT40_Nss1,(MCS0)_2TX

PSD

2422MHz

23/12/2020

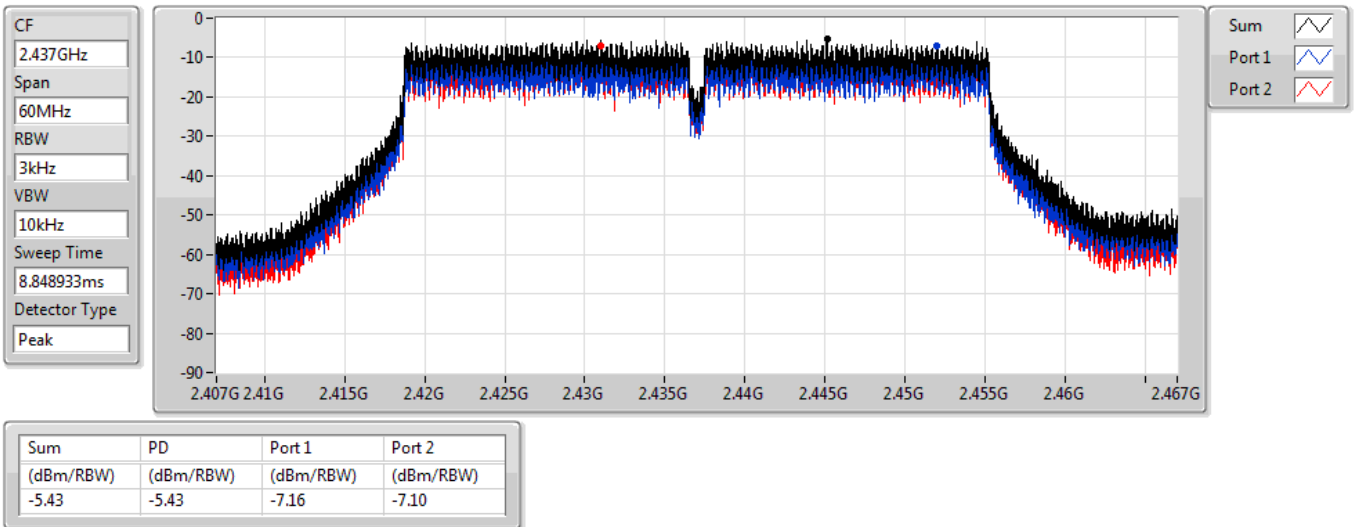


802.11n HT40_Nss1,(MCS0)_2TX

2437MHz

PSD

23/12/2020

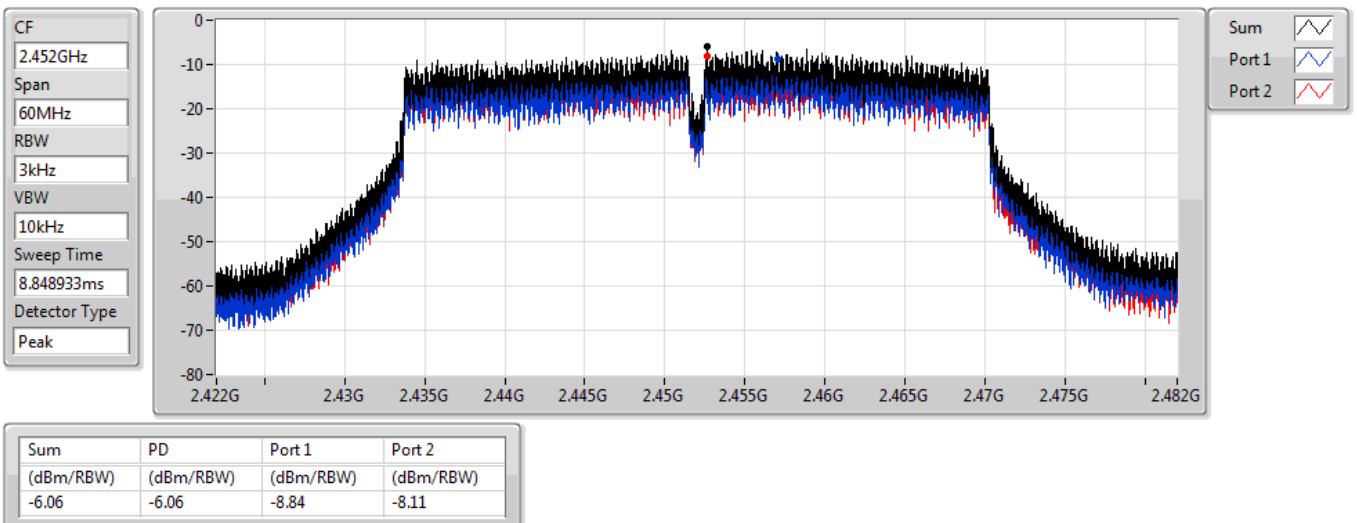


802.11n HT40_Nss1,(MCS0)_2TX

2452MHz

PSD

23/12/2020

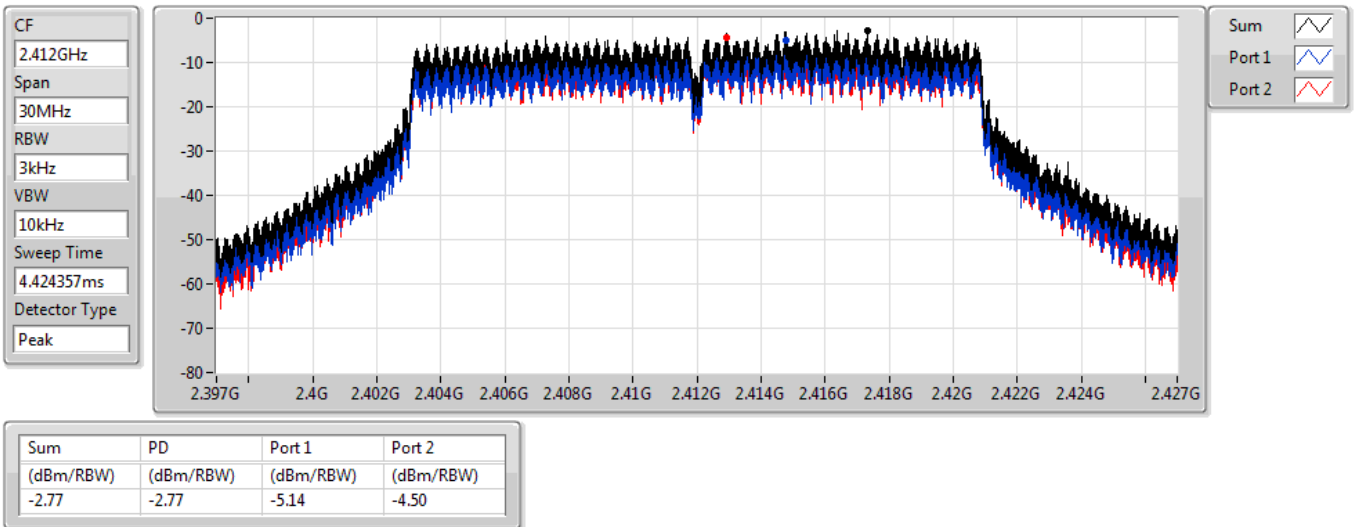


VHT20_Nss1,(MCS0)_2TX

2412MHz

PSD

24/12/2020

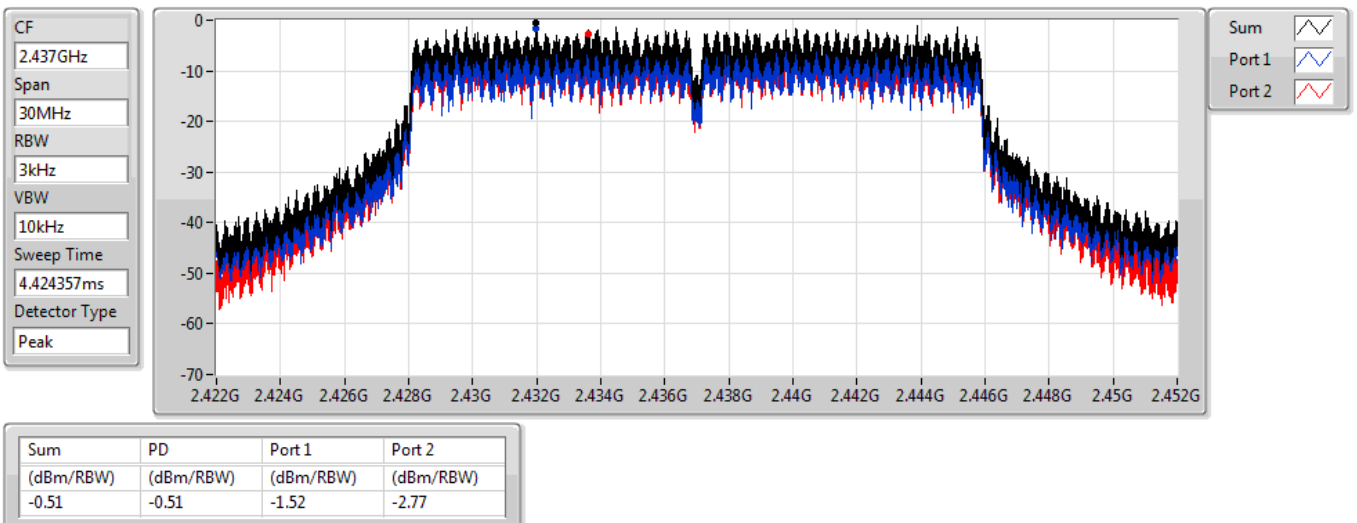


VHT20_Nss1,(MCS0)_2TX

2437MHz

PSD

24/12/2020

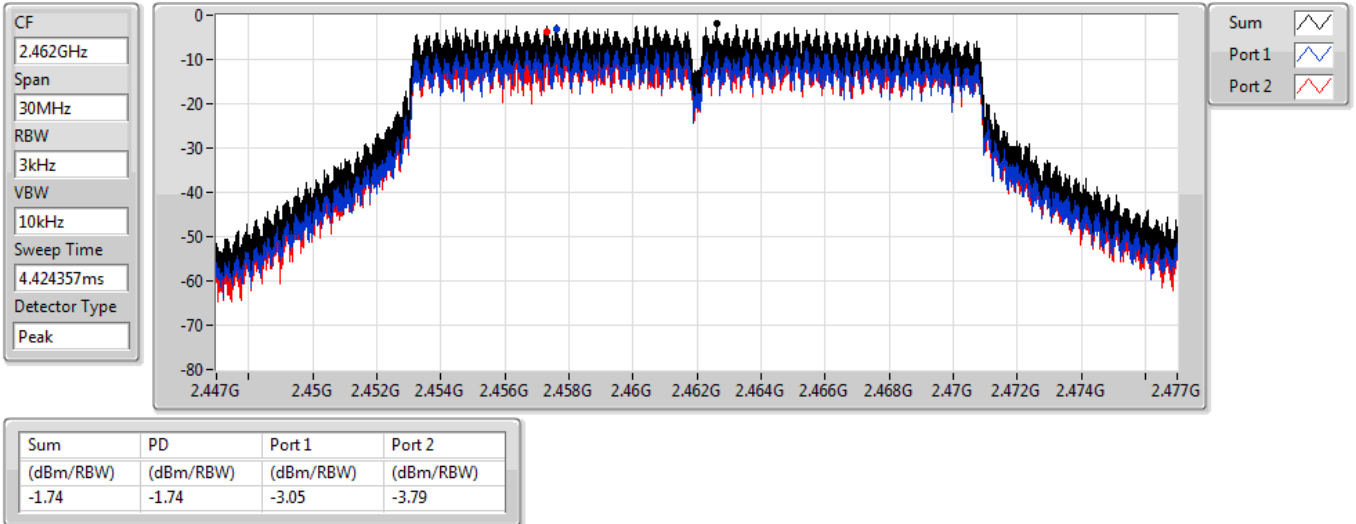


VHT20_Nss1,(MCS0)_2TX

2462MHz

PSD

24/12/2020

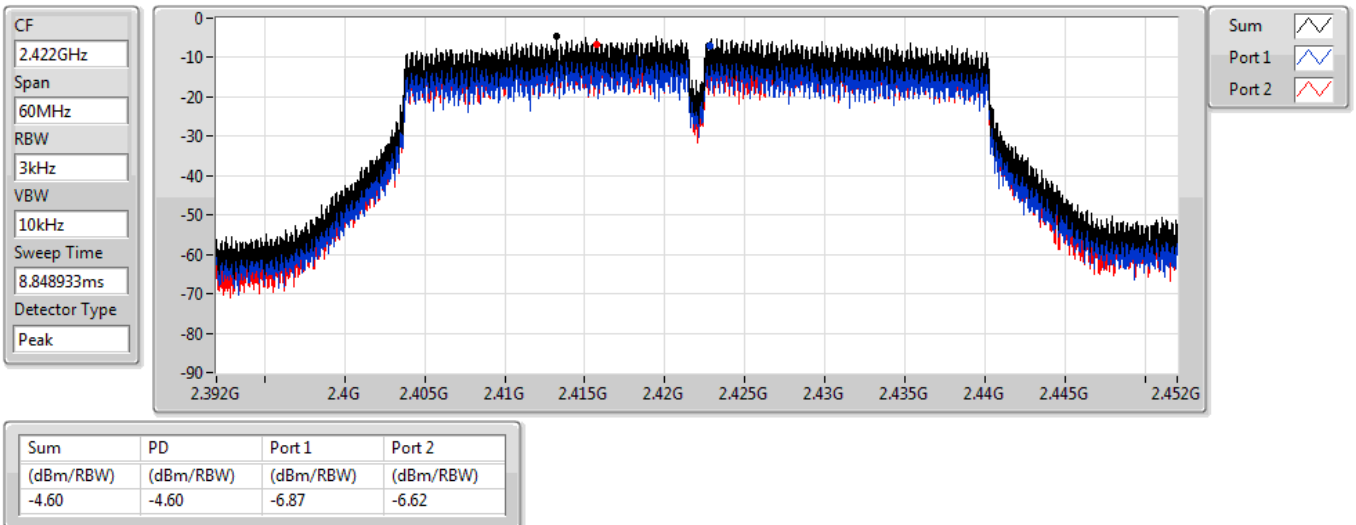


VHT40_Nss1,(MCS0)_2TX

2422MHz

PSD

24/12/2020

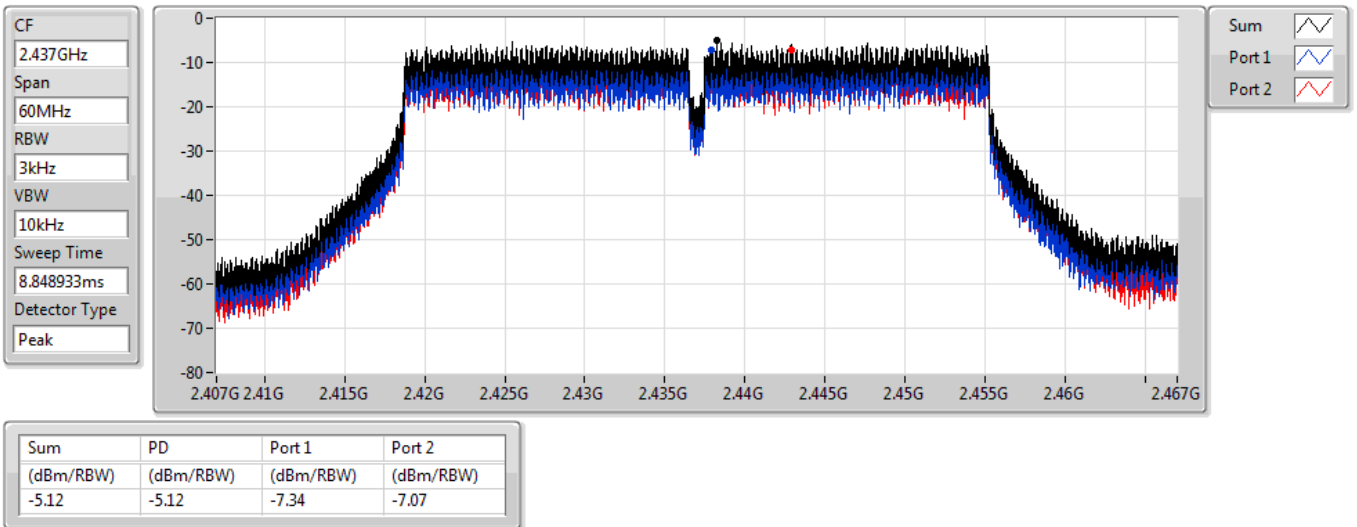


VHT40_Nss1,(MCS0)_2TX

PSD

2437MHz

24/12/2020

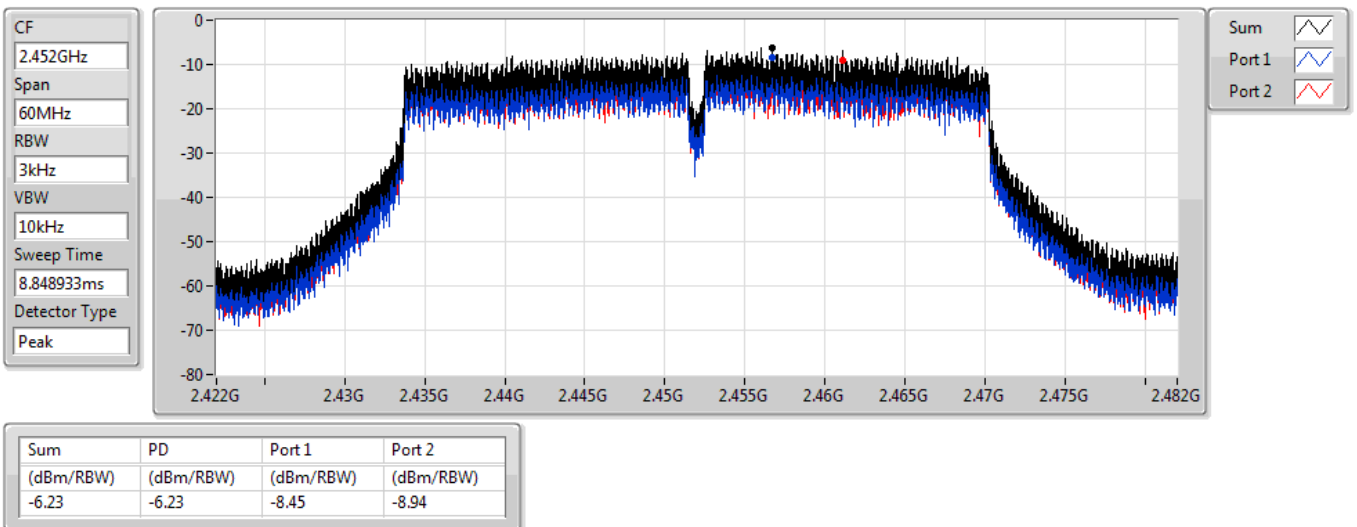


VHT40_Nss1,(MCS0)_2TX

PSD

2452MHz

24/12/2020

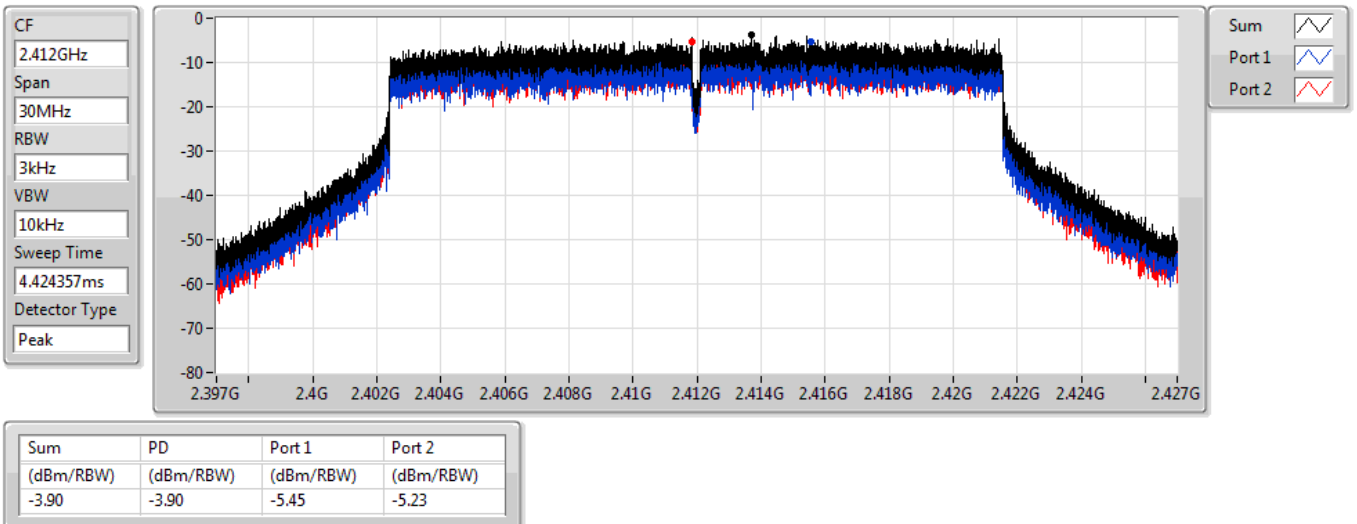


802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

2412MHz

09/11/2020

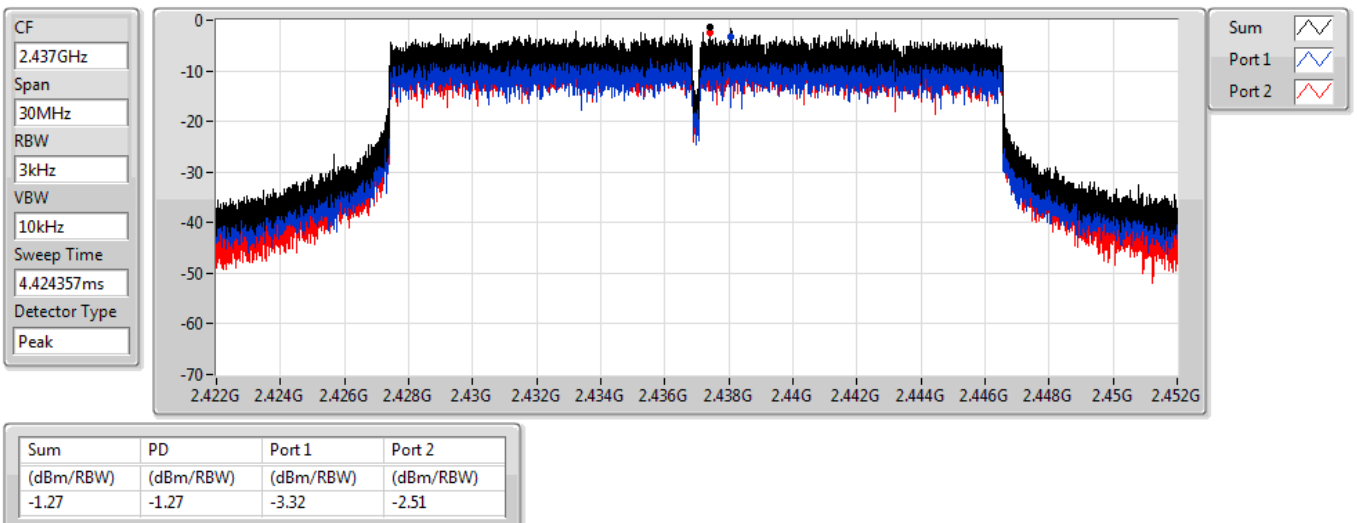


802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

2437MHz

09/11/2020

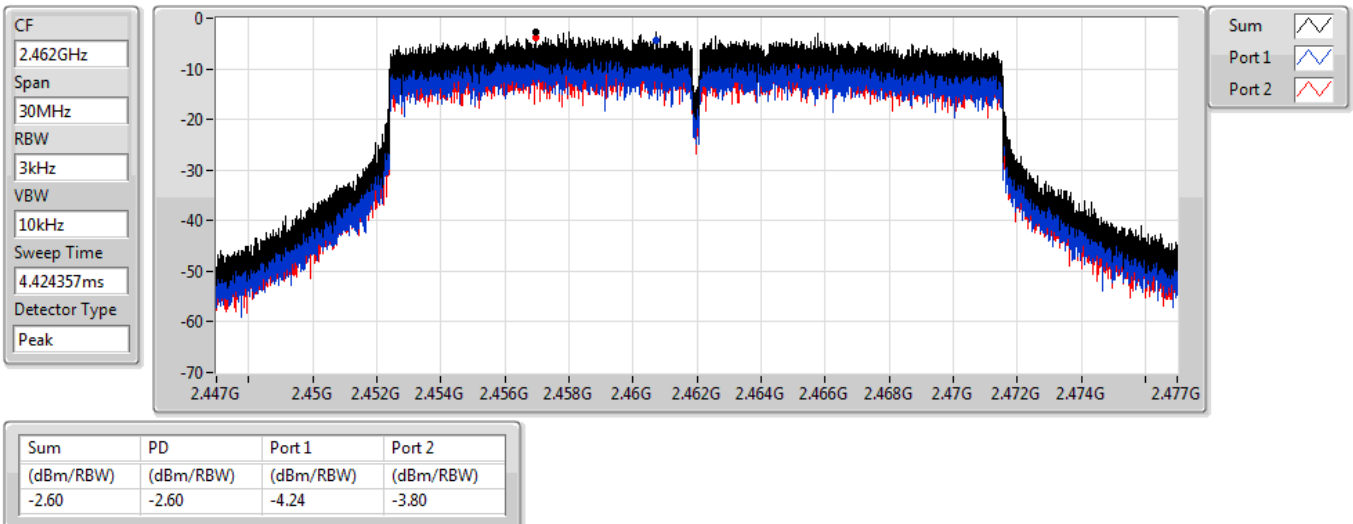


802.11ax HEW20_Nss1,(MCS0)_2TX

PSD

2462MHz

09/11/2020

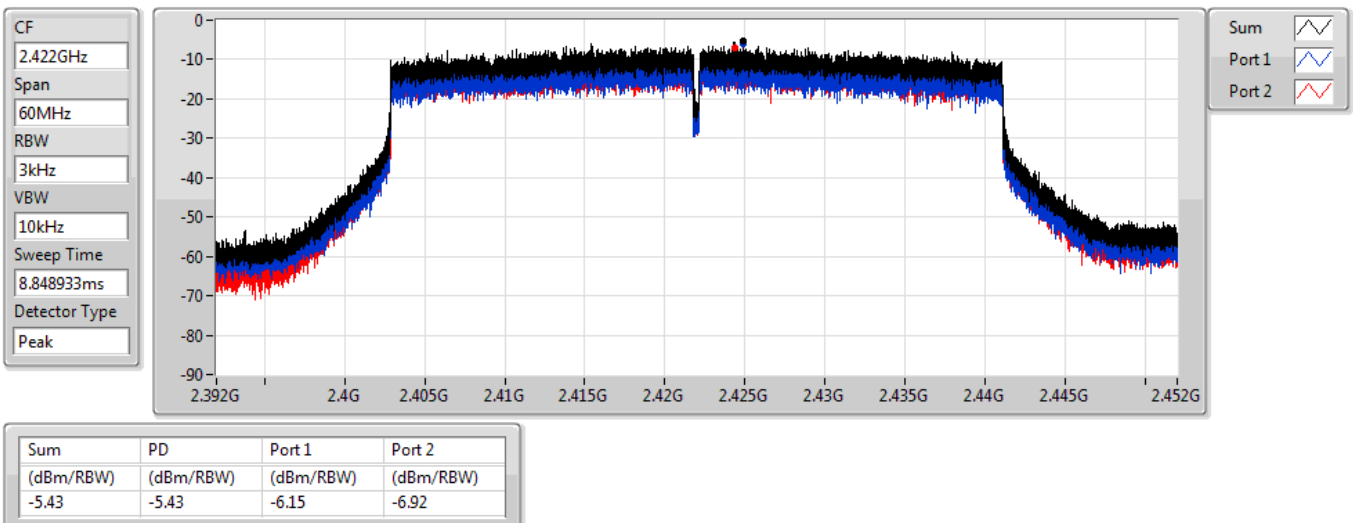


802.11ax HEW40_Nss1,(MCS0)_2TX

PSD

2422MHz

09/11/2020

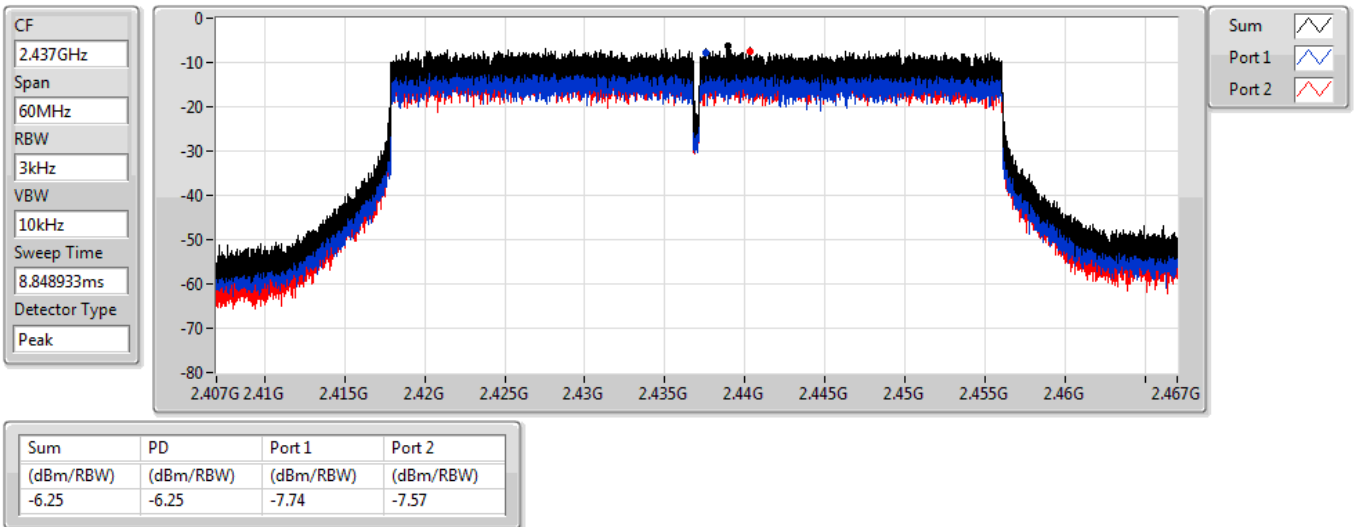


802.11ax HEW40_Nss1,(MCS0)_2TX

PSD

2437MHz

09/11/2020

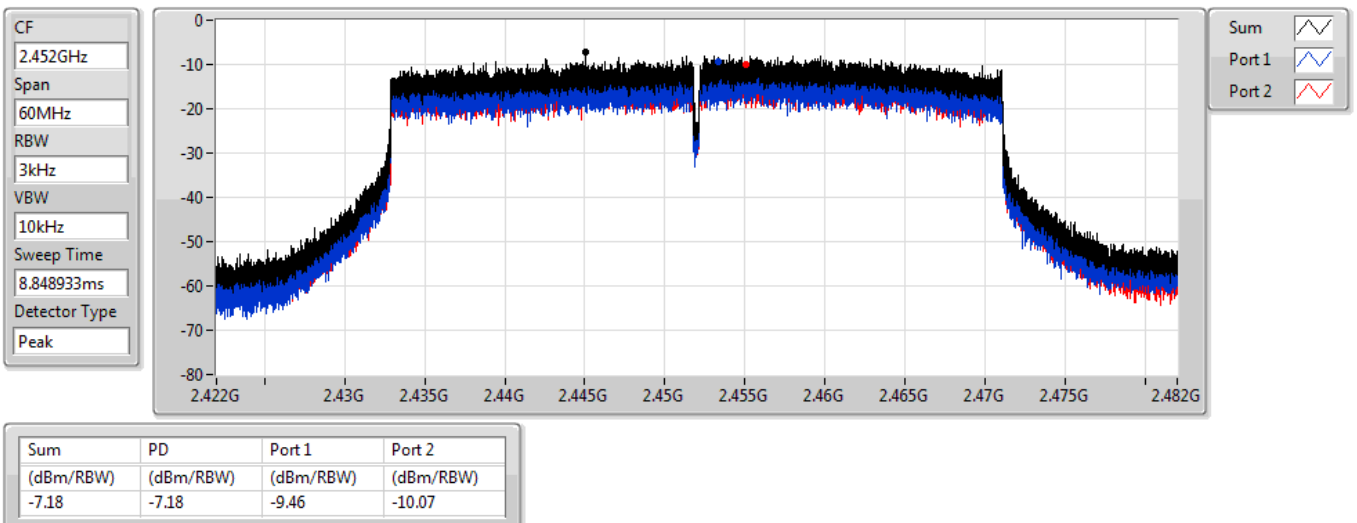


802.11ax HEW40_Nss1,(MCS0)_2TX

PSD

2452MHz

09/11/2020





Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	-2.33
802.11g_Nss1,(6Mbps)_1TX	-5.13
802.11n HT20_Nss1,(MCS0)_1TX	-6.36
802.11n HT40_Nss1,(MCS0)_1TX	-11.63

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	-2.63	-2.63	8.00
2437MHz	Pass	3.99	-2.33	-2.33	8.00
2462MHz	Pass	3.99	-2.91	-2.91	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	-7.90	-7.90	8.00
2437MHz	Pass	3.99	-5.13	-5.13	8.00
2462MHz	Pass	3.99	-8.27	-8.27	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	3.99	-9.11	-9.11	8.00
2437MHz	Pass	3.99	-6.36	-6.36	8.00
2462MHz	Pass	3.99	-8.16	-8.16	8.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2422MHz	Pass	3.99	-15.17	-15.17	8.00
2437MHz	Pass	3.99	-11.63	-11.63	8.00
2452MHz	Pass	3.99	-13.93	-13.93	8.00

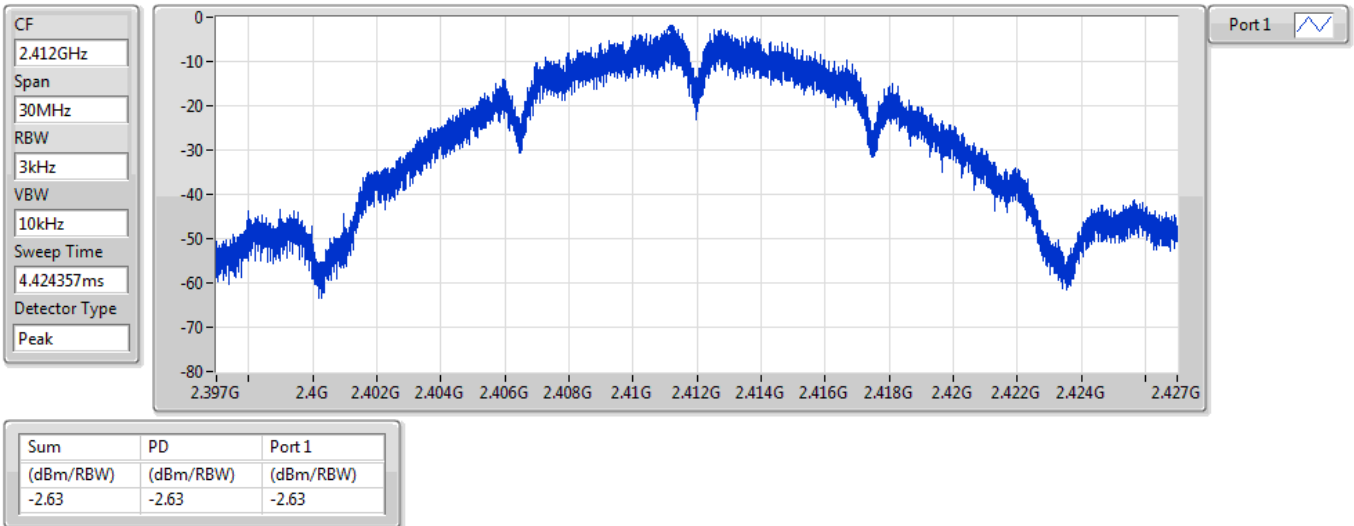
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

802.11b_Nss1,(1Mbps)_1TX

PSD

2412MHz

13/01/2021

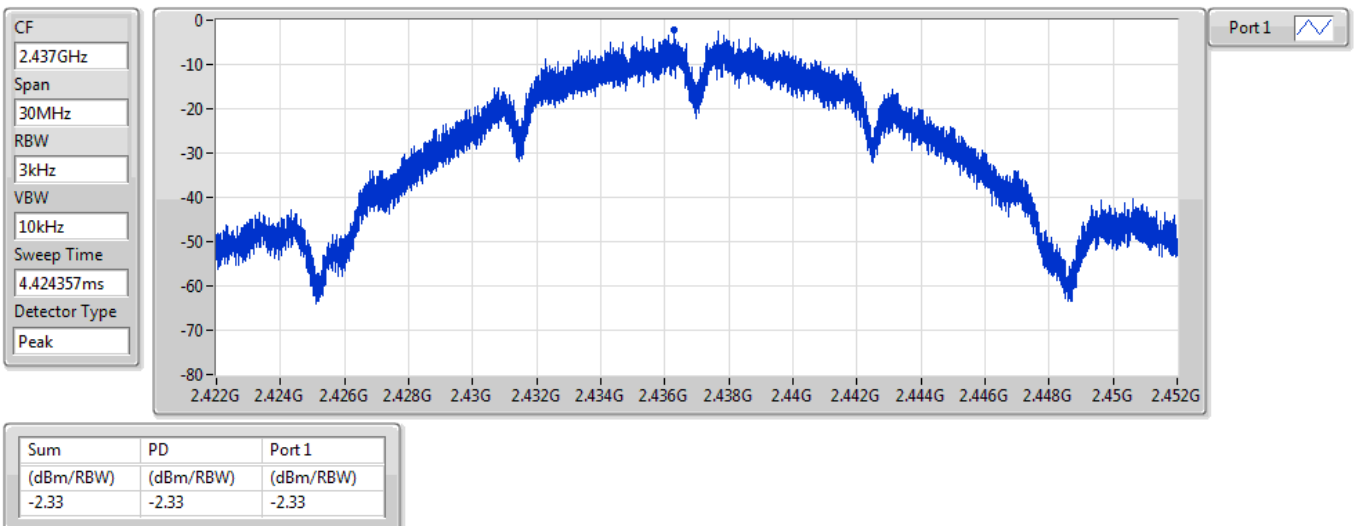


802.11b_Nss1,(1Mbps)_1TX

PSD

2437MHz

13/01/2021

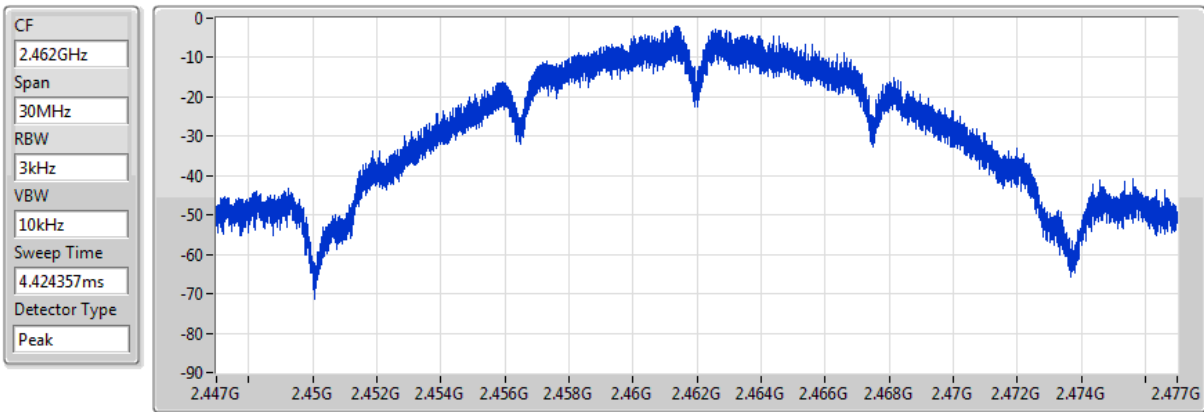


802.11b_Nss1,(1Mbps)_1TX

PSD

2462MHz

13/01/2021



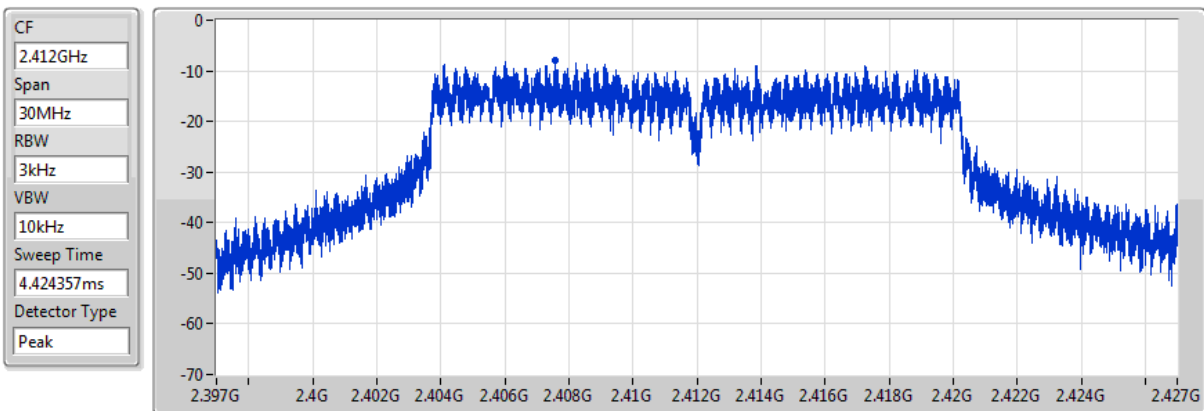
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.91	-2.91	-2.91

802.11g_Nss1,(6Mbps)_1TX

PSD

2412MHz

13/01/2021



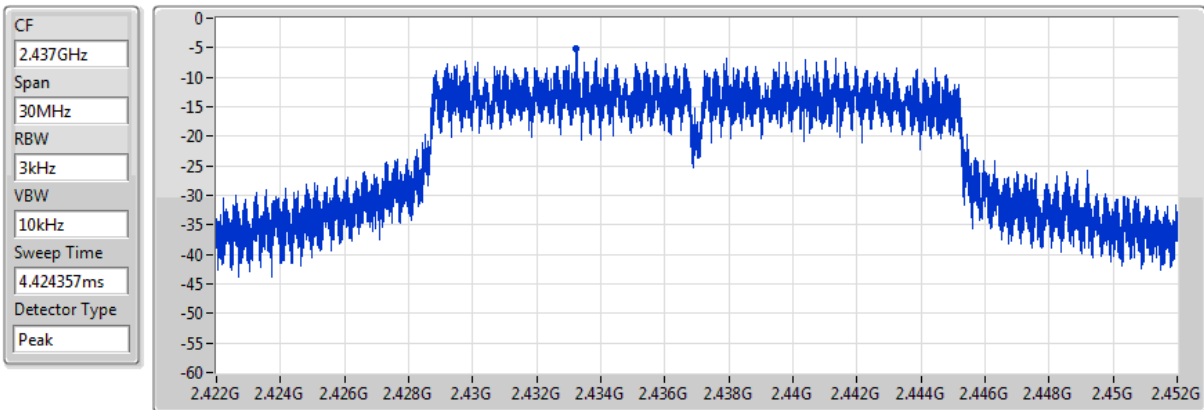
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.90	-7.90	-7.90

802.11g_Nss1,(6Mbps)_1TX

PSD

2437MHz

13/01/2021



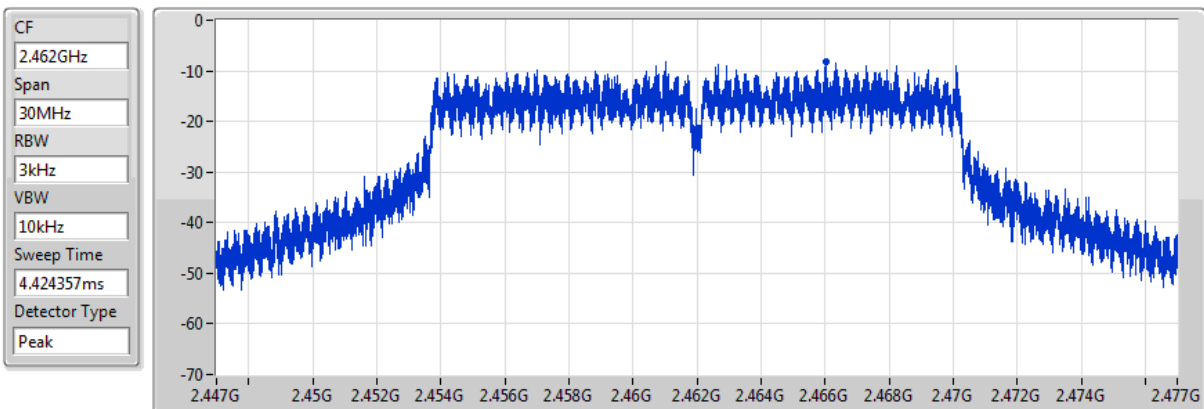
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-5.13	-5.13	-5.13

802.11g_Nss1,(6Mbps)_1TX

PSD

2462MHz

13/01/2021



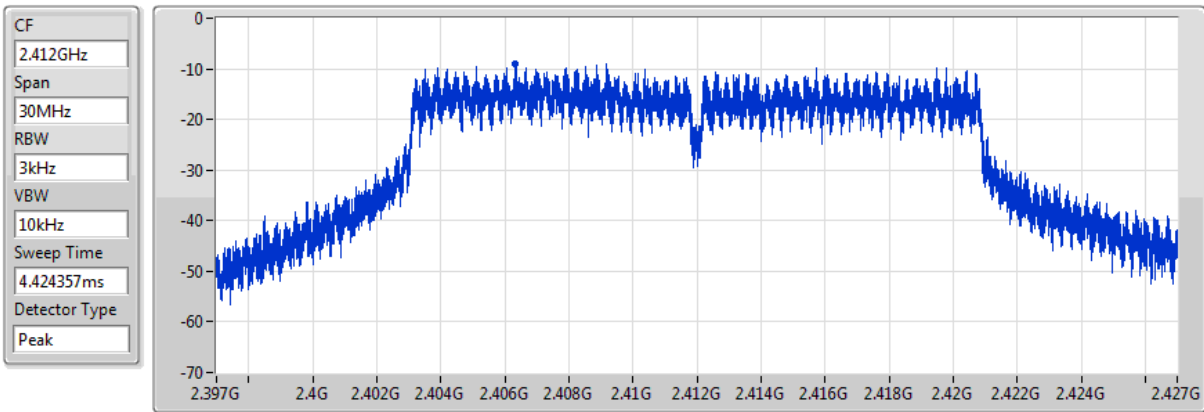
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.27	-8.27	-8.27

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2412MHz

13/01/2021



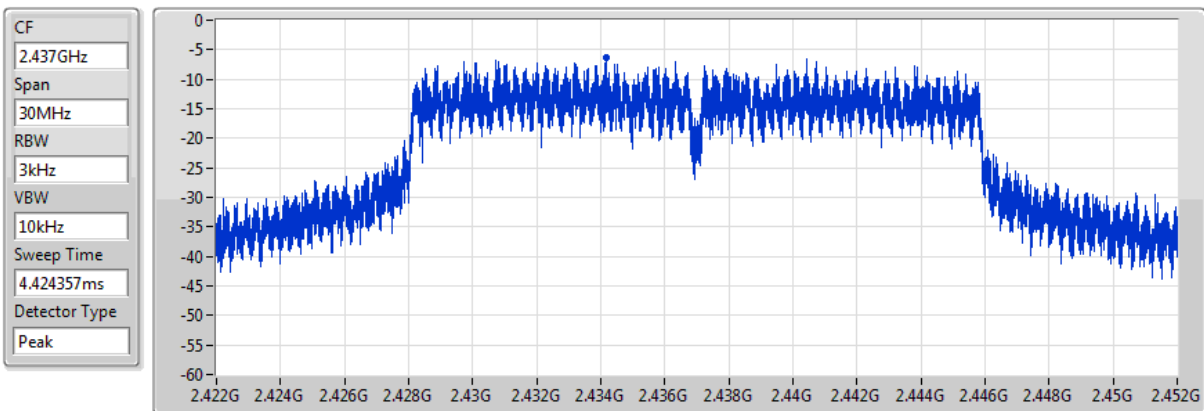
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.11	-9.11	-9.11

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2437MHz

13/01/2021



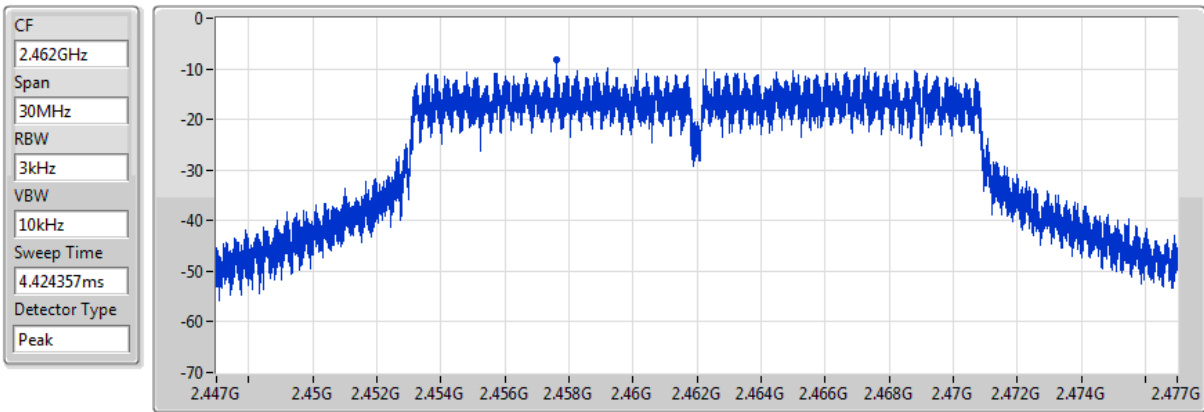
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.36	-6.36	-6.36

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2462MHz

13/01/2021



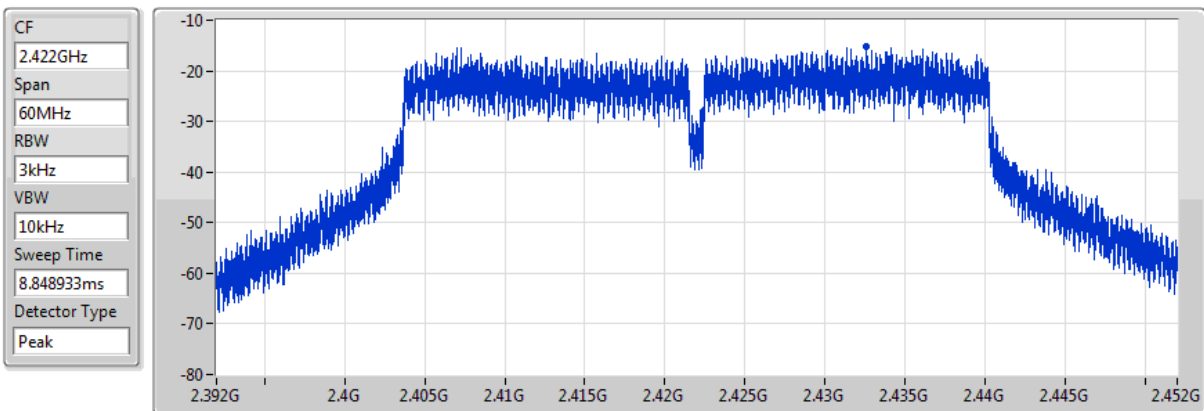
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.16	-8.16	-8.16

802.11n HT40_Nss1,(MCS0)_1TX

PSD

2422MHz

13/01/2021



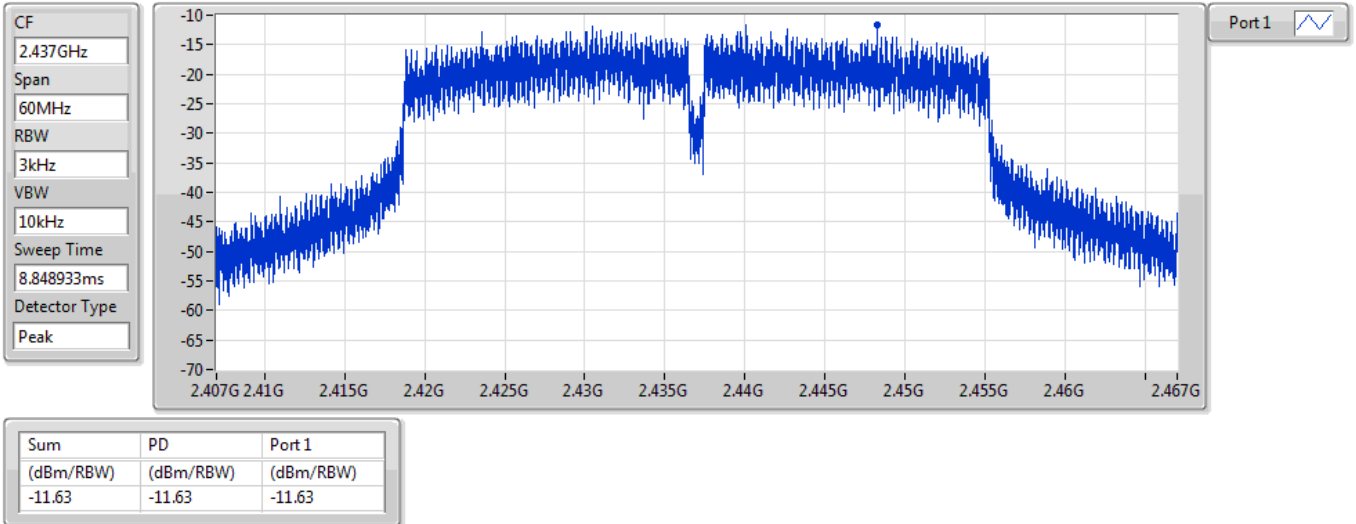
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-15.17	-15.17	-15.17

802.11n HT40_Nss1,(MCS0)_1TX

PSD

2437MHz

13/01/2021

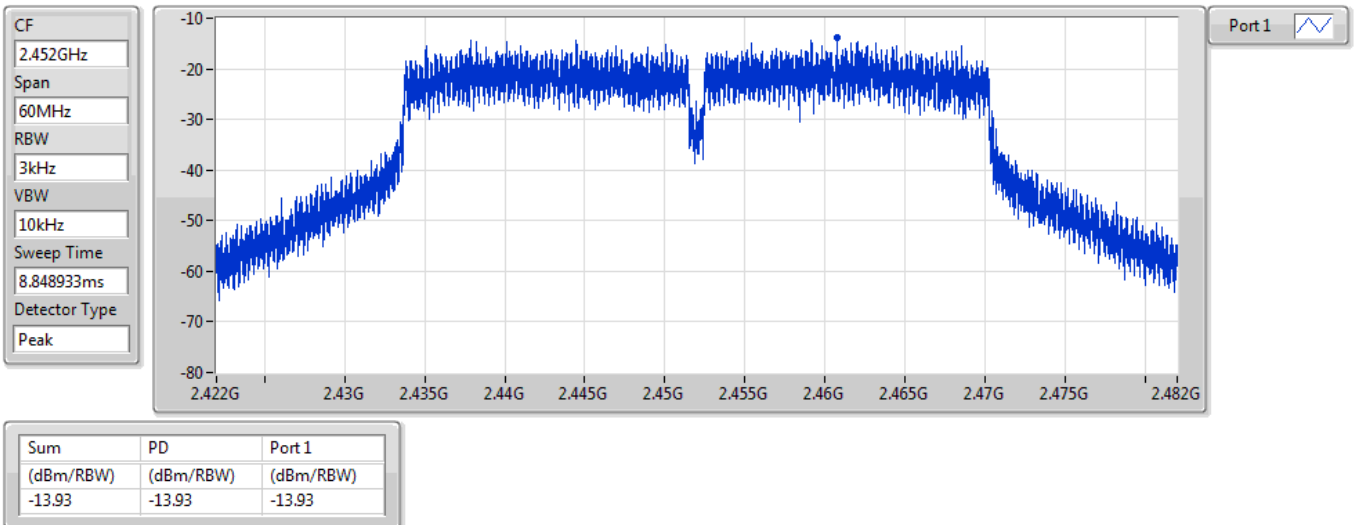


802.11n HT40_Nss1,(MCS0)_1TX

PSD

2452MHz

13/01/2021



**Summary**

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	Pass	2.41294G	17.42	-12.58	2.12671G	-53.91	2.39898G	-24.28	2.4G	-33.82	2.49056G	-51.83	23.35079G	-41.94	2
802.11g_Nss1,(6Mbps)_2TX	Pass	2.43824G	13.52	-16.48	2.01516G	-53.72	2.39972G	-24.65	2.4G	-25.35	2.48634G	-51.16	15.22834G	-41.47	2
802.11ax HEW20_Nss1,(MCS0)_2TX	Pass	2.44196G	13.46	-16.54	2.13603G	-54.01	2.3998G	-24.28	2.4G	-25.71	2.4879G	-51.87	24.80895G	-42.13	2
802.11ax HEW40_Nss1,(MCS0)_2TX	Pass	2.42572G	7.39	-22.61	2.16657G	-54.49	2.4G	-29.72	2.4G	-29.32	2.4835G	-49.32	24.90745G	-41.34	1

Result

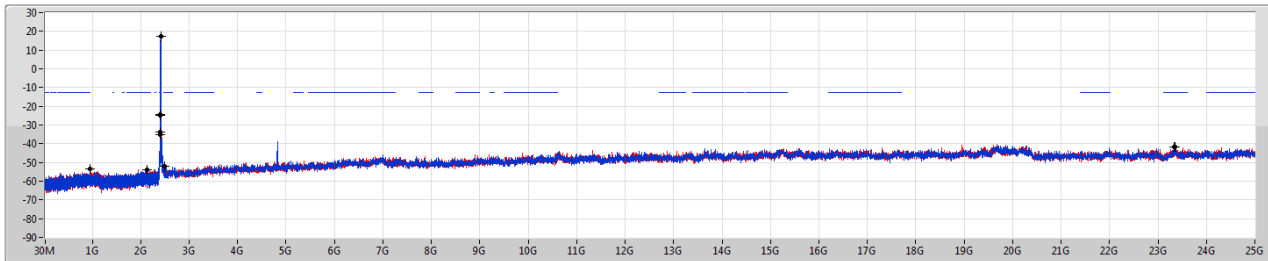
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.41294G	17.42	-12.58	954.14M	-53.61	2.399G	-24.67	2.4G	-35.30	2.48488G	-51.88	23.33112G	-41.67	1
2412MHz	Pass	2.41294G	17.42	-12.58	2.12671G	-53.91	2.39898G	-24.28	2.4G	-33.82	2.49056G	-51.83	23.35079G	-41.94	2
2437MHz	Pass	2.41294G	17.42	-12.58	746.77M	-54.84	2.3972G	-51.04	2.4835G	-52.87	2.48462G	-50.38	24.77524G	-41.43	1
2437MHz	Pass	2.41294G	17.42	-12.58	2.09147G	-54.22	2.39798G	-50.92	2.4G	-54.23	2.48694G	-51.52	15.21991G	-42.31	2
2462MHz	Pass	2.41294G	17.42	-12.58	2.14768G	-54.12	2.39652G	-52.64	2.4835G	-50.36	2.48498G	-48.09	23.3845G	-41.16	1
2462MHz	Pass	2.41294G	17.42	-12.58	955.3M	-53.91	2.39598G	-52.33	2.4835G	-51.53	2.48488G	-48.08	15.23677G	-42.06	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43824G	13.52	-16.48	2.30612G	-53.96	2.3995G	-25.30	2.4G	-25.55	2.49828G	-51.18	15.21429G	-40.99	1
2412MHz	Pass	2.43824G	13.52	-16.48	2.01516G	-53.72	2.39972G	-24.65	2.4G	-25.35	2.48634G	-51.16	15.22834G	-41.47	2
2437MHz	Pass	2.43824G	13.52	-16.48	2.11943G	-54.67	2.39984G	-33.76	2.4G	-35.34	2.48354G	-39.75	17.01803G	-41.23	1
2437MHz	Pass	2.43824G	13.52	-16.48	869.09M	-54.78	2.39946G	-40.97	2.4G	-41.95	2.4839G	-48.56	24.02508G	-41.01	2
2462MHz	Pass	2.43824G	13.52	-16.48	1.96885G	-54.33	2.3979G	-52.05	2.4835G	-38.46	2.4851G	-37.20	15.23115G	-42.33	1
2462MHz	Pass	2.43824G	13.52	-16.48	2.12642G	-53.66	2.39644G	-52.17	2.4835G	-40.66	2.4851G	-38.77	15.21991G	-41.95	2
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44196G	13.46	-16.54	2.17884G	-53.74	2.39992G	-25.38	2.4G	-27.73	2.48854G	-52.49	15.20867G	-41.72	1
2412MHz	Pass	2.44196G	13.46	-16.54	2.13603G	-54.01	2.3998G	-24.28	2.4G	-25.71	2.4879G	-51.87	24.80895G	-42.13	2
2437MHz	Pass	2.44196G	13.46	-16.54	2.14593G	-53.77	2.39662G	-34.46	2.4G	-37.29	2.48414G	-39.05	15.20306G	-41.30	1
2437MHz	Pass	2.44196G	13.46	-16.54	1.97905G	-54.13	2.3996G	-40.60	2.4G	-43.49	2.48474G	-45.23	24.92133G	-40.65	2
2462MHz	Pass	2.44196G	13.46	-16.54	590.07M	-54.40	2.3949G	-52.05	2.4835G	-39.20	2.4843G	-36.27	15.2171G	-41.48	1
2462MHz	Pass	2.44196G	13.46	-16.54	2.18088G	-54.65	2.39998G	-52.24	2.4835G	-34.93	2.48446G	-36.18	24.95224G	-42.04	2
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.42572G	7.39	-22.61	2.16657G	-54.49	2.4G	-29.72	2.4G	-29.32	2.4835G	-49.32	24.90745G	-41.34	1
2422MHz	Pass	2.42572G	7.39	-22.61	1.99453G	-54.30	2.4G	-30.46	2.4G	-31.17	2.48374G	-48.12	24.67467G	-41.83	2
2437MHz	Pass	2.42572G	7.39	-22.61	2.1076G	-54.57	2.39784G	-35.79	2.4G	-40.58	2.48466G	-38.60	24.62138G	-41.75	1
2437MHz	Pass	2.42572G	7.39	-22.61	2.09816G	-54.56	2.39988G	-39.48	2.4835G	-41.19	2.48378G	-39.26	15.20927G	-42.06	2
2452MHz	Pass	2.42572G	7.39	-22.61	2.12134G	-54.33	2.3984G	-50.61	2.4835G	-38.52	2.4841G	-35.85	15.21488G	-41.62	1
2452MHz	Pass	2.42572G	7.39	-22.61	1.95188G	-54.64	2.39948G	-50.43	2.4835G	-39.63	2.48574G	-39.72	24.83173G	-40.47	2

802.11b_Nss1,(1Mbps)_2TX

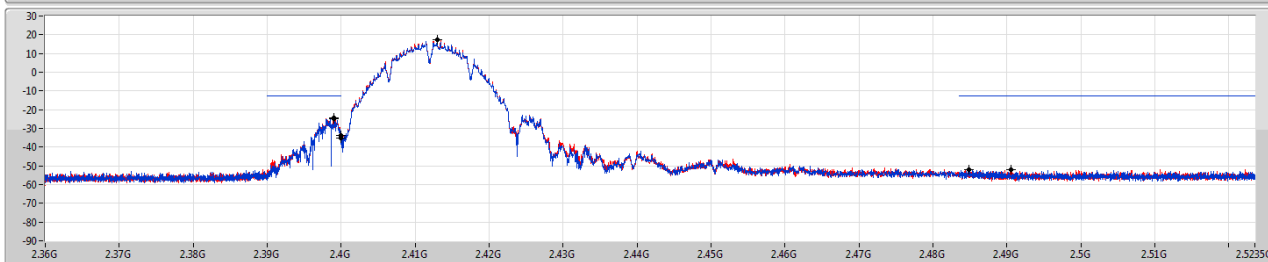
2412MHz

CSENdB

09/11/2020



Port 1
Port 2



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

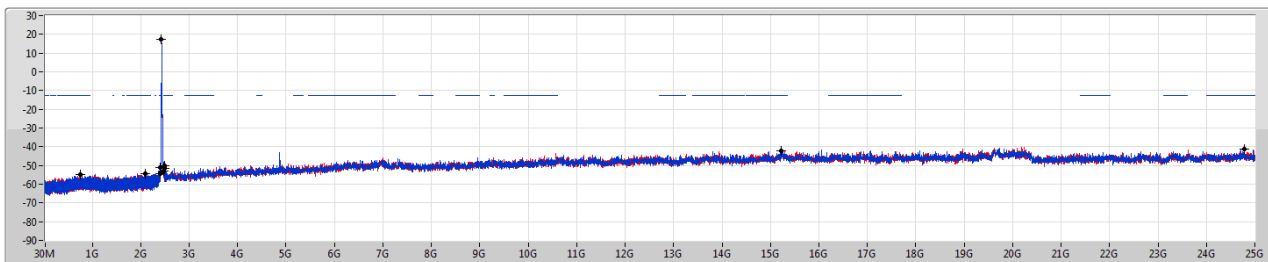
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41294G	17.42	-12.58	954.14M	-53.61	2.399G	-24.67	2.4G	-35.30	2.48488G	-51.88	23.3112G	-41.67	1
2.41294G	17.42	-12.58	2.12671G	-53.91	2.39898G	-24.28	2.4G	-33.82	2.48056G	-51.83	23.35079G	-41.94	2

802.11b_Nss1,(1Mbps)_2TX

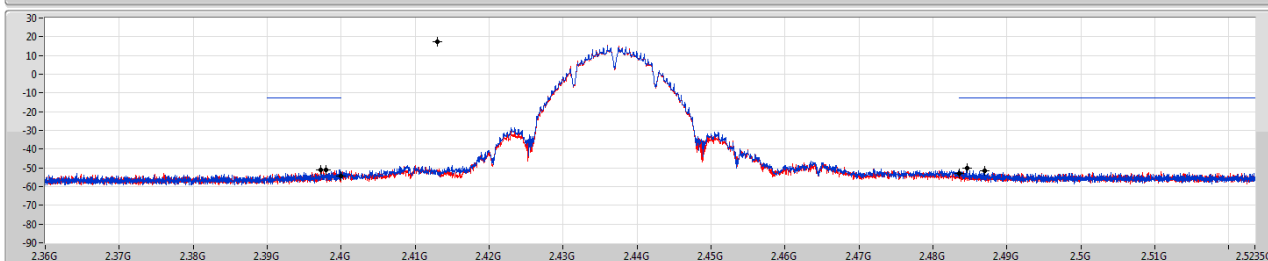
2437MHz

CSENdB

09/11/2020



Port 1
Port 2



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41294G	17.42	-12.58	746.77M	-54.84	2.3972G	-51.04	2.4835G	-52.87	2.48462G	-50.38	24.77524G	-41.43	1
2.41294G	17.42	-12.58	2.09147G	-54.22	2.39798G	-50.92	2.4G	-54.23	2.48694G	-51.52	15.21991G	-42.31	2

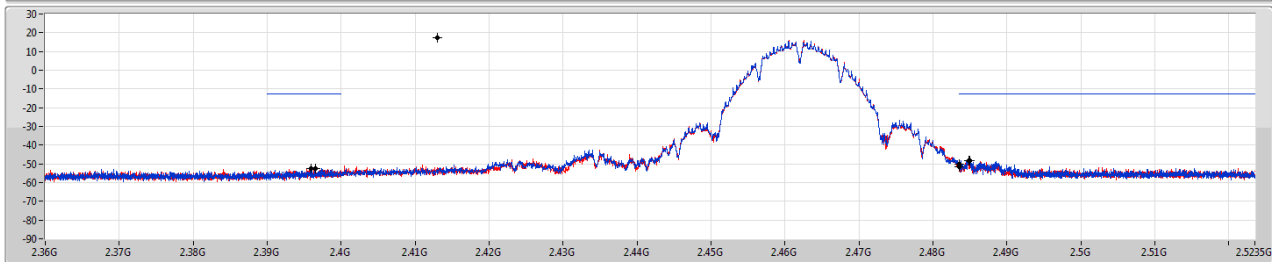
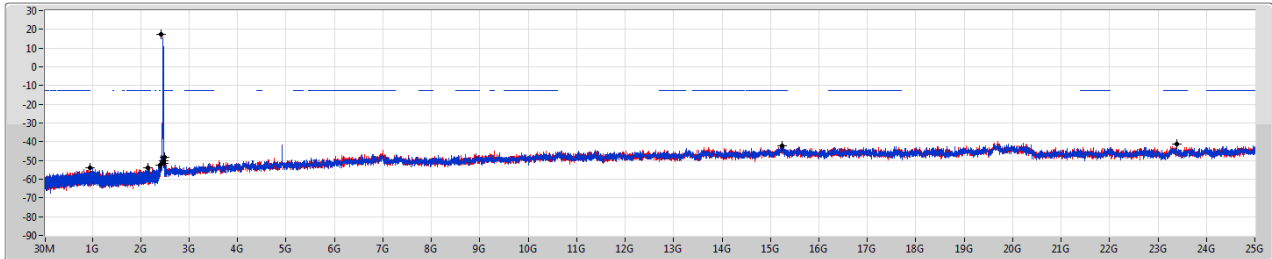
802.11b_Nss1,(1Mbps)_2TX

2462MHz

CSEndB

09/11/2020

Port 1
Port 2



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41294G	17.42	-12.58	2.14768G	-54.12	2.39652G	-52.64	2.4835G	-50.36	2.48498G	-48.09	2.3845G	-41.16	1
2.41294G	17.42	-12.58	955.3M	-53.91	2.39598G	-52.33	2.4835G	-51.53	2.48488G	-48.08	15.23677G	-42.06	2

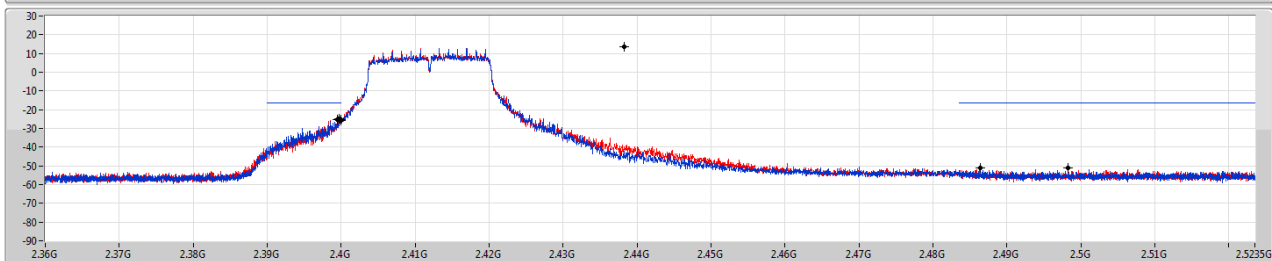
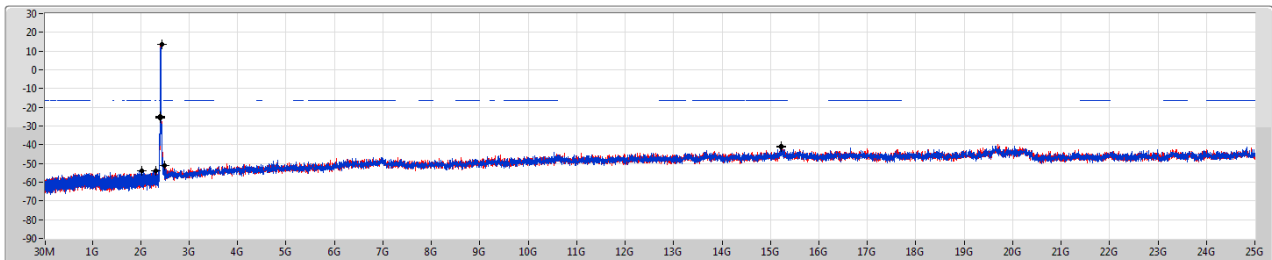
802.11g_Nss1,(6Mbps)_2TX

2412MHz

CSEndB

09/11/2020

Port 1
Port 2



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

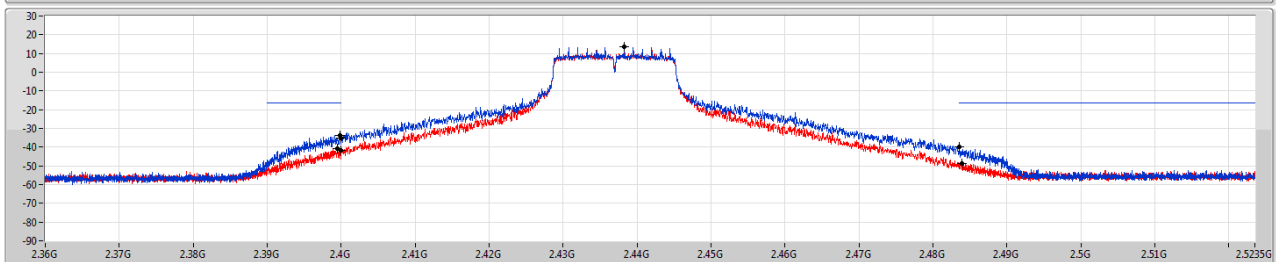
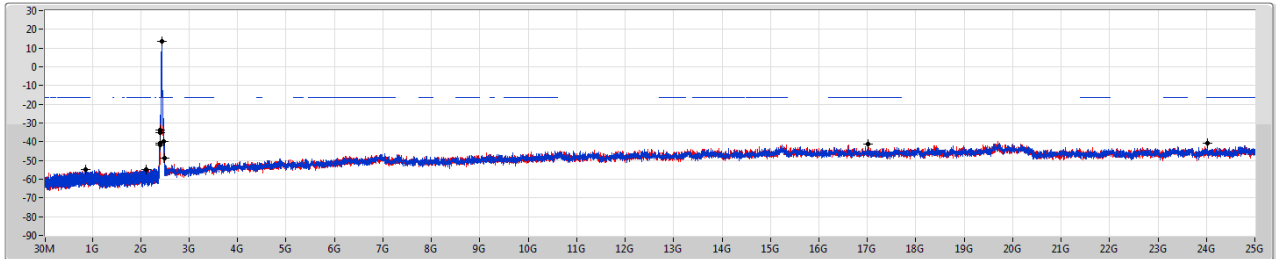
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43824G	13.52	-16.48	2.30612G	-53.96	2.3995G	-25.30	2.4G	-25.55	2.49628G	-51.18	15.21429G	-40.99	1
2.43824G	13.52	-16.48	2.01516G	-53.72	2.39972G	-24.65	2.4G	-25.35	2.48634G	-51.16	15.22834G	-41.47	2

802.11g_Nss1,(6Mbps)_2TX

2437MHz

CSEndB

09/11/2020



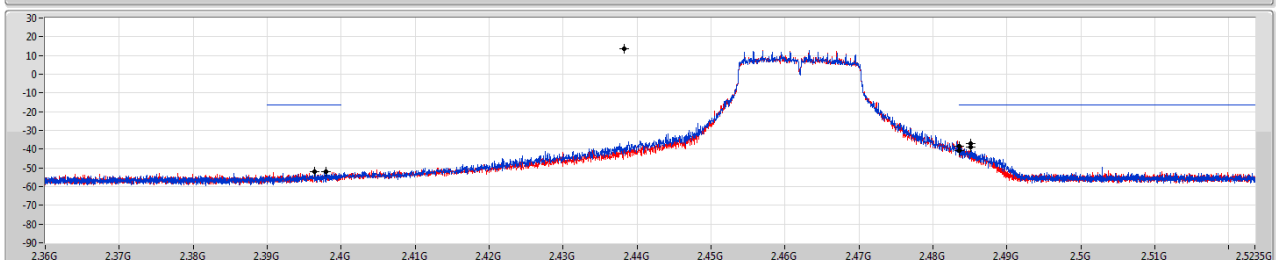
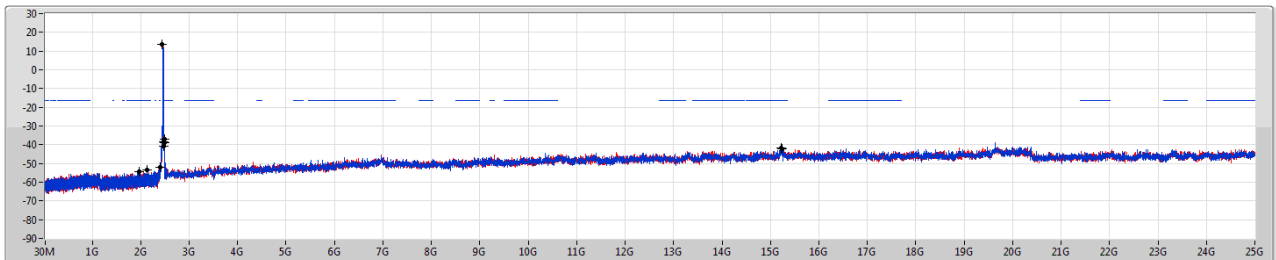
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43824G	13.52	-16.48	2.11943G	-54.67	2.39984G	-33.76	2.4G	-35.34	2.48354G	-39.75	17.01803G	-41.23	1
2.43824G	13.52	-16.48	869.09M	-54.78	2.39946G	-40.97	2.4G	-41.95	2.4839G	-48.56	24.02508G	-41.01	2

802.11g_Nss1,(6Mbps)_2TX

2462MHz

CSEndB

09/11/2020

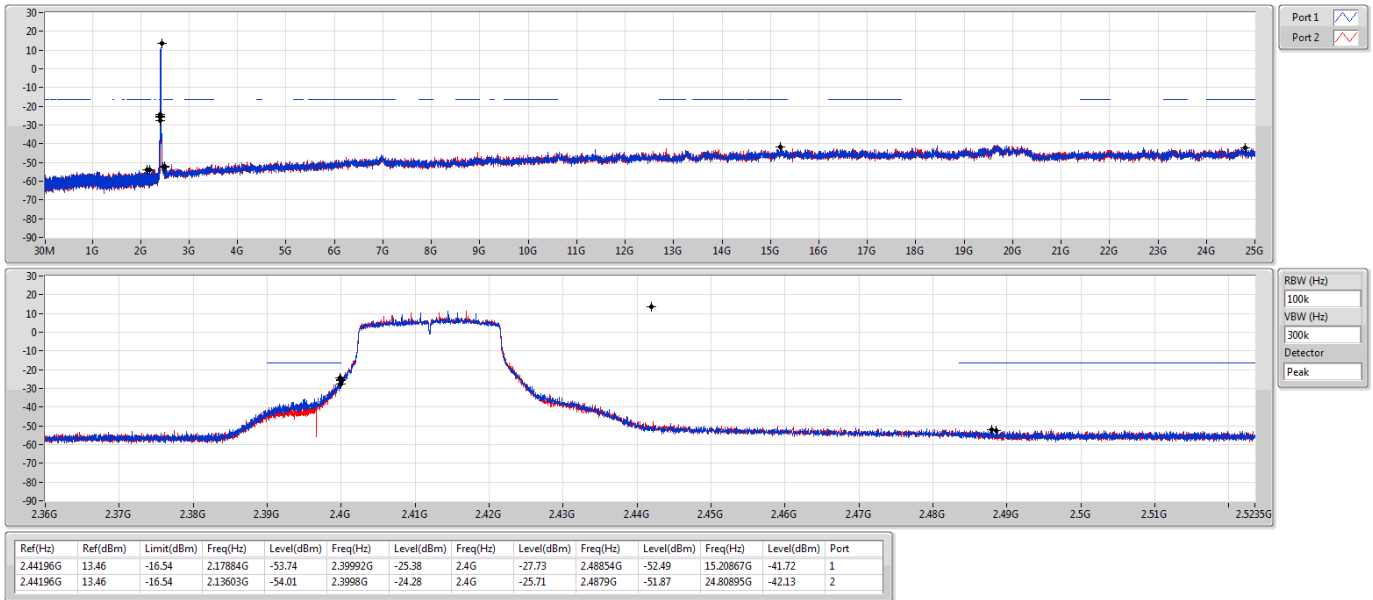


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43824G	13.52	-16.48	1.96885G	-54.33	2.3979G	-52.05	2.4835G	-38.46	2.4851G	-37.20	15.23115G	-42.33	1
2.43824G	13.52	-16.48	2.12642G	-53.66	2.39644G	-52.17	2.4835G	-40.66	2.4851G	-38.77	15.21991G	-41.95	2

802.11ax HEW20_Nss1,(MCS0)_2TX

CSENdB

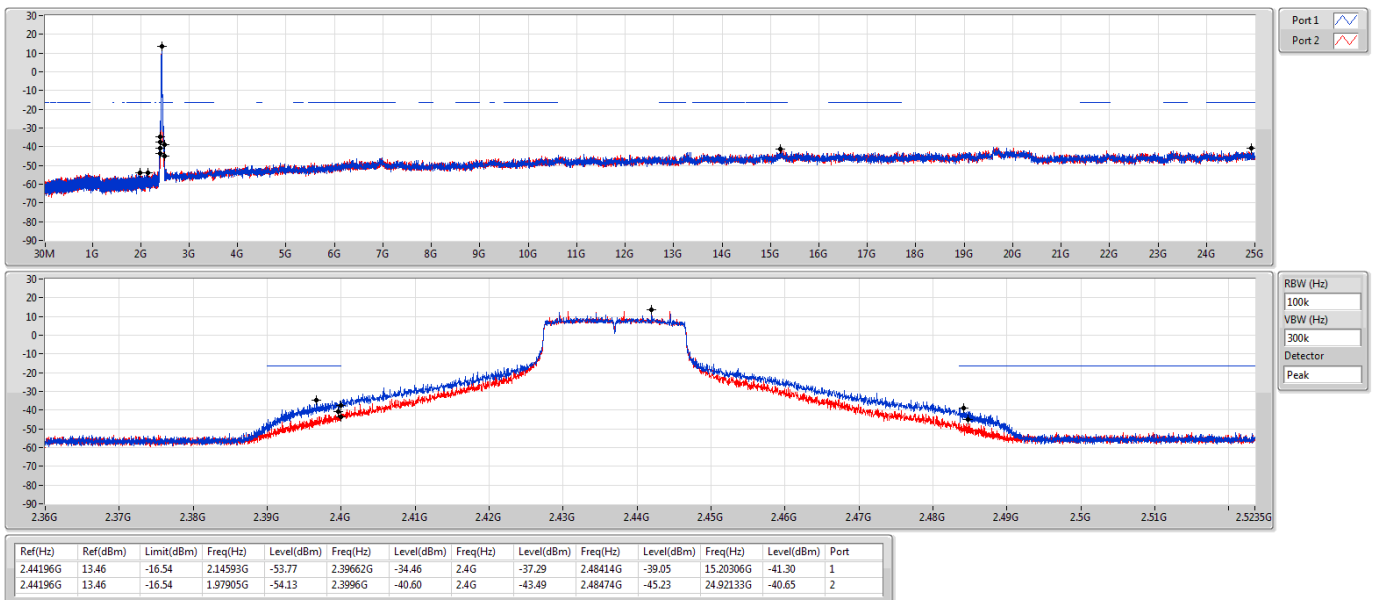
2412MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

CSENdB

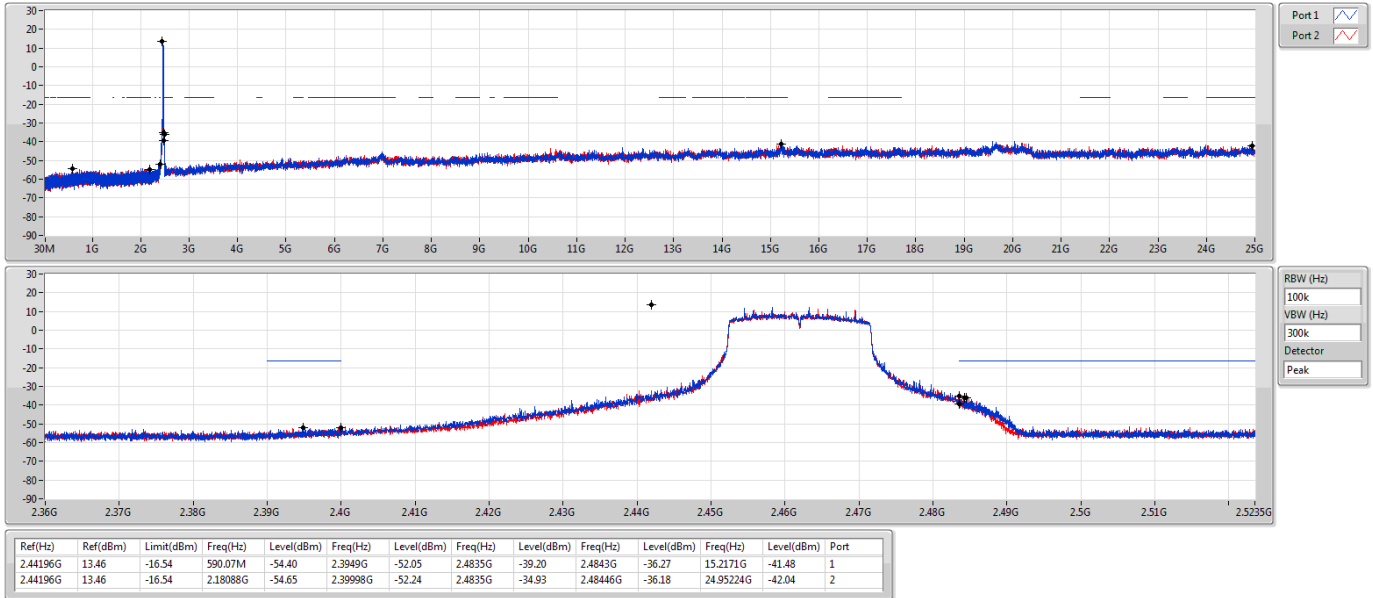
2437MHz



802.11ax HEW20_Nss1,(MCS0)_2TX

2462MHz

CSENdB



802.11ax HEW40_Nss1,(MCS0)_2TX

2422MHz

CSENdB

