



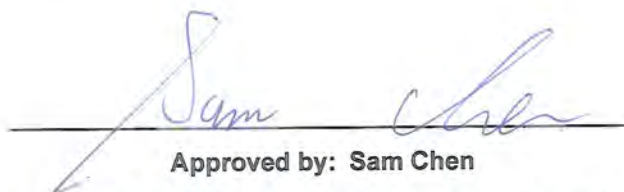
FCC RADIO TEST REPORT

FCC ID : G954331X
Equipment Name : DOCSIS Cable Gateway
Trade Name : Technicolor
Model Number : CGM4331COM
Applicant / Manufacturer : Technicolor Connected Home USA LLC
5030 Sugarloaf Parkway, Building 6, Lawrenceville
Georgia, United States, 30044
Standard : 47 CFR FCC Part 15.247

The product was received on Jun. 26, 2019, and testing was started from Jun. 29, 2019 and completed on Jul. 26, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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


Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Information.....	5
1.2 Applicable Standards	9
1.3 Testing Location Information	9
1.4 Measurement Uncertainty	9
2 Test Configuration of EUT.....	10
2.1 Test Channel Mode	10
2.2 The Worst Case Measurement Configuration.....	13
2.3 EUT Operation during Test	14
2.4 Accessories	14
2.5 Support Equipment.....	15
2.6 Test Setup Diagram	17
3 Transmitter Test Result	21
3.1 AC Power-line Conducted Emissions	21
3.2 DTS Bandwidth	23
3.3 Maximum Conducted Output Power	24
3.4 Power Spectral Density	26
3.5 Emissions in Non-restricted Frequency Bands	28
3.6 Emissions in Restricted Frequency Bands.....	29
4 Test Equipment and Calibration Data	33
Appendix A. Test Results of AC Power-line Conducted Emissions	
Appendix B. Test Results of DTS Bandwidth	
Appendix C. Test Results of Maximum Conducted Output Power	
Appendix D. Test Results of Power Spectral Density	
Appendix E. Test Results of Emissions in Non-restricted Frequency Bands	
Appendix F. Test Results of Emissions in Restricted Frequency Bands	
Appendix G. Test Results of Radiated Emission Co-location	
Appendix H. Test Photos	
Photographs of EUT v01	



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



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:

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Cindy Peng



1 General Description

1.1 Information

1.1.1 RF General Information

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]

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	VHT20	20	1TX
2.4-2.4835GHz	802.11ax HEW20	20	1TX
2.4-2.4835GHz	802.11n HT40	40	1TX
2.4-2.4835GHz	VHT40	40	1TX
2.4-2.4835GHz	802.11ax HEW40	40	1TX
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 HT20-BF	20	2TX
2.4-2.4835GHz	VHT20	20	2TX
2.4-2.4835GHz	VHT20-BF	20	2TX
2.4-2.4835GHz	802.11ax HEW20	20	2TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX
2.4-2.4835GHz	802.11n HT40-BF	40	2TX
2.4-2.4835GHz	VHT40	40	2TX
2.4-2.4835GHz	VHT40-BF	40	2TX
2.4-2.4835GHz	802.11ax HEW40	40	2TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	2TX
2.4-2.4835GHz	802.11b	20	3TX
2.4-2.4835GHz	802.11g	20	3TX
2.4-2.4835GHz	802.11n HT20	20	3TX



Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11n HT20-BF	20	3TX
2.4-2.4835GHz	VHT20	20	3TX
2.4-2.4835GHz	VHT20-BF	20	3TX
2.4-2.4835GHz	802.11ax HEW20	20	3TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	3TX
2.4-2.4835GHz	802.11n HT40	40	3TX
2.4-2.4835GHz	802.11n HT40-BF	40	3TX
2.4-2.4835GHz	VHT40	40	3TX
2.4-2.4835GHz	VHT40-BF	40	3TX
2.4-2.4835GHz	802.11ax HEW40	40	3TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	3TX
2.4-2.4835GHz	802.11b	20	4TX
2.4-2.4835GHz	802.11g	20	4TX
2.4-2.4835GHz	802.11n HT20	20	4TX
2.4-2.4835GHz	802.11n HT20-BF	20	4TX
2.4-2.4835GHz	VHT20	20	4TX
2.4-2.4835GHz	VHT20-BF	20	4TX
2.4-2.4835GHz	802.11ax HEW20	20	4TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	4TX
2.4-2.4835GHz	802.11n HT40	40	4TX
2.4-2.4835GHz	802.11n HT40-BF	40	4TX
2.4-2.4835GHz	VHT40	40	4TX
2.4-2.4835GHz	VHT40-BF	40	4TX
2.4-2.4835GHz	802.11ax HEW40	40	4TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	4TX

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, 1024QAM modulation.
- ♦ HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.


1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	1	-	-	-	-
2	2	-	-	-	-
3	3	-	-	-	-
4	4	-	-	-	-

Number of Transmit Antennas & Bandwidth

Number of Transmit Antennas	1TX		2TX		3TX		4TX	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz	20 MHz	40 MHz	20 MHz	40 MHz
802.11b	V	X	V	X	V	X	V	X
802.11g	V	X	V	X	V	X	V	X
VHT	V	V	V	V	V	V	V	V
802.11ax	V	V	V	V	V	V	V	V

Directional Gain (dBi) for TxBF & SDM & CDD mode						
Bandwidth Mode	Frequency	1 Stream 4 TX for TxBF mode	2 Stream 4 TX for TxBF mode	3 Stream 4 TX for TxBF mode	4 Stream 4 TX for SDM mode	1 Stream 4 TX for CDD mode
20MHz	2412MHz	5.3	2.6	2.4	-0.3	5.3
	2437MHz	5.3	2.6	2.4	-0.3	5.3
	2462MHz	5.3	2.6	2.4	-0.3	5.3
40MHz	2422MHz	5.3	2.6	2.4	-0.3	-
	2437MHz	5.3	2.6	2.4	-0.3	-
	2452MHz	5.3	2.6	2.4	-0.3	-

Note: The above information was declared by manufacturer.



1.1.3 Mode Test Duty Cycle

For non-beamforming mode:

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
802.11b	1	0	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT20	0.986	0.06	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
VHT40	0.972	0.12	953.75u	3k
802.11ax HEW20	0.982	0.08	n/a (DC $\geq$ 0.98)	n/a (DC $\geq$ 0.98)
802.11ax HEW40	0.965	0.15	773.75u	3k

For beamforming mode:

1 Stream 4 TX for TxBF mode:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
VHT20-BF	0.965	0.15	3.838m	300
VHT40-BF	0.966	0.15	3.695m	300
802.11ax HEW20-BF	0.951	0.22	2.926m	1k
802.11ax HEW40-BF	0.957	0.19	4.36m	300

2 Stream 4 TX for TxBF mode:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
VHT20-BF	0.947	0.24	3.838m	300
VHT40-BF	0.965	0.15	4.61m	300
802.11ax HEW20-BF	0.939	0.27	4.368m	300
802.11ax HEW40-BF	0.941	0.26	5.083m	300

Note:

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

1.1.4 EUT Operational Condition

EUT Power Type	From power adapter			
Beamforming Function	☒	With beamforming	☐	Without beamforming
	The product has beamforming function for 11n, VHT, 11ax in 2.4GHz and 11n, 11ac, 11ax in 5GHz.			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	For non-beamforming mode: accessMTool_3.1.0.1			
	For beamforming mode: Telnet			

Note: The above information was declared by manufacturer.



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ FCC KDB 558074 D01 v05r02
- ♦ FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Eddie Weng	26~27.7°C / 62~64%	Jul. 23, 2019~Jul. 26, 2019
Radiated below 1GHz	03CH05-CB	Cola Fan	26~27.3°C / 62~66%	Jul. 25, 2019
Radiated above 1GHz	03CH03-CB	Mason Chen	26.4~27.3°C / 61~66%	Jun. 29, 2019~Jul. 25, 2019
AC Conduction	CO01-CB	Max Lin	24.1~24.6°C / 58~59%	Jul. 26, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

For non-beamforming mode:

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

Mode	Power Setting
802.11b_Nss1,(1Mbps)_4TX	-
2412MHz	94
2437MHz	92
2462MHz	96
VHT20_Nss4,(MCS0)_4TX	-
2412MHz	93
2437MHz	92
2462MHz	89
VHT40_Nss4,(MCS0)_4TX	-
2422MHz	83
2437MHz	83
2452MHz	80
802.11ax HEW20_Nss4,(MCS0)_4TX	-
2412MHz	93
2437MHz	92
2462MHz	89
802.11ax HEW40_Nss4,(MCS0)_4TX	-
2422MHz	83
2437MHz	83
2452MHz	80

**For beamforming mode:**

1 Stream 4 TX for TxBF mode:

Mode	Power Setting
VHT20-BF_Nss1,(MCS0)_4TX	-
2412MHz	94
2437MHz	94
2462MHz	89
VHT40-BF_Nss1,(MCS0)_4TX	-
2422MHz	92
2437MHz	85
2452MHz	79
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-
2412MHz	94
2437MHz	94
2462MHz	89
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-
2422MHz	92
2437MHz	85
2452MHz	79



2 Stream 4 TX for TxBF mode:

Mode	Power Setting
VHT20-BF_Nss1,(MCS0)_4TX	-
2412MHz	95
2437MHz	92
2462MHz	93
VHT40-BF_Nss1,(MCS0)_4TX	-
2422MHz	88-92
2437MHz	86
2452MHz	80
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-
2412MHz	95
2437MHz	92
2462MHz	93
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-
2422MHz	92
2437MHz	86
2452MHz	80

Note:

- ♦ 11g CDD 、SDM modes can be covered by 11ac 20M SDM 4T/4S mode.
- ♦ 4T3S TxBF modes can be covered by 4T/2S TxBF mode.
- ♦ VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
- ♦ There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 11n, VHT, 11ax in 2.4GHz and 11n, 11ac, 11ax in 5GHz. All test results were recorded in the report.

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	Normal Link
1	EUT + Adapter 1
2	EUT + Adapter 2

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	Normal Link
1	EUT + Adapter 1
2	EUT + Adapter 2
Operating Mode > 1GHz	CTX

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated Emission Co-location
Test Condition	Radiated measurement
Operating Mode	Normal Link
1	WLAN 2.4GHz + WLAN 5GHz
Refer to Appendix G for Radiated Emission Co-location.	



The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz
2	WLAN 5GHz + Zigbee + Bluetooth
Refer to Sporton Test Report No.: FA971031 for Co-location RF Exposure Evaluation.	

Note: The EUT can only be used at Y axis position.

2.3 EUT Operation during Test

For CTX Mode:

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

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

The program was executed as follows:

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

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories				
No.	Equipment Name	Brand Name	Model Name	Rating
1	Adapter 1	AcBel	ADK002	INPUT: 100-120V ~50/60Hz, 1.5A, OUTPUT: 12V, 4.6A
2	Adapter 2	Netbit	NBC56A120460VU	INPUT: 100-120V ~50/60Hz, 1.5A, OUTPUT: 12V, 4.6A



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN NB	DELL	E6430	N/A
B	2.4G NB	DELL	E6430	N/A
C	5G NB	DELL	E6430	N/A
D	Phone1	SAMPO	HT-B 907WL	N/A
E	Phone2	SAMPO	HT-B 907WL	N/A
F	Terminal system	HUAWEI	SmartAX ma5633	N/A
G	Server	HUAWEI	ETP48200-C5A3	N/A
H	Terminal system NB	DELL	INSPIRON 3576	N/A
I	2.5G PC	DELL	T3400	N/A
J	SPLITTER	N/A	N/A	N/A
K	MoCA	Standalone	B2140	N/A
L	MoCA NB	DELL	E6430	N/A

For Radiated (below 1GHz):

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	NB	DELL	E4300	N/A
C	NB	DELL	E4300	N/A
D	NB	DELL	E4300	N/A
E	Phone	PHILIPS	M20	N/A
F	Phone	H-T-T	F-689	N/A
G	Terminal system	HUAWEI	SmartAX MA5633	N/A
H	MoCA	Standalone	B2140	N/A
I	NB	DELL	E4300	N/A
J	Server	HUAWEI	ETP48200-C5A3	N/A
K	NB	DELL	Inspiron 15	N/A



For Radiated (above 1GHz) and RF Conducted:

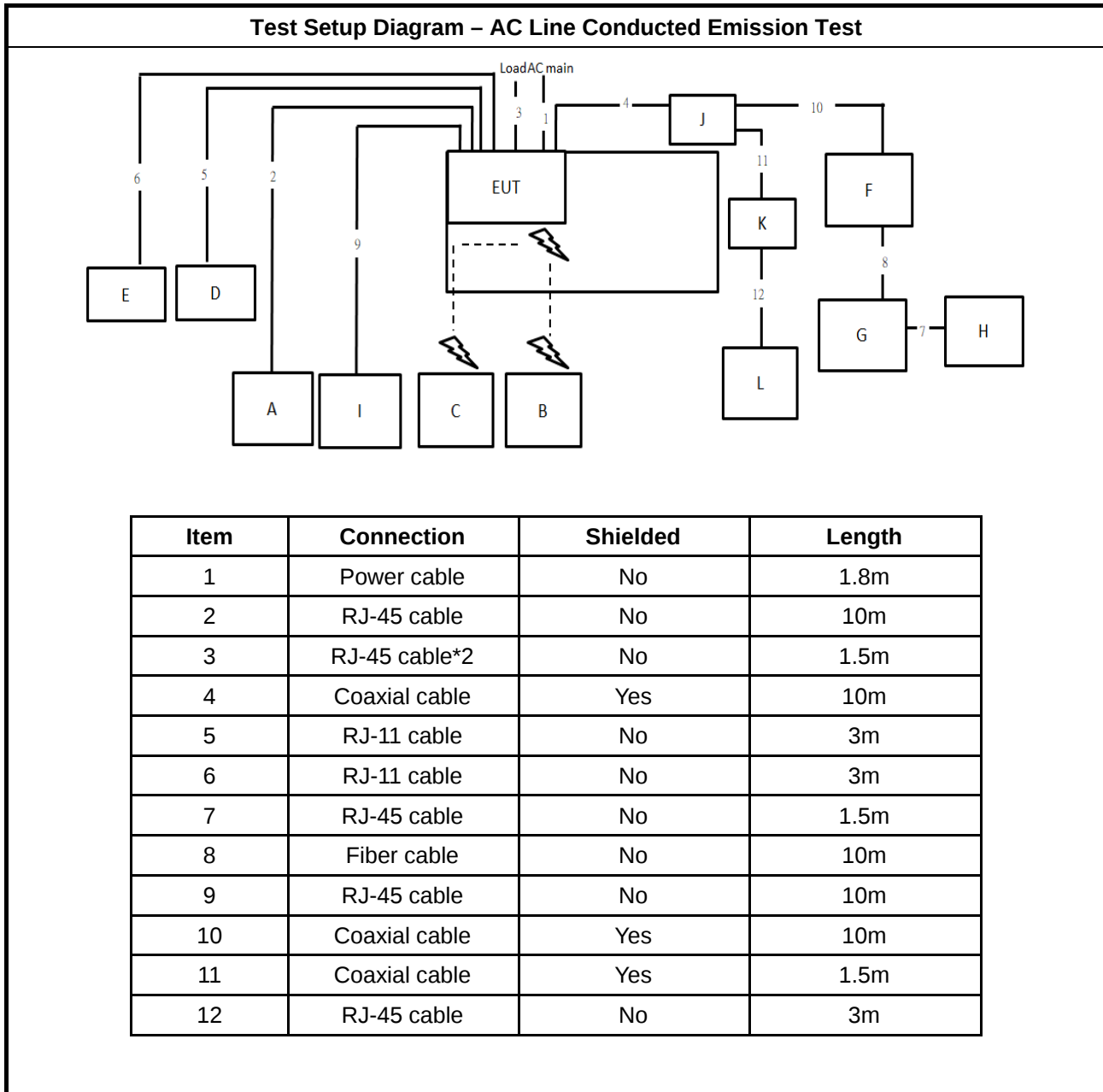
For non-beamforming mode:

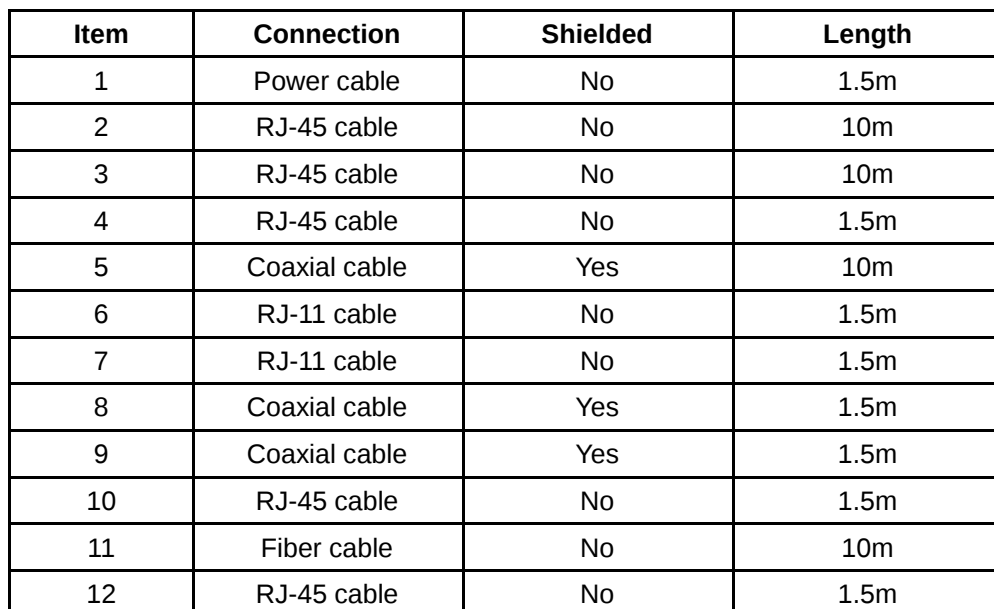
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

For beamforming mode:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	NA
B	NB	DELL	E4300	NA
C	AP (RX Device)	ASUS	RT-AX88U	N/A

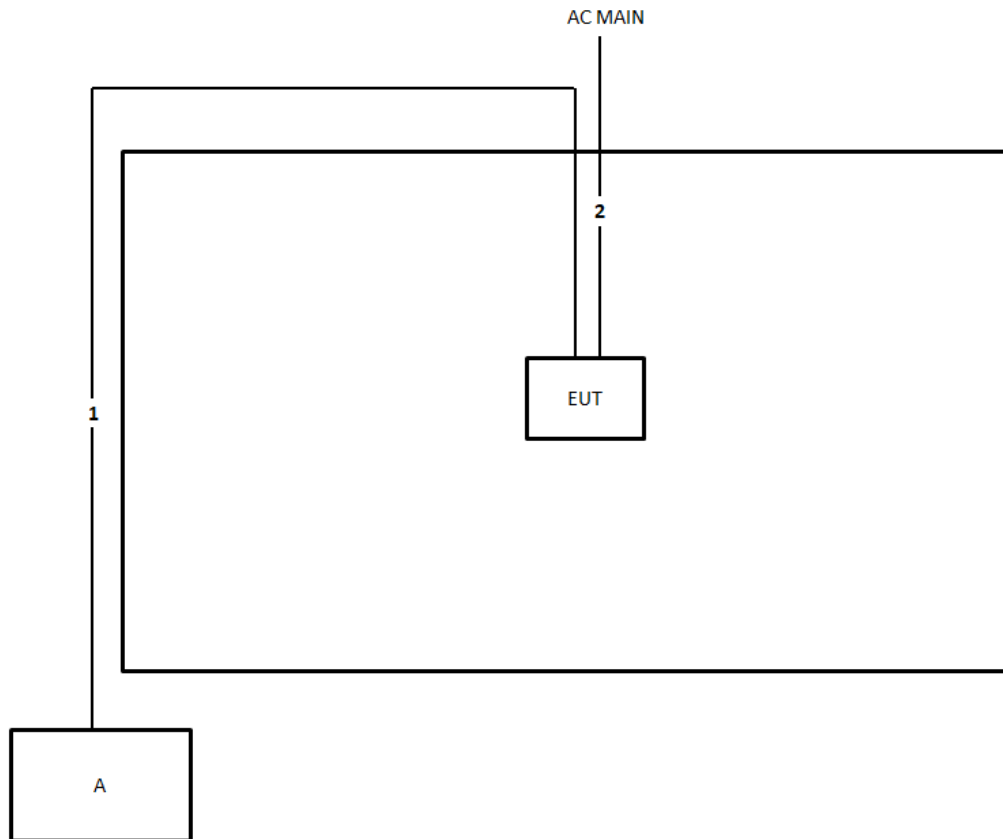
2.6 Test Setup Diagram





Test Setup Diagram - Radiated Test > 1GHz

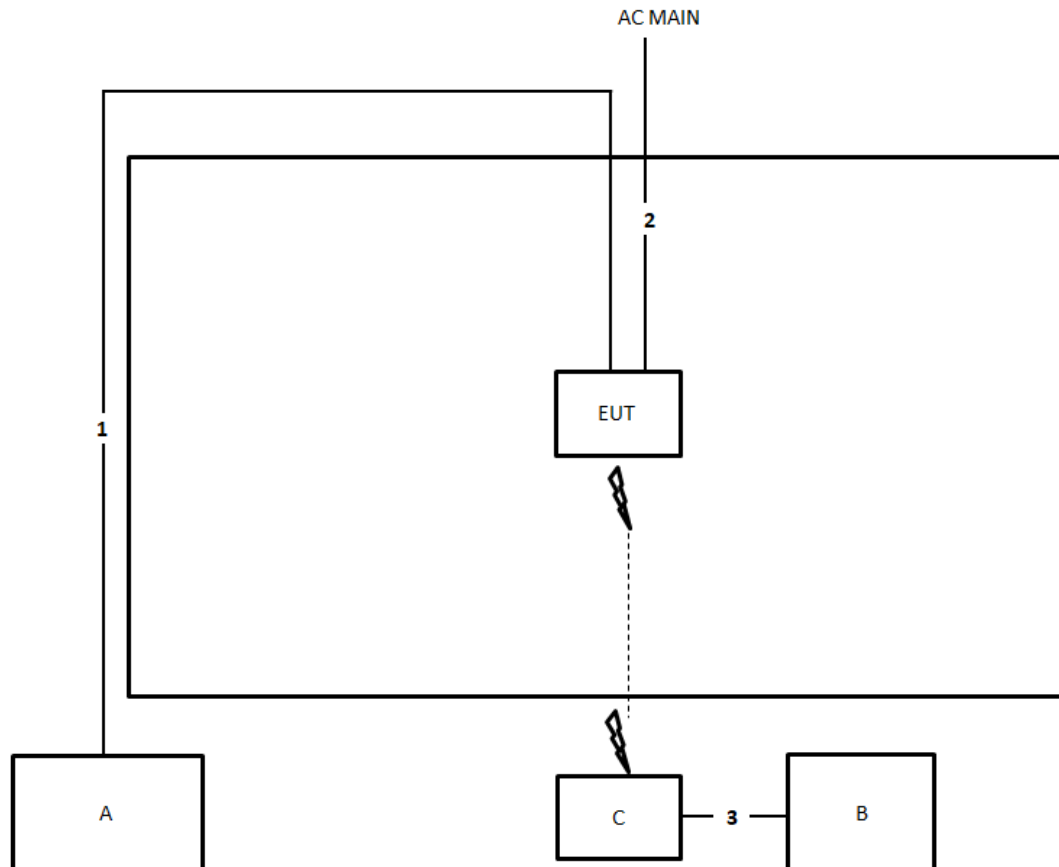
For non-beamforming mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.8m

Test Setup Diagram - Radiated Test > 1GHz

For beamforming mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.8m
3	RJ-45 cable	No	10m



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.

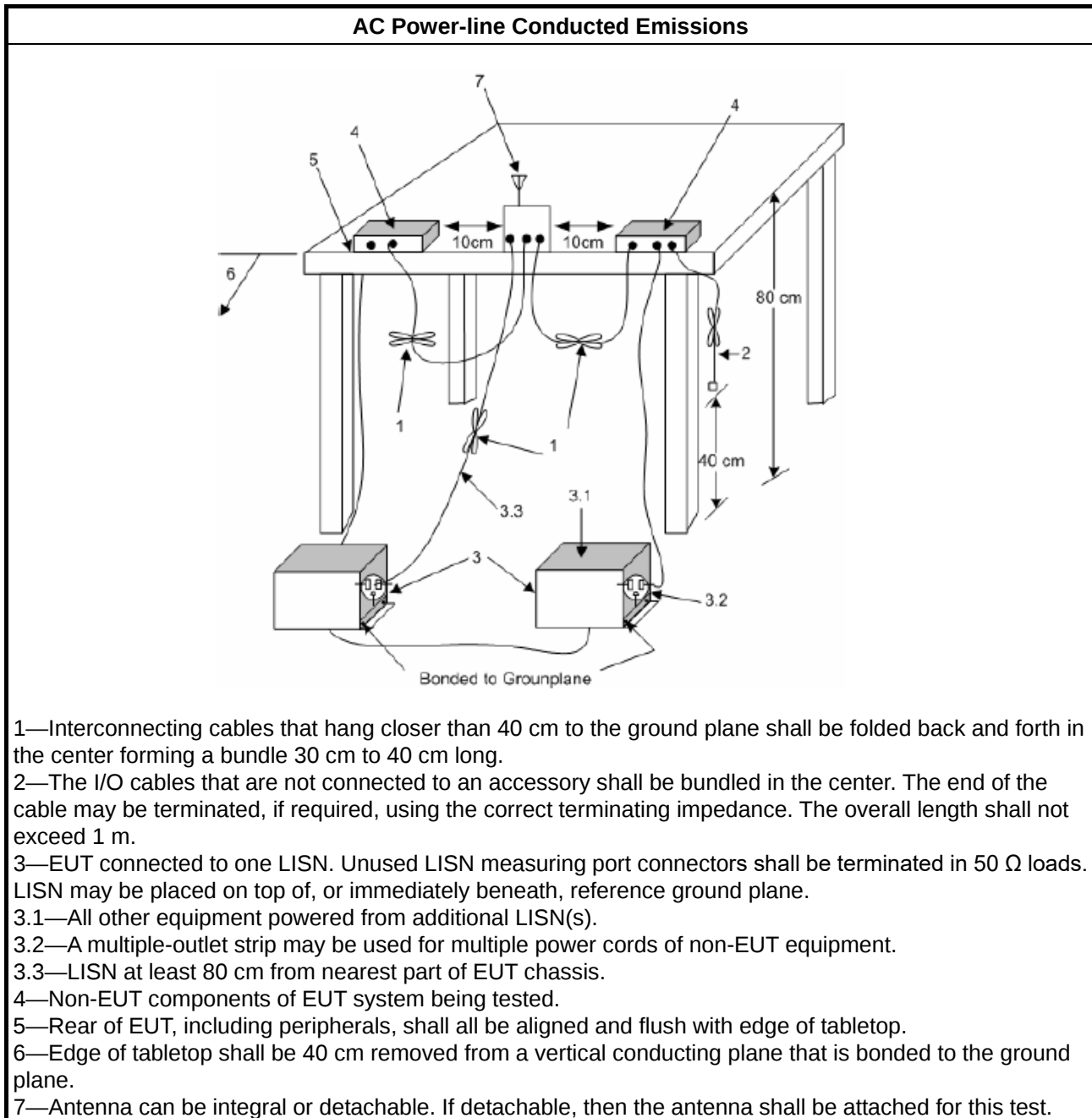
3.1.2 Measuring Instruments

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 Test Setup



3.1.5 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.

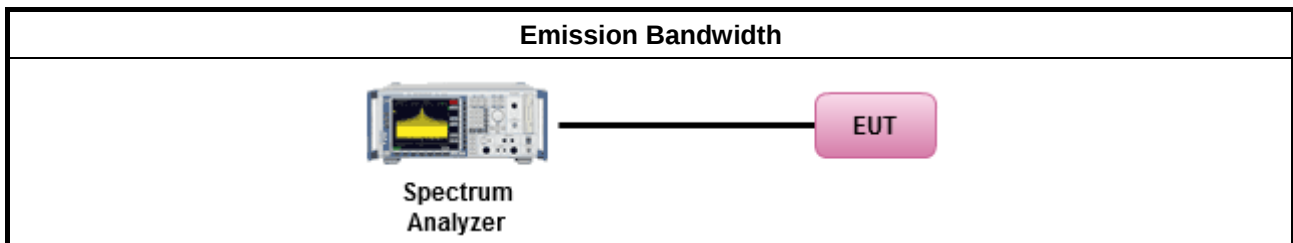
3.2.2 Measuring Instruments

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 FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
☐ Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
☐ Refer as ANSI C63.10, clause 6.9.1 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
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 FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW $\geq$ EBW method).
☐	Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
[duty cycle $\geq$ 98% or external video / power trigger]	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
duty cycle < 98% and average over on/off periods with duty factor	
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
☐	Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
Measurement using a power meter (PM)	
☒	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
☐	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).

▪ For conducted measurement.

- If the EUT supports multiple transmit chains using options given below:
Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
- If multiple transmit chains, EIRP calculation could be following as methods:

$$P_{\text{total}} = P_1 + P_2 + \dots + P_n$$
 (calculated in linear unit [mW] and transfer to log unit [dBm])

$$\text{EIRP}_{\text{total}} = P_{\text{total}} + \text{DG}$$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)



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

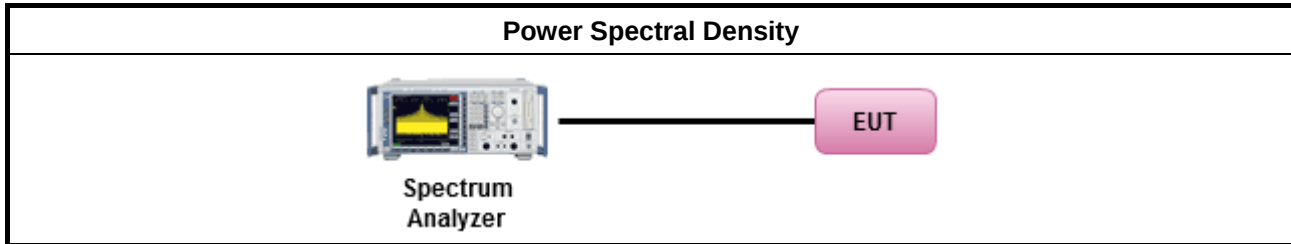
Refer a test equipment and calibration data table in this test report.

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 FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD. [duty cycle $\geq 98\%$ or external video / power trigger]
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPS-1.
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPS-2.
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPS-3.
duty cycle $< 98\%$ and average over on/off periods with duty factor
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPS-1A. (alternative).
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPS-2A. (alternative)
☐ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPS-3A. (alternative)
▪ For conducted measurement.
▪ If The EUT supports multiple transmit chains using options given below:
☒ Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,

- ☐ Option 3: Measure and add $10 \log(N)$ dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with $10 \log(N)$. Or each transmit chains shall be add $10 \log(N)$ to compared with the limit.

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 (dBc)
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 PSD 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 PSD level.	

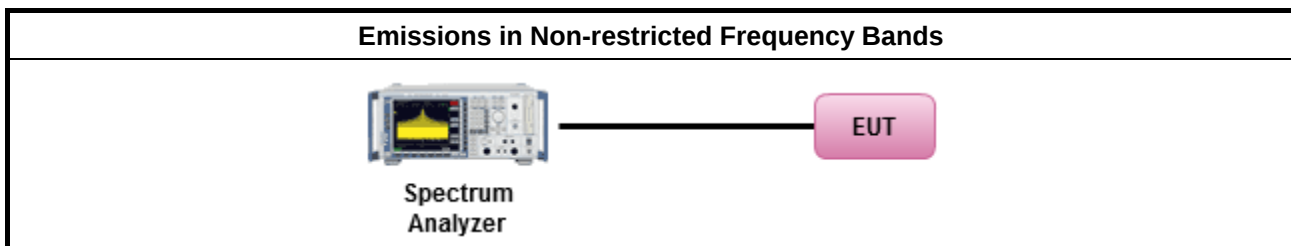
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted 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.

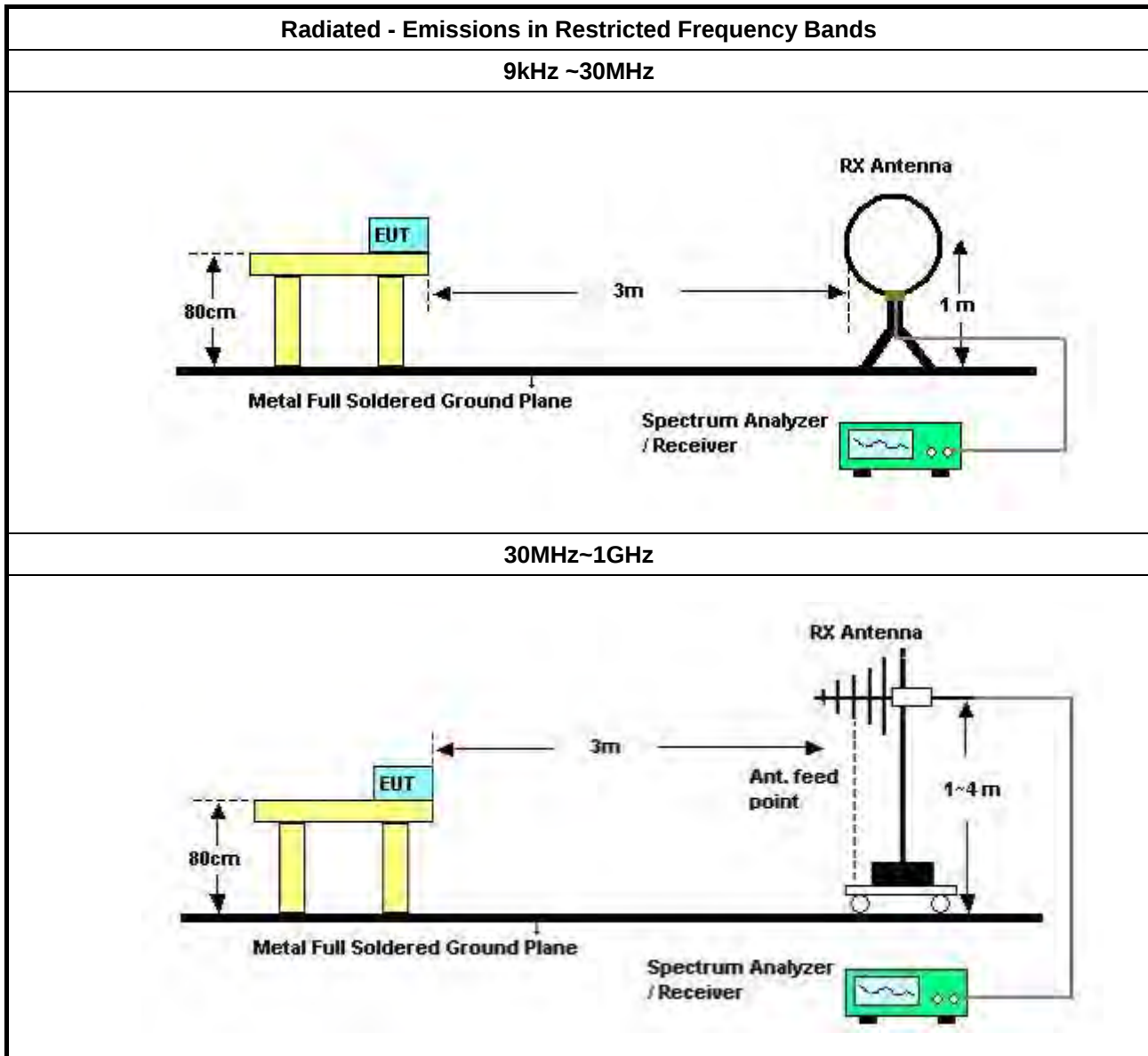
3.6.2 Measuring Instruments

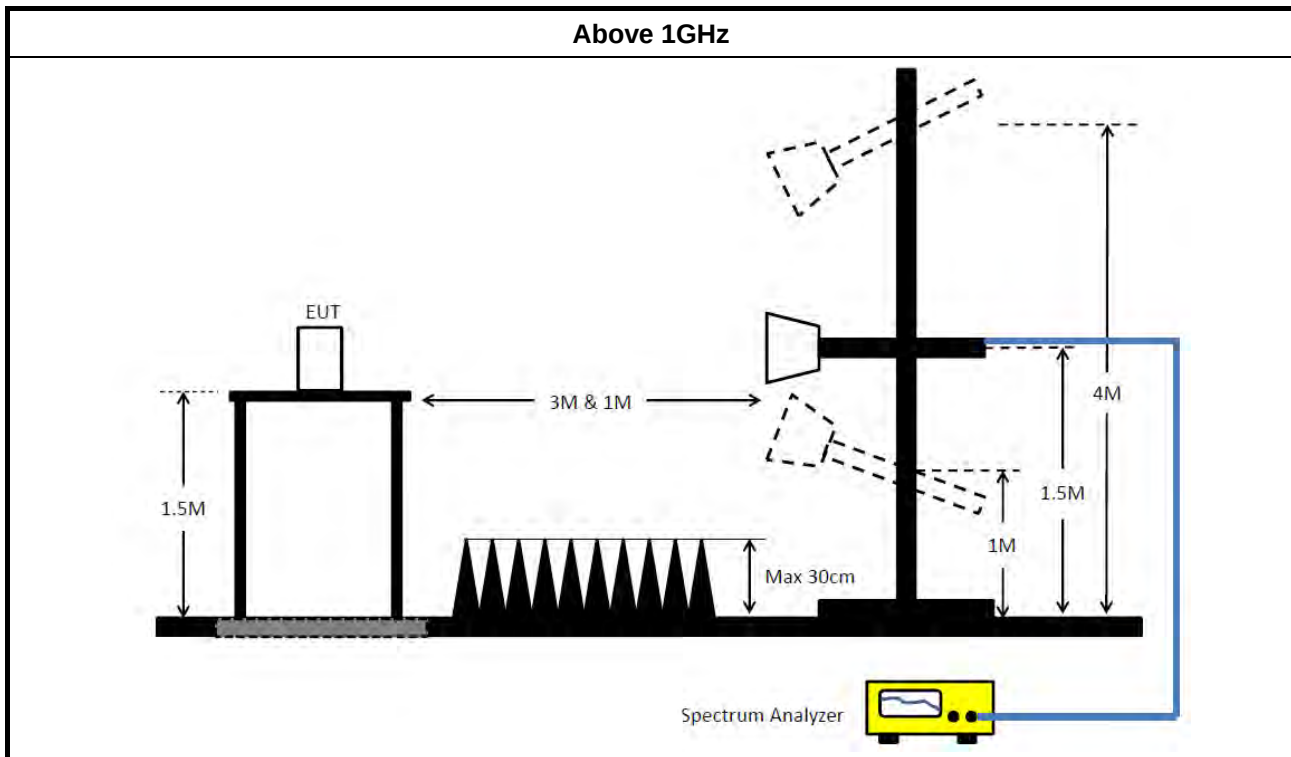
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method	
The average emission levels shall be measured in [duty cycle ≥ 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 FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
	☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle $\geq 98\%$).
	☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
	☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW $\geq 1/T$).
	☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time.
	☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
	☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
	For the transmitter band-edge emissions shall be measured using following options below:
	Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, 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 FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.6.4 Test Setup





3.6.5 Measurement Results Calculation

The measured Level is calculated using:

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

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F



4 Test Equipment and Calibration Data

For AC Conduction:

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)

For Radiated (below 1GHz):

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)

**For Radiated (above 1GHz):**

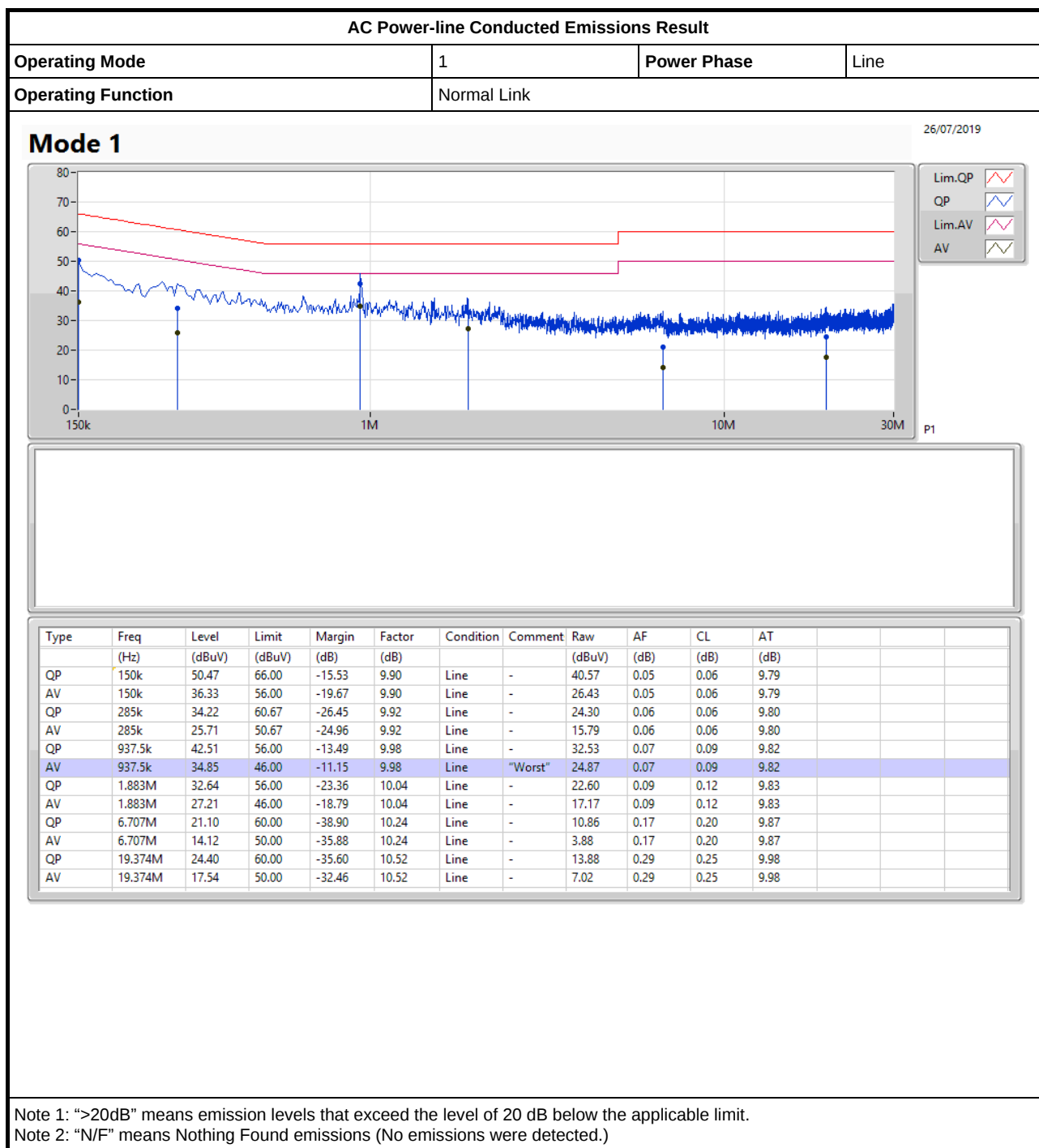
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Horn Antenna	ETS • Lindgren	3115	6821	750MHz~18GHz	Jan. 24, 2019	Jan. 23, 2020	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Dec. 20, 2018	Dec. 19, 2019	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP-40	100019	9kHz ~ 40GHz	Jun. 19, 2019	Jun. 18, 2020	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-20+27	1GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-27	1GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH03-CB)

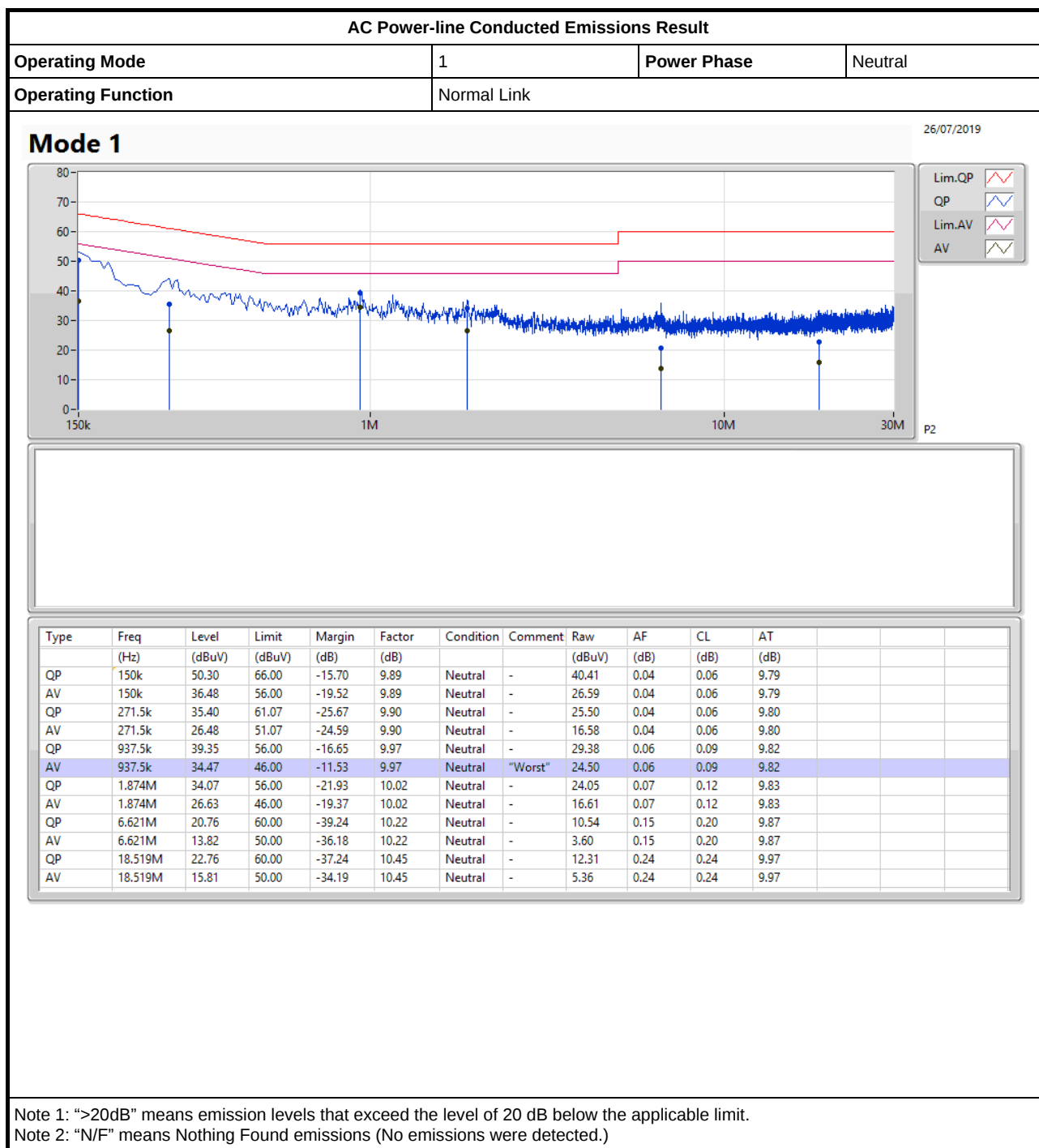
For RF Conducted:

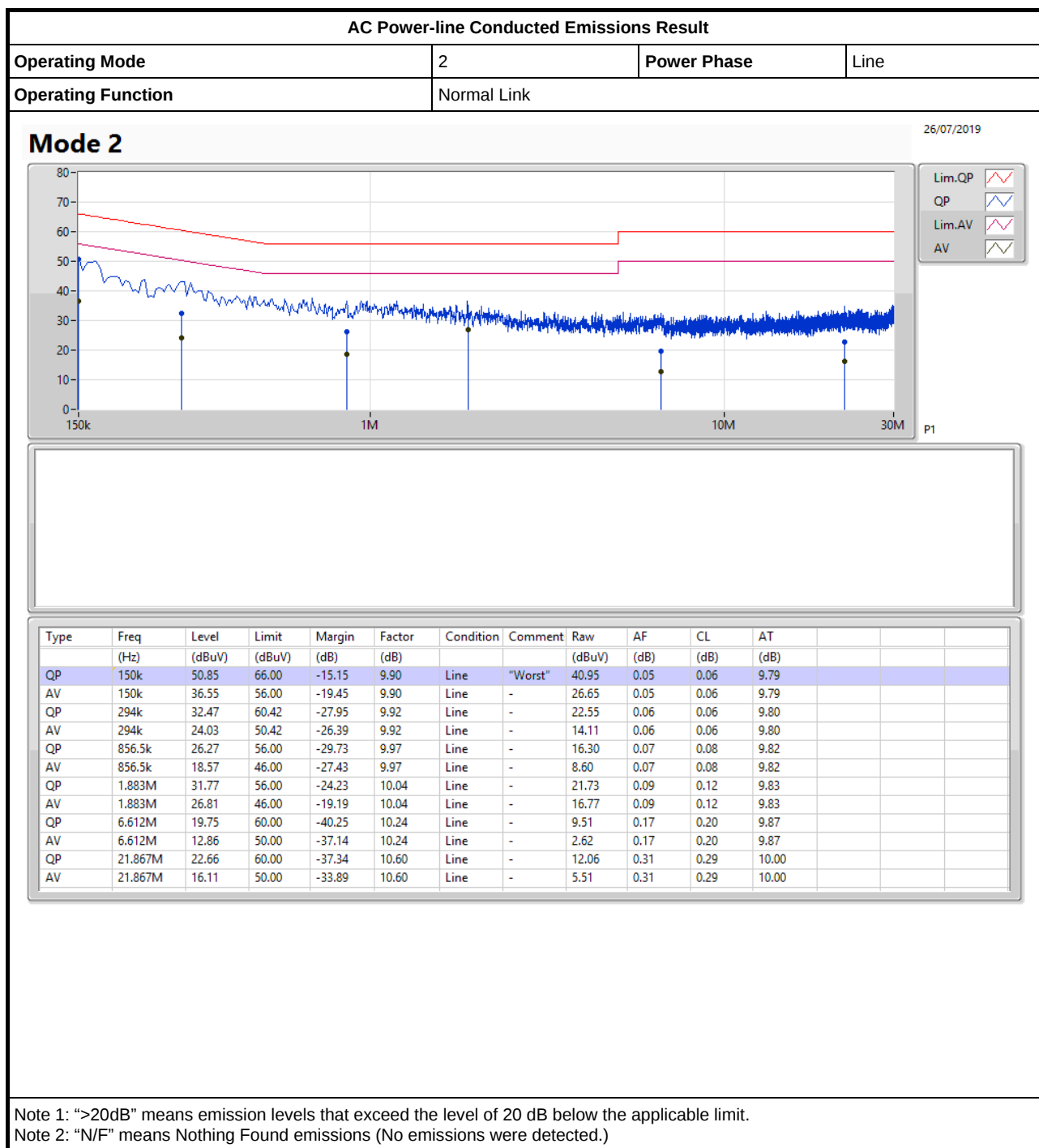
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz ~ 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz ~ 26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)

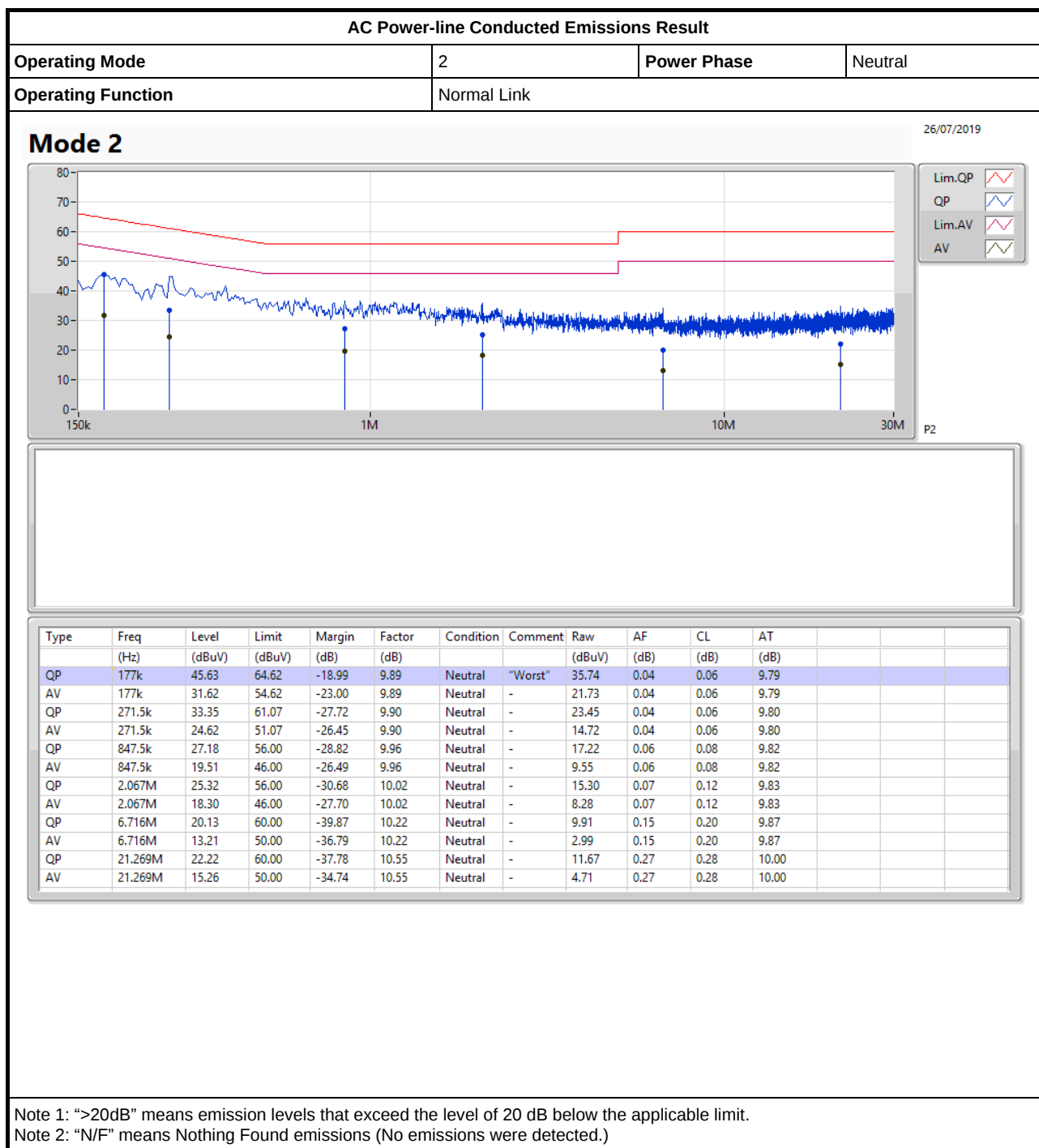
Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.











For non-beamforming mode:

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

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)_4TX	7.55M	11.569M	11M6G1D	6.075M	10.195M
VHT20_Nss4,(MCS0)_4TX	17.6M	17.891M	17M9D1D	17.3M	17.741M
VHT40_Nss4,(MCS0)_4TX	36.35M	36.332M	36M3D1D	35.65M	36.082M
802.11ax HEW20_Nss4,(MCS0)_4TX	18.975M	19.065M	19M1D1D	18.5M	18.966M
802.11ax HEW40_Nss4,(MCS0)_4TX	37.55M	37.631M	37M6D1D	34.95M	37.431M

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

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

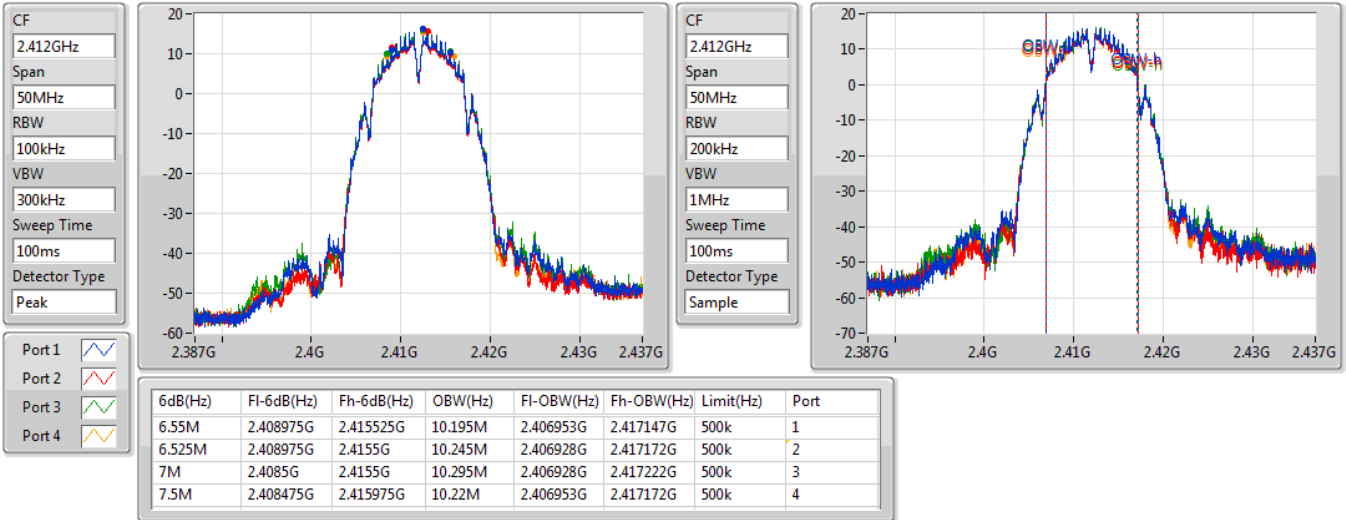
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	6.55M	10.195M	6.525M	10.245M	7M	10.295M	7.5M	10.22M
2437MHz	Pass	500k	7.05M	10.22M	6.075M	10.295M	7.025M	10.395M	7.025M	10.32M
2462MHz	Pass	500k	7.55M	11.569M	7.025M	11.169M	7.025M	11.519M	7.05M	11.194M
VHT20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	17.55M	17.766M	17.575M	17.741M	17.575M	17.791M	17.3M	17.741M
2437MHz	Pass	500k	17.575M	17.891M	17.575M	17.866M	17.6M	17.891M	17.575M	17.866M
2462MHz	Pass	500k	17.55M	17.816M	17.575M	17.841M	17.55M	17.841M	17.55M	17.816M
VHT40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	35.7M	36.182M	36.3M	36.182M	36.3M	36.182M	35.65M	36.082M
2437MHz	Pass	500k	36.3M	36.282M	36.35M	36.282M	36.3M	36.332M	36.3M	36.232M
2452MHz	Pass	500k	36.3M	36.232M	36.3M	36.232M	36.3M	36.182M	36.35M	36.132M
802.11ax HEW20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.625M	18.991M	18.5M	18.966M	18.725M	18.991M	18.775M	18.991M
2437MHz	Pass	500k	18.95M	19.015M	18.975M	18.991M	18.725M	19.065M	18.925M	19.04M
2462MHz	Pass	500k	18.775M	19.015M	18.9M	18.966M	18.85M	19.015M	18.9M	18.966M
802.11ax HEW40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	36.9M	37.481M	36.15M	37.531M	37.2M	37.481M	34.95M	37.431M
2437MHz	Pass	500k	37.55M	37.581M	37.15M	37.531M	37.55M	37.631M	37.15M	37.581M
2452MHz	Pass	500k	37.25M	37.581M	36.7M	37.481M	37.25M	37.481M	37.3M	37.481M

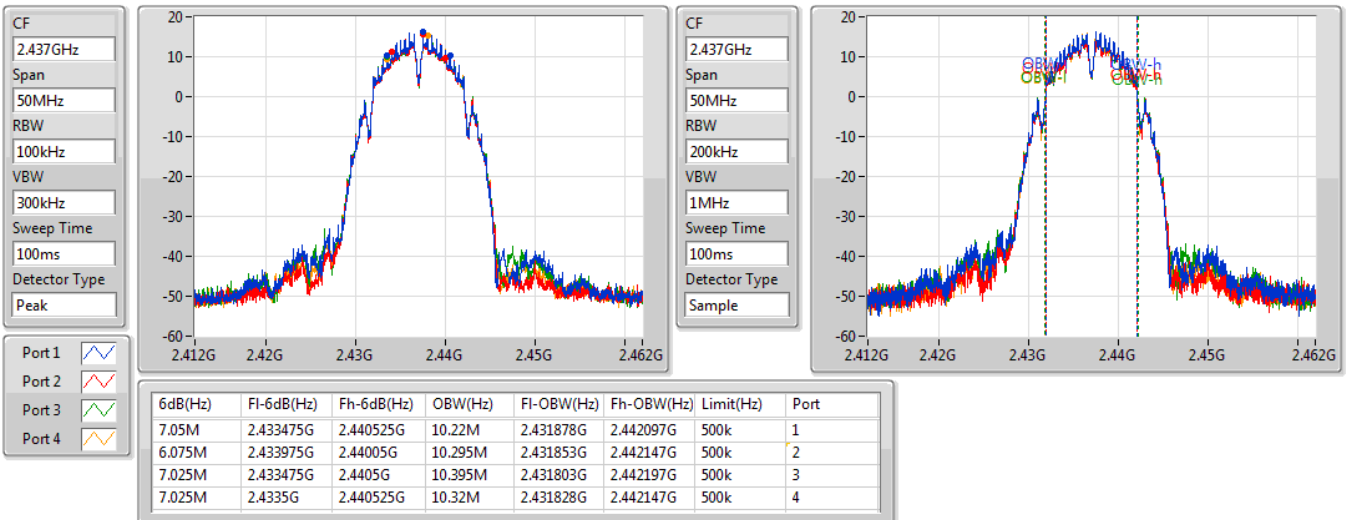
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

802.11b_Nss1,(1Mbps)_4TX
EBW
2412MHz

19/07/2019

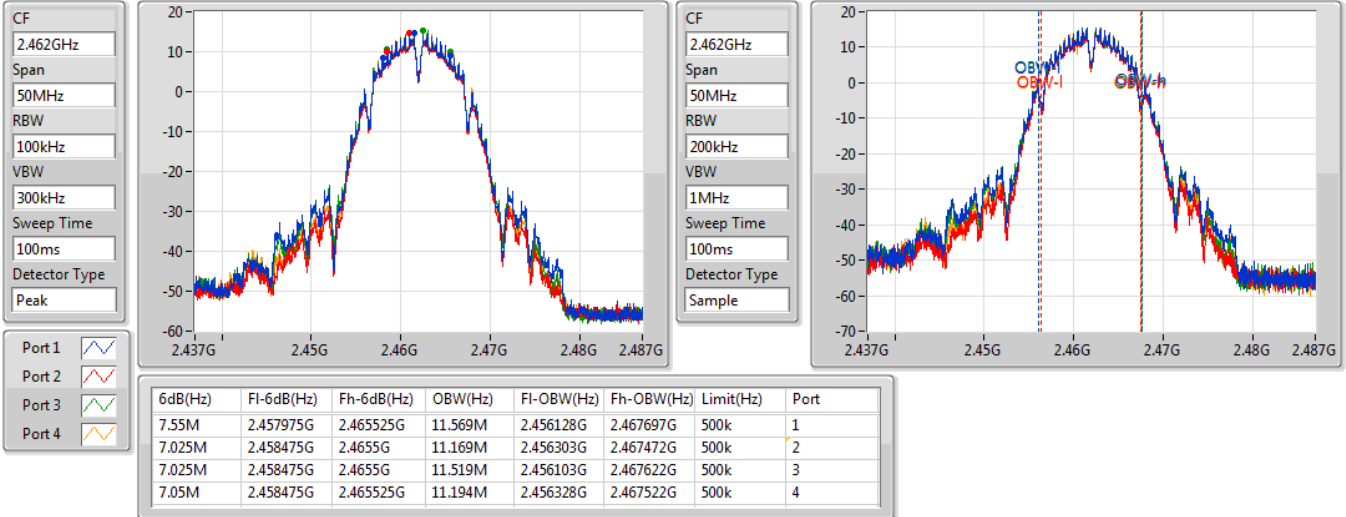

802.11b_Nss1,(1Mbps)_4TX
EBW
2437MHz

19/07/2019

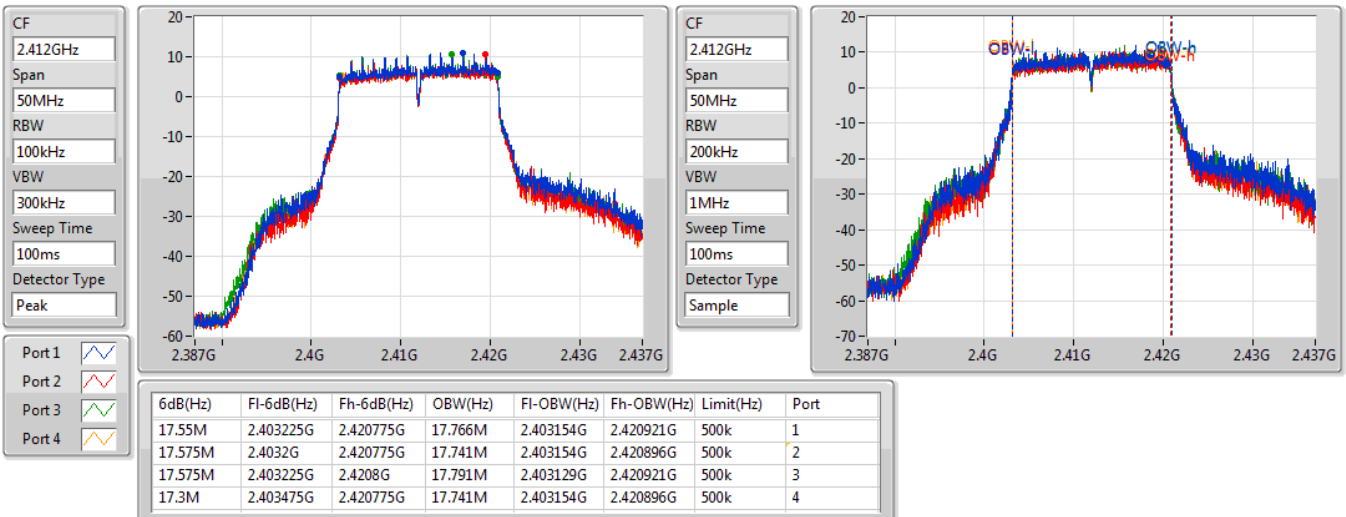


802.11b_Nss1,(1Mbps)_4TX
EBW
2462MHz

19/07/2019

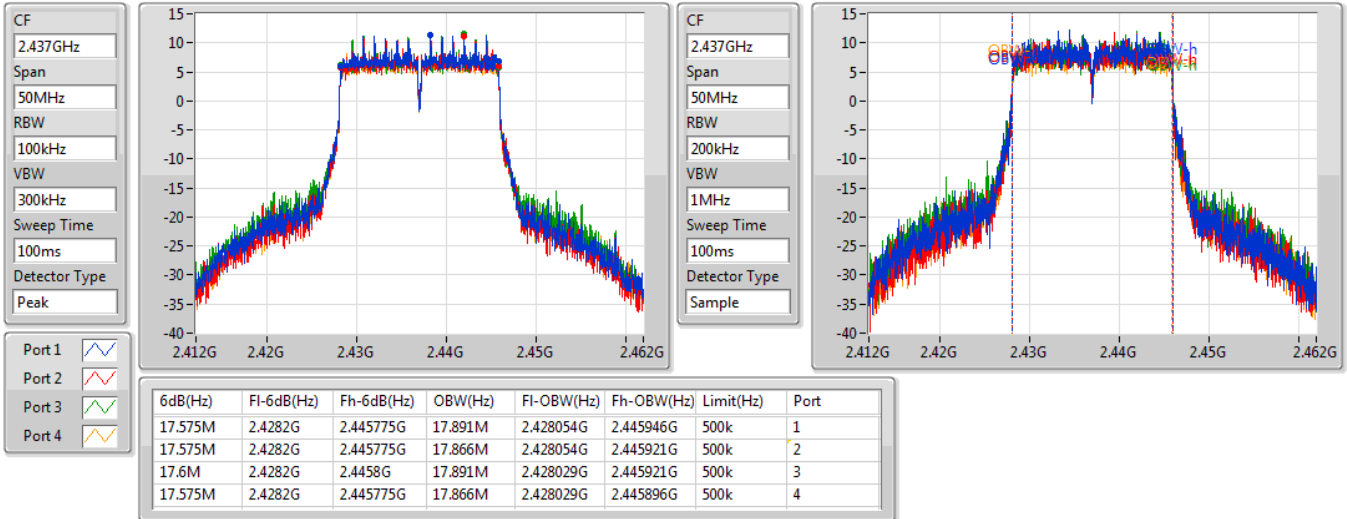

VHT20_Nss4,(MCS0)_4TX
EBW
2412MHz

19/07/2019

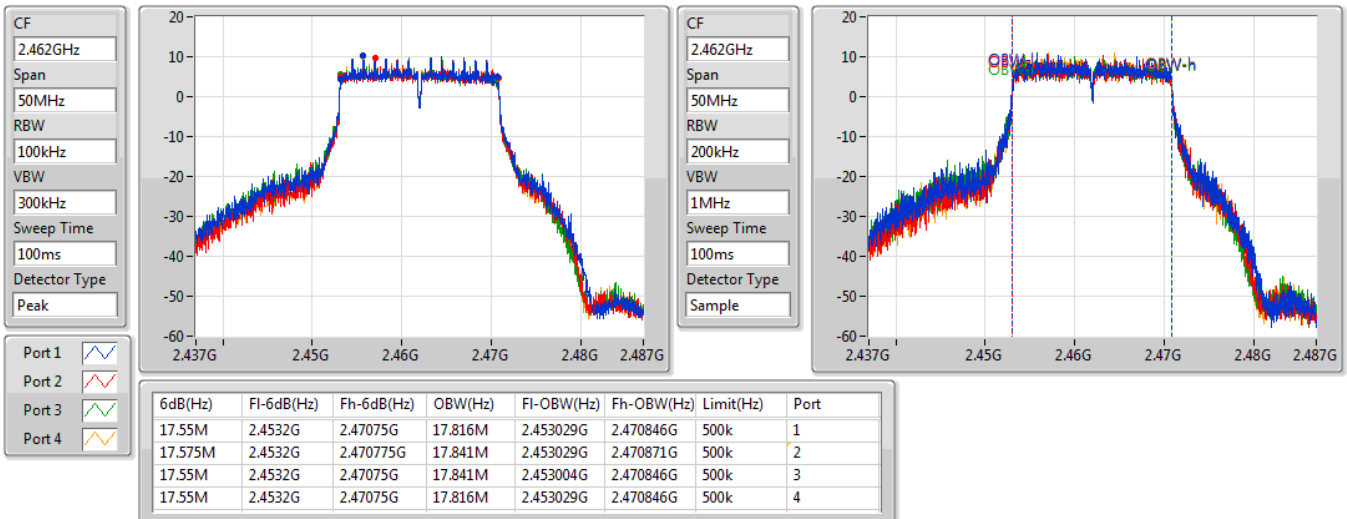


VHT20_Nss4,(MCS0)_4TX
EBW
2437MHz

19/07/2019

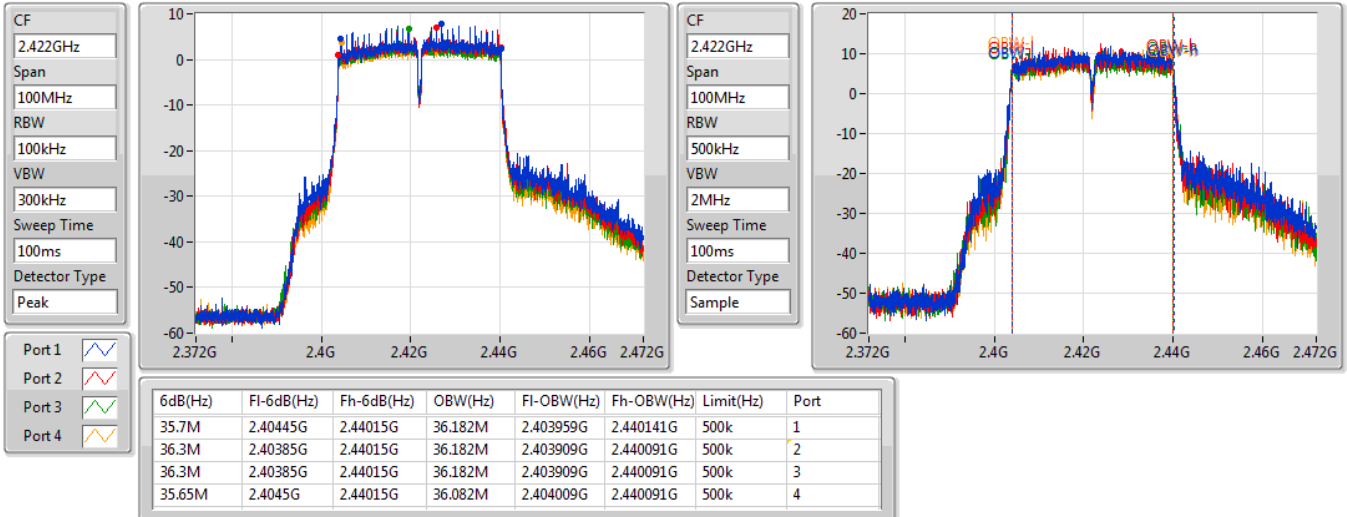

VHT20_Nss4,(MCS0)_4TX
EBW
2462MHz

19/07/2019

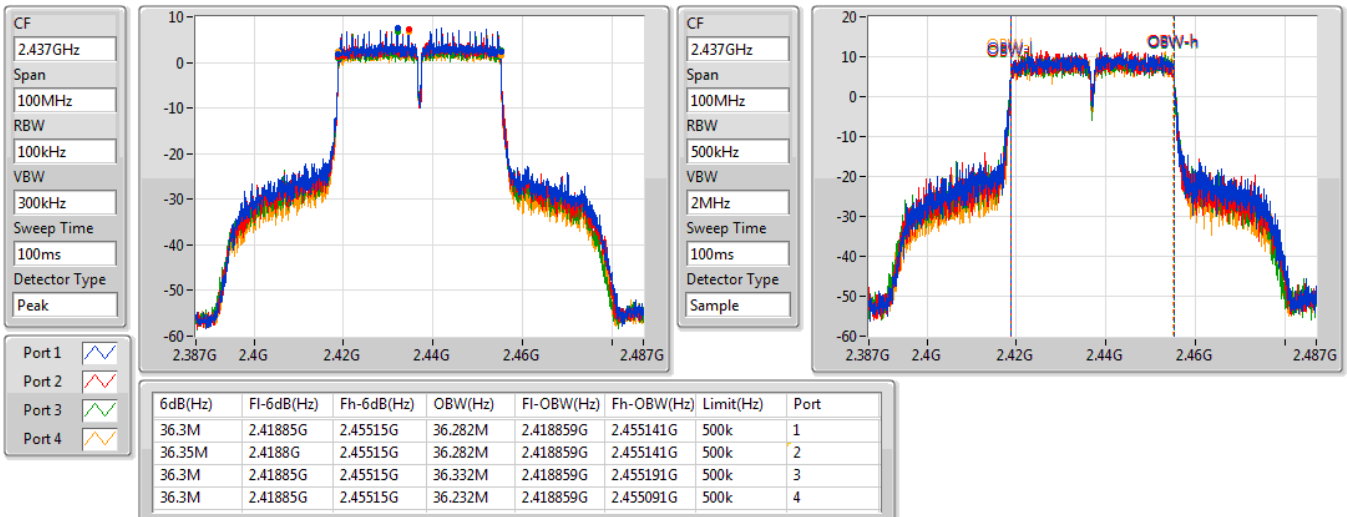


VHT40_Nss4,(MCS0)_4TX
EBW
2422MHz

19/07/2019

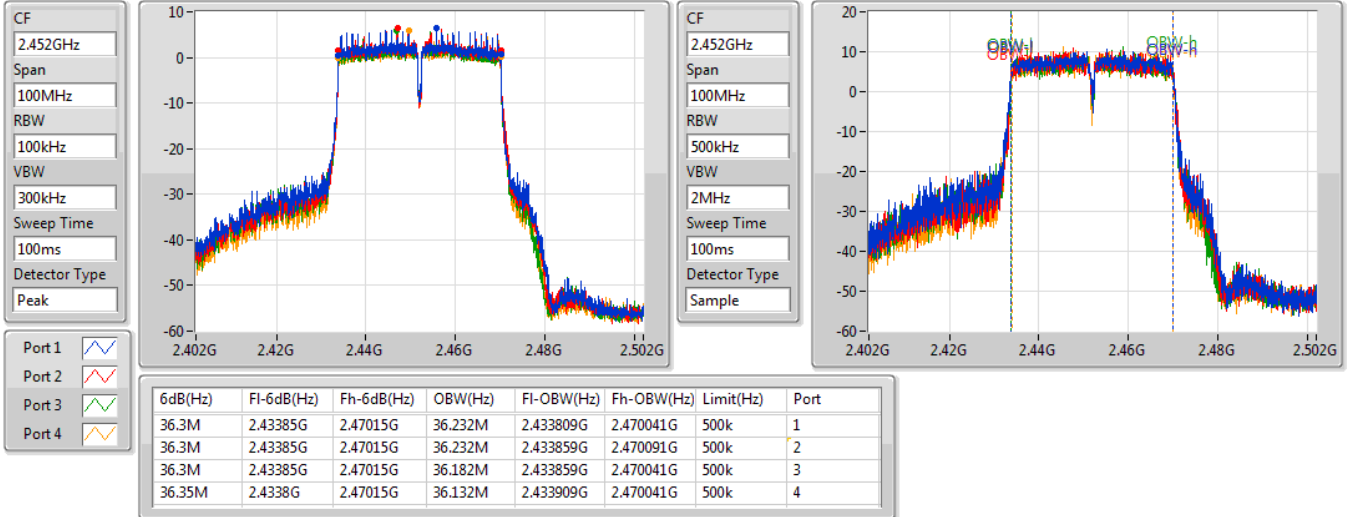

VHT40_Nss4,(MCS0)_4TX
EBW
2437MHz

19/07/2019

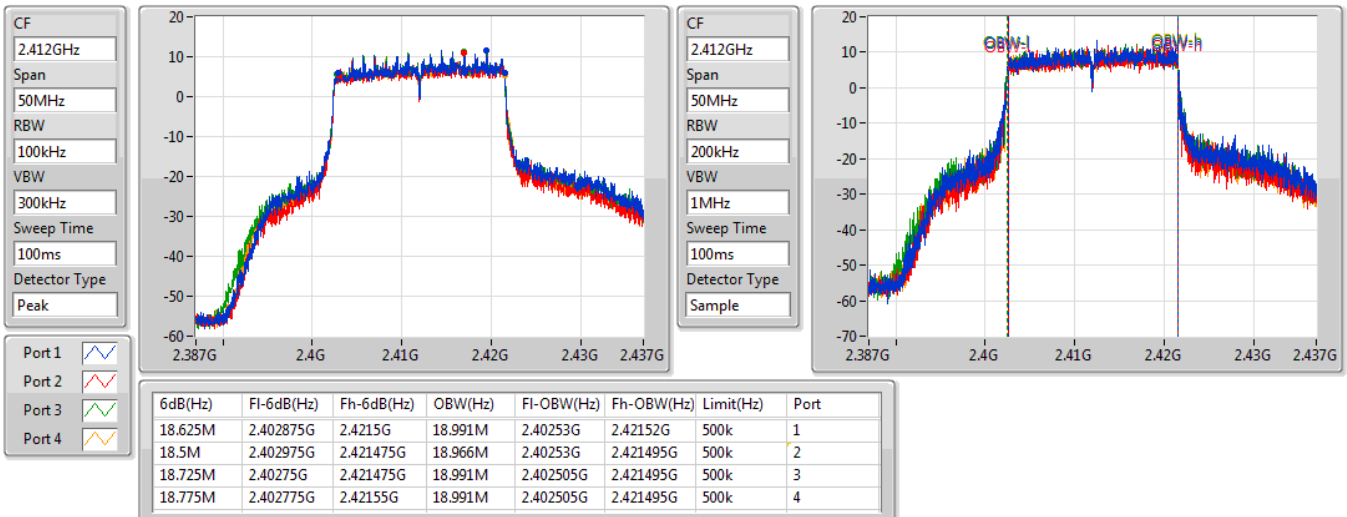


VHT40_Nss4,(MCS0)_4TX
EBW
2452MHz

19/07/2019

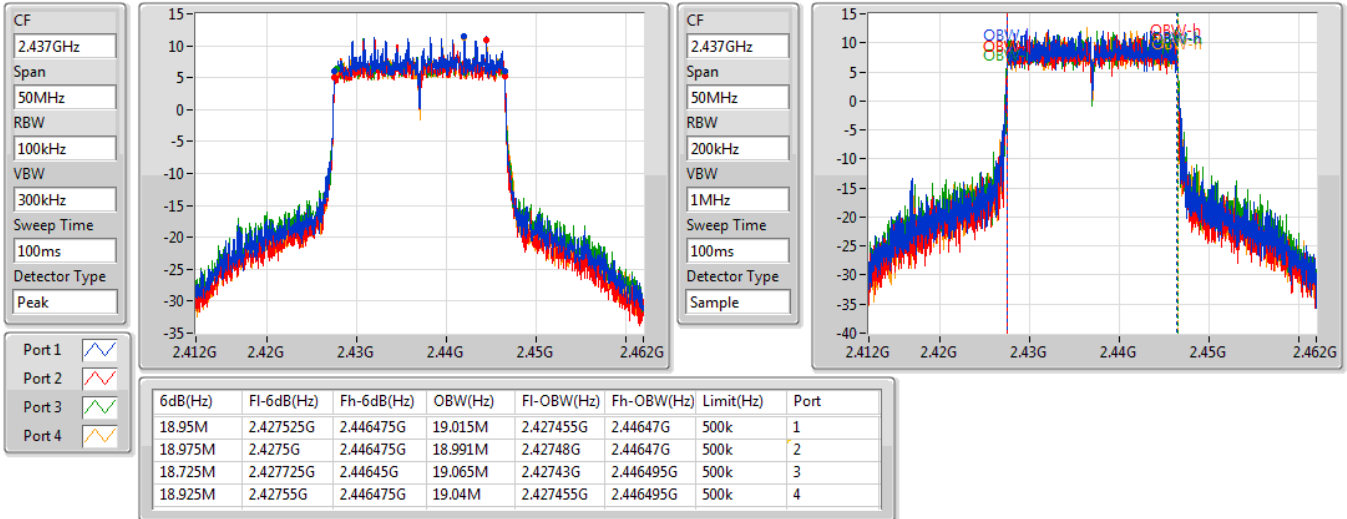

802.11ax HEW20_Nss4,(MCS0)_4TX
EBW
2412MHz

19/07/2019

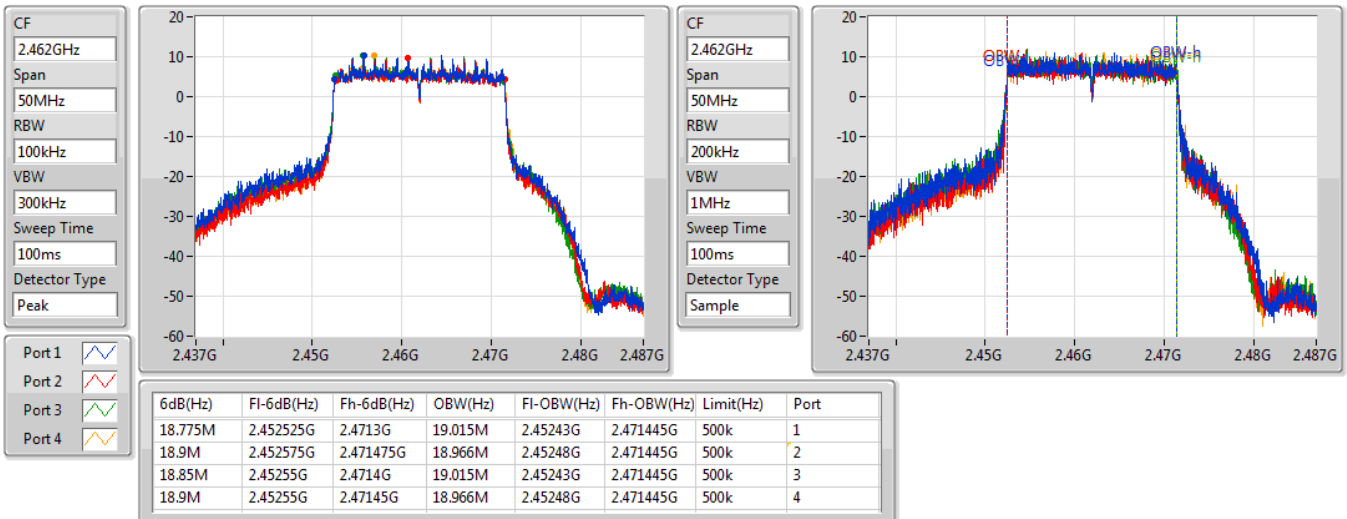


802.11ax HEW20_Nss4,(MCS0)_4TX
EBW
2437MHz

19/07/2019

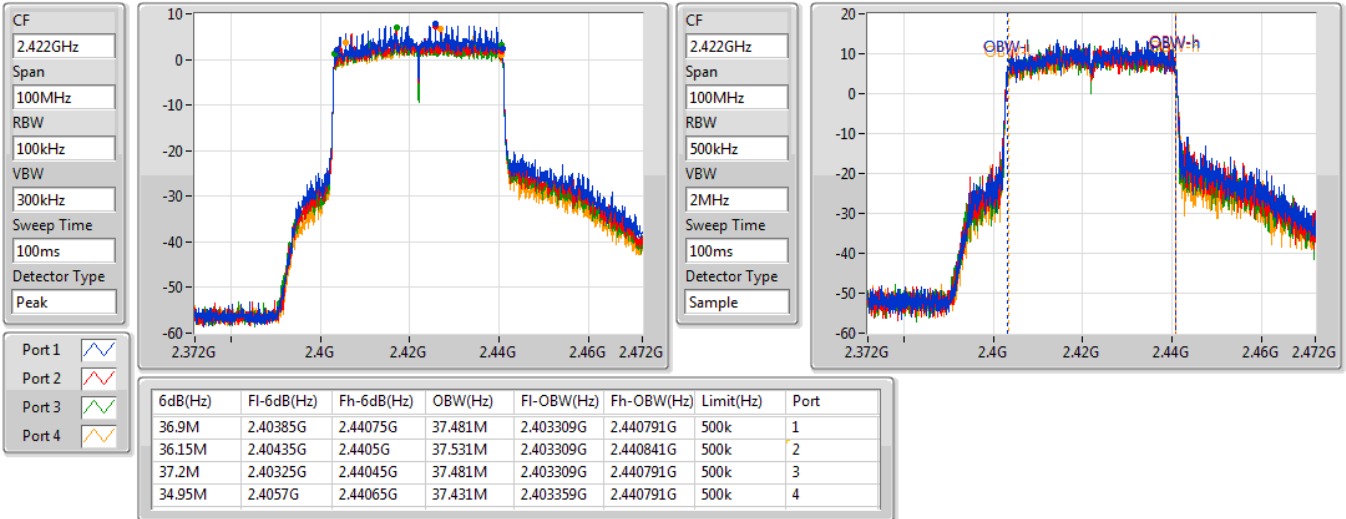

802.11ax HEW20_Nss4,(MCS0)_4TX
EBW
2462MHz

19/07/2019

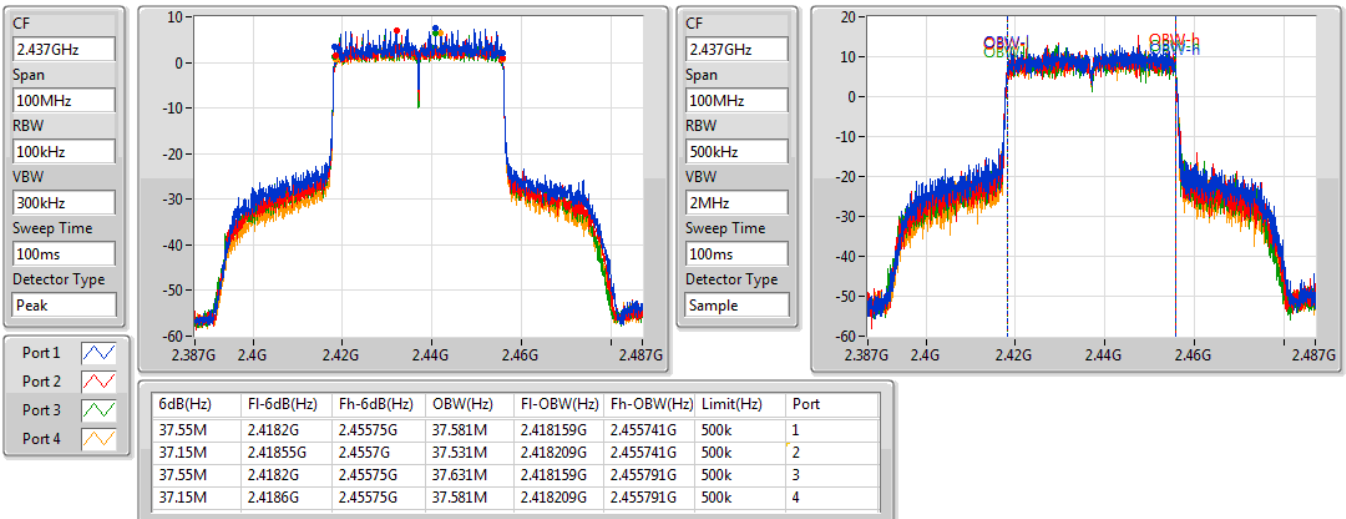


802.11ax HEW40_Nss4,(MCS0)_4TX
EBW
2422MHz

19/07/2019


802.11ax HEW40_Nss4,(MCS0)_4TX
EBW
2437MHz

19/07/2019

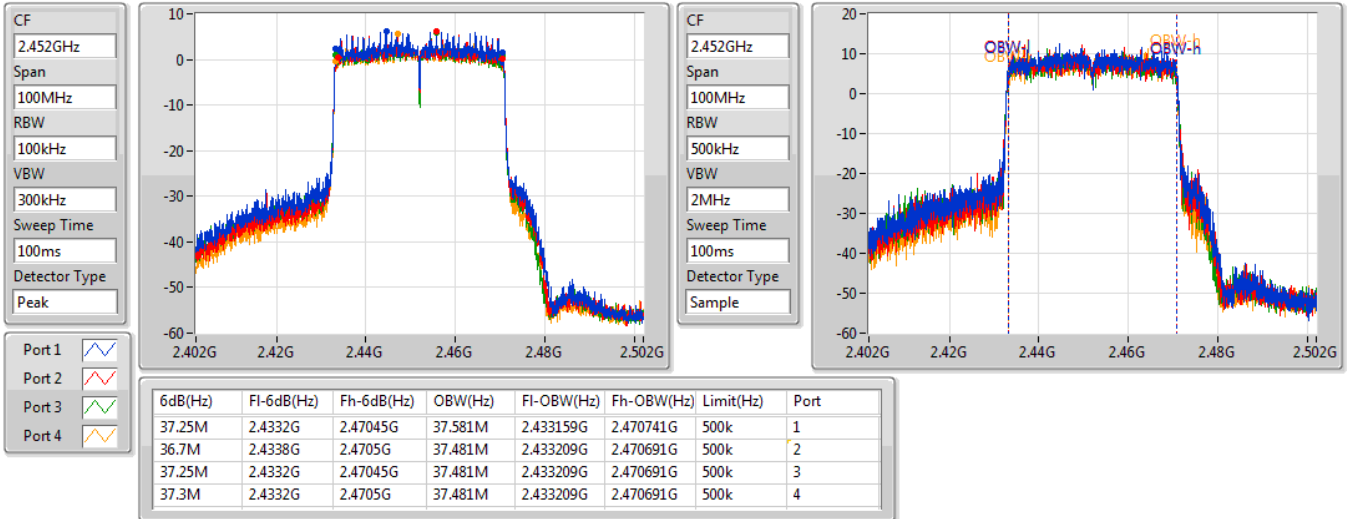


802.11ax HEW40_Nss4,(MCS0)_4TX

EBW

2452MHz

19/07/2019



**For beamforming mode:**

1 Stream 4 TX for TxBF mode:

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	17.625M	17.891M	17M9D1D	15.075M	17.716M
VHT40-BF_Nss1,(MCS0)_4TX	36.35M	36.282M	36M3D1D	30.05M	35.982M
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	17.575M	17.891M	17M9D1D	13.75M	17.741M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	37.45M	37.581M	37M6D1D	20M	36.132M

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

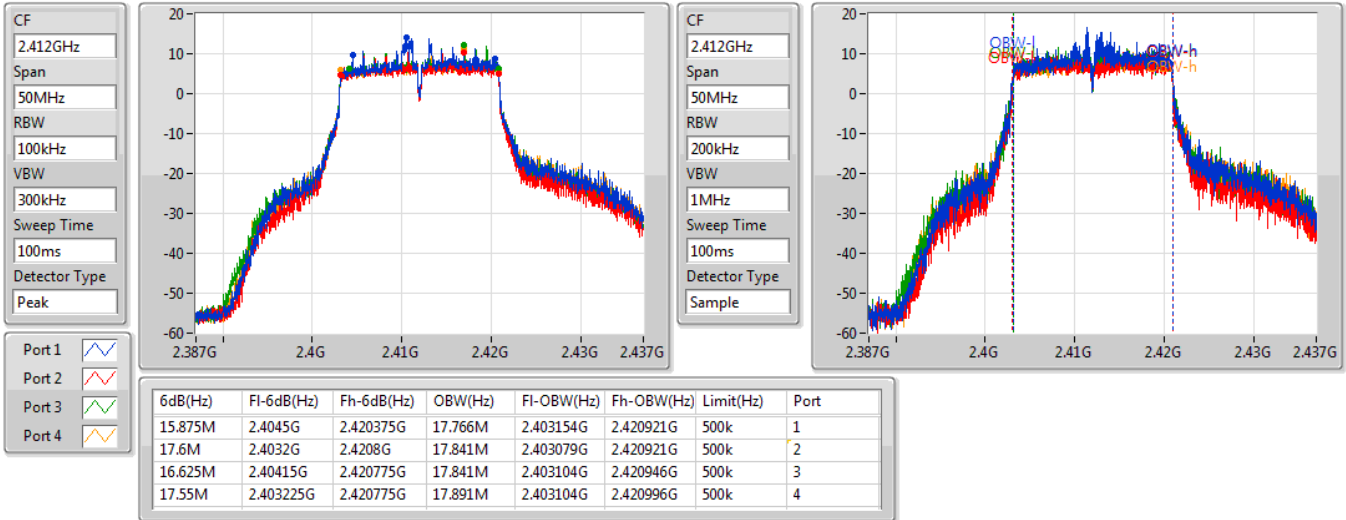
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	15.875M	17.766M	17.6M	17.841M	16.625M	17.841M	17.55M	17.891M
2437MHz	Pass	500k	15.3M	17.791M	17.55M	17.716M	17.575M	17.791M	17.575M	17.816M
2462MHz	Pass	500k	15.075M	17.816M	17.625M	17.816M	17.575M	17.866M	17.6M	17.841M
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	33.8M	36.282M	36.05M	36.282M	35.95M	36.282M	35.65M	36.232M
2437MHz	Pass	500k	32.8M	36.232M	35.95M	36.232M	36.05M	36.282M	36.35M	36.182M
2452MHz	Pass	500k	30.05M	35.982M	36.35M	36.232M	36.3M	36.132M	36.35M	36.132M
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	13.825M	17.741M	17.55M	17.791M	17.525M	17.841M	17.3M	17.866M
2437MHz	Pass	500k	13.75M	17.791M	17.575M	17.816M	17.575M	17.891M	17.575M	17.816M
2462MHz	Pass	500k	15.05M	17.791M	17.575M	17.891M	17.55M	17.841M	17.575M	17.866M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	29.05M	36.232M	35.45M	36.332M	35.7M	36.332M	35.7M	36.282M
2437MHz	Pass	500k	29.5M	36.132M	36.05M	36.182M	36.3M	36.282M	36.3M	36.232M
2452MHz	Pass	500k	20M	37.431M	37.45M	37.581M	37.35M	37.531M	37.4M	37.481M

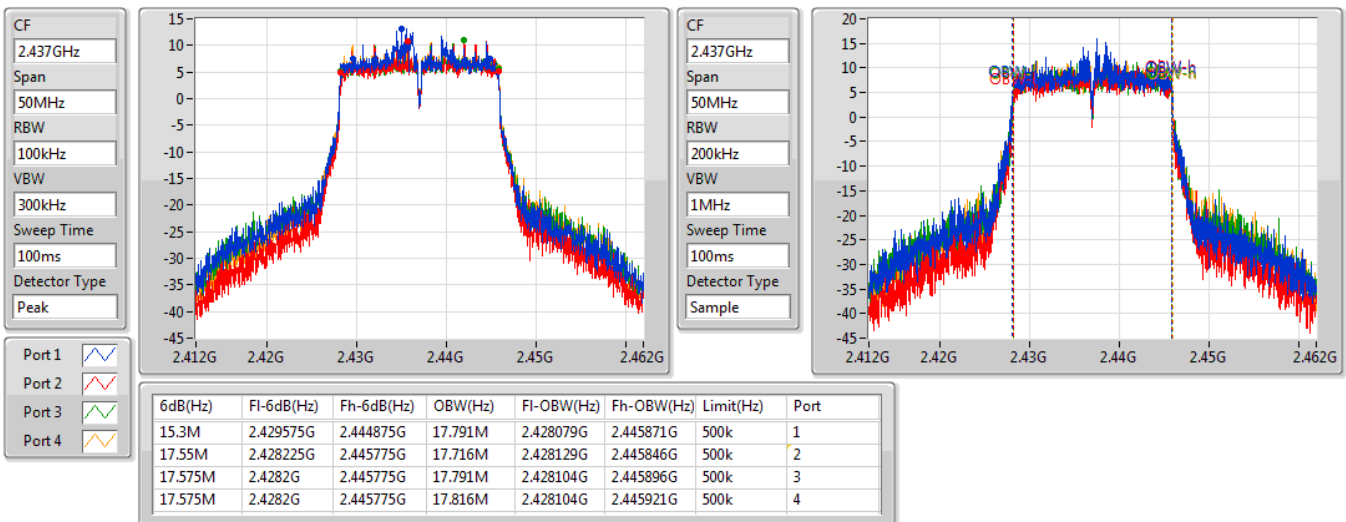
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

VHT20-BF_Nss1,(MCS0)_4TX
EBW
2412MHz

23/07/2019

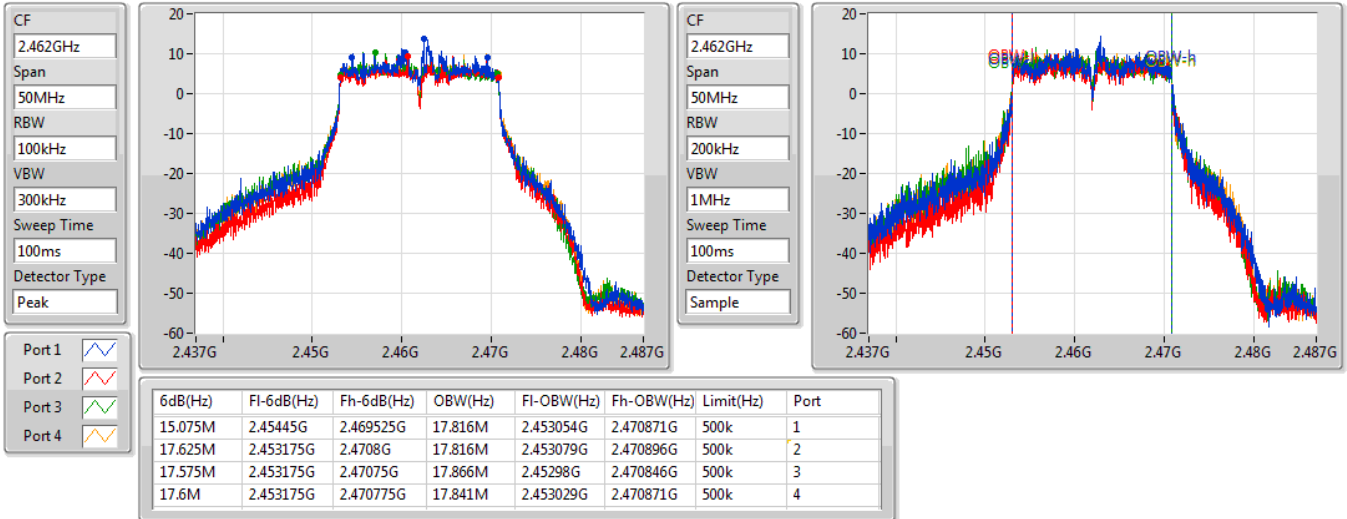

VHT20-BF_Nss1,(MCS0)_4TX
EBW
2437MHz

23/07/2019

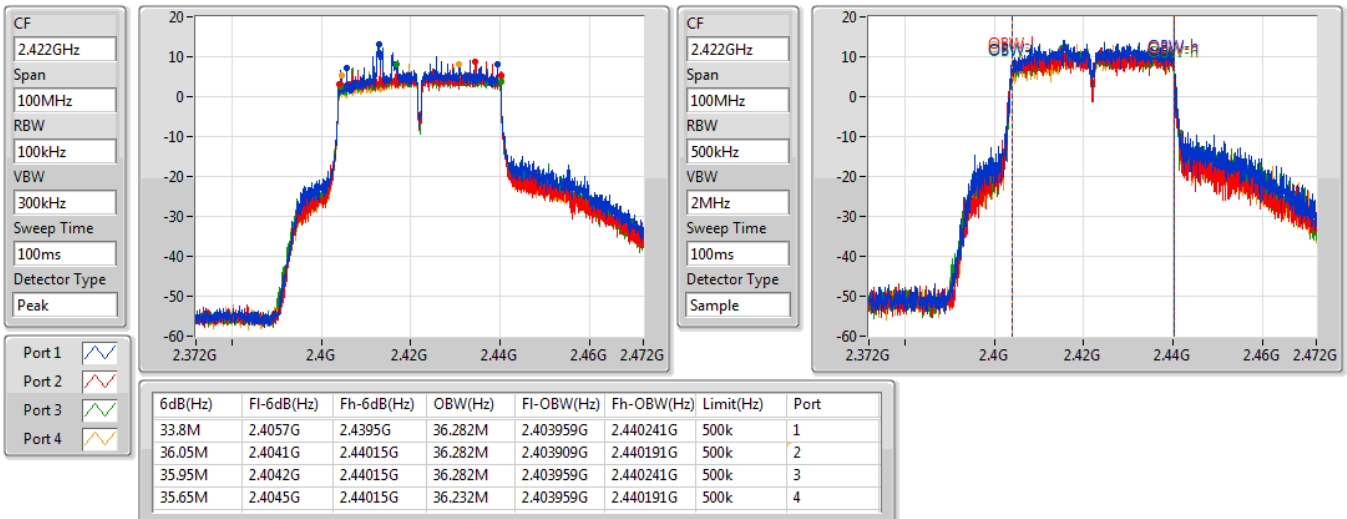


VHT20-BF_Nss1,(MCS0)_4TX
EBW
2462MHz

23/07/2019

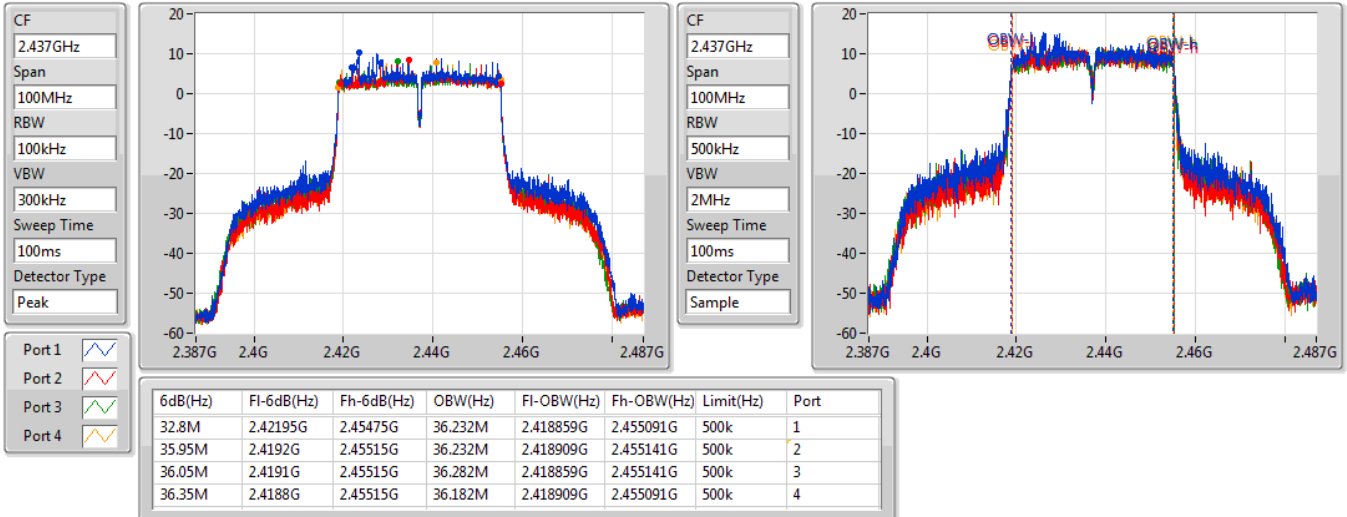

VHT40-BF_Nss1,(MCS0)_4TX
EBW
2422MHz

23/07/2019

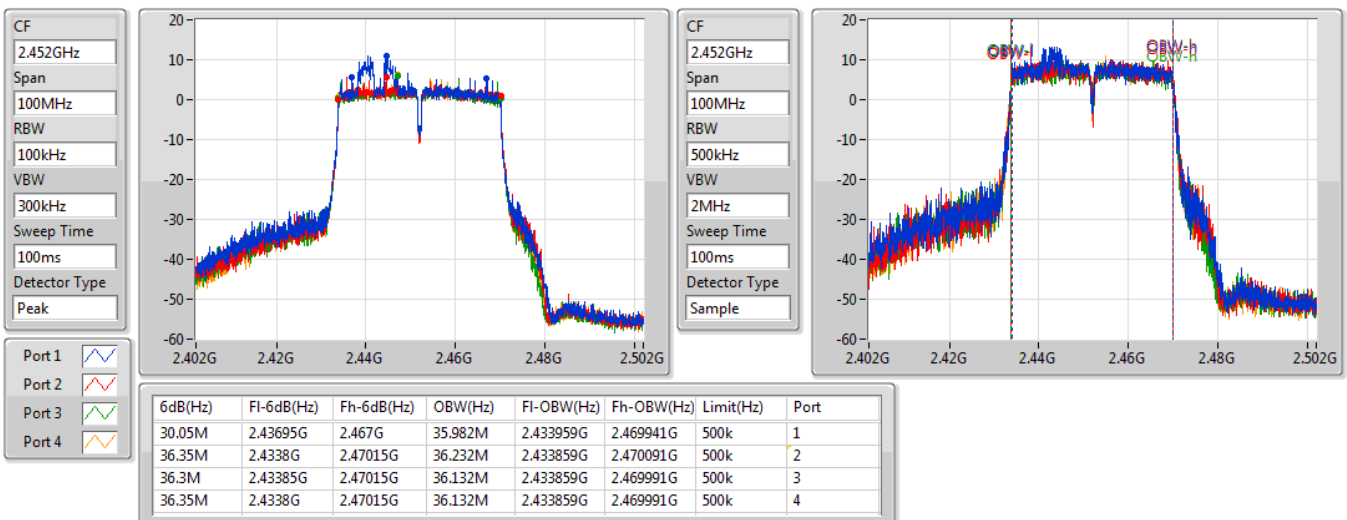


VHT40-BF_Nss1,(MCS0)_4TX
EBW
2437MHz

23/07/2019

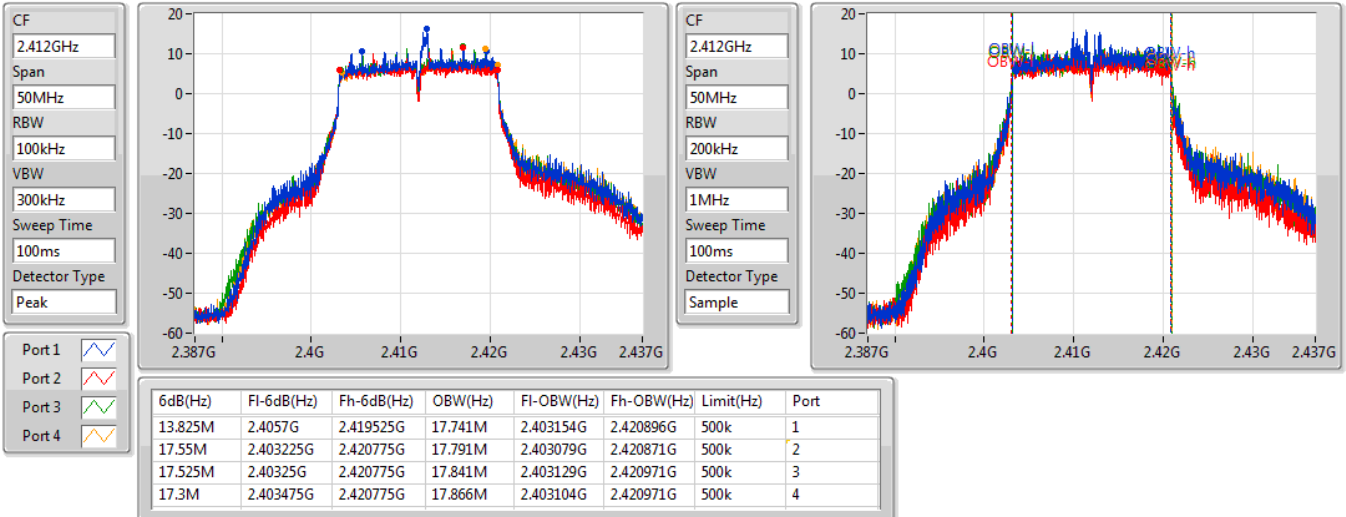

VHT40-BF_Nss1,(MCS0)_4TX
EBW
2452MHz

23/07/2019

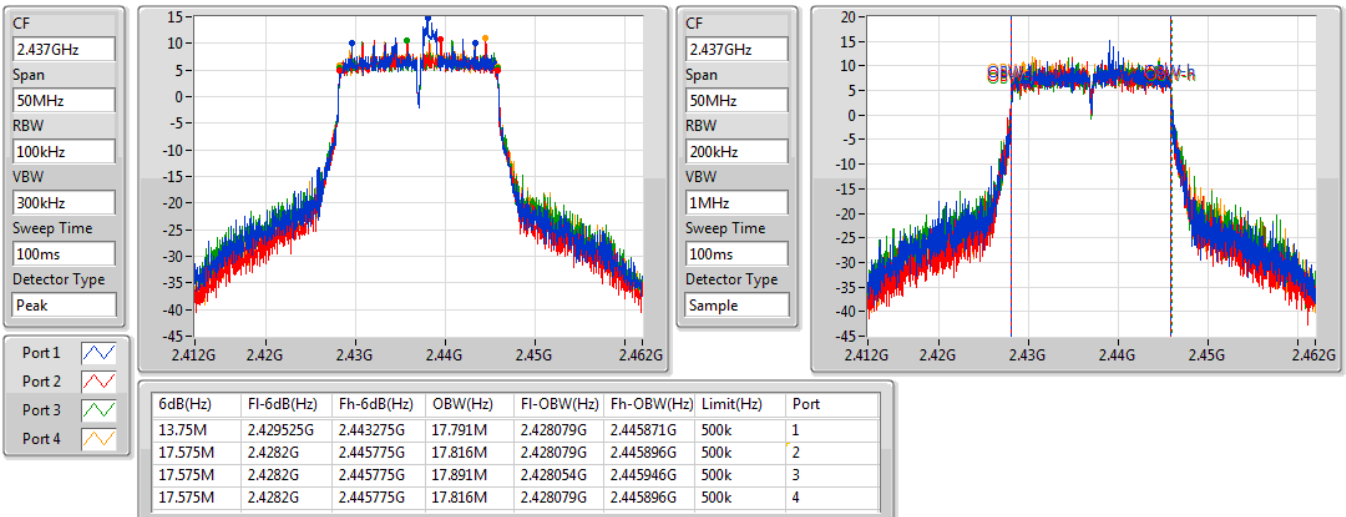


802.11ax HEW20-BF_Nss1,(MCS0)_4TX
EBW
2412MHz

23/07/2019

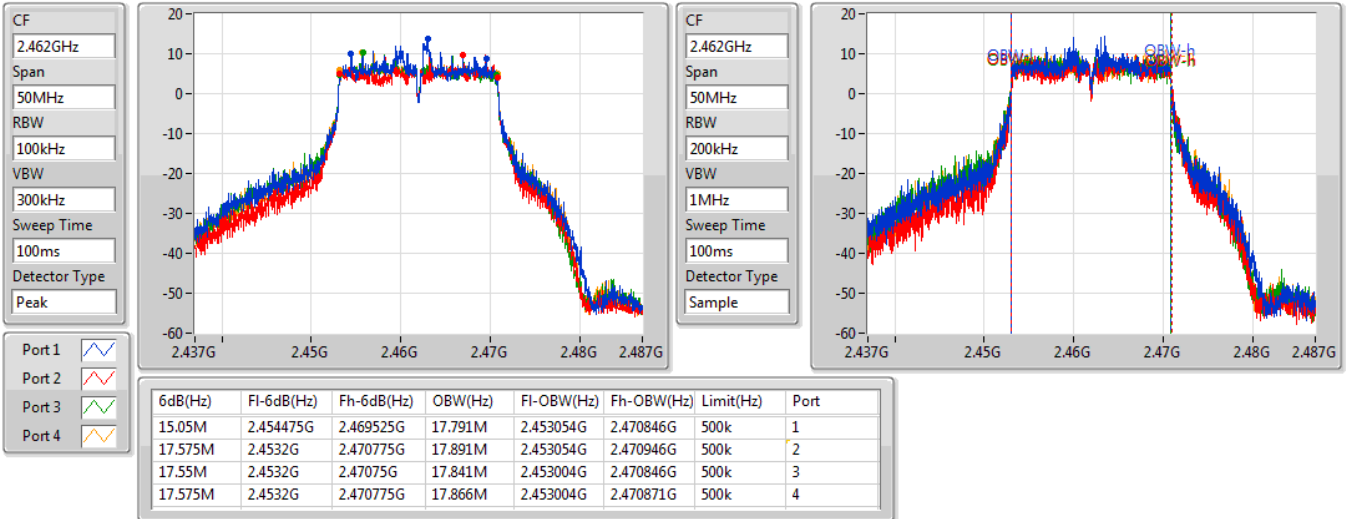

802.11ax HEW20-BF_Nss1,(MCS0)_4TX
EBW
2437MHz

23/07/2019

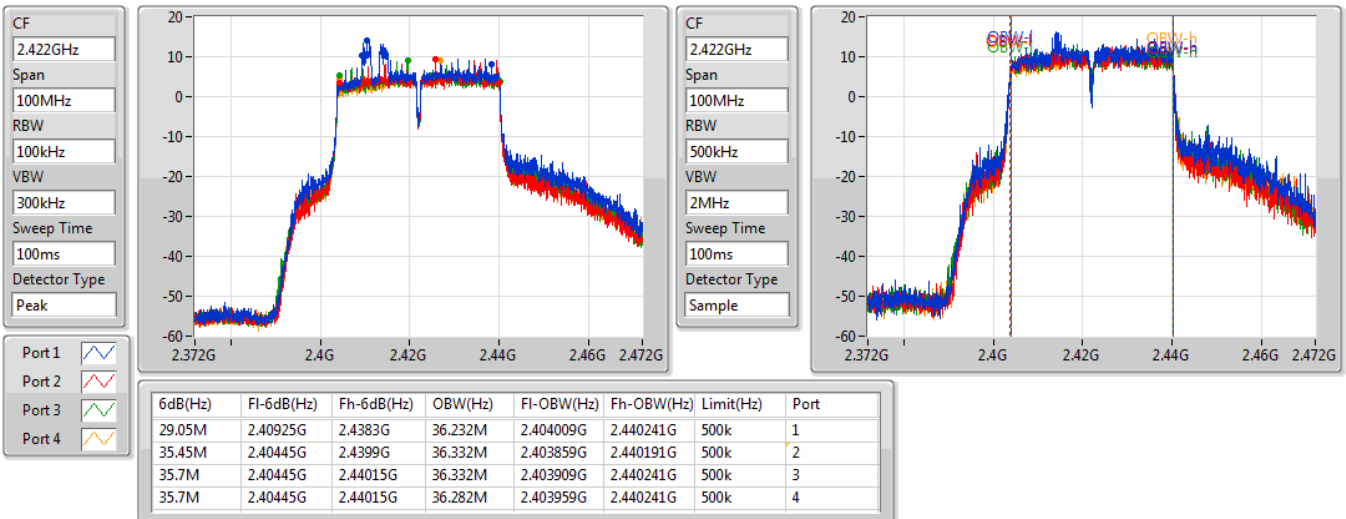


802.11ax HEW20-BF_Nss1,(MCS0)_4TX
EBW
2462MHz

23/07/2019

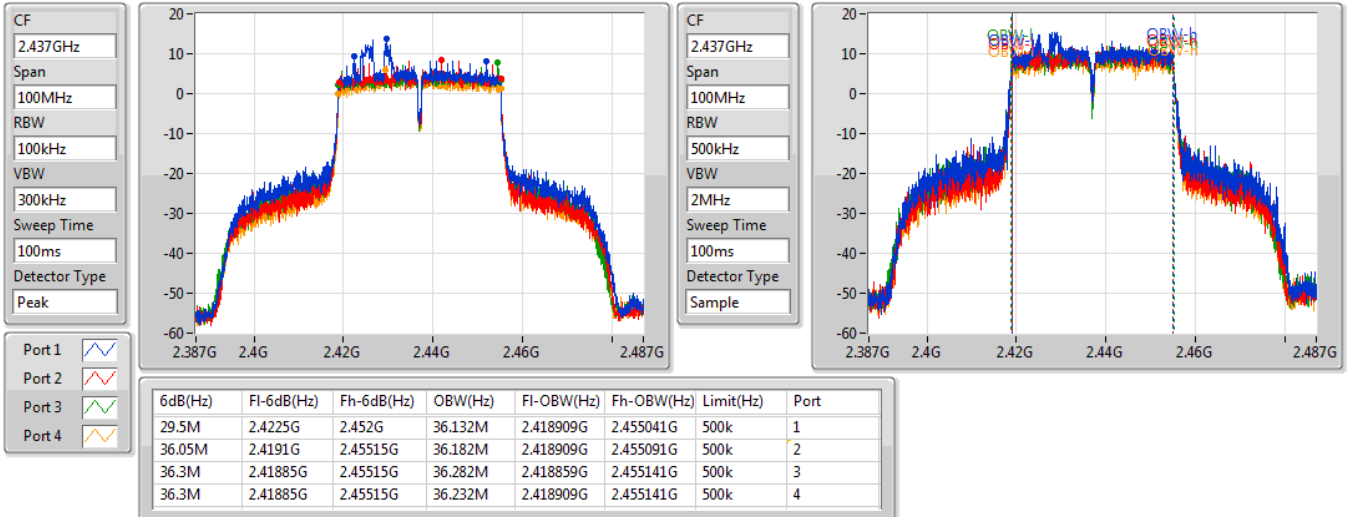

802.11ax HEW40-BF_Nss1,(MCS0)_4TX
EBW
2422MHz

23/07/2019

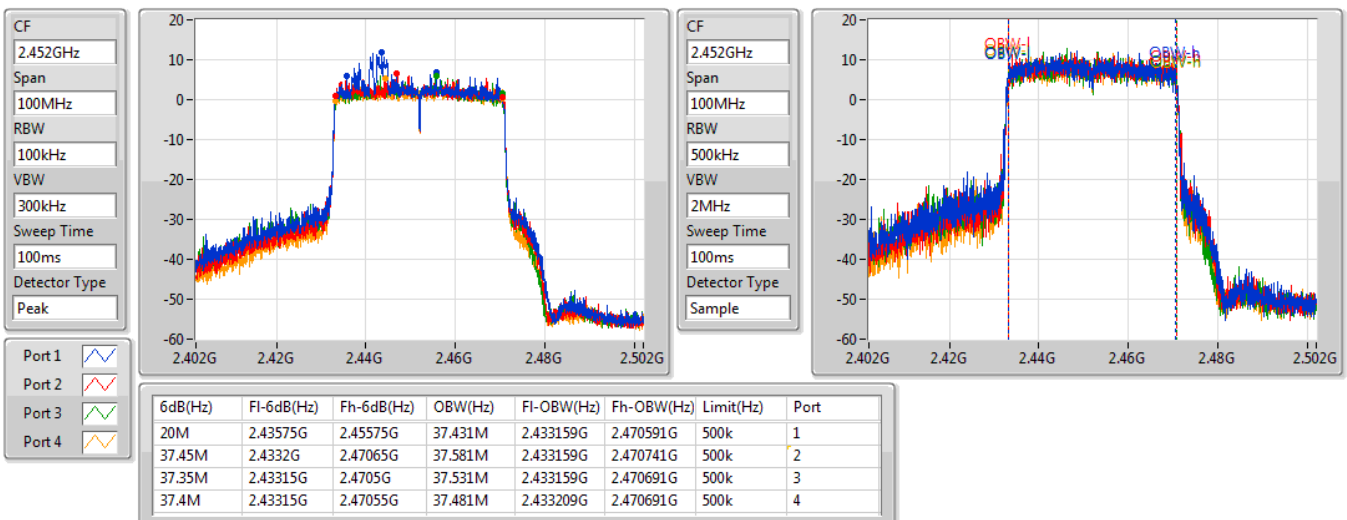


802.11ax HEW40-BF_Nss1,(MCS0)_4TX
EBW
2437MHz

23/07/2019


802.11ax HEW40-BF_Nss1,(MCS0)_4TX
EBW
2452MHz

23/07/2019





2 Stream 4 TX for TxBF mode:

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
VHT20-BF_Nss2,(MCS0)_4TX	17.7M	17.866M	17M9D1D	17.525M	17.691M
VHT40-BF_Nss2,(MCS0)_4TX	36.4M	36.432M	36M4D1D	13.9M	36.182M
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	19.075M	19.065M	19M1D1D	17.05M	18.916M
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	37.75M	37.681M	37M7D1D	22.8M	37.381M

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

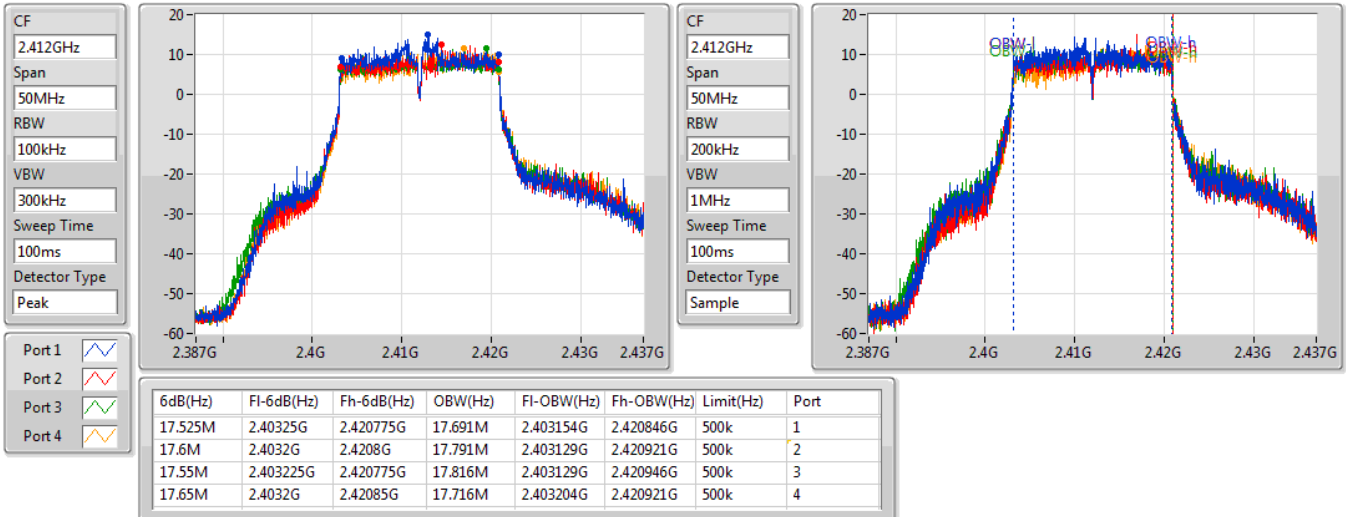
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	17.525M	17.691M	17.6M	17.791M	17.55M	17.816M	17.65M	17.716M
2437MHz	Pass	500k	17.7M	17.691M	17.625M	17.791M	17.6M	17.841M	17.675M	17.766M
2462MHz	Pass	500k	17.6M	17.791M	17.625M	17.766M	17.575M	17.841M	17.575M	17.866M
VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	33.75M	36.232M	35.65M	36.232M	36.05M	36.282M	35.75M	36.282M
2437MHz	Pass	500k	13.9M	36.432M	36.4M	36.232M	36.3M	36.332M	36.3M	36.282M
2452MHz	Pass	500k	36.4M	36.232M	36.4M	36.182M	36.3M	36.182M	36.35M	36.382M
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	17.05M	18.916M	19.05M	18.991M	19.025M	18.991M	18.975M	18.916M
2437MHz	Pass	500k	17.05M	18.991M	19.05M	18.991M	18.975M	19.04M	19.075M	18.966M
2462MHz	Pass	500k	18.925M	19.04M	18.95M	19.015M	18.875M	19.065M	19.075M	19.04M
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	31.65M	37.531M	37.05M	37.531M	37.65M	37.581M	37.3M	37.531M
2437MHz	Pass	500k	22.8M	37.631M	37.5M	37.581M	37.75M	37.581M	37.1M	37.431M
2452MHz	Pass	500k	35.35M	37.681M	37.7M	37.481M	37.05M	37.381M	37.75M	37.431M

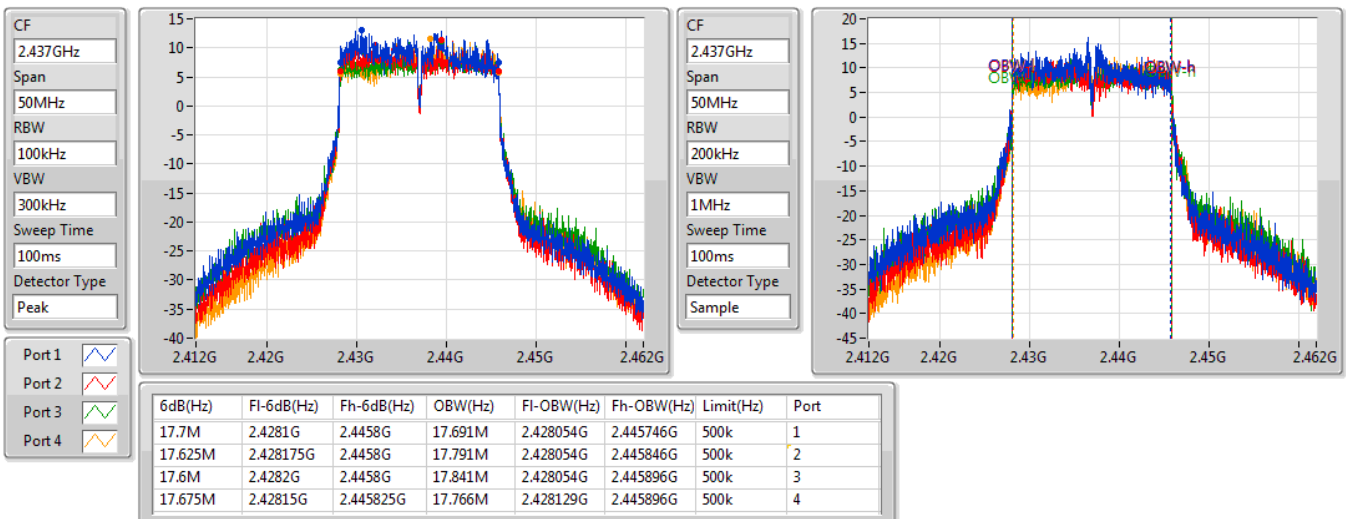
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

VHT20-BF_Nss2,(MCS0)_4TX
EBW
2412MHz

23/07/2019

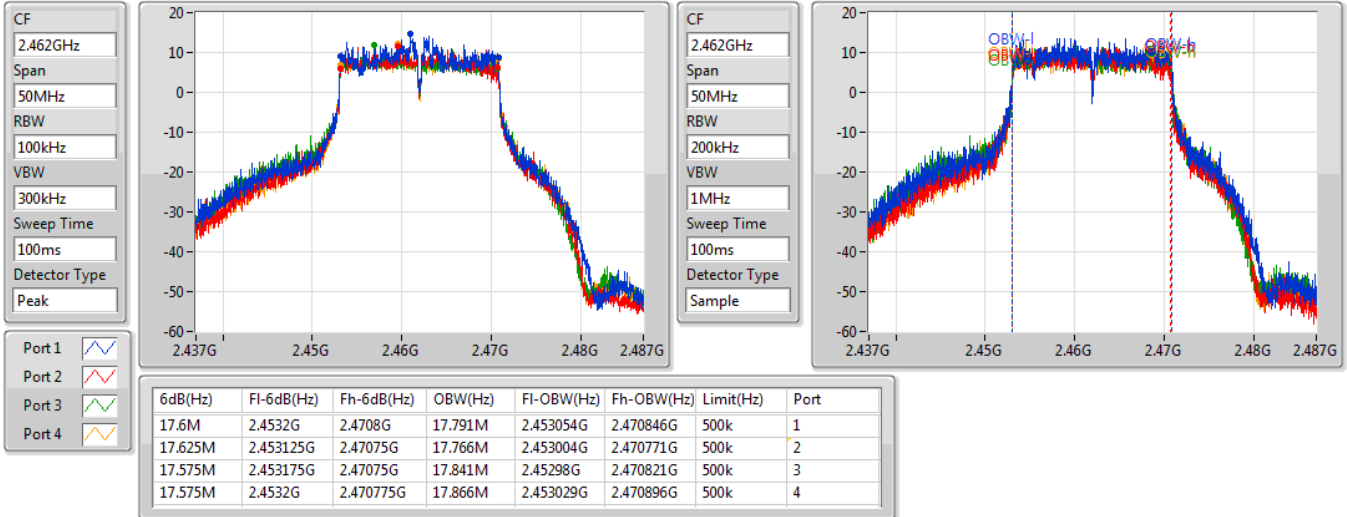

VHT20-BF_Nss2,(MCS0)_4TX
EBW
2437MHz

23/07/2019

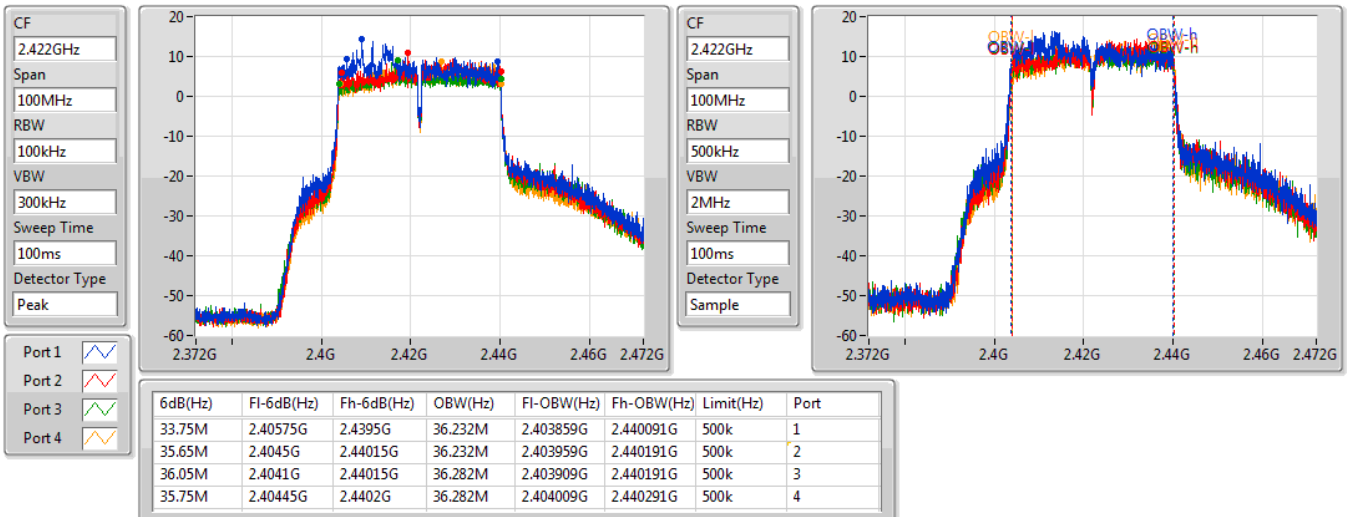


VHT20-BF_Nss2,(MCS0)_4TX
EBW
2462MHz

23/07/2019

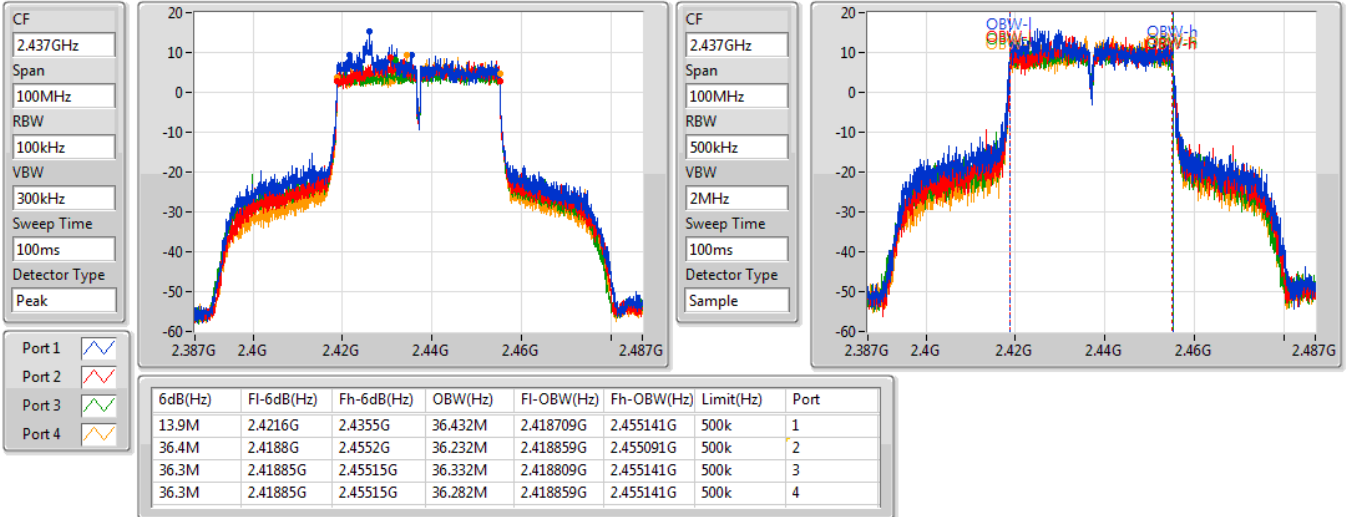

VHT40-BF_Nss2,(MCS0)_4TX
EBW
2422MHz

23/07/2019

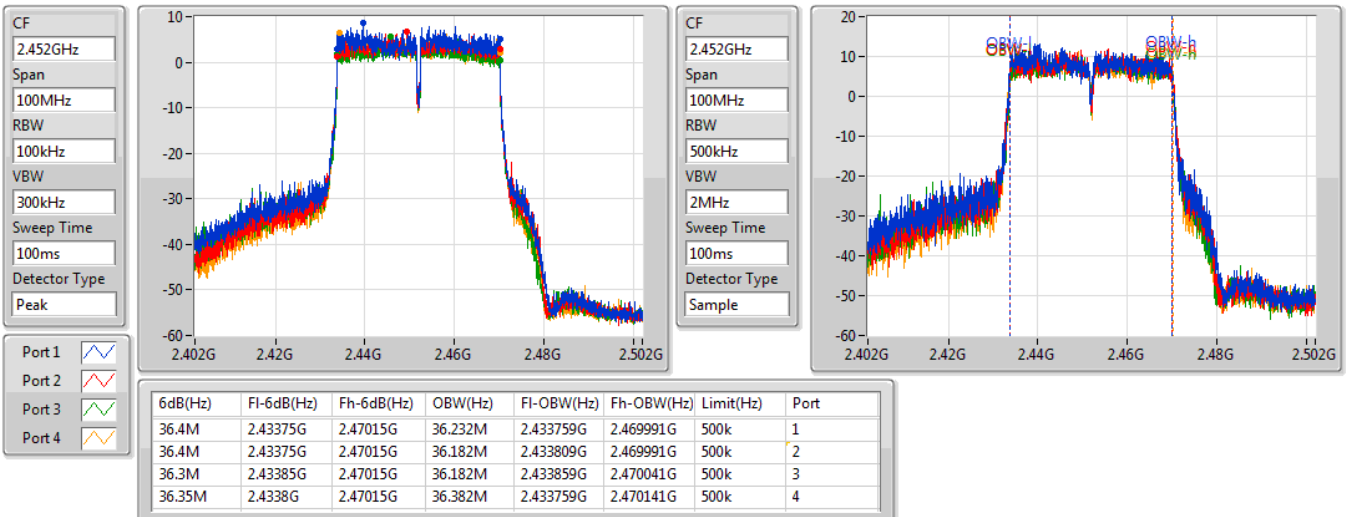


VHT40-BF_Nss2,(MCS0)_4TX
EBW
2437MHz

23/07/2019

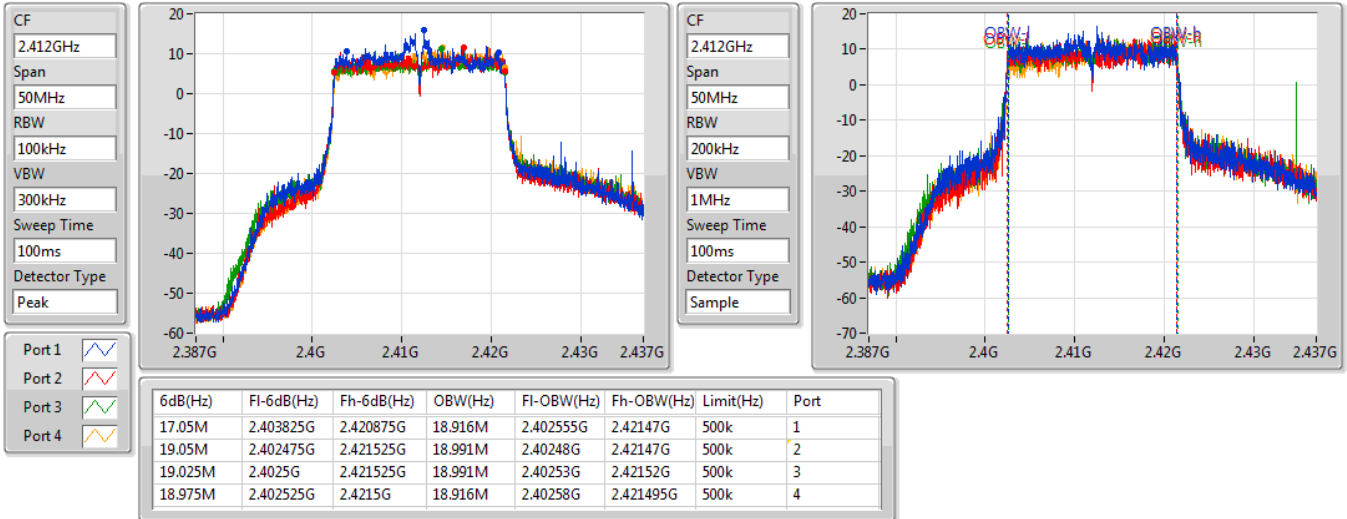

VHT40-BF_Nss2,(MCS0)_4TX
EBW
2452MHz

23/07/2019

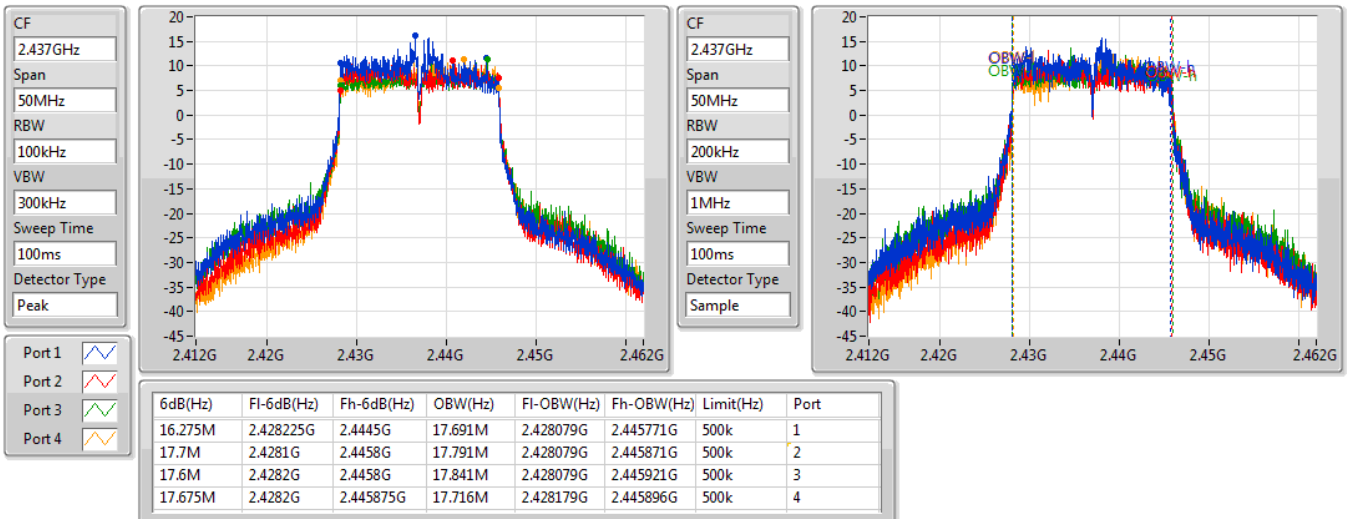


802.11ax HEW20-BF_Nss2,(MCS0)_4TX
EBW
2412MHz

23/07/2019

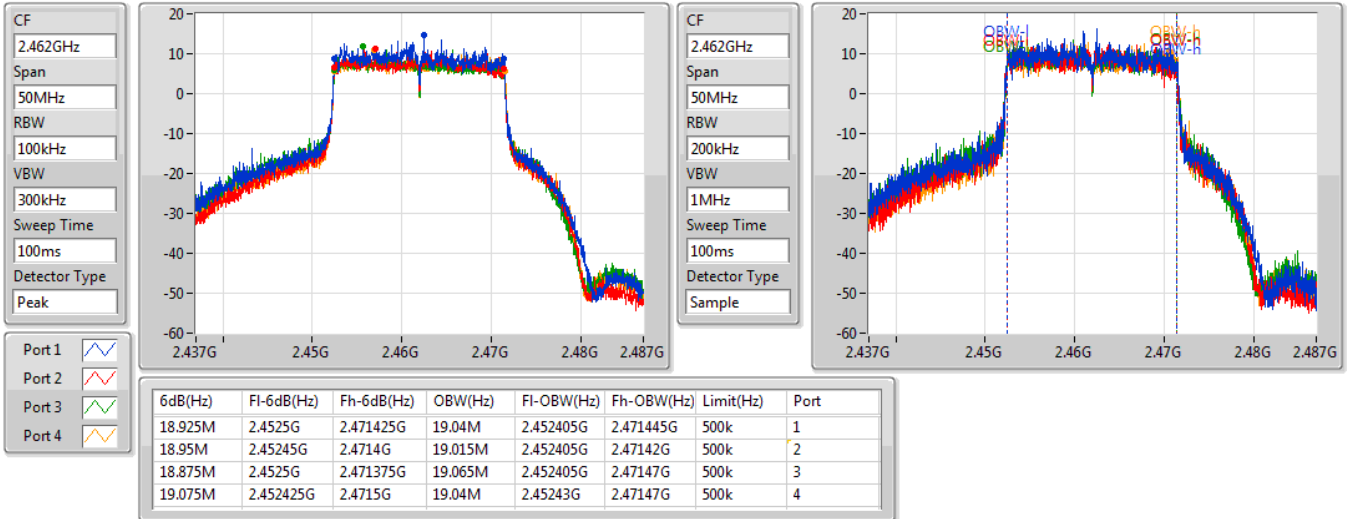

802.11ax HEW20-BF_Nss2,(MCS0)_4TX
EBW
2437MHz

23/07/2019

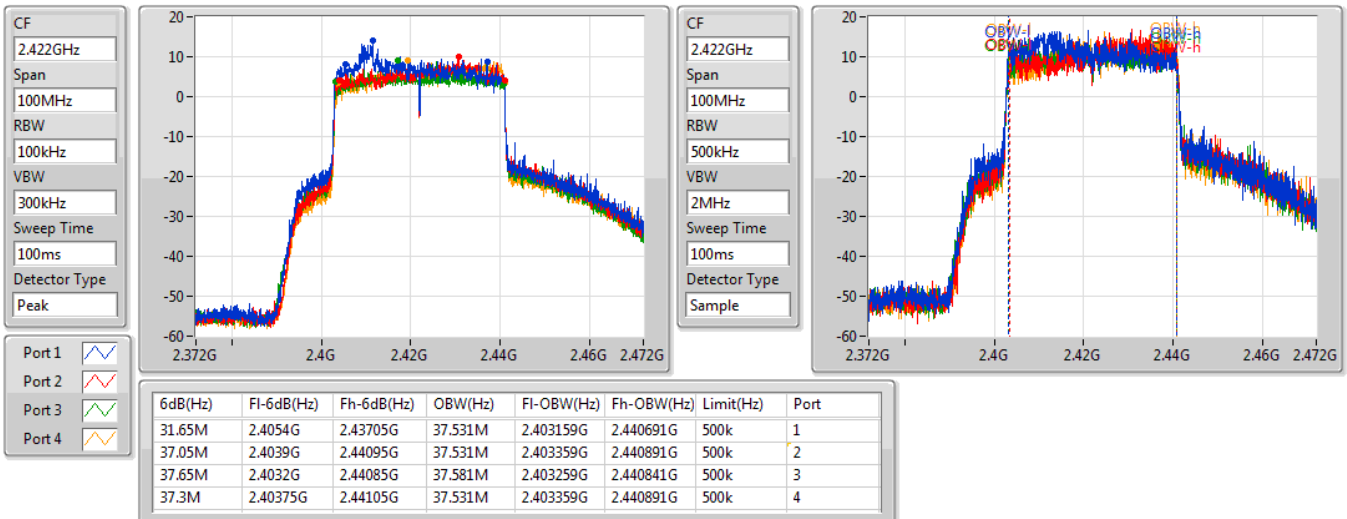


802.11ax HEW20-BF_Nss2,(MCS0)_4TX
EBW
2462MHz

23/07/2019

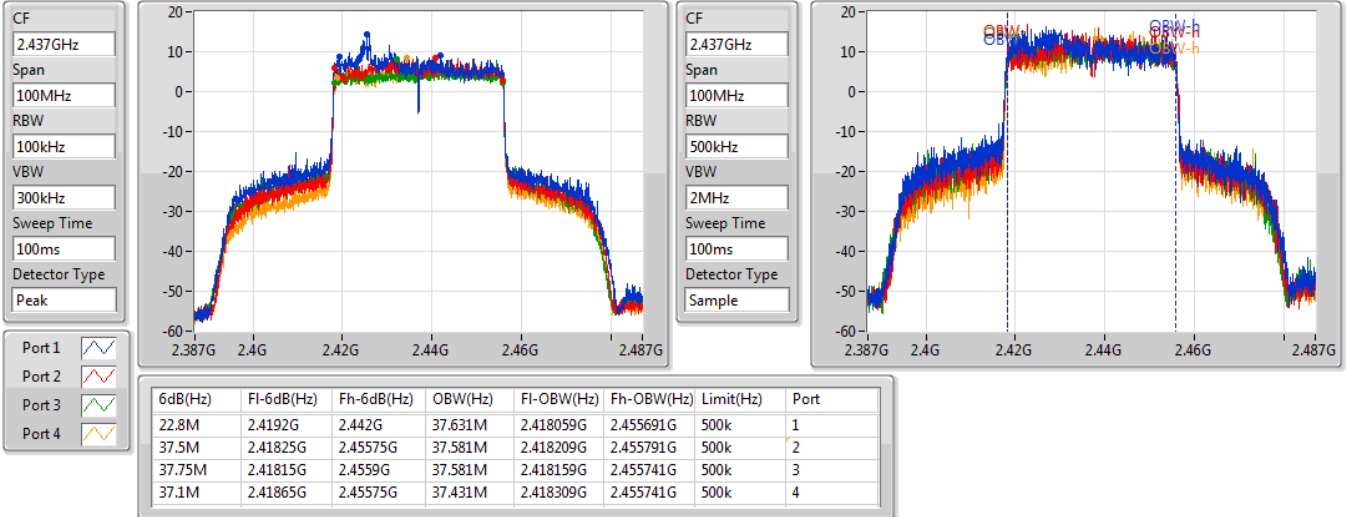

802.11ax HEW40-BF_Nss2,(MCS0)_4TX
EBW
2422MHz

23/07/2019

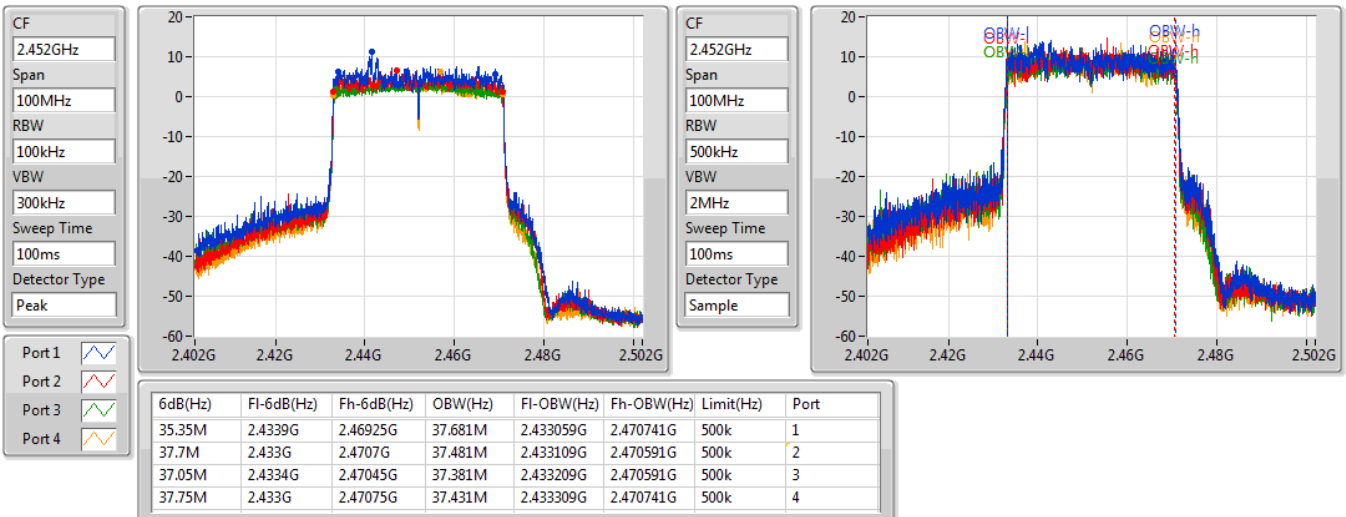


802.11ax HEW40-BF_Nss2,(MCS0)_4TX
EBW
2437MHz

23/07/2019


802.11ax HEW40-BF_Nss2,(MCS0)_4TX
EBW
2452MHz

23/07/2019





Average Power Result

Appendix C

For non-beamforming mode:

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_4TX	29.86	0.96828
VHT20_Nss4,(MCS0)_4TX	29.83	0.96161
VHT40_Nss4,(MCS0)_4TX	27.89	0.61518
802.11ax HEW20_Nss4,(MCS0)_4TX	29.99	0.99770
802.11ax HEW40_Nss4,(MCS0)_4TX	28.11	0.64714

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.3	24.03	23.40	24.09	23.82	29.86	30.00
2437MHz	Pass	5.3	24.09	23.52	23.93	23.81	29.86	30.00
2462MHz	Pass	5.3	23.78	23.52	23.91	24.05	29.84	30.00
VHT20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	-0.30	24.19	23.44	23.88	23.67	29.82	30.00
2437MHz	Pass	-0.30	24.26	23.42	23.93	23.57	29.83	30.00
2462MHz	Pass	-0.30	21.82	21.60	21.90	21.99	27.85	30.00
VHT40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	-0.30	22.05	21.84	21.49	21.53	27.75	30.00
2437MHz	Pass	-0.30	22.08	21.98	21.55	21.83	27.89	30.00
2452MHz	Pass	-0.30	21.02	20.82	20.60	20.39	26.73	30.00
802.11ax HEW20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	-0.30	24.19	23.63	24.16	23.76	29.96	30.00
2437MHz	Pass	-0.30	24.28	23.72	23.94	23.91	29.99	30.00
2462MHz	Pass	-0.30	22.10	21.78	21.90	21.96	27.96	30.00
802.11ax HEW40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	-0.30	22.06	21.01	21.85	21.65	27.68	30.00
2437MHz	Pass	-0.30	22.15	22.19	21.96	22.05	28.11	30.00
2452MHz	Pass	-0.30	21.22	20.98	20.79	20.53	26.91	30.00

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



Average Power Result

Appendix C

For beamforming mode:

1 Stream 4 TX for TxBF mode:

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
VHT20-BF_Nss1,(MCS0)_4TX	29.88	0.97275
VHT40-BF_Nss1,(MCS0)_4TX	29.87	0.97051
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	29.98	0.99541
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	29.93	0.98401

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.30	23.93	23.41	24.05	23.62	29.78	30.00
2437MHz	Pass	5.30	23.88	23.59	23.95	24.02	29.88	30.00
2462MHz	Pass	5.30	21.51	20.99	21.75	21.95	27.59	30.00
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.30	23.73	23.79	23.95	23.94	29.87	30.00
2437MHz	Pass	5.30	21.77	21.90	21.88	21.23	27.72	30.00
2452MHz	Pass	5.30	21.13	19.61	19.41	20.27	26.18	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.30	23.61	23.28	24.44	24.15	29.91	30.00
2437MHz	Pass	5.30	24.62	23.43	23.30	24.33	29.98	30.00
2462MHz	Pass	5.30	21.68	20.91	21.48	21.73	27.48	30.00
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.30	24.03	23.76	23.86	23.99	29.93	30.00
2437MHz	Pass	5.30	22.66	22.72	22.26	22.48	28.55	30.00
2452MHz	Pass	5.30	21.02	20.54	20.52	19.70	26.49	30.00

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



Average Power Result

Appendix C

2 Stream 4 TX for TxBF mode:

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
VHT20-BF_Nss1,(MCS0)_4TX	29.84	0.96383
VHT40-BF_Nss1,(MCS0)_4TX	29.86	0.96828
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	29.94	0.98628
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	29.98	0.99541

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.60	23.88	23.81	23.94	23.49	29.80	30.00
2437MHz	Pass	2.60	23.66	23.44	23.88	24.25	29.84	30.00
2462MHz	Pass	2.60	22.72	22.45	22.53	22.43	28.55	30.00
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.60	24.03	23.85	23.59	23.86	29.86	30.00
2437MHz	Pass	2.60	22.90	22.17	22.28	22.38	28.46	30.00
2452MHz	Pass	2.60	20.37	20.97	20.03	19.40	26.25	30.00
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.60	23.76	23.92	24.32	23.58	29.92	30.00
2437MHz	Pass	2.60	24.43	23.24	24.25	23.66	29.94	30.00
2462MHz	Pass	2.60	22.74	22.40	22.79	22.67	28.67	30.00
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.60	24.29	23.53	24.12	23.84	29.98	30.00
2437MHz	Pass	2.60	22.68	22.80	21.83	22.53	28.50	30.00
2452MHz	Pass	2.60	20.81	20.59	20.72	20.70	26.73	30.00

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



For non-beamforming mode:

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_4TX	5.58
VHT20_Nss4,(MCS0)_4TX	1.85
VHT40_Nss4,(MCS0)_4TX	-1.08
802.11ax HEW20_Nss4,(MCS0)_4TX	3.11
802.11ax HEW40_Nss4,(MCS0)_4TX	-0.88

RBW=3 kHz.

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.3	2.53	-0.11	1.36	1.22	5.55	8.00
2437MHz	Pass	5.3	1.41	1.50	1.04	0.96	5.58	8.00
2462MHz	Pass	5.3	0.49	-0.21	0.12	0.86	4.82	8.00
VHT20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	-0.30	-3.10	-4.17	-3.53	-2.95	1.57	8.00
2437MHz	Pass	-0.30	-2.97	-3.24	-3.20	-3.33	1.85	8.00
2462MHz	Pass	-0.30	-3.95	-4.59	-4.20	-4.42	1.54	8.00
VHT40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	-0.30	-5.45	-6.27	-7.52	-7.03	-1.08	8.00
2437MHz	Pass	-0.30	-6.73	-5.79	-6.23	-7.27	-1.96	8.00
2452MHz	Pass	-0.30	-6.25	-6.65	-6.71	-8.67	-1.55	8.00
802.11ax HEW20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	-0.30	-3.01	-3.05	-3.91	-4.14	1.84	8.00
2437MHz	Pass	-0.30	-2.03	-3.55	-2.66	-2.74	3.05	8.00
2462MHz	Pass	-0.30	-3.11	-3.00	-2.75	-2.80	3.11	8.00
802.11ax HEW40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	-0.30	-6.88	-6.38	-6.92	-7.51	-0.88	8.00
2437MHz	Pass	-0.30	-6.52	-6.95	-8.42	-7.74	-1.34	8.00
2452MHz	Pass	-0.30	-7.44	-8.80	-7.70	-8.93	-2.15	8.00

DG = Directional Gain; RBW=3 kHz;

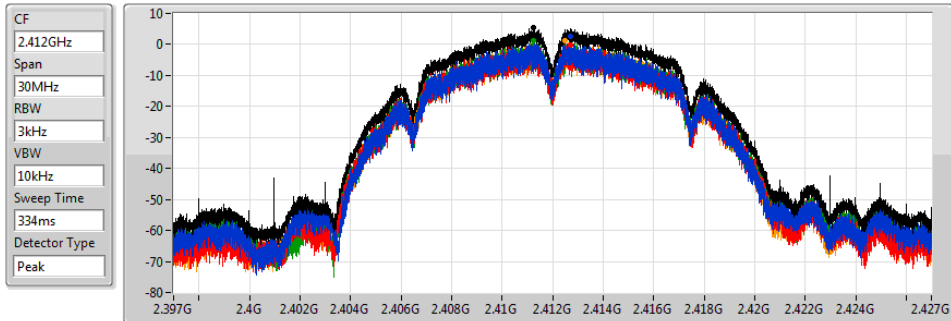
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.11b_Nss1,(1Mbps)_4TX

2412MHz

PSD

19/07/2019



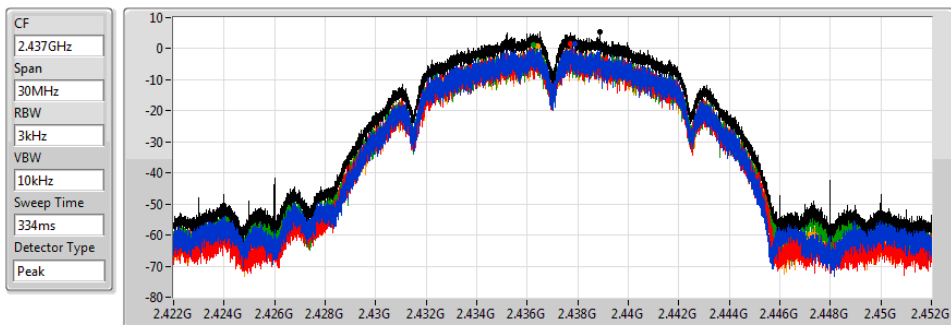
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.55	5.55	2.53	-0.11	1.36	1.22

802.11b_Nss1,(1Mbps)_4TX

2437MHz

PSD

19/07/2019



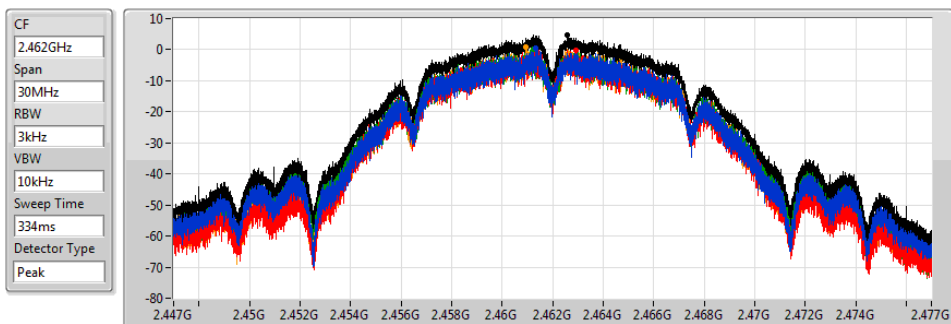
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.58	5.58	1.41	1.50	1.04	0.96

802.11b_Nss1,(1Mbps)_4TX

2462MHz

PSD

19/07/2019



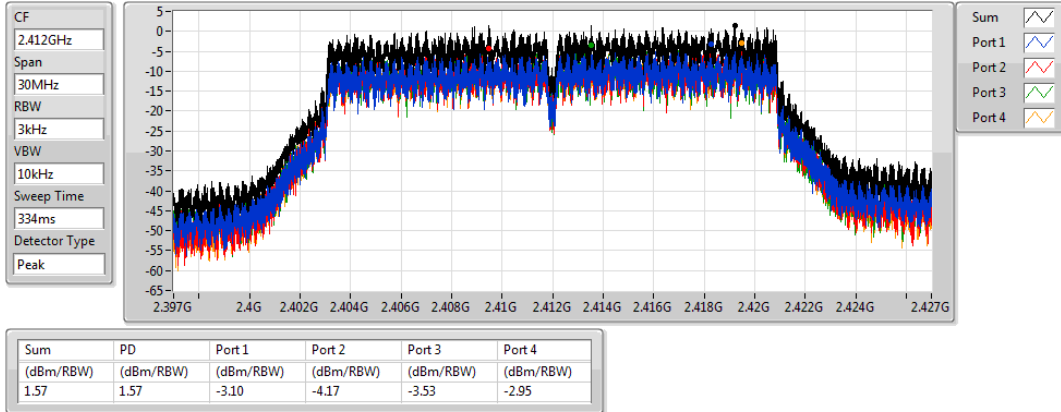
Sum	PD	Port 1	Port 2	Port 3	Port 4
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.82	4.82	0.49	-0.21	0.12	0.86

VHT20_Nss4,(MCS0)_4TX

PSD

2412MHz

19/07/2019

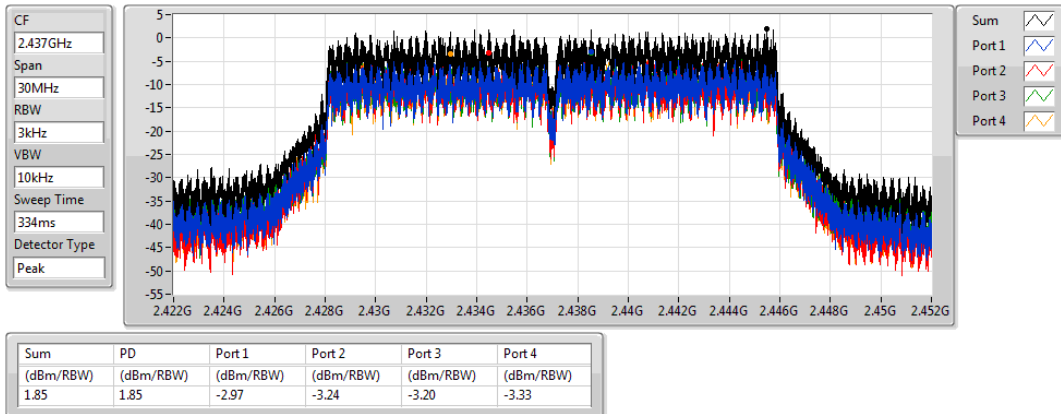


VHT20_Nss4,(MCS0)_4TX

PSD

2437MHz

19/07/2019

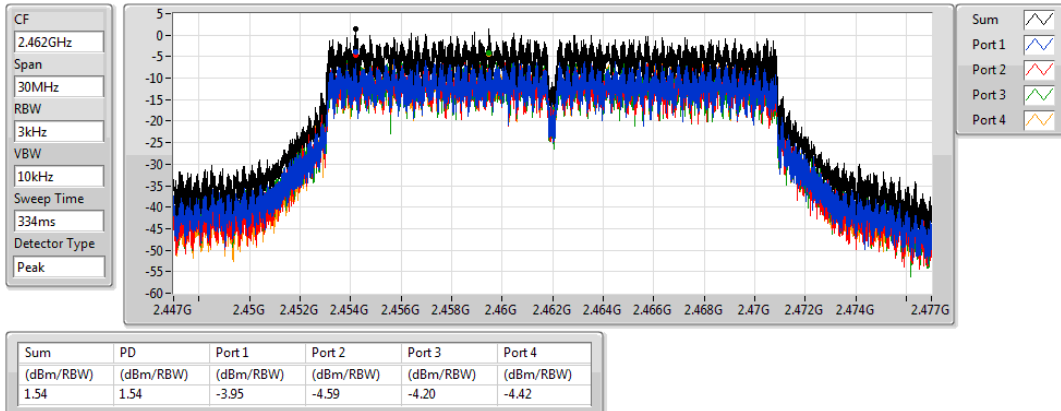


VHT20_Nss4,(MCS0)_4TX

PSD

2462MHz

19/07/2019

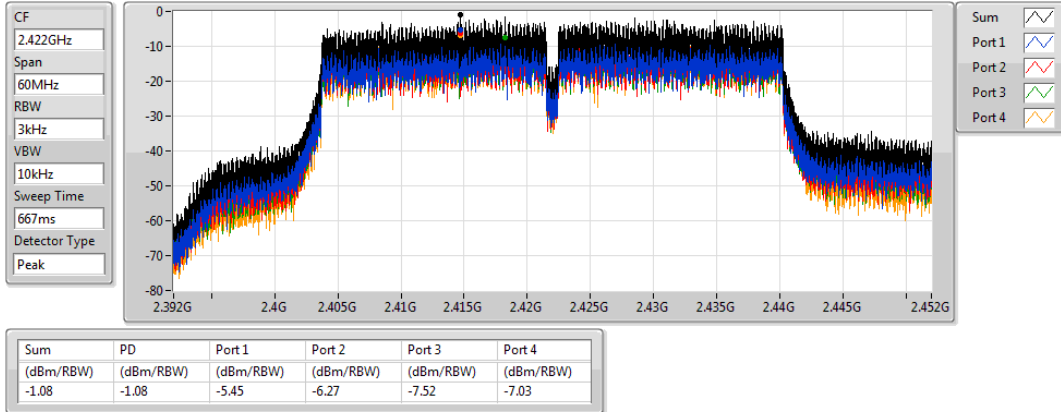


VHT40_Nss4,(MCS0)_4TX

PSD

2422MHz

19/07/2019

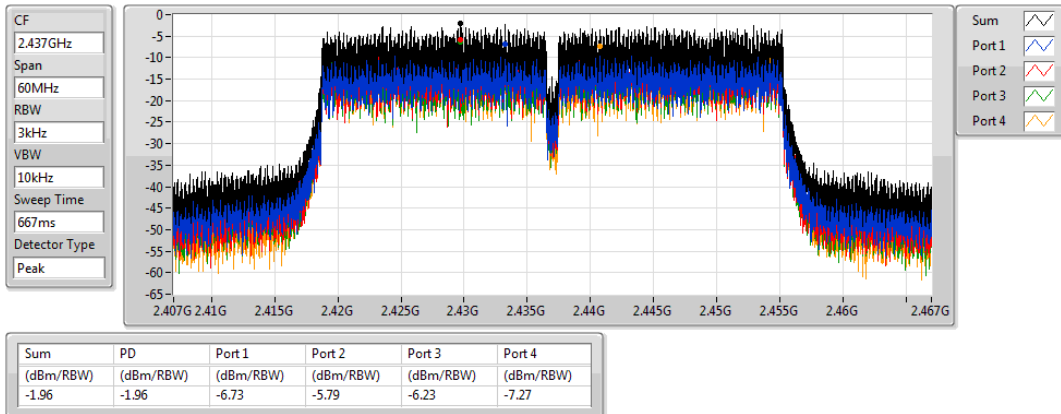


VHT40_Nss4,(MCS0)_4TX

PSD

2437MHz

19/07/2019

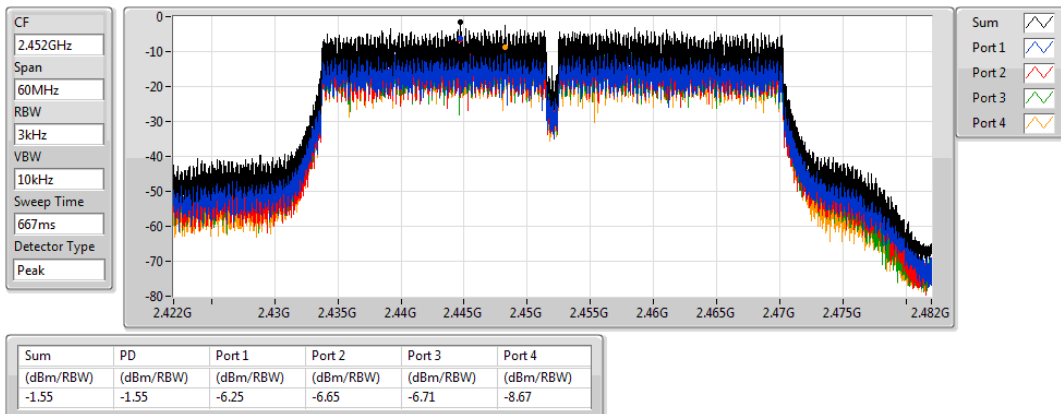


VHT40_Nss4,(MCS0)_4TX

PSD

2452MHz

19/07/2019

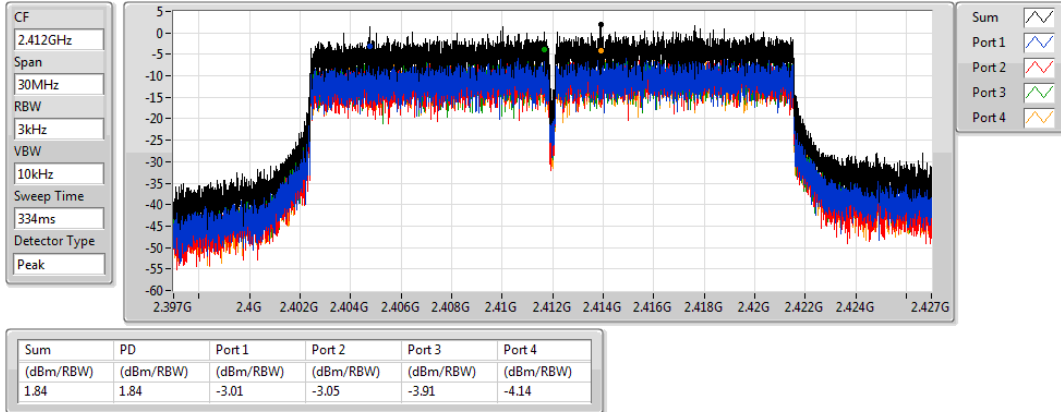


802.11ax HEW20_Nss4,(MCS0)_4TX

PSD

2412MHz

19/07/2019

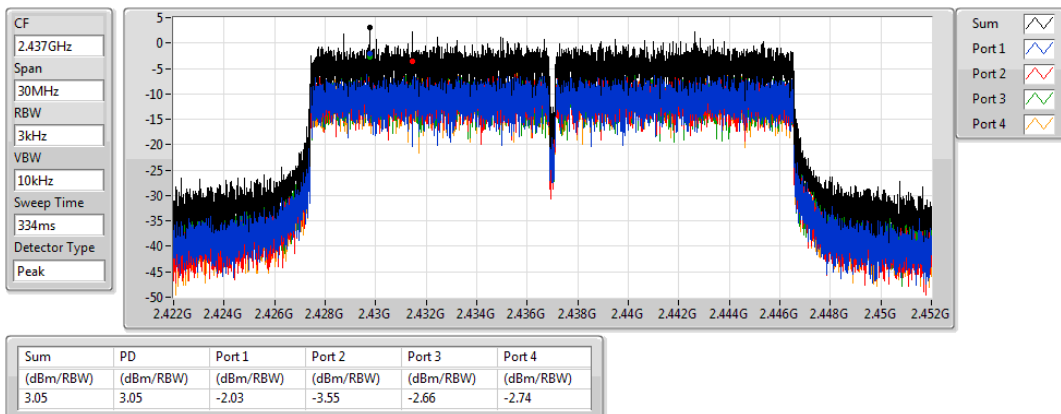


802.11ax HEW20_Nss4,(MCS0)_4TX

PSD

2437MHz

19/07/2019

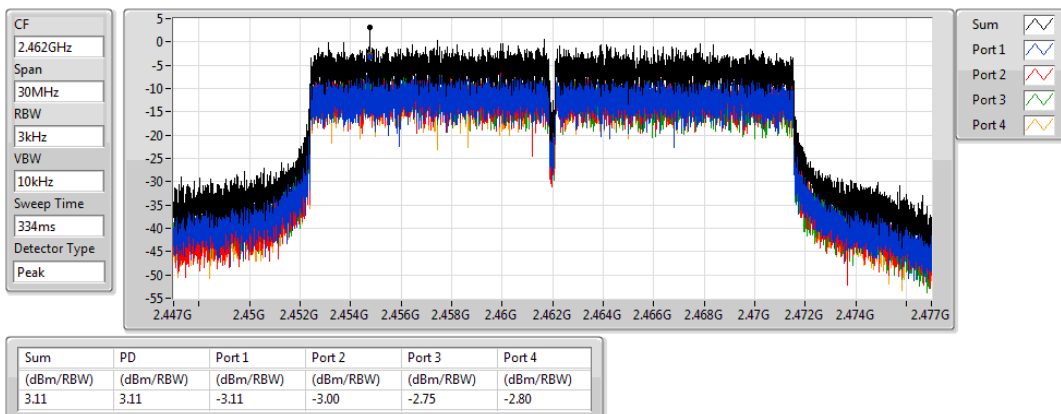


802.11ax HEW20_Nss4,(MCS0)_4TX

PSD

2462MHz

19/07/2019

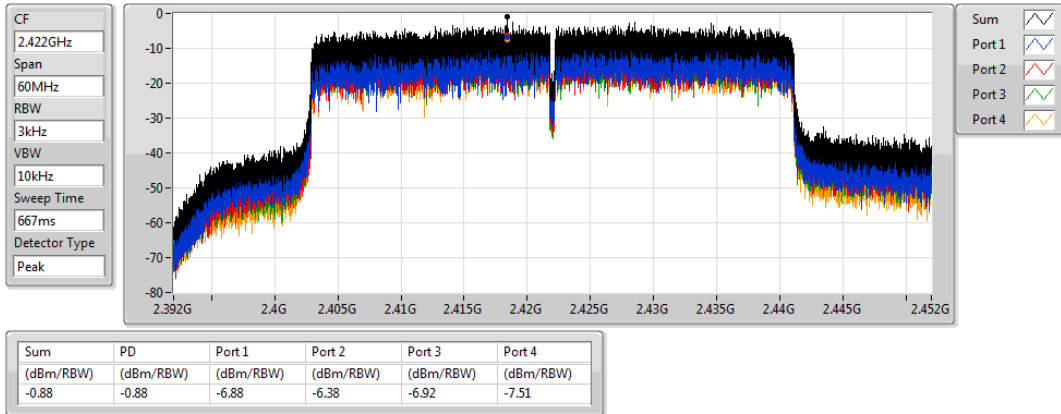


802.11ax HEW40_Nss4,(MCS0)_4TX

PSD

2422MHz

19/07/2019

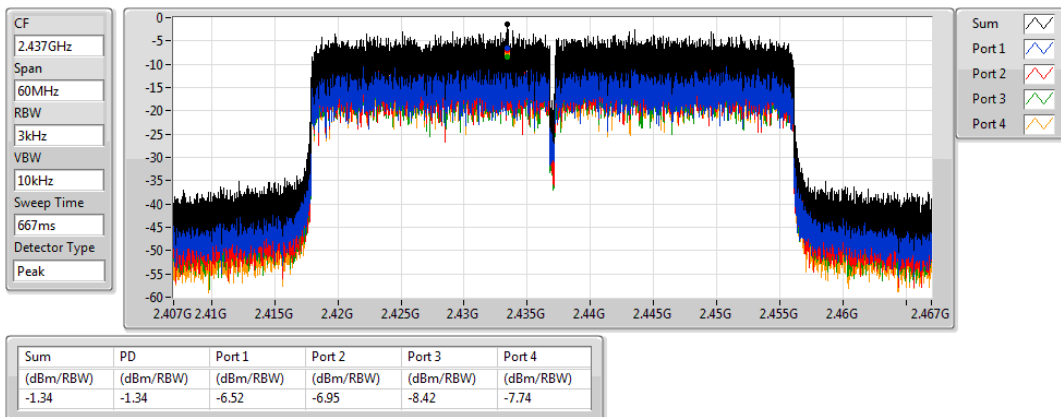


802.11ax HEW40_Nss4,(MCS0)_4TX

PSD

2437MHz

19/07/2019

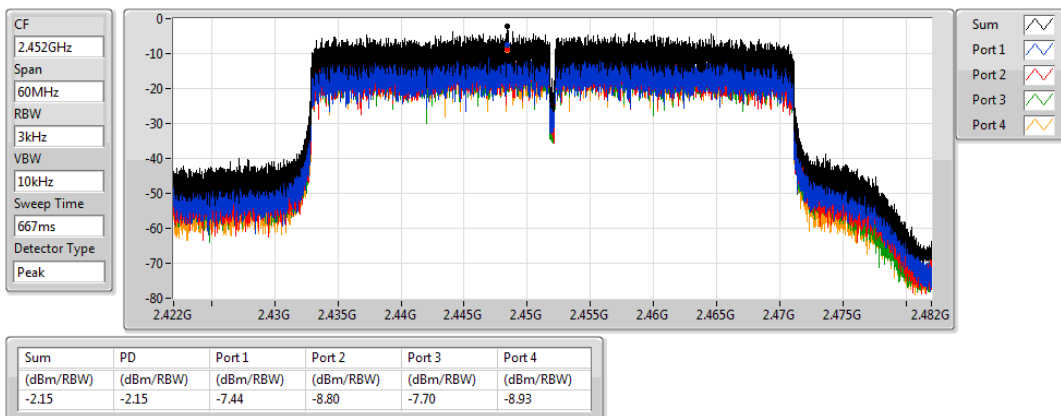


802.11ax HEW40_Nss4,(MCS0)_4TX

PSD

2452MHz

19/07/2019





For beamforming mode:

1 Stream 4 TX for TxBF mode:

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
VHT20-BF_Nss1,(MCS0)_4TX	2.53
VHT40-BF_Nss1,(MCS0)_4TX	1.85
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	2.97
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	0.93

RBW=3 kHz.

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.30	0.64	-3.87	-1.38	-1.64	2.53	8.00
2437MHz	Pass	5.30	-2.42	-3.64	-3.89	-2.30	1.74	8.00
2462MHz	Pass	5.30	-0.19	-3.38	-2.46	-4.25	1.47	8.00
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.30	1.41	-4.11	-5.22	-4.66	1.85	8.00
2437MHz	Pass	5.30	-0.38	-5.28	-4.40	-4.01	0.67	8.00
2452MHz	Pass	5.30	-3.71	-7.41	-7.24	-7.41	-1.61	8.00
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	5.30	0.80	-2.45	-2.23	-1.69	2.97	8.00
2437MHz	Pass	5.30	0.10	-2.88	-3.12	-3.15	2.69	8.00
2462MHz	Pass	5.30	0.68	-4.75	-3.52	-3.72	1.25	8.00
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	5.30	-0.49	-3.82	-5.27	-4.90	0.93	8.00
2437MHz	Pass	5.30	-0.71	-3.57	-5.99	-5.48	-0.04	8.00
2452MHz	Pass	5.30	-1.30	-8.00	-7.54	-7.78	-0.86	8.00

DG = Directional Gain; RBW=3 kHz;

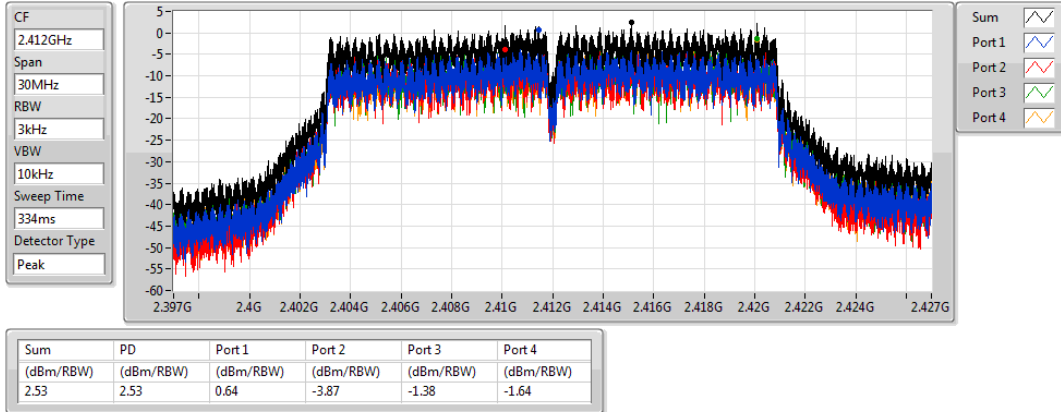
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

VHT20-BF_Nss1,(MCS0)_4TX

PSD

2412MHz

23/07/2019

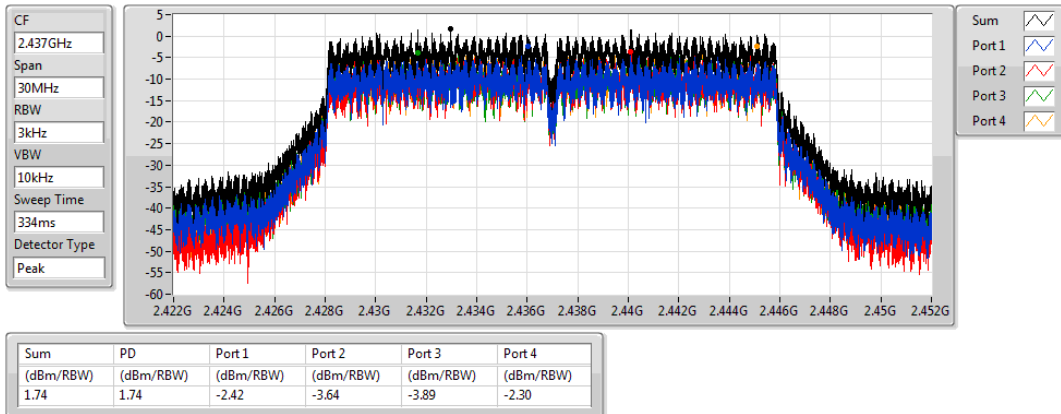


VHT20-BF_Nss1,(MCS0)_4TX

PSD

2437MHz

23/07/2019

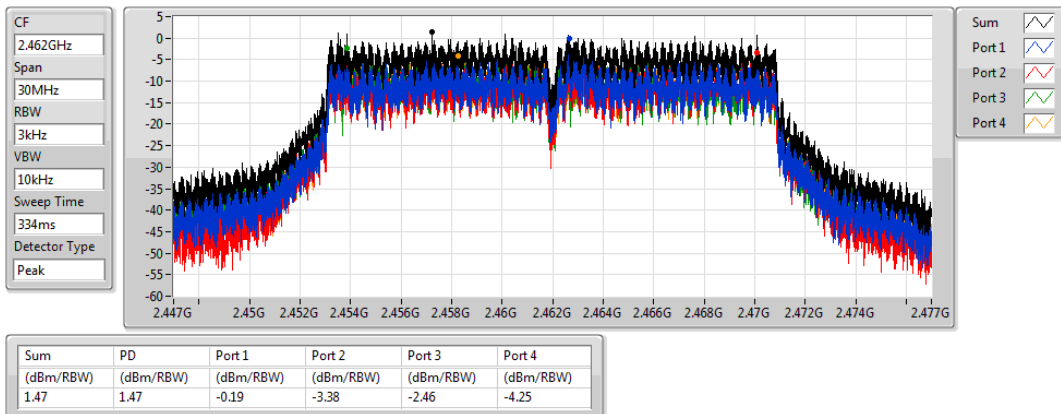


VHT20-BF_Nss1,(MCS0)_4TX

PSD

2462MHz

23/07/2019

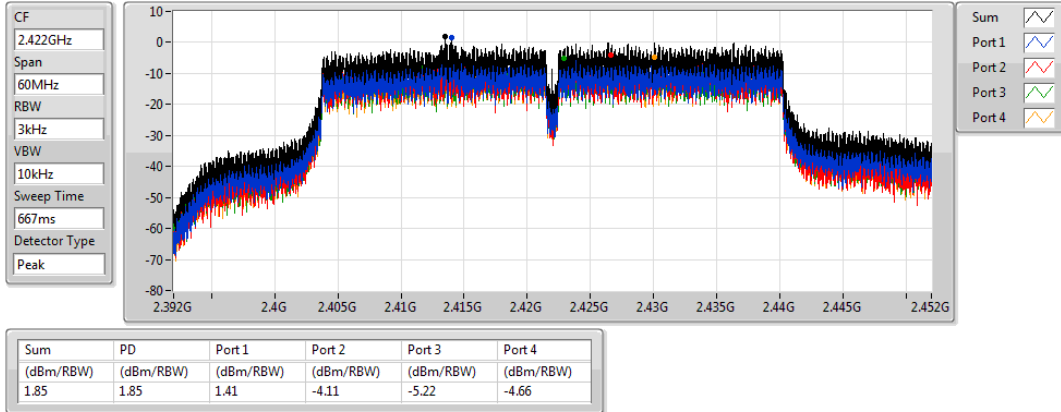


VHT40-BF_Nss1,(MCS0)_4TX

PSD

2422MHz

23/07/2019

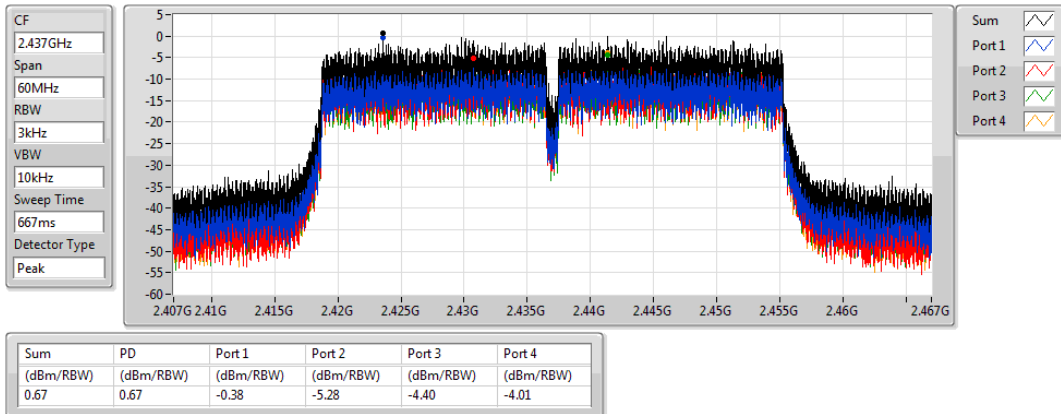


VHT40-BF_Nss1,(MCS0)_4TX

PSD

2437MHz

23/07/2019

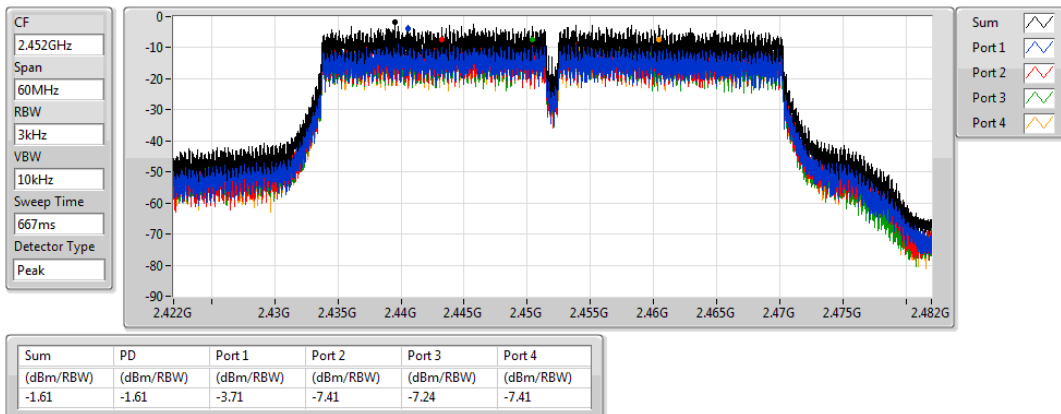


VHT40-BF_Nss1,(MCS0)_4TX

PSD

2452MHz

23/07/2019

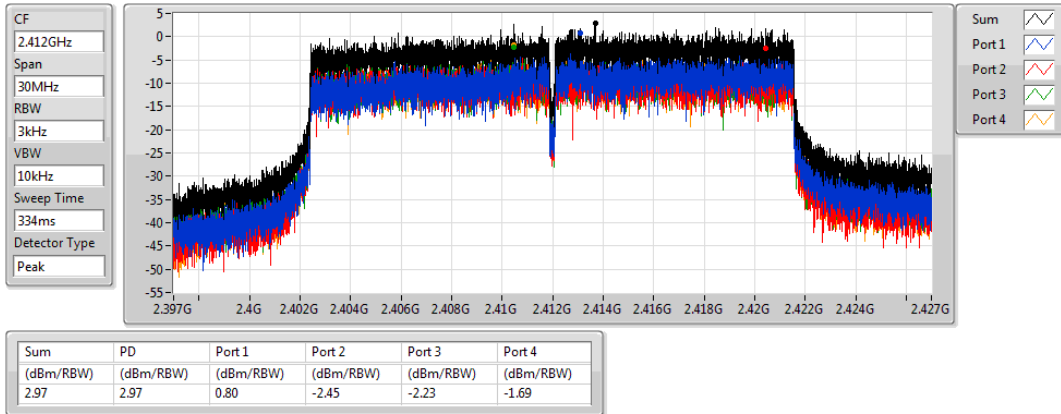


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

2412MHz

25/07/2019

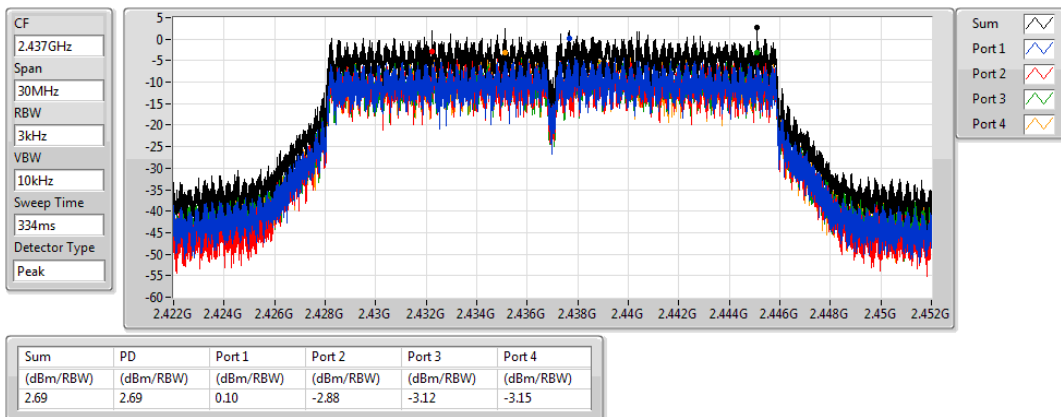


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

2437MHz

23/07/2019

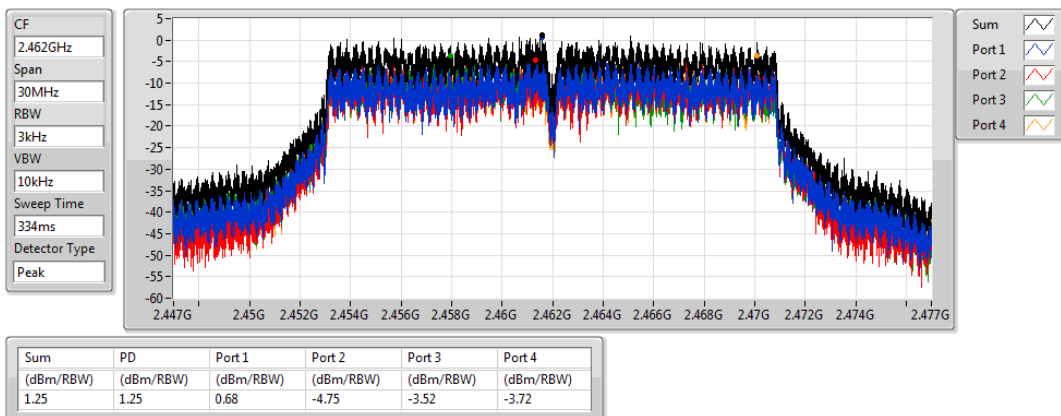


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

2462MHz

23/07/2019

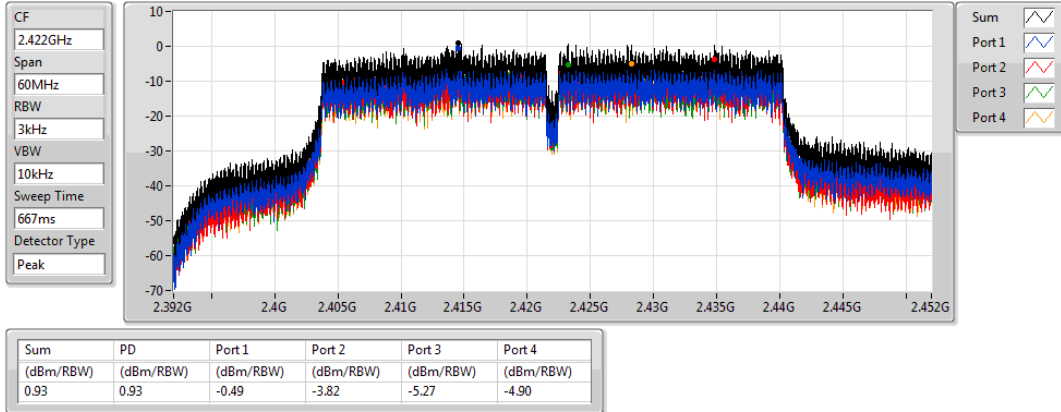


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

2422MHz

23/07/2019

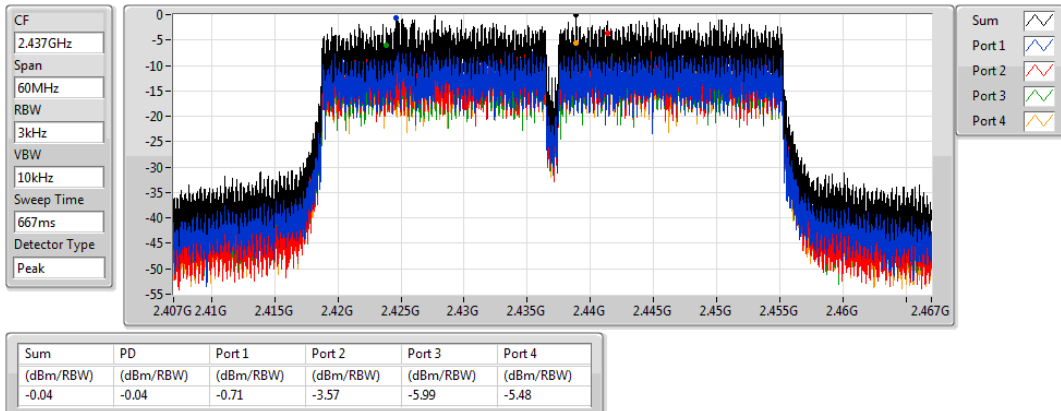


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

2437MHz

23/07/2019

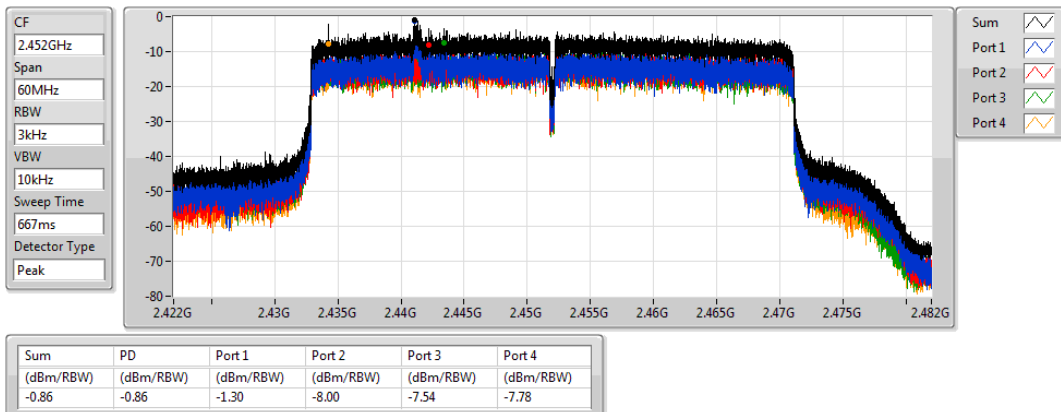


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

2452MHz

23/07/2019





2 Stream 4 TX for TxBF mode:

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
VHT20-BF_Nss1,(MCS0)_4TX	2.93
VHT40-BF_Nss1,(MCS0)_4TX	0.38
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	2.79
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	0.63

RBW=3 kHz.

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	Port 3 (dBm/RBW)	Port 4 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.60	-0.88	-2.07	-3.71	-1.34	2.93	8.00
2437MHz	Pass	2.60	0.06	-2.18	-2.53	-2.74	2.38	8.00
2462MHz	Pass	2.60	1.05	-1.97	-3.57	-2.55	2.19	8.00
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.60	-0.45	-3.24	-5.80	-3.84	0.38	8.00
2437MHz	Pass	2.60	-2.37	-4.23	-6.01	-4.75	-0.83	8.00
2452MHz	Pass	2.60	-4.45	-6.05	-7.14	-7.20	-2.04	8.00
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.60	0.15	-2.67	-2.69	-2.60	1.40	8.00
2437MHz	Pass	2.60	1.98	-3.65	-2.84	-4.07	2.79	8.00
2462MHz	Pass	2.60	-1.05	-1.81	-4.10	-3.86	0.82	8.00
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.60	-0.23	-4.31	-5.42	-5.21	0.38	8.00
2437MHz	Pass	2.60	-0.76	-3.69	-6.32	-4.70	0.63	8.00
2452MHz	Pass	2.60	-1.74	-5.68	-8.74	-6.17	-1.29	8.00

DG = Directional Gain; RBW=3 kHz;

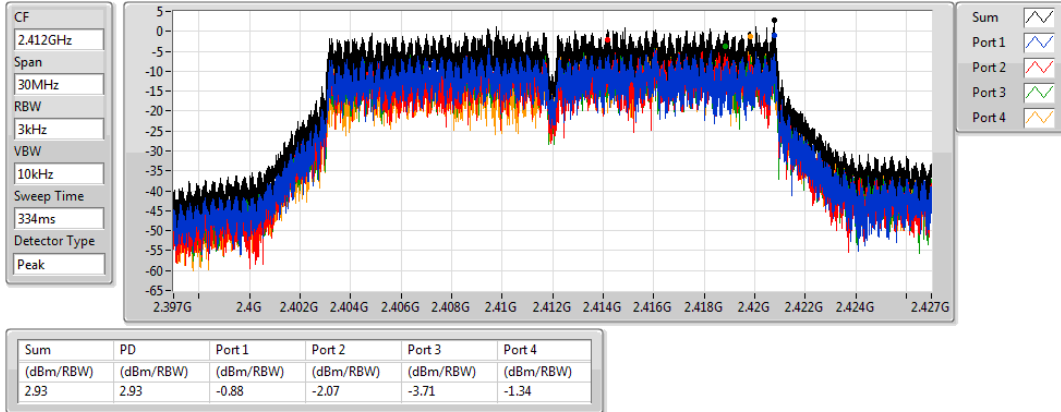
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

VHT20-BF_Nss2,(MCS0)_4TX

PSD

2412MHz

23/07/2019

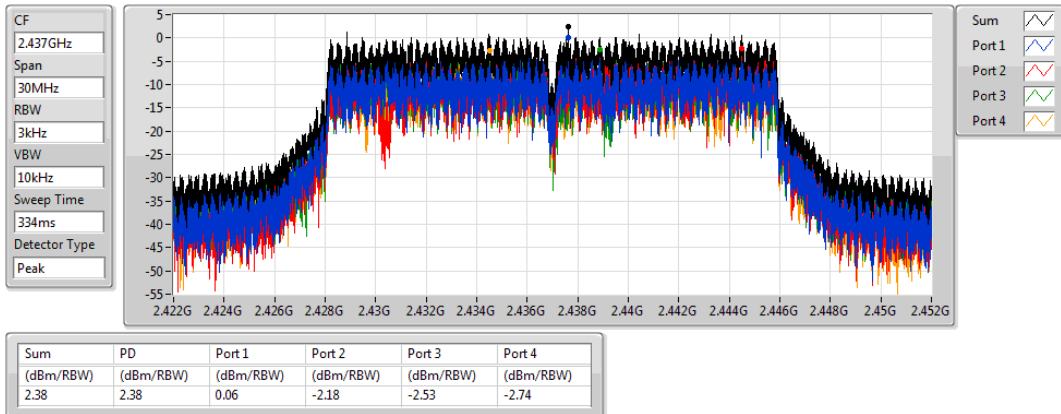


VHT20-BF_Nss1,(MCS0)_4TX

PSD

2437MHz

25/07/2019

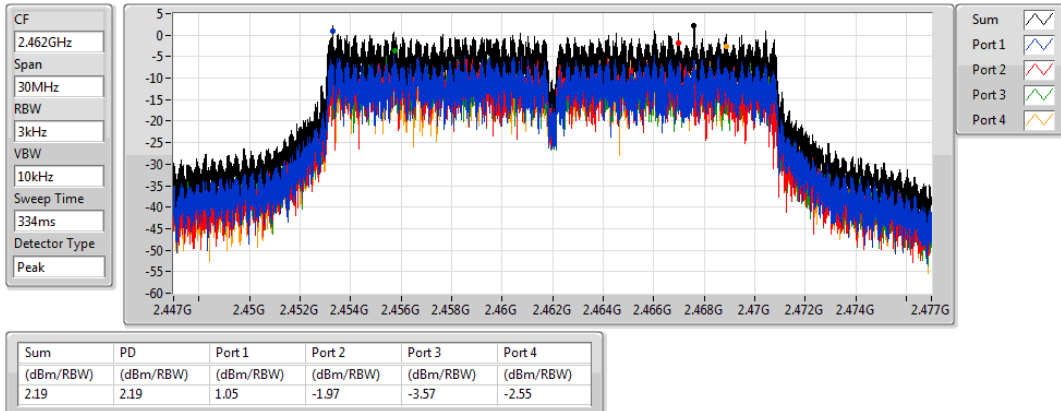


VHT20-BF_Nss2,(MCS0)_4TX

PSD

2462MHz

23/07/2019

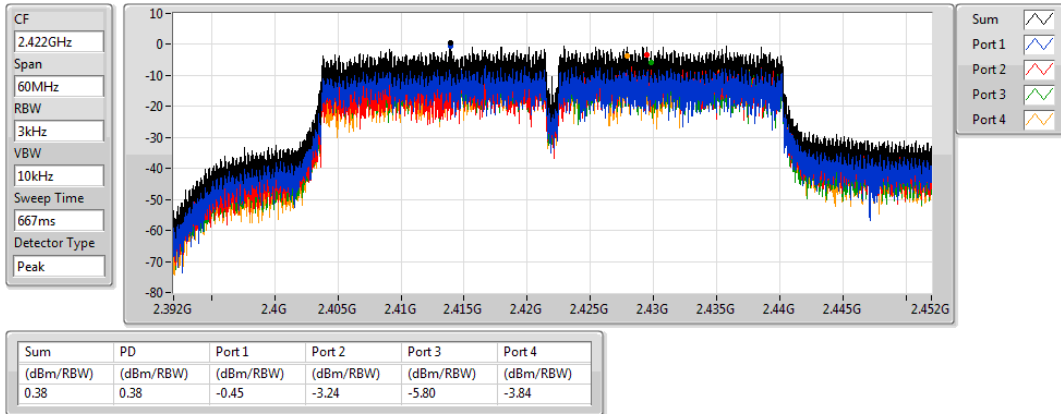


VHT40-BF_Nss2,(MCS0)_4TX

PSD

2422MHz

23/07/2019

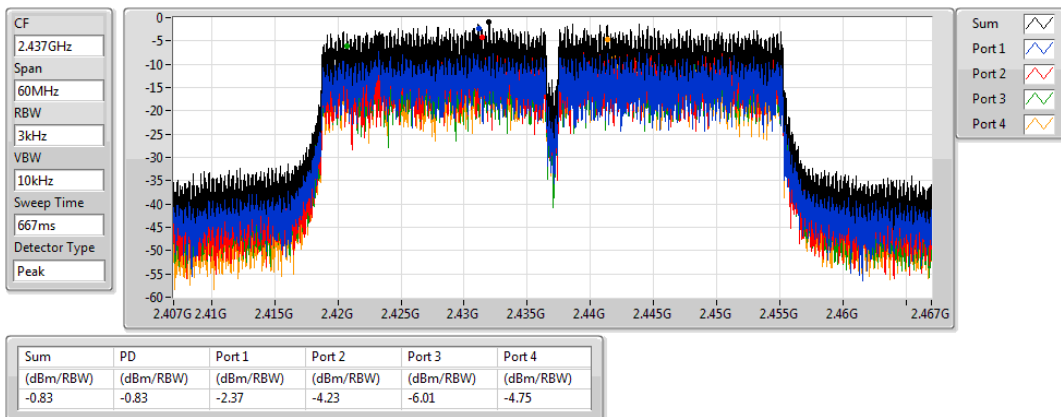


VHT40-BF_Nss2,(MCS0)_4TX

PSD

2437MHz

23/07/2019

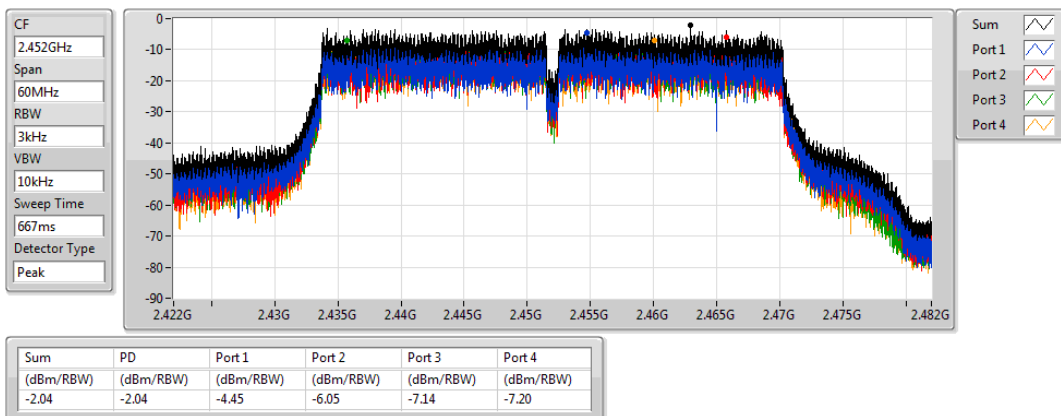


VHT40-BF_Nss2,(MCS0)_4TX

PSD

2452MHz

23/07/2019

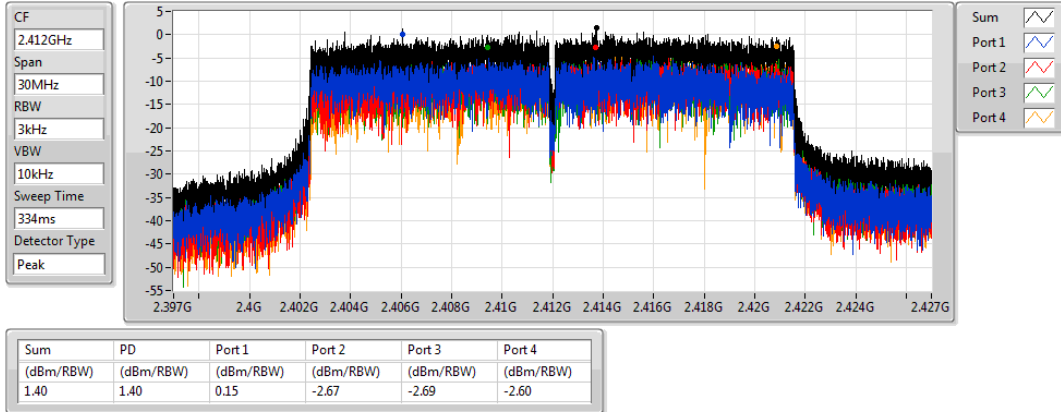


802.11ax HEW20-BF_Nss2,(MCS0)_4TX

PSD

2412MHz

25/07/2019

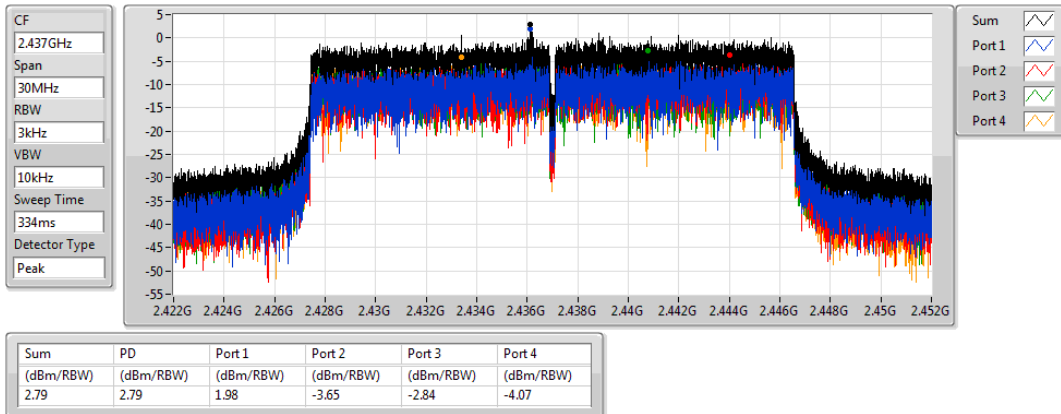


802.11ax HEW20-BF_Nss2,(MCS0)_4TX

PSD

2437MHz

25/07/2019

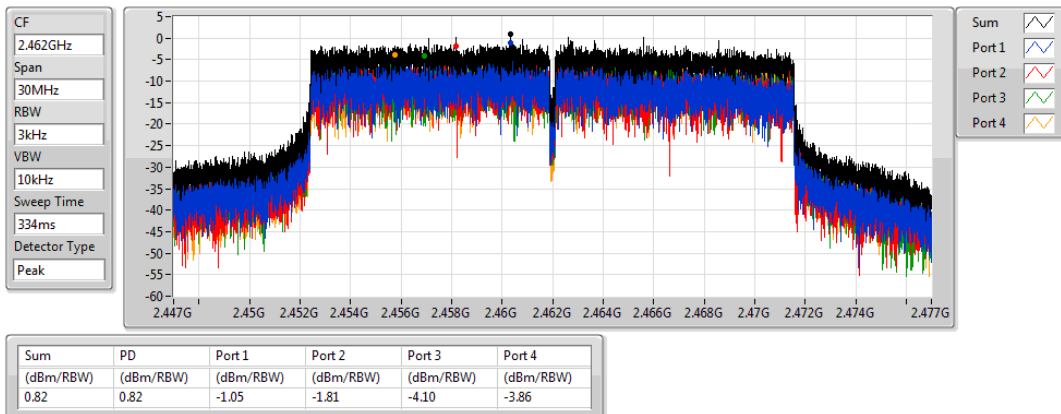


802.11ax HEW20-BF_Nss2,(MCS0)_4TX

PSD

2462MHz

25/07/2019

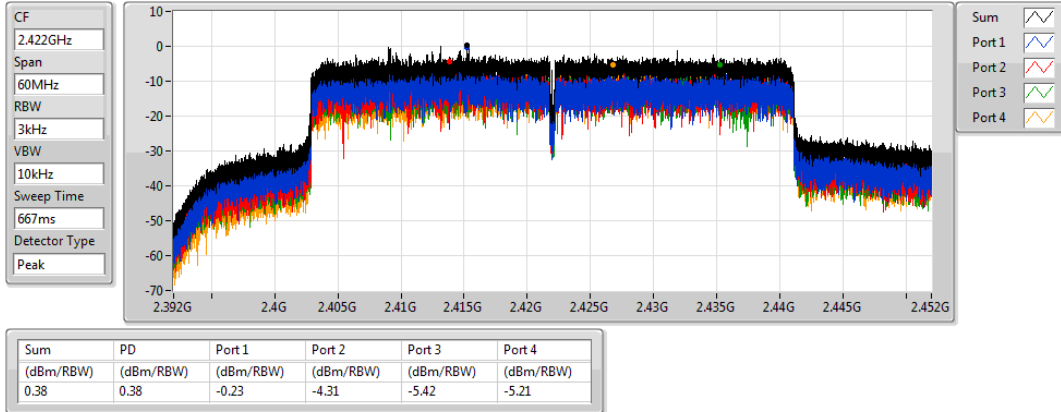


802.11ax HEW40-BF_Nss2,(MCS0)_4TX

PSD

2422MHz

25/07/2019

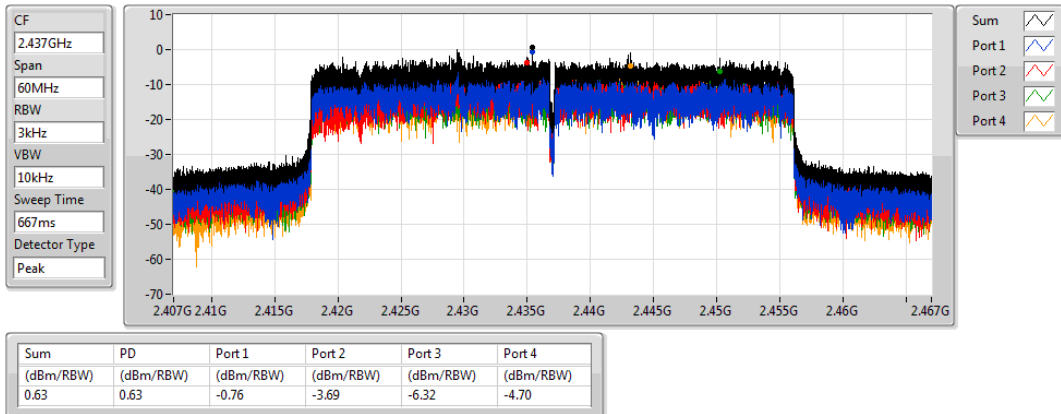


802.11ax HEW40-BF_Nss2,(MCS0)_4TX

PSD

2437MHz

23/07/2019

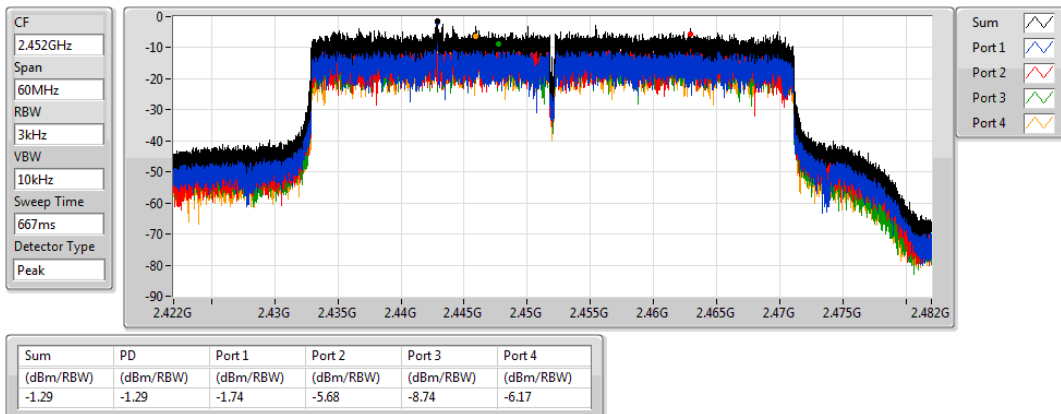


802.11ax HEW40-BF_Nss2,(MCS0)_4TX

PSD

2452MHz

23/07/2019



**For non-beamforming mode:**

4 Stream 4 TX for SDM mode & 1 Stream 4 TX for CDD mode:

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)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_4TX	Pass	2.41148G	15.96	-14.04	859.19M	-53.79	2.399G	-37.28	2.49834G	-52.53	7.23514G	-42.62	3
VHT20_Nss4,(MCS0)_4TX	Pass	2.442G	11.67	-18.33	234.75M	-53.69	2.39986G	-22.20	2.48524G	-52.01	24.96348G	-45.52	1
VHT40_Nss4,(MCS0)_4TX	Pass	2.44196G	7.39	-22.61	779.12M	-53.13	2.39636G	-25.49	2.50894G	-53.20	15.03258G	-44.88	1
802.11ax HEW20_Nss4,(MCS0)_4TX	Pass	2.4395G	11.49	-18.51	642.79M	-54.55	2.39972G	-19.20	2.50238G	-52.00	16.25102G	-45.62	3
802.11ax HEW40_Nss4,(MCS0)_4TX	Pass	2.442G	7.50	-22.50	1.63271G	-53.72	2.39976G	-24.03	2.54846G	-52.68	16.2694G	-45.94	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)	Port
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.41148G	15.96	-14.04	843.46M	-53.80	2.399G	-39.50	2.50518G	-52.88	7.23795G	-44.58	1
2412MHz	Pass	2.41148G	15.96	-14.04	819.29M	-52.83	2.399G	-42.95	2.52338G	-52.28	7.23514G	-44.95	2
2412MHz	Pass	2.41148G	15.96	-14.04	859.19M	-53.79	2.399G	-37.28	2.49834G	-52.53	7.23514G	-42.62	3
2412MHz	Pass	2.41148G	15.96	-14.04	1.6278G	-53.76	2.39898G	-42.96	2.51612G	-52.83	7.23514G	-44.15	4
2437MHz	Pass	2.41148G	15.96	-14.04	382.41M	-53.71	2.3974G	-50.82	2.51584G	-52.42	17.34956G	-45.93	1
2437MHz	Pass	2.41148G	15.96	-14.04	913.94M	-52.96	2.39876G	-50.70	2.49816G	-52.61	15.03729G	-45.59	2
2437MHz	Pass	2.41148G	15.96	-14.04	232.42M	-53.09	2.39898G	-49.27	2.52314G	-52.58	15.05696G	-45.75	3
2437MHz	Pass	2.41148G	15.96	-14.04	442.12M	-53.66	2.39868G	-50.42	2.51202G	-53.06	15.01201G	-45.37	4
2462MHz	Pass	2.41148G	15.96	-14.04	2.1005G	-54.17	2.39988G	-51.99	2.48922G	-52.76	24.81457G	-44.33	1
2462MHz	Pass	2.41148G	15.96	-14.04	733.37M	-53.52	2.39774G	-51.42	2.5138G	-52.70	23.43788G	-45.43	2
2462MHz	Pass	2.41148G	15.96	-14.04	1.82614G	-53.40	2.3998G	-50.73	2.48714G	-52.98	17.68671G	-45.51	3
2462MHz	Pass	2.41148G	15.96	-14.04	551.63M	-53.93	2.39884G	-50.74	2.5208G	-53.09	17.6839G	-45.26	4
VHT20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	11.67	-18.33	234.75M	-53.69	2.39986G	-22.20	2.48524G	-52.01	24.96348G	-45.52	1
2412MHz	Pass	2.442G	11.67	-18.33	1.99477G	-53.65	2.39978G	-24.46	2.52214G	-52.83	24.86795G	-44.87	2
2412MHz	Pass	2.442G	11.67	-18.33	2.08244G	-53.06	2.39972G	-24.41	2.51818G	-52.84	15.09067G	-45.40	3
2412MHz	Pass	2.442G	11.67	-18.33	2.11535G	-53.72	2.39978G	-25.49	2.50472G	-52.08	24.45494G	-45.76	4
2437MHz	Pass	2.442G	11.67	-18.33	1.99244G	-53.15	2.39948G	-41.33	2.511G	-52.41	16.6865G	-45.57	1
2437MHz	Pass	2.442G	11.67	-18.33	1.97206G	-53.35	2.39952G	-42.83	2.50602G	-52.90	16.90565G	-44.73	2
2437MHz	Pass	2.442G	11.67	-18.33	759.87M	-53.65	2.3979G	-41.02	2.51014G	-53.23	24.51676G	-45.20	3
2437MHz	Pass	2.442G	11.67	-18.33	1.79847G	-53.29	2.39946G	-41.13	2.4958G	-52.56	17.68671G	-44.95	4
2462MHz	Pass	2.442G	11.67	-18.33	1.65954G	-53.61	2.39976G	-51.70	2.48358G	-47.94	15.05696G	-45.28	1
2462MHz	Pass	2.442G	11.67	-18.33	918.31M	-53.29	2.3995G	-50.71	2.4839G	-48.53	23.49126G	-44.74	2
2462MHz	Pass	2.442G	11.67	-18.33	380.37M	-53.81	2.39964G	-50.21	2.48382G	-47.28	24.87919G	-45.69	3
2462MHz	Pass	2.442G	11.67	-18.33	823.07M	-54.06	2.3973G	-52.12	2.4838G	-48.34	14.99515G	-45.67	4
VHT40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.44196G	7.39	-22.61	779.12M	-53.13	2.39636G	-25.49	2.50894G	-53.20	15.03258G	-44.88	1
2422MHz	Pass	2.44196G	7.39	-22.61	2.12907G	-53.75	2.39636G	-27.58	2.52914G	-52.85	24.82051G	-44.00	2
2422MHz	Pass	2.44196G	7.39	-22.61	1.97278G	-53.55	2.39912G	-29.62	2.49382G	-53.08	15.0438G	-45.44	3
2422MHz	Pass	2.44196G	7.39	-22.61	2.08699G	-53.85	2.39968G	-29.65	2.52606G	-52.96	17.69411G	-45.36	4
2437MHz	Pass	2.44196G	7.39	-22.61	814.9M	-53.32	2.39944G	-26.93	2.4857G	-52.72	24.42506G	-45.81	1
2437MHz	Pass	2.44196G	7.39	-22.61	2.15483G	-53.13	2.39952G	-27.90	2.52118G	-52.79	15.32987G	-45.73	2
2437MHz	Pass	2.44196G	7.39	-22.61	367.49M	-54.32	2.39944G	-28.75	2.4847G	-52.75	24.85416G	-45.70	3
2437MHz	Pass	2.44196G	7.39	-22.61	895.91M	-52.86	2.39944G	-30.79	2.4853G	-53.45	24.9411G	-45.17	4
2452MHz	Pass	2.44196G	7.39	-22.61	370.07M	-53.13	2.39824G	-41.89	2.48502G	-47.74	16.35353G	-45.73	1
2452MHz	Pass	2.44196G	7.39	-22.61	900.2M	-52.14	2.3992G	-41.61	2.48502G	-47.52	17.69692G	-45.47	2
2452MHz	Pass	2.44196G	7.39	-22.61	1.89778G	-53.75	2.39924G	-43.43	2.48506G	-47.42	24.9411G	-45.16	3
2452MHz	Pass	2.44196G	7.39	-22.61	1.95618G	-52.81	2.39884G	-44.95	2.48502G	-50.45	23.48273G	-45.44	4
802.11ax HEW20_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.4395G	11.49	-18.51	1.84536G	-53.76	2.39968G	-19.48	2.49226G	-52.68	24.80614G	-44.97	1
2412MHz	Pass	2.4395G	11.49	-18.51	749.68M	-52.85	2.3997G	-19.70	2.50826G	-52.80	24.95786G	-45.57	2
2412MHz	Pass	2.4395G	11.49	-18.51	642.79M	-54.55	2.39972G	-19.20	2.50238G	-52.00	16.25102G	-45.62	3
2412MHz	Pass	2.4395G	11.49	-18.51	523.38M	-54.05	2.39944G	-19.98	2.48436G	-52.90	15.04853G	-45.65	4
2437MHz	Pass	2.4395G	11.49	-18.51	2.01982G	-53.55	2.39826G	-40.30	2.49314G	-53.16	15.23115G	-44.00	1
2437MHz	Pass	2.4395G	11.49	-18.51	806.47M	-54.04	2.39954G	-41.52	2.49842G	-52.71	17.68952G	-45.52	2
2437MHz	Pass	2.4395G	11.49	-18.51	688.81M	-53.08	2.39902G	-40.38	2.4934G	-52.55	17.69795G	-45.74	3
2437MHz	Pass	2.4395G	11.49	-18.51	934.33M	-53.71	2.39956G	-40.65	2.51338G	-51.12	24.89324G	-45.78	4

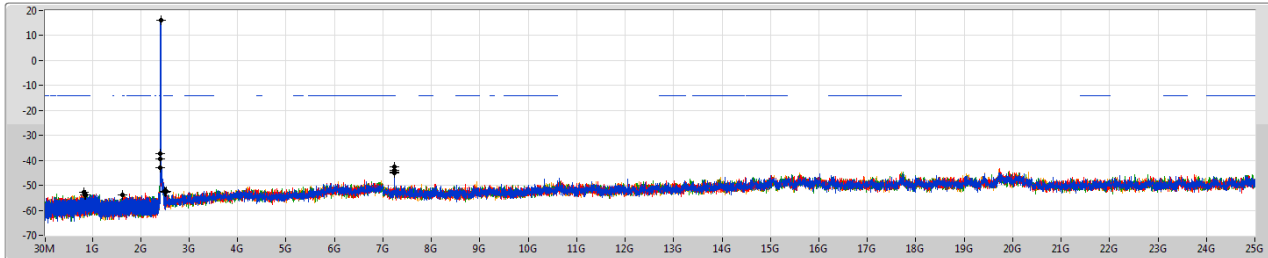
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2462MHz	Pass	2.4395G	11.49	-18.51	2.02594G	-53.69	2.39974G	-51.04	2.48362G	-46.81	15.28453G	-45.22	1
2462MHz	Pass	2.4395G	11.49	-18.51	2.02798G	-53.17	2.39922G	-50.45	2.48574G	-48.25	24.89886G	-45.89	2
2462MHz	Pass	2.4395G	11.49	-18.51	946.27M	-53.23	2.39762G	-50.77	2.4844G	-45.62	24.2948G	-45.58	3
2462MHz	Pass	2.4395G	11.49	-18.51	1.9141G	-54.05	2.39746G	-50.79	2.48428G	-48.42	16.61627G	-45.66	4
802.11ax HEW40_Nss4,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.442G	7.50	-22.50	1.63271G	-53.72	2.39976G	-24.03	2.54846G	-52.68	16.2694G	-45.94	1
2422MHz	Pass	2.442G	7.50	-22.50	943.42M	-53.49	2.39916G	-26.26	2.54506G	-53.61	16.88079G	-46.05	2
2422MHz	Pass	2.442G	7.50	-22.50	945.43M	-53.65	2.39912G	-26.98	2.49814G	-52.38	15.02137G	-45.74	3
2422MHz	Pass	2.442G	7.50	-22.50	2.11877G	-52.89	2.39956G	-30.03	2.5047G	-53.30	15.06344G	-45.62	4
2437MHz	Pass	2.442G	7.50	-22.50	855.26M	-52.93	2.39968G	-28.70	2.48974G	-51.79	24.52322G	-45.91	1
2437MHz	Pass	2.442G	7.50	-22.50	2.1305G	-53.78	2.39848G	-29.21	2.48634G	-52.08	14.99613G	-45.88	2
2437MHz	Pass	2.442G	7.50	-22.50	2.08585G	-53.82	2.39996G	-32.27	2.48794G	-52.84	23.39299G	-45.91	3
2437MHz	Pass	2.442G	7.50	-22.50	922.24M	-53.95	2.39952G	-34.36	2.51878G	-52.93	15.34389G	-45.46	4
2452MHz	Pass	2.442G	7.50	-22.50	956.31M	-53.47	2.39972G	-38.43	2.48418G	-48.57	24.85416G	-45.59	1
2452MHz	Pass	2.442G	7.50	-22.50	912.51M	-53.34	2.3998G	-40.42	2.48622G	-48.97	23.32848G	-44.96	2
2452MHz	Pass	2.442G	7.50	-22.50	837.23M	-52.76	2.39972G	-40.61	2.4857G	-49.68	15.03539G	-45.81	3
2452MHz	Pass	2.442G	7.50	-22.50	2.16314G	-53.56	2.39992G	-44.33	2.48434G	-51.60	16.97895G	-45.51	4

802.11b_Nss1,(1Mbps)_4TX

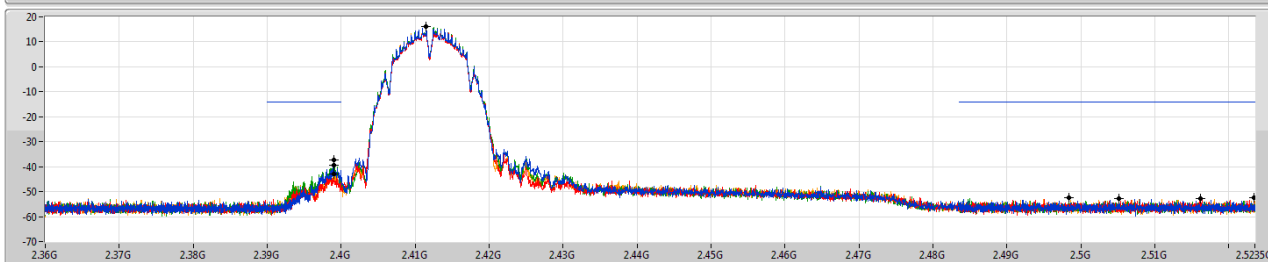
CSE NdB

2412MHz

19/07/2019



Port 1
Port 2
Port 3
Port 4



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

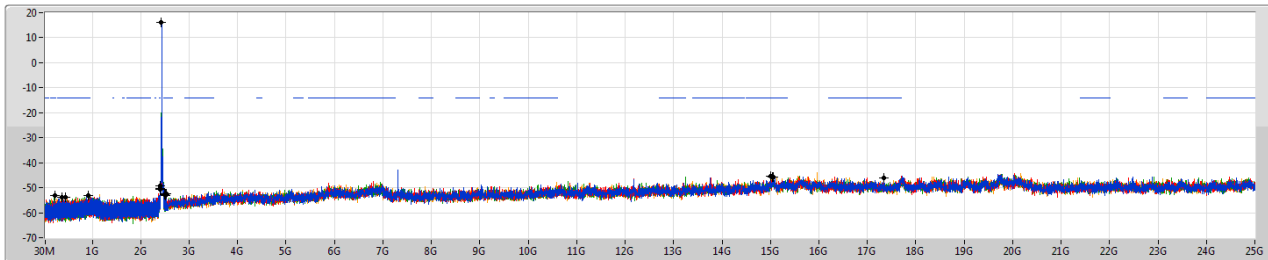
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241148G	15.96	-14.04	843.46M	-53.80	2.399G	-39.50	2.50518G	-52.88	7.23795G	-44.58	1
241148G	15.96	-14.04	819.29M	-52.83	2.399G	-42.95	2.52338G	-52.28	7.23514G	-44.95	2
241148G	15.96	-14.04	859.19M	-53.79	2.399G	-37.28	2.49834G	-52.53	7.23514G	-42.62	3
241148G	15.96	-14.04	1.6278G	-53.76	2.39898G	-42.96	2.51612G	-52.83	7.23514G	-44.15	4

802.11b_Nss1,(1Mbps)_4TX

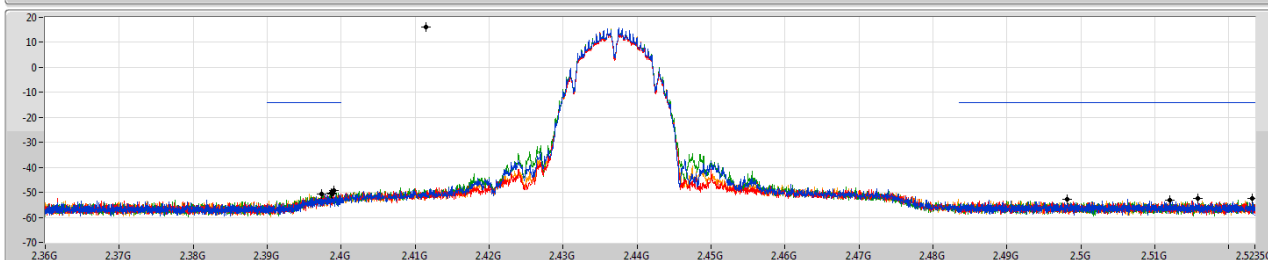
CSE NdB

2437MHz

19/07/2019



Port 1
Port 2
Port 3
Port 4



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

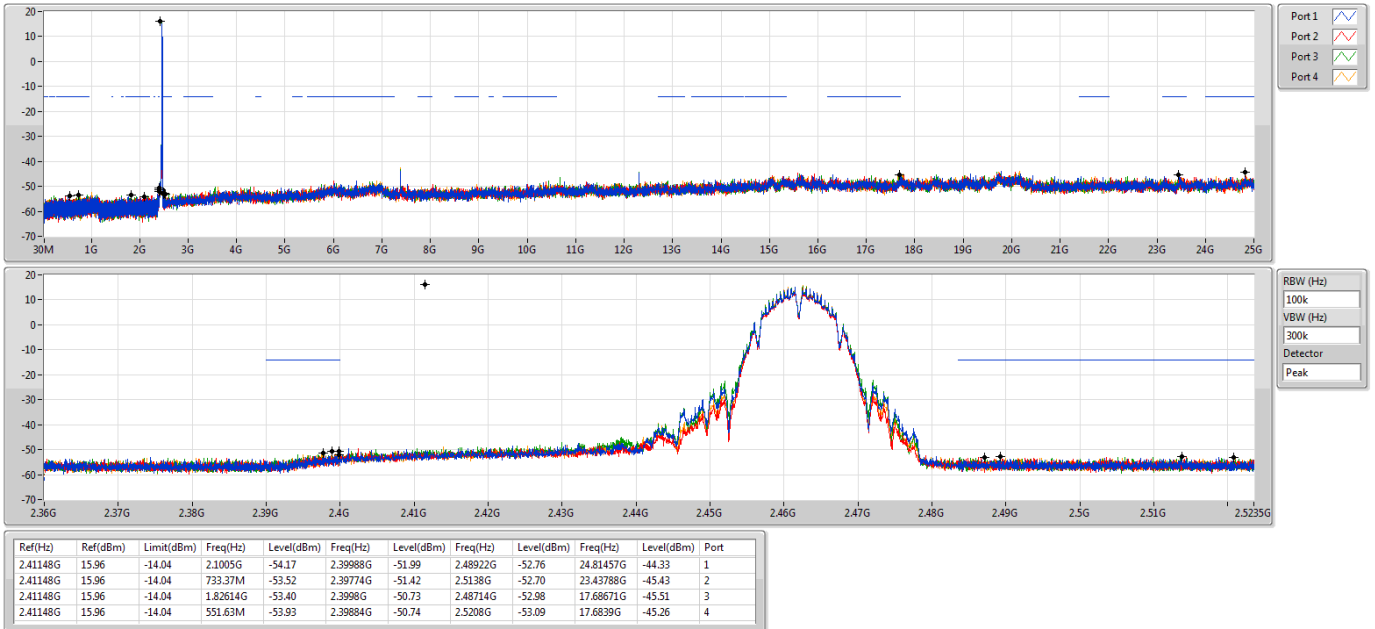
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241148G	15.96	-14.04	382.41M	-53.71	2.3974G	-50.82	2.51584G	-52.42	17.34956G	-45.93	1
241148G	15.96	-14.04	913.94M	-52.96	2.39876G	-50.70	2.49816G	-52.61	15.03729G	-45.59	2
241148G	15.96	-14.04	232.42M	-53.09	2.39898G	-49.27	2.52314G	-52.58	15.05696G	-45.75	3
241148G	15.96	-14.04	442.12M	-53.66	2.39868G	-50.42	2.51202G	-53.06	15.01201G	-45.37	4

802.11b_Nss1,(1Mbps)_4TX

CSE NdB

2462MHz

19/07/2019

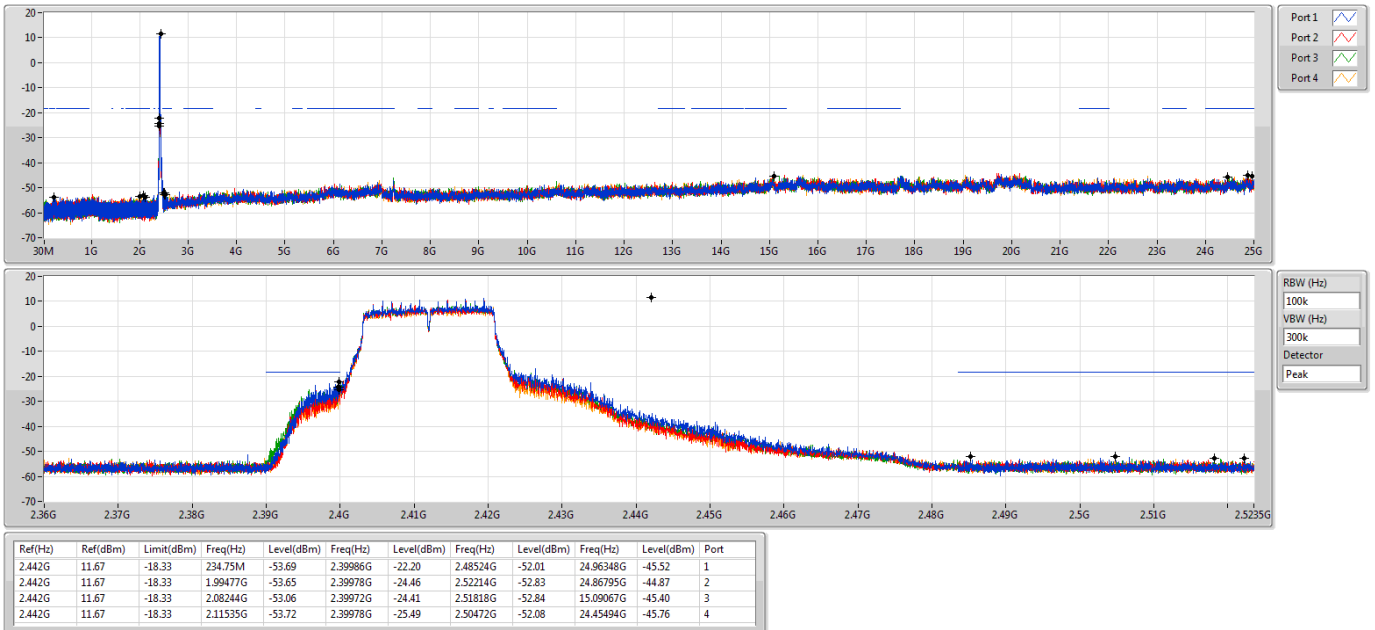


VHT20_Nss4,(MCS0)_4TX

CSE NdB

2412MHz

19/07/2019

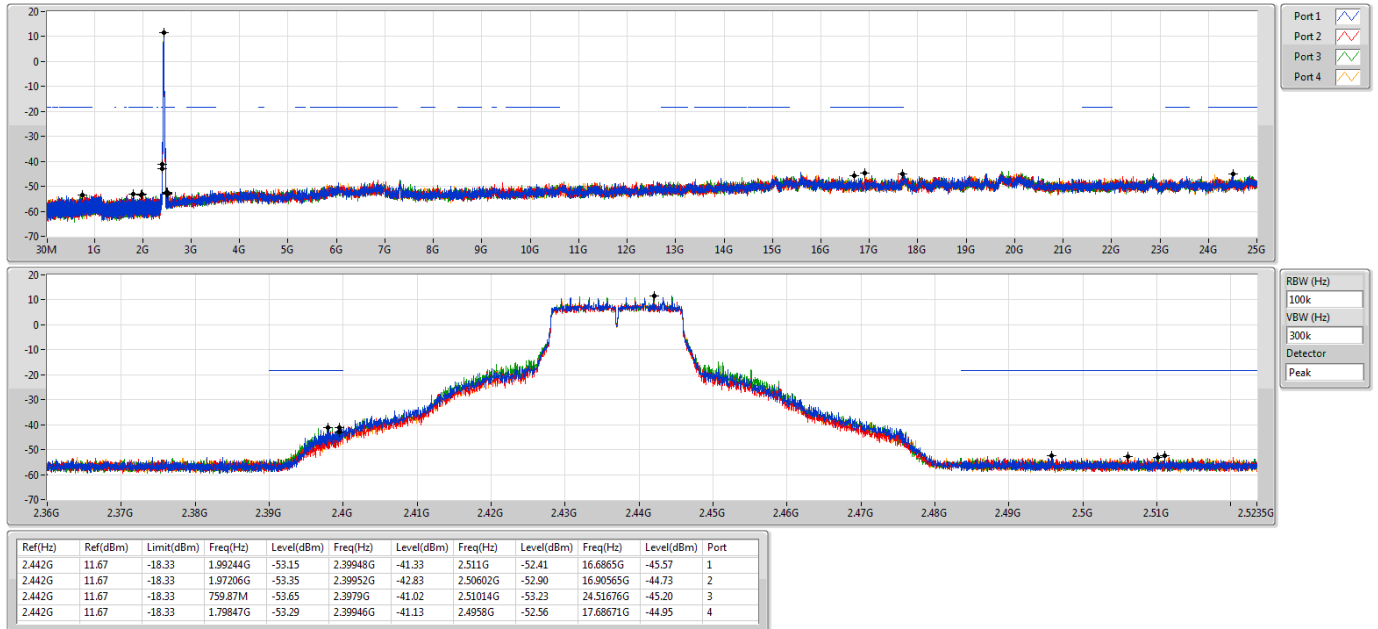


VHT20_Nss4,(MCS0)_4TX

CSE NdB

2437MHz

19/07/2019

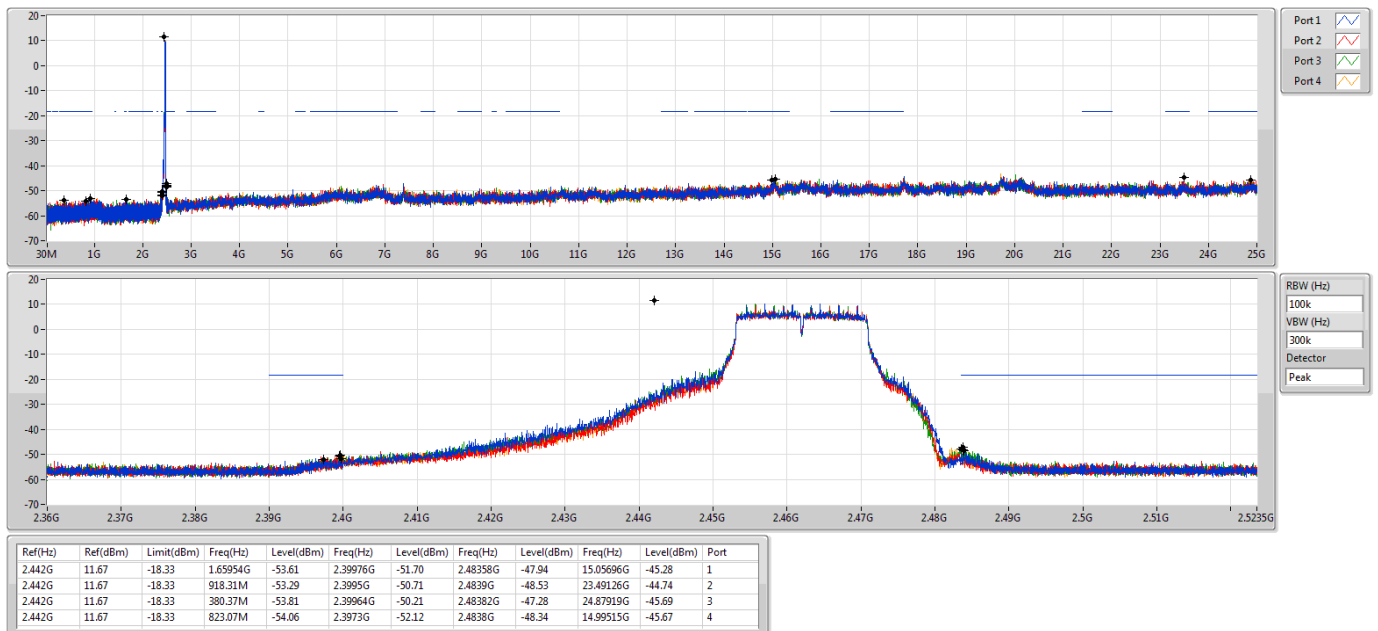


VHT20_Nss4,(MCS0)_4TX

CSE NdB

2462MHz

19/07/2019

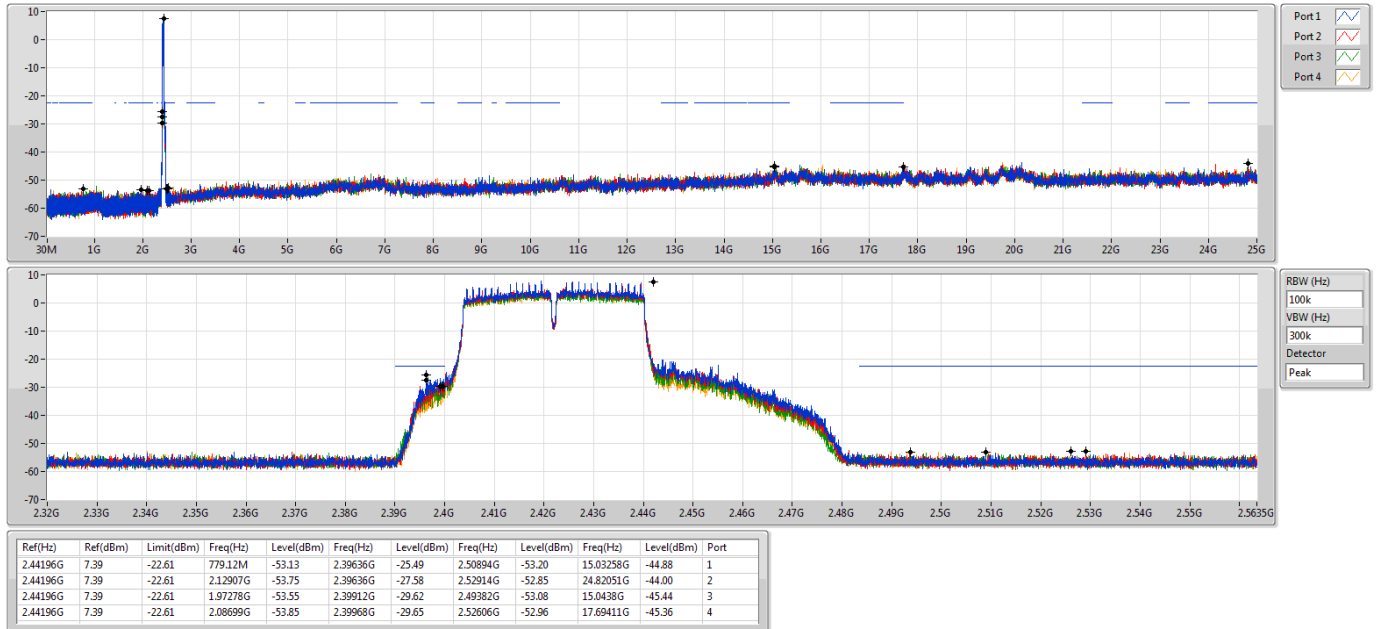


VHT40_Nss4,(MCS0)_4TX

2422MHz

CSE NdB

19/07/2019



VHT40_Nss4,(MCS0)_4TX

2437MHz

CSE NdB

19/07/2019

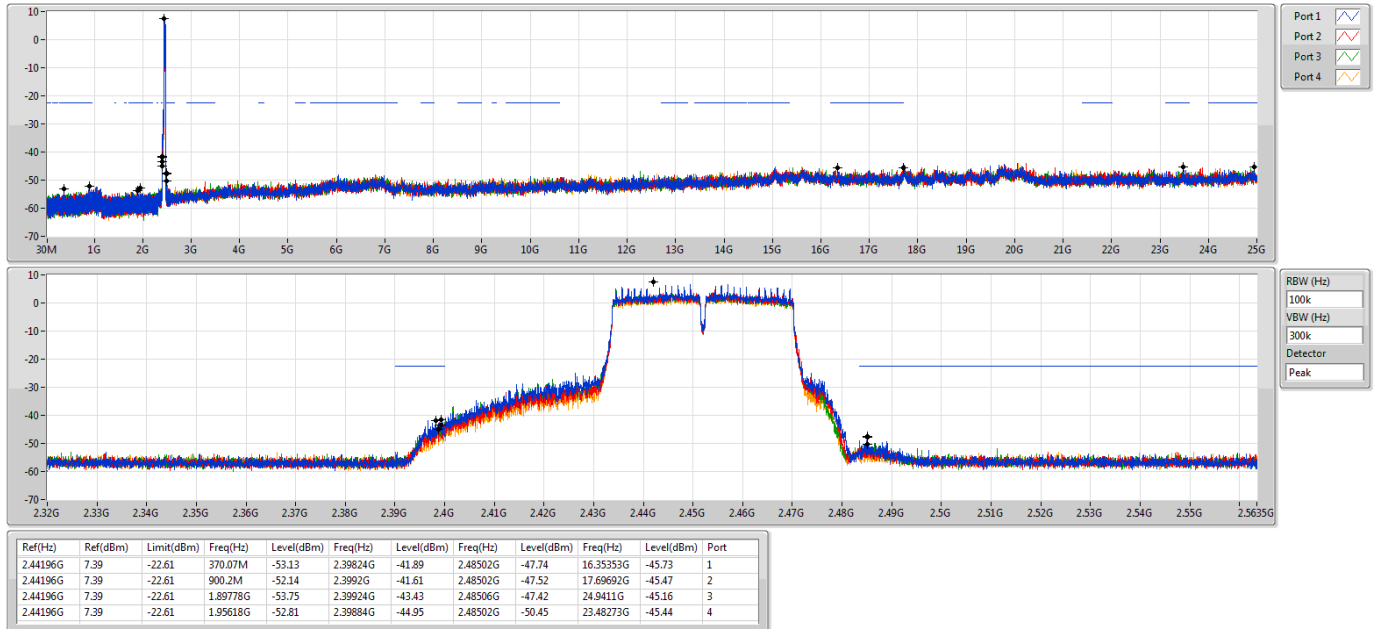


VHT40_Nss4,(MCS0)_4TX

CSE NdB

2452MHz

19/07/2019

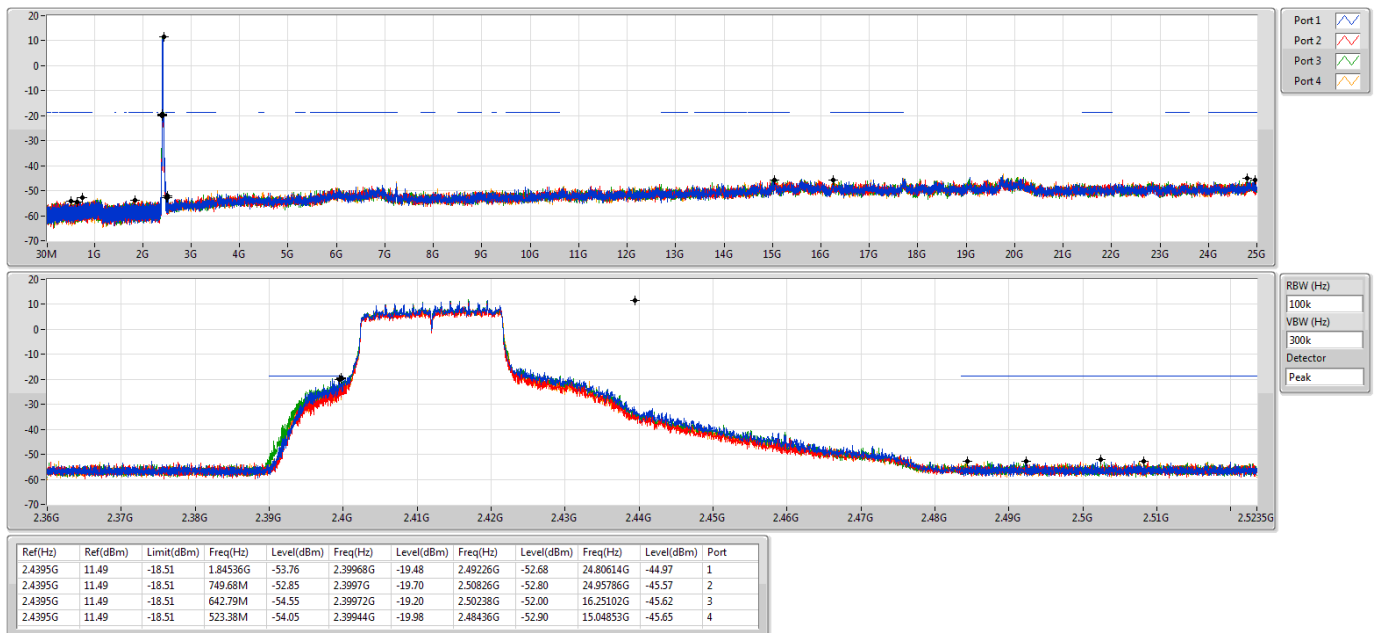


802.11ax HEW20_Nss4,(MCS0)_4TX

CSE NdB

2412MHz

19/07/2019

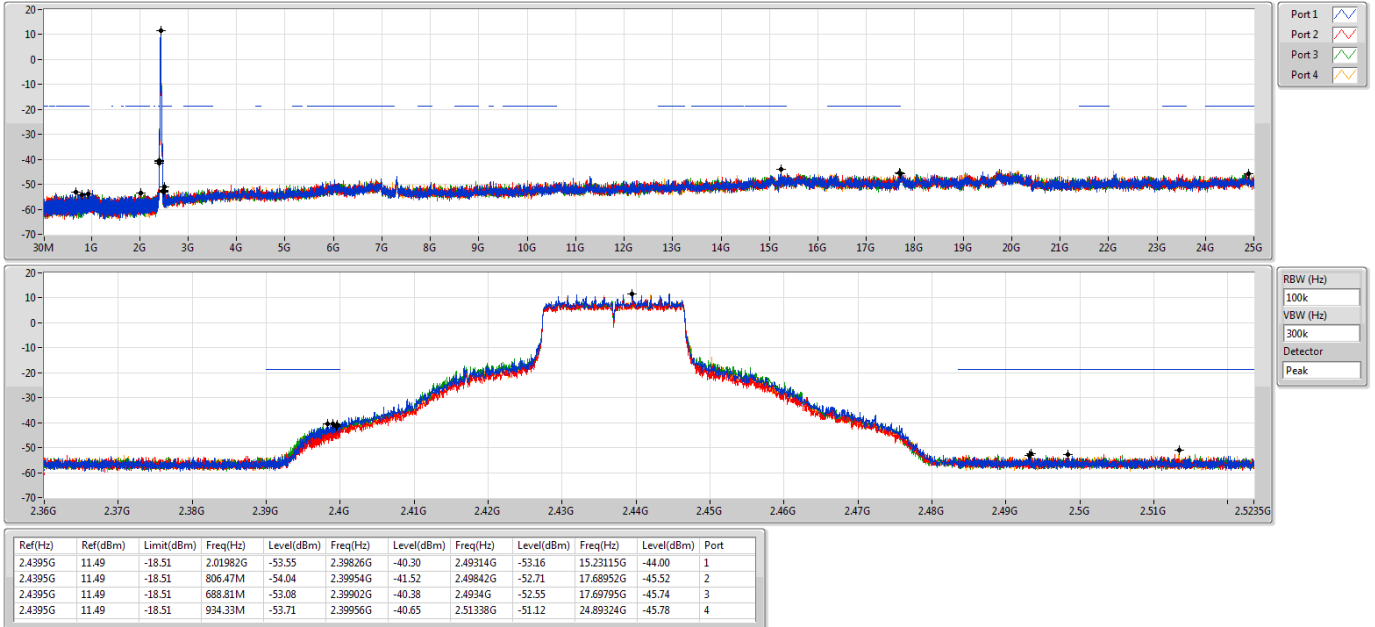


802.11ax HEW20_Nss4,(MCS0)_4TX

CSE NdB

2437MHz

19/07/2019

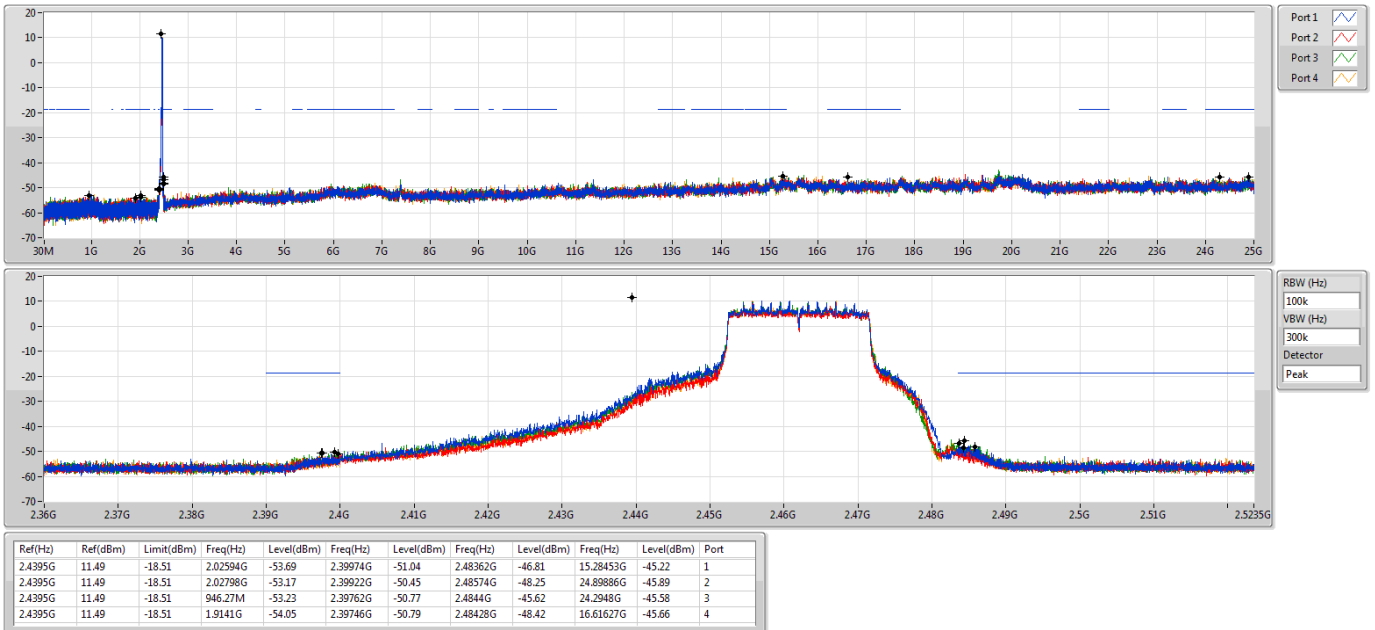


802.11ax HEW20_Nss4,(MCS0)_4TX

CSE NdB

2462MHz

19/07/2019



802.11ax HEW40_Nss4,(MCS0)_4TX

CSE NdB

2422MHz

19/07/2019



802.11ax HEW40_Nss4,(MCS0)_4TX

CSE NdB

2437MHz

19/07/2019

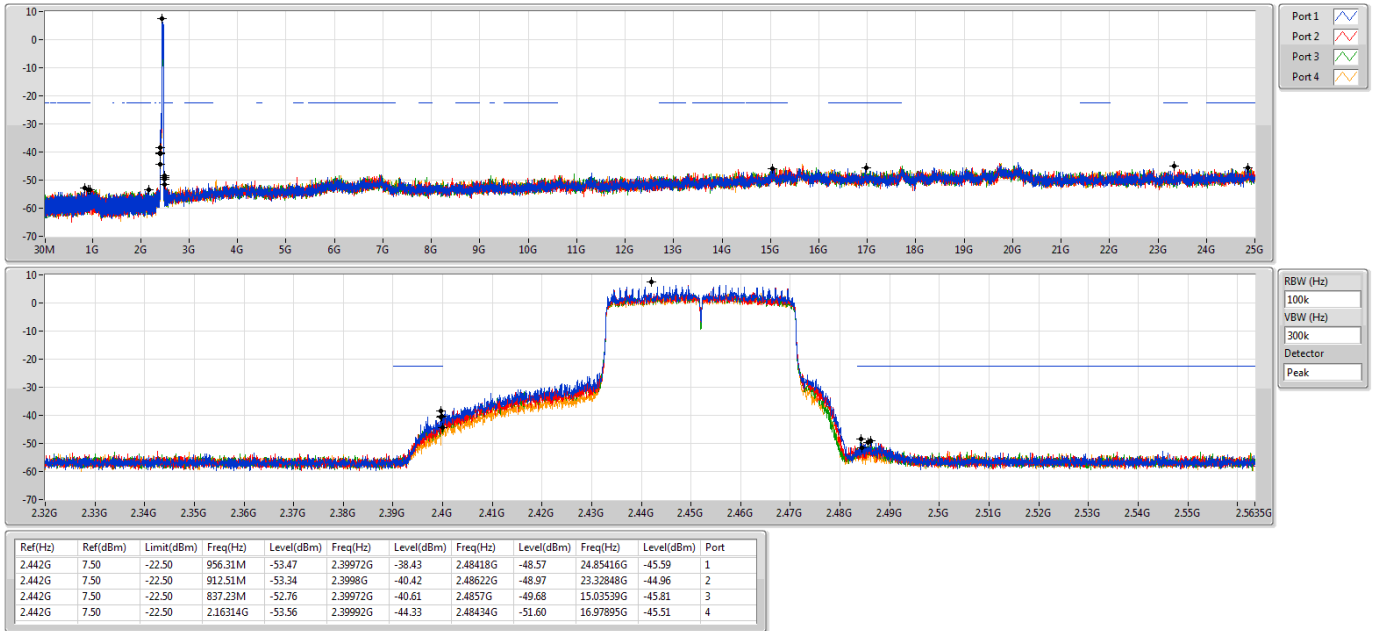


802.11ax HEW40_Nss4,(MCS0)_4TX

2452MHz

CSE NdB

19/07/2019



**For beamforming mode:**

1 Stream 4 TX for TxBF mode:

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)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	Pass	2.43749G	14.85	-15.15	2.15642G	-48.81	2.39986G	-18.39	2.51346G	-48.04	17.67266G	-40.86	1
VHT40-BF_Nss1,(MCS0)_4TX	Pass	2.41349G	13.79	-16.21	707.84M	-48.51	2.39892G	-19.82	2.48606G	-48.28	24.8766G	-39.77	1
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	Pass	2.43899G	12.38	-17.62	1.65401G	-48.96	2.39988G	-18.59	2.50022G	-47.93	24.8539G	-40.79	3
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	Pass	2.41449G	14.12	-15.88	885.32M	-48.68	2.3984G	-19.73	2.53238G	-48.53	23.23873G	-41.26	1



CSE(Non-restricted Band) Result

Appendix E

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)	Port
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43749G	14.85	-15.15	2.15642G	-48.81	2.39986G	-18.39	2.51346G	-48.04	17.67266G	-40.86	1
2412MHz	Pass	2.43749G	14.85	-15.15	860.65M	-48.46	2.3998G	-22.50	2.4985G	-48.23	24.18242G	-40.84	2
2412MHz	Pass	2.43749G	14.85	-15.15	2.10923G	-48.58	2.39986G	-19.98	2.50582G	-48.06	17.6839G	-40.00	3
2412MHz	Pass	2.43749G	14.85	-15.15	896.18M	-40.71	2.39952G	-19.87	2.488G	-47.72	24.21613G	-40.76	4
2437MHz	Pass	2.43749G	14.85	-15.15	1.82352G	-48.87	2.3988G	-42.75	2.48742G	-47.03	17.69795G	-40.29	1
2437MHz	Pass	2.43749G	14.85	-15.15	2.30117G	-49.13	2.39886G	-45.43	2.50108G	-48.64	24.87919G	-40.81	2
2437MHz	Pass	2.43749G	14.85	-15.15	657.94M	-48.32	2.39728G	-42.43	2.50318G	-47.37	5.8135G	-37.84	3
2437MHz	Pass	2.43749G	14.85	-15.15	1.77837G	-48.30	2.39894G	-43.98	2.49408G	-48.28	17.69795G	-40.76	4
2462MHz	Pass	2.43749G	14.85	-15.15	2.00118G	-47.87	2.39864G	-47.92	2.48476G	-46.64	15.07663G	-40.96	1
2462MHz	Pass	2.43749G	14.85	-15.15	937.83M	-48.95	2.397G	-48.52	2.48412G	-47.92	24.87919G	-40.48	2
2462MHz	Pass	2.43749G	14.85	-15.15	890.06M	-49.05	2.3984G	-47.89	2.48384G	-46.60	24.14589G	-41.52	3
2462MHz	Pass	2.43749G	14.85	-15.15	934.04M	-48.83	2.39944G	-48.41	2.48472G	-47.37	17.69233G	-39.84	4
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.41349G	13.79	-16.21	707.84M	-48.51	2.39892G	-19.82	2.48606G	-48.28	24.8766G	-39.77	1
2422MHz	Pass	2.41349G	13.79	-16.21	875.01M	-48.39	2.39808G	-23.24	2.52146G	-48.15	16.25257G	-40.58	2
2422MHz	Pass	2.41349G	13.79	-16.21	907.07M	-49.23	2.39664G	-22.43	2.50278G	-48.13	16.28903G	-40.41	3
2422MHz	Pass	2.41349G	13.79	-16.21	1.77756G	-48.80	2.39916G	-24.16	2.48618G	-48.35	15.0438G	-40.86	4
2437MHz	Pass	2.41349G	13.79	-16.21	1.82622G	-49.15	2.39972G	-27.37	2.48386G	-48.26	23.4631G	-40.69	1
2437MHz	Pass	2.41349G	13.79	-16.21	2.04577G	-49.10	2.39936G	-26.93	2.49154G	-48.58	23.4659G	-41.07	2
2437MHz	Pass	2.41349G	13.79	-16.21	835.51M	-47.72	2.39952G	-26.69	2.53566G	-48.37	24.82892G	-40.79	3
2437MHz	Pass	2.41349G	13.79	-16.21	2.01743G	-47.44	2.39948G	-26.36	2.55458G	-48.08	24.20911G	-40.61	4
2452MHz	Pass	2.41349G	13.79	-16.21	957.74M	-49.02	2.39948G	-42.10	2.49422G	-47.16	17.69131G	-39.27	1
2452MHz	Pass	2.41349G	13.79	-16.21	596.78M	-48.78	2.39932G	-42.70	2.48594G	-48.38	17.69411G	-40.69	2
2452MHz	Pass	2.41349G	13.79	-16.21	380.37M	-49.36	2.3998G	-43.96	2.48574G	-47.55	15.05222G	-39.72	3
2452MHz	Pass	2.41349G	13.79	-16.21	1.98051G	-48.26	2.39956G	-43.49	2.48362G	-46.93	15.05502G	-40.70	4
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43899G	12.38	-17.62	2.11389G	-48.66	2.39986G	-18.61	2.52326G	-48.53	15.05134G	-40.19	1
2412MHz	Pass	2.43899G	12.38	-17.62	953.85M	-48.52	2.39972G	-21.86	2.52266G	-47.90	24.89043G	-41.15	2
2412MHz	Pass	2.43899G	12.38	-17.62	1.65401G	-48.96	2.39988G	-18.59	2.50022G	-47.93	24.8539G	-40.79	3
2412MHz	Pass	2.43899G	12.38	-17.62	1.83604G	-48.97	2.3999G	-19.76	2.49916G	-47.99	24.9719G	-39.90	4
2437MHz	Pass	2.43899G	12.38	-17.62	944.23M	-48.95	2.39888G	-40.13	2.51302G	-48.09	24.83705G	-40.99	1
2437MHz	Pass	2.43899G	12.38	-17.62	779.97M	-48.76	2.3981G	-44.95	2.51982G	-48.25	15.22553G	-40.57	2
2437MHz	Pass	2.43899G	12.38	-17.62	2.15846G	-48.39	2.39912G	-41.96	2.49524G	-48.13	15.05415G	-39.74	3
2437MHz	Pass	2.43899G	12.38	-17.62	371.35M	-48.71	2.39892G	-42.52	2.51504G	-47.66	17.68952G	-41.02	4
2462MHz	Pass	2.43899G	12.38	-17.62	1.79002G	-48.98	2.39696G	-47.77	2.50844G	-46.22	24.8539G	-40.93	1
2462MHz	Pass	2.43899G	12.38	-17.62	935.21M	-49.32	2.3998G	-48.37	2.4845G	-46.77	24.50271G	-40.78	2
2462MHz	Pass	2.43899G	12.38	-17.62	508.23M	-48.41	2.39832G	-48.13	2.48352G	-46.25	24.85671G	-39.61	3
2462MHz	Pass	2.43899G	12.38	-17.62	1.76439G	-49.09	2.39818G	-48.09	2.50108G	-46.53	17.10232G	-40.84	4
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.41449G	14.12	-15.88	885.32M	-48.68	2.3984G	-19.73	2.53238G	-48.53	23.23873G	-41.26	1
2422MHz	Pass	2.41449G	14.12	-15.88	2.12077G	-47.97	2.3984G	-21.95	2.50522G	-48.00	17.03785G	-40.24	2
2422MHz	Pass	2.41449G	14.12	-15.88	904.21M	-48.90	2.398G	-22.73	2.55966G	-48.54	24.80088G	-40.50	3
2422MHz	Pass	2.41449G	14.12	-15.88	1.8016G	-48.20	2.39948G	-21.71	2.5143G	-47.99	24.85416G	-40.14	4
2437MHz	Pass	2.41449G	14.12	-15.88	1.7953G	-49.08	2.39948G	-22.20	2.53258G	-47.42	15.04661G	-40.67	1
2437MHz	Pass	2.41449G	14.12	-15.88	1.80418G	-48.80	2.39948G	-23.51	2.52598G	-48.07	16.36756G	-41.31	2
2437MHz	Pass	2.41449G	14.12	-15.88	745.34M	-48.86	2.39948G	-24.36	2.48538G	-47.12	15.25975G	-39.84	3
2437MHz	Pass	2.41449G	14.12	-15.88	1.98051G	-48.53	2.39944G	-25.32	2.50482G	-47.99	23.47712G	-41.28	4



CSE(Non-restricted Band) Result

Appendix E

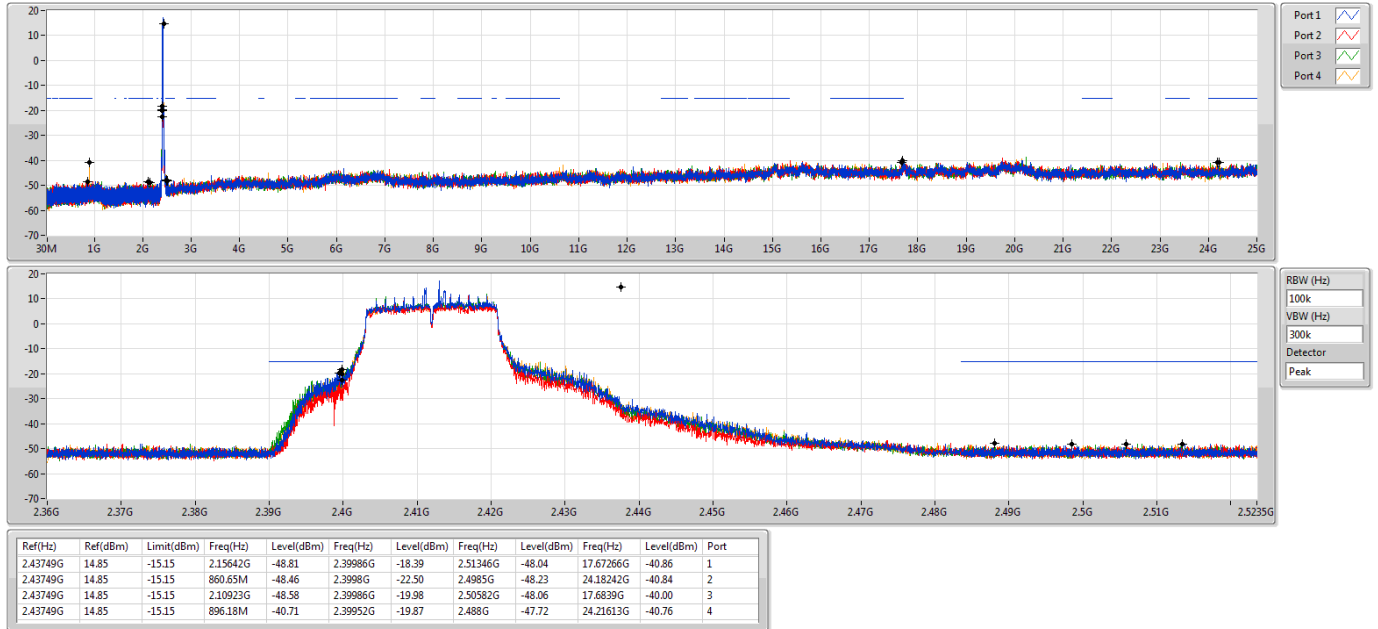
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2452MHz	Pass	2.41449G	14.12	-15.88	429.89M	-48.60	2.3998G	-38.43	2.48398G	-46.74	15.08026G	-41.10	1
2452MHz	Pass	2.41449G	14.12	-15.88	1.65218G	-48.85	2.39916G	-41.36	2.54282G	-47.39	17.49219G	-41.20	2
2452MHz	Pass	2.41449G	14.12	-15.88	1.92526G	-49.27	2.39976G	-38.38	2.48766G	-47.13	24.57932G	-40.30	3
2452MHz	Pass	2.41449G	14.12	-15.88	795.15M	-48.44	2.3988G	-43.57	2.52834G	-47.45	16.23574G	-41.32	4

VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2412MHz

23/07/2019

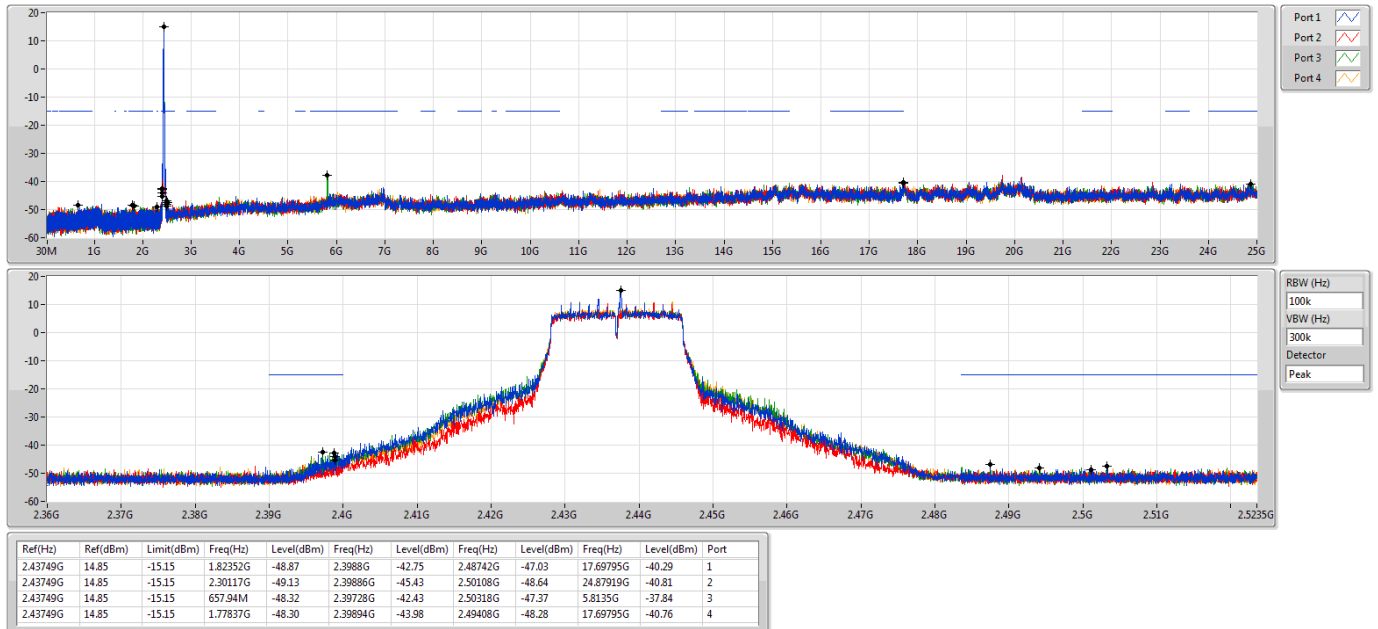


VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2437MHz

23/07/2019

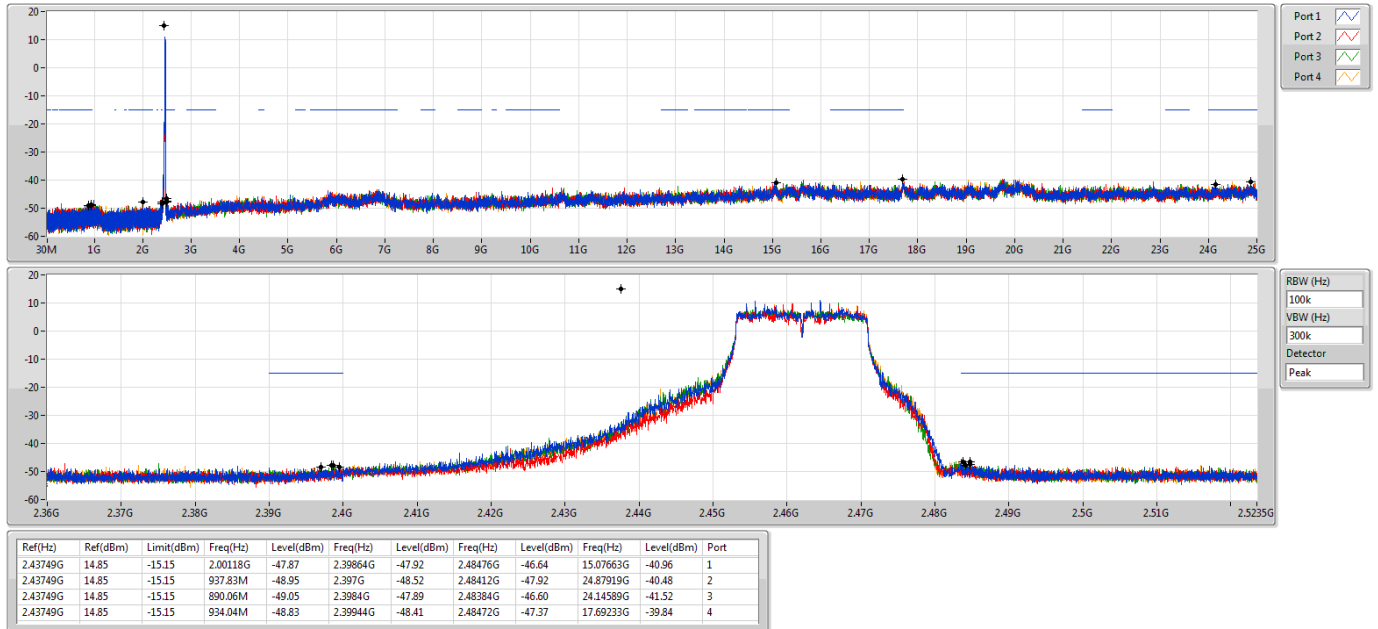


VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2462MHz

23/07/2019

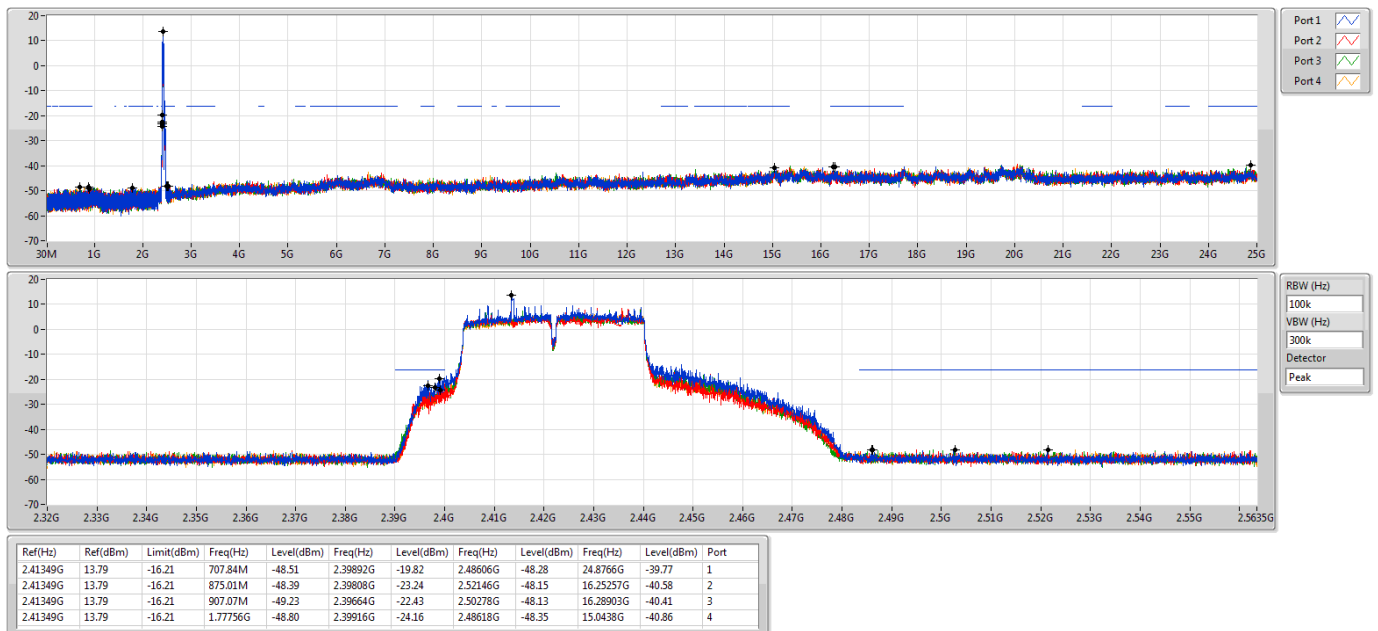


VHT40-BF_Nss1,(MCS0)_4TX

CSE NdB

2422MHz

23/07/2019

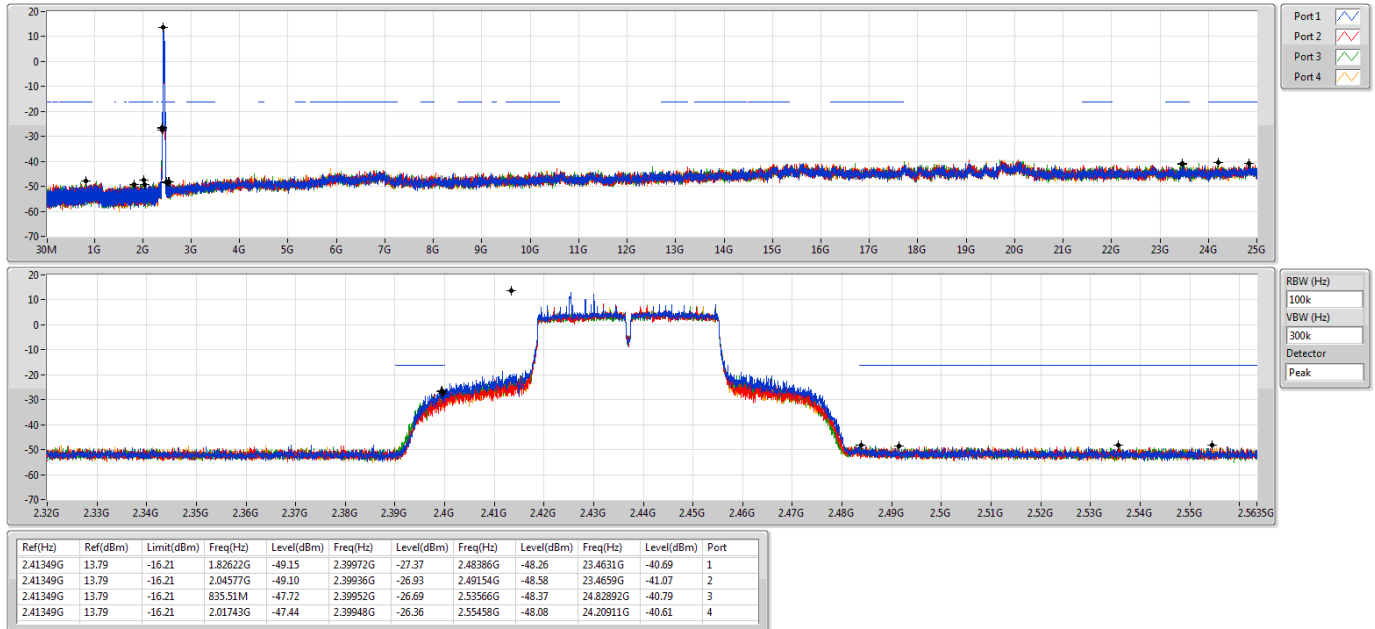


VHT40-BF_Nss1,(MCS0)_4TX

2437MHz

CSE NdB

23/07/2019

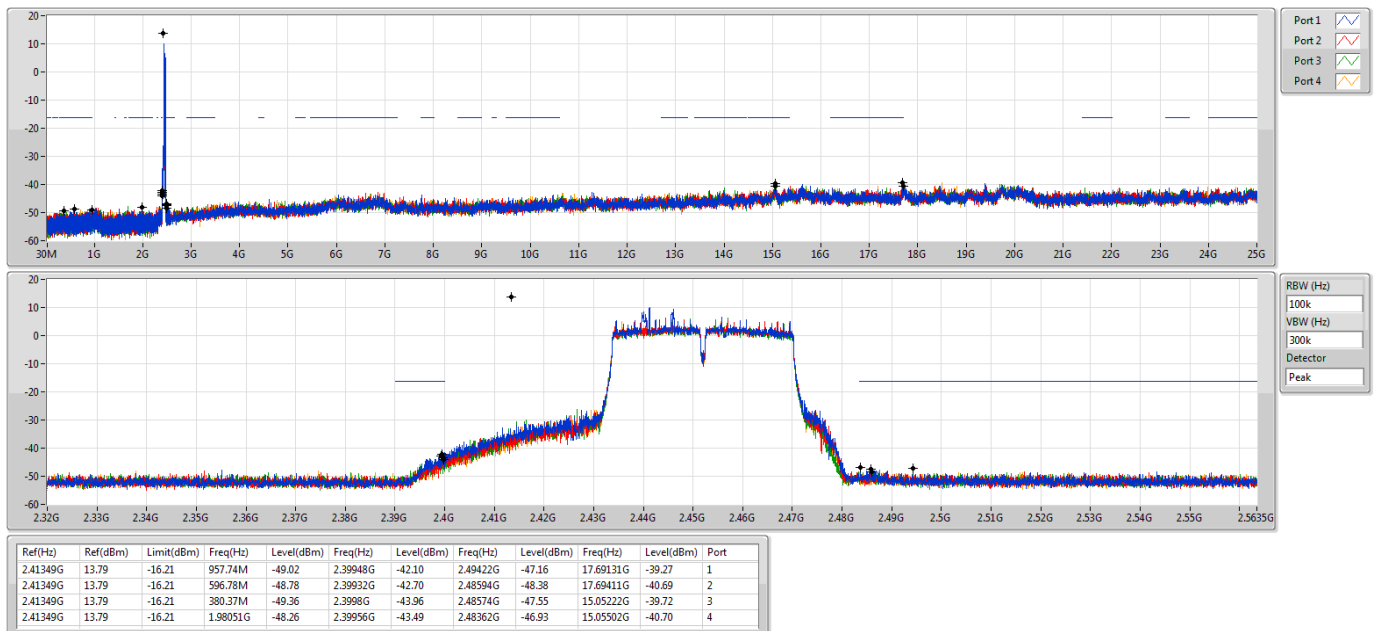


VHT40-BF_Nss1,(MCS0)_4TX

2452MHz

CSE NdB

23/07/2019

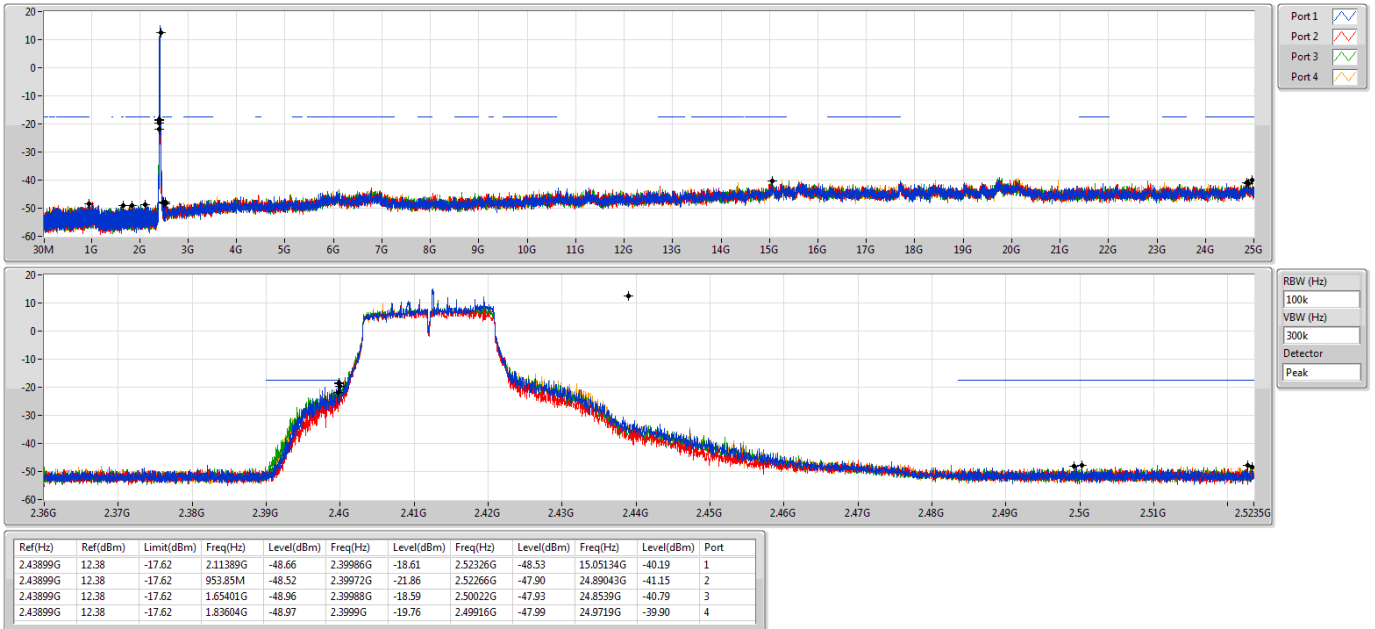


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSE NdB

2412MHz

23/07/2019

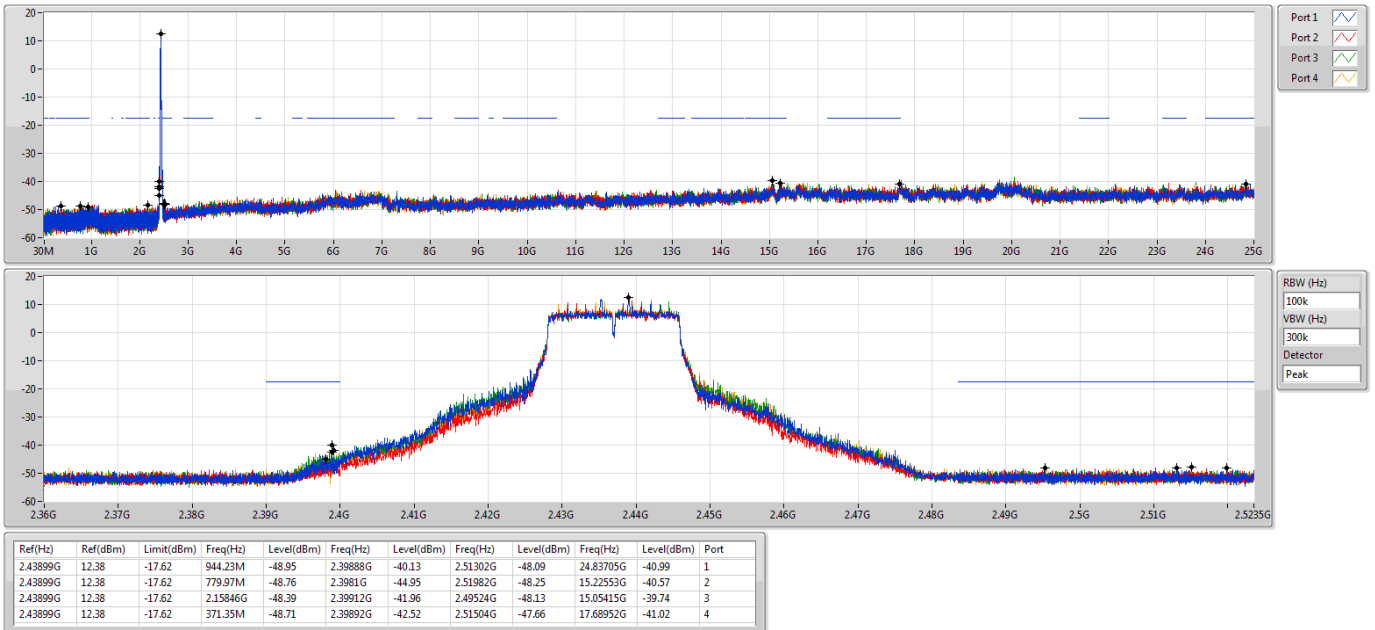


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSE NdB

2437MHz

23/07/2019

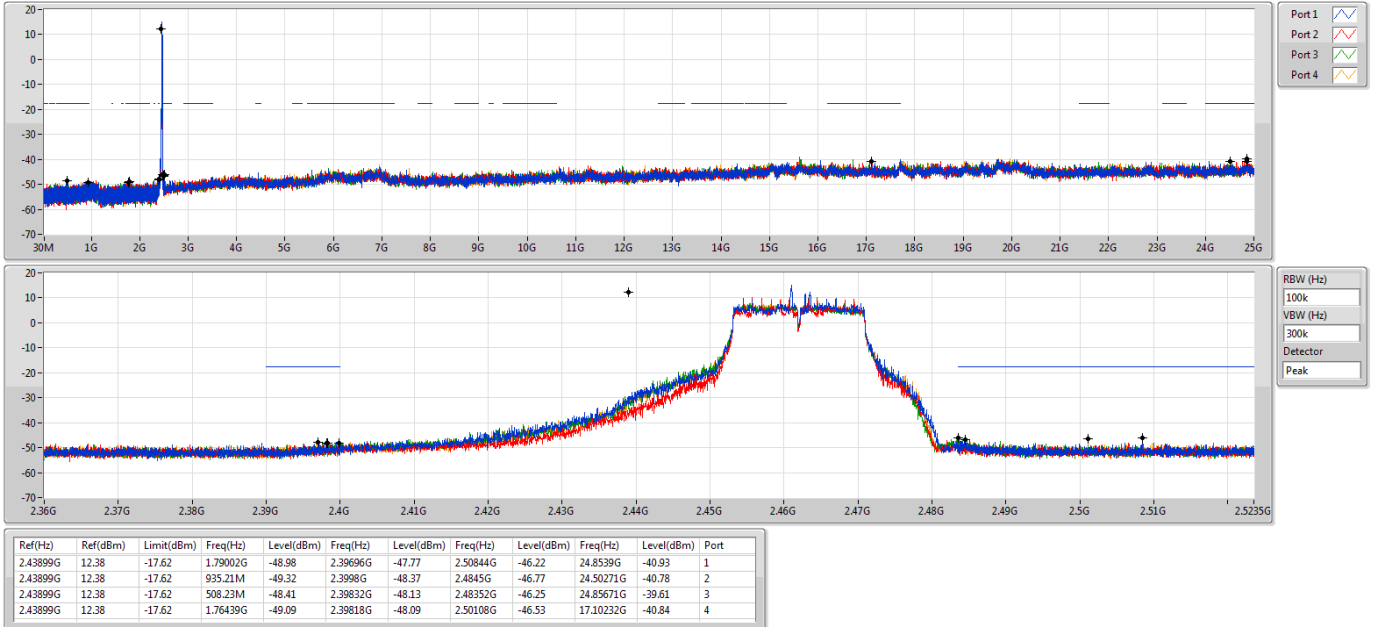


802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSE NdB

2462MHz

23/07/2019

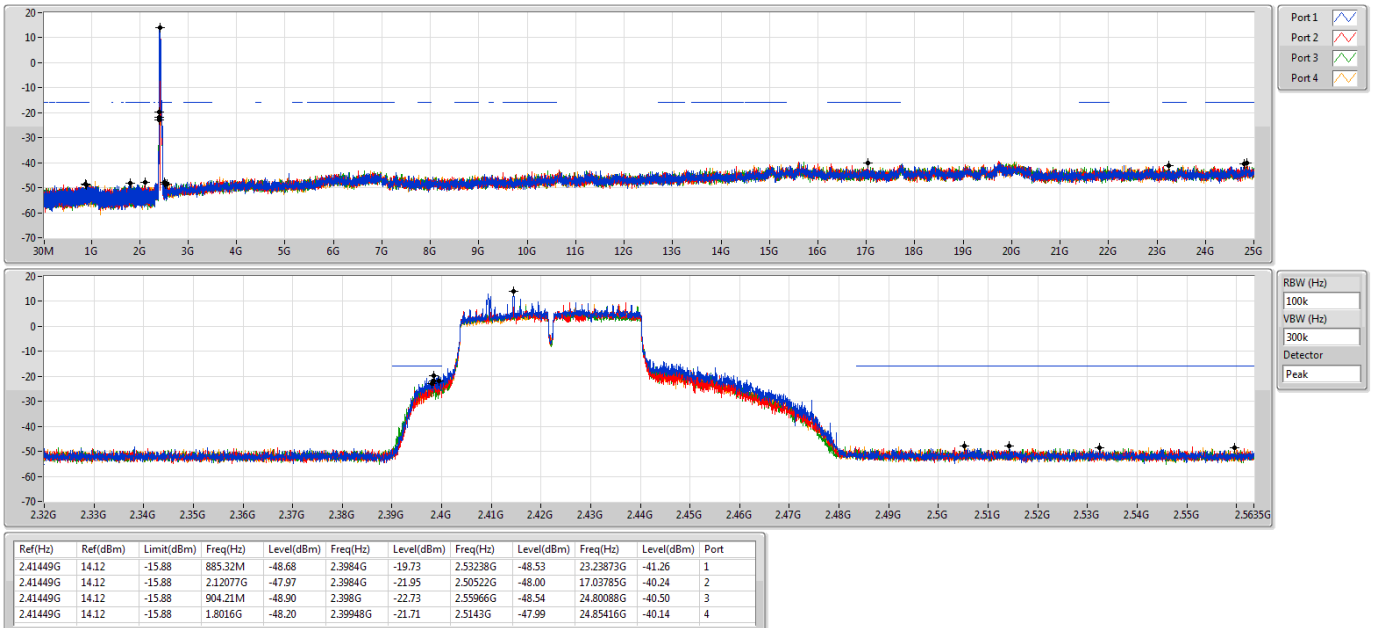


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSE NdB

2422MHz

23/07/2019

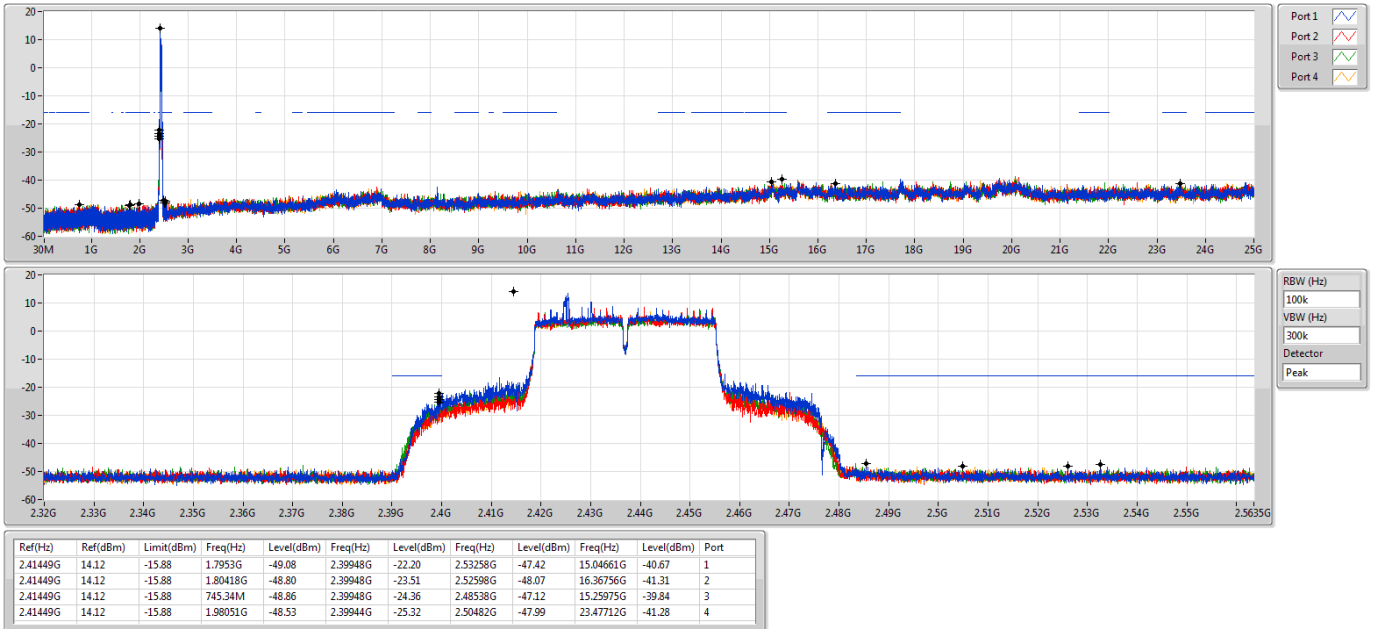


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSE NdB

2437MHz

23/07/2019

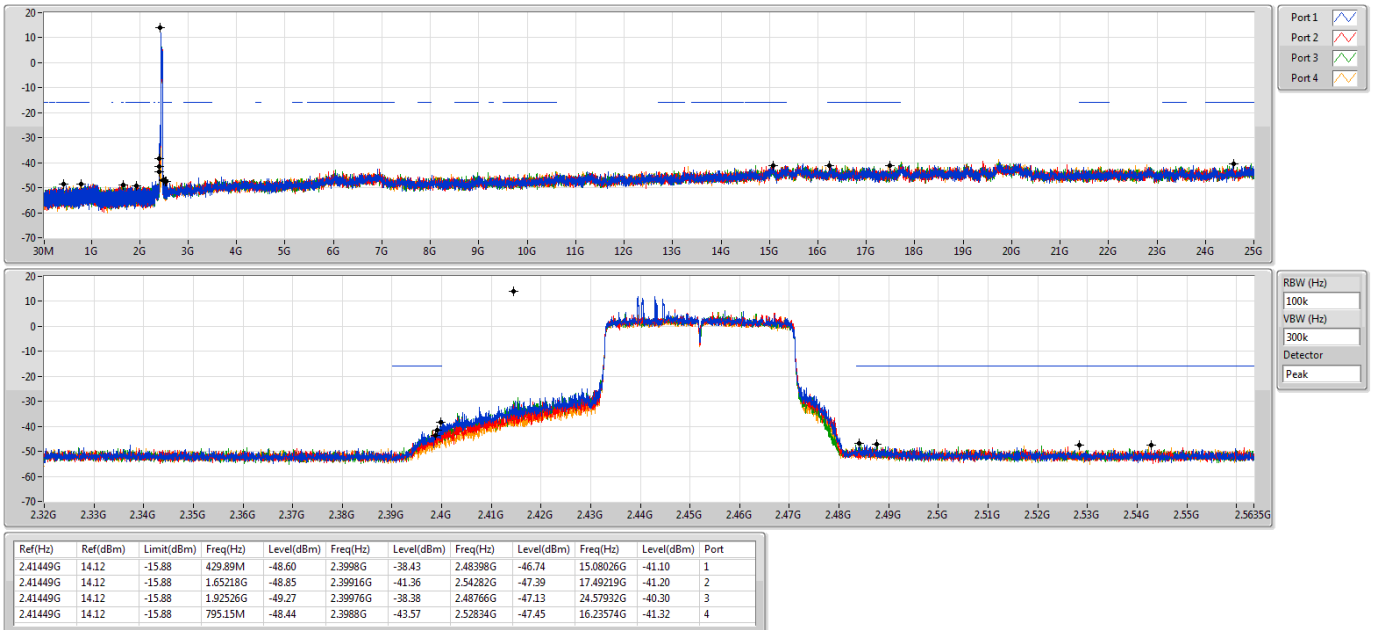


802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSE NdB

2452MHz

23/07/2019





2 Stream 4 TX for TxBF mode:

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)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_4TX	Pass	2.442G	12.38	-17.62	556M	-48.99	2.39924G	-18.17	2.48432G	-47.42	15.11315G	-41.90	3
VHT40-BF_Nss1,(MCS0)_4TX	Pass	2.41048G	13.71	-16.29	919.09M	-48.58	2.3998G	-18.84	2.48942G	-47.56	17.69972G	-39.99	1
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	Pass	2.44451G	12.73	-17.27	1.78653G	-48.78	2.39946G	-18.70	2.51298G	-46.97	16.4505G	-41.88	1
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	Pass	2.40998G	14.72	-15.28	936.84M	-47.88	2.39944G	-20.17	2.56082G	-47.56	15.26817G	-39.34	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)	Port
VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	12.38	-17.62	949.77M	-48.23	2.39976G	-19.01	2.52294G	-47.87	16.84384G	-42.18	1
2412MHz	Pass	2.442G	12.38	-17.62	2.10923G	-49.01	2.39978G	-18.90	2.49916G	-46.61	15.16091G	-42.35	2
2412MHz	Pass	2.442G	12.38	-17.62	556M	-48.99	2.39924G	-18.17	2.48432G	-47.42	15.11315G	-41.90	3
2412MHz	Pass	2.442G	12.38	-17.62	410.08M	-49.22	2.39976G	-21.00	2.49492G	-47.15	17.25123G	-42.43	4
2437MHz	Pass	2.442G	12.38	-17.62	876.96M	-48.67	2.39984G	-38.27	2.49834G	-48.09	15.11877G	-42.58	1
2437MHz	Pass	2.442G	12.38	-17.62	1.78303G	-48.33	2.39944G	-40.54	2.51788G	-46.84	6.77156G	-42.03	2
2437MHz	Pass	2.442G	12.38	-17.62	1.95633G	-48.77	2.39704G	-40.24	2.49488G	-48.19	16.76517G	-42.57	3
2437MHz	Pass	2.442G	12.38	-17.62	2.12351G	-48.28	2.39956G	-39.81	2.48818G	-47.39	16.86351G	-41.58	4
2462MHz	Pass	2.442G	12.38	-17.62	1.78391G	-48.59	2.39816G	-46.43	2.48394G	-44.19	16.51512G	-41.31	1
2462MHz	Pass	2.442G	12.38	-17.62	938.99M	-48.82	2.39966G	-48.34	2.48382G	-43.05	15.11034G	-42.24	2
2462MHz	Pass	2.442G	12.38	-17.62	1.97642G	-48.97	2.39666G	-47.66	2.48388G	-43.27	16.74551G	-42.29	3
2462MHz	Pass	2.442G	12.38	-17.62	814.63M	-48.95	2.3964G	-47.56	2.48416G	-44.18	24.4409G	-42.52	4
VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.41048G	13.71	-16.29	919.09M	-48.58	2.3998G	-18.84	2.48942G	-47.56	17.69972G	-39.99	1
2422MHz	Pass	2.41048G	13.71	-16.29	952.01M	-48.64	2.39944G	-21.81	2.52846G	-48.11	24.78405G	-40.50	2
2422MHz	Pass	2.41048G	13.71	-16.29	2.30569G	-48.04	2.39968G	-22.09	2.49706G	-47.85	17.69411G	-38.81	3
2422MHz	Pass	2.41048G	13.71	-16.29	1.95246G	-48.77	2.39828G	-24.18	2.48842G	-47.96	15.02417G	-40.40	4
2437MHz	Pass	2.41048G	13.71	-16.29	742.76M	-48.53	2.3998G	-21.00	2.48454G	-47.79	15.04941G	-40.07	1
2437MHz	Pass	2.41048G	13.71	-16.29	2.07554G	-48.64	2.39928G	-26.56	2.5395G	-47.87	24.35215G	-40.98	2
2437MHz	Pass	2.41048G	13.71	-16.29	939.13M	-47.79	2.3998G	-22.77	2.49158G	-46.95	16.38438G	-39.64	3
2437MHz	Pass	2.41048G	13.71	-16.29	650.3M	-48.44	2.39964G	-29.36	2.51658G	-47.24	15.26817G	-39.93	4
2452MHz	Pass	2.41048G	13.71	-16.29	169.98M	-48.43	2.3986G	-40.44	2.48698G	-47.65	24.99439G	-40.68	1
2452MHz	Pass	2.41048G	13.71	-16.29	948M	-47.93	2.39948G	-40.30	2.4857G	-46.14	16.31147G	-40.24	2
2452MHz	Pass	2.41048G	13.71	-16.29	1.81019G	-48.14	2.39944G	-43.06	2.4851G	-46.31	24.52883G	-40.97	3
2452MHz	Pass	2.41048G	13.71	-16.29	821.2M	-47.69	2.3994G	-42.42	2.55758G	-47.75	5.78033G	-25.13	4
802.11ax HEW20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44451G	12.73	-17.27	1.78653G	-48.78	2.39946G	-18.70	2.51298G	-46.97	16.4505G	-41.88	1
2412MHz	Pass	2.44451G	12.73	-17.27	959.09M	-48.22	2.3997G	-19.65	2.48616G	-48.01	17.4479G	-41.97	2
2412MHz	Pass	2.44451G	12.73	-17.27	955.59M	-48.24	2.3997G	-18.74	2.51356G	-48.09	6.16469G	-42.17	3
2412MHz	Pass	2.44451G	12.73	-17.27	941.32M	-47.84	2.3997G	-18.86	2.5057G	-47.85	21.533G	-41.46	4
2437MHz	Pass	2.44451G	12.73	-17.27	2.13312G	-48.53	2.39894G	-36.88	2.4978G	-47.40	16.42241G	-42.80	1
2437MHz	Pass	2.44451G	12.73	-17.27	2.18787G	-48.38	2.39946G	-38.62	2.48982G	-47.19	23.15412G	-42.06	2
2437MHz	Pass	2.44451G	12.73	-17.27	795.7M	-48.78	2.39898G	-38.40	2.48708G	-47.21	16.52636G	-42.60	3
2437MHz	Pass	2.44451G	12.73	-17.27	2.30874G	-48.92	2.39894G	-38.59	2.4981G	-47.30	16.7427G	-41.99	4
2462MHz	Pass	2.44451G	12.73	-17.27	1.77517G	-48.54	2.39794G	-47.64	2.4847G	-45.04	16.46174G	-42.07	1
2462MHz	Pass	2.44451G	12.73	-17.27	2.12438G	-48.76	2.39958G	-47.83	2.48502G	-44.56	24.4999G	-41.49	2
2462MHz	Pass	2.44451G	12.73	-17.27	1.99157G	-49.11	2.39846G	-47.49	2.48482G	-44.19	17.2737G	-42.21	3
2462MHz	Pass	2.44451G	12.73	-17.27	2.14273G	-48.26	2.39888G	-46.83	2.48576G	-45.17	16.43645G	-42.51	4
802.11ax HEW40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.40998G	14.72	-15.28	936.84M	-47.88	2.39944G	-20.17	2.56082G	-47.56	15.26817G	-39.34	1
2422MHz	Pass	2.40998G	14.72	-15.28	561.85M	-48.96	2.3996G	-20.32	2.53214G	-48.50	24.79527G	-40.50	2
2422MHz	Pass	2.40998G	14.72	-15.28	1.90809G	-48.39	2.39924G	-21.48	2.5343G	-47.68	16.26379G	-40.44	3
2422MHz	Pass	2.40998G	14.72	-15.28	879.3M	-48.41	2.39968G	-23.32	2.5625G	-47.99	17.69972G	-40.19	4
2437MHz	Pass	2.40998G	14.72	-15.28	1.98566G	-48.64	2.3998G	-22.59	2.48562G	-44.31	17.67448G	-40.19	1
2437MHz	Pass	2.40998G	14.72	-15.28	2.07497G	-48.86	2.39828G	-25.06	2.48446G	-47.75	24.15302G	-39.55	2
2437MHz	Pass	2.40998G	14.72	-15.28	2.10445G	-48.81	2.39936G	-25.76	2.48642G	-47.63	15.03819G	-40.48	3
2437MHz	Pass	2.40998G	14.72	-15.28	2.11419G	-48.67	2.39984G	-26.19	2.49046G	-47.28	15.06904G	-38.47	4



CSE(Non-restricted Band) Result

Appendix E

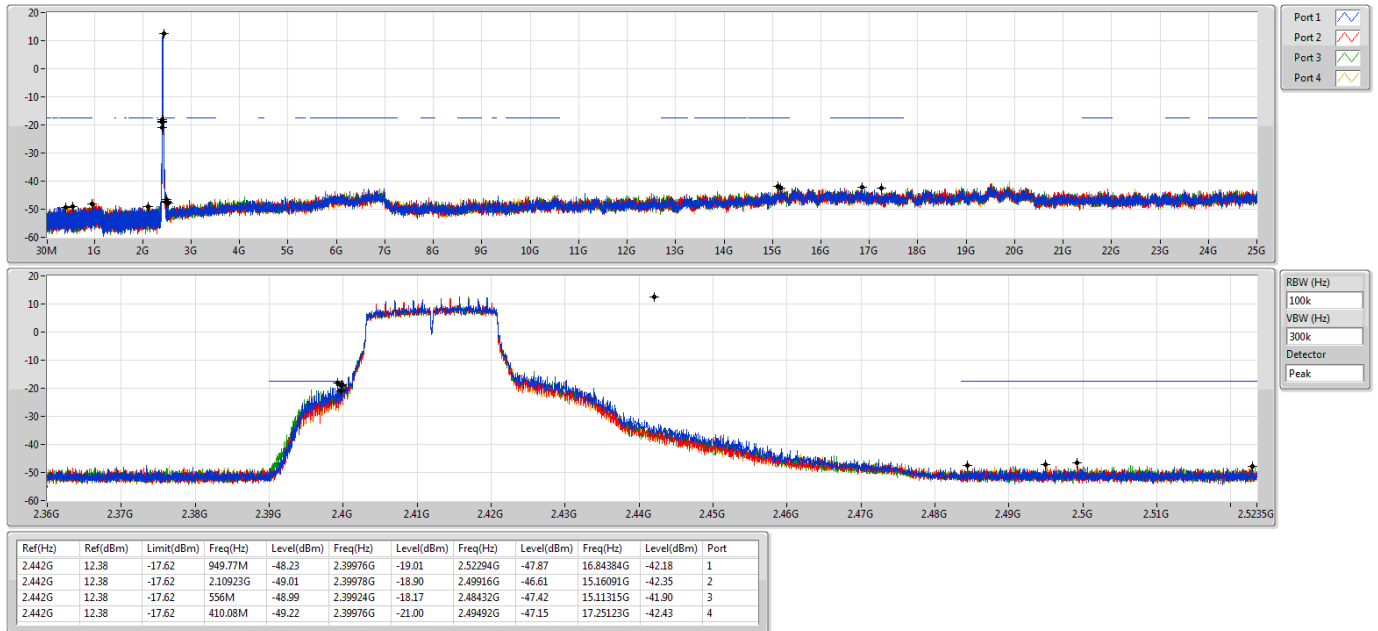
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2452MHz	Pass	2.40998G	14.72	-15.28	703.26M	-48.61	2.39952G	-39.41	2.48482G	-43.90	16.26098G	-41.07	1
2452MHz	Pass	2.40998G	14.72	-15.28	948M	-48.46	2.3996G	-41.11	2.48554G	-47.52	15.25415G	-40.25	2
2452MHz	Pass	2.40998G	14.72	-15.28	931.69M	-48.24	2.39972G	-40.17	2.48798G	-47.05	23.19386G	-40.58	3
2452MHz	Pass	2.40998G	14.72	-15.28	888.46M	-48.62	2.39976G	-42.38	2.48722G	-47.70	16.2722G	-40.12	4

VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2412MHz

25/07/2019

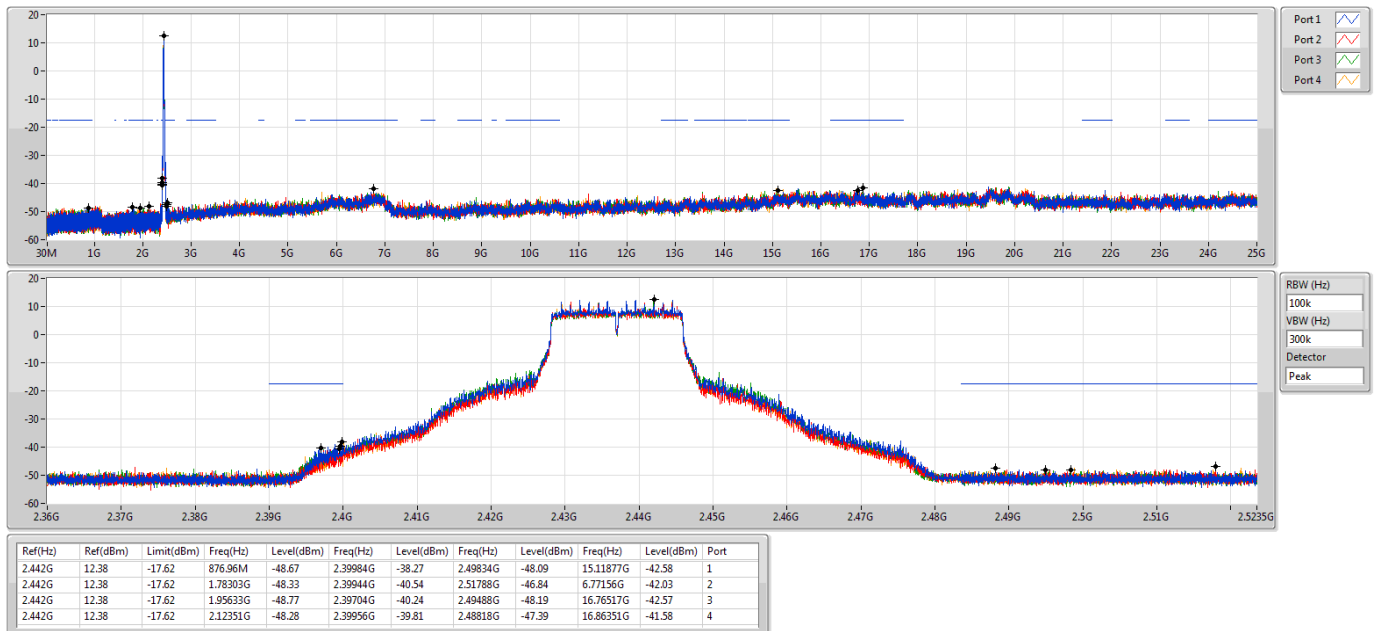


VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2437MHz

25/07/2019

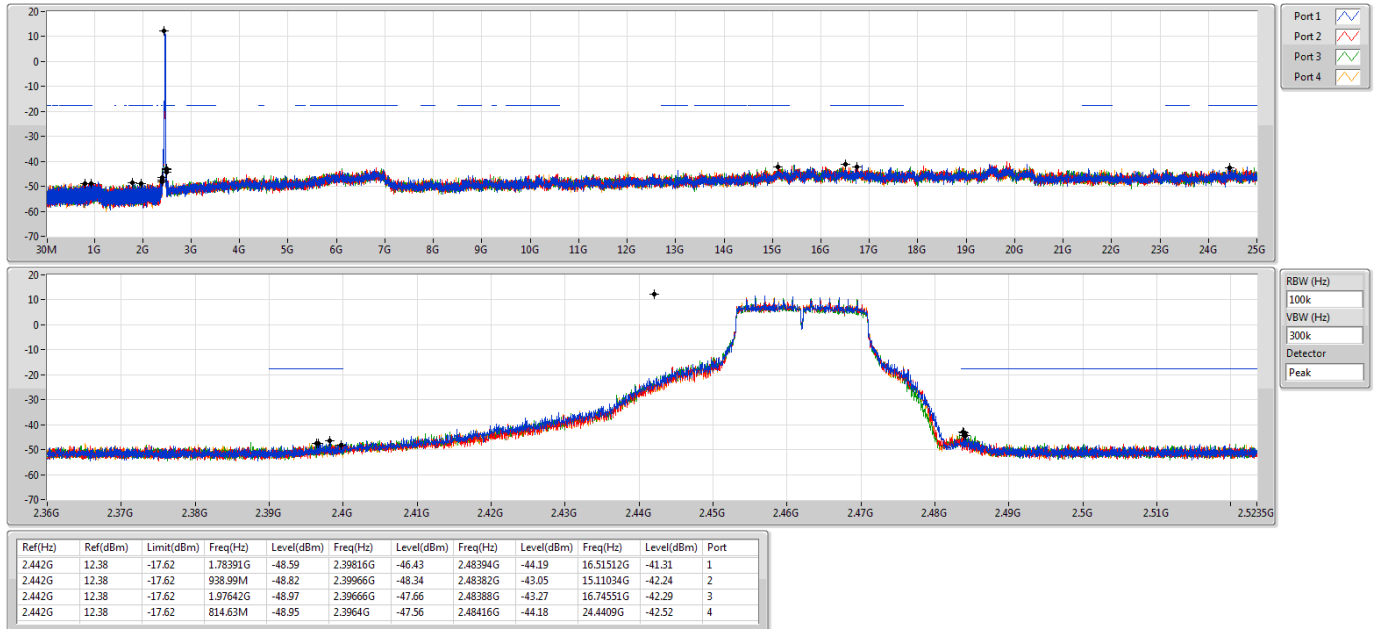


VHT20-BF_Nss1,(MCS0)_4TX

CSE NdB

2462MHz

25/07/2019

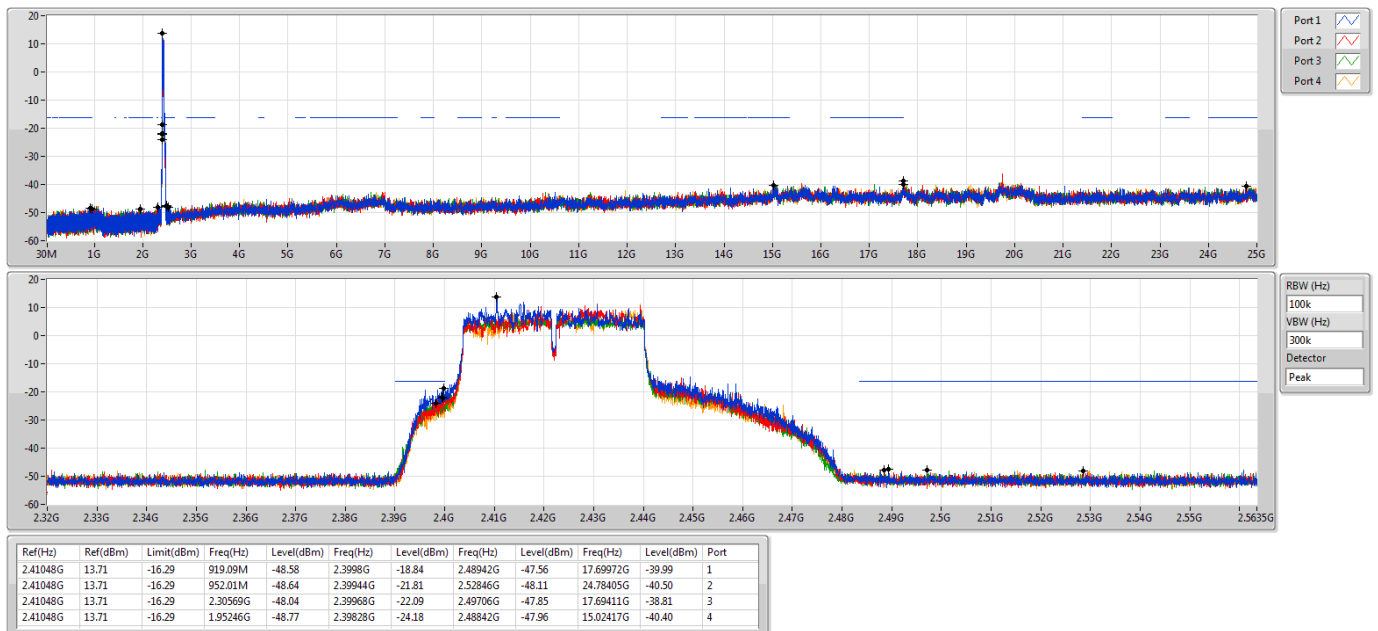


VHT40-BF_Nss2,(MCS0)_4TX

CSE NdB

2422MHz

25/07/2019



VHT40-BF_Nss2,(MCS0)_4TX

CSE NdB

2437MHz

23/07/2019

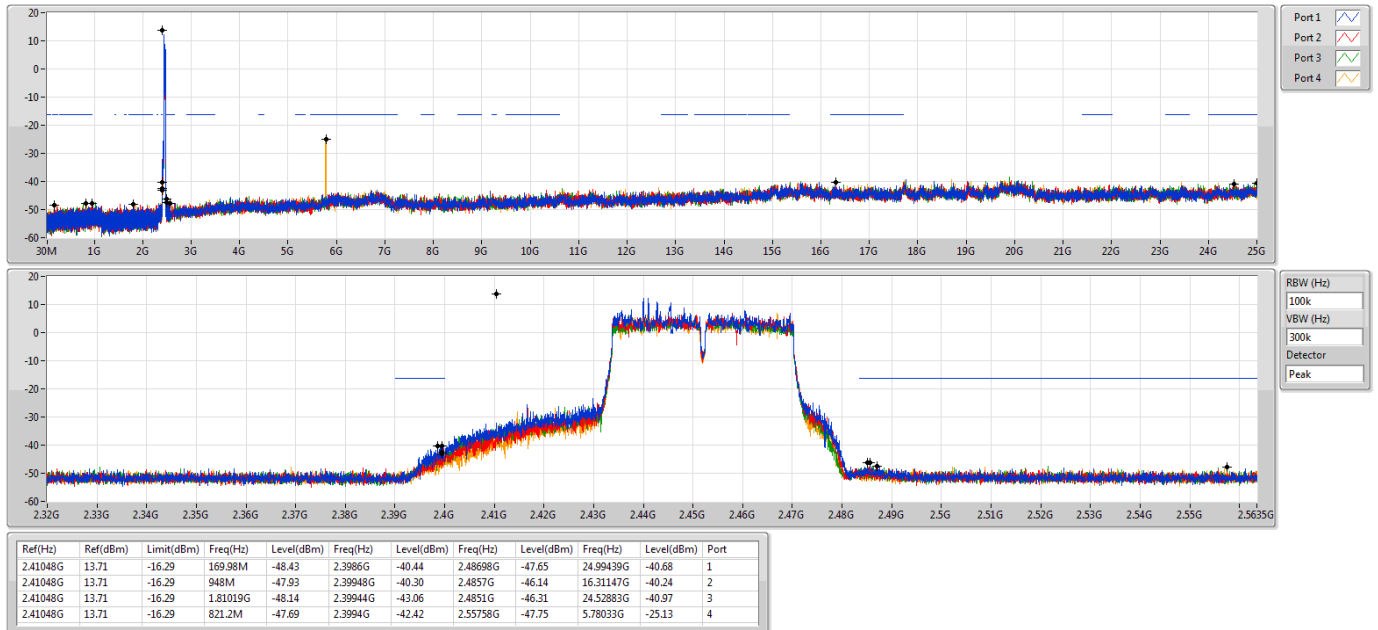


VHT40-BF_Nss2,(MCS0)_4TX

CSE NdB

2452MHz

23/07/2019

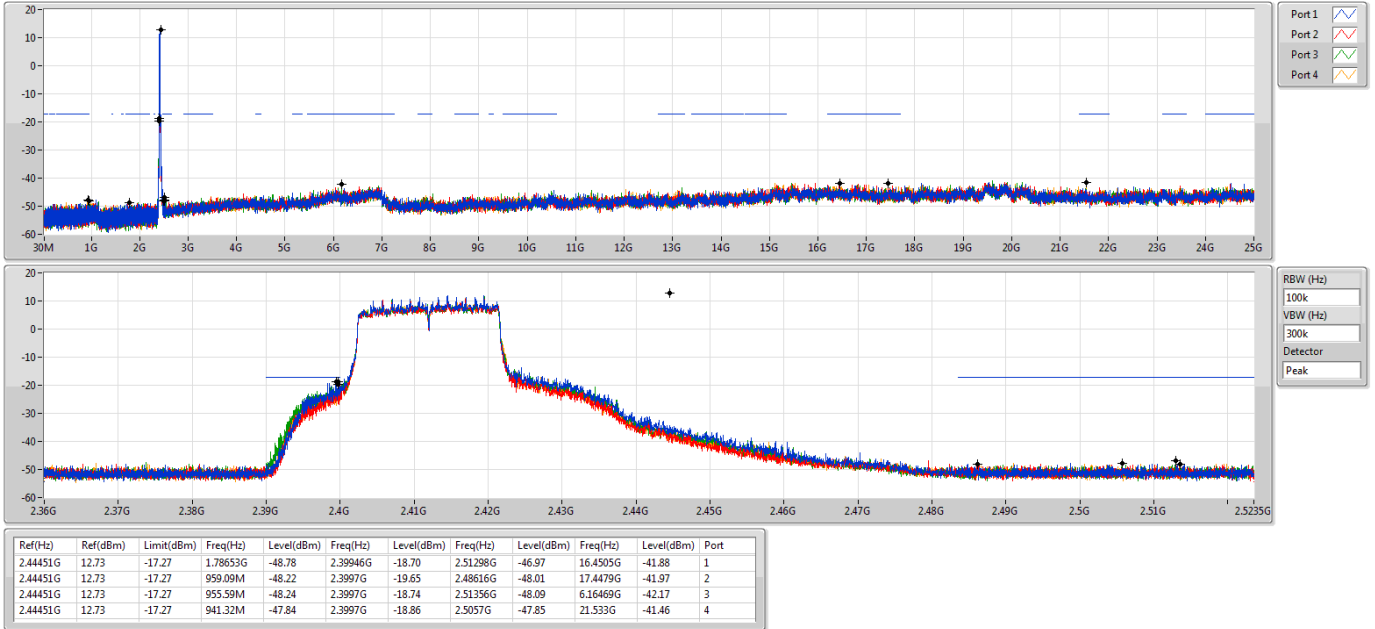


802.11ax HEW20-BF_Nss2,(MCS0)_4TX

CSE NdB

2412MHz

25/07/2019



802.11ax HEW20-BF_Nss2,(MCS0)_4TX

CSE NdB

2437MHz

25/07/2019

