

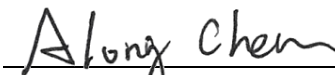
FCC Test Report

FCC ID : P27-IP5446M
Equipment : IP5446M
Model No. : IP5446M
Multiple Listing : IP5446MXXX
(the X should be 0 to 9, A to Z, a to z, "blank" or "-", for the marketing purpose)
Brand Name : Sercomm
Applicant : Sercomm Corporation
Address : 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : May 12, 2023
Tested Date : May 15 ~ Jun. 01, 2023

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

Reviewed by:

Approved by:


Along Chen / Assistant Manager

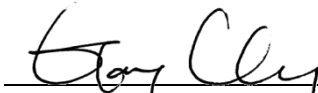

Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
FR351201AC	Rev. 01	Initial issue	Jul. 07, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.152MHz 53.25 (Margin -12.62dB) - QP	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 2390.00MHz 53.86 (Margin -0.14dB) - AV	Pass
15.247(b)(3)	Conducted Output Power	Max Power [dBm]: Non-beamforming mode 27.63 Beamforming mode 25.46	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:

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

Comments and Explanations:

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

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Sercomm	IP5446M	IP5446M	Main tested model.
	IP5446MXXX		the X should be 0 to 9, A to Z, a to z, "blank" or "-", for the marketing purpose

✦ All models are electrically identical, different model names are for marketing purpose.

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	4	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	4	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	4	MCS 0-31
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	4	MCS 0-31
2400-2483.5	ax (HE20)	2412-2462	1-11 [11]	4	MCS 0-11
2400-2483.5	ax (HE40)	2422-2452	3-9 [7]	4	MCS 0-11

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.
 Note 2: DBPSK, DQPSK, CCK modulation
 BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024QAM modulation.
 Note 3: 802.11ax supports beamforming function.

1.1.3 Antenna Details

Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
			2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
Ant_1	Dipole	UFL	3.1	3	3	2.6	2.4
Ant_2	Dipole	UFL	3	2.9	2.9	2.6	3.1
Ant_3	Dipole	UFL	3.1	3.2	3.2	3	2.9
Ant_4	Dipole	UFL	2.6	2.8	2.8	3	2.7

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter
-------------------	-----------------------

1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: MOSO Model: MS-V2500R120-030H0-US I/P: 100-240Vac, 50/60Hz, 1.0A max. O/P: 12.0Vdc, 2.5A Power Line: 1.45m non-shielded without core
2	AC adapter	Brand: MASS POWER Model: S030-1C120250VU I/P: 100-240Vac, 50/60Hz, 0.8A O/P: 12.0Vdc, 2.5A Power Line: 1.45m non-shielded without core

1.1.6 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20 / ax HE20		802.11n HT40 / ax HE40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	Non-beamforming: QATool_Dbg, V0.0.2.88 Beamforming: PuTTY, V0.60				
Duty Cycle and Duty Factor	Mode	Non-beamforming		Beamforming	
		Duty cycle (%)	Duty factor (dB)	Duty cycle (%)	Duty factor (dB)
	11b	99.56%	0.02	---	---
	11g	98.97%	0.05	---	---
	ax HE20	98.22%	0.08	99.48%	0.02
	ax HE40	95.97%	0.18	97.12%	0.13

1.1.8 Power Index of Test Tool

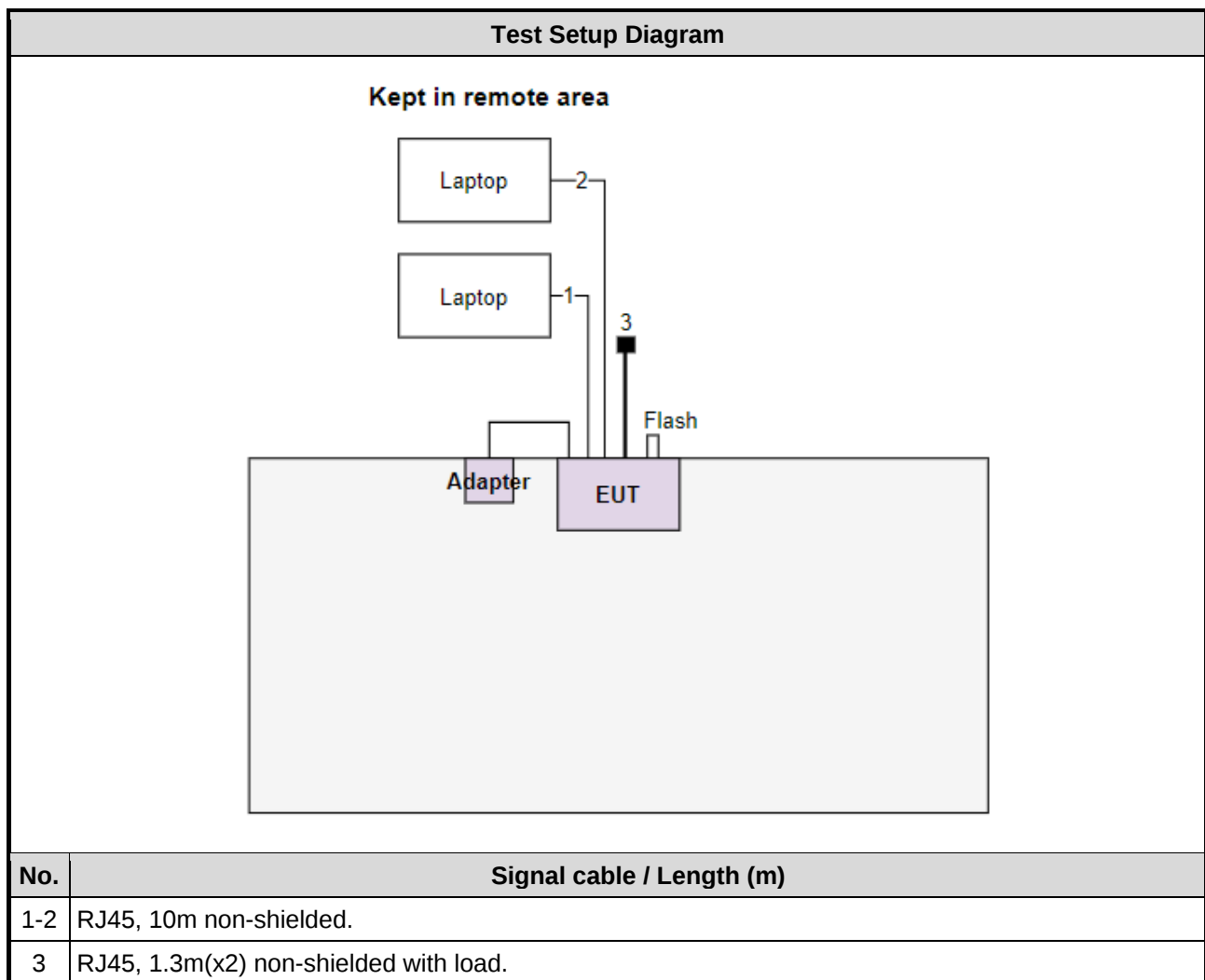
Modulation Mode	Test Frequency (MHz)	Power Index	
		Non-beamforming	Beamforming
11b	2412	17.5	---
11b	2437	19.5	---
11b	2462	16	---
11g	2412	16	---
11g	2437	19	---
11g	2462	15.5	---
ax HE20	2412	15	29
ax HE20	2437	18.5	36
ax HE20	2462	15	29
ax HE40	2422	13.5	26
ax HE40	2437	15.5	30
ax HE40	2452	14	27

1.2 Local Support Equipment List

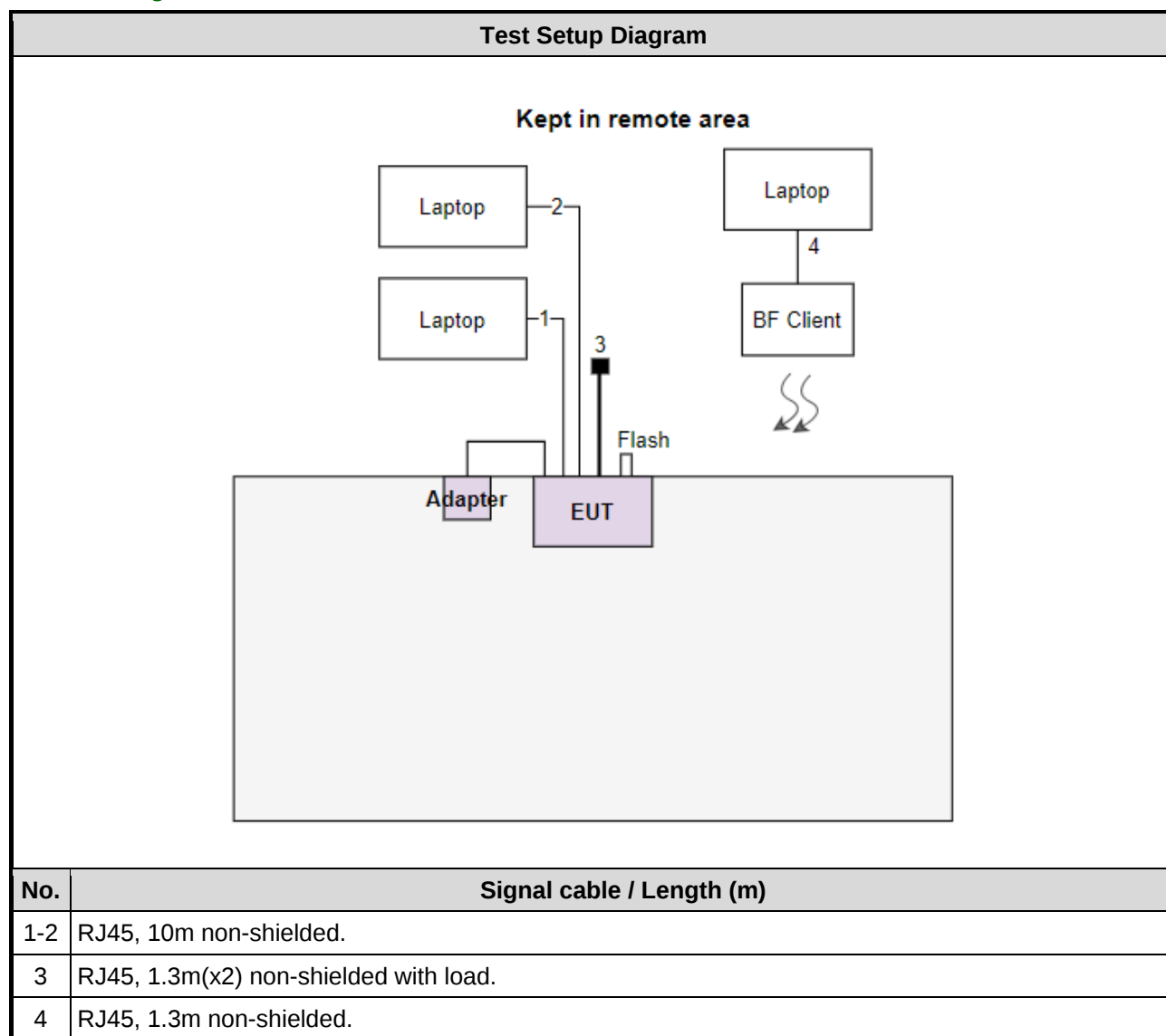
Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Laptop	DELL	Latitude 5400	DoC	---
2	Laptop	DELL	Latitude 3400	DoC	---
3	USB 3.0 flash	Kingston	DTSE9	---	---
4	RJ45 Load	ICC	---	---	---
5	Laptop	DELL	Latitude E5470	DoC	For Beamforming mode only.
6	BF Client	Sercomm	IP5446M	---	For Beamforming mode only. (Provided by applicant.)

1.3 Test Setup Chart

Non-beamforming mode



Beamforming mode



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	May 25, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 17, 2023	Feb. 16, 2024
LISN	R&S	ENV216	101579	May 09, 2023	May 08, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan .03, 2023	Jan .02, 2024
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 17, 2022	Oct. 16, 2023
50 ohm terminal (Support Unit)	NA	50	03	Jun. 08, 2022	Jun. 07, 2023
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber3 / (03CH03-WS)				
Tested Date	May 15 ~ May 22, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Spectrum Analyzer	R&S	FSV40	101499	Mar. 16, 2023	Mar. 15, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Jun. 28, 2022	Jun. 27, 2023
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Dec. 15, 2022	Dec. 14, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 27, 2022	Oct. 26, 2023
Preamplifier	EMC	EMC02325	980187	Jul. 16, 2022	Jul. 15, 2023
Preamplifier	EMC	EMC184045SE	980897	Aug. 01, 2022	Jul. 31, 2023
Preamplifier	EMC	EMC184045SE	980903	Jul. 16, 2022	Jul. 15, 2023
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 04, 2022	Oct. 03, 2023
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Sep. 23, 2022	Sep. 22, 2023
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Sep. 23, 2022	Sep. 22, 2023
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Sep. 23, 2022	Sep. 22, 2023
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Sep. 23, 2022	Sep. 22, 2023
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Sep. 23, 2022	Sep. 22, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	May 26 ~ Jun. 01, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
Measurement Software	Sporton	SENSE-15247_DTS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

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

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Unwanted Emission ≤ 1 GHz	± 3.96 dB
Unwanted Emission > 1 GHz	± 4.51 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)
Test Site	03CH03-WS
Address of Test Site	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISSED#: 10807C
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Non-beamforming mode				
AC Power Line Conducted Emission	11b	2437	1 Mbps	---
Unwanted Emissions ≤ 1GHz	11b	2437	1 Mbps	---
Unwanted Emissions >1GHz	11b	2412 / 2437 / 2462	1 Mbps	---
Conducted Output Power	11g	2412 / 2437 / 2462	6 Mbps	
6dB bandwidth	ax HE20	2412 / 2437 / 2462	MCS 0	
Power spectral density	ax HE40	2422 / 2437 / 2452	MCS 0	
Beamforming mode				
AC Power Line Conducted Emission	ax HE20	2437	MCS 0	---
Unwanted Emissions ≤1GHz	ax HE20	2437	MCS 0	---
Unwanted Emissions >1GHz	ax HE20 ax HE40	2412 / 2437 / 2462 2422 / 2437 / 2452	MCS 0 MCS 0	---
Conducted Output Power				
6dB bandwidth				
Power spectral density				
Note: Two adapters (MOSO & MASS POWER) had been covered during the pretest and found that MOSO adapter was the worst case and was selected for final testing.				

3 Transmitter Test Results

3.1 6dB and Occupied Bandwidth

3.1.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.1.2 Test Procedures

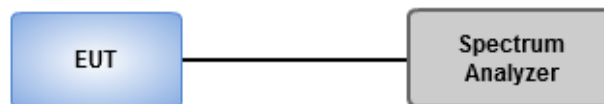
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	23-28°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

Antenna gain $> 6\text{dBi}$

Non Fixed, point to point operations.

The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

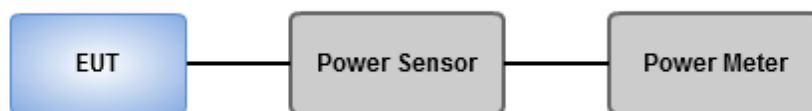
Fixed, point to point operations

Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	23-28°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix B.

3.3 Power Spectral Density

3.3.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.3.2 Test Procedures

Peak PSD

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

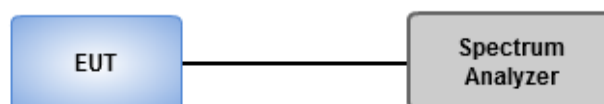
Average PSD, duty cycle $\geq 98\%$

1. Set the RBW = 30 kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

Average PSD, duty cycle $< 98\%$

1. Set the RBW = 30 kHz, VBW = 100 kHz. Detector = RMS.
2. Set the sweep time to: ≥ 10 (number of measurement points in sweep) $\times$ (total on/off period of the transmitted signal).
3. Perform the measurement over a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log (1/x)$, where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	23-28°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix C.

3.4 Unwanted Emissions into Restricted Frequency Bands

3.4.1 Limit of Unwanted Emissions into Restricted Frequency Bands

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

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

3.4.2 Test Procedures

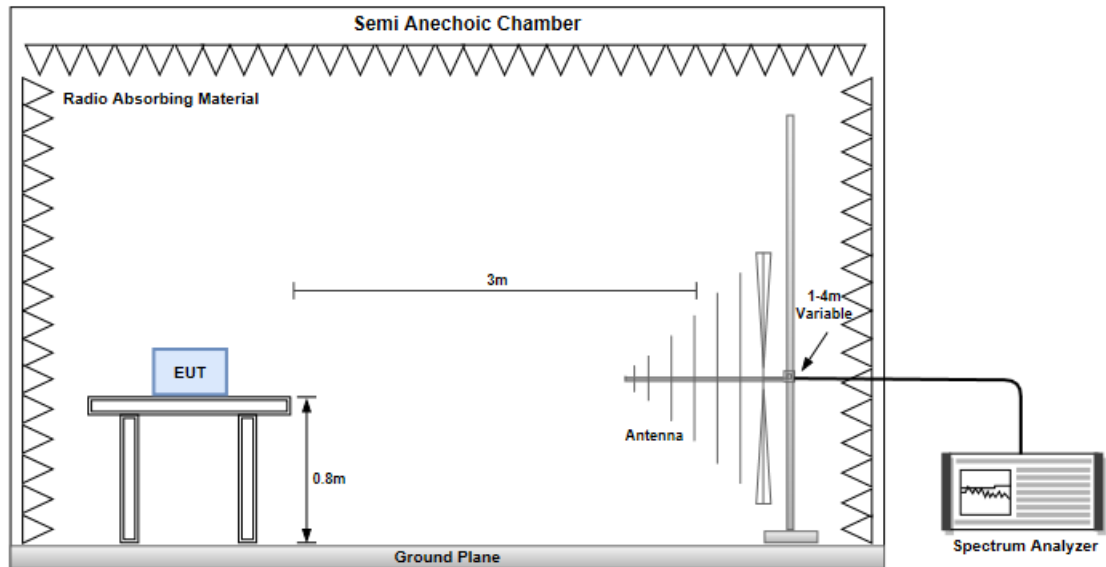
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

Note:

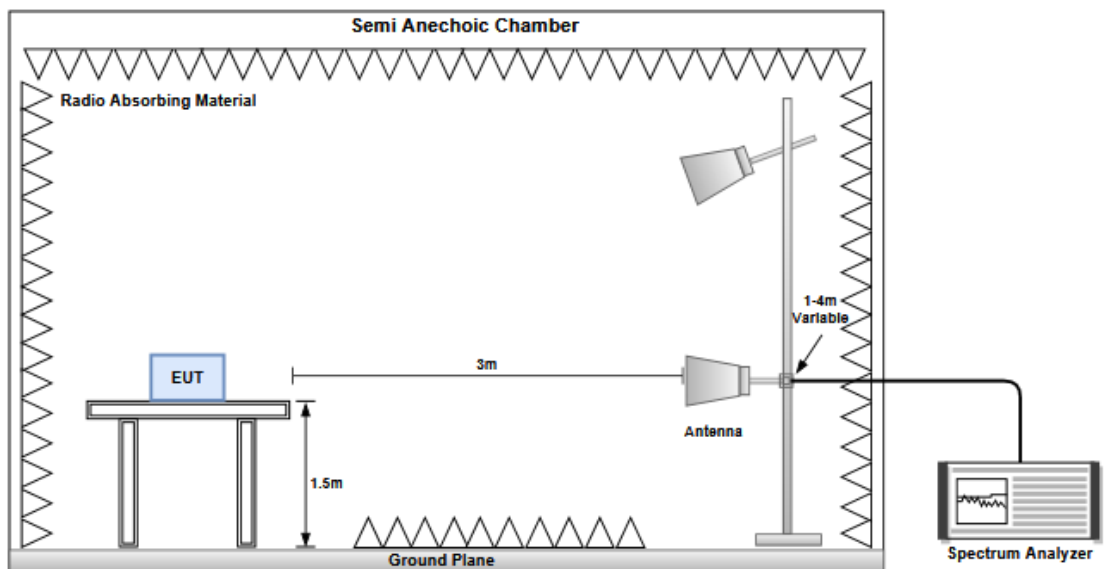
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.4.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Emissions in Non-Restricted Frequency Bands

3.5.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.5.2 Test Procedures

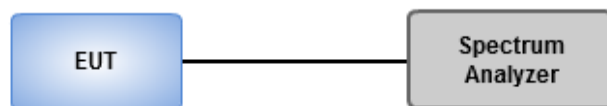
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	23-28°C / 62-63%	Tested By	Brad Wu
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

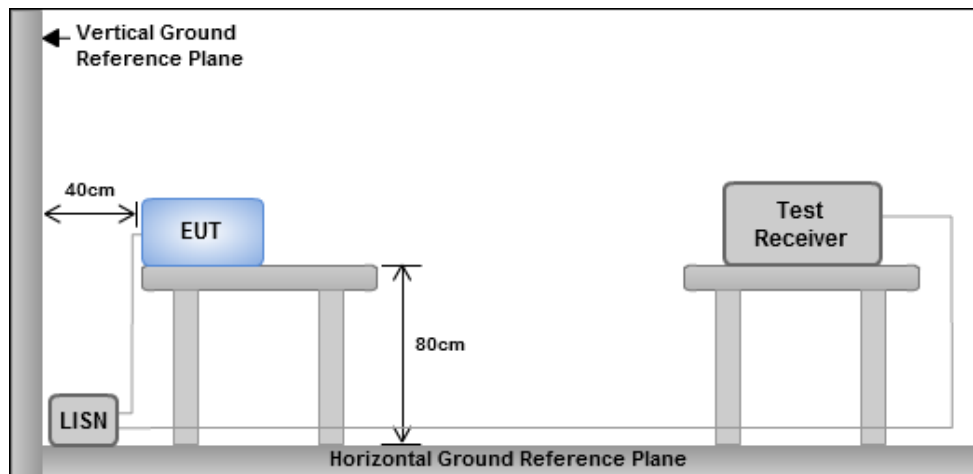
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.6.2 Test Procedures

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

3.6.3 Test Setup



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

3.6.4 Test Results

Refer to Appendix F.

4 Test laboratory information

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

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

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

Linkou

Tel: 886-2-2601-1640

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

Kwei Shan

Tel: 886-3-271-8666

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

Kwei Shan Site II

Tel: 886-3-271-8640

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

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

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==

Non-beamforming mode
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_4TX	8.525M	13.538M	13M5G1D	7.55M	12.624M
802.11g_Nss1,(6Mbps)_4TX	16.325M	17.899M	17M9D1D	15.725M	16.646M
802.11ax HEW20_Nss1,(MCS0)_4TX	18.775M	19.14M	19M1D1D	17.825M	18.866M
802.11ax HEW40_Nss1,(MCS0)_4TX	36.75M	37.731M	37M7D1D	34.95M	37.631M

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	8M	12.684M	8.05M	12.624M	8.025M	12.714M	8.025M	12.789M
2437MHz	Pass	500k	8.025M	13.478M	7.55M	13.163M	8.05M	13.508M	8.525M	13.538M
2462MHz	Pass	500k	7.975M	12.654M	7.975M	12.639M	8.05M	12.744M	8.025M	12.699M
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	16.025M	16.734M	16.275M	16.668M	16.325M	16.646M	16.3M	16.69M
2437MHz	Pass	500k	16.25M	17.635M	16.275M	17.217M	16.325M	17.899M	16.275M	17.855M
2462MHz	Pass	500k	16.025M	16.668M	15.725M	16.646M	16.3M	16.668M	16.25M	16.668M
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.55M	18.866M	18.775M	18.916M	18.7M	18.866M	18.575M	18.891M
2437MHz	Pass	500k	18.7M	19.115M	18.075M	19.065M	18.625M	19.115M	17.825M	19.14M
2462MHz	Pass	500k	18.475M	18.991M	18.425M	19.04M	18.45M	18.991M	18.375M	18.966M
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	35.65M	37.731M	36.25M	37.681M	35.05M	37.681M	35.55M	37.681M
2437MHz	Pass	500k	35.85M	37.731M	35.1M	37.731M	35.1M	37.681M	35M	37.681M
2452MHz	Pass	500k	34.95M	37.681M	35.05M	37.631M	35.05M	37.731M	36.75M	37.631M

Port X-N dB = Port X 6dB down bandwidth;

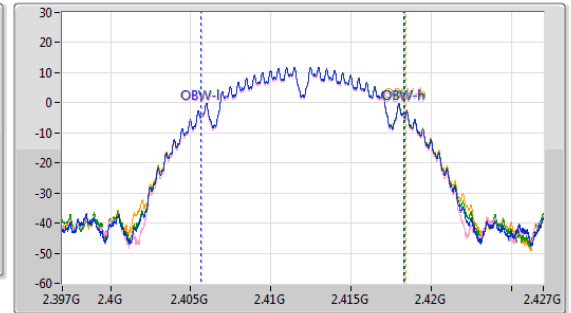
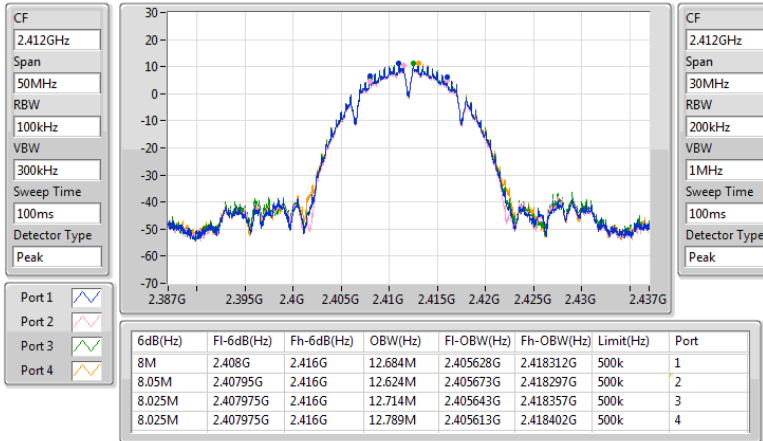
Port X-OBW = Port X 99% occupied bandwidth



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

EBW

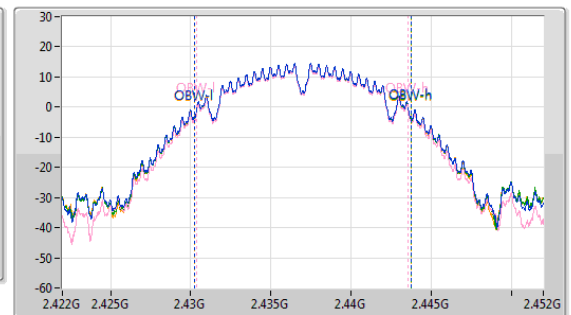
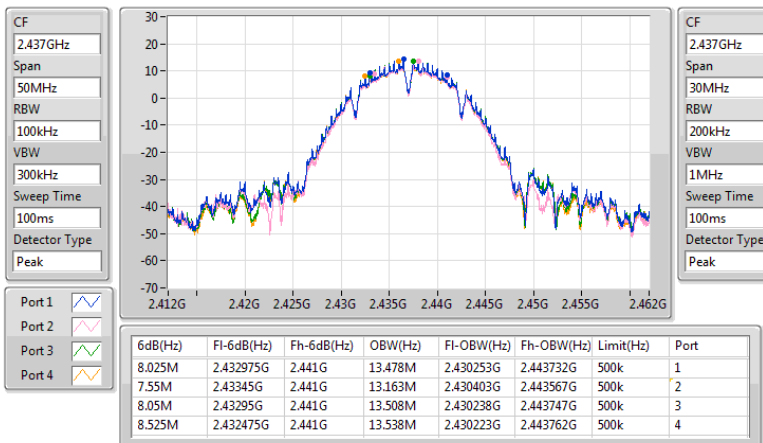
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2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

EBW

2437MHz

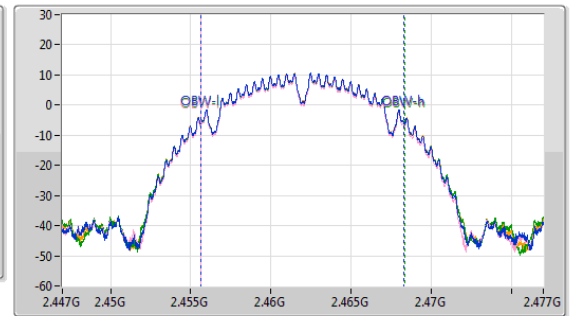
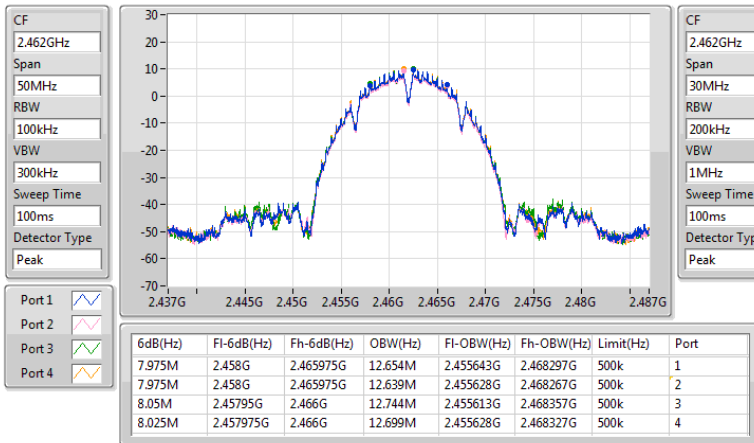




2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

EBW

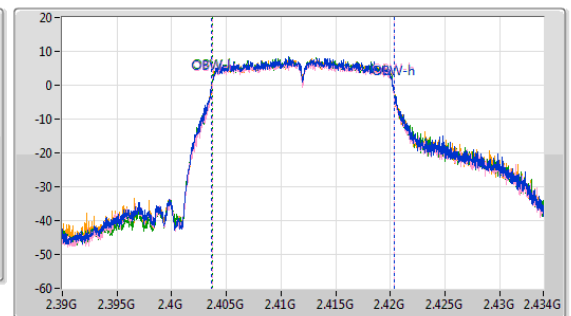
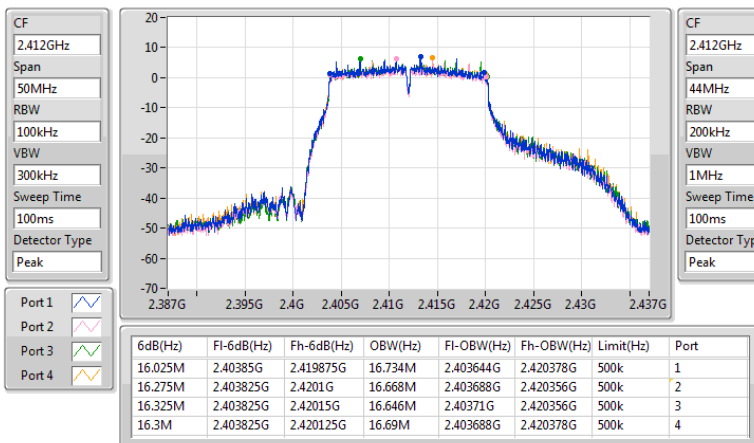
2462MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

EBW

2412MHz

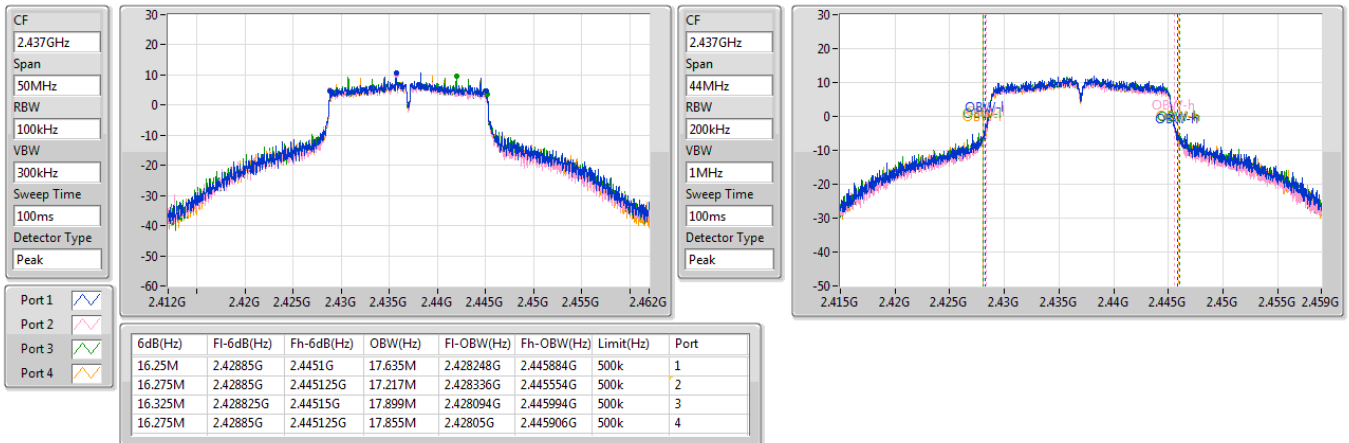




2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

EBW

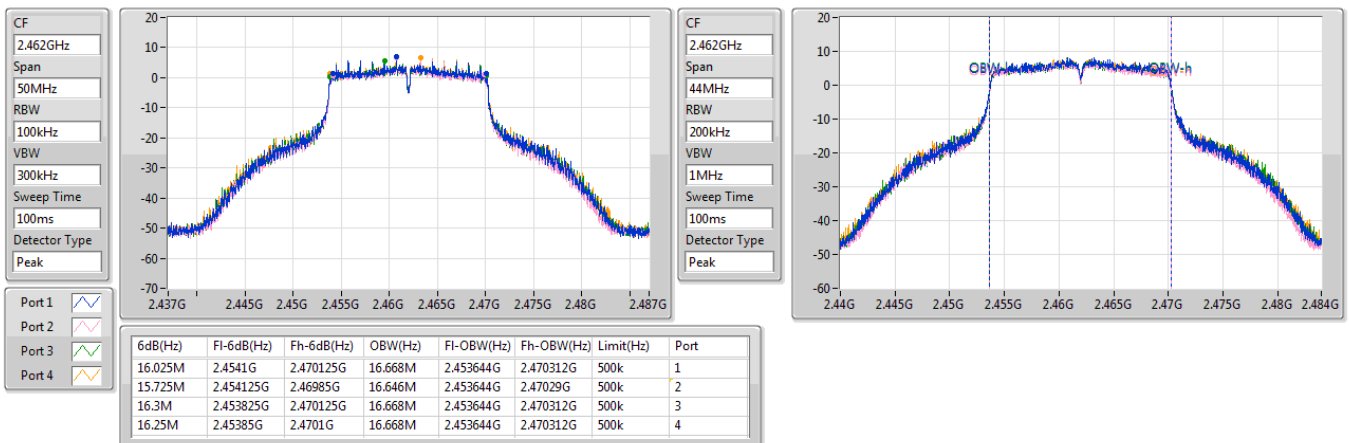
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2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

EBW

2462MHz

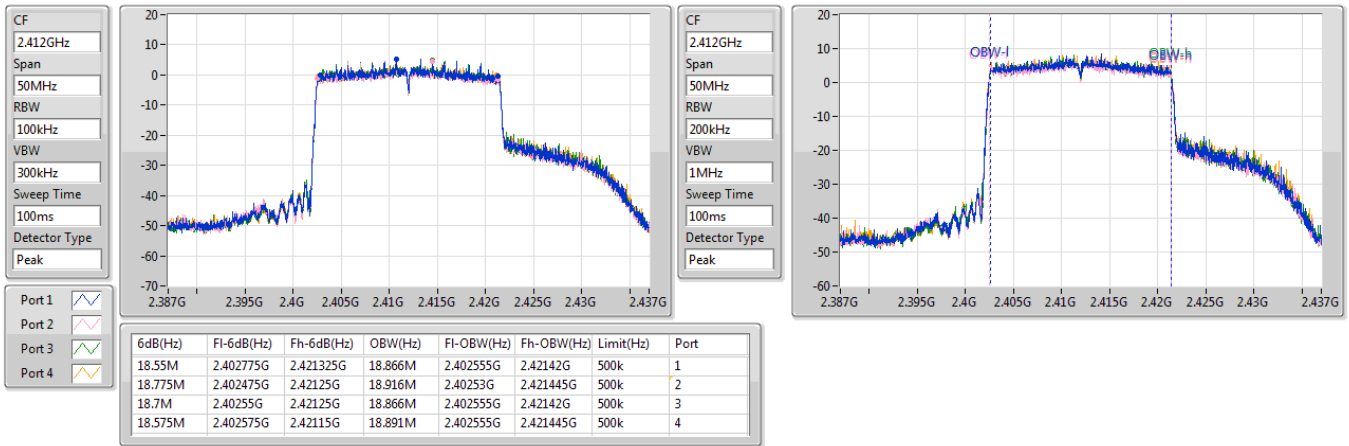




2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

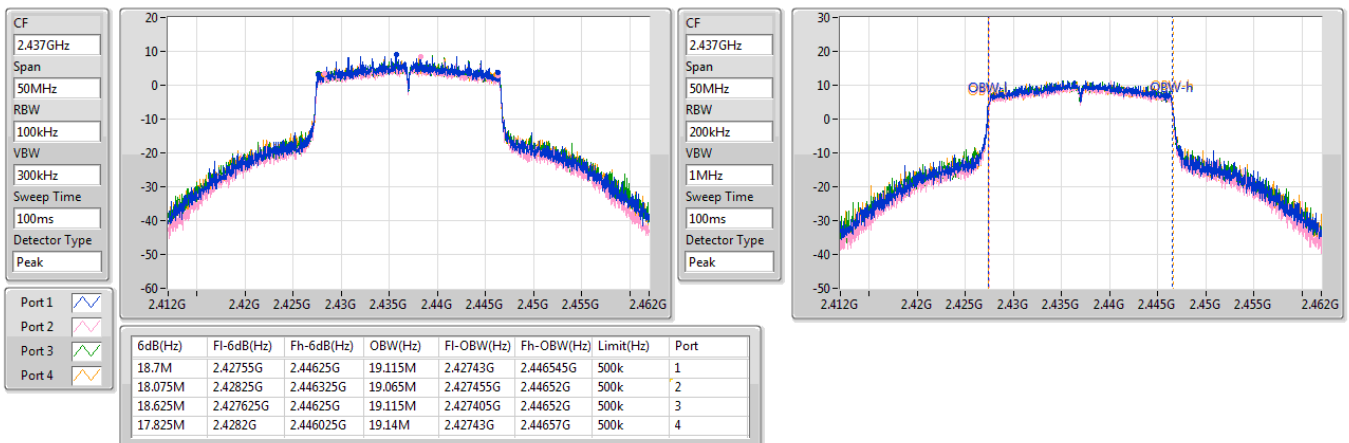
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2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

2437MHz

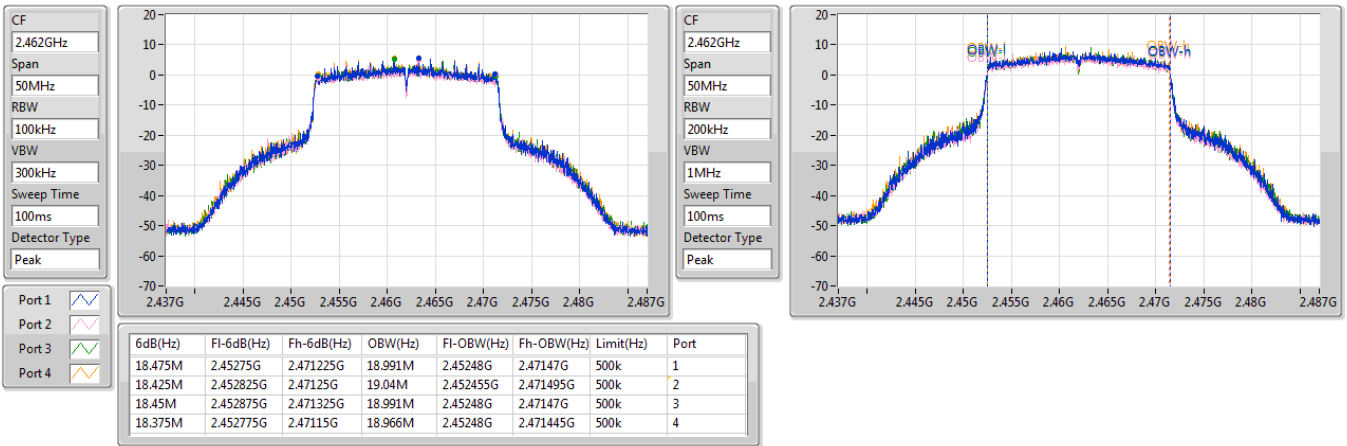




2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

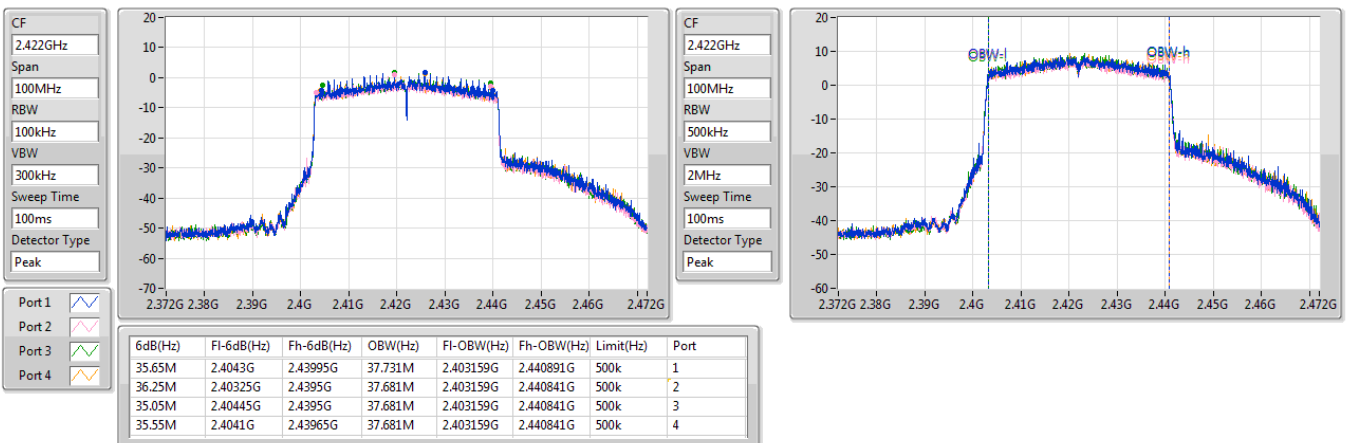
2462MHz



2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

2422MHz

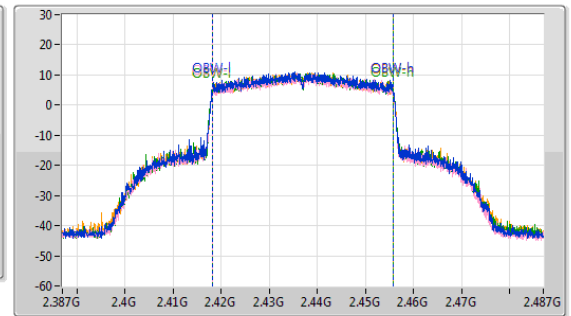
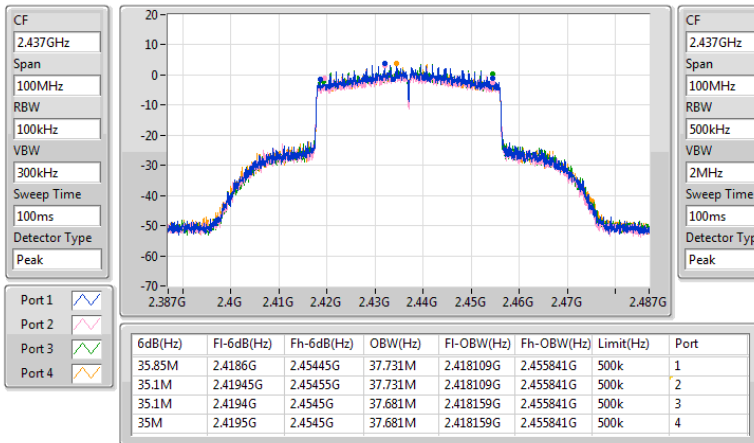




2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

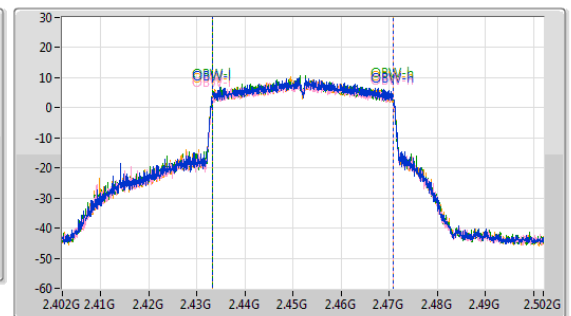
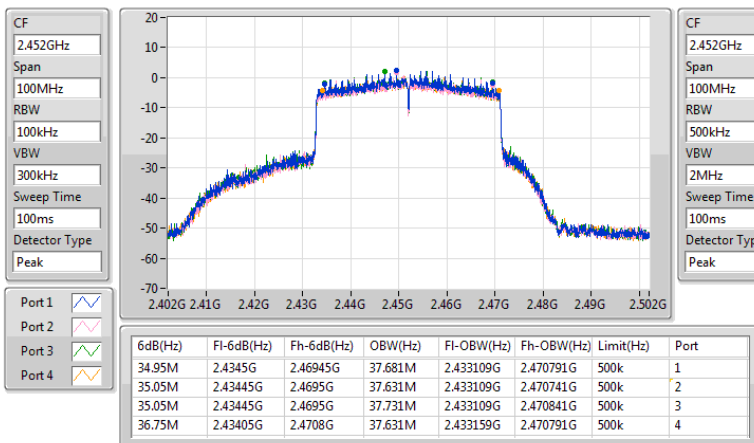
2437MHz



2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

2452MHz



Beamforming mode
Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	18.925M	19.19M	19M2D1D	17.05M	18.866M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	38.15M	38.081M	38M1D1D	36.55M	36.882M

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

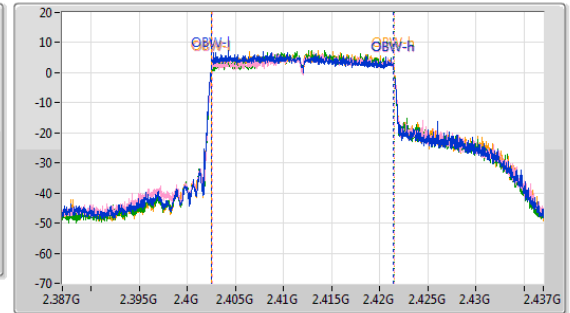
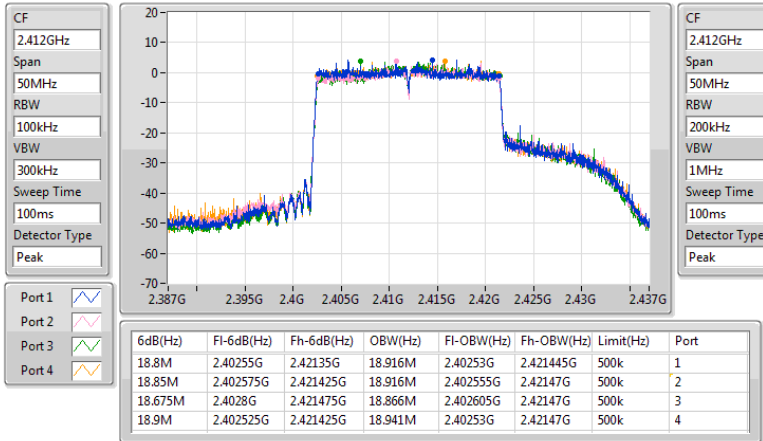
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)	Port 3-N dB (Hz)	Port 3-OBW (Hz)	Port 4-N dB (Hz)	Port 4-OBW (Hz)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.8M	18.916M	18.85M	18.916M	18.675M	18.866M	18.9M	18.941M
2437MHz	Pass	500k	18.675M	19.065M	18.925M	19.115M	18.25M	19.115M	18.775M	19.19M
2462MHz	Pass	500k	18.05M	19.015M	17.05M	18.866M	17.95M	18.966M	18.5M	18.991M
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	37.5M	37.831M	37.55M	37.831M	37.85M	37.831M	37.8M	37.731M
2437MHz	Pass	500k	37.45M	37.781M	37.1M	37.831M	37.75M	37.831M	36.55M	38.081M
2452MHz	Pass	500k	38.15M	38.081M	36.6M	36.882M	37.3M	37.581M	37.35M	37.731M

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

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

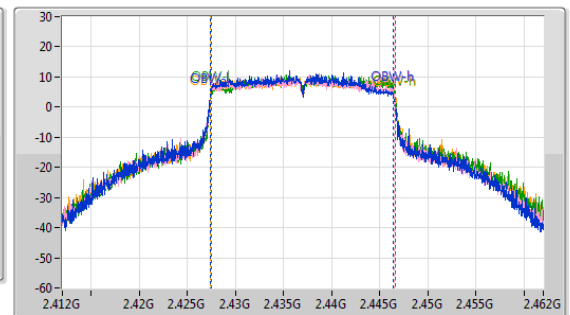
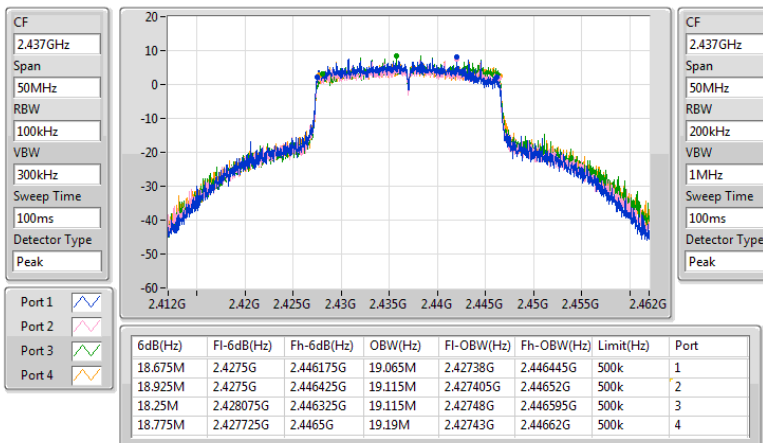
2412MHz



2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

2437MHz

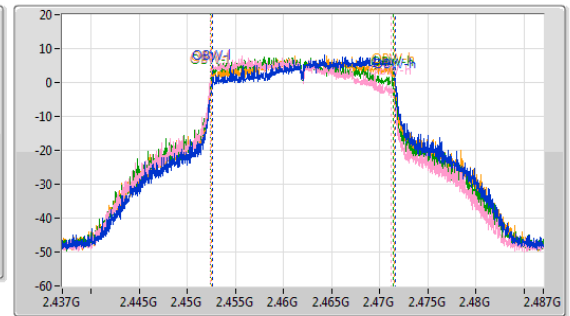
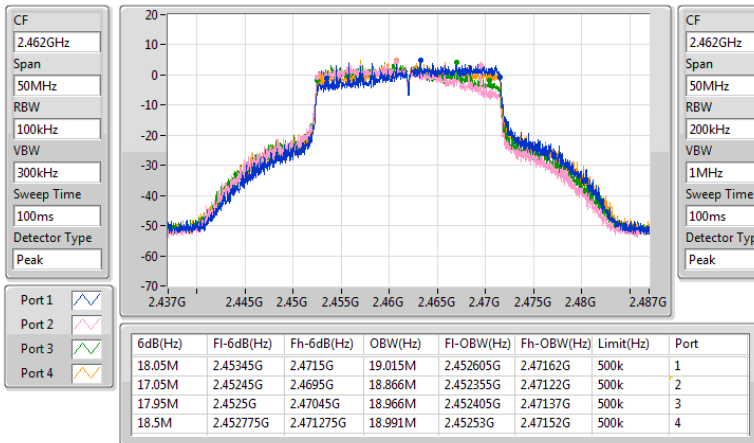




2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

EBW

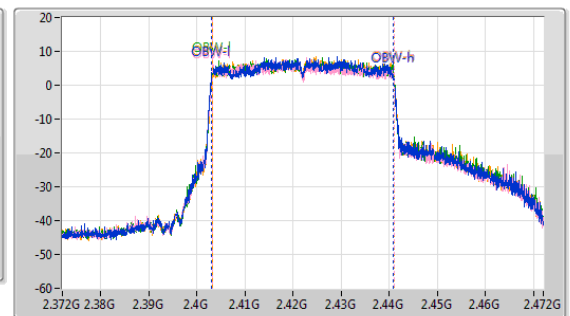
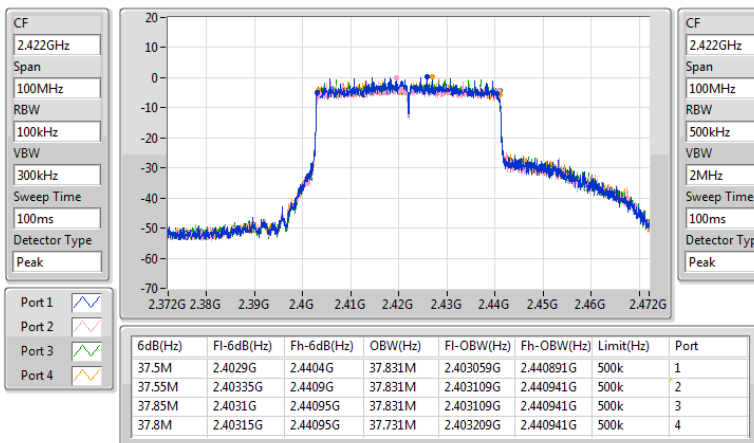
2462MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

EBW

2422MHz

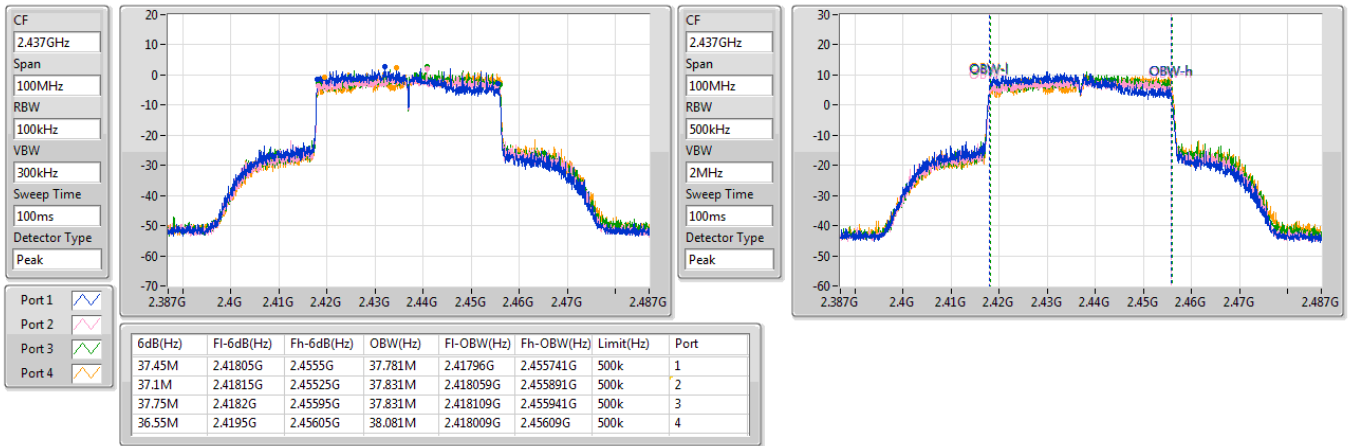




2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

EBW

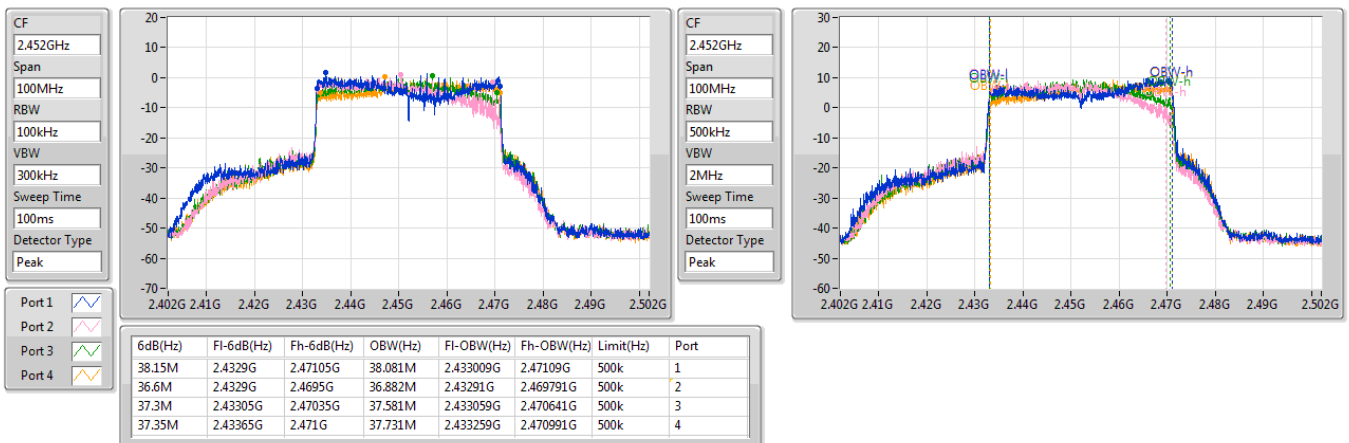
2437MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

EBW

2452MHz



Non-beamforming mode
Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_4TX	27.63	0.57943
802.11g_Nss1,(6Mbps)_4TX	26.88	0.48753
802.11ax HEW20_Nss1,(MCS0)_4TX	25.96	0.39446
802.11ax HEW40_Nss1,(MCS0)_4TX	23.14	0.20606

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	3.10	19.68	18.94	19.56	19.72	25.51	30.00	28.61	36.00
2437MHz	Pass	3.10	21.93	21.23	21.75	21.51	27.63	30.00	30.73	36.00
2462MHz	Pass	3.10	17.92	17.25	17.78	18.18	23.82	30.00	26.92	36.00
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	3.10	17.89	17.24	17.82	18.04	23.78	30.00	26.88	36.00
2437MHz	Pass	3.10	21.15	20.42	21.02	20.82	26.88	30.00	29.98	36.00
2462MHz	Pass	3.10	17.92	17.28	17.69	18.01	23.75	30.00	26.85	36.00
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	3.10	16.48	15.82	16.48	16.62	22.38	30.00	25.48	36.00
2437MHz	Pass	3.10	20.16	19.47	20.1	19.98	25.96	30.00	29.06	36.00
2462MHz	Pass	3.10	16.39	15.77	16.23	16.52	22.26	30.00	25.36	36.00
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	3.10	15.37	14.65	15.25	15.31	21.17	30.00	24.27	36.00
2437MHz	Pass	3.10	17.33	16.67	17.22	17.24	23.14	30.00	26.24	36.00
2452MHz	Pass	3.10	15.75	15.12	15.58	15.49	21.51	30.00	24.61	36.00

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

Note : Conducted average output power is for reference

Beamforming mode
Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	25.46	0.35156
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	22.71	0.18664

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Port 3 (dBm)	Port 4 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	8.97	16.08	15.53	16.08	16.26	22.02	27.03	30.99	36.00
2437MHz	Pass	8.97	19.8	18.96	19.54	19.43	25.46	27.03	34.43	36.00
2462MHz	Pass	8.97	15.93	15.37	16	16.21	21.91	27.03	30.88	36.00
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	8.97	14.89	14.23	14.68	14.82	20.68	27.03	29.65	36.00
2437MHz	Pass	8.97	16.86	16.27	16.8	16.8	22.71	27.03	31.68	36.00
2452MHz	Pass	8.97	15.36	14.7	15.11	15.12	21.10	27.03	30.07	36.00

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

Note : Conducted average output power is for reference

Remarks:

Directional gain = $10 \times \log((10^{3.1/20} + 10^{3/20} + 10^{3.1/20} + 10^{2.6/20})^2 / 4) = 8.97 \text{ dBi} > 6 \text{ dBi}$, so the limit shall be reduced to 30 dBm – (8.97dBi – 6dBi) = 27.03 dBm

Non-beamforming mode
Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_4TX	-2.97
802.11g_Nss1,(6Mbps)_4TX	-6.27
802.11ax HEW20_Nss1,(MCS0)_4TX	-7.42
802.11ax HEW40_Nss1,(MCS0)_4TX	-12.71

RBW = 3kHz;

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	8.97	-10.17	-10.31	-9.94	-9.54	-5.34	5.03
2437MHz	Pass	8.97	-7.38	-7.91	-7.44	-8.05	-2.97	5.03
2462MHz	Pass	8.97	-11.22	-11.87	-11.40	-11.26	-6.52	5.03
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	8.97	-13.90	-14.58	-14.38	-13.56	-9.79	5.03
2437MHz	Pass	8.97	-11.20	-11.18	-11.32	-11.07	-6.27	5.03
2462MHz	Pass	8.97	-14.77	-14.90	-14.63	-14.13	-9.60	5.03
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	8.97	-17.01	-17.64	-17.13	-16.27	-11.83	5.03
2437MHz	Pass	8.97	-12.63	-12.41	-13.14	-13.11	-7.42	5.03
2462MHz	Pass	8.97	-16.35	-17.27	-16.70	-16.53	-11.70	5.03
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	8.97	-20.00	-21.06	-19.94	-20.33	-14.59	5.03
2437MHz	Pass	8.97	-18.23	-18.78	-17.50	-17.79	-12.71	5.03
2452MHz	Pass	8.97	-19.64	-20.70	-19.32	-19.56	-14.43	5.03

DG = Directional Gain; RBW = 3kHz;

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

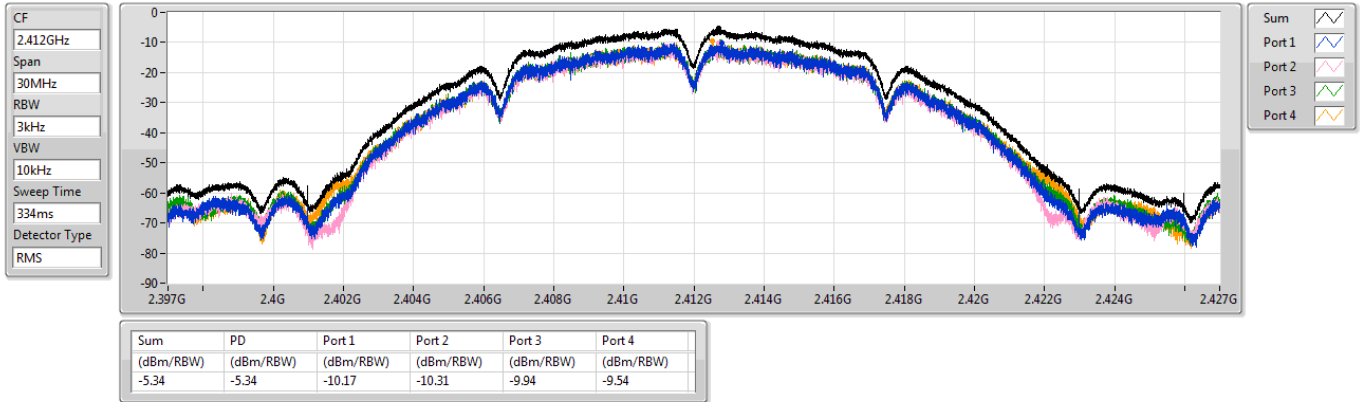
Remarks:

Directional gain = $10 \times \log((10^{3.1/20} + 10^{3/20} + 10^{3.1/20} + 10^{2.6/20})^2 / 4) = 8.97 \text{ dBi} > 6\text{dBi}$, so the limit shall be reduced to 8 dBm – (8.97dBi – 6dBi) = 5.03 dBm

2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

PSD

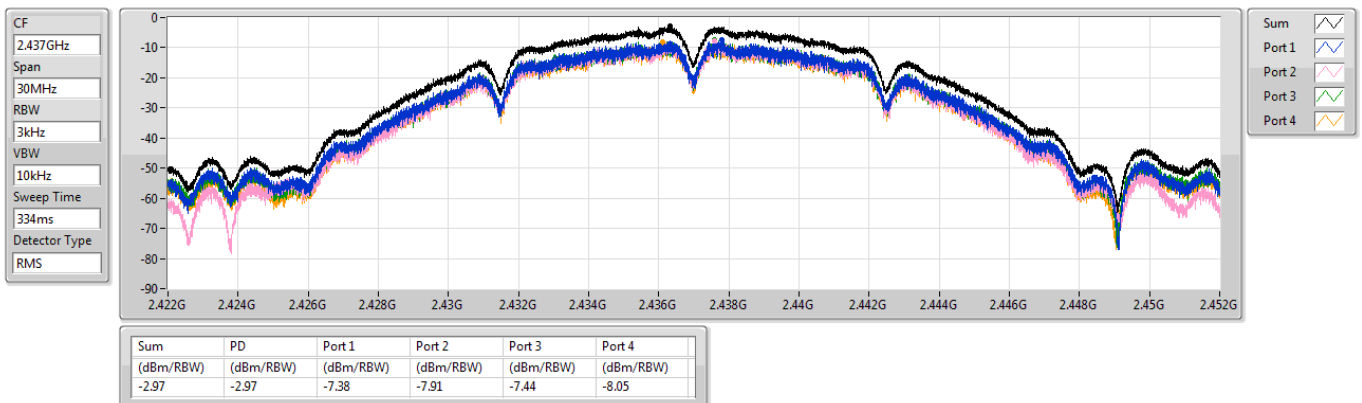
2412MHz



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

PSD

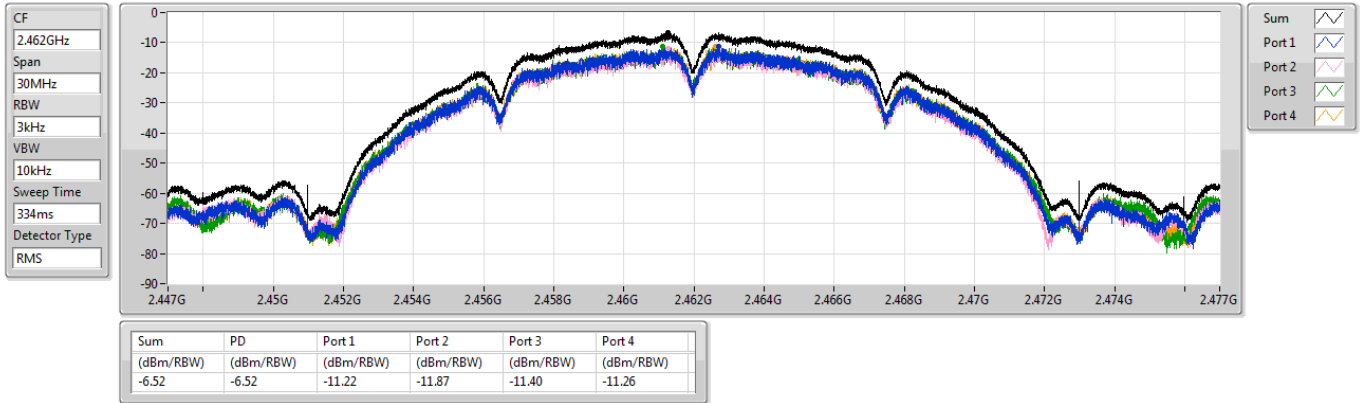
2437MHz



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

PSD

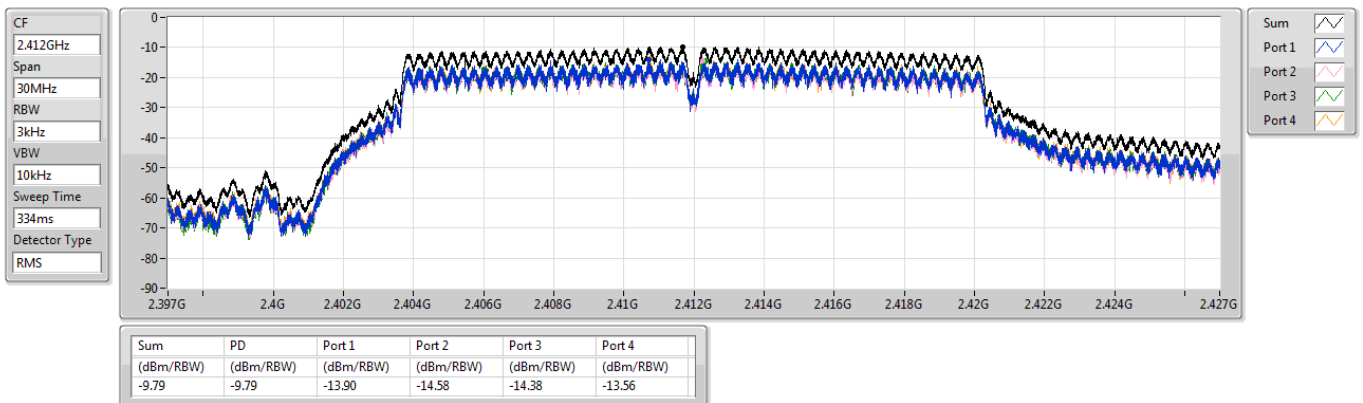
2462MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

PSD

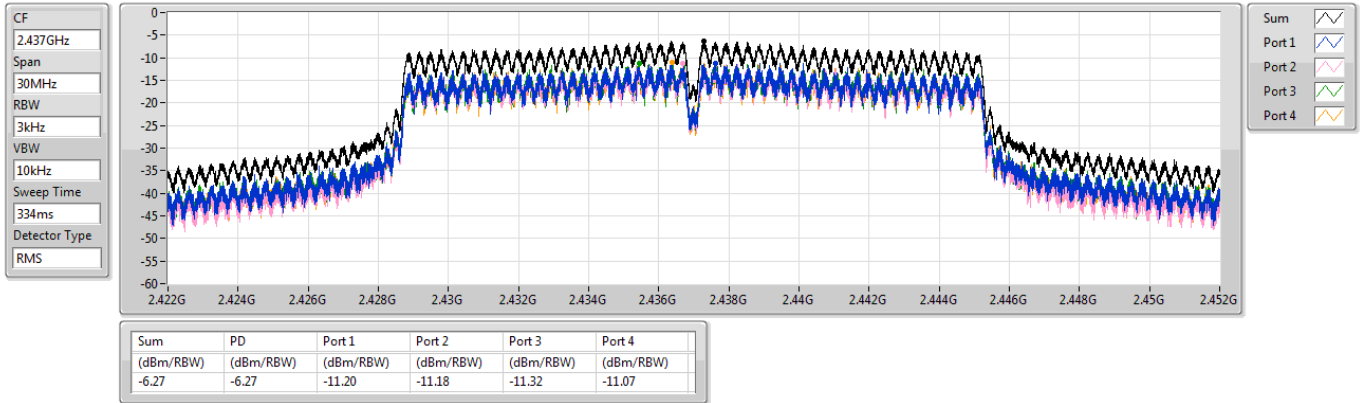
2412MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

PSD

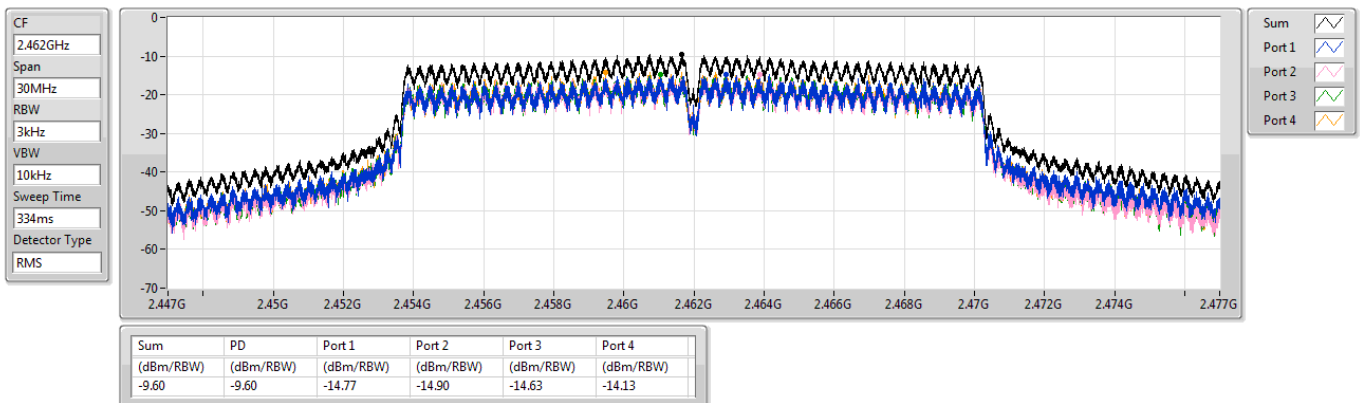
2437MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

PSD

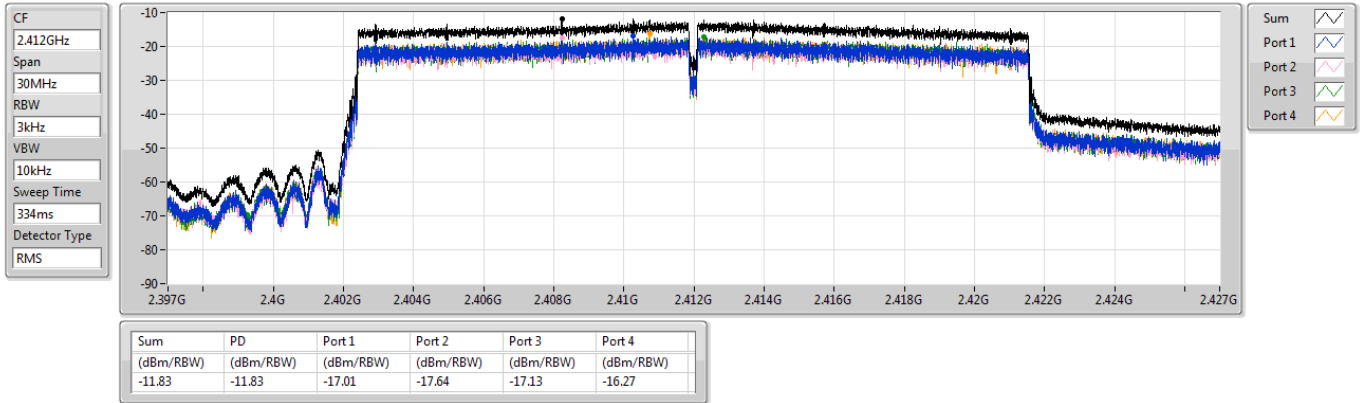
2462MHz



2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

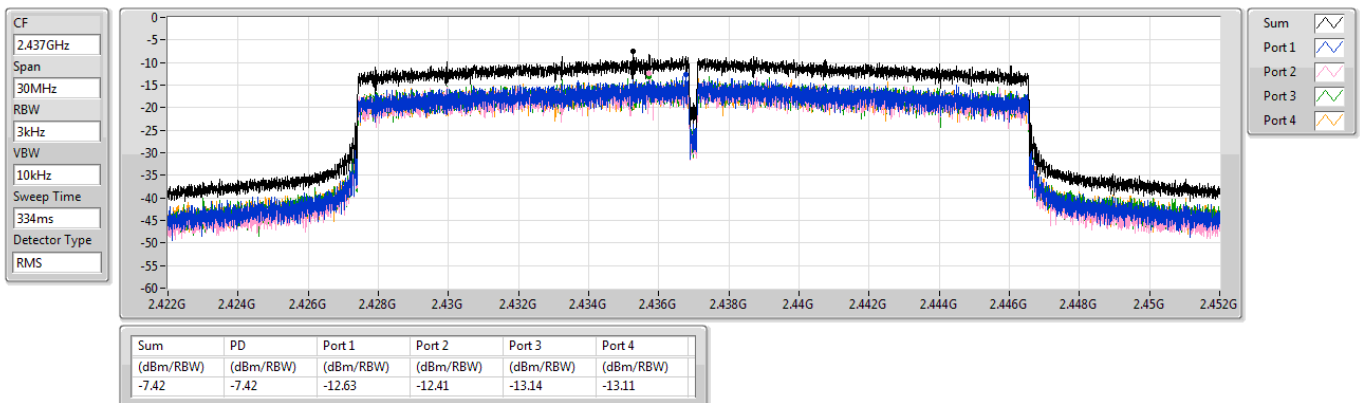
2412MHz



2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

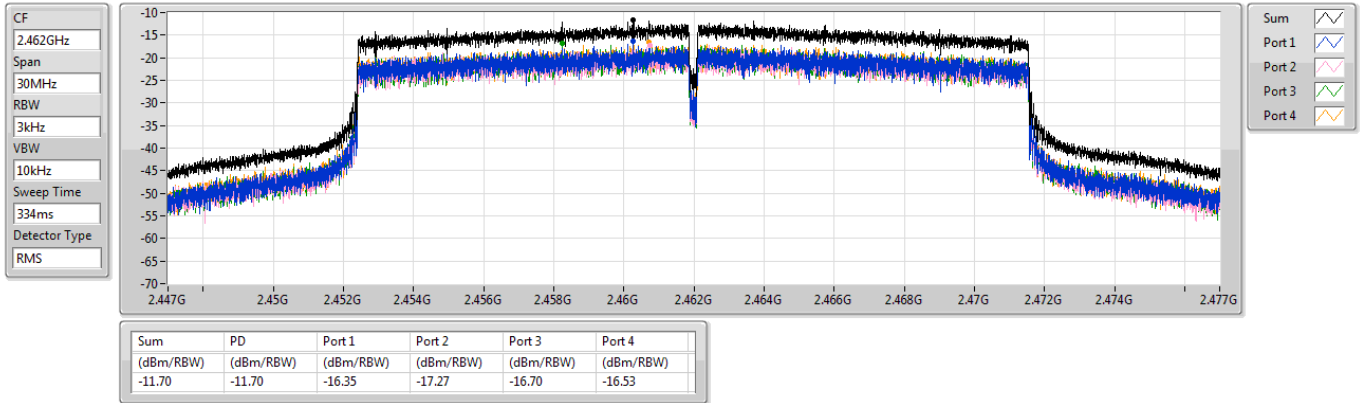
2437MHz



2.4-2.4835GHz_802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

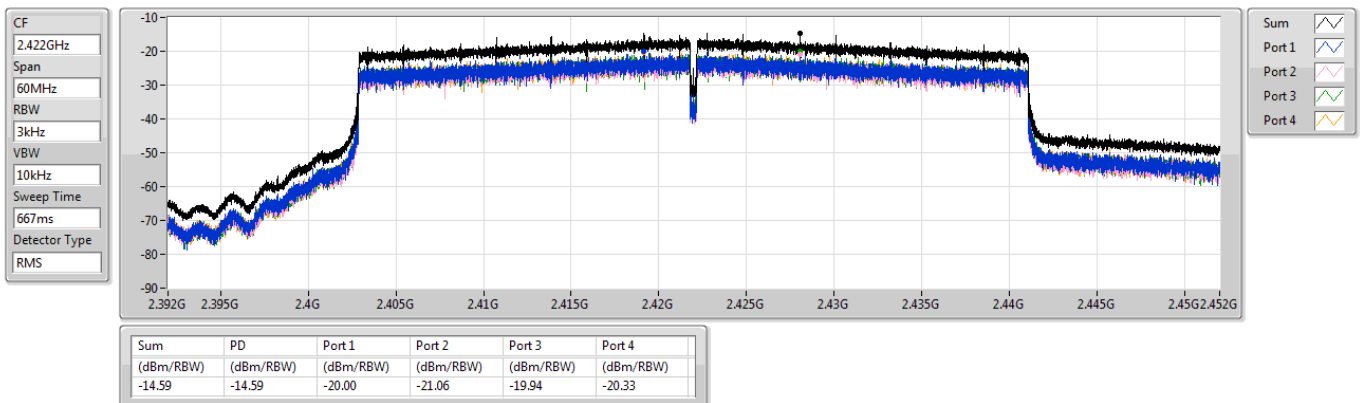
2462MHz



2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

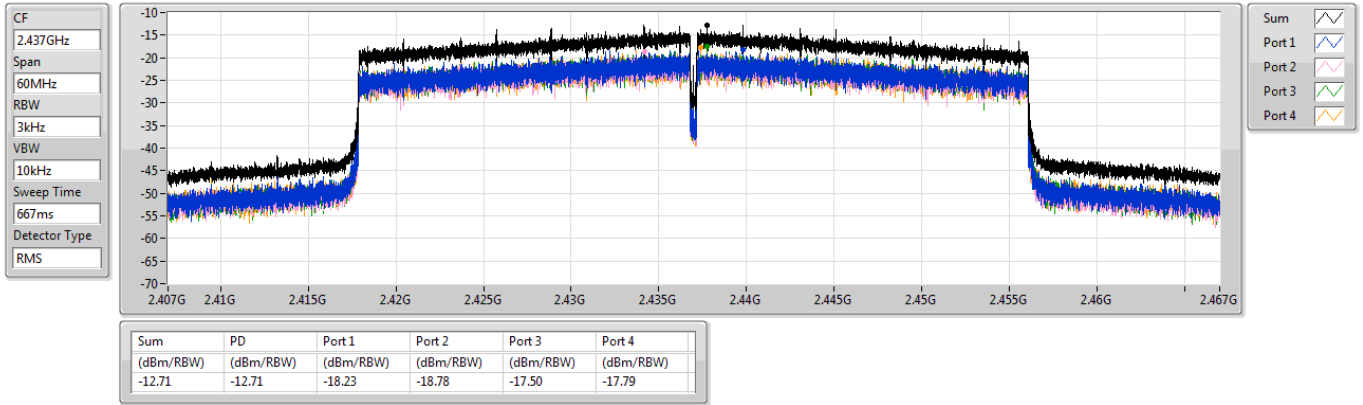
2422MHz



2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

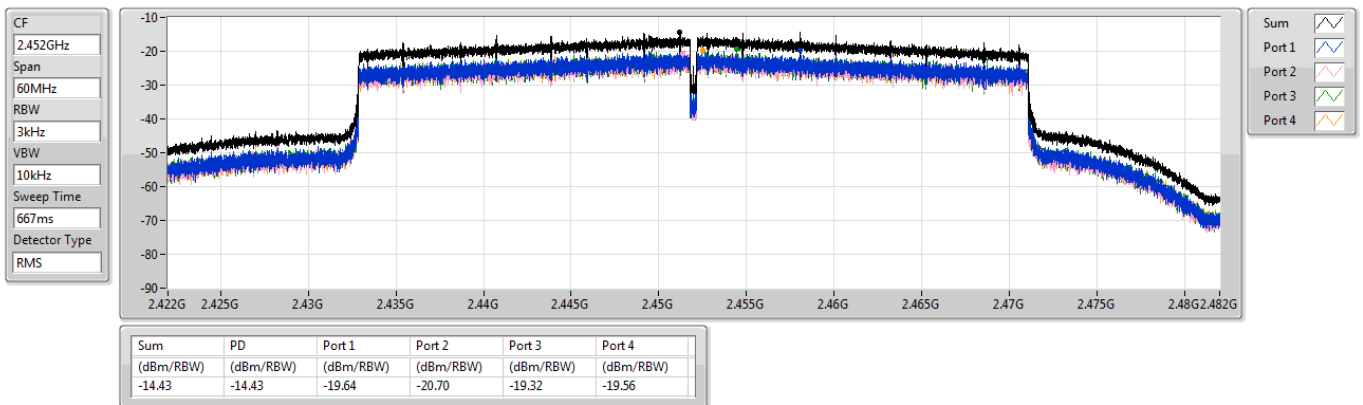
2437MHz



2.4-2.4835GHz_802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

2452MHz



Beamforming mode
Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-9.12
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-14.48

RBW = 3kHz;

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)
802.11ax HEW20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	8.97	-17.24	-18.28	-17.77	-18.05	-13.38	5.03
2437MHz	Pass	8.97	-13.95	-14.96	-14.06	-14.00	-9.12	5.03
2462MHz	Pass	8.97	-16.72	-16.40	-17.37	-16.87	-12.03	5.03
802.11ax HEW40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	8.97	-21.20	-21.71	-22.51	-21.75	-16.91	5.03
2437MHz	Pass	8.97	-19.47	-19.58	-19.26	-20.17	-14.48	5.03
2452MHz	Pass	8.97	-19.62	-20.68	-19.57	-20.24	-16.05	5.03

DG = Directional Gain; RBW = 3kHz;

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

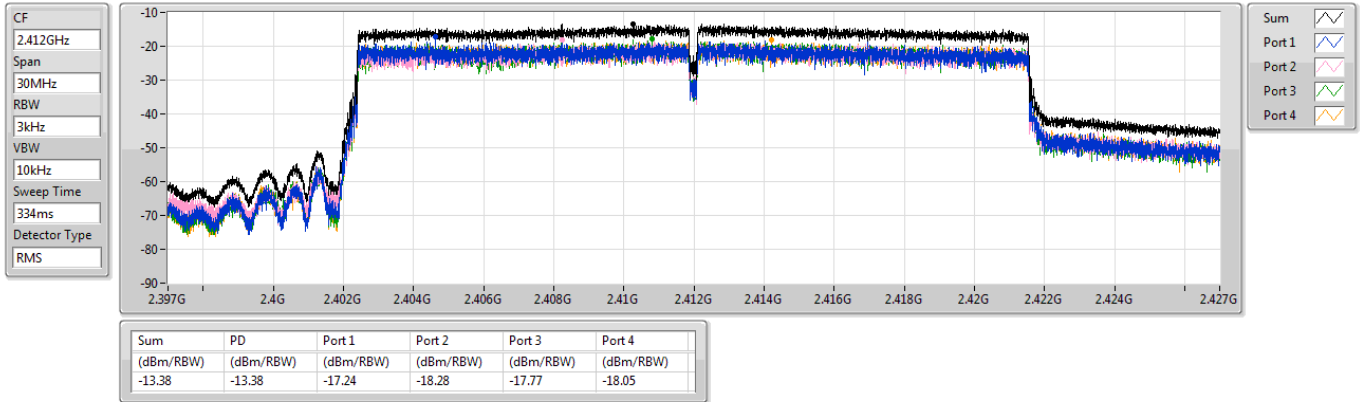
Remarks:

Directional gain = $10 \times \log((10^{3.1/20} + 10^{3/20} + 10^{3.1/20} + 10^{2.6/20})^2 / 4) = 8.97 \text{ dBi} > 6\text{dBi}$, so the limit shall be reduced to 8 dBm – (8.97dBi – 6dBi) = 5.03 dBm

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

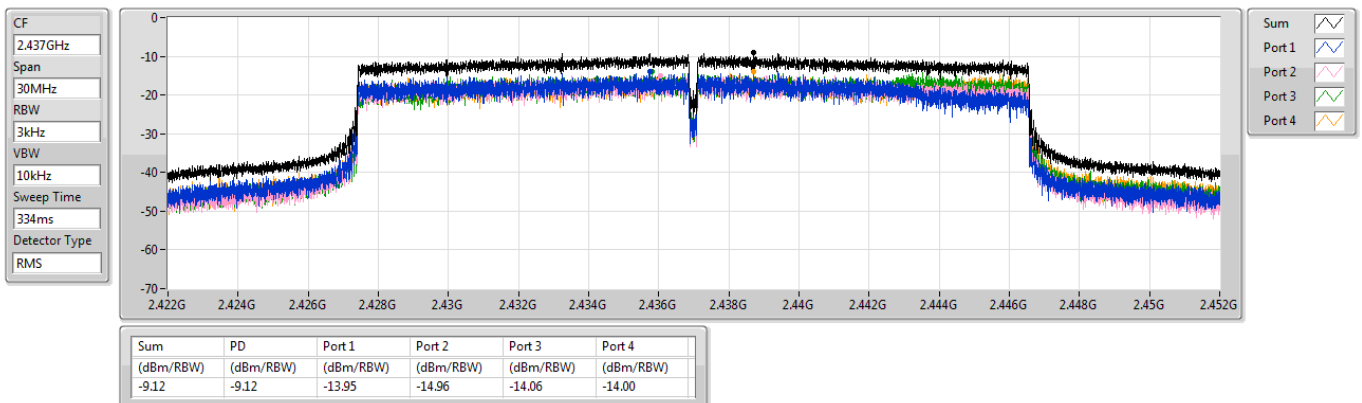
2412MHz



2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

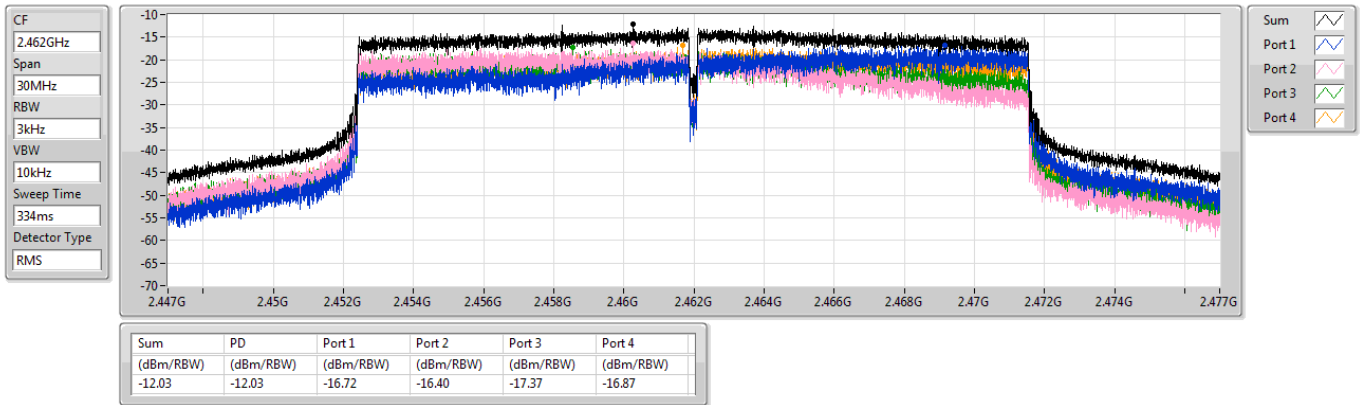
2437MHz



2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

PSD

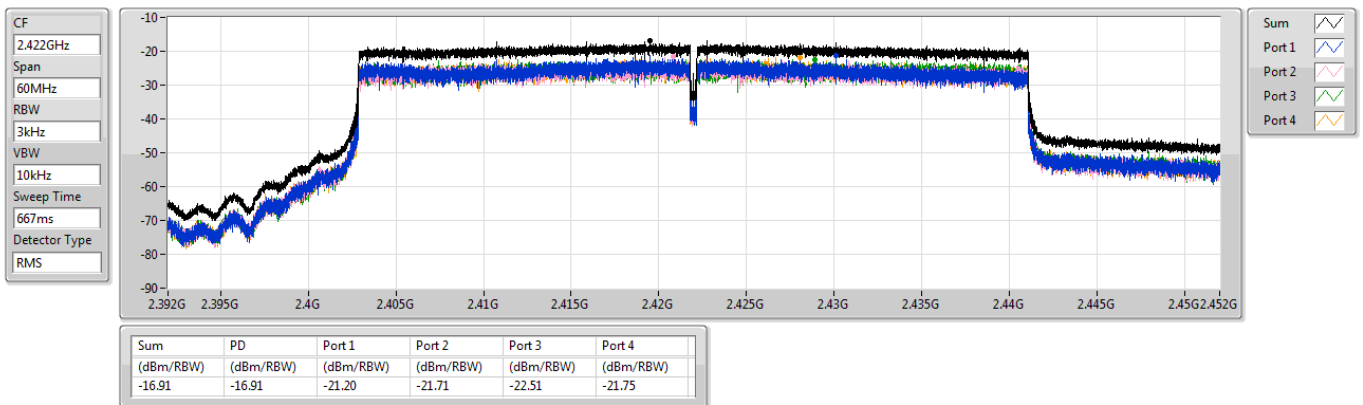
2462MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

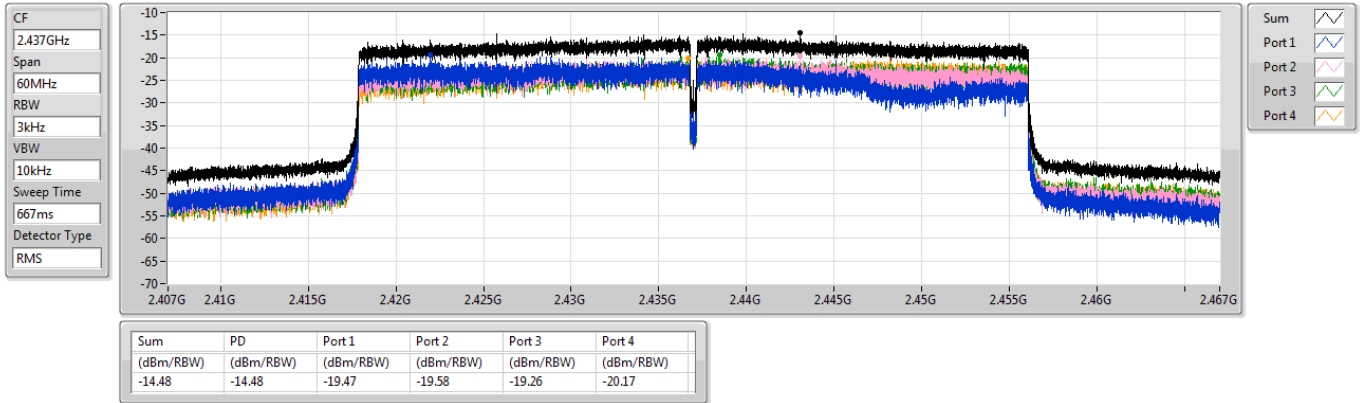
2422MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

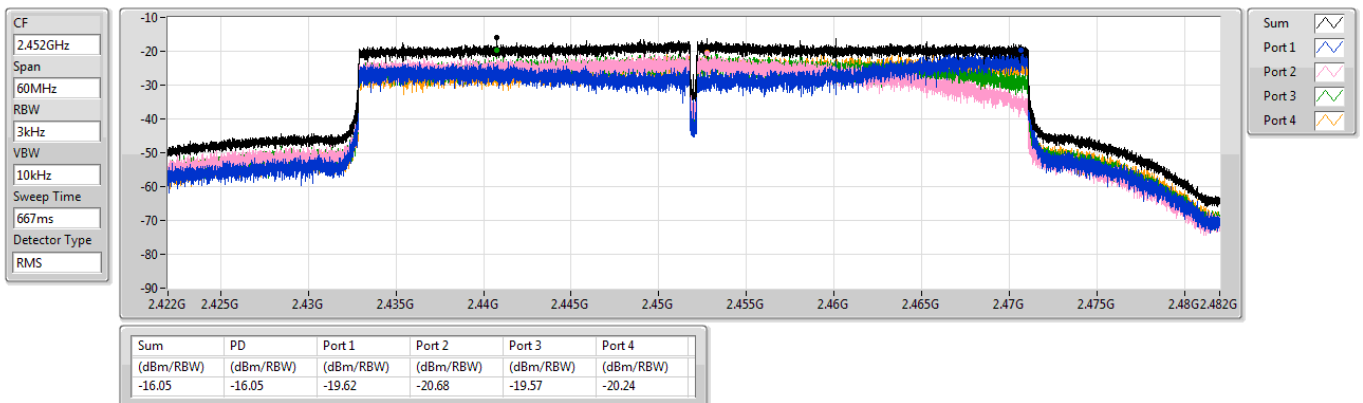
2437MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

PSD

2452MHz





Non-beamforming mode

Unwanted Emissions (Below 1GHz)

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):26 Humidity(%):66			
Level (dBuV/m) <			



Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):26 Humidity(%):66			
Level (dBuV/m) </			



Unwanted Emission (Above 1GHz) for 11b

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBUV/m)			



Modulation	11b		Test Freq. (MHz)		2412	
Polarization	Vertical					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBUV/m)						

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):26 Humidity(%):66			
Level (dBuV/m)			



Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):26 Humidity(%):66			
Level (dBuV/m)			



Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			

Unwanted Emissions (Above 1GHz) for 11g

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBUV/m)			



Modulation	11g		Test Freq. (MHz)		2412	
Polarization	Vertical					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBUV/m)						



Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBUV/m) </			



Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			



Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) </			

Unwanted Emissions (Above 1GHz) for ax HE20

Modulation	ax HE20		Test Freq. (MHz)	2412	
Polarization	Horizontal				
Test By :Akun Chung Temperature(°C):24 Humidity(%):66					
Level (dBUV/m) <					



Modulation	ax HE20	Test Freq. (MHz)	2412																																																																						
Polarization	Vertical																																																																								
Test By :Akun Chung Temperature(°C):24 Humidity(%):66																																																																									
<table><tr><th></th><th>Freq. MHz</th><th>Emission level dBUV/m</th><th>Limit dBUV/m</th><th>Margin dB</th><th>SA reading dBUV</th><th>Factor dB/m</th><th>Remark</th><th>ANT High cm</th><th>Turn Table deg</th></tr><tr><td>1</td><td>2390.00</td><td>51.07</td><td>54.00</td><td>-2.93</td><td>54.86</td><td>-3.79</td><td>Average</td><td>281</td><td>121</td></tr><tr><td>2</td><td>2390.00</td><td>73.71</td><td>74.00</td><td>-0.29</td><td>77.50</td><td>-3.79</td><td>Peak</td><td>281</td><td>121</td></tr><tr><td>3</td><td>4824.00</td><td>31.50</td><td>54.00</td><td>-22.50</td><td>31.38</td><td>0.12</td><td>Average</td><td>100</td><td>135</td></tr><tr><td>4</td><td>4824.00</td><td>45.13</td><td>74.00</td><td>-28.87</td><td>45.01</td><td>0.12</td><td>Peak</td><td>100</td><td>135</td></tr><tr><td>5</td><td>12060.00</td><td>42.51</td><td>54.00</td><td>-11.49</td><td>34.71</td><td>7.80</td><td>Average</td><td>100</td><td>109</td></tr><tr><td>6</td><td>12060.00</td><td>56.44</td><td>74.00</td><td>-17.56</td><td>48.64</td><td>7.80</td><td>Peak</td><td>100</td><td>109</td></tr></table>					Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB/m	Remark	ANT High cm	Turn Table deg	1	2390.00	51.07	54.00	-2.93	54.86	-3.79	Average	281	121	2	2390.00	73.71	74.00	-0.29	77.50	-3.79	Peak	281	121	3	4824.00	31.50	54.00	-22.50	31.38	0.12	Average	100	135	4	4824.00	45.13	74.00	-28.87	45.01	0.12	Peak	100	135	5	12060.00	42.51	54.00	-11.49	34.71	7.80	Average	100	109	6	12060.00	56.44	74.00	-17.56	48.64	7.80	Peak	100	109
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB/m	Remark	ANT High cm	Turn Table deg																																																																
1	2390.00	51.07	54.00	-2.93	54.86	-3.79	Average	281	121																																																																
2	2390.00	73.71	74.00	-0.29	77.50	-3.79	Peak	281	121																																																																
3	4824.00	31.50	54.00	-22.50	31.38	0.12	Average	100	135																																																																
4	4824.00	45.13	74.00	-28.87	45.01	0.12	Peak	100	135																																																																
5	12060.00	42.51	54.00	-11.49	34.71	7.80	Average	100	109																																																																
6	12060.00	56.44	74.00	-17.56	48.64	7.80	Peak	100	109																																																																
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV) + Factor* (dB/m) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).																																																																									



Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBUV/m) </			



Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) </			

Unwanted Emissions (Above 1GHz) for ax HE40

Modulation	ax HE40	Test Freq. (MHz)	2422
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBUV/m)			



Modulation	ax HE40		Test Freq. (MHz)		2422																																																																																											
Polarization	Vertical																																																																																															
Test By :Akun Chung Temperature(°C):24 Humidity(%):66																																																																																																
Level (dBuV/m) CLASS-B CLASS-B (AVG) Frequency (MHz)																																																																																																
<table><tr><td></td><td>Freq.</td><td>Emission</td><td>Limit</td><td>Margin</td><td>SA</td><td>Factor</td><td>Remark</td><td>ANT</td><td>Turn</td></tr><tr><td></td><td>MHz</td><td>level</td><td></td><td></td><td>reading</td><td></td><td></td><td>High</td><td>Table</td></tr><tr><td></td><td></td><td>dBuV/m</td><td>dBuV/m</td><td>dB</td><td>dBuV</td><td>dB/m</td><td></td><td>cm</td><td>deg</td></tr><tr><td>1</td><td>2390.00</td><td>53.86</td><td>54.00</td><td>-0.14</td><td>57.65</td><td>-3.79</td><td>Average</td><td>192</td><td>97</td></tr><tr><td>2</td><td>2390.00</td><td>68.19</td><td>74.00</td><td>-5.81</td><td>71.98</td><td>-3.79</td><td>Peak</td><td>192</td><td>97</td></tr><tr><td>3</td><td>4844.00</td><td>31.30</td><td>54.00</td><td>-22.70</td><td>31.10</td><td>0.20</td><td>Average</td><td>100</td><td>189</td></tr><tr><td>4</td><td>4844.00</td><td>45.45</td><td>74.00</td><td>-28.55</td><td>45.25</td><td>0.20</td><td>Peak</td><td>100</td><td>189</td></tr><tr><td>5</td><td>7266.00</td><td>36.79</td><td>54.00</td><td>-17.21</td><td>30.81</td><td>5.98</td><td>Average</td><td>100</td><td>143</td></tr><tr><td>6</td><td>7266.00</td><td>49.47</td><td>74.00</td><td>-24.53</td><td>43.49</td><td>5.98</td><td>Peak</td><td>100</td><td>143</td></tr></table>								Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn		MHz	level			reading			High	Table			dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg	1	2390.00	53.86	54.00	-0.14	57.65	-3.79	Average	192	97	2	2390.00	68.19	74.00	-5.81	71.98	-3.79	Peak	192	97	3	4844.00	31.30	54.00	-22.70	31.10	0.20	Average	100	189	4	4844.00	45.45	74.00	-28.55	45.25	0.20	Peak	100	189	5	7266.00	36.79	54.00	-17.21	30.81	5.98	Average	100	143	6	7266.00	49.47	74.00	-24.53	43.49	5.98	Peak	100	143
	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn																																																																																							
	MHz	level			reading			High	Table																																																																																							
		dBuV/m	dBuV/m	dB	dBuV	dB/m		cm	deg																																																																																							
1	2390.00	53.86	54.00	-0.14	57.65	-3.79	Average	192	97																																																																																							
2	2390.00	68.19	74.00	-5.81	71.98	-3.79	Peak	192	97																																																																																							
3	4844.00	31.30	54.00	-22.70	31.10	0.20	Average	100	189																																																																																							
4	4844.00	45.45	74.00	-28.55	45.25	0.20	Peak	100	189																																																																																							
5	7266.00	36.79	54.00	-17.21	30.81	5.98	Average	100	143																																																																																							
6	7266.00	49.47	74.00	-24.53	43.49	5.98	Peak	100	143																																																																																							
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).																																																																																																



Modulation	ax HE40	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	ax HE40	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			



Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			



Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Vertical		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) </			

**Beamforming mode****Unwanted Emissions (Below 1GHz)**

Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):63			
Level (dBUV/m)			



Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Vertical		
Test By :Paul Lin Temperature(°C):24 Humidity(%):63			
Level (dBuV/m) </			



Unwanted Emissions (Above 1GHz) for ax HE20

Modulation	ax HE20	Test Freq. (MHz)	2412
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBUV/m)			

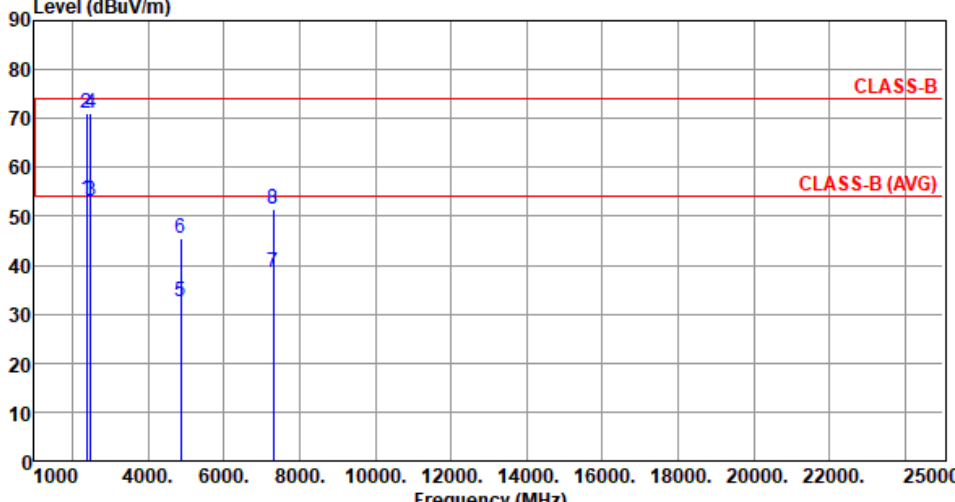


Modulation	ax HE20		Test Freq. (MHz)		2412	
Polarization	Vertical					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBUV/m) <						



Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Akun Chung Temperature(°C):24 Humidity(%):66			
Level (dBUV/m) <			



Modulation	ax HE20	Test Freq. (MHz)	2437						
Polarization	Vertical								
Test By :Akun Chung Temperature(°C):24 Humidity(%):66									
Level (dBuV/m)  Frequency (MHz)									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	53.55	54.00	-0.45	57.34	-3.79	Average	185	242
2	2390.00	71.21	74.00	-2.79	75.00	-3.79	Peak	185	242
3	2483.50	53.23	54.00	-0.77	57.32	-4.09	Average	185	285
4	2483.50	71.16	74.00	-2.84	75.25	-4.09	Peak	185	285
5	4874.00	32.67	54.00	-21.33	32.55	0.12	Average	100	201
6	4874.00	45.60	74.00	-28.40	45.48	0.12	Peak	100	201
7	7311.00	38.52	54.00	-15.48	32.58	5.94	Average	100	298
8	7311.00	51.33	74.00	-22.67	45.39	5.94	Peak	100	298

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Vertical		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			



Unwanted Emissions (Above 1GHz) for ax HE40

Modulation	ax HE40		Test Freq. (MHz)		2422	
Polarization	Horizontal					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBUV/m)						



Modulation	ax HE40		Test Freq. (MHz)		2422	
Polarization	Vertical					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBuV/m)						



Modulation	ax HE40	Test Freq. (MHz)	2437
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBUV/m) <			



Modulation	ax HE40		Test Freq. (MHz)		2437	
Polarization	Vertical					
Test By :Paul Lin Temperature(°C):24 Humidity(%):66						
Level (dBuV/m) <						



Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Horizontal		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m)			



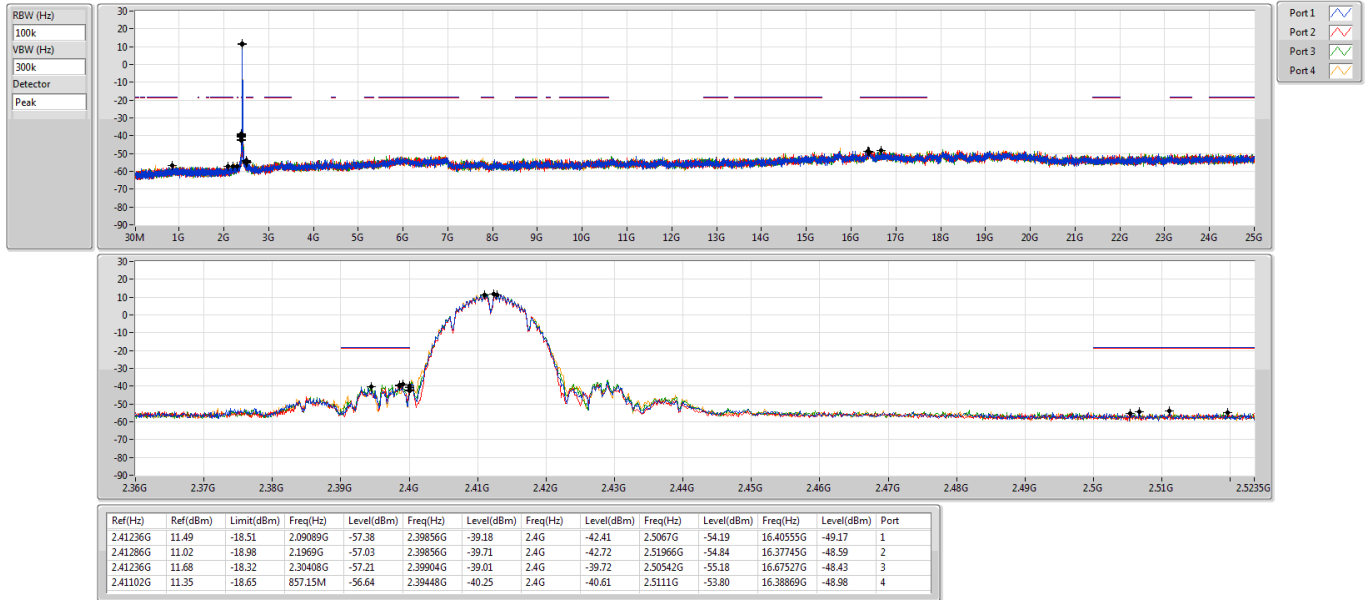
Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Vertical		
Test By :Paul Lin Temperature(°C):24 Humidity(%):66			
Level (dBuV/m) <			

Non-beamforming mode

2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

CSENdB

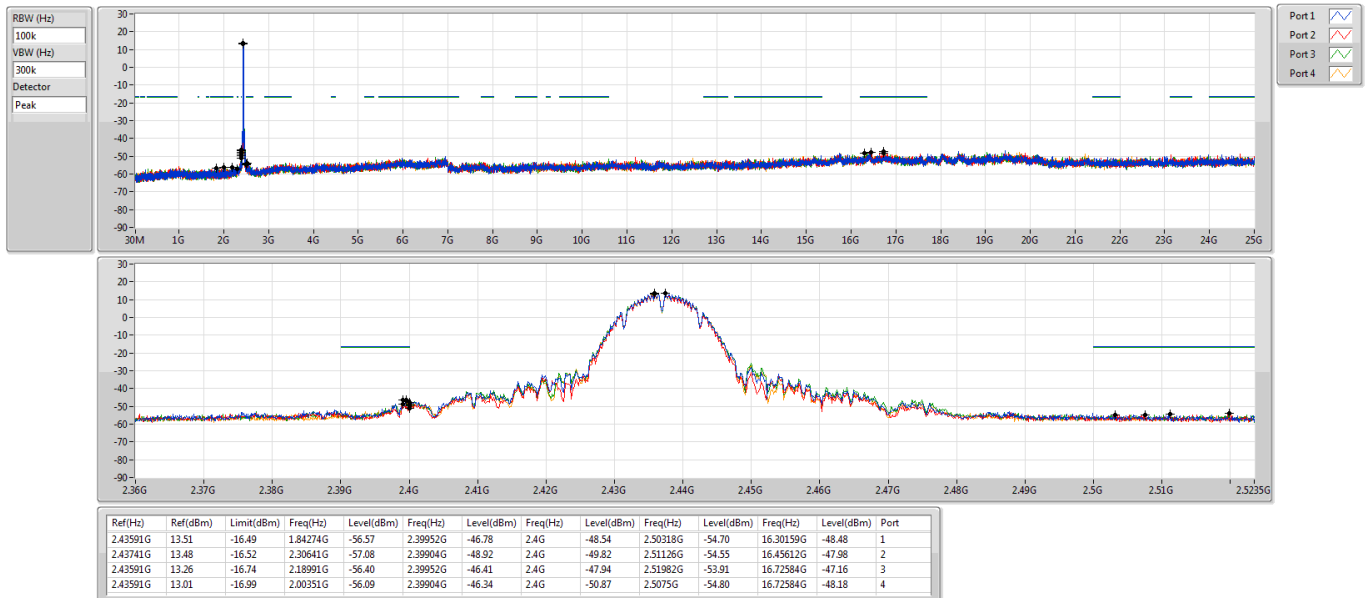
2412MHz



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

CSENdB

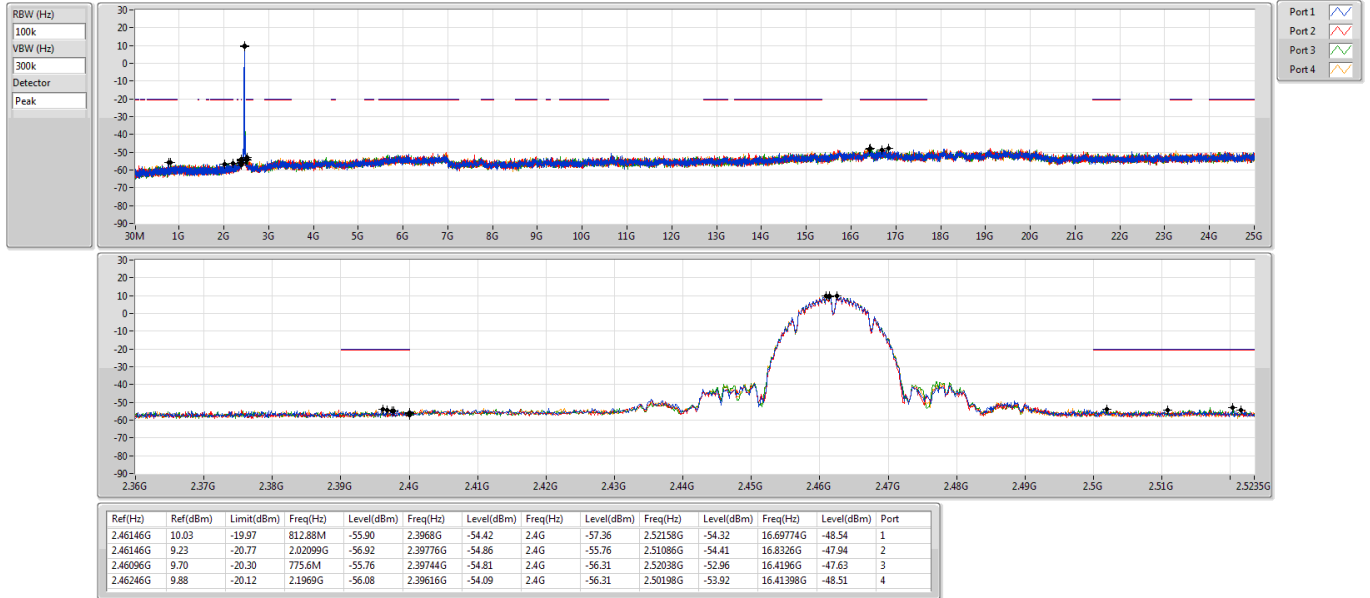
2437MHz



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_4TX

CSEndB

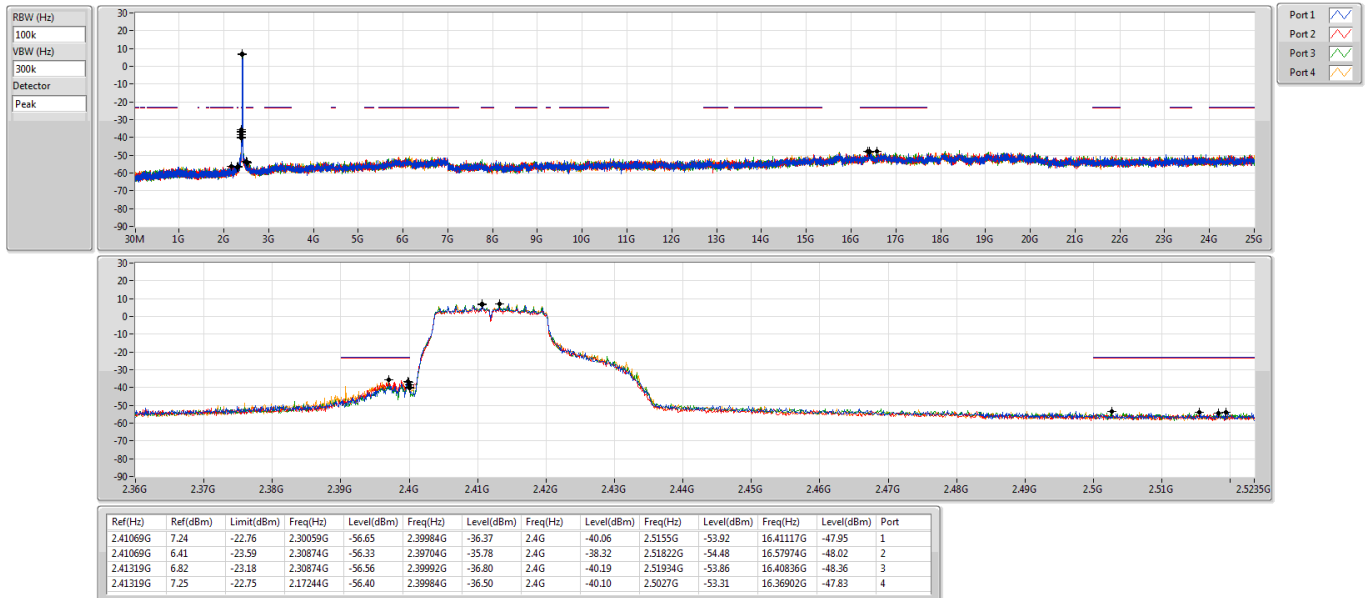
2462MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

CSEndB

2412MHz

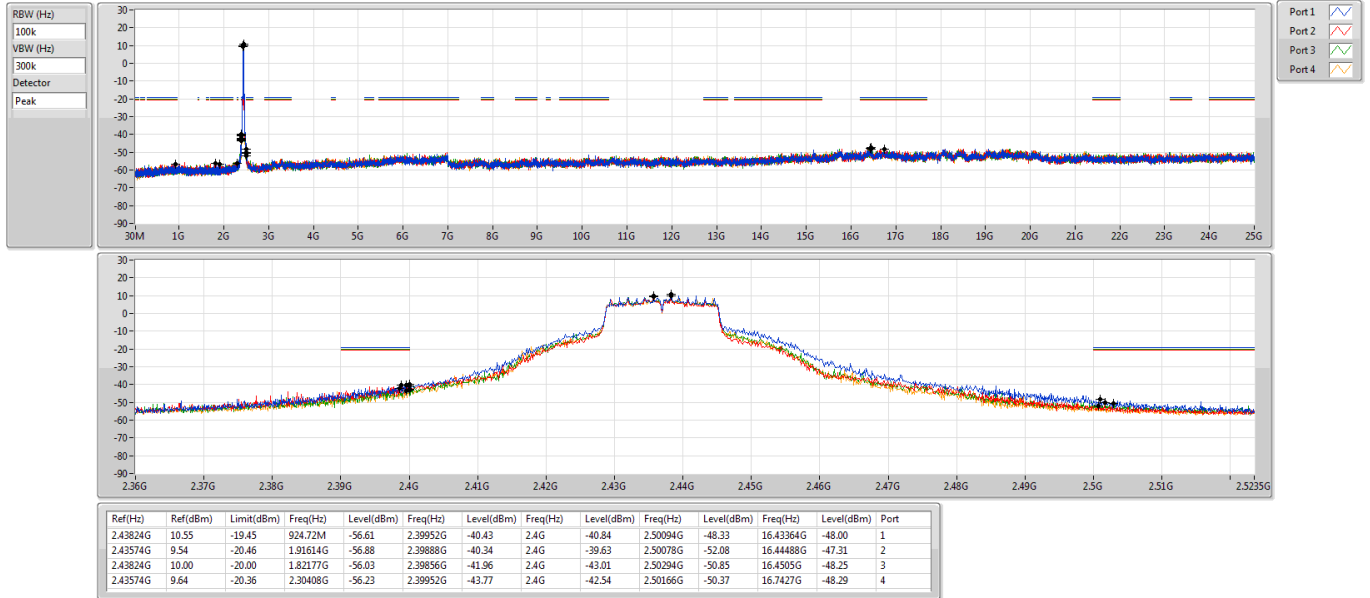




2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

CSEndB

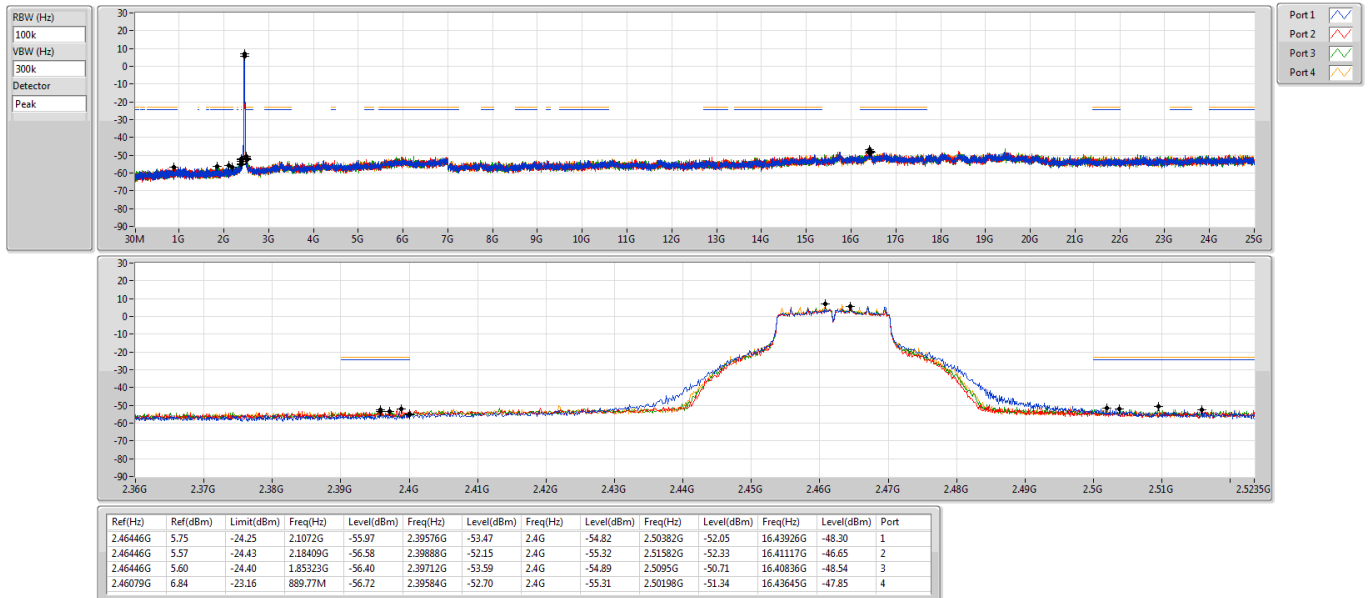
2437MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_4TX

CSEndB

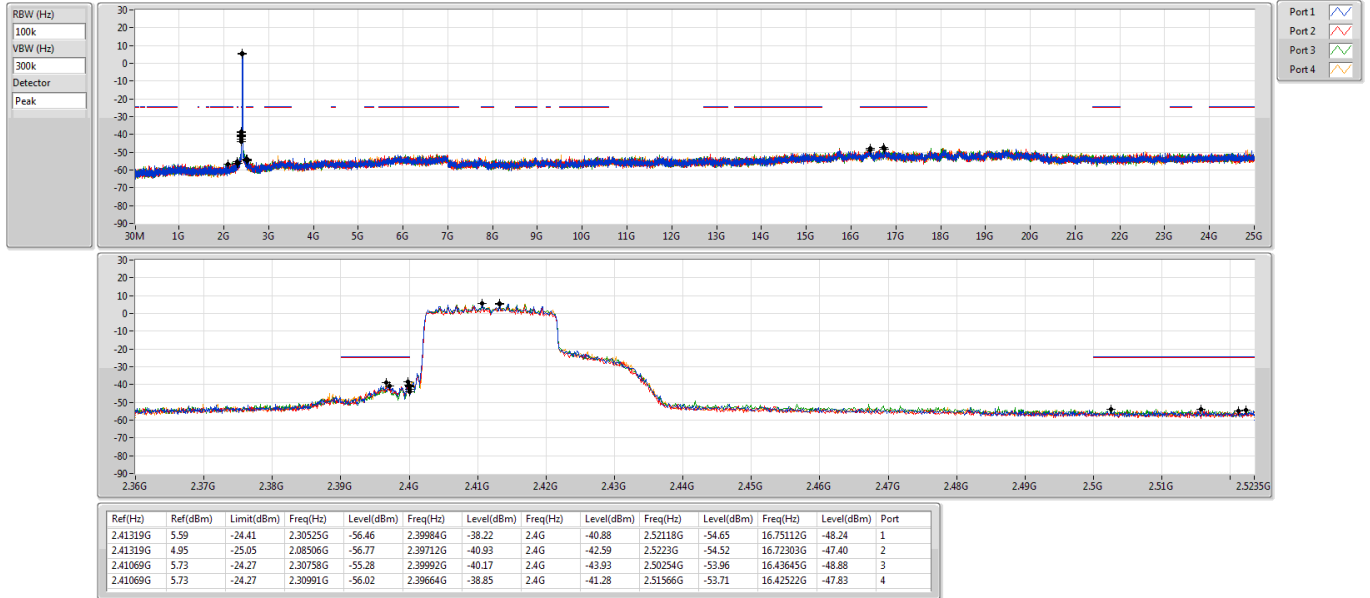
2462MHz



2.4-2.4835GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

CSEndB

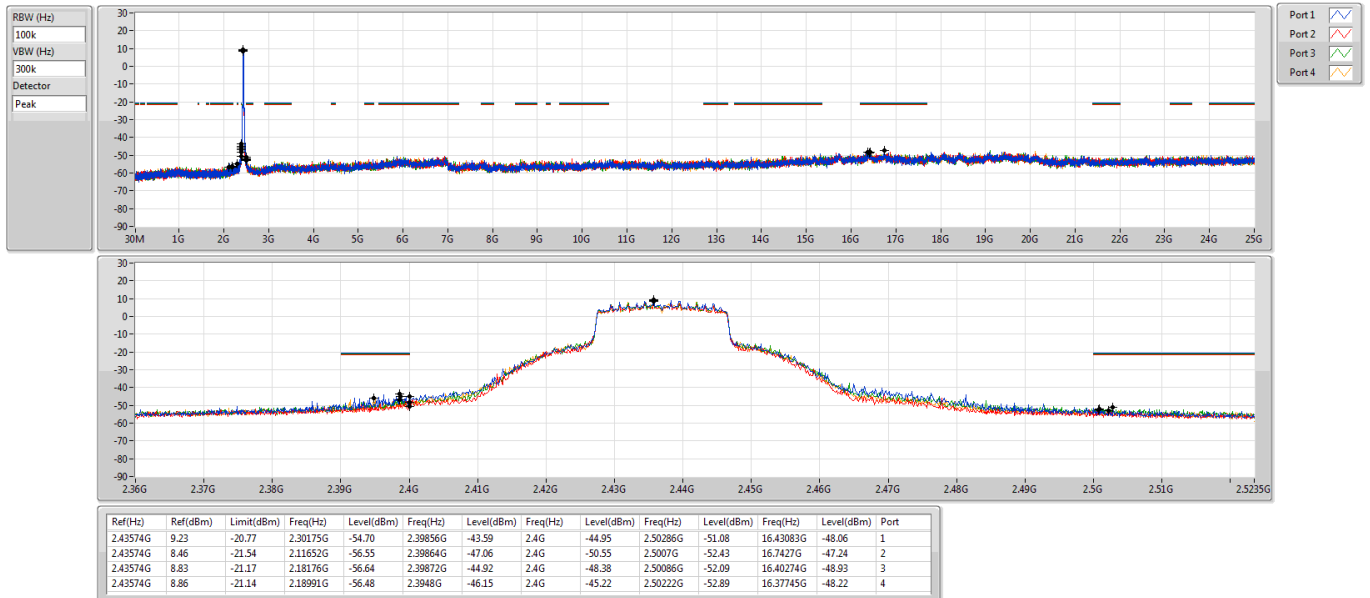
2412MHz



2.4-2.4835GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

CSEndB

2437MHz

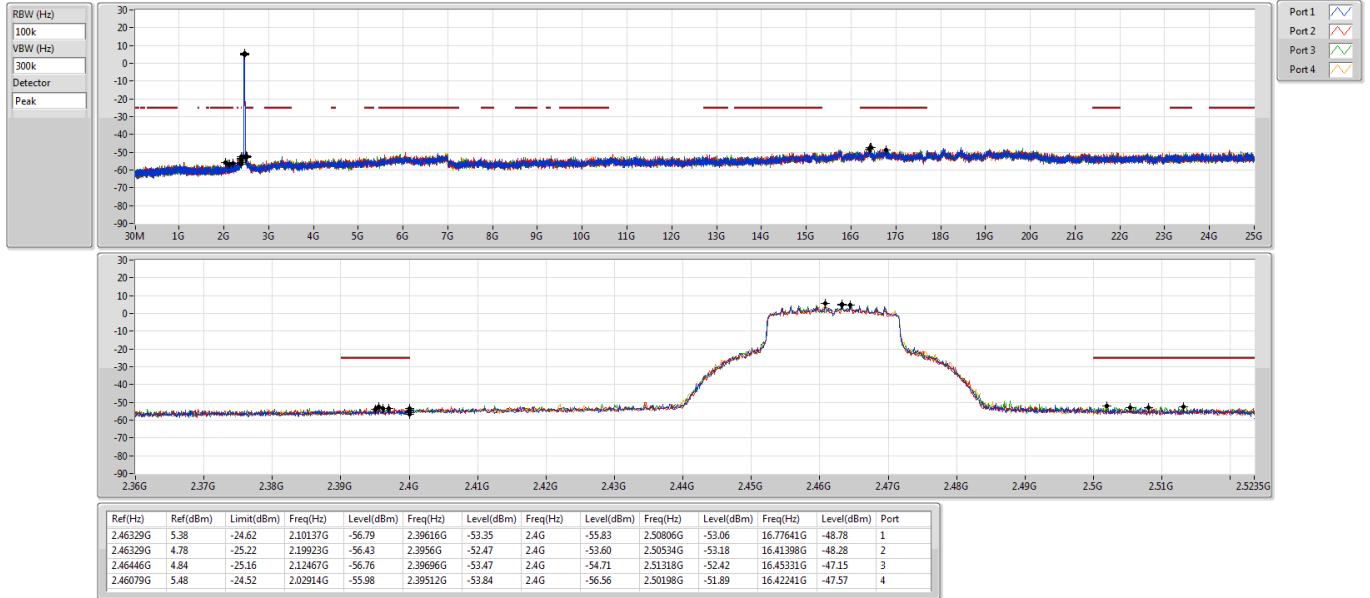




2.4-2.4835GHz_802.11ax_HEW20_Nss1,(MCS0)_4TX

CSEndB

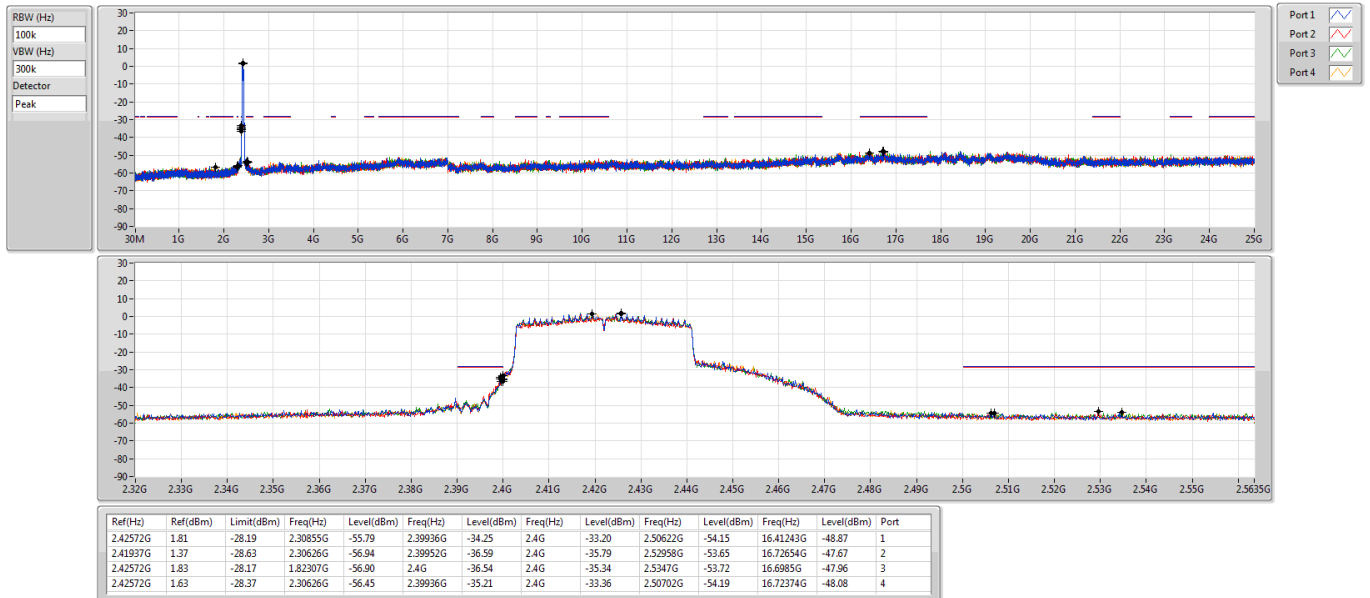
2462MHz



2.4-2.4835GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

CSEndB

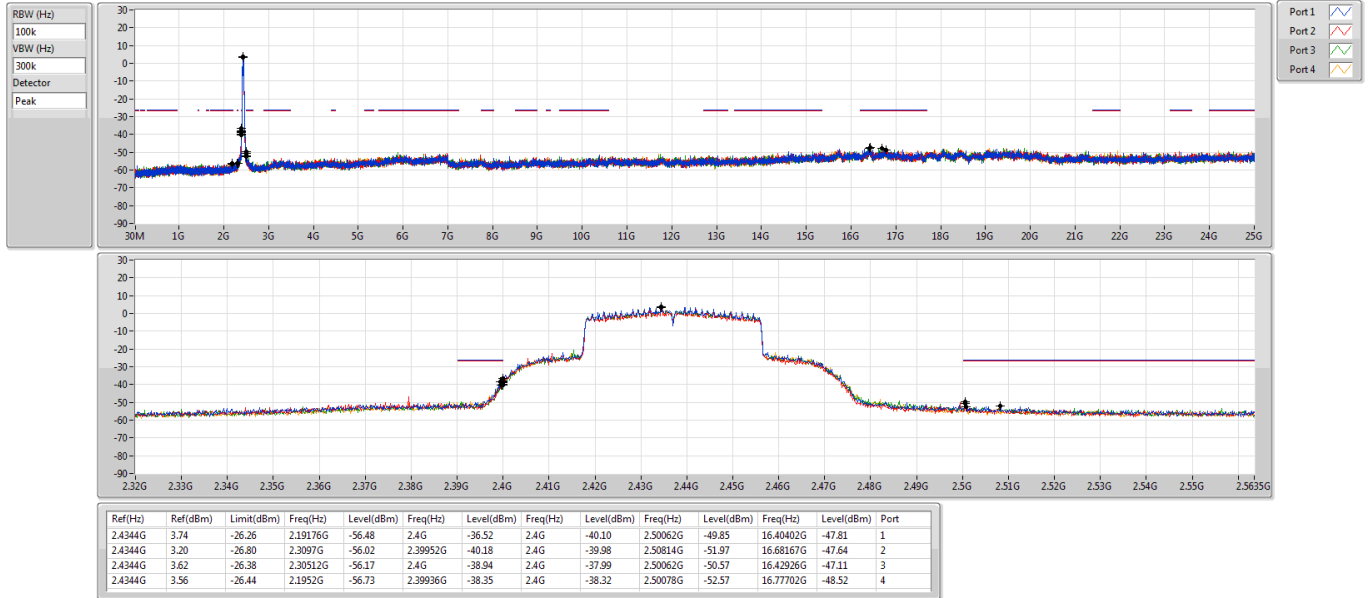
2422MHz



2.4-2.4835GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

CSEndB

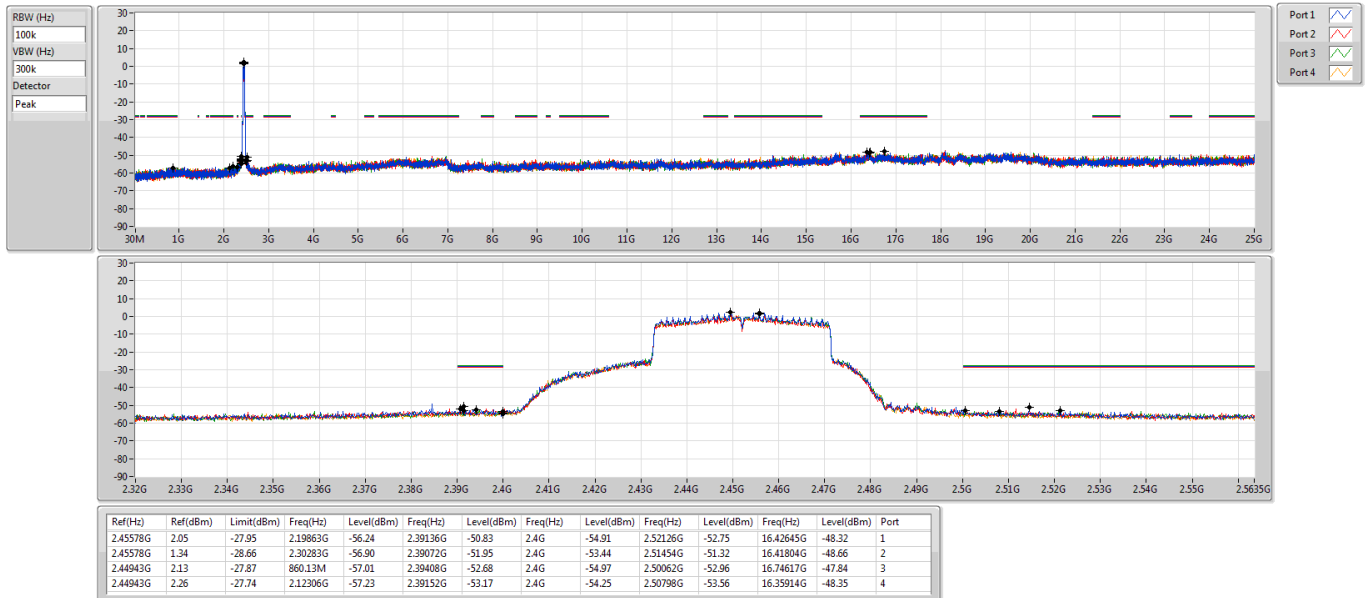
2437MHz



2.4-2.4835GHz_802.11ax_HEW40_Nss1,(MCS0)_4TX

CSEndB

2452MHz

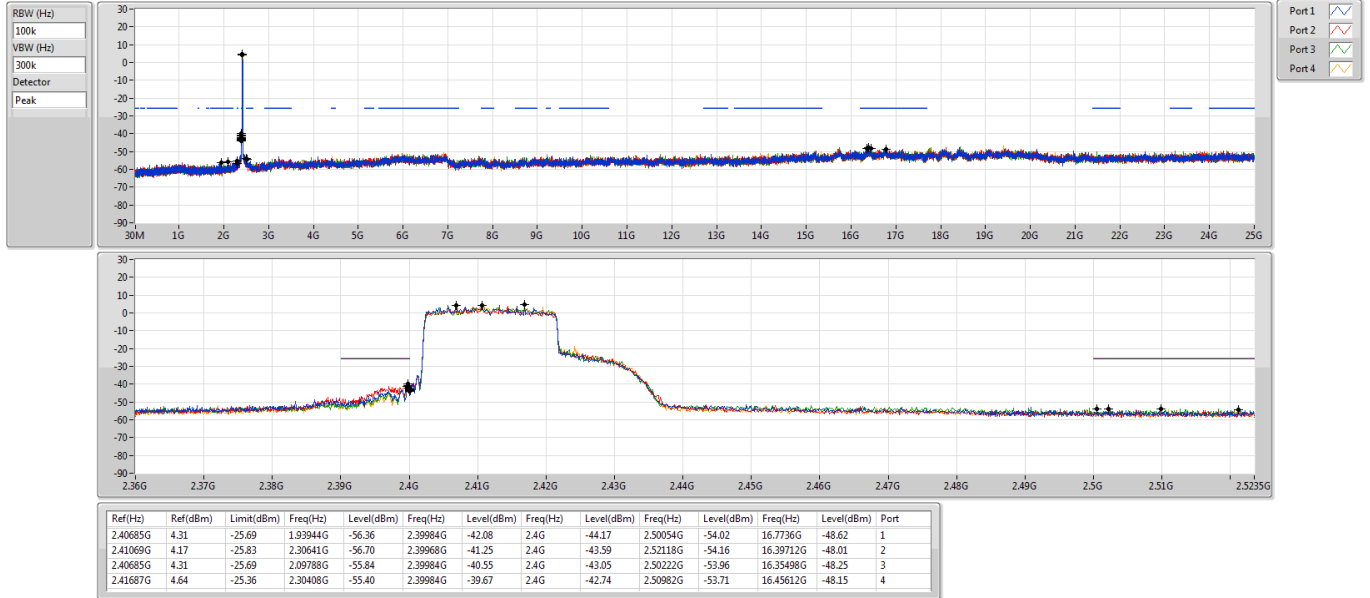


Beamforming mode

2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSENdB

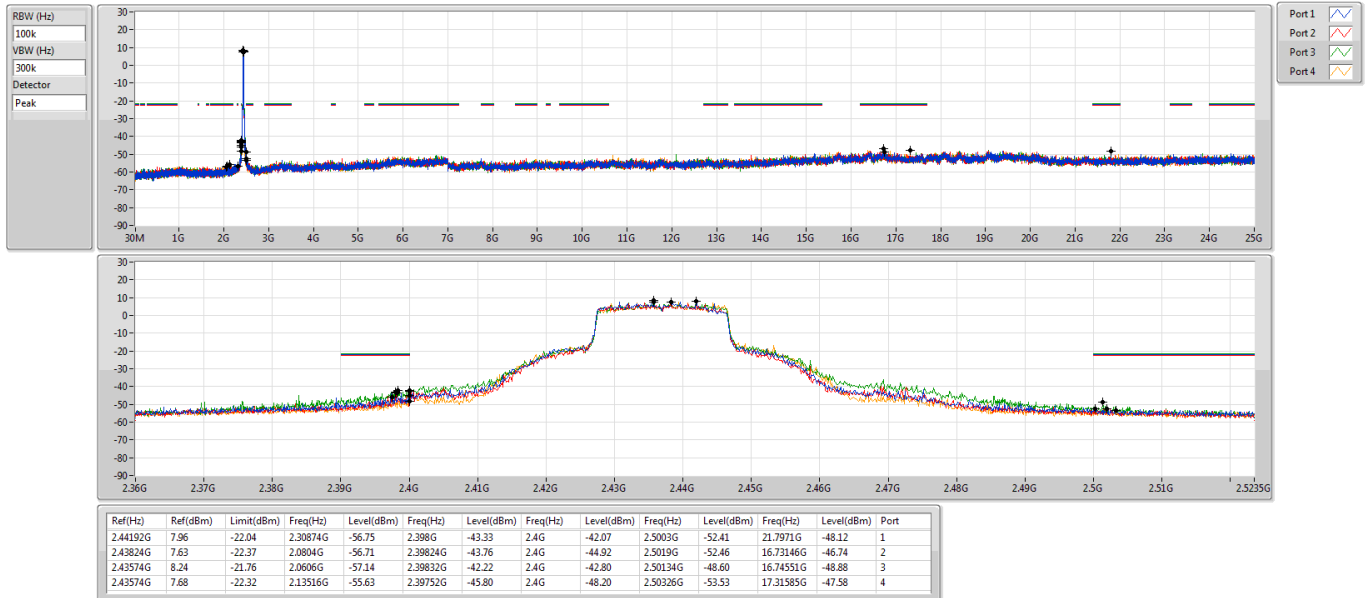
2412MHz



2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSENdB

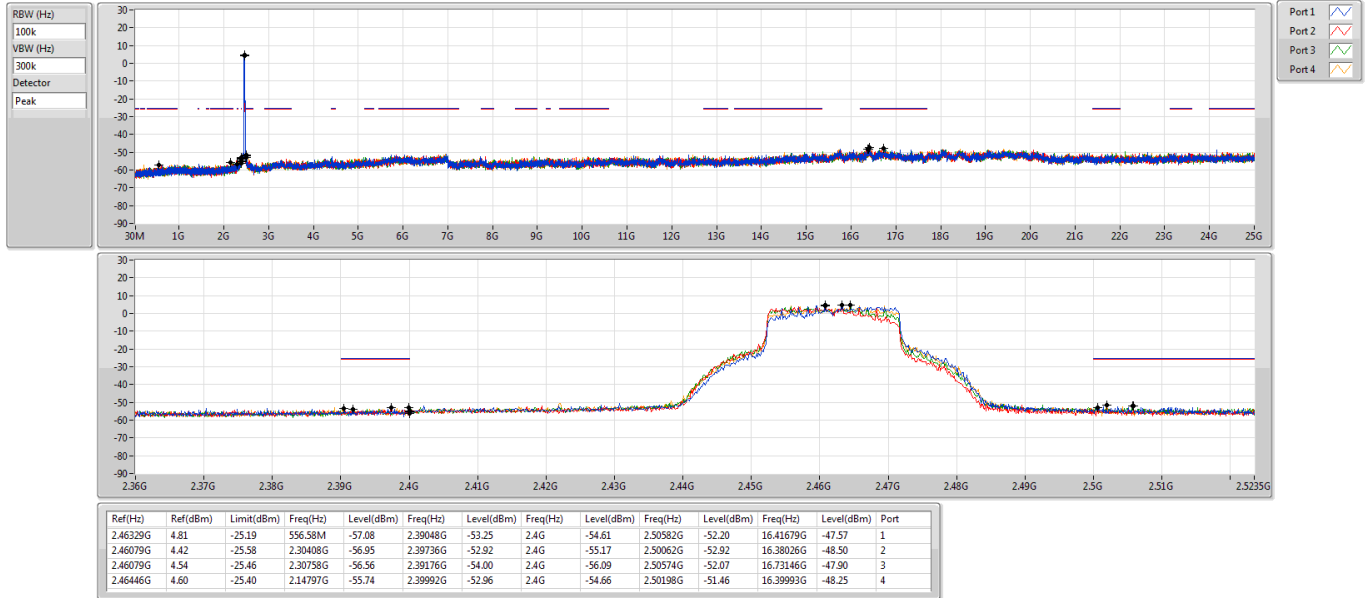
2437MHz



2.4-2.4835GHz_802.11ax HEW20-BF_Nss1,(MCS0)_4TX

CSEndB

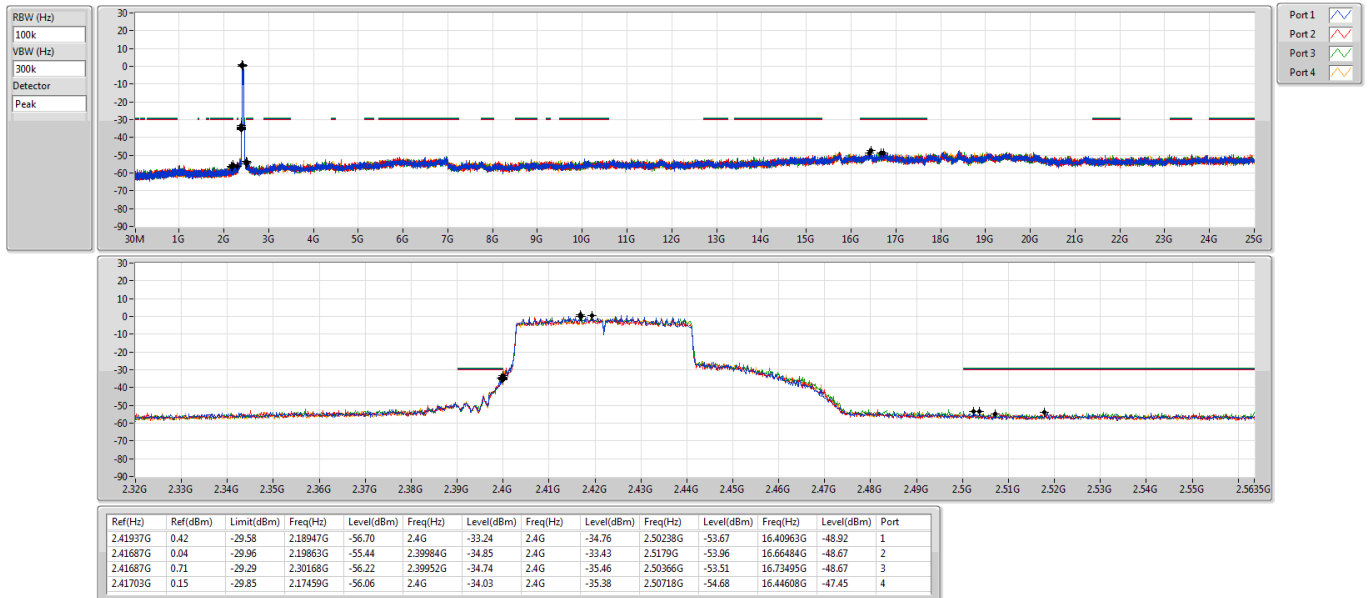
2462MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSEndB

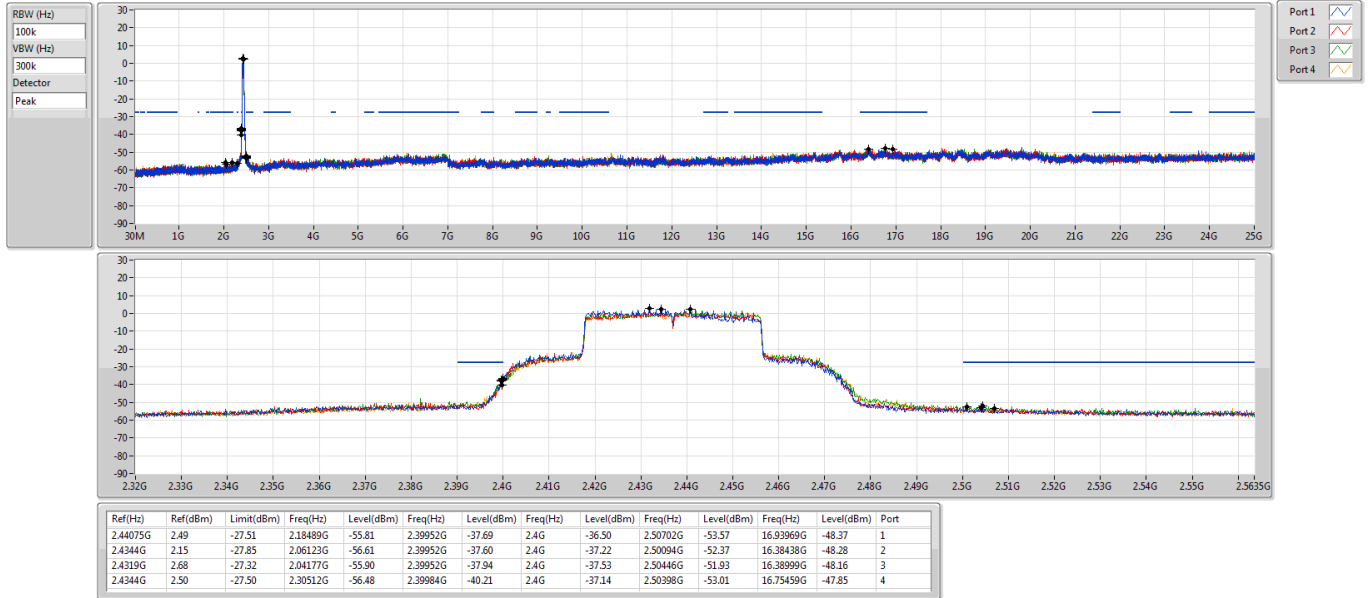
2422MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSEndB

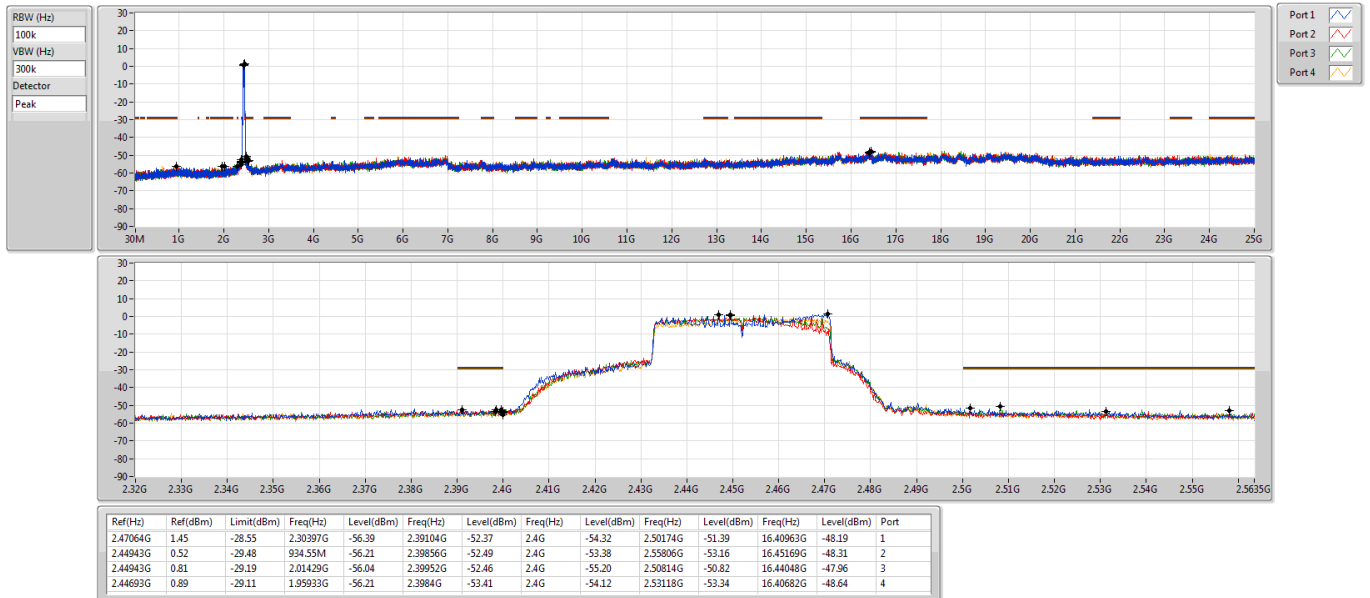
2437MHz



2.4-2.4835GHz_802.11ax HEW40-BF_Nss1,(MCS0)_4TX

CSEndB

2452MHz





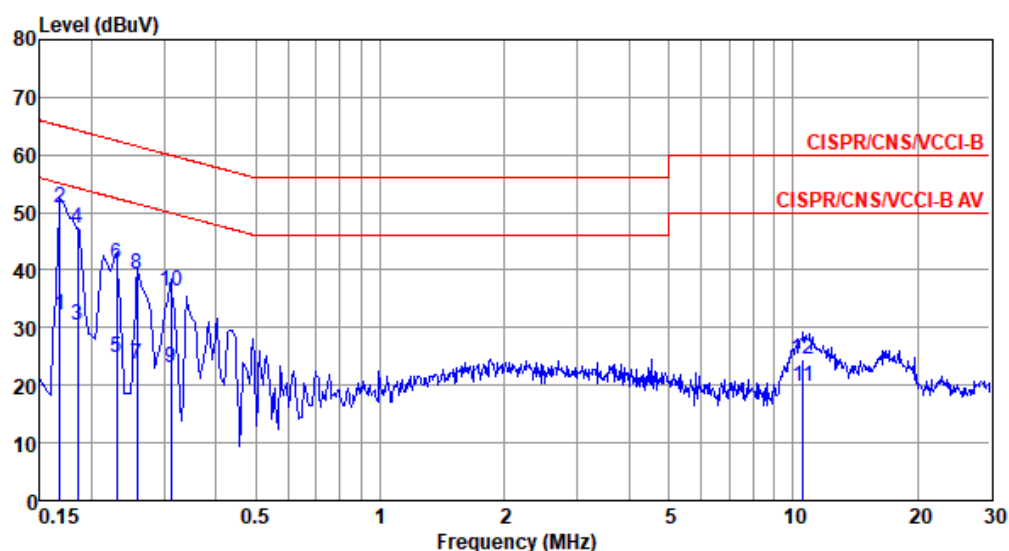
Non-beamforming mode

Modulation Mode	11b	Test Freq. (MHz)	2437
Power Phase	Line		

Test by : Joe Liao

Temperature: 22°C

Humidity: 62%



	Freq MHz	Level dBUV	Limit dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.168	32.16	55.08	-22.92	22.29	9.63	0.06	0.18	Average
2*	0.168	50.72	65.08	-14.36	40.85	9.63	0.06	0.18	QP
3	0.185	30.34	54.24	-23.90	20.47	9.62	0.06	0.19	Average
4	0.185	47.31	64.24	-16.93	37.44	9.62	0.06	0.19	QP
5	0.230	24.89	52.44	-27.55	15.00	9.62	0.06	0.21	Average
6	0.230	41.02	62.44	-21.42	31.13	9.62	0.06	0.21	QP
7	0.258	23.75	51.51	-27.76	13.84	9.62	0.06	0.23	Average
8	0.258	39.19	61.51	-22.32	29.28	9.62	0.06	0.23	QP
9	0.312	22.92	49.93	-27.01	12.98	9.62	0.06	0.26	Average
10	0.312	36.37	59.93	-23.56	26.43	9.62	0.06	0.26	QP
11	10.564	19.71	50.00	-30.29	9.20	9.69	0.37	0.45	Average
12	10.564	24.51	60.00	-35.49	14.00	9.69	0.37	0.45	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).

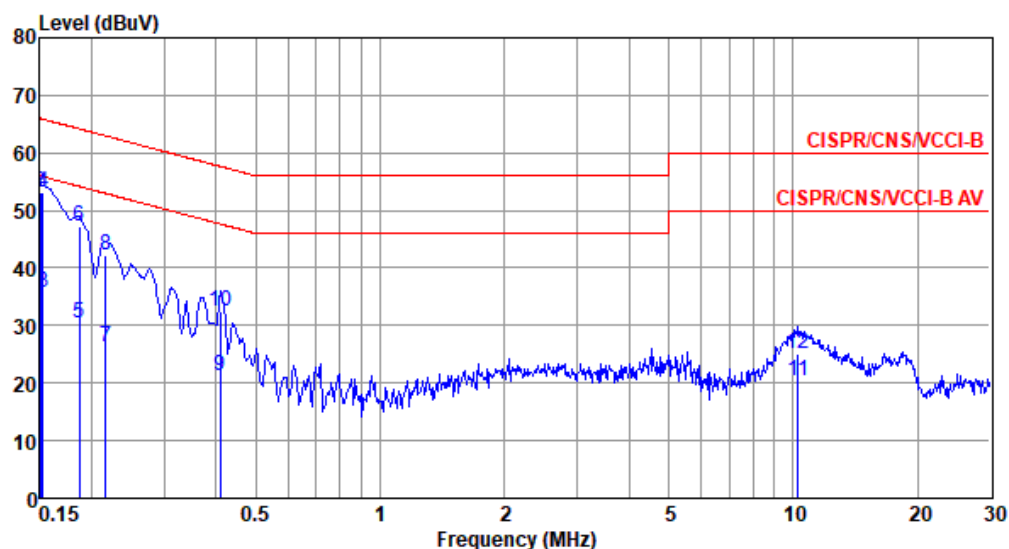


Modulation Mode	11b	Test Freq. (MHz)	2437
Power Phase	Neutral		

Test by : Joe Liao

Temperature: 22°C

Humidity: 62%



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.150	35.77	56.00	-20.23	25.90	9.63	0.06	0.18	Average
2	0.150	53.19	66.00	-12.81	43.32	9.63	0.06	0.18	QP
3	0.152	35.80	55.87	-20.07	25.93	9.63	0.06	0.18	Average
4*	0.152	53.25	65.87	-12.62	43.38	9.63	0.06	0.18	QP
5	0.186	30.37	54.20	-23.83	20.49	9.63	0.06	0.19	Average
6	0.186	47.22	64.20	-16.98	37.34	9.63	0.06	0.19	QP
7	0.216	26.30	52.96	-26.66	16.41	9.63	0.06	0.20	Average
8	0.216	42.14	62.96	-20.82	32.25	9.63	0.06	0.20	QP
9	0.410	21.20	47.64	-26.44	11.22	9.62	0.06	0.30	Average
10	0.410	32.46	57.64	-25.18	22.48	9.62	0.06	0.30	QP
11	10.288	20.43	50.00	-29.57	9.91	9.71	0.37	0.44	Average
12	10.288	24.95	60.00	-35.05	14.43	9.71	0.37	0.44	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).



Beamforming mode

Modulation Mode	ax HE20	Test Freq. (MHz)	2437																																																																																																																																												
Power Phase	Line																																																																																																																																														
Test by : Joe Liao Temperature: 22°C Humidity: 62%																																																																																																																																															
Level (dBuV) Frequency (MHz) <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>Factor</th><th>Cable</th><th>Aux</th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>Line</th><th>Limit</th><th>Level</th><th>dB</th><th>loss</th><th>dB</th><th>Remark</th></tr><tr><td>1</td><td>0.159</td><td>33.46</td><td>55.52</td><td>-22.06</td><td>23.59</td><td>9.63</td><td>0.06</td><td>0.18</td><td>Average</td></tr><tr><td>2*</td><td>0.159</td><td>49.79</td><td>65.52</td><td>-15.73</td><td>39.92</td><td>9.63</td><td>0.06</td><td>0.18</td><td>QP</td></tr><tr><td>3</td><td>0.177</td><td>29.28</td><td>54.64</td><td>-25.36</td><td>19.41</td><td>9.62</td><td>0.06</td><td>0.19</td><td>Average</td></tr><tr><td>4</td><td>0.177</td><td>45.76</td><td>64.64</td><td>-18.88</td><td>35.89</td><td>9.62</td><td>0.06</td><td>0.19</td><td>QP</td></tr><tr><td>5</td><td>0.195</td><td>28.45</td><td>53.80</td><td>-25.35</td><td>18.58</td><td>9.62</td><td>0.06</td><td>0.19</td><td>Average</td></tr><tr><td>6</td><td>0.195</td><td>44.85</td><td>63.80</td><td>-18.95</td><td>34.98</td><td>9.62</td><td>0.06</td><td>0.19</td><td>QP</td></tr><tr><td>7</td><td>0.240</td><td>22.81</td><td>52.08</td><td>-29.27</td><td>12.91</td><td>9.62</td><td>0.06</td><td>0.22</td><td>Average</td></tr><tr><td>8</td><td>0.240</td><td>39.04</td><td>62.08</td><td>-23.04</td><td>29.14</td><td>9.62</td><td>0.06</td><td>0.22</td><td>QP</td></tr><tr><td>9</td><td>0.303</td><td>22.53</td><td>50.15</td><td>-27.62</td><td>12.59</td><td>9.62</td><td>0.06</td><td>0.26</td><td>Average</td></tr><tr><td>10</td><td>0.303</td><td>35.87</td><td>60.15</td><td>-24.28</td><td>25.93</td><td>9.62</td><td>0.06</td><td>0.26</td><td>QP</td></tr><tr><td>11</td><td>10.676</td><td>19.81</td><td>50.00</td><td>-30.19</td><td>9.30</td><td>9.69</td><td>0.37</td><td>0.45</td><td>Average</td></tr><tr><td>12</td><td>10.676</td><td>24.27</td><td>60.00</td><td>-35.73</td><td>13.76</td><td>9.69</td><td>0.37</td><td>0.45</td><td>QP</td></tr></table>					Freq	Level	Limit	Over	Read	Factor	Cable	Aux			MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark	1	0.159	33.46	55.52	-22.06	23.59	9.63	0.06	0.18	Average	2*	0.159	49.79	65.52	-15.73	39.92	9.63	0.06	0.18	QP	3	0.177	29.28	54.64	-25.36	19.41	9.62	0.06	0.19	Average	4	0.177	45.76	64.64	-18.88	35.89	9.62	0.06	0.19	QP	5	0.195	28.45	53.80	-25.35	18.58	9.62	0.06	0.19	Average	6	0.195	44.85	63.80	-18.95	34.98	9.62	0.06	0.19	QP	7	0.240	22.81	52.08	-29.27	12.91	9.62	0.06	0.22	Average	8	0.240	39.04	62.08	-23.04	29.14	9.62	0.06	0.22	QP	9	0.303	22.53	50.15	-27.62	12.59	9.62	0.06	0.26	Average	10	0.303	35.87	60.15	-24.28	25.93	9.62	0.06	0.26	QP	11	10.676	19.81	50.00	-30.19	9.30	9.69	0.37	0.45	Average	12	10.676	24.27	60.00	-35.73	13.76	9.69	0.37	0.45	QP
	Freq	Level	Limit	Over	Read	Factor	Cable	Aux																																																																																																																																							
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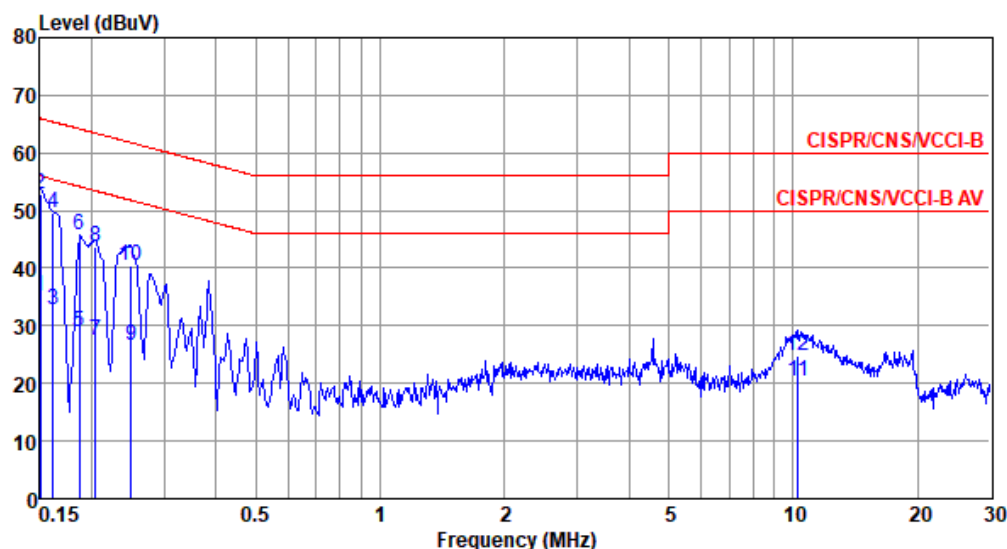


Modulation Mode	ax HE20	Test Freq. (MHz)	2437
Power Phase	Neutral		

Test by : Joe Liao

Temperature: 22°C

Humidity: 62%



	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.150	35.24	56.00	-20.76	25.37	9.63	0.06	0.18	Average
2*	0.150	52.86	66.00	-13.14	42.99	9.63	0.06	0.18	QP
3	0.162	32.75	55.38	-22.63	22.88	9.63	0.06	0.18	Average
4	0.162	49.51	65.38	-15.87	39.64	9.63	0.06	0.18	QP
5	0.186	28.95	54.20	-25.25	19.07	9.63	0.06	0.19	Average
6	0.186	45.61	64.20	-18.59	35.73	9.63	0.06	0.19	QP
7	0.204	27.54	53.45	-25.91	17.66	9.63	0.06	0.19	Average
8	0.204	43.69	63.45	-19.76	33.81	9.63	0.06	0.19	QP
9	0.249	26.53	51.78	-25.25	16.61	9.63	0.06	0.23	Average
10	0.249	40.39	61.78	-21.39	30.47	9.63	0.06	0.23	QP
11	10.288	20.33	50.00	-29.67	9.81	9.71	0.37	0.44	Average
12	10.288	24.75	60.00	-35.25	14.23	9.71	0.37	0.44	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBUV) - Limit Line (dBUV).