

FCC Test Report

FCC ID : I88WAX650S
Equipment : 802.11ax (WiFi 6) Dual-Radio Unified Pro
Access Point
Model No. : WAX650S
Brand Name : ZYXEL
Applicant : Zyxel Communications Corporation
Address : No.2 Industry East RD. IX, Hsinchu Science
Park, Hsinchu 30075, Taiwan, R.O.C
Standard : 47 CFR FCC Part 15.247
Received Date : Aug. 01, 2019
Tested Date : Aug. 14 ~ Sep. 16, 2019

We, International Certification Corp., 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 may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR980101AC	Rev. 01	Initial issue	Nov. 05, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 2.962MHz 42.77 (Margin -3.23dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4924.00MHz 53.80 (Margin -0.20dB) – AV [dBuV/m at 3m]: 2483.50MHz 73.80 (Margin -0.20dB) – PK	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: <i>Non-beamforming mode</i> 29.64 <i>Beamforming mode</i> 23.57	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 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: Chip feature :
 DSSS-DBPSK, DQPSK, CCK modulation
 OFDM/OFDMA- BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024 QAM modulation.
 Note 3: Operating modes of this device are listed as above table.
 Note 4: 802.11ax supports beamforming function.

1.1.2 Radio Details

Radio	Function
1	Wi-Fi 2.4GHz, 4T4R
2	Wi-Fi 5GHz, 4T4R
3	Wi-Fi 2.4GHz & 5GHz, RX only
4	Bluetooth LE only

1.1.3 Antenna Details

For Radio 1

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	AD442 R1.3	PIFA	lpex	0	3.51	4.22	4.61	4.68
2	AD442 R1.3	PIFA	lpex	0	3.51	4.22	4.61	4.68
3	AD442 R1.3	PIFA	lpex	0	3.51	4.22	4.61	4.68
4	AD442 R1.3	PIFA	lpex	0	3.51	4.22	4.61	4.68

For Radio 3

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	AD442 R1.3	PIFA	lpex	5.7	6.9			
2	AD442 R1.3	PIFA	lpex	5.7	6.9			

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter 30~57Vdc from POE
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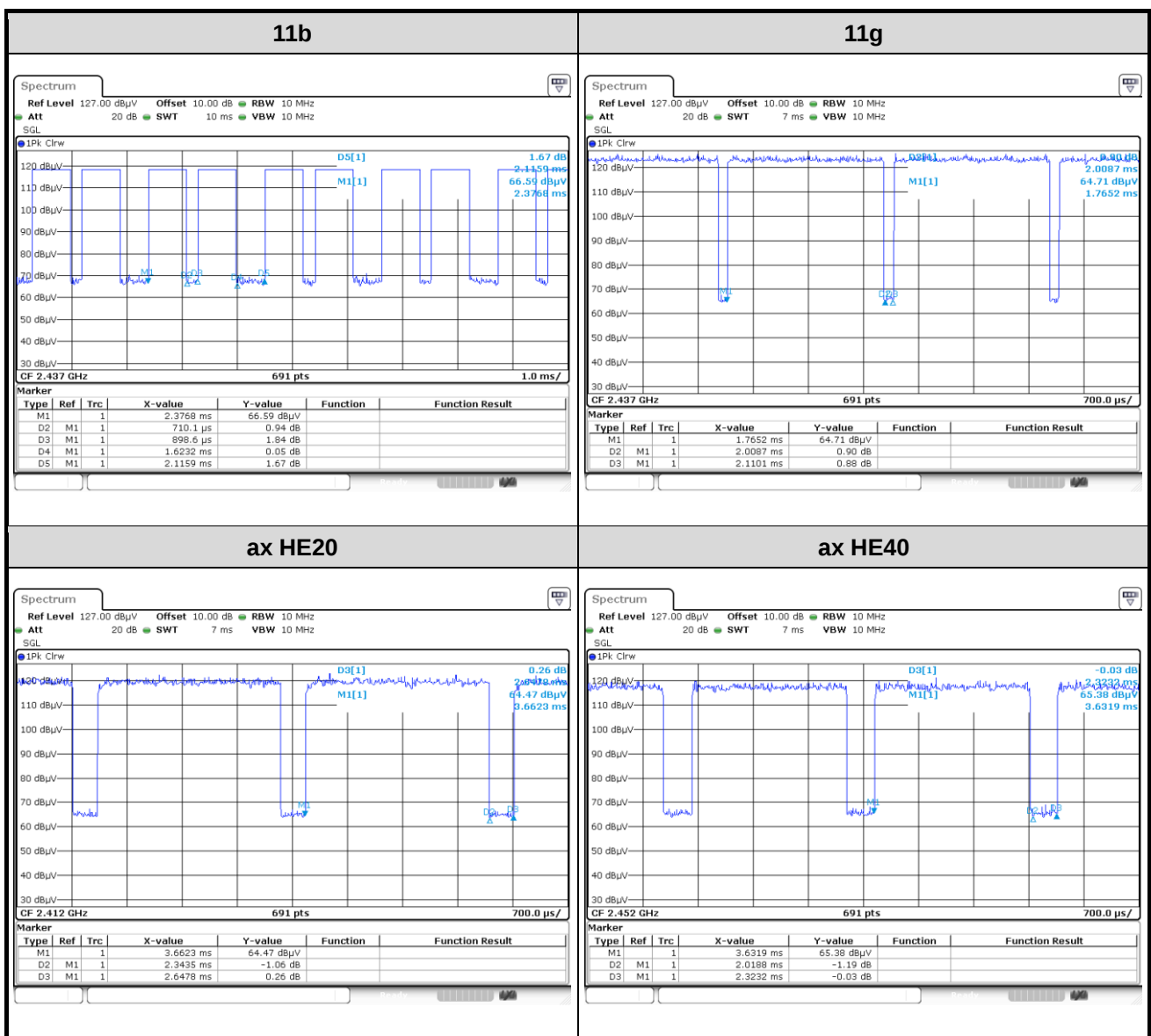
Note: The above power supply is not bundled in market.

1.1.5 Channel List

Frequency band (MHz)		2400~2483.5	
802.11a / 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	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	QSPR, v5.0-00170		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	67.81%	1.69
	11g	95.19%	0.21
	ax (HE20)	88.51%	0.53
	ax (HE40)	86.90%	0.61



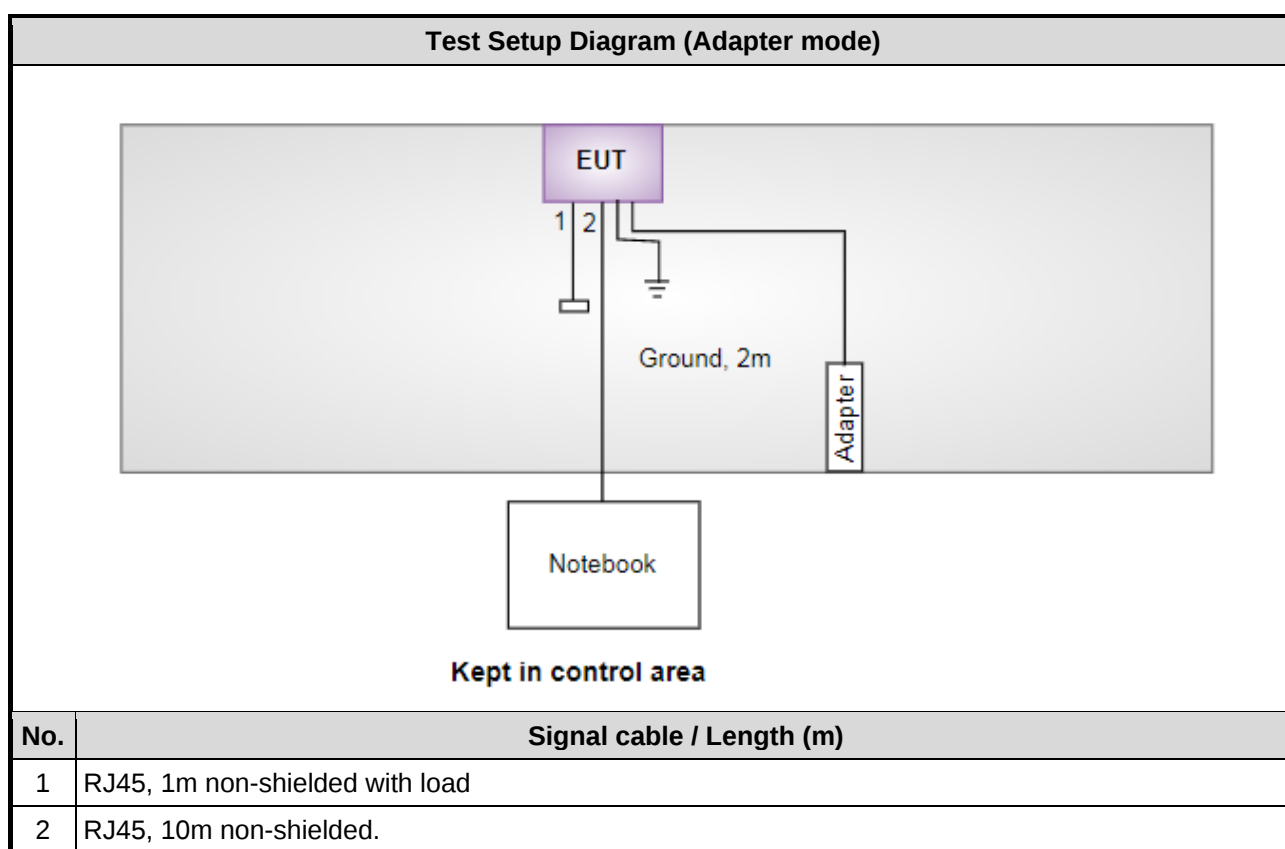
1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	21
11b	2437	22
11b	2462	22
11g	2412	21.5
11g	2437	24
11g	2462	18
ax (HE20)	2412	19
ax (HE20)	2437	24
ax (HE20)	2462	17
ax (HE40)	2422	18.5
ax (HE40)	2437	20
ax (HE40)	2452	16

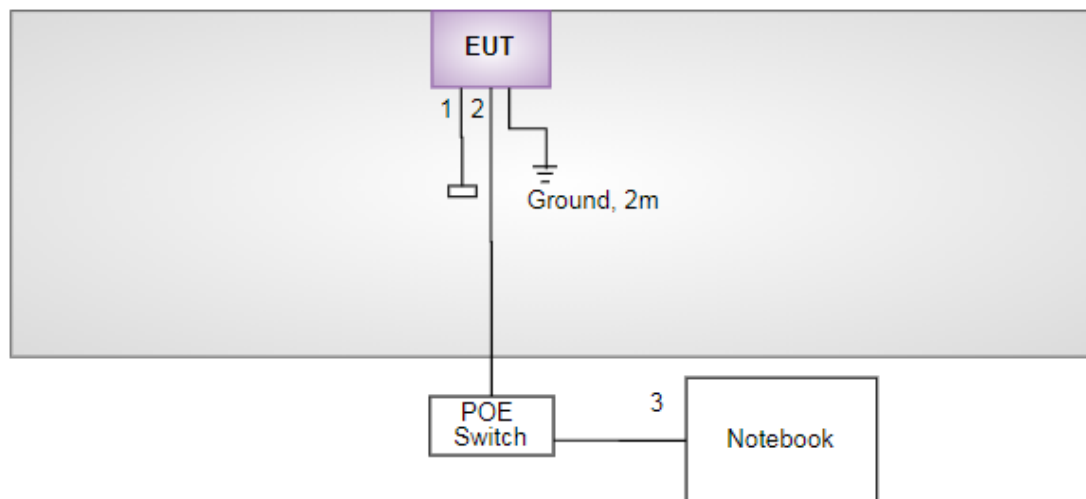
1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E6440	DoC	---
2	POE Switch	ZYXEL	XS1930-12HP	---	Provided by applicant.
3	Adapter	APD	WA-30P12R	---	Provided by applicant.

1.3 Test Setup Chart



Test Setup Diagram (POE mode)



Kept in control area

No.	Signal cable / Length (m)
1	RJ45, 1m non-shielded with load
2	RJ45, 10m non-shielded.
3	RJ45, 1m non-shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Sep. 16, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 05, 2018	Nov. 04, 2019
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 23, 2018	Oct. 22, 2019
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 chamber 3 / (03CH03-WS)				
Tested Date	Aug. 14 ~ Aug. 30, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Jan. 07, 2019	Jan. 06, 2020
Receiver	R&S	ESR3	101658	Dec. 11, 2018	Dec. 10, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 17, 2019	Apr. 16, 2020
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Jan. 07, 2019	Jan. 06, 2020
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 15, 2018	Nov. 14, 2019
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 09, 2018	Nov. 08, 2019
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 08, 2018	Oct. 07, 2019
Preamplifier	EMC	EMC02325	980187	Aug. 14, 2019	Aug. 13, 2020
Preamplifier	Agilent	83017A	MY53270014	Aug. 07, 2019	Aug. 06, 2020
Preamplifier	EMC	EMC184045B	980192	Aug. 01, 2019	Jul. 31, 2020
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Oct. 01, 2018	Sep. 30, 2019
RF cable-8M	EMC	EMC104-SM-SM-8000	181107	Oct. 01, 2018	Sep. 30, 2019
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Oct. 01, 2018	Sep. 30, 2019
LF cable-0.8M	EMC	EMC8D-NM-NM-8000	EMC8D-NM-NM-800-001	Oct. 01, 2018	Sep. 30, 2019
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Oct. 01, 2018	Sep. 30, 2019
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Oct. 01, 2018	Sep. 30, 2019
Measurement Software	SENSE-15247_DTS	V5.9	--	NA	NA

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

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Sep. 09 ~ Sep. 10, 2019				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 17, 2019	Apr. 16, 2020
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
Measurement Software	Sporton	SENSE-15247_DTS	V5.9	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247

ANSI C63.10-2013

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 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 ($k=2$))

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
Radiated emission ≤ 1 GHz	± 3.96 dB
Radiated emission > 1 GHz	± 4.51 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 62%	Alex Tsai
Radiated Emissions	03CH03-WS	24-25°C / 61-65%	Roger Lu Brad Wu
RF Conducted	TH01-WS	22°C / 65%	Roger Lu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11g	2437	6 Mbps	1, 2
Radiated Emissions ≤1GHz	11g	2437	6 Mbps	1, 2
Maximum Output Power	11b 11g ax HE20 ax HE40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	1
Maximum Output Power	ax HE20 ax HE40	2412 / 2437 / 2462 2422 / 2437 / 2452	MCS 0 MCS 0	3
Radiated Emissions >1GHz 6dB bandwidth Power spectral density	11b 11g ax HE20 ax HE40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	1

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. The EUT had been tested by following test configurations.
 - 1) Configuration 1: Adapter mode, Radio1 / Non-Beamforming
 - 2) Configuration 2: POE mode, Radio1 / Non-Beamforming
 - 3) Configuration 3: Adapter mode, Radio1 / Beamforming

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

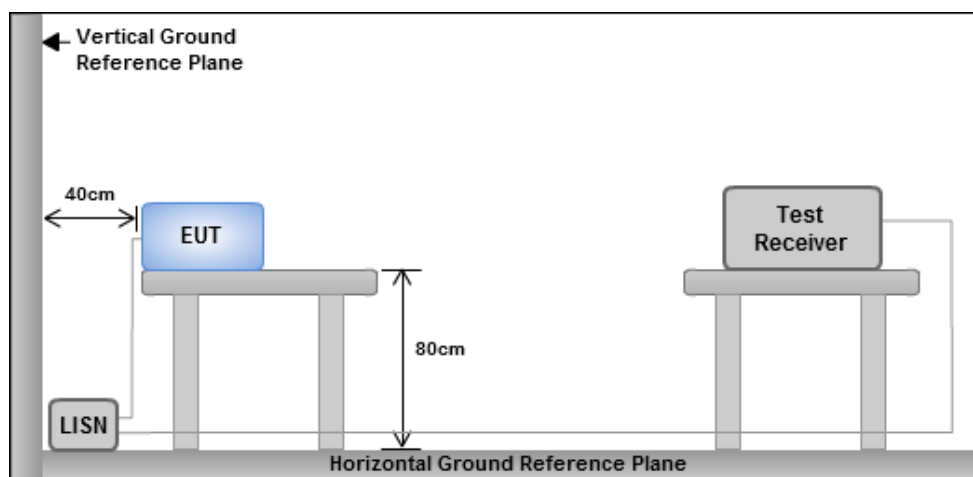
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

3.1.2 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.

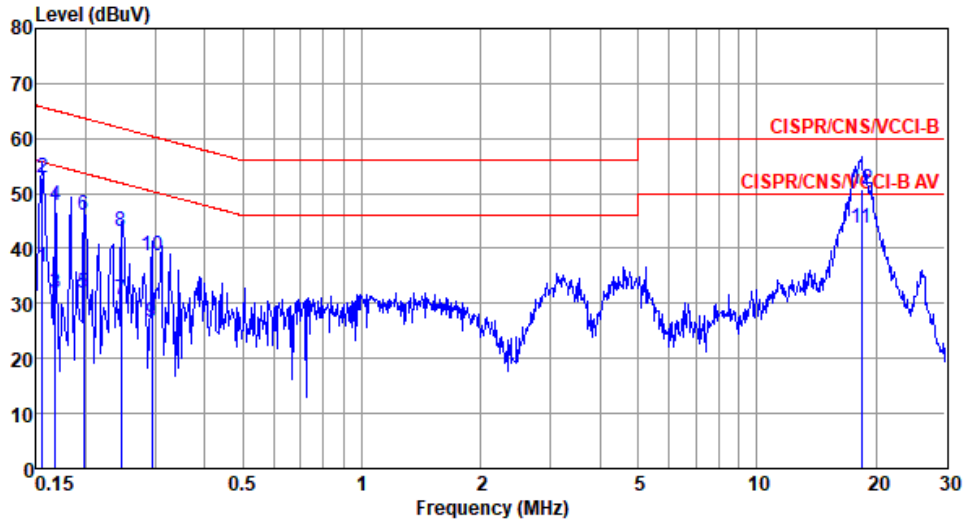
3.1.3 Test Setup



- 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

3.1.4 Test Result of Conducted Emissions

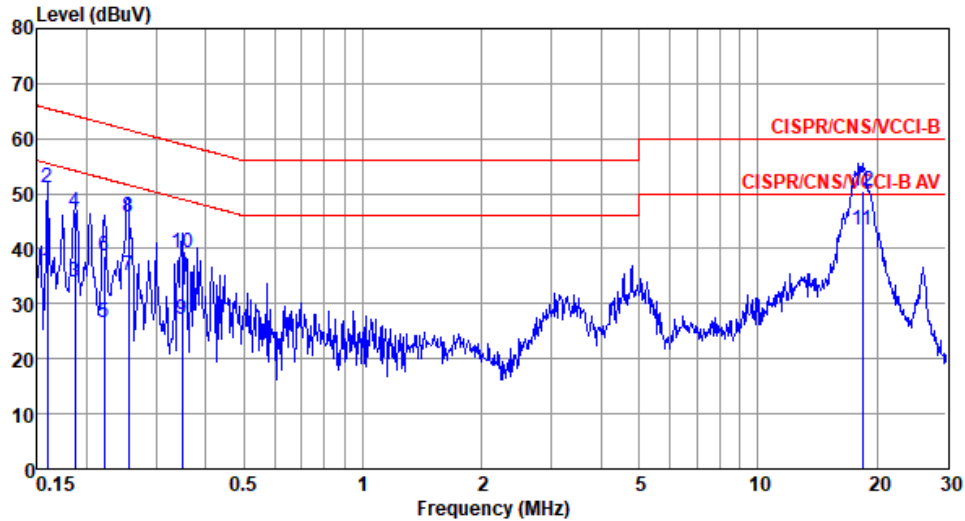
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	36.68	55.69	-19.01	26.97	9.53	0.05	Average
2	0.156	52.75	65.69	-12.94	43.04	9.53	0.05	QP
3	0.168	31.90	55.08	-23.18	22.16	9.53	0.06	Average
4	0.168	47.84	65.08	-17.24	38.10	9.53	0.06	QP
5	0.198	32.02	53.71	-21.69	22.22	9.54	0.07	Average
6	0.198	46.05	63.71	-17.66	36.25	9.54	0.07	QP
7	0.246	30.62	51.91	-21.29	20.79	9.55	0.07	Average
8	0.246	43.03	61.91	-18.88	33.20	9.55	0.07	QP
9	0.294	26.59	50.41	-23.82	16.72	9.56	0.08	Average
10	0.294	38.78	60.41	-21.63	28.91	9.56	0.08	QP
11*	18.426	43.74	50.00	-6.26	32.92	9.66	0.59	Average
12	18.426	50.82	60.00	-9.18	40.00	9.66	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

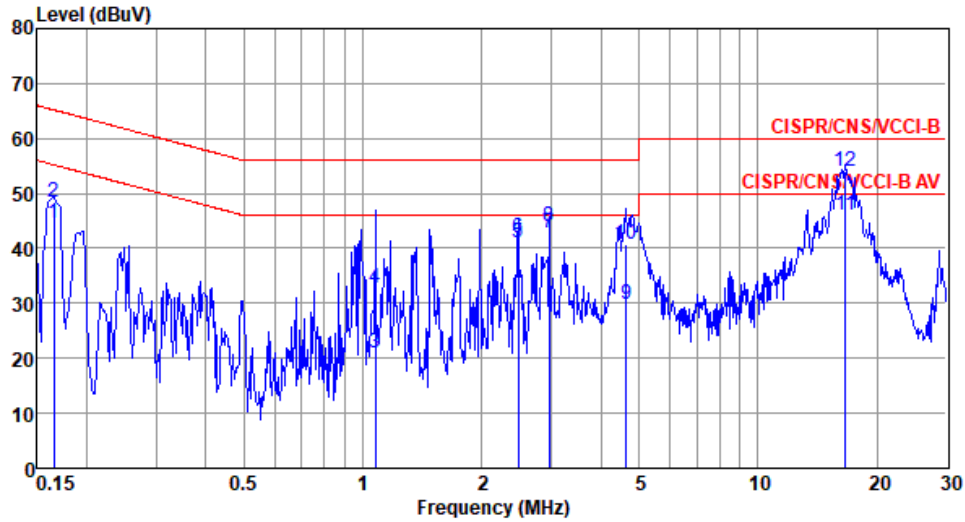
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	36.16	55.52	-19.36	26.42	9.57	0.05	Average
2	0.159	51.02	65.52	-14.50	41.28	9.57	0.05	QP
3	0.186	33.81	54.20	-20.39	24.03	9.58	0.07	Average
4	0.186	46.69	64.20	-17.51	36.91	9.58	0.07	QP
5	0.222	26.61	52.74	-26.13	16.82	9.58	0.07	Average
6	0.222	38.78	62.74	-23.96	28.99	9.58	0.07	QP
7	0.255	35.24	51.60	-16.36	25.45	9.59	0.07	Average
8	0.255	45.75	61.60	-15.85	35.96	9.59	0.07	QP
9	0.348	27.27	49.00	-21.73	17.47	9.60	0.08	Average
10	0.348	39.16	59.00	-19.84	29.36	9.60	0.08	QP
11*	18.426	43.32	50.00	-6.68	32.51	9.80	0.59	Average
12	18.426	50.42	60.00	-9.58	39.61	9.80	0.59	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

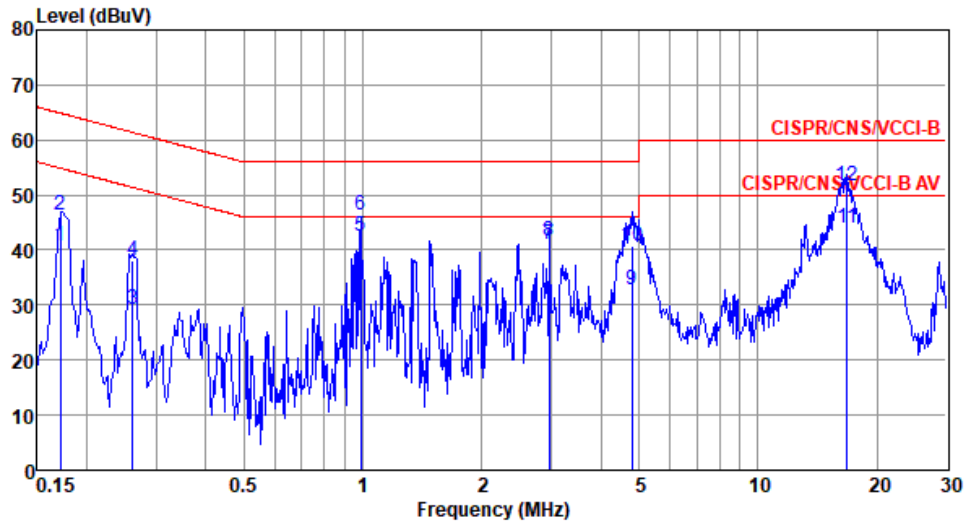
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.165	44.66	55.21	-10.55	35.07	9.53	0.06	Average
2	0.165	48.50	65.21	-16.71	38.91	9.53	0.06	QP
3	1.077	20.88	46.00	-25.12	11.17	9.60	0.11	Average
4	1.077	32.89	56.00	-23.11	23.18	9.60	0.11	QP
5	2.474	41.05	46.00	-4.95	31.25	9.60	0.20	Average
6	2.474	41.92	56.00	-14.08	32.12	9.60	0.20	QP
7*	2.962	42.77	46.00	-3.23	32.93	9.61	0.23	Average
8	2.962	44.10	56.00	-11.90	34.26	9.61	0.23	QP
9	4.647	29.82	46.00	-16.18	19.89	9.62	0.31	Average
10	4.647	40.78	56.00	-15.22	30.85	9.62	0.31	QP
11	16.683	46.01	50.00	-3.99	35.78	9.66	0.57	Average
12	16.683	53.92	60.00	-6.08	43.69	9.66	0.57	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.171	40.76	54.90	-14.14	31.17	9.53	0.06	Average
2	0.171	46.21	64.90	-18.69	36.62	9.53	0.06	QP
3	0.262	29.26	51.38	-22.12	19.64	9.55	0.07	Average
4	0.262	37.93	61.38	-23.45	28.31	9.55	0.07	QP
5*	0.989	42.37	46.00	-3.63	32.67	9.60	0.10	Average
6	0.989	46.46	56.00	-9.54	36.76	9.60	0.10	QP
7	2.962	41.11	46.00	-4.89	31.27	9.61	0.23	Average
8	2.962	41.60	56.00	-14.40	31.76	9.61	0.23	QP
9	4.797	32.74	46.00	-13.26	22.81	9.62	0.31	Average
10	4.797	40.74	56.00	-15.26	30.81	9.62	0.31	QP
11	16.820	43.84	50.00	-6.16	33.60	9.66	0.58	Average
12	16.820	51.66	60.00	-8.34	41.42	9.66	0.58	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

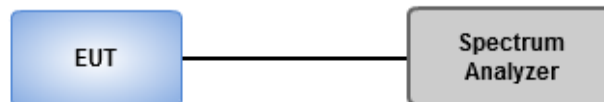
6dB Bandwidth

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.

3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

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	8.116M	13.097M	13M1G1D	5.87M	12.663M
802.11g_Nss1,(6Mbps)_4TX	16.377M	16.57M	16M6D1D	15.942M	16.281M
802.11ax HEW20_Nss1,(MCS0)_4TX	18.986M	19.103M	19M1D1D	17.681M	18.813M
802.11ax HEW40_Nss1,(MCS0)_4TX	37.971M	38.061M	38M1D1D	37.536M	37.627M

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

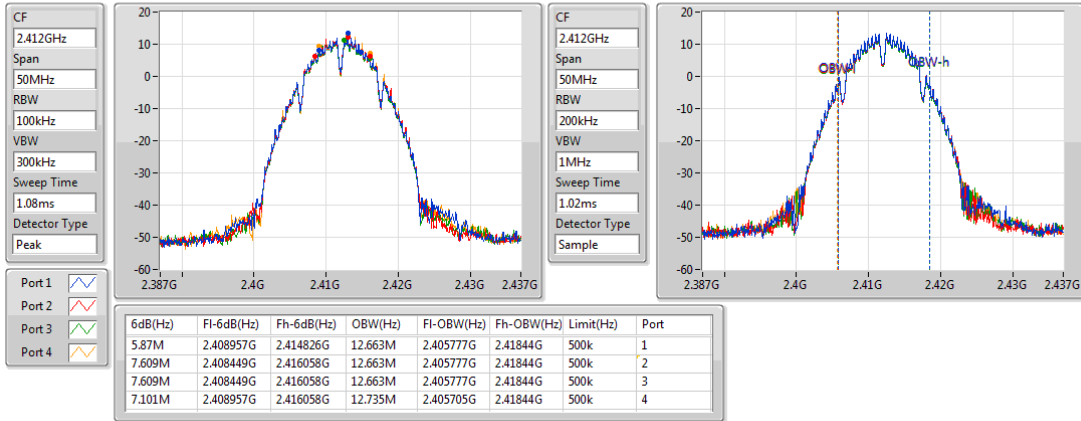
Mode	Result	Limit (Hz)	Port 1 -N dB (Hz)	Port 1 -OBW (Hz)	Port 2 -N dB (Hz)	Port 2 -OBW (Hz)	Port 3 -N dB (Hz)	Port 3 -OBW (Hz)	Port 4 -N dB (Hz)	Port 4 -OBW (Hz)
802.11b_Nss1, (1Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	5.87M	12.663M	7.609M	12.663M	7.609M	12.663M	7.101M	12.735M
2437MHz	Pass	500k	7.536M	13.097M	7.609M	13.025M	7.609M	13.025M	6.594M	13.097M
2462MHz	Pass	500k	6.522M	13.025M	8.116M	12.952M	7.029M	13.025M	7.609M	13.025M
802.11g_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	15.942M	16.353M	16.304M	16.281M	16.304M	16.353M	15.942M	16.353M
2437MHz	Pass	500k	16.304M	16.498M	16.304M	16.57M	16.377M	16.498M	16.304M	16.57M
2462MHz	Pass	500k	16.377M	16.353M	16.087M	16.281M	16.087M	16.425M	16.087M	16.353M
802.11ax HEW20_Nss1, (MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	500k	18.551M	18.886M	18.768M	18.886M	17.681M	18.813M	17.826M	18.813M
2437MHz	Pass	500k	18.841M	19.03M	18.986M	19.103M	18.841M	18.958M	18.841M	19.03M
2462MHz	Pass	500k	18.913M	18.886M	18.696M	18.886M	18.406M	18.958M	17.826M	18.886M
802.11ax HEW40_Nss1, (MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	500k	37.971M	37.771M	37.536M	37.771M	37.971M	37.627M	37.971M	37.916M
2437MHz	Pass	500k	37.971M	37.916M	37.971M	37.916M	37.971M	37.916M	37.971M	38.061M
2452MHz	Pass	500k	37.681M	37.771M	37.971M	37.627M	37.826M	37.771M	37.971M	37.771M

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

802.11b_Nss1,(1Mbps)_4TX

EBW

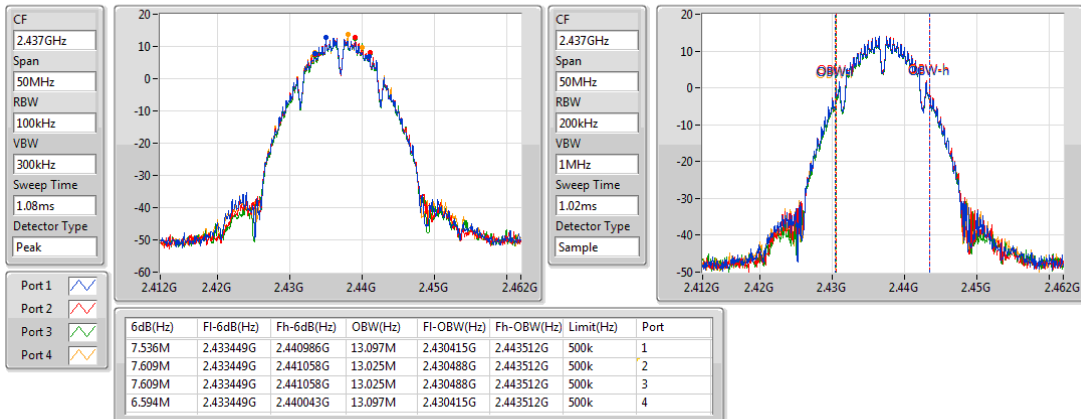
2412MHz



802.11b_Nss1,(1Mbps)_4TX

EBW

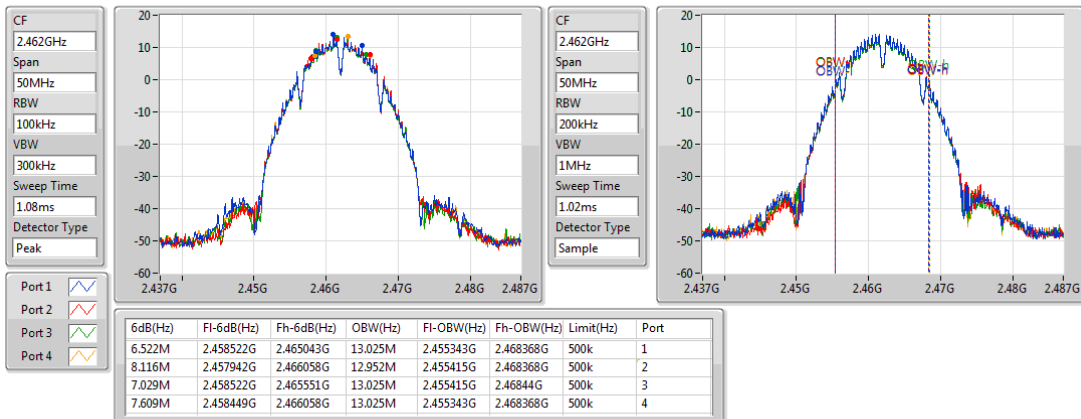
2437MHz



802.11b_Nss1,(1Mbps)_4TX

EBW

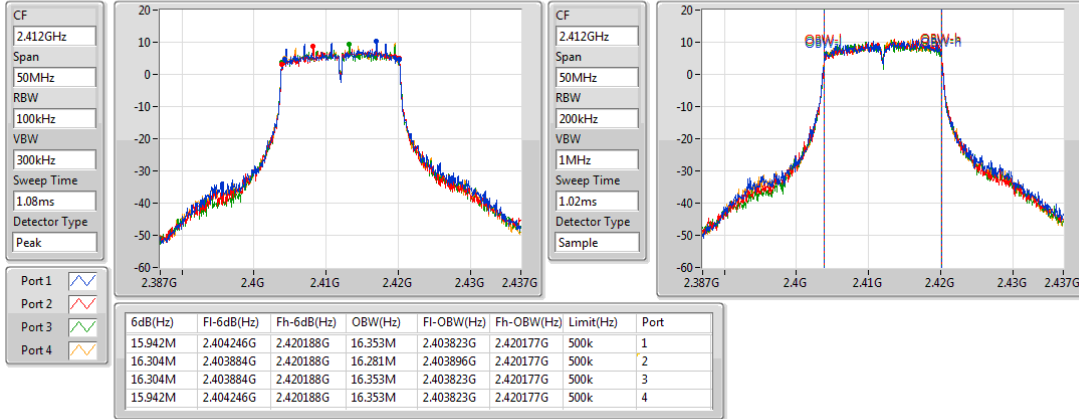
2462MHz



802.11g_Nss1,(6Mbps)_4TX

EBW

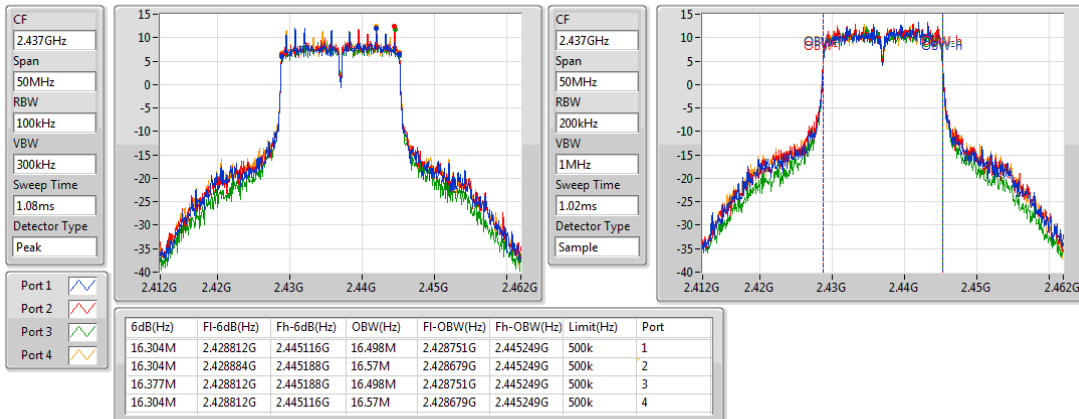
2412MHz



802.11g_Nss1,(6Mbps)_4TX

EBW

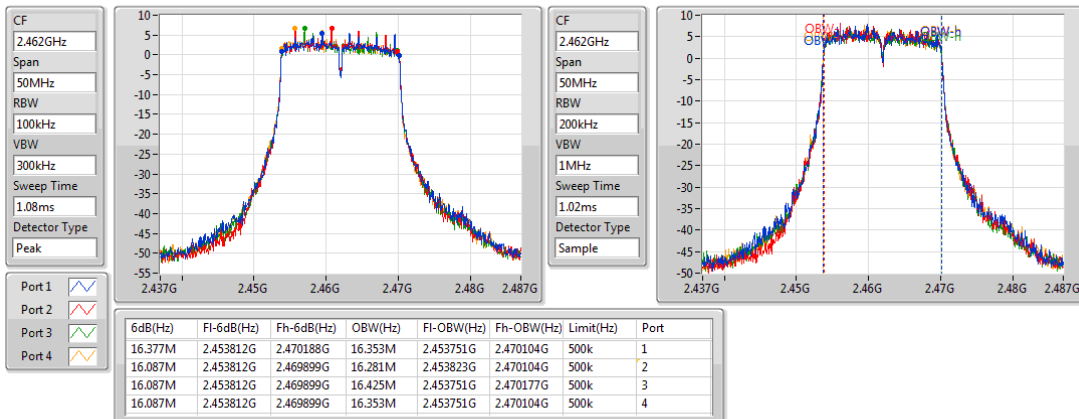
2437MHz



802.11g_Nss1,(6Mbps)_4TX

EBW

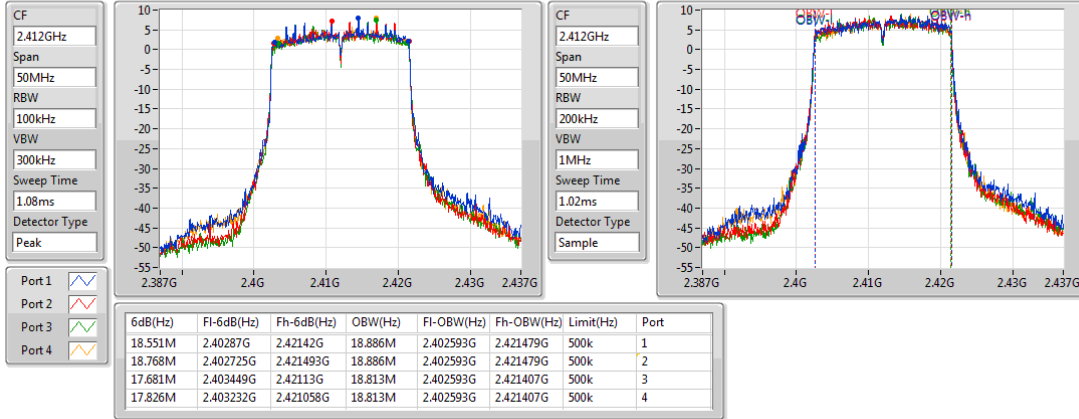
2462MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

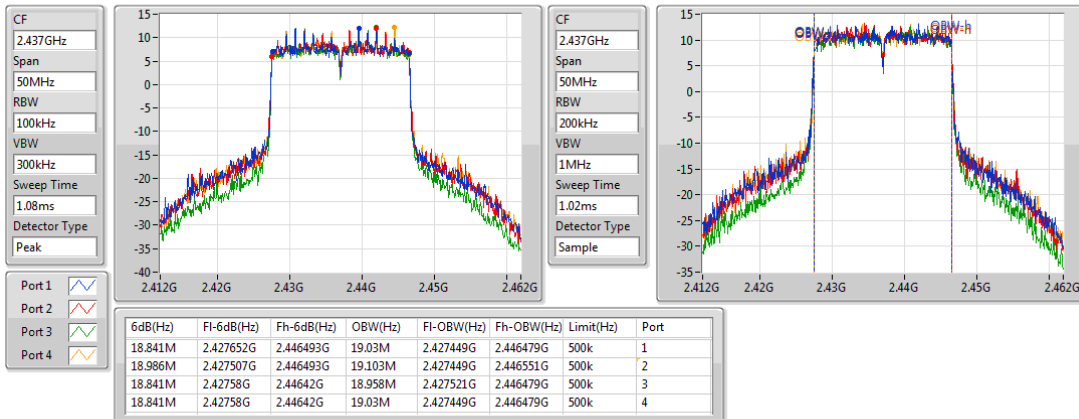
2412MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

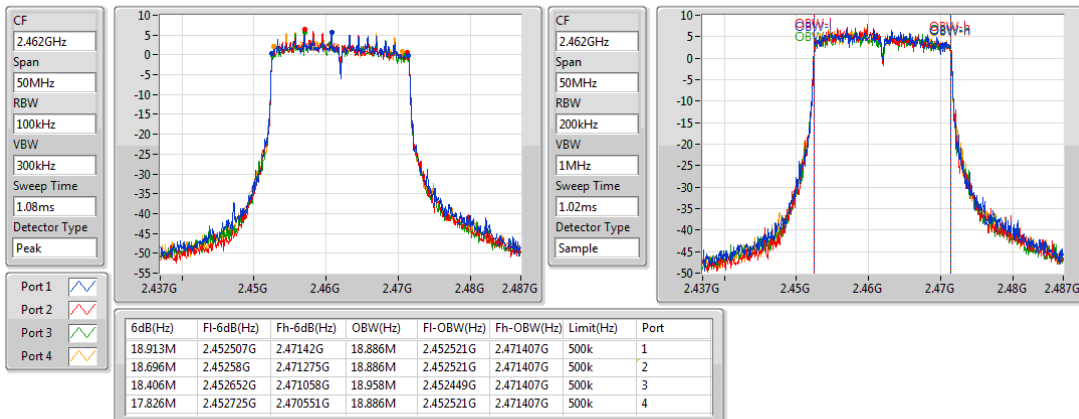
2437MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

EBW

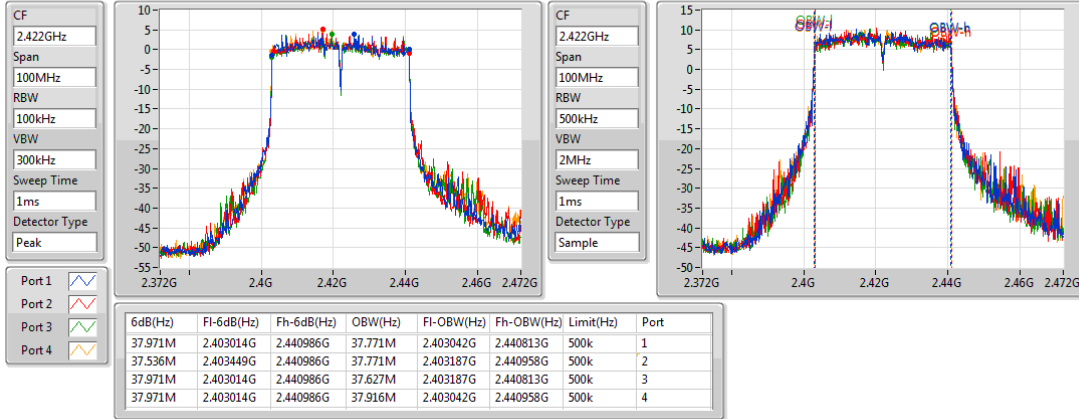
2462MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

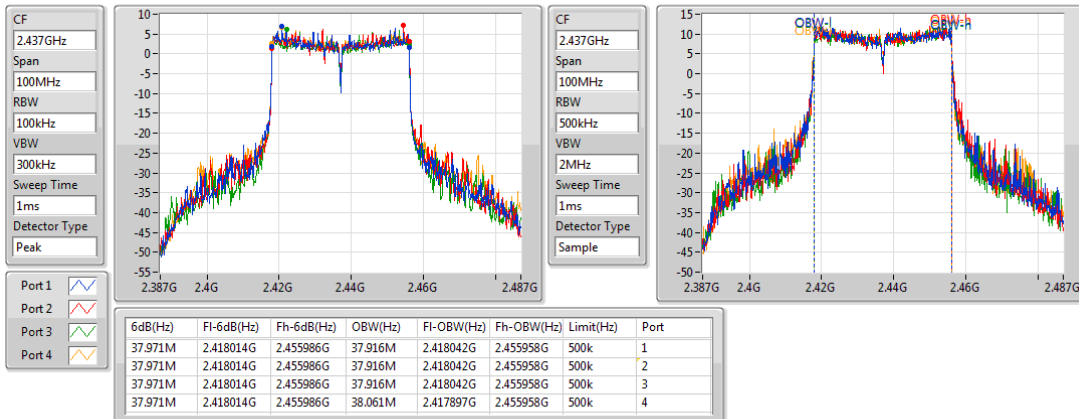
2422MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

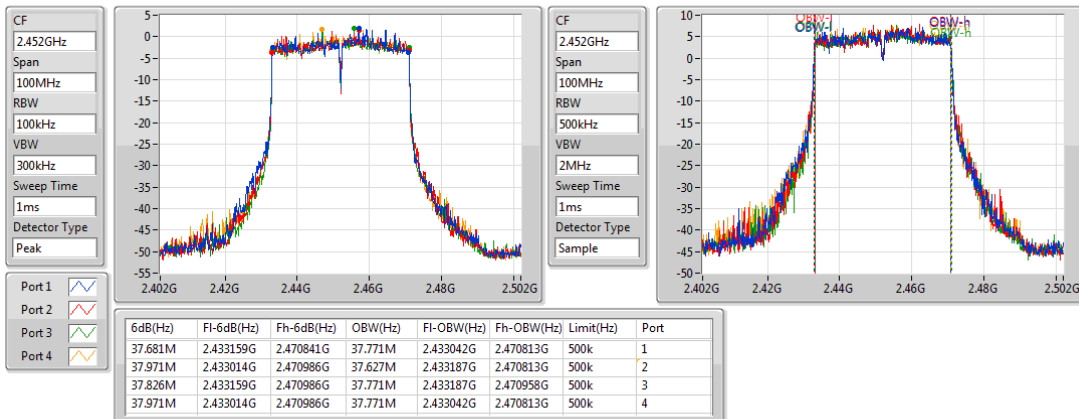
2437MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

EBW

2452MHz



3.3 RF Output Power

3.3.1 Limit of RF 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 $> 6\text{dBi}$

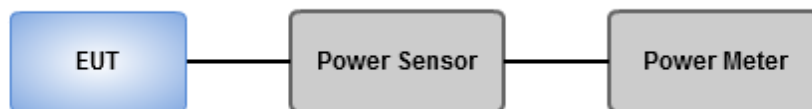
Non Fixed, point to point operations.

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

3.3.2 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.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Output Power

Non-beamforming mode

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_4TX	28.16	0.65464
802.11g_Nss1,(6Mbps)_4TX	29.64	0.92045
802.11ax HEW20_Nss1,(MCS0)_4TX	29.59	0.90991
802.11ax HEW40_Nss1,(MCS0)_4TX	26.61	0.45814

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	0.00	21.46	21.46	21.19	21.05	27.31	30.00	27.31	36.00
2437MHz	Pass	0.00	22.21	22.23	21.69	21.76	28.00	30.00	28.00	36.00
2462MHz	Pass	0.00	22.3	22.32	21.89	22.05	28.16	30.00	28.16	36.00
802.11g_Nss1, (6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	0.00	21.84	21.81	21.65	21.63	27.75	30.00	27.75	36.00
2437MHz	Pass	0.00	23.67	23.87	23.34	23.6	29.64	30.00	29.64	36.00
2462MHz	Pass	0.00	18.27	18.33	18.01	17.92	24.16	30.00	24.16	36.00
802.11ax HEW20_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	0.00	19.34	19.32	18.86	19.23	25.21	30.00	25.21	36.00
2437MHz	Pass	0.00	23.61	23.71	23.33	23.61	29.59	30.00	29.59	36.00
2462MHz	Pass	0.00	17.11	17.16	16.75	17.06	23.04	30.00	23.04	36.00
802.11ax HEW40_ Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	0.00	18.59	18.53	18.35	18.55	24.53	30.00	24.53	36.00
2437MHz	Pass	0.00	20.55	20.72	20.31	20.78	26.61	30.00	26.61	36.00
2452MHz	Pass	0.00	16.08	16.13	15.83	16.15	22.07	30.00	22.07	36.00

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

Beamforming mode

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
11ax20,BF_Nss1,(MCS0)_4TX	23.57	0.22751
11ax24,BF_Nss1,(MCS0)_4TX	20.59	0.11455

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)
11ax20,BF_Nss1, (MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	6.02	13.32	13.3	12.84	13.21	19.19	29.98	25.21	36.00
2437MHz	Pass	6.02	17.59	17.69	17.31	17.59	23.57	29.98	29.59	36.00
2462MHz	Pass	6.02	11.09	11.14	10.73	11.04	17.02	29.98	23.04	36.00
11ax24,BF_Nss1, (MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	6.02	12.57	12.51	12.33	12.53	18.51	29.98	24.53	36.00
2437MHz	Pass	6.02	14.53	14.7	14.29	14.76	20.59	29.98	26.61	36.00
2452MHz	Pass	6.02	10.06	10.11	9.81	10.13	16.05	29.98	22.07	36.00

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

Note:

- Directional gain = $0 + 10 \cdot \log(4/1) = 6.02 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to $30 \text{ dBm} - (6.02 \text{ dBi} - 6 \text{ dBi}) = 29.98 \text{ dBm}$.

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

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

3.4.2 Test Procedures

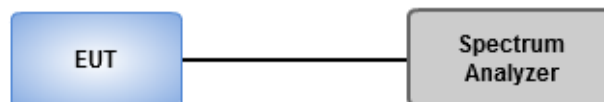
Average PSD, duty cycle $\geq 98\%$

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.

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_4TX	6.36
802.11g_Nss1,(6Mbps)_4TX	3.93
802.11ax HEW20_Nss1,(MCS0)_4TX	3.42
802.11ax HEW40_Nss1,(MCS0)_4TX	-3.30

Result

Mode	Result	DG (dBi)	Port 1 (dBm/R BW)	Port 2 (dBm/R BW)	Port 3 (dBm/R BW)	Port 4 (dBm/R BW)	PD (dBm/R BW)	PD Limit (dBm/R BW)
802.11b_Nss1, (1Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.02	-0.40	-0.32	-0.45	-0.48	5.60	7.98
2437MHz	Pass	6.02	0.16	0.46	-0.17	0.23	6.12	7.98
2462MHz	Pass	6.02	0.56	0.63	0.21	0.29	6.36	7.98
802.11g_Nss1, (6Mbps)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.02	-3.38	-3.46	-3.83	-3.70	2.31	7.98
2437MHz	Pass	6.02	-1.91	-1.80	-1.97	-1.94	3.93	7.98
2462MHz	Pass	6.02	-7.13	-6.90	-7.16	-7.16	-1.23	7.98
802.11ax HEW20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2412MHz	Pass	6.02	-6.64	-6.70	-6.93	-6.75	-0.73	7.98
2437MHz	Pass	6.02	-2.76	-1.91	-2.53	-2.68	3.42	7.98
2462MHz	Pass	6.02	-8.73	-7.92	-8.77	-8.39	-2.42	7.98
802.11ax HEW40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
2422MHz	Pass	6.02	-10.76	-9.87	-10.25	-10.61	-4.41	7.98
2437MHz	Pass	6.02	-9.35	-8.71	-9.31	-9.28	-3.30	7.98
2452MHz	Pass	6.02	-13.24	-13.02	-13.13	-13.13	-7.28	7.98

DG = Directional Gain;

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

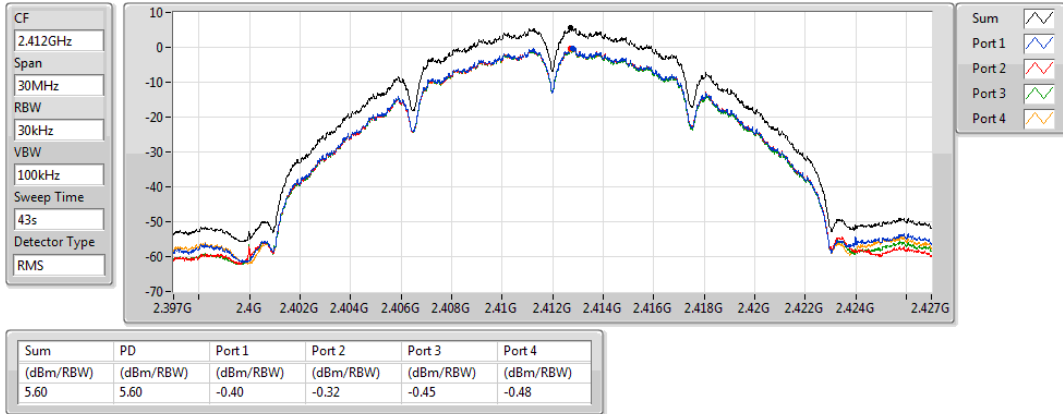
Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. Directional gain = $0 + 10 * \log(4/1) = 6.02 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to $8 \text{ dBm} - (6.02 \text{ dBi} - 6 \text{ dBi}) = 7.98 \text{ dBm}$.

802.11b_Nss1,(1Mbps)_4TX

PSD

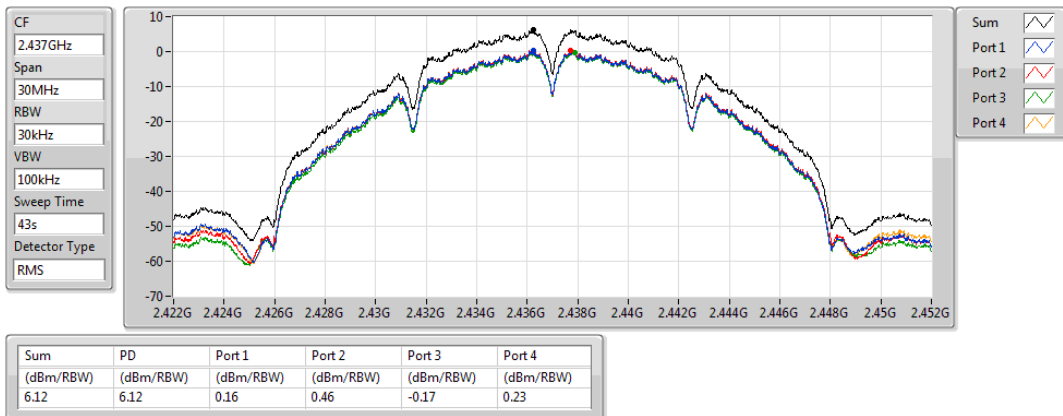
2412MHz



802.11b_Nss1,(1Mbps)_4TX

PSD

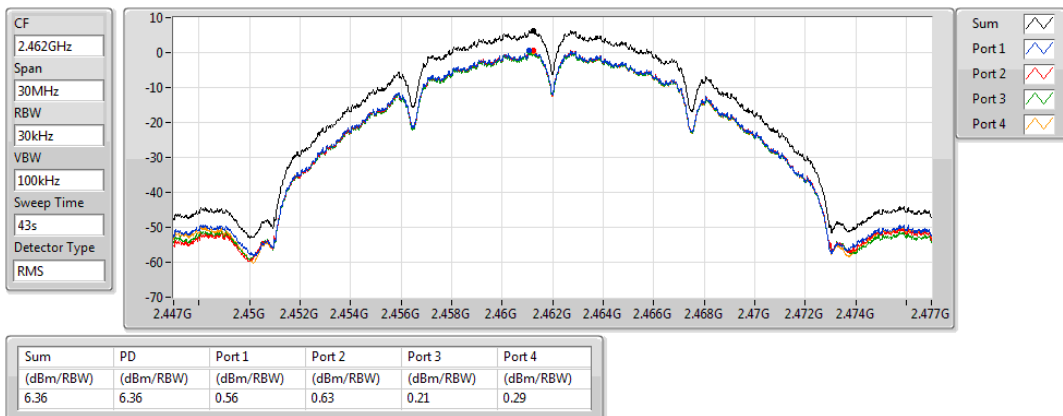
2437MHz



802.11b_Nss1,(1Mbps)_4TX

PSD

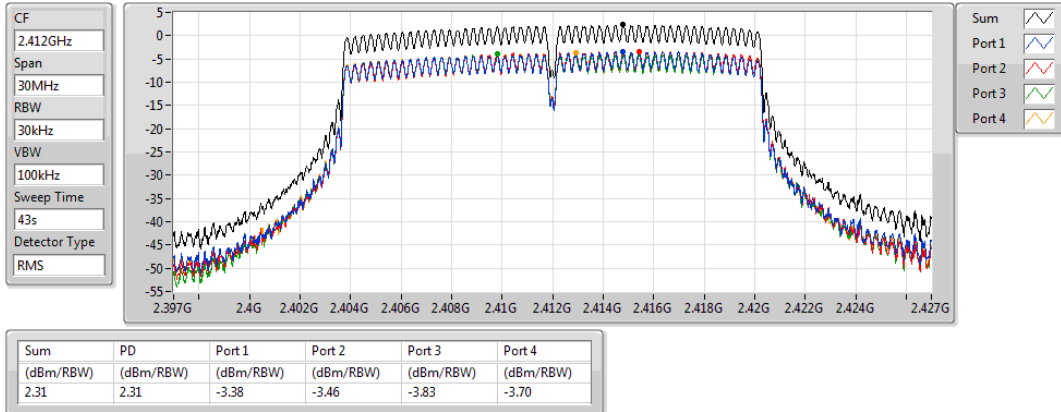
2462MHz



802.11g_Nss1,(6Mbps)_4TX

PSD

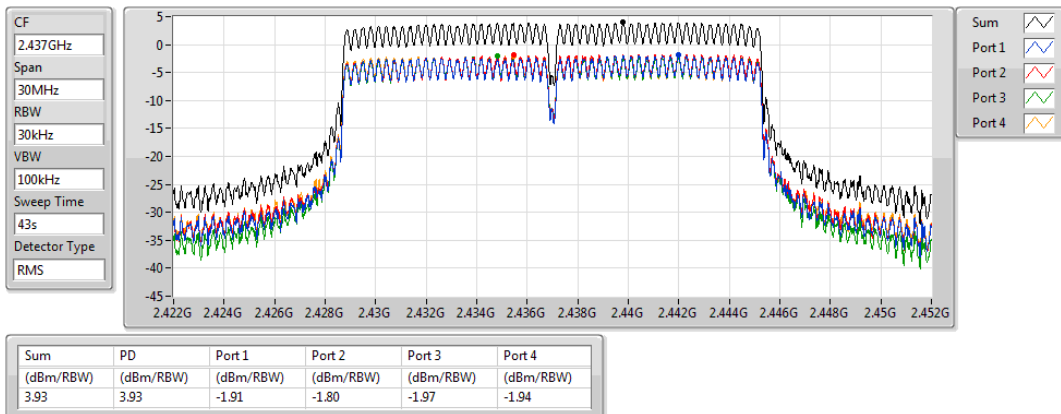
2412MHz



802.11g_Nss1,(6Mbps)_4TX

PSD

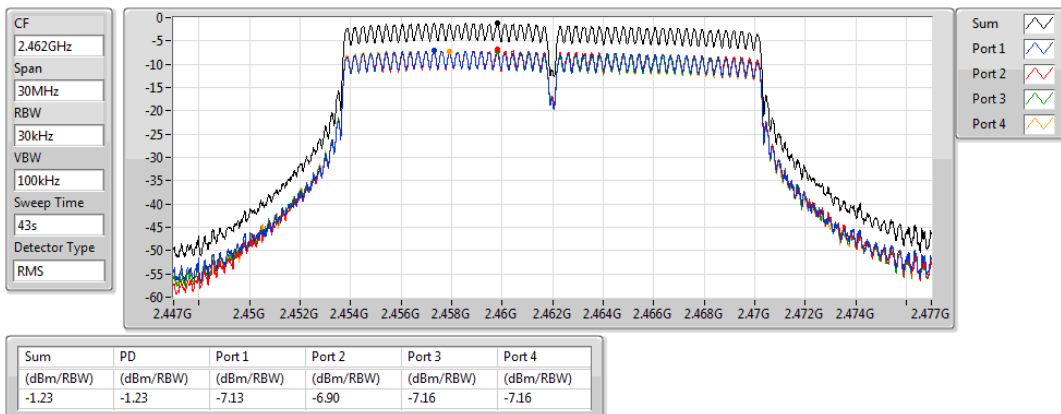
2437MHz



802.11g_Nss1,(6Mbps)_4TX

PSD

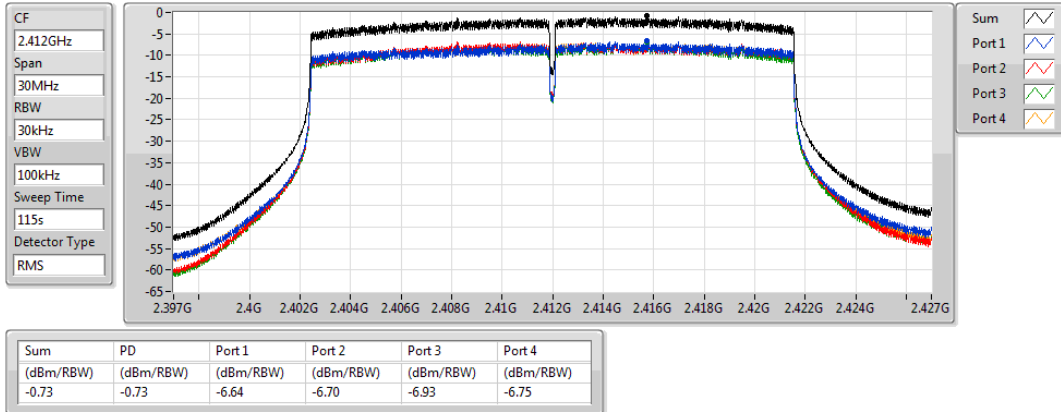
2462MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

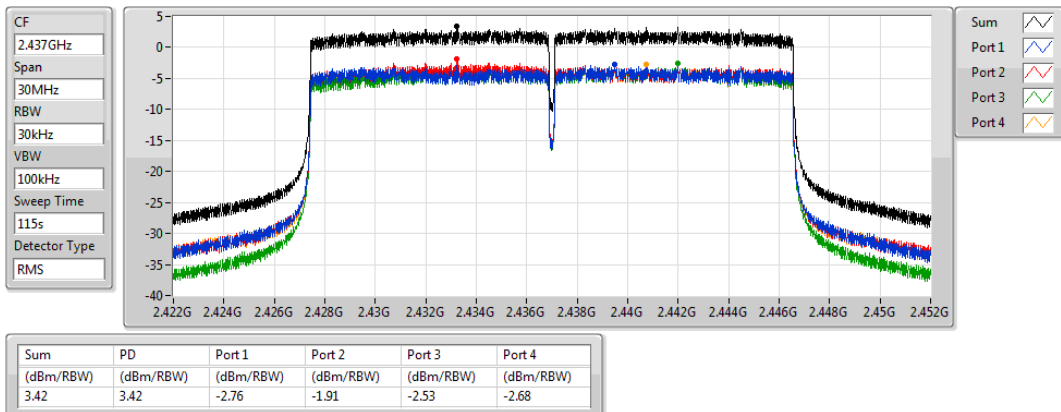
2412MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

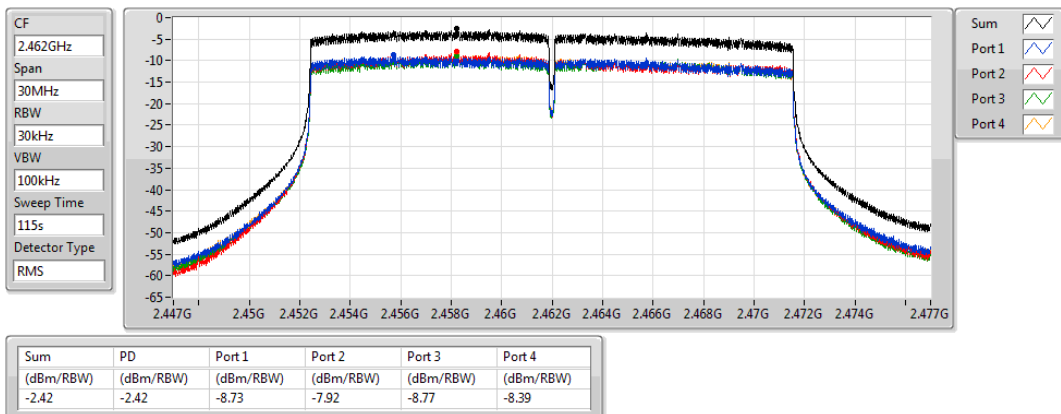
2437MHz



802.11ax HEW20_Nss1,(MCS0)_4TX

PSD

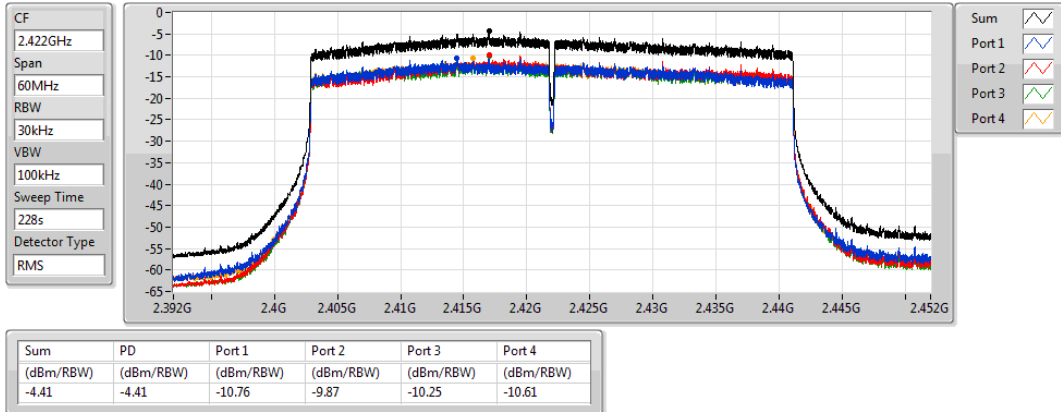
2462MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

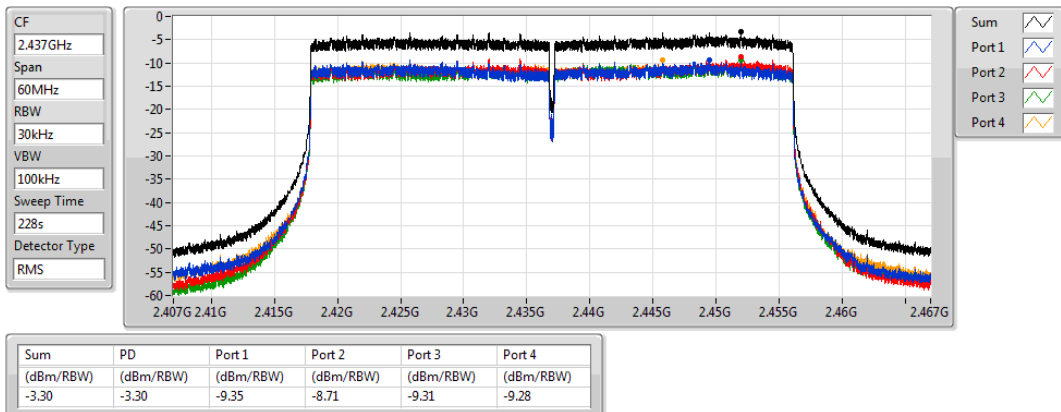
2422MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

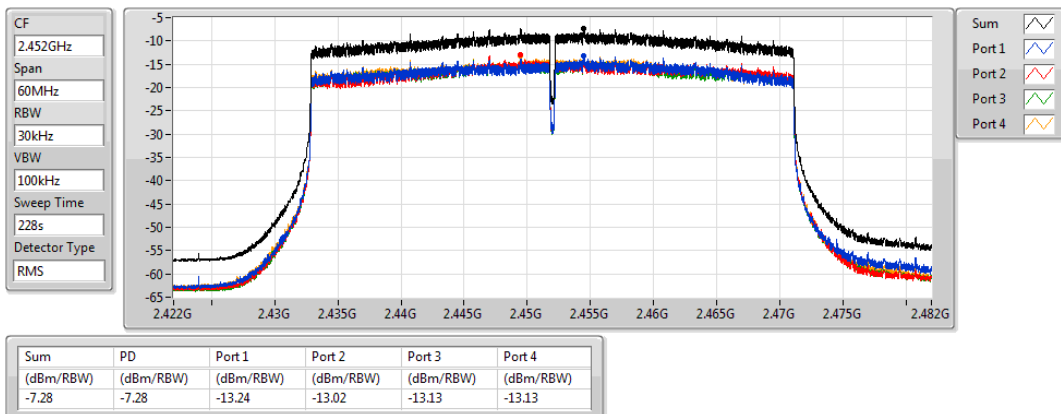
2437MHz



802.11ax HEW40_Nss1,(MCS0)_4TX

PSD

2452MHz



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 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:
Qusai-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.

3.5.2 Test Procedures

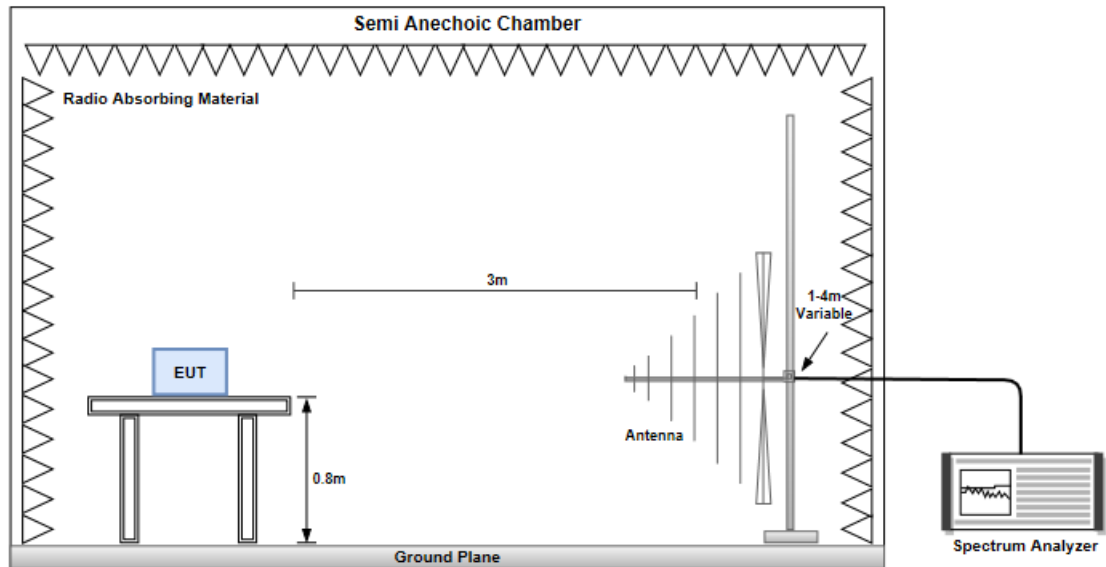
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

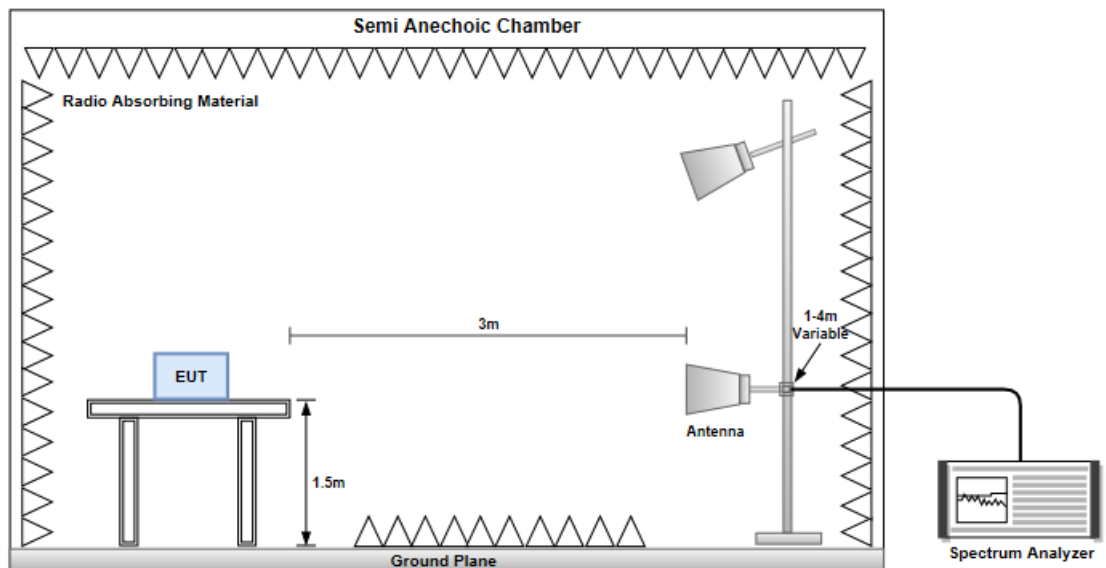
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

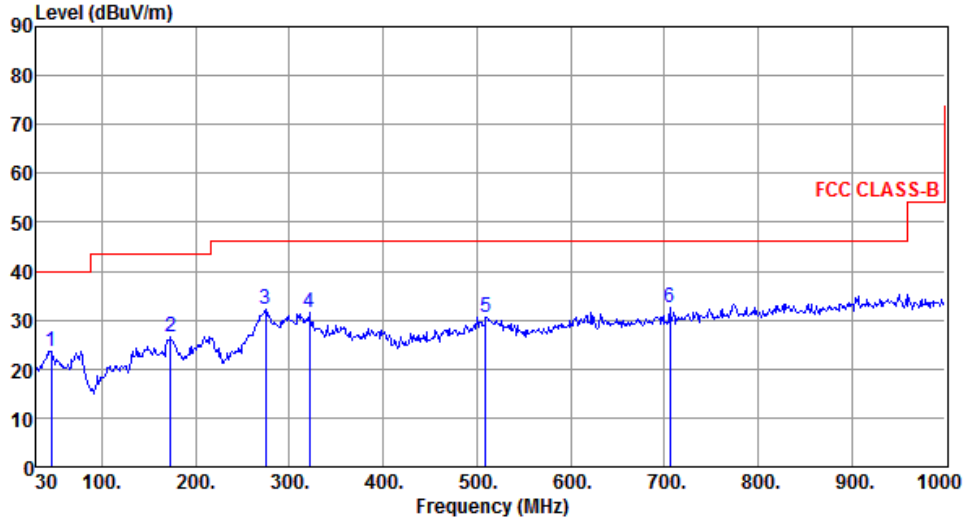


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1

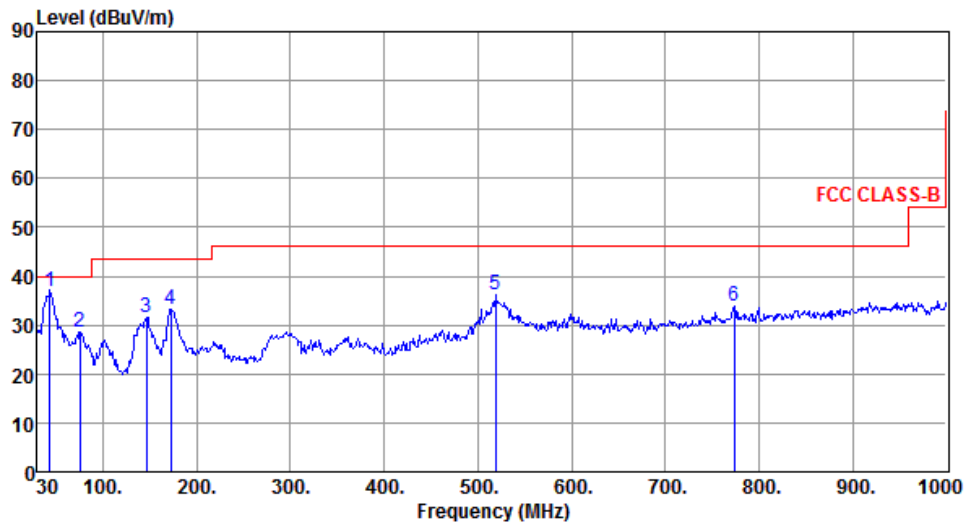


The graph displays the radiated unwanted emissions for a transmitter. The y-axis represents the Level in dBUV/m, ranging from 0 to 90. The x-axis represents the Frequency in MHz, ranging from 30 to 1000. A red line indicates the FCC CLASS-B limit, which is 40 dBUV/m from 30 to 100 MHz, 45 dBUV/m from 100 to 1000 MHz. A blue line shows the measured emission level, with six specific peaks labeled 1 through 6. The emission level is generally below the limit, with a margin of at least 13 dB.

	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	45.52	23.60	40.00	-16.40	32.31	-8.71	Peak	---	---
2	173.56	26.64	43.50	-16.86	36.12	-9.48	Peak	---	---
3	274.44	32.07	46.00	-13.93	41.13	-9.06	Peak	---	---
4	321.00	31.70	46.00	-14.30	39.27	-7.57	Peak	---	---
5	509.18	30.48	46.00	-15.52	33.42	-2.94	Peak	---	---
6	706.09	32.59	46.00	-13.41	31.78	0.81	Peak	---	---

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	43.58	36.98	40.00	-3.02	45.91	-8.93	Peak	---	---
2	75.59	28.59	40.00	-11.41	40.72	-12.13	Peak	---	---
3	146.40	31.55	43.50	-11.95	40.40	-8.85	Peak	---	---
4	172.59	33.32	43.50	-10.18	42.66	-9.34	Peak	---	---
5	518.88	36.26	46.00	-9.74	38.97	-2.71	Peak	---	---
6	773.99	33.88	46.00	-12.12	31.43	2.45	Peak	---	---

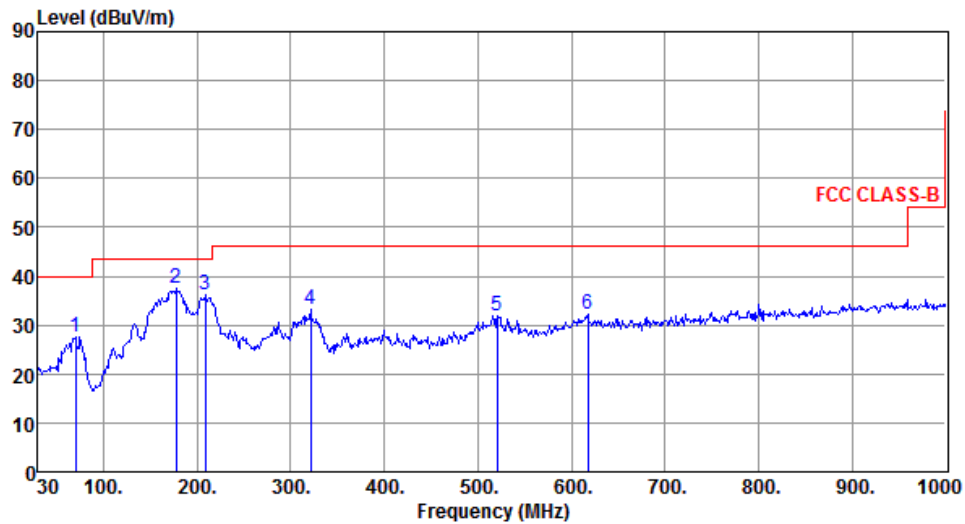
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	69.77	27.45	40.00	-12.55	38.32	-10.87	Peak	---	---
2	177.44	37.41	43.50	-6.09	47.30	-9.89	Peak	---	---
3	208.48	36.08	43.50	-7.42	48.10	-12.02	Peak	---	---
4	321.00	33.31	46.00	-12.69	40.88	-7.57	Peak	---	---
5	520.82	31.92	46.00	-14.08	34.59	-2.67	Peak	---	---
6	617.82	32.33	46.00	-13.67	32.70	-0.37	Peak	---	---

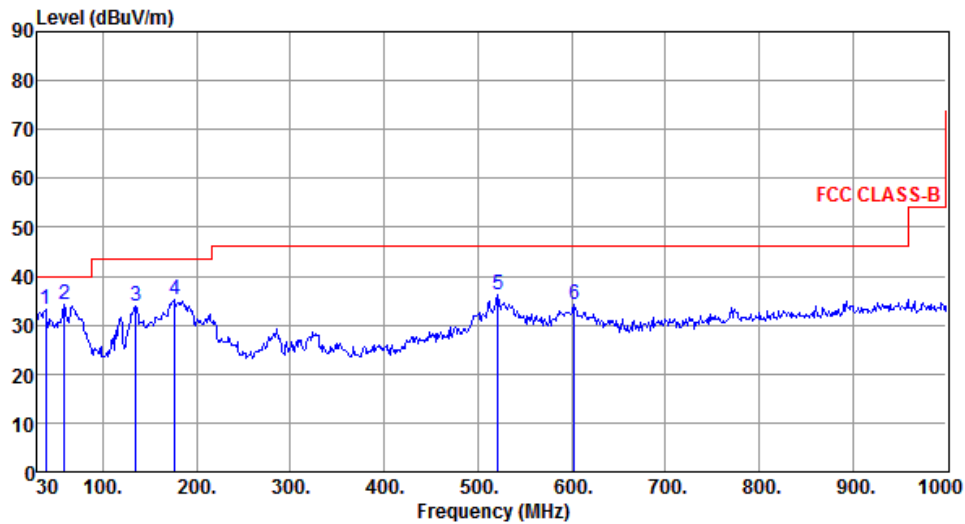
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	38.73	33.37	40.00	-6.63	42.78	-9.41	Peak	---	---
2	59.10	34.24	40.00	-5.76	43.50	-9.26	Peak	---	---
3	134.76	33.71	43.50	-9.79	43.36	-9.65	Peak	---	---
4	176.47	35.07	43.50	-8.43	44.81	-9.74	Peak	---	---
5	521.79	36.17	46.00	-9.83	38.82	-2.65	Peak	---	---
6	603.27	34.21	46.00	-11.79	34.82	-0.61	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

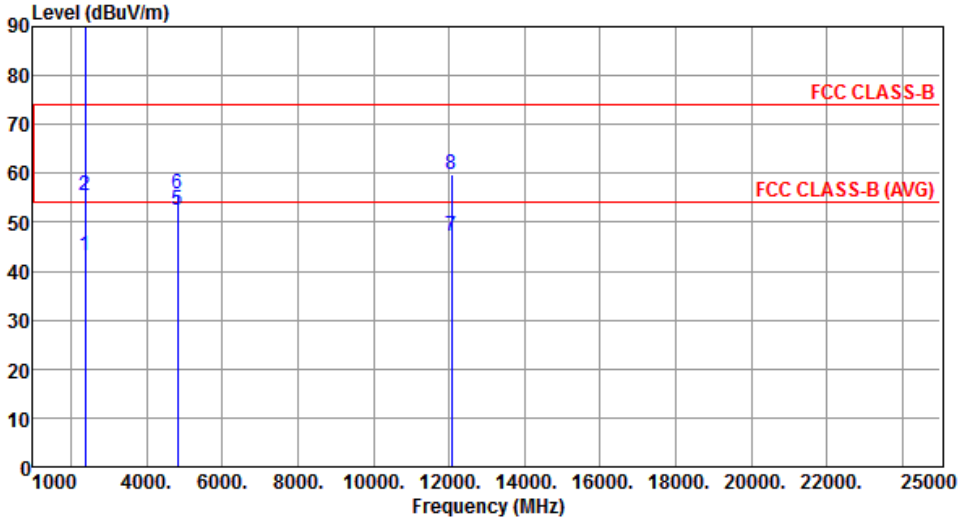
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

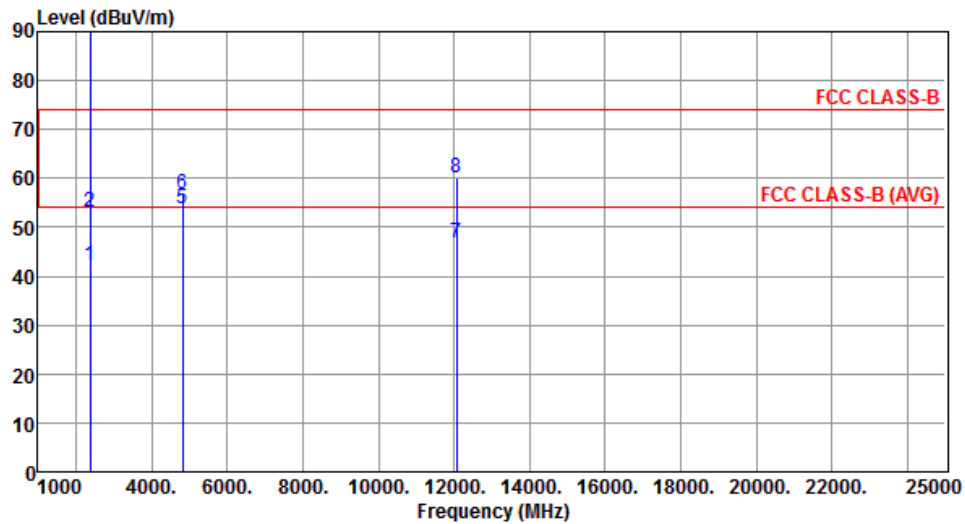
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.29	54.00	-10.71	42.87	0.42	Average	100	35
2	2390.00	55.53	74.00	-18.47	55.11	0.42	Peak	100	35
3 *	2412.00	116.02			115.63	0.39	Average	100	35
4 *	2412.00	118.17			117.78	0.39	Peak	100	35
5	4824.00	52.50	54.00	-1.50	46.11	6.39	Average	100	49
6	4824.00	55.88	74.00	-18.12	49.49	6.39	Peak	100	49
7	12060.00	47.03	54.00	-6.97	30.45	16.58	Average	100	30
8	12060.00	59.87	74.00	-14.13	43.29	16.58	Peak	100	30

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.26	54.00	-11.74	41.84	0.42	Average	118	3
2	2390.00	53.00	74.00	-21.00	52.58	0.42	Peak	118	3
3 *	2412.00	112.81			112.42	0.39	Average	118	3
4 *	2412.00	114.91			114.52	0.39	Peak	118	3
5	4824.00	53.75	54.00	-0.25	47.36	6.39	Average	224	353
6	4824.00	56.84	74.00	-17.16	50.45	6.39	Peak	224	353
7	12060.00	46.83	54.00	-7.17	30.25	16.58	Average	100	40
8	12060.00	60.10	74.00	-13.90	43.52	16.58	Peak	100	40

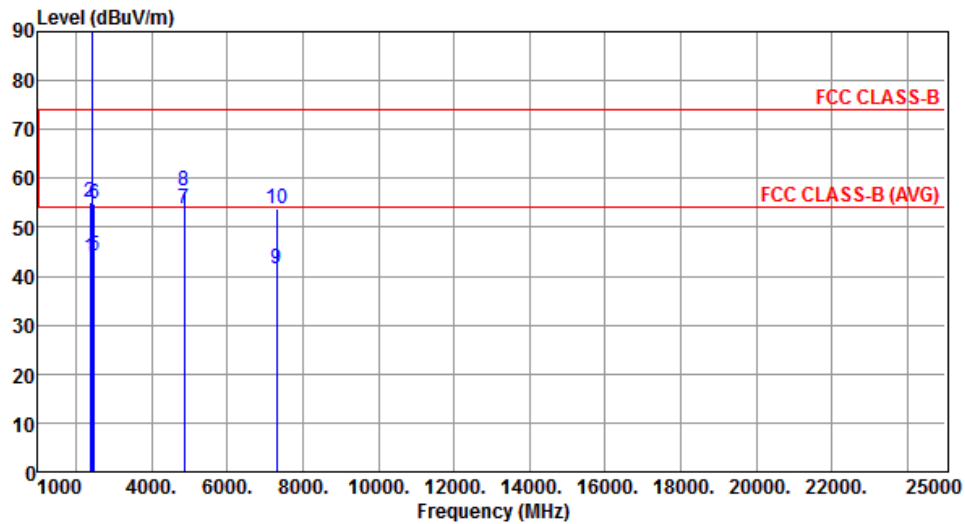
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.86	54.00	-10.14	43.44	0.42	Average	111	32
2	2390.00	55.11	74.00	-18.89	54.69	0.42	Peak	111	32
3 *	2437.00	116.92			116.55	0.37	Average	111	32
4 *	2437.00	118.91			118.54	0.37	Peak	111	32
5	2483.50	44.08	54.00	-9.92	43.82	0.26	Average	111	32
6	2483.50	54.95	74.00	-19.05	54.69	0.26	Peak	111	32
7	4874.00	53.77	54.00	-0.23	47.34	6.43	Average	100	48
8	4874.00	57.51	74.00	-16.49	51.08	6.43	Peak	100	48
9	7311.00	41.36	54.00	-12.64	29.54	11.82	Average	100	30
10	7311.00	53.82	74.00	-20.18	42.00	11.82	Peak	100	30

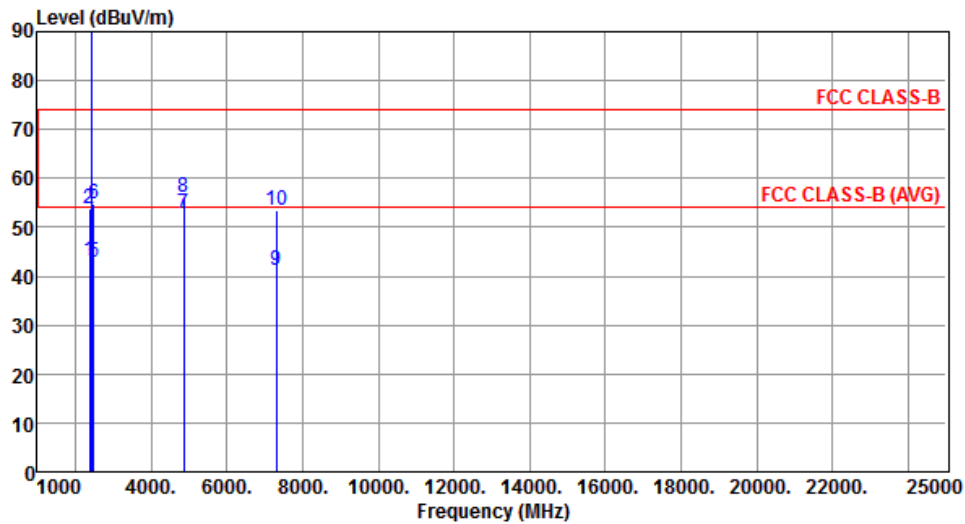
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.13	54.00	-10.87	42.71	0.42	Average	110	4
2	2390.00	53.87	74.00	-20.13	53.45	0.42	Peak	110	4
3 *	2437.00	113.55			113.18	0.37	Average	110	4
4 *	2437.00	115.79			115.42	0.37	Peak	110	4
5	2483.50	42.80	54.00	-11.20	42.54	0.26	Average	110	4
6	2483.50	54.89	74.00	-19.11	54.63	0.26	Peak	110	4
7	4874.00	52.81	54.00	-1.19	46.38	6.43	Average	307	6
8	4874.00	56.09	74.00	-17.91	49.66	6.43	Peak	307	6
9	7311.00	41.16	54.00	-12.84	29.34	11.82	Average	100	50
10	7311.00	53.34	74.00	-20.66	41.52	11.82	Peak	100	50

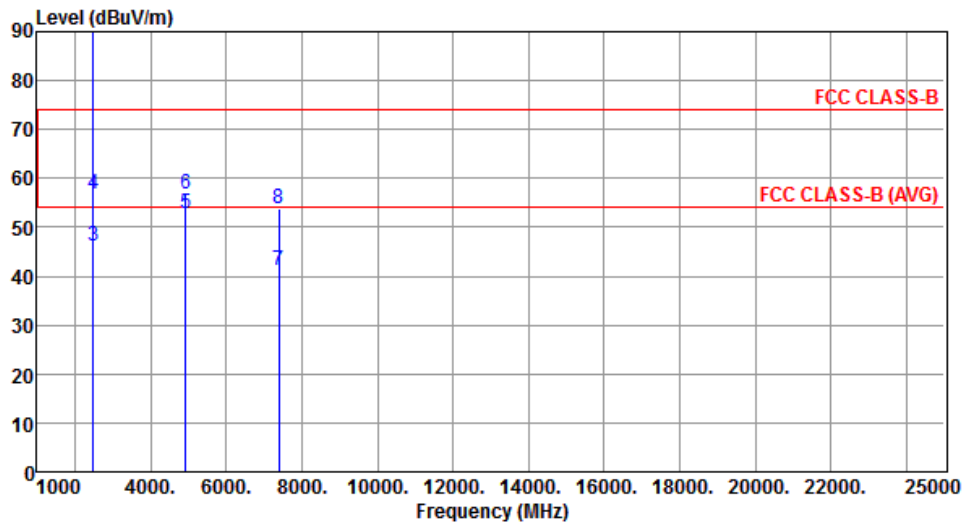
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	116.57			116.25	0.32	Average	207	33
2	*	2462.00	119.07			118.75	0.32	Peak	207	33
3		2483.50	46.18	54.00	-7.82	45.92	0.26	Average	207	33
4		2483.50	56.78	74.00	-17.22	56.52	0.26	Peak	207	33
5		4924.00	52.89	54.00	-1.11	46.36	6.53	Average	125	55
6		4924.00	56.93	74.00	-17.07	50.40	6.53	Peak	125	55
7		7386.00	41.03	54.00	-12.97	29.41	11.62	Average	100	20
8		7386.00	53.67	74.00	-20.33	42.05	11.62	Peak	100	20

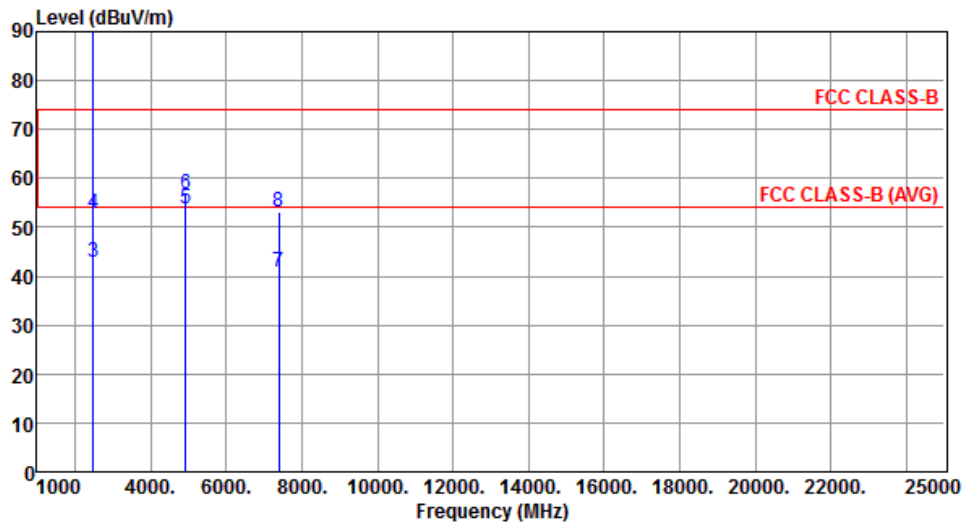
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	113.57			113.25	0.32	Average	112	15
2	*	2462.00	115.64			115.32	0.32	Peak	112	15
3		2483.50	42.77	54.00	-11.23	42.51	0.26	Average	112	15
4		2483.50	52.81	74.00	-21.19	52.55	0.26	Peak	112	15
5		4924.00	53.80	54.00	-0.20	47.27	6.53	Average	303	10
6		4924.00	56.78	74.00	-17.22	50.25	6.53	Peak	303	10
7		7386.00	40.87	54.00	-13.13	29.25	11.62	Average	100	40
8		7386.00	53.19	74.00	-20.81	41.57	11.62	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

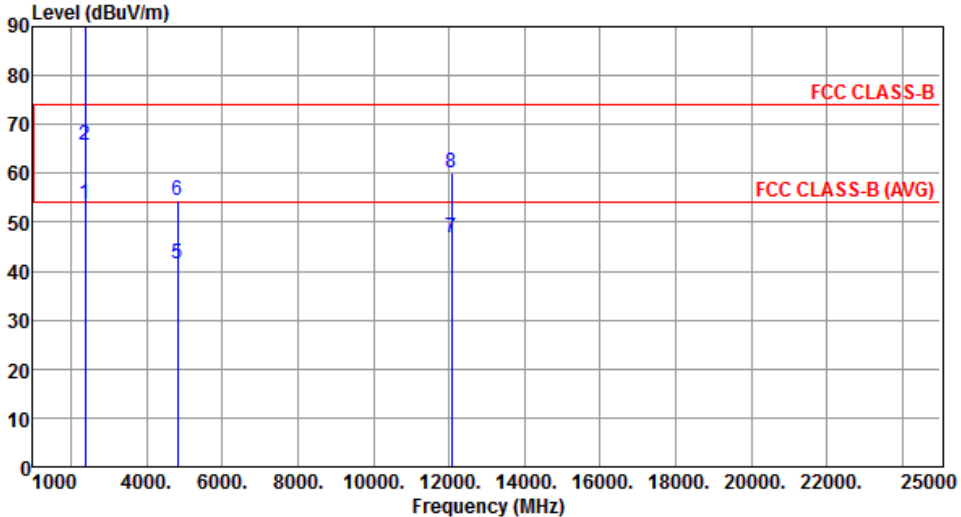
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

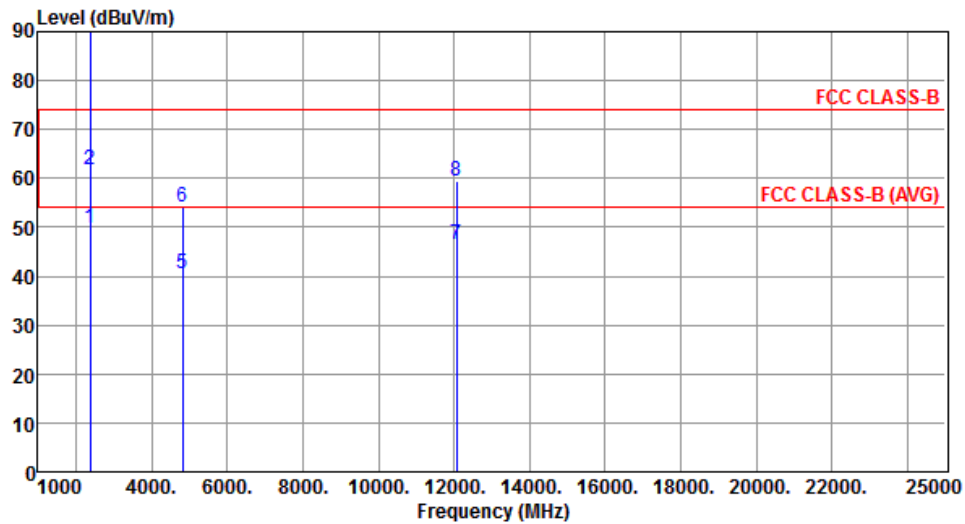
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.67	54.00	-0.33	53.25	0.42	Average	101	31
2	2390.00	65.67	74.00	-8.33	65.25	0.42	Peak	101	31
3 *	2412.00	111.38			110.99	0.39	Average	101	54
4 *	2412.00	120.24			119.85	0.39	Peak	101	54
5	4824.00	41.40	54.00	-12.60	35.01	6.39	Average	100	55
6	4824.00	54.59	74.00	-19.41	48.20	6.39	Peak	100	55
7	12060.00	46.80	54.00	-7.20	30.22	16.58	Average	100	30
8	12060.00	60.10	74.00	-13.90	43.52	16.58	Peak	100	30

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.96	54.00	-4.04	49.54	0.42	Average	104	33
2	2390.00	61.67	74.00	-12.33	61.25	0.42	Peak	104	33
3 *	2412.00	106.94			106.55	0.39	Average	104	33
4 *	2412.00	116.35			115.96	0.39	Peak	104	33
5	4824.00	40.58	54.00	-13.42	34.19	6.39	Average	321	4
6	4824.00	53.97	74.00	-20.03	47.58	6.39	Peak	321	4
7	12060.00	46.57	54.00	-7.43	29.99	16.58	Average	100	51
8	12060.00	59.42	74.00	-14.58	42.84	16.58	Peak	100	51

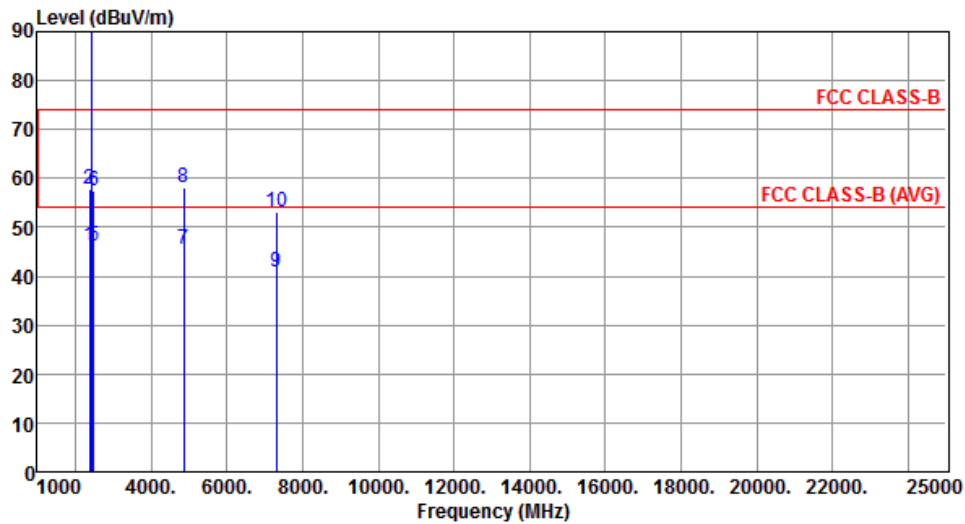
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.30	54.00	-7.70	45.88	0.42	Average	183	57
2	2390.00	57.65	74.00	-16.35	57.23	0.42	Peak	183	57
3 *	2437.00	113.86			113.49	0.37	Average	183	57
4 *	2437.00	123.14			122.77	0.37	Peak	183	57
5	2483.50	46.29	54.00	-7.71	46.03	0.26	Average	183	57
6	2483.50	57.55	74.00	-16.45	57.29	0.26	Peak	183	57
7	4874.00	45.38	54.00	-8.62	38.95	6.43	Average	100	54
8	4874.00	58.08	74.00	-15.92	51.65	6.43	Peak	100	54
9	7311.00	40.99	54.00	-13.01	29.17	11.82	Average	100	50
10	7311.00	53.27	74.00	-20.73	41.45	11.82	Peak	100	50

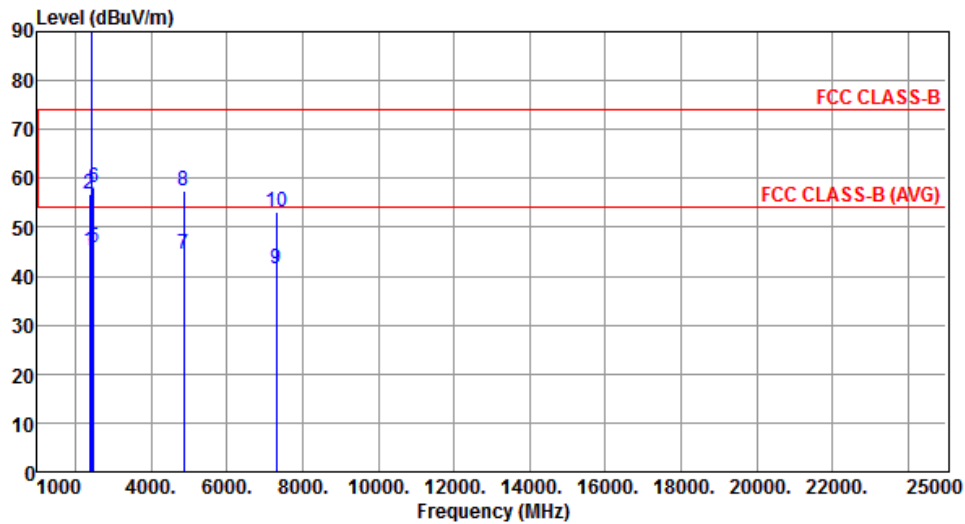
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	45.32	54.00	-8.68	44.90	0.42	Average	100	32
2	2390.00	56.75	74.00	-17.25	56.33	0.42	Peak	100	32
3 *	2437.00	109.58			109.21	0.37	Average	100	32
4 *	2437.00	119.52			119.15	0.37	Peak	100	32
5	2483.50	45.95	54.00	-8.05	45.69	0.26	Average	100	32
6	2483.50	57.99	74.00	-16.01	57.73	0.26	Peak	100	32
7	4874.00	44.48	54.00	-9.52	38.05	6.43	Average	311	1
8	4874.00	57.45	74.00	-16.55	51.02	6.43	Peak	311	1
9	7311.00	41.47	54.00	-12.53	29.65	11.82	Average	100	45
10	7311.00	53.01	74.00	-20.99	41.19	11.82	Peak	100	45

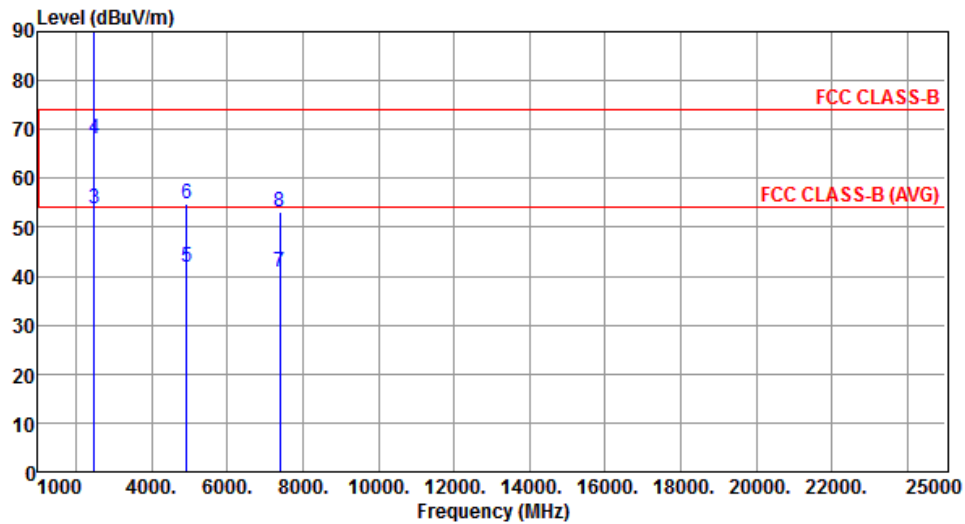
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	108.54			108.22	0.32	Average	183	57
2	*	2462.00	118.36			118.04	0.32	Peak	183	57
3		2483.50	53.68	54.00	-0.32	53.42	0.26	Average	183	57
4		2483.50	68.04	74.00	-5.96	67.78	0.26	Peak	183	57
5		4924.00	41.71	54.00	-12.29	35.18	6.53	Average	100	55
6		4924.00	54.88	74.00	-19.12	48.35	6.53	Peak	100	55
7		7386.00	40.76	54.00	-13.24	29.14	11.62	Average	100	50
8		7386.00	52.97	74.00	-21.03	41.35	11.62	Peak	100	50

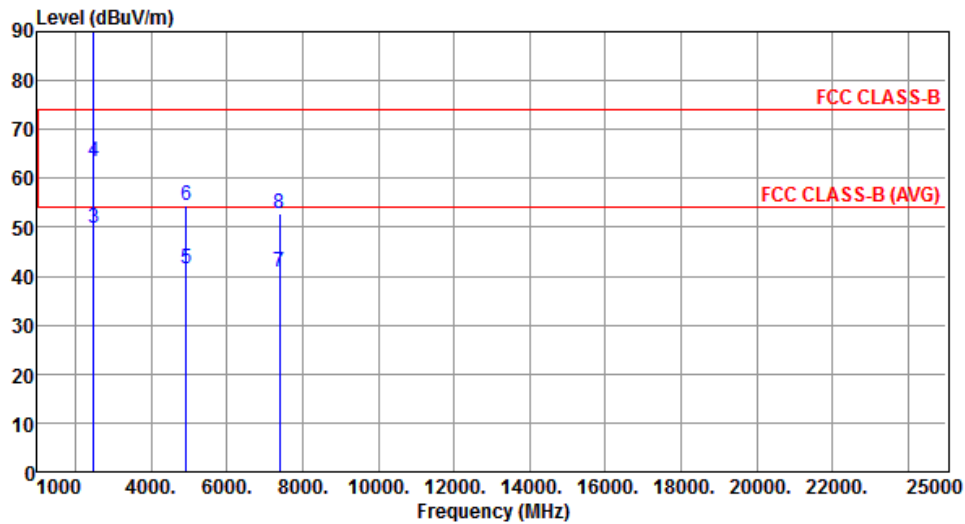
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	104.46			104.14	0.32	Average	100	41
2	*	2462.00	114.84			114.52	0.32	Peak	100	41
3		2483.50	49.84	54.00	-4.16	49.58	0.26	Average	100	41
4		2483.50	63.51	74.00	-10.49	63.25	0.26	Peak	100	41
5		4924.00	41.41	54.00	-12.59	34.88	6.53	Average	324	5
6		4924.00	54.54	74.00	-19.46	48.01	6.53	Peak	324	5
7		7386.00	40.72	54.00	-13.28	29.10	11.62	Average	100	53
8		7386.00	52.83	74.00	-21.17	41.21	11.62	Peak	100	53

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

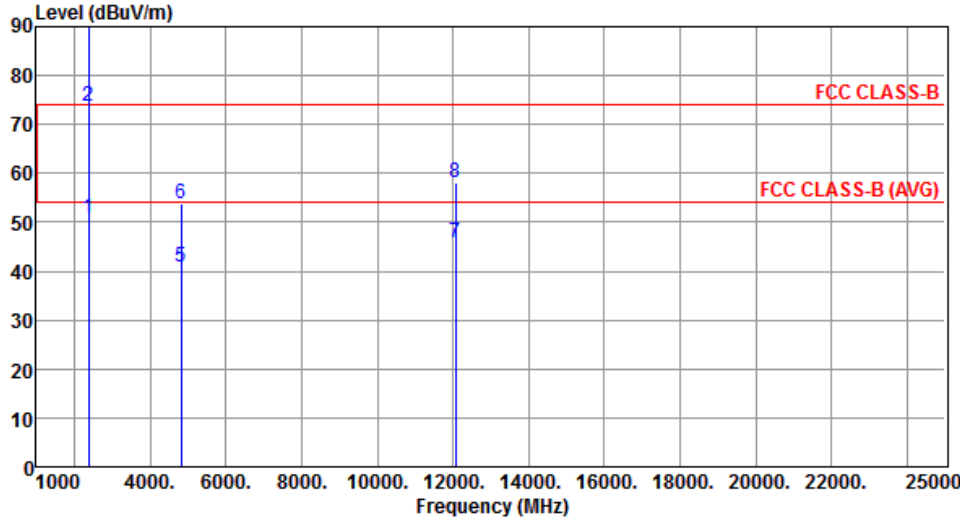
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax HE20

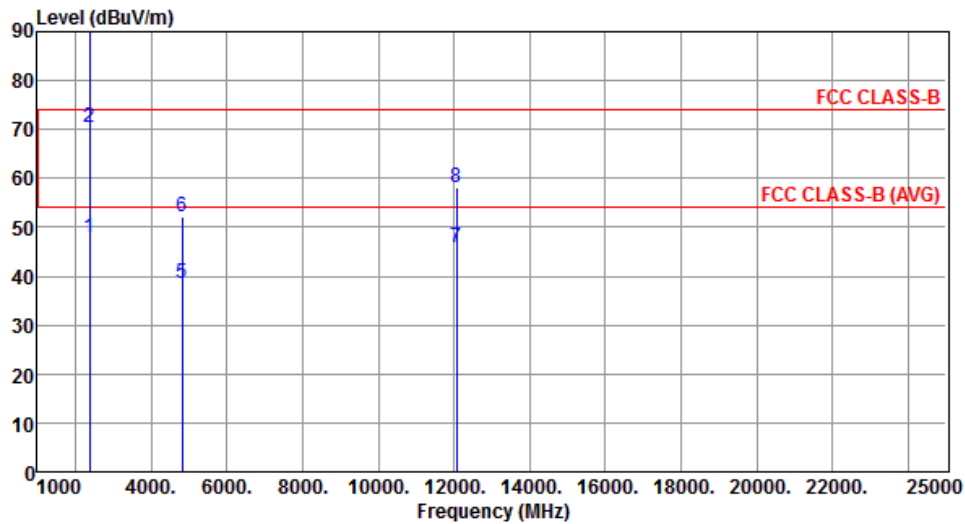
Modulation	ax HE20	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	50.73	54.00	-3.27	50.31	0.42	Average	157	305
2	2390.00	73.76	74.00	-0.24	73.34	0.42	Peak	157	305
3 *	2412.00	109.40			109.01	0.39	Average	157	305
4 *	2412.00	119.82			119.43	0.39	Peak	157	305
5	4824.00	40.79	54.00	-13.21	34.40	6.39	Average	100	52
6	4824.00	53.94	74.00	-20.06	47.55	6.39	Peak	100	52
7	12060.00	45.73	54.00	-8.27	29.15	16.58	Average	100	40
8	12060.00	58.14	74.00	-15.86	41.56	16.58	Peak	100	40

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE20	Test Freq. (MHz)	2412
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.68	54.00	-6.32	47.26	0.42	Average	100	22
2	2390.00	70.54	74.00	-3.46	70.12	0.42	Peak	100	22
3 *	2412.00	105.35			104.96	0.39	Average	100	22
4 *	2412.00	115.51			115.12	0.39	Peak	100	22
5	4824.00	38.64	54.00	-15.36	32.25	6.39	Average	100	40
6	4824.00	52.00	74.00	-22.00	45.61	6.39	Peak	100	40
7	12060.00	45.71	54.00	-8.29	29.13	16.58	Average	100	80
8	12060.00	58.25	74.00	-15.75	41.67	16.58	Peak	100	80

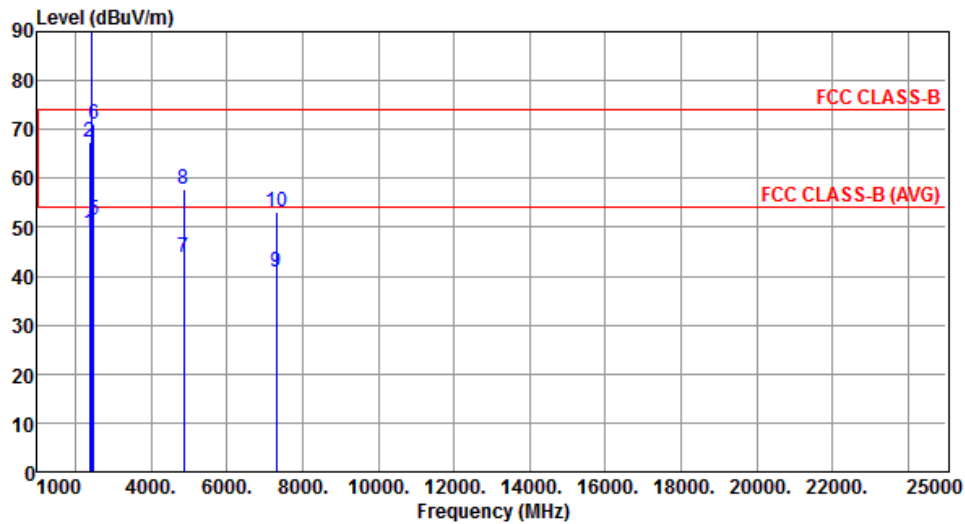
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.93	54.00	-5.07	48.51	0.42	Average	174	301
2	2390.00	67.37	74.00	-6.63	66.95	0.42	Peak	174	301
3 *	2437.00	113.47			113.10	0.37	Average	174	301
4 *	2437.00	123.65			123.28	0.37	Peak	174	301
5	2483.50	51.45	54.00	-2.55	51.19	0.26	Average	174	301
6	2483.50	70.97	74.00	-3.03	70.71	0.26	Peak	174	301
7	4874.00	43.99	54.00	-10.01	37.56	6.43	Average	100	49
8	4874.00	57.89	74.00	-16.11	51.46	6.43	Peak	100	49
9	7311.00	40.83	54.00	-13.17	29.01	11.82	Average	100	40
10	7311.00	53.27	74.00	-20.73	41.45	11.82	Peak	100	40

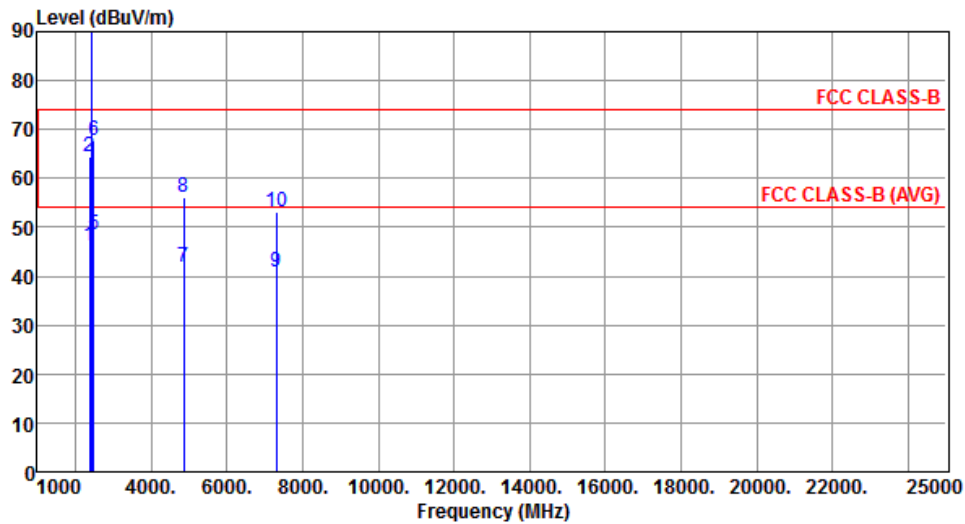
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE20	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.04	54.00	-7.96	45.62	0.42	Average	100	22
2	2390.00	64.27	74.00	-9.73	63.85	0.42	Peak	100	22
3 *	2437.00	109.39			109.02	0.37	Average	100	22
4 *	2437.00	119.54			119.17	0.37	Peak	100	22
5	2483.50	48.52	54.00	-5.48	48.26	0.26	Average	100	22
6	2483.50	67.72	74.00	-6.28	67.46	0.26	Peak	100	22
7	4874.00	41.69	54.00	-12.31	35.26	6.43	Average	100	39
8	4874.00	56.04	74.00	-17.96	49.61	6.43	Peak	100	39
9	7311.00	40.83	54.00	-13.17	29.01	11.82	Average	100	90
10	7311.00	53.26	74.00	-20.74	41.44	11.82	Peak	100	90

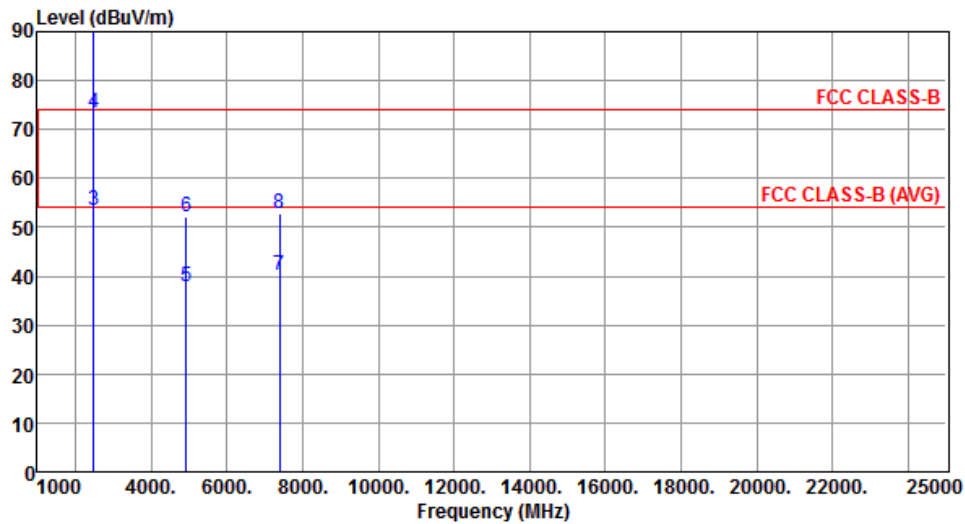
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Horizontal	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	106.67			106.35	0.32	Average	174	301
2	*	2462.00	117.14			116.82	0.32	Peak	174	301
3		2483.50	53.61	54.00	-0.39	53.35	0.26	Average	174	301
4		2483.50	73.52	74.00	-0.48	73.26	0.26	Peak	174	301
5		4924.00	38.02	54.00	-15.98	31.49	6.53	Average	100	51
6		4924.00	52.16	74.00	-21.84	45.63	6.53	Peak	100	51
7		7386.00	40.16	54.00	-13.84	28.54	11.62	Average	100	40
8		7386.00	52.86	74.00	-21.14	41.24	11.62	Peak	100	40

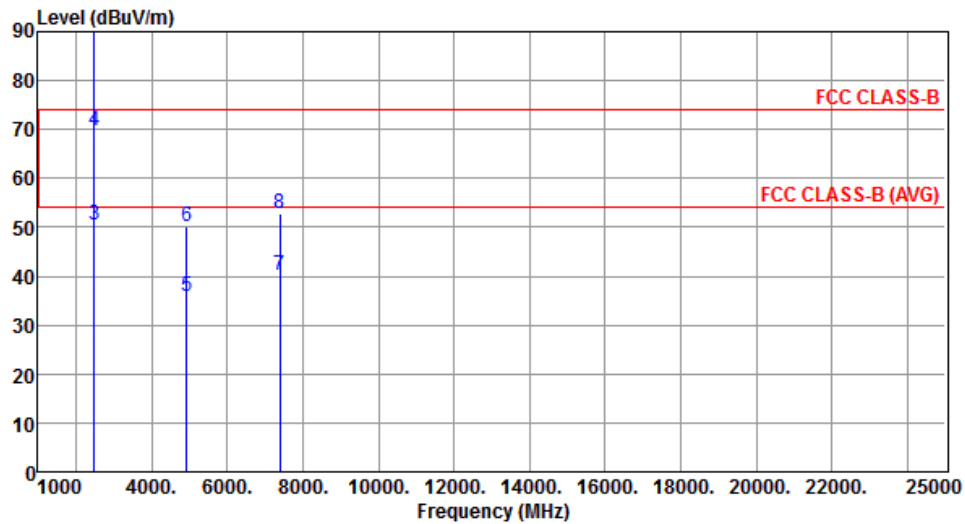
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE20	Test Freq. (MHz)	2462
Polarization	Vertical	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2462.00	102.74			102.42	0.32	Average	100	26
2	*	2462.00	113.06			112.74	0.32	Peak	100	26
3		2483.50	50.47	54.00	-3.53	50.21	0.26	Average	100	26
4		2483.50	69.72	74.00	-4.28	69.46	0.26	Peak	100	26
5		4924.00	35.99	54.00	-18.01	29.46	6.53	Average	100	42
6		4924.00	50.09	74.00	-23.91	43.56	6.53	Peak	100	42
7		7386.00	40.23	54.00	-13.77	28.61	11.62	Average	100	50
8		7386.00	52.92	74.00	-21.08	41.30	11.62	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

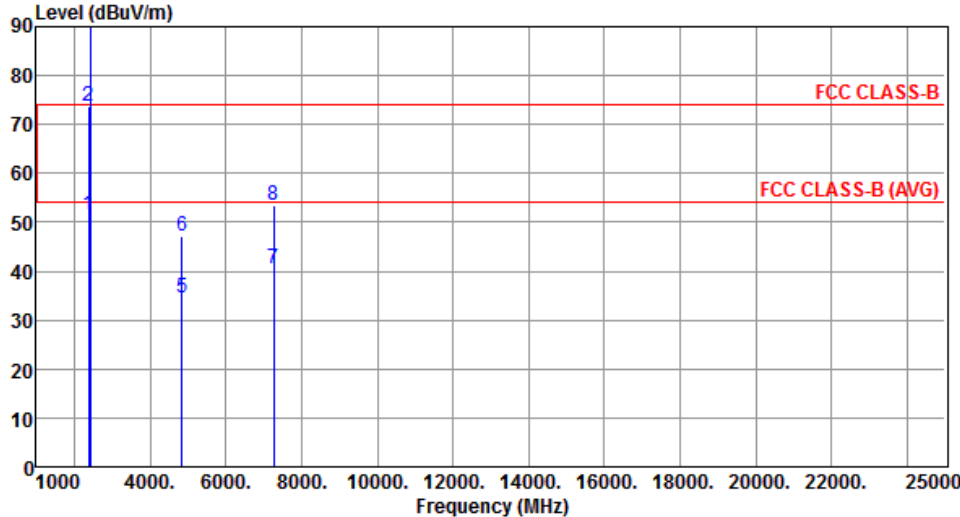
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for ax HE40

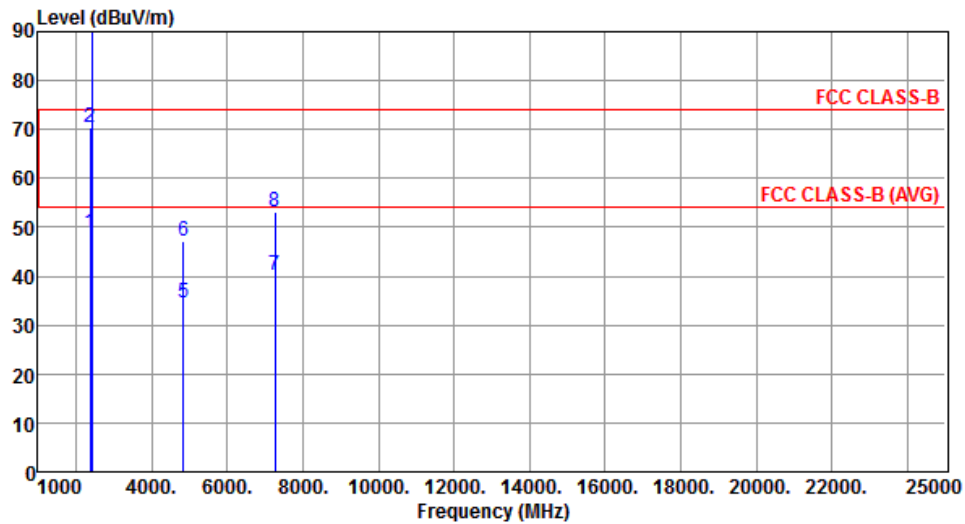
Modulation	ax HE40	Test Freq. (MHz)	2422
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	51.60	54.00	-2.40	51.18	0.42	Average	198	301
2	2390.00	73.59	74.00	-0.41	73.17	0.42	Peak	198	301
3 *	2422.00	105.13			104.74	0.39	Average	198	301
4 *	2422.00	116.54			116.15	0.39	Peak	198	301
5	4844.00	34.70	54.00	-19.30	28.25	6.45	Average	100	20
6	4844.00	47.00	74.00	-27.00	40.55	6.45	Peak	100	20
7	7266.00	40.39	54.00	-13.61	28.52	11.87	Average	100	40
8	7266.00	53.40	74.00	-20.60	41.53	11.87	Peak	100	40

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).
 Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE40	Test Freq. (MHz)	2422
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.68	54.00	-5.32	48.26	0.42	Average	100	26
2	2390.00	70.53	74.00	-3.47	70.11	0.42	Peak	100	26
3 *	2422.00	102.03			101.64	0.39	Average	100	26
4 *	2422.00	112.50			112.11	0.39	Peak	100	26
5	4844.00	34.55	54.00	-19.45	28.10	6.45	Average	100	30
6	4844.00	47.05	74.00	-26.95	40.60	6.45	Peak	100	30
7	7266.00	40.22	54.00	-13.78	28.35	11.87	Average	100	20
8	7266.00	53.27	74.00	-20.73	41.40	11.87	Peak	100	20

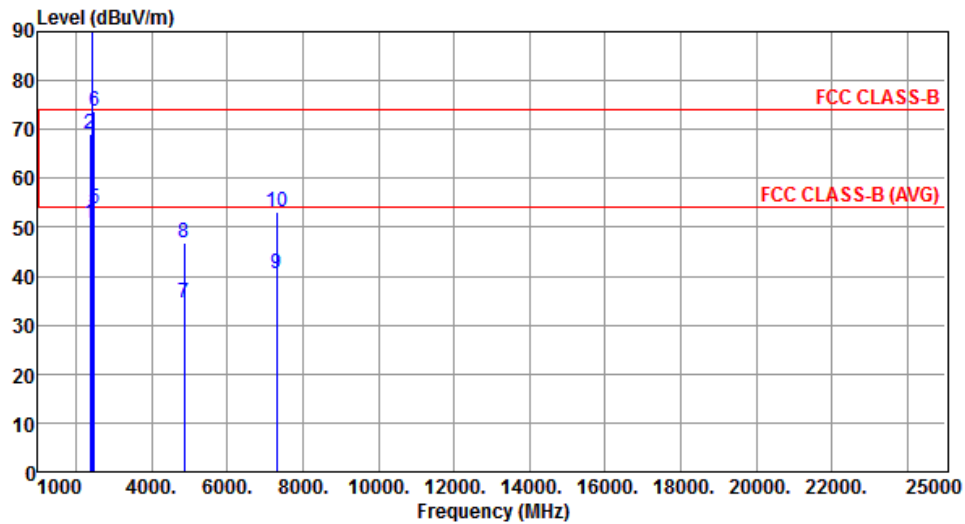
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE40	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	50.69	54.00	-3.31	50.27	0.42	Average	173	302
2	2390.00	69.04	74.00	-4.96	68.62	0.42	Peak	173	302
3 *	2437.00	106.71			106.34	0.37	Average	173	302
4 *	2437.00	117.96			117.59	0.37	Peak	173	302
5	2483.50	53.76	54.00	-0.24	53.50	0.26	Average	173	302
6	2483.50	73.80	74.00	-0.20	73.54	0.26	Peak	173	302
7	4874.00	34.69	54.00	-19.31	28.26	6.43	Average	100	100
8	4874.00	46.97	74.00	-27.03	40.54	6.43	Peak	100	100
9	7311.00	40.46	54.00	-13.54	28.64	11.82	Average	100	40
10	7311.00	53.05	74.00	-20.95	41.23	11.82	Peak	100	40

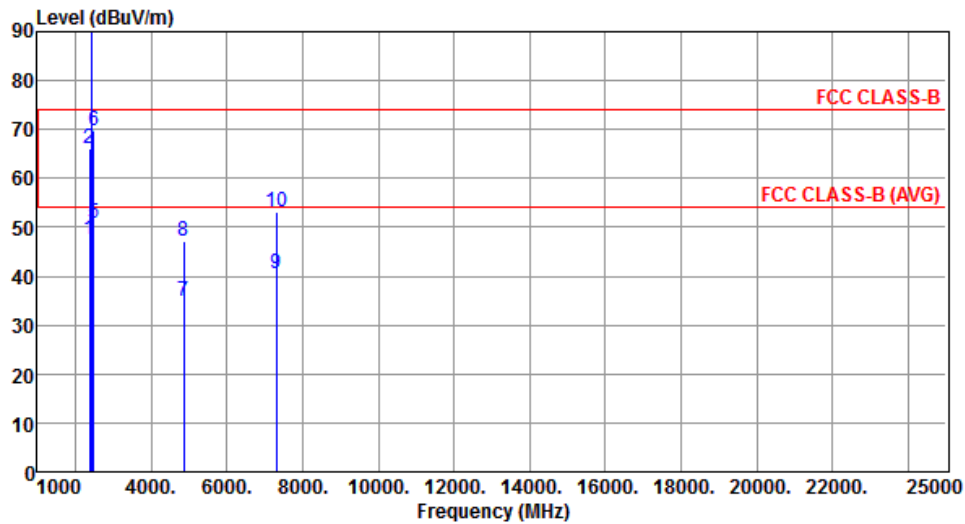
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE40	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.58	54.00	-6.42	47.16	0.42	Average	100	22
2	2390.00	65.97	74.00	-8.03	65.55	0.42	Peak	100	22
3 *	2437.00	103.58			103.21	0.37	Average	100	22
4 *	2437.00	114.01			113.64	0.37	Peak	100	22
5	2483.50	50.68	54.00	-3.32	50.42	0.26	Average	100	22
6	2483.50	69.84	74.00	-4.16	69.58	0.26	Peak	100	22
7	4874.00	34.74	54.00	-19.26	28.31	6.43	Average	100	40
8	4874.00	47.11	74.00	-26.89	40.68	6.43	Peak	100	40
9	7311.00	40.38	54.00	-13.62	28.56	11.82	Average	100	80
10	7311.00	53.12	74.00	-20.88	41.30	11.82	Peak	100	80

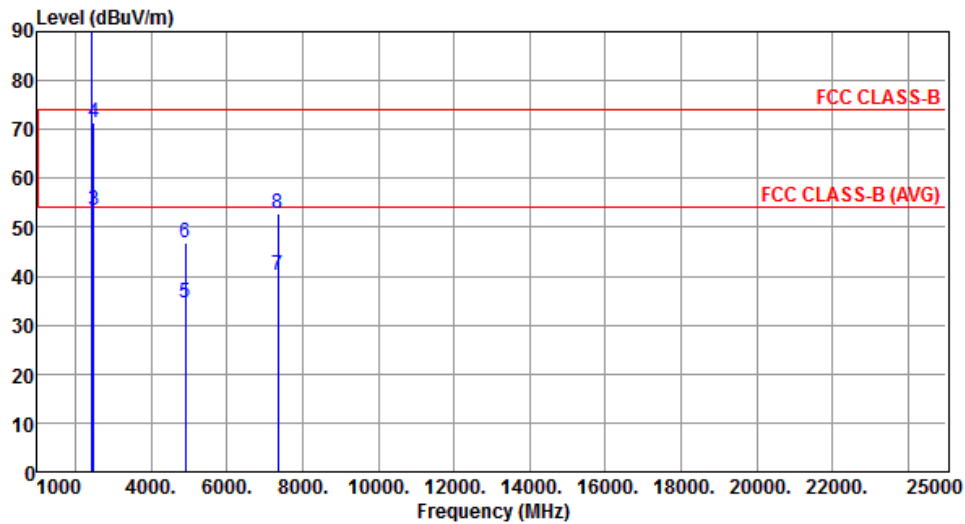
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Horizontal	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2452.00	102.65			102.30	0.35	Average	173	300
2	*	2452.00	113.82			113.47	0.35	Peak	173	300
3		2483.50	53.57	54.00	-0.43	53.31	0.26	Average	173	300
4		2483.50	71.24	74.00	-2.76	70.98	0.26	Peak	173	300
5		4904.00	34.67	54.00	-19.33	28.24	6.43	Average	100	50
6		4904.00	46.96	74.00	-27.04	40.53	6.43	Peak	100	50
7		7356.00	40.13	54.00	-13.87	28.43	11.70	Average	100	80
8		7356.00	52.85	74.00	-21.15	41.15	11.70	Peak	100	80

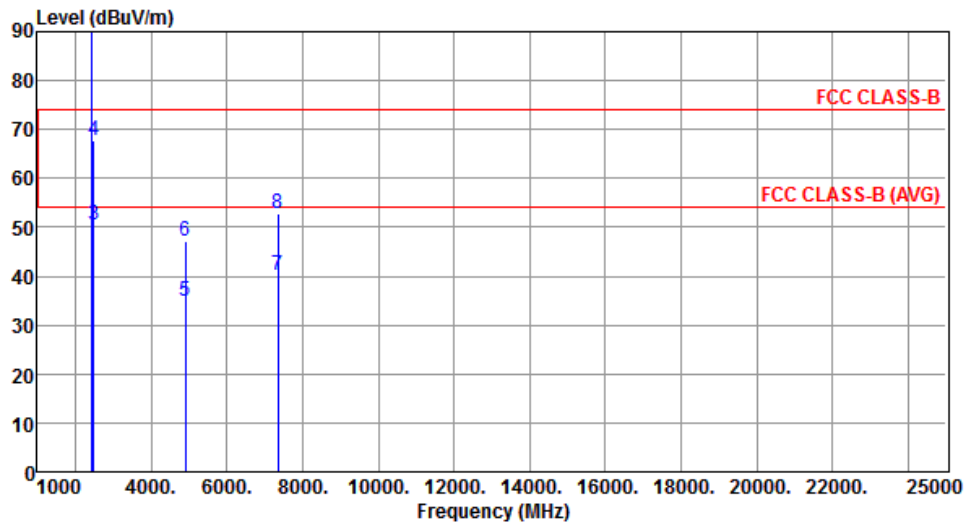
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Vertical	Test Configuration	1



		Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	*	2452.00	99.45			99.10	0.35	Average	100	24
2	*	2452.00	109.86			109.51	0.35	Peak	100	24
3		2483.50	50.52	54.00	-3.48	50.26	0.26	Average	100	24
4		2483.50	67.71	74.00	-6.29	67.45	0.26	Peak	100	24
5		4904.00	34.74	54.00	-19.26	28.31	6.43	Average	100	60
6		4904.00	47.00	74.00	-27.00	40.57	6.43	Peak	100	60
7		7356.00	40.27	54.00	-13.73	28.57	11.70	Average	100	30
8		7356.00	52.95	74.00	-21.05	41.25	11.70	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Note 3: "*" is Peak / Average value of fundamental frequency

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 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 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

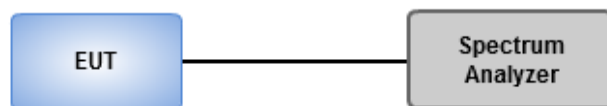
Reference level measurement

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

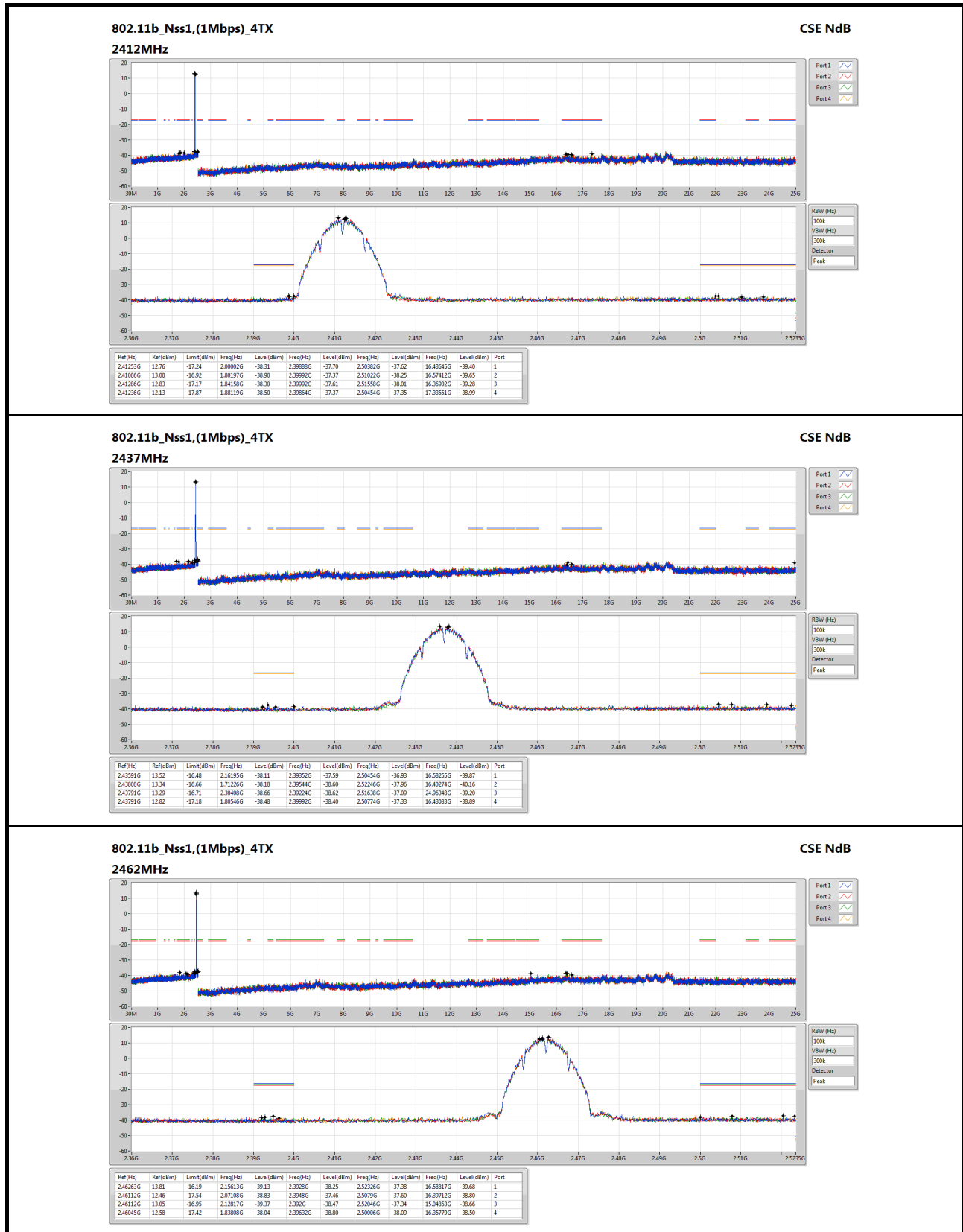
Emission level measurement

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

3.6.3 Test Setup

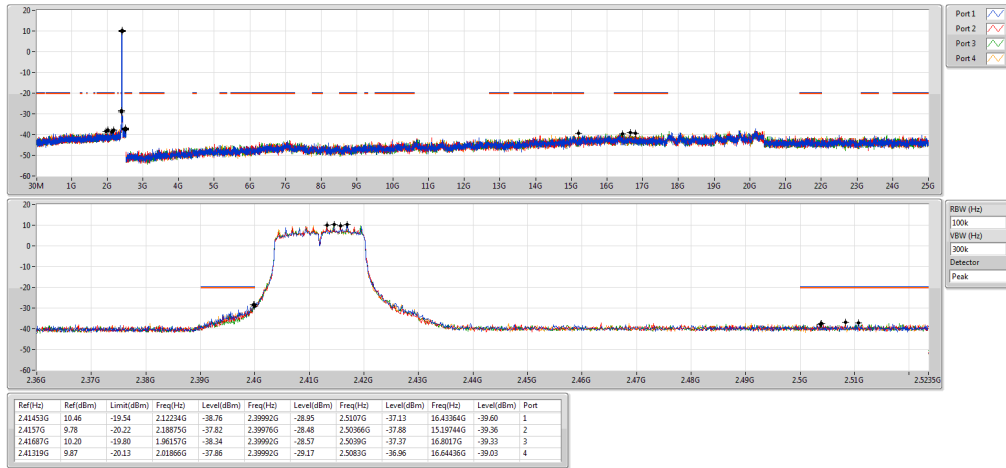


3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands



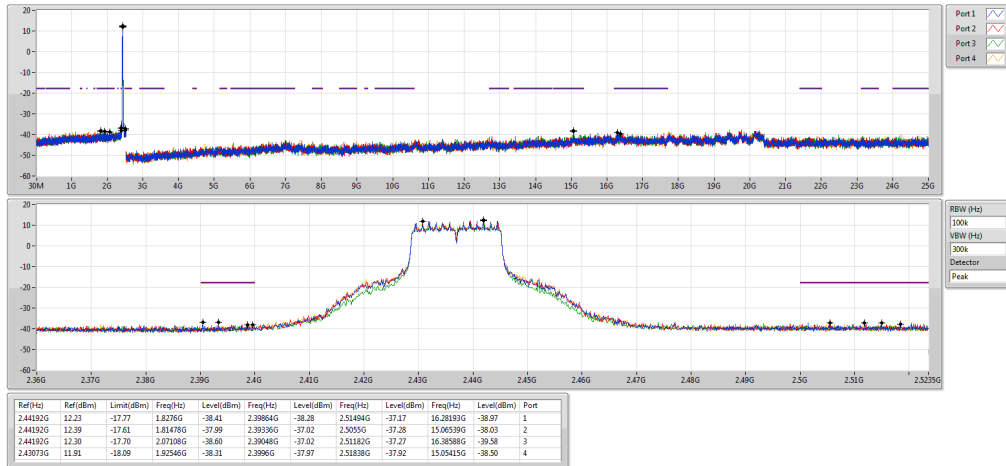
802.11g_Nss1,(6Mbps)_4TX
2412MHz

CSE NdB



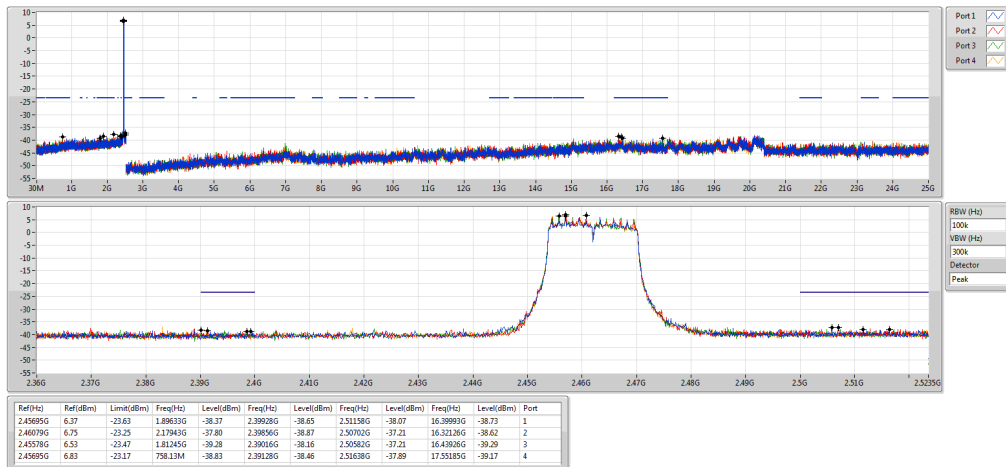
802.11g_Nss1,(6Mbps)_4TX
2437MHz

CSE NdB



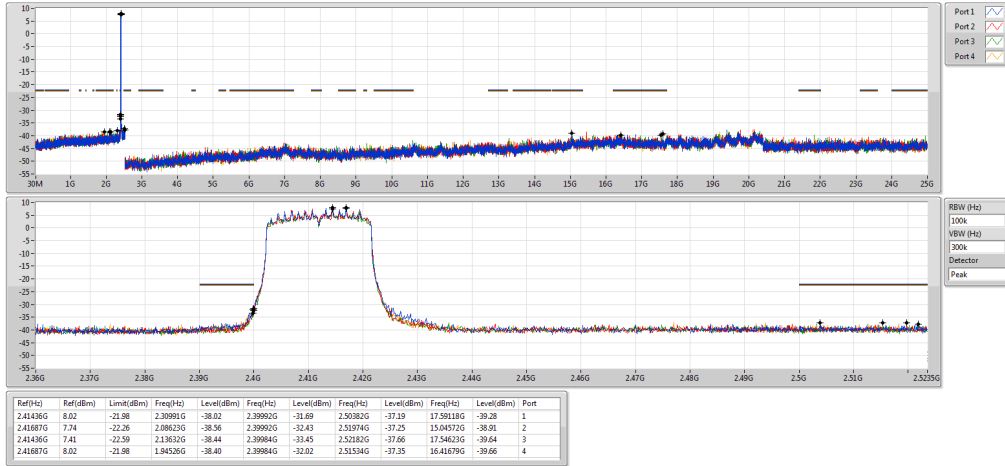
802.11g_Nss1,(6Mbps)_4TX
2462MHz

CSE NdB



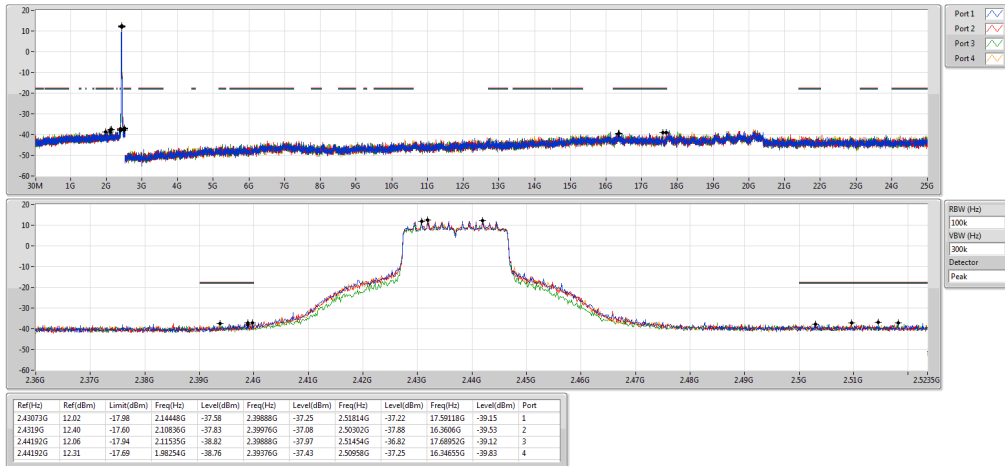
802.11ax HEW20_Nss1,(MCS0)_4TX
2412MHz

CSE NdB



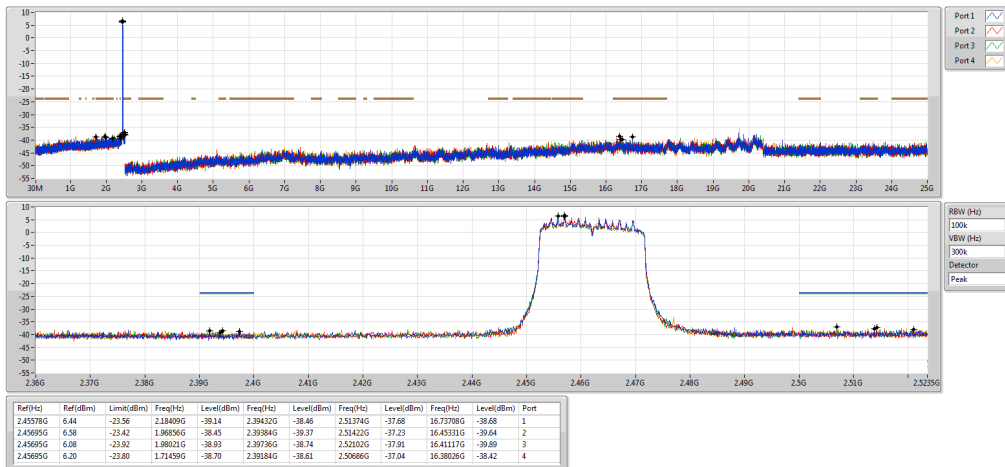
802.11ax HEW20_Nss1,(MCS0)_4TX
2437MHz

CSE NdB



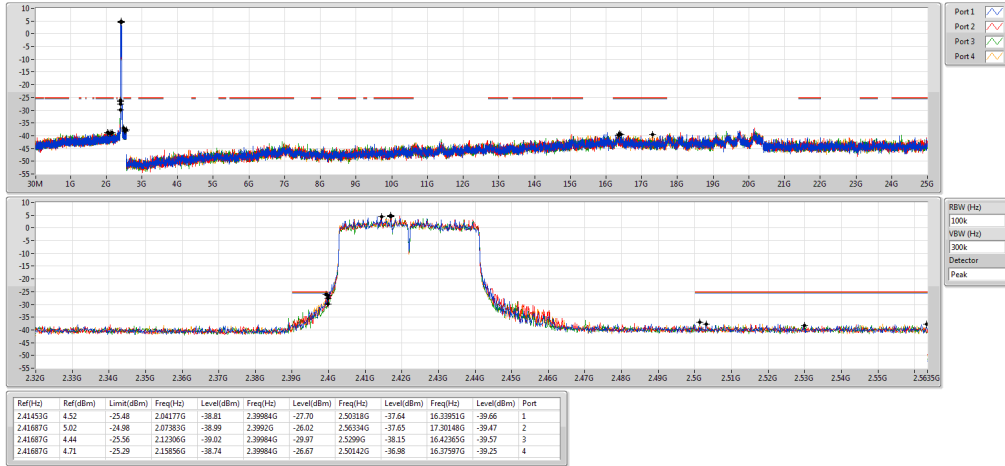
802.11ax HEW20_Nss1,(MCS0)_4TX
2462MHz

CSE NdB



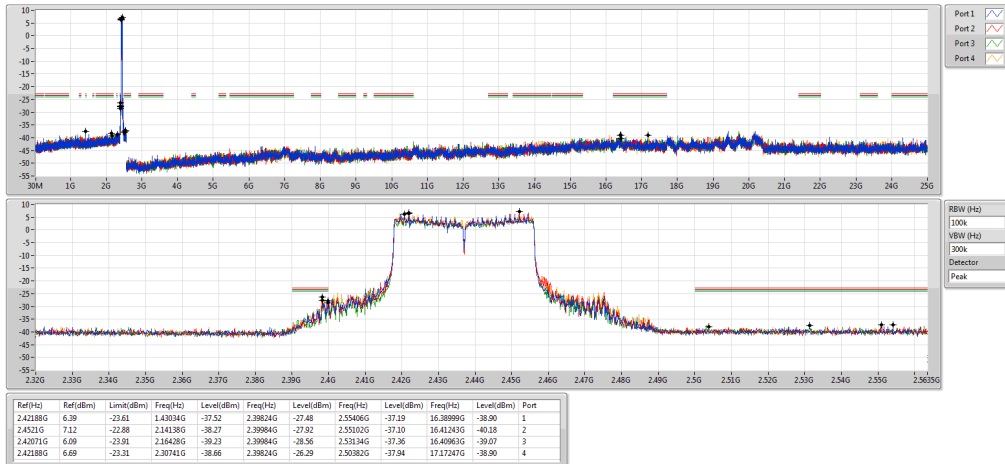
802.11ax HEW40_Nss1,(MCS0)_4TX
2422MHz

CSE NdB



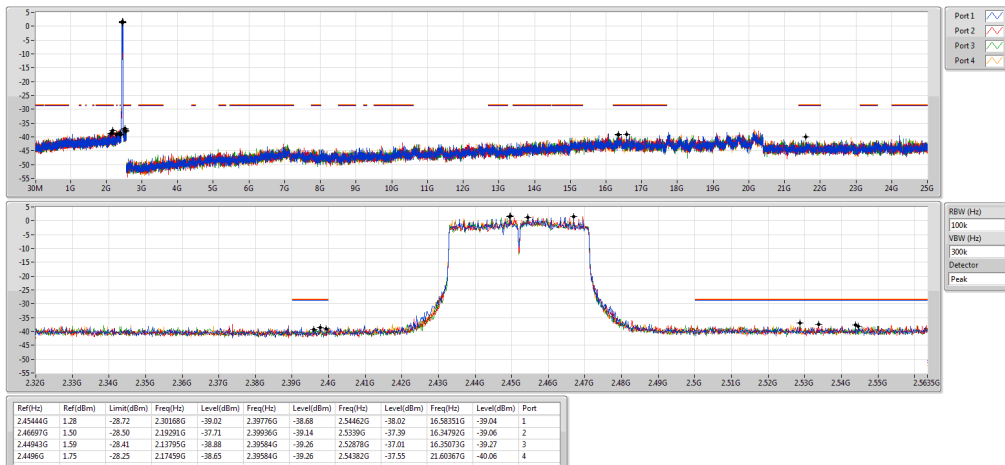
802.11ax HEW40_Nss1,(MCS0)_4TX
2437MHz

CSE NdB



802.11ax HEW40_Nss1,(MCS0)_4TX
2452MHz

CSE NdB



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 Corp (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 District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

No. 14-1, Lane 19, Wen San 3rd
St., Kwei Shan District, Tao Yuan
City 333, Taiwan, R.O.C.

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

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

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