

FCC Test Report

FCC ID : 2AAS9-WLRRTES106V2
Equipment : Femto Lite IoT Gateway
(Please refer to section 1.1.1 for more details)
Model No. : WLRRTES-106V2
Brand Name : BROWAN
Applicant : Browan Communications Incorporation.
Address : No.15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan (R.O.C.) , 30352.
Standard : 47 CFR FCC Part 15.247
Received Date : Oct. 27, 2023
Tested Date : Nov. 23 ~ Nov. 29, 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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Appendix A. 6dB and Occupied Bandwidth

Appendix B. Conducted Output Power

Appendix C. Power Spectral Density

Appendix D. Unwanted Emissions into Restricted Frequency Bands

Appendix E. Emissions in Non-Restricted Frequency Bands

Appendix F. AC Power Line Conducted Emissions

Release Record

Report No.	Version	Description	Issued Date
FR0D2402-02AC	Rev. 01	Initial issue	Dec. 19, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.712MHz 31.82 (Margin -14.18dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 4824.00MHz 53.84 (Margin -0.16dB) - AV	Pass
15.247(b)(3)	Conducted Output Power	Max Power [dBm]: 23.79	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
BROWAN	WLRRTES-106V2	Femto Lite IoT Gateway	For marketing purpose
		MerryIoT Hub	

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]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	1	MCS 0-7

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.
 Note 2: DSSS-DBPSK, DQPSK, CCK modulation
 OFDM- BPSK, QPSK, 16QAM and 64QAM modulation.

1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Gain (dBi)
1	WiFi(2.4GHz)	PIFA	No	3.01

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from adapter
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1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: PHIHONG Model: PSAF10A-050Q I/P: 100-240Vac, 50/60Hz, 0.28A O/P: 5.0Vdc=2.0A Power Line: 1.10m non-shielded without core.
2	AC adapter	Brand: Ktec Model: KSC-10A-050200HU I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5.0Vdc=2.0A Power Line: 1.10m non-shielded without core.
3	Ethernet cable	0.95m non-shielded without core.

1.1.6 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20		802.11n HT40	
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	EspRFTestTool, V3.6		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	90.97%	0.41
	11g	100.00%	0.00
	HT20	100.00%	0.00
	HT40	100.00%	0.00

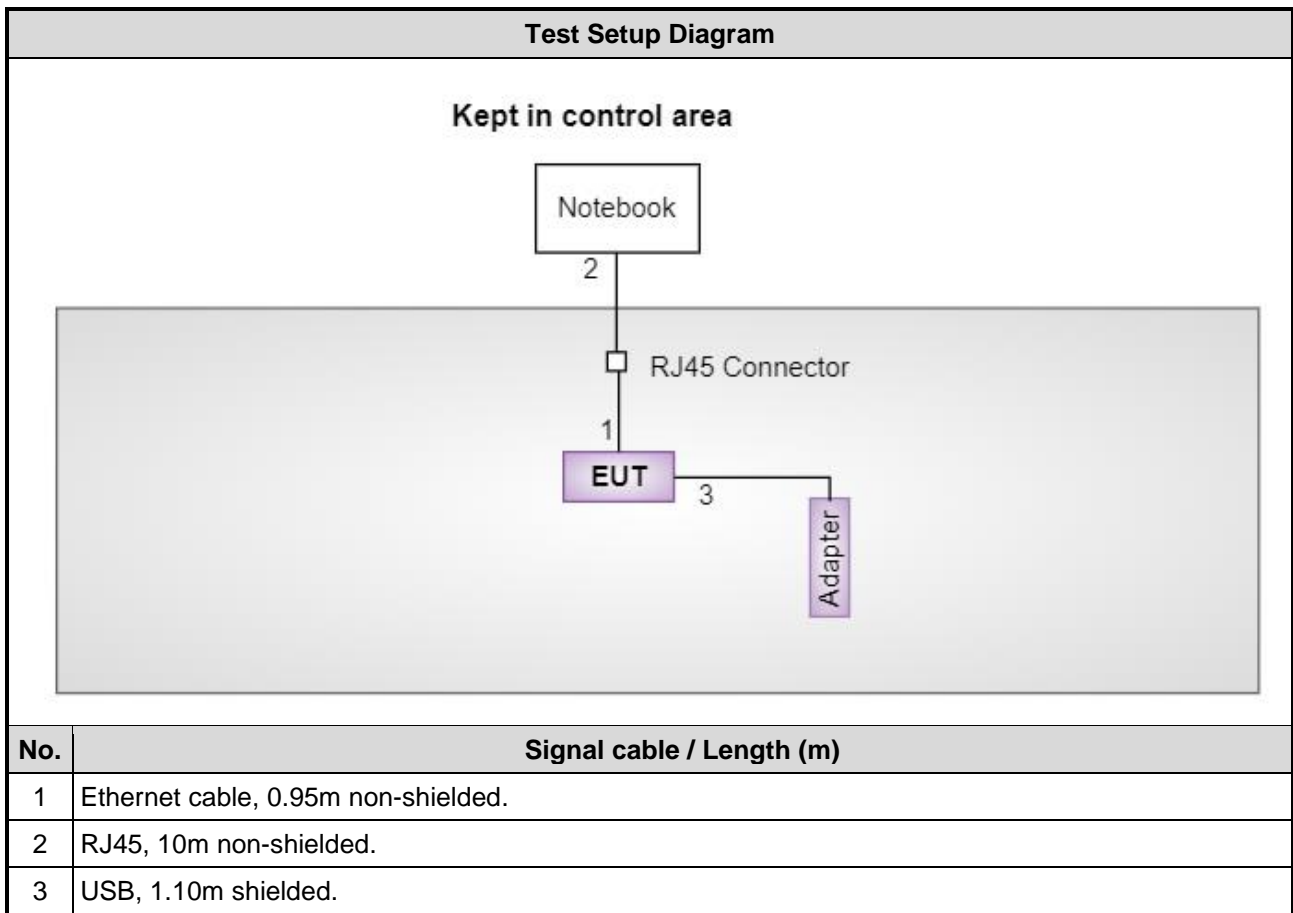
1.1.8 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	16
11b	2437	4
11b	2462	0
11g	2412	0
11g	2437	0
11g	2462	0
HT20	2412	0
HT20	2437	0
HT20	2462	2
HT40	2422	0
HT40	2437	0
HT40	2452	3

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E5470	DoC	---
2	RJ45 Connector	ICC	---	---	---

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Nov. 29, 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
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 11, 2023	Oct. 10, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan. 03, 2023	Jan. 02, 2024
50 ohm terminal (Support Unit)	NA	50	01	Jun. 14, 2023	Jun. 13, 2024
Measurement Software	Sporton	SENSE-EMI	V5.11.6	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Nov. 23 ~ Nov. 24, 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	101498	Nov. 23, 2022	Nov. 22, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Oct. 31, 2023	Oct. 30, 2024
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Sep. 01, 2023	Aug. 31, 2024
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 30, 2023	Oct. 29, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 03, 2023	Oct. 02, 2024
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 03, 2023	Oct. 02, 2024
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 03, 2023	Oct. 02, 2024
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 03, 2023	Oct. 02, 2024
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Attenuator	Pasternack	PE7005-10	10-1	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 05, 2023	Oct. 04, 2024
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Nov. 28, 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	1241001	Jan. 11, 2023	Jan. 10, 2024
Power Sensor	Anritsu	MA2411B	1911228	Jan. 11, 2023	Jan. 10, 2024
Attenuator	Pasternack	PE7005-10	10-2	Oct. 05, 2023	Oct. 04, 2024
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

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	± 3.41 dB
Unwanted Emission > 1 GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-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.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
AC Power Line Conducted Emission	11g	2462	6 Mbps	-
Unwanted Emissions ≤ 1GHz	11g	2462	6 Mbps	-
Unwanted Emissions >1GHz	11b	2412 / 2437 / 2462	1 Mbps	-
	11g	2412 / 2437 / 2462	6 Mbps	
	HT20	2412 / 2437 / 2462	MCS 0	
	HT40	2422 / 2437 / 2452	MCS 0	
Conducted Output Power 6dB bandwidth Power spectral density	11b	2412 / 2437 / 2462	1 Mbps	-
	11g	2412 / 2437 / 2462	6 Mbps	
	HT20	2412 / 2437 / 2462	MCS 0	
	HT40	2422 / 2437 / 2452	MCS 0	

Note:

- Two adapters (PHIHONG & Ktec) had been covered during the pretest and found that **PHIHONG** 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

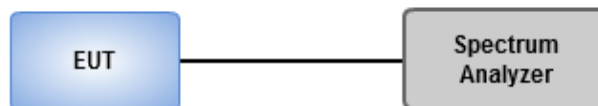
6dB Bandwidth

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	22°C / 65%	Tested By	Roger Lu
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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 6dBi, no any corresponding reduction is in output power limit.

Antenna gain $>$ 6dBi

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	22°C / 65%	Tested By	Roger Lu
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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.

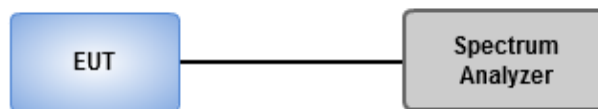
Average PSD, duty cycle \geq 98%

1. Set the RBW = 3 kHz, VBW = 10 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 = 3 kHz, VBW = 10 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.
6. Add $10 \log (1/x)$, where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	22°C / 65%	Tested By	Roger Lu
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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.

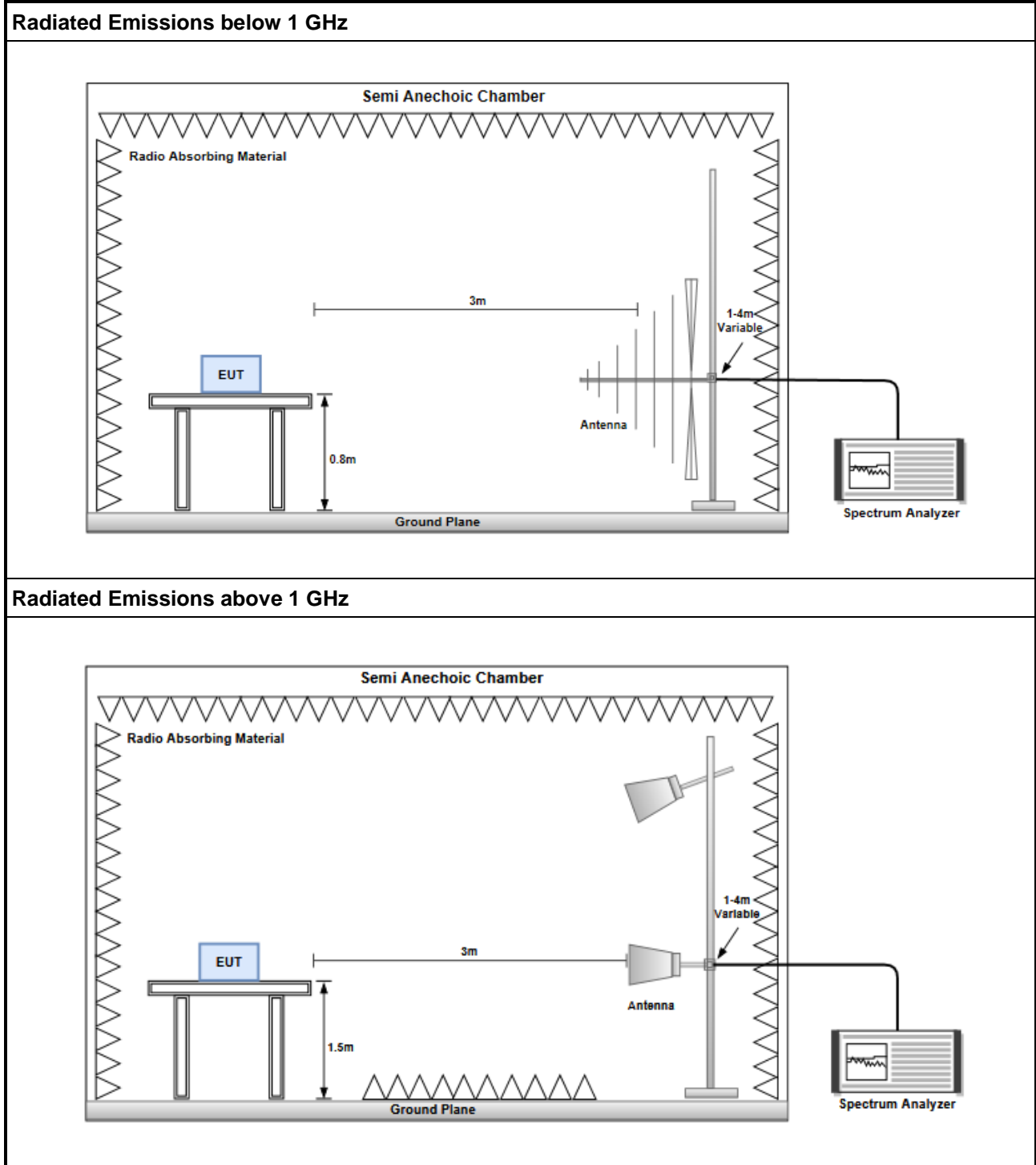
3.4.2 Test Procedures

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



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

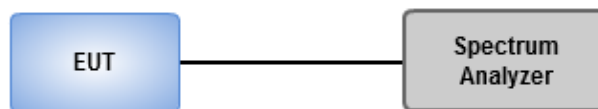
Reference level measurement

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	22°C / 65%	Tested By	Roger Lu
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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

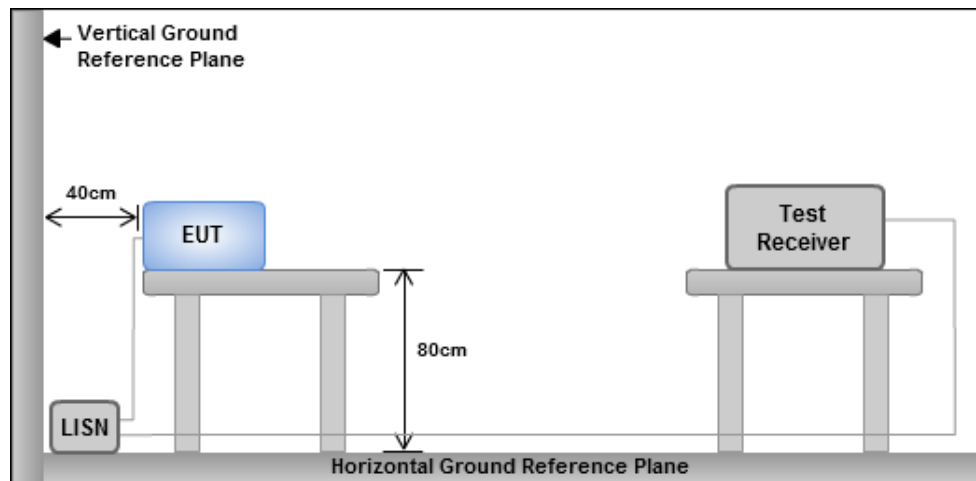
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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==



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_1TX	10M	13.454M	13M5G1D	9.55M	13.154M
802.11g_Nss1,(6Mbps)_1TX	16.4M	16.469M	16M5D1D	16.4M	16.434M
802.11n HT20_Nss1,(MCS0)_1TX	17.075M	17.325M	17M3D1D	17.075M	17.296M
802.11n HT40_Nss1,(MCS0)_1TX	33.5M	34.734M	34M7D1D	33.25M	34.71M

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

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	9.55M	13.154M
2437MHz	Pass	500k	10M	13.301M
2462MHz	Pass	500k	10M	13.454M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.4M	16.434M
2437MHz	Pass	500k	16.4M	16.455M
2462MHz	Pass	500k	16.4M	16.469M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	17.075M	17.296M
2437MHz	Pass	500k	17.075M	17.325M
2462MHz	Pass	500k	17.075M	17.302M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	500k	33.25M	34.734M
2437MHz	Pass	500k	33.5M	34.719M
2452MHz	Pass	500k	33.5M	34.71M

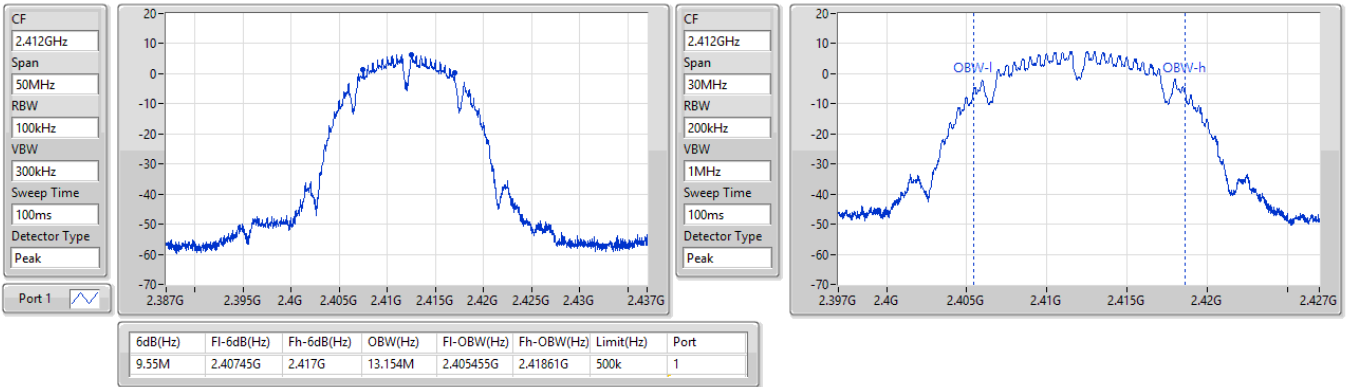
Port X-N dB = Port X 6dB down bandwidth;
 Port X-OBW = Port X 99% occupied bandwidth



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_1TX

EBW

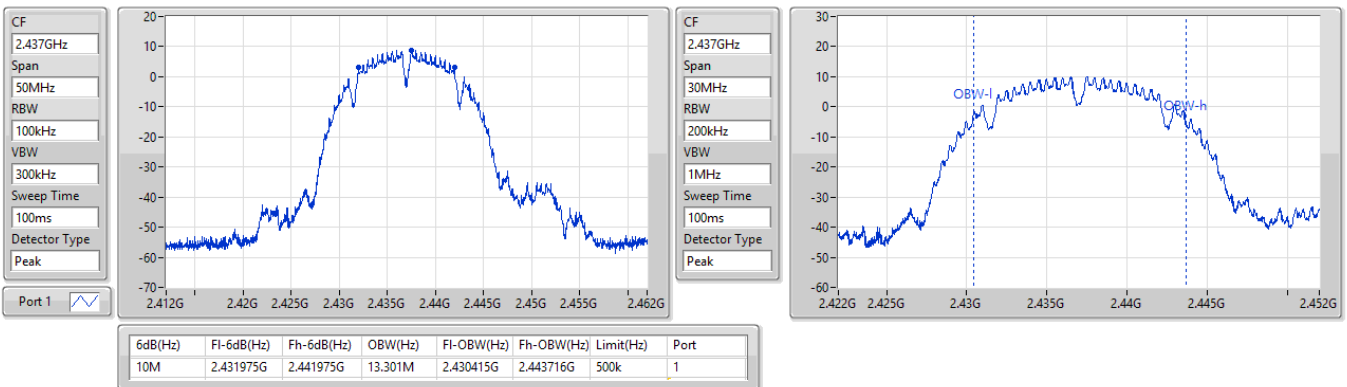
2412MHz



2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_1TX

EBW

2437MHz

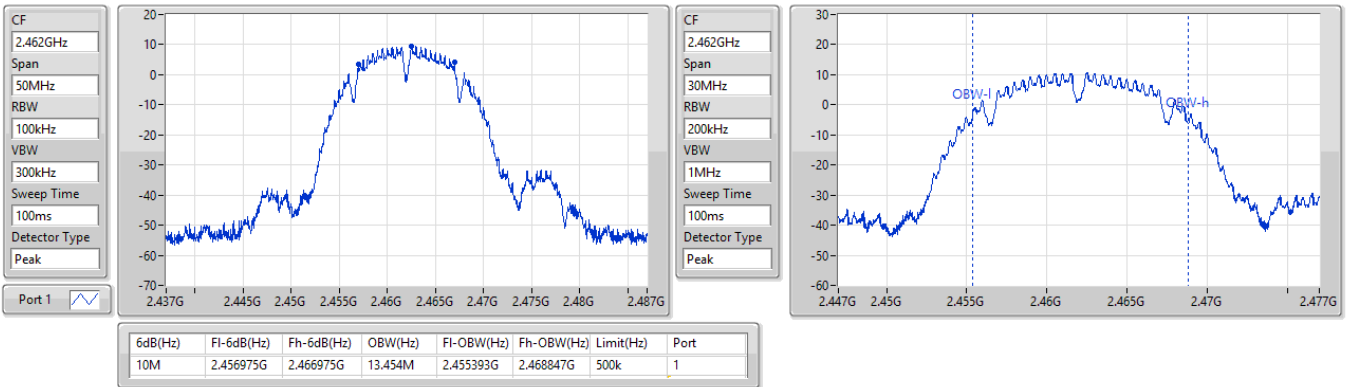




2.4-2.4835GHz_802.11b_Nss1,(1Mbps)_1TX

EBW

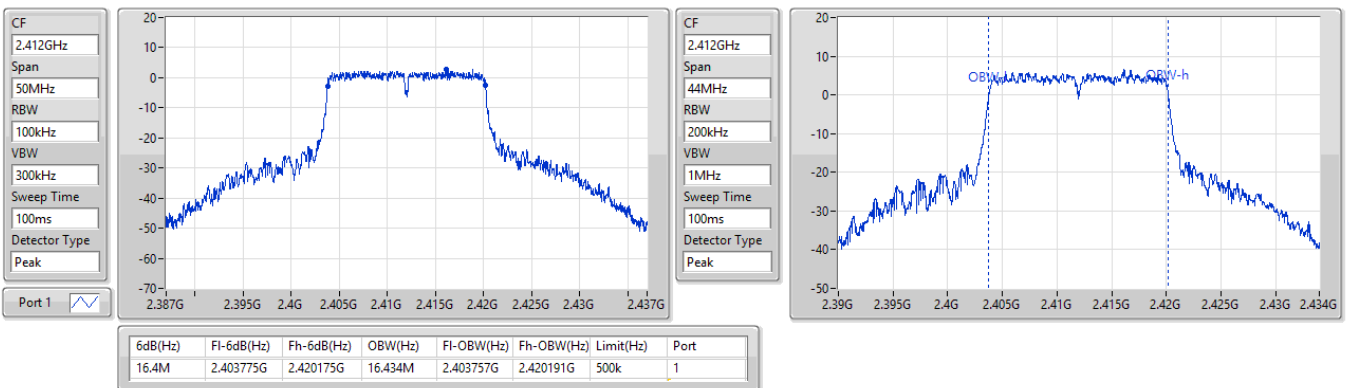
2462MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_1TX

EBW

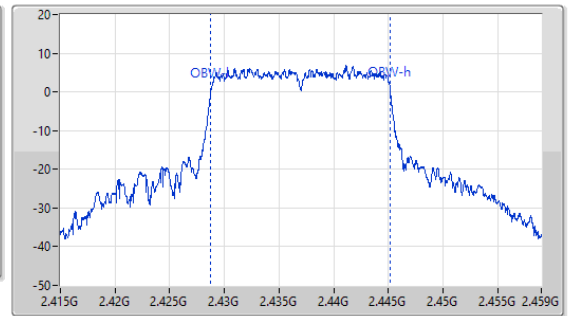
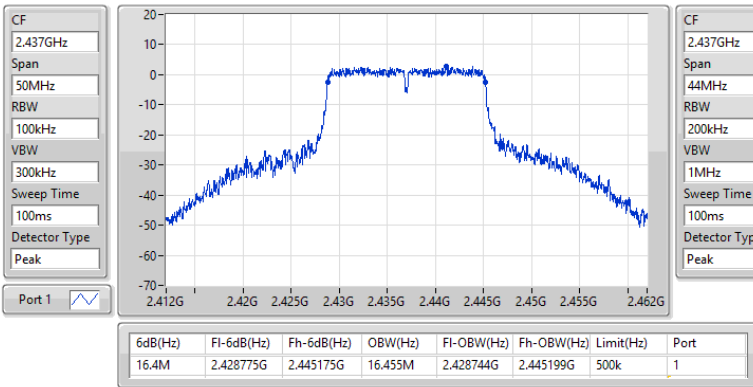
2412MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_1TX

EBW

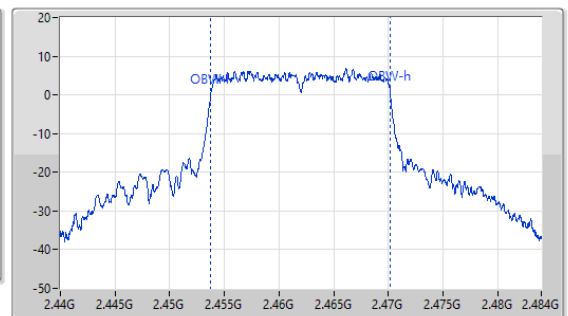
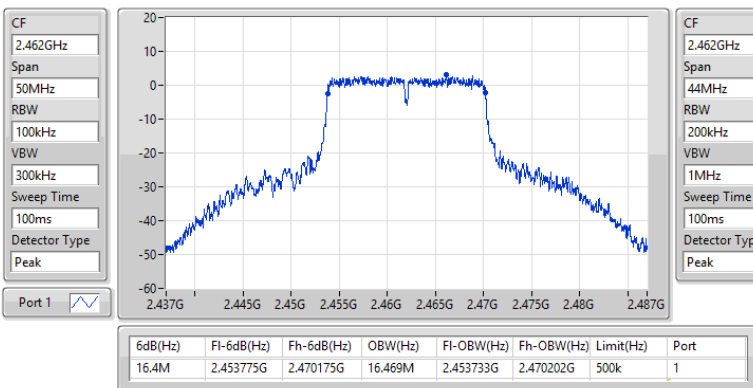
2437MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_1TX

EBW

2462MHz



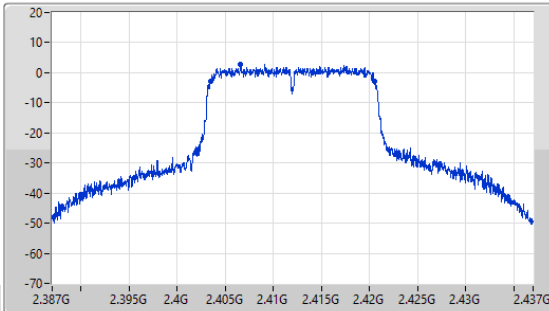


2.4-2.4835GHz_802.11n_HT20_Nss1,(MCS0)_1TX

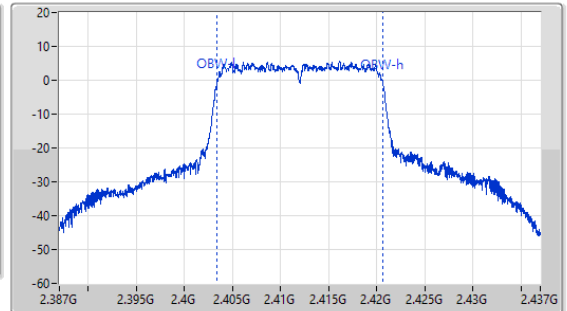
EBW

2412MHz

CF
2.412GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
100ms
Detector Type
Peak



CF
2.412GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak



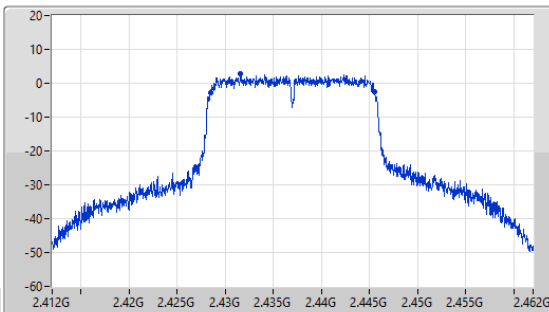
6dB(Hz)	F1-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	F1-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.075M	2.40345G	2.420525G	17.296M	2.403347G	2.420642G	500k	1

2.4-2.4835GHz_802.11n_HT20_Nss1,(MCS0)_1TX

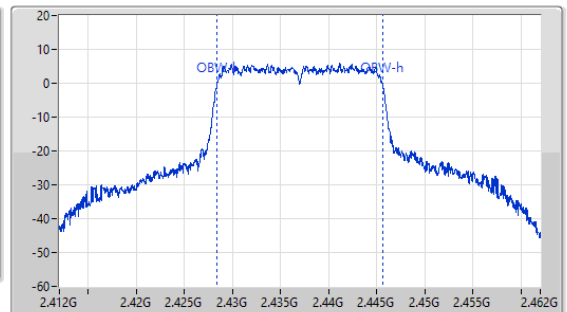
EBW

2437MHz

CF
2.437GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
100ms
Detector Type
Peak



CF
2.437GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
100ms
Detector Type
Peak

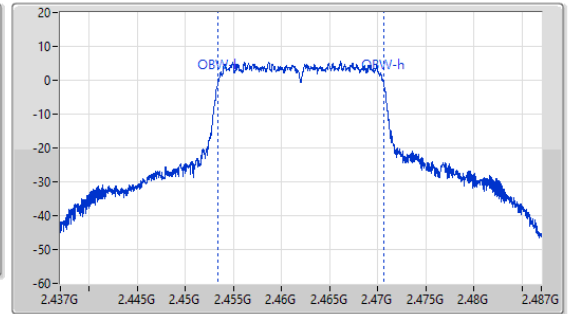
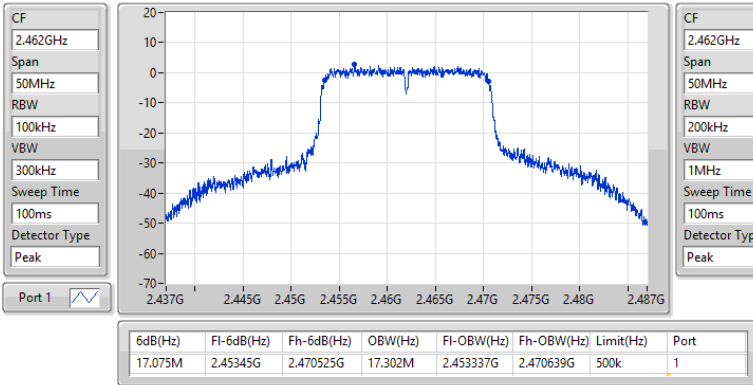


6dB(Hz)	F1-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	F1-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.075M	2.42845G	2.445525G	17.325M	2.428334G	2.445659G	500k	1

2.4-2.4835GHz_802.11n_HT20_Nss1,(MCS0)_1TX

EBW

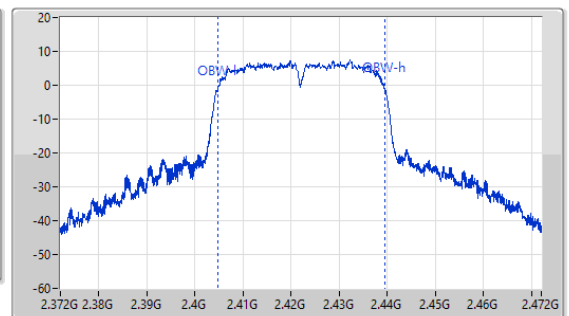
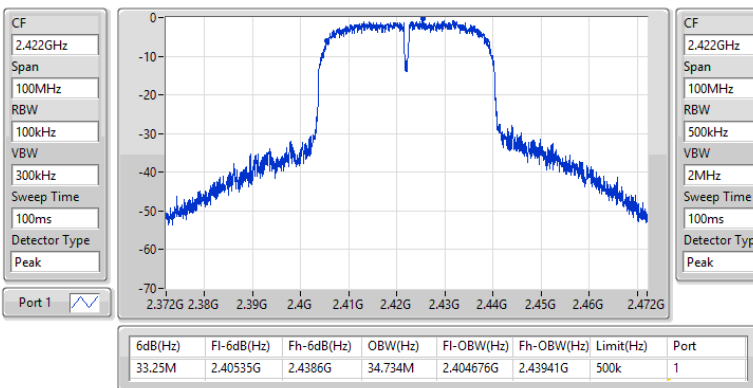
2462MHz



2.4-2.4835GHz_802.11n_HT40_Nss1,(MCS0)_1TX

EBW

2422MHz

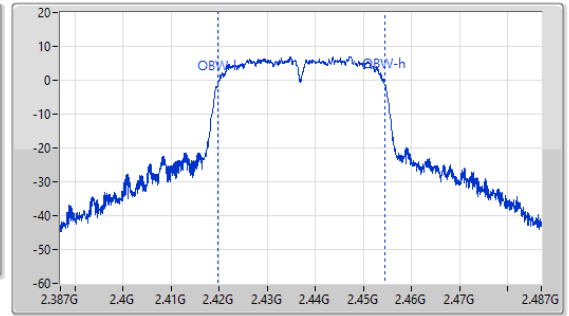
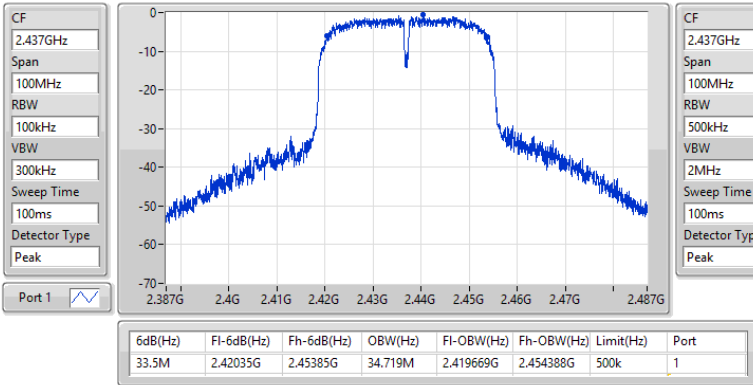




2.4-2.4835GHz_802.11n_HT40_Nss1,(MCS0)_1TX

EBW

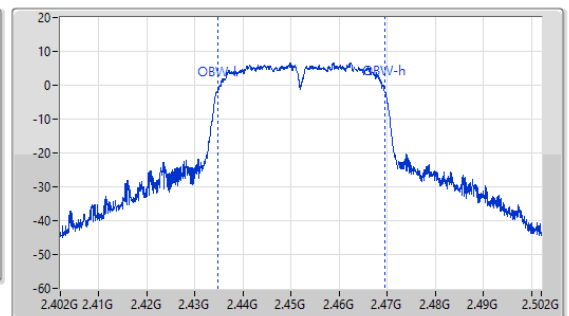
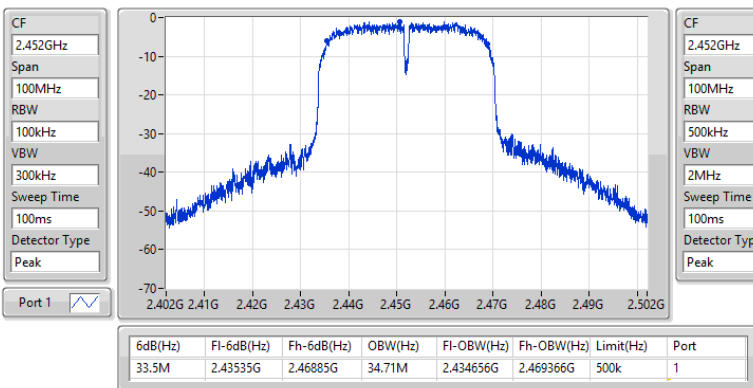
2437MHz



2.4-2.4835GHz_802.11n_HT40_Nss1,(MCS0)_1TX

EBW

2452MHz





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	21.48	0.14060
802.11g_Nss1,(6Mbps)_1TX	23.79	0.23933
802.11n HT20_Nss1,(MCS0)_1TX	23.69	0.23388
802.11n HT40_Nss1,(MCS0)_1TX	23.53	0.22542

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	18.58	18.58	30.00	21.59	36.00
2437MHz	Pass	3.01	21.02	21.02	30.00	24.03	36.00
2462MHz	Pass	3.01	21.48	21.48	30.00	24.49	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	23.58	23.58	30.00	26.59	36.00
2437MHz	Pass	3.01	23.65	23.65	30.00	26.66	36.00
2462MHz	Pass	3.01	23.79	23.79	30.00	26.80	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	23.62	23.62	30.00	26.63	36.00
2437MHz	Pass	3.01	23.69	23.69	30.00	26.70	36.00
2462MHz	Pass	3.01	23.25	23.25	30.00	26.26	36.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2422MHz	Pass	3.01	23.53	23.53	30.00	26.54	36.00
2437MHz	Pass	3.01	23.45	23.45	30.00	26.46	36.00
2452MHz	Pass	3.01	23.21	23.21	30.00	26.22	36.00

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



Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	19.10	0.08128
802.11g_Nss1,(6Mbps)_1TX	17.25	0.05309
802.11n HT20_Nss1,(MCS0)_1TX	17.01	0.05023
802.11n HT40_Nss1,(MCS0)_1TX	16.48	0.04446

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	16.02	16.02	-	19.03	-
2437MHz	Pass	3.01	18.47	18.47	-	21.48	-
2462MHz	Pass	3.01	19.1	19.10	-	22.11	-
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	17.08	17.08	-	20.09	-
2437MHz	Pass	3.01	17.12	17.12	-	20.13	-
2462MHz	Pass	3.01	17.25	17.25	-	20.26	-
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	3.01	16.86	16.86	-	19.87	-
2437MHz	Pass	3.01	17.01	17.01	-	20.02	-
2462MHz	Pass	3.01	16.42	16.42	-	19.43	-
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2422MHz	Pass	3.01	16.48	16.48	-	19.49	-
2437MHz	Pass	3.01	16.4	16.40	-	19.41	-
2452MHz	Pass	3.01	15.85	15.85	-	18.86	-

DG = Directional Gain; Port X = Port X output power
Note : Conducted average output power is for reference



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	-5.52
802.11g_Nss1,(6Mbps)_1TX	-12.02
802.11n HT20_Nss1,(MCS0)_1TX	-11.32
802.11n HT40_Nss1,(MCS0)_1TX	-12.75

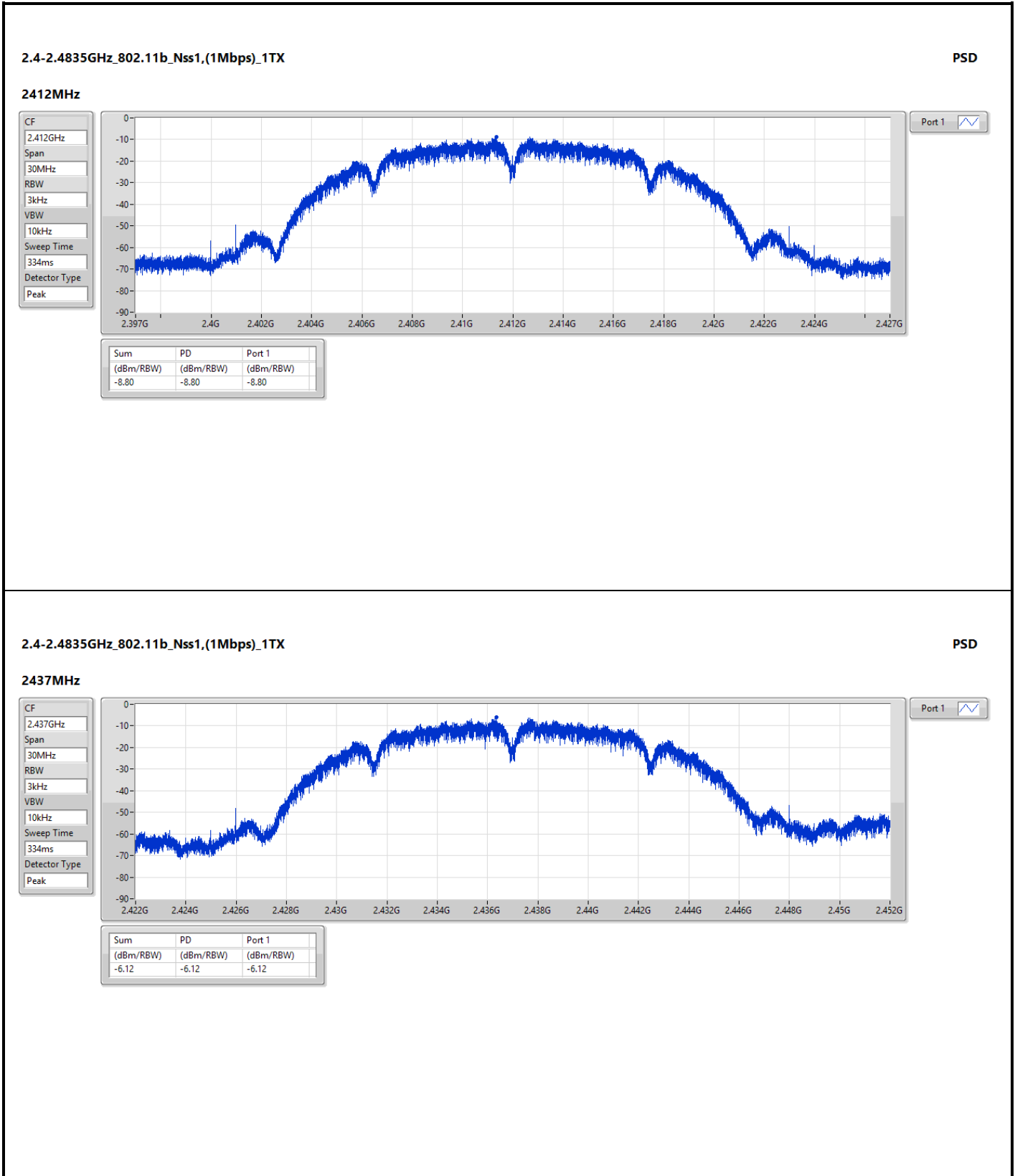
RBW = 3kHz;

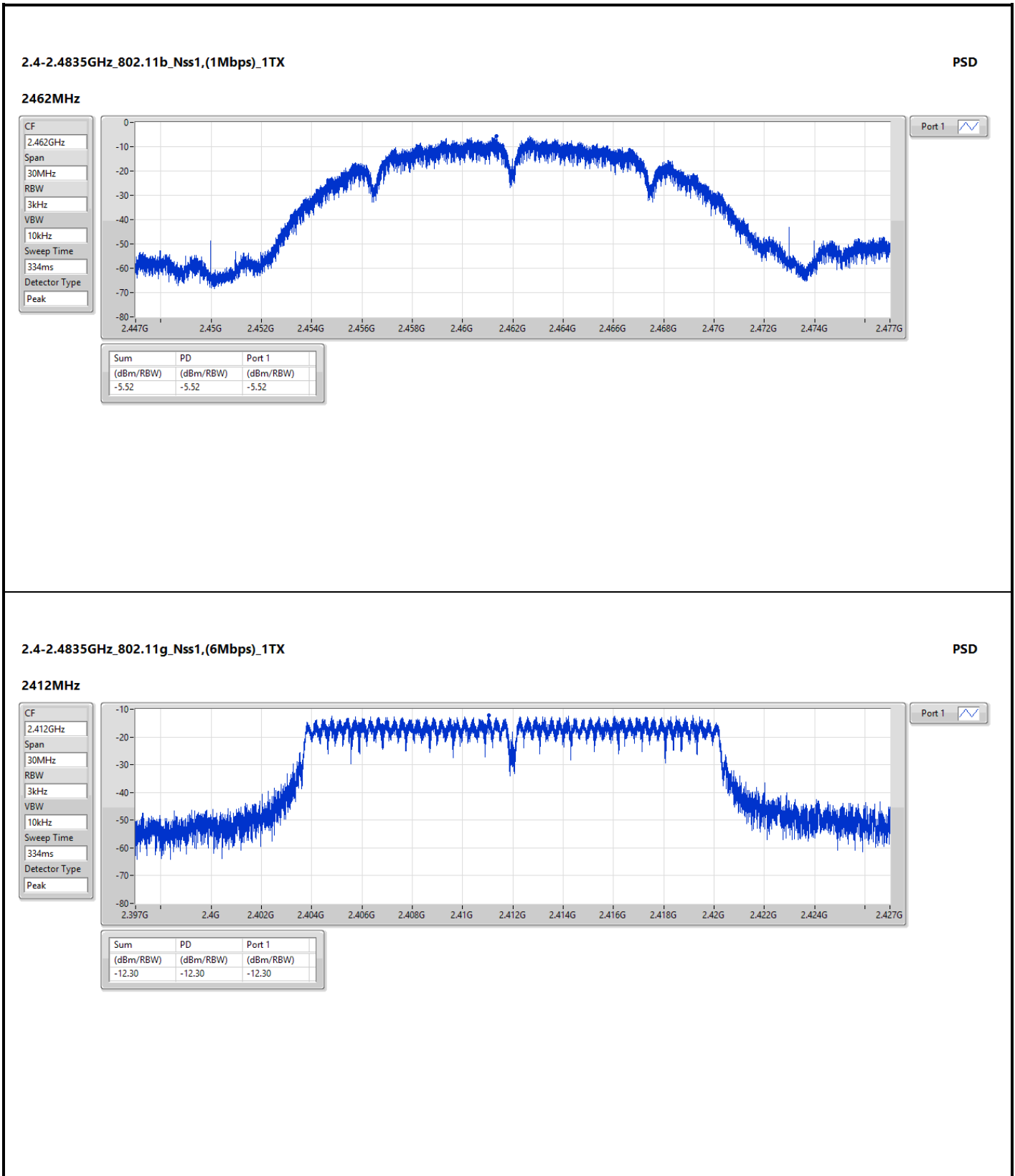
Result

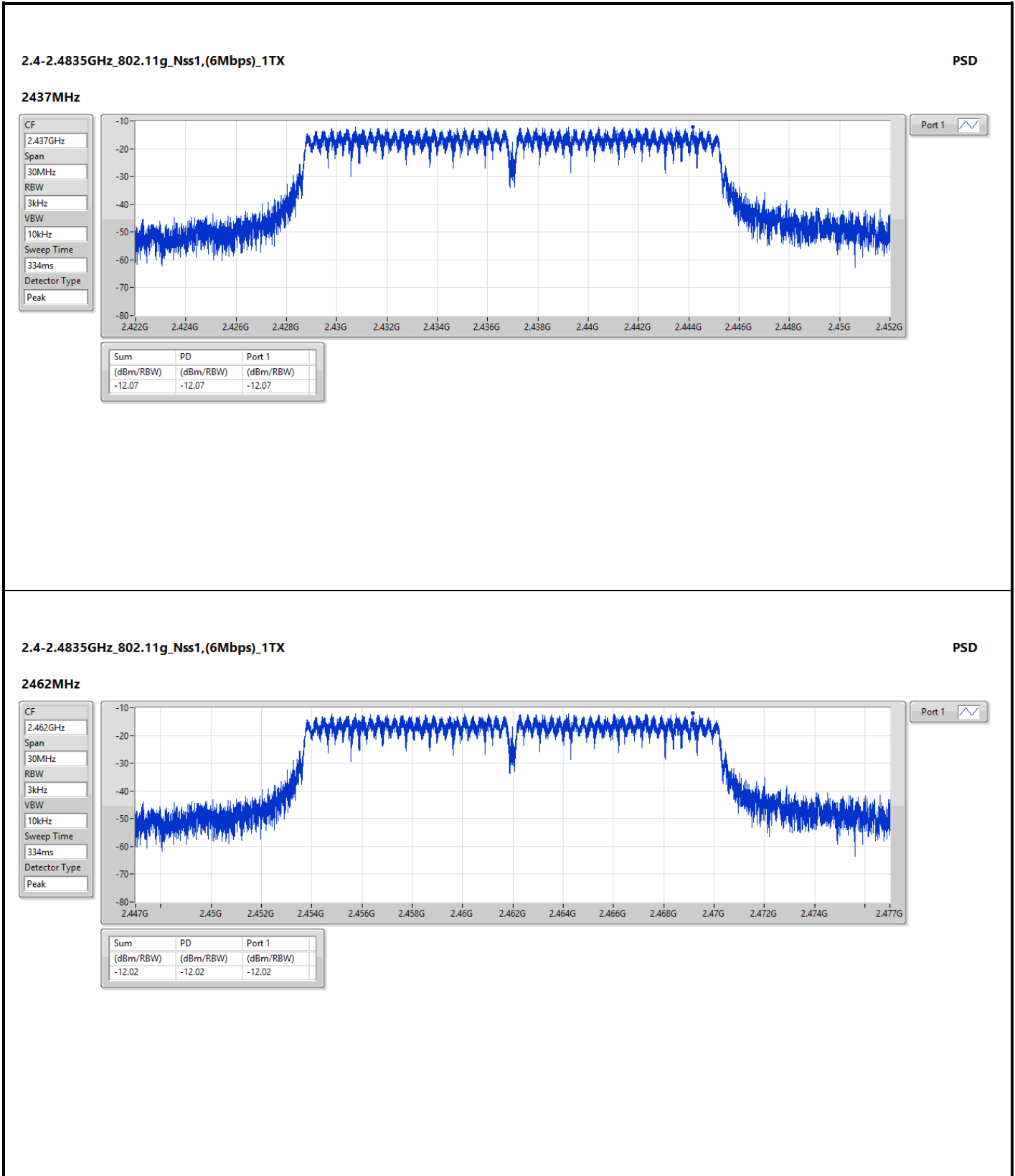
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.01	-8.80	-8.80	8.00
2437MHz	Pass	3.01	-6.12	-6.12	8.00
2462MHz	Pass	3.01	-5.52	-5.52	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	3.01	-12.30	-12.30	8.00
2437MHz	Pass	3.01	-12.07	-12.07	8.00
2462MHz	Pass	3.01	-12.02	-12.02	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	3.01	-11.32	-11.32	8.00
2437MHz	Pass	3.01	-11.60	-11.60	8.00
2462MHz	Pass	3.01	-11.49	-11.49	8.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2422MHz	Pass	3.01	-12.75	-12.75	8.00
2437MHz	Pass	3.01	-12.80	-12.80	8.00
2452MHz	Pass	3.01	-12.91	-12.91	8.00

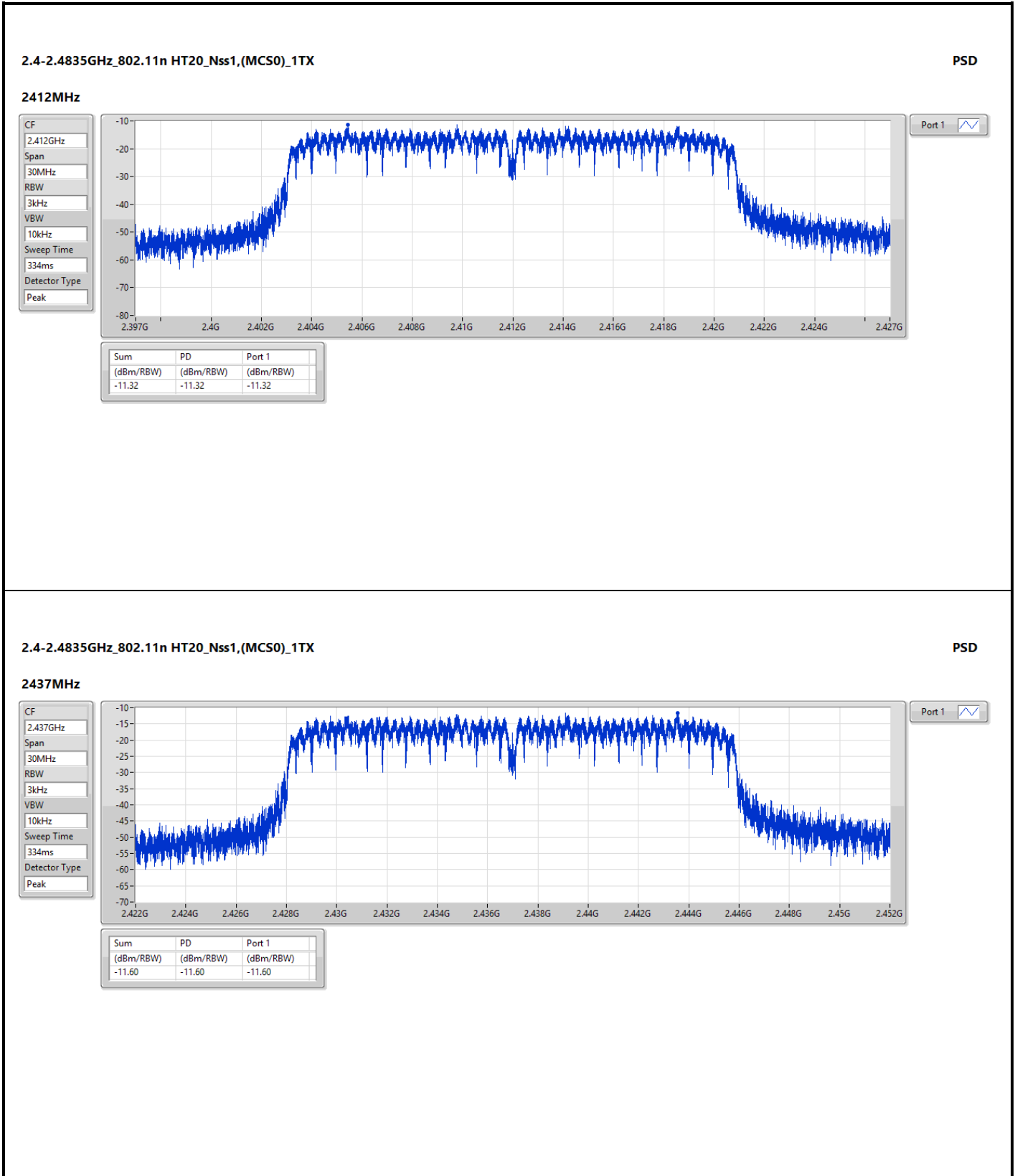
DG = Directional Gain; RBW = 3kHz;

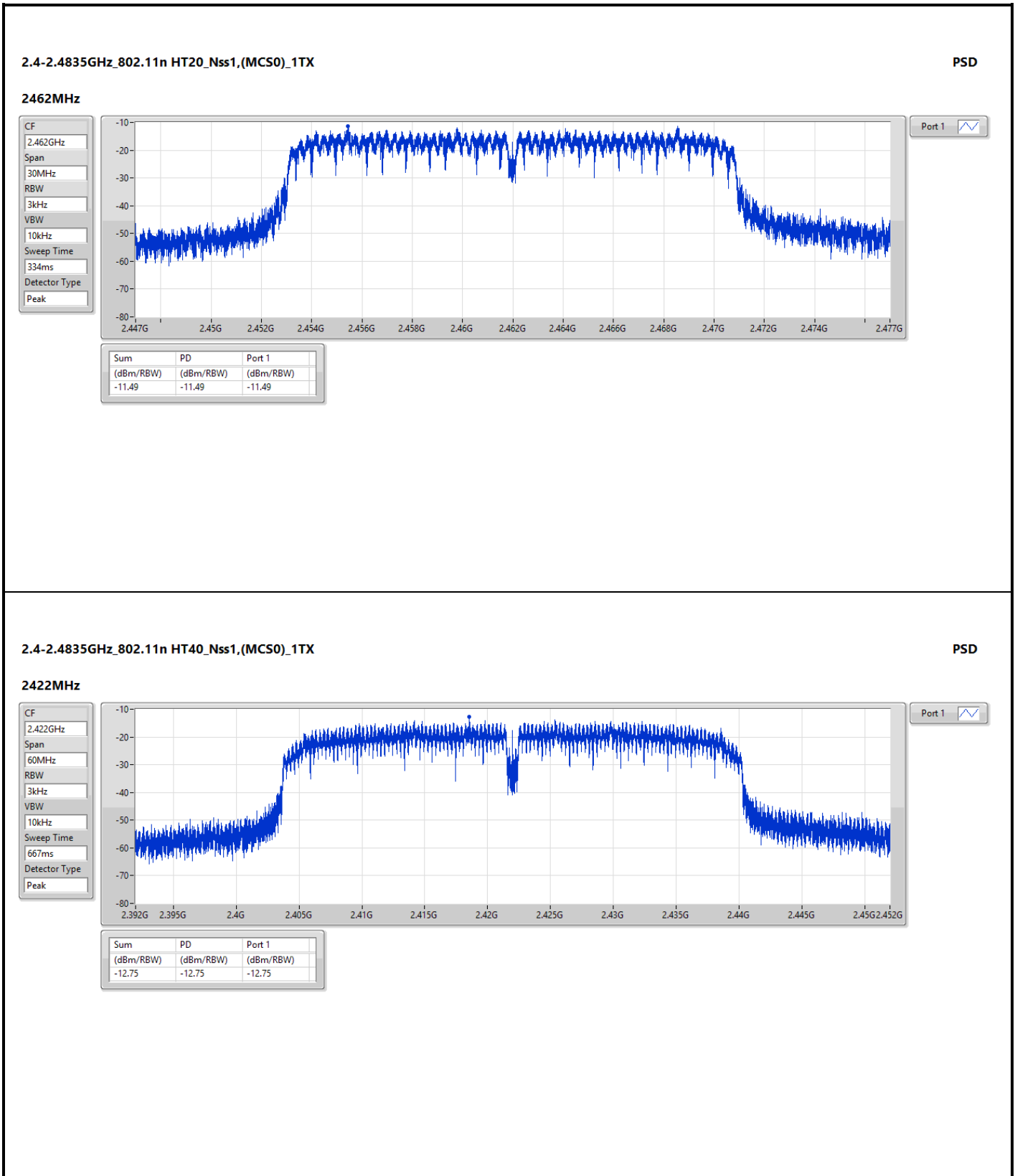
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

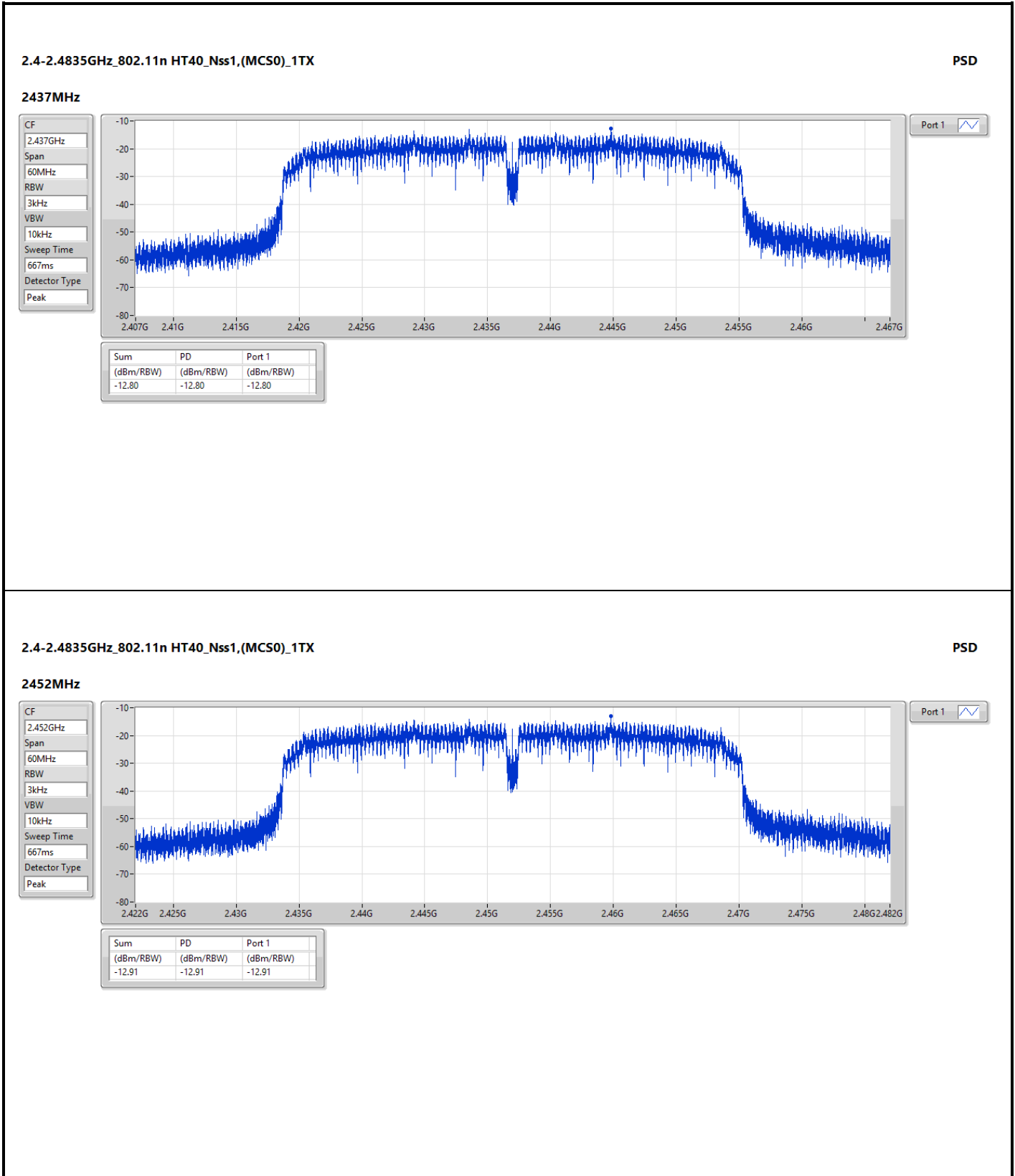










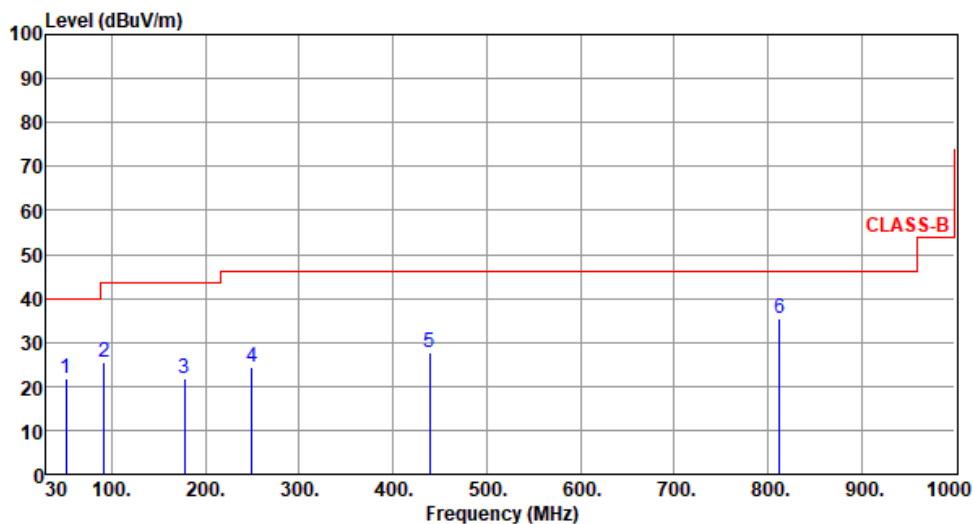




Unwanted Emissions (Below 1GHz)

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

Test By :Sean Yu Temperature(°C):24 Humidity(%):61



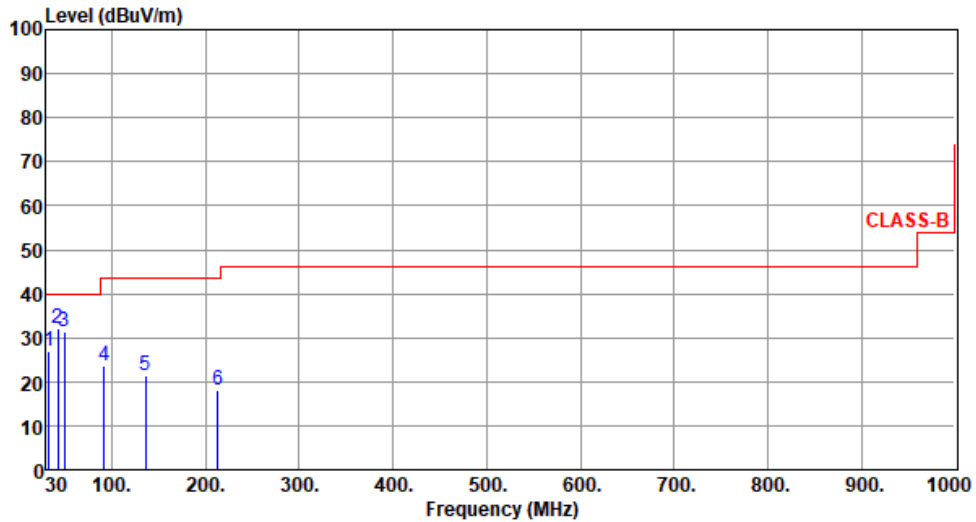
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	51.34	21.82	40.00	-18.18	29.69	-7.87	Peak	---	---
2	92.08	25.38	43.50	-18.12	39.69	-14.31	Peak	---	---
3	177.44	21.90	43.50	-21.60	31.96	-10.06	Peak	---	---
4	249.22	24.20	46.00	-21.80	34.17	-9.97	Peak	---	---
5	439.34	27.56	46.00	-18.44	31.80	-4.24	Peak	---	---
6	812.79	35.38	46.00	-10.62	32.48	2.90	Peak	---	---

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 61



	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	32.91	27.07	40.00	-12.93	36.92	-9.85	Peak	---	---
2	42.61	32.18	40.00	-7.82	40.57	-8.39	Peak	---	---
3	49.40	31.38	40.00	-8.62	39.26	-7.88	Peak	---	---
4	92.08	23.59	43.50	-19.91	37.90	-14.31	Peak	---	---
5	135.73	21.30	43.50	-22.20	30.91	-9.61	Peak	---	---
6	213.33	18.13	43.50	-25.37	30.10	-11.97	Peak	---	---

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).

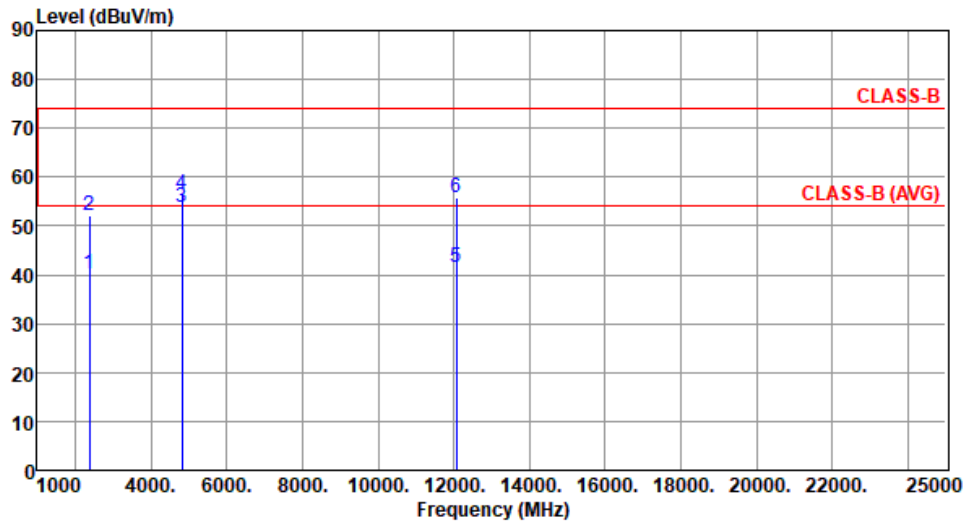
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Unwanted Emission (Above 1GHz) for 11b

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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



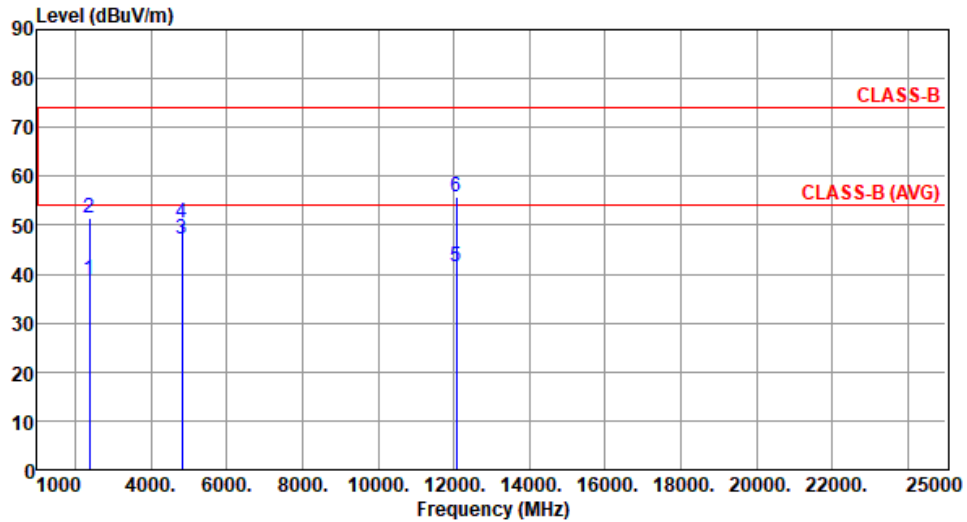
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	40.02	54.00	-13.98	44.34	-4.32	Average	100	181
2	2390.00	52.12	74.00	-21.88	56.44	-4.32	Peak	100	181
3	4824.00	53.84	54.00	-0.16	54.30	-0.46	Average	256	346
4	4824.00	56.37	74.00	-17.63	56.83	-0.46	Peak	256	346
5	12060.00	41.68	54.00	-12.32	35.46	6.22	Average	100	172
6	12060.00	55.64	74.00	-18.36	49.42	6.22	Peak	100	172

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	11b	Test Freq. (MHz)	2412
Polarization	Vertical		

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	38.80	54.00	-15.20	43.12	-4.32	Average	100	69
2	2390.00	51.34	74.00	-22.66	55.66	-4.32	Peak	100	69
3	4824.00	47.09	54.00	-6.91	47.55	-0.46	Average	183	77
4	4824.00	50.56	74.00	-23.44	51.02	-0.46	Peak	183	77
5	12060.00	41.66	54.00	-12.34	35.44	6.22	Average	100	208
6	12060.00	55.63	74.00	-18.37	49.41	6.22	Peak	100	208

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

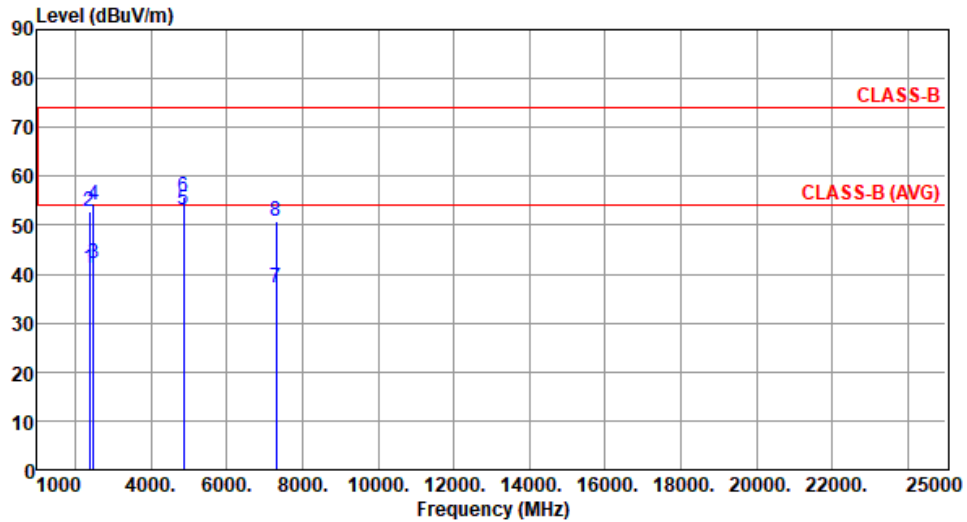
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	41.02	54.00	-12.98	45.34	-4.32	Average	100	181
2	2390.00	52.80	74.00	-21.20	57.12	-4.32	Peak	100	181
3	2483.50	42.10	54.00	-11.90	46.52	-4.42	Average	100	181
4	2483.50	54.26	74.00	-19.74	58.68	-4.42	Peak	100	181
5	4874.00	53.15	54.00	-0.85	53.60	-0.45	Average	256	326
6	4874.00	55.68	74.00	-18.32	56.13	-0.45	Peak	256	326
7	7311.00	37.30	54.00	-16.70	32.14	5.16	Average	100	24
8	7311.00	50.86	74.00	-23.14	45.70	5.16	Peak	100	24

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

*Factor includes antenna factor , cable loss and amplifier gain

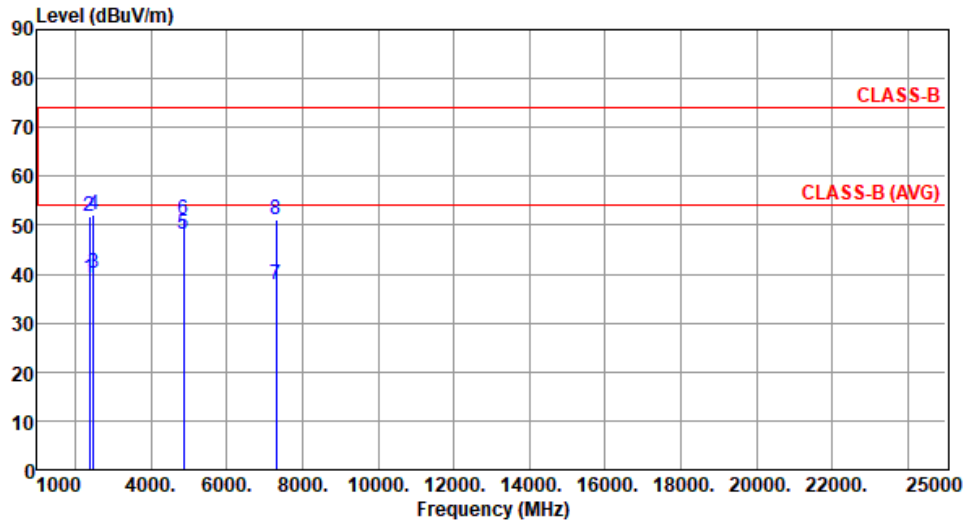
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation	11b	Test Freq. (MHz)	2437
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Polarization	Vertical
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Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	39.20	54.00	-14.80	43.52	-4.32	Average	100	68
2	2390.00	51.76	74.00	-22.24	56.08	-4.32	Peak	100	68
3	2483.50	40.08	54.00	-13.92	44.50	-4.42	Average	100	68
4	2483.50	52.04	74.00	-21.96	56.46	-4.42	Peak	100	68
5	4874.00	48.17	54.00	-5.83	48.62	-0.45	Average	102	138
6	4874.00	51.31	74.00	-22.69	51.76	-0.45	Peak	102	138
7	7311.00	37.80	54.00	-16.20	32.64	5.16	Average	100	41
8	7311.00	51.30	74.00	-22.70	46.14	5.16	Peak	100	41

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

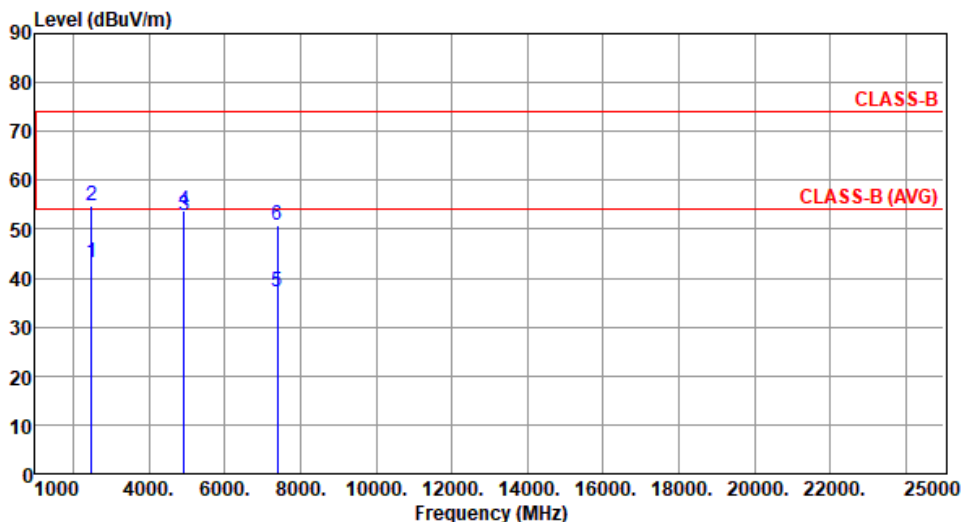
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	43.02	54.00	-10.98	47.44	-4.42	Average	100	179
2	2483.50	54.91	74.00	-19.09	59.33	-4.42	Peak	100	179
3	4924.00	52.83	54.00	-1.17	53.27	-0.44	Average	237	342
4	4924.00	53.85	74.00	-20.15	54.29	-0.44	Peak	237	342
5	7386.00	37.16	54.00	-16.84	32.13	5.03	Average	100	176
6	7386.00	50.71	74.00	-23.29	45.68	5.03	Peak	100	176

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

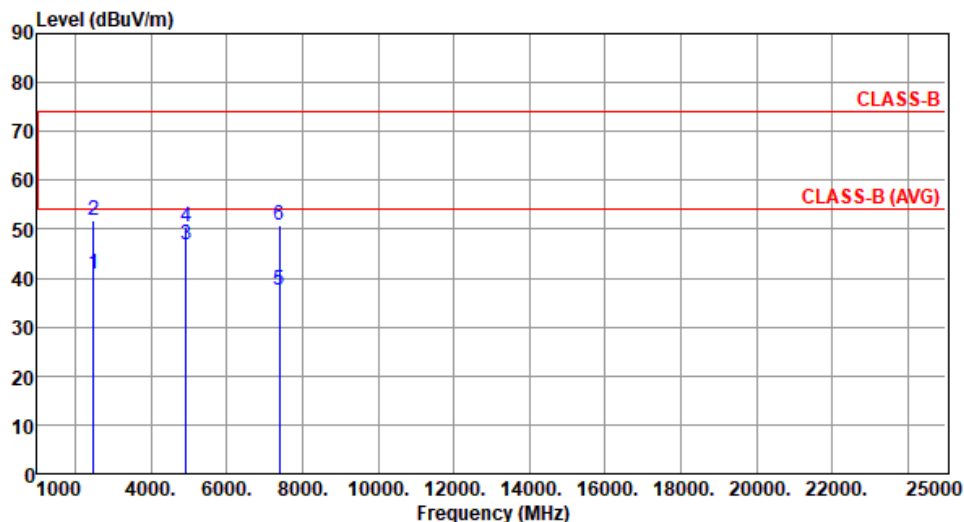
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	40.93	54.00	-13.07	45.35	-4.42	Average	100	70
2	2483.50	51.90	74.00	-22.10	56.32	-4.42	Peak	100	70
3	4924.00	46.98	54.00	-7.02	47.42	-0.44	Average	244	208
4	4924.00	50.41	74.00	-23.59	50.85	-0.44	Peak	244	208
5	7386.00	37.54	54.00	-16.46	32.51	5.03	Average	100	158
6	7386.00	50.71	74.00	-23.29	45.68	5.03	Peak	100	158

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

*Factor includes antenna factor , cable loss and amplifier gain

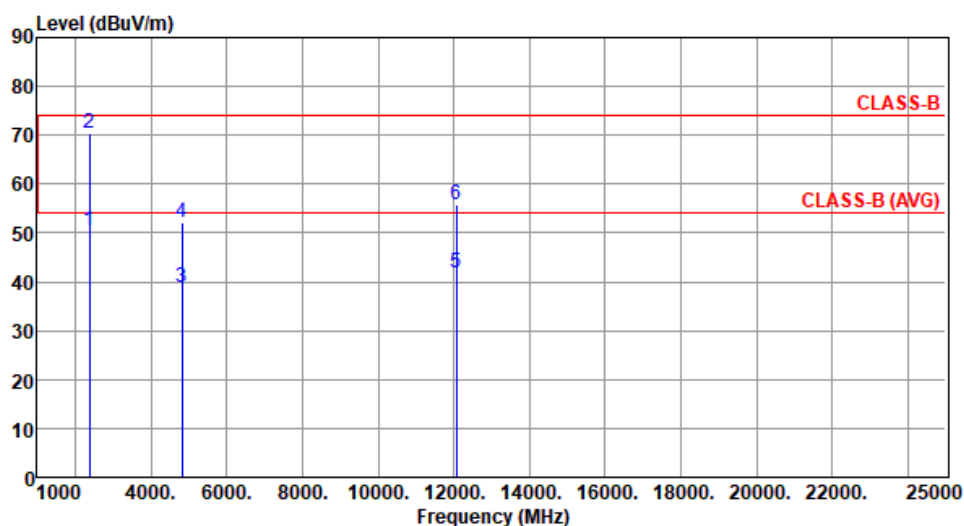
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Unwanted Emissions (Above 1GHz) for 11g

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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	50.47	54.00	-3.53	54.79	-4.32	Average	136	223
2	2390.00	70.28	74.00	-3.72	74.60	-4.32	Peak	136	223
3	4824.00	38.95	54.00	-15.05	39.41	-0.46	Average	257	334
4	4824.00	52.22	74.00	-21.78	52.68	-0.46	Peak	257	334
5	12060.00	41.98	54.00	-12.02	35.76	6.22	Average	100	177
6	12060.00	55.84	74.00	-18.16	49.62	6.22	Peak	100	177

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

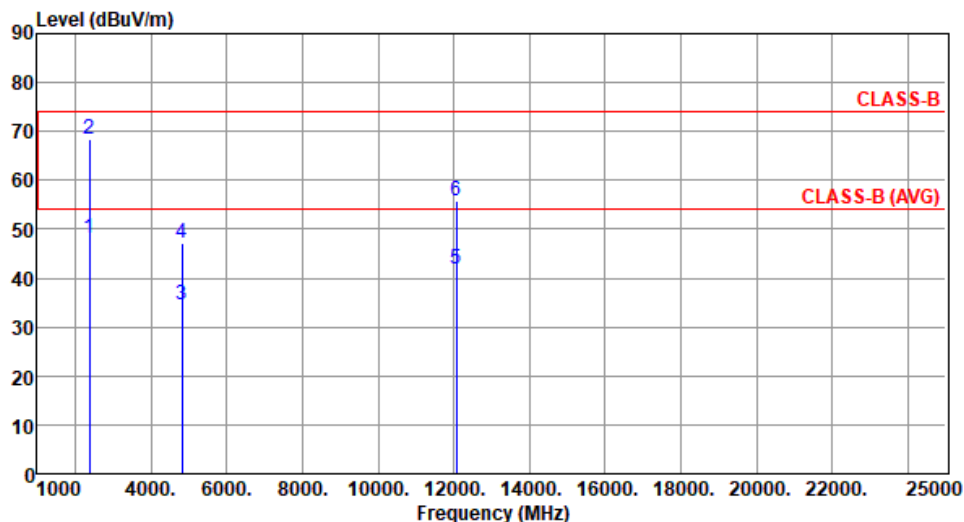
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	48.31	54.00	-5.69	52.63	-4.32	Average	308	176
2	2390.00	68.26	74.00	-5.74	72.58	-4.32	Peak	308	176
3	4824.00	34.57	54.00	-19.43	35.03	-0.46	Average	100	102
4	4824.00	47.22	74.00	-26.78	47.68	-0.46	Peak	100	102
5	12060.00	41.86	54.00	-12.14	35.64	6.22	Average	100	186
6	12060.00	55.73	74.00	-18.27	49.51	6.22	Peak	100	186

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

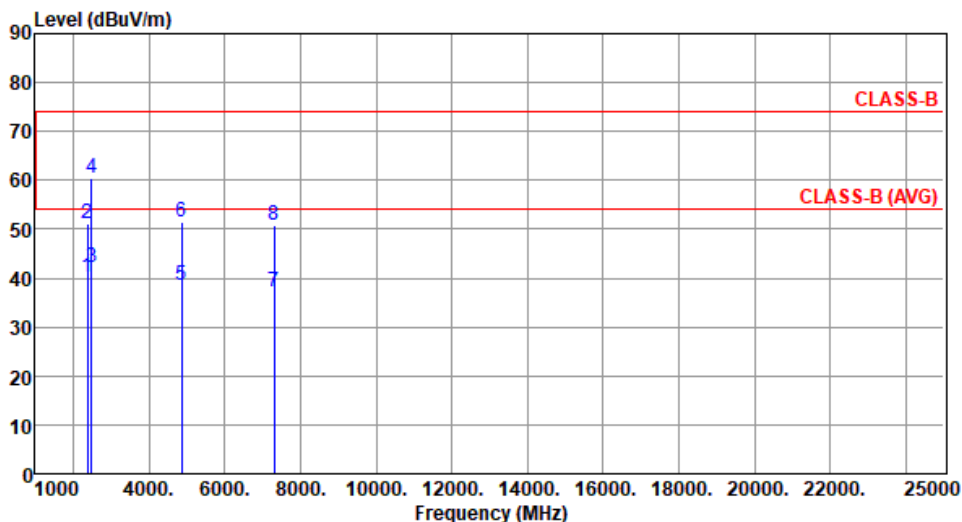
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	40.11	54.00	-13.89	44.43	-4.32	Average	122	192
2	2390.00	51.15	74.00	-22.85	55.47	-4.32	Peak	122	192
3	2483.50	42.11	54.00	-11.89	46.53	-4.42	Average	122	192
4	2483.50	60.47	74.00	-13.53	64.89	-4.42	Peak	122	192
5	4874.00	38.47	54.00	-15.53	38.92	-0.45	Average	253	340
6	4874.00	51.49	74.00	-22.51	51.94	-0.45	Peak	253	340
7	7311.00	37.19	54.00	-16.81	32.03	5.16	Average	100	158
8	7311.00	50.88	74.00	-23.12	45.72	5.16	Peak	100	158

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

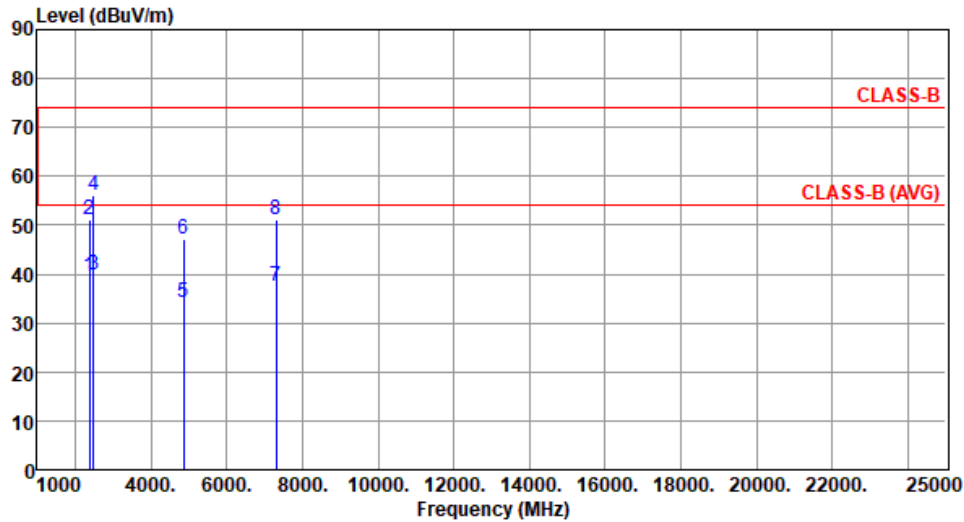
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	39.54	54.00	-14.46	43.86	-4.32	Average	116	68
2	2390.00	51.00	74.00	-23.00	55.32	-4.32	Peak	116	68
3	2483.50	39.82	54.00	-14.18	44.24	-4.42	Average	116	68
4	2483.50	56.09	74.00	-17.91	60.51	-4.42	Peak	116	68
5	4874.00	34.21	54.00	-19.79	34.66	-0.45	Average	100	92
6	4874.00	47.25	74.00	-26.75	47.70	-0.45	Peak	100	92
7	7311.00	37.62	54.00	-16.38	32.46	5.16	Average	100	206
8	7311.00	51.04	74.00	-22.96	45.88	5.16	Peak	100	206

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

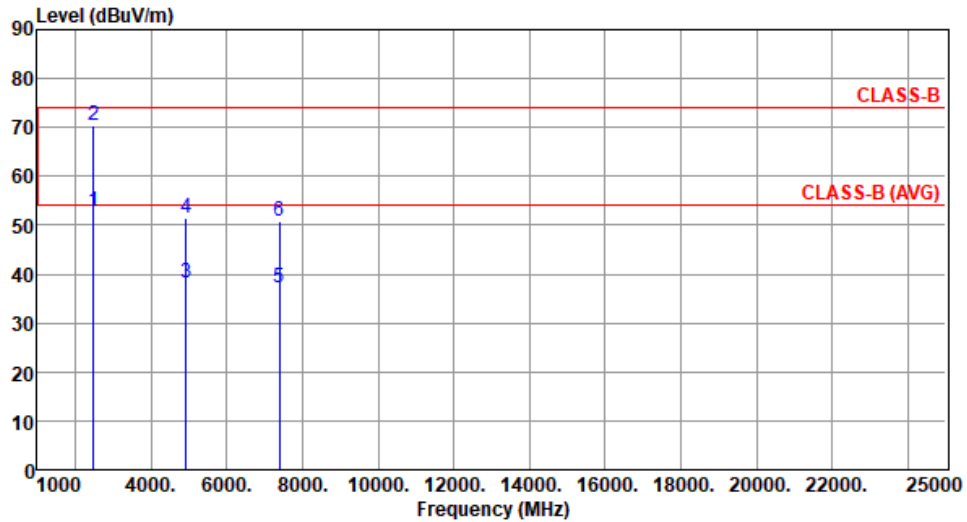
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	52.94	54.00	-1.06	57.36	-4.42	Average	133	226
2	2483.50	70.45	74.00	-3.55	74.87	-4.42	Peak	133	226
3	4924.00	38.30	54.00	-15.70	38.74	-0.44	Average	255	341
4	4924.00	51.40	74.00	-22.60	51.84	-0.44	Peak	255	341
5	7386.00	37.06	54.00	-16.94	32.03	5.03	Average	100	158
6	7386.00	50.77	74.00	-23.23	45.74	5.03	Peak	100	158

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

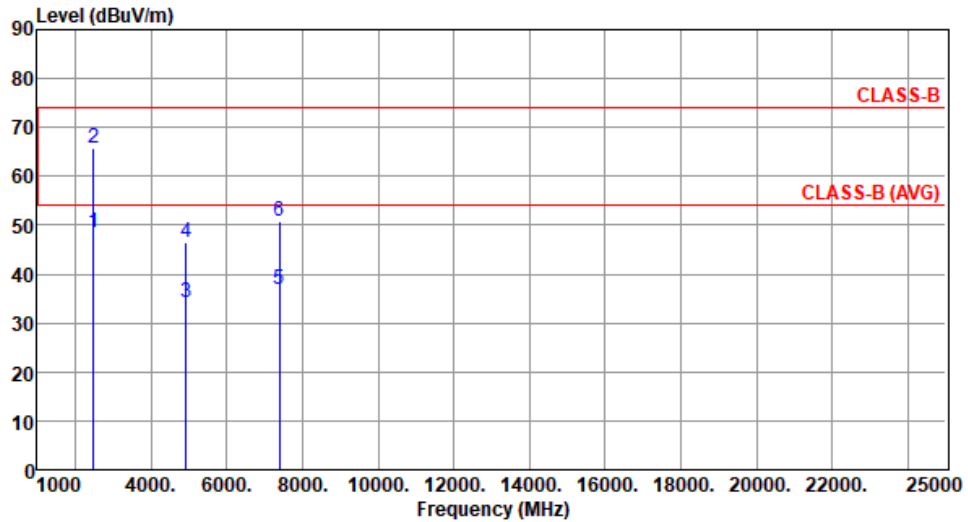
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	48.39	54.00	-5.61	52.81	-4.42	Average	106	70
2	2483.50	65.78	74.00	-8.22	70.20	-4.42	Peak	106	70
3	4924.00	34.28	54.00	-19.72	34.72	-0.44	Average	100	108
4	4924.00	46.40	74.00	-27.60	46.84	-0.44	Peak	100	108
5	7386.00	36.97	54.00	-17.03	31.94	5.03	Average	100	221
6	7386.00	50.87	74.00	-23.13	45.84	5.03	Peak	100	221

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

*Factor includes antenna factor , cable loss and amplifier gain

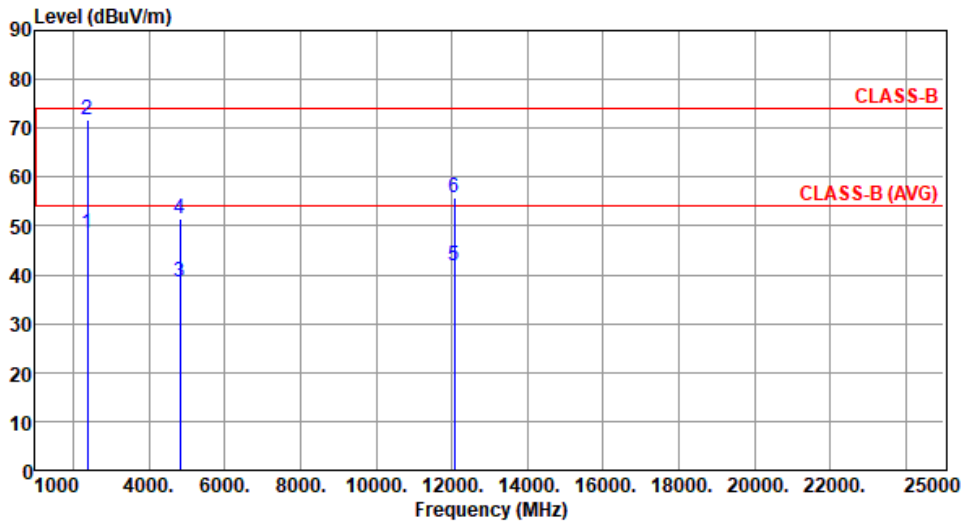
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Unwanted Emissions (Above 1GHz) for ax HE20

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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



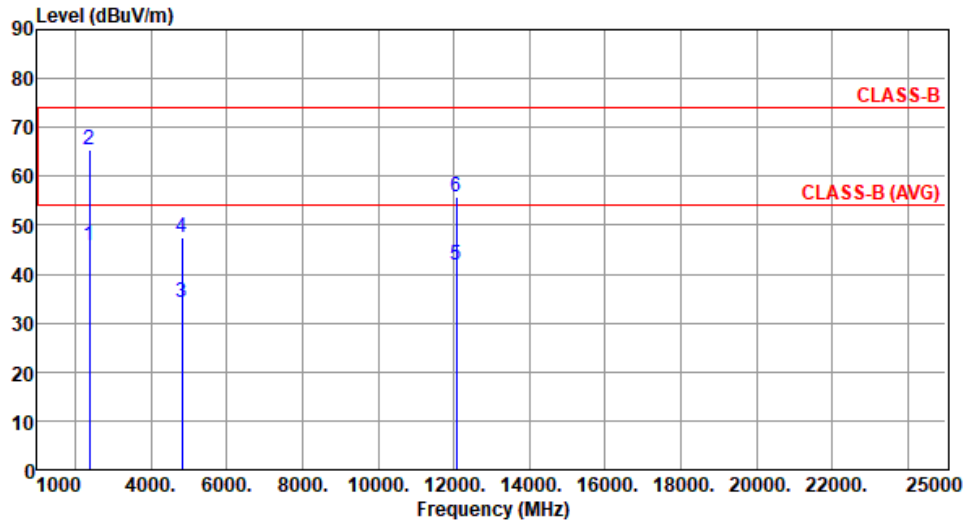
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	48.61	54.00	-5.39	52.93	-4.32	Average	115	225
2	2390.00	71.89	74.00	-2.11	76.21	-4.32	Peak	115	225
3	4824.00	38.43	54.00	-15.57	38.89	-0.46	Average	254	340
4	4824.00	51.64	74.00	-22.36	52.10	-0.46	Peak	254	340
5	12060.00	41.90	54.00	-12.10	35.68	6.22	Average	100	175
6	12060.00	55.84	74.00	-18.16	49.62	6.22	Peak	100	175

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)	2412
Polarization	Vertical		

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	45.89	54.00	-8.11	50.21	-4.32	Average	118	69
2	2390.00	65.49	74.00	-8.51	69.81	-4.32	Peak	118	69
3	4824.00	34.09	54.00	-19.91	34.55	-0.46	Average	100	79
4	4824.00	47.38	74.00	-26.62	47.84	-0.46	Peak	100	79
5	12060.00	41.79	54.00	-12.21	35.57	6.22	Average	100	202
6	12060.00	55.68	74.00	-18.32	49.46	6.22	Peak	100	202

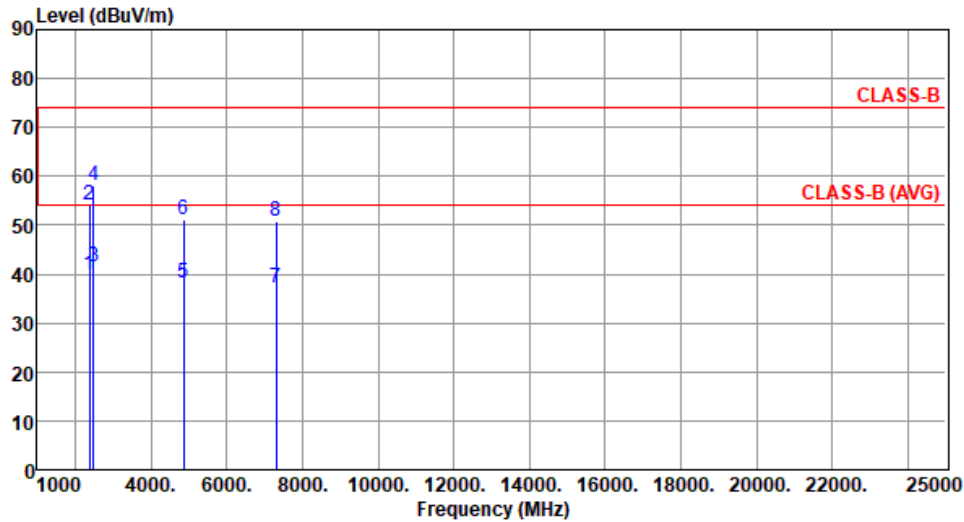
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation	ax HE20	Test Freq. (MHz)	2437
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Polarization	Horizontal
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Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	39.73	54.00	-14.27	44.05	-4.32	Average	177	191
2	2390.00	54.10	74.00	-19.90	58.42	-4.32	Peak	177	191
3	2483.50	41.60	54.00	-12.40	46.02	-4.42	Average	177	191
4	2483.50	58.05	74.00	-15.95	62.47	-4.42	Peak	177	191
5	4874.00	38.31	54.00	-15.69	38.76	-0.45	Average	253	341
6	4874.00	51.31	74.00	-22.69	51.76	-0.45	Peak	253	341
7	7311.00	37.32	54.00	-16.68	32.16	5.16	Average	100	108
8	7311.00	50.84	74.00	-23.16	45.68	5.16	Peak	100	108

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

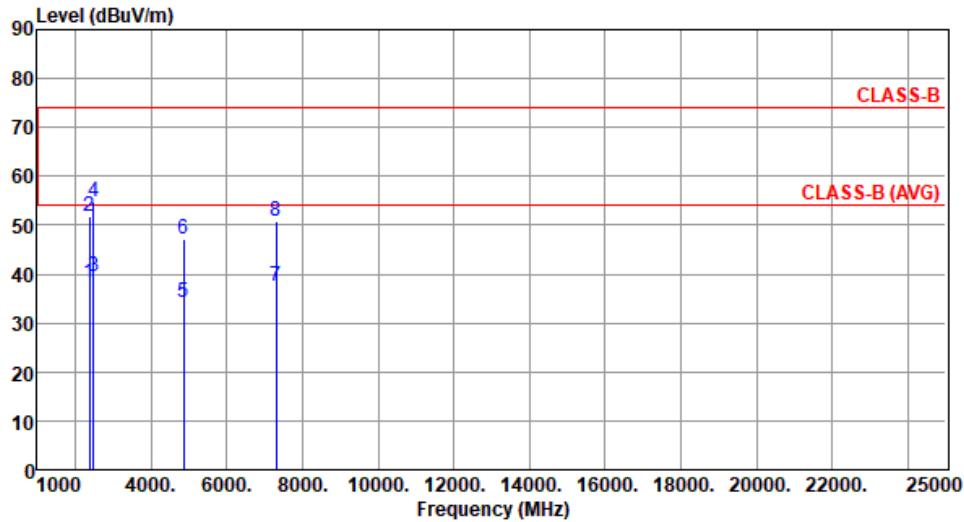
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



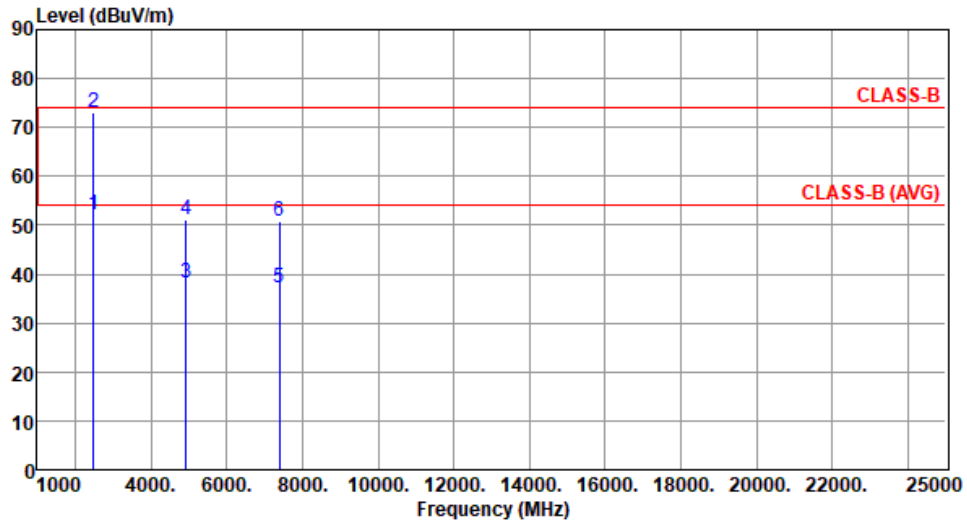
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	38.22	54.00	-15.78	42.54	-4.32	Average	118	70
2	2390.00	51.93	74.00	-22.07	56.25	-4.32	Peak	118	70
3	2483.50	39.48	54.00	-14.52	43.90	-4.42	Average	118	70
4	2483.50	54.79	74.00	-19.21	59.21	-4.42	Peak	118	70
5	4874.00	34.11	54.00	-19.89	34.56	-0.45	Average	100	98
6	4874.00	47.13	74.00	-26.87	47.58	-0.45	Peak	100	98
7	7311.00	37.42	54.00	-16.58	32.26	5.16	Average	100	204
8	7311.00	50.92	74.00	-23.08	45.76	5.16	Peak	100	204

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 : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	52.11	54.00	-1.89	56.53	-4.42	Average	134	226
2	2483.50	72.90	74.00	-1.10	77.32	-4.42	Peak	134	226
3	4924.00	38.03	54.00	-15.97	38.47	-0.44	Average	256	341
4	4924.00	51.24	74.00	-22.76	51.68	-0.44	Peak	256	341
5	7386.00	37.11	54.00	-16.89	32.08	5.03	Average	100	177
6	7386.00	50.72	74.00	-23.28	45.69	5.03	Peak	100	177

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

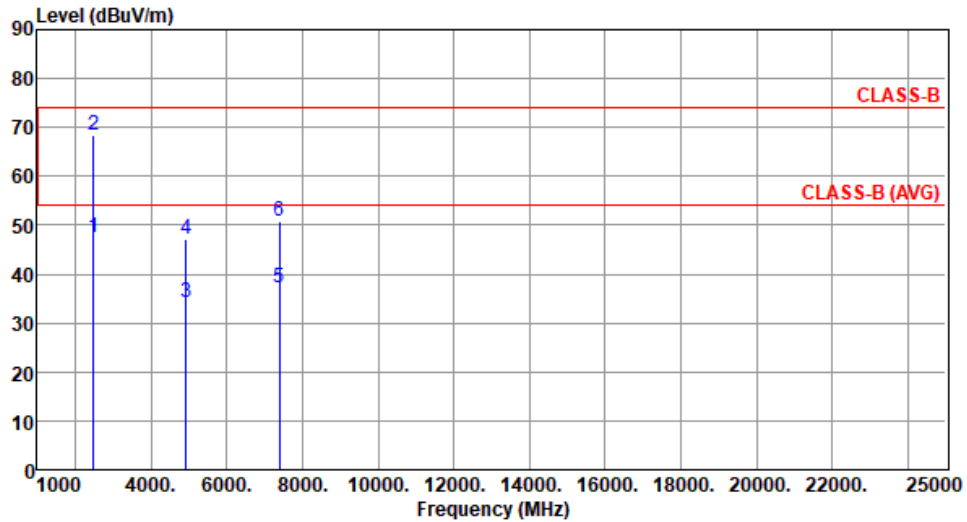
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	47.48	54.00	-6.52	51.90	-4.42	Average	116	70
2	2483.50	68.53	74.00	-5.47	72.95	-4.42	Peak	116	70
3	4924.00	34.07	54.00	-19.93	34.51	-0.44	Average	100	89
4	4924.00	47.12	74.00	-26.88	47.56	-0.44	Peak	100	89
5	7386.00	37.19	54.00	-16.81	32.16	5.03	Average	100	176
6	7386.00	50.75	74.00	-23.25	45.72	5.03	Peak	100	176

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

*Factor includes antenna factor , cable loss and amplifier gain

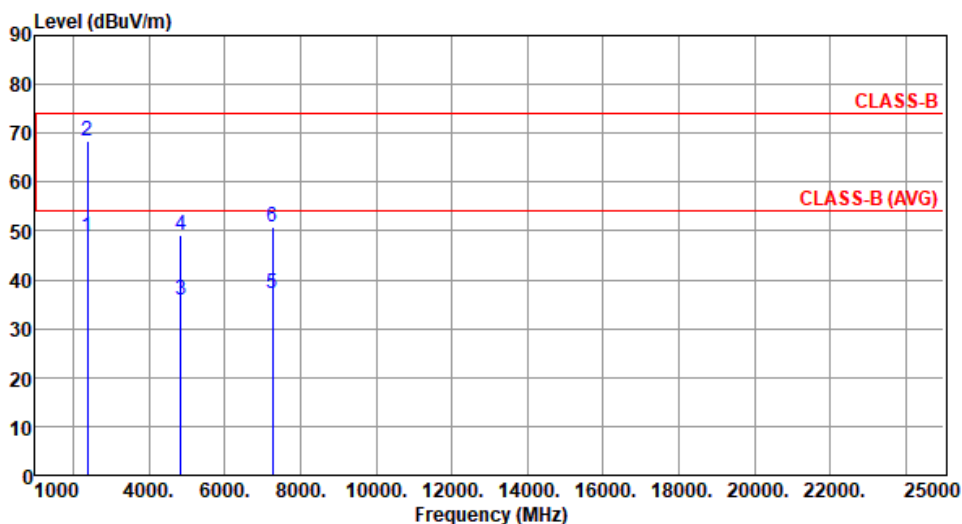
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Unwanted Emissions (Above 1GHz) for ax HE40

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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	48.69	54.00	-5.31	53.01	-4.32	Average	138	225
2	2390.00	68.45	74.00	-5.55	72.77	-4.32	Peak	138	225
3	4844.00	35.99	54.00	-18.01	36.45	-0.46	Average	250	344
4	4844.00	49.11	74.00	-24.89	49.57	-0.46	Peak	250	344
5	7266.00	37.07	54.00	-16.93	31.86	5.21	Average	100	175
6	7266.00	50.68	74.00	-23.32	45.47	5.21	Peak	100	175

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

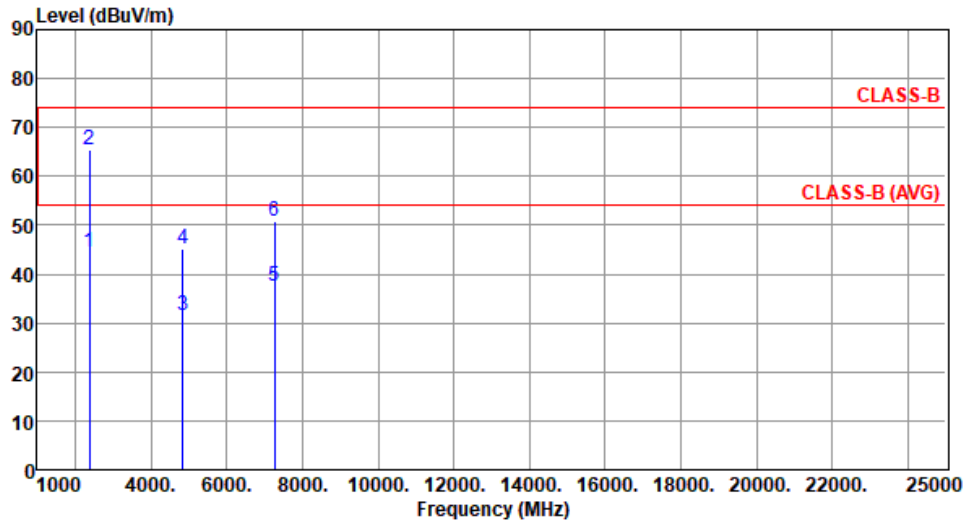
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	44.54	54.00	-9.46	48.86	-4.32	Average	118	69
2	2390.00	65.46	74.00	-8.54	69.78	-4.32	Peak	118	69
3	4844.00	31.62	54.00	-22.38	32.08	-0.46	Average	100	176
4	4844.00	45.12	74.00	-28.88	45.58	-0.46	Peak	100	176
5	7266.00	37.39	54.00	-16.61	32.18	5.21	Average	100	217
6	7266.00	50.97	74.00	-23.03	45.76	5.21	Peak	100	217

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

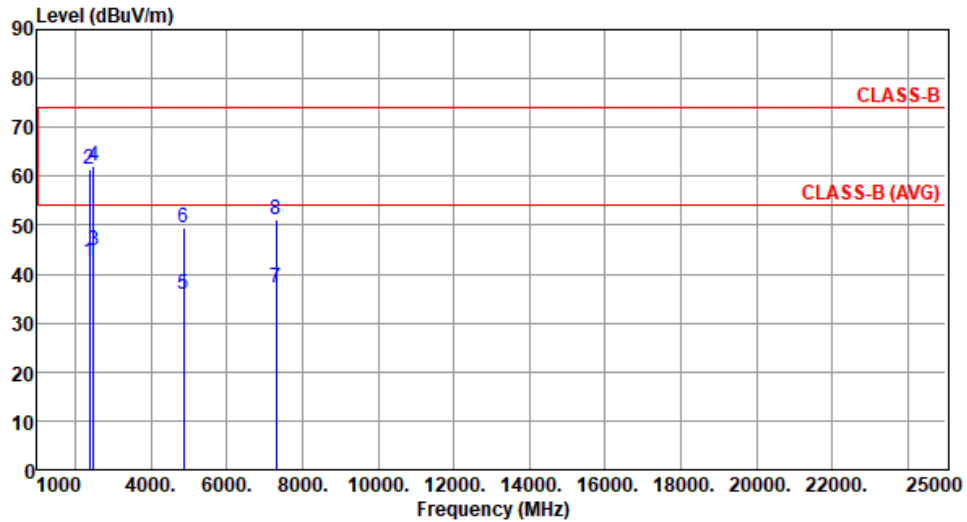
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	42.66	54.00	-11.34	46.98	-4.32	Average	192	190
2	2390.00	61.58	74.00	-12.42	65.90	-4.32	Peak	192	190
3	2483.50	44.95	54.00	-9.05	49.37	-4.42	Average	192	190
4	2483.50	62.06	74.00	-11.94	66.48	-4.42	Peak	192	190
5	4874.00	35.97	54.00	-18.03	36.42	-0.45	Average	251	334
6	4874.00	49.41	74.00	-24.59	49.86	-0.45	Peak	251	334
7	7311.00	37.10	54.00	-16.90	31.94	5.16	Average	100	206
8	7311.00	51.02	74.00	-22.98	45.86	5.16	Peak	100	206

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

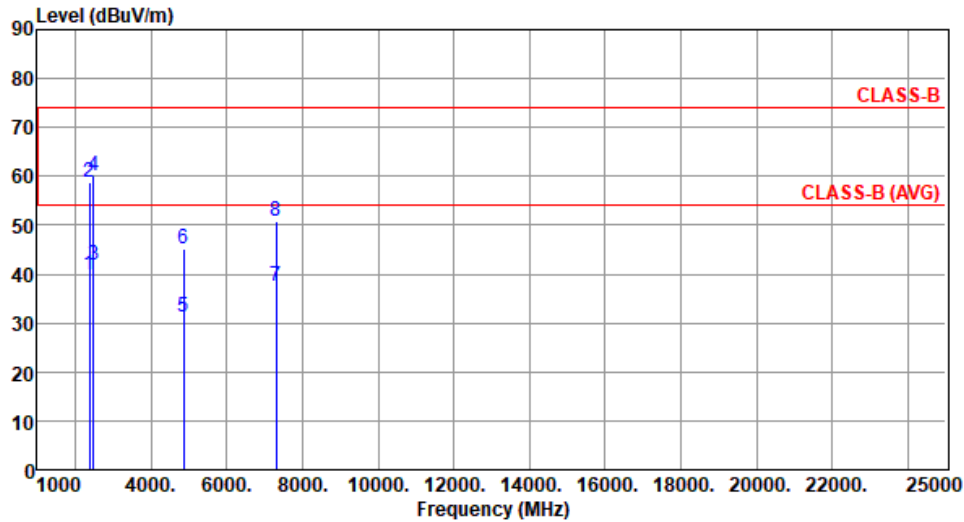
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	39.80	54.00	-14.20	44.12	-4.32	Average	116	70
2	2390.00	58.91	74.00	-15.09	63.23	-4.32	Peak	116	70
3	2483.50	41.99	54.00	-12.01	46.41	-4.42	Average	116	70
4	2483.50	60.10	74.00	-13.90	64.52	-4.42	Peak	116	70
5	4874.00	31.11	54.00	-22.89	31.56	-0.45	Average	100	147
6	4874.00	45.03	74.00	-28.97	45.48	-0.45	Peak	100	147
7	7311.00	37.42	54.00	-16.58	32.26	5.16	Average	100	102
8	7311.00	50.92	74.00	-23.08	45.76	5.16	Peak	100	102

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

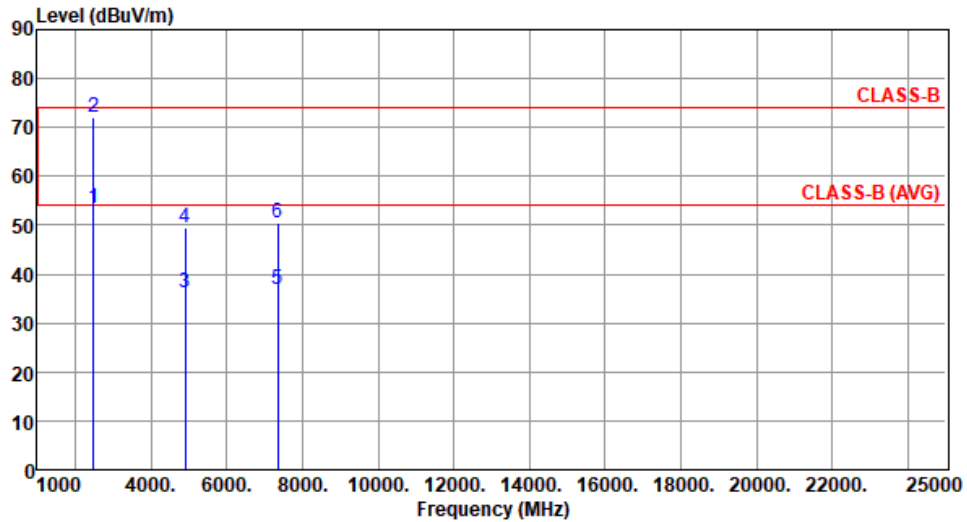
*Factor includes antenna factor , cable loss and amplifier gain

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



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

Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	53.31	54.00	-0.69	57.73	-4.42	Average	135	226
2	2483.50	72.02	74.00	-1.98	76.44	-4.42	Peak	135	226
3	4904.00	36.14	54.00	-17.86	36.59	-0.45	Average	255	340
4	4904.00	49.42	74.00	-24.58	49.87	-0.45	Peak	255	340
5	7356.00	36.89	54.00	-17.11	31.84	5.05	Average	100	208
6	7356.00	50.52	74.00	-23.48	45.47	5.05	Peak	100	208

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

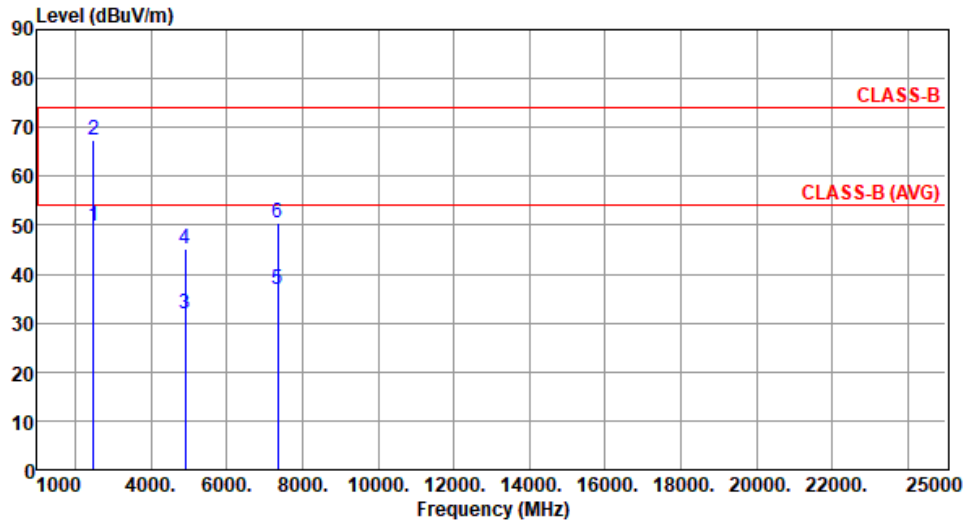
*Factor includes antenna factor , cable loss and amplifier gain

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



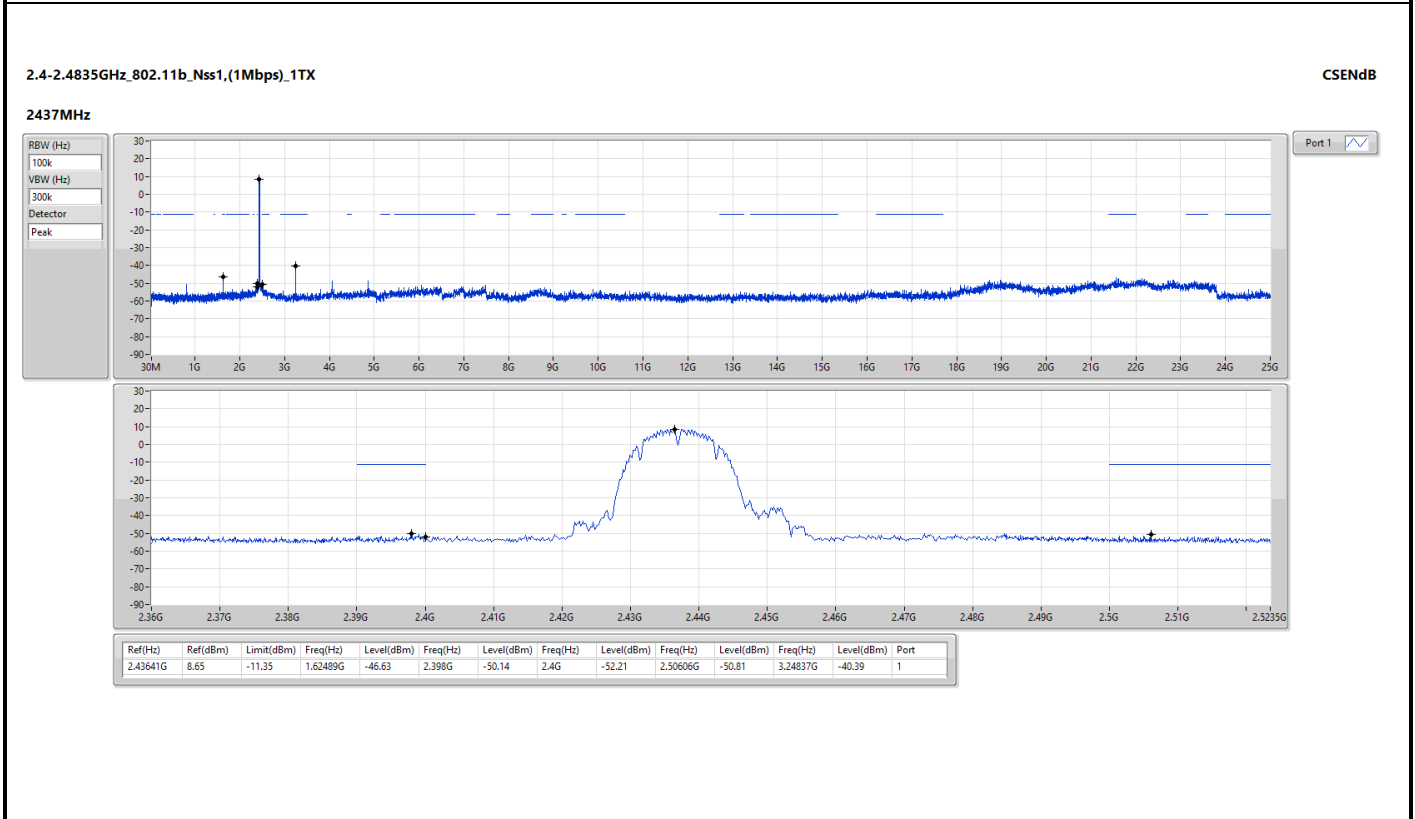
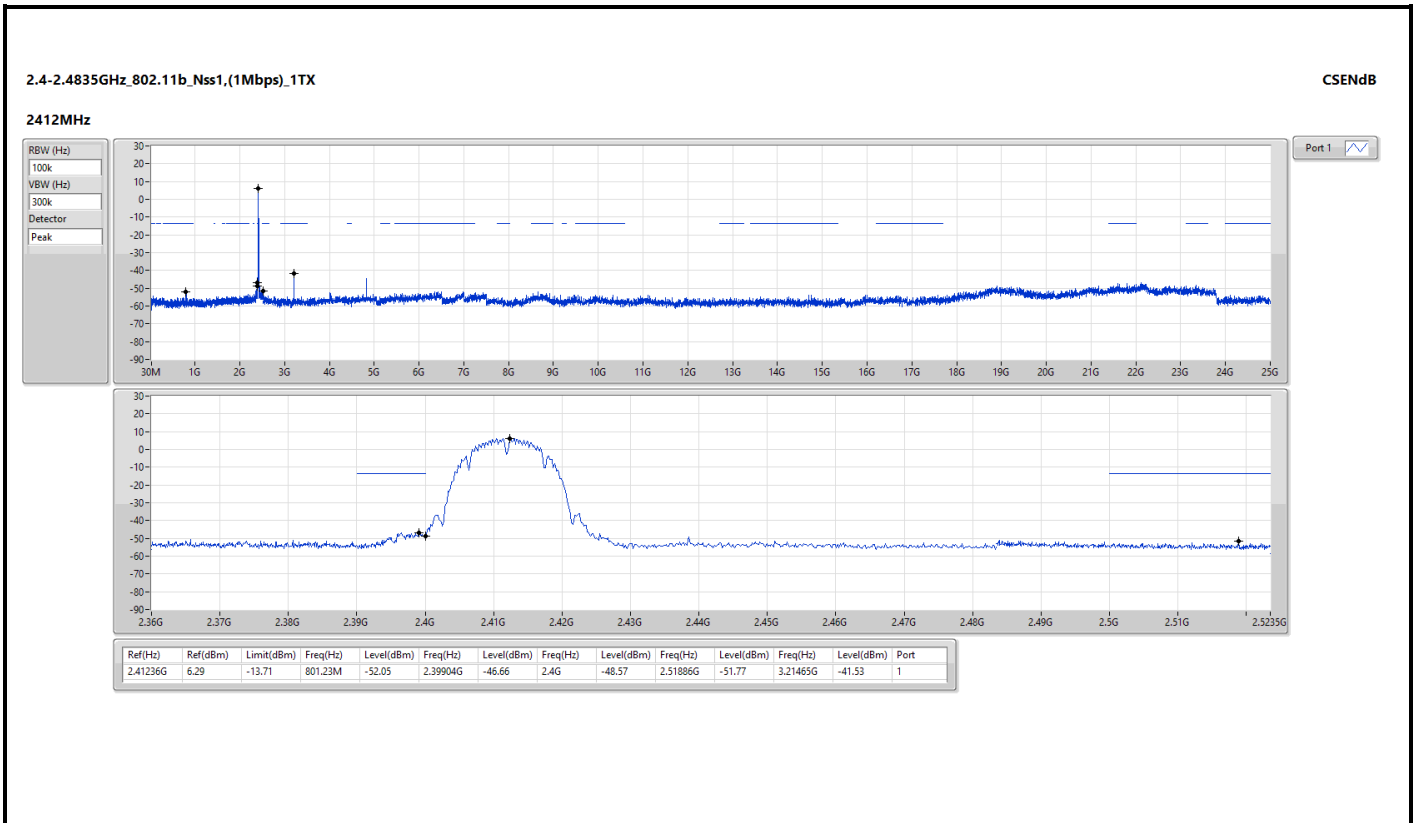
Modulation	ax HE40	Test Freq. (MHz)	2452
Polarization	Vertical		

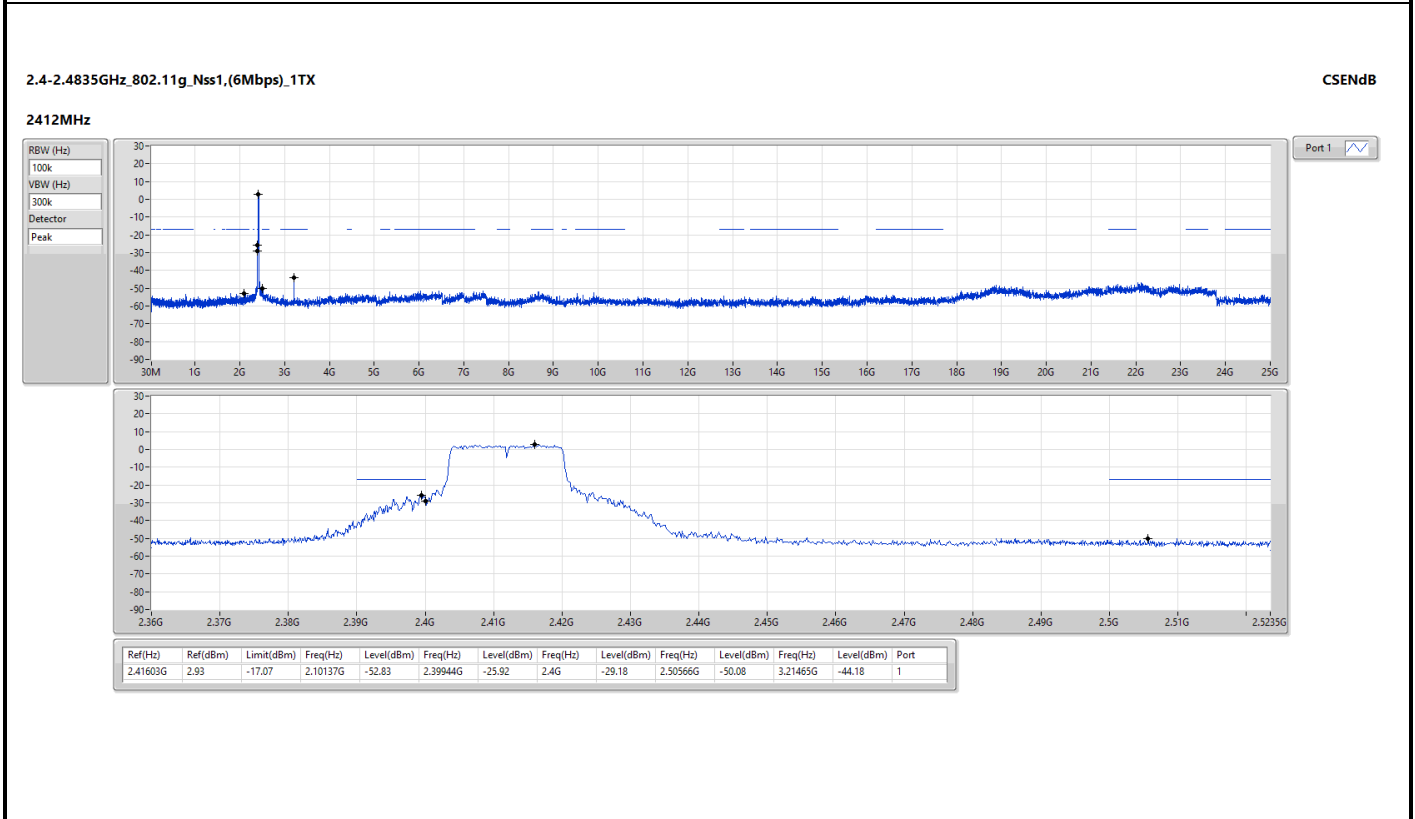
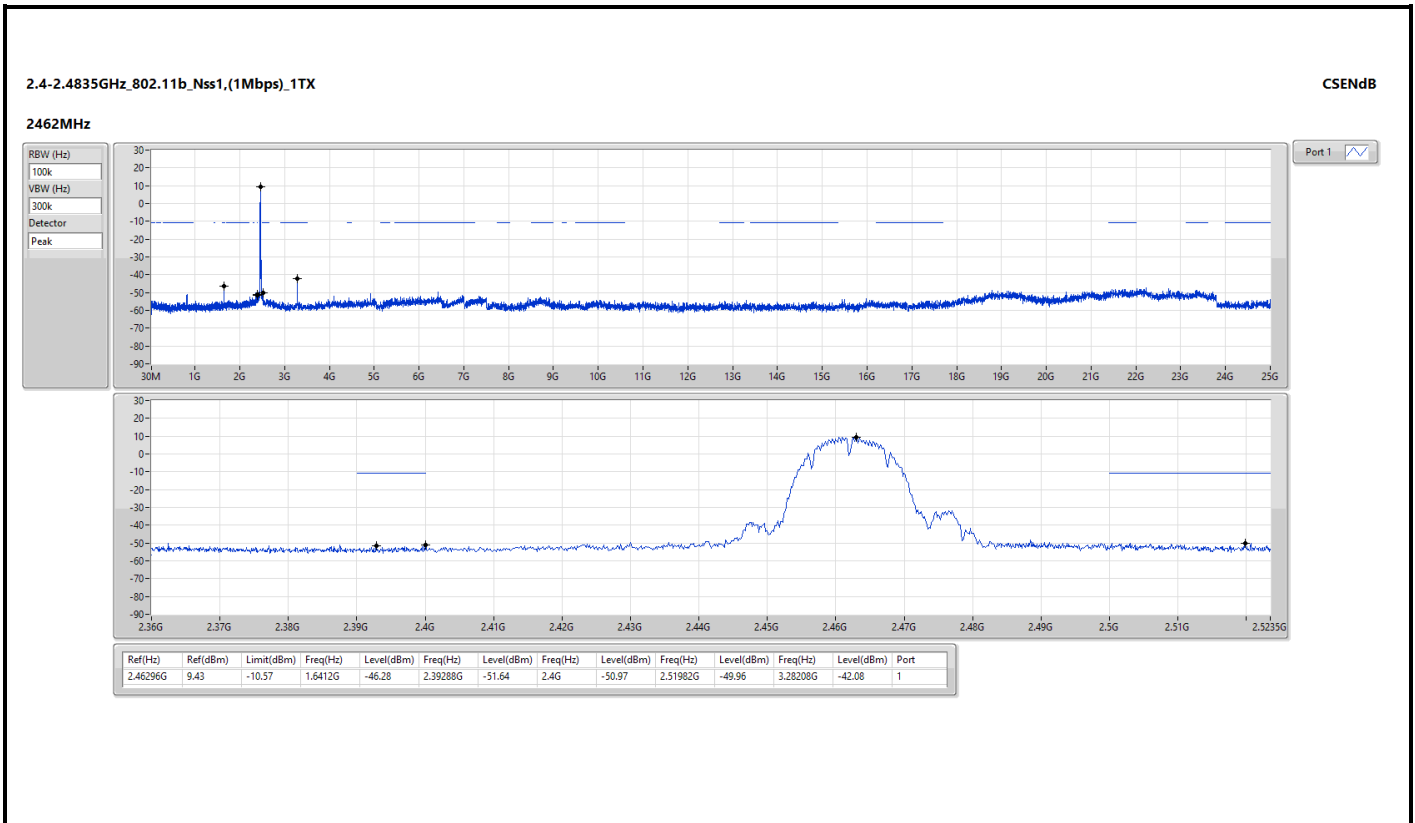
Test By : Sean Yu Temperature(°C): 24 Humidity(%): 62



	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	2483.50	49.71	54.00	-4.29	54.13	-4.42	Average	119	70
2	2483.50	67.37	74.00	-6.63	71.79	-4.42	Peak	119	70
3	4904.00	32.02	54.00	-21.98	32.47	-0.45	Average	100	77
4	4904.00	45.20	74.00	-28.80	45.65	-0.45	Peak	100	77
5	7356.00	36.91	54.00	-17.09	31.86	5.05	Average	100	147
6	7356.00	50.59	74.00	-23.41	45.54	5.05	Peak	100	147

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).



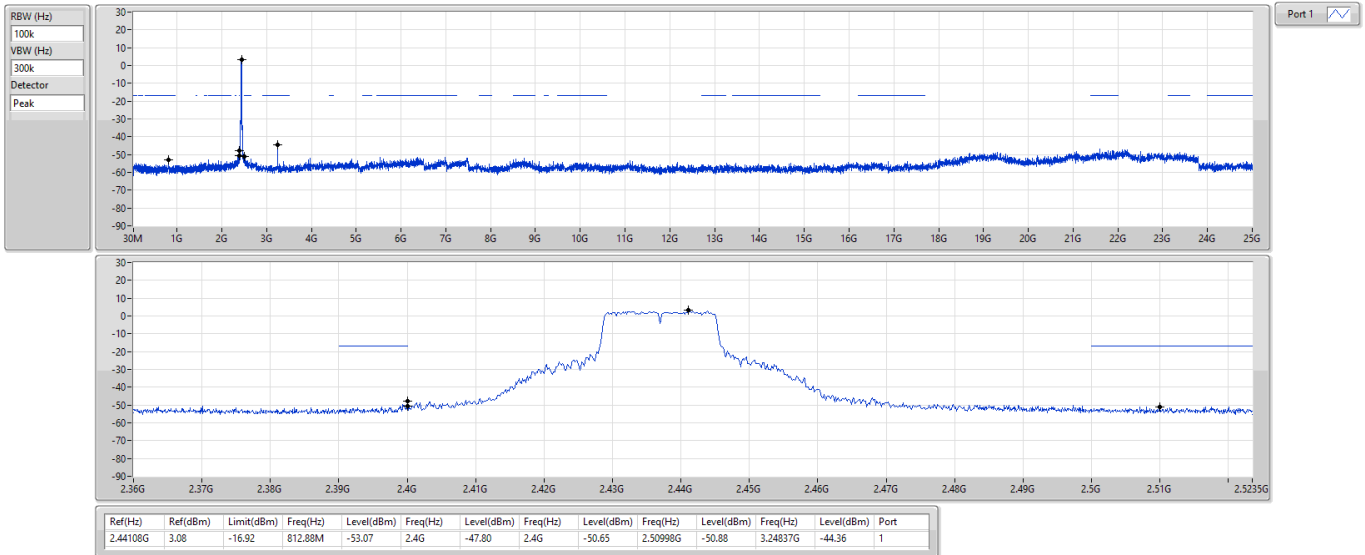




2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_1TX

CSEndB

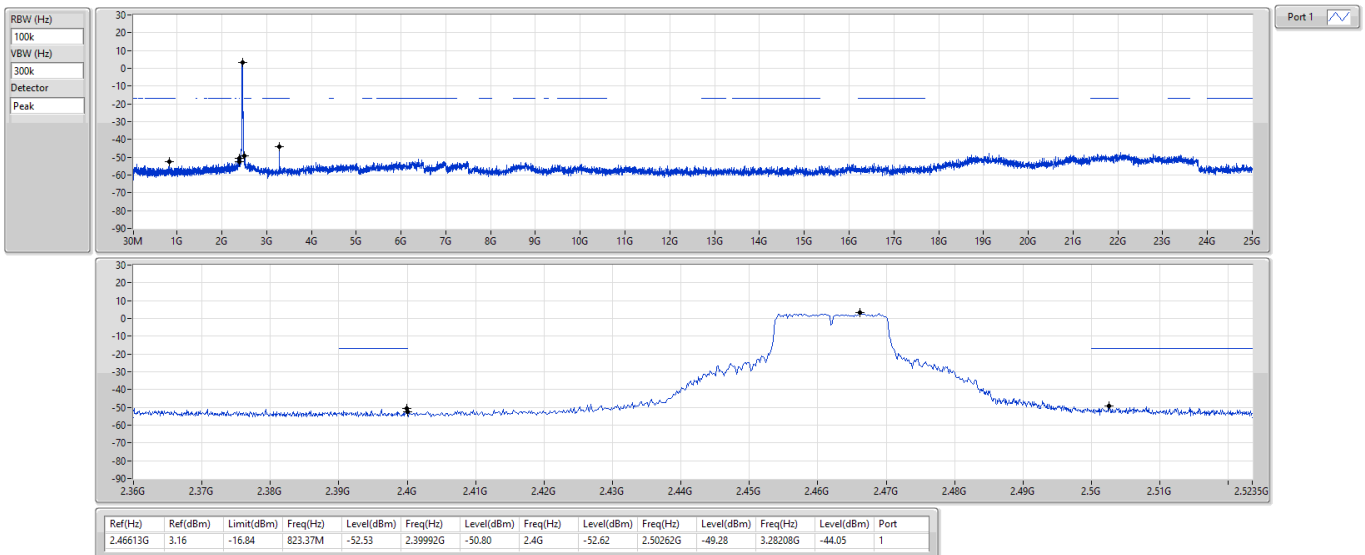
2437MHz



2.4-2.4835GHz_802.11g_Nss1,(6Mbps)_1TX

CSEndB

2462MHz

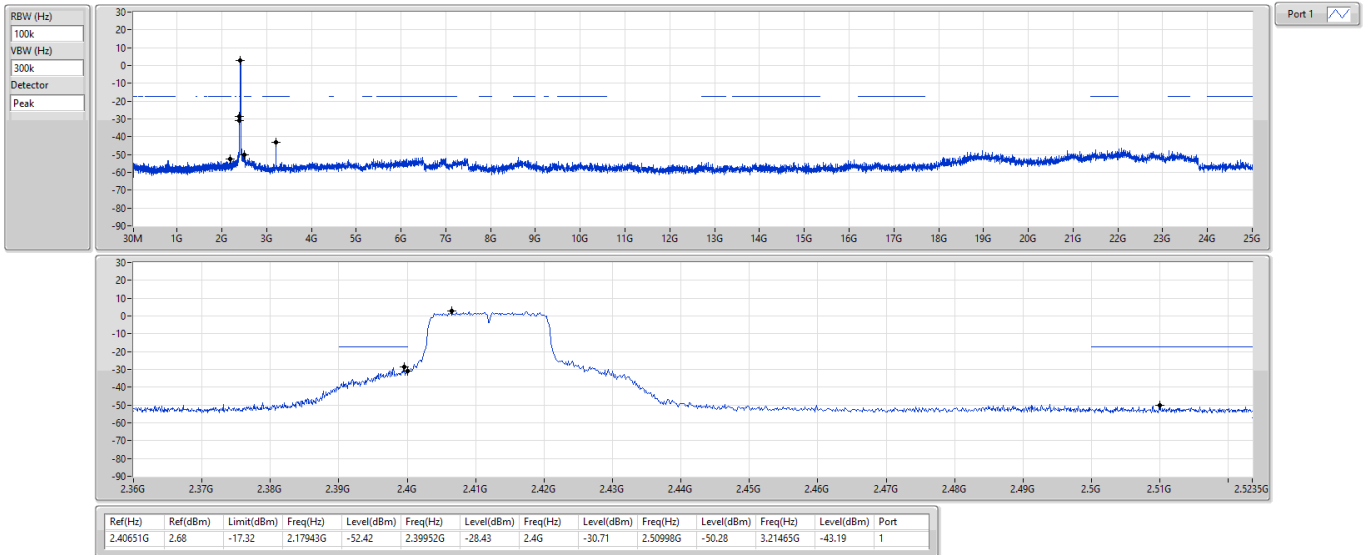




2.4-2.4835GHz_802.11n HT20_Nss1,(MCS0)_1TX

CSEndB

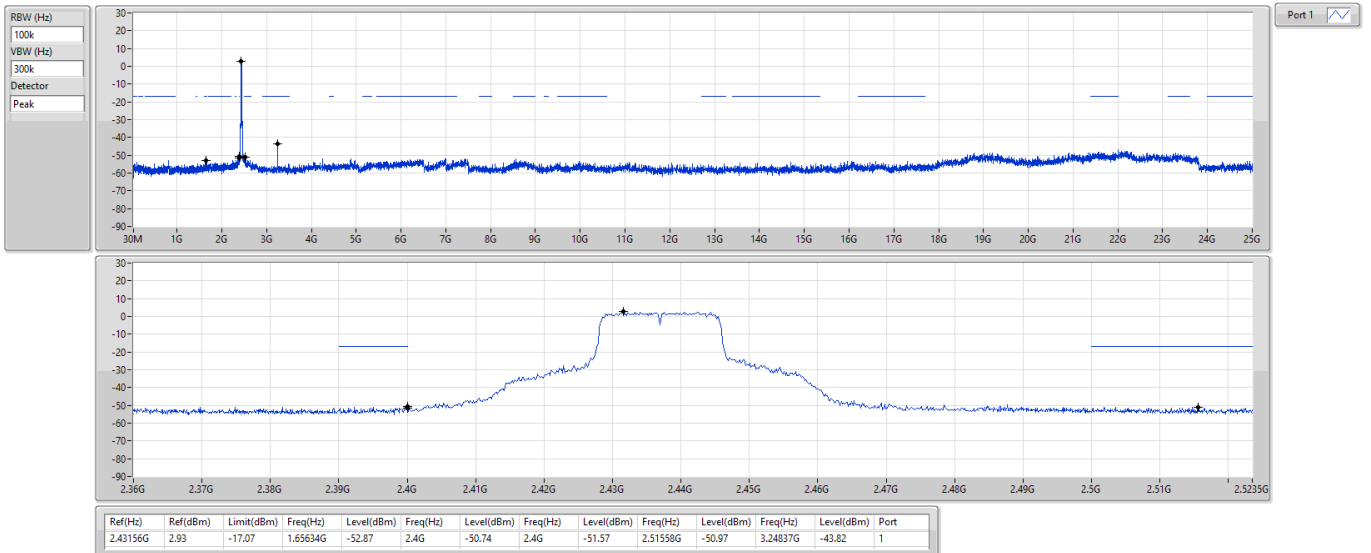
2412MHz

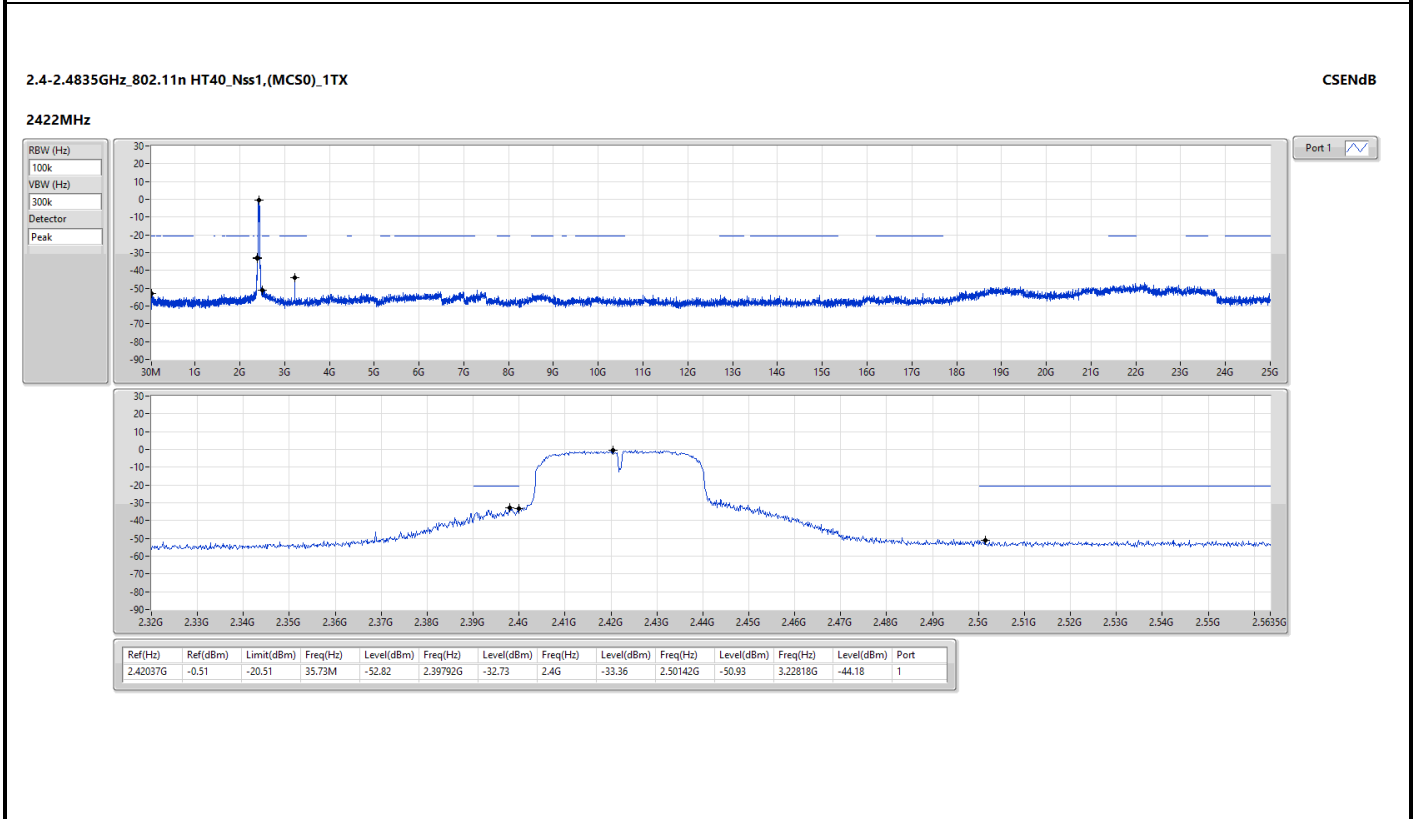
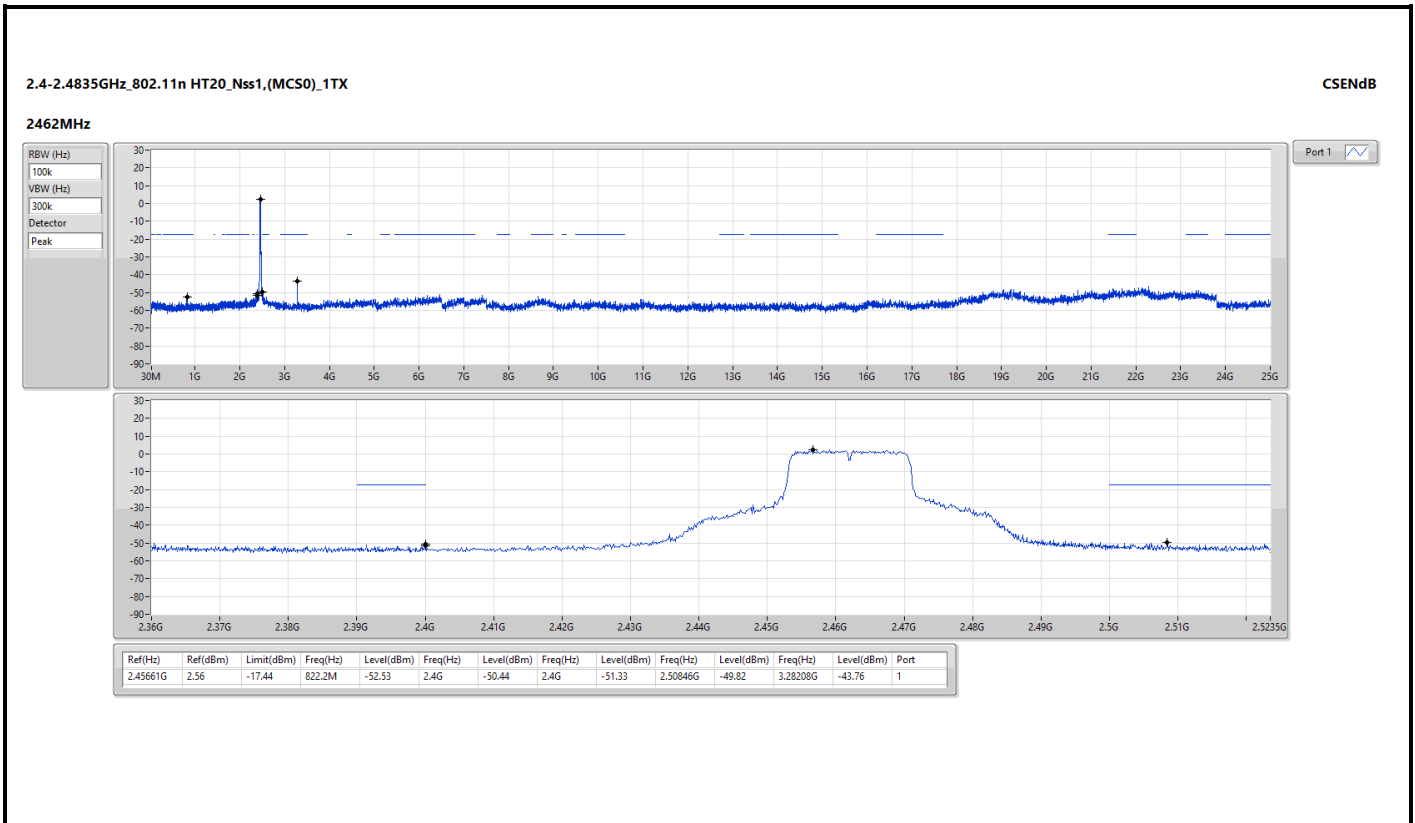


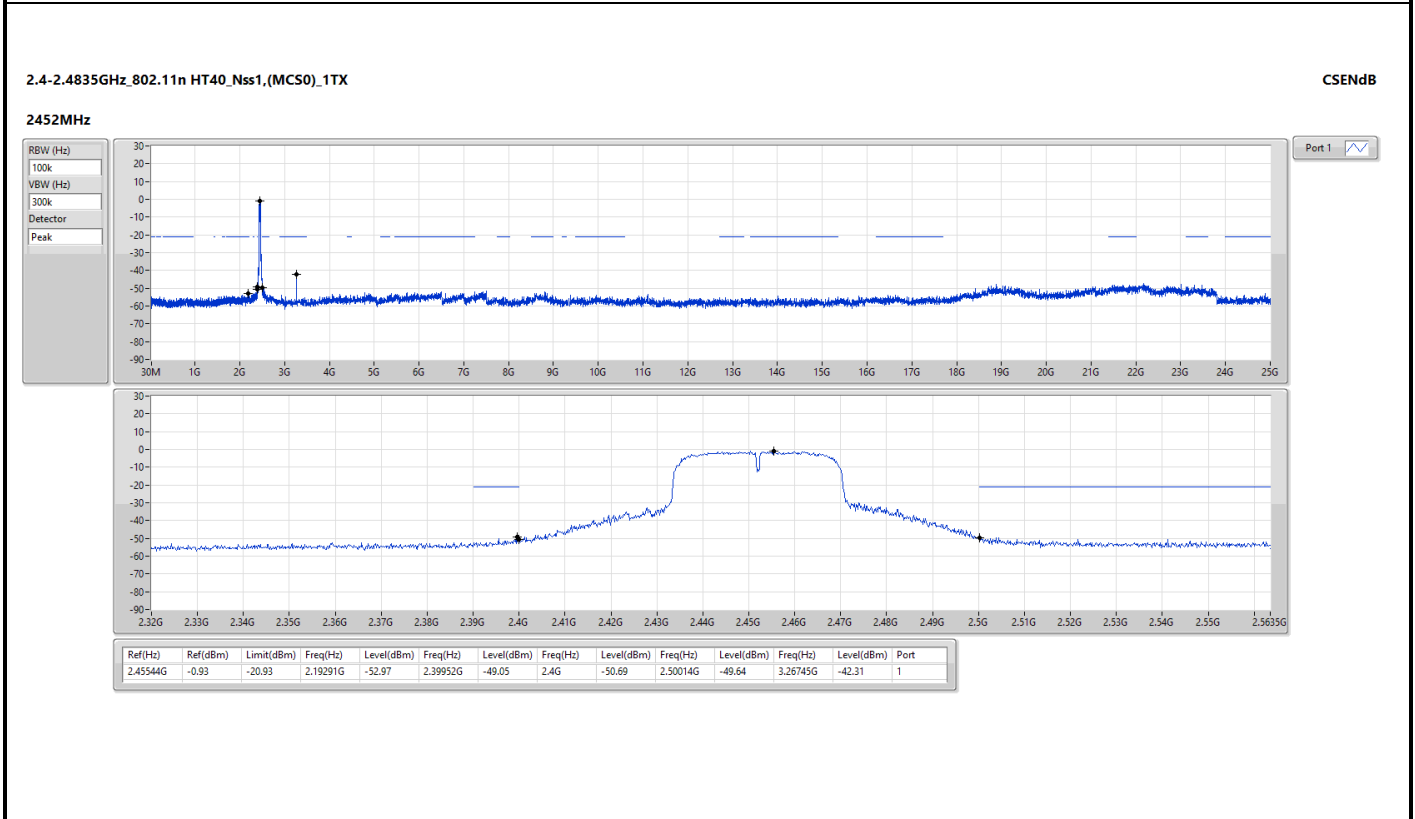
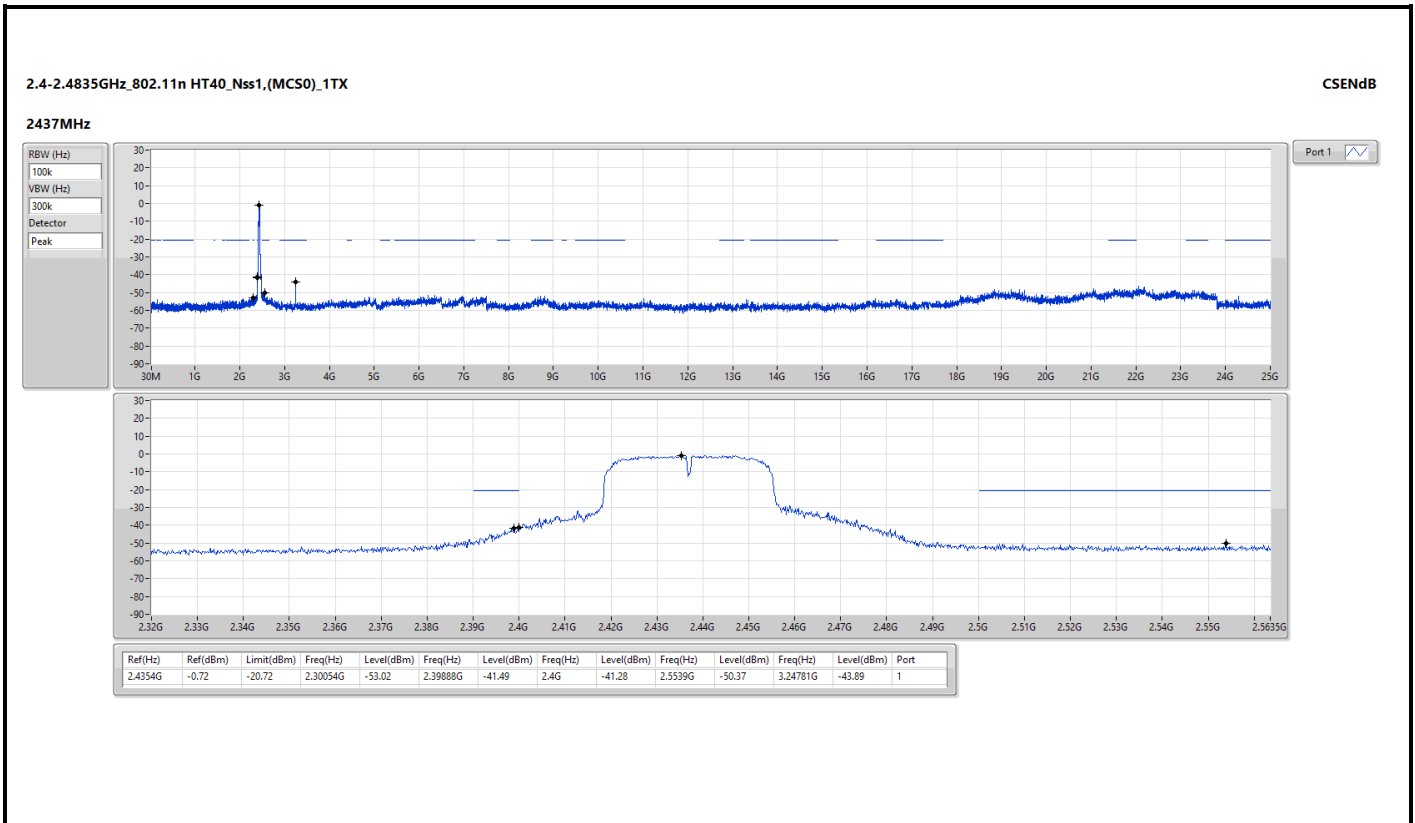
2.4-2.4835GHz_802.11n HT20_Nss1,(MCS0)_1TX

CSEndB

2437MHz



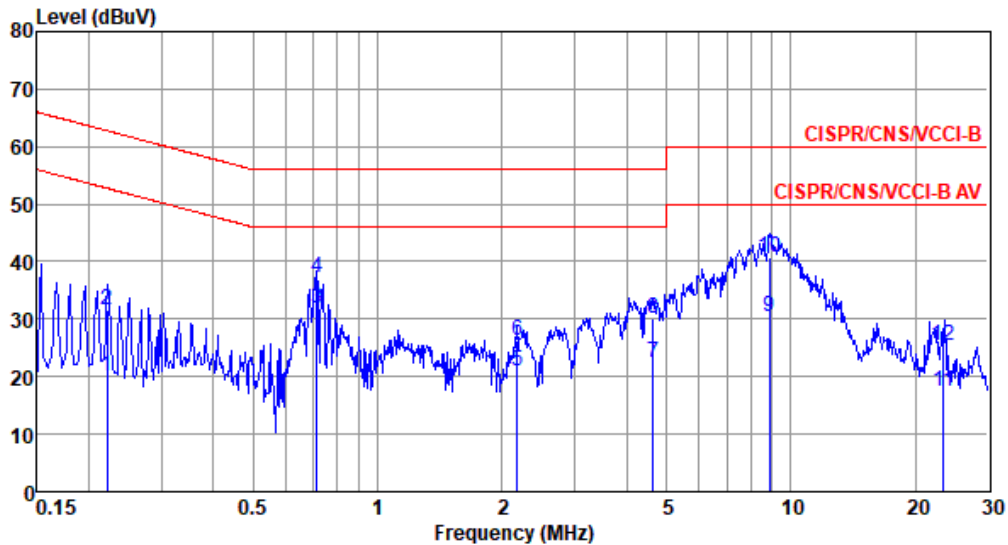






Modulation Mode	11g	Test Freq. (MHz)	2462
Power Phase	Line		

Test by : Joe Liao Temperature: 23°C Humidity: 61%



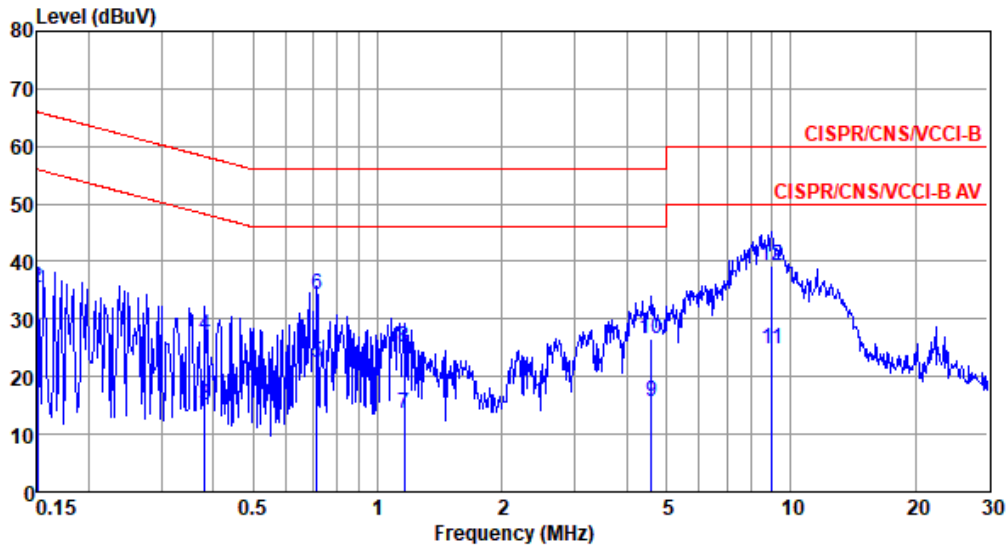
	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.222	19.93	52.74	-32.81	9.99	9.62	0.06	0.26	Average
2	0.222	31.47	62.74	-31.27	21.53	9.62	0.06	0.26	QP
3*	0.712	31.82	46.00	-14.18	21.75	9.63	0.09	0.35	Average
4	0.712	37.20	56.00	-18.80	27.13	9.63	0.09	0.35	QP
5	2.178	20.95	46.00	-25.05	10.82	9.63	0.12	0.38	Average
6	2.178	26.21	56.00	-29.79	16.08	9.63	0.12	0.38	QP
7	4.647	22.39	46.00	-23.61	12.10	9.66	0.21	0.42	Average
8	4.647	29.97	56.00	-26.03	19.68	9.66	0.21	0.42	QP
9	8.869	30.38	50.00	-19.62	19.93	9.68	0.33	0.44	Average
10	8.869	40.64	60.00	-19.36	30.19	9.68	0.33	0.44	QP
11	23.468	17.28	50.00	-32.72	6.43	9.66	0.53	0.66	Average
12	23.468	25.26	60.00	-34.74	14.41	9.66	0.53	0.66	QP

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



Modulation Mode	11g	Test Freq. (MHz)	2462
Power Phase	Neutral		

Test by : Joe Liao Temperature: 23°C Humidity: 61%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.150	18.03	56.00	-37.97	8.20	9.63	0.08	0.12	Average
2	0.150	35.44	66.00	-30.56	25.61	9.63	0.08	0.12	QP
3	0.381	15.14	48.25	-33.11	5.20	9.62	0.08	0.24	Average
4	0.381	27.03	58.25	-31.22	17.09	9.62	0.08	0.24	QP
5	0.712	22.44	46.00	-23.56	12.44	9.63	0.09	0.28	Average
6	0.712	34.24	56.00	-21.76	24.24	9.63	0.09	0.28	QP
7	1.160	13.44	46.00	-32.56	3.41	9.63	0.09	0.31	Average
8	1.160	25.04	56.00	-30.96	15.01	9.63	0.09	0.31	QP
9	4.598	15.58	46.00	-30.42	5.31	9.66	0.21	0.40	Average
10	4.598	26.71	56.00	-29.29	16.44	9.66	0.21	0.40	QP
11	9.011	24.91	50.00	-25.09	14.46	9.70	0.33	0.42	Average
12*	9.011	39.29	60.00	-20.71	28.84	9.70	0.33	0.42	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).