FCC Test Report

FCC ID	:	**SWX-AF60**
Equipment	:	**airFiber 60**
Model No.	:	**AF60**
Brand Name	:	**UBIQUITI**
Applicant	:	**Ubiquiti Inc.**
Address	:	**685 Third Avenue, 27th Floor New York, New York 10017 USA**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Aug. 01, 2019**
Tested Date	:	**Aug. 14, 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: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR981302AC	Rev. 01	Initial issue	Aug. 20, 2019
FR981302AC	Rev. 02	Revised applicant name	Sep. 05, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.180MHz 58.48 (Margin -6.02dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 38.66MHz 39.05 (Margin -0.95dB) - QP	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 21.59	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]	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: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation. Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	internal antenna	2	---	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	24Vdc from POE

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	POE	Brand: UBIQUITI Model: GP-A240-050G Power Rating: I/P: 100-240Vac, 50/60Hz 0.3A O/P: 24Vdc, 0.5A Power Line: 0.6m non-shielded without core

1.1.5 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	---	---

1.1.6 Test Tool and Duty Cycle

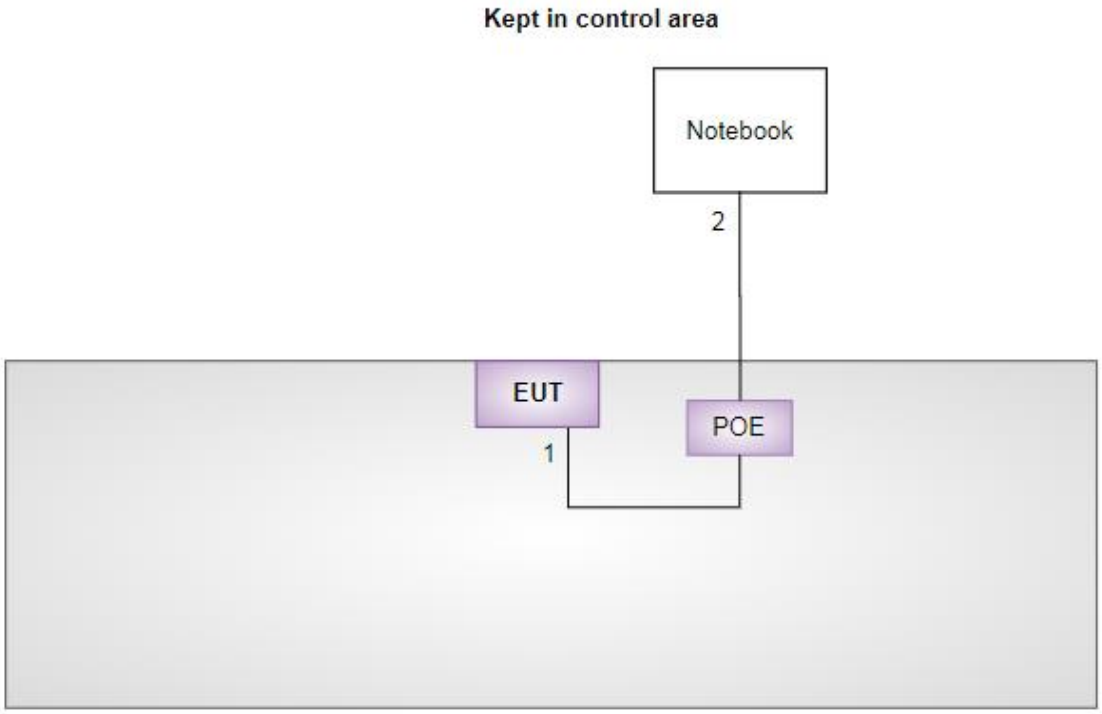
Test Tool	Putty, Version: V0.60.0		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	100.00%	0.00
	11g	96.63%	0.15
	HT20	98.98%	0.04
	HT40	96.91%	0.14

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	Notebook	DELL	Latitude E6440	DoC	---

1.3 Test Setup Chart

Test Setup Diagram



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

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Jan. 08, 2019	Jan. 07, 2020
LISN	R&S	ENV216	101579	Mar. 08, 2019	Mar. 07, 2020
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)				
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. 24, 2018	Aug. 23, 2019
Preamplifier	Agilent	83017A	MY53270013	Dec. 27, 2018	Dec. 26, 2019
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-800	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	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
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
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 25, 2018	Oct. 24, 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

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

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 64%	Alex Tsai
Radiated Emissions	03CH03-WS	24°C / 65%	Akun Chung
RF Conducted	TH01-WS	24°C / 68%	Akun Chung

- 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	Test Configuration
Conducted Emissions	11b	2462	1 Mbps	---
Radiated Emissions ≤1GHz	11b	2462	1 Mbps	---
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	11b 11g HT20 HT40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	---

3 Transmitter Test Results

3.1 Conducted Emissions

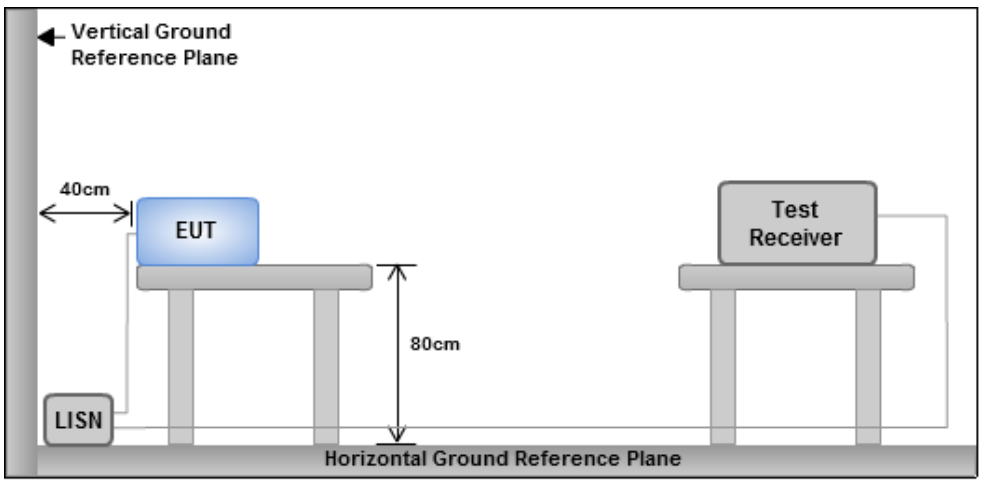
3.1.1 Limit of Conducted Emissions

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

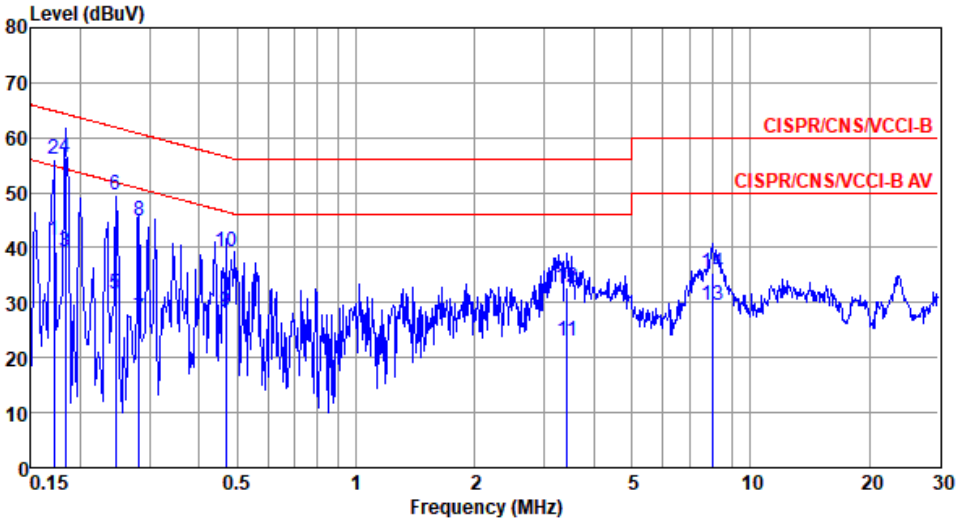


Note: 1. Support units were connected to second LISN.

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

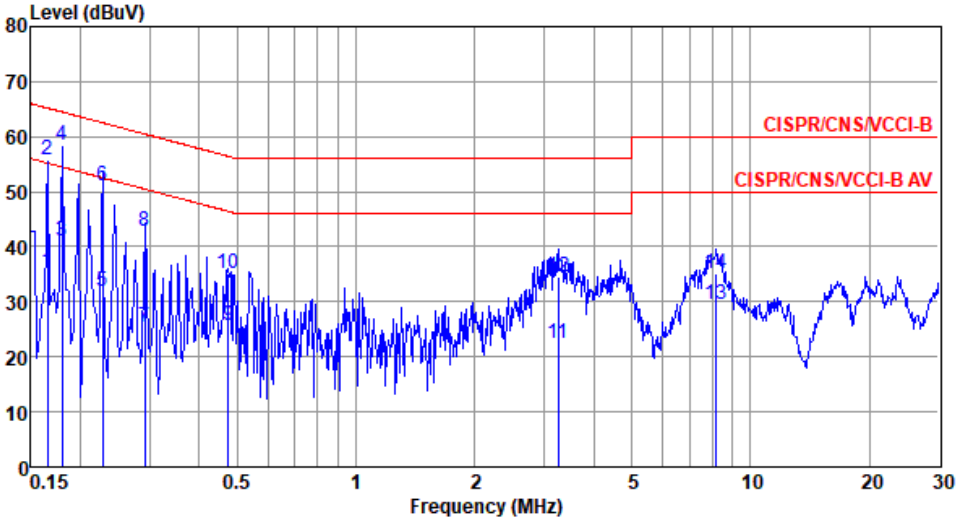
Modulation	11b	Test Freq. (MHz)	2462
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.171	41.23	54.90	-13.67	31.64	9.53	0.06	Average
2	0.171	56.23	64.90	-8.67	46.64	9.53	0.06	QP
3	0.183	39.32	54.33	-15.01	29.72	9.54	0.06	Average
4*	0.183	56.31	64.33	-8.02	46.71	9.54	0.06	QP
5	0.246	31.46	51.91	-20.45	21.84	9.55	0.07	Average
6	0.246	49.67	61.91	-12.24	40.05	9.55	0.07	QP
7	0.282	27.23	50.76	-23.53	17.59	9.56	0.08	Average
8	0.282	44.85	60.76	-15.91	35.21	9.56	0.08	QP
9	0.469	28.30	46.54	-18.24	18.64	9.58	0.08	Average
10	0.469	39.13	56.54	-17.41	29.47	9.58	0.08	QP
11	3.436	22.95	46.00	-23.05	13.09	9.61	0.25	Average
12	3.436	32.85	56.00	-23.15	22.99	9.61	0.25	QP
13	8.020	29.44	50.00	-20.56	19.40	9.64	0.40	Average
14	8.020	35.37	60.00	-24.63	25.33	9.64	0.40	QP

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

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



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.165	35.33	55.21	-19.88	25.70	9.57	0.06	Average
2	0.165	55.91	65.21	-9.30	46.28	9.57	0.06	QP
3	0.180	40.91	54.50	-13.59	31.27	9.58	0.06	Average
4*	0.180	58.48	64.50	-6.02	48.84	9.58	0.06	QP
5	0.228	31.86	52.52	-20.66	22.20	9.59	0.07	Average
6	0.228	51.21	62.52	-11.31	41.55	9.59	0.07	QP
7	0.291	25.36	50.50	-25.14	15.68	9.60	0.08	Average
8	0.291	42.70	60.50	-17.80	33.02	9.60	0.08	QP
9	0.474	25.64	46.45	-20.81	15.94	9.62	0.08	Average
10	0.474	35.02	56.45	-21.43	25.32	9.62	0.08	QP
11	3.258	22.38	46.00	-23.62	12.48	9.66	0.24	Average
12	3.258	34.67	56.00	-21.33	24.77	9.66	0.24	QP
13	8.192	29.41	50.00	-20.59	19.31	9.70	0.40	Average
14	8.192	35.02	60.00	-24.98	24.92	9.70	0.40	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

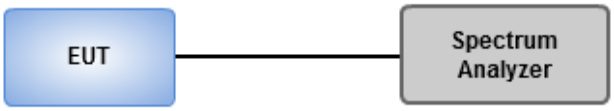
6dB Bandwidth

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)_1TX	8.116M	14.399M	14M4G1D	8.116M	14.255M
802.11g_Nss1,(6Mbps)_1TX	16.377M	22.576M	22M6D1D	16.377M	16.425M
802.11n HT20_Nss1,(MCS0)_1TX	17.536M	23.3M	23M3D1D	17.536M	17.583M
802.11n HT40_Nss1,(MCS0)_1TX	35.362M	36.179M	36M2D1D	33.913M	35.89M

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;

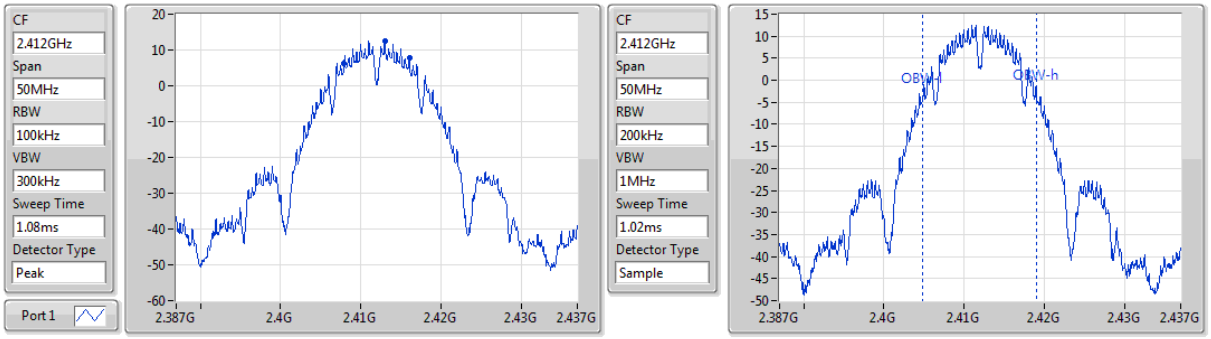
Result

Mode	Result	Limit (Hz)	N dB (Hz)	OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	8.116M	14.255M
2437MHz	Pass	500k	8.116M	14.255M
2462MHz	Pass	500k	8.116M	14.399M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.377M	16.425M
2437MHz	Pass	500k	16.377M	22.576M
2462MHz	Pass	500k	16.377M	16.425M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	17.536M	17.656M
2437MHz	Pass	500k	17.536M	23.3M
2462MHz	Pass	500k	17.536M	17.583M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	500k	35.072M	35.89M
2437MHz	Pass	500k	35.362M	36.179M
2452MHz	Pass	500k	33.913M	35.89M

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

802.11b_Nss1,(1Mbps)_1TX EBW

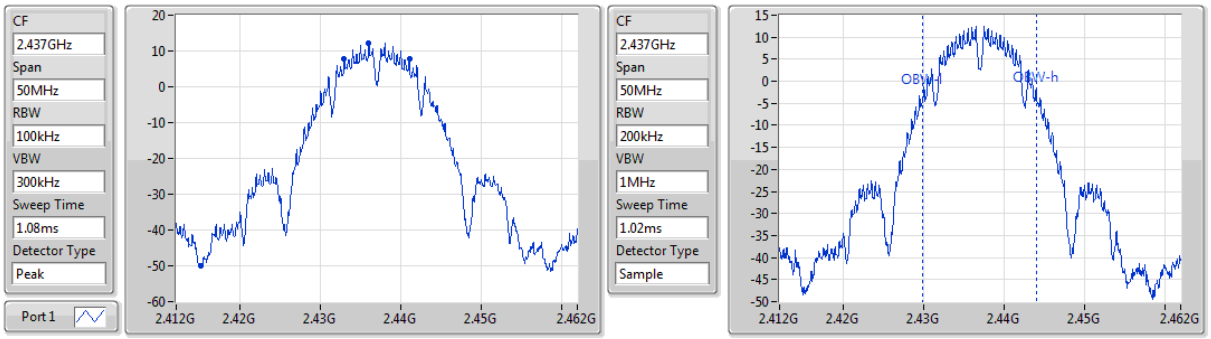
2412MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.116M	2.407942G	2.416058G	14.255M	2.404836G	2.419091G	500k	1

802.11b_Nss1,(1Mbps)_1TX EBW

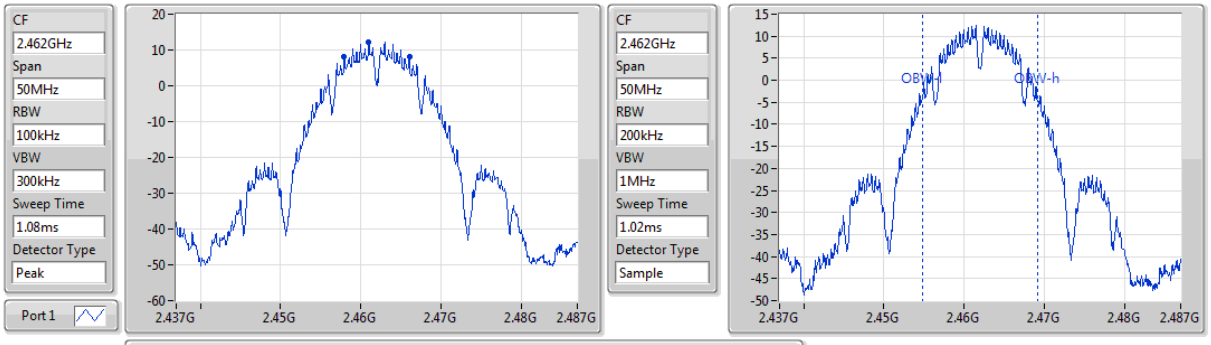
2437MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.116M	2.432942G	2.441058G	14.255M	2.429836G	2.444091G	500k	1

802.11b_Nss1,(1Mbps)_1TX EBW

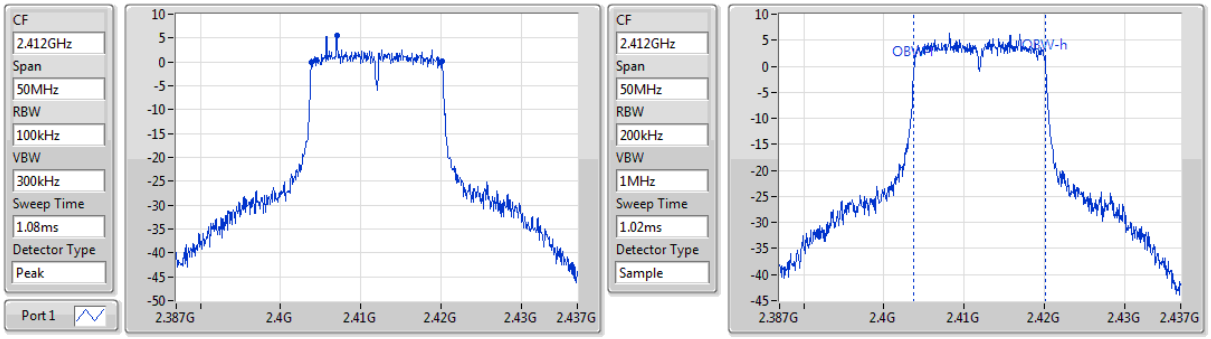
2462MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.116M	2.457942G	2.466058G	14.399M	2.454764G	2.469164G	500k	1

802.11g_Nss1,(6Mbps)_1TX EBW

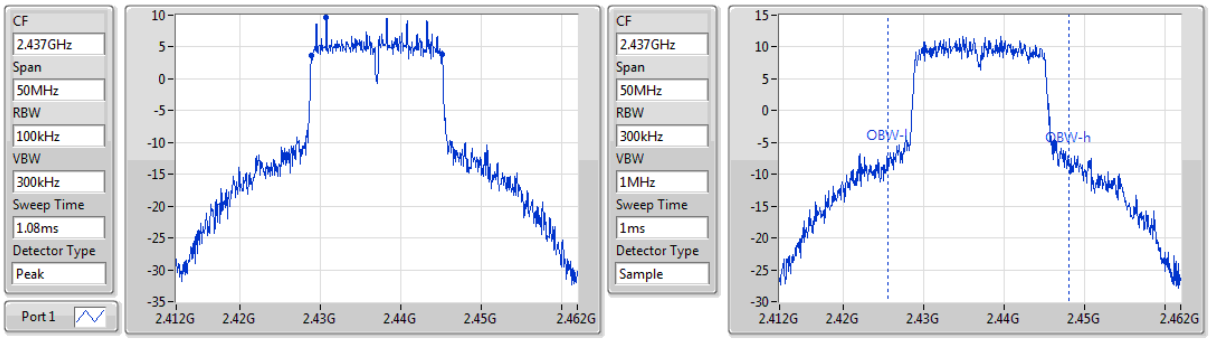
2412MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.403812G	2.420188G	16.425M	2.403751G	2.420177G	500k	1

802.11g_Nss1,(6Mbps)_1TX EBW

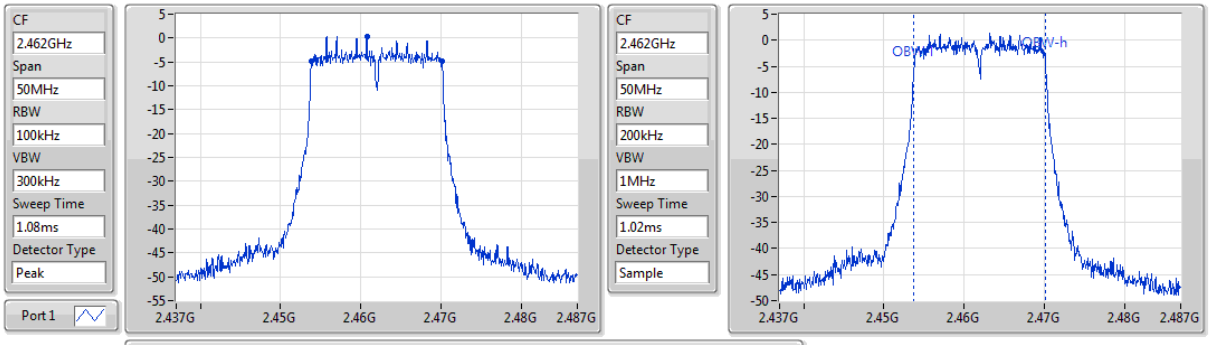
2437MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.428812G	2.445188G	22.576M	2.425495G	2.448071G	500k	1

802.11g_Nss1,(6Mbps)_1TX EBW

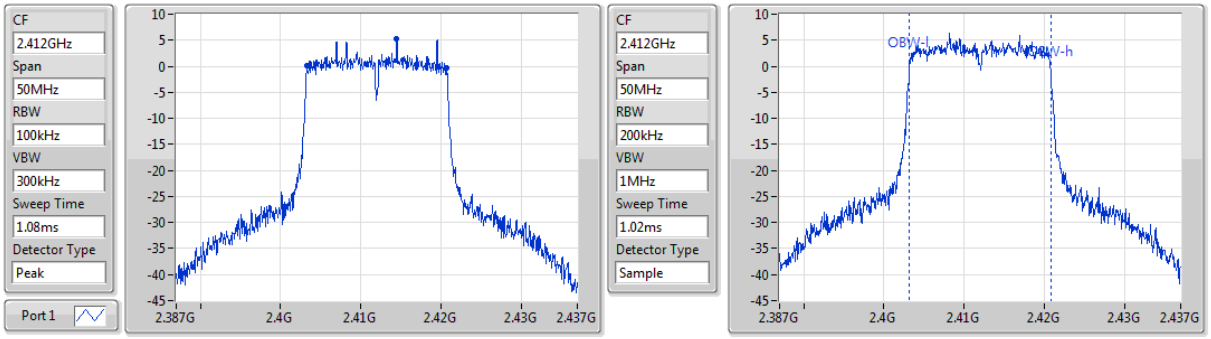
2462MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.453812G	2.470188G	16.425M	2.453751G	2.470177G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX EBW

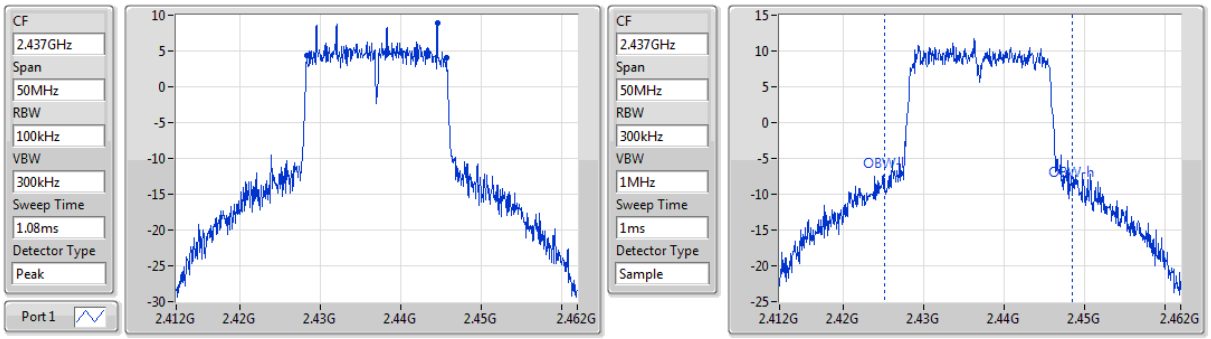
2412MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.536M	2.403232G	2.420768G	17.656M	2.403172G	2.420828G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX EBW

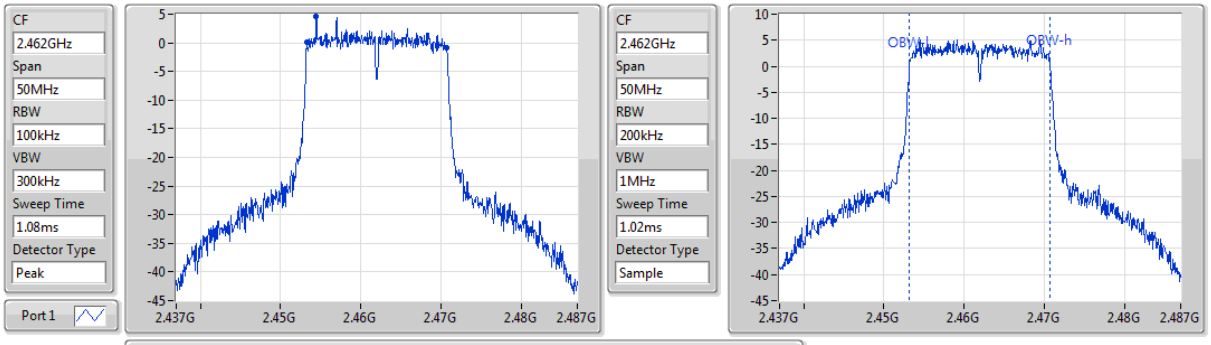
2437MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.536M	2.428232G	2.445768G	23.3M	2.425133G	2.448433G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX EBW

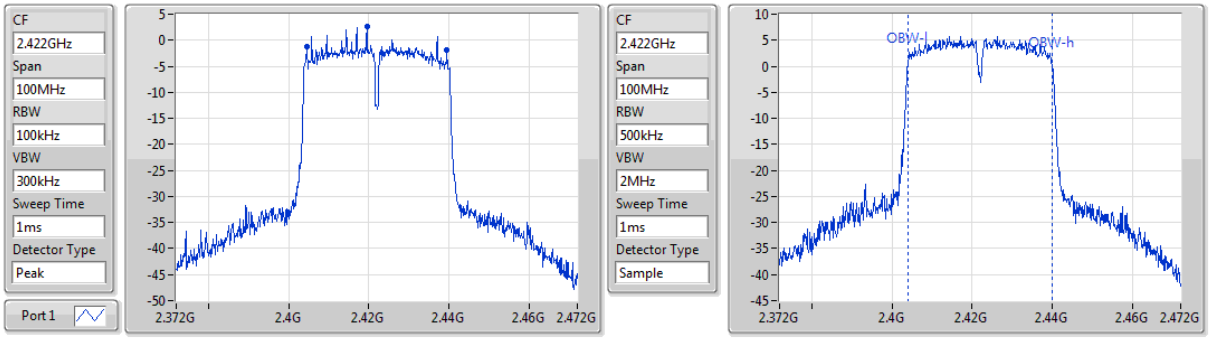
2462MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.536M	2.453232G	2.470768G	17.583M	2.453172G	2.470755G	500k	1

802.11n HT40_Nss1,(MCS0)_1TX EBW

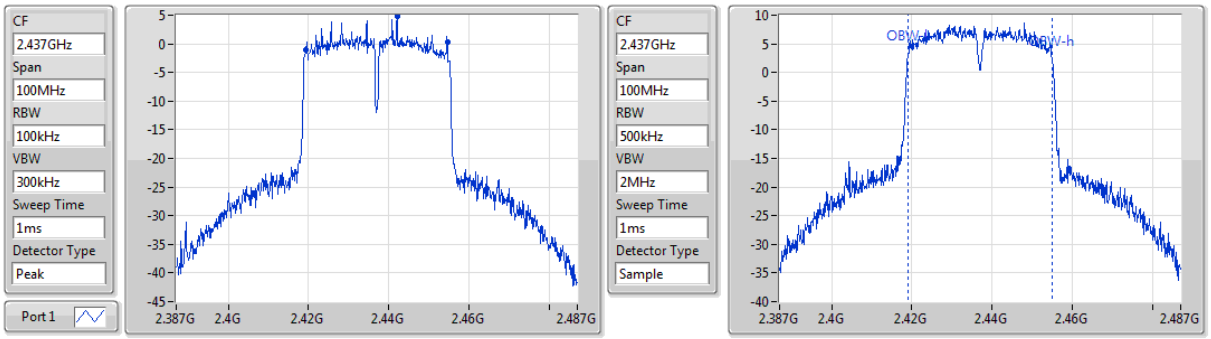
2422MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
35.072M	2.404464G	2.439536G	35.89M	2.404055G	2.439945G	500k	1

802.11n HT40_Nss1,(MCS0)_1TX EBW

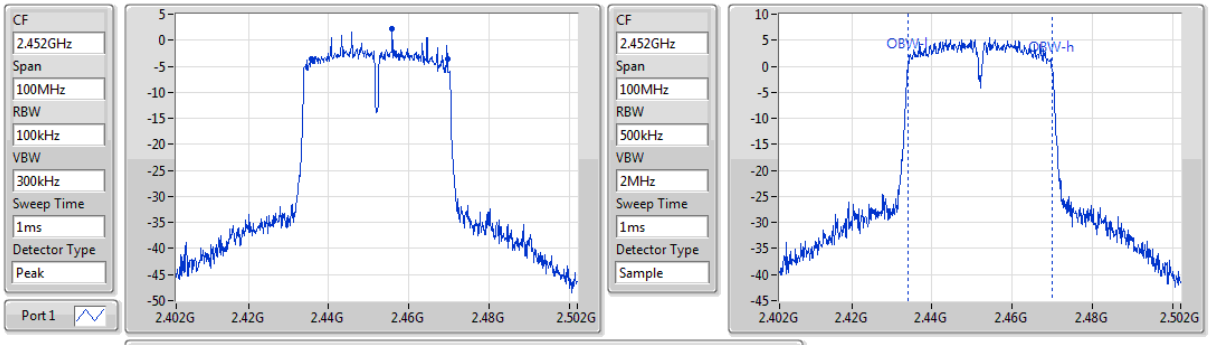
2437MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
35.362M	2.419319G	2.454681G	36.179M	2.41891G	2.45509G	500k	1

802.11n HT40_Nss1,(MCS0)_1TX EBW

2452MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
33.913M	2.435768G	2.469681G	35.89M	2.434055G	2.469945G	500k	1

3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

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

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	**21.59**	0.14421
802.11g_Nss1,(6Mbps)_1TX	20.91	0.12331
802.11n HT20_Nss1,(MCS0)_1TX	20.93	0.12388
802.11n HT40_Nss1,(MCS0)_1TX	19.31	0.08531

Result

Mode	Result	DG (dBi)	Conducted Power (dBm)	Conducted Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00	21.19	30.00	23.19	36.00
2437MHz	Pass	2.00	21.05	30.00	23.05	36.00
2462MHz	Pass	2.00	21.59	30.00	23.59	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00	17.52	30.00	19.52	36.00
2437MHz	Pass	2.00	20.91	30.00	22.91	36.00
2462MHz	Pass	2.00	17.47	30.00	19.47	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-
2412MHz	Pass	2.00	17.07	30.00	19.07	36.00
2437MHz	Pass	2.00	20.93	30.00	22.93	36.00
2462MHz	Pass	2.00	17.03	30.00	19.03	36.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-
2422MHz	Pass	2.00	16.31	30.00	18.31	36.00
2437MHz	Pass	2.00	19.31	30.00	21.31	36.00
2452MHz	Pass	2.00	15.82	30.00	17.82	36.00

DG = Directional Gain;

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 ≥ 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.

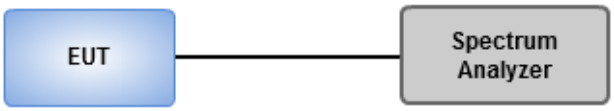
2 Set the sweep time to: ≥ 10 (number of measurement points in sweep) x (total on/off period of the transmitted signal).

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	PSD (dBm/3 kHz)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_1TX	-0.63
802.11g_Nss1,(6Mbps)_1TX	-4.56
802.11n HT20_Nss1,(MCS0)_1TX	-4.00
802.11n HT40_Nss1,(MCS0)_1TX	-9.95

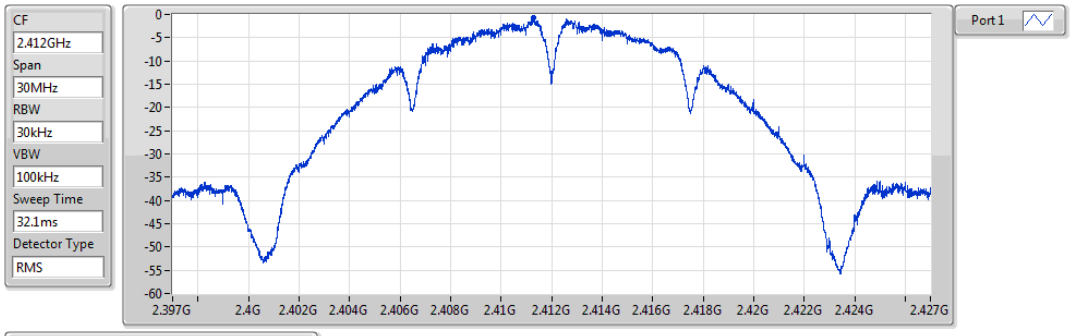
Result

Mode	Result	DG (dBi)	PSD (dBm/3 kHz)	PSD Limit (dBm/3 kHz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	2.00	-0.63	8.00
2437MHz	Pass	2.00	-0.77	8.00
2462MHz	Pass	2.00	-0.79	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	2.00	-8.10	8.00
2437MHz	Pass	2.00	-4.56	8.00
2462MHz	Pass	2.00	-13.38	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	2.00	-8.23	8.00
2437MHz	Pass	2.00	-4.00	8.00
2462MHz	Pass	2.00	-7.89	8.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	2.00	-12.45	8.00
2437MHz	Pass	2.00	-9.95	8.00
2452MHz	Pass	2.00	-12.90	8.00

DG = Directional Gain;

802.11b_Nss1,(1Mbps)_1TX **PSD**

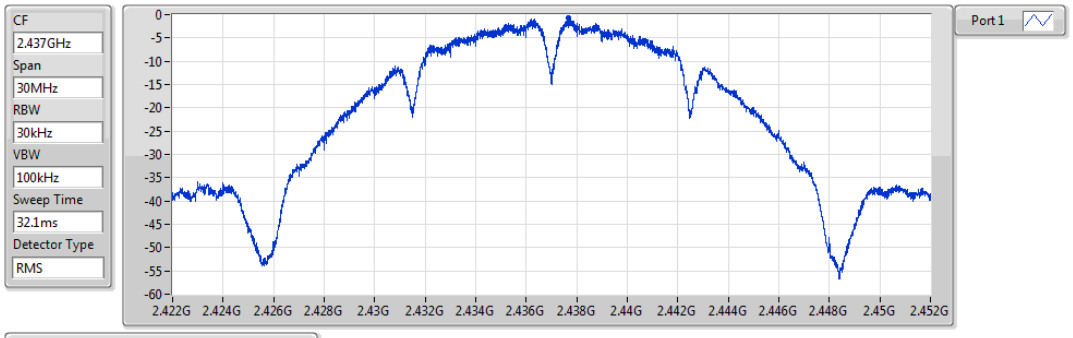
2412MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.63	-0.63	-0.63

802.11b_Nss1,(1Mbps)_1TX **PSD**

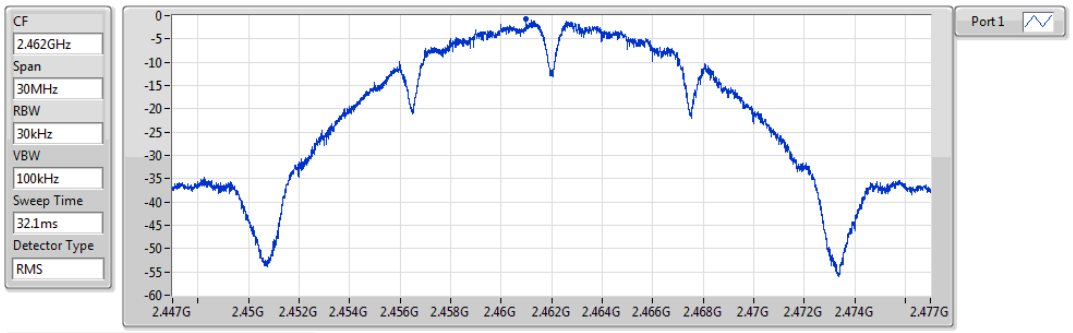
2437MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.77	-0.77	-0.77

802.11b_Nss1,(1Mbps)_1TX **PSD**

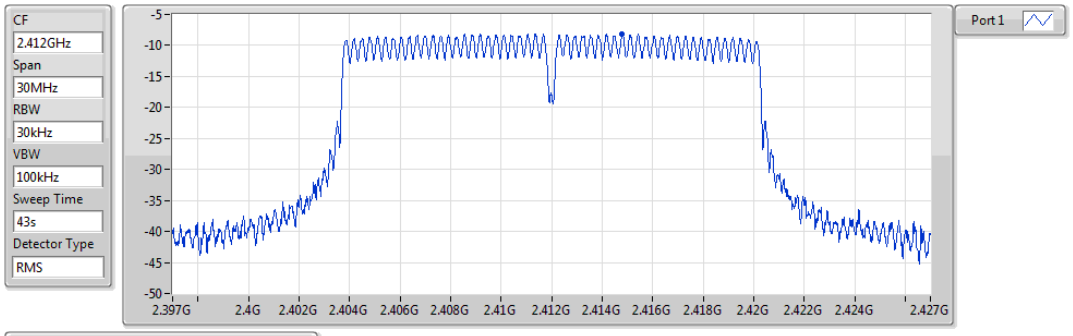
2462MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.79	-0.79	-0.79

802.11g_Nss1,(6Mbps)_1TX **PSD**

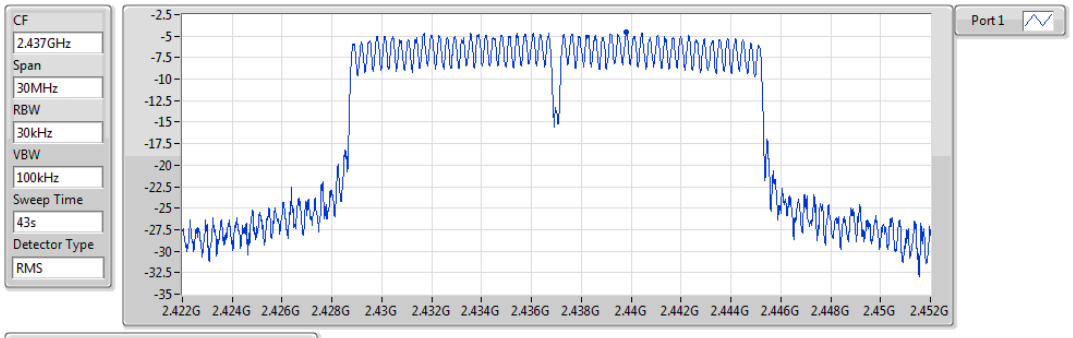
2412MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.10	-8.10	-8.10

802.11g_Nss1,(6Mbps)_1TX **PSD**

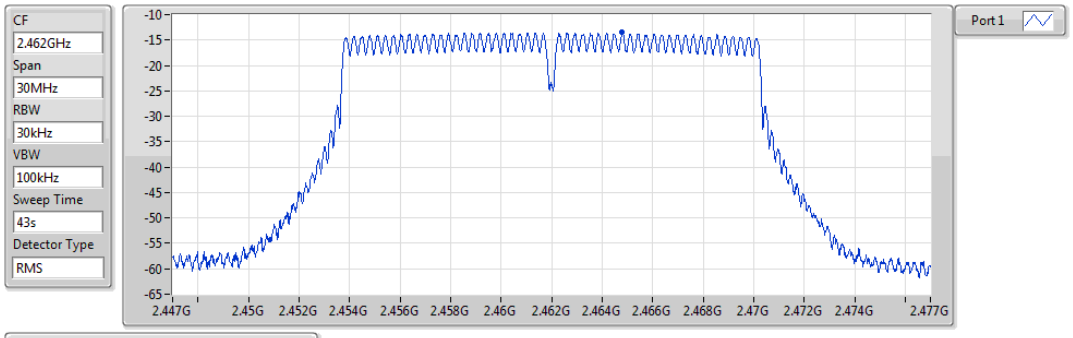
2437MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.56	-4.56	-4.56

802.11g_Nss1,(6Mbps)_1TX **PSD**

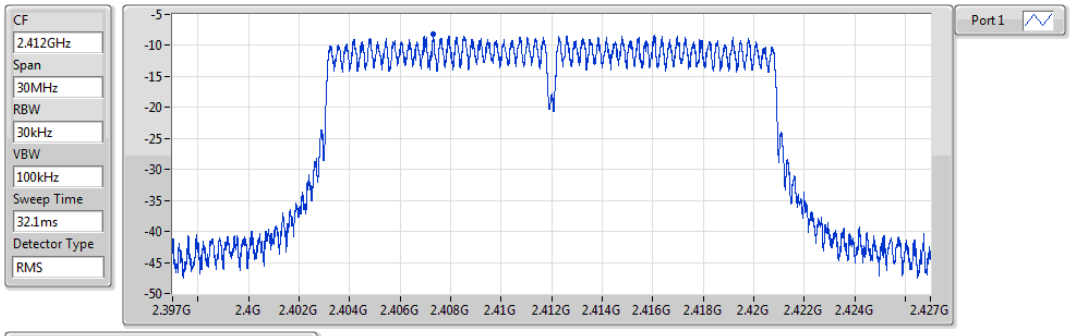
2462MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.38	-13.38	-13.38

802.11n HT20_Nss1,(MCS0)_1TX **PSD**

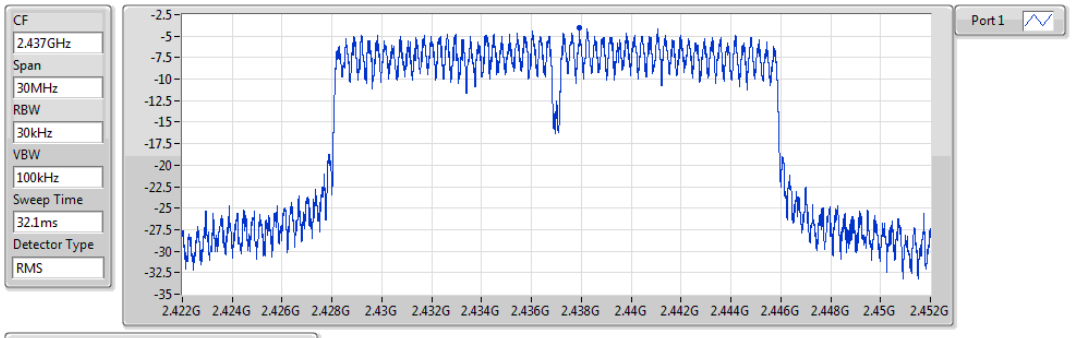
2412MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.23	-8.23	-8.23

802.11n HT20_Nss1,(MCS0)_1TX **PSD**

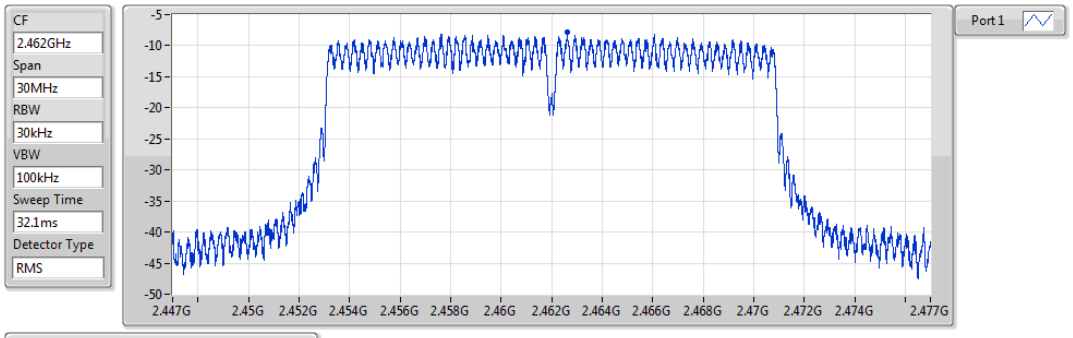
2437MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.00	-4.00	-4.00

802.11n HT20_Nss1,(MCS0)_1TX **PSD**

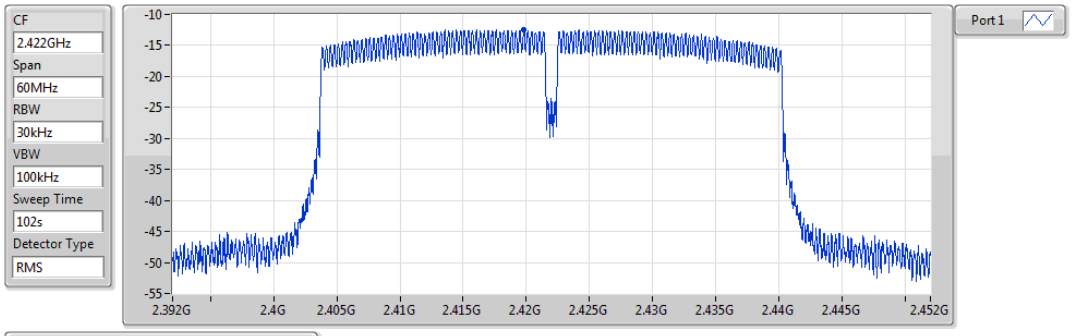
2462MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.89	-7.89	-7.89

802.11n HT40_Nss1,(MCS0)_1TX **PSD**

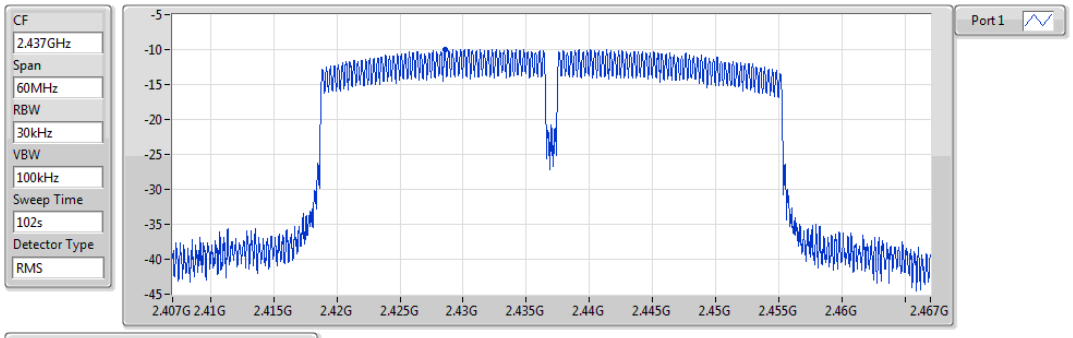
2422MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.45	-12.45	-12.45

802.11n HT40_Nss1,(MCS0)_1TX **PSD**

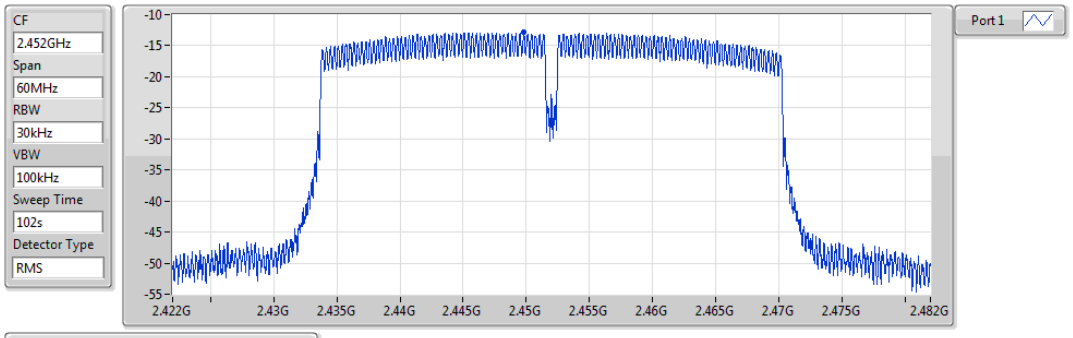
2437MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.95	-9.95	-9.95

802.11n HT40_Nss1,(MCS0)_1TX **PSD**

2452MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.90	-12.90	-12.90

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

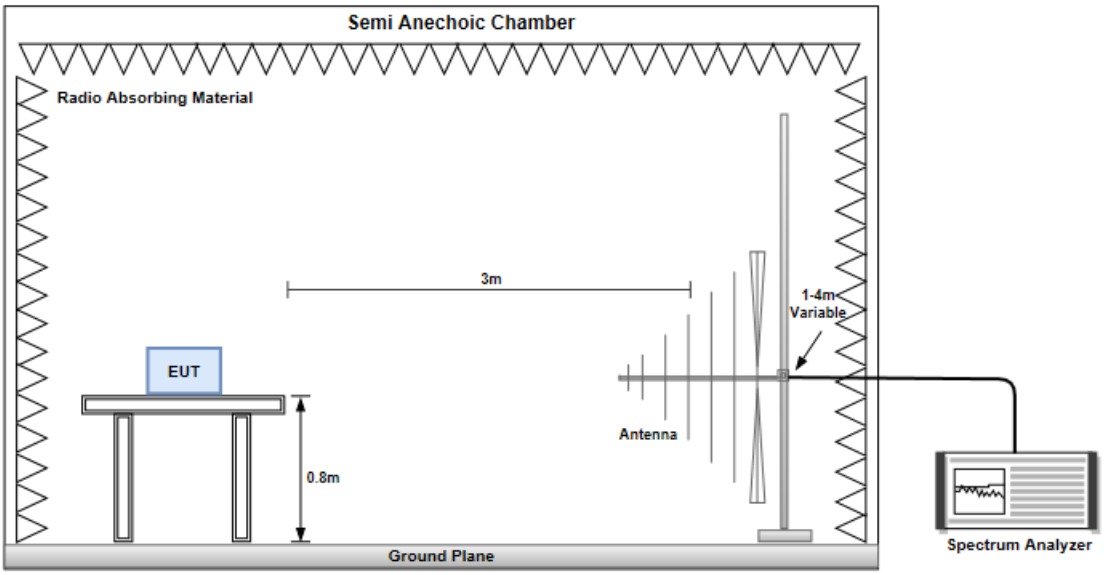
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

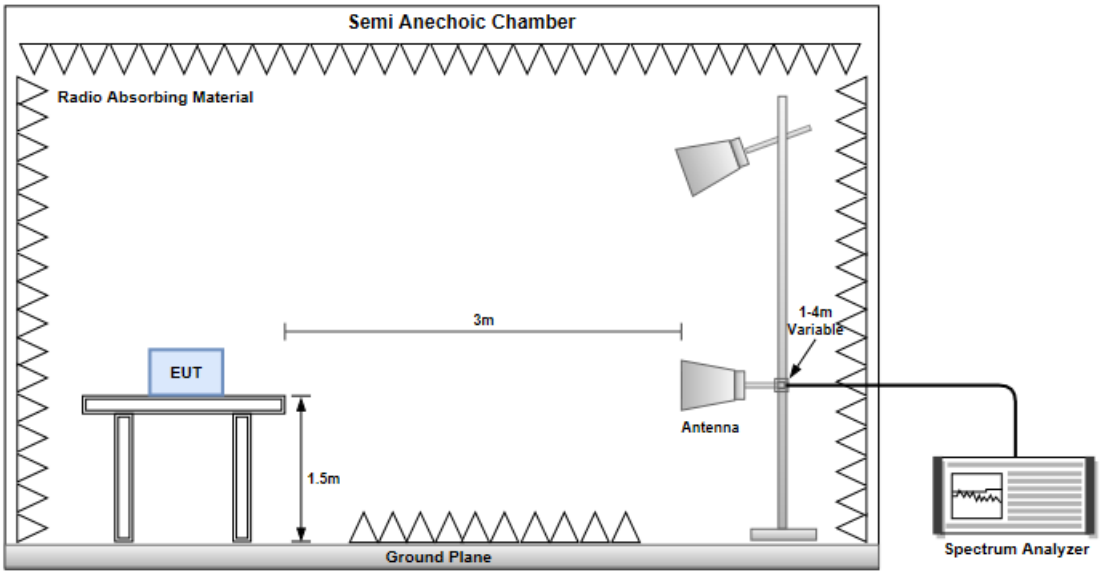
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

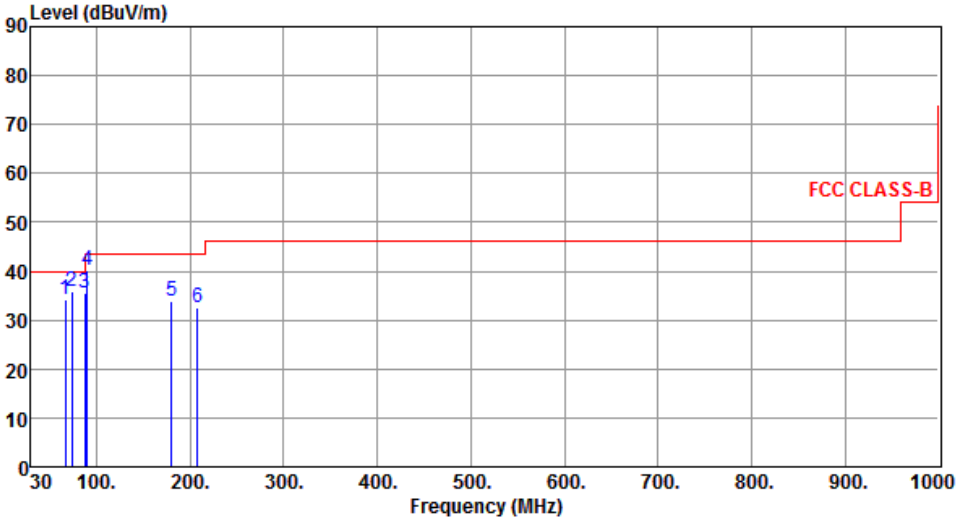


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

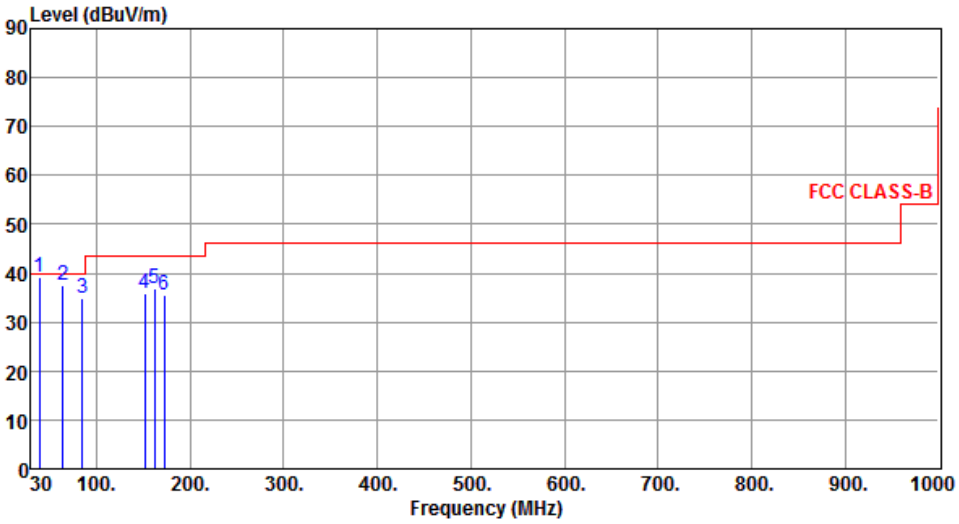
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	66.69	34.31	40.00	-5.69	44.56	-10.25	Peak	---	---
2	74.00	35.85	40.00	-4.15	47.65	-11.80	Peak	---	---
3	87.31	35.49	40.00	-4.51	49.97	-14.48	QP	195	75
4	90.26	40.34	43.50	-3.16	54.91	-14.57	Peak	---	---
5	180.42	33.85	43.50	-9.65	43.88	-10.03	Peak	---	---
6	207.69	32.68	43.50	-10.82	44.47	-11.79	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	11b	Test Freq. (MHz)	2462
Polarization	Vertical		

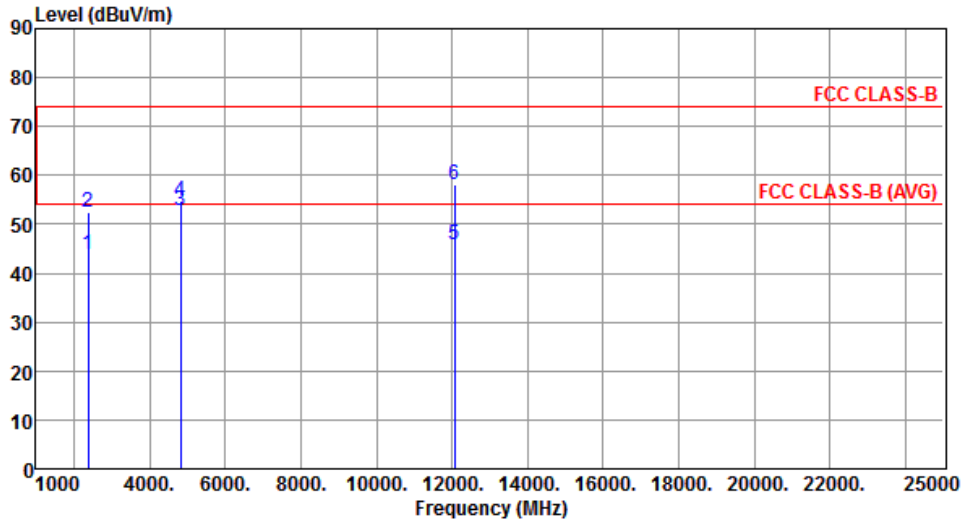


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	38.66	39.05	40.00	-0.95	48.36	-9.31	QP	100	59
2	63.88	37.58	40.00	-2.42	47.21	-9.63	QP	100	179
3	85.31	34.82	40.00	-5.18	49.09	-14.27	QP	100	106
4	151.31	35.77	43.50	-7.73	44.12	-8.35	Peak	---	---
5	161.88	36.87	43.50	-6.63	45.31	-8.44	Peak	---	---
6	172.34	35.68	43.50	-7.82	44.71	-9.03	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

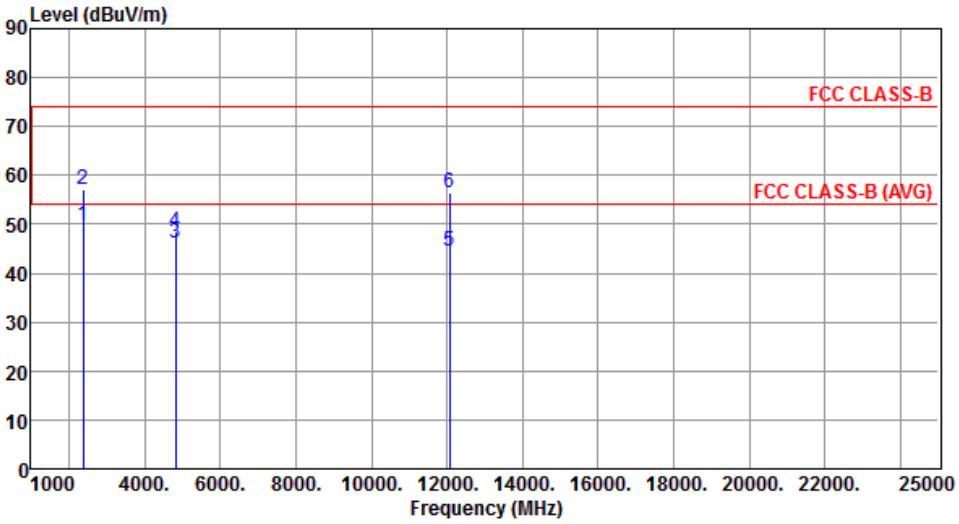
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	43.91	54.00	-10.09	43.49	0.42	Average	220	359
2	2390.00	52.62	74.00	-21.38	52.20	0.42	Peak	220	359
3	4824.00	52.93	54.00	-1.07	46.54	6.39	Average	224	348
4	4824.00	54.85	74.00	-19.15	48.46	6.39	Peak	224	348
5	12060.00	45.95	54.00	-8.05	29.37	16.58	Average	194	344
6	12060.00	58.25	74.00	-15.75	41.67	16.58	Peak	194	344

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).

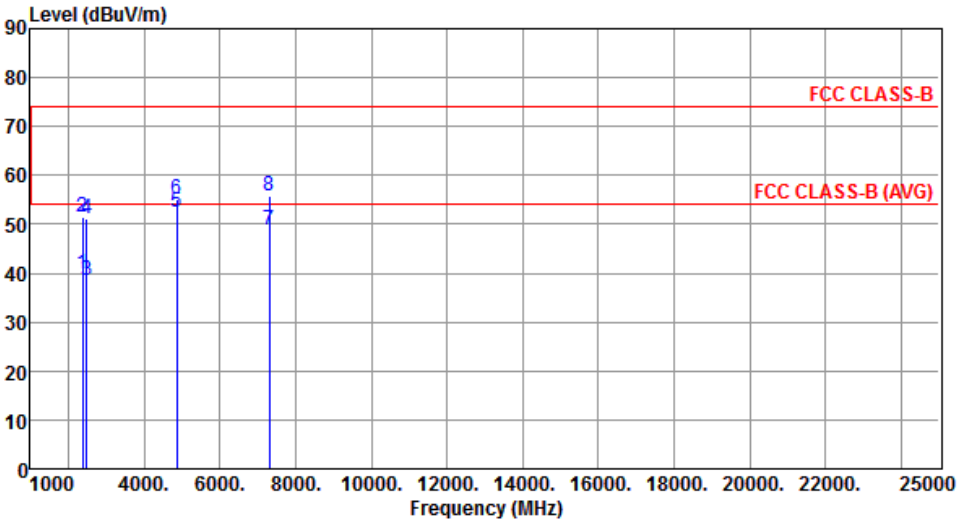
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	49.74	54.00	-4.26	49.32	0.42	Average	216	353
2	2390.00	57.04	74.00	-16.96	56.62	0.42	Peak	216	353
3	4824.00	46.17	54.00	-7.83	39.78	6.39	Average	223	358
4	4824.00	48.41	74.00	-25.59	42.02	6.39	Peak	223	358
5	12060.00	44.53	54.00	-9.47	27.95	16.58	Average	150	89
6	12060.00	56.52	74.00	-17.48	39.94	16.58	Peak	150	89

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).

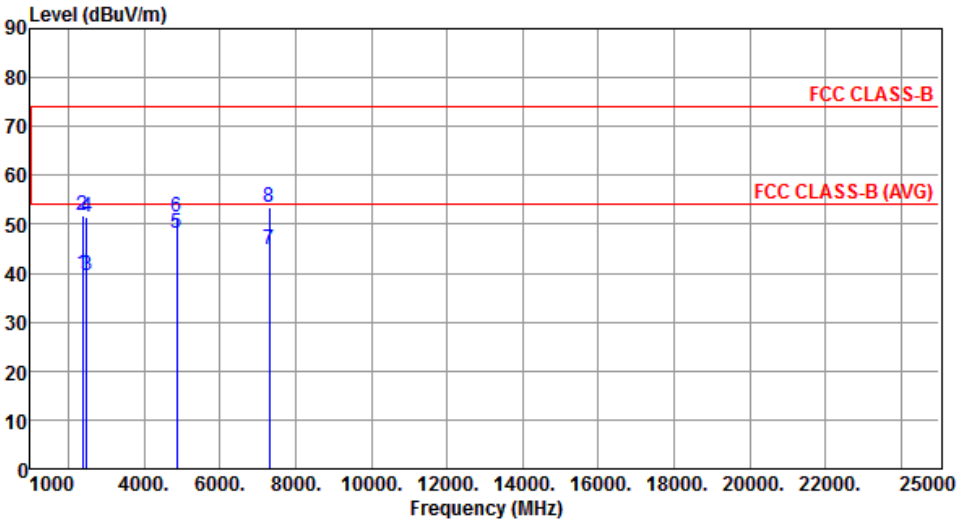
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	39.73	54.00	-14.27	39.31	0.42	Average	123	354
2	2390.00	51.47	74.00	-22.53	51.05	0.42	Peak	123	354
3	2483.50	38.64	54.00	-15.36	38.38	0.26	Average	123	354
4	2483.50	51.25	74.00	-22.75	50.99	0.26	Peak	123	354
5	4874.00	52.53	54.00	-1.47	46.10	6.43	Average	223	345
6	4874.00	54.98	74.00	-19.02	48.55	6.43	Peak	223	345
7	7311.00	48.76	54.00	-5.24	36.94	11.82	Average	215	347
8	7311.00	55.71	74.00	-18.29	43.89	11.82	Peak	215	347

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).

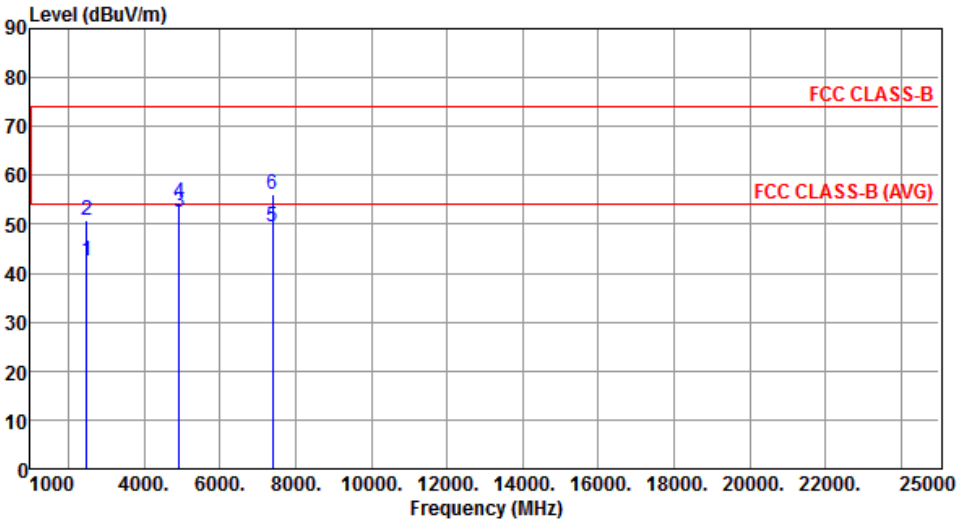
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	39.77	54.00	-14.23	39.35	0.42	Average	214	340
2	2390.00	51.77	74.00	-22.23	51.35	0.42	Peak	214	340
3	2483.50	39.61	54.00	-14.39	39.35	0.26	Average	214	340
4	2483.50	51.50	74.00	-22.50	51.24	0.26	Peak	214	340
5	4874.00	48.13	54.00	-5.87	41.70	6.43	Average	100	2
6	4874.00	51.38	74.00	-22.62	44.95	6.43	Peak	100	2
7	7311.00	44.99	54.00	-9.01	33.17	11.82	Average	111	335
8	7311.00	53.44	74.00	-20.56	41.62	11.82	Peak	111	335

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).

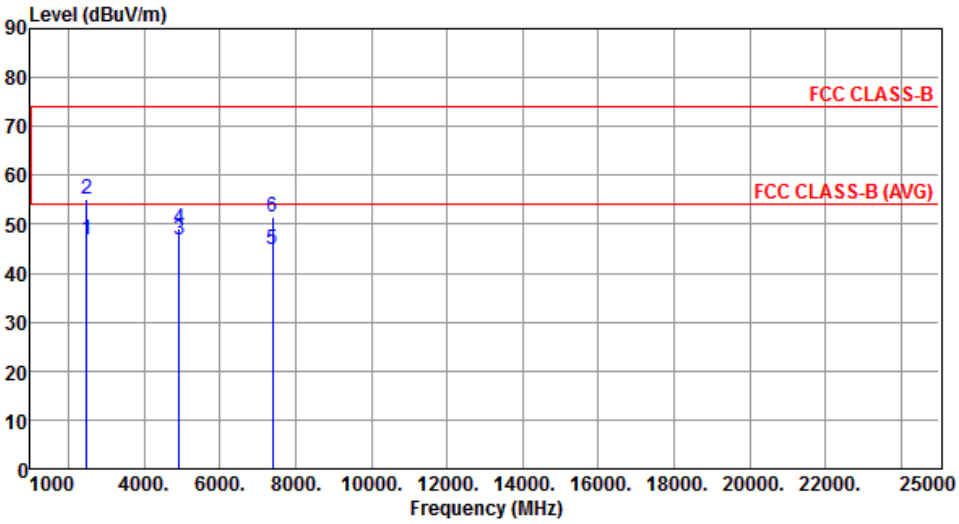
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	42.42	54.00	-11.58	42.16	0.26	Average	242	351
2	2483.50	50.77	74.00	-23.23	50.51	0.26	Peak	242	351
3	4924.00	52.55	54.00	-1.45	46.02	6.53	Average	224	345
4	4924.00	54.39	74.00	-19.61	47.86	6.53	Peak	224	345
5	7386.00	49.64	54.00	-4.36	38.02	11.62	Average	210	346
6	7386.00	55.98	74.00	-18.02	44.36	11.62	Peak	210	346

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).

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

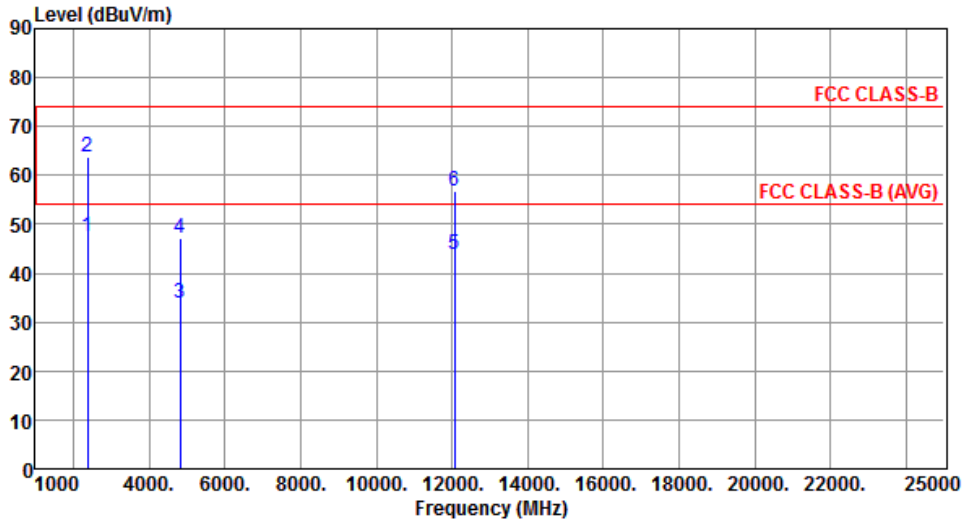


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	46.88	54.00	-7.12	46.62	0.26	Average	238	347
2	2483.50	55.02	74.00	-18.98	54.76	0.26	Peak	238	347
3	4924.00	46.96	54.00	-7.04	40.43	6.53	Average	142	2
4	4924.00	49.10	74.00	-24.90	42.57	6.53	Peak	142	2
5	7386.00	44.79	54.00	-9.21	33.17	11.62	Average	152	3
6	7386.00	51.39	74.00	-22.61	39.77	11.62	Peak	152	3

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).

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

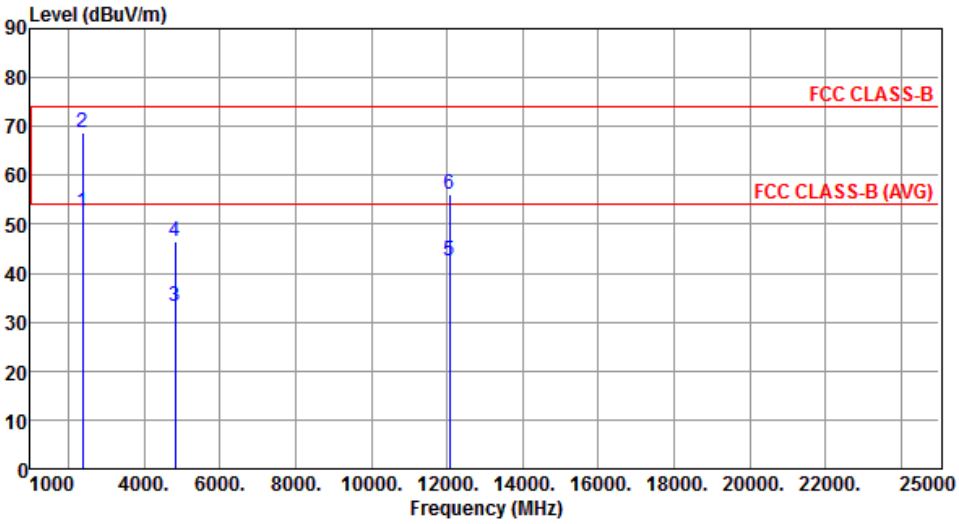
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	47.56	54.00	-6.44	50.63	-3.07	Average	149	23
2	2390.00	63.81	74.00	-10.19	66.88	-3.07	Peak	149	23
3	4824.00	33.84	54.00	-20.16	30.31	3.53	Average	219	346
4	4824.00	47.15	74.00	-26.85	43.62	3.53	Peak	219	346
5	12060.00	43.82	54.00	-10.18	30.55	13.27	Average	246	335
6	12060.00	56.91	74.00	-17.09	43.64	13.27	Peak	246	335

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).

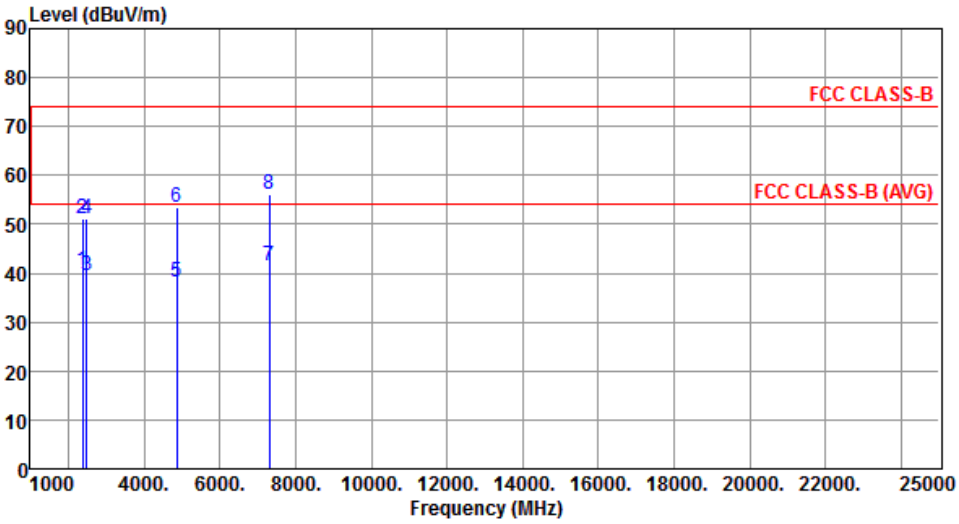
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	52.54	54.00	-1.46	52.12	0.42	Average	196	342
2	2390.00	68.75	74.00	-5.25	68.33	0.42	Peak	196	342
3	4824.00	33.17	54.00	-20.83	26.78	6.39	Average	174	354
4	4824.00	46.52	74.00	-27.48	40.13	6.39	Peak	174	354
5	12060.00	42.61	54.00	-11.39	26.03	16.58	Average	165	345
6	12060.00	56.11	74.00	-17.89	39.53	16.58	Peak	165	345

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).

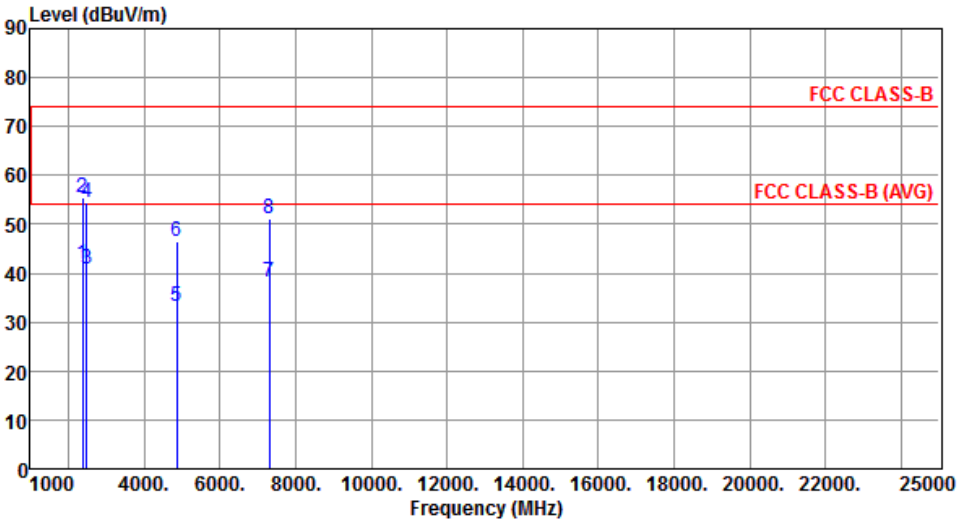
Modulation	11g	**Test Freq. (MHz)**	2437
Polarization	Horizontal		



	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	40.44	54.00	-13.56	40.02	0.42	Average	154	25
2	2390.00	51.23	74.00	-22.77	50.81	0.42	Peak	154	25
3	2483.50	39.59	54.00	-14.41	39.33	0.26	Average	154	25
4	2483.50	50.99	74.00	-23.01	50.73	0.26	Peak	154	25
5	4874.00	38.35	54.00	-15.65	31.92	6.43	Average	233	351
6	4874.00	53.56	74.00	-20.44	47.13	6.43	Peak	233	351
7	7311.00	41.44	54.00	-12.56	29.62	11.82	Average	223	346
8	7311.00	56.28	74.00	-17.72	44.46	11.82	Peak	223	346

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).

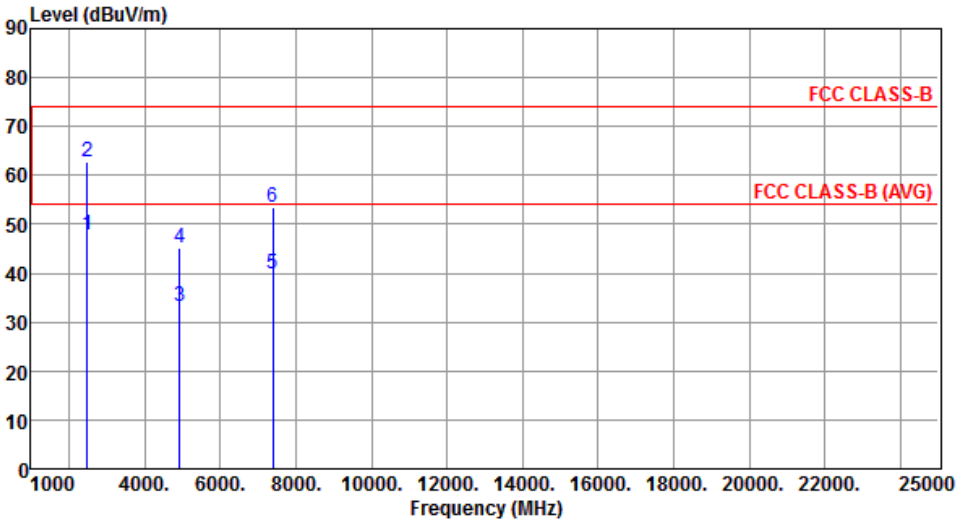
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	41.75	54.00	-12.25	41.33	0.42	Average	189	344
2	2390.00	55.46	74.00	-18.54	55.04	0.42	Peak	189	344
3	2483.50	40.71	54.00	-13.29	40.45	0.26	Average	189	344
4	2483.50	54.32	74.00	-19.68	54.06	0.26	Peak	189	344
5	4874.00	33.24	54.00	-20.76	26.81	6.43	Average	175	345
6	4874.00	46.54	74.00	-27.46	40.11	6.43	Peak	175	345
7	7311.00	38.22	54.00	-15.78	26.40	11.82	Average	176	342
8	7311.00	51.29	74.00	-22.71	39.47	11.82	Peak	176	342

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).

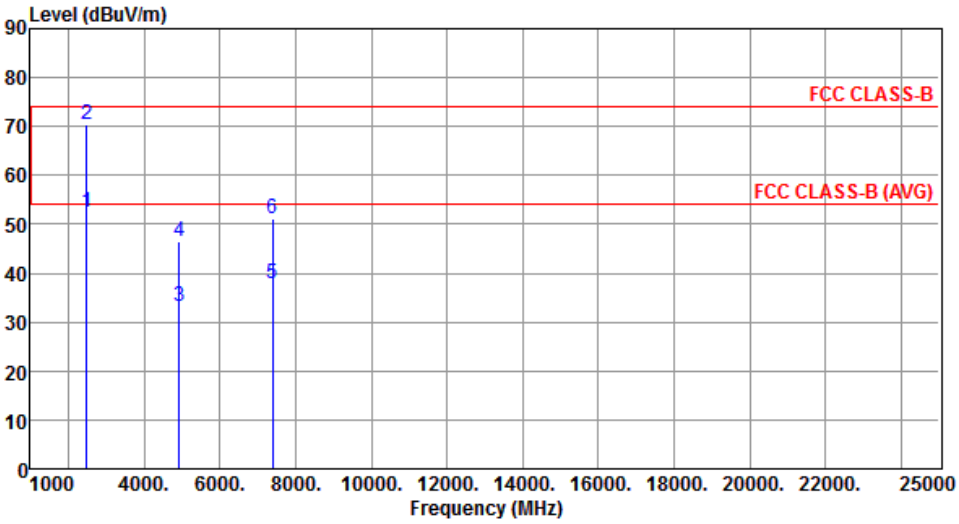
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.72	54.00	-6.28	47.46	0.26	Average	164	22
2	2483.50	62.67	74.00	-11.33	62.41	0.26	Peak	164	22
3	4924.00	33.05	54.00	-20.95	26.52	6.53	Average	221	339
4	4924.00	45.16	74.00	-28.84	38.63	6.53	Peak	221	339
5	7386.00	39.81	54.00	-14.19	28.19	11.62	Average	211	342
6	7386.00	53.62	74.00	-20.38	42.00	11.62	Peak	211	342

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).

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

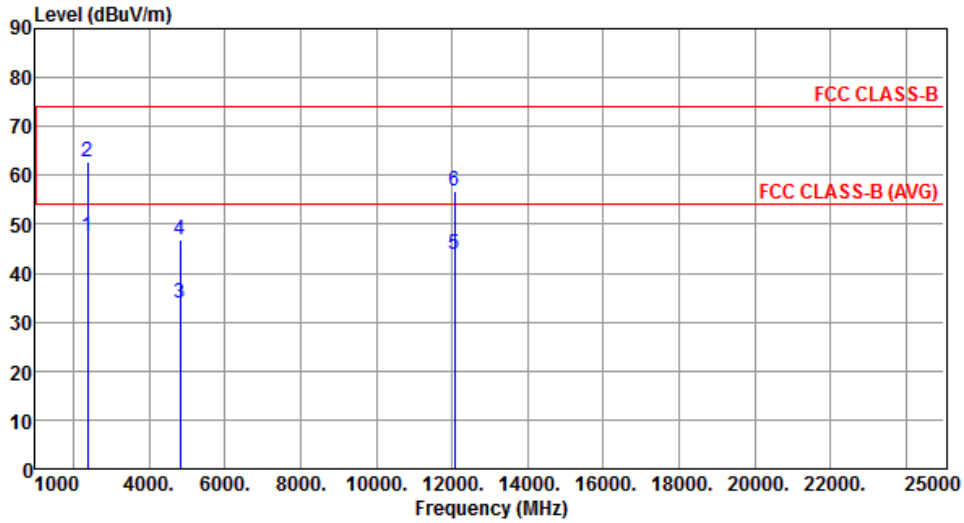


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.52	54.00	-1.48	52.26	0.26	Average	196	345
2	2483.50	70.56	74.00	-3.44	70.30	0.26	Peak	196	345
3	4924.00	33.36	54.00	-20.64	26.83	6.53	Average	165	342
4	4924.00	46.66	74.00	-27.34	40.13	6.53	Peak	165	342
5	7386.00	37.96	54.00	-16.04	26.34	11.62	Average	156	345
6	7386.00	51.09	74.00	-22.91	39.47	11.62	Peak	156	345

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).

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

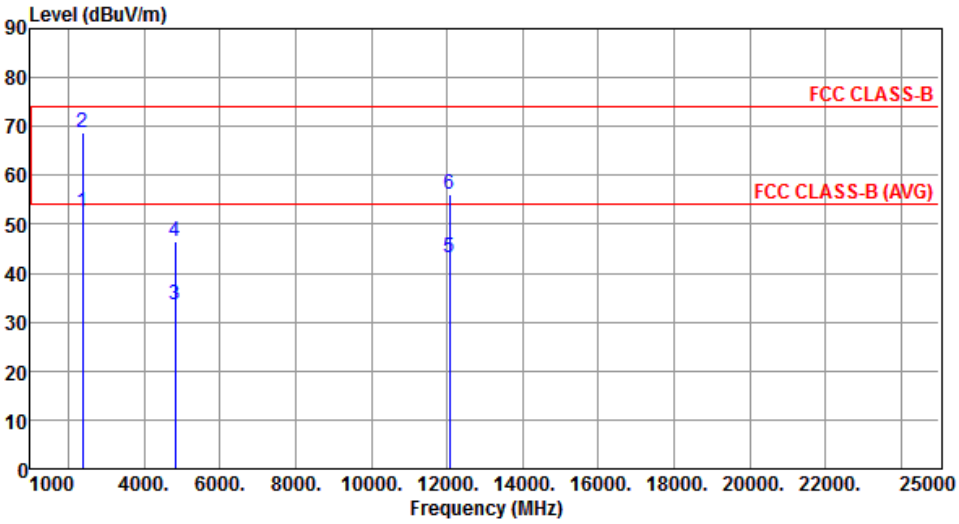
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	47.34	54.00	-6.66	46.92	0.42	Average	152	27
2	2390.00	62.78	74.00	-11.22	62.36	0.42	Peak	152	27
3	4824.00	33.78	54.00	-20.22	27.39	6.39	Average	218	344
4	4824.00	46.98	74.00	-27.02	40.59	6.39	Peak	218	344
5	12060.00	43.75	54.00	-10.25	27.17	16.58	Average	242	332
6	12060.00	56.89	74.00	-17.11	40.31	16.58	Peak	242	332

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).

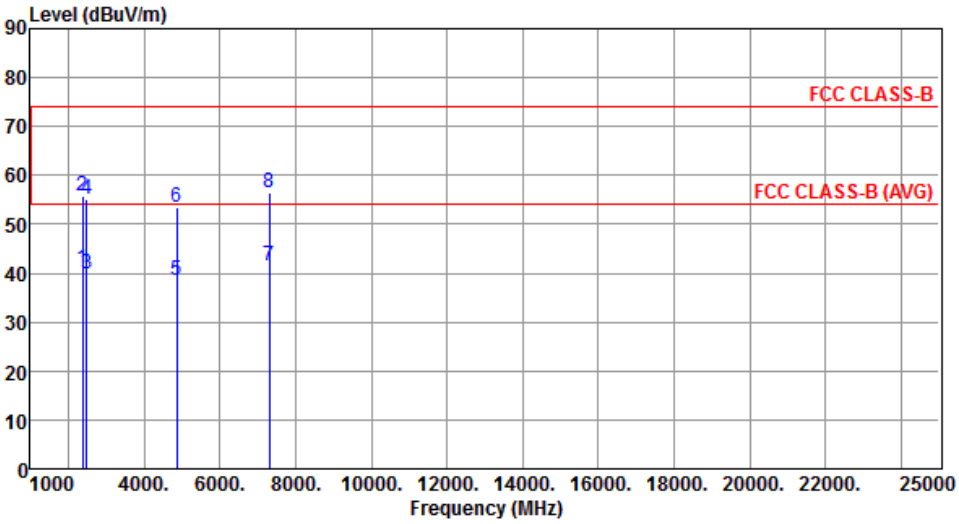
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	52.58	54.00	-1.42	52.16	0.42	Average	196	346
2	2390.00	68.78	74.00	-5.22	68.36	0.42	Peak	196	346
3	4824.00	33.40	54.00	-20.60	27.01	6.39	Average	184	354
4	4824.00	46.47	74.00	-27.53	40.08	6.39	Peak	184	354
5	12060.00	43.15	54.00	-10.85	26.57	16.58	Average	100	351
6	12060.00	55.98	74.00	-18.02	39.40	16.58	Peak	100	351

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).

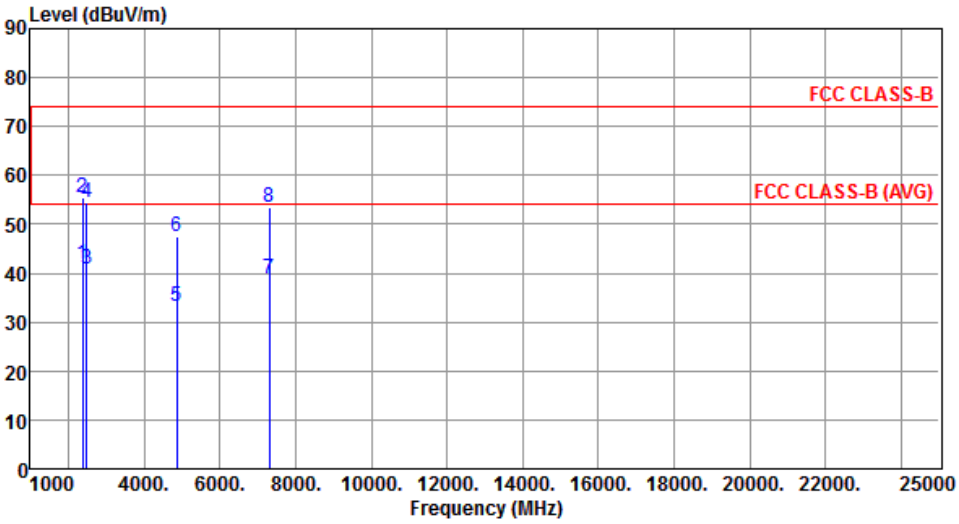
Modulation	HT20	**Test Freq. (MHz)**	2437
Polarization	Horizontal		



	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	40.95	54.00	-13.05	40.53	0.42	Average	167	18
2	2390.00	55.89	74.00	-18.11	55.47	0.42	Peak	167	18
3	2483.50	39.99	54.00	-14.01	39.73	0.26	Average	167	18
4	2483.50	55.22	74.00	-18.78	54.96	0.26	Peak	167	18
5	4874.00	38.42	54.00	-15.58	31.99	6.43	Average	230	349
6	4874.00	53.63	74.00	-20.37	47.20	6.43	Peak	230	349
7	7311.00	41.58	54.00	-12.42	29.76	11.82	Average	221	344
8	7311.00	56.34	74.00	-17.66	44.52	11.82	Peak	221	344

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).

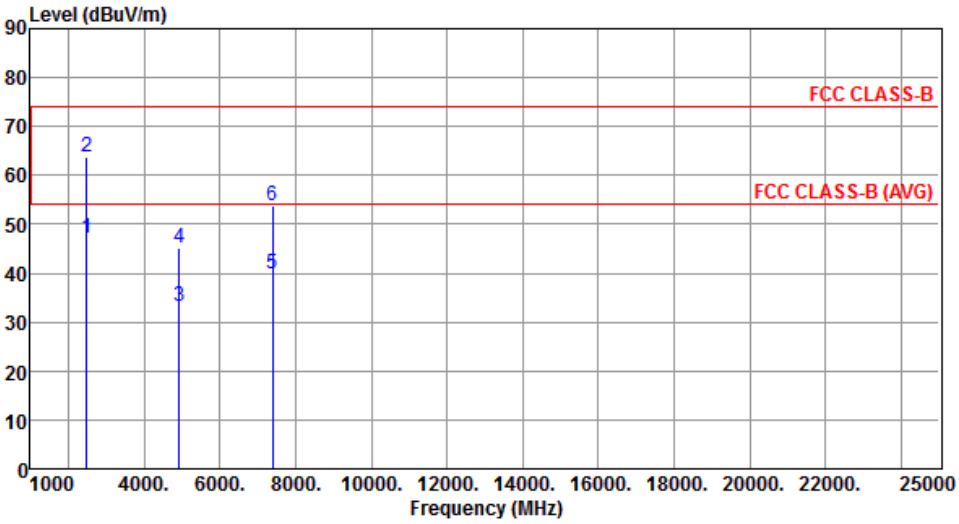
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	41.84	54.00	-12.16	41.42	0.42	Average	187	346
2	2390.00	55.50	74.00	-18.50	55.08	0.42	Peak	187	346
3	2483.50	40.83	54.00	-13.17	40.57	0.26	Average	187	346
4	2483.50	54.45	74.00	-19.55	54.19	0.26	Peak	187	346
5	4874.00	33.09	54.00	-20.91	26.66	6.43	Average	182	346
6	4874.00	47.41	74.00	-26.59	40.98	6.43	Peak	182	346
7	7311.00	38.84	54.00	-15.16	27.02	11.82	Average	185	344
8	7311.00	53.33	74.00	-20.67	41.51	11.82	Peak	185	344

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).

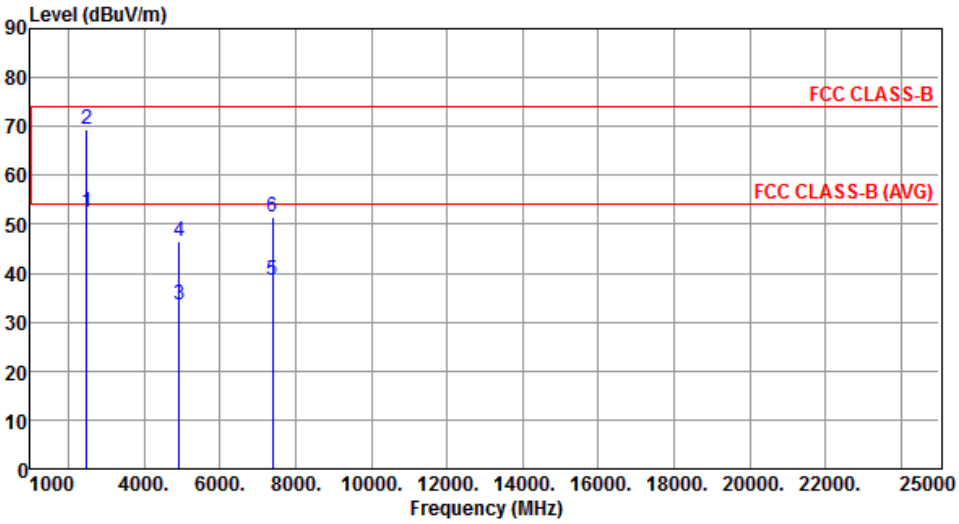
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.19	54.00	-6.81	46.93	0.26	Average	127	25
2	2483.50	63.62	74.00	-10.38	63.36	0.26	Peak	127	25
3	4924.00	33.18	54.00	-20.82	26.65	6.53	Average	219	341
4	4924.00	45.28	74.00	-28.72	38.75	6.53	Peak	219	341
5	7386.00	39.86	54.00	-14.14	28.24	11.62	Average	209	345
6	7386.00	53.70	74.00	-20.30	42.08	11.62	Peak	209	345

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).

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

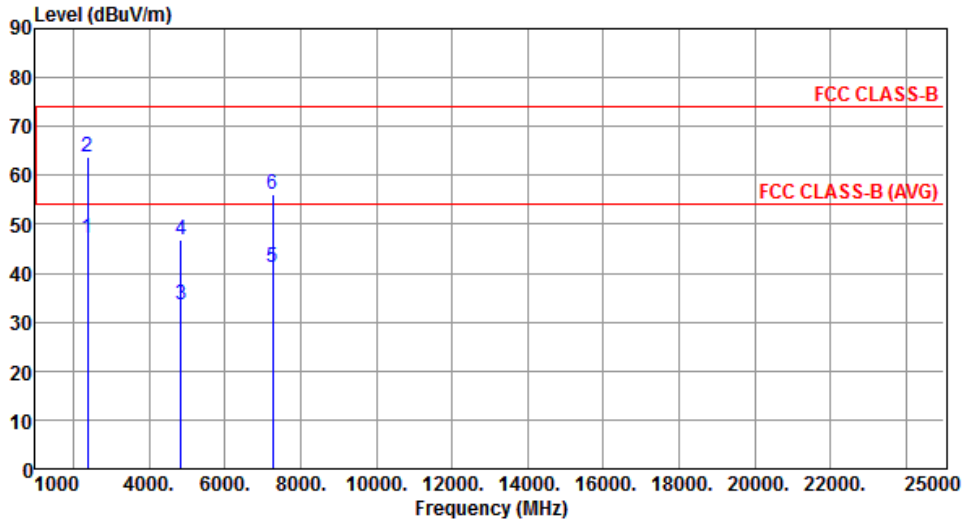


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.60	54.00	-1.40	52.34	0.26	Average	194	343
2	2483.50	69.43	74.00	-4.57	69.17	0.26	Peak	194	343
3	4924.00	33.43	54.00	-20.57	26.90	6.53	Average	178	348
4	4924.00	46.66	74.00	-27.34	40.13	6.53	Peak	178	348
5	7386.00	38.49	54.00	-15.51	26.87	11.62	Average	182	347
6	7386.00	51.42	74.00	-22.58	39.80	11.62	Peak	182	347

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).

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

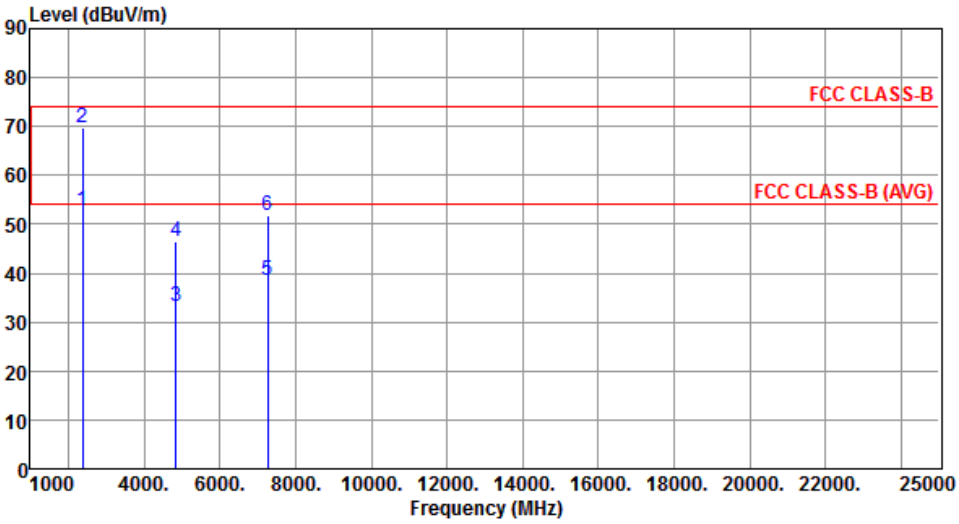
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	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	47.10	54.00	-6.90	46.68	0.42	Average	100	357
2	2390.00	63.63	74.00	-10.37	63.21	0.42	Peak	100	357
3	4844.00	33.65	54.00	-20.35	27.20	6.45	Average	212	345
4	4844.00	46.81	74.00	-27.19	40.36	6.45	Peak	212	345
5	7266.00	41.15	54.00	-12.85	29.28	11.87	Average	218	341
6	7266.00	56.22	74.00	-17.78	44.35	11.87	Peak	218	341

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).

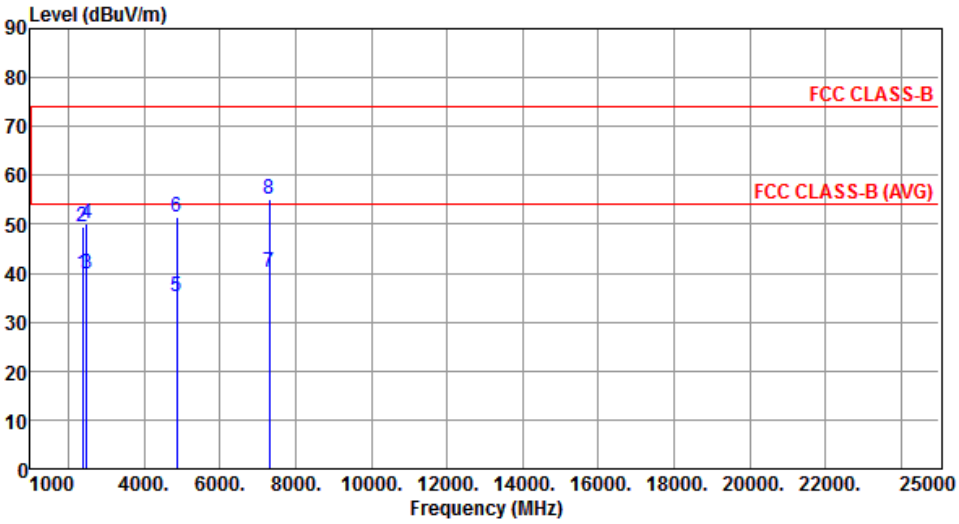
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	52.86	54.00	-1.14	52.44	0.42	Average	195	342
2	2390.00	69.72	74.00	-4.28	69.30	0.42	Peak	195	342
3	4844.00	33.20	54.00	-20.80	26.75	6.45	Average	100	354
4	4844.00	46.50	74.00	-27.50	40.05	6.45	Peak	100	354
5	7266.00	38.51	54.00	-15.49	26.64	11.87	Average	100	345
6	7266.00	51.71	74.00	-22.29	39.84	11.87	Peak	100	345

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).

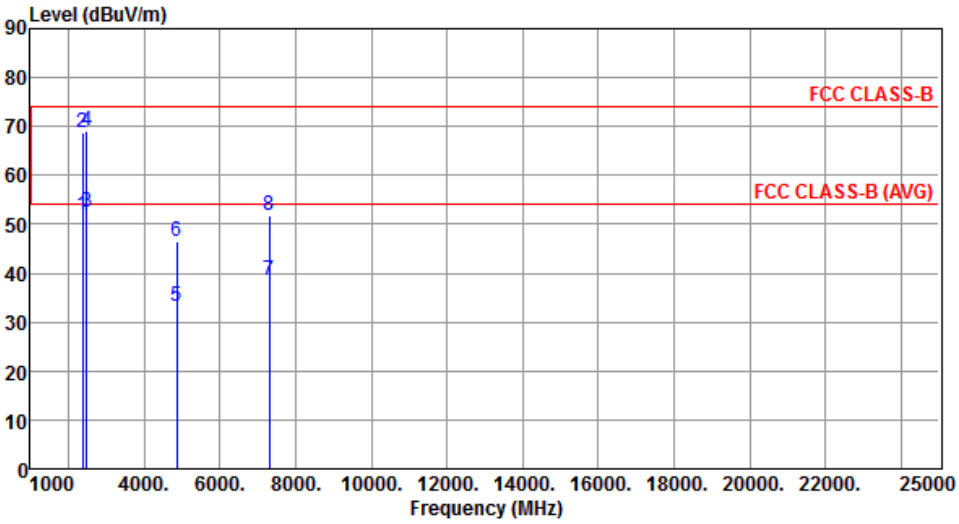
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	39.84	54.00	-14.16	39.42	0.42	Average	147	25
2	2390.00	49.40	74.00	-24.60	48.98	0.42	Peak	147	25
3	2483.50	39.72	54.00	-14.28	39.46	0.26	Average	147	25
4	2483.50	50.02	74.00	-23.98	49.76	0.26	Peak	147	25
5	4874.00	35.24	54.00	-18.76	28.81	6.43	Average	221	342
6	4874.00	51.41	74.00	-22.59	44.98	6.43	Peak	221	342
7	7311.00	40.34	54.00	-13.66	28.52	11.82	Average	216	345
8	7311.00	55.25	74.00	-18.75	43.43	11.82	Peak	216	345

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).

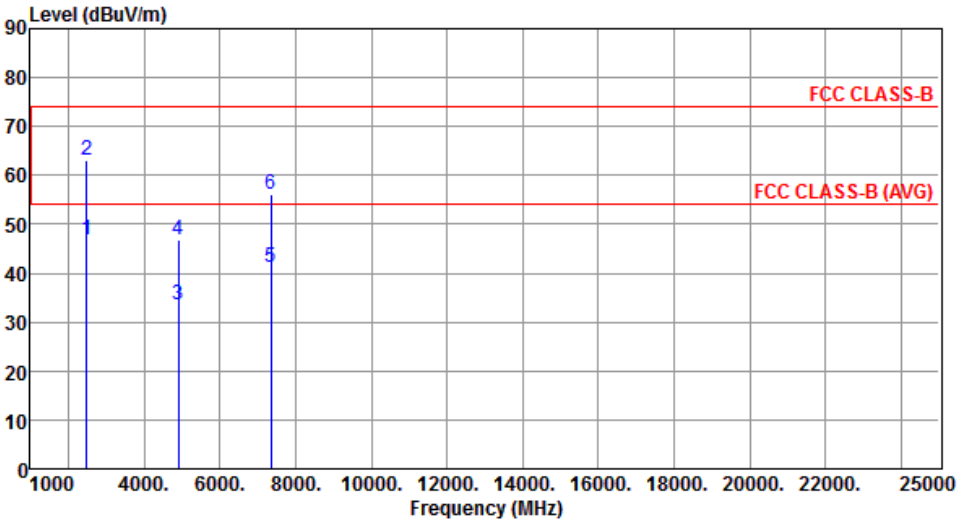
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	51.89	54.00	-2.11	51.47	0.42	Average	210	341
2	2390.00	68.74	74.00	-5.26	68.32	0.42	Peak	210	341
3	2483.50	52.62	54.00	-1.38	52.36	0.26	Average	210	341
4	2483.50	68.94	74.00	-5.06	68.68	0.26	Peak	210	341
5	4874.00	33.24	54.00	-20.76	26.81	6.43	Average	100	354
6	4874.00	46.54	74.00	-27.46	40.11	6.43	Peak	100	354
7	7311.00	38.46	54.00	-15.54	26.64	11.82	Average	100	351
8	7311.00	51.70	74.00	-22.30	39.88	11.82	Peak	100	351

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).

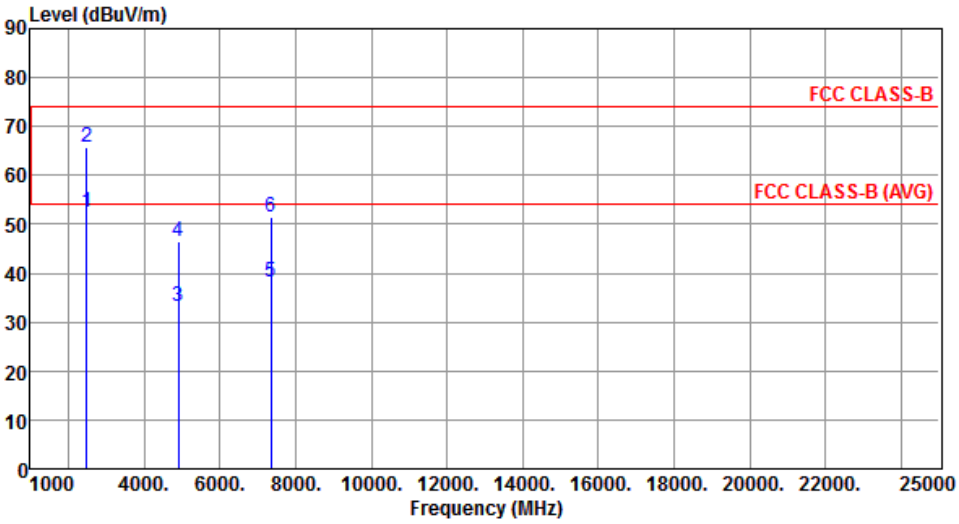
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	46.91	54.00	-7.09	46.65	0.26	Average	111	0
2	2483.50	62.94	74.00	-11.06	62.68	0.26	Peak	111	0
3	4904.00	33.64	54.00	-20.36	27.21	6.43	Average	220	344
4	4904.00	46.85	74.00	-27.15	40.42	6.43	Peak	220	344
5	7356.00	41.22	54.00	-12.78	29.52	11.70	Average	219	346
6	7356.00	56.15	74.00	-17.85	44.45	11.70	Peak	219	346

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).

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.51	54.00	-1.49	52.25	0.26	Average	191	344
2	2483.50	65.65	74.00	-8.35	65.39	0.26	Peak	191	344
3	4904.00	33.32	54.00	-20.68	26.89	6.43	Average	100	354
4	4904.00	46.59	74.00	-27.41	40.16	6.43	Peak	100	354
5	7356.00	38.30	54.00	-15.70	26.60	11.70	Average	100	349
6	7356.00	51.53	74.00	-22.47	39.83	11.70	Peak	100	349

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).

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

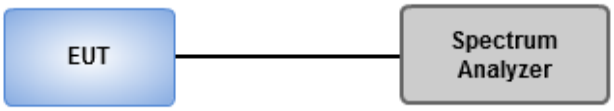
Reference level measurement

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

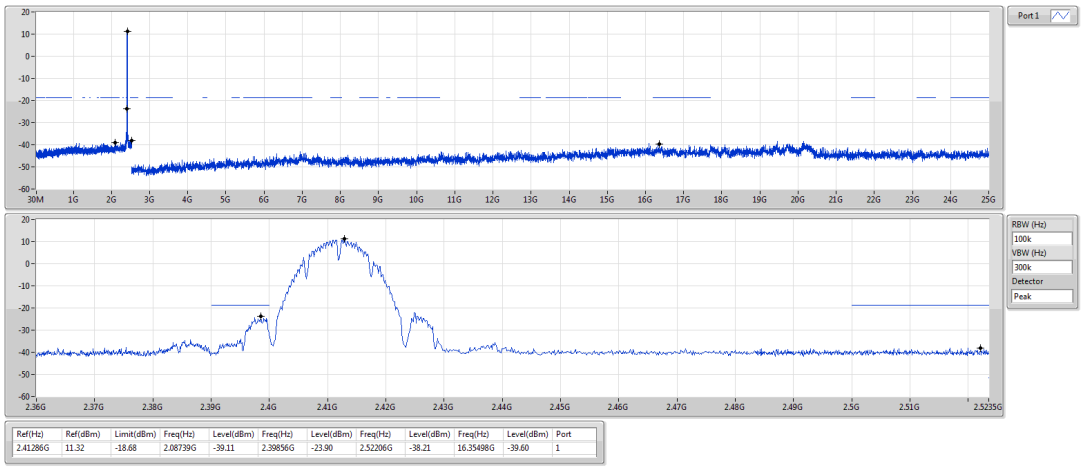
3.6.3 Test Setup



3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

802.11b_Nss1,(1Mbps)_1TX **CSE NdB**

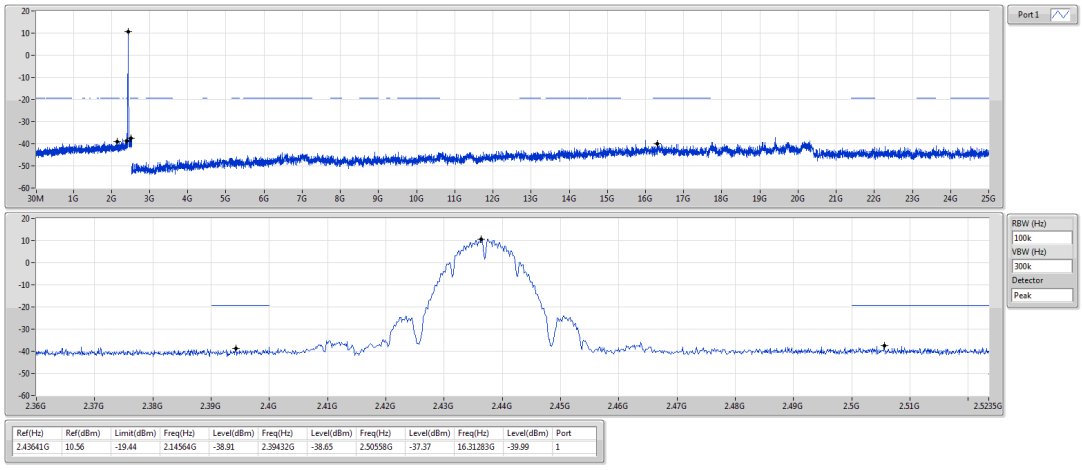
2412MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41286G	11.32	-18.68	2.08739G	-39.11	2.39856G	-23.90	2.52206G	-38.21	16.35498G	-39.60	1

802.11b_Nss1,(1Mbps)_1TX **CSE NdB**

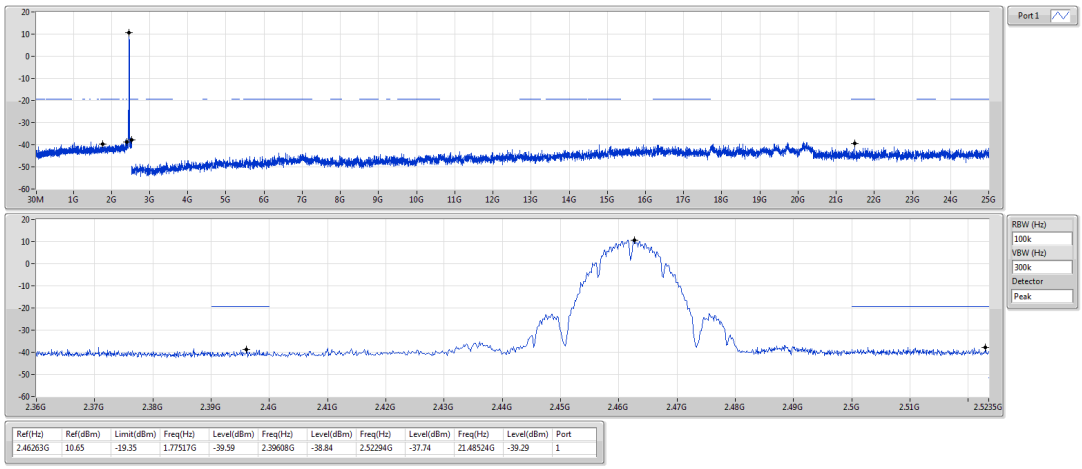
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43641G	10.56	-19.44	2.14564G	-38.91	2.39432G	-38.65	2.50558G	-37.37	16.31283G	-39.99	1

802.11b_Nss1,(1Mbps)_1TX **CSE NdB**

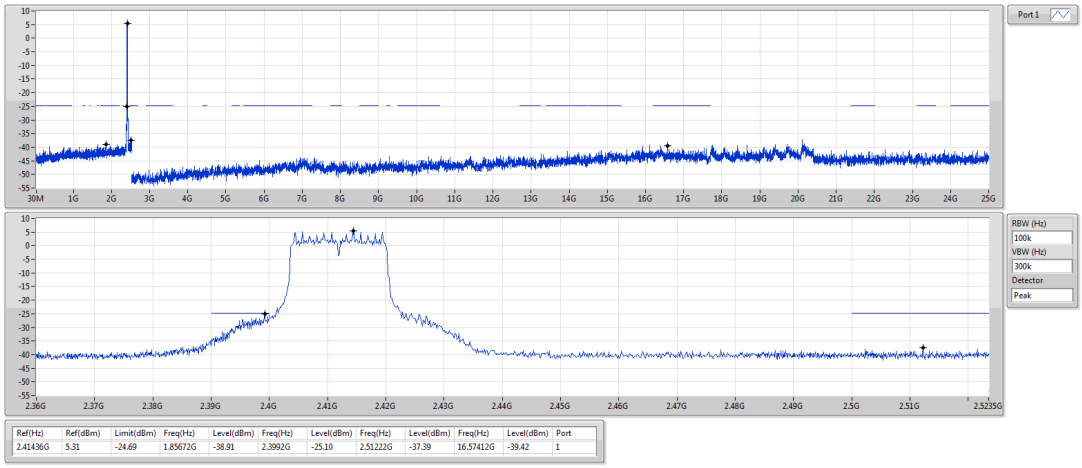
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.46263G	10.65	-19.35	1.77517G	-39.59	2.39608G	-38.84	2.52294G	-37.74	21.48524G	-39.29	1

802.11g_Nss1,(6Mbps)_1TX **CSE NdB**

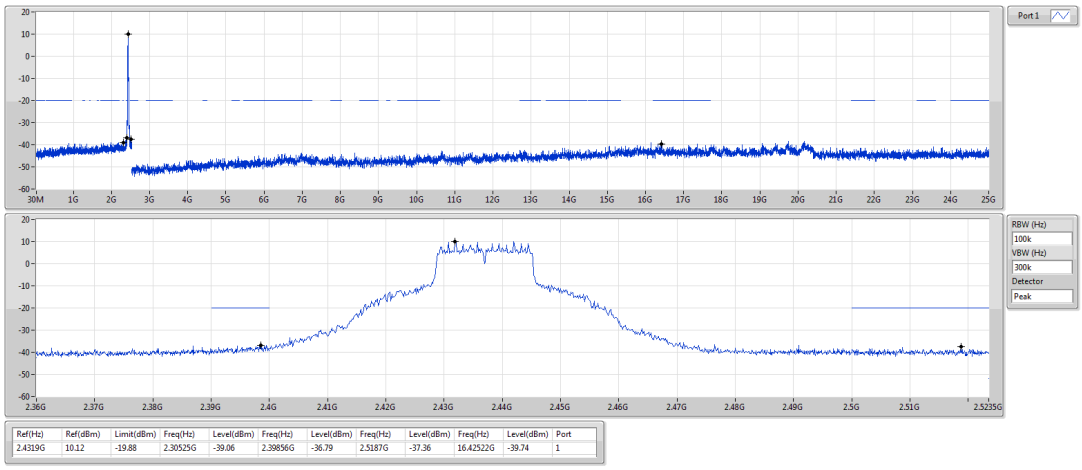
2412MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41436G	5.31	-24.69	1.85672G	-38.91	2.3992G	-25.10	2.51222G	-37.39	16.57412G	-39.42	1

802.11g_Nss1,(6Mbps)_1TX **CSE NdB**

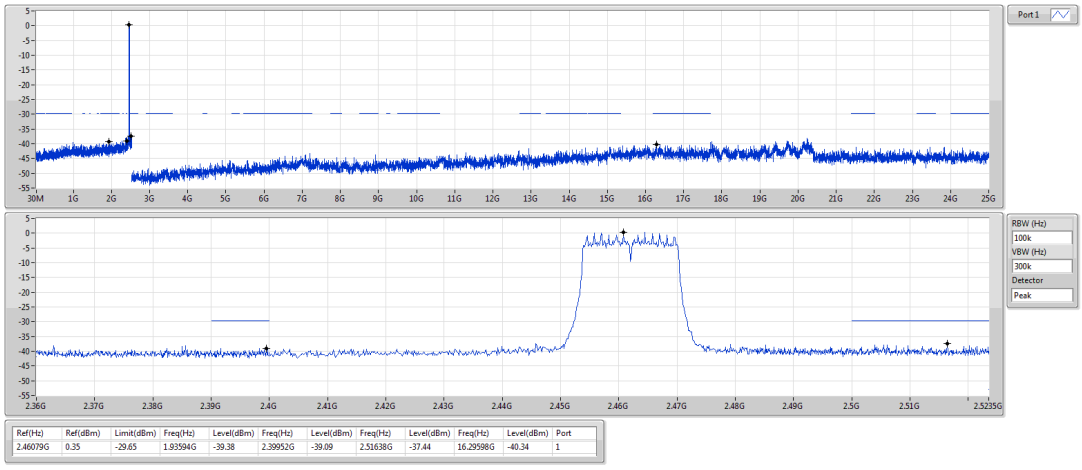
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.4319G	10.12	-19.88	2.30525G	-39.06	2.39856G	-36.79	2.5187G	-37.36	16.42522G	-39.74	1

802.11g_Nss1,(6Mbps)_1TX **CSE NdB**

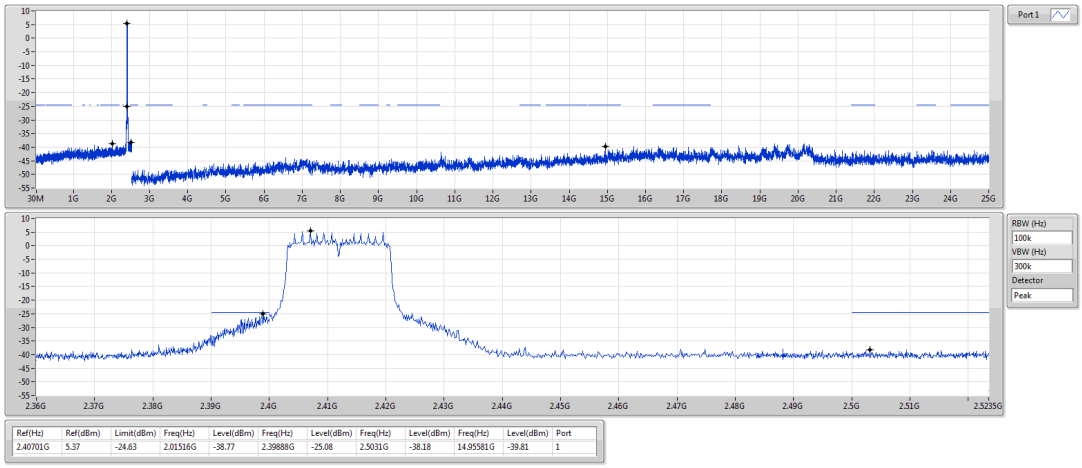
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.46079G	0.35	-29.65	1.93594G	-39.38	2.39952G	-39.09	2.51638G	-37.44	16.29598G	-40.34	1

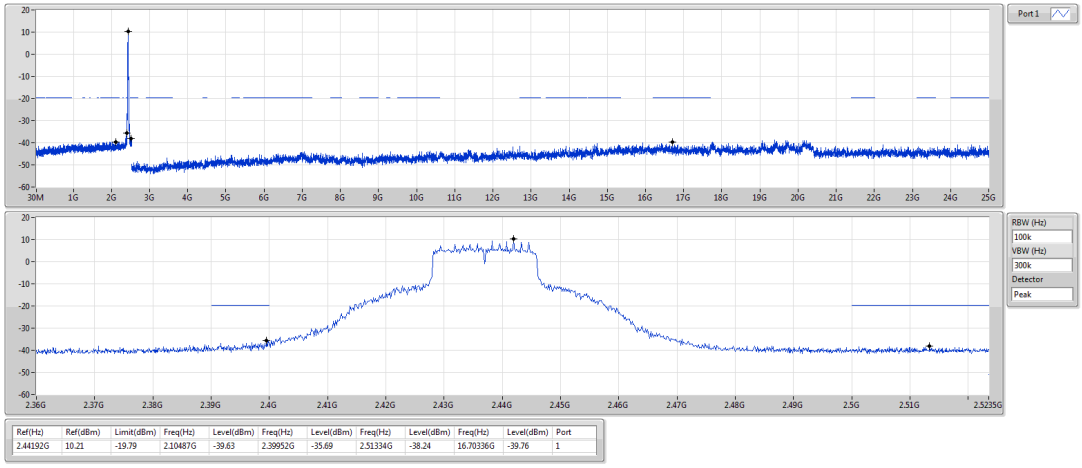
802.11n HT20_Nss1,(MCS0)_1TX **CSE NdB**

2412MHz



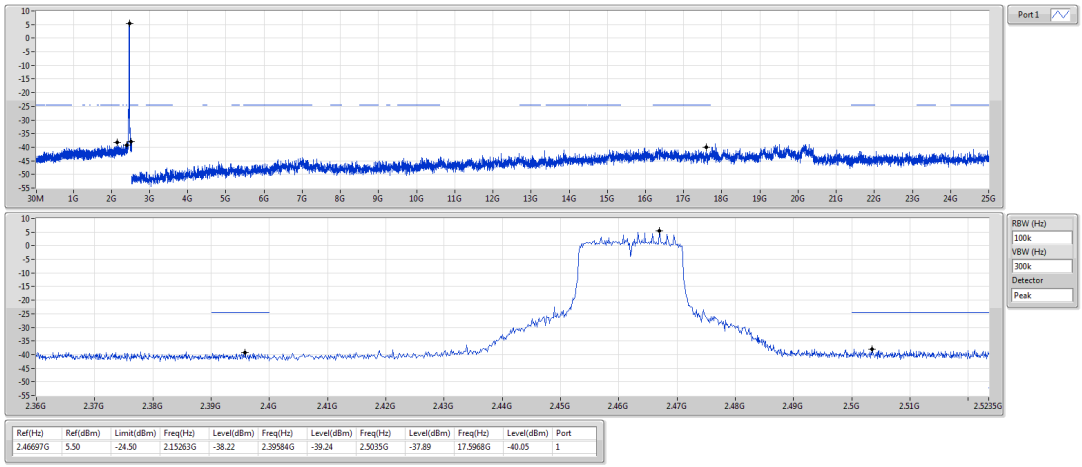
802.11n HT20_Nss1,(MCS0)_1TX **CSE NdB**

2437MHz



802.11n HT20_Nss1,(MCS0)_1TX **CSE NdB**

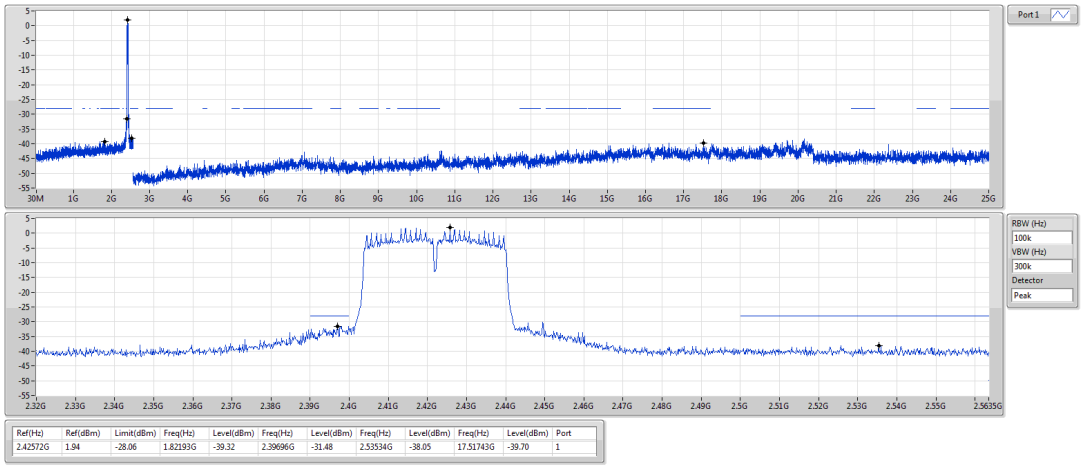
2462MHz



The previous version of the test report has been cancelled and replaced by new version.

802.11n HT40_Nss1,(MCS0)_1TX **CSE NdB**

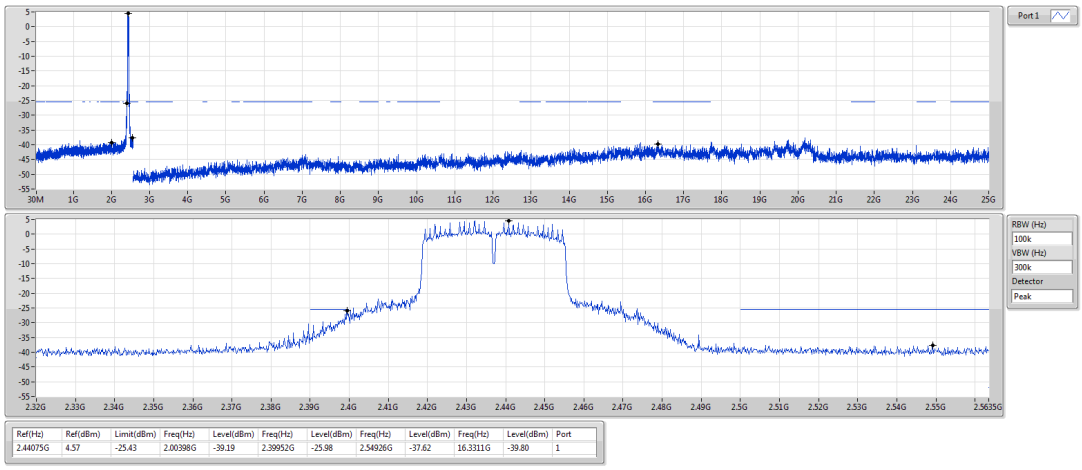
2422MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.42572G	1.94	-28.06	1.82193G	-39.32	2.39696G	-31.48	2.53534G	-38.05	17.51743G	-39.70	1

802.11n HT40_Nss1,(MCS0)_1TX **CSE NdB**

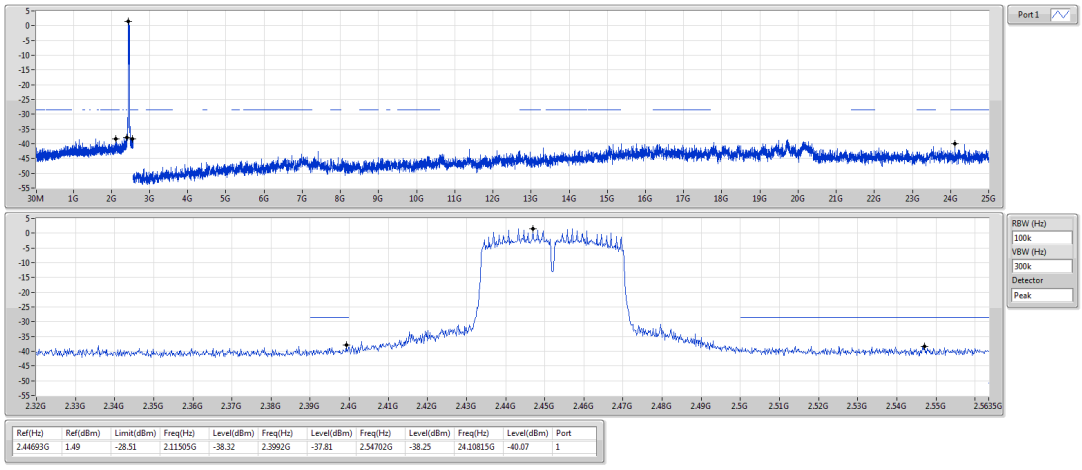
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44075G	4.57	-25.43	2.00398G	-39.19	2.39952G	-25.98	2.54926G	-37.62	16.3311G	-39.80	1

802.11n HT40_Nss1,(MCS0)_1TX **CSE NdB**

2452MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44693G	1.49	-28.51	2.11505G	-38.32	2.3992G	-37.81	2.54702G	-38.25	24.10815G	-40.07	1

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	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	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

==END==