FCC Test Report

FCC ID	:	**2ARU9NEPHUBL001**
Equipment	:	**Neptune IoT Hub Lite**
Model No.	:	**HM-HUB-120**
Brand Name	:	**HOMA**
Applicant	:	**HOMA Technologies JSC**
Address	:	**Building 5, 13th Street, QTSC Tan Chanh Hiep Ward, District 12, Ho Chi Minh city, 729226, Vietnam.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Nov. 09, 2018**
Tested Date	:	**Nov. 27 ~ Nov. 28, 2018**

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

Table of Contents

1 GENERAL DESCRIPTION 5

1.1 Information 5
1.2 Local Support Equipment List 8
1.3 Test Setup Chart 8
1.4 The Equipment List 9
1.5 Test Standards 10
1.6 Deviation from Test Standard and Measurement Procedure 10
1.7 Measurement Uncertainty 10

2 TEST CONFIGURATION 11

2.1 Testing Condition 11
2.2 The Worst Test Modes and Channel Details 11

3 TRANSMITTER TEST RESULTS 12

3.1 Conducted Emissions 12
3.2 6dB and Occupied Bandwidth 15
3.3 RF Output Power 21
3.4 Power Spectral Density 23
3.5 Unwanted Emissions into Restricted Frequency Bands 29
3.6 Emissions in Non-Restricted Frequency Bands 57

4 TEST LABORATORY INFORMATION 62

Release Record

Report No.	Version	Description	Issued Date
FR8N0901AC	Rev. 01	Initial issue	Feb. 15, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.396MHz 47.95 (Margin -20.68dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 52.92 (Margin -1.08dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 27.35	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 values of gain for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of the gain.

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]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15
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.	Model	Type	Connector	Gain (dBi)
1	2.4GHz,G1	PIFA	IPEX	1.75
2	2.4GHz,G2	PIFA	IPEX	2.22

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC Adapter	Brand: APD Model: WA-36A12R Power Rating: I/P: 100-240Vac, 50/60Hz, 0.9A Max O/P: 12Vdc, 3.0A Power Line: DC 1.8m non-shielded w/o 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	QDART, Version: V3.0.250.0		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	100.00%	0.00
	11g	96.97%	0.13
	HT20	99.14%	0.04
	HT40	97.18%	0.12

1.1.7 Power Index of Test Tool

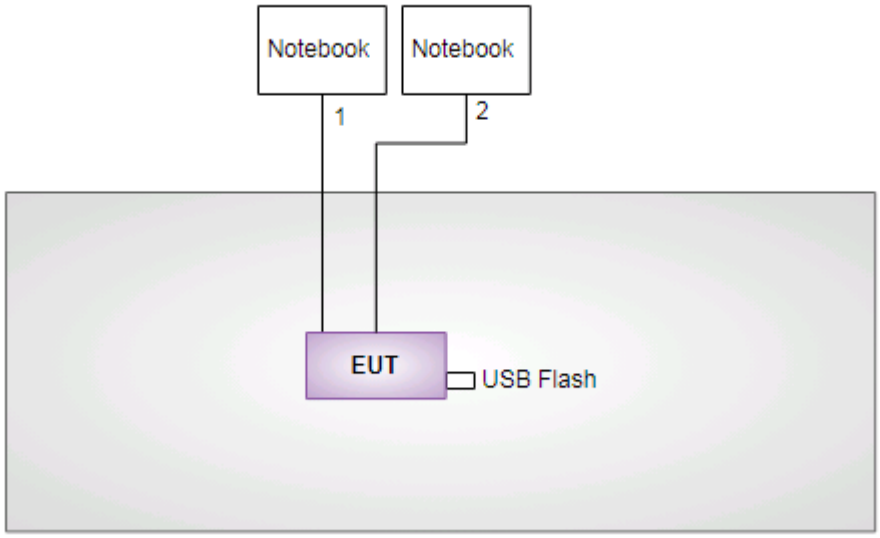
Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	23
11b	2437	22
11b	2462	22
11g	2412	18.5
11g	2437	23
11g	2462	18.5
HT20	2412	18
HT20	2437	23
HT20	2462	18
HT40	2422	16
HT40	2437	19
HT40	2452	16

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	Notebook	DELL	Latitude E5470	3J5JVF2	---
2	Notebook	DELL	Latitude E6430	9ZFB4X1	---
3	USB Flash	Kingston	DTSE9	NXPAB	---

1.3 Test Setup Chart

Test Setup Diagram



No.	Signal cable / Length (m)
1	RJ45, 10m 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. 05, 2018	Jan. 04, 2019
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 05, 2018	Nov. 04, 2019
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 23, 2018	Oct. 23, 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 1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2017	Dec. 03, 2018
Receiver	R&S	ESR3	101657	Jan. 05, 2018	Jan. 04, 2019
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 18, 2018	Jul. 17, 2019
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 20, 2017	Dec. 19, 2018
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	980225	Jul. 20, 2018	Jul. 19, 2019
Preamplifier	Agilent	83017A	MY39501308	Oct. 04, 2018	Oct. 03, 2019
Preamplifier	EMC	EMC184045B	980192	Aug. 09, 2018	Aug. 08, 2019
RF Cable	EMC	EMC104-SM-SM-8000	181106	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 08, 2018	Oct. 07, 2019
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 08, 2018	Oct. 07, 2019
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 08, 2018	Oct. 07, 2019
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 08, 2018	Oct. 07, 2019
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Oct. 08, 2018	Oct. 07, 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. 16, 2018	Apr. 15, 2019
Power Meter	Anritsu	ML2495A	1241002	Oct. 09, 2018	Oct. 08, 2019
Power Sensor	Anritsu	MA2411B	1207366	Oct. 09, 2018	Oct. 08, 2019
AC POWER SOURCE	APC	AFC-500W	F312060012	Dec. 01, 2017	Nov. 30, 2018
Measurement Software	Sporton	Sporton_1	1.3.30	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 v05
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

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

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.139 Hz
Conducted power	±0.808 dB
Power density	±0.557 dB
Conducted emission	±2.680 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.41 dB
Radiated emission > 1GHz	±4.59 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 57%	Alex Tsai
Radiated Emissions	03CH01-WS	24°C / 65-66%	Aska Huang Akun Chung
RF Conducted	TH01-WS	20°C / 65%	Aska Huang

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	11b	2412	1 Mbps	---
Radiated Emissions ≤1GHz	11b	2412	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	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.

3 Transmitter Test Results

3.1 Conducted Emissions

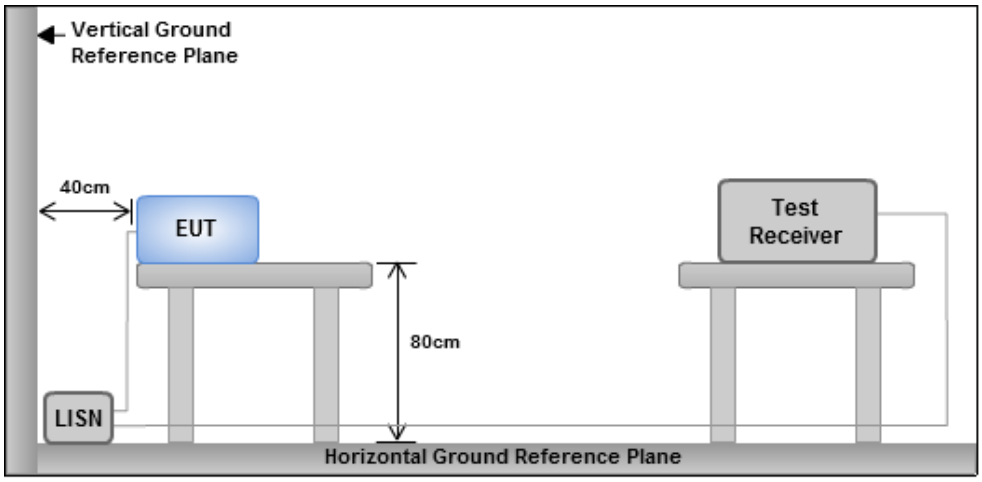
3.1.1 Limit of Conducted Emissions

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.

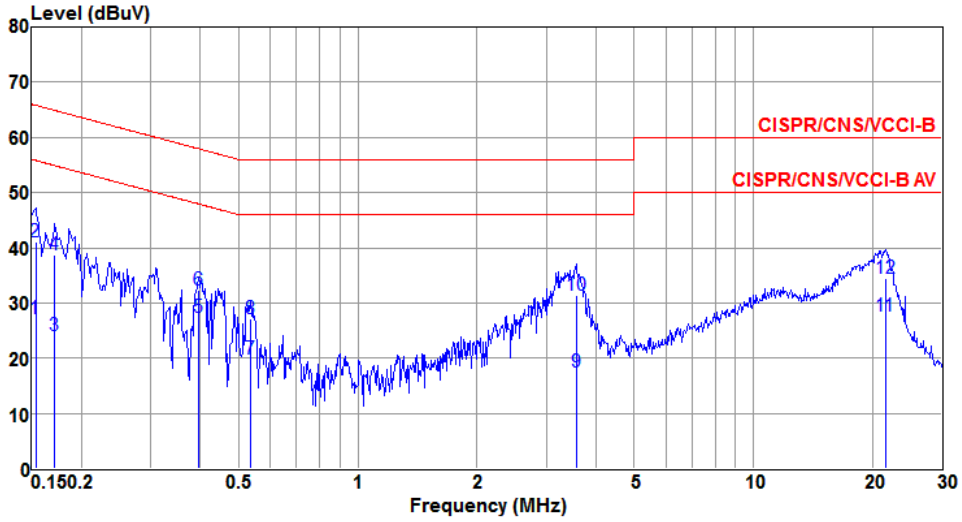
3.1.3 Test Setup



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

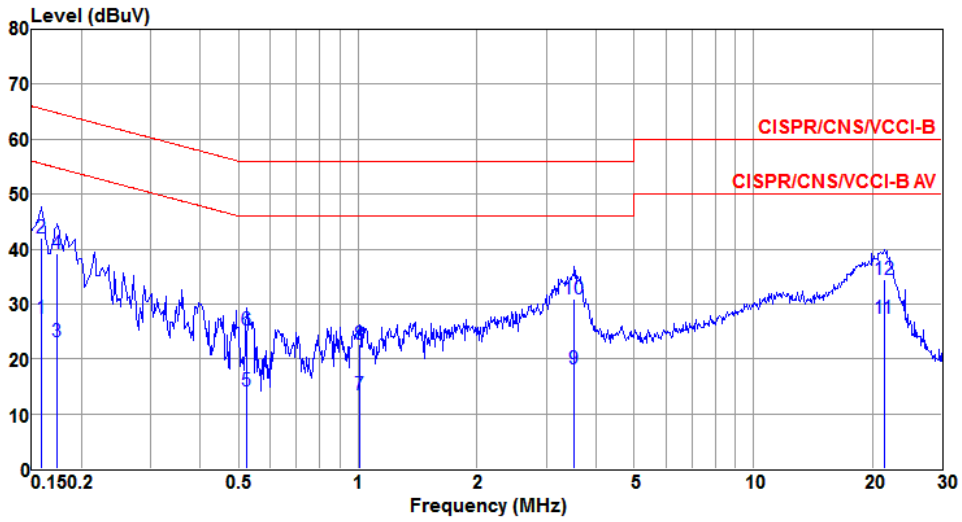
Modulation	11b	Test Freq. (MHz)	2412
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	27.25	55.82	-28.57	27.07	0.07	0.01	Average
2	0.153	41.13	65.82	-24.69	40.95	0.07	0.01	QP
3	0.171	24.06	54.90	-30.84	23.87	0.07	0.02	Average
4	0.171	38.71	64.90	-26.19	38.52	0.07	0.02	QP
5*	0.396	27.27	47.95	-20.68	27.04	0.06	0.02	Average
6	0.396	32.28	57.95	-25.67	32.05	0.06	0.02	QP
7	0.535	19.81	46.00	-26.19	19.55	0.07	0.02	Average
8	0.535	27.18	56.00	-28.82	26.92	0.07	0.02	QP
9	3.565	17.56	46.00	-28.44	16.99	0.11	0.20	Average
10	3.565	31.34	56.00	-24.66	30.77	0.11	0.20	QP
11	21.600	27.72	50.00	-22.28	26.60	0.25	0.36	Average
12	21.600	34.49	60.00	-25.51	33.37	0.25	0.36	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)	2412
Power Phase	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	27.28	55.52	-28.24	27.02	0.05	0.01	Average
2	0.159	41.93	65.52	-23.59	41.67	0.05	0.01	QP
3	0.174	23.09	54.77	-31.68	22.82	0.04	0.02	Average
4	0.174	39.14	64.77	-25.63	38.87	0.04	0.02	QP
5	0.524	14.14	46.00	-31.86	13.80	0.05	0.02	Average
6	0.524	25.26	56.00	-30.74	24.92	0.05	0.02	QP
7	1.010	13.36	46.00	-32.64	12.97	0.06	0.03	Average
8	1.010	22.55	56.00	-33.45	22.16	0.06	0.03	QP
9	3.528	18.09	46.00	-27.91	17.46	0.09	0.20	Average
10	3.528	30.82	56.00	-25.18	30.19	0.09	0.20	QP
11*	21.373	27.30	50.00	-22.70	26.06	0.27	0.35	Average
12	21.373	34.46	60.00	-25.54	33.22	0.27	0.35	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

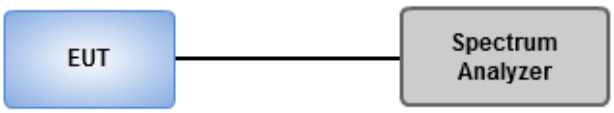
6dB Bandwidth

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)_2TX	8.043M	12.88M	12M9G1D	7.609M	12.735M
802.11g_Nss1,(6Mbps)_2TX	16.377M	16.498M	16M5D1D	16.304M	16.425M
802.11n HT20_Nss1,(MCS0)_2TX	17.609M	17.656M	17M7D1D	17.319M	17.583M
802.11n HT40_Nss1,(MCS0)_2TX	35.072M	36.035M	36M0D1D	31.014M	35.745M

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

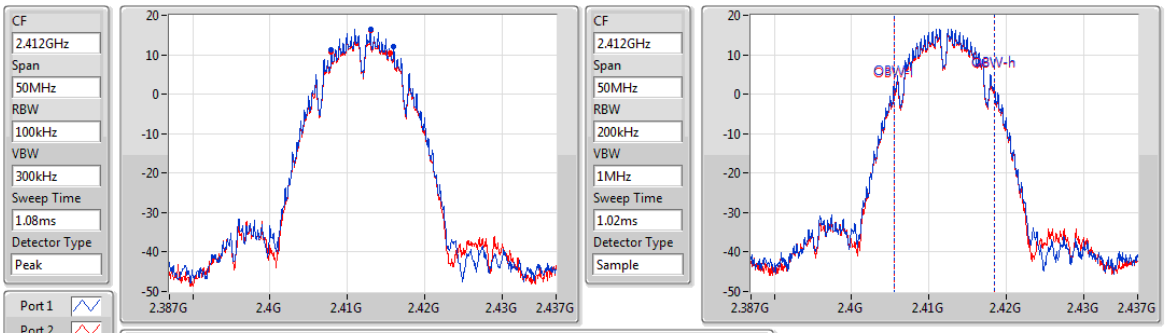
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	8.043M	12.88M	7.609M	12.88M
2437MHz	Pass	500k	8.043M	12.735M	8.043M	12.88M
2462MHz	Pass	500k	8.043M	12.735M	8.043M	12.88M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.377M	16.425M	16.377M	16.425M
2437MHz	Pass	500k	16.304M	16.498M	16.304M	16.425M
2462MHz	Pass	500k	16.304M	16.425M	16.304M	16.425M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.609M	17.583M	17.609M	17.583M
2437MHz	Pass	500k	17.536M	17.656M	17.319M	17.656M
2462MHz	Pass	500k	17.609M	17.583M	17.609M	17.583M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	33.913M	35.89M	31.014M	35.89M
2437MHz	Pass	500k	35.072M	36.035M	35.072M	35.89M
2452MHz	Pass	500k	33.913M	35.89M	32.609M	35.745M

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

802.11b_Nss1,(1Mbps)_2TX EBW

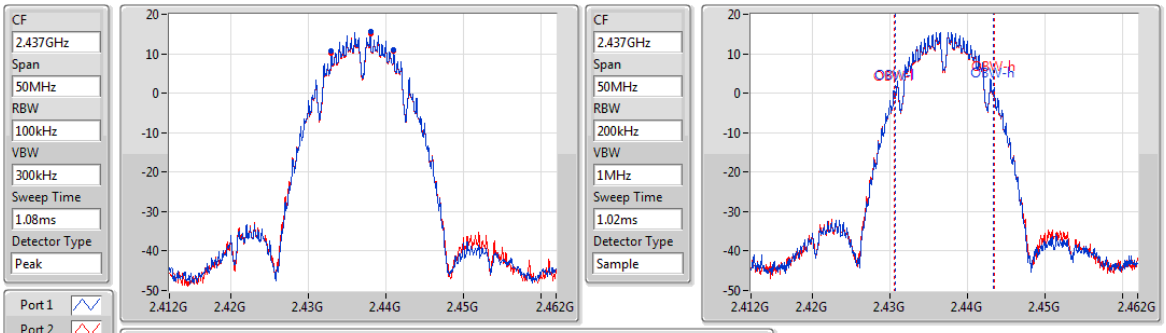
2412MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.043M	2.407942G	2.415986G	12.88M	2.40556G	2.41844G	500k	1
7.609M	2.407942G	2.415551G	12.88M	2.40556G	2.41844G	500k	2

802.11b_Nss1,(1Mbps)_2TX EBW

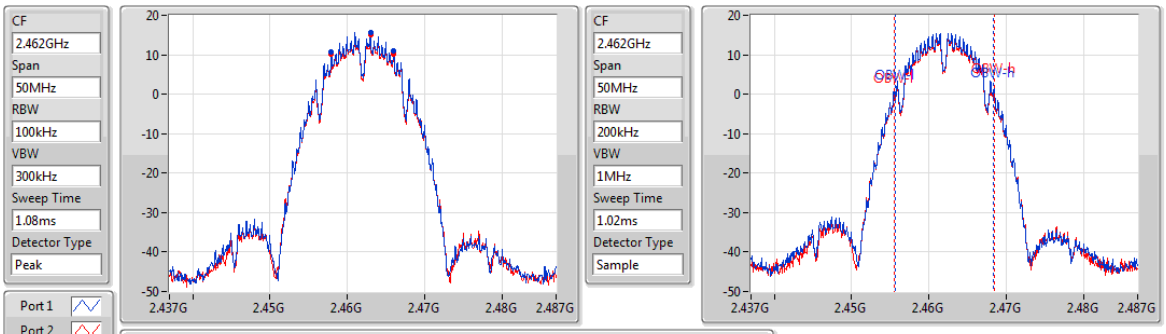
2437MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.043M	2.432942G	2.440986G	12.735M	2.430632G	2.443368G	500k	1
8.043M	2.432942G	2.440986G	12.88M	2.43056G	2.44344G	500k	2

802.11b_Nss1,(1Mbps)_2TX EBW

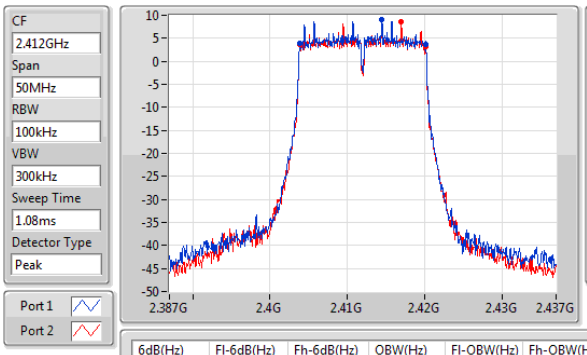
2462MHz

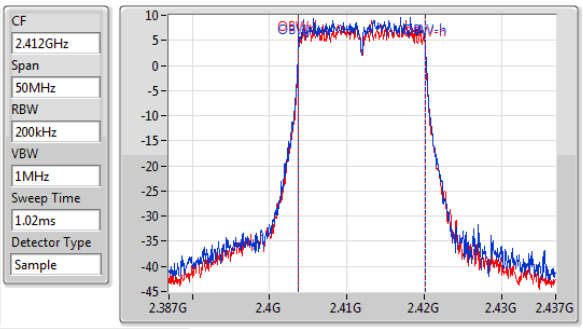


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.043M	2.457942G	2.465986G	12.735M	2.455632G	2.468368G	500k	1
8.043M	2.457942G	2.465986G	12.88M	2.45556G	2.46844G	500k	2

802.11g_Nss1,(6Mbps)_2TX EBW

2412MHz

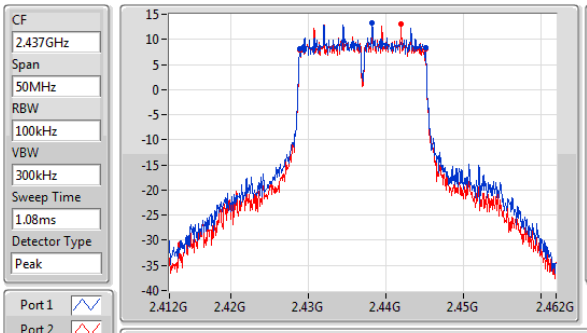


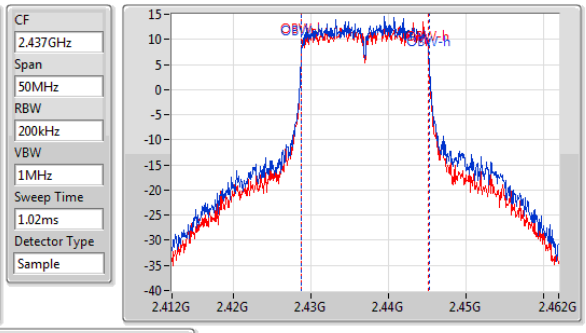


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.403812G	2.420188G	16.425M	2.403751G	2.420177G	500k	1
16.377M	2.403812G	2.420188G	16.425M	2.403751G	2.420177G	500k	2

802.11g_Nss1,(6Mbps)_2TX EBW

2437MHz

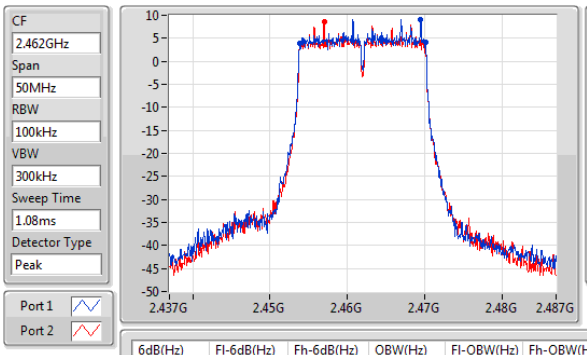


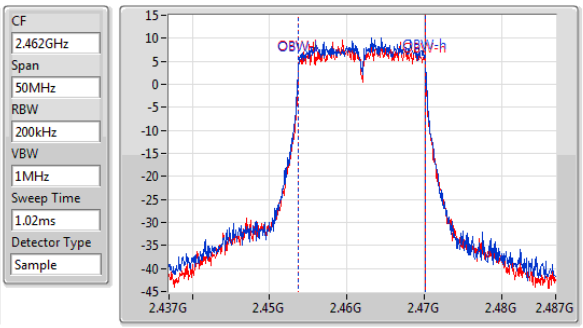


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.304M	2.428812G	2.445116G	16.498M	2.428751G	2.445249G	500k	1
16.304M	2.428812G	2.445116G	16.425M	2.428751G	2.445177G	500k	2

802.11g_Nss1,(6Mbps)_2TX EBW

2462MHz

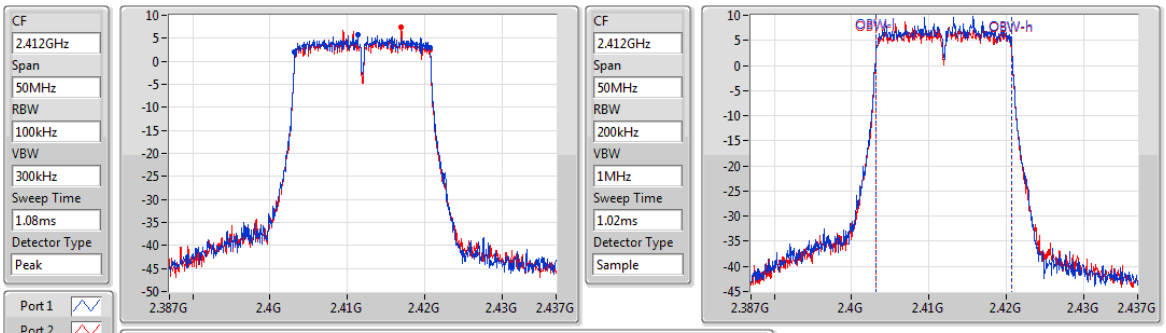




6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.304M	2.453812G	2.470116G	16.425M	2.453751G	2.470177G	500k	1
16.304M	2.453812G	2.470116G	16.425M	2.453751G	2.470177G	500k	2

802.11n HT20_Nss1,(MCS0)_2TX EBW

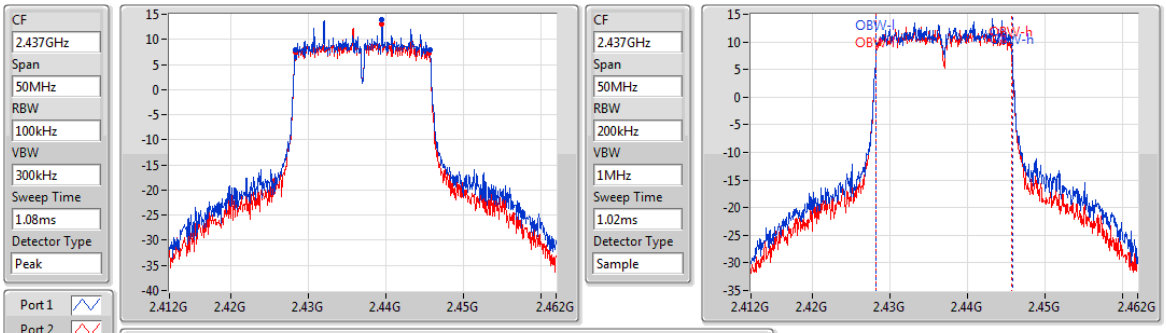
2412MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.609M	2.403159G	2.420768G	17.583M	2.403172G	2.420755G	500k	1
17.609M	2.403159G	2.420768G	17.583M	2.403172G	2.420755G	500k	2

802.11n HT20_Nss1,(MCS0)_2TX EBW

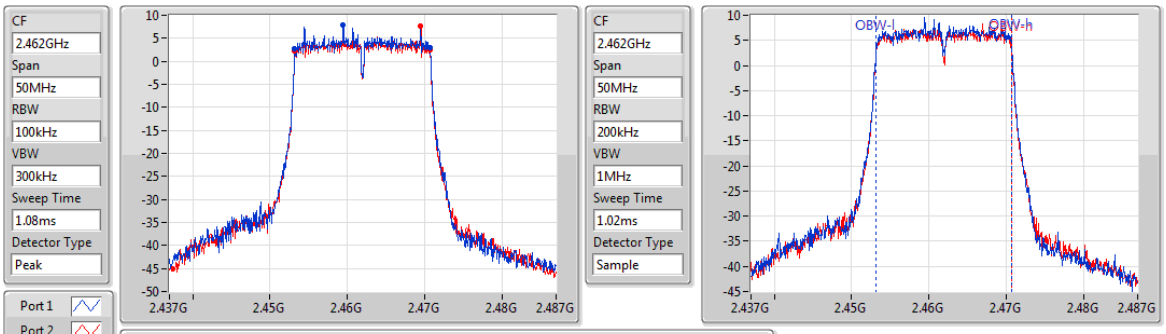
2437MHz



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	17.656M	2.428172G	2.445828G	500k	1
17.319M	2.428232G	2.445551G	17.656M	2.4281G	2.445755G	500k	2

802.11n HT20_Nss1,(MCS0)_2TX EBW

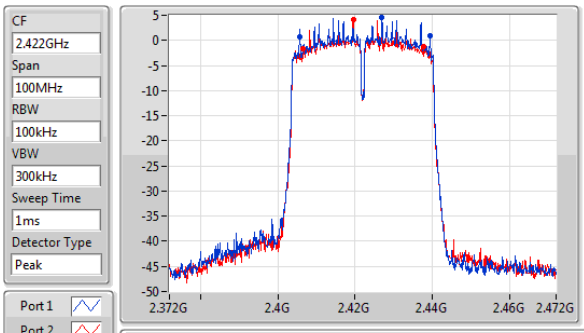
2462MHz

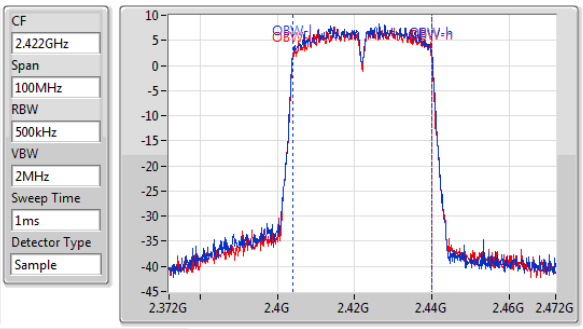


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
17.609M	2.453159G	2.470768G	17.583M	2.453172G	2.470755G	500k	1
17.609M	2.453159G	2.470768G	17.583M	2.453172G	2.470755G	500k	2

802.11n HT40_Nss1,(MCS0)_2TX EBW

2422MHz

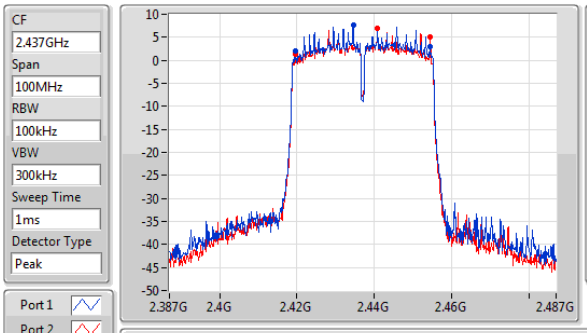


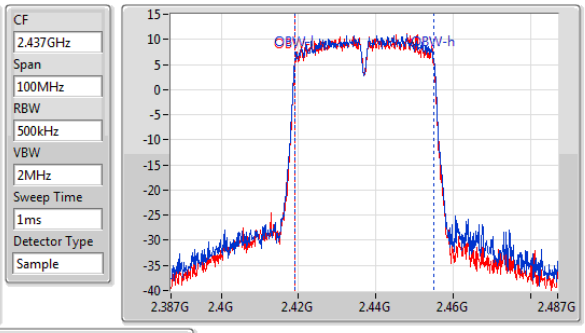


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
33.913M	2.405623G	2.439536G	35.89M	2.404055G	2.439945G	500k	1
31.014M	2.406638G	2.437652G	35.89M	2.404055G	2.439945G	500k	2

802.11n HT40_Nss1,(MCS0)_2TX EBW

2437MHz

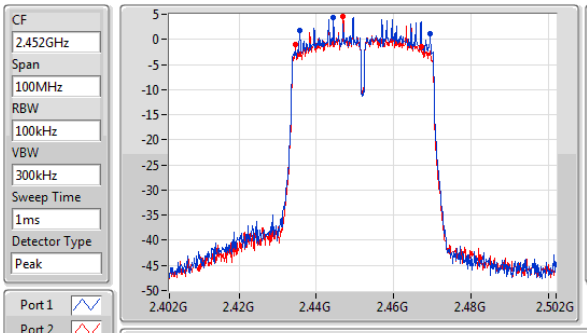


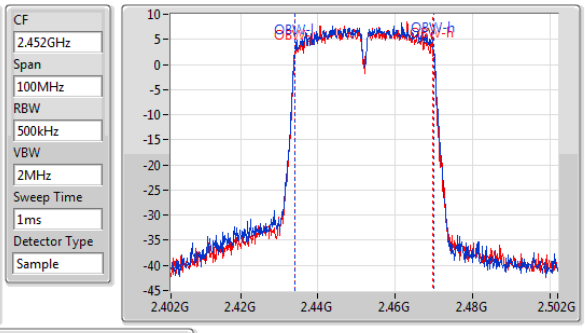


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
35.072M	2.419464G	2.454536G	36.035M	2.419055G	2.45509G	500k	1
35.072M	2.419464G	2.454536G	35.89M	2.419055G	2.454945G	500k	2

802.11n HT40_Nss1,(MCS0)_2TX EBW

2452MHz





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
33.913M	2.435623G	2.469536G	35.89M	2.434055G	2.469945G	500k	1
32.609M	2.434464G	2.467072G	35.745M	2.434055G	2.4698G	500k	2

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)_2TX	**27.35**	**0.54325**
802.11g_Nss1,(6Mbps)_2TX	27.10	0.51286
802.11n HT20_Nss1,(MCS0)_2TX	27.08	0.51050
802.11n HT40_Nss1,(MCS0)_2TX	23.61	0.22961

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.22	24.35	24.33	27.35	30.00	29.57	36.00
2437MHz	Pass	2.22	23.42	23.5	26.47	30.00	28.69	36.00
2462MHz	Pass	2.22	23.27	23.15	26.22	30.00	28.44	36.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.22	20.01	20.03	23.03	30.00	25.25	36.00
2437MHz	Pass	2.22	24.15	24.02	27.10	30.00	29.32	36.00
2462MHz	Pass	2.22	19.99	19.78	22.90	30.00	25.12	36.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2412MHz	Pass	2.22	19.46	19.45	22.47	30.00	24.69	36.00
2437MHz	Pass	2.22	24.11	24.03	27.08	30.00	29.30	36.00
2462MHz	Pass	2.22	19.43	19.25	22.35	30.00	24.57	36.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
2422MHz	Pass	2.22	17.6	17.45	20.54	30.00	22.76	36.00
2437MHz	Pass	2.22	20.6	20.59	23.61	30.00	25.83	36.00
2452MHz	Pass	2.22	17.55	17.29	20.43	30.00	22.65	36.00

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

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

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 ≥ 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.

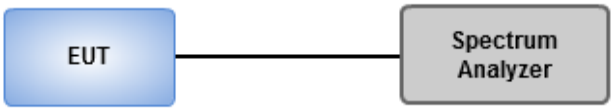
2 Set the sweep time to: ≥ 10 (number of measurement points in sweep) x (total on/off period of the transmitted signal).

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	PD (dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	5.85
802.11g_Nss1,(6Mbps)_2TX	2.00
802.11n HT20_Nss1,(MCS0)_2TX	2.38
802.11n HT40_Nss1,(MCS0)_2TX	-4.22

RBW=3kHz.

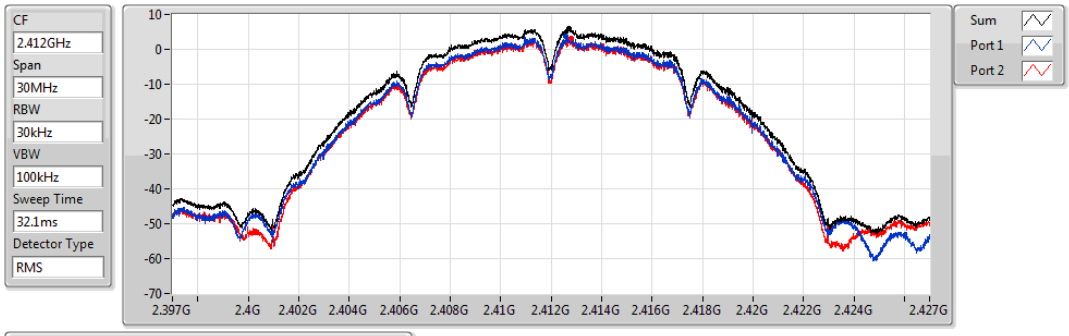
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.00	3.70	3.06	5.85	8.00
2437MHz	Pass	5.00	2.29	1.97	4.97	8.00
2462MHz	Pass	5.00	2.13	2.50	5.02	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.00	-4.90	-5.33	-2.21	8.00
2437MHz	Pass	5.00	-0.74	-0.92	2.00	8.00
2462MHz	Pass	5.00	-4.83	-5.32	-2.17	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.00	-4.52	-5.03	-1.90	8.00
2437MHz	Pass	5.00	-0.26	-0.46	2.38	8.00
2462MHz	Pass	5.00	-4.47	-5.07	-2.13	8.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.00	-9.94	-10.60	-7.28	8.00
2437MHz	Pass	5.00	-6.93	-7.41	-4.22	8.00
2452MHz	Pass	5.00	-10.15	-10.63	-7.45	8.00

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

802.11b_Nss1,(1Mbps)_2TX PSD

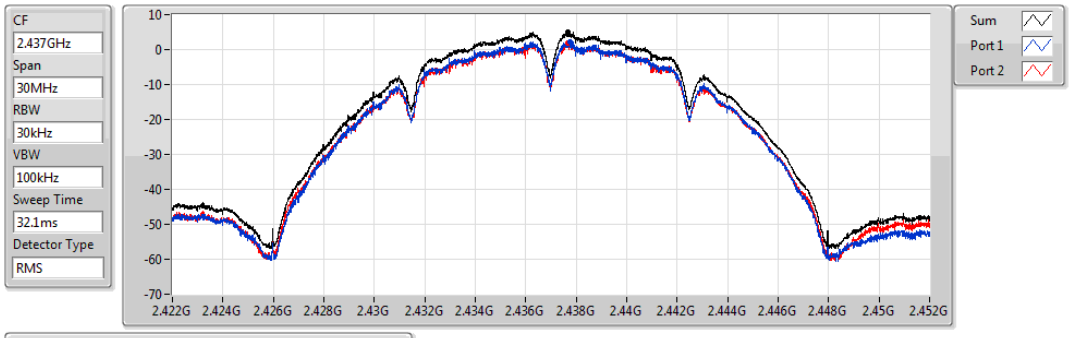
2412MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.85	5.85	3.70	3.06

802.11b_Nss1,(1Mbps)_2TX PSD

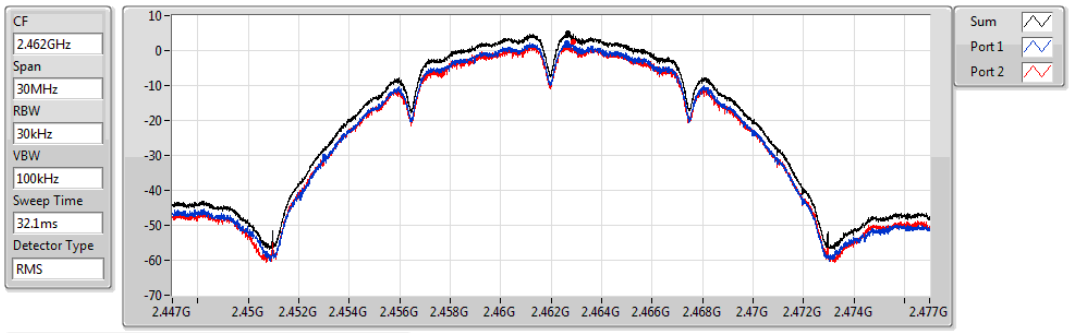
2437MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
4.97	4.97	2.29	1.97

802.11b_Nss1,(1Mbps)_2TX PSD

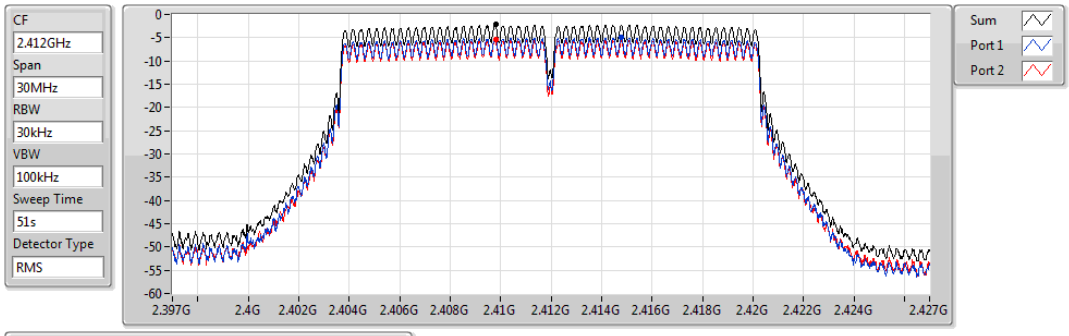
2462MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.02	5.02	2.13	2.50

802.11g_Nss1,(6Mbps)_2TX **PSD**

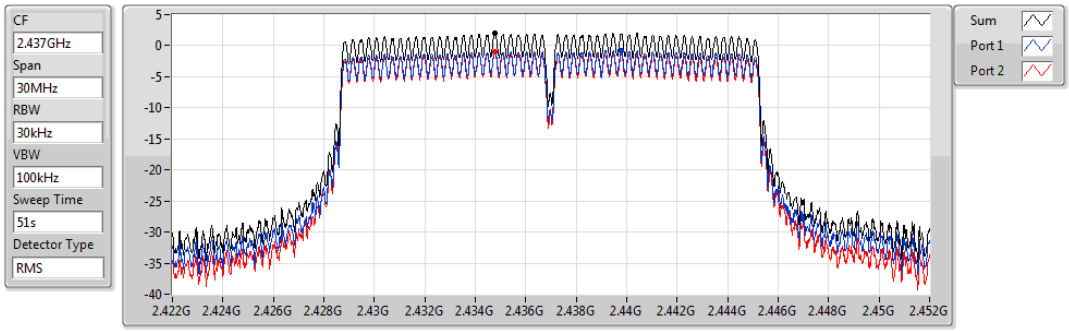
2412MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.21	-2.21	-4.90	-5.33

802.11g_Nss1,(6Mbps)_2TX **PSD**

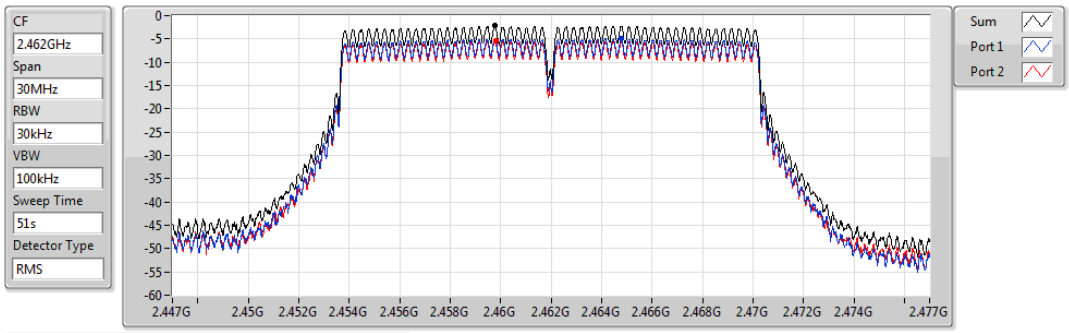
2437MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.00	2.00	-0.74	-0.92

802.11g_Nss1,(6Mbps)_2TX **PSD**

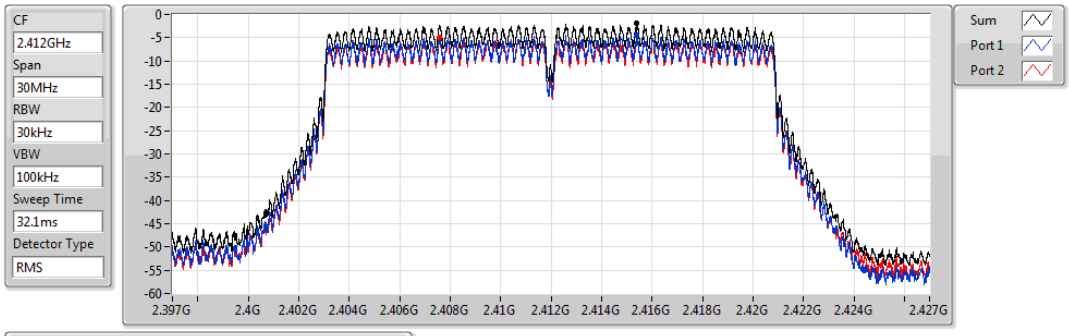
2462MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.17	-2.17	-4.83	-5.32

802.11n HT20_Nss1,(MCS0)_2TX PSD

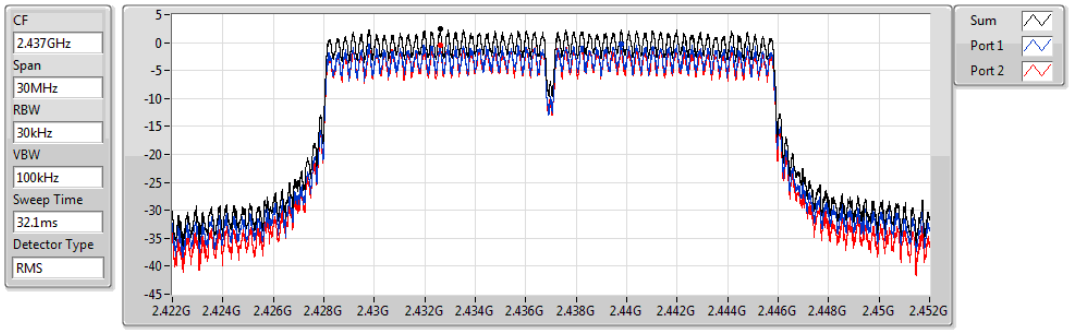
2412MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.90	-1.90	-4.52	-5.03

802.11n HT20_Nss1,(MCS0)_2TX PSD

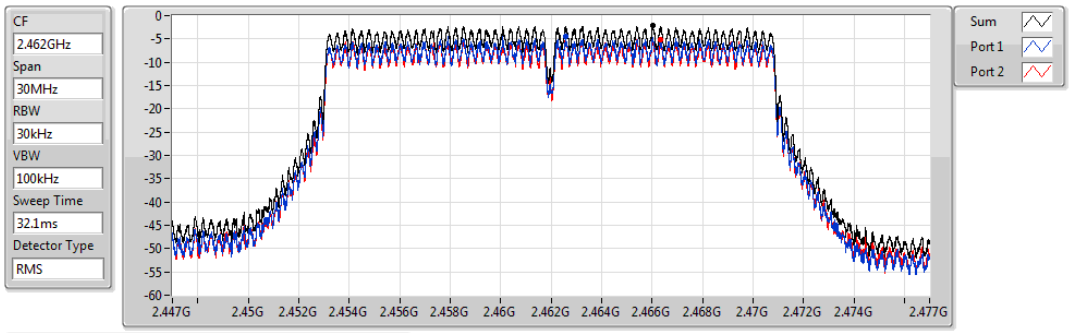
2437MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
2.38	2.38	-0.26	-0.46

802.11n HT20_Nss1,(MCS0)_2TX PSD

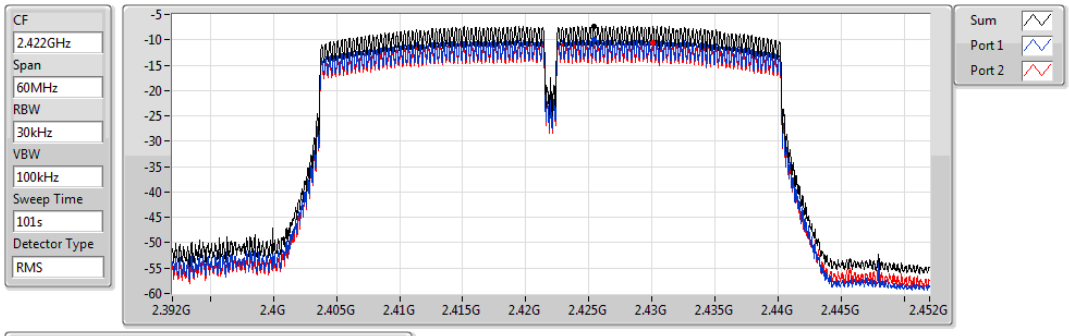
2462MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.13	-2.13	-4.47	-5.07

802.11n HT40_Nss1,(MCS0)_2TX PSD

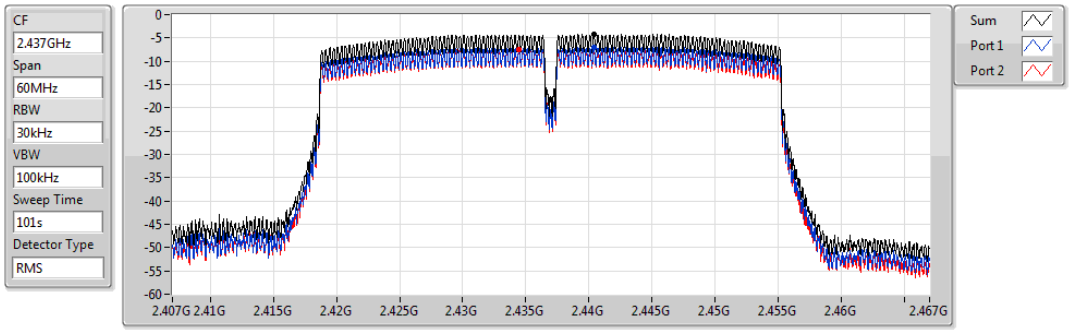
2422MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.28	-7.28	-9.94	-10.60

802.11n HT40_Nss1,(MCS0)_2TX PSD

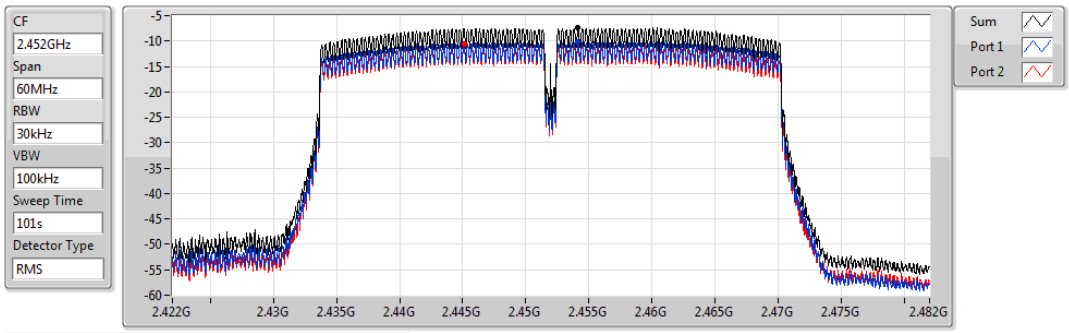
2437MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.22	-4.22	-6.93	-7.41

802.11n HT40_Nss1,(MCS0)_2TX PSD

2452MHz



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.45	-7.45	-10.15	-10.63

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

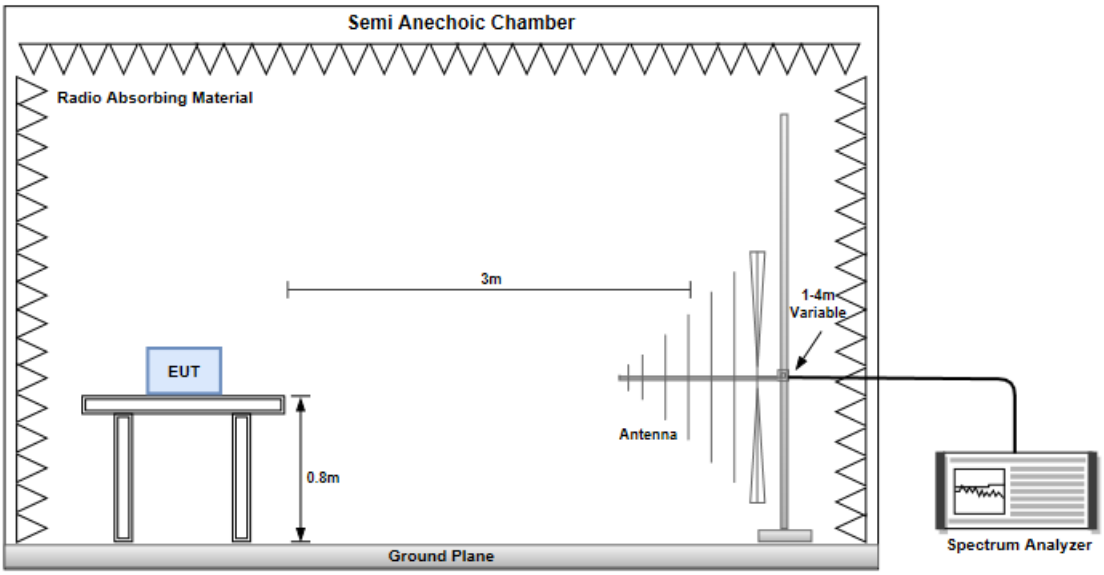
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

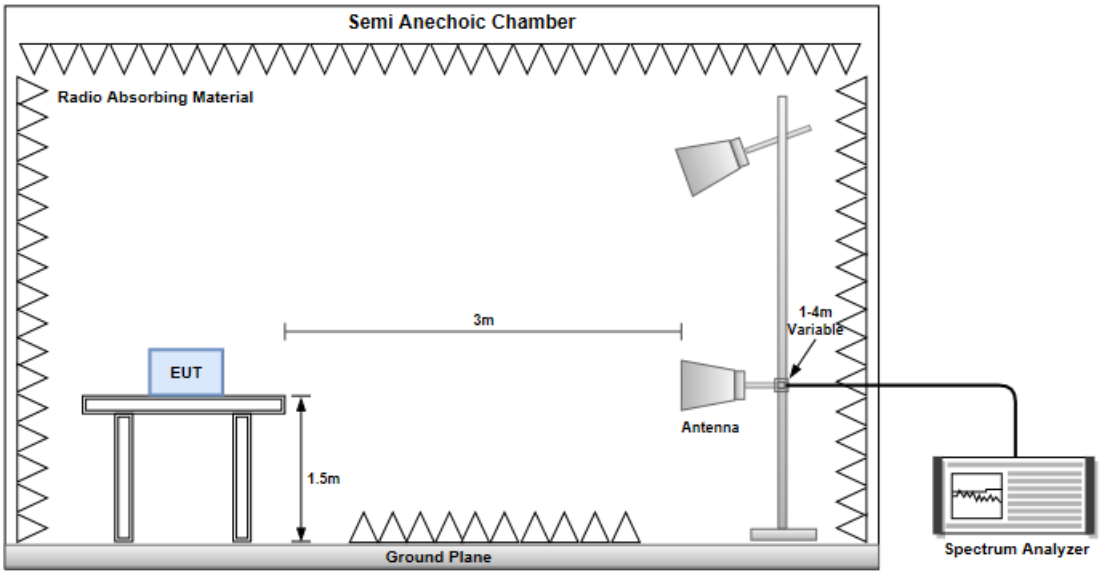
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

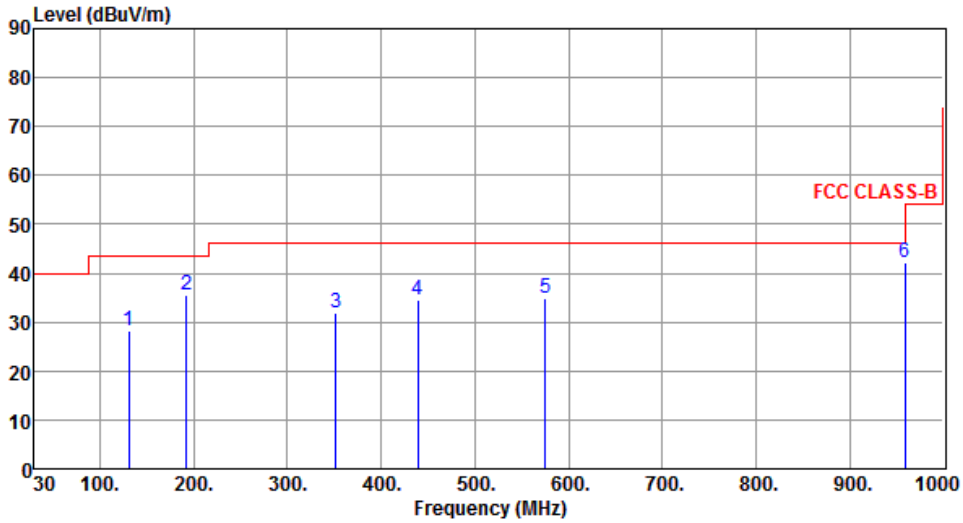


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

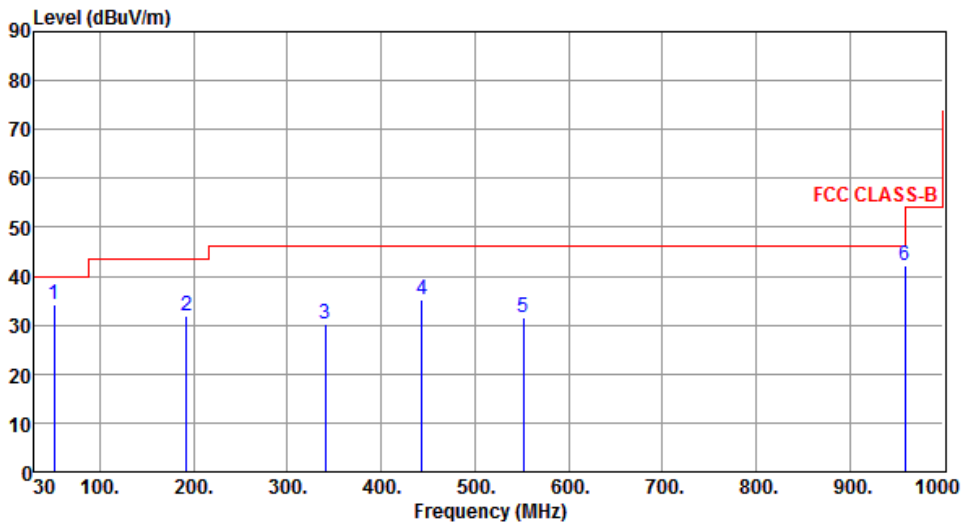
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	130.88	28.13	43.50	-15.37	37.65	-9.52	Peak	---	---
2	191.99	35.62	43.50	-7.88	46.20	-10.58	Peak	---	---
3	352.04	32.02	46.00	-13.98	38.63	-6.61	Peak	---	---
4	439.34	34.63	46.00	-11.37	39.05	-4.42	Peak	---	---
5	575.14	35.03	46.00	-10.97	36.55	-1.52	Peak	---	---
6	959.26	42.23	46.00	-3.77	38.03	4.20	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)	2412
Polarization	Vertical		

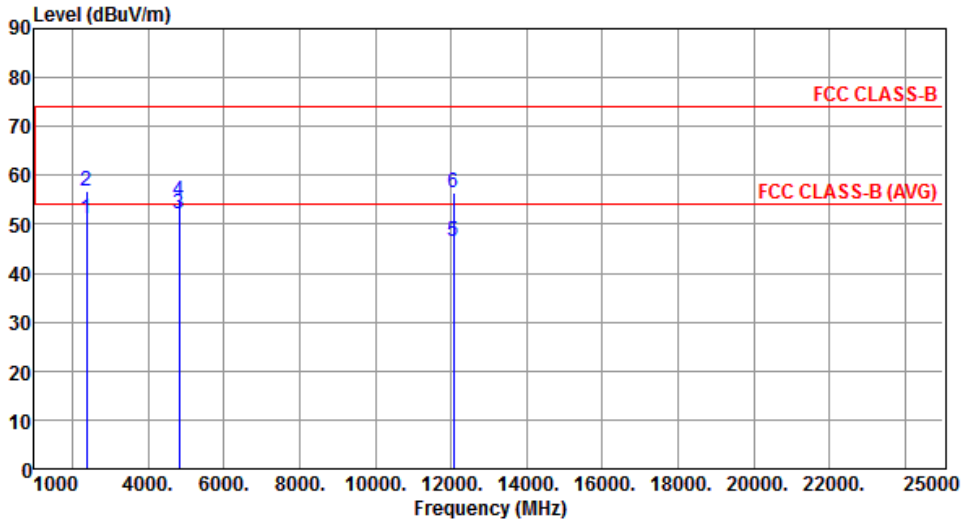


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	51.34	34.25	40.00	-5.75	42.15	-7.90	Peak	---	---
2	191.99	31.80	43.50	-11.70	42.38	-10.58	Peak	---	---
3	340.40	30.34	46.00	-15.66	37.20	-6.86	Peak	---	---
4	443.22	35.28	46.00	-10.72	39.62	-4.34	Peak	---	---
5	551.86	31.53	46.00	-14.47	33.46	-1.93	Peak	---	---
6	959.26	42.15	46.00	-3.85	37.95	4.20	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

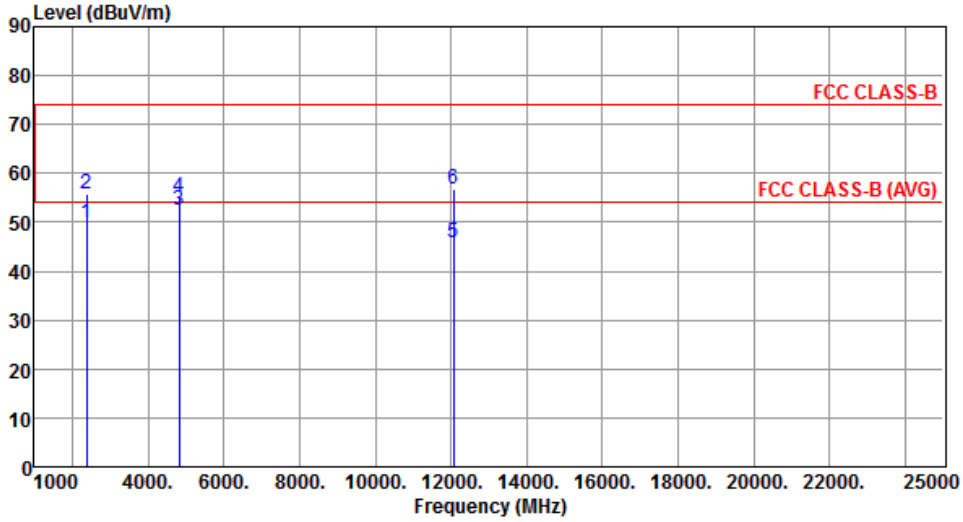
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	50.98	54.00	-3.02	54.05	-3.07	Average	181	85
2	2390.00	56.95	74.00	-17.05	60.02	-3.07	Peak	181	85
3	4824.00	52.04	54.00	-1.96	48.51	3.53	Average	185	193
4	4824.00	54.72	74.00	-19.28	51.19	3.53	Peak	185	193
5	12060.00	46.53	54.00	-7.47	33.26	13.27	Average	140	200
6	12060.00	56.61	74.00	-17.39	43.34	13.27	Peak	140	200

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).

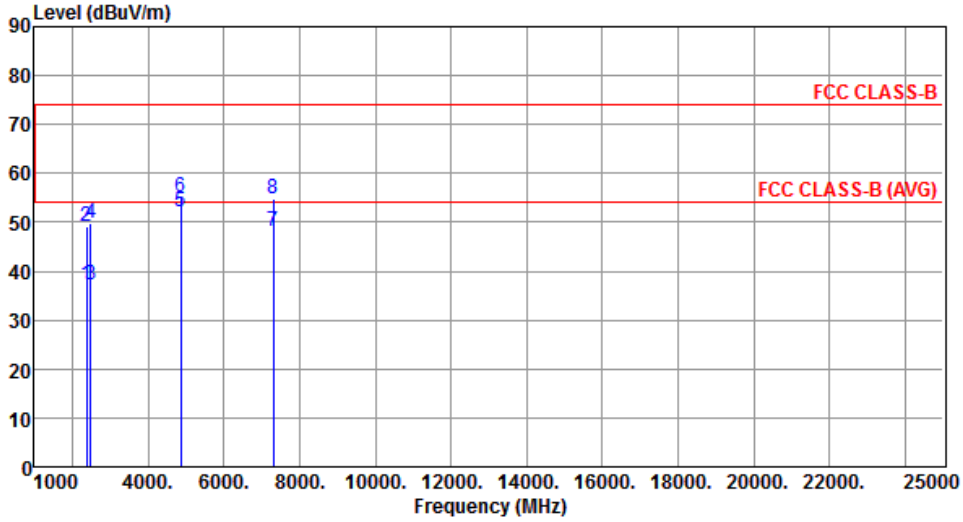
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	49.90	54.00	-4.10	52.97	-3.07	Average	100	58
2	2390.00	55.70	74.00	-18.30	58.77	-3.07	Peak	100	58
3	4824.00	52.34	54.00	-1.66	48.81	3.53	Average	341	150
4	4824.00	55.02	74.00	-18.98	51.49	3.53	Peak	341	150
5	12060.00	45.93	54.00	-8.07	32.66	13.27	Average	107	183
6	12060.00	56.94	74.00	-17.06	43.67	13.27	Peak	107	183

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).

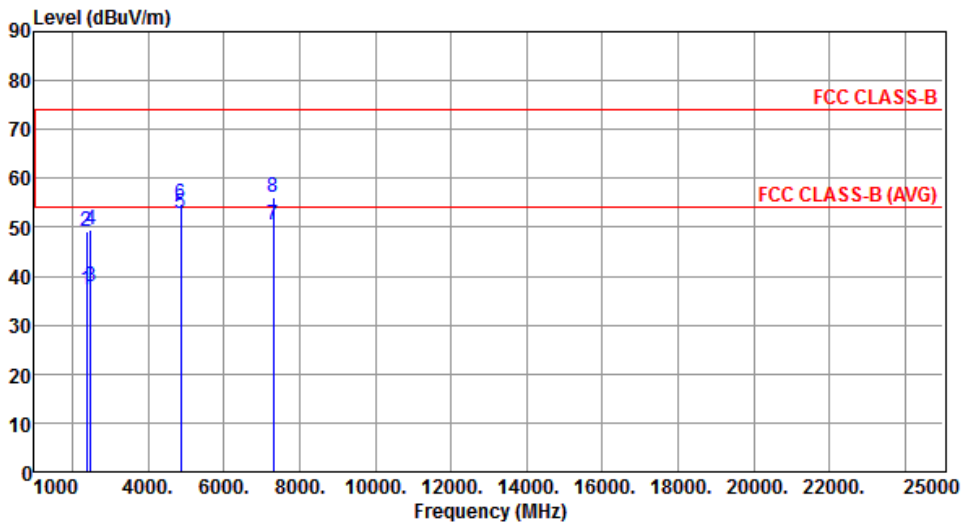
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	37.21	54.00	-16.79	40.28	-3.07	Average	184	288
2	2390.00	48.99	74.00	-25.01	52.06	-3.07	Peak	184	288
3	2483.50	37.29	54.00	-16.71	40.51	-3.22	Average	184	288
4	2483.50	49.79	74.00	-24.21	53.01	-3.22	Peak	184	288
5	4874.00	52.28	54.00	-1.72	48.68	3.60	Average	178	184
6	4874.00	54.99	74.00	-19.01	51.39	3.60	Peak	178	184
7	7311.00	48.16	54.00	-5.84	39.34	8.82	Average	381	166
8	7311.00	54.88	74.00	-19.12	46.06	8.82	Peak	381	166

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).

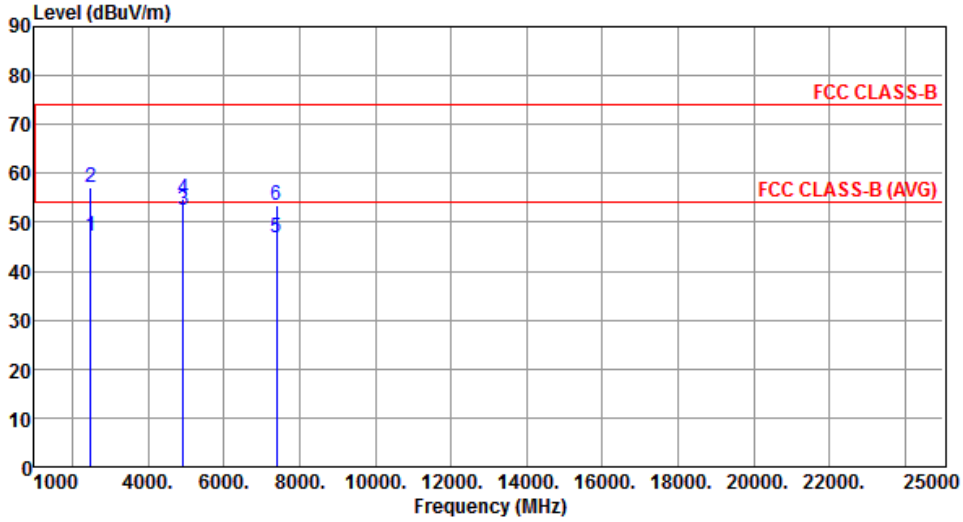
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	37.20	54.00	-16.80	40.27	-3.07	Average	198	8
2	2390.00	49.27	74.00	-24.73	52.34	-3.07	Peak	198	8
3	2483.50	37.84	54.00	-16.16	41.06	-3.22	Average	198	8
4	2483.50	49.37	74.00	-24.63	52.59	-3.22	Peak	198	8
5	4874.00	52.68	54.00	-1.32	49.08	3.60	Average	328	175
6	4874.00	54.76	74.00	-19.24	51.16	3.60	Peak	328	175
7	7311.00	50.44	54.00	-3.56	41.62	8.82	Average	310	156
8	7311.00	56.15	74.00	-17.85	47.33	8.82	Peak	310	156

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).

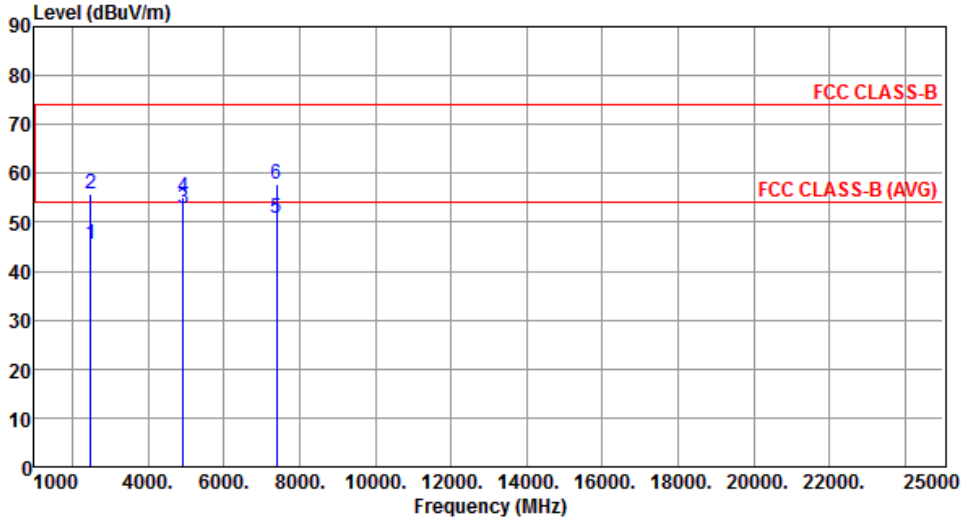
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	47.28	54.00	-6.72	50.50	-3.22	Average	180	289
2	2483.50	57.18	74.00	-16.82	60.40	-3.22	Peak	180	289
3	4924.00	52.48	54.00	-1.52	48.77	3.71	Average	182	196
4	4924.00	54.72	74.00	-19.28	51.01	3.71	Peak	182	196
5	7386.00	46.87	54.00	-7.13	38.32	8.55	Average	371	169
6	7386.00	53.63	74.00	-20.37	45.08	8.55	Peak	371	169

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		

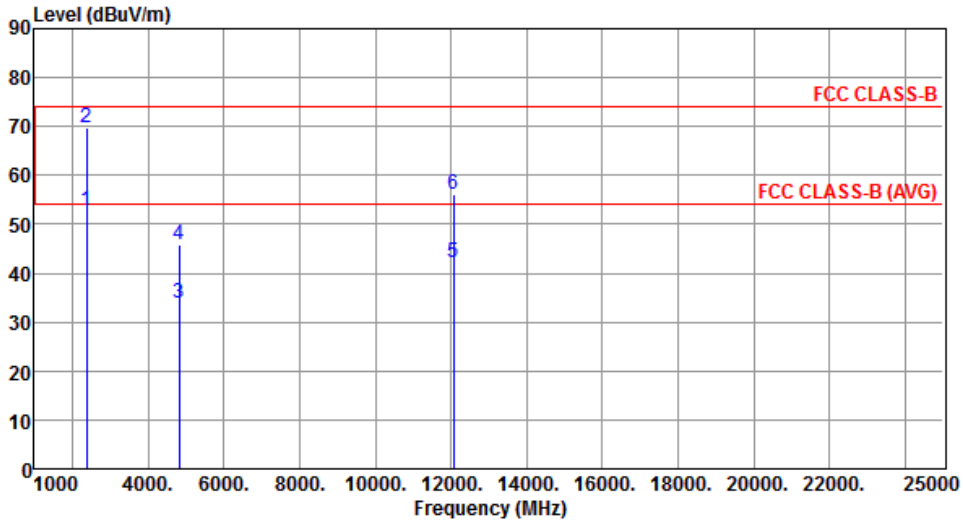


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	45.37	54.00	-8.63	48.59	-3.22	Average	215	334
2	2483.50	55.72	74.00	-18.28	58.94	-3.22	Peak	215	334
3	4924.00	52.84	54.00	-1.16	49.13	3.71	Average	293	155
4	4924.00	55.04	74.00	-18.96	51.33	3.71	Peak	293	155
5	7386.00	50.66	54.00	-3.34	42.11	8.55	Average	293	160
6	7386.00	57.93	74.00	-16.07	49.38	8.55	Peak	293	160

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

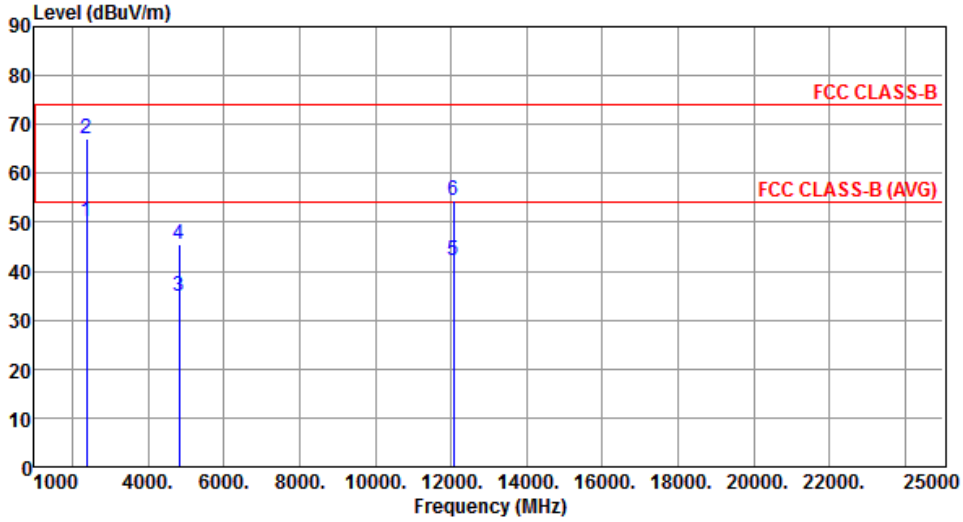
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.74	54.00	-1.26	55.81	-3.07	Average	219	290
2	2390.00	69.71	74.00	-4.29	72.78	-3.07	Peak	219	290
3	4824.00	33.89	54.00	-20.11	30.36	3.53	Average	100	207
4	4824.00	45.89	74.00	-28.11	42.36	3.53	Peak	100	207
5	12060.00	42.05	54.00	-11.95	28.78	13.27	Average	100	158
6	12060.00	55.99	74.00	-18.01	42.72	13.27	Peak	100	158

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).

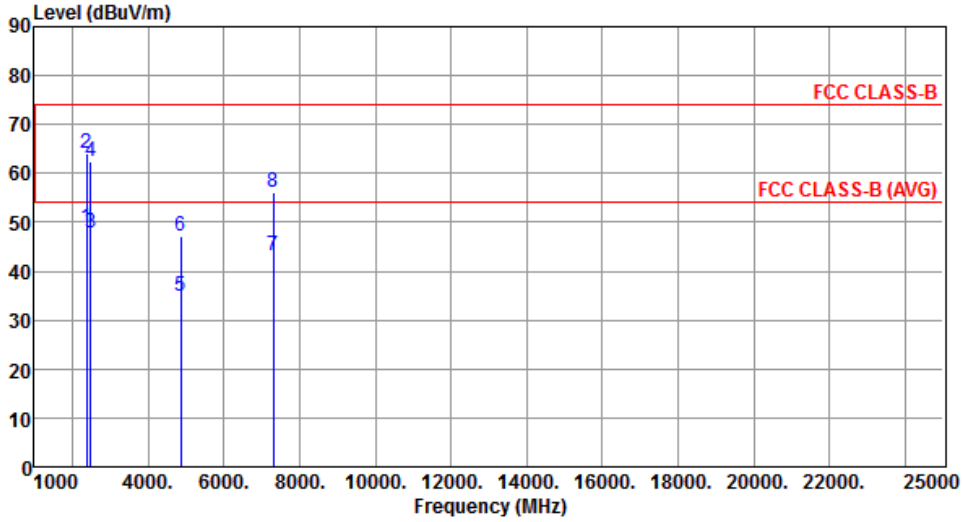
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	50.27	54.00	-3.73	53.34	-3.07	Average	223	17
2	2390.00	67.14	74.00	-6.86	70.21	-3.07	Peak	223	17
3	4824.00	34.75	54.00	-19.25	31.22	3.53	Average	302	165
4	4824.00	45.36	74.00	-28.64	41.83	3.53	Peak	302	165
5	12060.00	42.07	54.00	-11.93	28.80	13.27	Average	100	162
6	12060.00	54.61	74.00	-19.39	41.34	13.27	Peak	100	162

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).

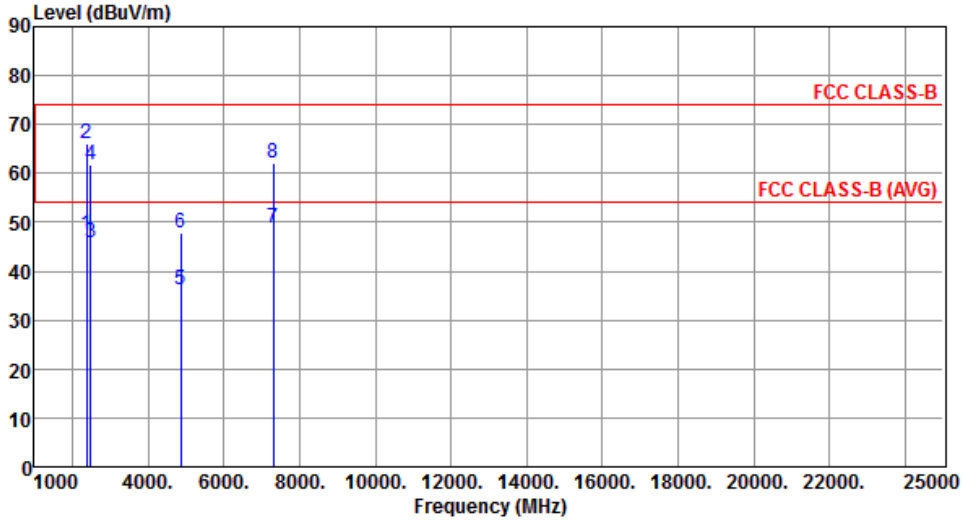
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	48.95	54.00	-5.05	52.02	-3.07	Average	242	281
2	2390.00	63.98	74.00	-10.02	67.05	-3.07	Peak	242	281
3	2483.50	47.73	54.00	-6.27	50.95	-3.22	Average	210	296
4	2483.50	62.57	74.00	-11.43	65.79	-3.22	Peak	210	296
5	4874.00	34.87	54.00	-19.13	31.27	3.60	Average	238	189
6	4874.00	47.28	74.00	-26.72	43.68	3.60	Peak	238	189
7	7311.00	43.34	54.00	-10.66	34.52	8.82	Average	142	152
8	7311.00	56.23	74.00	-17.77	47.41	8.82	Peak	142	152

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).

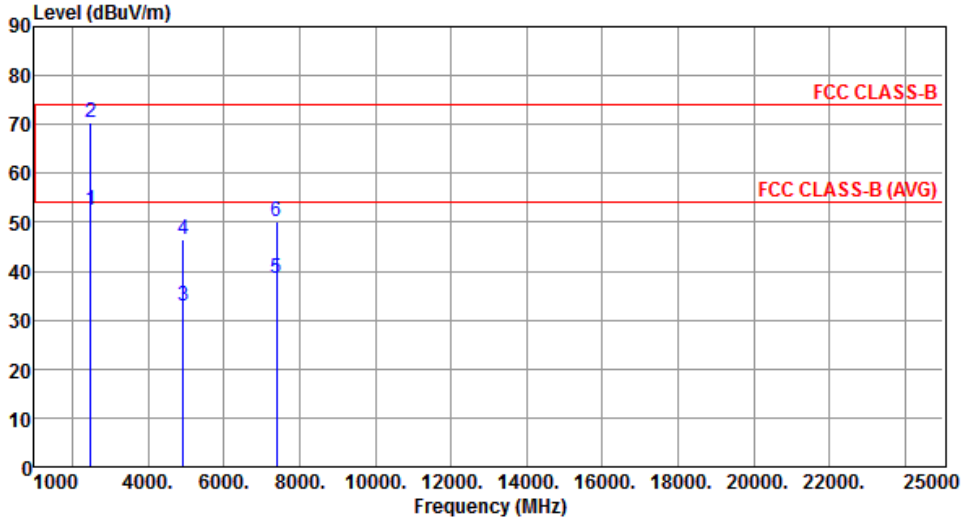
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	47.56	54.00	-6.44	50.63	-3.07	Average	232	9
2	2390.00	66.14	74.00	-7.86	69.21	-3.07	Peak	232	9
3	2483.50	45.69	54.00	-8.31	48.91	-3.22	Average	232	9
4	2483.50	61.89	74.00	-12.11	65.11	-3.22	Peak	232	9
5	4874.00	36.07	54.00	-17.93	32.47	3.60	Average	323	161
6	4874.00	47.76	74.00	-26.24	44.16	3.60	Peak	323	161
7	7311.00	48.88	54.00	-5.12	40.06	8.82	Average	296	162
8	7311.00	62.21	74.00	-11.79	53.39	8.82	Peak	296	162

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).

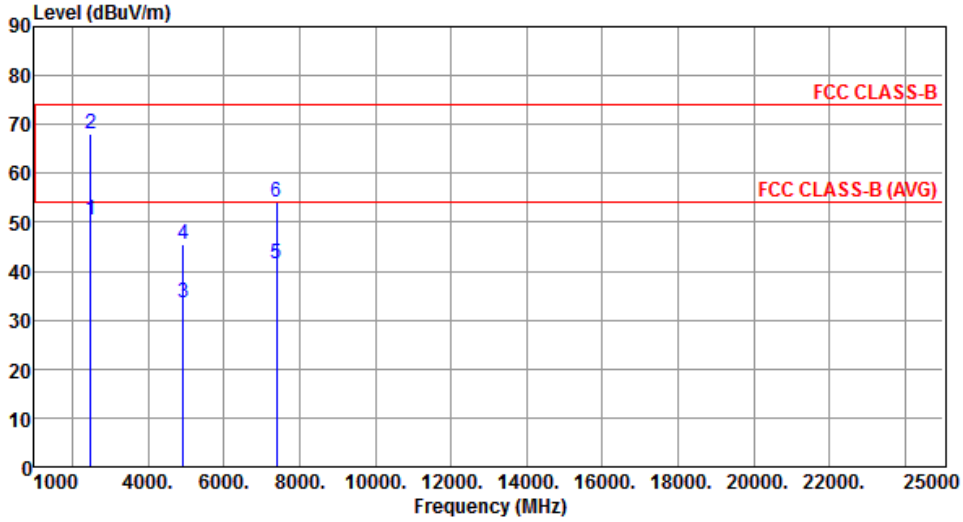
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.63	54.00	-1.37	55.85	-3.22	Average	205	286
2	2483.50	70.47	74.00	-3.53	73.69	-3.22	Peak	205	286
3	4924.00	32.94	54.00	-21.06	29.23	3.71	Average	100	183
4	4924.00	46.55	74.00	-27.45	42.84	3.71	Peak	100	183
5	7386.00	38.38	54.00	-15.62	29.83	8.55	Average	100	153
6	7386.00	50.22	74.00	-23.78	41.67	8.55	Peak	100	153

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		

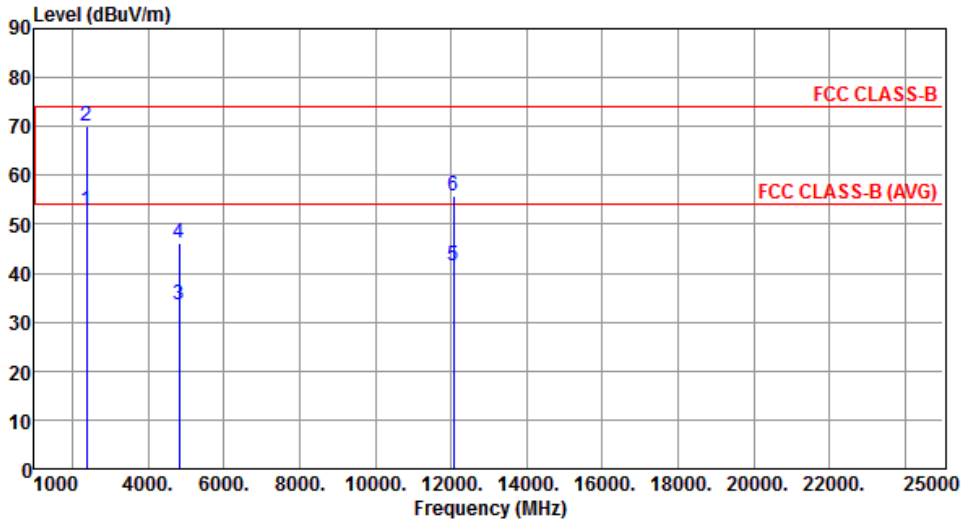


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.57	54.00	-3.43	53.79	-3.22	Average	215	5
2	2483.50	68.18	74.00	-5.82	71.40	-3.22	Peak	215	5
3	4924.00	33.64	54.00	-20.36	29.93	3.71	Average	100	163
4	4924.00	45.61	74.00	-28.39	41.90	3.71	Peak	100	163
5	7386.00	41.37	54.00	-12.63	32.82	8.55	Average	288	165
6	7386.00	54.00	74.00	-20.00	45.45	8.55	Peak	288	165

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

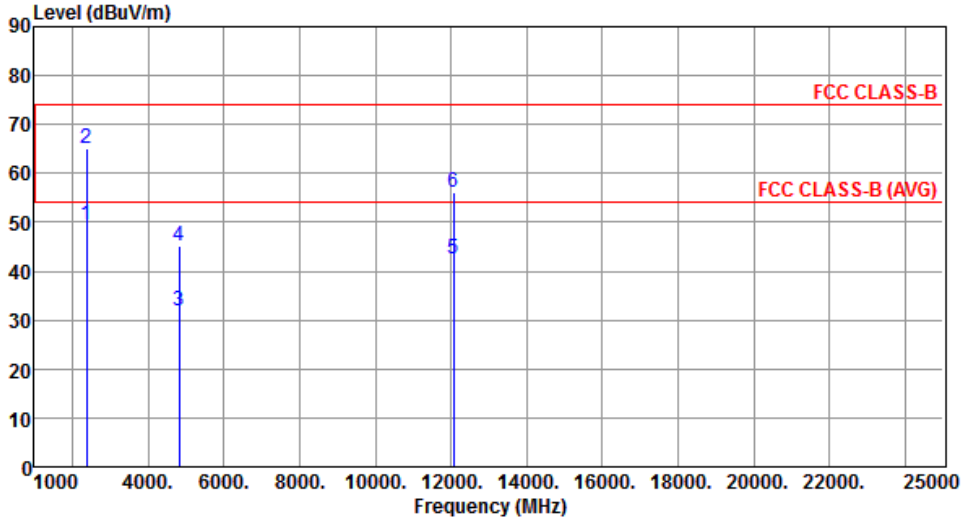
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.74	54.00	-1.26	55.81	-3.07	Average	295	72
2	2390.00	70.07	74.00	-3.93	73.14	-3.07	Peak	295	72
3	4824.00	33.59	54.00	-20.41	30.06	3.53	Average	100	192
4	4824.00	46.31	74.00	-27.69	42.78	3.53	Peak	100	192
5	12060.00	41.67	54.00	-12.33	28.40	13.27	Average	100	161
6	12060.00	55.72	74.00	-18.28	42.45	13.27	Peak	100	161

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).

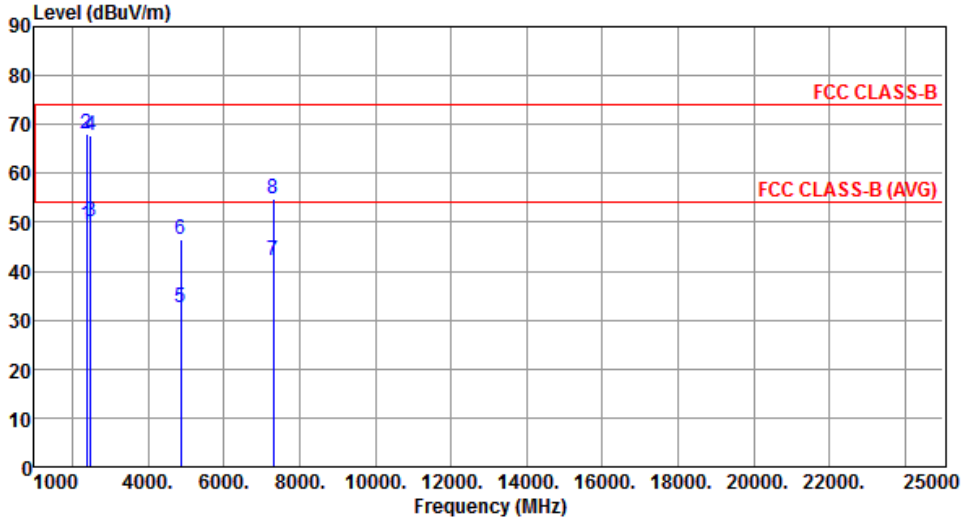
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	49.37	54.00	-4.63	52.44	-3.07	Average	283	349
2	2390.00	65.18	74.00	-8.82	68.25	-3.07	Peak	283	349
3	4824.00	31.80	54.00	-22.20	28.27	3.53	Average	100	166
4	4824.00	45.03	74.00	-28.97	41.50	3.53	Peak	100	166
5	12060.00	42.67	54.00	-11.33	29.40	13.27	Average	100	159
6	12060.00	56.16	74.00	-17.84	42.89	13.27	Peak	100	159

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).

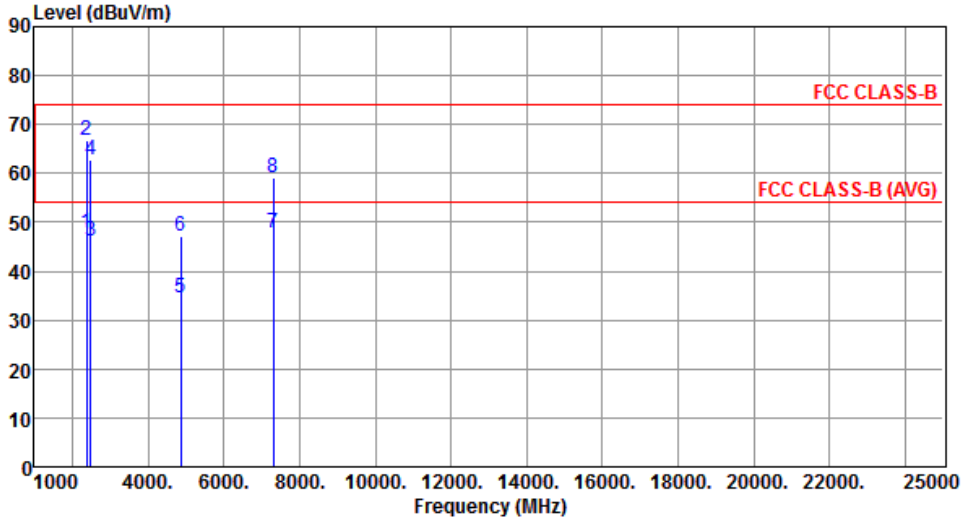
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	49.64	54.00	-4.36	52.71	-3.07	Average	242	267
2	2390.00	68.19	74.00	-5.81	71.26	-3.07	Peak	242	267
3	2483.50	50.00	54.00	-4.00	53.22	-3.22	Average	178	288
4	2483.50	67.61	74.00	-6.39	70.83	-3.22	Peak	178	288
5	4874.00	32.44	54.00	-21.56	28.84	3.60	Average	100	197
6	4874.00	46.46	74.00	-27.54	42.86	3.60	Peak	100	197
7	7311.00	42.17	54.00	-11.83	33.35	8.82	Average	138	148
8	7311.00	54.86	74.00	-19.14	46.04	8.82	Peak	138	148

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).

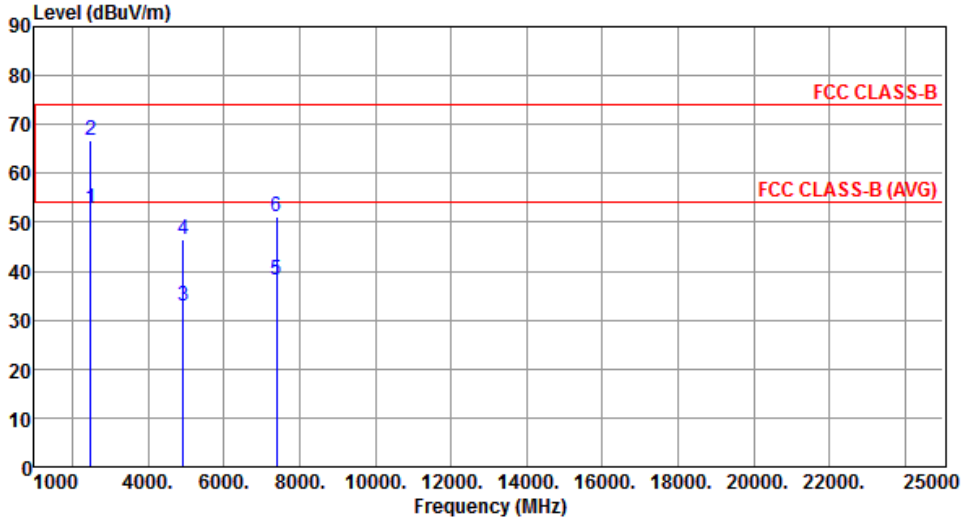
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	47.96	54.00	-6.04	51.03	-3.07	Average	228	17
2	2390.00	66.63	74.00	-7.37	69.70	-3.07	Peak	228	17
3	2483.50	46.03	54.00	-7.97	49.25	-3.22	Average	100	50
4	2483.50	62.90	74.00	-11.10	66.12	-3.22	Peak	100	50
5	4874.00	34.68	54.00	-19.32	31.08	3.60	Average	100	163
6	4874.00	46.99	74.00	-27.01	43.39	3.60	Peak	100	163
7	7311.00	47.97	54.00	-6.03	39.15	8.82	Average	300	158
8	7311.00	58.99	74.00	-15.01	50.17	8.82	Peak	300	158

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).

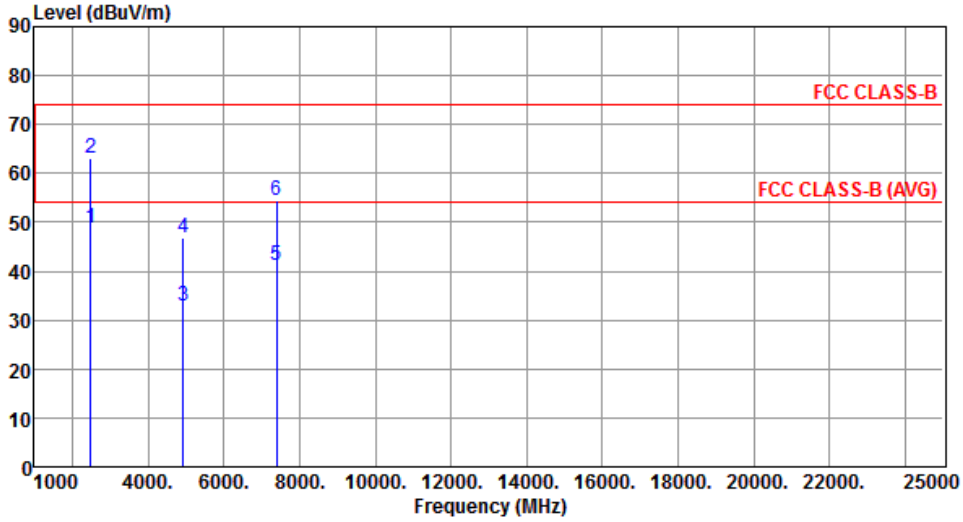
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.77	54.00	-1.23	55.99	-3.22	Average	247	67
2	2483.50	66.78	74.00	-7.22	70.00	-3.22	Peak	247	67
3	4924.00	32.94	54.00	-21.06	29.23	3.71	Average	100	178
4	4924.00	46.62	74.00	-27.38	42.91	3.71	Peak	100	178
5	7386.00	38.08	54.00	-15.92	29.53	8.55	Average	100	145
6	7386.00	50.98	74.00	-23.02	42.43	8.55	Peak	100	145

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		

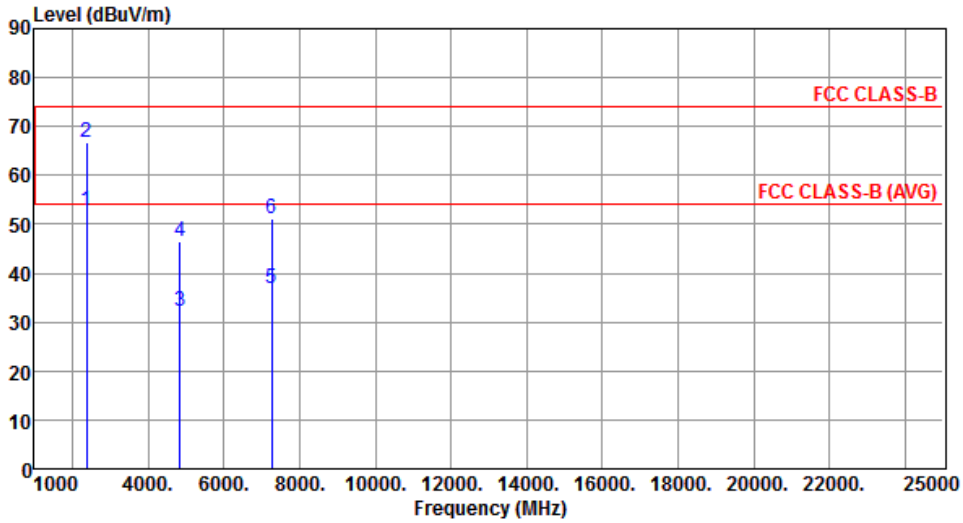


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.83	54.00	-5.17	52.05	-3.22	Average	112	359
2	2483.50	63.09	74.00	-10.91	66.31	-3.22	Peak	112	359
3	4924.00	32.86	54.00	-21.14	29.15	3.71	Average	100	154
4	4924.00	46.95	74.00	-27.05	43.24	3.71	Peak	100	154
5	7386.00	41.34	54.00	-12.66	32.79	8.55	Average	285	158
6	7386.00	54.46	74.00	-19.54	45.91	8.55	Peak	285	158

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

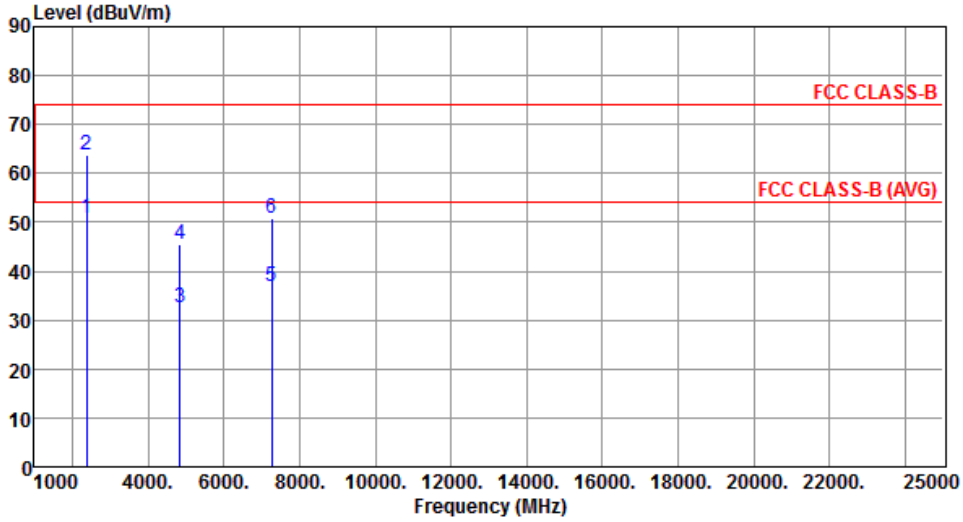
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	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	52.92	54.00	-1.08	55.99	-3.07	Average	220	278
2	2390.00	66.62	74.00	-7.38	69.69	-3.07	Peak	220	278
3	4844.00	32.37	54.00	-21.63	28.81	3.56	Average	100	187
4	4844.00	46.34	74.00	-27.66	42.78	3.56	Peak	100	187
5	7266.00	36.93	54.00	-17.07	28.06	8.87	Average	100	153
6	7266.00	51.12	74.00	-22.88	42.25	8.87	Peak	100	153

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).

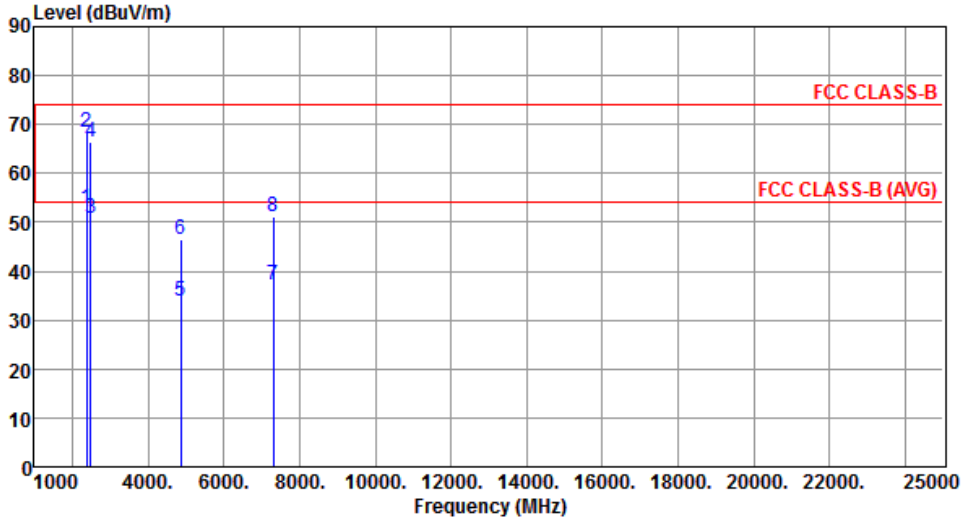
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	50.69	54.00	-3.31	53.76	-3.07	Average	100	318
2	2390.00	63.83	74.00	-10.17	66.90	-3.07	Peak	100	318
3	4844.00	32.61	54.00	-21.39	29.05	3.56	Average	100	162
4	4844.00	45.59	74.00	-28.41	42.03	3.56	Peak	100	162
5	7266.00	36.95	54.00	-17.05	28.08	8.87	Average	100	168
6	7266.00	50.92	74.00	-23.08	42.05	8.87	Peak	100	168

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).

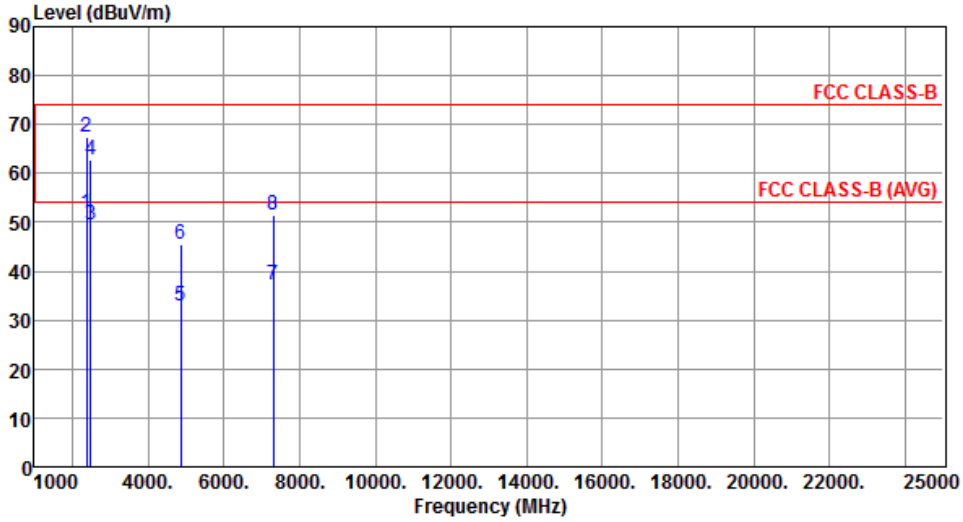
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	52.64	54.00	-1.36	55.71	-3.07	Average	241	289
2	2390.00	68.43	74.00	-5.57	71.50	-3.07	Peak	241	289
3	2483.50	50.71	54.00	-3.29	53.93	-3.22	Average	241	289
4	2483.50	66.28	74.00	-7.72	69.50	-3.22	Peak	241	289
5	4874.00	33.74	54.00	-20.26	30.14	3.60	Average	100	184
6	4874.00	46.46	74.00	-27.54	42.86	3.60	Peak	100	184
7	7311.00	37.34	54.00	-16.66	28.52	8.82	Average	100	153
8	7311.00	51.21	74.00	-22.79	42.39	8.82	Peak	100	153

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).

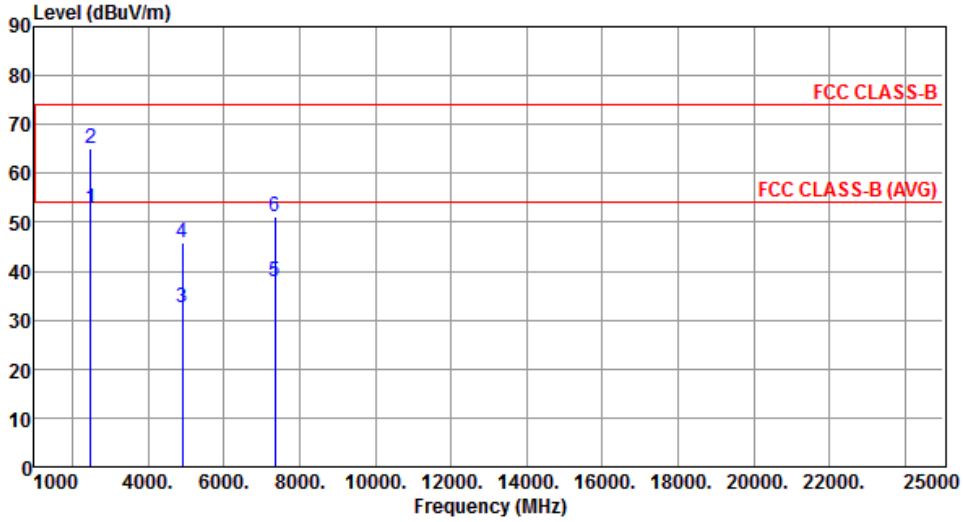
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	51.83	54.00	-2.17	54.90	-3.07	Average	229	18
2	2390.00	67.27	74.00	-6.73	70.34	-3.07	Peak	229	18
3	2483.50	49.62	54.00	-4.38	52.84	-3.22	Average	107	336
4	2483.50	62.93	74.00	-11.07	66.15	-3.22	Peak	107	336
5	4874.00	32.74	54.00	-21.26	29.14	3.60	Average	100	159
6	4874.00	45.34	74.00	-28.66	41.74	3.60	Peak	100	159
7	7311.00	37.32	54.00	-16.68	28.50	8.82	Average	100	165
8	7311.00	51.41	74.00	-22.59	42.59	8.82	Peak	100	165

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).

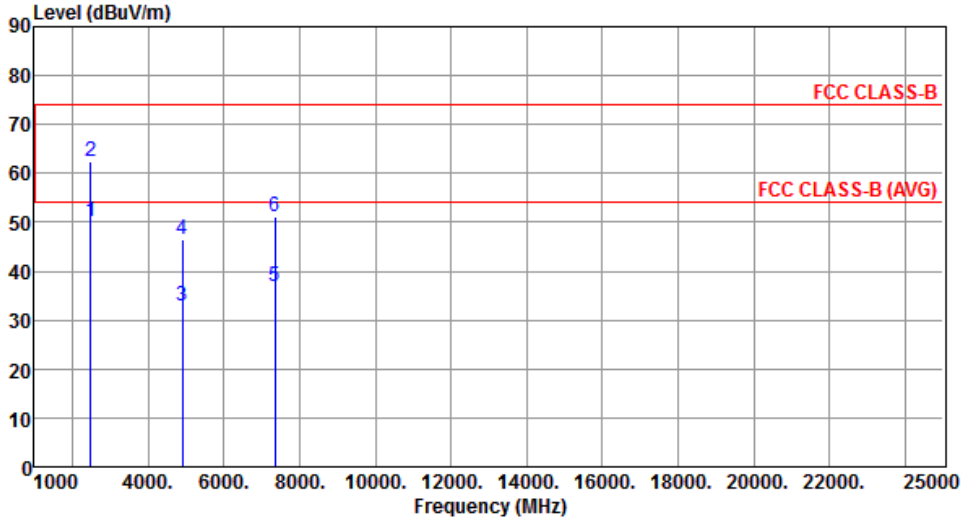
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	52.84	54.00	-1.16	56.06	-3.22	Average	177	289
2	2483.50	64.95	74.00	-9.05	68.17	-3.22	Peak	177	289
3	4904.00	32.60	54.00	-21.40	28.95	3.65	Average	100	196
4	4904.00	45.77	74.00	-28.23	42.12	3.65	Peak	100	196
5	7356.00	37.92	54.00	-16.08	29.22	8.70	Average	100	147
6	7356.00	51.07	74.00	-22.93	42.37	8.70	Peak	100	147

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	50.01	54.00	-3.99	53.23	-3.22	Average	301	20
2	2483.50	62.30	74.00	-11.70	65.52	-3.22	Peak	301	20
3	4904.00	32.83	54.00	-21.17	29.18	3.65	Average	100	162
4	4904.00	46.59	74.00	-27.41	42.94	3.65	Peak	100	162
5	7356.00	37.02	54.00	-16.98	28.32	8.70	Average	100	165
6	7356.00	51.29	74.00	-22.71	42.59	8.70	Peak	100	165

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

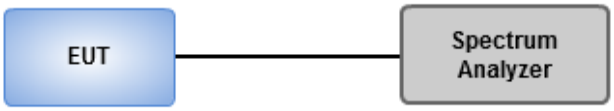
Reference level measurement

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

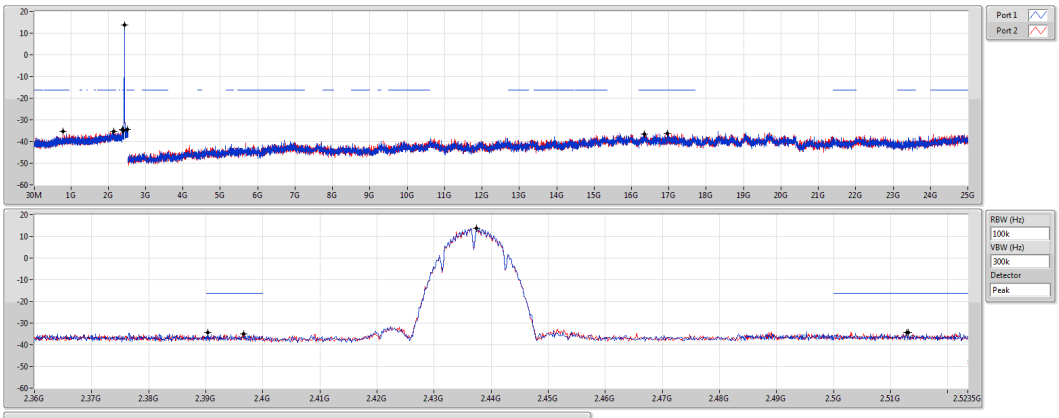
802.11b_Nss1,(1Mbps)_2TX **CSE NdB**

2412MHz

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41236G	14.95	-15.05	2.13399G	-35.59	2.398G	-30.02	2.51742G	-34.20	24.96909G	-36.23	1
2.41236G	14.40	-15.60	2.11768G	-35.44	2.39752G	-30.34	2.51462G	-34.42	24.92695G	-36.21	2

802.11b_Nss1,(1Mbps)_2TX **CSE NdB**

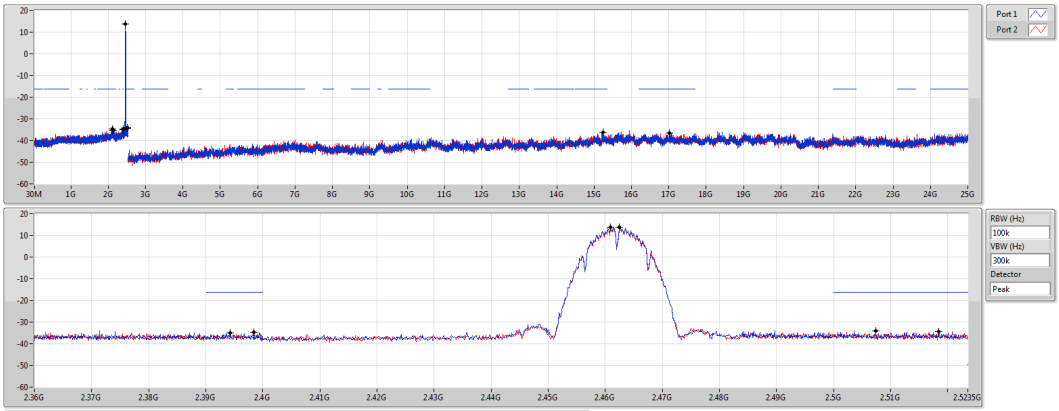
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43741G	13.81	-16.19	2.15263G	-35.25	2.3904G	-34.25	2.51302G	-34.40	16.34655G	-36.41	1
2.43741G	13.64	-16.36	787.25M	-35.40	2.39664G	-34.92	2.51278G	-34.45	16.96746G	-36.35	2

802.11b_Nss1,(1Mbps)_2TX **CSE NdB**

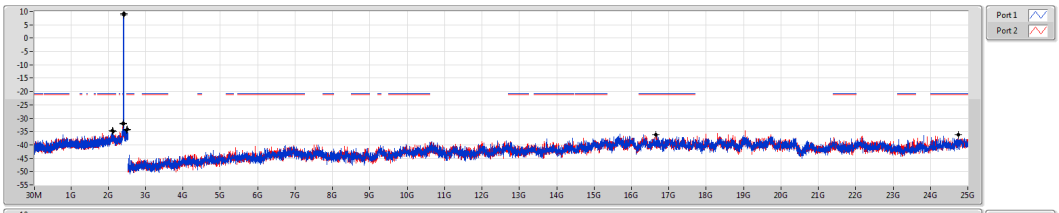
2462MHz

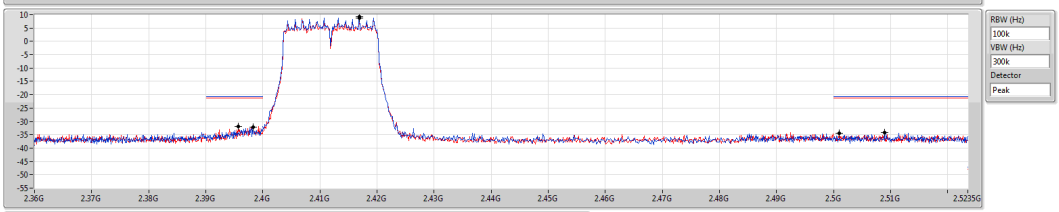


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.46246G	13.89	-16.11	2.12584G	-35.18	2.3984G	-34.58	2.51838G	-34.27	15.24239G	-36.24	1
2.46096G	13.67	-16.33	2.10603G	-34.82	2.39424G	-35.13	2.50742G	-34.16	17.0096G	-36.41	2

802.11g_Nss1,(6Mbps)_2TX **CSE NdB**

2412MHz

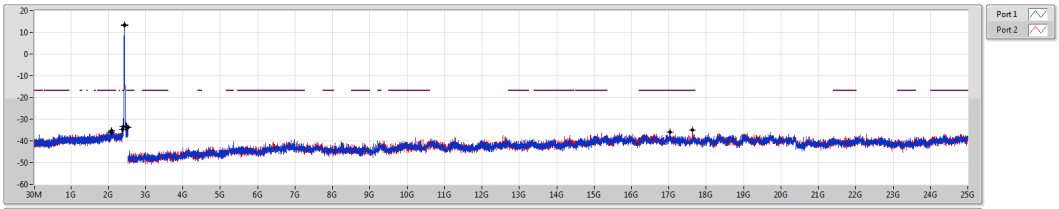


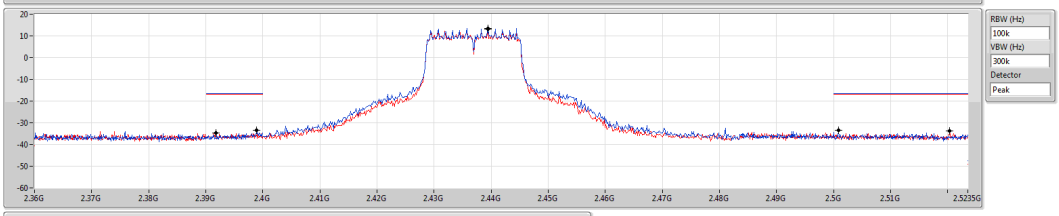


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41687G	9.30	-20.70	2.10836G	-34.70	2.39824G	-32.03	2.50886G	-34.21	24.74152G	-36.16	1
2.41687G	8.72	-21.28	2.13749G	-35.01	2.39568G	-31.78	2.50102G	-34.48	16.66122G	-36.30	2

802.11g_Nss1,(6Mbps)_2TX **CSE NdB**

2437MHz

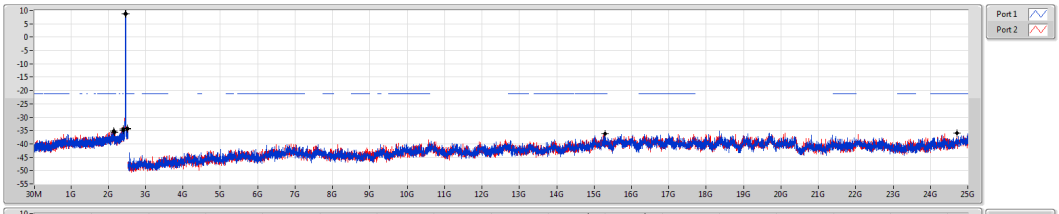


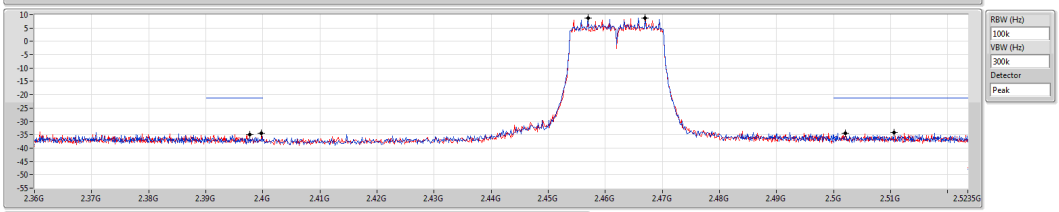


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43941G	13.52	-16.48	2.08739G	-35.18	2.39888G	-33.50	2.50086G	-33.39	17.03489G	-36.04	1
2.43941G	13.03	-16.97	2.07691G	-35.80	2.39176G	-34.78	2.5203G	-33.80	17.63052G	-35.05	2

802.11g_Nss1,(6Mbps)_2TX **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
2.45695G	8.82	-21.18	2.16195G	-35.78	2.39776G	-34.88	2.51054G	-34.21	15.30139G	-36.15	1
2.46697G	8.66	-21.34	2.13982G	-35.22	2.39976G	-34.37	2.50206G	-34.45	24.705G	-36.02	2

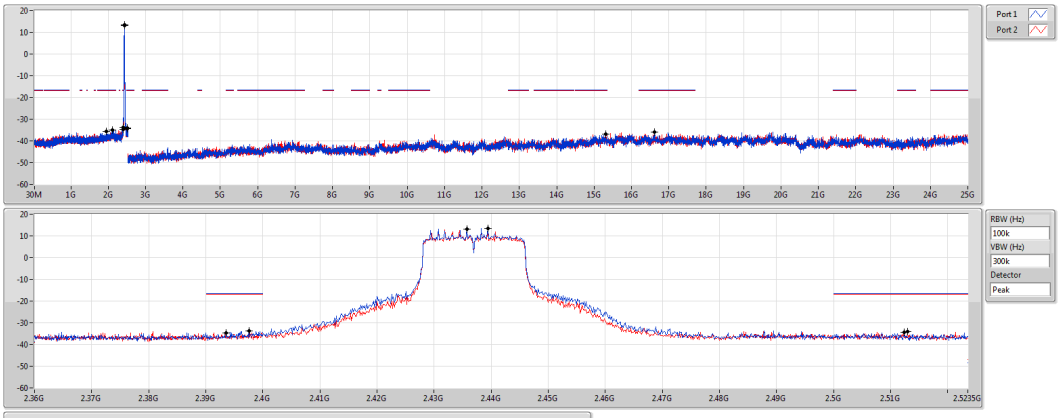
802.11n HT20_Nss1,(MCS0)_2TX **CSE NdB**

2412MHz

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40685G	8.60	-21.40	2.12234G	-35.79	2.39992G	-32.10	2.50718G	-33.62	16.36902G	-35.32	1
2.41687G	8.28	-21.72	2.10953G	-35.17	2.3996G	-32.05	2.51742G	-34.29	17.6558G	-35.86	2

802.11n HT20_Nss1,(MCS0)_2TX **CSE NdB**

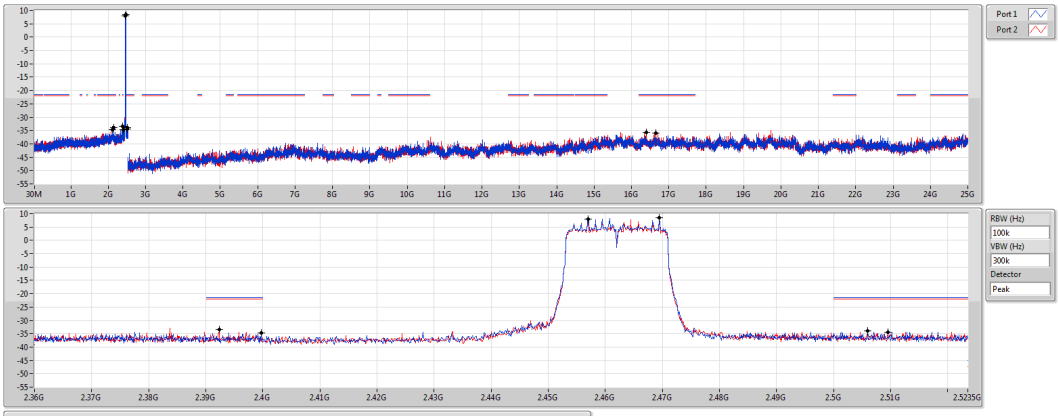
2437MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43941G	13.47	-16.53	2.11535G	-35.12	2.3976G	-33.70	2.51238G	-34.28	16.62188G	-36.04	1
2.43574G	12.98	-17.02	1.9441G	-35.59	2.39352G	-34.56	2.51294G	-34.06	15.3042G	-36.79	2

802.11n HT20_Nss1,(MCS0)_2TX **CSE NdB**

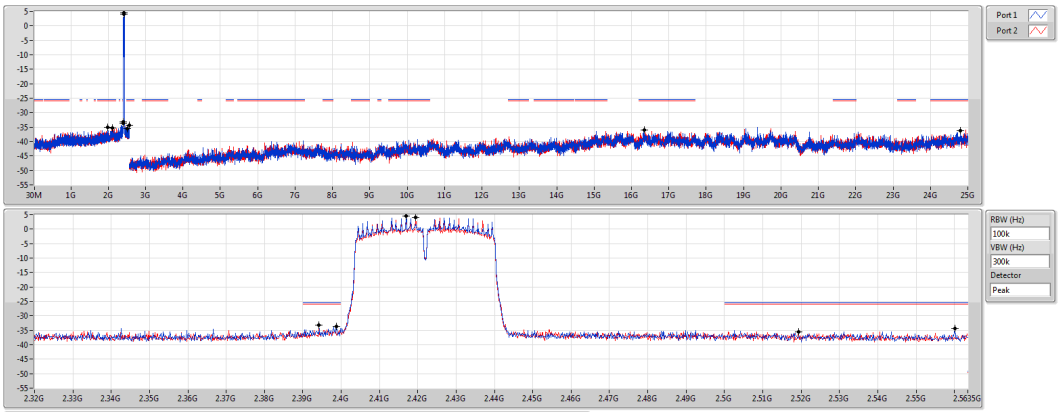
2462MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.46947G	8.51	-21.49	2.11535G	-34.63	2.39968G	-34.67	2.50598G	-33.99	16.66122G	-35.91	1
2.45605G	7.90	-22.10	2.1538G	-34.04	2.39232G	-33.46	2.5095G	-34.36	16.39993G	-35.75	2

802.11n HT40_Nss1,(MCS0)_2TX **CSE NdB**

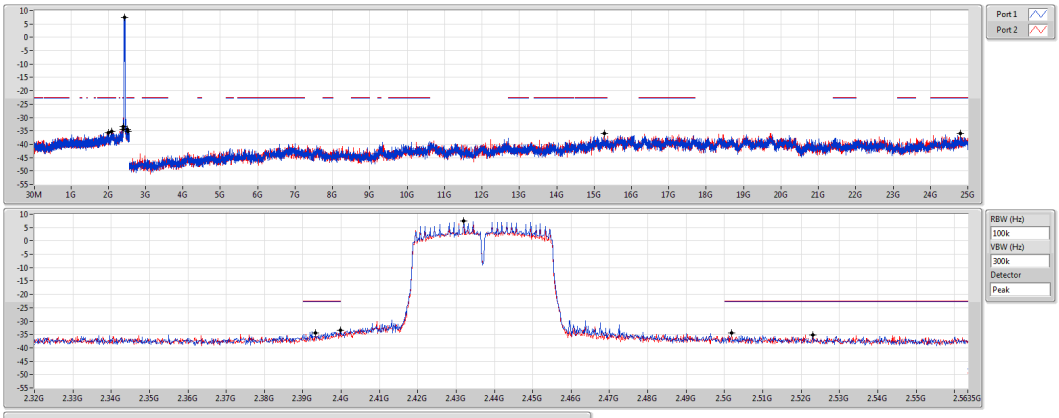
2422MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.41687G	4.49	-25.51	1.97765G	-35.04	2.39872G	-33.68	2.56014G	-34.29	24.80929G	-36.14	1
2.41937G	4.14	-25.86	2.11161G	-35.29	2.39424G	-33.11	2.51934G	-35.58	16.33951G	-35.94	2

802.11n HT40_Nss1,(MCS0)_2TX **CSE NdB**

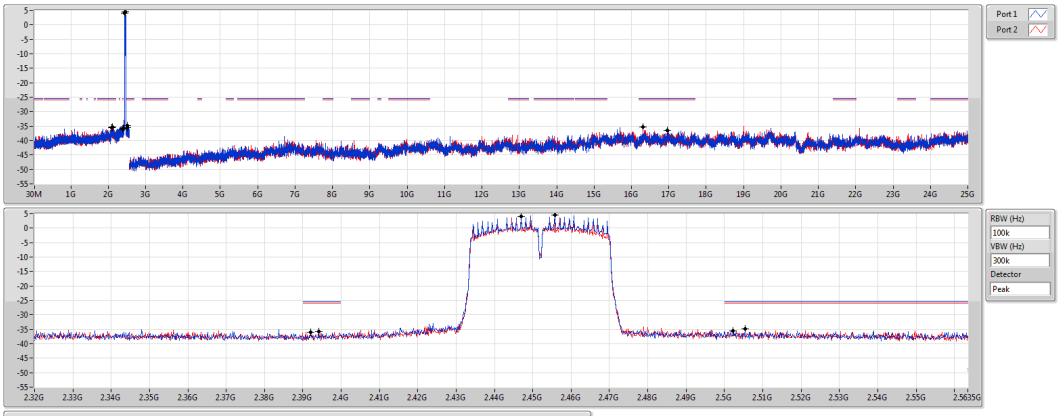
2437MHz



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	7.34	-22.66	2.09673G	-35.08	2.39984G	-33.51	2.52302G	-35.19	24.79807G	-35.93	1
2.4319G	7.45	-22.55	2.00971G	-35.60	2.39328G	-34.40	2.5019G	-34.45	15.27658G	-35.89	2

802.11n HT40_Nss1,(MCS0)_2TX **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
2.45578G	4.47	-25.53	2.11848G	-35.26	2.392G	-36.07	2.50542G	-34.94	16.96773G	-36.53	1
2.44693G	4.08	-25.92	2.10131G	-35.53	2.39424G	-35.77	2.50222G	-35.46	16.30025G	-35.38	2

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═