

FCC Test Report

FCC ID : MXF-MHB100
Equipment : Tabs Mini Hub
Model No. : TBMH100
Brand Name : Tabs
Applicant : Gemtek Technology Co., Ltd.
Address : No. 15-1 Zhonghua Road, Hsinchu Industrial
Park, Hukou, Hsinchu, Taiwan, 30352.
Standard : 47 CFR FCC Part 15.247
Received Date : Nov. 20, 2018
Tested Date : Nov. 28 ~ Dec. 20, 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



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Release Record

Report No.	Version	Description	Issued Date
FR8N2002AC	Rev. 01	Initial issue	Jan. 10, 2019

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.716MHz 38.21 (Margin -7.79dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2483.50MHz 52.71 (Margin -1.29dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 23.91	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]	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

Note 1: RF output power specifies that Maximum Peak Conducted 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	Remarks
1	PIFA	2.72	Murata	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	100-240Vac , 5Vdc / 2A
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1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	USB cable	1m shielded without core

1.1.5 Channel List

Channel	Frequency(MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

1.1.6 Test Tool and Duty Cycle

Test Tool	Putty, Version: 0.60.0.0		
Duty Cycle and Duty Factor	Mode	Duty Cycle (%)	Duty Factor (dB)
	11b	94.68%	0.24
	11g	73.18%	1.36
	HT20	88.39%	0.54

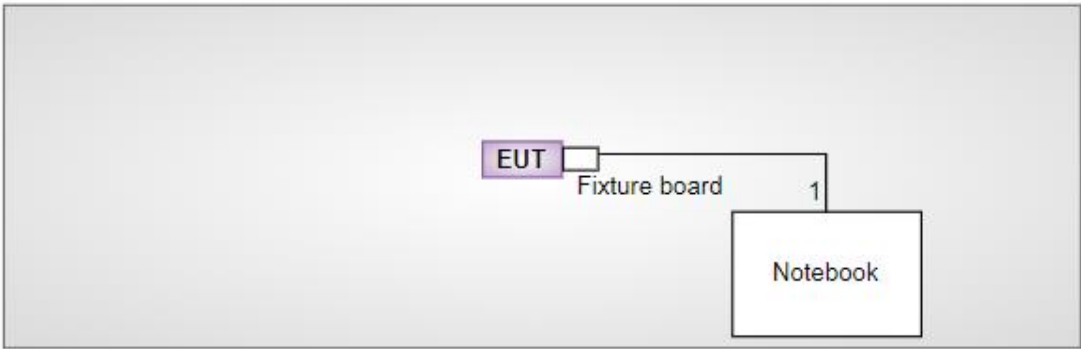
1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
11b	2412	249
11b	2437	245
11b	2462	252
11g	2412	251
11g	2437	245
11g	2462	246
HT20	2412	253
HT20	2437	245
HT20	2462	247

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Notebook	DELL	Latitude E6440	DoC	---
2	Fixture board	---	---	---	Provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram	
	
No.	Signal cable / Length (m)
1	USB, 1m shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Dec. 07, 2018				
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	EMC	EMCCFD300-BM-B M-6000	50821	Dec. 18, 2017	Dec. 17, 2018
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 chamber1 / (03CH01-WS)				
Tested Date	Nov. 28, 2018				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2017	Dec. 03, 2018
Receiver	Agilent	N9038A	MY53290044	Sep. 17, 2018	Sep. 16, 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-80 00	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-N M-1000	16052	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)				
Tested Date	Dec. 20, 2018				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Apr. 16, 2018	Apr. 15, 2019
Spectrum Analyzer	R&S	FSV40	101499	Jan. 03, 2018	Jan. 02, 2019
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
AC POWER SOURCE	APC	AFC-500W	F312060012	Nov. 29, 2018	Nov. 28, 2019
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

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	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.63 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 58%	Steve Chin
Radiated Emissions	03CH01-WS	22°C / 66%	Akun Chung
RF Conducted	TH01-WS	22°C / 66%	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	HT20	2437	MCS 0	---
Radiated Emissions ≤1GHz	HT20	2437	MCS 0	---
Radiated Emissions >1GHz				
Maximum Output Power	11b	2412 / 2437 / 2462	1 Mbps	---
6dB bandwidth	11g	2412 / 2437 / 2462	6 Mbps	
Power spectral density	HT20	2412 / 2437 / 2462	MCS 0	

NOTE:

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-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

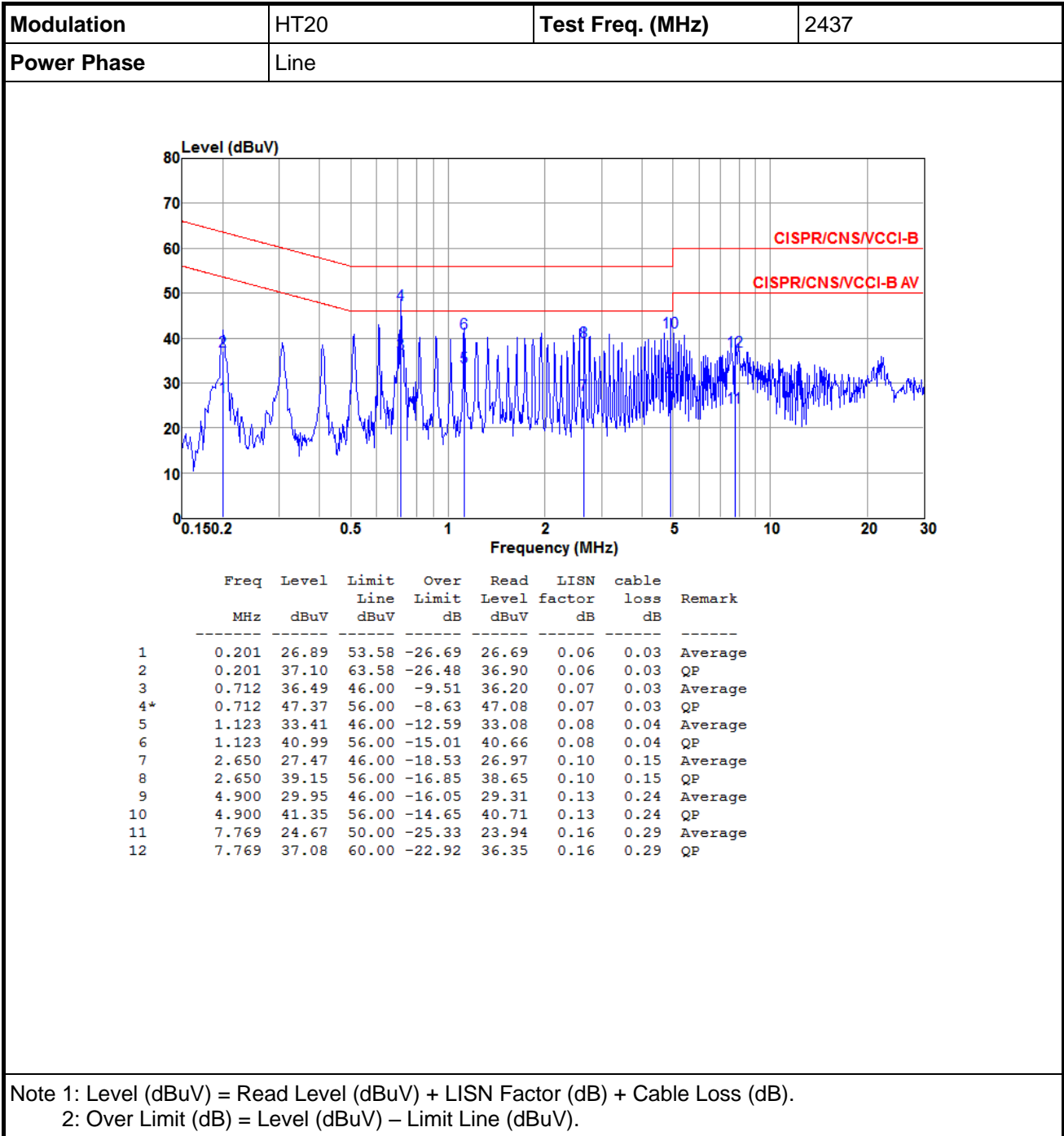
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels 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

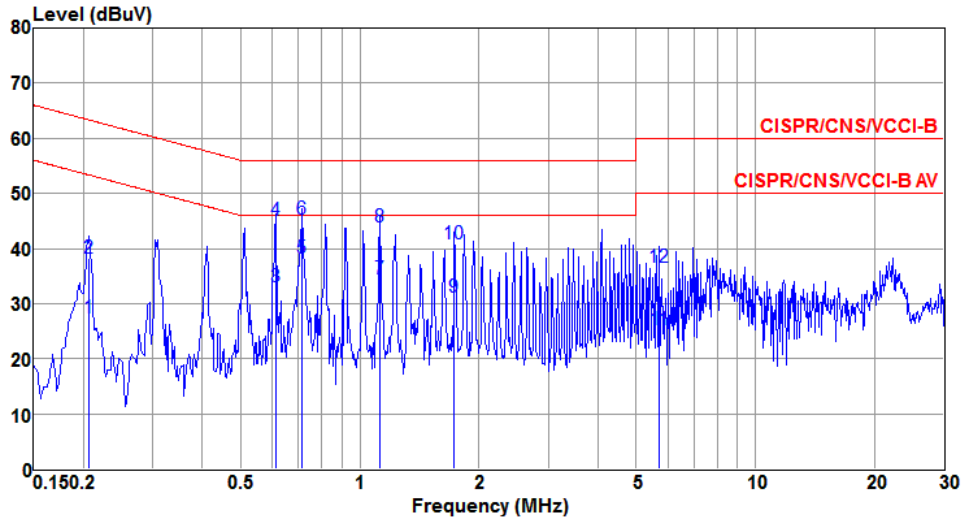


- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions



Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.207	27.39	53.32	-25.93	27.21	0.04	0.03	Average
2	0.207	38.23	63.32	-25.09	38.05	0.04	0.03	QP
3	0.614	33.10	46.00	-12.90	32.85	0.05	0.02	Average
4	0.614	45.03	56.00	-10.97	44.78	0.05	0.02	QP
5*	0.716	38.21	46.00	-7.79	37.93	0.06	0.03	Average
6	0.716	45.22	56.00	-10.78	44.94	0.06	0.03	QP
7	1.123	34.47	46.00	-11.53	34.16	0.06	0.04	Average
8	1.123	43.84	56.00	-12.16	43.53	0.06	0.04	QP
9	1.734	31.11	46.00	-14.89	30.72	0.07	0.09	Average
10	1.734	40.82	56.00	-15.18	40.43	0.07	0.09	QP
11	5.713	25.34	50.00	-24.66	24.68	0.13	0.26	Average
12	5.713	36.63	60.00	-23.37	35.97	0.13	0.26	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

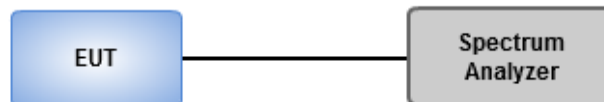
6dB Bandwidth

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	9.13M	11.939M	11M9G1D	8.623M	11.288M
802.11g_Nss1,(6Mbps)_1TX	16.377M	16.643M	16M6D1D	16.232M	16.425M
802.11n HT20_Nss1,(MCS0)_1TX	16.594M	17.656M	17M7D1D	16.522M	17.511M

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

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	9.058M	11.939M
2437MHz	Pass	500k	9.13M	11.939M
2462MHz	Pass	500k	8.623M	11.288M
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.377M	16.425M
2437MHz	Pass	500k	16.232M	16.643M
2462MHz	Pass	500k	16.377M	16.498M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	16.594M	17.511M
2437MHz	Pass	500k	16.522M	17.656M
2462MHz	Pass	500k	16.522M	17.511M

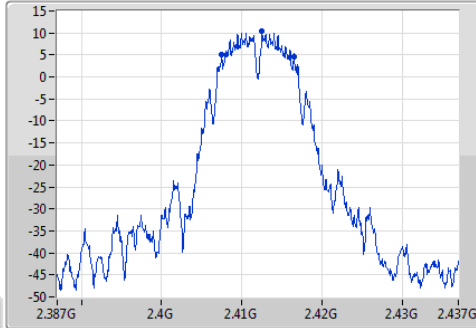
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

802.11b_Nss1,(1Mbps)_1TX

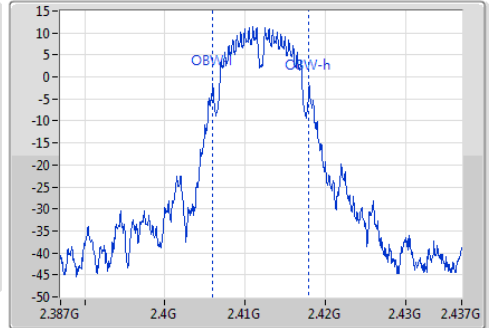
EBW

2412MHz

CF
2.412GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.412GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



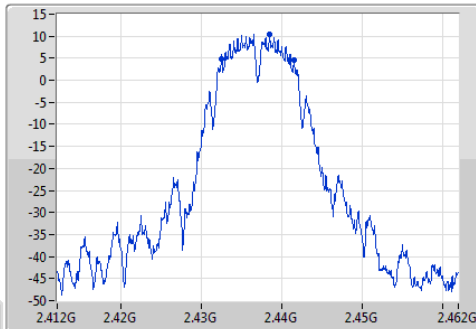
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
9.058M	2.407507G	2.416565G	11.939M	2.405994G	2.417933G	500k	1

802.11b_Nss1,(1Mbps)_1TX

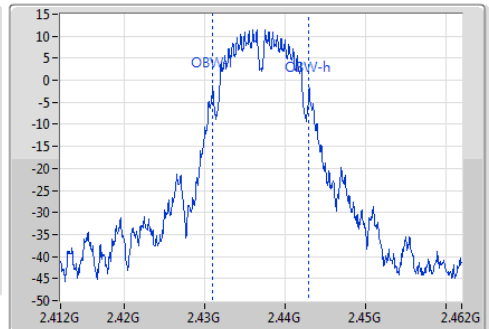
EBW

2437MHz

CF
2.437GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.437GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



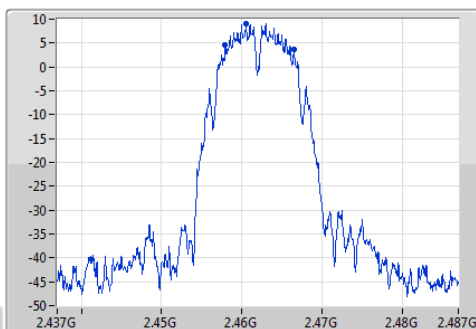
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
9.13M	2.432435G	2.441565G	11.939M	2.430994G	2.442933G	500k	1

802.11b_Nss1,(1Mbps)_1TX

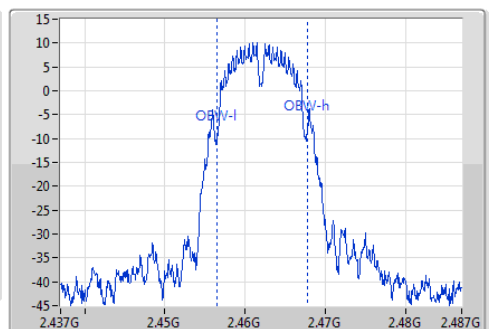
EBW

2462MHz

CF
2.462GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.462GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



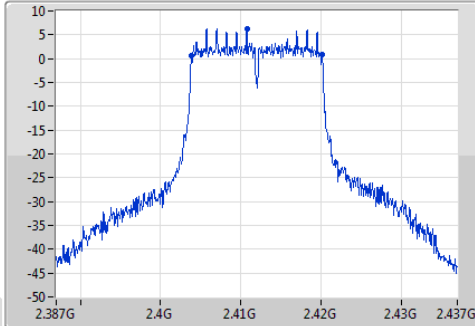
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
8.623M	2.457942G	2.466565G	11.288M	2.456501G	2.467789G	500k	1

802.11g_Nss1,(6Mbps)_1TX

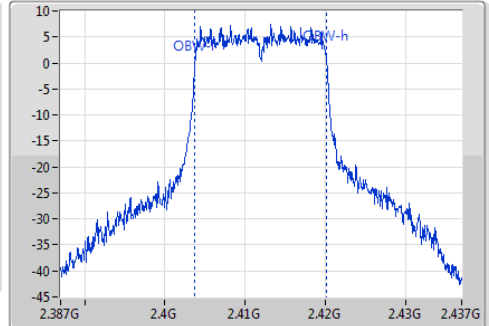
EBW

2412MHz

CF
2.412GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.412GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



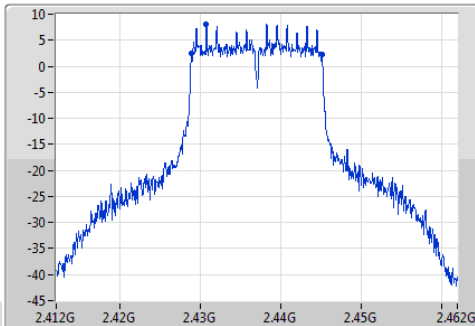
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.403812G	2.420188G	16.425M	2.403751G	2.420177G	500k	1

802.11g_Nss1,(6Mbps)_1TX

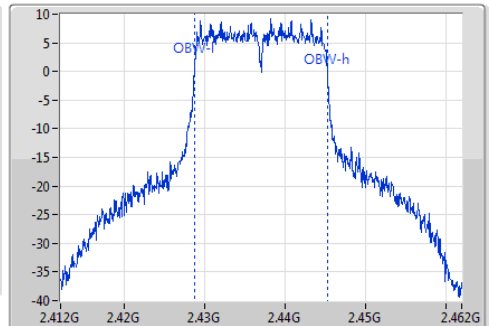
EBW

2437MHz

CF
2.437GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.437GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



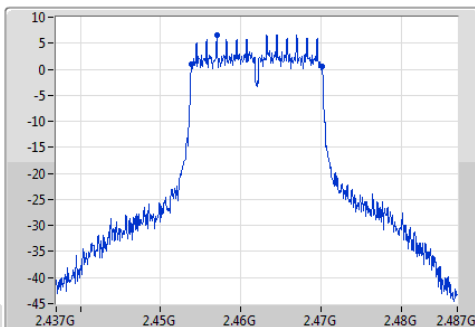
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.232M	2.428884G	2.445116G	16.643M	2.428679G	2.445321G	500k	1

802.11g_Nss1,(6Mbps)_1TX

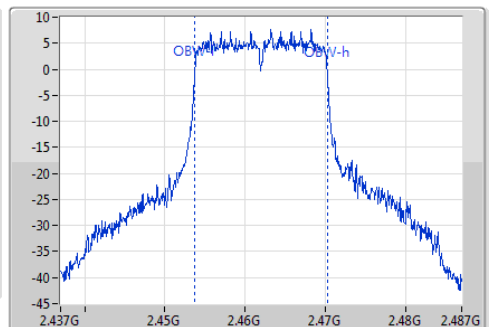
EBW

2462MHz

CF
2.462GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.462GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



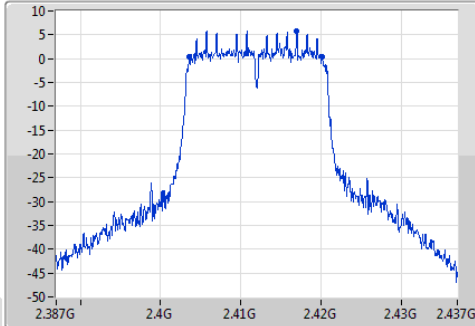
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.377M	2.453812G	2.470188G	16.498M	2.453751G	2.470249G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX

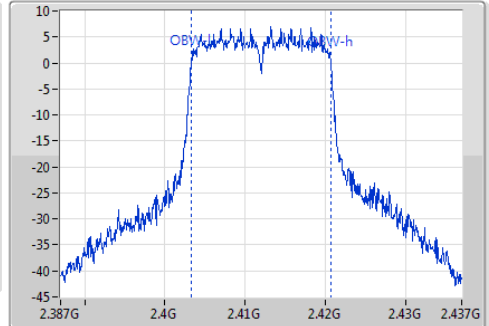
EBW

2412MHz

CF
2.412GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.412GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



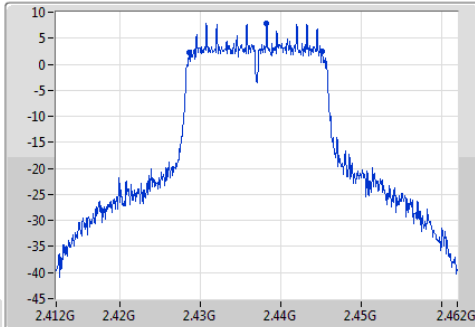
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.594M	2.403594G	2.420188G	17.511M	2.403245G	2.420755G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX

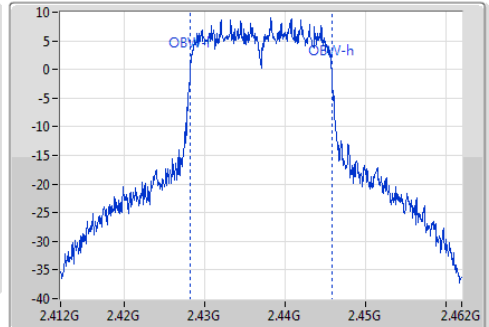
EBW

2437MHz

CF
2.437GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.437GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



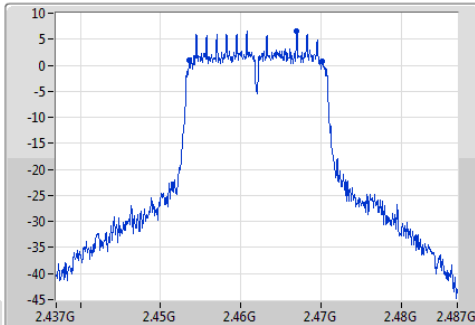
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.522M	2.428594G	2.445116G	17.656M	2.428172G	2.445828G	500k	1

802.11n HT20_Nss1,(MCS0)_1TX

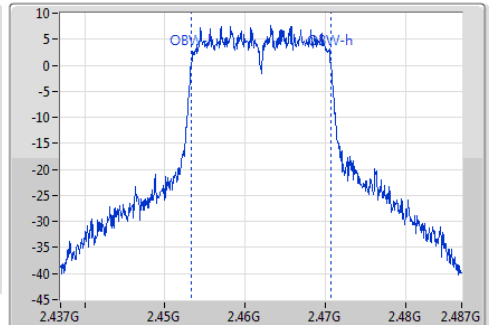
EBW

2462MHz

CF
2.462GHz
Span
50MHz
RBW
100kHz
VBW
300kHz
Sweep Time
1.08ms
Detector Type
Peak
Port 1



CF
2.462GHz
Span
50MHz
RBW
200kHz
VBW
1MHz
Sweep Time
1.02ms
Detector Type
Sample



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.522M	2.453594G	2.470116G	17.511M	2.453245G	2.470755G	500k	1

3.3 RF Output Power

3.3.1 Limit of RF Output Power

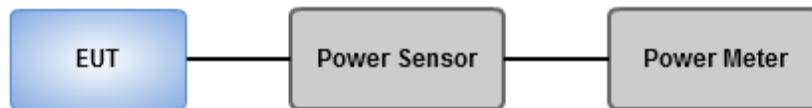
Conducted power shall not exceed 1Watt.

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

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 of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	22.54	0.17947
802.11g_Nss1,(6Mbps)_1TX	23.89	0.24491
802.11n HT20_Nss1,(MCS0)_1TX	23.91	0.24604

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	22.26	22.26	30.00	24.98	36.00
2437MHz	Pass	2.72	22.54	22.54	30.00	25.26	36.00
2462MHz	Pass	2.72	21.60	21.60	30.00	24.32	36.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	23.69	23.69	30.00	26.41	36.00
2437MHz	Pass	2.72	23.89	23.89	30.00	26.61	36.00
2462MHz	Pass	2.72	23.72	23.72	30.00	26.44	36.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	23.52	23.52	30.00	26.24	36.00
2437MHz	Pass	2.72	23.91	23.91	30.00	26.63	36.00
2462MHz	Pass	2.72	23.76	23.76	30.00	26.48	36.00

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

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_1TX	19.54	0.08995
802.11g_Nss1,(6Mbps)_1TX	18.62	0.07278
802.11n HT20_Nss1,(MCS0)_1TX	18.43	0.06966

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	19.05	19.05	-	21.77	-
2437MHz	Pass	2.72	19.54	19.54	-	22.26	-
2462MHz	Pass	2.72	18.27	18.27	-	20.99	-
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	17.21	17.21	-	19.93	-
2437MHz	Pass	2.72	18.62	18.62	-	21.34	-
2462MHz	Pass	2.72	17.58	17.58	-	20.30	-
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-
2412MHz	Pass	2.72	16.63	16.63	-	19.35	-
2437MHz	Pass	2.72	18.43	18.43	-	21.15	-
2462MHz	Pass	2.72	17.15	17.15	-	19.87	-

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

Note : Conducted average output power is for reference only

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.

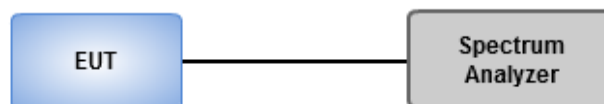
Average PSD, duty cycle $\geq 98\%$

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

Average PSD, duty cycle $< 98\%$

1. Set the RBW = 30 kHz, VBW = 100 kHz. Detector = RMS.
2. Set the sweep time to: ≥ 10 (number of measurement points in sweep) 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)_1TX	-3.63
802.11g_Nss1,(6Mbps)_1TX	-7.10
802.11n HT20_Nss1,(MCS0)_1TX	-7.26

Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.72	-3.86	-3.86	8.00
2437MHz	Pass	2.72	-3.63	-3.63	8.00
2462MHz	Pass	2.72	-4.85	-4.85	8.00
802.11g_Nss1,(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.72	-8.26	-8.26	8.00
2437MHz	Pass	2.72	-7.10	-7.10	8.00
2462MHz	Pass	2.72	-8.35	-8.35	8.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	2.72	-9.26	-9.26	8.00
2437MHz	Pass	2.72	-7.26	-7.26	8.00
2462MHz	Pass	2.72	-8.77	-8.77	8.00

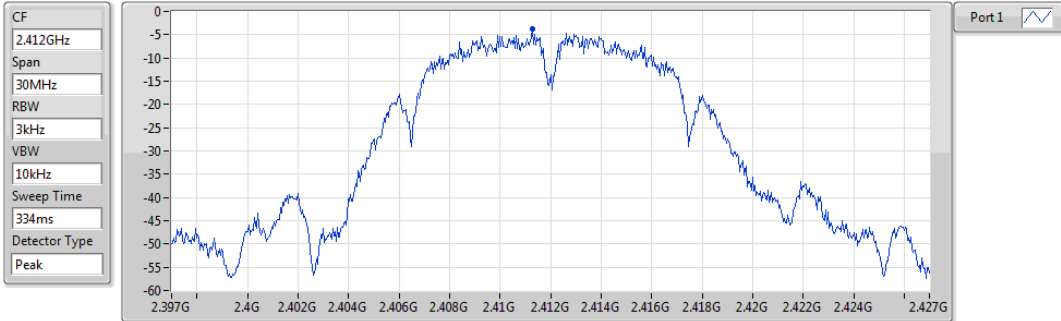
DG = Directional Gain;

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)_1TX

PSD

2412MHz

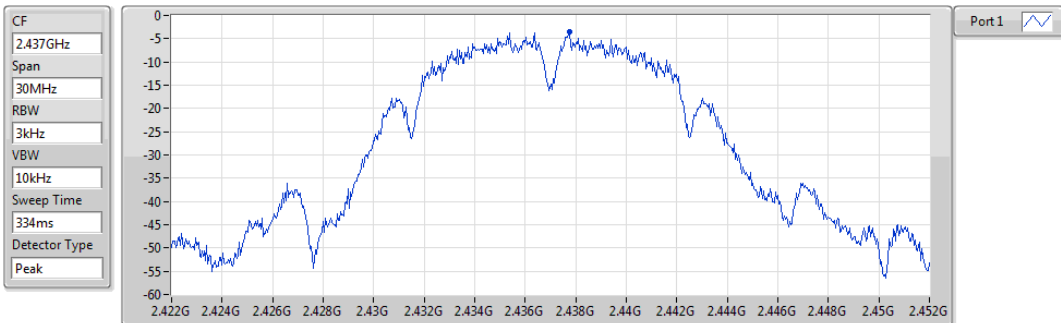


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.86	-3.86	-3.86

802.11b_Nss1,(1Mbps)_1TX

PSD

2437MHz

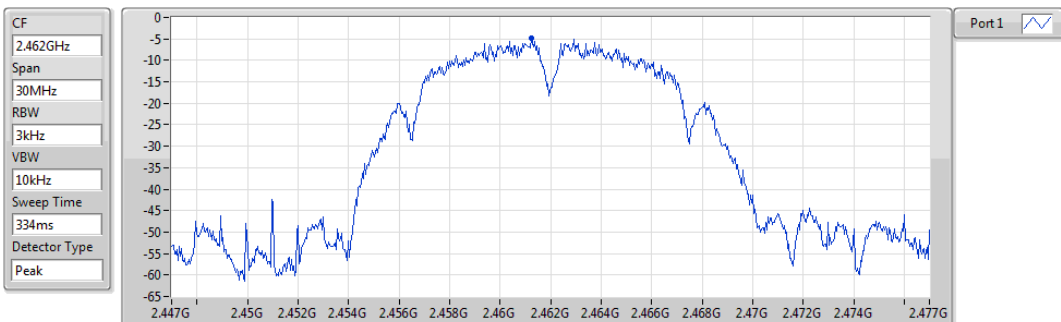


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.63	-3.63	-3.63

802.11b_Nss1,(1Mbps)_1TX

PSD

2462MHz

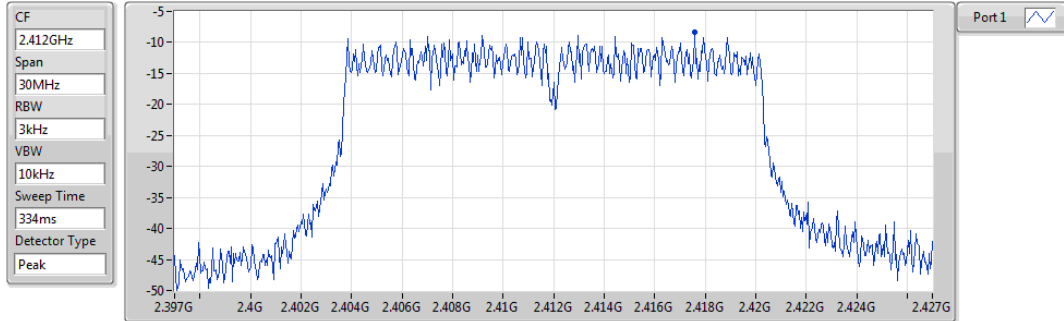


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-4.85	-4.85	-4.85

802.11g_Nss1,(6Mbps)_1TX

PSD

2412MHz

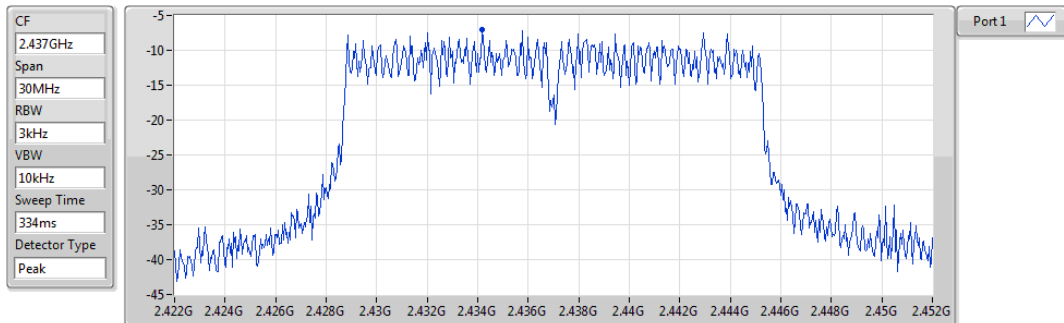


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.26	-8.26	-8.26

802.11g_Nss1,(6Mbps)_1TX

PSD

2437MHz

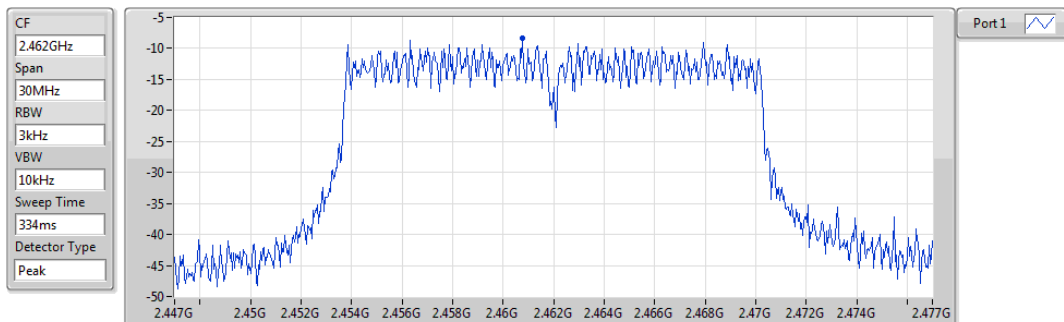


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.10	-7.10	-7.10

802.11g_Nss1,(6Mbps)_1TX

PSD

2462MHz

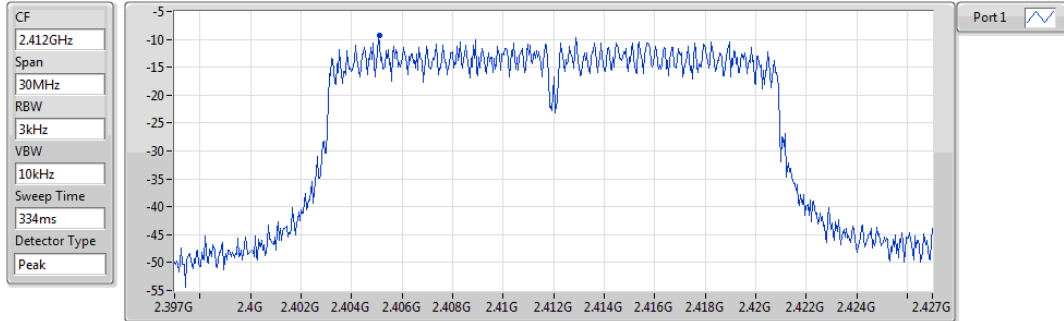


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.35	-8.35	-8.35

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2412MHz

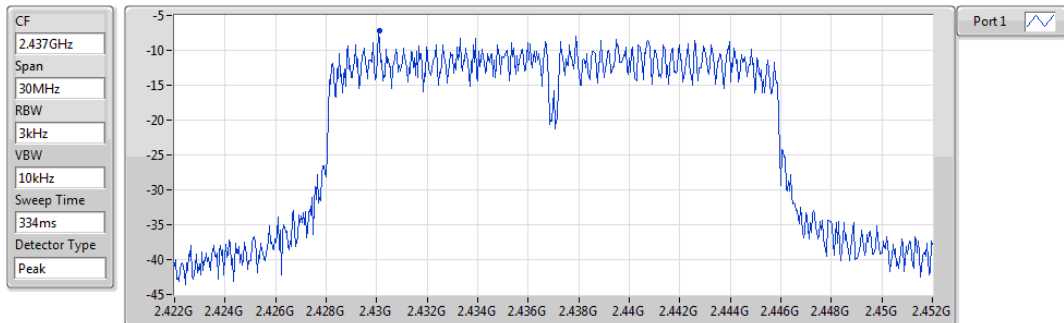


Sum	PD	Port 1
(dBm/3kHz)	(dBm/3kHz)	(dBm/3kHz)
-9.26	-9.26	-9.26

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2437MHz

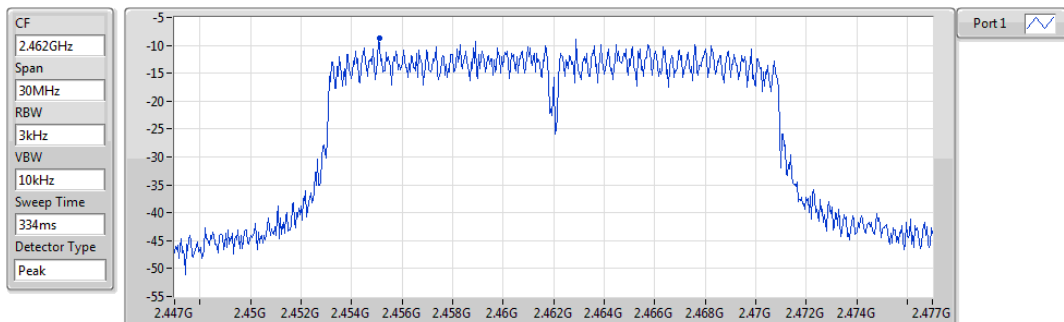


Sum	PD	Port 1
(dBm/3kHz)	(dBm/3kHz)	(dBm/3kHz)
-7.26	-7.26	-7.26

802.11n HT20_Nss1,(MCS0)_1TX

PSD

2462MHz



Sum	PD	Port 1
(dBm/3kHz)	(dBm/3kHz)	(dBm/3kHz)
-8.77	-8.77	-8.77

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

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

3.5.2 Test Procedures

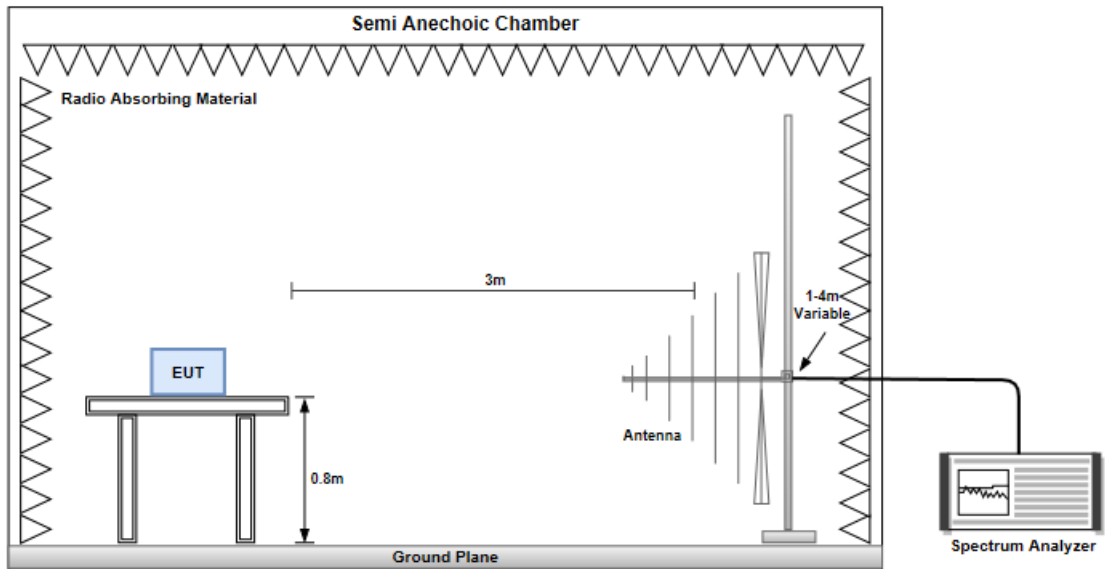
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

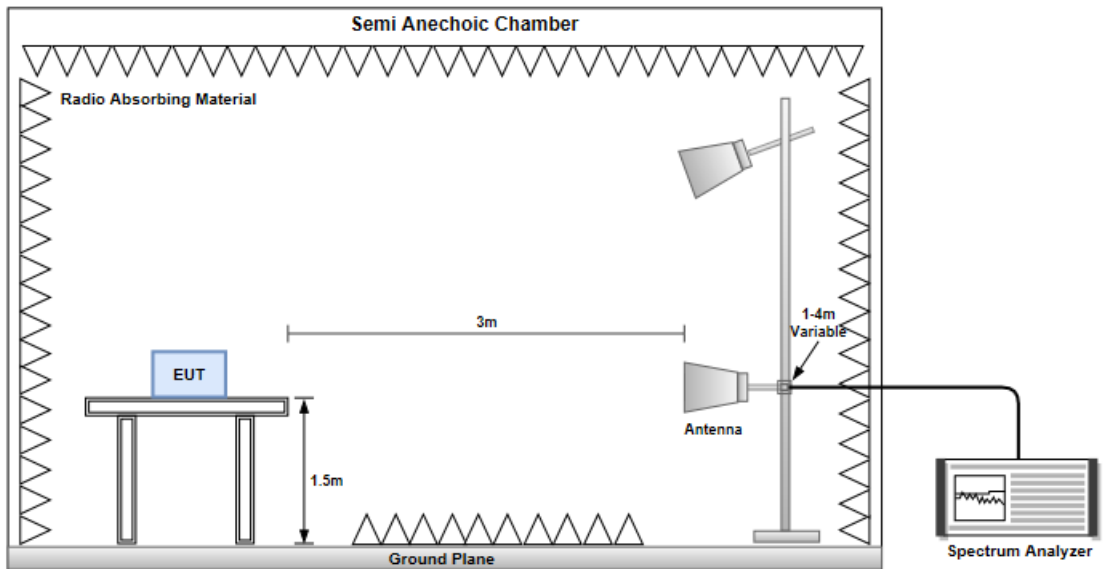
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

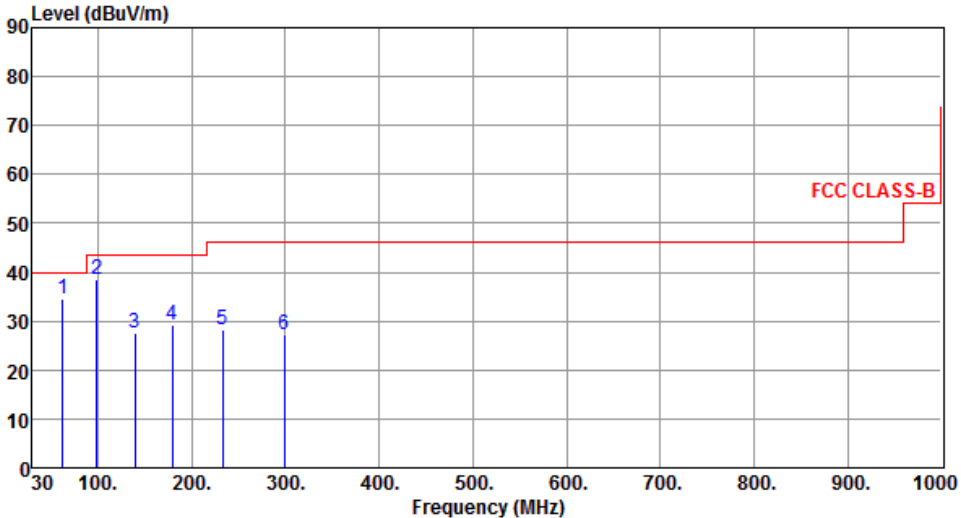
Radiated Emissions below 1 GHz



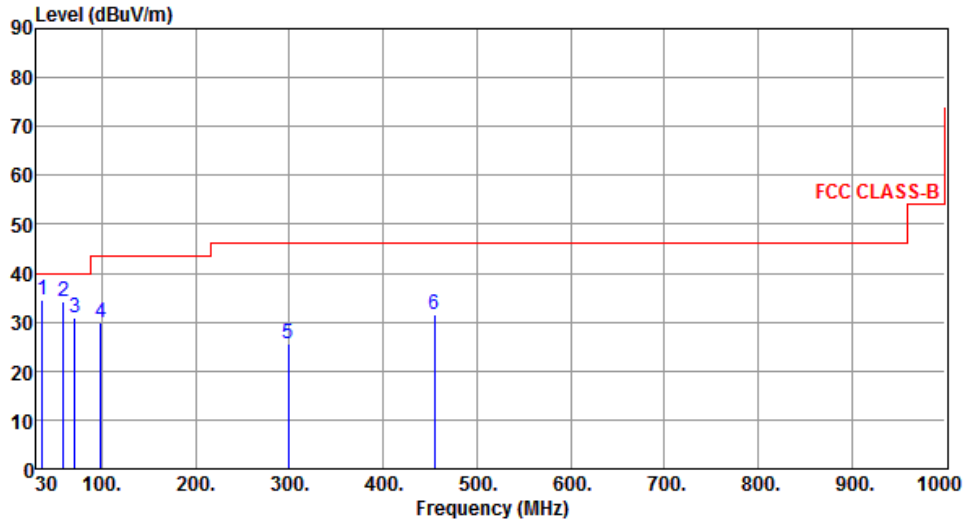
Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	HT20	Test Freq. (MHz)	2437						
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	62.01	34.58	40.00	-5.42	43.77	-9.19	Peak	---	---
2	98.87	38.45	43.50	-5.05	51.79	-13.34	Peak	---	---
3	139.61	27.42	43.50	-16.08	36.18	-8.76	Peak	---	---
4	179.38	29.07	43.50	-14.43	38.66	-9.59	Peak	---	---
5	232.73	28.16	46.00	-17.84	38.35	-10.19	Peak	---	---
6	298.69	27.34	46.00	-18.66	35.32	-7.98	Peak	---	---
<p>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.</p>									

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	36.79	34.69	40.00	-5.31	43.40	-8.71	Peak	---	---
2	59.10	34.05	40.00	-5.95	42.76	-8.71	Peak	---	---
3	70.74	30.80	40.00	-9.20	41.81	-11.01	Peak	---	---
4	98.87	29.80	43.50	-13.70	43.14	-13.34	Peak	---	---
5	298.69	25.64	46.00	-20.36	33.62	-7.98	Peak	---	---
6	454.86	31.43	46.00	-14.57	35.50	-4.07	Peak	---	---

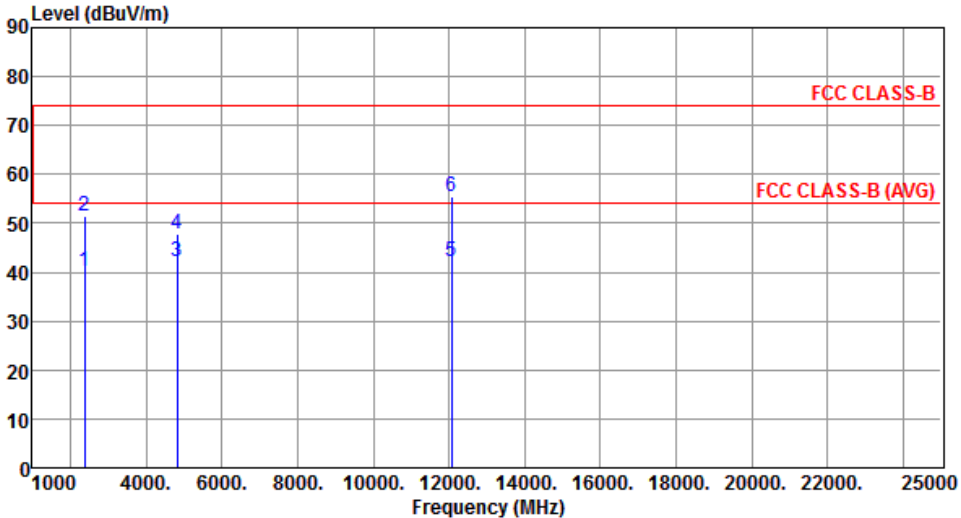
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

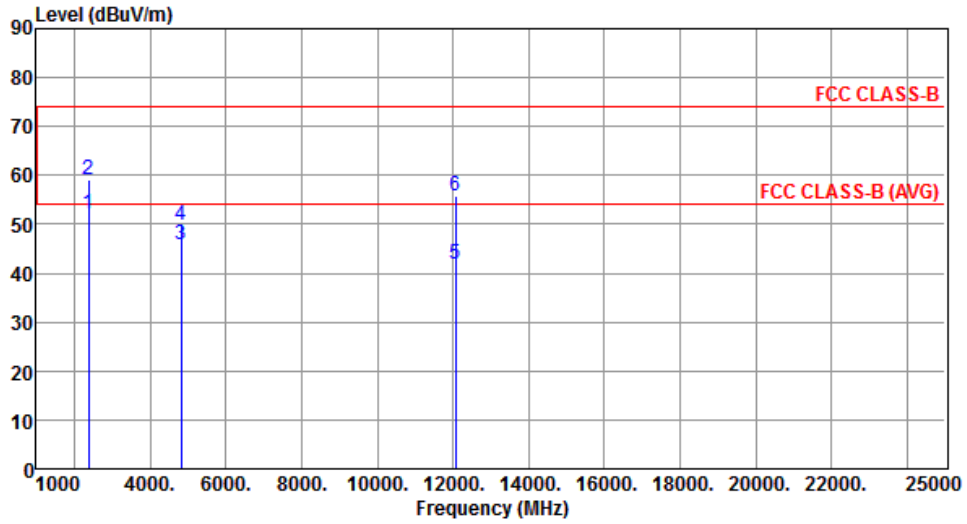
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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

Modulation	11b	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	40.33	54.00	-13.67	43.70	-3.37	Average	100	320
2	2390.00	51.63	74.00	-22.37	55.00	-3.37	Peak	100	320
3	4824.00	42.17	54.00	-11.83	38.22	3.95	Average	100	222
4	4824.00	47.97	74.00	-26.03	44.02	3.95	Peak	100	222
5	12060.00	42.03	54.00	-11.97	28.67	13.36	Average	100	344
6	12060.00	55.58	74.00	-18.42	42.22	13.36	Peak	100	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		



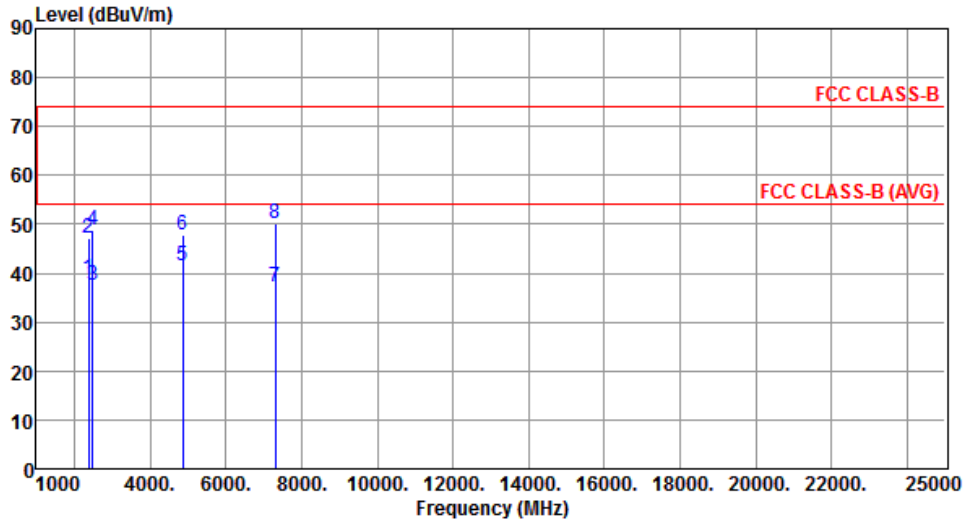
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.11	54.00	-1.89	55.48	-3.37	Average	214	264
2	2390.00	59.03	74.00	-14.97	62.40	-3.37	Peak	214	264
3	4824.00	45.76	54.00	-8.24	41.81	3.95	Average	141	7
4	4824.00	49.83	74.00	-24.17	45.88	3.95	Peak	141	7
5	12060.00	41.77	54.00	-12.23	28.41	13.36	Average	100	51
6	12060.00	55.72	74.00	-18.28	42.36	13.36	Peak	100	51

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

*Factor includes antenna factor , cable loss and amplifier gain

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

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



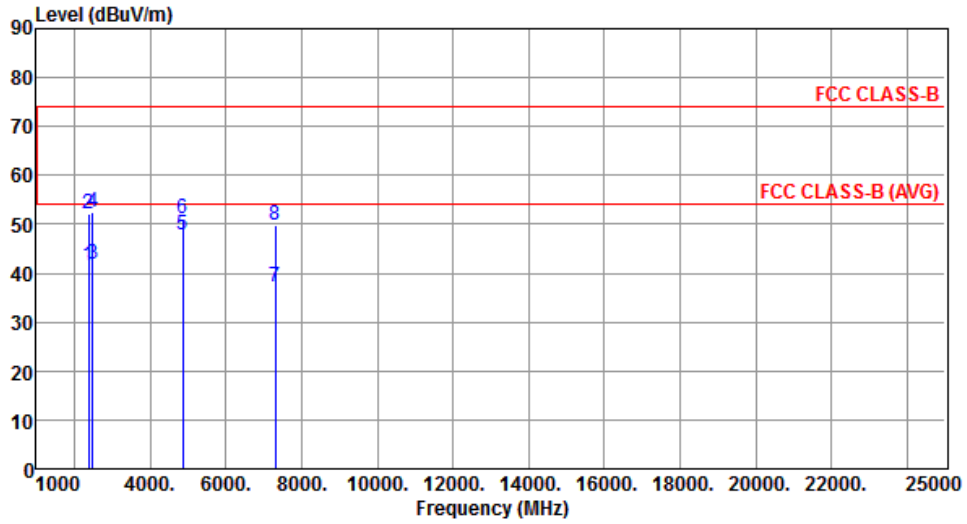
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.73	54.00	-15.27	42.10	-3.37	Average	100	327
2	2390.00	47.17	74.00	-26.83	50.54	-3.37	Peak	100	327
3	2483.50	37.62	54.00	-16.38	40.58	-2.96	Average	100	327
4	2483.50	48.73	74.00	-25.27	51.69	-2.96	Peak	100	327
5	4874.00	41.64	54.00	-12.36	37.54	4.10	Average	154	206
6	4874.00	47.84	74.00	-26.16	43.74	4.10	Peak	154	206
7	7311.00	37.28	54.00	-16.72	28.65	8.63	Average	100	250
8	7311.00	50.18	74.00	-23.82	41.55	8.63	Peak	100	250

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		



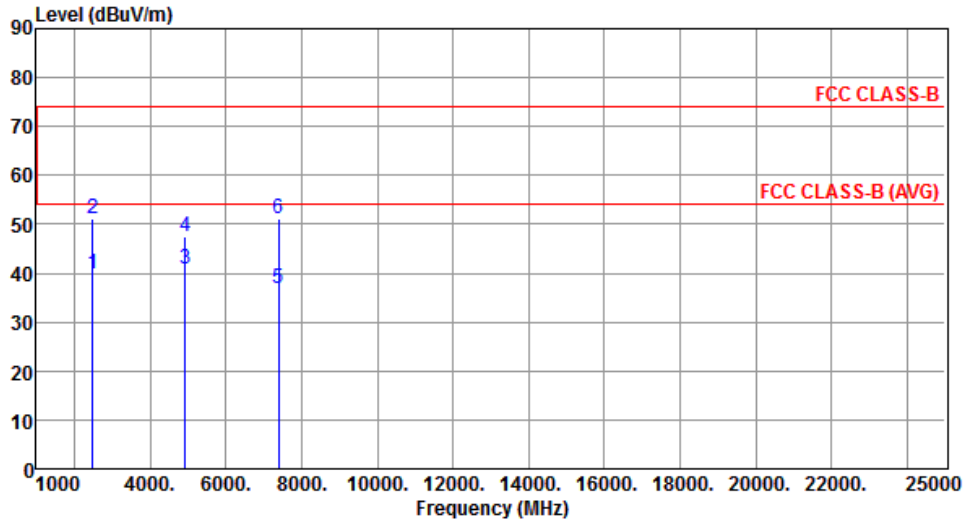
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	41.52	54.00	-12.48	44.89	-3.37	Average	234	264
2	2390.00	52.17	74.00	-21.83	55.54	-3.37	Peak	234	264
3	2483.50	41.93	54.00	-12.07	44.89	-2.96	Average	234	264
4	2483.50	52.43	74.00	-21.57	55.39	-2.96	Peak	234	264
5	4874.00	47.70	54.00	-6.30	43.60	4.10	Average	128	20
6	4874.00	51.23	74.00	-22.77	47.13	4.10	Peak	128	20
7	7311.00	37.10	54.00	-16.90	28.47	8.63	Average	100	50
8	7311.00	49.79	74.00	-24.21	41.16	8.63	Peak	100	50

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

*Factor includes antenna factor , cable loss and amplifier gain

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

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



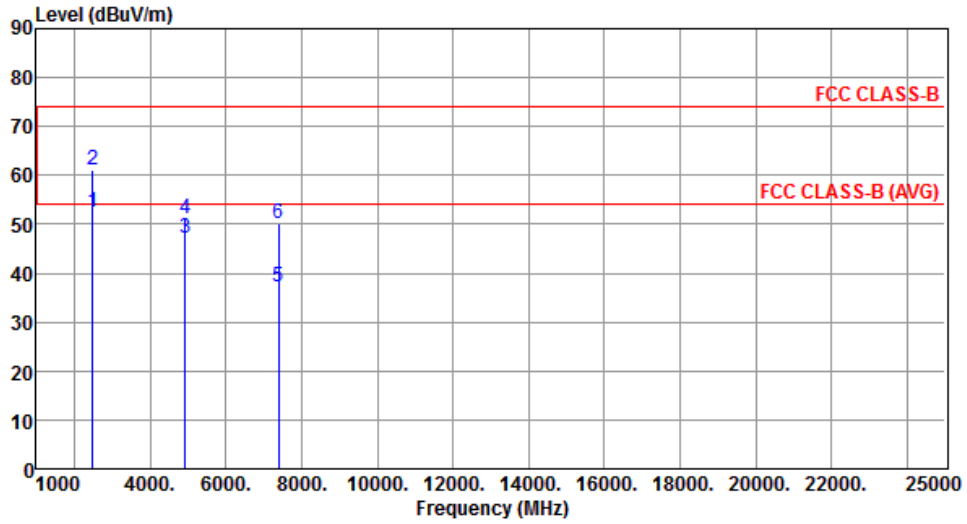
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	39.94	54.00	-14.06	42.90	-2.96	Average	103	330
2	2483.50	51.27	74.00	-22.73	54.23	-2.96	Peak	103	330
3	4924.00	40.78	54.00	-13.22	36.53	4.25	Average	145	214
4	4924.00	47.36	74.00	-26.64	43.11	4.25	Peak	145	214
5	7386.00	36.98	54.00	-17.02	28.22	8.76	Average	100	249
6	7386.00	51.02	74.00	-22.98	42.26	8.76	Peak	100	249

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		



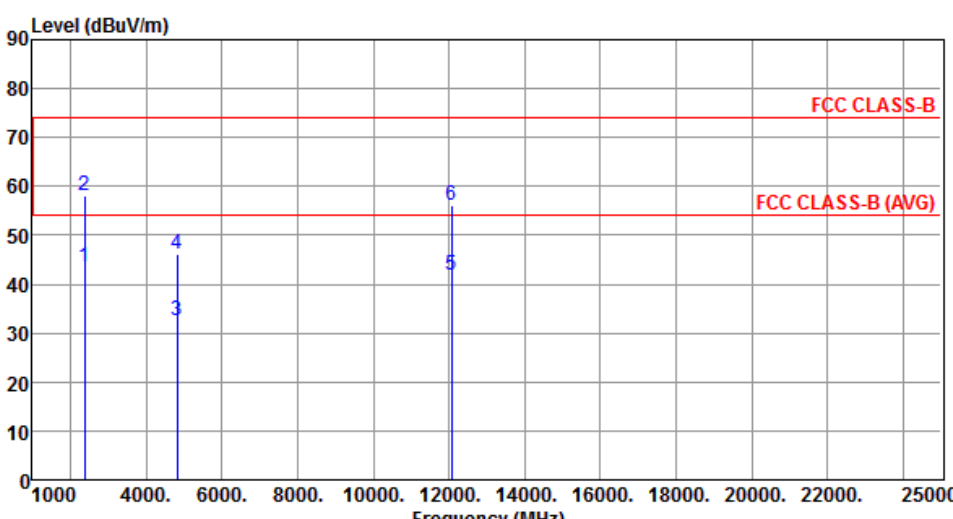
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.39	54.00	-1.61	55.35	-2.96	Average	226	271
2	2483.50	60.96	74.00	-13.04	63.92	-2.96	Peak	226	271
3	4924.00	47.15	54.00	-6.85	42.90	4.25	Average	115	18
4	4924.00	51.04	74.00	-22.96	46.79	4.25	Peak	115	18
5	7386.00	37.18	54.00	-16.82	28.42	8.76	Average	100	53
6	7386.00	50.27	74.00	-23.73	41.51	8.76	Peak	100	53

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

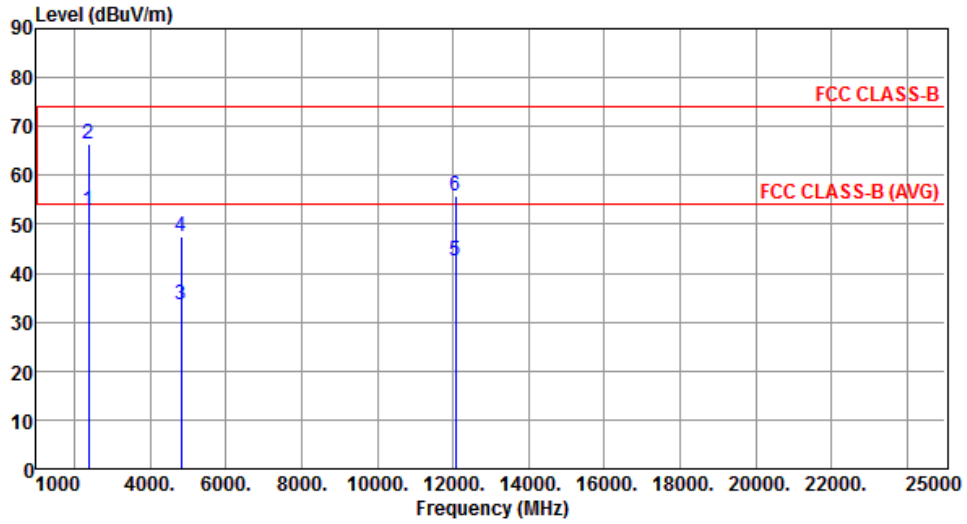
*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	11g	Test Freq. (MHz)	2412																																																															
Polarization	Horizontal																																																																	
 <table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>43.50</td> <td>54.00</td> <td>-10.50</td> <td>46.87</td> <td>-3.37</td> <td>Average</td> <td>100</td> <td>336</td> </tr> <tr> <td>2</td> <td>58.21</td> <td>74.00</td> <td>-15.79</td> <td>61.58</td> <td>-3.37</td> <td>Peak</td> <td>100</td> <td>336</td> </tr> <tr> <td>3</td> <td>32.56</td> <td>54.00</td> <td>-21.44</td> <td>28.61</td> <td>3.95</td> <td>Average</td> <td>100</td> <td>202</td> </tr> <tr> <td>4</td> <td>46.31</td> <td>74.00</td> <td>-27.69</td> <td>42.36</td> <td>3.95</td> <td>Peak</td> <td>100</td> <td>202</td> </tr> <tr> <td>5</td> <td>41.77</td> <td>54.00</td> <td>-12.23</td> <td>28.41</td> <td>13.36</td> <td>Average</td> <td>100</td> <td>255</td> </tr> <tr> <td>6</td> <td>56.01</td> <td>74.00</td> <td>-17.99</td> <td>42.65</td> <td>13.36</td> <td>Peak</td> <td>100</td> <td>255</td> </tr> </tbody> </table>				Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	43.50	54.00	-10.50	46.87	-3.37	Average	100	336	2	58.21	74.00	-15.79	61.58	-3.37	Peak	100	336	3	32.56	54.00	-21.44	28.61	3.95	Average	100	202	4	46.31	74.00	-27.69	42.36	3.95	Peak	100	202	5	41.77	54.00	-12.23	28.41	13.36	Average	100	255	6	56.01	74.00	-17.99	42.65	13.36	Peak	100	255
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																										
1	43.50	54.00	-10.50	46.87	-3.37	Average	100	336																																																										
2	58.21	74.00	-15.79	61.58	-3.37	Peak	100	336																																																										
3	32.56	54.00	-21.44	28.61	3.95	Average	100	202																																																										
4	46.31	74.00	-27.69	42.36	3.95	Peak	100	202																																																										
5	41.77	54.00	-12.23	28.41	13.36	Average	100	255																																																										
6	56.01	74.00	-17.99	42.65	13.36	Peak	100	255																																																										
<p>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).</p>																																																																		

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



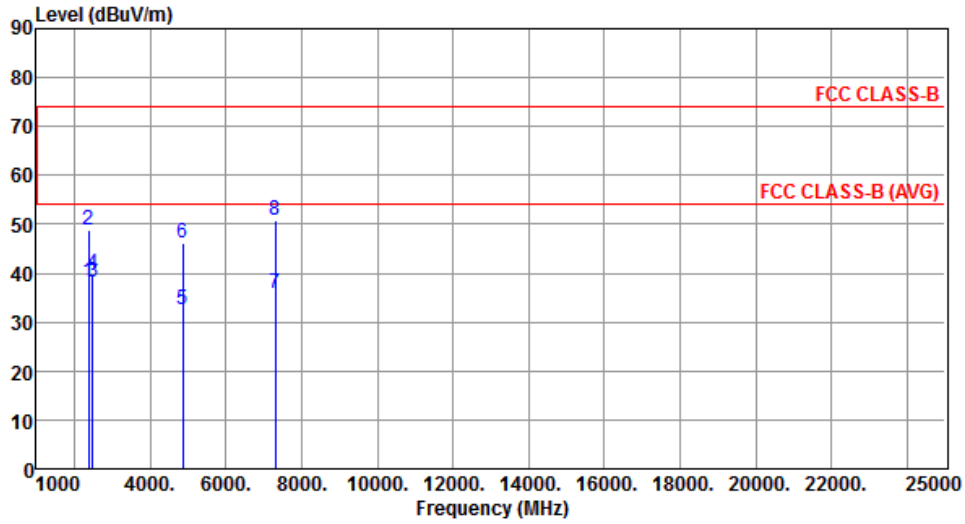
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.65	54.00	-1.35	56.02	-3.37	Average	216	255
2	2390.00	66.57	74.00	-7.43	69.94	-3.37	Peak	216	255
3	4824.00	33.52	54.00	-20.48	29.57	3.95	Average	100	21
4	4824.00	47.55	74.00	-26.45	43.60	3.95	Peak	100	21
5	12060.00	42.53	54.00	-11.47	29.17	13.36	Average	100	55
6	12060.00	55.85	74.00	-18.15	42.49	13.36	Peak	100	55

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		



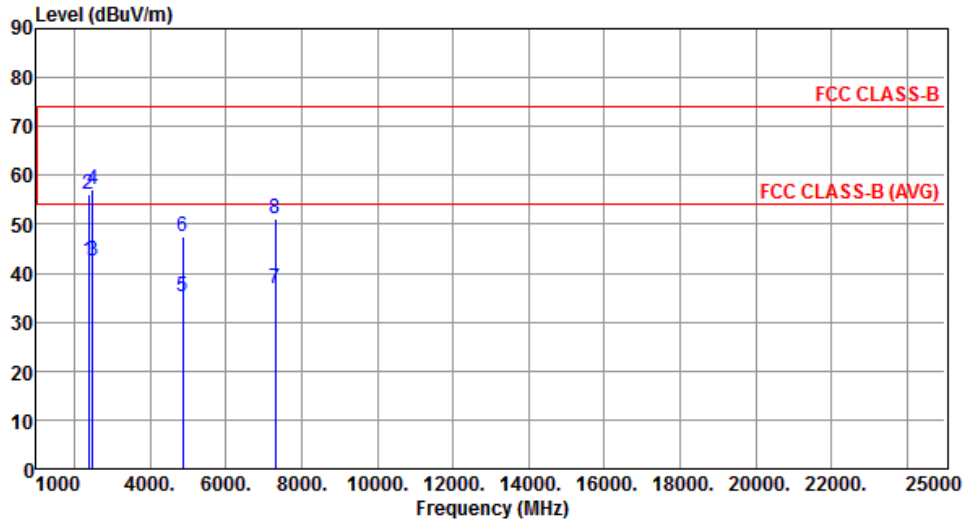
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.21	54.00	-15.79	41.58	-3.37	Average	100	334
2	2390.00	48.95	74.00	-25.05	52.32	-3.37	Peak	100	334
3	2483.50	38.09	54.00	-15.91	41.05	-2.96	Average	100	334
4	2483.50	39.84	74.00	-34.16	42.80	-2.96	Peak	100	334
5	4874.00	32.56	54.00	-21.44	28.46	4.10	Average	100	201
6	4874.00	46.25	74.00	-27.75	42.15	4.10	Peak	100	201
7	7311.00	35.84	54.00	-18.16	27.21	8.63	Average	100	256
8	7311.00	50.98	74.00	-23.02	42.35	8.63	Peak	100	256

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		



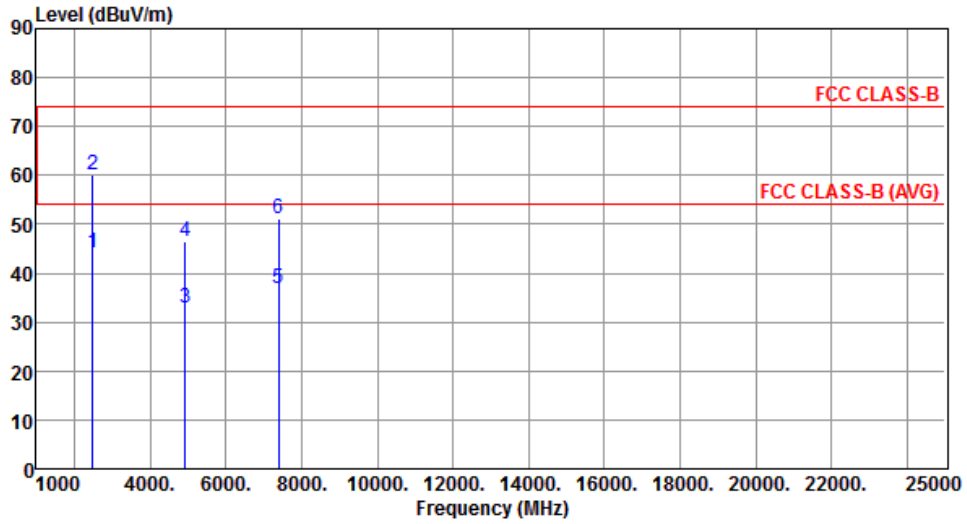
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.55	54.00	-11.45	45.92	-3.37	Average	237	261
2	2390.00	56.13	74.00	-17.87	59.50	-3.37	Peak	237	261
3	2483.50	42.64	54.00	-11.36	45.60	-2.96	Average	237	261
4	2483.50	56.99	74.00	-17.01	59.95	-2.96	Peak	237	261
5	4874.00	35.10	54.00	-18.90	31.00	4.10	Average	100	203
6	4874.00	47.35	74.00	-26.65	43.25	4.10	Peak	100	203
7	7311.00	36.92	54.00	-17.08	28.29	8.63	Average	100	257
8	7311.00	51.21	74.00	-22.79	42.58	8.63	Peak	100	257

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		



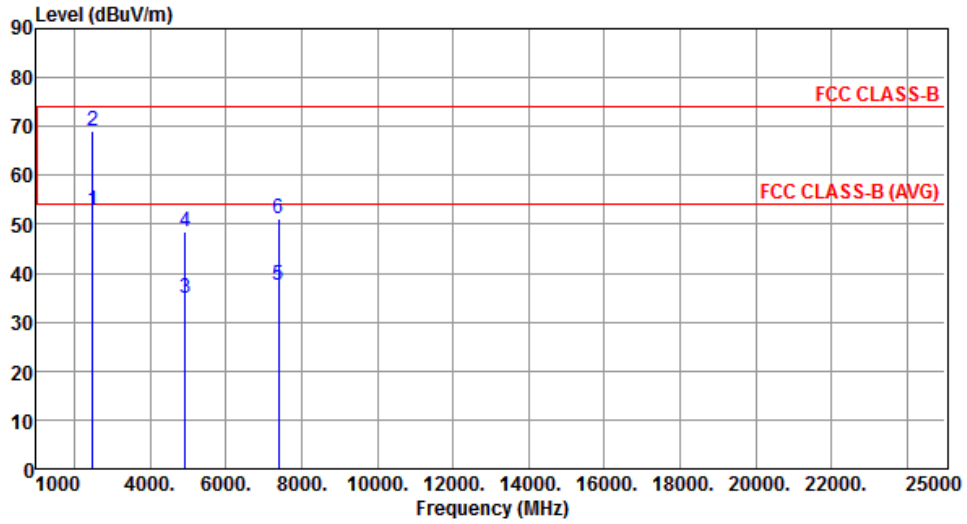
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	44.10	54.00	-9.90	47.06	-2.96	Average	100	326
2	2483.50	60.05	74.00	-13.95	63.01	-2.96	Peak	100	326
3	4924.00	32.86	54.00	-21.14	28.61	4.25	Average	100	207
4	4924.00	46.56	74.00	-27.44	42.31	4.25	Peak	100	207
5	7386.00	36.92	54.00	-17.08	28.16	8.76	Average	100	254
6	7386.00	50.99	74.00	-23.01	42.23	8.76	Peak	100	254

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		



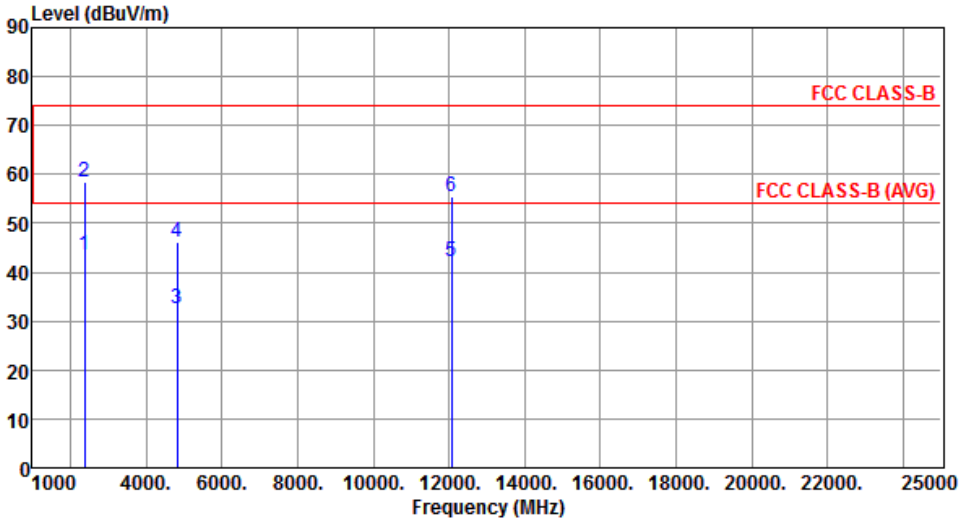
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.71	54.00	-1.29	55.67	-2.96	Average	229	267
2	2483.50	69.04	74.00	-4.96	72.00	-2.96	Peak	229	267
3	4924.00	34.83	54.00	-19.17	30.58	4.25	Average	100	205
4	4924.00	48.46	74.00	-25.54	44.21	4.25	Peak	100	205
5	7386.00	37.52	54.00	-16.48	28.76	8.76	Average	100	256
6	7386.00	51.02	74.00	-22.98	42.26	8.76	Peak	100	256

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

*Factor includes antenna factor , cable loss and amplifier gain

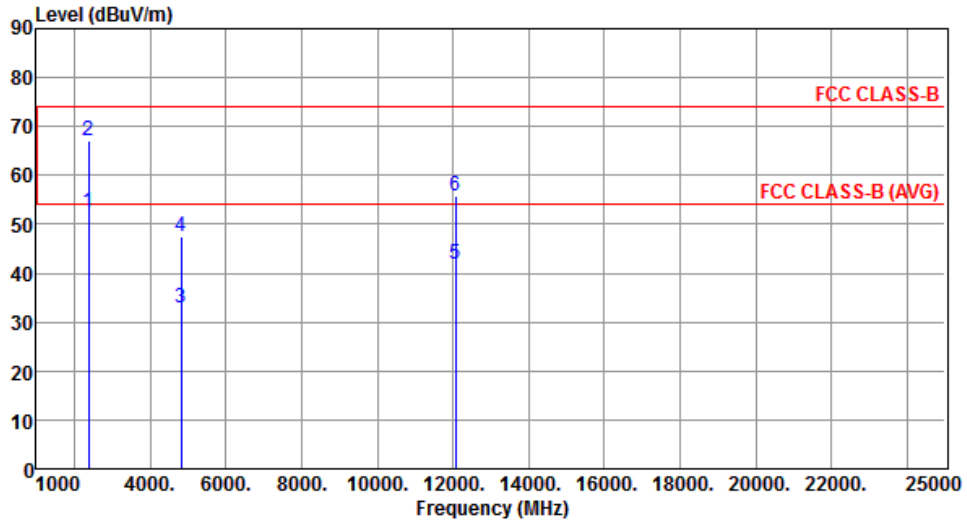
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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	43.51	54.00	-10.49	46.88	-3.37	Average	100	33
2	2390.00	58.36	74.00	-15.64	61.73	-3.37	Peak	100	33
3	4824.00	32.49	54.00	-21.51	28.54	3.95	Average	100	201
4	4824.00	46.18	74.00	-27.82	42.23	3.95	Peak	100	201
5	12060.00	42.05	54.00	-11.95	28.69	13.36	Average	100	253
6	12060.00	55.50	74.00	-18.50	42.14	13.36	Peak	100	253

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		



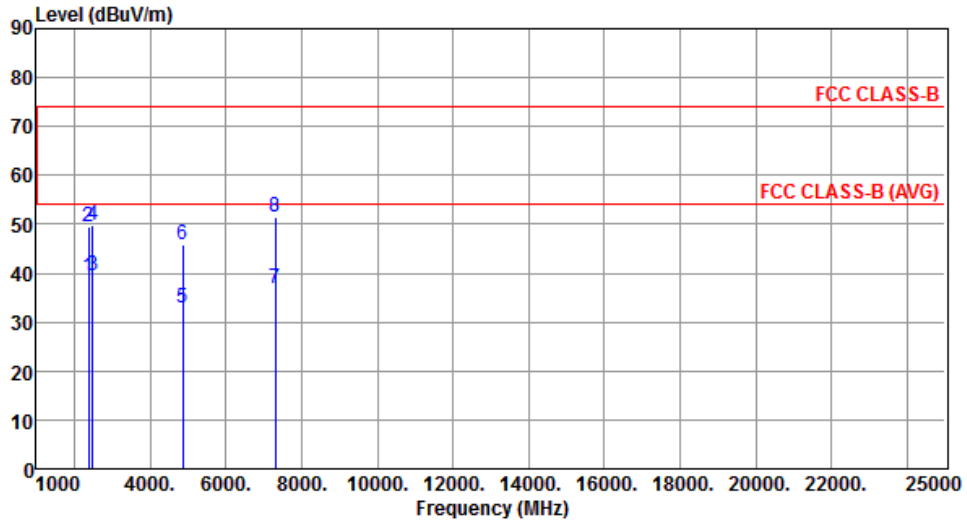
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.49	54.00	-1.51	55.86	-3.37	Average	210	265
2	2390.00	67.03	74.00	-6.97	70.40	-3.37	Peak	210	265
3	4824.00	33.00	54.00	-21.00	29.05	3.95	Average	100	21
4	4824.00	47.45	74.00	-26.55	43.50	3.95	Peak	100	21
5	12060.00	41.83	54.00	-12.17	28.47	13.36	Average	100	53
6	12060.00	55.94	74.00	-18.06	42.58	13.36	Peak	100	53

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



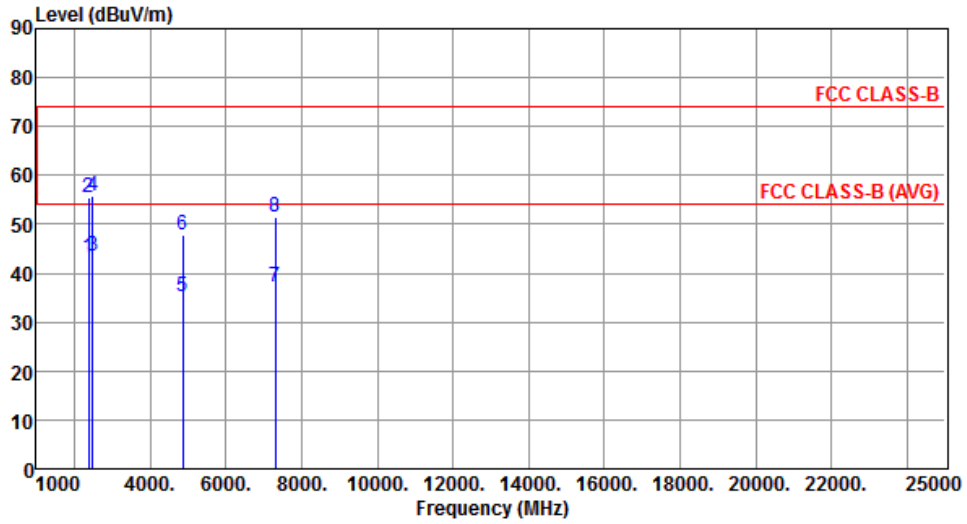
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.23	54.00	-14.77	42.60	-3.37	Average	100	336
2	2390.00	49.32	74.00	-24.68	52.69	-3.37	Peak	100	336
3	2483.50	39.48	54.00	-14.52	42.44	-2.96	Average	100	336
4	2483.50	49.83	74.00	-24.17	52.79	-2.96	Peak	100	336
5	4874.00	32.84	54.00	-21.16	28.74	4.10	Average	100	210
6	4874.00	45.68	74.00	-28.32	41.58	4.10	Peak	100	210
7	7311.00	36.84	54.00	-17.16	28.21	8.63	Average	100	253
8	7311.00	51.43	74.00	-22.57	42.80	8.63	Peak	100	253

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		



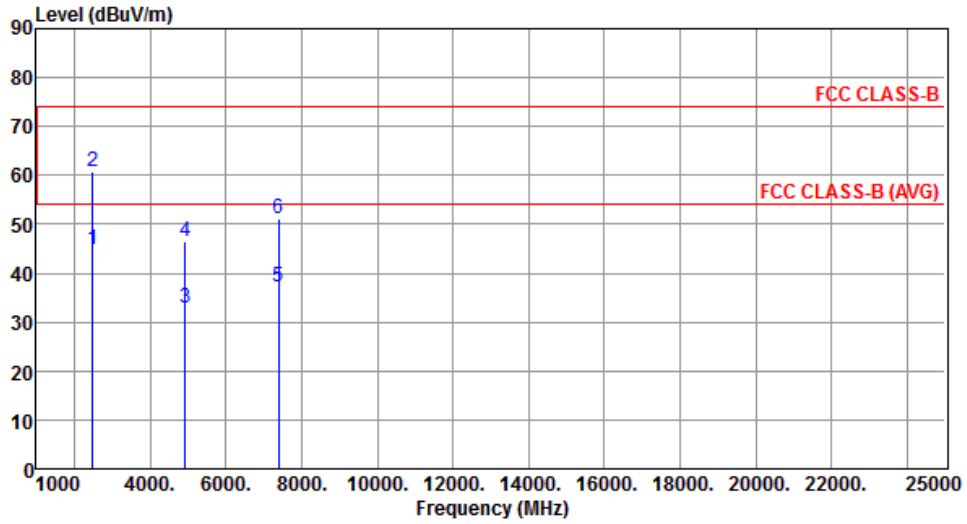
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.20	54.00	-10.80	46.57	-3.37	Average	240	254
2	2390.00	55.52	74.00	-18.48	58.89	-3.37	Peak	240	254
3	2483.50	43.62	54.00	-10.38	46.58	-2.96	Average	240	254
4	2483.50	55.68	74.00	-18.32	58.64	-2.96	Peak	240	254
5	4874.00	35.15	54.00	-18.85	31.05	4.10	Average	100	18
6	4874.00	47.68	74.00	-26.32	43.58	4.10	Peak	100	18
7	7311.00	37.21	54.00	-16.79	28.58	8.63	Average	100	18
8	7311.00	51.34	74.00	-22.66	42.71	8.63	Peak	100	18

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		



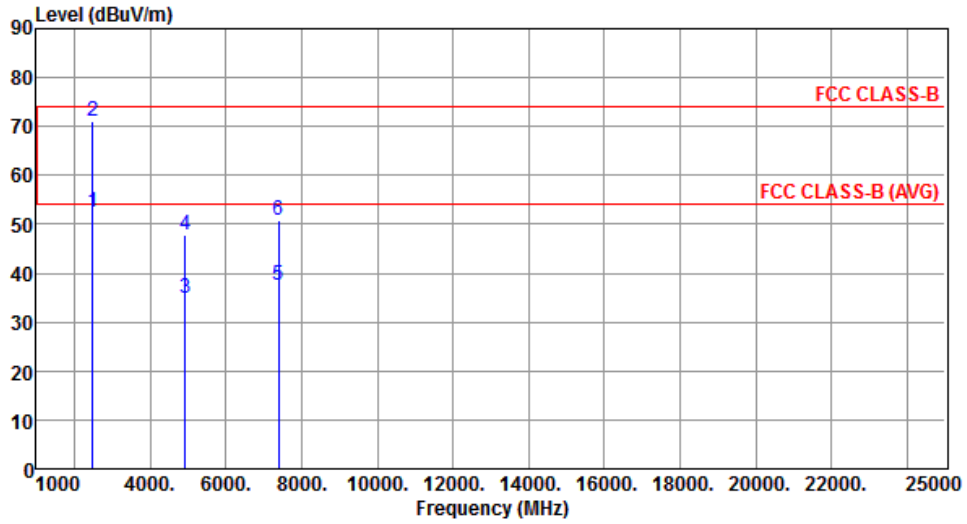
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	44.98	54.00	-9.02	47.94	-2.96	Average	100	329
2	2483.50	60.63	74.00	-13.37	63.59	-2.96	Peak	100	329
3	4924.00	32.74	54.00	-21.26	28.49	4.25	Average	100	208
4	4924.00	46.35	74.00	-27.65	42.10	4.25	Peak	100	208
5	7386.00	37.17	54.00	-16.83	28.41	8.76	Average	100	252
6	7386.00	51.03	74.00	-22.97	42.27	8.76	Peak	100	252

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	52.45	54.00	-1.55	55.41	-2.96	Average	198	267
2	2483.50	71.06	74.00	-2.94	74.02	-2.96	Peak	198	267
3	4924.00	34.83	54.00	-19.17	30.58	4.25	Average	100	24
4	4924.00	47.81	74.00	-26.19	43.56	4.25	Peak	100	24
5	7386.00	37.67	54.00	-16.33	28.91	8.76	Average	100	53
6	7386.00	50.87	74.00	-23.13	42.11	8.76	Peak	100	53

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

*Factor includes antenna factor , cable loss and amplifier gain

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

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

3.6.2 Test Procedures

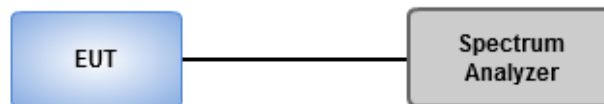
Reference level measurement

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

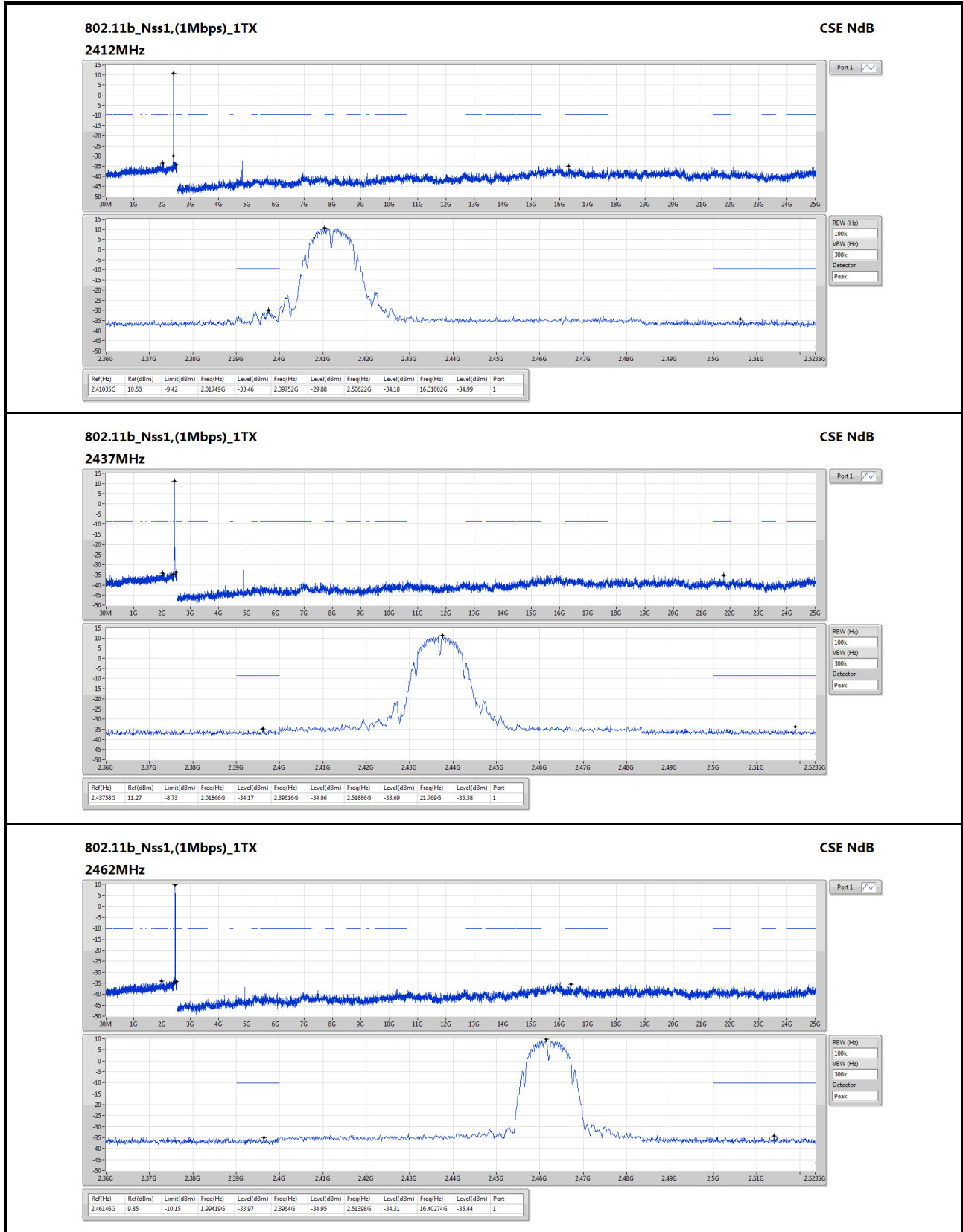
Emission level measurement

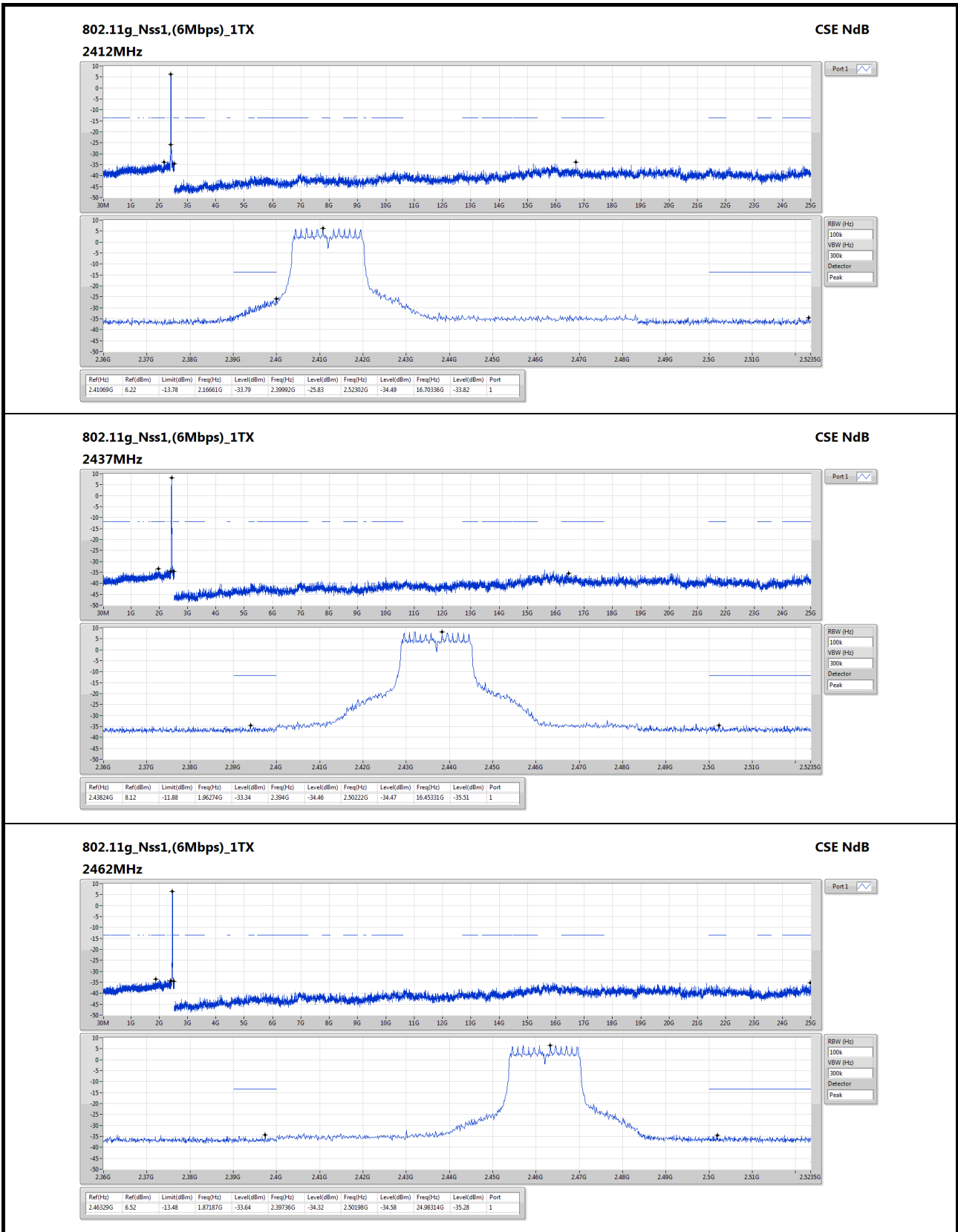
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

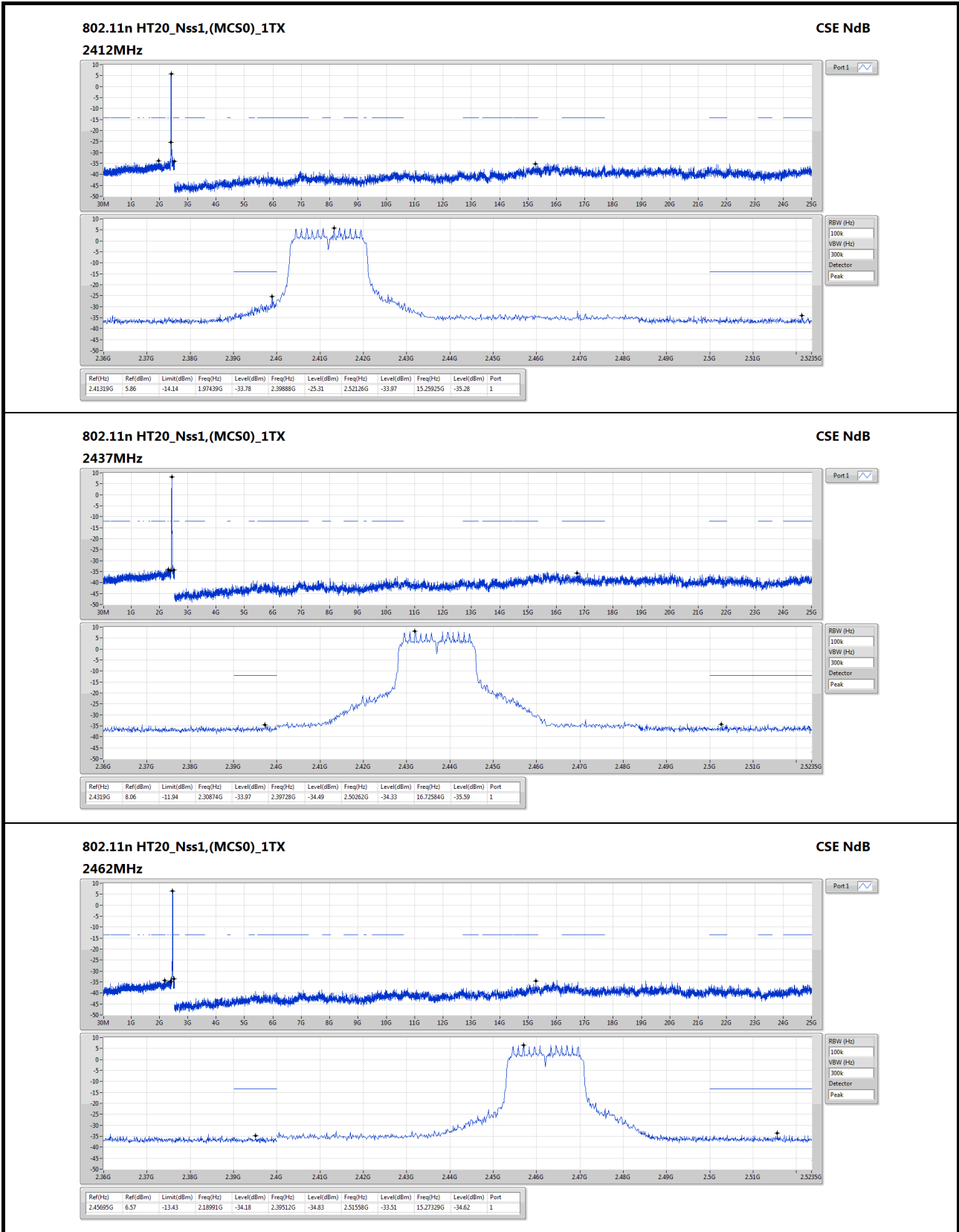
3.6.3 Test Setup



3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands







4 Test laboratory information

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

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

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

Linkou

Tel: 886-2-2601-1640

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

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

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

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

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