FCC Test Report

FCC ID	:	**TLZ-CM299**
Equipment	:	**IEEE 802.11 1X1 ac/a/b/g/n Wireless LAN + Bluetooth Module**
Model No.	:	**AW-CM299**
Brand Name	:	**AzureWave**
Applicant	:	**AzureWave Technologies, Inc.**
Address	:	**8F, No. 94, Baozhong Rd., Xindian Dist., New Taipei City, Taiwan 231**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Jul. 18, 2017**
Tested Date	:	**Nov. 09, 2017 ~ Jan. 15, 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

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Release Record

Report No.	Version	Description	Issued Date
FR771801AC	Rev. 01	Initial issue	Jan. 31, 2018

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.153MHz 50.33 (Margin -15.49dB) – QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2483.50MHz 73.43 (Margin -0.57dB) – PK	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 26.27	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

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
2400-2483.5	b	2412-2462	1-11 [11]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	1	MCS 0-7
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	1	MCS 0-7
Note 1: RF output power specifies that Maximum 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.	Brand	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
					2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	Yageo	ANT5320LL04R2455A	Chip	N/A	2.09	4.32			

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc from host 1.8Vdc from host

1.1.4 Accessories

N/A

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	Dut labtool, Version: 2.0.0.89		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	100.00%	0.00
	11g	100.00%	0.00
	HT20	100.00%	0.00
	HT40	100.00%	0.00

1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	12
11b	2437	12
11b	2462	14
11g	2412	16
11g	2437	20
11g	2462	16
HT20	2412	16
HT20	2437	20
HT20	2462	16
HT40	2422	16
HT40	2437	17
HT40	2452	15

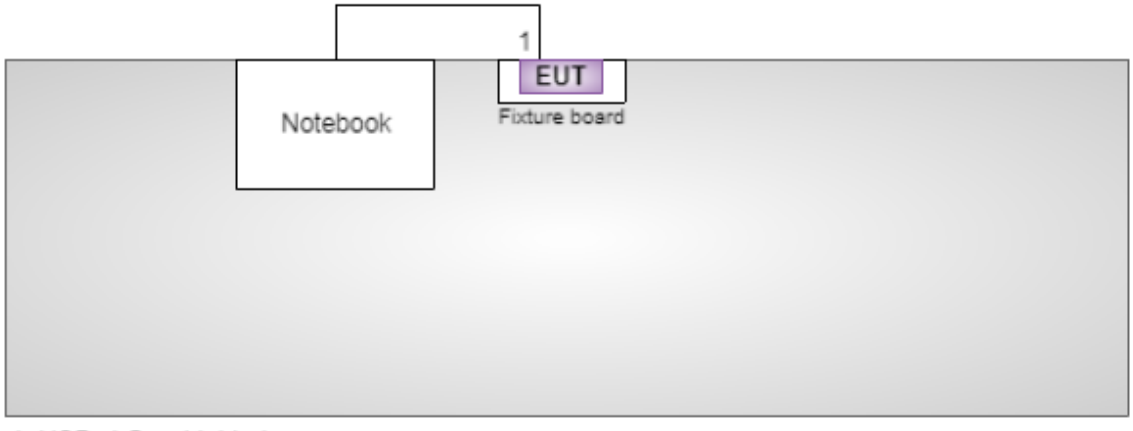
1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	---	USB, 1.5m shielded.
2	Fixture board	AzureWave	---	---	---

Note: No.2 was provided by applicant

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Dec. 26. 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101658	Nov. 20, 2017	Nov. 19, 2018
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2017	Nov. 12, 2018
RF Cable-CON	EMC	EMCCFD300-BM-BM-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 chamber 3 / (03CH03-WS)				
Tested Date	Nov. 09 ~ Nov. 29, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&**S**	FSV40	101499	Dec. 16, 2016	Dec. 15, 2017
Receiver	Agilent	N9038A	MY53290044	Sep. 26, 2017	Sep. 25, 2018
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 28, 2017	Apr. 27, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 29, 2016	Dec. 28, 2017
Loop Antenna	TESEQ	HLA 6120	31244	Mar. 02, 2017	Mar. 01, 2018
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980187	Sep. 04, 2017	Sep. 03, 2018
Preamplifier	Agilent	83017A	MY53270014	Aug. 21, 2017	Aug. 20, 2018
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 04, 2017	Feb. 03, 2018
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 04, 2017	Feb. 03, 2018
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 04, 2017	Feb. 03, 2018
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 04, 2017	Feb. 03, 2018
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Jan. 15, 2018				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&**S**	FSV40	101499	Jan. 03, 2018	Jan. 02, 2019
Receiver	R&**S**	ESR3	101658	Nov. 20, 2017	Nov. 19, 2018
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 28, 2017	Apr. 27, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 23, 2017	Nov. 22, 2018
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2017	Nov. 12, 2018
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 07, 2017	Dec. 06, 2018
Preamplifier	EMC	EMC02325	980187	Sep. 04, 2017	Sep. 03, 2018
Preamplifier	Agilent	83017A	MY53270014	Aug. 21, 2017	Aug. 20, 2018
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Nov. 27, 2017	Nov. 26, 2018
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY32487/4	Nov. 27, 2017	Nov. 26, 2018
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Nov. 27, 2017	Nov. 26, 2018
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Nov. 27, 2017	Nov. 26, 2018
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Nov. 27, 2017	Nov. 26, 2018
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Nov. 27, 2017	Nov. 26, 2018
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. 21, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 16, 2017	Oct. 15, 2018
Power Sensor	Anritsu	MA2411B	1207366	Oct. 16, 2017	Oct. 15, 2018
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 26, 2017	Oct. 25, 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 DTS Meas Guidance v04

1.6 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	±5.37 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 56%	Alex Huang
Radiated Emissions	03CH03WS	23-24°C / 61-65%	Vincent Yeh Brad Wu
RF Conducted	TH01-WS	20°C / 61%	Brad Wu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- IC site registration No.: 10807B-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	11g	2437	6 Mbps	---
Radiated Emissions ≤1GHz	11g	2437	6 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 **X-plane** results were found as the worst case and were shown in this report.				

3 Transmitter Test Results

3.1 Conducted Emissions

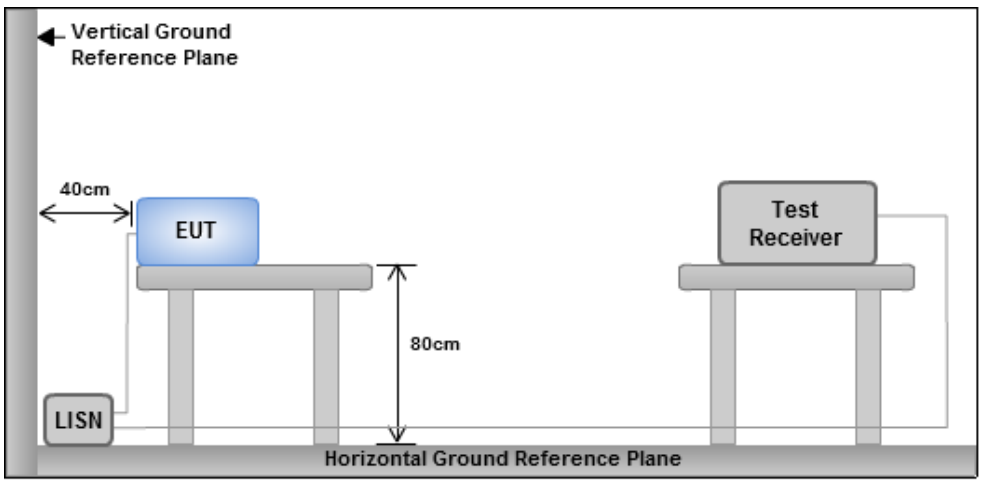
3.1.1 Limit of Conducted Emissions

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

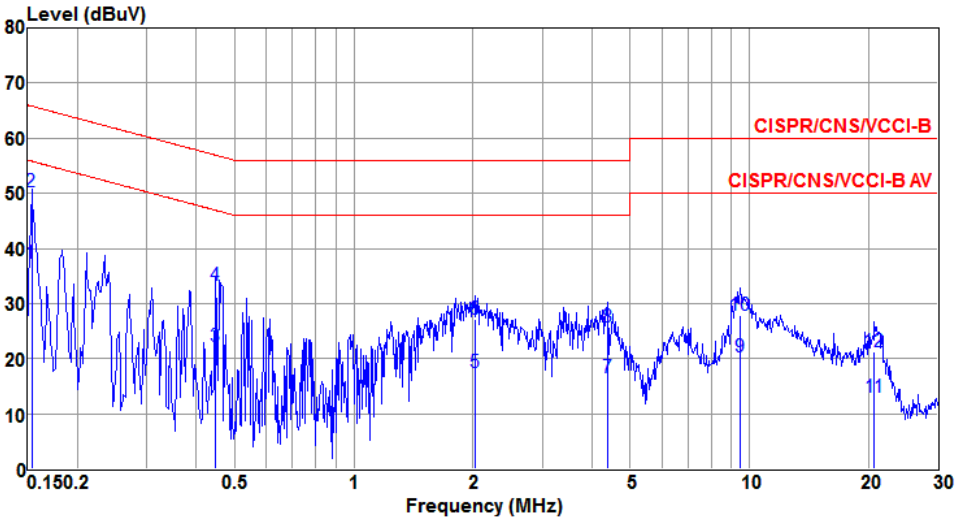


Note: 1. Support units were connected to second LISN.

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

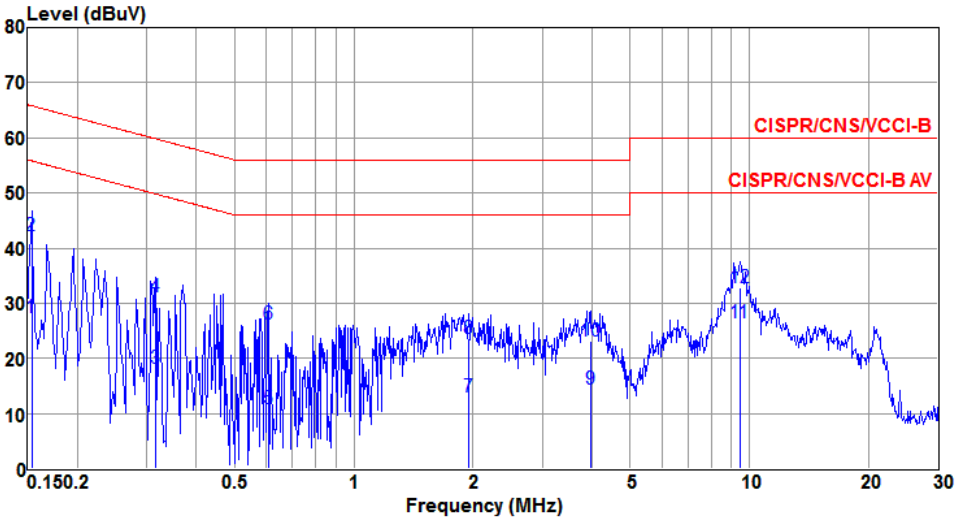
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	37.41	55.82	-18.41	37.30	0.07	0.04	Average
2@	0.153	50.33	65.82	-15.49	50.22	0.07	0.04	QP
3	0.447	22.17	46.93	-24.76	22.05	0.08	0.04	Average
4	0.447	33.21	56.93	-23.72	33.09	0.08	0.04	QP
5	2.023	17.43	46.00	-28.57	17.28	0.11	0.04	Average
6	2.023	27.22	56.00	-28.78	27.07	0.11	0.04	QP
7	4.384	16.50	46.00	-29.50	16.19	0.14	0.17	Average
8	4.384	25.71	56.00	-30.29	25.40	0.14	0.17	QP
9	9.451	20.40	50.00	-29.60	19.98	0.20	0.22	Average
10	9.451	27.77	60.00	-32.23	27.35	0.20	0.22	QP
11	20.704	13.04	50.00	-36.96	12.51	0.27	0.26	Average
12	20.704	21.26	60.00	-38.74	20.73	0.27	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).

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



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	27.47	55.82	-28.35	27.39	0.04	0.04	Average
2@	0.153	42.30	65.82	-23.52	42.22	0.04	0.04	QP
3	0.315	18.12	49.84	-31.72	18.04	0.04	0.04	Average
4	0.315	31.08	59.84	-28.76	31.00	0.04	0.04	QP
5	0.608	10.89	46.00	-35.11	10.81	0.04	0.04	Average
6	0.608	26.16	56.00	-29.84	26.08	0.04	0.04	QP
7	1.949	12.97	46.00	-33.03	12.86	0.07	0.04	Average
8	1.949	23.60	56.00	-32.40	23.49	0.07	0.04	QP
9	3.964	14.50	46.00	-31.50	14.25	0.09	0.16	Average
10	3.964	23.17	56.00	-32.83	22.92	0.09	0.16	QP
11	9.451	26.40	50.00	-23.60	26.01	0.17	0.22	Average
12	9.451	32.79	60.00	-27.21	32.40	0.17	0.22	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

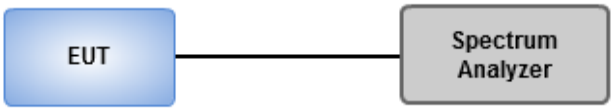
6dB Bandwidth

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 MHz, Video bandwidth = 3 MHz.
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.

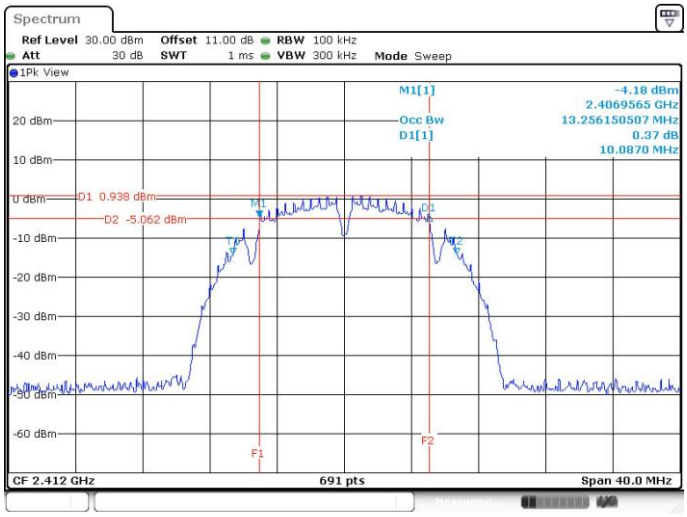
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

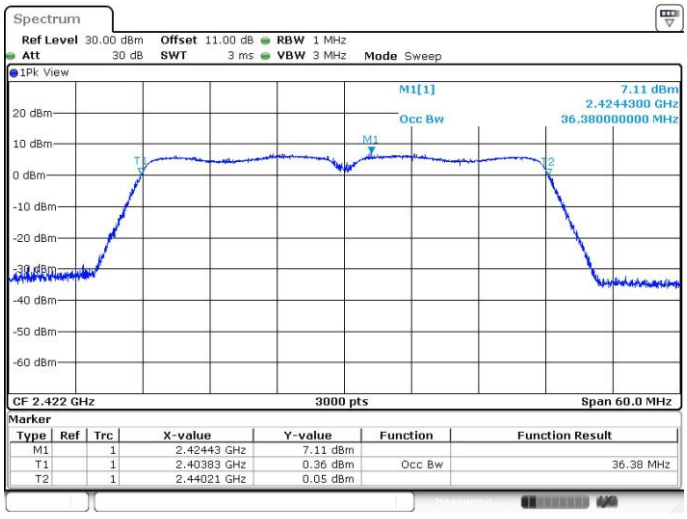
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	1	2412	10.09	---	---	---	500
11b	1	2437	10.09	---	---	---	500
11b	1	2462	10.09	---	---	---	500
11g	1	2412	16.52	---	---	---	500
11g	1	2437	16.58	---	---	---	500
11g	1	2462	16.58	---	---	---	500
HT20	1	2412	17.74	---	---	---	500
HT20	1	2437	17.68	---	---	---	500
HT20	1	2462	17.62	---	---	---	500
HT40	1	2422	36.41	---	---	---	500
HT40	1	2437	36.41	---	---	---	500
HT40	1	2452	36.41	---	---	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	1	2412	13.26	---	---	---
11b	1	2437	13.25	---	---	---
11b	1	2462	13.21	---	---	---
11g	1	2412	16.74	---	---	---
11g	1	2437	16.72	---	---	---
11g	1	2462	16.70	---	---	---
HT20	1	2412	17.67	---	---	---
HT20	1	2437	17.69	---	---	---
HT20	1	2462	17.67	---	---	---
HT40	1	2422	36.38	---	---	---
HT40	1	2437	36.34	---	---	---
HT40	1	2452	36.34	---	---	---

Worst Plot



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.

☐ Antenna gain > 6dBi

☐ Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

☐ Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

☒ Maximum Peak Conducted Output Power

☐ **Spectrum analyzer**

1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

☒ **Power meter**

1. A broadband Peak 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.

☒ Maximum Conducted Output Power (For reference only)

☒ **Power meter**

1. A broadband Average 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

Modulation Mode	N_{TX}	Freq. (MHz)	Peak conducted Output Power (dBm)							Ant. Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3	Total Power (mW)	Total Power (dBm)	Limit (dBm)			
11b	1	2412	13.68	---	---	---	23.335	13.68	30.00	2.09	15.77	36.00
11b	1	2437	13.79	---	---	---	23.933	13.79	30.00	2.09	15.88	36.00
11b	1	2462	15.71	---	---	---	37.239	15.71	30.00	2.09	17.80	36.00
11g	1	2412	21.19	---	---	---	131.522	21.19	30.00	2.09	23.28	36.00
11g	1	2437	26.27	---	---	---	423.643	**26.27**	30.00	2.09	28.36	36.00
11g	1	2462	22.37	---	---	---	172.584	22.37	30.00	2.09	24.46	36.00
HT20	1	2412	21.85	---	---	---	153.109	21.85	30.00	2.09	23.94	36.00
HT20	1	2437	25.93	---	---	---	391.742	25.93	30.00	2.09	28.02	36.00
HT20	1	2462	22.15	---	---	---	164.059	22.15	30.00	2.09	24.24	36.00
HT40	1	2422	22.16	---	---	---	164.437	22.16	30.00	2.09	24.25	36.00
HT40	1	2437	23.05	---	---	---	201.837	23.05	30.00	2.09	25.14	36.00
HT40	1	2452	20.92	---	---	---	123.595	20.92	30.00	2.09	23.01	36.00

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (Average) Output Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	1	2412	10.7	---	---	---	11.749	10.70	---
11b	1	2437	10.8	---	---	---	12.023	10.80	---
11b	1	2462	12.72	---	---	---	18.707	12.72	---
11g	1	2412	12.8	---	---	---	19.055	12.80	---
11g	1	2437	17.13	---	---	---	51.642	17.13	---
11g	1	2462	13.16	---	---	---	20.701	13.16	---
HT20	1	2412	13.02	---	---	---	20.045	13.02	---
HT20	1	2437	17.15	---	---	---	51.880	**17.15**	---
HT20	1	2462	13.05	---	---	---	20.184	13.05	---
HT40	1	2422	12.36	---	---	---	17.219	12.36	---
HT40	1	2437	13.36	---	---	---	21.677	13.36	---
HT40	1	2452	11.35	---	---	---	13.646	11.35	---

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

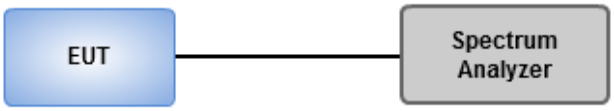
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 3kHz, VBW = 10kHz.
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.

☐ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 100kHz, VBW = 300 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (maximum data rate per stream).
4. Perform the measurement over a single sweep.
5. Use the peak marker function to determine the maximum amplitude level.

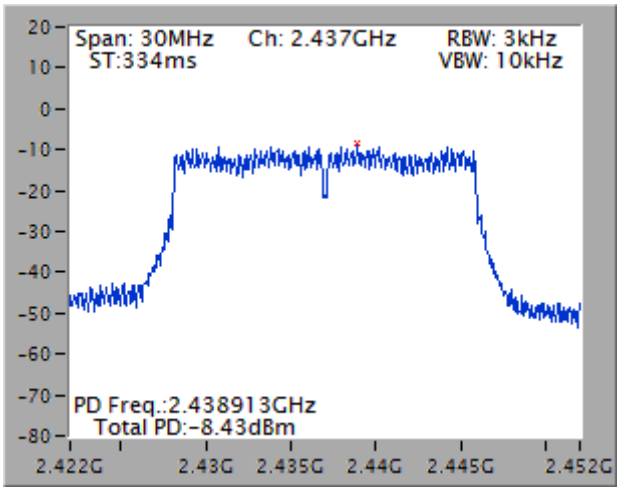
3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	1	2412	-13.46	8.00
11b	1	2437	-13.98	8.00
11b	1	2462	-10.83	8.00
11g	1	2412	-13.47	8.00
11g	1	2437	-10.22	8.00
11g	1	2462	-13.98	8.00
HT20	1	2412	-13.39	8.00
HT20	1	2437	-8.43	8.00
HT20	1	2462	-12.56	8.00
HT40	1	2422	-15.62	8.00
HT40	1	2437	-15.67	8.00
HT40	1	2452	-17.78	8.00

Worst Plot



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

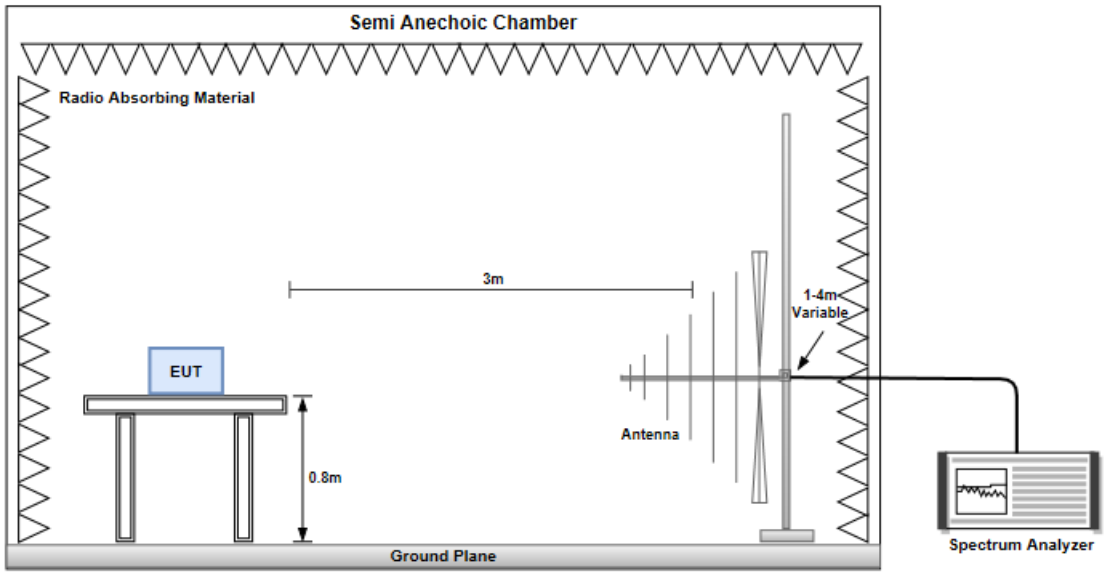
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

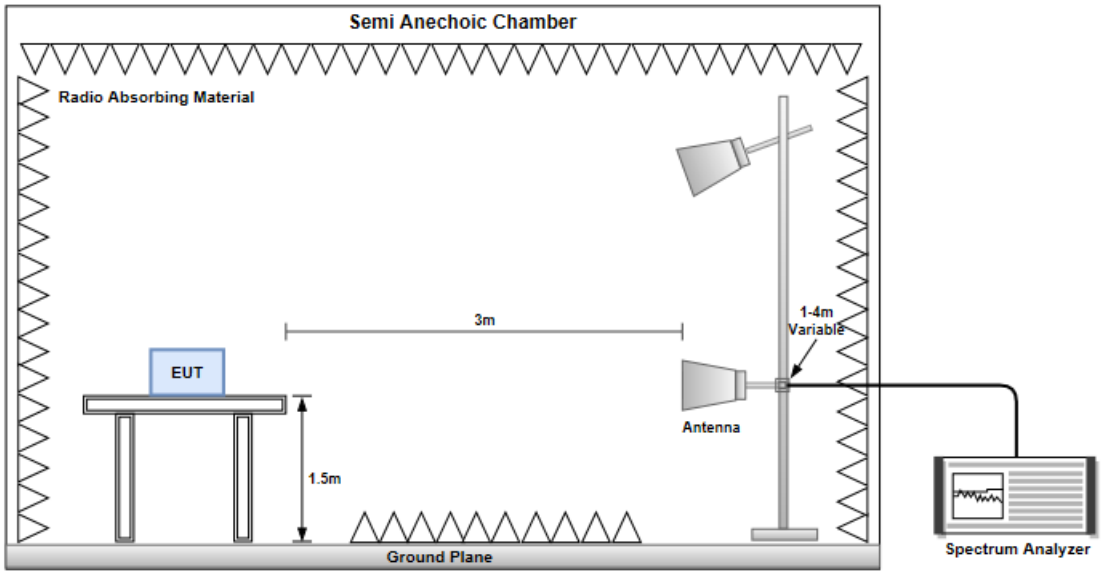
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

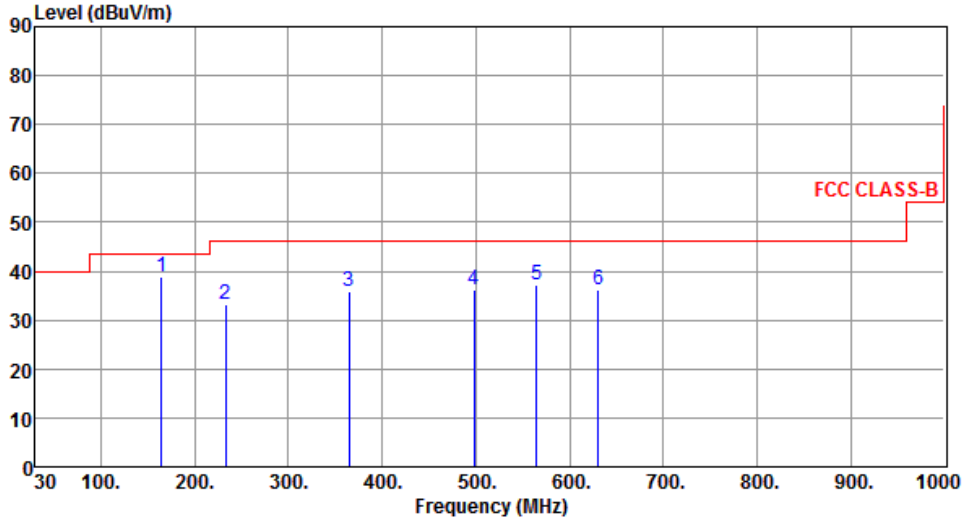


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

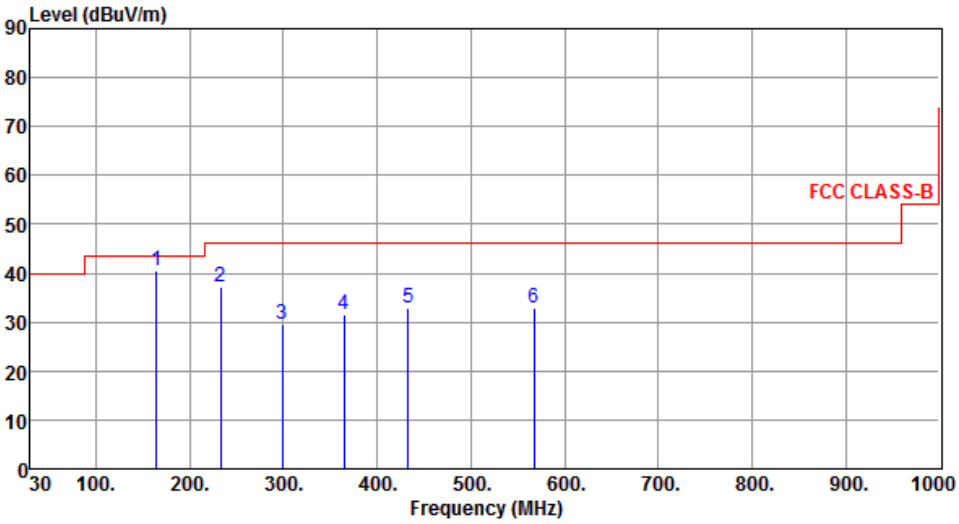
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	164.83	38.89	43.50	-4.61	46.99	-8.10	Peak	---	---
2	232.73	33.21	46.00	-12.79	43.02	-9.81	Peak	---	---
3	364.65	35.75	46.00	-10.25	41.73	-5.98	Peak	---	---
4	498.51	36.09	46.00	-9.91	39.10	-3.01	Peak	---	---
5	564.47	37.27	46.00	-8.73	38.82	-1.55	Peak	---	---
6	630.43	36.36	46.00	-9.64	36.60	-0.24	Peak	---	---

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

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

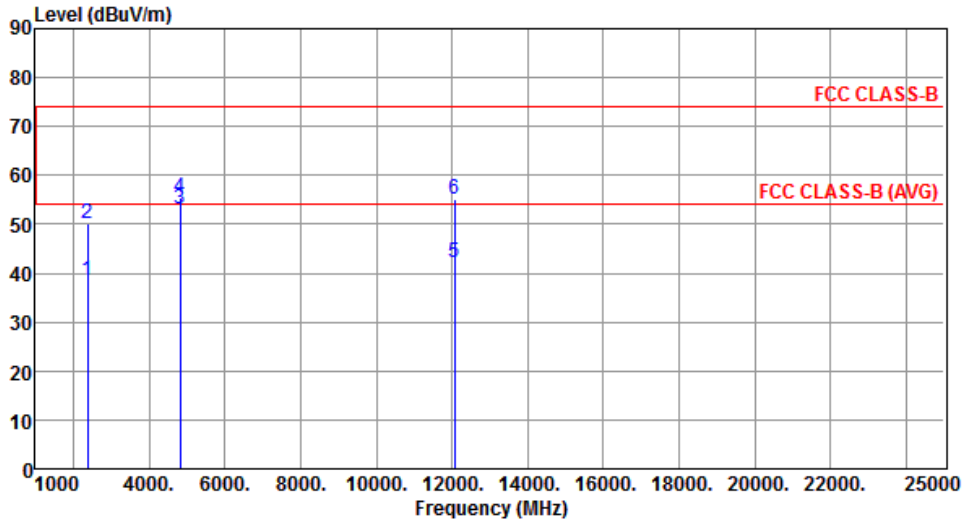


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	164.83	40.46	43.50	-3.04	48.56	-8.10	Peak	---	---
2	232.73	37.15	46.00	-8.85	46.96	-9.81	Peak	---	---
3	298.69	29.67	46.00	-16.33	37.22	-7.55	Peak	---	---
4	364.65	31.45	46.00	-14.55	37.43	-5.98	Peak	---	---
5	433.52	33.03	46.00	-12.97	37.15	-4.12	Peak	---	---
6	567.38	32.82	46.00	-13.18	34.29	-1.47	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

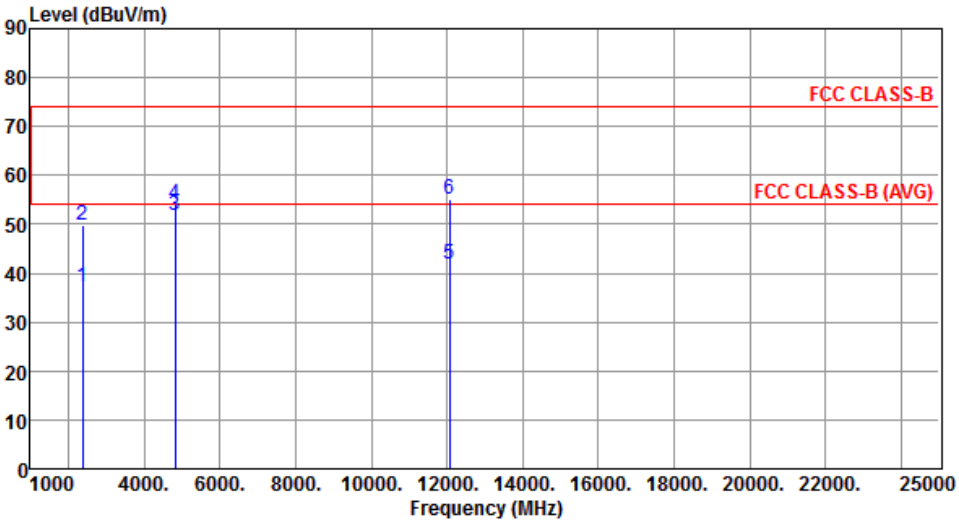
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	38.55	54.00	-15.45	40.52	-1.97	Average	320	140
2	2390.00	50.18	74.00	-23.82	52.15	-1.97	Peak	320	140
3	4824.00	53.09	54.00	-0.91	48.42	4.67	Average	185	110
4	4824.00	55.39	74.00	-18.61	50.72	4.67	Peak	185	110
5	12060.00	42.08	54.00	-11.92	28.25	13.83	Average	185	108
6	12060.00	55.17	74.00	-18.83	41.34	13.83	Peak	185	108

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).

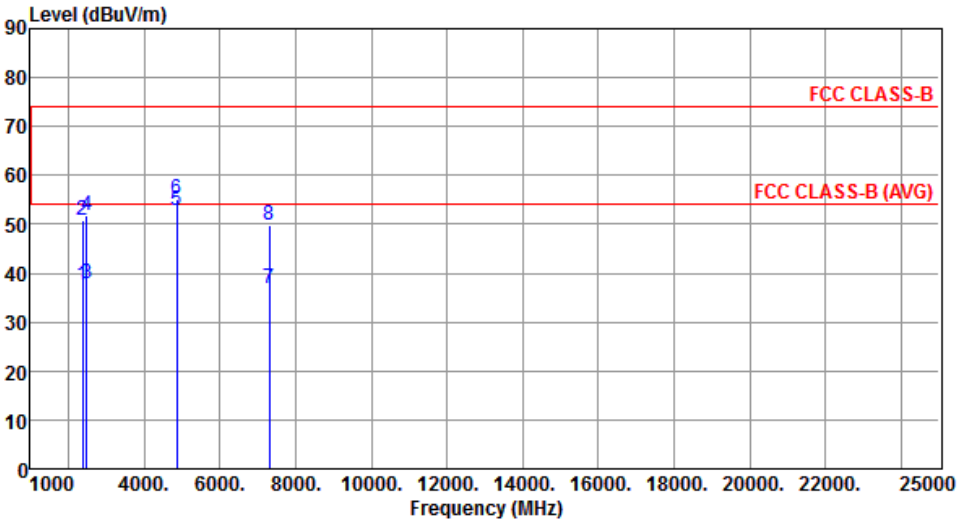
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	37.28	54.00	-16.72	39.25	-1.97	Average	332	5
2	2390.00	49.88	74.00	-24.12	51.85	-1.97	Peak	332	5
3	4824.00	51.65	54.00	-2.35	46.98	4.67	Average	286	104
4	4824.00	54.14	74.00	-19.86	49.47	4.67	Peak	286	104
5	12060.00	41.99	54.00	-12.01	28.16	13.83	Average	286	100
6	12060.00	55.09	74.00	-18.91	41.26	13.83	Peak	286	100

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).

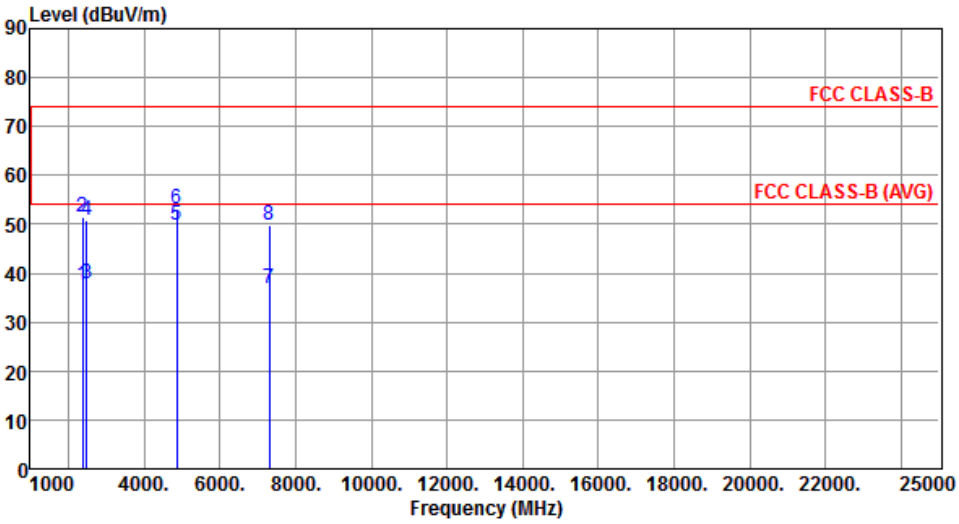
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	37.54	54.00	-16.46	39.51	-1.97	Average	323	143
2	2390.00	50.87	74.00	-23.13	52.84	-1.97	Peak	323	143
3	2483.50	37.74	54.00	-16.26	39.36	-1.62	Average	323	143
4	2483.50	51.71	74.00	-22.29	53.33	-1.62	Peak	323	143
5	4874.00	52.83	54.00	-1.17	48.06	4.77	Average	233	109
6	4874.00	55.22	74.00	-18.78	50.45	4.77	Peak	233	109
7	7311.00	36.89	54.00	-17.11	27.58	9.31	Average	235	112
8	7311.00	49.82	74.00	-24.18	40.51	9.31	Peak	235	112

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).

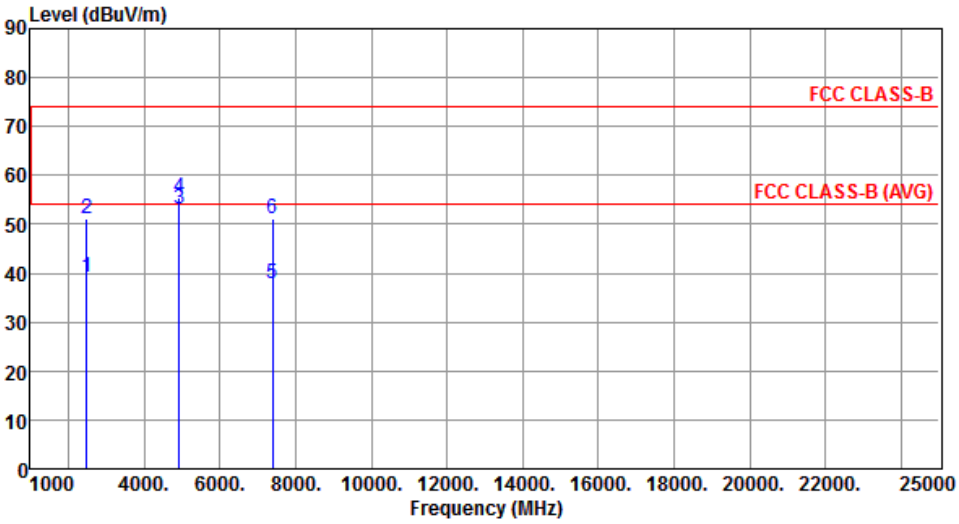
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	37.39	54.00	-16.61	39.36	-1.97	Average	334	4
2	2390.00	51.57	74.00	-22.43	53.54	-1.97	Peak	334	4
3	2483.50	37.76	54.00	-16.24	39.38	-1.62	Average	334	4
4	2483.50	50.74	74.00	-23.26	52.36	-1.62	Peak	334	4
5	4874.00	49.82	54.00	-4.18	45.05	4.77	Average	275	91
6	4874.00	53.09	74.00	-20.91	48.32	4.77	Peak	275	91
7	7311.00	36.77	54.00	-17.23	27.46	9.31	Average	269	102
8	7311.00	49.66	74.00	-24.34	40.35	9.31	Peak	269	102

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).

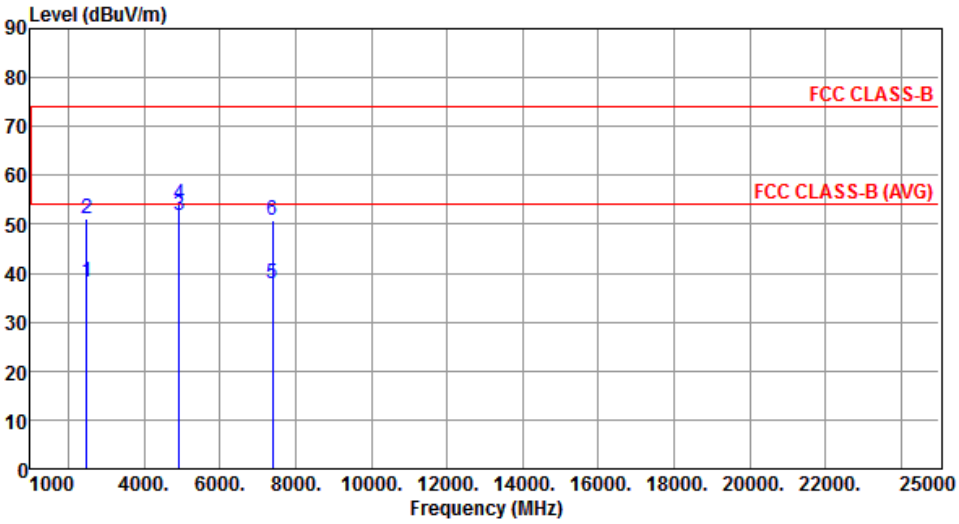
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	39.03	54.00	-14.97	40.65	-1.62	Average	315	148
2	2483.50	51.16	74.00	-22.84	52.78	-1.62	Peak	315	148
3	4924.00	53.28	54.00	-0.72	48.42	4.86	Average	213	138
4	4924.00	55.34	74.00	-18.66	50.48	4.86	Peak	213	138
5	7386.00	37.82	54.00	-16.18	28.24	9.58	Average	211	86
6	7386.00	51.00	74.00	-23.00	41.42	9.58	Peak	211	86

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		

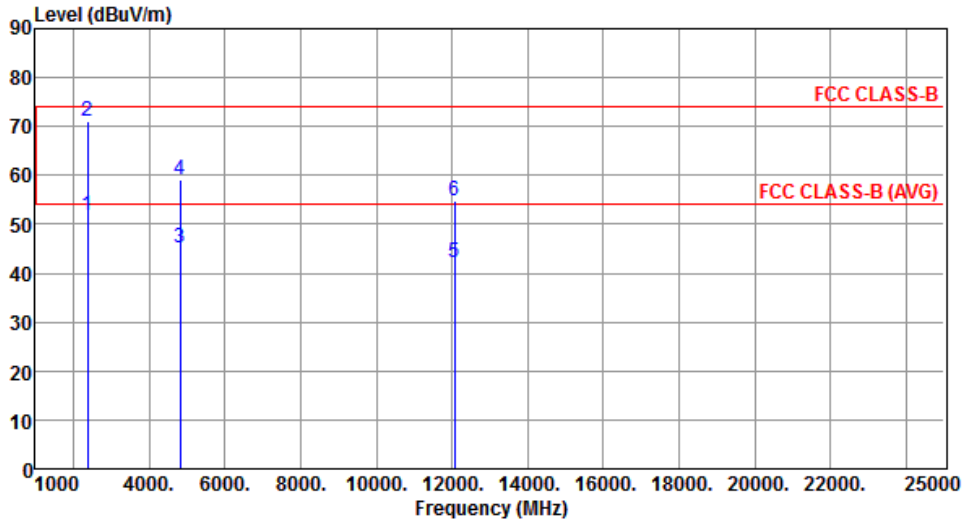


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.10	54.00	-15.90	39.72	-1.62	Average	322	3
2	2483.50	51.16	74.00	-22.84	52.78	-1.62	Peak	322	3
3	4924.00	51.88	54.00	-2.12	47.02	4.86	Average	345	106
4	4924.00	54.27	74.00	-19.73	49.41	4.86	Peak	345	106
5	7386.00	37.84	54.00	-16.16	28.26	9.58	Average	341	100
6	7386.00	50.93	74.00	-23.07	41.35	9.58	Peak	341	100

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

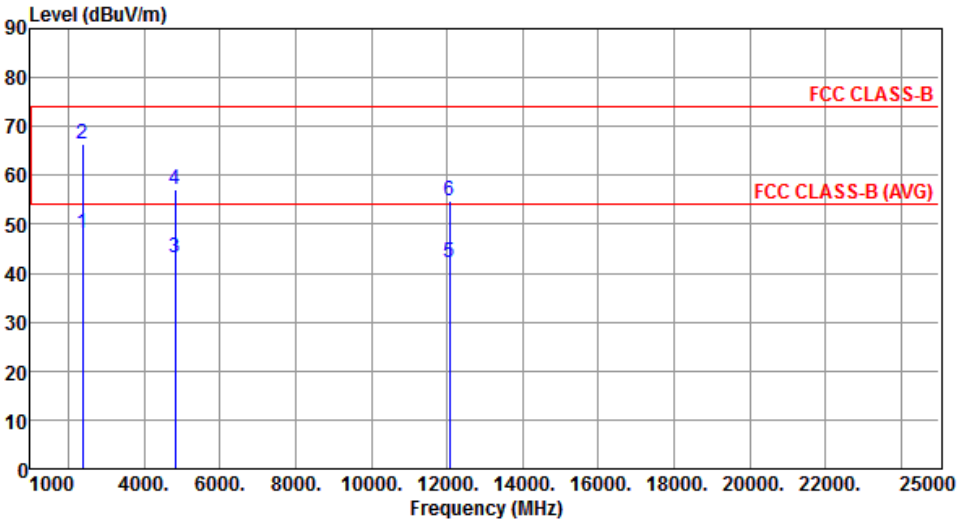
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	51.83	54.00	-2.17	53.80	-1.97	Average	241	155
2	2390.00	70.98	74.00	-3.02	72.95	-1.97	Peak	241	155
3	4824.00	45.33	54.00	-8.67	40.66	4.67	Average	185	105
4	4824.00	59.27	74.00	-14.73	54.60	4.67	Peak	185	105
5	12060.00	42.30	54.00	-11.70	28.47	13.83	Average	188	101
6	12060.00	54.73	74.00	-19.27	40.90	13.83	Peak	188	101

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).

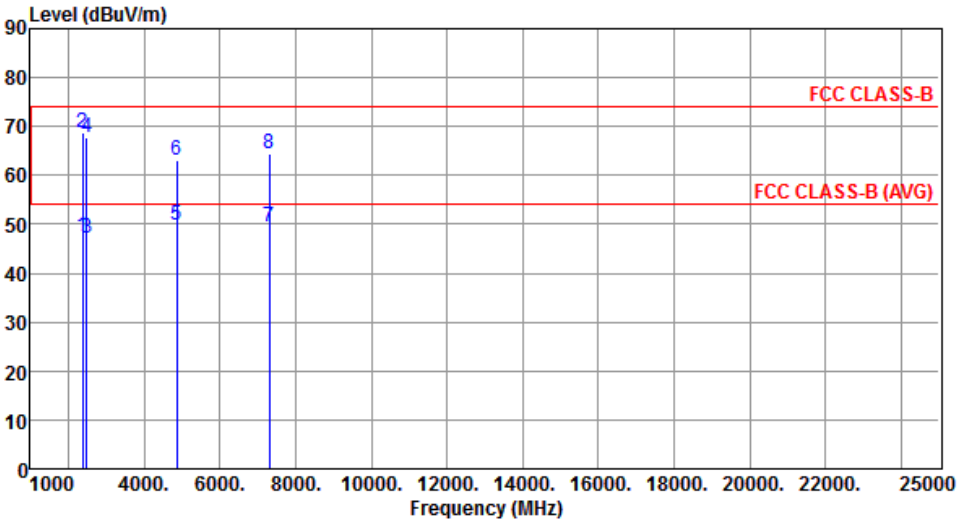
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Vertical		



	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	48.26	54.00	-5.74	50.23	-1.97	Average	335	6
2	2390.00	66.45	74.00	-7.55	68.42	-1.97	Peak	335	6
3	4824.00	43.16	54.00	-10.84	38.49	4.67	Average	283	114
4	4824.00	57.04	74.00	-16.96	52.37	4.67	Peak	283	114
5	12060.00	42.25	54.00	-11.75	28.42	13.83	Average	283	119
6	12060.00	54.68	74.00	-19.32	40.85	13.83	Peak	283	119

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).

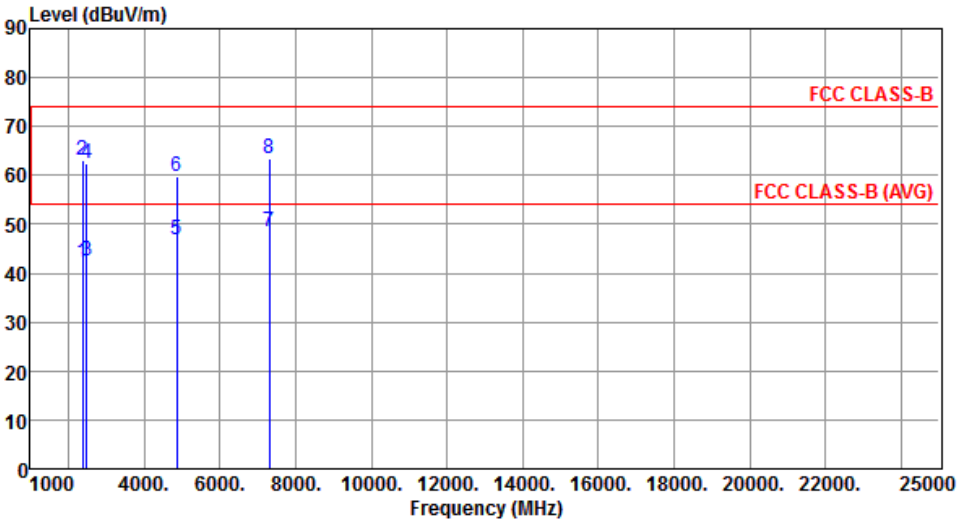
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	47.59	54.00	-6.41	49.56	-1.97	Average	195	168
2	2390.00	68.84	74.00	-5.16	70.81	-1.97	Peak	195	168
3	2483.50	47.19	54.00	-6.81	48.81	-1.62	Average	251	168
4	2483.50	67.84	74.00	-6.16	69.46	-1.62	Peak	251	168
5	4874.00	49.96	54.00	-4.04	45.19	4.77	Average	186	106
6	4874.00	63.08	74.00	-10.92	58.31	4.77	Peak	186	106
7	7311.00	49.64	54.00	-4.36	40.33	9.31	Average	226	102
8	7311.00	64.34	74.00	-9.66	55.03	9.31	Peak	226	102

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).

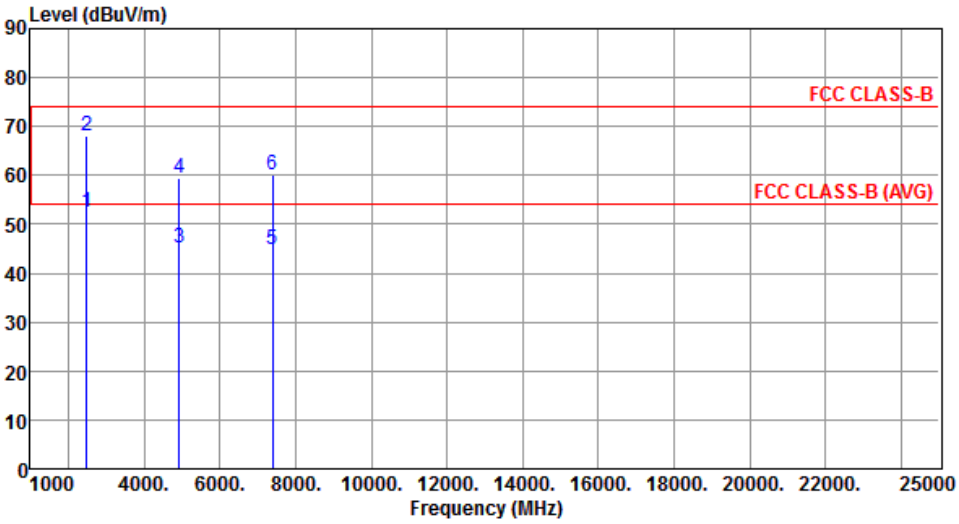
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	42.20	54.00	-11.80	44.17	-1.97	Average	335	3
2	2390.00	63.11	74.00	-10.89	65.08	-1.97	Peak	335	3
3	2483.50	42.66	54.00	-11.34	44.28	-1.62	Average	335	3
4	2483.50	62.28	74.00	-11.72	63.90	-1.62	Peak	335	3
5	4874.00	46.96	54.00	-7.04	42.19	4.77	Average	282	112
6	4874.00	59.93	74.00	-14.07	55.16	4.77	Peak	282	112
7	7311.00	48.45	54.00	-5.55	39.14	9.31	Average	287	96
8	7311.00	63.52	74.00	-10.48	54.21	9.31	Peak	287	96

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).

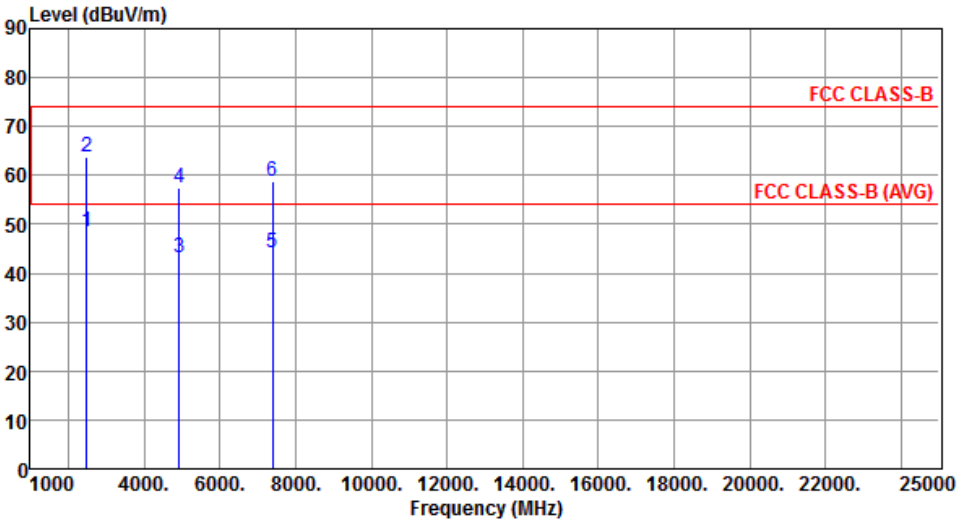
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.58	54.00	-1.42	54.20	-1.62	Average	309	156
2	2483.50	67.96	74.00	-6.04	69.58	-1.62	Peak	309	156
3	4924.00	45.12	54.00	-8.88	40.26	4.86	Average	188	102
4	4924.00	59.41	74.00	-14.59	54.55	4.86	Peak	188	102
5	7386.00	44.86	54.00	-9.14	35.28	9.58	Average	221	105
6	7386.00	60.01	74.00	-13.99	50.43	9.58	Peak	221	105

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		

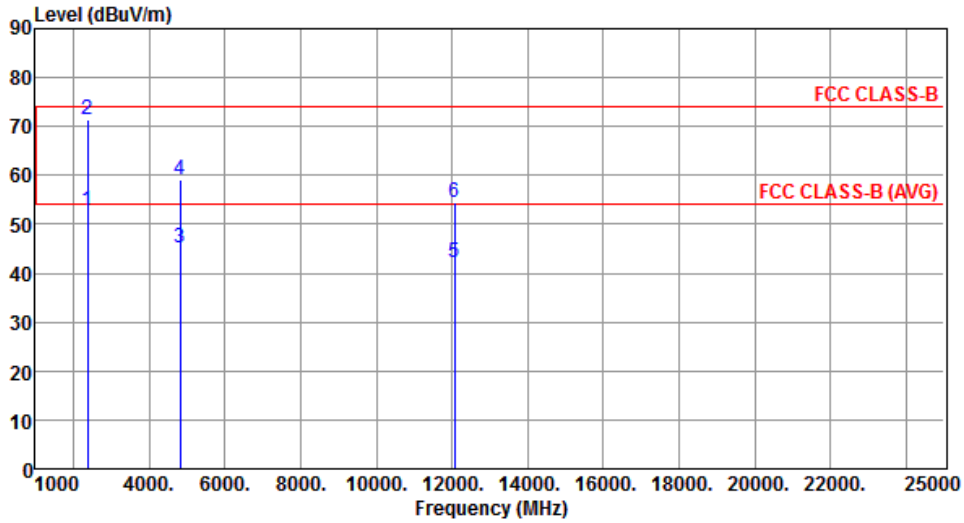


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.58	54.00	-5.42	50.20	-1.62	Average	332	4
2	2483.50	63.82	74.00	-10.18	65.44	-1.62	Peak	332	4
3	4924.00	43.28	54.00	-10.72	38.42	4.86	Average	285	110
4	4924.00	57.29	74.00	-16.71	52.43	4.86	Peak	285	110
5	7386.00	44.04	54.00	-9.96	34.46	9.58	Average	283	93
6	7386.00	58.85	74.00	-15.15	49.27	9.58	Peak	283	93

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

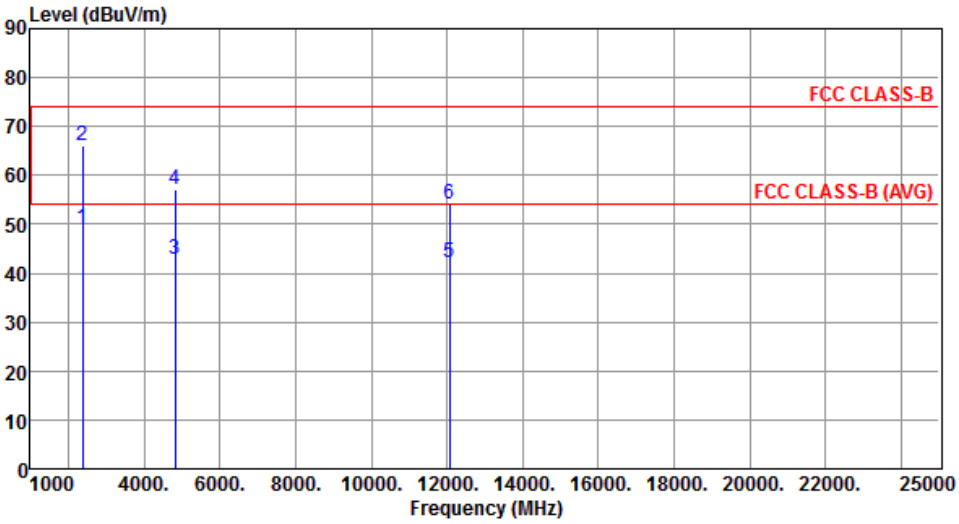
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.73	54.00	-1.27	54.70	-1.97	Average	207	157
2	2390.00	71.41	74.00	-2.59	73.38	-1.97	Peak	207	157
3	4824.00	45.02	54.00	-8.98	40.35	4.67	Average	293	102
4	4824.00	59.00	74.00	-15.00	54.33	4.67	Peak	293	102
5	12060.00	42.29	54.00	-11.71	28.46	13.83	Average	185	133
6	12060.00	54.59	74.00	-19.41	40.76	13.83	Peak	185	133

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).

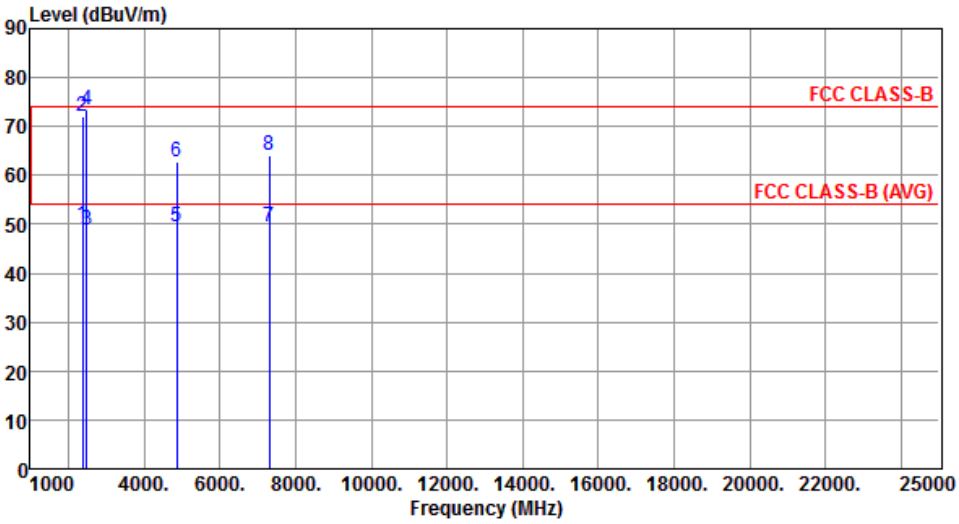
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Vertical		



	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	49.27	54.00	-4.73	51.24	-1.97	Average	332	5
2	2390.00	66.16	74.00	-7.84	68.13	-1.97	Peak	332	5
3	4824.00	42.95	54.00	-11.05	38.28	4.67	Average	282	116
4	4824.00	56.98	74.00	-17.02	52.31	4.67	Peak	282	116
5	12060.00	42.12	54.00	-11.88	28.29	13.83	Average	282	120
6	12060.00	53.97	74.00	-20.03	40.14	13.83	Peak	282	120

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).

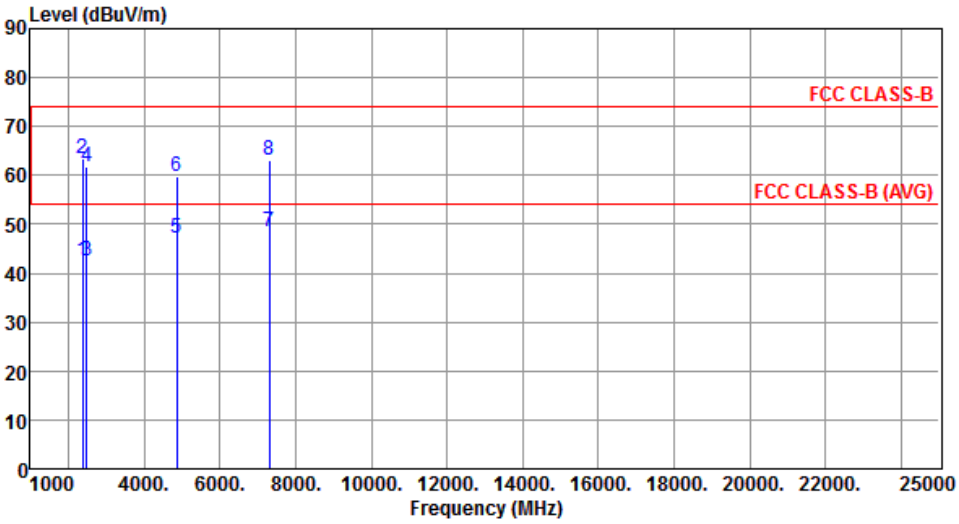
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	49.75	54.00	-4.25	51.72	-1.97	Average	209	157
2	2390.00	72.19	74.00	-1.81	74.16	-1.97	Peak	209	157
3	2483.50	48.68	54.00	-5.32	50.30	-1.62	Average	305	157
4	2483.50	73.28	74.00	-0.72	74.90	-1.62	Peak	305	157
5	4874.00	49.63	54.00	-4.37	44.86	4.77	Average	182	163
6	4874.00	62.93	74.00	-11.07	58.16	4.77	Peak	182	163
7	7311.00	49.55	54.00	-4.45	40.24	9.31	Average	156	138
8	7311.00	64.06	74.00	-9.94	54.75	9.31	Peak	156	138

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).

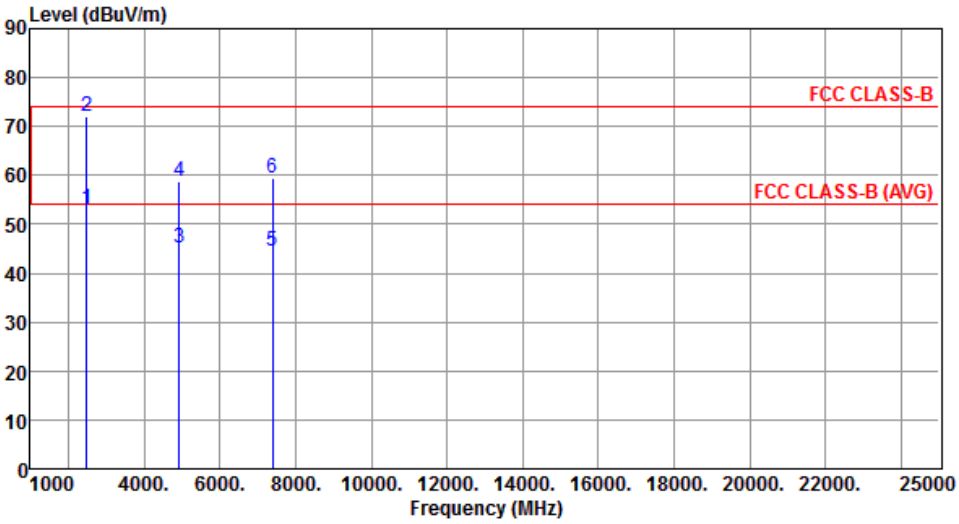
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	42.38	54.00	-11.62	44.35	-1.97	Average	333	5
2	2390.00	63.34	74.00	-10.66	65.31	-1.97	Peak	332	5
3	2483.50	42.54	54.00	-11.46	44.16	-1.62	Average	332	5
4	2483.50	61.80	74.00	-12.20	63.42	-1.62	Peak	332	5
5	4874.00	47.18	54.00	-6.82	42.41	4.77	Average	280	110
6	4874.00	59.89	74.00	-14.11	55.12	4.77	Peak	280	110
7	7311.00	48.58	54.00	-5.42	39.27	9.31	Average	281	93
8	7311.00	63.17	74.00	-10.83	53.86	9.31	Peak	281	93

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).

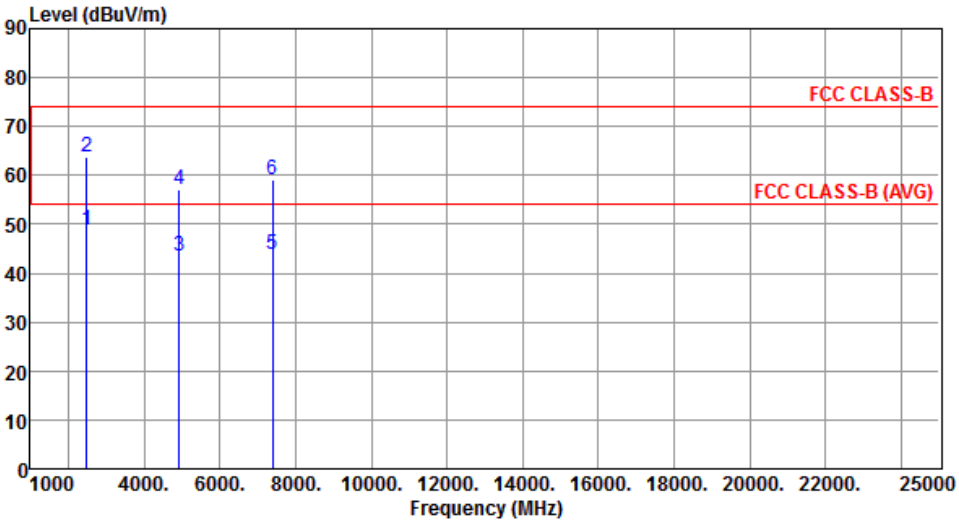
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	53.00	54.00	-1.00	54.62	-1.62	Average	310	154
2	2483.50	72.19	74.00	-1.81	73.81	-1.62	Peak	310	154
3	4924.00	45.29	54.00	-8.71	40.43	4.86	Average	165	174
4	4924.00	58.82	74.00	-15.18	53.96	4.86	Peak	165	174
5	7386.00	44.44	54.00	-9.56	34.86	9.58	Average	182	163
6	7386.00	59.44	74.00	-14.56	49.86	9.58	Peak	182	163

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		

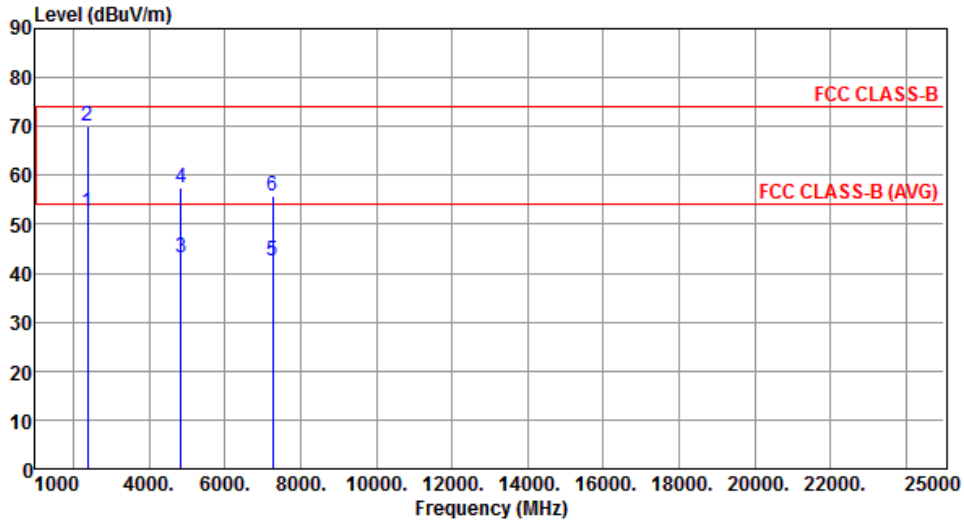


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.94	54.00	-5.06	50.56	-1.62	Average	331	3
2	2483.50	63.69	74.00	-10.31	65.31	-1.62	Peak	331	3
3	4924.00	43.42	54.00	-10.58	38.56	4.86	Average	282	108
4	4924.00	57.11	74.00	-16.89	52.25	4.86	Peak	282	108
5	7386.00	43.82	54.00	-10.18	34.24	9.58	Average	281	86
6	7386.00	59.02	74.00	-14.98	49.44	9.58	Peak	281	86

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

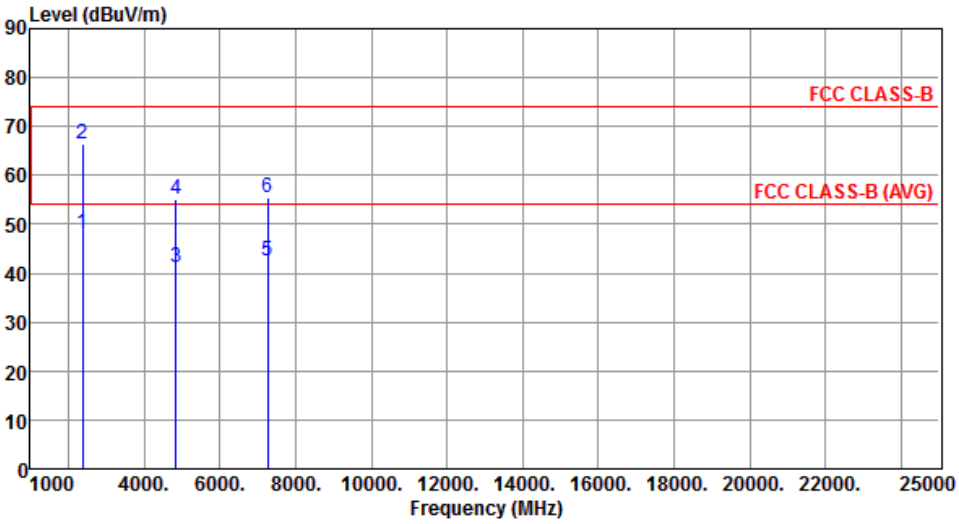
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	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	52.45	54.00	-1.55	54.42	-1.97	Average	241	163
2	2390.00	70.13	74.00	-3.87	72.10	-1.97	Peak	241	163
3	4844.00	43.23	54.00	-10.77	38.53	4.70	Average	165	172
4	4844.00	57.46	74.00	-16.54	52.76	4.70	Peak	165	172
5	7266.00	42.65	54.00	-11.35	33.50	9.15	Average	158	172
6	7266.00	55.92	74.00	-18.08	46.77	9.15	Peak	158	172

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).

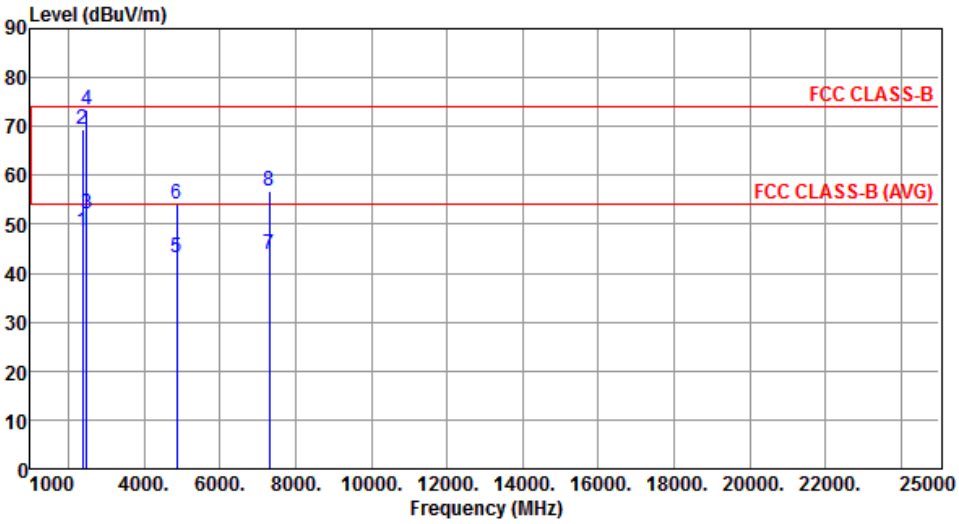
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	48.16	54.00	-5.84	50.13	-1.97	Average	162	185
2	2390.00	66.47	74.00	-7.53	68.44	-1.97	Peak	162	185
3	4844.00	41.15	54.00	-12.85	36.45	4.70	Average	100	205
4	4844.00	55.15	74.00	-18.85	50.45	4.70	Peak	100	205
5	7266.00	42.38	54.00	-11.62	33.23	9.15	Average	100	193
6	7266.00	55.61	74.00	-18.39	46.46	9.15	Peak	100	193

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).

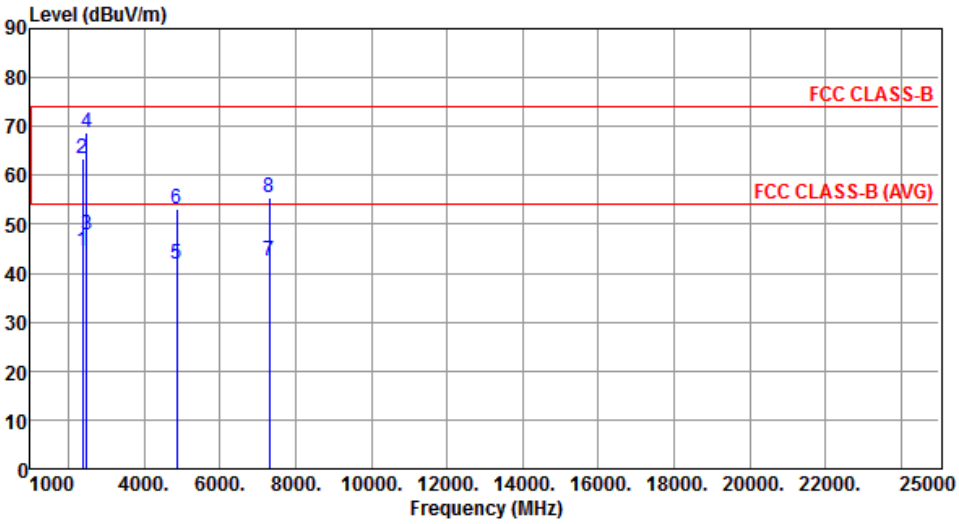
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	48.50	54.00	-5.50	50.47	-1.97	Average	266	166
2	2390.00	69.55	74.00	-4.45	71.52	-1.97	Peak	266	166
3	2483.50	52.20	54.00	-1.80	53.82	-1.62	Average	313	157
4	2483.50	73.29	74.00	-0.71	74.91	-1.62	Peak	313	157
5	4874.00	43.29	54.00	-10.71	38.52	4.77	Average	155	142
6	4874.00	54.10	74.00	-19.90	49.33	4.77	Peak	155	142
7	7311.00	43.86	54.00	-10.14	34.55	9.31	Average	100	193
8	7311.00	56.79	74.00	-17.21	47.48	9.31	Peak	100	193

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).

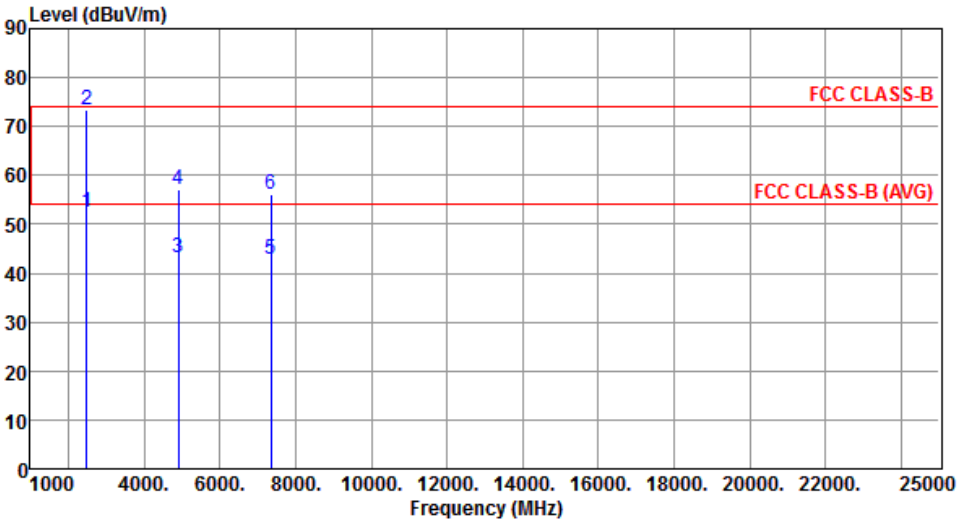
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	44.55	54.00	-9.45	46.52	-1.97	Average	162	185
2	2390.00	63.47	74.00	-10.53	65.44	-1.97	Peak	162	185
3	2483.50	47.69	54.00	-6.31	49.31	-1.62	Average	162	185
4	2483.50	68.71	74.00	-5.29	70.33	-1.62	Peak	162	185
5	4874.00	41.93	54.00	-12.07	37.16	4.77	Average	163	158
6	4874.00	53.19	74.00	-20.81	48.42	4.77	Peak	163	158
7	7311.00	42.52	54.00	-11.48	33.21	9.31	Average	100	192
8	7311.00	55.52	74.00	-18.48	46.21	9.31	Peak	100	192

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).

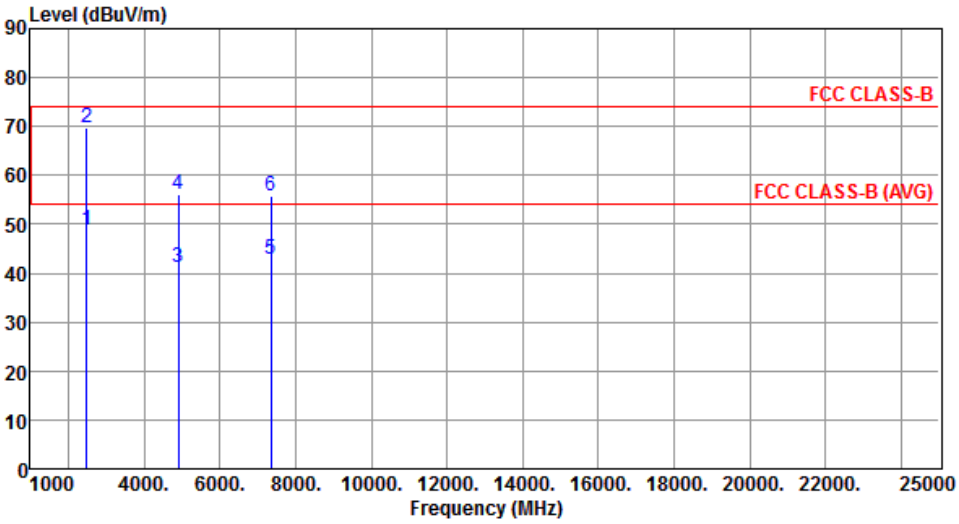
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	52.51	54.00	-1.49	54.13	-1.62	Average	313	156
2	2483.50	73.43	74.00	-0.57	75.05	-1.62	Peak	313	156
3	4904.00	43.17	54.00	-10.83	38.35	4.82	Average	100	196
4	4904.00	57.28	74.00	-16.72	52.46	4.82	Peak	100	196
5	7356.00	42.75	54.00	-11.25	33.28	9.47	Average	100	148
6	7356.00	56.03	74.00	-17.97	46.56	9.47	Peak	100	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	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	48.82	54.00	-5.18	50.44	-1.62	Average	160	182
2	2483.50	69.71	74.00	-4.29	71.33	-1.62	Peak	160	182
3	4904.00	41.26	54.00	-12.74	36.44	4.82	Average	100	145
4	4904.00	56.04	74.00	-17.96	51.22	4.82	Peak	100	145
5	7356.00	42.88	54.00	-11.12	33.41	9.47	Average	100	143
6	7356.00	55.78	74.00	-18.22	46.31	9.47	Peak	100	143

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

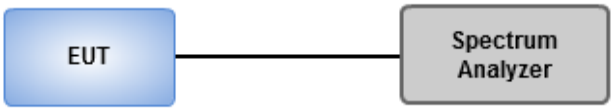
Reference level measurement

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

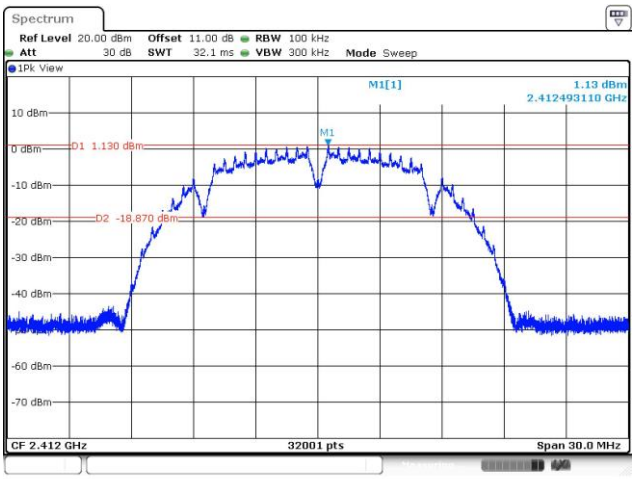
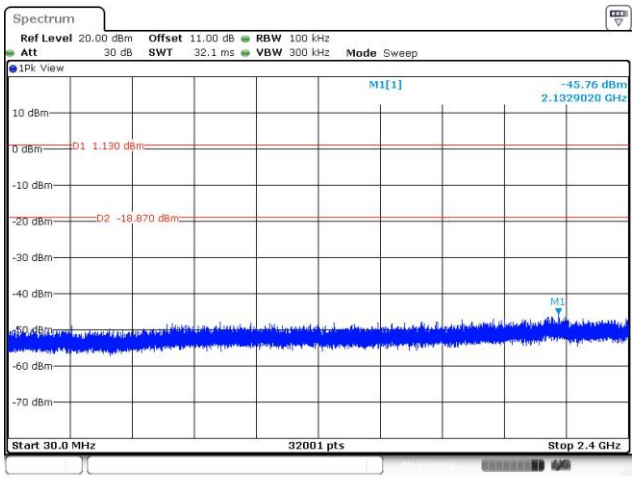
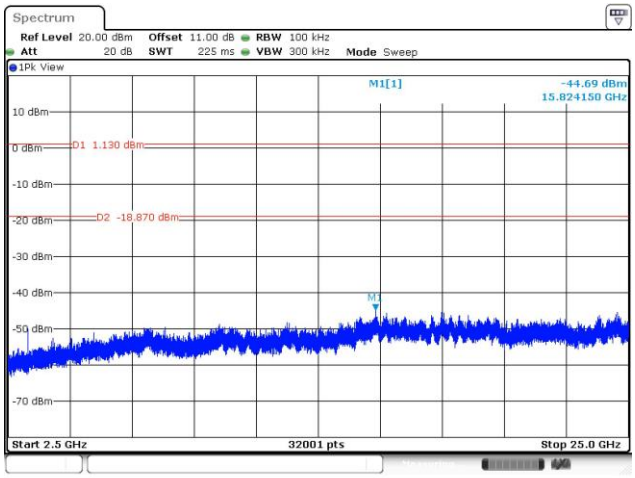
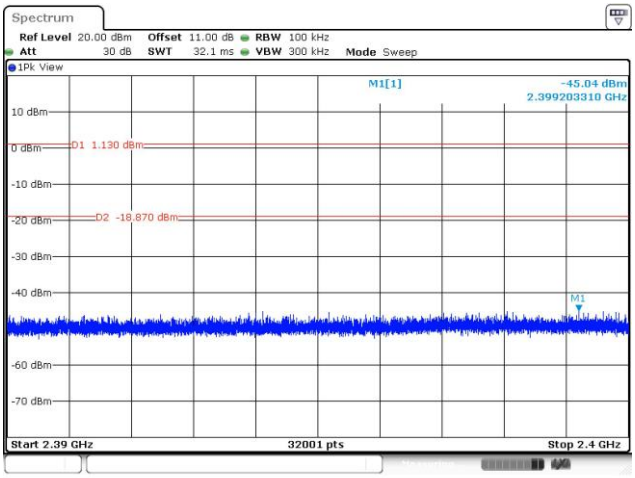
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

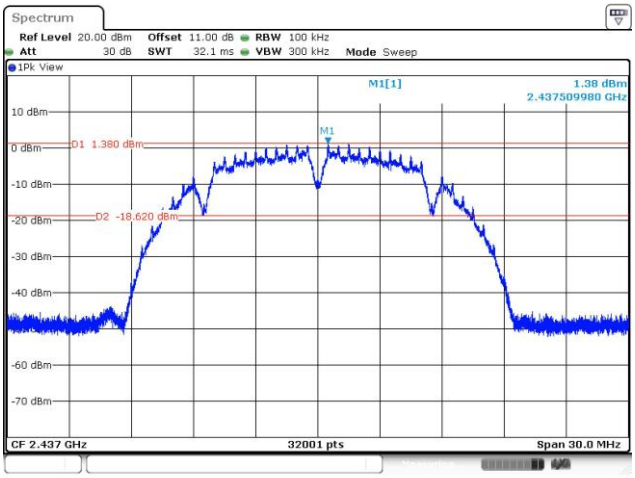
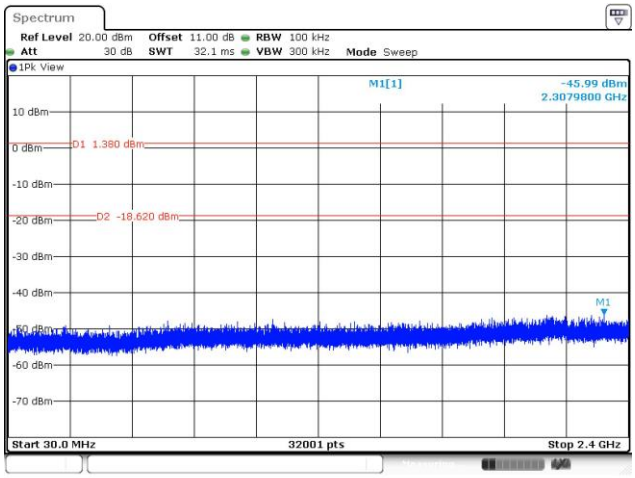
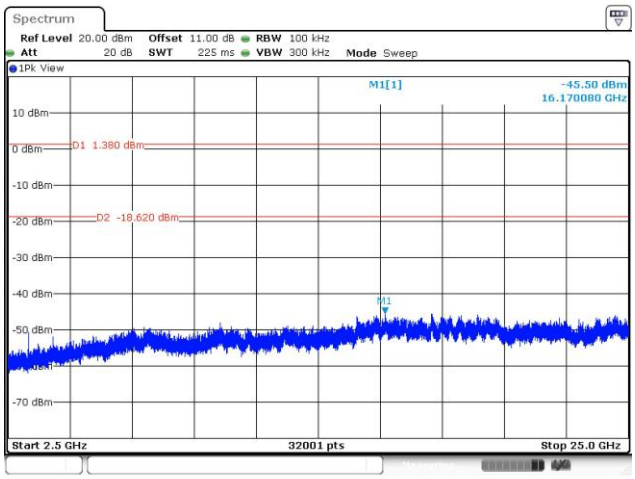
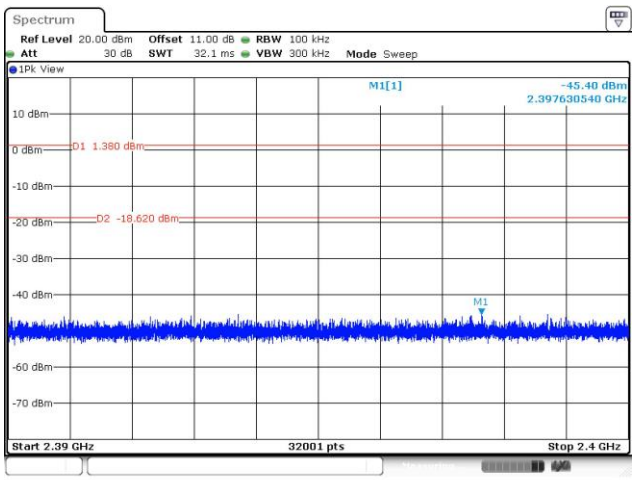
3.6.3 Test Setup

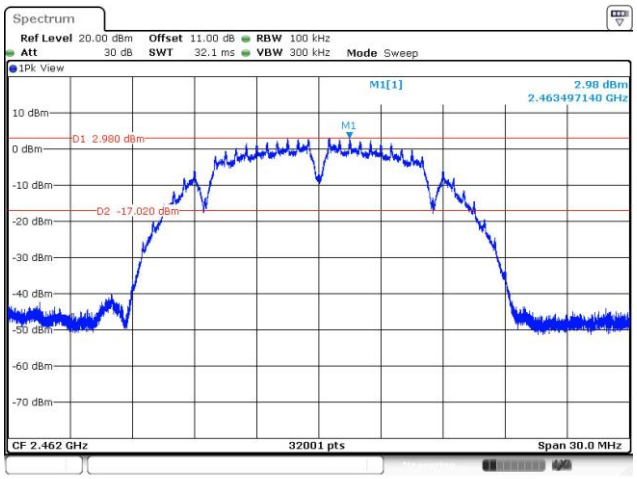
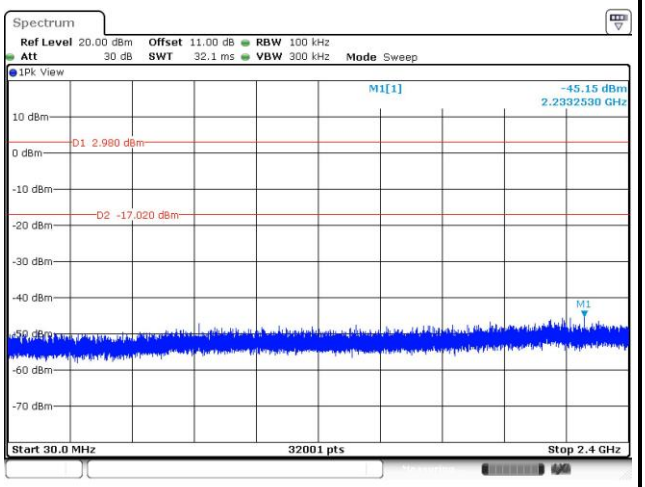
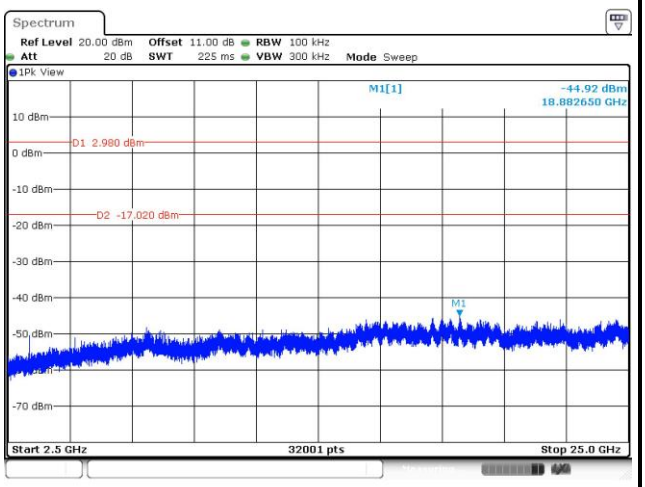
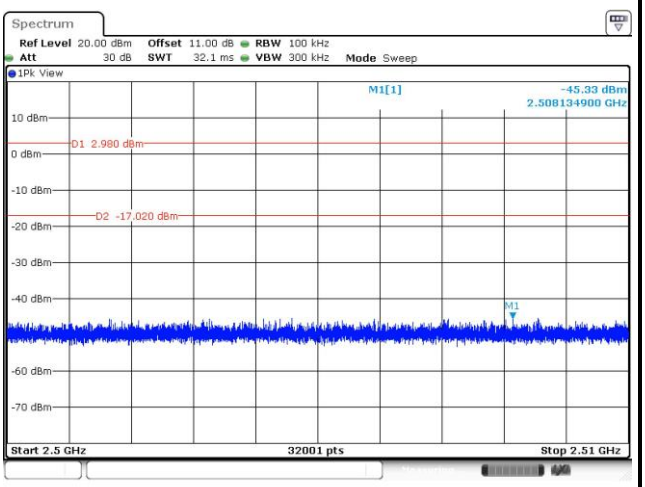


3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

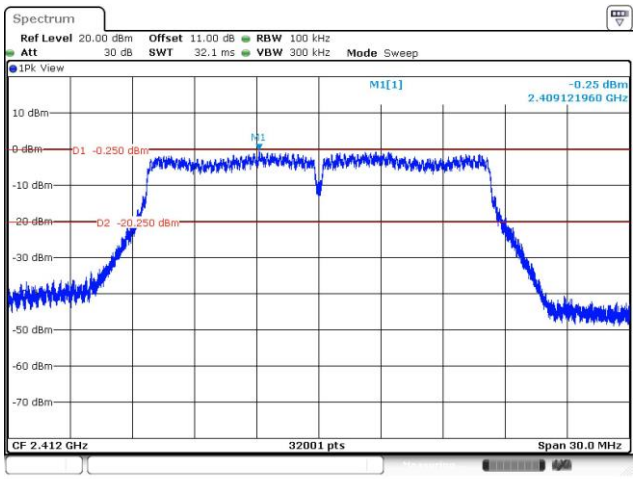
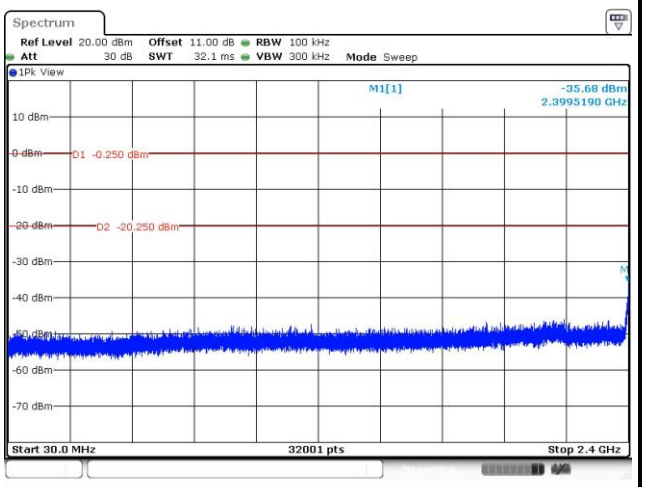
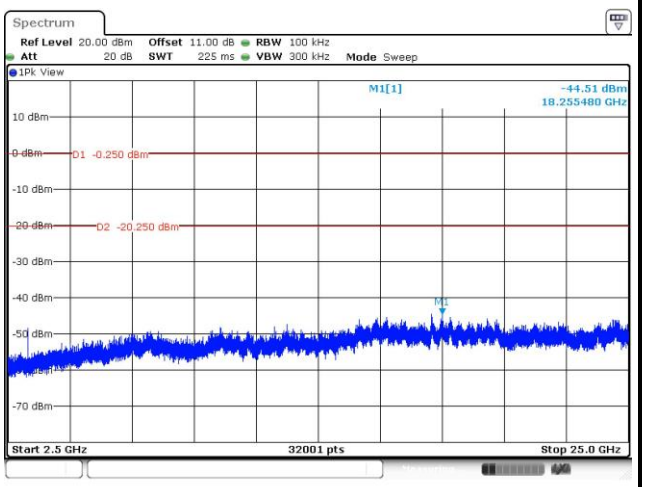
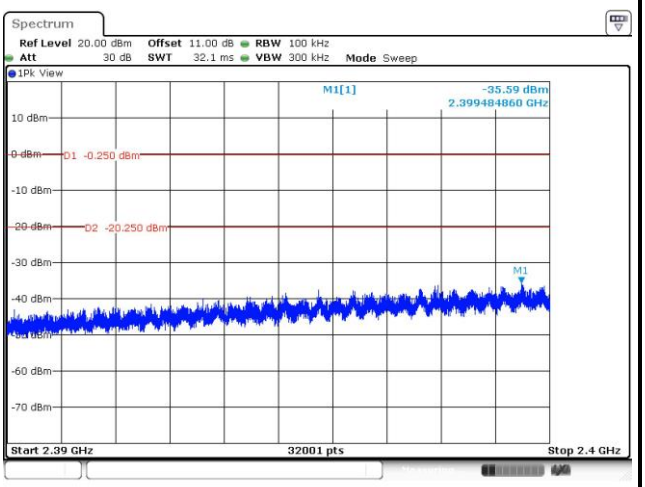
802.11b

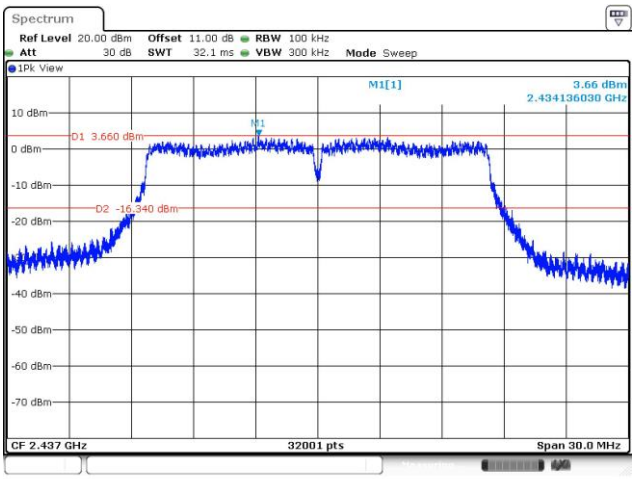
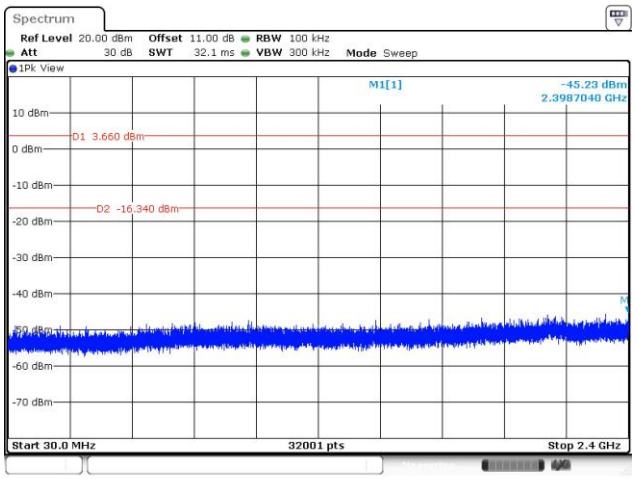
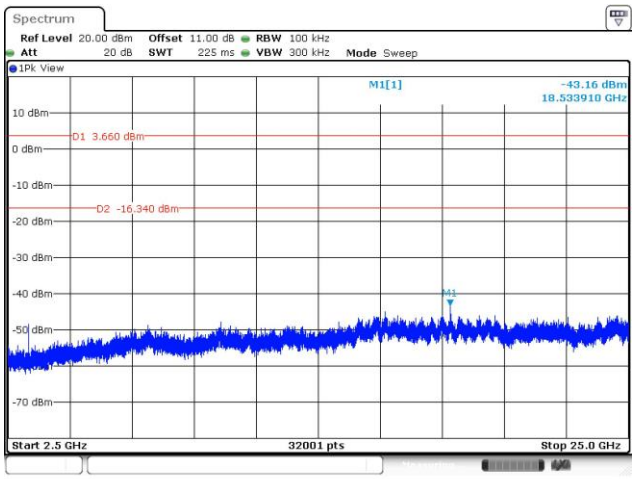
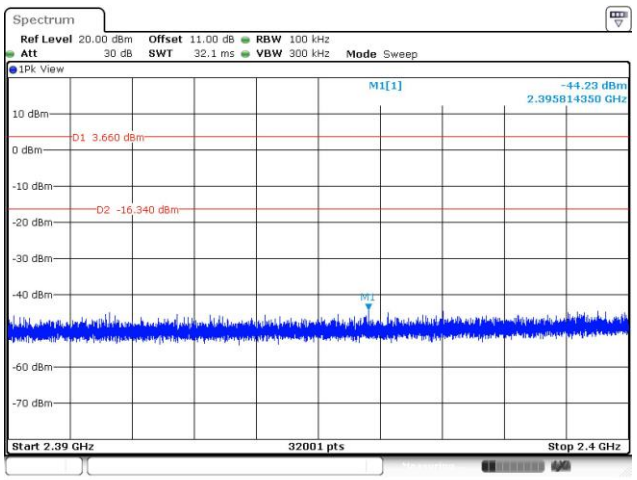
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

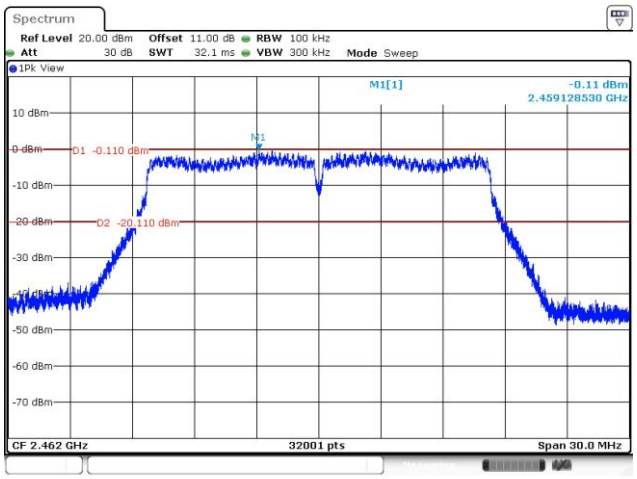
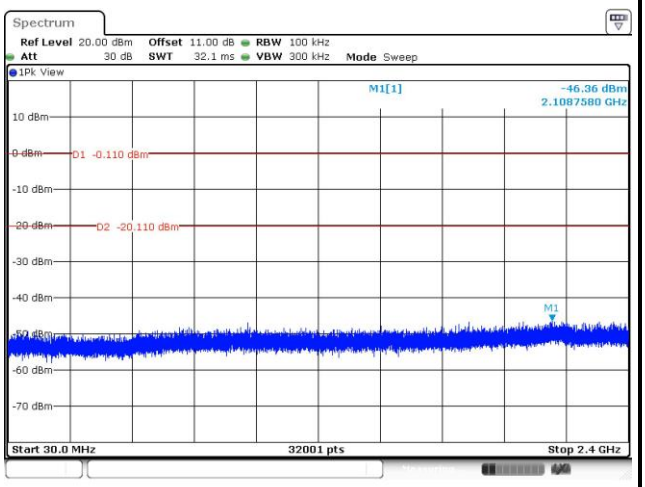
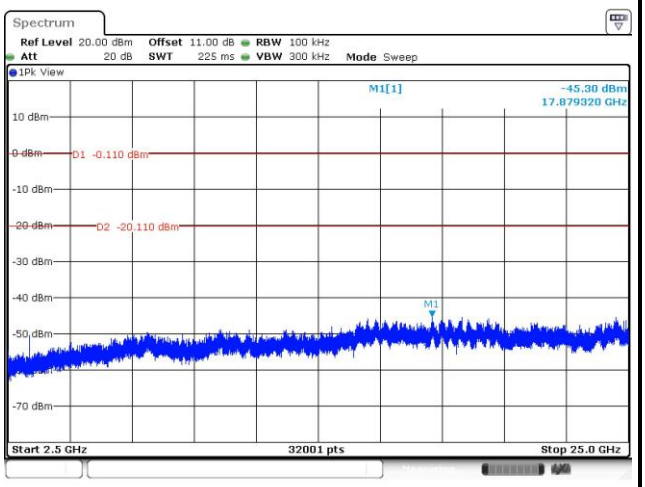
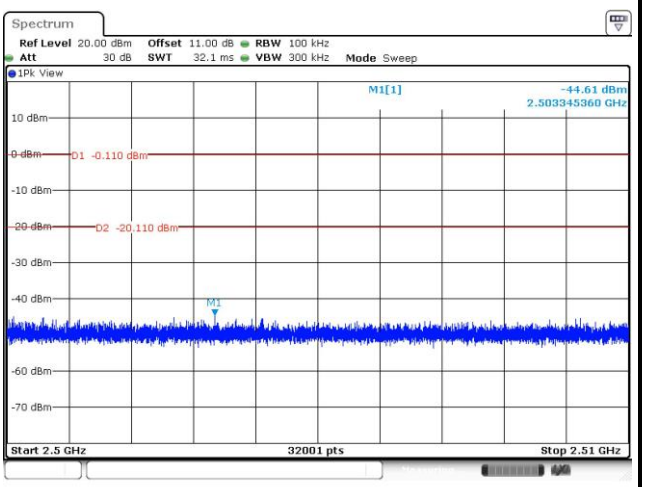
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

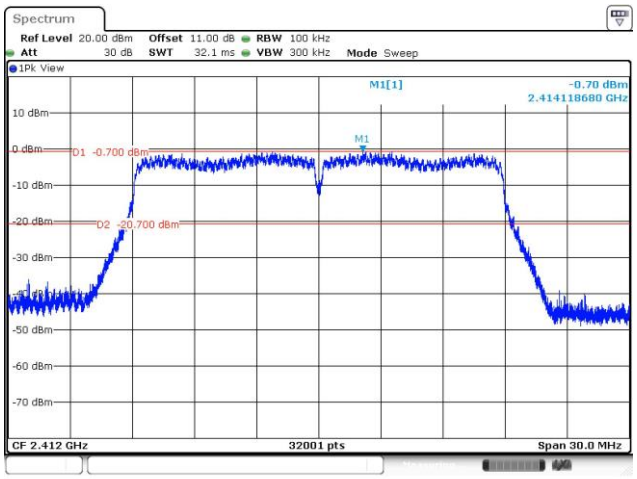
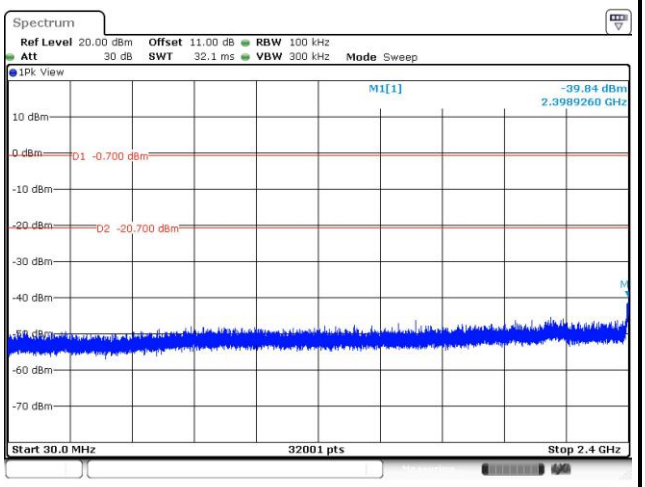
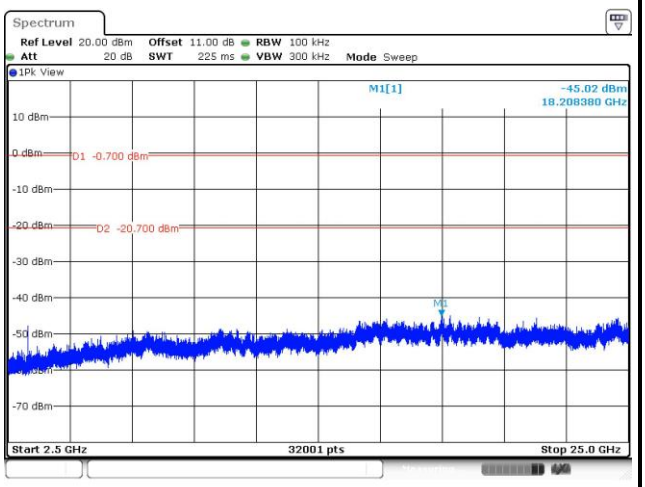
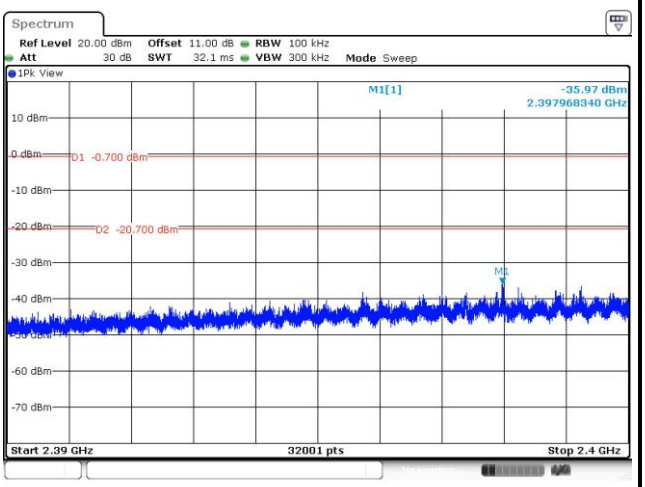
802.11g

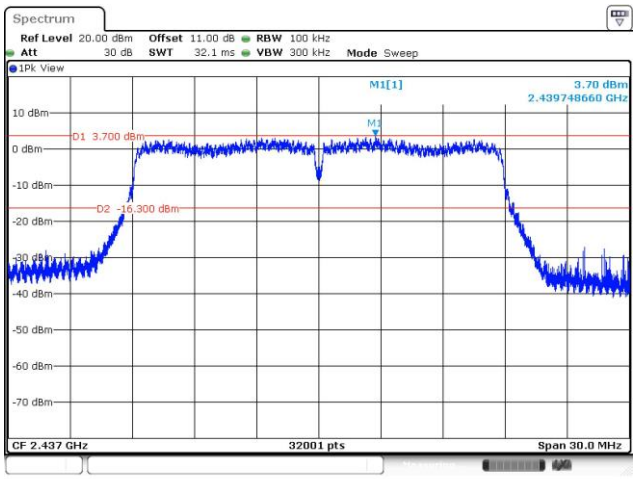
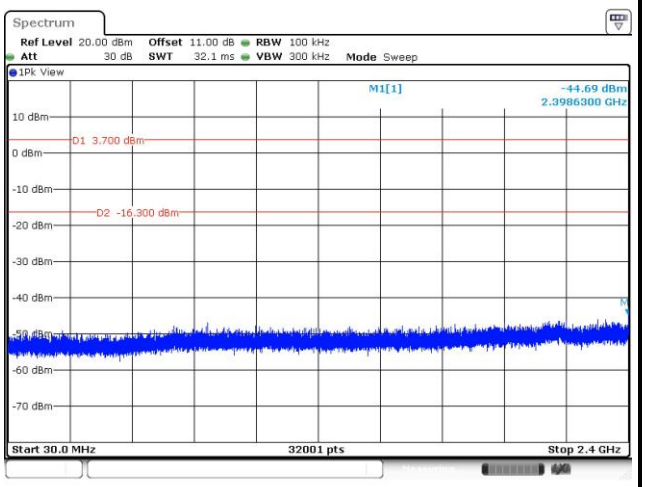
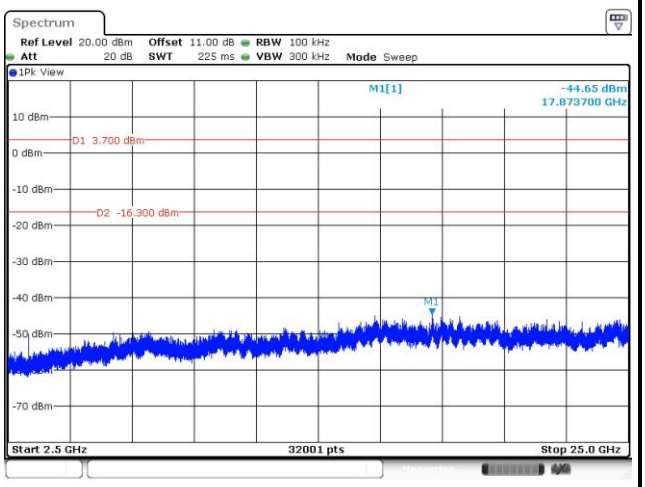
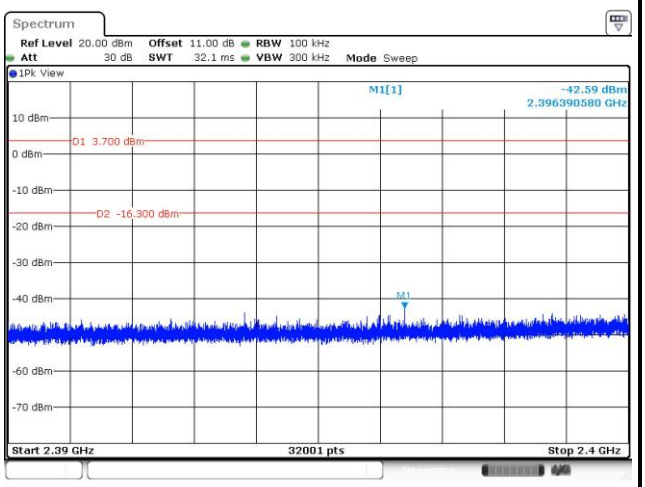
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

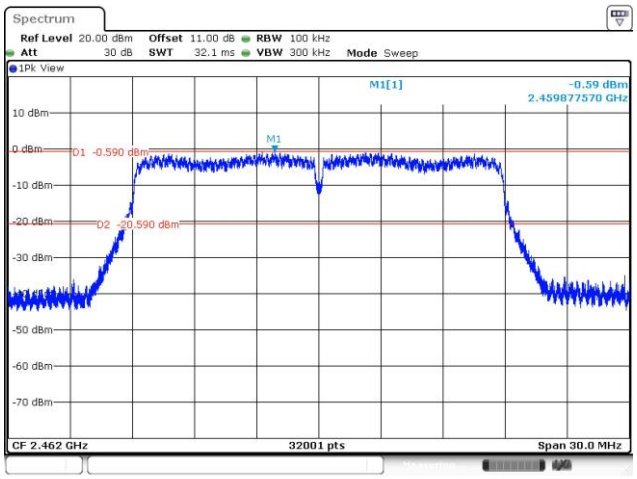
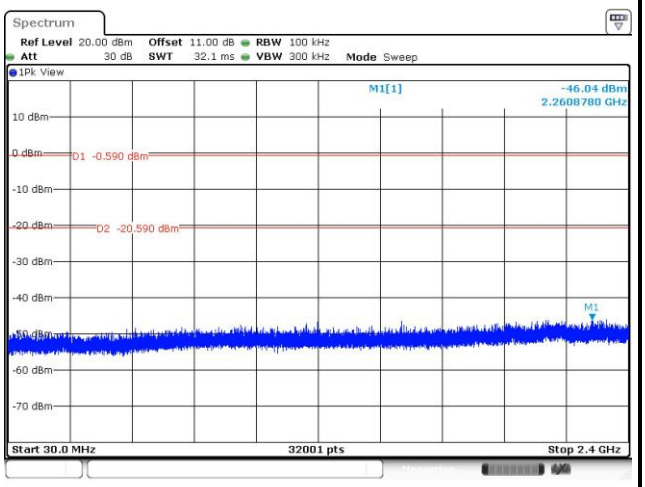
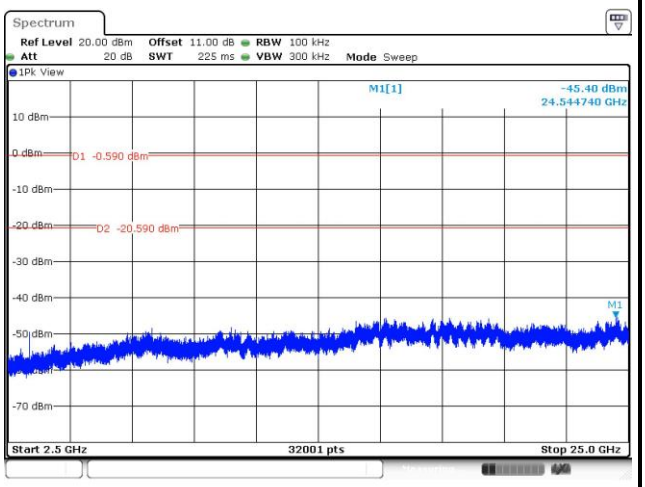
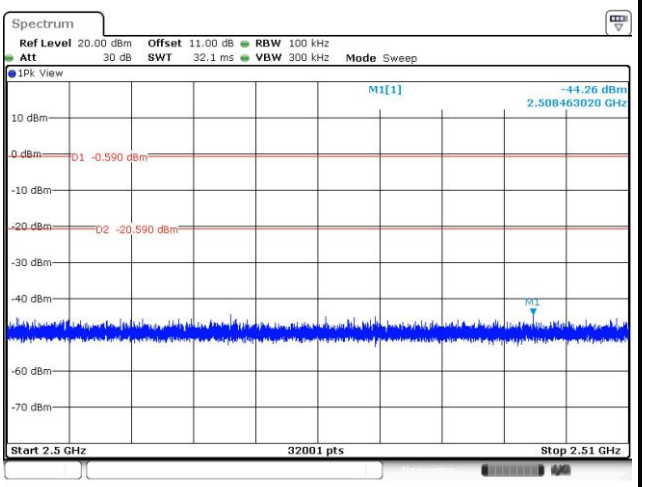
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

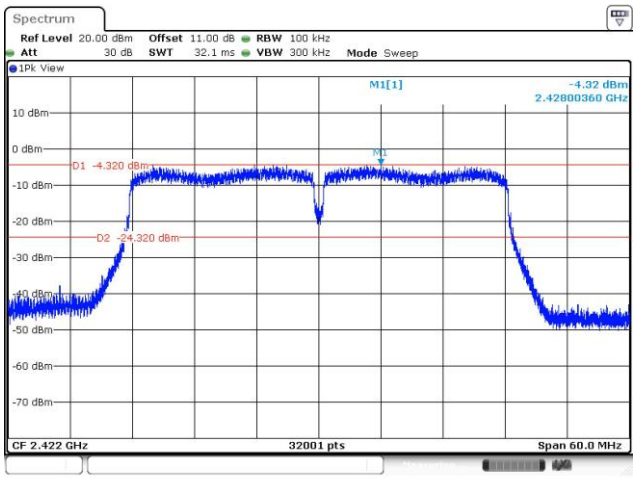
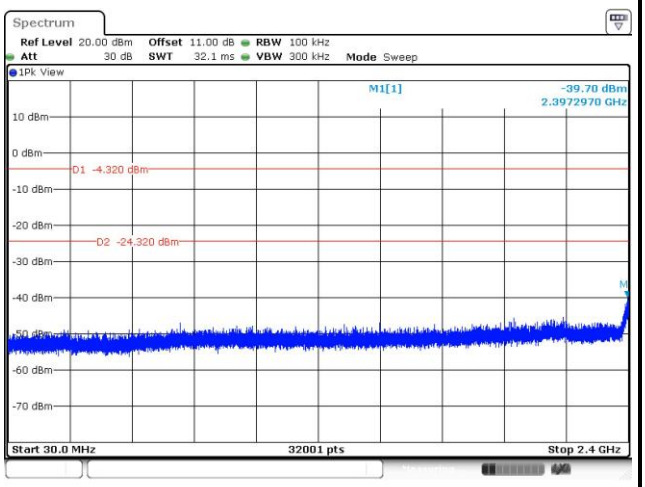
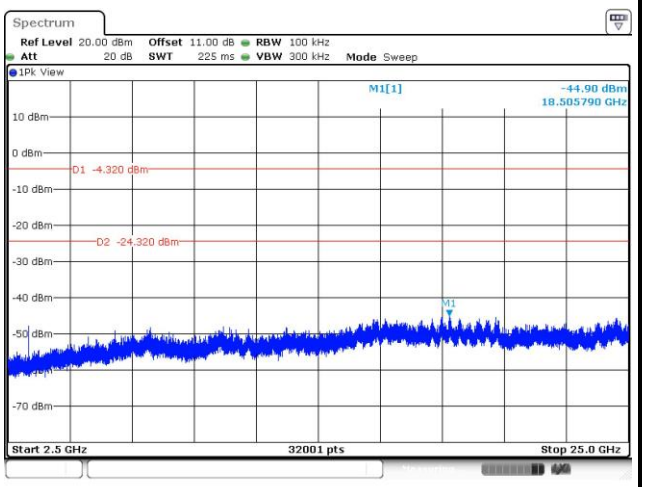
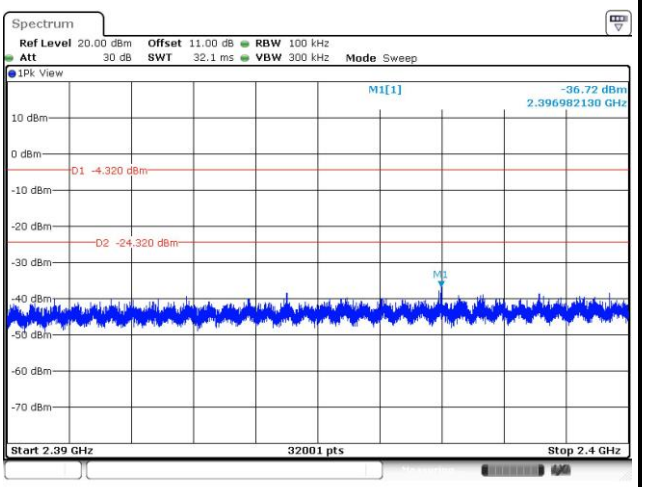
802.11n HT20

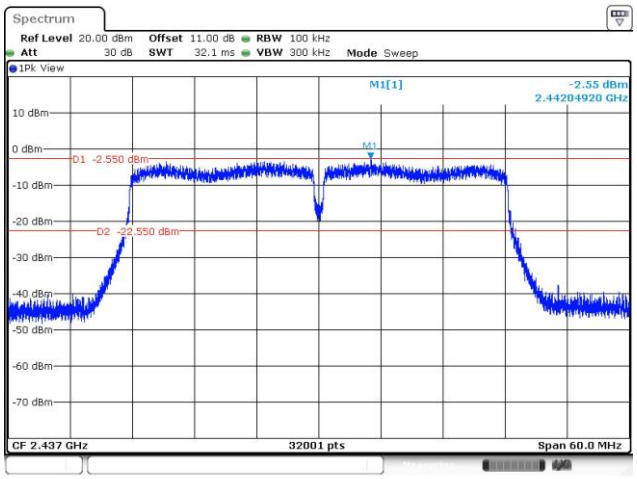
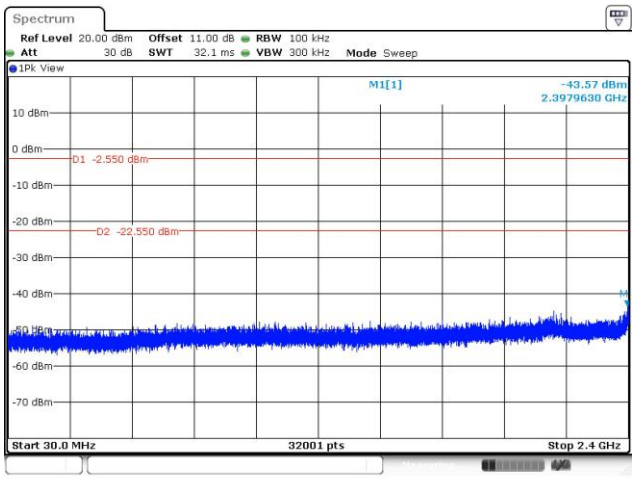
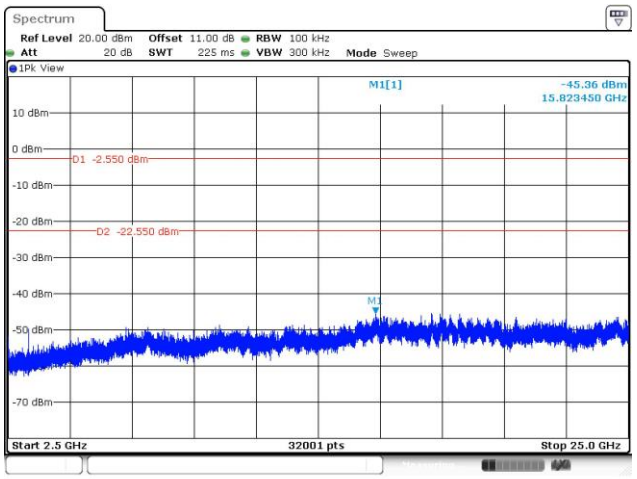
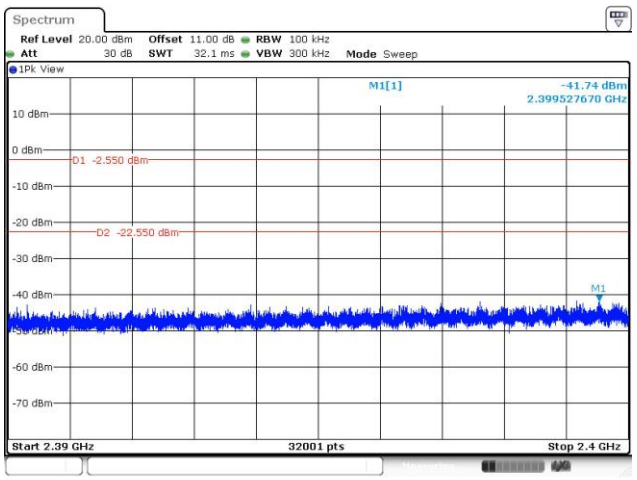
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

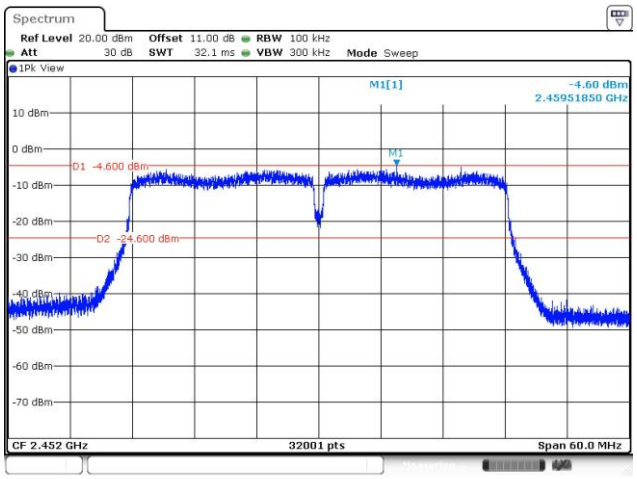
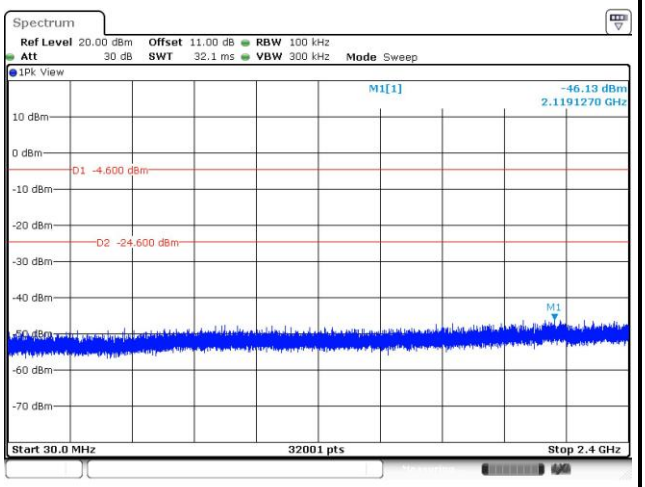
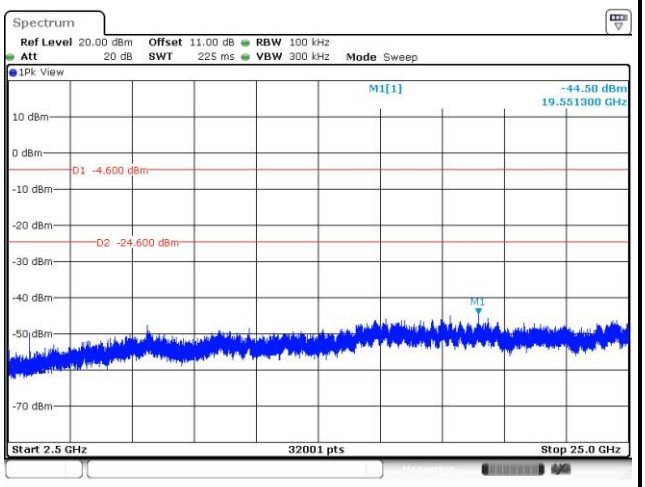
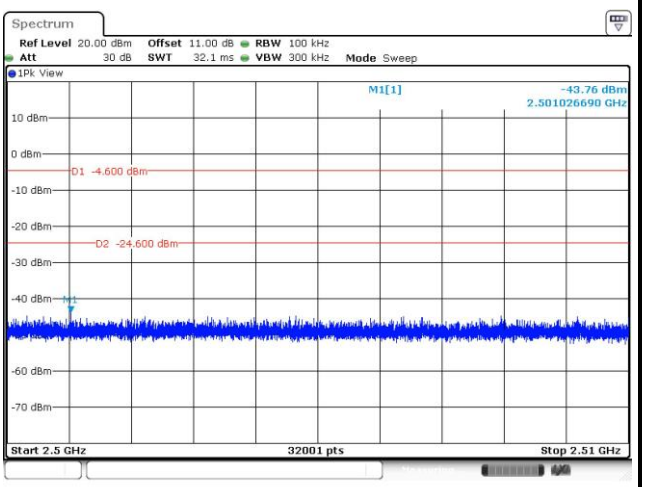
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

802.11n HT40

Reference Level	Tx 2422MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2452MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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==