FCC Test Report

FCC ID	:	**MXF-L1000**
Equipment	:	**Luma Home**
Model No.	:	**WRTQ-329ACN**
Brand Name	:	**Gemtek**
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	:	**Mar. 18, 2016**
Tested Date	:	**Mar. 28 ~ Apr. 24, 2016**

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.

Approved & Reviewed by:

Gary Chang / Manager

Testing Laboratory
2732

Table of Contents

1 GENERAL DESCRIPTION 5

1.1 Information 5
1.2 Local Support Equipment List 8
1.3 Test Setup Chart 8
1.4 The Equipment List 9
1.5 Test Standards 10
1.6 Measurement Uncertainty 10

2 TEST CONFIGURATION 11

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

3 TRANSMITTER TEST RESULTS 12

3.1 Conducted Emissions 12
3.2 6dB and Occupied Bandwidth 15
3.3 RF Output Power 18
3.4 Power Spectral Density 20
3.5 Unwanted Emissions into Restricted Frequency Bands 22
3.6 Emissions in Non-Restricted Frequency Bands 50

4 TEST LABORATORY INFORMATION 63

Release Record

Report No.	Version	Description	Issued Date
FR632301AC	Rev. 01	Initial issue	May 31, 2016

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.381MHz 36.66 (Margin -11.59dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2483.50MHz 52.99(Margin -1.01dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 27.28	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]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15
Note 1: RF output power specifies that Maximum 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	Operating Frequency (MHz) / Gain (dBi)			Connector
		2400~2483.5	5150~5250	5725~5850	
1	PIFA	3	4.5	5.5	IPEX

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Adapter	Brand: Luma Model: LWONCA-US1215 I/P: 100-240Vac, 50-60Hz, 0.5A Max O/P: 12Vdc, 1.5A Power line: 1.55m non-shielded without core
2	RJ45 cable	Brand: EKSON Model: ZP01-C254 1m non-shielded w/o core
3	RJ45 cable	Brand: Ricolink Model: 21A16030101 1m non-shielded w/o core

1.1.5 Channel List

Frequency band (MHz)		2400~2483.5	
802.11 b / g / n HT20		802.11n HT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	QSPR		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	100.00%	0.00
	11g	97.26%	0.12
	HT20	99.28%	0.03
	HT40	97.23%	0.12

1.1.7 Power Setting

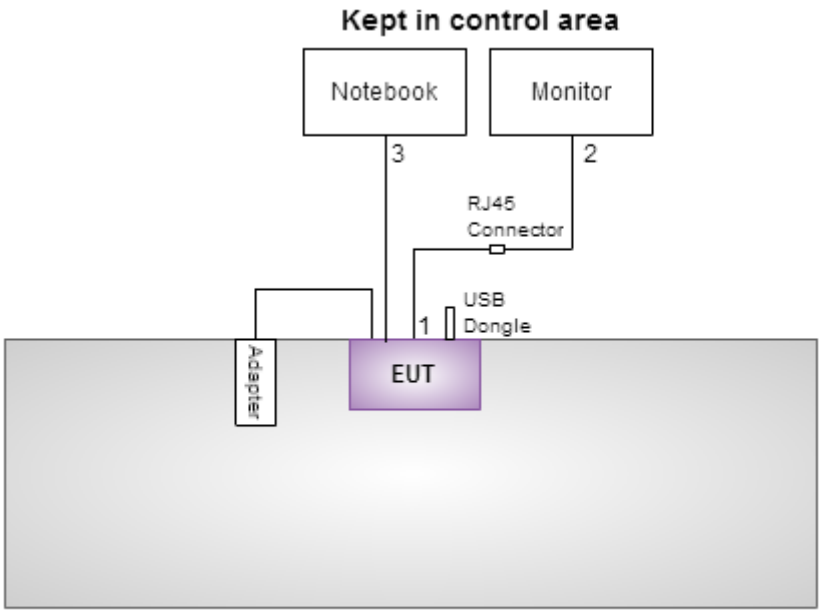
Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	15.5
11b	2437	17
11b	2462	18
11g	2412	18.5
11g	2437	20
11g	2462	17.5
HT20	2412	18
HT20	2437	20
HT20	2462	17
HT40	2422	14.5
HT40	2437	17.5
HT40	2452	15.5

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
2	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded. RJ45, 1m non-shielded.
3	USB Dongle	Kingston	DTSE9	---	---

1.3 Test Setup Chart

Test Setup Diagram



1. RJ45, 1m non-shielded (provided by client)
2 & 3. RJ45, 10m non-shielded

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Apr. 20, 2016				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
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	Mar. 28 ~ Apr. 08, 2016				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Dec. 13, 2015	Dec. 12, 2016
Receiver	R&S	ESR3	101658	Nov. 04, 2015	Nov. 03, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 20, 2015	Aug. 19, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 16, 2015	Dec. 15, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 16, 2015	Nov. 15, 2016
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 10, 2015	Dec. 09, 2016
Preamplifier	Burgeon	BPA-530	SN:100219	Sep. 10, 2015	Sep. 09, 2016
Preamplifier	Agilent	83017A	MY39501308	Oct. 02, 2015	Oct. 01, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 10, 2015	Dec. 09, 2016
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 10, 2015	Dec. 09, 2016
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 10, 2015	Dec. 09, 2016
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	Apr. 18 ~ Apr. 24, 2016				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 14, 2015	Sep. 13, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Signal Generator	R&S	SMB100A	175727	Oct. 05, 2015	Oct. 04, 2016
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 v03r05
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

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	±5.63 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 59%	Howard Huang
Radiated Emissions	03CH01-WS	20-24°C / 61-62%	Vincent Yeh
RF Conducted	TH01-WS	21°C / 69%	Anderson Hong

- 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	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.
2. 2 RJ45 cables, EKSON and Ricolink, had been pretested and found that **EKSON** was the worst case and was selected for final testing.

3 Transmitter Test Results

3.1 Conducted Emissions

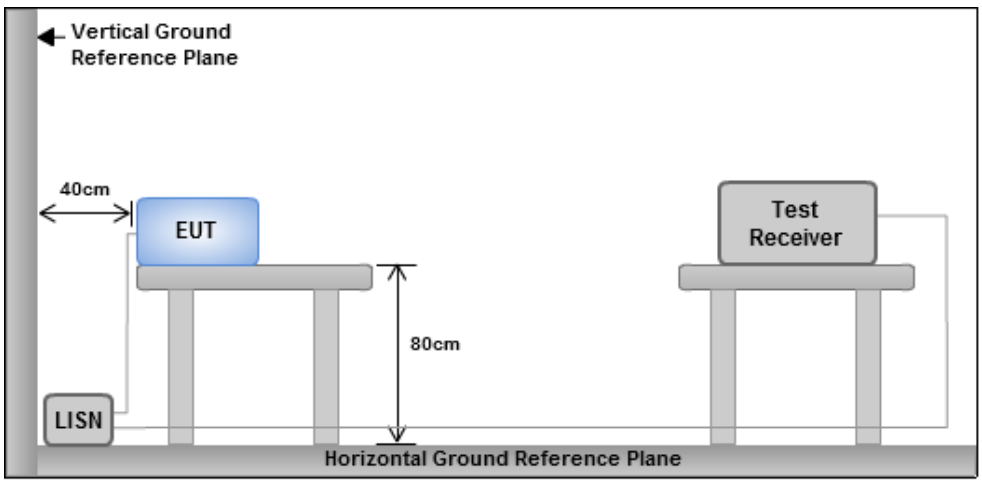
3.1.1 Limit of Conducted Emissions

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

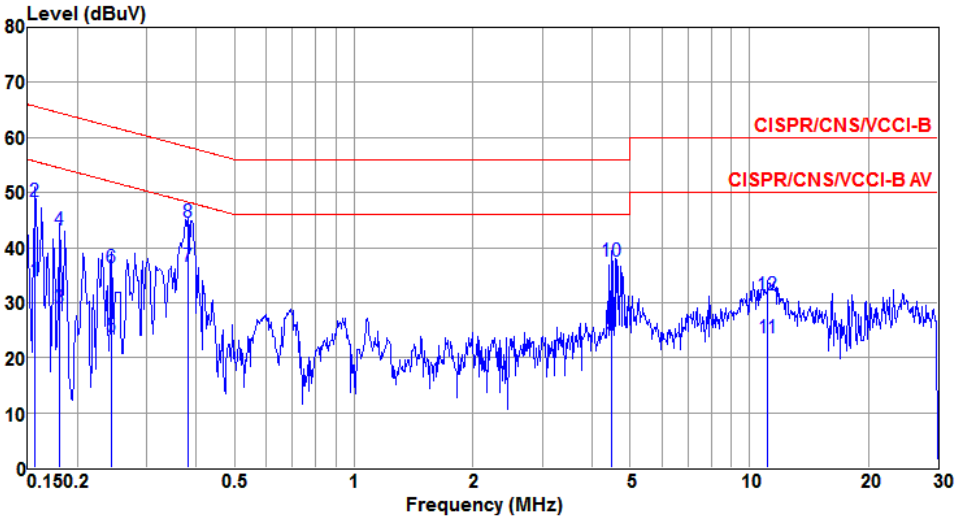


Note: 1. Support units were connected to second LISN.

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

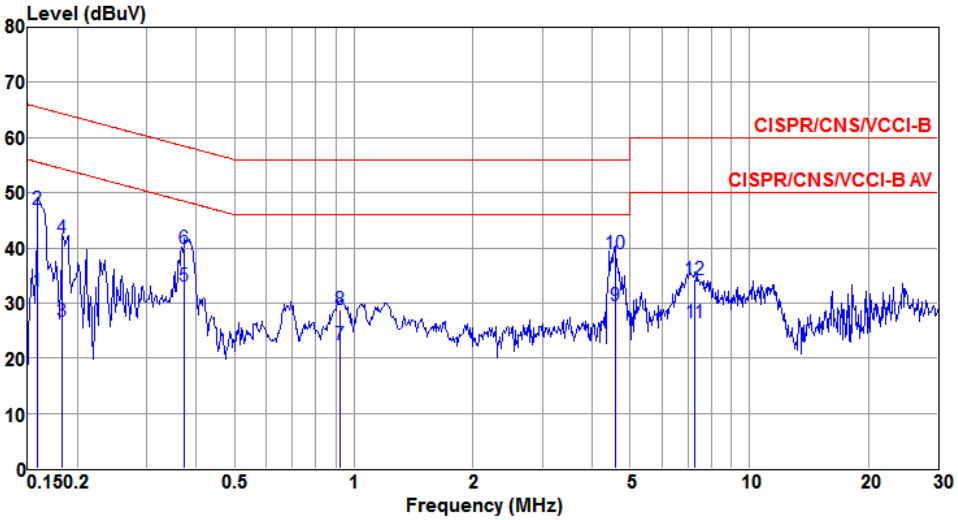
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.156	33.90	55.65	-21.75	33.06	0.82	0.02	Average
2	0.156	48.41	65.65	-17.24	47.57	0.82	0.02	QP
3	0.181	28.92	54.46	-25.54	28.42	0.48	0.02	Average
4	0.181	43.10	64.46	-21.36	42.60	0.48	0.02	QP
5	0.244	23.80	51.95	-28.15	23.55	0.23	0.02	Average
6	0.244	36.45	61.95	-25.50	36.20	0.23	0.02	QP
7@	0.381	36.66	48.25	-11.59	36.45	0.18	0.03	Average
8	0.381	44.63	58.25	-13.62	44.42	0.18	0.03	QP
9	4.478	24.18	46.00	-21.82	23.75	0.31	0.12	Average
10	4.478	37.54	56.00	-18.46	37.11	0.31	0.12	QP
11	11.139	23.70	50.00	-26.30	22.84	0.69	0.17	Average
12	11.139	31.50	60.00	-28.50	30.64	0.69	0.17	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	0.159	32.05	55.52	-23.47	31.30	0.73	0.02	Average
2	0.159	47.08	65.52	-18.44	46.33	0.73	0.02	QP
3	0.183	26.76	54.33	-27.57	26.33	0.41	0.02	Average
4	0.183	41.70	64.33	-22.63	41.27	0.41	0.02	QP
5@	0.373	32.96	48.43	-15.47	32.79	0.14	0.03	Average
6	0.373	39.91	58.43	-18.52	39.74	0.14	0.03	QP
7	0.923	22.44	46.00	-23.56	22.12	0.26	0.06	Average
8	0.923	28.76	56.00	-27.24	28.44	0.26	0.06	QP
9	4.574	29.45	46.00	-16.55	28.61	0.71	0.13	Average
10	4.574	39.02	56.00	-16.98	38.18	0.71	0.13	QP
11	7.290	26.46	50.00	-23.54	25.71	0.60	0.15	Average
12	7.290	34.29	60.00	-25.71	33.54	0.60	0.15	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

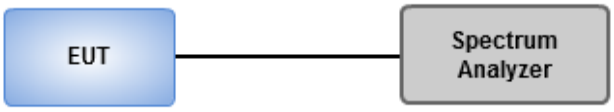
6dB Bandwidth

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.

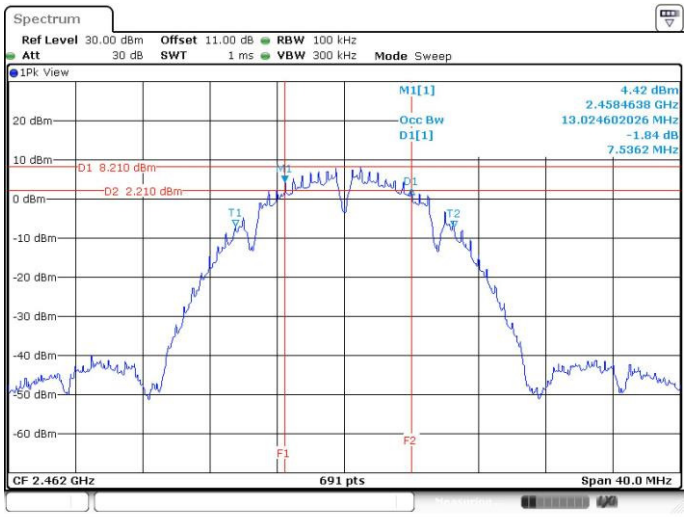
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

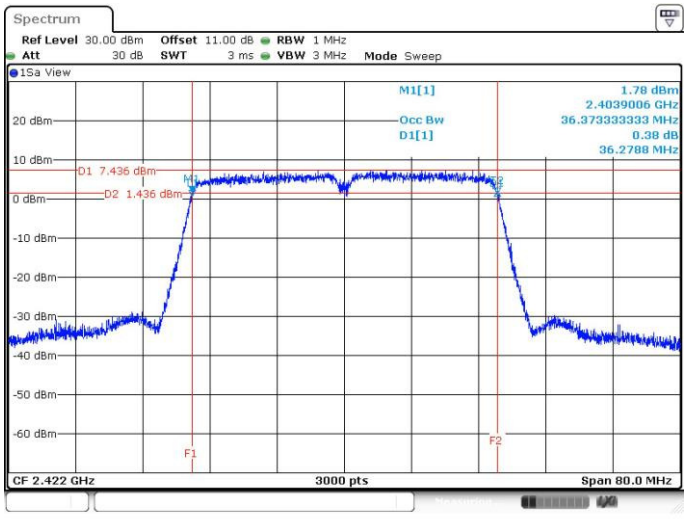
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	8.06	8.06	---	---	500
11b	2	2437	8.06	8.06	---	---	500
11b	2	2462	8.06	7.54	---	---	500
11g	2	2412	16.35	16.35	---	---	500
11g	2	2437	16.35	16.06	---	---	500
11g	2	2462	16.35	16.35	---	---	500
HT20	2	2412	17.16	16.93	---	---	500
HT20	2	2437	17.68	17.62	---	---	500
HT20	2	2462	17.28	17.57	---	---	500
HT40	2	2422	35.25	35.36	---	---	500
HT40	2	2437	35.36	35.36	---	---	500
HT40	2	2452	35.59	35.59	---	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	12.93	12.97	---	---
11b	2	2437	12.93	12.92	---	---
11b	2	2462	12.97	12.96	---	---
11g	2	2412	16.51	16.48	---	---
11g	2	2437	30.15	29.20	---	---
11g	2	2462	16.48	16.47	---	---
HT20	2	2412	17.65	17.63	---	---
HT20	2	2437	29.68	28.73	---	---
HT20	2	2462	17.64	17.63	---	---
HT40	2	2422	36.37	36.32	---	---
HT40	2	2437	36.37	36.37	---	---
HT40	2	2452	36.35	36.35	---	---

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	2	2412	16.80	16.93	---	---	97.180	19.88	30.00	3.00	22.88	36.00
11b	2	2437	18.46	18.26	---	---	137.134	21.37	30.00	3.00	24.37	36.00
11b	2	2462	19.12	19.21	---	---	165.026	22.18	30.00	3.00	25.18	36.00
11g	2	2412	22.45	22.79	---	---	365.900	25.63	30.00	3.00	28.63	36.00
11g	2	2437	24.10	24.43	---	---	534.372	**27.28**	30.00	3.00	30.28	36.00
11g	2	2462	21.66	22.17	---	---	311.371	24.93	30.00	3.00	27.93	36.00
HT20	2	2412	21.98	22.02	---	---	316.982	25.01	30.00	3.00	28.01	36.00
HT20	2	2437	23.96	24.41	---	---	524.944	27.20	30.00	3.00	30.20	36.00
HT20	2	2462	21.30	21.41	---	---	273.253	24.37	30.00	3.00	27.37	36.00
HT40	2	2422	19.76	19.59	---	---	185.615	22.69	30.00	3.00	25.69	36.00
HT40	2	2437	21.91	22.10	---	---	317.420	25.02	30.00	3.00	28.02	36.00
HT40	2	2452	20.43	20.43	---	---	220.816	23.44	30.00	3.00	26.44	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	2	2412	14.35	14.45	---	---	55.088	17.41	---
11b	2	2437	16.02	15.84	---	---	78.365	18.94	---
11b	2	2462	16.73	16.88	---	---	95.851	19.82	---
11g	2	2412	17.37	17.61	---	---	112.252	20.50	---
11g	2	2437	22.49	22.76	---	---	366.218	**25.64**	---
11g	2	2462	16.37	16.82	---	---	91.435	19.61	---
HT20	2	2412	16.55	16.87	---	---	93.826	19.72	---
HT20	2	2437	22.18	22.83	---	---	357.063	25.53	---
HT20	2	2462	15.62	15.84	---	---	74.846	18.74	---
HT40	2	2422	13.61	13.48	---	---	45.246	16.56	---
HT40	2	2437	16.45	16.62	---	---	90.077	19.55	---
HT40	2	2452	14.38	14.45	---	---	55.277	17.43	---

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

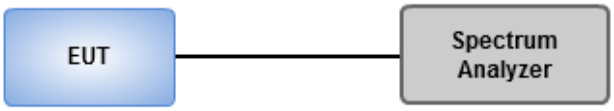
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

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. Perform the measurement over a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.

3.4.3 Test Setup

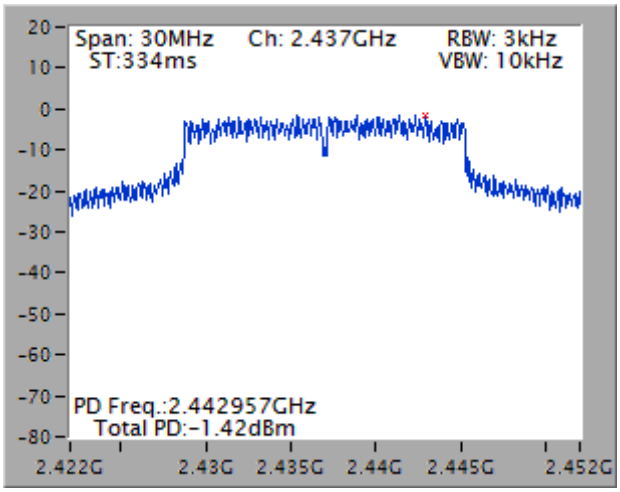


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	-4.92	8.00
11b	2	2437	-4.82	8.00
11b	2	2462	-3.53	8.00
11g	2	2412	-5.71	8.00
11g	2	2437	-1.42	8.00
11g	2	2462	-6.94	8.00
HT20	2	2412	-7.38	8.00
HT20	2	2437	-1.44	8.00
HT20	2	2462	-7.01	8.00
HT40	2	2422	-13.58	8.00
HT40	2	2437	-9.97	8.00
HT40	2	2452	-12.06	8.00

Note: Test result is bin-by-bin summing measured value of each TX port.

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

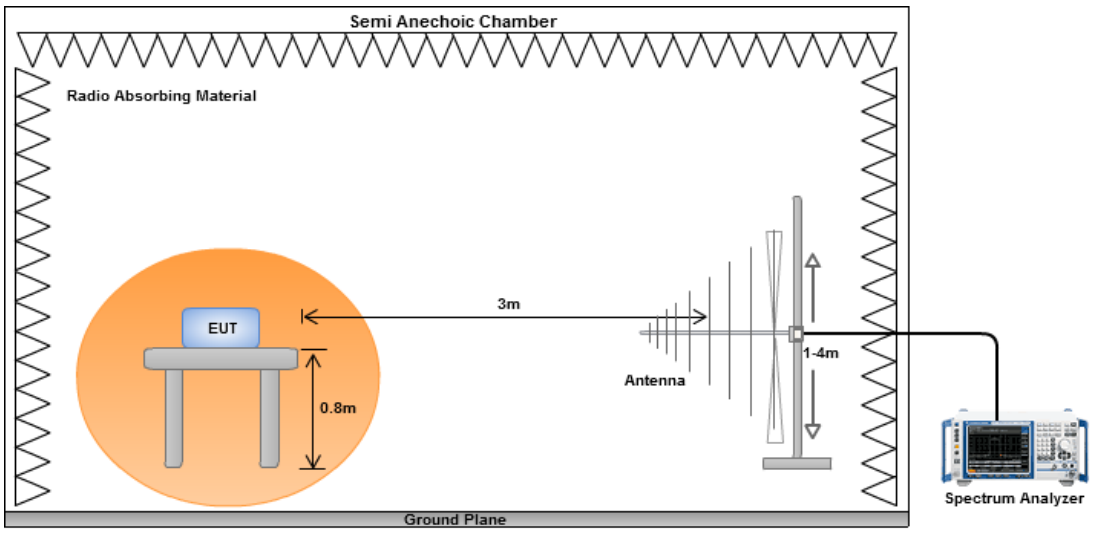
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

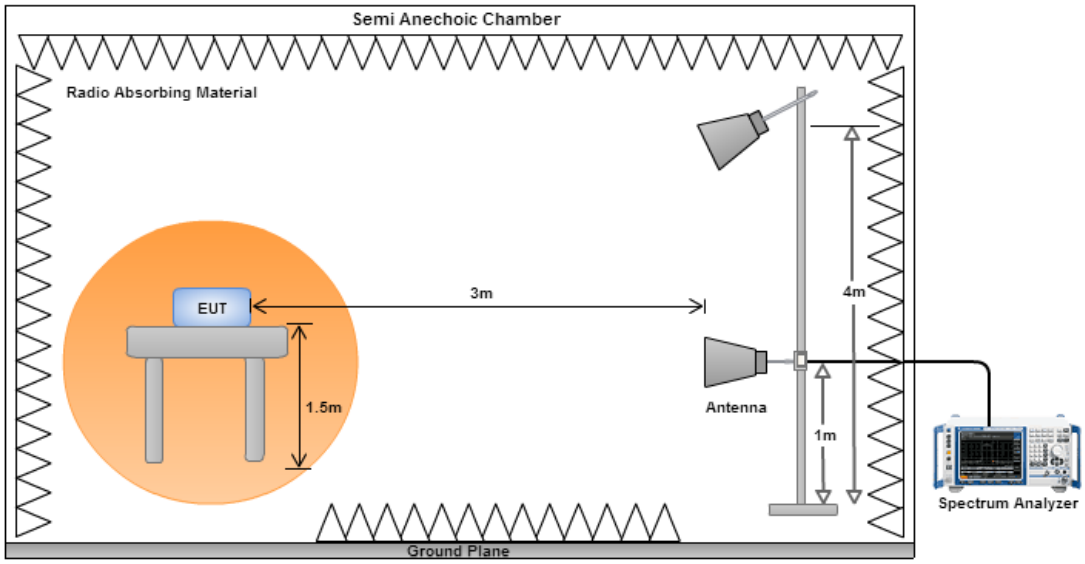
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

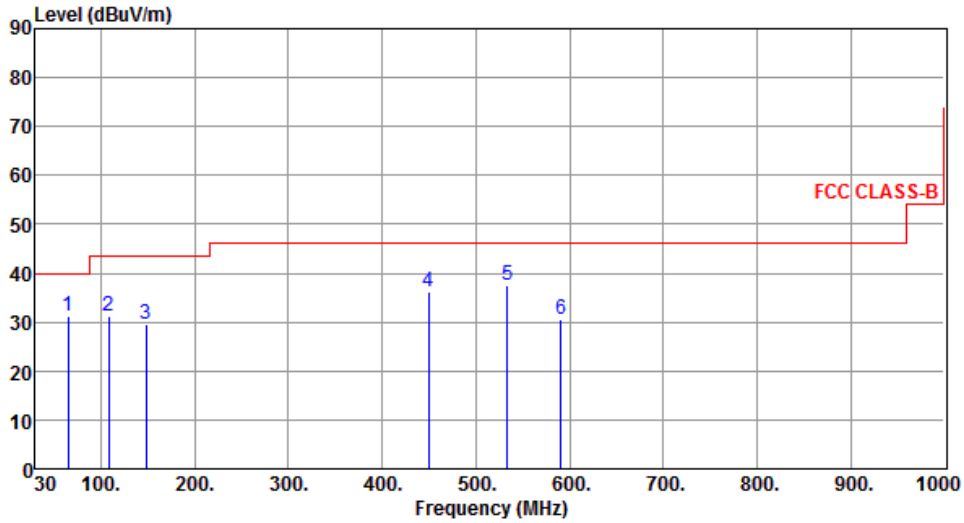


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

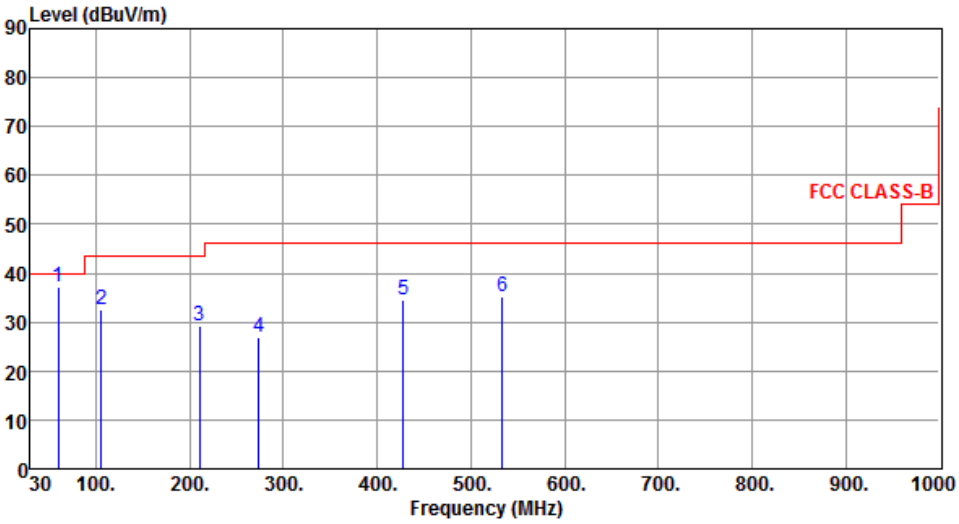
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	64.92	31.08	40.00	-8.92	49.48	-18.40	Peak	---	---
2	108.57	31.11	43.50	-12.39	50.93	-19.82	Peak	---	---
3	148.34	29.62	43.50	-13.88	46.38	-16.76	Peak	---	---
4	450.01	36.15	46.00	-9.85	48.32	-12.17	Peak	---	---
5	533.43	37.37	46.00	-8.63	48.06	-10.69	Peak	---	---
6	590.66	30.50	46.00	-15.50	40.20	-9.70	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		

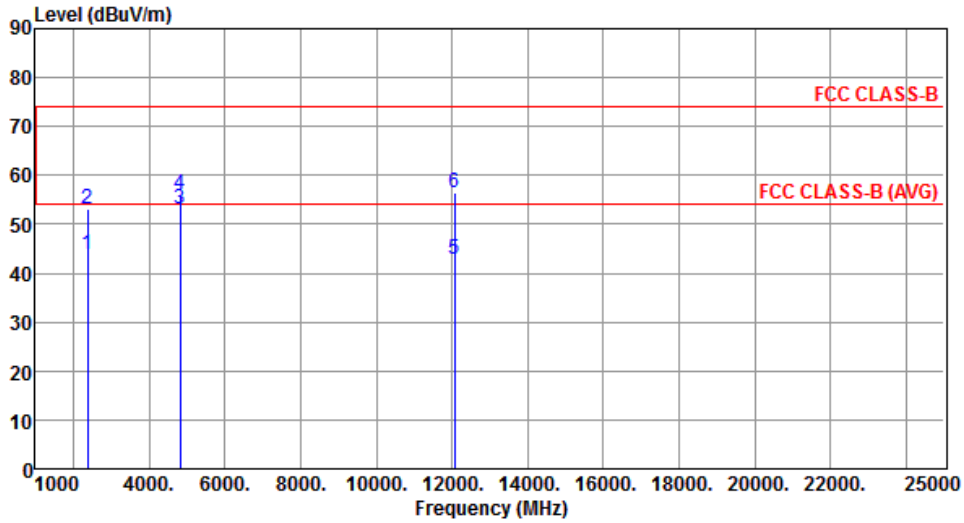


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	60.19	37.16	40.00	-2.84	54.71	-17.55	QP	100	19
2	105.66	32.70	43.50	-10.80	53.03	-20.33	Peak	---	---
3	210.42	29.07	43.50	-14.43	48.41	-19.34	Peak	---	---
4	273.47	27.05	46.00	-18.95	43.76	-16.71	Peak	---	---
5	427.70	34.48	46.00	-11.52	47.20	-12.72	Peak	---	---
6	533.43	35.23	46.00	-10.77	45.92	-10.69	Peak	---	---

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

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

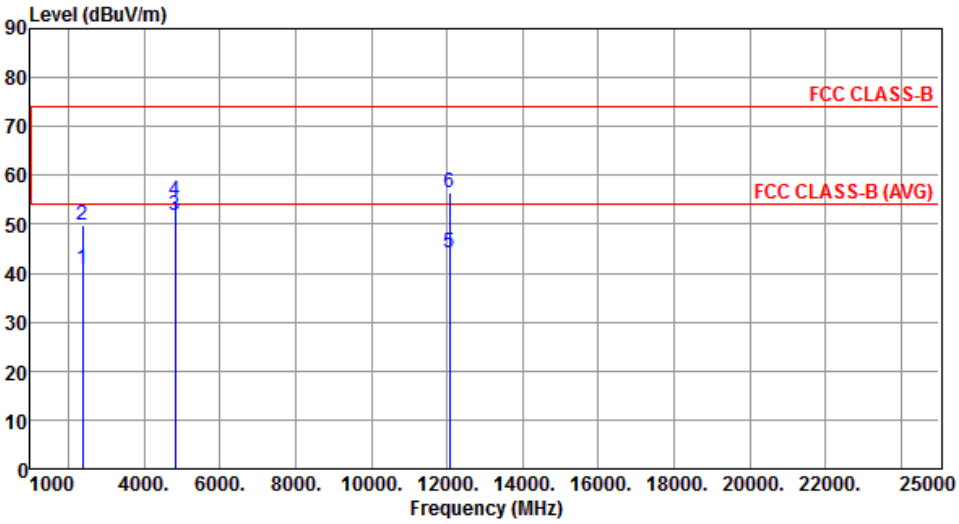
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.86	54.00	-10.14	47.21	-3.35	Average	123	177
2	2390.00	53.19	74.00	-20.81	56.54	-3.35	Peak	123	177
3	4824.00	52.98	54.00	-1.02	49.39	3.59	Average	100	47
4	4824.00	56.12	74.00	-17.88	52.53	3.59	Peak	100	47
5	12060.00	42.96	54.00	-11.04	28.83	14.13	Average	100	261
6	12060.00	56.44	74.00	-17.56	42.31	14.13	Peak	100	261

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).

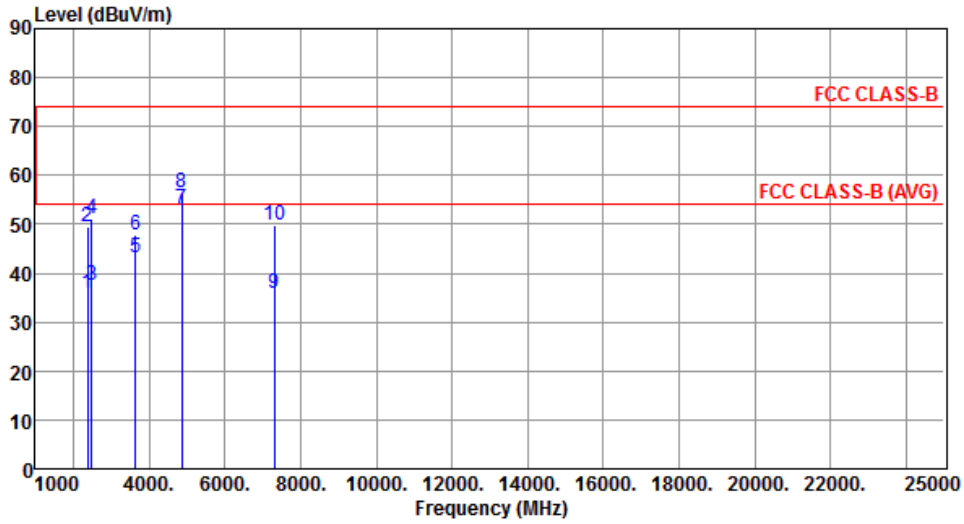
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	40.77	54.00	-13.23	44.12	-3.35	Average	320	35
2	2390.00	49.87	74.00	-24.13	53.22	-3.35	Peak	320	35
3	4824.00	51.78	54.00	-2.22	48.19	3.59	Average	106	87
4	4824.00	54.64	74.00	-19.36	51.05	3.59	Peak	106	87
5	12060.00	44.29	54.00	-9.71	30.16	14.13	Average	100	5
6	12060.00	56.44	74.00	-17.56	42.31	14.13	Peak	100	5

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).

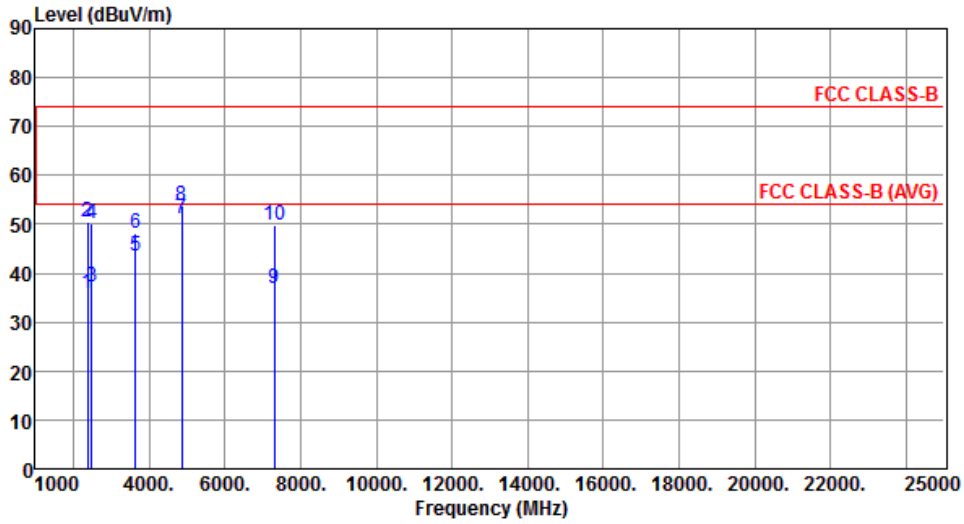
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	35.99	54.00	-18.01	39.34	-3.35	Average	283	183
2	2390.00	49.65	74.00	-24.35	53.00	-3.35	Peak	283	183
3	2483.50	37.58	54.00	-16.42	40.51	-2.93	Average	283	183
4	2483.50	51.21	74.00	-22.79	54.14	-2.93	Peak	283	183
5	3655.00	43.24	54.00	-10.76	42.84	0.40	Average	103	142
6	3655.00	47.94	74.00	-26.06	47.54	0.40	Peak	103	142
7	4874.00	52.98	54.00	-1.02	49.23	3.75	Average	100	70
8	4874.00	56.37	74.00	-17.63	52.62	3.75	Peak	100	70
9	7311.00	35.98	54.00	-18.02	27.56	8.42	Average	222	165
10	7311.00	49.98	74.00	-24.02	41.56	8.42	Peak	222	165

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

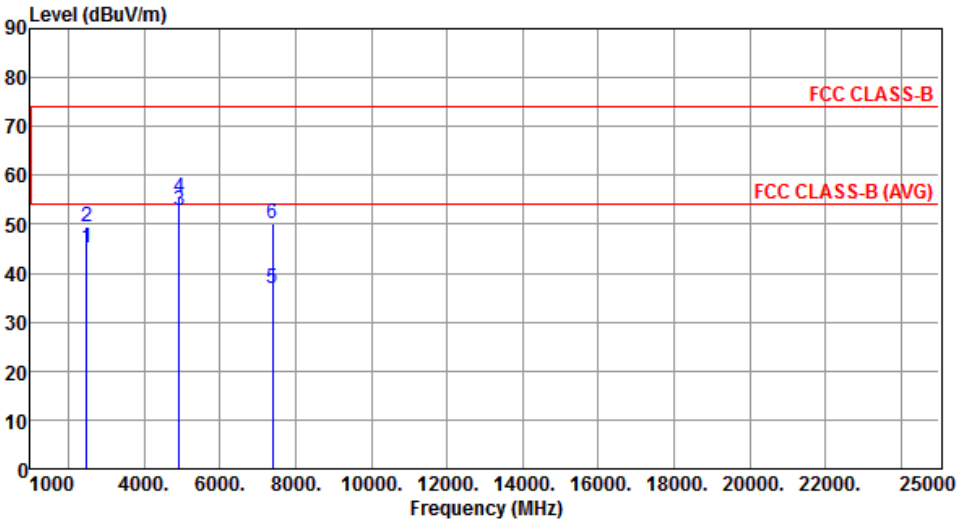
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	35.84	54.00	-18.16	39.19	-3.35	Average	318	252
2	2390.00	50.41	74.00	-23.59	53.76	-3.35	Peak	318	252
3	2483.50	37.28	54.00	-16.72	40.21	-2.93	Average	318	252
4	2483.50	50.25	74.00	-23.75	53.18	-2.93	Peak	318	252
5	3655.00	43.59	54.00	-10.41	43.19	0.40	Average	100	196
6	3655.00	48.02	74.00	-25.98	47.62	0.40	Peak	100	196
7	4874.00	51.16	54.00	-2.84	47.41	3.75	Average	227	344
8	4874.00	53.85	74.00	-20.15	50.10	3.75	Peak	227	344
9	7311.00	36.86	54.00	-17.14	28.44	8.42	Average	211	69
10	7311.00	49.78	74.00	-24.22	41.36	8.42	Peak	211	69

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).

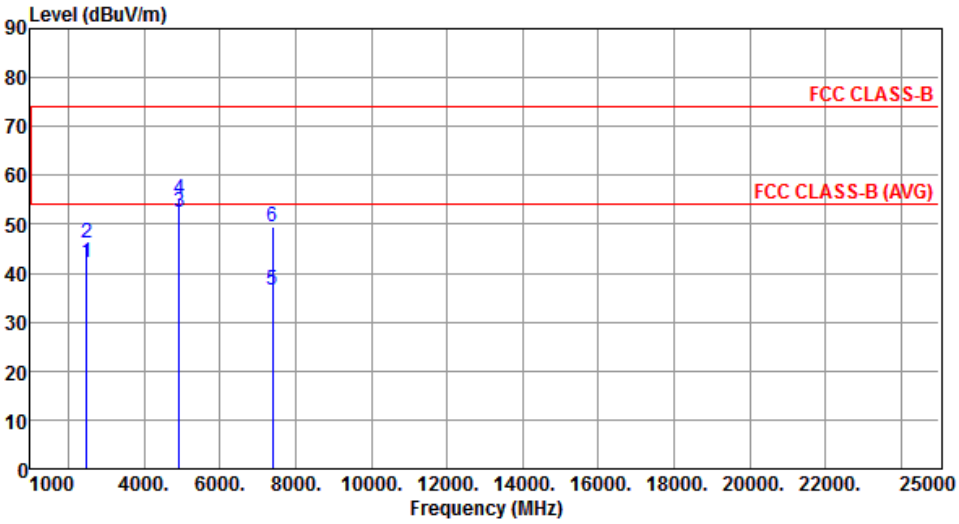
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	45.29	54.00	-8.71	48.22	-2.93	Average	191	350
2	2483.50	49.38	74.00	-24.62	52.31	-2.93	Peak	191	350
3	4924.00	52.95	54.00	-1.05	49.04	3.91	Average	293	79
4	4924.00	55.61	74.00	-18.39	51.70	3.91	Peak	293	79
5	7386.00	36.81	54.00	-17.19	28.35	8.46	Average	168	99
6	7386.00	50.11	74.00	-23.89	41.65	8.46	Peak	168	99

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		

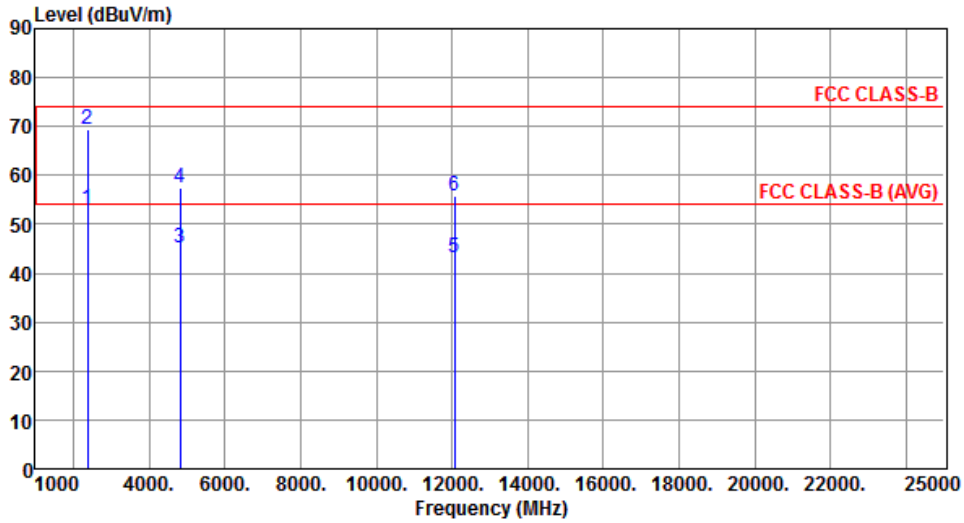


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	42.11	54.00	-11.89	45.04	-2.93	Average	222	311
2	2483.50	46.09	74.00	-27.91	49.02	-2.93	Peak	222	311
3	4924.00	52.58	54.00	-1.42	48.67	3.91	Average	268	322
4	4924.00	55.03	74.00	-18.97	51.12	3.91	Peak	268	322
5	7386.00	36.57	54.00	-17.43	28.11	8.46	Average	222	165
6	7386.00	49.55	74.00	-24.45	41.09	8.46	Peak	222	165

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

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

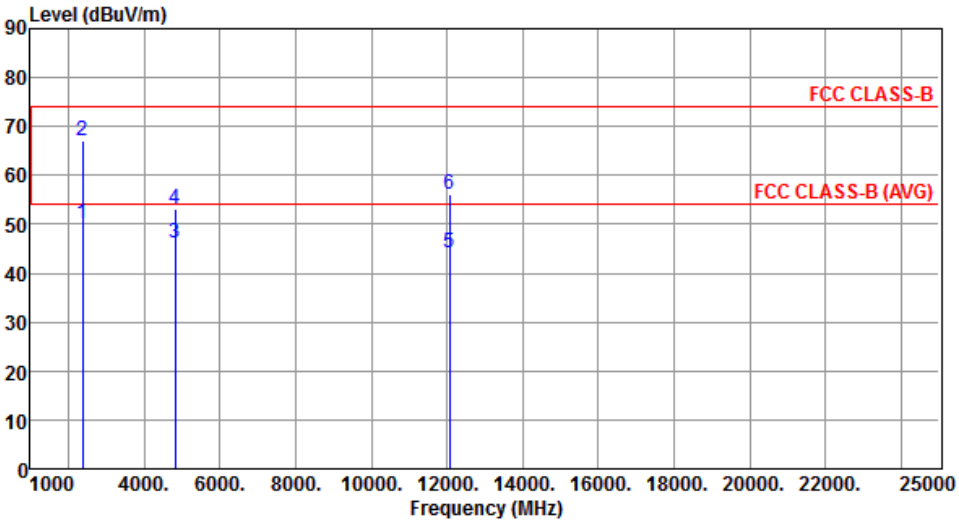
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.98	54.00	-1.02	56.33	-3.35	Average	115	174
2	2390.00	69.56	74.00	-4.44	72.91	-3.35	Peak	115	174
3	4824.00	45.02	54.00	-8.98	41.43	3.59	Average	302	314
4	4824.00	57.42	74.00	-16.58	53.83	3.59	Peak	302	314
5	12060.00	43.24	54.00	-10.76	29.11	14.13	Average	222	165
6	12060.00	55.72	74.00	-18.28	41.59	14.13	Peak	222	165

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

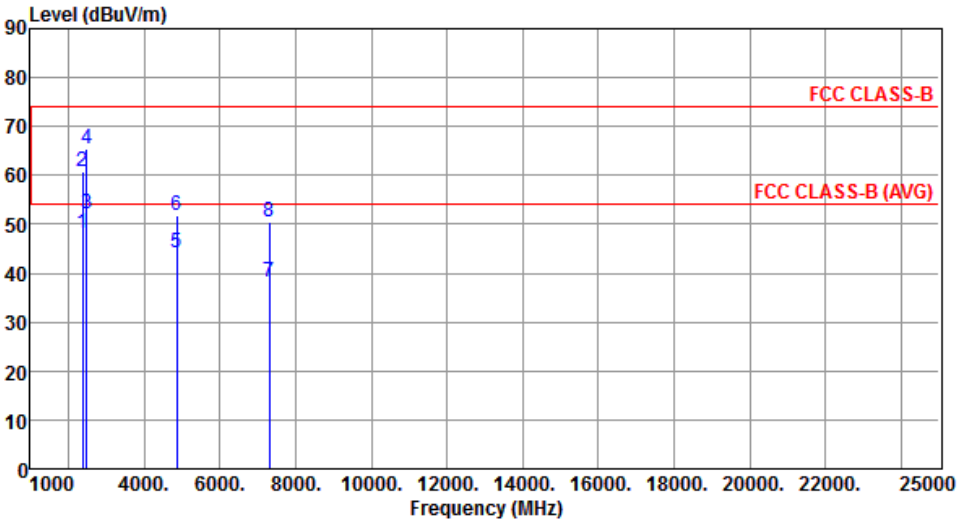
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	50.10	54.00	-3.90	53.45	-3.35	Average	104	87
2	2390.00	67.00	74.00	-7.00	70.35	-3.35	Peak	104	87
3	4824.00	46.12	54.00	-7.88	42.53	3.59	Average	100	269
4	4824.00	53.25	74.00	-20.75	49.66	3.59	Peak	100	269
5	12060.00	44.01	54.00	-9.99	29.88	14.13	Average	116	278
6	12060.00	55.99	74.00	-18.01	41.86	14.13	Peak	116	278

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

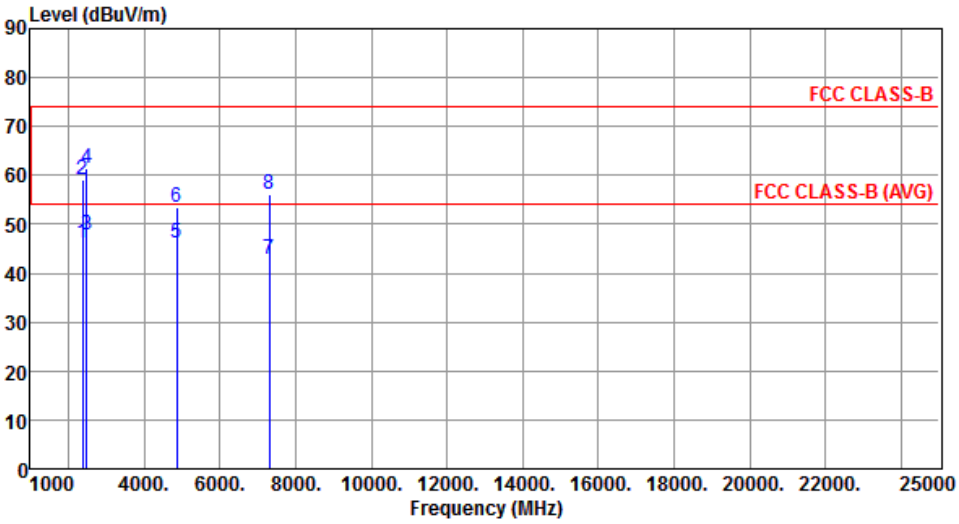
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.28	54.00	-5.72	51.63	-3.35	Average	162	177
2	2390.00	60.92	74.00	-13.08	64.27	-3.35	Peak	162	177
3	2483.50	52.20	54.00	-1.80	55.13	-2.93	Average	162	206
4	2483.50	65.51	74.00	-8.49	68.44	-2.93	Peak	162	206
5	4874.00	44.17	54.00	-9.83	40.42	3.75	Average	100	173
6	4874.00	51.66	74.00	-22.34	47.91	3.75	Peak	100	173
7	7311.00	38.31	54.00	-15.69	29.89	8.42	Average	221	246
8	7311.00	50.32	74.00	-23.68	41.90	8.42	Peak	221	246

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).

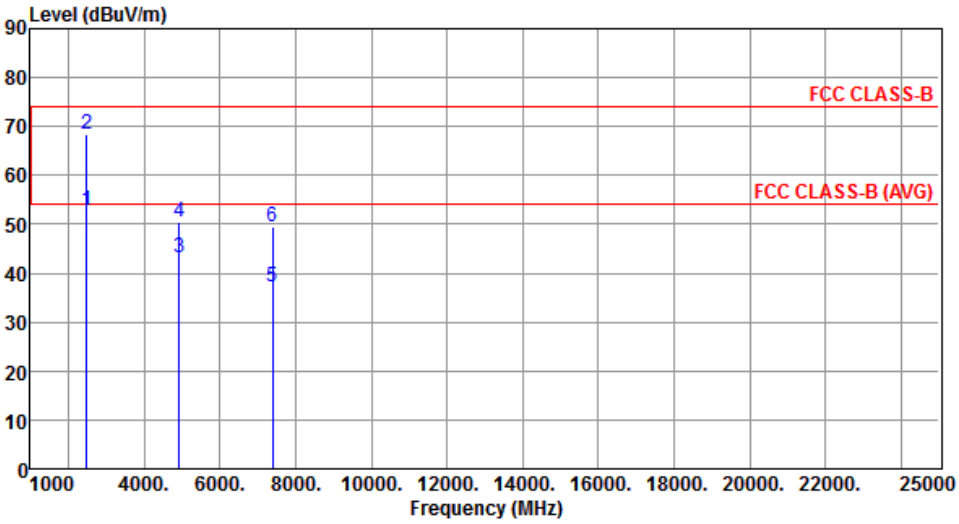
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	46.28	54.00	-7.72	49.63	-3.35	Average	100	267
2	2390.00	59.05	74.00	-14.95	62.40	-3.35	Peak	100	267
3	2483.50	47.80	54.00	-6.20	50.73	-2.93	Average	100	157
4	2483.50	61.59	74.00	-12.41	64.52	-2.93	Peak	100	157
5	4874.00	46.29	54.00	-7.71	42.54	3.75	Average	100	269
6	4874.00	53.34	74.00	-20.66	49.59	3.75	Peak	100	269
7	7311.00	42.98	54.00	-11.02	34.56	8.42	Average	259	266
8	7311.00	56.26	74.00	-17.74	47.84	8.42	Peak	259	266

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).

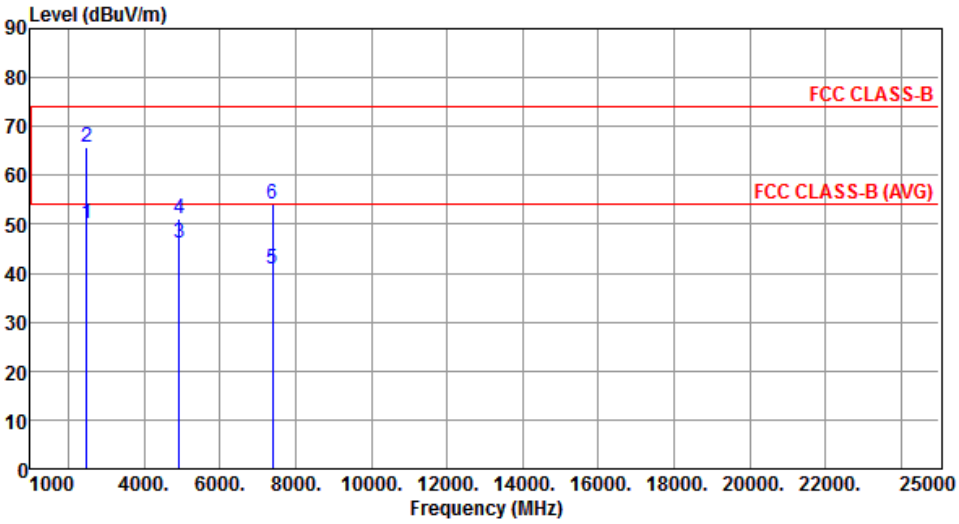
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.68	54.00	-1.32	55.61	-2.93	Average	184	145
2	2483.50	68.38	74.00	-5.62	71.31	-2.93	Peak	184	145
3	4924.00	43.13	54.00	-10.87	39.22	3.91	Average	333	229
4	4924.00	50.45	74.00	-23.55	46.54	3.91	Peak	333	229
5	7386.00	37.34	54.00	-16.66	28.88	8.46	Average	222	165
6	7386.00	49.62	74.00	-24.38	41.16	8.46	Peak	222	165

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

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

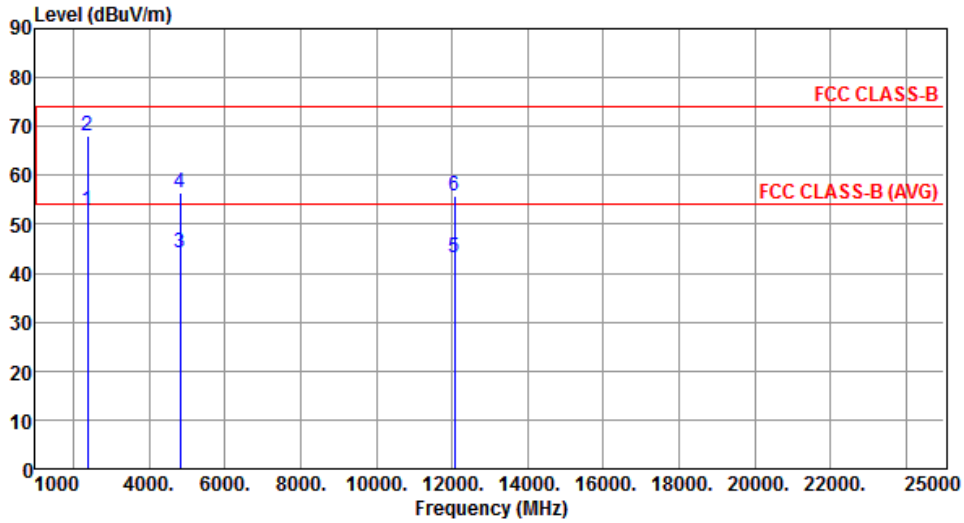


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.11	54.00	-3.89	53.04	-2.93	Average	100	89
2	2483.50	65.90	74.00	-8.10	68.83	-2.93	Peak	100	89
3	4924.00	46.25	54.00	-7.75	42.34	3.91	Average	234	281
4	4924.00	51.10	74.00	-22.90	47.19	3.91	Peak	234	281
5	7386.00	41.01	54.00	-12.99	32.55	8.46	Average	222	188
6	7386.00	54.01	74.00	-19.99	45.55	8.46	Peak	222	188

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

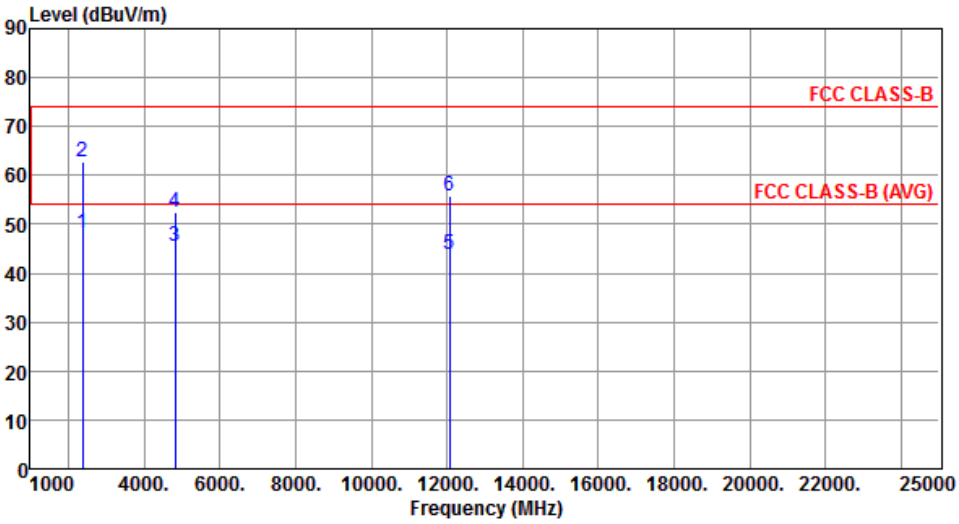
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.96	54.00	-1.04	56.31	-3.35	Average	355	167
2	2390.00	68.05	74.00	-5.95	71.40	-3.35	Peak	355	167
3	4824.00	44.29	54.00	-9.71	40.70	3.59	Average	222	188
4	4824.00	56.31	74.00	-17.69	52.72	3.59	Peak	222	188
5	12060.00	43.11	54.00	-10.89	28.98	14.13	Average	111	65
6	12060.00	55.68	74.00	-18.32	41.55	14.13	Peak	111	65

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).

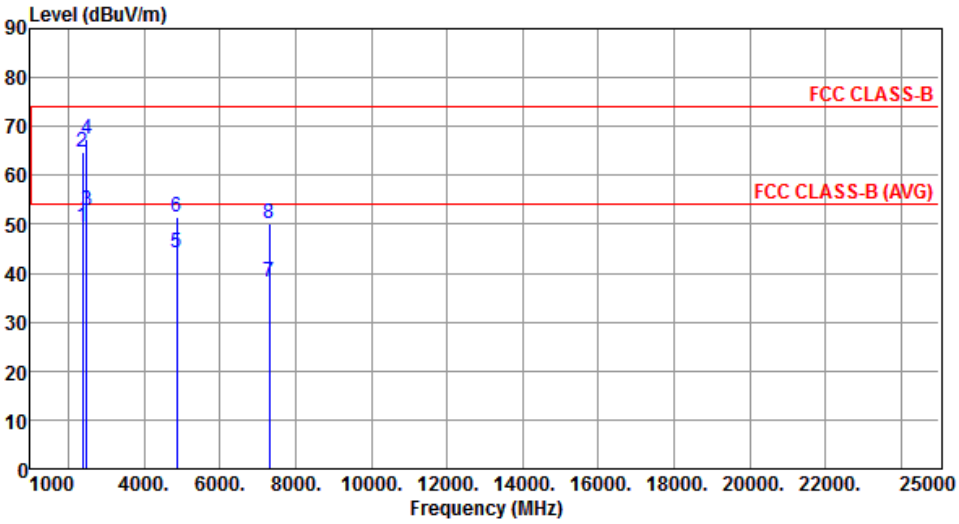
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	48.25	54.00	-5.75	51.60	-3.35	Average	100	105
2	2390.00	62.93	74.00	-11.07	66.28	-3.35	Peak	100	105
3	4824.00	45.53	54.00	-8.47	41.94	3.59	Average	166	259
4	4824.00	52.39	74.00	-21.61	48.80	3.59	Peak	166	259
5	12060.00	43.83	54.00	-10.17	29.70	14.13	Average	222	183
6	12060.00	55.86	74.00	-18.14	41.73	14.13	Peak	222	183

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

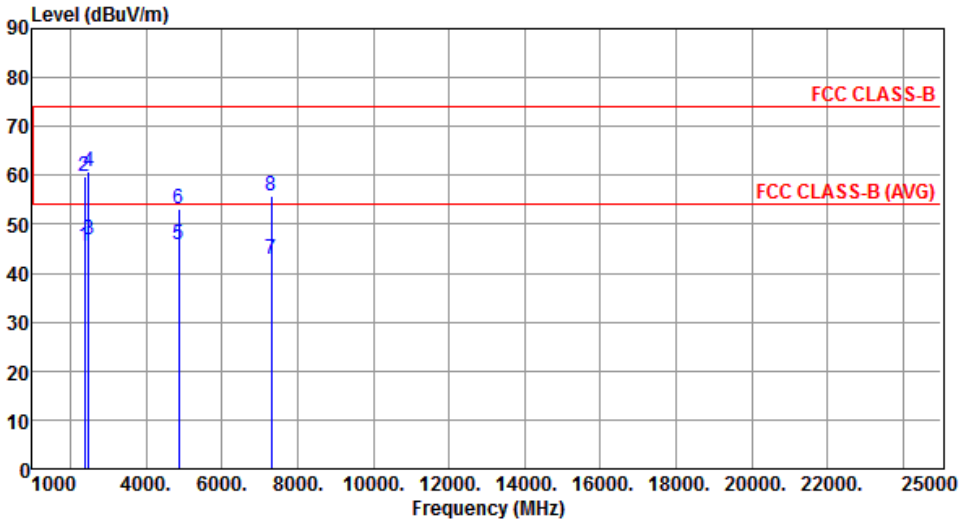
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	49.62	54.00	-4.38	52.97	-3.35	Average	363	176
2	2390.00	64.63	74.00	-9.37	67.98	-3.35	Peak	363	176
3	2483.50	52.75	54.00	-1.25	55.68	-2.93	Average	329	139
4	2483.50	67.43	74.00	-6.57	70.36	-2.93	Peak	329	139
5	4874.00	44.03	54.00	-9.97	40.28	3.75	Average	100	166
6	4874.00	51.59	74.00	-22.41	47.84	3.75	Peak	100	166
7	7311.00	38.29	54.00	-15.71	29.87	8.42	Average	221	169
8	7311.00	50.29	74.00	-23.71	41.87	8.42	Peak	221	169

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

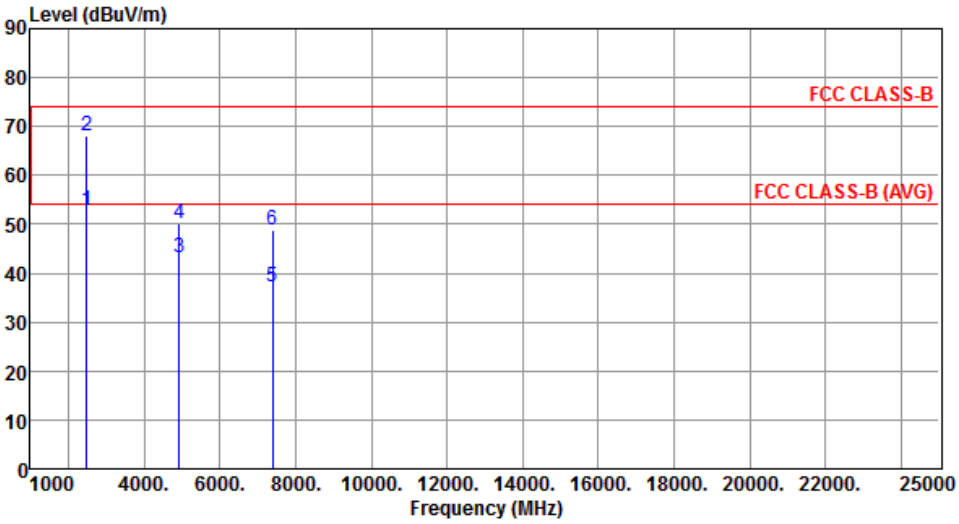
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	45.51	54.00	-8.49	48.86	-3.35	Average	100	314
2	2390.00	59.92	74.00	-14.08	63.27	-3.35	Peak	100	314
3	2483.50	46.99	54.00	-7.01	49.92	-2.93	Average	100	109
4	2483.50	60.91	74.00	-13.09	63.84	-2.93	Peak	100	109
5	4874.00	45.93	54.00	-8.07	42.18	3.75	Average	258	229
6	4874.00	52.99	74.00	-21.01	49.24	3.75	Peak	258	229
7	7311.00	42.83	54.00	-11.17	34.41	8.42	Average	268	159
8	7311.00	55.94	74.00	-18.06	47.52	8.42	Peak	268	159

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

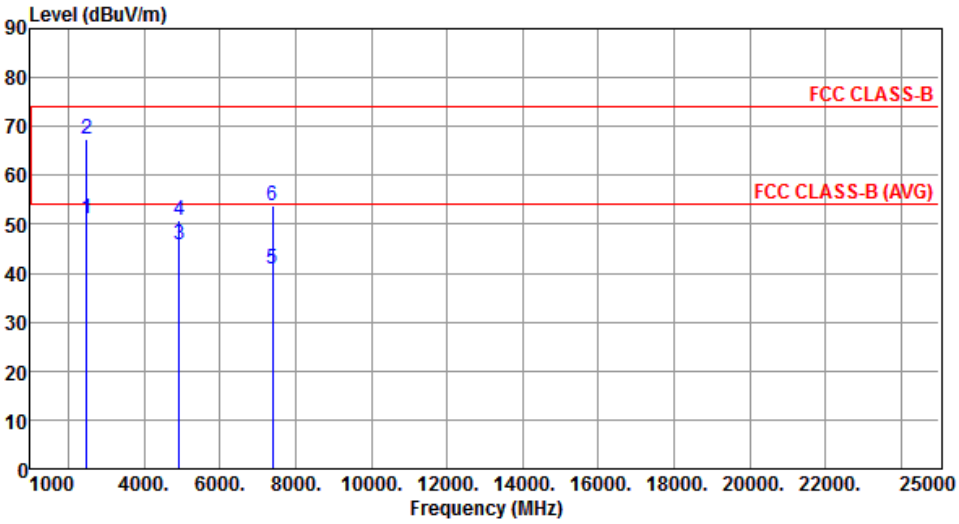
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.87	54.00	-1.13	55.80	-2.93	Average	299	60
2	2483.50	68.20	74.00	-5.80	71.13	-2.93	Peak	299	60
3	4924.00	43.10	54.00	-10.90	39.19	3.91	Average	321	165
4	4924.00	50.30	74.00	-23.70	46.39	3.91	Peak	321	165
5	7386.00	37.19	54.00	-16.81	28.73	8.46	Average	221	165
6	7386.00	48.96	74.00	-25.04	40.50	8.46	Peak	221	165

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

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

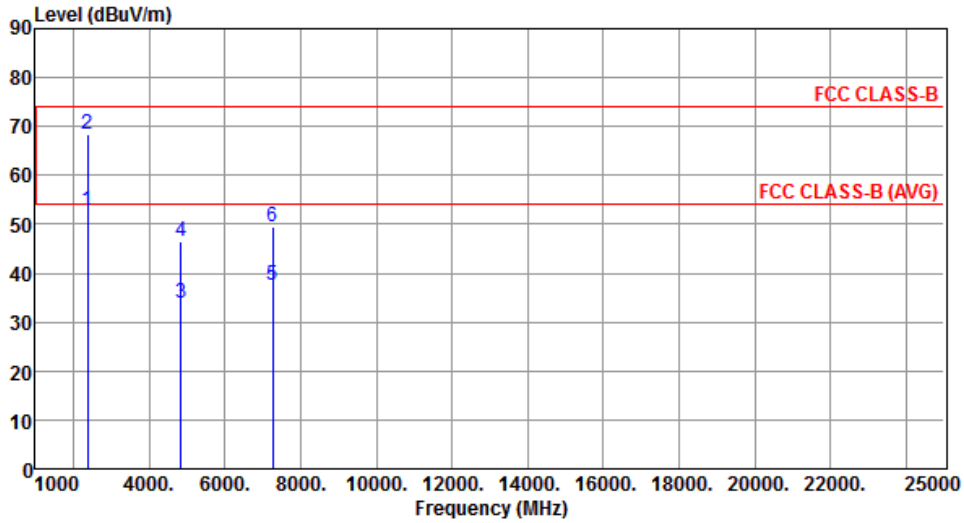


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	51.29	54.00	-2.71	54.22	-2.93	Average	100	136
2	2483.50	67.27	74.00	-6.73	70.20	-2.93	Peak	100	136
3	4924.00	45.89	54.00	-8.11	41.98	3.91	Average	232	188
4	4924.00	50.89	74.00	-23.11	46.98	3.91	Peak	232	188
5	7386.00	40.88	54.00	-13.12	32.42	8.46	Average	222	98
6	7386.00	53.76	74.00	-20.24	45.30	8.46	Peak	222	98

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

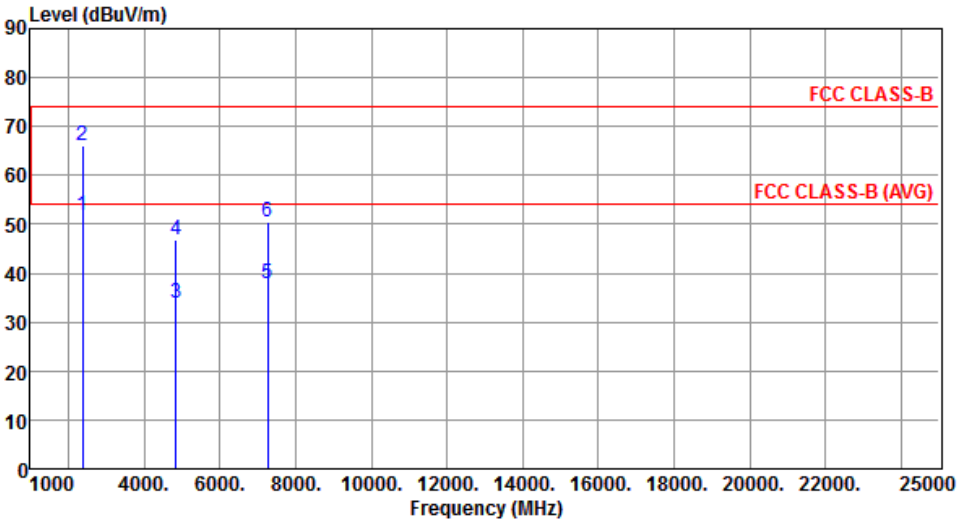
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	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	52.90	54.00	-1.10	56.25	-3.35	Average	221	194
2	2390.00	68.50	74.00	-5.50	71.85	-3.35	Peak	221	194
3	4844.00	33.81	54.00	-20.19	30.15	3.66	Average	226	199
4	4844.00	46.52	74.00	-27.48	42.86	3.66	Peak	226	199
5	7266.00	37.52	54.00	-16.48	29.10	8.42	Average	189	26
6	7266.00	49.65	74.00	-24.35	41.23	8.42	Peak	189	26

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).

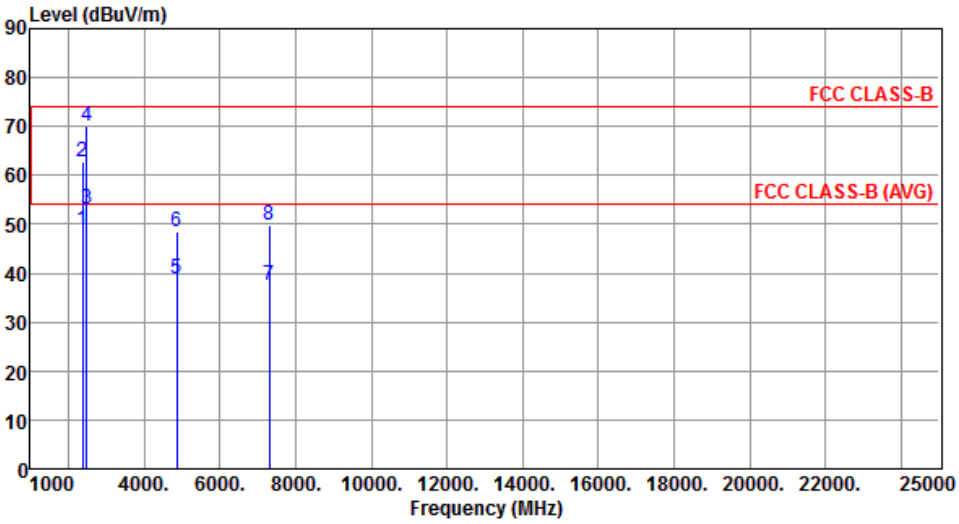
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	51.83	54.00	-2.17	55.18	-3.35	Average	188	256
2	2390.00	66.19	74.00	-7.81	69.54	-3.35	Peak	188	256
3	4844.00	33.88	54.00	-20.12	30.22	3.66	Average	199	283
4	4844.00	46.85	74.00	-27.15	43.19	3.66	Peak	199	283
5	7266.00	37.76	54.00	-16.24	29.34	8.42	Average	212	311
6	7266.00	50.47	74.00	-23.53	42.05	8.42	Peak	212	311

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).

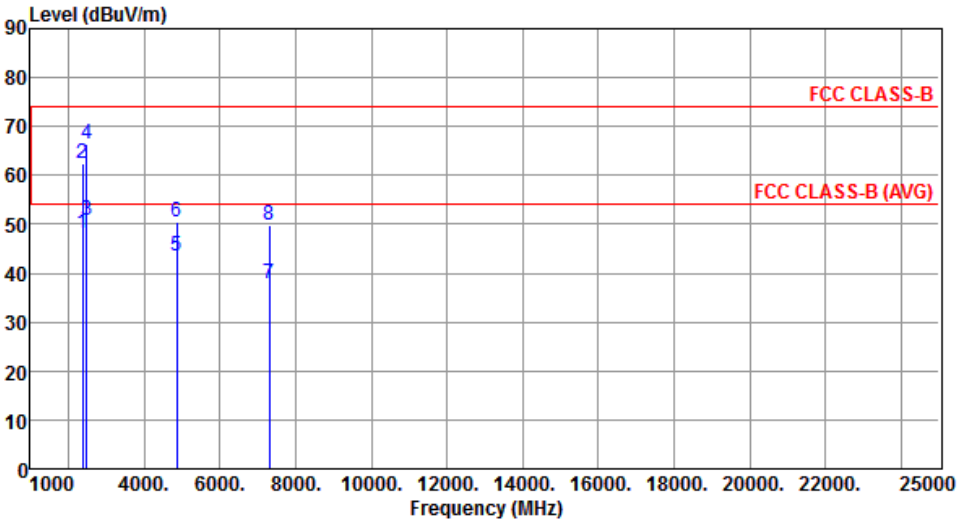
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	48.81	54.00	-5.19	52.16	-3.35	Average	273	183
2	2390.00	62.63	74.00	-11.37	65.98	-3.35	Peak	273	183
3	2483.50	52.99	54.00	-1.01	55.92	-2.93	Average	273	137
4	2483.50	69.92	74.00	-4.08	72.85	-2.93	Peak	273	137
5	4874.00	38.98	54.00	-15.02	35.23	3.75	Average	116	253
6	4874.00	48.65	74.00	-25.35	44.90	3.75	Peak	116	253
7	7311.00	37.46	54.00	-16.54	29.04	8.42	Average	222	69
8	7311.00	49.87	74.00	-24.13	41.45	8.42	Peak	222	69

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).

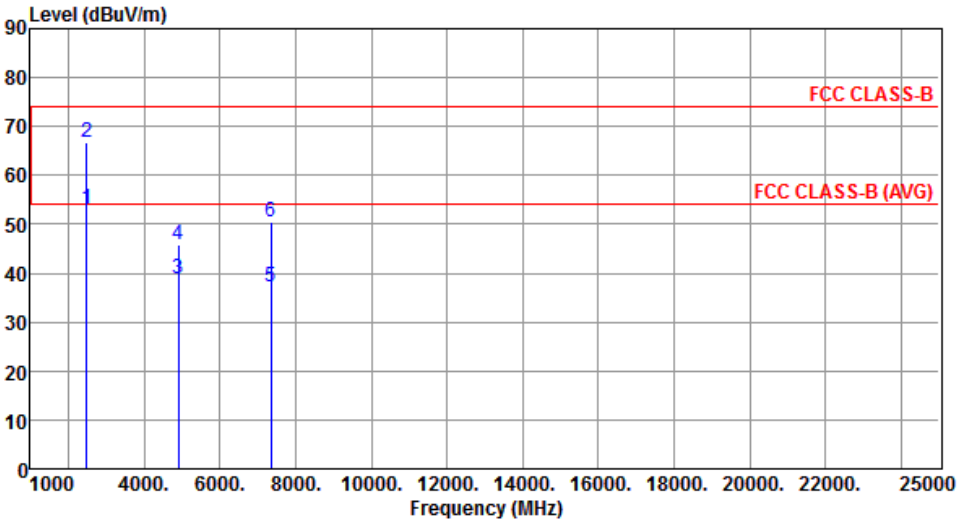
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	48.00	54.00	-6.00	51.35	-3.35	Average	100	301
2	2390.00	62.35	74.00	-11.65	65.70	-3.35	Peak	100	301
3	2483.50	50.91	54.00	-3.09	53.84	-2.93	Average	100	93
4	2483.50	66.29	74.00	-7.71	69.22	-2.93	Peak	100	93
5	4874.00	43.35	54.00	-10.65	39.60	3.75	Average	222	319
6	4874.00	50.53	74.00	-23.47	46.78	3.75	Peak	222	319
7	7311.00	37.78	54.00	-16.22	29.36	8.42	Average	118	211
8	7311.00	49.96	74.00	-24.04	41.54	8.42	Peak	118	211

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).

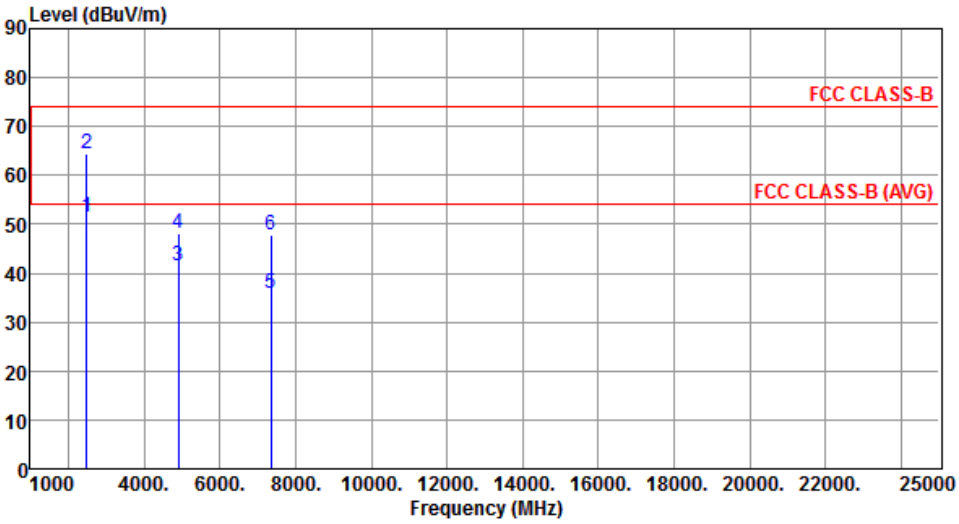
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	52.99	54.00	-1.01	55.92	-2.93	Average	232	199
2	2483.50	66.87	74.00	-7.13	69.80	-2.93	Peak	232	199
3	4904.00	38.74	54.00	-15.26	34.88	3.86	Average	222	143
4	4904.00	45.96	74.00	-28.04	42.10	3.86	Peak	222	143
5	7356.00	37.04	54.00	-16.96	28.60	8.44	Average	113	266
6	7356.00	50.33	74.00	-23.67	41.89	8.44	Peak	113	266

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	51.48	54.00	-2.52	54.41	-2.93	Average	133	299
2	2483.50	64.36	74.00	-9.64	67.29	-2.93	Peak	133	299
3	4904.00	41.38	54.00	-12.62	37.52	3.86	Average	289	255
4	4904.00	48.24	74.00	-25.76	44.38	3.86	Peak	289	255
5	7356.00	35.79	54.00	-18.21	27.35	8.44	Average	253	288
6	7356.00	47.84	74.00	-26.16	39.40	8.44	Peak	253	288

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 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Reference level measurement

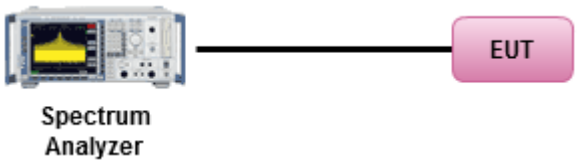
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

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

3.6.4 Test Setup

Transmitter Radiated Bandedge Emissions

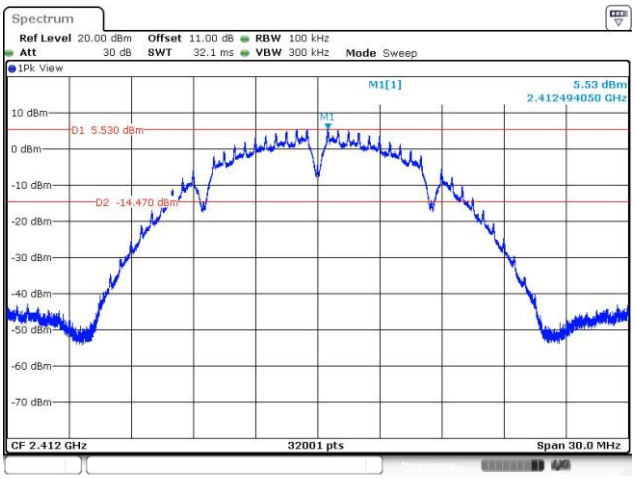
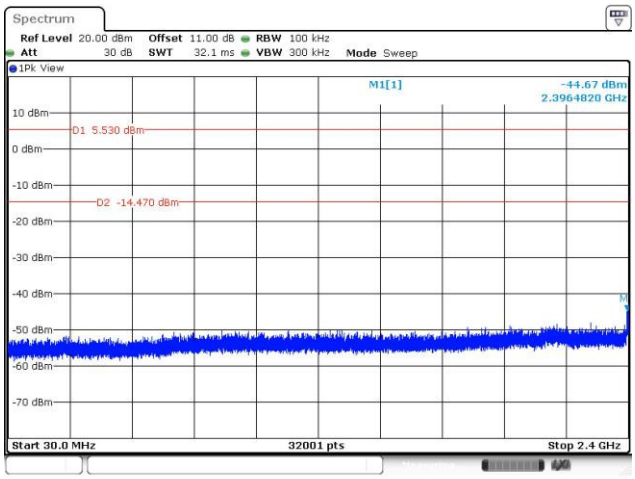
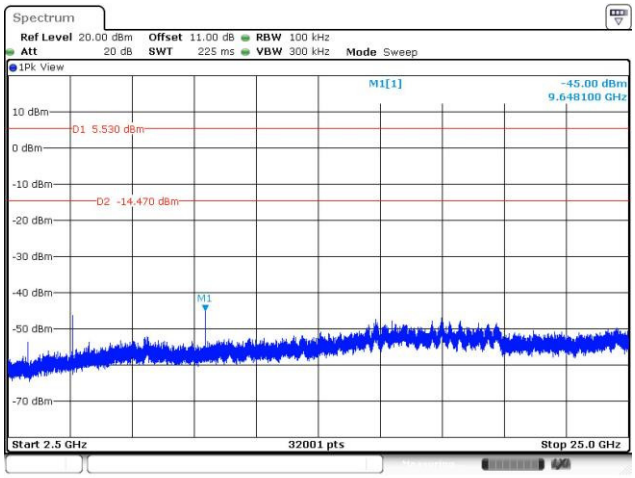
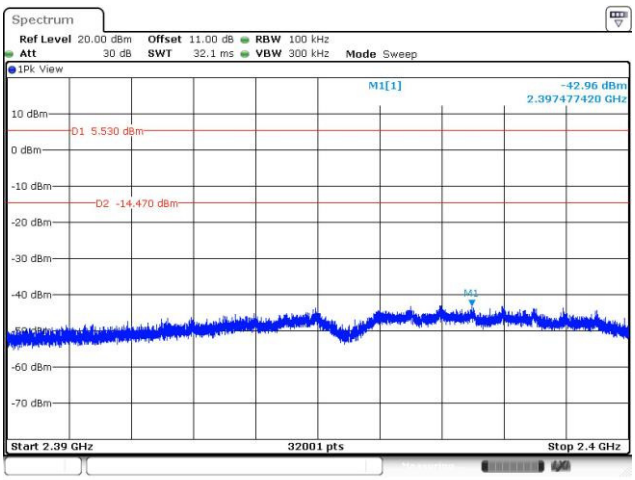


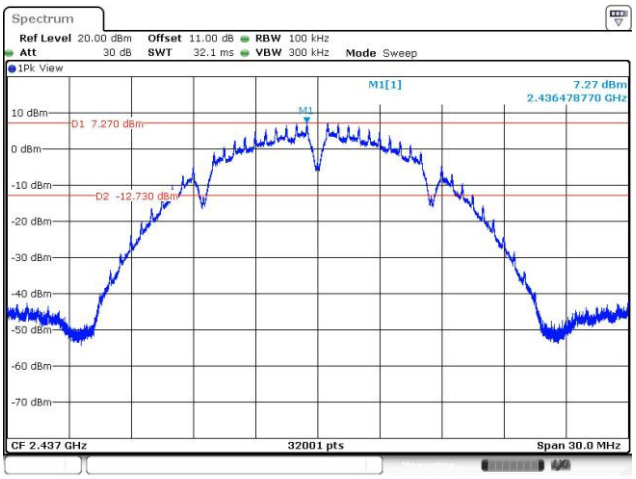
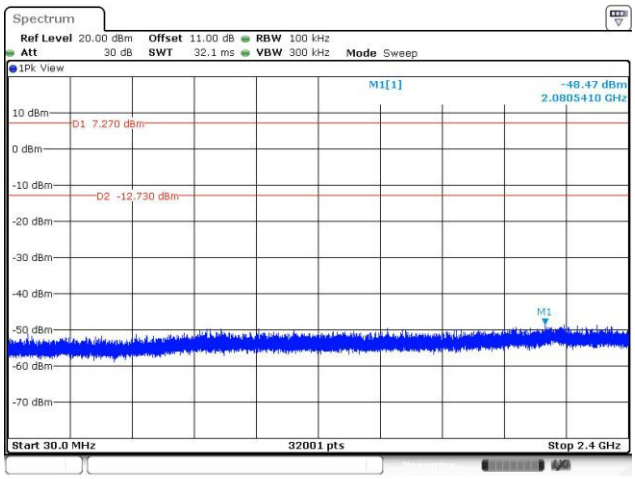
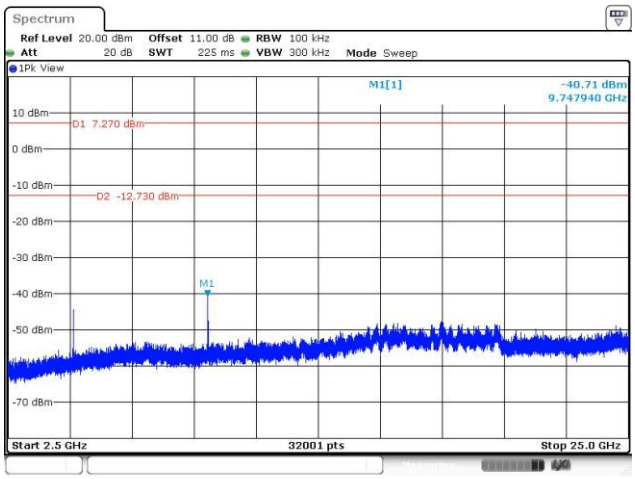
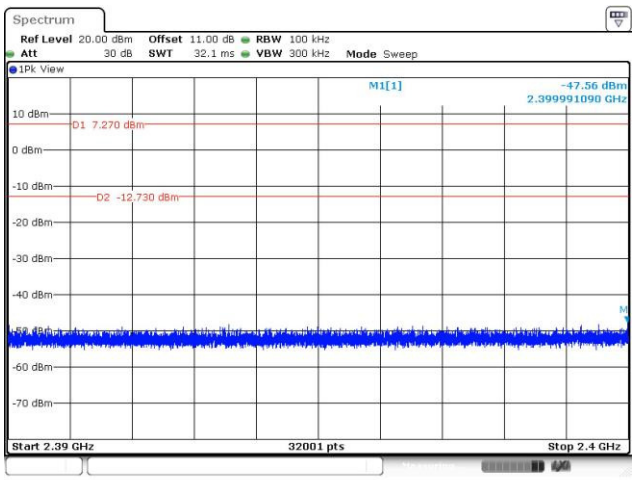
3.6.5 Test Result of Emissions in non-restricted frequency bands

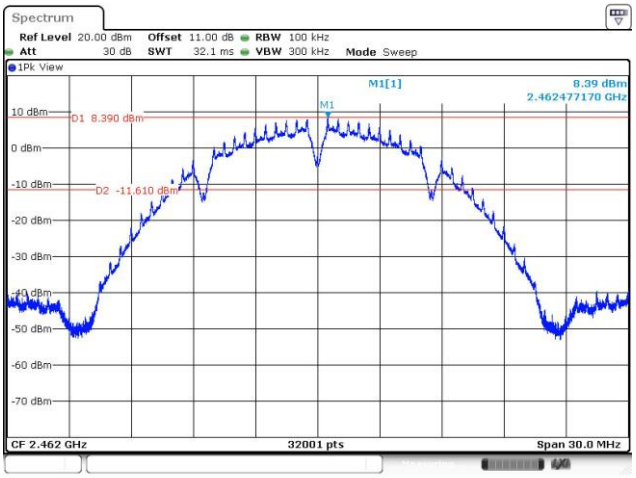
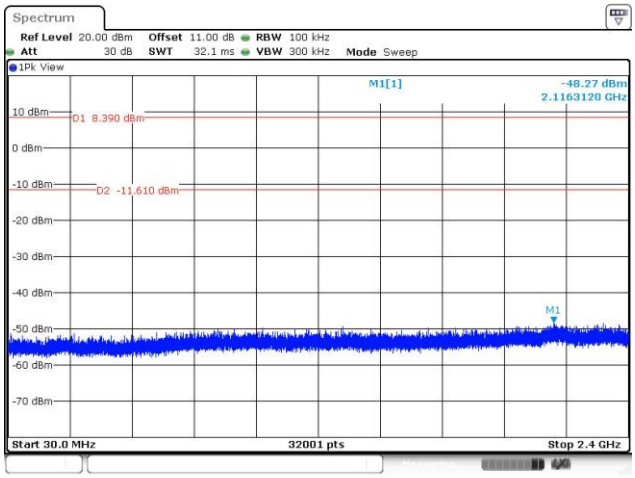
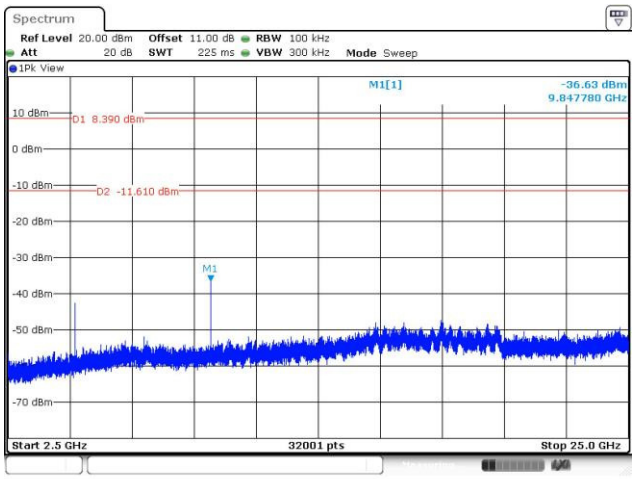
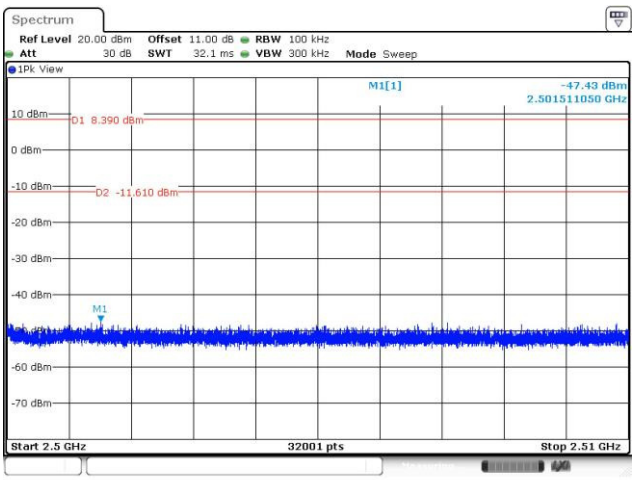
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.6 Unwanted Emissions into Non-Restricted Frequency Bands

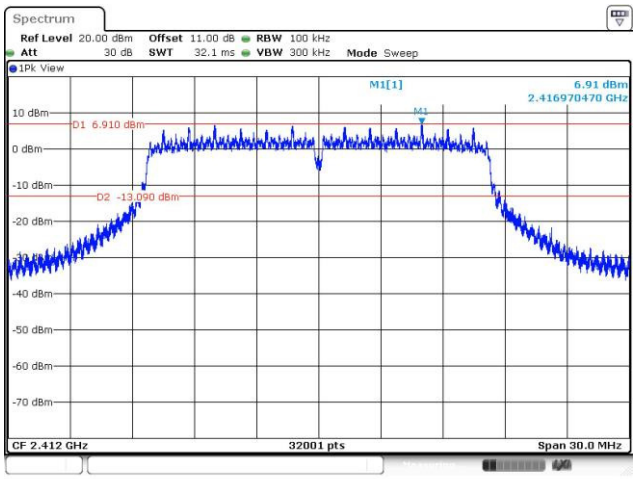
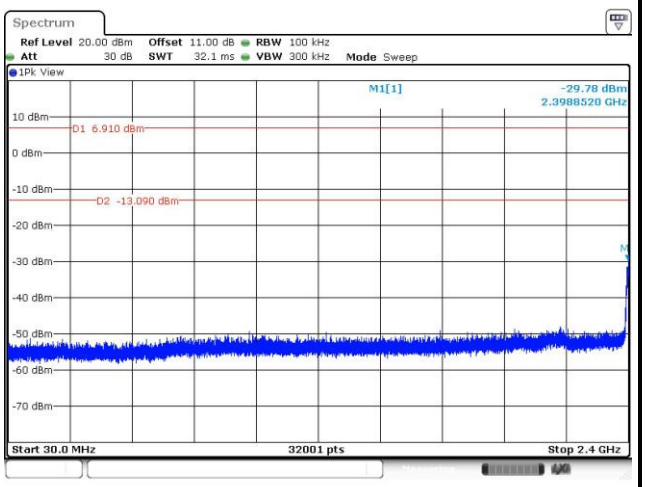
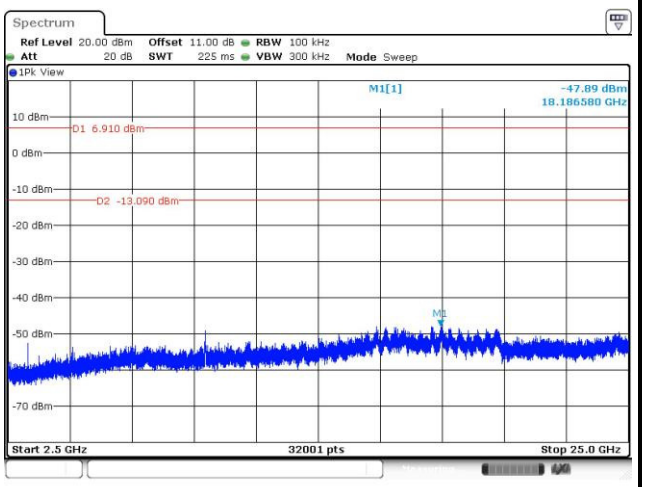
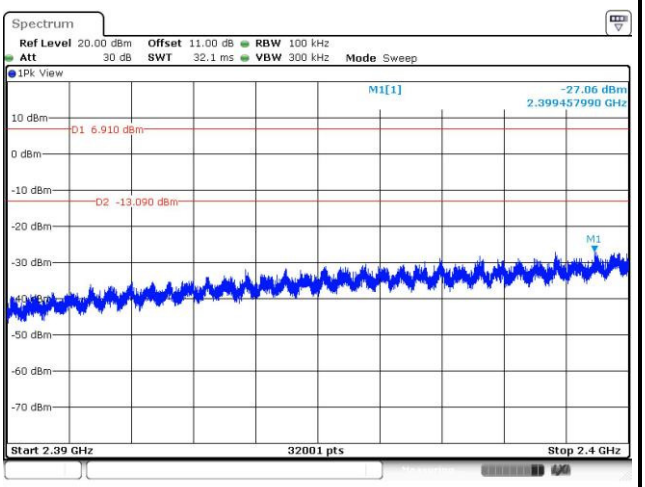
802.11b

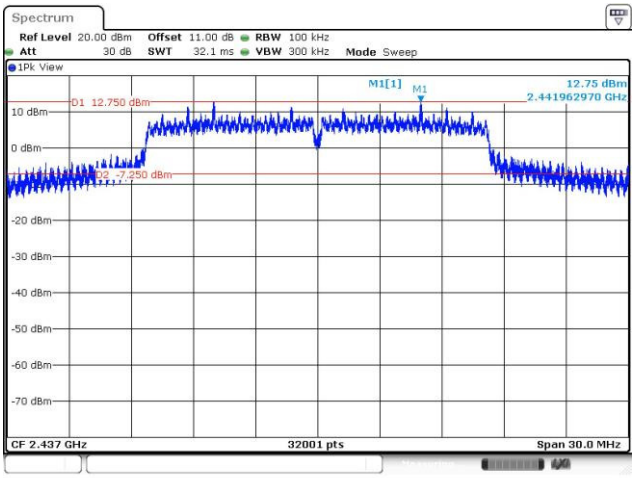
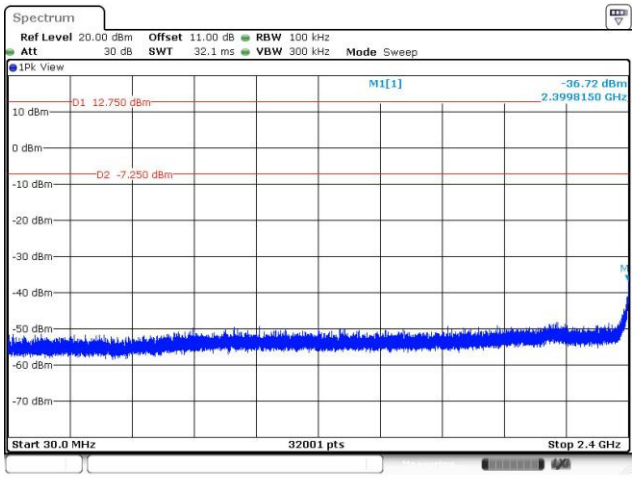
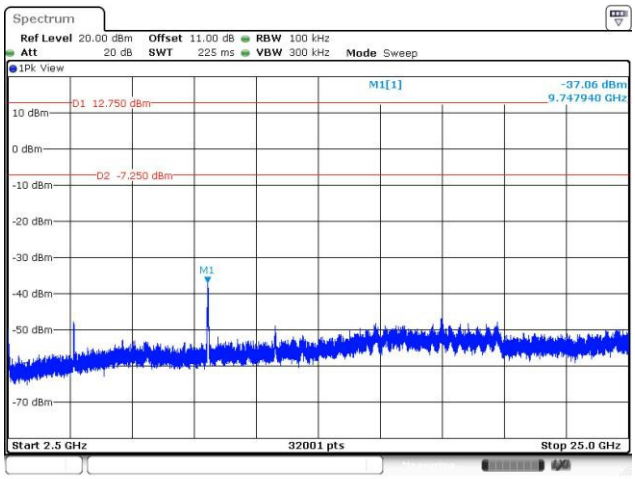
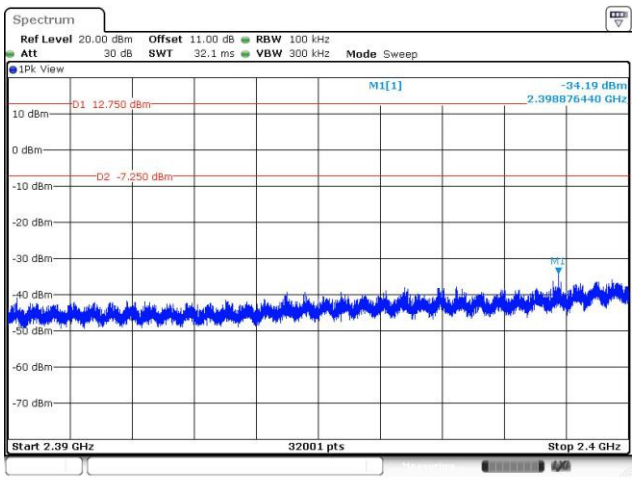
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

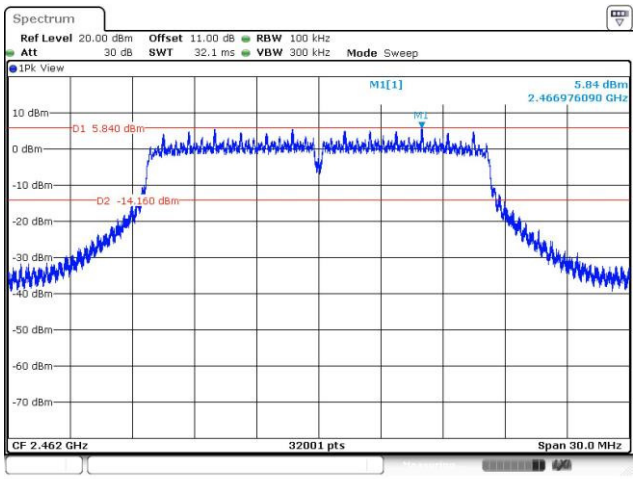
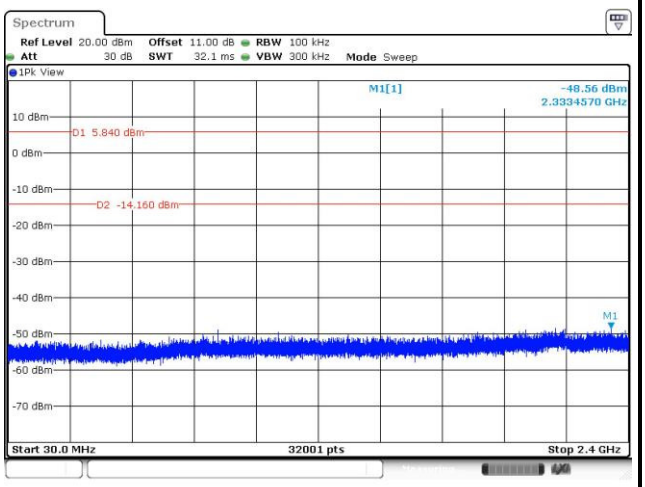
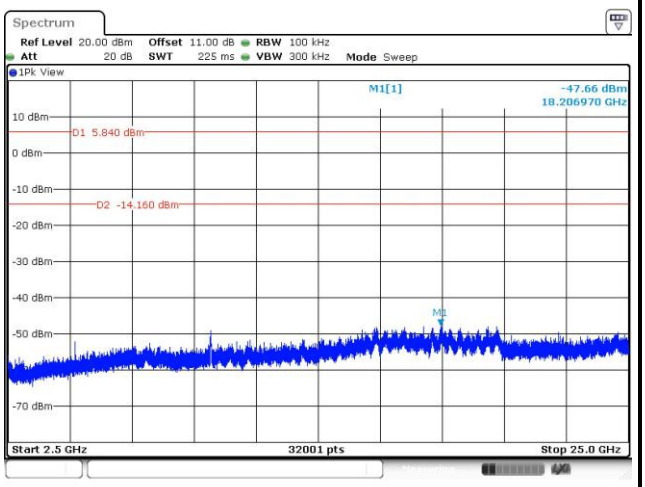
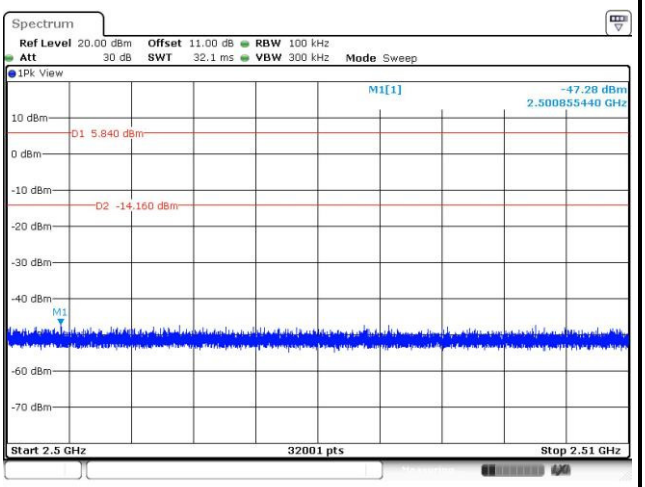
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

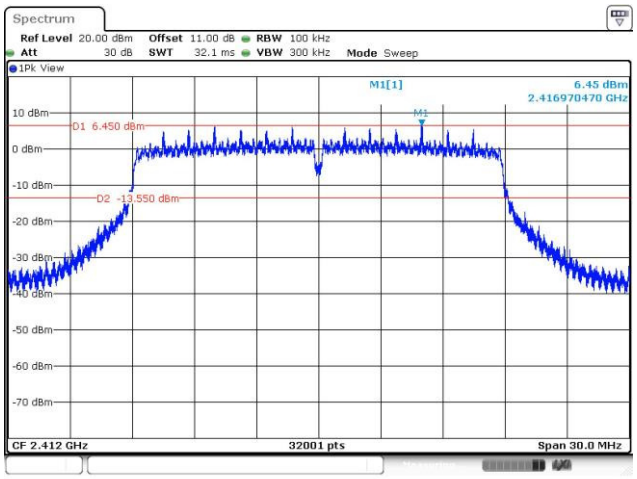
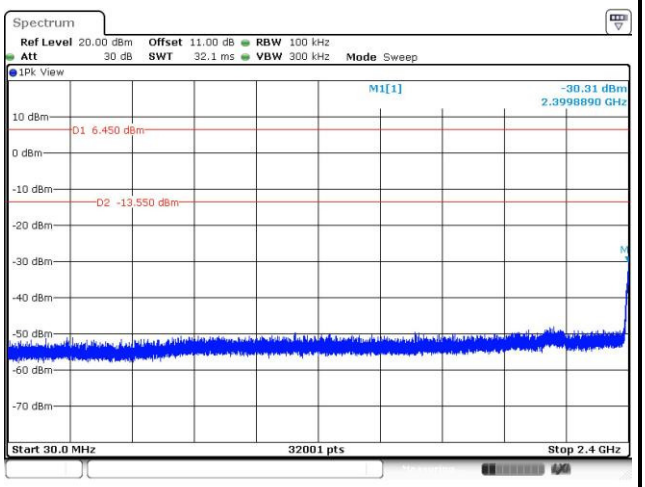
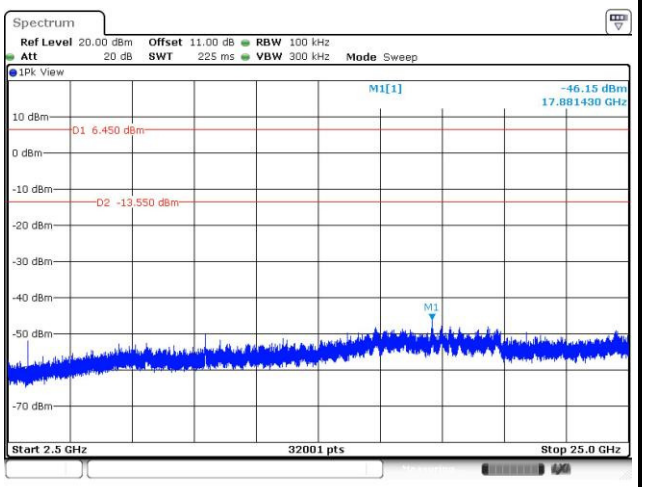
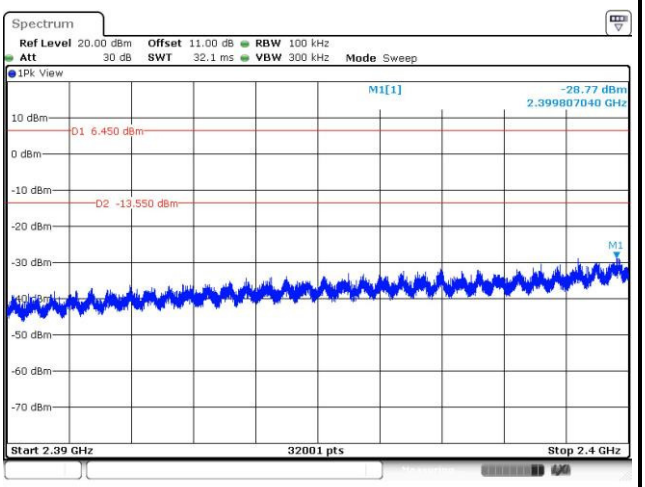
802.11g

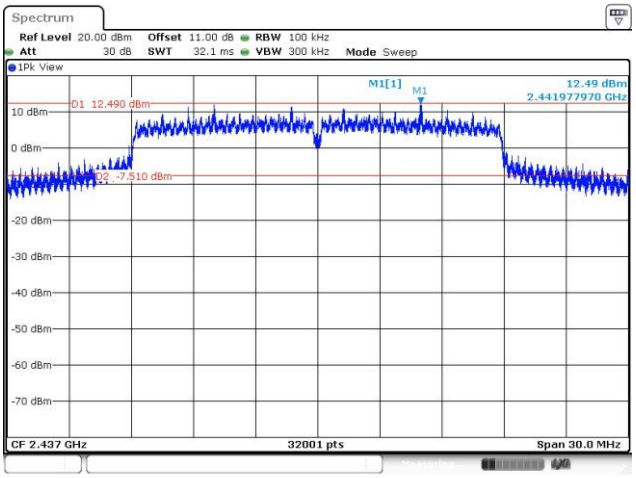
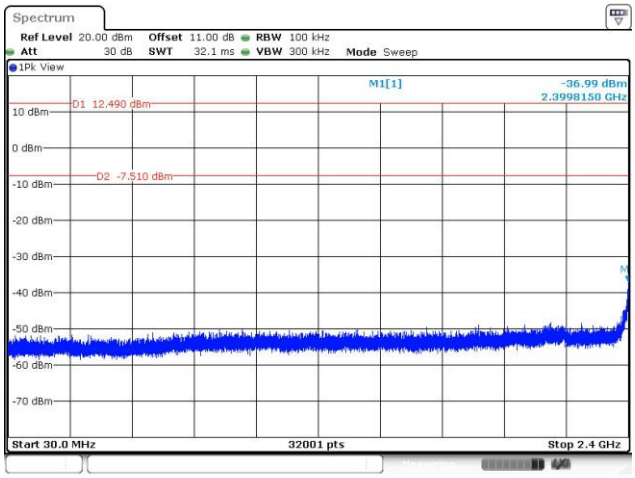
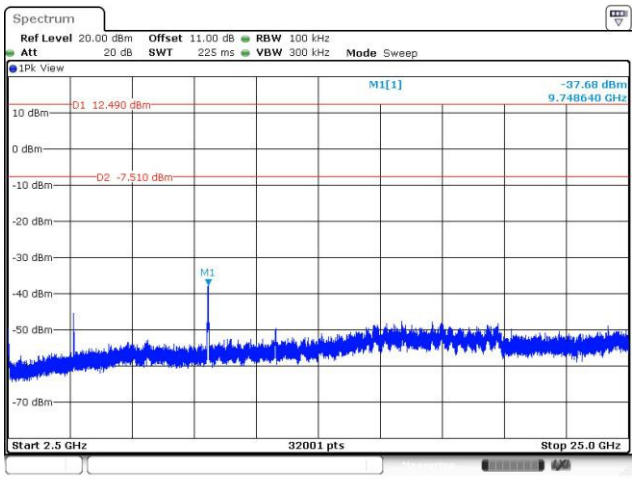
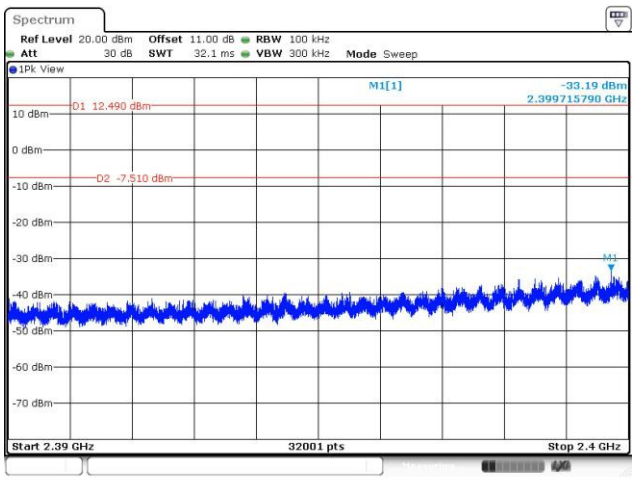
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

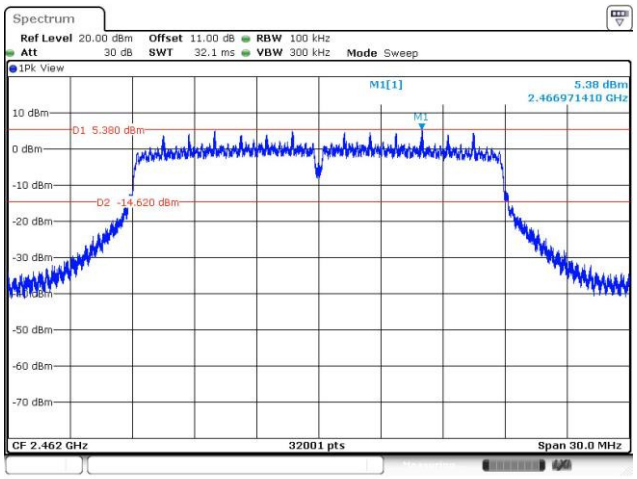
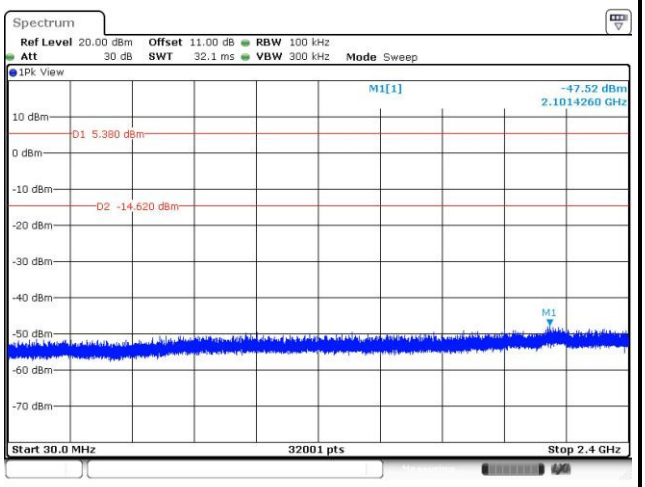
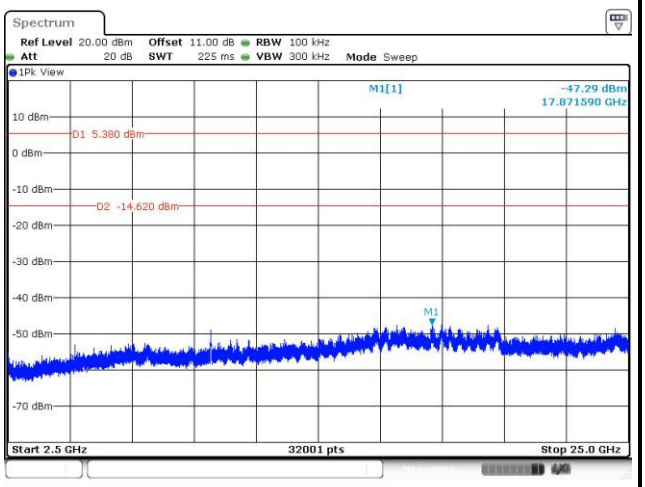
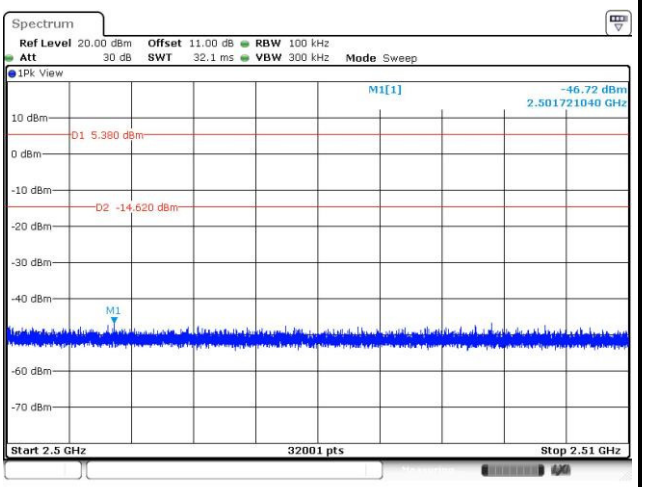
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

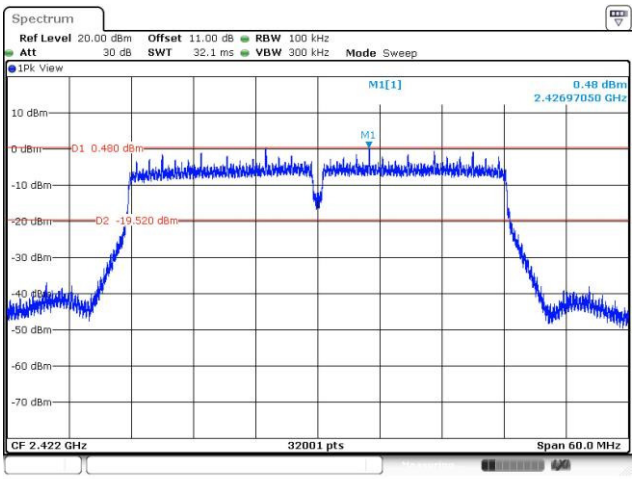
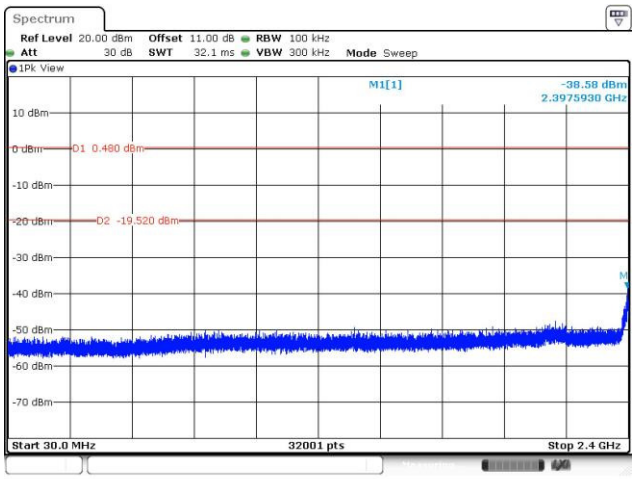
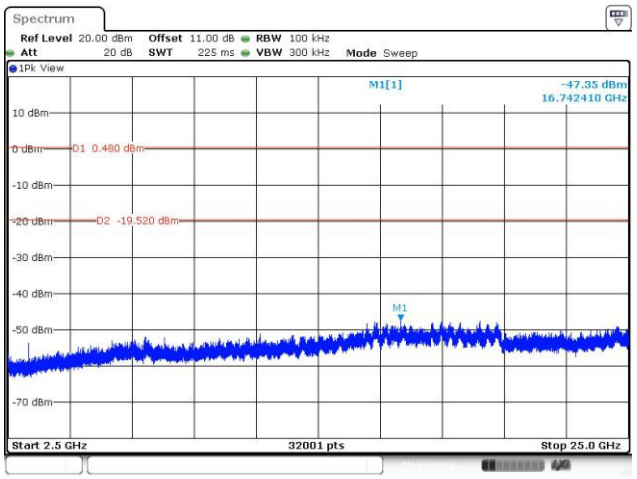
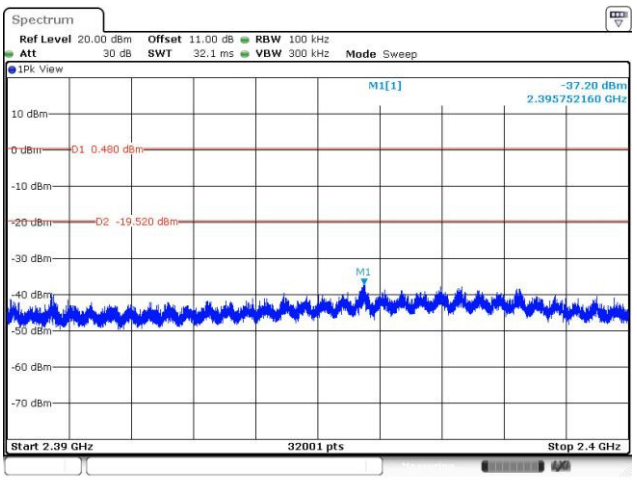
802.11n HT20

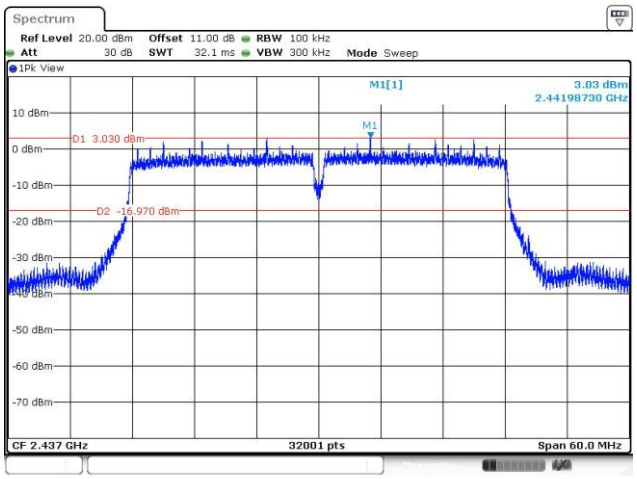
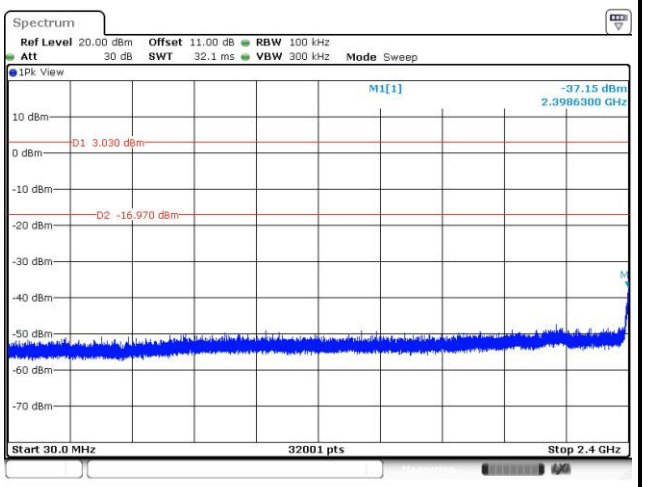
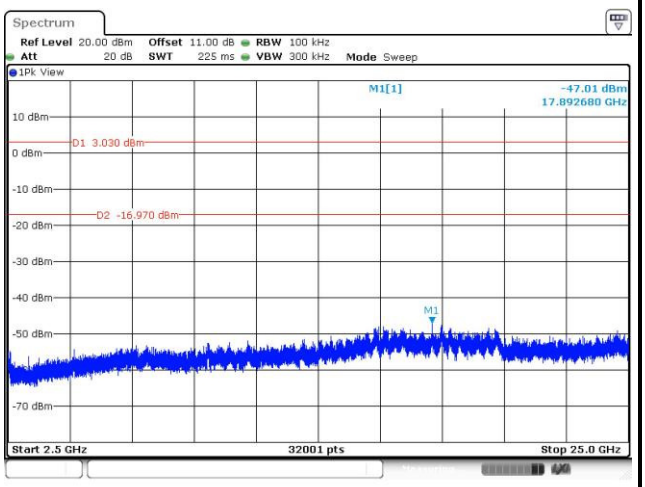
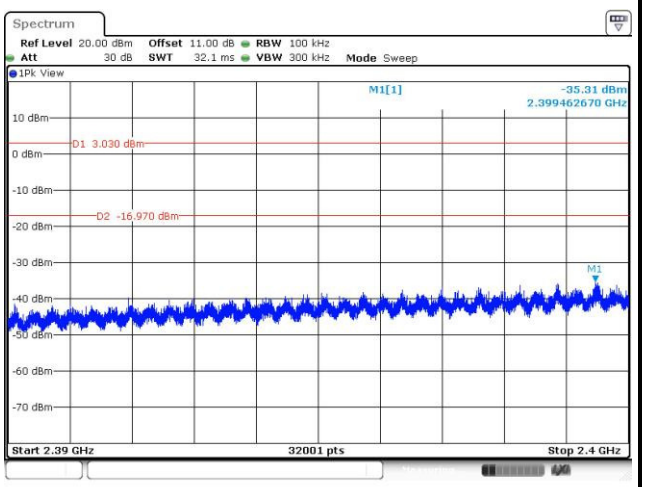
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

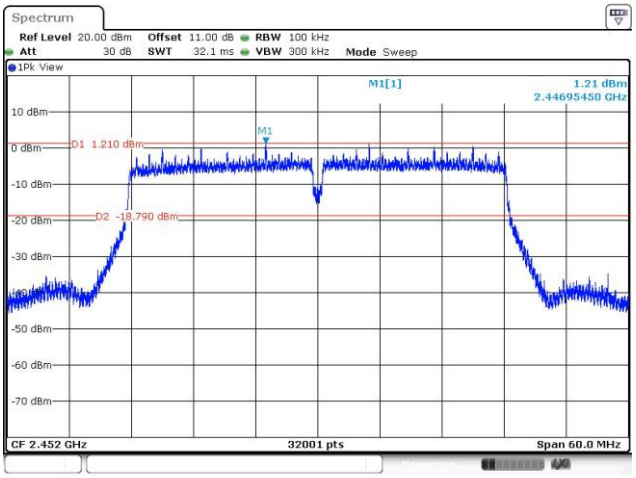
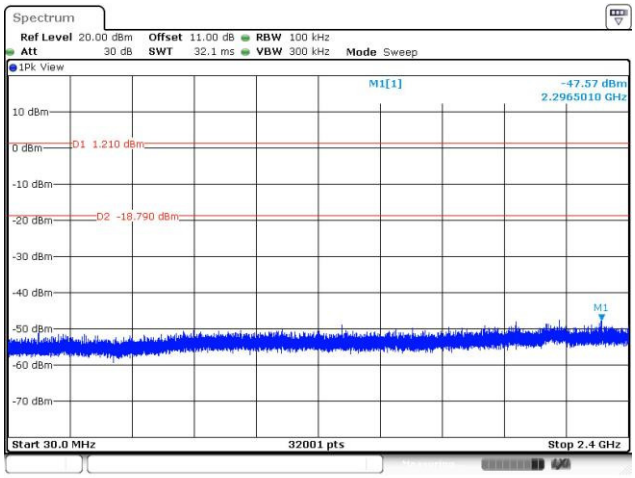
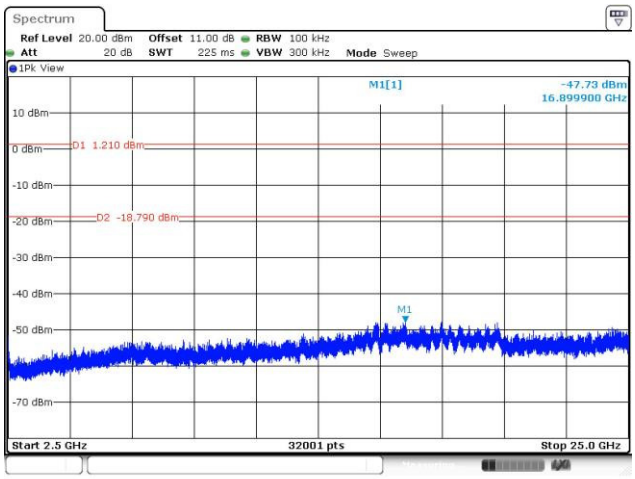
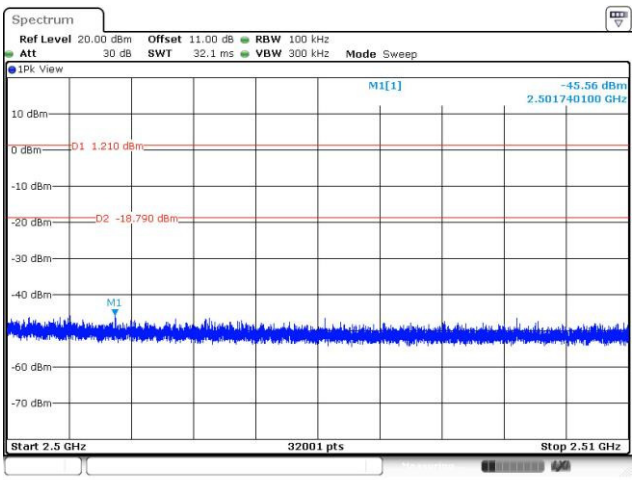
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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