FCC Test Report

FCC ID	:	**2AMRS-WIPCG217N**
Equipment	:	**Sure Smart Door Bell**
Model No.	:	**PB178**
Brand Name	:	**PiOctave**
Applicant	:	**PiOctave Solutions Pvt Ltd**
Address	:	**1217, 4th Cross Rd, 1st Block, HAL 3rd Stage, Bhoomi Reddy Colony, New Tippasandra, Bengaluru, Karnataka 560075**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Jul. 27, 2017**
Tested Date	:	**Aug. 22 ~ Aug. 24, 2017**

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
FR772702AC	Rev. 01	Initial issue	Sep. 01, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.549MHz 40.19 (Margin -5.81dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4924.00MHz 52.99 (Margin -1.01dB) – AV [dBuV/m at 3m]: 7311.00MHz 52.99 (Margin -1.01dB) – AV [dBuV/m at 3m]: 2483.50MHz 52.99 (Margin -1.01dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 27.20	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.	Model	Type	Connector	Gain (dBi)	Remark
1	WIPCG-217N Ant_1	Slot	UFL	2.86	---
2	WIPCG-217N Ant_2	Slot	UFL	1.59	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.7Vdc from Battery 110 ~ 230Vac

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Power board	Brand Name: AOEM Model Name: A0104FI-050020 Power Rating: I/P: 90-264Vac, 47-63Hz, 0.25A O/P: 5.3Vdc, 2A
2	Rechargeable Li-ion Battery	Model Name: GT-1000A Power Rating: Norma/Charging Voltage: 3.7V / 4.2V Capacity:1000mAh, 3.7Wh

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	MT7620 QA, Version: 1.0.6.2		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	100.00%	0.00
	11g	99.60%	0.02
	HT20	99.58%	0.02
	HT40	98.73%	0.06

1.1.7 Power Setting

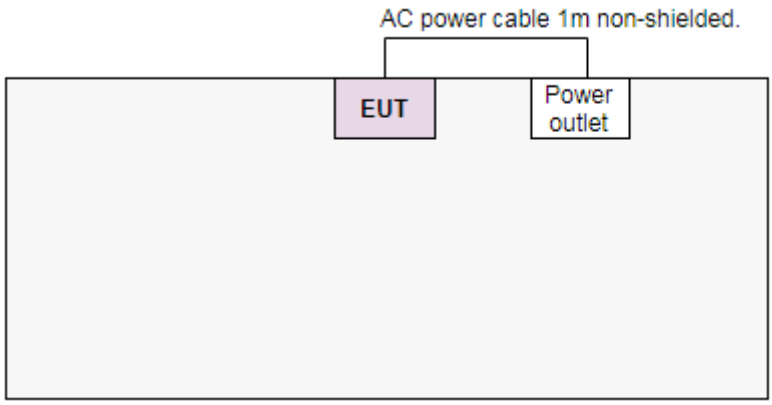
Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	0A/0C
11b	2437	0E/11
11b	2462	08/0B
11g	2412	0C/11
11g	2437	1E/23
11g	2462	0D/12
HT20	2412	08/0C
HT20	2437	1F/23
HT20	2462	0C/11
HT40	2422	07/08
HT40	2437	12/16
HT40	2452	08/0C

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	---

1.3 Test Setup Chart

Test Setup Diagram



Note: The notebook is disconnected from EUT and removed from test table when EUT is set to transmit continuously.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
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)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 25, 2017	Jul. 24, 2018
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 21, 2016	Dec. 20, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980225	Jul. 28, 2017	Jul. 27, 2018
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 09, 2016	Dec. 08, 2017
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	16052	Dec. 09, 2016	Dec. 08, 2017
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 09, 2016	Dec. 08, 2017
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 09, 2016	Dec. 08, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
Signal Generator	R&S	SMB100A	175727	Oct. 19, 2016	Oct. 18, 2017
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 20, 2016	Oct. 19, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
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
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	±3.87 dB
Radiated emission > 1GHz	±5.60 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 57%	Alex Tsai
Radiated Emissions	03CH01-WS	23°C / 64%	Vincent Yeh
RF Conducted	TH01-WS	22°C / 63%	Felix Sung

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

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	HT20	2437	6 Mbps	---
Radiated Emissions ≤1GHz	HT20	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	---

3 Transmitter Test Results

3.1 Conducted Emissions

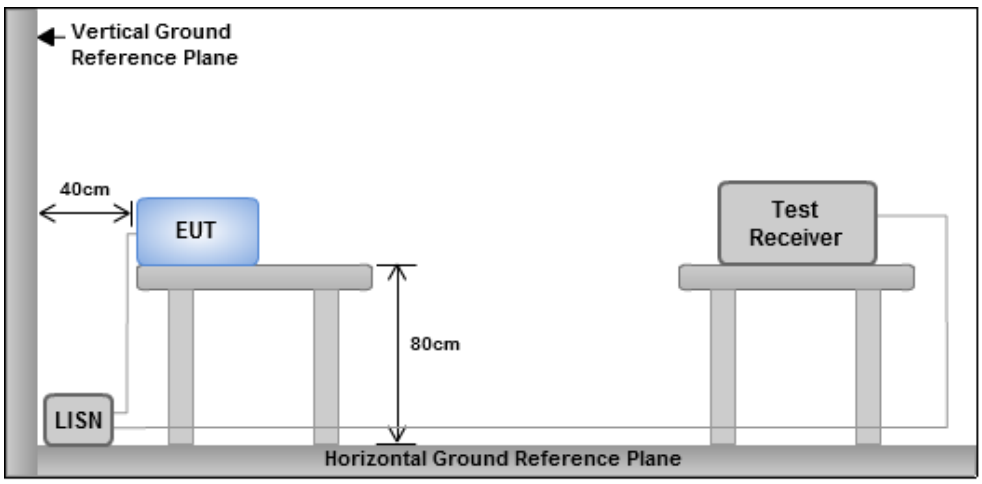
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

3.1.3 Test Setup

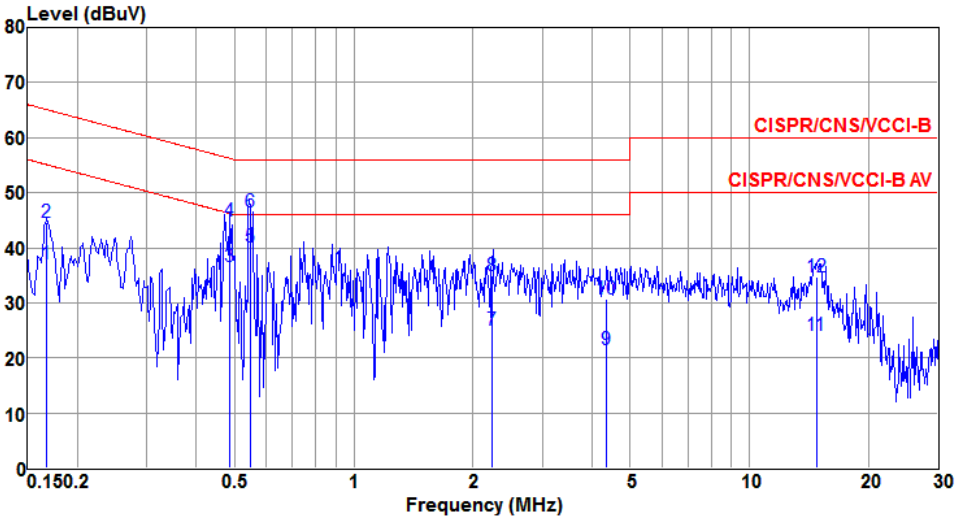


Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

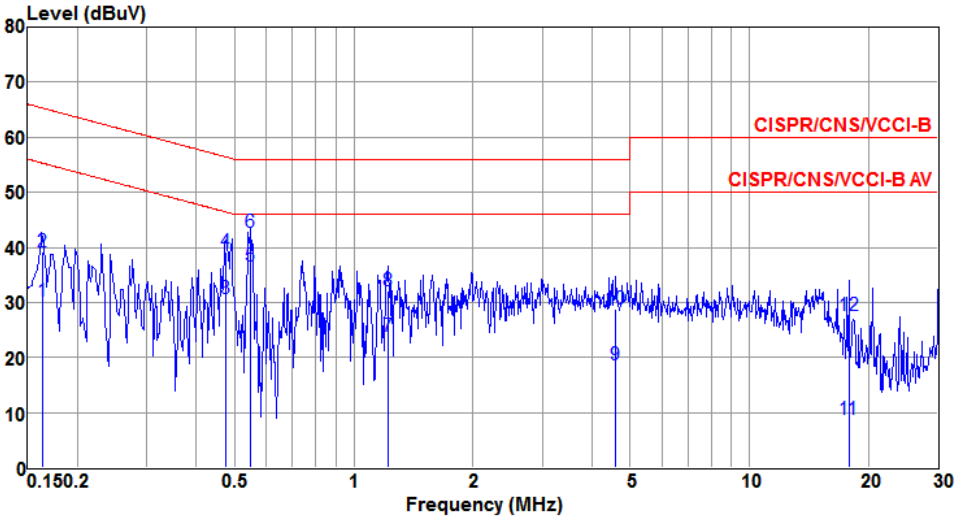
Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.168	37.06	55.08	-18.02	36.64	0.38	0.04	Average
2	0.168	44.64	65.08	-20.44	44.22	0.38	0.04	QP
3	0.486	36.63	46.23	-9.60	36.25	0.34	0.04	Average
4	0.486	44.93	56.23	-11.30	44.55	0.34	0.04	QP
5@	0.549	40.19	46.00	-5.81	39.81	0.34	0.04	Average
6	0.549	46.41	56.00	-9.59	46.03	0.34	0.04	QP
7	2.241	25.03	46.00	-20.97	24.50	0.47	0.06	Average
8	2.241	34.92	56.00	-21.08	34.39	0.47	0.06	QP
9	4.361	21.46	46.00	-24.54	20.65	0.64	0.17	Average
10	4.361	30.78	56.00	-25.22	29.97	0.64	0.17	QP
11	14.776	24.04	50.00	-25.96	23.49	0.32	0.23	Average
12	14.776	34.78	60.00	-25.22	34.23	0.32	0.23	QP

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

Modulation	HT20	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	0.163	30.15	55.30	-25.15	29.77	0.34	0.04	Average
2	0.163	39.21	65.30	-26.09	38.83	0.34	0.04	QP
3	0.476	30.80	46.41	-15.61	30.38	0.38	0.04	Average
4	0.476	39.17	56.41	-17.24	38.75	0.38	0.04	QP
5@	0.547	36.48	46.00	-9.52	36.07	0.37	0.04	Average
6	0.547	42.64	56.00	-13.36	42.23	0.37	0.04	QP
7	1.223	23.91	46.00	-22.09	23.48	0.39	0.04	Average
8	1.223	32.09	56.00	-23.91	31.66	0.39	0.04	QP
9	4.598	18.53	46.00	-27.47	17.78	0.58	0.17	Average
10	4.598	28.92	56.00	-27.08	28.17	0.58	0.17	QP
11	17.831	8.85	50.00	-41.15	8.19	0.41	0.25	Average
12	17.831	27.58	60.00	-32.42	26.92	0.41	0.25	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.

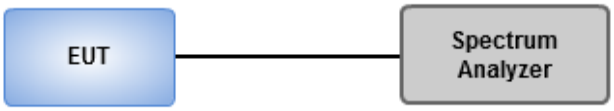
Occupied Bandwidth

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.

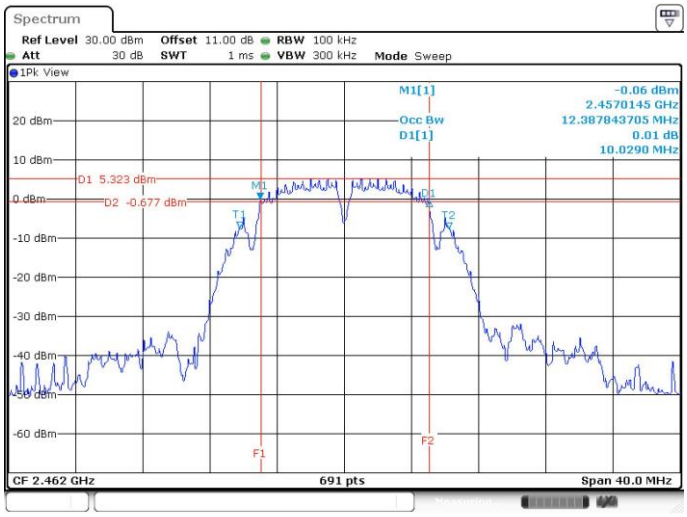
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

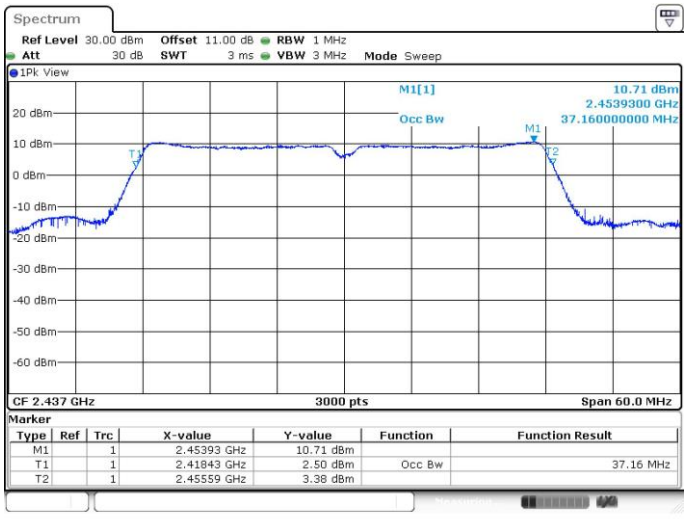
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	10.09	10.09	---	---	500
11b	2	2437	10.09	10.09	---	---	500
11b	2	2462	10.09	10.03	---	---	500
11g	2	2412	16.35	16.35	---	---	500
11g	2	2437	16.35	16.35	---	---	500
11g	2	2462	16.35	16.35	---	---	500
HT20	2	2412	17.10	17.62	---	---	500
HT20	2	2437	17.04	17.10	---	---	500
HT20	2	2462	17.04	17.04	---	---	500
HT40	2	2422	36.29	36.06	---	---	500
HT40	2	2437	36.41	36.41	---	---	500
HT40	2	2452	36.29	36.29	---	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	12.30	12.40	---	---
11b	2	2437	12.45	12.54	---	---
11b	2	2462	12.34	12.44	---	---
11g	2	2412	16.99	17.04	---	---
11g	2	2437	19.81	22.01	---	---
11g	2	2462	16.99	17.05	---	---
HT20	2	2412	17.76	17.74	---	---
HT20	2	2437	20.60	22.57	---	---
HT20	2	2462	17.76	17.79	---	---
HT40	2	2422	36.84	36.80	---	---
HT40	2	2437	36.94	37.16	---	---
HT40	2	2452	36.82	36.84	---	---

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	18.63	18.45	---	---	142.930	21.55	30.00	2.86	24.41	36.00
11b	2	2437	20.01	20.05	---	---	201.388	23.04	30.00	2.86	25.90	36.00
11b	2	2462	18.32	18.21	---	---	134.142	21.28	30.00	2.86	24.14	36.00
11g	2	2412	23.82	23.16	---	---	448.005	26.51	30.00	2.86	29.37	36.00
11g	2	2437	23.88	23.73	---	---	480.391	26.82	30.00	2.86	29.68	36.00
11g	2	2462	23.79	23.22	---	---	449.226	26.52	30.00	2.86	29.38	36.00
HT20	2	2412	22.25	21.65	---	---	314.098	24.97	30.00	2.86	27.83	36.00
HT20	2	2437	24.42	23.95	---	---	525.007	**27.20**	30.00	2.86	30.06	36.00
HT20	2	2462	23.25	23.52	---	---	436.254	26.40	30.00	2.86	29.26	36.00
HT40	2	2422	20.53	20.35	---	---	221.372	23.45	30.00	2.86	26.31	36.00
HT40	2	2437	22.87	22.53	---	---	372.703	25.71	30.00	2.86	28.57	36.00
HT40	2	2452	20.76	20.69	---	---	236.344	23.74	30.00	2.86	26.60	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	15.31	15.19	---	---	66.999	18.26	---
11b	2	2437	17.05	17.07	---	---	101.632	20.07	---
11b	2	2462	15.04	15.01	---	---	63.611	18.04	---
11g	2	2412	16.55	16.99	---	---	95.189	19.79	---
11g	2	2437	20.56	20.51	---	---	226.223	23.55	---
11g	2	2462	16.89	17.23	---	---	101.710	20.07	---
HT20	2	2412	14.45	14.21	---	---	54.225	17.34	---
HT20	2	2437	20.34	20.13	---	---	211.182	23.25	---
HT20	2	2462	16.06	16.34	---	---	83.417	19.21	---
HT40	2	2422	12.66	12.43	---	---	35.949	15.56	---
HT40	2	2437	16.89	16.72	---	---	95.855	19.82	---
HT40	2	2452	12.92	13.03	---	---	39.679	15.99	---

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

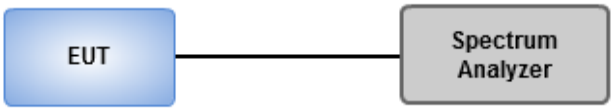
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

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

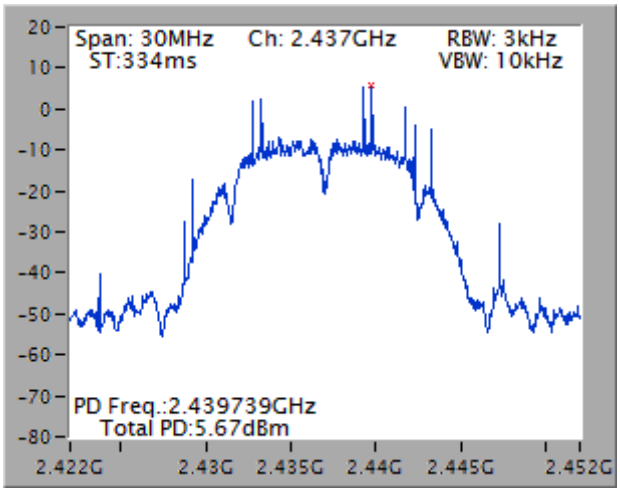


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	3.47	8.00
11b	2	2437	5.67	8.00
11b	2	2462	3.85	8.00
11g	2	2412	-7.59	8.00
11g	2	2437	-4.10	8.00
11g	2	2462	-5.69	8.00
HT20	2	2412	-10.29	8.00
HT20	2	2437	-4.04	8.00
HT20	2	2462	-7.73	8.00
HT40	2	2422	-14.07	8.00
HT40	2	2437	-8.72	8.00
HT40	2	2452	-10.98	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

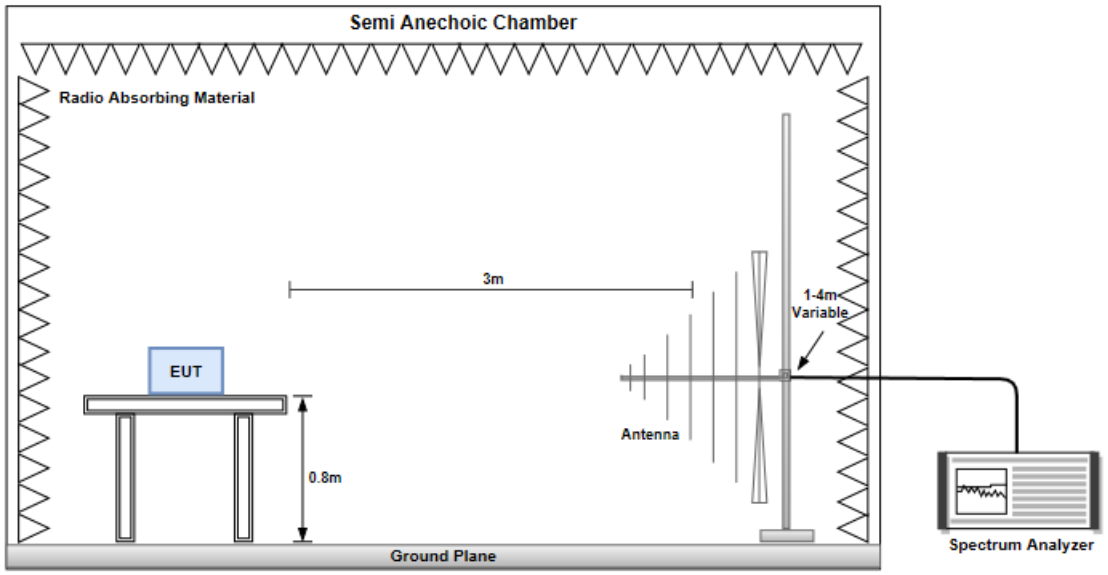
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

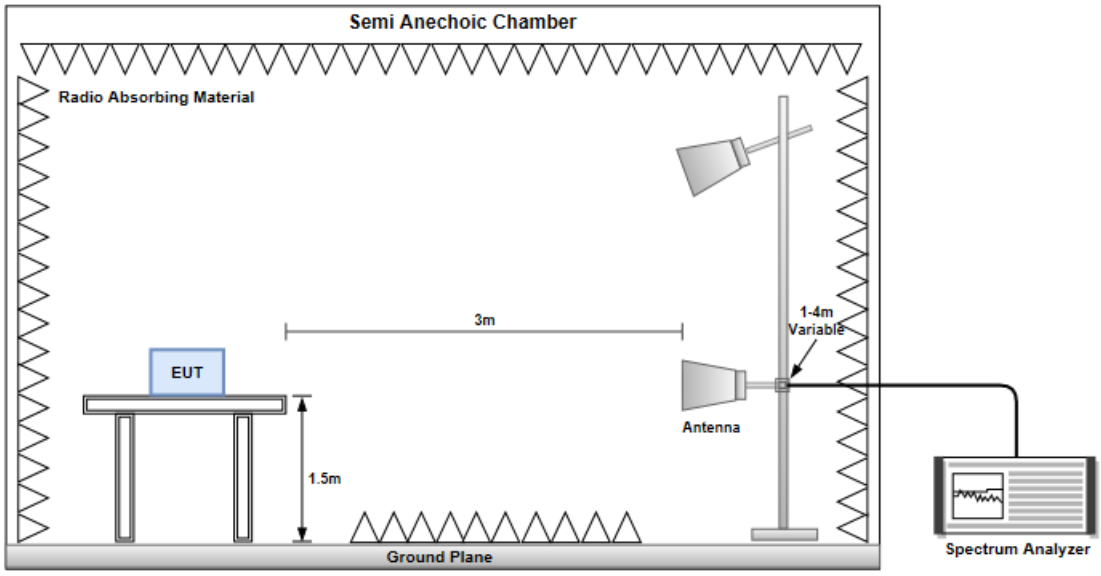
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

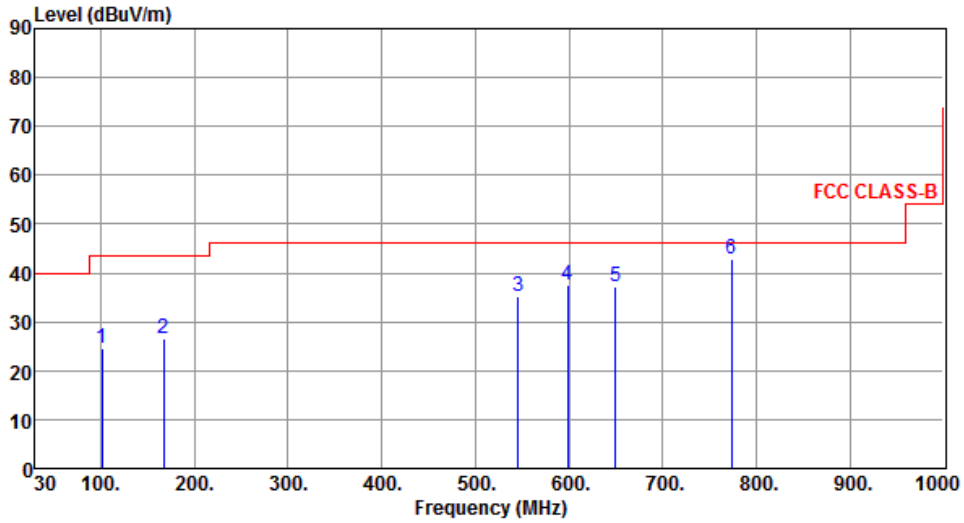


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

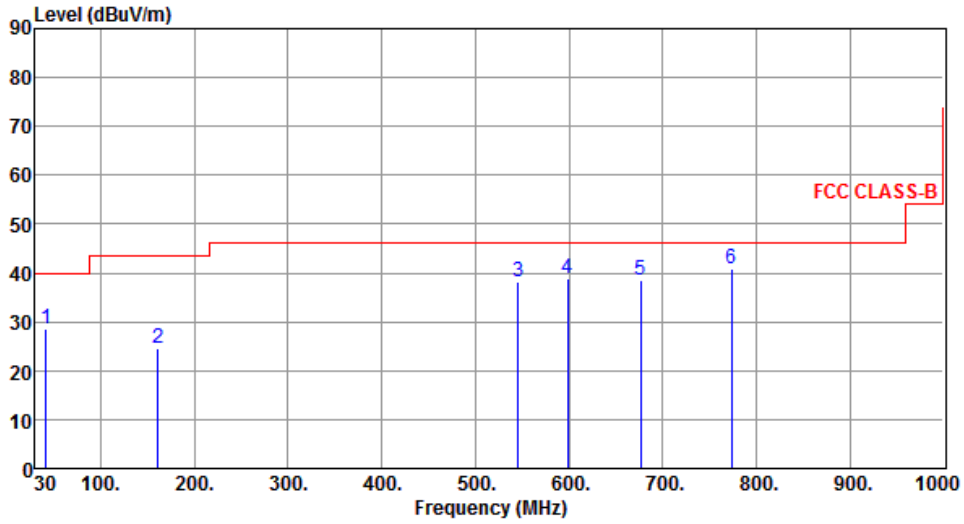
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	101.78	24.58	43.50	-18.92	37.27	-12.69	Peak	---	---
2	166.77	26.46	43.50	-17.04	34.94	-8.48	Peak	---	---
3	546.04	35.14	46.00	-10.86	36.98	-1.84	Peak	---	---
4	598.42	37.51	46.00	-8.49	38.26	-0.75	Peak	---	---
5	649.83	37.19	46.00	-8.81	37.35	-0.16	Peak	---	---
6	773.99	42.86	46.00	-3.14	40.87	1.99	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	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		

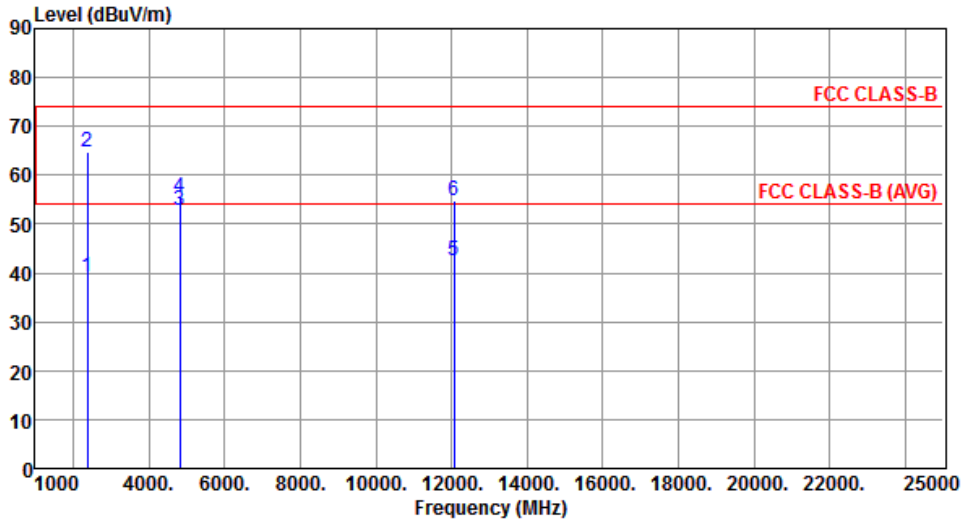


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	41.64	28.46	40.00	-11.54	36.52	-8.06	Peak	---	---
2	160.95	24.71	43.50	-18.79	32.98	-8.27	Peak	---	---
3	546.04	38.29	46.00	-7.71	40.13	-1.84	Peak	---	---
4	598.42	38.93	46.00	-7.07	39.68	-0.75	Peak	---	---
5	676.99	38.54	46.00	-7.46	38.28	0.26	Peak	---	---
6	773.99	40.91	46.00	-5.09	38.92	1.99	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

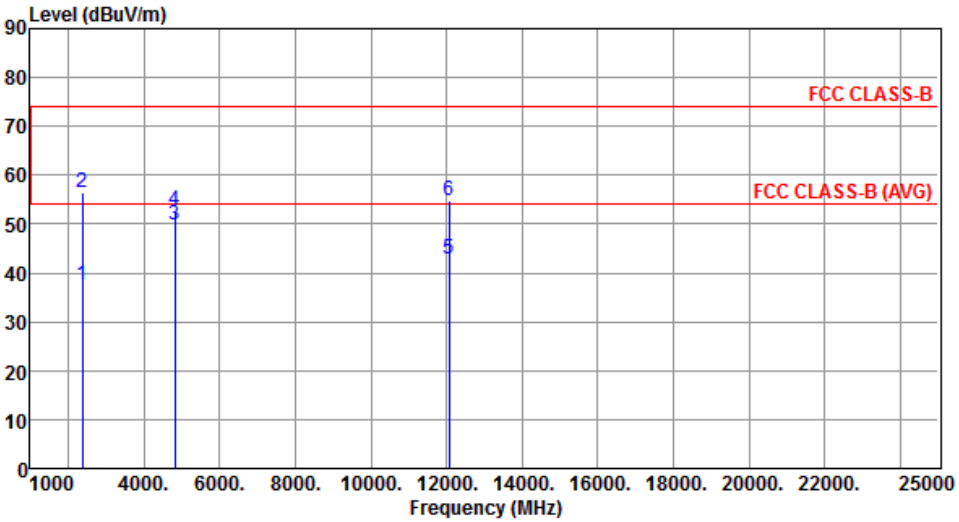
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	39.14	54.00	-14.86	42.32	-3.18	Average	214	164
2	2390.00	64.64	74.00	-9.36	67.82	-3.18	Peak	214	164
3	4824.00	52.90	54.00	-1.10	49.12	3.78	Average	213	187
4	4824.00	55.42	74.00	-18.58	51.64	3.78	Peak	213	187
5	12060.00	42.44	54.00	-11.56	28.86	13.58	Average	100	175
6	12060.00	54.89	74.00	-19.11	41.31	13.58	Peak	100	175

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).

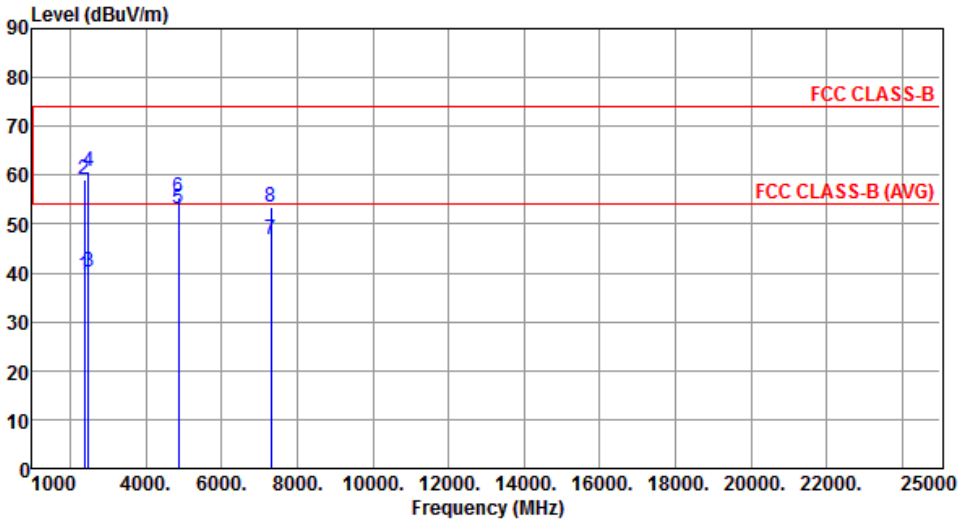
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	37.41	54.00	-16.59	40.59	-3.18	Average	137	298
2	2390.00	56.35	74.00	-17.65	59.53	-3.18	Peak	137	298
3	4824.00	49.97	54.00	-4.03	46.19	3.78	Average	162	273
4	4824.00	52.83	74.00	-21.17	49.05	3.78	Peak	162	273
5	12060.00	42.72	54.00	-11.28	29.14	13.58	Average	100	165
6	12060.00	54.86	74.00	-19.14	41.28	13.58	Peak	100	165

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

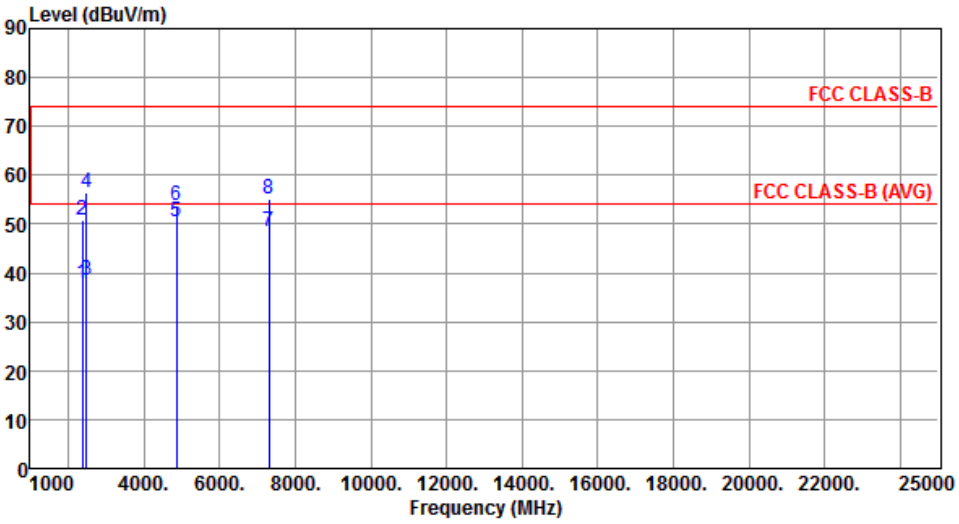
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.56	54.00	-14.44	42.74	-3.18	Average	211	166
2	2390.00	59.00	74.00	-15.00	62.18	-3.18	Peak	211	166
3	2483.50	40.23	54.00	-13.77	43.03	-2.80	Average	211	166
4	2483.50	60.94	74.00	-13.06	63.74	-2.80	Peak	211	166
5	4874.00	52.98	54.00	-1.02	49.04	3.94	Average	208	173
6	4874.00	55.30	74.00	-18.70	51.36	3.94	Peak	208	173
7	7311.00	46.87	54.00	-7.13	38.46	8.41	Average	100	222
8	7311.00	53.40	74.00	-20.60	44.99	8.41	Peak	100	222

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).

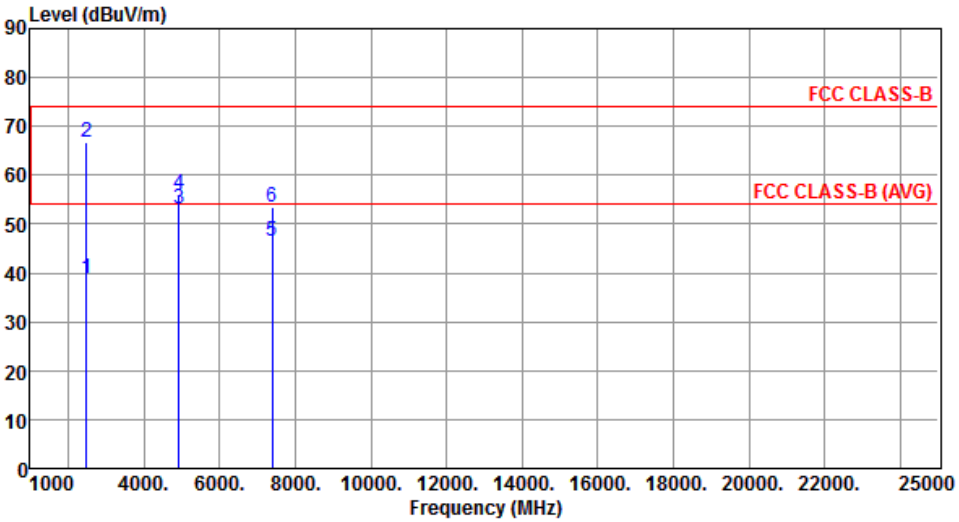
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	37.98	54.00	-16.02	41.16	-3.18	Average	137	297
2	2390.00	50.91	74.00	-23.09	54.09	-3.18	Peak	137	297
3	2483.50	38.64	54.00	-15.36	41.44	-2.80	Average	137	297
4	2483.50	56.48	74.00	-17.52	59.28	-2.80	Peak	137	297
5	4874.00	50.62	54.00	-3.38	46.68	3.94	Average	100	23
6	4874.00	53.73	74.00	-20.27	49.79	3.94	Peak	100	23
7	7311.00	48.51	54.00	-5.49	40.10	8.41	Average	108	234
8	7311.00	55.04	74.00	-18.96	46.63	8.41	Peak	108	234

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).

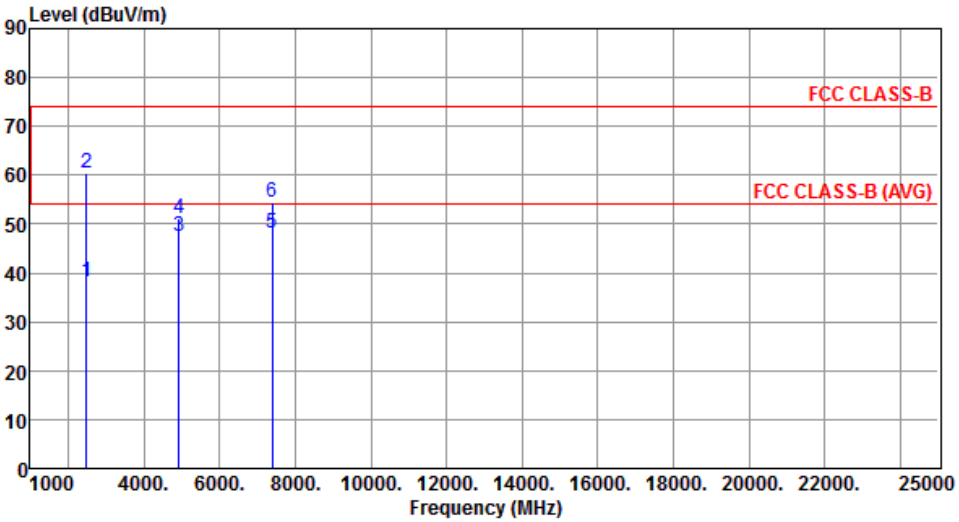
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	38.80	54.00	-15.20	41.60	-2.80	Average	211	167
2	2483.50	66.73	74.00	-7.27	69.53	-2.80	Peak	211	167
3	4924.00	52.99	54.00	-1.01	48.89	4.10	Average	210	187
4	4924.00	56.15	74.00	-17.85	52.05	4.10	Peak	210	187
5	7386.00	46.45	54.00	-7.55	38.01	8.44	Average	100	224
6	7386.00	53.31	74.00	-20.69	44.87	8.44	Peak	100	224

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		

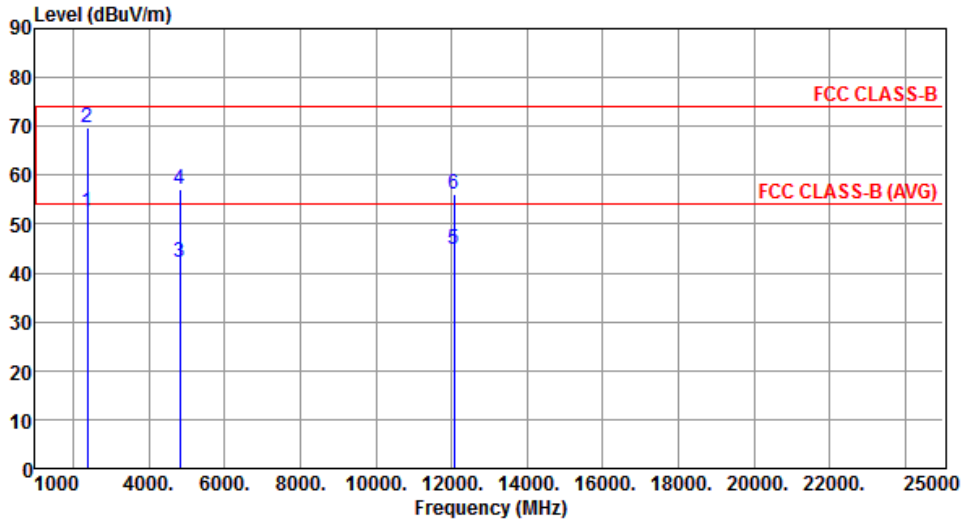


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.08	54.00	-15.92	40.88	-2.80	Average	123	297
2	2483.50	60.43	74.00	-13.57	63.23	-2.80	Peak	123	297
3	4924.00	47.39	54.00	-6.61	43.29	4.10	Average	100	312
4	4924.00	51.06	74.00	-22.94	46.96	4.10	Peak	100	312
5	7386.00	48.27	54.00	-5.73	39.83	8.44	Average	100	235
6	7386.00	54.42	74.00	-19.58	45.98	8.44	Peak	100	235

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

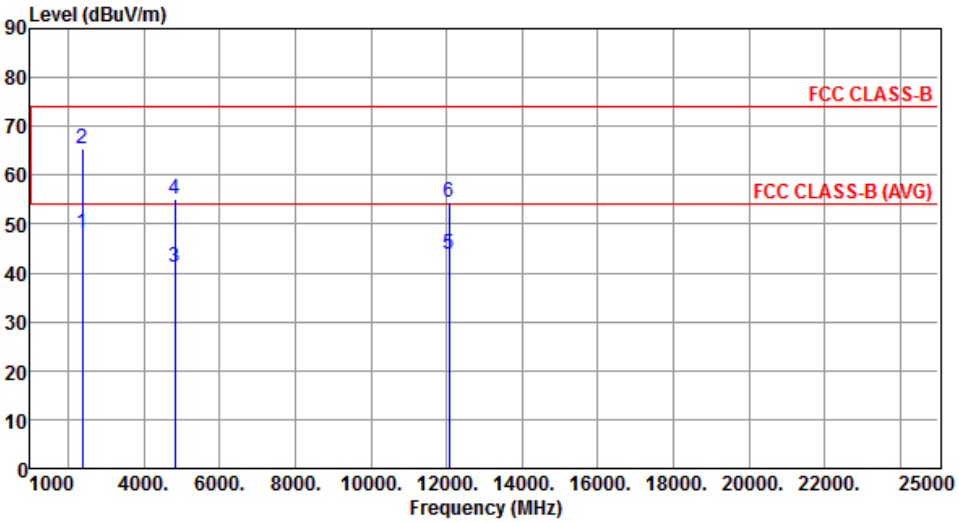
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	52.45	54.00	-1.55	55.63	-3.18	Average	246	154
2	2390.00	69.60	74.00	-4.40	72.78	-3.18	Peak	246	154
3	4824.00	42.23	54.00	-11.77	38.45	3.78	Average	230	149
4	4824.00	57.26	74.00	-16.74	53.48	3.78	Peak	230	149
5	12060.00	44.83	54.00	-9.17	31.25	13.58	Average	100	225
6	12060.00	56.17	74.00	-17.83	42.59	13.58	Peak	100	225

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).

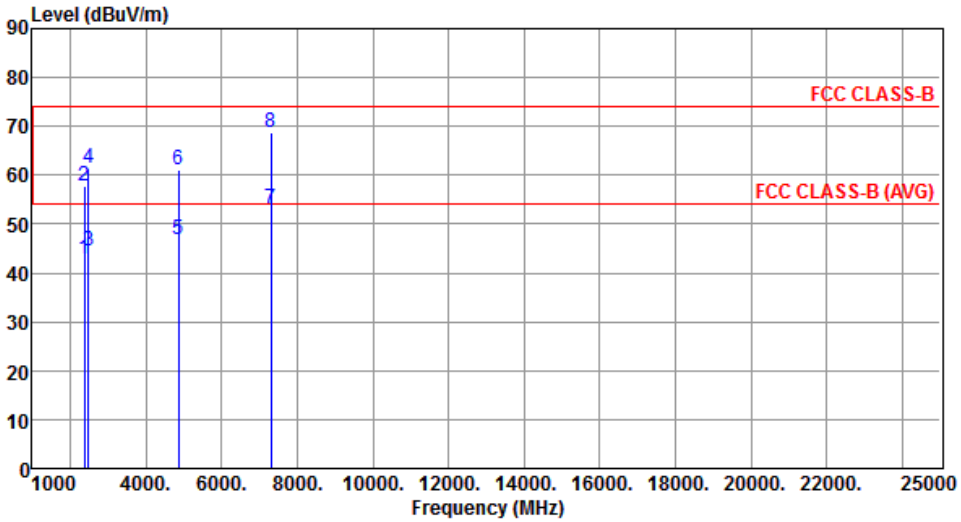
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	51.44	-3.18	Average	105	243
2	2390.00	65.43	74.00	-8.57	68.61	-3.18	Peak	105	243
3	4824.00	41.08	54.00	-12.92	37.30	3.78	Average	203	198
4	4824.00	55.23	74.00	-18.77	51.45	3.78	Peak	203	198
5	12060.00	43.95	54.00	-10.05	30.37	13.58	Average	100	251
6	12060.00	54.40	74.00	-19.60	40.82	13.58	Peak	100	251

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).

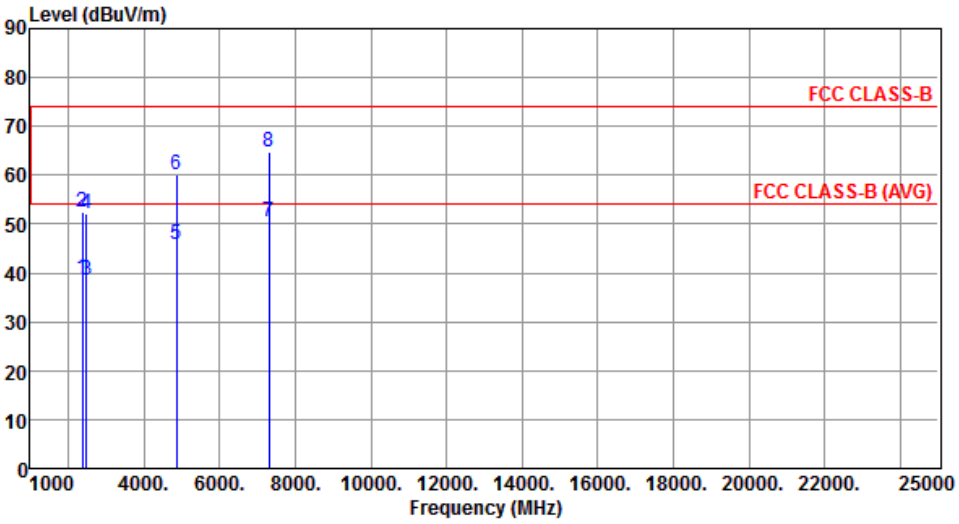
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	42.72	54.00	-11.28	45.90	-3.18	Average	240	162
2	2390.00	57.75	74.00	-16.25	60.93	-3.18	Peak	240	162
3	2483.50	44.43	54.00	-9.57	47.23	-2.80	Average	240	162
4	2483.50	61.30	74.00	-12.70	64.10	-2.80	Peak	240	162
5	4874.00	46.73	54.00	-7.27	42.79	3.94	Average	232	152
6	4874.00	61.03	74.00	-12.97	57.09	3.94	Peak	232	152
7	7311.00	52.99	54.00	-1.01	44.58	8.41	Average	186	145
8	7311.00	68.74	74.00	-5.26	60.33	8.41	Peak	186	145

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

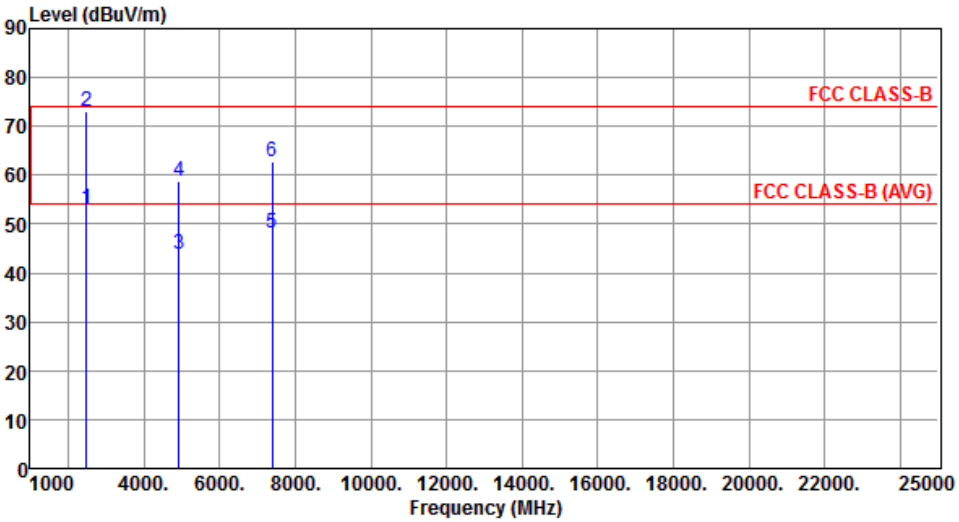
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	38.75	54.00	-15.25	41.93	-3.18	Average	106	238
2	2390.00	52.37	74.00	-21.63	55.55	-3.18	Peak	106	238
3	2483.50	38.52	54.00	-15.48	41.32	-2.80	Average	106	238
4	2483.50	52.18	74.00	-21.82	54.98	-2.80	Peak	106	238
5	4874.00	45.82	54.00	-8.18	41.88	3.94	Average	200	192
6	4874.00	60.02	74.00	-13.98	56.08	3.94	Peak	200	192
7	7311.00	50.32	54.00	-3.68	41.91	8.41	Average	100	232
8	7311.00	64.65	74.00	-9.35	56.24	8.41	Peak	100	232

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).

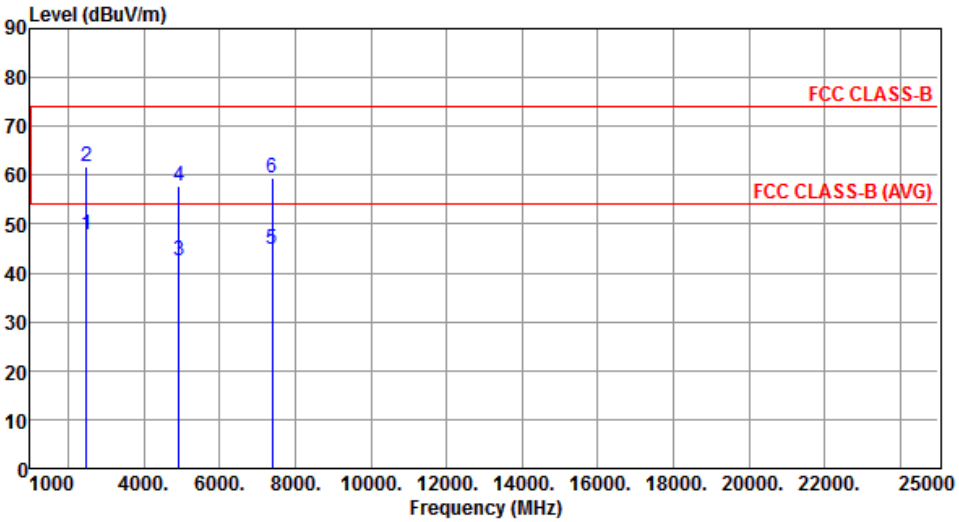
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.99	54.00	-1.01	55.79	-2.80	Average	236	154
2	2483.50	72.97	74.00	-1.03	75.77	-2.80	Peak	236	154
3	4924.00	43.90	54.00	-10.10	39.80	4.10	Average	236	160
4	4924.00	58.87	74.00	-15.13	54.77	4.10	Peak	235	151
5	7386.00	48.05	54.00	-5.95	39.61	8.44	Average	183	142
6	7386.00	62.74	74.00	-11.26	54.30	8.44	Peak	183	142

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		

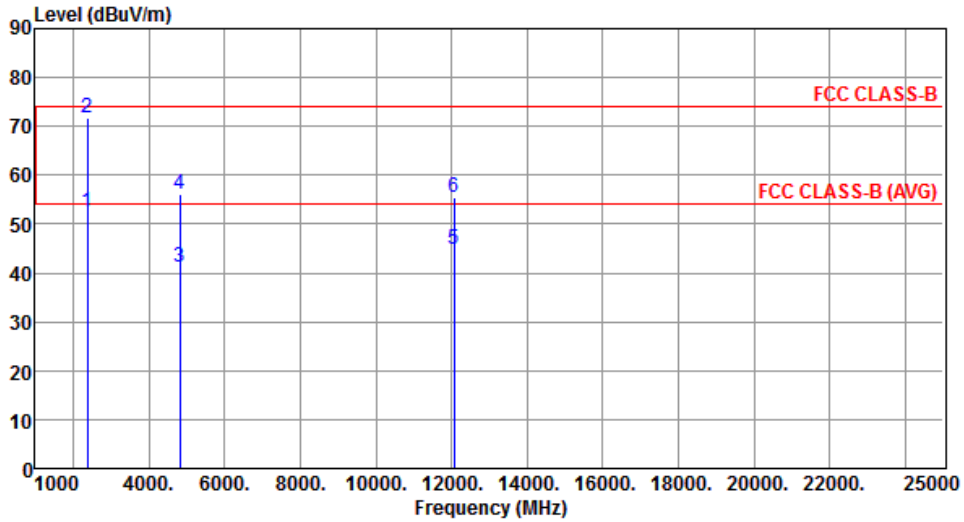


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.76	54.00	-6.24	50.56	-2.80	Average	105	247
2	2483.50	61.72	74.00	-12.28	64.52	-2.80	Peak	105	247
3	4924.00	42.59	54.00	-11.41	38.49	4.10	Average	203	188
4	4924.00	57.68	74.00	-16.32	53.58	4.10	Peak	203	188
5	7386.00	44.79	54.00	-9.21	36.35	8.44	Average	100	239
6	7386.00	59.32	74.00	-14.68	50.88	8.44	Peak	100	239

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

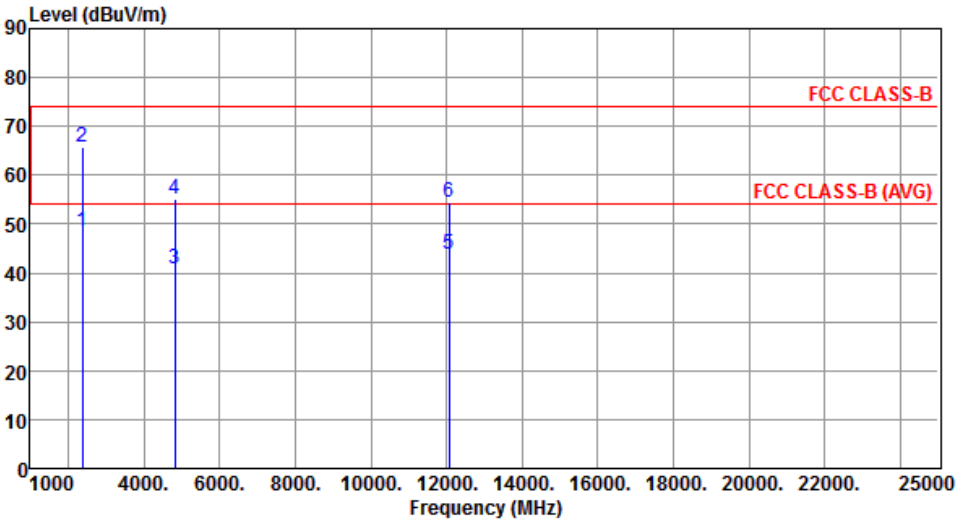
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	52.62	54.00	-1.38	55.80	-3.18	Average	280	157
2	2390.00	71.67	74.00	-2.33	74.85	-3.18	Peak	280	157
3	4824.00	41.06	54.00	-12.94	37.28	3.78	Average	226	153
4	4824.00	56.13	74.00	-17.87	52.35	3.78	Peak	226	153
5	12060.00	44.74	54.00	-9.26	31.16	13.58	Average	100	232
6	12060.00	55.44	74.00	-18.56	41.86	13.58	Peak	100	232

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).

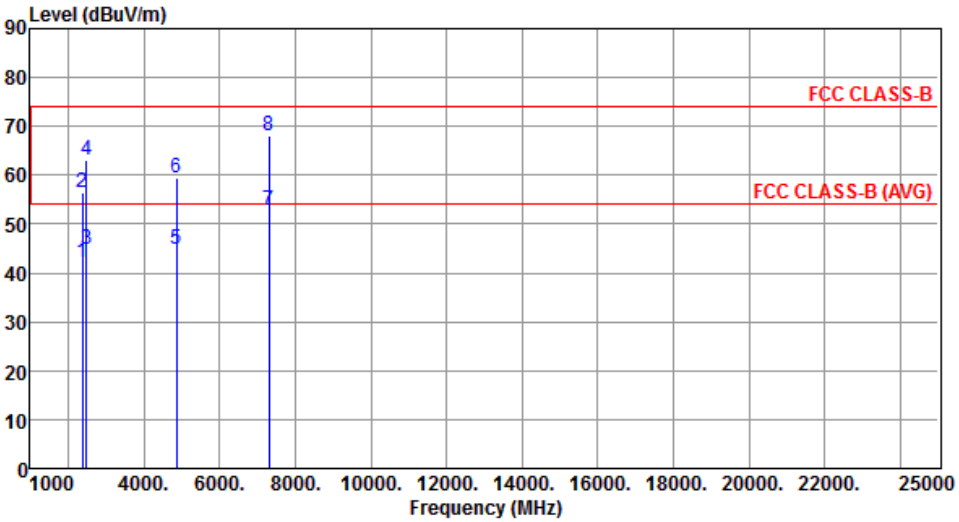
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Vertical		



	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	48.48	54.00	-5.52	51.66	-3.18	Average	103	248
2	2390.00	65.71	74.00	-8.29	68.89	-3.18	Peak	103	248
3	4824.00	40.74	54.00	-13.26	36.96	3.78	Average	210	193
4	4824.00	55.03	74.00	-18.97	51.25	3.78	Peak	210	193
5	12060.00	43.78	54.00	-10.22	30.20	13.58	Average	100	258
6	12060.00	54.63	74.00	-19.37	41.05	13.58	Peak	100	258

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).

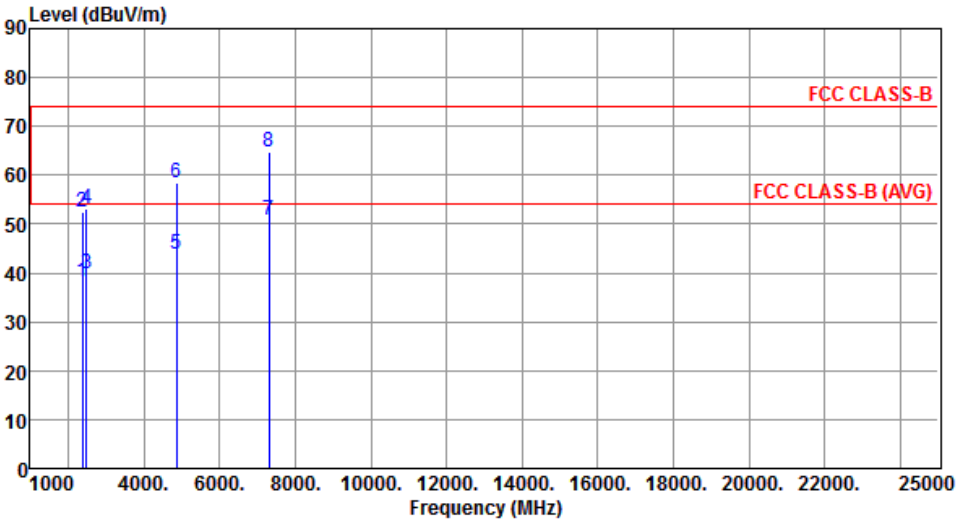
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	42.16	54.00	-11.84	45.34	-3.18	Average	268	157
2	2390.00	56.47	74.00	-17.53	59.65	-3.18	Peak	268	157
3	2483.50	44.85	54.00	-9.15	47.65	-2.80	Average	268	157
4	2483.50	63.03	74.00	-10.97	65.83	-2.80	Peak	268	157
5	4874.00	44.85	54.00	-9.15	40.91	3.94	Average	237	154
6	4874.00	59.40	74.00	-14.60	55.46	3.94	Peak	237	154
7	7311.00	52.79	54.00	-1.21	44.38	8.41	Average	193	141
8	7311.00	68.00	74.00	-6.00	59.59	8.41	Peak	193	141

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).

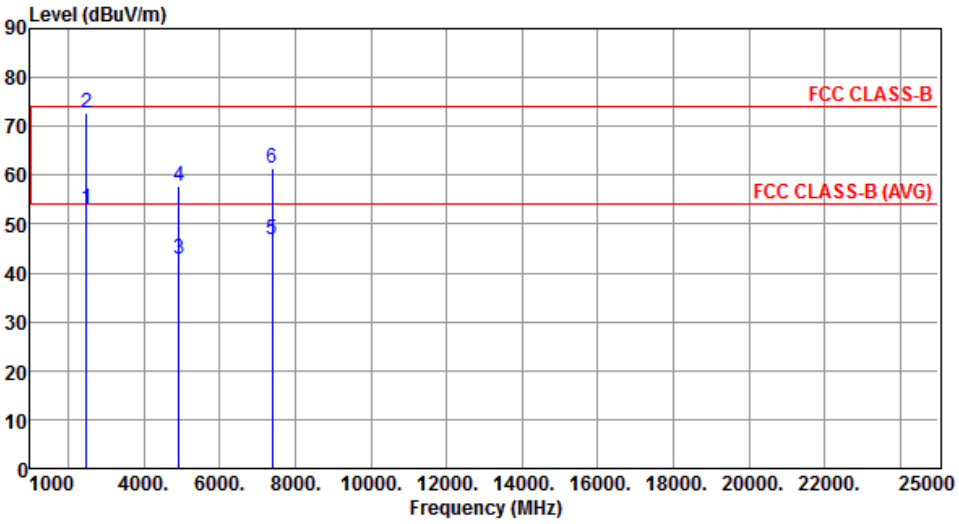
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	38.26	54.00	-15.74	41.44	-3.18	Average	104	242
2	2390.00	52.62	74.00	-21.38	55.80	-3.18	Peak	104	242
3	2483.50	39.73	54.00	-14.27	42.53	-2.80	Average	104	242
4	2483.50	53.16	74.00	-20.84	55.96	-2.80	Peak	104	242
5	4874.00	43.76	54.00	-10.24	39.82	3.94	Average	197	196
6	4874.00	58.47	74.00	-15.53	54.53	3.94	Peak	197	196
7	7311.00	50.86	54.00	-3.14	42.45	8.41	Average	100	251
8	7311.00	64.83	74.00	-9.17	56.42	8.41	Peak	100	251

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).

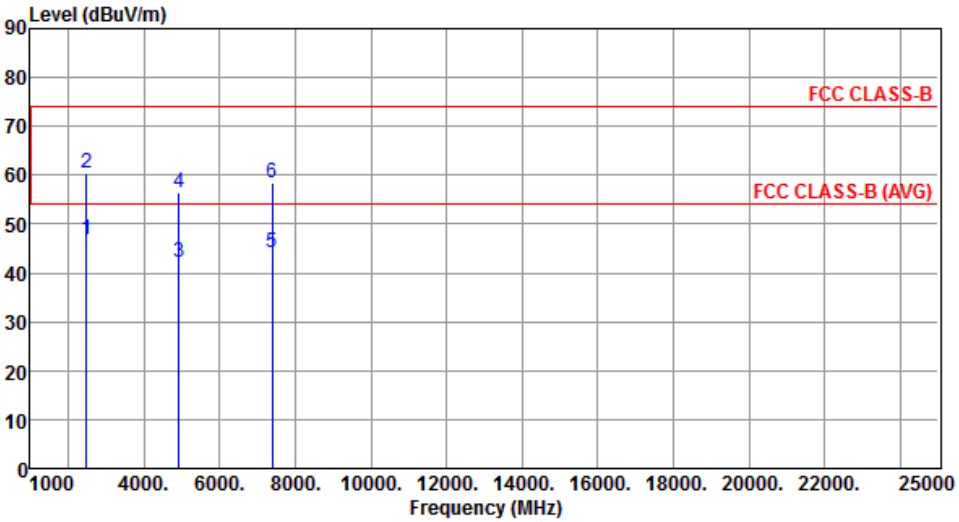
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.99	54.00	-1.01	55.79	-2.80	Average	230	155
2	2483.50	72.65	74.00	-1.35	75.45	-2.80	Peak	230	155
3	4924.00	42.92	54.00	-11.08	38.82	4.10	Average	231	169
4	4924.00	57.72	74.00	-16.28	53.62	4.10	Peak	231	169
5	7386.00	46.86	54.00	-7.14	38.42	8.44	Average	176	139
6	7386.00	61.28	74.00	-12.72	52.84	8.44	Peak	176	139

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		

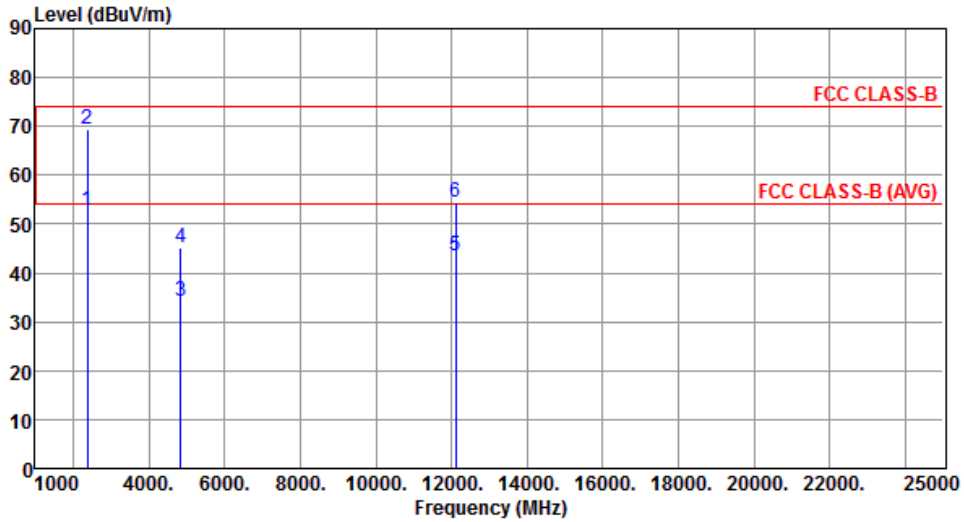


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	46.86	54.00	-7.14	49.66	-2.80	Average	106	245
2	2483.50	60.54	74.00	-13.46	63.34	-2.80	Peak	106	245
3	4924.00	42.16	54.00	-11.84	38.06	4.10	Average	198	172
4	4924.00	56.62	74.00	-17.38	52.52	4.10	Peak	198	172
5	7386.00	44.16	54.00	-9.84	35.72	8.44	Average	100	229
6	7386.00	58.39	74.00	-15.61	49.95	8.44	Peak	100	229

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

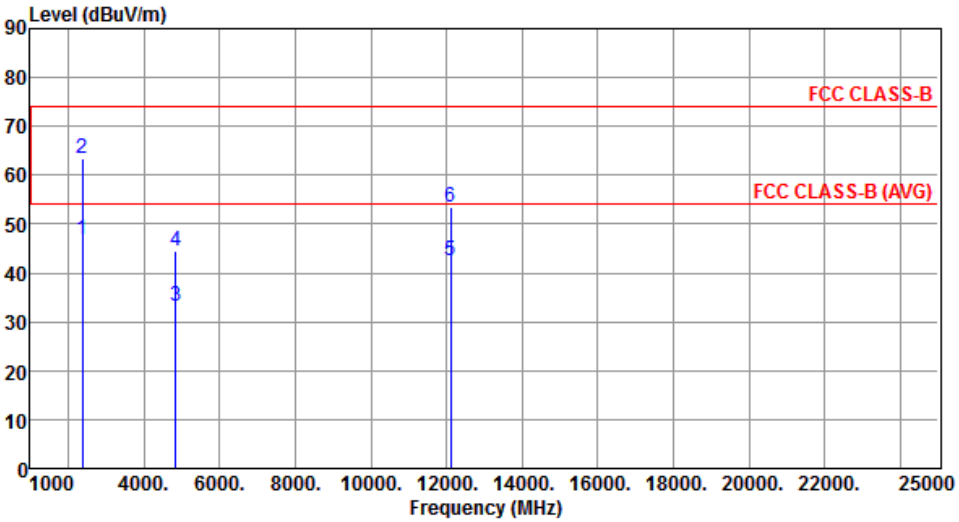
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	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	52.96	54.00	-1.04	56.14	-3.18	Average	282	156
2	2390.00	69.42	74.00	-4.58	72.60	-3.18	Peak	282	156
3	4844.00	34.23	54.00	-19.77	30.38	3.85	Average	236	158
4	4844.00	45.22	74.00	-28.78	41.37	3.85	Peak	236	158
5	12110.00	43.45	54.00	-10.55	29.83	13.62	Average	100	218
6	12110.00	54.35	74.00	-19.65	40.73	13.62	Peak	100	218

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).

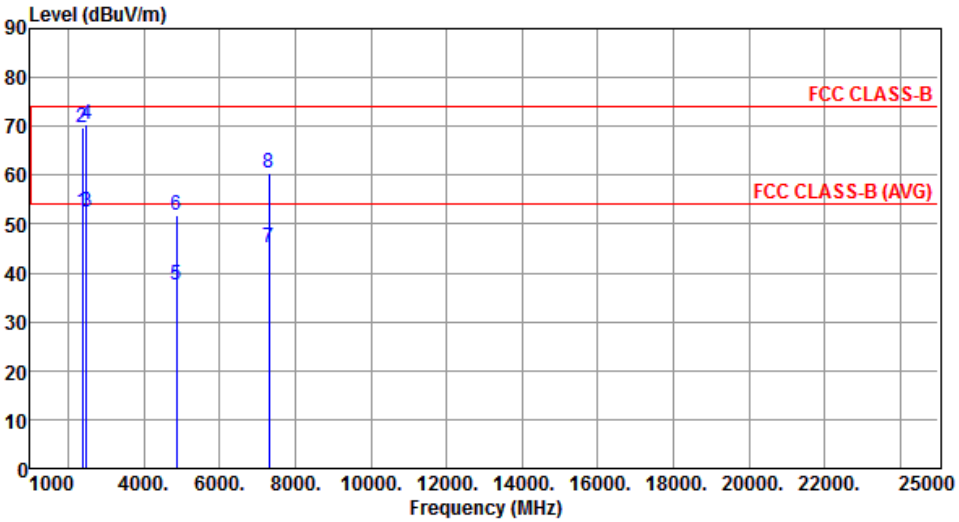
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	46.88	54.00	-7.12	50.06	-3.18	Average	104	240
2	2390.00	63.38	74.00	-10.62	66.56	-3.18	Peak	104	240
3	4844.00	33.36	54.00	-20.64	29.51	3.85	Average	195	178
4	4844.00	44.38	74.00	-29.62	40.53	3.85	Peak	195	178
5	12110.00	42.35	54.00	-11.65	28.73	13.62	Average	100	233
6	12110.00	53.52	74.00	-20.48	39.90	13.62	Peak	100	233

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

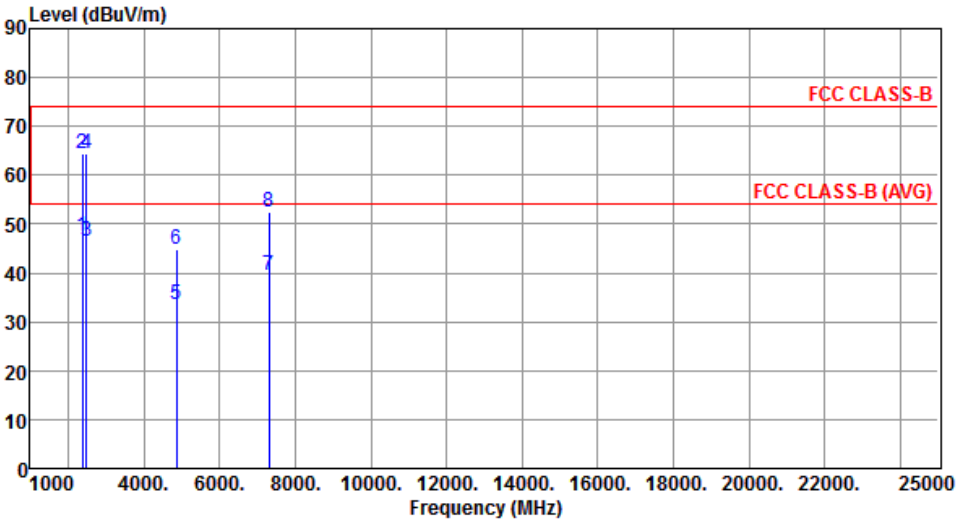
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.42	54.00	-1.58	55.60	-3.18	Average	250	156
2	2390.00	69.62	74.00	-4.38	72.80	-3.18	Peak	250	156
3	2483.50	52.36	54.00	-1.64	55.16	-2.80	Average	250	156
4	2483.50	70.49	74.00	-3.51	73.29	-2.80	Peak	250	156
5	4874.00	37.57	54.00	-16.43	33.63	3.94	Average	233	161
6	4874.00	51.87	74.00	-22.13	47.93	3.94	Peak	233	161
7	7311.00	45.23	54.00	-8.77	36.82	8.41	Average	186	140
8	7311.00	60.37	74.00	-13.63	51.96	8.41	Peak	186	140

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).

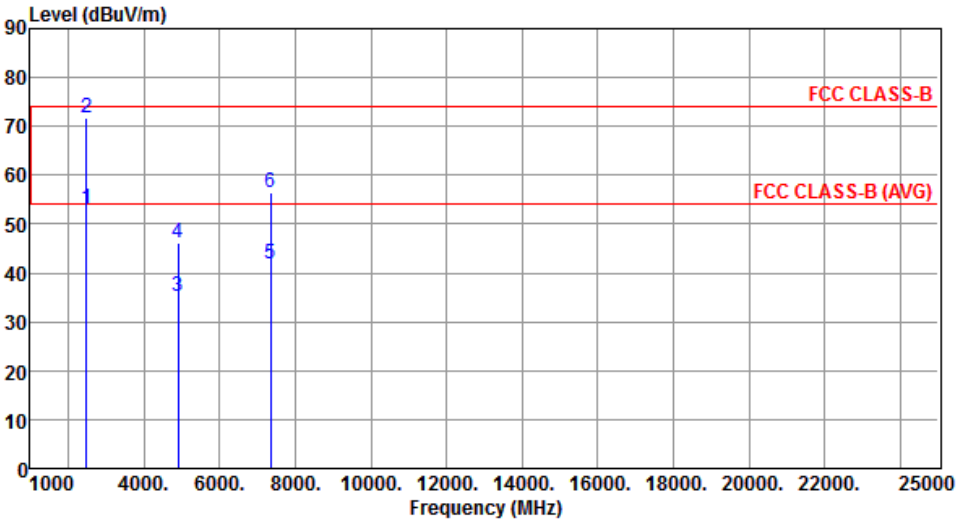
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	47.36	54.00	-6.64	50.54	-3.18	Average	104	247
2	2390.00	64.46	74.00	-9.54	67.64	-3.18	Peak	104	247
3	2483.50	46.47	54.00	-7.53	49.27	-2.80	Average	104	247
4	2483.50	64.39	74.00	-9.61	67.19	-2.80	Peak	104	247
5	4874.00	33.57	54.00	-20.43	29.63	3.94	Average	192	199
6	4874.00	44.93	74.00	-29.07	40.99	3.94	Peak	192	199
7	7311.00	39.54	54.00	-14.46	31.13	8.41	Average	100	252
8	7311.00	52.44	74.00	-21.56	44.03	8.41	Peak	100	252

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

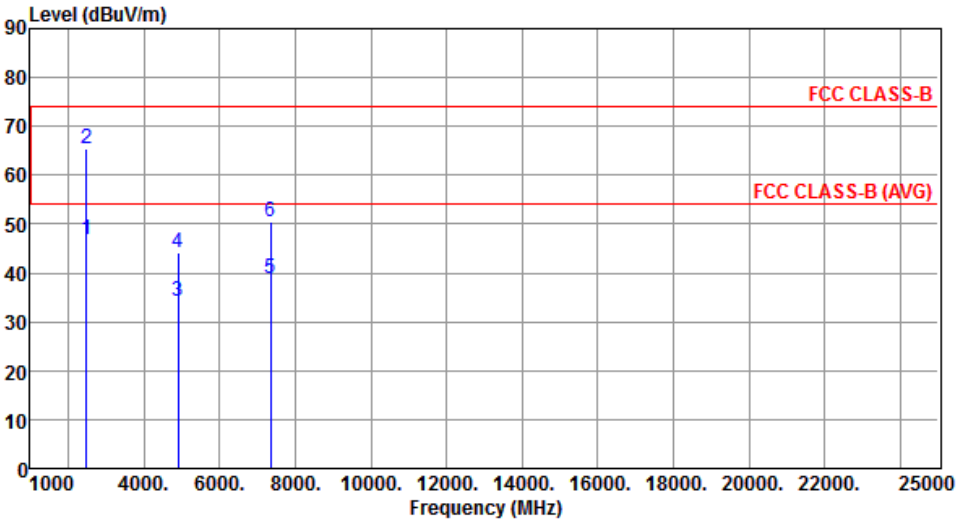
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	55.79	-2.80	Average	258	161
2	2483.50	71.57	74.00	-2.43	74.37	-2.80	Peak	258	161
3	4904.00	35.36	54.00	-18.64	31.31	4.05	Average	241	163
4	4904.00	46.18	74.00	-27.82	42.13	4.05	Peak	241	163
5	7356.00	41.88	54.00	-12.12	33.45	8.43	Average	182	143
6	7356.00	56.52	74.00	-17.48	48.09	8.43	Peak	182	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).

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	46.99	54.00	-7.01	49.79	-2.80	Average	103	241
2	2483.50	65.57	74.00	-8.43	68.37	-2.80	Peak	103	241
3	4904.00	34.08	54.00	-19.92	30.03	4.05	Average	188	187
4	4904.00	44.30	74.00	-29.70	40.25	4.05	Peak	188	187
5	7356.00	38.88	54.00	-15.12	30.45	8.43	Average	100	161
6	7356.00	50.41	74.00	-23.59	41.98	8.43	Peak	182	161

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

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

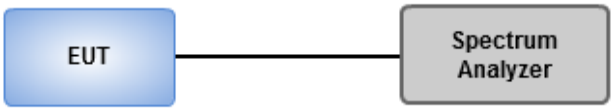
Reference level measurement

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

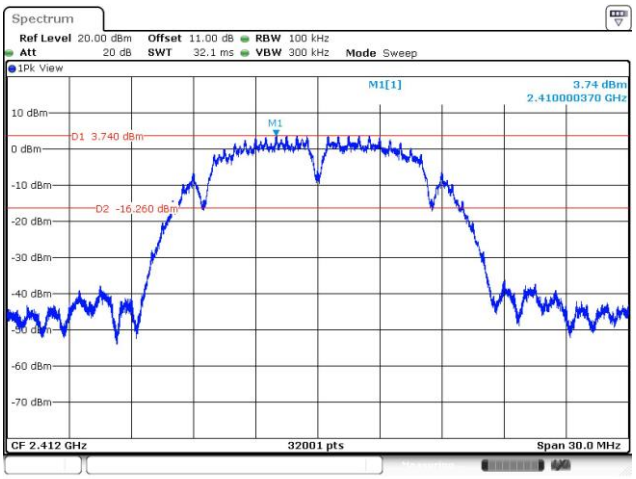
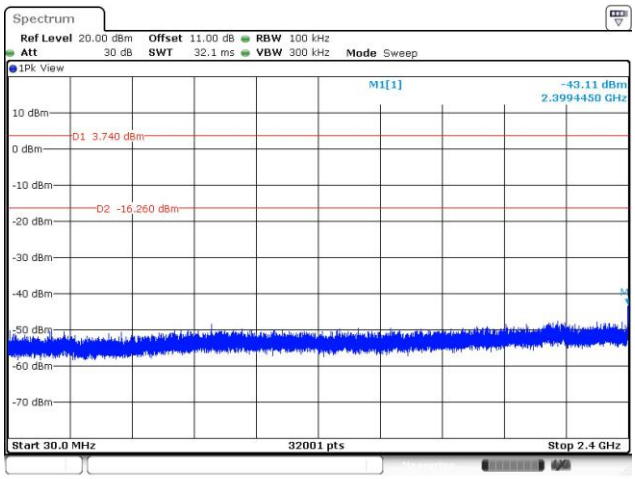
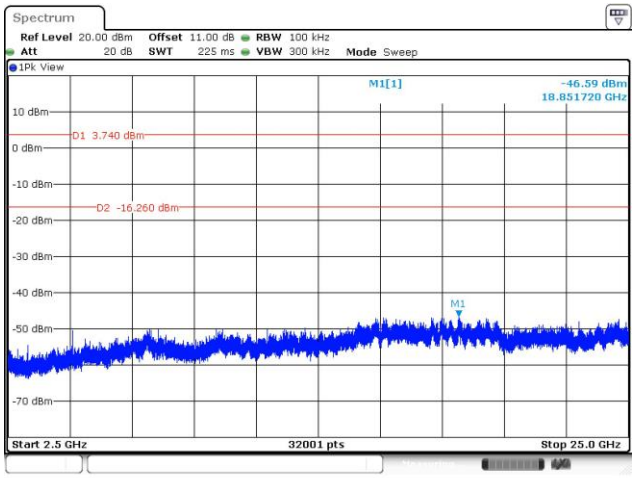
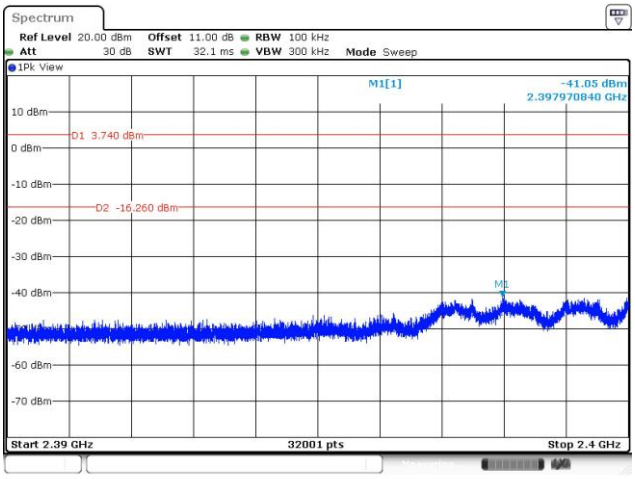


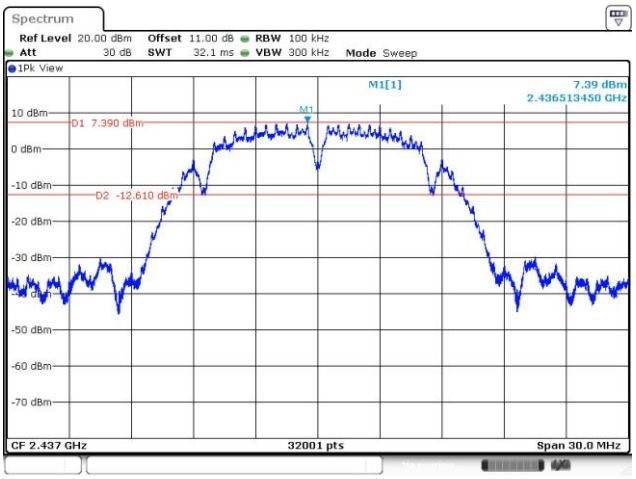
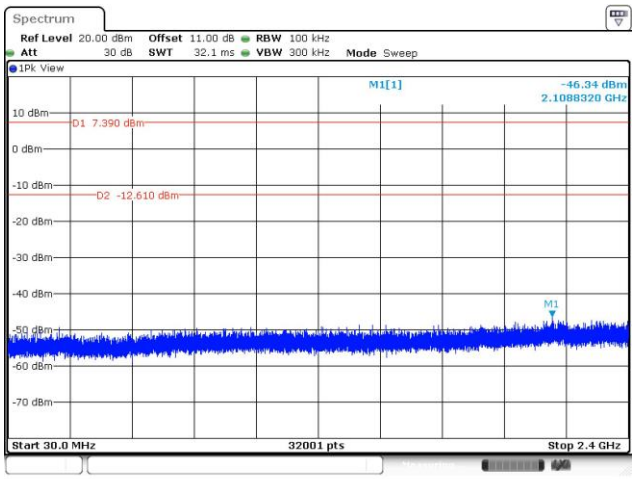
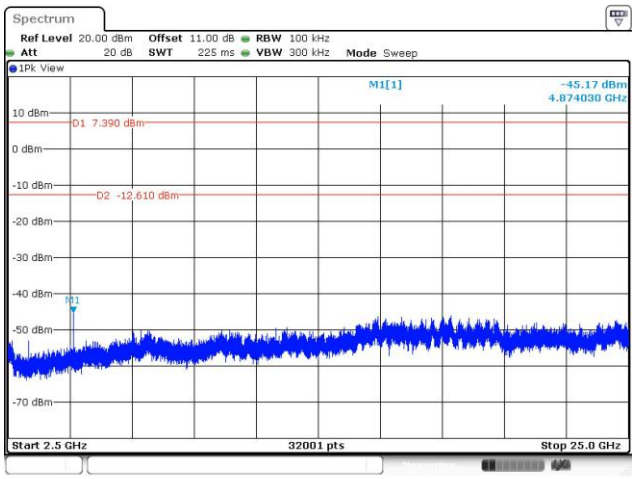
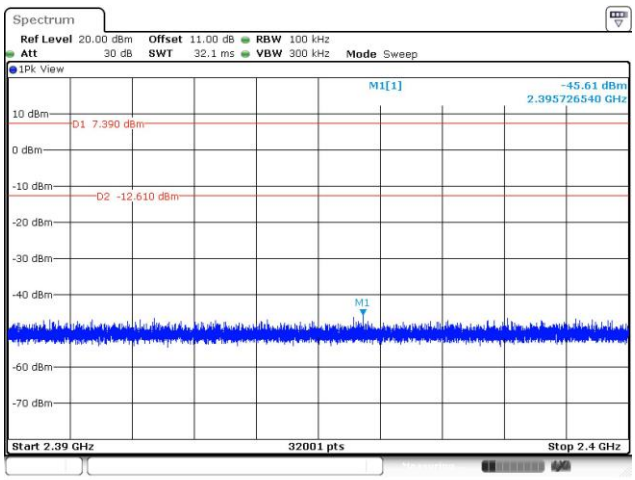
3.6.4 Test Result of Emissions in non-restricted frequency bands

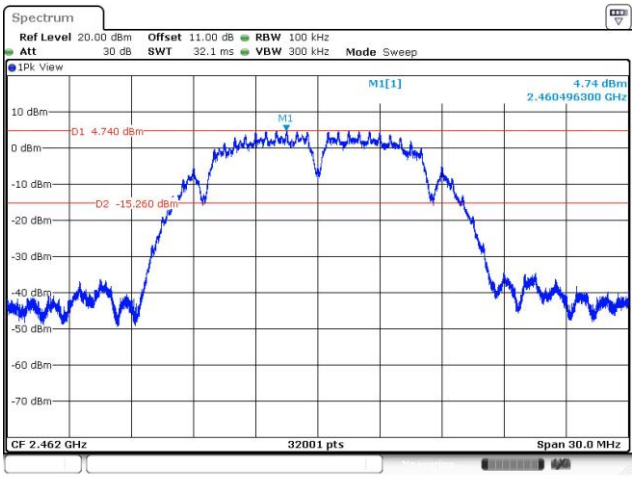
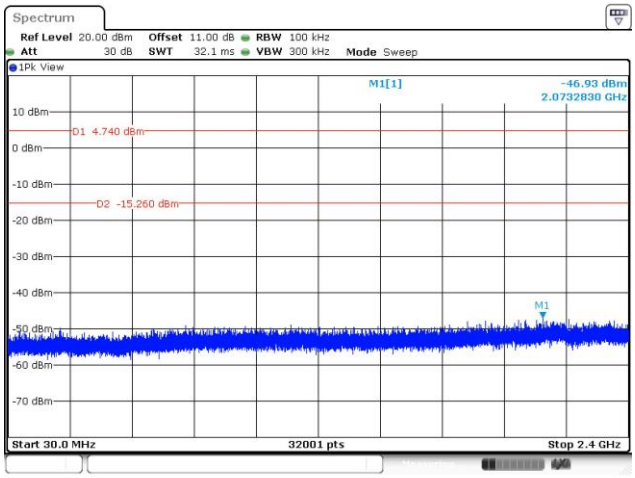
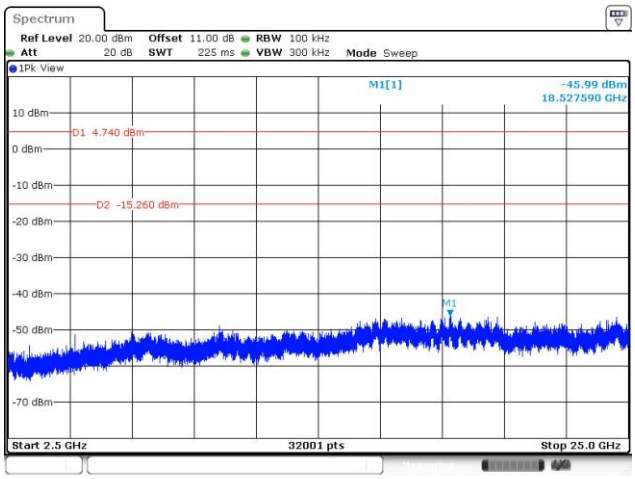
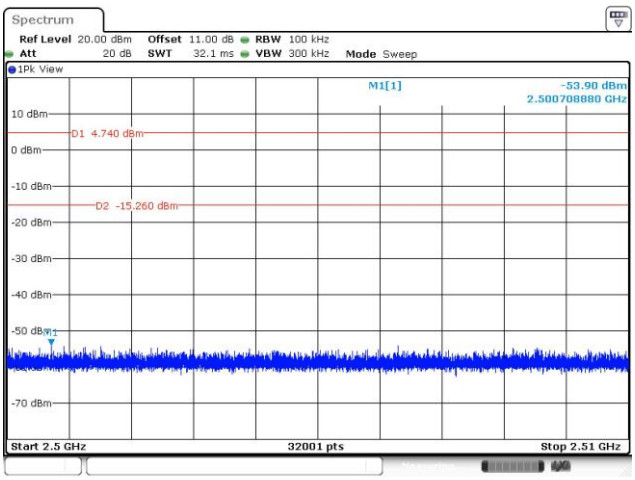
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.5 Unwanted Emissions into Non-Restricted Frequency Bands

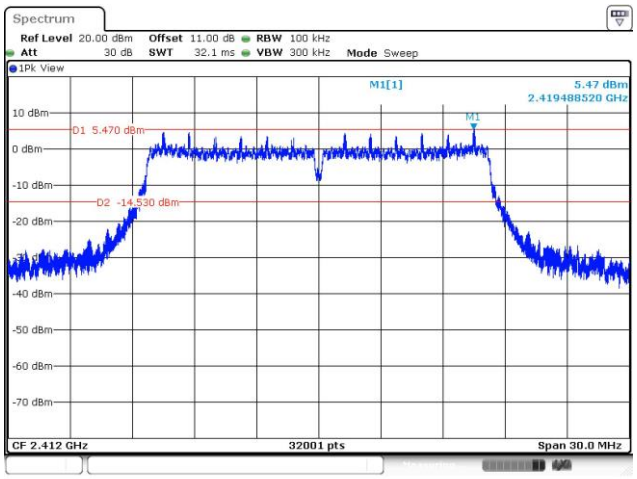
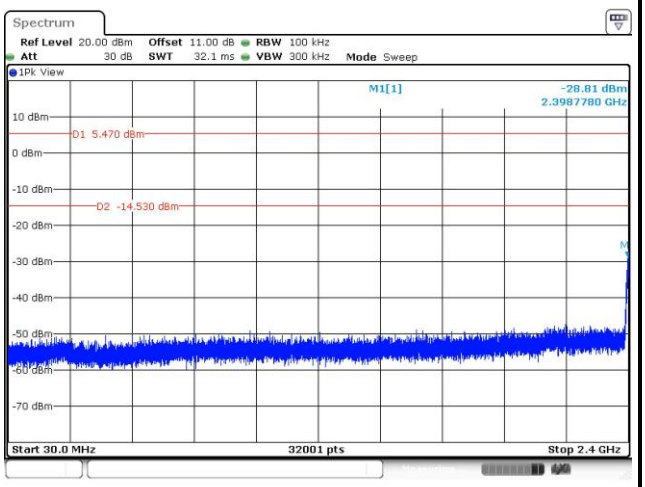
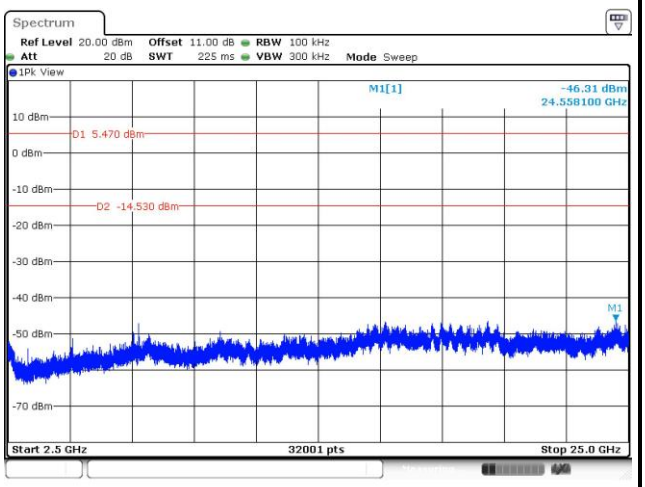
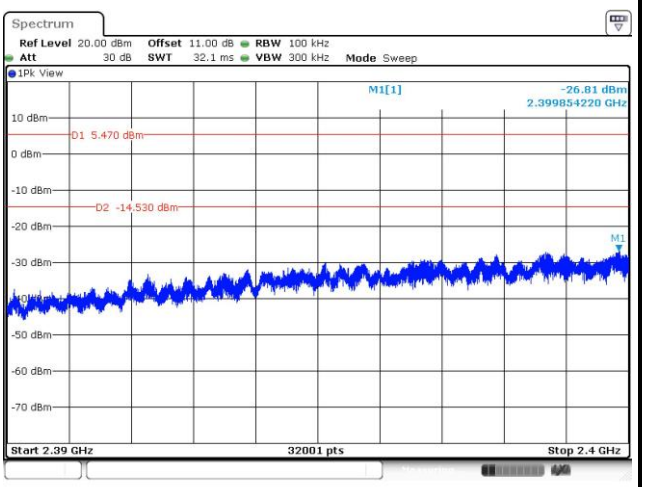
802.11b

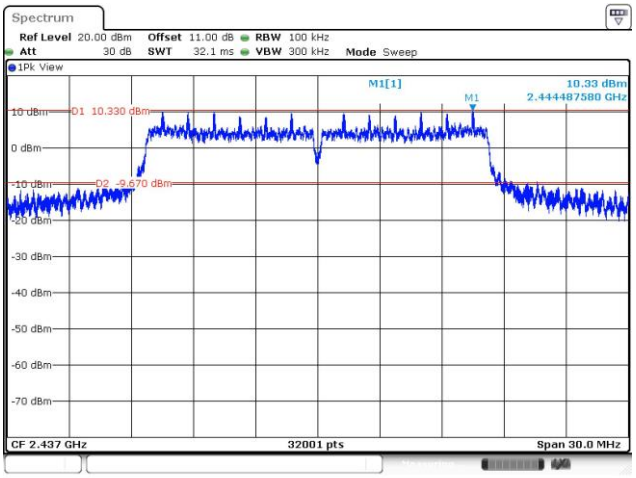
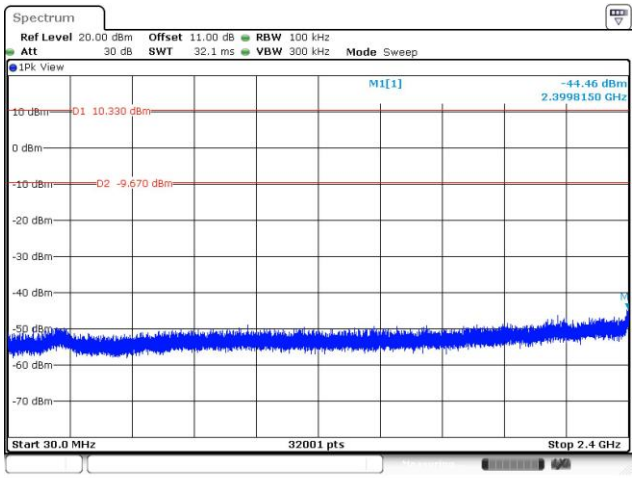
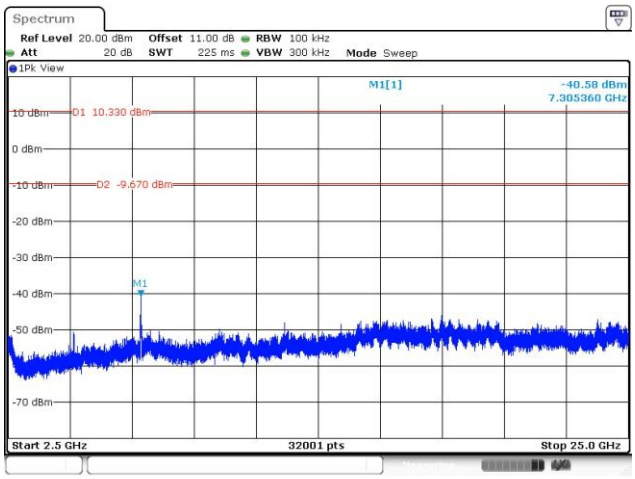
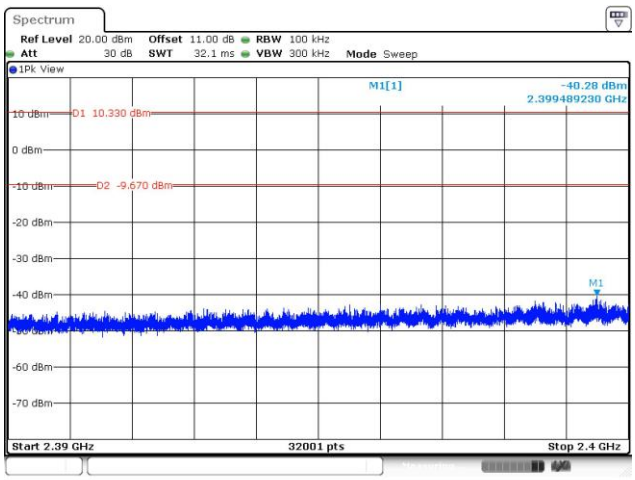
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

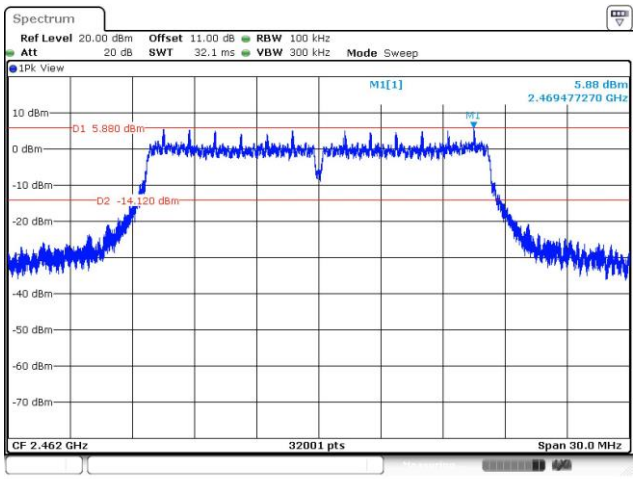
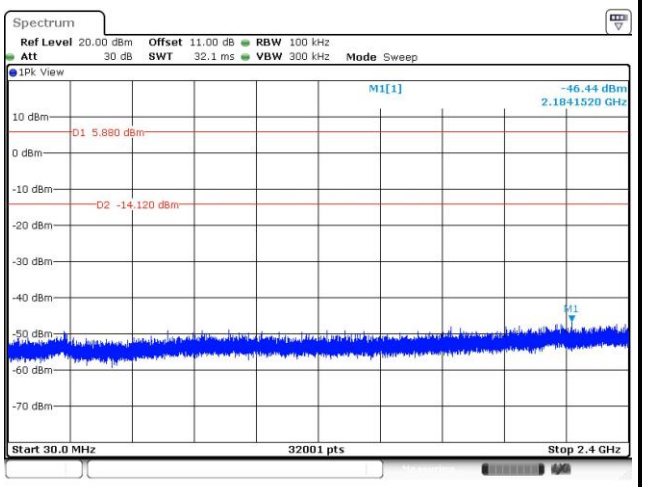
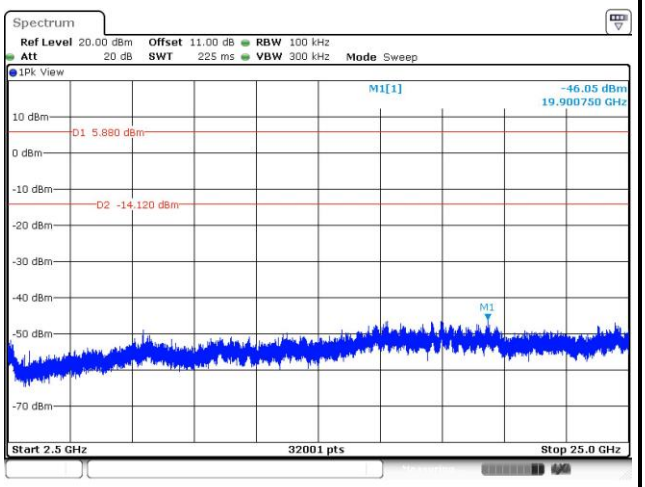
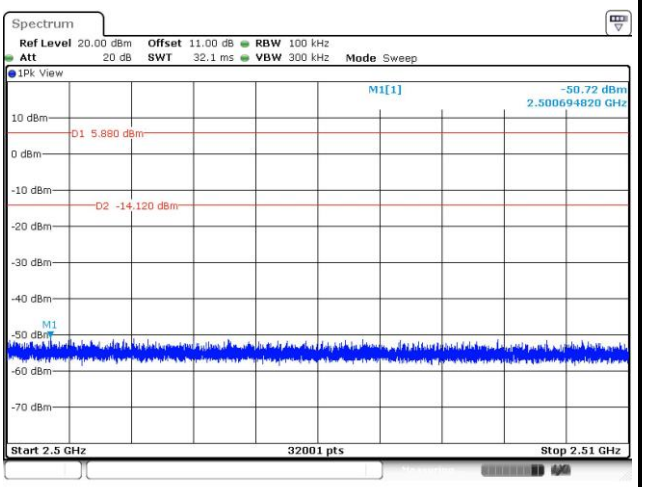
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

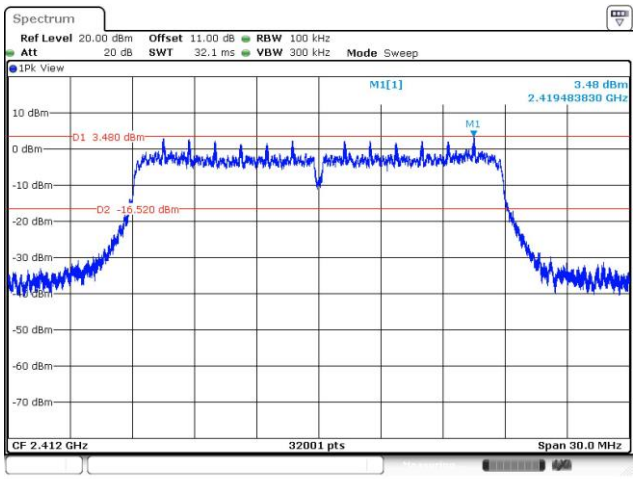
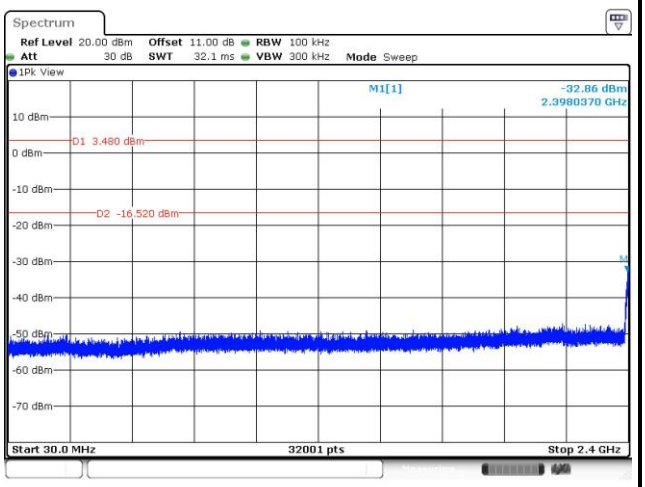
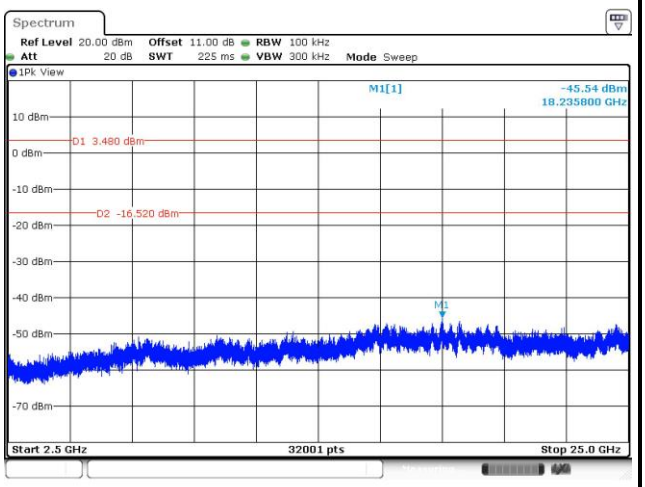
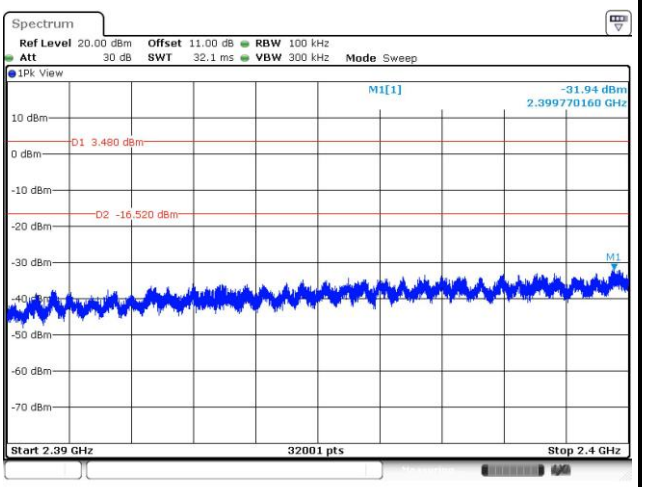
802.11g

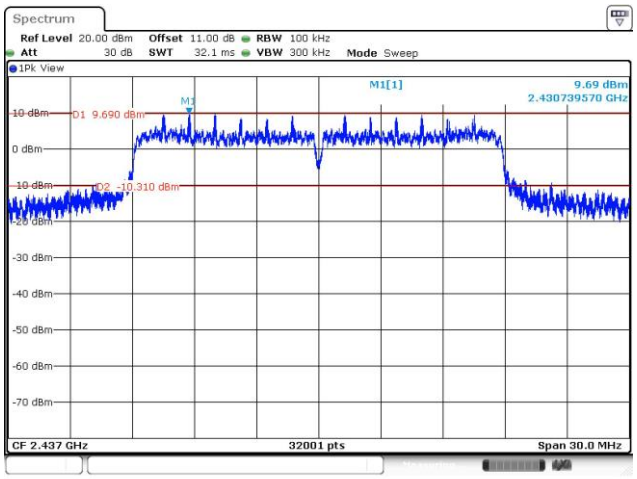
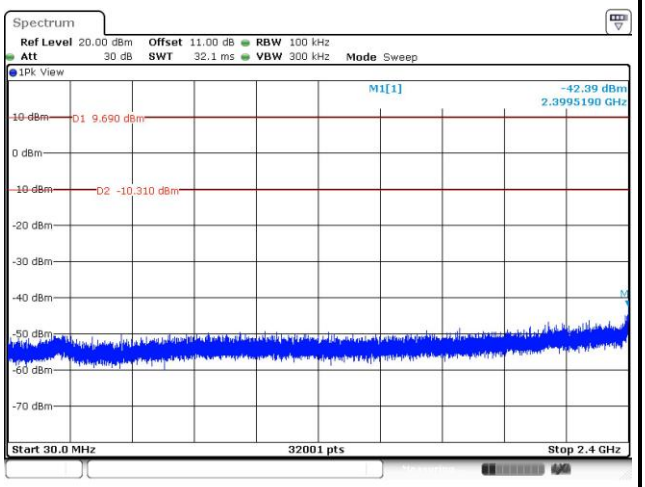
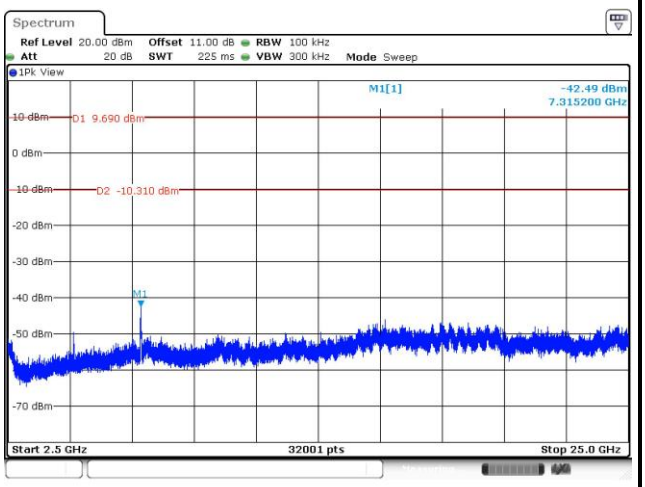
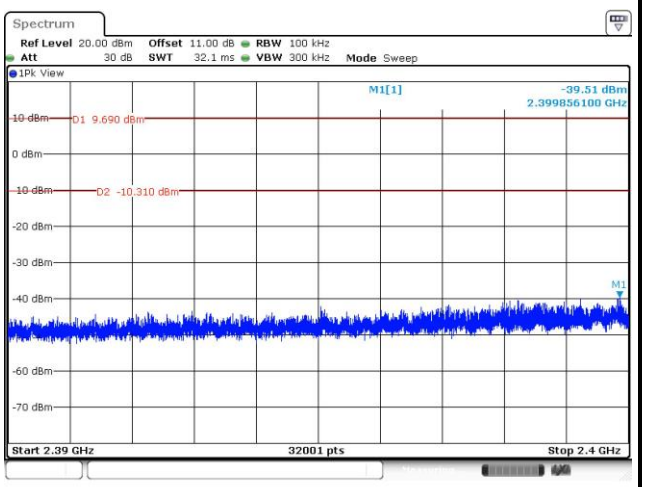
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

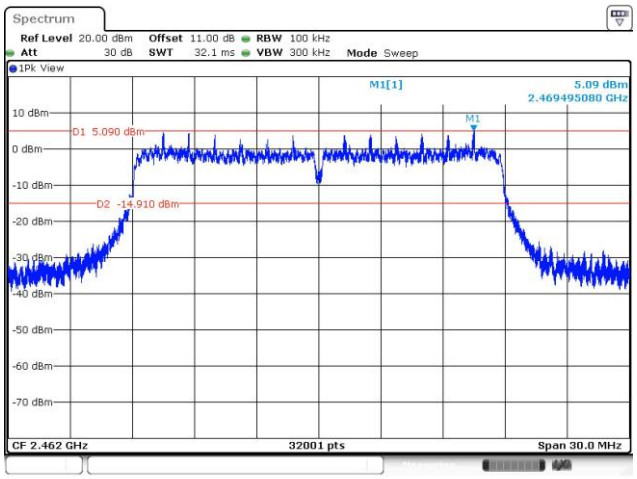
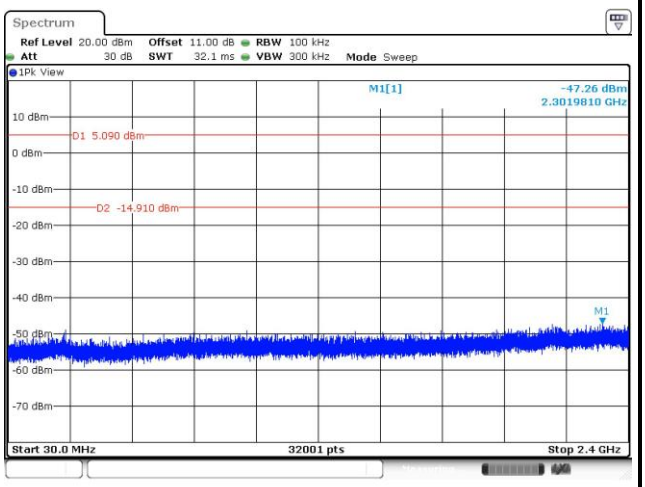
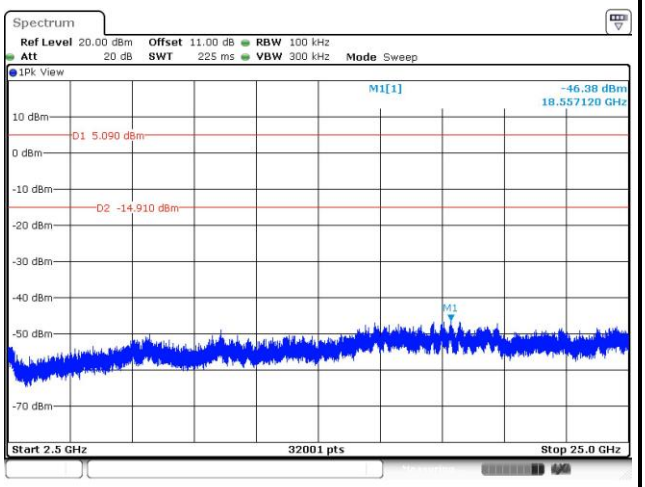
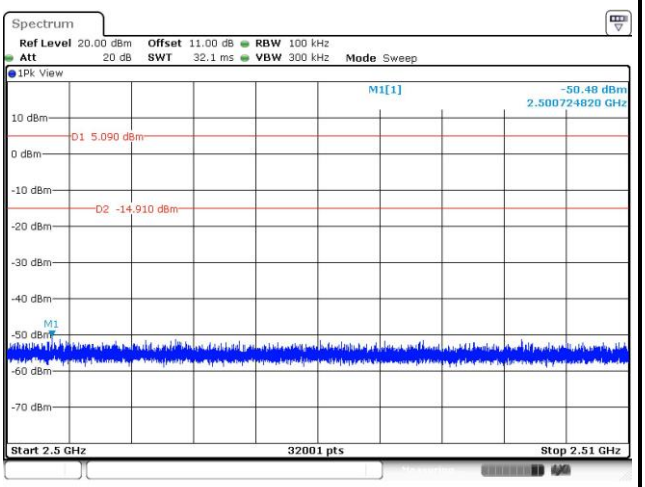
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

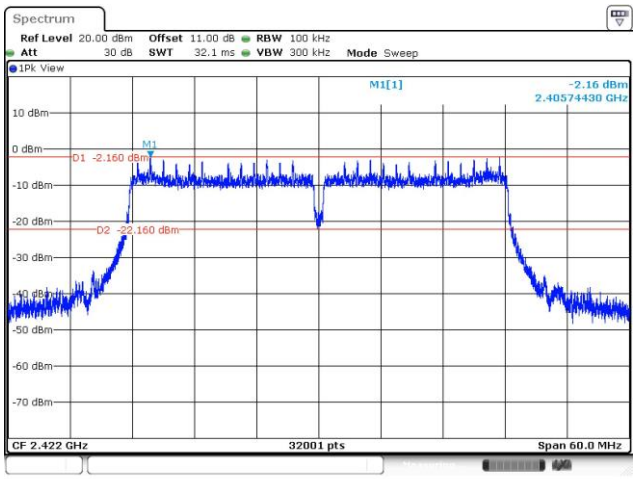
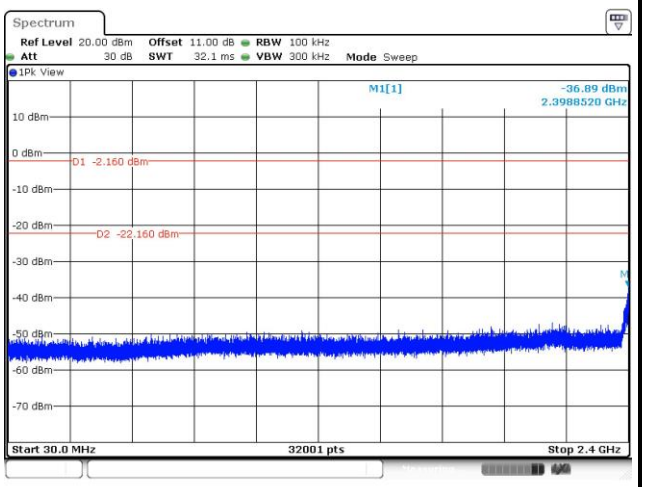
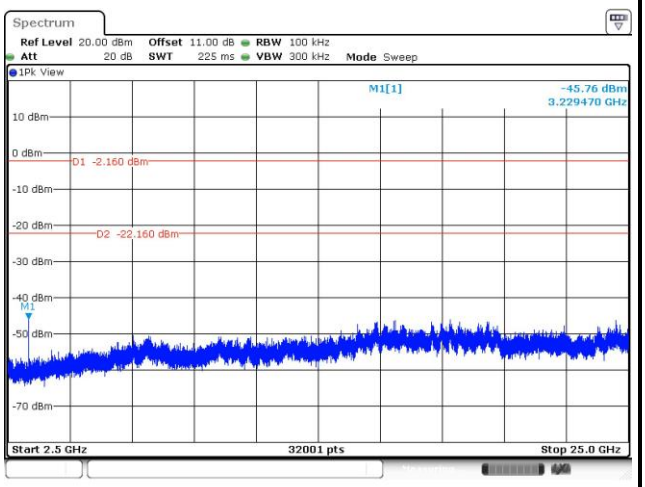
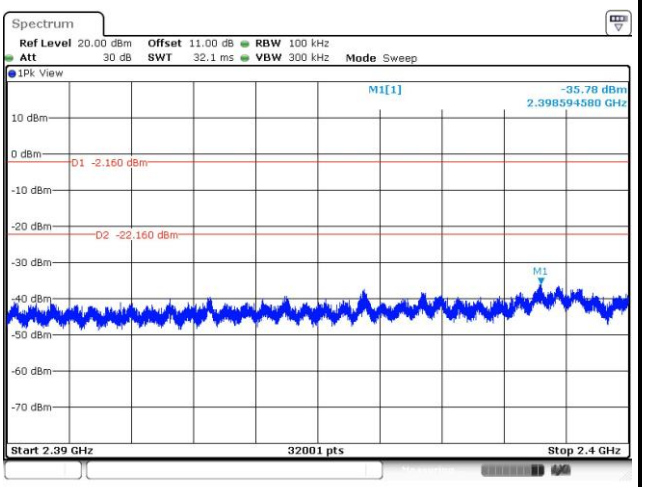
802.11n HT20

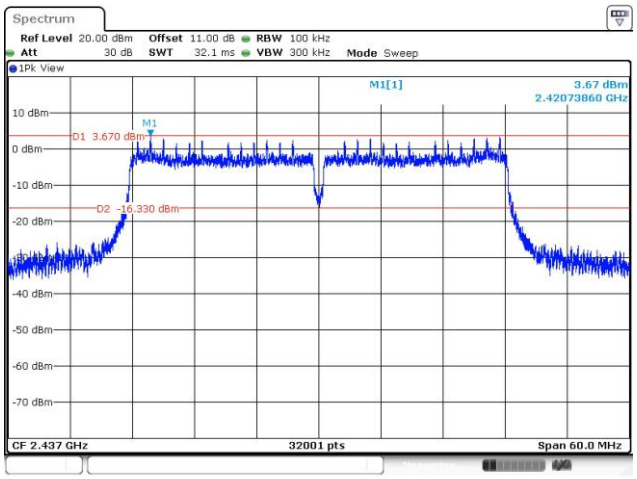
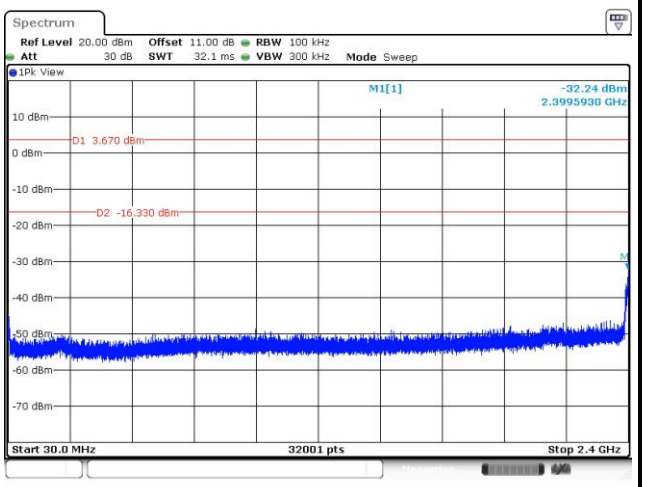
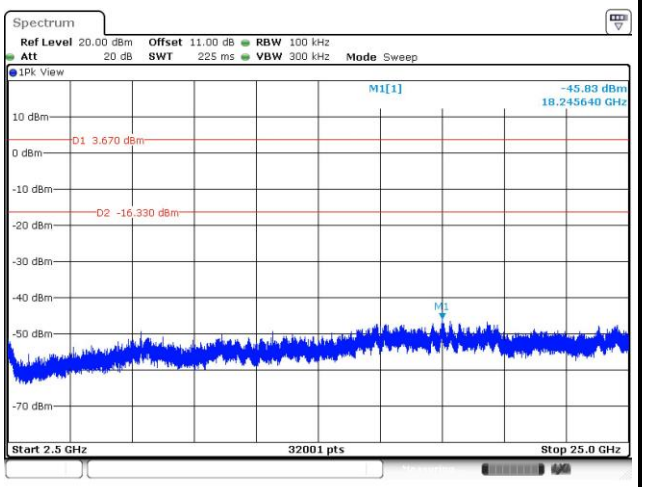
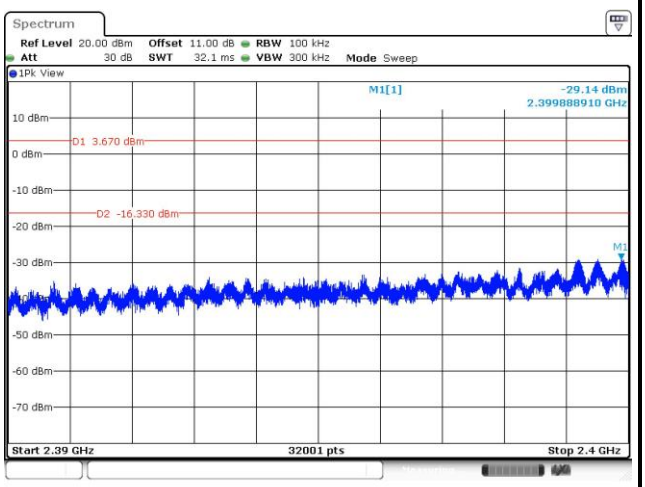
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

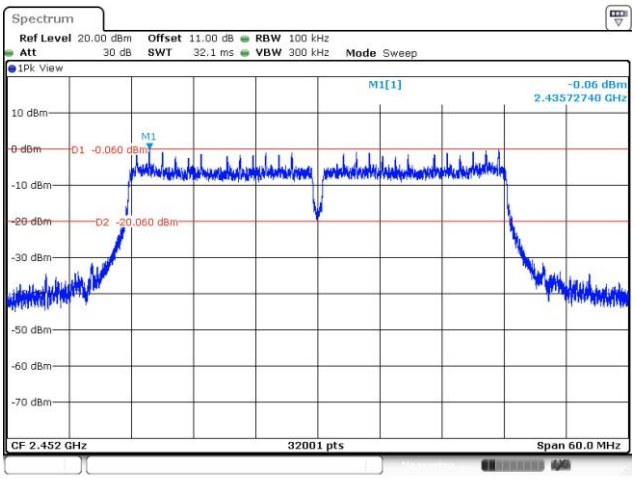
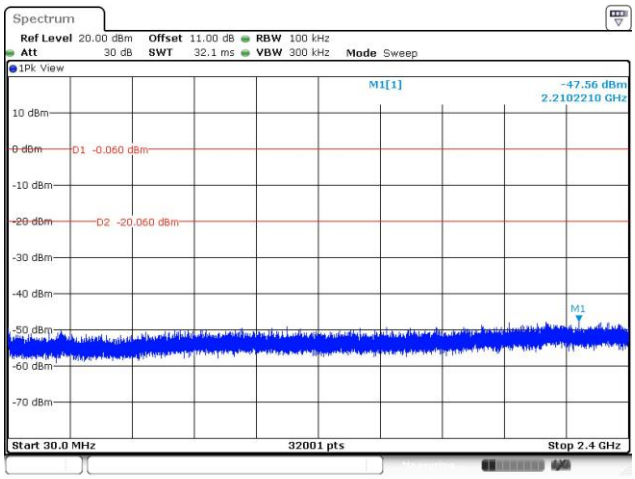
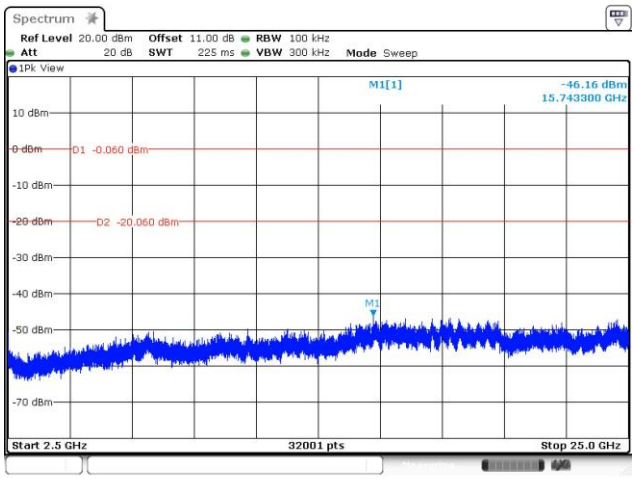
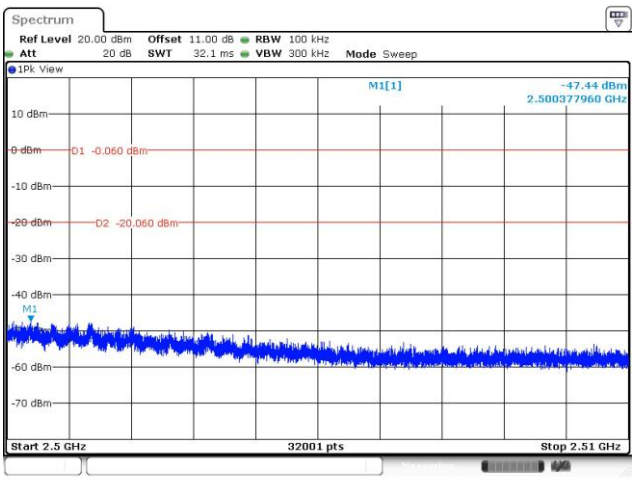
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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==