FCC Test Report

FCC ID	:	**P27NA502S**
Equipment	:	**Multiple RF Home Gateway**
Model No.	:	**NA502S**
Brand Name	:	**Sercomm**
Multiple Listing	:	**Refer to item 1.1.1 for more details**
Applicant	:	**Sercomm Corporation**
Address	:	**8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Nov. 21, 2016**
Tested Date	:	**Nov. 25 ~ Dec. 12, 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.

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
FR6N2103AC	Rev. 01	Initial issue	Mar. 03, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.406MHz 40.96 (Margin -6.77dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 7311.00MHz 52.99 (Margin -1.01dB) – AV [dBuV/m at 3m]: 2390.00MHz 52.99 (Margin -1.01dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 26.42	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 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Product Name	Description
Sercomm	NA502Sxxxxxxxx	Multiple RF Home Gateway	the 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or "-" , for marketing purpose.
MiOS	G550xxxxx	Multiple RF Home Gateway	
Nortek	GC1xxxxxxxx	Multiple RF Home Gateway	
Vera	VeraSecurexxxxx	Multiple RF Home Gateway	
Vera	VeraSecurexxxxx	Advanced Smart Home Security Controller	

- ✦ All models are electrically identical, different model names are for marketing purpose.
- ✦ The above models, model **NA502S** was selected as a representative one for the final test and only its data was recorded in this report.

1.1.2 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.

1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)		
				2400~2483.5	**5150~5250**	**5725~5850**
1	2.4G-1	PIFA	UFL	3.7	---	---
2	2.4G-2	PIFA	UFL	3.9	---	---
3	5G-1	Dipole	UFL	---	1.1	2.2
4	5G-2	PIFA	UFL	---	1.4	3.6

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter

1.1.5 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Adapter	Brand: LEI Model: MU24-Y120200-A2 I/P: 100-240Vac, 50/60Hz, 0.7A O/P: 12Vdc, 2A Power line: 1.5m non-shielded without core
2	Adapter	Brand: APD Model: WA-24Q12FU I/P: 100-240Vac, 50-60Hz, 0.7A O/P: 12Vdc, 2A Power line: 1.5m non-shielded without core
3	Lithium-ion Battery	Brand: Simplo Technology Co. LTD. Model: A3EQ2009H Rating: 7.5Vdc, 2400mAh

1.1.6 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	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	MT7603QA, V0.0.0.72		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	99.65%	0.02
	11g	94.39%	0.25
	HT20	93.97%	0.27
	HT40	83.76%	0.77

1.1.8 Power Setting

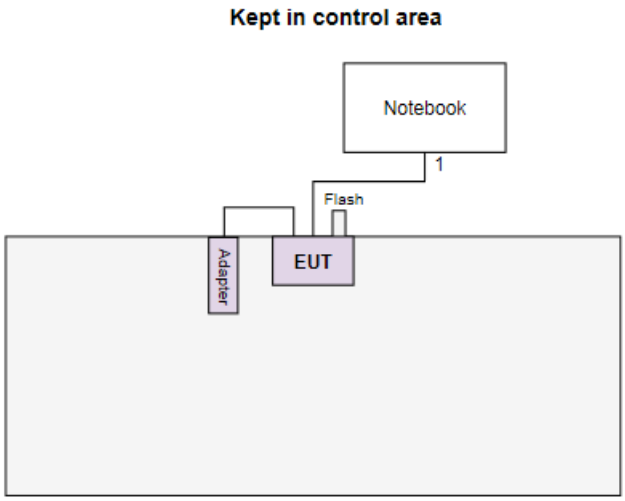
Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	25
11b	2437	22
11b	2462	22
11g	2412	20
11g	2437	29
11g	2462	20
HT20	2412	1E
HT20	2437	29
HT20	2462	1E
HT40	2422	19
HT40	2437	22
HT40	2452	19

1.2 Local Support Equipment List

Support Equipment List						
No.	**Equipment**	**Brand**	**Model**	**S/N**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	9ZFB4X1	DoC	RJ45, 10m non-shielded.
2	USB Flash	SONY	USM16GU	0000020	---	---

1.3 Test Setup Chart

Test Setup Diagram



1. RJ45, 10m non-shielded

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Dec. 12, 2016				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Jan. 12, 2016	Jan. 11, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
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	Nov. 25 ~ Dec. 06, 2016				
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	Aug. 04, 2016	Aug. 03, 2017
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	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Preamplifier	EMC	EMC02325	980225	Aug. 05, 2016	Aug. 04, 2017
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
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 1M	EMC	EMCCFD400-NM-NM-1000	16052	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	Dec. 09, 2016				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 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 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	22°C / 60%	Howard Huang
Radiated Emissions	03CH01-WS	21-22°C / 61-64%	Aska Huang Kevin Lee
RF Conducted	TH01-WS	21°C / 64%	Alex Huang

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

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	HT20	2437	MCS 0	---
Radiated Emissions ≤1GHz	HT20	2437	MCS 0	---
Radiated Emissions >1GHz Maximum Output Power 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. Two adapters (LEI & APD) had been covered during the pretest and found that **LEI adapter** was the worst case and was selected for final test.
2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.

3 Transmitter Test Results

3.1 Conducted Emissions

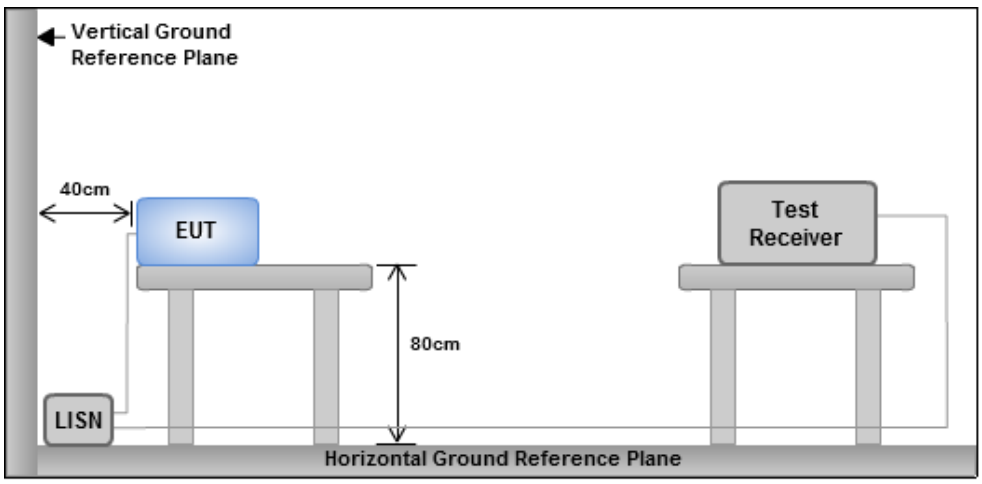
3.1.1 Limit of Conducted Emissions

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

3.1.2 Test Procedures

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

3.1.3 Test Setup

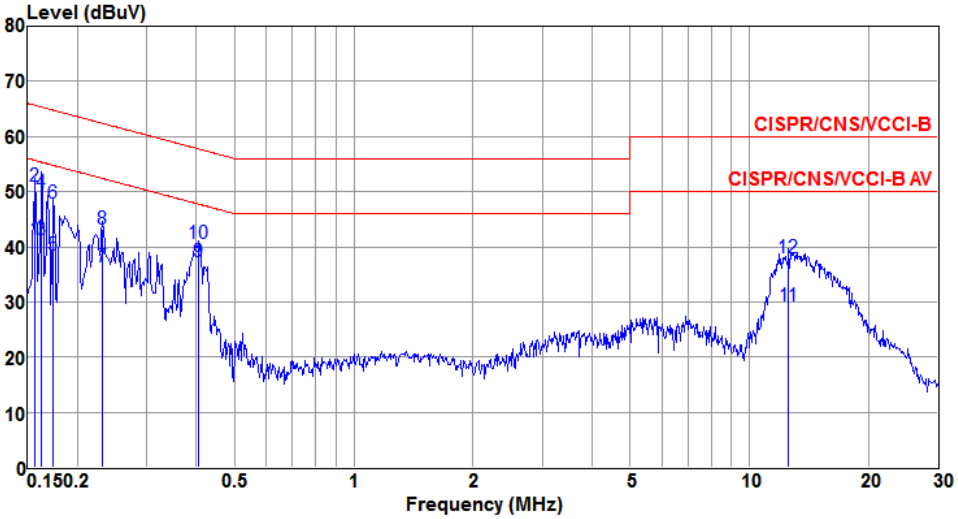


Note: 1. Support units were connected to second LISN.

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

3.1.4 Test Result of Conducted Emissions

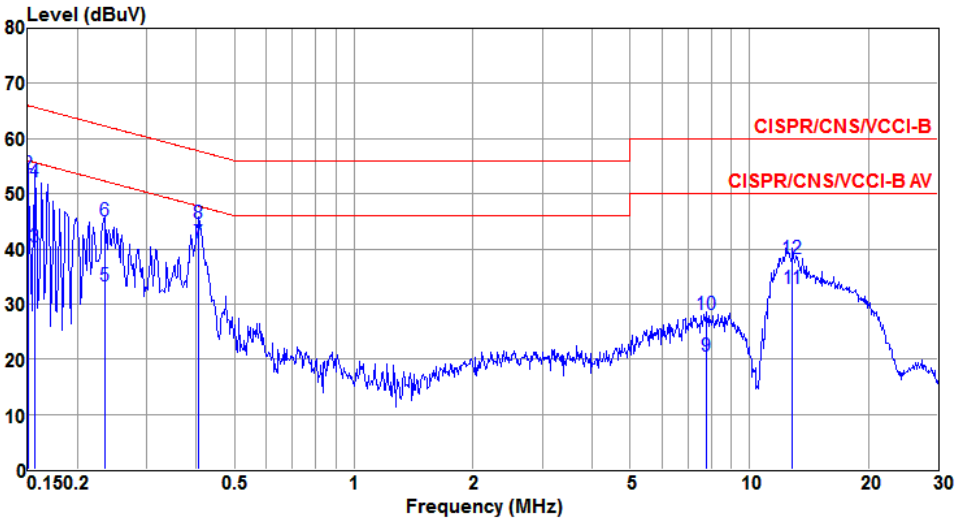
Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.156	41.24	55.65	-14.41	41.15	0.07	0.02	Average
2	0.156	51.09	65.65	-14.56	51.00	0.07	0.02	QP
3	0.162	41.30	55.34	-14.04	41.20	0.08	0.02	Average
4	0.162	49.87	65.34	-15.47	49.77	0.08	0.02	QP
5	0.174	38.42	54.77	-16.35	38.31	0.09	0.02	Average
6	0.174	48.01	64.77	-16.76	47.90	0.09	0.02	QP
7	0.232	36.35	52.39	-16.04	36.24	0.09	0.02	Average
8	0.232	43.28	62.39	-19.11	43.17	0.09	0.02	QP
9@	0.406	37.23	47.73	-10.50	37.14	0.06	0.03	Average
10	0.406	40.69	57.73	-17.04	40.60	0.06	0.03	QP
11	12.582	29.37	50.00	-20.63	28.91	0.27	0.19	Average
12	12.582	38.04	60.00	-21.96	37.58	0.27	0.19	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	0.150	38.38	56.00	-17.62	38.26	0.10	0.02	Average
2	0.150	53.58	66.00	-12.42	53.46	0.10	0.02	QP
3	0.156	40.29	55.65	-15.36	40.17	0.10	0.02	Average
4	0.156	52.06	65.65	-13.59	51.94	0.10	0.02	QP
5	0.234	33.37	52.30	-18.93	33.25	0.10	0.02	Average
6	0.234	44.98	62.30	-17.32	44.86	0.10	0.02	QP
7@	0.406	40.96	47.73	-6.77	40.80	0.13	0.03	Average
8	0.406	44.52	57.73	-13.21	44.36	0.13	0.03	QP
9	7.769	20.64	50.00	-29.36	20.23	0.26	0.15	Average
10	7.769	28.08	60.00	-31.92	27.67	0.26	0.15	QP
11	12.852	32.76	50.00	-17.24	32.22	0.35	0.19	Average
12	12.852	38.36	60.00	-21.64	37.82	0.35	0.19	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

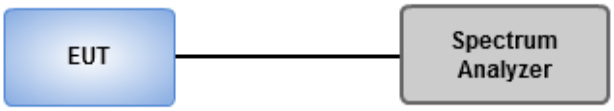
6dB Bandwidth

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.

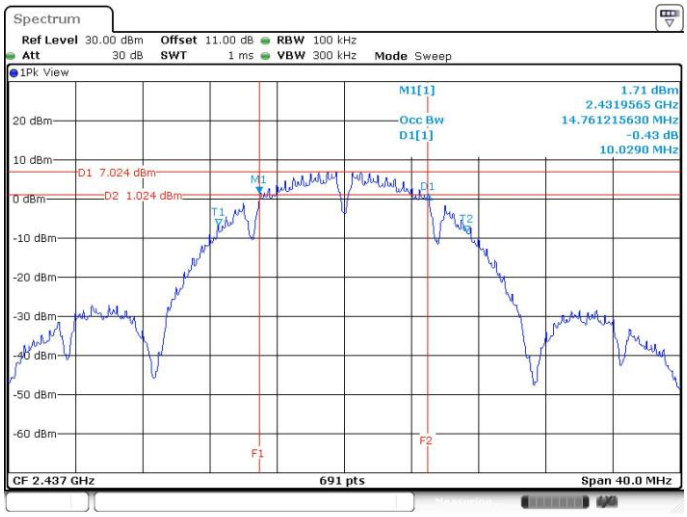
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

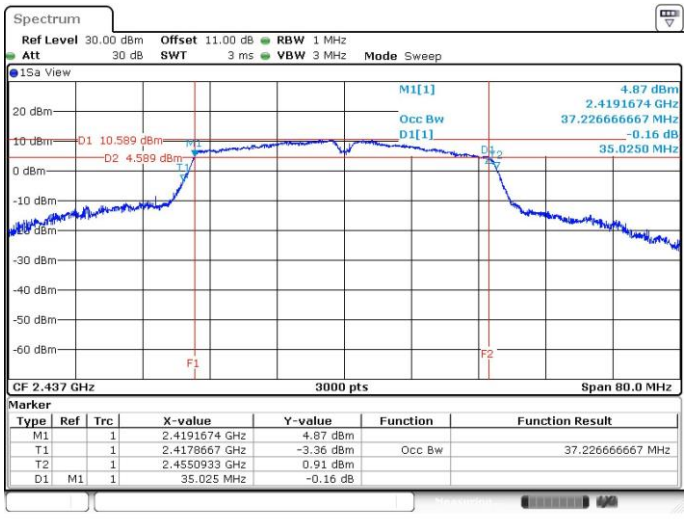
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	10.09	10.09	---	---	500
11b	2	2437	10.03	10.03	---	---	500
11b	2	2462	10.03	10.03	---	---	500
11g	2	2412	13.86	15.13	---	---	500
11g	2	2437	15.30	15.13	---	---	500
11g	2	2462	14.96	15.13	---	---	500
HT20	2	2412	13.86	15.13	---	---	500
HT20	2	2437	15.13	15.71	---	---	500
HT20	2	2462	15.13	16.35	---	---	500
HT40	2	2422	32.58	35.01	---	---	500
HT40	2	2437	32.58	32.58	---	---	500
HT40	2	2452	32.58	35.01	---	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	15.53	15.09	---	---
11b	2	2437	15.09	14.80	---	---
11b	2	2462	15.17	14.83	---	---
11g	2	2412	17.15	16.69	---	---
11g	2	2437	25.03	23.19	---	---
11g	2	2462	17.61	16.87	---	---
HT20	2	2412	17.85	17.64	---	---
HT20	2	2437	25.83	24.68	---	---
HT20	2	2462	18.03	17.71	---	---
HT40	2	2422	36.00	36.24	---	---
HT40	2	2437	37.23	36.83	---	---
HT40	2	2452	36.13	36.21	---	---

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	20.94	20.95	---	---	248.617	23.96	30.00	3.90	27.86	36.00
11b	2	2437	19.36	19.52	---	---	175.834	22.45	30.00	3.90	26.35	36.00
11b	2	2462	19.03	19.25	---	---	164.123	22.15	30.00	3.90	26.05	36.00
11g	2	2412	22.77	22.47	---	---	365.838	25.63	30.00	3.90	29.53	36.00
11g	2	2437	23.32	23.47	---	---	437.114	26.41	30.00	3.90	30.31	36.00
11g	2	2462	21.76	21.93	---	---	305.924	24.86	30.00	3.90	28.76	36.00
HT20	2	2412	22.23	22.4	---	---	340.889	25.33	30.00	3.90	29.23	36.00
HT20	2	2437	23.27	23.54	---	---	438.268	26.42	30.00	3.90	30.32	36.00
HT20	2	2462	21.48	21.74	---	---	289.884	24.62	30.00	3.90	28.52	36.00
HT40	2	2422	20.26	20.14	---	---	209.446	23.21	30.00	3.90	27.11	36.00
HT40	2	2437	22.07	22.17	---	---	325.881	25.13	30.00	3.90	29.03	36.00
HT40	2	2452	19.78	19.67	---	---	187.743	22.74	30.00	3.90	26.64	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	19.3	19.24	---	---	169.060	22.28	---
11b	2	2437	17.65	17.7	---	---	117.095	20.69	---
11b	2	2462	17.33	17.49	---	---	110.180	20.42	---
11g	2	2412	15.99	15.93	---	---	78.893	18.97	---
11g	2	2437	19.5	19.56	---	---	179.490	22.54	---
11g	2	2462	15.42	15.56	---	---	70.809	18.50	---
HT20	2	2412	14.77	14.97	---	---	61.397	17.88	---
HT20	2	2437	19.32	19.59	---	---	176.498	22.47	---
HT20	2	2462	14.32	14.7	---	---	56.552	17.52	---
HT40	2	2422	12.13	12.1	---	---	32.549	15.13	---
HT40	2	2437	16.2	16.29	---	---	84.247	19.26	---
HT40	2	2452	11.87	11.82	---	---	30.587	14.86	---

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

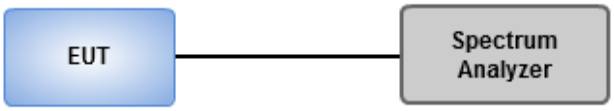
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

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

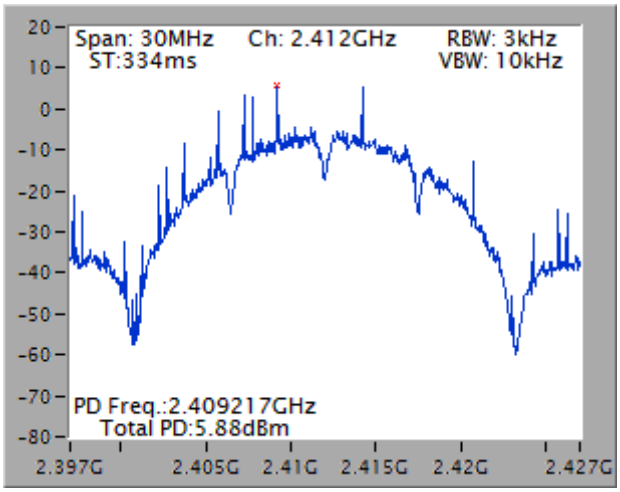


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	5.88	8.00
11b	2	2437	4.35	8.00
11b	2	2462	4.54	8.00
11g	2	2412	-9.01	8.00
11g	2	2437	-5.25	8.00
11g	2	2462	-8.42	8.00
HT20	2	2412	-8.97	8.00
HT20	2	2437	-5.24	8.00
HT20	2	2462	-9.70	8.00
HT40	2	2422	-14.65	8.00
HT40	2	2437	-10.73	8.00
HT40	2	2452	-15.24	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

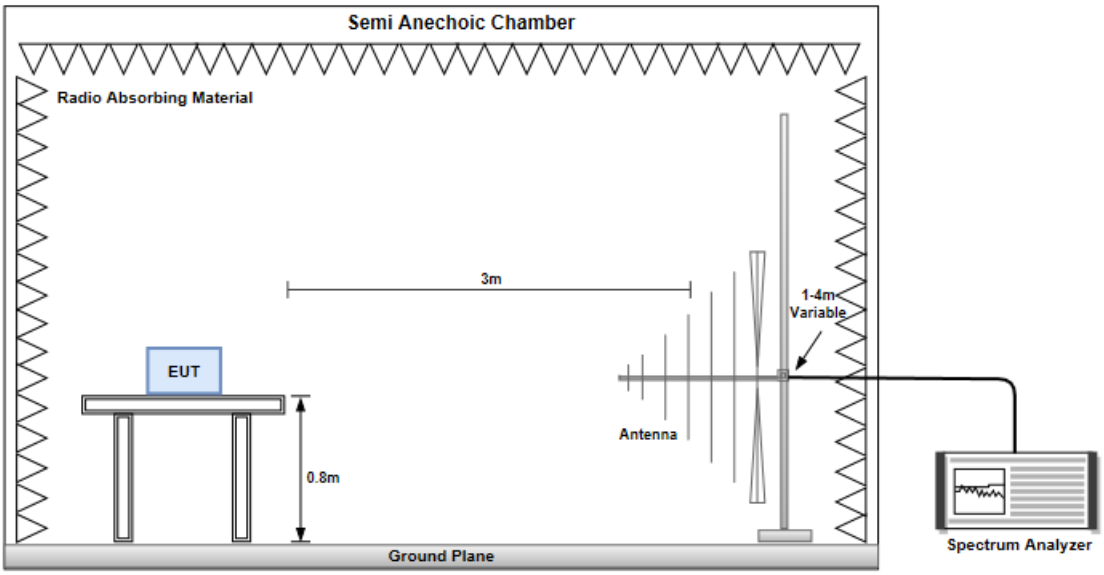
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

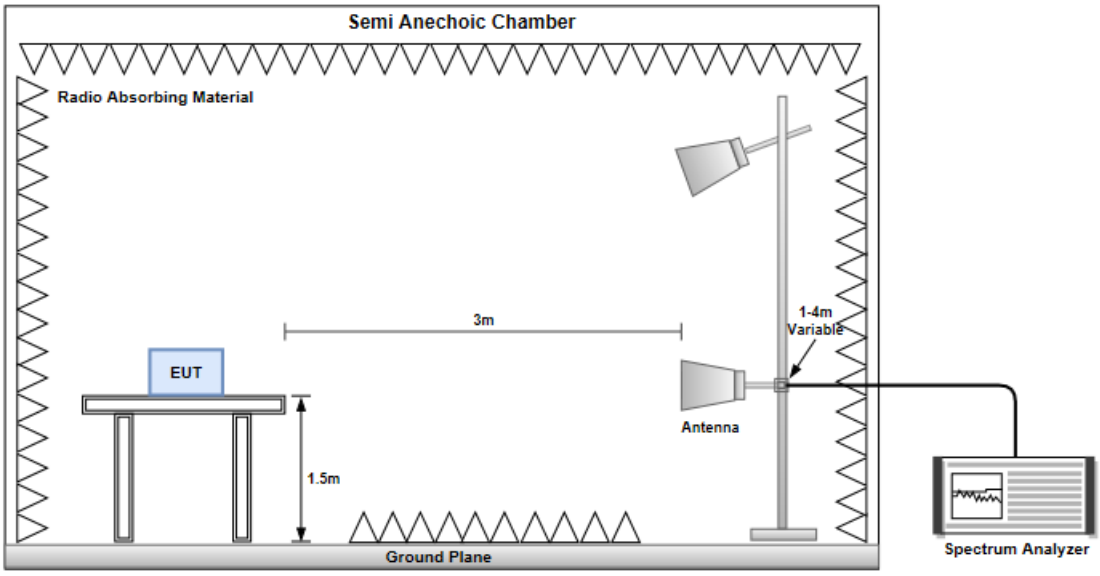
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

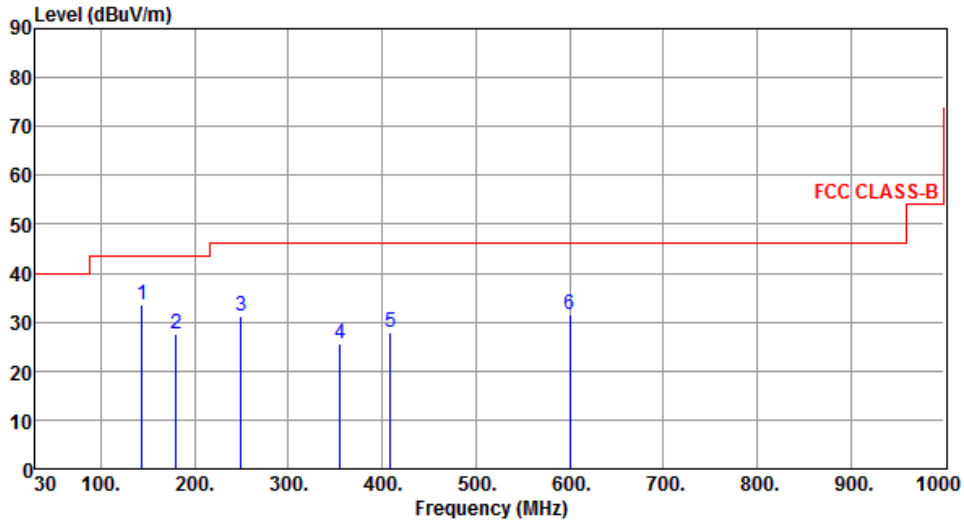


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

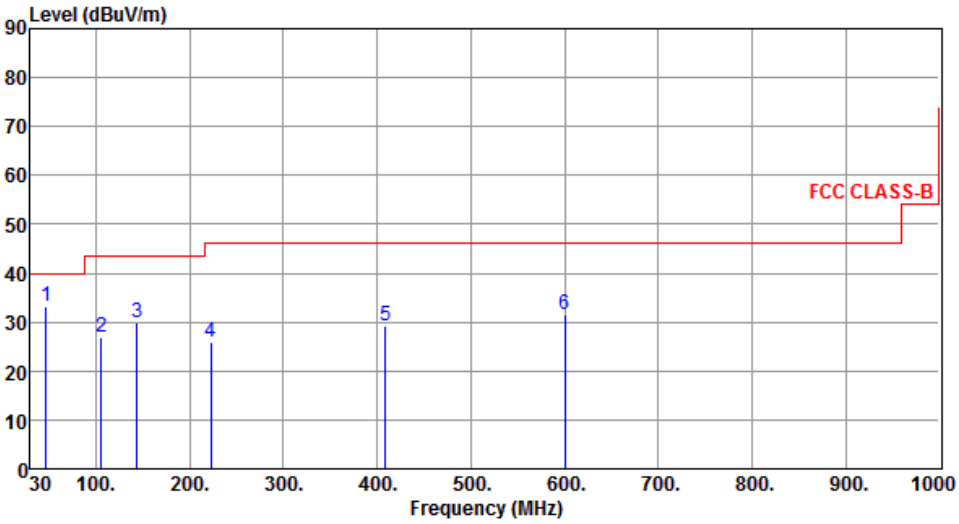
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	143.49	33.68	43.50	-9.82	41.98	-8.30	Peak	---	---
2	180.35	27.40	43.50	-16.10	37.19	-9.79	Peak	---	---
3	249.22	31.15	46.00	-14.85	40.36	-9.21	Peak	---	---
4	354.95	25.56	46.00	-20.44	31.70	-6.14	Peak	---	---
5	409.27	27.87	46.00	-18.13	32.64	-4.77	Peak	---	---
6	600.36	31.52	46.00	-14.48	32.24	-0.72	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		

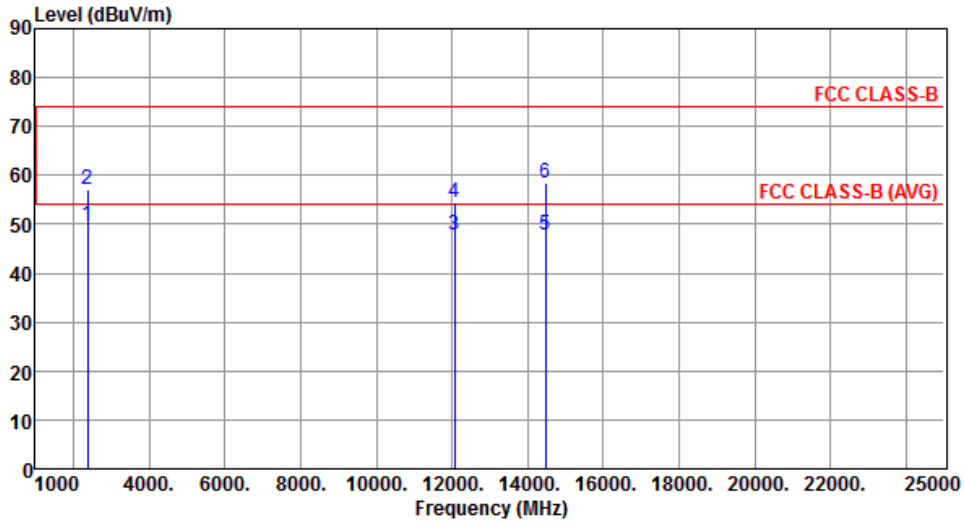


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	46.49	33.10	40.00	-6.90	40.65	-7.55	Peak	---	---
2	105.66	26.80	43.50	-16.70	38.71	-11.91	Peak	---	---
3	143.49	29.91	43.50	-13.59	38.21	-8.30	Peak	---	---
4	223.03	25.96	46.00	-20.04	36.22	-10.26	Peak	---	---
5	409.27	29.07	46.00	-16.93	33.84	-4.77	Peak	---	---
6	600.36	31.47	46.00	-14.53	32.19	-0.72	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

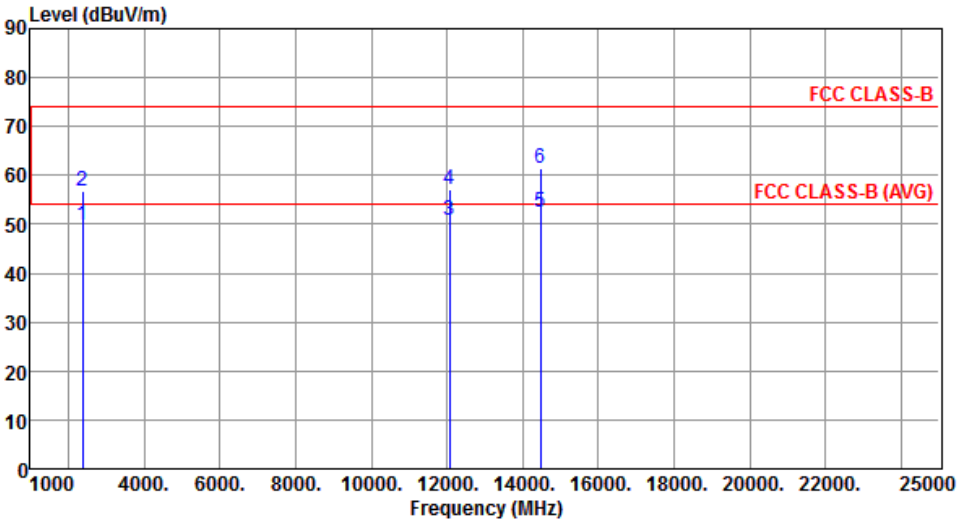
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	49.79	54.00	-4.21	53.08	-3.29	Average	212	241
2	2390.00	57.07	74.00	-16.93	60.36	-3.29	Peak	212	241
3	12060.00	47.99	54.00	-6.01	33.65	14.34	Average	350	122
4	12060.00	54.56	74.00	-19.44	40.22	14.34	Peak	350	122
5	14472.00	47.96	54.00	-6.04	29.36	18.60	Average	153	147
6	14472.00	58.55	74.00	-15.45	39.95	18.60	Peak	153	147

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

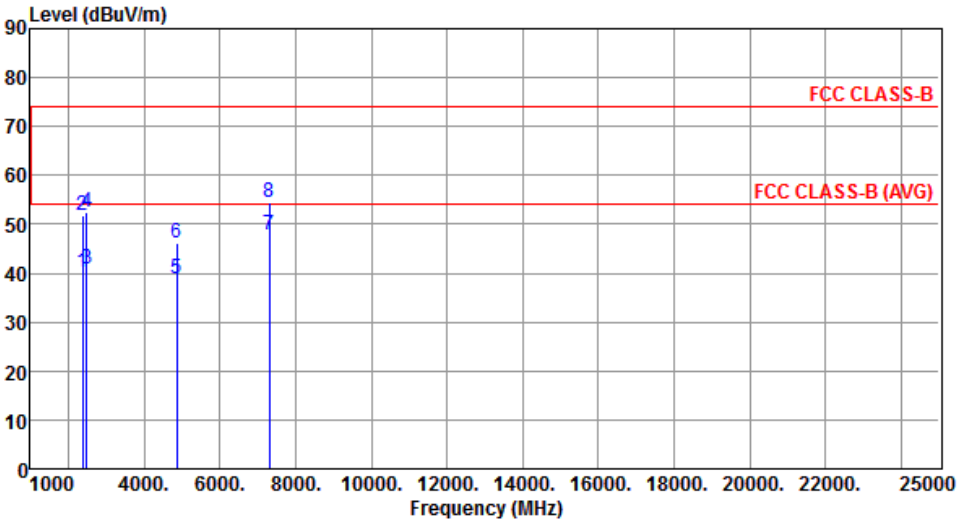
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.90	54.00	-4.10	53.19	-3.29	Average	100	225
2	2390.00	56.78	74.00	-17.22	60.07	-3.29	Peak	100	225
3	12060.00	50.81	54.00	-3.19	36.47	14.34	Average	184	215
4	12060.00	57.27	74.00	-16.73	42.93	14.34	Peak	184	215
5	14472.00	52.48	54.00	-1.52	33.88	18.60	Average	100	234
6	14472.00	61.36	74.00	-12.64	42.76	18.60	Peak	100	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).

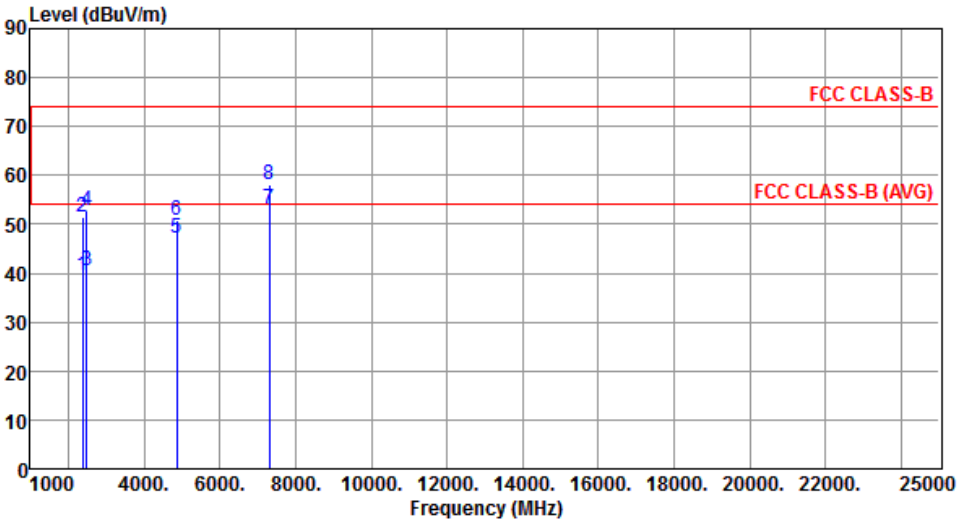
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	40.07	54.00	-13.93	43.36	-3.29	Average	200	256
2	2390.00	51.97	74.00	-22.03	55.26	-3.29	Peak	200	256
3	2483.50	41.01	54.00	-12.99	43.91	-2.90	Average	200	256
4	2483.50	52.34	74.00	-21.66	55.24	-2.90	Peak	200	256
5	4874.00	38.89	54.00	-15.11	35.20	3.69	Average	104	102
6	4874.00	46.32	74.00	-27.68	42.63	3.69	Peak	104	102
7	7311.00	47.89	54.00	-6.11	39.38	8.51	Average	346	130
8	7311.00	54.42	74.00	-19.58	45.91	8.51	Peak	346	130

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).

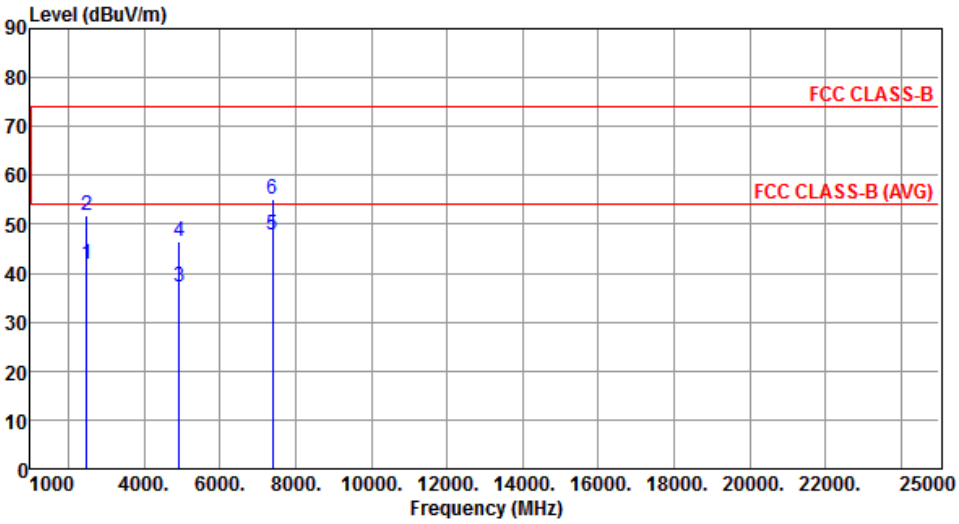
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	39.51	54.00	-14.49	42.80	-3.29	Average	100	226
2	2390.00	51.44	74.00	-22.56	54.73	-3.29	Peak	100	226
3	2483.50	40.45	54.00	-13.55	43.35	-2.90	Average	100	226
4	2483.50	52.68	74.00	-21.32	55.58	-2.90	Peak	100	226
5	4874.00	47.29	54.00	-6.71	43.60	3.69	Average	276	87
6	4874.00	50.84	74.00	-23.16	47.15	3.69	Peak	276	87
7	7311.00	52.99	54.00	-1.01	44.48	8.51	Average	344	166
8	7311.00	58.01	74.00	-15.99	49.50	8.51	Peak	344	166

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

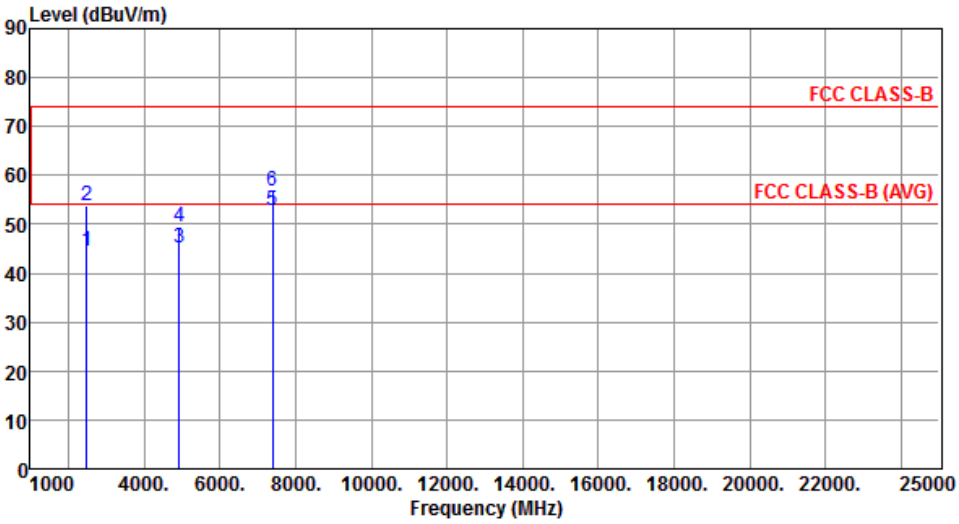
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	41.83	54.00	-12.17	44.73	-2.90	Average	215	273
2	2483.50	51.93	74.00	-22.07	54.83	-2.90	Peak	215	273
3	4924.00	37.14	54.00	-16.86	33.28	3.86	Average	150	109
4	4924.00	46.62	74.00	-27.38	42.76	3.86	Peak	150	109
5	7386.00	47.73	54.00	-6.27	39.19	8.54	Average	353	168
6	7386.00	55.26	74.00	-18.74	46.72	8.54	Peak	353	168

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

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

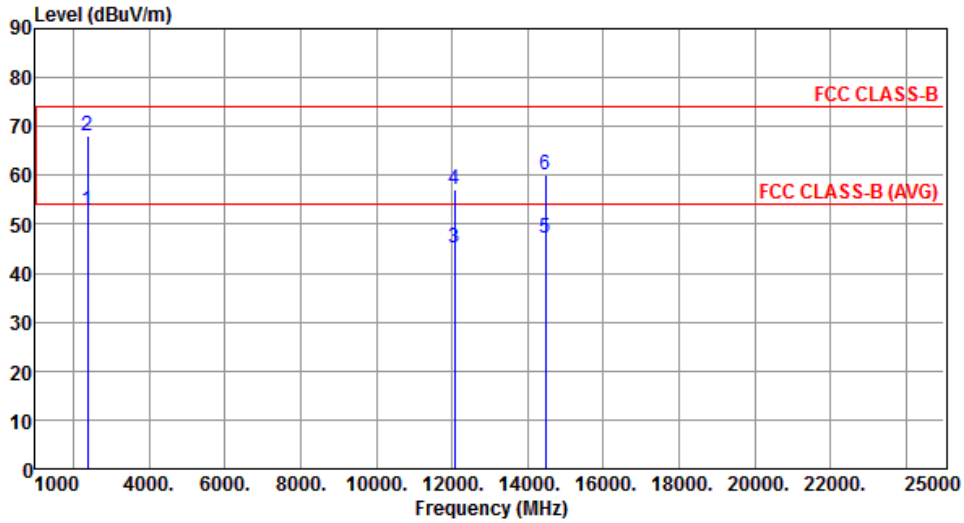


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	44.60	54.00	-9.40	47.50	-2.90	Average	100	224
2	2483.50	53.91	74.00	-20.09	56.81	-2.90	Peak	100	224
3	4924.00	45.16	54.00	-8.84	41.30	3.86	Average	300	207
4	4924.00	49.52	74.00	-24.48	45.66	3.86	Peak	300	207
5	7386.00	52.83	54.00	-1.17	44.29	8.54	Average	343	186
6	7386.00	56.73	74.00	-17.27	48.19	8.54	Peak	343	186

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

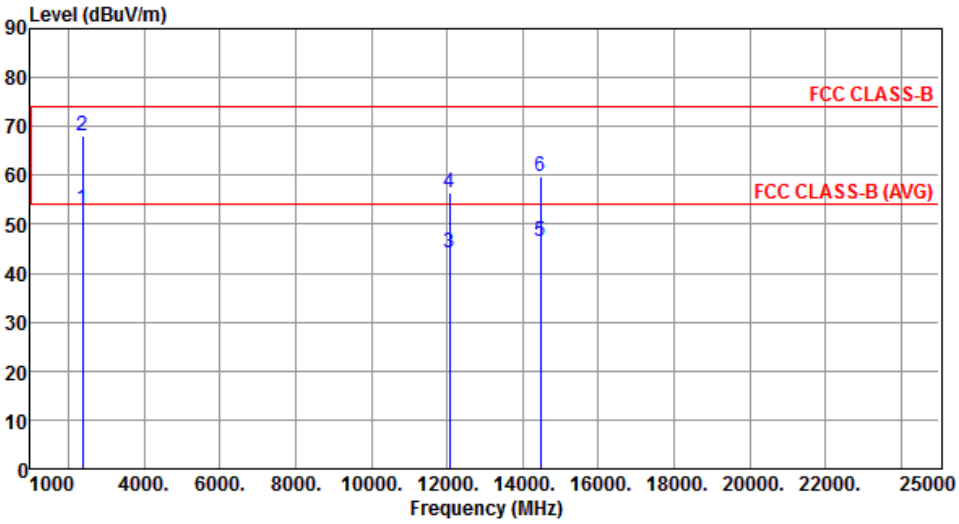
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	52.90	54.00	-1.10	56.19	-3.29	Average	100	244
2	2390.00	68.09	74.00	-5.91	71.38	-3.29	Peak	100	244
3	12060.00	45.07	54.00	-8.93	30.73	14.34	Average	152	241
4	12060.00	57.18	74.00	-16.82	42.84	14.34	Peak	152	241
5	14472.00	47.07	54.00	-6.93	28.47	18.60	Average	100	221
6	14472.00	60.06	74.00	-13.94	41.46	18.60	Peak	100	221

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).

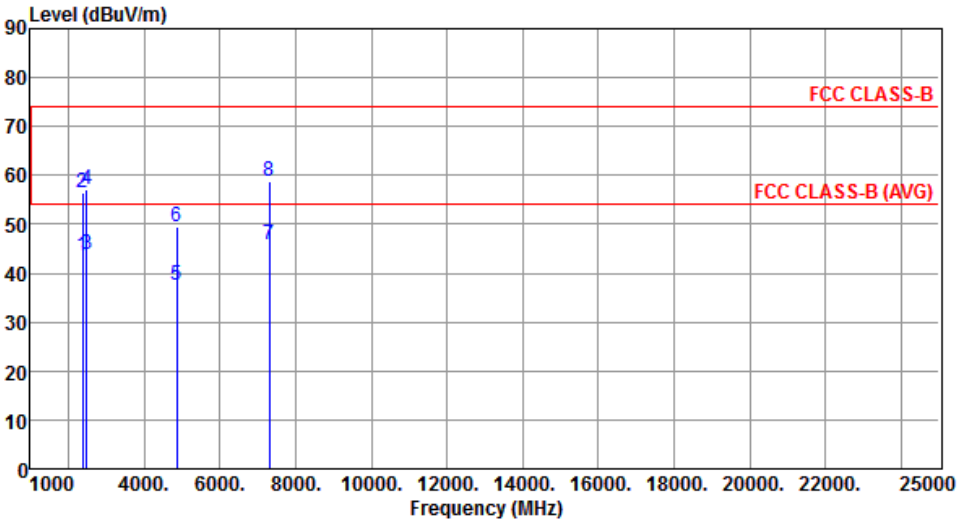
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	52.99	54.00	-1.01	56.28	-3.29	Average	100	132
2	2390.00	68.17	74.00	-5.83	71.46	-3.29	Peak	100	132
3	12060.00	44.01	54.00	-9.99	29.67	14.34	Average	229	5
4	12060.00	56.50	74.00	-17.50	42.16	14.34	Peak	229	5
5	14472.00	46.37	54.00	-7.63	27.77	18.60	Average	100	215
6	14472.00	59.79	74.00	-14.21	41.19	18.60	Peak	100	215

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).

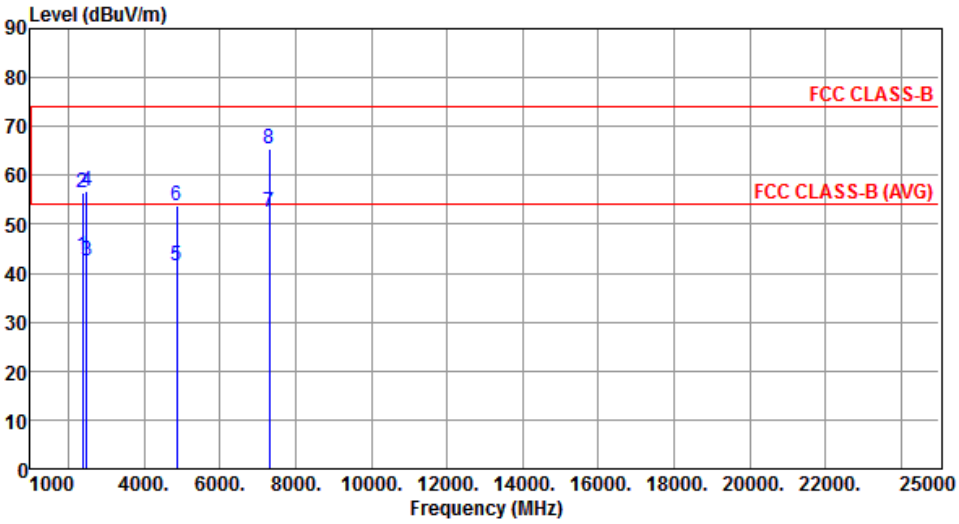
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	43.59	54.00	-10.41	46.88	-3.29	Average	158	248
2	2390.00	56.32	74.00	-17.68	59.61	-3.29	Peak	158	248
3	2483.50	43.69	54.00	-10.31	46.59	-2.90	Average	158	256
4	2483.50	57.09	74.00	-16.91	59.99	-2.90	Peak	158	256
5	4874.00	37.39	54.00	-16.61	33.70	3.69	Average	233	164
6	4874.00	49.40	74.00	-24.60	45.71	3.69	Peak	233	164
7	7311.00	45.82	54.00	-8.18	37.31	8.51	Average	252	58
8	7311.00	58.74	74.00	-15.26	50.23	8.51	Peak	252	58

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).

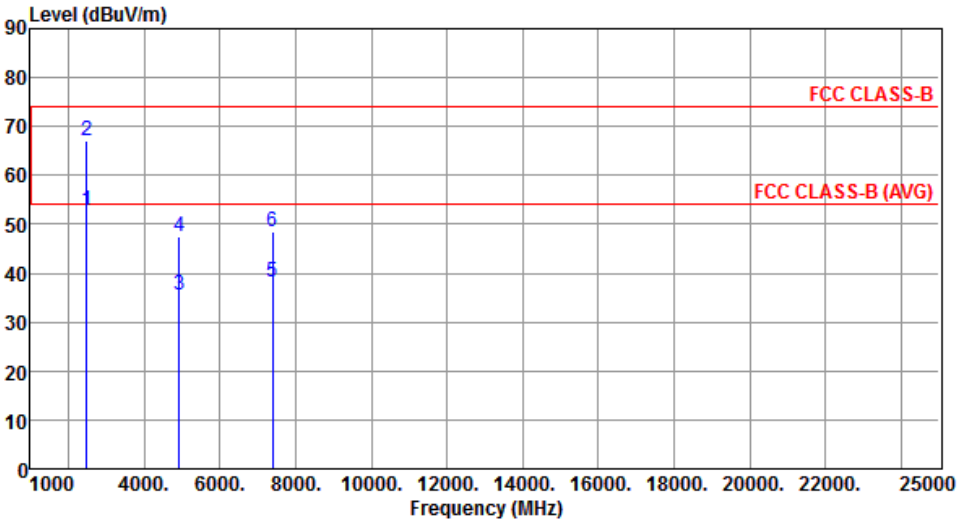
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	43.62	54.00	-10.38	46.91	-3.29	Average	100	234
2	2390.00	56.52	74.00	-17.48	59.81	-3.29	Peak	100	234
3	2483.50	42.50	54.00	-11.50	45.40	-2.90	Average	100	234
4	2483.50	56.90	74.00	-17.10	59.80	-2.90	Peak	100	234
5	4874.00	41.48	54.00	-12.52	37.79	3.69	Average	317	267
6	4874.00	53.75	74.00	-20.25	50.06	3.69	Peak	379	100
7	7311.00	52.61	54.00	-1.39	44.10	8.51	Average	327	185
8	7311.00	65.37	74.00	-8.63	56.86	8.51	Peak	327	185

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).

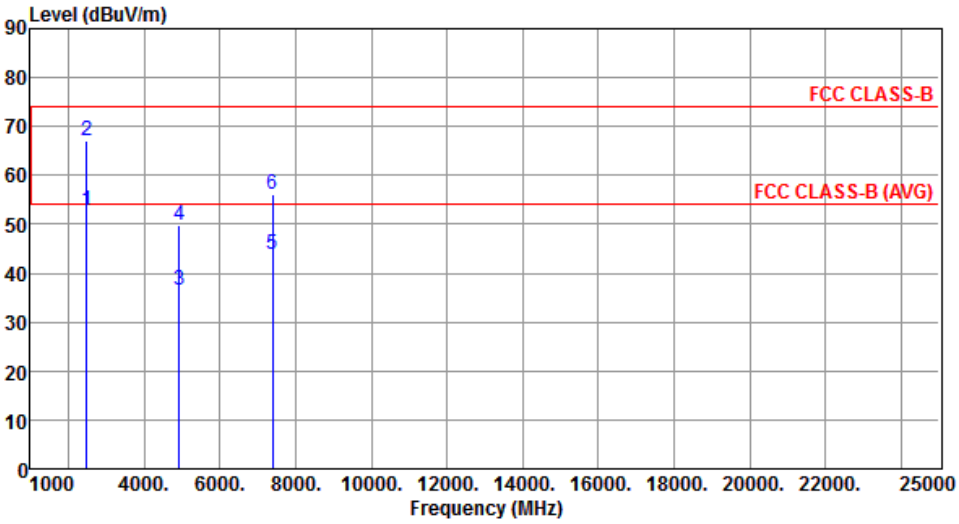
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.70	54.00	-1.30	55.60	-2.90	Average	121	252
2	2483.50	67.00	74.00	-7.00	69.90	-2.90	Peak	121	252
3	4924.00	35.69	54.00	-18.31	31.83	3.86	Average	253	161
4	4924.00	47.47	74.00	-26.53	43.61	3.86	Peak	253	161
5	7386.00	38.05	54.00	-15.95	29.51	8.54	Average	250	47
6	7386.00	48.38	74.00	-25.62	39.84	8.54	Peak	250	47

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

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

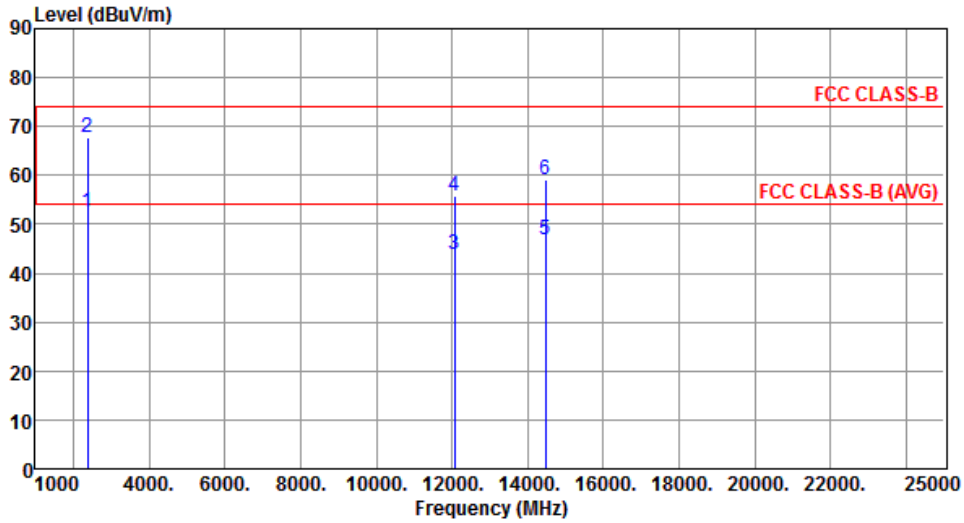


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.78	54.00	-1.22	55.68	-2.90	Average	100	212
2	2483.50	66.93	74.00	-7.07	69.83	-2.90	Peak	100	212
3	4924.00	36.62	54.00	-17.38	32.76	3.86	Average	257	95
4	4924.00	49.75	74.00	-24.25	45.89	3.86	Peak	257	95
5	7386.00	43.75	54.00	-10.25	35.21	8.54	Average	348	184
6	7386.00	56.24	74.00	-17.76	47.70	8.54	Peak	348	184

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

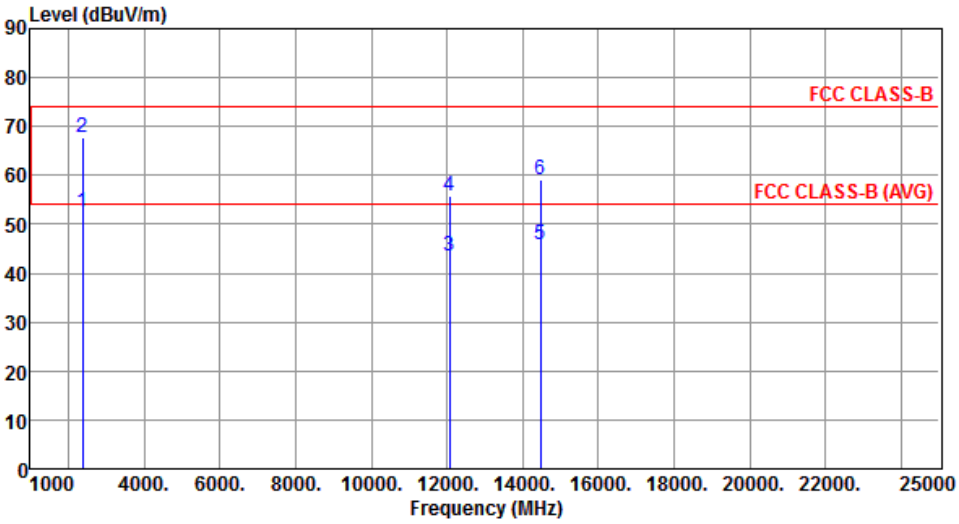
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.43	54.00	-1.57	55.72	-3.29	Average	156	261
2	2390.00	67.62	74.00	-6.38	70.91	-3.29	Peak	156	261
3	12060.00	43.73	54.00	-10.27	29.39	14.34	Average	215	114
4	12060.00	55.71	74.00	-18.29	41.37	14.34	Peak	215	114
5	14472.00	46.67	54.00	-7.33	28.07	18.60	Average	100	257
6	14472.00	59.23	74.00	-14.77	40.63	18.60	Peak	100	257

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

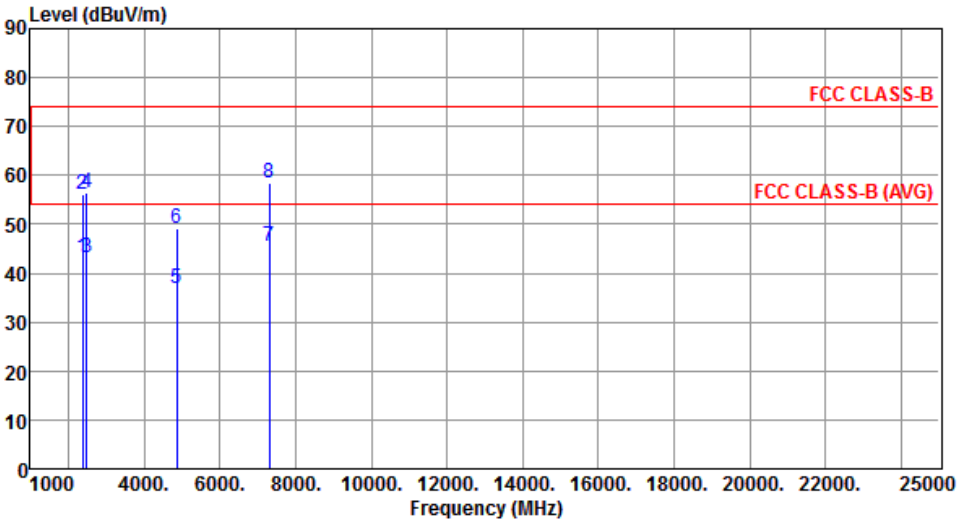
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.58	54.00	-1.42	55.87	-3.29	Average	100	214
2	2390.00	67.66	74.00	-6.34	70.95	-3.29	Peak	100	214
3	12060.00	43.36	54.00	-10.64	29.02	14.34	Average	236	12
4	12060.00	55.73	74.00	-18.27	41.39	14.34	Peak	236	12
5	14472.00	45.89	54.00	-8.11	27.29	18.60	Average	100	236
6	14472.00	59.11	74.00	-14.89	40.51	18.60	Peak	100	236

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).

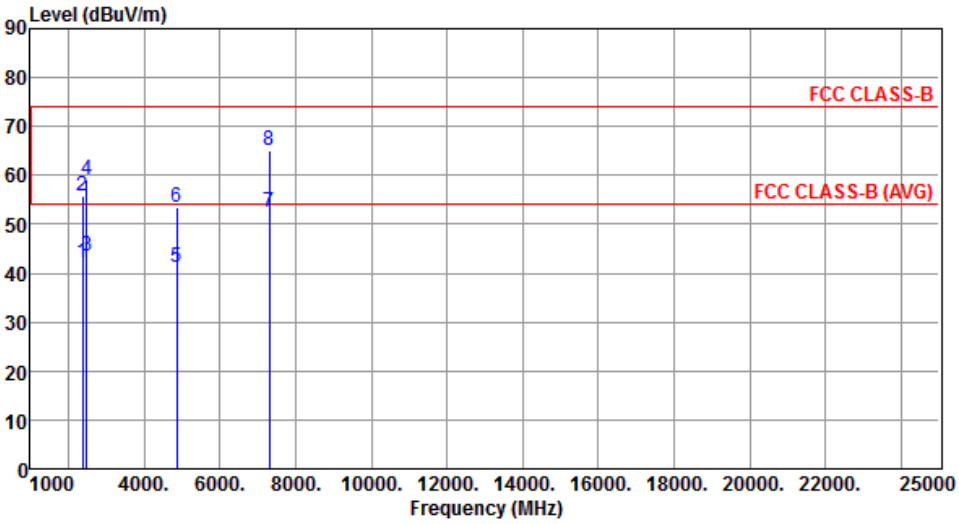
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	43.16	54.00	-10.84	46.45	-3.29	Average	162	237
2	2390.00	56.07	74.00	-17.93	59.36	-3.29	Peak	162	237
3	2483.50	43.29	54.00	-10.71	46.19	-2.90	Average	162	237
4	2483.50	56.53	74.00	-17.47	59.43	-2.90	Peak	162	237
5	4874.00	36.91	54.00	-17.09	33.22	3.69	Average	243	159
6	4874.00	49.05	74.00	-24.95	45.36	3.69	Peak	243	159
7	7311.00	45.60	54.00	-8.40	37.09	8.51	Average	258	51
8	7311.00	58.46	74.00	-15.54	49.95	8.51	Peak	258	51

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

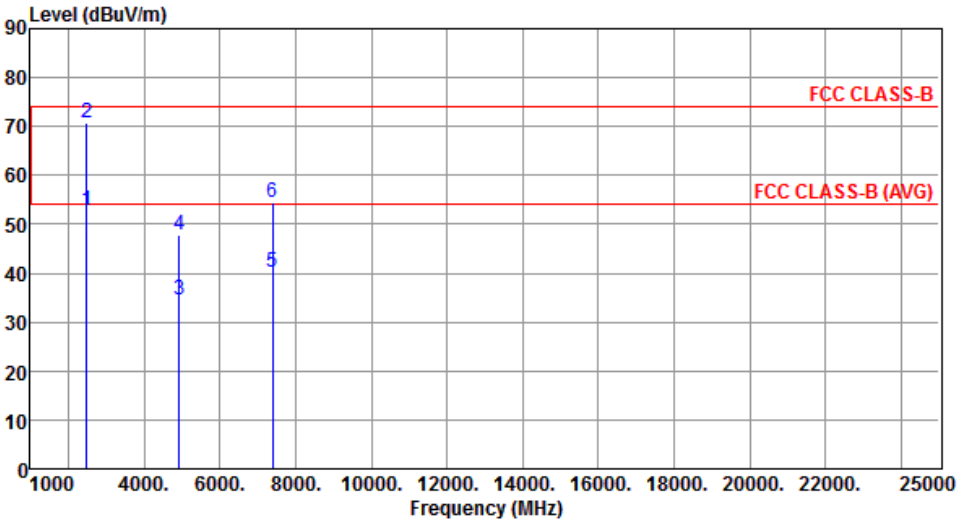
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.28	54.00	-11.72	45.57	-3.29	Average	100	233
2	2390.00	55.84	74.00	-18.16	59.13	-3.29	Peak	100	233
3	2483.50	43.53	54.00	-10.47	46.43	-2.90	Average	100	233
4	2483.50	58.97	74.00	-15.03	61.87	-2.90	Peak	100	233
5	4874.00	41.12	54.00	-12.88	37.43	3.69	Average	314	272
6	4874.00	53.48	74.00	-20.52	49.79	3.69	Peak	314	272
7	7311.00	52.50	54.00	-1.50	43.99	8.51	Average	311	183
8	7311.00	64.93	74.00	-9.07	56.42	8.51	Peak	311	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).

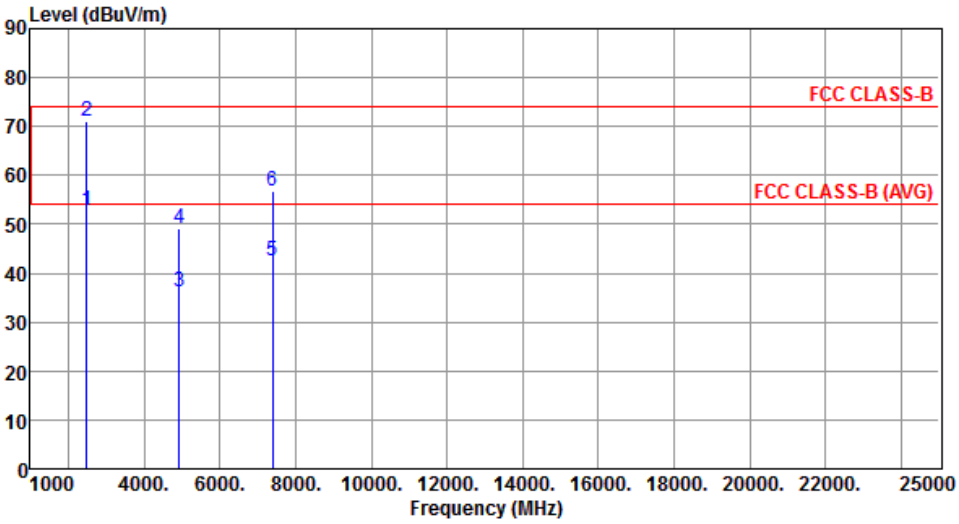
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.71	54.00	-1.29	55.61	-2.90	Average	165	243
2	2483.50	70.89	74.00	-3.11	73.79	-2.90	Peak	165	243
3	4924.00	34.59	54.00	-19.41	30.73	3.86	Average	253	170
4	4924.00	47.69	74.00	-26.31	43.83	3.86	Peak	253	170
5	7386.00	40.05	54.00	-13.95	31.51	8.54	Average	255	62
6	7386.00	54.32	74.00	-19.68	45.78	8.54	Peak	255	62

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

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

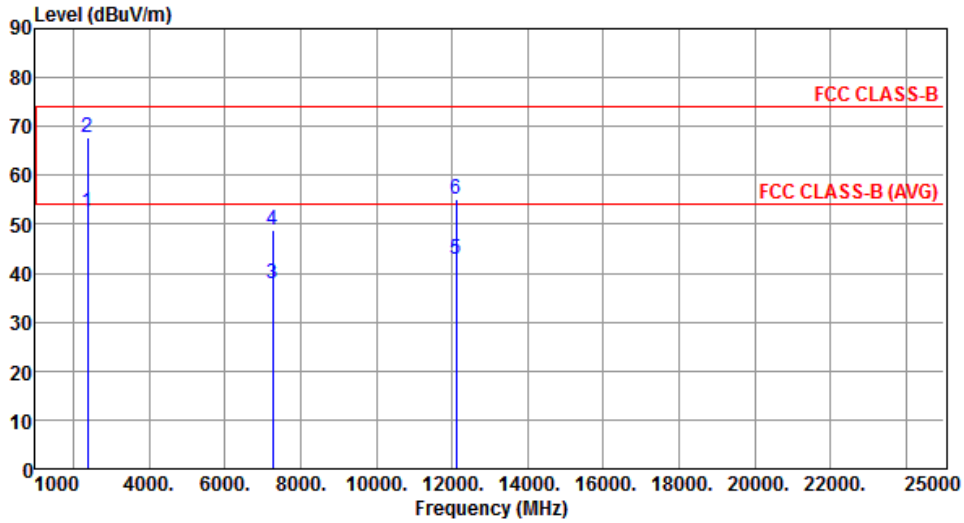


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.80	54.00	-1.20	55.70	-2.90	Average	100	234
2	2483.50	70.94	74.00	-3.06	73.84	-2.90	Peak	100	234
3	4924.00	36.21	54.00	-17.79	32.35	3.86	Average	263	91
4	4924.00	49.28	74.00	-24.72	45.42	3.86	Peak	263	91
5	7386.00	42.50	54.00	-11.50	33.96	8.54	Average	361	182
6	7386.00	56.72	74.00	-17.28	48.18	8.54	Peak	361	182

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

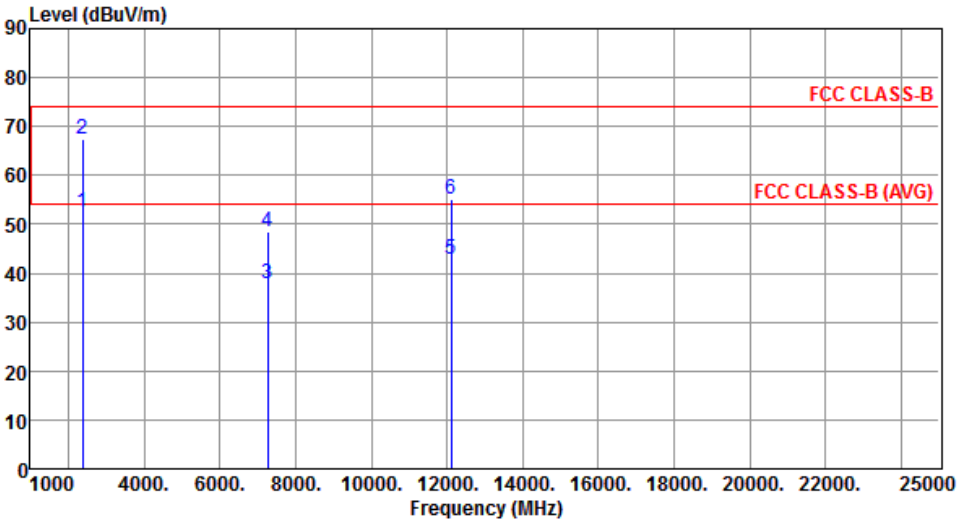
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	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	52.51	54.00	-1.49	55.80	-3.29	Average	106	250
2	2390.00	67.91	74.00	-6.09	71.20	-3.29	Peak	106	250
3	7266.00	37.81	54.00	-16.19	29.30	8.51	Average	255	170
4	7266.00	48.68	74.00	-25.32	40.17	8.51	Peak	255	170
5	12110.00	42.82	54.00	-11.18	28.43	14.39	Average	292	53
6	12110.00	55.03	74.00	-18.97	40.64	14.39	Peak	292	53

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

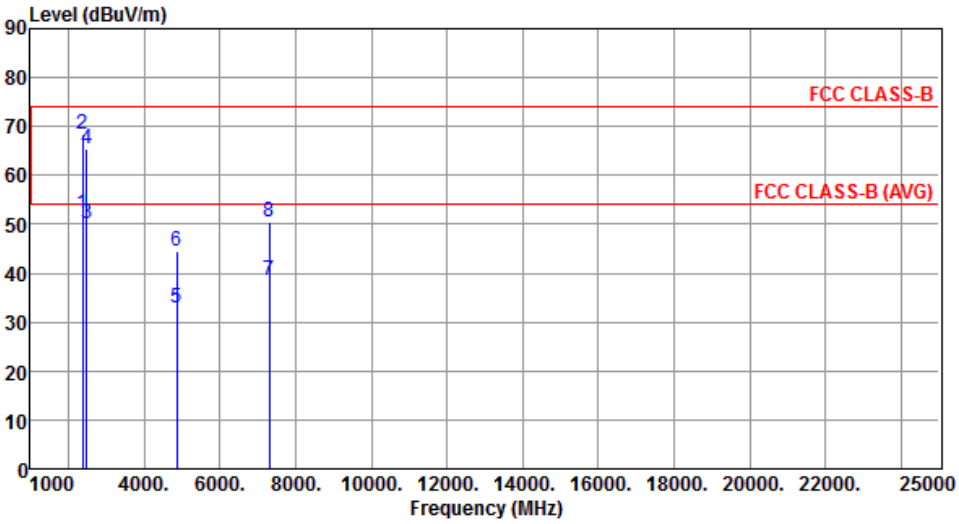
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	52.64	54.00	-1.36	55.93	-3.29	Average	100	134
2	2390.00	67.48	74.00	-6.52	70.77	-3.29	Peak	100	134
3	7266.00	37.88	54.00	-16.12	29.37	8.51	Average	213	342
4	7266.00	48.34	74.00	-25.66	39.83	8.51	Peak	213	342
5	12110.00	42.75	54.00	-11.25	28.36	14.39	Average	100	242
6	12110.00	55.14	74.00	-18.86	40.75	14.39	Peak	100	242

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).

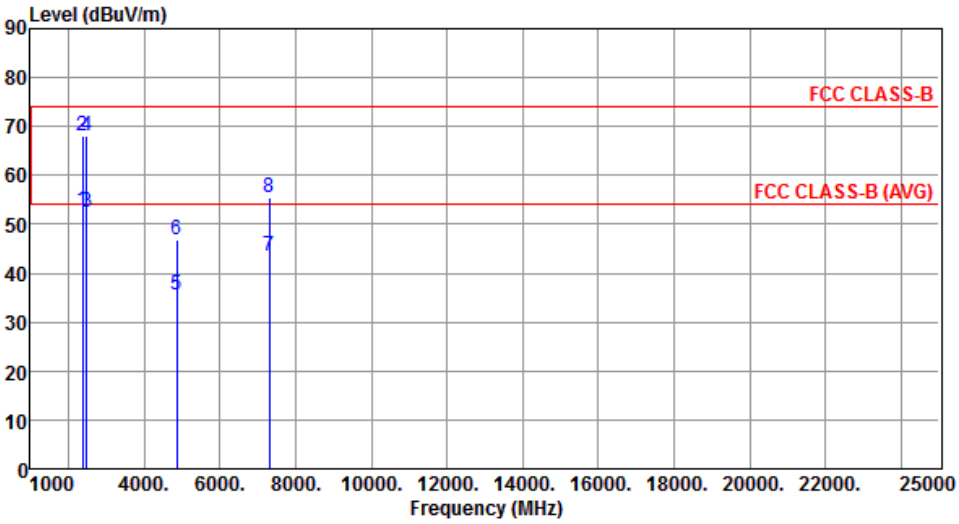
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	52.24	54.00	-1.76	55.53	-3.29	Average	160	158
2	2390.00	68.47	74.00	-5.53	71.76	-3.29	Peak	160	158
3	2483.50	50.30	54.00	-3.70	53.20	-2.90	Average	160	254
4	2483.50	65.38	74.00	-8.62	68.28	-2.90	Peak	160	254
5	4874.00	32.90	54.00	-21.10	29.21	3.69	Average	251	163
6	4874.00	44.63	74.00	-29.37	40.94	3.69	Peak	251	163
7	7311.00	38.62	54.00	-15.38	30.11	8.51	Average	285	60
8	7311.00	50.36	74.00	-23.64	41.85	8.51	Peak	285	60

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).

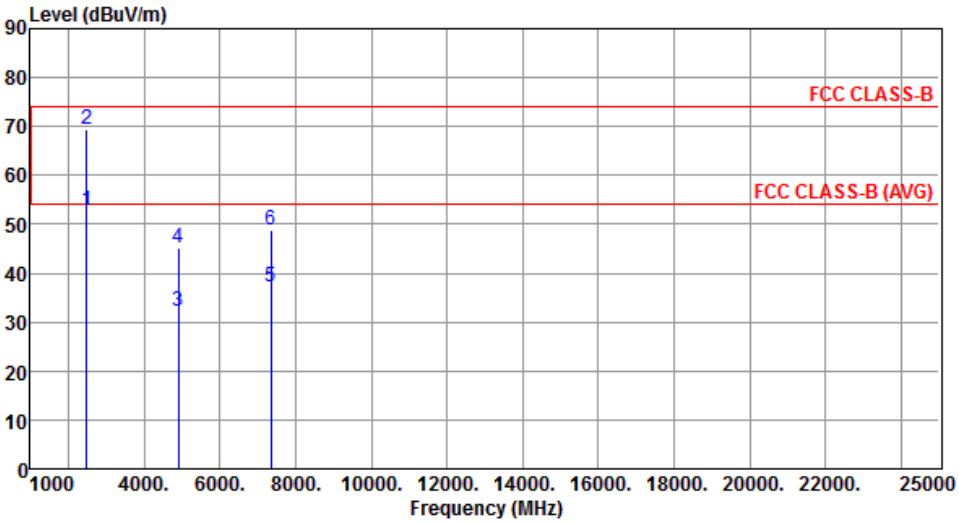
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	52.67	54.00	-1.33	55.96	-3.29	Average	100	212
2	2390.00	68.07	74.00	-5.93	71.36	-3.29	Peak	100	212
3	2483.50	52.55	54.00	-1.45	55.45	-2.90	Average	100	235
4	2483.50	67.94	74.00	-6.06	70.84	-2.90	Peak	100	235
5	4874.00	35.64	54.00	-18.36	31.95	3.69	Average	320	266
6	4874.00	46.93	74.00	-27.07	43.24	3.69	Peak	320	266
7	7311.00	43.52	54.00	-10.48	35.01	8.51	Average	351	184
8	7311.00	55.42	74.00	-18.58	46.91	8.51	Peak	351	184

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).

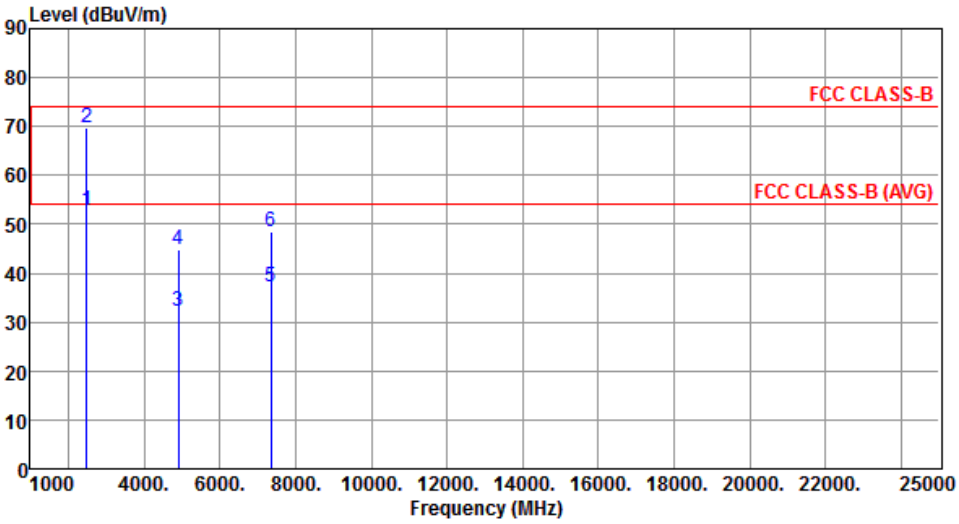
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	52.77	54.00	-1.23	55.67	-2.90	Average	191	147
2	2483.50	69.49	74.00	-4.51	72.39	-2.90	Peak	191	147
3	4904.00	32.28	54.00	-21.72	28.48	3.80	Average	181	48
4	4904.00	45.17	74.00	-28.83	41.37	3.80	Peak	181	48
5	7356.00	37.26	54.00	-16.74	28.73	8.53	Average	262	108
6	7356.00	48.68	74.00	-25.32	40.15	8.53	Peak	262	108

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

Modulation	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	52.85	54.00	-1.15	55.75	-2.90	Average	100	237
2	2483.50	69.58	74.00	-4.42	72.48	-2.90	Peak	100	237
3	4904.00	32.28	54.00	-21.72	28.48	3.80	Average	278	99
4	4904.00	45.00	74.00	-29.00	41.20	3.80	Peak	278	99
5	7356.00	37.33	54.00	-16.67	28.80	8.53	Average	353	178
6	7356.00	48.51	74.00	-25.49	39.98	8.53	Peak	353	178

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

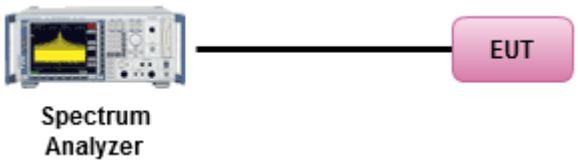
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

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

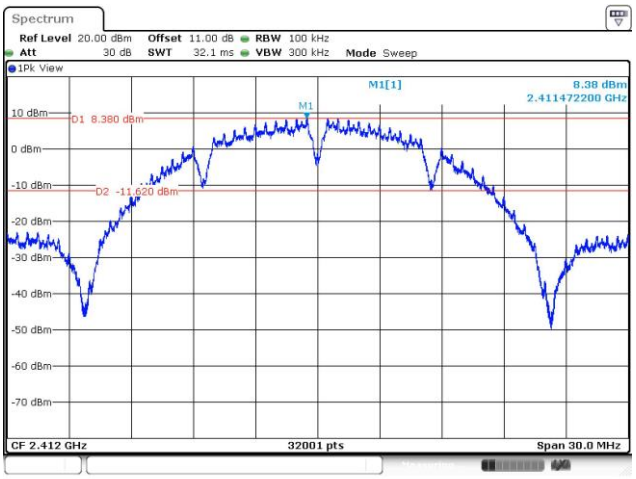
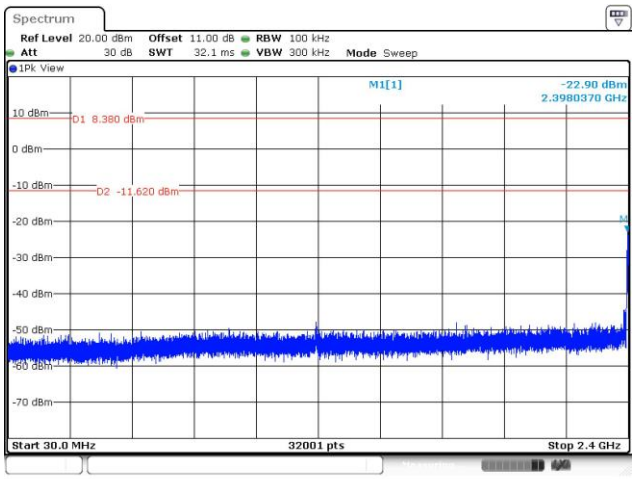
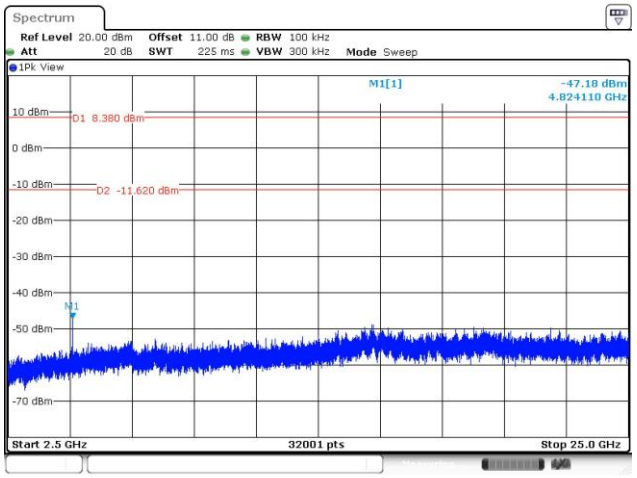
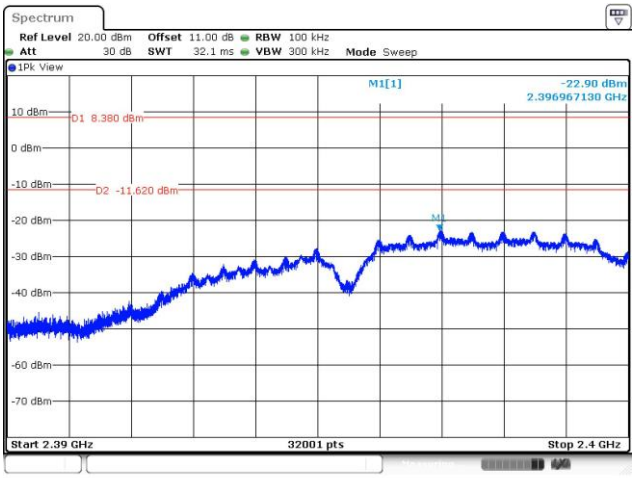


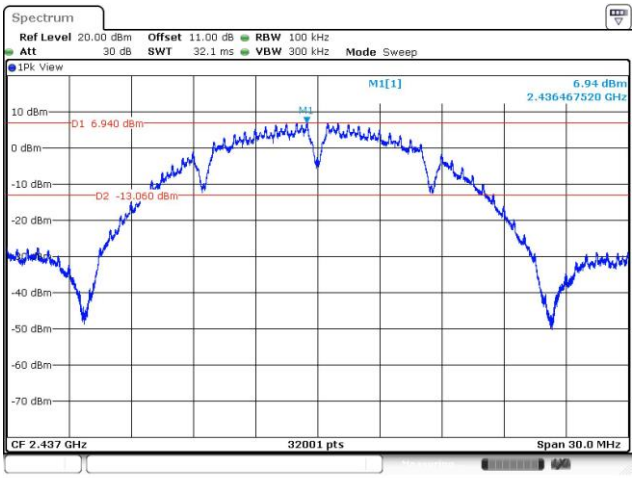
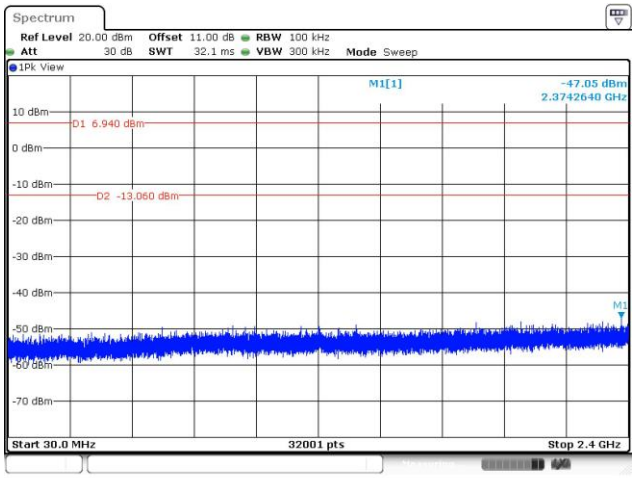
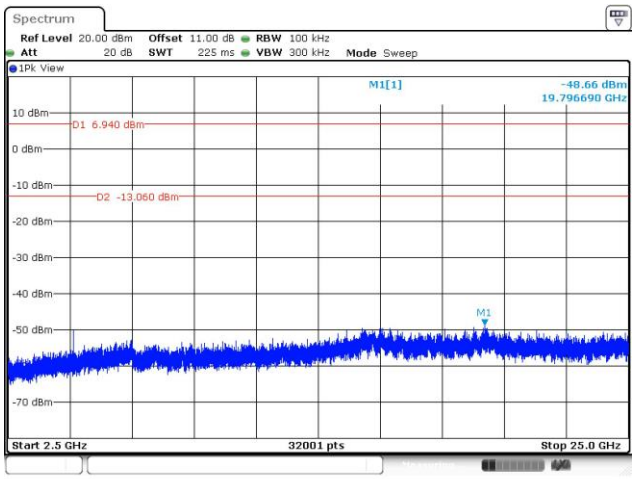
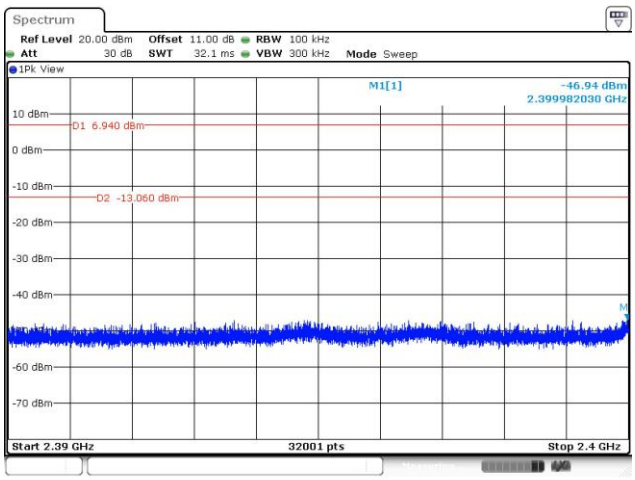
3.6.5 Test Result of Emissions in non-restricted frequency bands

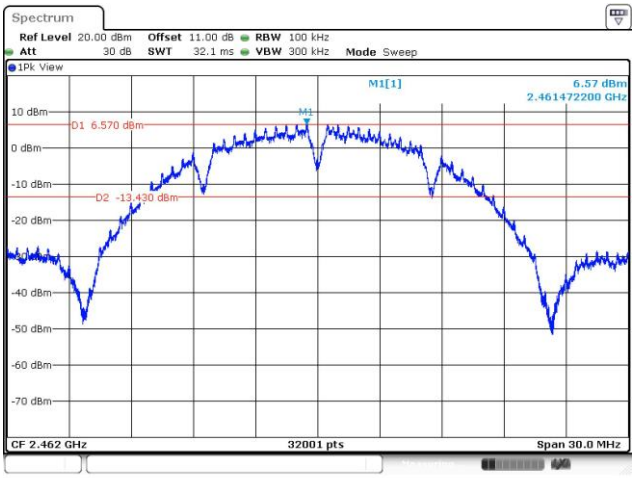
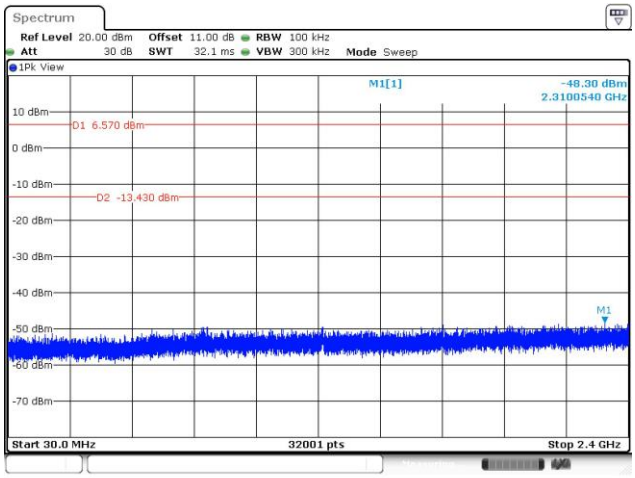
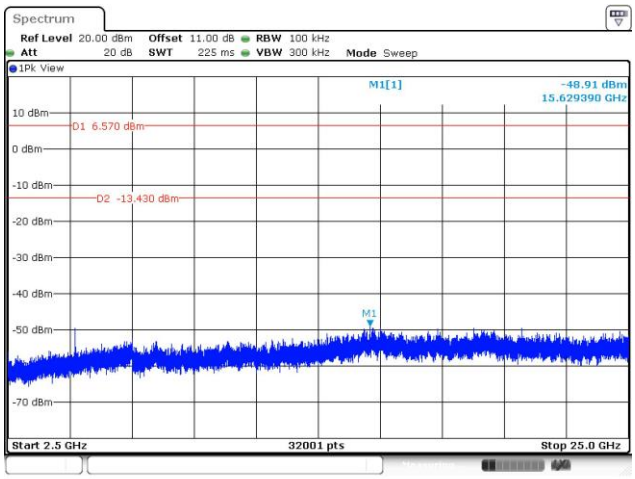
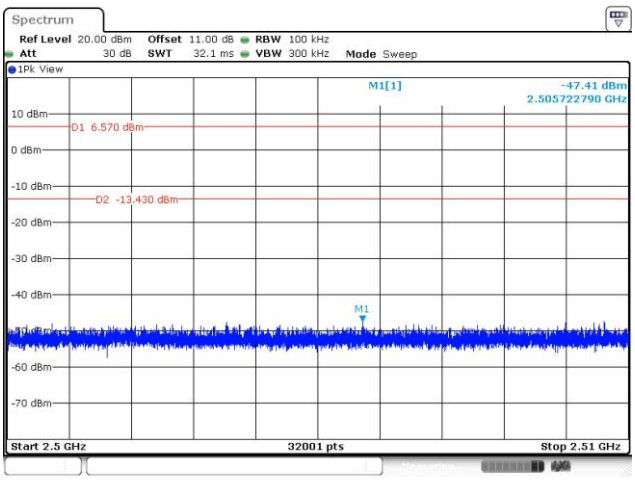
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.6 Unwanted Emissions into Non-Restricted Frequency Bands

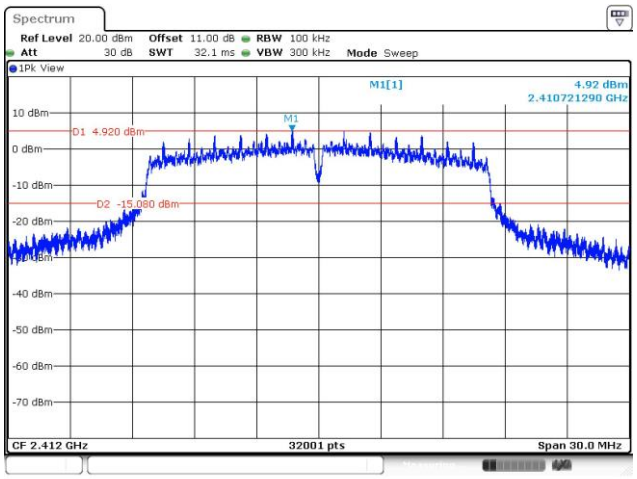
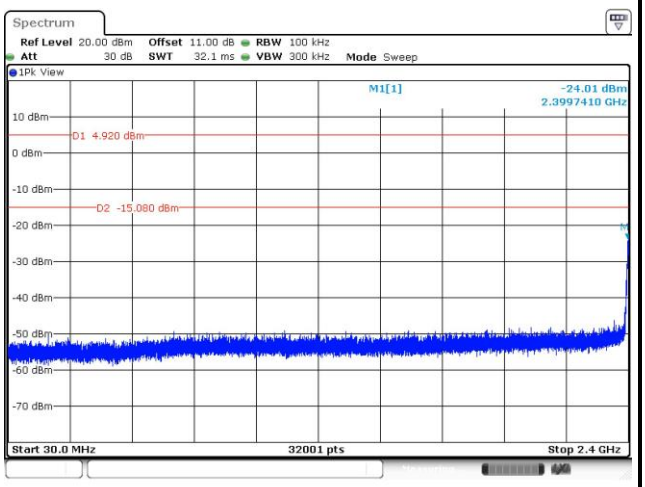
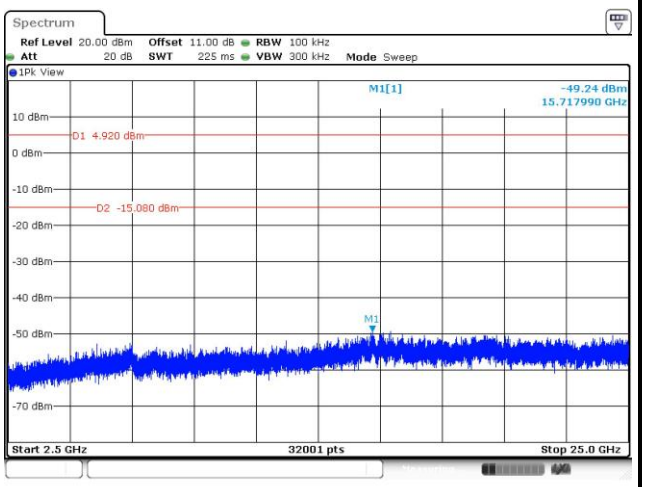
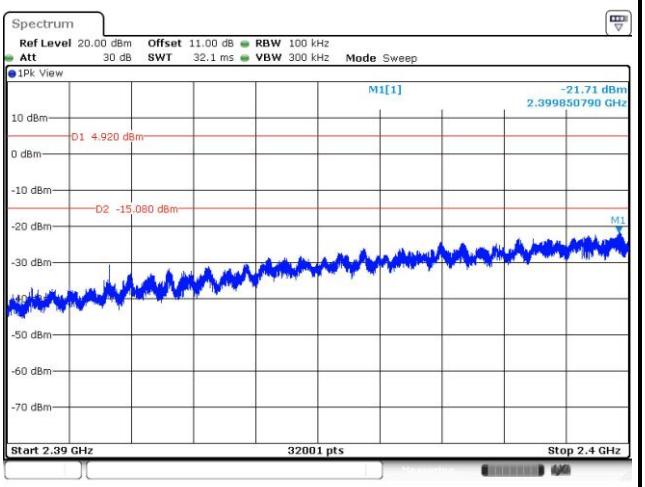
802.11b

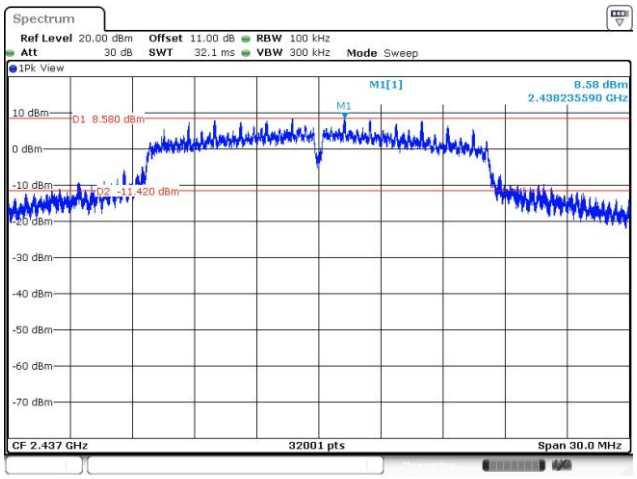
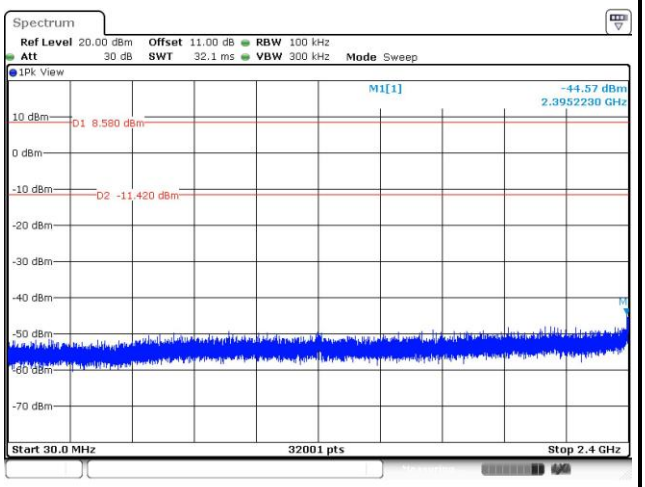
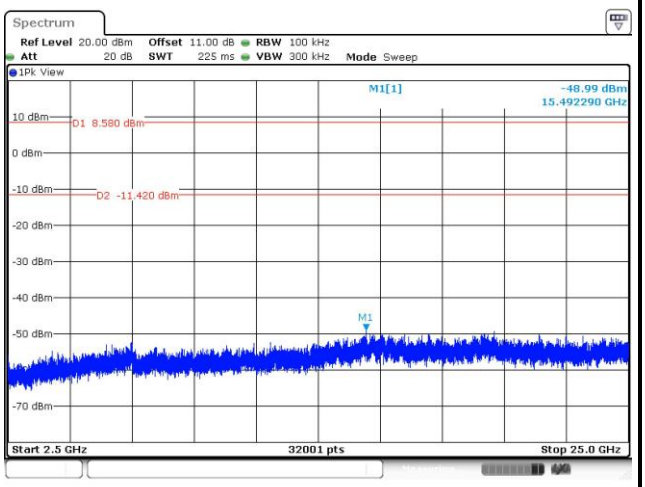
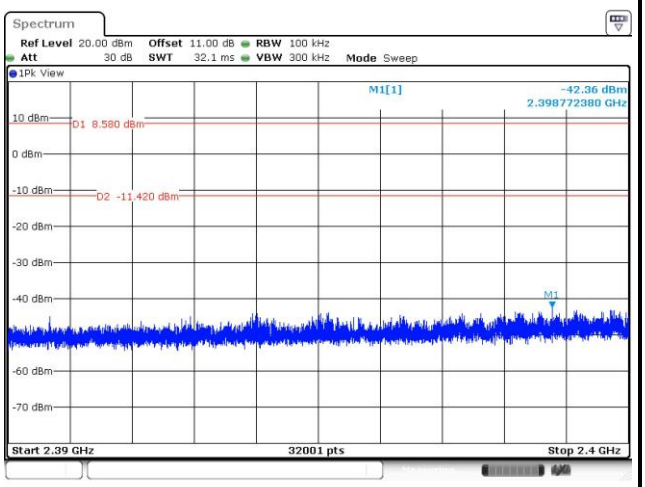
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

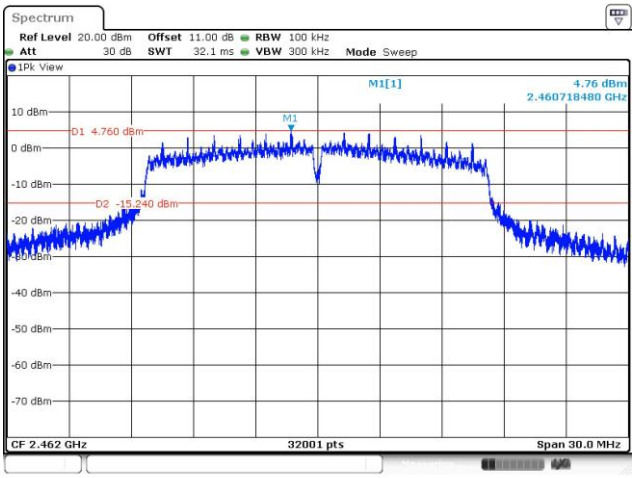
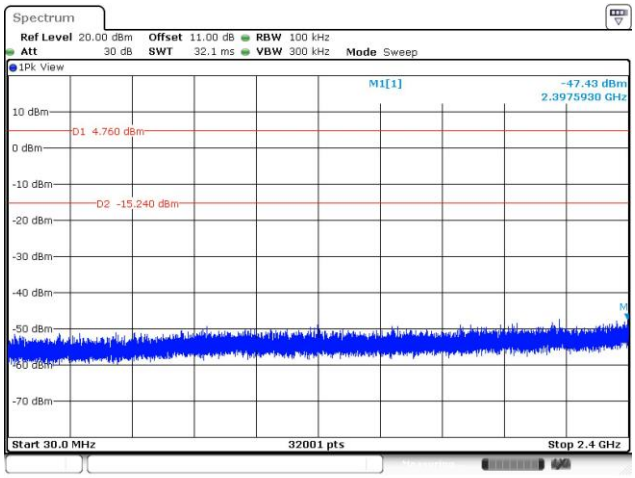
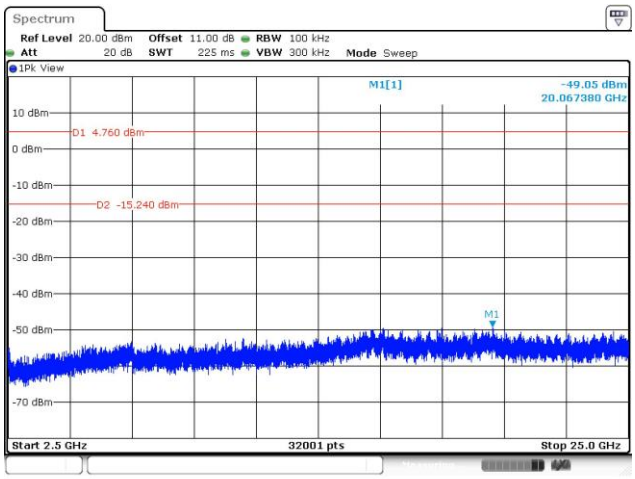
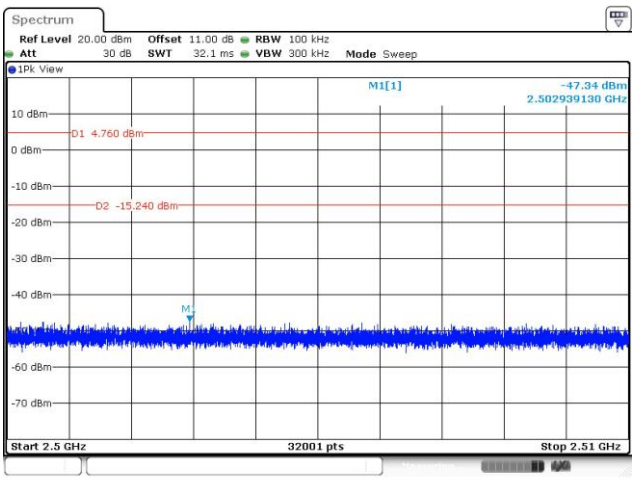
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

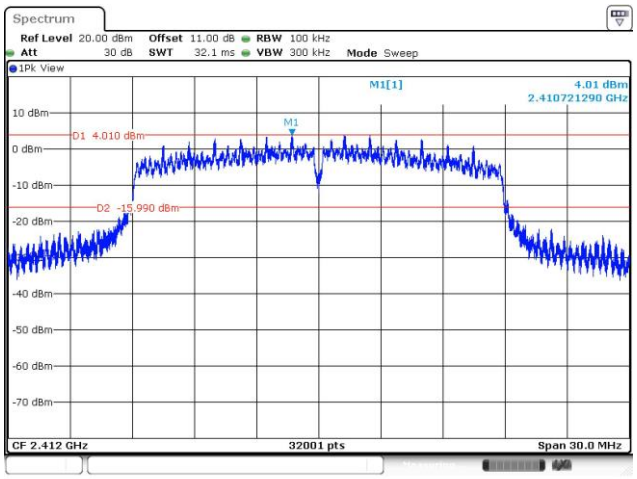
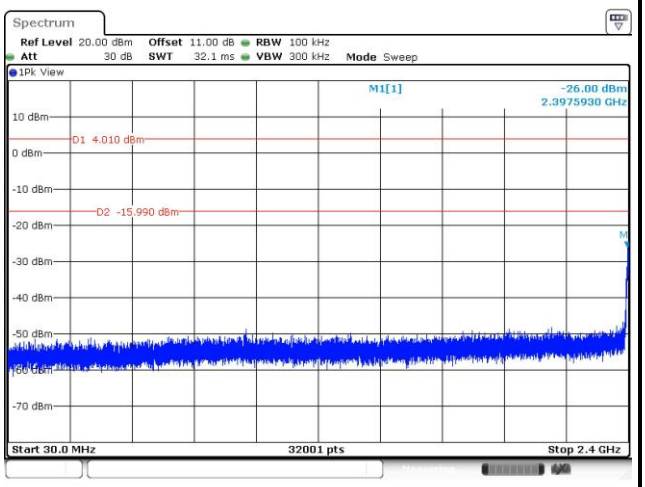
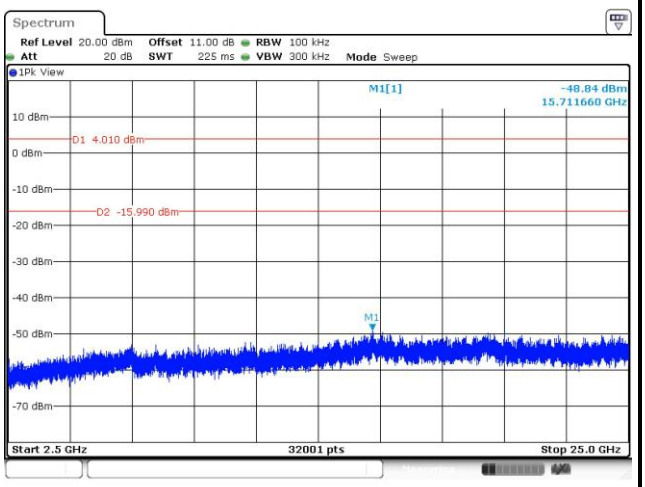
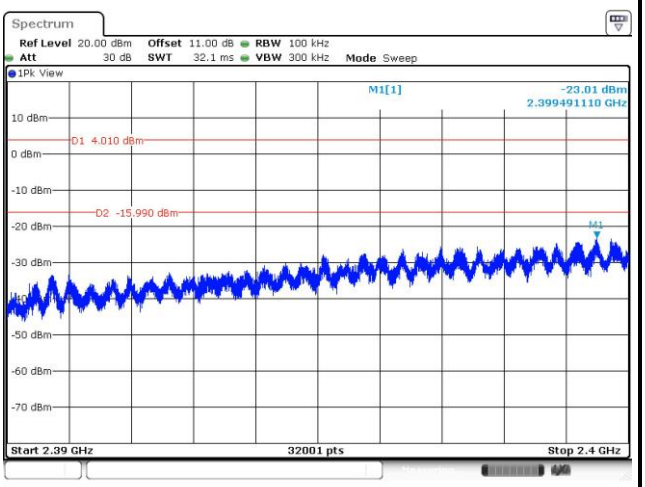
802.11g

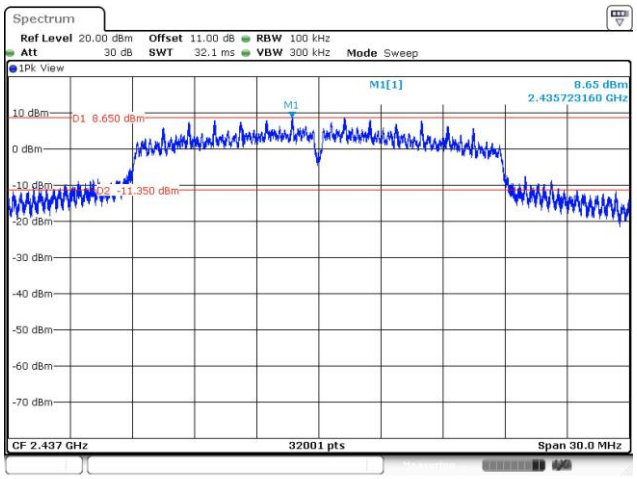
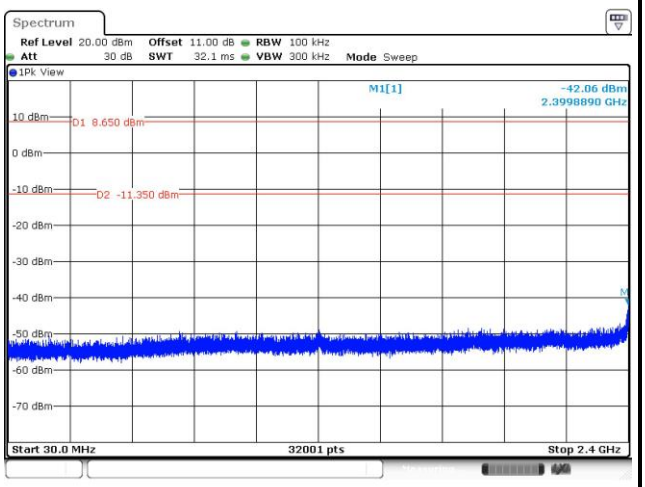
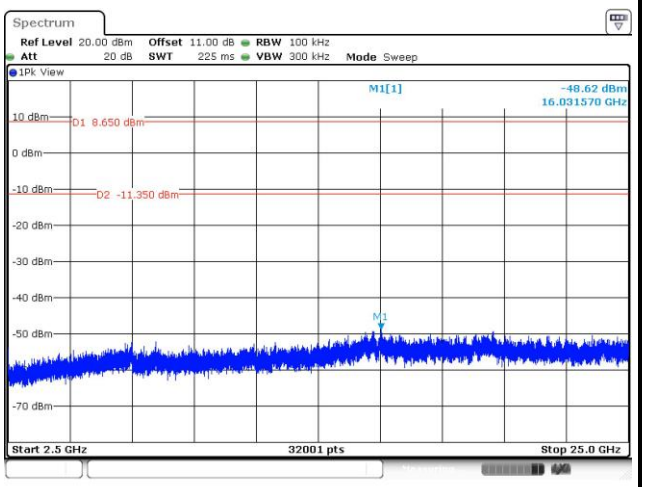
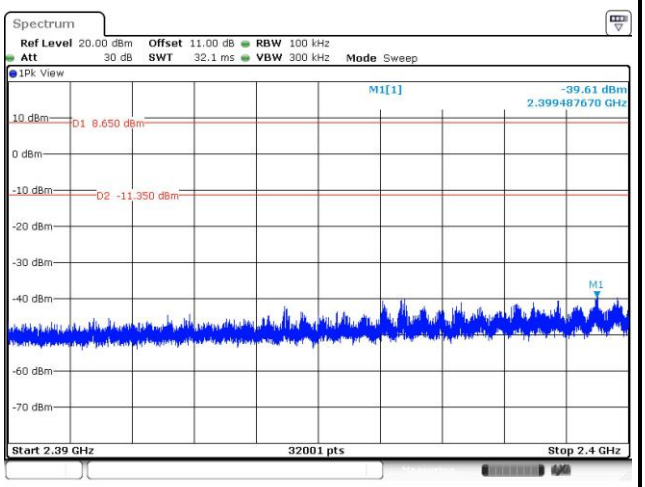
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

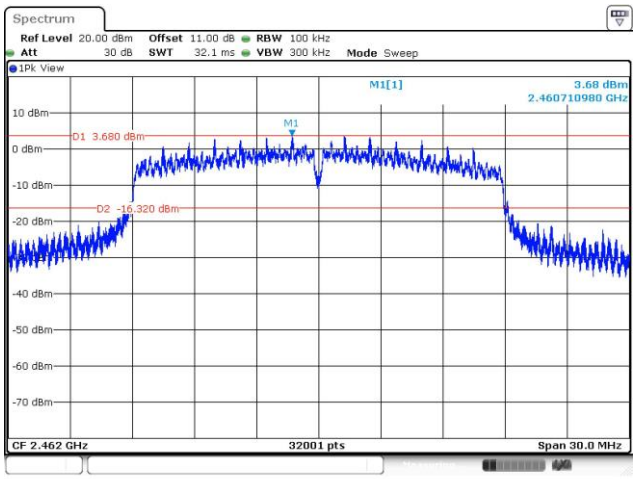
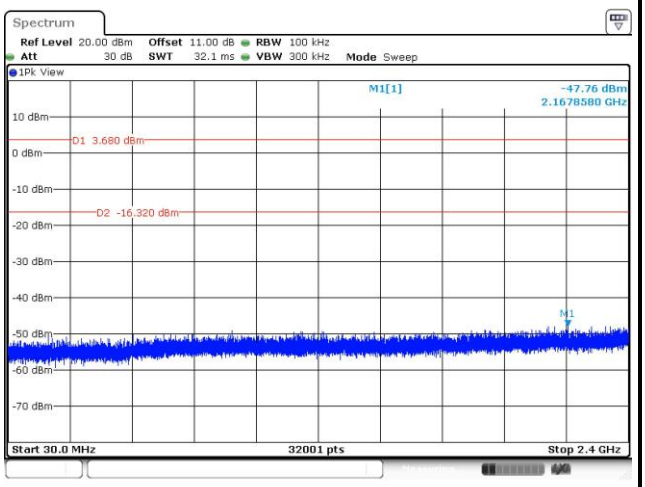
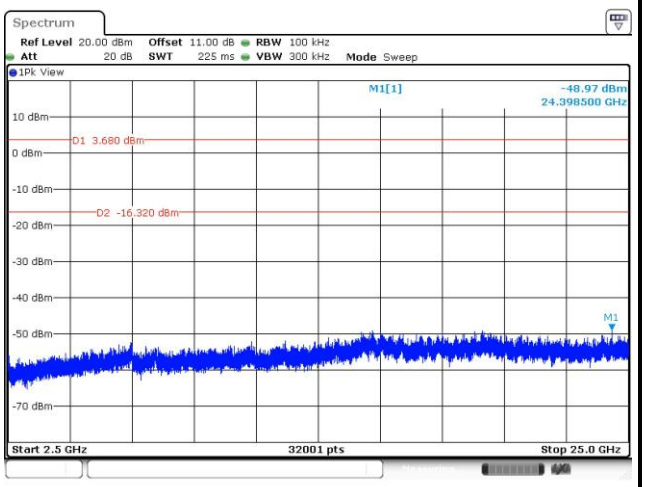
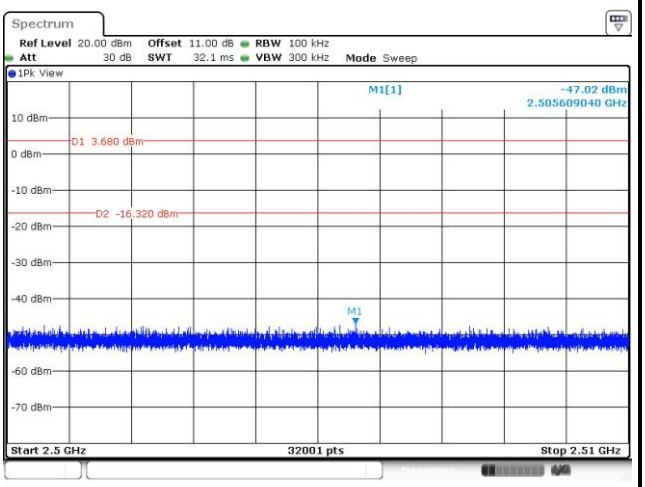
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

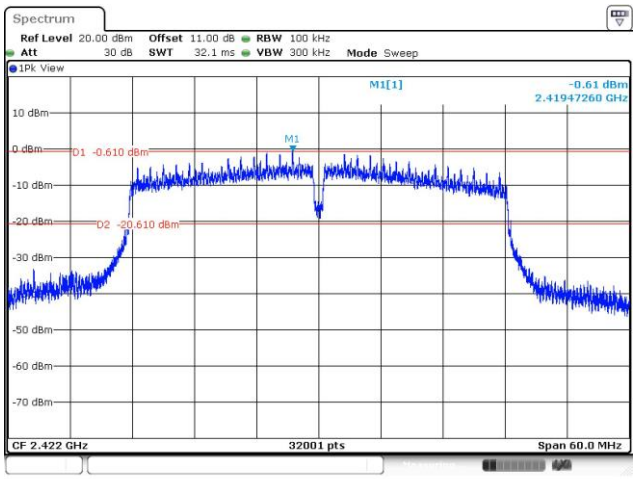
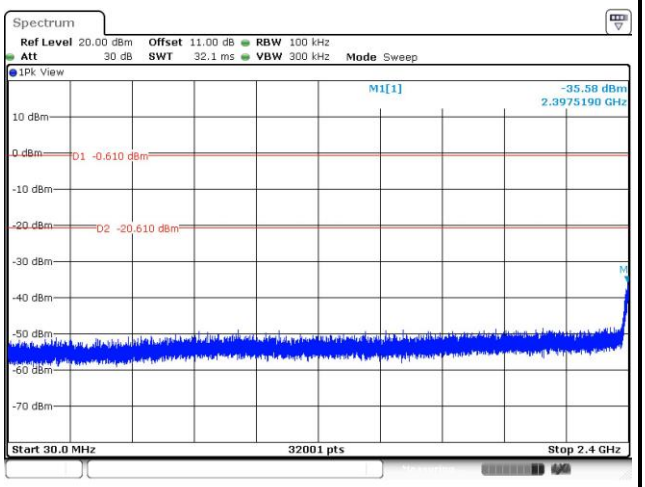
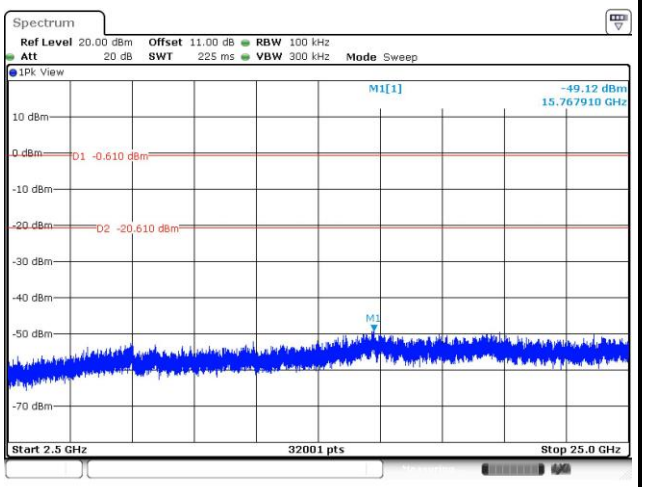
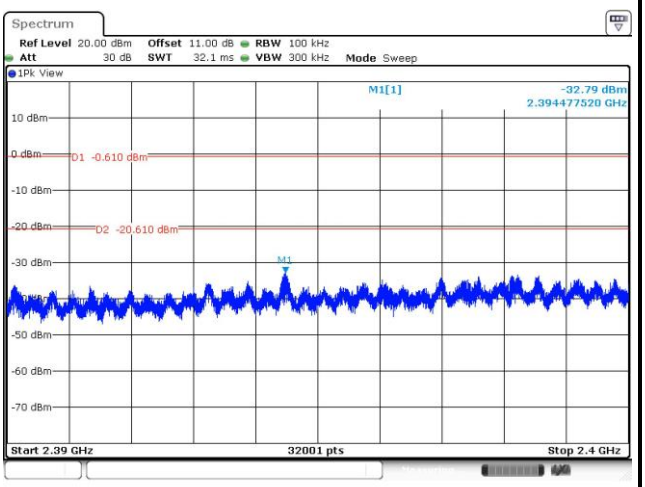
802.11n HT20

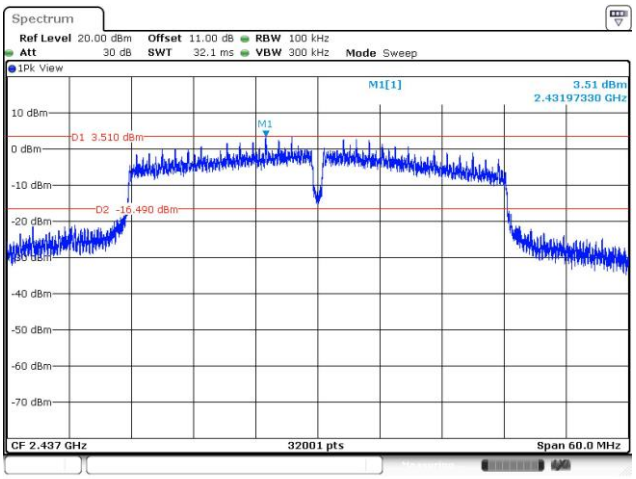
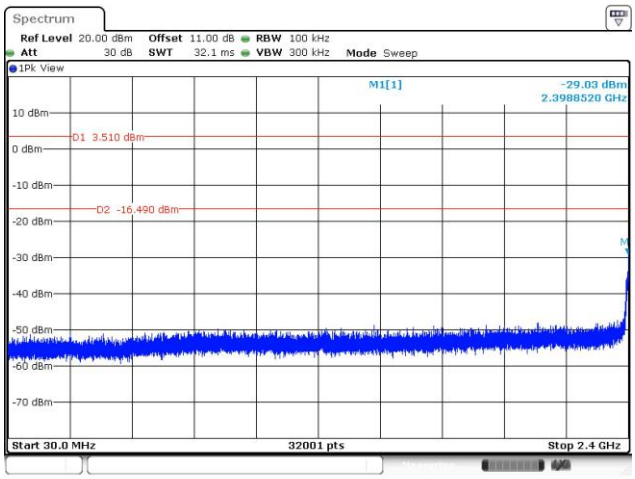
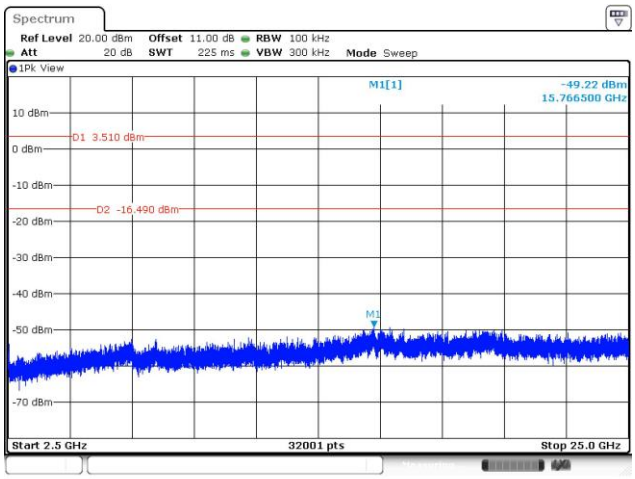
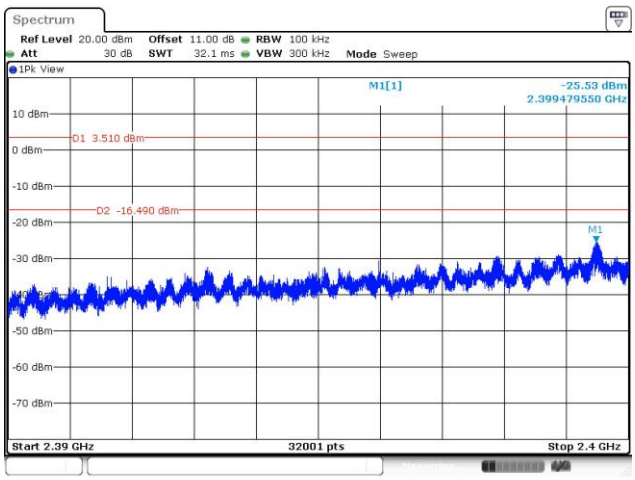
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

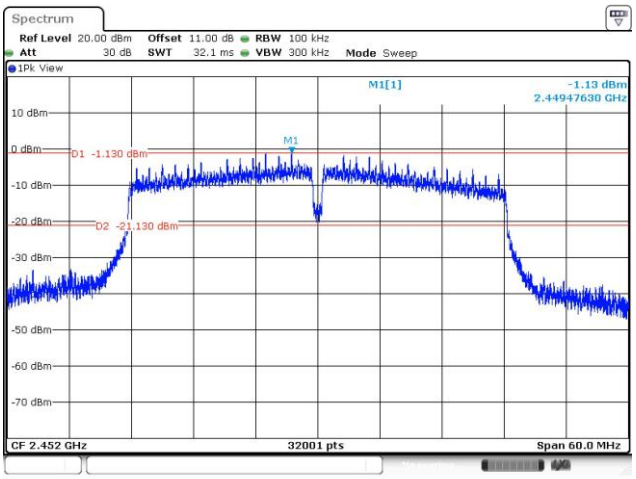
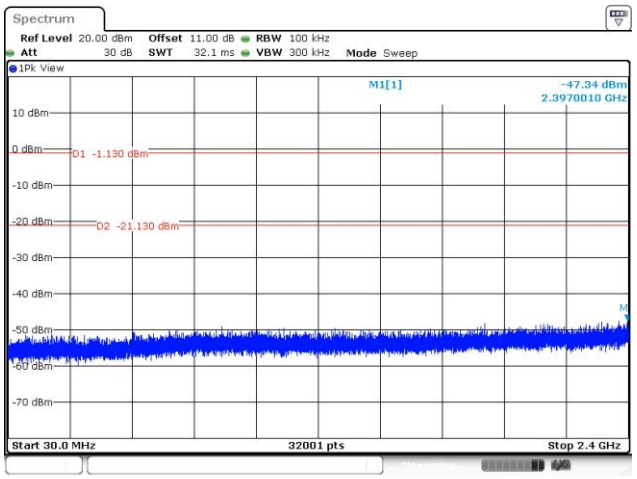
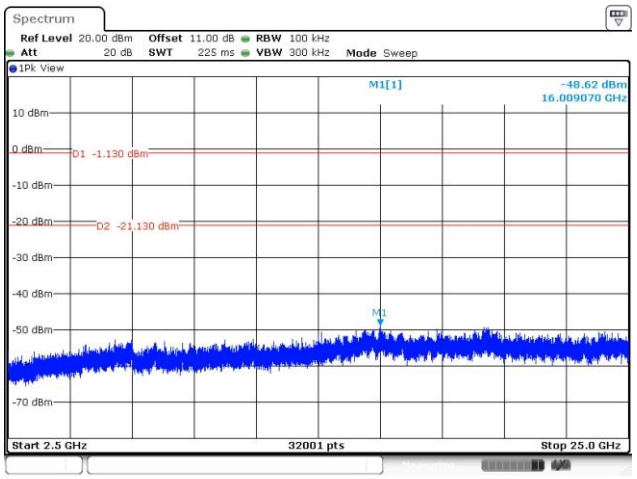
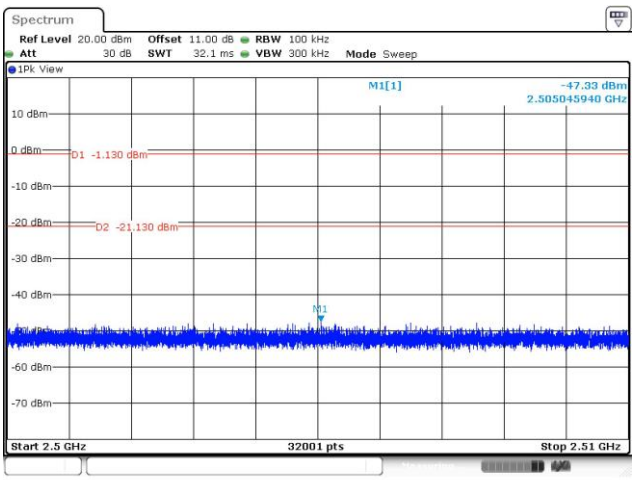
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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 (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==