FCC Test Report

FCC ID	:	**S4A50-0100-RT-22**
Equipment	:	**High Definition IP TV receiver**
Model No.	:	**Aria 5XYzzzzzz** **(where "X" can be 0-9, "Y" can be 0-9; "zzzzzz" can be any combination of "0-9" , "a-z","-", "/" or blank)** **(Please refer to section 1.1.1 for more details)**
Brand Name	:	**Entone**
Applicant	:	**Entone Technologies(HK) Limited**
Address	:	**Level 28,Saxon Tower 7 Cheung Shun Street,Lai Chi Kok,Kowloon,Hong Kong**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Mar. 05, 2015**
Tested Date	:	**Mar. 09 ~ Mar. 13, 2015**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FR530501	Rev. 01	Initial issue	Jul. 28, 2015

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.379MHz 39.65 (Margin -8.65dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2387.00MHz 53.00 (Margin -1.00dB) – AV 2483.50MHz 53.00 (Margin -1.00dB) – AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 28.89	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
Entone	Aria 5XYzzzzzz	High Definition IP TV receiver	where “X” can be 0-9, “Y” can be 0-9; “zzzzzz” can be any combination of “0-9” , “a-z”,”-“, “/” or blank
✦ All models are electrically identical, different model names are for marketing purpose. ✦ The above models, model **Aria 551c** 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]	1	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	1	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	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. Note 4: 802.11b/g has no TX diversity function. The signal is only transmitted through TX chain 1.					

1.1.3 Antenna Details

Ant. No.	Model	Type	Connector	Gain (dBi)	Remark
1	MAG. LAYERS / MSA-3410-2G4A8-A1	PIFA	UFL	3.36	---
2	MAG. LAYERS / MSA-3410-2G4A8-A2	PIFA	UFL	3.48	---

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc AC from adapter

1.1.5 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC Adapter	Brand Name: APD Model Name: WA-24Q12FU Power Rating: I/P: 100-240Vac, 50-60Hz, 0.7A O/P: 12Vdc, 2.0A Power Line: DC 1.8m non-shielded w/o core
2	HDMI	1.4m shielded w/o core
3	RJ45	2m non-shielded w/o core
4	Scart to MiNiDIN	0.9m non-shielded w/o core
5	AV to MiNiDIN	2m non-shielded w/o core
6	Remote controller	Brand: N/A / Model: N/A

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	emi nonsec, Version: 20141021		
Duty Cycle and Duty Factor	**Mode**	**Duty cycle (%)**	**Duty factor (dB)**
	11b	98.73%	0.06
	11g	92.07%	0.36
	HT20	93.85%	0.28
	HT40	81.95%	0.86

1.1.8 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	50
11b	2437	53
11b	2462	50
11g	2412	50
11g	2437	61
11g	2462	51
HT20	2412	49
HT20	2437	61
HT20	2462	51
HT40	2422	49
HT40	2437	53
HT40	2452	50

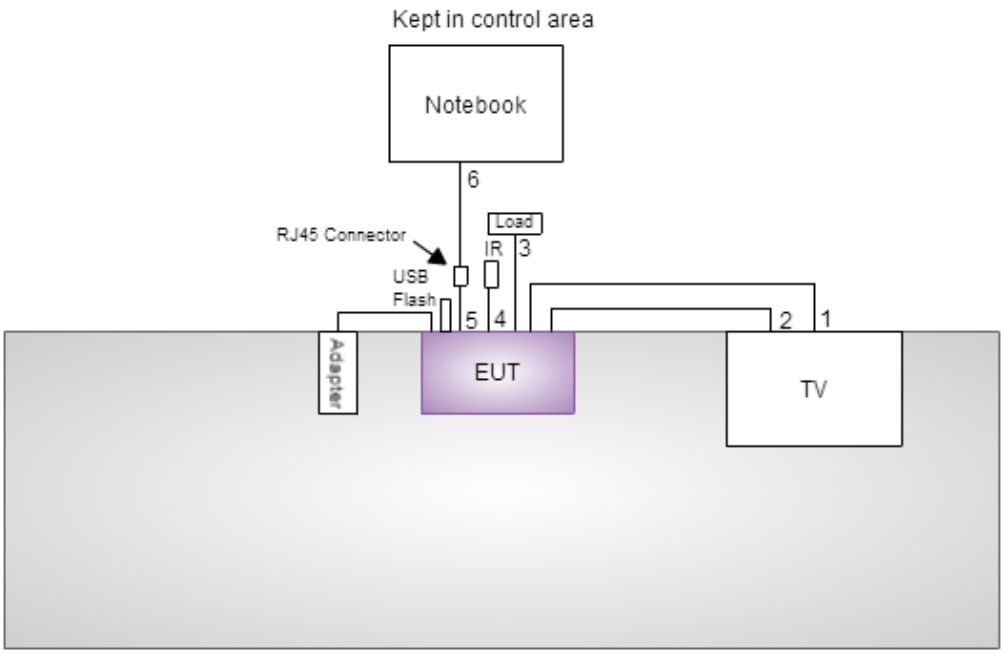
1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded w/o core RJ45, 2m non-shielded w/o core..
2	USB Flash	Kingston	DTSE9	---	---
3	Load	ICC	---	---	Coaxial, 1.2m shielded w/o care
4	IR	---	---	---	IR, 1m non-shielded w/o core.
5	TV	CHIMEI	TL-24LF500D	---	HDMI, 1.4m shielded w/o core AV+RGB to MiNiDIN, 2m non-shielded w/o core

Note: IR & AV+RGB to MiNiDIN cable were supplied by applicant.

1.3 Test Setup Chart

Test Setup Diagram



1. AV+RGB to MiNiDIN , 2m non-shielded w/o core.
2. HDMI, 1.4m shielded w/o core.
3. Coaxial, 1.2 shielded w/o core.
4. IR, 1m non-shielded w/o core.
5. RJ45, 2m non-shielded w/o core.
6. RJ45, 10m non-shielded w/o core.

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**
EMC Receiver	R&S	ESCS 30	100169	Oct. 17, 2014	Oct. 16, 2015
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 17, 2014	Nov. 16, 2015
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Nov. 26, 2014	Nov. 25, 2015
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 31, 2014	Dec. 30, 2015
50 ohm terminal (Support Unit)	NA	50	04	Apr. 18, 2014	Apr. 17, 2015
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	Dec. 09, 2014	Dec. 08, 2015
Receiver	R&S	ESR3	101658	Nov. 10, 2014	Nov. 09, 2015
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Sep. 05, 2014	Sep. 04, 2015
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 11, 2014	Dec. 10, 2015
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 10, 2014	Nov. 09, 2015
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 10, 2014	Nov. 09, 2015
Preamplifier	Burgeon	BPA-530	SN:100219	Sep. 09, 2014	Sep. 08, 2015
Preamplifier	Agilent	83017A	MY39501308	Oct. 09, 2014	Oct. 08, 2015
Preamplifier	EMC	EMC184045B	980192	Aug. 26, 2014	Aug. 25, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 15, 2014	Dec. 14, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 15, 2014	Dec. 14, 2015
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 15, 2014	Dec. 14, 2015
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 15, 2014	Dec. 14, 2015
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 15, 2014	Dec. 14, 2015
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	Feb. 03, 2015	Feb. 02, 2016
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 03, 2014	Dec. 02, 2015
Power Meter	Anritsu	ML2495A	1241002	Sep. 29, 2014	Sep. 28, 2015
Power Sensor	Anritsu	MA2411B	1207366	Sep. 29, 2014	Sep. 28, 2015
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 C63.10-2009
FCC KDB 558074 D01 DTS Meas Guidance v03r03
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

Note: FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 02, 2014.

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	±2.92 dB
Radiated emission ≤ 1GHz	±3.72 dB
Radiated emission > 1GHz	±5.65 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	18°C / 74%	Kevin Ma
Radiated Emissions	03CH01-WS	20-21°C / 65-67%	Aska Huang
RF Conducted	TH01-WS	22°C / 60%	Felix Sung

- FCC site registration No.: 657002
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	HT20	2437	MCS 0	2Tx
Radiated Emissions ≤1GHz	HT20	2437	MCS 0	2Tx
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	11b	2412 / 2437 / 2462	1 Mbps	1Tx / chain 1
	11g	2412 / 2437 / 2462	6 Mbps	1Tx / chain 1
	HT20	2412 / 2437 / 2462	MCS 0 MCS 0	2Tx
	HT40	2422 / 2437 / 2452	MCS 0 MCS 0	2Tx

3 Transmitter Test Results

3.1 Conducted Emissions

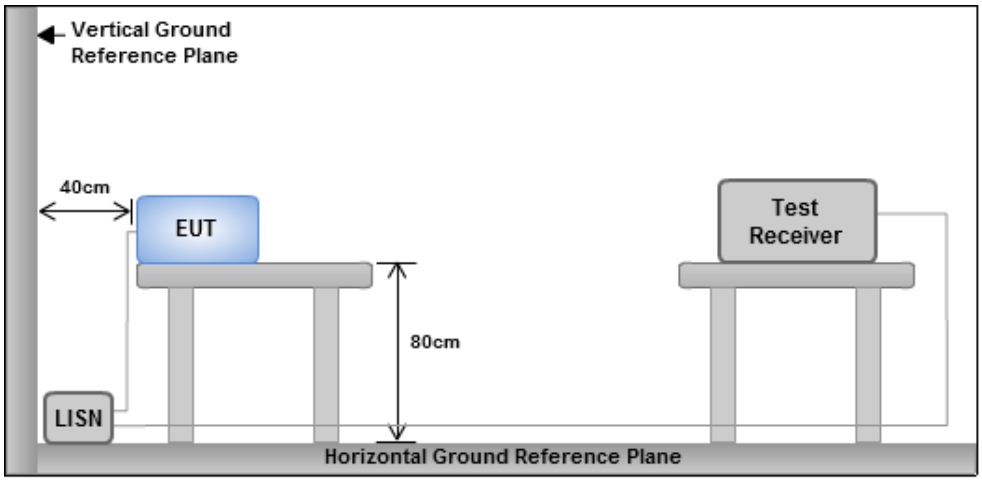
3.1.1 Limit of Conducted Emissions

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.

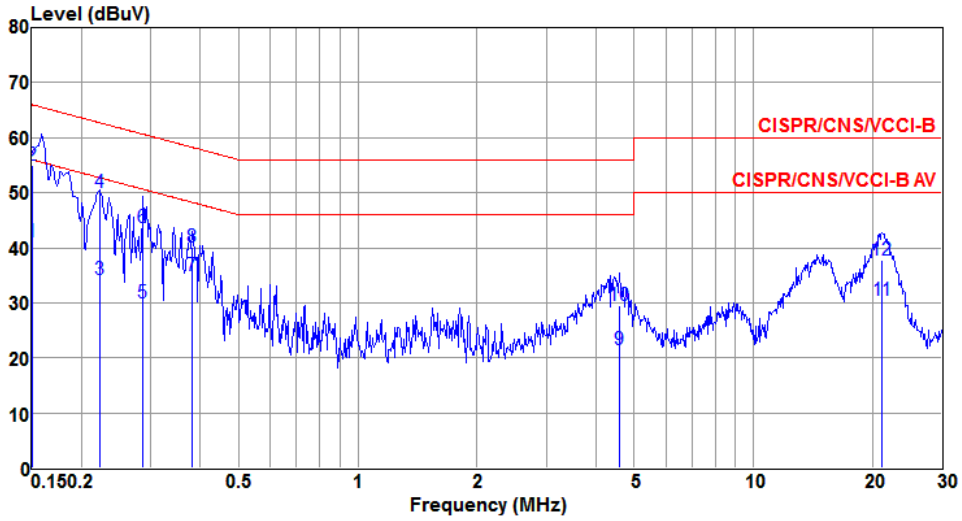
3.1.3 Test Setup



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

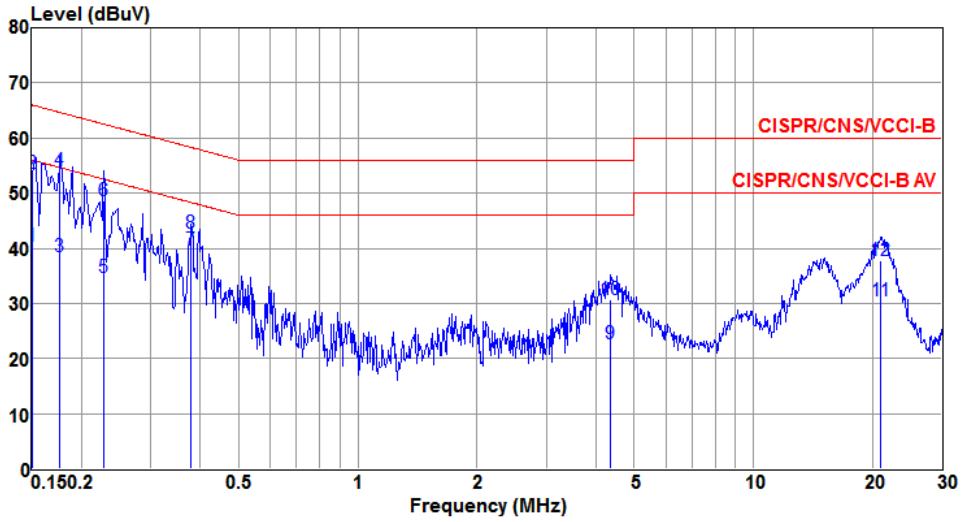
Modulation	HT20	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	41.03	56.00	-14.97	40.03	0.92	0.08	Average
2*	0.150	54.90	66.00	-11.10	53.90	0.92	0.08	QP
3	0.222	34.32	52.74	-18.42	33.99	0.24	0.09	Average
4	0.222	50.12	62.74	-12.62	49.79	0.24	0.09	QP
5	0.286	30.04	50.63	-20.59	29.73	0.21	0.10	Average
6	0.286	43.70	60.63	-16.93	43.39	0.21	0.10	QP
7	0.381	34.98	48.25	-13.27	34.69	0.18	0.11	Average
8	0.381	40.20	58.25	-18.05	39.91	0.18	0.11	QP
9	4.574	21.46	46.00	-24.54	20.83	0.32	0.31	Average
10	4.574	29.54	56.00	-26.46	28.91	0.32	0.31	QP
11	21.147	30.46	50.00	-19.54	29.60	0.82	0.04	Average
12	21.147	37.71	60.00	-22.29	36.85	0.82	0.04	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 MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	40.36	56.00	-15.64	39.43	0.85	0.08	Average
2	0.150	53.57	66.00	-12.43	52.64	0.85	0.08	QP
3	0.177	38.44	54.64	-16.20	37.85	0.50	0.09	Average
4	0.177	53.95	64.64	-10.69	53.36	0.50	0.09	QP
5	0.228	34.58	52.52	-17.94	34.27	0.22	0.09	Average
6	0.228	48.68	62.52	-13.84	48.37	0.22	0.09	QP
7*	0.379	39.65	48.30	-8.65	39.40	0.14	0.11	Average
8	0.379	42.72	58.30	-15.58	42.47	0.14	0.11	QP
9	4.361	22.69	46.00	-23.31	21.66	0.72	0.31	Average
10	4.361	30.72	56.00	-25.28	29.69	0.72	0.31	QP
11	21.035	30.43	50.00	-19.57	29.59	0.80	0.04	Average
12	21.035	37.68	60.00	-22.32	36.84	0.80	0.04	QP

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

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.2.2 Test Procedures

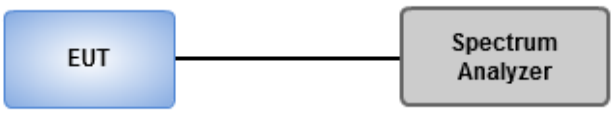
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3 Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

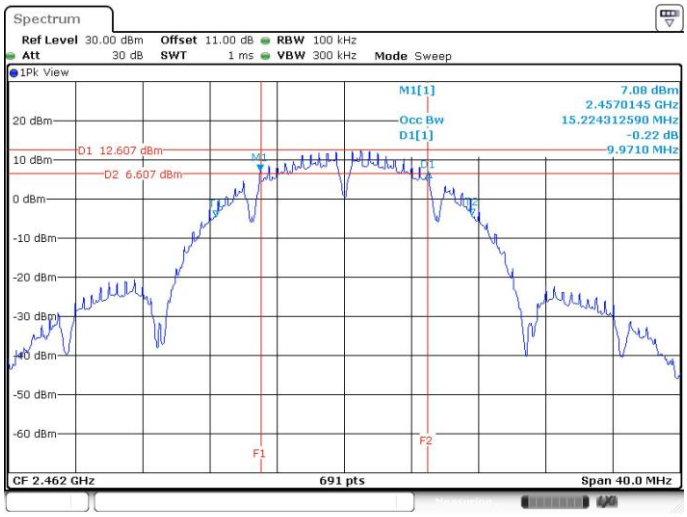
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

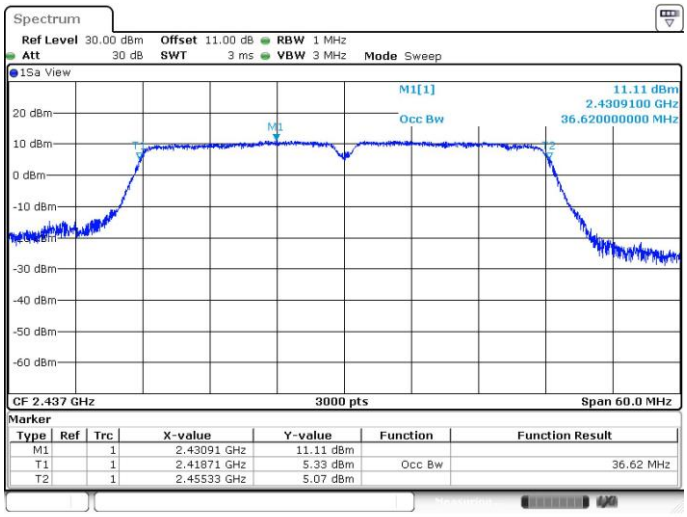
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	1	2412	---	10.09	---	---	500
11b	1	2437	---	10.09	---	---	500
11b	1	2462	---	9.97	---	---	500
11g	1	2412	---	16.35	---	---	500
11g	1	2437	---	16.35	---	---	500
11g	1	2462	---	16.35	---	---	500
HT20	2	2412	17.62	17.62	---	---	500
HT20	2	2437	17.57	17.62	---	---	500
HT20	2	2462	17.62	17.62	---	---	500
HT40	2	2422	35.13	35.48	---	---	500
HT40	2	2437	35.36	35.36	---	---	500
HT40	2	2452	35.13	35.36	---	---	500

Worst Plots



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	1	2412	---	15.25	---	---
11b	1	2437	---	15.27	---	---
11b	1	2462	---	15.27	---	---
11g	1	2412	---	17.38	---	---
11g	1	2437	---	18.32	---	---
11g	1	2462	---	17.08	---	---
HT20	2	2412	18.07	18.07	---	---
HT20	2	2437	18.59	18.32	---	---
HT20	2	2462	18.00	18.01	---	---
HT40	2	2422	36.56	36.46	---	---
HT40	2	2437	36.62	36.46	---	---
HT40	2	2452	36.54	36.50	---	---

Worst Plots



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)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	1	2412	---	22.86	---	---	193.197	22.86	30.00
11b	1	2437	---	22.65	---	---	184.077	22.65	30.00
11b	1	2462	---	22.77	---	---	189.234	22.77	30.00
11g	1	2412	---	25.47	---	---	352.371	25.47	30.00
11g	1	2437	---	26.36	---	---	432.514	26.36	30.00
11g	1	2462	---	25.55	---	---	358.922	25.55	30.00
HT20	2	2412	24.23	23.99	---	---	515.461	27.12	30.00
HT20	2	2437	26.25	25.48	---	---	774.880	**28.89**	30.00
HT20	2	2462	24.98	24.78	---	---	615.382	27.89	30.00
HT40	2	2422	24.02	23.67	---	---	485.157	26.86	30.00
HT40	2	2437	25.51	24.71	---	---	651.433	28.14	30.00
HT40	2	2452	25.12	24.09	---	---	581.536	27.65	30.00

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (average) output power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	1	2412	---	20.81	---	---	120.504	20.81	30.00
11b	1	2437	---	20.57	---	---	114.025	20.57	30.00
11b	1	2462	---	20.69	---	---	117.220	20.69	30.00
11g	1	2412	---	18.46	---	---	70.146	18.46	30.00
11g	1	2437	---	22.45	---	---	175.792	22.45	30.00
11g	1	2462	---	19.15	---	---	82.224	19.15	30.00
HT20	2	2412	15.84	15.53	---	---	74.098	18.70	30.00
HT20	2	2437	21.55	20.08	---	---	244.749	23.89	30.00
HT20	2	2462	17.61	17.08	---	---	108.727	20.36	30.00
HT40	2	2422	15.58	15.29	---	---	69.947	18.45	30.00
HT40	2	2437	17.53	17.46	---	---	112.343	20.51	30.00
HT40	2	2452	17.47	16.65	---	---	102.085	20.09	30.00

Note: Conducted average output power is for reference only.

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

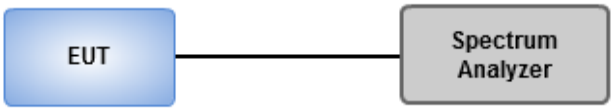
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 3kHz, VBW = 10kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

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

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

3.4.3 Test Setup

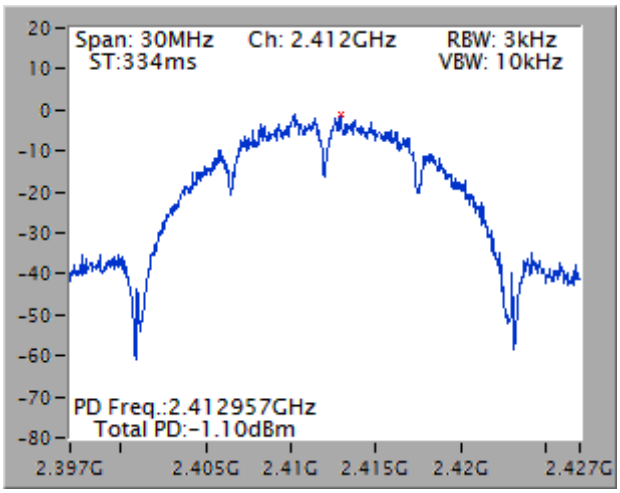


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	1	2412	-1.10	8.00
11b	1	2437	-1.95	8.00
11b	1	2462	-1.65	8.00
11g	1	2412	-7.83	8.00
11g	1	2437	-3.94	8.00
11g	1	2462	-7.55	8.00
HT20	2	2412	-7.88	7.57
HT20	2	2437	-3.07	7.57
HT20	2	2462	-7.05	7.57
HT40	2	2422	-11.06	7.57
HT40	2	2437	-8.80	7.57
HT40	2	2452	-9.49	7.57

Note:
1. Note: Test result for HT20 / HT40 is bin-by-bin summing measured value of each TX port.
2. Directional gain = $10 * \log((10^{3.36/20}+10^{3.48/20})^2/2)$ = 6.43 dBi > 6 dBi.
   Limit shall be reduced to 8 dBm – (6.43 dBi – 6 dBi) = 7.57 dBm.

Worst Plots



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

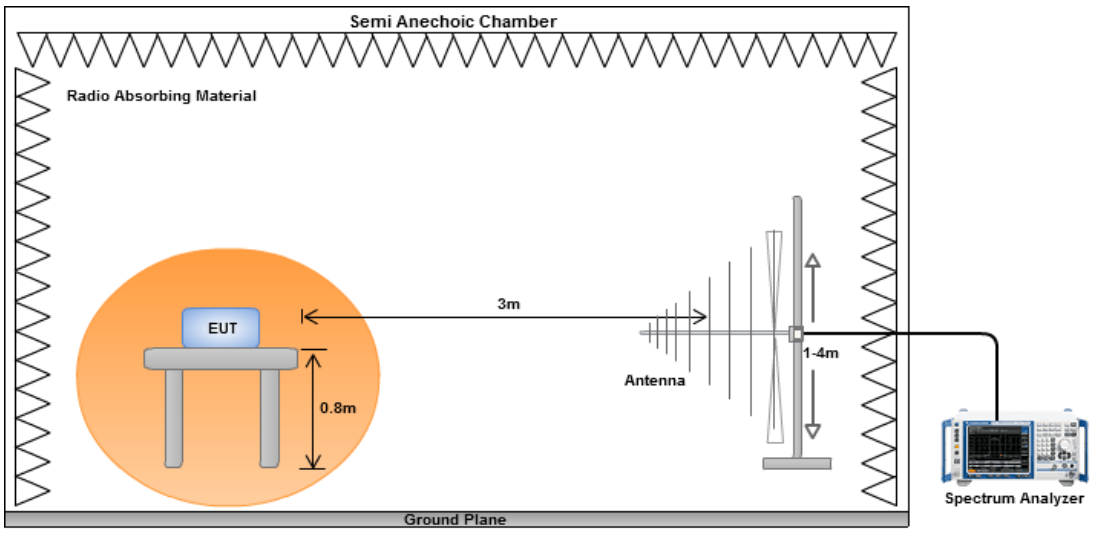
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

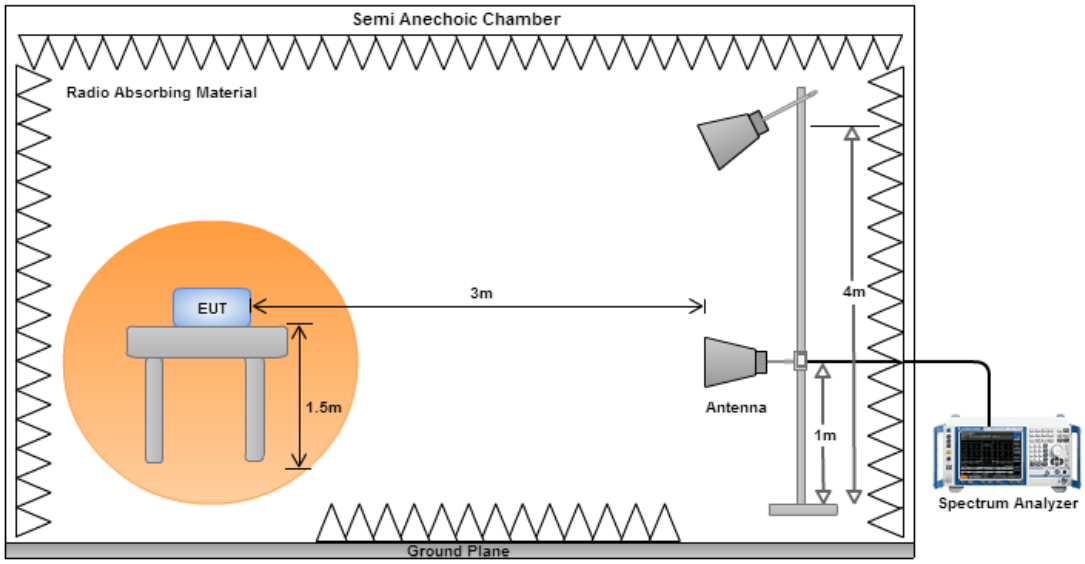
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

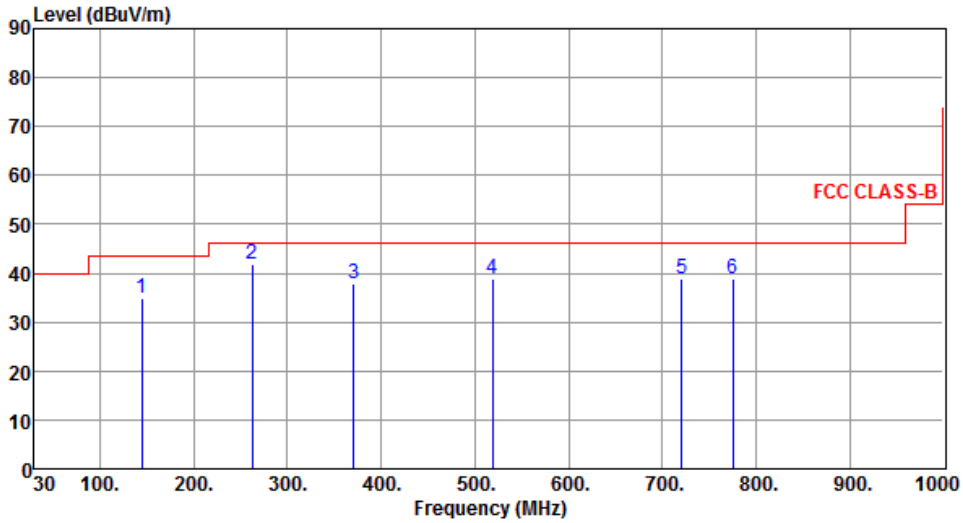


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

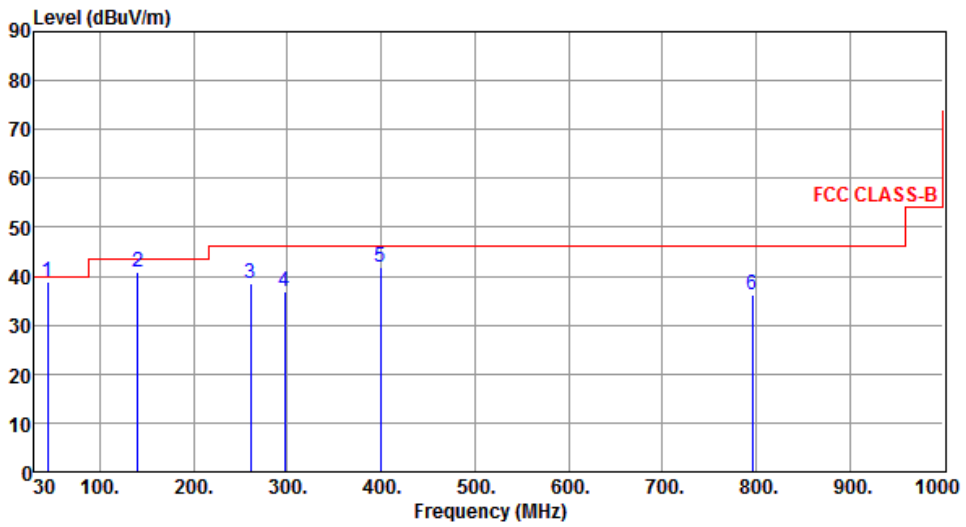
Modulation	HT20	**Test Freq. (MHz)**	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	144.46	34.92	43.50	-8.58	51.68	-16.76	Peak	---	---
2	262.80	41.75	46.00	-4.25	58.96	-17.21	Peak	---	---
3	370.47	37.80	46.00	-8.20	52.12	-14.32	Peak	---	---
4	518.88	38.93	46.00	-7.07	49.97	-11.04	Peak	---	---
5	720.64	38.83	46.00	-7.17	46.49	-7.66	Peak	---	---
6	774.96	38.83	46.00	-7.17	45.74	-6.91	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		

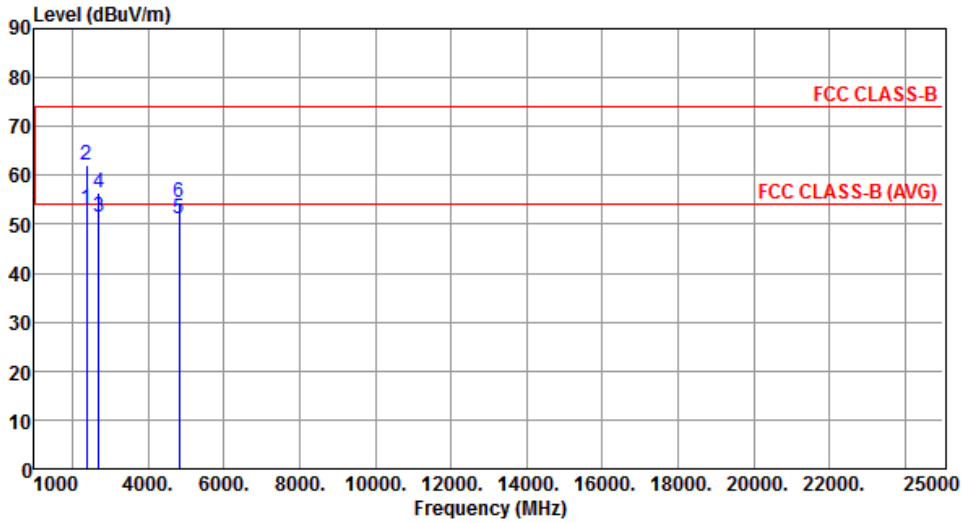


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	43.79	38.99	40.00	-1.01	55.38	-16.39	QP	---	---
2	140.58	40.84	43.50	-2.66	57.68	-16.84	Peak	---	---
3	260.86	38.46	46.00	-7.54	55.76	-17.30	Peak	---	---
4	296.75	36.93	46.00	-9.07	53.02	-16.09	Peak	---	---
5	399.57	41.89	46.00	-4.11	55.45	-13.56	Peak	---	---
6	796.30	36.31	46.00	-9.69	43.04	-6.73	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

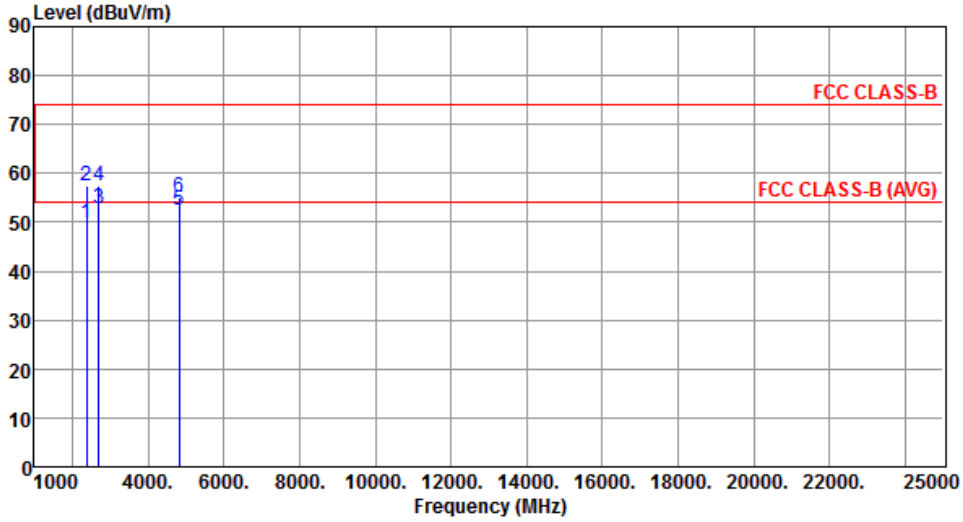
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2387.00	53.00	54.00	-1.00	56.35	-3.35	Average	---	---
2	2387.00	62.18	74.00	-11.82	65.53	-3.35	Peak	---	---
3	2700.00	51.41	54.00	-2.59	53.45	-2.04	Average	---	---
4	2700.00	56.58	74.00	-17.42	58.62	-2.04	Peak	---	---
5	4824.00	51.24	54.00	-2.76	46.40	4.84	Average	---	---
6	4824.00	54.30	74.00	-19.70	49.46	4.84	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).

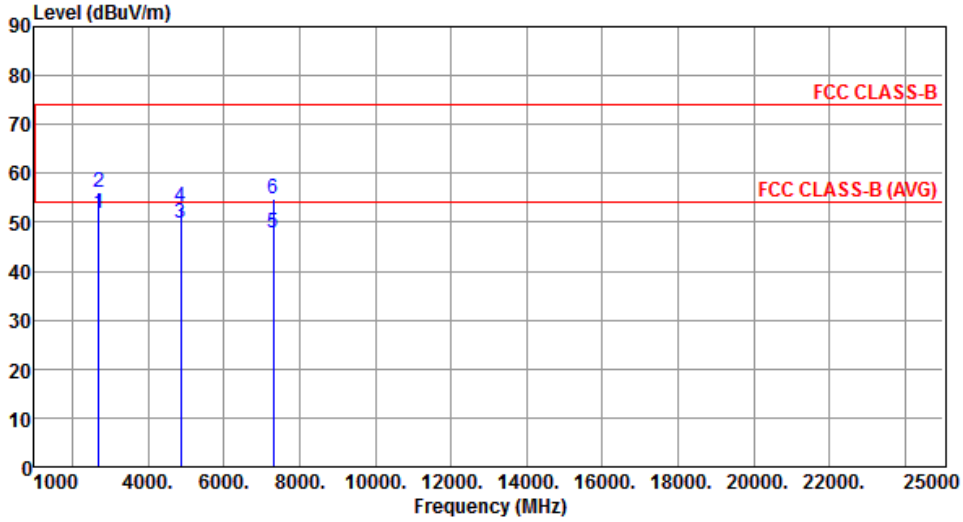
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2387.00	49.73	54.00	-4.27	53.08	-3.35	Average	---	---
2	2387.00	57.59	74.00	-16.41	60.94	-3.35	Peak	---	---
3	2700.00	52.91	54.00	-1.09	54.95	-2.04	Average	---	---
4	2700.00	57.38	74.00	-16.62	59.42	-2.04	Peak	---	---
5	4824.00	52.59	54.00	-1.41	47.75	4.84	Average	---	---
6	4824.00	55.19	74.00	-18.81	50.35	4.84	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).

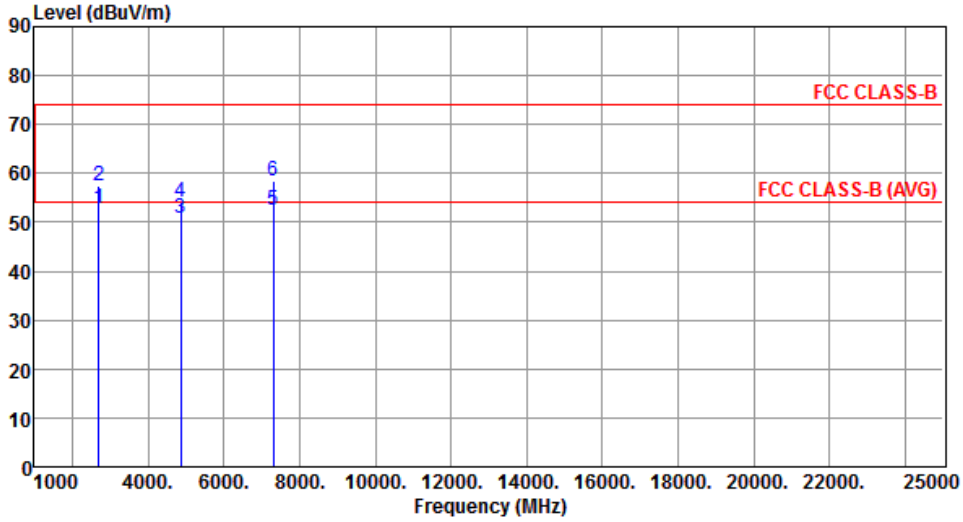
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2700.00	51.71	54.00	-2.29	53.75	-2.04	Average	---	---
2	2700.00	56.25	74.00	-17.75	58.29	-2.04	Peak	---	---
3	4874.00	49.97	54.00	-4.03	45.00	4.97	Average	---	---
4	4874.00	53.24	74.00	-20.76	48.27	4.97	Peak	---	---
5	7311.00	47.84	54.00	-6.16	38.31	9.53	Average	---	---
6	7311.00	54.74	74.00	-19.26	45.21	9.53	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).

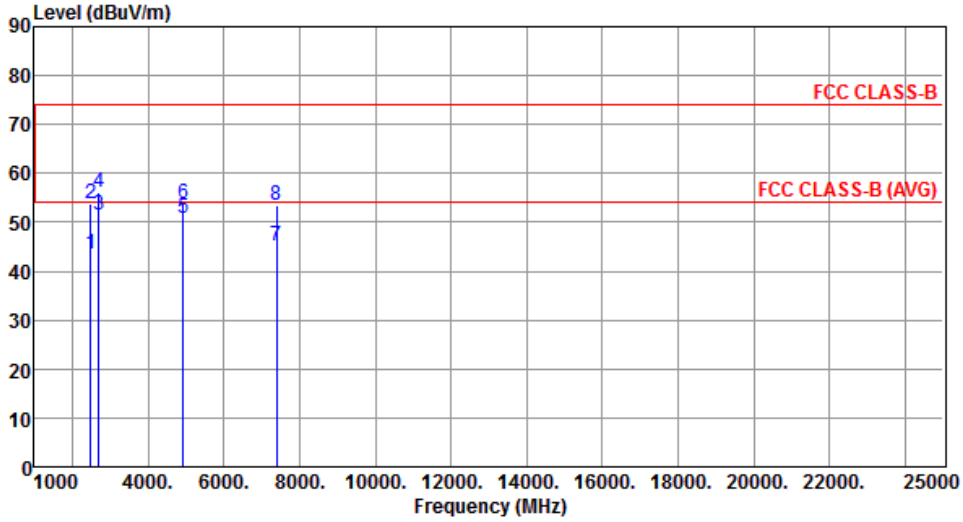
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2700.00	52.87	54.00	-1.13	54.91	-2.04	Average	---	---
2	2700.00	57.59	74.00	-16.41	59.63	-2.04	Peak	---	---
3	4874.00	50.89	54.00	-3.11	45.92	4.97	Average	---	---
4	4874.00	54.10	74.00	-19.90	49.13	4.97	Peak	---	---
5	7311.00	52.55	54.00	-1.45	43.02	9.53	Average	---	---
6	7311.00	58.29	74.00	-15.71	48.76	9.53	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).

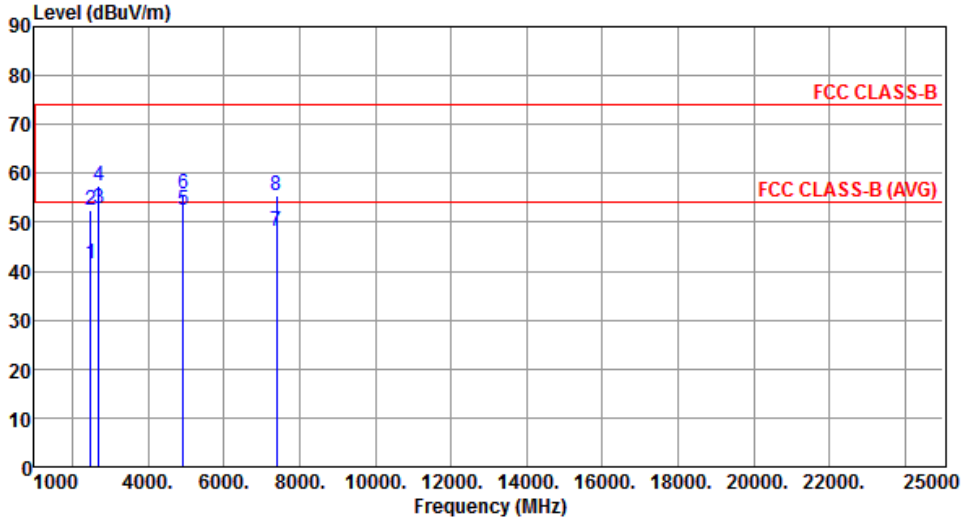
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2487.00	43.51	54.00	-10.49	46.39	-2.88	Average	---	---
2	2487.00	53.87	74.00	-20.13	56.75	-2.88	Peak	---	---
3	2700.00	51.37	54.00	-2.63	53.41	-2.04	Average	---	---
4	2700.00	56.23	74.00	-17.77	58.27	-2.04	Peak	---	---
5	4924.00	50.80	54.00	-3.20	45.69	5.11	Average	---	---
6	4924.00	53.93	74.00	-20.07	48.82	5.11	Peak	---	---
7	7386.00	45.07	54.00	-8.93	35.40	9.67	Average	---	---
8	7386.00	53.57	74.00	-20.43	43.90	9.67	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).

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

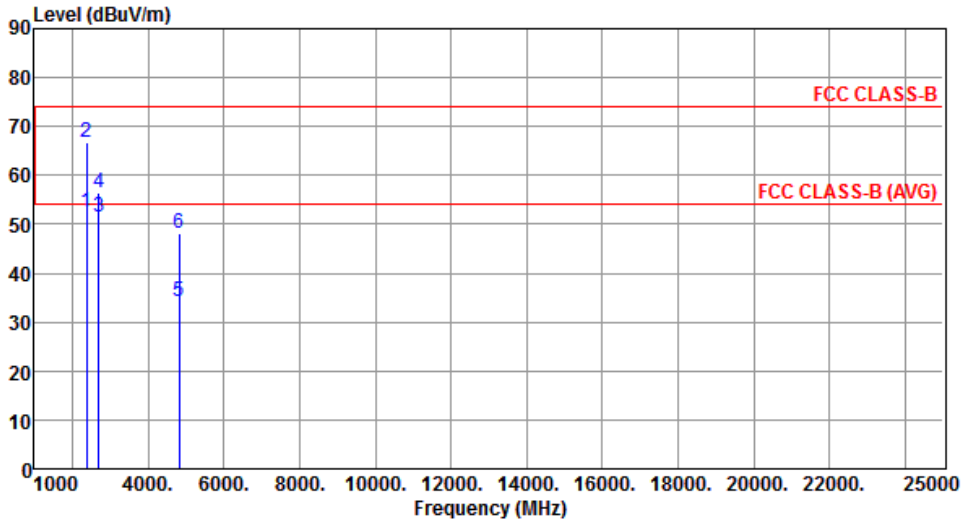


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2487.00	41.35	54.00	-12.65	44.23	-2.88	Average	---	---
2	2487.00	52.33	74.00	-21.67	55.21	-2.88	Peak	---	---
3	2700.00	52.76	54.00	-1.24	54.80	-2.04	Average	---	---
4	2700.00	57.54	74.00	-16.46	59.58	-2.04	Peak	---	---
5	4924.00	52.64	54.00	-1.36	47.53	5.11	Average	---	---
6	4924.00	55.64	74.00	-18.36	50.53	5.11	Peak	---	---
7	7386.00	48.12	54.00	-5.88	38.45	9.67	Average	---	---
8	7386.00	55.34	74.00	-18.66	45.67	9.67	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).

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

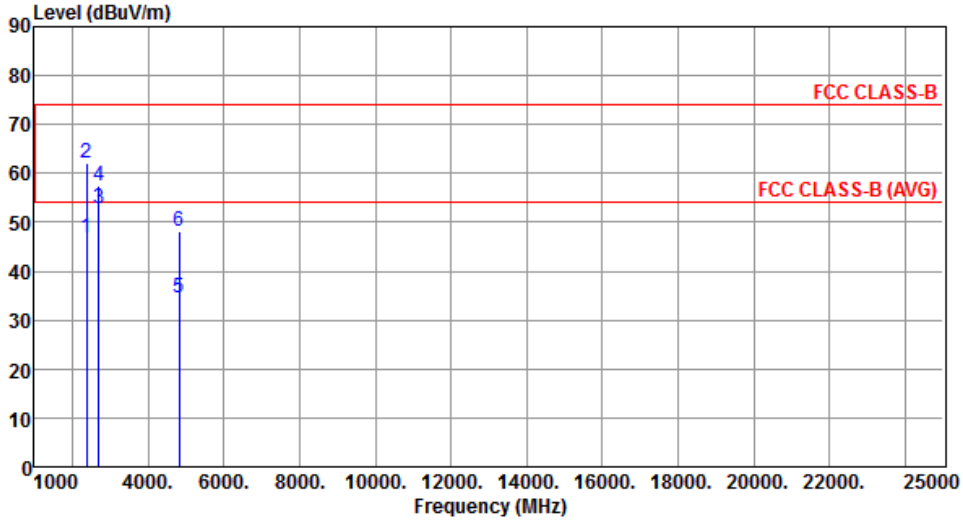
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	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	52.51	54.00	-1.49	55.85	-3.34	Average	---	---
2	2390.00	66.91	74.00	-7.09	70.25	-3.34	Peak	---	---
3	2700.00	51.58	54.00	-2.42	53.62	-2.04	Average	---	---
4	2700.00	56.43	74.00	-17.57	58.47	-2.04	Peak	---	---
5	4824.00	34.09	54.00	-19.91	29.25	4.84	Average	---	---
6	4824.00	48.17	74.00	-25.83	43.33	4.84	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).

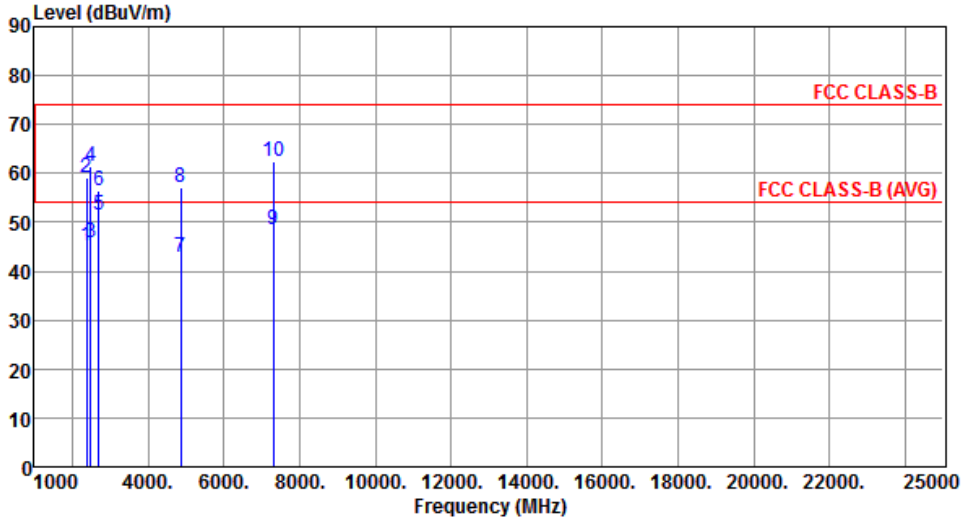
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	46.82	54.00	-7.18	50.16	-3.34	Average	---	---
2	2390.00	62.09	74.00	-11.91	65.43	-3.34	Peak	---	---
3	2700.00	52.91	54.00	-1.09	54.95	-2.04	Average	---	---
4	2700.00	57.57	74.00	-16.43	59.61	-2.04	Peak	---	---
5	4824.00	34.50	54.00	-19.50	29.66	4.84	Average	---	---
6	4824.00	48.30	74.00	-25.70	43.46	4.84	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).

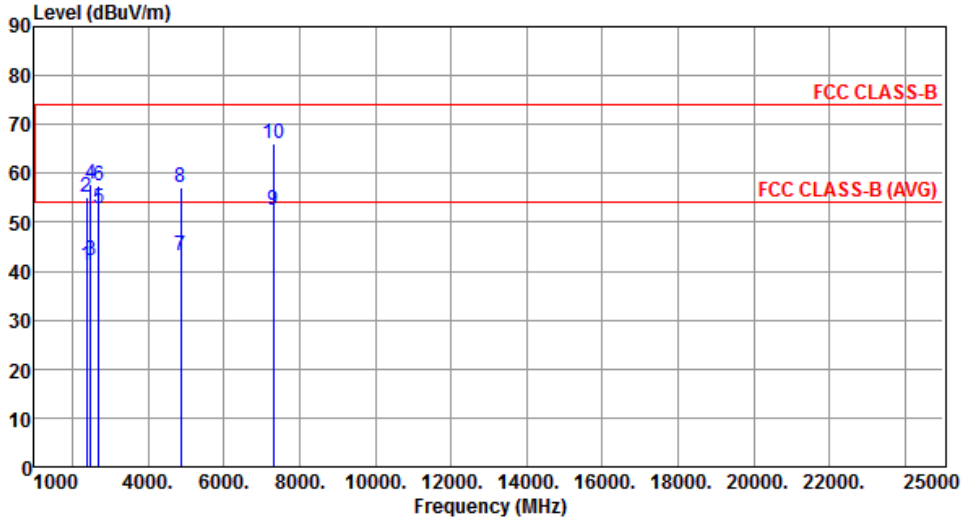
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	45.17	54.00	-8.83	48.51	-3.34	Average	---	---
2	2390.00	59.11	74.00	-14.89	62.45	-3.34	Peak	---	---
3	2483.50	45.69	54.00	-8.31	48.59	-2.90	Average	---	---
4	2483.50	61.30	74.00	-12.70	64.20	-2.90	Peak	---	---
5	2700.00	51.56	54.00	-2.44	53.60	-2.04	Average	---	---
6	2700.00	56.45	74.00	-17.55	58.49	-2.04	Peak	---	---
7	4874.00	42.93	54.00	-11.07	37.96	4.97	Average	---	---
8	4874.00	57.20	74.00	-16.80	52.23	4.97	Peak	---	---
9	7311.00	48.56	54.00	-5.44	39.03	9.53	Average	---	---
10	7311.00	62.35	74.00	-11.65	52.82	9.53	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).

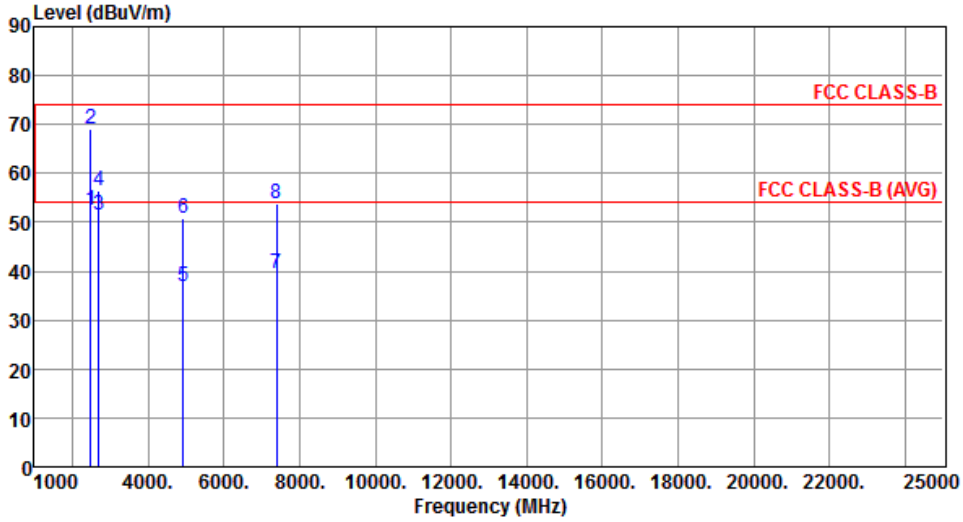
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	41.20	54.00	-12.80	44.54	-3.34	Average	---	---
2	2390.00	55.11	74.00	-18.89	58.45	-3.34	Peak	---	---
3	2483.50	42.31	54.00	-11.69	45.21	-2.90	Average	---	---
4	2483.50	57.74	74.00	-16.26	60.64	-2.90	Peak	---	---
5	2700.00	52.74	54.00	-1.26	54.78	-2.04	Average	---	---
6	2700.00	57.51	74.00	-16.49	59.55	-2.04	Peak	---	---
7	4874.00	43.19	54.00	-10.81	38.22	4.97	Average	---	---
8	4874.00	57.25	74.00	-16.75	52.28	4.97	Peak	---	---
9	7311.00	52.63	54.00	-1.37	43.10	9.53	Average	---	---
10	7311.00	66.21	74.00	-7.79	56.68	9.53	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).

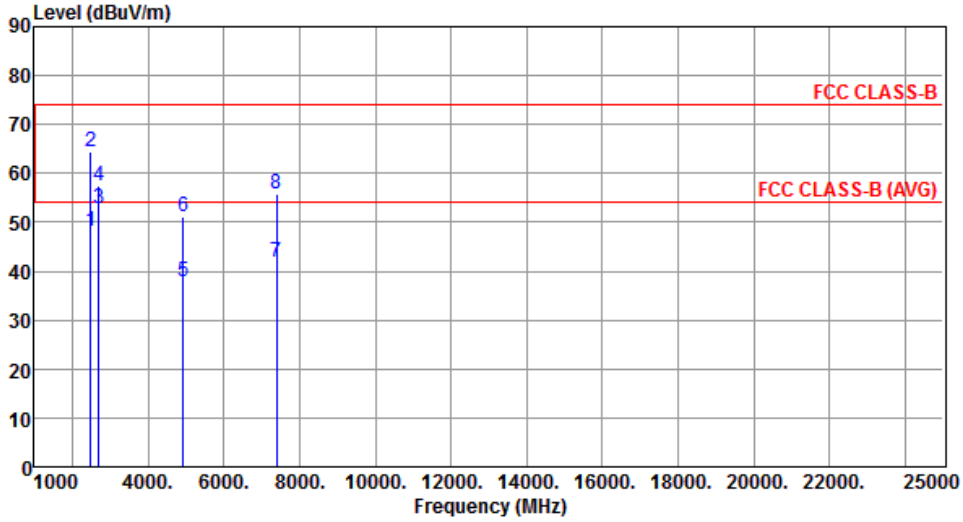
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.63	54.00	-1.37	55.53	-2.90	Average	---	---
2	2483.50	68.96	74.00	-5.04	71.86	-2.90	Peak	---	---
3	2700.00	51.49	54.00	-2.51	53.53	-2.04	Average	---	---
4	2700.00	56.44	74.00	-17.56	58.48	-2.04	Peak	---	---
5	4924.00	36.92	54.00	-17.08	31.81	5.11	Average	---	---
6	4924.00	50.87	74.00	-23.13	45.76	5.11	Peak	---	---
7	7386.00	39.67	54.00	-14.33	30.00	9.67	Average	---	---
8	7386.00	53.94	74.00	-20.06	44.27	9.67	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).

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

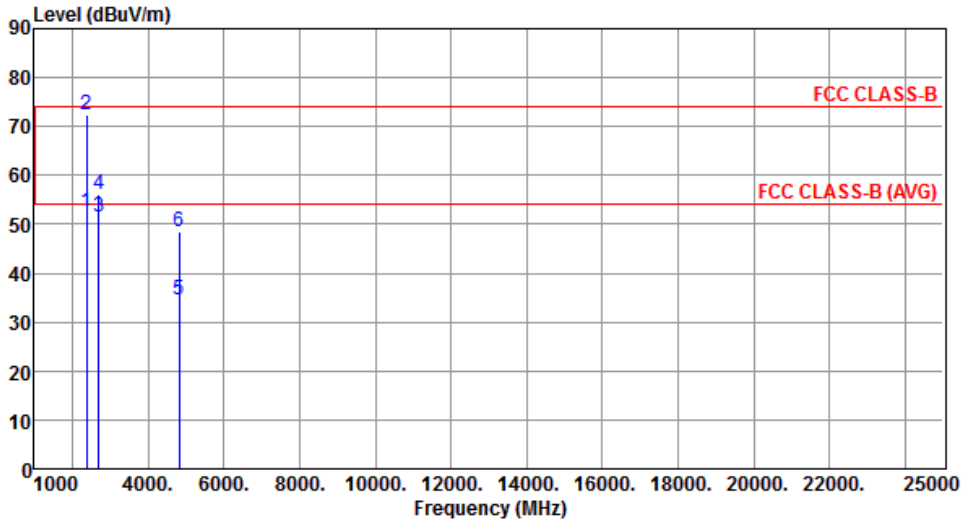


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.12	54.00	-5.88	51.02	-2.90	Average	---	---
2	2483.50	64.43	74.00	-9.57	67.33	-2.90	Peak	---	---
3	2700.00	52.84	54.00	-1.16	54.88	-2.04	Average	---	---
4	2700.00	57.30	74.00	-16.70	59.34	-2.04	Peak	---	---
5	4924.00	37.96	54.00	-16.04	32.85	5.11	Average	---	---
6	4924.00	51.12	74.00	-22.88	46.01	5.11	Peak	---	---
7	7386.00	41.91	54.00	-12.09	32.24	9.67	Average	---	---
8	7386.00	55.67	74.00	-18.33	46.00	9.67	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).

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

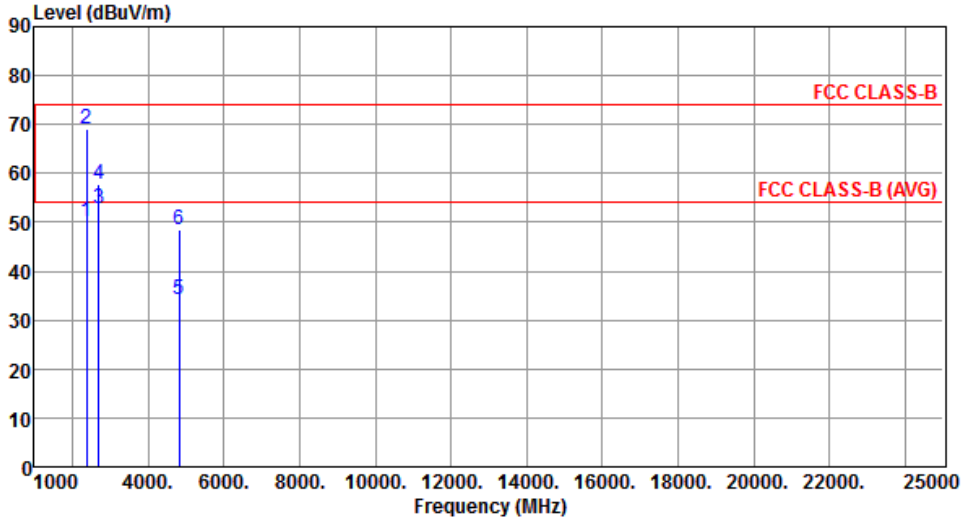
Modulation	HT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	52.52	54.00	-1.48	55.86	-3.34	Average	---	---
2	2390.00	72.36	74.00	-1.64	75.70	-3.34	Peak	---	---
3	2700.00	51.57	54.00	-2.43	53.61	-2.04	Average	---	---
4	2700.00	56.25	74.00	-17.75	58.29	-2.04	Peak	---	---
5	4824.00	34.45	54.00	-19.55	29.61	4.84	Average	---	---
6	4824.00	48.36	74.00	-25.64	43.52	4.84	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).

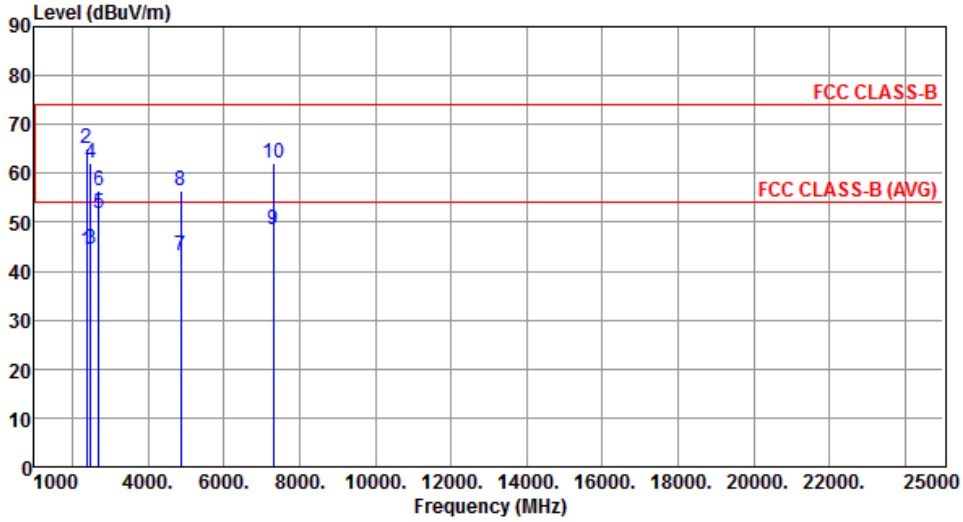
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	50.15	54.00	-3.85	53.49	-3.34	Average	---	---
2	2390.00	69.14	74.00	-4.86	72.48	-3.34	Peak	---	---
3	2700.00	52.96	54.00	-1.04	55.00	-2.04	Average	---	---
4	2700.00	57.63	74.00	-16.37	59.67	-2.04	Peak	---	---
5	4824.00	34.37	54.00	-19.63	29.53	4.84	Average	---	---
6	4824.00	48.41	74.00	-25.59	43.57	4.84	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).

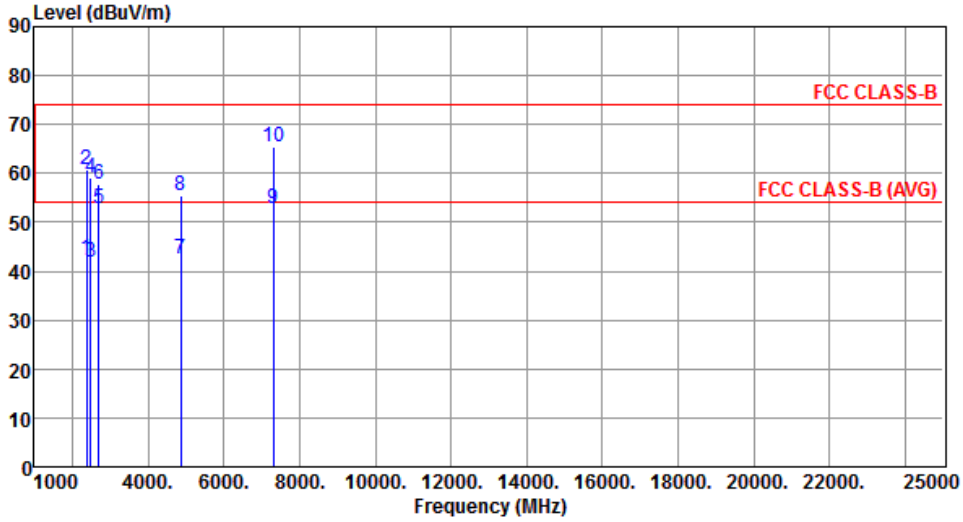
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	44.22	54.00	-9.78	47.56	-3.34	Average	---	---
2	2390.00	65.02	74.00	-8.98	68.36	-3.34	Peak	---	---
3	2483.50	44.42	54.00	-9.58	47.32	-2.90	Average	---	---
4	2483.50	61.98	74.00	-12.02	64.88	-2.90	Peak	---	---
5	2700.00	51.78	54.00	-2.22	53.82	-2.04	Average	---	---
6	2700.00	56.55	74.00	-17.45	58.59	-2.04	Peak	---	---
7	4874.00	43.24	54.00	-10.76	38.27	4.97	Average	---	---
8	4874.00	56.36	74.00	-17.64	51.39	4.97	Peak	---	---
9	7311.00	48.54	54.00	-5.46	39.01	9.53	Average	---	---
10	7311.00	62.20	74.00	-11.80	52.67	9.53	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).

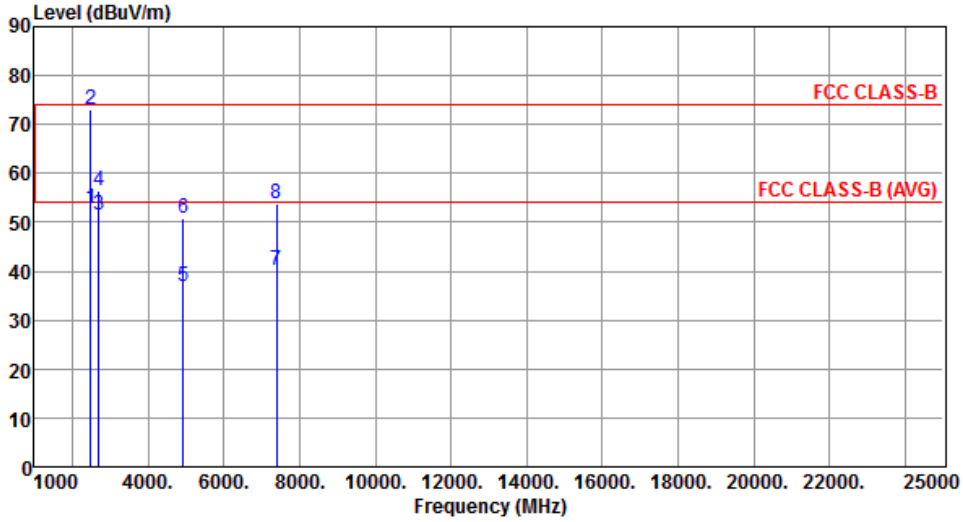
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	42.47	54.00	-11.53	45.81	-3.34	Average	---	---
2	2390.00	60.93	74.00	-13.07	64.27	-3.34	Peak	---	---
3	2483.50	41.84	54.00	-12.16	44.74	-2.90	Average	---	---
4	2483.50	59.18	74.00	-14.82	62.08	-2.90	Peak	---	---
5	2700.00	52.79	54.00	-1.21	54.83	-2.04	Average	---	---
6	2700.00	57.67	74.00	-16.33	59.71	-2.04	Peak	---	---
7	4874.00	42.42	54.00	-11.58	37.45	4.97	Average	---	---
8	4874.00	55.33	74.00	-18.67	50.36	4.97	Peak	---	---
9	7311.00	52.84	54.00	-1.16	43.31	9.53	Average	---	---
10	7311.00	65.48	74.00	-8.52	55.95	9.53	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).

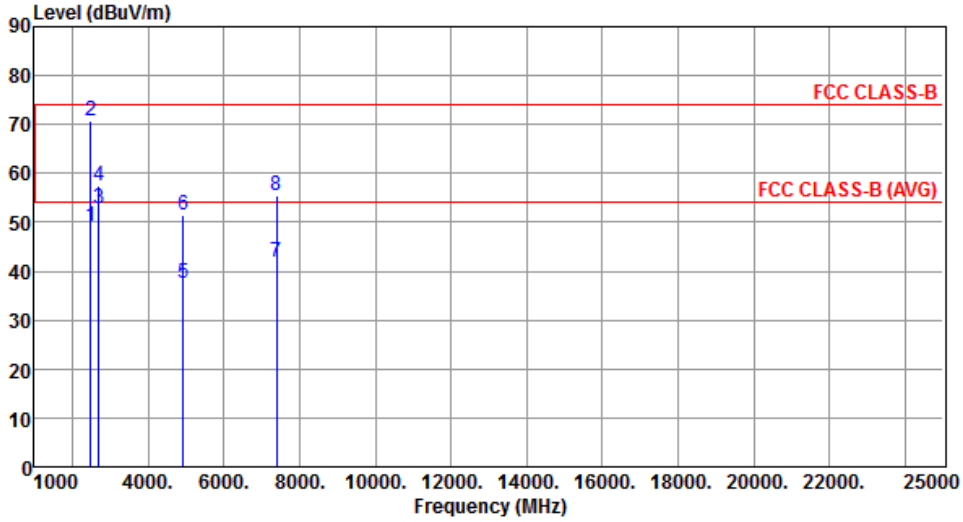
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	52.80	54.00	-1.20	55.70	-2.90	Average	---	---
2	2483.50	72.95	74.00	-1.05	75.85	-2.90	Peak	---	---
3	2700.00	51.59	54.00	-2.41	53.63	-2.04	Average	---	---
4	2700.00	56.42	74.00	-17.58	58.46	-2.04	Peak	---	---
5	4924.00	36.87	54.00	-17.13	31.76	5.11	Average	---	---
6	4924.00	50.71	74.00	-23.29	45.60	5.11	Peak	---	---
7	7386.00	40.15	54.00	-13.85	30.48	9.67	Average	---	---
8	7386.00	53.88	74.00	-20.12	44.21	9.67	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).

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

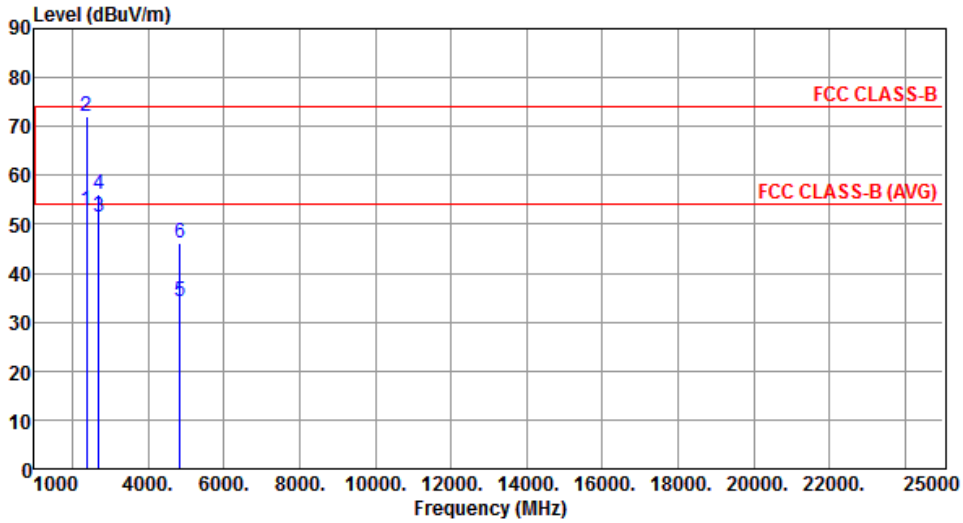


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	49.30	54.00	-4.70	52.20	-2.90	Average	---	---
2	2483.50	70.63	74.00	-3.37	73.53	-2.90	Peak	---	---
3	2700.00	52.86	54.00	-1.14	54.90	-2.04	Average	---	---
4	2700.00	57.54	74.00	-16.46	59.58	-2.04	Peak	---	---
5	4924.00	37.65	54.00	-16.35	32.54	5.11	Average	---	---
6	4924.00	51.61	74.00	-22.39	46.50	5.11	Peak	---	---
7	7386.00	41.73	54.00	-12.27	32.06	9.67	Average	---	---
8	7386.00	55.60	74.00	-18.40	45.93	9.67	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).

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

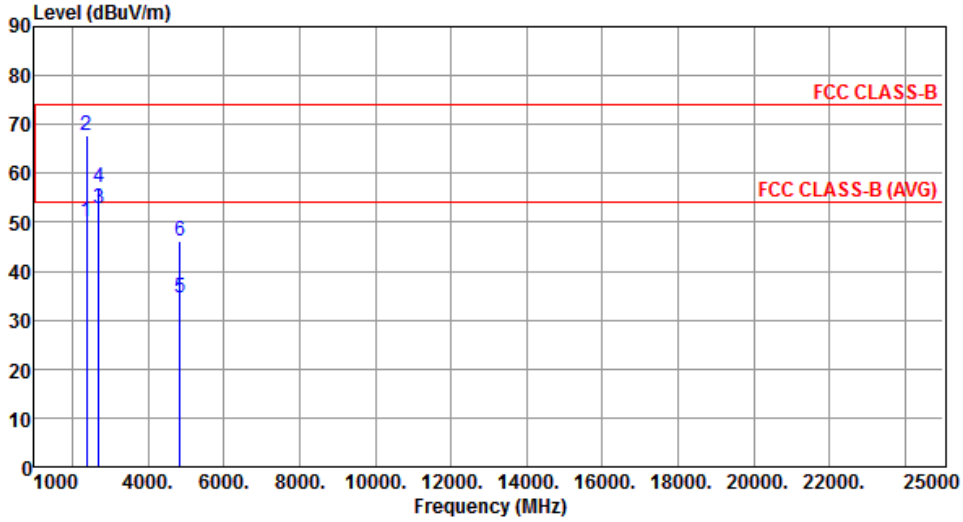
Modulation	HT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	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	52.67	54.00	-1.33	56.01	-3.34	Average	---	---
2	2390.00	71.92	74.00	-2.08	75.26	-3.34	Peak	---	---
3	2700.00	51.44	54.00	-2.56	53.48	-2.04	Average	---	---
4	2700.00	56.24	74.00	-17.76	58.28	-2.04	Peak	---	---
5	4844.00	34.32	54.00	-19.68	29.42	4.90	Average	---	---
6	4844.00	46.28	74.00	-27.72	41.38	4.90	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).

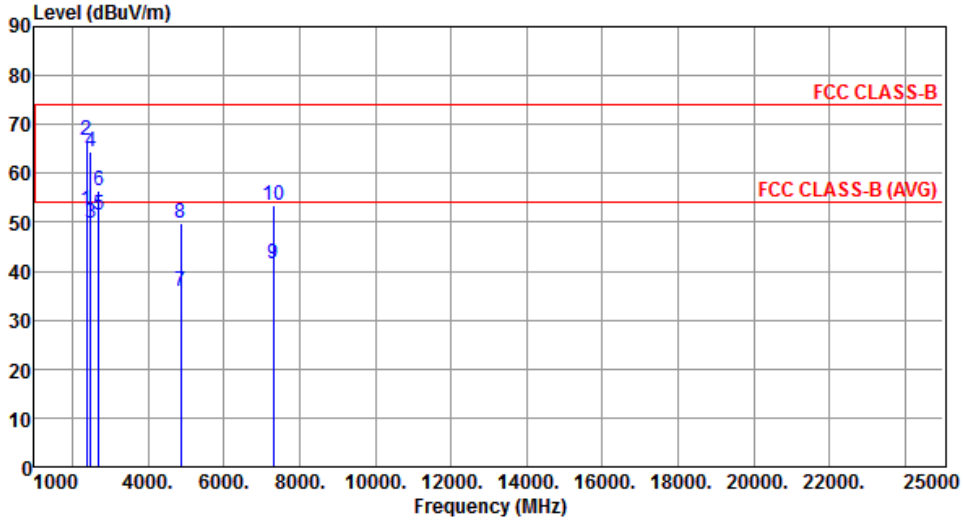
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	50.05	54.00	-3.95	53.39	-3.34	Average	---	---
2	2390.00	67.89	74.00	-6.11	71.23	-3.34	Peak	---	---
3	2700.00	52.83	54.00	-1.17	54.87	-2.04	Average	---	---
4	2700.00	57.09	74.00	-16.91	59.13	-2.04	Peak	---	---
5	4844.00	34.43	54.00	-19.57	29.53	4.90	Average	---	---
6	4844.00	46.14	74.00	-27.86	41.24	4.90	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).

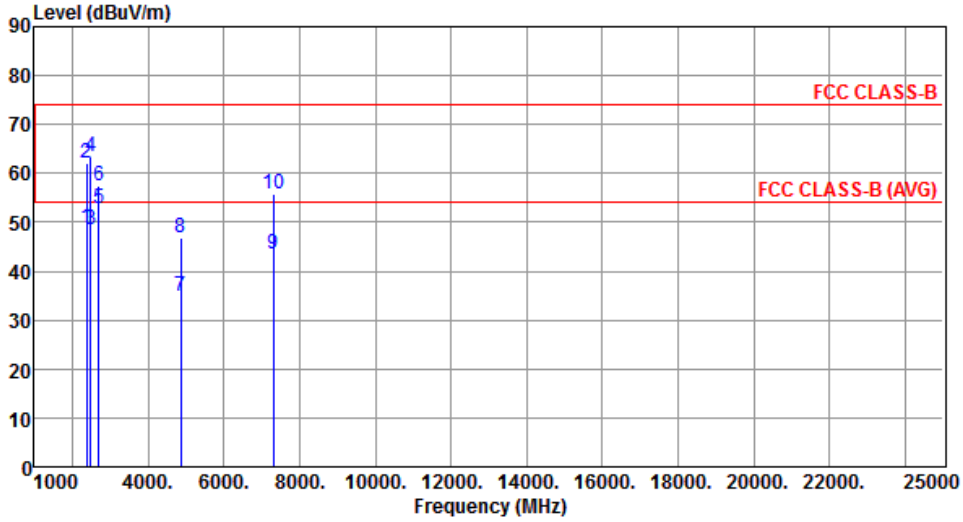
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	52.51	54.00	-1.49	55.85	-3.34	Average	---	---
2	2390.00	66.90	74.00	-7.10	70.24	-3.34	Peak	---	---
3	2483.50	49.96	54.00	-4.04	52.86	-2.90	Average	---	---
4	2483.50	64.33	74.00	-9.67	67.23	-2.90	Peak	---	---
5	2700.00	51.62	54.00	-2.38	53.66	-2.04	Average	---	---
6	2700.00	56.43	74.00	-17.57	58.47	-2.04	Peak	---	---
7	4874.00	35.97	54.00	-18.03	31.00	4.97	Average	---	---
8	4874.00	49.65	74.00	-24.35	44.68	4.97	Peak	---	---
9	7311.00	41.46	54.00	-12.54	31.93	9.53	Average	---	---
10	7311.00	53.35	74.00	-20.65	43.82	9.53	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).

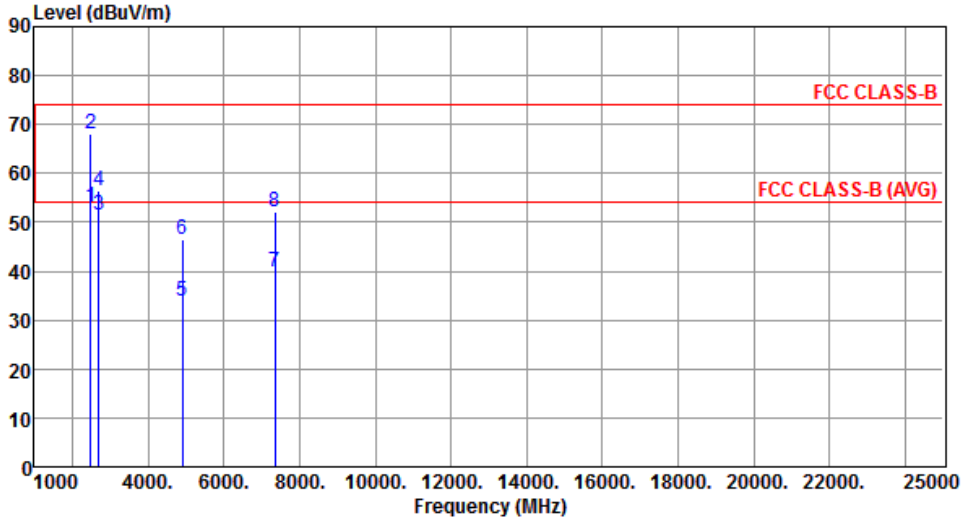
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.87	54.00	-5.13	52.21	-3.34	Average	---	---
2	2390.00	62.20	74.00	-11.80	65.54	-3.34	Peak	---	---
3	2483.50	48.33	54.00	-5.67	51.23	-2.90	Average	---	---
4	2483.50	63.41	74.00	-10.59	66.31	-2.90	Peak	---	---
5	2700.00	52.73	54.00	-1.27	54.77	-2.04	Average	---	---
6	2700.00	57.34	74.00	-16.66	59.38	-2.04	Peak	---	---
7	4874.00	34.85	54.00	-19.15	29.88	4.97	Average	---	---
8	4874.00	46.91	74.00	-27.09	41.94	4.97	Peak	---	---
9	7311.00	43.40	54.00	-10.60	33.87	9.53	Average	---	---
10	7311.00	55.80	74.00	-18.20	46.27	9.53	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).

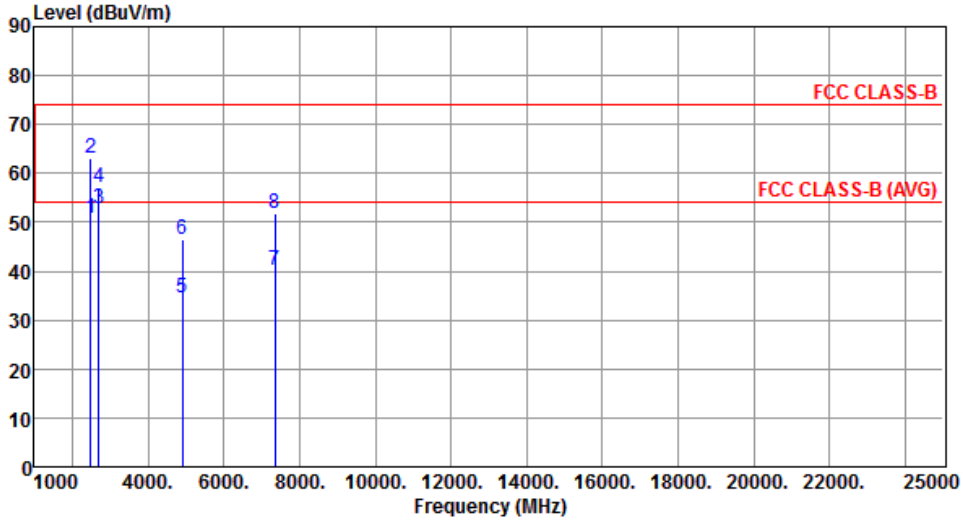
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	53.00	54.00	-1.00	55.90	-2.90	Average	---	---
2	2483.50	68.09	74.00	-5.91	70.99	-2.90	Peak	---	---
3	2700.00	51.49	54.00	-2.51	53.53	-2.04	Average	---	---
4	2700.00	56.30	74.00	-17.70	58.34	-2.04	Peak	---	---
5	4904.00	34.01	54.00	-19.99	28.95	5.06	Average	---	---
6	4904.00	46.42	74.00	-27.58	41.36	5.06	Peak	---	---
7	7356.00	39.94	54.00	-14.06	30.33	9.61	Average	---	---
8	7356.00	52.02	74.00	-21.98	42.41	9.61	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).

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	50.85	54.00	-3.15	53.75	-2.90	Average	---	---
2	2483.50	63.08	74.00	-10.92	65.98	-2.90	Peak	---	---
3	2700.00	52.89	54.00	-1.11	54.93	-2.04	Average	---	---
4	2700.00	57.27	74.00	-16.73	59.31	-2.04	Peak	---	---
5	4904.00	34.38	54.00	-19.62	29.32	5.06	Average	---	---
6	4904.00	46.63	74.00	-27.37	41.57	5.06	Peak	---	---
7	7356.00	40.03	54.00	-13.97	30.42	9.61	Average	---	---
8	7356.00	51.89	74.00	-22.11	42.28	9.61	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).

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

Reference level measurement

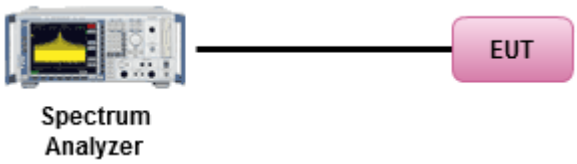
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

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

3.6.4 Test Setup

Transmitter Radiated Bandedge Emissions

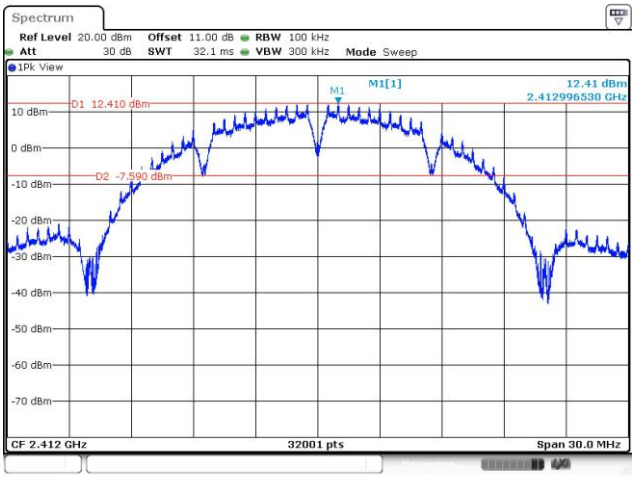
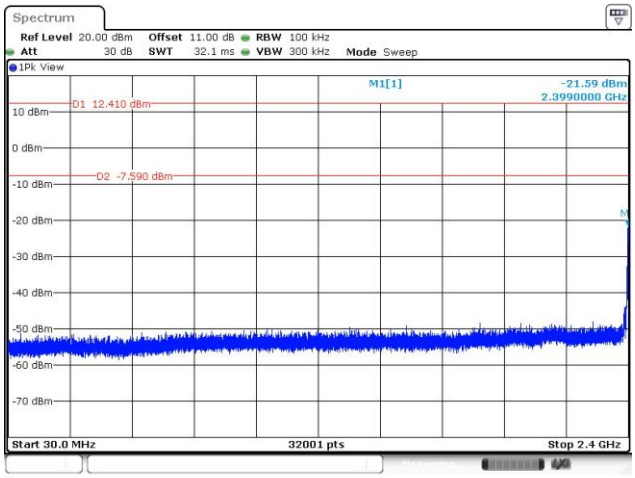
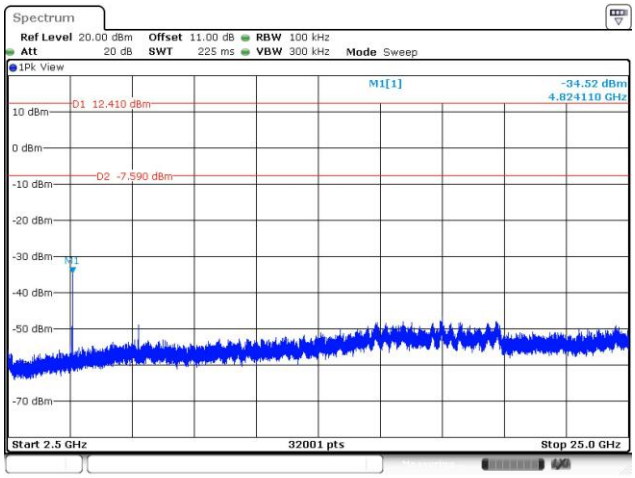
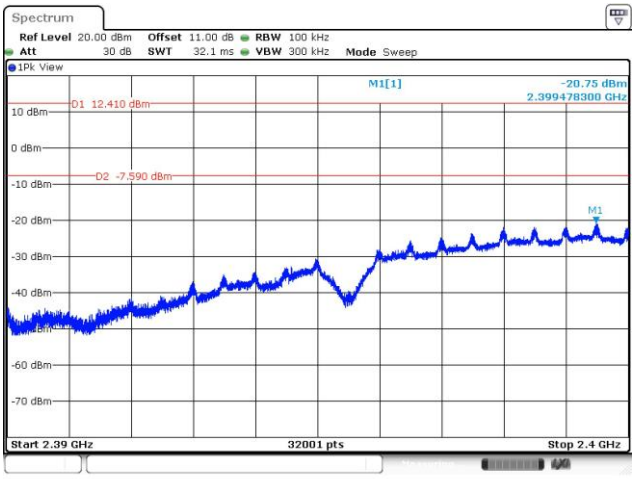


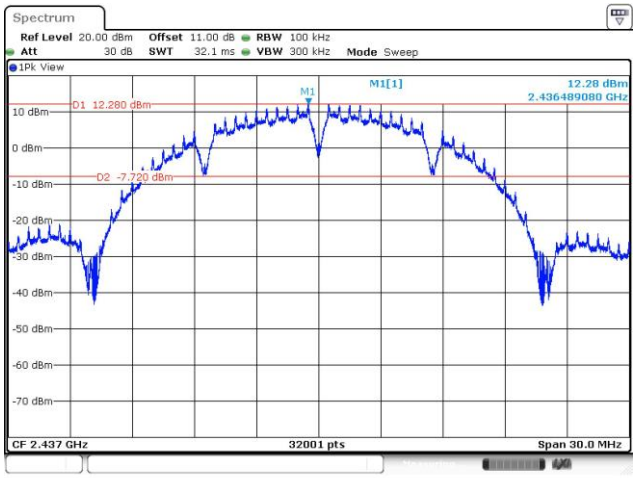
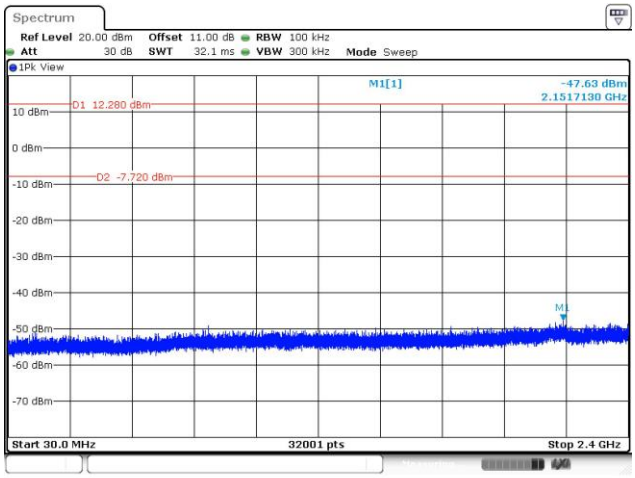
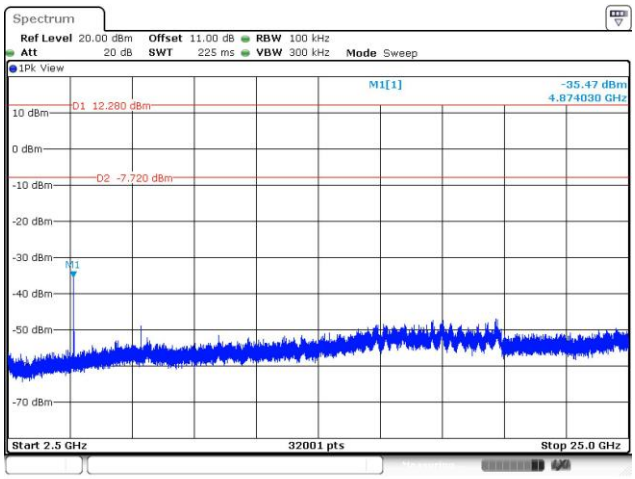
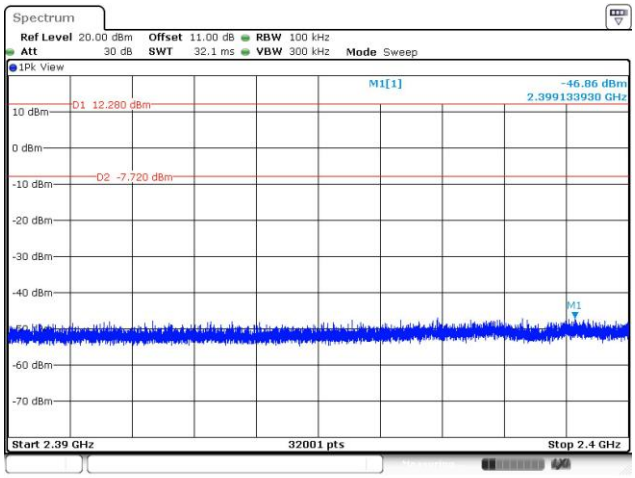
3.6.5 Test Result of Emissions in non-restricted frequency bands

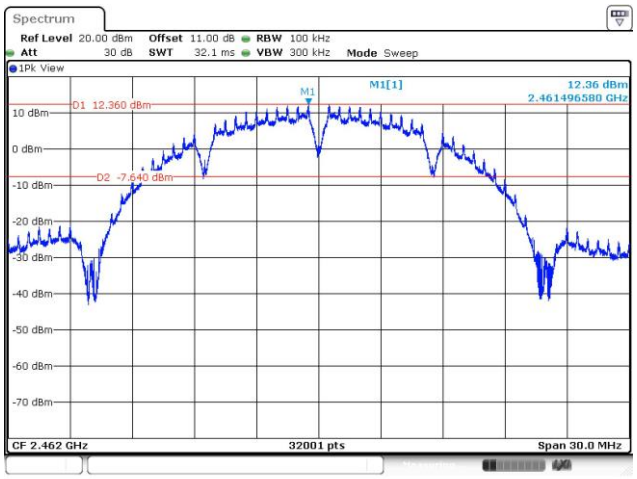
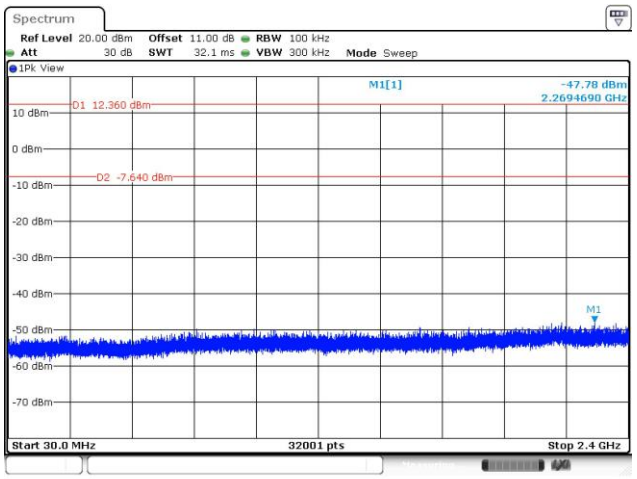
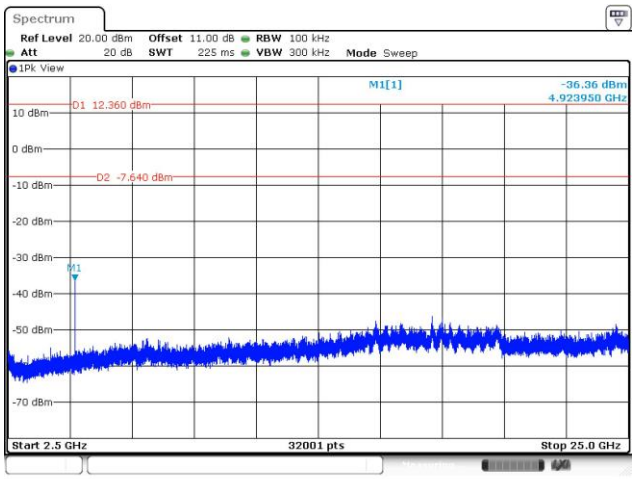
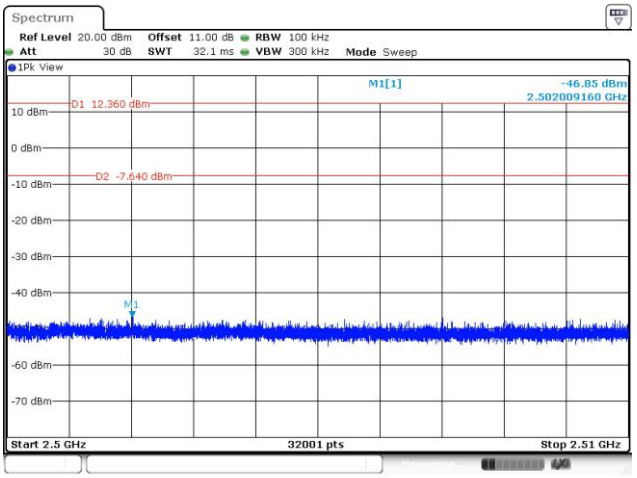
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.6 Unwanted Emissions into Non-Restricted Frequency Bands

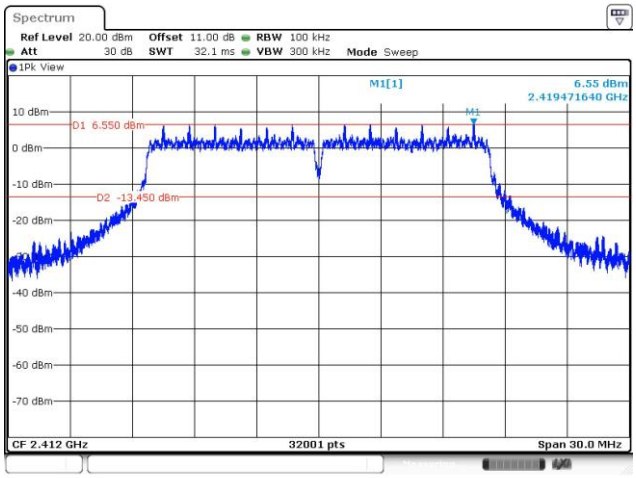
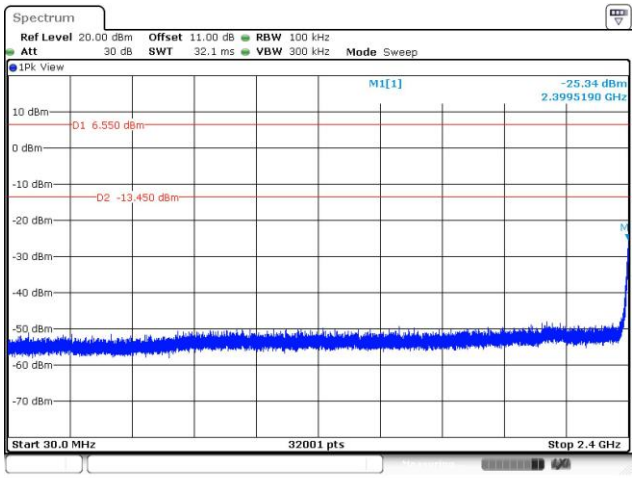
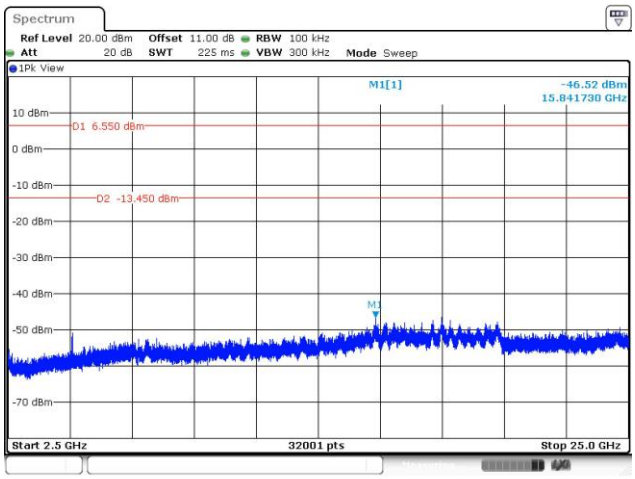
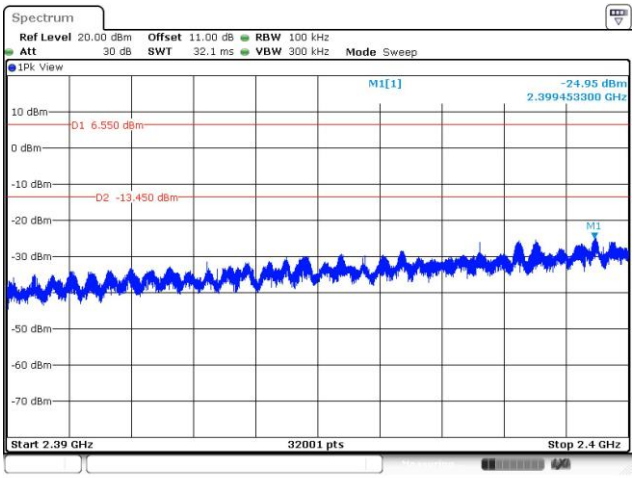
802.11b

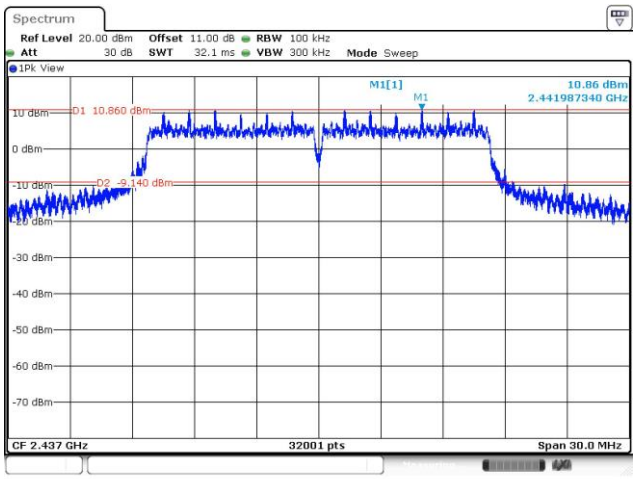
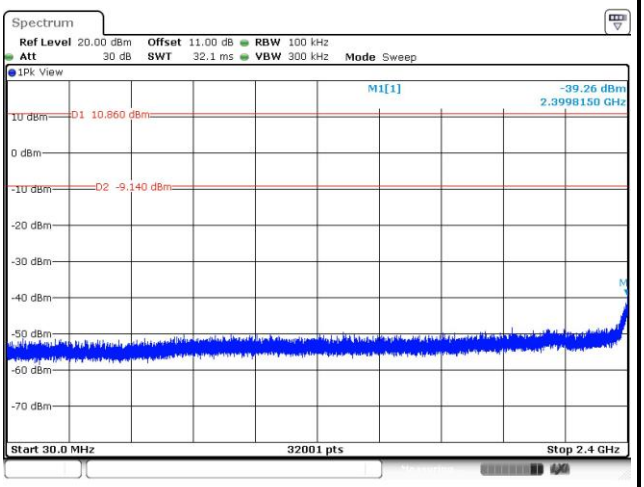
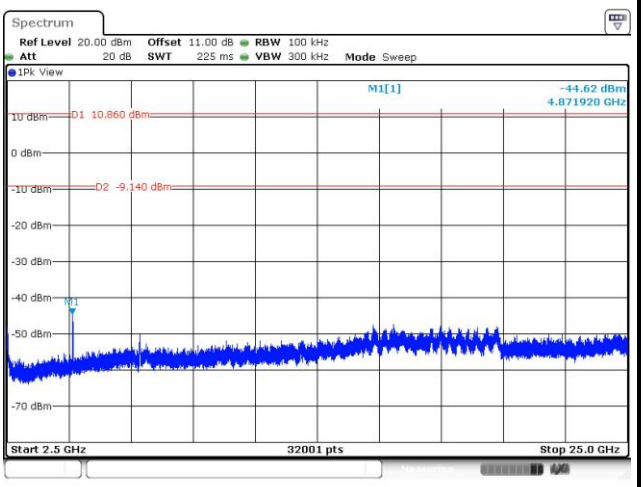
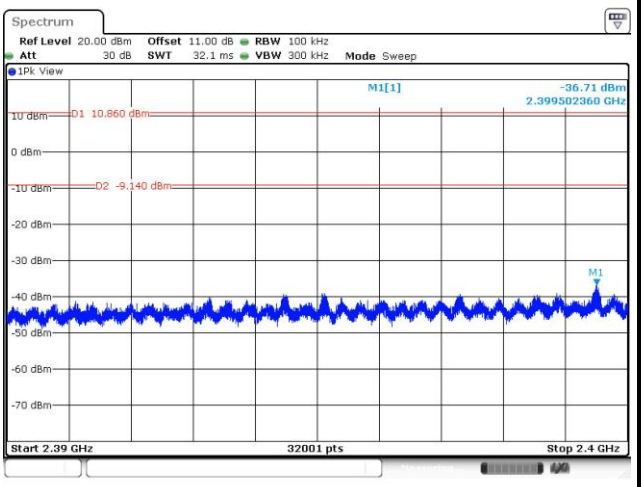
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

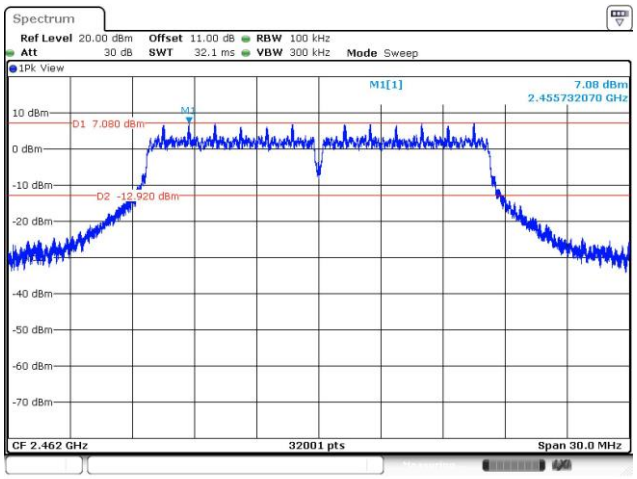
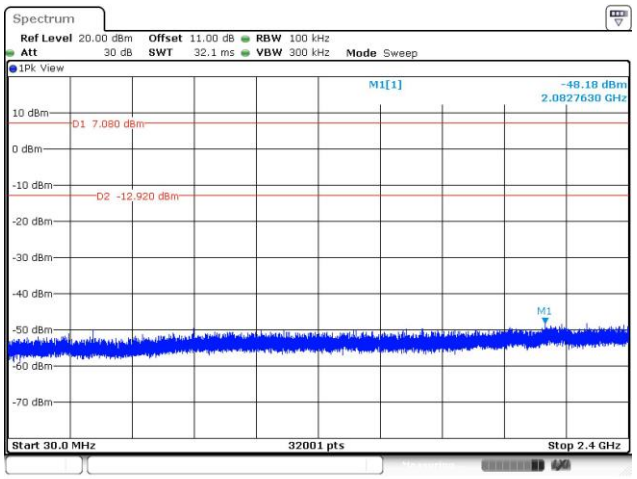
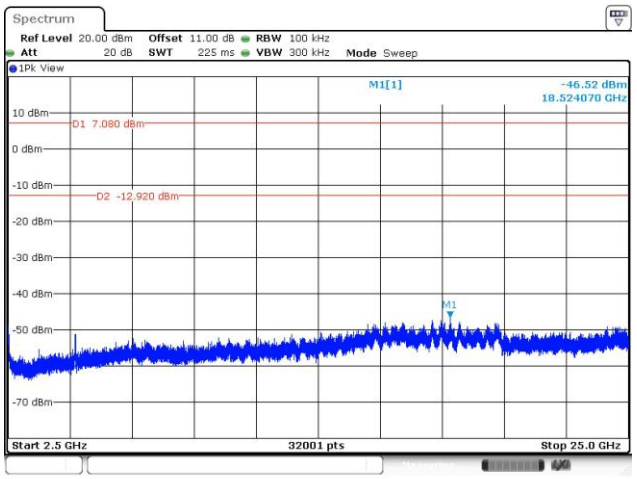
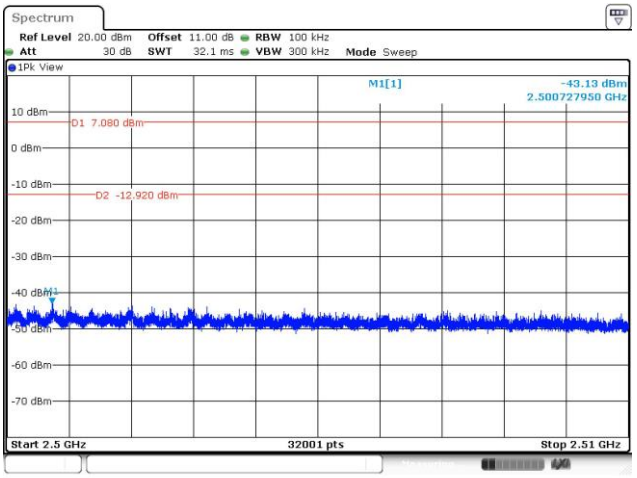
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

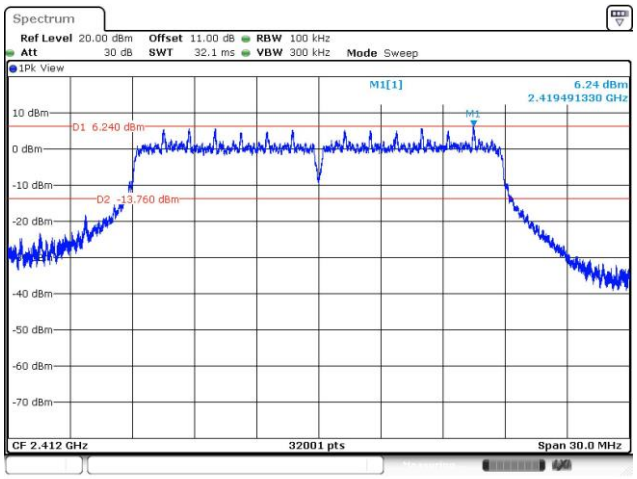
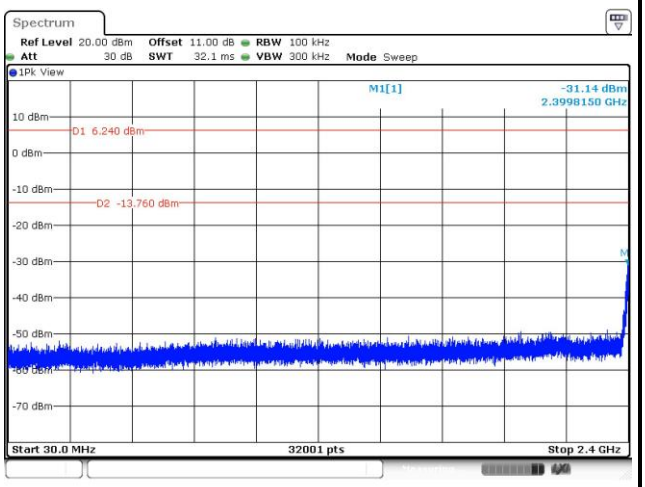
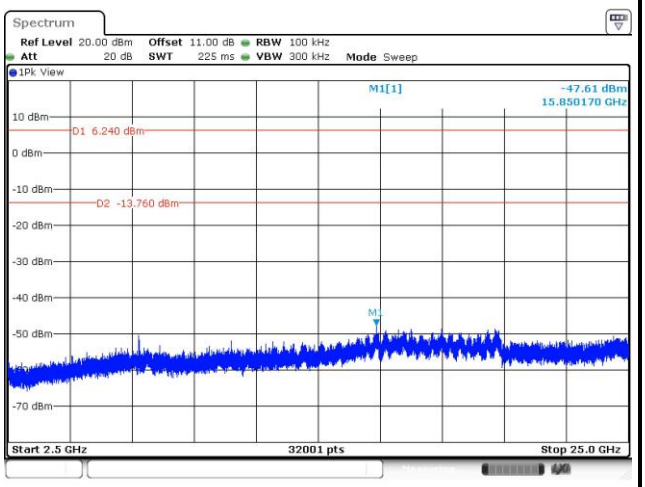
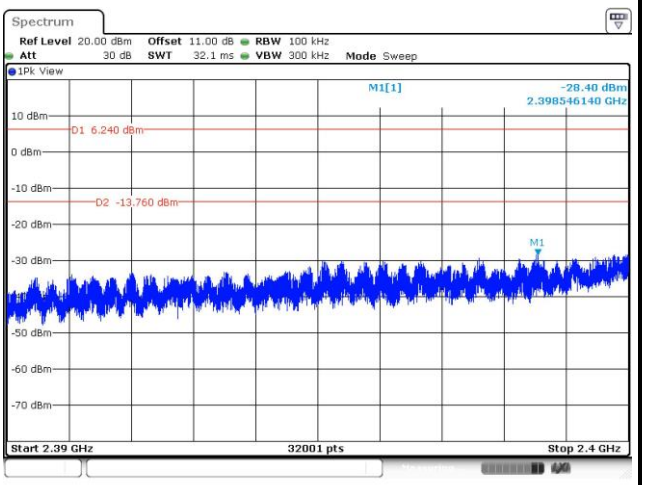
802.11g

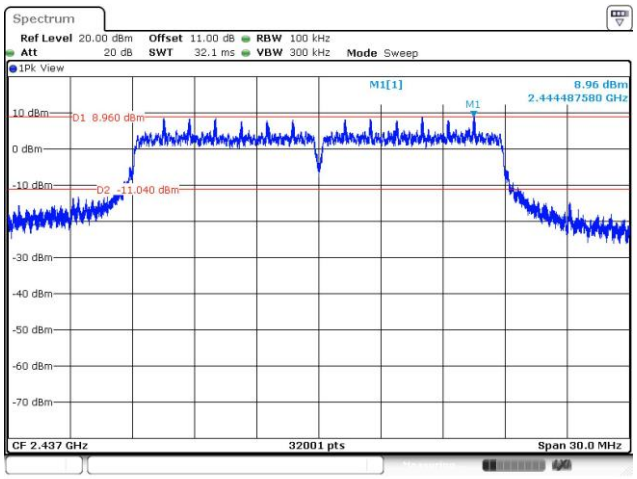
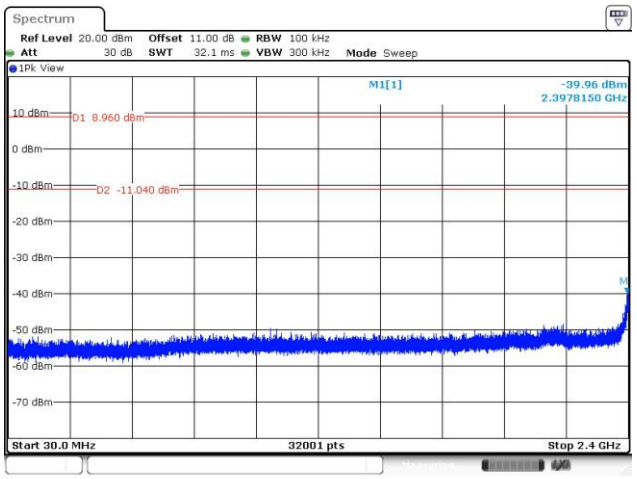
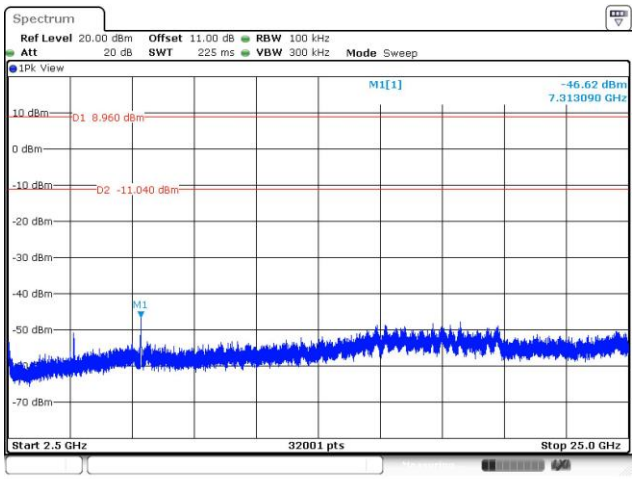
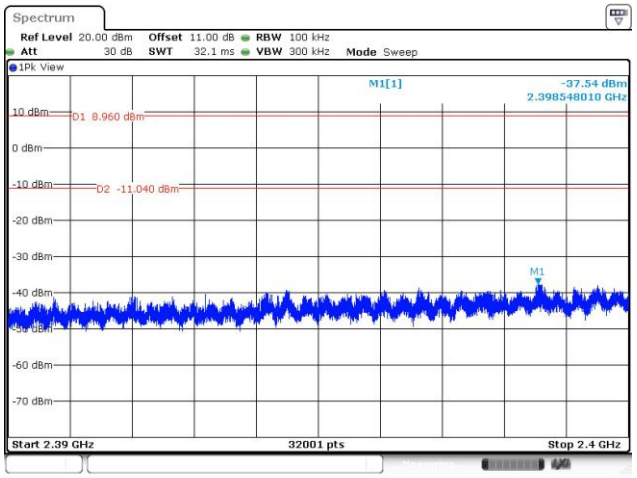
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

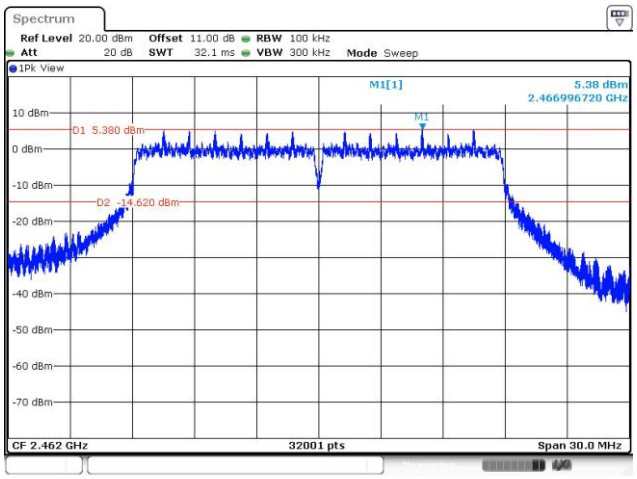
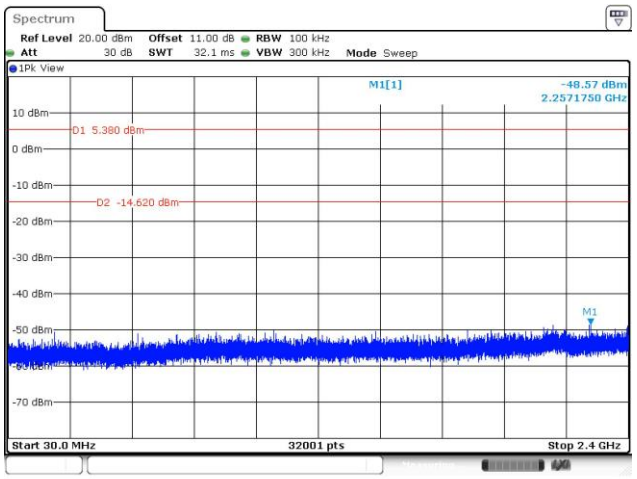
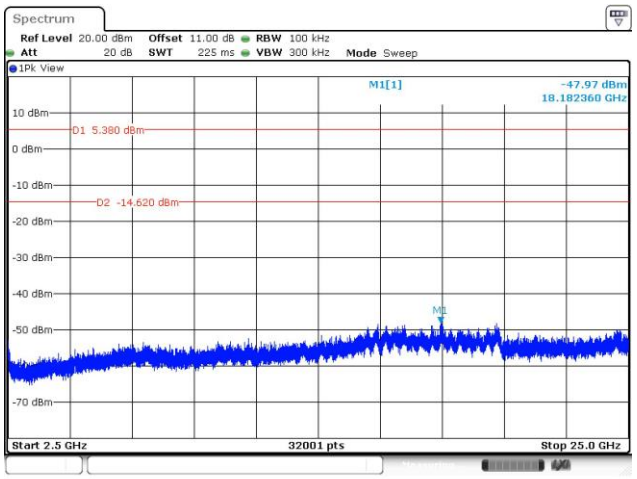
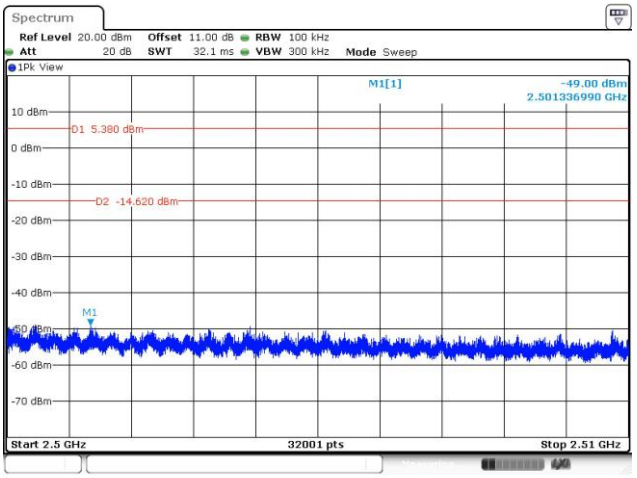
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

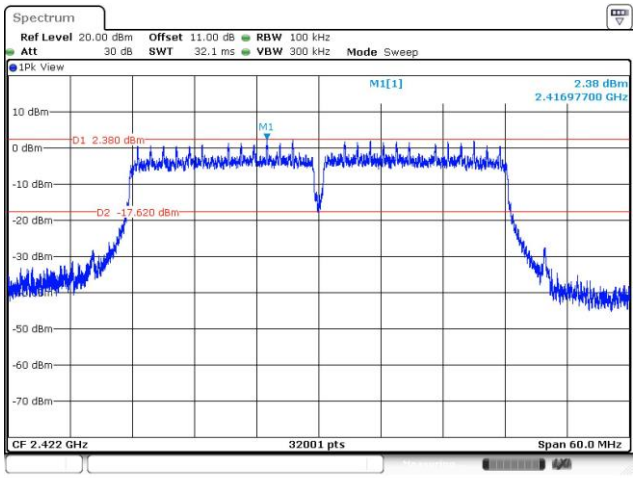
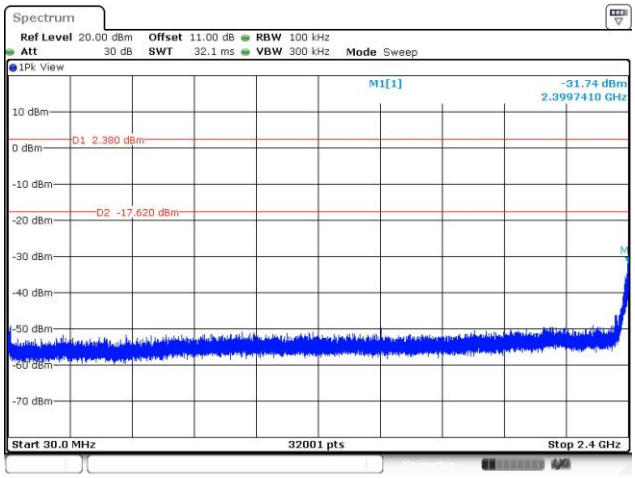
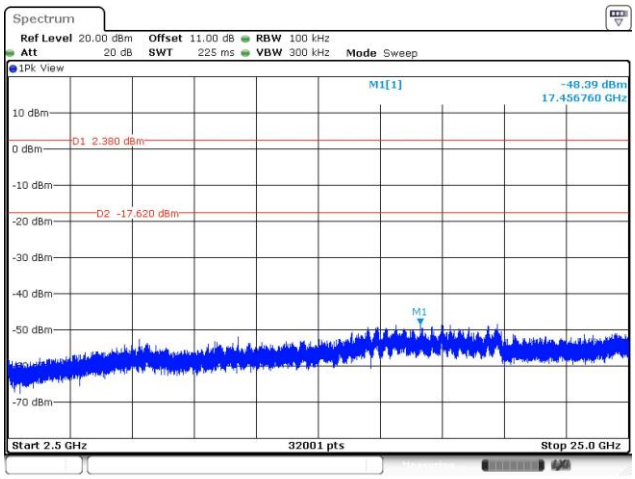
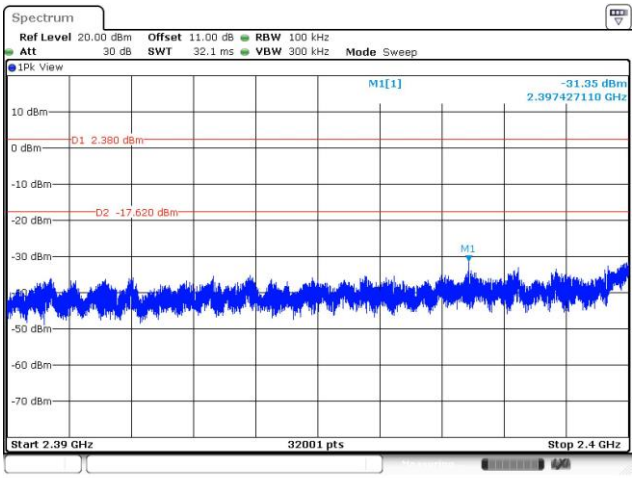
802.11n HT20

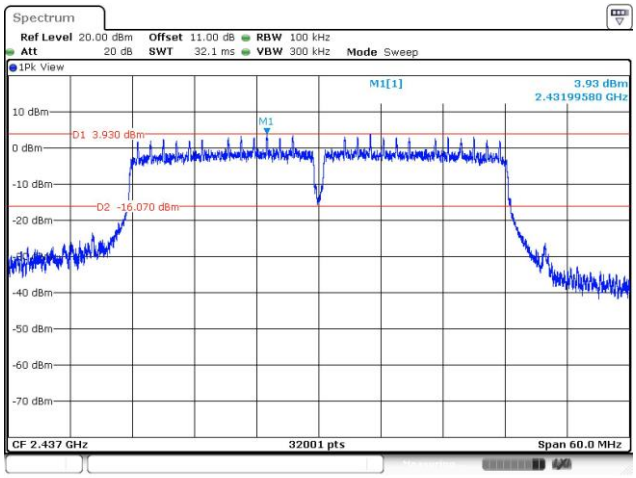
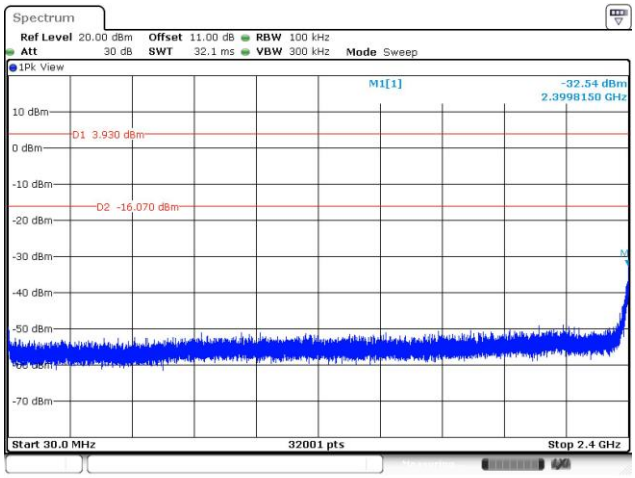
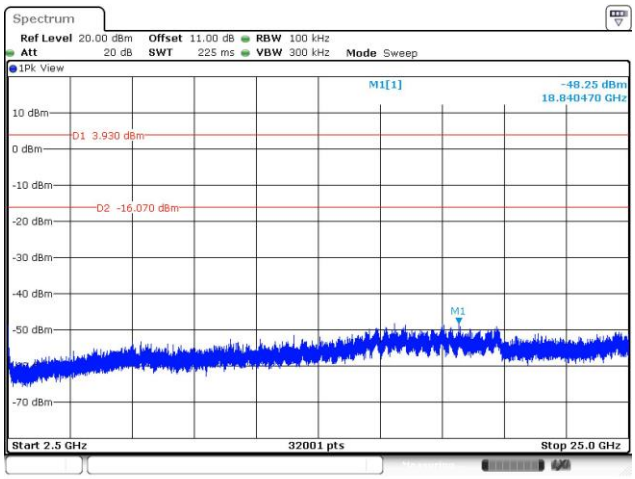
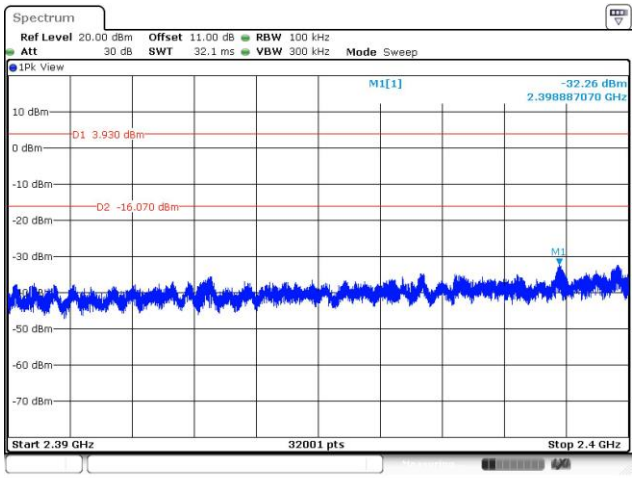
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

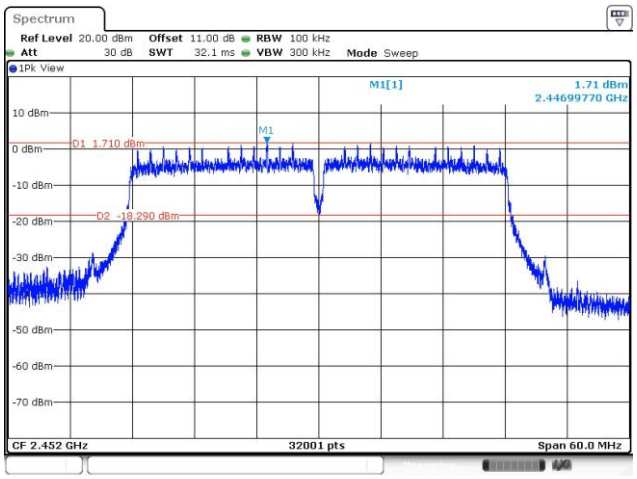
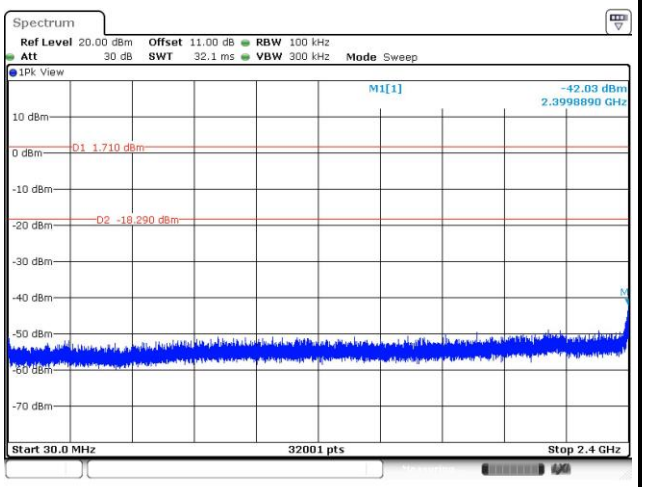
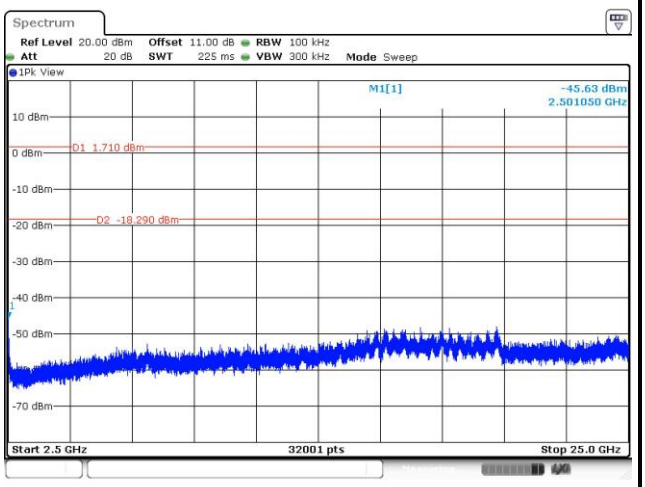
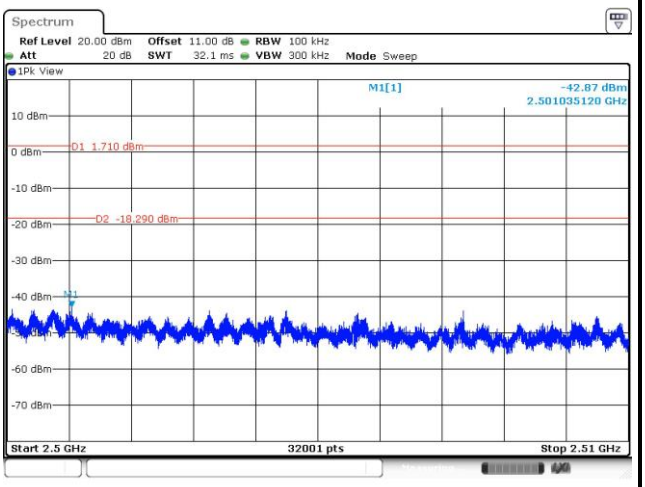
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

802.11n HT40

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

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

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

4 Test laboratory information

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

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

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

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

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

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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