FCC Test Report

FCC ID	:	**UIDTR4400**
Equipment	:	**802.11ac Wireless Router**
Model No.	:	**TR4400-AC, RAC2V1A** **(Two models are for marketing difference)**
Brand Name	:	**ARRIS**
Applicant	:	**Arris**
Address	:	**3871 LAKEFIELD DRIVE SUITE 300 SUWANEE GA USA**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Feb. 10, 2017**
Tested Date	:	**Mar. 03 ~ Jun. 27, 2017**

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

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR721001AC	Rev. 01	Initial issue	Aug. 07, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.183MHz 52.47 (Margin -11.86dB) - QP	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 53.69 (Margin -0.31dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: ***Non-beamforming mode*** 29.54 ***Beamforming mode*** 27.88	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
2400-2483.5	b	2412-2462	1-11 [11]	3	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	3	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	3	MCS 0-23
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	3	MCS 0-23
2400-2483.5	ac (VHT20)	2412-2462	1-11 [11]	3	MCS 0-9
2400-2483.5	ac (VHT40)	2422-2452	3-9 [7]	3	MCS 0-9
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power. Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation. Note 3: 802.11g/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.. Note 4: 802.11ac supports beamforming function.					

1.1.2 Antenna Details

Model	Type	Connector	Gain (dBi)
2.4 G ANT 1	Dipole	I-PEX	2.4
2.4 G ANT 3	Dipole	I-PEX	3.1
2.4 G ANT 4	Dipole	I-PEX	3.4

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from AC adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand: SERCOMM Model: PU30W120ULB18-CAU-00 Power Rating: I/P: 100-240Vac, 50-60Hz, 1.0A O/P: 12Vdc, 2.5A Power Line: 1.75m non-shielded without core
2	AC adapter	Brand: ARRIS Model: NBS36E120250VU Power Rating: I/P: 100-240Vac, 50/60Hz, 0.8A O/P: 12Vdc, 2.5A Power Line: 1.8m non-shielded without core
3	RJ45 cable	1.16m shielded without core

1.1.5 Channel List

Frequency band (MHz)		**2400~2483.5**	
802.11 b / g / n HT20 / ac VHT20		**802.11n HT40 / ac VHT40**	
Channel	**Frequency(MHz)**	**Channel**	**Frequency(MHz)**
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	Non-beamforming: QCART, V3.0.144.0 Beamforming: LanTest20, V2.0.0.2				
Duty Cycle and Duty Factor	Mode	Non-beamforming		Beamforming	
		Duty cycle (%)	Duty factor (dB)	Duty cycle (%)	Duty factor (dB)
	11b	99.68%	0.01	---	---
	11g	98.04%	0.09	---	---
	VHT20	99.29%	0.03	92.29%	0.35
	VHT40	98.60%	0.06	91.98%	0.36

1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set	
		Non-beamforming	Beamforming
11b	2412	23.5	---
11b	2437	25	---
11b	2462	24	---
11g	2412	20	---
11g	2437	25.5	---
11g	2462	21	---
HT20	2412	19	---
HT20	2437	25.5	---
HT20	2462	20.5	---
HT40	2422	16	---
HT40	2437	20	---
HT40	2452	17.5	---
VHT20	2412	19	23
VHT20	2437	25.5	29
VHT20	2462	20.5	24
VHT40	2422	16	20
VHT40	2437	20	24
VHT40	2452	17.5	21

1.2 Local Support Equipment List

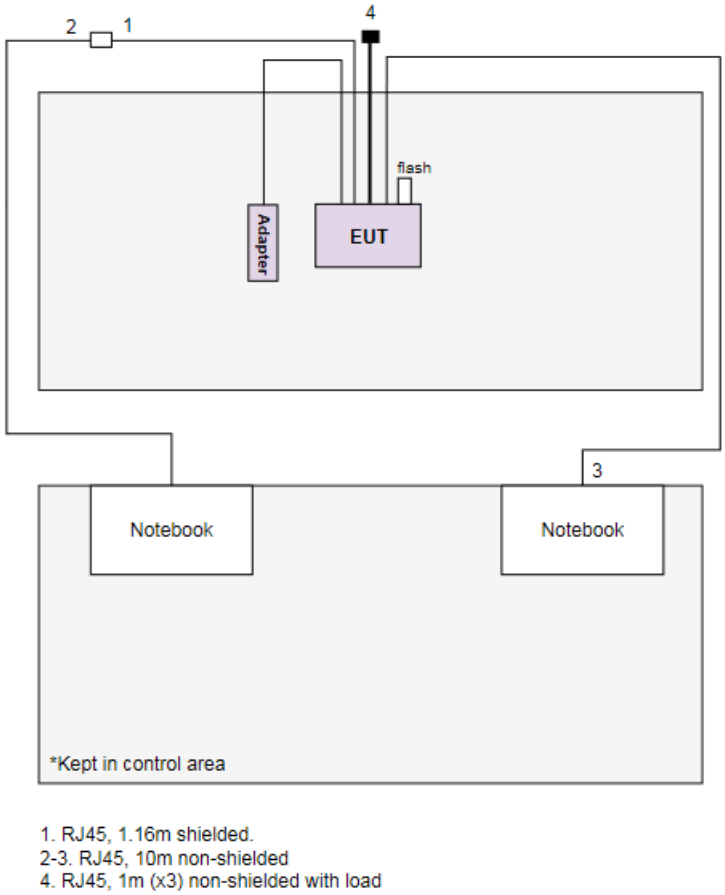
Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
2	Notebook	DELL	Latitude E5420	DoC	RJ45, 10m non-shielded.
3	USB 3.0 flash	SONY	USM16GU	---	---
4	BF Client device	ARRIS	TR4400-AC	---	---

Note: No. 4 is provided by applicant.

1.3 Test Setup Chart

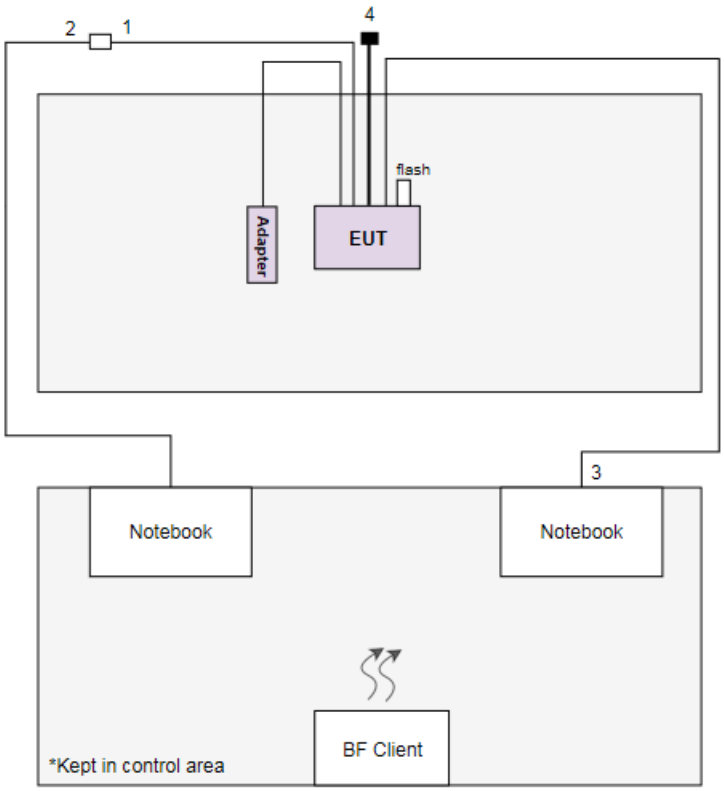
Non-beamforming mode

Test Setup Diagram



Beamforming mode

Test Setup Diagram



1. RJ45, 1.16m shielded.
2-3. RJ45, 10m non-shielded
4. RJ45, 1m (x3) non-shielded with load

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Mar. 20, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Mar. 03, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	Agilent	N9038A	MY53290044	Oct. 06, 2016	Oct. 05, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 26, 2016	Apr. 25, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980187	Sep. 08, 2016	Sep. 07, 2017
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 04, 2017	Feb. 03, 2018
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 04, 2017	Feb. 03, 2018
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 04, 2017	Feb. 03, 2018
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Jun. 05 ~ Jun. 14, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 09, 2016	Sep. 08, 2017
Receiver	Agilent	N9038A	MY53290044	Oct. 06, 2016	Oct. 05, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Preamplifier	Agilent	83017A	MY53270014	Aug. 22, 2016	Aug. 21, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 04, 2017	Feb. 03, 2018
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	Jun. 10 ~ Jun. 27, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Mar. 15, 2017	Mar. 14, 2018
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247
ANSI C63.10-2013
FCC KDB 558074 D01 DTS Meas Guidance v04
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.37 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 57%	Howard Huang
Radiated Emissions	03CH03-WS	23-24°C / 62-67%	Aska Huang
RF Conducted	TH01-WS	22°C / 60%	Brad Wu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- IC site registration No.: 10807C-2

2.2 The Worst Test Modes and Channel Details

Non-beamforming mode

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	11b	2437	1 Mbps	---
Radiated Emissions ≤1GHz	11b	2437	1 Mbps	---
Maximum Output Power	11b 11g HT20 HT40 VHT20 VHT40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0 MCS 0 MCS 0	---
Radiated Emissions >1GHz 6dB bandwidth Power spectral density	11b 11g VHT20 VHT40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	---
NOTE: 1) Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)				

Beamforming mode

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	VHT20	2437	MCS 0	---
Radiated Emissions ≤1GHz	VHT20	2437	MCS 0	---
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	VHT20 VHT40	2412 / 2437 / 2462 2422 / 2437 / 2452	MCS 0 MCS 0	---
NOTE: 1) Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing. (Adapter 1: SERCOMM; Adapter 2: ARRIS)				

3 Transmitter Test Results

3.1 Conducted Emissions

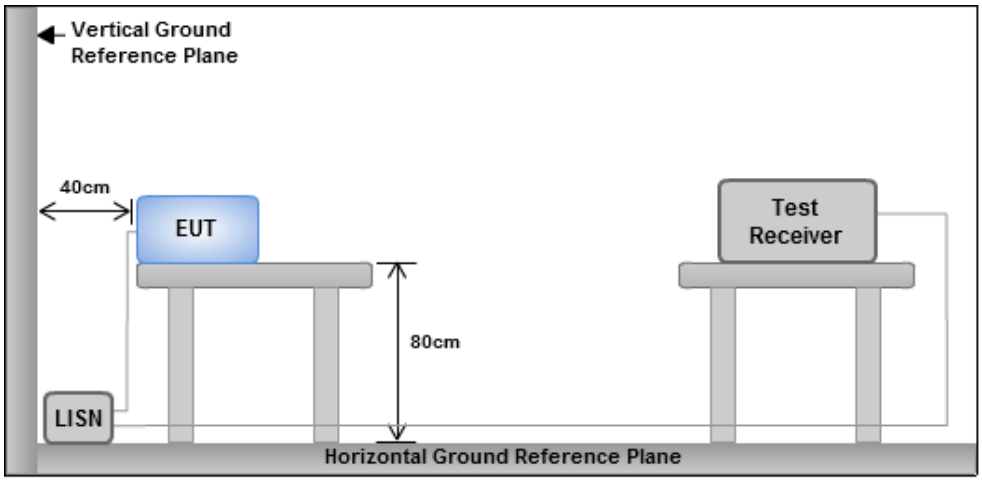
3.1.1 Limit of Conducted Emissions

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

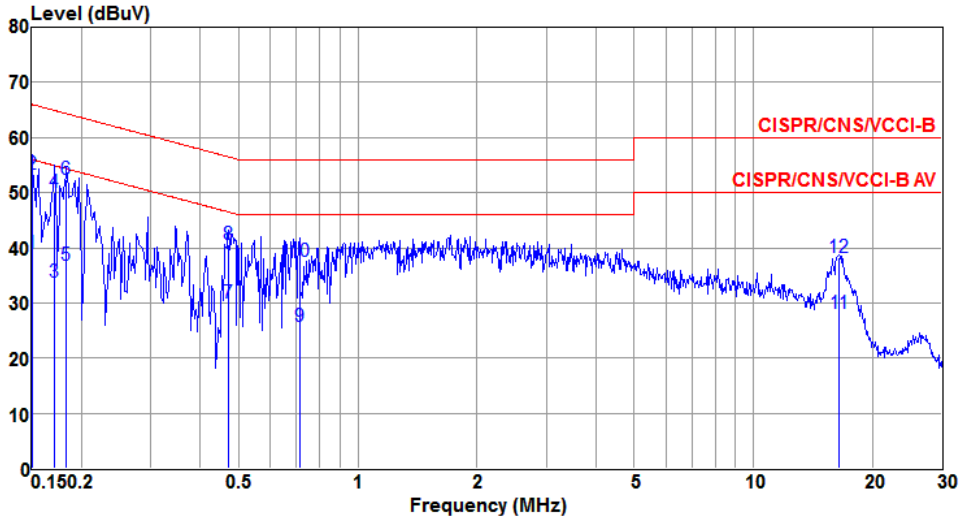


Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

Non-beamforming mode

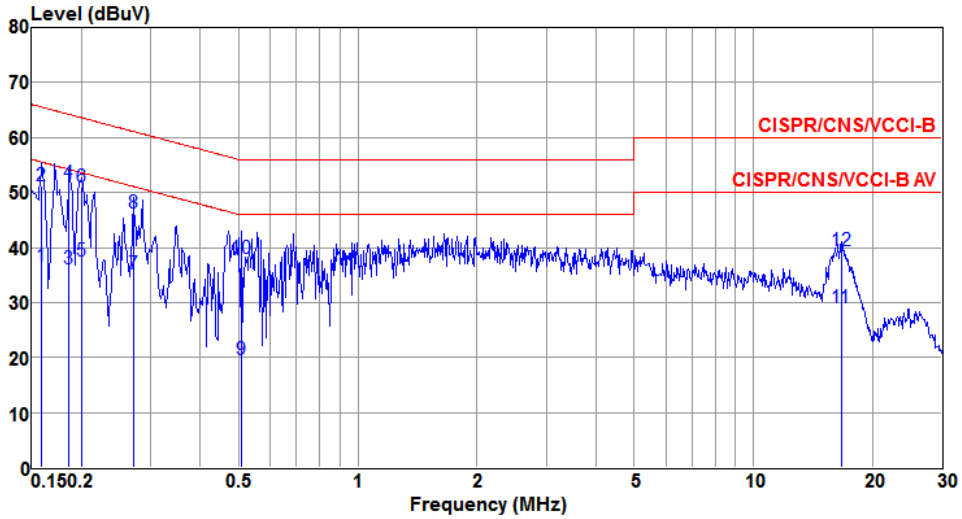
Modulation	11b	**Test Freq. (MHz)**	2437
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.150	39.05	56.00	-16.95	38.96	0.07	0.02	Average
2	0.150	53.36	66.00	-12.64	53.27	0.07	0.02	QP
3	0.171	33.86	54.90	-21.04	33.76	0.08	0.02	Average
4	0.171	49.95	64.90	-14.95	49.85	0.08	0.02	QP
5	0.183	36.72	54.33	-17.61	36.61	0.09	0.02	Average
6@	0.183	52.47	64.33	-11.86	52.36	0.09	0.02	QP
7	0.471	29.91	46.49	-16.58	29.81	0.06	0.04	Average
8	0.471	40.69	56.49	-15.80	40.59	0.06	0.04	QP
9	0.712	25.82	46.00	-20.18	25.70	0.07	0.05	Average
10	0.712	37.60	56.00	-18.40	37.48	0.07	0.05	QP
11	16.486	28.19	50.00	-21.81	27.65	0.34	0.20	Average
12	16.486	38.13	60.00	-21.87	37.59	0.34	0.20	QP

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

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

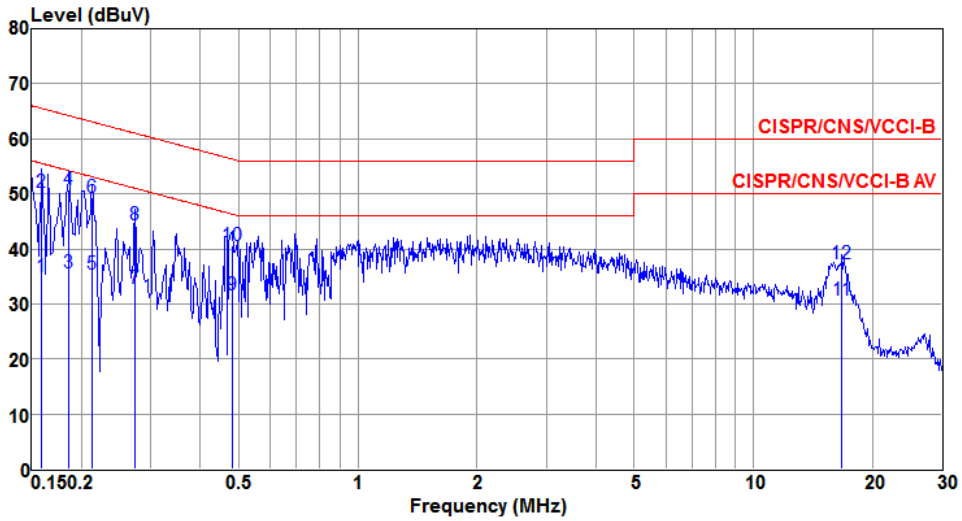


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	36.52	55.52	-19.00	36.40	0.10	0.02	Average
2	0.159	51.33	65.52	-14.19	51.21	0.10	0.02	QP
3	0.186	36.05	54.20	-18.15	35.94	0.09	0.02	Average
4@	0.186	51.60	64.20	-12.60	51.49	0.09	0.02	QP
5	0.201	37.61	53.58	-15.97	37.50	0.09	0.02	Average
6	0.201	50.96	63.58	-12.62	50.85	0.09	0.02	QP
7	0.270	35.12	51.12	-16.00	34.99	0.11	0.02	Average
8	0.270	46.36	61.12	-14.76	46.23	0.11	0.02	QP
9	0.507	19.61	46.00	-26.39	19.45	0.12	0.04	Average
10	0.507	38.04	56.00	-17.96	37.88	0.12	0.04	QP
11	16.661	29.05	50.00	-20.95	28.47	0.38	0.20	Average
12	16.661	39.47	60.00	-20.53	38.89	0.38	0.20	QP

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

Beamforming mode

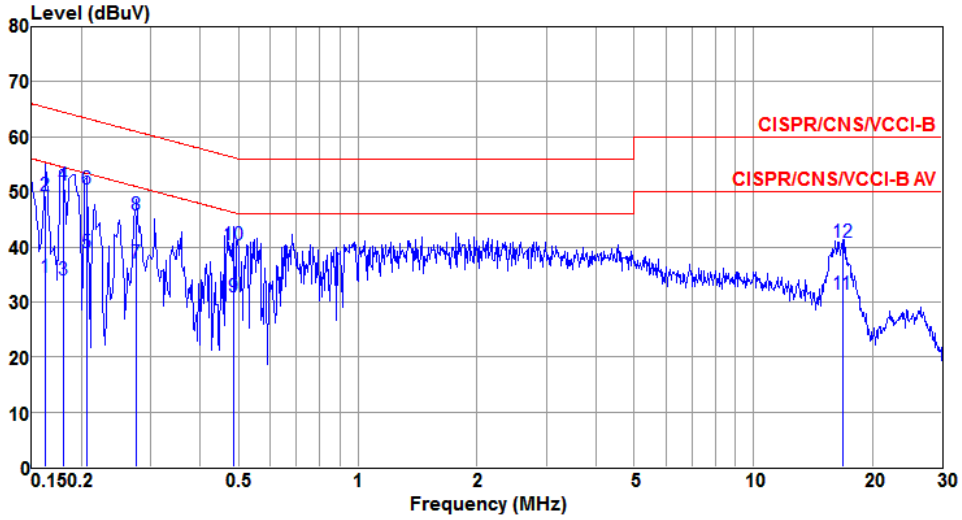
Modulation	VHT20	**Test Freq. (MHz)**	2437
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	34.83	55.52	-20.69	34.73	0.08	0.02	Average
2	0.159	50.29	65.52	-15.23	50.19	0.08	0.02	QP
3	0.186	35.74	54.20	-18.46	35.63	0.09	0.02	Average
4@	0.186	50.85	64.20	-13.35	50.74	0.09	0.02	QP
5	0.213	35.43	53.10	-17.67	35.31	0.10	0.02	Average
6	0.213	49.26	63.10	-13.84	49.14	0.10	0.02	QP
7	0.273	32.79	51.03	-18.24	32.69	0.08	0.02	Average
8	0.273	44.48	61.03	-16.55	44.38	0.08	0.02	QP
9	0.481	31.66	46.32	-14.66	31.56	0.06	0.04	Average
10	0.481	40.60	56.32	-15.72	40.50	0.06	0.04	QP
11	16.750	30.65	50.00	-19.35	30.10	0.35	0.20	Average
12	16.750	37.34	60.00	-22.66	36.79	0.35	0.20	QP

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

Modulation	VHT20	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	0.162	34.50	55.34	-20.84	34.38	0.10	0.02	Average
2	0.162	49.27	65.34	-16.07	49.15	0.10	0.02	QP
3	0.180	33.94	54.50	-20.56	33.83	0.09	0.02	Average
4	0.180	51.27	64.50	-13.23	51.16	0.09	0.02	QP
5	0.207	39.01	53.32	-14.31	38.90	0.09	0.02	Average
6@	0.207	50.62	63.32	-12.70	50.51	0.09	0.02	QP
7	0.276	37.02	50.94	-13.92	36.89	0.11	0.02	Average
8	0.276	45.80	60.94	-15.14	45.67	0.11	0.02	QP
9	0.484	30.81	46.27	-15.46	30.65	0.12	0.04	Average
10	0.484	40.32	56.27	-15.95	40.16	0.12	0.04	QP
11	16.839	31.39	50.00	-18.61	30.81	0.39	0.19	Average
12	16.839	40.77	60.00	-19.23	40.19	0.39	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

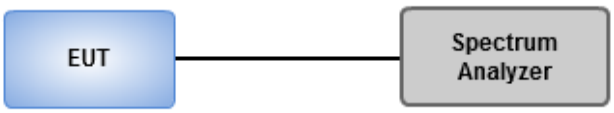
6dB Bandwidth

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

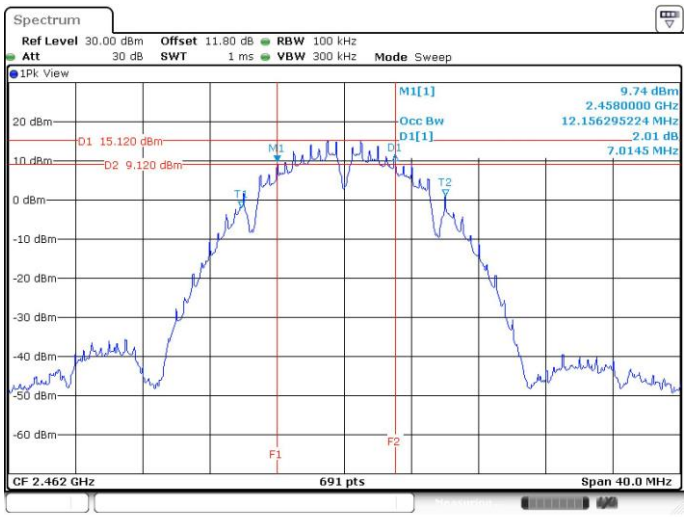


3.2.4 Test Result of 6dB and Occupied Bandwidth

Non-beamforming mode

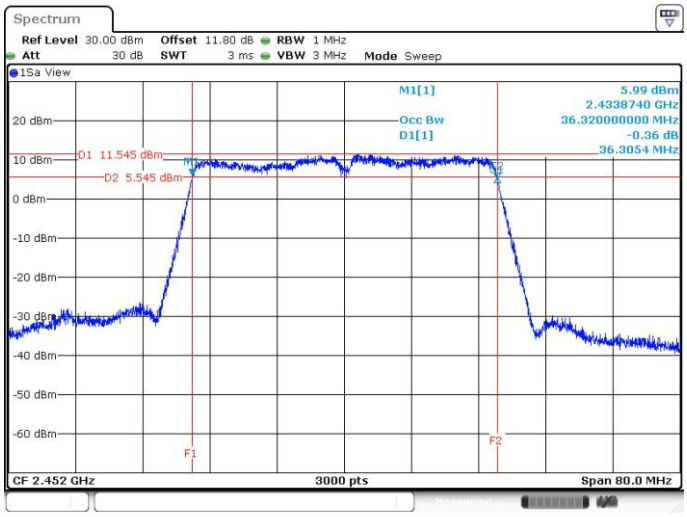
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	3	2412	8.06	8.06	8.06	---	500
11b	3	2437	7.13	9.04	8.12	---	500
11b	3	2462	8.06	7.01	7.07	---	500
11g	3	2412	15.77	15.07	15.77	---	500
11g	3	2437	15.71	16.06	15.71	---	500
11g	3	2462	16.29	15.07	16.35	---	500
VHT20	3	2412	16.41	15.65	15.71	---	500
VHT20	3	2437	16.35	16.35	16.99	---	500
VHT20	3	2462	17.22	16.00	17.62	---	500
VHT40	3	2422	30.15	32.58	31.30	---	500
VHT40	3	2437	32.58	35.36	35.01	---	500
VHT40	3	2452	35.71	35.36	35.13	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	3	2412	12.92	12.45	12.75	---
11b	3	2437	12.73	13.31	13.12	---
11b	3	2462	12.95	13.19	12.81	---
11g	3	2412	16.51	16.36	16.41	---
11g	3	2437	16.48	16.55	16.41	---
11g	3	2462	16.51	16.48	16.41	---
VHT20	3	2412	17.61	17.61	17.57	---
VHT20	3	2437	17.60	17.55	17.69	---
VHT20	3	2462	17.63	17.49	17.64	---
VHT40	3	2422	35.41	35.84	35.65	---
VHT40	3	2437	35.73	36.24	35.97	---
VHT40	3	2452	36.24	36.32	36.11	---

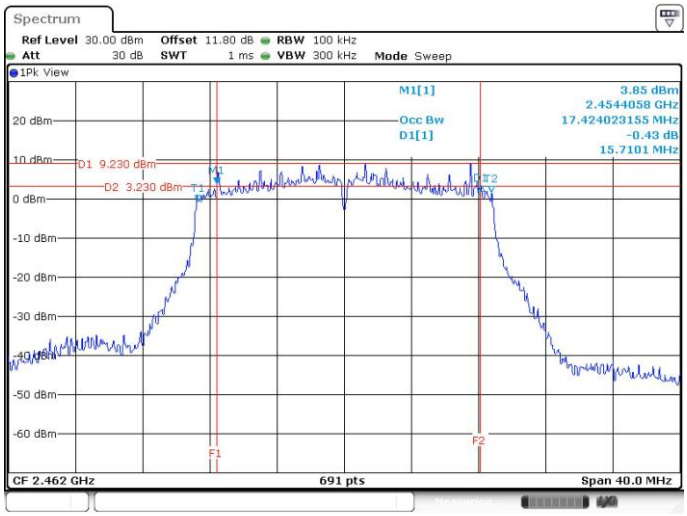
Worst Plot



Beamforming mode

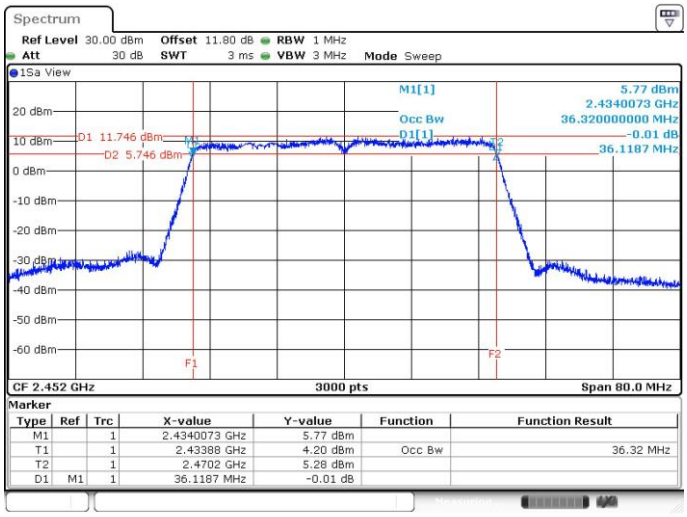
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
VHT20	3	2412	16.41	16.41	16.52	---	500
VHT20	3	2437	16.35	17.22	17.57	---	500
VHT20	3	2462	17.22	15.71	17.57	---	500
VHT40	3	2422	28.87	30.03	30.15	---	500
VHT40	3	2437	32.58	30.15	30.15	---	500
VHT40	3	2452	32.58	35.01	33.74	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
VHT20	3	2412	17.63	17.55	17.53	---
VHT20	3	2437	17.59	17.53	17.67	---
VHT20	3	2462	17.65	17.48	17.65	---
VHT40	3	2422	35.36	35.89	35.63	---
VHT40	3	2437	35.57	36.24	35.95	---
VHT40	3	2452	36.19	36.32	36.19	---

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

☒ **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

Non-beamforming mode

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (Average) 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	3	2412	23.41	23.05	23.43	---	641.410	28.07	30.00	3.40	31.47	36.00
11b	3	2437	24.51	24.91	24.88	---	899.840	29.54	30.00	3.40	32.94	36.00
11b	3	2462	24.28	23.68	24.14	---	760.681	28.81	30.00	3.40	32.21	36.00
11g	3	2412	19.31	19.06	19.08	---	246.757	23.92	30.00	3.40	27.32	36.00
11g	3	2437	24.72	24.82	24.67	---	892.962	29.51	30.00	3.40	32.91	36.00
11g	3	2462	20.51	20.26	20.41	---	328.531	25.17	30.00	3.40	28.57	36.00
HT20	3	2412	17.89	17.71	17.58	---	177.817	22.50	30.00	3.40	25.90	36.00
HT20	3	2437	24.25	24.71	24.18	---	823.692	29.16	30.00	3.40	32.56	36.00
HT20	3	2462	19.52	19.43	19.78	---	272.297	24.35	30.00	3.40	27.75	36.00
HT40	3	2422	16.15	16.02	15.87	---	119.841	20.79	30.00	3.40	24.19	36.00
HT40	3	2437	19.84	20.29	19.82	---	299.228	24.76	30.00	3.40	28.16	36.00
HT40	3	2452	17.31	17.68	17.35	---	166.766	22.22	30.00	3.40	25.62	36.00
VHT20	3	2412	18.04	17.82	17.71	---	183.234	22.63	30.00	3.40	26.03	36.00
VHT20	3	2437	24.38	24.85	24.32	---	850.045	29.29	30.00	3.40	32.69	36.00
VHT20	3	2462	19.68	19.58	19.92	---	281.853	24.50	30.00	3.40	27.90	36.00
VHT40	3	2422	16.27	16.15	16.05	---	123.846	20.93	30.00	3.40	24.33	36.00
VHT40	3	2437	20.03	20.42	19.98	---	310.388	24.92	30.00	3.40	28.32	36.00
VHT40	3	2452	17.44	17.82	17.51	---	172.360	22.36	30.00	3.40	25.76	36.00

Beamforming mode

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (Average) 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)			
VHT20	3	2412	16.56	16.68	16.49	---	136.414	21.35	28.25	7.75	29.10	36.00
VHT20	3	2437	23.20	22.96	23.15	---	613.165	27.88	28.25	7.75	35.63	36.00
VHT20	3	2462	18.61	18.43	18.62	---	215.051	23.33	28.25	7.75	31.08	36.00
VHT40	3	2422	15.06	14.91	14.65	---	92.211	19.65	28.25	7.75	27.40	36.00
VHT40	3	2437	18.07	17.95	17.71	---	185.515	22.68	28.25	7.75	30.43	36.00
VHT40	3	2452	15.29	15.48	15.61	---	105.516	20.23	28.25	7.75	27.98	36.00

Note:

1. Directional gain = $10 * \log((10^{2.4/20}+10^{3.1/20}+10^{3.4/20})^2/3)$ = 7.75 dBi > 6 dBi
   Limit shall be reduced to 30 dBm – (7.75 dBi – 6 dBi) = 28.25 dBm

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

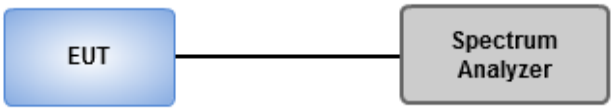
☐ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 30kHz, VBW = 100kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Employ trace averaging (RMS) mode over a minimum of 100 traces.
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 = 30kHz, VBW = 100 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.
6. Add 10 log (1/x), where x is the duty cycle

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

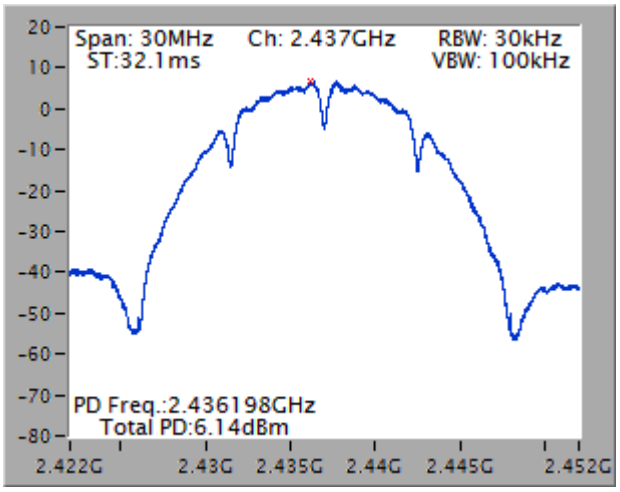
Non-beamforming mode

Modulation Mode	N_{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/30kHz)	Duty Factor (dB)	PPSD with D.F (dBm/30kHz)	Limit (dBm/3kHz)
11b	3	2412	5.52	0.00	5.52	6.25
11b	3	2437	6.14	0.00	6.14	6.25
11b	3	2462	6.01	0.00	6.01	6.25
11g	3	2412	-0.07	0.00	-0.07	6.25
11g	3	2437	4.41	0.00	4.41	6.25
11g	3	2462	0.94	0.00	0.94	6.25
VHT20	3	2412	-1.65	0.00	-1.65	6.25
VHT20	3	2437	3.10	0.00	3.10	6.25
VHT20	3	2462	0.08	0.00	0.08	6.25
VHT40	3	2422	-7.42	0.00	-7.42	6.25
VHT40	3	2437	-2.64	0.00	-2.64	6.25
VHT40	3	2452	-6.20	0.00	-6.20	6.25

Note:

1. Test result is bin-by-bin summing measured value of each TX port.
2. D.F is duty factor
3. Directional gain = 10 * log((10$^{2.4/20}$+10$^{3.1/20}$+10$^{3.4/20}$)^2/3) = 7.75 dBi > 6 dBi
   Limit shall be reduced to 8 dBm – (7.75 dBi – 6 dBi) = 6.25 dBm

Worst Plot



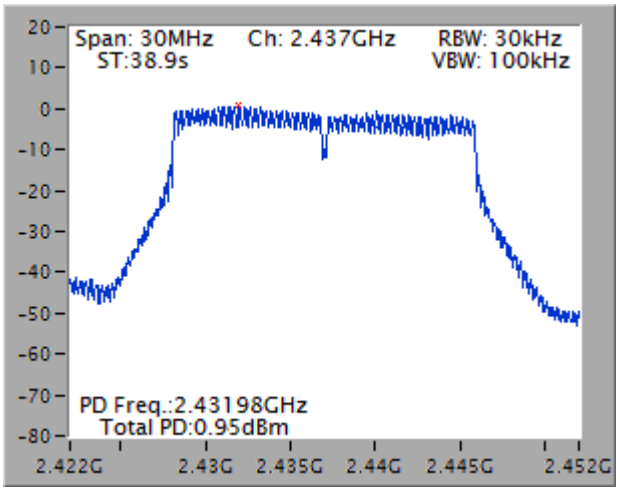
Beamforming mode

Modulation Mode	N_{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/30kHz)	Duty Factor (dB)	PPSD with D.F (dBm/30kHz)	Limit (dBm/3kHz)
VHT20	3	2412	-3.43	0.35	-3.08	6.25
VHT20	3	2437	0.95	0.35	1.30	6.25
VHT20	3	2462	-1.84	0.35	-1.49	6.25
VHT40	3	2422	-6.98	0.36	-6.62	6.25
VHT40	3	2437	-3.27	0.36	-2.91	6.25
VHT40	3	2452	-7.08	0.36	-6.72	6.25

Note:

1. Test result is bin-by-bin summing measured value of each TX port.
2. D.F is duty factor
3. Directional gain = $10 * \log((10^{2.4/20}+10^{3.1/20}+10^{3.4/20})^2/3)$ = 7.75 dBi > 6 dBi
   Limit shall be reduced to 8 dBm – (7.75 dBi – 6 dBi) = 6.25 dBm

Worst Plot



Note: The plot without duty factor.

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

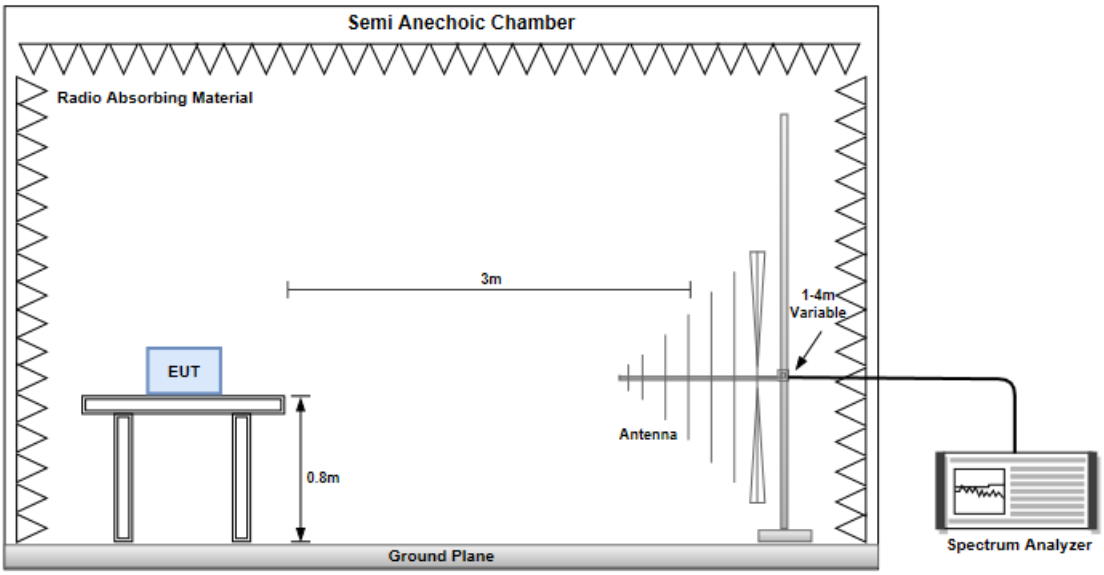
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

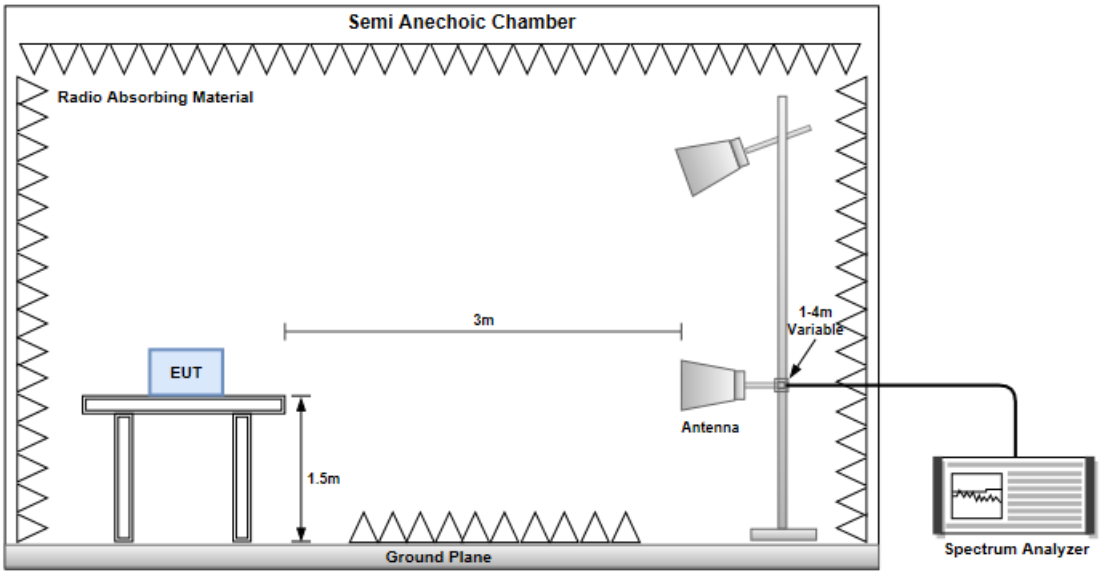
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz



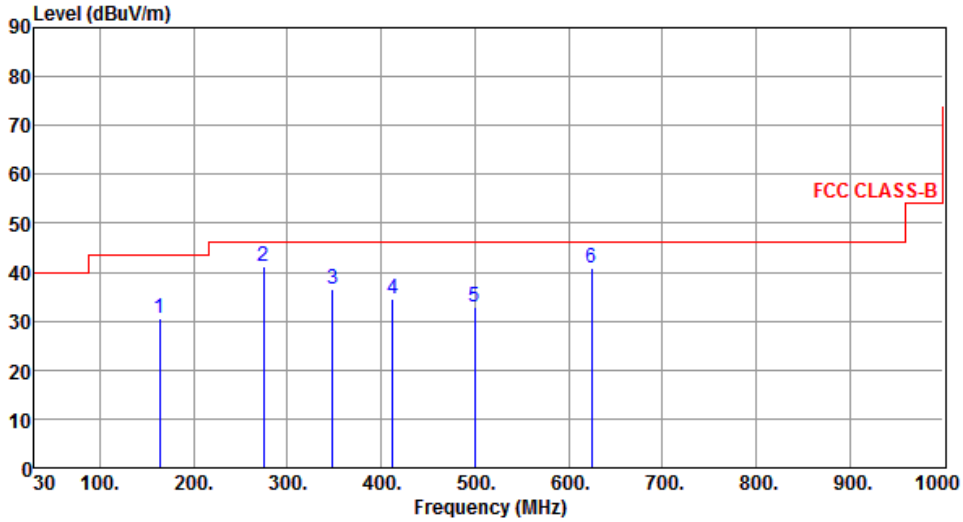
Radiated Emissions above 1 GHz



Non-beamforming mode

3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

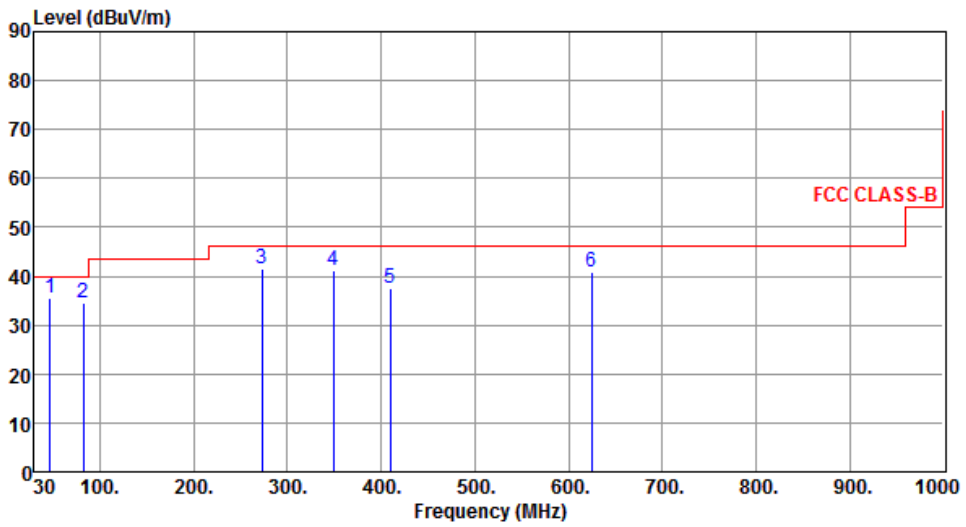
Modulation	11g	**Test Freq. (MHz)**	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	163.96	30.67	43.50	-12.83	39.20	-8.53	Peak	---	---
2	274.35	41.25	46.00	-4.75	49.91	-8.66	QP	100	138
3	348.26	36.52	46.00	-9.48	43.15	-6.63	Peak	---	---
4	412.32	34.55	46.00	-11.45	39.43	-4.88	Peak	---	---
5	499.53	32.76	46.00	-13.24	35.90	-3.14	Peak	---	---
6	624.82	40.73	46.00	-5.27	41.25	-0.52	Peak	---	---

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

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

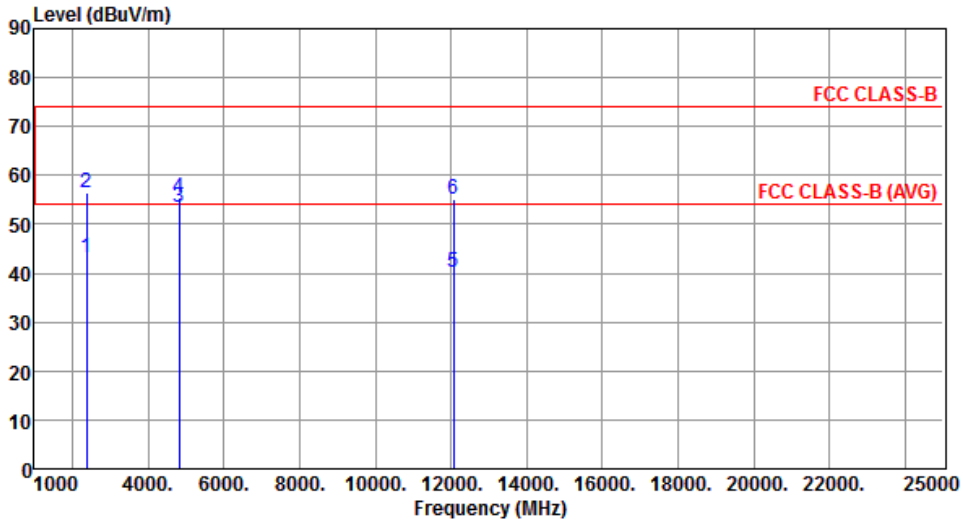


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	46.55	35.68	40.00	-4.32	43.90	-8.22	QP	100	21
2	82.43	34.63	40.00	-5.37	48.16	-13.53	Peak	---	---
3	273.26	41.56	46.00	-4.44	50.26	-8.70	Peak	---	---
4	349.26	41.25	46.00	-4.75	47.86	-6.61	Peak	---	---
5	409.51	37.58	46.00	-8.42	42.53	-4.95	Peak	---	---
6	624.56	40.73	46.00	-5.27	41.25	-0.52	Peak	---	---

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

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

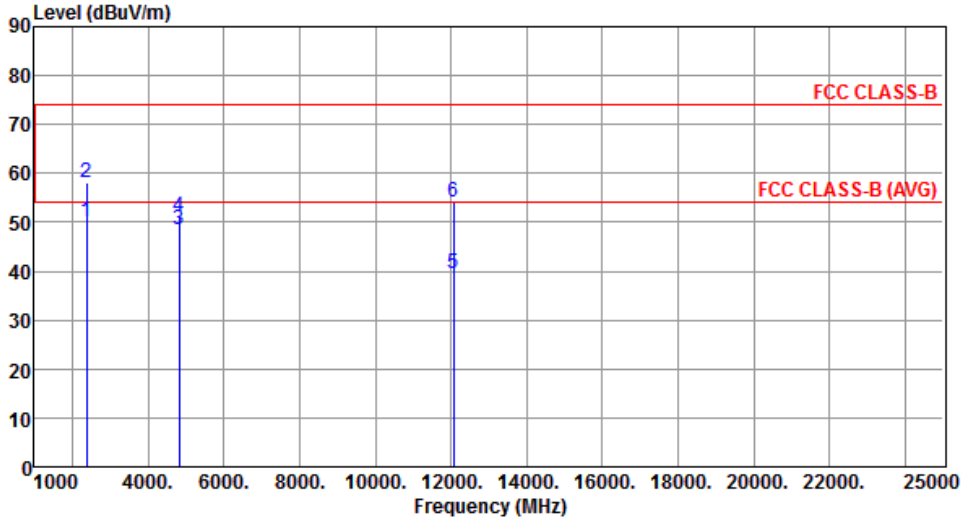
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.10	54.00	-10.90	45.22	-2.12	Average	130	35
2	2390.00	56.60	74.00	-17.40	58.72	-2.12	Peak	130	35
3	4824.00	53.59	54.00	-0.41	49.11	4.48	Average	100	313
4	4824.00	55.30	74.00	-18.70	50.82	4.48	Peak	100	313
5	12060.00	40.20	54.00	-13.80	26.54	13.66	Average	100	155
6	12060.00	55.00	74.00	-19.00	41.34	13.66	Peak	100	155

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).

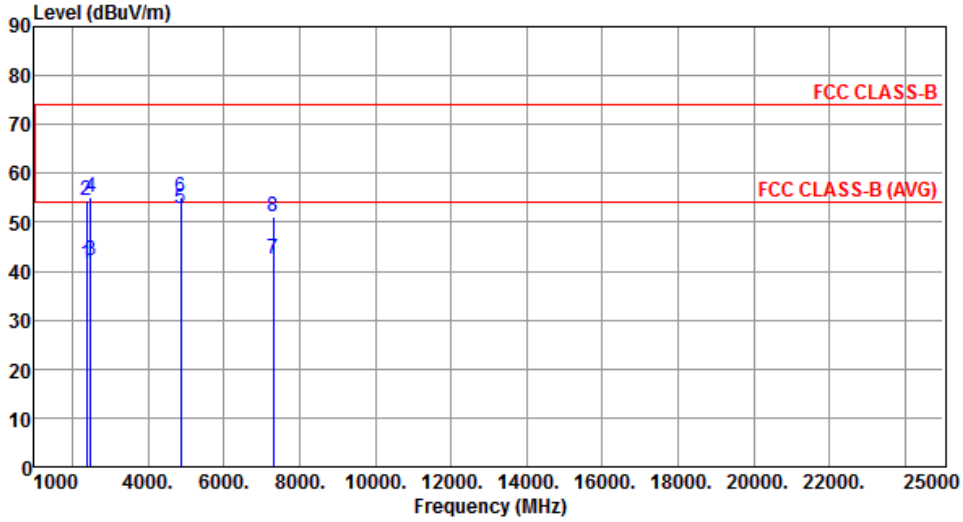
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	50.12	54.00	-3.88	52.24	-2.12	Average	209	100
2	2390.00	58.11	74.00	-15.89	60.23	-2.12	Peak	209	100
3	4824.00	48.48	54.00	-5.52	44.00	4.48	Average	104	234
4	4824.00	51.23	74.00	-22.77	46.75	4.48	Peak	104	234
5	12060.00	39.53	54.00	-14.47	25.87	13.66	Average	100	144
6	12060.00	53.98	74.00	-20.02	40.32	13.66	Peak	100	144

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).

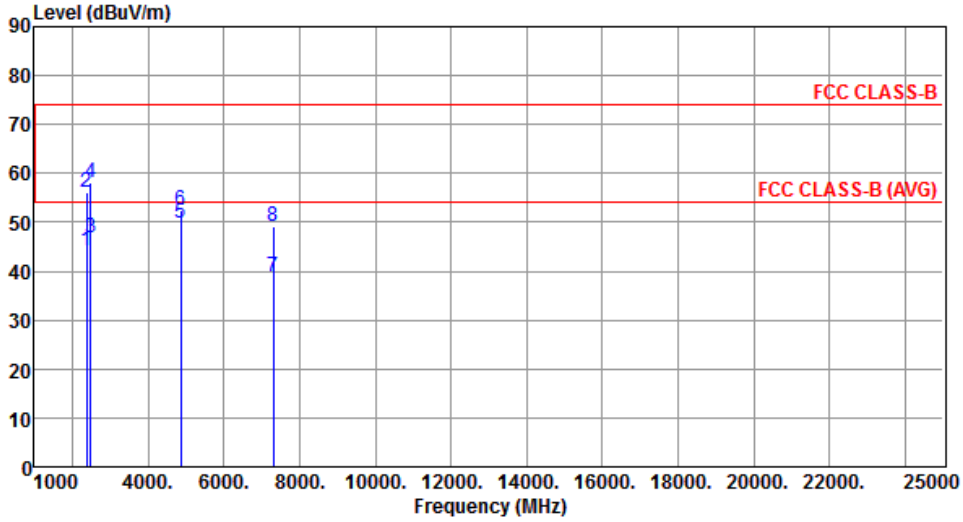
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	41.52	54.00	-12.48	43.64	-2.12	Average	132	31
2	2390.00	54.56	74.00	-19.44	56.68	-2.12	Peak	132	31
3	2483.50	42.20	54.00	-11.80	43.97	-1.77	Average	132	31
4	2483.50	55.09	74.00	-18.91	56.86	-1.77	Peak	132	31
5	4874.00	52.91	54.00	-1.09	48.33	4.58	Average	116	208
6	4874.00	55.21	74.00	-18.79	50.63	4.58	Peak	116	208
7	7311.00	42.54	54.00	-11.46	33.41	9.13	Average	194	161
8	7311.00	51.02	74.00	-22.98	41.89	9.13	Peak	194	161

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

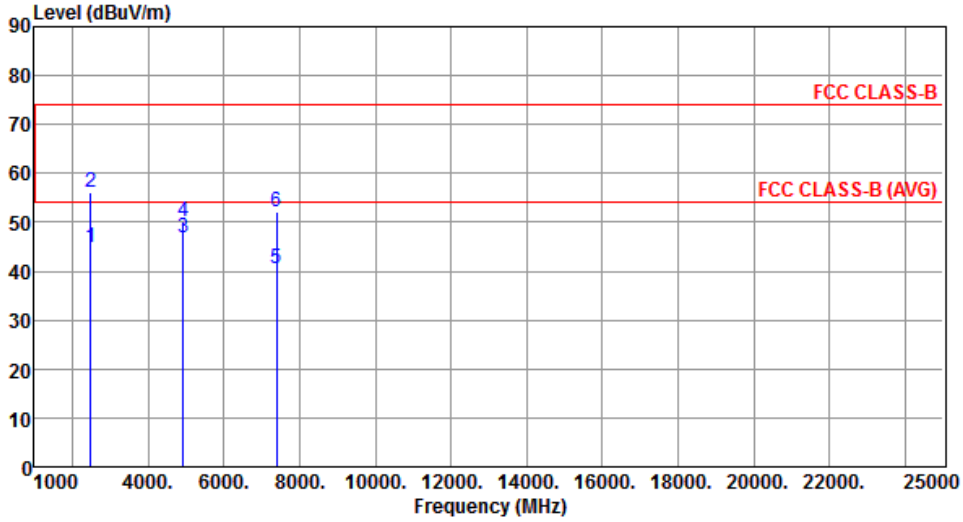
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	44.04	54.00	-9.96	46.16	-2.12	Average	186	112
2	2390.00	56.09	74.00	-17.91	58.21	-2.12	Peak	186	112
3	2483.50	46.80	54.00	-7.20	48.57	-1.77	Average	186	112
4	2483.50	58.19	74.00	-15.81	59.96	-1.77	Peak	186	112
5	4874.00	49.97	54.00	-4.03	45.39	4.58	Average	102	234
6	4874.00	52.45	74.00	-21.55	47.87	4.58	Peak	102	234
7	7311.00	38.99	54.00	-15.01	29.86	9.13	Average	100	288
8	7311.00	49.09	74.00	-24.91	39.96	9.13	Peak	100	288

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

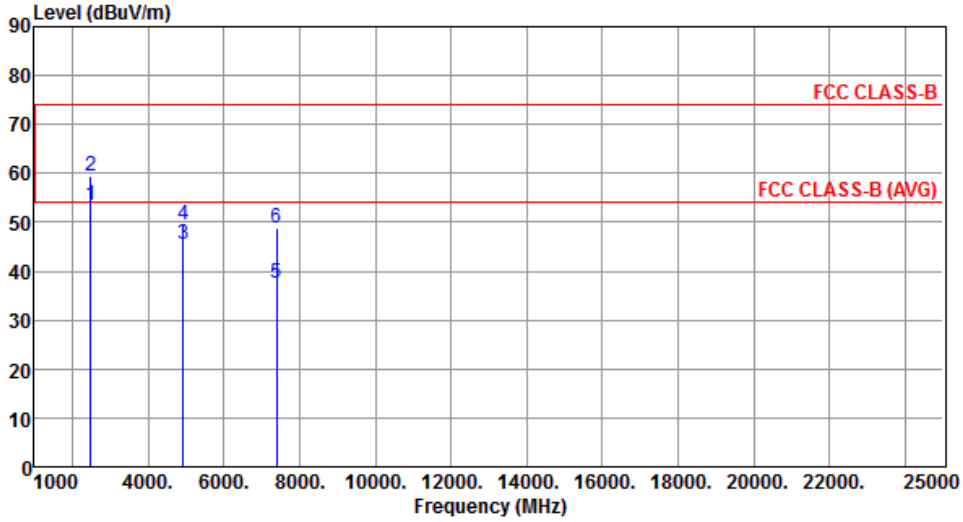
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	44.95	54.00	-9.05	46.72	-1.77	Average	130	28
2	2483.50	55.96	74.00	-18.04	57.73	-1.77	Peak	130	28
3	4924.00	46.87	54.00	-7.13	42.20	4.67	Average	100	309
4	4924.00	50.08	74.00	-23.92	45.41	4.67	Peak	100	309
5	7386.00	40.67	54.00	-13.33	31.27	9.40	Average	122	159
6	7386.00	52.02	74.00	-21.98	42.62	9.40	Peak	122	159

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

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

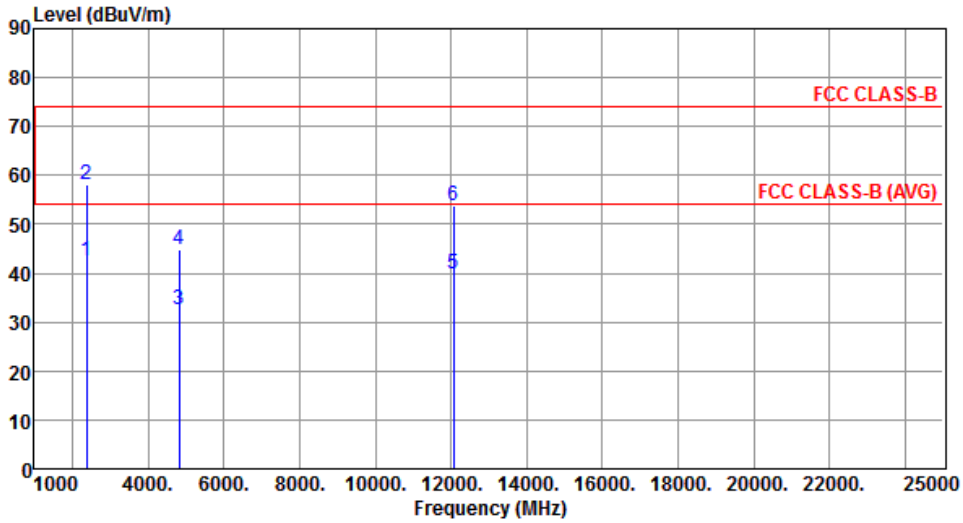


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.46	54.00	-0.54	55.23	-1.77	Average	194	347
2	2483.50	59.54	74.00	-14.46	61.31	-1.77	Peak	194	347
3	4924.00	45.41	54.00	-8.59	40.74	4.67	Average	100	235
4	4924.00	49.35	74.00	-24.65	44.68	4.67	Peak	100	235
5	7386.00	37.69	54.00	-16.31	28.29	9.40	Average	100	292
6	7386.00	48.82	74.00	-25.18	39.42	9.40	Peak	100	292

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

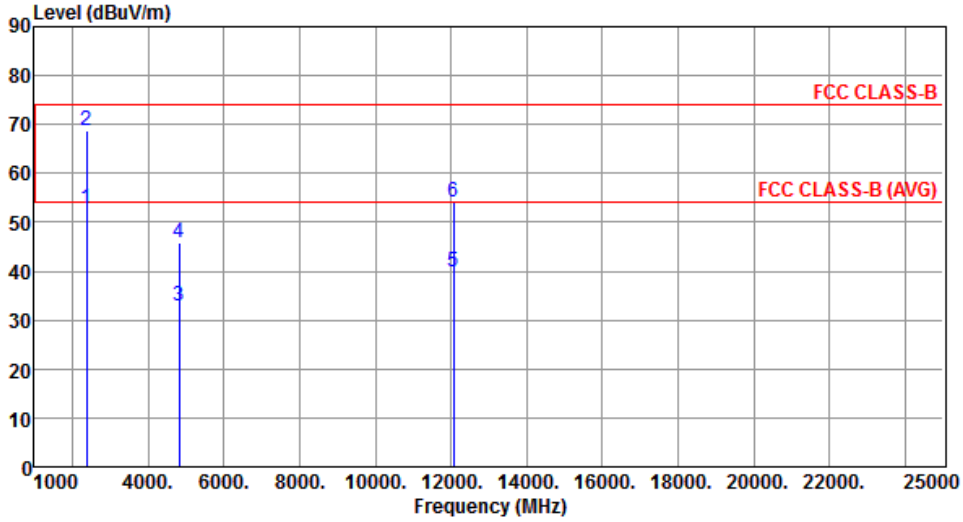
Modulation	11g	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	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	42.42	54.00	-11.58	44.54	-2.12	Average	122	42
2	2390.00	58.16	74.00	-15.84	60.28	-2.12	Peak	122	42
3	4824.00	32.64	54.00	-21.36	28.16	4.48	Average	100	188
4	4824.00	44.79	74.00	-29.21	40.31	4.48	Peak	100	188
5	12060.00	39.98	54.00	-14.02	26.32	13.66	Average	100	205
6	12060.00	53.83	74.00	-20.17	40.17	13.66	Peak	100	205

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).

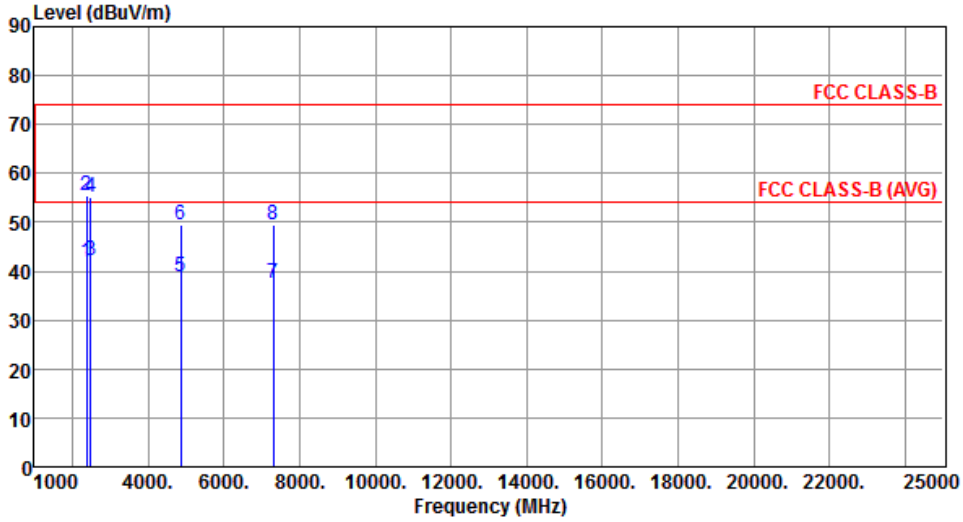
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	52.80	54.00	-1.20	54.92	-2.12	Average	209	0
2	2390.00	68.79	74.00	-5.21	70.91	-2.12	Peak	209	0
3	4824.00	32.73	54.00	-21.27	28.25	4.48	Average	100	251
4	4824.00	45.79	74.00	-28.21	41.31	4.48	Peak	100	251
5	12060.00	39.88	54.00	-14.12	26.22	13.66	Average	100	144
6	12060.00	54.04	74.00	-19.96	40.38	13.66	Peak	100	144

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).

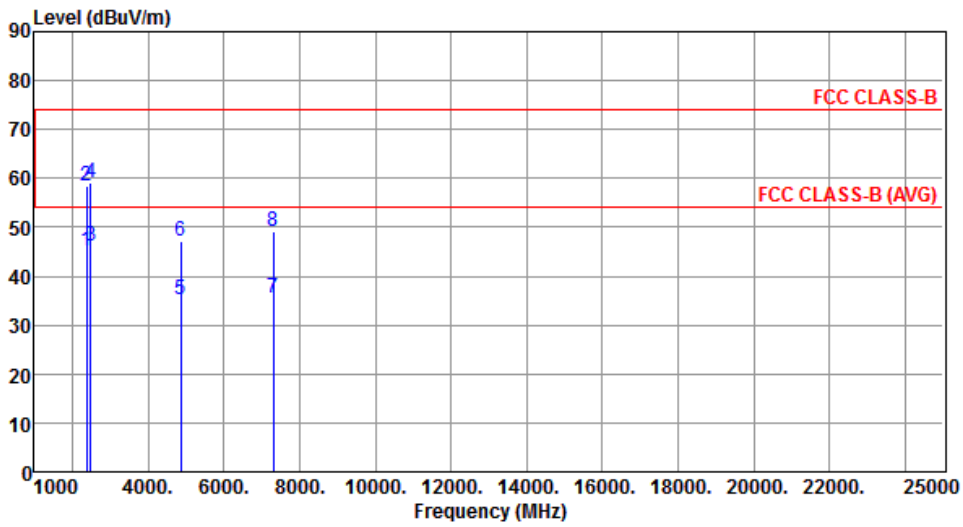
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	41.77	54.00	-12.23	43.89	-2.12	Average	145	177
2	2390.00	55.36	74.00	-18.64	57.48	-2.12	Peak	145	177
3	2483.50	42.31	54.00	-11.69	44.08	-1.77	Average	145	177
4	2483.50	54.97	74.00	-19.03	56.74	-1.77	Peak	145	177
5	4874.00	38.93	54.00	-15.07	34.35	4.58	Average	100	309
6	4874.00	49.50	74.00	-24.50	44.92	4.58	Peak	100	309
7	7311.00	37.37	54.00	-16.63	28.24	9.13	Average	111	156
8	7311.00	49.36	74.00	-24.64	40.23	9.13	Peak	111	156

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).

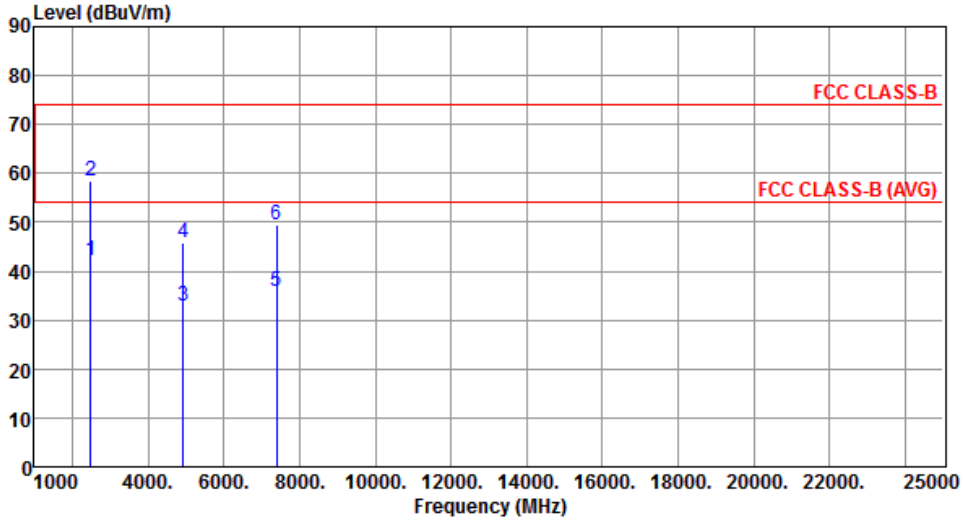
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	45.07	54.00	-8.93	47.19	-2.12	Average	222	116
2	2390.00	58.45	74.00	-15.55	60.57	-2.12	Peak	222	116
3	2483.50	46.05	54.00	-7.95	47.82	-1.77	Average	222	116
4	2483.50	59.05	74.00	-14.95	60.82	-1.77	Peak	222	116
5	4874.00	35.14	54.00	-18.86	30.56	4.58	Average	136	237
6	4874.00	47.00	74.00	-27.00	42.42	4.58	Peak	136	237
7	7311.00	35.53	54.00	-18.47	26.40	9.13	Average	100	286
8	7311.00	48.99	74.00	-25.01	39.86	9.13	Peak	100	286

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).

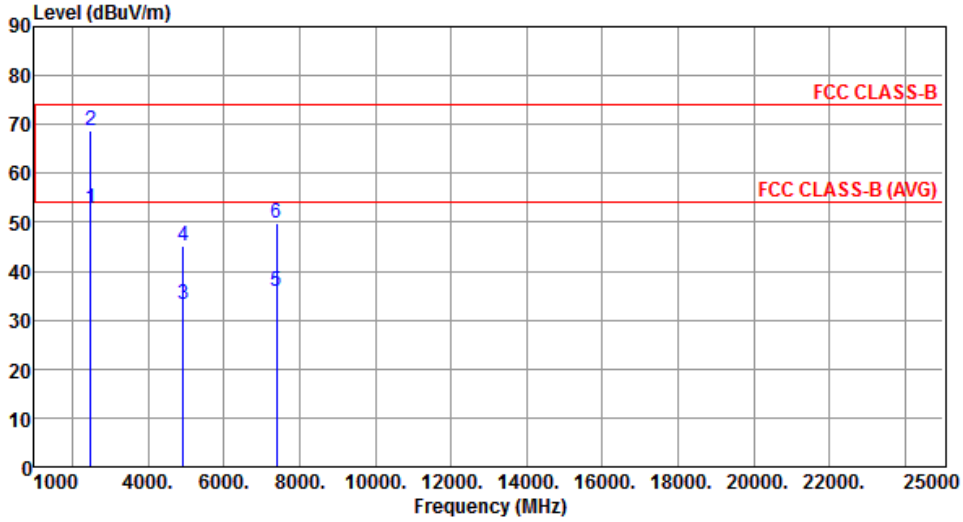
Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	42.21	54.00	-11.79	43.98	-1.77	Average	128	37
2	2483.50	58.41	74.00	-15.59	60.18	-1.77	Peak	128	37
3	4924.00	32.98	54.00	-21.02	28.31	4.67	Average	100	168
4	4924.00	45.91	74.00	-28.09	41.24	4.67	Peak	100	168
5	7386.00	35.74	54.00	-18.26	26.34	9.40	Average	100	188
6	7386.00	49.53	74.00	-24.47	40.13	9.40	Peak	100	188

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

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

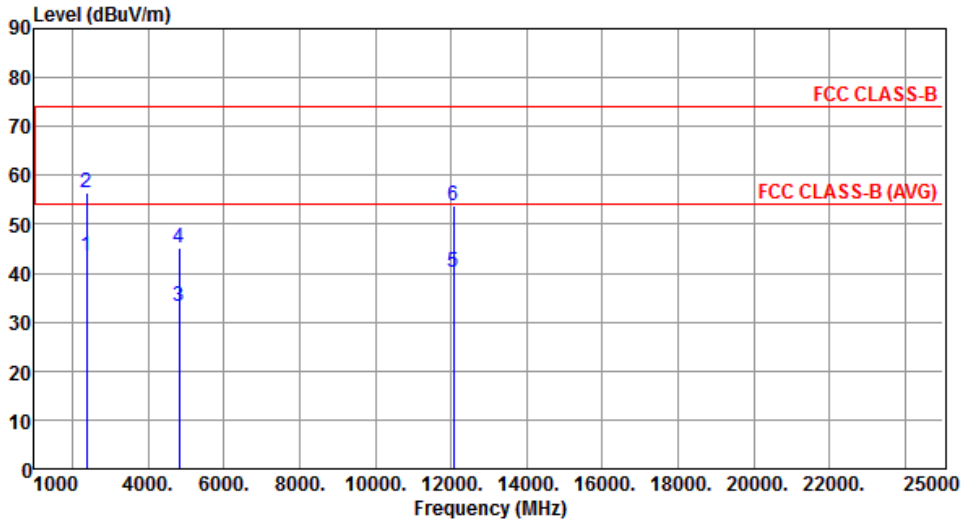


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.89	54.00	-1.11	54.66	-1.77	Average	205	58
2	2483.50	68.75	74.00	-5.25	70.52	-1.77	Peak	205	58
3	4924.00	33.18	54.00	-20.82	28.51	4.67	Average	100	132
4	4924.00	45.14	74.00	-28.86	40.47	4.67	Peak	100	132
5	7386.00	36.01	54.00	-17.99	26.61	9.40	Average	100	193
6	7386.00	49.65	74.00	-24.35	40.25	9.40	Peak	100	193

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

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20

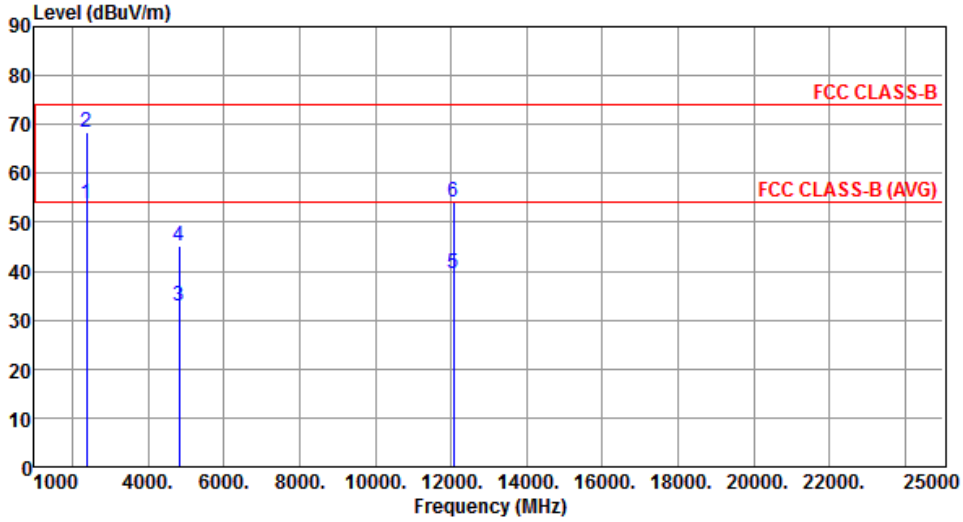
Modulation	VHT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.52	54.00	-10.48	45.64	-2.12	Average	120	36
2	2390.00	56.30	74.00	-17.70	58.42	-2.12	Peak	120	36
3	4824.00	33.09	54.00	-20.91	28.61	4.48	Average	100	167
4	4824.00	45.03	74.00	-28.97	40.55	4.48	Peak	100	167
5	12060.00	40.28	54.00	-13.72	26.62	13.66	Average	100	205
6	12060.00	53.83	74.00	-20.17	40.17	13.66	Peak	100	205

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).

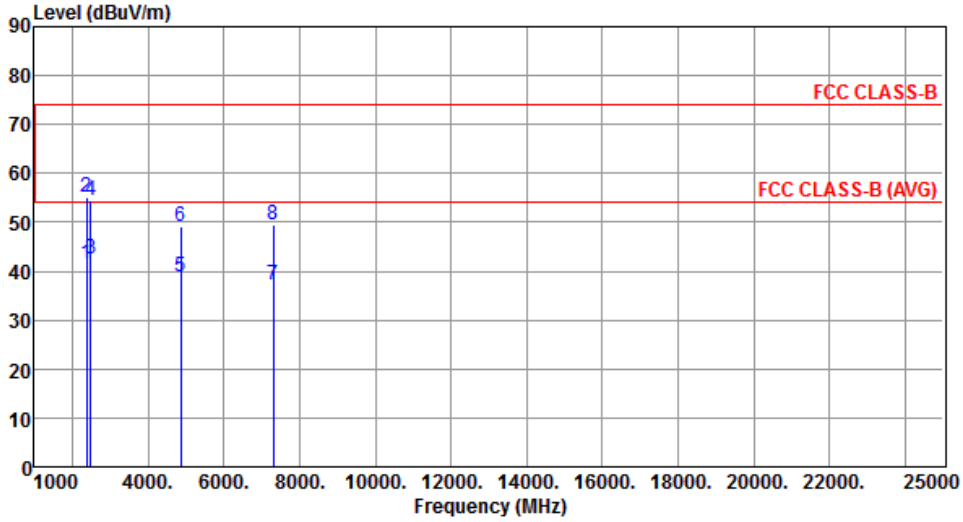
Modulation	VHT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	53.64	54.00	-0.36	55.76	-2.12	Average	205	0
2	2390.00	68.56	74.00	-5.44	70.68	-2.12	Peak	205	0
3	4824.00	32.83	54.00	-21.17	28.35	4.48	Average	100	147
4	4824.00	45.16	74.00	-28.84	40.68	4.48	Peak	100	147
5	12060.00	39.67	54.00	-14.33	26.01	13.66	Average	100	152
6	12060.00	54.00	74.00	-20.00	40.34	13.66	Peak	100	152

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).

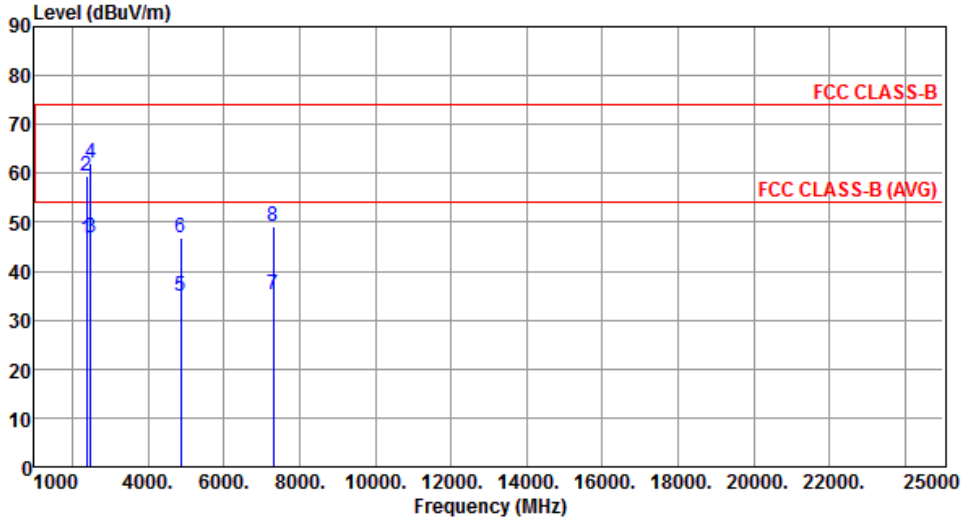
Modulation	VHT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	41.44	54.00	-12.56	43.56	-2.12	Average	143	175
2	2390.00	55.14	74.00	-18.86	57.26	-2.12	Peak	143	175
3	2483.50	42.54	54.00	-11.46	44.31	-1.77	Average	143	175
4	2483.50	54.58	74.00	-19.42	56.35	-1.77	Peak	143	175
5	4874.00	38.79	54.00	-15.21	34.21	4.58	Average	100	305
6	4874.00	49.15	74.00	-24.85	44.57	4.58	Peak	100	305
7	7311.00	37.24	54.00	-16.76	28.11	9.13	Average	100	143
8	7311.00	49.54	74.00	-24.46	40.41	9.13	Peak	100	143

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

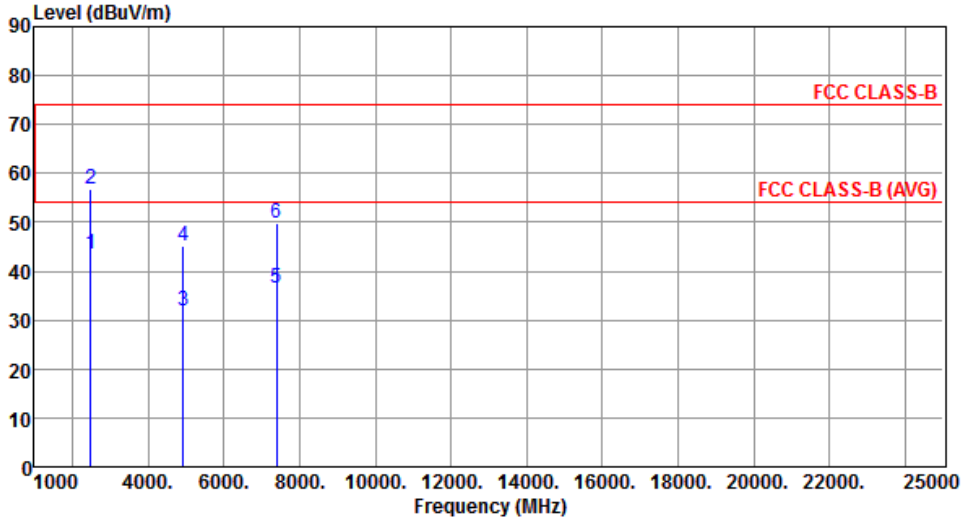
Modulation	VHT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	46.49	54.00	-7.51	48.61	-2.12	Average	205	61
2	2390.00	59.50	74.00	-14.50	61.62	-2.12	Peak	205	61
3	2483.50	46.92	54.00	-7.08	48.69	-1.77	Average	205	61
4	2483.50	62.20	74.00	-11.80	63.97	-1.77	Peak	205	61
5	4874.00	34.83	54.00	-19.17	30.25	4.58	Average	135	235
6	4874.00	46.89	74.00	-27.11	42.31	4.58	Peak	135	235
7	7311.00	35.35	54.00	-18.65	26.22	9.13	Average	100	282
8	7311.00	49.26	74.00	-24.74	40.13	9.13	Peak	100	282

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).

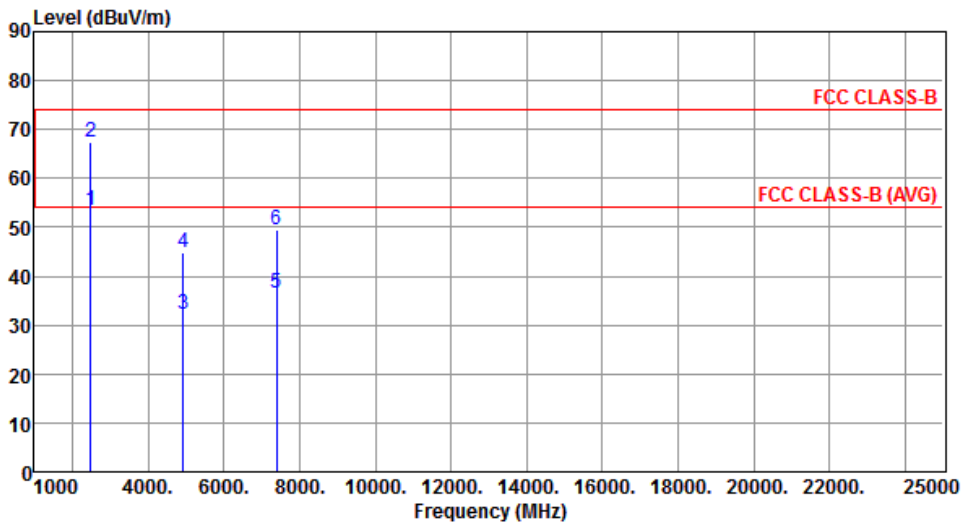
Modulation	VHT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	43.36	54.00	-10.64	45.13	-1.77	Average	120	36
2	2483.50	56.85	74.00	-17.15	58.62	-1.77	Peak	120	36
3	4924.00	31.92	54.00	-22.08	27.25	4.67	Average	100	158
4	4924.00	45.04	74.00	-28.96	40.37	4.67	Peak	100	158
5	7386.00	36.66	54.00	-17.34	27.26	9.40	Average	100	121
6	7386.00	49.71	74.00	-24.29	40.31	9.40	Peak	100	121

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	VHT20	Test Freq. (MHz)	2462
Polarization	Vertical		

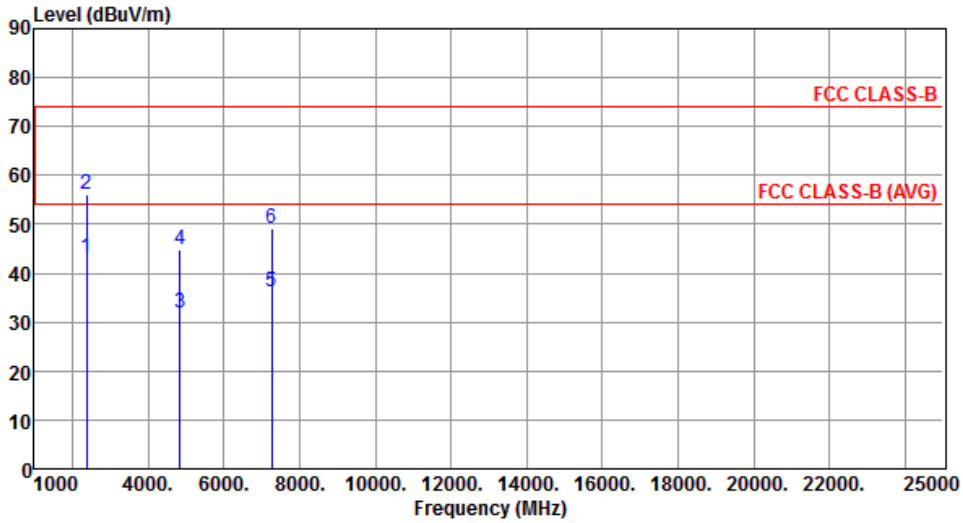


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.42	54.00	-0.58	55.19	-1.77	Average	199	111
2	2483.50	67.50	74.00	-6.50	69.27	-1.77	Peak	199	111
3	4924.00	32.11	54.00	-21.89	27.44	4.67	Average	100	162
4	4924.00	44.98	74.00	-29.02	40.31	4.67	Peak	100	162
5	7386.00	36.53	54.00	-17.47	27.13	9.40	Average	100	144
6	7386.00	49.64	74.00	-24.36	40.24	9.40	Peak	100	144

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 VHT40

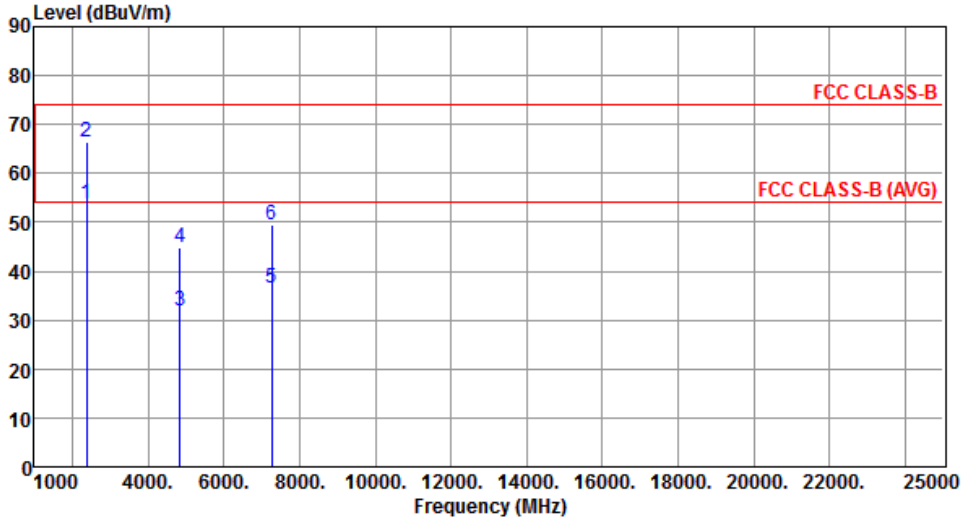
Modulation	VHT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	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	43.10	54.00	-10.90	45.22	-2.12	Average	121	38
2	2390.00	56.01	74.00	-17.99	58.13	-2.12	Peak	121	38
3	4844.00	31.96	54.00	-22.04	27.45	4.51	Average	100	131
4	4844.00	44.93	74.00	-29.07	40.42	4.51	Peak	100	131
5	7266.00	36.25	54.00	-17.75	27.28	8.97	Average	100	165
6	7266.00	49.25	74.00	-24.75	40.28	8.97	Peak	100	165

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

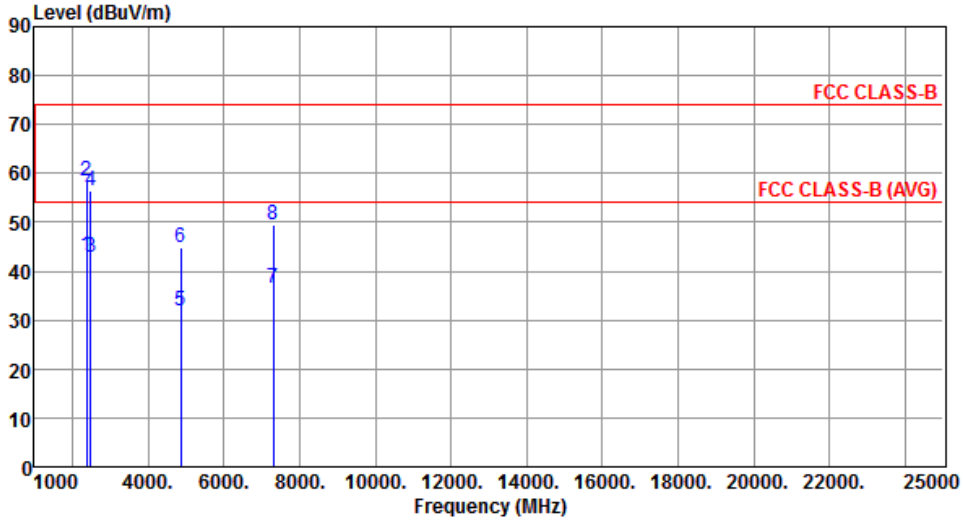
Modulation	VHT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	53.69	54.00	-0.31	55.81	-2.12	Average	195	117
2	2390.00	66.36	74.00	-7.64	68.48	-2.12	Peak	195	117
3	4844.00	31.87	54.00	-22.13	27.36	4.51	Average	100	162
4	4844.00	44.76	74.00	-29.24	40.25	4.51	Peak	100	162
5	7266.00	36.53	54.00	-17.47	27.56	8.97	Average	100	131
6	7266.00	49.38	74.00	-24.62	40.41	8.97	Peak	100	131

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).

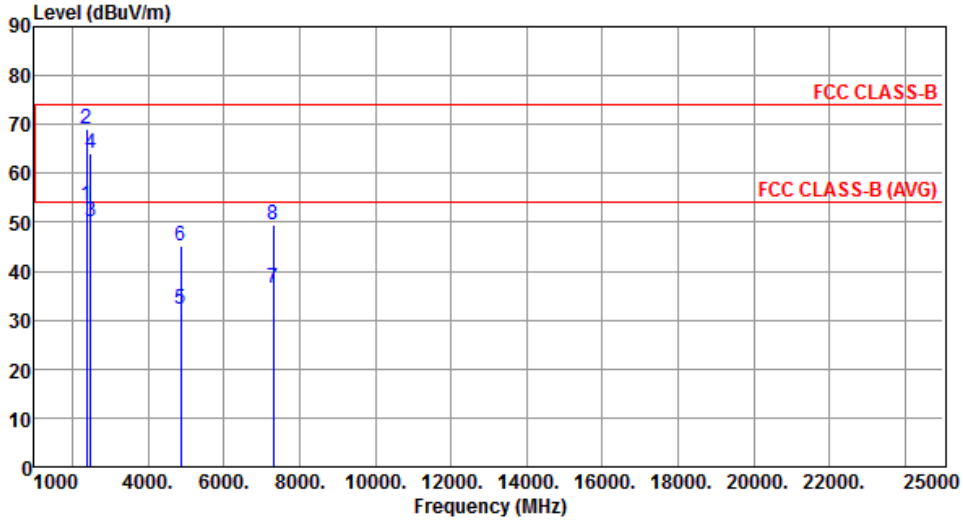
Modulation	VHT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	43.13	54.00	-10.87	45.25	-2.12	Average	116	43
2	2390.00	58.44	74.00	-15.56	60.56	-2.12	Peak	116	43
3	2483.50	42.75	54.00	-11.25	44.52	-1.77	Average	116	43
4	2483.50	56.54	74.00	-17.46	58.31	-1.77	Peak	116	43
5	4874.00	32.03	54.00	-21.97	27.45	4.58	Average	100	178
6	4874.00	44.82	74.00	-29.18	40.24	4.58	Peak	100	178
7	7311.00	36.41	54.00	-17.59	27.28	9.13	Average	100	108
8	7311.00	49.49	74.00	-24.51	40.36	9.13	Peak	100	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).

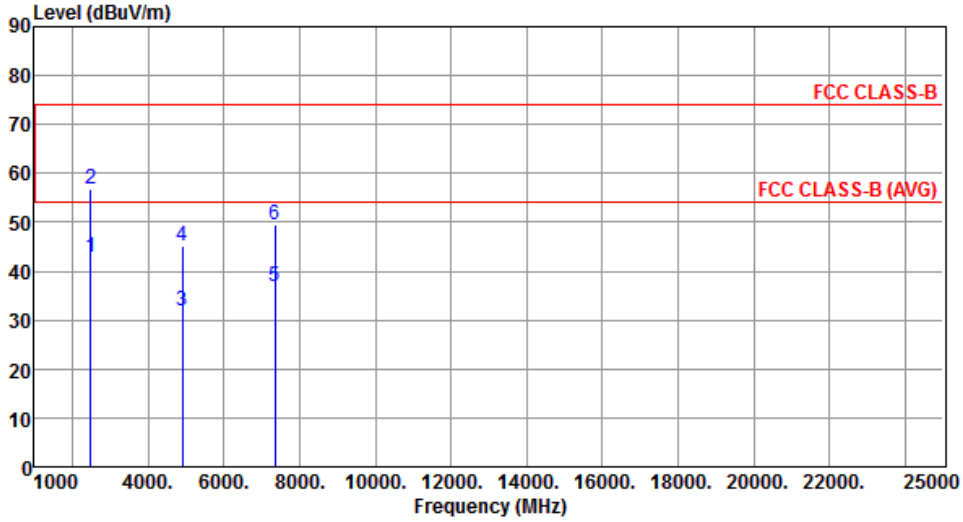
Modulation	VHT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	53.61	54.00	-0.39	55.73	-2.12	Average	195	328
2	2390.00	69.18	74.00	-4.82	71.30	-2.12	Peak	195	328
3	2483.50	50.08	54.00	-3.92	51.85	-1.77	Average	195	56
4	2483.50	64.00	74.00	-10.00	65.77	-1.77	Peak	195	56
5	4874.00	32.24	54.00	-21.76	27.66	4.58	Average	100	182
6	4874.00	45.09	74.00	-28.91	40.51	4.58	Peak	100	182
7	7311.00	36.54	54.00	-17.46	27.41	9.13	Average	100	105
8	7311.00	49.37	74.00	-24.63	40.24	9.13	Peak	100	105

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

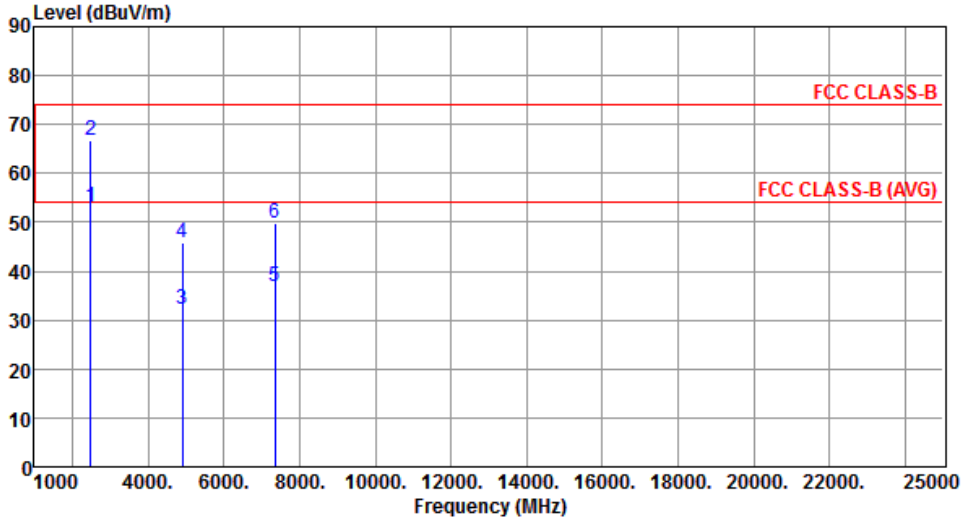
Modulation	VHT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	42.68	54.00	-11.32	44.45	-1.77	Average	124	35
2	2483.50	56.79	74.00	-17.21	58.56	-1.77	Peak	124	35
3	4904.00	31.89	54.00	-22.11	27.26	4.63	Average	100	138
4	4904.00	45.07	74.00	-28.93	40.44	4.63	Peak	100	138
5	7356.00	36.85	54.00	-17.15	27.56	9.29	Average	100	193
6	7356.00	49.60	74.00	-24.40	40.31	9.29	Peak	100	193

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

Modulation	VHT40	Test Freq. (MHz)	2452
Polarization	Vertical		



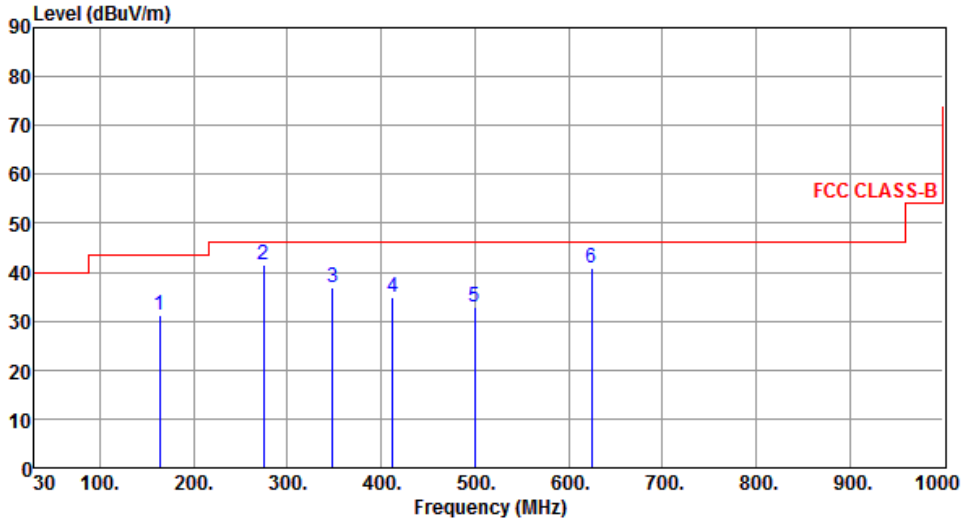
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.98	54.00	-1.02	54.75	-1.77	Average	187	321
2	2483.50	66.75	74.00	-7.25	68.52	-1.77	Peak	187	321
3	4904.00	32.18	54.00	-21.82	27.55	4.63	Average	100	151
4	4904.00	45.84	74.00	-28.16	41.21	4.63	Peak	100	151
5	7356.00	36.71	54.00	-17.29	27.42	9.29	Average	100	162
6	7356.00	49.72	74.00	-24.28	40.43	9.29	Peak	100	162

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).

Beamforming mode

3.5.9 Transmitter Radiated Unwanted Emissions (Below 1GHz)

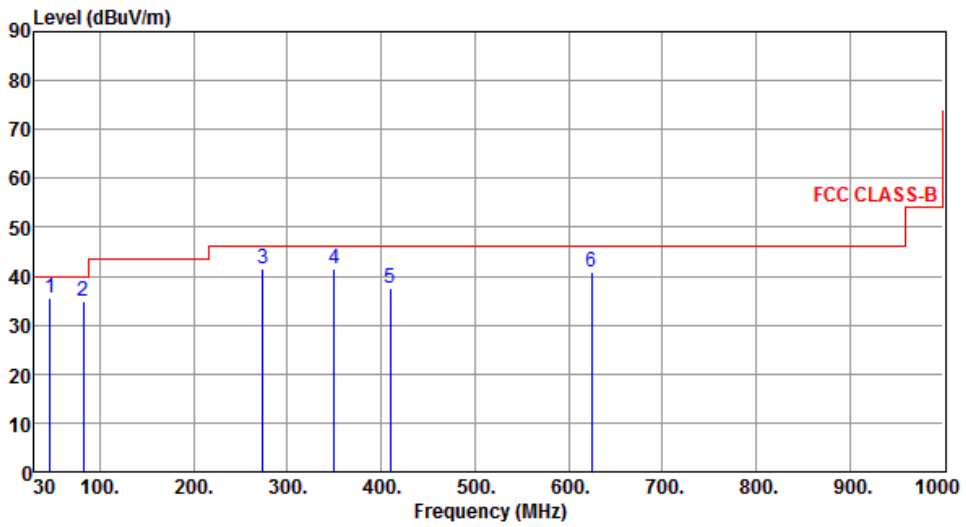
Modulation	VHT20	**Test Freq. (MHz)**	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	163.52	31.24	43.50	-12.26	39.75	-8.51	Peak	---	---
2	274.55	41.48	46.00	-4.52	50.13	-8.65	QP	100	139
3	348.54	36.72	46.00	-9.28	43.35	-6.63	Peak	---	---
4	412.44	34.75	46.00	-11.25	39.62	-4.87	Peak	---	---
5	499.68	32.91	46.00	-13.09	36.05	-3.14	Peak	---	---
6	624.92	40.85	46.00	-5.15	41.37	-0.52	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	VHT20	Test Freq. (MHz)	2437
Polarization	Vertical		

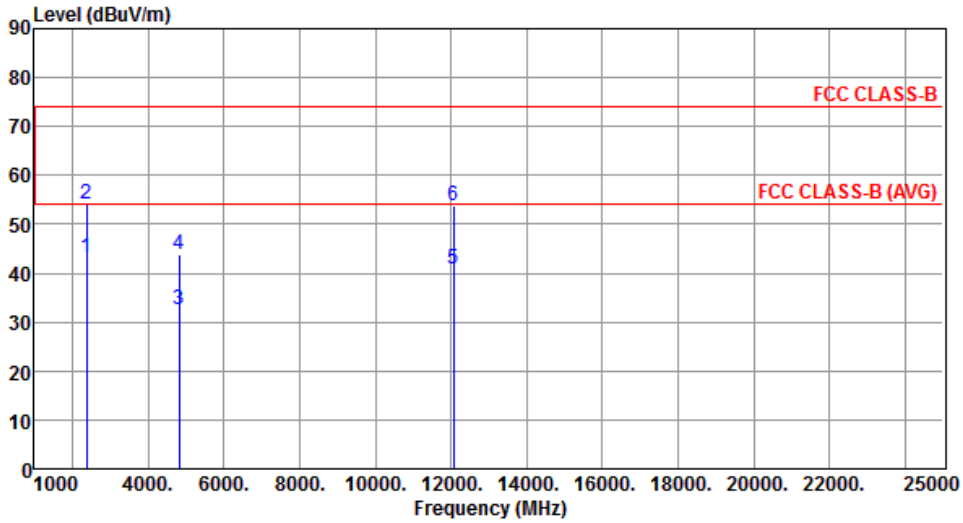


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	46.42	35.61	40.00	-4.39	43.83	-8.22	QP	100	20
2	82.54	34.72	40.00	-5.28	48.27	-13.55	Peak	---	---
3	273.56	41.48	46.00	-4.52	50.17	-8.69	Peak	---	---
4	349.61	41.35	46.00	-4.65	47.95	-6.60	Peak	---	---
5	410.05	37.66	46.00	-8.34	42.60	-4.94	Peak	---	---
6	624.83	40.91	46.00	-5.09	41.43	-0.52	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.

3.5.10 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20

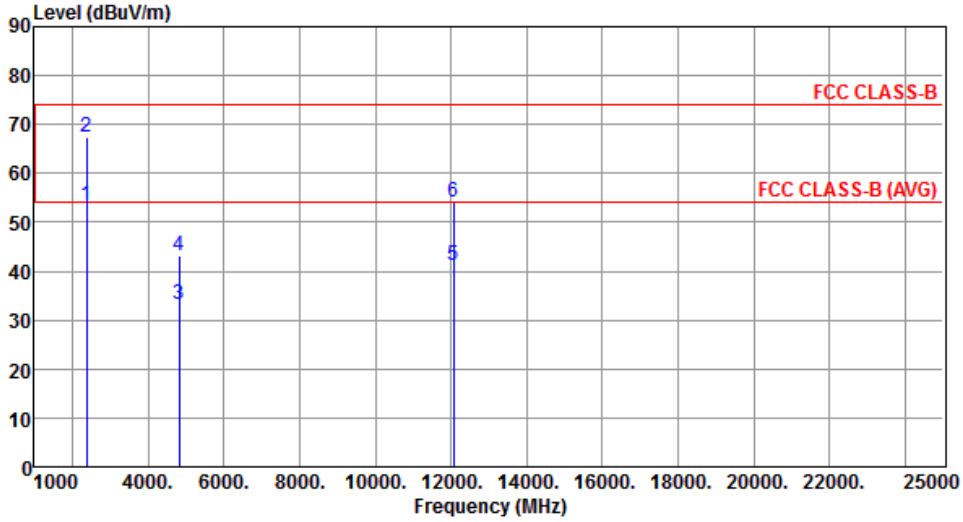
Modulation	VHT20	**Test Freq. (MHz)**	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.10	54.00	-10.90	45.22	-2.12	Average	282	310
2	2390.00	54.00	74.00	-20.00	56.12	-2.12	Peak	282	310
3	4824.00	32.64	54.00	-21.36	28.16	4.48	Average	100	156
4	4824.00	43.79	74.00	-30.21	39.31	4.48	Peak	100	156
5	12060.00	40.80	54.00	-13.20	27.14	13.66	Average	100	122
6	12060.00	53.85	74.00	-20.15	40.19	13.66	Peak	100	122

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).

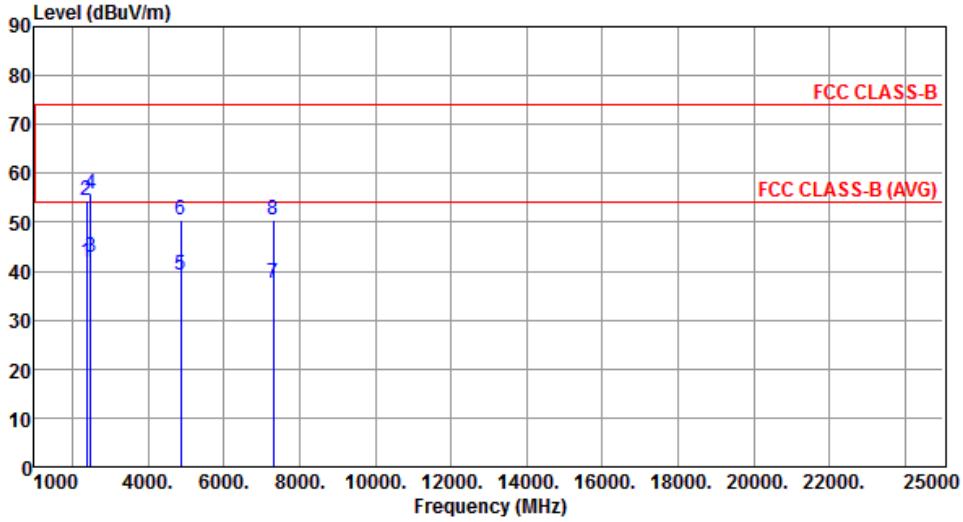
Modulation	VHT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	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	53.42	54.00	-0.58	55.54	-2.12	Average	202	111
2	2390.00	67.28	74.00	-6.72	69.40	-2.12	Peak	202	111
3	4824.00	33.06	54.00	-20.94	28.58	4.48	Average	100	176
4	4824.00	43.17	74.00	-30.83	38.69	4.48	Peak	100	176
5	12060.00	41.02	54.00	-12.98	27.36	13.66	Average	100	156
6	12060.00	54.20	74.00	-19.80	40.54	13.66	Peak	100	156

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).

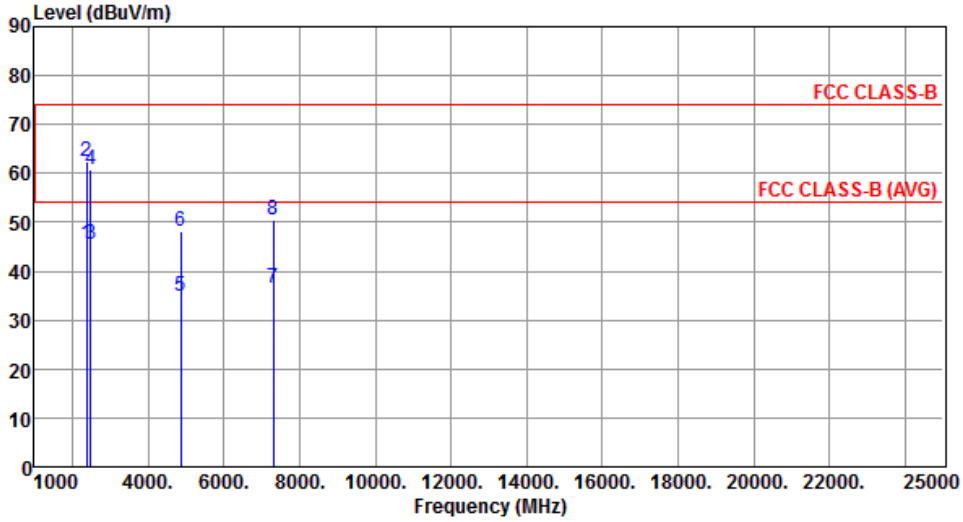
Modulation	VHT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	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	41.96	54.00	-12.04	44.08	-2.12	Average	285	313
2	2390.00	54.47	74.00	-19.53	56.59	-2.12	Peak	285	313
3	2483.50	42.68	54.00	-11.32	44.45	-1.77	Average	285	313
4	2483.50	55.93	74.00	-18.07	57.70	-1.77	Peak	285	313
5	4874.00	39.23	54.00	-14.77	34.65	4.58	Average	100	313
6	4874.00	50.33	74.00	-23.67	45.75	4.58	Peak	100	313
7	7311.00	37.48	54.00	-16.52	28.35	9.13	Average	100	162
8	7311.00	50.51	74.00	-23.49	41.38	9.13	Peak	100	162

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).

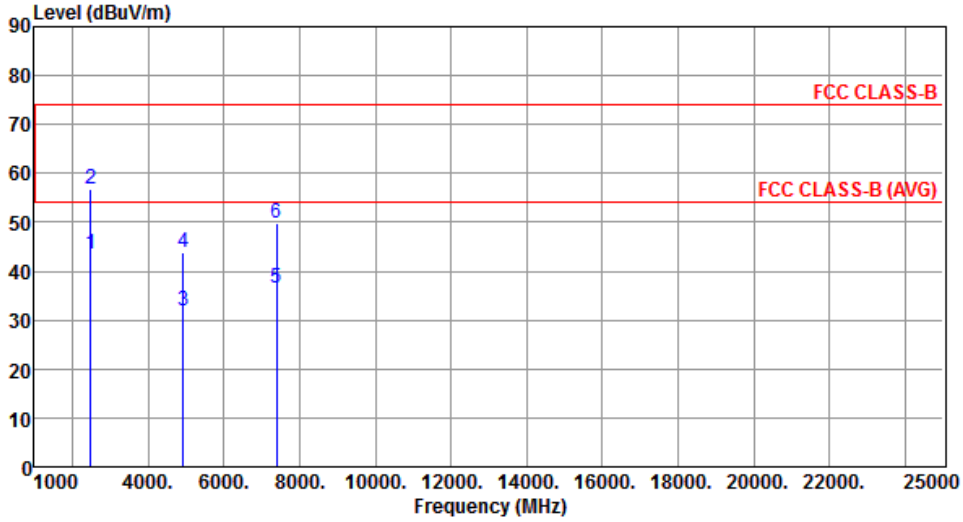
Modulation	VHT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	45.45	54.00	-8.55	47.57	-2.12	Average	213	117
2	2390.00	62.43	74.00	-11.57	64.55	-2.12	Peak	213	117
3	2483.50	45.58	54.00	-8.42	47.35	-1.77	Average	213	117
4	2483.50	60.83	74.00	-13.17	62.60	-1.77	Peak	213	117
5	4874.00	34.89	54.00	-19.11	30.31	4.58	Average	100	234
6	4874.00	48.09	74.00	-25.91	43.51	4.58	Peak	100	234
7	7311.00	36.66	54.00	-17.34	27.53	9.13	Average	100	175
8	7311.00	50.37	74.00	-23.63	41.24	9.13	Peak	100	175

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

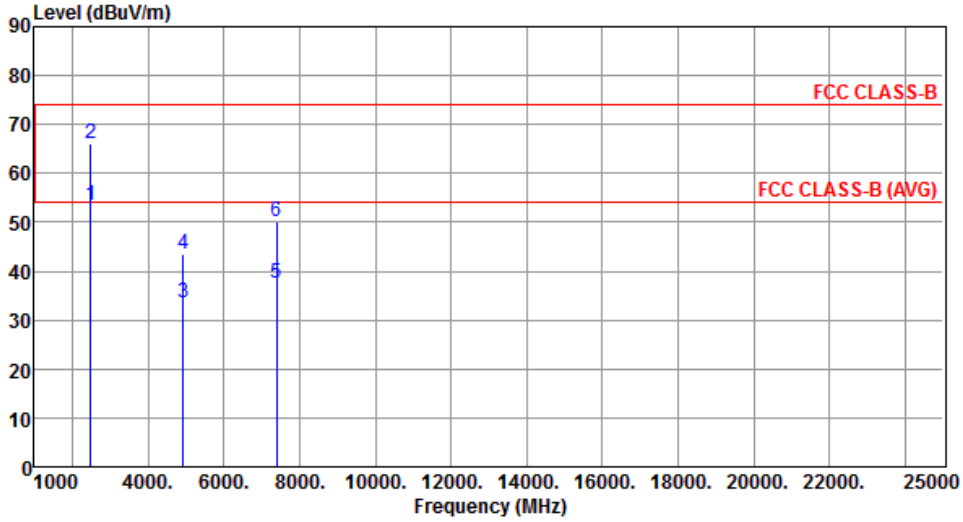
Modulation	VHT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	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	43.64	54.00	-10.36	45.41	-1.77	Average	282	315
2	2483.50	56.76	74.00	-17.24	58.53	-1.77	Peak	282	315
3	4924.00	32.01	54.00	-21.99	27.34	4.67	Average	100	173
4	4924.00	44.00	74.00	-30.00	39.33	4.67	Peak	100	173
5	7386.00	36.65	54.00	-17.35	27.25	9.40	Average	100	125
6	7386.00	49.96	74.00	-24.04	40.56	9.40	Peak	100	125

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	VHT20	Test Freq. (MHz)	2462
Polarization	Vertical		

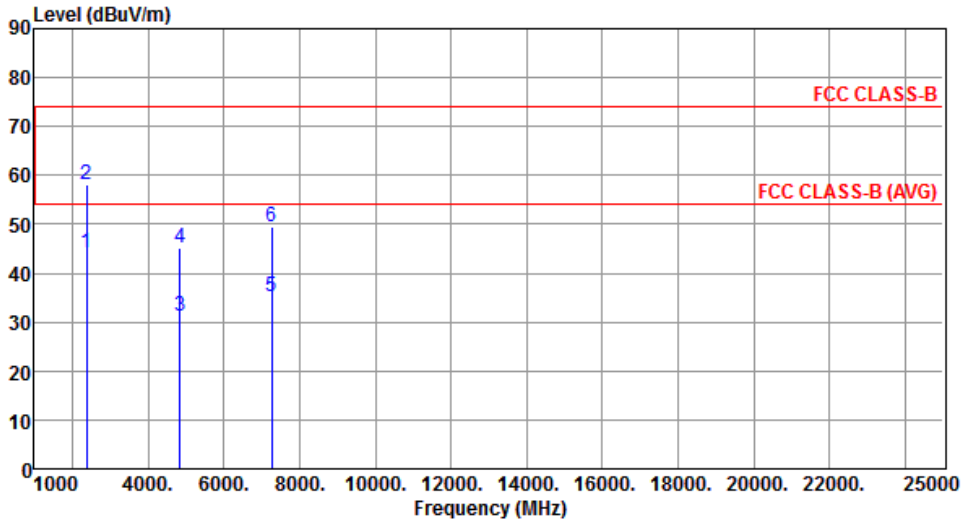


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.58	54.00	-0.42	55.35	-1.77	Average	141	340
2	2483.50	66.16	74.00	-7.84	67.93	-1.77	Peak	141	340
3	4924.00	33.41	54.00	-20.59	28.74	4.67	Average	100	231
4	4924.00	43.54	74.00	-30.46	38.87	4.67	Peak	100	231
5	7386.00	37.61	54.00	-16.39	28.21	9.40	Average	100	146
6	7386.00	50.13	74.00	-23.87	40.73	9.40	Peak	100	146

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).

3.5.11 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT40

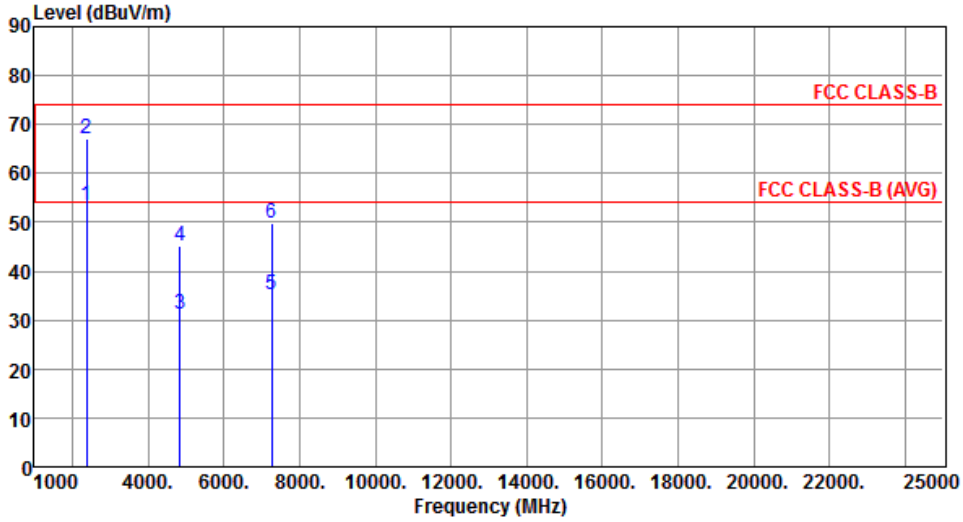
Modulation	VHT40	**Test Freq. (MHz)**	2422
Polarization	Horizontal		



	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	44.10	54.00	-9.90	46.22	-2.12	Average	282	312
2	2390.00	58.22	74.00	-15.78	60.34	-2.12	Peak	282	312
3	4844.00	31.07	54.00	-22.93	26.56	4.51	Average	100	168
4	4844.00	45.03	74.00	-28.97	40.52	4.51	Peak	100	168
5	7266.00	35.13	54.00	-18.87	26.16	8.97	Average	100	135
6	7266.00	49.44	74.00	-24.56	40.47	8.97	Peak	100	135

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).

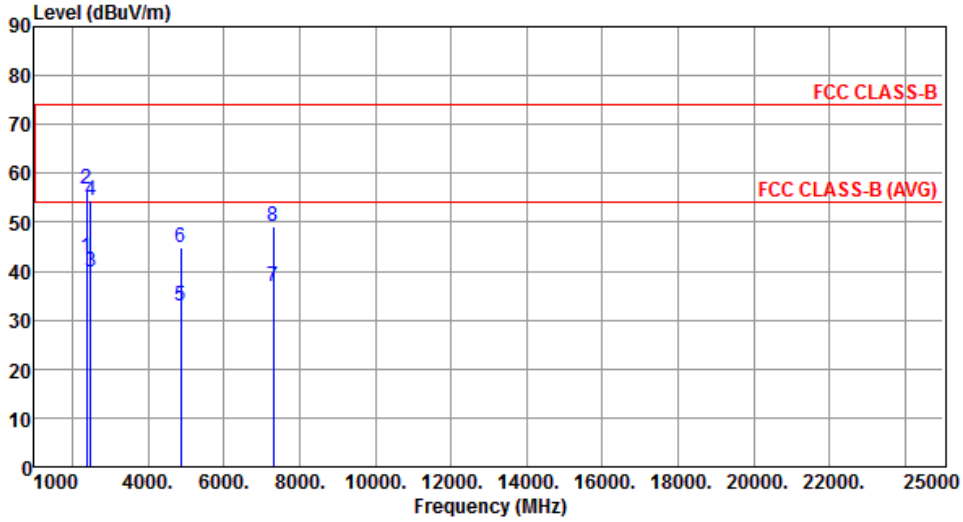
Modulation	VHT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	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	53.51	54.00	-0.49	55.63	-2.12	Average	180	345
2	2390.00	67.22	74.00	-6.78	69.34	-2.12	Peak	180	345
3	4844.00	31.15	54.00	-22.85	26.64	4.51	Average	100	214
4	4844.00	45.27	74.00	-28.73	40.76	4.51	Peak	100	214
5	7266.00	35.35	54.00	-18.65	26.38	8.97	Average	100	113
6	7266.00	49.79	74.00	-24.21	40.82	8.97	Peak	100	113

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).

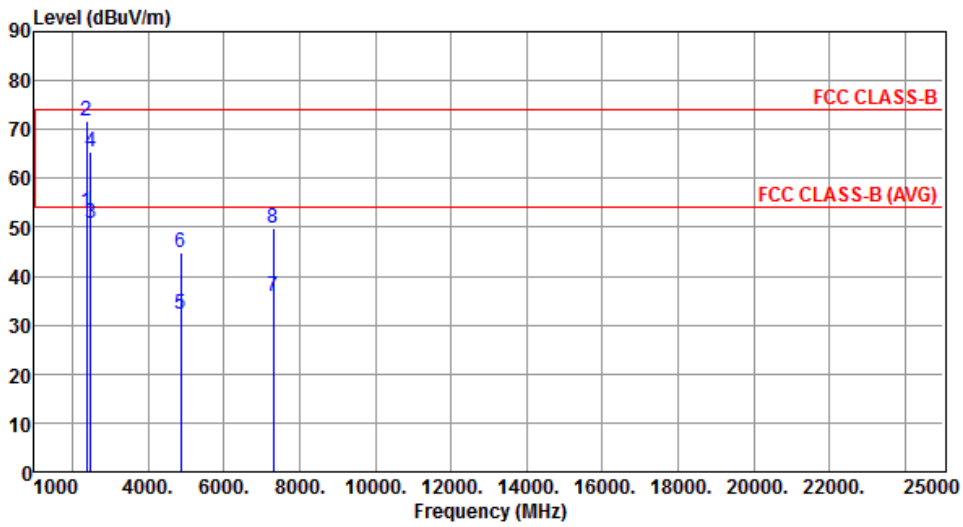
Modulation	VHT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.84	54.00	-11.16	44.96	-2.12	Average	157	61
2	2390.00	56.76	74.00	-17.24	58.88	-2.12	Peak	157	61
3	2483.50	39.86	54.00	-14.14	41.63	-1.77	Average	157	61
4	2483.50	54.41	74.00	-19.59	56.18	-1.77	Peak	157	61
5	4874.00	32.80	54.00	-21.20	28.22	4.58	Average	100	175
6	4874.00	44.84	74.00	-29.16	40.26	4.58	Peak	100	175
7	7311.00	36.88	54.00	-17.12	27.75	9.13	Average	100	114
8	7311.00	49.21	74.00	-24.79	40.08	9.13	Peak	100	114

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).

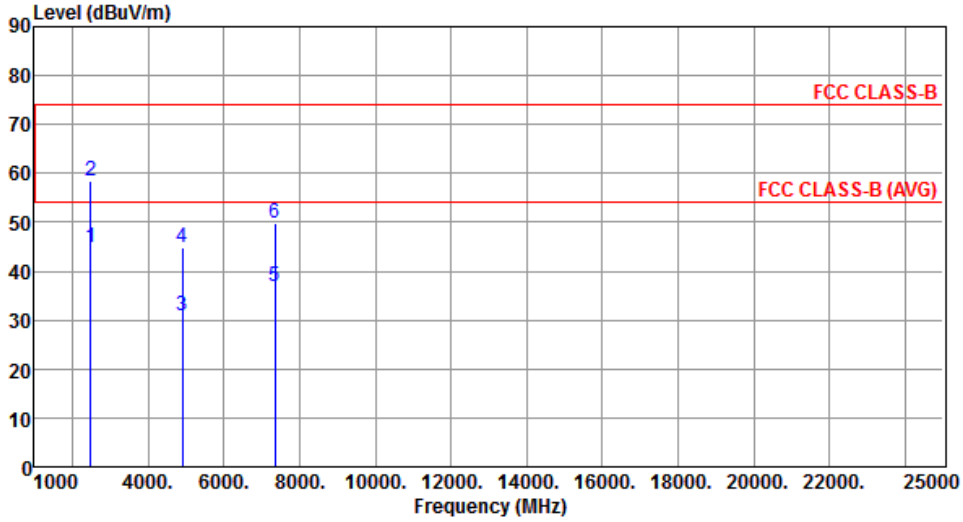
Modulation	VHT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	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	53.11	54.00	-0.89	55.23	-2.12	Average	223	4
2	2390.00	71.79	74.00	-2.21	73.91	-2.12	Peak	223	4
3	2483.50	50.93	54.00	-3.07	52.70	-1.77	Average	190	106
4	2483.50	65.32	74.00	-8.68	67.09	-1.77	Peak	190	106
5	4874.00	32.15	54.00	-21.85	27.57	4.58	Average	100	289
6	4874.00	45.00	74.00	-29.00	40.42	4.58	Peak	100	289
7	7311.00	35.95	54.00	-18.05	26.82	9.13	Average	100	136
8	7311.00	49.96	74.00	-24.04	40.83	9.13	Peak	100	136

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).

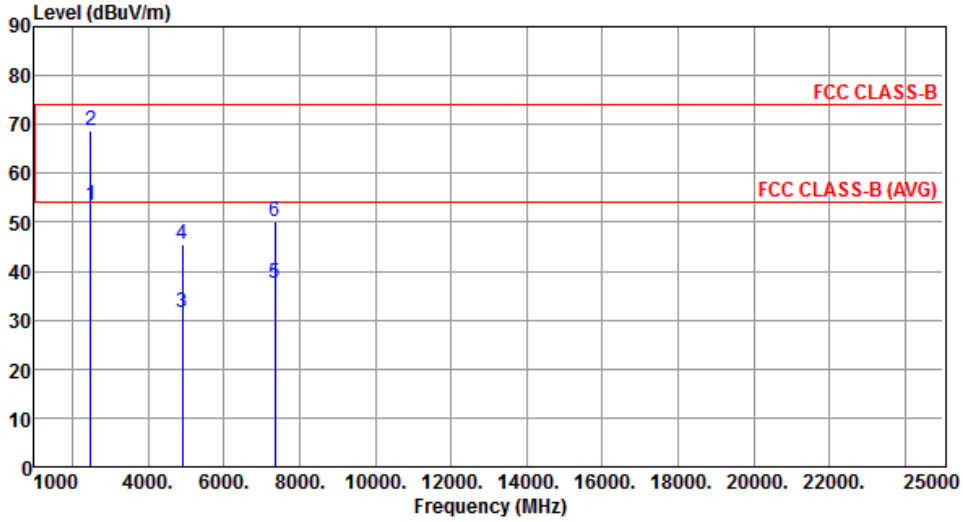
Modulation	VHT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	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	44.95	54.00	-9.05	46.72	-1.77	Average	275	312
2	2483.50	58.54	74.00	-15.46	60.31	-1.77	Peak	275	312
3	4904.00	30.94	54.00	-23.06	26.31	4.63	Average	100	156
4	4904.00	44.94	74.00	-29.06	40.31	4.63	Peak	100	156
5	7356.00	36.73	54.00	-17.27	27.44	9.29	Average	100	131
6	7356.00	49.70	74.00	-24.30	40.41	9.29	Peak	100	131

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	VHT40	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	53.30	54.00	-0.70	55.07	-1.77	Average	172	333
2	2483.50	68.78	74.00	-5.22	70.55	-1.77	Peak	172	333
3	4904.00	31.45	54.00	-22.55	26.82	4.63	Average	100	174
4	4904.00	45.46	74.00	-28.54	40.83	4.63	Peak	100	174
5	7356.00	37.60	54.00	-16.40	28.31	9.29	Average	130	159
6	7356.00	50.26	74.00	-23.74	40.97	9.29	Peak	130	159

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

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 30 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

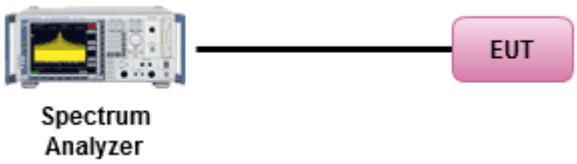
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

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

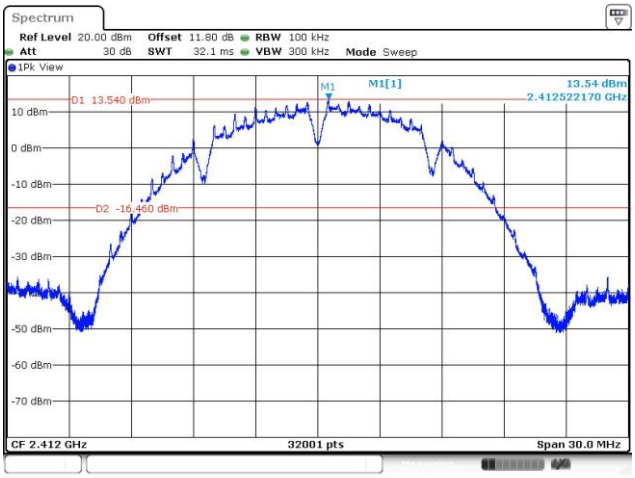
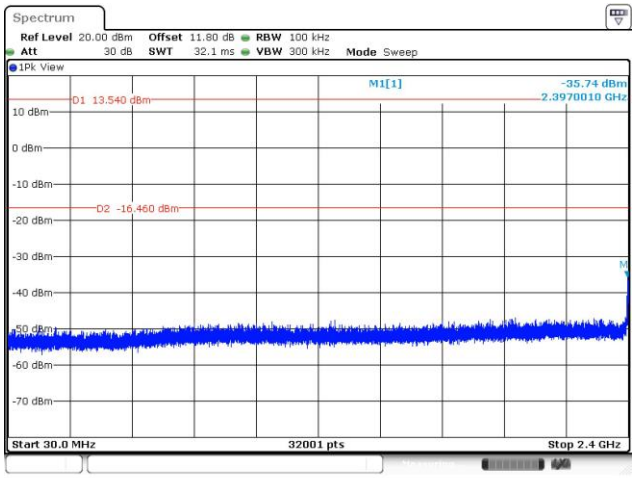
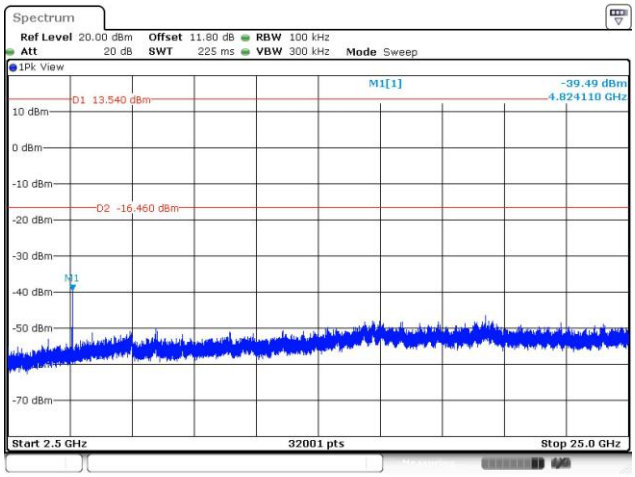
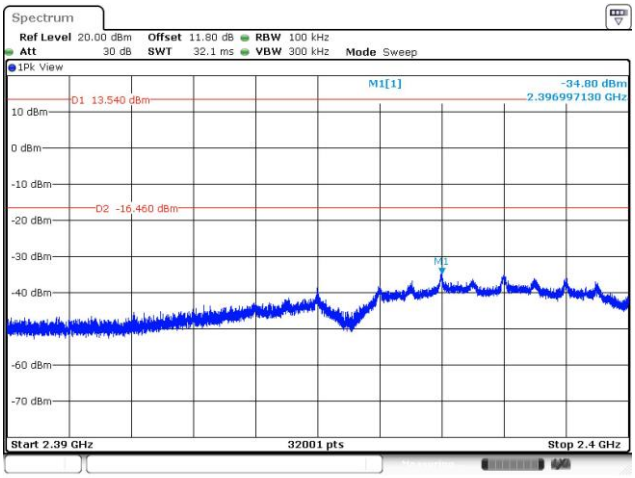


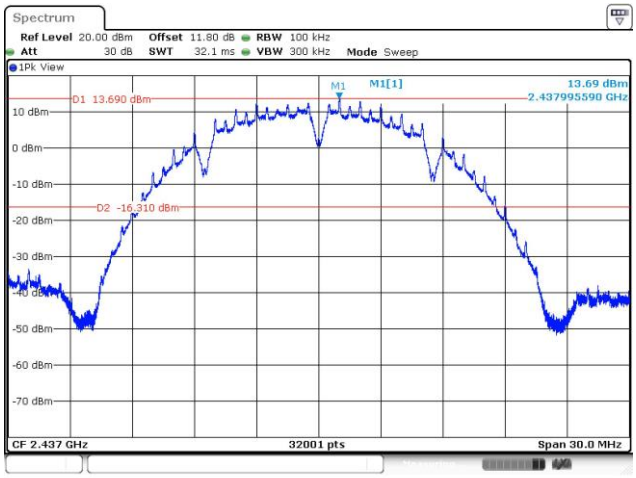
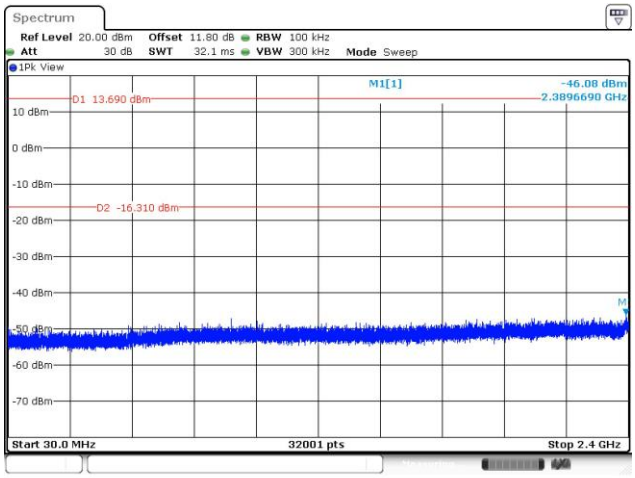
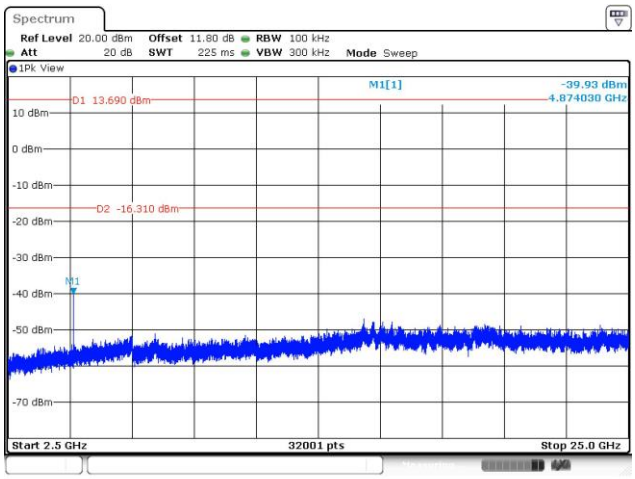
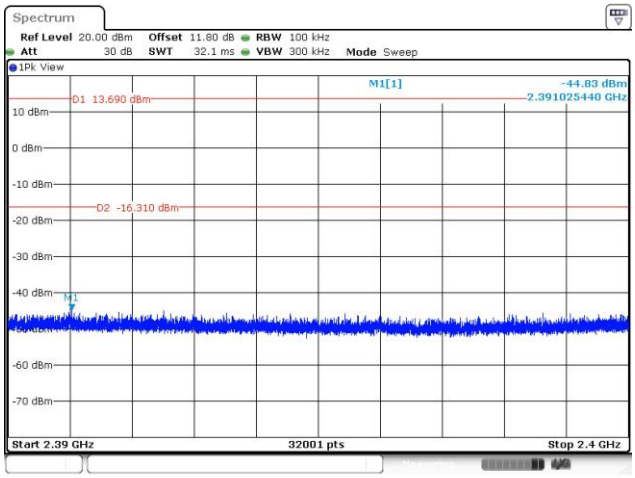
3.6.5 Test Result of Emissions in non-restricted frequency bands

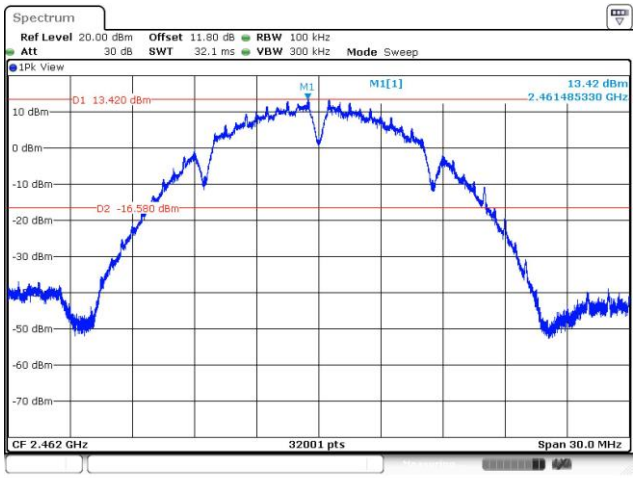
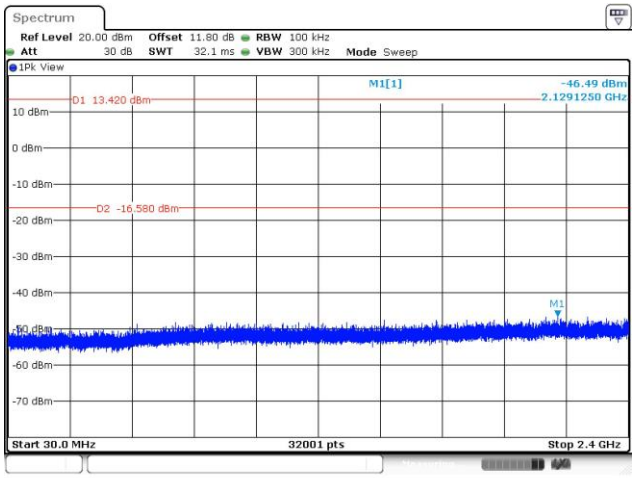
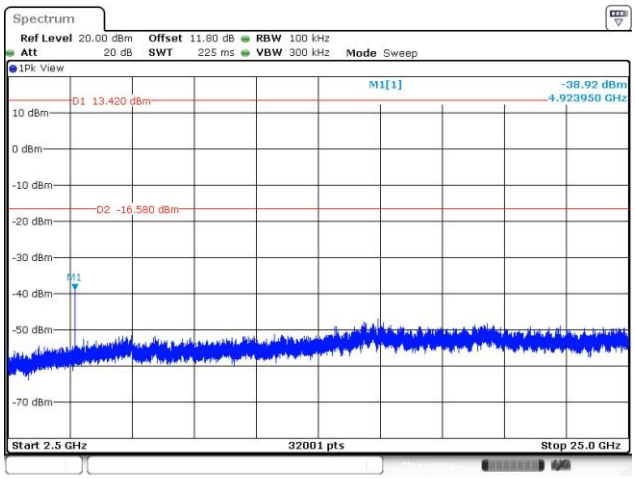
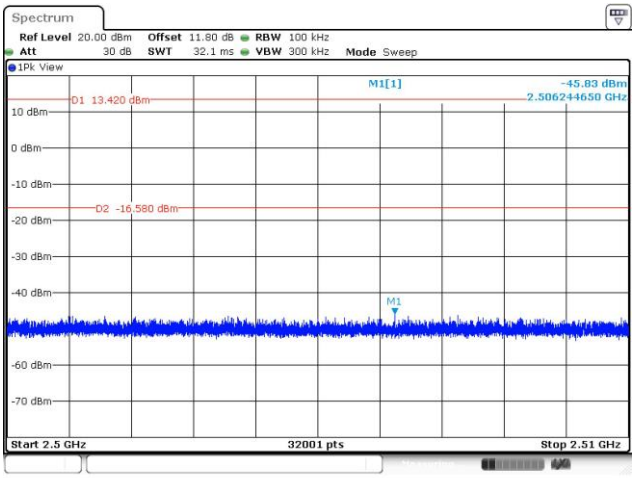
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

Non-beamforming mode

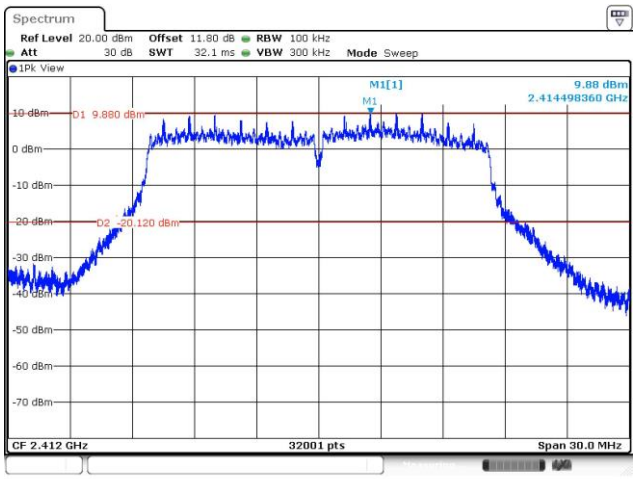
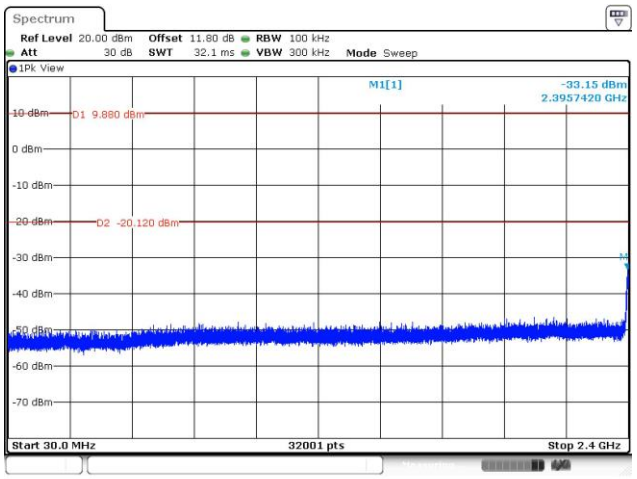
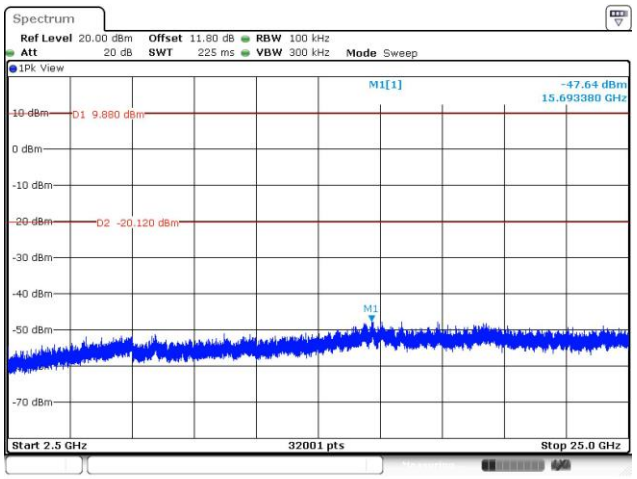
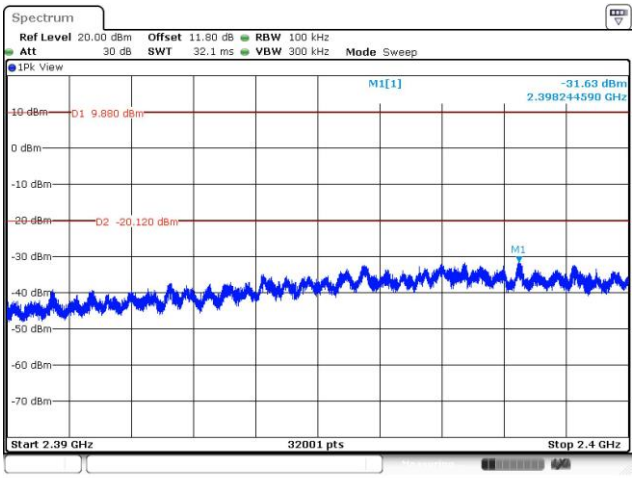
802.11b

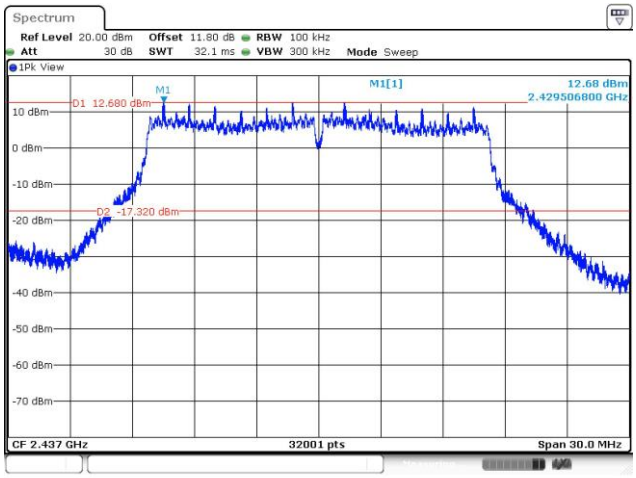
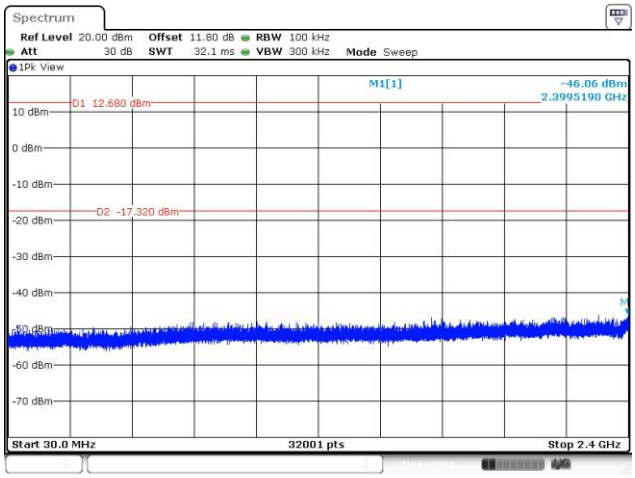
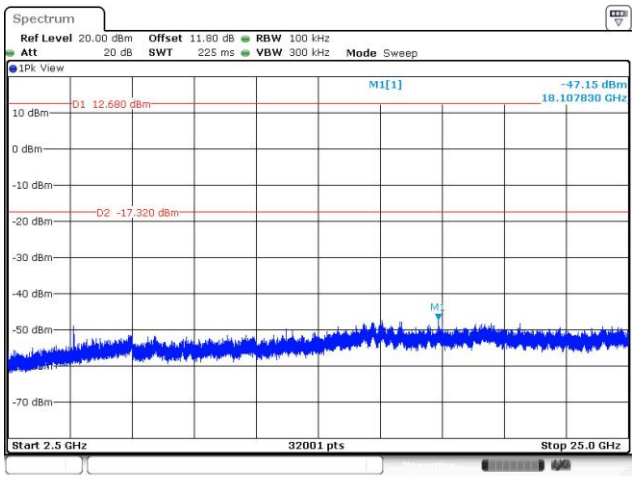
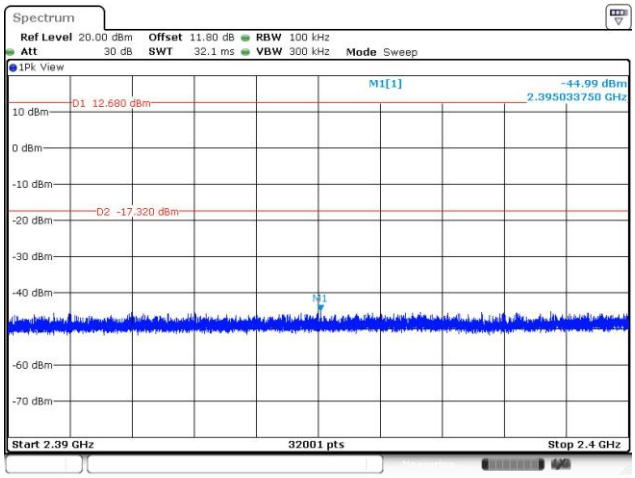
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

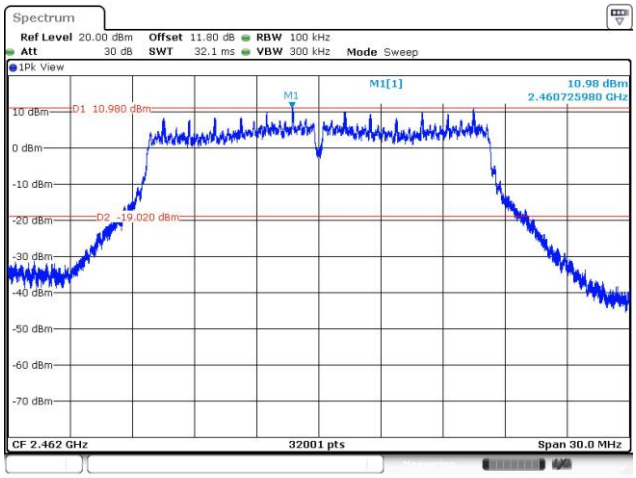
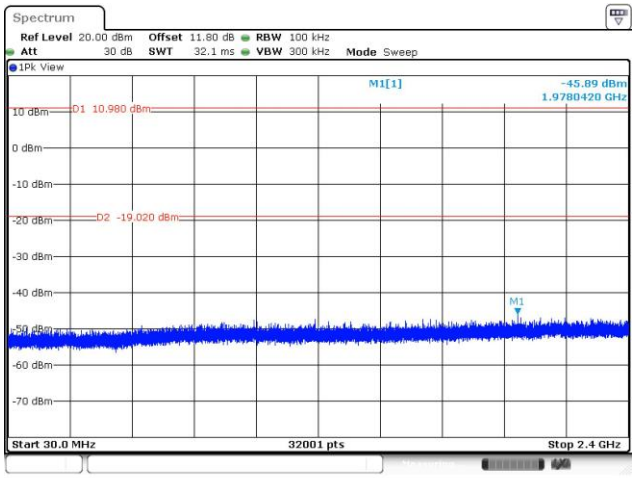
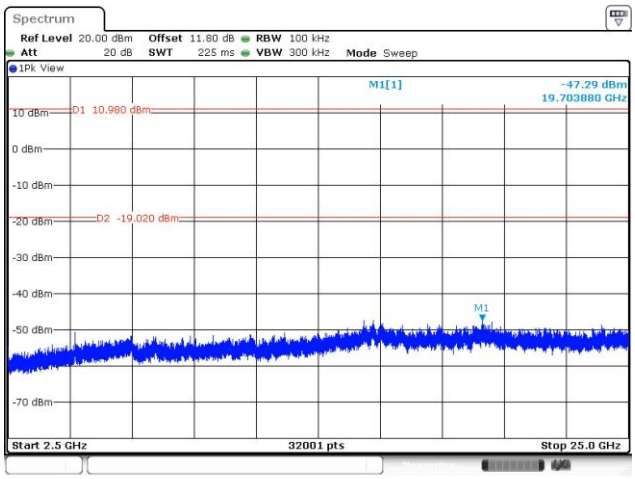
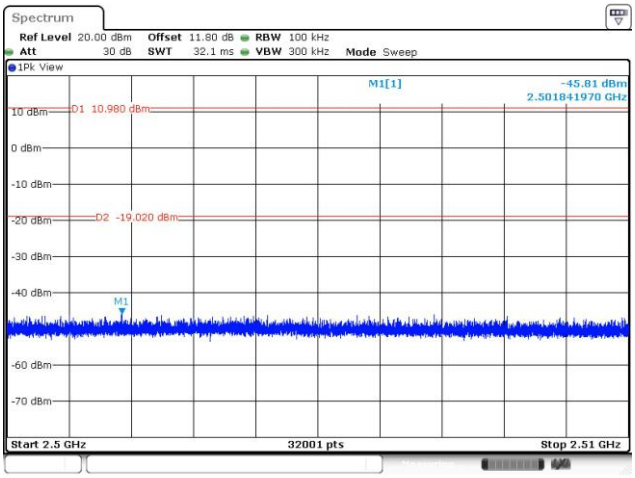
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

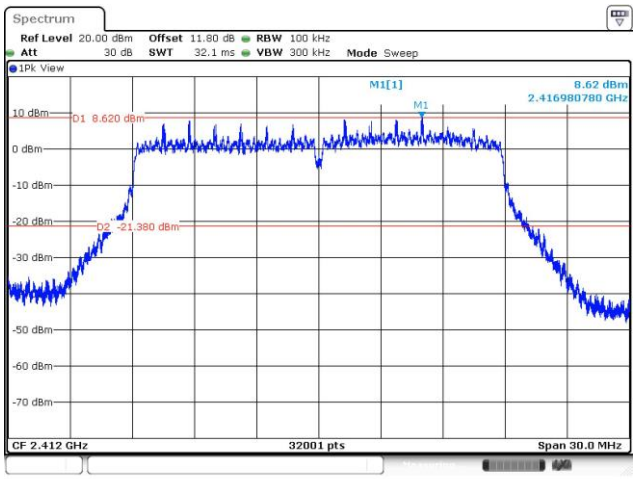
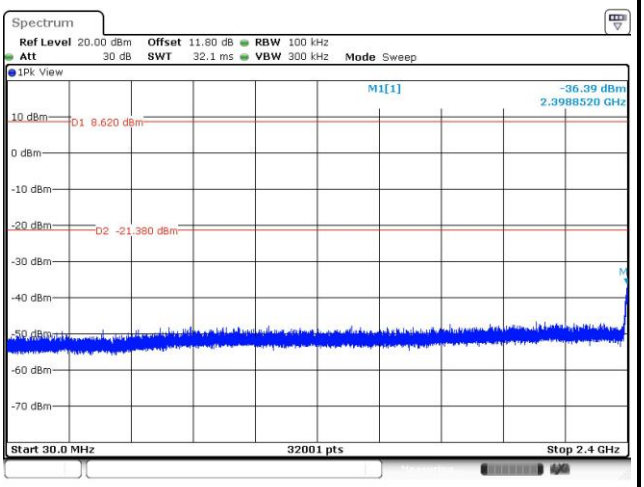
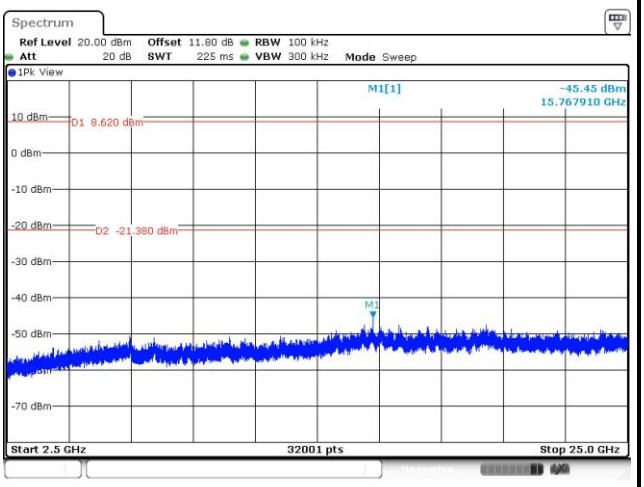
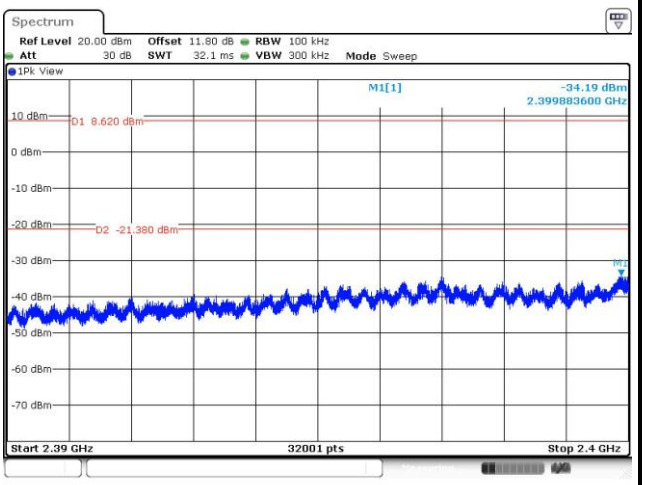
802.11g

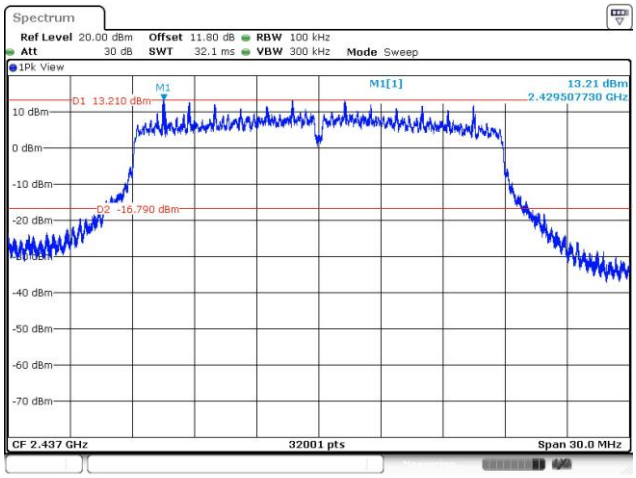
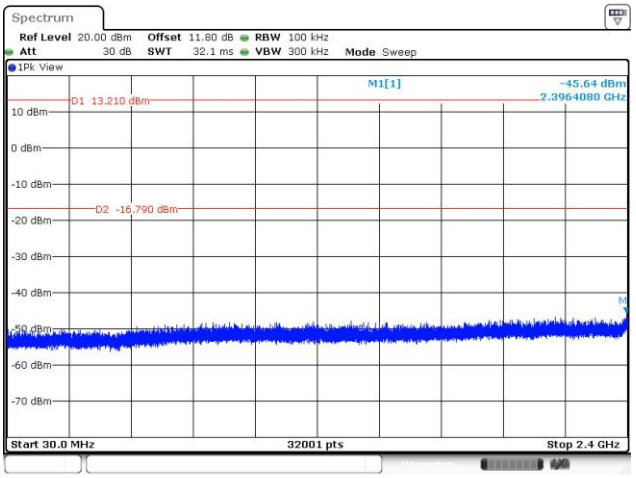
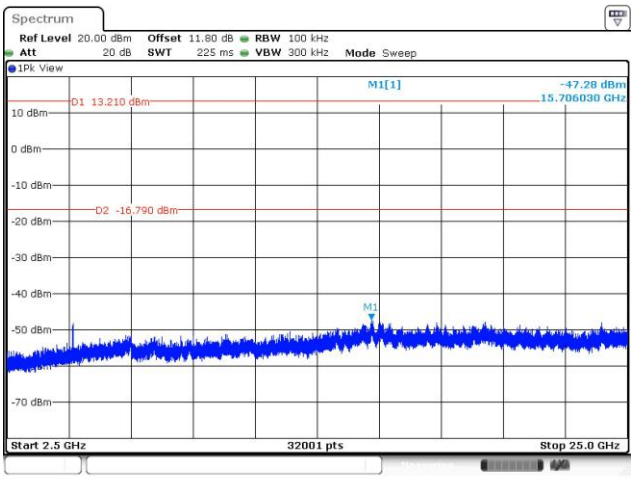
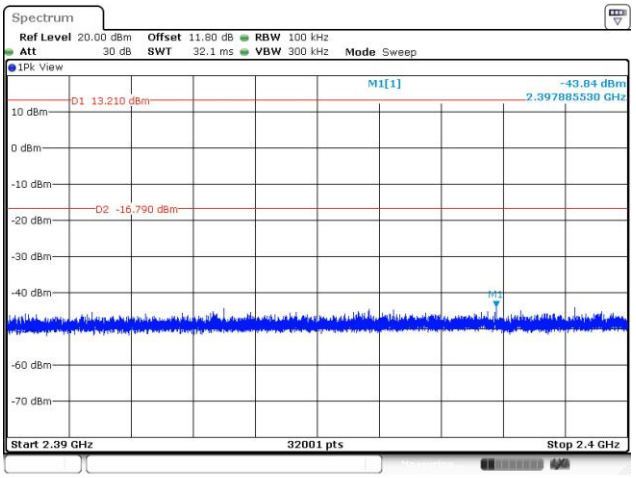
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

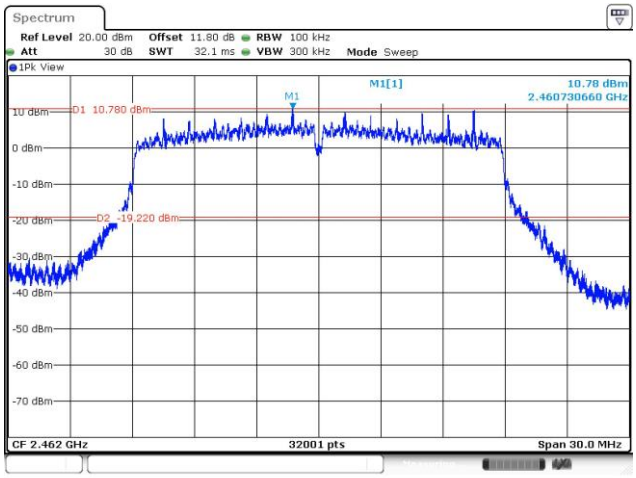
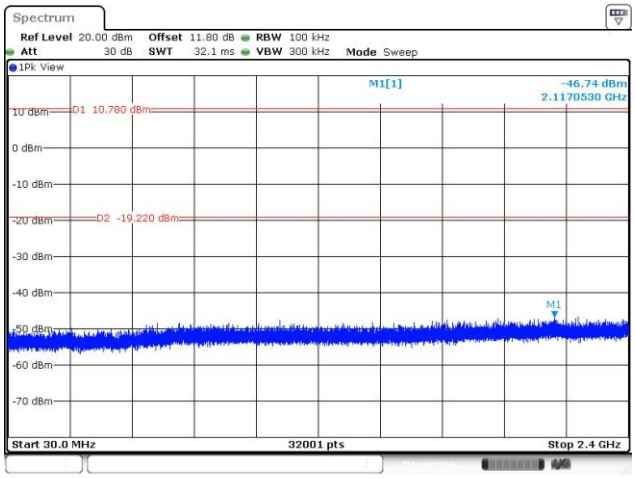
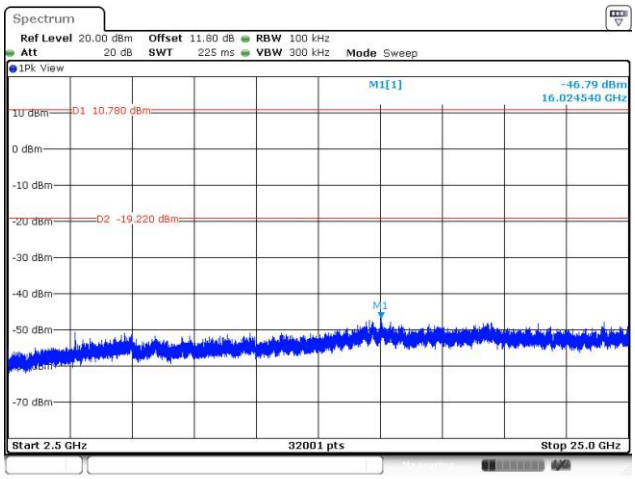
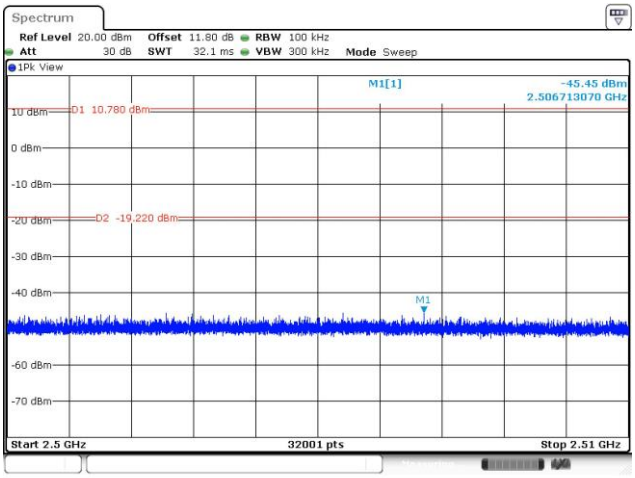
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

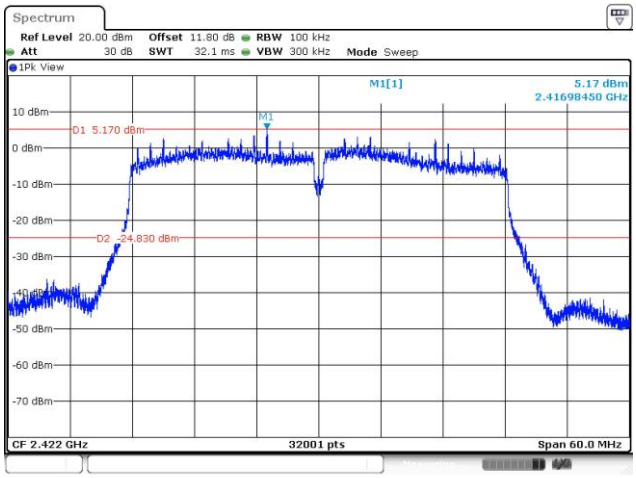
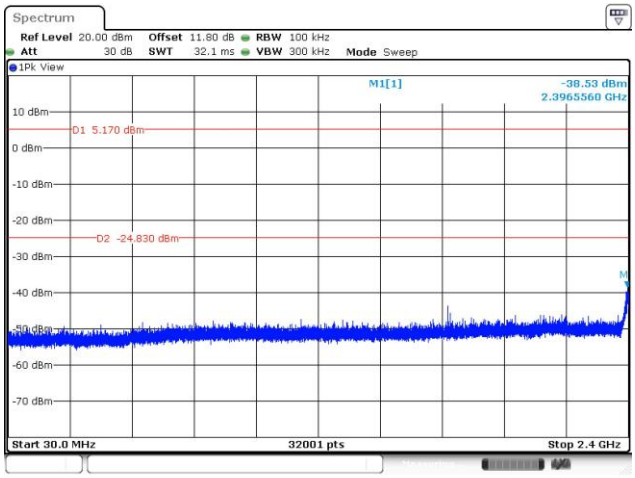
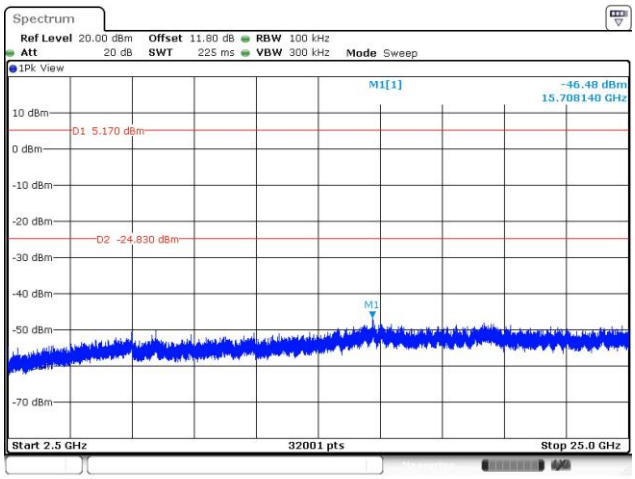
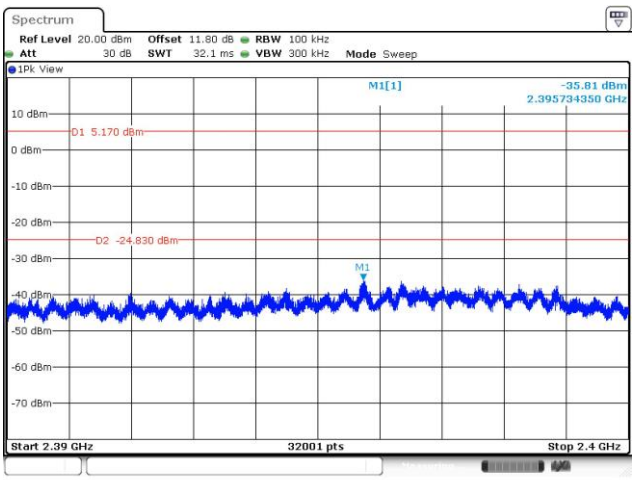
802.11n VHT20

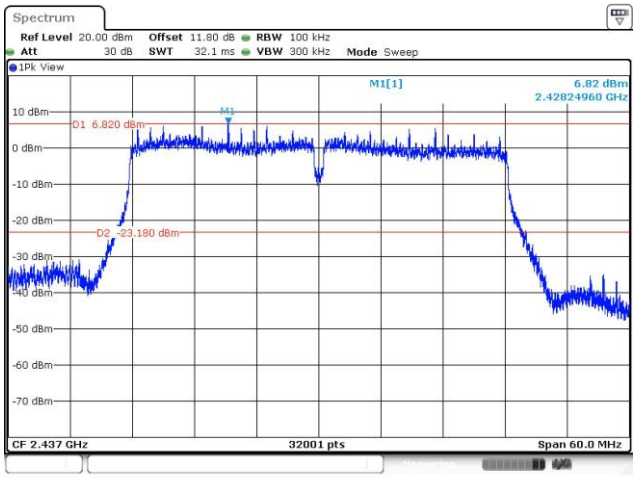
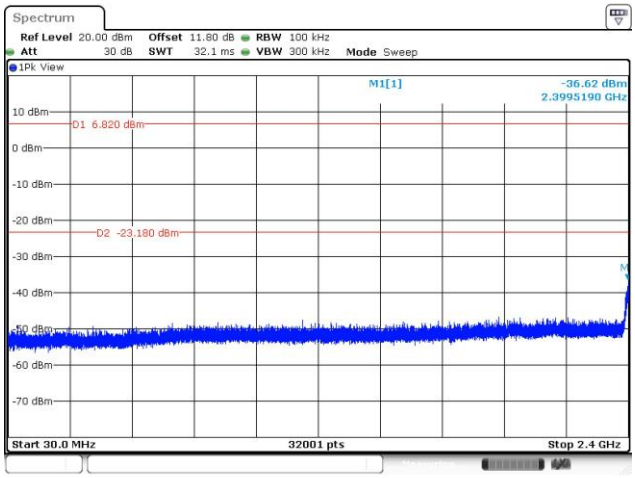
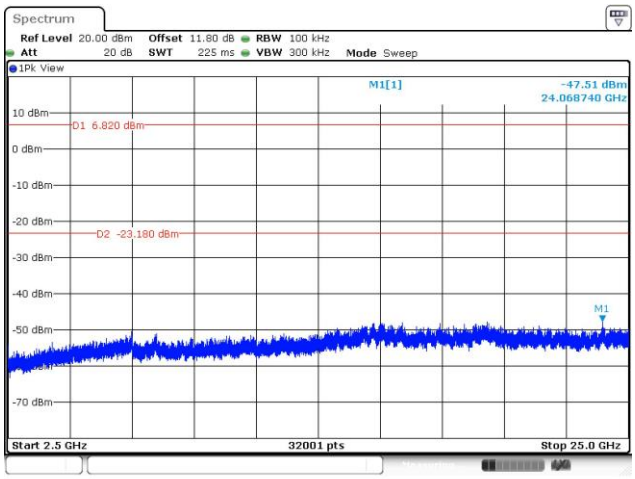
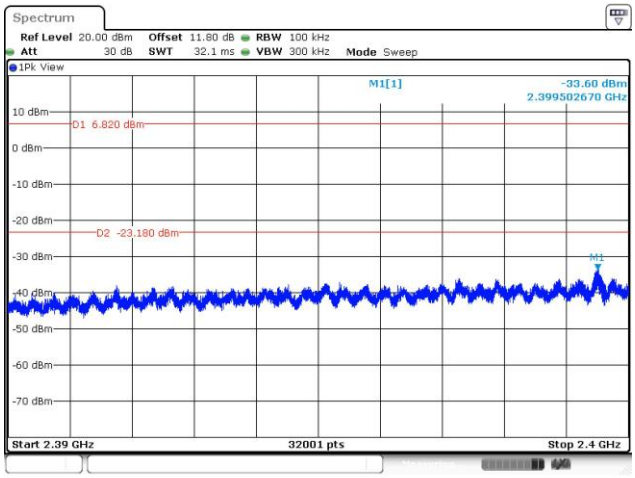
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

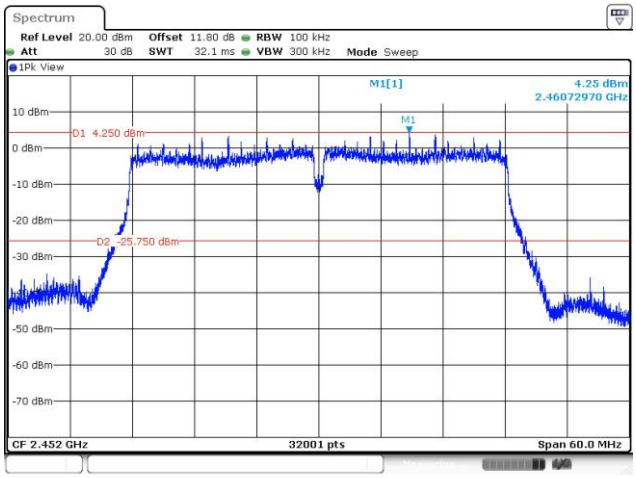
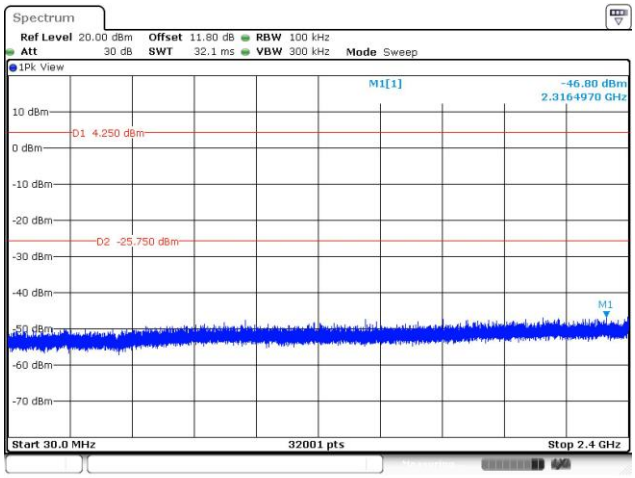
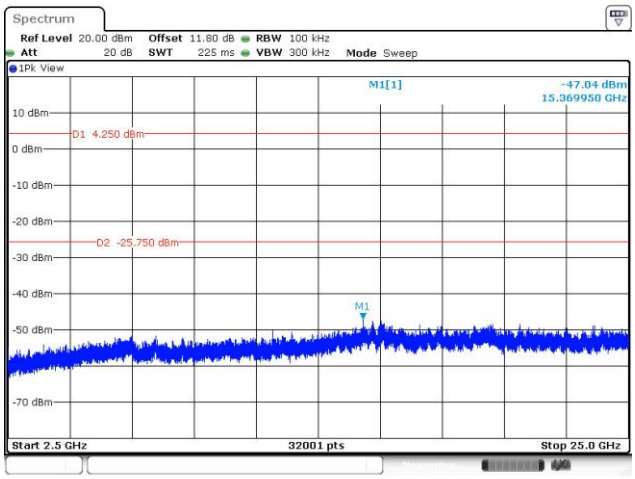
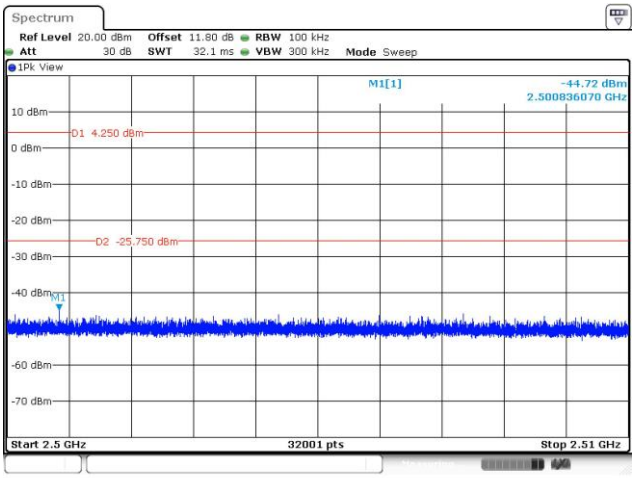
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

802.11n VHT40

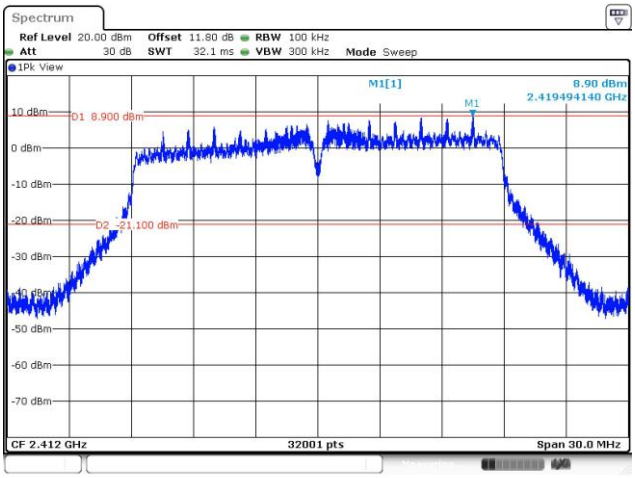
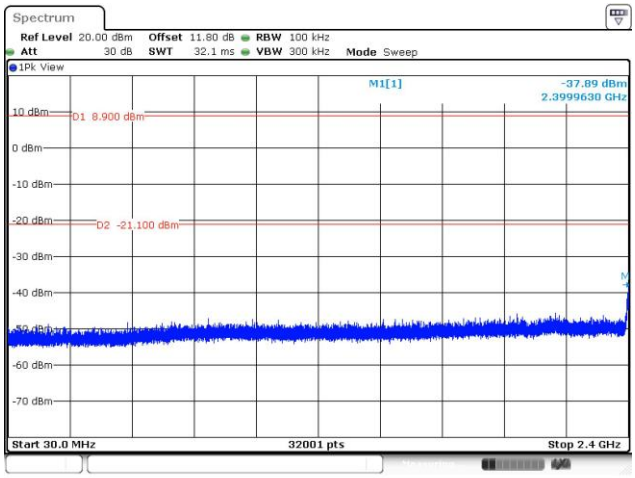
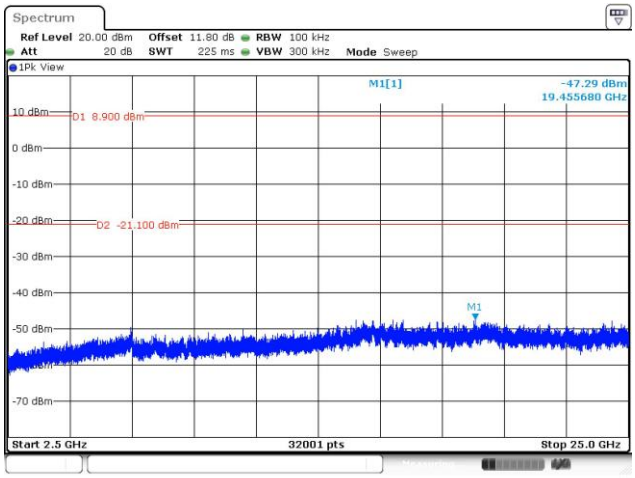
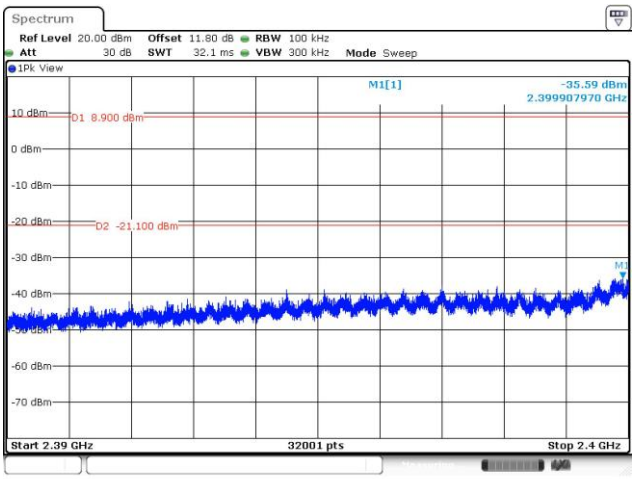
Reference Level	Tx 2422MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

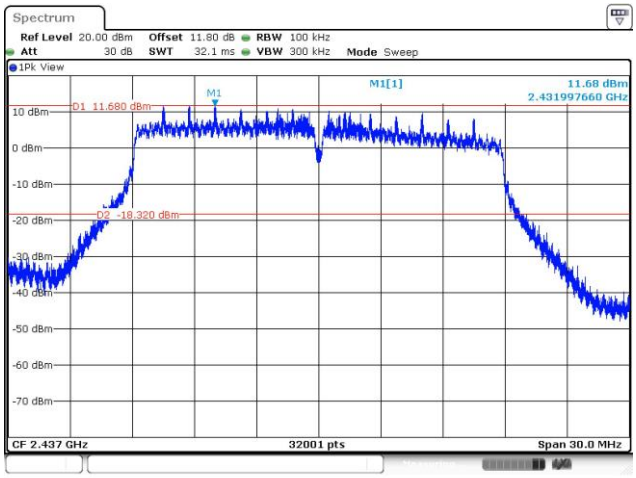
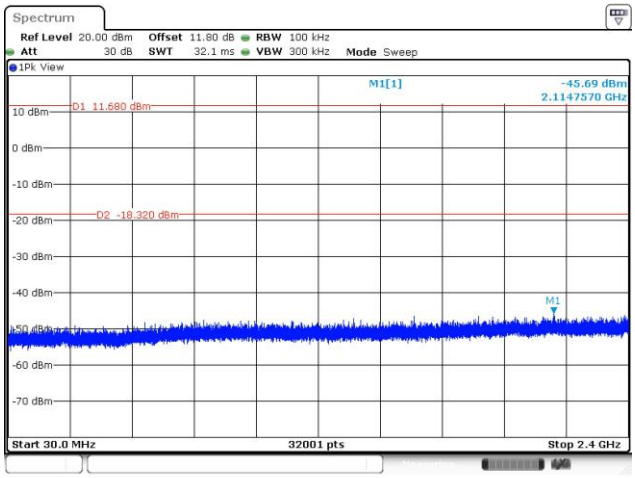
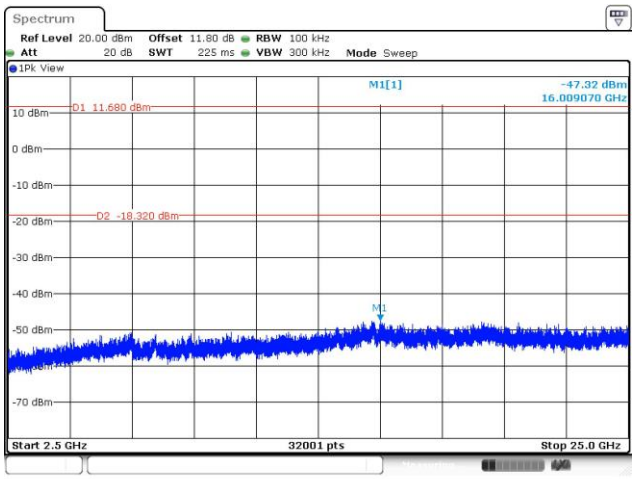
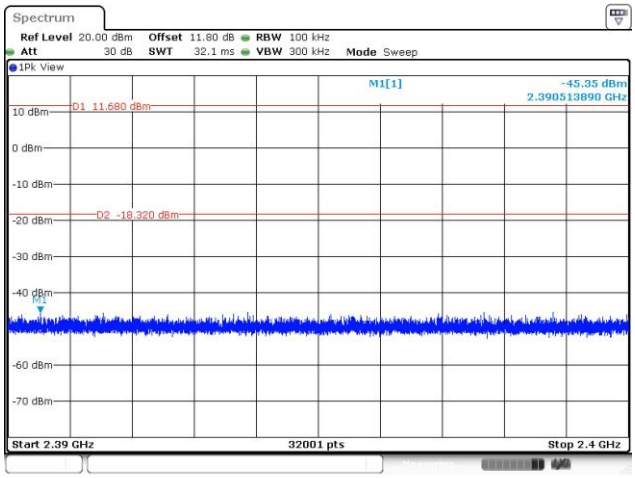
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

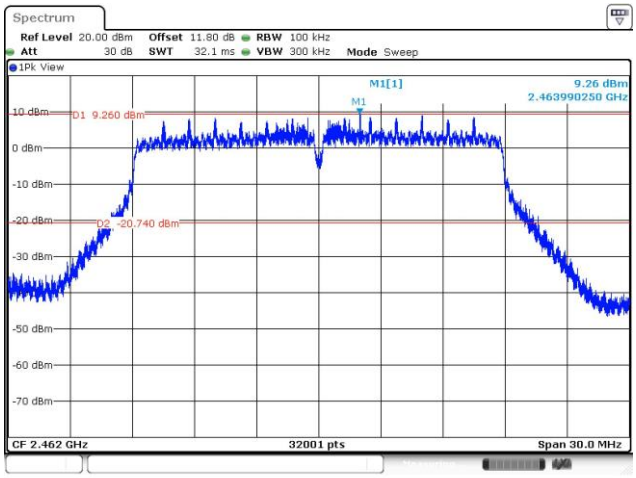
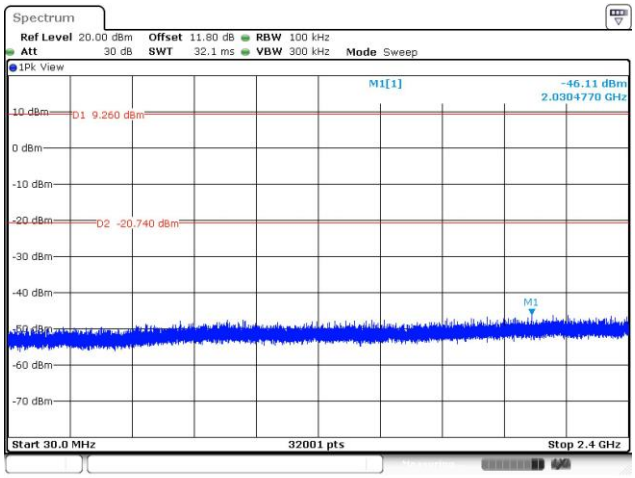
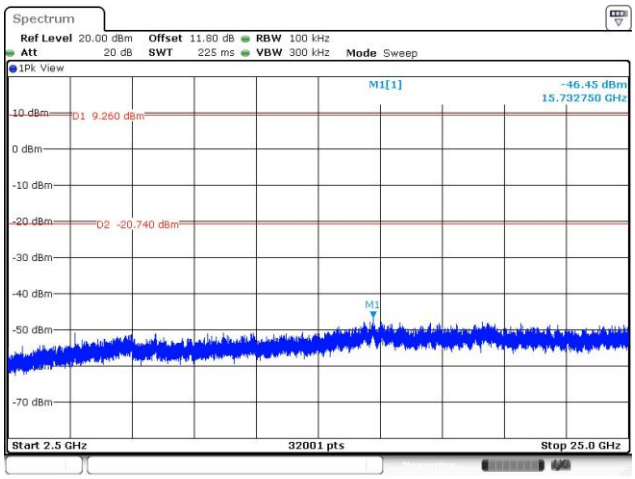
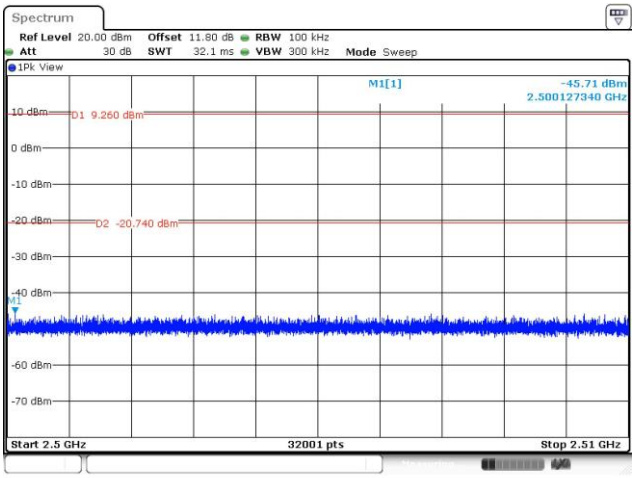
Reference Level	Tx 2452MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Beamforming mode

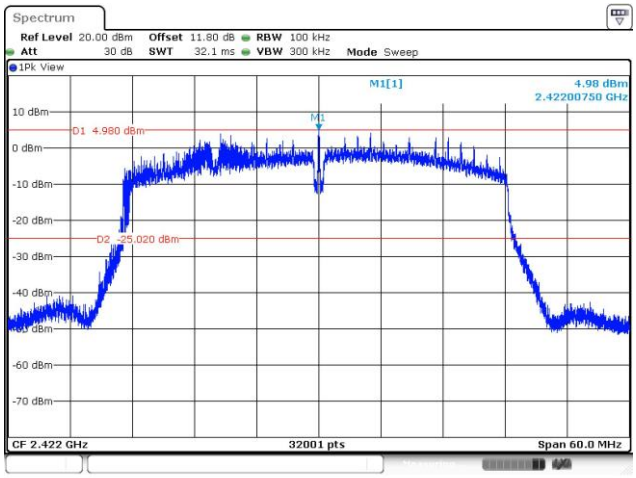
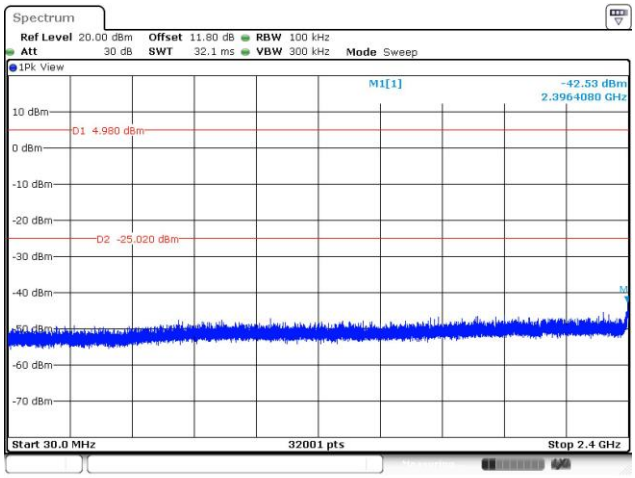
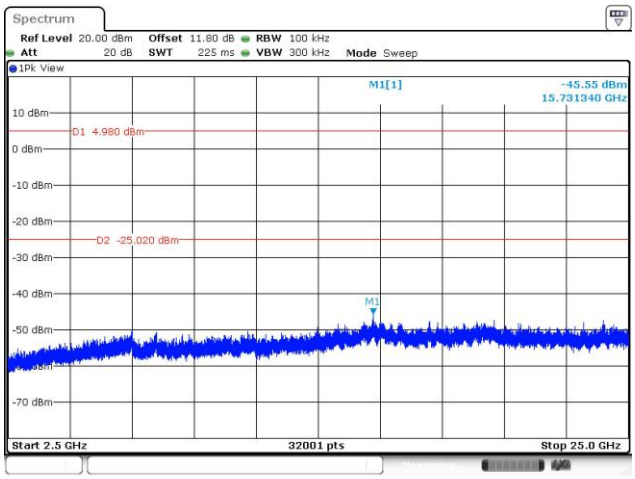
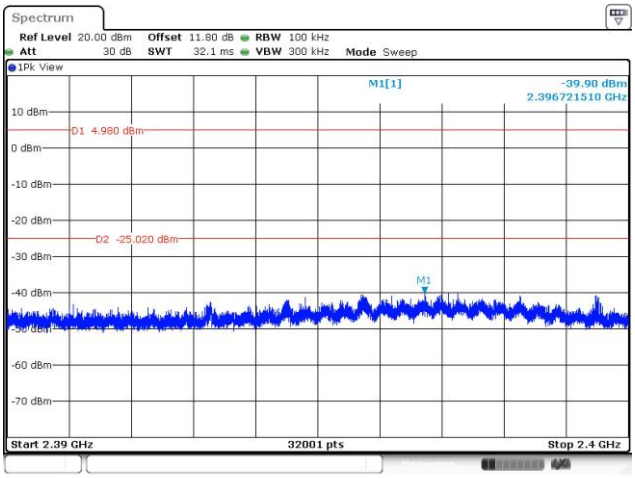
802.11n VHT20

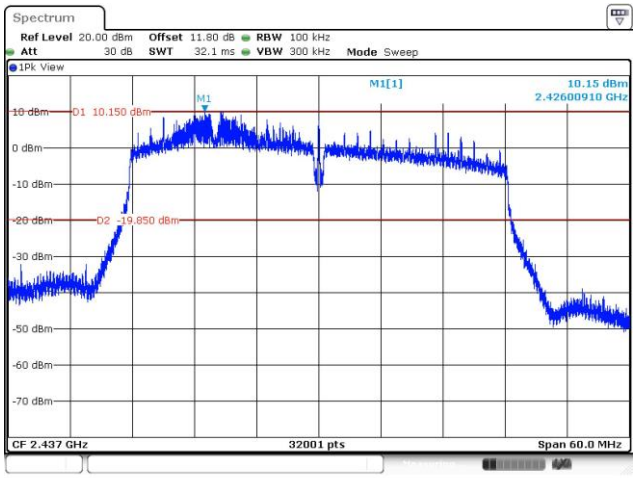
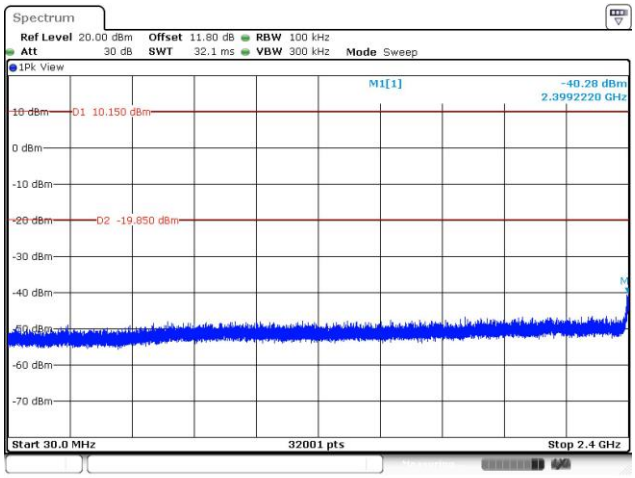
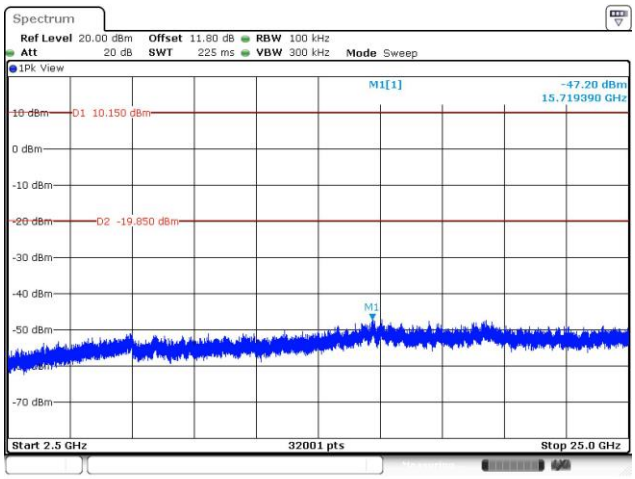
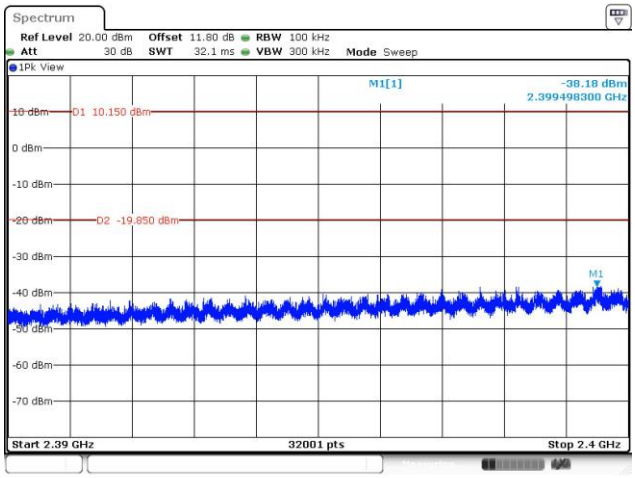
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

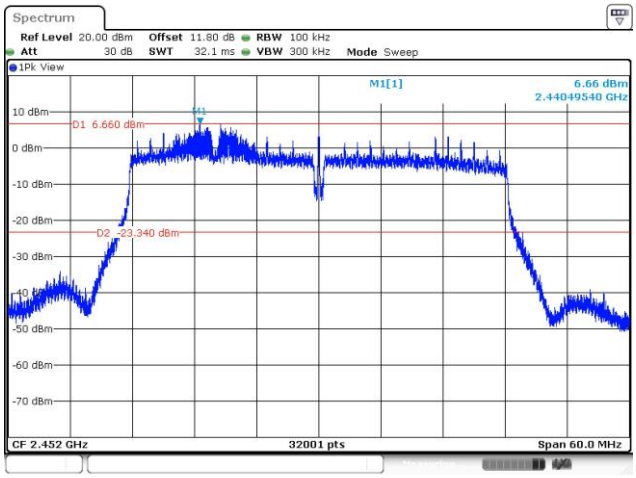
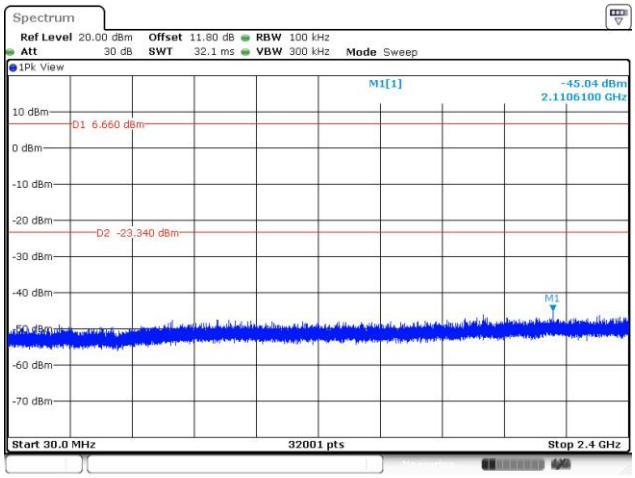
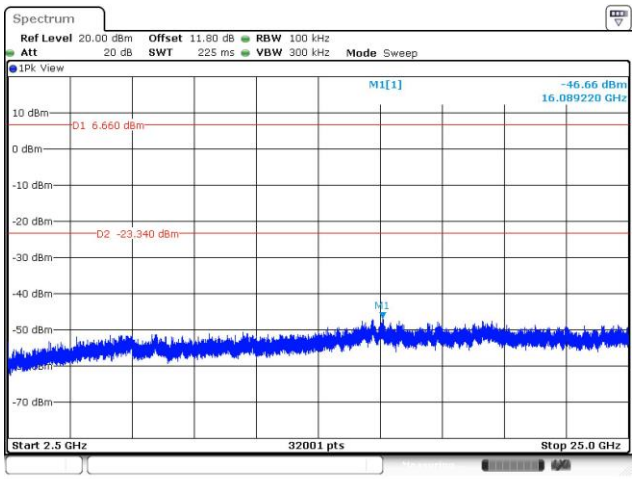
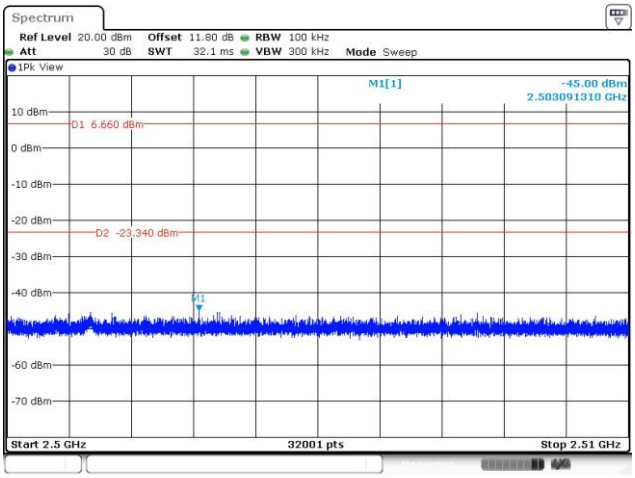
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

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

802.11n VHT40

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

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