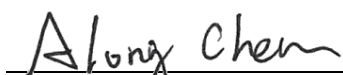


FCC Test Report

FCC ID : NKR-DHUAW8S
Equipment : WLAN/Bluetooth module - 802.11ac/a/b/g/n
2x2 & BT4.1
Model No. : DHUA-W8S
Brand Name : Wistron NeWeb Corp.
Applicant : Wistron NeWeb Corporation
Address : 20 Park Avenue II, Hsinchu Science Park,
Hsinchu 308,Taiwan,R.O.C.
Standard : 47 CFR FCC Part 15.247
Received Date : Dec. 18, 2017
Tested Date : Dec. 25, 2017 ~ Jan. 04, 2018

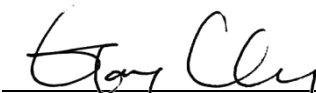
We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval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

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR7D1803AC	Rev. 01	Initial issue	Feb. 02, 2018

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.195MHz 30.79 (Margin -23.01dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4924.00MHz 53.59 (Margin -0.41dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 28.11	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15
Note 1: RF output power specifies that Maximum Peak Conducted Output Power. Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation. Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequency (MHz) / Gain (dBi)					Cable length (mm)
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850	
1	025.9019W.0001	PIFA	UFL	-1.9	2.2	2.5	3.2	3.4	320
2	025.9019V.0001	PIFA	UFL	-3.5	3.1	3.3	3.7	3.9	550
	025.9019U.0001	PIFA	UFL	-3.4	0.7	1.1	1.4	1.2	820

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	3.3Vdc from host
-------------------	------------------

1.1.4 Accessories

N/A

1.1.5 Channel List

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

1.1.6 Test Tool and Duty Cycle

Test Tool	QCARCT, Version: 3.0.187.0		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	99.78%	0.01
	11g	98.46%	0.07
	HT20	98.34%	0.07
	HT40	95.15%	0.22

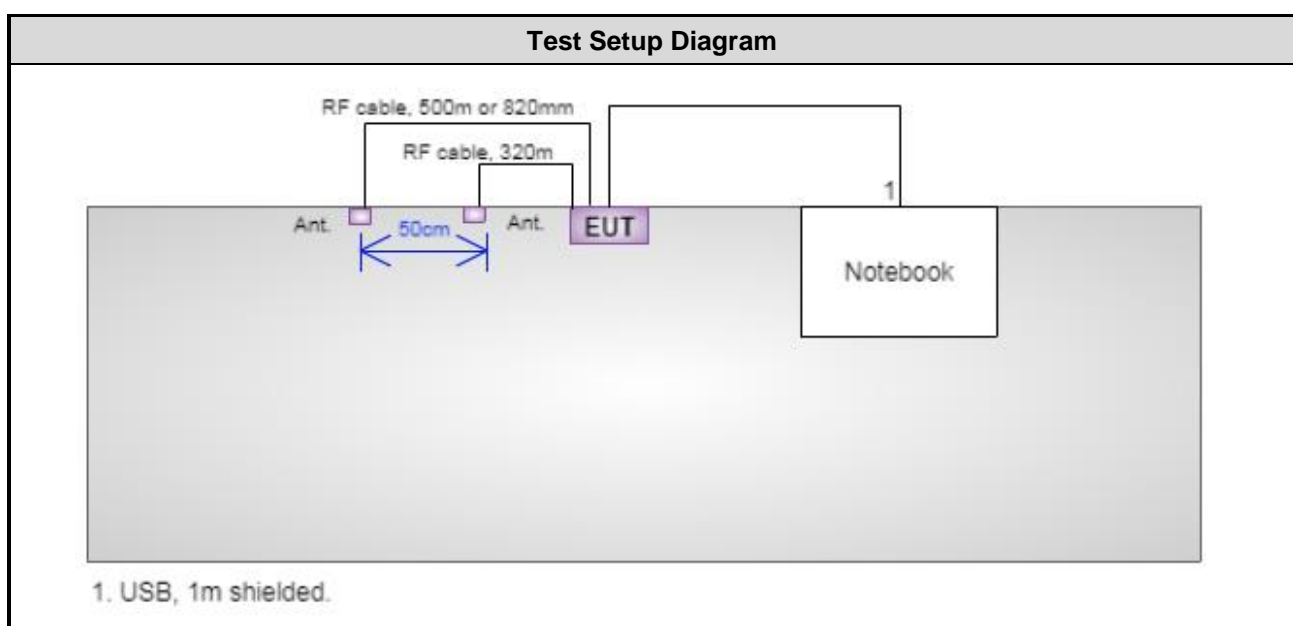
1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	15
11b	2437	15
11b	2462	15
11g	2412	19.5
11g	2437	22.5
11g	2462	16.5
HT20	2412	19
HT20	2437	22
HT20	2462	15.5
HT40	2422	16.5
HT40	2437	18
HT40	2452	14.5

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	acer	TravelMat 5760	---	USB, 1m shielded.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Dec. 27, 2017				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Nov. 20, 2017	Nov. 19, 2018
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2017	Nov. 12, 2018
RF Cable-CON	EMC	EMCCFD300-BM-B M-6000	50821	Dec. 18, 2017	Dec. 17, 2018
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	Dec. 25 ~ Dec. 29, 2017				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2017	Dec. 03, 2018
Receiver	R&S	ESR3	101658	Nov. 20, 2017	Nov. 19, 2018
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 28, 2017	Apr. 27, 2018
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	Nov. 23, 2017	Nov. 22, 2018
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 13, 2017	Nov. 12, 2018
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 07, 2017	Dec. 06, 2018
Preamplifier	EMC	EMC02325	980187	Sep. 04, 2017	Sep. 03, 2018
Preamplifier	Agilent	83017A	MY53270014	Aug. 21, 2017	Aug. 20, 2018
Preamplifier	EMC	EMC184045B	980192	Aug. 22, 2017	Aug. 21, 2018
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Nov. 27, 2017	Nov. 26, 2018
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY32487/4	Nov. 27, 2017	Nov. 26, 2018
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Nov. 27, 2017	Nov. 26, 2018
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800 -001	Nov. 27, 2017	Nov. 26, 2018
LF cable-3M	EMC	EMC8D-NM-NM-300 0	131103	Nov. 27, 2017	Nov. 26, 2018
LF cable-13M	EMC	EMC8D-NM-NM-130 00	131104	Nov. 27, 2017	Nov. 26, 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	Jan. 04, 2018				
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. 16, 2017	Oct. 15, 2018
Power Sensor	Anritsu	MA2411B	1207366	Oct. 16, 2017	Oct. 15, 2018
DC POWER SOURCE	GW INSTEK	GPC-6030D	EM892433	Oct. 26, 2017	Oct. 25, 2018
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 ≤ 1 GHz	± 3.66 dB
Radiated emission > 1 GHz	± 5.37 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	25°C / 59%	Alex Huang
Radiated Emissions	03CH03-WS	21-23°C / 65-66%	Vincent Yeh Roger Lu
RF Conducted	TH01-WS	23°C / 63%	Brad Wu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- IC site registration No.: 10807C-1

2.2 The Worst Test Modes and Channel Details

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

NOTE:

1. The antenna has two combinations of different cable lengths:
 - 1) Configuration 1: ANT1 with 320mm cable + ANT2 with 500mm cable
 - 2) Configuration 2: ANT1 with 320mm cable + ANT2 with 820mm cable
 Two antenna configurations had been covered during the pretest of radiated emission above 1GHz, and found that Configuration 1 was the worst case and was selected for final test.

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

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

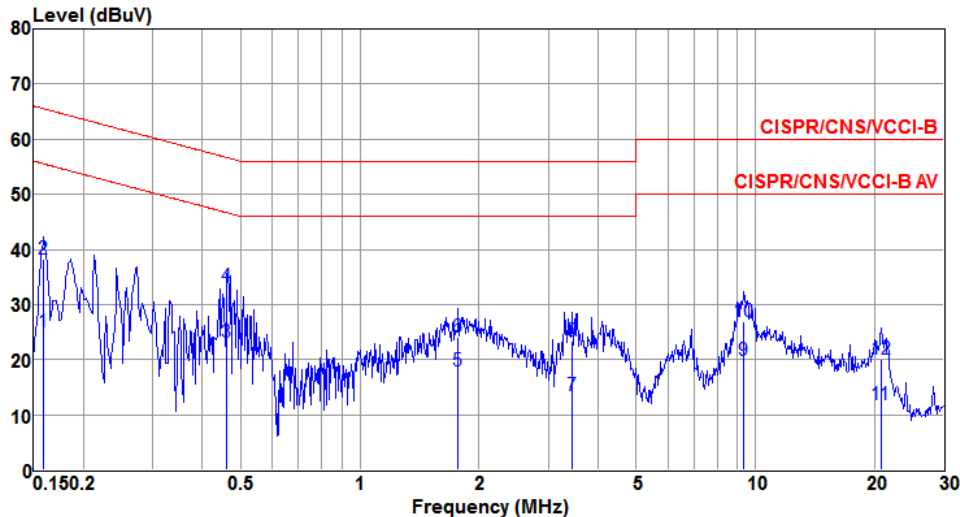
3.1.3 Test Setup



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

3.1.4 Test Result of Conducted Emissions

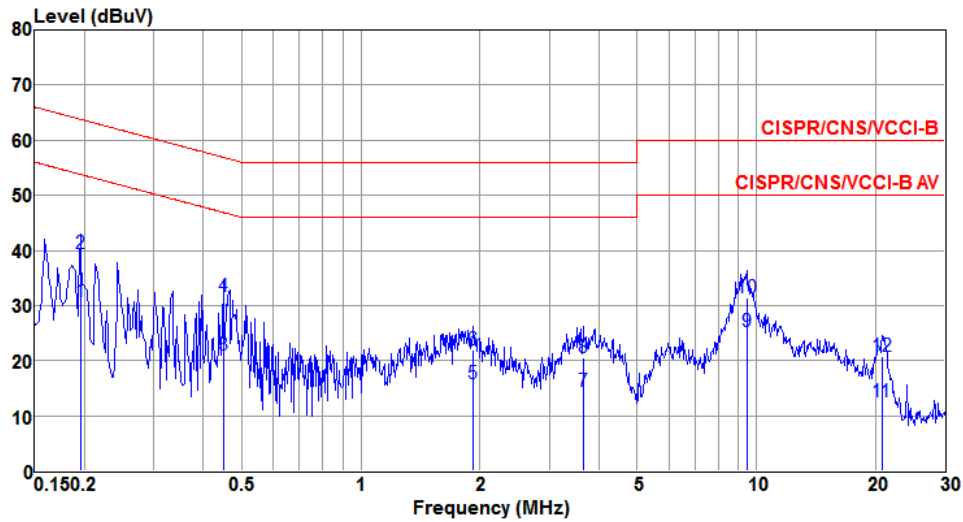
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line	Test Configuration	1



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line	Limit	Level	factor	loss	
			dBuV	dB	dBuV	dB	dB	
1	0.159	24.98	55.52	-30.54	24.87	0.07	0.04	Average
2	0.159	38.32	65.52	-27.20	38.21	0.07	0.04	QP
3	0.461	23.21	46.67	-23.46	23.09	0.08	0.04	Average
4@	0.461	33.26	56.67	-23.41	33.14	0.08	0.04	QP
5	1.772	17.97	46.00	-28.03	17.82	0.11	0.04	Average
6	1.772	24.12	56.00	-31.88	23.97	0.11	0.04	QP
7	3.436	13.48	46.00	-32.52	13.22	0.13	0.13	Average
8	3.436	23.41	56.00	-32.59	23.15	0.13	0.13	QP
9	9.352	19.72	50.00	-30.28	19.31	0.19	0.22	Average
10	9.352	26.80	60.00	-33.20	26.39	0.19	0.22	QP
11	20.814	11.78	50.00	-38.22	11.24	0.27	0.27	Average
12	20.814	19.96	60.00	-40.04	19.42	0.27	0.27	QP

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

Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1@	0.195	30.79	53.80	-23.01	30.71	0.04	0.04	Average
2	0.195	39.36	63.80	-24.44	39.28	0.04	0.04	QP
3	0.449	20.97	46.89	-25.92	20.89	0.04	0.04	Average
4	0.449	31.60	56.89	-25.29	31.52	0.04	0.04	QP
5	1.928	15.83	46.00	-30.17	15.72	0.07	0.04	Average
6	1.928	21.95	56.00	-34.05	21.84	0.07	0.04	QP
7	3.642	14.30	46.00	-31.70	14.07	0.09	0.14	Average
8	3.642	20.45	56.00	-35.55	20.22	0.09	0.14	QP
9	9.451	25.31	50.00	-24.69	24.92	0.17	0.22	Average
10	9.451	31.44	60.00	-28.56	31.05	0.17	0.22	QP
11	20.814	12.42	50.00	-37.58	11.88	0.27	0.27	Average
12	20.814	20.75	60.00	-39.25	20.21	0.27	0.27	QP

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

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

6dB Bandwidth

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

Occupied Bandwidth

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

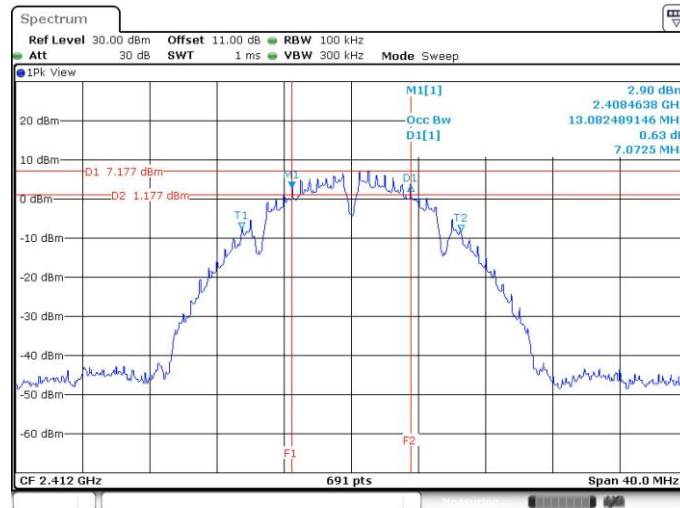
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

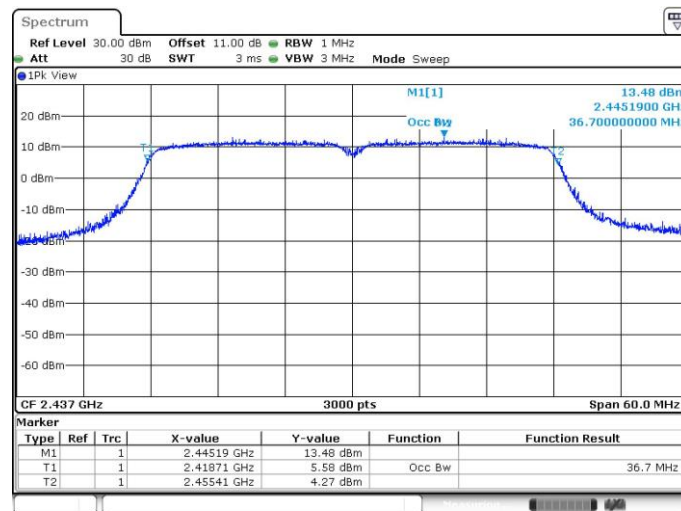
Modulation Mode	N _{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	7.07	7.54	---	---	500
11b	2	2437	8.00	7.54	---	---	500
11b	2	2462	7.54	7.07	---	---	500
11g	2	2412	16.35	16.35	---	---	500
11g	2	2437	16.23	16.35	---	---	500
11g	2	2462	16.35	16.35	---	---	500
HT20	2	2412	17.22	17.51	---	---	500
HT20	2	2437	16.35	16.29	---	---	500
HT20	2	2462	16.58	16.58	---	---	500
HT40	2	2422	36.06	35.71	---	---	500
HT40	2	2437	35.83	36.06	---	---	500
HT40	2	2452	35.94	36.06	---	---	500

Worst Plot



Modulation Mode	N _{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	13.08	13.07	---	---
11b	2	2437	13.10	13.14	---	---
11b	2	2462	13.10	13.11	---	---
11g	2	2412	16.62	17.35	---	---
11g	2	2437	19.82	18.53	---	---
11g	2	2462	16.54	16.55	---	---
HT20	2	2412	17.67	17.71	---	---
HT20	2	2437	18.86	21.47	---	---
HT20	2	2462	17.65	17.64	---	---
HT40	2	2422	36.60	36.56	---	---
HT40	2	2437	36.56	36.70	---	---
HT40	2	2452	36.58	36.60	---	---

Worst Plot



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

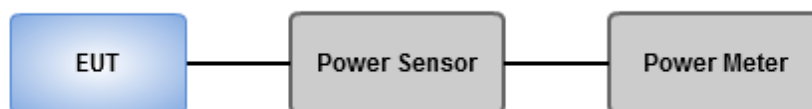
- ☒ Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.
- ☐ Antenna gain $> 6\text{dBi}$
 - ☐ Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB
 - ☐ Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

- ☒ Maximum Peak Conducted Output Power
 - ☐ **Spectrum analyzer**
 1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
 2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
 3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.
 - ☒ **Power meter**
 1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.
- ☒ Maximum Conducted Output Power (For reference only)
 - ☒ **Power meter**
 1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Output Power

Modulation Mode	N _{TX}	Freq. (MHz)	Peak conducted Output Power (dBm)							Ant. Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3	Total Power (mW)	Total Power (dBm)	Limit (dBm)			
11b	2	2412	17.28	17.36	---	---	107.907	20.33	30.00	-1.90	18.43	36.00
11b	2	2437	17.19	17.22	---	---	105.083	20.22	30.00	-1.90	18.32	36.00
11b	2	2462	17.52	17.23	---	---	109.338	20.39	30.00	-1.90	18.49	36.00
11g	2	2412	23.83	23.41	---	---	460.827	26.64	30.00	-1.90	24.74	36.00
11g	2	2437	25.54	24.61	---	---	647.164	28.11	30.00	-1.90	26.21	36.00
11g	2	2462	21.86	21.38	---	---	290.866	24.64	30.00	-1.90	22.74	36.00
HT20	2	2412	23.31	23.02	---	---	414.736	26.18	30.00	-1.90	24.28	36.00
HT20	2	2437	24.93	24.39	---	---	585.961	27.68	30.00	-1.90	25.78	36.00
HT20	2	2462	20.63	20.42	---	---	225.765	23.54	30.00	-1.90	21.64	36.00
HT40	2	2422	21.58	21.28	---	---	278.156	24.44	30.00	-1.90	22.54	36.00
HT40	2	2437	22.73	22.63	---	---	370.731	25.69	30.00	-1.90	23.79	36.00
HT40	2	2452	19.87	19.68	---	---	189.948	22.79	30.00	-1.90	20.89	36.00

Modulation Mode	N _{TX}	Freq. (MHz)	Conducted (Average) Output Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	2	2412	14.72	14.92	---	---	60.694	17.83	---
11b	2	2437	14.71	14.88	---	---	60.341	17.81	---
11b	2	2462	14.83	14.76	---	---	60.331	17.81	---
11g	2	2412	18.63	18.51	---	---	143.904	21.58	---
11g	2	2437	22.18	20.72	---	---	283.228	24.52	---
11g	2	2462	16.11	15.91	---	---	79.826	19.02	---
HT20	2	2412	17.98	17.92	---	---	124.750	20.96	---
HT20	2	2437	20.76	20.28	---	---	225.784	23.54	---
HT20	2	2462	14.86	14.81	---	---	60.889	17.85	---
HT40	2	2422	15.73	15.62	---	---	73.886	18.69	---
HT40	2	2437	17.21	17.11	---	---	104.006	20.17	---
HT40	2	2452	13.93	13.85	---	---	48.983	16.90	---

Note: Conducted average output power is for reference only.

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

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

3.4.2 Test Procedures

- ☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.
 1. Set the RBW = 3kHz, VBW = 10kHz.
 2. Detector = Peak, Sweep time = auto couple.
 3. Trace mode = max hold, allow trace to fully stabilize.
 4. Use the peak marker function to determine the maximum amplitude level.
- ☐ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.
 1. Set the RBW = 100kHz, VBW = 300 kHz.
 2. Detector = RMS, Sweep time = auto couple.
 3. Set the sweep time to: $\geq 10 \times (\text{number of measurement points in sweep}) \times (\text{maximum data rate per stream})$.
 4. Perform the measurement over a single sweep.
 5. Use the peak marker function to determine the maximum amplitude level.

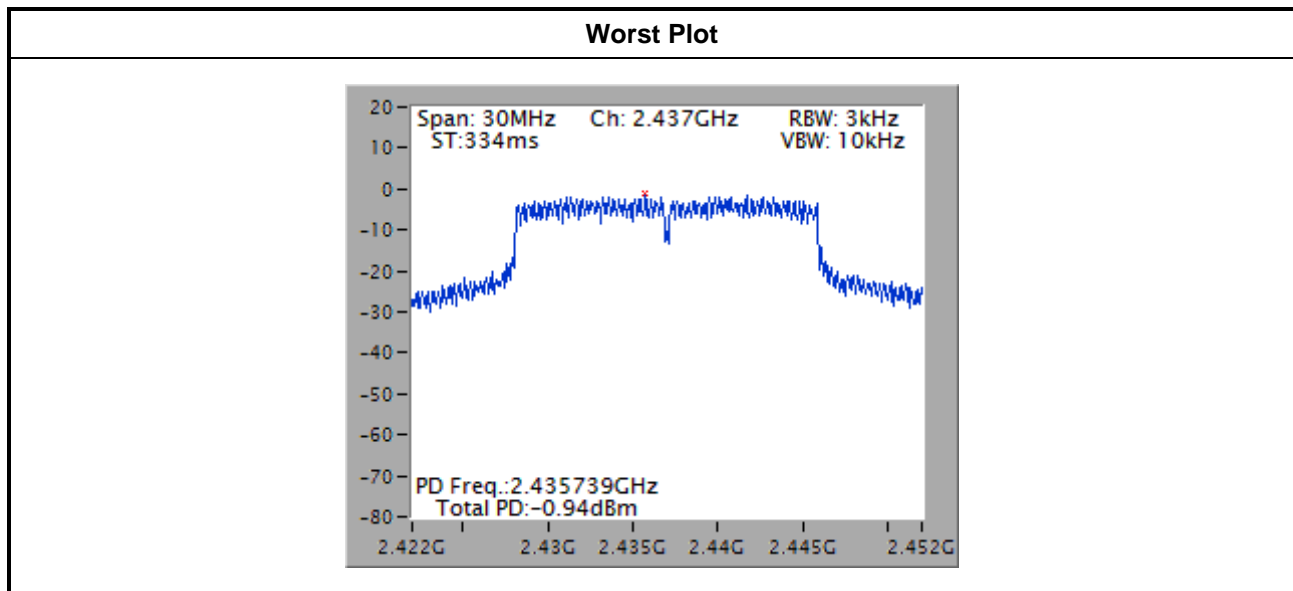
3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Modulation Mode	N _{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	-4.97	8.00
11b	2	2437	-4.45	8.00
11b	2	2462	-4.58	8.00
11g	2	2412	-2.69	8.00
11g	2	2437	-1.90	8.00
11g	2	2462	-6.49	8.00
HT20	2	2412	-5.10	8.00
HT20	2	2437	-0.94	8.00
HT20	2	2462	-7.81	8.00
HT40	2	2422	-9.82	8.00
HT40	2	2437	-7.81	8.00
HT40	2	2452	-11.78	8.00

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



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:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

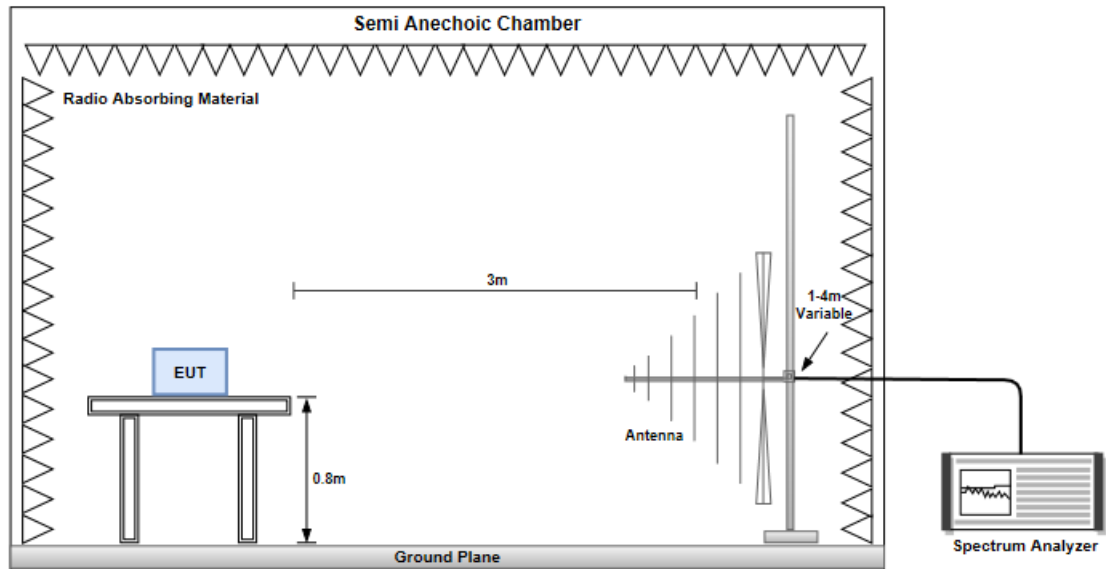
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

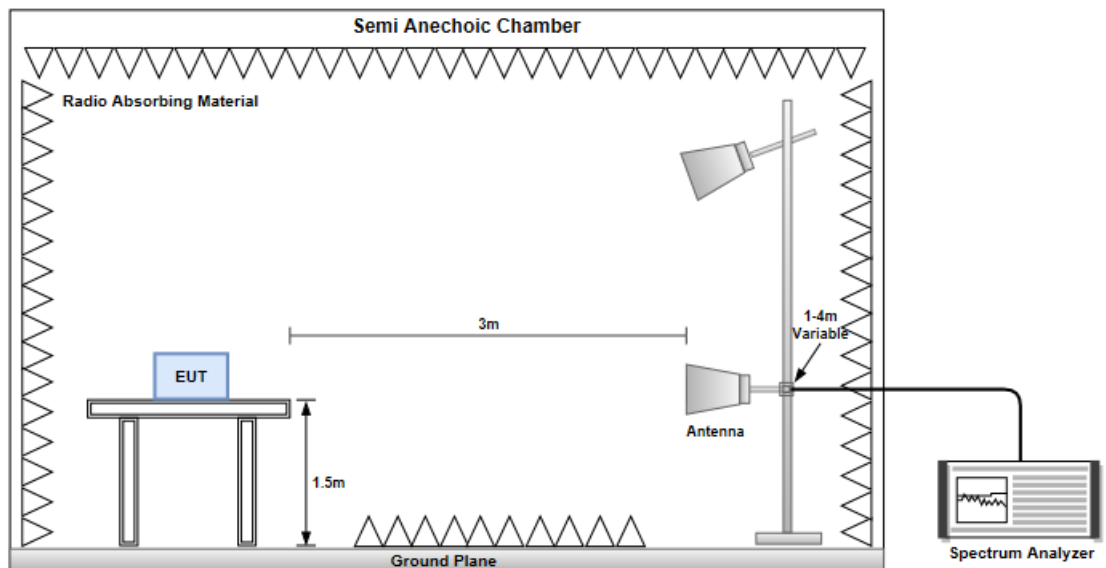
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

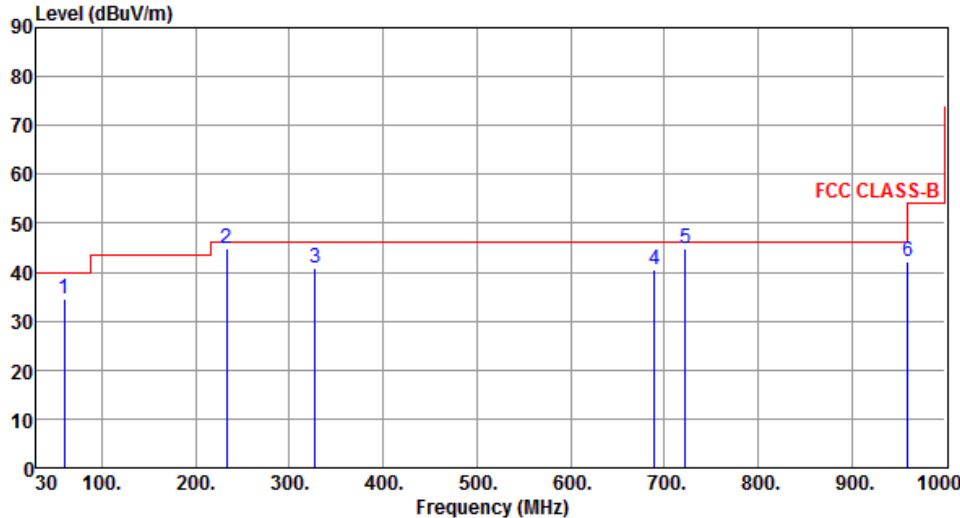


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

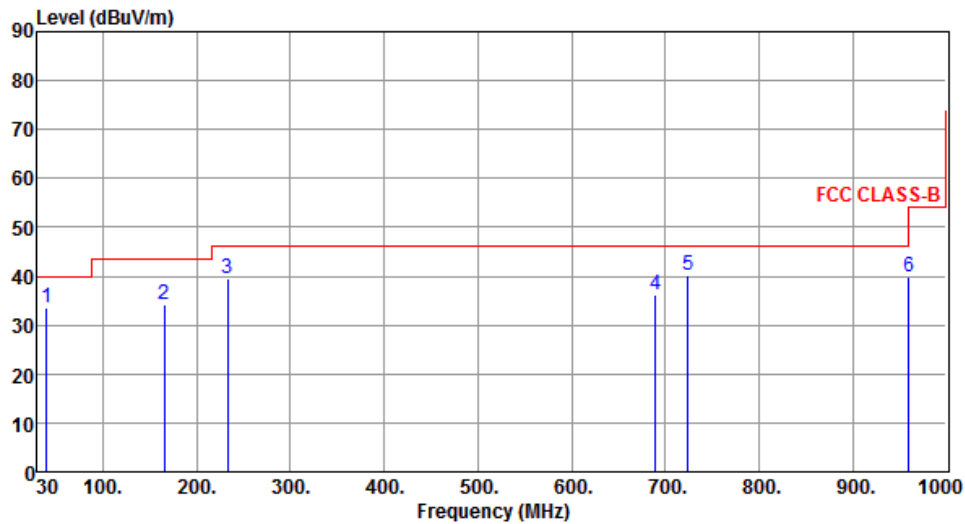
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	60.07	34.66	40.00	-5.34	43.32	-8.66	Peak	---	---
2	233.40	44.88	46.00	-1.12	54.65	-9.77	QP	126	151
3	327.79	40.74	46.00	-5.26	47.63	-6.89	Peak	---	---
4	689.60	40.55	46.00	-5.45	39.96	0.59	Peak	---	---
5	722.60	44.95	46.00	-1.05	43.62	1.33	QP	117	290
6	960.23	42.09	54.00	-11.91	36.87	5.22	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	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	39.70	33.56	40.00	-6.44	42.02	-8.46	Peak	---	---
2	165.80	34.28	43.50	-9.22	42.42	-8.14	Peak	---	---
3	232.73	39.40	46.00	-6.60	49.21	-9.81	Peak	---	---
4	689.60	36.27	46.00	-9.73	35.68	0.59	Peak	---	---
5	724.52	40.13	46.00	-5.87	38.75	1.38	Peak	---	---
6	960.23	39.72	54.00	-14.28	34.50	5.22	Peak	---	---

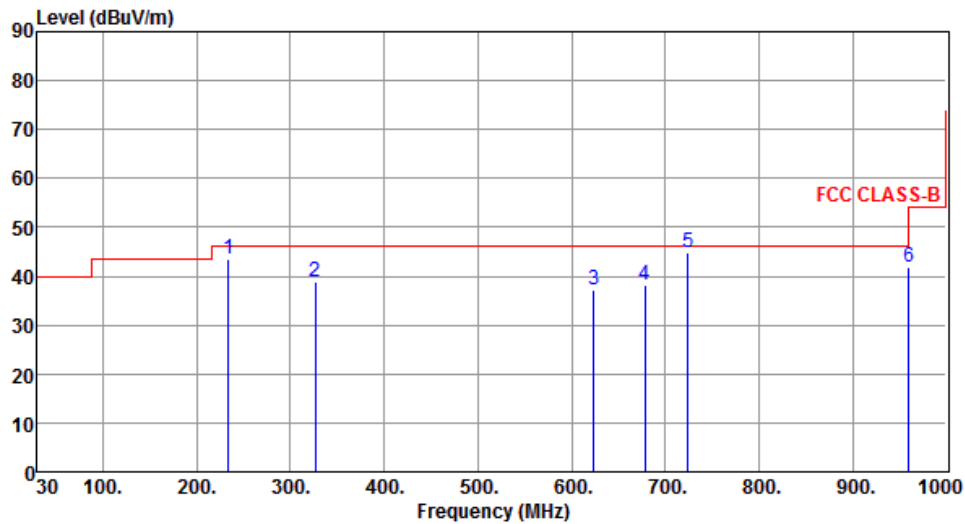
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*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	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	233.70	43.57	46.00	-2.43	53.32	-9.75	QP	122	150
2	326.82	38.70	46.00	-7.30	45.61	-6.91	Peak	---	---
3	623.64	37.03	46.00	-8.97	37.35	-0.32	Peak	---	---
4	677.96	38.23	46.00	-7.77	37.80	0.43	Peak	---	---
5	724.00	44.98	46.00	-1.02	43.61	1.37	QP	113	283
6	960.23	41.91	54.00	-12.09	36.69	5.22	Peak	---	---

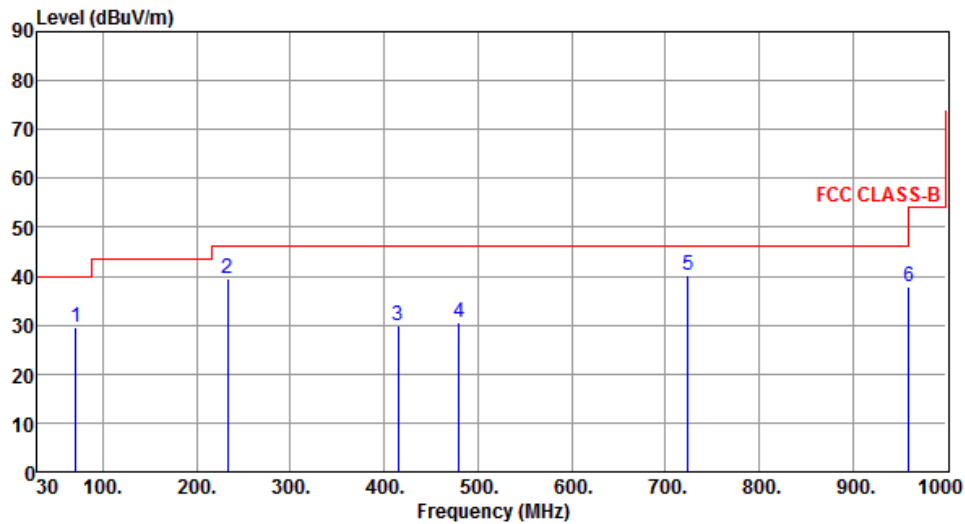
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	Test Configuration	2



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	70.74	29.53	40.00	-10.47	40.07	-10.54	Peak	---	---
2	232.73	39.64	46.00	-6.36	49.45	-9.81	Peak	---	---
3	415.09	30.01	46.00	-15.99	34.60	-4.59	Peak	---	---
4	480.08	30.70	46.00	-15.30	33.98	-3.28	Peak	---	---
5	724.52	40.11	46.00	-5.89	38.73	1.38	Peak	---	---
6	960.23	37.82	54.00	-16.18	32.60	5.22	Peak	---	---

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

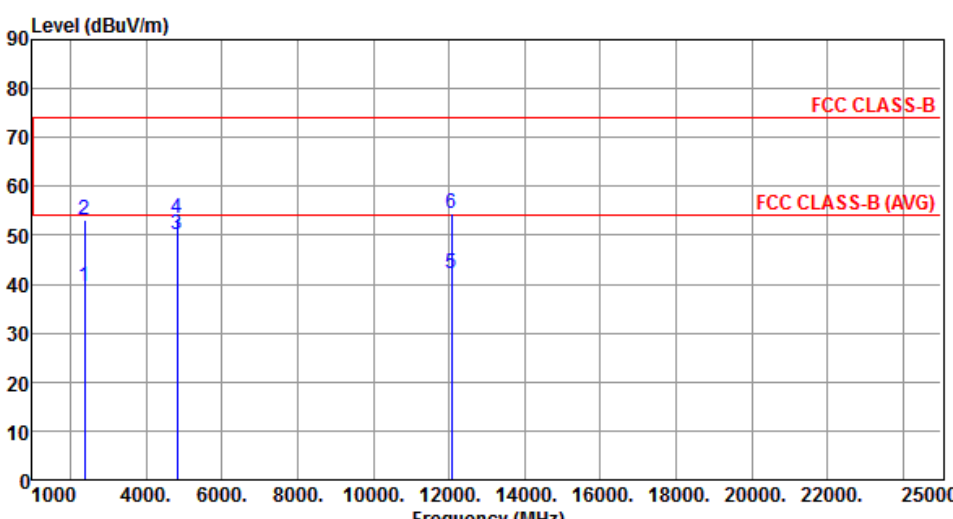
*Factor includes antenna factor , cable loss and amplifier gain

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

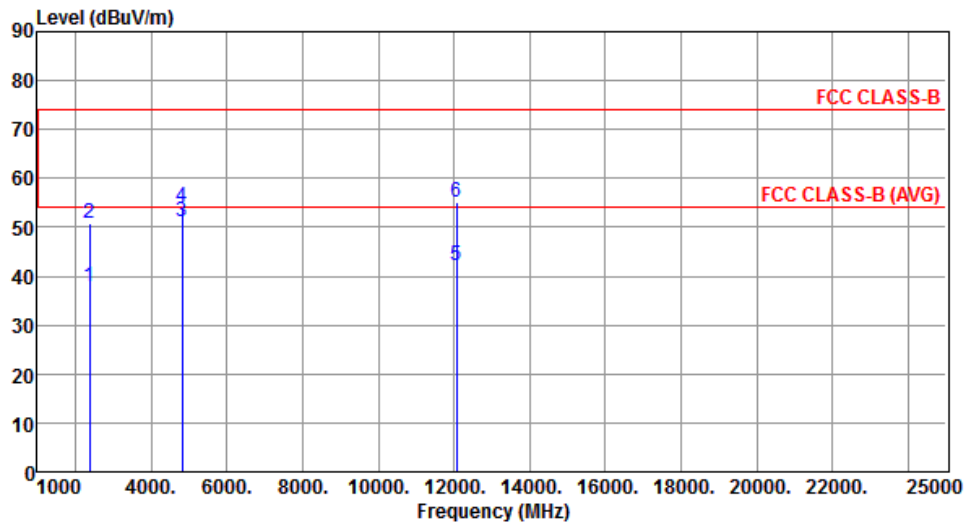
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.64	54.00	-14.36	41.05	-1.41	Average	111	320
2	2390.00	53.16	74.00	-20.84	54.57	-1.41	Peak	111	320
3	4824.00	50.08	54.00	-3.92	44.60	5.48	Average	242	249
4	4824.00	53.31	74.00	-20.69	47.83	5.48	Peak	242	249
5	12060.00	42.24	54.00	-11.76	26.46	15.78	Average	100	50
6	12060.00	54.45	74.00	-19.55	38.67	15.78	Peak	100	50

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	Test Configuration	1



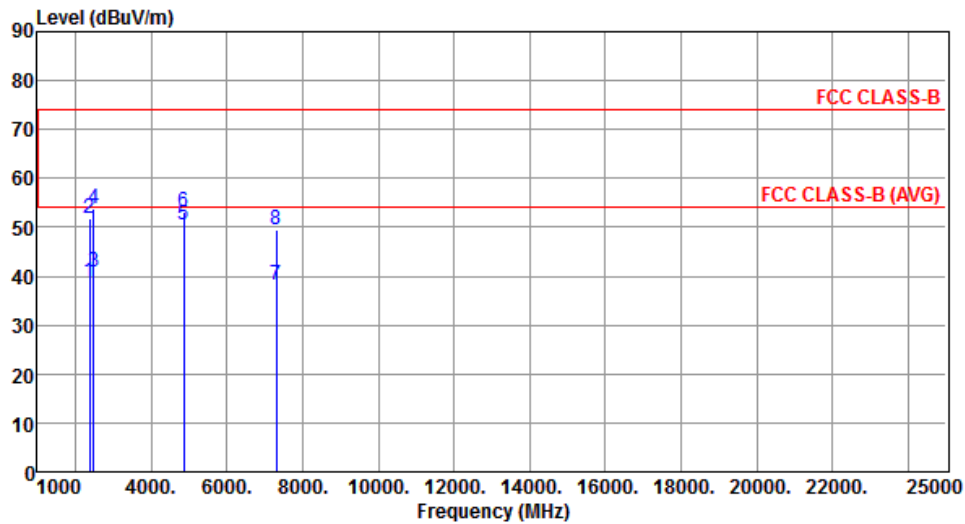
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.80	54.00	-16.20	39.21	-1.41	Average	110	135
2	2390.00	50.82	74.00	-23.18	52.23	-1.41	Peak	110	135
3	4824.00	51.12	54.00	-2.88	45.64	5.48	Average	183	266
4	4824.00	54.17	74.00	-19.83	48.69	5.48	Peak	183	266
5	12060.00	42.22	54.00	-11.78	26.44	15.78	Average	100	60
6	12060.00	55.12	74.00	-18.88	39.34	15.78	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



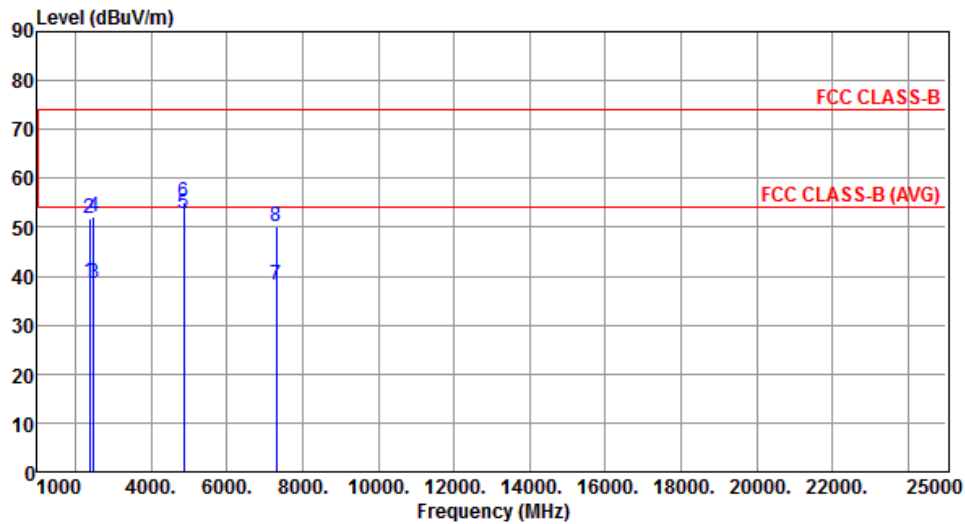
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.01	54.00	-14.99	40.42	-1.41	Average	104	319
2	2390.00	51.75	74.00	-22.25	53.16	-1.41	Peak	104	319
3	2483.50	40.98	54.00	-13.02	42.04	-1.06	Average	104	319
4	2483.50	53.79	74.00	-20.21	54.85	-1.06	Peak	104	319
5	4874.00	50.46	54.00	-3.54	44.87	5.59	Average	243	249
6	4874.00	53.04	74.00	-20.96	47.45	5.59	Peak	243	249
7	7311.00	38.05	54.00	-15.95	27.20	10.85	Average	100	240
8	7311.00	49.36	74.00	-24.64	38.51	10.85	Peak	100	240

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	Test Configuration	1



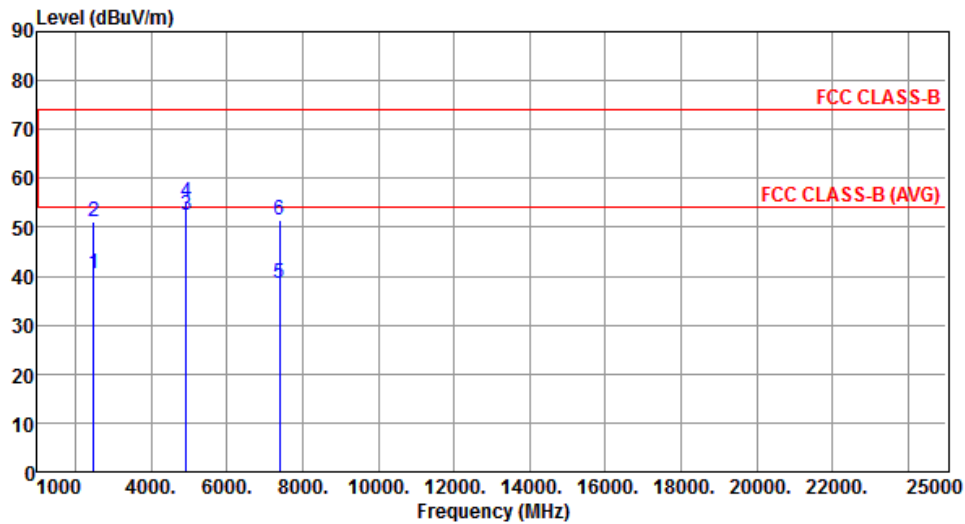
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.78	54.00	-15.22	40.19	-1.41	Average	102	143
2	2390.00	51.85	74.00	-22.15	53.26	-1.41	Peak	102	143
3	2483.50	38.61	54.00	-15.39	39.67	-1.06	Average	102	143
4	2483.50	52.05	74.00	-21.95	53.11	-1.06	Peak	102	143
5	4874.00	52.71	54.00	-1.29	47.12	5.59	Average	181	268
6	4874.00	55.00	74.00	-19.00	49.41	5.59	Peak	181	268
7	7311.00	38.17	54.00	-15.83	27.32	10.85	Average	100	250
8	7311.00	50.25	74.00	-23.75	39.40	10.85	Peak	100	250

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	Test Configuration	1



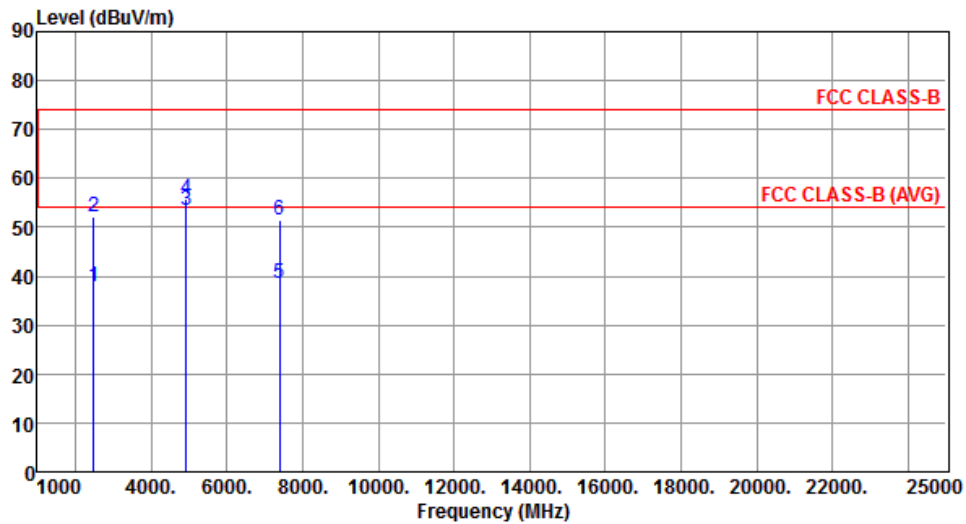
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	40.44	54.00	-13.56	41.50	-1.06	Average	101	317
2	2483.50	51.04	74.00	-22.96	52.10	-1.06	Peak	101	317
3	4924.00	52.59	54.00	-1.41	46.89	5.70	Average	240	250
4	4924.00	54.99	74.00	-19.01	49.29	5.70	Peak	240	250
5	7386.00	38.38	54.00	-15.62	27.21	11.17	Average	100	25
6	7386.00	51.63	74.00	-22.37	40.46	11.17	Peak	100	25

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	Test Configuration	1



	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	37.78	54.00	-16.22	38.84	-1.06	Average	113	141
2	2483.50	52.16	74.00	-21.84	53.22	-1.06	Peak	113	141
3	4924.00	53.59	54.00	-0.41	47.89	5.70	Average	254	100
4	4924.00	55.90	74.00	-18.10	50.20	5.70	Peak	254	100
5	7386.00	38.42	54.00	-15.58	27.25	11.17	Average	100	50
6	7386.00	51.49	74.00	-22.51	40.32	11.17	Peak	100	50

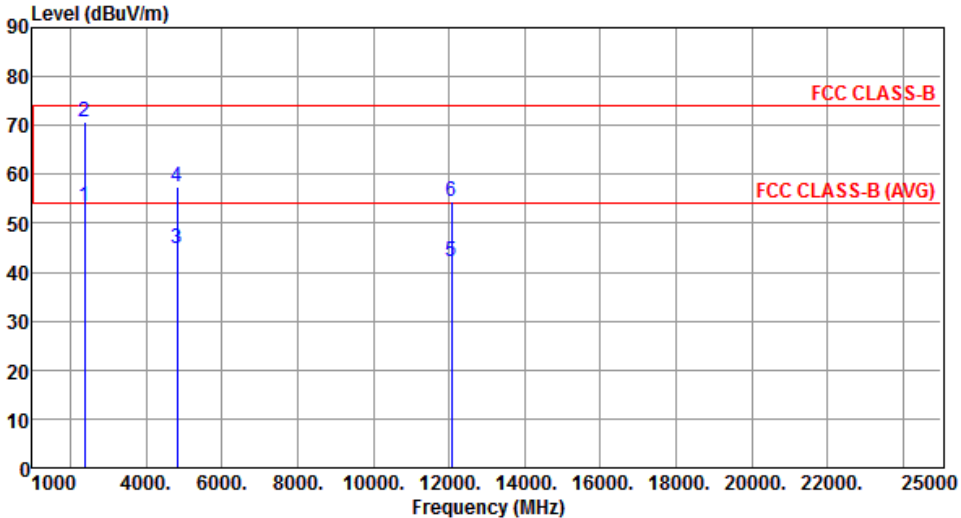
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*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

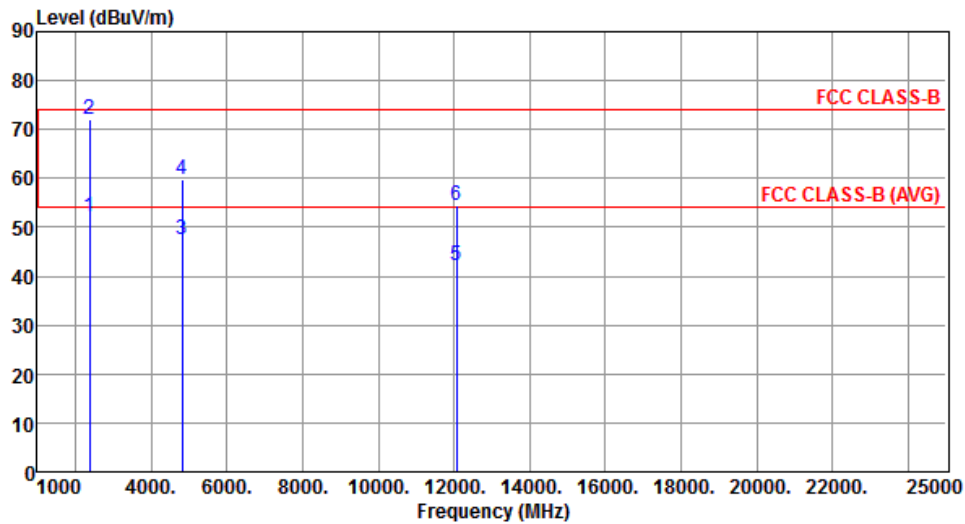
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	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	53.55	54.00	-0.45	54.96	-1.41	Average	107	321
2	2390.00	70.85	74.00	-3.15	72.26	-1.41	Peak	107	321
3	4824.00	44.88	54.00	-9.12	39.40	5.48	Average	100	228
4	4824.00	57.54	74.00	-16.46	52.06	5.48	Peak	100	228
5	12060.00	42.23	54.00	-11.77	26.45	15.78	Average	100	65
6	12060.00	54.44	74.00	-19.56	38.66	15.78	Peak	100	65

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

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical	Test Configuration	1



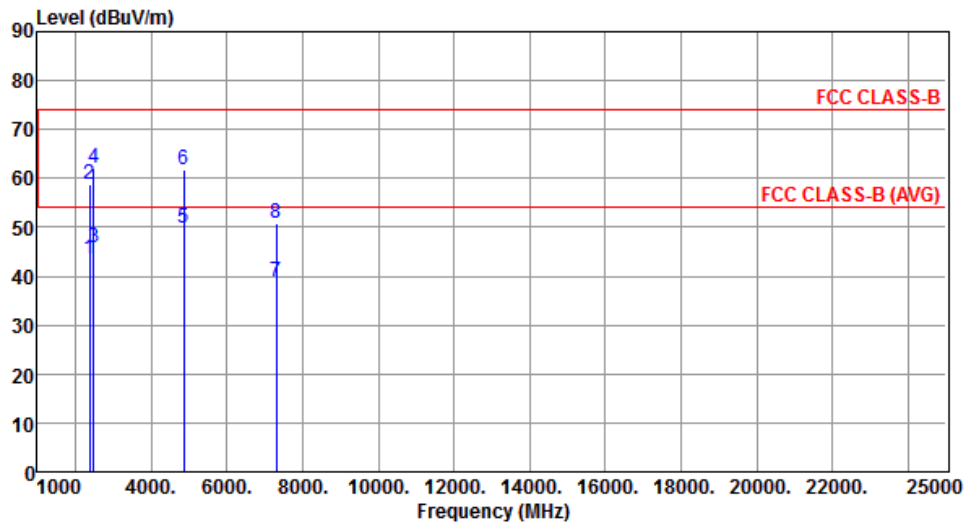
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.21	54.00	-1.79	53.62	-1.41	Average	105	140
2	2390.00	71.90	74.00	-2.10	73.31	-1.41	Peak	105	140
3	4824.00	47.43	54.00	-6.57	41.95	5.48	Average	100	118
4	4824.00	59.74	74.00	-14.26	54.26	5.48	Peak	100	118
5	12060.00	42.33	54.00	-11.67	26.55	15.78	Average	100	70
6	12060.00	54.33	74.00	-19.67	38.55	15.78	Peak	100	70

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	Test Configuration	1



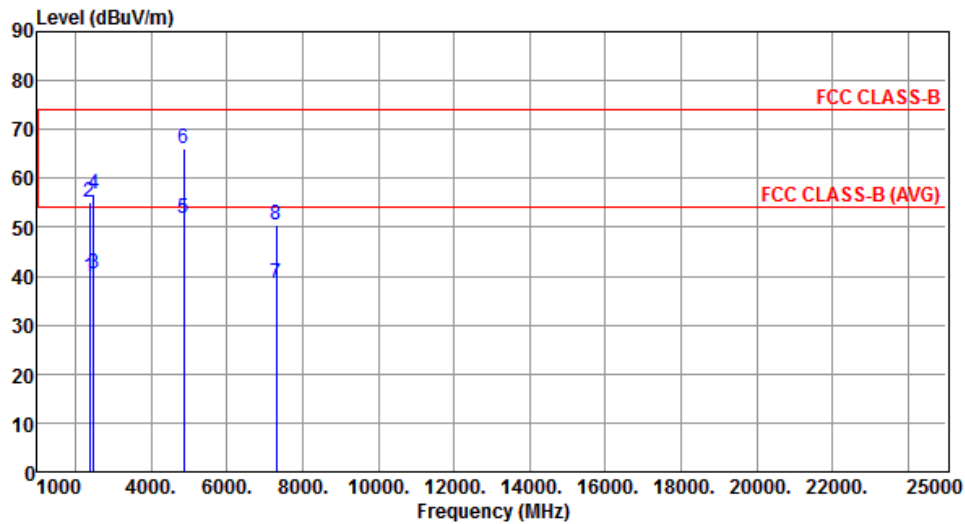
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.61	54.00	-10.39	45.02	-1.41	Average	107	319
2	2390.00	58.88	74.00	-15.12	60.29	-1.41	Peak	107	319
3	2483.50	45.74	54.00	-8.26	46.80	-1.06	Average	107	319
4	2483.50	62.13	74.00	-11.87	63.19	-1.06	Peak	107	319
5	4874.00	49.78	54.00	-4.22	44.19	5.59	Average	100	121
6	4874.00	61.73	74.00	-12.27	56.14	5.59	Peak	100	121
7	7311.00	38.72	54.00	-15.28	27.87	10.85	Average	100	125
8	7311.00	50.80	74.00	-23.20	39.95	10.85	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	11g	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



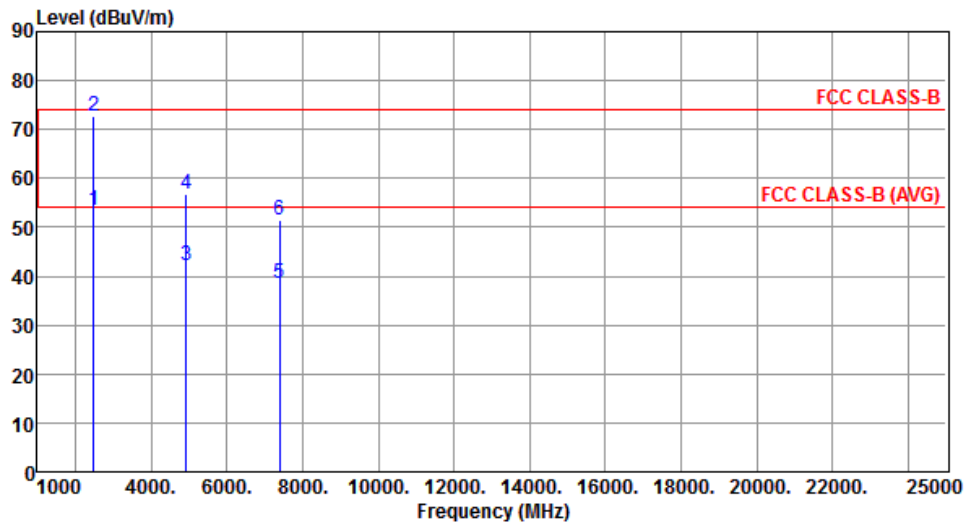
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.92	54.00	-14.08	41.33	-1.41	Average	102	146
2	2390.00	55.19	74.00	-18.81	56.60	-1.41	Peak	102	146
3	2483.50	40.43	54.00	-13.57	41.49	-1.06	Average	102	146
4	2483.50	56.88	74.00	-17.12	57.94	-1.06	Peak	102	146
5	4874.00	51.66	54.00	-2.34	46.07	5.59	Average	128	96
6	4874.00	66.07	74.00	-7.93	60.48	5.59	Peak	128	96
7	7311.00	38.45	54.00	-15.55	27.60	10.85	Average	100	90
8	7311.00	50.49	74.00	-23.51	39.64	10.85	Peak	100	90

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	Test Configuration	1



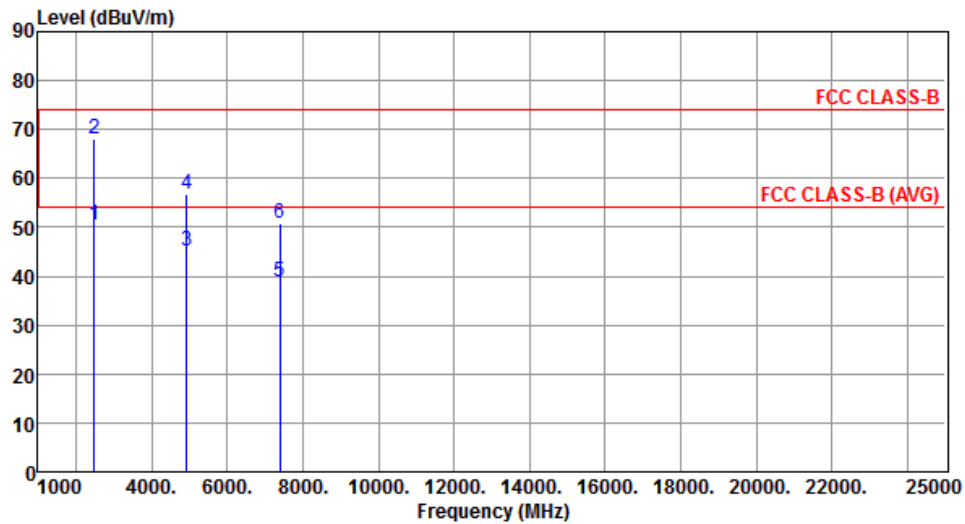
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.58	54.00	-0.42	54.64	-1.06	Average	101	318
2	2483.50	72.59	74.00	-1.41	73.65	-1.06	Peak	101	318
3	4924.00	42.25	54.00	-11.75	36.55	5.70	Average	100	225
4	4924.00	56.93	74.00	-17.07	51.23	5.70	Peak	100	225
5	7386.00	38.69	54.00	-15.31	27.52	11.17	Average	100	80
6	7386.00	51.38	74.00	-22.62	40.21	11.17	Peak	100	80

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	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.38	54.00	-3.62	51.44	-1.06	Average	111	159
2	2483.50	67.97	74.00	-6.03	69.03	-1.06	Peak	111	159
3	4924.00	45.21	54.00	-8.79	39.51	5.70	Average	100	116
4	4924.00	56.94	74.00	-17.06	51.24	5.70	Peak	100	116
5	7386.00	38.71	54.00	-15.29	27.54	11.17	Average	100	90
6	7386.00	50.82	74.00	-23.18	39.65	11.17	Peak	100	90

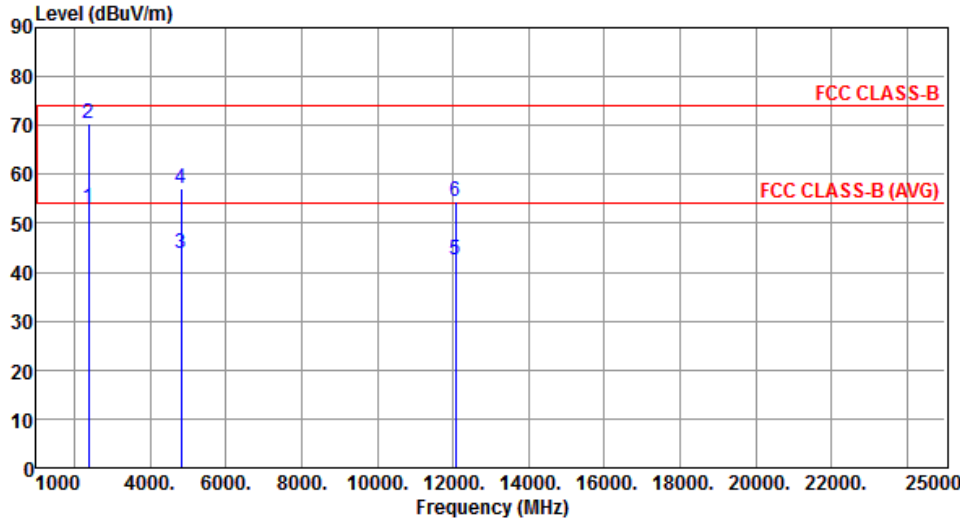
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

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

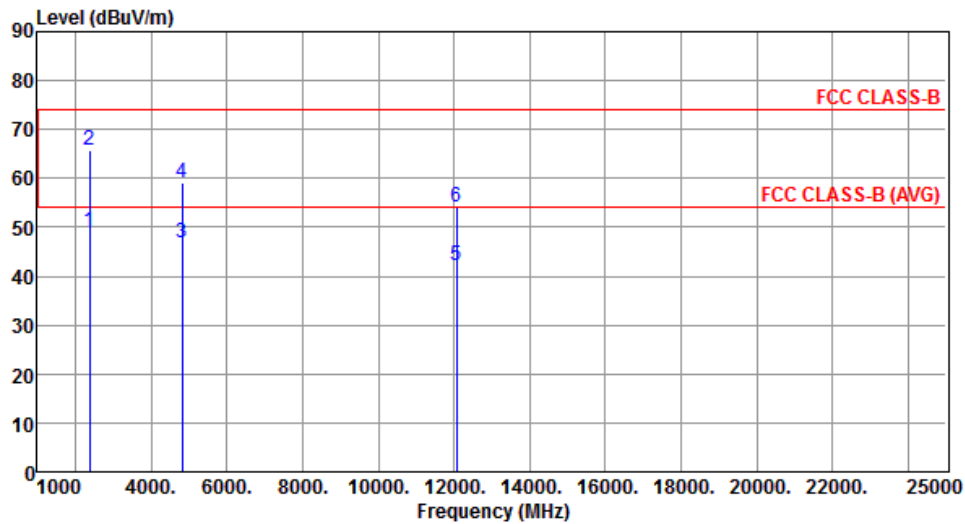
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal	Test Configuration	1



	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	53.28	54.00	-0.72	54.69	-1.41	Average	109	321
2	2390.00	70.30	74.00	-3.70	71.71	-1.41	Peak	109	321
3	4824.00	43.98	54.00	-10.02	38.50	5.48	Average	100	221
4	4824.00	57.02	74.00	-16.98	51.54	5.48	Peak	100	221
5	12060.00	42.37	54.00	-11.63	26.59	15.78	Average	100	80
6	12060.00	54.56	74.00	-19.44	38.78	15.78	Peak	100	80

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

Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical	Test Configuration	1



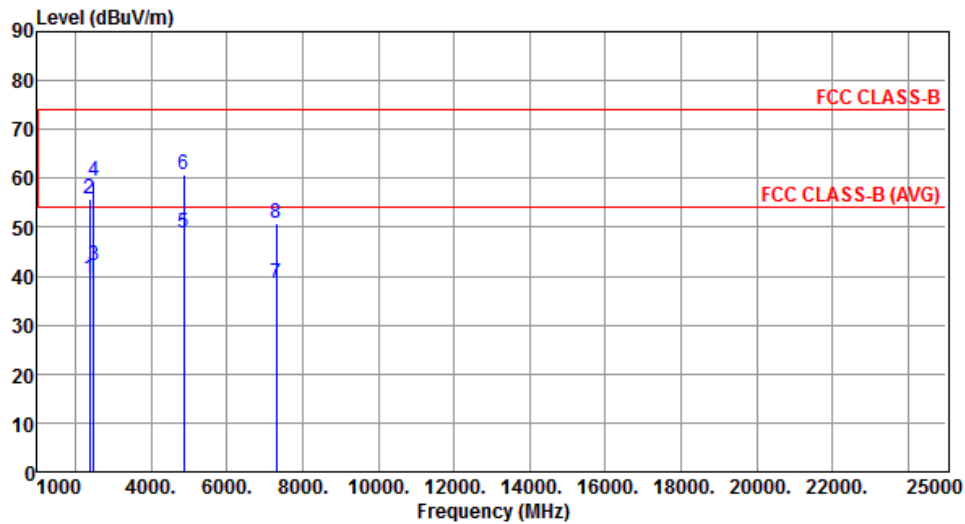
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.14	54.00	-4.86	50.55	-1.41	Average	106	145
2	2390.00	65.67	74.00	-8.33	67.08	-1.41	Peak	106	145
3	4824.00	46.80	54.00	-7.20	41.32	5.48	Average	100	120
4	4824.00	59.23	74.00	-14.77	53.75	5.48	Peak	100	120
5	12060.00	42.22	54.00	-11.78	26.44	15.78	Average	100	160
6	12060.00	54.16	74.00	-19.84	38.38	15.78	Peak	100	160

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



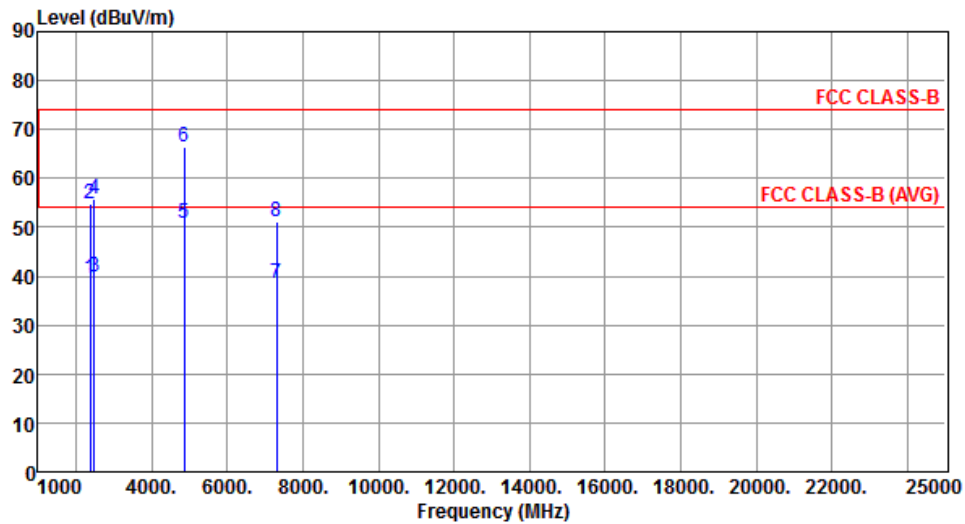
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.41	54.00	-14.59	40.82	-1.41	Average	105	318
2	2390.00	55.87	74.00	-18.13	57.28	-1.41	Peak	105	318
3	2483.50	42.24	54.00	-11.76	43.30	-1.06	Average	105	318
4	2483.50	59.57	74.00	-14.43	60.63	-1.06	Peak	105	318
5	4874.00	48.72	54.00	-5.28	43.13	5.59	Average	100	119
6	4874.00	60.88	74.00	-13.12	55.29	5.59	Peak	100	119
7	7311.00	38.40	54.00	-15.60	27.55	10.85	Average	100	150
8	7311.00	50.96	74.00	-23.04	40.11	10.85	Peak	100	150

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



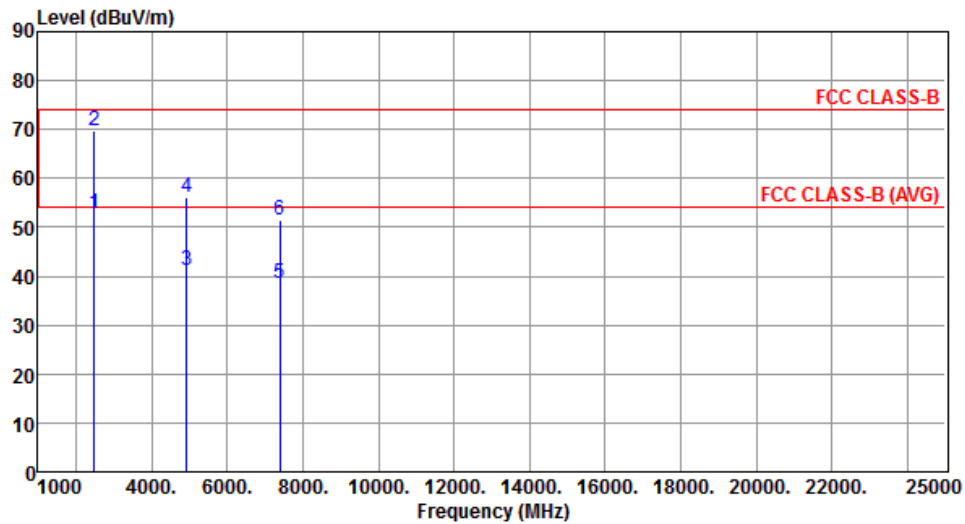
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.47	54.00	-14.53	40.88	-1.41	Average	103	148
2	2390.00	54.71	74.00	-19.29	56.12	-1.41	Peak	103	148
3	2483.50	39.92	54.00	-14.08	40.98	-1.06	Average	103	148
4	2483.50	55.83	74.00	-18.17	56.89	-1.06	Peak	103	148
5	4874.00	50.96	54.00	-3.04	45.37	5.59	Average	121	92
6	4874.00	66.38	74.00	-7.62	60.79	5.59	Peak	121	92
7	7311.00	38.40	54.00	-15.60	27.55	10.85	Average	100	160
8	7311.00	51.19	74.00	-22.81	40.34	10.85	Peak	100	160

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal	Test Configuration	1



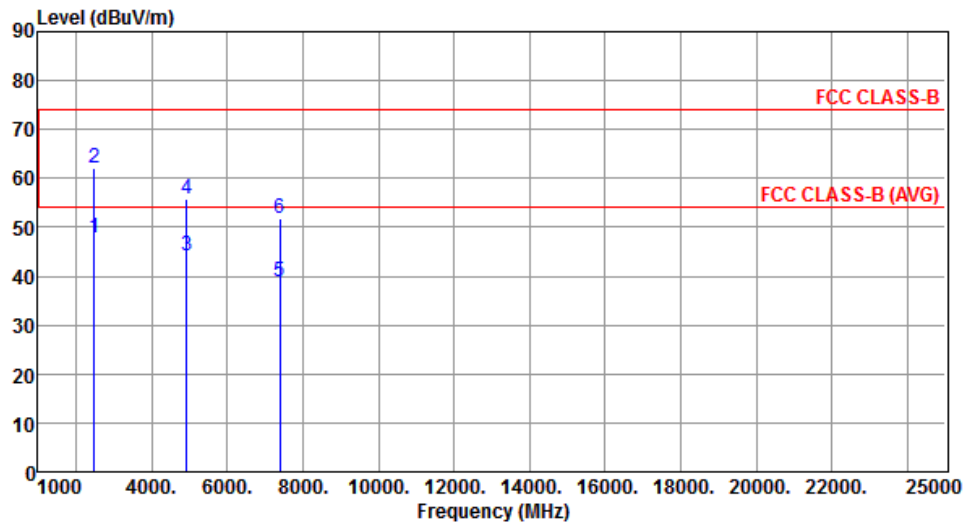
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.79	54.00	-1.21	53.85	-1.06	Average	100	323
2	2483.50	69.76	74.00	-4.24	70.82	-1.06	Peak	100	323
3	4924.00	41.11	54.00	-12.89	35.41	5.70	Average	100	223
4	4924.00	56.16	74.00	-17.84	50.46	5.70	Peak	100	223
5	7386.00	38.66	54.00	-15.34	27.49	11.17	Average	100	75
6	7386.00	51.52	74.00	-22.48	40.35	11.17	Peak	100	75

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	47.66	54.00	-6.34	48.72	-1.06	Average	100	145
2	2483.50	62.10	74.00	-11.90	63.16	-1.06	Peak	100	145
3	4924.00	44.13	54.00	-9.87	38.43	5.70	Average	100	119
4	4924.00	55.91	74.00	-18.09	50.21	5.70	Peak	100	119
5	7386.00	38.85	54.00	-15.15	27.68	11.17	Average	100	60
6	7386.00	51.71	74.00	-22.29	40.54	11.17	Peak	100	60

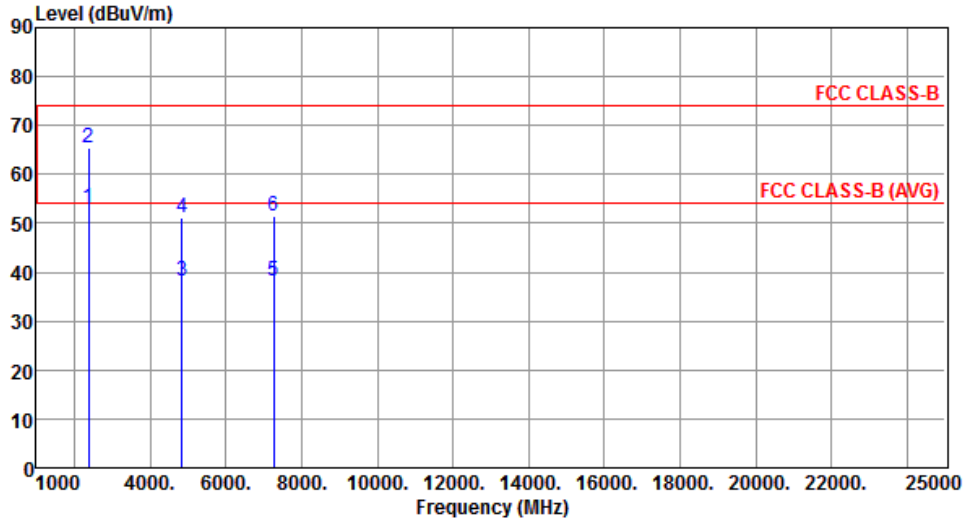
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

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

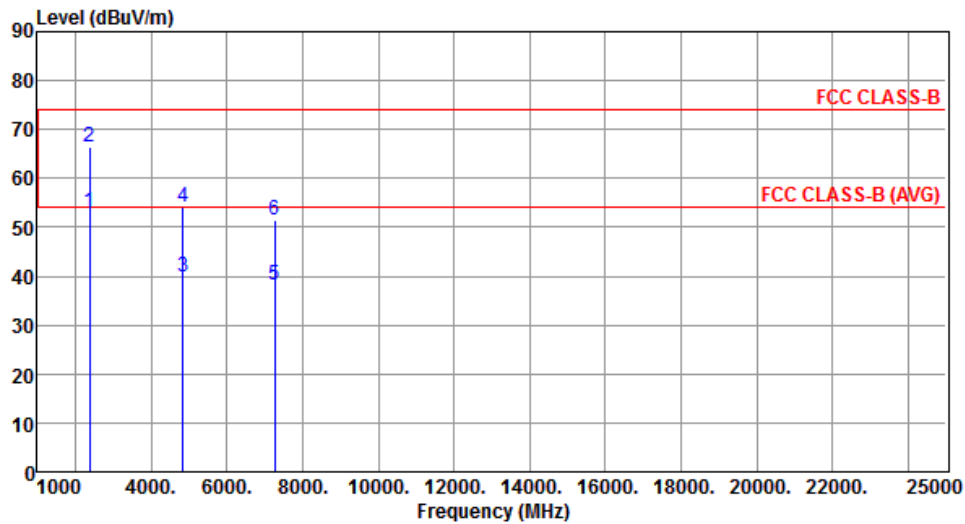
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal	Test Configuration	1



	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	53.30	54.00	-0.70	54.71	-1.41	Average	106	319
2	2390.00	65.56	74.00	-8.44	66.97	-1.41	Peak	106	319
3	4844.00	38.17	54.00	-15.83	32.65	5.52	Average	100	240
4	4844.00	51.18	74.00	-22.82	45.66	5.52	Peak	100	240
5	7266.00	38.10	54.00	-15.90	27.45	10.65	Average	100	250
6	7266.00	51.33	74.00	-22.67	40.68	10.65	Peak	100	250

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

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical	Test Configuration	1



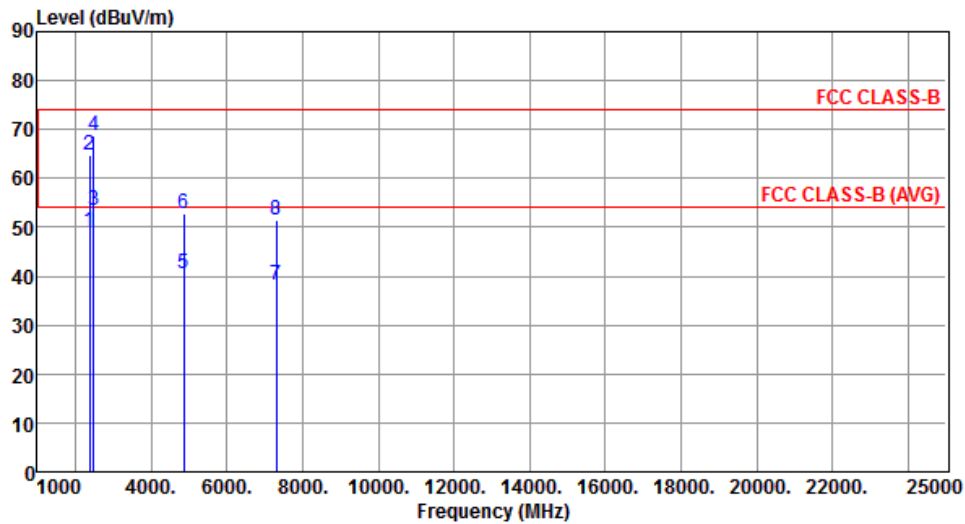
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.19	54.00	-0.81	54.60	-1.41	Average	105	142
2	2390.00	66.34	74.00	-7.66	67.75	-1.41	Peak	105	142
3	4844.00	39.73	54.00	-14.27	34.21	5.52	Average	113	89
4	4844.00	54.18	74.00	-19.82	48.66	5.52	Peak	113	89
5	7266.00	38.16	54.00	-15.84	27.51	10.65	Average	100	160
6	7266.00	51.43	74.00	-22.57	40.78	10.65	Peak	100	160

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal	Test Configuration	1



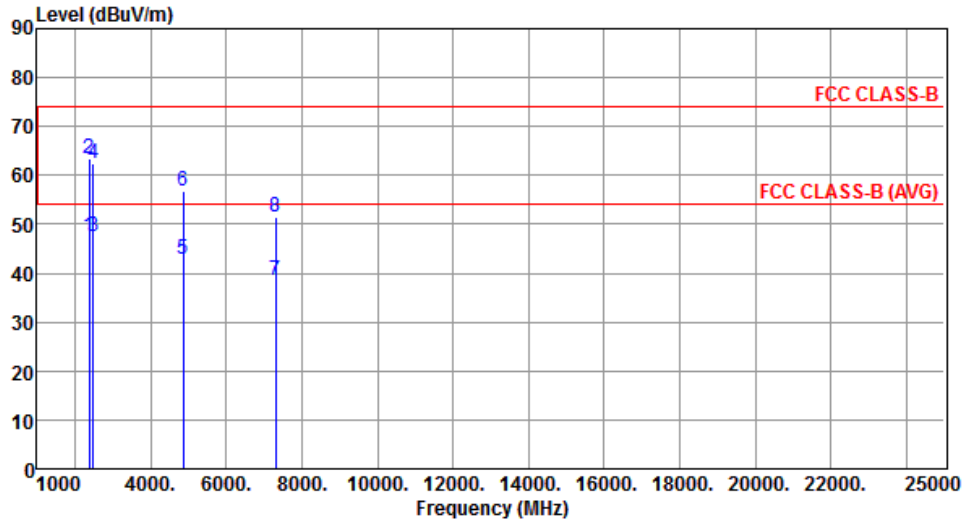
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.04	54.00	-4.96	50.45	-1.41	Average	100	317
2	2390.00	64.69	74.00	-9.31	66.10	-1.41	Peak	100	317
3	2483.50	53.39	54.00	-0.61	54.45	-1.06	Average	100	317
4	2483.50	68.73	74.00	-5.27	69.79	-1.06	Peak	100	317
5	4874.00	40.46	54.00	-13.54	34.87	5.59	Average	100	239
6	4874.00	52.84	74.00	-21.16	47.25	5.59	Peak	100	239
7	7311.00	38.25	54.00	-15.75	27.40	10.85	Average	100	60
8	7311.00	51.53	74.00	-22.47	40.68	10.85	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor, cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical	Test Configuration	1



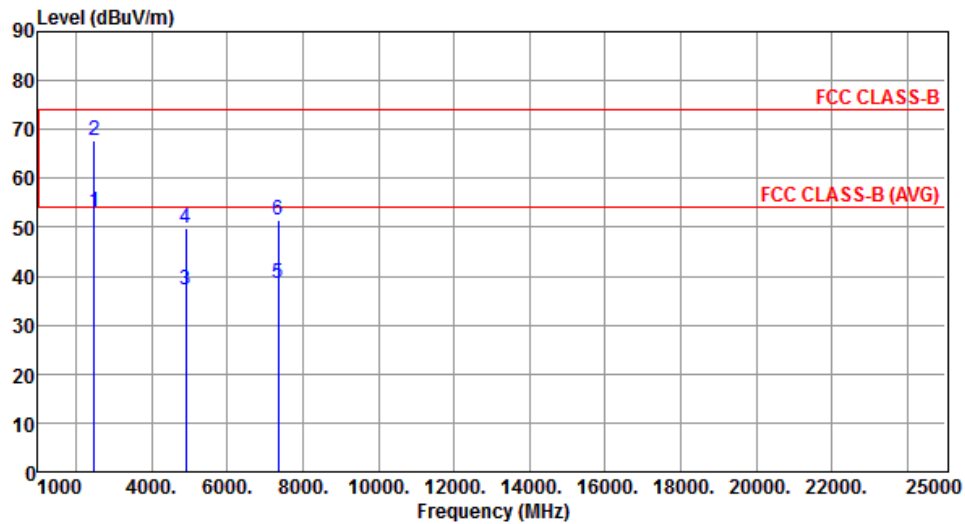
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.49	54.00	-6.51	48.90	-1.41	Average	102	146
2	2390.00	63.47	74.00	-10.53	64.88	-1.41	Peak	102	146
3	2483.50	47.58	54.00	-6.42	48.64	-1.06	Average	102	146
4	2483.50	62.43	74.00	-11.57	63.49	-1.06	Peak	102	146
5	4874.00	42.68	54.00	-11.32	37.09	5.59	Average	115	91
6	4874.00	56.84	74.00	-17.16	51.25	5.59	Peak	115	91
7	7311.00	38.40	54.00	-15.60	27.55	10.85	Average	100	20
8	7311.00	51.38	74.00	-22.62	40.53	10.85	Peak	100	20

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal	Test Configuration	1



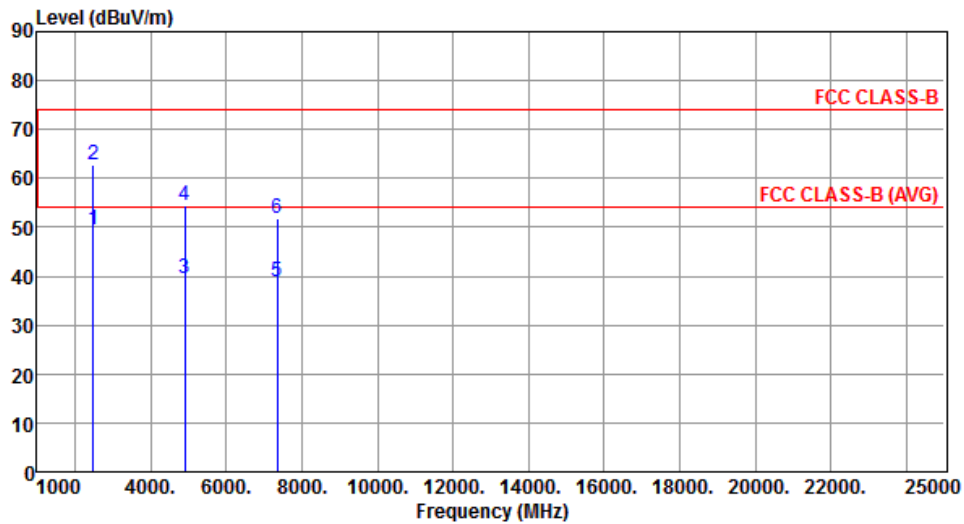
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.15	54.00	-0.85	54.21	-1.06	Average	102	319
2	2483.50	67.64	74.00	-6.36	68.70	-1.06	Peak	102	319
3	4904.00	37.31	54.00	-16.69	31.66	5.65	Average	101	243
4	4904.00	49.76	74.00	-24.24	44.11	5.65	Peak	101	243
5	7356.00	38.59	54.00	-15.41	27.55	11.04	Average	100	95
6	7356.00	51.55	74.00	-22.45	40.51	11.04	Peak	100	95

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	49.46	54.00	-4.54	50.52	-1.06	Average	100	147
2	2483.50	62.65	74.00	-11.35	63.71	-1.06	Peak	100	147
3	4904.00	39.67	54.00	-14.33	34.02	5.65	Average	113	88
4	4904.00	54.42	74.00	-19.58	48.77	5.65	Peak	113	88
5	7356.00	38.70	54.00	-15.30	27.66	11.04	Average	100	80
6	7356.00	51.81	74.00	-22.19	40.77	11.04	Peak	100	80

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

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

3.6.2 Test Procedures

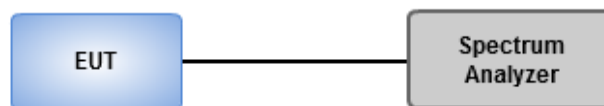
Reference level measurement

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

Emission level measurement

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

3.6.3 Test Setup

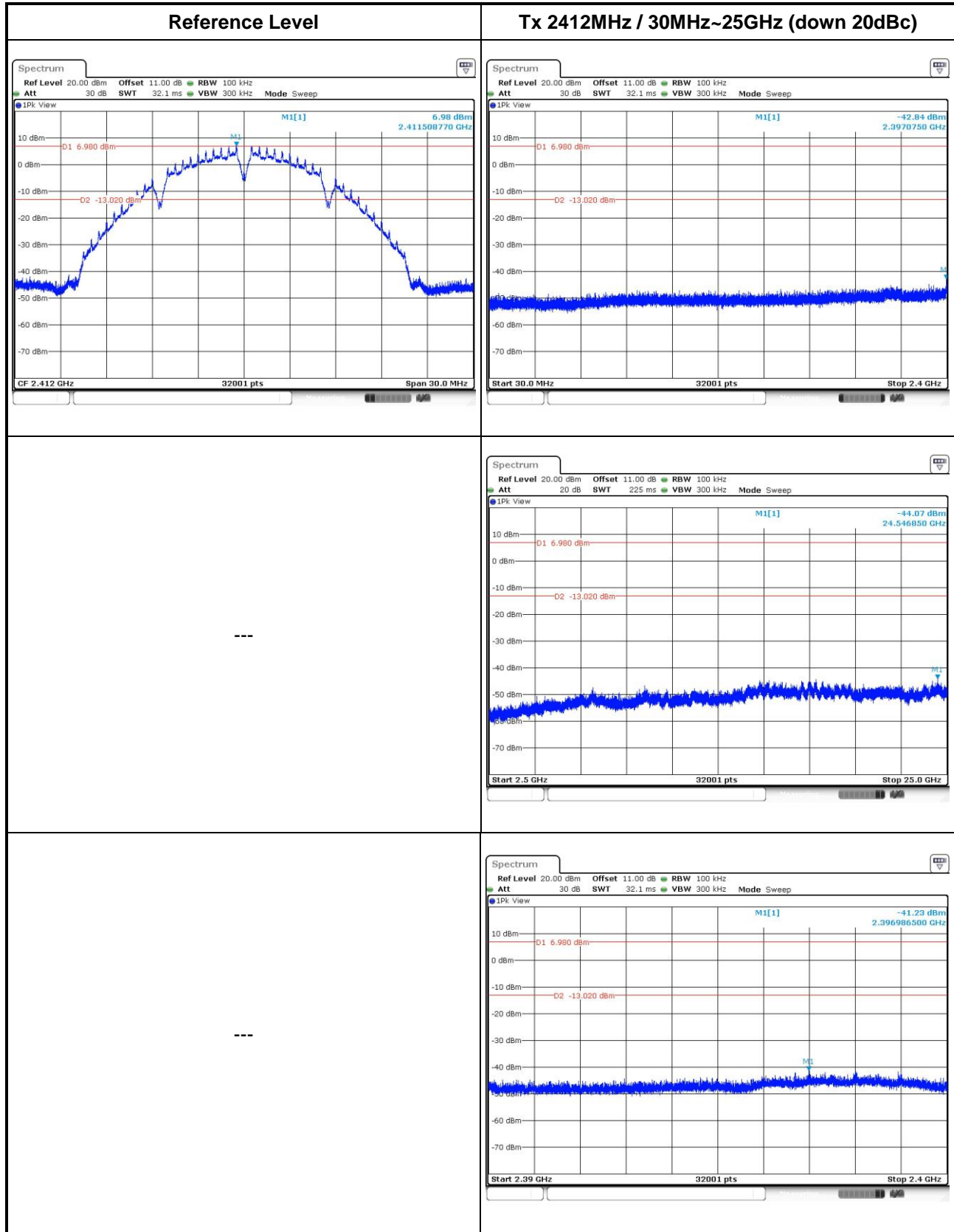


3.6.4 Test Result of Emissions in non-restricted frequency bands

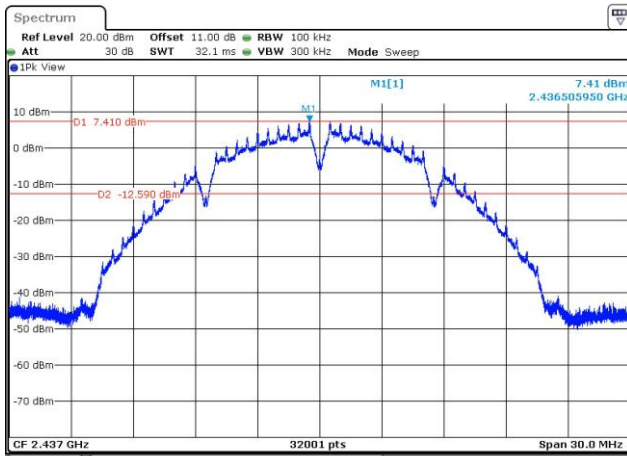
This test item is performed on each TX output individually without summing or adding $10 \log(N_{ANT})$ since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.5 Unwanted Emissions into Non-Restricted Frequency Bands

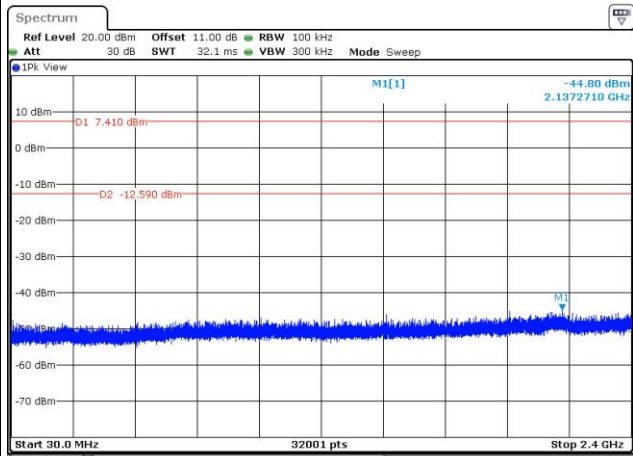
802.11b

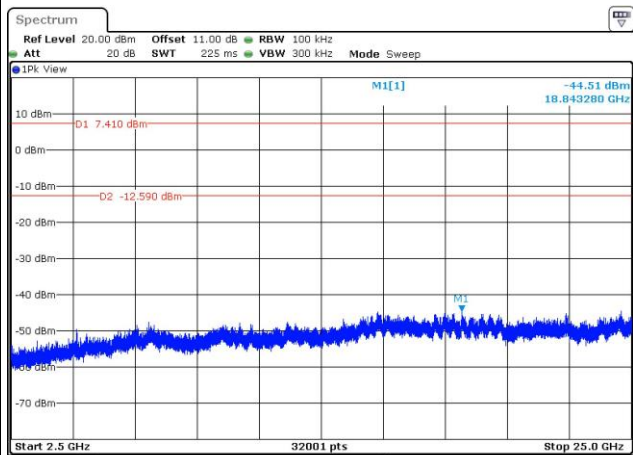


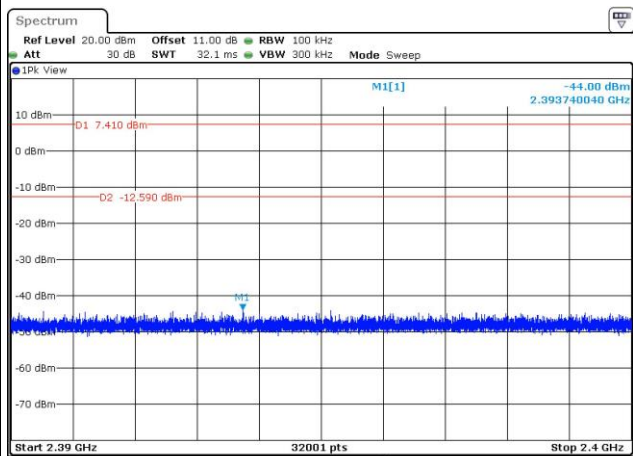
Reference Level

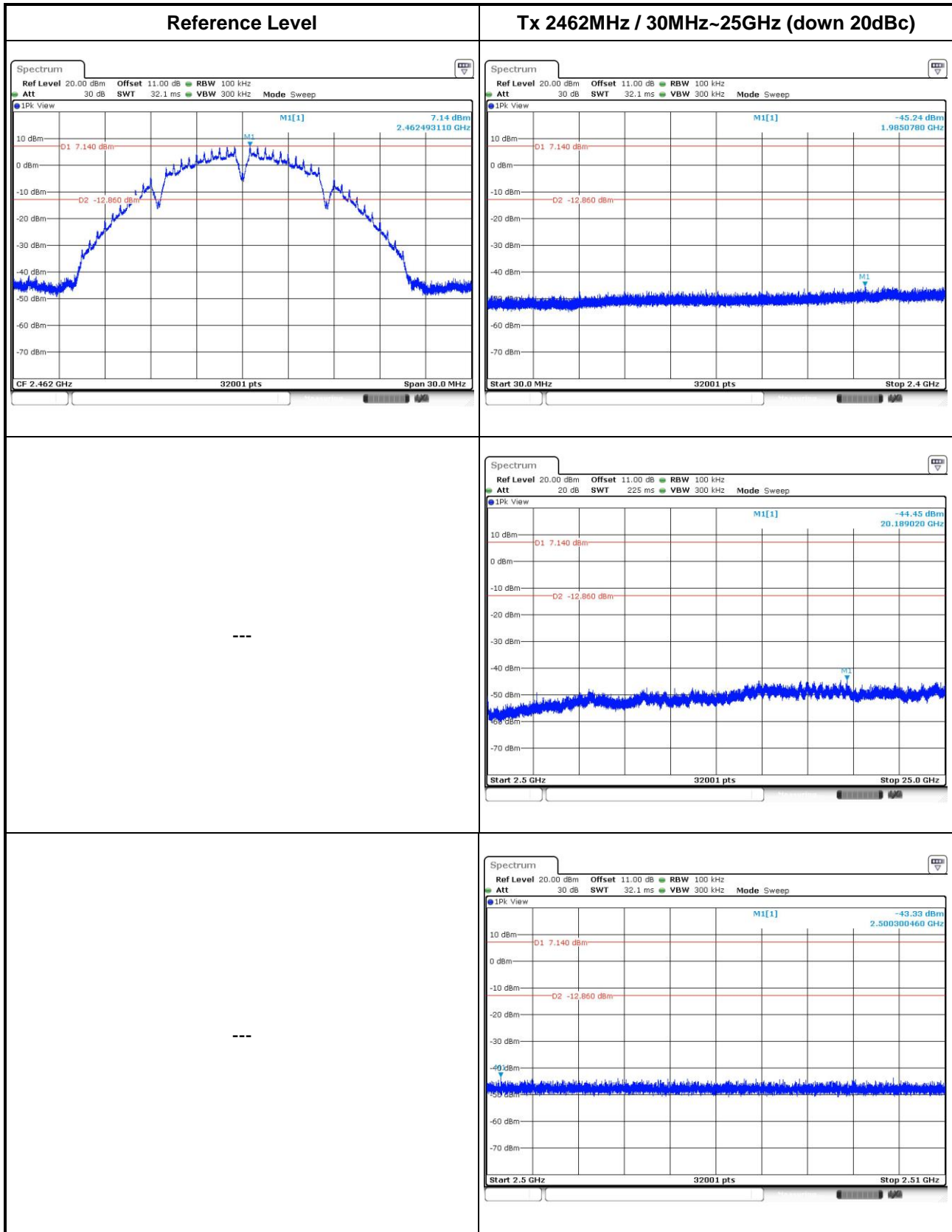


Tx 2437MHz / 30MHz~25GHz (down 20dBc)

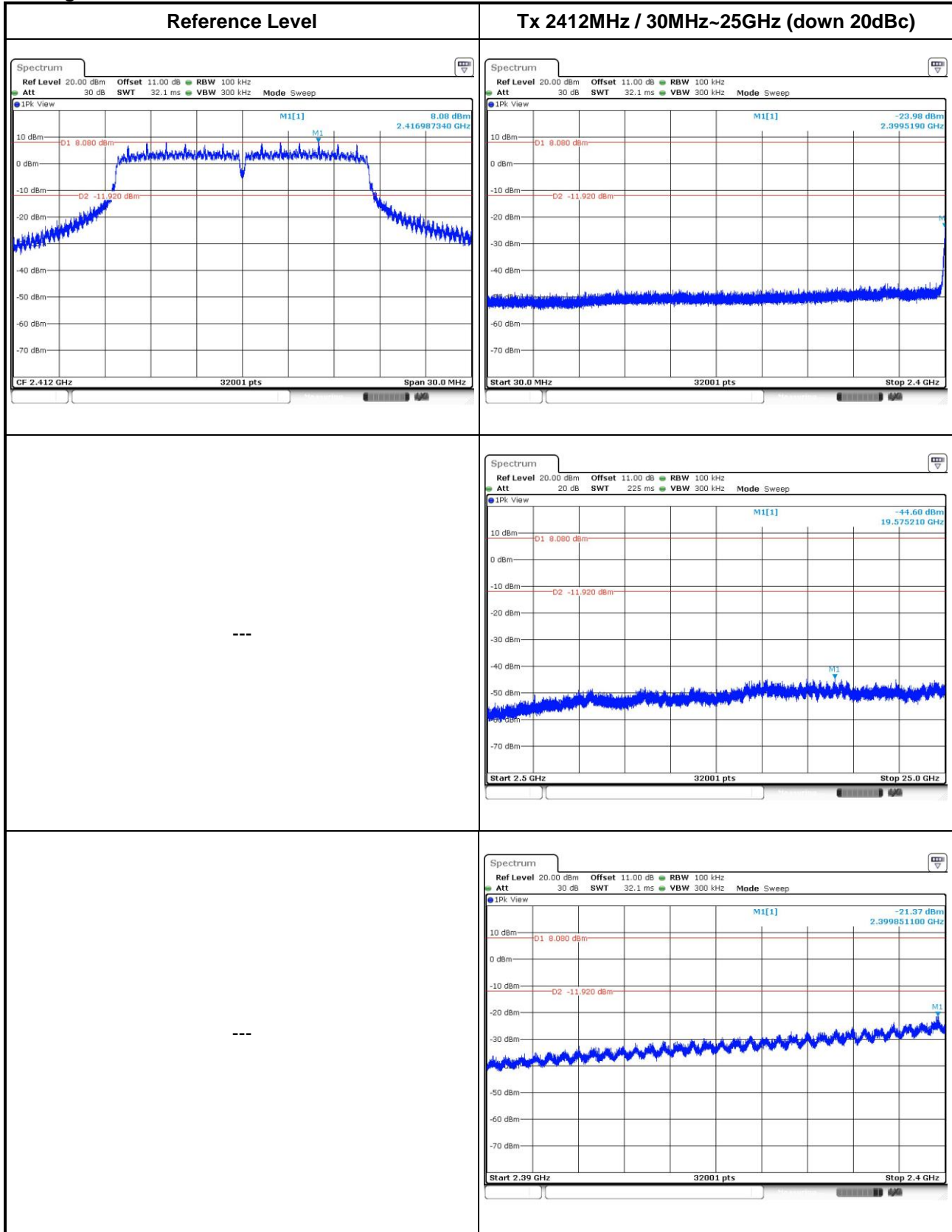


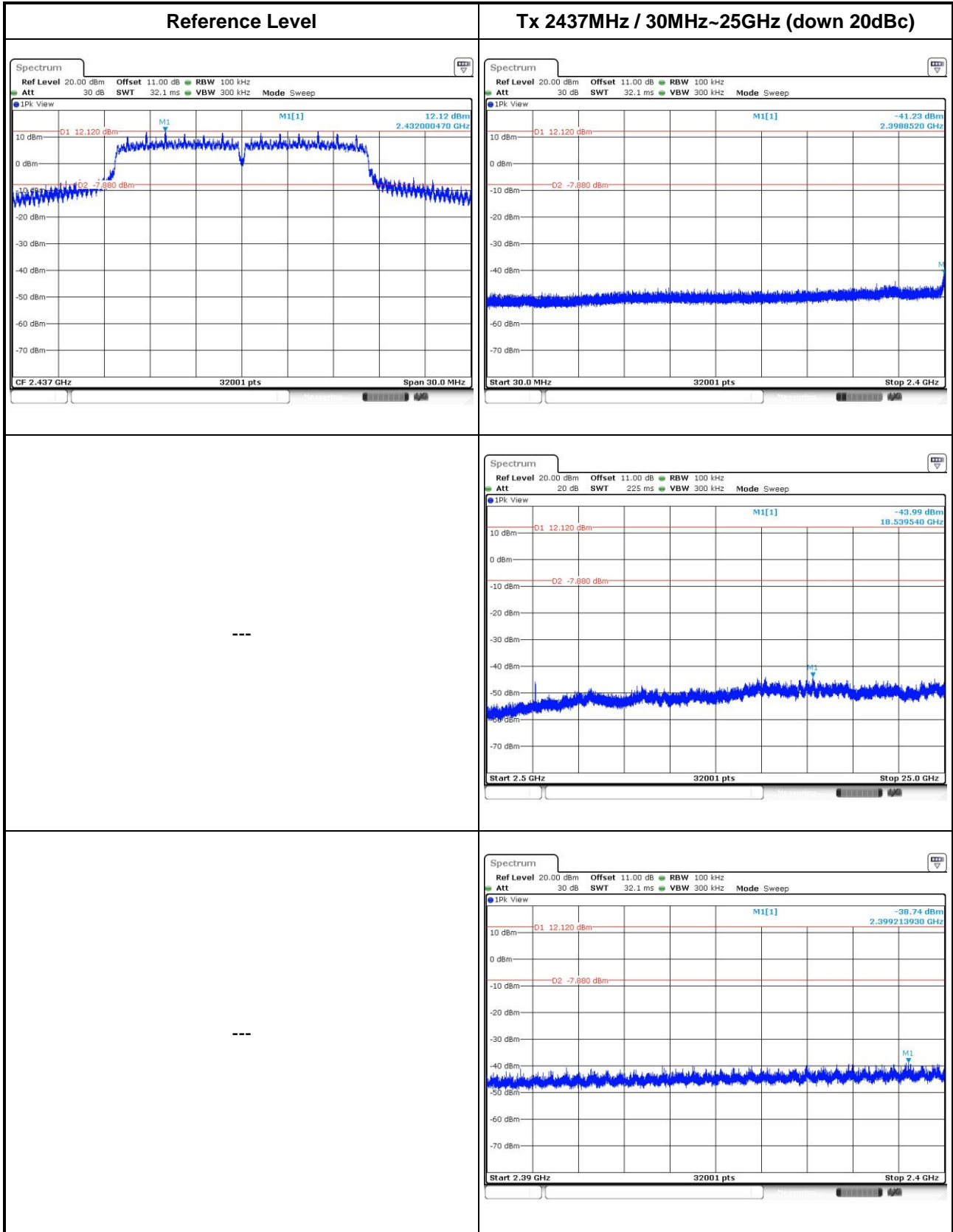


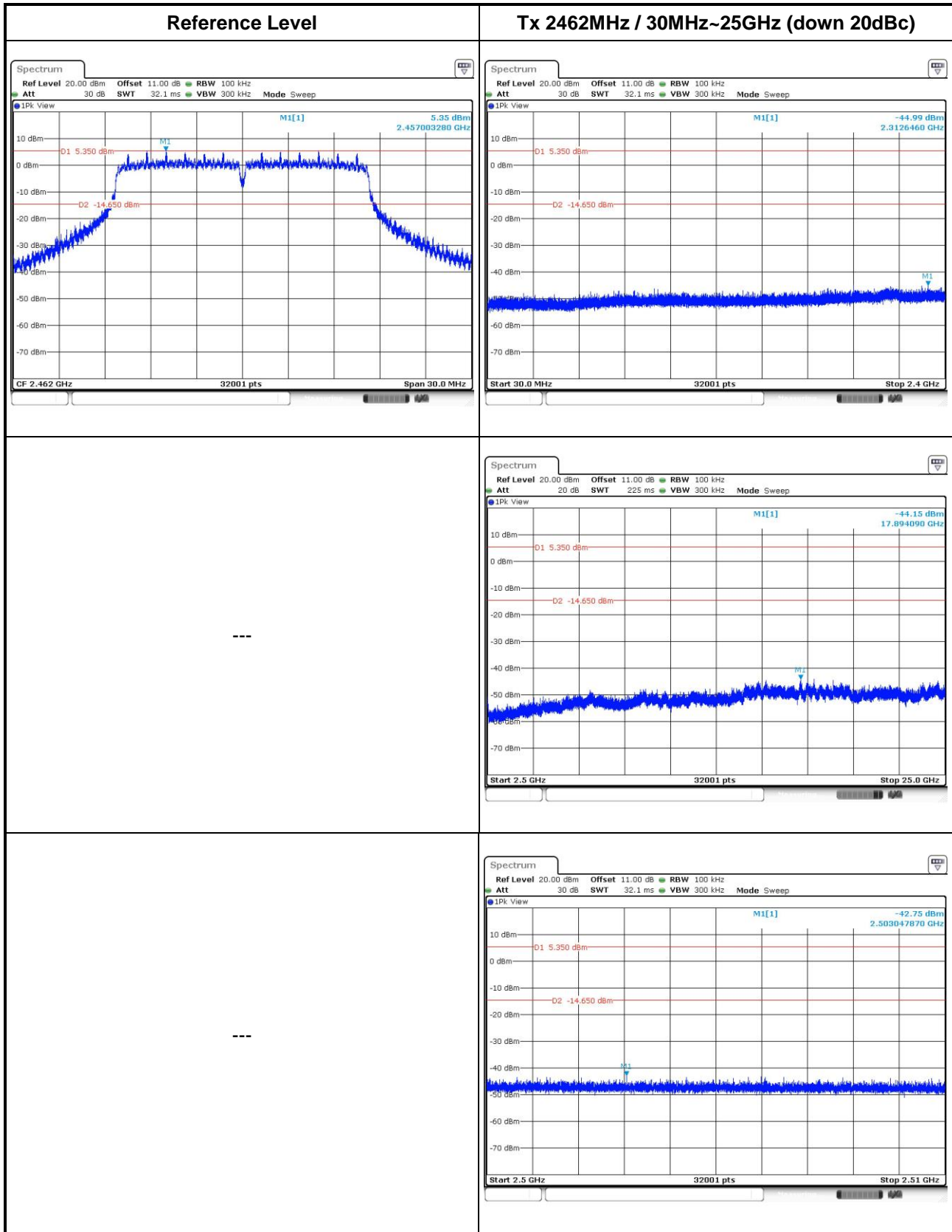




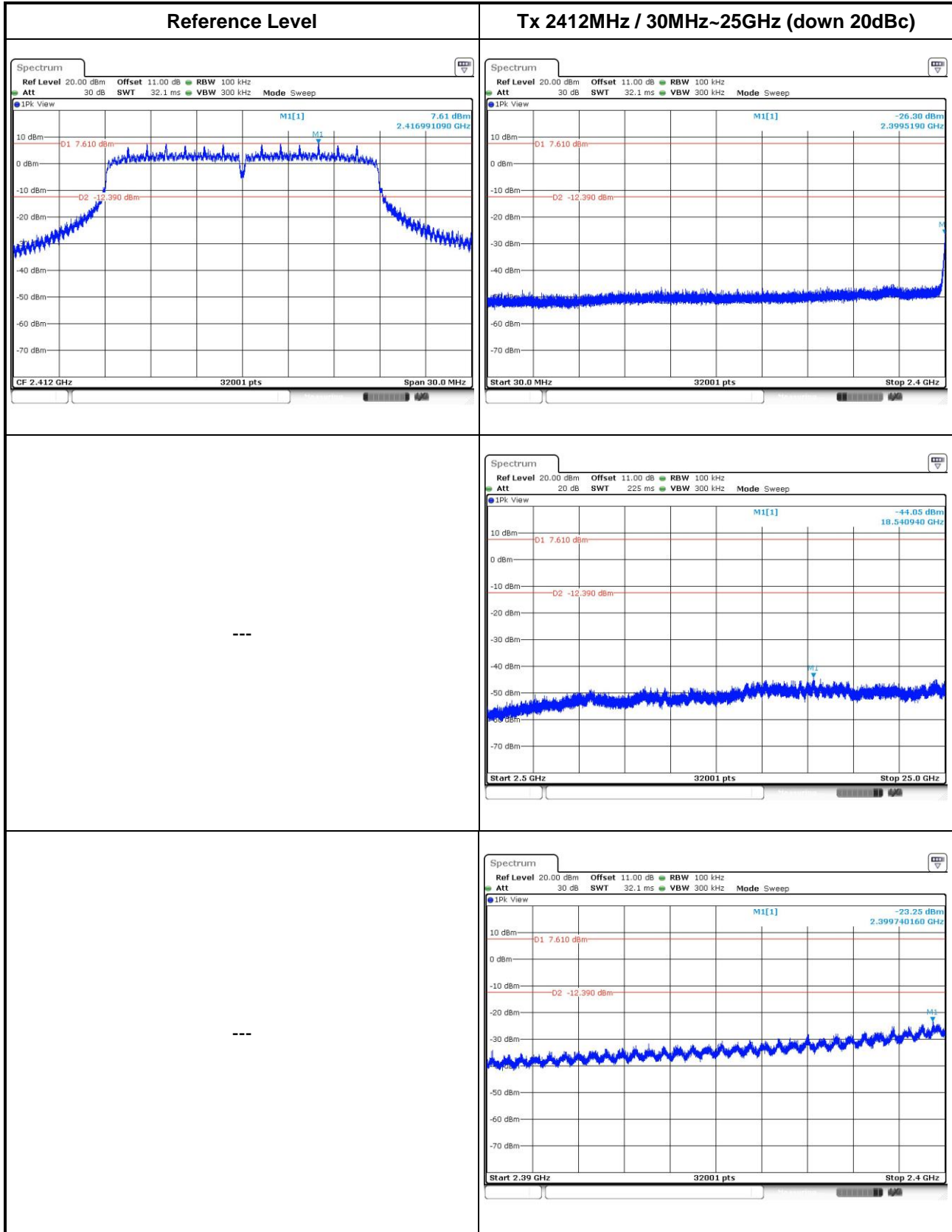
802.11g

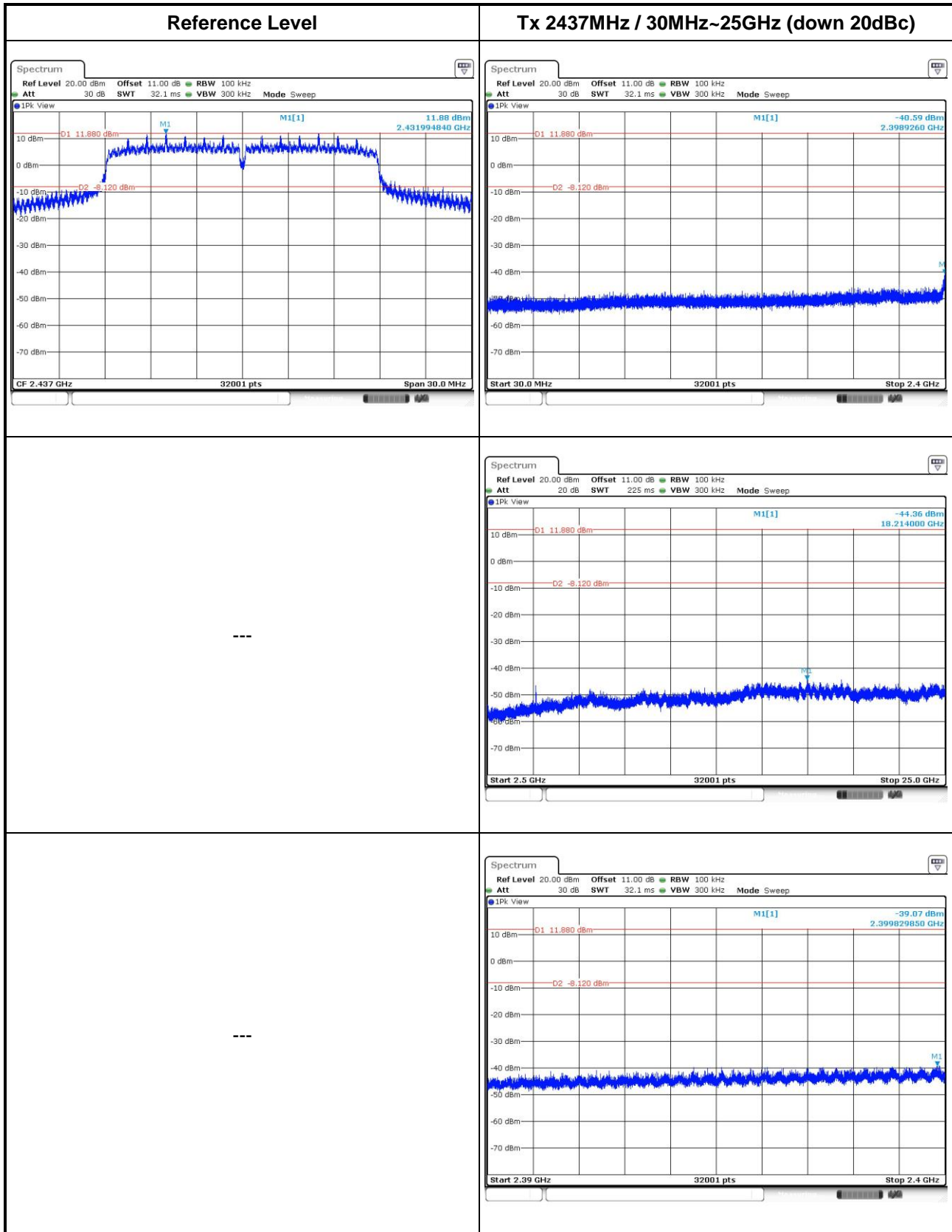




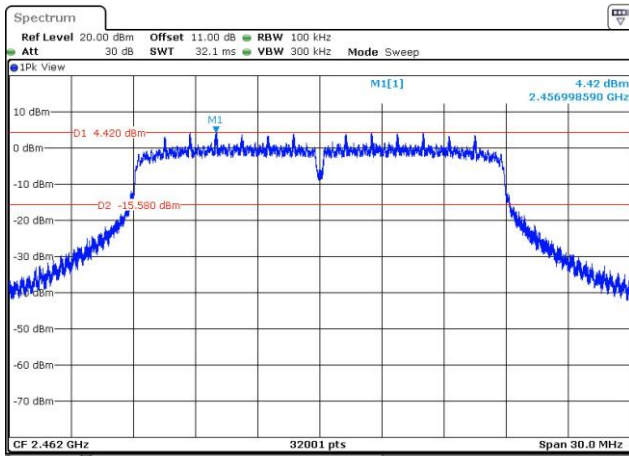


802.11n HT20

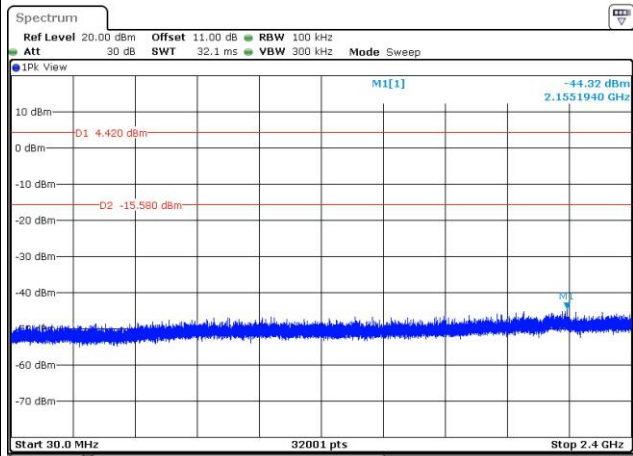


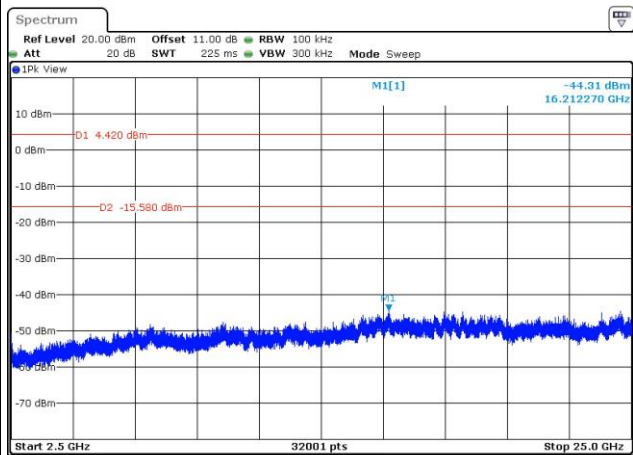


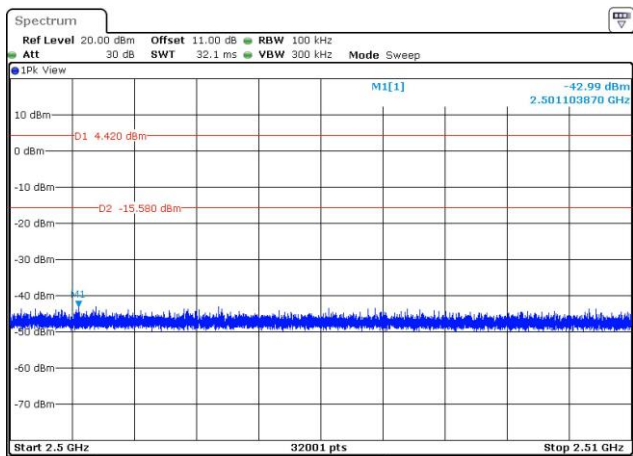
Reference Level



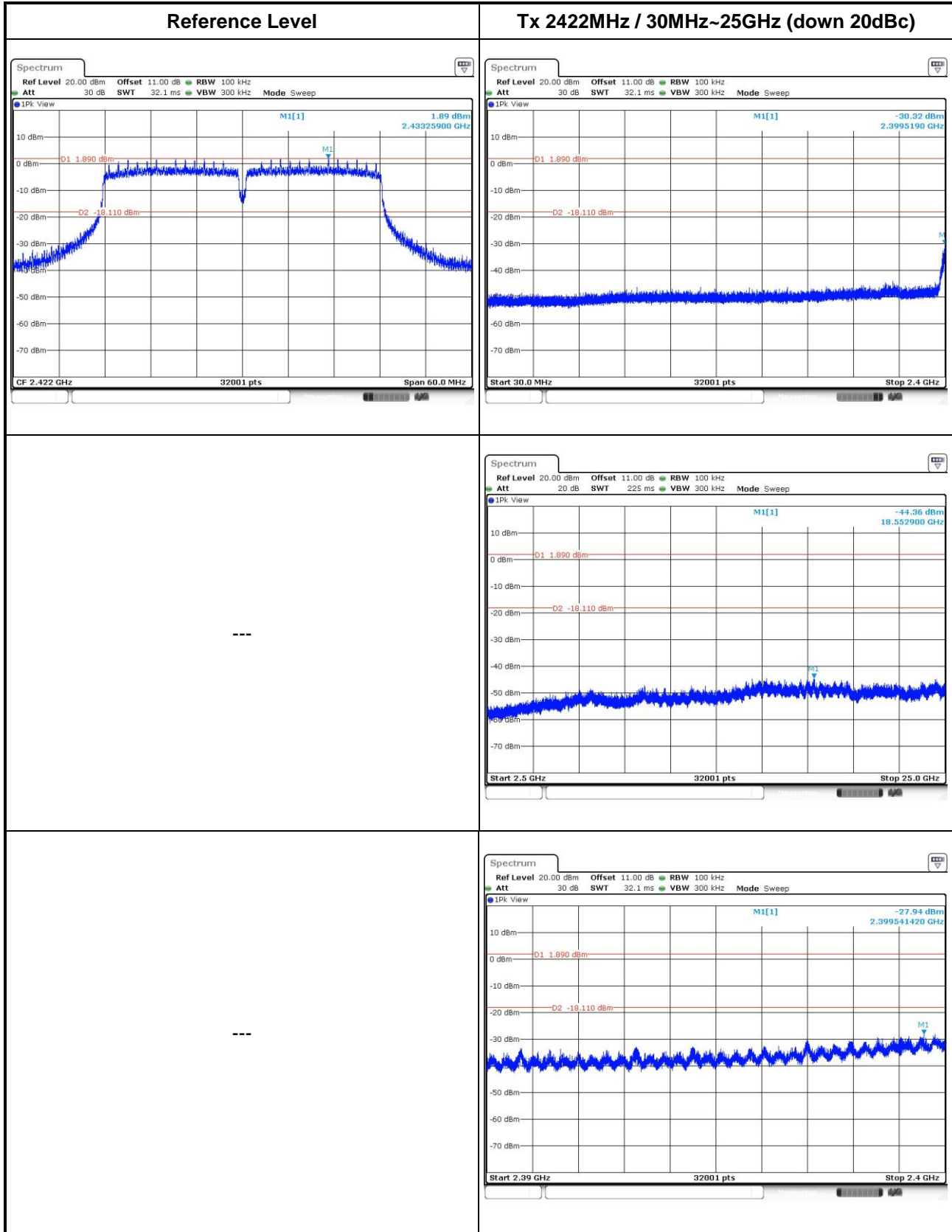
Tx 2462MHz / 30MHz~25GHz (down 20dBc)

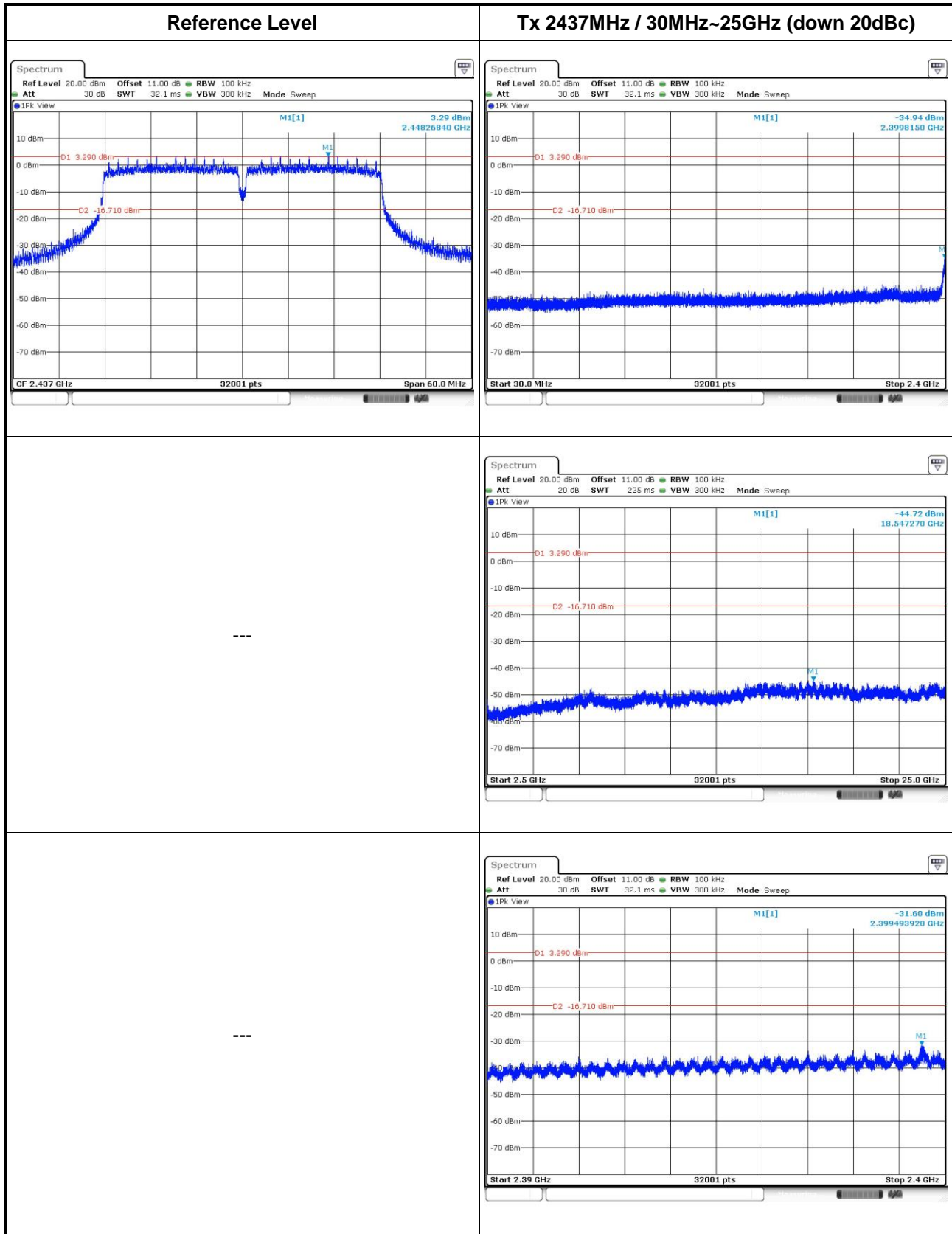


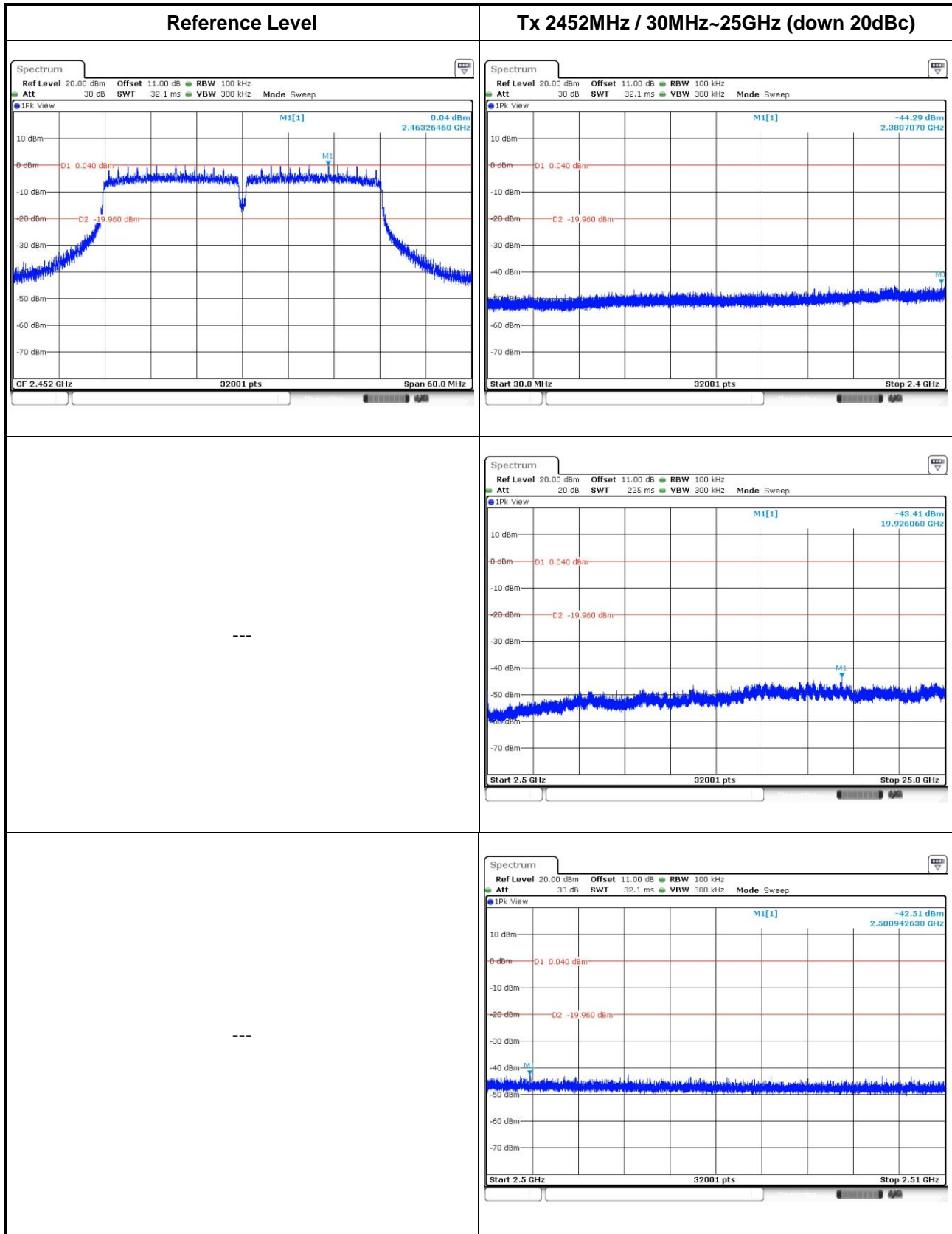




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4 Test laboratory information

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

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin
Kou District, New Taipei City,
Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St.,
Kwei Shan District, Tao Yuan City
333, Taiwan, R.O.C.

Kwei Shan Site II

Tel: 886-3-271-8640

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.

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Email: ICC_Service@icertifi.com.tw

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