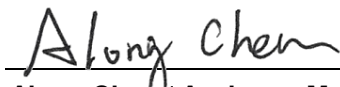


# FCC Test Report

**FCC ID** : SWX-UINS  
**Equipment** : U-Installer  
**Model No.** : U-Installer  
**Brand Name** : UBIQUITI  
**Applicant** : Ubiquiti Networks, Inc.  
**Address** : 2580 Orchard Parkway, San Jose, California,  
United States 95131  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Mar. 23, 2017  
**Tested Date** : Mar. 24 ~ Mar. 28, 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:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR732302	Rev. 01	Initial issue	Mar. 31, 2017

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.661MHz 38.29 (Margin -7.71dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4924.00MHz 53.90 (Margin -0.10dB) – AV 2390.00MHz 73.90 (Margin -0.10dB) – PK 2483.50MHz 73.90 (Margin -0.10dB) - PK	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 29.27	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 <sub>TX</sub> )	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.	Type	Gain (dBi)	Connector	Remark
1	Internal antenna	1	N/A	---

### 1.1.3 Power Supply Type of Equipment under Test (EUT)

<b>Power Supply Type</b>	5Vdc from adapter 7.6Vdc from battery
--------------------------	--

### 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

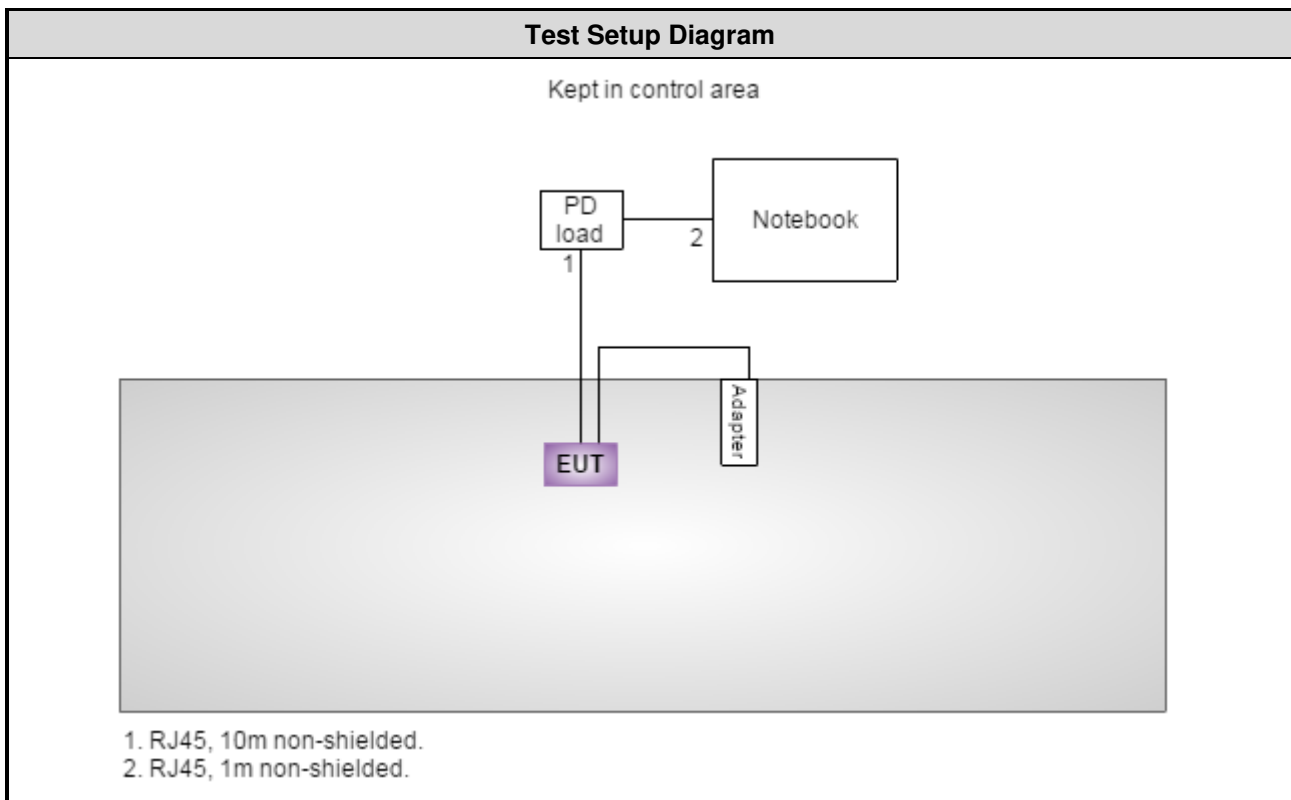
Test Tool	telnet		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	99.82%	0.01
	11g	98.58%	0.06
	HT20	98.94%	0.05
	HT40	99.11%	0.04

## 1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E6440	DoC	RJ45, 1m non-shielded.
2	PD Load	---	GP-A240-050G	---	RJ45, 10m non-shielded.
3	Adapter	UBIQUITI	GP-M015-QC	---	---

Note: No.2 & 3 were provided by applicant

## 1.3 Test Setup Chart



## 1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-B M-6000	50821	Dec. 20, 2016	Dec. 19, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA

Note: Calibration Interval of instruments listed above is one year.

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 04, 2016	Aug. 03, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 21, 2016	Dec. 20, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980225	Aug. 05, 2016	Aug. 04, 2017
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 09, 2016	Dec. 08, 2017
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	16052	Dec. 09, 2016	Dec. 08, 2017
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 09, 2016	Dec. 08, 2017
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 09, 2016	Dec. 08, 2017
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.



<b>Test Item</b>	RF Conducted				
<b>Test Site</b>	(TH01-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
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
DC POWER SOURCE	GW INSTRON	GPC-6030D	EM892433	Oct. 20, 2016	Oct. 19, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

## 1.5 Test Standards

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

47 CFR FCC Part 15.247

ANSI C63.10-2013

FCC KDB 558074 D01 DTS Meas Guidance v03r05

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

## 1.6 Measurement Uncertainty

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

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.63 dB

## 2 Test Configuration

### 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	17°C / 57%	David Chiu
Radiated Emissions	03CH01-WS	24°C / 62%	Vincent Yeh Kevin Lee
RF Conducted	TH01-WS	21°C / 64%	Alex Huang

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

### 2.2 The Worst Test Modes and Channel Details

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

**NOTE:**

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.

## 3 Transmitter Test Results

### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

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

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

#### 3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50  $\Omega$  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

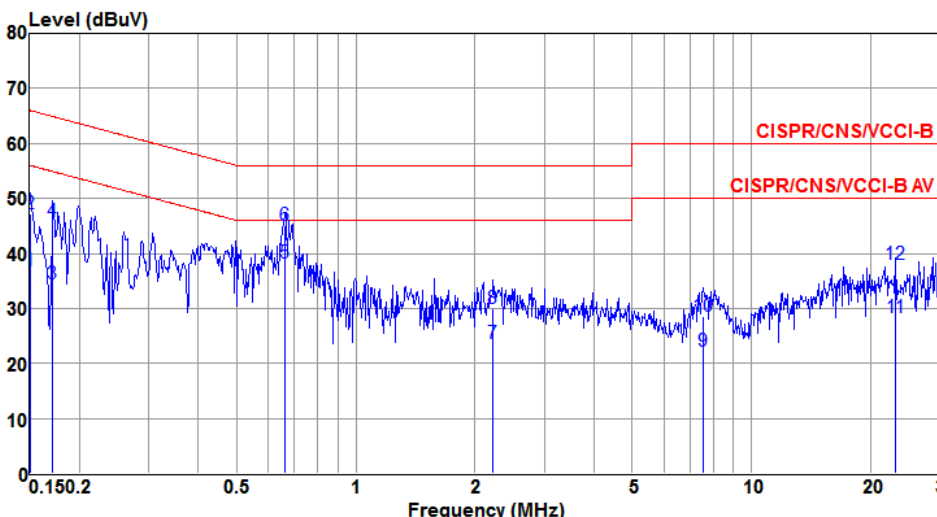


- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Power Phase</b>	Line		

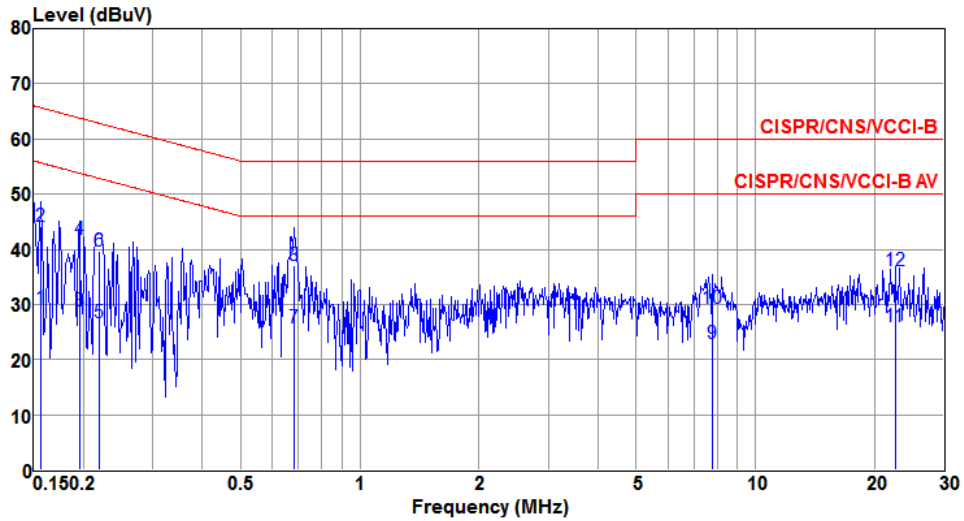
  



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.150	36.86	56.00	-19.14	36.75	0.07	0.04	Average
2	0.150	47.29	66.00	-18.71	47.18	0.07	0.04	QP
3	0.171	34.55	54.90	-20.35	34.43	0.08	0.04	Average
4	0.171	45.73	64.90	-19.17	45.61	0.08	0.04	QP
5@	0.661	38.29	46.00	-7.71	38.18	0.07	0.04	Average
6	0.661	45.20	56.00	-10.80	45.09	0.07	0.04	QP
7	2.225	23.51	46.00	-22.49	23.31	0.14	0.06	Average
8	2.225	30.06	56.00	-25.94	29.86	0.14	0.06	QP
9	7.566	22.22	50.00	-27.78	21.83	0.19	0.20	Average
10	7.566	28.53	60.00	-31.47	28.14	0.19	0.20	QP
11	23.140	28.43	50.00	-21.57	27.73	0.42	0.28	Average
12	23.140	37.91	60.00	-22.09	37.21	0.42	0.28	QP

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

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Power Phase</b>	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	29.26	55.65	-26.39	29.12	0.10	0.04	Average
2	0.156	44.20	65.65	-21.45	44.06	0.10	0.04	QP
3	0.195	28.69	53.80	-25.11	28.56	0.09	0.04	Average
4	0.195	41.73	63.80	-22.07	41.60	0.09	0.04	QP
5	0.220	26.77	52.83	-26.06	26.63	0.10	0.04	Average
6	0.220	39.60	62.83	-23.23	39.46	0.10	0.04	QP
7	0.683	25.73	46.00	-20.27	25.58	0.11	0.04	Average
8@	0.683	37.01	56.00	-18.99	36.86	0.11	0.04	QP
9	7.769	23.01	50.00	-26.99	22.55	0.26	0.20	Average
10	7.769	29.16	60.00	-30.84	28.70	0.26	0.20	QP
11	22.535	25.96	50.00	-24.04	25.25	0.43	0.28	Average
12	22.535	36.05	60.00	-23.95	35.34	0.43	0.28	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

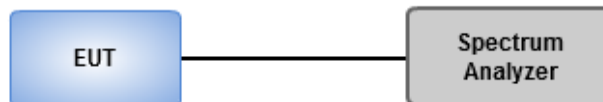
#### 6dB Bandwidth

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

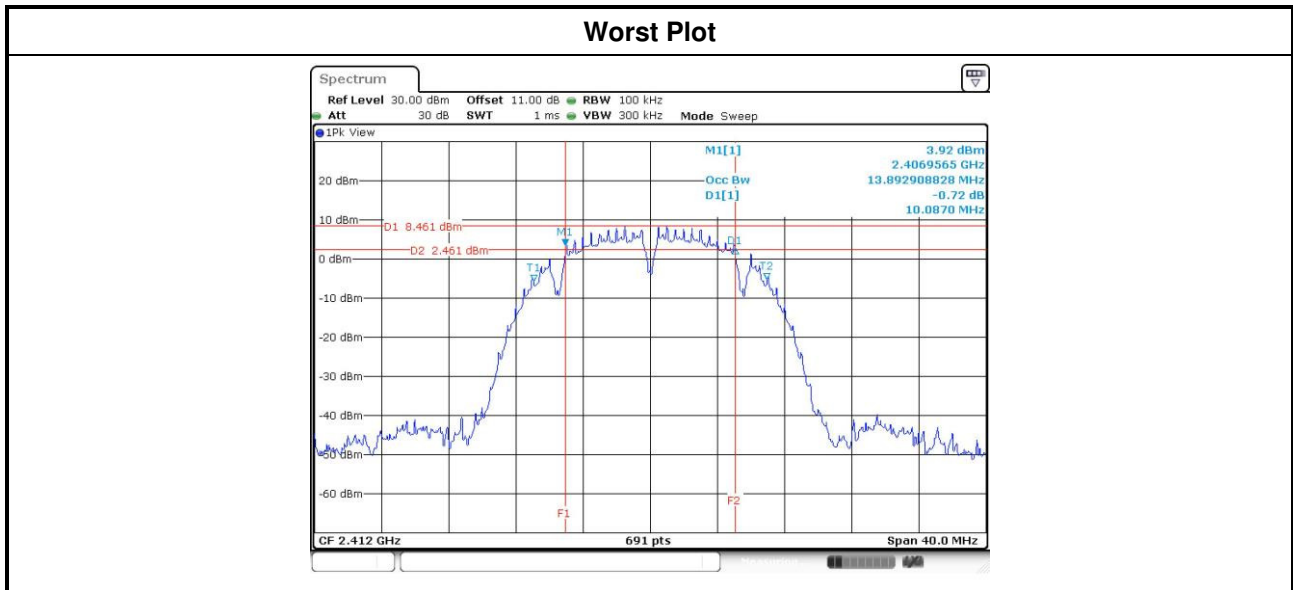
1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

### 3.2.3 Test Setup

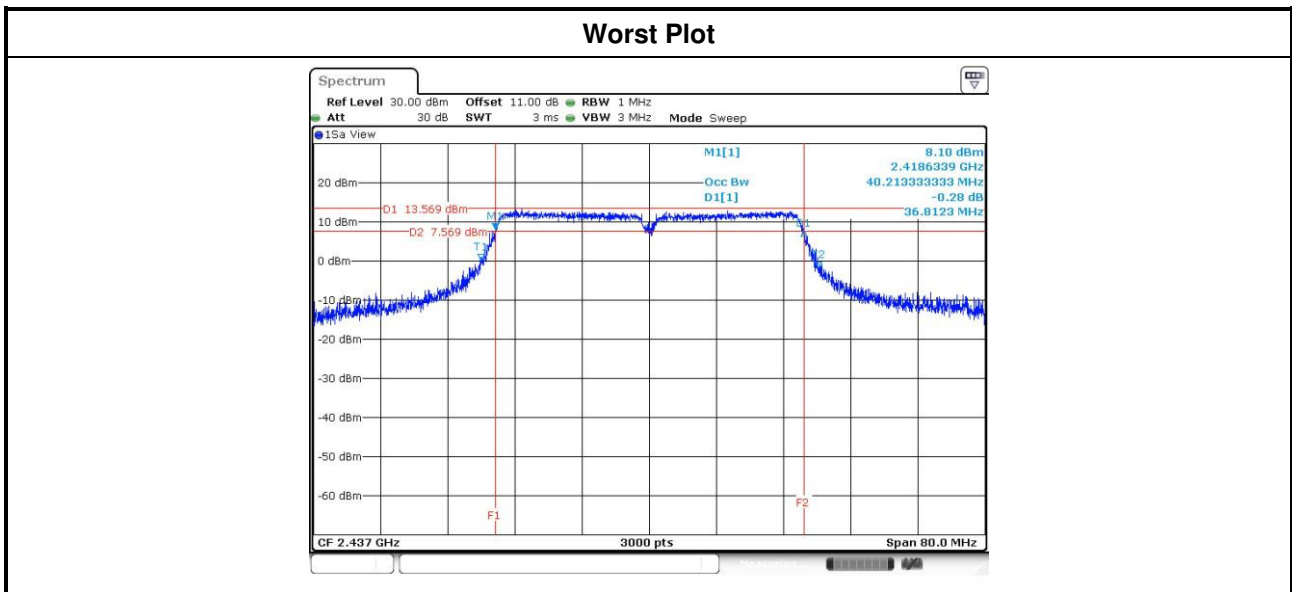


### 3.2.4 Test Result of 6dB and Occupied Bandwidth

Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	10.09	10.09	---	---	500
11b	2	2437	10.09	10.09	---	---	500
11b	2	2462	10.09	10.09	---	---	500
11g	2	2412	16.35	16.35	---	---	500
11g	2	2437	16.35	16.35	---	---	500
11g	2	2462	16.35	16.35	---	---	500
HT20	2	2412	17.57	17.33	---	---	500
HT20	2	2437	17.16	17.33	---	---	500
HT20	2	2462	17.57	17.62	---	---	500
HT40	2	2422	36.41	36.41	---	---	500
HT40	2	2437	36.41	36.41	---	---	500
HT40	2	2452	36.41	36.41	---	---	500



Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	13.93	13.91	---	---
11b	2	2437	13.93	13.89	---	---
11b	2	2462	13.84	13.97	---	---
11g	2	2412	17.29	16.87	---	---
11g	2	2437	22.09	18.91	---	---
11g	2	2462	17.31	16.88	---	---
HT20	2	2412	18.32	18.09	---	---
HT20	2	2437	22.37	19.99	---	---
HT20	2	2462	18.19	18.01	---	---
HT40	2	2422	38.21	38.00	---	---
HT40	2	2437	40.21	39.12	---	---
HT40	2	2452	38.21	37.89	---	---





## 3.3 RF Output Power

### 3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

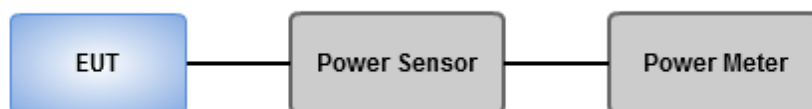
- Antenna gain  $\leq$  6dBi, no any corresponding reduction is in output power limit.
- Antenna gain  $>$  6dBi
  - Non Fixed, point to point operations.  
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6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

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

### 3.3.2 Test Procedures

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

### 3.3.3 Test Setup



### 3.3.4 Test Result of Maximum Output Power

Modulation Mode	N <sub>TX</sub>	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	21.13	20.63	---	---	245.329	23.90	30.00	1.00	24.90	36.00
11b	2	2437	21.29	19.45	---	---	222.691	23.48	30.00	1.00	24.48	36.00
11b	2	2462	19.49	18.61	---	---	161.531	22.08	30.00	1.00	23.08	36.00
11g	2	2412	25.89	24.91	---	---	697.892	28.44	30.00	1.00	29.44	36.00
11g	2	2437	26.43	26.08	---	---	845.050	<b>29.27</b>	30.00	1.00	30.27	36.00
11g	2	2462	26.12	25.45	---	---	760.013	28.81	30.00	1.00	29.81	36.00
HT20	2	2412	25.77	25.03	---	---	695.992	28.43	30.00	1.00	29.43	36.00
HT20	2	2437	26.43	26.06	---	---	843.187	29.26	30.00	1.00	30.26	36.00
HT20	2	2462	25.86	24.95	---	---	698.086	28.44	30.00	1.00	29.44	36.00
HT40	2	2422	24.86	23.8	---	---	546.080	27.37	30.00	1.00	28.37	36.00
HT40	2	2437	26.18	25.72	---	---	788.204	28.97	30.00	1.00	29.97	36.00
HT40	2	2452	25.08	24.33	---	---	593.126	27.73	30.00	1.00	28.73	36.00

Modulation Mode	N <sub>TX</sub>	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	18.96	18.11	---	---	143.419	21.57	---
11b	2	2437	18.85	17.22	---	---	129.459	21.12	---
11b	2	2462	17.01	16.2	---	---	91.921	19.63	---
11g	2	2412	19.17	17.01	---	---	132.838	21.23	---
11g	2	2437	21.95	20.84	---	---	278.014	24.44	---
11g	2	2462	19.45	17.61	---	---	145.782	21.64	---
HT20	2	2412	19.14	17.01	---	---	132.269	21.21	---
HT20	2	2437	21.88	20.84	---	---	275.509	24.40	---
HT20	2	2462	18.8	17.09	---	---	127.026	21.04	---
HT40	2	2422	16.68	14.87	---	---	77.249	18.88	---
HT40	2	2437	20.71	19.43	---	---	205.461	23.13	---
HT40	2	2452	17.14	15.39	---	---	86.355	19.36	---

Note: Conducted average output power is for reference only.

## 3.4 Power Spectral Density

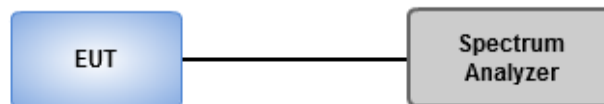
### 3.4.1 Limit of Power Spectral Density

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.

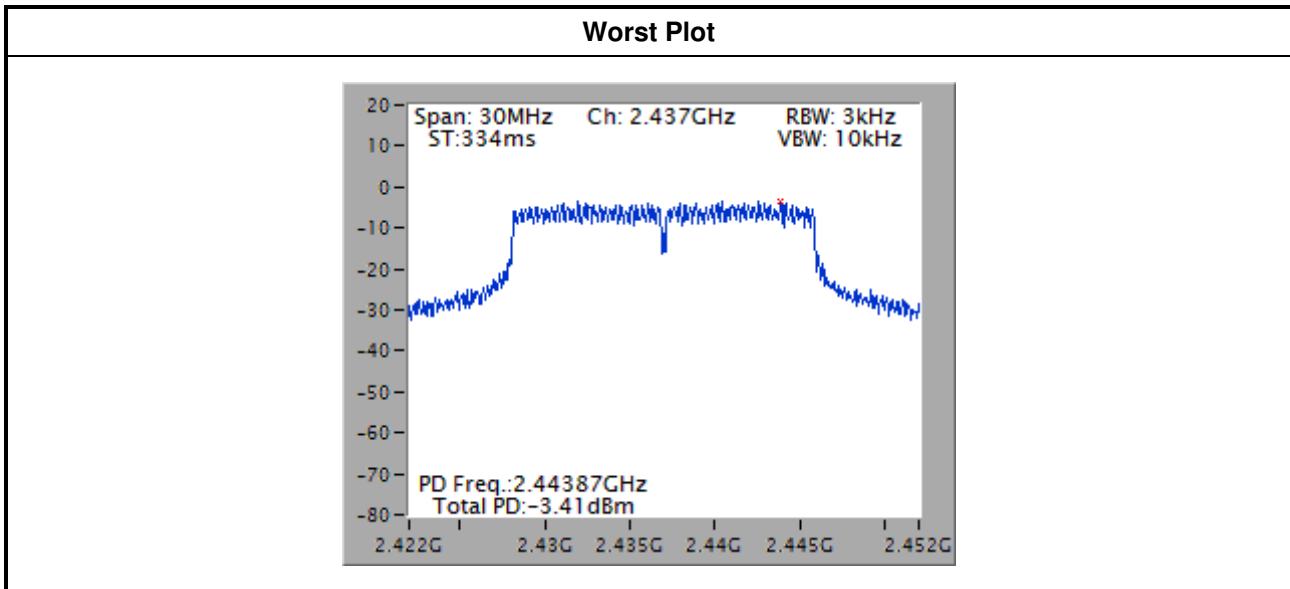
### 3.4.3 Test Setup



### 3.4.4 Test Result of Power Spectral Density

Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	-4.16	8.00
11b	2	2437	-4.72	8.00
11b	2	2462	-6.22	8.00
11g	2	2412	-5.77	8.00
11g	2	2437	-3.45	8.00
11g	2	2462	-5.75	8.00
HT20	2	2412	-5.71	8.00
HT20	2	2437	-3.41	8.00
HT20	2	2462	-6.82	8.00
HT40	2	2422	-10.76	8.00
HT40	2	2437	-6.35	8.00
HT40	2	2452	-9.98	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:**  
 Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

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

### 3.5.2 Test Procedures

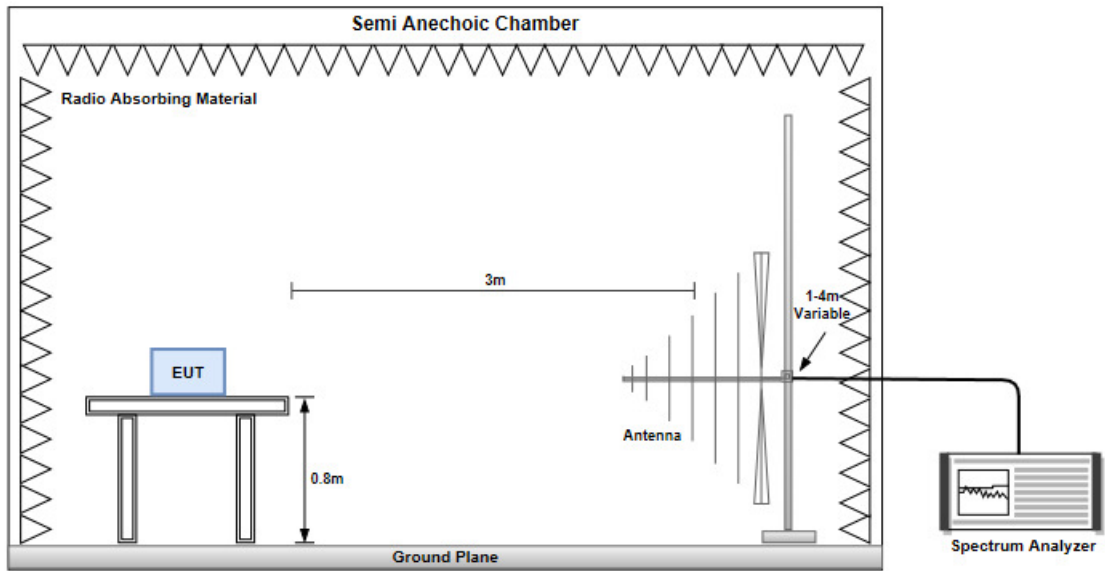
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

Note:

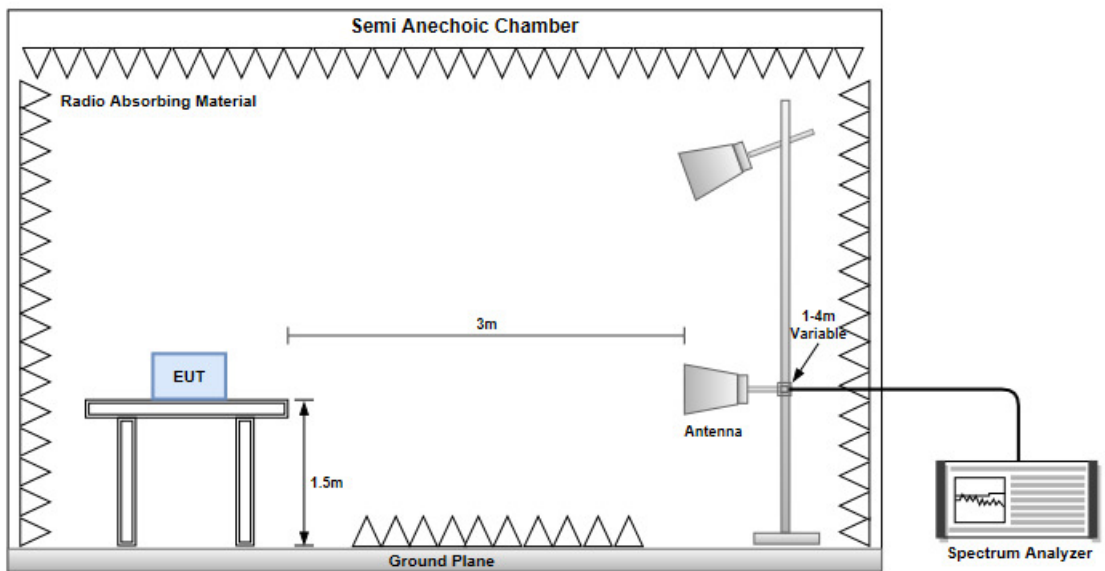
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

### 3.5.3 Test Setup

#### Radiated Emissions below 1 GHz



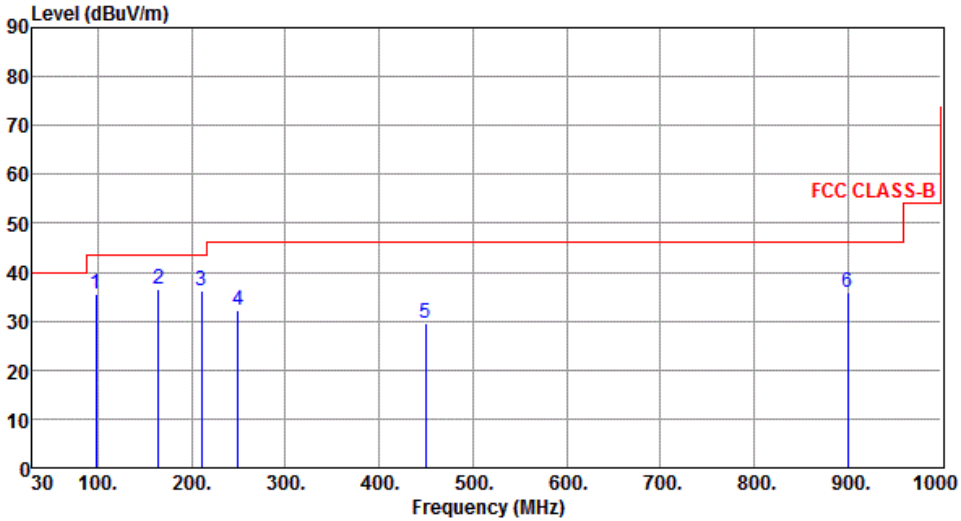
#### Radiated Emissions above 1 GHz



### 3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		

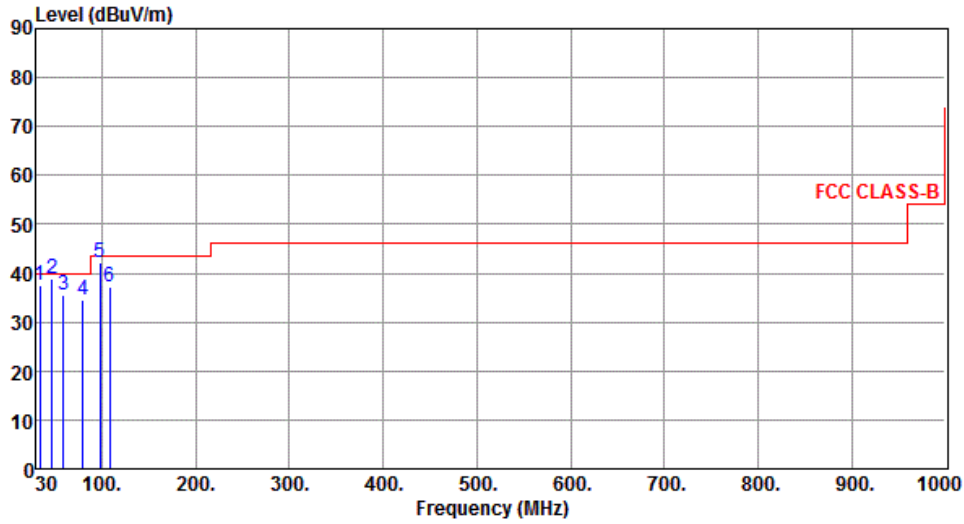
  



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	97.90	35.53	43.50	-7.97	48.73	-13.20	Peak	---	---
2	164.83	36.44	43.50	-7.06	44.75	-8.31	Peak	---	---
3	210.42	36.35	43.50	-7.15	47.05	-10.70	Peak	---	---
4	249.22	32.12	46.00	-13.88	41.35	-9.23	Peak	---	---
5	450.01	29.70	46.00	-16.30	33.44	-3.74	Peak	---	---
6	900.09	35.85	46.00	-10.15	31.58	4.27	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.

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	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	33.88	37.38	40.00	-2.62	46.02	-8.64	QP	100	55
2	46.49	38.86	40.00	-1.14	46.44	-7.58	QP	100	344
3	59.10	35.70	40.00	-4.30	44.50	-8.80	QP	100	204
4	79.47	34.45	40.00	-5.55	46.91	-12.46	QP	120	167
5	97.90	42.30	43.50	-1.20	55.50	-13.20	QP	100	283
6	108.57	37.23	43.50	-6.27	48.63	-11.40	Peak	---	---

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

\*Factor includes antenna factor , cable loss and amplifier gain

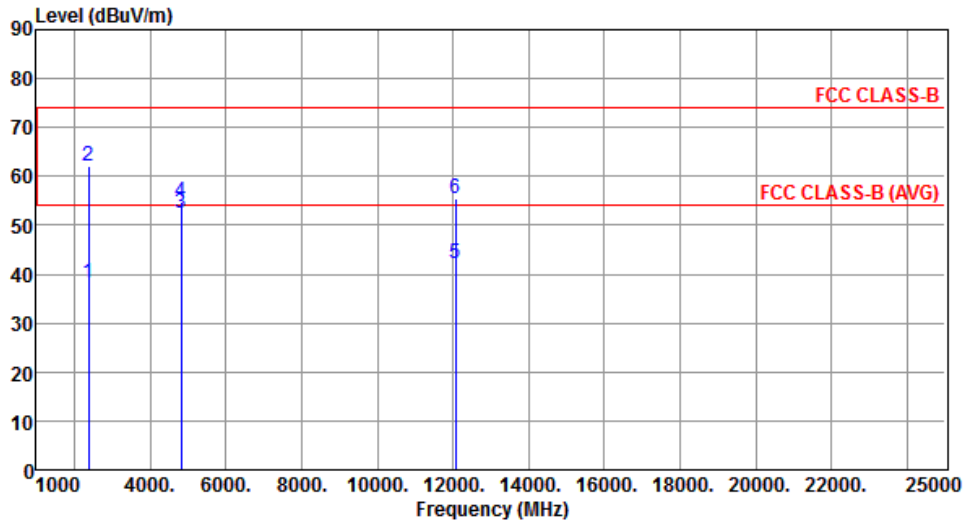
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

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



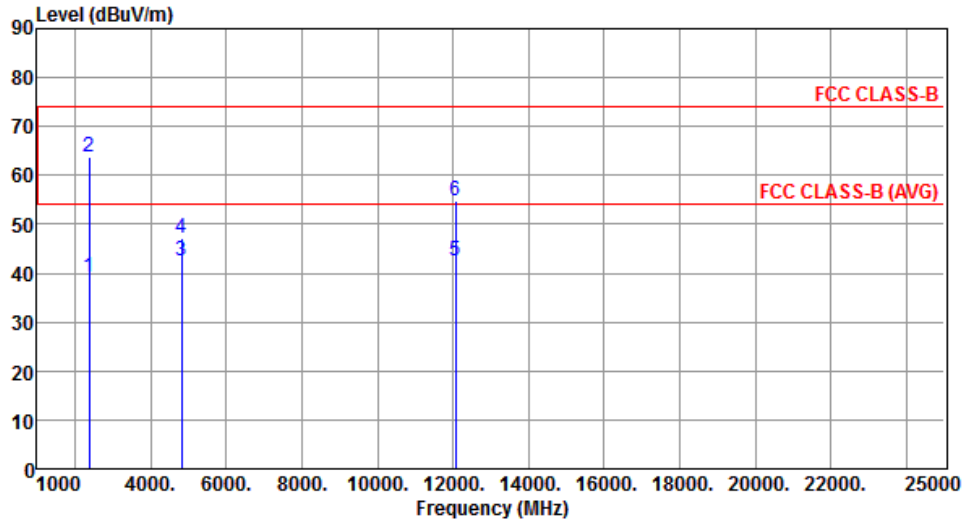
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.33	54.00	-15.67	41.51	-3.18	Average	131	226
2	2390.00	62.09	74.00	-11.91	65.27	-3.18	Peak	131	226
3	4824.00	52.57	54.00	-1.43	48.79	3.78	Average	302	150
4	4824.00	54.82	74.00	-19.18	51.04	3.78	Peak	302	150
5	12060.00	42.29	54.00	-11.71	28.71	13.58	Average	100	218
6	12060.00	55.35	74.00	-18.65	41.77	13.58	Peak	100	218

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

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



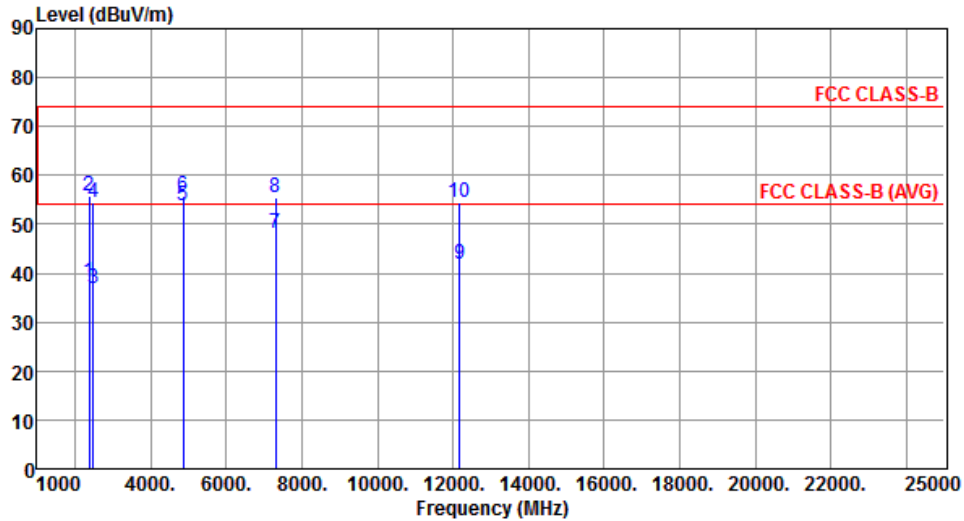
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.16	54.00	-14.84	42.34	-3.18	Average	100	104
2	2390.00	63.62	74.00	-10.38	66.80	-3.18	Peak	100	104
3	4824.00	42.63	54.00	-11.37	38.85	3.78	Average	215	191
4	4824.00	47.32	74.00	-26.68	43.54	3.78	Peak	215	191
5	12060.00	42.52	54.00	-11.48	28.94	13.58	Average	100	253
6	12060.00	54.94	74.00	-19.06	41.36	13.58	Peak	100	253

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).

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



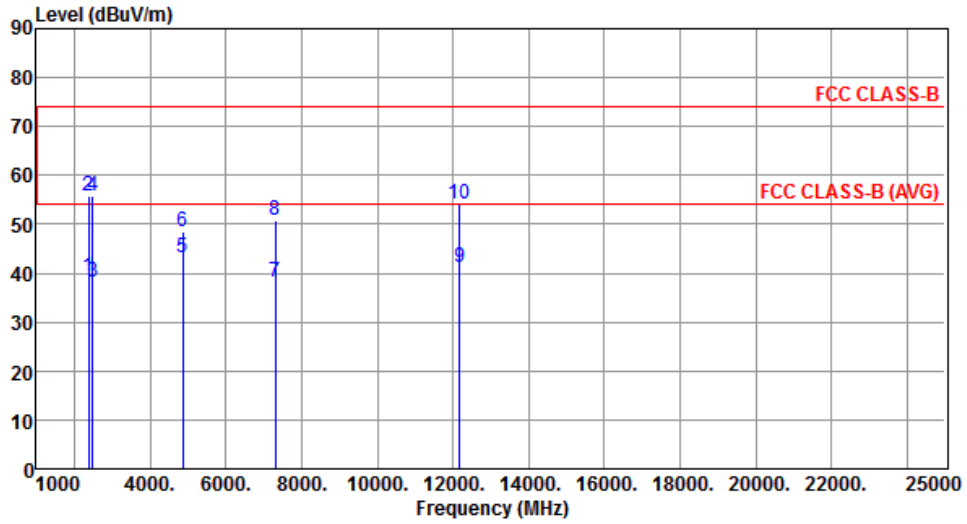
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.04	54.00	-15.96	41.22	-3.18	Average	158	16
2	2390.00	55.76	74.00	-18.24	58.94	-3.18	Peak	158	16
3	2483.50	36.75	54.00	-17.25	39.55	-2.80	Average	100	225
4	2483.50	54.50	74.00	-19.50	57.30	-2.80	Peak	100	225
5	4874.00	53.69	54.00	-0.31	49.75	3.94	Average	318	161
6	4874.00	55.67	74.00	-18.33	51.73	3.94	Peak	318	141
7	7311.00	48.19	54.00	-5.81	39.78	8.41	Average	147	168
8	7311.00	55.41	74.00	-18.59	47.00	8.41	Peak	147	168
9	12185.00	41.80	54.00	-12.20	28.13	13.67	Average	100	225
10	12185.00	54.54	74.00	-19.46	40.87	13.67	Peak	100	225

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

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



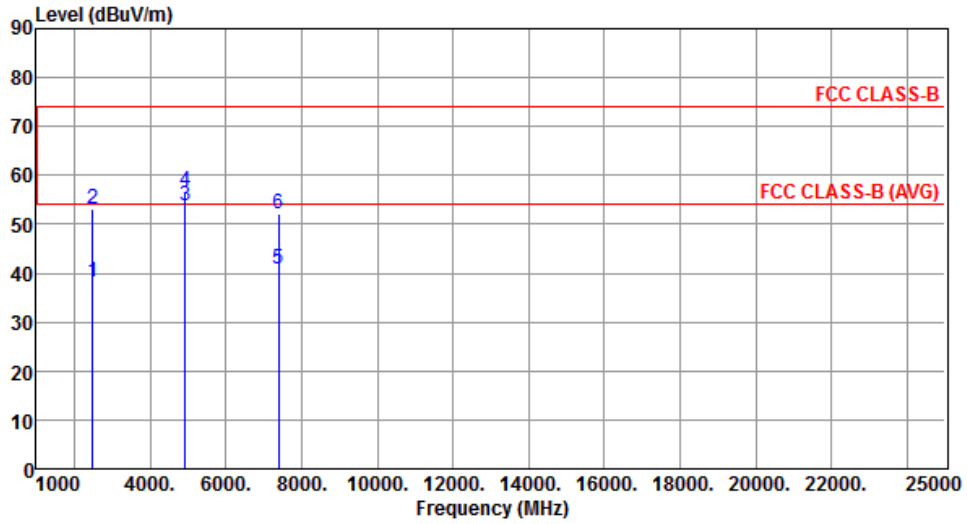
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	39.11	54.00	-14.89	42.29	-3.18	Average	135	89
2	2390.00	55.94	74.00	-18.06	59.12	-3.18	Peak	135	89
3	2483.50	38.16	54.00	-15.84	40.96	-2.80	Average	135	89
4	2483.50	55.68	74.00	-18.32	58.48	-2.80	Peak	135	89
5	4874.00	43.05	54.00	-10.95	39.11	3.94	Average	337	336
6	4874.00	48.61	74.00	-25.39	44.67	3.94	Peak	337	336
7	7311.00	38.14	54.00	-15.86	29.73	8.41	Average	222	195
8	7311.00	50.89	74.00	-23.11	42.48	8.41	Peak	222	195
9	12185.00	41.27	54.00	-12.73	27.60	13.67	Average	100	192
10	12185.00	54.24	74.00	-19.76	40.57	13.67	Peak	100	192

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).

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



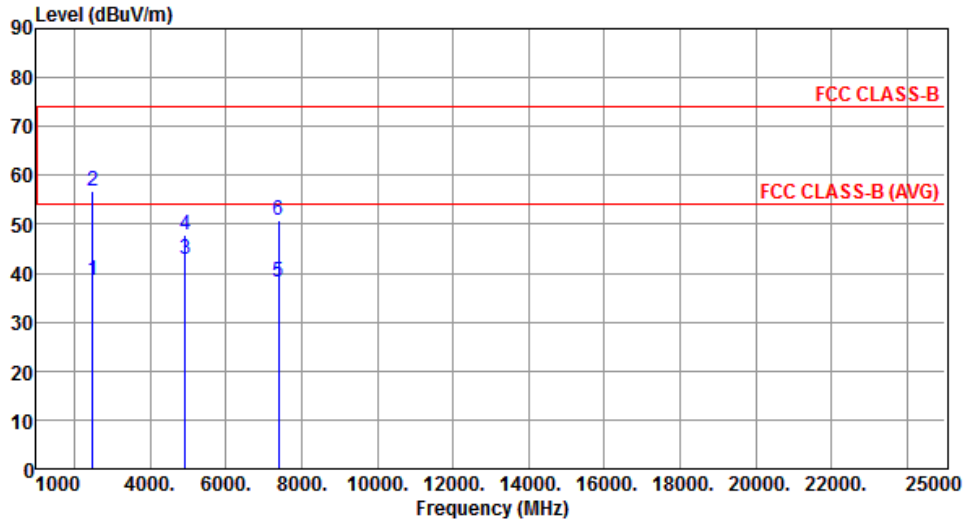
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.31	54.00	-15.69	41.11	-2.80	Average	134	128
2	2483.50	53.03	74.00	-20.97	55.83	-2.80	Peak	134	128
3	4924.00	53.90	54.00	-0.10	49.80	4.10	Average	197	155
4	4924.00	56.67	74.00	-17.33	52.57	4.10	Peak	197	155
5	7386.00	40.90	54.00	-13.10	32.46	8.44	Average	140	165
6	7386.00	52.25	74.00	-21.75	43.81	8.44	Peak	140	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).

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



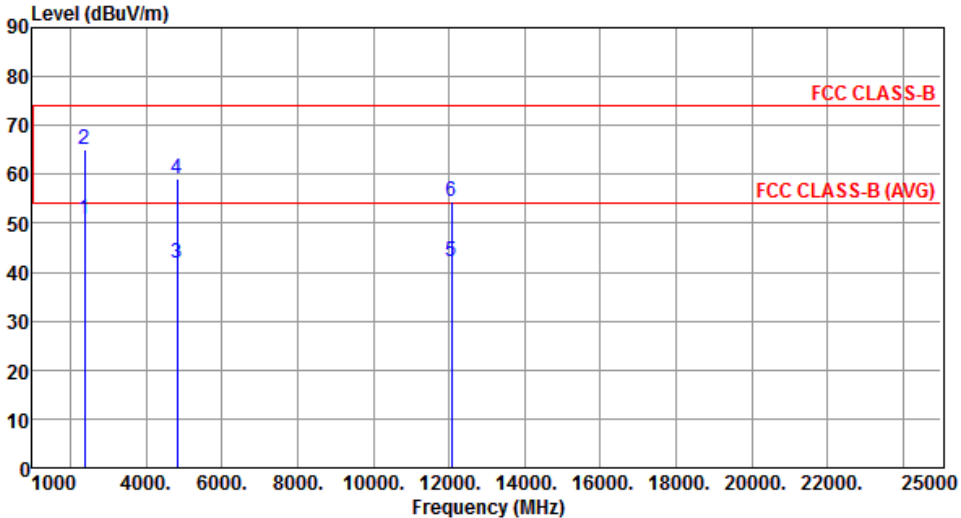
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	38.54	54.00	-15.46	41.34	-2.80	Average	119	98
2	2483.50	56.92	74.00	-17.08	59.72	-2.80	Peak	119	98
3	4924.00	42.95	54.00	-11.05	38.85	4.10	Average	314	298
4	4924.00	47.89	74.00	-26.11	43.79	4.10	Peak	314	298
5	7386.00	38.09	54.00	-15.91	29.65	8.44	Average	206	194
6	7386.00	50.77	74.00	-23.23	42.33	8.44	Peak	206	194

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

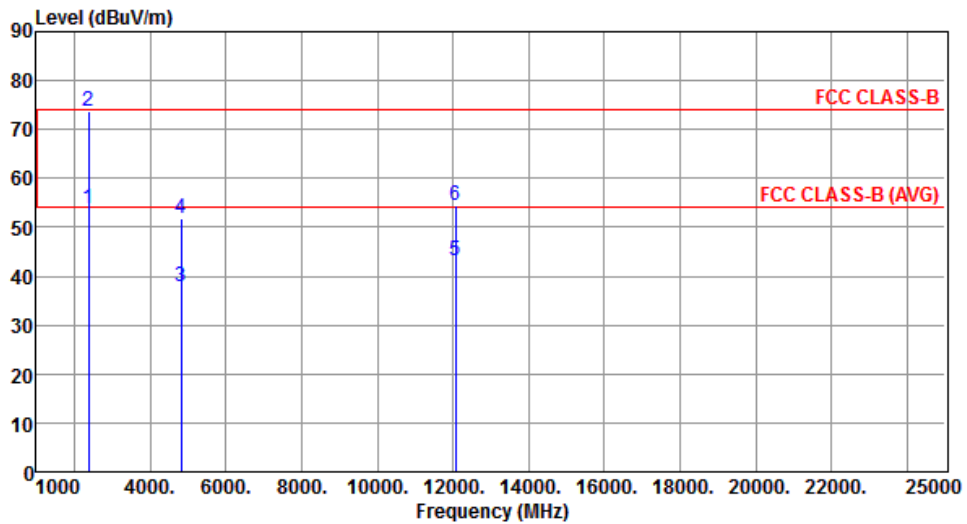
\*Factor includes antenna factor , cable loss and amplifier gain

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	50.65	54.00	-3.35	53.83	-3.18	Average	100	243
2	2390.00	65.14	74.00	-8.86	68.32	-3.18	Peak	100	243
3	4824.00	42.01	54.00	-11.99	38.23	3.78	Average	201	151
4	4824.00	59.09	74.00	-14.91	55.31	3.78	Peak	201	151
5	12060.00	42.14	54.00	-11.86	28.56	13.58	Average	100	148
6	12060.00	54.43	74.00	-19.57	40.85	13.58	Peak	100	148
<p>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).</p>									

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	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	53.77	54.00	-0.23	56.95	-3.18	Average	100	100
2	2390.00	73.80	74.00	-0.20	76.98	-3.18	Peak	100	100
3	4824.00	37.75	54.00	-16.25	33.97	3.78	Average	308	329
4	4824.00	51.90	74.00	-22.10	48.12	3.78	Peak	308	329
5	12060.00	43.20	54.00	-10.80	29.62	13.58	Average	120	97
6	12060.00	54.41	74.00	-19.59	40.83	13.58	Peak	120	97

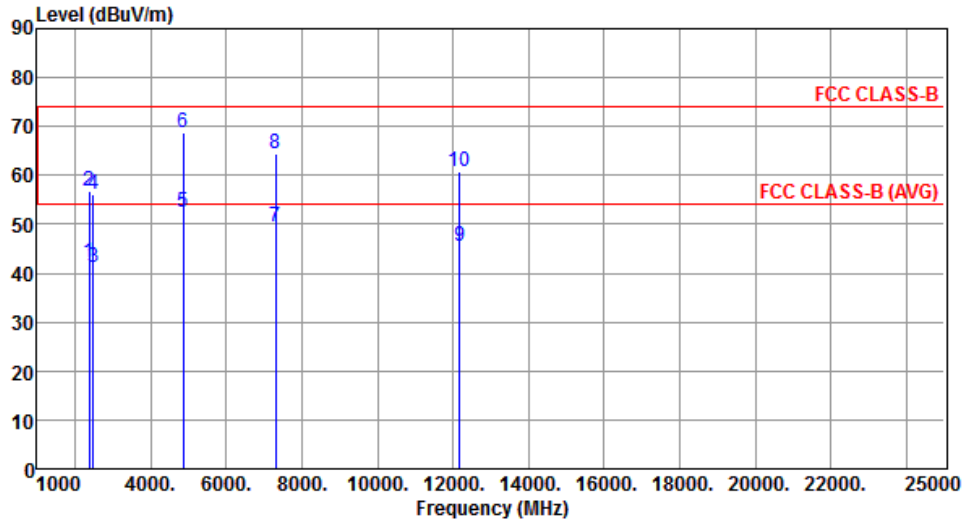
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

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



<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



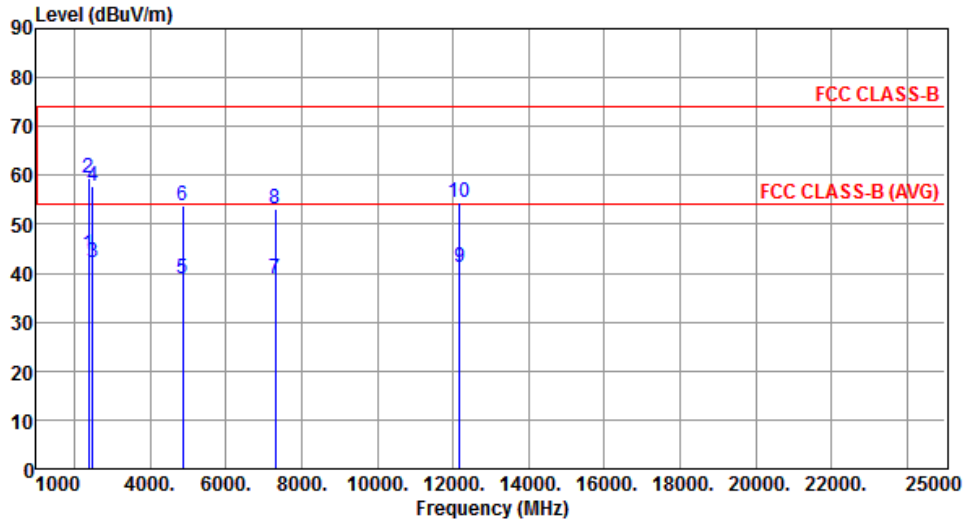
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	42.30	54.00	-11.70	45.48	-3.18	Average	100	226
2	2390.00	56.83	74.00	-17.17	60.01	-3.18	Peak	100	226
3	2483.50	41.15	54.00	-12.85	43.95	-2.80	Average	100	226
4	2483.50	56.09	74.00	-17.91	58.89	-2.80	Peak	100	226
5	4874.00	52.44	54.00	-1.56	48.50	3.94	Average	200	177
6	4874.00	68.61	74.00	-5.39	64.67	3.94	Peak	200	177
7	7311.00	49.58	54.00	-4.42	41.17	8.41	Average	182	178
8	7311.00	64.39	74.00	-9.61	55.98	8.41	Peak	182	178
9	12185.00	45.65	54.00	-8.35	31.98	13.67	Average	150	240
10	12185.00	60.86	74.00	-13.14	47.19	13.67	Peak	150	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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



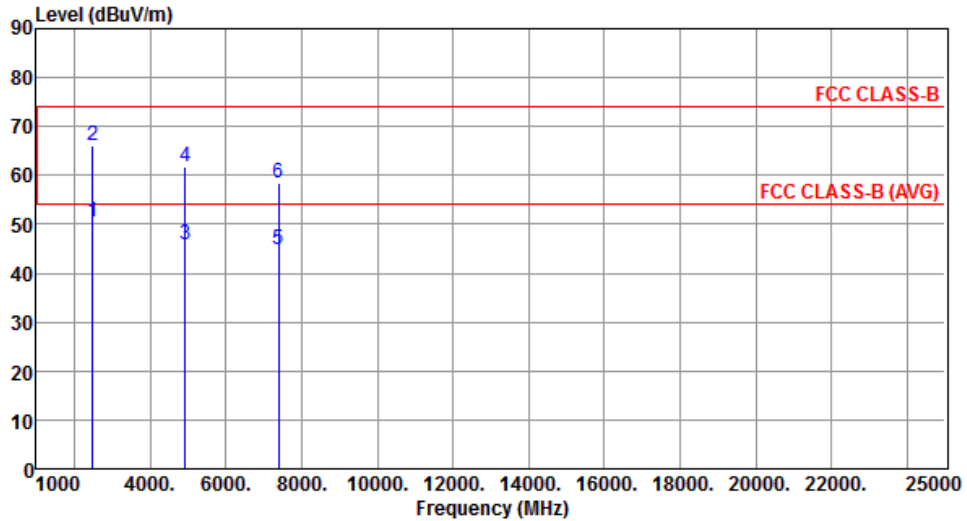
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.98	54.00	-10.02	47.16	-3.18	Average	100	95
2	2390.00	59.41	74.00	-14.59	62.59	-3.18	Peak	100	95
3	2483.50	42.32	54.00	-11.68	45.12	-2.80	Average	100	95
4	2483.50	57.87	74.00	-16.13	60.67	-2.80	Peak	100	95
5	4874.00	38.88	54.00	-15.12	34.94	3.94	Average	379	108
6	4874.00	53.64	74.00	-20.36	49.70	3.94	Peak	379	108
7	7311.00	38.86	54.00	-15.14	30.45	8.41	Average	379	108
8	7311.00	52.99	74.00	-21.01	44.58	8.41	Peak	379	108
9	12185.00	41.03	54.00	-12.97	27.36	13.67	Average	116	107
10	12185.00	54.42	74.00	-19.58	40.75	13.67	Peak	116	107

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).

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Horizontal		



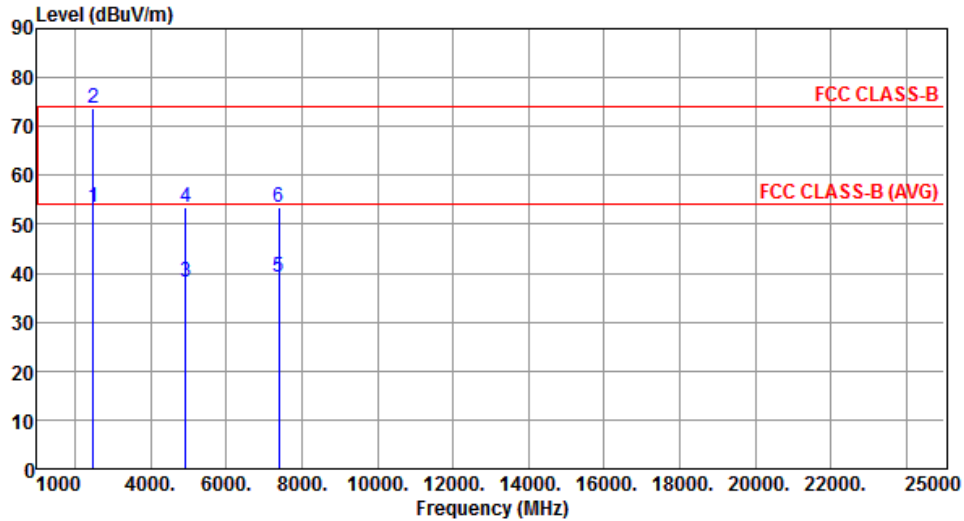
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.51	54.00	-3.49	53.31	-2.80	Average	120	241
2	2483.50	65.94	74.00	-8.06	68.74	-2.80	Peak	120	241
3	4924.00	45.75	54.00	-8.25	41.65	4.10	Average	207	156
4	4924.00	61.78	74.00	-12.22	57.68	4.10	Peak	207	156
5	7386.00	44.77	54.00	-9.23	36.33	8.44	Average	162	184
6	7386.00	58.47	74.00	-15.53	50.03	8.44	Peak	162	184

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

<b>Modulation</b>	11g	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Vertical		



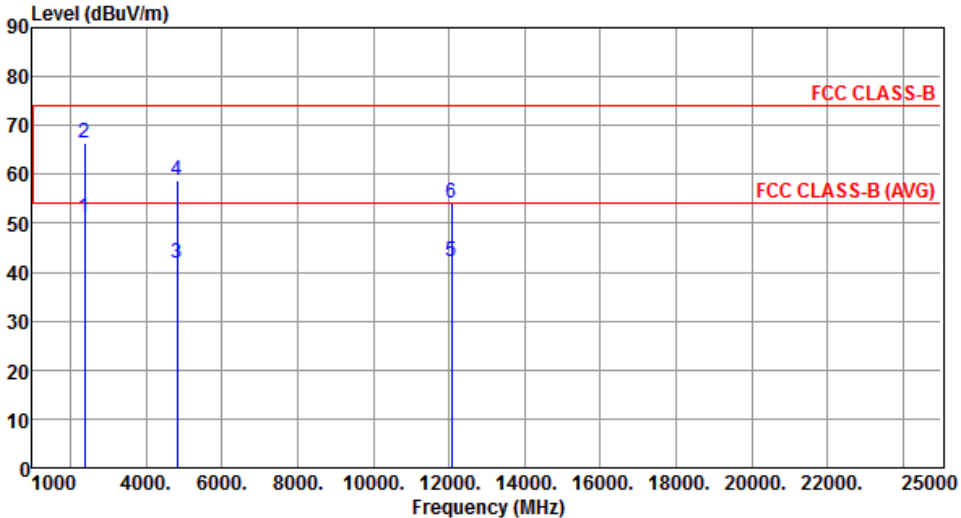
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.50	54.00	-0.50	56.30	-2.80	Average	121	95
2	2483.50	73.88	74.00	-0.12	76.68	-2.80	Peak	121	95
3	4924.00	38.26	54.00	-15.74	34.16	4.10	Average	356	140
4	4924.00	53.36	74.00	-20.64	49.26	4.10	Peak	356	140
5	7386.00	39.19	54.00	-14.81	30.75	8.44	Average	249	186
6	7386.00	53.46	74.00	-20.54	45.02	8.44	Peak	249	186

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

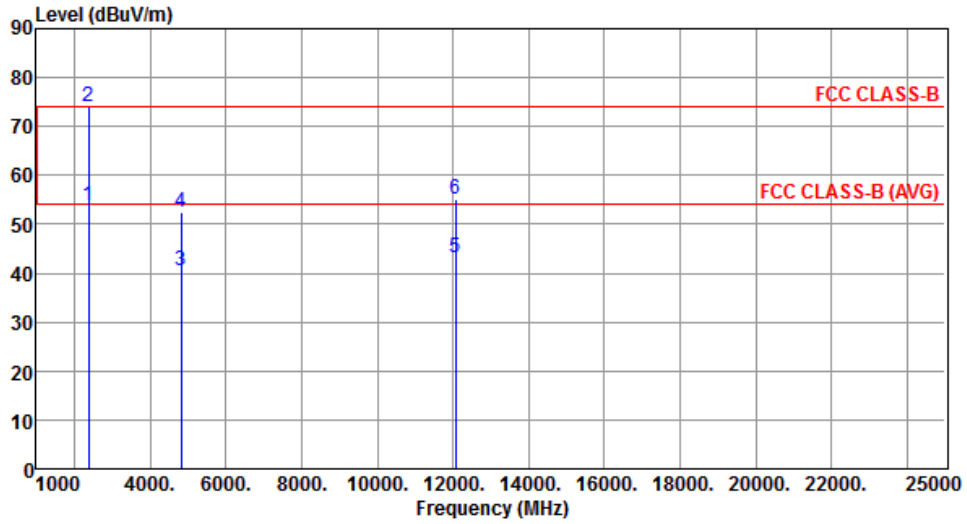
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	HT20	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	2390.00	51.12	54.00	-2.88	54.30	-3.18	Average	245	311
2	2390.00	66.56	74.00	-7.44	69.74	-3.18	Peak	245	311
3	4824.00	41.86	54.00	-12.14	38.08	3.78	Average	208	158
4	4824.00	58.88	74.00	-15.12	55.10	3.78	Peak	208	158
5	12060.00	42.13	54.00	-11.87	28.55	13.58	Average	100	142
6	12060.00	54.28	74.00	-19.72	40.70	13.58	Peak	100	142
<p>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).</p>									

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2412
<b>Polarization</b>	Vertical		



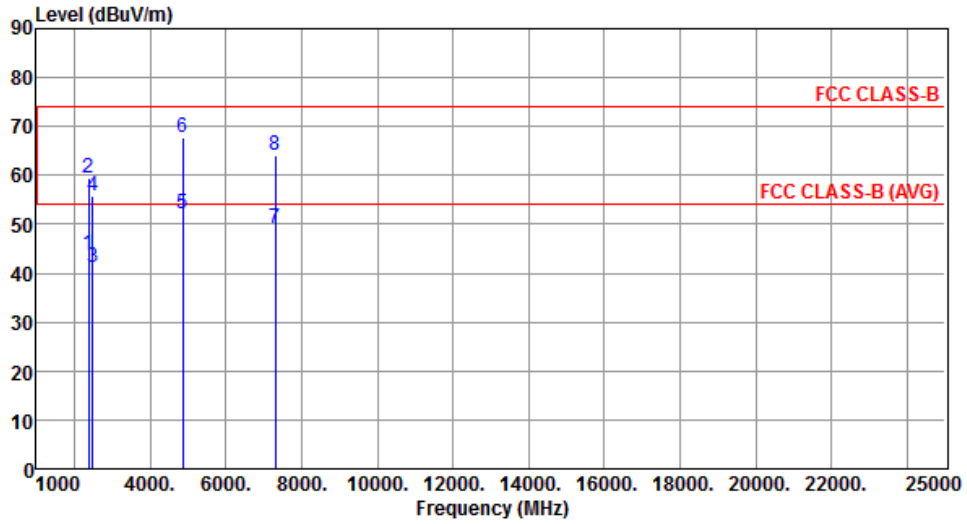
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.85	54.00	-0.15	57.03	-3.18	Average	100	103
2	2390.00	73.90	74.00	-0.10	77.08	-3.18	Peak	100	103
3	4824.00	40.57	54.00	-13.43	36.79	3.78	Average	212	139
4	4824.00	52.55	74.00	-21.45	48.77	3.78	Peak	212	139
5	12060.00	43.11	54.00	-10.89	29.53	13.58	Average	268	184
6	12060.00	55.16	74.00	-18.84	41.58	13.58	Peak	268	184

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



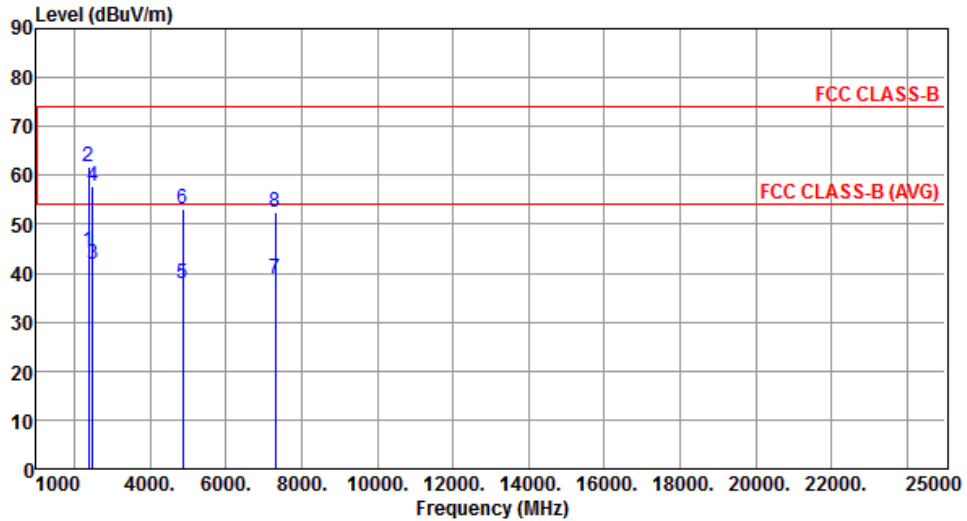
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	43.69	54.00	-10.31	46.87	-3.18	Average	224	259
2	2390.00	59.47	74.00	-14.53	62.65	-3.18	Peak	224	259
3	2483.50	41.17	54.00	-12.83	43.97	-2.80	Average	224	259
4	2483.50	55.90	74.00	-18.10	58.70	-2.80	Peak	224	259
5	4874.00	52.00	54.00	-2.00	48.06	3.94	Average	190	150
6	4874.00	67.86	74.00	-6.14	63.92	3.94	Peak	190	150
7	7311.00	49.16	54.00	-4.84	40.75	8.41	Average	183	185
8	7311.00	64.03	74.00	-9.97	55.62	8.41	Peak	183	185

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	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	44.45	54.00	-9.55	47.63	-3.18	Average	100	99
2	2390.00	61.80	74.00	-12.20	64.98	-3.18	Peak	100	99
3	2483.50	41.70	54.00	-12.30	44.50	-2.80	Average	100	99
4	2483.50	57.75	74.00	-16.25	60.55	-2.80	Peak	100	99
5	4874.00	37.70	54.00	-16.30	33.76	3.94	Average	284	17
6	4874.00	53.27	74.00	-20.73	49.33	3.94	Peak	284	17
7	7311.00	38.77	54.00	-15.23	30.36	8.41	Average	273	264
8	7311.00	52.32	74.00	-21.68	43.91	8.41	Peak	273	264

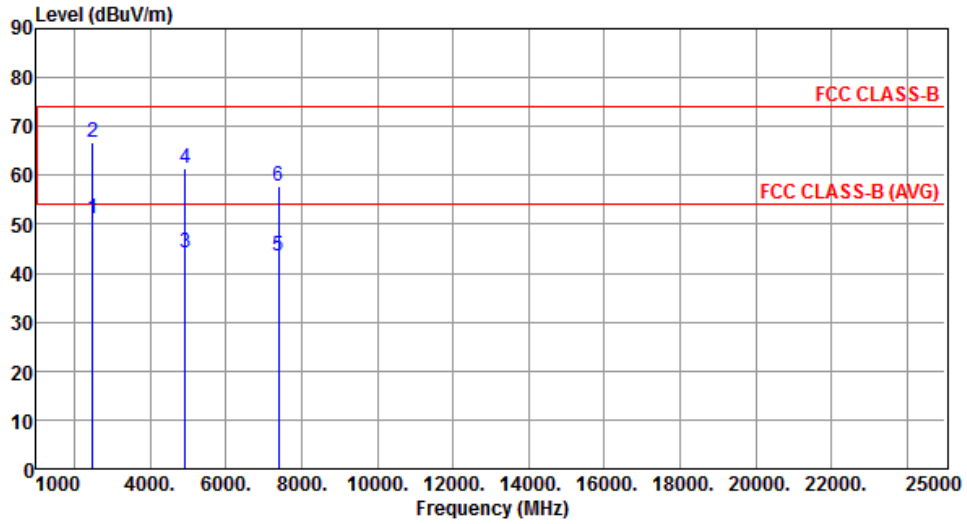
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

\*Factor includes antenna factor , cable loss and amplifier gain

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



<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Horizontal		



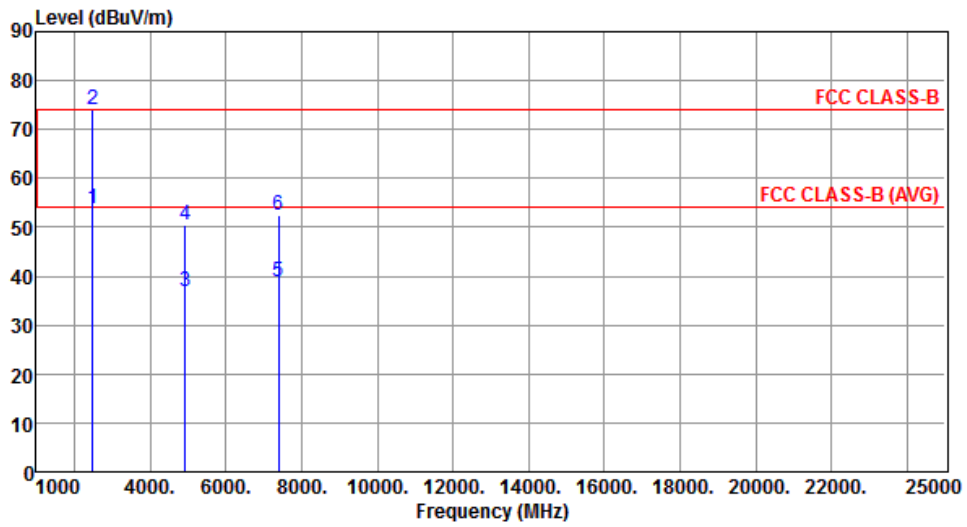
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	51.27	54.00	-2.73	54.07	-2.80	Average	352	283
2	2483.50	66.79	74.00	-7.21	69.59	-2.80	Peak	352	283
3	4924.00	44.14	54.00	-9.86	40.04	4.10	Average	196	153
4	4924.00	61.35	74.00	-12.65	57.25	4.10	Peak	196	153
5	7386.00	43.57	54.00	-10.43	35.13	8.44	Average	165	193
6	7386.00	57.63	74.00	-16.37	49.19	8.44	Peak	165	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).

<b>Modulation</b>	HT20	<b>Test Freq. (MHz)</b>	2462
<b>Polarization</b>	Vertical		



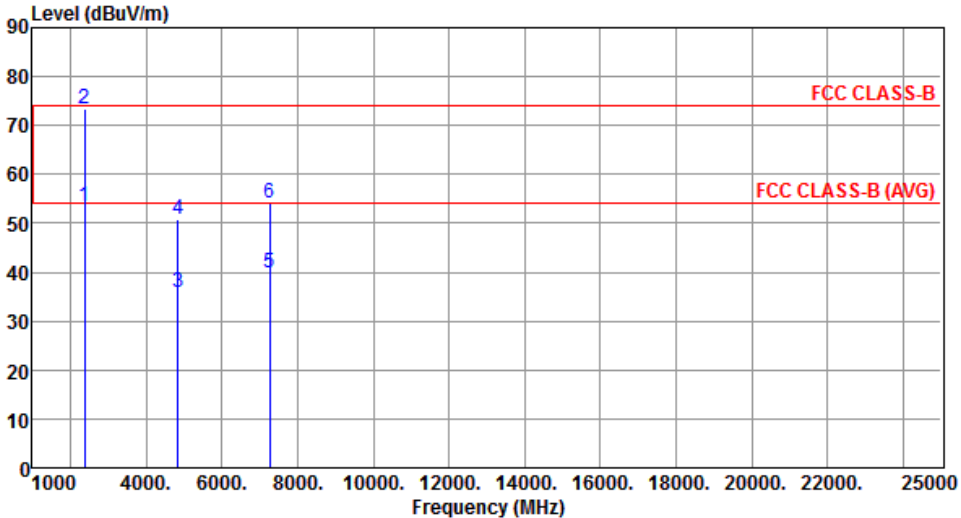
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.65	54.00	-0.35	56.45	-2.80	Average	120	98
2	2483.50	73.90	74.00	-0.10	76.70	-2.80	Peak	120	98
3	4924.00	36.94	54.00	-17.06	32.84	4.10	Average	231	295
4	4924.00	50.38	74.00	-23.62	46.28	4.10	Peak	231	295
5	7386.00	39.00	54.00	-15.00	30.56	8.44	Average	100	329
6	7386.00	52.35	74.00	-21.65	43.91	8.44	Peak	100	329

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

\*Factor includes antenna factor , cable loss and amplifier gain

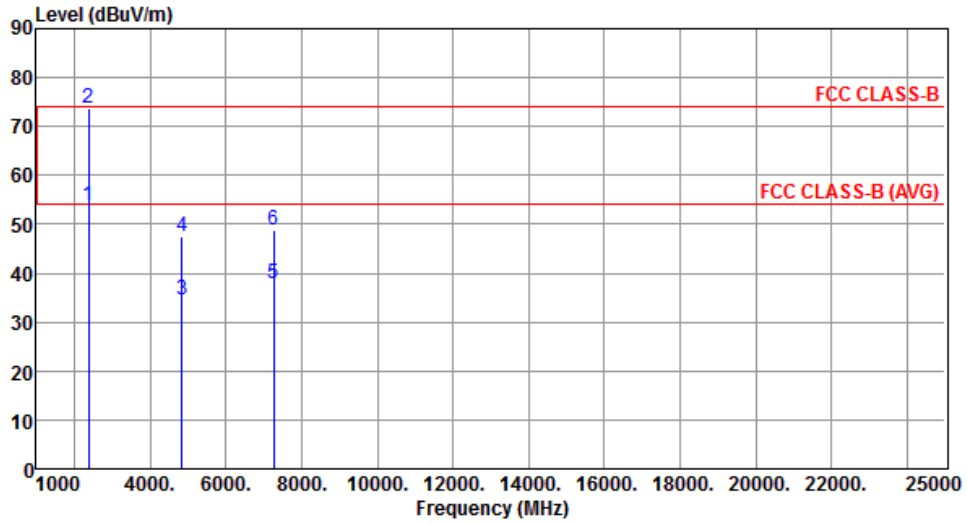
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

Modulation	HT40	Test Freq. (MHz)	2422						
Polarization	Horizontal								
									
Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	
MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	
1	2390.00	53.40	54.00	-0.60	56.58	-3.18	Average	134	20
2	2390.00	73.50	74.00	-0.50	76.68	-3.18	Peak	134	20
3	4844.00	35.80	54.00	-18.20	31.95	3.85	Average	224	154
4	4844.00	50.95	74.00	-23.05	47.10	3.85	Peak	224	154
5	7266.00	39.70	54.00	-14.30	31.31	8.39	Average	174	183
6	7266.00	54.00	74.00	-20.00	45.61	8.39	Peak	174	183

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

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2422
<b>Polarization</b>	Vertical		



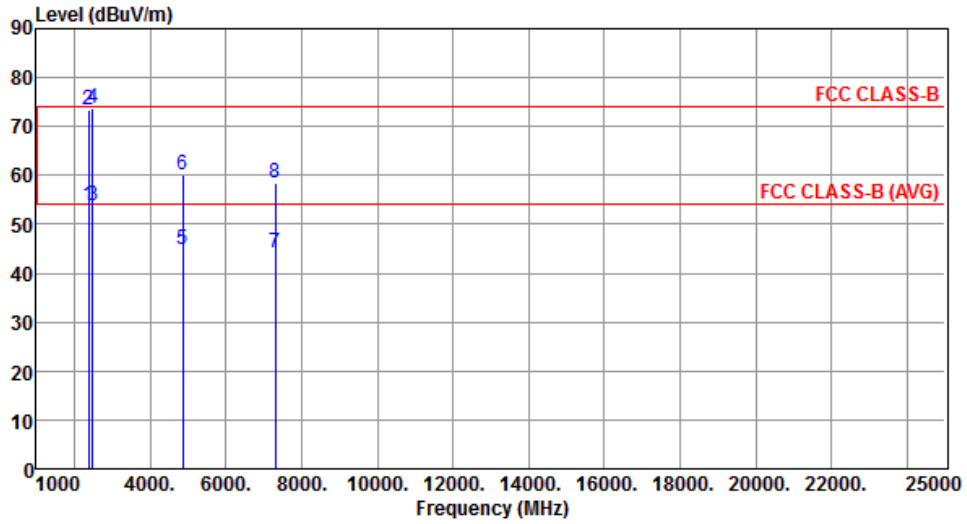
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.80	54.00	-0.20	56.98	-3.18	Average	100	97
2	2390.00	73.82	74.00	-0.18	77.00	-3.18	Peak	100	97
3	4844.00	34.47	54.00	-19.53	30.62	3.85	Average	215	302
4	4844.00	47.47	74.00	-26.53	43.62	3.85	Peak	215	302
5	7266.00	37.76	54.00	-16.24	29.37	8.39	Average	171	283
6	7266.00	48.78	74.00	-25.22	40.39	8.39	Peak	171	283

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).

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Horizontal		



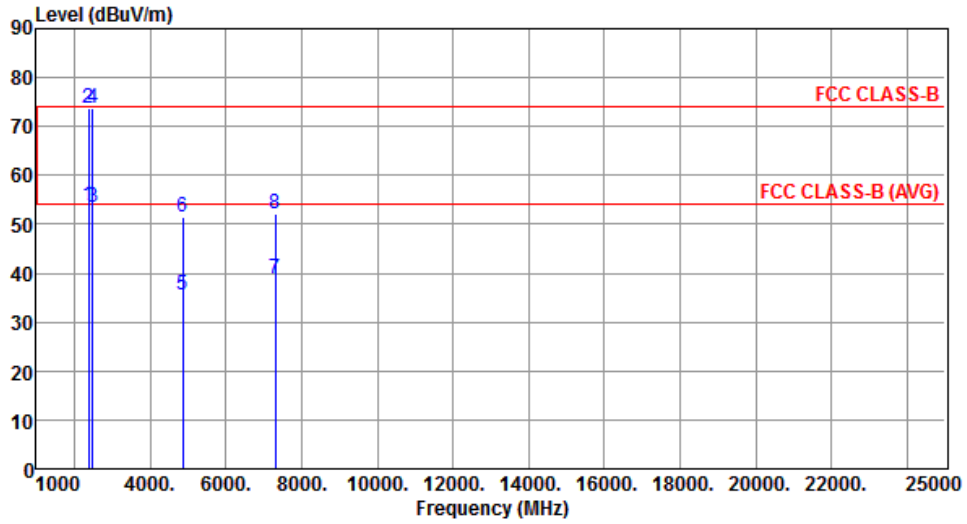
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.65	54.00	-0.35	56.83	-3.18	Average	100	0
2	2390.00	73.42	74.00	-0.58	76.60	-3.18	Peak	100	0
3	2483.50	53.74	54.00	-0.26	56.54	-2.80	Average	100	0
4	2483.50	73.60	74.00	-0.40	76.40	-2.80	Peak	100	0
5	4874.00	44.90	54.00	-9.10	40.96	3.94	Average	190	146
6	4874.00	59.97	74.00	-14.03	56.03	3.94	Peak	190	146
7	7311.00	44.16	54.00	-9.84	35.75	8.41	Average	195	186
8	7311.00	58.30	74.00	-15.70	49.89	8.41	Peak	195	186

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2437
<b>Polarization</b>	Vertical		



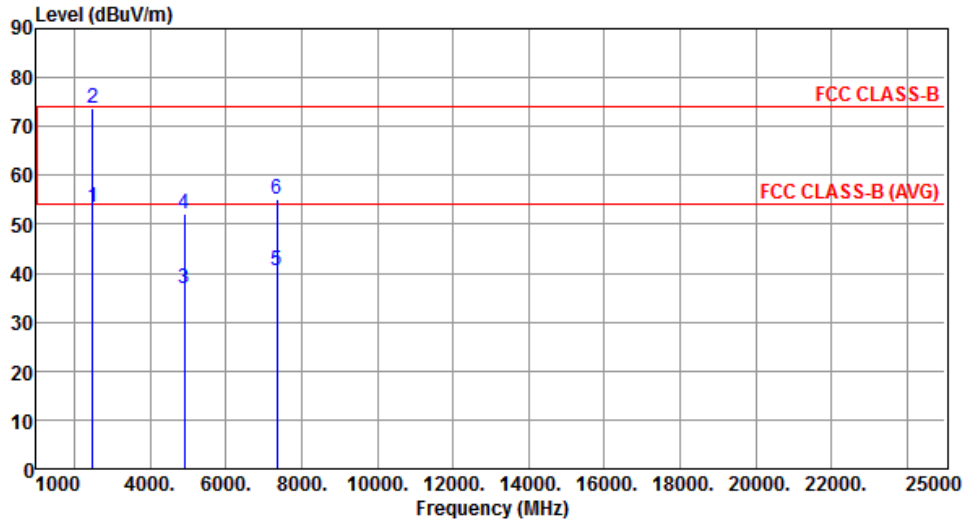
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	53.85	54.00	-0.15	57.03	-3.18	Average	100	98
2	2390.00	73.87	74.00	-0.13	77.05	-3.18	Peak	100	98
3	2483.50	53.53	54.00	-0.47	56.33	-2.80	Average	100	98
4	2483.50	73.62	74.00	-0.38	76.42	-2.80	Peak	100	98
5	4874.00	35.38	54.00	-18.62	31.44	3.94	Average	262	43
6	4874.00	51.57	74.00	-22.43	47.63	3.94	Peak	262	43
7	7311.00	38.82	54.00	-15.18	30.41	8.41	Average	281	243
8	7311.00	52.04	74.00	-21.96	43.63	8.41	Peak	281	243

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).

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2452
<b>Polarization</b>	Horizontal		



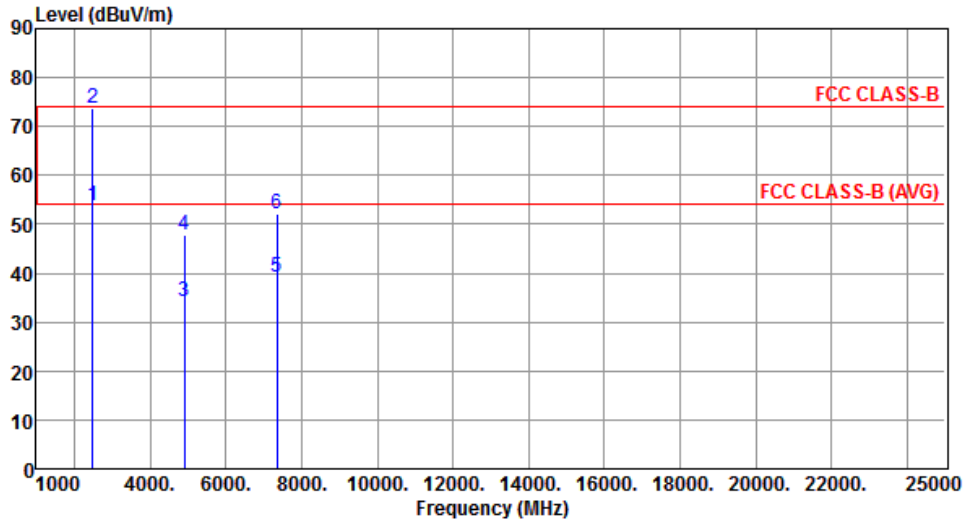
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	53.46	54.00	-0.54	56.26	-2.80	Average	339	235
2	2483.50	73.63	74.00	-0.37	76.43	-2.80	Peak	339	235
3	4904.00	36.72	54.00	-17.28	32.67	4.05	Average	218	156
4	4904.00	52.06	74.00	-21.94	48.01	4.05	Peak	218	156
5	7356.00	40.59	54.00	-13.41	32.16	8.43	Average	165	182
6	7356.00	55.29	74.00	-18.71	46.86	8.43	Peak	165	182

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

<b>Modulation</b>	HT40	<b>Test Freq. (MHz)</b>	2452
<b>Polarization</b>	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	53.88	54.00	-0.12	56.68	-2.80	Average	131	92
2	2483.50	73.85	74.00	-0.15	76.65	-2.80	Peak	131	92
3	4904.00	34.33	54.00	-19.67	30.28	4.05	Average	269	113
4	4904.00	47.86	74.00	-26.14	43.81	4.05	Peak	269	113
5	7356.00	39.04	54.00	-14.96	30.61	8.43	Average	295	184
6	7356.00	52.18	74.00	-21.82	43.75	8.43	Peak	295	184

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

\*Factor includes antenna factor , cable loss and amplifier gain

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



## 3.6 Emissions in Non-Restricted Frequency Bands

### 3.6.1 Emissions in Non-Restricted Frequency Bands Limit

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

### 3.6.2 Measuring Instruments

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

### 3.6.3 Test Procedures

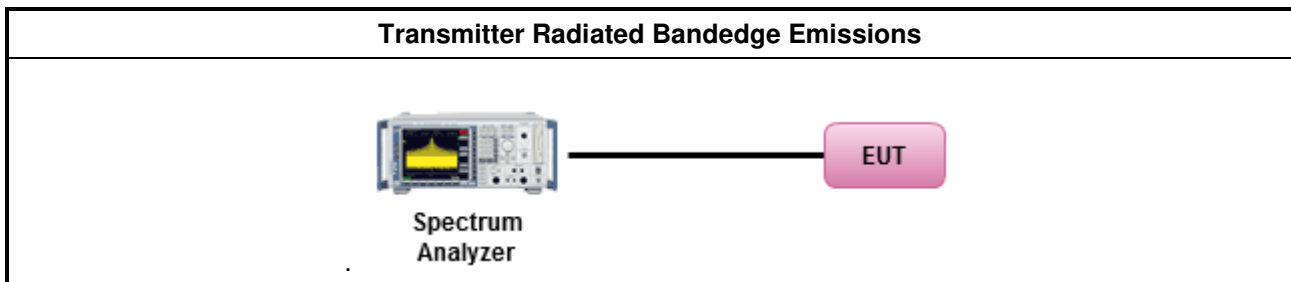
#### Reference level measurement

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

#### Emission level measurement

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

### 3.6.4 Test Setup

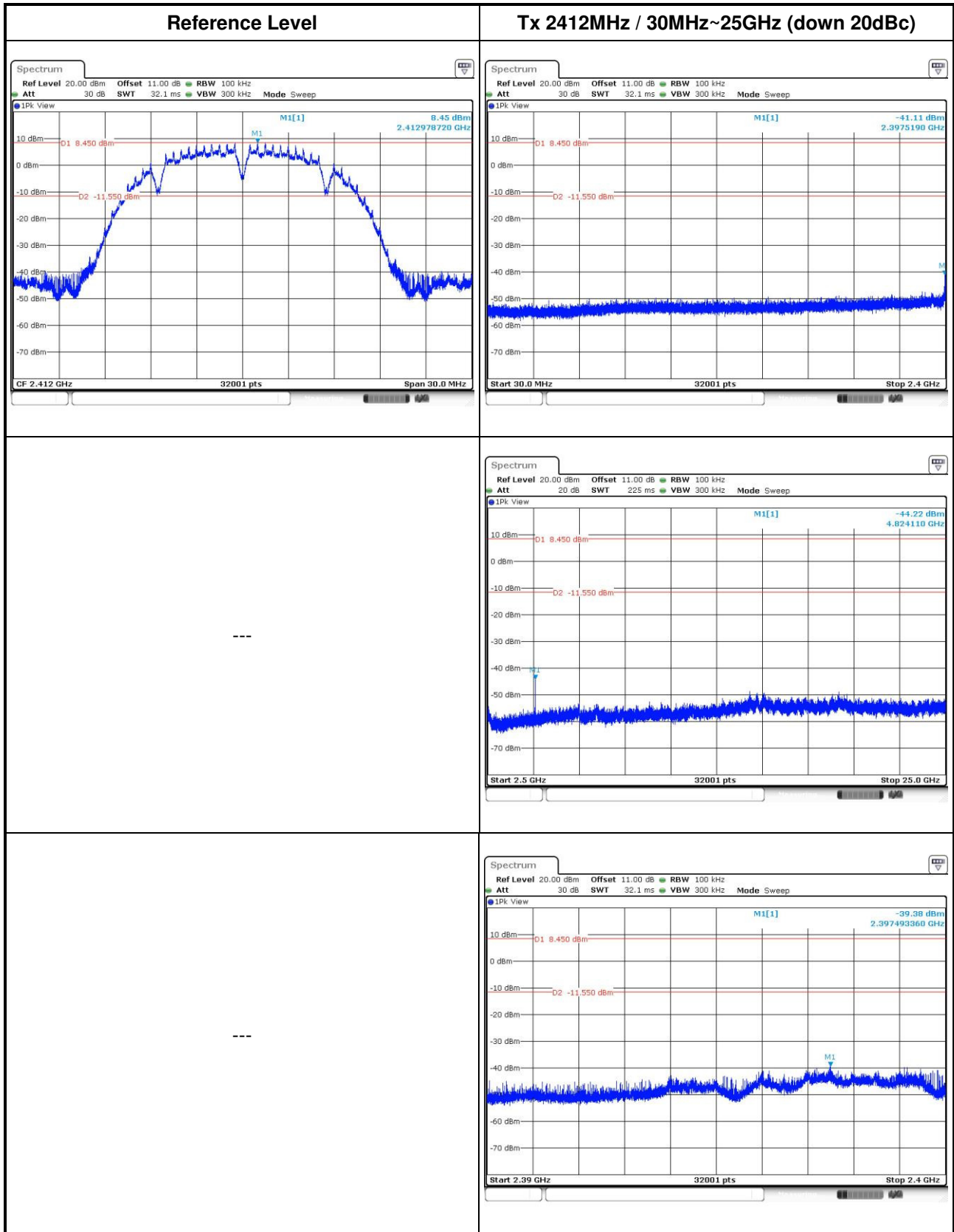


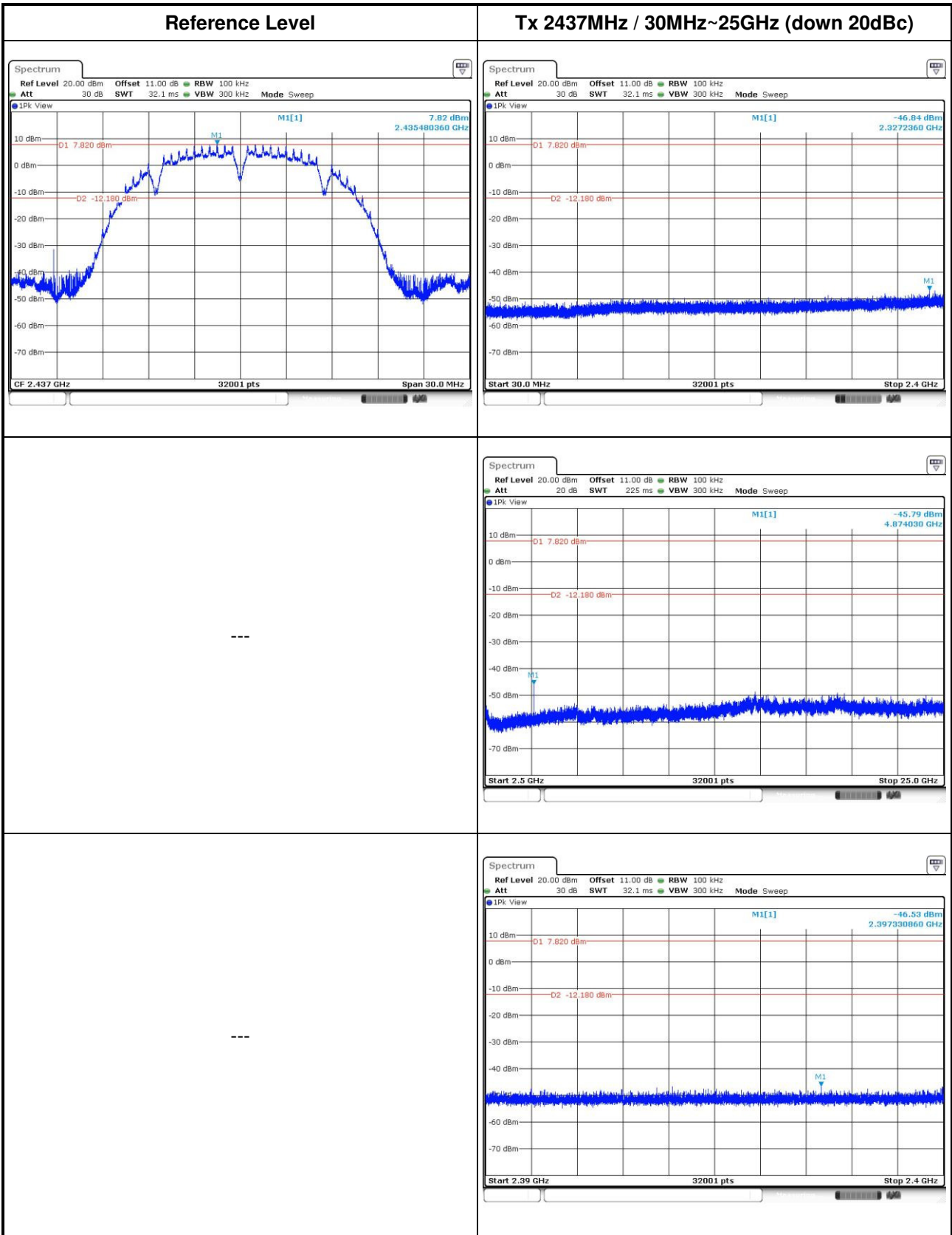
### 3.6.5 Test Result of Emissions in non-restricted frequency bands

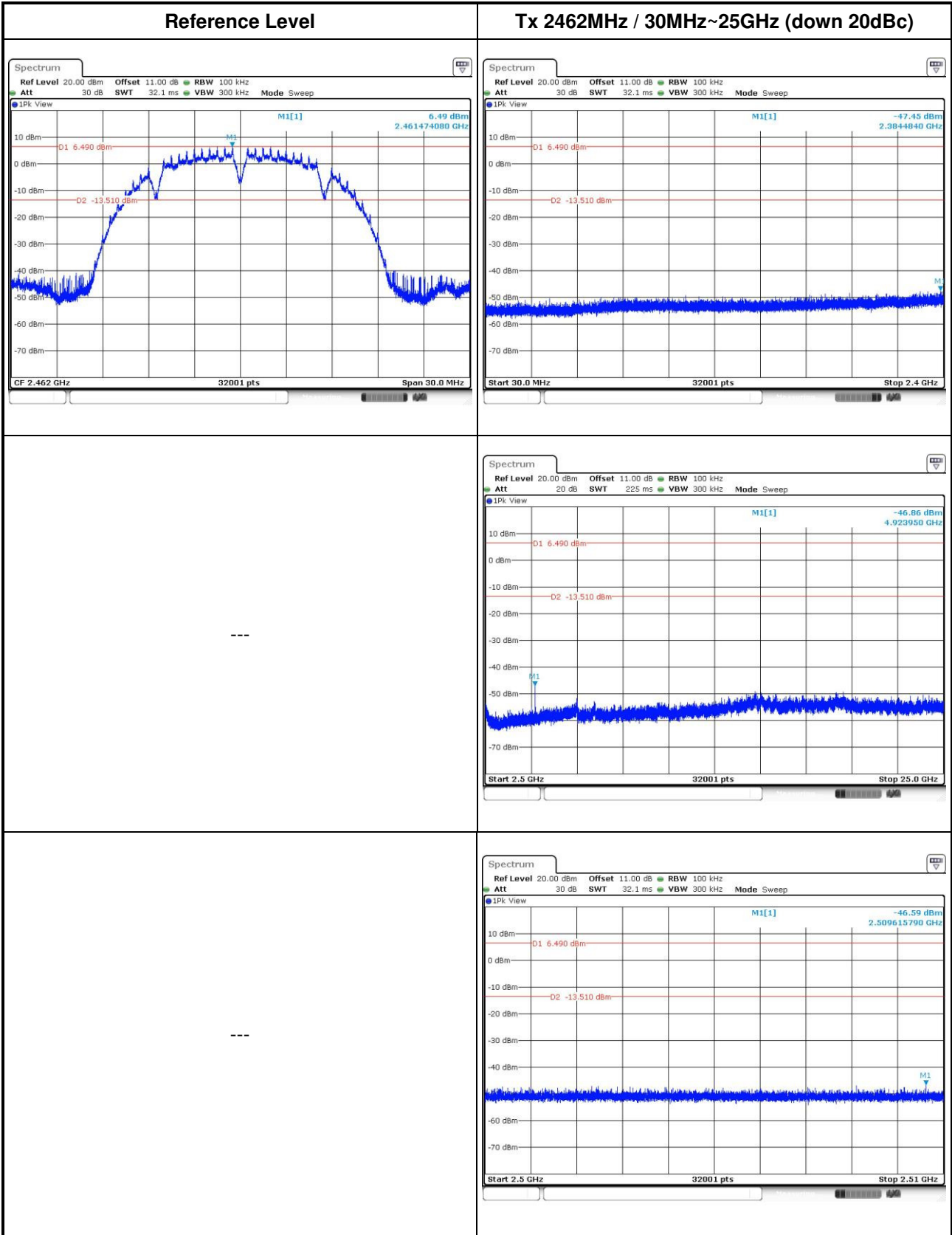
This test item is performed on each TX output individually without summing or adding  $10 \log(N_{ANT})$  since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

### 3.6.6 Unwanted Emissions into Non-Restricted Frequency Bands

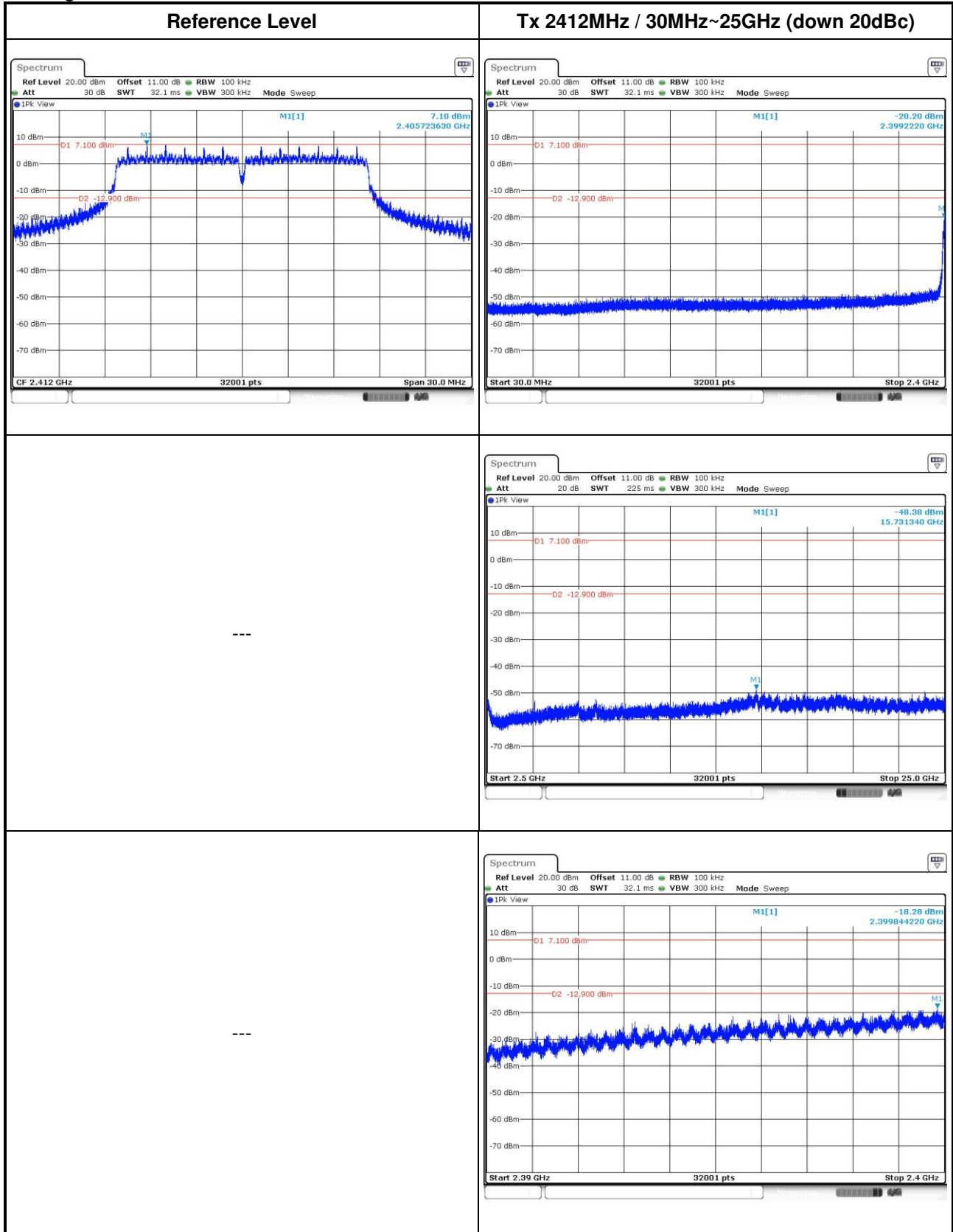
#### 802.11b

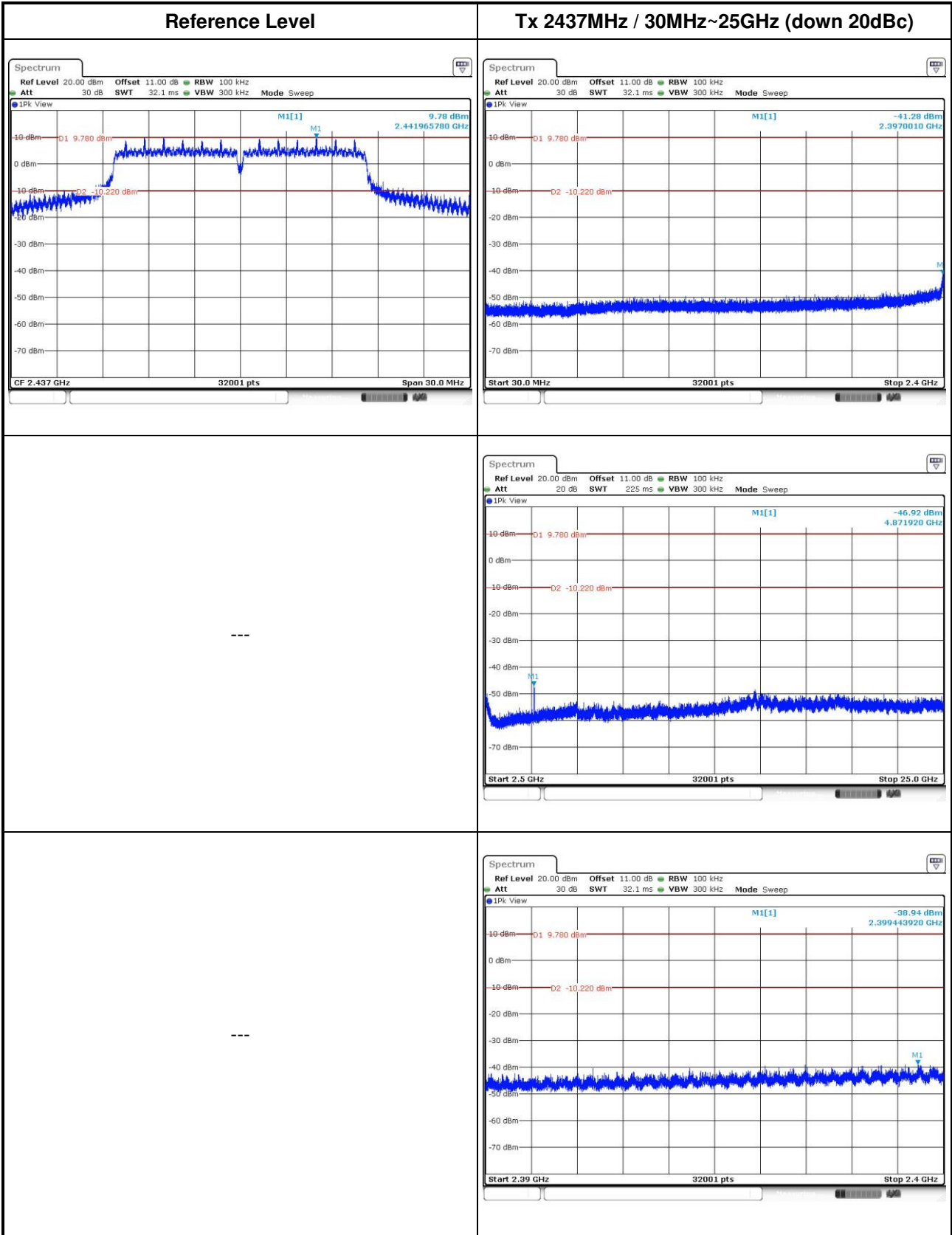




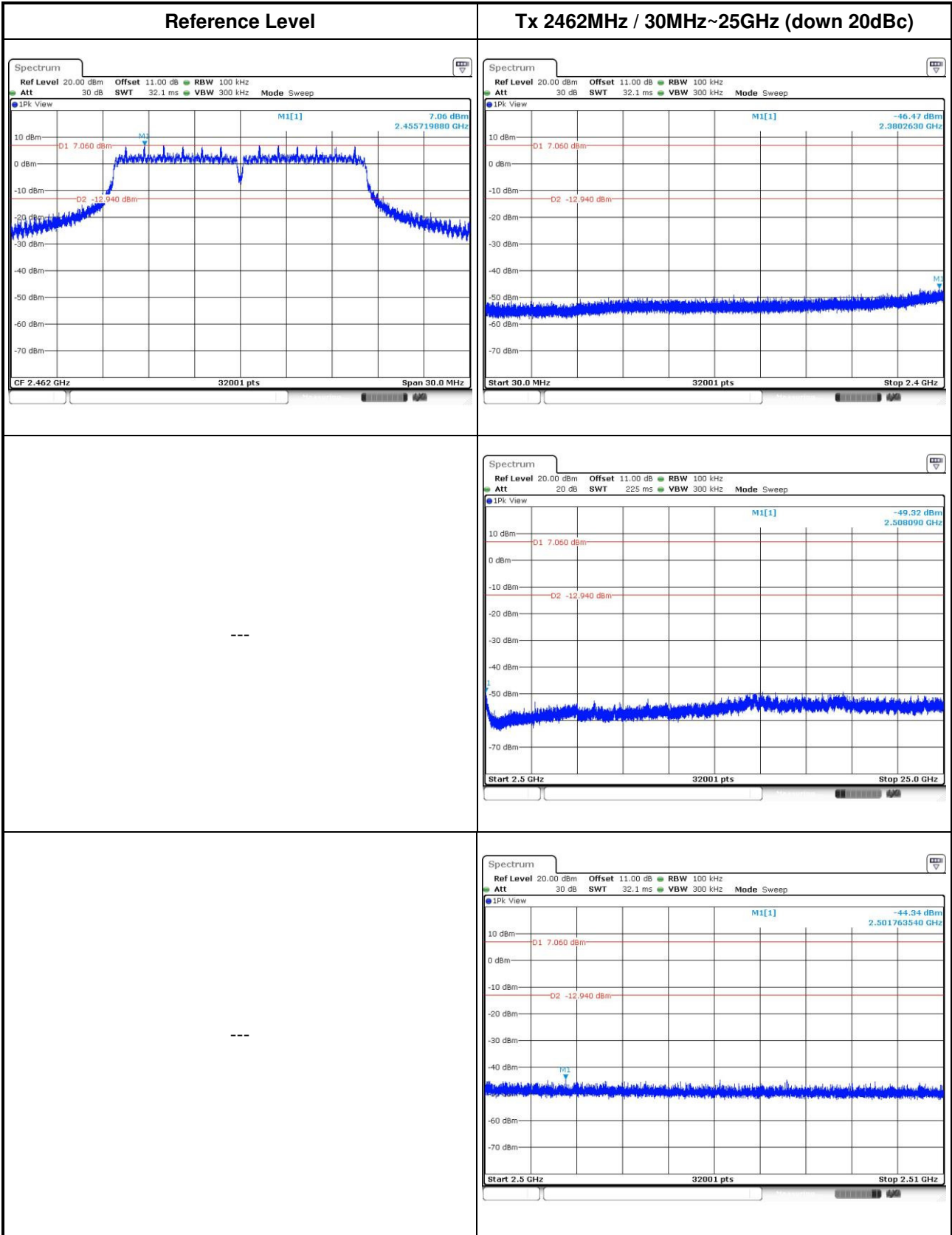


802.11g

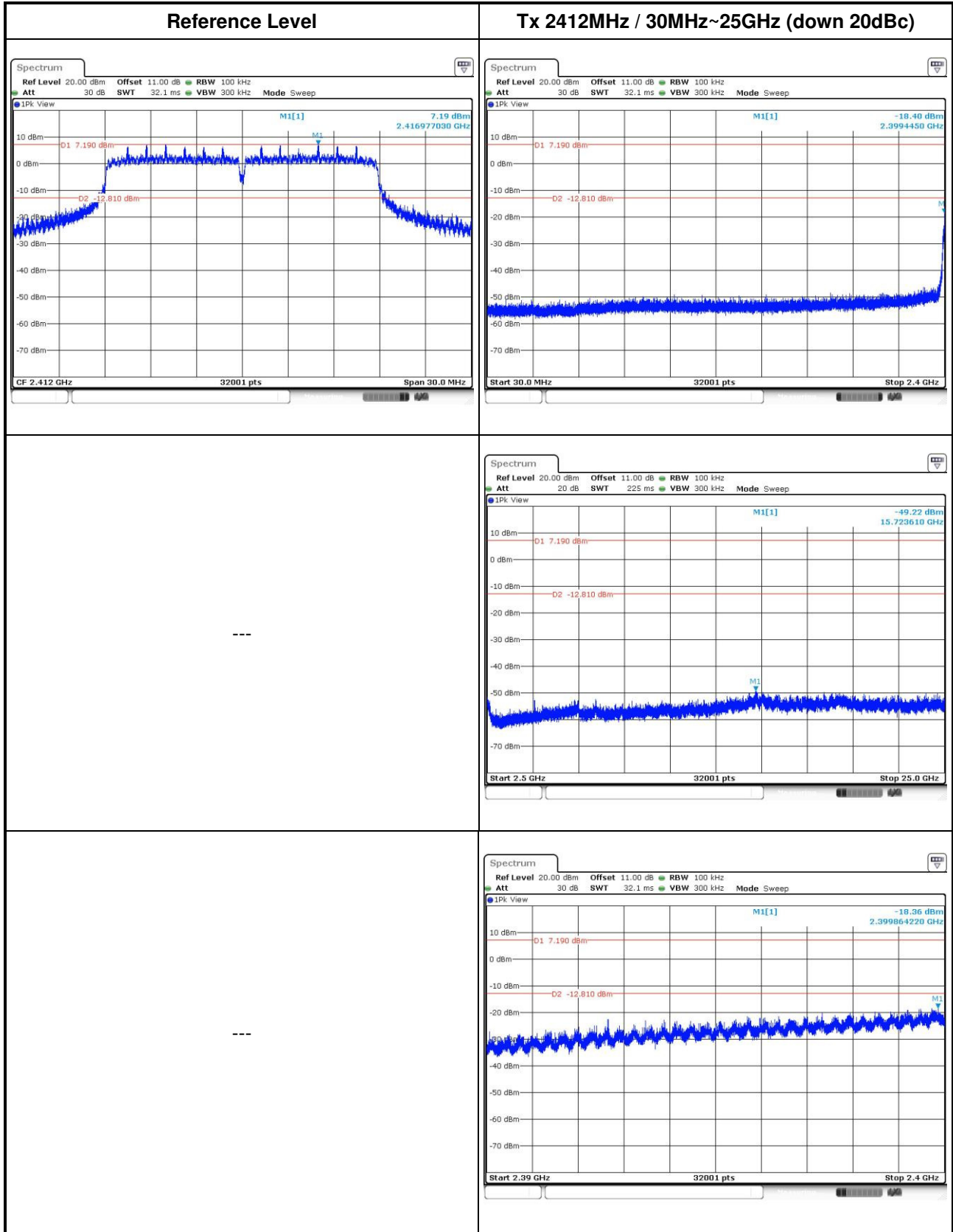




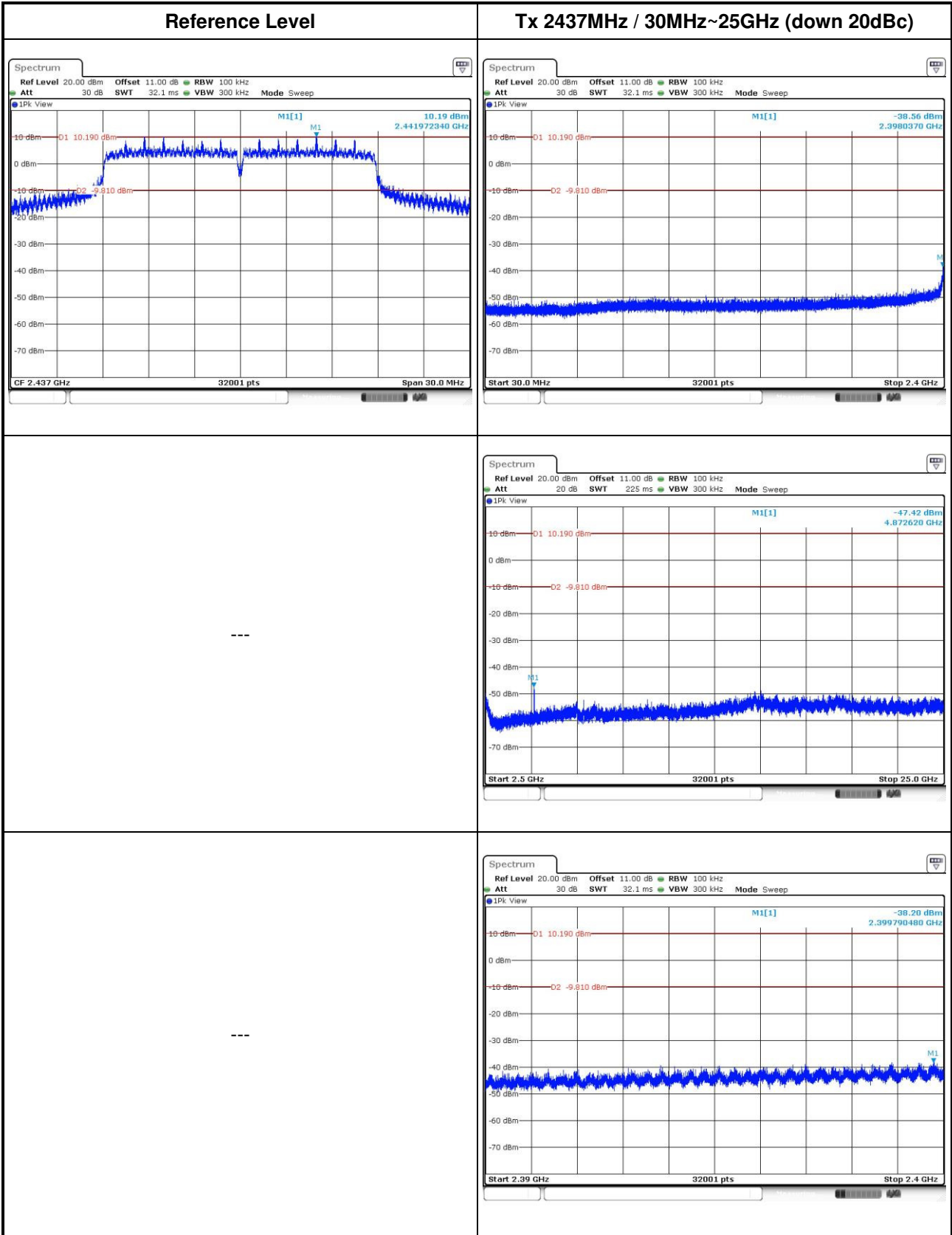


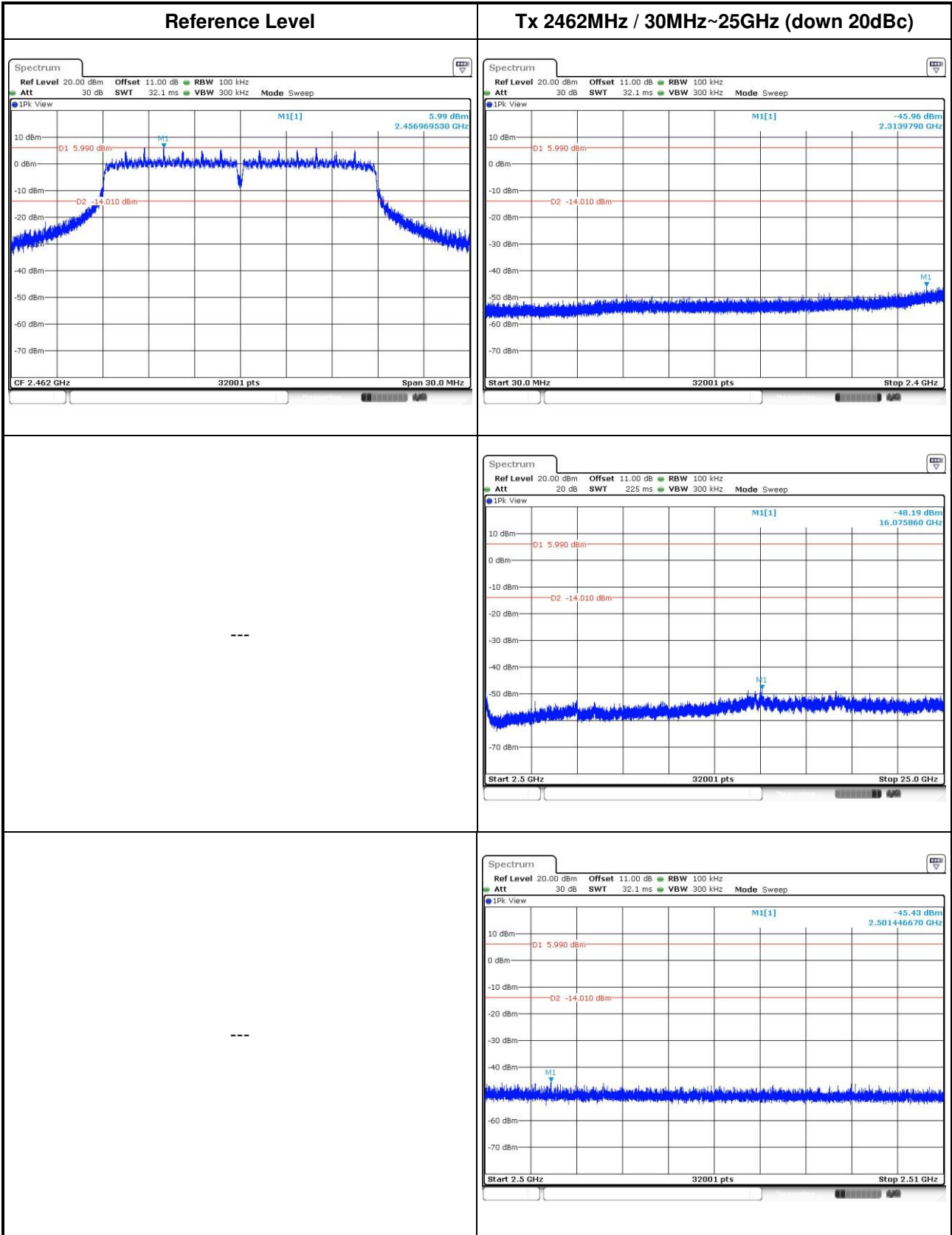


802.11n HT20

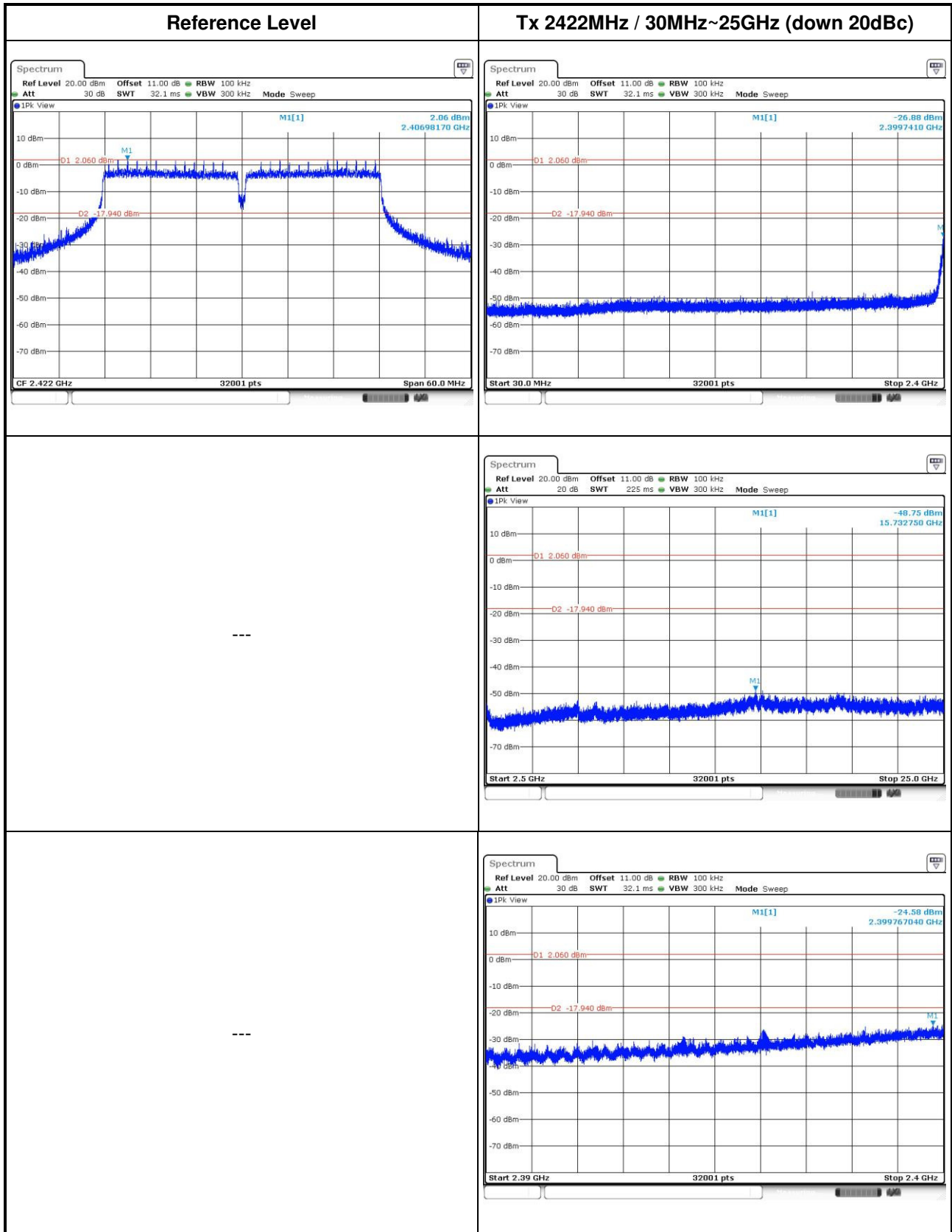


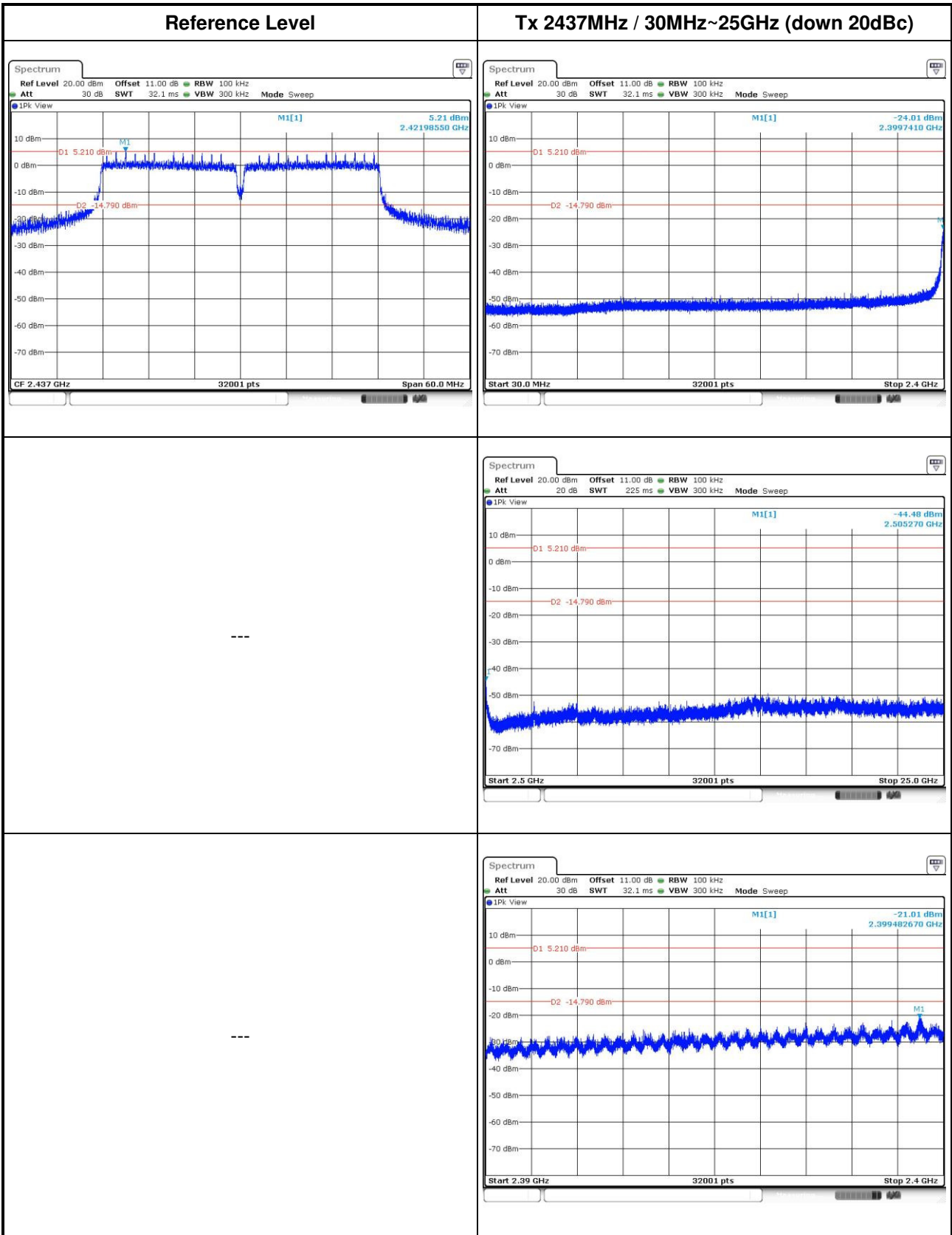


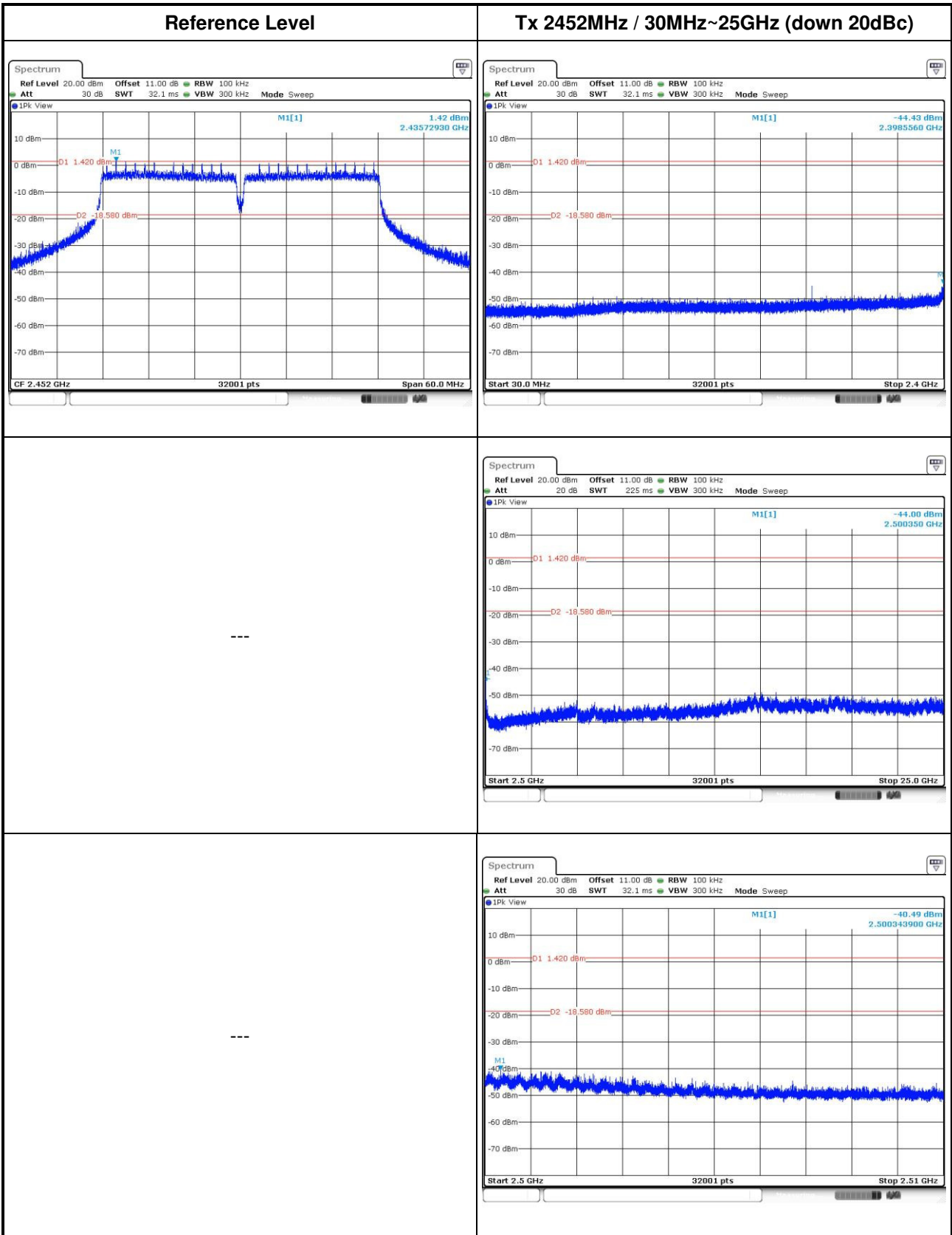




802.11n HT40







## 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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