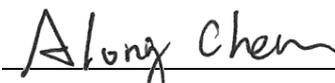


# FCC Test Report

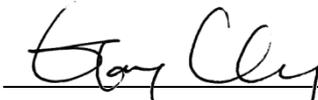
**FCC ID** : QIS-B5338-168  
**Equipment** : LTE Indoor CPE  
**Model No.** : B5338-168  
**Brand Name** : Huawei  
**Applicant** : Huawei Technologies Co., Ltd.  
**Address** : Administration Building, Headquarters of  
Huawei Technologies Co., Ltd., Bantian,  
Longgang District, Shenzhen, 518129, China.  
**Standard** : 47 CFR FCC Part 15.247  
**Received Date** : Sep. 23, 2016  
**Tested Date** : Sep. 26 ~ Dec. 21, 2016

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

Reviewed by:

  
\_\_\_\_\_  
Along Chen / Assistant Manager

Approved by:

  
\_\_\_\_\_  
Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR690901-01AC	Rev. 01	Initial issue	Mar. 06, 2017

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.267MHz 35.92 (Margin -15.28dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 2390.00MHz 52.99 (Margin -1.01dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 25.12	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	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)		
			2400~2483.5	5150~5250	5725~5850
1	PIFA	UFL	2.45	1.3	2.96
2	PIFA	UFL	2.46	1.97	2.99

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

<b>Power Supply Type</b>	12Vdc from adapter
--------------------------	--------------------

### 1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter	Brand: APD Model: WB-24D12FU Power Rating: I/P: 100-240Vac, 50/60Hz, 0.6A Max. O/P: 12Vdc, 2A Power Line: 1.5m non-shielded cable w/o core Efficiency Level: VI
2	AC adapter	Brand: SHENZHEN FRECOM Model: F24W7-120200SPAU Power Rating: I/P: 100-240Vac, 50/60Hz, 0.6A O/P: 12Vdc, 2A Power Line: 1.5m non-shielded cable w/o core Efficiency Level: VI
3	Core (x2) for RJ45	Brand: King core Model: KCF-130
4	Core (x1) for RJ11	Brand: King core Model: K5B RC 16x28x9-M2

### 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

<b>Test Tool</b>	QATool, Version: 0.0.0.68		
<b>Duty Cycle and Duty Factor</b>	<b>Mode</b>	<b>Duty cycle (%)</b>	<b>Duty factor (dB)</b>
	11b	99.32%	0.03
	11g	94.63%	0.24
	HT20	96.84%	0.14
	HT40	88.98%	0.51

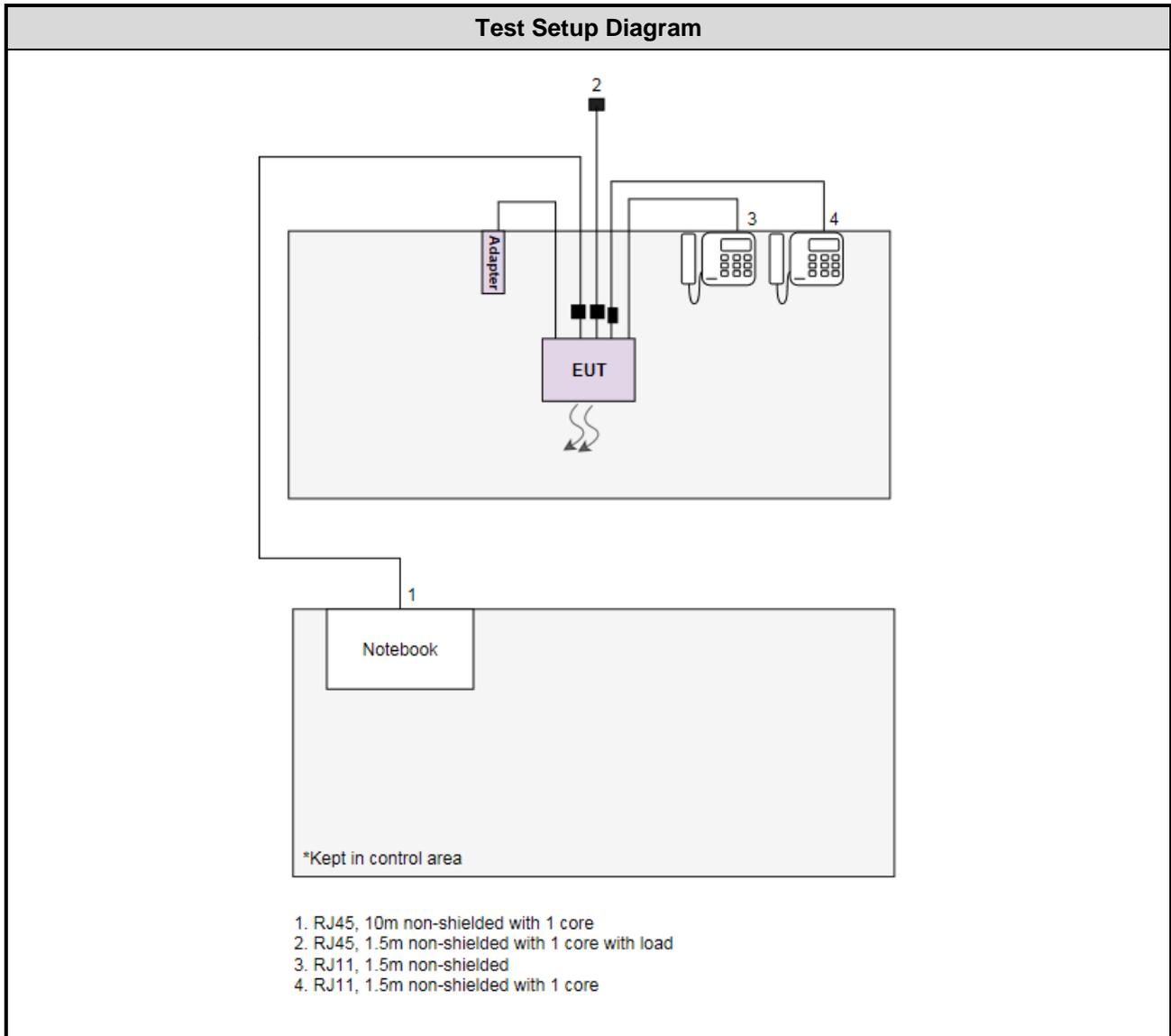
### 1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	29
11b	2437	2A
11b	2462	26
11g	2412	2A
11g	2437	2D
11g	2462	29
HT20	2412	29
HT20	2437	2D
HT20	2462	29
HT40	2422	23
HT40	2437	2C
HT40	2452	25

## 1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5420	B6FT9T1	DoC	RJ45, 10m non-shielded with 1 core.
2	Telephone	HTT	HTT-806	187118	---	RJ11, 1.5m non-shielded with 1 core.
3	Telephone	HTT	HTT-806	188597	---	RJ11, 1.5m non-shielded.
4	RJ45 Load	ICC	---	---	---	RJ45, 10m non-shielded with 1 core.

### 1.3 Test Setup Chart



## 1.4 The Equipment List

<b>Test Item</b>	Conducted Emission				
<b>Test Site</b>	Conduction room 1 / (CO01-WS)				
<b>Test Date</b>	Dec. 21, 2016				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Receiver	R&S	ESR3	101657	Jan. 12, 2016	Jan. 11, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber1 / (03CH01-WS)				
<b>Tested Date</b>	Sep. 26, 2016				
<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	101498	Dec. 13, 2015	Dec. 12, 2016
Receiver	R&S	ESR3	101658	Nov. 04, 2015	Nov. 03, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 04, 2016	Aug. 03, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 16, 2015	Dec. 15, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 16, 2015	Nov. 15, 2016
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 10, 2015	Dec. 09, 2016
Preamplifier	EMC	EMC02325	980225	Aug. 05, 2016	Aug. 04, 2017
Preamplifier	Agilent	83017A	MY39501308	Oct. 02, 2015	Oct. 01, 2016
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 10, 2015	Dec. 09, 2016
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	16052	Dec. 10, 2015	Dec. 09, 2016
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 10, 2015	Dec. 09, 2016
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 10, 2015	Dec. 09, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission				
<b>Test Site</b>	966 chamber1 / (03CH01-WS)				
<b>Tested Date</b>	Dec. 15, 2016				
<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	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 04, 2016	Aug. 03, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 16, 2015	Dec. 15, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna 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>Tested Date</b>	Oct. 14, 2016				
<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	Feb. 17, 2016	Feb. 16, 2017
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 26, 2015	Oct. 25, 2016
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	19°C / 62%	Howard Huang
Radiated Emissions	03CH01-WS	20-26°C / 61-62%	Vincent Yeh Kevin Lee
RF Conducted	TH01-WS	23°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	11b	2437	1 Mbps	---
Radiated Emissions ≤1GHz	11b	2437	1 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. Two adapters had been covered during the pretest and found that **Adapter 2** was the worst case and was selected for final testing (Adapter 1: APD; Adapter 2: SHENZHEN FRECOM).

## 3 Transmitter Test Results

### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

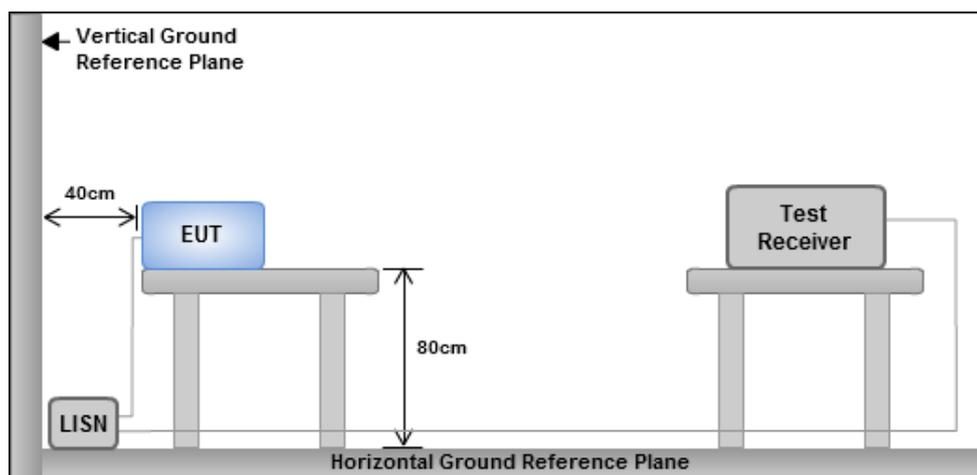
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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

#### 3.1.2 Test Procedures

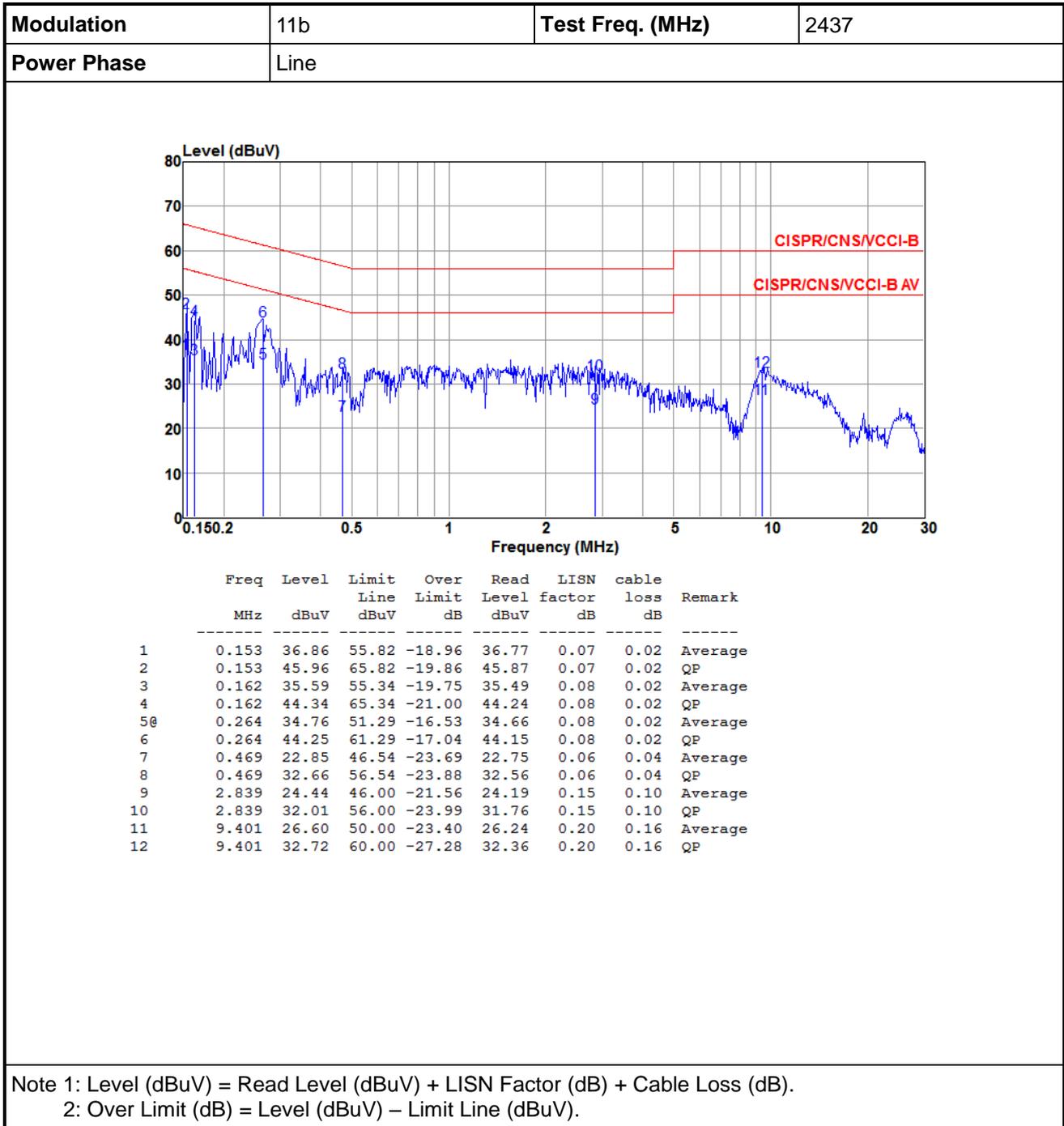
1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels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

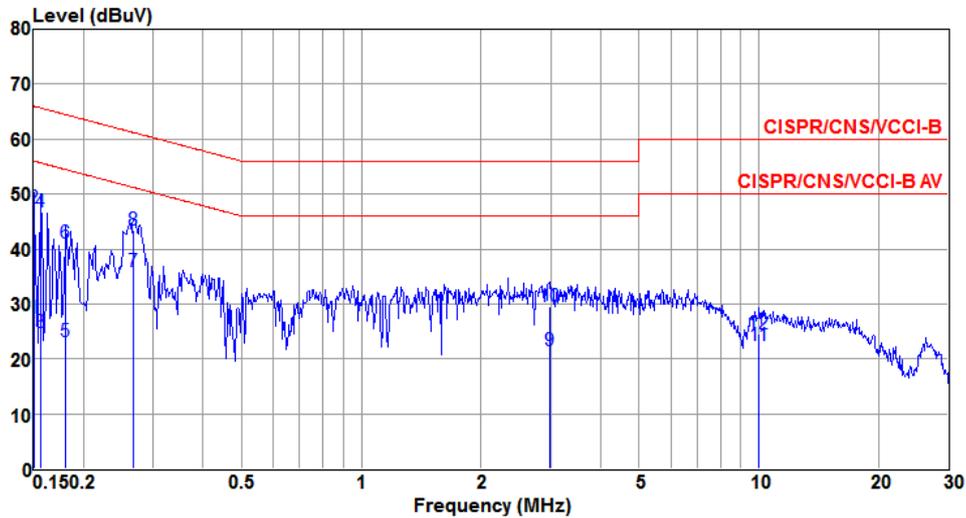


- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

### 3.1.4 Test Result of Conducted Emissions



<b>Modulation</b>	11b	<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	0.150	27.43	56.00	-28.57	27.31	0.10	0.02	Average
2	0.150	47.41	66.00	-18.59	47.29	0.10	0.02	QP
3	0.156	24.69	55.65	-30.96	24.57	0.10	0.02	Average
4	0.156	46.67	65.65	-18.98	46.55	0.10	0.02	QP
5	0.181	23.04	54.46	-31.42	22.93	0.09	0.02	Average
6	0.181	41.06	64.46	-23.40	40.95	0.09	0.02	QP
7	0.267	35.92	51.20	-15.28	35.79	0.11	0.02	Average
8	0.267	43.36	61.20	-17.84	43.23	0.11	0.02	QP
9	2.978	21.55	46.00	-24.45	21.30	0.15	0.10	Average
10	2.978	29.48	56.00	-26.52	29.23	0.15	0.10	QP
11	10.019	22.34	50.00	-27.66	21.87	0.31	0.16	Average
12	10.019	24.53	60.00	-35.47	24.06	0.31	0.16	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

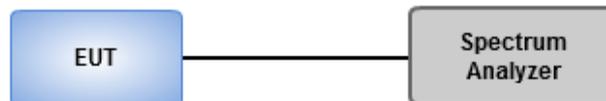
#### 6dB Bandwidth

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

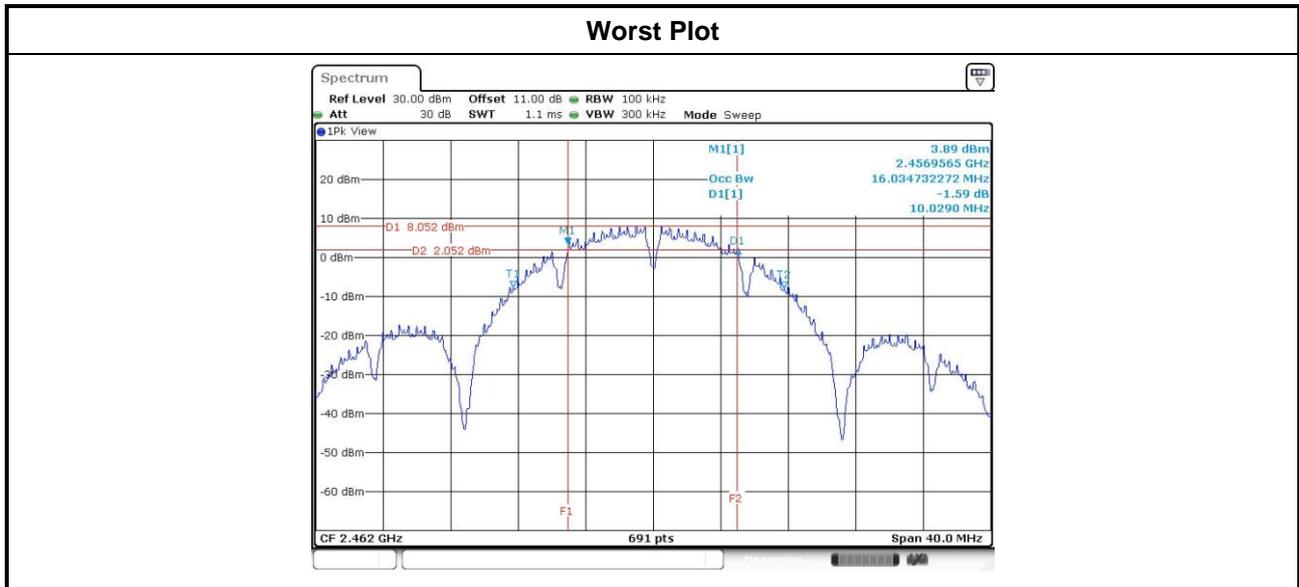
1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

### 3.2.3 Test Setup

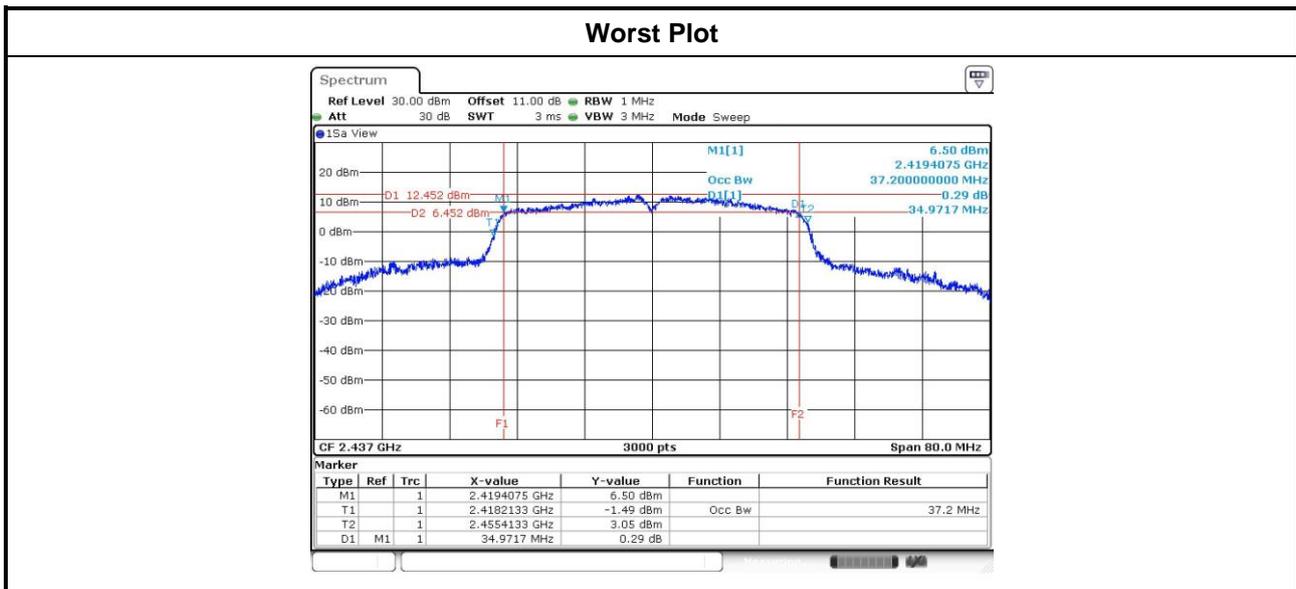


### 3.2.4 Test Result of 6dB and Occupied Bandwidth

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	10.03	---	---	500
11g	2	2412	13.86	15.30	---	---	500
11g	2	2437	15.13	15.07	---	---	500
11g	2	2462	15.71	15.71	---	---	500
HT20	2	2412	15.13	15.13	---	---	500
HT20	2	2437	16.52	15.07	---	---	500
HT20	2	2462	16.35	15.07	---	---	500
HT40	2	2422	35.01	35.13	---	---	500
HT40	2	2437	33.74	35.13	---	---	500
HT40	2	2452	27.59	31.30	---	---	500



Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	16.12	15.41	---	---
11b	2	2437	17.83	18.56	---	---
11b	2	2462	16.37	15.77	---	---
11g	2	2412	16.93	16.91	---	---
11g	2	2437	19.08	18.07	---	---
11g	2	2462	20.29	18.07	---	---
HT20	2	2412	17.84	17.76	---	---
HT20	2	2437	20.79	19.11	---	---
HT20	2	2462	22.01	18.73	---	---
HT40	2	2422	36.37	35.97	---	---
HT40	2	2437	37.20	36.85	---	---
HT40	2	2452	36.05	35.79	---	---



## 3.3 RF Output Power

### 3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

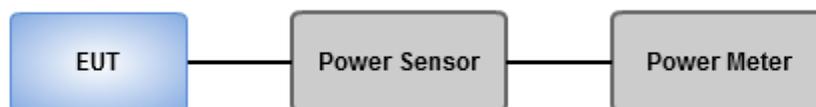
- Antenna gain  $\leq$  6dBi, no any corresponding reduction is in output power limit.
- Antenna gain  $>$  6dBi
  - Non Fixed, point to point operations.  
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 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	20.65	21.12	---	---	245.564	23.90	30.00	2.46	26.36	36.00
11b	2	2437	22.29	21.92	---	---	325.030	25.12	30.00	2.46	27.58	36.00
11b	2	2462	20.11	19.29	---	---	187.483	22.73	30.00	2.46	25.19	36.00
11g	2	2412	21.3	21.45	---	---	274.533	24.39	30.00	2.46	26.85	36.00
11g	2	2437	22.13	21.92	---	---	318.902	25.04	30.00	2.46	27.50	36.00
11g	2	2462	21.4	20.52	---	---	250.758	23.99	30.00	2.46	26.45	36.00
HT20	2	2412	21.26	21.34	---	---	269.804	24.31	30.00	2.46	26.77	36.00
HT20	2	2437	22.15	21.95	---	---	320.734	25.06	30.00	2.46	27.52	36.00
HT20	2	2462	21.48	20.62	---	---	255.950	24.08	30.00	2.46	26.54	36.00
HT40	2	2422	20.54	20.61	---	---	228.320	23.59	30.00	2.46	26.05	36.00
HT40	2	2437	22.05	21.69	---	---	307.895	24.88	30.00	2.46	27.34	36.00
HT40	2	2452	20.49	20.66	---	---	228.356	23.59	30.00	2.46	26.05	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	19.18	19.88	---	---	180.069	22.55	---
11b	2	2437	21.02	20.81	---	---	246.977	23.93	---
11b	2	2462	18.74	18.01	---	---	138.058	21.40	---
11g	2	2412	16.15	16.62	---	---	87.130	19.40	---
11g	2	2437	17.84	17.79	---	---	120.931	20.83	---
11g	2	2462	16.35	16.23	---	---	85.128	19.30	---
HT20	2	2412	15.67	16.12	---	---	77.824	18.91	---
HT20	2	2437	17.87	17.83	---	---	121.909	20.86	---
HT20	2	2462	16.57	16.24	---	---	87.467	19.42	---
HT40	2	2422	12.39	12.96	---	---	37.108	15.69	---
HT40	2	2437	16.99	17.14	---	---	101.764	20.08	---
HT40	2	2452	13.65	13.84	---	---	47.384	16.76	---

Note: Conducted average output power is for reference only.

## 3.4 Power Spectral Density

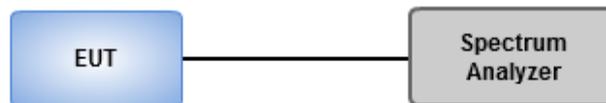
### 3.4.1 Limit of Power Spectral Density

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:  $\geq 10 \times$  (number of measurement points in sweep)  $\times$  (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.

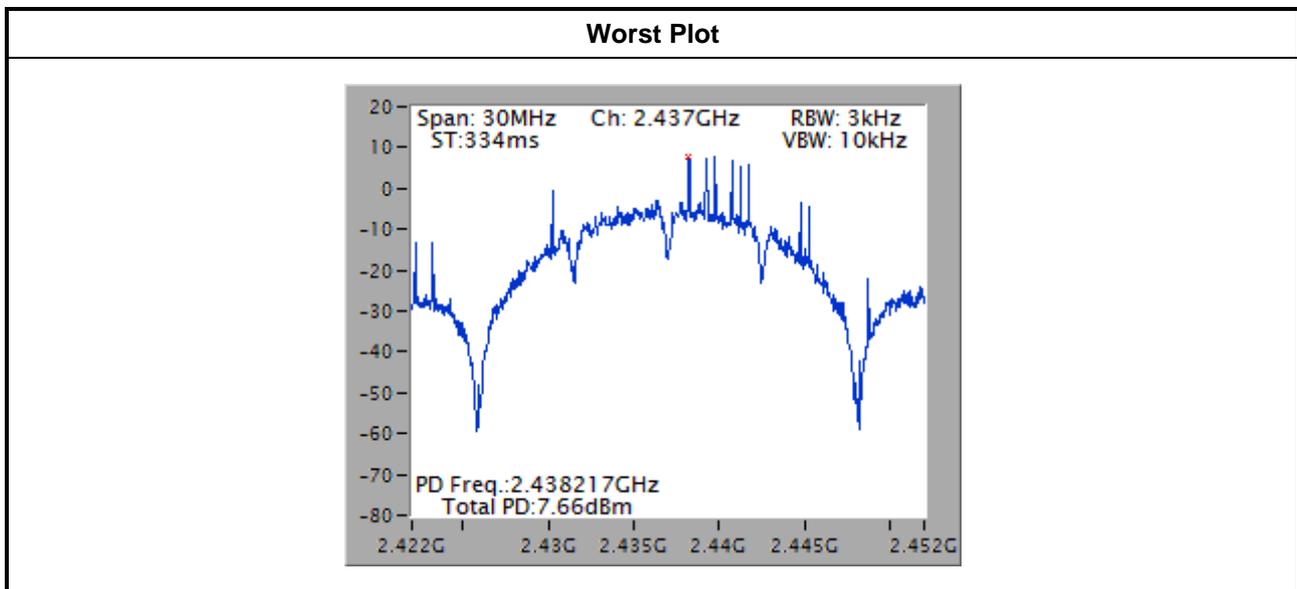
### 3.4.3 Test Setup



### 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	7.21	8.00
11b	2	2437	7.66	8.00
11b	2	2462	5.67	8.00
11g	2	2412	-7.75	8.00
11g	2	2437	-6.55	8.00
11g	2	2462	-8.27	8.00
HT20	2	2412	-7.48	8.00
HT20	2	2437	-6.10	8.00
HT20	2	2462	-8.41	8.00
HT40	2	2422	-13.79	8.00
HT40	2	2437	-9.10	8.00
HT40	2	2452	-11.92	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

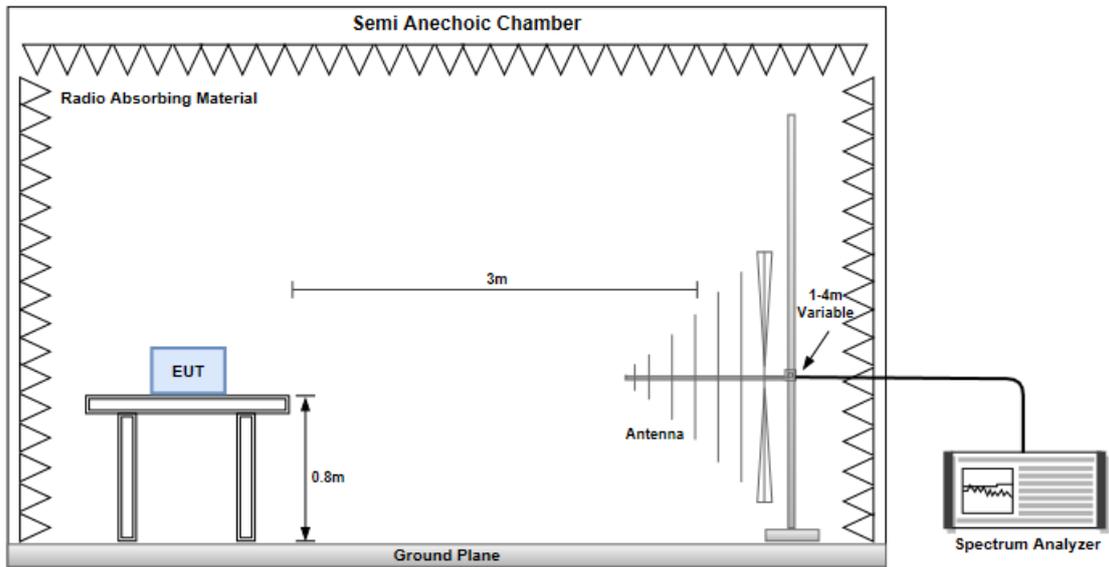
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

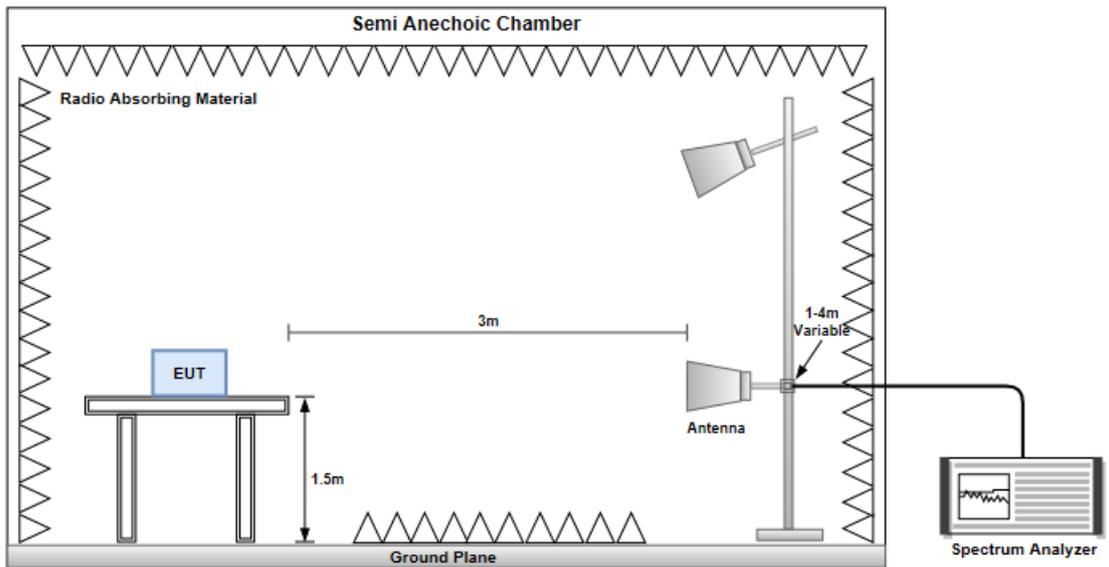
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

### 3.5.3 Test Setup

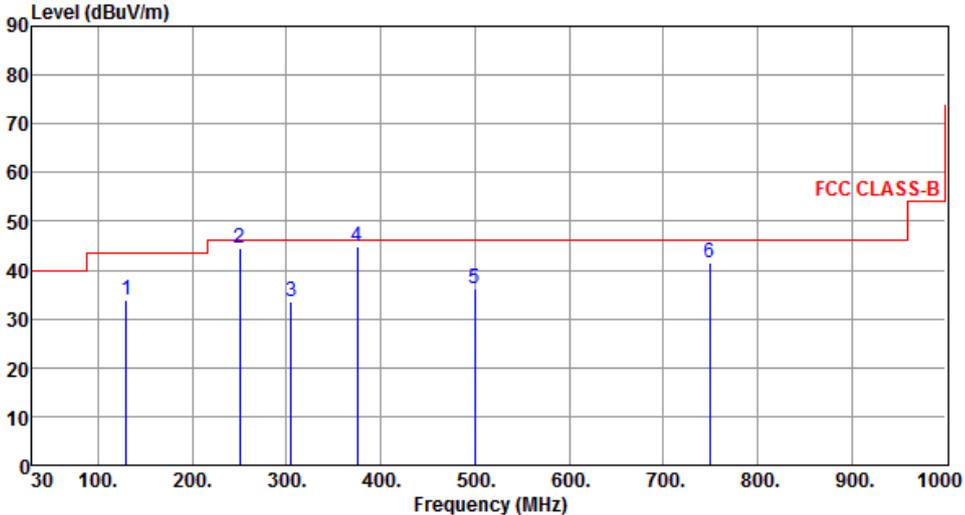
#### Radiated Emissions below 1 GHz



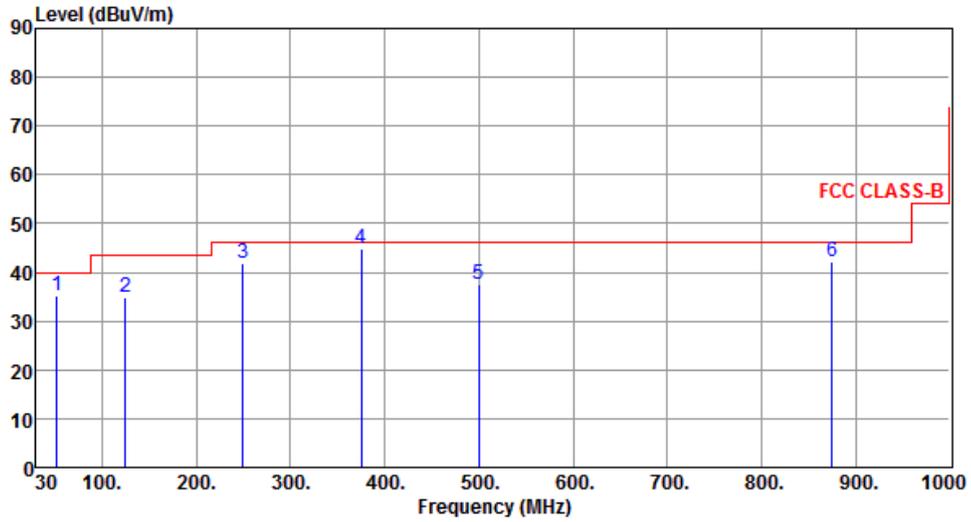
#### Radiated Emissions above 1 GHz



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

Modulation	11b	Test Freq. (MHz)	2437						
Polarization	Horizontal								
									
	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High cm	Turn Table deg
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB			
1	130.13	33.83	43.50	-9.67	42.85	-9.02	Peak	---	---
2	249.99	44.52	46.00	-1.48	53.73	-9.21	QP	100	171
3	304.88	33.47	46.00	-12.53	40.85	-7.38	Peak	---	---
4	375.00	44.96	46.00	-1.04	50.58	-5.62	QP	100	125
5	499.63	36.34	46.00	-9.66	39.16	-2.82	Peak	---	---
6	749.16	41.39	46.00	-4.61	39.58	1.81	Peak	---	---
<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).            Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.</p>									

<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	51.68	35.05	40.00	-4.95	42.90	-7.85	Peak	---	---
2	124.39	34.97	43.50	-8.53	44.63	-9.66	Peak	---	---
3	249.55	41.85	46.00	-4.15	51.07	-9.22	Peak	---	---
4	375.00	44.81	46.00	-1.19	50.43	-5.62	QP	142	248
5	499.71	37.51	46.00	-8.49	40.32	-2.81	Peak	---	---
6	874.65	42.08	46.00	-3.92	38.31	3.77	Peak	---	---

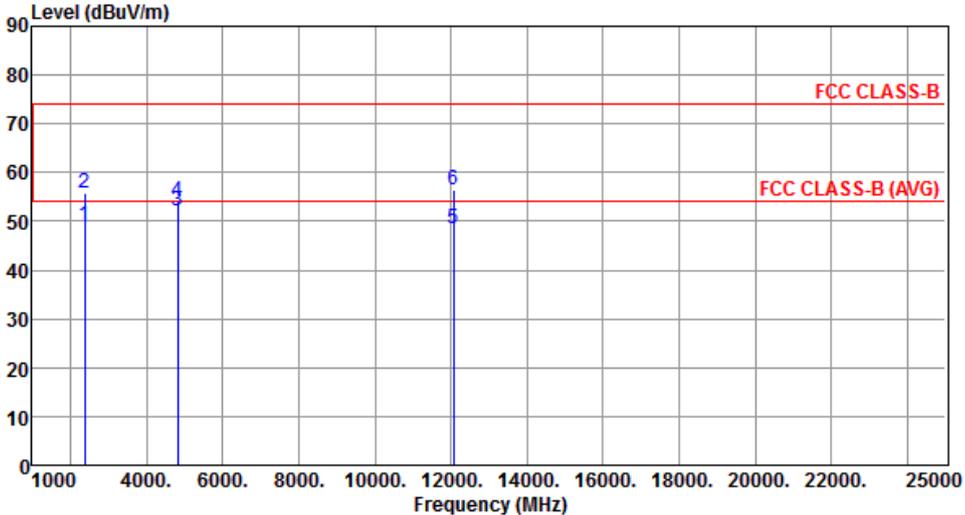
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)

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

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

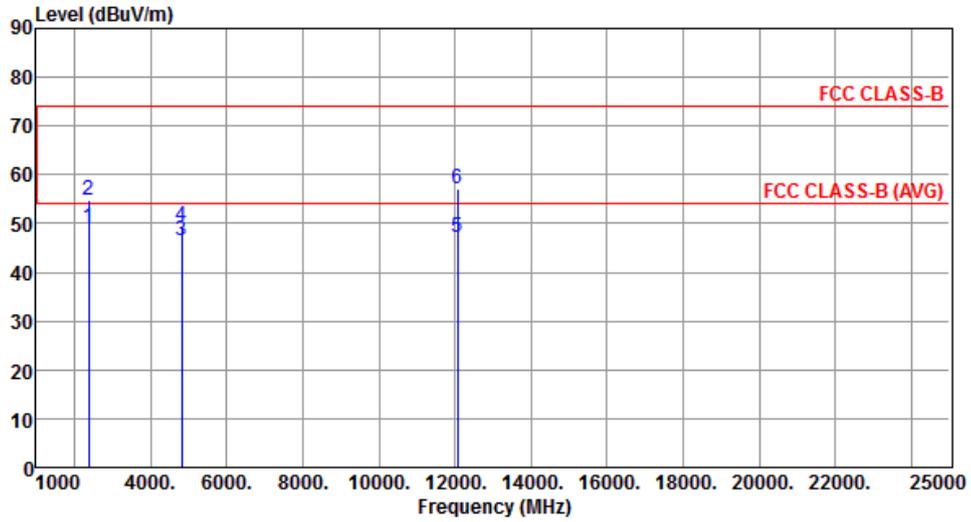
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

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

Modulation	11b	Test Freq. (MHz)	2412						
Polarization	Horizontal								
									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.28	54.00	-4.72	52.63	-3.35	Average	374	24
2	2390.00	55.78	74.00	-18.22	59.13	-3.35	Peak	374	24
3	4824.00	52.22	54.00	-1.78	48.63	3.59	Average	198	342
4	4824.00	54.01	74.00	-19.99	50.42	3.59	Peak	198	342
5	12060.00	48.53	54.00	-5.47	34.40	14.13	Average	221	205
6	12060.00	56.51	74.00	-17.49	42.38	14.13	Peak	221	205

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

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



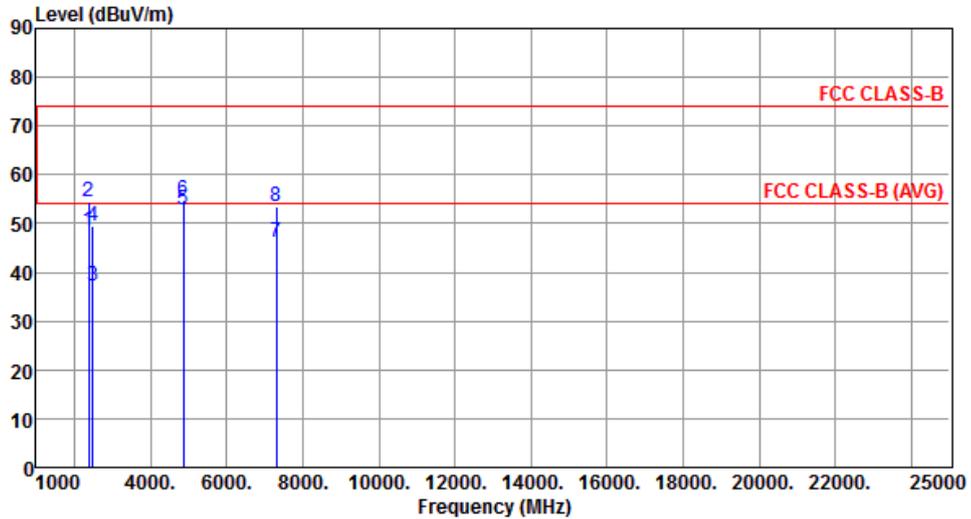
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.01	54.00	-4.99	52.36	-3.35	Average	387	180
2	2390.00	54.85	74.00	-19.15	58.20	-3.35	Peak	387	180
3	4824.00	46.39	54.00	-7.61	42.80	3.59	Average	100	194
4	4824.00	49.45	74.00	-24.55	45.86	3.59	Peak	100	194
5	12060.00	47.00	54.00	-7.00	32.87	14.13	Average	152	160
6	12060.00	57.10	74.00	-16.90	42.97	14.13	Peak	152	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).

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



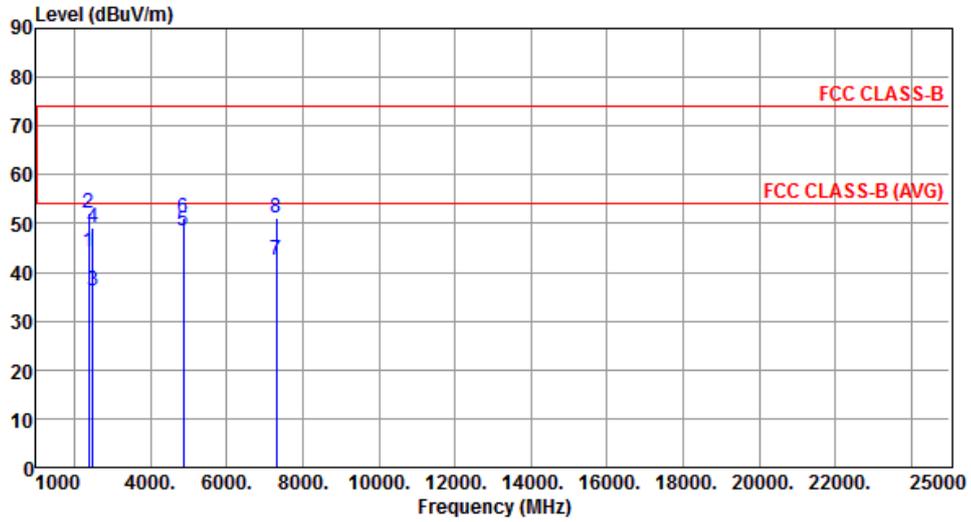
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.35	54.00	-5.65	51.70	-3.35	Average	378	32
2	2390.00	54.35	74.00	-19.65	57.70	-3.35	Peak	378	32
3	2483.50	37.14	54.00	-16.86	40.07	-2.93	Average	378	32
4	2483.50	49.54	74.00	-24.46	52.47	-2.93	Peak	378	32
5	4874.00	52.65	54.00	-1.35	48.90	3.75	Average	198	347
6	4874.00	54.85	74.00	-19.15	51.10	3.75	Peak	198	347
7	7311.00	46.08	54.00	-7.92	37.66	8.42	Average	106	285
8	7311.00	53.50	74.00	-20.50	45.08	8.42	Peak	106	285

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		



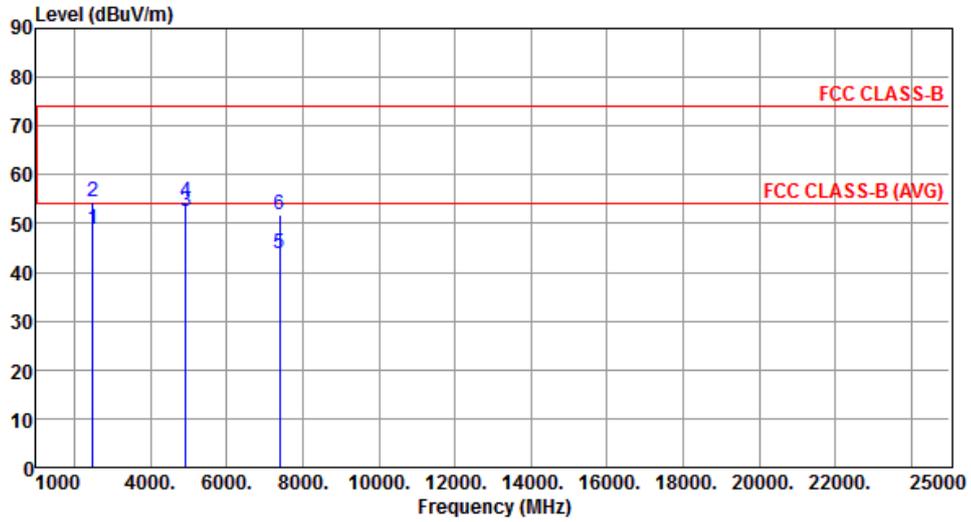
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	44.31	54.00	-9.69	47.66	-3.35	Average	100	160
2	2390.00	52.04	74.00	-21.96	55.39	-3.35	Peak	100	160
3	2483.50	36.30	54.00	-17.70	39.23	-2.93	Average	100	160
4	2483.50	49.21	74.00	-24.79	52.14	-2.93	Peak	100	160
5	4874.00	48.39	54.00	-5.61	44.64	3.75	Average	100	197
6	4874.00	51.00	74.00	-23.00	47.25	3.75	Peak	100	197
7	7311.00	42.59	54.00	-11.41	34.17	8.42	Average	204	210
8	7311.00	51.16	74.00	-22.84	42.74	8.42	Peak	204	210

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		



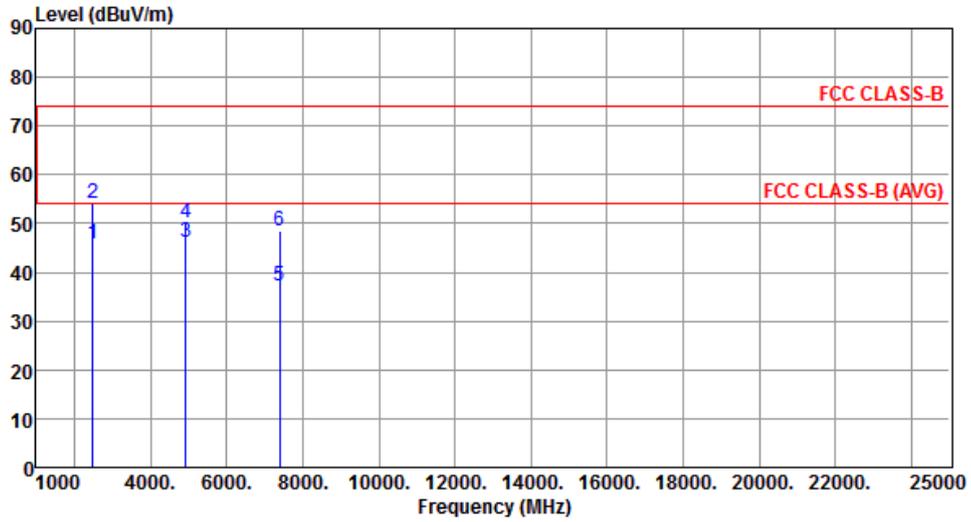
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	48.87	54.00	-5.13	51.80	-2.93	Average	357	23
2	2483.50	54.47	74.00	-19.53	57.40	-2.93	Peak	357	23
3	4924.00	52.43	54.00	-1.57	48.52	3.91	Average	196	348
4	4924.00	54.43	74.00	-19.57	50.52	3.91	Peak	196	348
5	7386.00	43.73	54.00	-10.27	35.27	8.46	Average	121	282
6	7386.00	51.82	74.00	-22.18	43.36	8.46	Peak	121	282

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

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

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

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



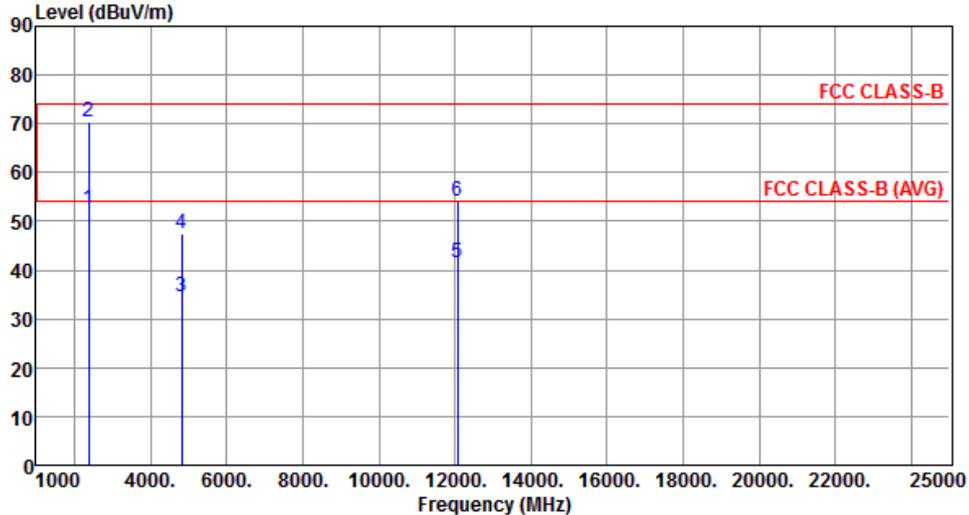
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	45.70	54.00	-8.30	48.63	-2.93	Average	100	152
2	2483.50	54.07	74.00	-19.93	57.00	-2.93	Peak	100	152
3	4924.00	46.16	54.00	-7.84	42.25	3.91	Average	104	204
4	4924.00	50.07	74.00	-23.93	46.16	3.91	Peak	104	204
5	7386.00	37.26	54.00	-16.74	28.80	8.46	Average	202	240
6	7386.00	48.61	74.00	-25.39	40.15	8.46	Peak	202	240

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

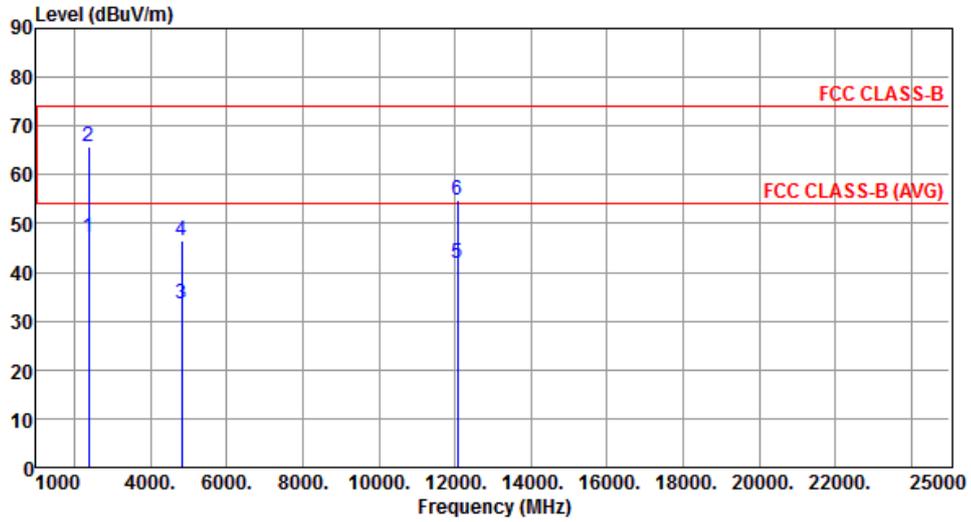
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	11g	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	52.32	54.00	-1.68	55.67	-3.35	Average	339	56
2	2390.00	70.50	74.00	-3.50	73.85	-3.35	Peak	339	56
3	4824.00	34.61	54.00	-19.39	31.02	3.59	Average	209	340
4	4824.00	47.51	74.00	-26.49	43.92	3.59	Peak	209	340
5	12060.00	41.56	54.00	-12.44	27.43	14.13	Average	176	40
6	12060.00	54.22	74.00	-19.78	40.09	14.13	Peak	176	40
<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		



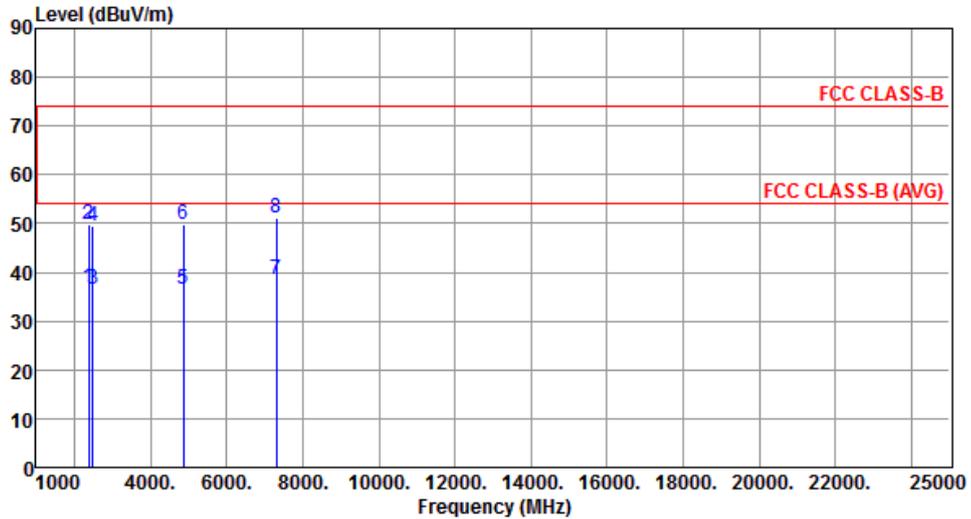
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	47.11	54.00	-6.89	50.46	-3.35	Average	112	177
2	2390.00	65.60	74.00	-8.40	68.95	-3.35	Peak	112	177
3	4824.00	33.59	54.00	-20.41	30.00	3.59	Average	122	7
4	4824.00	46.37	74.00	-27.63	42.78	3.59	Peak	122	7
5	12060.00	41.69	54.00	-12.31	27.56	14.13	Average	151	342
6	12060.00	54.82	74.00	-19.18	40.69	14.13	Peak	151	342

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		



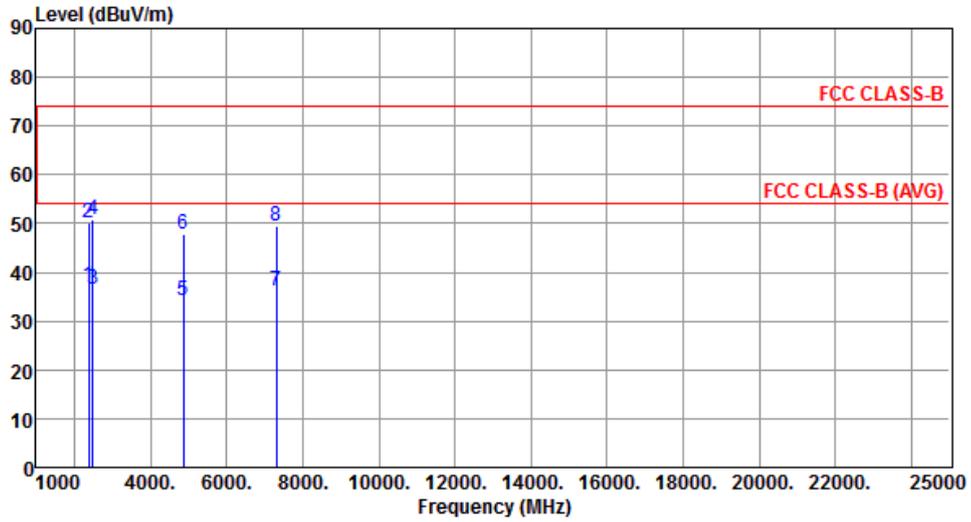
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	36.89	54.00	-17.11	40.24	-3.35	Average	365	14
2	2390.00	49.72	74.00	-24.28	53.07	-3.35	Peak	365	14
3	2483.50	36.66	54.00	-17.34	39.59	-2.93	Average	365	374
4	2483.50	49.58	74.00	-24.42	52.51	-2.93	Peak	365	374
5	4874.00	36.46	54.00	-17.54	32.71	3.75	Average	190	344
6	4874.00	49.72	74.00	-24.28	45.97	3.75	Peak	190	344
7	7311.00	38.50	54.00	-15.50	30.08	8.42	Average	100	281
8	7311.00	51.22	74.00	-22.78	42.80	8.42	Peak	100	281

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		



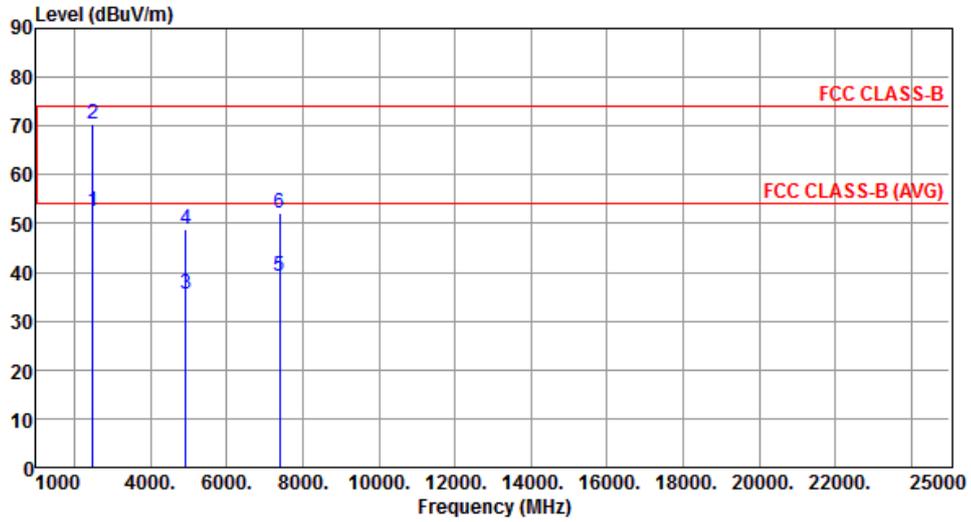
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.30	54.00	-16.70	40.65	-3.35	Average	100	176
2	2390.00	50.28	74.00	-23.72	53.63	-3.35	Peak	100	176
3	2483.50	36.65	54.00	-17.35	39.58	-2.93	Average	100	176
4	2483.50	50.68	74.00	-23.32	53.61	-2.93	Peak	100	176
5	4874.00	34.15	54.00	-19.85	30.40	3.75	Average	105	355
6	4874.00	47.76	74.00	-26.24	44.01	3.75	Peak	105	355
7	7311.00	36.24	54.00	-17.76	27.82	8.42	Average	115	282
8	7311.00	49.52	74.00	-24.48	41.10	8.42	Peak	115	282

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

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

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

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



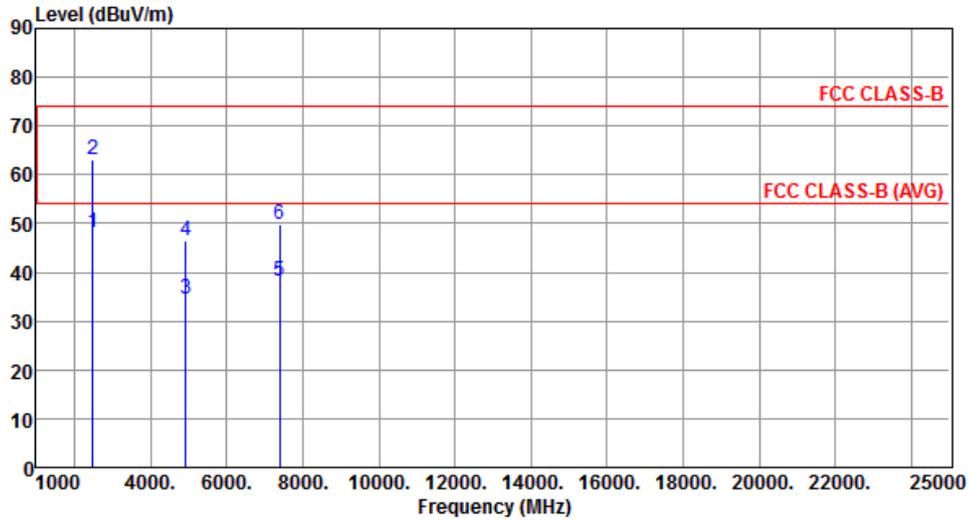
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.38	54.00	-1.62	55.31	-2.93	Average	355	356
2	2483.50	70.42	74.00	-3.58	73.35	-2.93	Peak	355	356
3	4924.00	35.50	54.00	-18.50	31.59	3.91	Average	192	323
4	4924.00	48.69	74.00	-25.31	44.78	3.91	Peak	192	323
5	7386.00	39.07	54.00	-14.93	30.61	8.46	Average	189	46
6	7386.00	52.28	74.00	-21.72	43.82	8.46	Peak	189	46

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	48.01	54.00	-5.99	50.94	-2.93	Average	100	148
2	2483.50	63.04	74.00	-10.96	65.97	-2.93	Peak	100	148
3	4924.00	34.48	54.00	-19.52	30.57	3.91	Average	114	75
4	4924.00	46.49	74.00	-27.51	42.58	3.91	Peak	114	75
5	7386.00	38.29	54.00	-15.71	29.83	8.46	Average	113	288
6	7386.00	49.75	74.00	-24.25	41.29	8.46	Peak	113	288

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

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

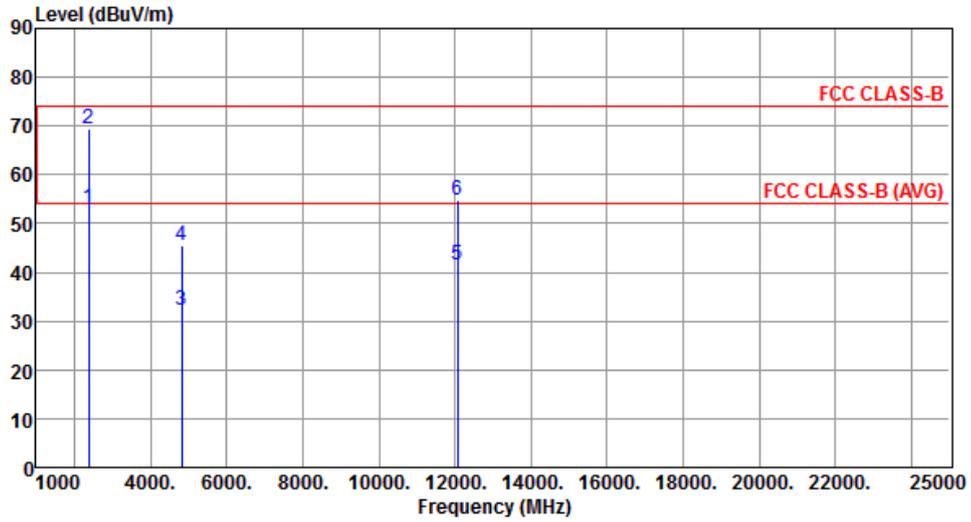
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

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

Modulation	HT20	Test Freq. (MHz)	2412						
Polarization	Horizontal								
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.89	54.00	-1.11	56.24	-3.35	Average	340	40
2	2390.00	68.71	74.00	-5.29	72.06	-3.35	Peak	340	40
3	4824.00	34.06	54.00	-19.94	30.47	3.59	Average	214	340
4	4824.00	47.36	74.00	-26.64	43.77	3.59	Peak	214	340
5	12060.00	41.43	54.00	-12.57	27.30	14.13	Average	100	220
6	12060.00	54.13	74.00	-19.87	40.00	14.13	Peak	100	220

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>	2412
<b>Polarization</b>	Vertical		



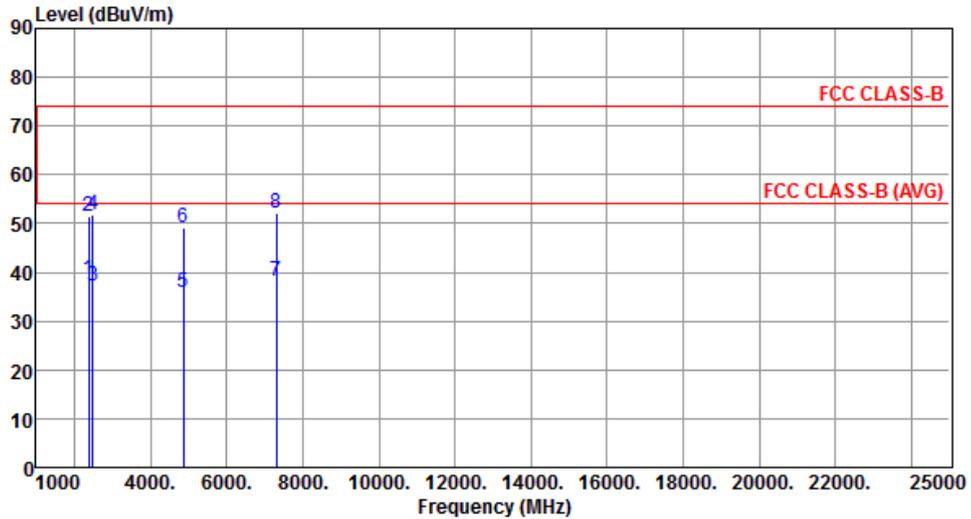
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.99	54.00	-1.01	56.34	-3.35	Average	400	13
2	2390.00	69.56	74.00	-4.44	72.91	-3.35	Peak	400	13
3	4824.00	32.07	54.00	-21.93	28.48	3.59	Average	100	196
4	4824.00	45.65	74.00	-28.35	42.06	3.59	Peak	100	196
5	12060.00	41.66	54.00	-12.34	27.53	14.13	Average	100	124
6	12060.00	54.67	74.00	-19.33	40.54	14.13	Peak	100	124

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		



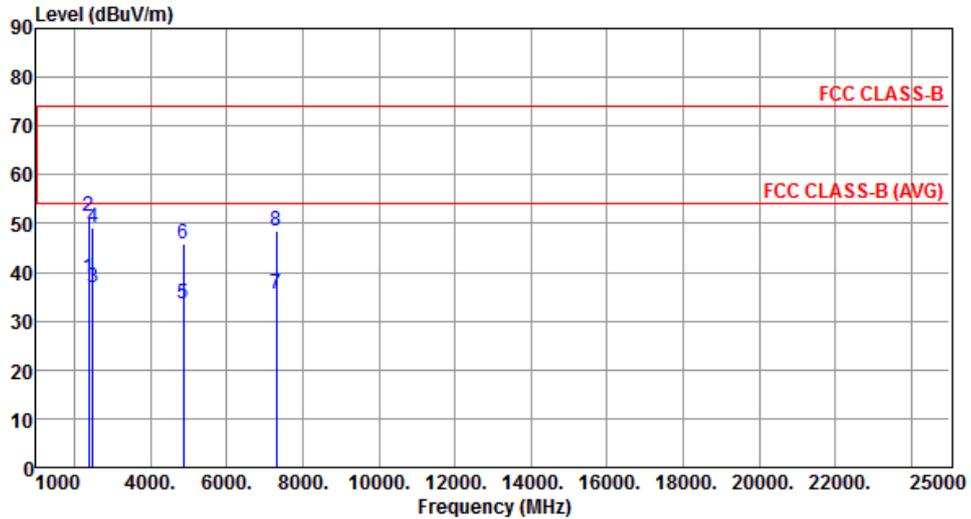
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.64	54.00	-15.36	41.99	-3.35	Average	388	4
2	2390.00	51.56	74.00	-22.44	54.91	-3.35	Peak	388	4
3	2483.50	37.32	54.00	-16.68	40.25	-2.93	Average	357	4
4	2483.50	51.66	74.00	-22.34	54.59	-2.93	Peak	357	4
5	4874.00	35.77	54.00	-18.23	32.02	3.75	Average	222	342
6	4874.00	49.00	74.00	-25.00	45.25	3.75	Peak	222	342
7	7311.00	38.35	54.00	-15.65	29.93	8.42	Average	100	325
8	7311.00	52.23	74.00	-21.77	43.81	8.42	Peak	100	325

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		



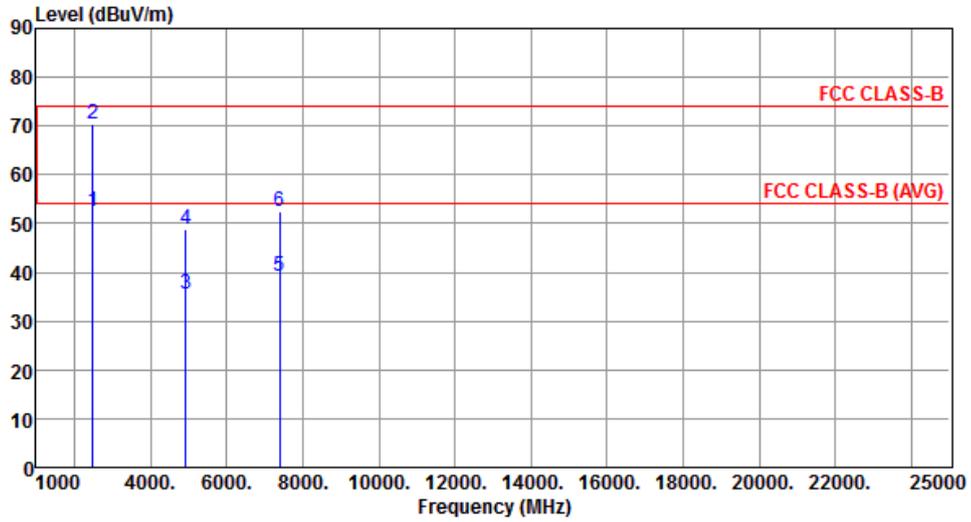
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.70	54.00	-15.30	42.05	-3.35	Average	400	15
2	2390.00	51.46	74.00	-22.54	54.81	-3.35	Peak	400	15
3	2483.50	36.72	54.00	-17.28	39.65	-2.93	Average	400	15
4	2483.50	49.07	74.00	-24.93	52.00	-2.93	Peak	400	15
5	4874.00	33.58	54.00	-20.42	29.83	3.75	Average	100	194
6	4874.00	45.96	74.00	-28.04	42.21	3.75	Peak	100	194
7	7311.00	35.69	54.00	-18.31	27.27	8.42	Average	100	132
8	7311.00	48.54	74.00	-25.46	40.12	8.42	Peak	100	132

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		



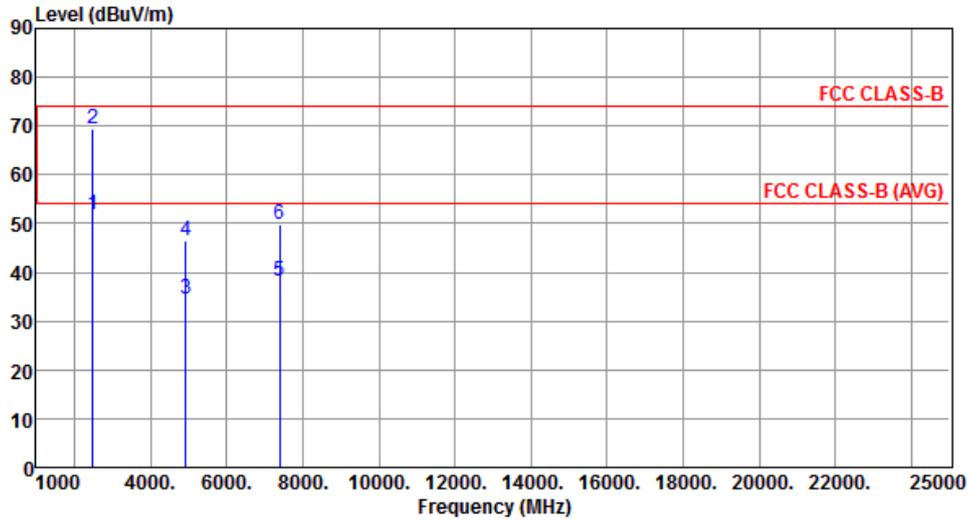
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.48	54.00	-1.52	55.41	-2.93	Average	352	358
2	2483.50	70.53	74.00	-3.47	73.46	-2.93	Peak	352	358
3	4924.00	35.58	54.00	-18.42	31.67	3.91	Average	190	328
4	4924.00	48.76	74.00	-25.24	44.85	3.91	Peak	190	328
5	7386.00	39.14	54.00	-14.86	30.68	8.46	Average	100	56
6	7386.00	52.35	74.00	-21.65	43.89	8.46	Peak	100	56

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	51.97	54.00	-2.03	54.90	-2.93	Average	400	15
2	2483.50	69.32	74.00	-4.68	72.25	-2.93	Peak	400	15
3	4924.00	34.53	54.00	-19.47	30.62	3.91	Average	110	76
4	4924.00	46.57	74.00	-27.43	42.66	3.91	Peak	110	76
5	7386.00	38.31	54.00	-15.69	29.85	8.46	Average	111	286
6	7386.00	49.81	74.00	-24.19	41.35	8.46	Peak	111	286

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

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

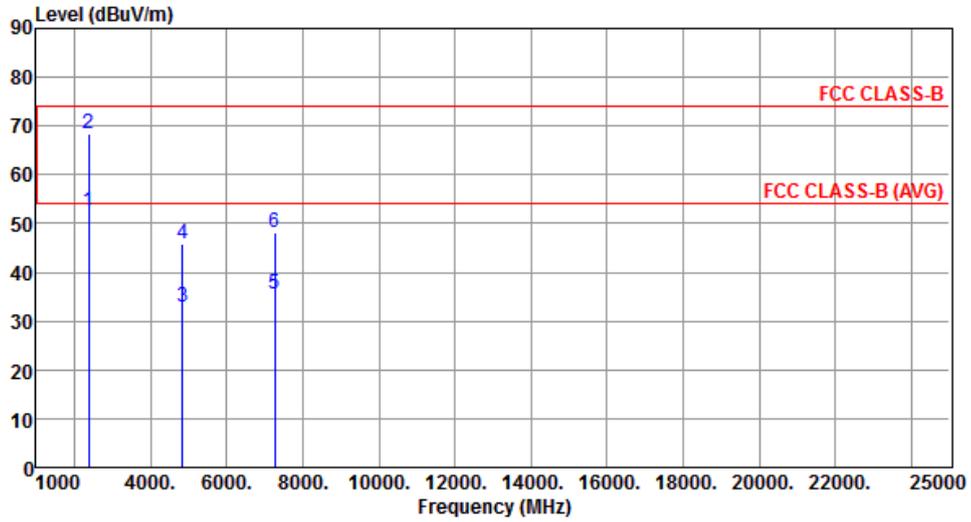
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

### 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	52.99	54.00	-1.01	56.34	-3.35	Average	338	48
2	2390.00	68.84	74.00	-5.16	72.19	-3.35	Peak	338	48
3	4844.00	33.14	54.00	-20.86	29.48	3.66	Average	220	340
4	4844.00	44.91	74.00	-29.09	41.25	3.66	Peak	220	340
5	7266.00	36.76	54.00	-17.24	28.34	8.42	Average	100	222
6	7266.00	49.39	74.00	-24.61	40.97	8.42	Peak	100	222

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		



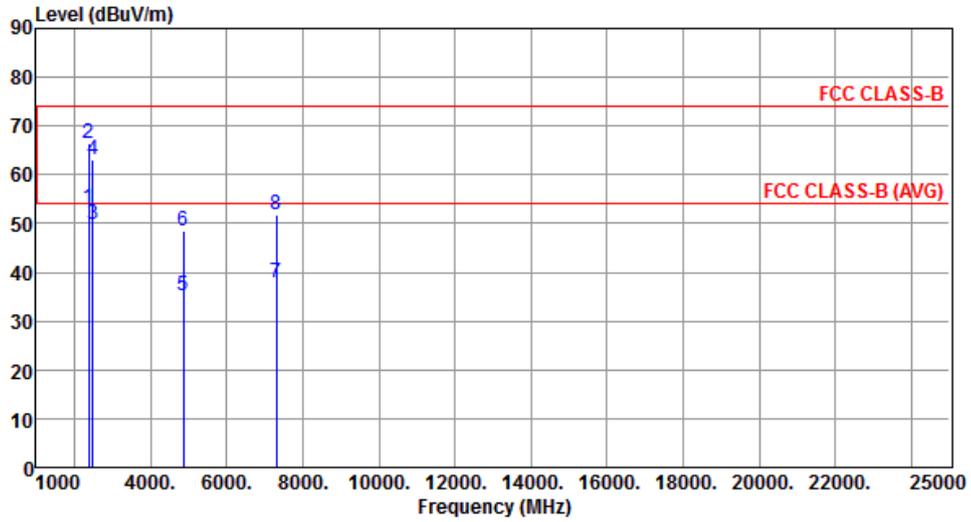
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.49	54.00	-1.51	55.84	-3.35	Average	400	12
2	2390.00	68.43	74.00	-5.57	71.78	-3.35	Peak	400	12
3	4844.00	32.92	54.00	-21.08	29.26	3.66	Average	100	192
4	4844.00	45.77	74.00	-28.23	42.11	3.66	Peak	100	192
5	7266.00	35.64	54.00	-18.36	27.22	8.42	Average	100	121
6	7266.00	48.29	74.00	-25.71	39.87	8.42	Peak	100	121

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

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

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

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



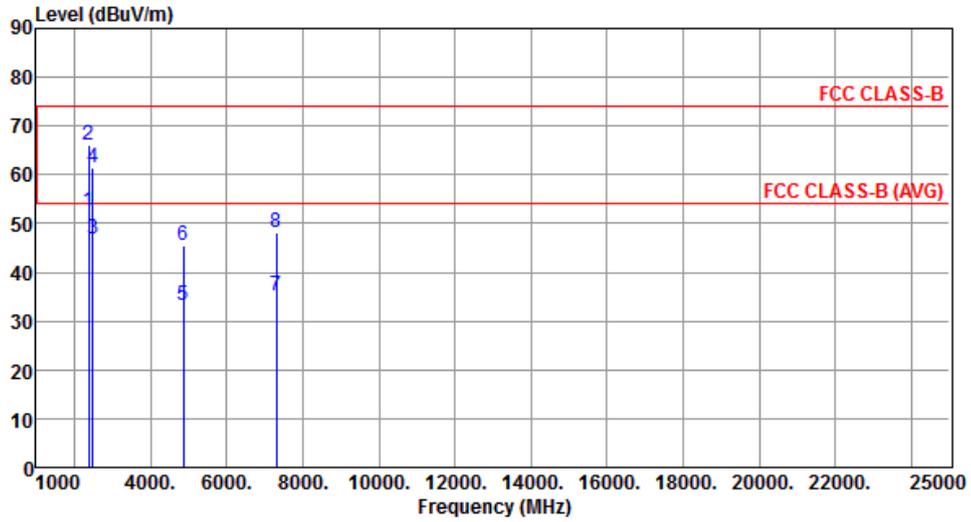
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.99	54.00	-1.01	56.34	-3.35	Average	390	3
2	2390.00	66.36	74.00	-7.64	69.71	-3.35	Peak	390	3
3	2483.50	49.94	54.00	-4.06	52.87	-2.93	Average	356	3
4	2483.50	62.99	74.00	-11.01	65.92	-2.93	Peak	356	3
5	4874.00	35.22	54.00	-18.78	31.47	3.75	Average	220	347
6	4874.00	48.49	74.00	-25.51	44.74	3.75	Peak	220	347
7	7311.00	37.81	54.00	-16.19	29.39	8.42	Average	100	320
8	7311.00	51.86	74.00	-22.14	43.44	8.42	Peak	100	320

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		



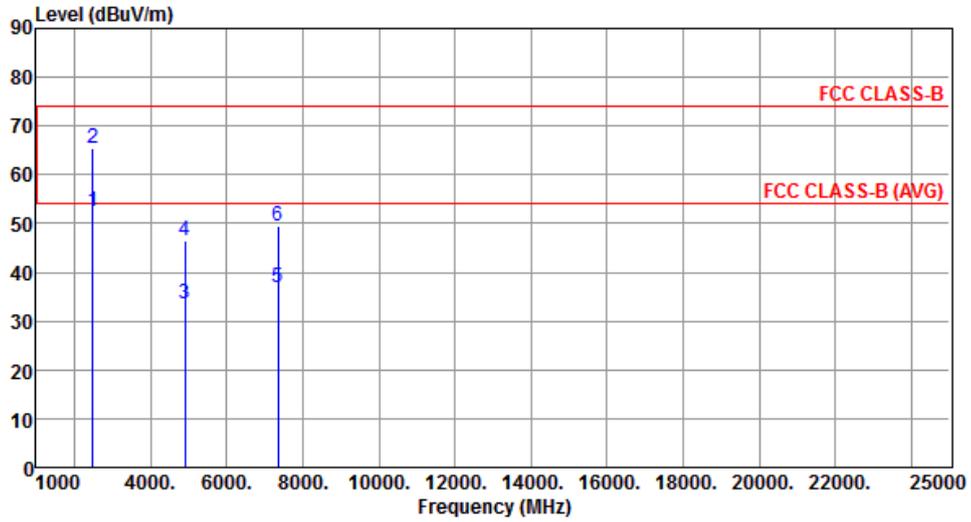
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.62	54.00	-1.38	55.97	-3.35	Average	400	18
2	2390.00	65.98	74.00	-8.02	69.33	-3.35	Peak	400	18
3	2483.50	46.71	54.00	-7.29	49.64	-2.93	Average	400	18
4	2483.50	61.38	74.00	-12.62	64.31	-2.93	Peak	400	18
5	4874.00	33.06	54.00	-20.94	29.31	3.75	Average	100	191
6	4874.00	45.63	74.00	-28.37	41.88	3.75	Peak	100	191
7	7311.00	35.16	54.00	-18.84	26.74	8.42	Average	100	145
8	7311.00	48.11	74.00	-25.89	39.69	8.42	Peak	100	145

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		



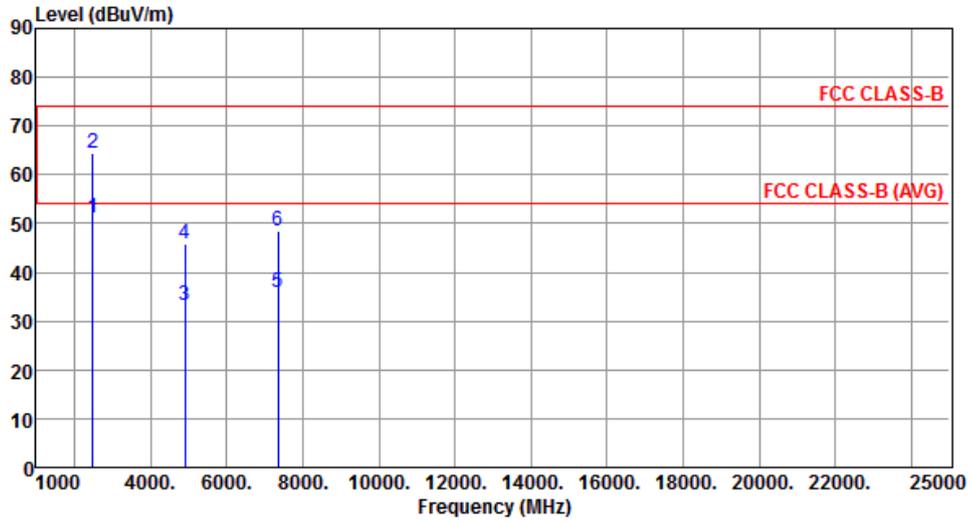
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.47	54.00	-1.53	55.40	-2.93	Average	352	358
2	2483.50	65.59	74.00	-8.41	68.52	-2.93	Peak	352	358
3	4904.00	33.63	54.00	-20.37	29.77	3.86	Average	196	342
4	4904.00	46.49	74.00	-27.51	42.63	3.86	Peak	196	342
5	7356.00	36.89	54.00	-17.11	28.45	8.44	Average	100	199
6	7356.00	49.52	74.00	-24.48	41.08	8.44	Peak	100	199

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	51.17	54.00	-2.83	54.10	-2.93	Average	395	25
2	2483.50	64.35	74.00	-9.65	67.28	-2.93	Peak	395	25
3	4904.00	33.23	54.00	-20.77	29.37	3.86	Average	100	196
4	4904.00	45.98	74.00	-28.02	42.12	3.86	Peak	100	196
5	7356.00	35.96	54.00	-18.04	27.52	8.44	Average	100	122
6	7356.00	48.44	74.00	-25.56	40.00	8.44	Peak	100	122

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

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

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

## 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

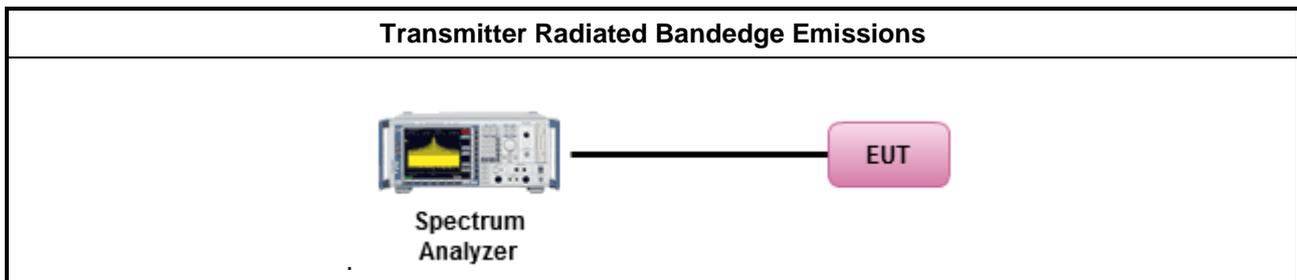
#### Reference level measurement

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

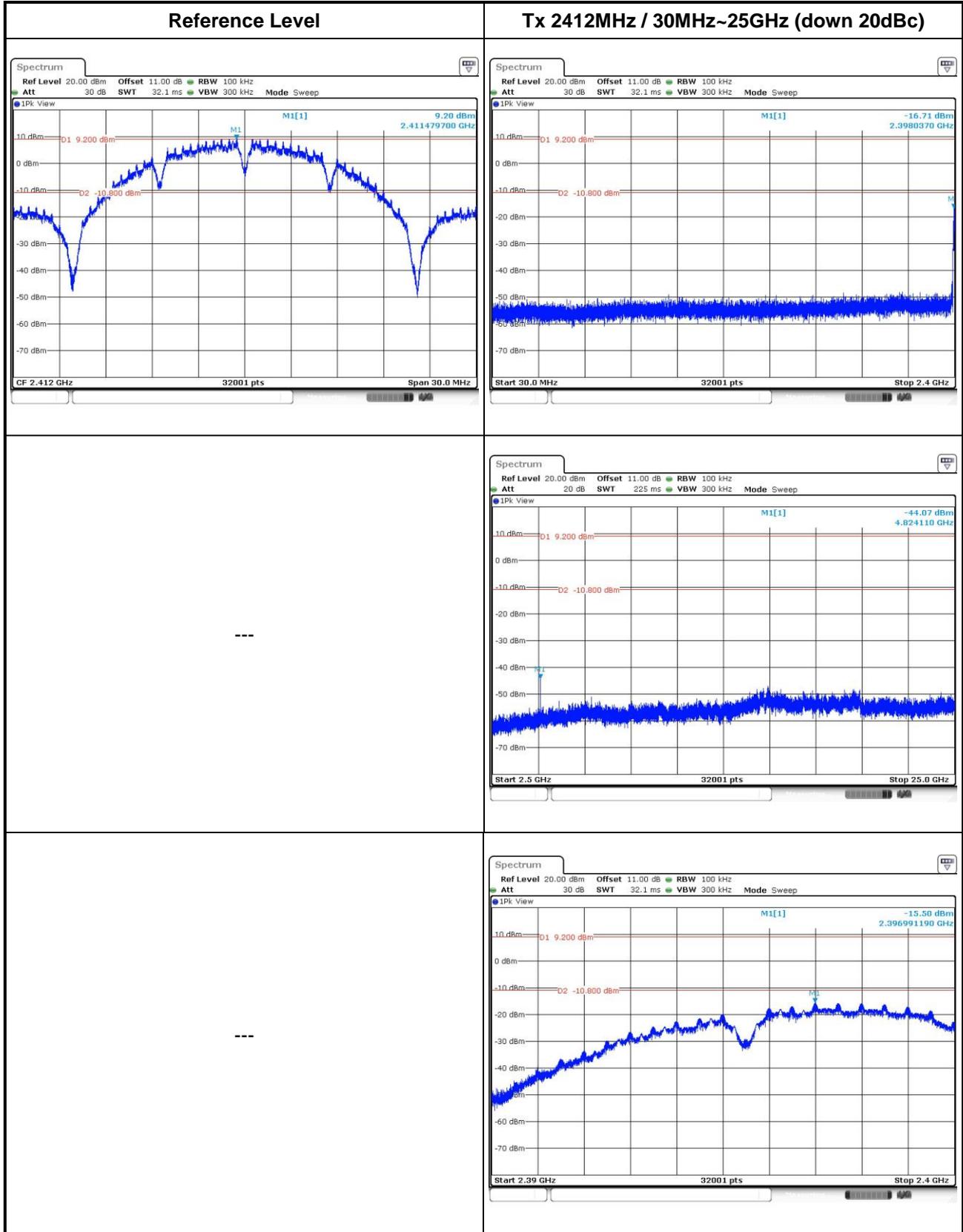


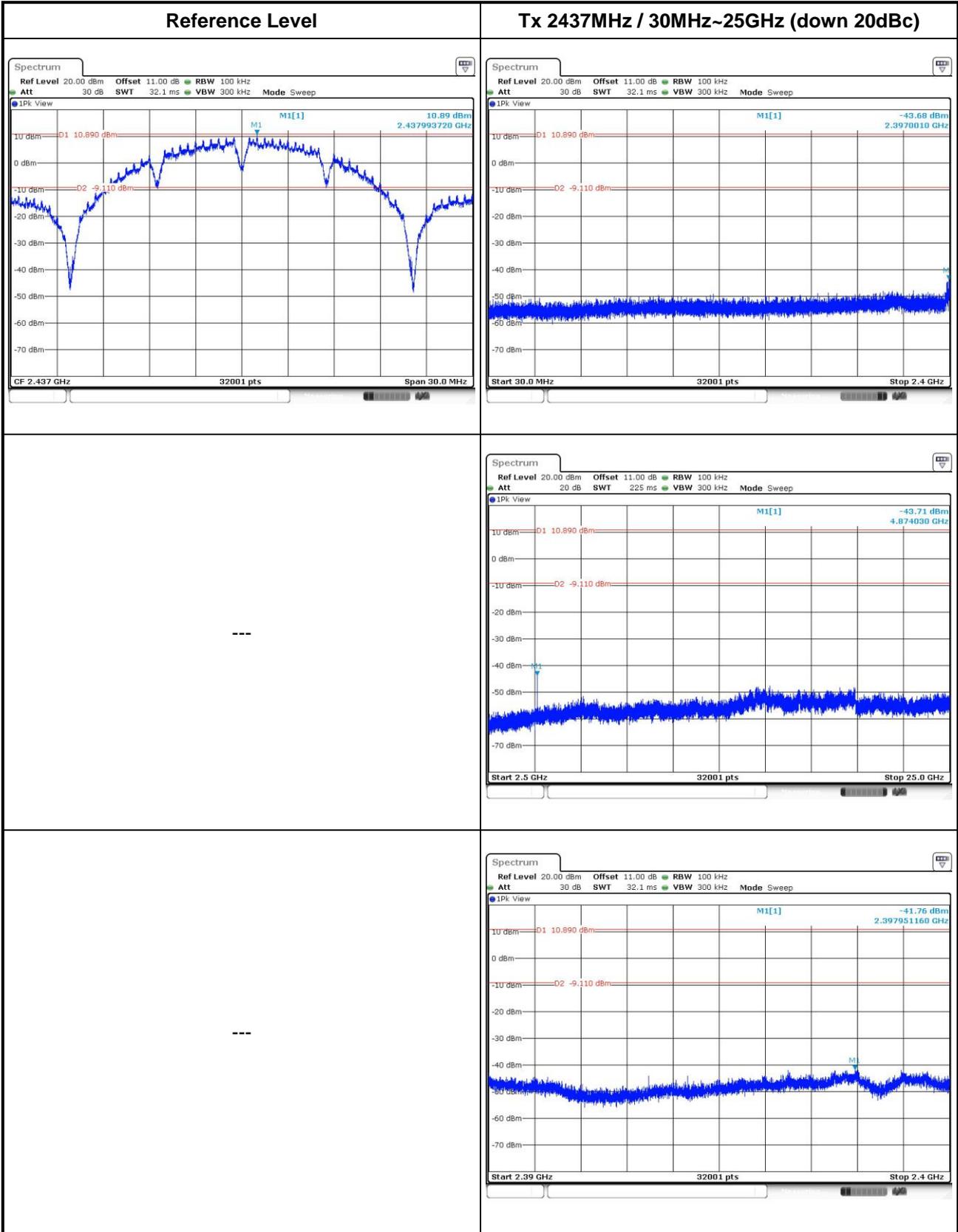
### 3.6.5 Test Result of Emissions in non-restricted frequency bands

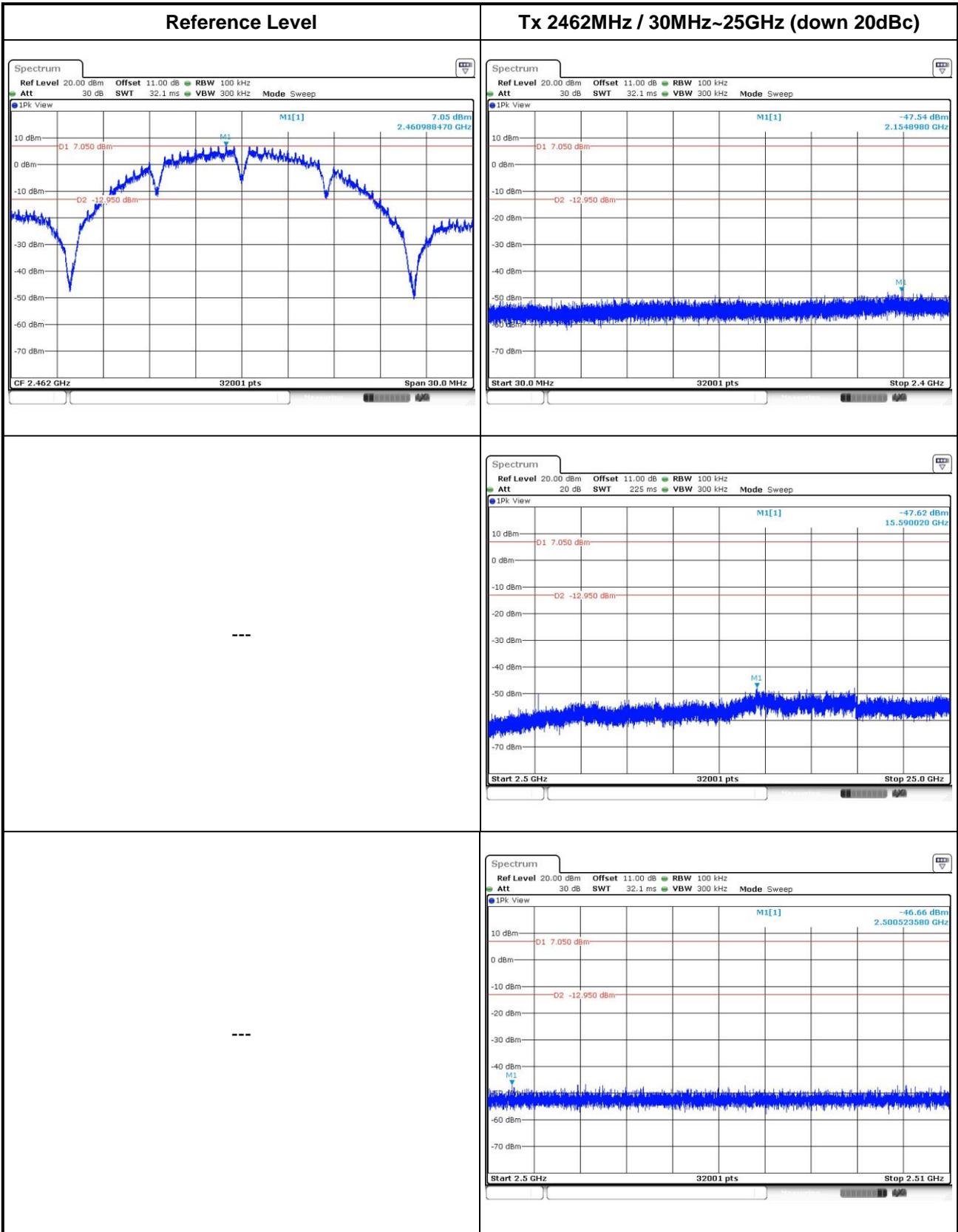
This test item is performed on each TX output individually without summing or adding  $10 \log(N_{ANT})$  since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

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

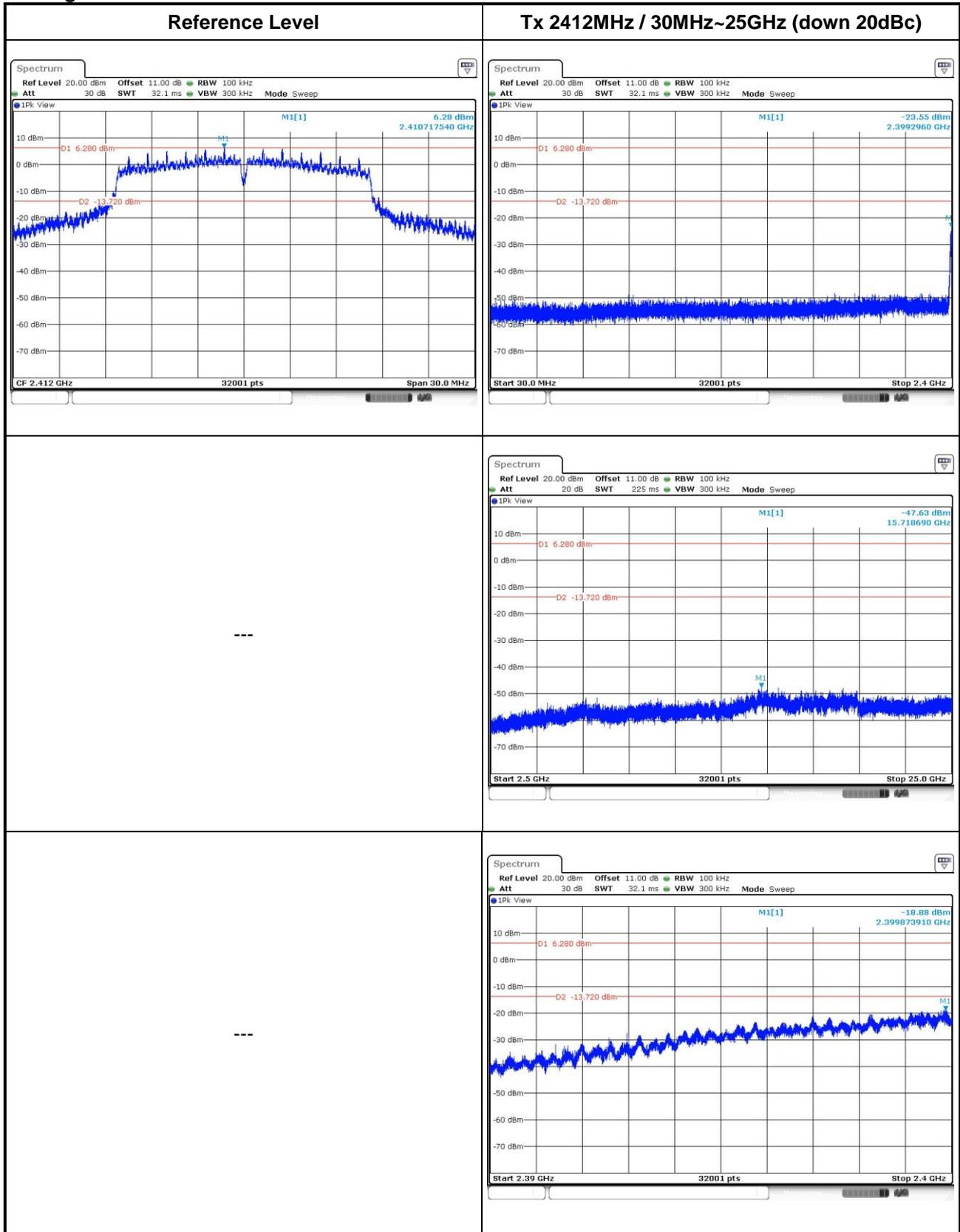
802.11b

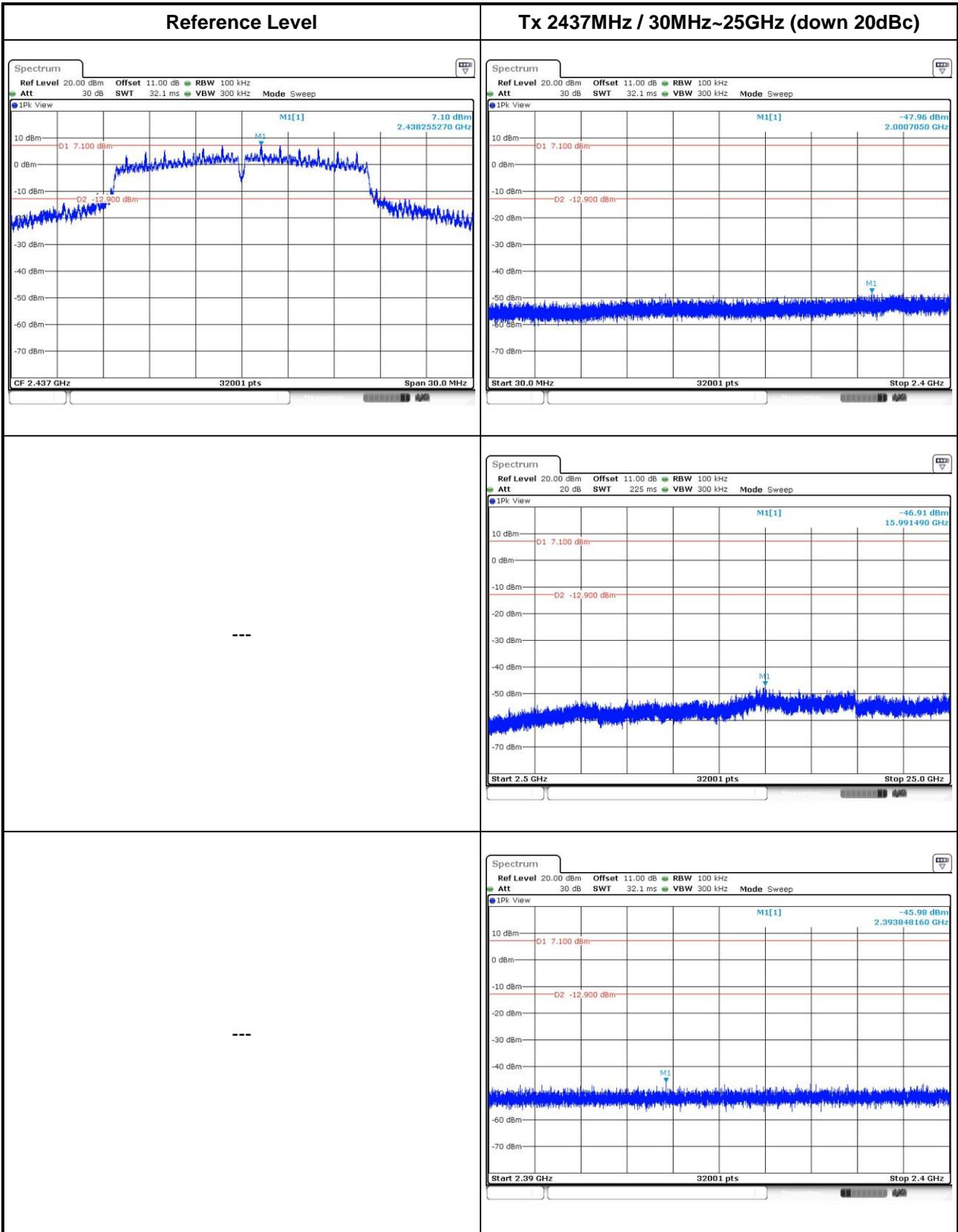


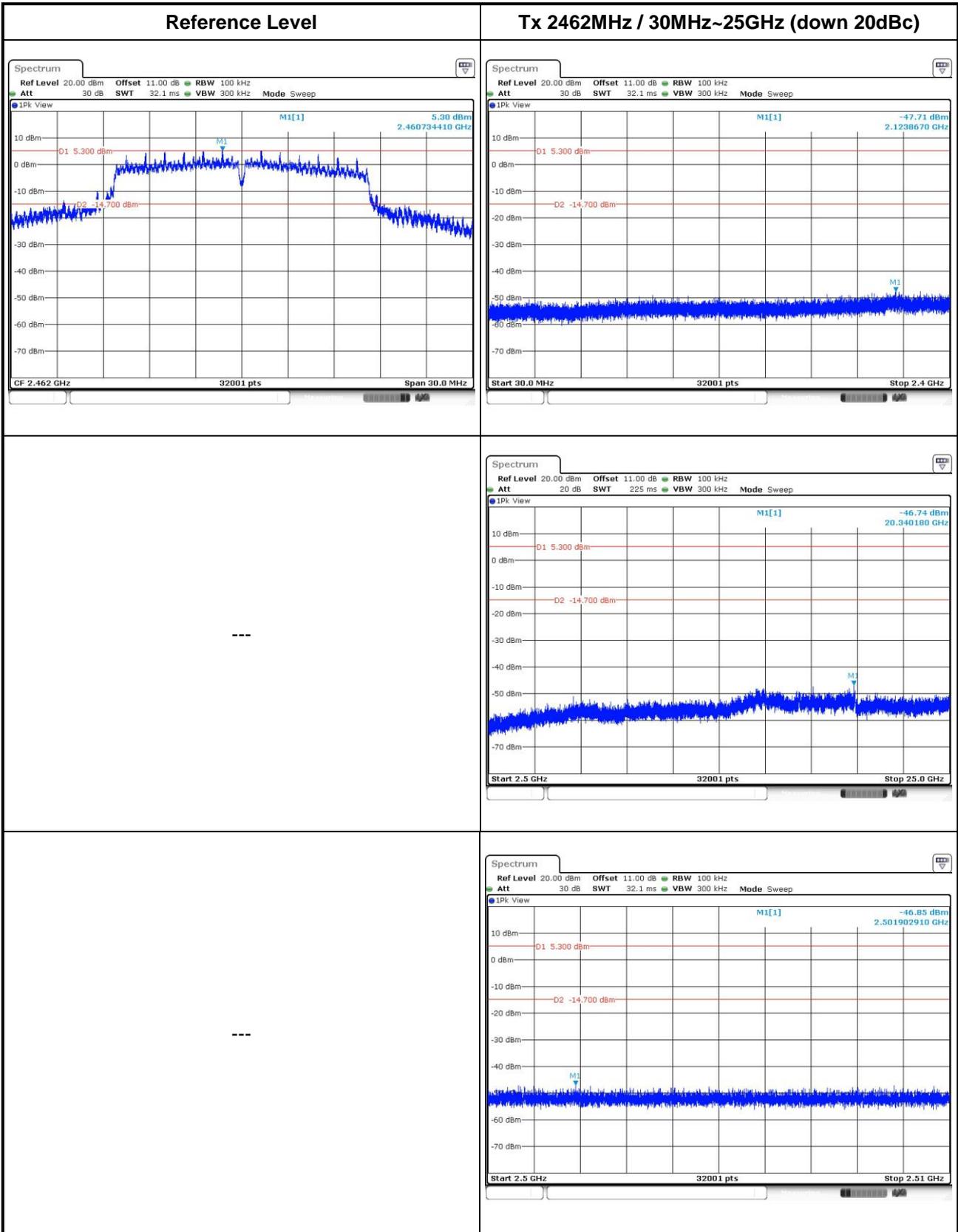




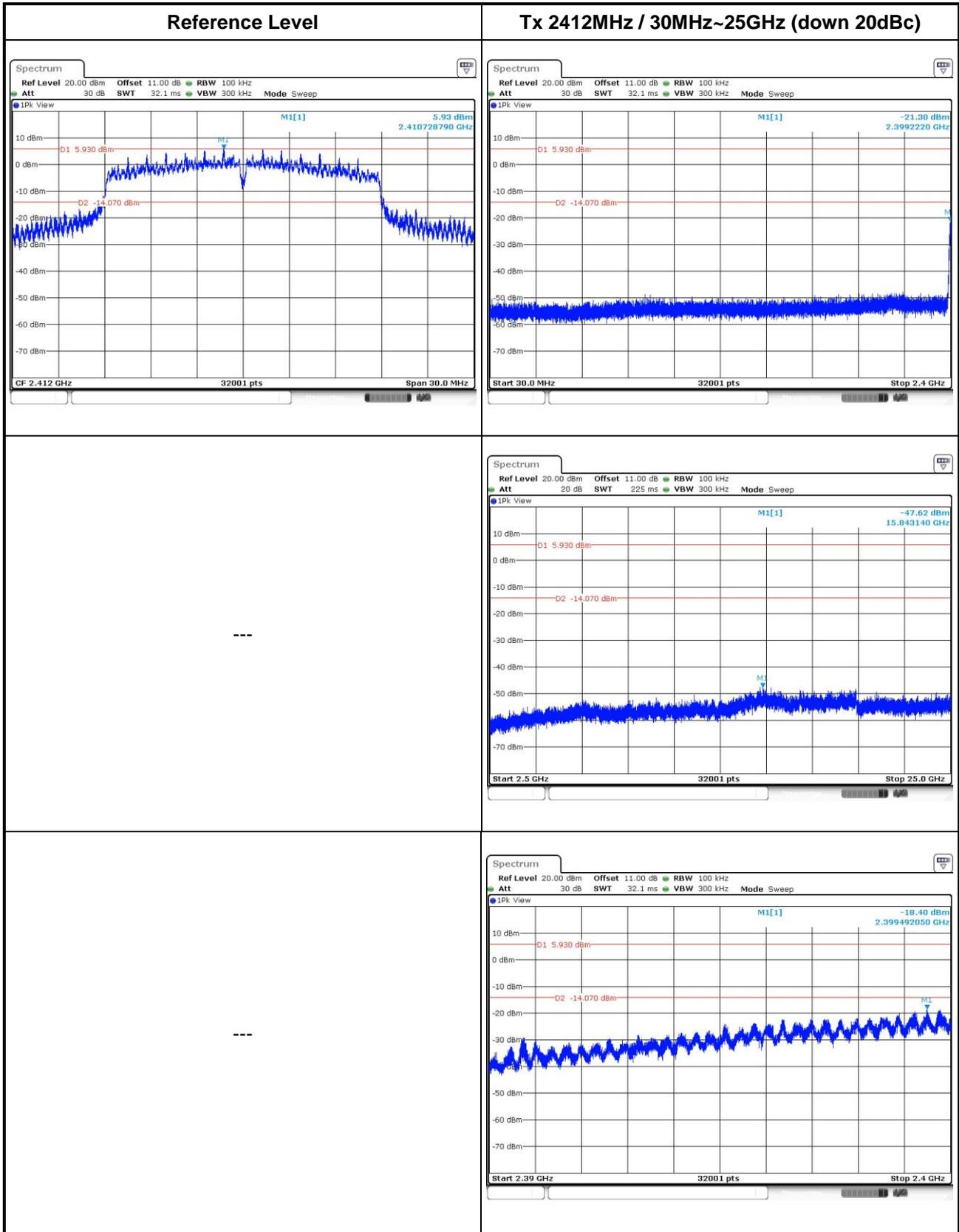
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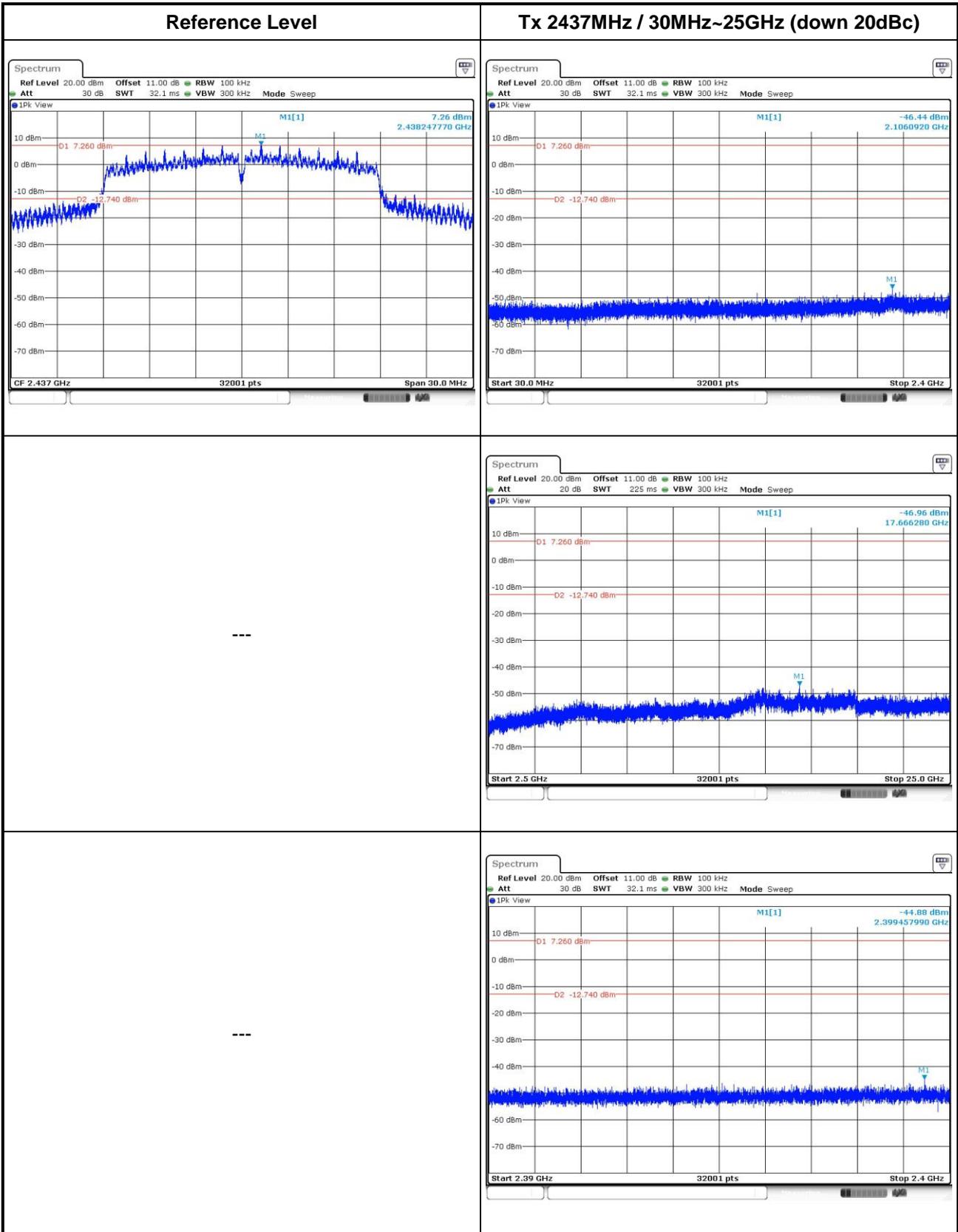


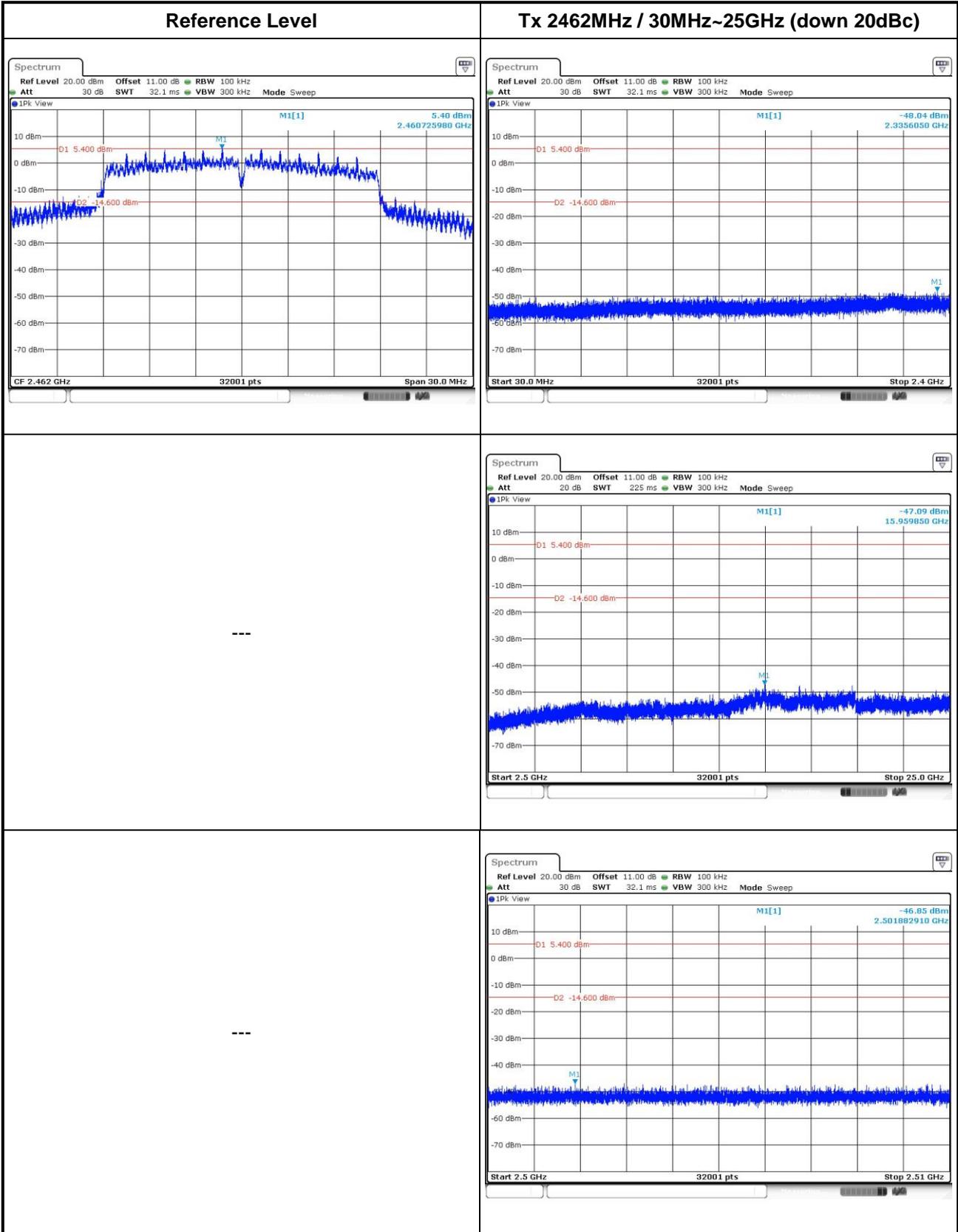




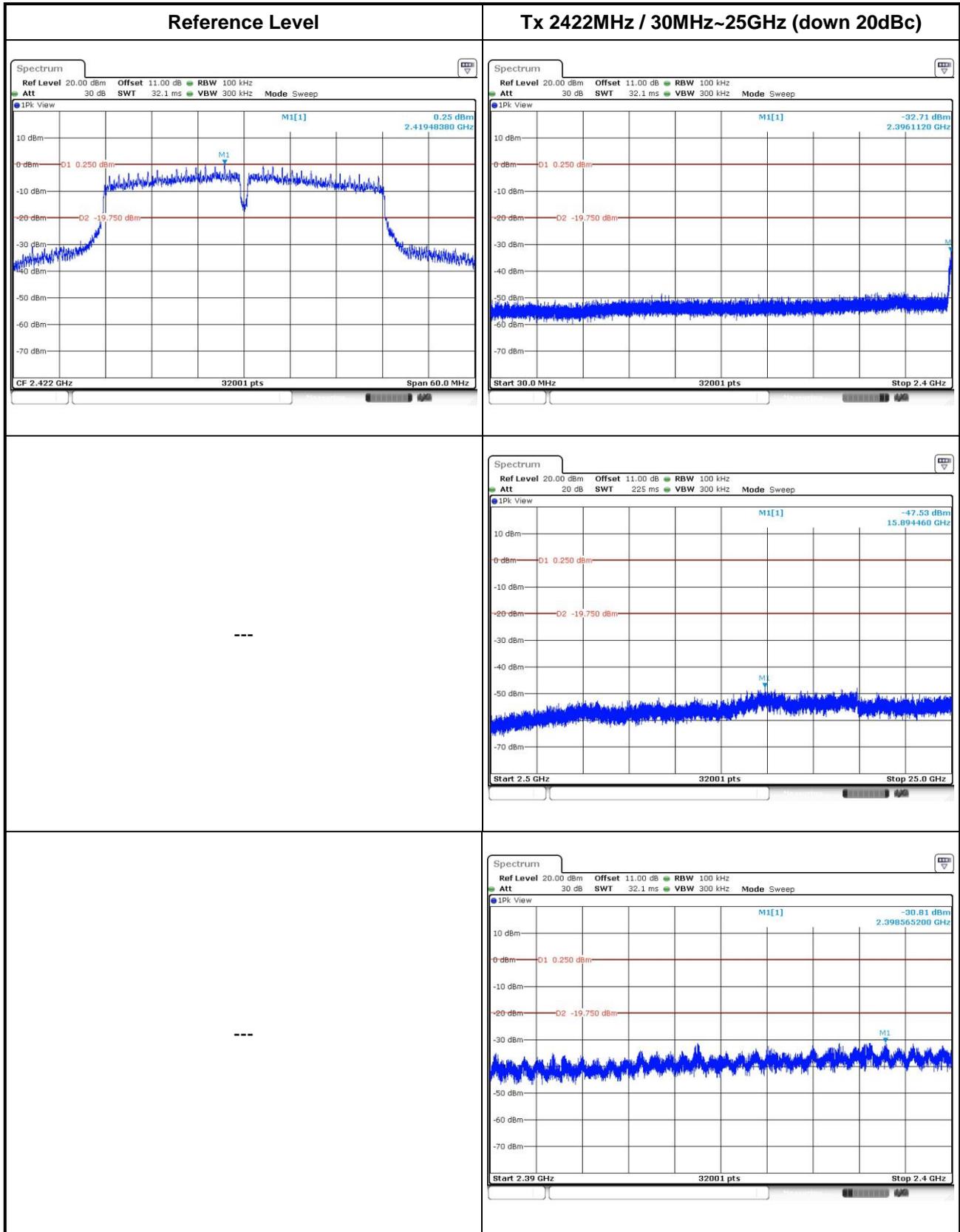
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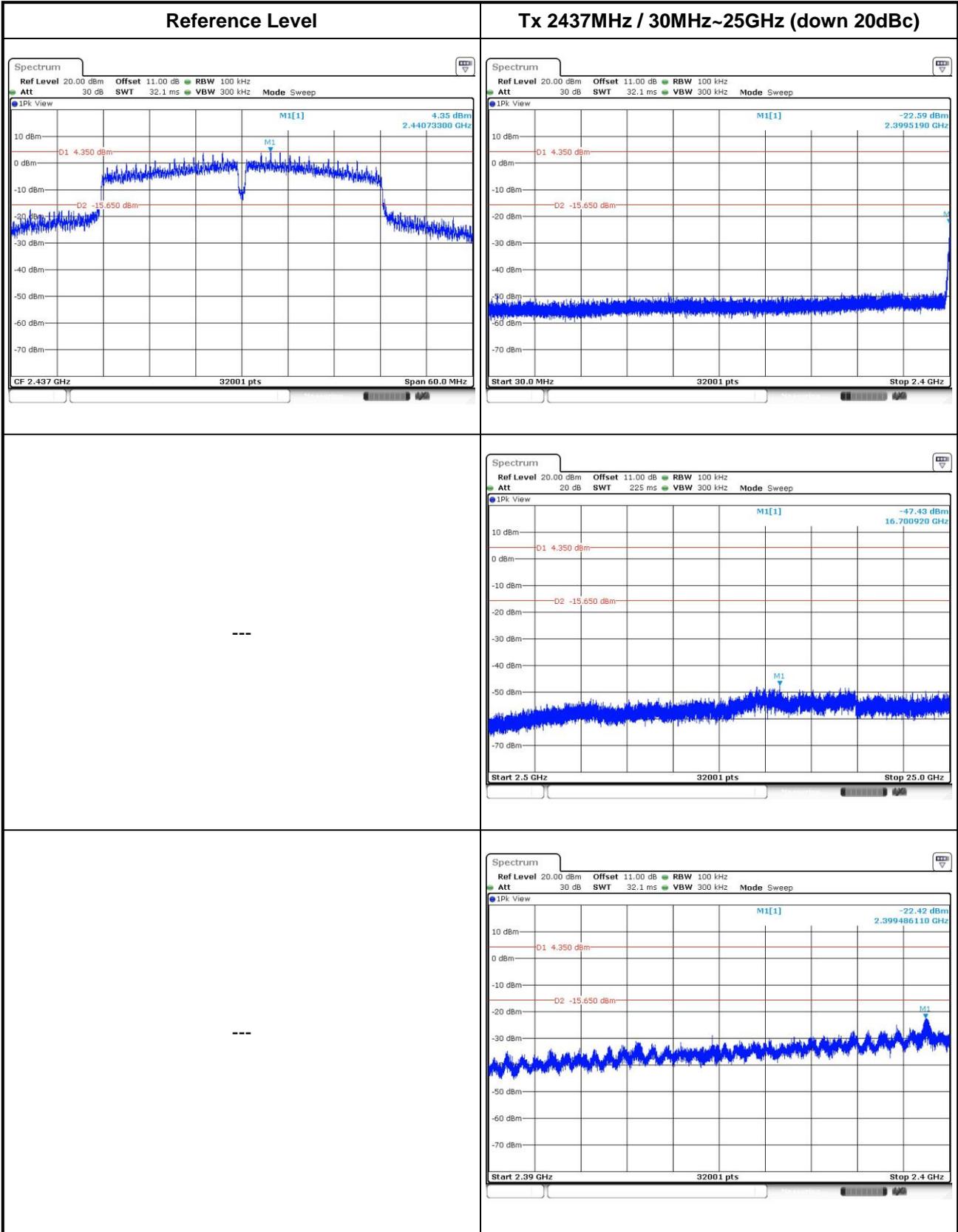


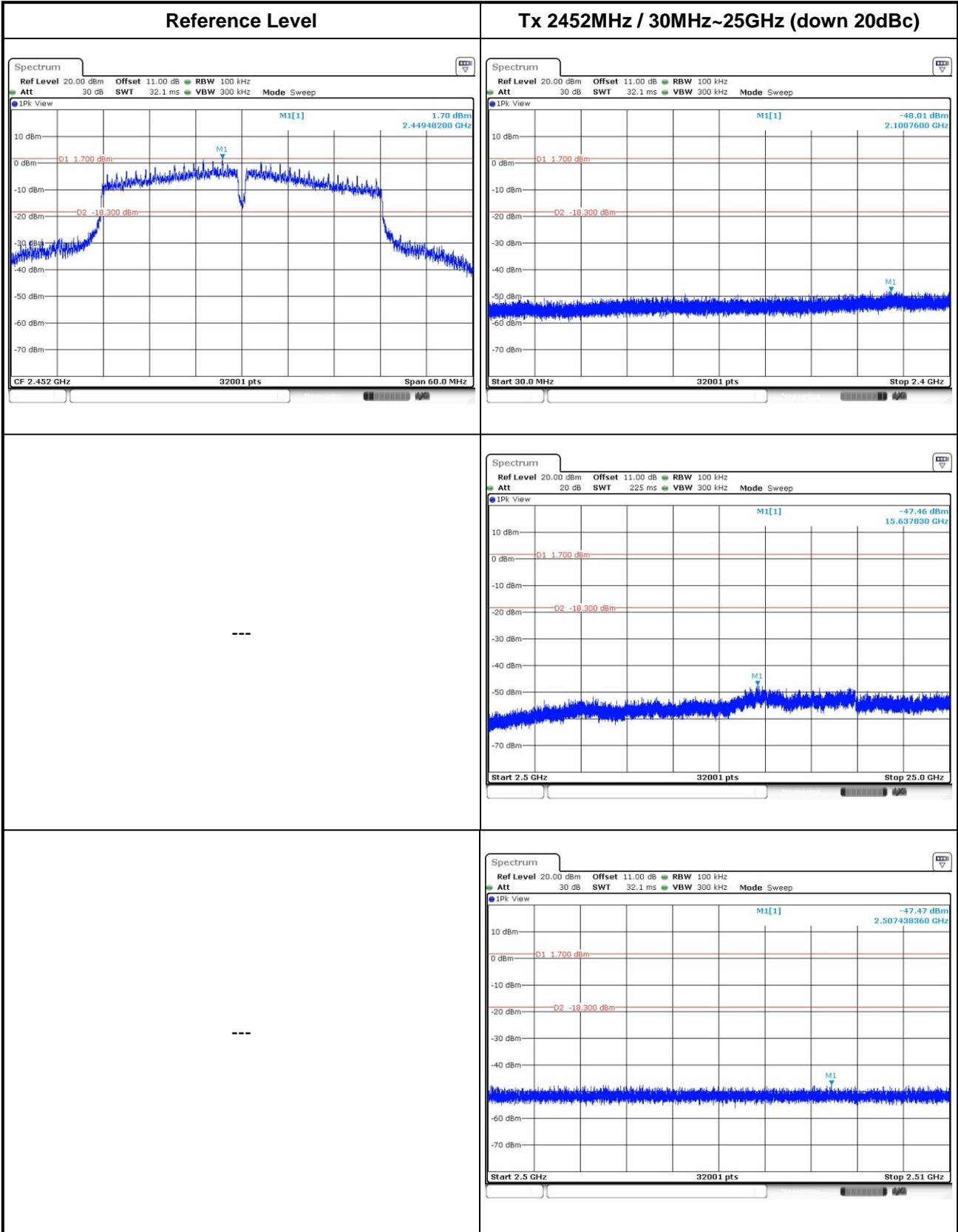




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## 4 Test laboratory information

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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