

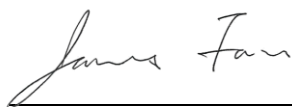
FCC Test Report

Equipment : 1X1 802.11b/g/n-BT4.0 Combo PCIe MoB Module
Brand Name : LITE-ON
Model No. : SS335
FCC ID : PPQ-SS335
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
FCC Classification : DTS
Applicant : Lite-On Technology Corp.
4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585,
Taiwan, R.O.C.

The product sample received on Jul. 24, 2014 and completely tested on Aug. 04, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:



James Fan / Assistant Manager



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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.476MHz 28.81 (Margin 17.60dB) – AV 40.44 (Margin 15.97dB) – QP	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth [MHz] 20M:10.9 / 40M:36.41	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm]: 24.36	Power [dBm]: 30	Complied
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]: -5.19	PSD [dBm/3kHz]: 8	Complied
3.5	15.247(d)	Emissions in non-restricted frequency bands	Out-of -band emissions are 20dB below the highest power	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.6	15.247(d)	Transmitter Unwanted Emissions	Restricted Bands Radiated emission [dBuV/m at 3m]:299.32MHz 44.97 (Margin 1.03dB) – QP Conducted emission [dBm]:2386.1 MHz -41.69 (Margin 0.49 dB) - AV	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied

[illegible]

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	RF Output Power (dBm)
2400-2483.5	b	2412-2462	1-11 [11]	1	20.80
2400-2483.5	g	2412-2462	1-11 [11]	1	23.99
2400-2483.5	HT20	2412-2462	1-11 [11]	1	24.36
2400-2483.5	HT40	2422-2452	3-9 [7]	1	22.28

Note 1: RF output power specifies that Maximum Peak Conducted Output Power.
 Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
 Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
 Note 4: TX diversity function is not supported. Wi-Fi signal is always transmitted through Main path.

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☐	Integral antenna (antenna permanently attached)
☐	Temporary RF connector provided
☐	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☒	External antenna (dedicated antennas)
☒	RF connector provided
☒	Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...)
☐	Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...)

Antenna General Information					
No.	Model	Ant. Cat.	Ant. Type	Connector	Gain (dBi)
1	Main	External	PIFA	U.FL	3

Note: an extended coax cable was supplied for this antenna with below info.:

- ✧ Cable loss: 1dB
- ✧ Connector type: U.FL

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☐ Production ; ☒ Pre-Production ; ☐ Prototype
Type of EUT	
☐	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...
☒	Plug-in radio (EUT intended for a variety of host systems)
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐ Operated normally mode for worst duty cycle	
☒ Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
☒ 100.00% - IEEE 802.11b	0.00
☒ 98.61% - IEEE 802.11g	0.06
☒ 98.13% - IEEE 802.11n (HT20)	0.08
☒ 98.20% - IEEE 802.11n (HT40)	0.08

1.1.5 EUT Operational Condition

Power Supply Type	3.3Vdc from host.
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1.2 Accessories and Support Equipment

N/A

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2009
- ♦ FCC KDB 558074 v03r02
- ♦ FCC KDB 412172 v01

1.4 Testing Location Information

Testing Location				
☒	Sporton Lab	ADD :	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.	
		TEL :	886-3-327-3456	FAX : 886-3-327-0973
☒	ICC Lab	ADD :	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsein 333, Taiwan (R.O.C.)	
		TEL :	886-3-271-8666	FAX : 886-3-318-0155
Test Condition		Test Site No.	Test Engineer	Test Environment
RF Conducted		TH01-HY	Mark Liao	22°C / 62%
AC Conduction*		CO01-WS	Peter Lin	22°C / 57%
Radiated Emission*		03CH01-WS	Haru Yang	23°C / 68%
				Test Date
				Aug. 04, 2014
				Aug. 01, 2014
				Jul. 31, 2014

Note: * Sporton Lab subcontracts this test item to ICC lab (TAF:2732).

ICC lab is a TAF accreditation test firm and also is an approved provider of Sporton Lab.

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

1.5 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			
Test Item		Uncertainty	Limit
AC power-line conducted emissions		±2.26 dB	N/A
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted		±0.81 dB	N/A
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A
	1 – 18 GHz	±0.67 dB	N/A
	18 – 40 GHz	±0.83 dB	N/A
	40 – 200 GHz	N/A	N/A
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	N/A
Temperature		±0.8 °C	N/A
Humidity		±3 %	N/A
DC and low frequency voltages		±3 %	N/A
Time		±1.42 %	N/A
Duty Cycle		±1.42 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing			
Modulation Mode	Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS
11b,1-11Mbps	1	1-11 Mbps	1 Mbps
11g,6-54Mbps	1	6-54 Mbps	6 Mbps
HT20,M0-7	1	MCS 0-7	MCS 0
HT40,M0-7	1	MCS 0-7	MCS 0

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
IEEE Std. 802.11	Test Channel Frequencies (MHz)
b, g, n (HT-20)	2412-(F1), 2437-(F2), 2462-(F3)
n (HT-40)	2422-(F4), 2437-(F5), 2452-(F6)

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter (2400-2483.5MHz band)							
Test Software	ART2-GUI						
Test Software Version	2.3						
Modulation Mode	N _{TX}	Test Frequency (MHz)					
		NCB: 20MHz			NCB: 40MHz		
		2412	2437	2462	2422	2437	2452
11b,1-11Mbps	1	19.5	20	20	--	--	--
11g,6-54Mbps	1	14.5	20.5	13.5	--	--	--
HT20,M0-15	1	13.5	20	13	--	--	--
HT40,M0-15	1	--	--	--	12.5	14.5	12

2.4 The Worst Case Measurement Configuration

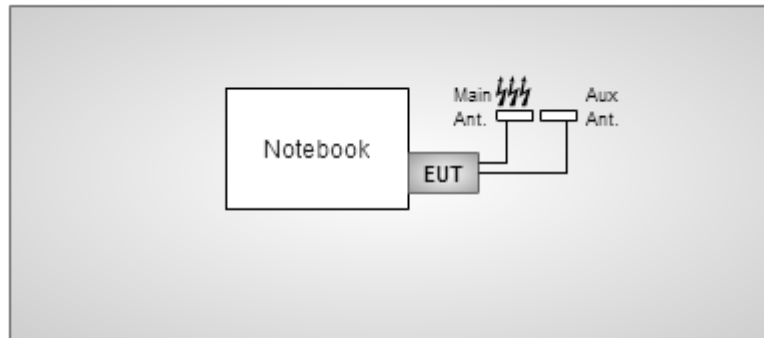
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	Radio link (WLAN)

The Worst Case Mode for Following Conformance Tests	
Tests Item	RF Output Power, 6dB bandwidth, Power Spectral Density Transmitter Conducted Unwanted Emissions above 1GHz
Test Condition	Conducted measurement at transmit chains
Modulation Mode	11b, 11g, HT20, HT40
Operating Mode	Operating Mode Description
1	Radio link (WLAN)

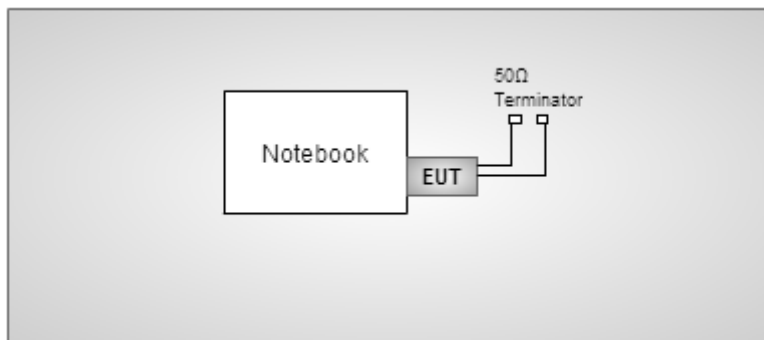
The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Unwanted Emissions Transmitter Bandedge Emissions
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode	☒ 1. Radio link (WLAN)
Modulation Mode	11b, 11g, HT20, HT40

2.5 Test Setup Diagram

Test Setup Diagram – Radiated Emission Test (with antenna)



Test Setup Diagram – Radiated Emission Test (with 50Ω Terminator)



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line 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.

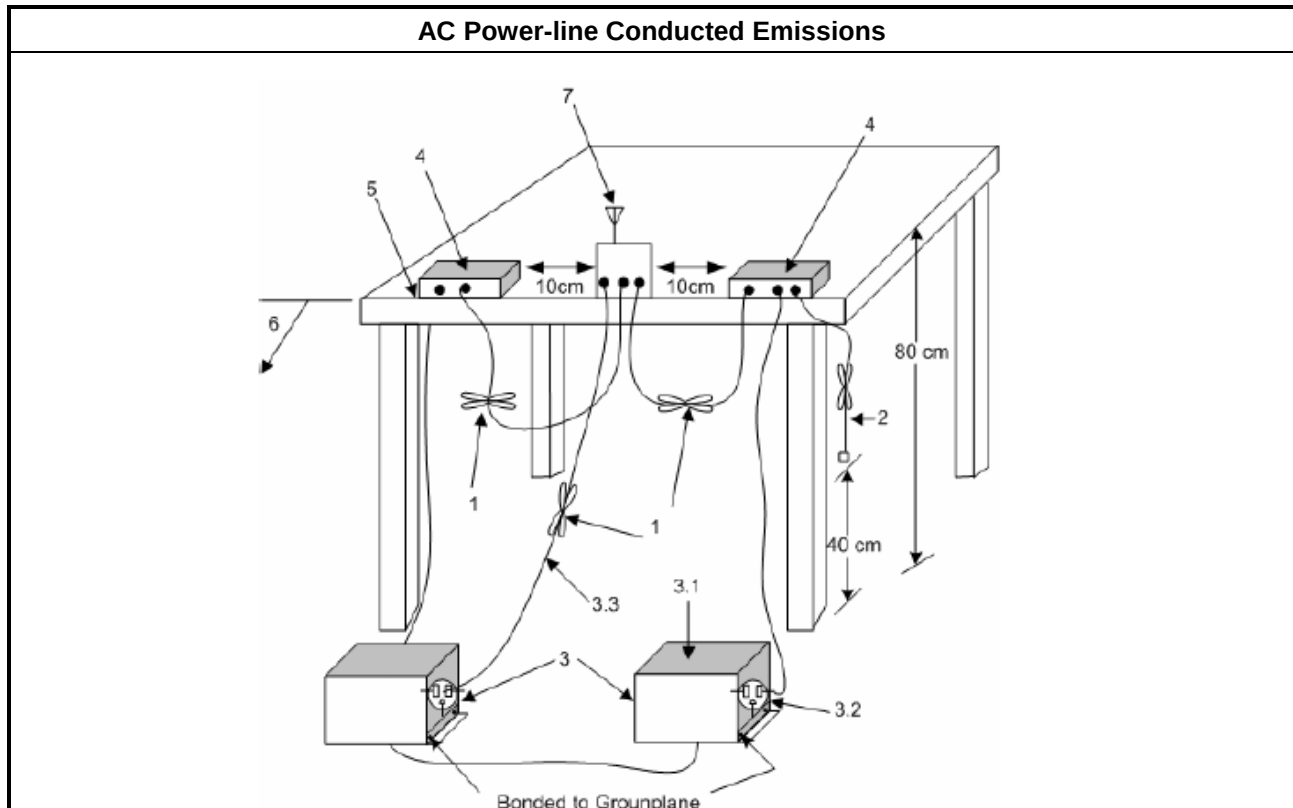
3.1.2 Measuring Instruments

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

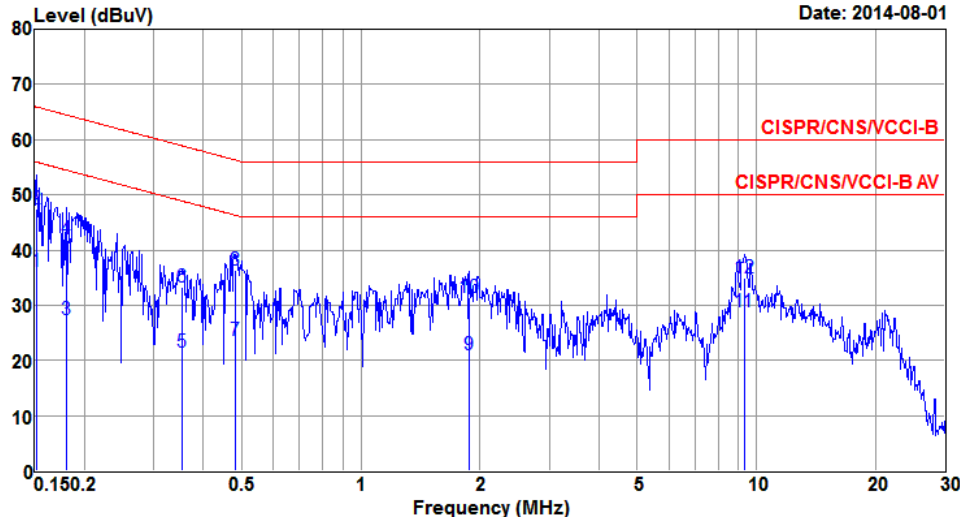
3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

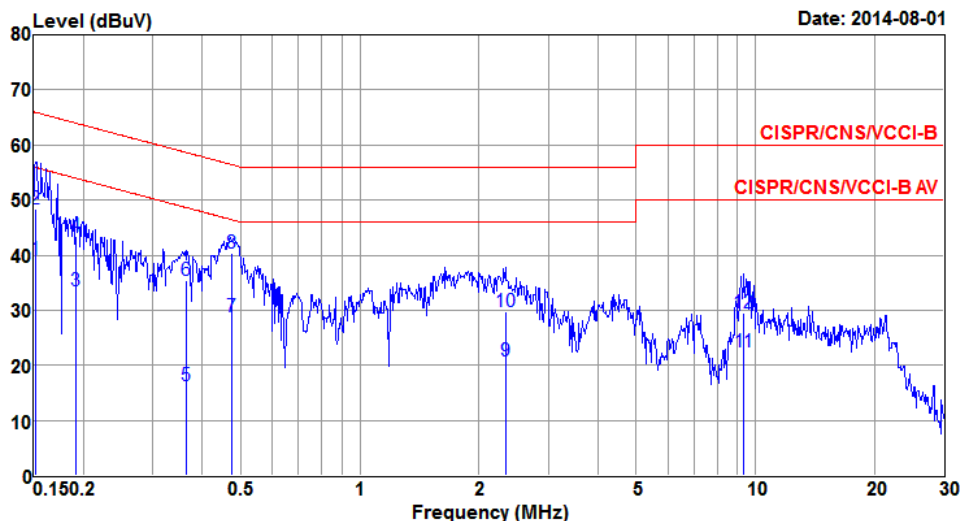


3.1.5 Test Result of AC Power-line Conducted Emissions

AC Power-line Conducted Emissions Result																																																																																																																																														
Operating Mode	1		Power Phase		Neutral																																																																																																																																									
Operating Function	Radio link (WLAN)																																																																																																																																													
Level (dBuV)  Date: 2014-08-01 <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>LISN</th><th>cable</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>Line</th><th>Limit</th><th>Level</th><th>factor</th><th>loss</th><th></th></tr><tr><th></th><th></th><th></th><th>dBuV</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB</th><th></th></tr><tr><td>1</td><td>0.152</td><td>36.21</td><td>55.91</td><td>-19.70</td><td>35.70</td><td>0.49</td><td>0.02</td><td>Average</td></tr><tr><td>2*</td><td>0.152</td><td>47.54</td><td>65.91</td><td>-18.37</td><td>47.03</td><td>0.49</td><td>0.02</td><td>QP</td></tr><tr><td>3</td><td>0.181</td><td>27.39</td><td>54.46</td><td>-27.07</td><td>26.88</td><td>0.50</td><td>0.01</td><td>Average</td></tr><tr><td>4</td><td>0.181</td><td>42.02</td><td>64.46</td><td>-22.44</td><td>41.51</td><td>0.50</td><td>0.01</td><td>QP</td></tr><tr><td>5</td><td>0.354</td><td>21.58</td><td>48.87</td><td>-27.29</td><td>20.97</td><td>0.59</td><td>0.02</td><td>Average</td></tr><tr><td>6</td><td>0.354</td><td>33.31</td><td>58.87</td><td>-25.56</td><td>32.70</td><td>0.59</td><td>0.02</td><td>QP</td></tr><tr><td>7</td><td>0.481</td><td>23.67</td><td>46.32</td><td>-22.65</td><td>22.96</td><td>0.65</td><td>0.06</td><td>Average</td></tr><tr><td>8</td><td>0.481</td><td>36.46</td><td>56.32</td><td>-19.86</td><td>35.75</td><td>0.65</td><td>0.06</td><td>QP</td></tr><tr><td>9</td><td>1.878</td><td>21.13</td><td>46.00</td><td>-24.87</td><td>20.03</td><td>1.06</td><td>0.04</td><td>Average</td></tr><tr><td>10</td><td>1.878</td><td>31.33</td><td>56.00</td><td>-24.67</td><td>30.23</td><td>1.06</td><td>0.04</td><td>QP</td></tr><tr><td>11</td><td>9.302</td><td>28.89</td><td>50.00</td><td>-21.11</td><td>26.98</td><td>1.67</td><td>0.24</td><td>Average</td></tr><tr><td>12</td><td>9.302</td><td>34.84</td><td>60.00</td><td>-25.16</td><td>32.93</td><td>1.67</td><td>0.24</td><td>QP</td></tr></table>									Freq	Level	Limit	Over	Read	LISN	cable	Remark		MHz	dBuV	Line	Limit	Level	factor	loss					dBuV	dB	dBuV	dB	dB		1	0.152	36.21	55.91	-19.70	35.70	0.49	0.02	Average	2*	0.152	47.54	65.91	-18.37	47.03	0.49	0.02	QP	3	0.181	27.39	54.46	-27.07	26.88	0.50	0.01	Average	4	0.181	42.02	64.46	-22.44	41.51	0.50	0.01	QP	5	0.354	21.58	48.87	-27.29	20.97	0.59	0.02	Average	6	0.354	33.31	58.87	-25.56	32.70	0.59	0.02	QP	7	0.481	23.67	46.32	-22.65	22.96	0.65	0.06	Average	8	0.481	36.46	56.32	-19.86	35.75	0.65	0.06	QP	9	1.878	21.13	46.00	-24.87	20.03	1.06	0.04	Average	10	1.878	31.33	56.00	-24.67	30.23	1.06	0.04	QP	11	9.302	28.89	50.00	-21.11	26.98	1.67	0.24	Average	12	9.302	34.84	60.00	-25.16	32.93	1.67	0.24	QP
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Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)																																																																																																																																														

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Radio link (WLAN)		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.152	39.29	55.91	-16.62	38.86	0.41	0.02	Average
2	0.152	48.41	65.91	-17.50	47.98	0.41	0.02	QP
3	0.191	33.51	53.98	-20.47	33.08	0.42	0.01	Average
4	0.191	43.41	63.98	-20.57	42.98	0.42	0.01	QP
5	0.365	16.31	48.61	-32.30	15.77	0.52	0.02	Average
6	0.365	35.49	58.61	-23.12	34.95	0.52	0.02	QP
7	0.476	28.81	46.41	-17.60	28.19	0.57	0.05	Average
8*	0.476	40.44	56.41	-15.97	39.82	0.57	0.05	QP
9	2.334	20.74	46.00	-25.26	19.67	1.02	0.05	Average
10	2.334	29.70	56.00	-26.30	28.63	1.02	0.05	QP
11	9.352	22.45	50.00	-27.55	20.56	1.65	0.24	Average
12	9.352	29.59	60.00	-30.41	27.70	1.65	0.24	QP

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
☒ 6 dB bandwidth $\geq$ 500 kHz.

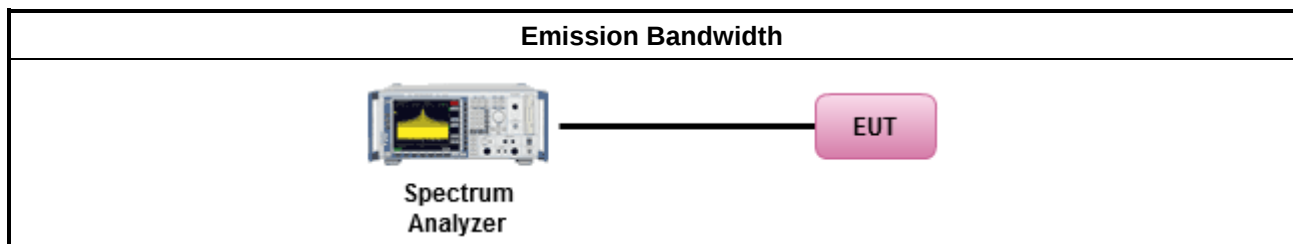
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

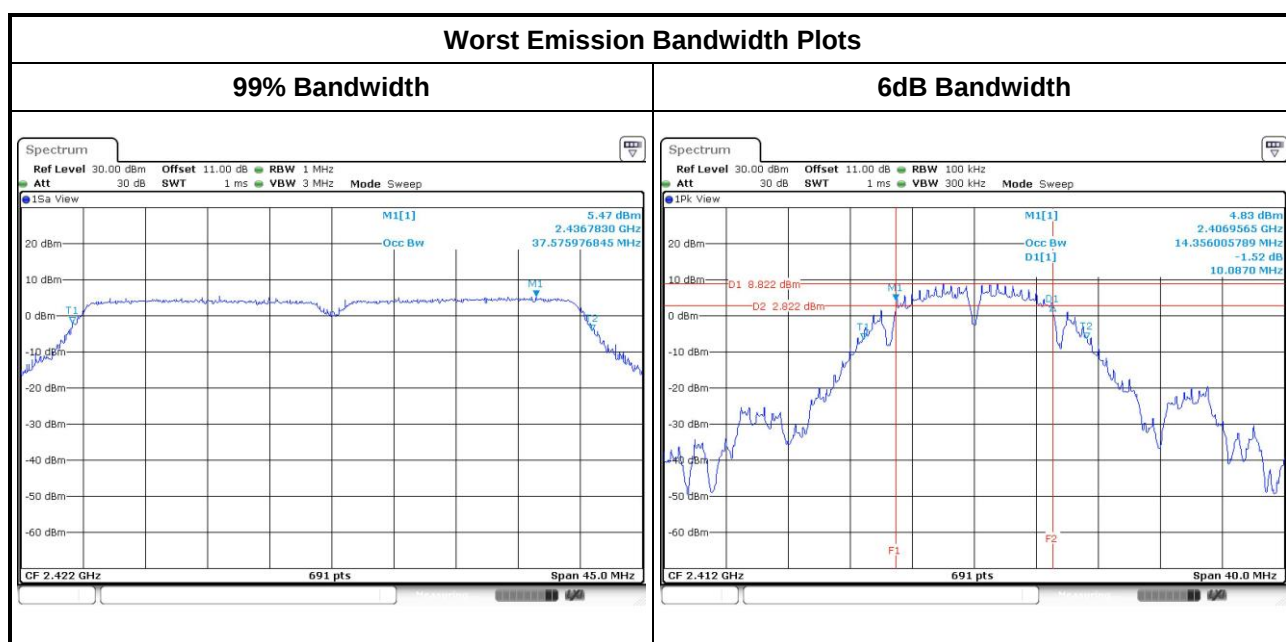
Test Method
☒ For the emission bandwidth shall be measured using one of the options below:
☒ Refer as FCC KDB 558074 v03r02, clause 8.1 Option 1 for 6 dB bandwidth measurement. ☐ Refer as FCC KDB 558074 v03r02, clause 8.2 Option 2 for 6 dB bandwidth measurement. ☐ Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒ For conducted measurement.
☒ The EUT supports single transmit chain and measurements performed on this transmit chain. ☐ The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. ☐ The EUT supports multiple transmit chains using options given below:
☐ Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1. ☐ Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result										
Condition			Emission Bandwidth (MHz)							
Modulation Mode	N _{TX}	Freq. (MHz)	99% Bandwidth				6dB Bandwidth			
			Chain-Port 1	Chain-Port 2	Chain-Port 3	Chain-Port 4	Chain-Port 1	Chain-Port 2	Chain-Port 3	Chain-Port 4
11b	1	2412	14.25	--	--	--	10.09	--	--	--
11b	1	2437	14.18	--	--	--	10.09	--	--	--
11b	1	2462	14.22	--	--	--	10.09	--	--	--
11g	1	2412	17.11	--	--	--	16.35	--	--	--
11g	1	2437	19.72	--	--	--	16.29	--	--	--
11g	1	2462	17.04	--	--	--	16.35	--	--	--
HT-20	1	2412	18.09	--	--	--	17.62	--	--	--
HT-20	1	2437	19.65	--	--	--	17.16	--	--	--
HT-20	1	2462	18.09	--	--	--	17.51	--	--	--
HT-40	1	2422	37.58	--	--	--	36.41	--	--	--
HT-40	1	2437	37.58	--	--	--	36.41	--	--	--
HT-40	1	2452	37.58	--	--	--	36.41	--	--	--
Limit			N/A				≥500 kHz			
Result			Complied							
Note 1: N _{TX} = Number of Transmit Chains										



3.3 RF Output Power

3.3.1 RF Output Power Limit

RF Output Power Limit	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
☒ 2400-2483.5 MHz Band:	
☒	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
☒	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
☐	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
☐	Smart antenna system (SAS):
☐	Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
☐	Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
☐	Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dBm
e.i.r.p. Power Limit:	
☒ 2400-2483.5 MHz Band	
☒	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
☐	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
☐	Smart antenna system (SAS)
☐	Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
☐	Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
☐	Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm.	

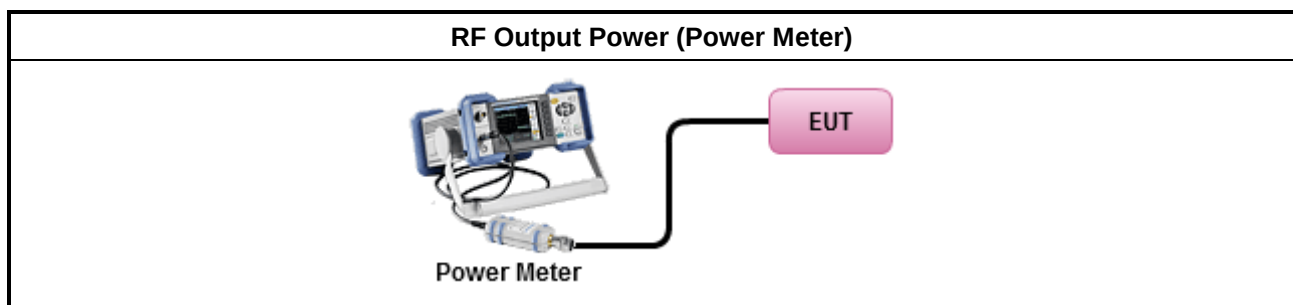
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
☒	Maximum Peak Conducted Output Power
☐	Refer as FCC KDB 558074 v03r02, clause 9.1.1 (RBW $\geq$ DTS BW).
☒	Refer as FCC KDB 558074 v03r02, clause 9.1.2 (Peak power meter)
☒	Maximum Conducted Output Power (Reference only)
☐	Refer as FCC KDB 558074 v03r02, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
☐	Refer as FCC KDB 558074 v03r02, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
☐	Refer as FCC KDB 558074 v03r02, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
☐	Refer as FCC KDB 558074 v03r02, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
☒	Refer as FCC KDB 558074 v03r02, clause 9.2.3 Method AVGPM-G (using a gated RF average power meter)
☒	For conducted measurement.
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☐	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
☐	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
☐	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup



3.3.5 Directional Gain for Power Measurement

Directional Gain (DG) Result					
Transmit Chains No.		1	-	-	-
Maximum G_{ANT} (dBi)		3	-	-	-
Modulation Mode	DG (dBi)	N_{TX}	N_{SS}	STBC	Array Gain (dB)
11b,1-11Mbps	3	1	-	-	-
11g,6-54Mbps	3	1	-	-	-
HT-20,M0-M7	3	1	-	-	-
HT-40,M0-M7	3	1	-	-	-

3.3.6 Test Result of Maximum Conducted Output Power

Maximum Peak Conducted Output Power											
Condition			RF Output Power (dBm)								
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 4	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	20.38	-	-	-	20.38	30.00	3	23.38	36.00
11b	1	2437	20.72	-	-	-	20.72	30.00	3	23.72	36.00
11b	1	2462	20.80	-	-	-	20.80	30.00	3	23.80	36.00
11g	1	2412	21.98	-	-	-	21.98	30.00	3	24.98	36.00
11g	1	2437	23.99	-	-	-	23.99	30.00	3	26.99	36.00
11g	1	2462	20.13	-	-	-	20.13	30.00	3	23.13	36.00
HT-20	1	2412	21.58	-	-	-	21.58	30.00	3	24.58	36.00
HT-20	1	2437	24.36	-	-	-	24.36	30.00	3	27.36	36.00
HT-20	1	2462	20.14	-	-	-	20.14	30.00	3	23.14	36.00
HT-40	1	2422	20.76	-	-	-	20.76	30.00	3	23.76	36.00
HT-40	1	2437	22.28	-	-	-	22.28	30.00	3	25.28	36.00
HT-40	1	2452	20.61	-	-	-	20.61	30.00	3	23.61	36.00
Result			Complied								

Maximum Conducted (Average) Output Power											
Condition			RF Output Power (dBm)								
Modulation Mode	N _{TX}	Freq. (MHz)	Chain Port 1	Chain Port 2	Chain Port 3	Chain Port 4	Sum Chain	Power Limit	DG (dBi)	EIRP Power	EIRP Limit
11b	1	2412	18.35	-	-	-	18.35	30.00	3	21.35	36.00
11b	1	2437	18.65	-	-	-	18.65	30.00	3	21.65	36.00
11b	1	2462	18.78	-	-	-	18.78	30.00	3	21.78	36.00
11g	1	2412	13.34	-	-	-	13.34	30.00	3	16.34	36.00
11g	1	2437	19.04	-	-	-	19.04	30.00	3	22.04	36.00
11g	1	2462	12.45	-	-	-	12.45	30.00	3	15.45	36.00
HT-20	1	2412	12.84	-	-	-	12.84	30.00	3	15.84	36.00
HT-20	1	2437	18.90	-	-	-	18.90	30.00	3	21.90	36.00
HT-20	1	2462	12.03	-	-	-	12.03	30.00	3	15.03	36.00
HT-40	1	2422	12.12	-	-	-	12.12	30.00	3	15.12	36.00
HT-40	1	2437	13.88	-	-	-	13.88	30.00	3	16.88	36.00
HT-40	1	2452	11.61	-	-	-	11.61	30.00	3	14.61	36.00
Result			Complied								

Note: AV power is for reference only.

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit	
☒	Power Spectral Density (PSD) $\leq$ 8 dBm/3kHz

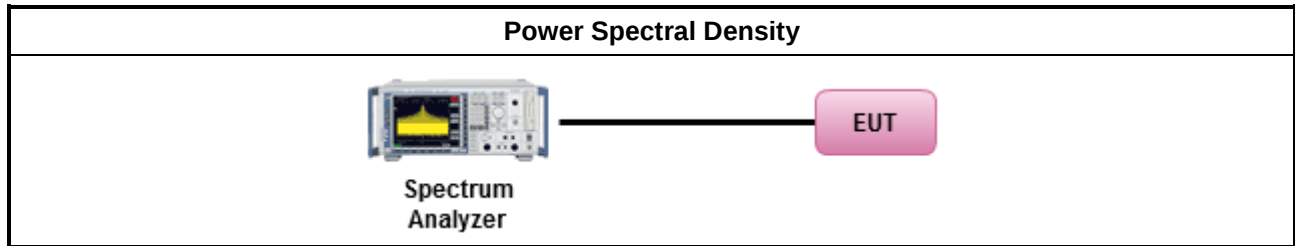
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

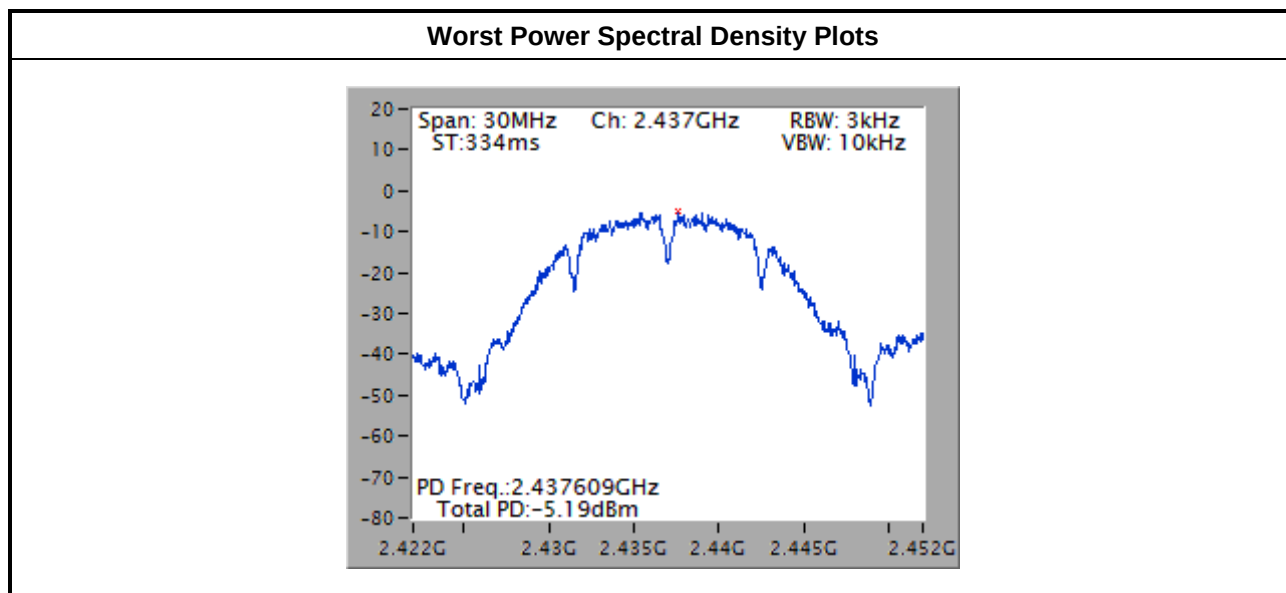
Test Method	
☒	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒	Refer as FCC KDB 558074 v03r02, clause 10.2 Method PKPSD (RBW=30kHz; detector=peak)..
☐	Refer as FCC KDB 558074 v03r02, clause 10.3 Method AVGPS-1 (spectral trace averaging).
☐	Refer as FCC KDB 558074 v03r02, clause 10.4 Method AVGPS-1 Alt. (slow sweep speed)
☐	Refer as FCC KDB 558074 v03r02, clause 10.5 Method AVGPS-2 (spectral trace averaging).
☐	Refer as FCC KDB 558074 v03r02, clause 10.6 Method AVGPS-2 Alt. (slow sweep speed)
☒	For conducted measurement.
☒	The EUT supports single transmit chain and measurements performed on this transmit chain.
☐	The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case.
☐	The EUT supports multiple transmit chains using options given below:
☐	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N _{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Power Spectral Density Result				
Condition			Power Spectral Density (dBm/3kHz)	
Modulation Mode	N _{TX}	Freq. (MHz)	Sum Chain	Power Limit
11b	1	2412	-5.22	8
11b	1	2437	-5.19	8
11b	1	2462	-5.35	8
11g	1	2412	-11.79	8
11g	1	2437	-6.43	8
11g	1	2462	-13.53	8
HT-20	1	2412	-12.44	8
HT-20	1	2437	-7.27	8
HT-20	1	2462	-13.58	8
HT-40	1	2422	-17.07	8
HT-40	1	2437	-15.24	8
HT-40	1	2452	-17.86	8
Result			Complied	



3.5 Emissions in non-restricted frequency bands

3.5.1 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

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

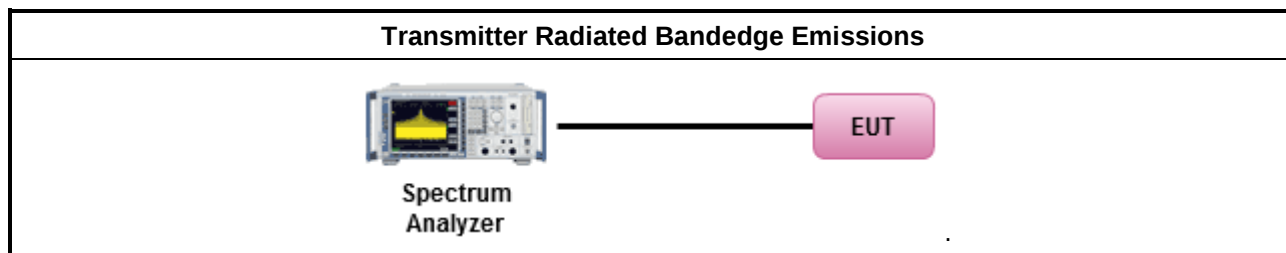
Reference level measurement

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

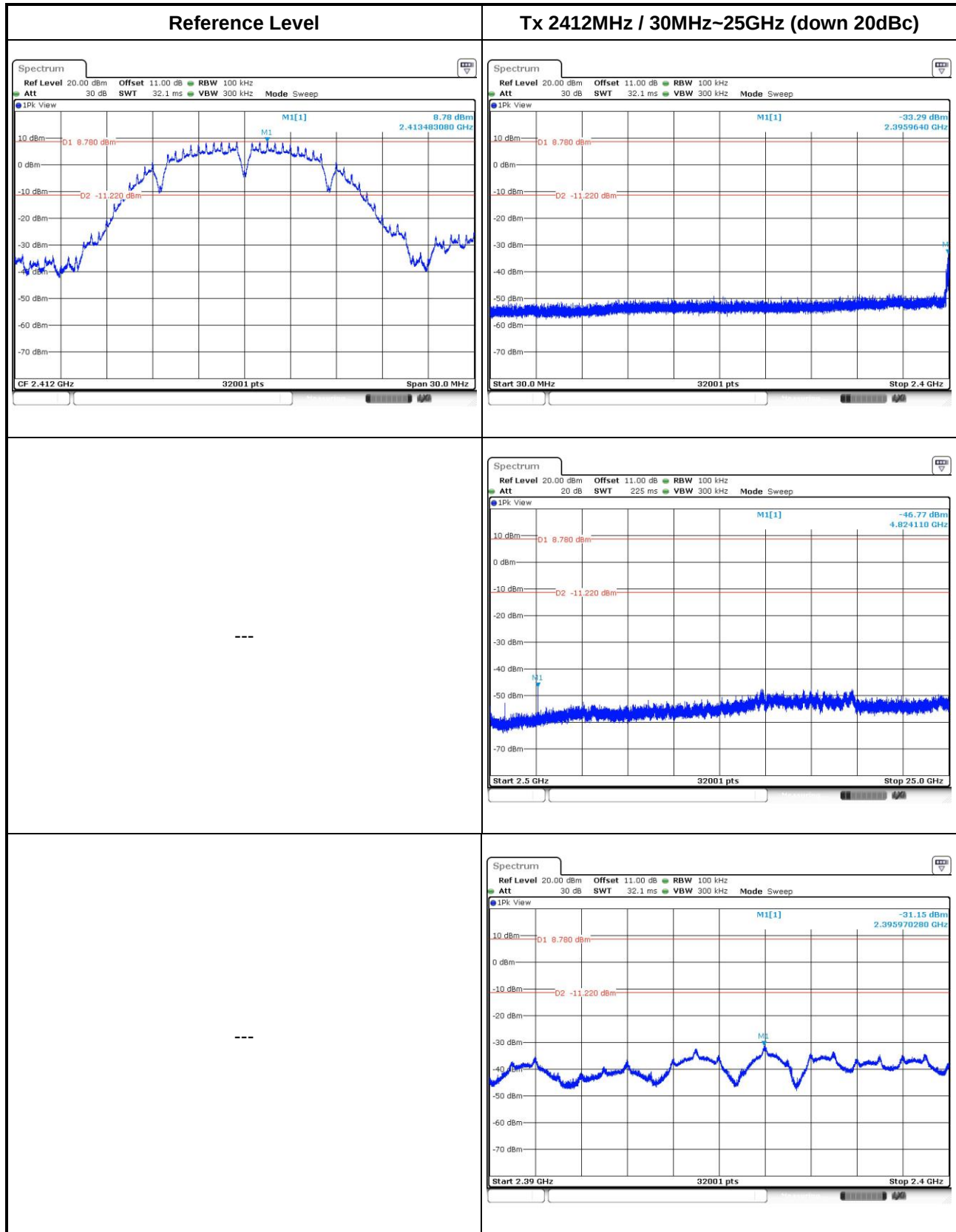
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

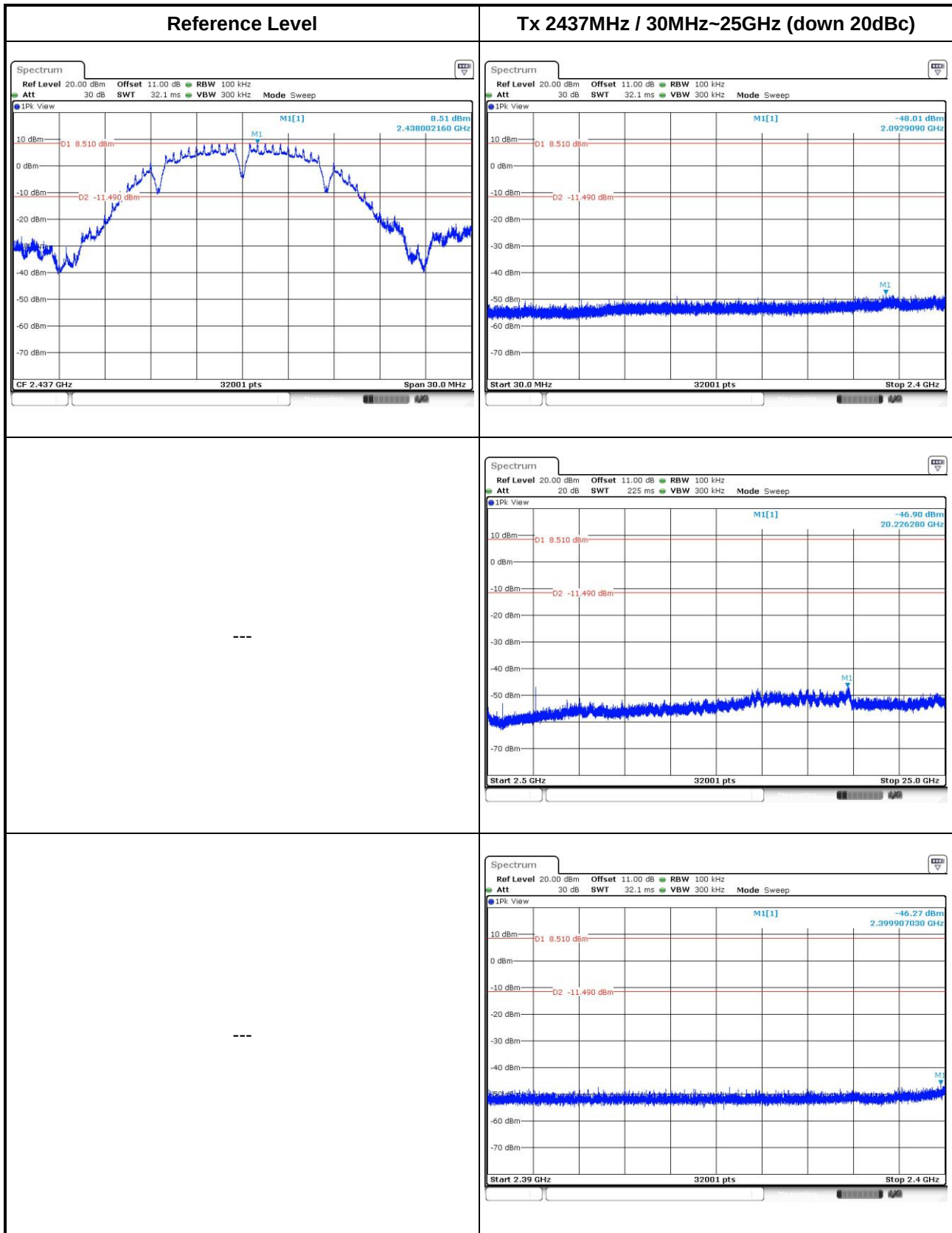
3.5.4 Test Setup

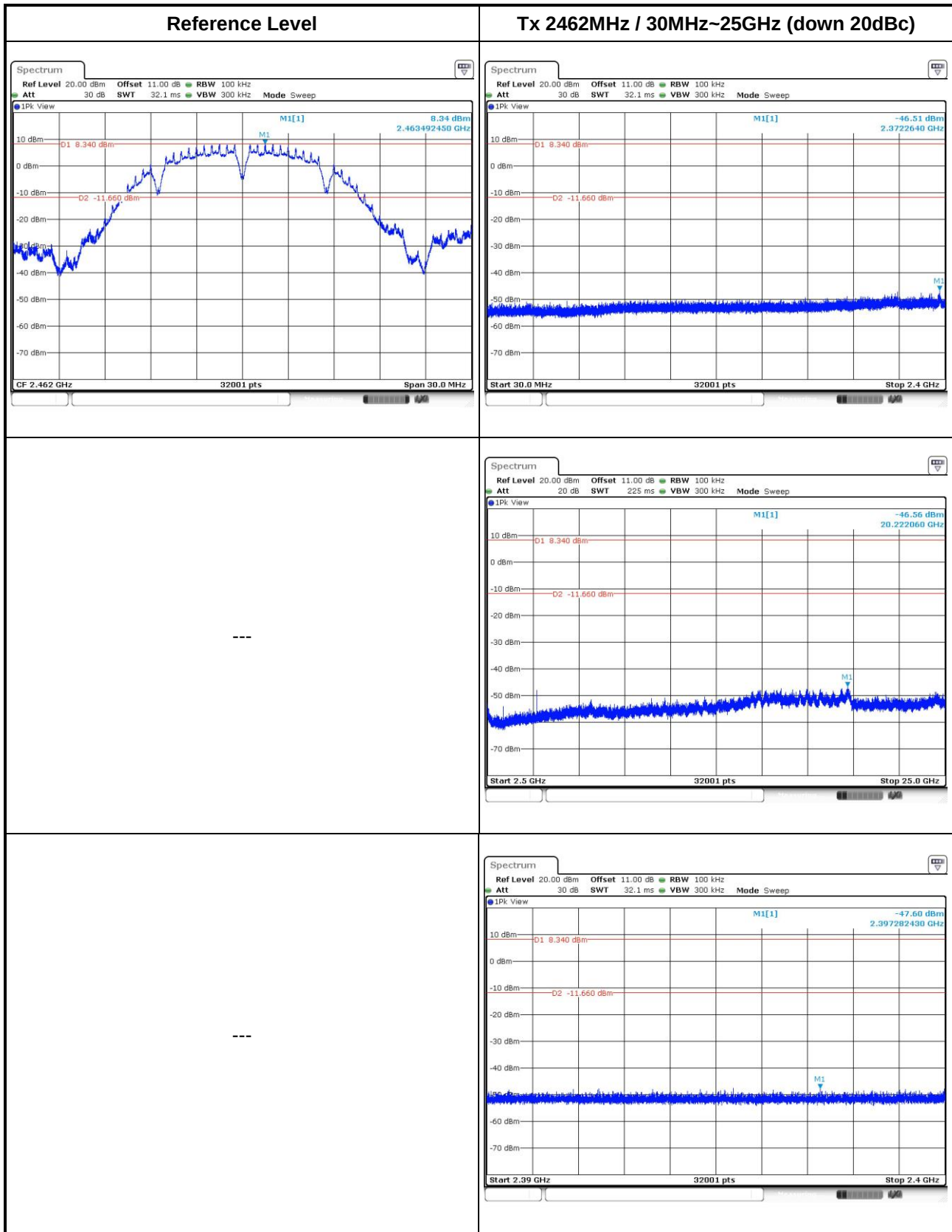


3.5.5 Test Result of Emissions in non-restricted frequency bands

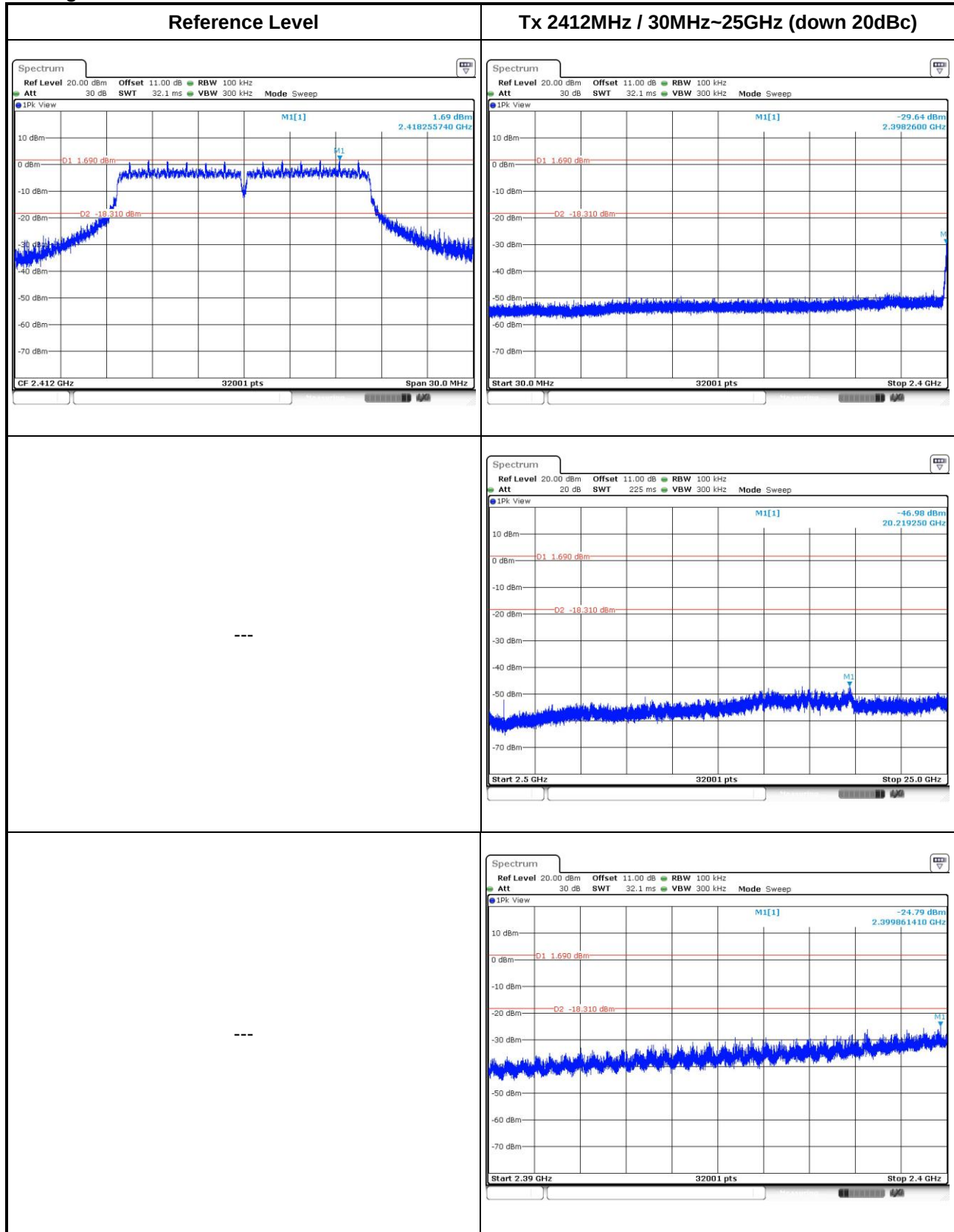
802.11b

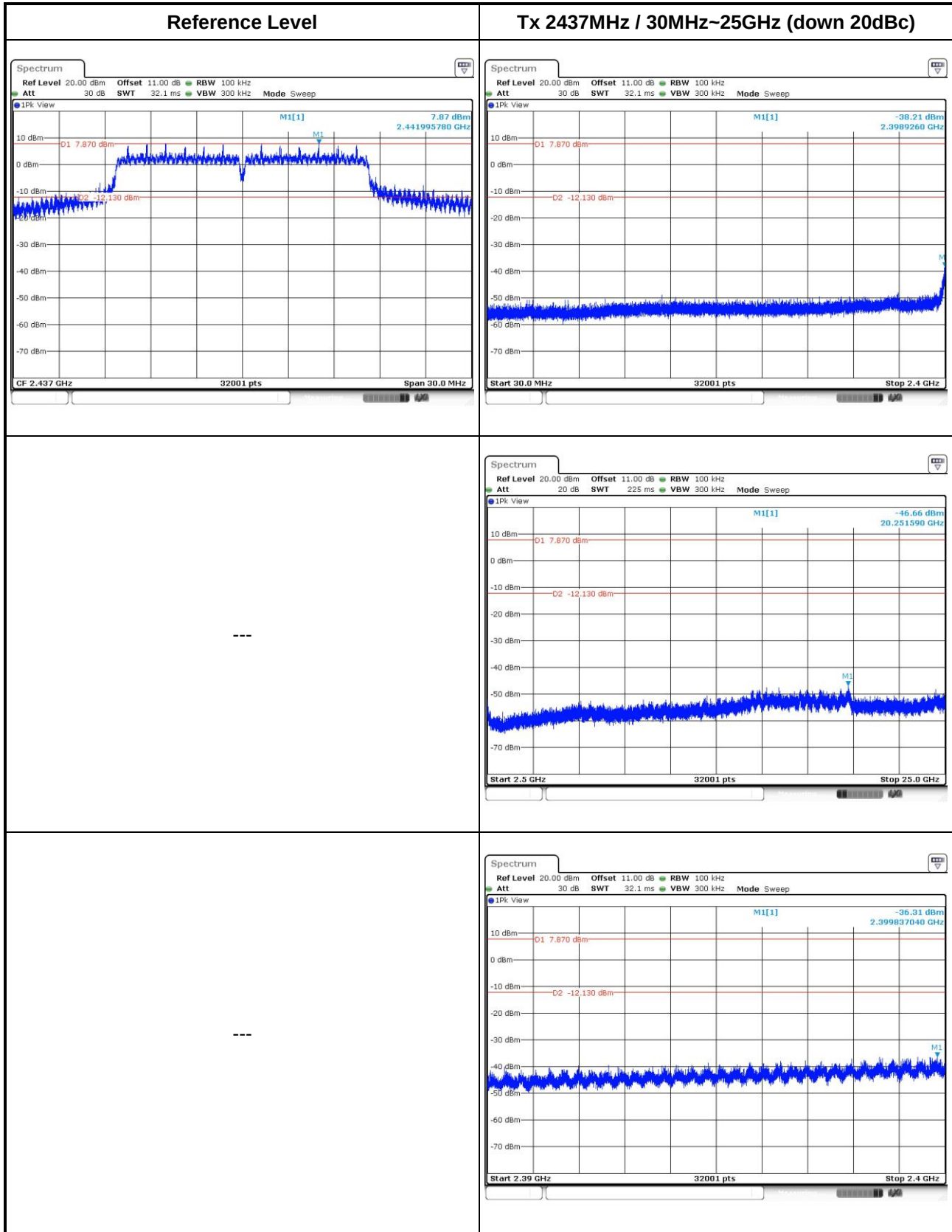


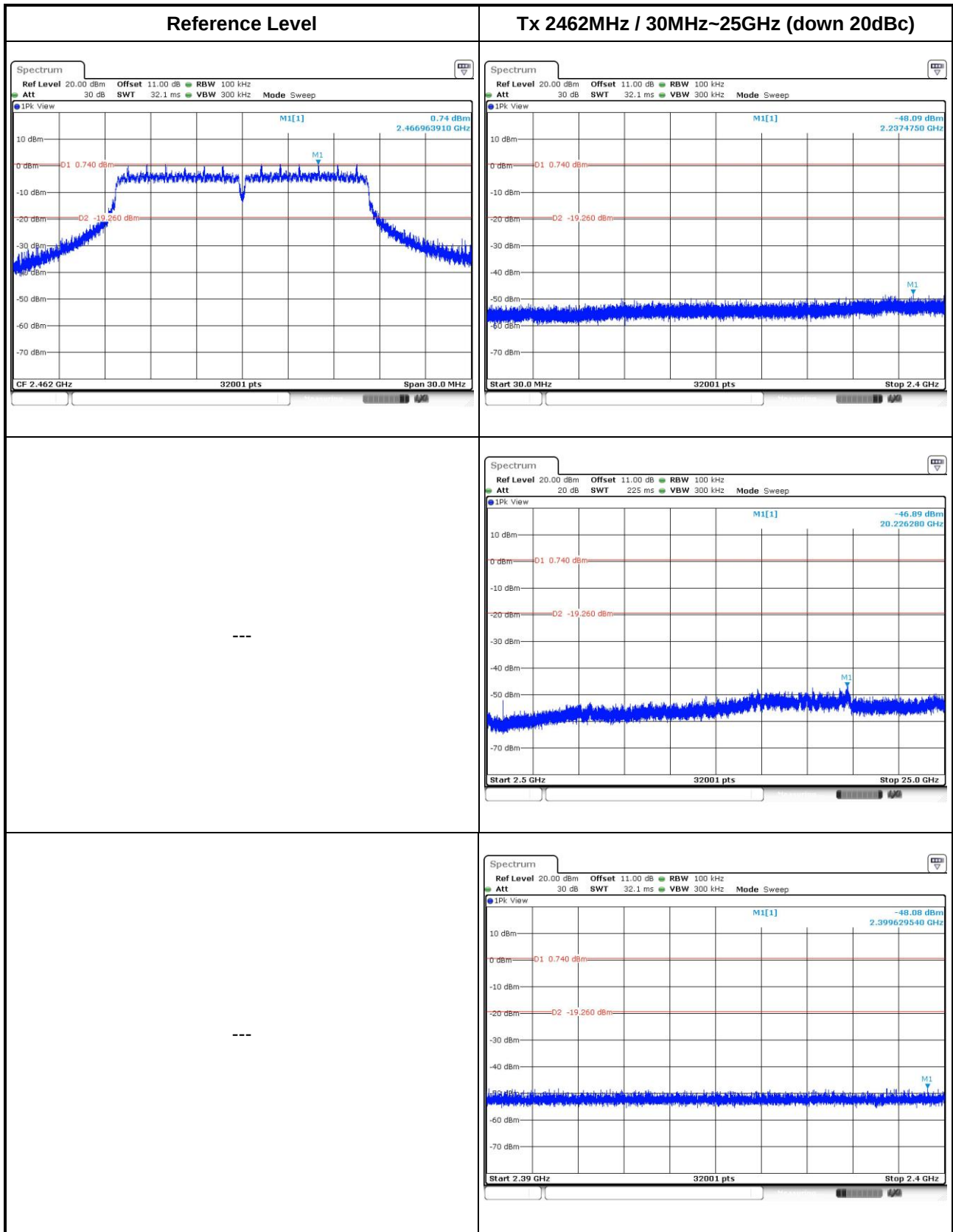




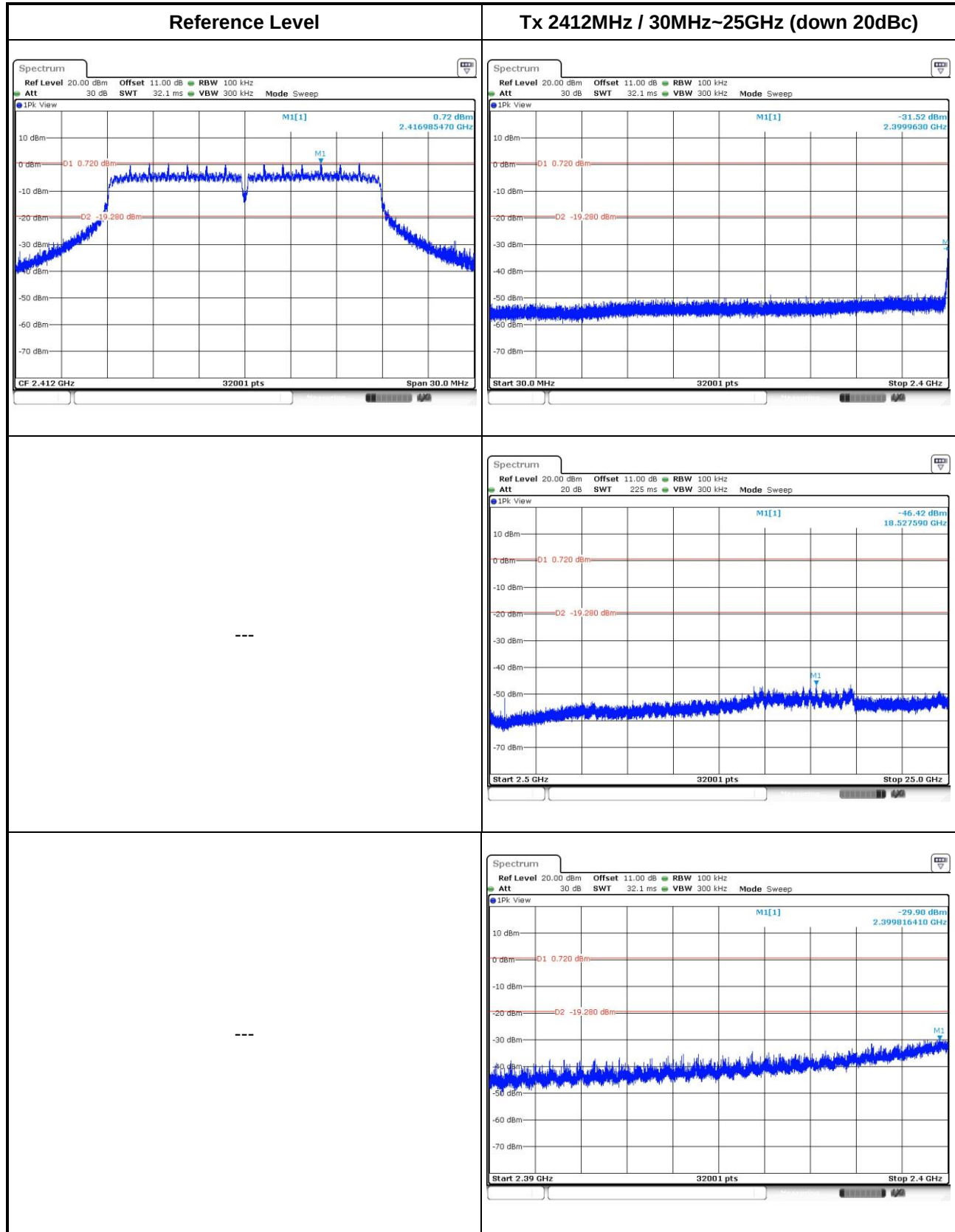
802.11g





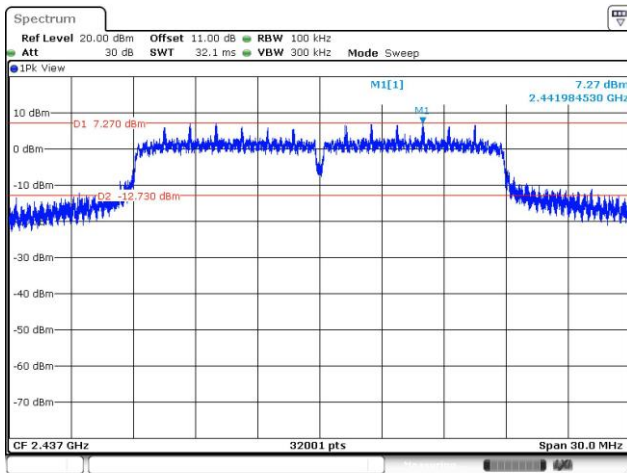


802.11n HT20

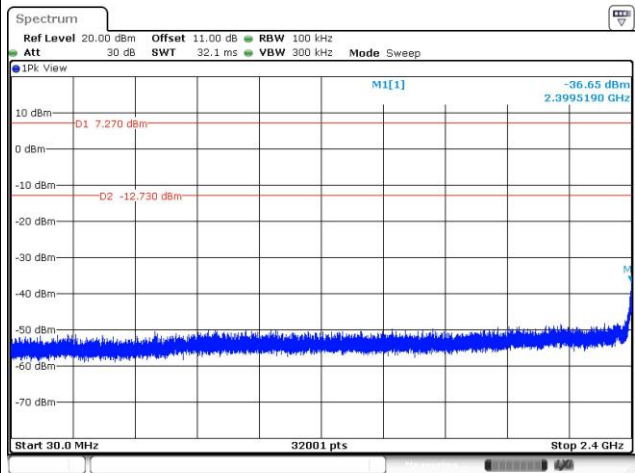


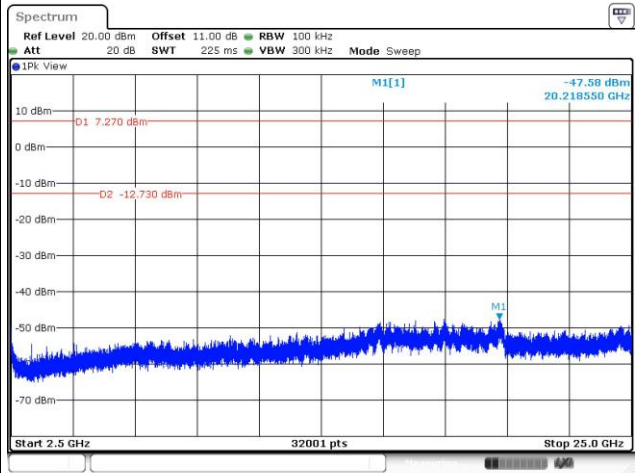


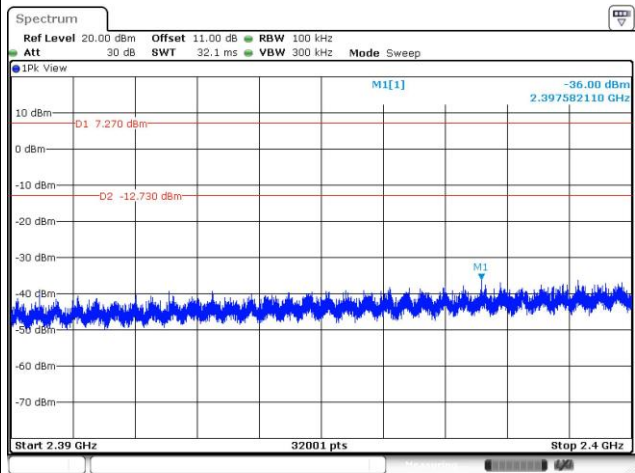
Reference Level

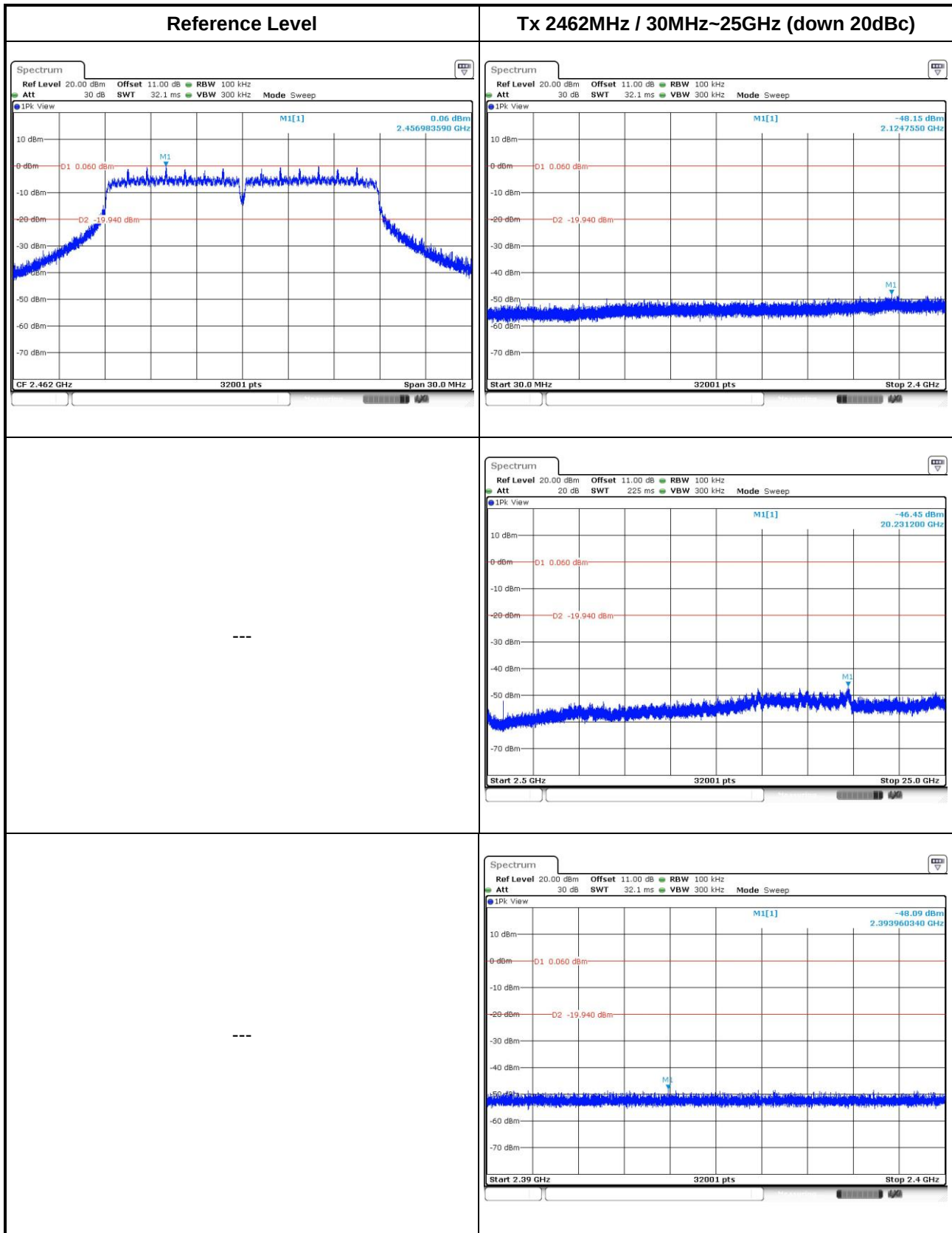


Tx 2437MHz / 30MHz-25GHz (down 20dBc)

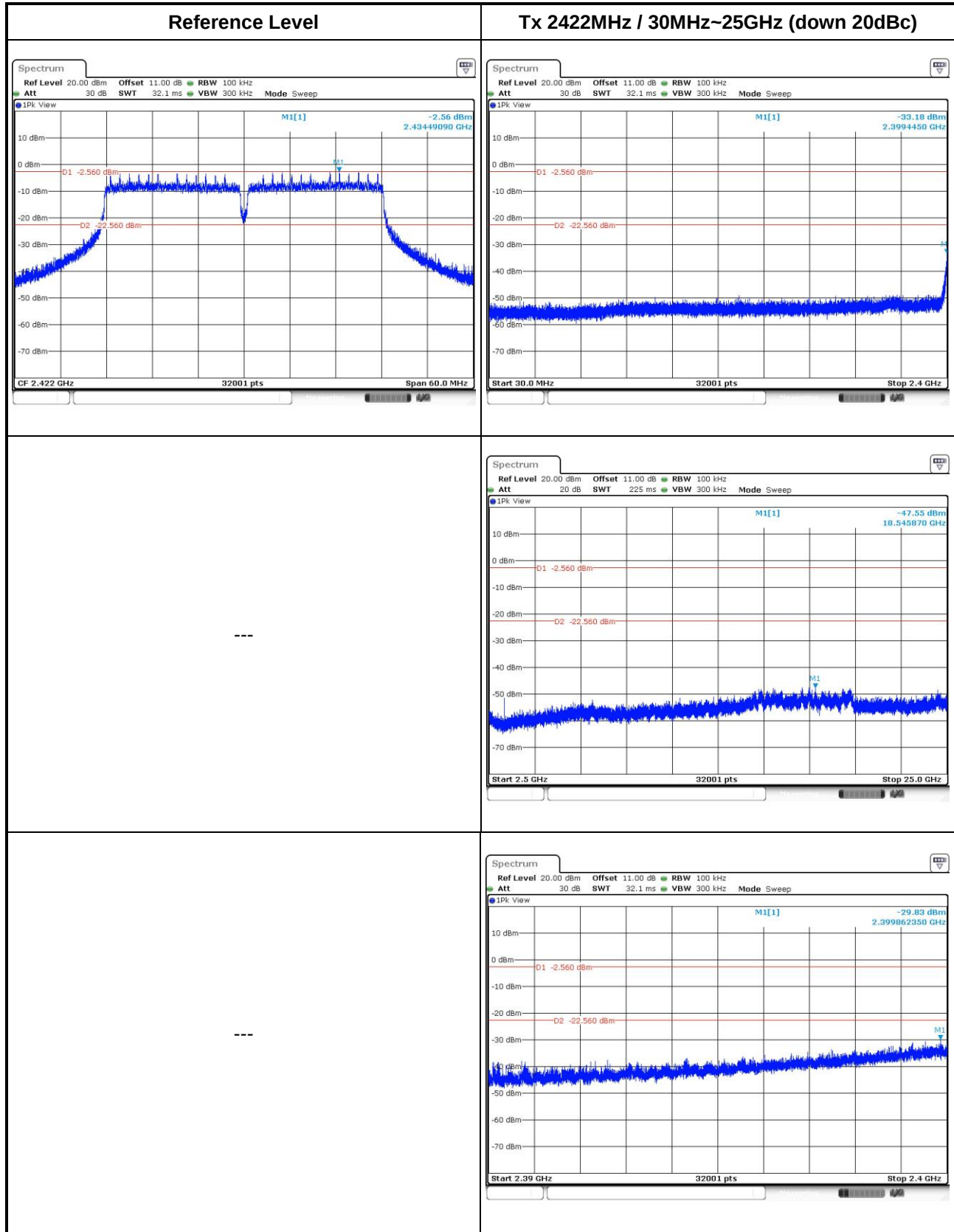


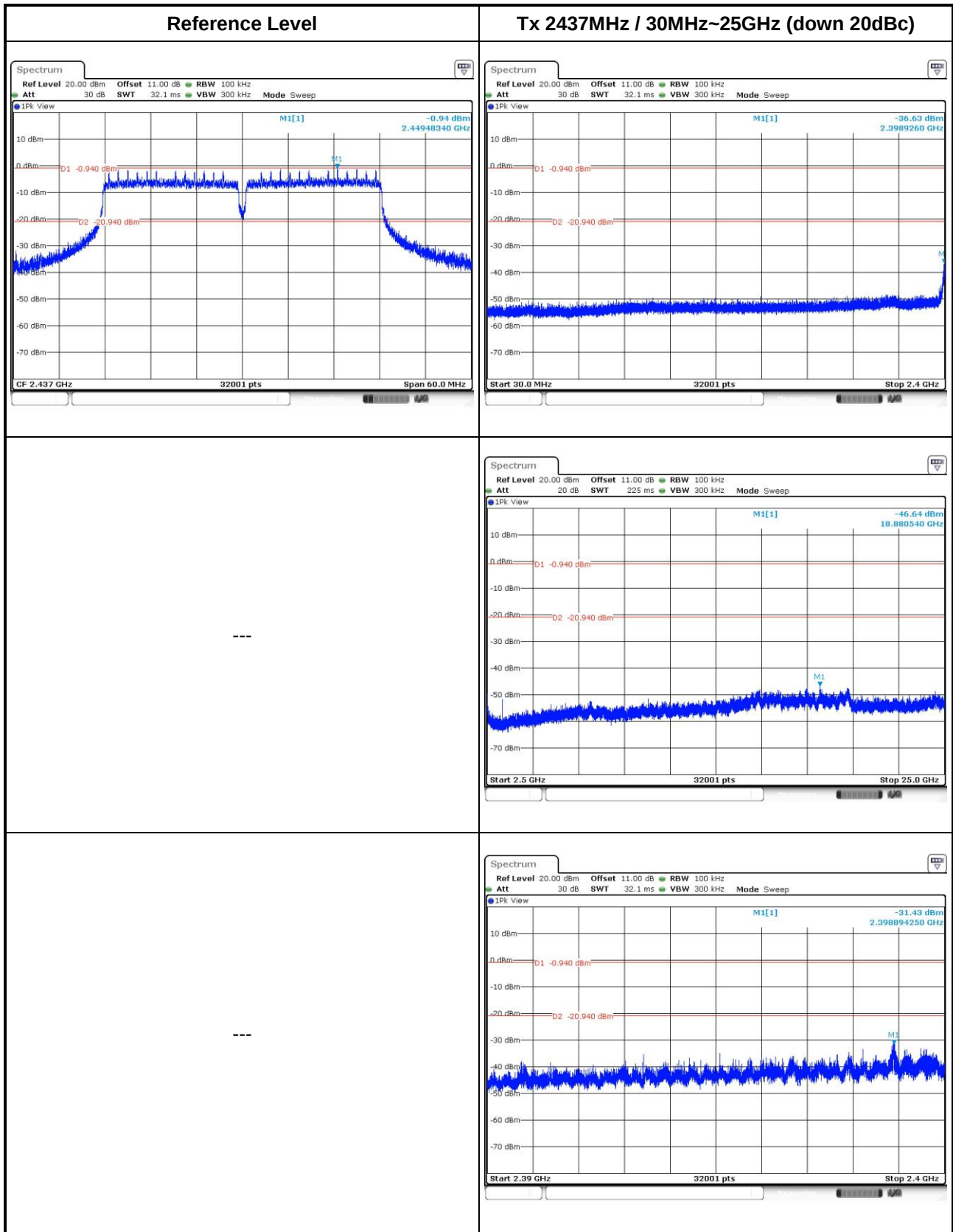


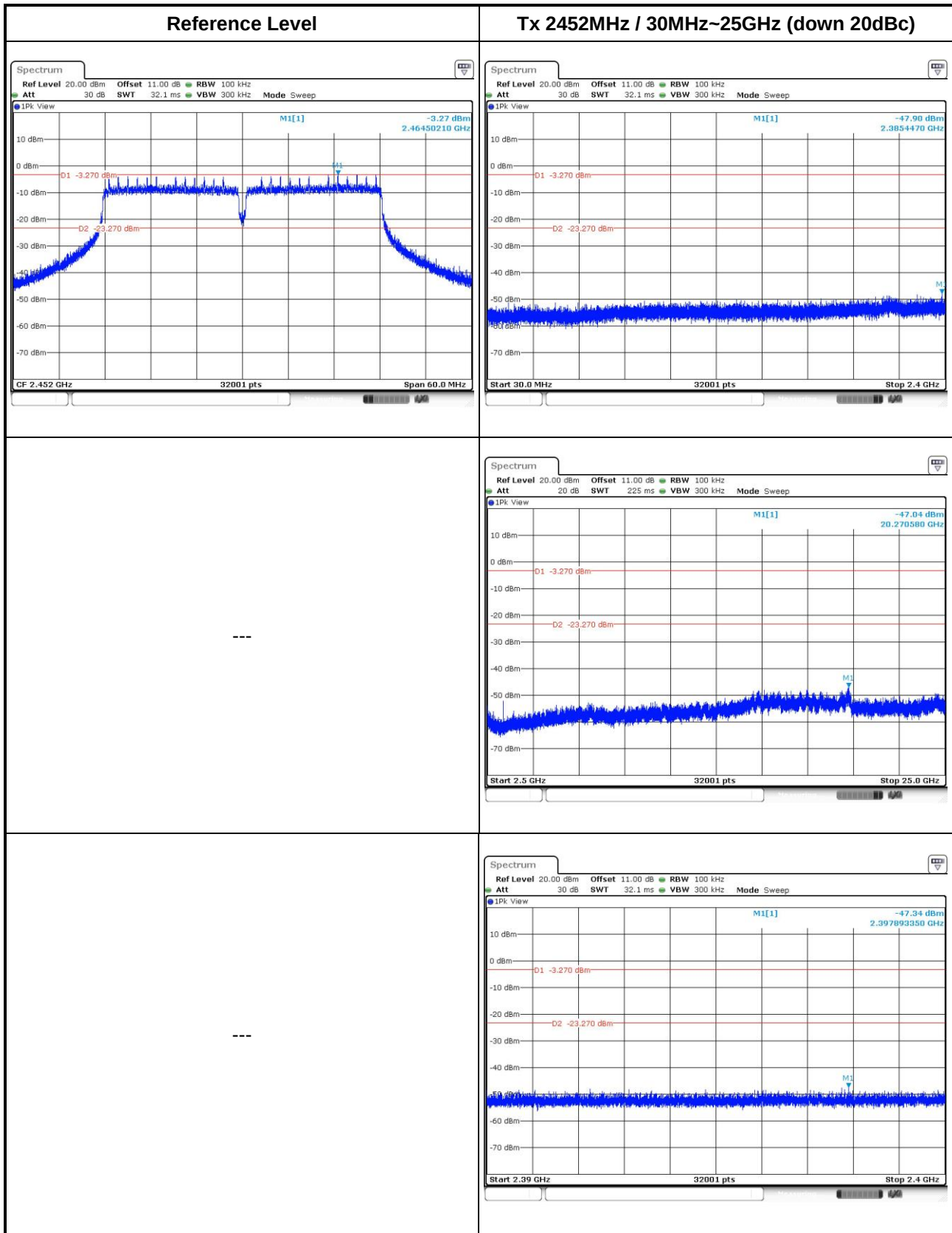




802.11n HT40







3.6 Transmitter Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

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: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

Test Method	
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
☒	For the transmitter unwanted emissions shall be measured using following options below:
☒	Refer as FCC KDB 558074 v03r02, clause 11 for unwanted emissions into non-restricted bands.
☒	Refer as FCC KDB 558074 v03r02, clause 12 for unwanted emissions into restricted bands.
☐	Refer as FCC KDB 558074 v03r02, clause 12.2.5.1 Option 1 (trace averaging for duty cycle $\geq 98\%$)
☐	Refer as FCC KDB 558074 v03r02, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
☒	Refer as FCC KDB 558074 v03r02, clause 12.2.5.3 Option 3 (Reduced VBW $\geq 1/T$).
☐	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW $\geq 1/T$, where T is pulse time
☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
☒	Refer as FCC KDB 558074 v03r02, clause 11.3 and 12.2.4 measurement procedure peak limit.
☒	Refer as FCC KDB 558074 v03r02, clause 12.2.3 measurement procedure Quasi-Peak limit.
☒	For radiated measurement, refer as FCC KDB 558074 v03r02, clause 12.1
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz.

Test Method	
☒	For conducted and cabinet radiation measurement, refer as FCC KDB 558074 v03r02, clause 12.2
☐	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
☒	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB

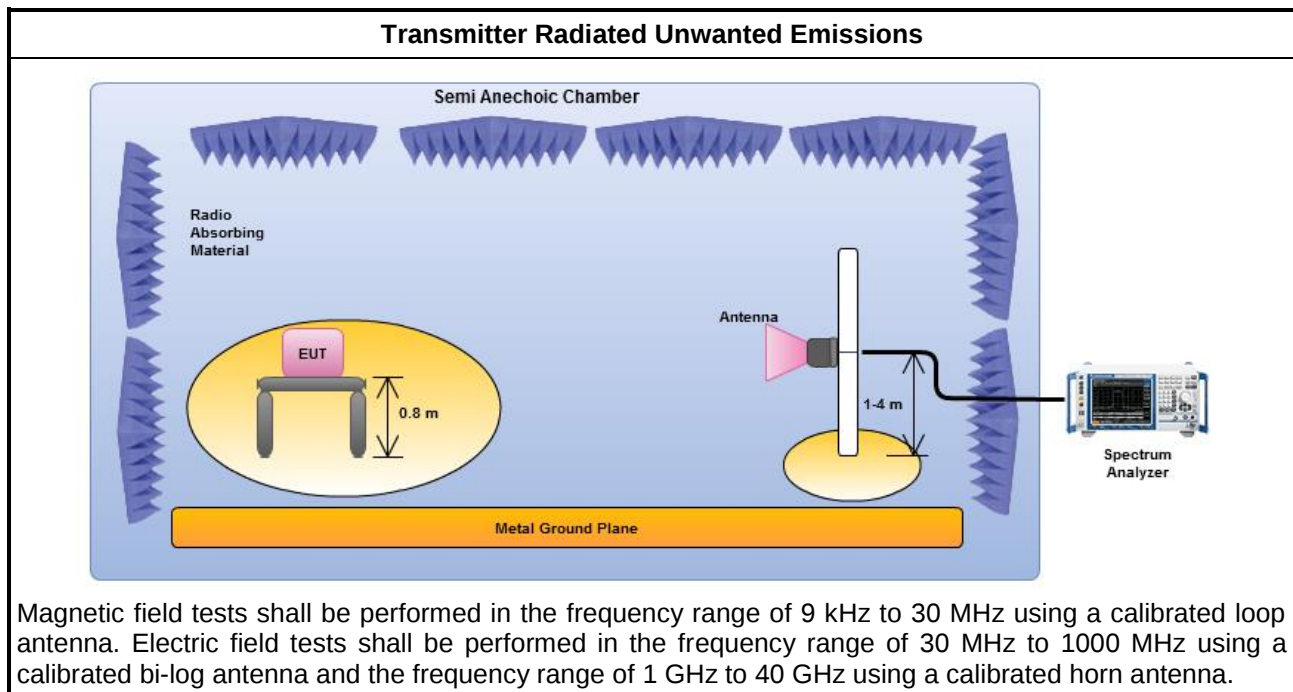
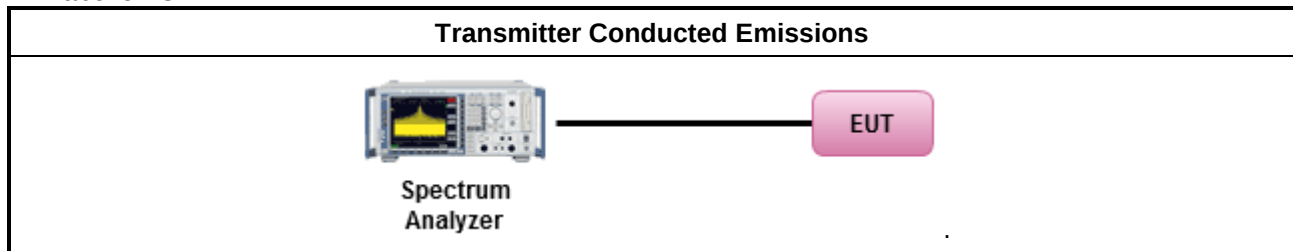
3.6.4 Test Setup

Spurious emission test below 1GHz is performed by using radiated test method.

Spurious emission test above 1GHz is performed by below 2 conditions

- 1) Antenna-port conducted measurement
- 2) Radiated test for cabinet spurious emissions

A 50 Ω terminator is connected to EUT instead of antenna to perform radiated spurious emission test above 1GHz .



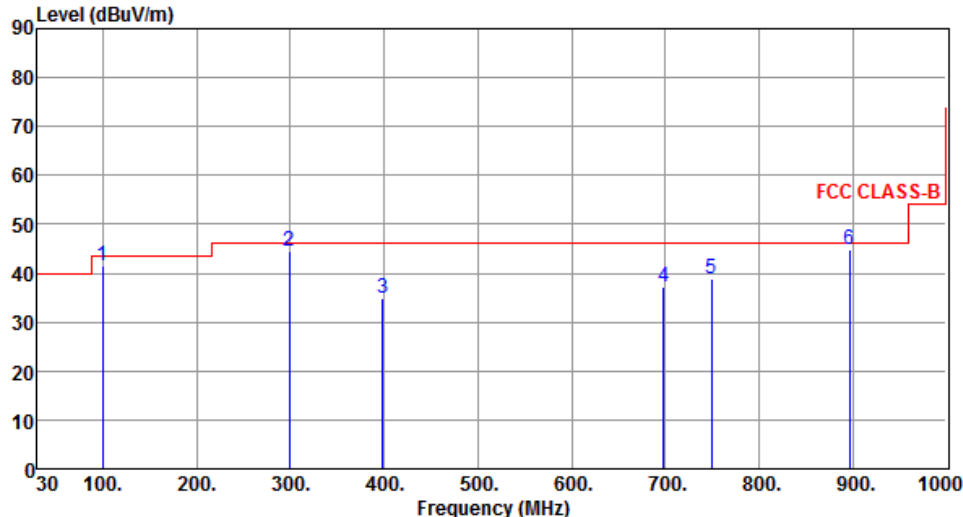
Note: Test distance is 3m.

3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	HT20		Test Freq. (MHz)		2437	
Polarization	Horizontal					



The graph displays the radiated unwanted emissions level in dBuV/m against frequency in MHz from 30 to 1000 MHz. A red line represents the FCC CLASS-B limit, which is 40 dBuV/m from 30 to 100 MHz, 45 dBuV/m from 100 to 300 MHz, and 50 dBuV/m from 300 to 1000 MHz. Six blue vertical lines indicate measured peaks at 99.84, 298.69, 398.60, 698.33, 749.74, and 896.21 MHz. The peak levels are 41.40, 44.61, 34.87, 37.06, 38.94, and 44.69 dBuV/m respectively. The margins relative to the limit are -2.10, -1.39, -11.13, -8.94, -7.06, and -1.31 dB.

	Freq.	Emission	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	level			reading			High	Table
		dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg
1	99.84	41.40	43.50	-2.10	63.25	-21.85	Peak	---	---
2	298.69	44.61	46.00	-1.39	60.80	-16.19	Peak	---	---
3	398.60	34.87	46.00	-11.13	48.56	-13.69	Peak	---	---
4	698.33	37.06	46.00	-8.94	45.32	-8.26	Peak	---	---
5	749.74	38.94	46.00	-7.06	46.18	-7.24	Peak	---	---
6	896.21	44.69	46.00	-1.31	50.24	-5.55	Peak	---	---

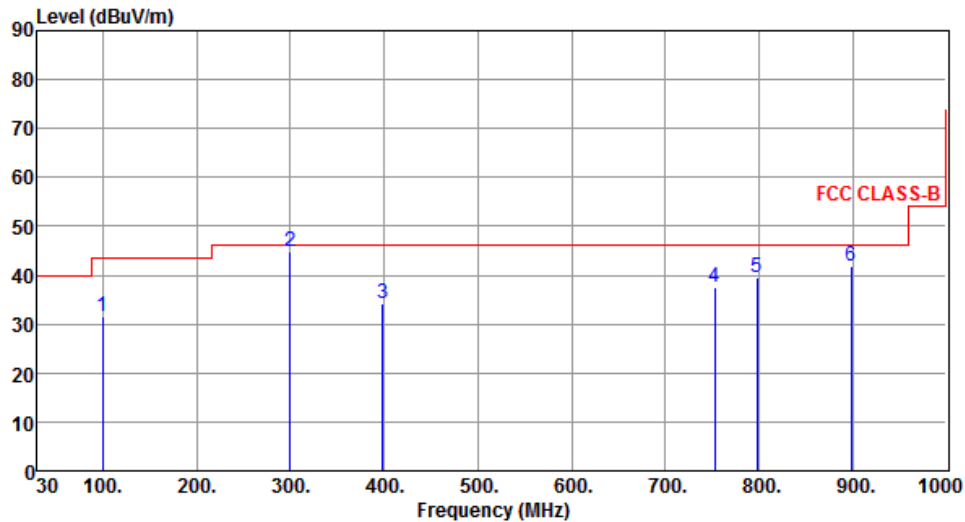
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	99.84	31.46	43.50	-12.04	53.31	-21.85	Peak	---	---
2	299.32	44.97	46.00	-1.03	61.14	-16.17	QP	---	---
3	398.60	34.35	46.00	-11.65	48.04	-13.69	Peak	---	---
4	752.65	37.56	46.00	-8.44	44.78	-7.22	Peak	---	---
5	798.24	39.64	46.00	-6.36	46.43	-6.79	Peak	---	---
6	898.15	41.92	46.00	-4.08	47.43	-5.51	Peak	---	---

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

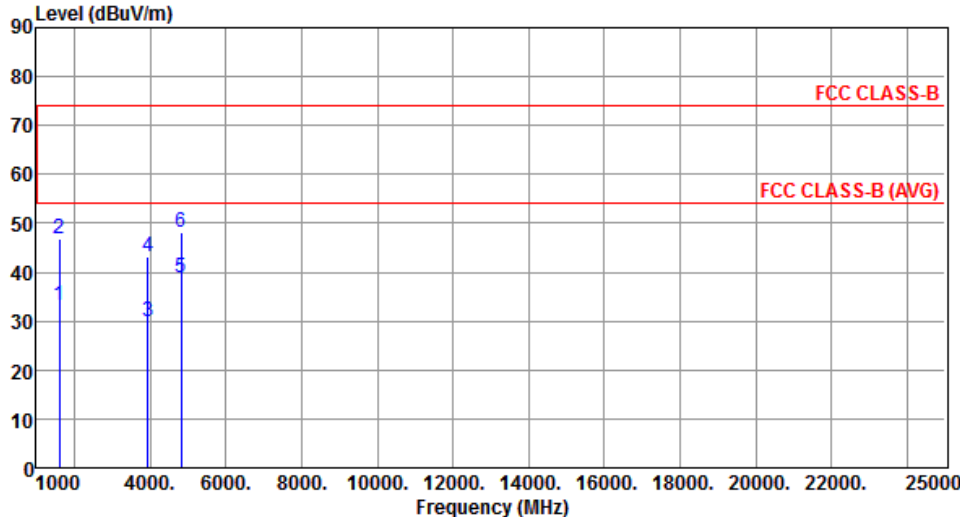
*Factor includes antenna factor , cable loss and amplifier gain

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.

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

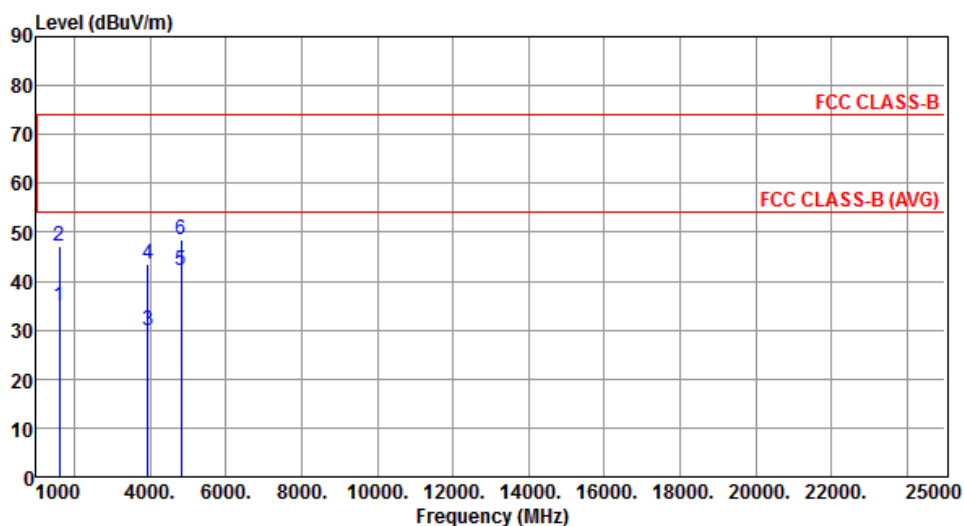
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	33.34	54.00	-20.66	40.09	-6.75	Average	---	---
2	1608.00	46.92	74.00	-27.08	53.67	-6.75	Peak	---	---
3	3935.00	29.89	54.00	-24.11	28.37	1.52	Average	---	---
4	3935.00	43.08	74.00	-30.92	41.56	1.52	Peak	---	---
5	4824.00	38.97	54.00	-15.03	33.98	4.99	Average	---	---
6	4824.00	48.14	74.00	-25.86	43.15	4.99	Peak	---	---

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

Modulation	11b	Test Freq. (MHz)	2412
Polarization	Vertical	Configuration	With 50Ω Terminator



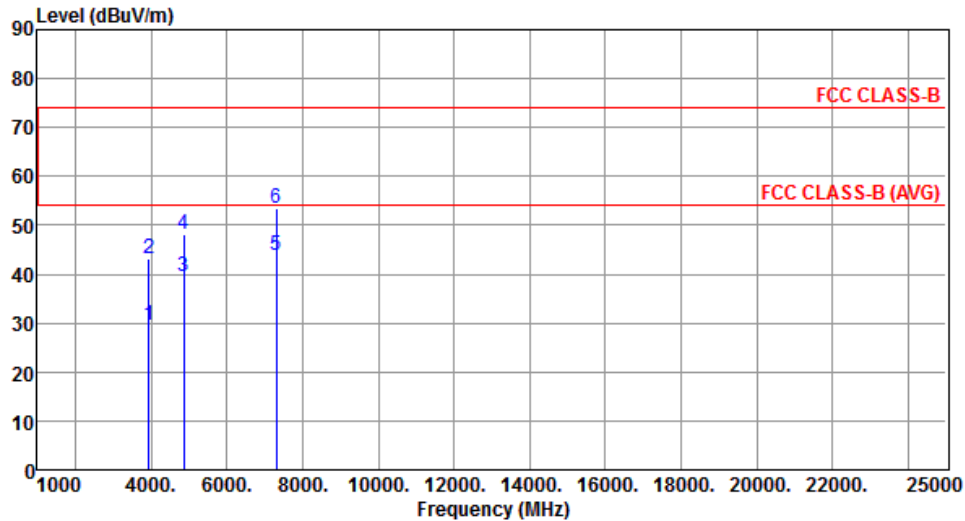
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	34.78	54.00	-19.22	41.53	-6.75	Average	---	---
2	1608.00	47.06	74.00	-26.94	53.81	-6.75	Peak	---	---
3	3935.00	29.93	54.00	-24.07	28.41	1.52	Average	---	---
4	3935.00	43.39	74.00	-30.61	41.87	1.52	Peak	---	---
5	4824.00	42.11	54.00	-11.89	37.12	4.99	Average	---	---
6	4824.00	48.58	74.00	-25.42	43.59	4.99	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal	Configuration	With 50 Ω Terminator



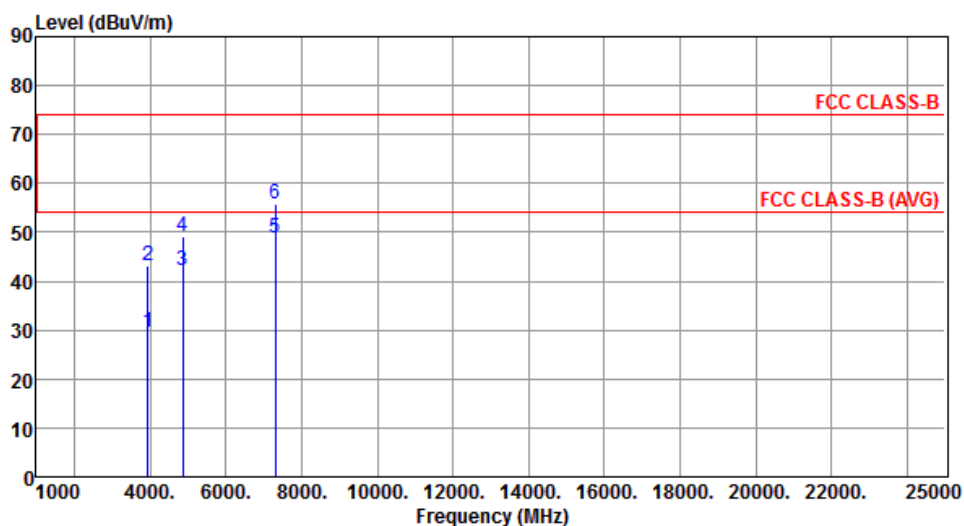
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.70	54.00	-24.30	28.18	1.52	Average	---	---
2	3935.00	43.23	74.00	-30.77	41.71	1.52	Peak	---	---
3	4874.00	39.39	54.00	-14.61	34.29	5.10	Average	---	---
4	4874.00	48.26	74.00	-25.74	43.16	5.10	Peak	---	---
5	7311.00	43.74	54.00	-10.26	34.41	9.33	Average	---	---
6	7311.00	53.59	74.00	-20.41	44.26	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical	Configuration	With 50 Ω Terminator



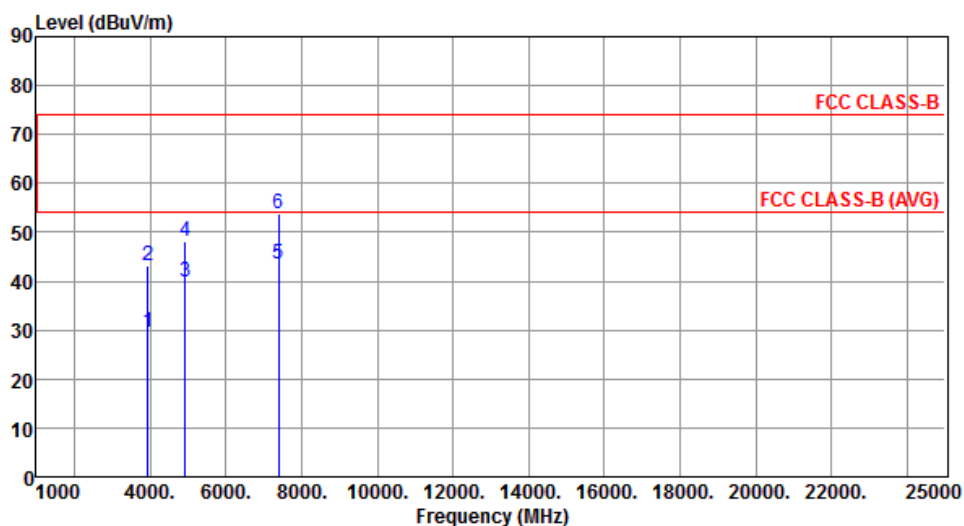
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.61	54.00	-24.39	28.09	1.52	Average	---	---
2	3935.00	43.11	74.00	-30.89	41.59	1.52	Peak	---	---
3	4874.00	42.10	54.00	-11.90	37.00	5.10	Average	---	---
4	4874.00	49.23	74.00	-24.77	44.13	5.10	Peak	---	---
5	7311.00	48.72	54.00	-5.28	39.39	9.33	Average	---	---
6	7311.00	55.79	74.00	-18.21	46.46	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal	Configuration	With 50Ω Terminator



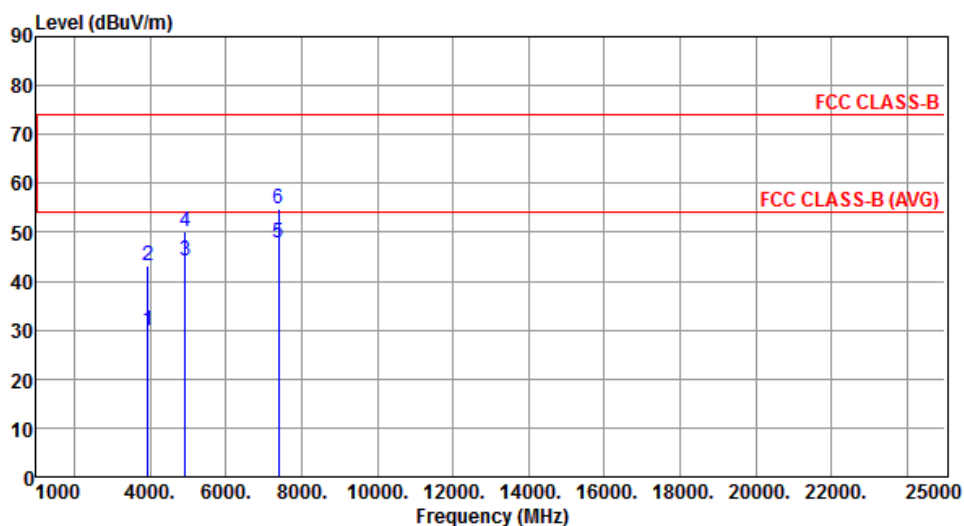
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.53	54.00	-24.47	28.01	1.52	Average	---	---
2	3935.00	43.08	74.00	-30.92	41.56	1.52	Peak	---	---
3	4924.00	39.93	54.00	-14.07	34.73	5.20	Average	---	---
4	4924.00	48.03	74.00	-25.97	42.83	5.20	Peak	---	---
5	7386.00	43.65	54.00	-10.35	34.26	9.39	Average	---	---
6	7386.00	53.96	74.00	-20.04	44.57	9.39	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.83	54.00	-24.17	28.31	1.52	Average	---	---
2	3935.00	43.24	74.00	-30.76	41.72	1.52	Peak	---	---
3	4924.00	44.28	54.00	-9.72	39.08	5.20	Average	---	---
4	4924.00	50.19	74.00	-23.81	44.99	5.20	Peak	---	---
5	7386.00	47.68	54.00	-6.32	38.29	9.39	Average	---	---
6	7386.00	54.91	74.00	-19.09	45.52	9.39	Peak	---	---

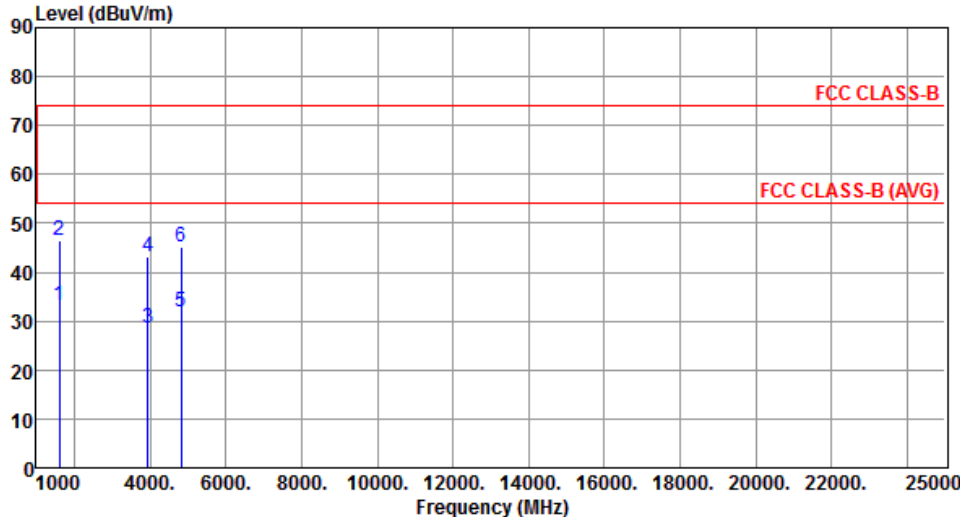
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

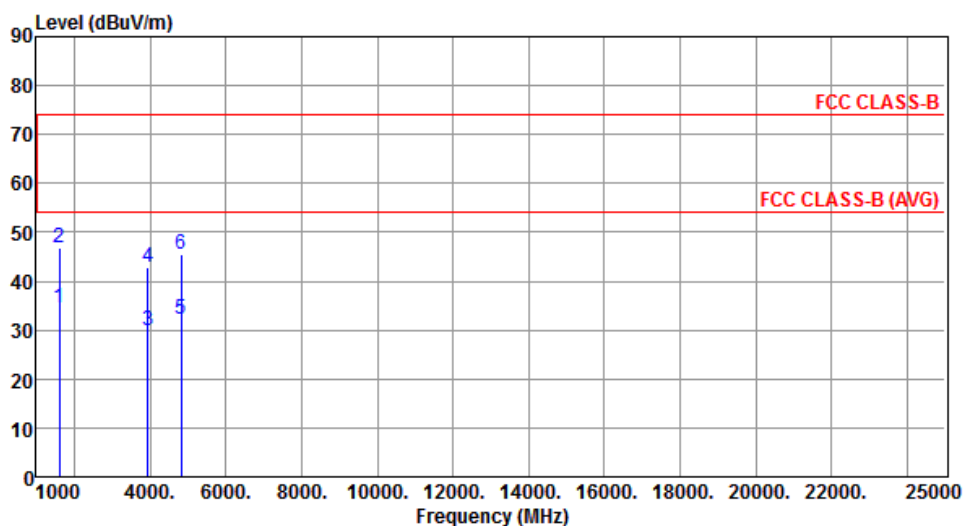
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	33.10	54.00	-20.90	39.85	-6.75	Average	---	---
2	1608.00	46.43	74.00	-27.57	53.18	-6.75	Peak	---	---
3	3935.00	28.65	54.00	-25.35	27.13	1.52	Average	---	---
4	3935.00	43.06	74.00	-30.94	41.54	1.52	Peak	---	---
5	4824.00	32.02	54.00	-21.98	27.03	4.99	Average	---	---
6	4824.00	45.28	74.00	-28.72	40.29	4.99	Peak	---	---

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

Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical	Configuration	With 50Ω Terminator



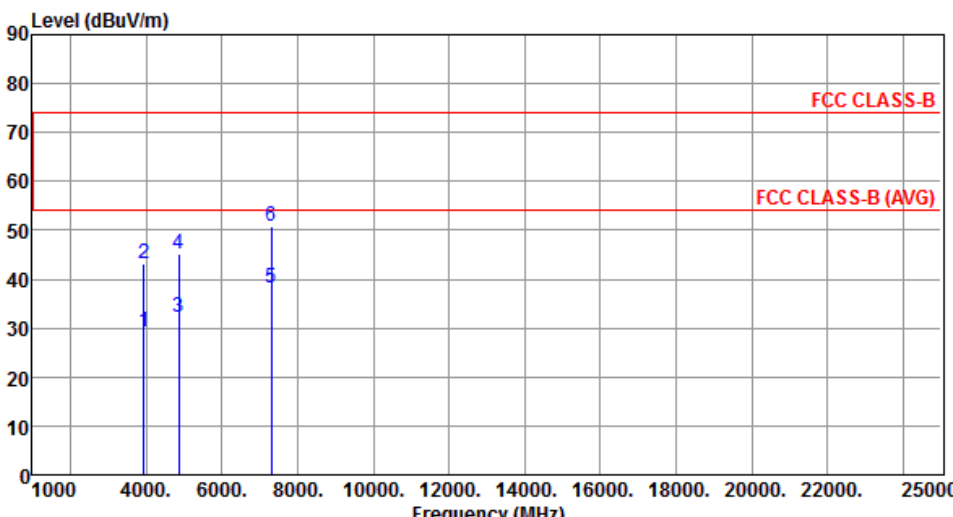
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	34.47	54.00	-19.53	41.22	-6.75	Average	---	---
2	1608.00	46.74	74.00	-27.26	53.49	-6.75	Peak	---	---
3	3935.00	29.93	54.00	-24.07	28.41	1.52	Average	---	---
4	3935.00	42.76	74.00	-31.24	41.24	1.52	Peak	---	---
5	4824.00	32.12	54.00	-21.88	27.13	4.99	Average	---	---
6	4824.00	45.55	74.00	-28.45	40.56	4.99	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

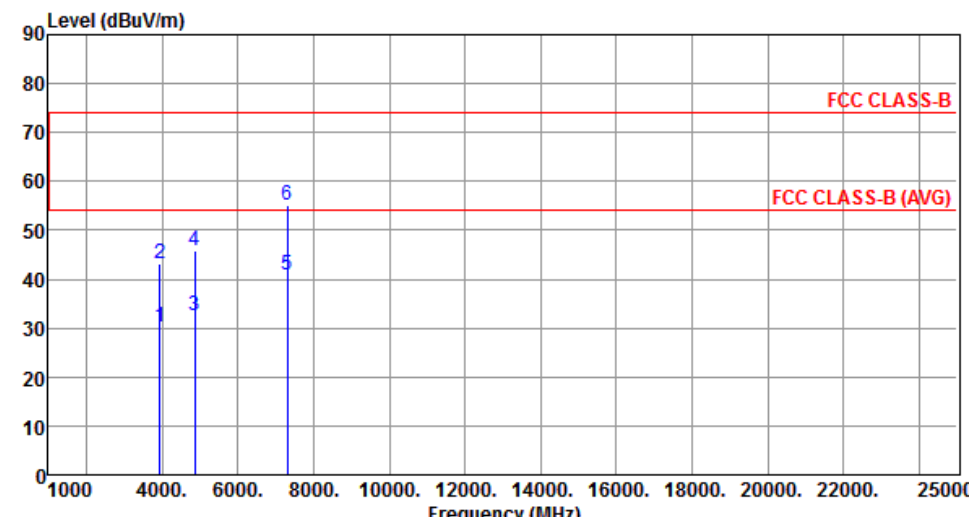
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal	Configuration	With 50Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.33	54.00	-24.67	27.81	1.52	Average	---	---
2	3935.00	43.19	74.00	-30.81	41.67	1.52	Peak	---	---
3	4874.00	32.33	54.00	-21.67	27.23	5.10	Average	---	---
4	4874.00	45.28	74.00	-28.72	40.18	5.10	Peak	---	---
5	7311.00	38.24	54.00	-15.76	28.91	9.33	Average	---	---
6	7311.00	50.97	74.00	-23.03	41.64	9.33	Peak	---	---

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

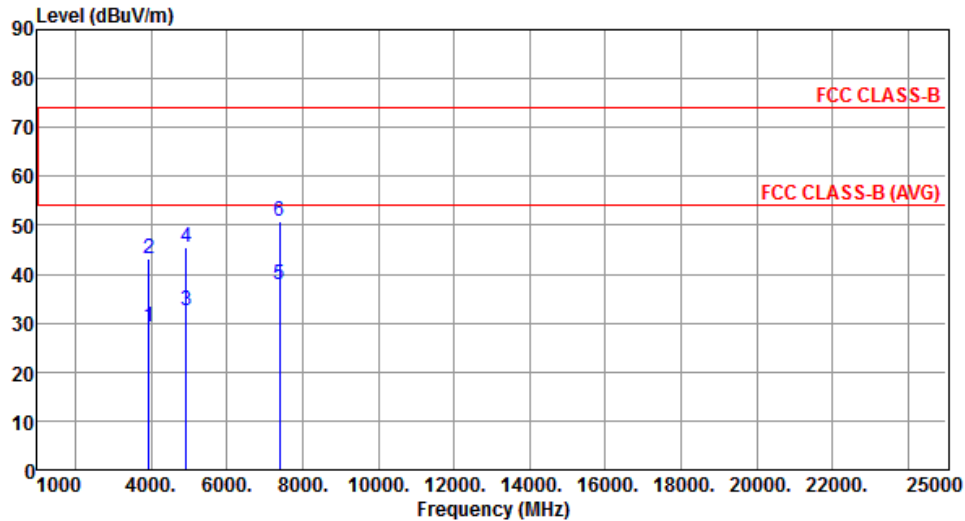
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical	Configuration	With 50Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	30.14	54.00	-23.86	28.62	1.52	Average	---	---
2	3935.00	43.24	74.00	-30.76	41.72	1.52	Peak	---	---
3	4874.00	32.60	54.00	-21.40	27.50	5.10	Average	---	---
4	4874.00	45.93	74.00	-28.07	40.83	5.10	Peak	---	---
5	7311.00	40.95	54.00	-13.05	31.62	9.33	Average	---	---
6	7311.00	55.20	74.00	-18.80	45.87	9.33	Peak	---	---

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

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Horizontal	Configuration	With 50Ω Terminator



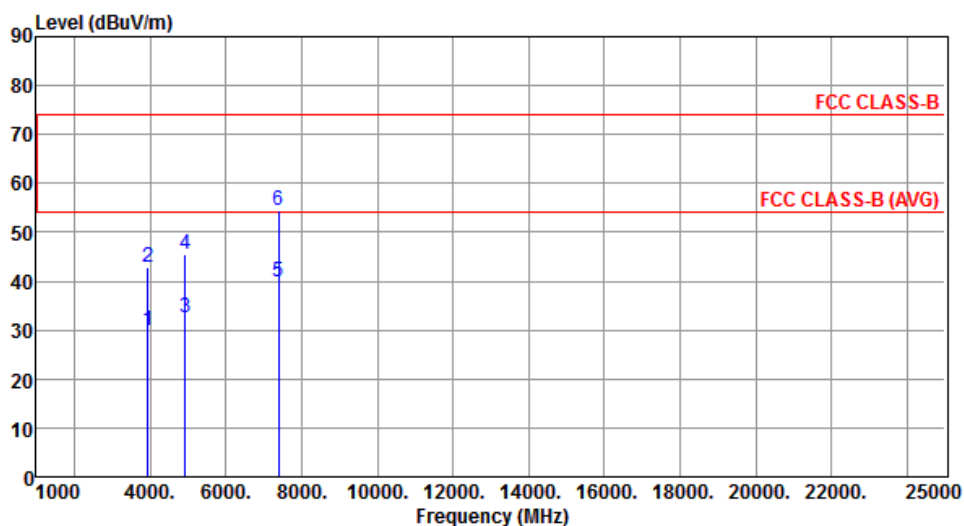
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.16	54.00	-24.84	27.64	1.52	Average	---	---
2	3935.00	43.10	74.00	-30.90	41.58	1.52	Peak	---	---
3	4924.00	32.56	54.00	-21.44	27.36	5.20	Average	---	---
4	4924.00	45.48	74.00	-28.52	40.28	5.20	Peak	---	---
5	7386.00	37.86	54.00	-16.14	28.47	9.39	Average	---	---
6	7386.00	50.92	74.00	-23.08	41.53	9.39	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical	Configuration	With 50Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.95	54.00	-24.05	28.43	1.52	Average	---	---
2	3935.00	42.86	74.00	-31.14	41.34	1.52	Peak	---	---
3	4924.00	32.44	54.00	-21.56	27.24	5.20	Average	---	---
4	4924.00	45.61	74.00	-28.39	40.41	5.20	Peak	---	---
5	7386.00	39.90	54.00	-14.10	30.51	9.39	Average	---	---
6	7386.00	54.52	74.00	-19.48	45.13	9.39	Peak	---	---

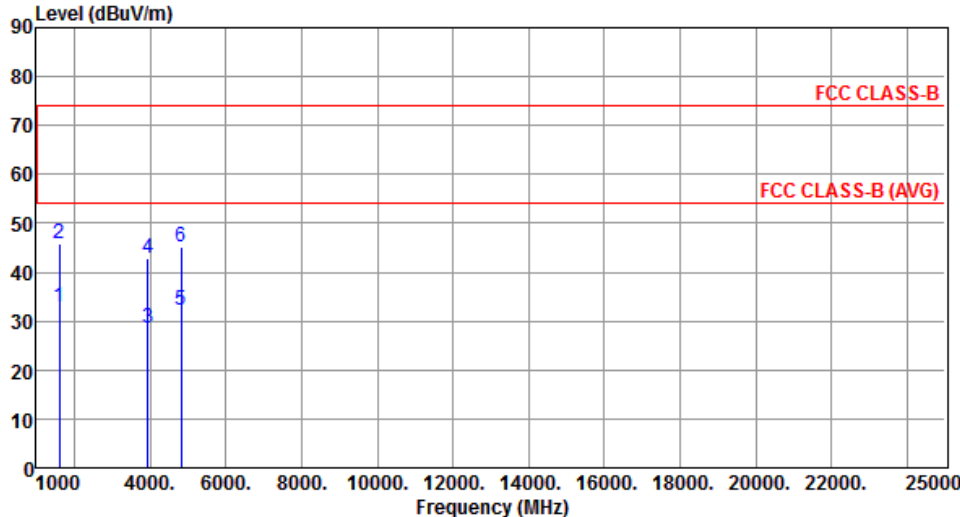
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

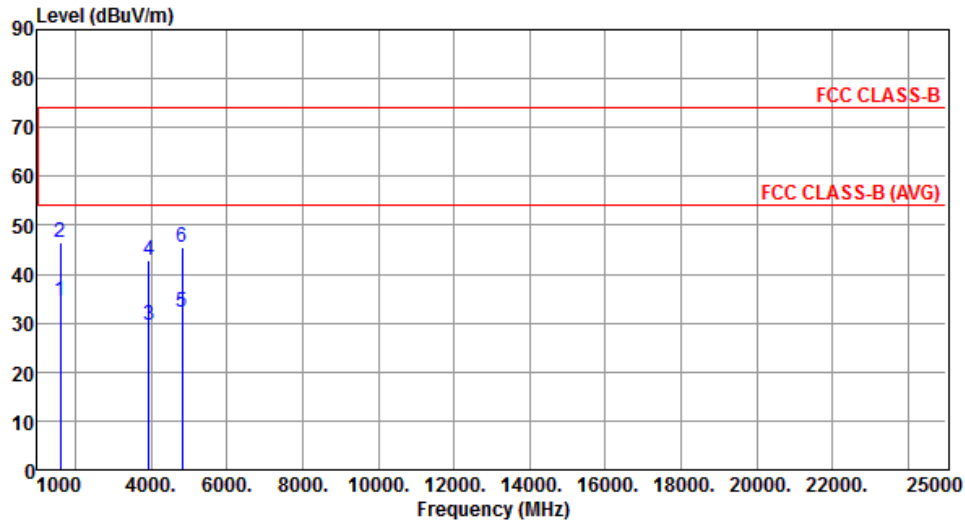
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	32.82	54.00	-21.18	39.57	-6.75	Average	---	---
2	1608.00	45.73	74.00	-28.27	52.48	-6.75	Peak	---	---
3	3935.00	28.54	54.00	-25.46	27.02	1.52	Average	---	---
4	3935.00	42.78	74.00	-31.22	41.26	1.52	Peak	---	---
5	4824.00	32.23	54.00	-21.77	27.24	4.99	Average	---	---
6	4824.00	45.15	74.00	-28.85	40.16	4.99	Peak	---	---

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

Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical	Configuration	With 50Ω Terminator



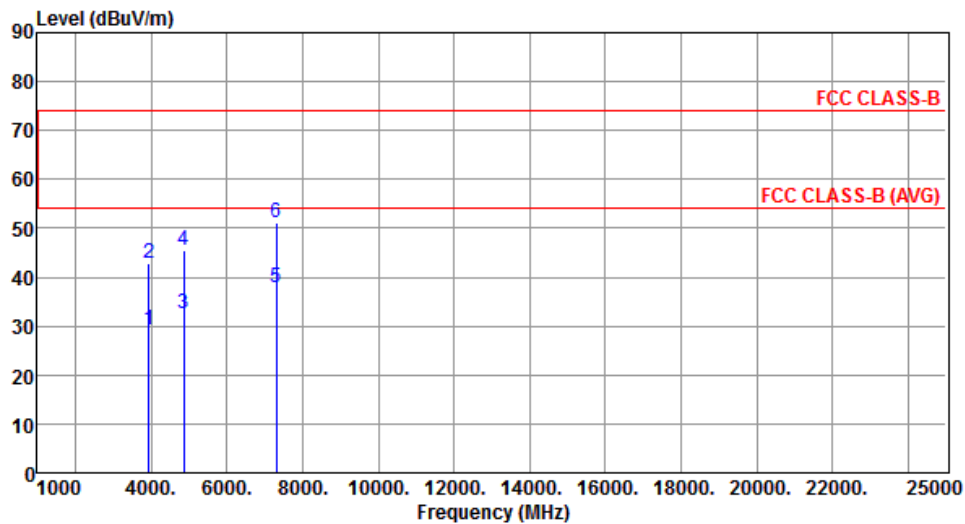
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1608.00	34.59	54.00	-19.41	41.34	-6.75	Average	---	---
2	1608.00	46.50	74.00	-27.50	53.25	-6.75	Peak	---	---
3	3935.00	29.68	54.00	-24.32	28.16	1.52	Average	---	---
4	3935.00	42.88	74.00	-31.12	41.36	1.52	Peak	---	---
5	4824.00	32.05	54.00	-21.95	27.06	4.99	Average	---	---
6	4824.00	45.48	74.00	-28.52	40.49	4.99	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal	Configuration	With 50Ω Terminator



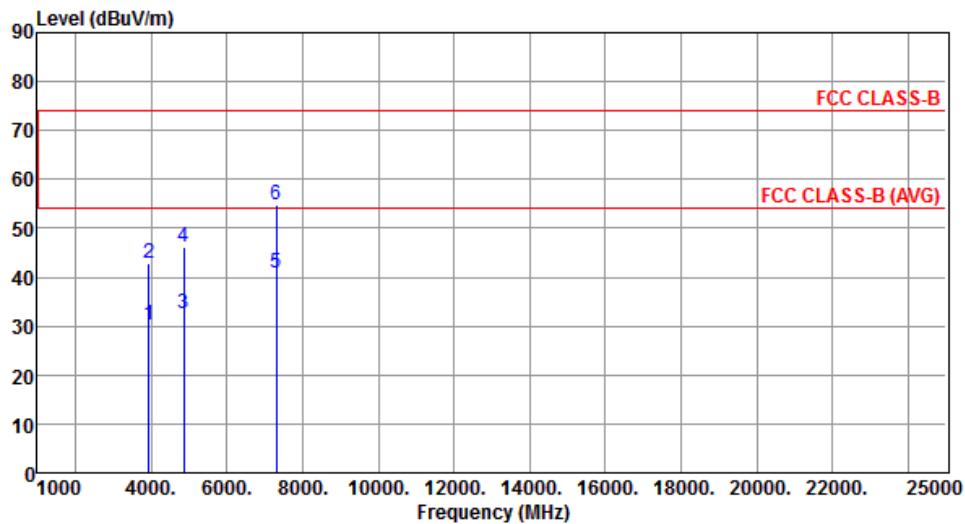
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.17	54.00	-24.83	27.65	1.52	Average	---	---
2	3935.00	42.75	74.00	-31.25	41.23	1.52	Peak	---	---
3	4874.00	32.44	54.00	-21.56	27.34	5.10	Average	---	---
4	4874.00	45.51	74.00	-28.49	40.41	5.10	Peak	---	---
5	7311.00	37.97	54.00	-16.03	28.64	9.33	Average	---	---
6	7311.00	51.15	74.00	-22.85	41.82	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical	Configuration	With 50Ω Terminator



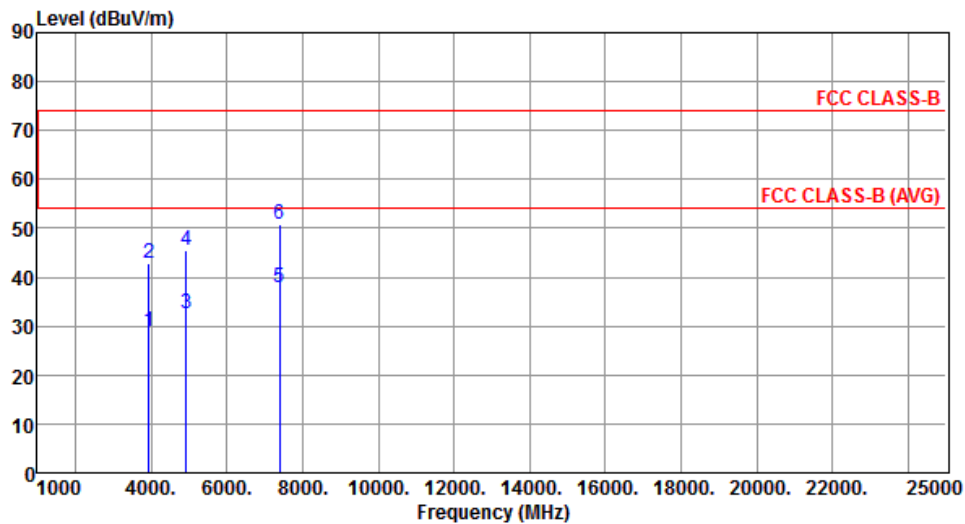
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	30.07	54.00	-23.93	28.55	1.52	Average	---	---
2	3935.00	42.91	74.00	-31.09	41.39	1.52	Peak	---	---
3	4874.00	32.48	54.00	-21.52	27.38	5.10	Average	---	---
4	4874.00	46.04	74.00	-27.96	40.94	5.10	Peak	---	---
5	7311.00	40.70	54.00	-13.30	31.37	9.33	Average	---	---
6	7311.00	54.85	74.00	-19.15	45.52	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal	Configuration	With 50Ω Terminator



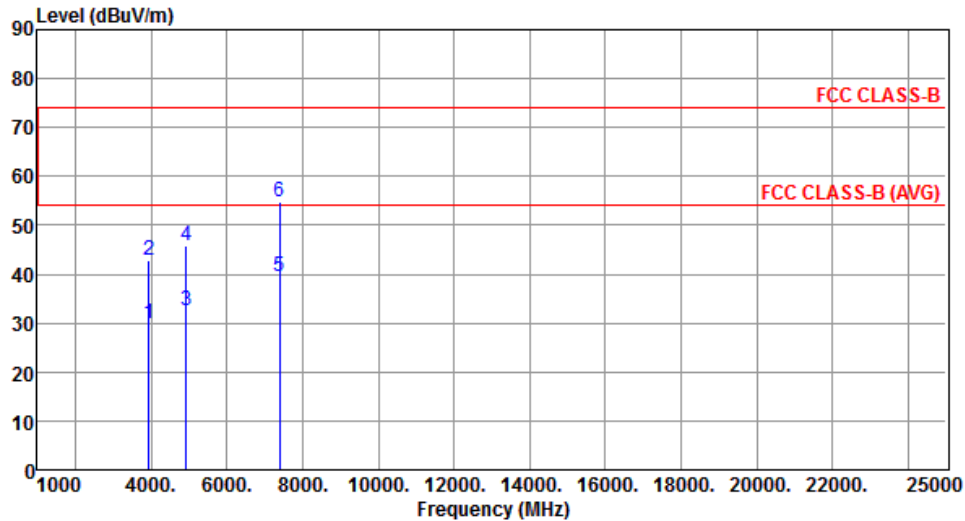
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	28.90	54.00	-25.10	27.38	1.52	Average	---	---
2	3935.00	42.78	74.00	-31.22	41.26	1.52	Peak	---	---
3	4924.00	32.38	54.00	-21.62	27.18	5.20	Average	---	---
4	4924.00	45.54	74.00	-28.46	40.34	5.20	Peak	---	---
5	7386.00	37.70	54.00	-16.30	28.31	9.39	Average	---	---
6	7386.00	50.85	74.00	-23.15	41.46	9.39	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.91	54.00	-24.09	28.39	1.52	Average	---	---
2	3935.00	42.77	74.00	-31.23	41.25	1.52	Peak	---	---
3	4924.00	32.39	54.00	-21.61	27.19	5.20	Average	---	---
4	4924.00	45.78	74.00	-28.22	40.58	5.20	Peak	---	---
5	7386.00	39.63	54.00	-14.37	30.24	9.39	Average	---	---
6	7386.00	54.66	74.00	-19.34	45.27	9.39	Peak	---	---

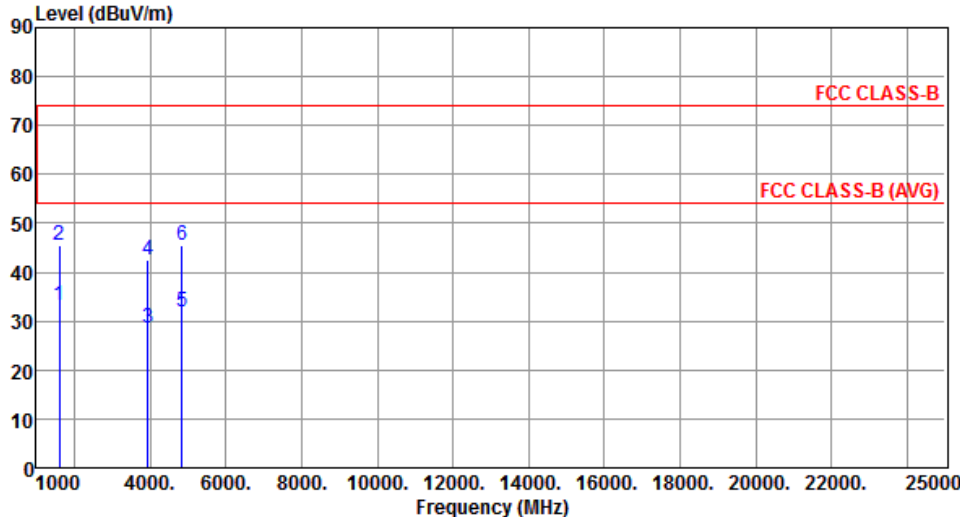
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

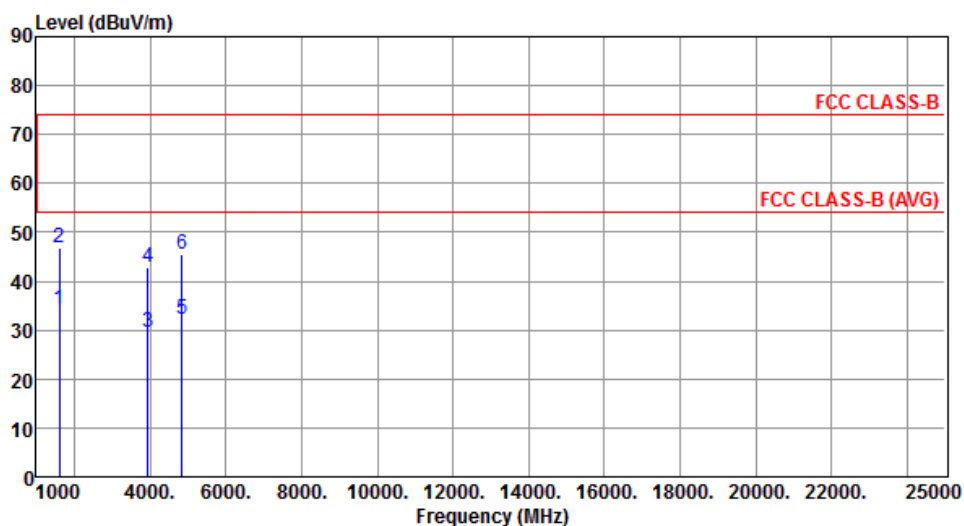
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal	Configuration	With 50 Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1614.00	33.08	54.00	-20.92	39.81	-6.73	Average	---	---
2	1614.00	45.61	74.00	-28.39	52.34	-6.73	Peak	---	---
3	3935.00	28.63	54.00	-25.37	27.11	1.52	Average	---	---
4	3935.00	42.60	74.00	-31.40	41.08	1.52	Peak	---	---
5	4844.00	31.82	54.00	-22.18	26.79	5.03	Average	---	---
6	4844.00	45.39	74.00	-28.61	40.36	5.03	Peak	---	---

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

Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical	Configuration	With 50Ω Terminator



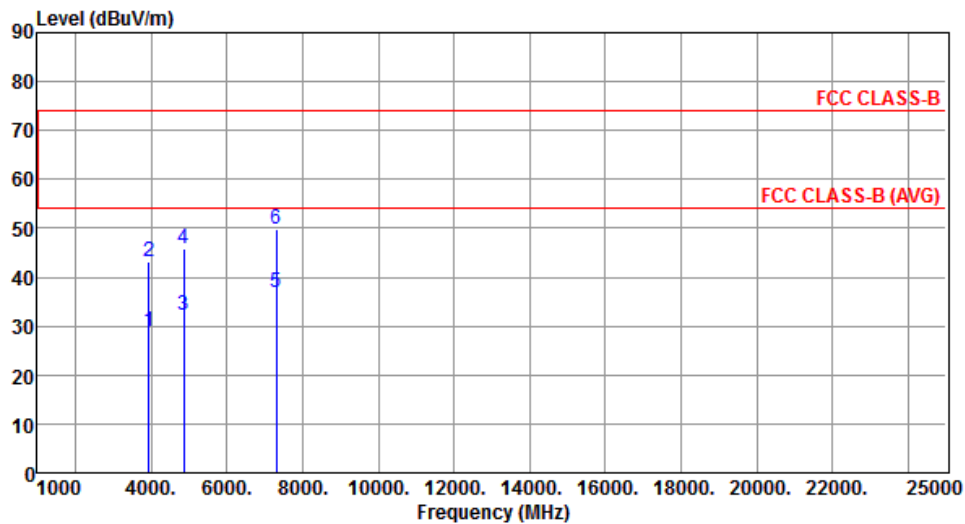
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1614.00	34.36	54.00	-19.64	41.09	-6.73	Average	---	---
2	1614.00	46.75	74.00	-27.25	53.48	-6.73	Peak	---	---
3	3935.00	29.71	54.00	-24.29	28.19	1.52	Average	---	---
4	3935.00	42.76	74.00	-31.24	41.24	1.52	Peak	---	---
5	4844.00	32.17	54.00	-21.83	27.14	5.03	Average	---	---
6	4844.00	45.58	74.00	-28.42	40.55	5.03	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal	Configuration	With 50Ω Terminator



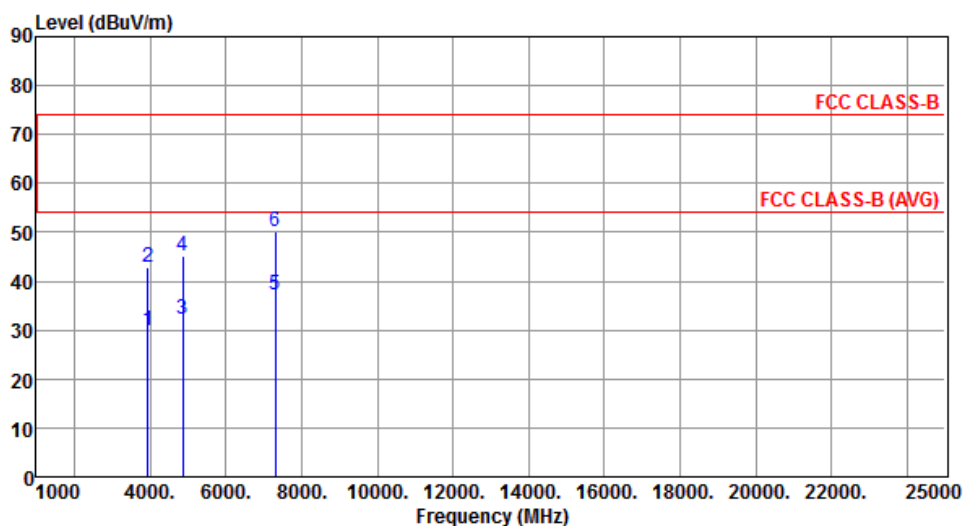
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.00	54.00	-25.00	27.48	1.52	Average	---	---
2	3935.00	43.07	74.00	-30.93	41.55	1.52	Peak	---	---
3	4874.00	32.09	54.00	-21.91	26.99	5.10	Average	---	---
4	4874.00	45.88	74.00	-28.12	40.78	5.10	Peak	---	---
5	7311.00	36.84	54.00	-17.16	27.51	9.33	Average	---	---
6	7311.00	49.67	74.00	-24.33	40.34	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical	Configuration	With 50Ω Terminator



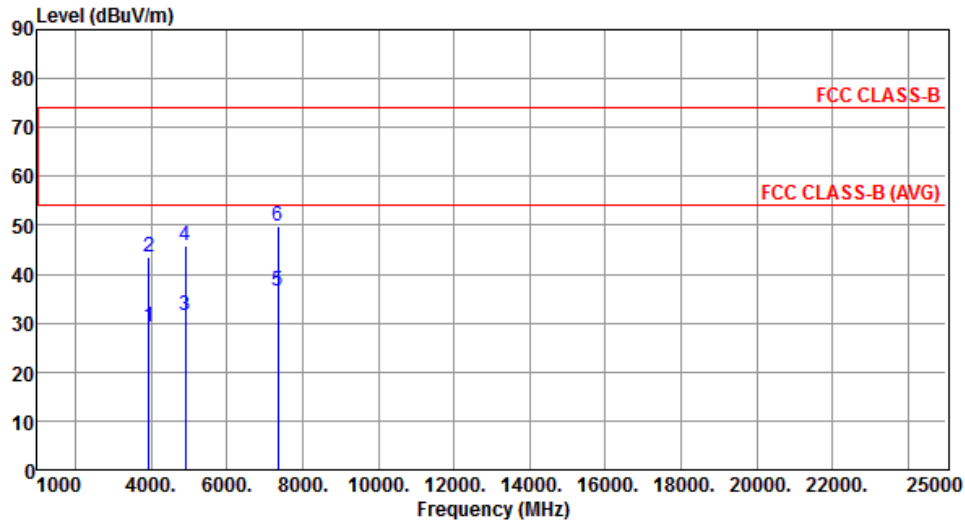
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.92	54.00	-24.08	28.40	1.52	Average	---	---
2	3935.00	42.91	74.00	-31.09	41.39	1.52	Peak	---	---
3	4874.00	32.32	54.00	-21.68	27.22	5.10	Average	---	---
4	4874.00	45.27	74.00	-28.73	40.17	5.10	Peak	---	---
5	7311.00	37.20	54.00	-16.80	27.87	9.33	Average	---	---
6	7311.00	50.17	74.00	-23.83	40.84	9.33	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal	Configuration	With 50Ω Terminator



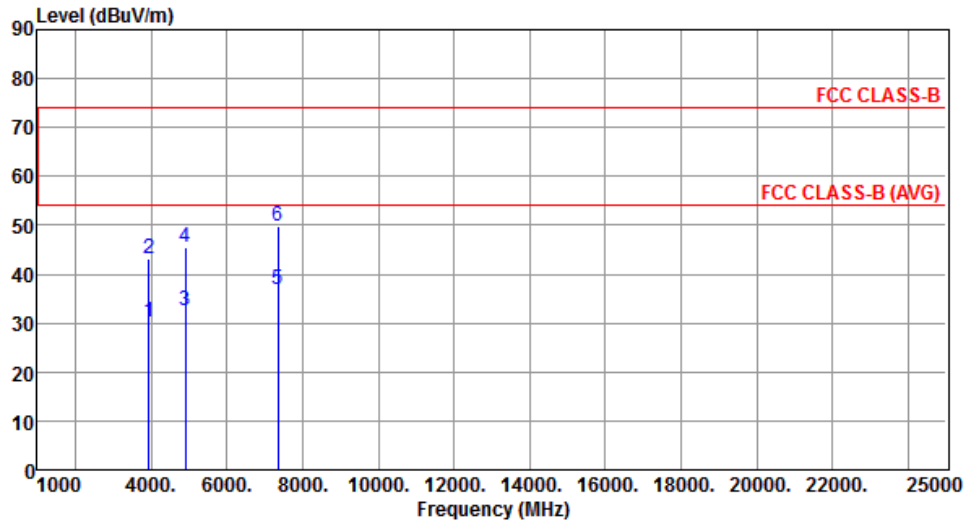
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	29.15	54.00	-24.85	27.63	1.52	Average	---	---
2	3935.00	43.39	74.00	-30.61	41.87	1.52	Peak	---	---
3	4904.00	31.67	54.00	-22.33	26.51	5.16	Average	---	---
4	4904.00	45.79	74.00	-28.21	40.63	5.16	Peak	---	---
5	7356.00	36.53	54.00	-17.47	27.17	9.36	Average	---	---
6	7356.00	49.94	74.00	-24.06	40.58	9.36	Peak	---	---

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

*Factor includes antenna factor , cable loss and amplifier gain

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

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical	Configuration	With 50Ω Terminator



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3935.00	30.16	54.00	-23.84	28.64	1.52	Average	---	---
2	3935.00	43.06	74.00	-30.94	41.54	1.52	Peak	---	---
3	4904.00	32.54	54.00	-21.46	27.38	5.16	Average	---	---
4	4904.00	45.42	74.00	-28.58	40.26	5.16	Peak	---	---
5	7356.00	36.92	54.00	-17.08	27.56	9.36	Average	---	---
6	7356.00	49.76	74.00	-24.24	40.40	9.36	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).