CFR 47 FCC PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

AXE7800 Tri-Band Wi-Fi 6E Router

MODEL NUMBER: EX920

FCC ID: 2AXJ4EX920

REPORT NUMBER: 4790653203-RF-1

ISSUE DATE: January 12, 2023

Prepared for

TP-Link Corporation Limited
Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China

Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com

The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	January 12, 2023	Initial Issue	

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Summary of Test Results			
Clause	**Test Items**	**FCC Rules**	**Test Results**
1	6dB Bandwidth and 99% Occupied Bandwidth	FCC Part 15.247 (a) (2)	Pass
2	Conducted Output Power	FCC Part 15.247 (b) (3)	Pass
3	Power Spectral Density	FCC Part 15.247 (e)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
6	Conducted Emission Test for AC Power Port	FCC Part 15.207	Pass
7	Antenna Requirement	FCC Part 15.203	Pass

Note:
1.This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C > when <Accuracy Method> decision rule is applied.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

CONTENTS

1. ATTESTATION OF TEST RESULTS 6

2. TEST METHODOLOGY 7

3. FACILITIES AND ACCREDITATION 7

4. CALIBRATION AND UNCERTAINTY 8

4.1. MEASURING INSTRUMENT CALIBRATION 8

4.2. MEASUREMENT UNCERTAINTY 8

5. EQUIPMENT UNDER TEST 9

5.1. DESCRIPTION OF EUT 9

5.2. CHANNEL LIST 9

5.3. MAXIMUM EIRP 10

5.4. TEST CHANNEL CONFIGURATION 10

5.5. THE WORSE CASE POWER SETTING PARAMETER 10

5.6. THE WORSE CASE CONFIGURATIONS 11

5.7. DESCRIPTION OF AVAILABLE ANTENNAS 12

5.8. DESCRIPTION OF TEST SETUP 13

6. MEASURING EQUIPMENT AND SOFTWARE USED 14

7. ANTENNA PORT TEST RESULTS 16

7.1. CONDUCTED OUTPUT POWER 16

7.2. 6DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH 17

7.3. POWER SPECTRAL DENSITY 19

7.4. CONDUCTED BAND EDGE AND SPURIOUS EMISSION 20

7.5. DUTY CYCLE 22

8. RADIATED TEST RESULTS 23

8.1. RESTRICTED BANDEDGE 32

8.2. SPURIOUS EMISSIONS (1 GHZ ~ 3 GHZ) 56

8.3. SPURIOUS EMISSIONS (3 GHZ ~ 18 GHZ) 62

8.4. SPURIOUS EMISSIONS (9 KHZ ~ 30 MHZ) 86

8.5. SPURIOUS EMISSIONS (18 GHZ ~ 26 GHZ) 89

8.6. SPURIOUS EMISSIONS (30 MHZ ~ 1 GHZ) 91

9. ANTENNA REQUIREMENT 93

10. AC POWER LINE CONDUCTED EMISSION 94

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11. TEST DATA.....97

11.1. APPENDIX A: DTS BANDWIDTH.....97
11.1.1. Test Result.....97
11.1.2. Test Graphs.....98

11.2. APPENDIX B: OCCUPIED CHANNEL BANDWIDTH.....109
11.2.1. Test Result.....109
11.2.2. Test Graphs.....110

11.3. APPENDIX C: MAXIMUM AVERAGE CONDUCTED OUTPUT POWER.....121
11.3.1. Test Result.....121

11.4. APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY.....122
11.4.1. Test Result.....122
11.4.2. Test Graphs.....123

11.5. APPENDIX E: BAND EDGE MEASUREMENTS.....134
11.5.1. Test Result.....134
11.5.2. Test Graphs.....135

11.6. APPENDIX F: CONDUCTED SPURIOUS EMISSION.....143
11.6.1. Test Result.....143
11.6.2. Test Graphs.....145

11.7. APPENDIX G: DUTY CYCLE.....177
11.7.1. Test Result.....177
11.7.2. Test Graphs.....178

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	TP-Link Corporation Limited
Address:	Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong

Manufacturer Information

Company Name:	TP-Link Corporation Limited
Address:	Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong

EUT Information

EUT Name:	AXE7800 Tri-Band Wi-Fi 6E Router
Model:	EX920
Sample Received Date:	November 28, 2022
Sample Status:	Normal
Sample ID:	5571490
Date of Tested:	December 1, 2022 ~ January 12, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART C	**PASS**

Prepared By:

Denny Huang

Senior Project Engineer

Checked By:

Kebo Zhang

Senior Project Engineer

Approved By:

Stephen Guo

Operations Manager

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

2. TEST METHODOLOGY

All tests were performed in accordance with the standard CFR 47 FCC PART 15 SUBPART C, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, KDB 662911 D01 Multiple Transmitter Output v02r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **ISED (Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1:
All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People’s Republic of China.

Note 2:
The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd.
Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3:
For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
Radiated Emission (Included Fundamental Emission) (1 GHz to 26 GHz)	5.78 dB (1 GHz ~ 18 GHz)
	5.23 dB (18 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	AXE7800 Tri-Band Wi-Fi 6E Router
Model	EX920
Radio Technology	IEEE802.11b/g/n HT20/n HT40/ax HE20/ax HE40
Operation Frequency	IEEE 802.11b: 2412 MHz ~ 2462 MHz IEEE 802.11g: 2412 MHz ~ 2462 MHz IEEE 802.11n HT20: 2412 MHz ~ 2462 MHz IEEE 802.11n HT40: 2422 MHz ~ 2452 MHz IEEE 802.11ax HE20: 2412 MHz ~ 2462 MHz IEEE 802.11ax HE40: 2422 MHz ~ 2452 MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT40: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE20: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax HE40: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Power Supply	DC 12 V

5.2. CHANNEL LIST

Channel List for 802.11b/g/n/ax (20 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

Channel List for 802.11n/ax (40 MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447	/	/

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

5.3. MAXIMUM EIRP

IEEE Std. 802.11	Frequency (MHz)	Channel Number	Maximum Conducted AVG Output Power (dBm)
b	2412 ~ 2462	1-11[11]	24.32
g	2412 ~ 2462	1-11[11]	24.64
n HT20	2412 ~ 2462	1-11[11]	Cover by 802.11ax HE20
n HT40	2422 ~ 2452	3-9[7]	Cover by 802.11ax HE40
ax HE20	2412 ~ 2462	1-11[11]	27.48
ax HE40	2422 ~ 2452	3-9[7]	27.41

5.4. TEST CHANNEL CONFIGURATION

IEEE Std. 802.11	Test Channel Number	Frequency
b	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
g	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
ax HE20	CH 1(Low Channel), CH 2(Low Channel), CH 6(MID Channel), CH 10(High Channel), CH 11(High Channel)	2412 MHz, 2427 MHz, 2437 MHz, 2457 MHz, 2462 MHz
ax HE40	CH 3(Low Channel), CH 4(Low Channel), CH 6(MID Channel), CH 8(High Channel), CH 9(High Channel)	2422 MHz, 2427 MHz, 2437 MHz, 2447 MHz, 2452 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5 MHz Band											
Test Software		QA Tool									
Modulation Mode	Transmit Antenna Number	Test Channel									
		NCB: 20 MHz					NCB: 40 MHz				
		CH 1	CH 2	CH 6	CH 10	CH 11	CH 3	CH 4	CH 6	CH 8	CH 9
802.11b	1	23	23	23	23	23	/				
	2	23	23	23	23	23					
802.11g	1	23	23	23	23	23					
	2	23	23	23	23	23					
802.11n HT20	1	Cover by 802.11ax HE20									
	2										
802.11n HT40	1	/					Cover by 802.11ax HE20				
	2	/									
802.11ax HE20	1	21	23	23	23	20	/				
	2	21	23	23	23	20					
802.11ax HE40	1	/					20	23	23	23	20
	2	/					20	23	23	23	20

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

5.6. THE WORSE CASE CONFIGURATIONS

The EUT was tested in the following configuration(s):
Controlled in test mode using a software application on the EUT supplied by customer. The application was used to enable a continuous transmission and to select the mode, test channels, bandwidth, data rates as required.

Test channels referring to section 5.4.

Maximum power setting referring to section 5.5.

Worst case Data Rates declared by the customer:

IEEE 802.11b / SISO – DBPSK / 1 Mbps
IEEE 802.11g / SISO – BPSK / 6 Mbps
IEEE 802.11ax HE20 / MIMO / STBC / CDD / TxBF – BPSK / MCS0
IEEE 802.11ax HE40 / MIMO / STBC / CDD / TxBF – BPSK / MCS0

The EUT support STBC, CDD and TxBF (Tx Beamforming) modes, all the modes had been tested, but only the worst data was recorded in the report.

802.11n HT20/HT40 and 802.11ax HE20/HE40 were performed on the worst case (802.11ax HE20/HE40) mode and only the worst data was recorded in this report.

The EUT has 2 separate antennas which correspond to 2 separate antenna ports. Core 1 and Core 2 correspond to antenna 1 and antenna 2 respectively.

The measured additional path loss was included in any path loss calculations for all RF cable used during tested.

Conducted output power, power spectral density tests separately on each port with all supported SISO & MIMO port combinations.

Duty cycle and 6dB DTS bandwidth/occupied channel bandwidth tests, only SISO mode and one chain were tested since the duty cycle and bandwidth does not change depending on chains used.

Conducted bandedge and spurious emissions tests were performed with SISO mode, as this port was found to have the worst case in terms of power settings amongst all supported possible SISO & MIMO port combinations.

Radiated emissions tests were performed with the MIMO modes. These were found to be the worst modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest conducted output power level, it was deemed to be the worst case.

The 2.4 GHz beamforming function is enabled by test program, the carrier wave will be under radio chip phase control and sent to the antennas through the test program.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	Maimum Antenna Gain (dBi)
1	2412-2462	PCB	2
2	2412-2462	PCB	2

The EUT support Cyclic Shift Diversity (CDD) mode.
MIMO output power port and MIMO PSD port summing was performed in accordance with KDB 662911 D01. For the CDD mode results the Directional Gain was calculated in accordance with the following mothed.

For output power measurements:
Directional gain= G_{ANT} + Array Gain = 2 dBi
G_{ANT}: equal to the gain of the antenna having the highest gain
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$

For power spectral density (PSD) measurements:
Directional gain= G_{ANT} + Array Gain = 5 dBi
Array Gain = 10 log (N_{ANT}/N_{SS}) dB.
N_{ANT}: number of transmit antennas
N_{SS}: number of spatial streams, the worst case directional gain will occur when N_{SS} = 1

The EUT support Tx beamforming mode.
MIMO output power port and MIMO PSD port summing was performed in accordance with KDB 662911 D01. For the Tx beamforming mode results the Directional Gain was calculated in accordance with the following mothed.

For output power measurements:
Directional gain= G_{ANT} + 10 log (N_{ANT}) dBi = 5 dBi
G_{ANT}: equal to the gain of the antenna having the highest gain

For power spectral density (PSD) measurements:
Directional gain= G_{ANT} + 10 log (N_{ANT}) dBi = 5 dBi
G_{ANT}: equal to the gain of the antenna having the highest gain

The EUT support Space Time Block Codes (STBC) mode.
MIMO output power port and MIMO PSD port summing was performed in accordance with KDB 662911 D01. For the STBC mode results the Directional Gain was calculated in accordance with the following mothed.

For output power measurements:
Directional gain= G_{ANT} dBi = 2 dBi
G_{ANT}: equal to the gain of the antenna having the highest gain

For power spectral density (PSD) measurements:
Directional gain= G_{ANT} dBi = 2 dBi
G_{ANT}: equal to the gain of the antenna having the highest gain

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	ThinkPad	X230i	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	Unshielded	1.0 m	/
2	LAN1	RJ45	Unshielded	1.0 m	/
3	LAN2	RJ45	Unshielded	1.0 m	/
4	LAN3	RJ45	Unshielded	1.0 m	/
5	POWER	/	Unshielded	1.5 m	/

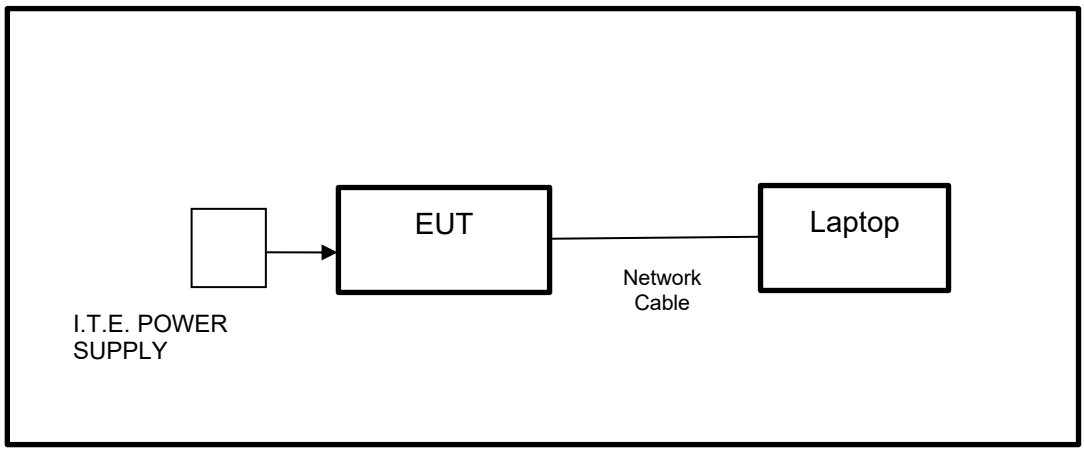
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	I.T.E. POWER SUPPLY	Tp-link	T120330-2B4	Input: AC 100-240 V, 50 / 60 Hz, 1 A Output: DC 12.0 V, 3.3 A

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

6. MEASURING EQUIPMENT AND SOFTWARE USED

R&S TS 8997 Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
Power sensor, Power Meter	R&S	OSP120	100921	Apr.02,2022	Apr.01,2023
Vector Signal Generator	R&S	SMBV100A	261637	Oct.17, 2022	Oct.16, 2023
Signal Generator	R&S	SMB100A	178553	Oct.17, 2022	Oct.16, 2023
Signal Analyzer	R&S	FSV40	101118	Oct.17, 2022	Oct.16, 2023

Software			
Description	Manufacturer	Name	Version
For R&S TS 8997 Test System	Rohde & Schwarz	EMC 32	10.60.10

Tonsend RF Test System					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
Wideband Radio Communication Tester	R&S	CMW500	155523	Oct.17, 2022	Oct.16, 2023
Wireless Connectivity Tester	R&S	CMW270	1201.0002N75-102	Sep.28, 2022	Sep.27, 2023
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Oct.17, 2022	Oct.16, 2023
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Oct.17, 2022	Oct.16, 2023
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Oct.17, 2022	Oct.16, 2023
Attenuator	Agilent	8495B	2814a12853	Oct.18, 2022	Oct.17, 2023

Software			
Description	Manufacturer	Name	Version
Tonsend SRD Test System	Tonsend	JS1120-3 RF Test System	2.6.77.0518

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Oct.17, 2022	Oct.16, 2023
Two-Line V-Network	R&S	ENV216	101983	Oct.17, 2022	Oct.16, 2023
Software					
Description			Manufacturer	Name	Version
Test Software for Conducted Emissions			Farad	EZ-EMC	Ver. UL-3A1

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.17, 2022	Oct.16, 2023
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.17, 2022	Oct.16, 2023
EMI Measurement Receiver	R&S	ESR26	101377	Oct.17, 2022	Oct.16, 2023
Horn Antenna	TDK	HRN-0118	130940	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct.17, 2022	Oct.16, 2023
Horn Antenna	Schwarzbeck	BBHA9170	697	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct.17, 2022	Oct.16, 2023
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct.17, 2022	Oct.16, 2023
Loop antenna	Schwarzbeck	1519B	00008	Dec.14, 2021	Dec.13, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Oct.17, 2022	Oct.16, 2023
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	/	/
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	/	/
Software					
Description			Manufacturer	Name	Version
Test Software for Radiated Emissions			Farad	EZ-EMC	Ver. UL-3A1

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

7. ANTENNA PORT TEST RESULTS

7.1. CONDUCTED OUTPUT POWER

LIMITS

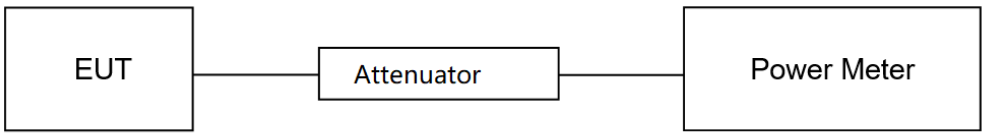
CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	AVG Output Power	1 watt or 30 dBm	2400-2483.5

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.9.2.3.1.

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth).
Measure peak emission level, the indicated level is the average output power, after any corrections for external attenuators and cables.
The test result in dBm by adding [10 log (1 / D)], where D is the duty cycle.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	52.3%
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

TEST RESULTS

Please refer to section "Test Data" - Appendix C

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

7.2. 6DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5
/	99 % Occupied Bandwidth	For reporting purposes only.	2400-2483.5

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.8 for DTS bandwidth and clause 6.9 for Occupied Bandwidth.

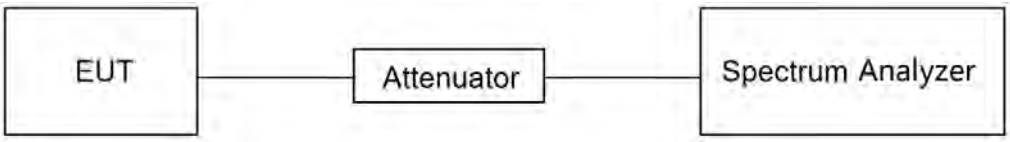
Connect the EUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Frequency Span	For 6 dB Bandwidth: Enough to capture all products of the modulation carrier emission For 99 % Occupied Bandwidth: Between 1.5 times and 5.0 times the OBW
Detector	Peak
RBW	For 6 dB Bandwidth: 100 kHz For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: ≥3 × RBW For 99 % Occupied Bandwidth: ≥3 × RBW
Trace	Max hold
Sweep	Auto couple

a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.

b) Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP



This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	52.3%
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

TEST RESULTS

Please refer to section "Test Data" - Appendix A & B

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

7.3. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

TEST PROCEDURE

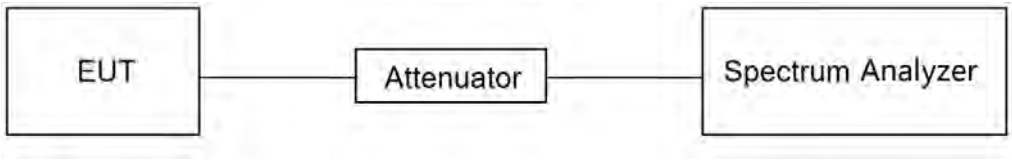
Refer to ANSI C63.10-2013 clause 11.10.5.

Connect the EUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	power averaging (rms)
RBW	3 kHz ≤ RBW ≤ 100 kHz
VBW	≥3 × RBW
Span	1.5 x OBW bandwidth
Trace	Average
Sweep time	Auto couple

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	52.3%
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

TEST RESULTS

Please refer to section "Test Data" - Appendix D

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

7.4. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.11 and 11.13.

Connect the EUT to the spectrum analyzer and use the following settings for reference level measurement:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

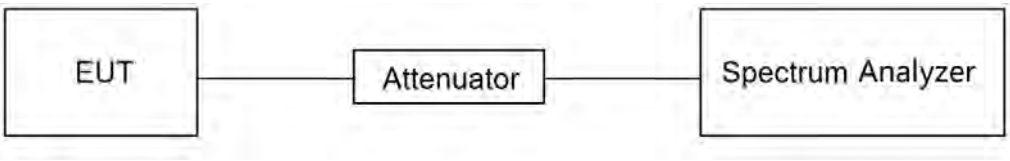
Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level.
Change the settings for emission level measurement:

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	52.3%
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

TEST RESULTS

Please refer to section "Test Data" - Appendix E & F

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

7.5. DUTY CYCLE

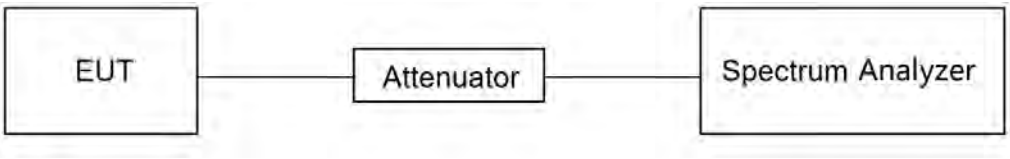
LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.6 Zero – Span Spectrum Analyzer method.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5 °C	Relative Humidity	52.3%
Atmosphere Pressure	101 kPa	Test Voltage	DC 12 V

TEST RESULTS

Please refer to section "Test Data" - Appendix G

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	**Magnetic field strength (H-Field) (µA/m)**	**Measurement distance (m)**
9 - 490 kHz[Note 1]	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

Table 7 – Restricted frequency bands[Note 1]		
MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 – 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 – 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 – 8500	
108 – 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

FCC Restricted bands of operation refer to FCC §15.205 (a):

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST PROCEDURE

Below 30 MHz

The setting of the spectrum analyzer

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.

7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Below 1 GHz and above 30 MHz

The setting of the spectrum analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Above 1 GHz

The setting of the spectrum analyzer

RBW	1 MHz
VBW	PEAK: 3 MHz AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5 m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.5. ON TIME AND DUTY CYCLE.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

For Restricted Bandedge:
Note:
1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.5.
6. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
7. Both horizontal and vertical have been tested, only the worst data was recorded in the report.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious emission (9 kHz ~ 30 MHz):
Note:
1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious Emission (30 MHz ~ 1 GHz):
Note:
1. Result Level = Read Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious Emission (1 GHz ~ 3 GHz):
1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.5.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

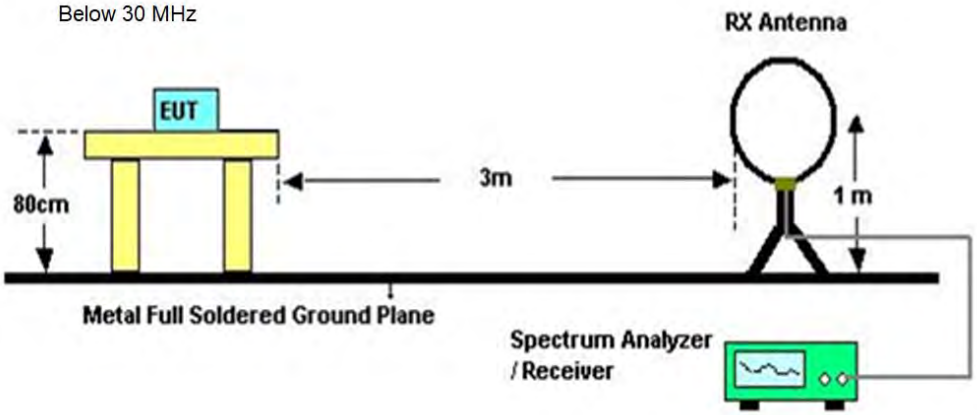
For Radiate Spurious Emission (3 GHz ~ 18 GHz):
Note:
1. Peak Result = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.5.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious emission (18 GHz ~ 26 GHz):
Note:
1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

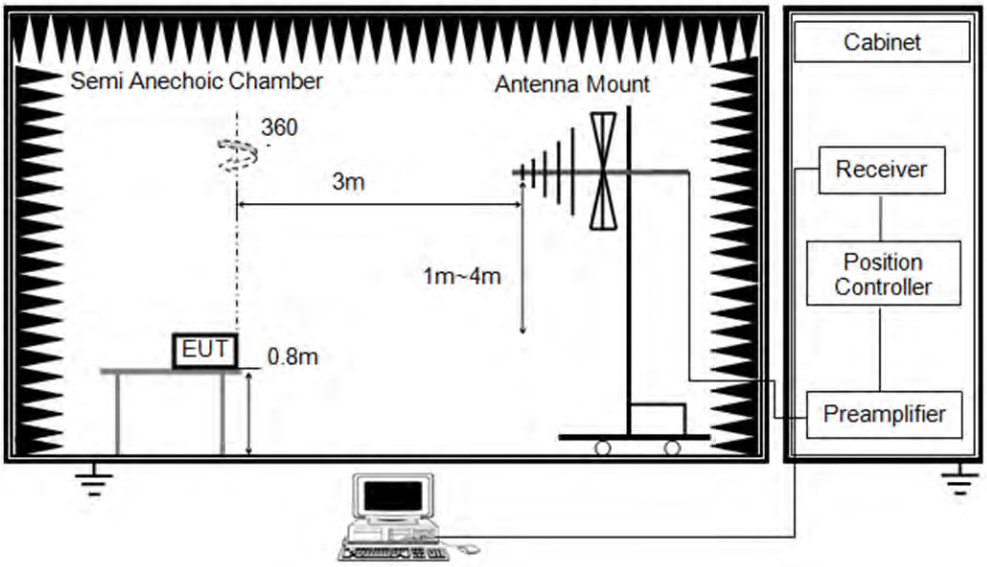
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST SETUP

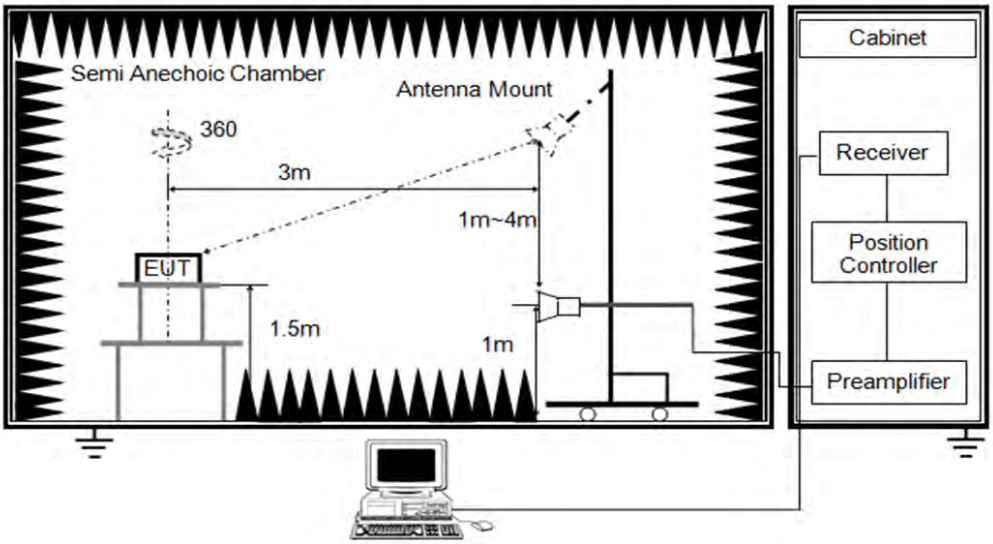
Below 30 MHz



Below 1 GHz and above 30 MHz



Above 1 GHz



This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST ENVIRONMENT

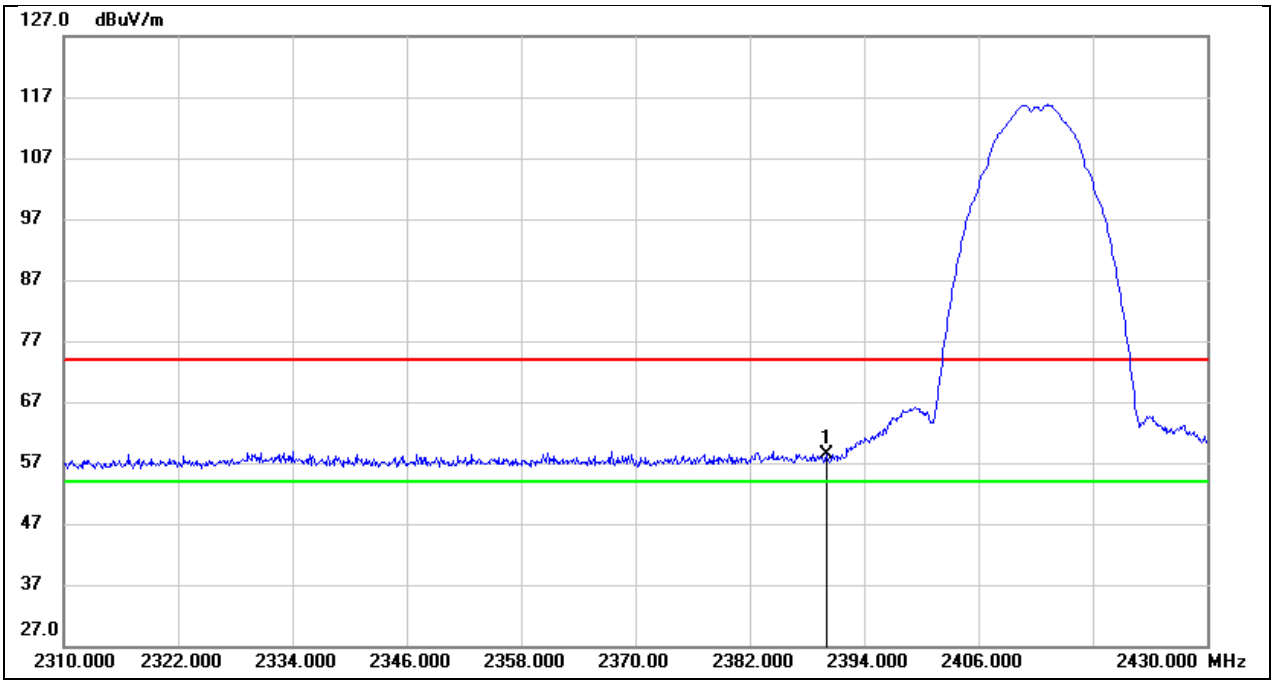
Temperature	24.8 °C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 12 V

TEST RESULTS

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.1. RESTRICTED BANDEDGE

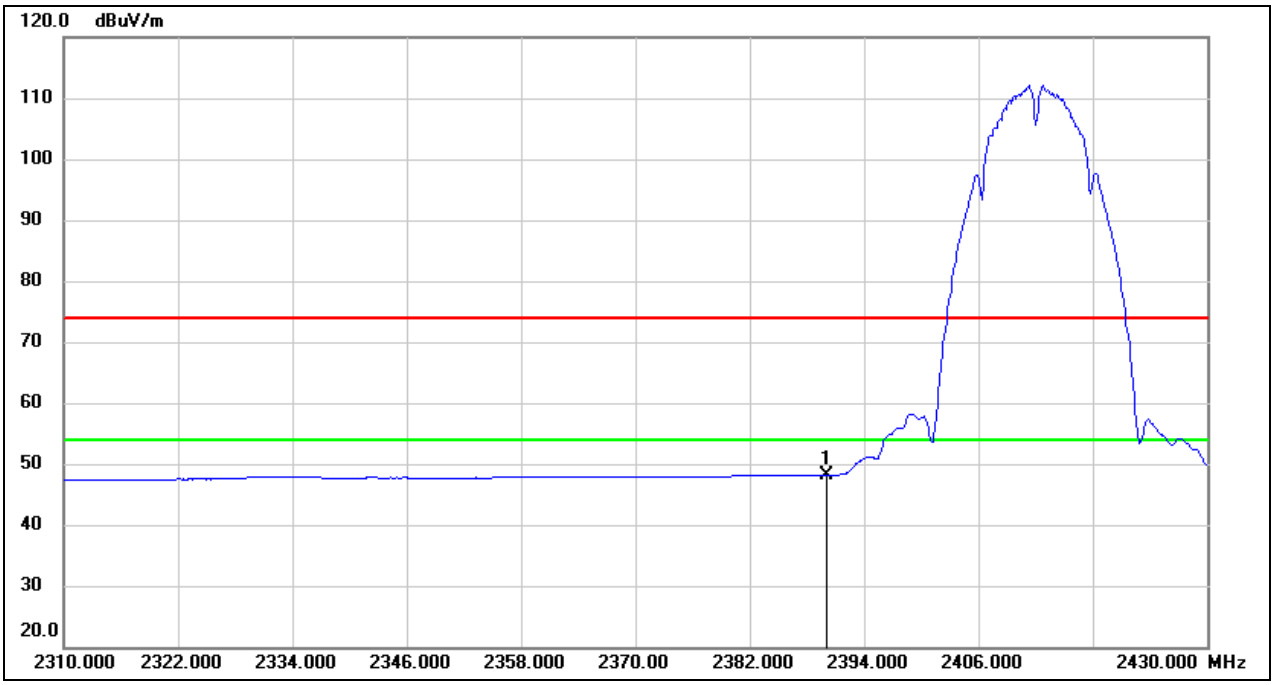
Test Mode:	802.11b Peak	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	26.12	32.16	58.28	74.00	-15.72	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

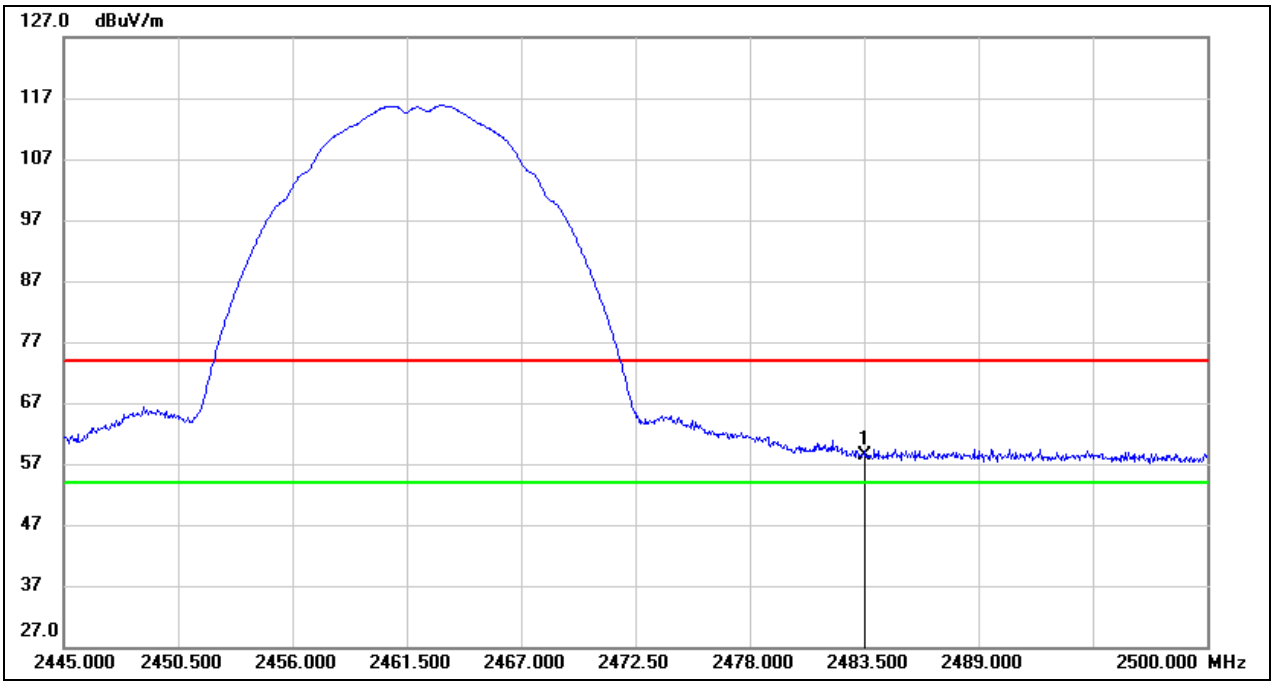
Test Mode:	802.11b Average	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	15.93	32.16	48.09	54.00	-5.91	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

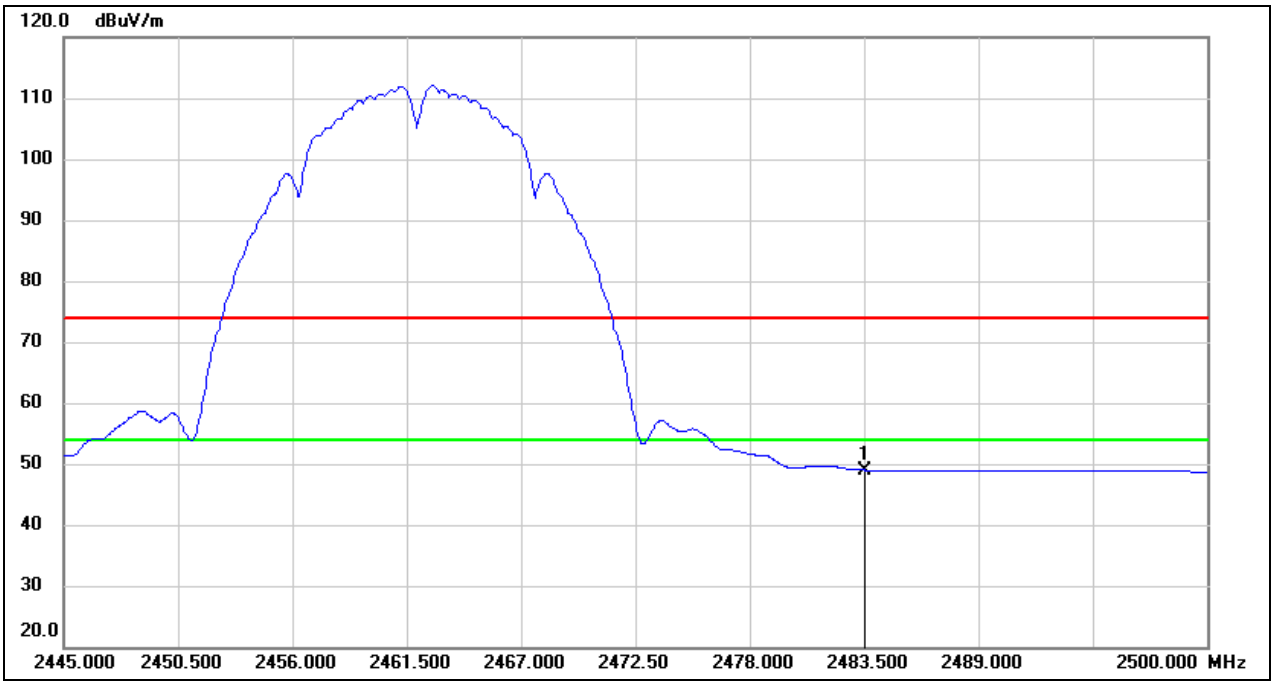
Test Mode:	802.11b Peak	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	25.89	32.44	58.33	74.00	-15.67	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

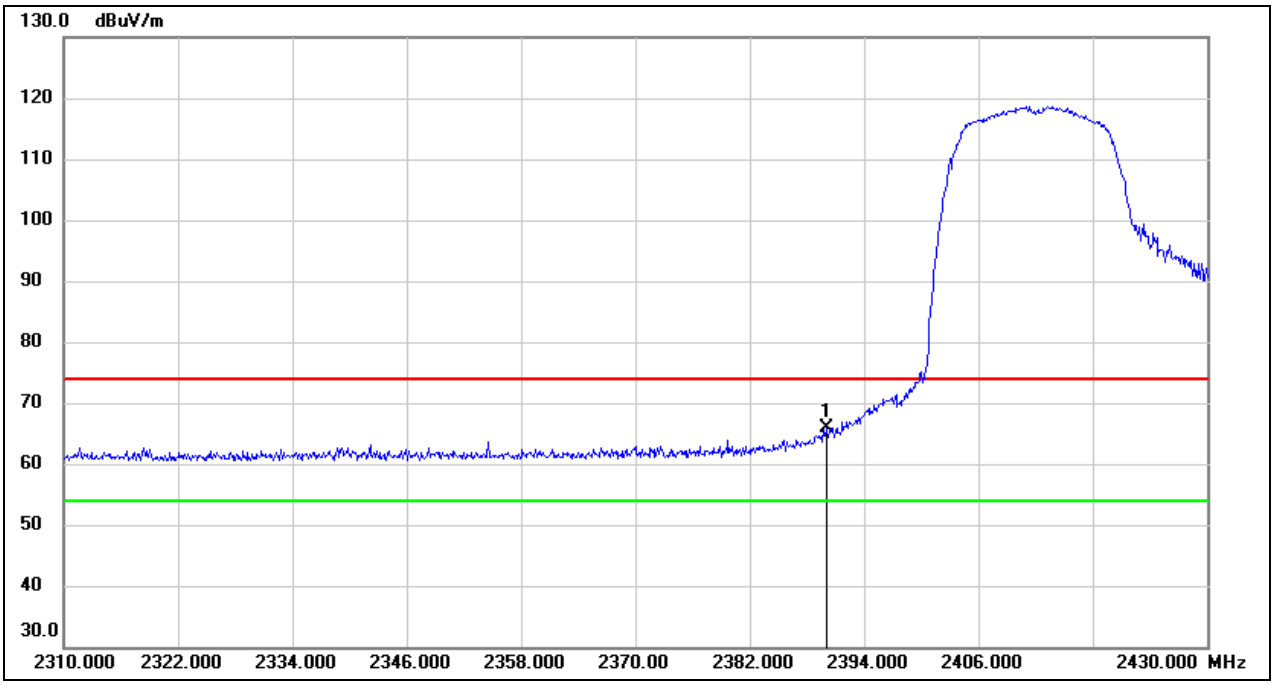
Test Mode:	802.11b Average	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	16.56	32.44	49.00	54.00	-5.00	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

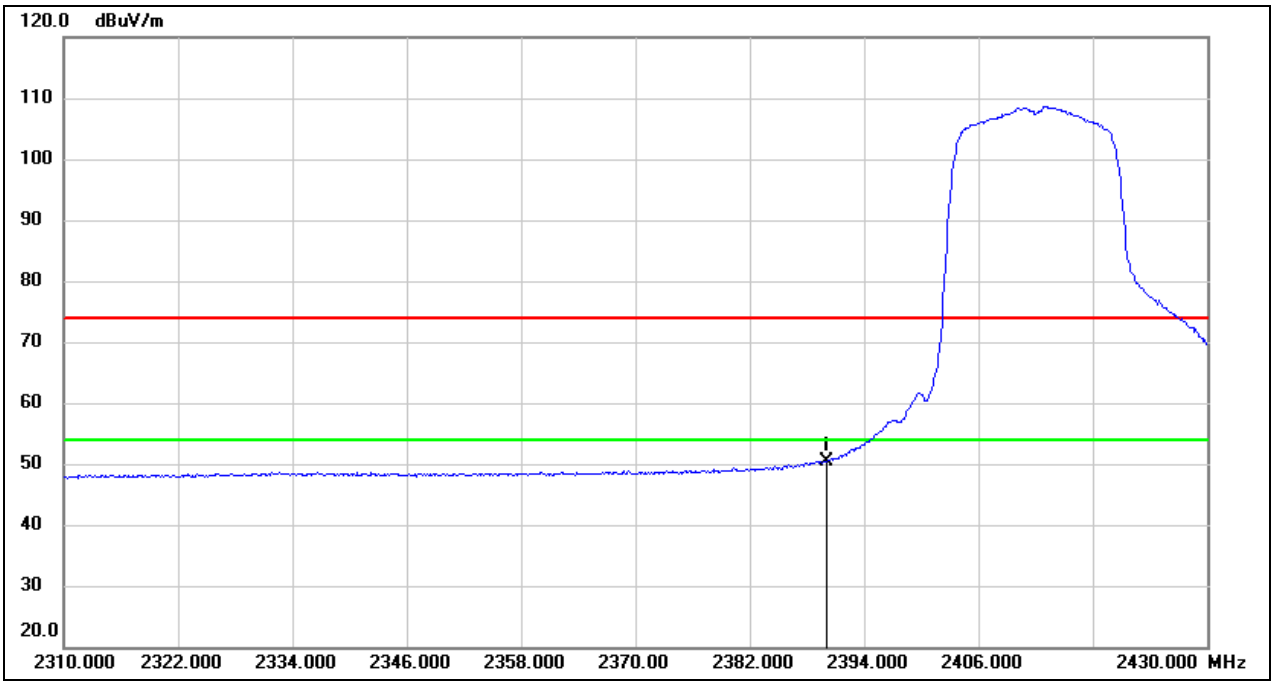
Test Mode:	802.11g Peak	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	33.69	32.16	65.85	74.00	-8.15	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

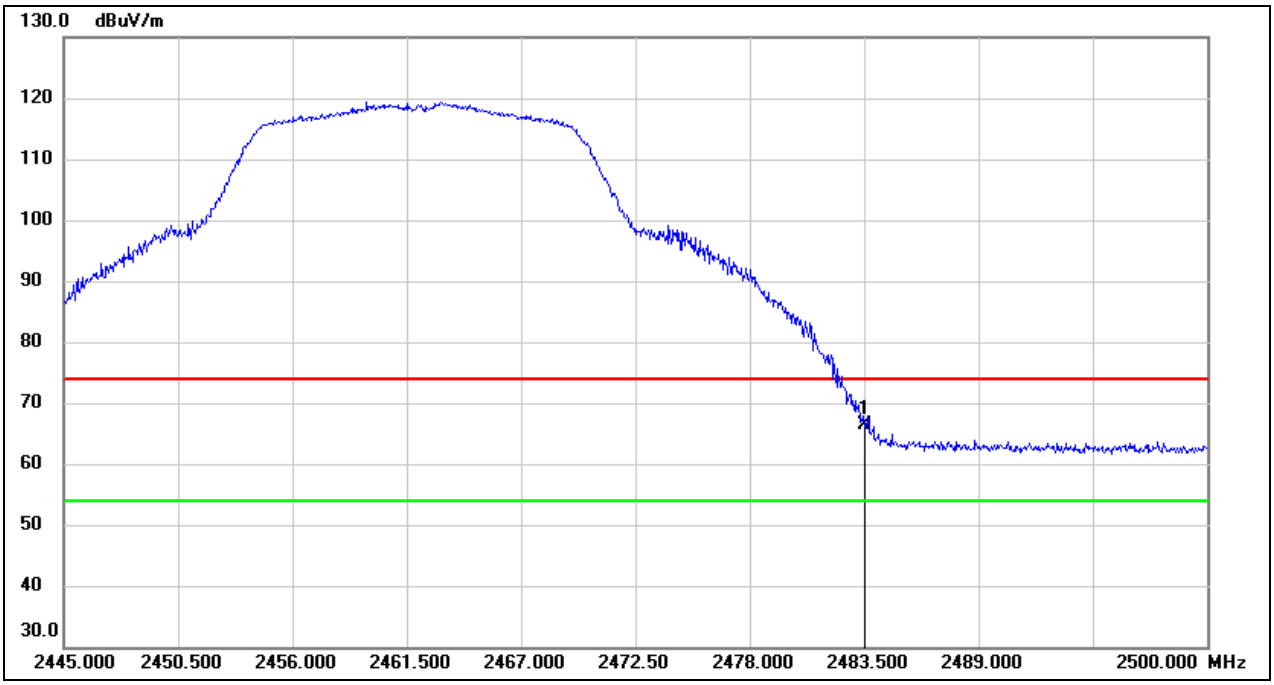
Test Mode:	802.11g Average	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	18.30	32.16	50.46	54.00	-3.54	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

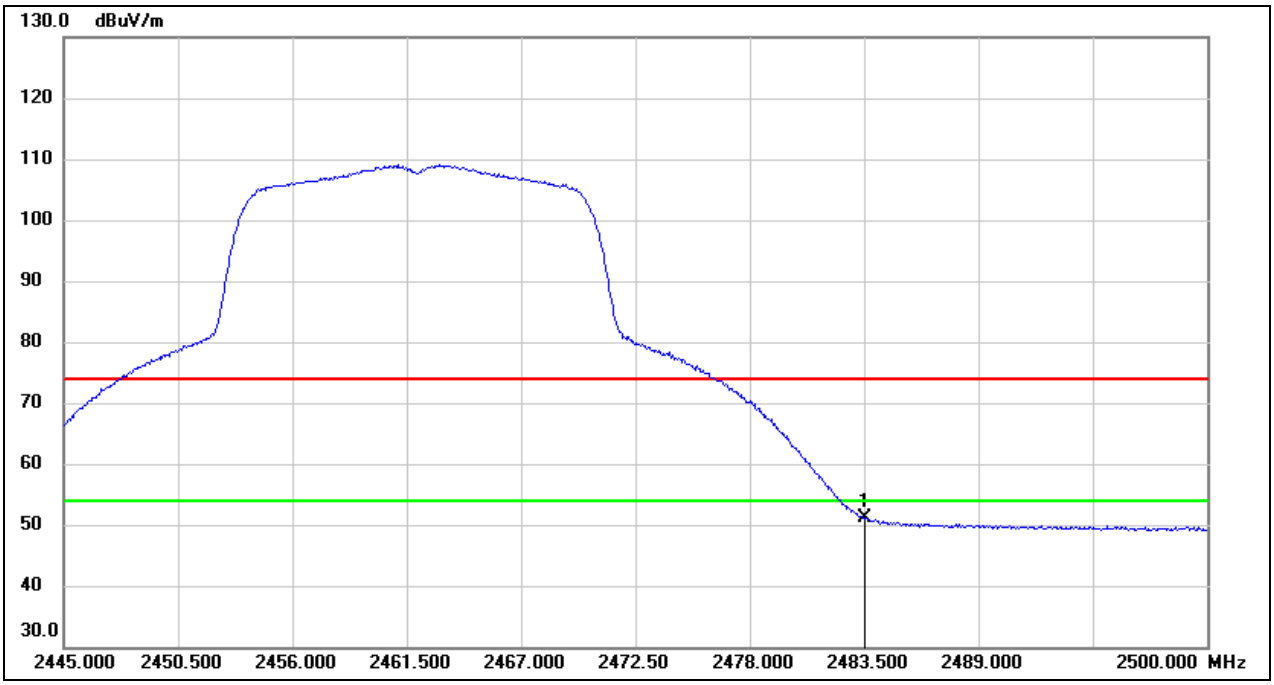
Test Mode:	802.11g Peak	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	33.95	32.44	66.39	74.00	-7.61	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

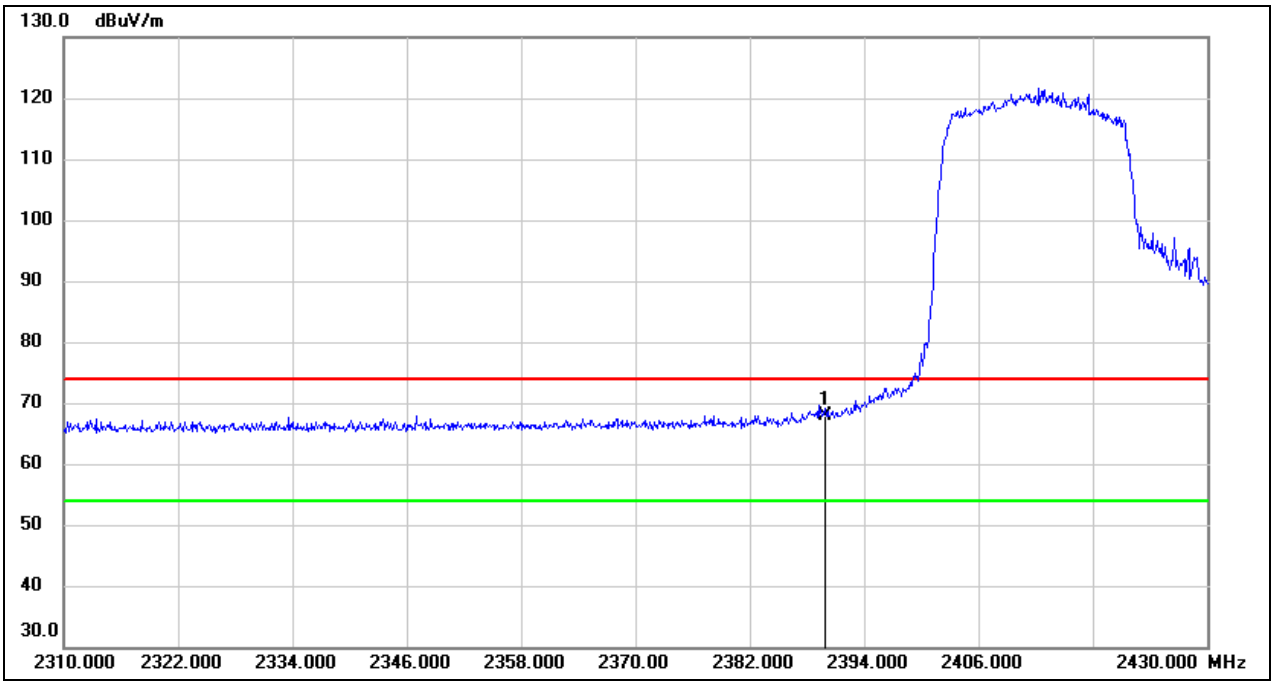
Test Mode:	802.11g Average	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	18.60	32.44	51.04	54.00	-2.96	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

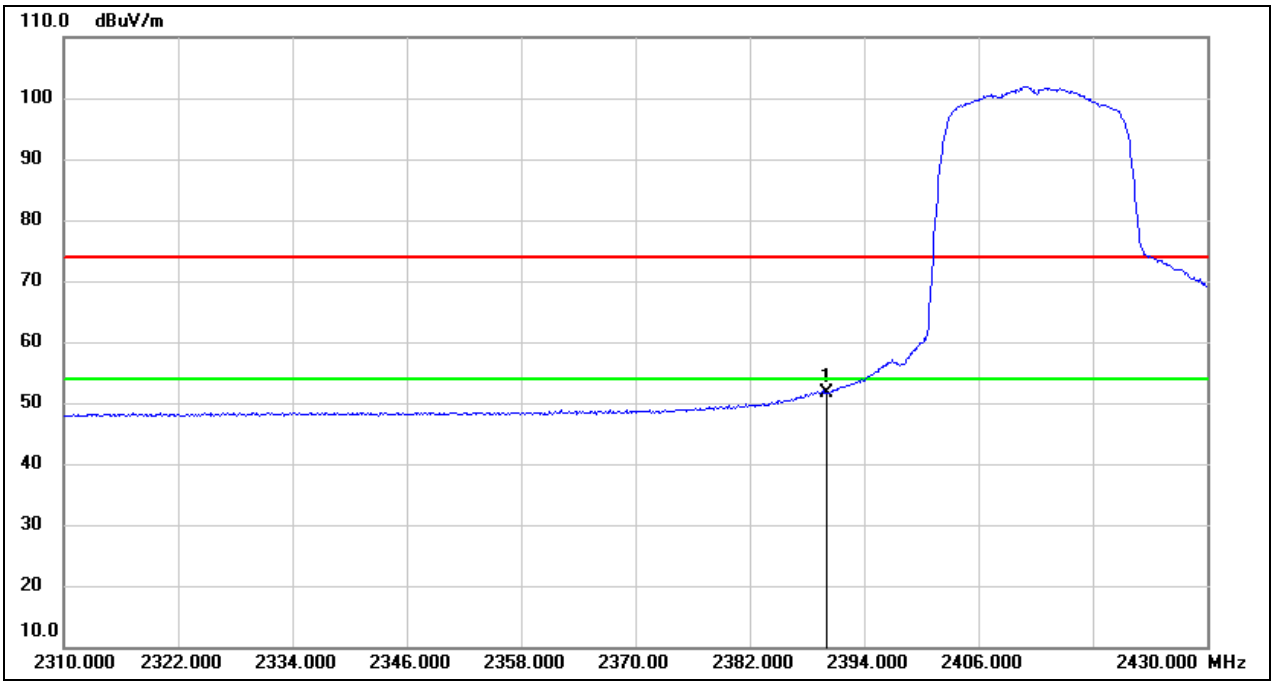
Test Mode:	802.11ax HE20 Peak	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	35.68	32.16	67.84	74.00	-6.16	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

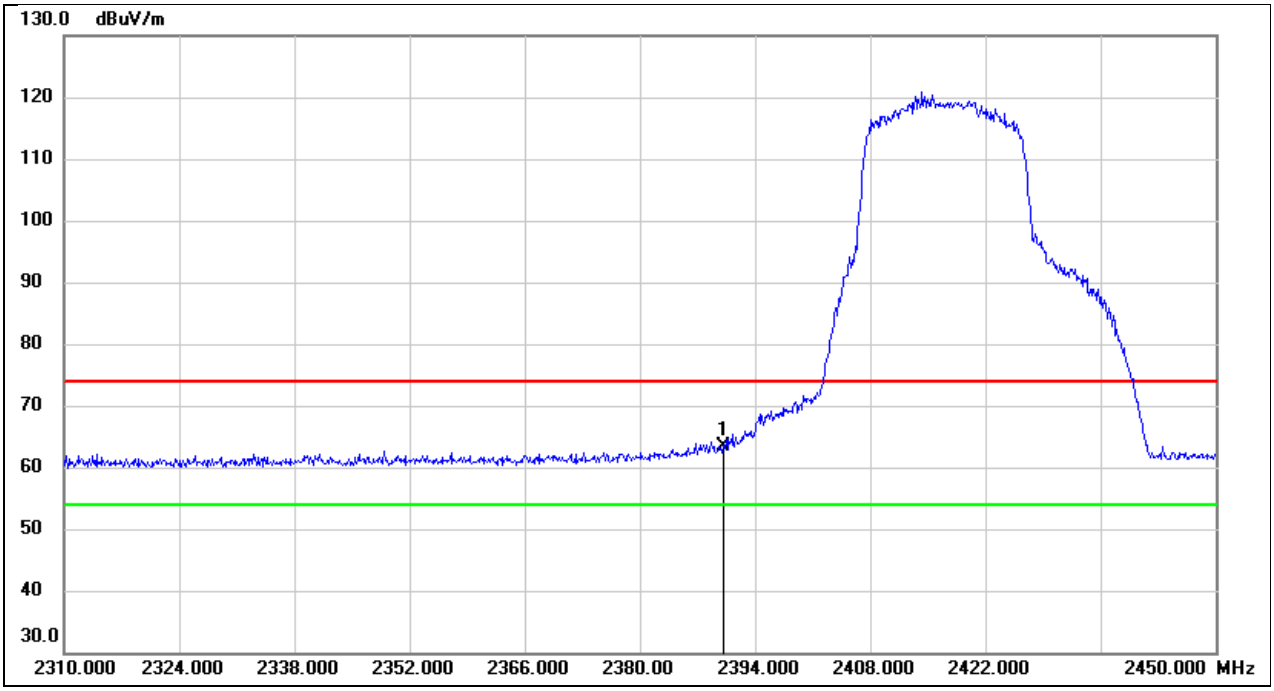
Test Mode:	802.11ax HE20 Average	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	19.53	32.16	51.69	54.00	-2.31	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

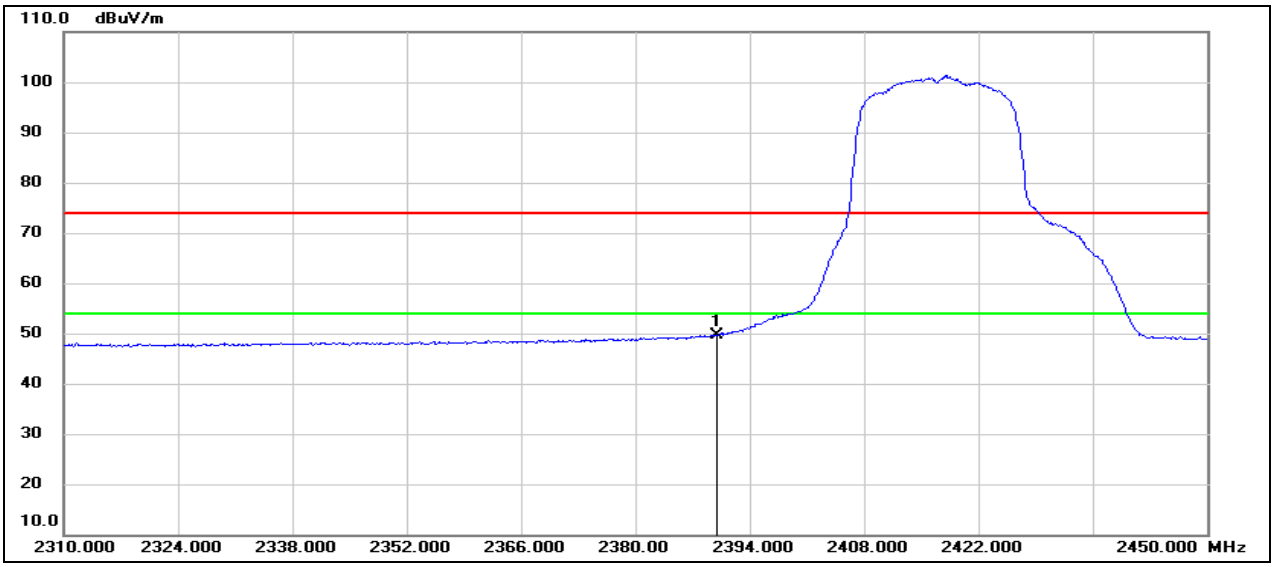
Test Mode:	802.11ax HE20 Peak	Channel:	2417 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	31.34	32.16	63.50	74.00	-10.50	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

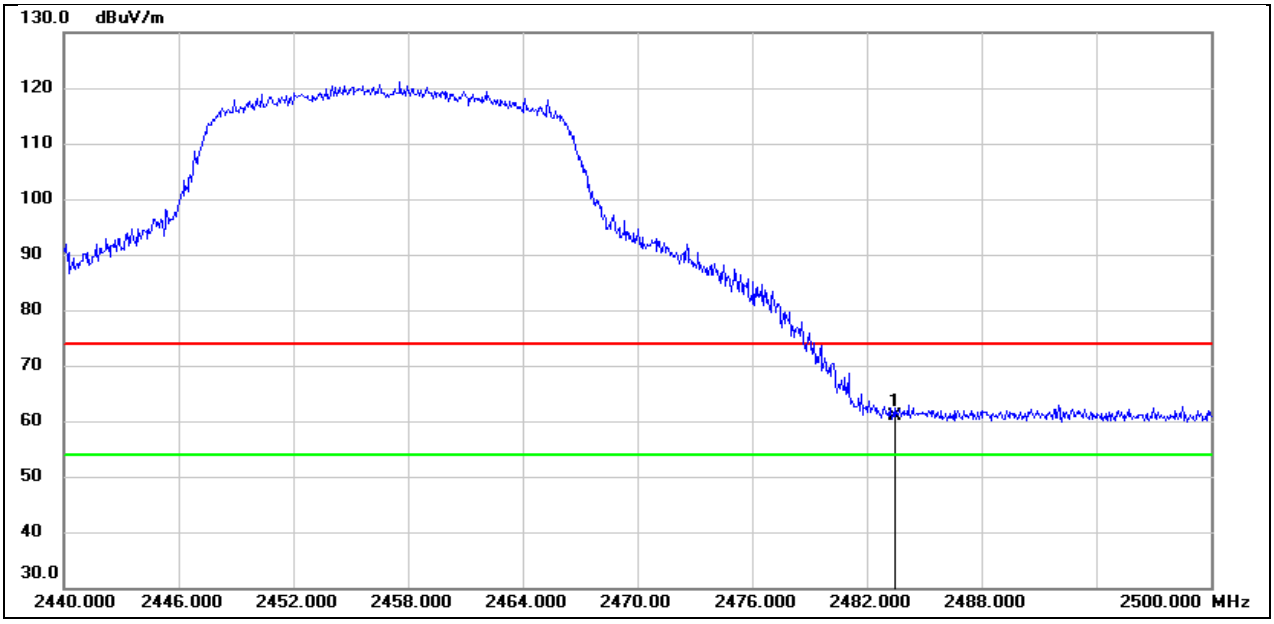
Test Mode:	802.11ax HE20 Average	Channel:	2417 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	17.52	32.16	49.68	54.00	-4.32	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

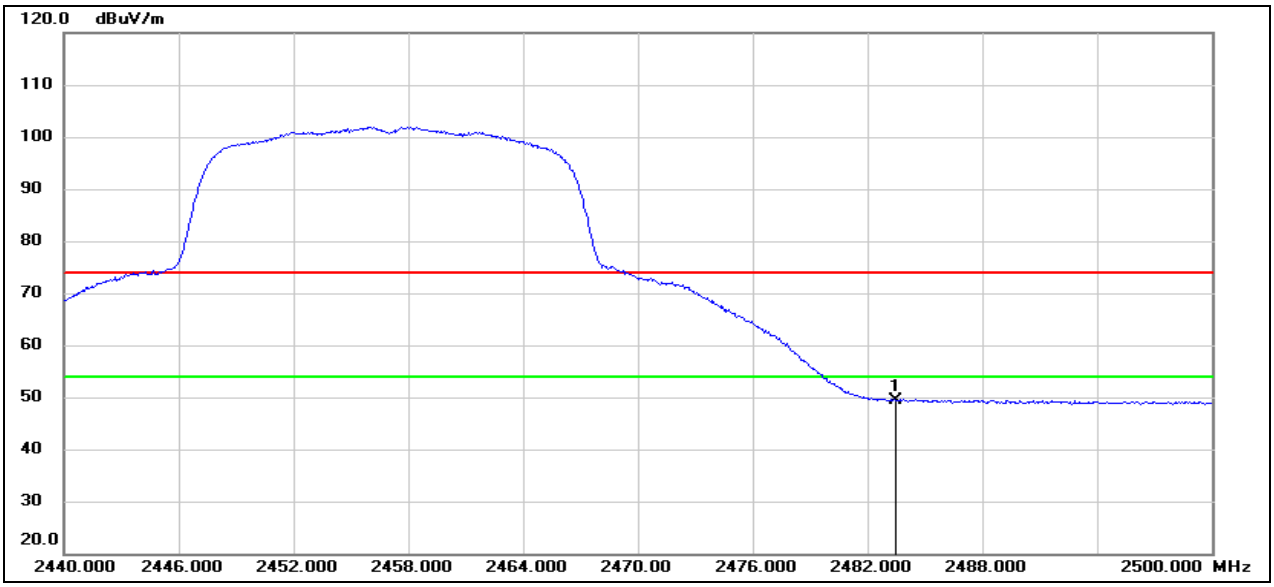
Test Mode:	802.11ax HE20 Peak	Channel:	2457 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	28.51	32.44	60.95	74.00	-13.05	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

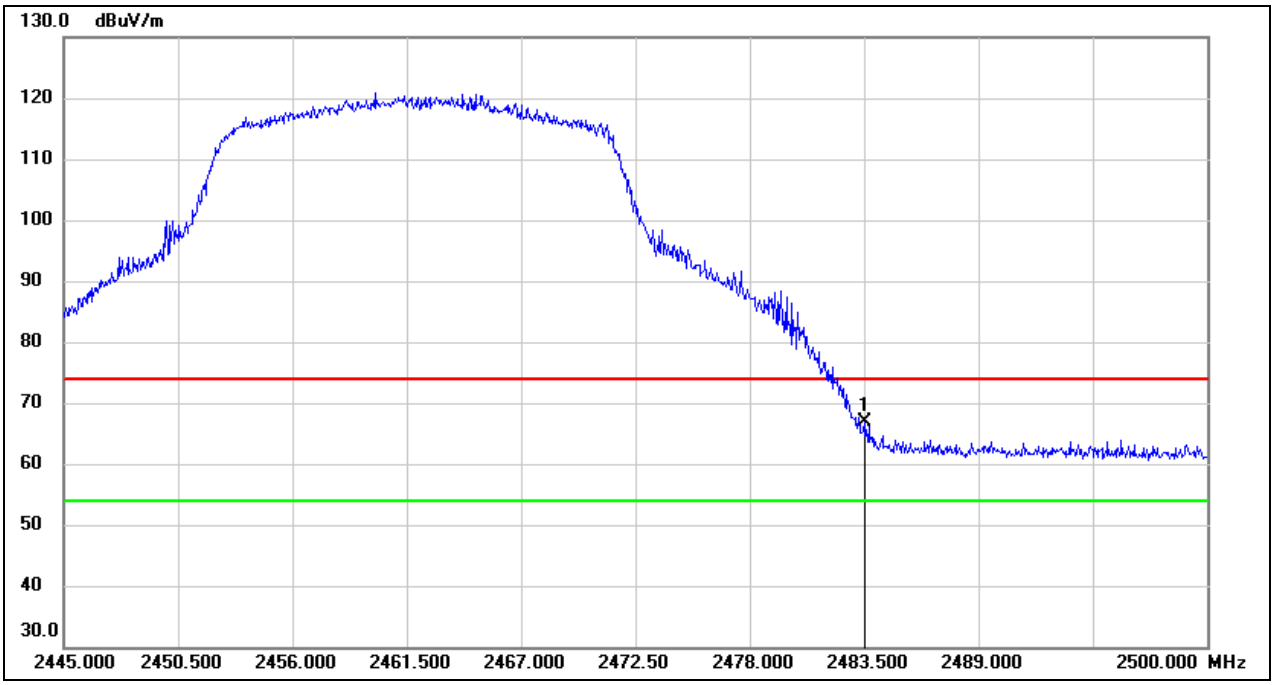
Test Mode:	802.11ax HE20 Average	Channel:	2457 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	16.90	32.44	49.34	54.00	-4.66	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

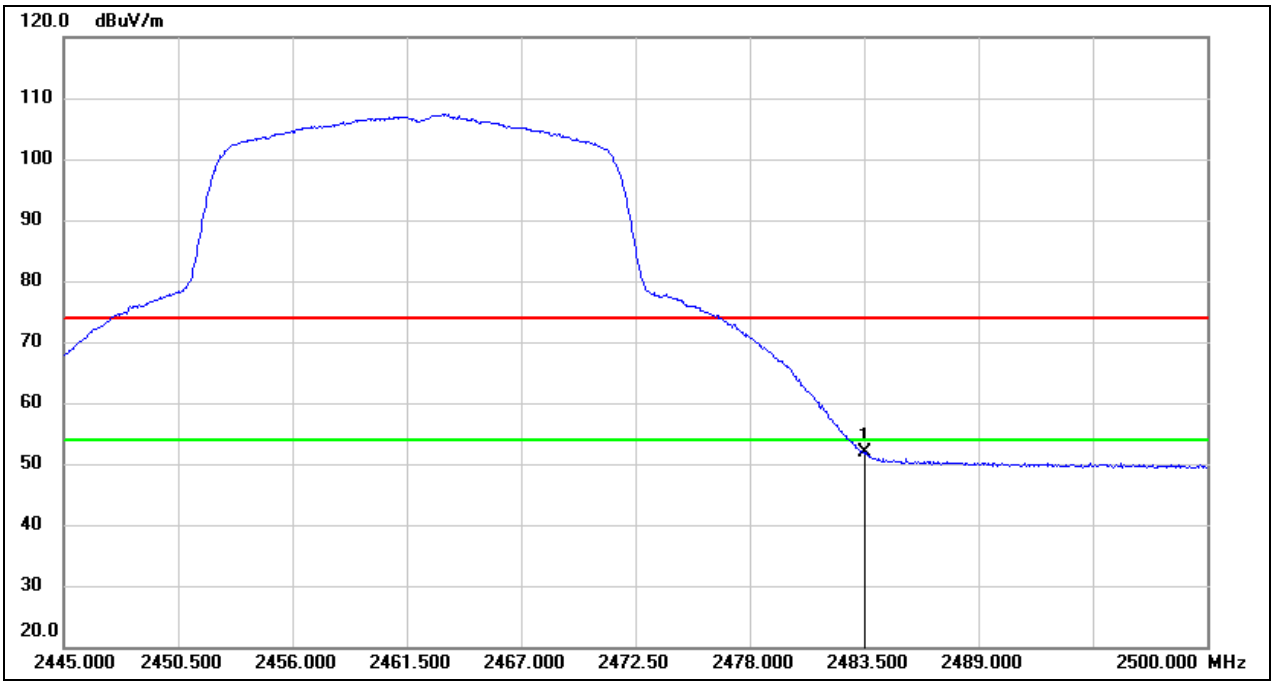
Test Mode:	802.11ax HE20 Peak	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	34.54	32.44	66.98	74.00	-7.02	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

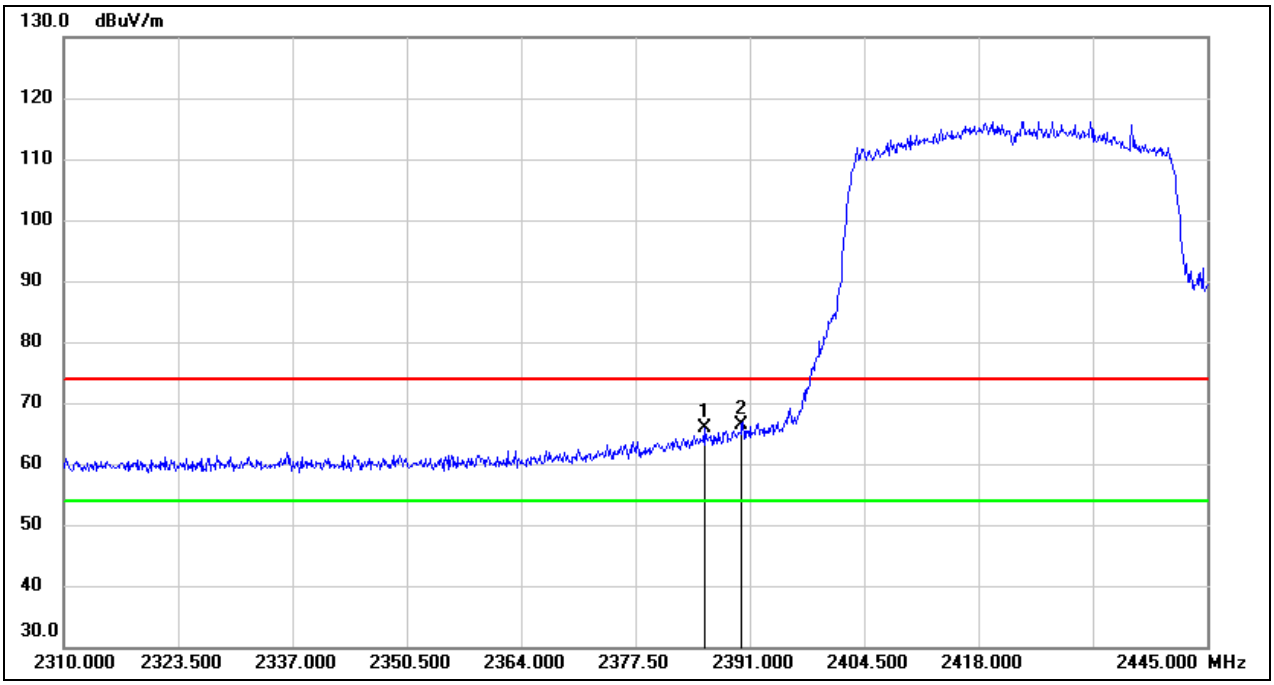
Test Mode:	802.11ax HE20 Average	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	19.46	32.44	51.90	54.00	-2.10	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

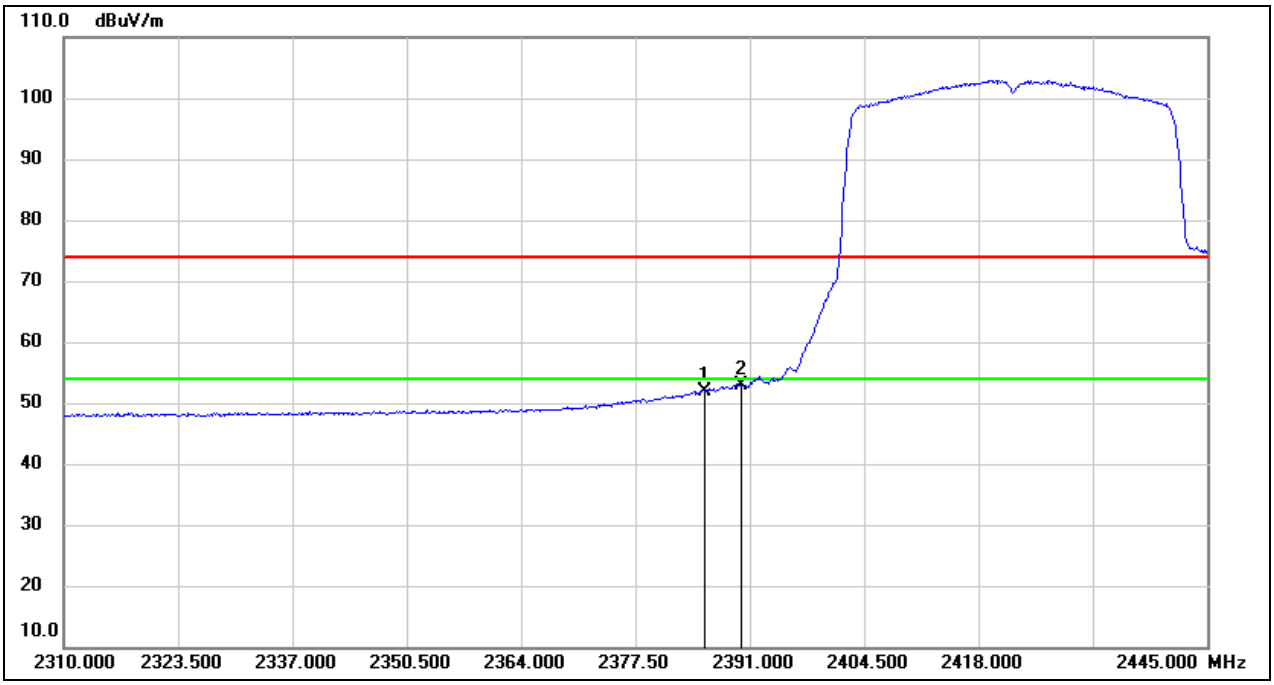
Test Mode:	802.11ax HE40 Peak	Channel:	2422 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.600	33.76	32.14	65.90	74.00	-8.10	peak
2	2390.000	34.23	32.16	66.39	74.00	-7.61	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

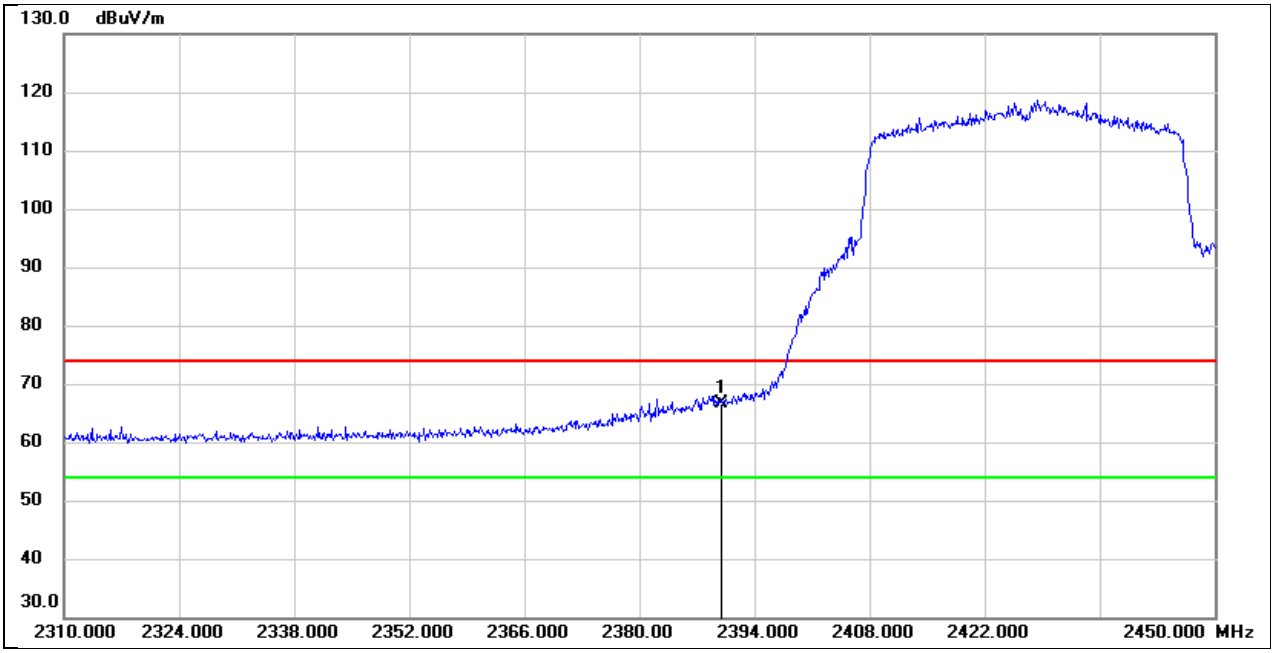
Test Mode:	802.11ax HE40 Average	Channel:	2422 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.600	19.68	32.14	51.82	54.00	-2.18	AVG
2	2390.000	20.63	32.16	52.79	54.00	-1.21	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

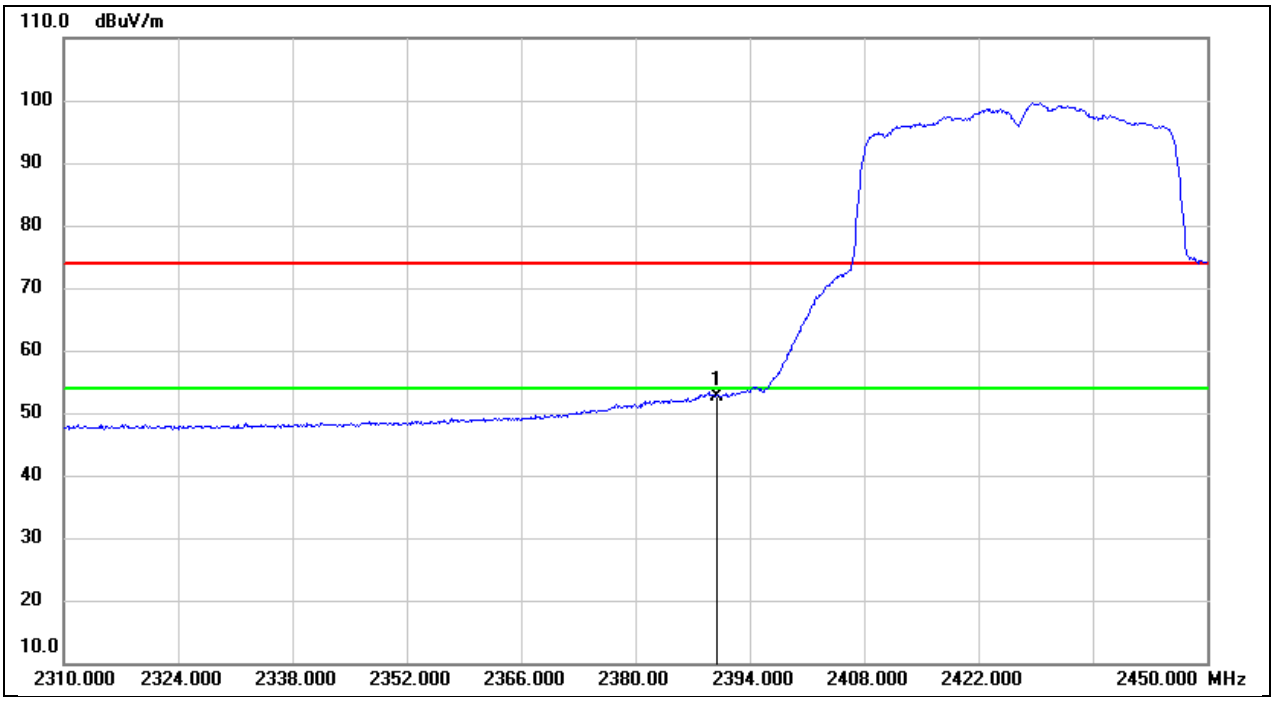
Test Mode:	802.11ax HE40 Peak	Channel:	2427 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	34.57	32.16	66.73	74.00	-7.27	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

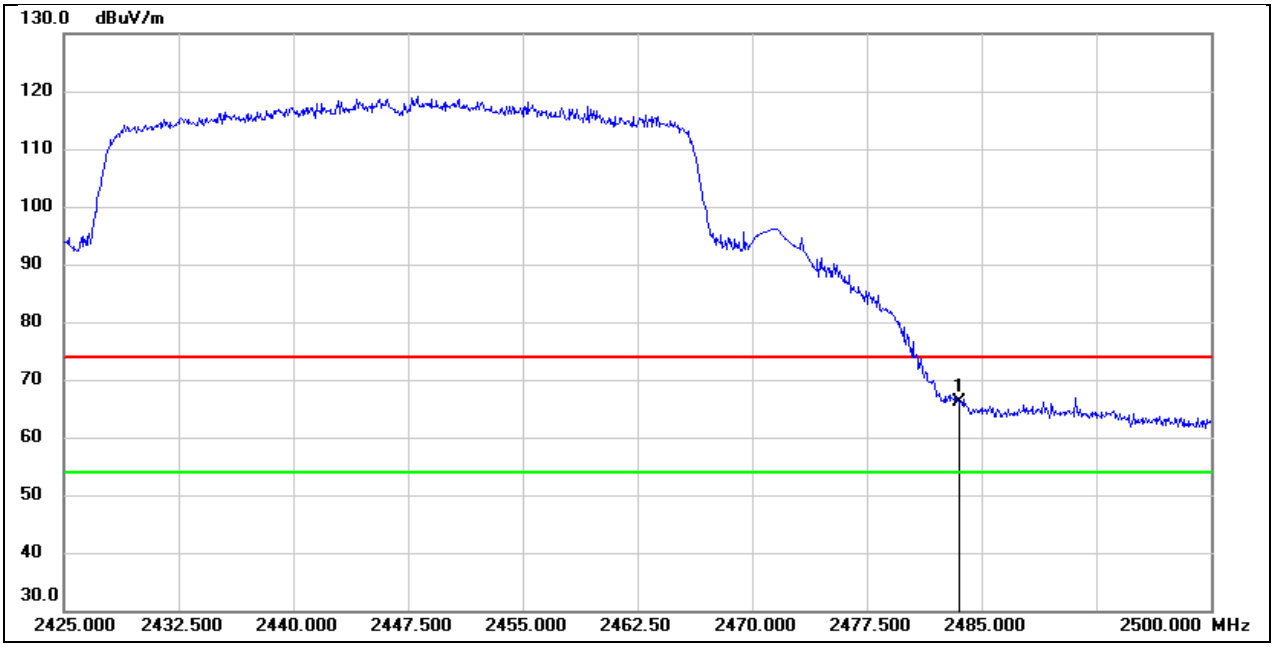
Test Mode:	802.11ax HE40 Average	Channel:	2427 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	20.59	32.16	52.75	54.00	-1.25	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

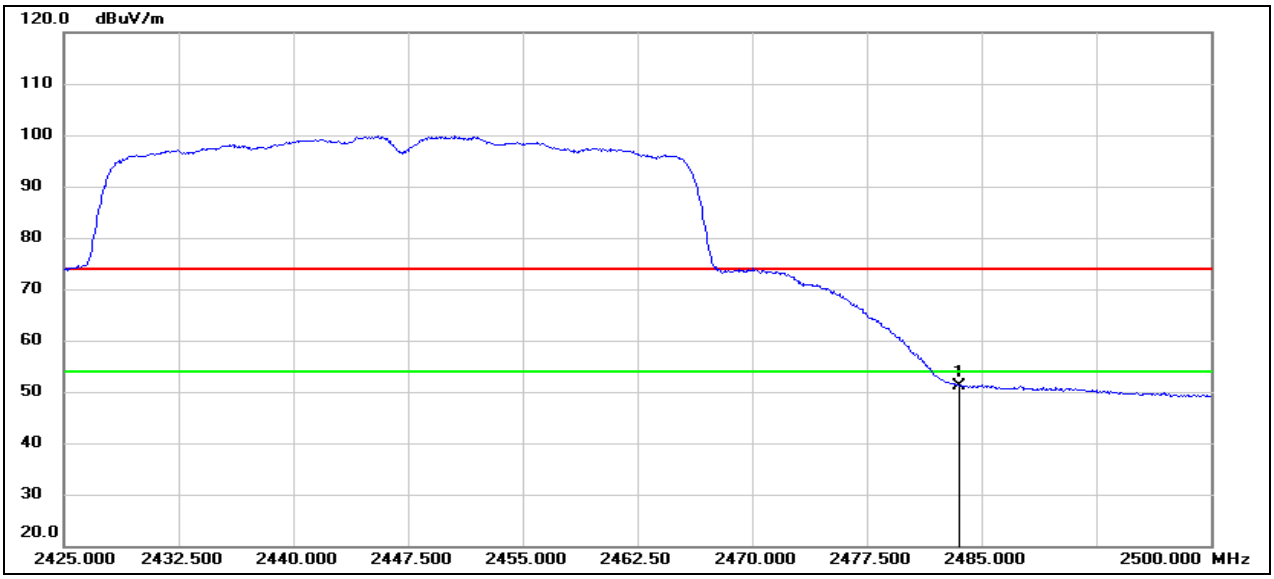
Test Mode:	802.11ax HE40 Peak	Channel:	2447 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	33.65	32.44	66.09	74.00	-7.91	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

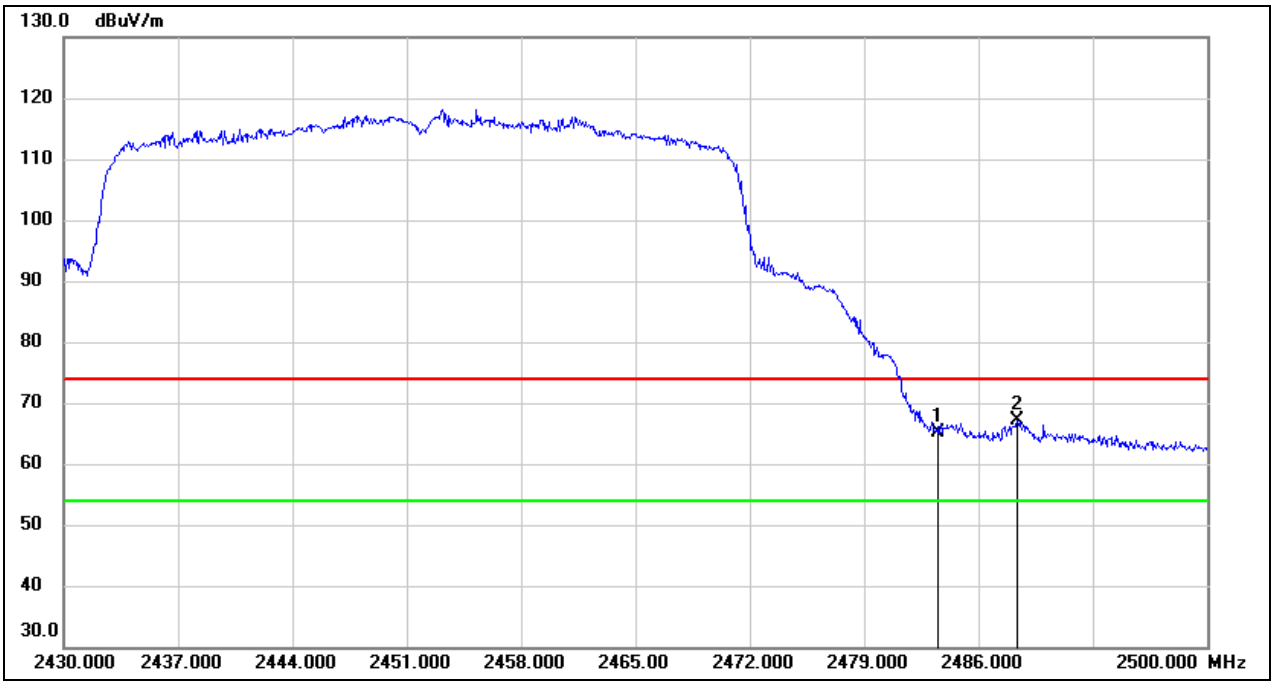
Test Mode:	802.11ax HE40 Average	Channel:	2447 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	18.79	32.44	51.23	54.00	-2.77	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

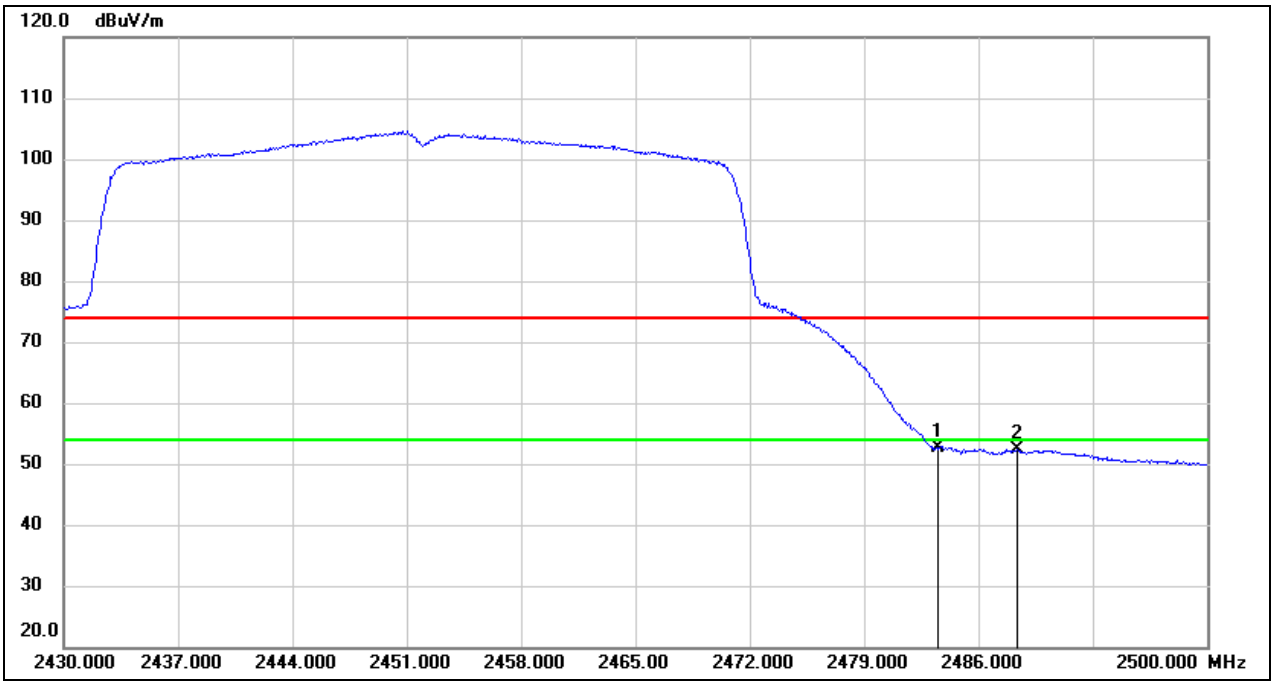
Test Mode:	802.11ax HE40 Peak	Channel:	2452 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	32.81	32.44	65.25	74.00	-8.75	peak
2	2488.380	34.76	32.46	67.22	74.00	-6.78	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE40 Average	Channel:	2452 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V

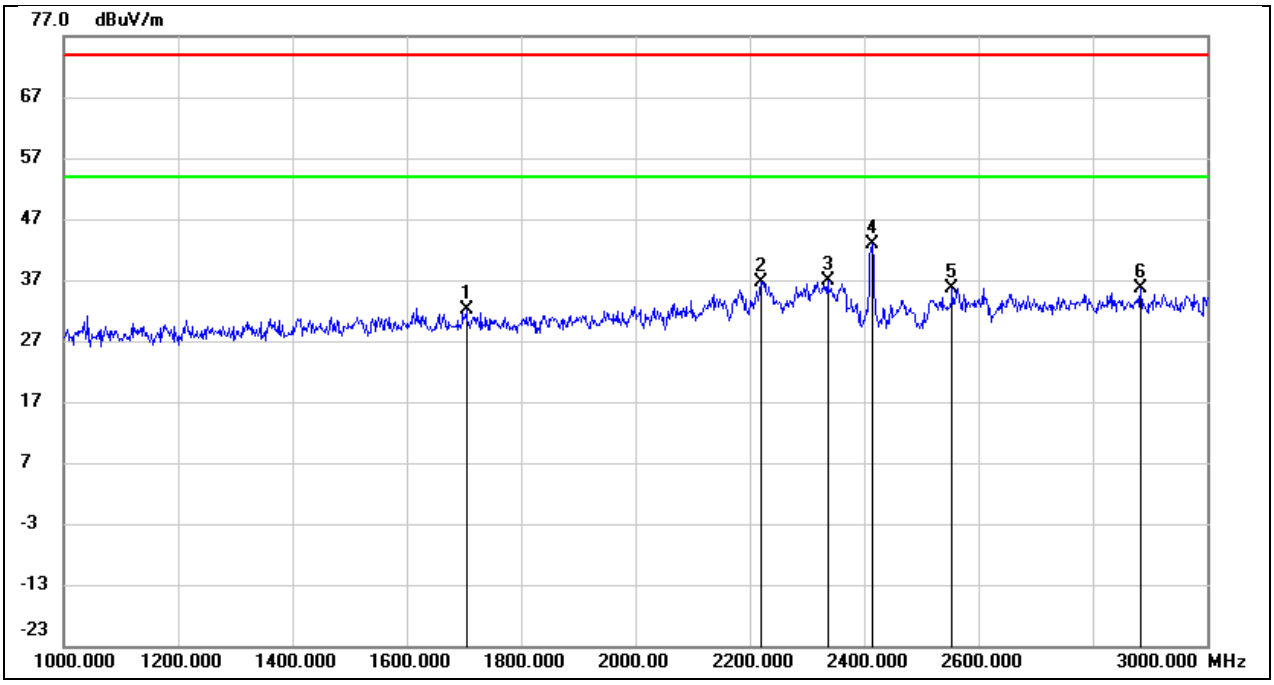


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	20.23	32.44	52.67	54.00	-1.33	AVG
2	2488.380	19.80	32.46	52.26	54.00	-1.74	AVG

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.2. SPURIOUS EMISSIONS (1 GHZ ~ 3 GHZ)

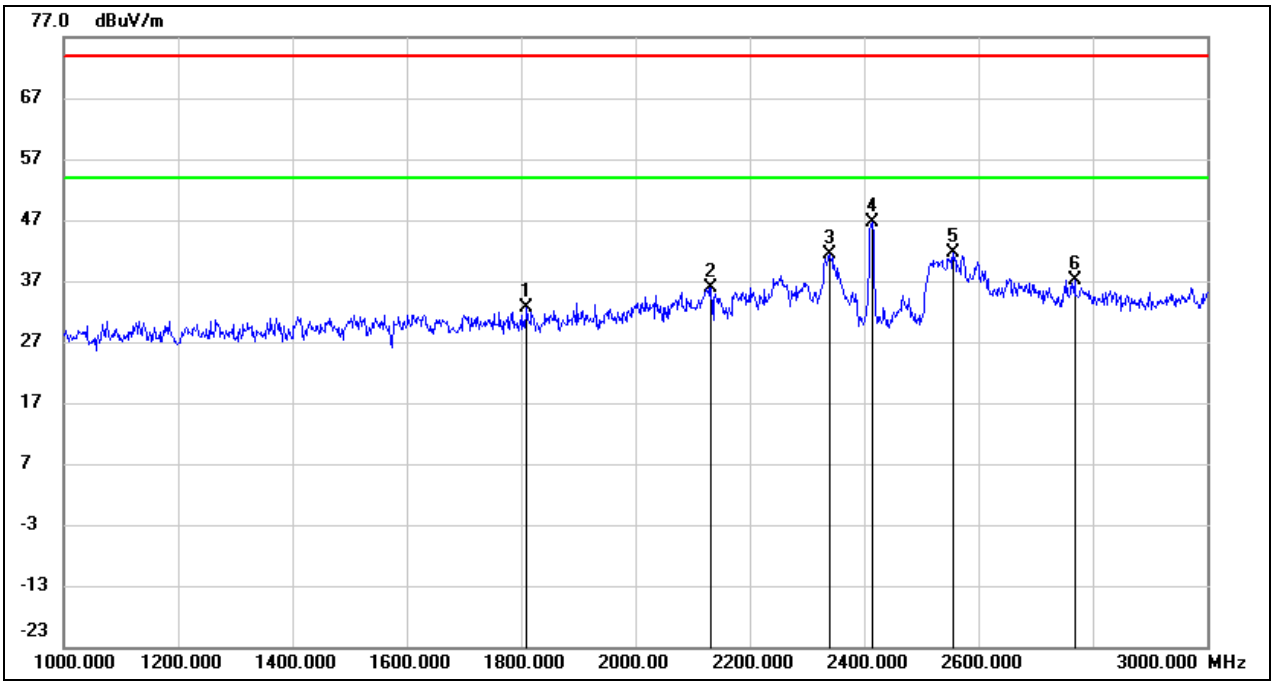
Test Mode:	802.11ax HE20	Channel:	2417
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1704.000	44.22	-12.04	32.18	74.00	-41.82	peak
2	2220.000	46.56	-9.94	36.62	74.00	-37.38	peak
3	2336.000	46.17	-9.33	36.84	74.00	-37.16	peak
4	2414.000	51.75	-8.93	42.82	74.00	-31.18	peak
5	2554.000	43.95	-8.32	35.63	74.00	-38.37	peak
6	2884.000	42.98	-7.33	35.65	74.00	-38.35	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

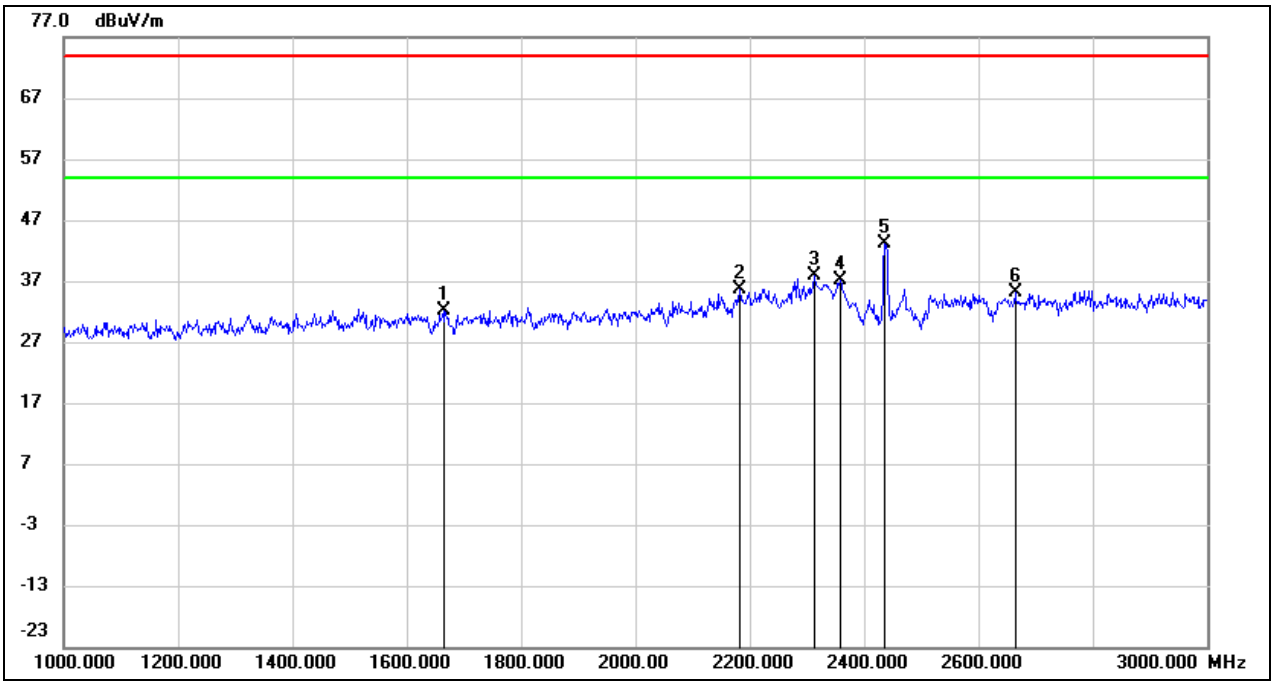
Test Mode:	802.11ax HE20	Channel:	2417
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1810.000	44.21	-11.69	32.52	74.00	-41.48	peak
2	2132.000	46.32	-10.39	35.93	74.00	-38.07	peak
3	2340.000	50.61	-9.31	41.30	74.00	-32.70	peak
4	2414.000	55.51	-8.93	46.58	74.00	-27.42	peak
5	2556.000	49.95	-8.32	41.63	74.00	-32.37	peak
6	2768.000	44.87	-7.68	37.19	74.00	-36.81	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

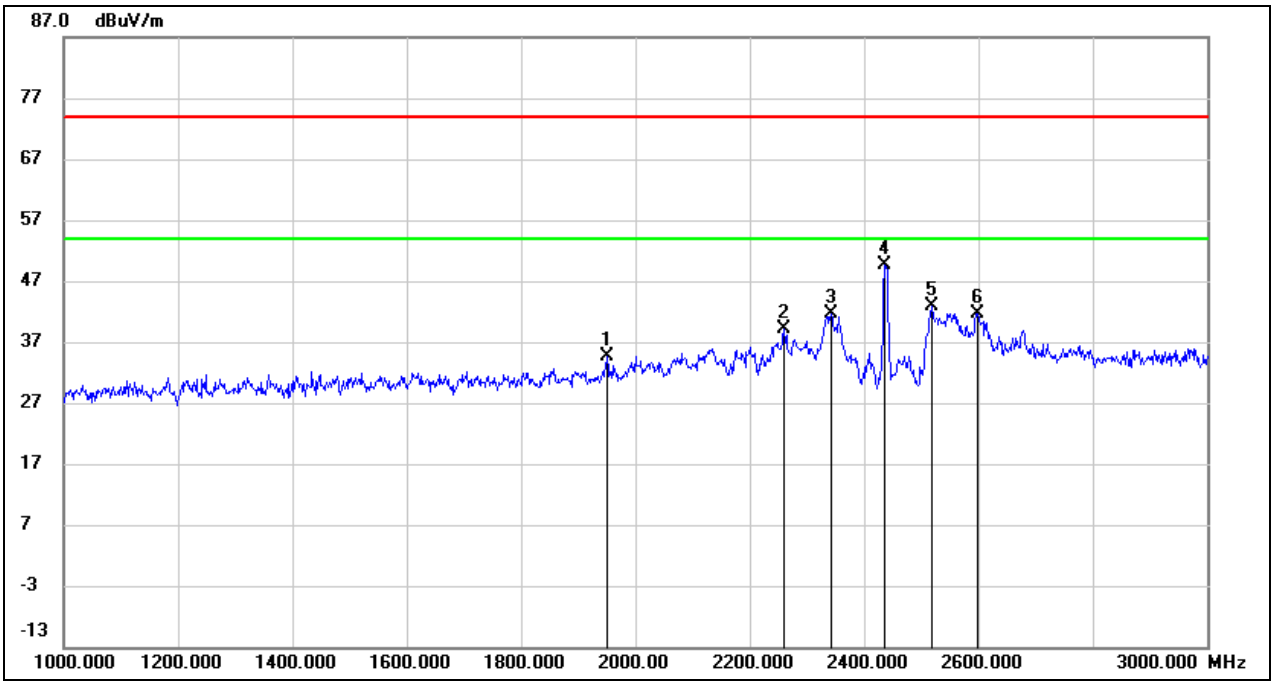
Test Mode:	802.11ax HE20	Channel:	2437
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1664.000	44.19	-12.17	32.02	74.00	-41.98	peak
2	2182.000	45.66	-10.13	35.53	74.00	-38.47	peak
3	2312.000	47.27	-9.46	37.81	74.00	-36.19	peak
4	2358.000	46.31	-9.22	37.09	74.00	-36.91	peak
5	2436.000	51.98	-8.82	43.16	74.00	-30.84	peak
6	2664.000	43.01	-7.99	35.02	74.00	-38.98	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

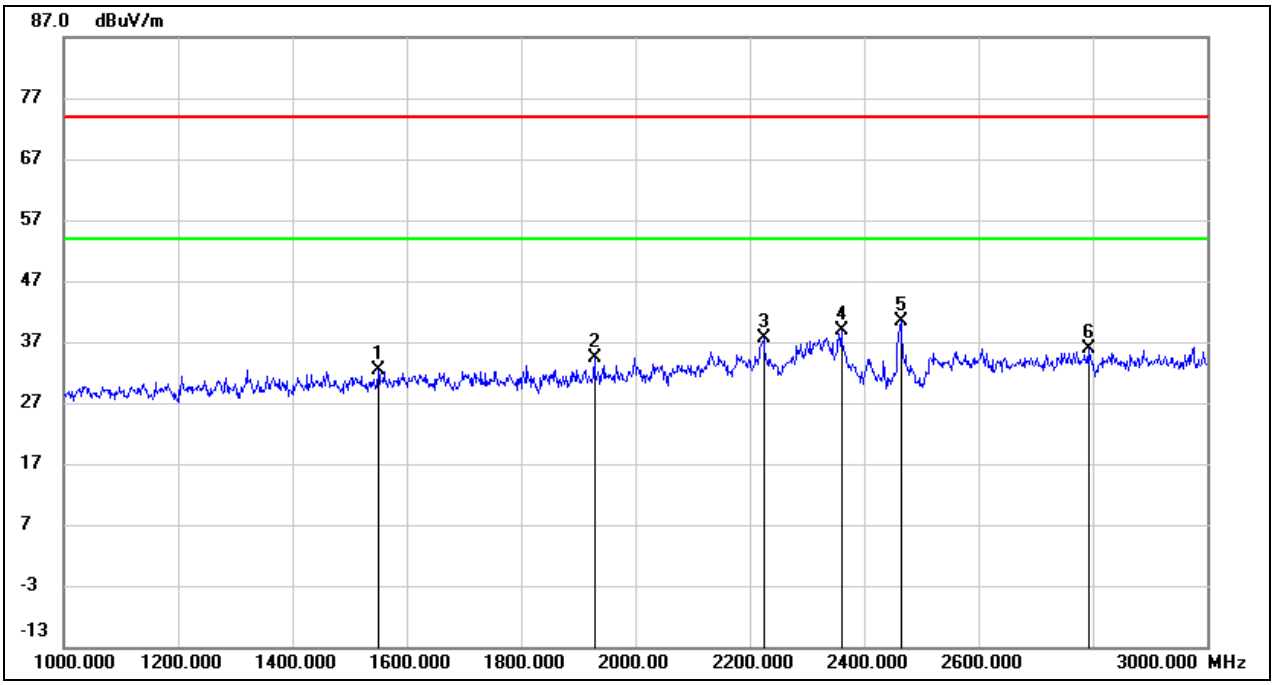
Test Mode:	802.11ax HE20	Channel:	2437
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1950.000	45.82	-11.22	34.60	74.00	-39.40	peak
2	2260.000	48.78	-9.72	39.06	74.00	-34.94	peak
3	2342.000	50.82	-9.30	41.52	74.00	-32.48	peak
4	2436.000	58.33	-8.82	49.51	74.00	-24.49	peak
5	2518.000	51.24	-8.44	42.80	74.00	-31.20	peak
6	2598.000	49.91	-8.19	41.72	74.00	-32.28	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

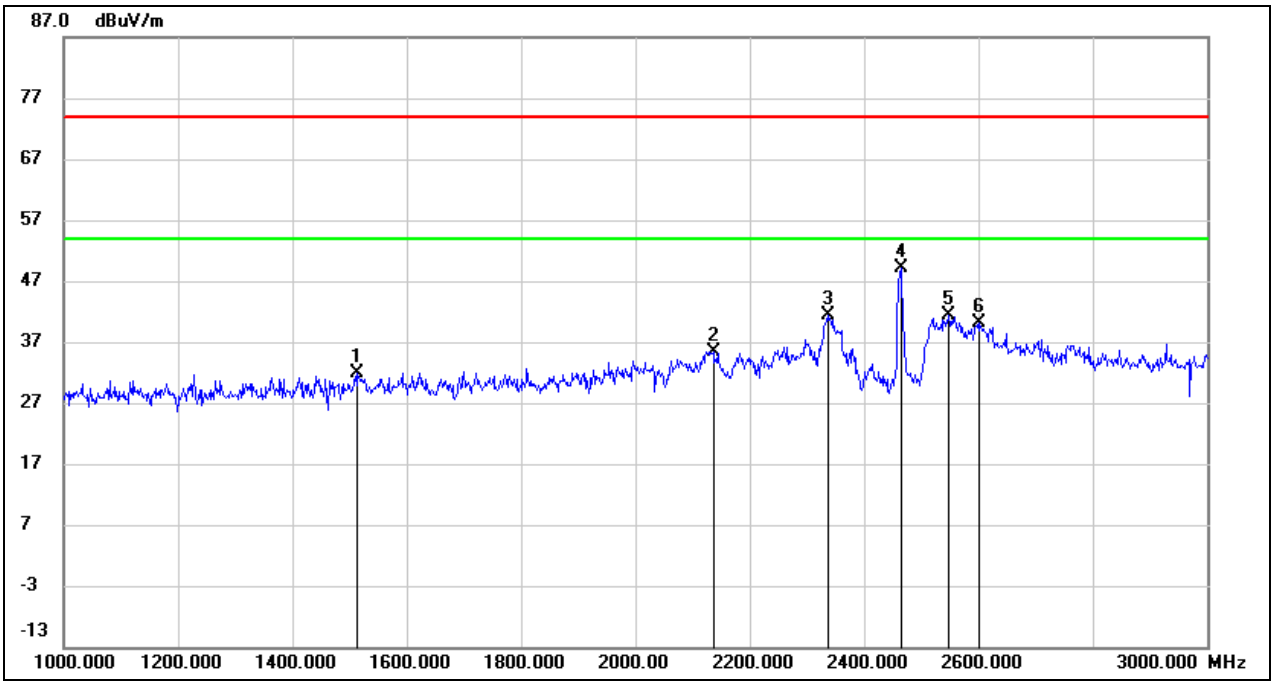
Test Mode:	802.11ax HE20	Channel:	2457
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1550.000	44.97	-12.54	32.43	74.00	-41.57	peak
2	1928.000	45.70	-11.29	34.41	74.00	-39.59	peak
3	2224.000	47.44	-9.91	37.53	74.00	-36.47	peak
4	2360.000	48.00	-9.21	38.79	74.00	-35.21	peak
5	2464.000	49.08	-8.68	40.40	74.00	-33.60	peak
6	2792.000	43.39	-7.61	35.78	74.00	-38.22	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE20	Channel:	2457
Polarity:	Vertical	Test Voltage:	DC 12 V

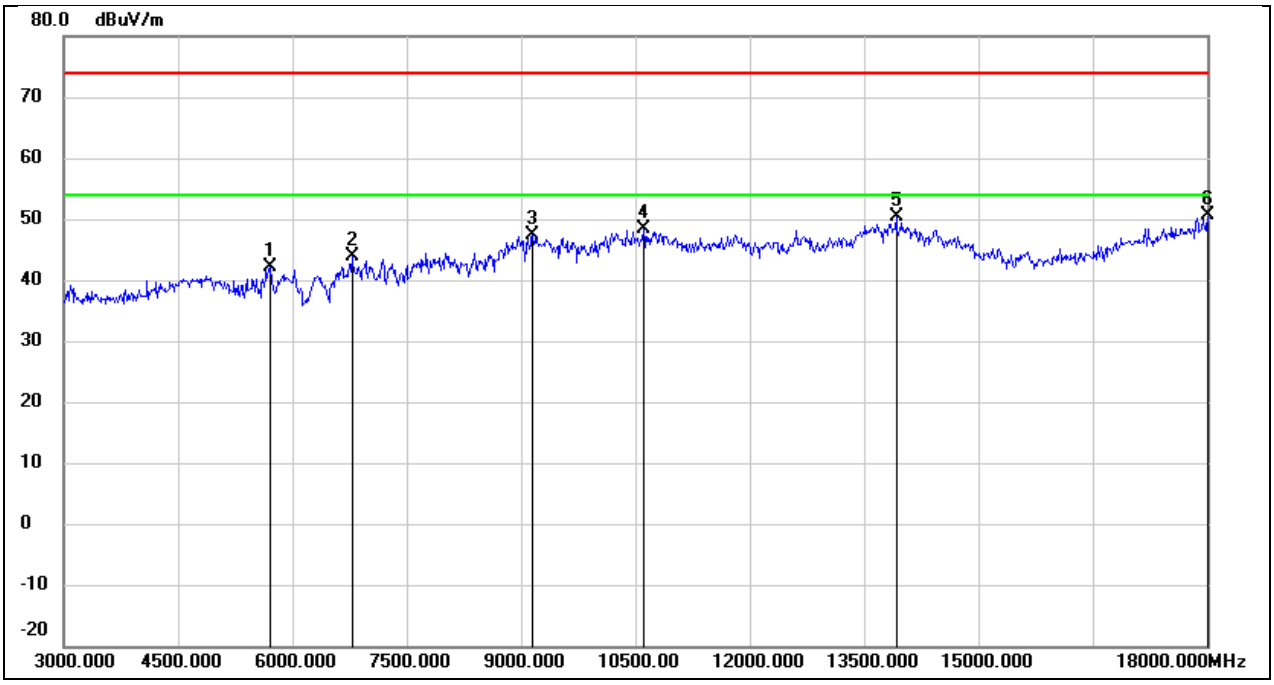


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1514.000	44.58	-12.67	31.91	74.00	-42.09	peak
2	2136.000	45.78	-10.36	35.42	74.00	-38.58	peak
3	2336.000	50.68	-9.33	41.35	74.00	-32.65	peak
4	2464.000	57.78	-8.68	49.10	74.00	-24.90	peak
5	2548.000	49.68	-8.35	41.33	74.00	-32.67	peak
6	2602.000	48.35	-8.19	40.16	74.00	-33.84	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.3. SPURIOUS EMISSIONS (3 GHZ ~ 18 GHZ)

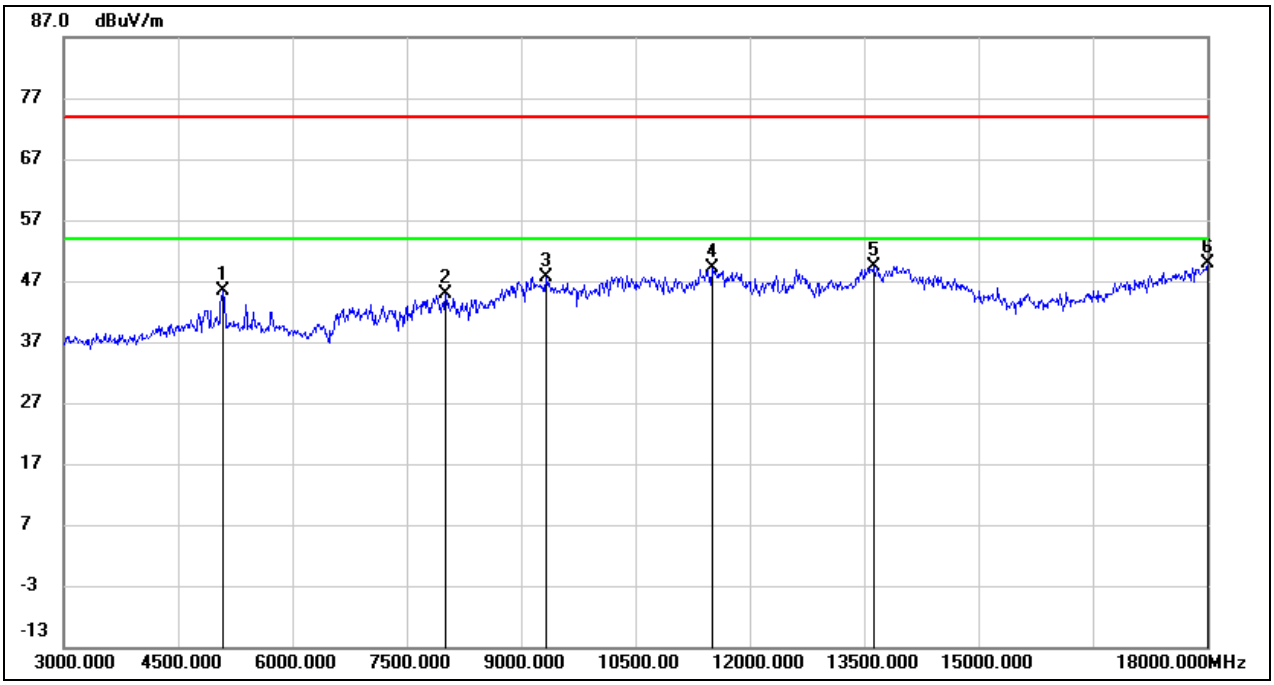
Test Mode:	802.11b	Channel:	2412 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5715.000	40.68	1.46	42.14	74.00	-31.86	peak
2	6780.000	38.40	5.60	44.00	74.00	-30.00	peak
3	9150.000	36.82	10.54	47.36	74.00	-26.64	peak
4	10605.000	35.08	13.37	48.45	74.00	-25.55	peak
5	13920.000	28.53	21.79	50.32	74.00	-23.68	peak
6	18000.000	25.01	25.69	50.70	74.00	-23.30	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

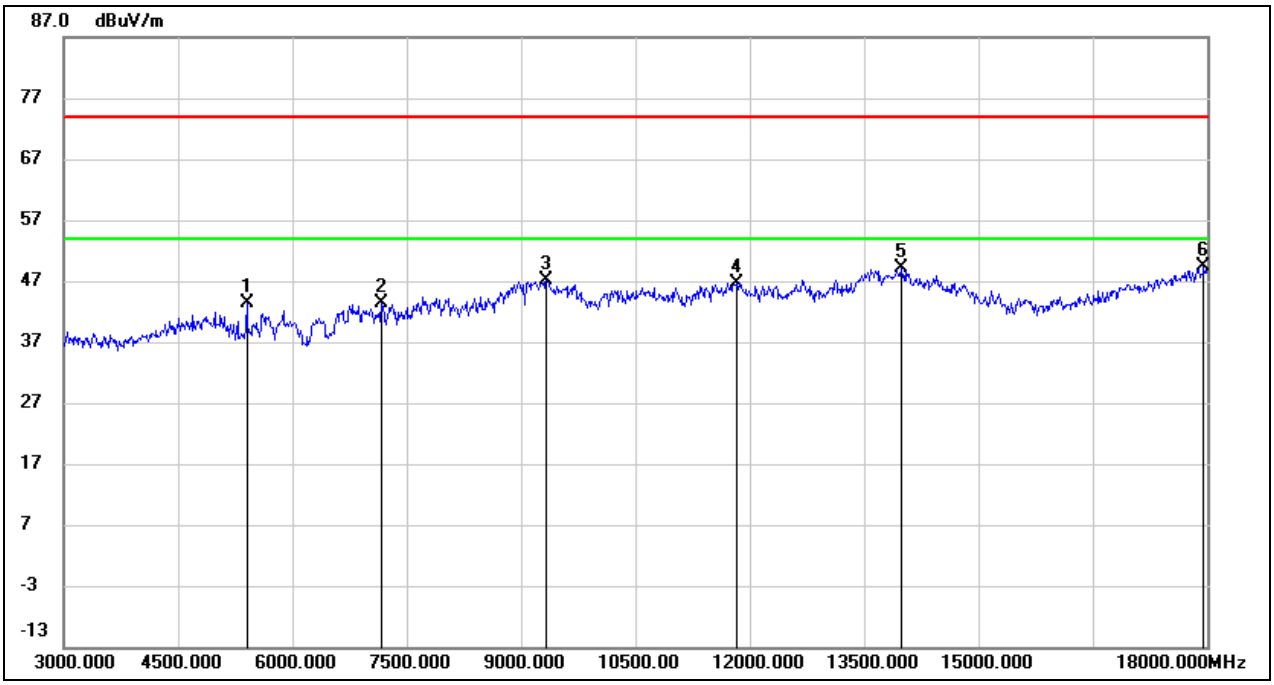
Test Mode:	802.11b	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5085.000	44.95	0.52	45.47	74.00	-28.53	peak
2	8010.000	38.47	6.32	44.79	74.00	-29.21	peak
3	9330.000	36.94	10.62	47.56	74.00	-26.44	peak
4	11505.000	32.41	16.61	49.02	74.00	-24.98	peak
5	13635.000	28.23	21.19	49.42	74.00	-24.58	peak
6	18000.000	24.26	25.69	49.95	74.00	-24.05	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

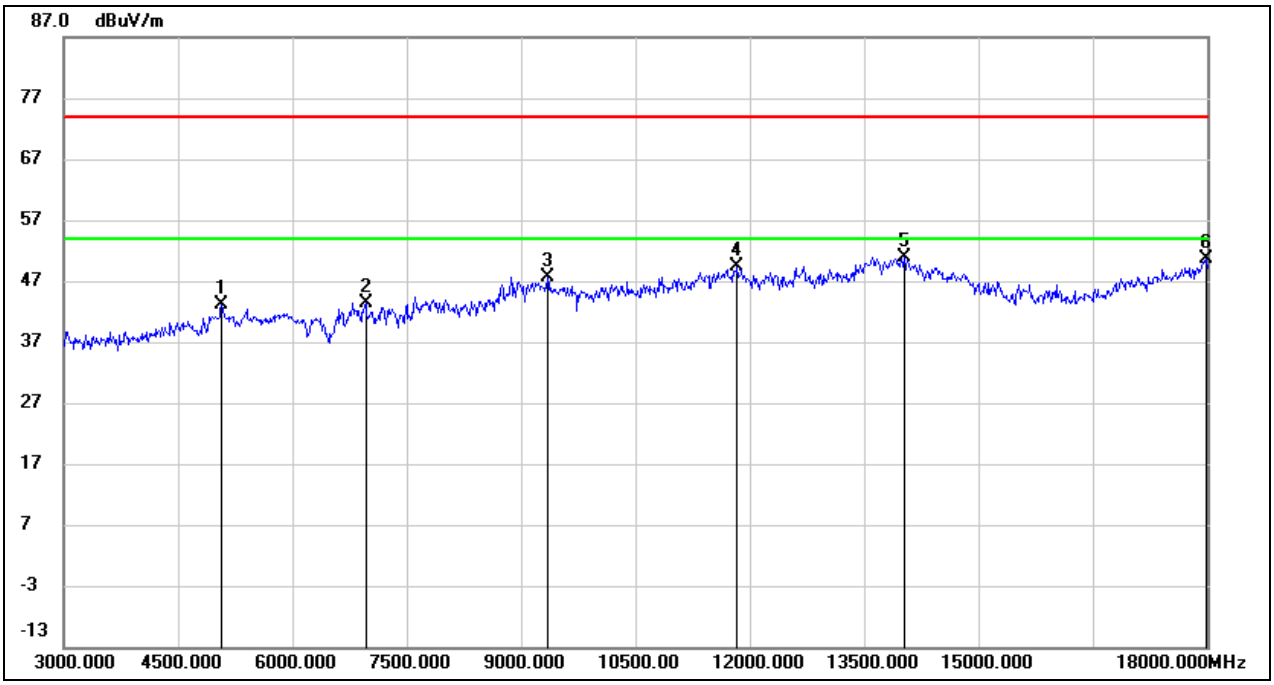
Test Mode:	802.11b	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5400.000	42.55	0.77	43.32	74.00	-30.68	peak
2	7170.000	36.82	6.56	43.38	74.00	-30.62	peak
3	9330.000	36.49	10.62	47.11	74.00	-26.89	peak
4	11835.000	29.12	17.51	46.63	74.00	-27.37	peak
5	13980.000	27.11	21.92	49.03	74.00	-24.97	peak
6	17955.000	23.91	25.42	49.33	74.00	-24.67	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

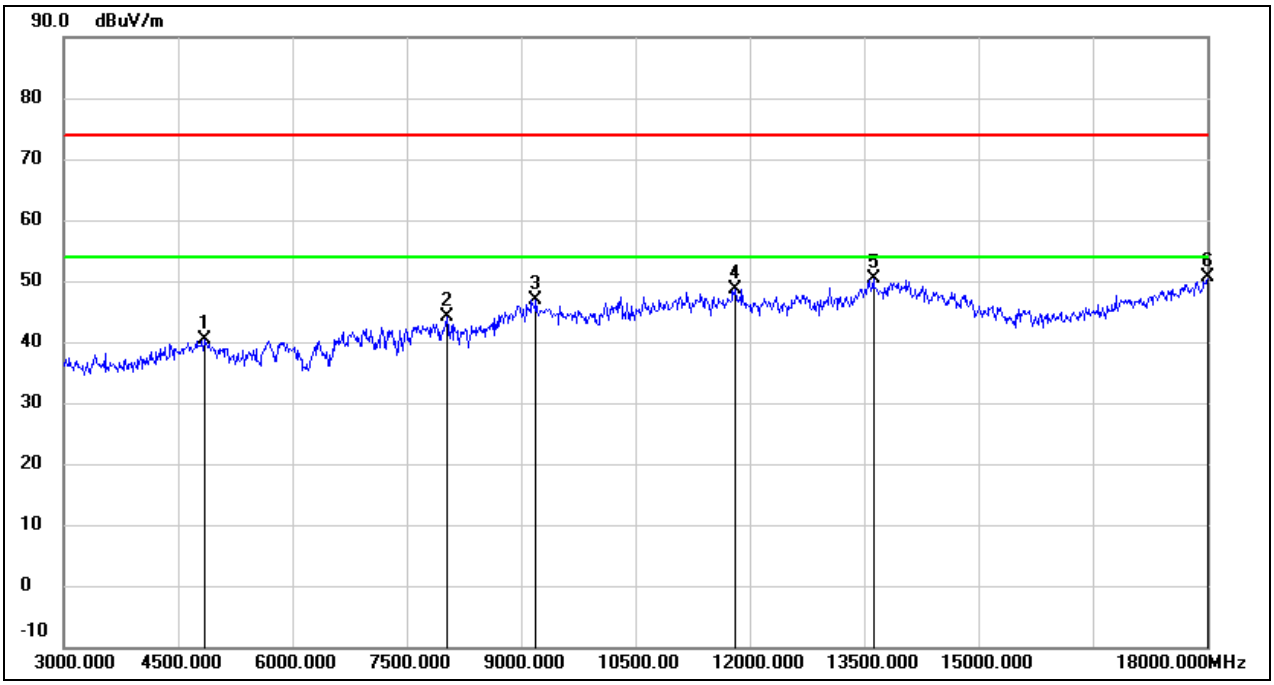
Test Mode:	802.11b	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5070.000	42.69	0.51	43.20	74.00	-30.80	peak
2	6960.000	36.83	6.50	43.33	74.00	-30.67	peak
3	9345.000	37.06	10.63	47.69	74.00	-26.31	peak
4	11835.000	31.79	17.51	49.30	74.00	-24.70	peak
5	14025.000	29.02	21.86	50.88	74.00	-23.12	peak
6	17985.000	25.09	25.60	50.69	74.00	-23.31	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

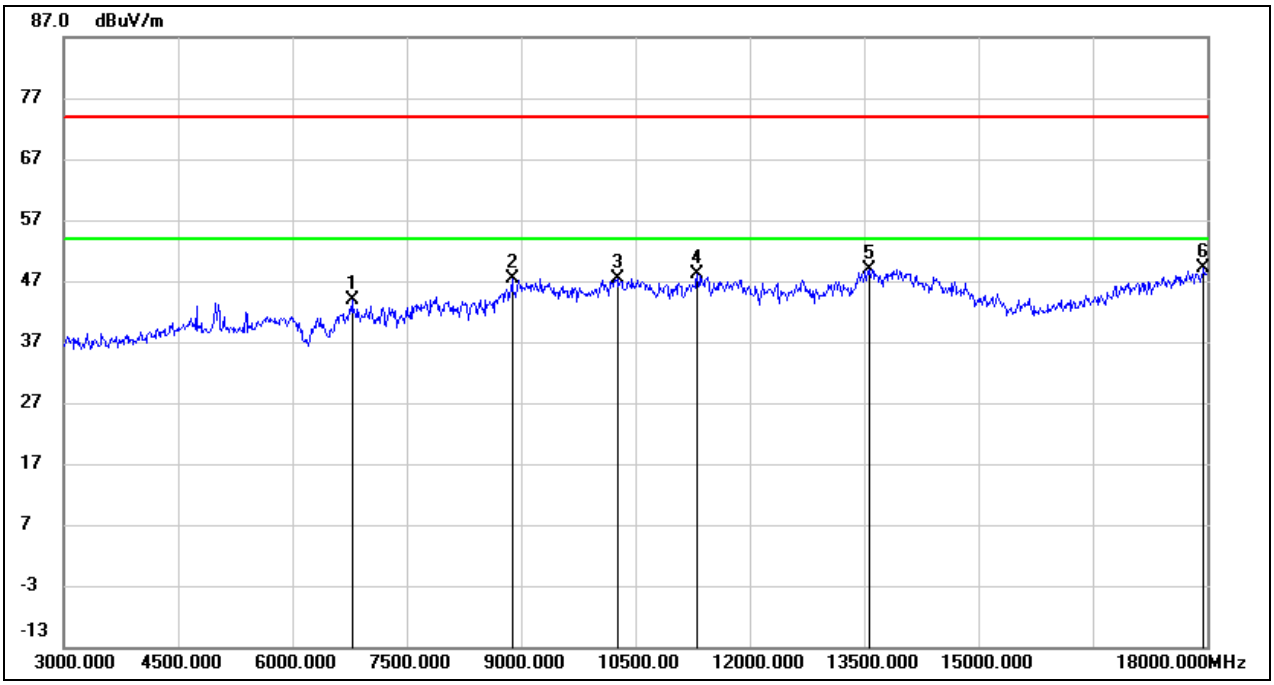
Test Mode:	802.11b	Channel:	2462 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4845.000	40.49	-0.15	40.34	74.00	-33.66	peak
2	8025.000	37.71	6.34	44.05	74.00	-29.95	peak
3	9195.000	36.30	10.56	46.86	74.00	-27.14	peak
4	11805.000	31.13	17.43	48.56	74.00	-25.44	peak
5	13620.000	29.22	21.15	50.37	74.00	-23.63	peak
6	18000.000	24.85	25.69	50.54	74.00	-23.46	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

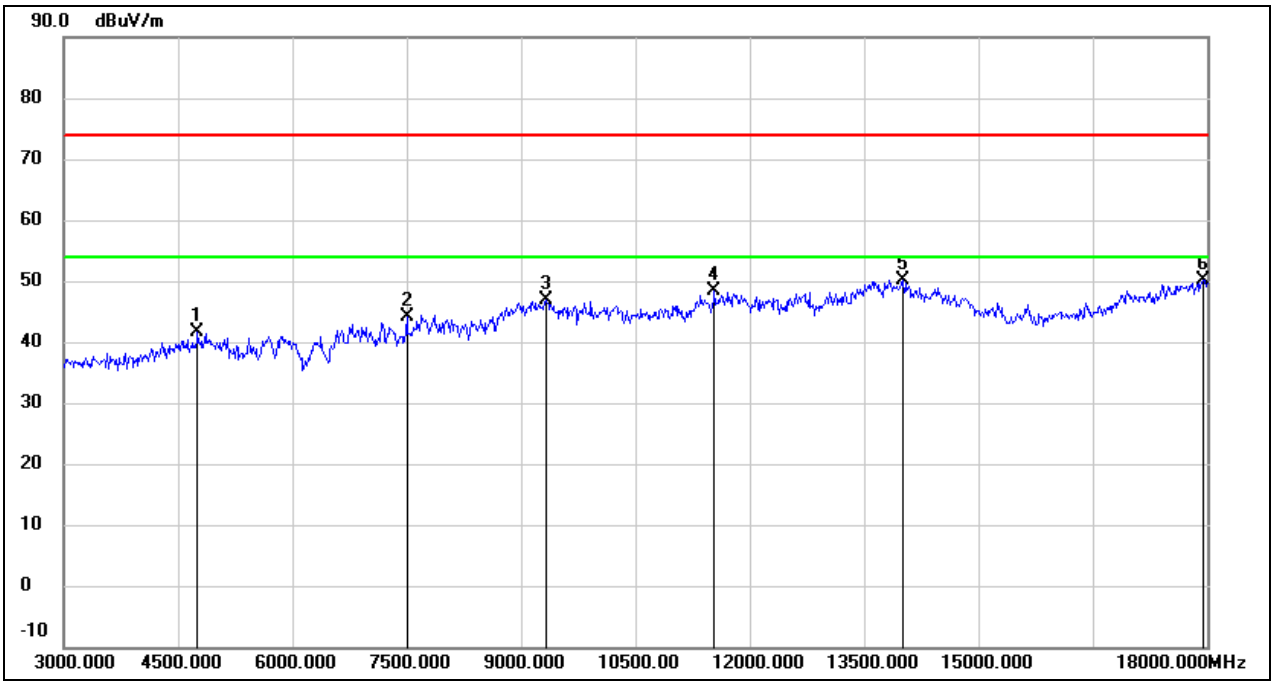
Test Mode:	802.11b	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6780.000	38.22	5.60	43.82	74.00	-30.18	peak
2	8880.000	37.85	9.61	47.46	74.00	-26.54	peak
3	10260.000	34.90	12.52	47.42	74.00	-26.58	peak
4	11310.000	32.13	15.91	48.04	74.00	-25.96	peak
5	13575.000	27.88	21.06	48.94	74.00	-25.06	peak
6	17955.000	23.66	25.42	49.08	74.00	-24.92	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

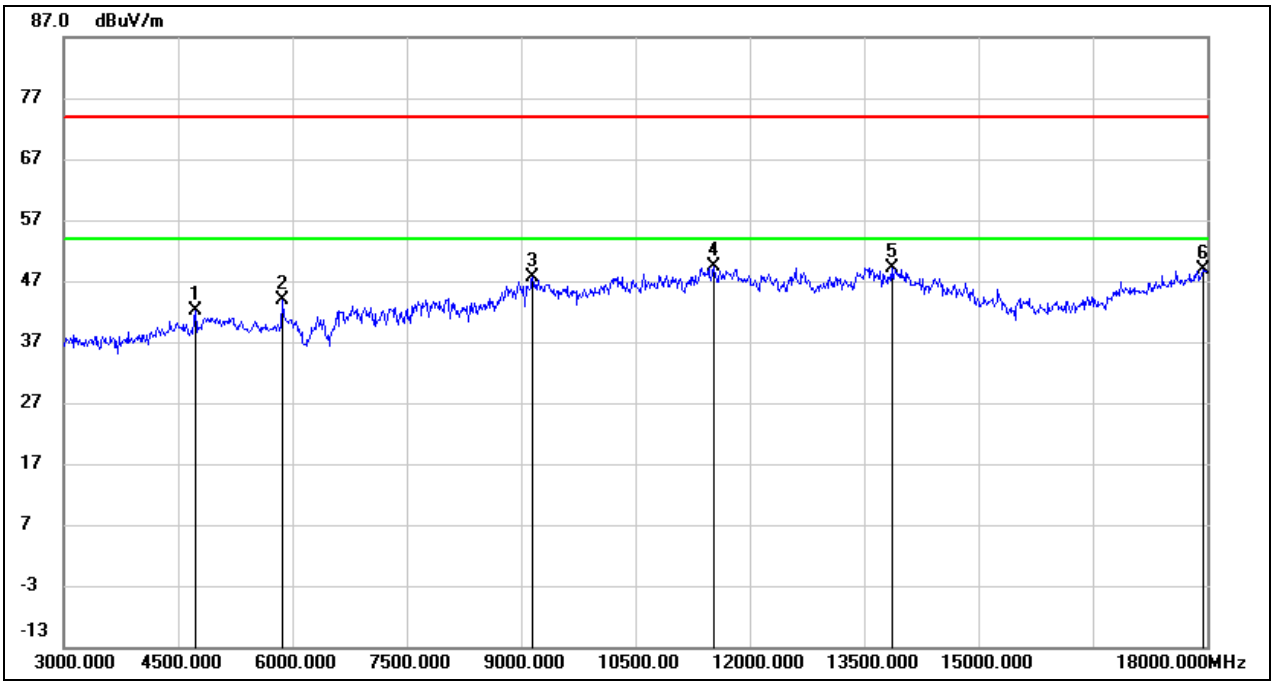
Test Mode:	802.11g	Channel:	2412 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4755.000	42.09	-0.48	41.61	74.00	-32.39	peak
2	7500.000	37.88	6.33	44.21	74.00	-29.79	peak
3	9330.000	36.16	10.62	46.78	74.00	-27.22	peak
4	11535.000	31.78	16.70	48.48	74.00	-25.52	peak
5	14010.000	28.23	21.93	50.16	74.00	-23.84	peak
6	17955.000	24.79	25.42	50.21	74.00	-23.79	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

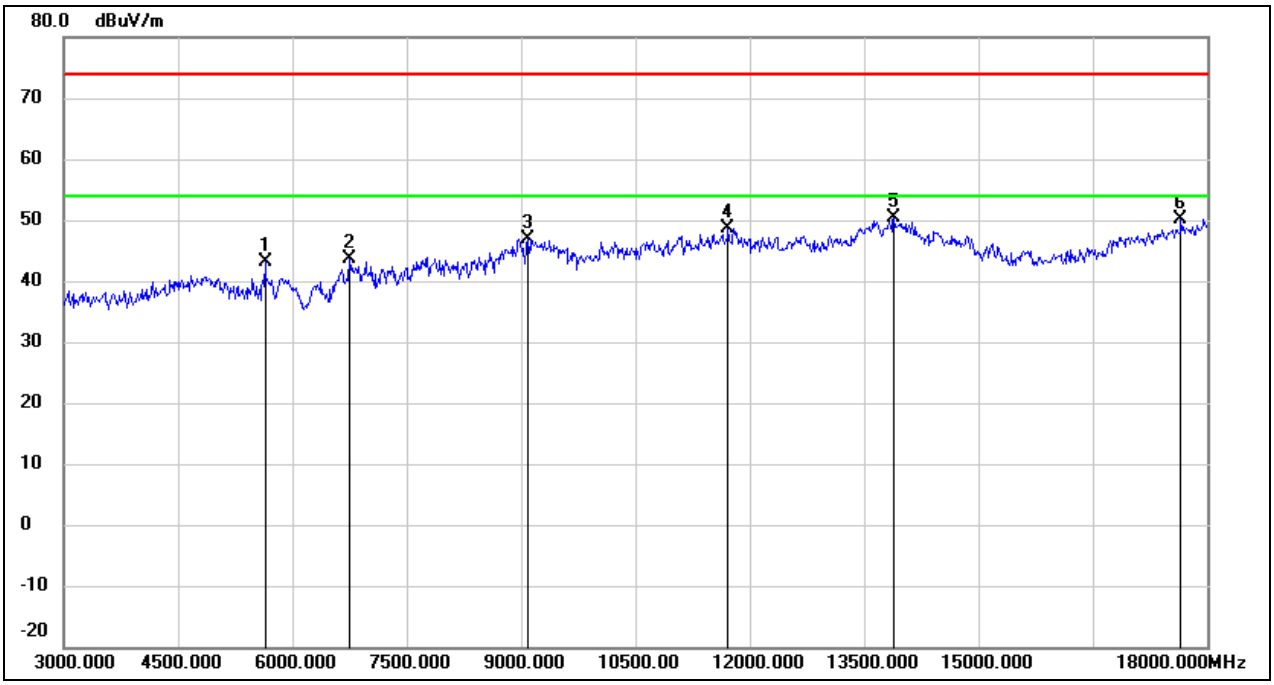
Test Mode:	802.11g	Channel:	2412 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4725.000	42.72	-0.59	42.13	74.00	-31.87	peak
2	5865.000	42.07	1.88	43.95	74.00	-30.05	peak
3	9150.000	37.12	10.54	47.66	74.00	-26.34	peak
4	11520.000	32.79	16.65	49.44	74.00	-24.56	peak
5	13860.000	27.54	21.67	49.21	74.00	-24.79	peak
6	17940.000	23.66	25.34	49.00	74.00	-25.00	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

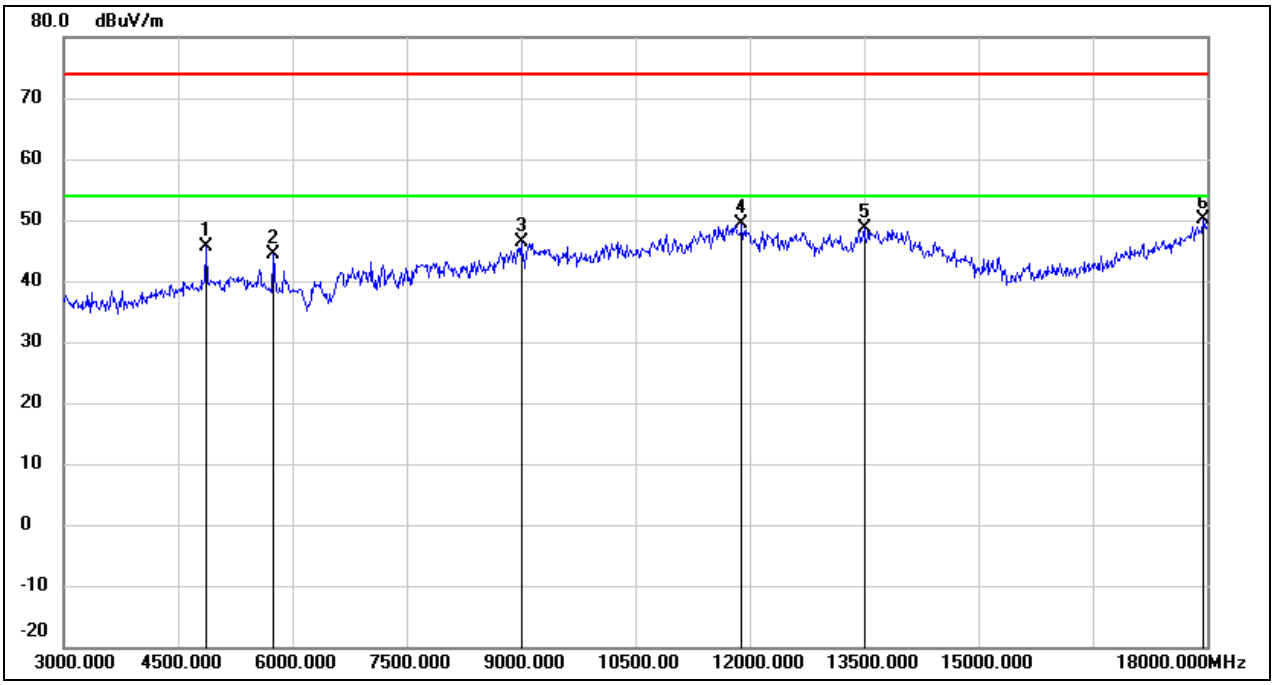
Test Mode:	802.11g	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5640.000	41.79	1.24	43.03	74.00	-30.97	peak
2	6750.000	38.16	5.45	43.61	74.00	-30.39	peak
3	9090.000	36.41	10.51	46.92	74.00	-27.08	peak
4	11715.000	31.47	17.19	48.66	74.00	-25.34	peak
5	13890.000	28.76	21.72	50.48	74.00	-23.52	peak
6	17655.000	26.50	23.64	50.14	74.00	-23.86	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

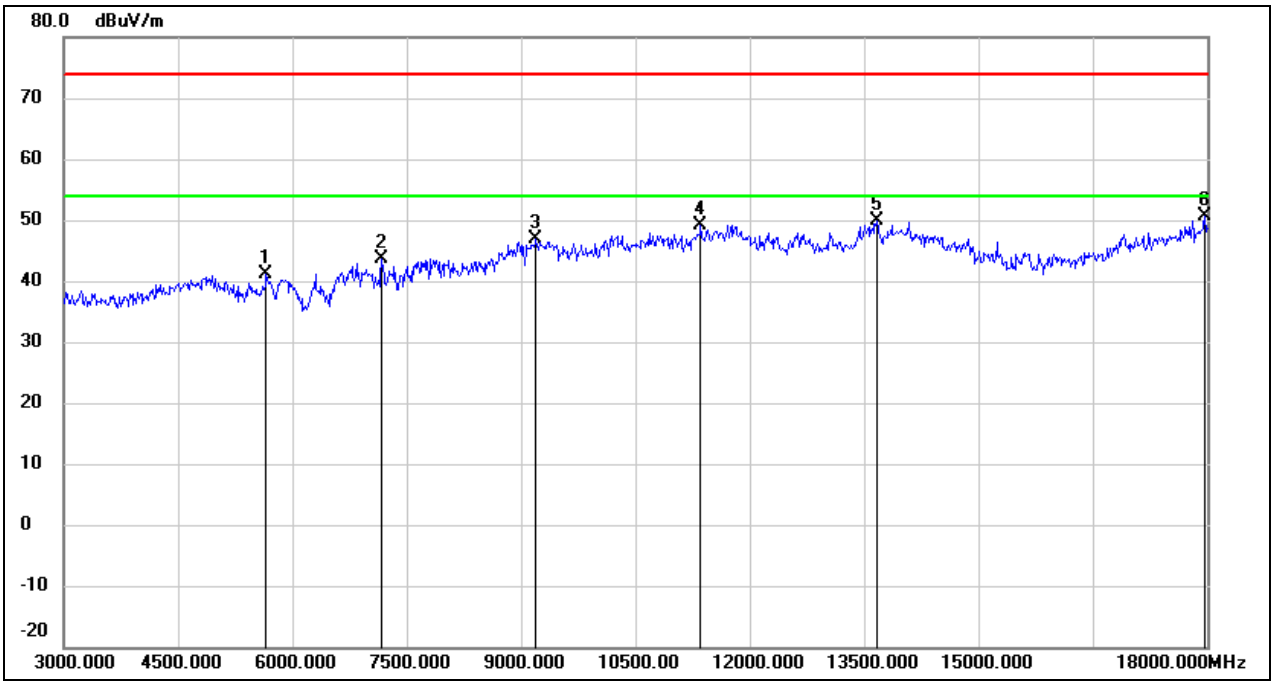
Test Mode:	802.11g	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	45.75	-0.03	45.72	74.00	-28.28	peak
2	5745.000	42.77	1.54	44.31	74.00	-29.69	peak
3	9000.000	35.93	10.48	46.41	74.00	-27.59	peak
4	11895.000	31.69	17.68	49.37	74.00	-24.63	peak
5	13500.000	27.61	20.90	48.51	74.00	-25.49	peak
6	17940.000	24.77	25.34	50.11	74.00	-23.89	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

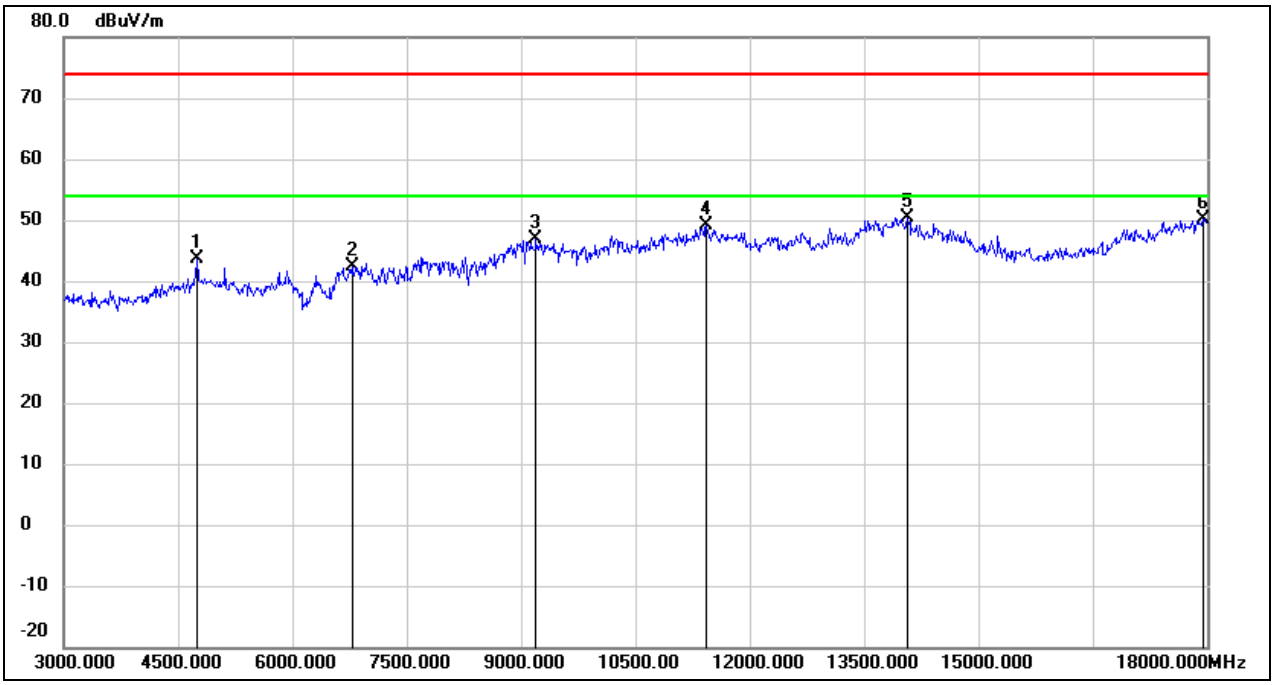
Test Mode:	802.11g	Channel:	2462 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5655.000	39.83	1.29	41.12	74.00	-32.88	peak
2	7170.000	37.17	6.56	43.73	74.00	-30.27	peak
3	9195.000	36.41	10.56	46.97	74.00	-27.03	peak
4	11355.000	33.10	16.06	49.16	74.00	-24.84	peak
5	13665.000	28.51	21.25	49.76	74.00	-24.24	peak
6	17970.000	25.08	25.51	50.59	74.00	-23.41	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

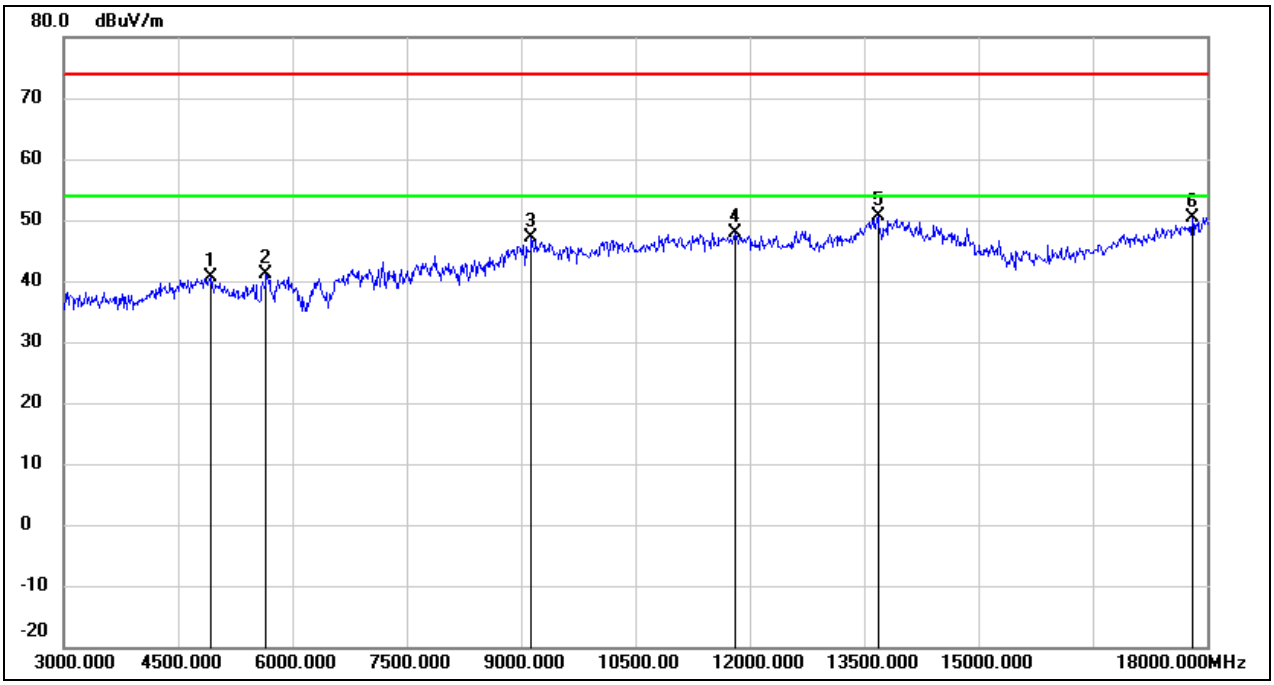
Test Mode:	802.11g	Channel:	2462 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4755.000	44.13	-0.48	43.65	74.00	-30.35	peak
2	6780.000	36.83	5.60	42.43	74.00	-31.57	peak
3	9195.000	36.28	10.56	46.84	74.00	-27.16	peak
4	11430.000	32.85	16.34	49.19	74.00	-24.81	peak
5	14070.000	28.70	21.67	50.37	74.00	-23.63	peak
6	17940.000	24.81	25.34	50.15	74.00	-23.85	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

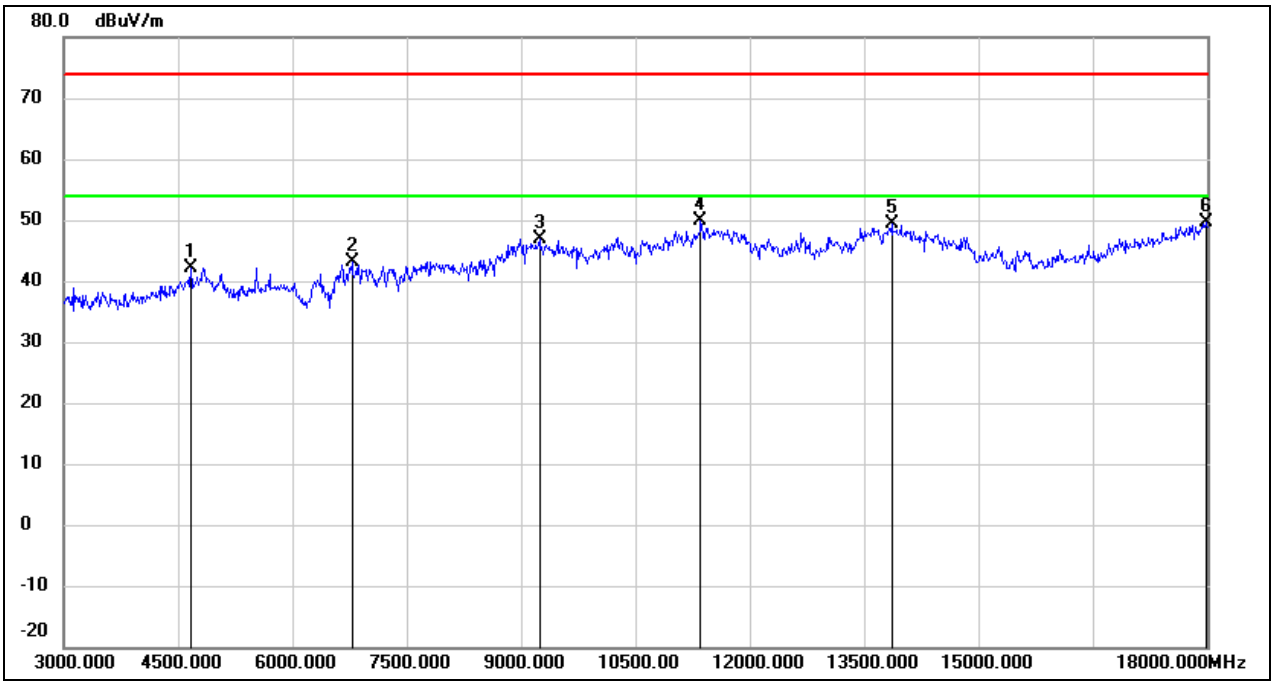
Test Mode:	802.11ax HE20	Channel:	2417 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4935.000	40.39	0.20	40.59	74.00	-33.41	peak
2	5655.000	39.76	1.29	41.05	74.00	-32.95	peak
3	9135.000	36.56	10.55	47.11	74.00	-26.89	peak
4	11805.000	30.56	17.43	47.99	74.00	-26.01	peak
5	13680.000	29.24	21.29	50.53	74.00	-23.47	peak
6	17805.000	25.83	24.54	50.37	74.00	-23.63	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

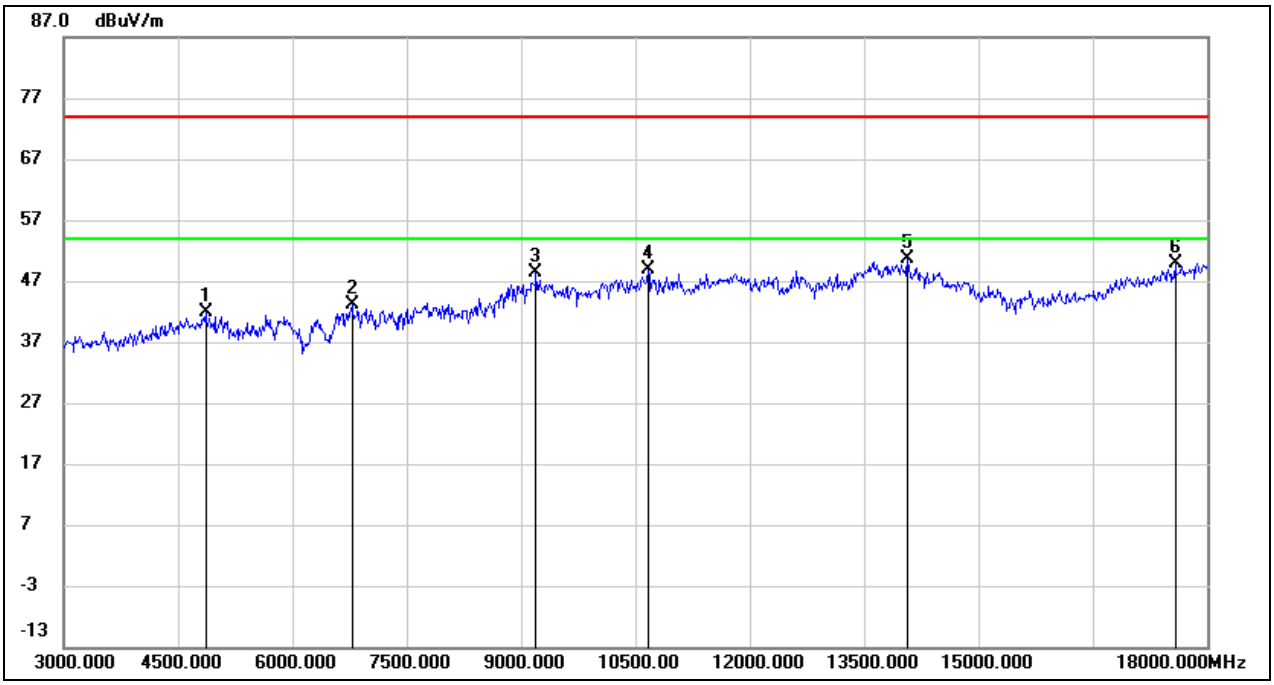
Test Mode:	802.11ax HE20	Channel:	2417 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4665.000	43.03	-0.83	42.20	74.00	-31.80	peak
2	6780.000	37.56	5.60	43.16	74.00	-30.84	peak
3	9240.000	36.22	10.58	46.80	74.00	-27.20	peak
4	11355.000	33.71	16.06	49.77	74.00	-24.23	peak
5	13860.000	27.75	21.67	49.42	74.00	-24.58	peak
6	17985.000	23.91	25.60	49.51	74.00	-24.49	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

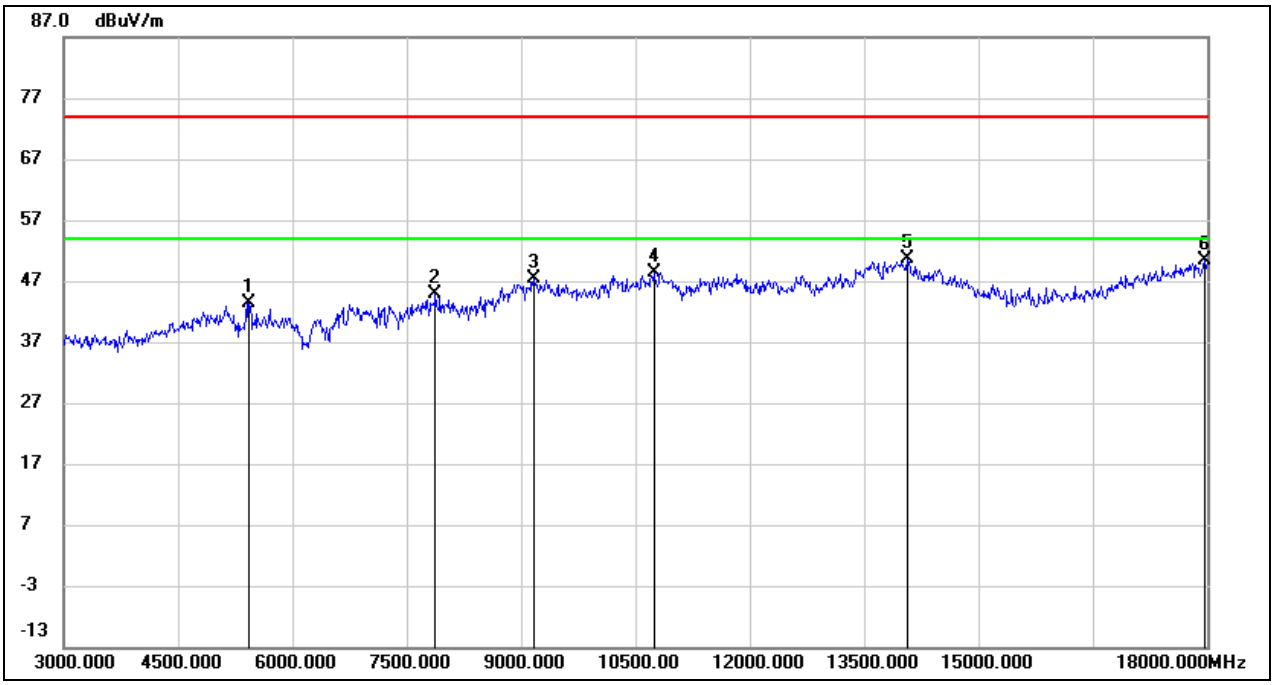
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4860.000	41.97	-0.09	41.88	74.00	-32.12	peak
2	6780.000	37.63	5.60	43.23	74.00	-30.77	peak
3	9195.000	37.89	10.56	48.45	74.00	-25.55	peak
4	10665.000	35.30	13.58	48.88	74.00	-25.12	peak
5	14070.000	29.00	21.67	50.67	74.00	-23.33	peak
6	17580.000	26.80	23.20	50.00	74.00	-24.00	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

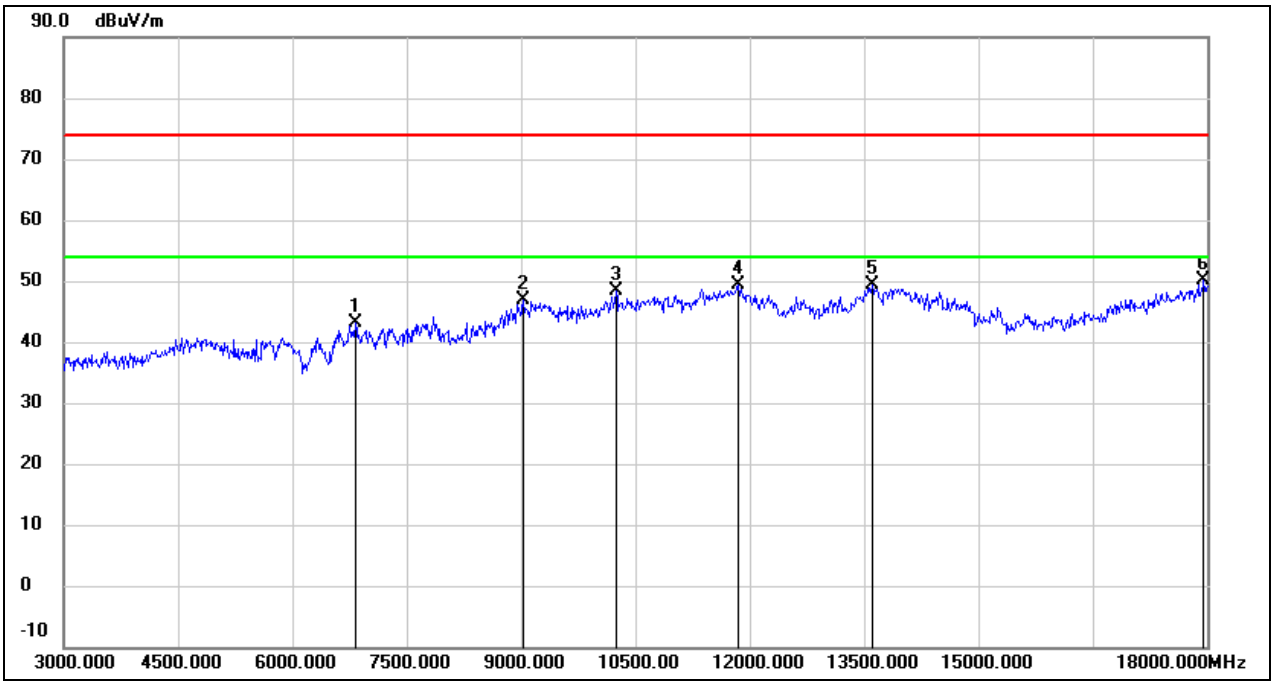
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5430.000	42.71	0.79	43.50	74.00	-30.50	peak
2	7875.000	38.45	6.31	44.76	74.00	-29.24	peak
3	9165.000	36.77	10.55	47.32	74.00	-26.68	peak
4	10740.000	34.55	13.85	48.40	74.00	-25.60	peak
5	14070.000	29.00	21.67	50.67	74.00	-23.33	peak
6	17970.000	24.84	25.51	50.35	74.00	-23.65	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

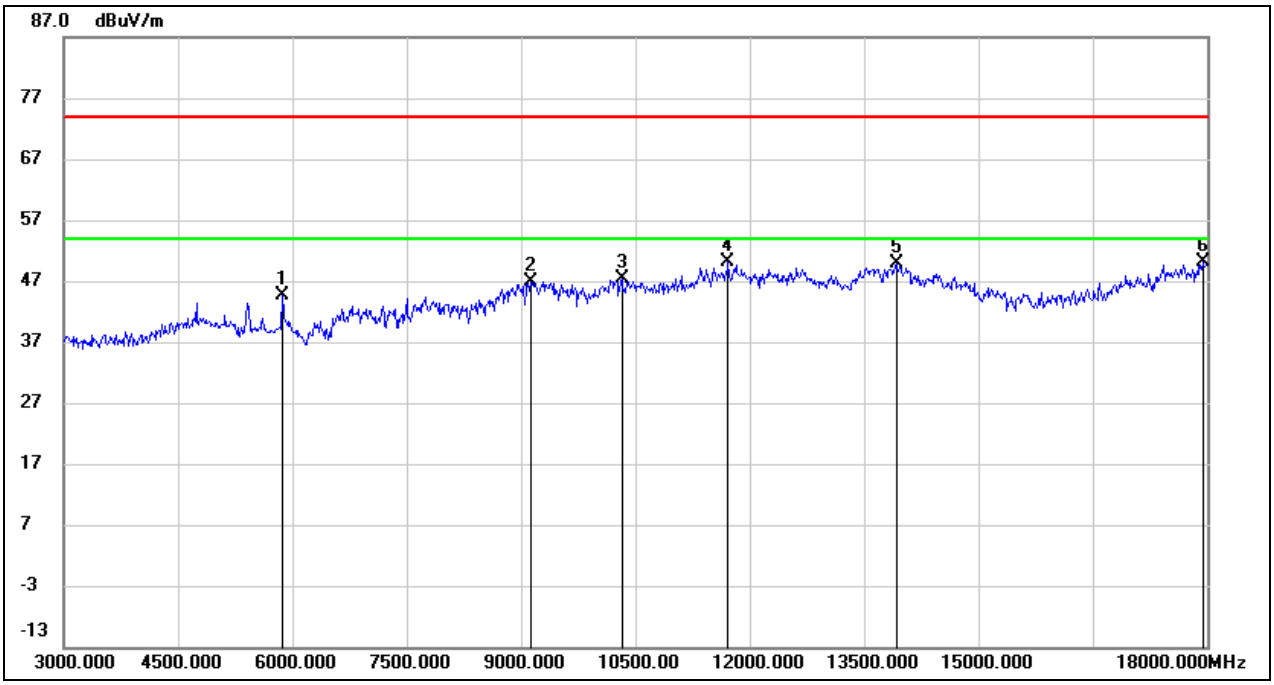
Test Mode:	802.11ax HE20	Channel:	2457 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6825.000	37.26	5.84	43.10	74.00	-30.90	peak
2	9030.000	36.50	10.49	46.99	74.00	-27.01	peak
3	10245.000	35.94	12.48	48.42	74.00	-25.58	peak
4	11850.000	31.71	17.56	49.27	74.00	-24.73	peak
5	13605.000	28.31	21.12	49.43	74.00	-24.57	peak
6	17955.000	24.83	25.42	50.25	74.00	-23.75	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

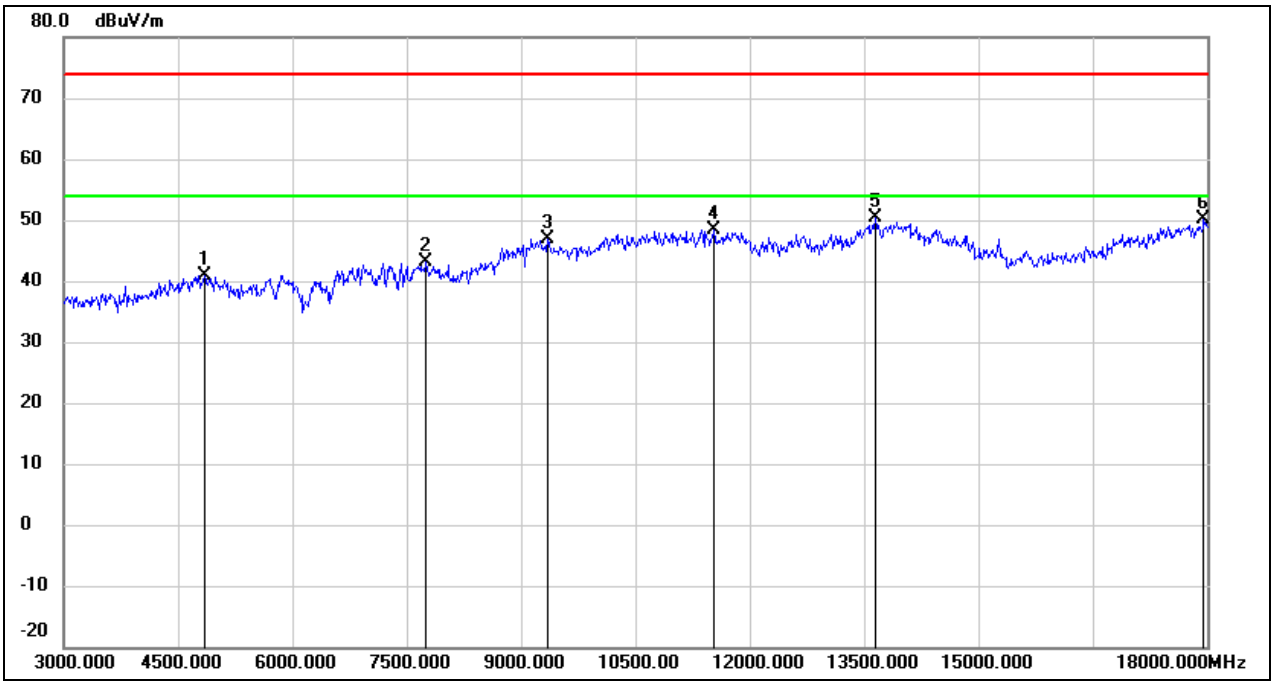
Test Mode:	802.11ax HE20	Channel:	2457 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5865.000	42.83	1.88	44.71	74.00	-29.29	peak
2	9120.000	36.36	10.53	46.89	74.00	-27.11	peak
3	10320.000	34.76	12.64	47.40	74.00	-26.60	peak
4	11715.000	32.84	17.19	50.03	74.00	-23.97	peak
5	13920.000	27.98	21.79	49.77	74.00	-24.23	peak
6	17940.000	24.72	25.34	50.06	74.00	-23.94	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

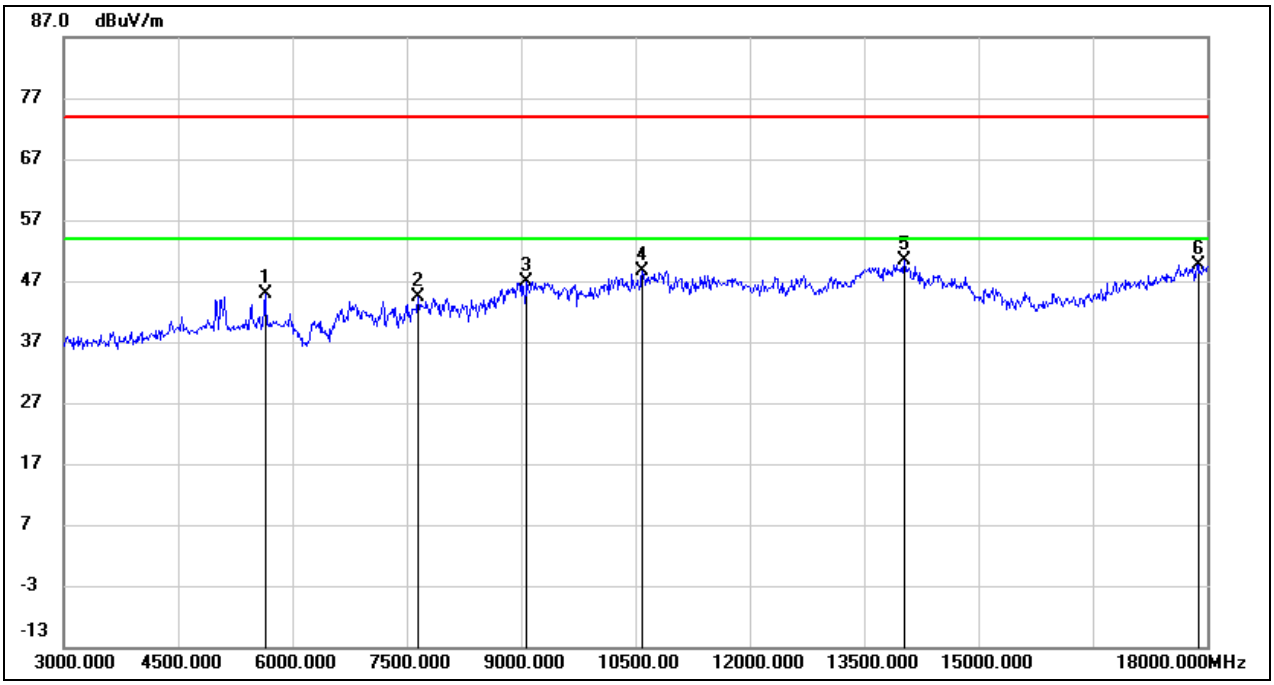
Test Mode:	802.11ax HE40	Channel:	2427 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4845.000	41.10	-0.15	40.95	74.00	-33.05	peak
2	7755.000	36.91	6.31	43.22	74.00	-30.78	peak
3	9345.000	36.24	10.63	46.87	74.00	-27.13	peak
4	11535.000	31.75	16.70	48.45	74.00	-25.55	peak
5	13650.000	29.11	21.21	50.32	74.00	-23.68	peak
6	17955.000	24.73	25.42	50.15	74.00	-23.85	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

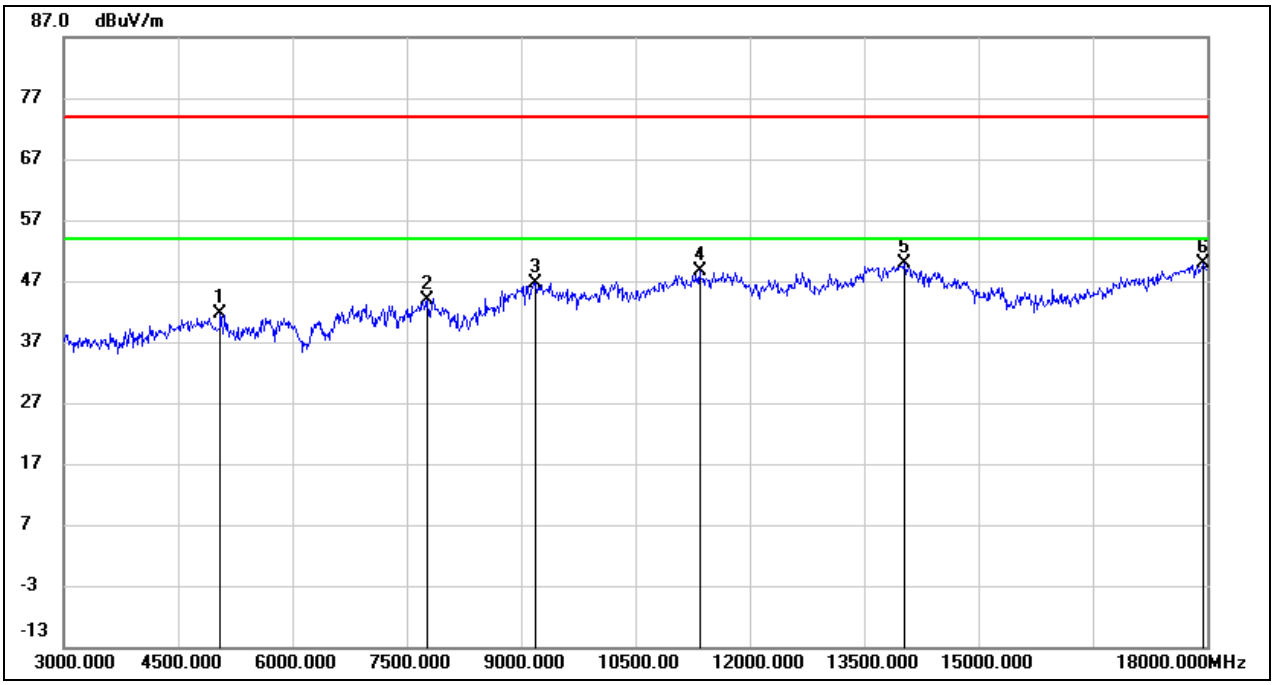
Test Mode:	802.11ax HE40	Channel:	2427 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5640.000	43.52	1.24	44.76	74.00	-29.24	peak
2	7650.000	38.06	6.33	44.39	74.00	-29.61	peak
3	9075.000	36.32	10.52	46.84	74.00	-27.16	peak
4	10590.000	35.26	13.32	48.58	74.00	-25.42	peak
5	14025.000	28.55	21.86	50.41	74.00	-23.59	peak
6	17880.000	24.73	24.98	49.71	74.00	-24.29	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

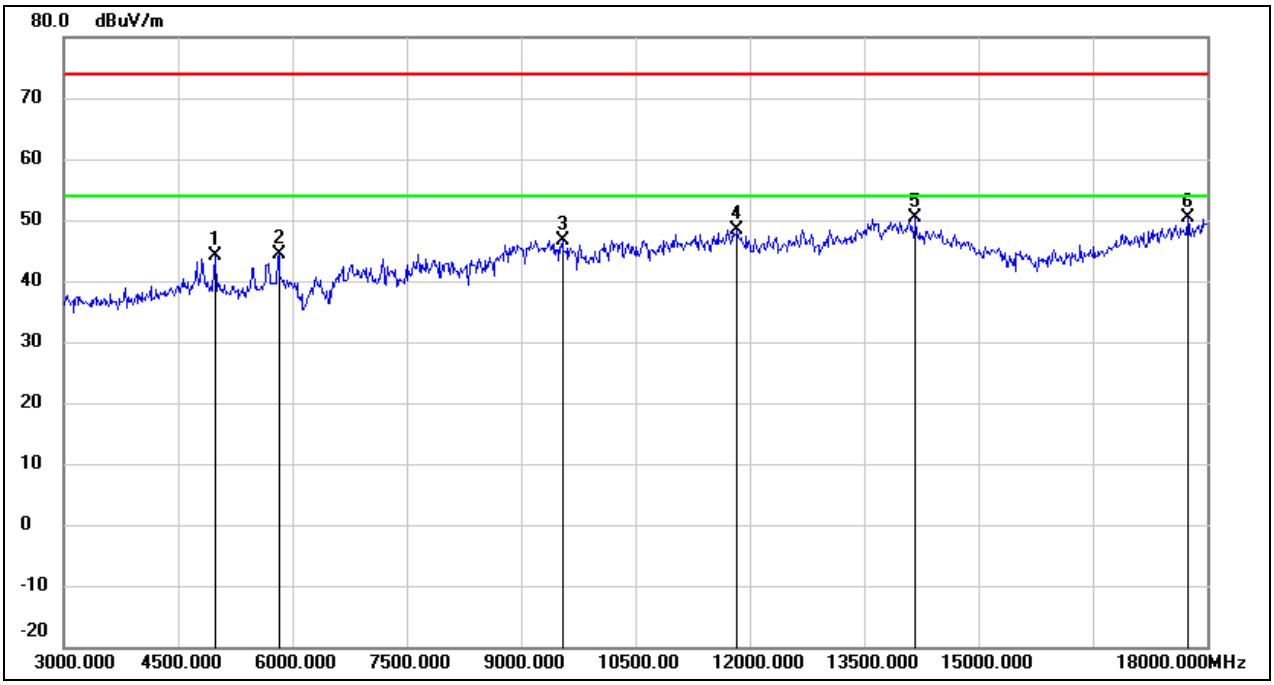
Test Mode:	802.11ax HE40	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5055.000	41.09	0.50	41.59	74.00	-32.41	peak
2	7770.000	37.51	6.31	43.82	74.00	-30.18	peak
3	9195.000	36.05	10.56	46.61	74.00	-27.39	peak
4	11340.000	32.69	16.01	48.70	74.00	-25.30	peak
5	14025.000	28.08	21.86	49.94	74.00	-24.06	peak
6	17940.000	24.61	25.34	49.95	74.00	-24.05	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

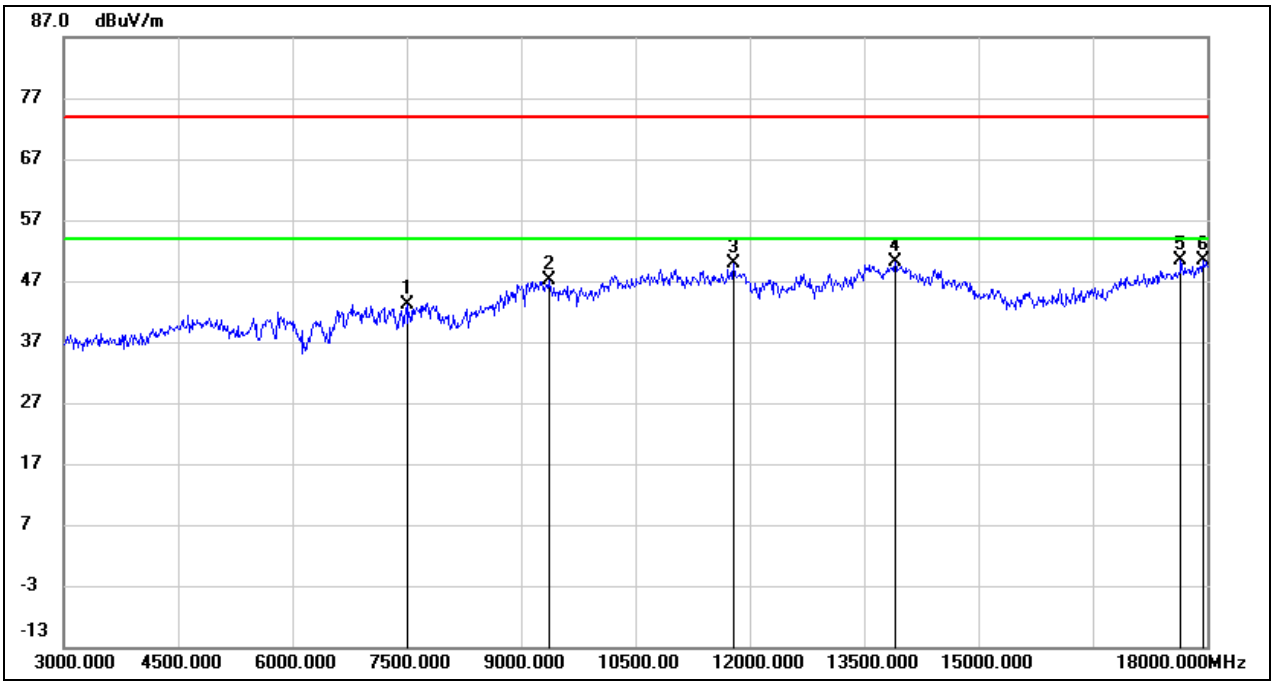
Test Mode:	802.11ax HE40	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4995.000	43.60	0.43	44.03	74.00	-29.97	peak
2	5820.000	42.55	1.74	44.29	74.00	-29.71	peak
3	9540.000	35.88	10.80	46.68	74.00	-27.32	peak
4	11835.000	30.94	17.51	48.45	74.00	-25.55	peak
5	14175.000	29.18	21.24	50.42	74.00	-23.58	peak
6	17745.000	26.09	24.18	50.27	74.00	-23.73	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

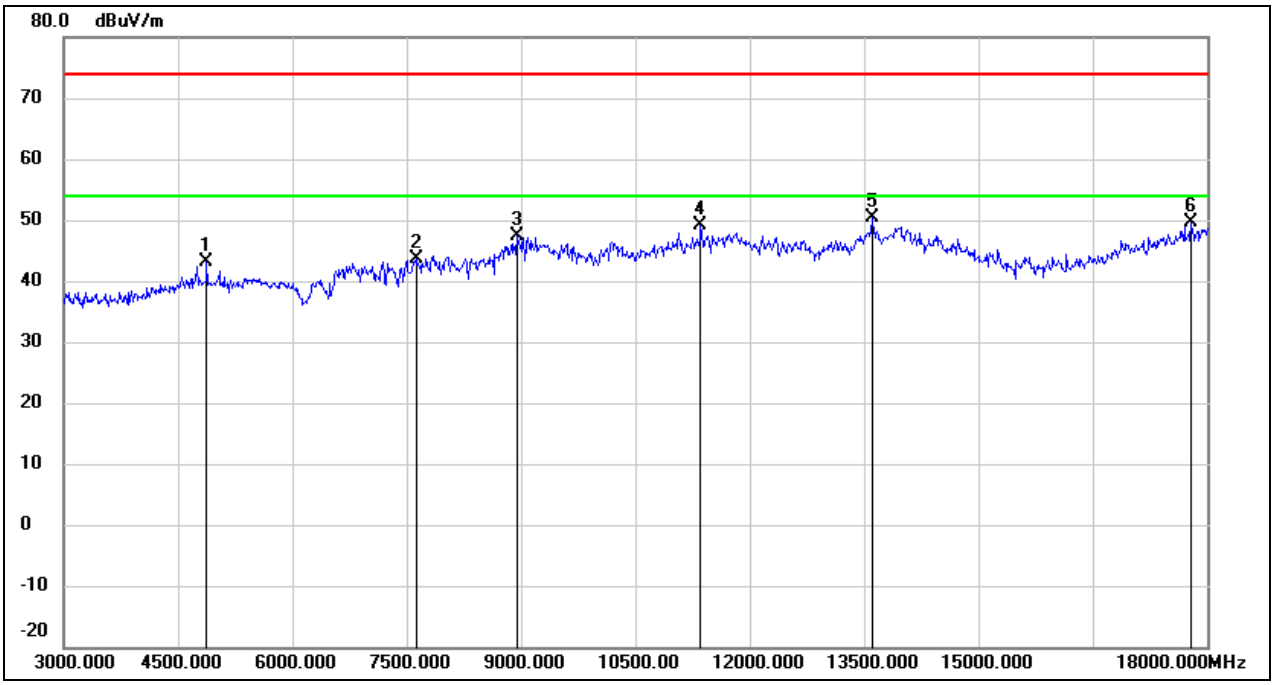
Test Mode:	802.11ax HE40	Channel:	2447 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7500.000	36.91	6.33	43.24	74.00	-30.76	peak
2	9360.000	36.58	10.64	47.22	74.00	-26.78	peak
3	11790.000	32.58	17.38	49.96	74.00	-24.04	peak
4	13905.000	28.34	21.76	50.10	74.00	-23.90	peak
5	17655.000	26.81	23.64	50.45	74.00	-23.55	peak
6	17940.000	25.14	25.34	50.48	74.00	-23.52	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE40	Channel:	2447 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V

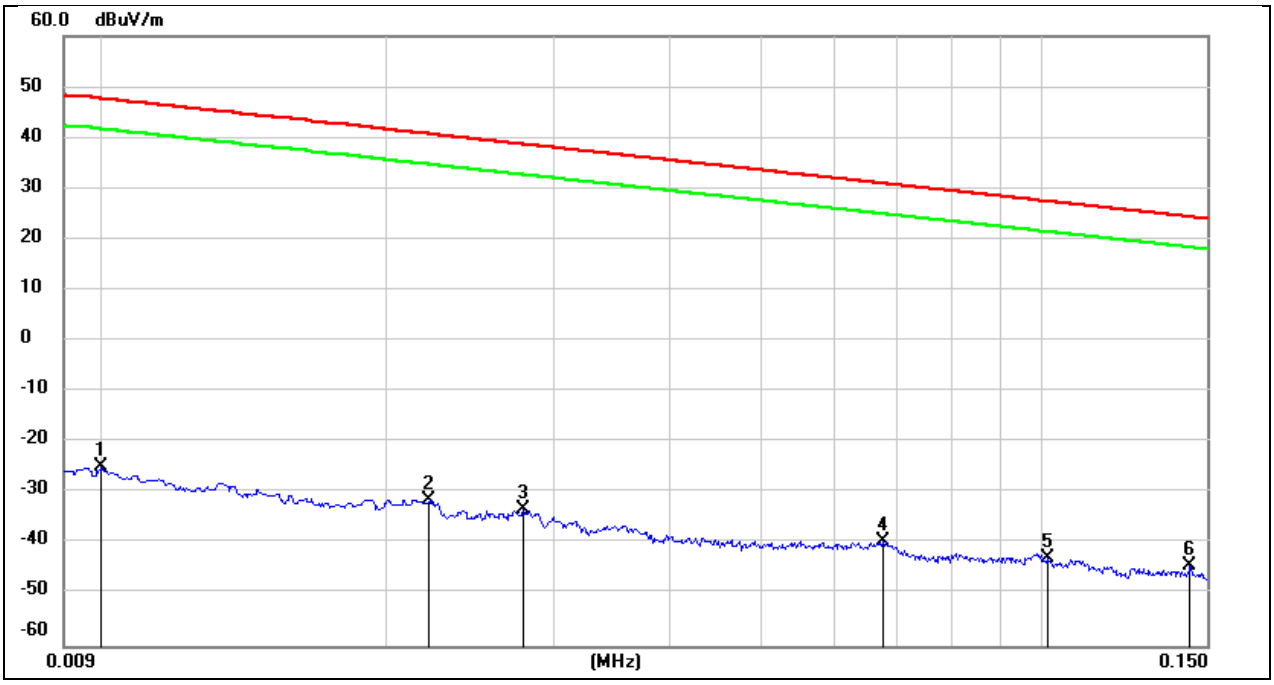


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	43.05	-0.03	43.02	74.00	-30.98	peak
2	7620.000	37.38	6.33	43.71	74.00	-30.29	peak
3	8940.000	37.34	10.04	47.38	74.00	-26.62	peak
4	11355.000	32.99	16.06	49.05	74.00	-24.95	peak
5	13605.000	29.27	21.12	50.39	74.00	-23.61	peak
6	17790.000	25.27	24.45	49.72	74.00	-24.28	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.4. SPURIOUS EMISSIONS (9 KHZ ~ 30 MHZ)

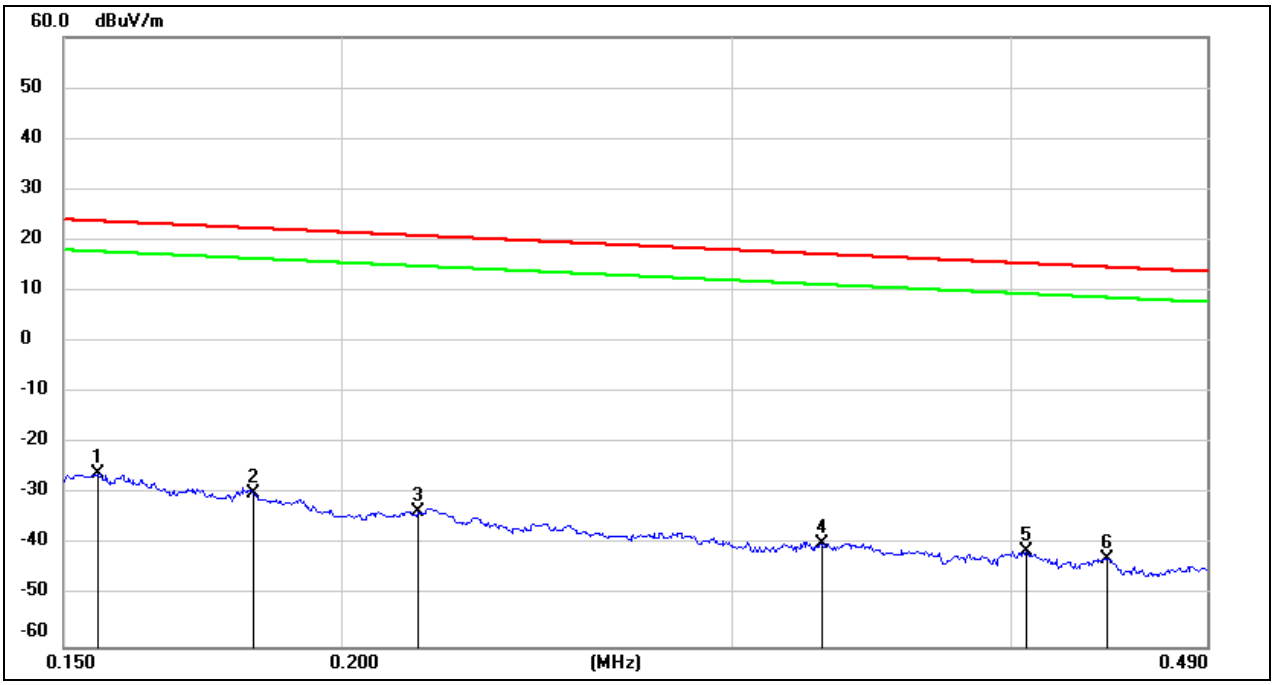
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Loop Antenna Face On To The EUT	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0100	76.72	-101.40	-24.68	47.60	-72.28	peak
2	0.0221	70.13	-101.35	-31.22	40.71	-71.93	peak
3	0.0279	68.17	-101.38	-33.21	38.69	-71.90	peak
4	0.0675	62.14	-101.56	-39.42	31.02	-70.44	peak
5	0.1014	59.06	-101.79	-42.73	27.48	-70.21	peak
6	0.1440	57.32	-101.65	-44.33	24.43	-68.76	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

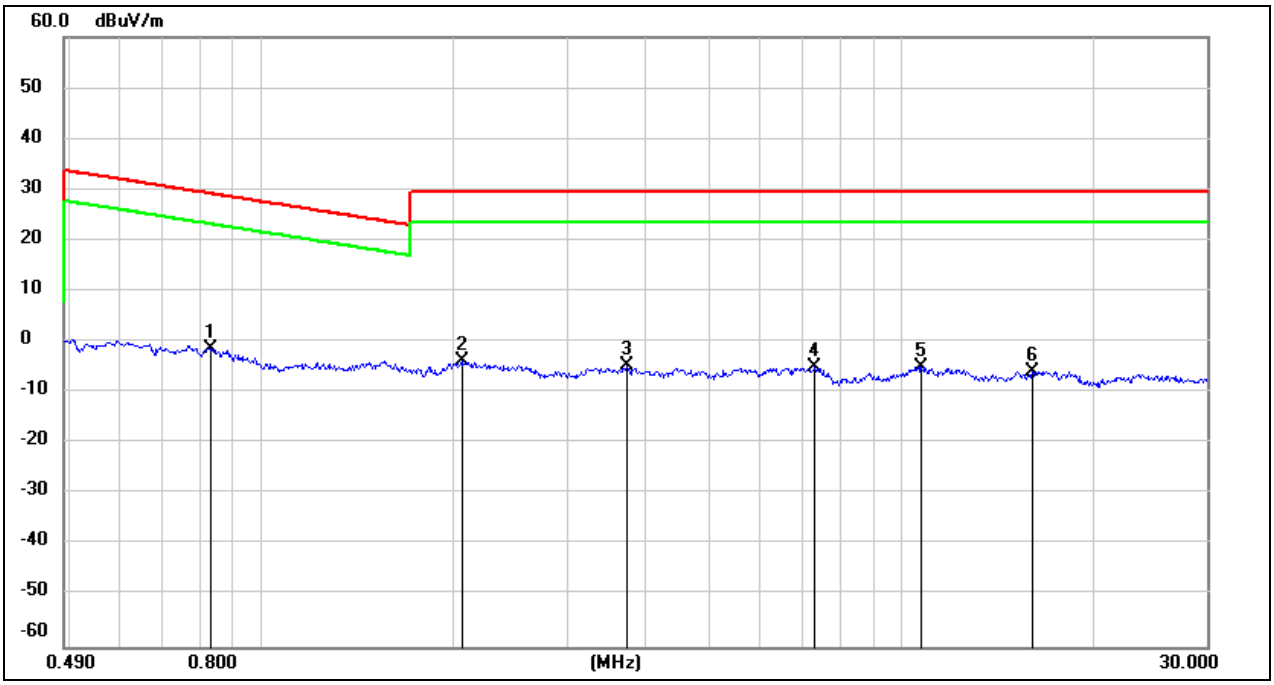
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Loop Antenna Face On To The EUT	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1554	75.77	-101.65	-25.88	23.77	-49.65	peak
2	0.1826	71.76	-101.69	-29.93	22.38	-52.31	peak
3	0.2164	68.27	-101.75	-33.48	20.90	-54.38	peak
4	0.3286	62.21	-101.88	-39.67	17.27	-56.94	peak
5	0.4062	60.64	-101.96	-41.32	15.43	-56.75	peak
6	0.4415	59.35	-102.01	-42.66	14.70	-57.36	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Loop Antenna Face On To The EUT	Test Voltage:	DC 12 V

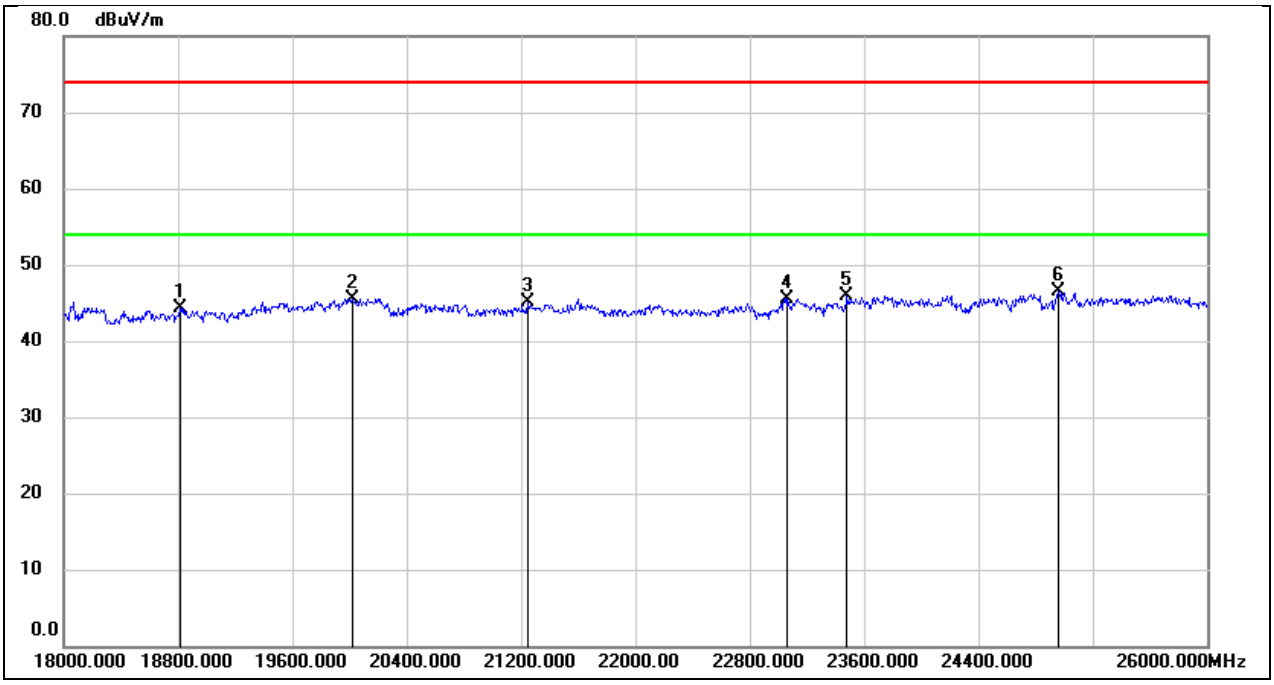


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.8296	60.94	-62.17	-1.23	29.23	-30.46	peak
2	2.0539	58.20	-61.81	-3.61	29.54	-33.15	peak
3	3.7100	56.70	-61.41	-4.71	29.54	-34.25	peak
4	7.3361	56.08	-61.17	-5.09	29.54	-34.63	peak
5	10.7299	55.98	-60.83	-4.85	29.54	-34.39	peak
6	16.0411	55.22	-60.98	-5.76	29.54	-35.30	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.5. SPURIOUS EMISSIONS (18 GHZ ~ 26 GHZ)

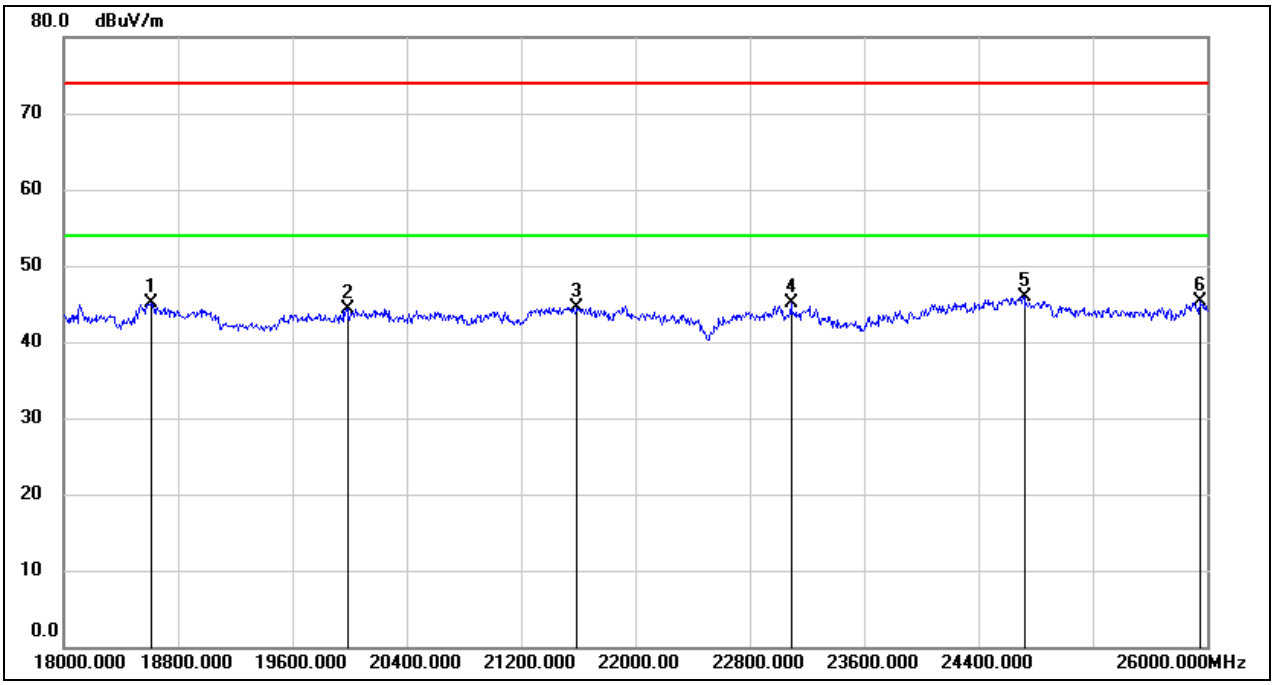
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18816.000	49.71	-5.38	44.33	74.00	-29.67	peak
2	20016.000	51.06	-5.47	45.59	74.00	-28.41	peak
3	21248.000	49.79	-4.77	45.02	74.00	-28.98	peak
4	23064.000	48.99	-3.42	45.57	74.00	-28.43	peak
5	23480.000	49.04	-3.16	45.88	74.00	-28.12	peak
6	24960.000	48.64	-2.14	46.50	74.00	-27.50	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V

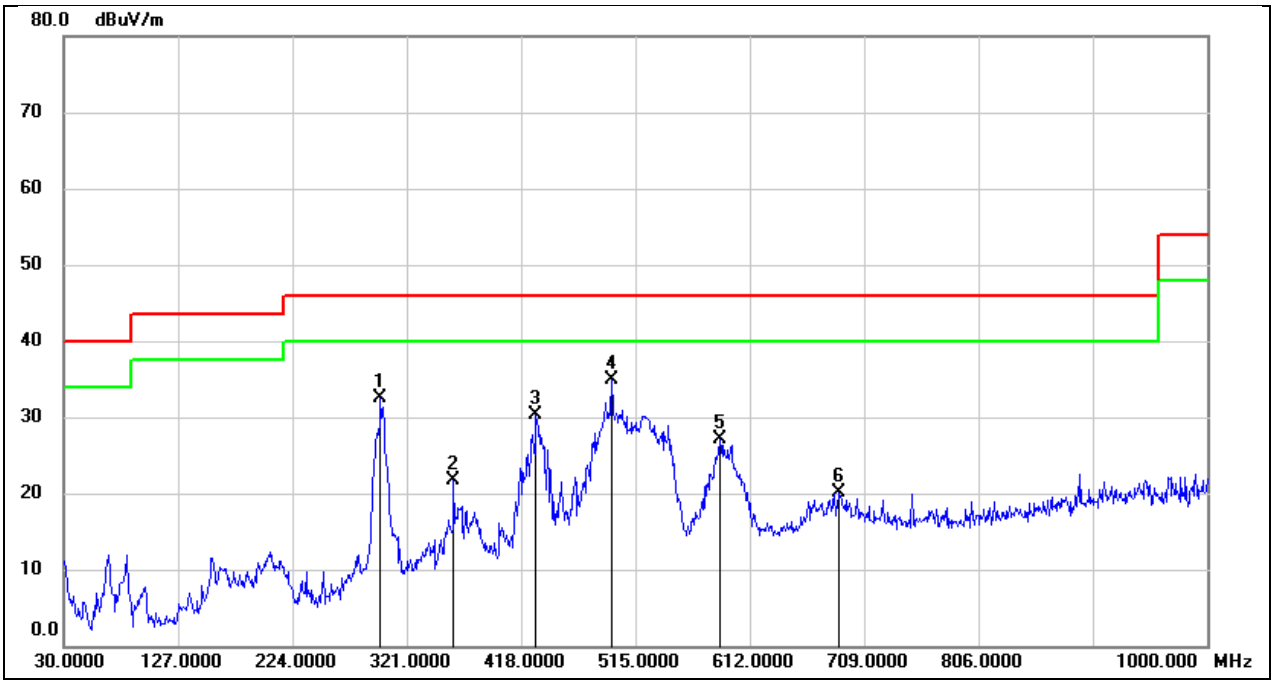


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18616.000	50.39	-5.34	45.05	74.00	-28.95	peak
2	19984.000	49.71	-5.44	44.27	74.00	-29.73	peak
3	21592.000	49.14	-4.55	44.59	74.00	-29.41	peak
4	23088.000	48.52	-3.41	45.11	74.00	-28.89	peak
5	24720.000	48.22	-2.33	45.89	74.00	-28.11	peak
6	25952.000	46.21	-0.98	45.23	74.00	-28.77	peak

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

8.6. SPURIOUS EMISSIONS (30 MHZ ~ 1 GHZ)

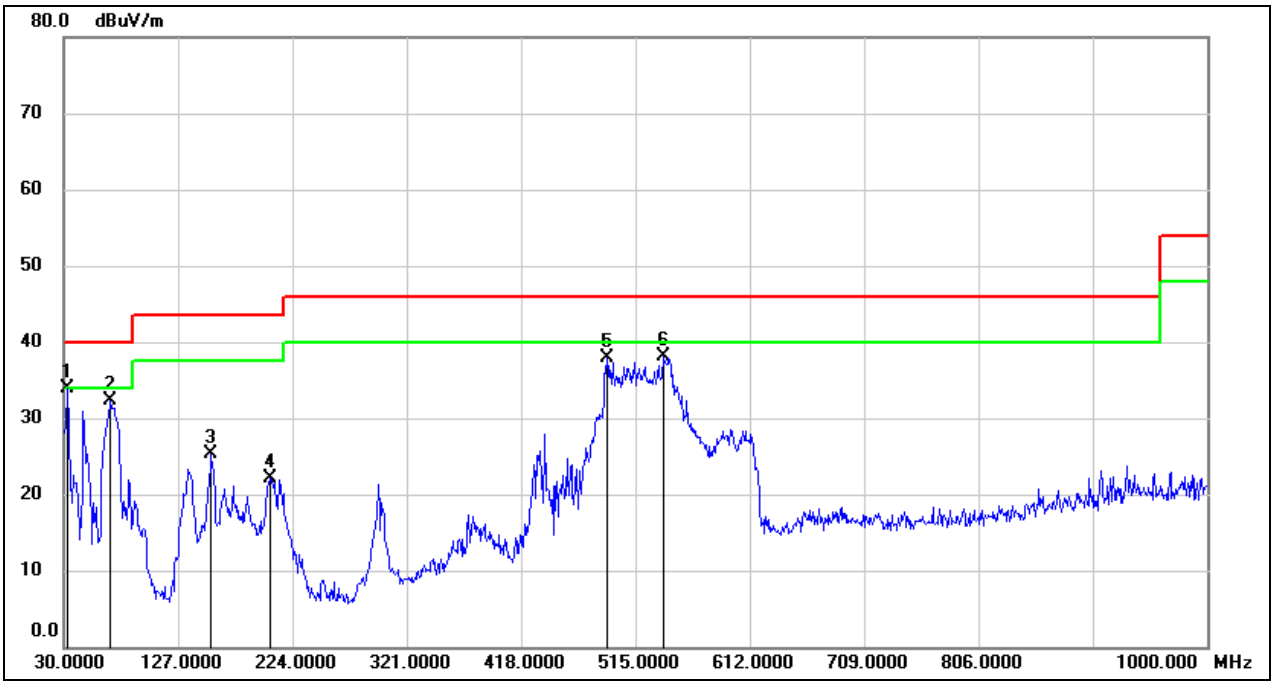
Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Horizontal	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	298.6900	47.97	-15.38	32.59	46.00	-13.41	QP
2	360.7700	35.86	-14.08	21.78	46.00	-24.22	QP
3	430.6100	43.09	-12.71	30.38	46.00	-15.62	QP
4	494.6300	46.51	-11.59	34.92	46.00	-11.08	QP
5	586.7800	36.91	-9.87	27.04	46.00	-18.96	QP
6	687.6599	28.47	-8.40	20.07	46.00	-25.93	QP

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE20	Channel:	2437 MHz
Polarity:	Vertical	Test Voltage:	DC 12 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	32.9100	53.20	-19.22	33.98	40.00	-6.02	QP
2	69.7699	52.96	-20.57	32.39	40.00	-7.61	QP
3	155.1300	43.24	-18.01	25.23	43.50	-18.27	QP
4	204.6000	38.96	-16.79	22.17	43.50	-21.33	QP
5	490.7500	49.59	-11.68	37.91	46.00	-8.09	QP
6	538.2800	48.72	-10.55	38.17	46.00	-7.83	QP

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

9. ANTENNA REQUIREMENT

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

10. AC POWER LINE CONDUCTED EMISSION

LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

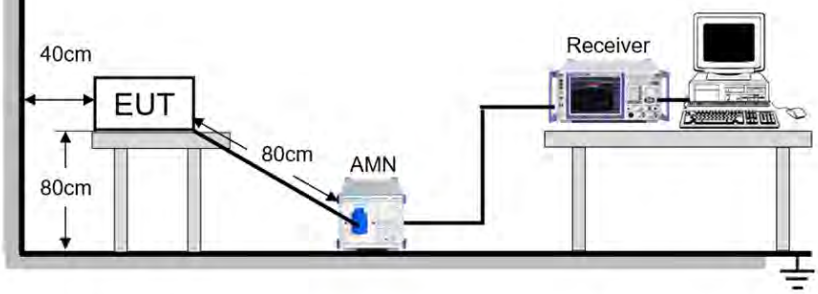
FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST PROCEDURE

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST SETUP



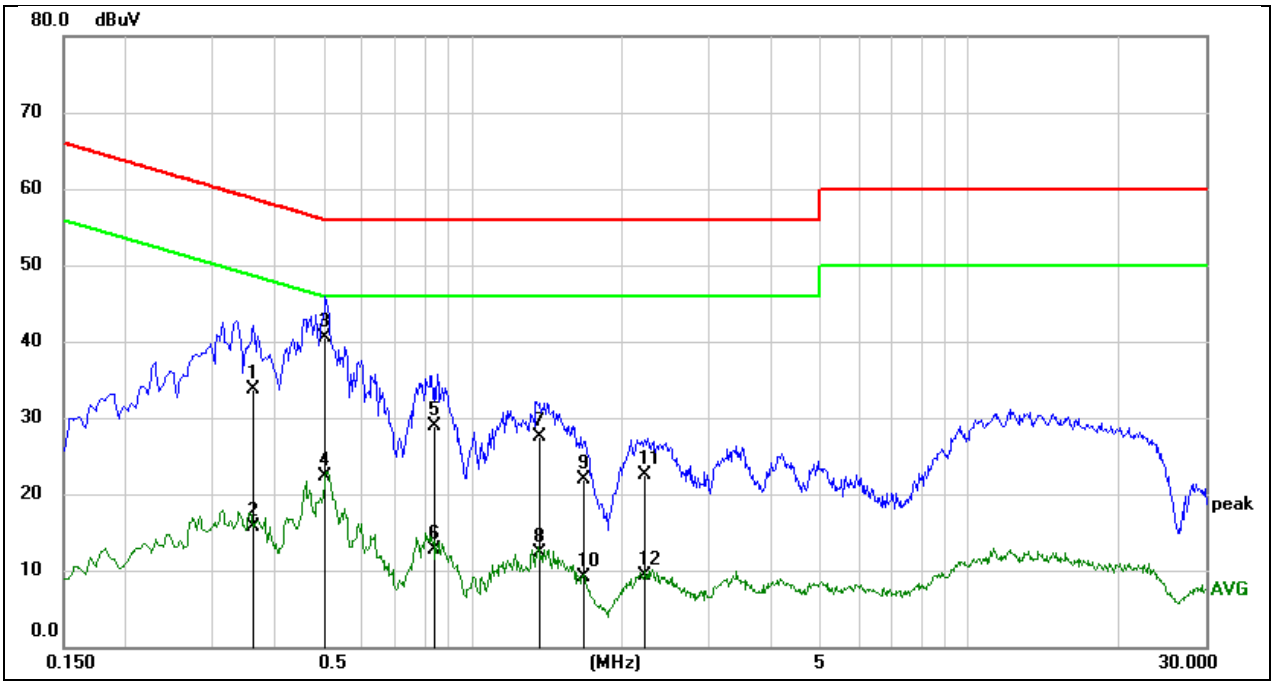
TEST ENVIRONMENT

Temperature	20.1 °C	Relative Humidity	57.7 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120 V, 60 Hz

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

TEST RESULTS

Test Mode:	802.11ax HE20	Channel:	2437 MHz
Line:	L1	Test Voltage	AC 120 V, 60 Hz



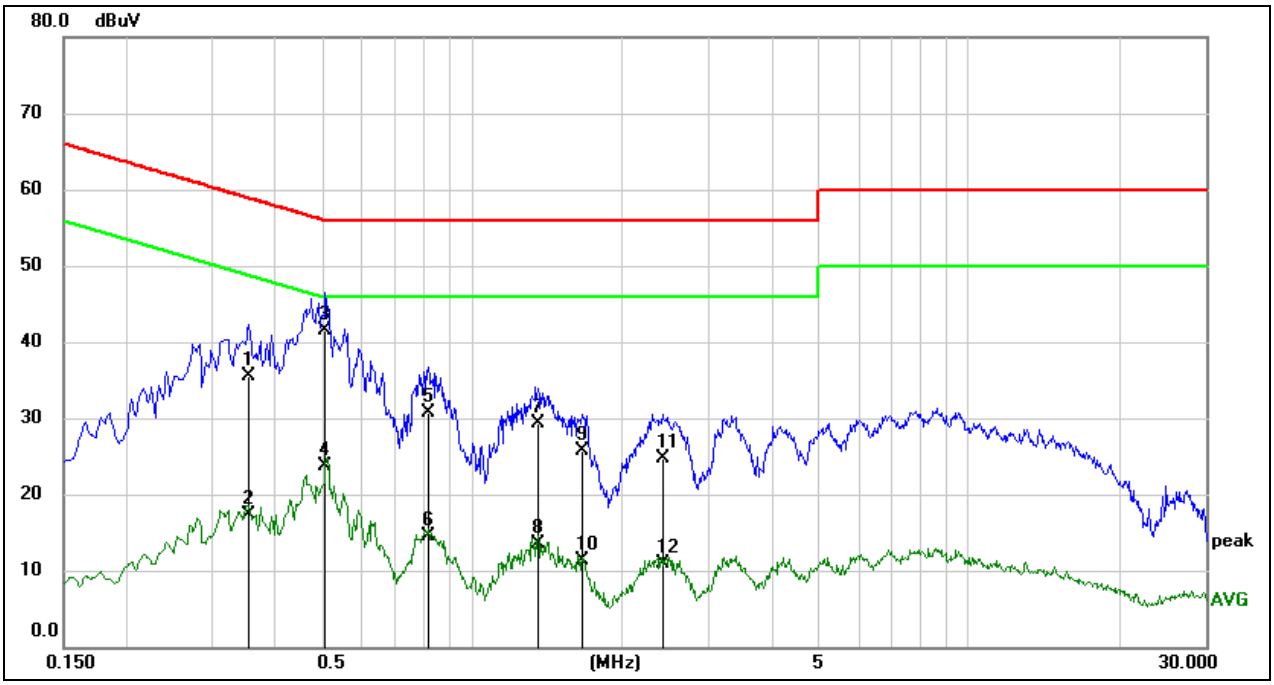
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3630	24.10	9.59	33.69	58.66	-24.97	QP
2	0.3630	6.15	9.59	15.74	48.66	-32.92	AVG
3	0.5070	30.97	9.60	40.57	56.00	-15.43	QP
4	0.5070	12.64	9.60	22.24	46.00	-23.76	AVG
5	0.8400	19.22	9.60	28.82	56.00	-27.18	QP
6	0.8400	3.19	9.60	12.79	46.00	-33.21	AVG
7	1.3595	17.88	9.61	27.49	56.00	-28.51	QP
8	1.3595	2.70	9.61	12.31	46.00	-33.69	AVG
9	1.6733	12.34	9.62	21.96	56.00	-34.04	QP
10	1.6733	-0.61	9.62	9.01	46.00	-36.99	AVG
11	2.2225	12.85	9.64	22.49	56.00	-33.51	QP
12	2.2225	-0.24	9.64	9.40	46.00	-36.60	AVG

Note:
1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes have been tested, only the worst data was recorded in the report.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

Test Mode:	802.11ax HE20	Channel:	2437 MHz
Line:	L1	Test Voltage	AC 120 V, 60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3533	25.85	9.59	35.44	58.88	-23.44	QP
2	0.3533	7.69	9.59	17.28	48.88	-31.60	AVG
3	0.5085	31.97	9.60	41.57	56.00	-14.43	QP
4	0.5085	14.20	9.60	23.80	46.00	-22.20	AVG
5	0.8148	21.02	9.60	30.62	56.00	-25.38	QP
6	0.8148	4.85	9.60	14.45	46.00	-31.55	AVG
7	1.3595	19.71	9.61	29.32	56.00	-26.68	QP
8	1.3595	3.91	9.61	13.52	46.00	-32.48	AVG
9	1.6718	16.00	9.62	25.62	56.00	-30.38	QP
10	1.6718	1.71	9.62	11.33	46.00	-34.67	AVG
11	2.4391	15.12	9.65	24.77	56.00	-31.23	QP
12	2.4391	1.35	9.65	11.00	46.00	-35.00	AVG

Note:
1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes have been tested, only the worst data was recorded in the report.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11. TEST DATA

11.1. APPENDIX A: DTS BANDWIDTH

11.1.1. Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	6.560	2408.520	2415.080	⩾0.5	PASS
	Ant2	2412	6.560	2408.520	2415.080	⩾0.5	PASS
	Ant1	2437	7.560	2433.000	2440.560	⩾0.5	PASS
	Ant2	2437	6.600	2433.480	2440.080	⩾0.5	PASS
	Ant1	2462	8.040	2458.000	2466.040	⩾0.5	PASS
	Ant2	2462	7.080	2458.480	2465.560	⩾0.5	PASS
11G	Ant1	2412	15.640	2403.880	2419.520	⩾0.5	PASS
	Ant2	2412	15.880	2403.880	2419.760	⩾0.5	PASS
	Ant1	2437	16.320	2428.880	2445.200	⩾0.5	PASS
	Ant2	2437	16.320	2428.840	2445.160	⩾0.5	PASS
	Ant1	2462	16.040	2454.120	2470.160	⩾0.5	PASS
	Ant2	2462	16.280	2453.880	2470.160	⩾0.5	PASS
11AX20MIMO	Ant1	2412	16.080	2403.480	2419.560	⩾0.5	PASS
	Ant2	2412	15.120	2404.440	2419.560	⩾0.5	PASS
	Ant1	2417	15.120	2409.440	2424.560	⩾0.5	PASS
	Ant2	2417	15.080	2409.480	2424.560	⩾0.5	PASS
	Ant1	2437	15.080	2429.440	2444.520	⩾0.5	PASS
	Ant2	2437	15.080	2429.480	2444.560	⩾0.5	PASS
	Ant1	2457	15.120	2449.440	2464.560	⩾0.5	PASS
	Ant2	2457	15.080	2449.480	2464.560	⩾0.5	PASS
	Ant1	2462	15.120	2454.440	2469.560	⩾0.5	PASS
	Ant2	2462	15.080	2454.480	2469.560	⩾0.5	PASS
11AX40MIMO	Ant1	2422	35.040	2404.480	2439.520	⩾0.5	PASS
	Ant2	2422	35.040	2404.480	2439.520	⩾0.5	PASS
	Ant1	2427	35.040	2409.480	2444.520	⩾0.5	PASS
	Ant2	2427	34.960	2409.560	2444.520	⩾0.5	PASS
	Ant1	2437	35.040	2419.480	2454.520	⩾0.5	PASS
	Ant2	2437	35.040	2419.480	2454.520	⩾0.5	PASS
	Ant1	2447	35.120	2429.480	2464.600	⩾0.5	PASS
	Ant2	2447	35.040	2429.480	2464.520	⩾0.5	PASS
	Ant1	2452	33.840	2435.680	2469.520	⩾0.5	PASS
	Ant2	2452	35.040	2434.480	2469.520	⩾0.5	PASS

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11.1.2. Test Graphs

11B_Ant1_2412

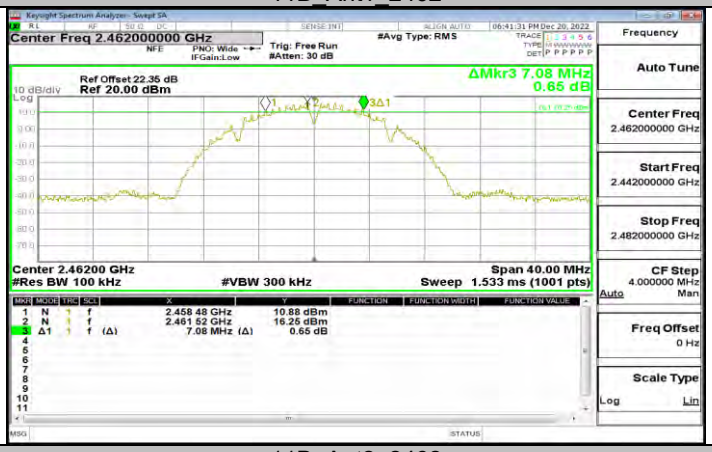
11B_Ant2_2412

11B_Ant1_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11B_Ant2_2437

11B_Ant1_2462

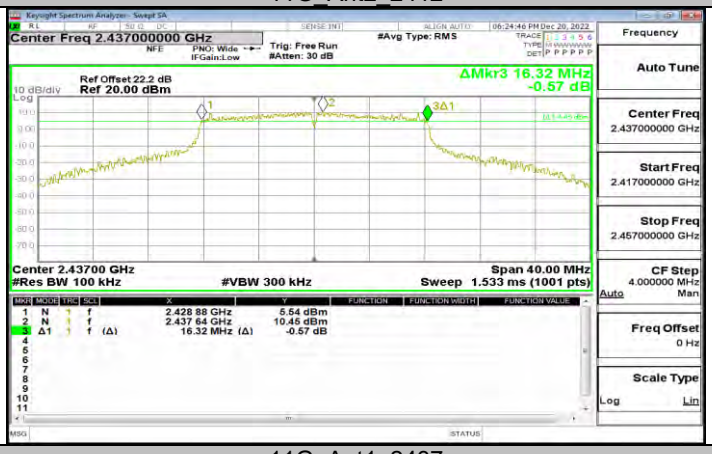


11B_Ant2_2462

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11G_Ant1_2412

11G_Ant2_2412

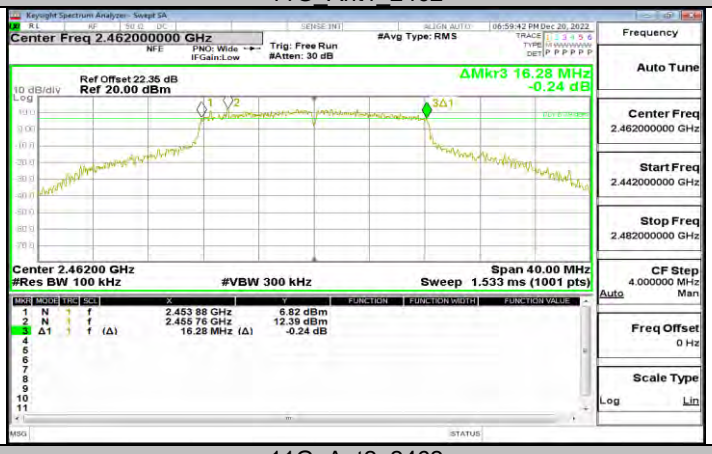


11G_Ant1_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11G_Ant2_2437

11G_Ant1_2462

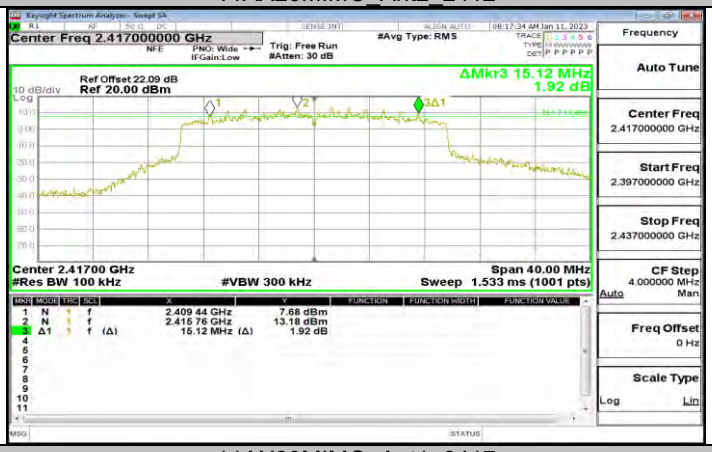


11G_Ant2_2462

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11AX20MIMO_Ant1_2412

11AX20MIMO_Ant2_2412



11AX20MIMO_Ant1_2417

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

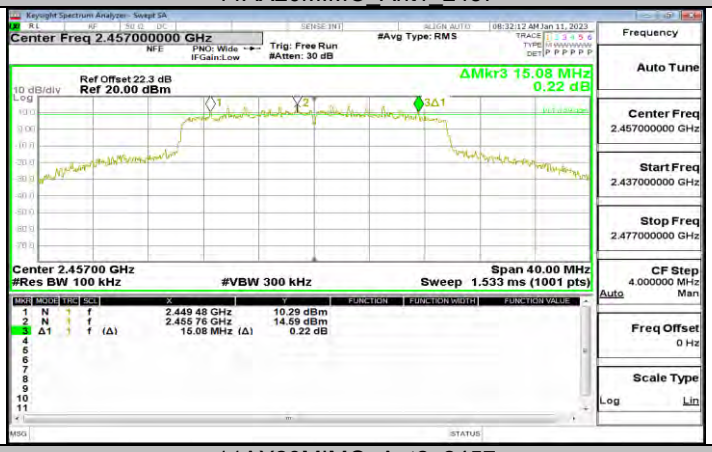
11AX20MIMO_Ant2_2417

11AX20MIMO_Ant1_2437

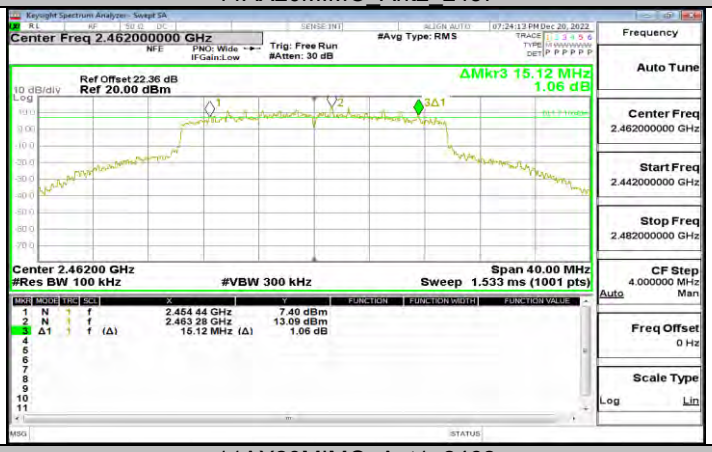
11AX20MIMO_Ant2_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11AX20MIMO_Ant1_2457



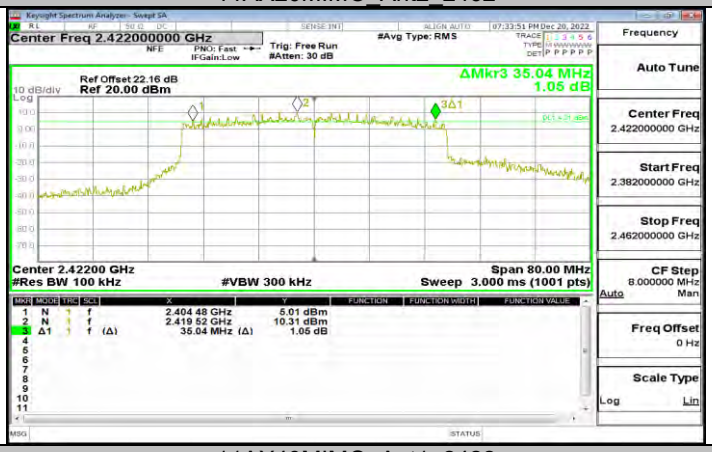
11AX20MIMO_Ant2_2457



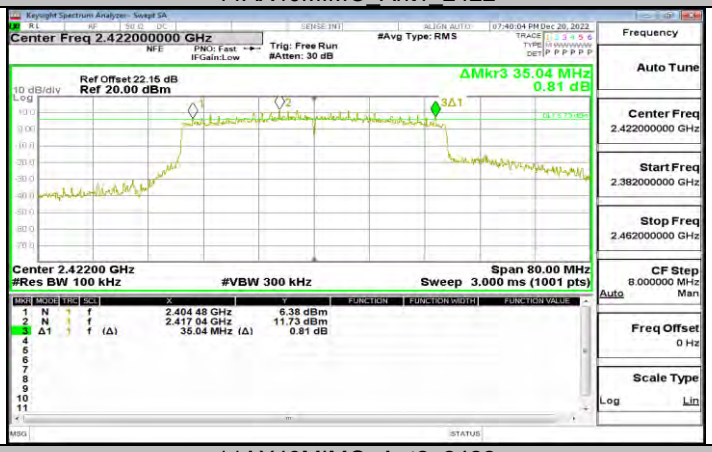
11AX20MIMO_Ant1_2462

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11AX20MIMO_Ant2_2462



11AX40MIMO_Ant1_2422



11AX40MIMO_Ant2_2422

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

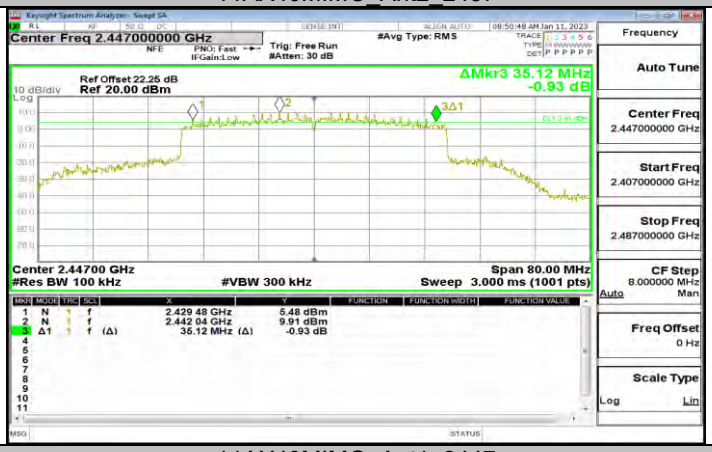
11AX40MIMO_Ant1_2427

11AX40MIMO_Ant2_2427

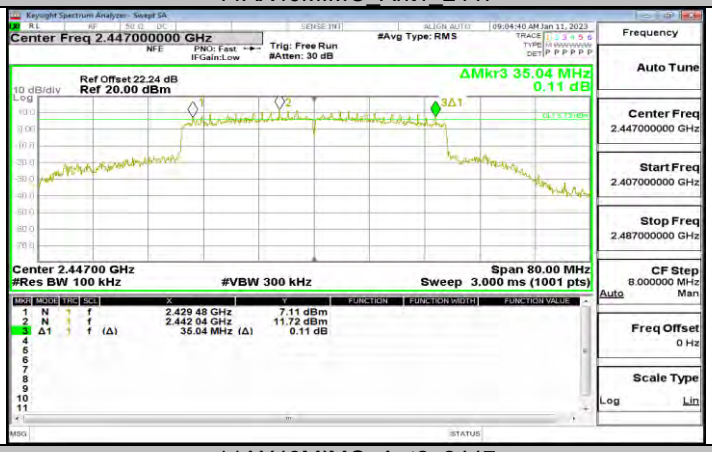
11AX40MIMO_Ant1_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11AX40MIMO_Ant2_2437



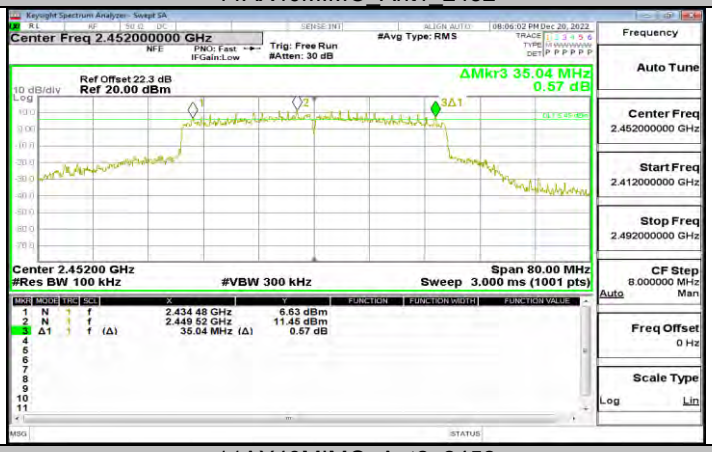
11AX40MIMO_Ant1_2447



11AX40MIMO_Ant2_2447

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11AX40MIMO_Ant1_2452



11AX40MIMO_Ant2_2452

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

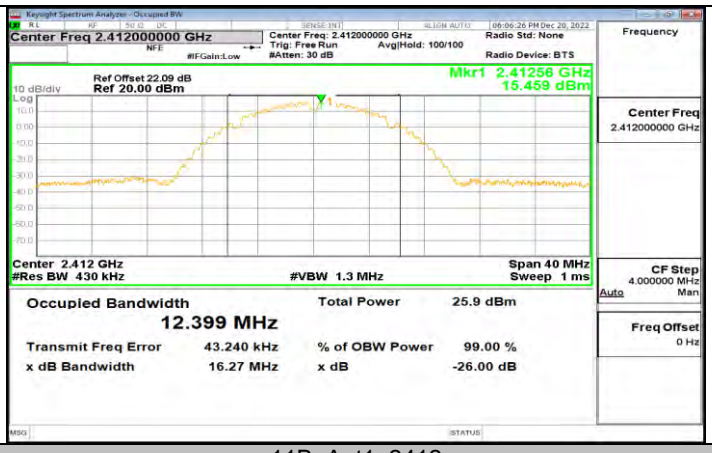
11.2. APPENDIX B: OCCUPIED CHANNEL BANDWIDTH

11.2.1. Test Result

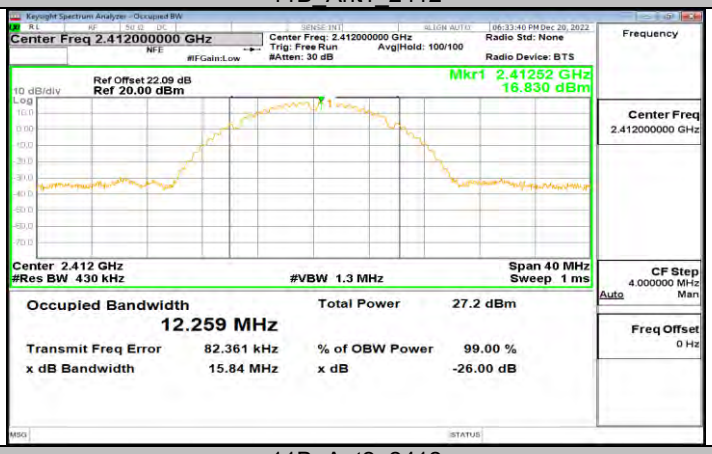
Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11B	Ant1	2412	12.399	2405.8437	2418.2427	PASS
	Ant2	2412	12.259	2405.9529	2418.2119	PASS
	Ant1	2437	12.347	2430.8476	2443.1946	PASS
	Ant2	2437	12.247	2430.9200	2443.1670	PASS
	Ant1	2462	12.321	2455.8635	2468.1845	PASS
	Ant2	2462	12.249	2455.9170	2468.1660	PASS
11G	Ant1	2412	17.025	2403.5412	2420.5662	PASS
	Ant2	2412	16.777	2403.7184	2420.4954	PASS
	Ant1	2437	16.810	2428.6182	2445.4282	PASS
	Ant2	2437	16.747	2428.6598	2445.4068	PASS
	Ant1	2462	16.850	2453.5897	2470.4397	PASS
	Ant2	2462	16.661	2453.6872	2470.3482	PASS
11AX20MIMO	Ant1	2412	18.853	2402.6120	2421.4650	PASS
	Ant2	2412	18.872	2402.5862	2421.4582	PASS
	Ant1	2417	18.781	2407.7021	2426.4831	PASS
	Ant2	2417	18.815	2407.6643	2426.4793	PASS
	Ant1	2437	18.950	2427.5836	2446.5336	PASS
	Ant2	2437	18.964	2427.5566	2446.5206	PASS
	Ant1	2457	18.931	2447.5892	2466.5202	PASS
	Ant2	2457	18.863	2447.5978	2466.4608	PASS
	Ant1	2462	18.997	2452.5208	2471.5178	PASS
	Ant2	2462	18.911	2452.5695	2471.4805	PASS
11AX40MIMO	Ant1	2422	37.584	2403.3423	2440.9263	PASS
	Ant2	2422	37.759	2403.1552	2440.9142	PASS
	Ant1	2427	37.691	2408.3098	2446.0008	PASS
	Ant2	2427	37.664	2408.2332	2445.8972	PASS
	Ant1	2437	37.663	2418.2274	2455.8904	PASS
	Ant2	2437	37.660	2418.2735	2455.9335	PASS
	Ant1	2447	37.818	2428.0928	2465.9108	PASS
	Ant2	2447	37.781	2428.1497	2465.9307	PASS
	Ant1	2452	37.639	2433.2071	2470.8461	PASS
	Ant2	2452	37.715	2433.1481	2470.8631	PASS

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

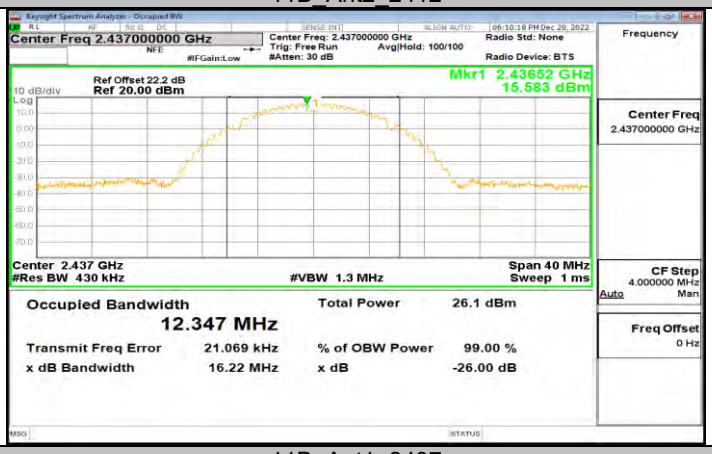
11.2.2. Test Graphs



11B_Ant1_2412

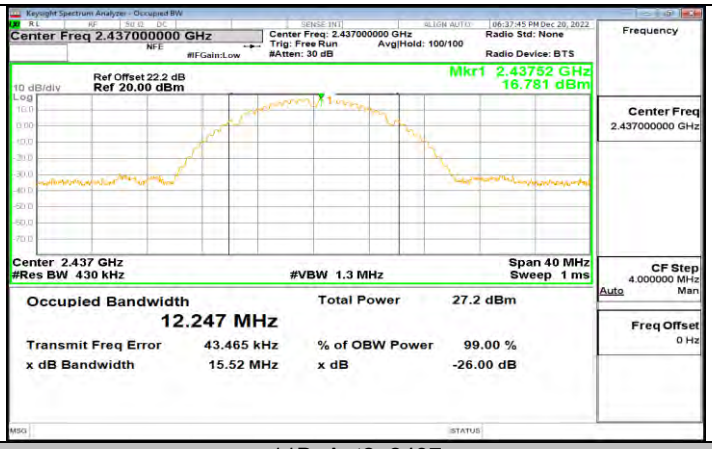


11B_Ant2_2412

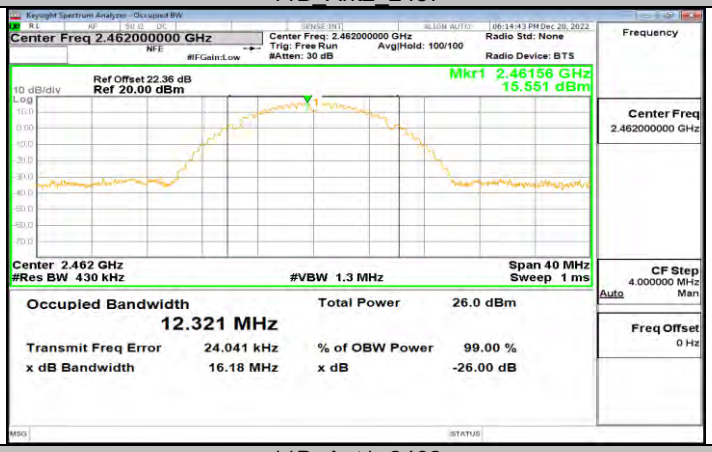


11B_Ant1_2437

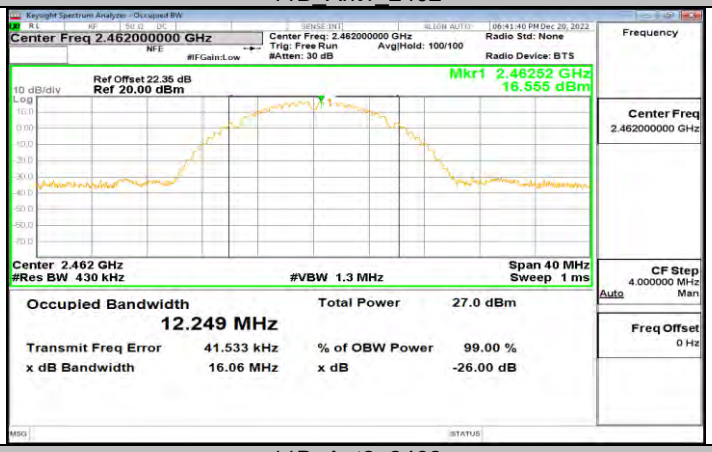
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11B_Ant2_2437

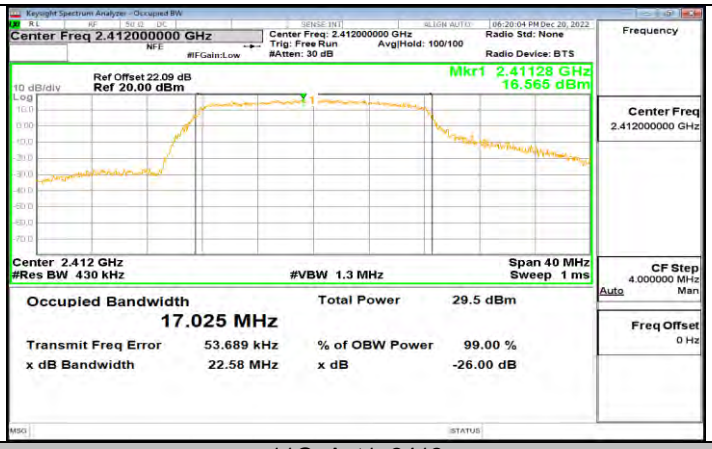


11B_Ant1_2462

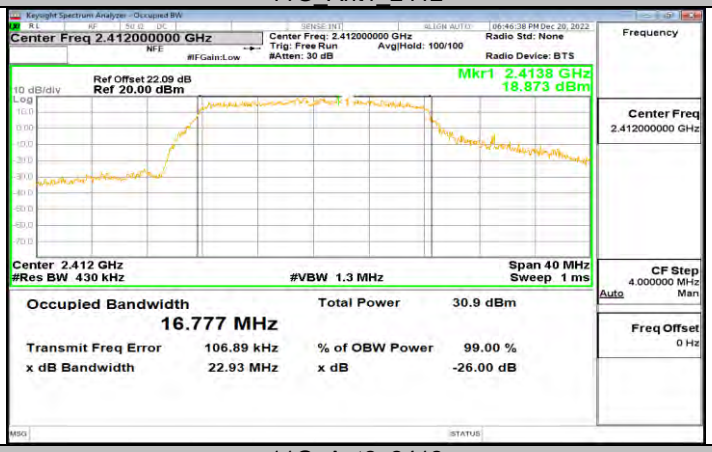


11B_Ant2_2462

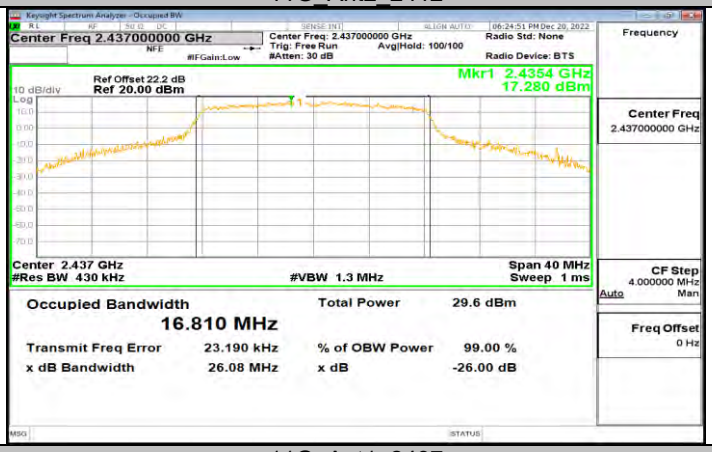
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11G_Ant1_2412

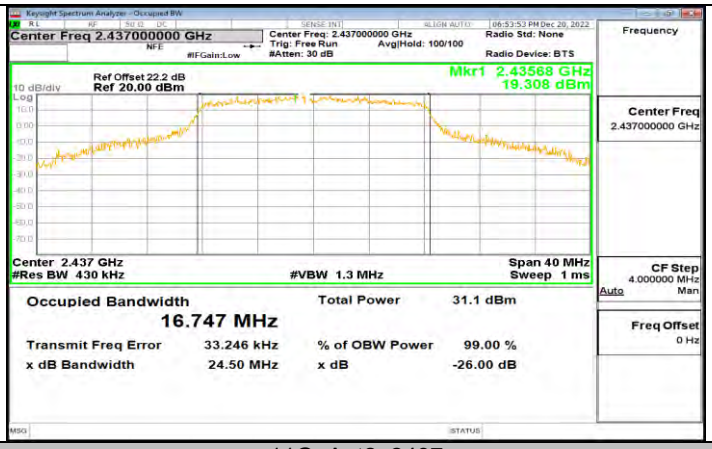


11G_Ant2_2412

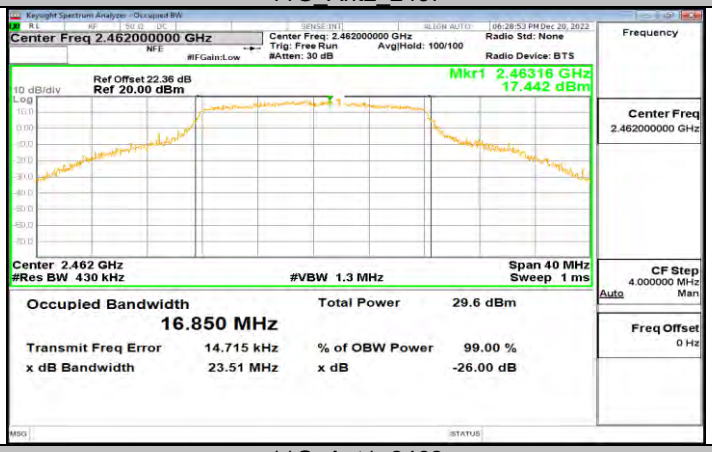


11G_Ant1_2437

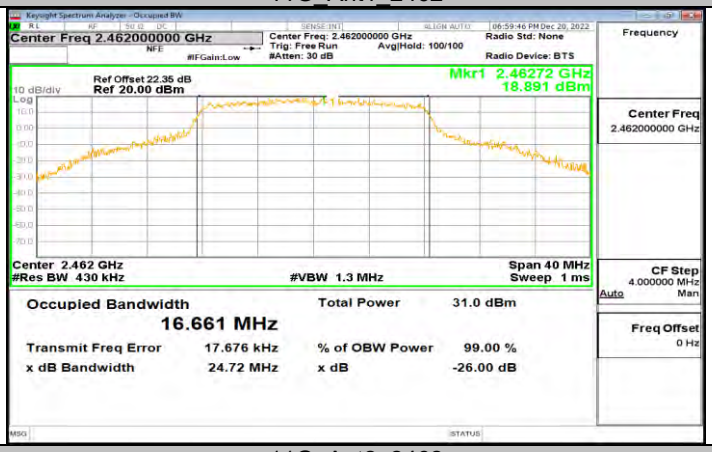
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11G_Ant2_2437

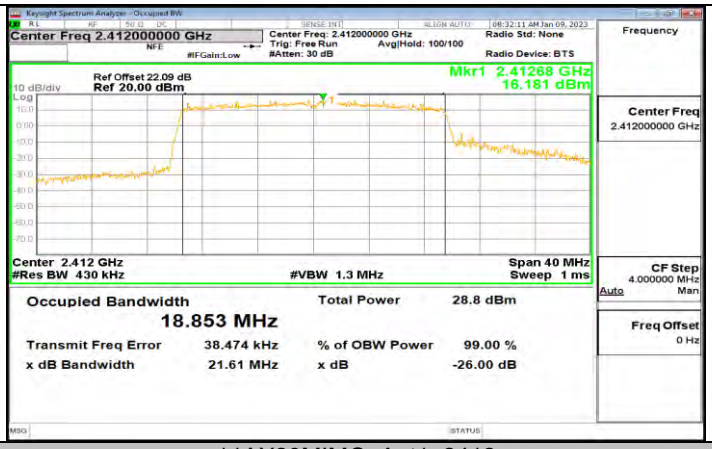


11G_Ant1_2462

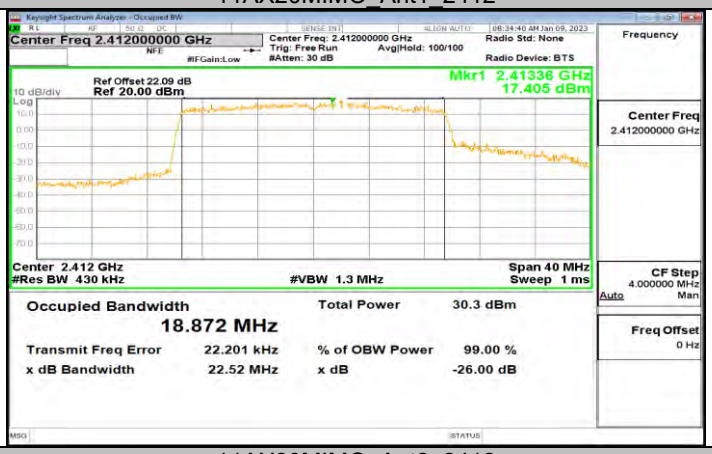


11G_Ant2_2462

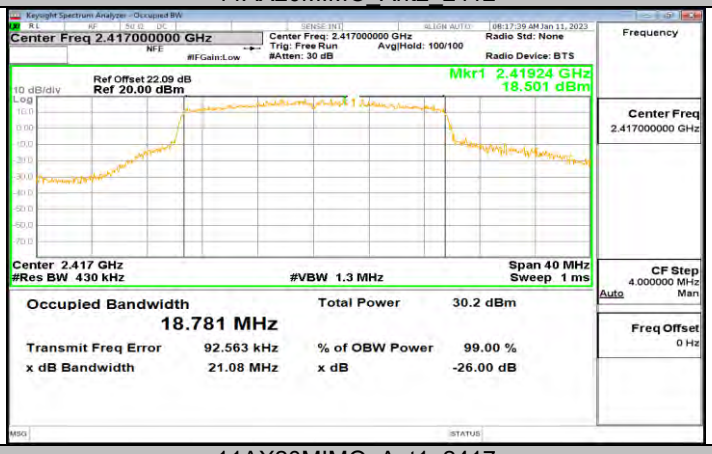
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX20MIMO_Ant1_2412

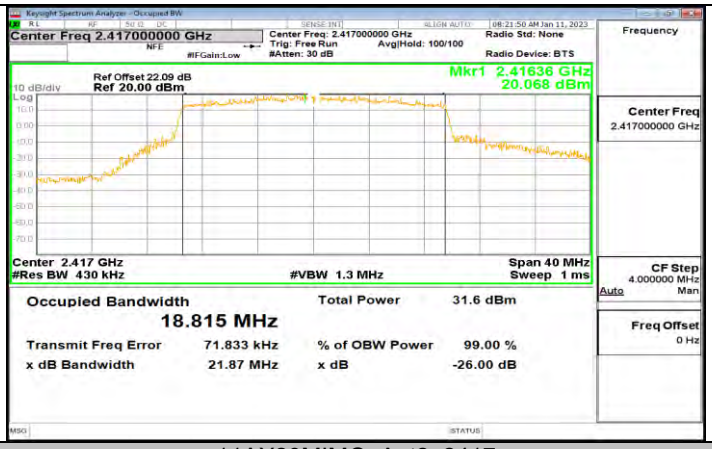


11AX20MIMO_Ant2_2412

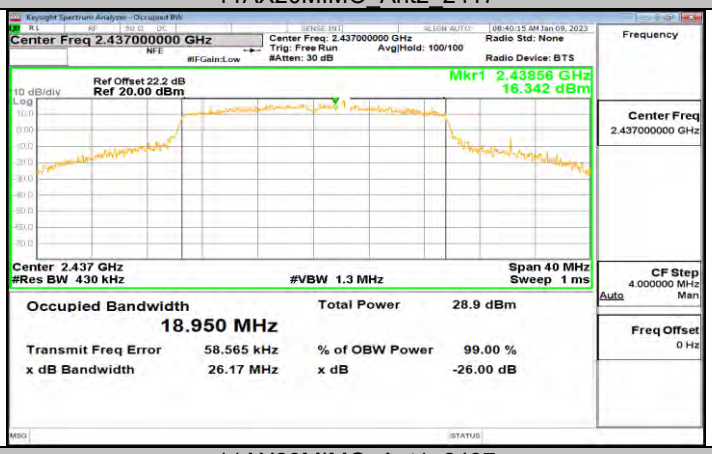


11AX20MIMO_Ant1_2417

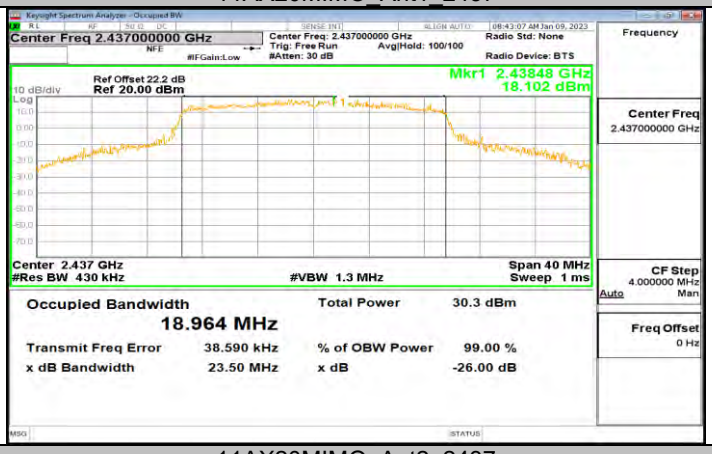
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX20MIMO_Ant2_2417

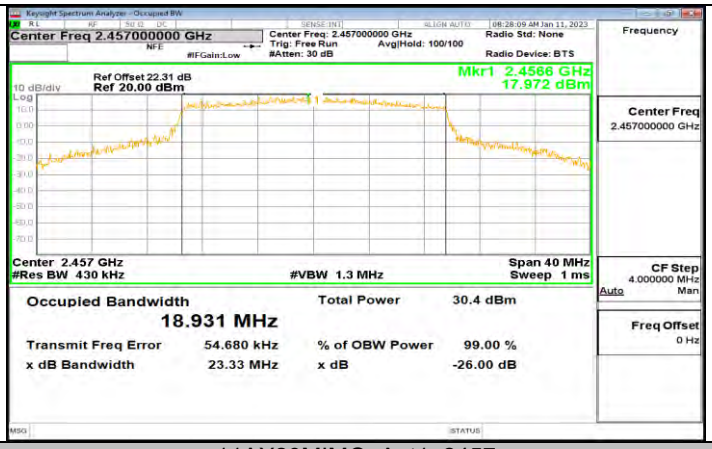


11AX20MIMO_Ant1_2437

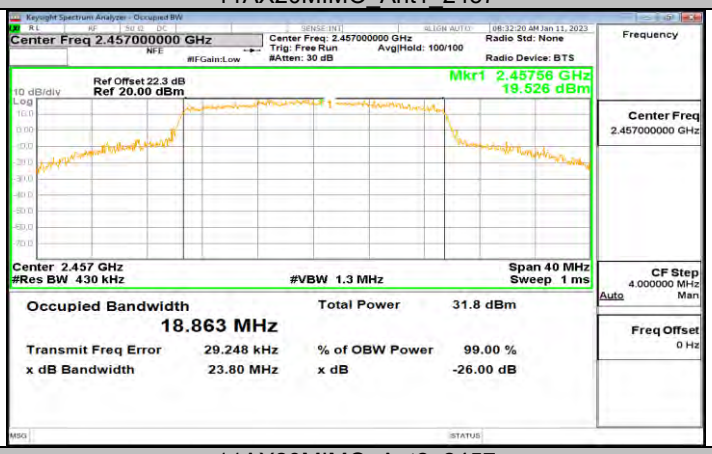


11AX20MIMO_Ant2_2437

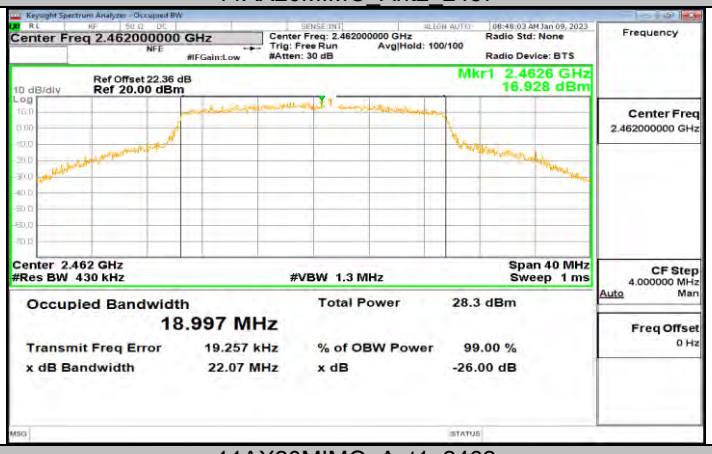
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX20MIMO_Ant1_2457

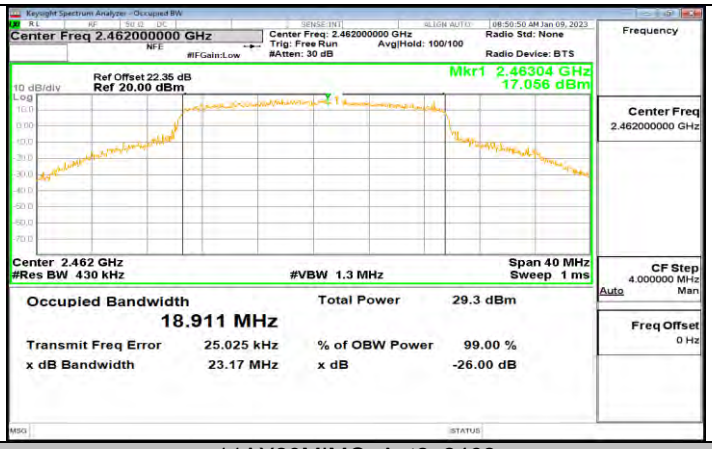


11AX20MIMO_Ant2_2457

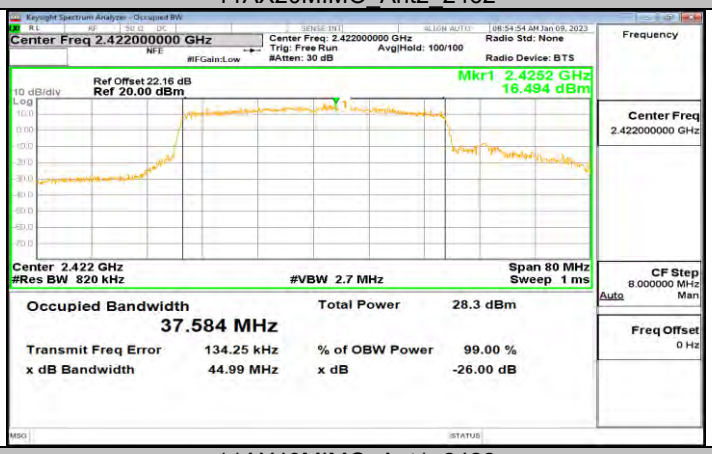


11AX20MIMO_Ant1_2462

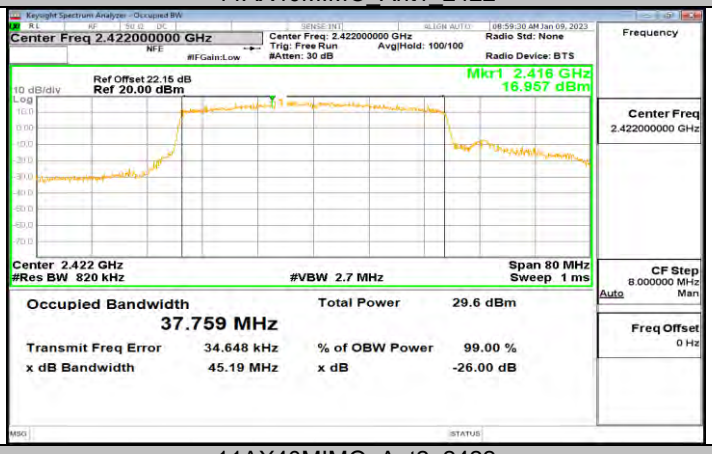
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX20MIMO_Ant2_2462

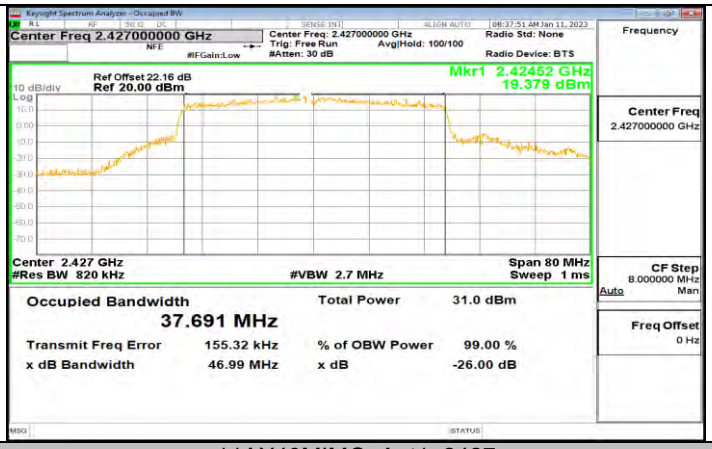


11AX40MIMO_Ant1_2422

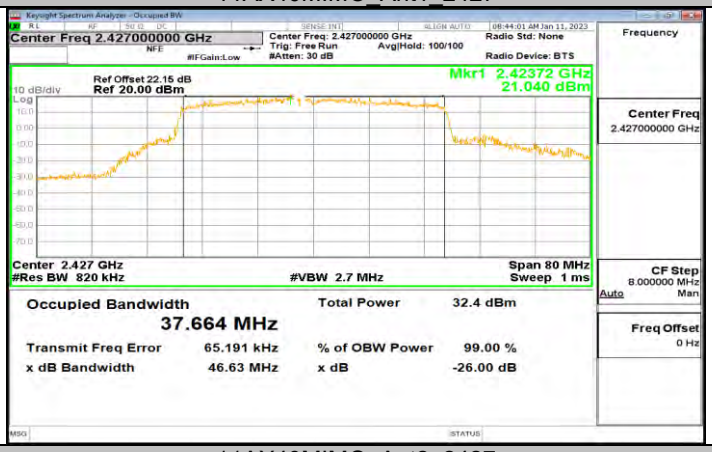


11AX40MIMO_Ant2_2422

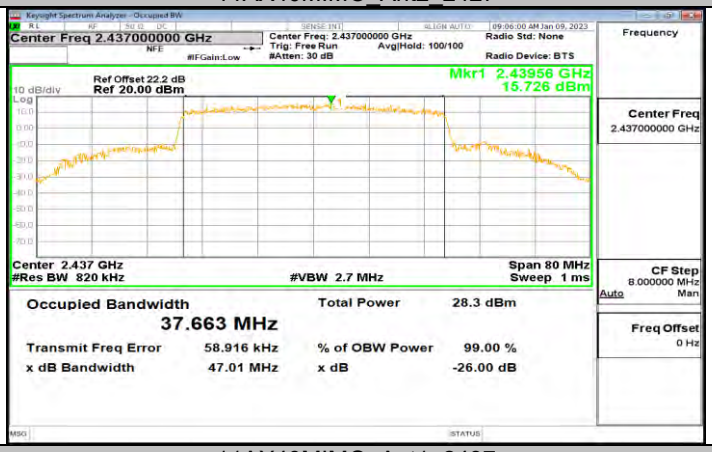
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX40MIMO_Ant1_2427

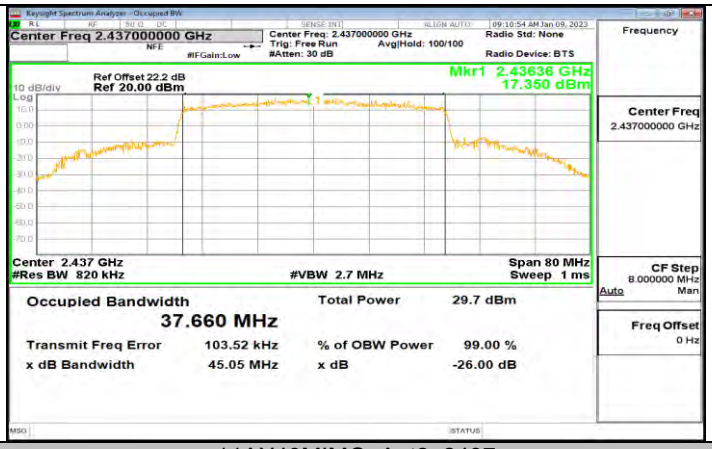


11AX40MIMO_Ant2_2427

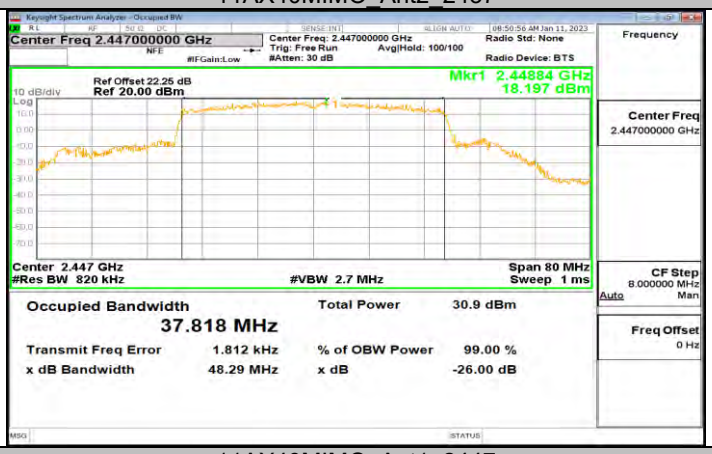


11AX40MIMO_Ant1_2437

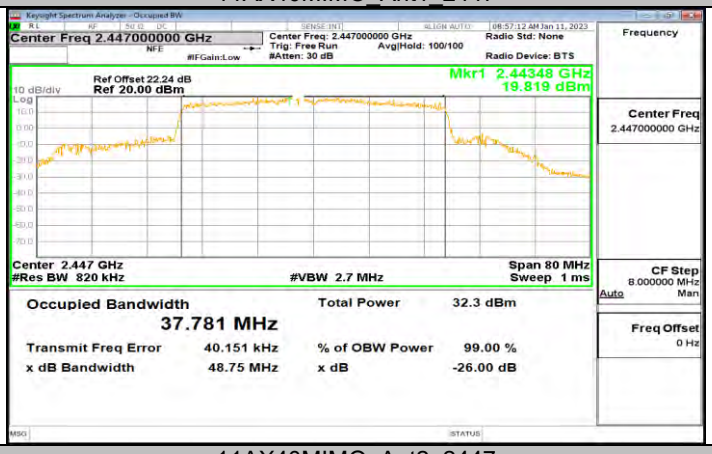
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX40MIMO_Ant2_2437

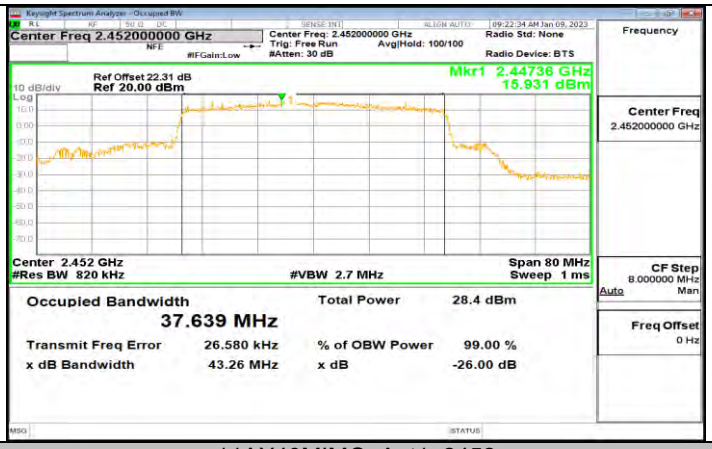


11AX40MIMO_Ant1_2447

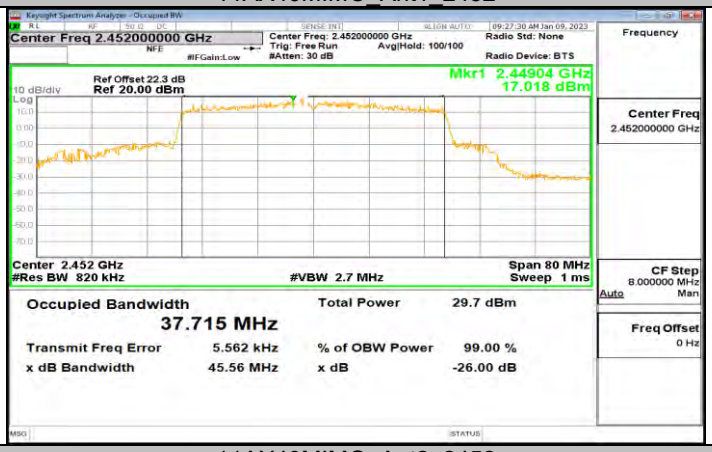


11AX40MIMO_Ant2_2447

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11AX40MIMO_Ant1_2452



11AX40MIMO_Ant2_2452

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11.3. APPENDIX C: MAXIMUM AVERAGE CONDUCTED OUTPUT POWER

11.3.1. Test Result

Mode	Frequency (MHz)	Conducted Average Output Power (dBm)			Limit (dBm)
		Antenna 1	Antenna 2	Total	
802.11b	2412	23.08	24.32	/	30
	2437	23.21	24.30	/	30
	2462	23.14	24.11	/	30
802.11g	2412	23.25	24.56	/	30
	2437	23.50	24.64	/	30
	2462	23.59	24.62	/	30
802.11ax HE20	2412	22.59	23.14	25.88	30
	2417	23.55	25.02	27.36	30
	2437	23.73	25.10	27.48	30
	2457	23.69	24.96	27.38	30
	2462	21.25	22.23	24.78	30
802.11ax HE40	2422	21.01	22.31	24.72	30
	2427	23.68	25.01	27.41	30
	2437	23.59	25.00	27.36	30
	2447	23.64	24.93	27.34	30
	2452	21.15	22.24	24.74	30

Note: 1. Conducted Power=Meas. Level+ Correction Factor
2. The Duty Cycle Factor (refer to section 7.5) had already compensated to the test data.

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

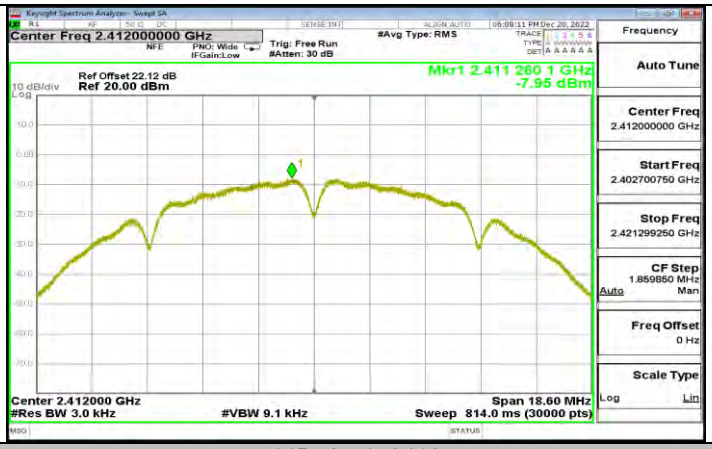
11.4. APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY

11.4.1. Test Result

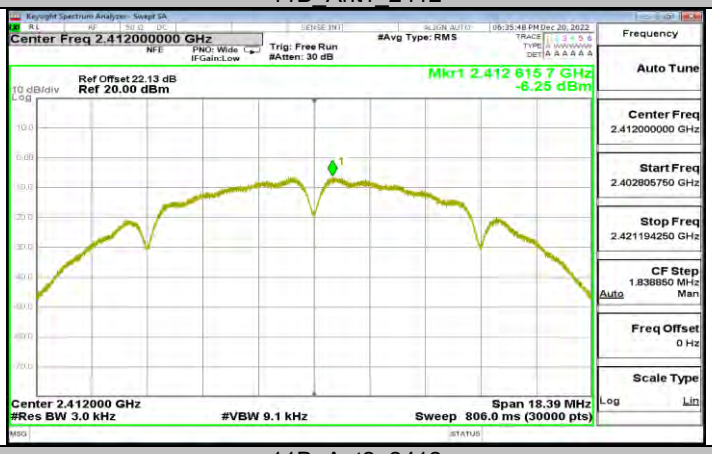
Mode	Frequency (MHz)	PSD (dBm/3 kHz)			Limit (dBm/3kHz)
		Antenna 1	Antenna 2	Total	
802.11b	2412	-7.95	-6.25	/	8
	2437	-7.32	-6.09	/	8
	2462	-7.50	-6.46	/	8
802.11g	2412	-9.74	-8.16	/	8
	2437	-9.35	-8.08	/	8
	2462	-9.10	-7.67	/	8
802.11ax HE20	2412	-10.20	-8.38	-6.11	8
	2417	-5.03	-4.04	-1.50	8
	2437	-5.21	-4.96	-2.07	8
	2457	-4.86	-3.96	-1.38	8
	2462	-10.73	-9.64	-7.14	8
802.11ax HE40	2422	-10.90	-9.86	-7.34	8
	2427	-7.87	-6.84	-4.31	8
	2437	-8.12	-7.30	-4.68	8
	2447	-7.96	-7.12	-4.51	8
	2452	-10.58	-9.50	-7.00	8

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

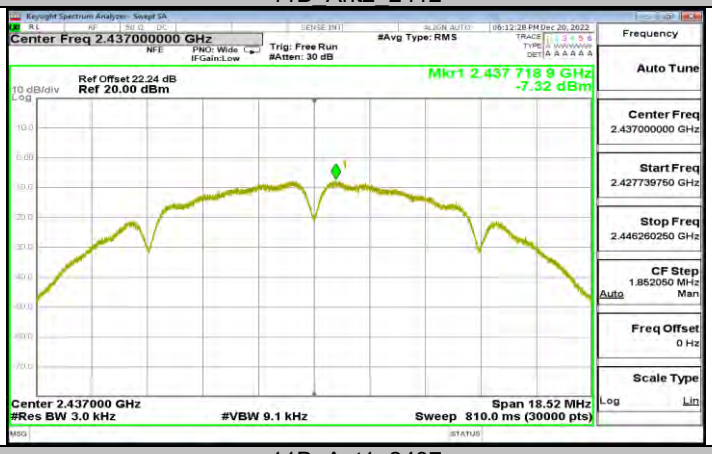
11.4.2. Test Graphs



11B_Ant1_2412



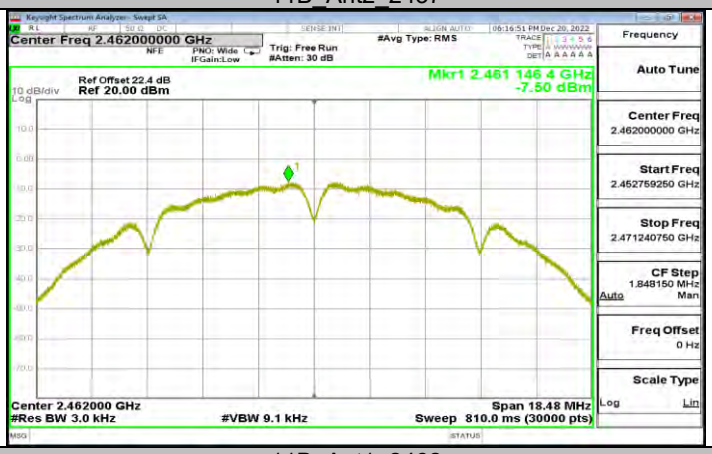
11B_Ant2_2412



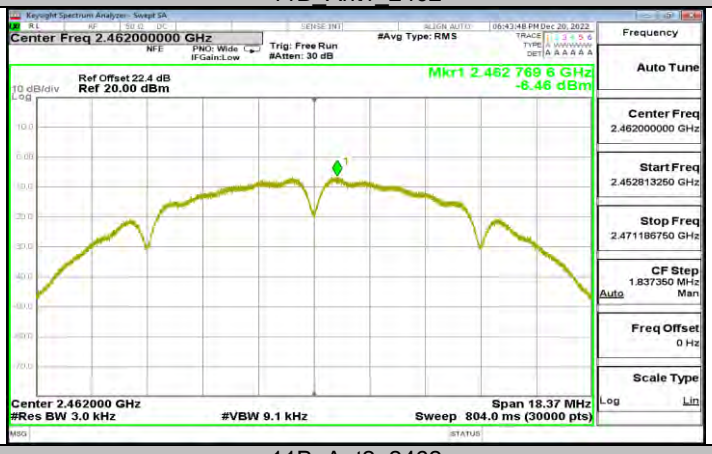
11B_Ant1_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.

11B_Ant2_2437

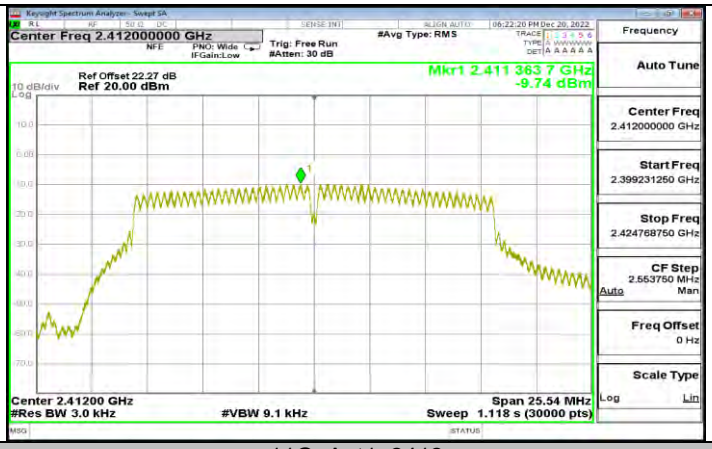


11B_Ant1_2462

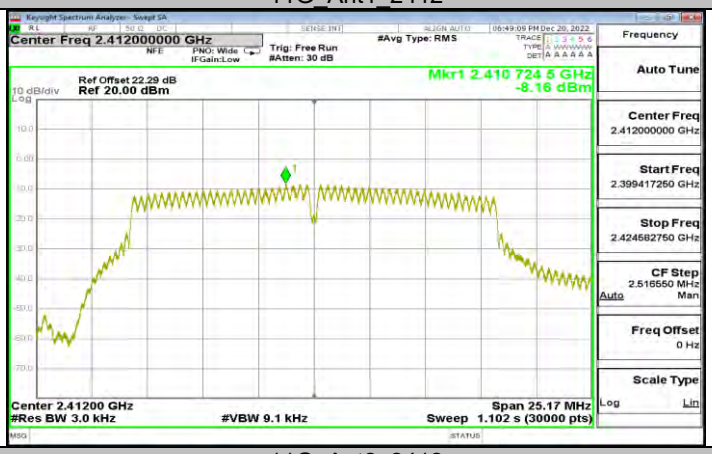


11B_Ant2_2462

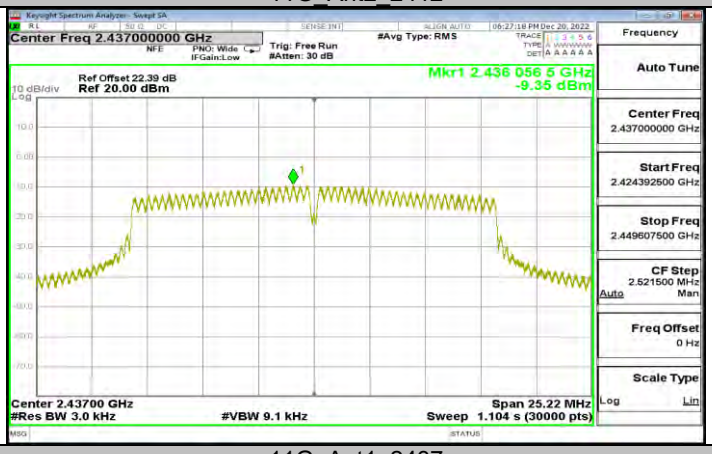
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11G_Ant1_2412



11G_Ant2_2412



11G_Ant1_2437

This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.