CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Intelligent Control System

MODEL NUMBER: SuperX5 Pro

FCC ID:2A46G-SUPERX5PRO

REPORT NUMBER: 4791353869-1-RF-6

ISSUE DATE: September 5, 2024

Prepared for

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Prepared by

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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	September 5, 2024	Initial Issue	

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Summary of Test Results

Test Item	Clause	Limit/Requirement	Result
Antenna Requirement	N/A	FCC Part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	ANSI C63.10-2013, Clause 6.2	FCC Part 15.207	N/A (Note 1)
Conducted Output Power	ANSI C63.10-2013, Clause 11.9.2.3.1	FCC Part 15.247 (b)(3)	Pass
6dB Bandwidth and 99% Occupied Bandwidth	ANSI C63.10-2013, Clause 11.8.1	FCC Part 15.247 (a)(2)	Pass
Power Spectral Density	ANSI C63.10-2013, Clause 11.10.5	FCC Part 15.247 (e)	Pass
Conducted Band edge and spurious emission	ANSI C63.10-2013, Clause 11.11	FCC Part 15.247(d)	Pass
Radiated Band edge and Spurious Emission	ANSI C63.10-2013, Clause 11.12 & Clause 11.13	FCC Part 15.247 (d) FCC Part 15.205/15.209	Pass
Duty Cycle	ANSI C63.10-2013, Clause 11.6	None; for reporting purposes only.	Pass

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

Note:
1. N/A: In this whole report not applicable.

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Guangzhou Xaircraft Technology CO., LTD
Address:	Block C, No.115, Gaopu Road, Tianhe District, GuangzhouCity, Guangdong, P.R. 510663 China

Manufacturer Information

Company Name:	Guangzhou Xaircraft Technology CO., LTD
Address:	Block C, No.115, Gaopu Road, Tianhe District, GuangzhouCity, Guangdong, P.R. 510663 China

EUT Information

EUT Name:	Intelligent Control System
Model:	SuperX5 Pro
Sample Received Date:	June 4, 2024
Sample Status:	Normal
Sample ID:	7284012
Date of Tested:	June 26, 2024 to September 5, 2024

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

Prepared By:

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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, 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-20192, C-20153, T-20155 and R-20202)** 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-20192 and R-20202 Shielding Room B, the VCCI registration No. is C-20153 and T-20155

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.

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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)
Duty Cycle	±0.028%
DTS and 99% Occupied Bandwidth	±0.0196%
Maximum Conducted Output Power	±0.686 dB
Maximum Power Spectral Density Level	±0.743 dB
Conducted Band-edge Compliance	±1.328 dB
Conducted Unwanted Emissions In Non-restricted Frequency Bands	±0.746 dB (9 kHz ~ 1 GHz)
	±1.328dB (1 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Intelligent Control System
Model	SuperX5 Pro

Frequency Band:	2400 MHz to 2483.5 MHz
Frequency Range:	2412 MHz to 2462 MHz
Support Standards:	CFR 47 FCC PART 15 SUBPART C
Type of Modulation:	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g/n: OFDM(64-QAM, 16-QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n: Up to MCS7
Radio Technology:	IEEE 802.11b/g/n HT20/11n HT40
Antenna Type:	PCB Antenna
Antenna Gain:	WIFI L: 2.73 dBi, WIFI R: 2.73 dBi
Normal Test Voltage:	DC 24 V
EUT Test software:	ART2

5.2. CHANNEL LIST

Channel List For Bandwidth=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 Bandwidth=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	/	/

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5.3. MAXIMUM POWER

IEEE Std. 802.11	Frequency (MHz)	Channel Number	Maximum Conducted AVG Output Power (dBm)
b	2412 ~ 2462	1-11[11]	17.49
g	2412 ~ 2462	1-11[11]	17.56
n HT20	2412 ~ 2462	1-11[11]	19.38
n HT40	2422 ~ 2452	3-9[7]	18.53

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
n HT20	CH 1(Low Channel), CH 6(MID Channel), CH 11(High Channel)	2412 MHz, 2437 MHz, 2462 MHz
n HT40	CH 3(Low Channel), CH 6(MID Channel), CH 9(High Channel)	2422 MHz, 2437 MHz, 2452 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band		
Test Software	ART2	
Mode	Freq(MHz)	Power setting
802.11b	2412	17.0
	2437	18.0
	2462	17.5
802.11g	2412	16.0
	2437	17.5
	2462	17.0
802.11n 20M	2412	15.0
	2437	17.0
	2462	16.0
802.11n 40M	2422	14.0
	2437	15.5
	2452	15.0

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5.6. WORST-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 as provided by the client were:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0

802.11b/g only support SISO mode, 802.11n HT20/HT40 support SISO and MIMO mode.

802.11a SISO mode, Antenna 1 and Antenna 2 has the same power setting, so only Antenna 1 worst case test data were recorded in the report.

802.11n SISO mode and MIMO mode have the same power setting, so only the worst case power mode(MIMO) will be record in the 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.

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.

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5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	PCB antenna	2.73
2	2412-2462	PCB antenna	2.73

Test Mode	Transmit and Receive Mode	Description
IEEE 802.11b	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11g	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11n HT20	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
IEEE 802.11n HT40	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.

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5.8. SUPPORT UNITS FOR SYSTEM TEST

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	Lenovo	E42-80	R303U5AG
2	DC power supply	SophPower	ADC50-10D	50V 10A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	RJ45	/	/	0.3	/

ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	GPS ant.	/	/	/
2	Cellular ant.	/	/	/
3	Sensor system	/	/	/
4	DC cable	/	/	/

TEST SETUP

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

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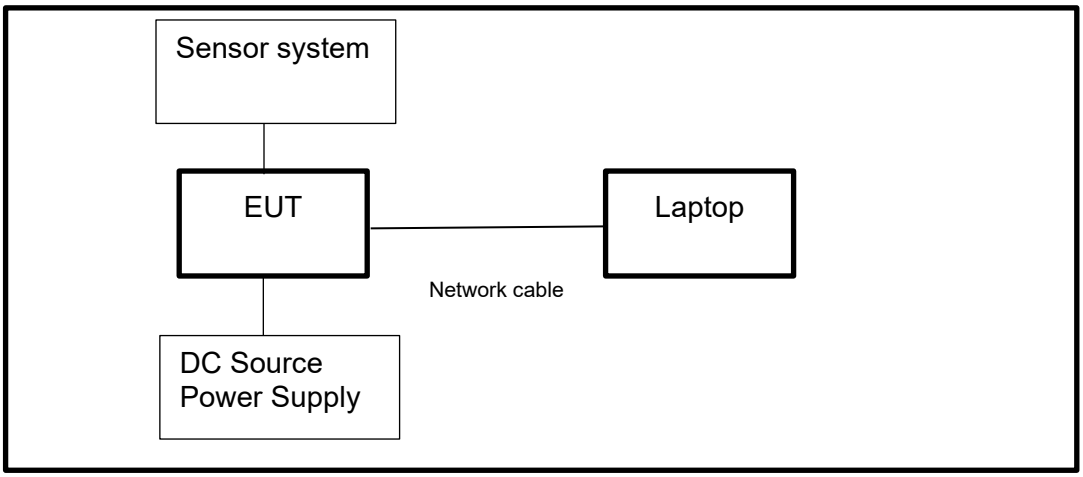
5.1. SETUP DIAGRAM



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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	Mar.25,2024	Mar.24,2025
Vector Signal Generator	R&S	SMBV100A	261637	Oct.12, 2023	Oct.11, 2024
Signal Generator	R&S	SMB100A	178553	Oct.12, 2023	Oct.11, 2024
Signal Analyzer	R&S	FSV40	101118	Oct.12, 2023	Oct.11, 2024

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.12, 2023	Oct.11, 2024
Wireless Connectivity Tester	R&S	CMW270	1201.0002N75-102	Sep.25, 2023	Sep.24, 2024
PXA Signal Analyzer	Keysight	N9030A	MY55410512	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Oct.12, 2023	Oct.11, 2024
MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Oct.12, 2023	Oct.11, 2024
DC power supply	Keysight	E3642A	MY55159130	Oct.12, 2023	Oct.11, 2024
Temperature & Humidity Chamber	SANMOOD	SG-80-CC-2	2088	Oct.12, 2023	Oct.11, 2024
Attenuator	Aglient	8495B	2814a12853	Oct.12, 2023	Oct.11, 2024
RF Control Unit	Tonscend	JS0806-2	23B80620666	Mar.25,2024	Mar.24,2025

Software			
Description	Manufacturer	Name	Version
Tonsend SRD Test System	Tonsend	JS1120-3 RF Test System	V3.2.22

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Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.12, 2023	Oct.11, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130959	Aug.02, 2021	Aug.01, 2024
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jun. 28, 2024	Jun. 27, 2027
Preamplifier	HP	8447D	2944A09099	Oct.12, 2023	Oct.11, 2024
EMI Measurement Receiver	R&S	ESR26	101377	Oct.12, 2023	Oct.11, 2024
Horn Antenna	TDK	HRN-0118	130939	April 29, 2022	April 30, 2025
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Oct.12, 2023	Oct.11, 2024
Horn Antenna	Schwarzbeck	BBHA9170	856	Feb 28, 2022	Feb 28, 2025
Preamplifier	TDK	PA-02-2	TRS-307-00003	Oct.12, 2023	Oct.11, 2024
Preamplifier	TDK	PA-02-3	TRS-308-00002	Oct.12, 2023	Oct.11, 2024
Loop antenna	Schwarzbeck	1519B	00008	Dec.14, 2021	Dec.13, 2024
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Oct.12, 2023	Oct.11, 2024
High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Oct.12, 2023	Oct.11, 2024
Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Oct.12, 2023	Oct.11, 2024

Software			
Description	Manufacturer	Name	Version
Test Software for Radiated Emissions	Farad	EZ-EMC	Ver. UL-3A1

Other Instrument					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Temperature humidity probe	OMEGA	ITHX-SD-5	18470007	Oct.21, 2023	Oct.20, 2024
Barometer	Yiyi	Baro	N/A	Oct.19, 2023	Oct.18, 2024
Attenuator	Agilent	8495B	2814a12853	Oct.12, 2023	Oct.11, 2024

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7. ANTENNA PORT TEST RESULTS

7.1. CONDUCTED OUTPUT POWER

LIMITS

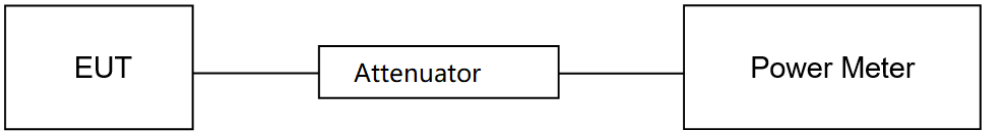
CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	AVG Output Power	1 watt or 30 dBm	2400-2483.5

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	25.6℃	Relative Humidity	61.0%
Atmosphere Pressure	101kPa	Test Voltage	DC 24 V

TEST DATE / ENGINEER

Test Date	June 26, 2024	Test By	Bairong Liu

TEST RESULTS

Please refer to section "Test Data" - Appendix C

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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

TEST PROCEDURE

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

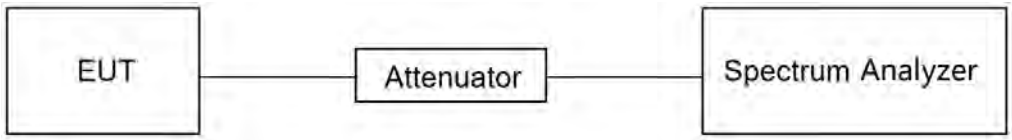
Connect the EUT to the spectrum analyzer and use the following settings:

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



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TEST ENVIRONMENT

Temperature	25.6℃	Relative Humidity	61.0%
Atmosphere Pressure	101kPa	Test Voltage	DC 24 V

TEST DATE / ENGINEER

Test Date	June 26, 2024	Test By	Bairong Liu

TEST RESULTS

Please refer to section "Test Data" - Appendix A

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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

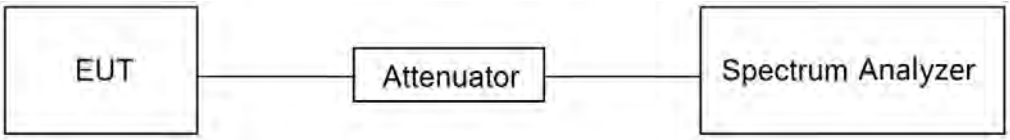
Refer to ANSI C63.10-2013 clause 11.10.2.

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	Employ trace averaging(rms)mode over a minimum of 100 traces
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	25.6℃	Relative Humidity	61.0%
Atmosphere Pressure	101kPa	Test Voltage	DC 24 V

TEST DATE / ENGINEER

Test Date	June 26, 2024	Test By	Bairong Liu

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TEST RESULTS

Please refer to section "Test Data" - Appendix D

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7.4. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

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:

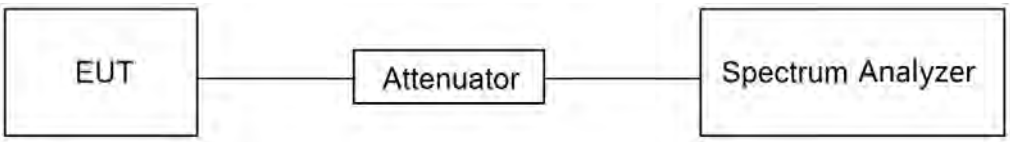
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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.

TEST SETUP



TEST ENVIRONMENT

Temperature	25.6℃	Relative Humidity	61.0%
Atmosphere Pressure	101kPa	Test Voltage	DC 24 V

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TEST DATE / ENGINEER

Test Date	June 26, 2024	Test By	Bairong Liu

TEST RESULTS

Please refer to section "Test Data" - Appendix E

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7.5. DUTY CYCLE

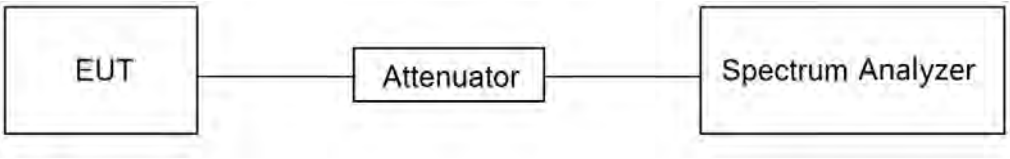
LIMITS

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	25.6℃	Relative Humidity	61.0%
Atmosphere Pressure	101kPa	Test Voltage	DC 24 V

TEST DATE / ENGINEER

Test Date	June 26, 2024	Test By	Bairong Liu

TEST RESULTS

Please refer to section "Test Data" - Appendix G

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8. RADIATED TEST RESULTS

LIMITS

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

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

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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

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

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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.

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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.

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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.

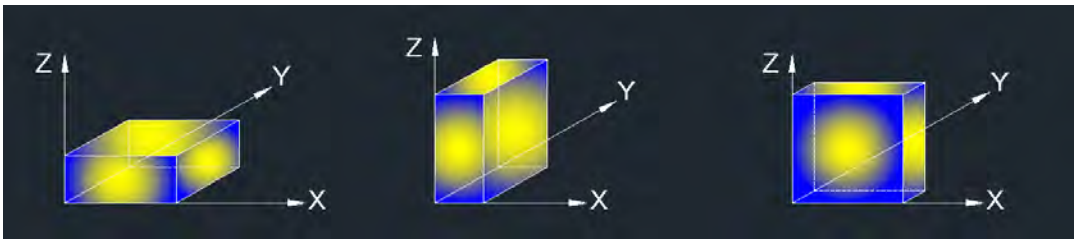
3. The EUT was placed on a turntable with 1.5 m above ground.

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.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

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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. PK=Peak: Peak detector.
4. AV=Average: 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 have been tested, but 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 have been tested, but only the worst data was recorded in the report.
5. dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5

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 have been tested, but only the worst data was recorded in the report.

For Radiate Spurious Emission (1 GHz ~ 3 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. 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 have been tested, but only the worst data was recorded in the report.

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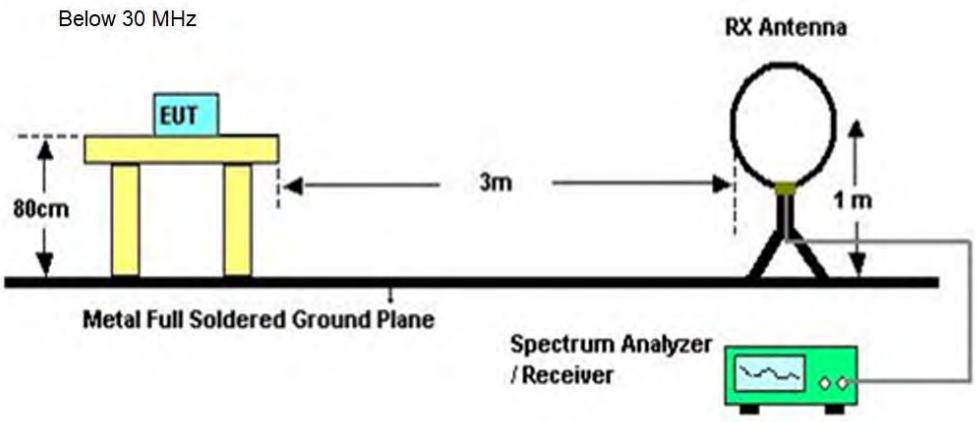
For Radiate Spurious Emission (3 GHz ~ 18 GHz):
Note:
1. Peak Result = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting 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 have been tested, but 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 have been tested, but only the worst data was recorded in the report.

TEST SETUP



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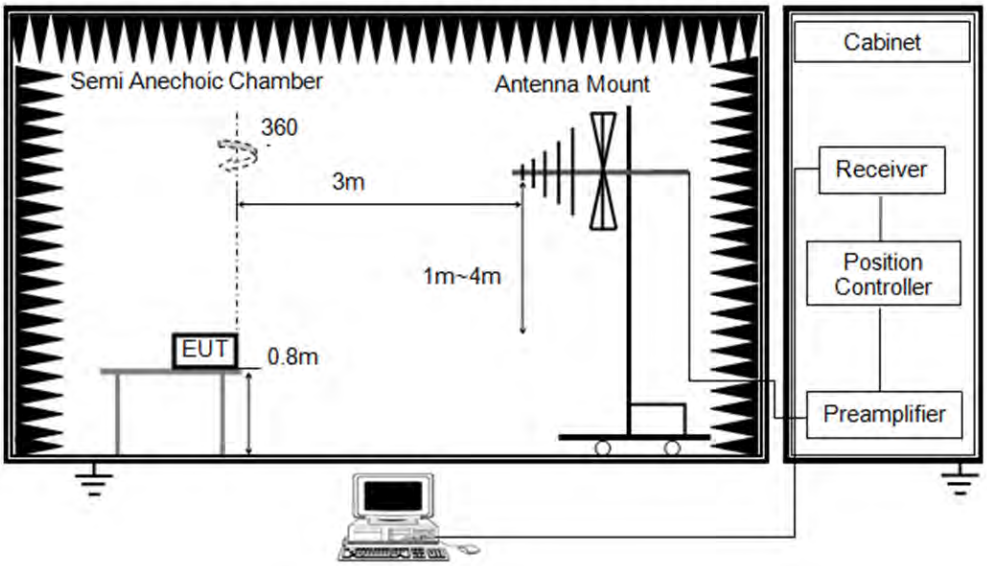
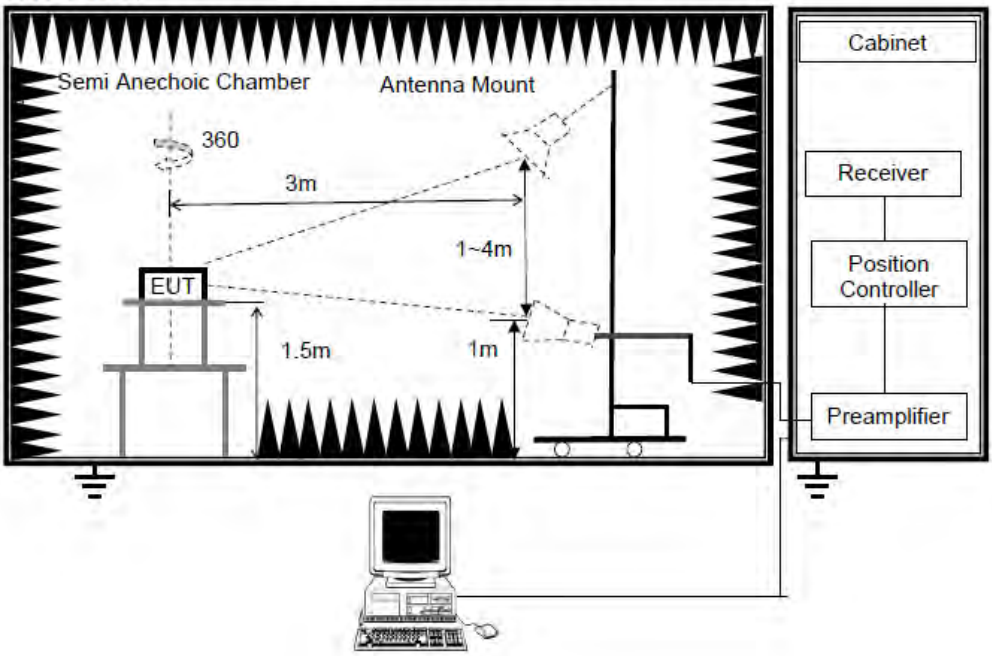
Below 1 GHz and above 30 MHz



Above 1GHz



TEST ENVIRONMENT

Temperature	23.8℃	Relative Humidity	56.2%
Atmosphere Pressure	101kPa	Test Voltage	

TEST DATE / ENGINEER

Test Date	September 4, 2024	Test By	Mason Wang

TEST RESULTS

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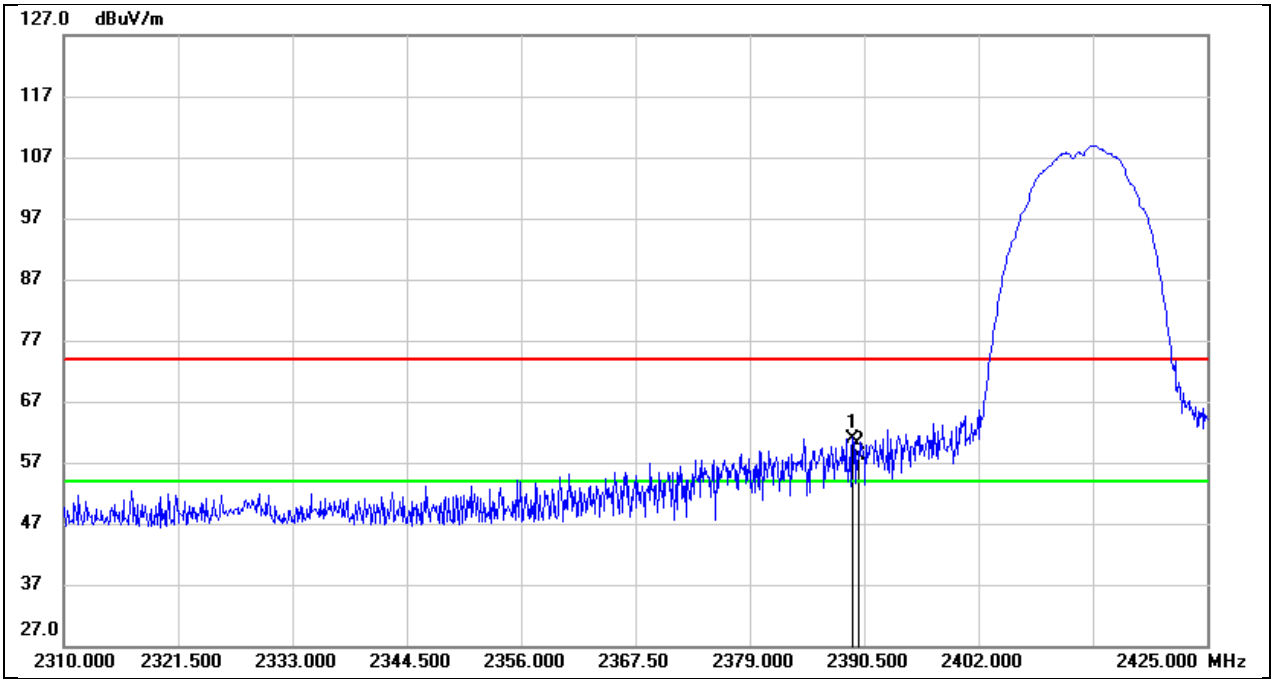
8.1. RESTRICTED BANDEDGE

Test Mode:	802.11b PK	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.350	28.21	32.79	61.00	74.00	-13.00	peak
2	2390.000	25.32	32.79	58.11	74.00	-15.89	peak

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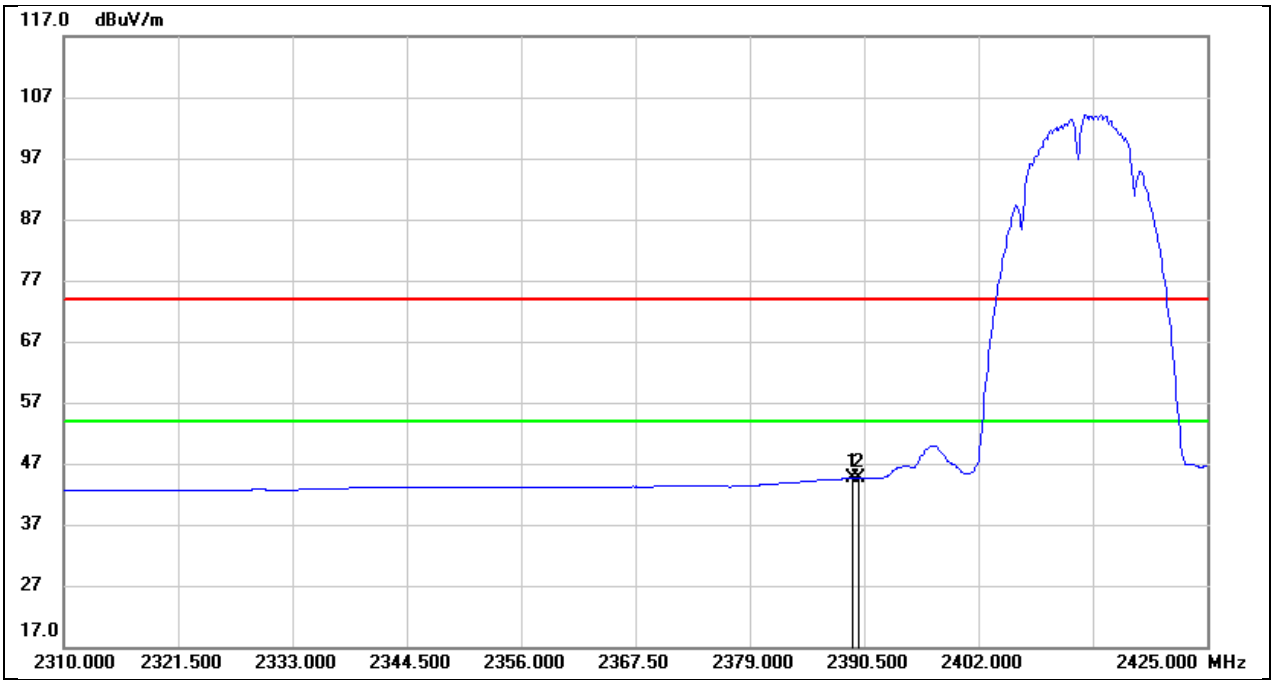
Test Mode:	802.11b AV	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.350	11.81	32.79	44.60	54.00	-9.40	AVG
2	2390.000	11.79	32.79	44.58	54.00	-9.42	AVG

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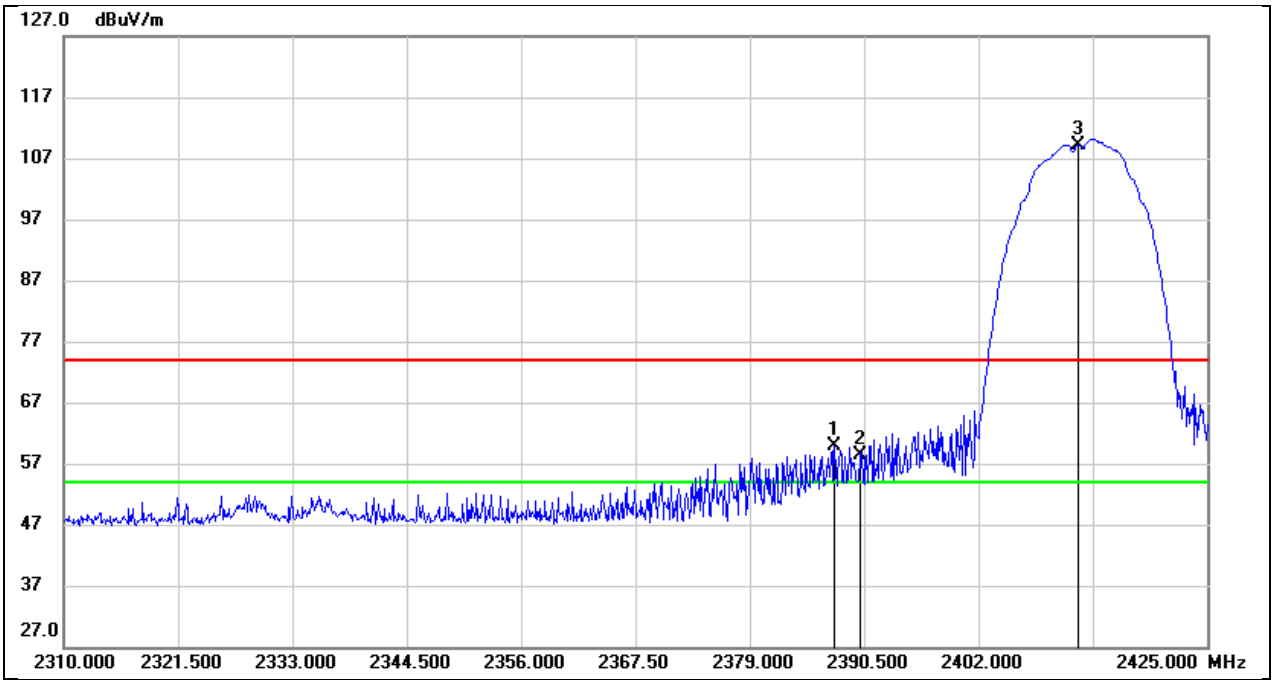
Test Mode:	802.11b PK	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.510	26.21	33.60	59.81	74.00	-14.19	peak
2	2390.000	24.83	33.61	58.44	74.00	-15.56	peak
3	2412.000	75.45	33.64	109.09	\	\	fundermental

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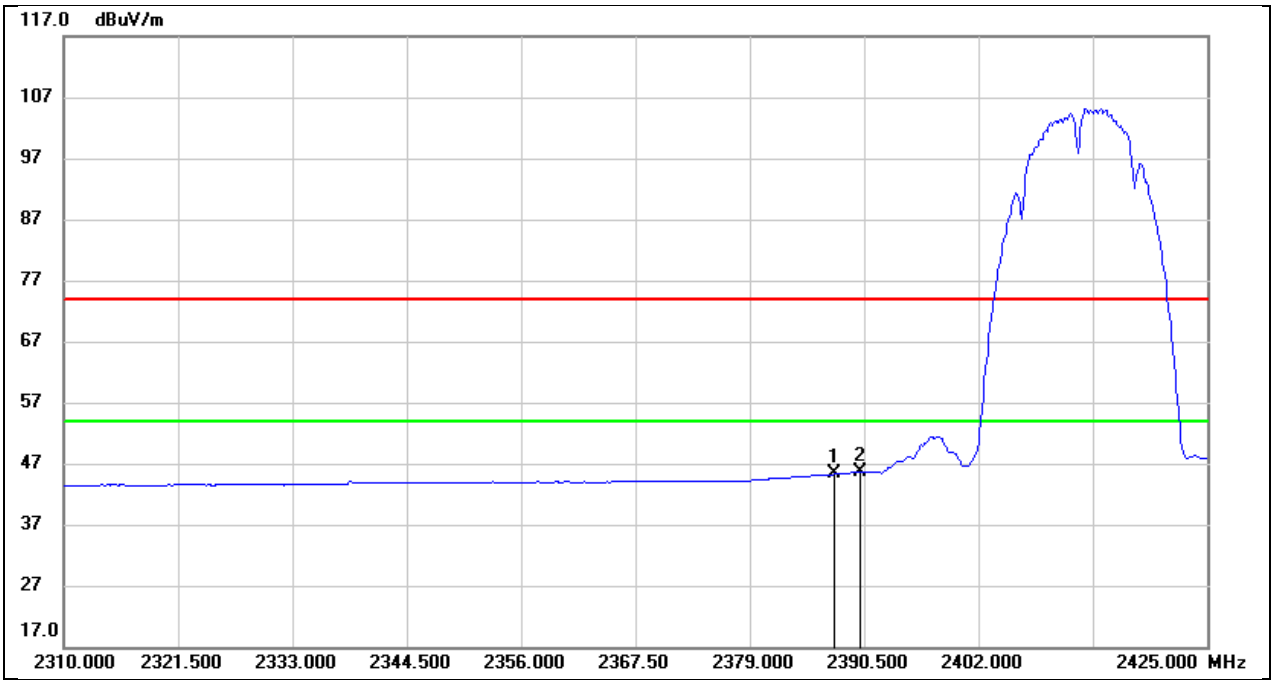
Test Mode:	802.11b AV	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2387.510	11.68	33.60	45.28	54.00	-8.72	AVG
2	2390.000	11.94	33.61	45.55	54.00	-8.45	AVG

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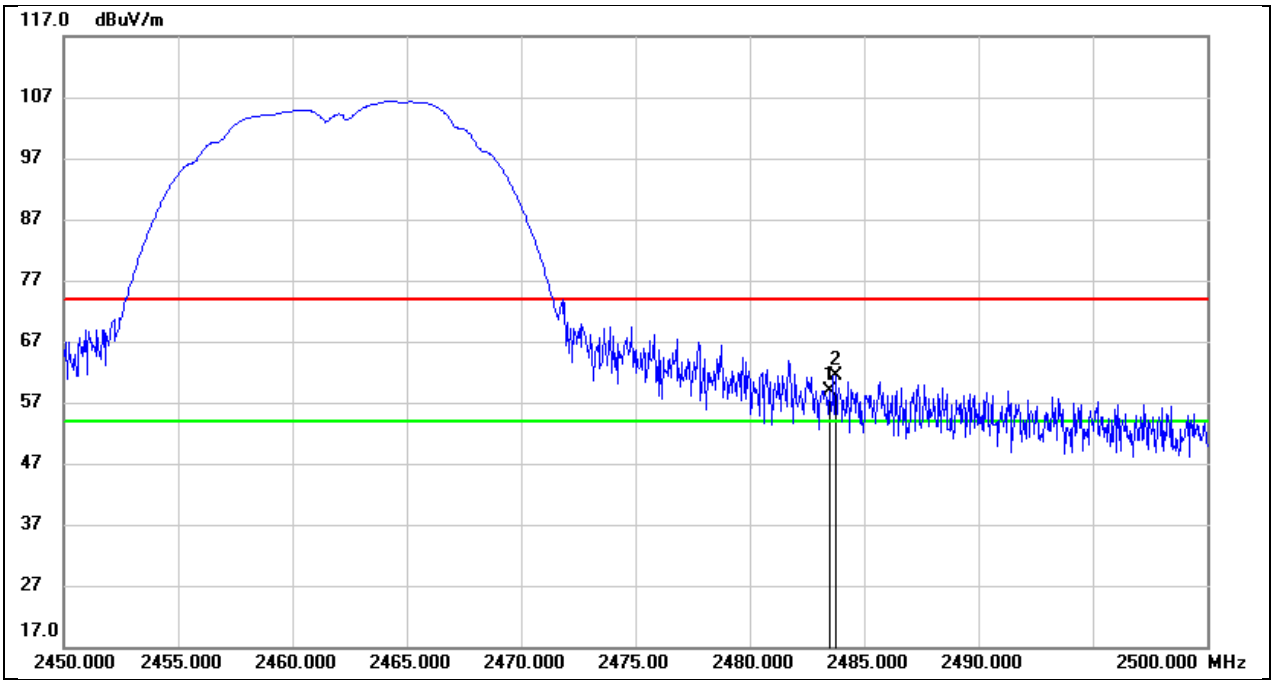
Test Mode:	802.11b PK	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	25.30	33.55	58.85	74.00	-15.15	peak
2	2483.750	27.88	33.55	61.43	74.00	-12.57	peak

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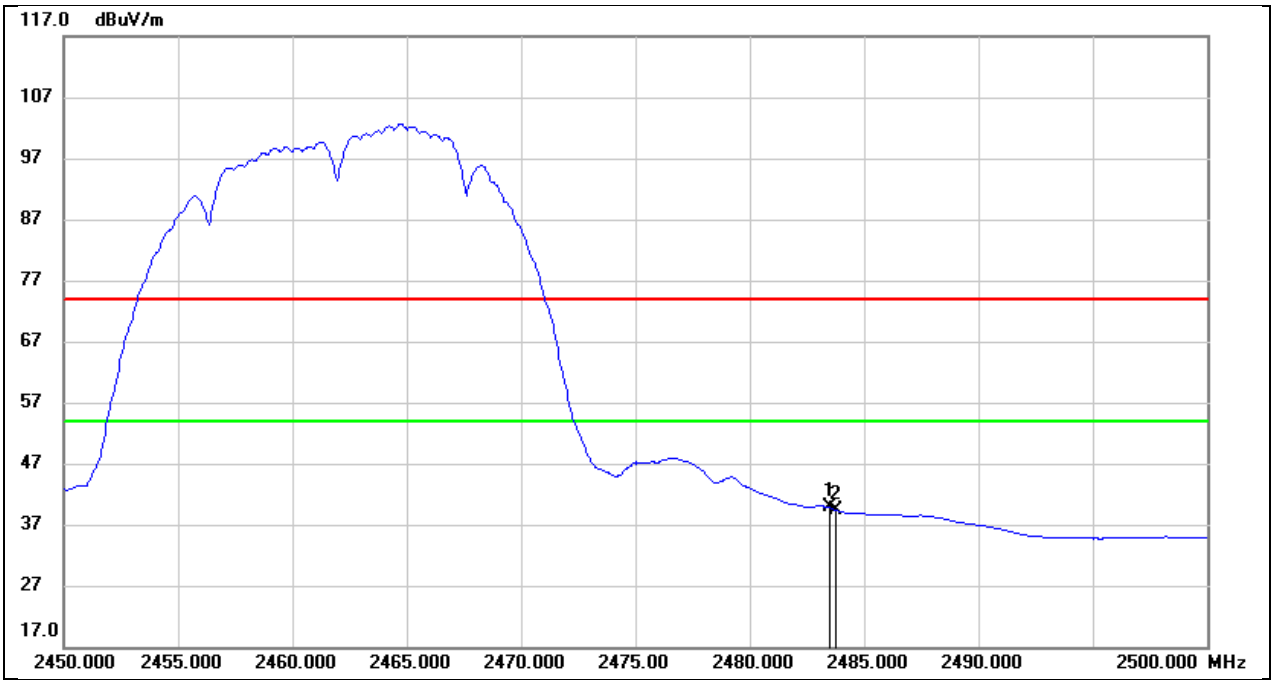
Test Mode:	802.11b AV	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	6.21	33.55	39.76	54.00	-14.24	AVG
2	2483.750	5.85	33.55	39.40	54.00	-14.60	AVG

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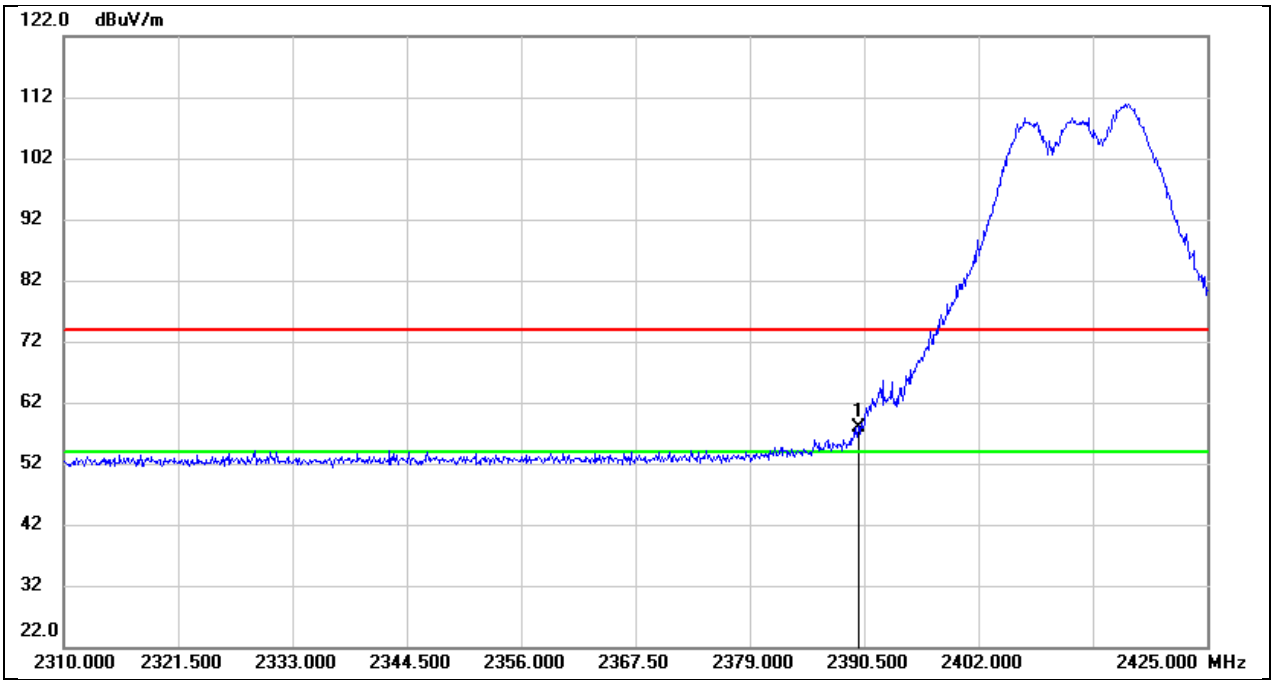
Test Mode:	802.11g PK	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	24.28	33.61	57.89	74.00	-16.11	peak

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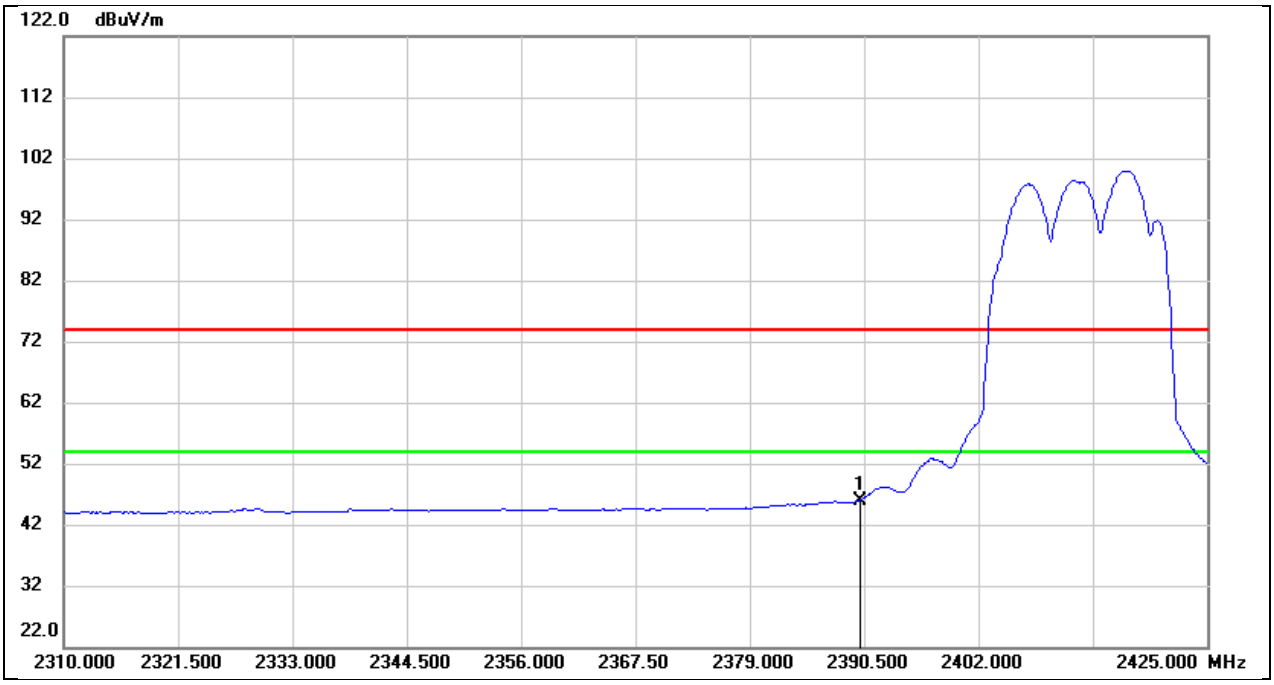
Test Mode:	802.11g AV	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	12.37	33.61	45.98	54.00	-8.02	AVG

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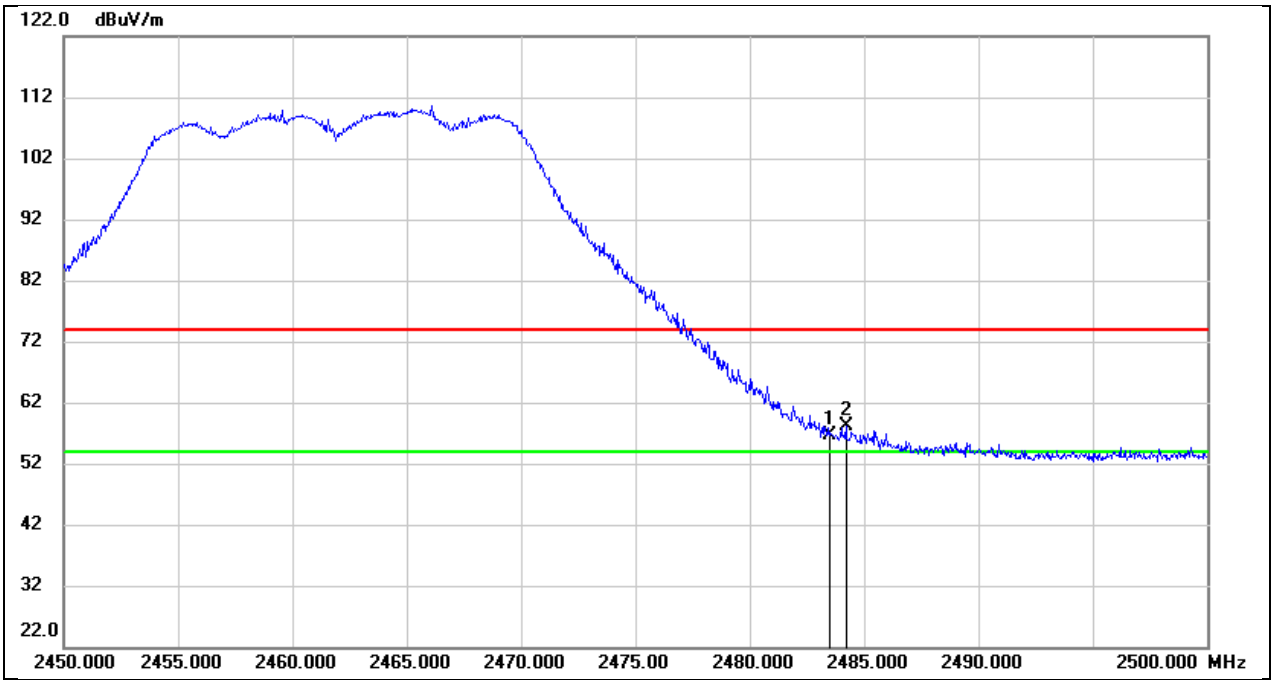
Test Mode:	802.11g PK	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	22.96	33.55	56.51	74.00	-17.49	peak
2	2484.200	24.50	33.55	58.05	74.00	-15.95	peak

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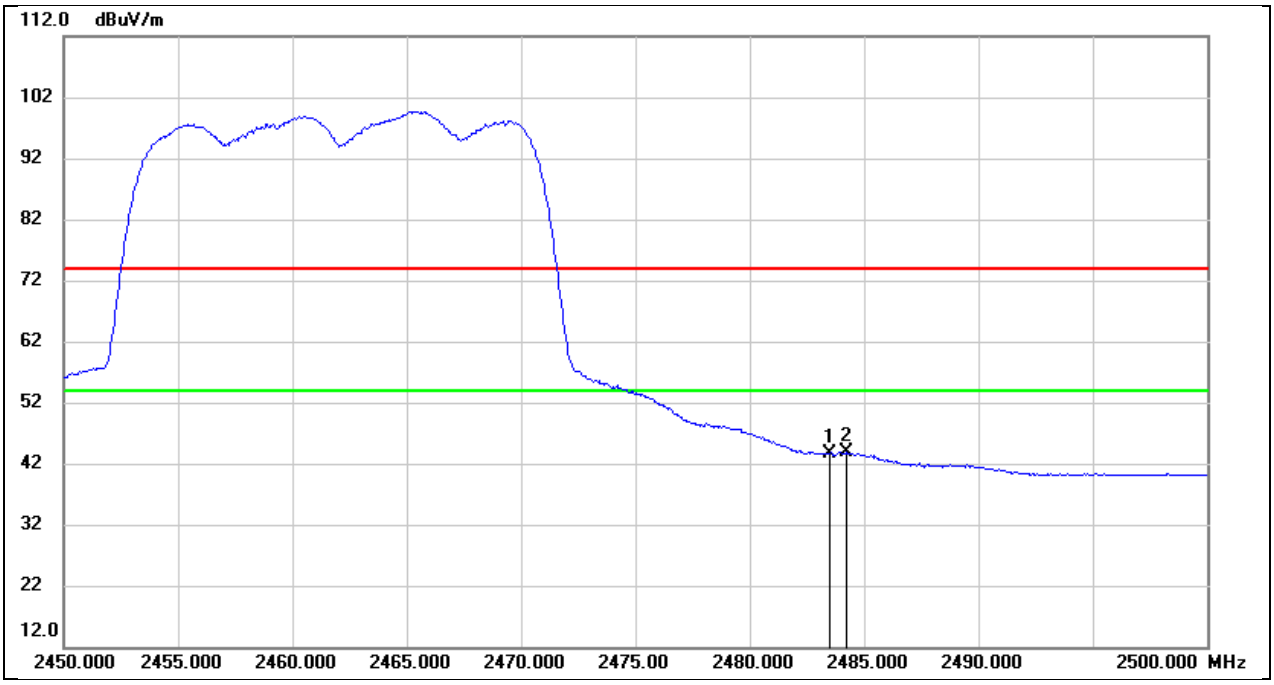
Test Mode:	802.11g AV	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	10.09	33.55	43.64	54.00	-10.36	AVG
2	2484.200	10.22	33.55	43.77	54.00	-10.23	AVG

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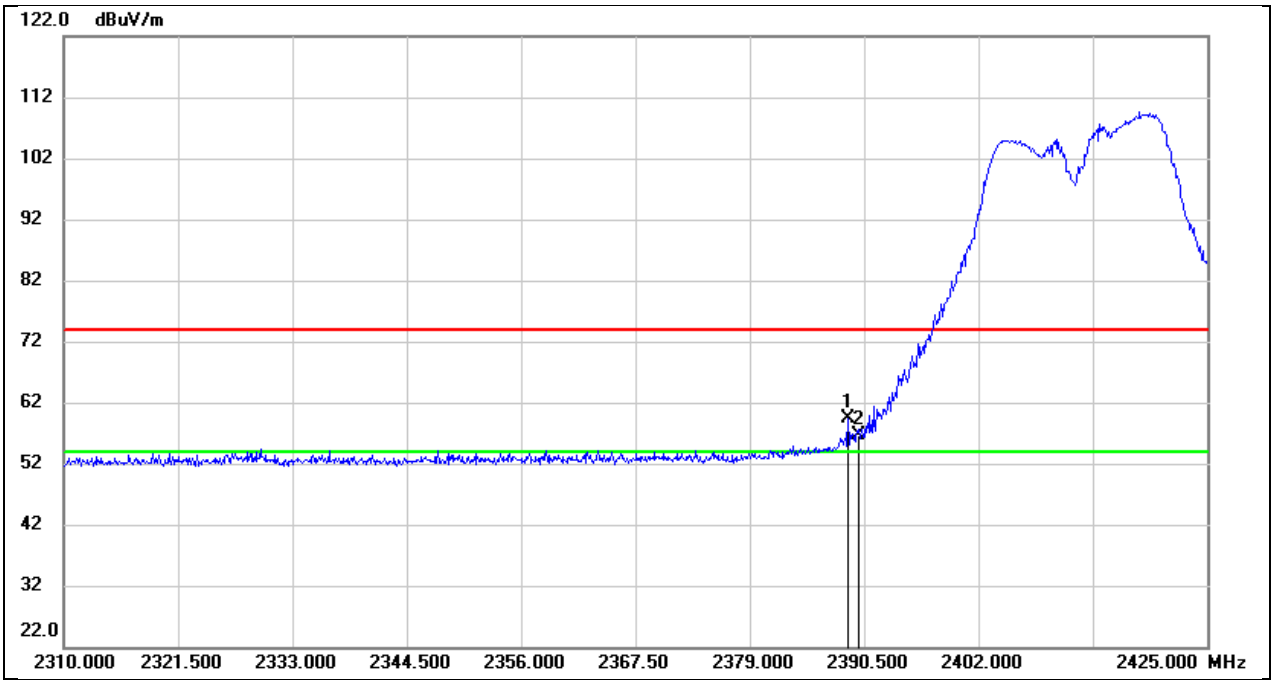
Test Mode:	802.11n HT20 PK	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.890	25.80	33.61	59.41	74.00	-14.59	peak
2	2390.000	23.09	33.61	56.70	74.00	-17.30	peak

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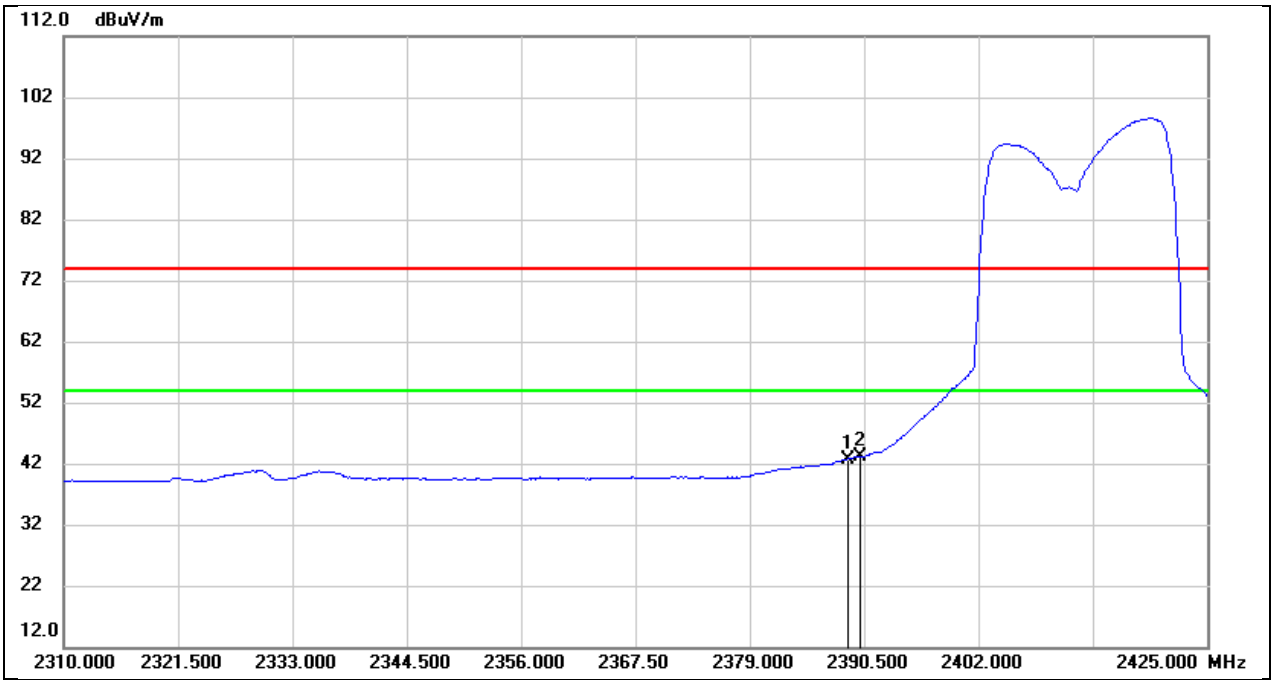
Test Mode:	802.11n HT20 AV	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.890	9.14	33.61	42.75	54.00	-11.25	AVG
2	2390.000	9.51	33.61	43.12	54.00	-10.88	AVG

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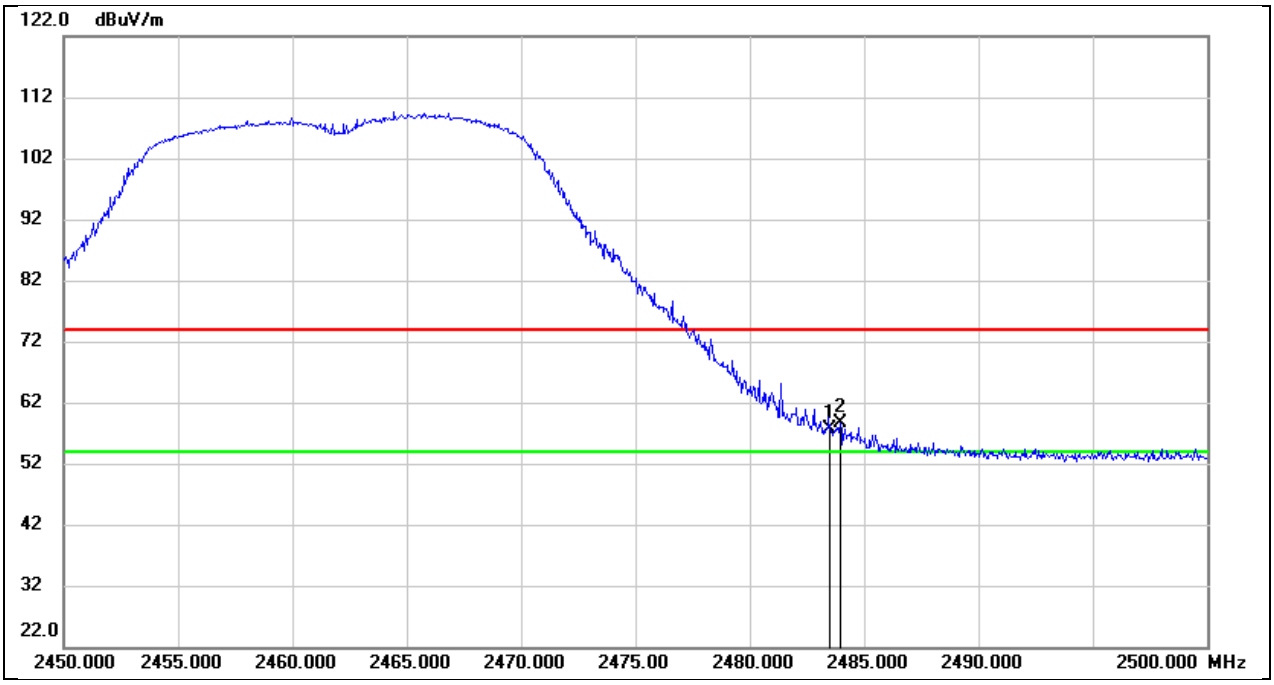
Test Mode:	802.11n HT20 PK	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	23.98	33.55	57.53	74.00	-16.47	peak
2	2483.950	25.03	33.55	58.58	74.00	-15.42	peak

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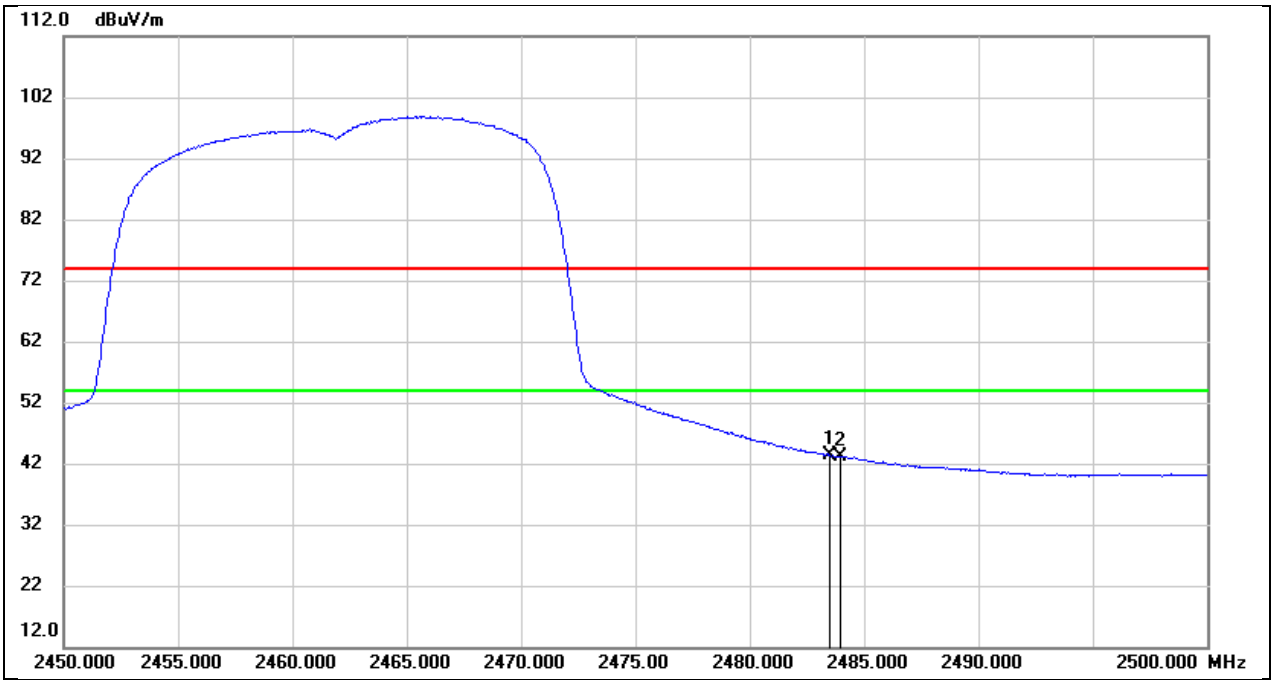
Test Mode:	802.11n HT20 AV	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	9.80	33.55	43.35	54.00	-10.65	AVG
2	2483.950	9.59	33.55	43.14	54.00	-10.86	AVG

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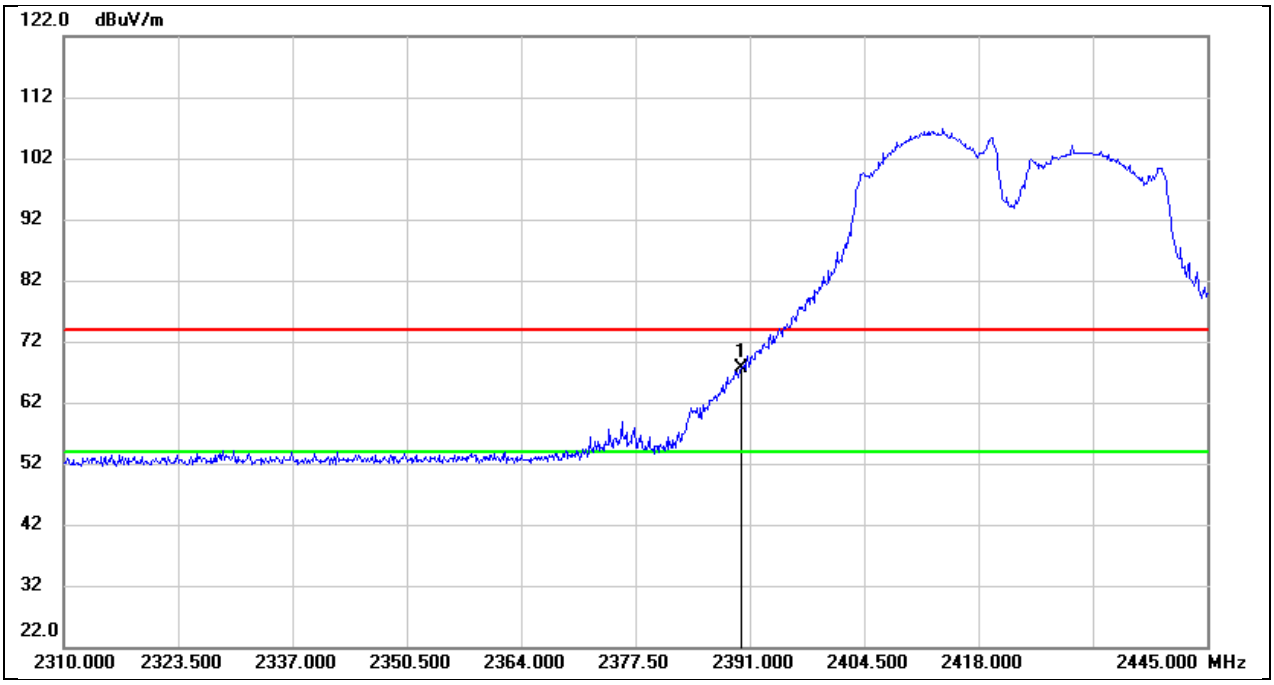
Test Mode:	802.11n HT40 PK	Frequency(MHz):	2422
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	33.94	33.61	67.55	74.00	-6.45	peak

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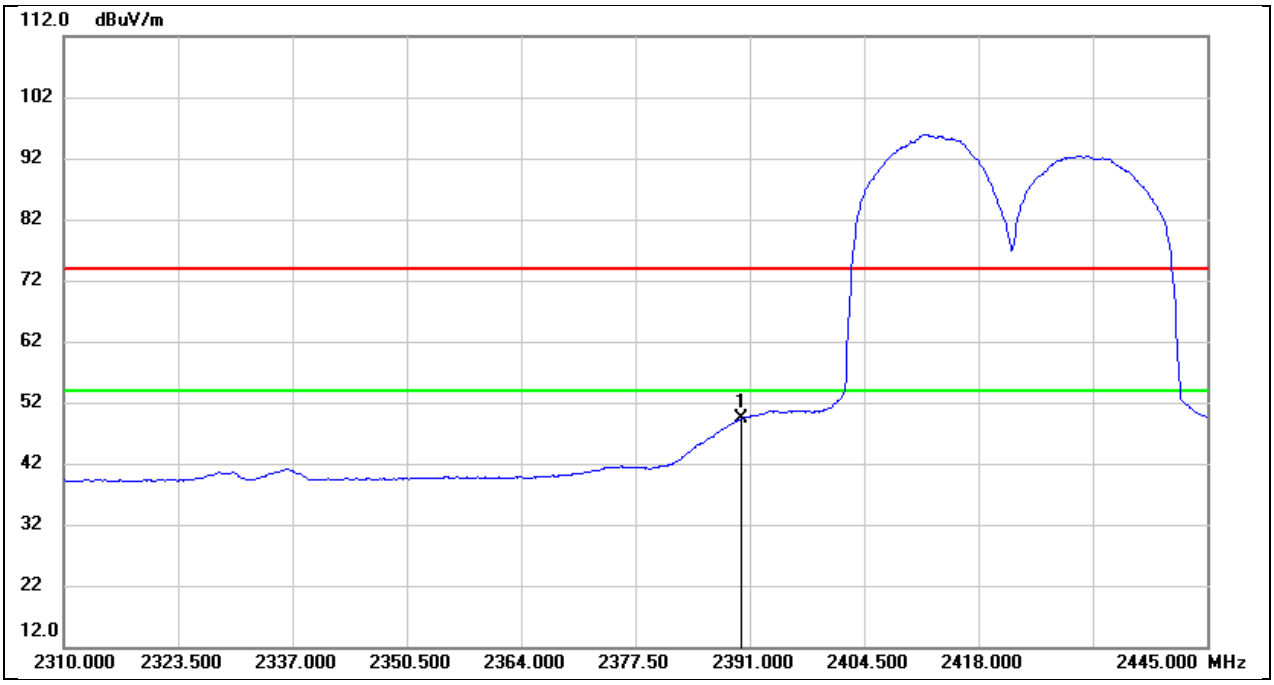
Test Mode:	802.11n HT40 AV	Frequency(MHz):	2422
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	15.75	33.61	49.36	54.00	-4.64	AVG

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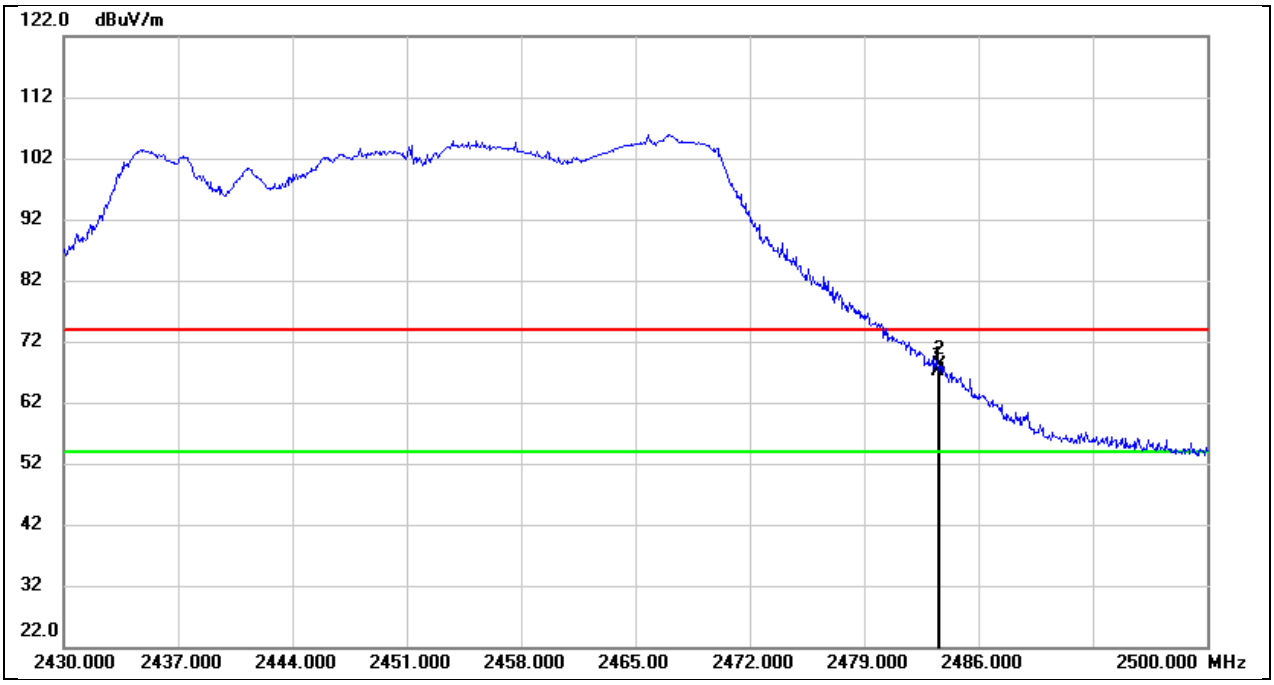
Test Mode:	802.11n HT40 PK	Frequency(MHz):	2452
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	33.67	33.55	67.22	74.00	-6.78	peak
2	2483.620	34.55	33.55	68.10	74.00	-5.90	peak

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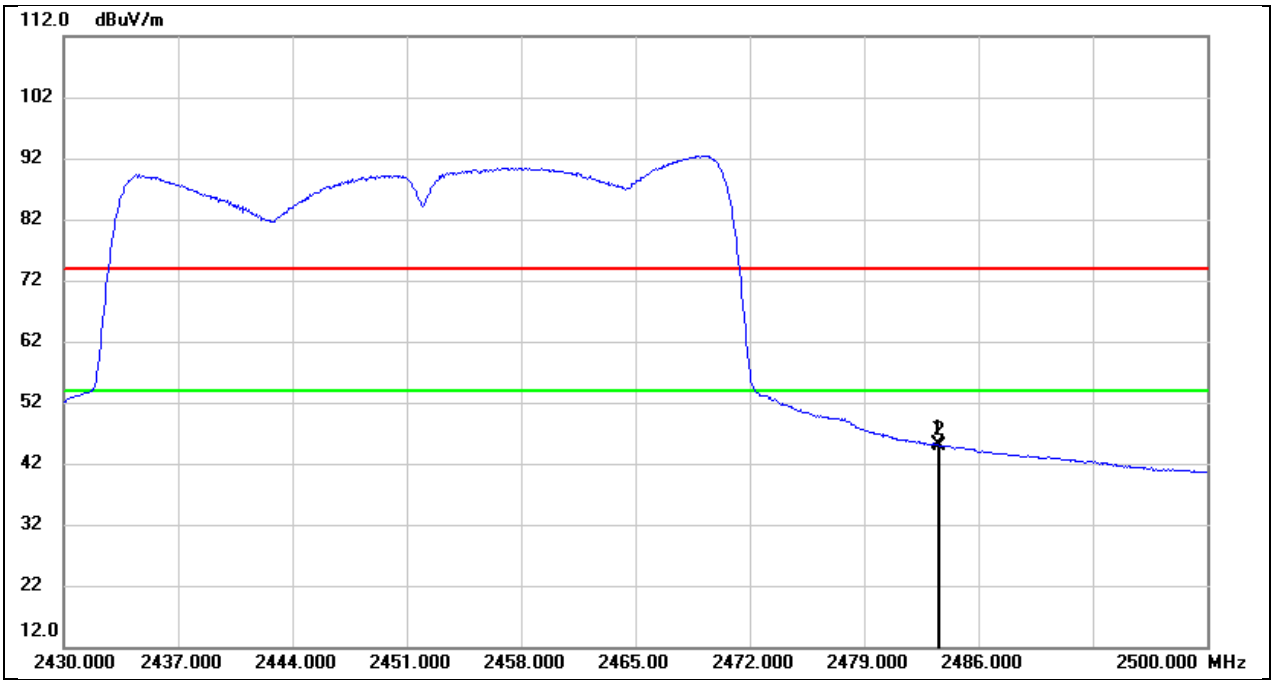
Test Mode:	802.11n HT40 AV	Frequency(MHz):	2452
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	11.58	33.55	45.13	54.00	-8.87	AVG
2	2483.620	11.44	33.55	44.99	54.00	-9.01	AVG

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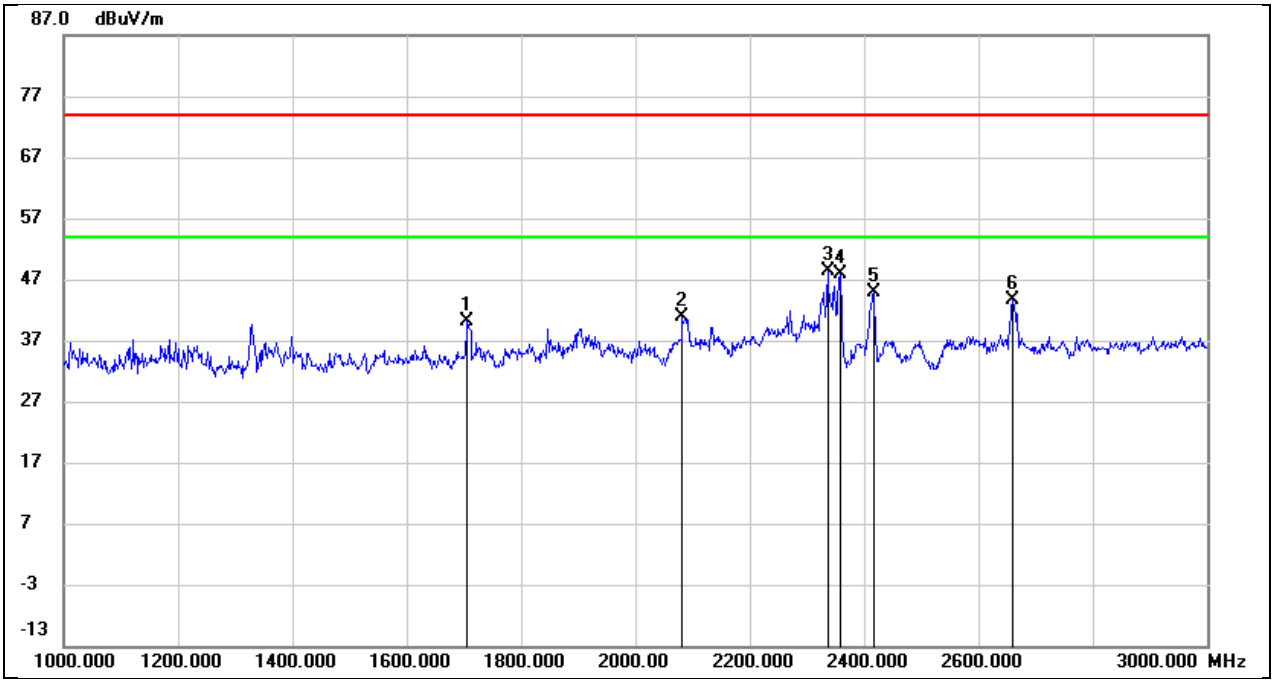
8.2. SPURIOUS EMISSIONS(1 GHZ~3 GHZ)

Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1706.000	50.93	-10.68	40.25	74.00	-33.75	peak
2	2082.000	50.40	-9.61	40.79	74.00	-33.21	peak
3	2336.000	56.31	-7.87	48.44	74.00	-25.56	peak
4	2358.000	55.47	-7.71	47.76	74.00	-26.24	peak
5	2416.000	52.32	-7.42	44.90	74.00	-29.10	peak
6	2660.000	51.04	-7.42	43.62	74.00	-30.38	peak

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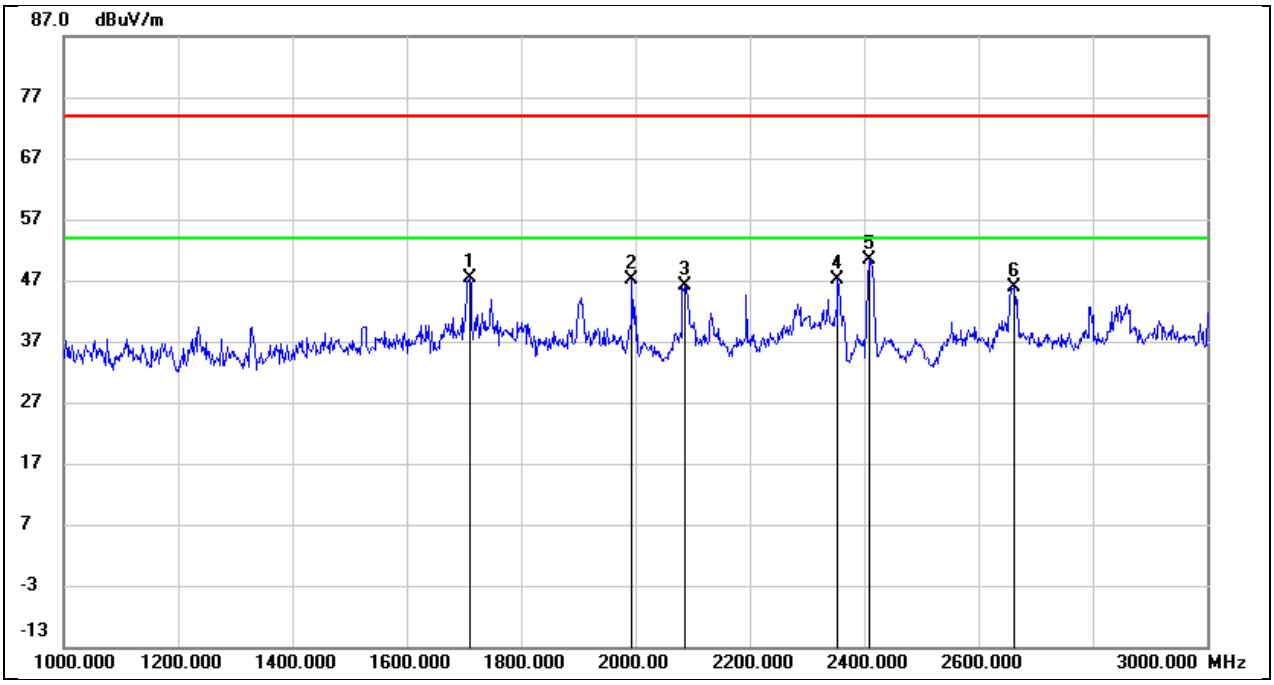
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1710.000	58.07	-10.66	47.41	74.00	-26.59	peak
2	1994.000	57.21	-10.11	47.10	74.00	-26.90	peak
3	2086.000	55.60	-9.58	46.02	74.00	-27.98	peak
4	2354.000	54.77	-7.74	47.03	74.00	-26.97	peak
5	2410.000	57.81	-7.40	50.41	74.00	-23.59	peak
6	2662.000	53.31	-7.41	45.90	74.00	-28.10	peak

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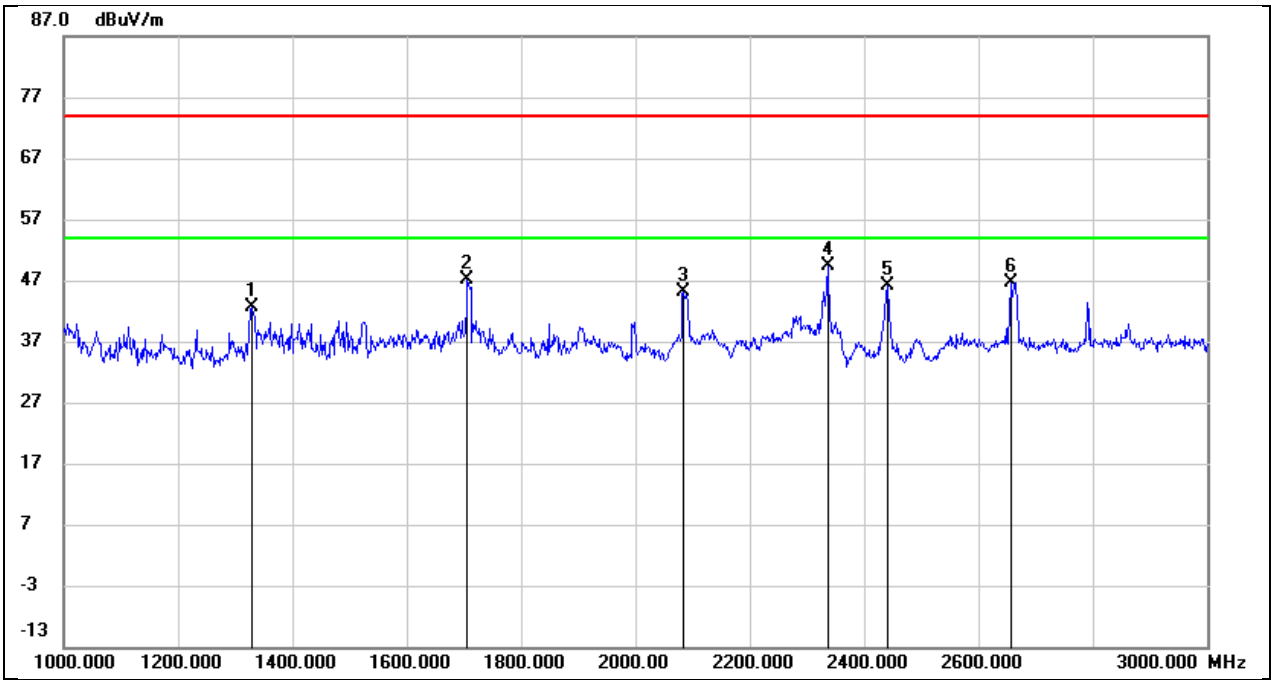
Test Mode:	802.11b	Frequency(MHz):	2437
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1328.000	55.09	-12.49	42.60	74.00	-31.40	peak
2	1706.000	57.75	-10.68	47.07	74.00	-26.93	peak
3	2084.000	54.61	-9.59	45.02	74.00	-28.98	peak
4	2336.000	57.31	-7.87	49.44	74.00	-24.56	peak
5	2440.000	53.56	-7.44	46.12	74.00	-27.88	peak
6	2658.000	54.16	-7.43	46.73	74.00	-27.27	peak

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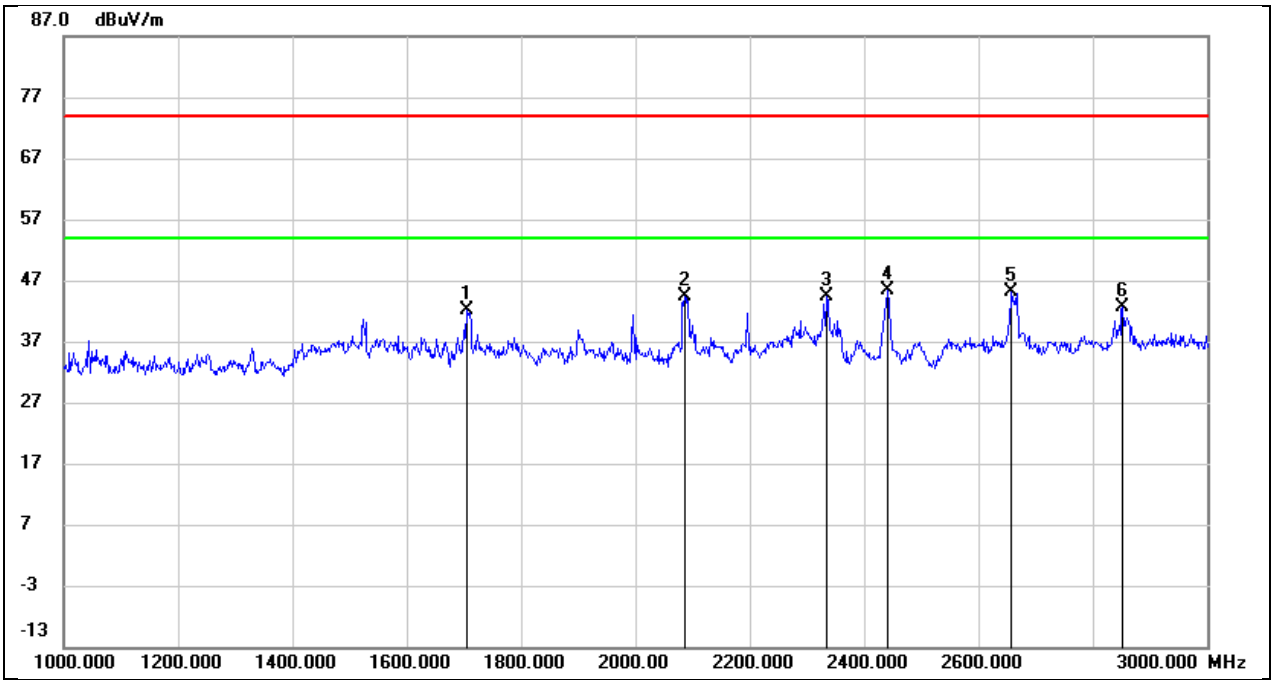
Test Mode:	802.11b	Frequency(MHz):	2437
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1704.000	52.85	-10.69	42.16	74.00	-31.84	peak
2	2086.000	53.99	-9.58	44.41	74.00	-29.59	peak
3	2334.000	52.20	-7.89	44.31	74.00	-29.69	peak
4	2442.000	52.92	-7.44	45.48	74.00	-28.52	peak
5	2658.000	52.48	-7.43	45.05	74.00	-28.95	peak
6	2852.000	49.07	-6.56	42.51	74.00	-31.49	peak

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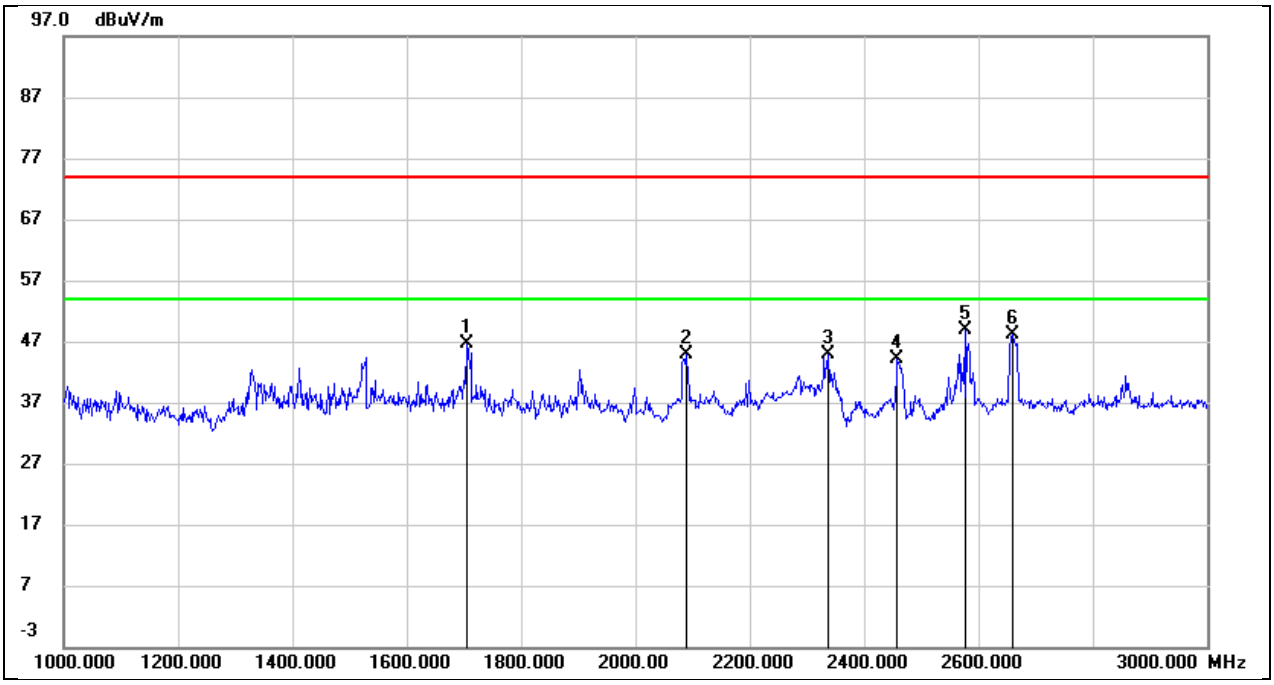
Test Mode:	802.11b	Frequency(MHz):	2462
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1706.000	57.30	-10.68	46.62	74.00	-27.38	peak
2	2088.000	54.39	-9.57	44.82	74.00	-29.18	peak
3	2338.000	52.68	-7.85	44.83	74.00	-29.17	peak
4	2458.000	51.68	-7.46	44.22	74.00	-29.78	peak
5	2576.000	56.42	-7.64	48.78	74.00	-25.22	peak
6	2660.000	55.47	-7.42	48.05	74.00	-25.95	peak

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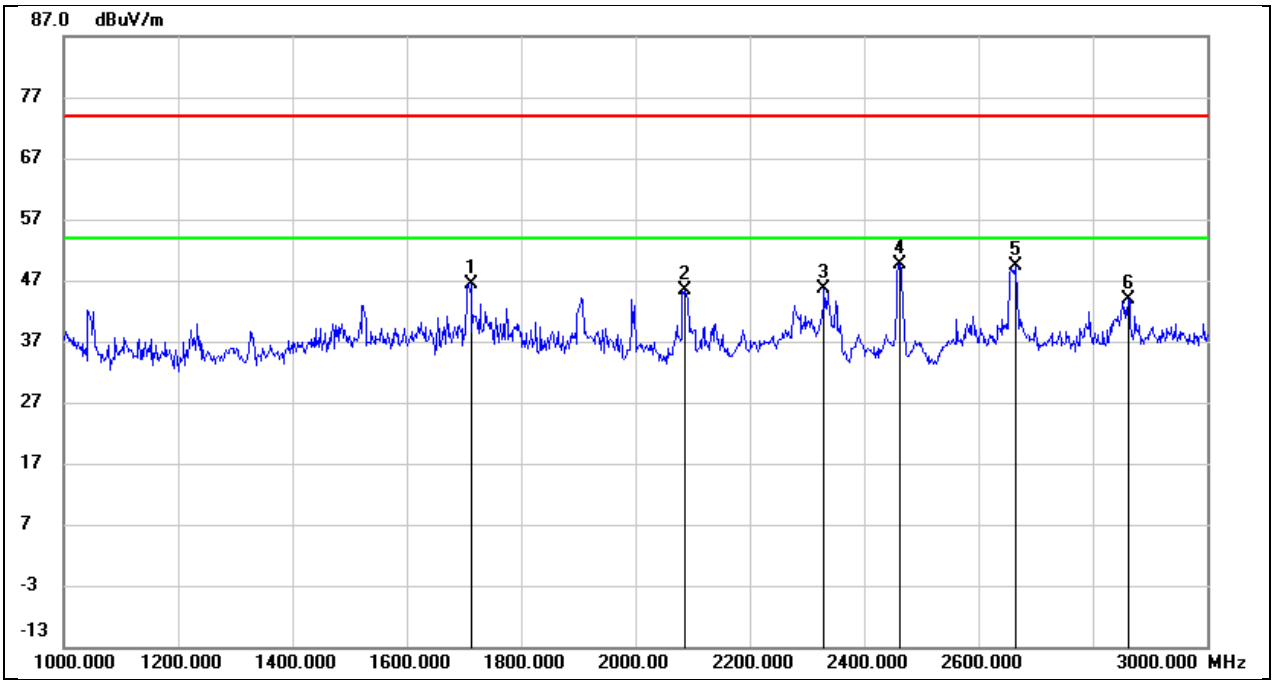
Test Mode:	802.11b	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1712.000	57.09	-10.65	46.44	74.00	-27.56	peak
2	2086.000	54.91	-9.58	45.33	74.00	-28.67	peak
3	2330.000	53.60	-7.92	45.68	74.00	-28.32	peak
4	2462.000	57.21	-7.47	49.74	74.00	-24.26	peak
5	2664.000	56.89	-7.40	49.49	74.00	-24.51	peak
6	2862.000	50.48	-6.52	43.96	74.00	-30.04	peak

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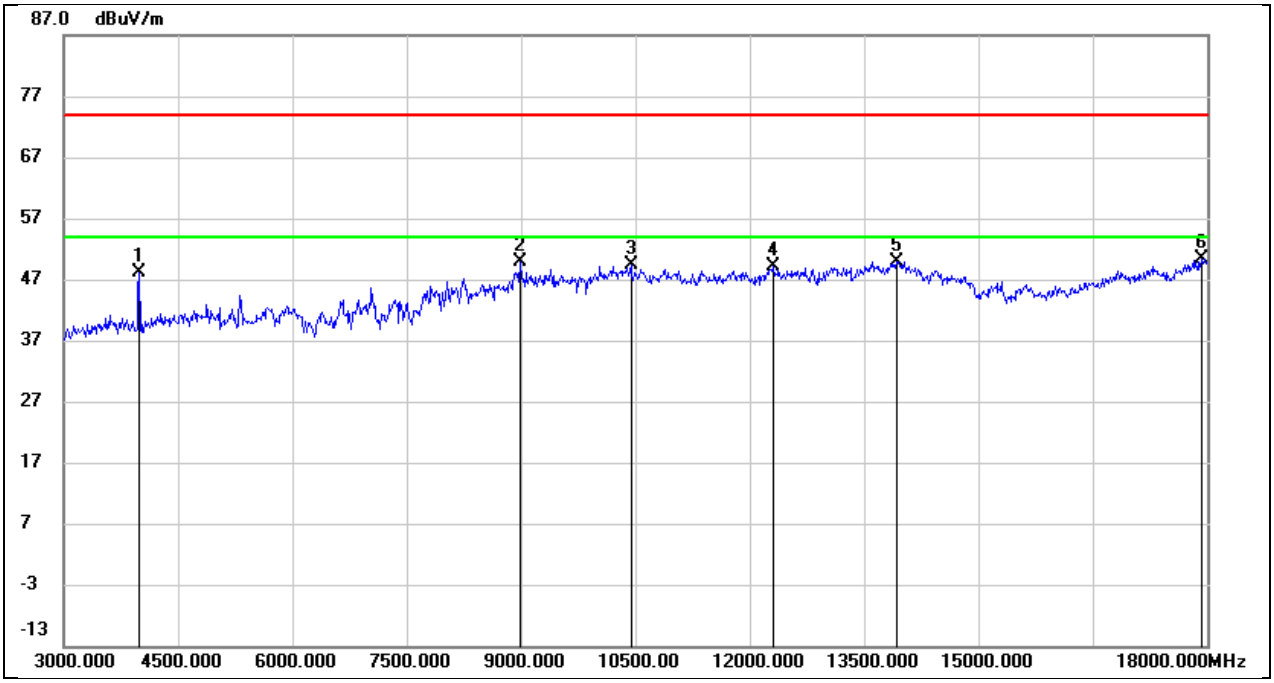
8.3. SPURIOUS EMISSIONS(3 GHZ~18 GHZ)

Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	50.83	-2.78	48.05	74.00	-25.95	peak
2	8985.000	38.87	11.07	49.94	74.00	-24.06	peak
3	10440.000	36.00	13.30	49.30	74.00	-24.70	peak
4	12300.000	30.91	18.17	49.08	74.00	-24.92	peak
5	13935.000	27.35	22.59	49.94	74.00	-24.06	peak
6	17925.000	22.56	27.93	50.49	74.00	-23.51	peak

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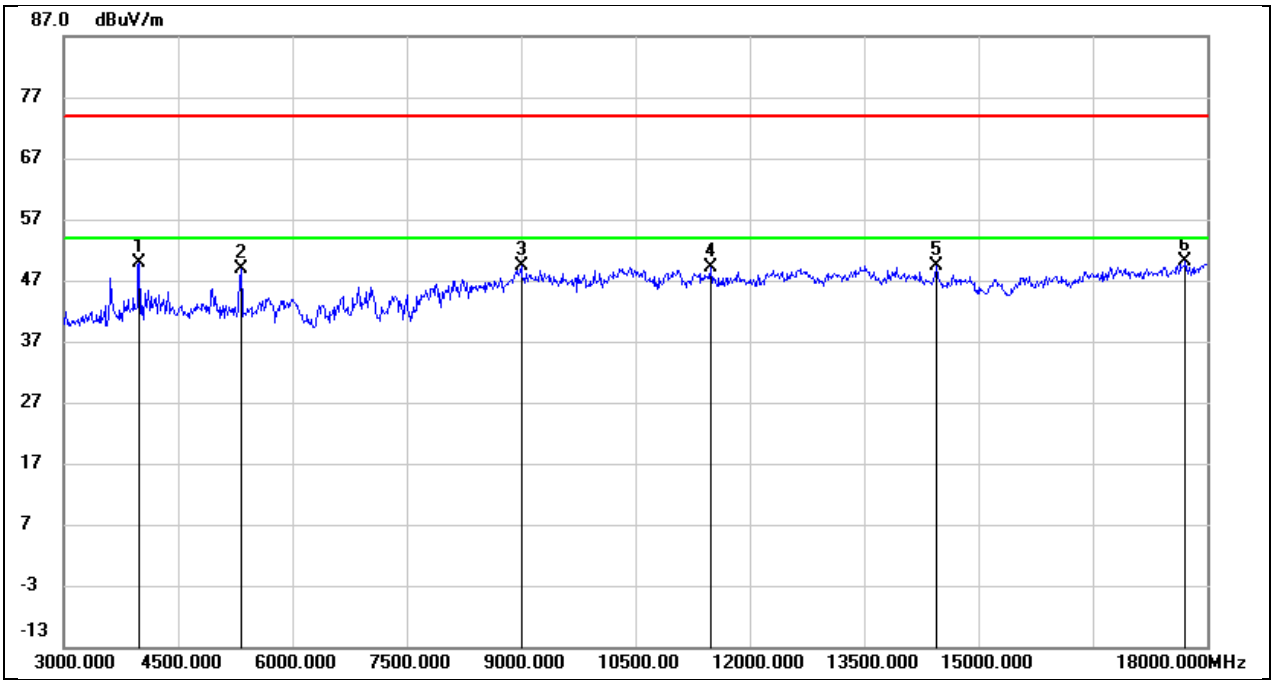
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	51.63	-1.68	49.95	74.00	-24.05	peak
2	5325.000	46.11	2.78	48.89	74.00	-25.11	peak
3	9000.000	37.61	11.67	49.28	74.00	-24.72	peak
4	11490.000	33.95	15.06	49.01	74.00	-24.99	peak
5	14445.000	29.09	20.34	49.43	74.00	-24.57	peak
6	17715.000	24.73	25.41	50.14	74.00	-23.86	peak

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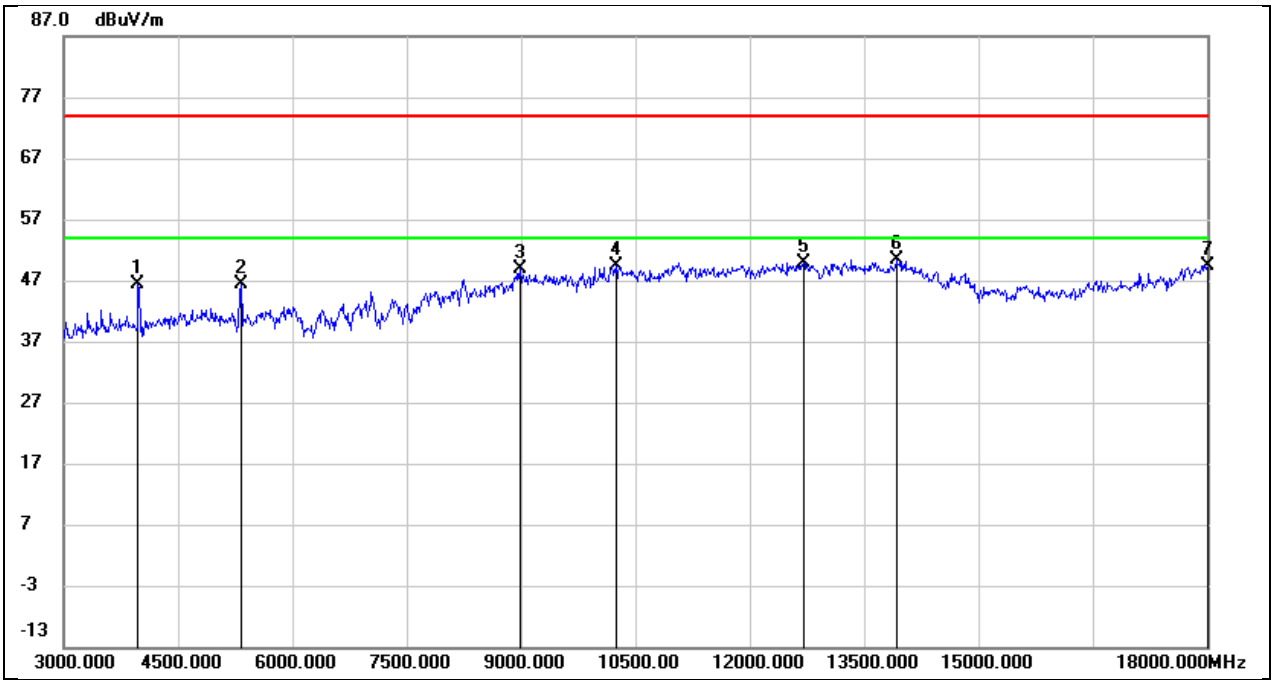
Test Mode:	802.11b	Frequency(MHz):	2437
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	49.09	-2.79	46.30	74.00	-27.70	peak
2	5325.000	44.86	1.58	46.44	74.00	-27.56	peak
3	8985.000	37.85	11.07	48.92	74.00	-25.08	peak
4	10245.000	36.78	12.61	49.39	74.00	-24.61	peak
5	12705.000	31.68	18.30	49.98	74.00	-24.02	peak
6	13920.000	27.82	22.58	50.40	74.00	-23.60	peak
7	18000.000	21.14	28.33	49.47	74.00	-24.53	peak

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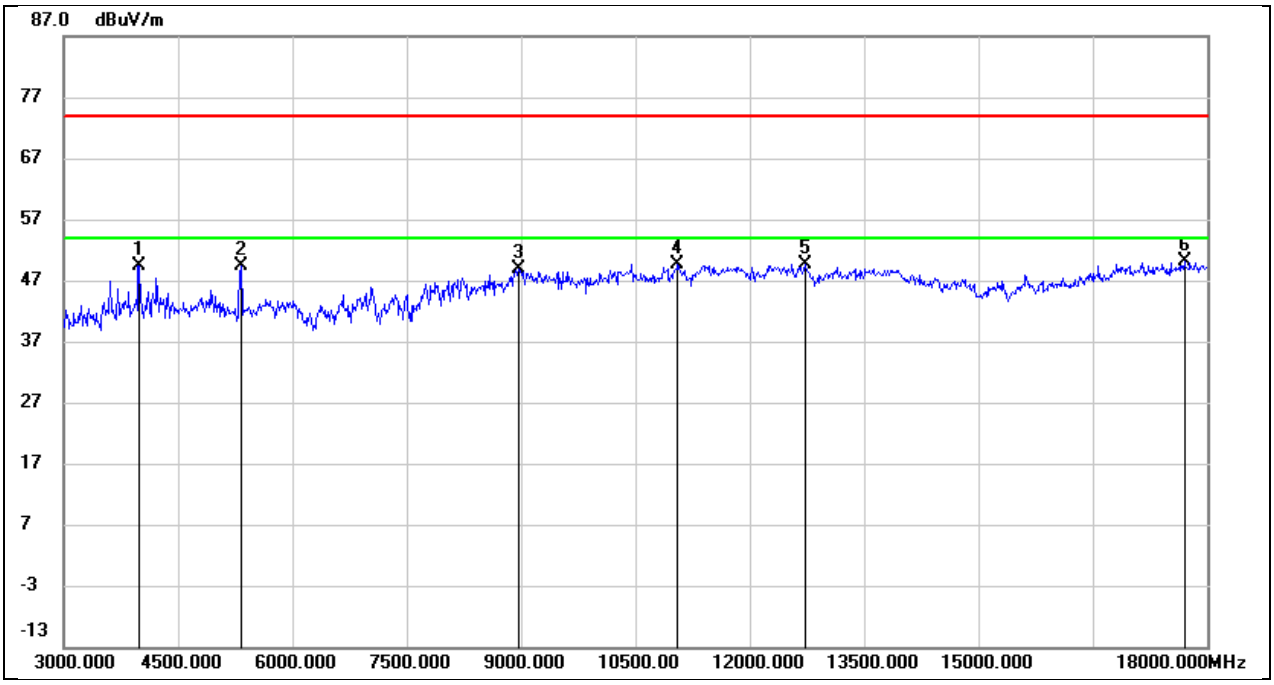
Test Mode:	802.11b	Frequency(MHz):	2437
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	51.14	-1.68	49.46	74.00	-24.54	peak
2	5325.000	46.58	2.78	49.36	74.00	-24.64	peak
3	8970.000	37.50	11.27	48.77	74.00	-25.23	peak
4	11055.000	35.70	14.04	49.74	74.00	-24.26	peak
5	12720.000	32.38	17.33	49.71	74.00	-24.29	peak
6	17700.000	24.80	25.31	50.11	74.00	-23.89	peak

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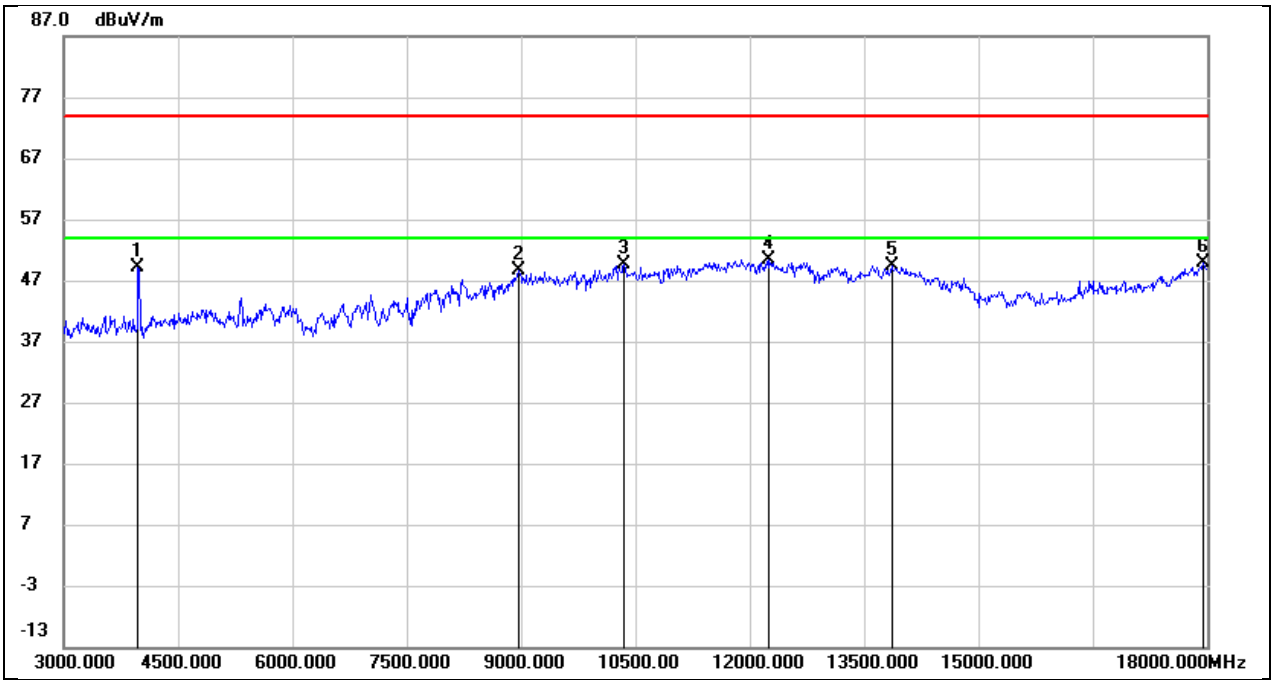
Test Mode:	802.11b	Frequency(MHz):	2462
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	51.84	-2.79	49.05	74.00	-24.95	peak
2	8970.000	37.85	10.85	48.70	74.00	-25.30	peak
3	10350.000	36.67	13.03	49.70	74.00	-24.30	peak
4	12255.000	32.35	18.00	50.35	74.00	-23.65	peak
5	13860.000	26.85	22.52	49.37	74.00	-24.63	peak
6	17940.000	21.83	28.01	49.84	74.00	-24.16	peak

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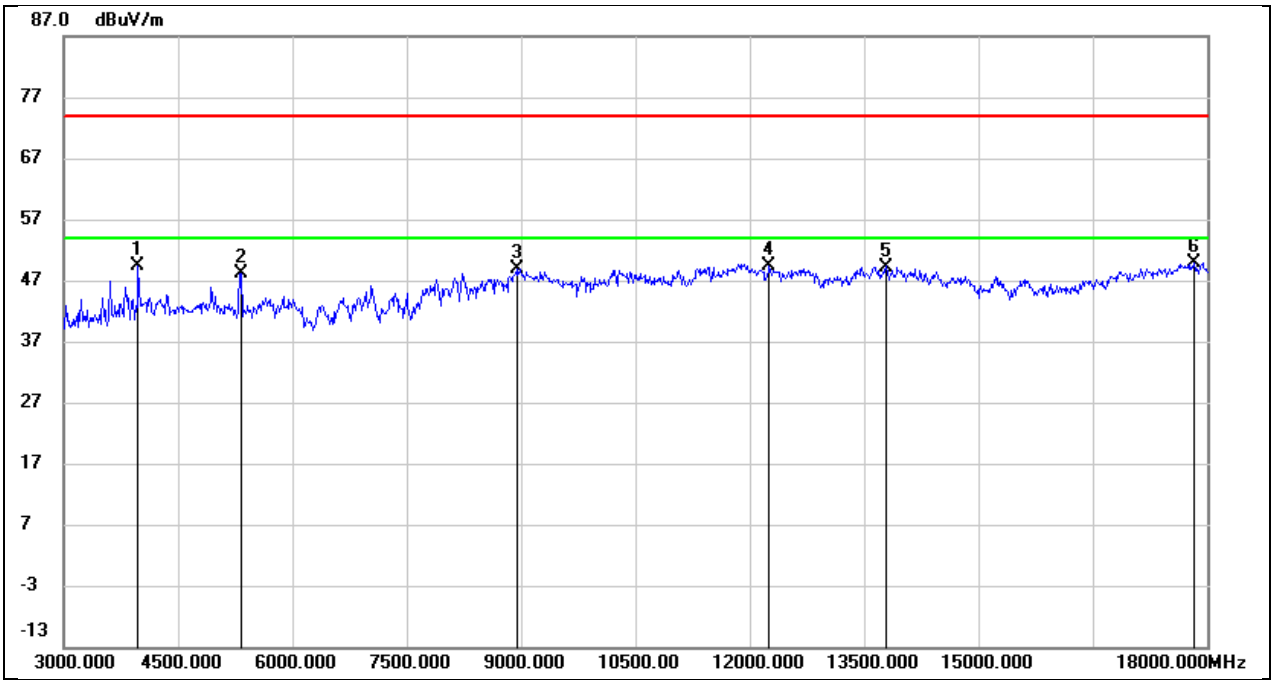
Test Mode:	802.11b	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	51.10	-1.69	49.41	74.00	-24.59	peak
2	5325.000	45.45	2.78	48.23	74.00	-25.77	peak
3	8940.000	38.03	10.87	48.90	74.00	-25.10	peak
4	12255.000	32.47	17.00	49.47	74.00	-24.53	peak
5	13785.000	28.51	20.74	49.25	74.00	-24.75	peak
6	17820.000	24.03	25.96	49.99	74.00	-24.01	peak

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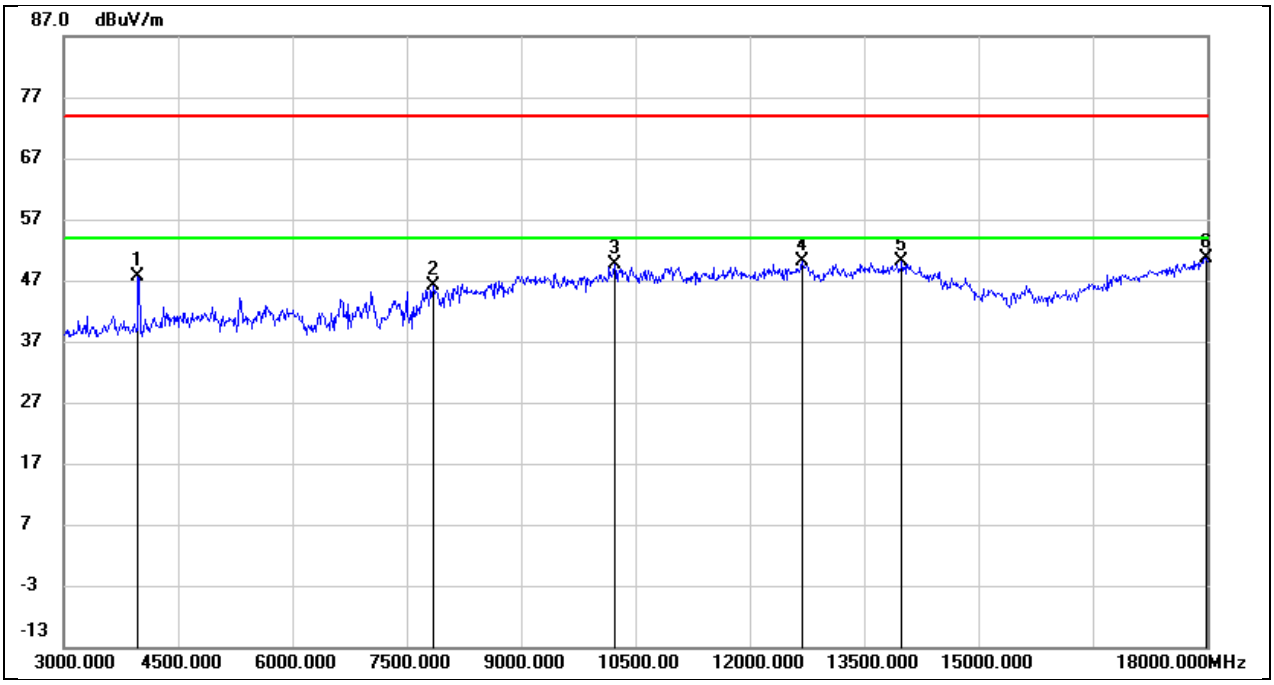
Test Mode:	802.11g	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	50.37	-2.79	47.58	74.00	-26.42	peak
2	7845.000	38.68	7.55	46.23	74.00	-27.77	peak
3	10230.000	37.09	12.54	49.63	74.00	-24.37	peak
4	12690.000	31.78	18.24	50.02	74.00	-23.98	peak
5	13995.000	27.50	22.66	50.16	74.00	-23.84	peak
6	17985.000	22.34	28.25	50.59	74.00	-23.41	peak

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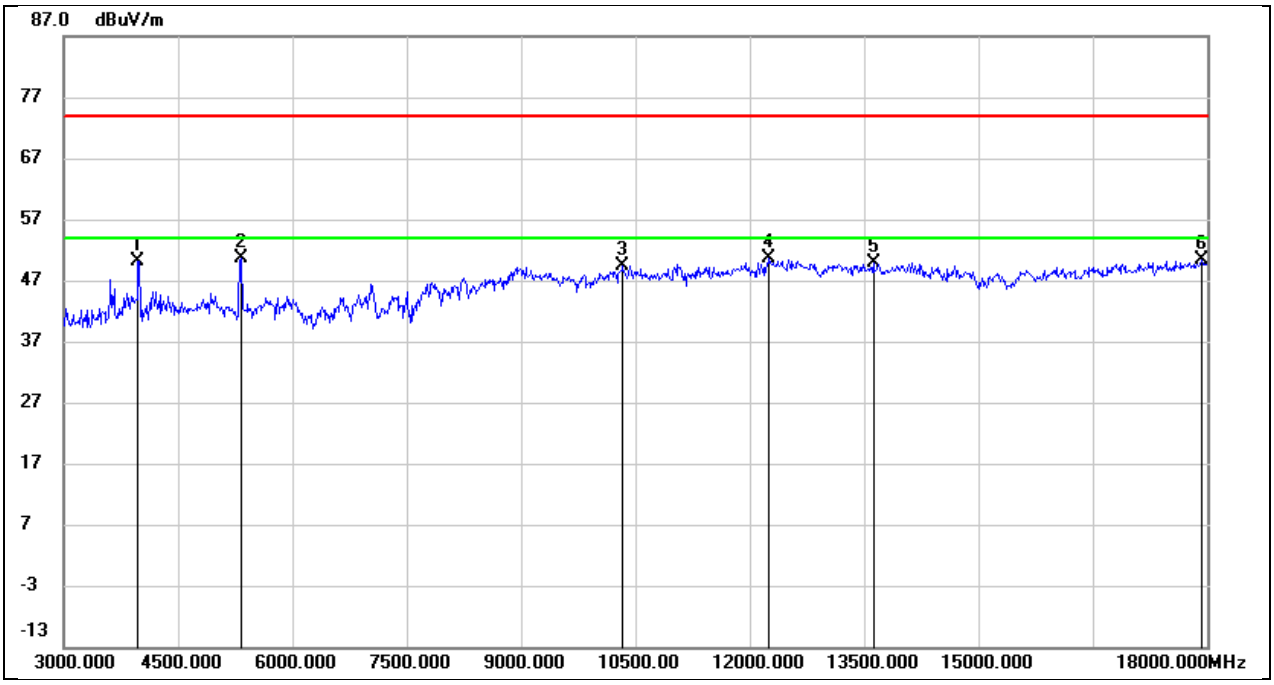
Test Mode:	802.11g	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	51.76	-1.69	50.07	74.00	-23.93	peak
2	5325.000	47.87	2.78	50.65	74.00	-23.35	peak
3	10335.000	36.67	12.61	49.28	74.00	-24.72	peak
4	12255.000	33.51	17.00	50.51	74.00	-23.49	peak
5	13620.000	30.07	19.83	49.90	74.00	-24.10	peak
6	17925.000	24.34	26.06	50.40	74.00	-23.60	peak

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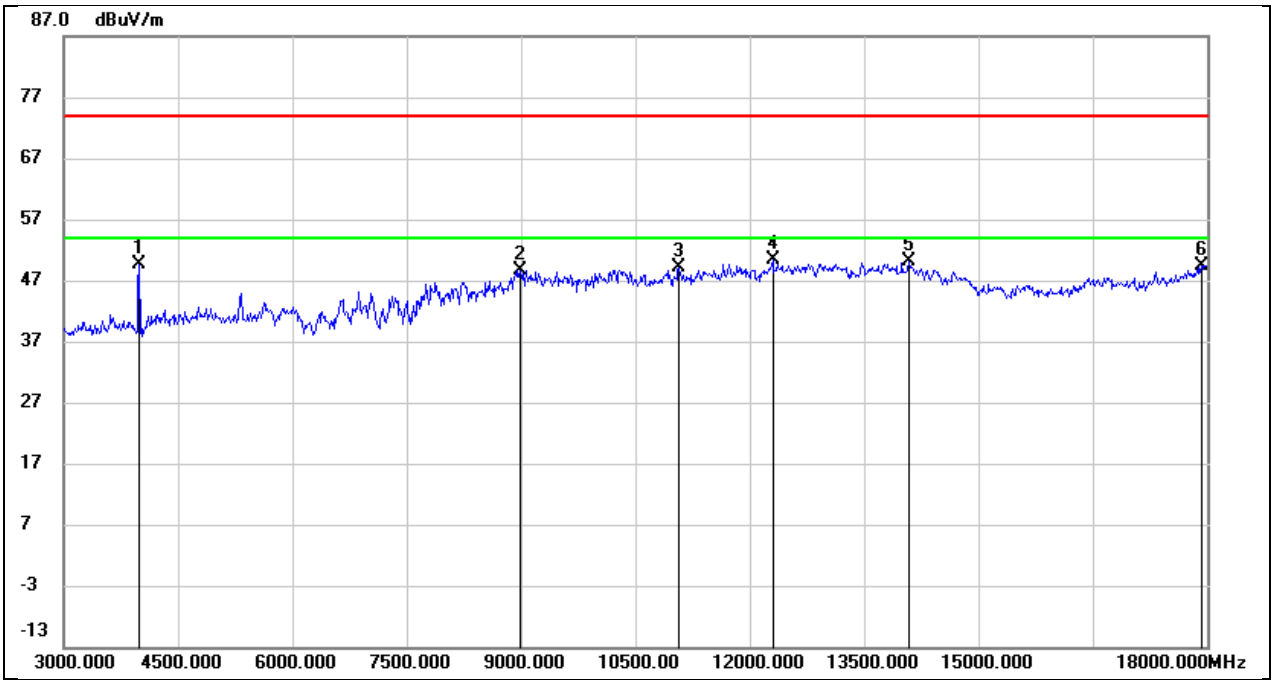
Test Mode:	802.11g	Frequency(MHz):	2437
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	52.50	-2.78	49.72	74.00	-24.28	peak
2	8985.000	37.61	11.07	48.68	74.00	-25.32	peak
3	11070.000	34.23	14.95	49.18	74.00	-24.82	peak
4	12300.000	32.10	18.17	50.27	74.00	-23.73	peak
5	14085.000	27.61	22.43	50.04	74.00	-23.96	peak
6	17925.000	21.53	27.93	49.46	74.00	-24.54	peak

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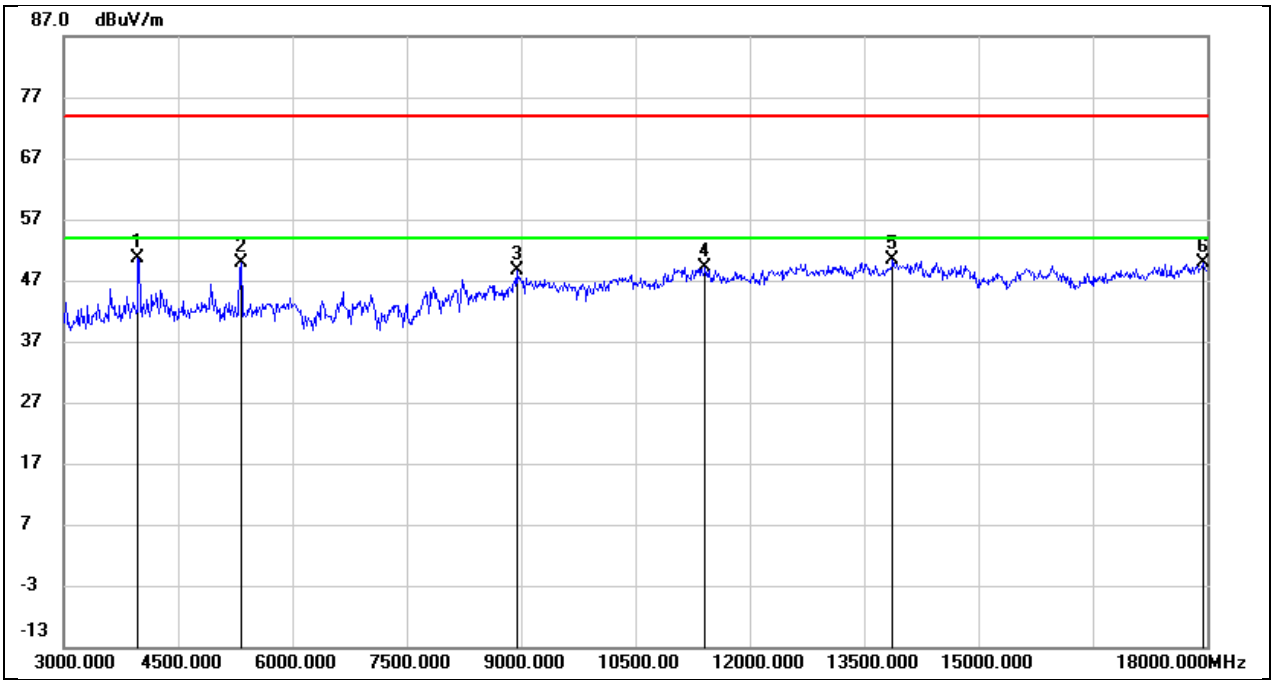
Test Mode:	802.11g	Frequency(MHz):	2437
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	52.28	-1.69	50.59	74.00	-23.41	peak
2	5325.000	47.18	2.78	49.96	74.00	-24.04	peak
3	8940.000	37.78	10.87	48.65	74.00	-25.35	peak
4	11415.000	34.25	14.94	49.19	74.00	-24.81	peak
5	13875.000	29.39	20.91	50.30	74.00	-23.70	peak
6	17940.000	23.79	26.08	49.87	74.00	-24.13	peak

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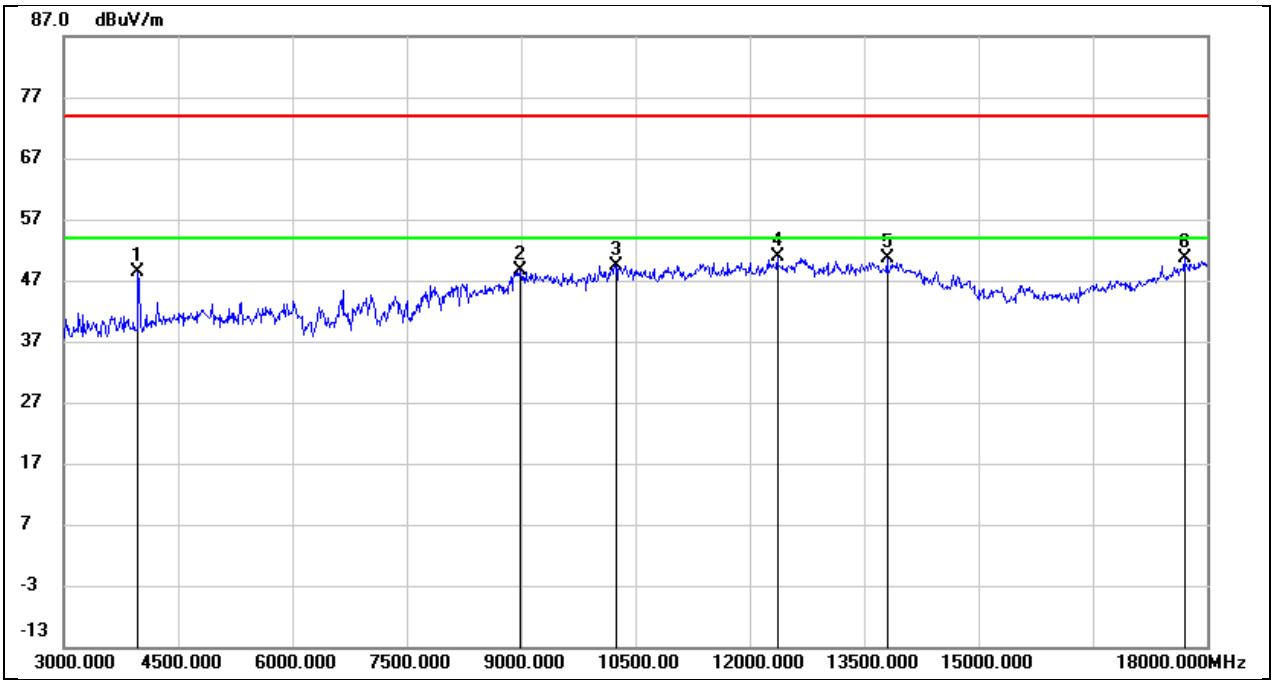
Test Mode:	802.11g	Frequency(MHz):	2462
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	51.29	-2.79	48.50	74.00	-25.50	peak
2	8985.000	37.44	11.07	48.51	74.00	-25.49	peak
3	10245.000	36.78	12.61	49.39	74.00	-24.61	peak
4	12360.000	32.47	18.40	50.87	74.00	-23.13	peak
5	13800.000	28.23	22.46	50.69	74.00	-23.31	peak
6	17700.000	24.41	26.19	50.60	74.00	-23.40	peak

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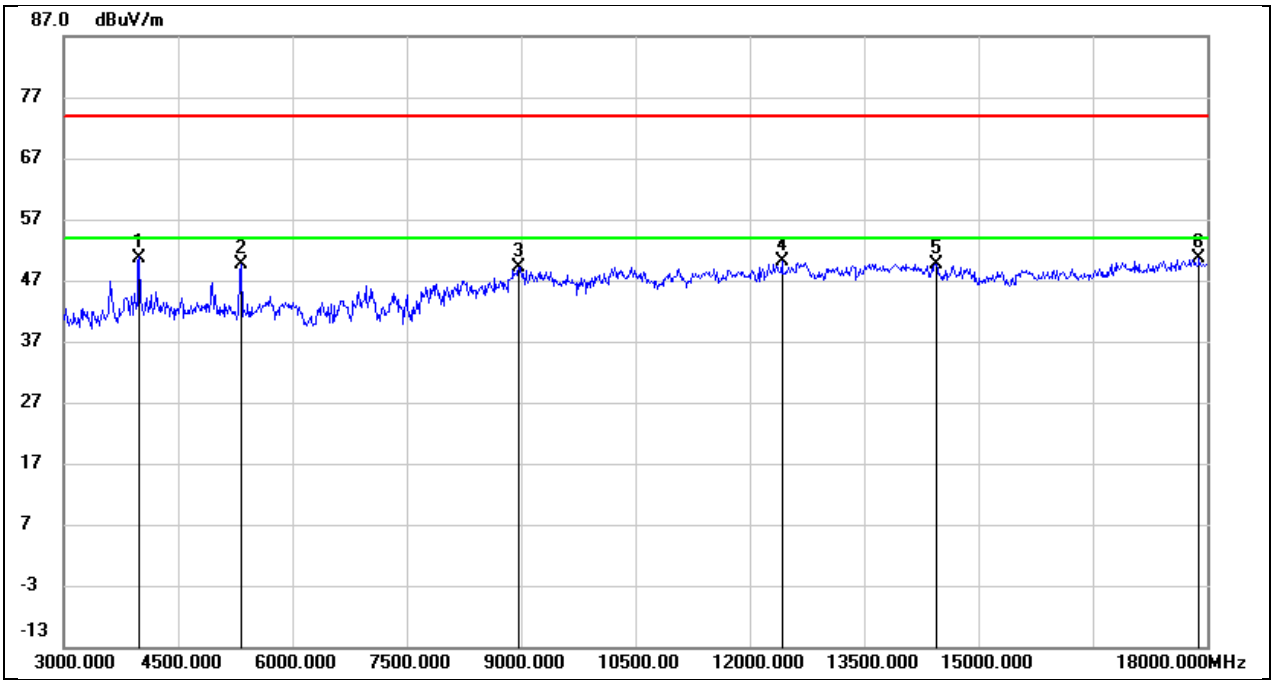
Test Mode:	802.11g	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	52.43	-1.68	50.75	74.00	-23.25	peak
2	5325.000	46.81	2.78	49.59	74.00	-24.41	peak
3	8970.000	37.90	11.27	49.17	74.00	-24.83	peak
4	12420.000	32.50	17.53	50.03	74.00	-23.97	peak
5	14445.000	29.38	20.34	49.72	74.00	-24.28	peak
6	17895.000	24.68	26.03	50.71	74.00	-23.29	peak

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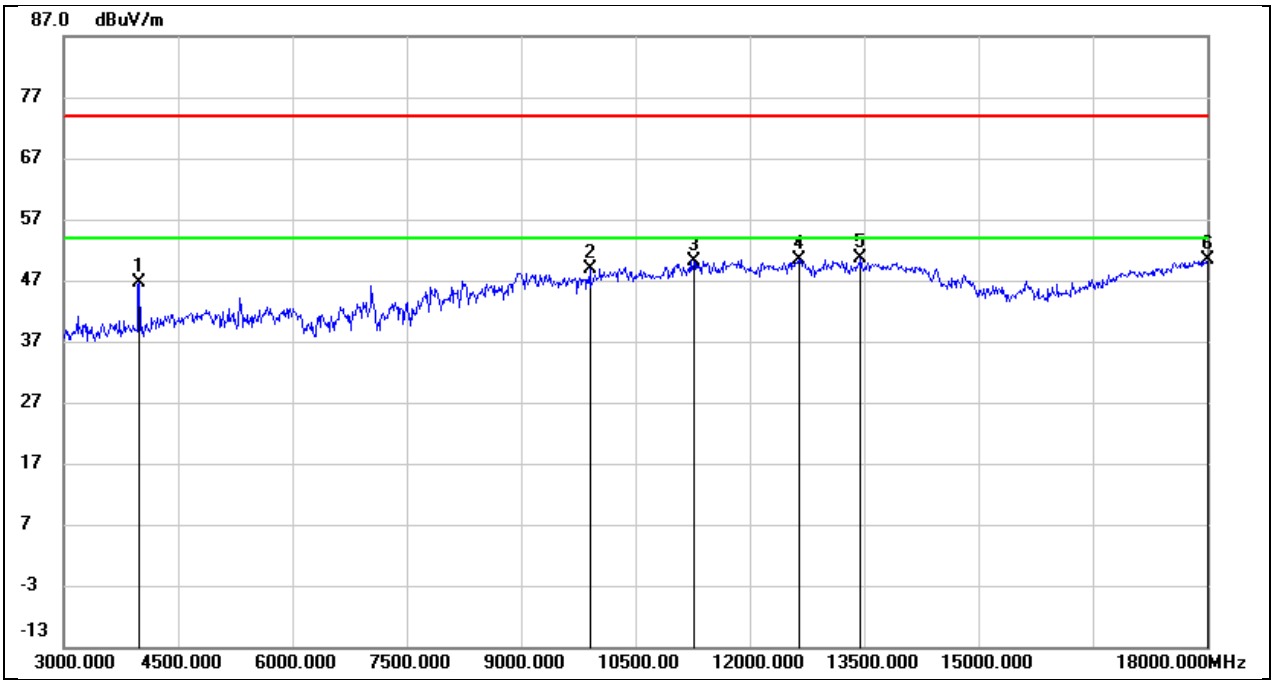
Test Mode:	802.11n HT20	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	49.40	-2.78	46.62	74.00	-27.38	peak
2	9900.000	36.86	12.10	48.96	74.00	-25.04	peak
3	11265.000	34.71	15.54	50.25	74.00	-23.75	peak
4	12645.000	32.33	18.07	50.40	74.00	-23.60	peak
5	13455.000	29.37	21.28	50.65	74.00	-23.35	peak
6	18000.000	21.99	28.33	50.32	74.00	-23.68	peak

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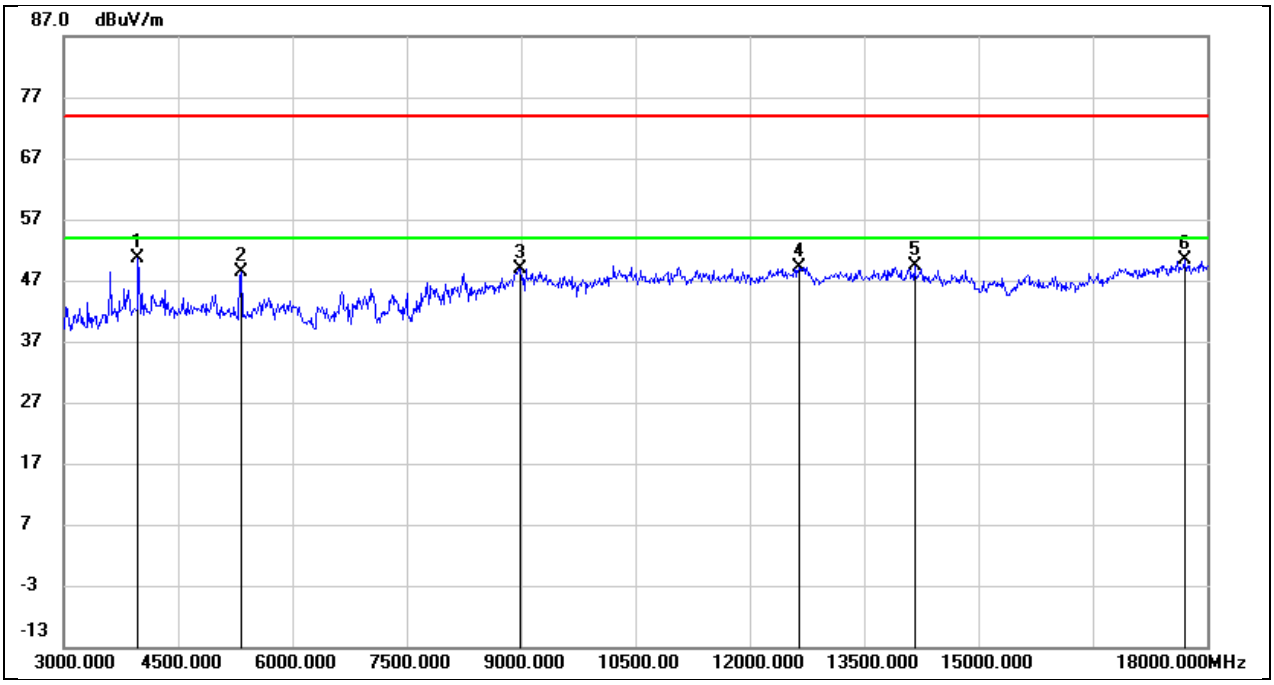
Test Mode:	802.11n HT20	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	52.38	-1.69	50.69	74.00	-23.31	peak
2	5325.000	45.62	2.78	48.40	74.00	-25.60	peak
3	8985.000	37.36	11.48	48.84	74.00	-25.16	peak
4	12645.000	32.13	17.09	49.22	74.00	-24.78	peak
5	14160.000	28.30	21.03	49.33	74.00	-24.67	peak
6	17700.000	25.11	25.31	50.42	74.00	-23.58	peak

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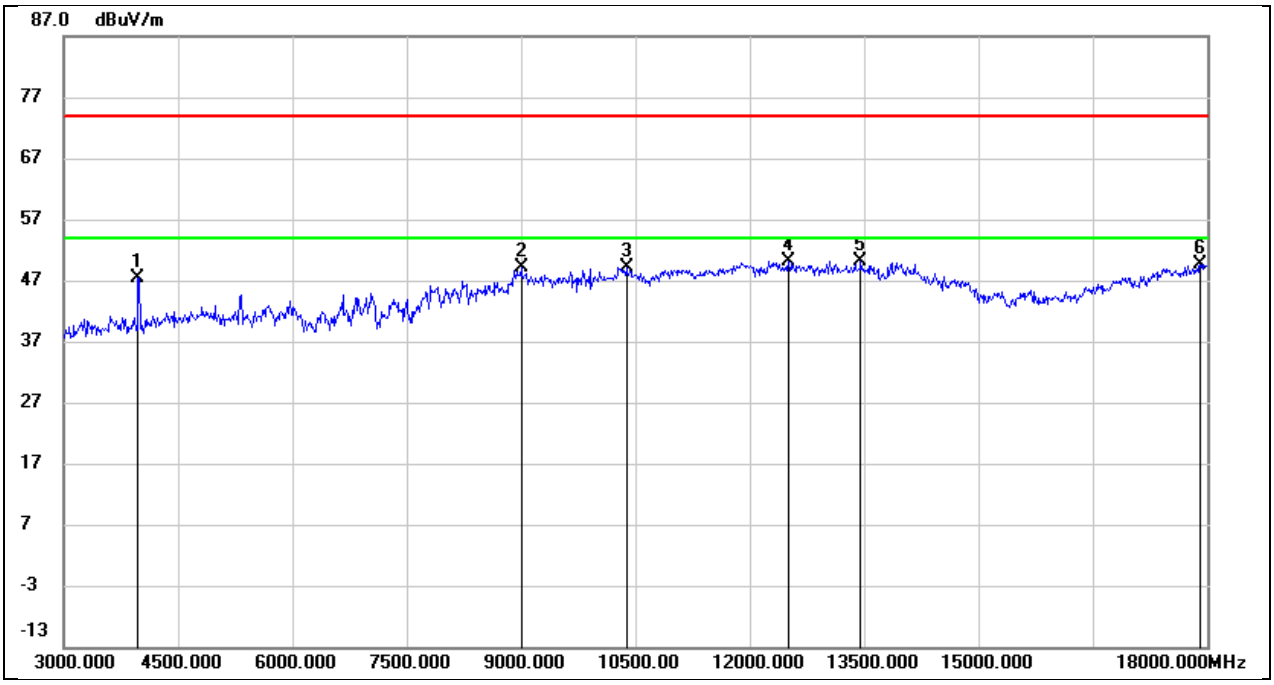
Test Mode:	802.11n HT20	Frequency(MHz):	2437
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	50.23	-2.79	47.44	74.00	-26.56	peak
2	9000.000	37.86	11.27	49.13	74.00	-24.87	peak
3	10380.000	35.95	13.16	49.11	74.00	-24.89	peak
4	12510.000	32.05	18.11	50.16	74.00	-23.84	peak
5	13455.000	28.92	21.28	50.20	74.00	-23.80	peak
6	17910.000	21.70	27.86	49.56	74.00	-24.44	peak

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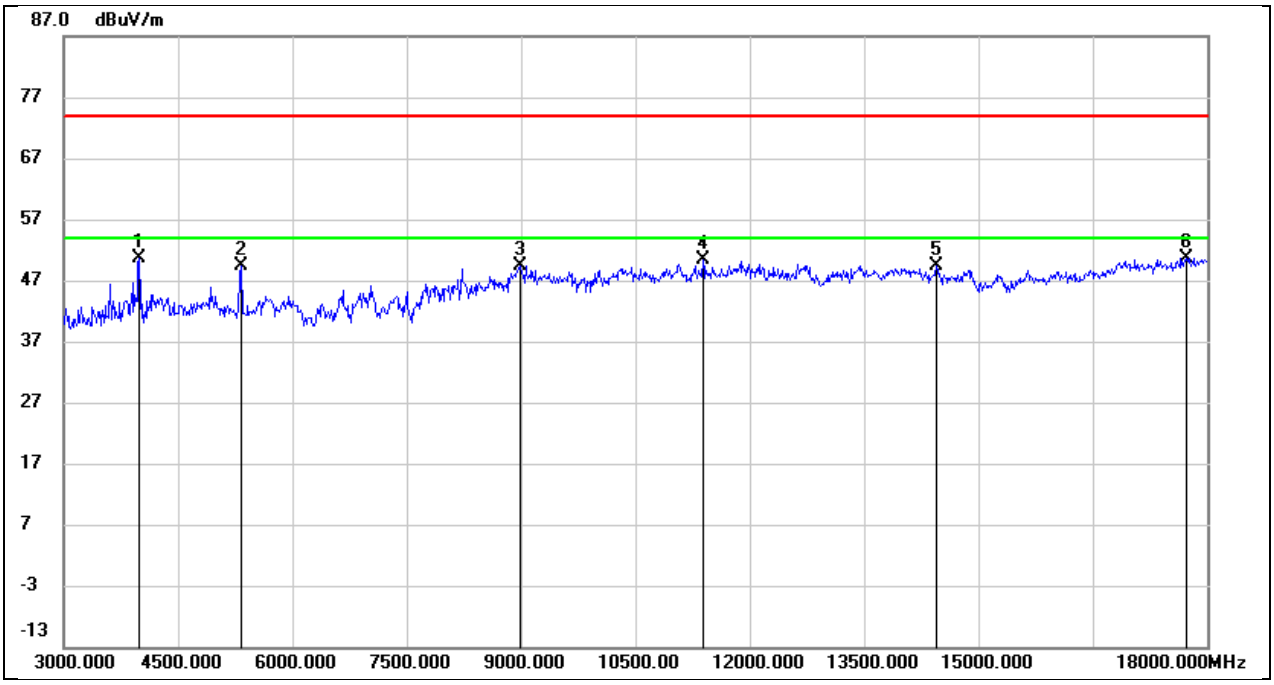
Test Mode:	802.11n HT20	Frequency(MHz):	2437
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	52.28	-1.68	50.60	74.00	-23.40	peak
2	5325.000	46.50	2.78	49.28	74.00	-24.72	peak
3	8985.000	37.93	11.48	49.41	74.00	-24.59	peak
4	11385.000	35.42	14.86	50.28	74.00	-23.72	peak
5	14445.000	29.00	20.34	49.34	74.00	-24.66	peak
6	17730.000	25.24	25.50	50.74	74.00	-23.26	peak

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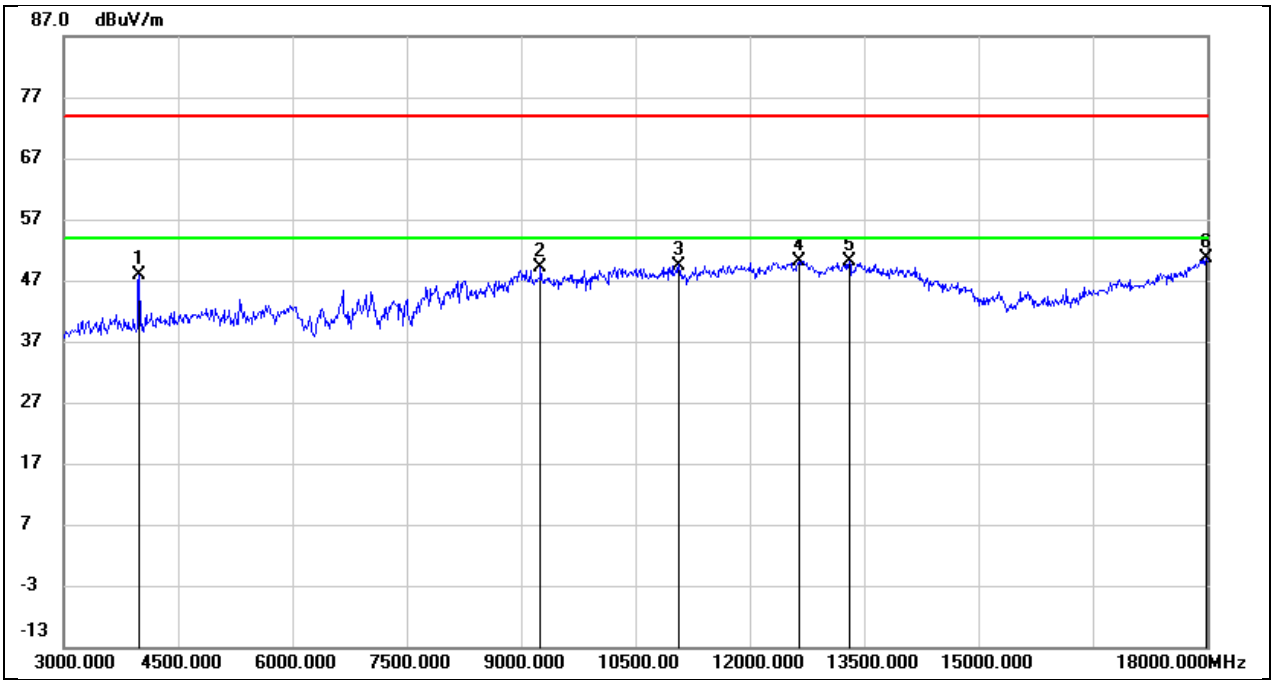
Test Mode:	802.11n HT20	Frequency(MHz):	2462
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	50.72	-2.78	47.94	74.00	-26.06	peak
2	9255.000	38.78	10.24	49.02	74.00	-24.98	peak
3	11070.000	34.55	14.95	49.50	74.00	-24.50	peak
4	12645.000	32.06	18.07	50.13	74.00	-23.87	peak
5	13305.000	29.61	20.51	50.12	74.00	-23.88	peak
6	17985.000	22.41	28.25	50.66	74.00	-23.34	peak

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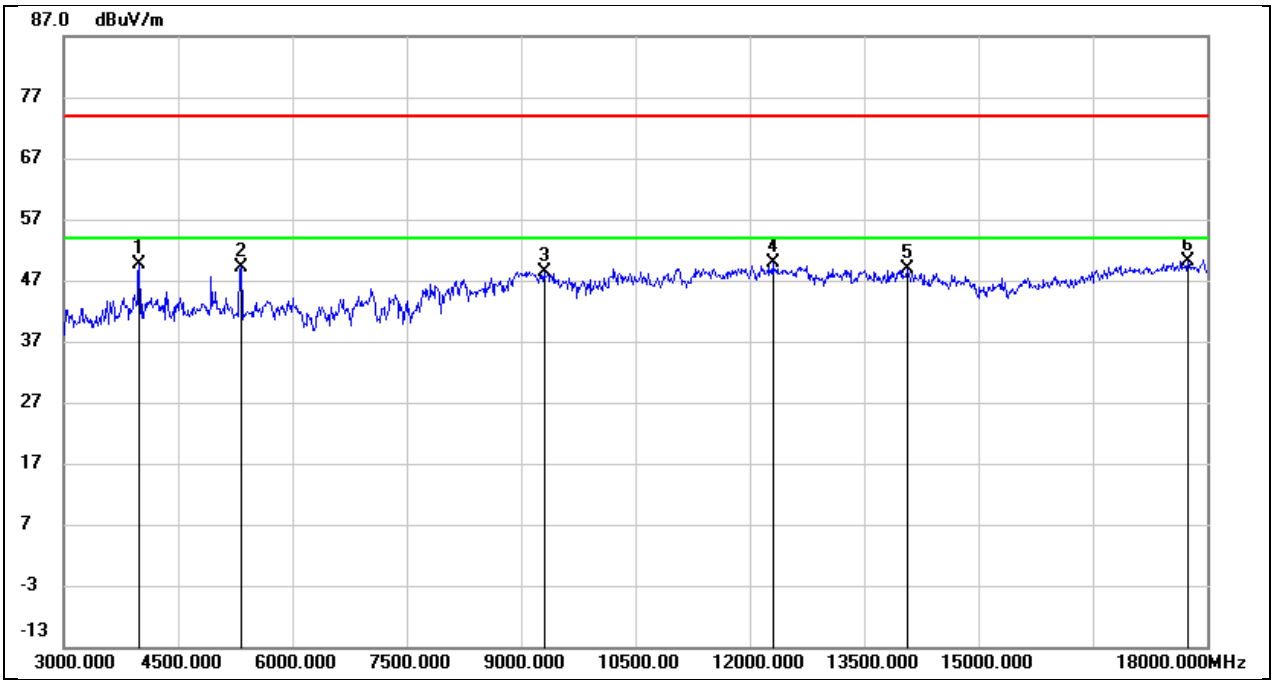
Test Mode:	802.11n HT20	Frequency(MHz):	2462
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	51.40	-1.68	49.72	74.00	-24.28	peak
2	5325.000	46.30	2.78	49.08	74.00	-24.92	peak
3	9300.000	38.00	10.49	48.49	74.00	-25.51	peak
4	12300.000	32.74	17.19	49.93	74.00	-24.07	peak
5	14070.000	27.72	21.05	48.77	74.00	-25.23	peak
6	17745.000	24.64	25.59	50.23	74.00	-23.77	peak

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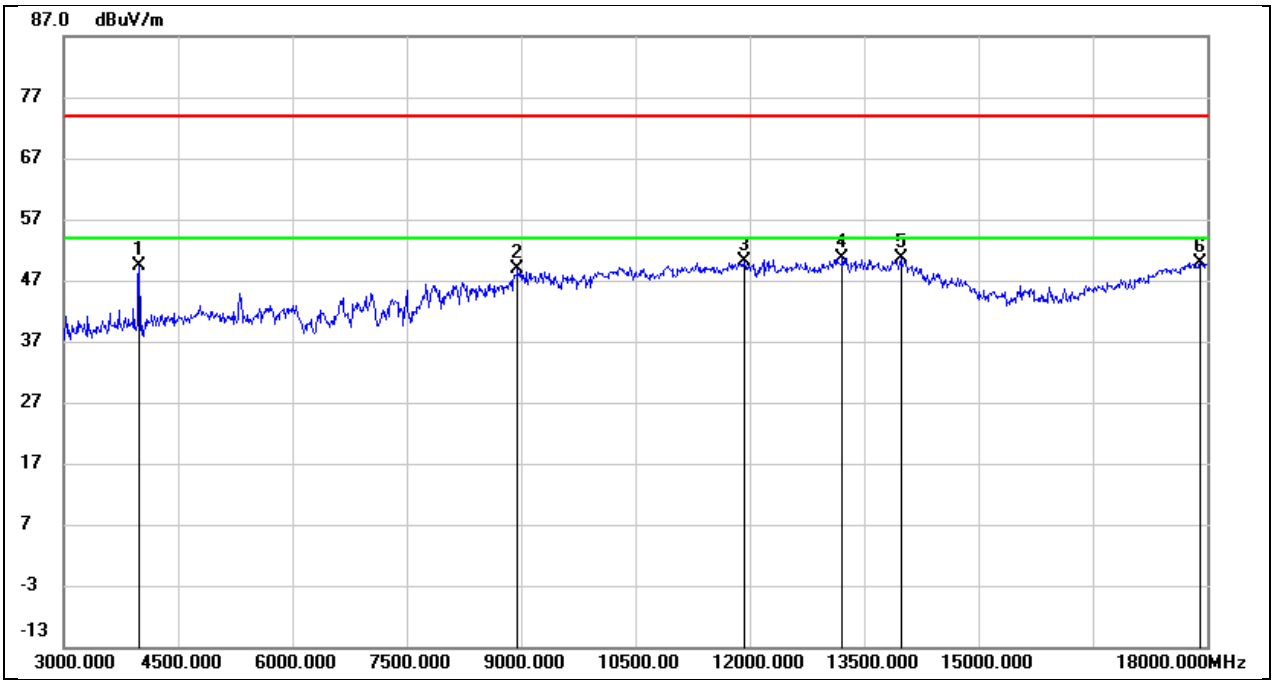
Test Mode:	802.11n HT40	Frequency(MHz):	2422
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	52.06	-2.78	49.28	74.00	-24.72	peak
2	8955.000	38.28	10.66	48.94	74.00	-25.06	peak
3	11925.000	32.47	17.62	50.09	74.00	-23.91	peak
4	13215.000	30.85	19.90	50.75	74.00	-23.25	peak
5	13980.000	27.95	22.64	50.59	74.00	-23.41	peak
6	17910.000	22.13	27.86	49.99	74.00	-24.01	peak

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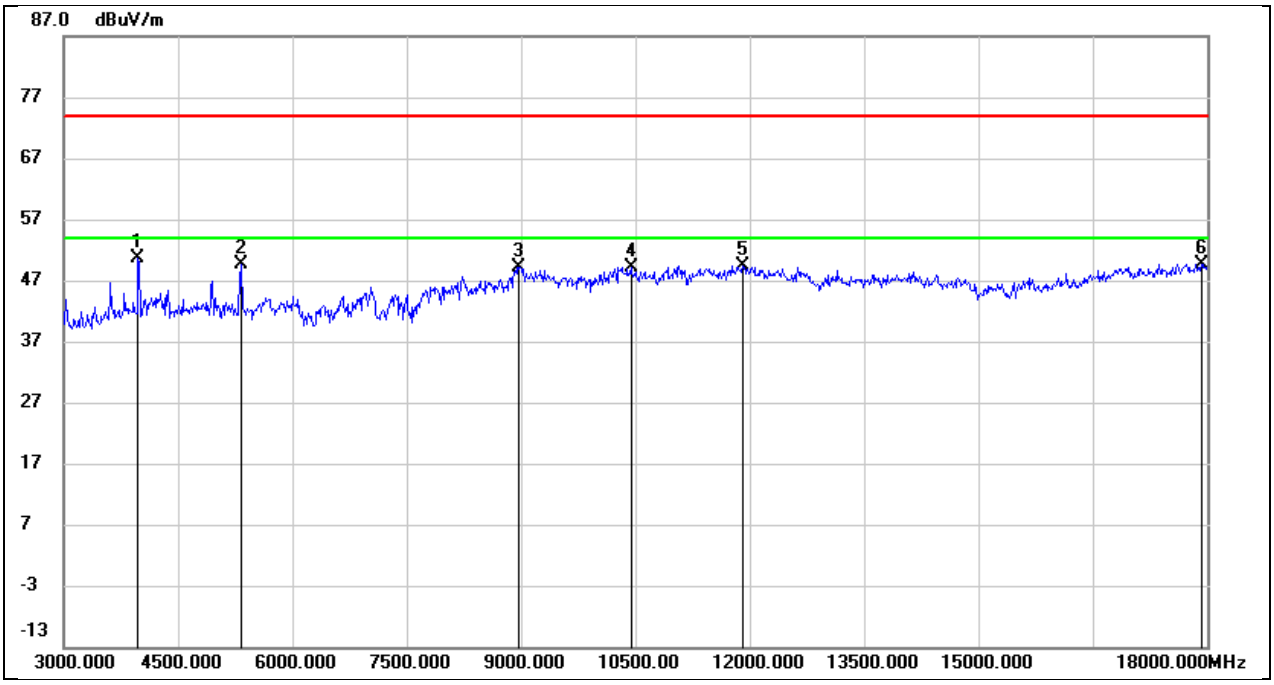
Test Mode:	802.11n HT40	Frequency(MHz):	2422
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	52.34	-1.69	50.65	74.00	-23.35	peak
2	5325.000	46.88	2.78	49.66	74.00	-24.34	peak
3	8970.000	37.80	11.27	49.07	74.00	-24.93	peak
4	10440.000	36.16	13.04	49.20	74.00	-24.80	peak
5	11910.000	33.06	16.39	49.45	74.00	-24.55	peak
6	17925.000	23.63	26.06	49.69	74.00	-24.31	peak

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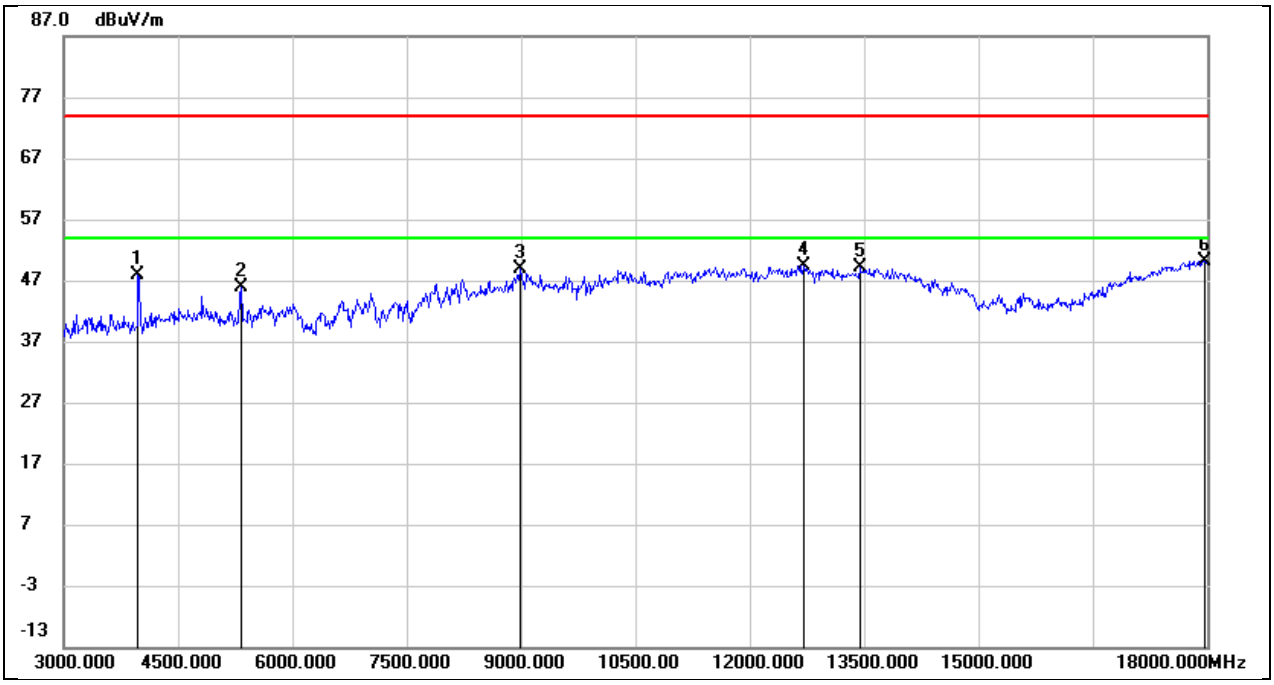
Test Mode:	802.11n HT40	Frequency(MHz):	2437
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	50.78	-2.79	47.99	74.00	-26.01	peak
2	5325.000	44.23	1.58	45.81	74.00	-28.19	peak
3	8985.000	37.78	11.07	48.85	74.00	-25.15	peak
4	12705.000	31.19	18.30	49.49	74.00	-24.51	peak
5	13440.000	27.81	21.26	49.07	74.00	-24.93	peak
6	17970.000	22.06	28.17	50.23	74.00	-23.77	peak

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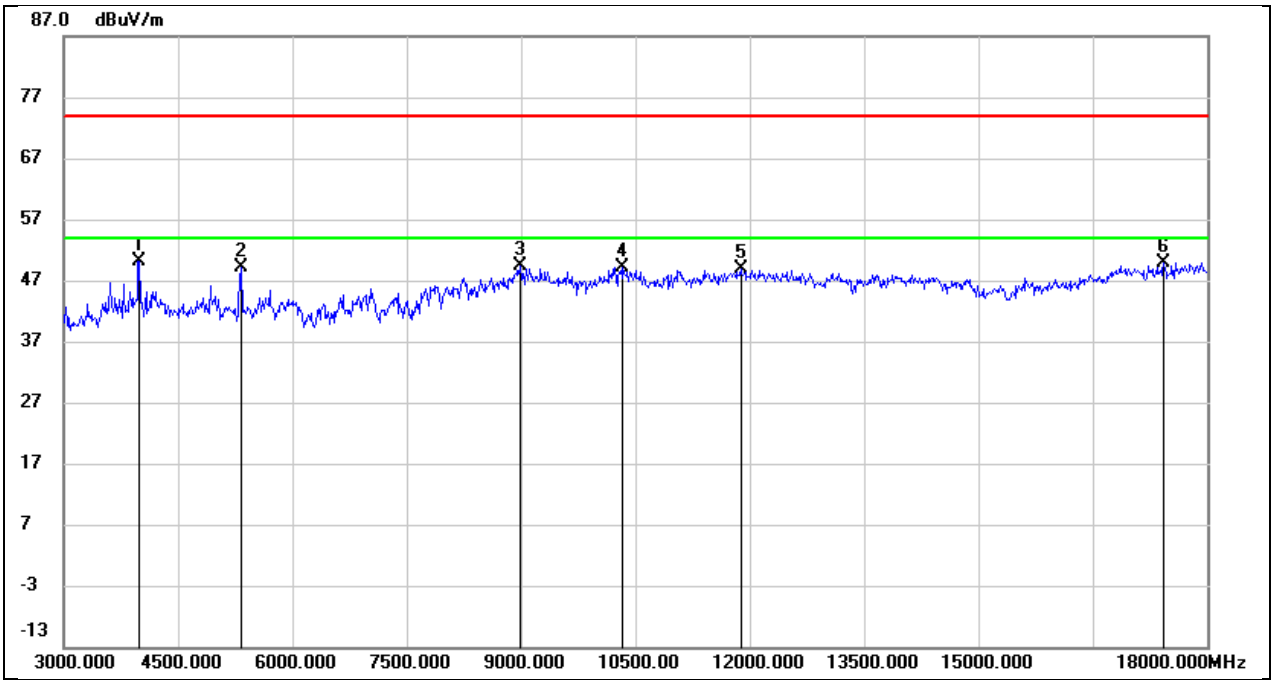
Test Mode:	802.11n HT40	Frequency(MHz):	2437
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	51.88	-1.68	50.20	74.00	-23.80	peak
2	5325.000	46.26	2.78	49.04	74.00	-24.96	peak
3	8985.000	37.84	11.48	49.32	74.00	-24.68	peak
4	10335.000	36.47	12.61	49.08	74.00	-24.92	peak
5	11880.000	32.55	16.25	48.80	74.00	-25.20	peak
6	17430.000	25.56	24.40	49.96	74.00	-24.04	peak

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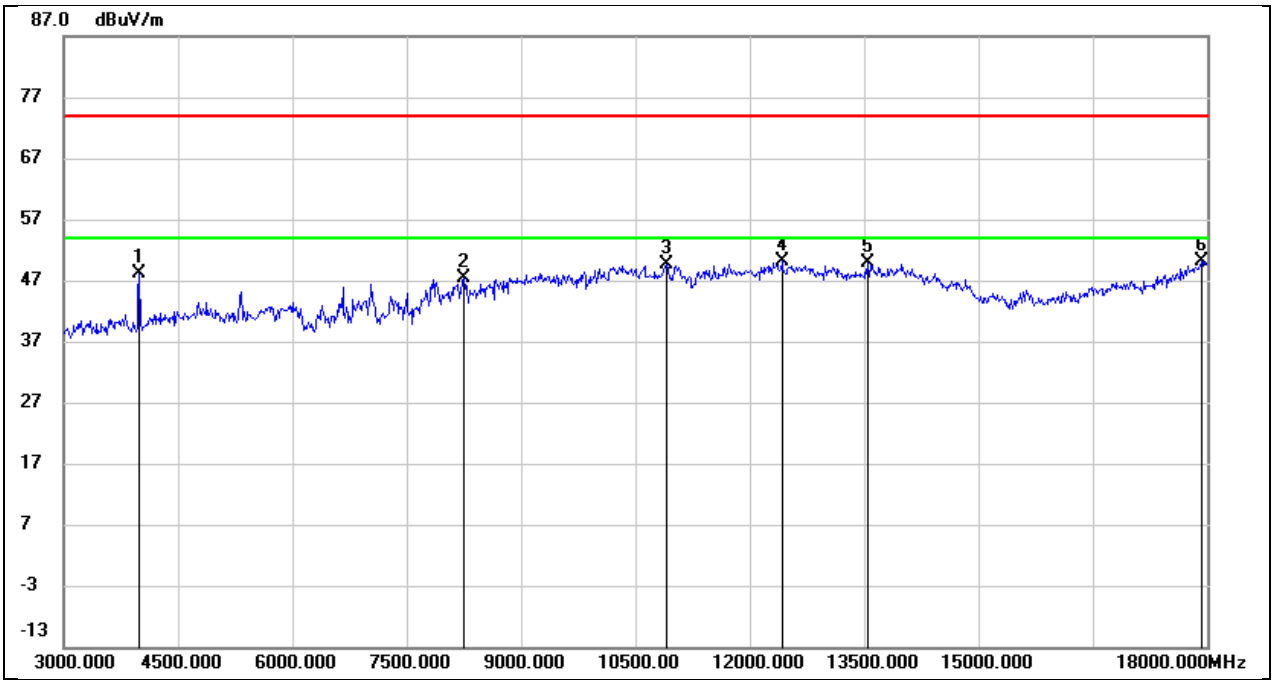
Test Mode:	802.11n HT40	Frequency(MHz):	2452
Polarity:	Horizontal	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3990.000	51.00	-2.78	48.22	74.00	-25.78	peak
2	8250.000	38.64	8.71	47.35	74.00	-26.65	peak
3	10905.000	35.29	14.32	49.61	74.00	-24.39	peak
4	12420.000	31.71	18.47	50.18	74.00	-23.82	peak
5	13545.000	28.57	21.40	49.97	74.00	-24.03	peak
6	17925.000	22.30	27.93	50.23	74.00	-23.77	peak

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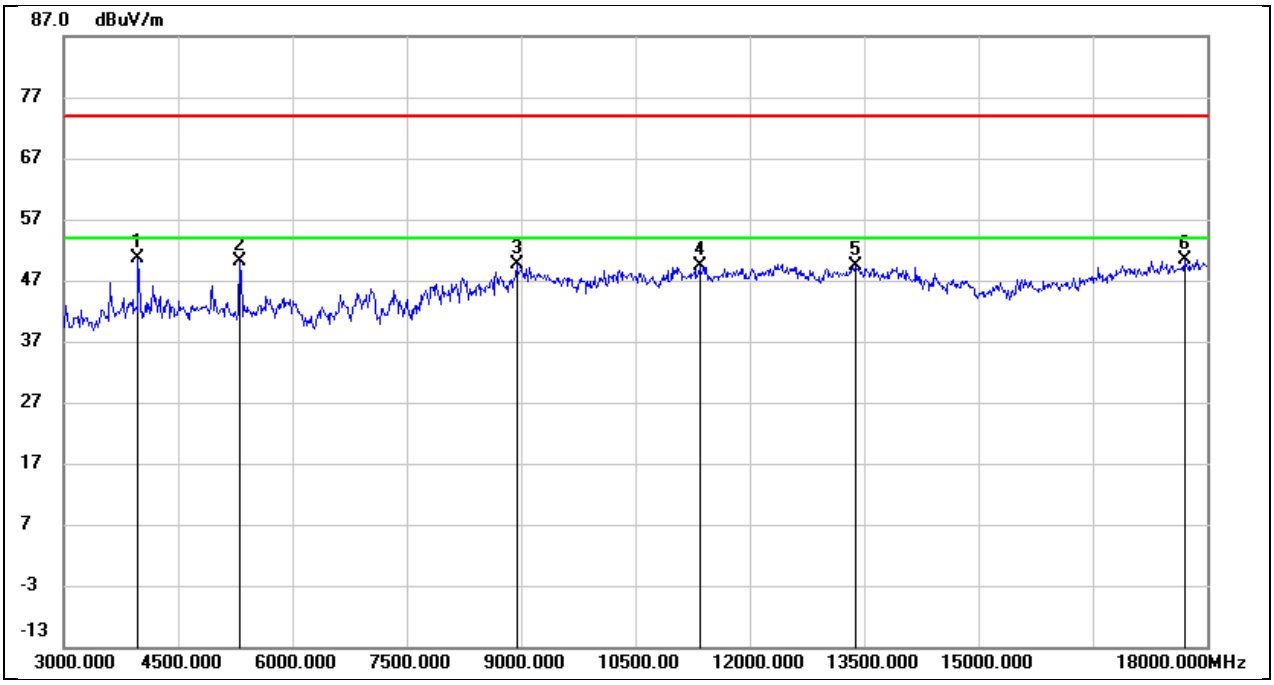
Test Mode:	802.11n HT40	Frequency(MHz):	2452
Polarity:	Vertical	Test Voltage:	DC 24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3975.000	52.24	-1.69	50.55	74.00	-23.45	peak
2	5310.000	47.33	2.77	50.10	74.00	-23.90	peak
3	8940.000	38.69	10.87	49.56	74.00	-24.44	peak
4	11340.000	34.66	14.68	49.34	74.00	-24.66	peak
5	13395.000	29.82	19.53	49.35	74.00	-24.65	peak
6	17700.000	25.02	25.31	50.33	74.00	-23.67	peak

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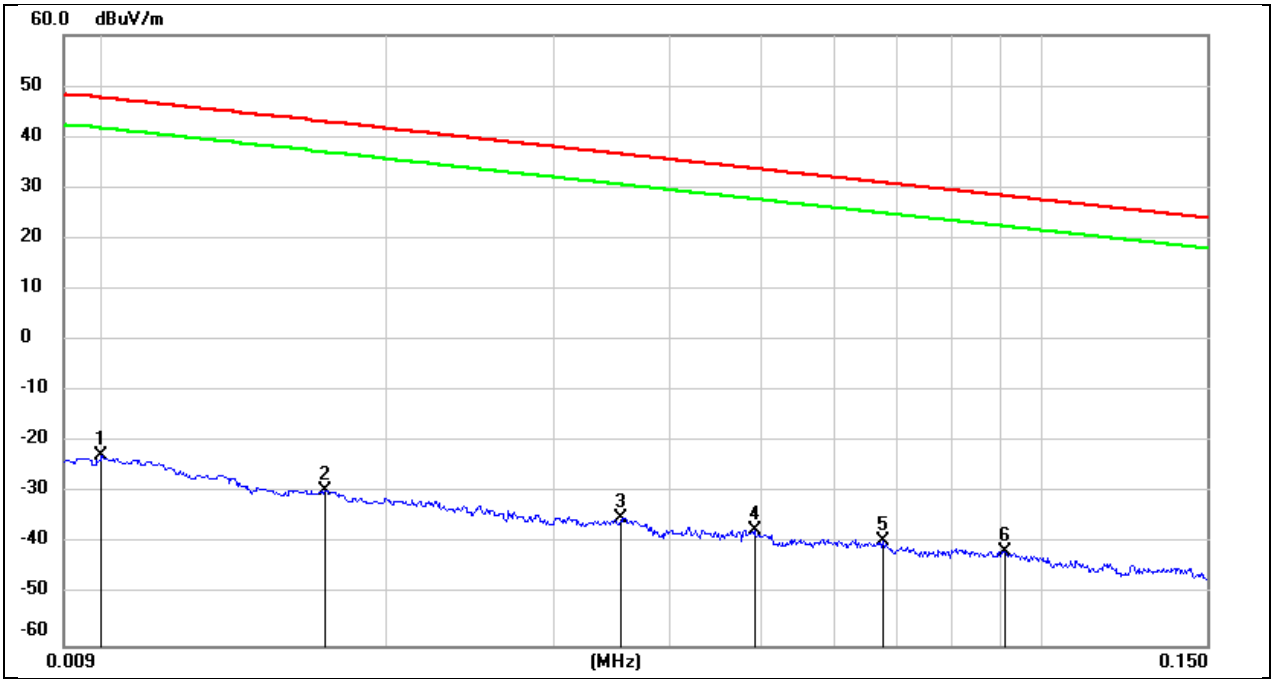
8.4. SPURIOUS EMISSIONS(9 KHZ~30 MHZ)

Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0100	78.72	-101.40	-22.68	47.60	-70.28	peak
2	0.0171	71.88	-101.36	-29.48	42.94	-72.42	peak
3	0.0354	66.47	-101.41	-34.94	36.62	-71.56	peak
4	0.0492	64.05	-101.47	-37.42	33.76	-71.18	peak
5	0.0675	62.14	-101.56	-39.42	31.02	-70.44	peak
6	0.0912	60.22	-101.73	-41.51	28.40	-69.91	peak

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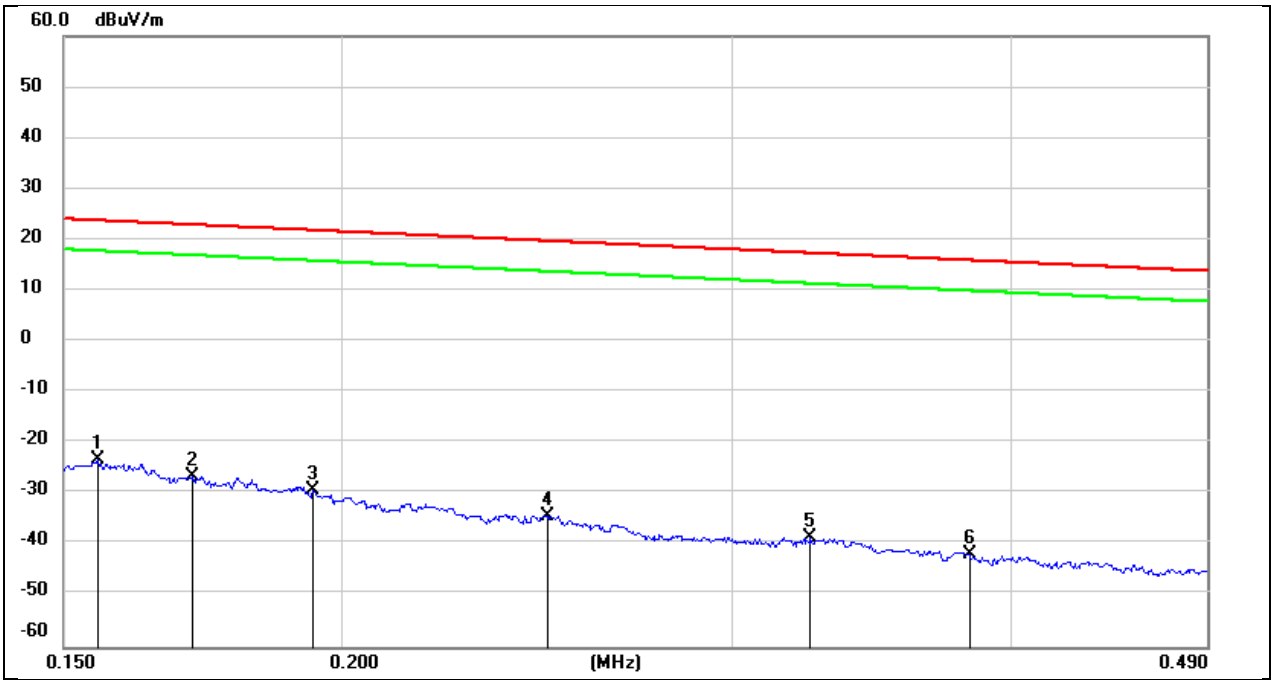
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1554	78.27	-101.65	-23.38	23.77	-47.15	peak
2	0.1715	75.11	-101.67	-26.56	22.92	-49.48	peak
3	0.1942	72.31	-101.70	-29.39	21.84	-51.23	peak
4	0.2474	67.44	-101.80	-34.36	19.73	-54.09	peak
5	0.3251	63.21	-101.88	-38.67	17.36	-56.03	peak
6	0.3830	60.20	-101.94	-41.74	15.94	-57.68	peak

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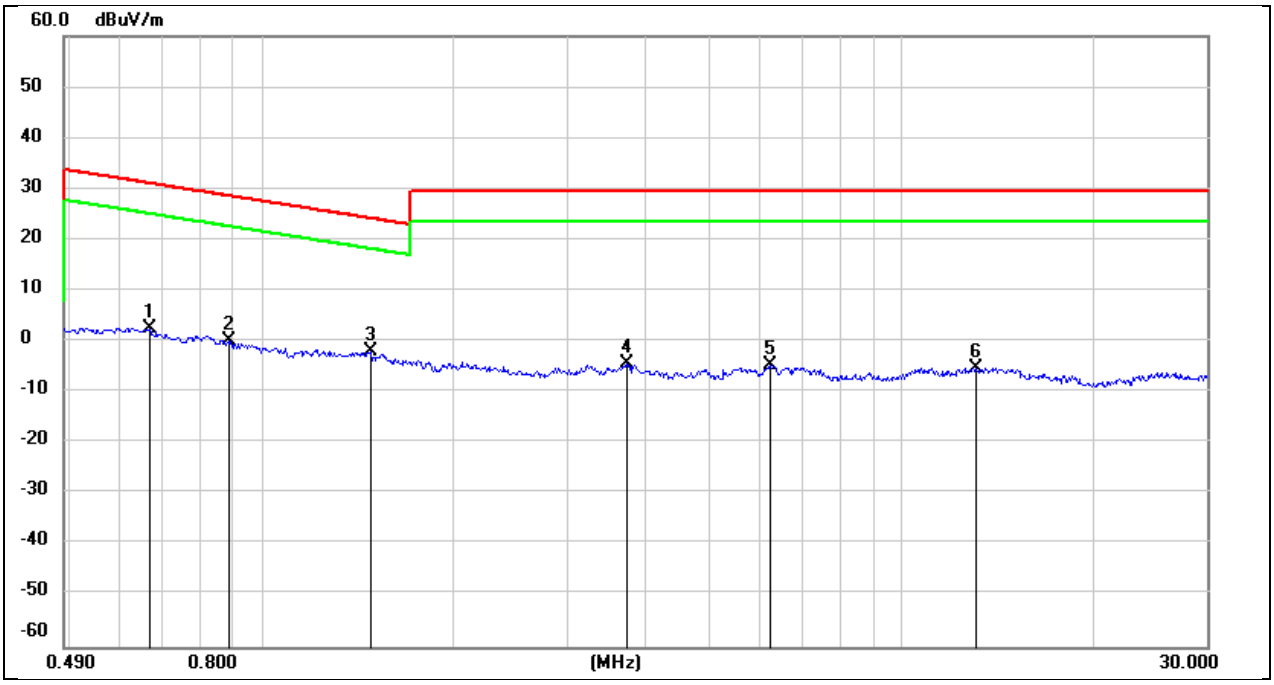
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.6671	64.75	-62.10	2.65	31.12	-28.47	peak
2	0.8898	62.45	-62.20	0.25	28.62	-28.37	peak
3	1.4818	60.11	-62.05	-1.94	24.19	-26.13	peak
4	3.7100	57.20	-61.41	-4.21	29.54	-33.75	peak
5	6.2445	56.63	-61.32	-4.69	29.54	-34.23	peak
6	13.0907	55.63	-60.93	-5.30	29.54	-34.84	peak

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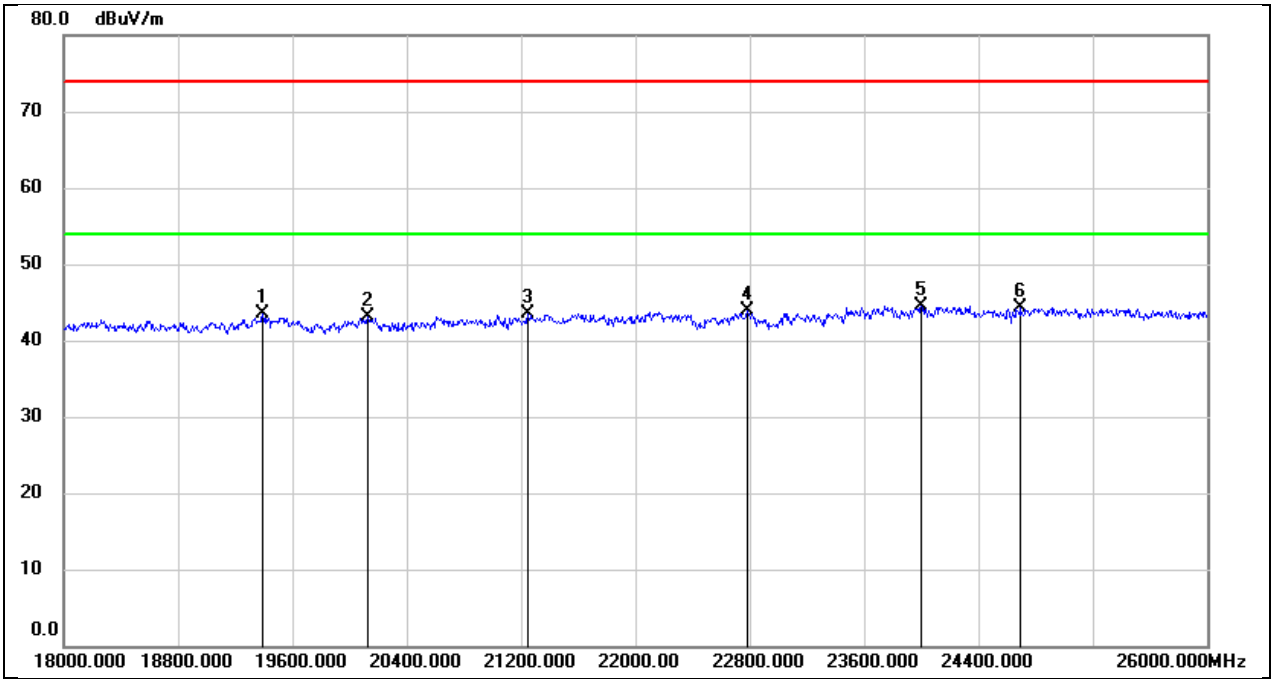
8.5. SPURIOUS EMISSIONS(18 GHZ~26 GHZ)

Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC 24 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19392.000	49.12	-5.57	43.55	74.00	-30.45	peak
2	20128.000	48.62	-5.53	43.09	74.00	-30.91	peak
3	21248.000	48.29	-4.77	43.52	74.00	-30.48	peak
4	22784.000	47.48	-3.65	43.83	74.00	-30.17	peak
5	24000.000	47.21	-2.75	44.46	74.00	-29.54	peak
6	24696.000	46.59	-2.32	44.27	74.00	-29.73	peak

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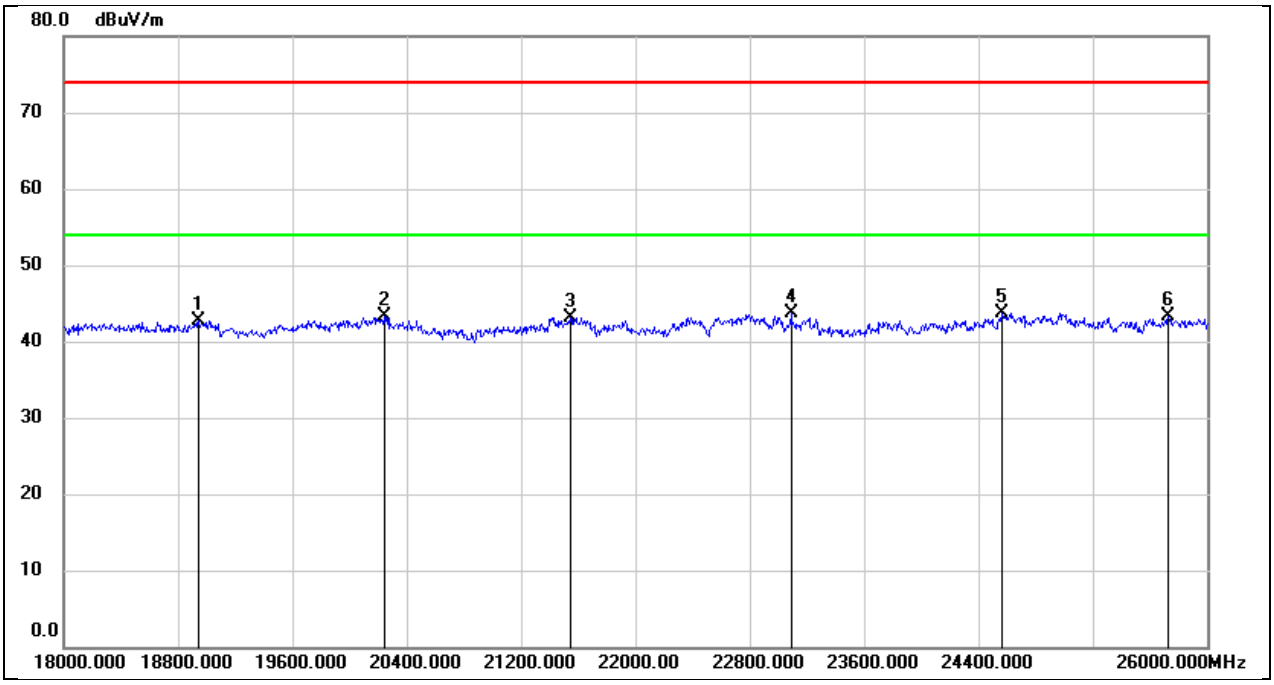
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC 24 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18944.000	47.92	-5.27	42.65	74.00	-31.35	peak
2	20240.000	48.82	-5.61	43.21	74.00	-30.79	peak
3	21544.000	47.76	-4.63	43.13	74.00	-30.87	peak
4	23088.000	47.02	-3.41	43.61	74.00	-30.39	peak
5	24568.000	46.10	-2.33	43.77	74.00	-30.23	peak
6	25728.000	44.11	-0.72	43.39	74.00	-30.61	peak

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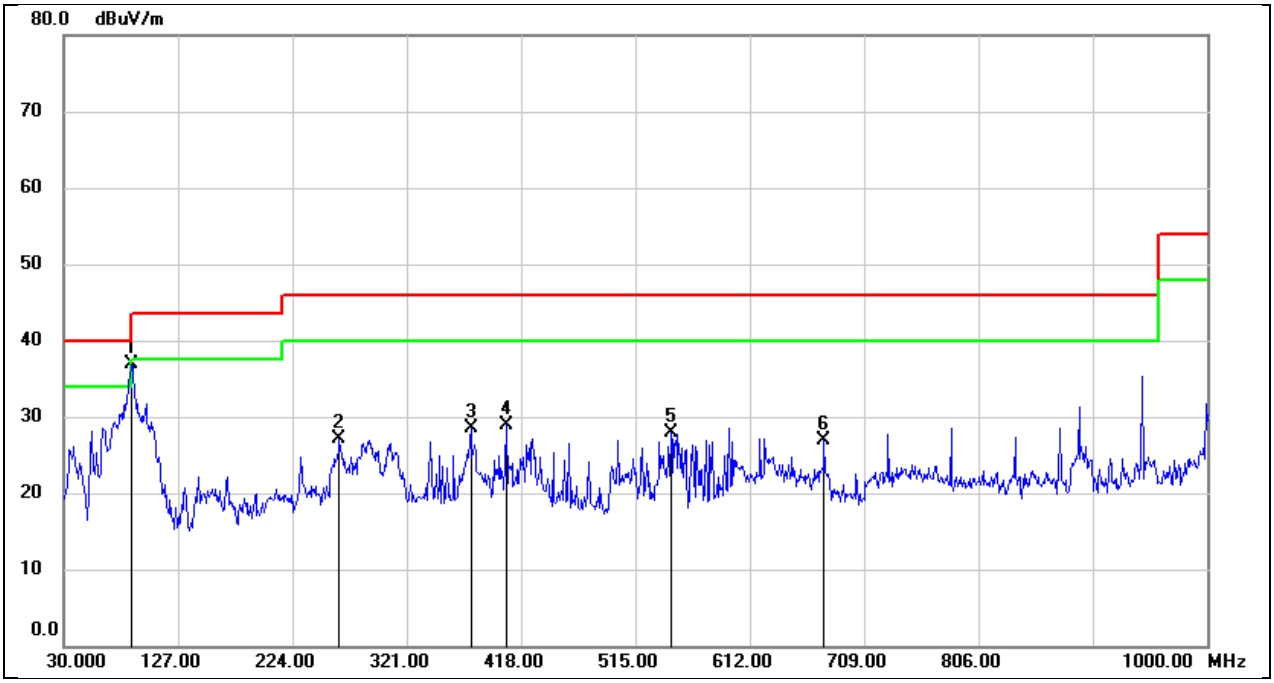
8.6. SPURIOUS EMISSIONS(30 MHZ~1 GHZ)

Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Horizontal	Test Voltage:	DC24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	87.2300	53.72	-16.77	36.95	40.00	-3.05	QP
2	263.7700	40.76	-13.74	27.02	46.00	-18.98	QP
3	375.3200	38.34	-9.79	28.55	46.00	-17.45	QP
4	405.3900	38.70	-9.78	28.92	46.00	-17.08	QP
5	545.0700	35.34	-7.48	27.86	46.00	-18.14	QP
6	675.0500	32.18	-5.37	26.81	46.00	-19.19	QP

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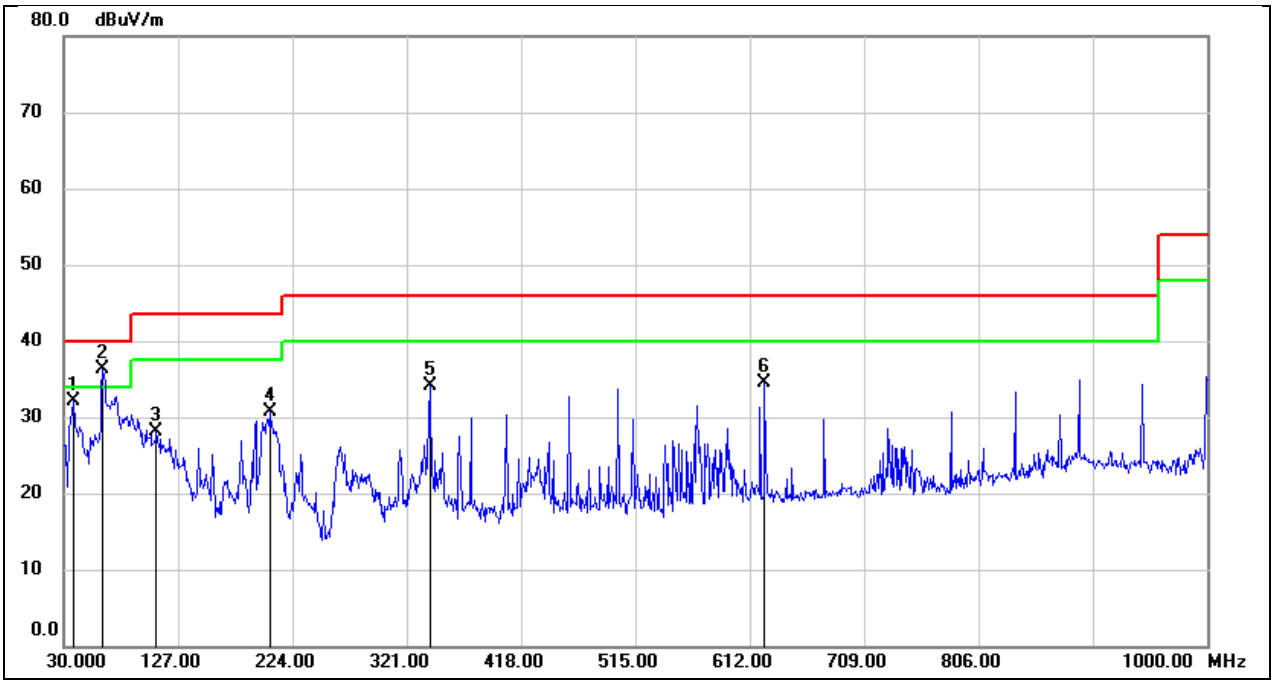
Test Mode:	802.11b	Frequency(MHz):	2412
Polarity:	Vertical	Test Voltage:	DC24V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	37.7599	47.22	-15.09	32.13	40.00	-7.87	QP
2	62.9800	51.51	-15.25	36.26	40.00	-3.74	QP
3	108.5700	43.72	-15.53	28.19	43.50	-15.31	QP
4	204.6000	43.00	-12.39	30.61	43.50	-12.89	QP
5	340.4000	43.99	-9.97	34.02	46.00	-11.98	QP
6	624.6100	40.61	-6.19	34.42	46.00	-11.58	QP

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9. ANTENNA REQUIREMENT

REQUIREMENT

DESCRIPTION

Pass

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10. TEST DATA

10.1. APPENDIX A: DTS BANDWIDTH

10.1.1. Test Result

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.56	2407.48	2417.04	≥0.5	PASS
	Ant2	2412	9.56	2407.48	2417.04	≥0.5	PASS
	Ant1	2437	10.12	2431.92	2442.04	≥0.5	PASS
	Ant2	2437	10.08	2431.96	2442.04	≥0.5	PASS
	Ant1	2462	9.56	2457.48	2467.04	≥0.5	PASS
	Ant2	2462	10.08	2456.96	2467.04	≥0.5	PASS
11G	Ant1	2412	15.96	2404.24	2420.20	≥0.5	PASS
	Ant2	2412	15.80	2404.44	2420.24	≥0.5	PASS
	Ant1	2437	15.68	2428.84	2444.52	≥0.5	PASS
	Ant2	2437	15.92	2428.84	2444.76	≥0.5	PASS
	Ant1	2462	16.12	2454.08	2470.20	≥0.5	PASS
	Ant2	2462	15.72	2454.44	2470.16	≥0.5	PASS
11N20MIMO	Ant1	2412	16.36	2404.44	2420.80	≥0.5	PASS
	Ant2	2412	14.80	2405.72	2420.52	≥0.5	PASS
	Ant1	2437	17.72	2428.08	2445.80	≥0.5	PASS
	Ant2	2437	16.96	2428.20	2445.16	≥0.5	PASS
	Ant1	2462	16.00	2454.52	2470.52	≥0.5	PASS
	Ant2	2462	16.92	2453.88	2470.80	≥0.5	PASS
11N40MIMO	Ant1	2422	35.12	2404.48	2439.60	≥0.5	PASS
	Ant2	2422	35.12	2404.48	2439.60	≥0.5	PASS
	Ant1	2437	35.76	2418.84	2454.60	≥0.5	PASS
	Ant2	2437	35.76	2418.84	2454.60	≥0.5	PASS
	Ant1	2452	36.00	2434.16	2470.16	≥0.5	PASS
	Ant2	2452	35.68	2434.48	2470.16	≥0.5	PASS

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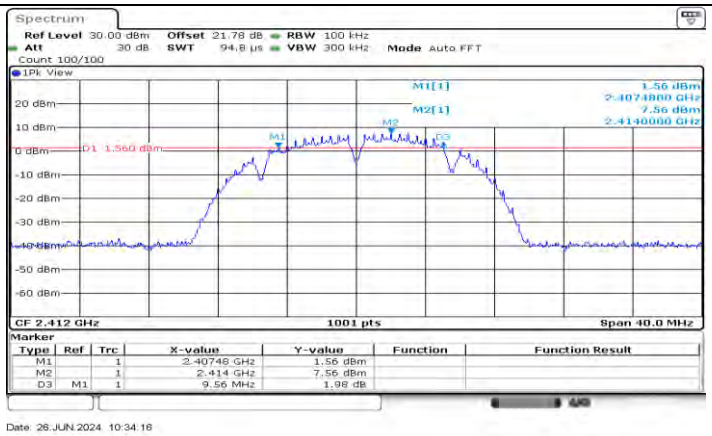
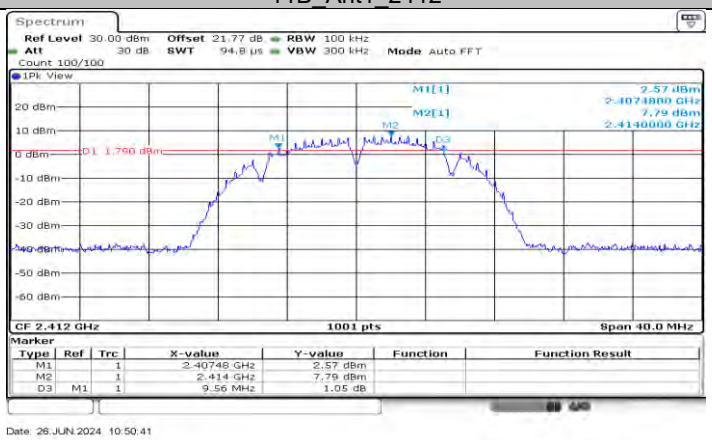
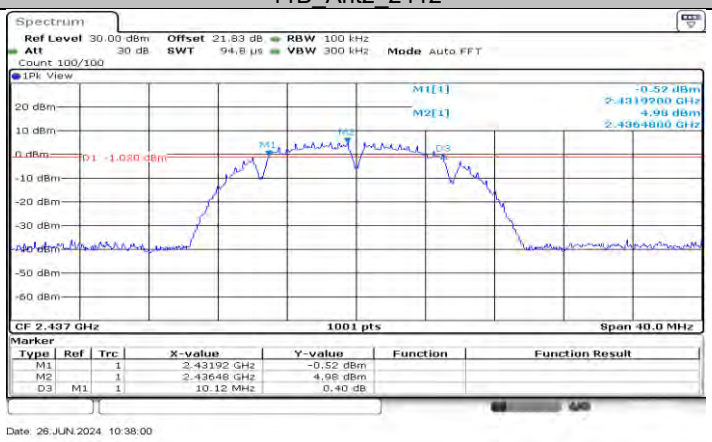
10.1.2. Test Graphs



11B_Ant1_2412



11B_Ant2_2412



11B_Ant1_2437

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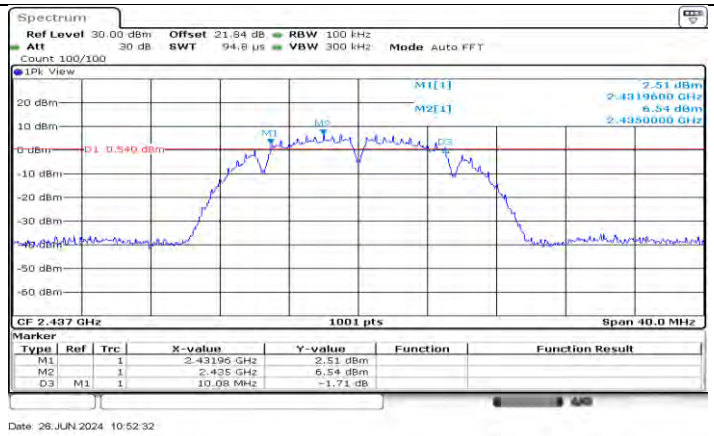
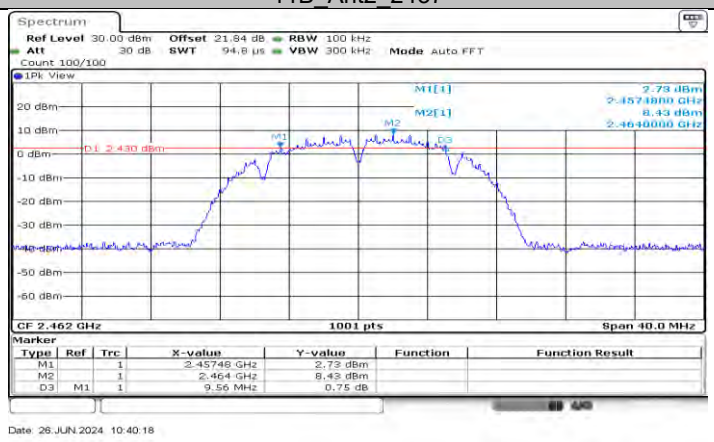
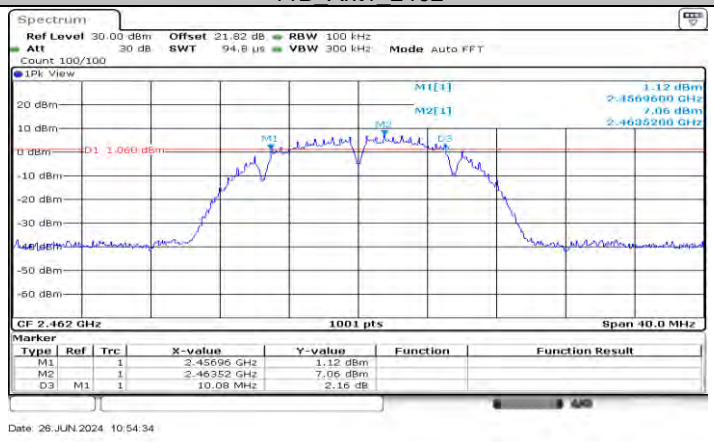


11B_Ant2_2437



11B_Ant1_2462



11B_Ant2_2462

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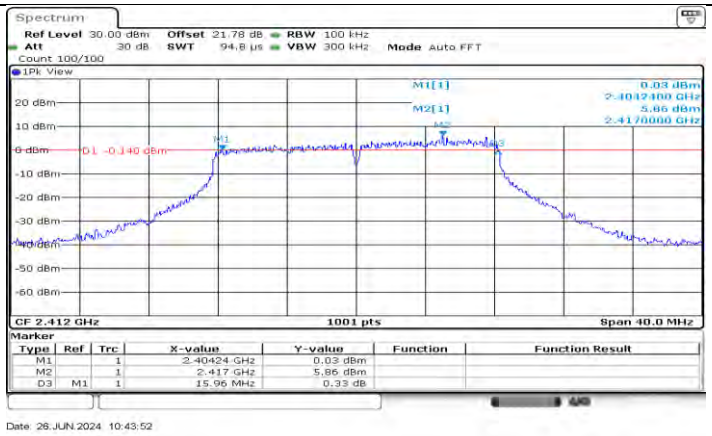
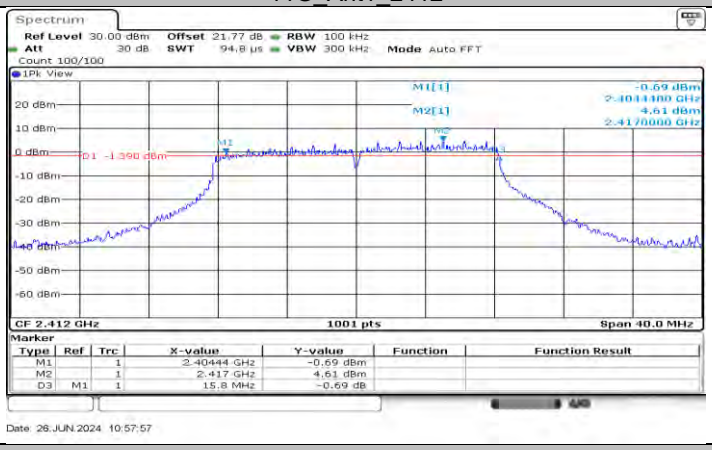
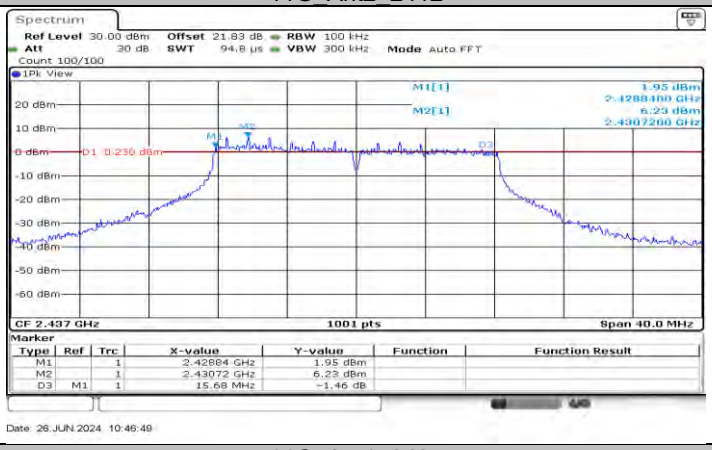


11G_Ant1_2412



11G_Ant2_2412



11G_Ant1_2437

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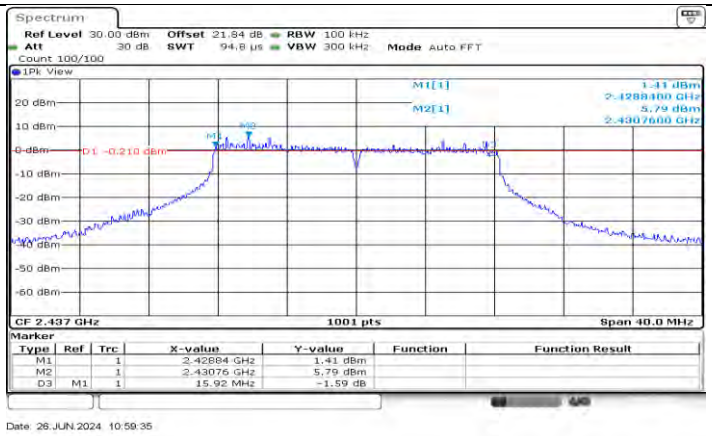
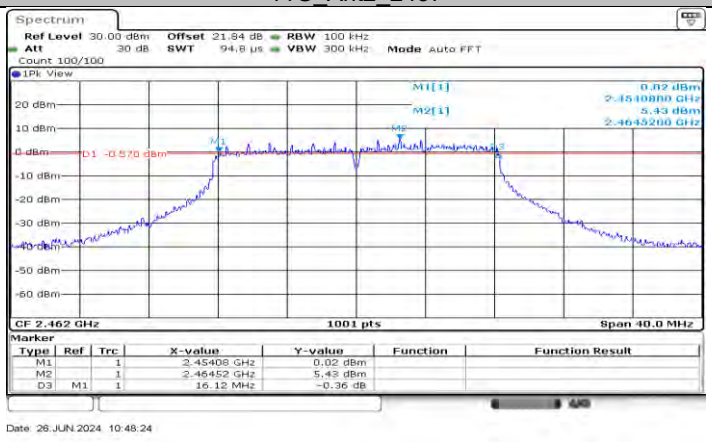
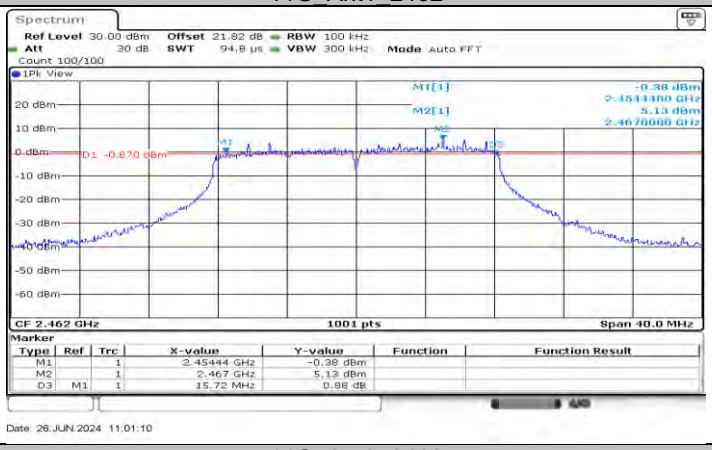


11G_Ant2_2437



11G_Ant1_2462



11G_Ant2_2462

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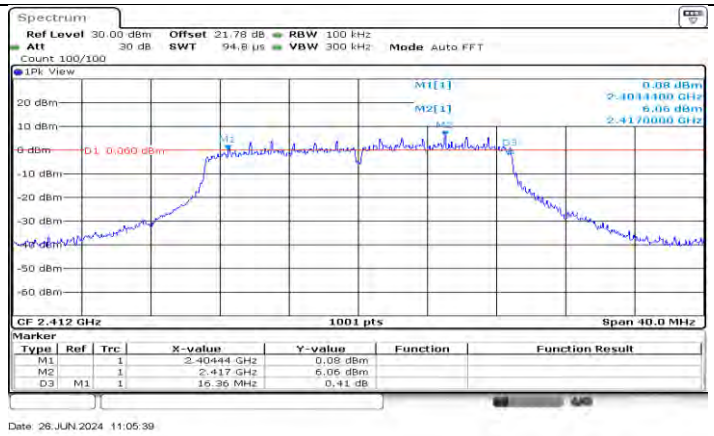
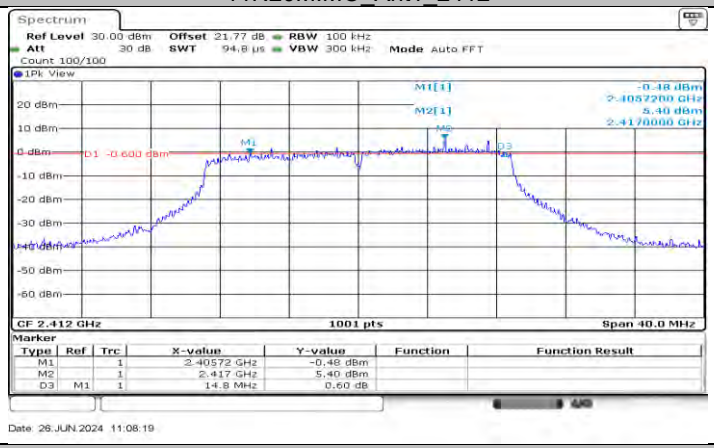
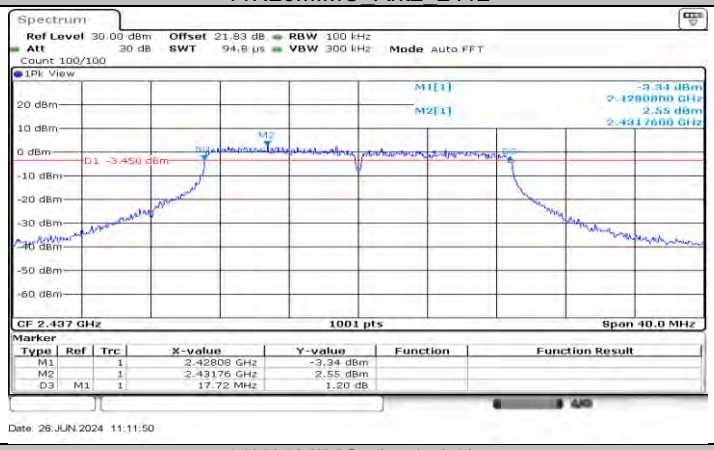


11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412



11N20MIMO_Ant1_2437

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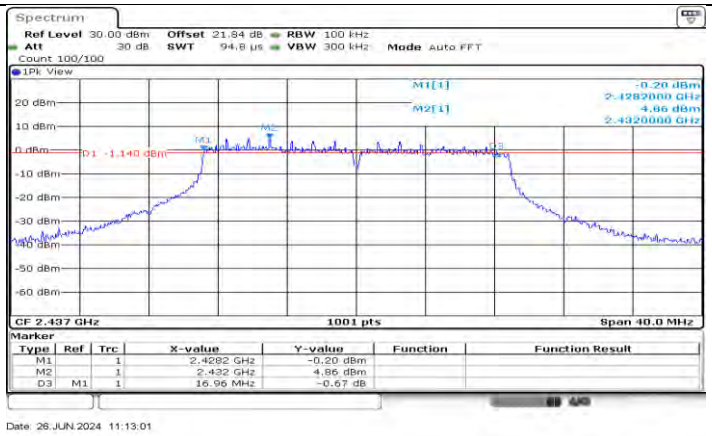
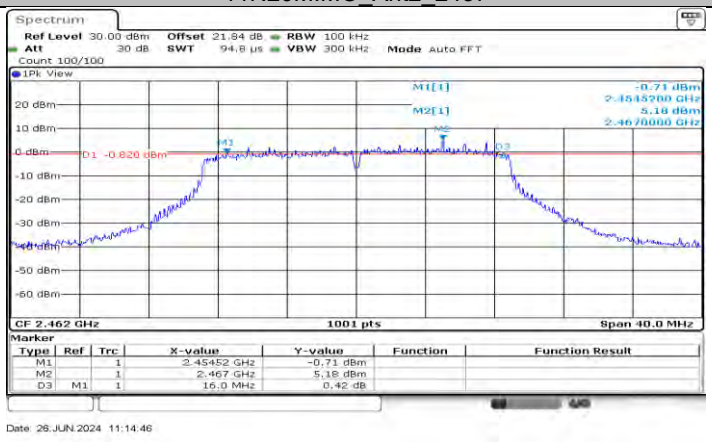
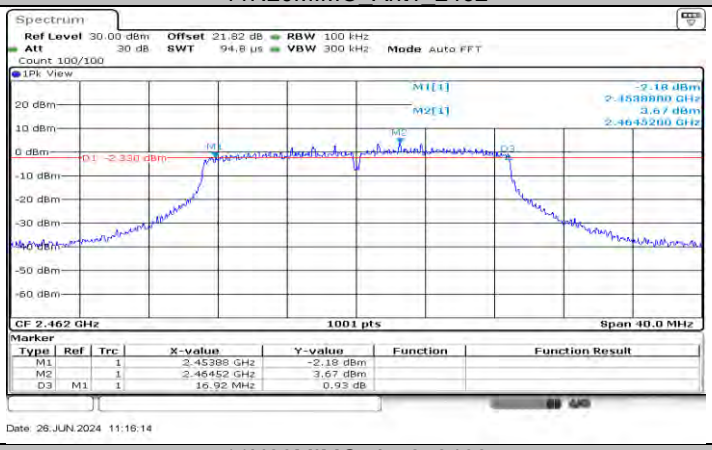


11N20MIMO_Ant2_2437



11N20MIMO_Ant1_2462



11N20MIMO_Ant2_2462

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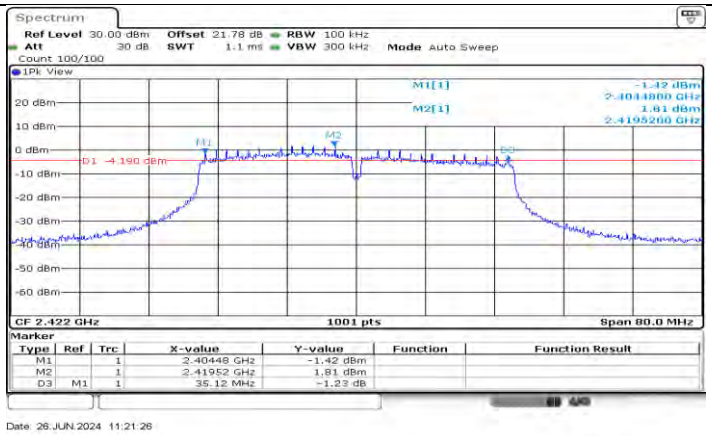
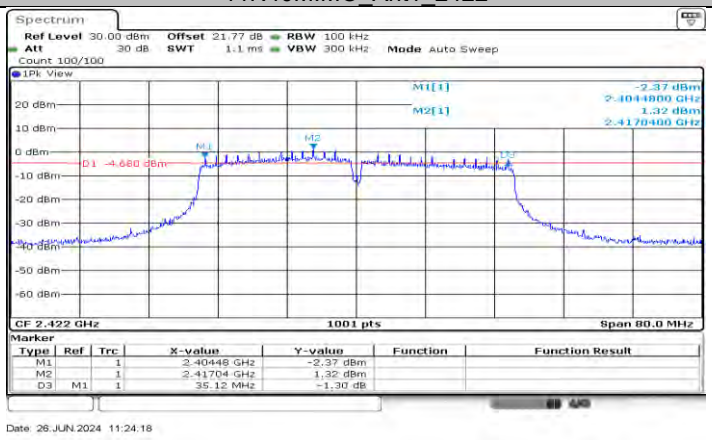
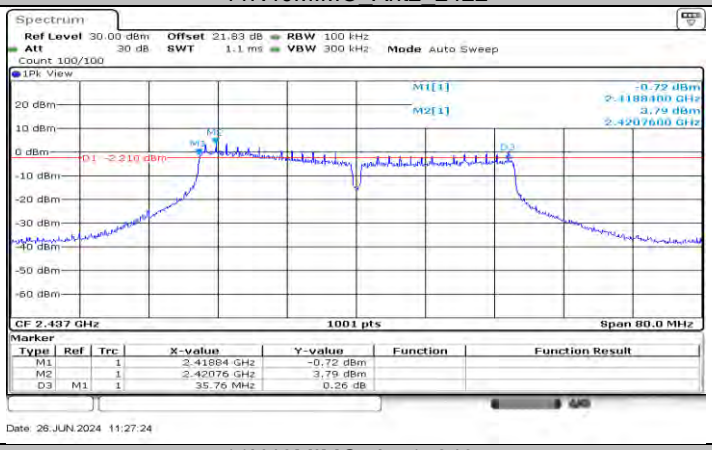


11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



11N40MIMO_Ant1_2437

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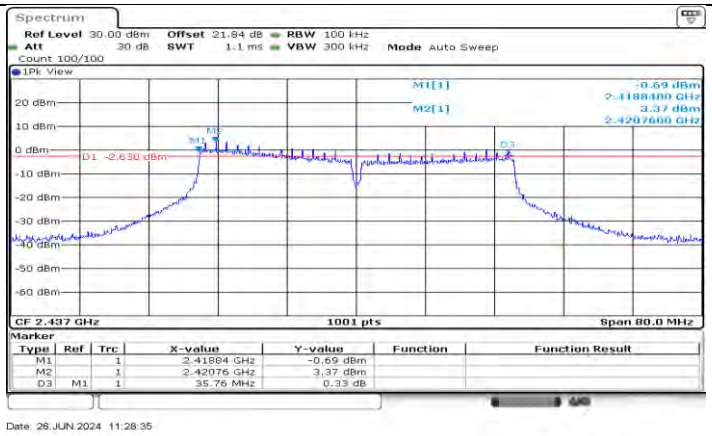
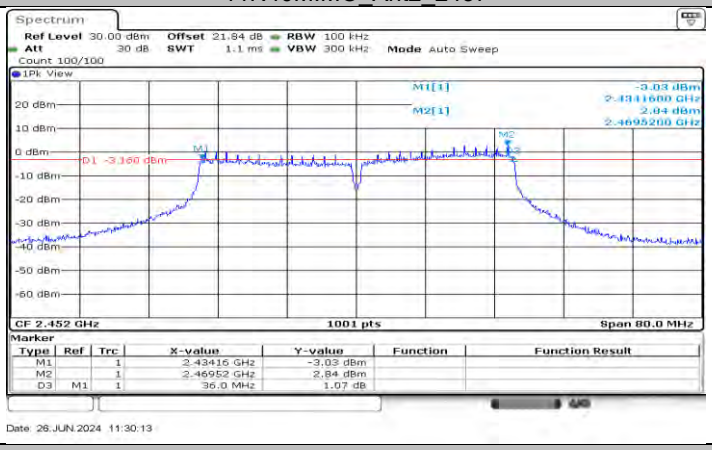
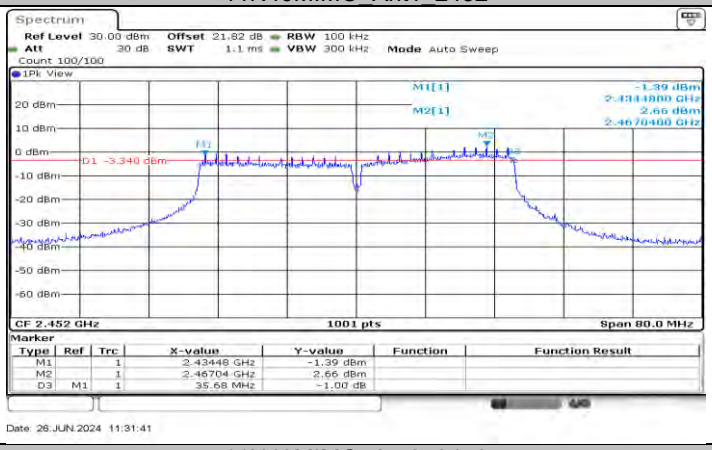


11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452



11N40MIMO_Ant2_2452

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10.2. APPENDIX B: OCCUPIED CHANNEL BANDWIDTH

10.2.1. Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
11B	Ant1	2412	13.706	2405.4066	2419.1129
	Ant2	2412	13.746	2405.4066	2419.1528
	Ant1	2462	13.746	2455.3267	2469.0729
	Ant2	2462	13.746	2455.3267	2469.0729
11G	Ant1	2412	17.622	2403.4486	2421.0709
	Ant2	2412	17.582	2403.4885	2421.0709
	Ant1	2462	17.582	2453.3686	2470.9510
	Ant2	2462	17.582	2453.3686	2470.9510
11N20MIMO	Ant1	2412	18.462	2403.0490	2421.5105
	Ant2	2412	18.382	2403.0889	2421.4705
	Ant1	2462	18.541	2452.8891	2471.4306
	Ant2	2462	18.342	2453.0090	2471.3506
11N40MIMO	Ant1	2422	37.642	2403.0589	2440.7013
	Ant2	2422	37.323	2403.3786	2440.7013
	Ant1	2452	39.481	2432.3397	2471.8202
	Ant2	2452	38.601	2432.8991	2471.5005

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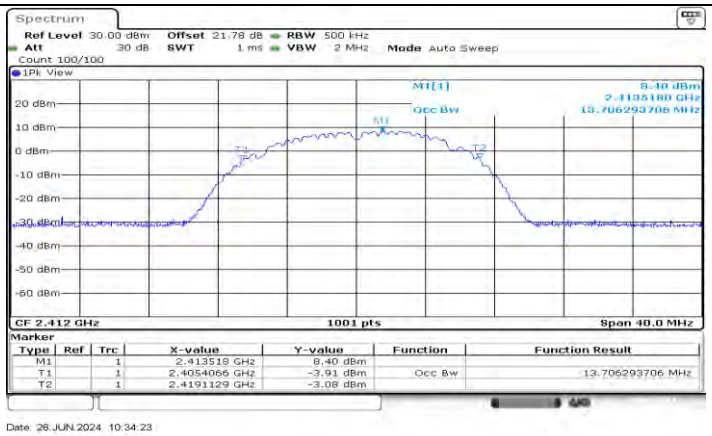
10.2.2. Test Graphs



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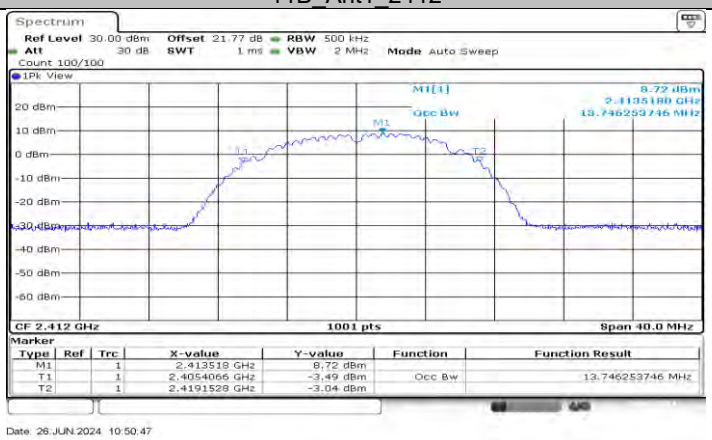

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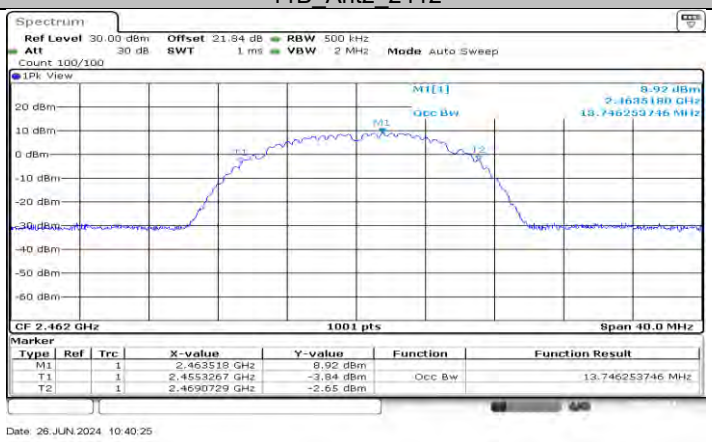

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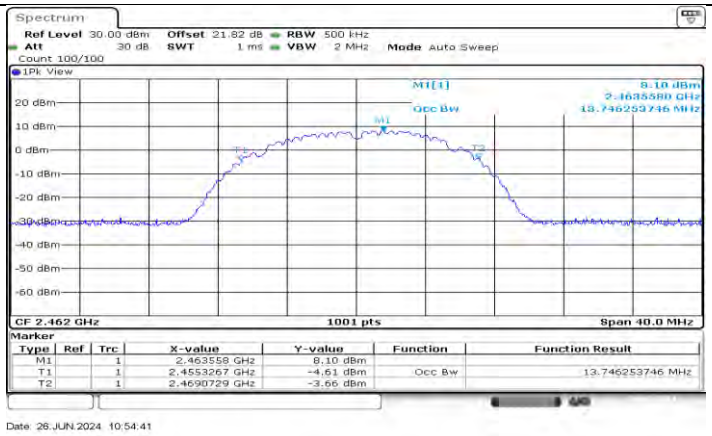

11B_Ant2_2462

11G_Ant1_2412

11G_Ant2_2412

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11G_Ant1_2462

11G_Ant2_2462

11N20MIMO_Ant1_2412

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11N20MIMO_Ant2_2412

11N20MIMO_Ant1_2462

11N20MIMO_Ant2_2462

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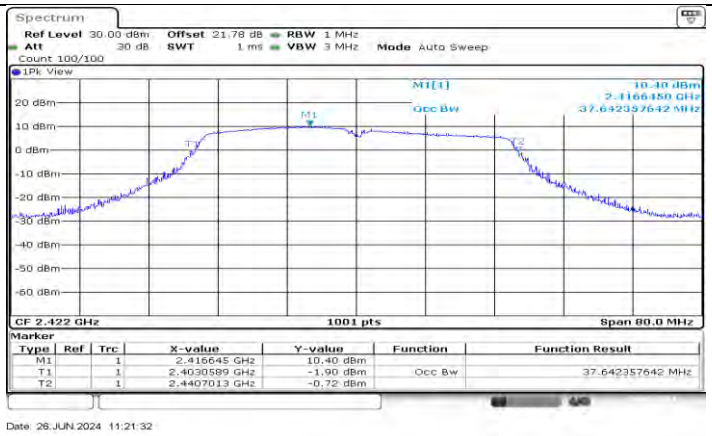
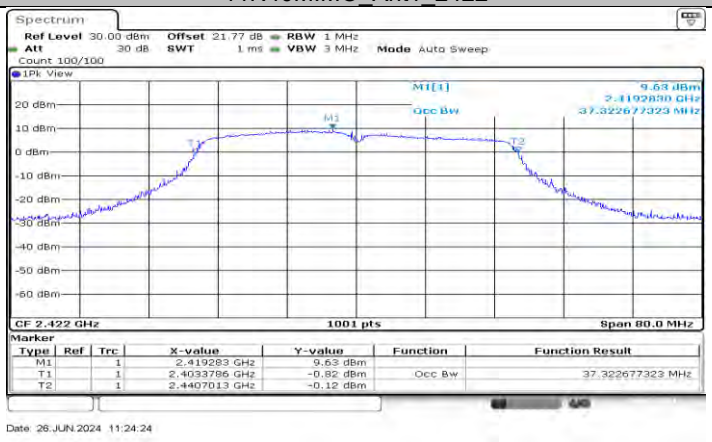
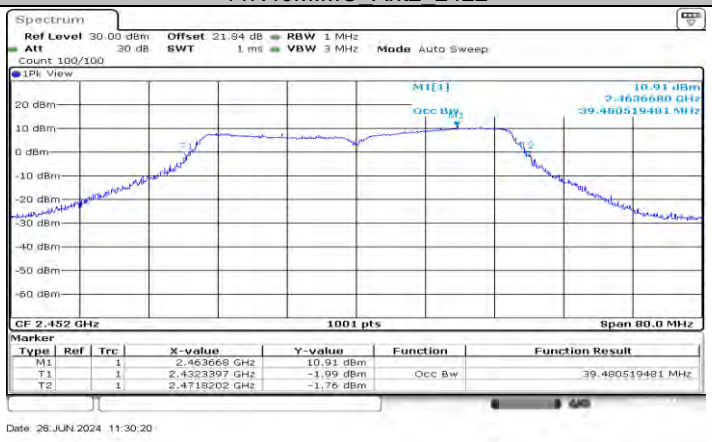


11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



11N40MIMO_Ant1_2452

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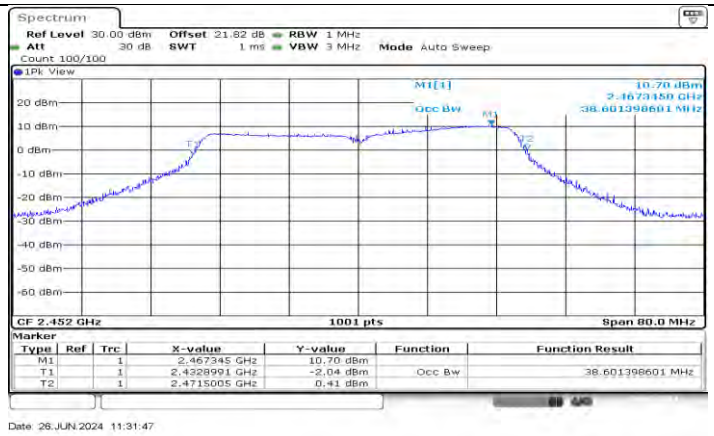

11N40MIMO_Ant2_2452

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10.3. APPENDIX C: MAXIMUM CONDUCTED OUTPUT POWER

10.3.1. Test Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	17.49	≤30.00	PASS
	Ant2	2412	17.46	≤30.00	PASS
	Ant1	2437	17.16	≤30.00	PASS
	Ant2	2437	16.82	≤30.00	PASS
	Ant1	2462	17.44	≤30.00	PASS
	Ant2	2462	17.09	≤30.00	PASS
11G	Ant1	2412	17.22	≤30.00	PASS
	Ant2	2412	16.97	≤30.00	PASS
	Ant1	2437	17.14	≤30.00	PASS
	Ant2	2437	17.20	≤30.00	PASS
	Ant1	2462	17.56	≤30.00	PASS
	Ant2	2462	17.08	≤30.00	PASS
11N20MIMO	Ant1	2412	16.06	≤30.00	PASS
	Ant2	2412	15.97	≤30.00	PASS
	total	2412	19.03	≤30.00	PASS
	Ant1	2437	16.22	≤30.00	PASS
	Ant2	2437	16.51	≤30.00	PASS
	total	2437	19.38	≤30.00	PASS
	Ant1	2462	16.24	≤30.00	PASS
	Ant2	2462	16.18	≤30.00	PASS
	total	2462	19.22	≤30.00	PASS
11N40MIMO	Ant1	2422	14.22	≤30.00	PASS
	Ant2	2422	14.34	≤30.00	PASS
	total	2422	17.29	≤30.00	PASS
	Ant1	2437	15.37	≤30.00	PASS
	Ant2	2437	15.66	≤30.00	PASS
	total	2437	18.53	≤30.00	PASS
	Ant1	2452	15.25	≤30.00	PASS
	Ant2	2452	15.13	≤30.00	PASS
	total	2452	18.20	≤30.00	PASS

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.

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10.4. APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY

10.4.1. Test Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-14.70	≤8.00	PASS
	Ant2	2412	-14.49	≤8.00	PASS
	Ant1	2437	-15.04	≤8.00	PASS
	Ant2	2437	-15.20	≤8.00	PASS
	Ant1	2462	-14.60	≤8.00	PASS
	Ant2	2462	-14.80	≤8.00	PASS
11G	Ant1	2412	-16.62	≤8.00	PASS
	Ant2	2412	-16.91	≤8.00	PASS
	Ant1	2437	-16.83	≤8.00	PASS
	Ant2	2437	-16.92	≤8.00	PASS
	Ant1	2462	-16.57	≤8.00	PASS
	Ant2	2462	-17.27	≤8.00	PASS
11N20MIMO	Ant1	2412	-18.06	≤8.00	PASS
	Ant2	2412	-17.79	≤8.00	PASS
	total	2412	-14.91	≤8.00	PASS
	Ant1	2437	-18.14	≤8.00	PASS
	Ant2	2437	-17.72	≤8.00	PASS
	total	2437	-14.91	≤8.00	PASS
	Ant1	2462	-18.07	≤8.00	PASS
	Ant2	2462	-18.02	≤8.00	PASS
	total	2462	-15.03	≤8.00	PASS
11N40MIMO	Ant1	2422	-17.90	≤8.00	PASS
	Ant2	2422	-16.84	≤8.00	PASS
	total	2422	-14.33	≤8.00	PASS
	Ant1	2437	-18.38	≤8.00	PASS
	Ant2	2437	-19.23	≤8.00	PASS
	total	2437	-15.77	≤8.00	PASS
	Ant1	2452	-20.37	≤8.00	PASS
	Ant2	2452	-19.99	≤8.00	PASS
	total	2452	-17.17	≤8.00	PASS

Note: 1. The Duty Cycle Factor (refer to section 7.5) had already compensated to the test data.

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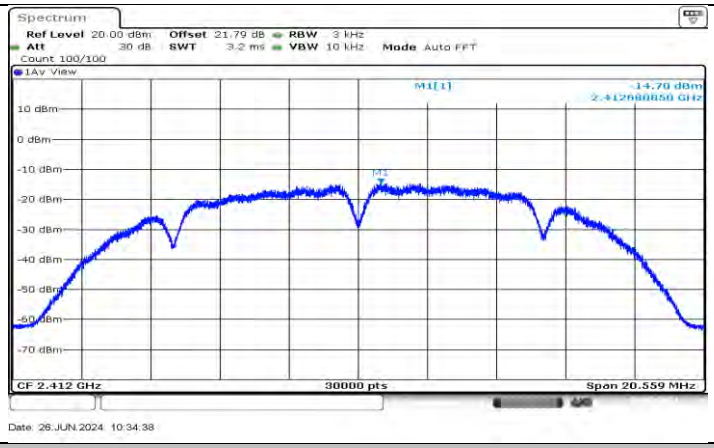
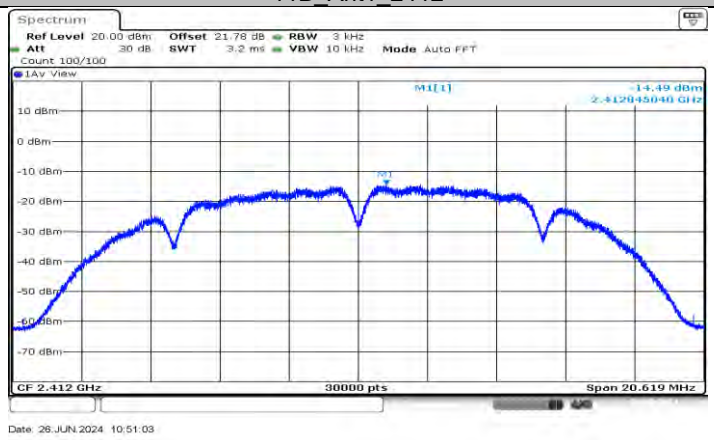
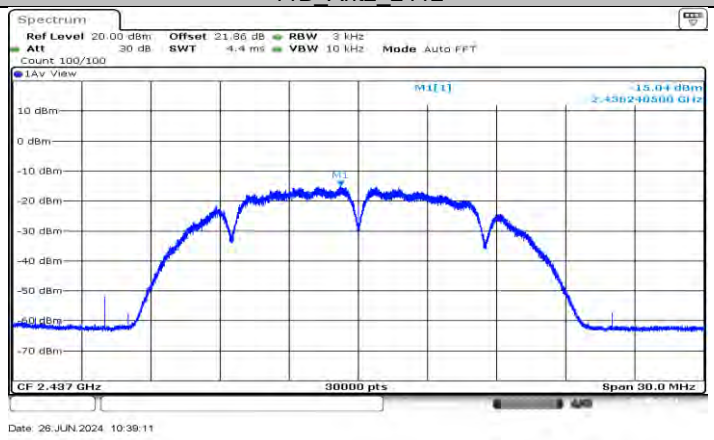
10.4.2. Test Graphs



11B_Ant1_2412



11B_Ant2_2412



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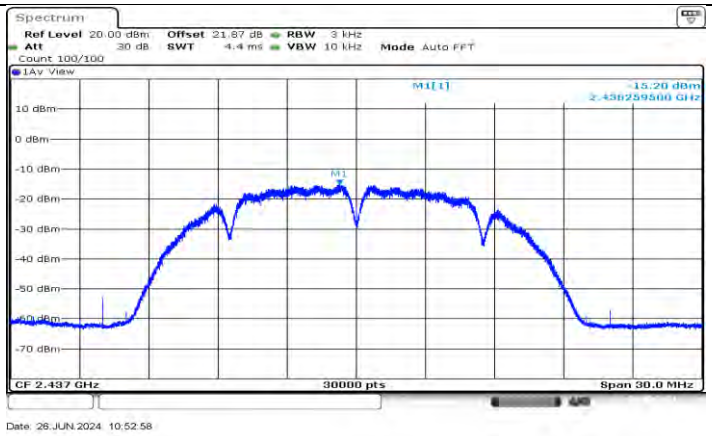

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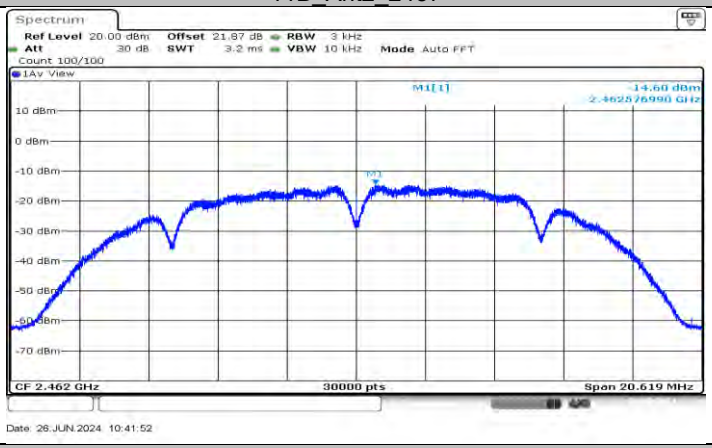

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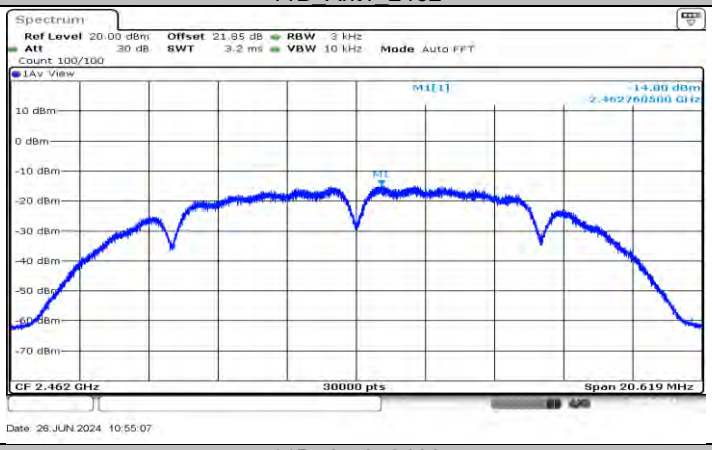

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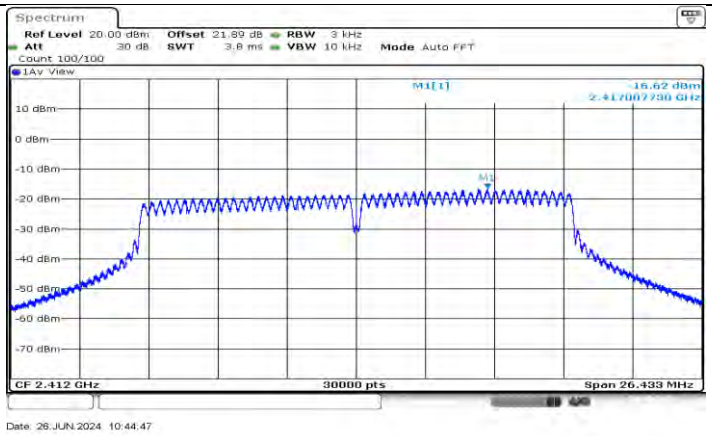
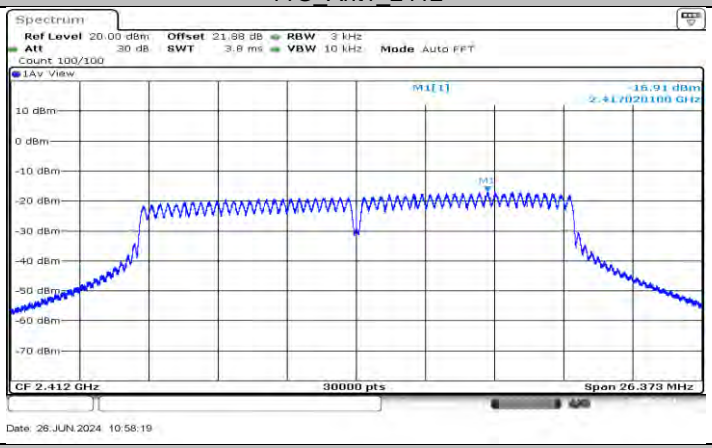


11G_Ant1_2412



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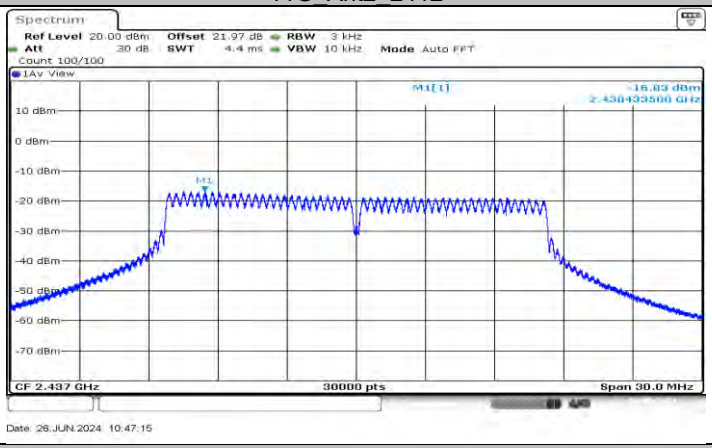

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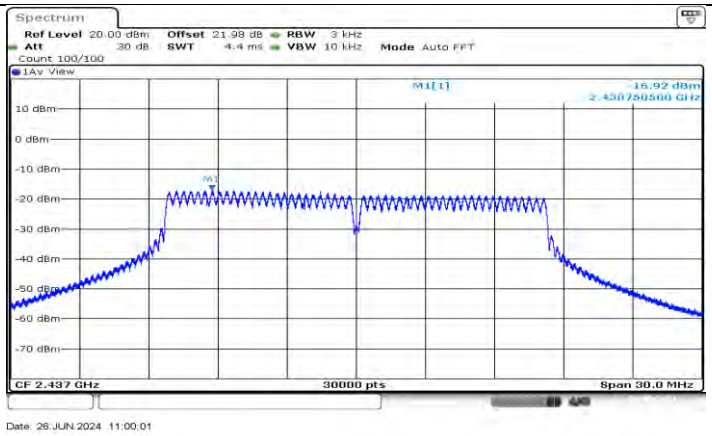

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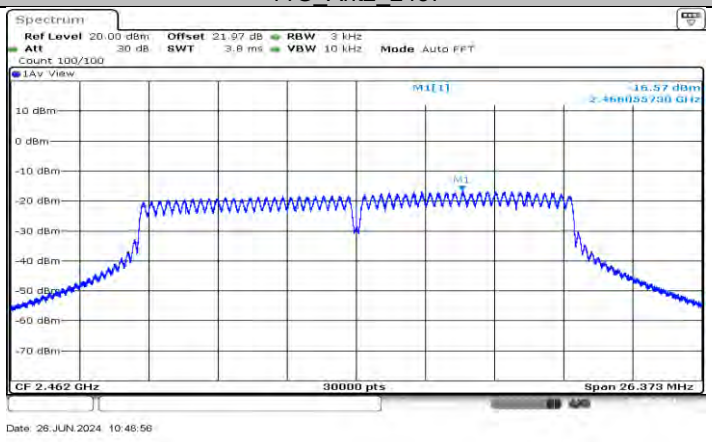

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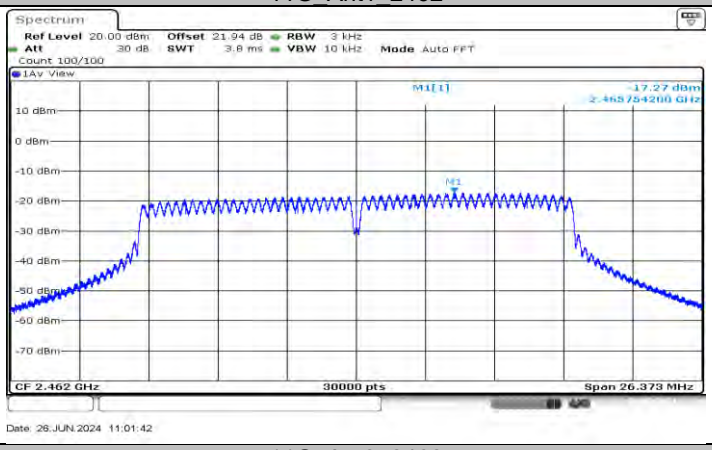

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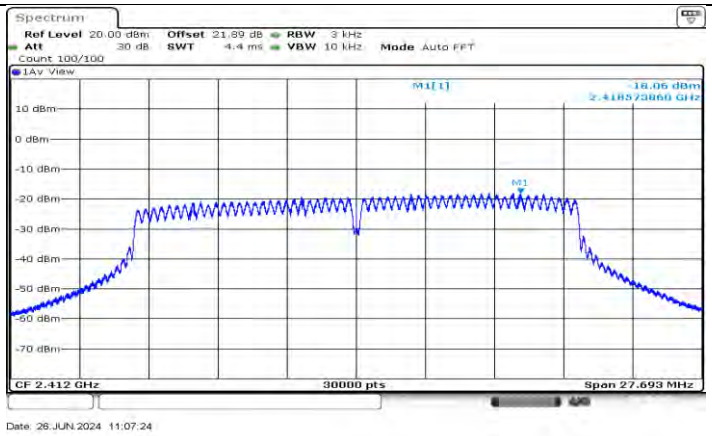

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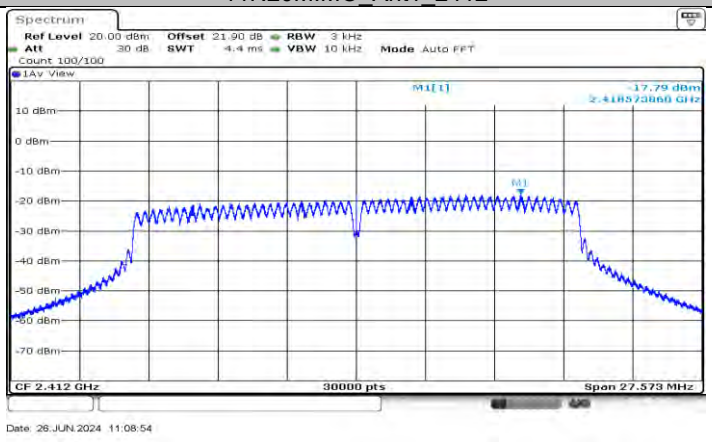

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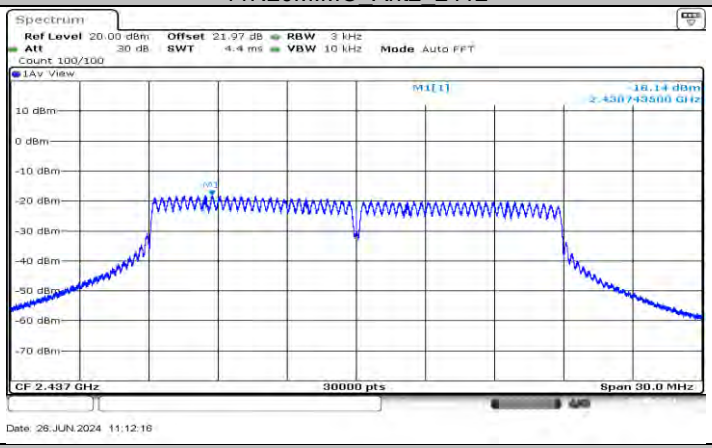

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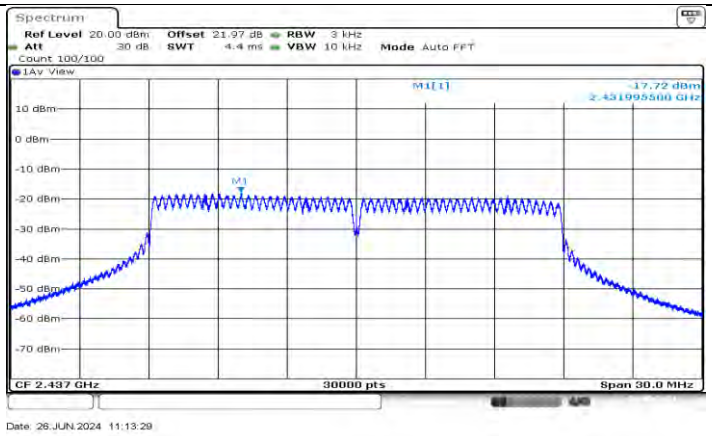

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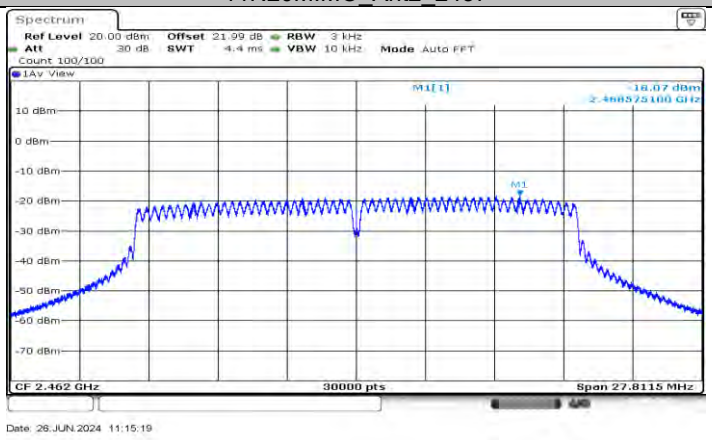

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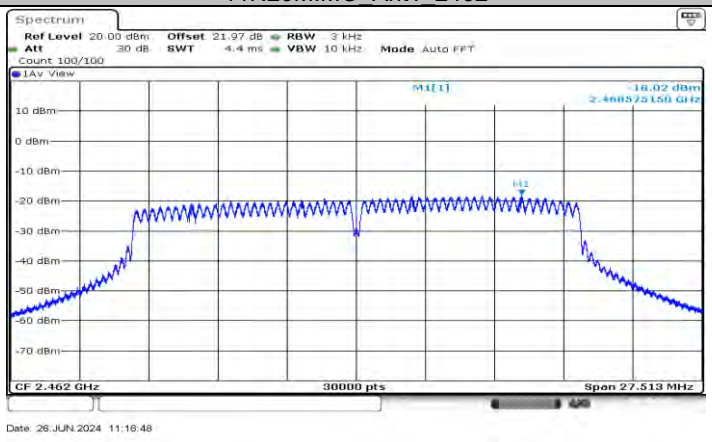

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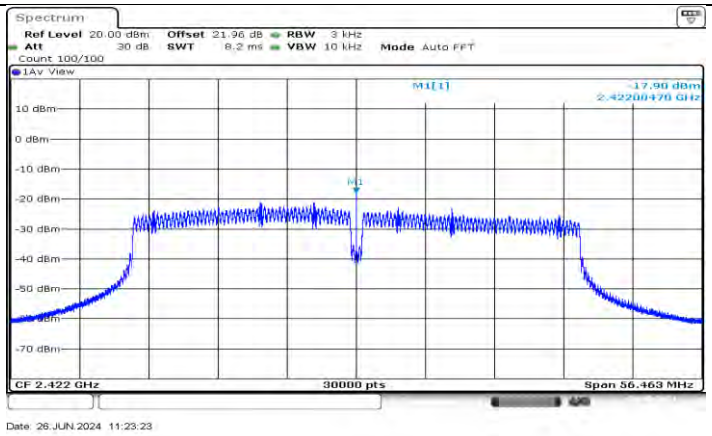

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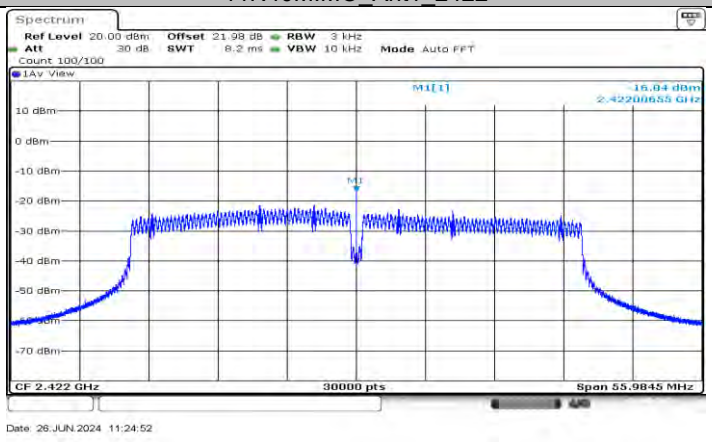

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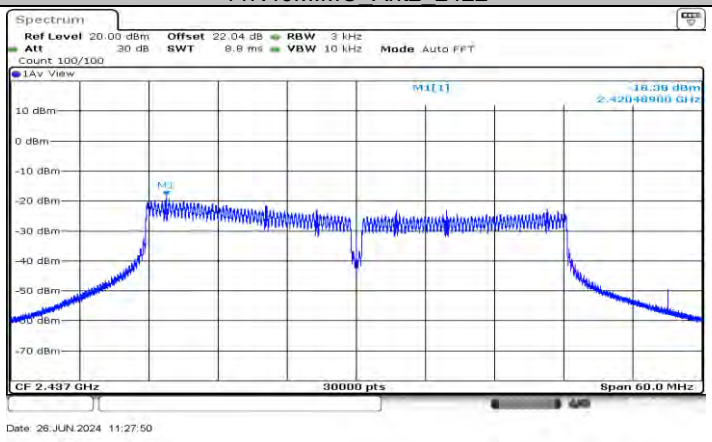

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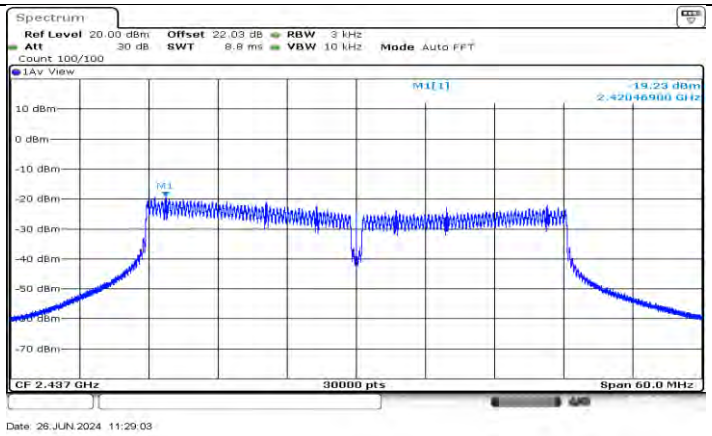

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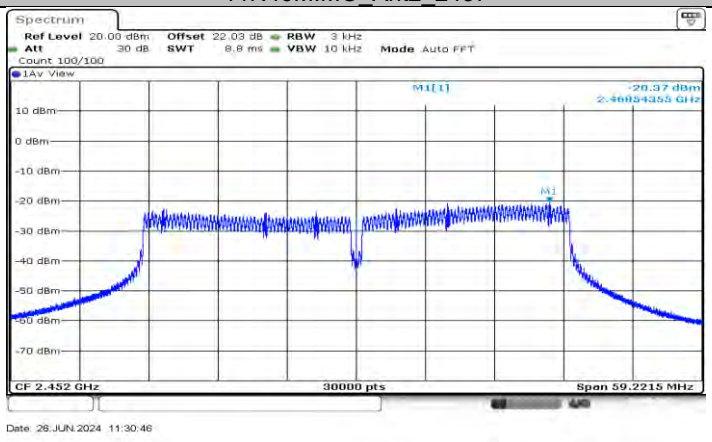

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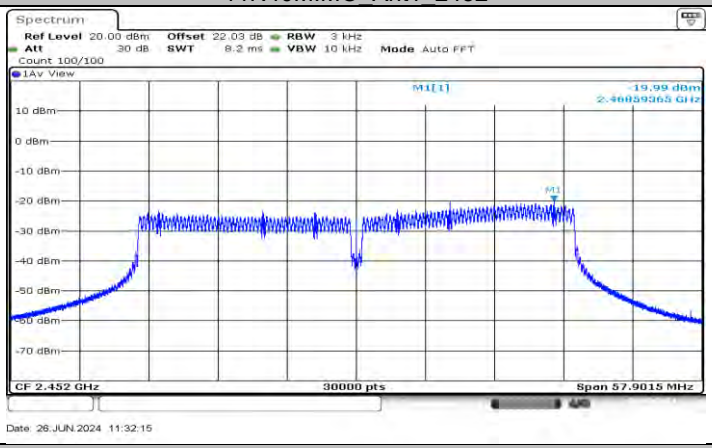

11N40MIMO_Ant2_2452

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10.5. APPENDIX E: BAND EDGE MEASUREMENTS

10.5.1. Test Result

Test Mode	Antenna	ChName	Frequency [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	6.90	-44.84	≤-23.1	PASS
	Ant2	Low	2412	7.17	-44.55	≤-22.83	PASS
	Ant1	High	2462	7.64	-46.54	≤-22.36	PASS
	Ant2	High	2462	7.18	-45.51	≤-22.82	PASS
11G	Ant1	Low	2412	3.57	-28.79	≤-26.43	PASS
	Ant2	Low	2412	5.99	-30.81	≤-24.01	PASS
	Ant1	High	2462	6.13	-46.45	≤-23.87	PASS
	Ant2	High	2462	5.45	-44.84	≤-24.55	PASS
11N20MIMO	Ant1	Low	2412	3.81	-31.28	≤-26.19	PASS
	Ant2	Low	2412	3.00	-31.55	≤-27	PASS
	Ant1	High	2462	2.92	-45.33	≤-27.08	PASS
	Ant2	High	2462	4.36	-46.16	≤-25.64	PASS
11N40MIMO	Ant1	Low	2422	0.61	-30.83	≤-29.39	PASS
	Ant2	Low	2422	1.03	-32.09	≤-28.97	PASS
	Ant1	High	2452	1.67	-42.04	≤-28.33	PASS
	Ant2	High	2452	2.32	-42.43	≤-27.68	PASS

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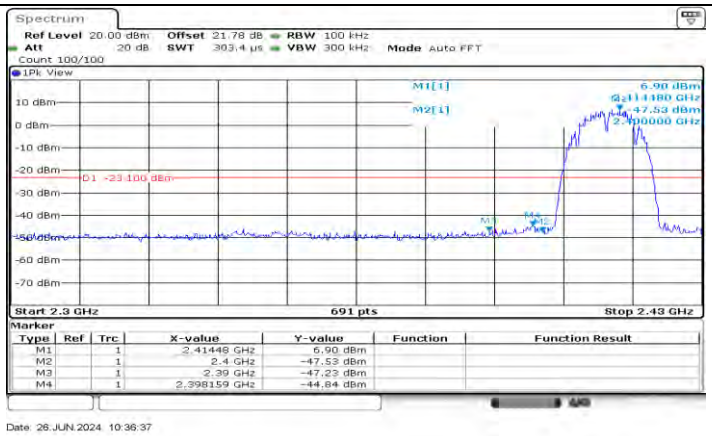
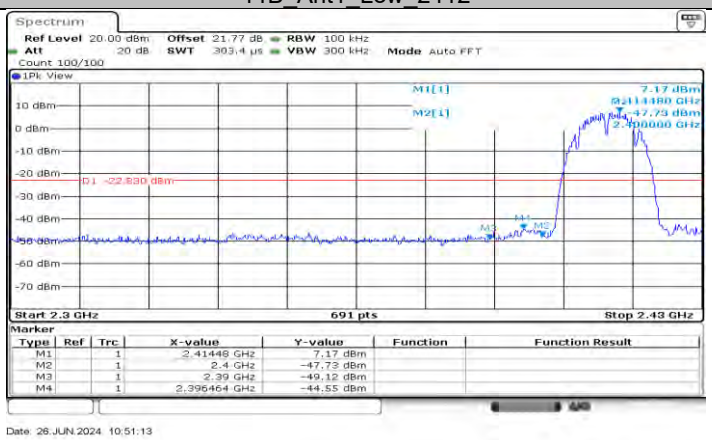
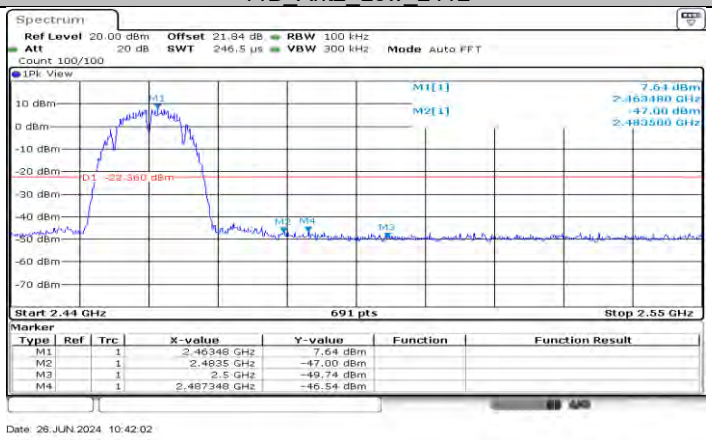
10.5.2. Test Graphs



11B_Ant1_Low_2412



11B_Ant2_Low_2412



11B_Ant1_High_2462

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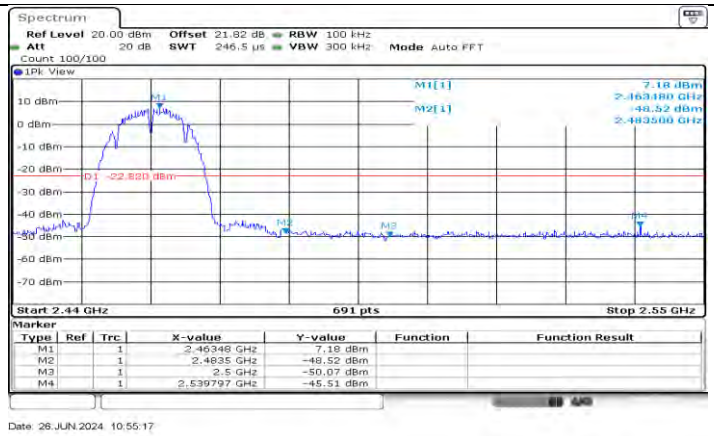
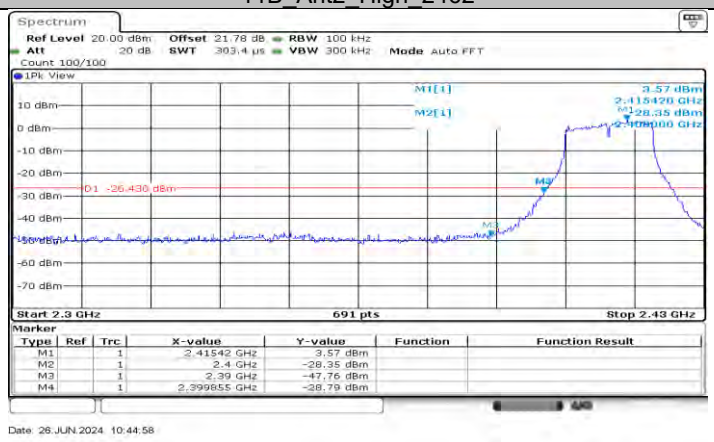
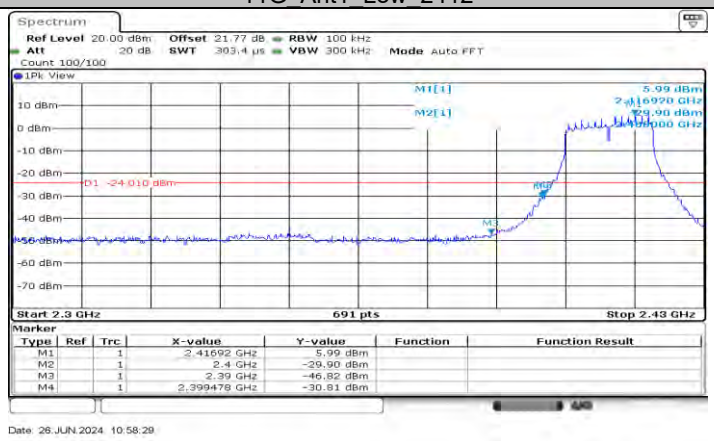


11B_Ant2_High_2462



11G_Ant1_Low_2412



11G_Ant2_Low_2412

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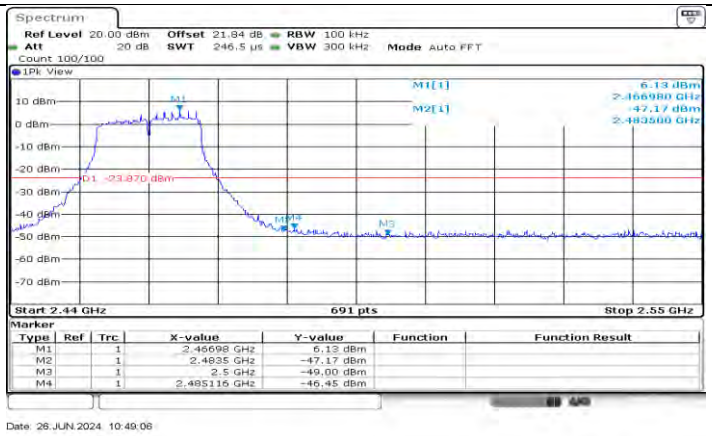
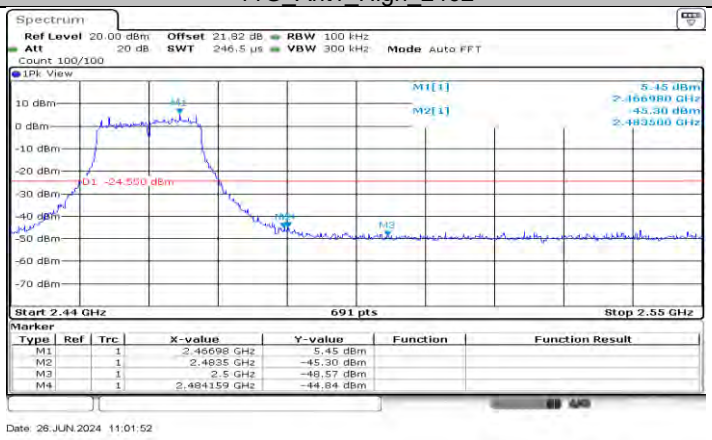
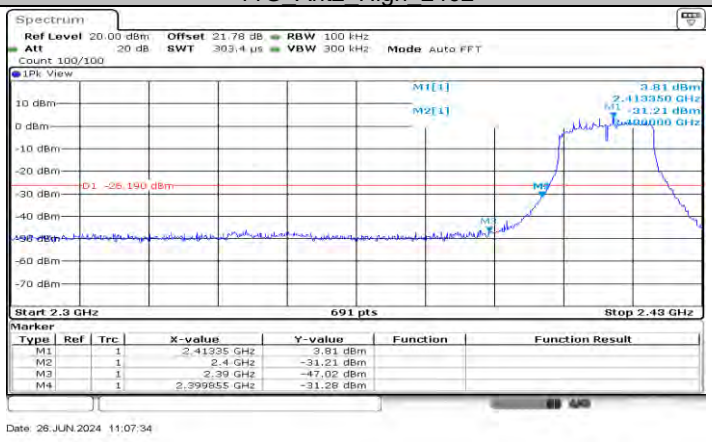


11G_Ant1_High_2462



11G_Ant2_High_2462



11N20MIMO_Ant1_Low_2412

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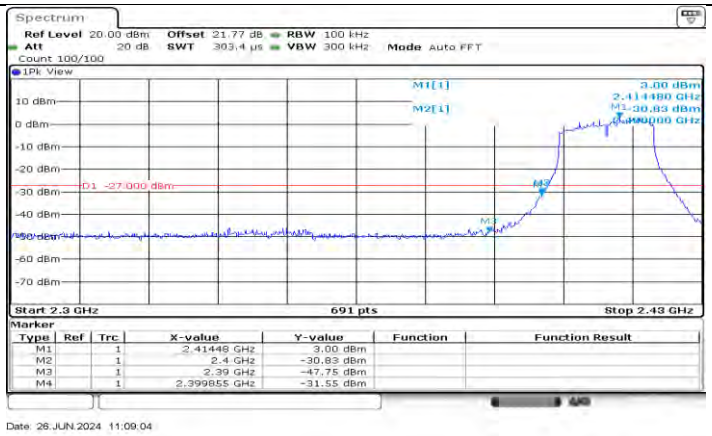
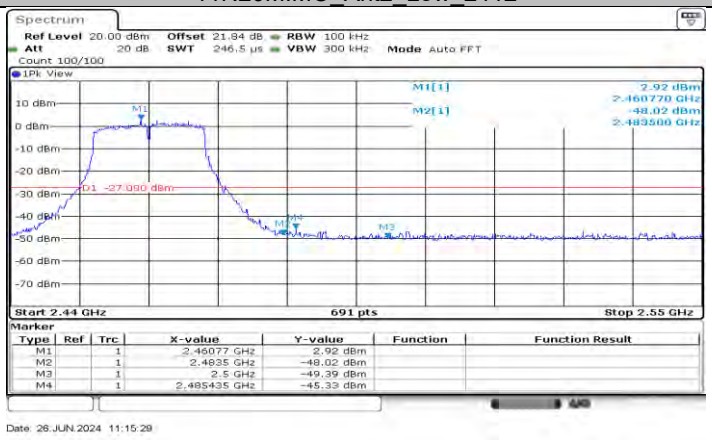
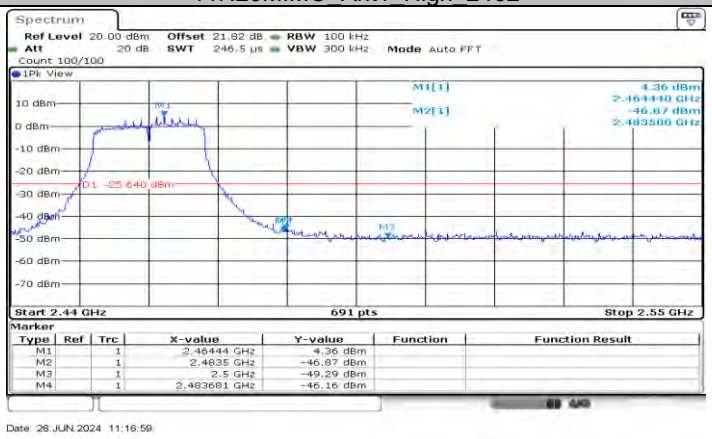


11N20MIMO_Ant2_Low_2412



11N20MIMO_Ant1_High_2462



11N20MIMO_Ant2_High_2462

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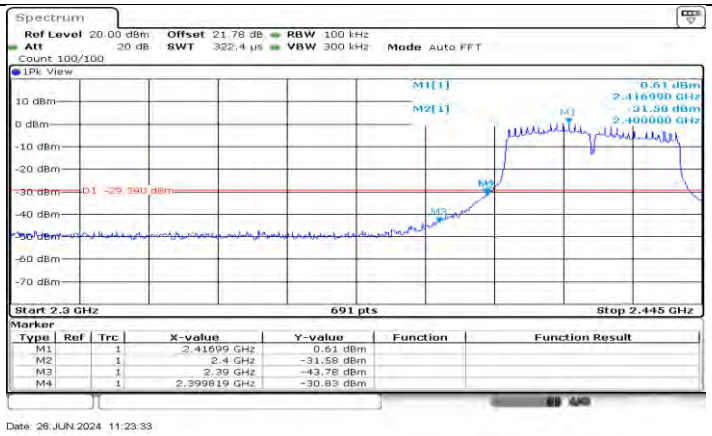
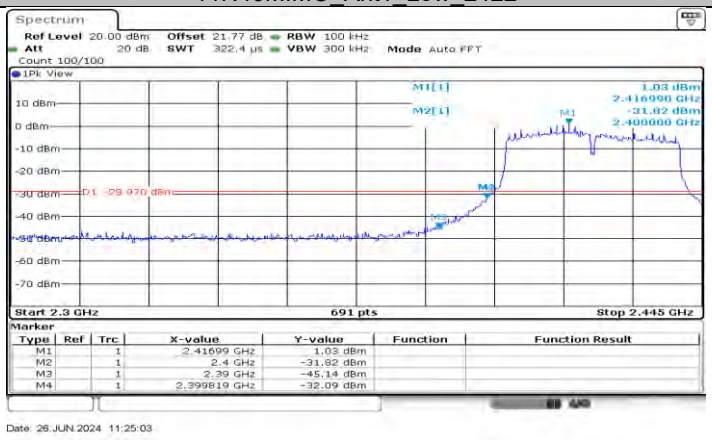
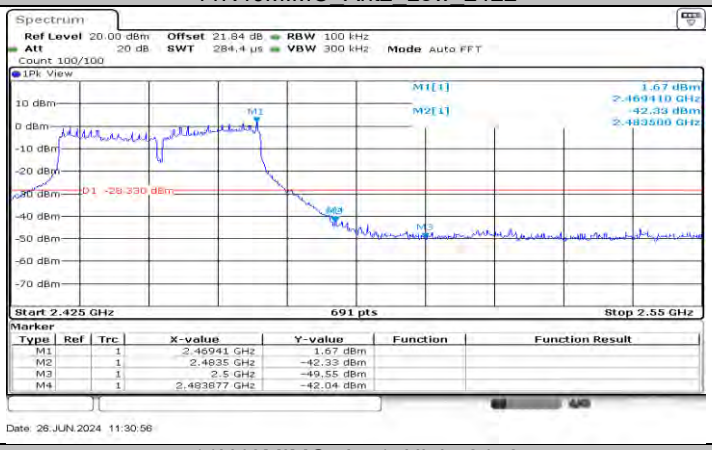


11N40MIMO_Ant1_Low_2422



11N40MIMO_Ant2_Low_2422



11N40MIMO_Ant1_High_2452

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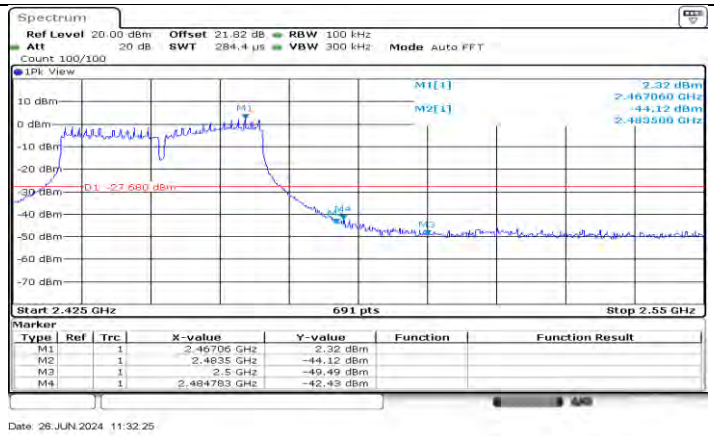

11N40MIMO_Ant2_High_2452

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10.6. APPENDIX F: CONDUCTED SPURIOUS EMISSION

10.6.1. Test Result

Test Mode	Antenna	Frequency[MHz]	FreqRange [Mhz]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	7.65	---	PASS
			30~1000	-40.36	≤-22.35	PASS
			1000~26500	-40.69	≤-22.35	PASS
	Ant2	2412	Reference	7.88	---	PASS
			30~1000	-38.9	≤-22.12	PASS
			1000~26500	-40.44	≤-22.12	PASS
	Ant1	2437	Reference	6.76	---	PASS
			30~1000	-39.66	≤-23.24	PASS
			1000~26500	-40.62	≤-23.24	PASS
	Ant2	2437	Reference	7.27	---	PASS
			30~1000	-39.86	≤-22.73	PASS
			1000~26500	-39.68	≤-22.73	PASS
	Ant1	2462	Reference	8.27	---	PASS
			30~1000	-40.3	≤-21.73	PASS
			1000~26500	-39.94	≤-21.73	PASS
	Ant2	2462	Reference	7.49	---	PASS
			30~1000	-38.23	≤-22.51	PASS
			1000~26500	-40.21	≤-22.51	PASS
11G	Ant1	2412	Reference	5.46	---	PASS
			30~1000	-40.15	≤-24.54	PASS
			1000~26500	-40.23	≤-24.54	PASS
	Ant2	2412	Reference	5.49	---	PASS
			30~1000	-39.98	≤-24.51	PASS
			1000~26500	-40.38	≤-24.51	PASS
	Ant1	2437	Reference	5.74	---	PASS
			30~1000	-40.09	≤-24.26	PASS
			1000~26500	-39.66	≤-24.26	PASS
	Ant2	2437	Reference	6.02	---	PASS
			30~1000	-39.95	≤-23.98	PASS
			1000~26500	-39.58	≤-23.98	PASS
	Ant1	2462	Reference	6.45	---	PASS
			30~1000	-40.19	≤-23.55	PASS
			1000~26500	-40.23	≤-23.55	PASS
	Ant2	2462	Reference	6.04	---	PASS
			30~1000	-40.33	≤-23.96	PASS
			1000~26500	-39.92	≤-23.96	PASS
11N20MIMO	Ant1	2412	Reference	5.30	---	PASS
			30~1000	-39.9	≤-24.7	PASS
			1000~26500	-40.84	≤-24.7	PASS
	Ant2	2412	Reference	5.04	---	PASS
			30~1000	-39.93	≤-24.96	PASS
			1000~26500	-40.16	≤-24.96	PASS
	Ant1	2437	Reference	5.22	---	PASS
			30~1000	-39.38	≤-24.78	PASS
			1000~26500	-40.46	≤-24.78	PASS
	Ant2	2437	Reference	5.29	---	PASS
			30~1000	-39.58	≤-24.71	PASS
			1000~26500	-40.27	≤-24.71	PASS
	Ant1	2462	Reference	5.31	---	PASS
			30~1000	-39.71	≤-24.69	PASS
			1000~26500	-40.27	≤-24.69	PASS
	Ant2	2462	Reference	5.39	---	PASS
			30~1000	-39.28	≤-24.61	PASS
			1000~26500	-40.46	≤-24.61	PASS
11N40MIMO	Ant1	2422	Reference	0.12	---	PASS

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			30~1000	-40.11	≤-29.88	PASS
			1000~26500	-40.66	≤-29.88	PASS
	Ant2	2422	Reference	0.52	---	PASS
			30~1000	-40.28	≤-29.48	PASS
			1000~26500	-40.83	≤-29.48	PASS
	Ant1	2437	Reference	3.22	---	PASS
			30~1000	-39.84	≤-26.78	PASS
			1000~26500	-40.51	≤-26.78	PASS
	Ant2	2437	Reference	3.33	---	PASS
			30~1000	-40.05	≤-26.67	PASS
			1000~26500	-40.13	≤-26.67	PASS
	Ant1	2452	Reference	2.32	---	PASS
			30~1000	-40.11	≤-27.68	PASS
			1000~26500	-40.22	≤-27.68	PASS
	Ant2	2452	Reference	2.36	---	PASS
			30~1000	-40.16	≤-27.64	PASS
			1000~26500	-40.68	≤-27.64	PASS

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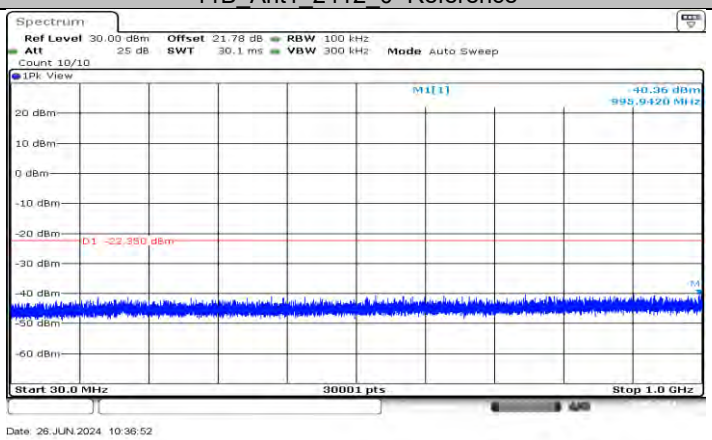
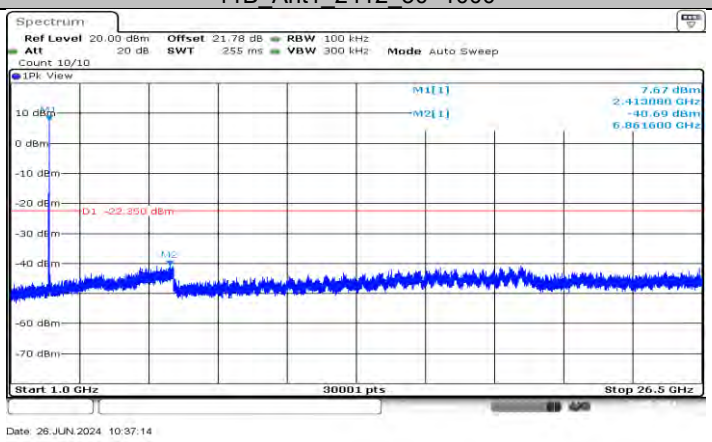
10.6.2. Test Graphs

11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500

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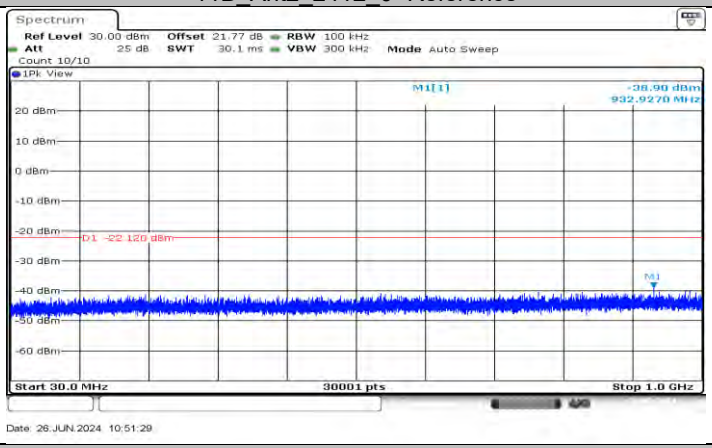
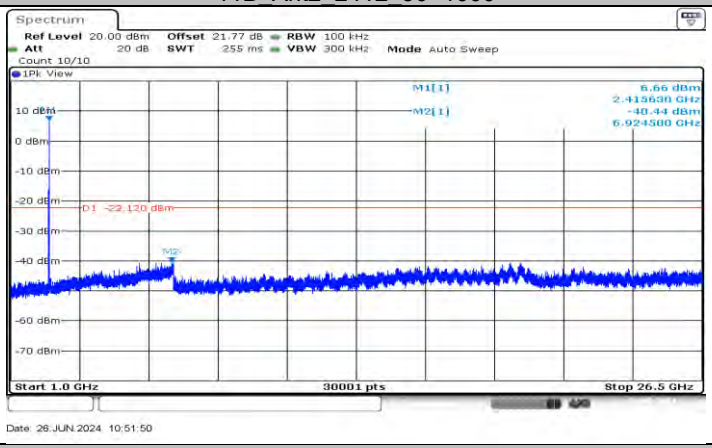
11B_Ant2_2412_0~Reference



11B_Ant2_2412_30~1000



11B_Ant2_2412_1000~26500

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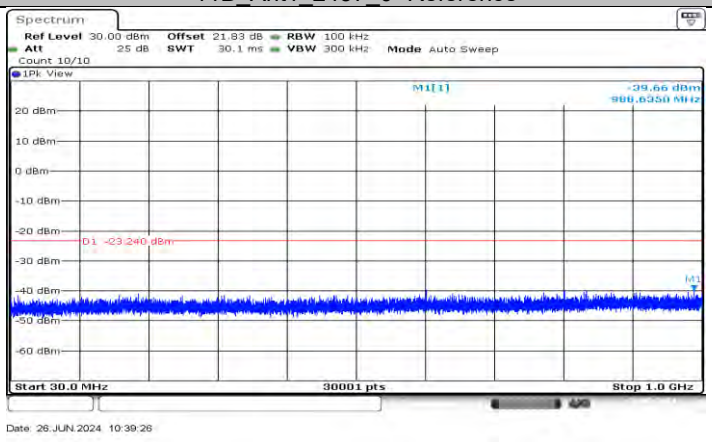
11B_Ant1_2437_0~Reference



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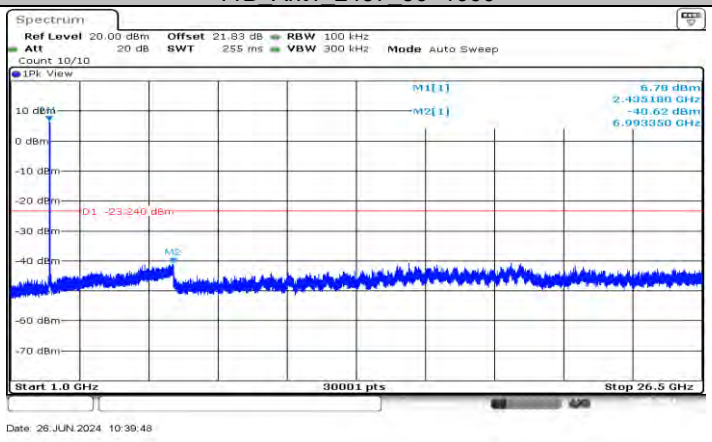

11B_Ant1_2437_1000~26500

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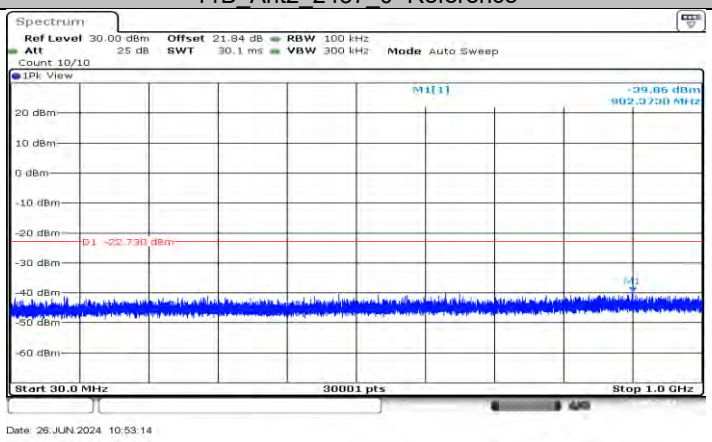
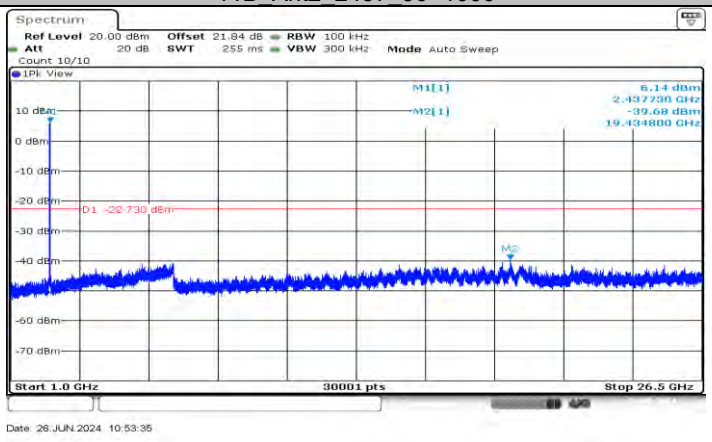
11B_Ant2_2437_0~Reference



11B_Ant2_2437_30~1000



11B_Ant2_2437_1000~26500

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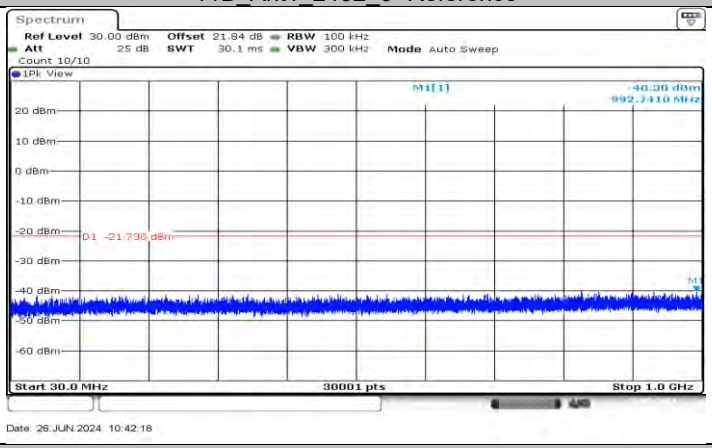
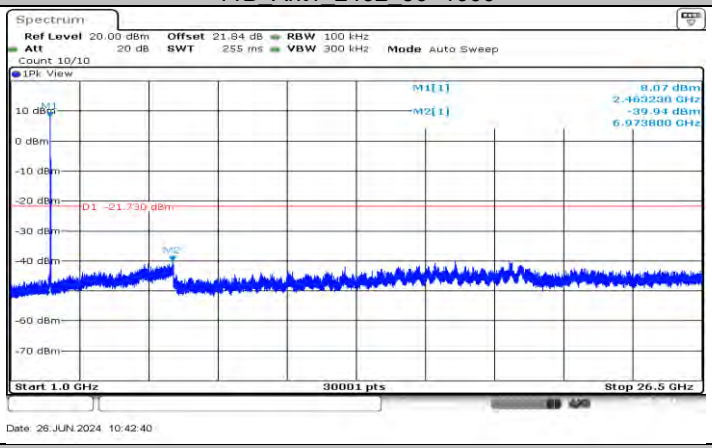
11B_Ant1_2462_0~Reference



11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

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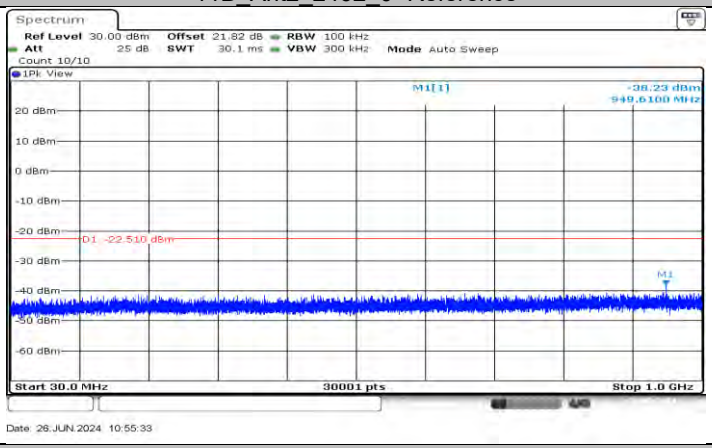
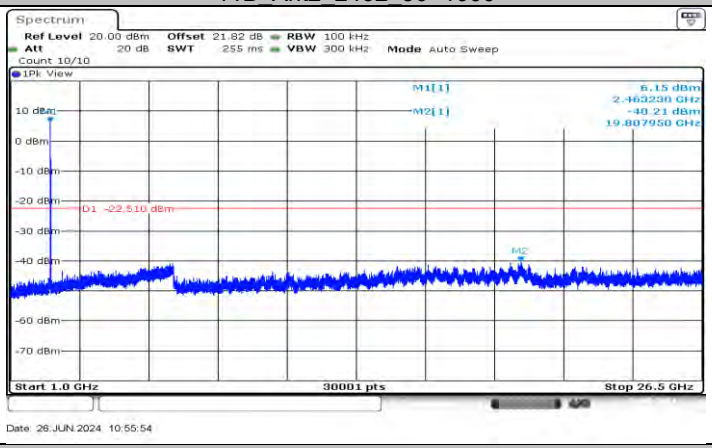
11B_Ant2_2462_0~Reference

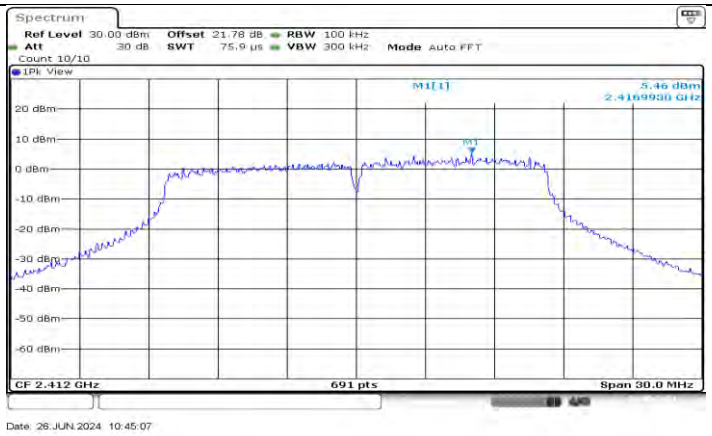


11B_Ant2_2462_30~1000

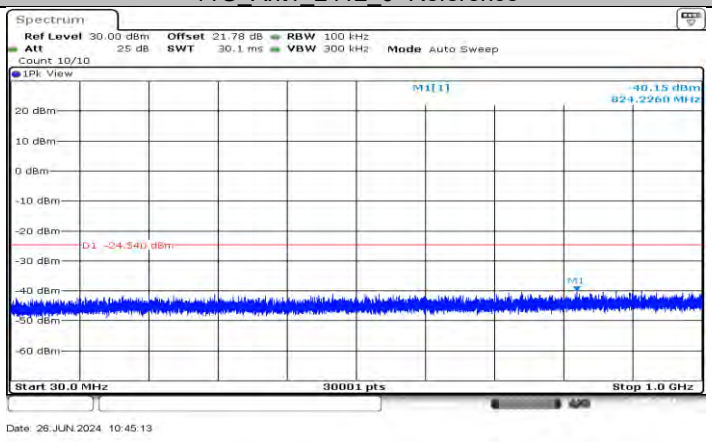


11B_Ant2_2462_1000~26500

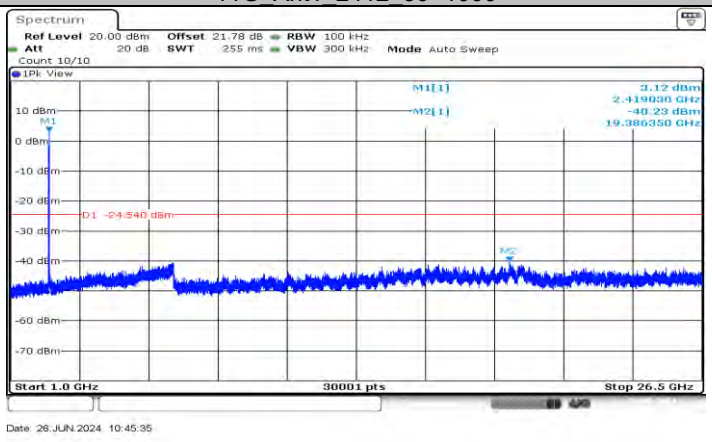
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500

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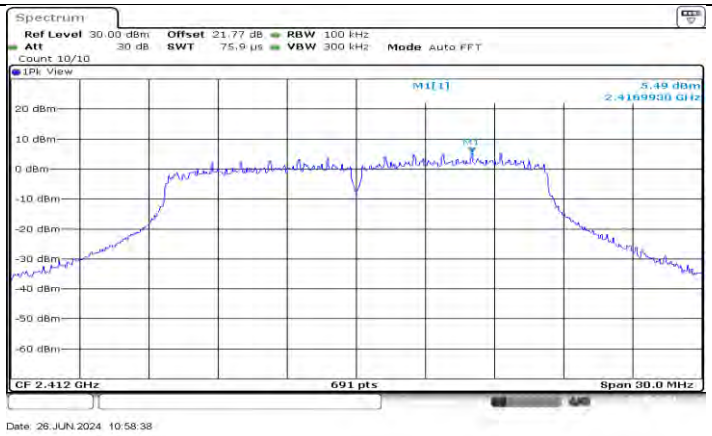
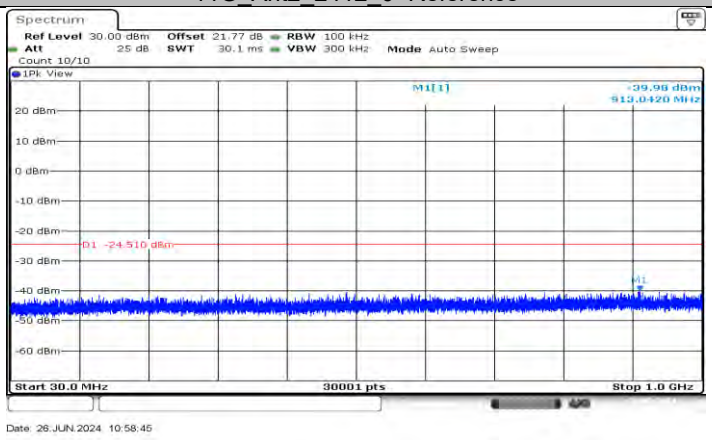
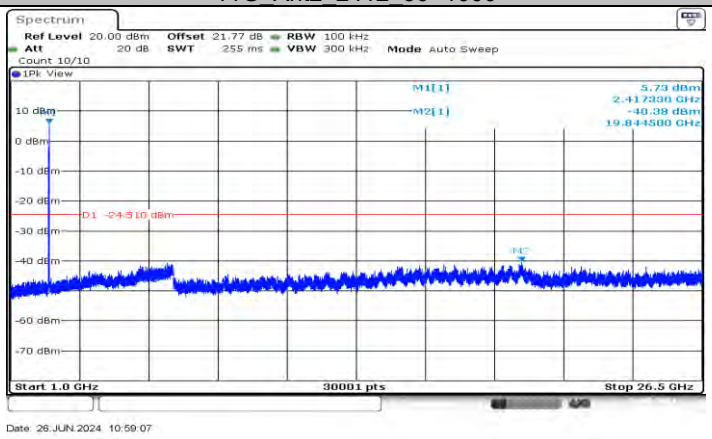


11G_Ant2_2412_0~Reference



11G_Ant2_2412_30~1000



11G_Ant2_2412_1000~26500

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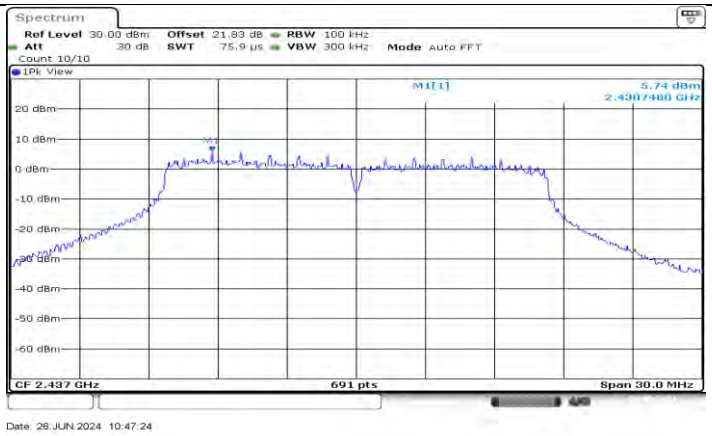
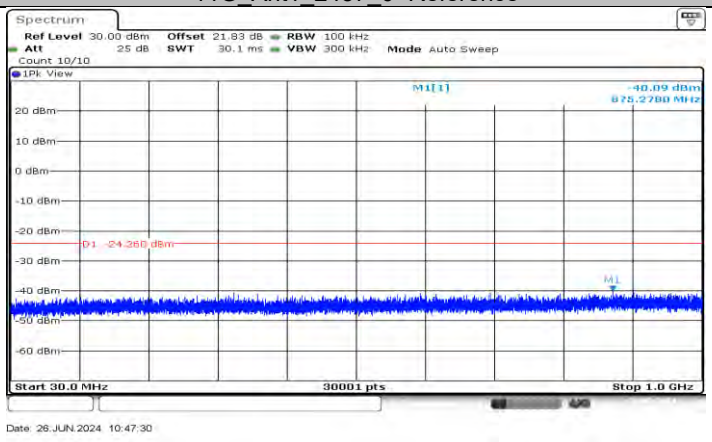
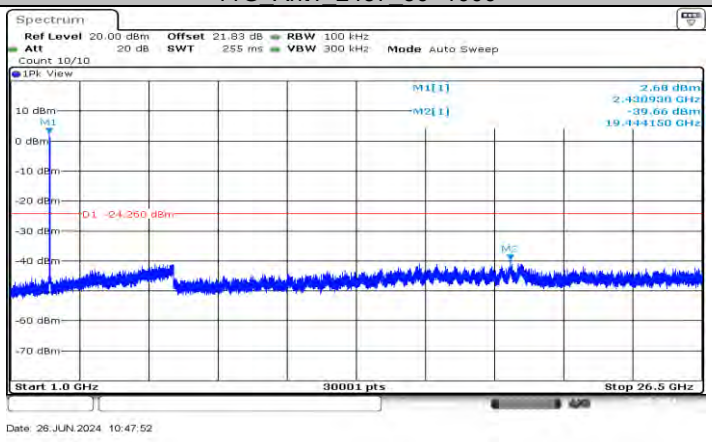


11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



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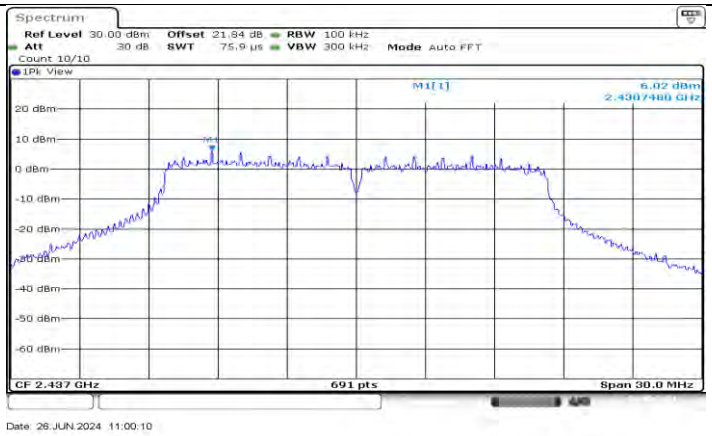

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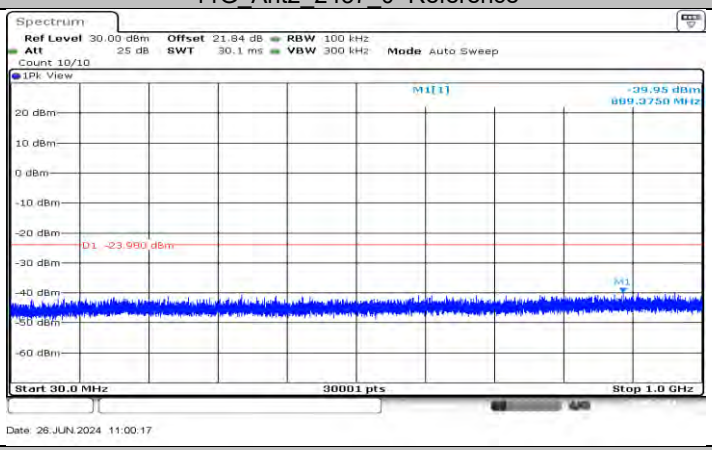

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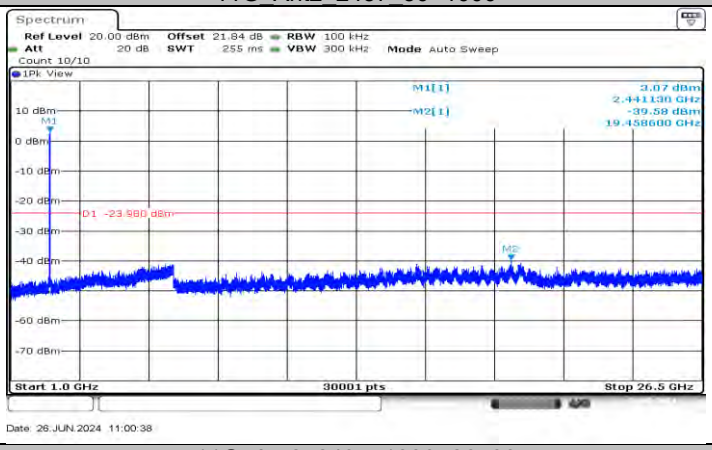

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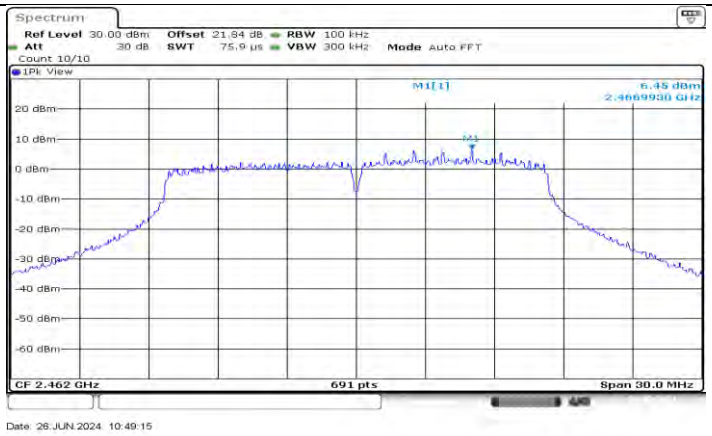

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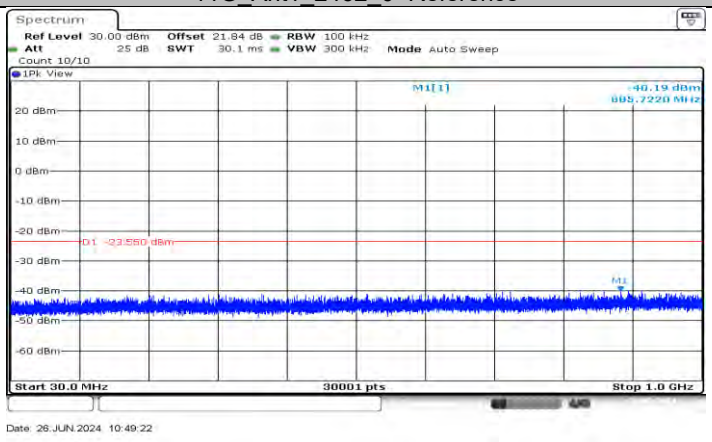

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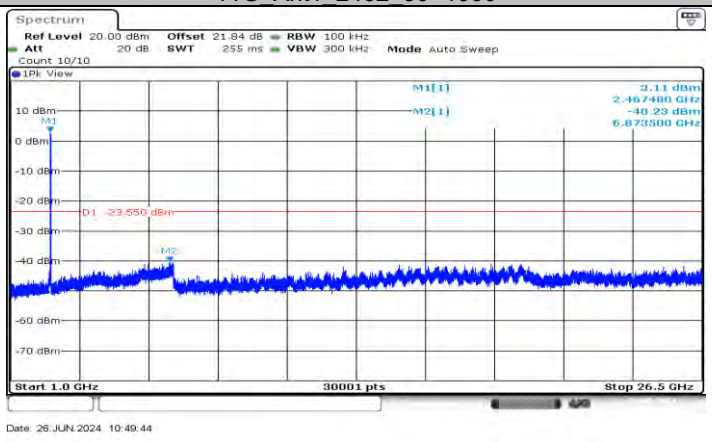

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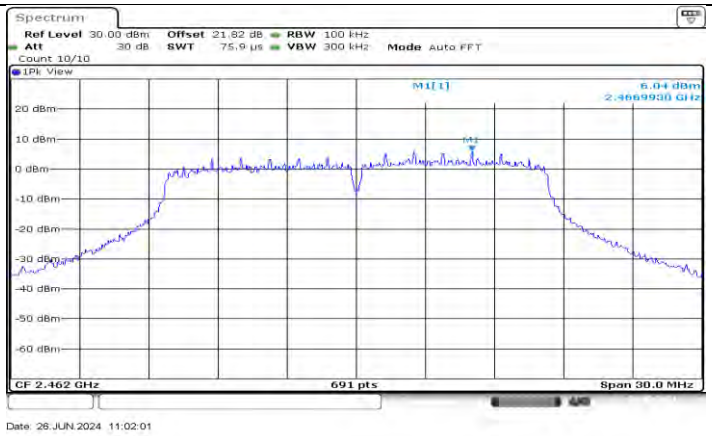

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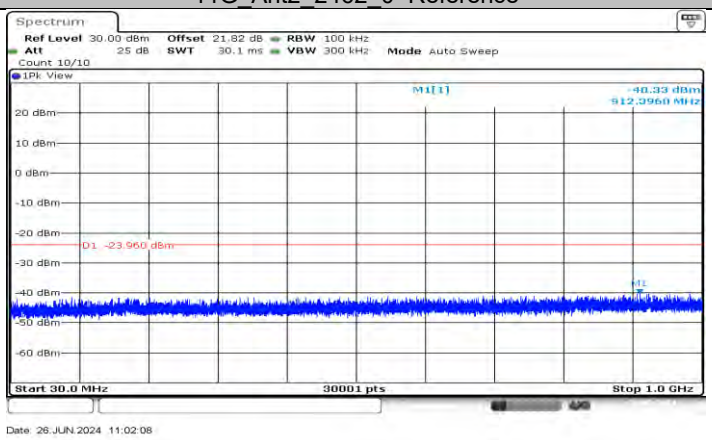

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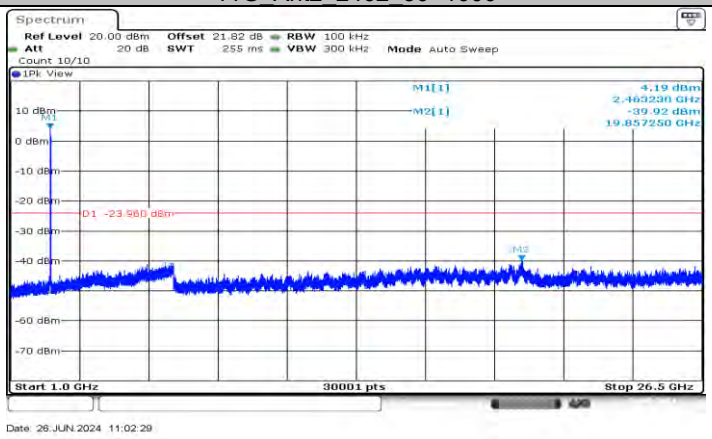

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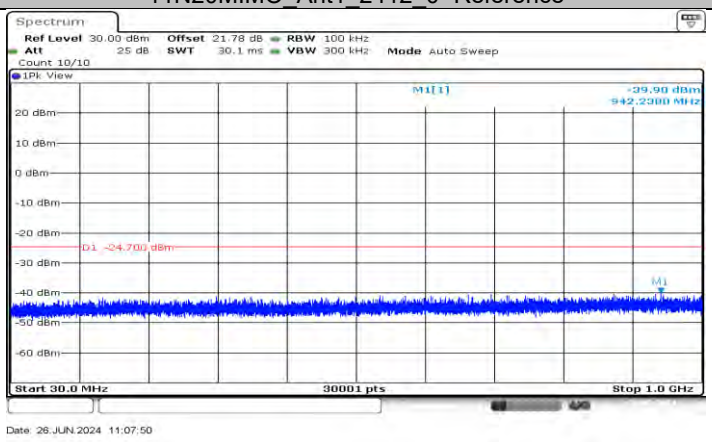

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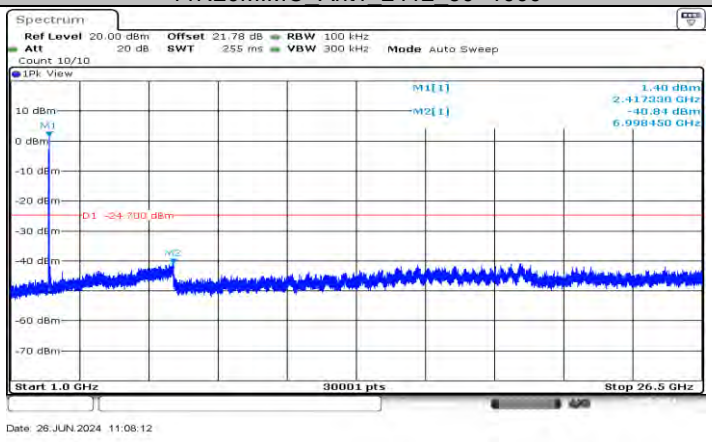

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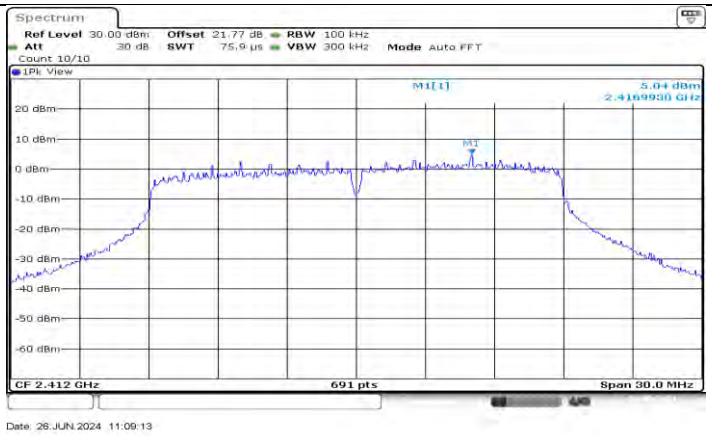

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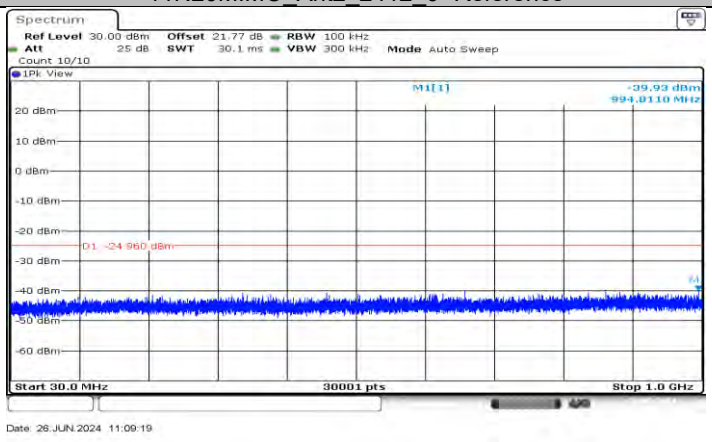

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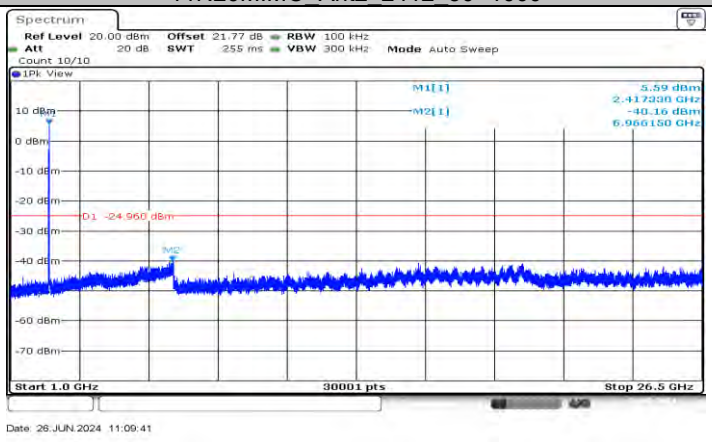

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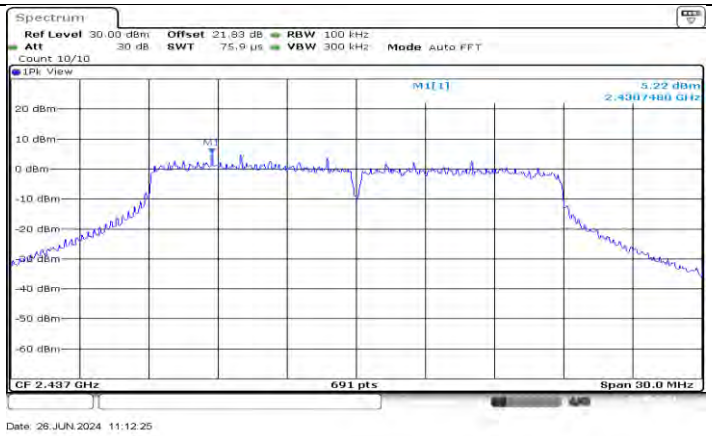

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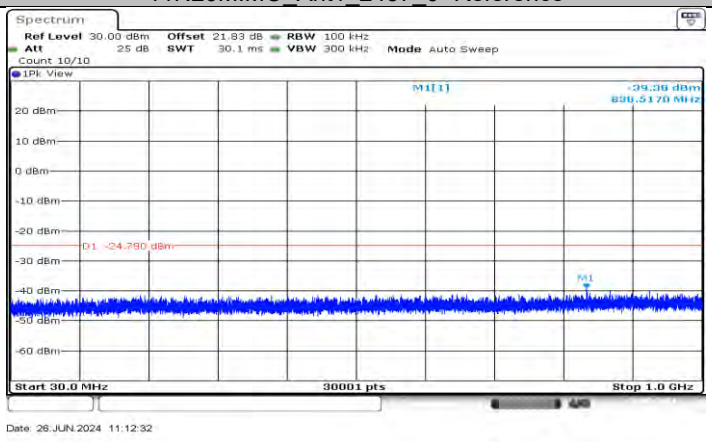

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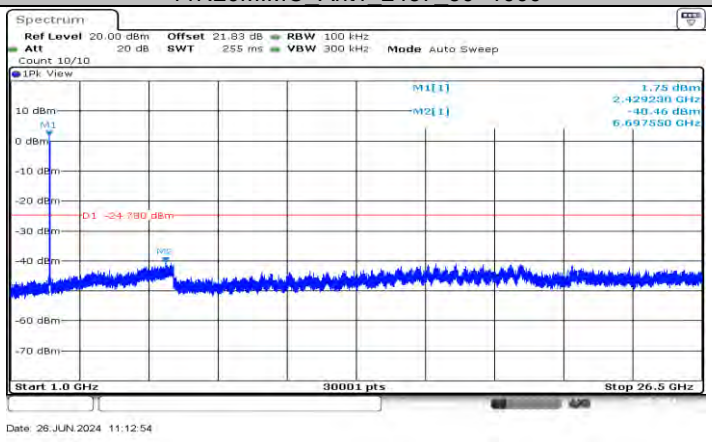

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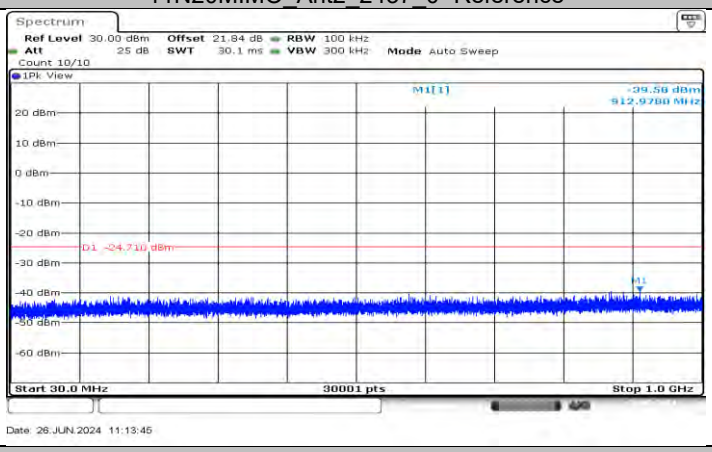

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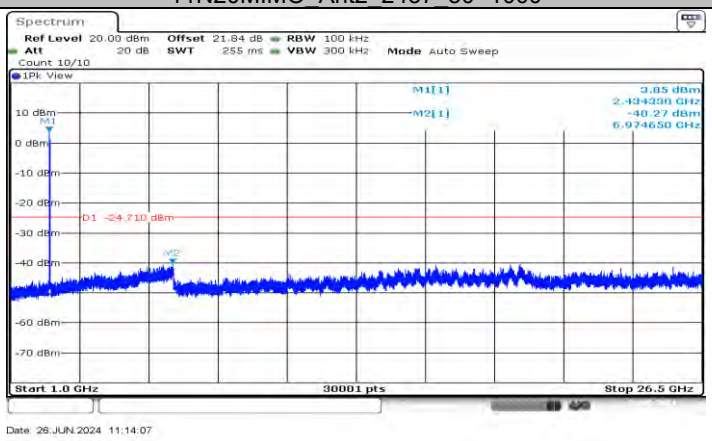

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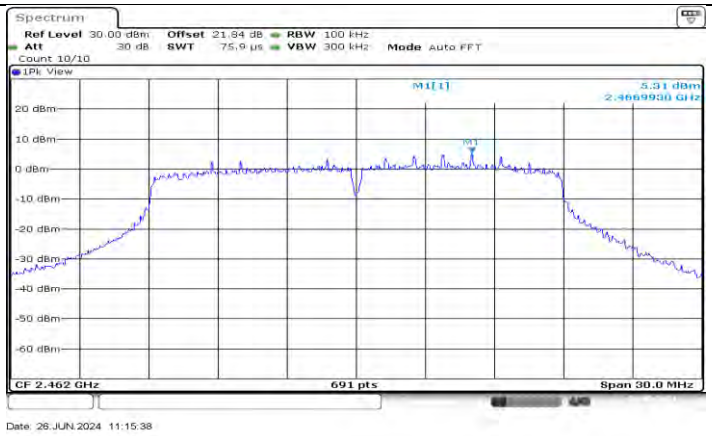

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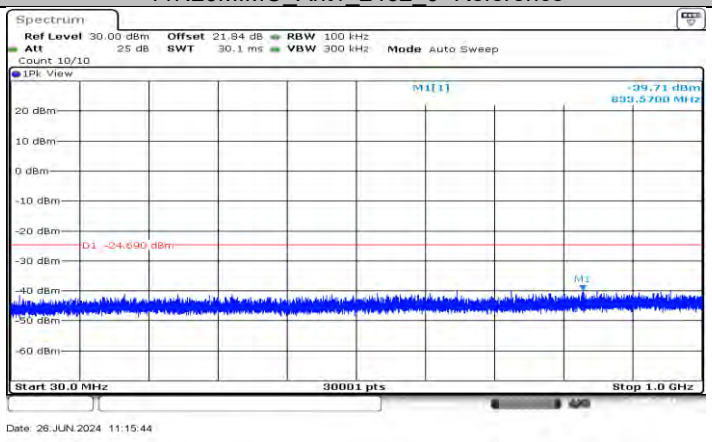

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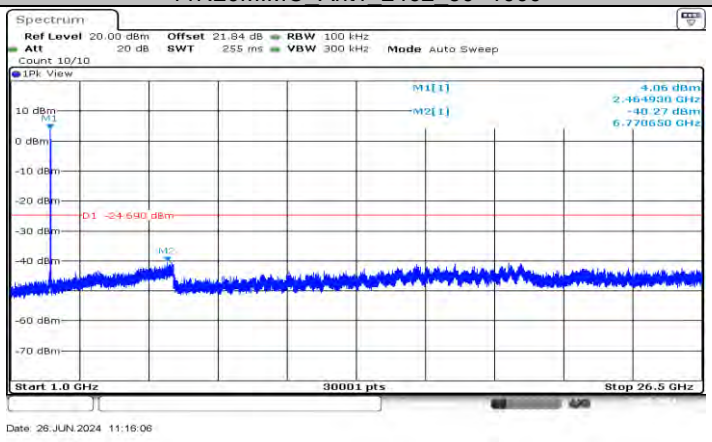

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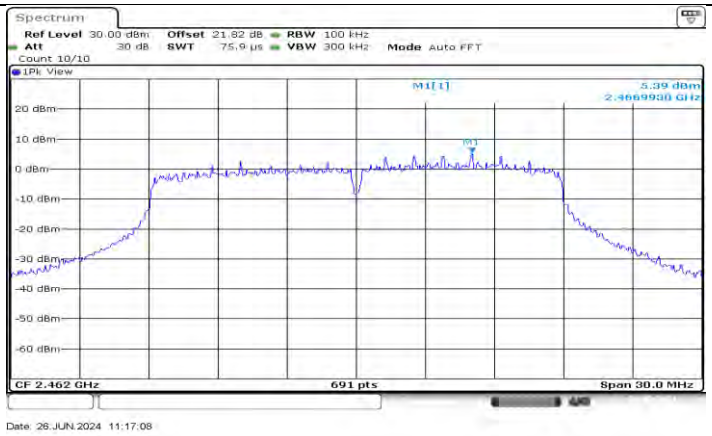

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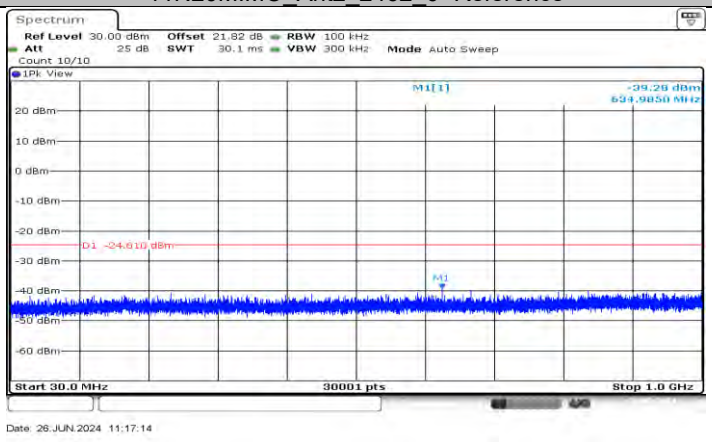

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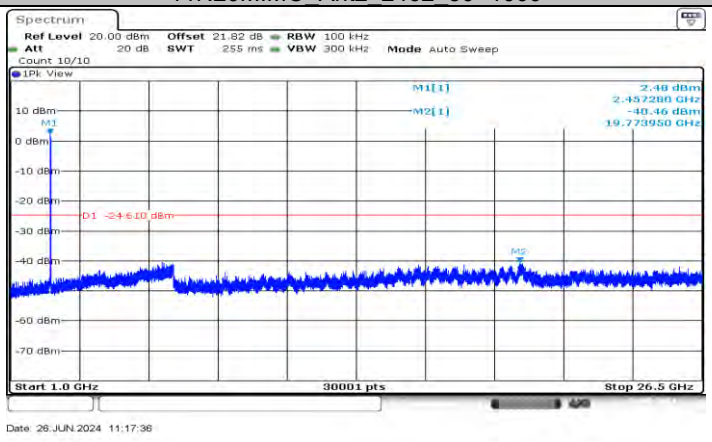

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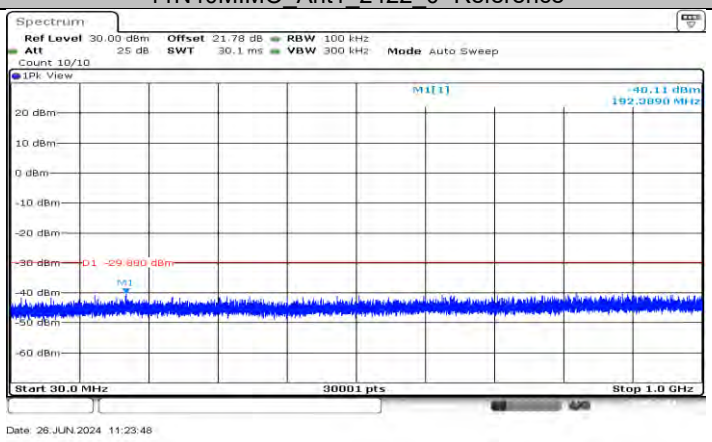

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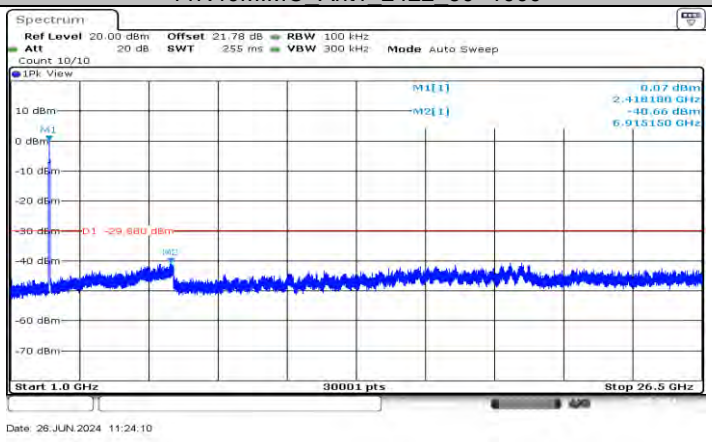

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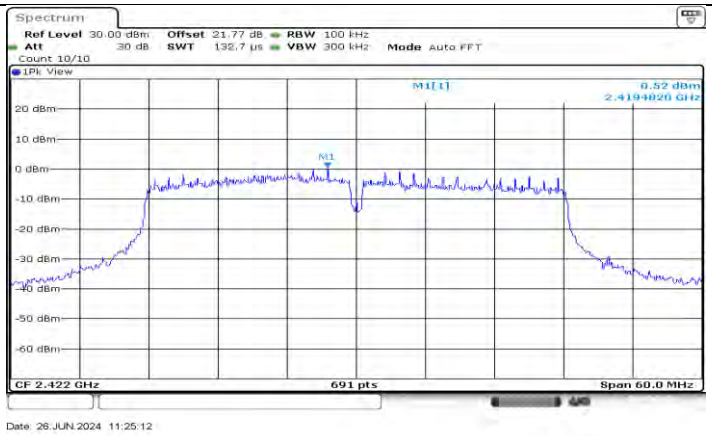

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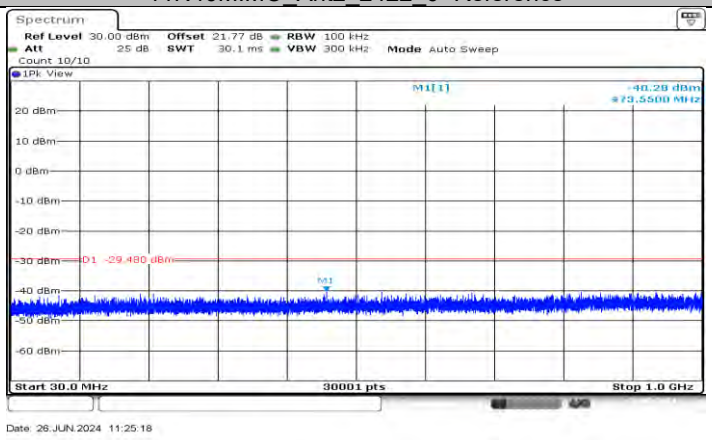

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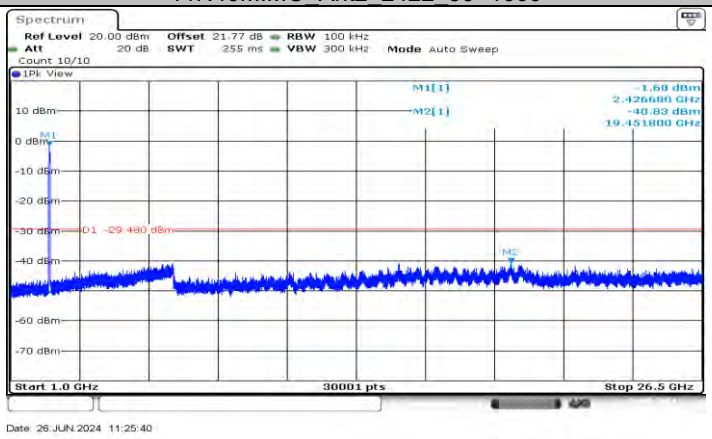

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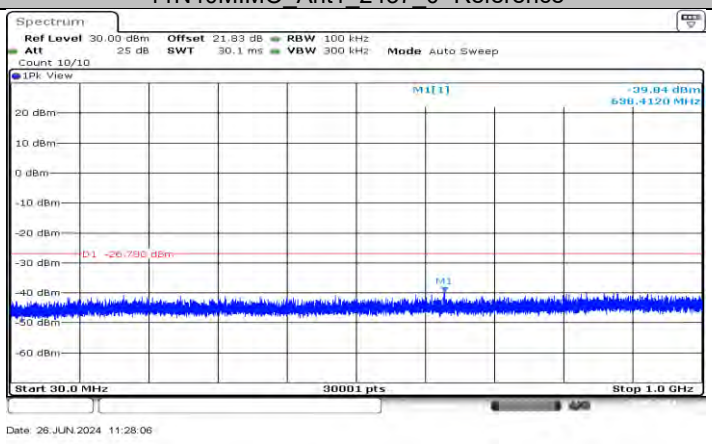

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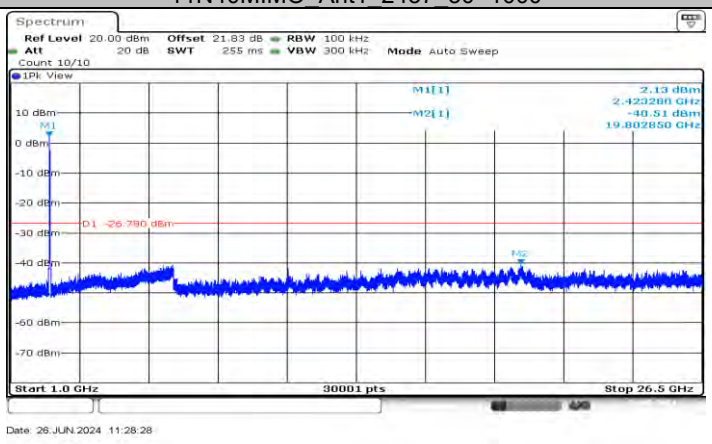

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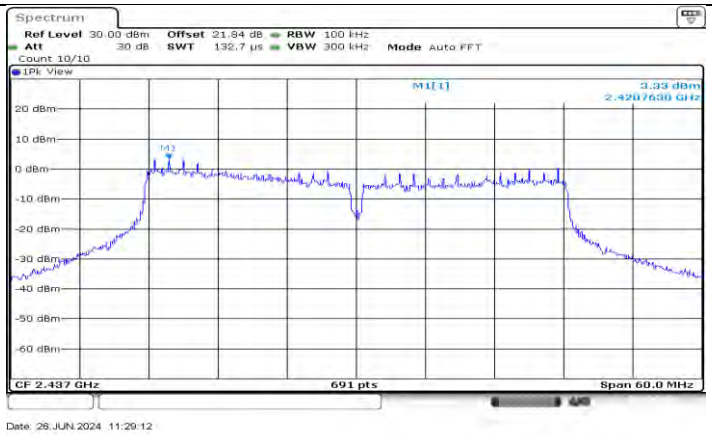

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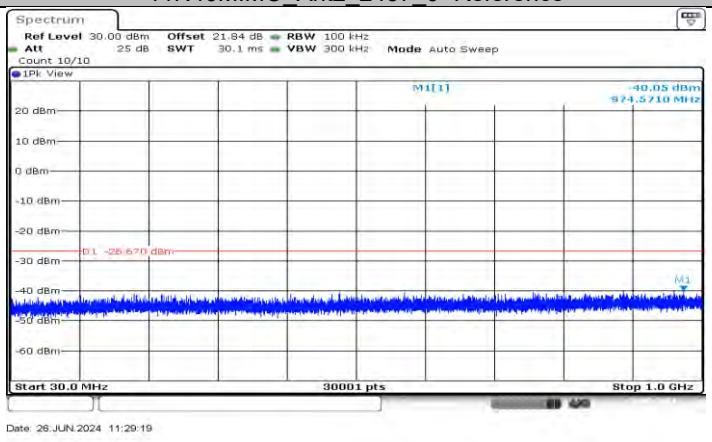

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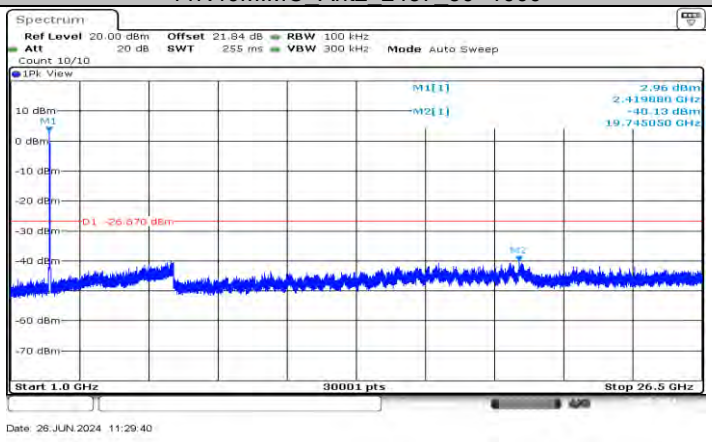

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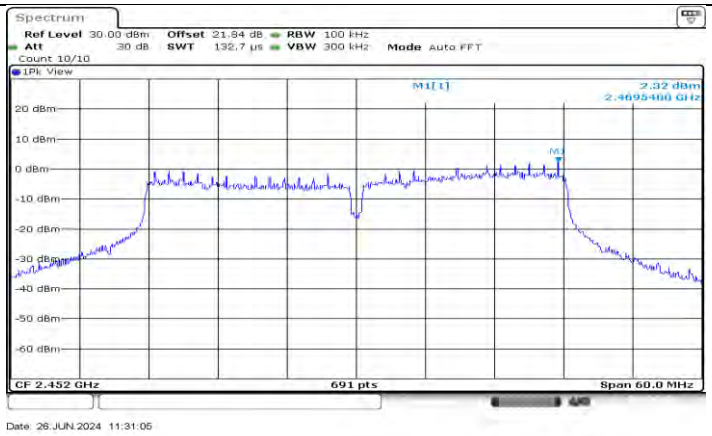

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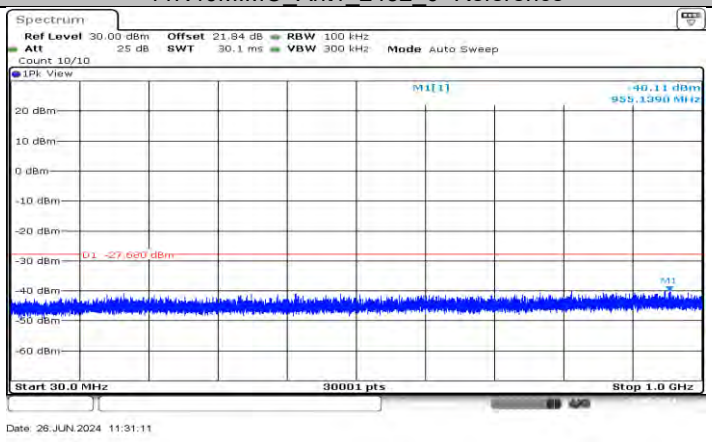

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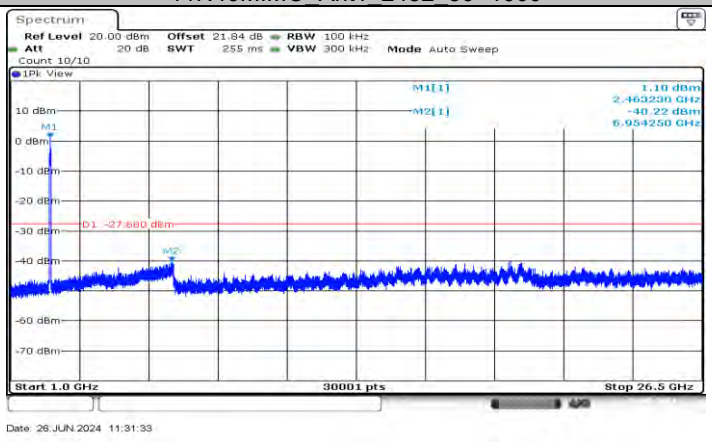

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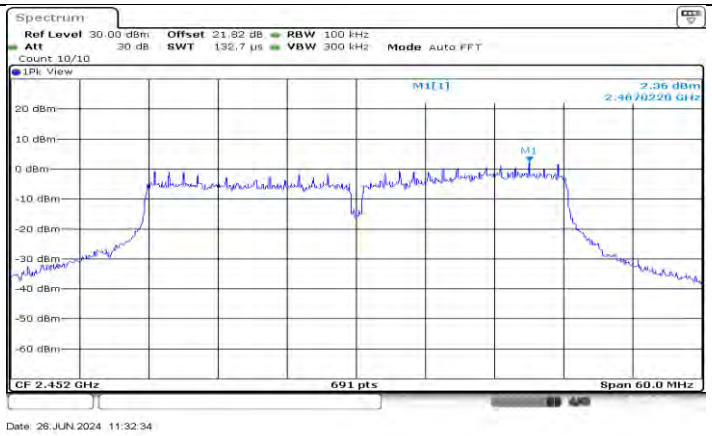

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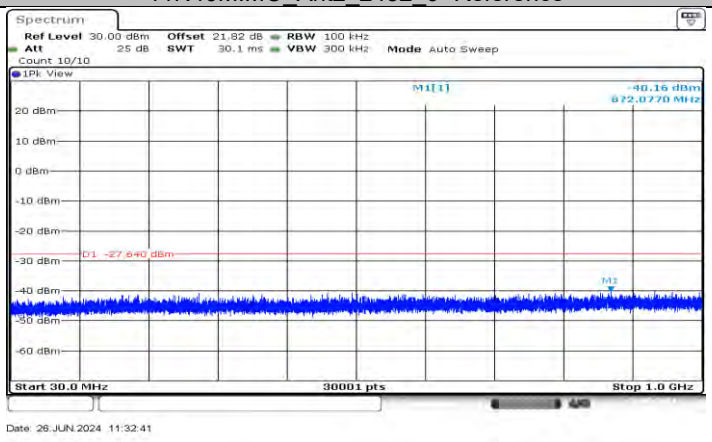

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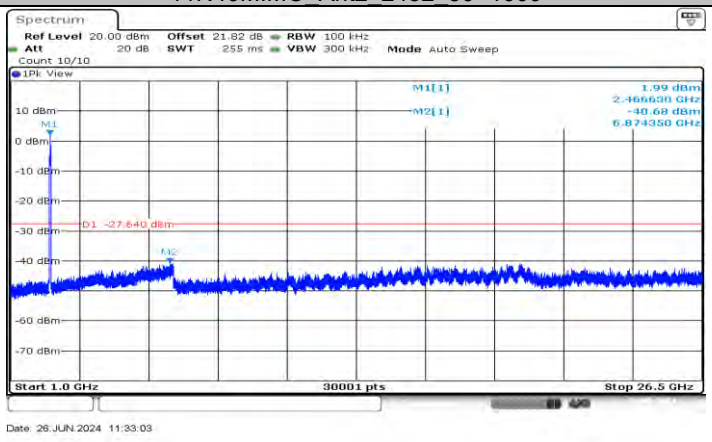

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10.7. APPENDIX G: DUTY CYCLE

10.7.1. Test Result

Test Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11B	12.16	12.20	0.9967	99.67	0.01	0.08	0.01
11G	2.01	2.06	0.9757	97.57	0.11	0.50	1
11N20MIMO	1.88	1.93	0.9741	97.41	0.11	0.53	1
11N40MIMO	0.92	0.96	0.9583	95.83	0.18	1.09	2

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer then the next higher value should be used.

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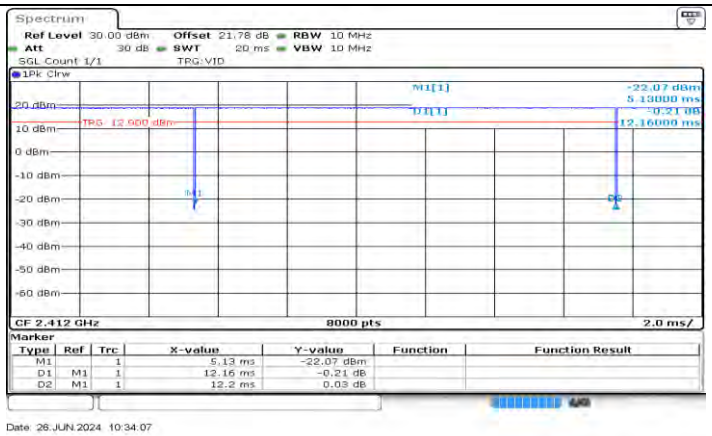
10.7.2. Test Graphs



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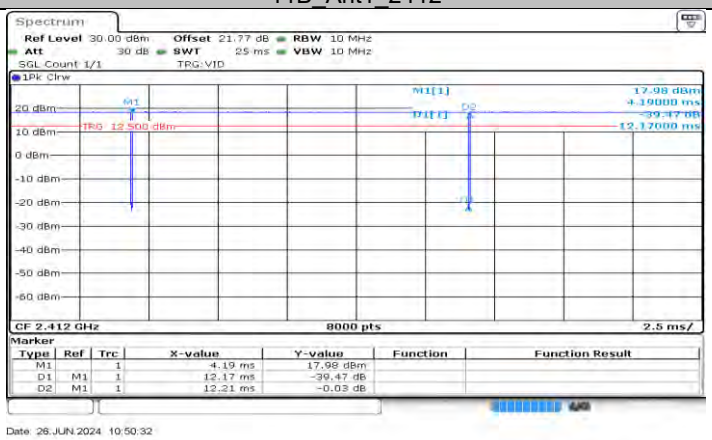

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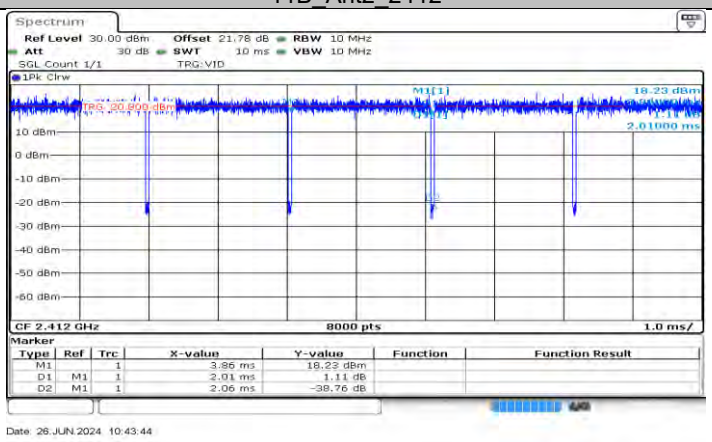

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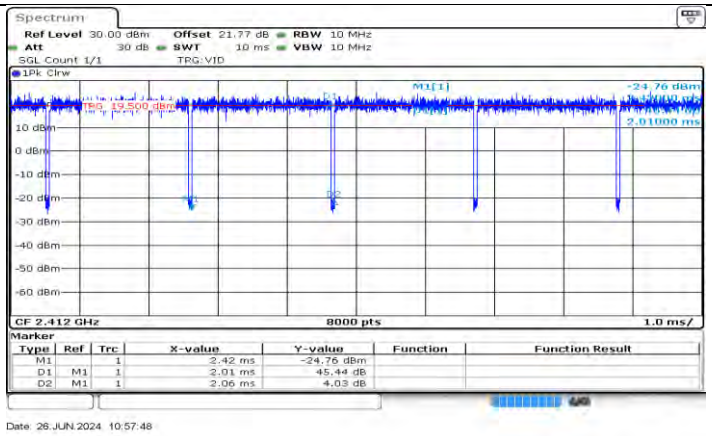
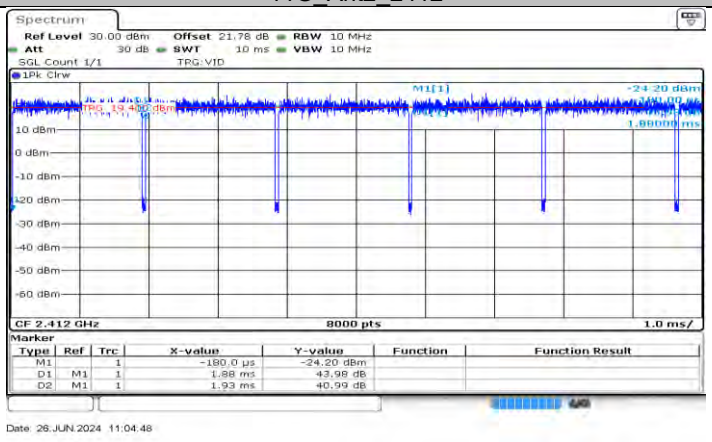
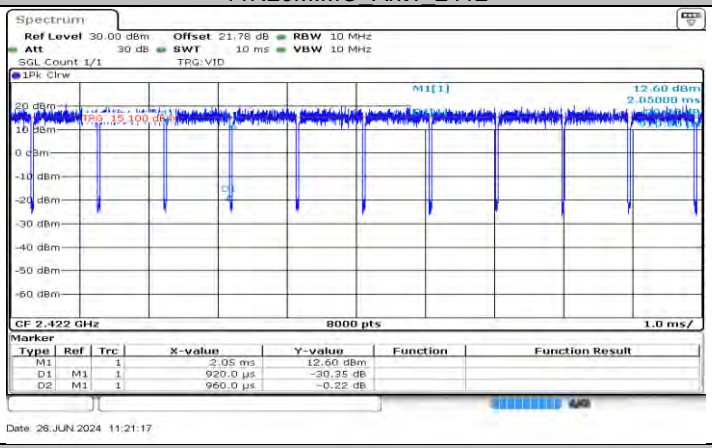


11G_Ant2_2412



11N20MIMO_Ant1_2412



11N40MIMO_Ant1_2422

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APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

4791353869-1_Appendix_SetupPhoto_Intelligent Control System

APPENDIX: PHOTOGRAPHS OF THE EUT

4791353869-1_Appendix_EUTPhoto_External_intelligent Control System
4791353869-1_Appendix_EUTPhoto_Internal_Intelligent Control System

END OF REPORT

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