

TEST REPORT

Applicant: REOLINK TECHNOLOGY PTE. LTD.
Address: 31 KAKI BUKIT ROAD 3, #06-02, TECHLINK,
SINGAPORE 417818
Equipment Type: WiFi module
Model Name: CDW-60832BU-00 (RL)
Brand Name: Reolink
FCC ID: 2BN5S-2503P
ISED Number: 33667-2503P
Test Standard: 47 CFR Part 15 Subpart C
RSS-Gen Issue 5
RSS-247 Issue 3
(refer to section 3.1)
Sample Arrival Date: Apr. 22, 2025
Test Date: May 11, 2025 - May 20, 2025
Date of Issue: Jun. 20, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Julie Zhu**Checked by:** Ye Hongji**Approved by:** Sunny Zou
(Technical Director)

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Jun. 17, 2025</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Jun. 20, 2025</u>	<u>Added 40M Radiated Spurious Emission & Band Edge test data in section A.6&A.7</u>

TABLE OF CONTENTS

1	GENERAL INFORMATION	4
1.1	Test Laboratory	4
1.2	Test Location	4
2	PRODUCT INFORMATION	5
2.1	Applicant Information	5
2.2	Manufacturer Information	5
2.3	General Description for Equipment under Test (EUT)	5
2.4	Technical Information	6
3	SUMMARY OF TEST RESULTS	10
3.1	Test Standards	10
3.2	Test Verdict	10
4	GENERAL TEST CONFIGURATIONS	11
4.1	Test Environments	11
4.2	Test Equipment List	11
4.3	Test Software List	11
4.4	Measurement Uncertainty	12
4.5	Description of Test Setup	12
4.6	Measurement Results Explanation Example	15
5	TEST ITEMS	16
5.1	Antenna Requirements	16
5.2	Output Power	17
5.3	Occupied Bandwidth	19
5.4	Conducted Spurious Emission	20

5.5	Band Edge (Authorized-band band-edge).....	22
5.6	Conducted Emission	24
5.7	Radiated Spurious Emission	25
5.8	Band Edge (Restricted-band band-edge).....	30
5.9	Power Spectral density (PSD).....	31
ANNEX A	TEST RESULT	32
A.1	Output Power	32
A.2	Occupied Bandwidth	48
A.3	Conducted Spurious Emissions	56
A.4	Band Edge (Authorized-band band-edge).....	70
A.5	Conducted Emissions.....	76
A.6	Radiated Emission	78
A.7	Band Edge (Restricted-band band-edge).....	98
A.8	Power Spectral Density (PSD)	102
ANNEX B	TEST SETUP PHOTOS	107
ANNEX C	EUT EXTERNAL PHOTOS	107
ANNEX D	EUT INTERNAL PHOTOS	107

1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	REOLINK TECHNOLOGY PTE. LTD.
Address	31 KAKI BUKIT ROAD 3, #06-02, TECHLINK, SINGAPORE 417818

2.2 Manufacturer Information

Manufacturer	REOLINK TECHNOLOGY PTE. LTD.
Address	31 KAKI BUKIT ROAD 3, #06-02, TECHLINK, SINGAPORE 417818

2.3 General Description for Equipment under Test (EUT)

EUT Name	WiFi module
Model Name Under Test	CDW-60832BU-00 (RL)
Series Model Name	N/A
Description of Model name differentiation	N/A
Serial Number	6C82A86C16B9
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	WIFI 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac and 802.11ax
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range	802.11b/g/n/ax(20 MHz): 2.412 GHz - 2.462 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 1 to 11. 802.11n/ax(40 MHz): 2.422 GHz - 2.452 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$, where - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 3 to 9.	
Modulation Technology	DSSS, OFDM, OFDMA	
Product Type	☒ Mobile ☐ Portable ☐ Fix Location	
Antenna System (eg., MIMO, Smart Antenna)	Cyclic Delay Diversity (CDD) for 802.11b/g Multi Input Multi Output (MIMO) for 802.11n/ax	
Categorization as Correlated or Completely Uncorrelated	Categorization as Correlated for 802.11b/g Categorization as Uncorrelated for 802.11n/ax	
Antenna Type	Antenna 1 Antenna 2	Dipole Antenna
Antenna Gain	Antenna 1 Antenna 2	3.05 dBi
Total directional gain	For power spectral density (PSD) measurements	Correlated: 6.06 dBi Formulas: Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi Uncorrelated: 3.05 dBi Formulas: Directional gain = G_{ANT}
	For power measurements	Correlated: 6.06 dBi Formulas: Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi Uncorrelated: 3.05 dBi Formulas: Directional gain = G_{ANT}
	For Conducted Out-of-Band and Spurious Measurem	Correlated: 6.06 dBi Formulas: Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi Uncorrelated: 3.05 dBi Formulas: Directional gain = G_{ANT}

	ents	
About the Product	Only the WIFI 802.11b, 802.11g, 802.11n (HT20/40) and 802.11ax (HE20/40) was tested in this report.	

Mode	Antenna		
	Antenna 1	Antenna 2	MIMO
802.11b	√	√	√
802.11g	√	√	√
802.11n20	√	√	√
802.11n40	√	√	√
802.11ax20	√	√	√
802.11ax40	√	√	√
Note: All the configurations were tested, but only the worst data was shown in this report.			

802.11ax RU configuration table					
Mode	Full RU (SU)	RU_26	RU_52	RU_106	RU_242
802.11ax20	√	--	--	--	--
802.11ax40	√	--	--	--	--

Modulation technology	Modulation Type	Transfer Rate (Mbps)(Single RF path)
DSSS (802.11b)	DBPSK	1
	DQPSK	2
	CCK	5.5/11
OFDM (802.11g)	BPSK	6/9
	QPSK	12/18
	16QAM	24/36
	64QAM	48/54
OFDM (802.11n-20 MHz)	BPSK	6.5/7.2
	QPSK	13/19.5/14.4/21.7
	16QAM	26/39/28.9/43.3
	64QAM	52/58.5/65/57.8/65/72.2
OFDM (802.11n-40 MHz)	BPSK	13.5/15
	QPSK	27/40.5/30/45
	16QAM	54/81/60/90
	64QAM	108/121.5/135/120/150
OFDMA (802.11ax-20 MHz)	BPSK	4
	QPSK	16/24/17/26
	16QAM	33/49/34/52
	64QAM	65/73/81/69/77/86
	256QAM	98/108/103/115
	1024QAM	122/135/129/143
OFDMA (802.11ax-40 MHz)	BPSK	8/9
	QPSK	33/49/34/52
	16QAM	65/98/69/103
	64QAM	130/146/163/138/155/172
	256QAM	195/217/207/229
	1024QAM	244/271/258/287

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	
Output Power	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Occupied Bandwidth	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Conducted Spurious Emission	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Conducted Emission	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Radiated Spurious Emission	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Band Edge	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9
Power spectral density (PSD)	11b/11g/11n20/11n40/ 11ax20/11ax40	1/6/6.5/13.5/ 4/8 Mbps	1/6/11	3/6/9

Note: The above EUT information in section 2.4 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional radiators of radio frequency equipment
2	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus
3	RSS-247 Issue 3	Digital Transmission Systems (DTSS), Frequency Hopping Systems(FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices
4	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
5	ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
6	KDB Publication 558074 D01v05r02	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES

3.2 Test Verdict

No.	Description	FCC PART No.	ISED Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	RSS-247, 5.4 (f)	N/A	Pass ^{Note 1}
2	Output Power	15.247 (b)	RSS-247, 5.4 (d)	ANNEX A.1	Pass
3	Occupied Bandwidth	15.247 (a)	RSS-GEN, 6.7; RSS-247, 5.2 (a)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247 (d)	RSS-247, 5.5	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.247 (d)	RSS-GEN, 8.9; RSS-247, 5.5	ANNEX A.4	Pass
6	Conducted Emission	15.207	RSS-GEN, 8.8	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209; 15.247 (d)	RSS-247, 5.5	ANNEX A.6	Pass
8	Band Edge(Restricted-band band-edge)	15.209; 15.247 (d)	RSS-247, 5.5	ANNEX A.7	Pass
9	Power spectral density (PSD)	15.247 (e)	RSS-247, 5.2 (b)	ANNEX A.8	Pass
10	Receiver Spurious Emissions	N/A	RSS-Gen, 7.3	N/A	N/A ^{Note 2}

Note¹: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

Note²: Only radio communication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements, so this test is not applicable.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	46% to 60%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+16.8℃ to +24.6℃
Working Voltage of the EUT	NV (Normal Voltage)	5 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	KEYSIGHT	N9020A	MY50330200	2025.04.28	2026.04.27
Power Sensor	KEYSIGHT	U2063XA	MY58000247	2024.07.04	2025.07.03
Spectrum Analyzer	KEYSIGHT	N9020A	MY50531259	2024.08.01	2025.07.31
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	02460	2024.05.16	2027.05.15
Test Antenna-Horn	A-INFO	LB-180400KF	J211060273	2024.06.15	2027.06.14
Anechoic Chamber	RAINFORD	9m*6m*6m	140	2024.07.28	2027.07.27
Amplifier	COM-MV	LSCX_LNA1-12G-01	7210214	2024.08.01	2025.07.31
Amplifier	COM-MV	XKu_LNA7-18G-01	7210209	2024.08.01	2025.07.31
Amplifier	COM-MV	KA LNA18 40G-01	18050001	2024.12.05	2025.12.04
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2024.12.16	2025.12.15
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2024.08.01	2025.07.31
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-01162	2023.08.04	2026.08.03
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2024.01.23	2027.01.22
Amplifier	COM-MV	ZT30-1000M	B2018054558	2024.11.28	2025.11.27
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2024.07.13	2027.07.12
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2024.08.01	2025.07.31
LISN	SCHWARZBECK	NSLK 8127	8127-687	2025.04.29	2026.04.28
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2025.02.14	2028.02.13

4.3 Test Software List

Description	Manufacturer	Software Version	Serial No.	Applicable test Setup
BL410R	BALUN	V2.1.1.488	N/A	The section 4.5.1
BL410E	BALUN	V22.930	N/A	The section 4.5.2&4.5.3&4.5.4&4.5.5

4.4 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Parameters	Uncertainty
Occupied Channel Bandwidth	2.8%
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.8℃
Humidity	4%

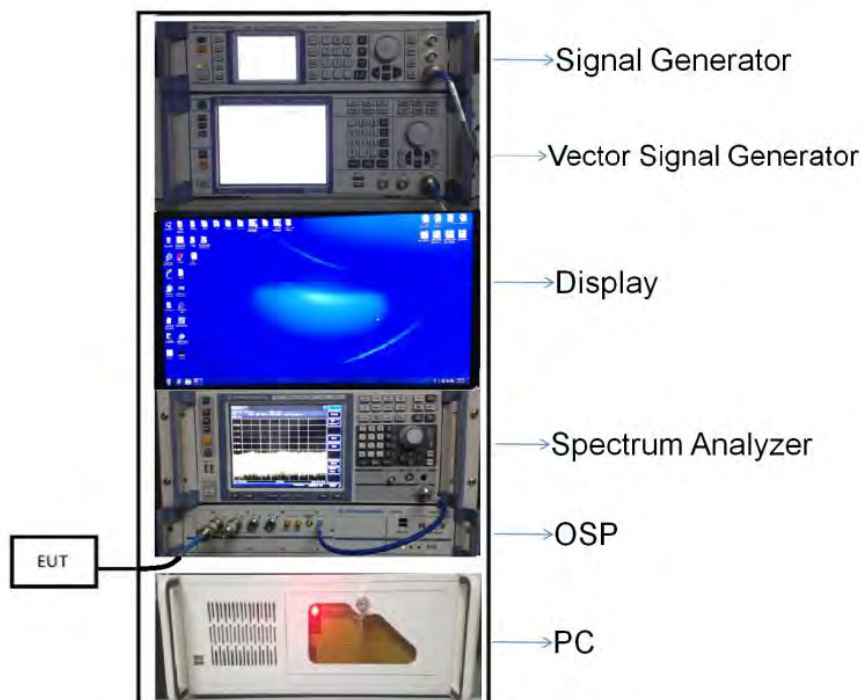
4.5 Description of Test Setup

4.5.1 For Antenna Port Test

Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

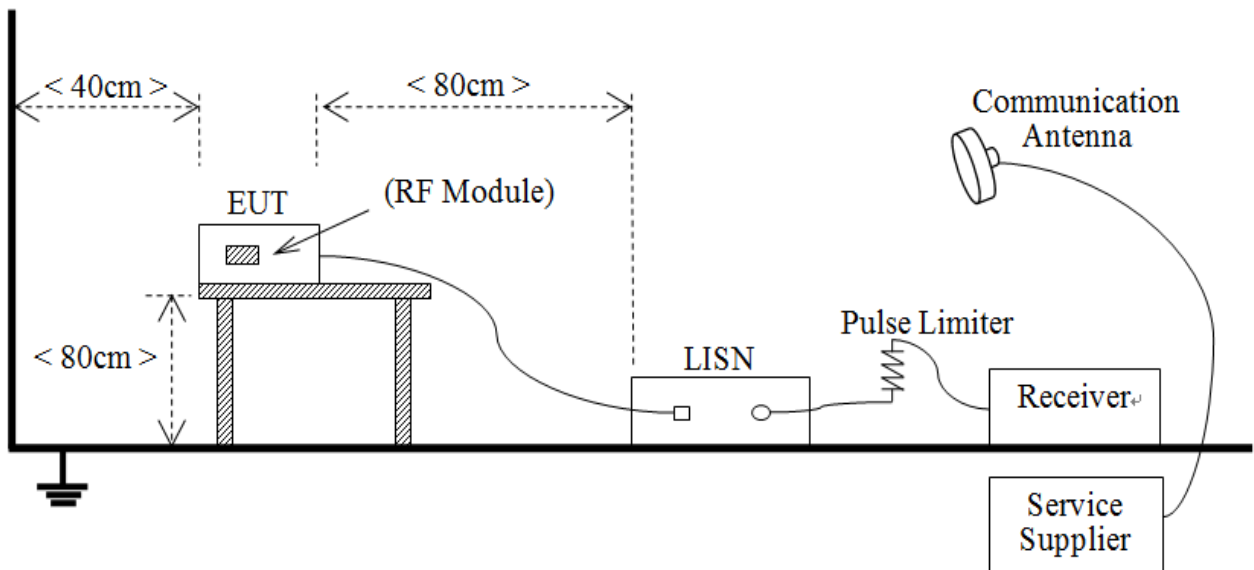
For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:

Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



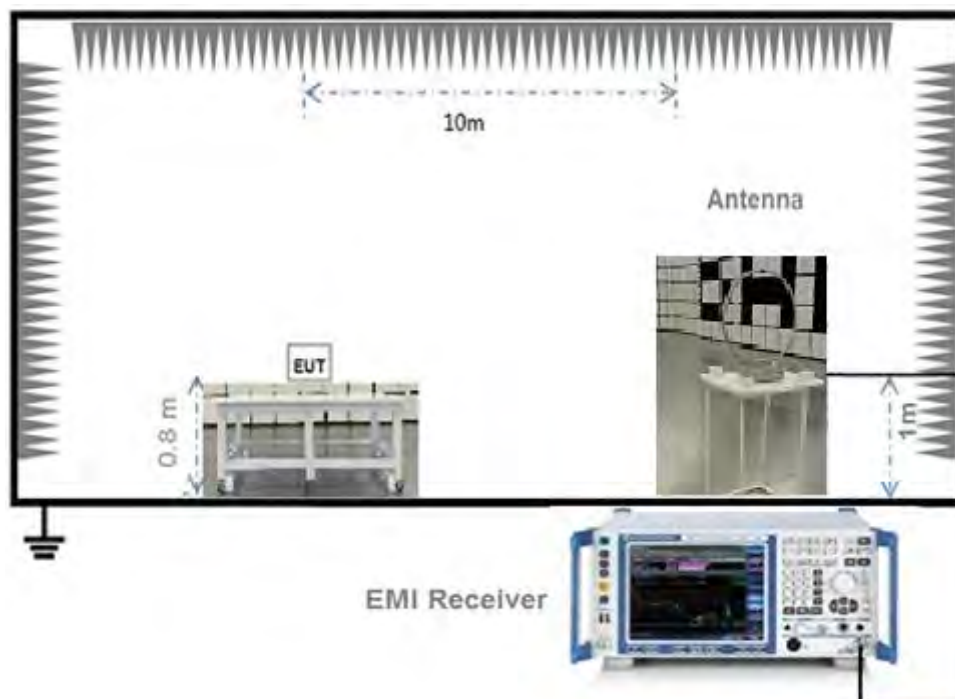
(Diagram 1)

4.5.2 For AC Power Supply Port Test



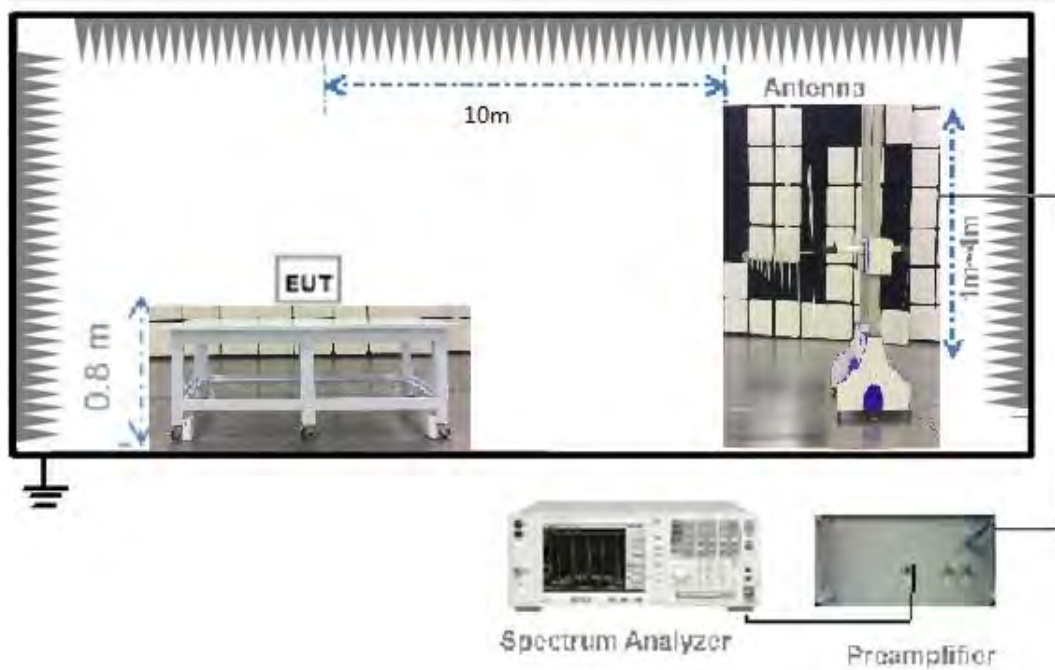
(Diagram 2)

4.5.3 For Radiated Test (Below 30 MHz)



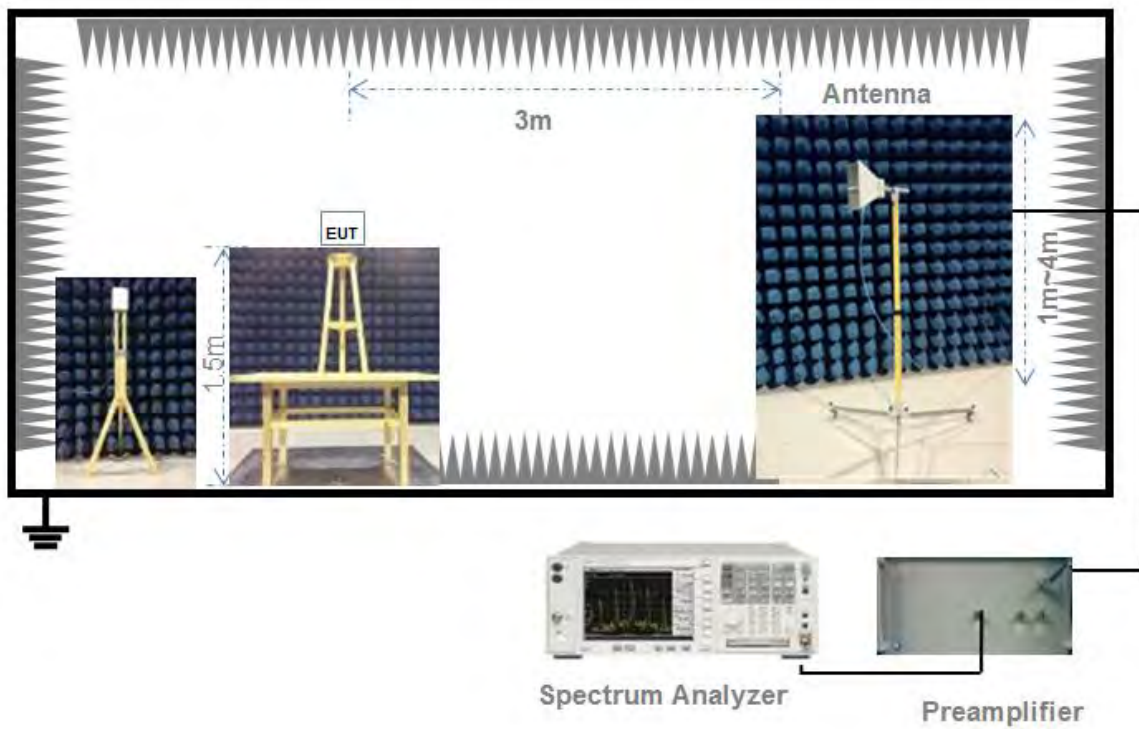
(Diagram 3)

4.5.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.5.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

4.6 Measurement Results Explanation Example

4.6.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

4.6.2 For radiated band edges and spurious emission test:

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dB μ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

EIRP = Measure Conducted output power Value (dBm) + Maximum transmit antenna gain (dBi) + the appropriate maximum ground reflection factor (dB)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203; RSS-247, 5.4 (f)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product.	An embedded-in antenna design is used.

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Output Power

5.2.1 Test Limit

FCC § 15.247(b); RSS-247, 5.4 (d)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

5.2.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Maximum peak conducted output power

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

The EUT shall be transmitted at its maximum power control level.

EIRP= Maximum peak conducted output power +Antenna Gain.

Maximum conducted (average) output power (Reporting Only)

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

- 1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.
 - 2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
 - 3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal.
- c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- d) Adjust the measurement in dBm by adding $10\log(1/x)$, where x is the duty cycle.

Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.

Set $VBW \geq RBW$. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 Occupied Bandwidth

5.3.1 Limit

FCC §15.247(a); RSS-GEN, 6.7; RSS-247, 5.2 (a)

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

5.3.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

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.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Conducted Spurious Emission

5.4.1 Limit

FCC §15.247(d); RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.4.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

- a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).
- b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).
- c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW $\geq 3 \times$ RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW $\geq 3 \times$ RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Band Edge (Authorized-band band-edge)

5.5.1 Limit

FCC §15.247(d); RSS-GEN, 8.9, RSS-247, 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.5.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle $\geq 98\%$). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW $\geq 3 \times$ RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) ± 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission ± 0.5 MHz.

Standard method(The 99% OBW of the fundamental emission is without 2 MHz of the authorized band):

Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.

Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (\text{OBW/RBW})]$ below the reference level. Specific guidance is given in 4.1.5.2.

Attenuation: Auto (at least 10 dB preferred).

Sweep time: Coupled.

Resolution bandwidth: 100 kHz.

Video bandwidth: 300 kHz.

Detector: Peak.

Trace: Max hold.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Conducted Emission

5.6.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.6.2 Test Setup

See section 4.5.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.6.4 Test Result

Please refer to ANNEX A.5.

5.7 Radiated Spurious Emission

5.7.1 Limit

FCC §15.209&15.247(d); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.7.2 Test Setup

See section 4.5.3 to 4.5.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

Since the emission limits are specified in terms of radiated field strength levels, measurements performed to demonstrate compliance have traditionally relied on a radiated test configuration. Radiated measurements remain the principal method for demonstrating compliance to the specified limits; however antenna-port conducted measurements are also now acceptable to demonstrate compliance (see below for details). When radiated measurements are utilized, test site requirements and procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 shall be followed.

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

General Procedure for conducted measurements in restricted bands

- a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
- b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see guidance on determining the applicable antenna gain)
- c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
- d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
- e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dB μ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

- f) Compare the resultant electric field strength level to the applicable limit.
- g) Perform radiated spurious emission test.

Quasi-Peak measurement procedure

The specifications for measurements using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Frequency Interference (CISPR) of the International Electrotechnical Commission.

As an alternative to CISPR quasi-peak measurement, compliance can be demonstrated to the applicable emission limits using a peak detector.

Peak power measurement procedure

Peak emission levels are measured by setting the instrument as follows:

- a) RBW = as specified in Table 1.
- b) VBW $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Sweep time = auto.
- e) Trace mode = max hold.
- f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be

longer for low duty cycle applications).

Table 1—RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Trace averaging across on and off times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT (i.e., duty cycle ≥ 98 percent) cannot be achieved and the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then the following procedure shall be used:

- a) The EUT shall be configured to operate at the maximum achievable duty cycle.
- b) Measure the duty cycle, x , of the transmitter output signal as described in section 6.0.
- c) RBW = 1 MHz (unless otherwise specified).
- d) VBW $\geq 3 \times$ RBW.
- e) Detector = RMS, if $\text{span}/(\# \text{ of points in sweep}) \leq (\text{RBW}/2)$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
- f) Averaging type = power (i.e., RMS).
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- g) Sweep time = auto.
- h) Perform a trace average of at least 100 traces.
- i) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is $10 \log(1/x)$, where x is the duty cycle.
 - 2) If linear voltage averaging mode was used in step f), then the applicable correction factor is $20 \log(1/x)$, where x is the duty cycle.
 - 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

NOTE: Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.

Determining the applicable transmit antenna gain

A conducted power measurement will determine the maximum output power associated with a restricted band emission; however, in order to determine the associated EIRP level, the gain of the transmitting antenna (in dBi) must be added to the measured output power (in dBm).

Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

See KDB 662911 for guidance on calculating the additional array gain term when determining the effective antenna gain for a EUT with multiple outputs occupying the same or overlapping frequency ranges in the same band.

Radiated spurious emission test

An additional consideration when performing conducted measurements of restricted band emissions is that unwanted emissions radiating from the EUT cabinet, control circuits, power leads, or intermediate circuit elements will likely go undetected in a conducted measurement configuration. To address this concern, a radiated test shall be performed to ensure that emissions emanating from the EUT cabinet (rather than the antenna port) also comply with the applicable limits.

For these cabinet radiated spurious emission measurements the EUT transmit antenna may be replaced with a termination matching the nominal impedance of the antenna. Procedures for performing radiated measurements are specified in ANSI C63.10. All detected emissions shall comply with the applicable limits.

The measurement frequency range is from 30 MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.7.4 Test Result

Please refer to ANNEX A.6.

5.8 Band Edge (Restricted-band band-edge)

5.8.1 Limit

FCC §15.209&15.247(d); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

5.8.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, 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.

For transmitters operating above 1 GHz repeat the measurement with an average detector.

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Power Spectral density (PSD)

5.9.1 Limit

FCC §15.247(e); RSS-247, 5.2 (b)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

5.9.2 Test Setup

See section 4.5.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.

Set the VBW $\geq 3 \text{ RBW}$.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

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.

5.9.4 Test Result

Please refer to ANNEX A.8.

ANNEX A TEST RESULT

A.1 Output Power

Duty Cycle

Test Mode	On Time (ms)	On+Off time (ms)	Duty Cycle	Duty Factor
802.11b	8.19	8.22	99.59%	0.02
802.11g	1.36	1.39	97.84%	0.09
802.11n-20 MHz	1.27	1.30	97.62%	0.10
802.11n-40 MHz	0.63	0.66	95.59%	0.20
802.11ax-20 MHz	1.16	1.19	97.49%	0.11
802.11ax-40 MHz	0.61	0.64	95.46%	0.20

Peak Power Test Data**SISO-Antenna 1****802.11b Mode:**

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	16.87	48.64	30	1000	Pass
Middle	16.92	49.20			Pass
High	16.61	45.81			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.61	182.39	30	1000	Pass
Middle	22.55	179.89			Pass
High	22.51	178.24			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.65	184.08	30	1000	Pass
Middle	22.75	188.36			Pass
High	22.66	184.50			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.67	184.93	30	1000	Pass
Middle	22.88	194.09			Pass
High	22.72	187.07			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	23.07	202.77	30	1000	Pass
Middle	23.05	201.84			Pass
High	22.91	195.43			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	20.90	123.03	30	1000	Pass
Middle	21.07	127.94			Pass
High	21.14	130.02			Pass

SISO-Antenna 2

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	16.77	47.53	30	1000	Pass
Middle	17.02	50.35			Pass
High	16.21	41.78			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.61	182.39	30	1000	Pass
Middle	22.15	164.06			Pass
High	22.61	182.39			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.75	188.36	30	1000	Pass
Middle	22.55	179.89			Pass
High	22.46	176.20			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.57	180.72	30	1000	Pass
Middle	22.58	181.13			Pass
High	22.32	170.61			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.87	193.64	30	1000	Pass
Middle	22.95	197.24			Pass
High	23.01	199.99			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	21.10	128.82	30	1000	Pass
Middle	21.17	130.92			Pass
High	20.84	121.34			Pass

MIMO-Antenna 1

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	13.67	23.28	29.94	986.28	Pass
Middle	13.82	24.10			Pass
High	13.21	20.94			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.21	83.37	29.94	986.28	Pass
Middle	19.75	94.41			Pass
High	19.71	93.54			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.55	90.16	30	1000	Pass
Middle	19.55	90.16			Pass
High	19.46	88.31			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.77	94.84	30	1000	Pass
Middle	19.78	95.06			Pass
High	19.32	85.51			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.77	94.84	30	1000	Pass
Middle	19.65	92.26			Pass
High	19.91	97.95			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	17.80	60.26	30	1000	Pass
Middle	18.17	65.61			Pass
High	18.04	63.68			Pass

MIMO-Antenna 2

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	13.77	23.82	29.94	986.28	Pass
Middle	13.82	24.10			Pass
High	13.31	21.43			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.11	81.47	29.94	986.28	Pass
Middle	19.85	96.61			Pass
High	19.41	87.30			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.45	88.10	30	1000	Pass
Middle	19.45	88.10			Pass
High	19.06	80.54			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.97	99.31	30	1000	Pass
Middle	19.88	97.27			Pass
High	19.52	89.54			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.67	92.68	30	1000	Pass
Middle	19.55	90.16			Pass
High	19.71	93.54			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	17.40	54.95	30	1000	Pass
Middle	18.27	67.14			Pass
High	18.14	65.16			Pass

MIMO**802.11b Mode:**

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	16.73	47.10	29.94	986.28	Pass
Middle	16.83	48.20			Pass
High	16.27	42.37			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.17	164.84	29.94	986.28	Pass
Middle	22.81	191.01			Pass
High	22.57	180.84			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.51	178.26	30	1000	Pass
Middle	22.51	178.26			Pass
High	22.27	168.85			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.88	194.15	30	1000	Pass
Middle	22.84	192.34			Pass
High	22.43	175.04			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	22.73	187.52	30	1000	Pass
Middle	22.61	182.41			Pass
High	22.82	191.49			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	20.61	115.21	30	1000	Pass
Middle	21.23	132.76			Pass
High	21.10	128.84			Pass

Average Power Test DataSISO-Antenna 1

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.85	30.55	30	1000	Pass
Middle	14.76	29.92			Pass
High	14.60	28.84			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.50	28.18	30	1000	Pass
Middle	14.82	30.34			Pass
High	14.40	27.54			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.48	28.05	30	1000	Pass
Middle	14.80	30.20			Pass
High	14.86	30.62			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.52	28.31	30	1000	Pass
Middle	14.66	29.24			Pass
High	14.70	29.51			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.57	28.64	30	1000	Pass
Middle	14.88	30.76			Pass
High	14.43	27.73			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.61	28.91	30	1000	Pass
Middle	14.75	29.85			Pass
High	14.80	30.20			Pass

SISO-Antenna 2

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.95	31.26	30	1000	Pass
Middle	14.86	30.62			Pass
High	14.40	27.54			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.70	29.51	30	1000	Pass
Middle	14.52	28.31			Pass
High	14.00	25.12			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.08	25.59	30	1000	Pass
Middle	15.00	31.62			Pass
High	14.86	30.62			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.52	28.31	30	1000	Pass
Middle	14.36	27.29			Pass
High	14.90	30.90			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.27	26.73	30	1000	Pass
Middle	14.68	29.38			Pass
High	14.03	25.29			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.41	27.61	30	1000	Pass
Middle	14.65	29.17			Pass
High	14.40	27.54			Pass

MIMO-Antenna 1

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.55	14.29	29.94	986.28	Pass
Middle	11.86	15.35			Pass
High	11.50	14.13			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.40	13.80	29.94	986.28	Pass
Middle	12.02	15.92			Pass
High	11.00	12.59			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.38	13.74	30	1000	Pass
Middle	11.40	13.80			Pass
High	11.46	14.00			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.42	13.87	30	1000	Pass
Middle	11.76	15.00			Pass
High	11.50	14.13			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.67	14.69	30	1000	Pass
Middle	11.68	14.72			Pass
High	11.03	12.68			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.21	13.21	30	1000	Pass
Middle	11.45	13.96			Pass
High	11.91	15.52			Pass

MIMO-Antenna 2

802.11b Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.65	14.62	29.94	986.28	Pass
Middle	11.66	14.66			Pass
High	11.50	14.13			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.20	13.18	29.94	986.28	Pass
Middle	11.82	15.21			Pass
High	11.00	12.59			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.08	12.82	30	1000	Pass
Middle	11.00	12.59			Pass
High	11.16	13.06			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.22	13.24	30	1000	Pass
Middle	11.96	15.70			Pass
High	11.70	14.79			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.47	14.03	30	1000	Pass
Middle	11.88	15.42			Pass
High	10.73	11.83			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	11.11	12.91	30	1000	Pass
Middle	11.15	13.03			Pass
High	11.85	15.31			Pass

MIMO**802.11b Mode:**

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.61	28.91	29.94	986.28	Pass
Middle	14.77	30.00			Pass
High	14.51	28.25			Pass

802.11g Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.31	26.99	29.94	986.28	Pass
Middle	14.93	31.13			Pass
High	14.01	25.18			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.24	26.56	30	1000	Pass
Middle	14.21	26.39			Pass
High	14.32	27.06			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.33	27.11	30	1000	Pass
Middle	14.87	30.70			Pass
High	14.61	28.92			Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.58	28.72	30	1000	Pass
Middle	14.79	30.14			Pass
High	13.89	24.51			Pass

802.11ax-40 MHz(SU) Mode:

Channel	Measured Output Average Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.17	26.13	30	1000	Pass
Middle	14.31	27.00			Pass
High	14.89	30.83			Pass

E.I.R.P Test Data (For ISSED)SISO-Antenna 1

802.11b Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	19.92	98.17	36	4	Pass
Middle	19.97	99.31			Pass
High	19.66	92.47			Pass

802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.66	368.13	36	4	Pass
Middle	25.60	363.08			Pass
High	25.56	359.75			Pass

802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.70	371.54	36	4	Pass
Middle	25.80	380.19			Pass
High	25.71	372.39			Pass

802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.72	373.25	36	4	Pass
Middle	25.93	391.74			Pass
High	25.77	377.57			Pass

802.11ax-20 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	26.12	409.26	36	4	Pass
Middle	26.10	407.38			Pass
High	25.96	394.46			Pass

802.11ax-40 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	23.95	248.31	36	4	Pass
Middle	24.12	258.23			Pass
High	24.19	262.42			Pass

SISO-Antenna 2

802.11b Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	19.82	95.94	36	4	Pass
Middle	20.07	101.62			Pass
High	19.26	84.33			Pass

802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.66	368.13	36	4	Pass
Middle	25.20	331.13			Pass
High	25.66	368.13			Pass

802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.80	380.19	36	4	Pass
Middle	25.60	363.08			Pass
High	25.51	355.63			Pass

802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.62	364.75	36	4	Pass
Middle	25.63	365.59			Pass
High	25.37	344.35			Pass

802.11ax-20 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.92	390.84	36	4	Pass
Middle	26.00	398.11			Pass
High	26.06	403.65			Pass

802.11ax-40 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	24.15	260.02	36	4	Pass
Middle	24.22	264.24			Pass
High	23.89	244.91			Pass

MIMO-Antenna 1

802.11b Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	16.72	46.99	36	4	Pass
Middle	16.87	48.64			Pass
High	16.26	42.27			Pass

802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.26	168.27	36	4	Pass
Middle	22.80	190.55			Pass
High	22.76	188.80			Pass

802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.60	181.97	36	4	Pass
Middle	22.60	181.97			Pass
High	22.51	178.24			Pass

802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.82	191.43	36	4	Pass
Middle	22.83	191.87			Pass
High	22.37	172.58			Pass

802.11ax-20 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.82	191.43	36	4	Pass
Middle	22.70	186.21			Pass
High	22.96	197.70			Pass

802.11ax-40 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	20.85	121.62	36	4	Pass
Middle	21.22	132.43			Pass
High	21.09	128.53			Pass

MIMO-Antenna 2

802.11b Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	16.82	48.08	36	4	Pass
Middle	16.87	48.64			Pass
High	16.36	43.25			Pass

802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.16	164.44	36	4	Pass
Middle	22.90	194.98			Pass
High	22.46	176.20			Pass

802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.50	177.83	36	4	Pass
Middle	22.50	177.83			Pass
High	22.11	162.55			Pass

802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	23.02	200.45	36	4	Pass
Middle	22.93	196.34			Pass
High	22.57	180.72			Pass

802.11ax-20 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	22.72	187.07	36	4	Pass
Middle	22.60	181.97			Pass
High	22.76	188.80			Pass

802.11ax-40 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	20.45	110.92	36	4	Pass
Middle	21.32	135.52			Pass
High	21.19	131.52			Pass

MIMO**802.11b Mode:**

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	19.78	95.07	36	4	Pass
Middle	19.88	97.28			Pass
High	19.32	85.52			Pass

802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.22	332.70	36	4	Pass
Middle	25.86	385.53			Pass
High	25.62	365.00			Pass

802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.56	359.80	36	4	Pass
Middle	25.56	359.80			Pass
High	25.32	340.79			Pass

802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.93	391.87	36	4	Pass
Middle	25.89	388.20			Pass
High	25.48	353.30			Pass

802.11ax-20 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	25.78	378.49	36	4	Pass
Middle	25.66	368.18			Pass
High	25.87	386.50			Pass

802.11ax-40 MHz(SU) Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	23.66	232.54	36	4	Pass
Middle	24.28	267.95			Pass
High	24.15	260.05			Pass

A.2 Occupied Bandwidth

Note: All antenna were pre tested, but only the worst case has been reported in this report.

Test Data

SISO-Antenna 1

802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	10.300000	14.877000	≥500
Middle	10.300000	14.902000	≥500
High	10.300000	14.893000	≥500

802.11g Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	16.500000	16.606000	≥500
Middle	16.500000	16.604000	≥500
High	16.500000	16.613000	≥500

802.11n-20MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	17.800000	17.671000	≥500
Middle	17.500000	17.671000	≥500
High	17.800000	17.718000	≥500

802.11n-40MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	36.600000	36.221000	≥500
Middle	36.500000	36.223000	≥500
High	36.600000	36.225000	≥500

802.11ax-20 MHz(SU) Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	19.000000	18.909000	≥500
Middle	19.100000	18.910000	≥500
High	19.100000	18.902000	≥500

802.11ax-40 MHz(SU) Mode:

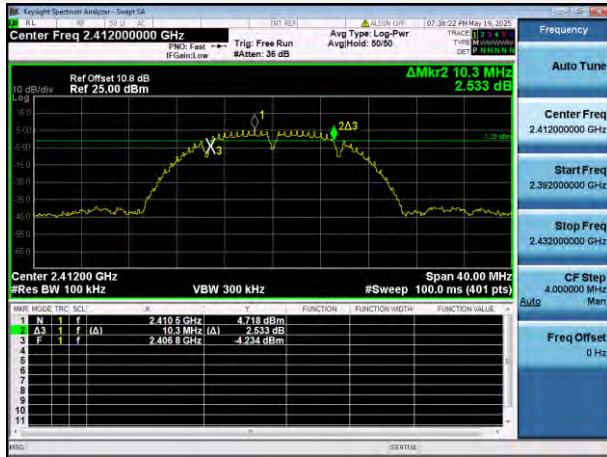
Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	38.200000	37.795000	≥500
Middle	38.200000	37.760000	≥500
High	38.200000	37.760000	≥500

Test Plots

SISO-Antenna 1

6 dB Bandwidth

802.11b LOW CHANNEL



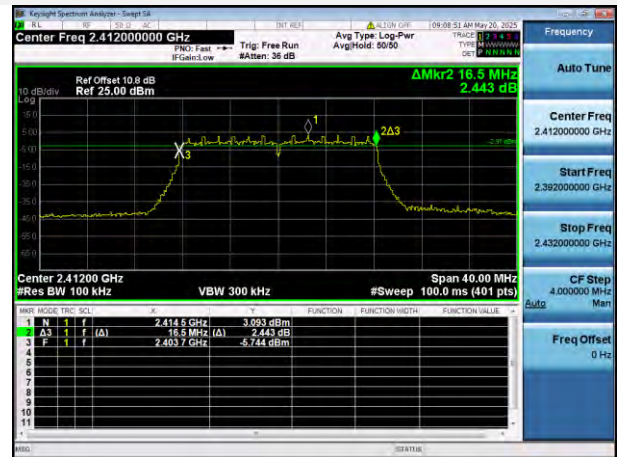
802.11b MIDDLE CHANNEL



802.11b HIGH CHANNEL



802.11g LOW CHANNEL



802.11g MIDDLE CHANNEL



802.11g HIGH CHANNEL



802.11n-20 MHz LOW CHANNEL



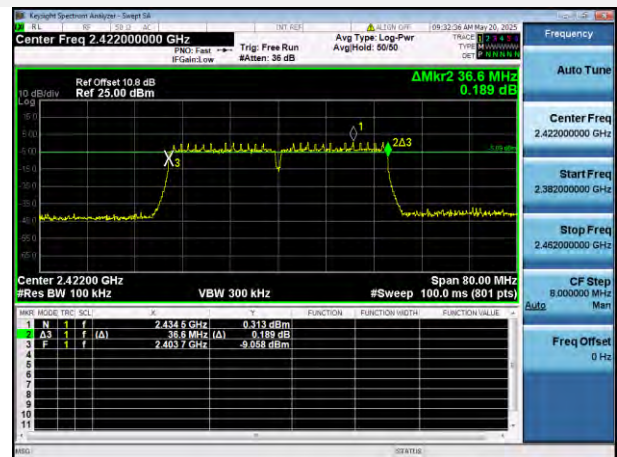
802.11n-20 MHz MIDDLE CHANNEL



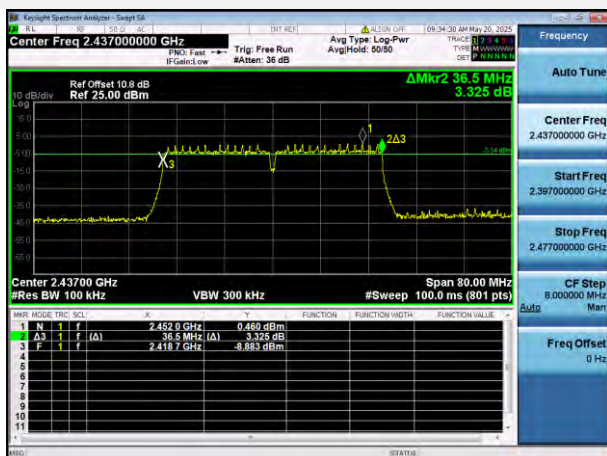
802.11n-20 MHz HIGH CHANNEL



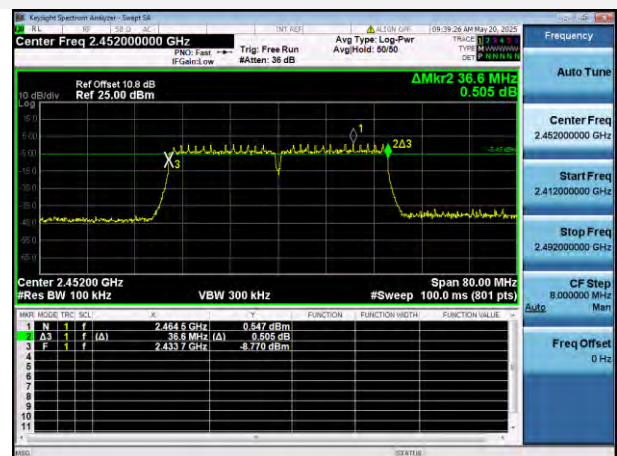
802.11n-40 MHz LOW CHANNEL



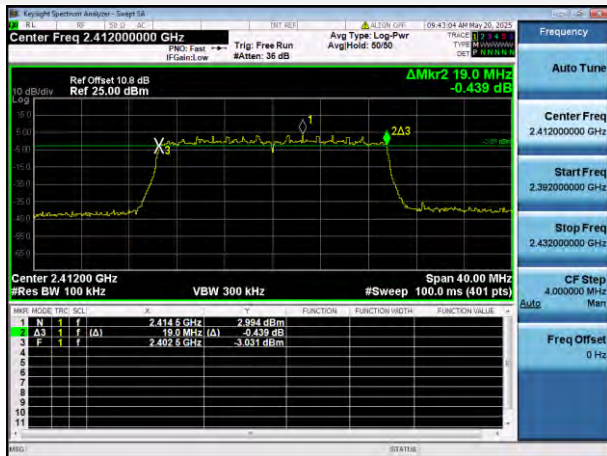
802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



802.11ax-20 MHz(SU) LOW CHANNEL



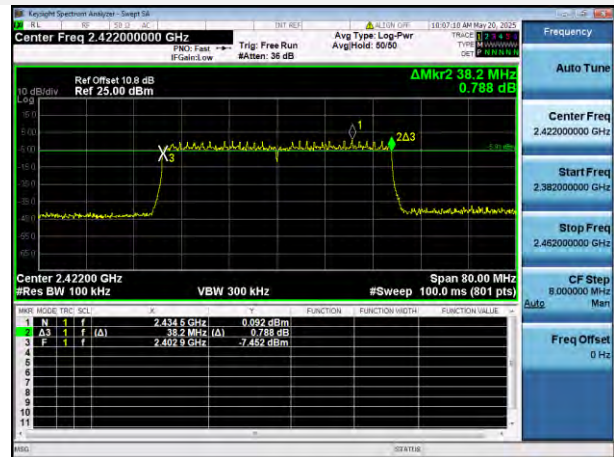
802.11ax-20 MHz(SU) MIDDLE CHANNEL



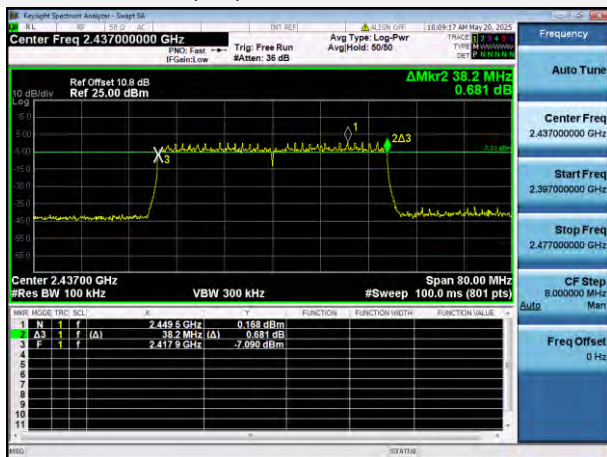
802.11ax-20 MHz(SU) HIGH CHANNEL



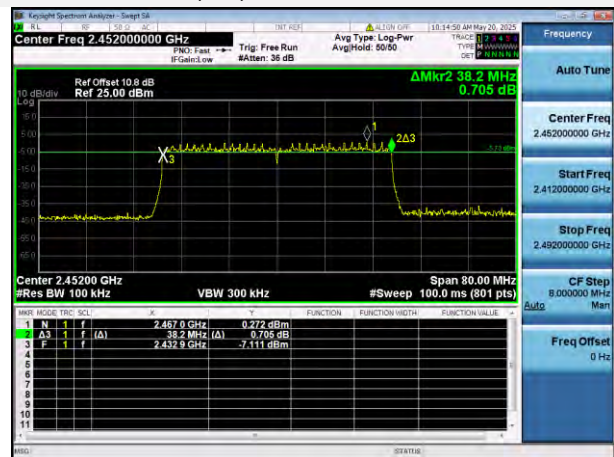
802.11ax-40 MHz(SU) LOW CHANNEL



802.11ax-40 MHz(SU) MIDDLE CHANNEL

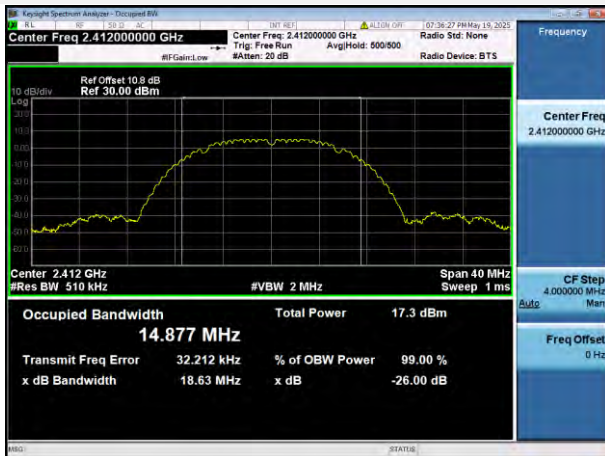


802.11ax-40 MHz(SU) HIGH CHANNEL



99% Bandwidth

802.11b LOW CHANNEL



802.11b MIDDLE CHANNEL



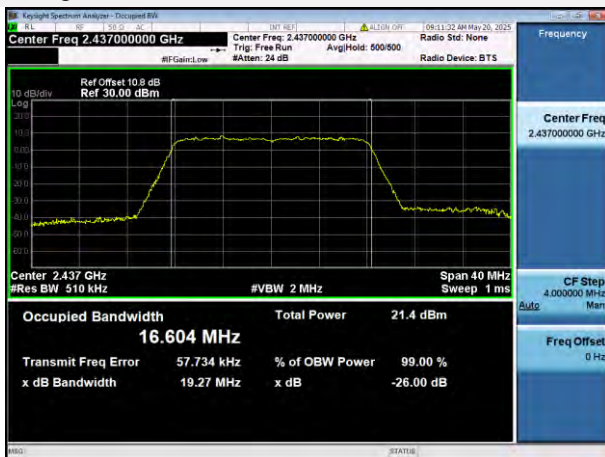
802.11b HIGH CHANNEL



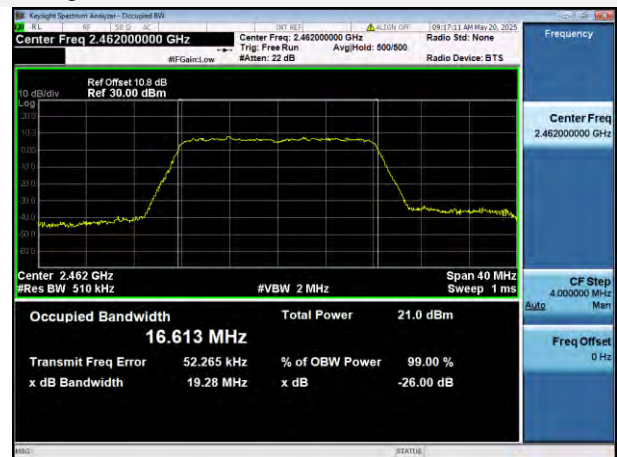
802.11g LOW CHANNEL



802.11g MIDDLE CHANNEL



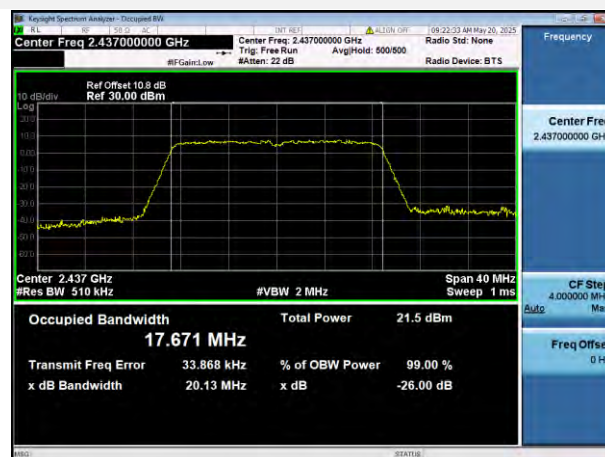
802.11g HIGH CHANNEL



802.11n-20 MHz LOW CHANNEL



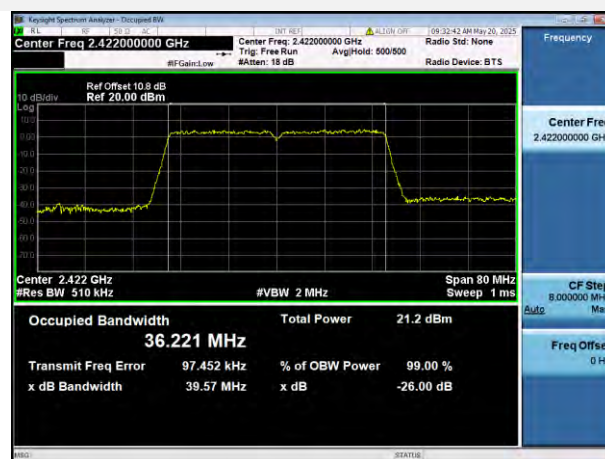
802.11n-20 MHz MIDDLE CHANNEL



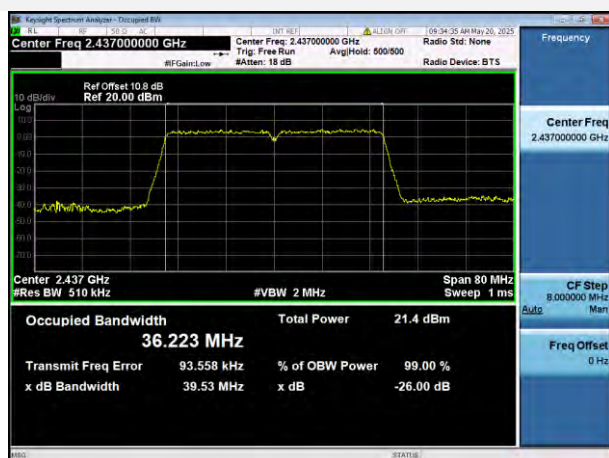
802.11n-20 MHz HIGH CHANNEL



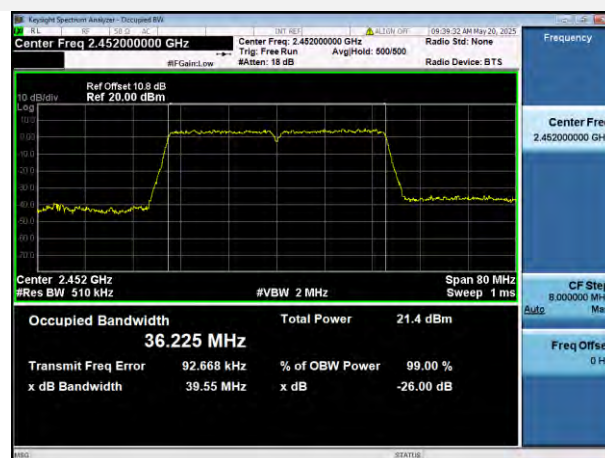
802.11n-40 MHz LOW CHANNEL



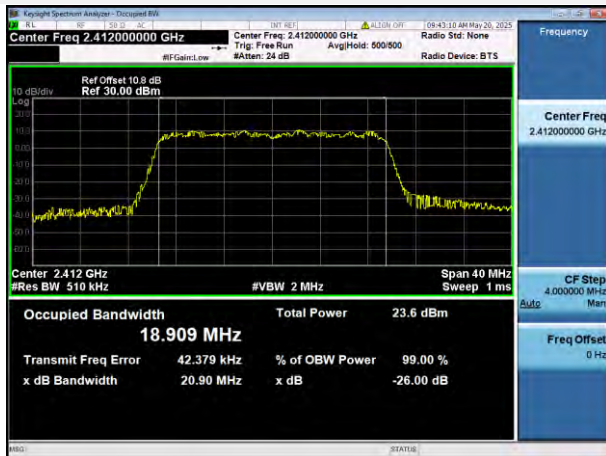
802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



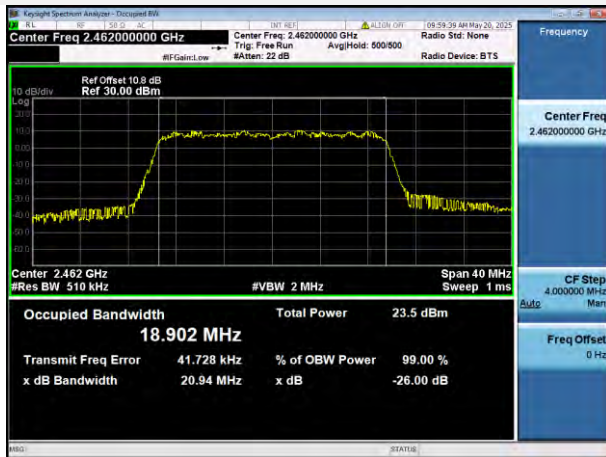
802.11ax-20 MHz(SU) LOW CHANNEL



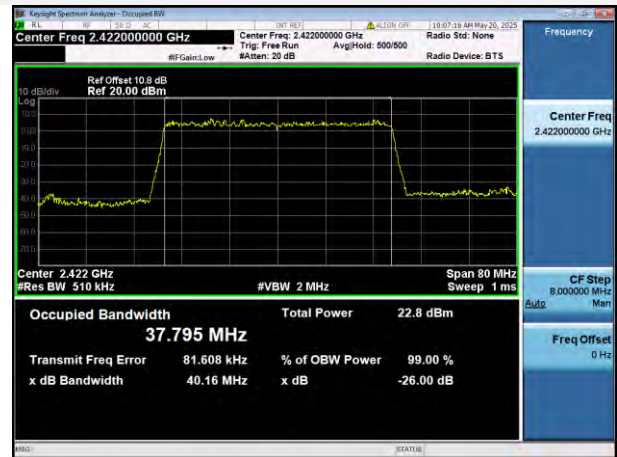
802.11ax-20 MHz(SU) MIDDLE CHANNEL



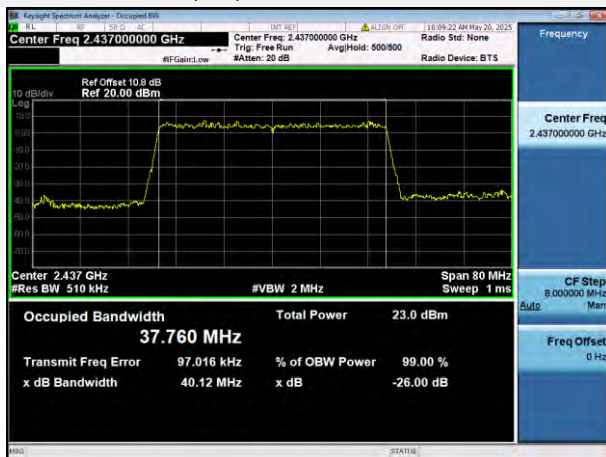
802.11ax-20 MHz(SU) HIGH CHANNEL



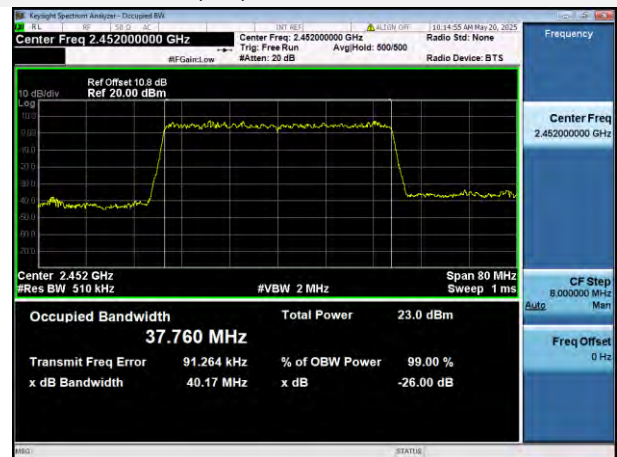
802.11ax-40 MHz(SU) LOW CHANNEL



802.11ax-40 MHz(SU) MIDDLE CHANNEL



802.11ax-40 MHz(SU) HIGH CHANNEL



A.3 Conducted Spurious Emissions

Note: All antenna were pre tested, but only the worst case has been reported in this report.

Test Data

SISO-Antenna 1

802.11b Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-37.68	4.93	-15.07	Pass
Middle	-37.45	4.85	-15.15	Pass
High	-38.78	4.87	-15.13	Pass

802.11g Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.27	3.61	-16.39	Pass
Middle	-37.74	3.87	-16.13	Pass
High	-39.30	3.52	-16.48	Pass

802.11n-20MHz Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.08	3.69	-16.31	Pass
Middle	-37.12	3.90	-16.10	Pass
High	-38.57	4.10	-15.90	Pass

802.11n-40MHz Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.72	0.73	-19.27	Pass
Middle	-37.64	0.88	-19.12	Pass
High	-39.19	1.00	-19.00	Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.43	3.42	-16.58	Pass
Middle	-39.57	3.72	-16.28	Pass
High	-38.91	3.32	-16.68	Pass

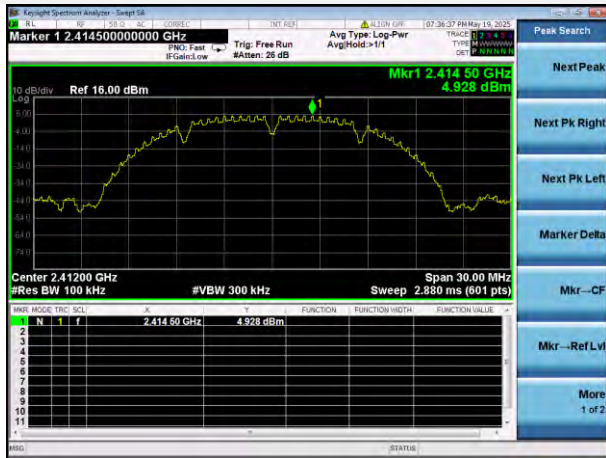
802.11ax-40 MHz(SU) Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-38.71	0.54	-19.46	Pass
Middle	-38.82	0.75	-19.25	Pass
High	-37.57	0.68	-19.32	Pass

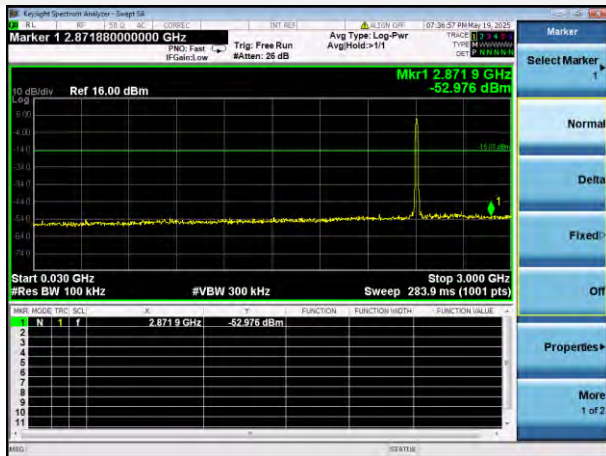
Test Plots

SISO-Antenna 1

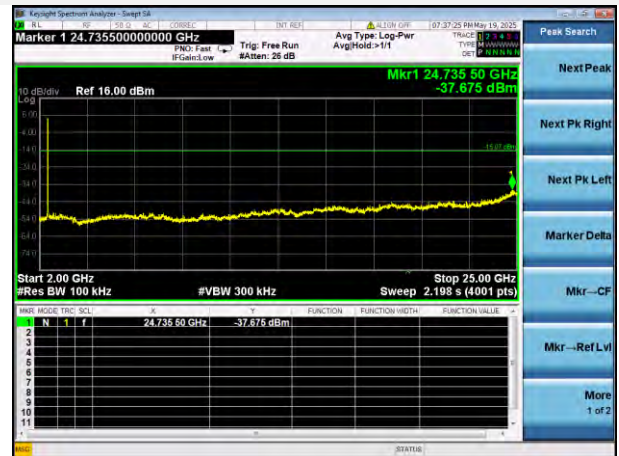
802.11b LOW CHANNEL CARRIER LEVEL



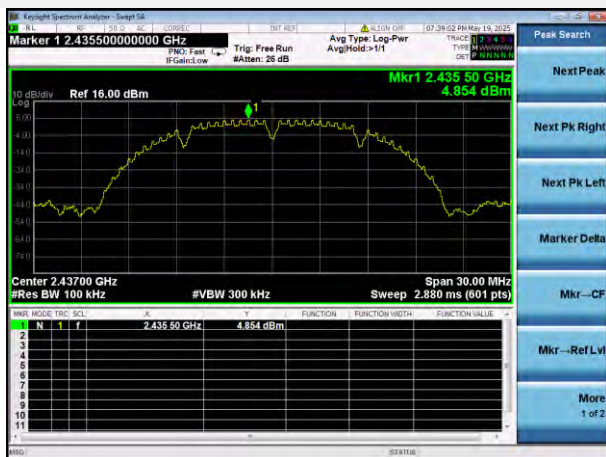
802.11b LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



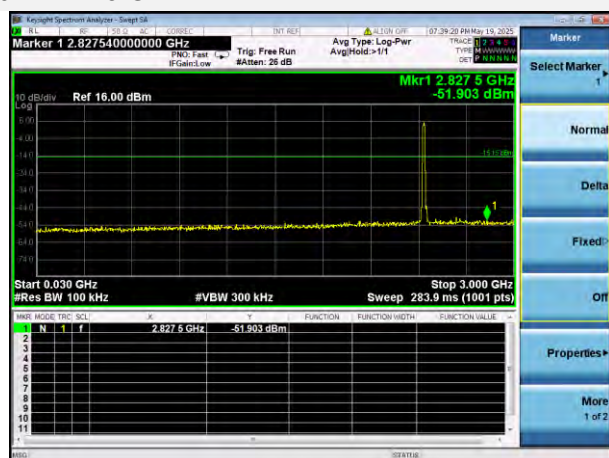
802.11b LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



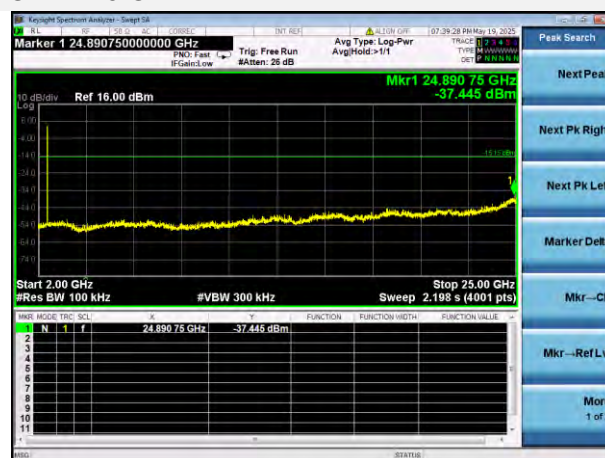
802.11b MIDDLE CHANNEL CARRIER LEVEL



802.11b MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



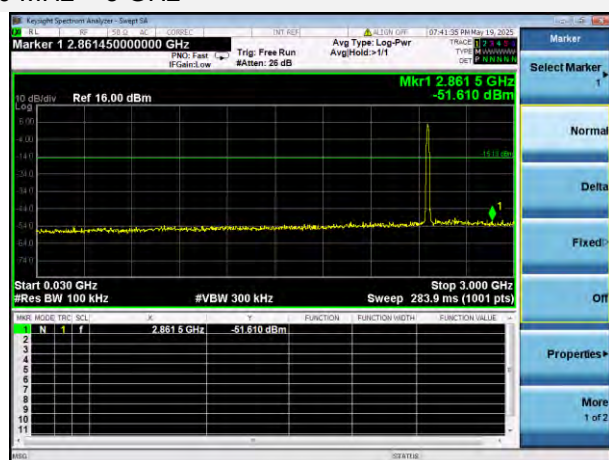
802.11b MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



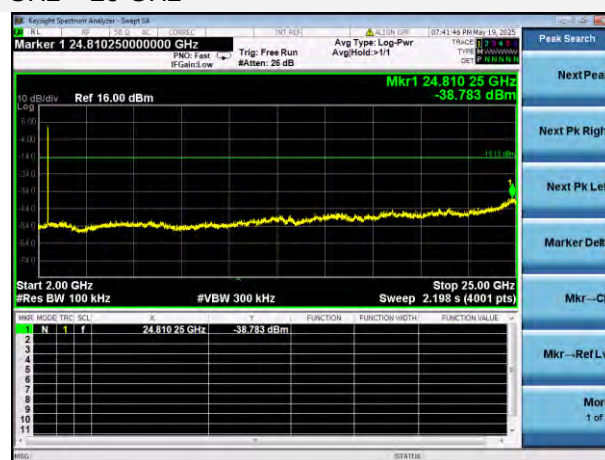
802.11b HIGH CHANNEL CARRIER LEVEL



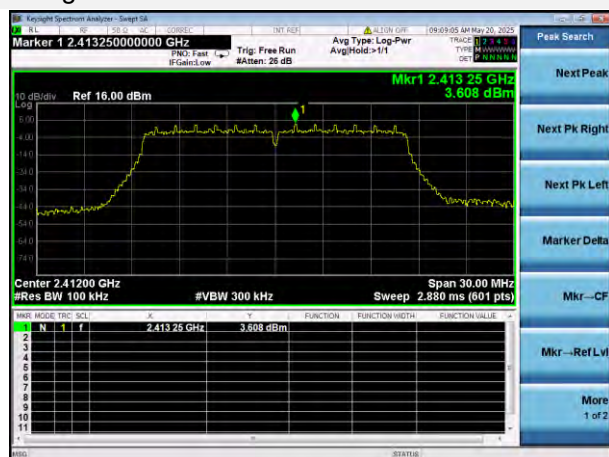
802.11b HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



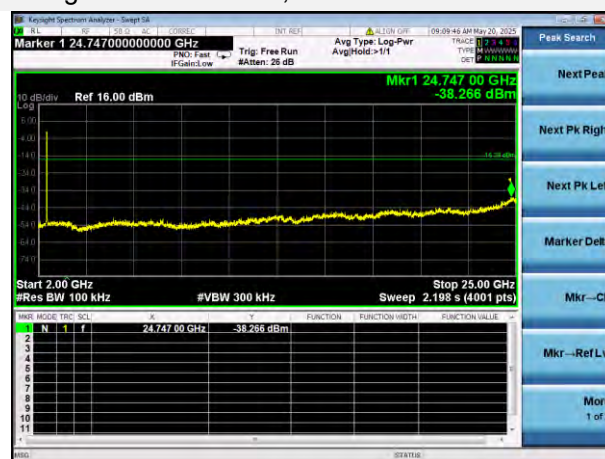
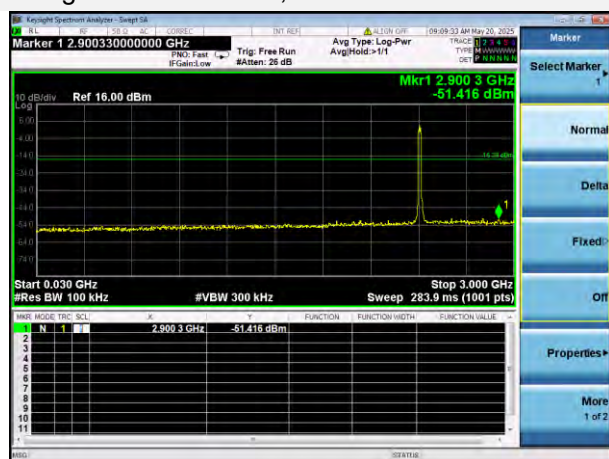
802.11b HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



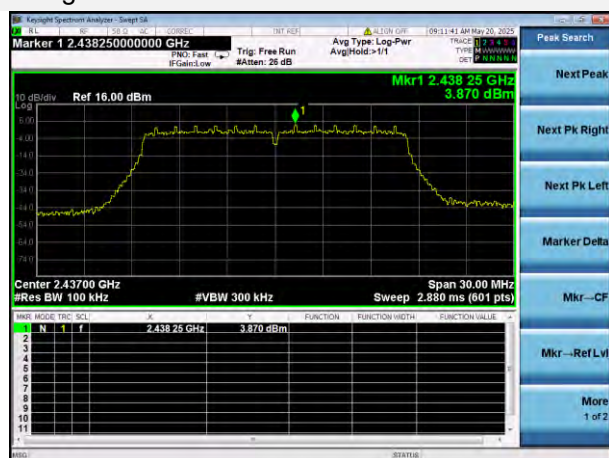
802.11g LOW CHANNEL CARRIER LEVEL



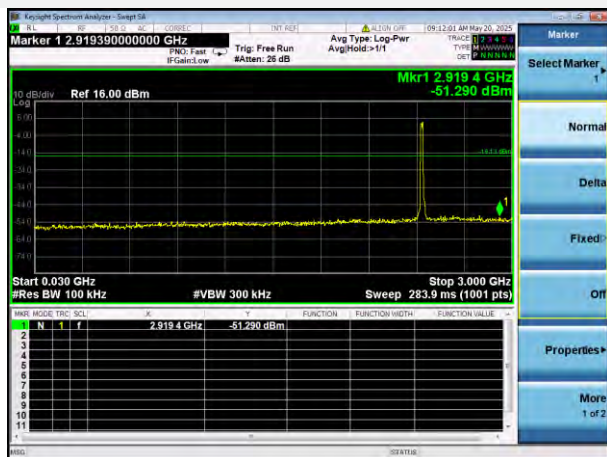
802.11g LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz 802.11g LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



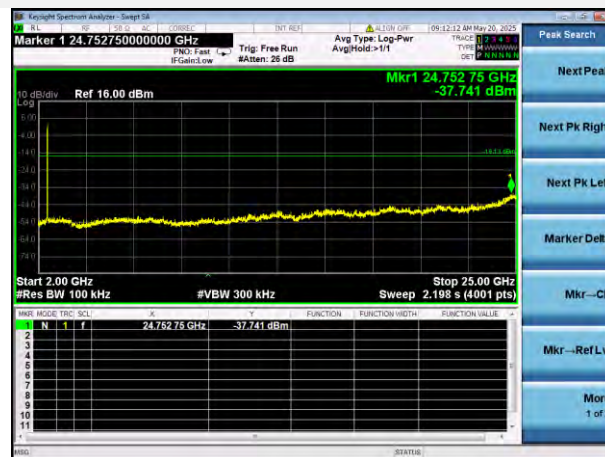
802.11g MIDDLE CHANNEL CARRIER LEVEL



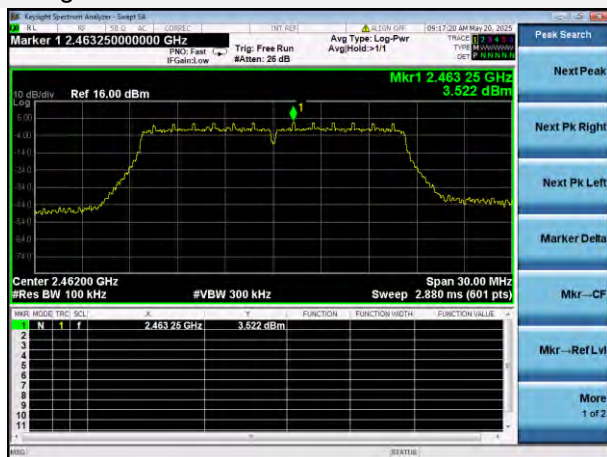
802.11g MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



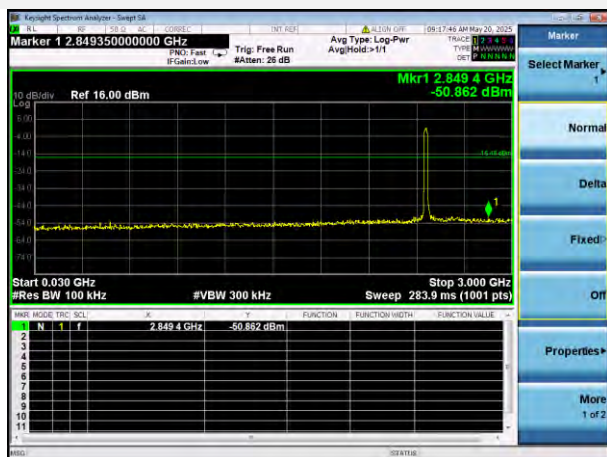
802.11g MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



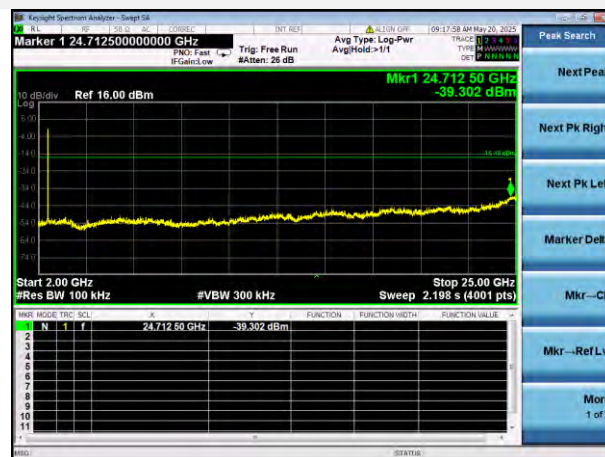
802.11g HIGH CHANNEL CARRIER LEVEL



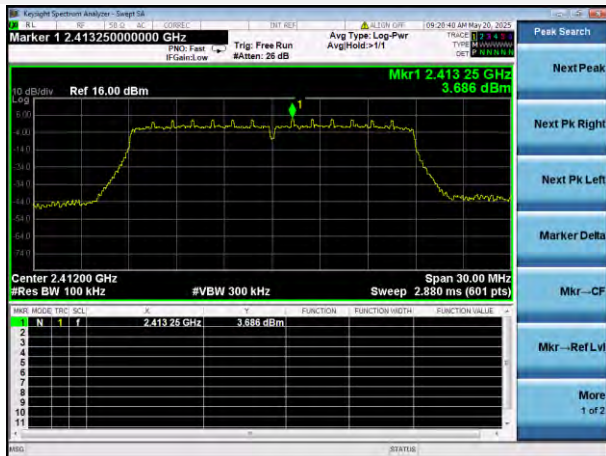
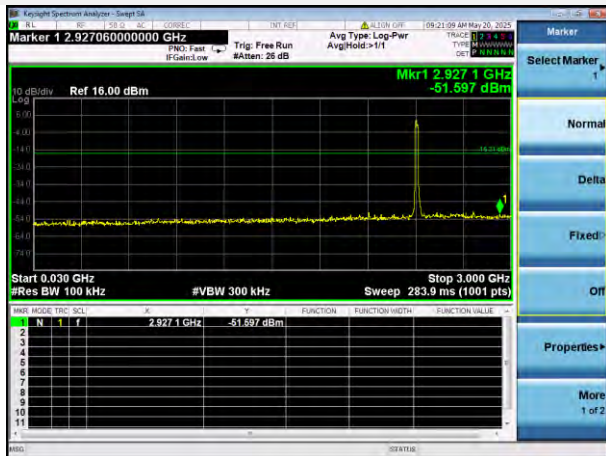
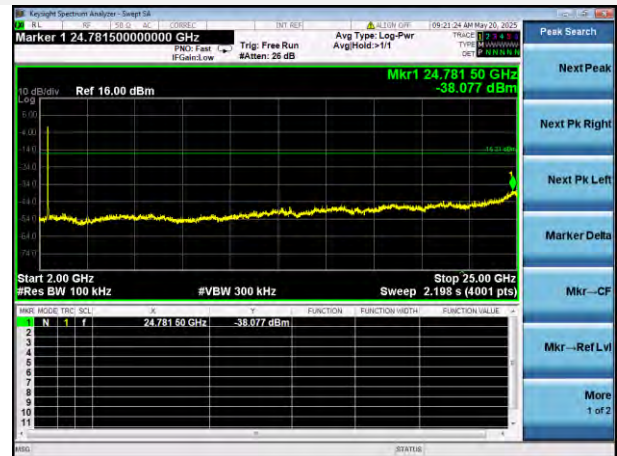
802.11g HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



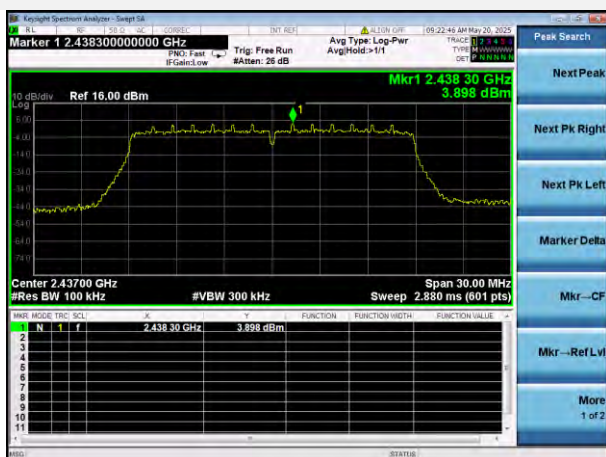
802.11g HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



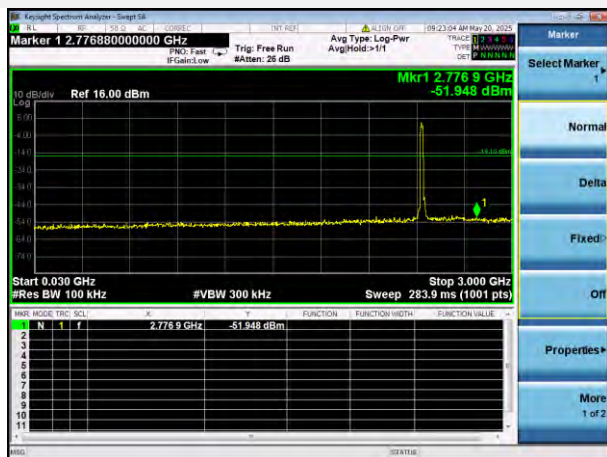
802.11n-20 MHz LOW CHANNEL CARRIER LEVEL

802.11n-20 MHz LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz802.11n-20 MHz LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

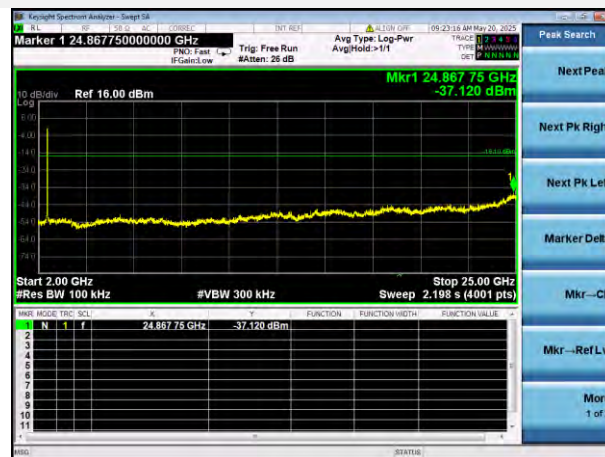
802.11n-20 MHz MIDDLE CHANNEL CARRIER LEVEL



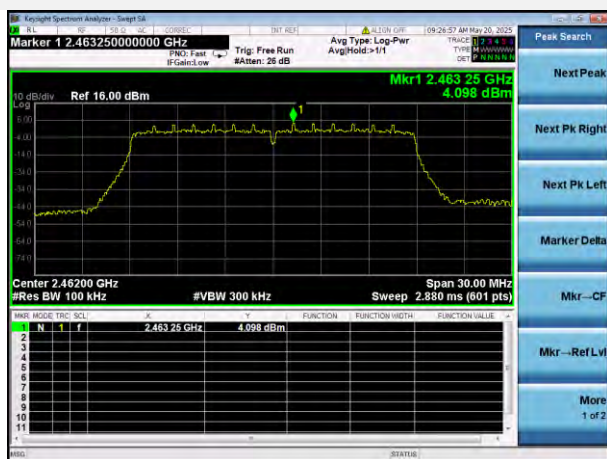
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



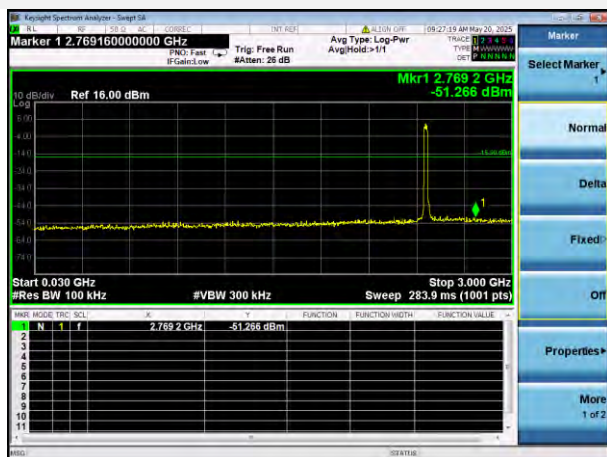
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



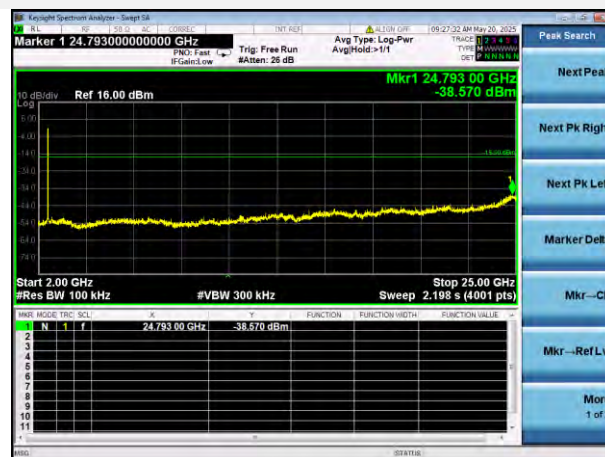
802.11n-20 MHz HIGH CHANNEL CARRIER LEVEL



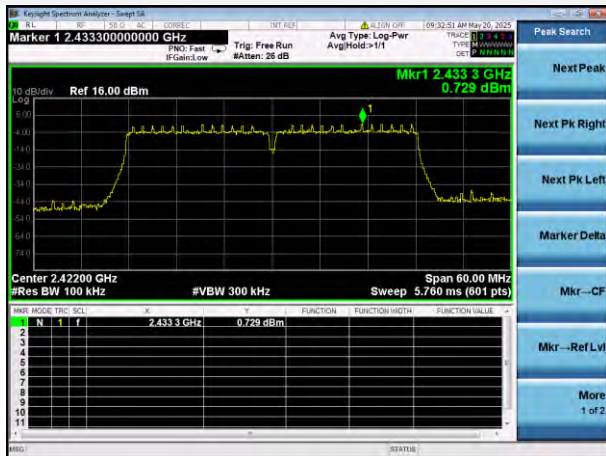
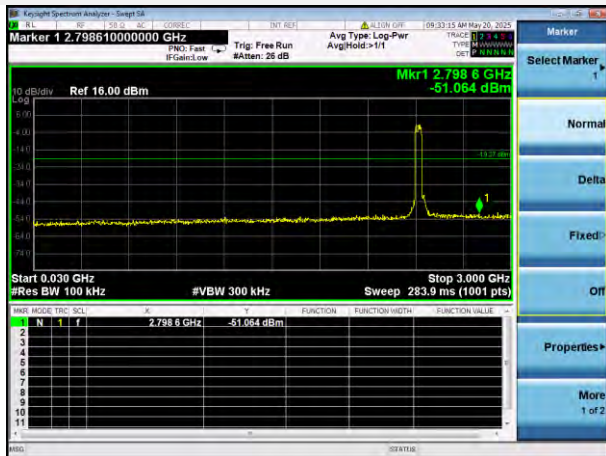
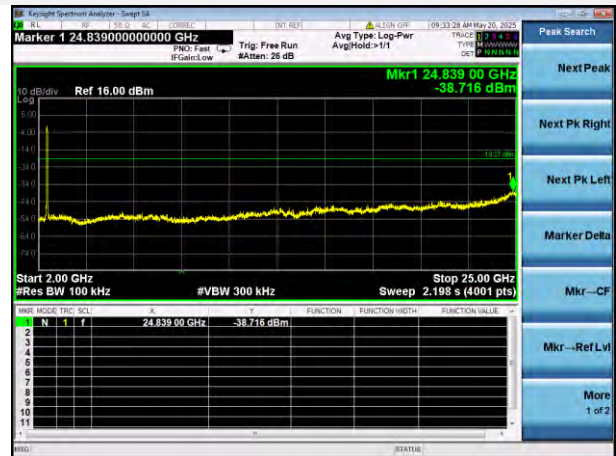
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



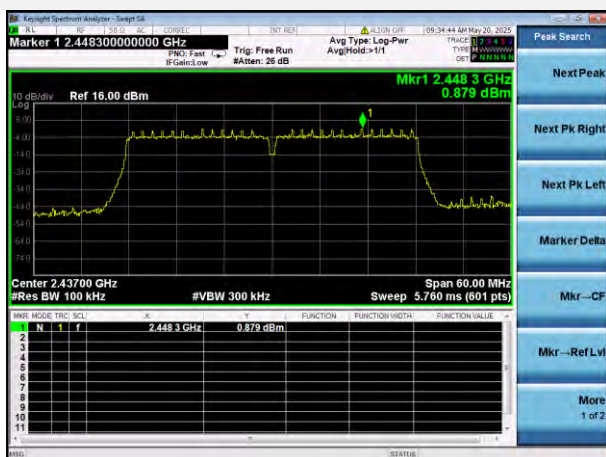
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



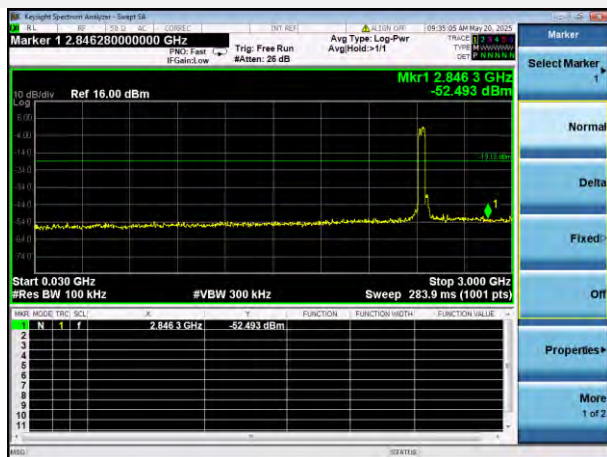
802.11n-40 MHz LOW CHANNEL CARRIER LEVEL

802.11n-40 MHz LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz802.11n-40 MHz LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz

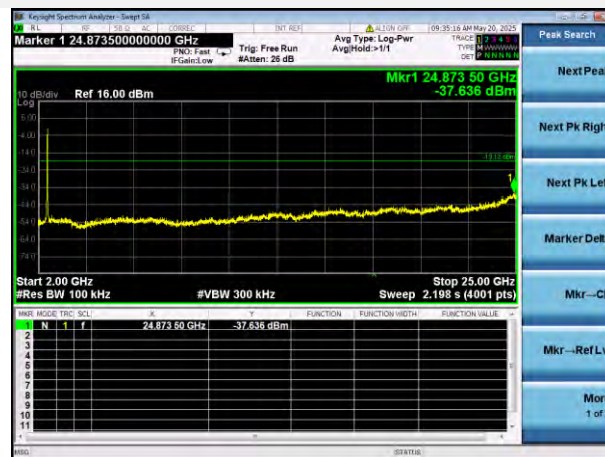
802.11n-40 MHz MIDDLE CHANNEL CARRIER LEVEL



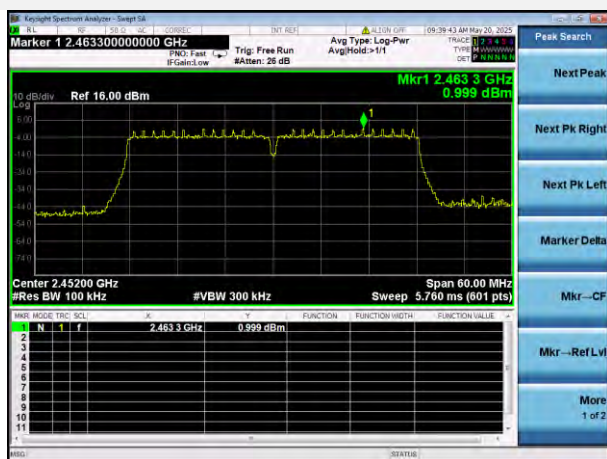
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



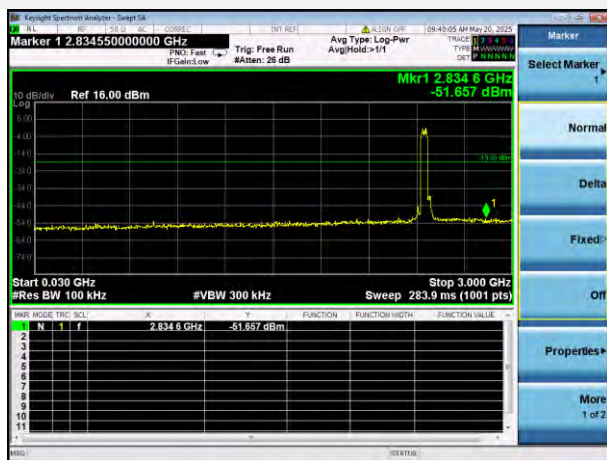
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



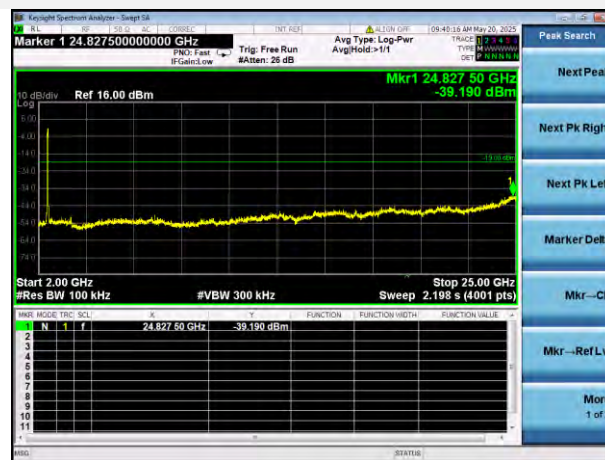
802.11n-40 MHz HIGH CHANNEL CARRIER LEVEL



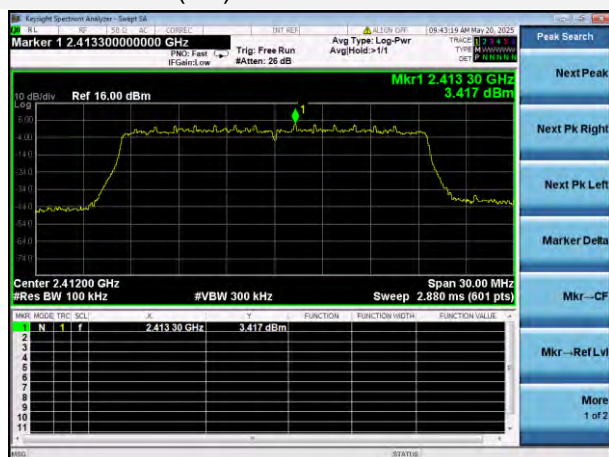
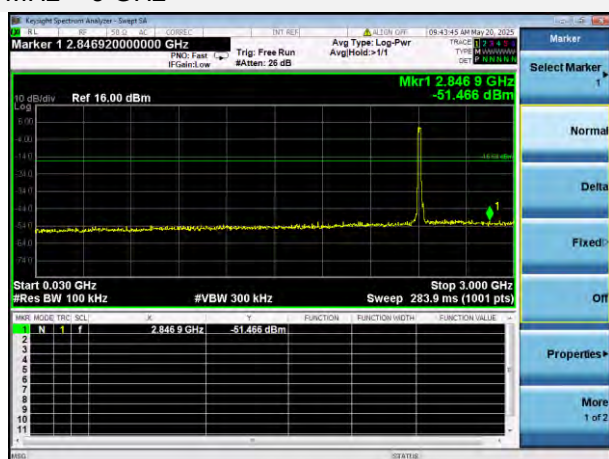
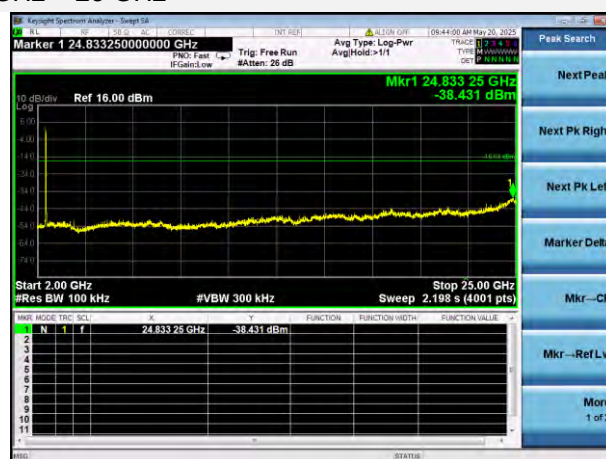
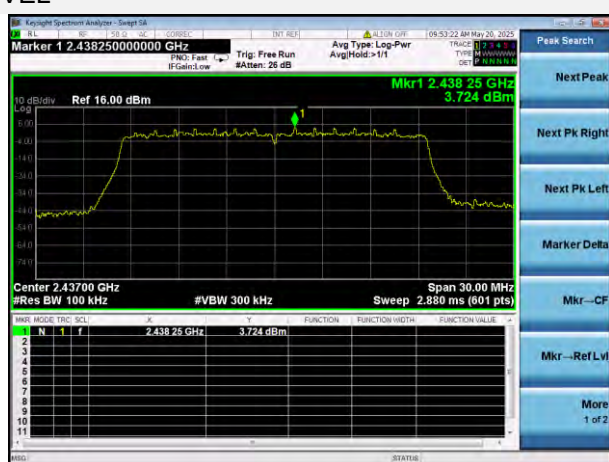
802.11n-40 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



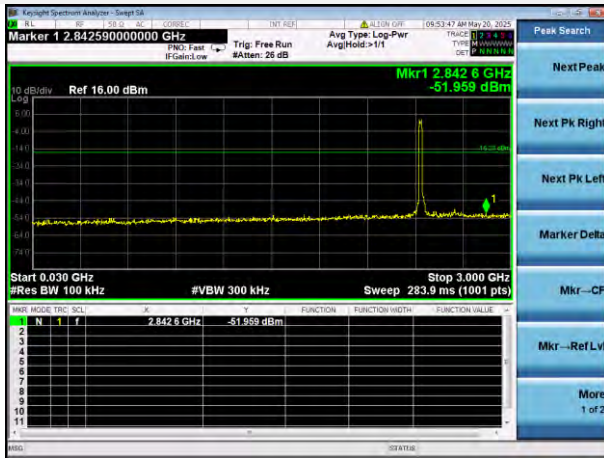
802.11n-40 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



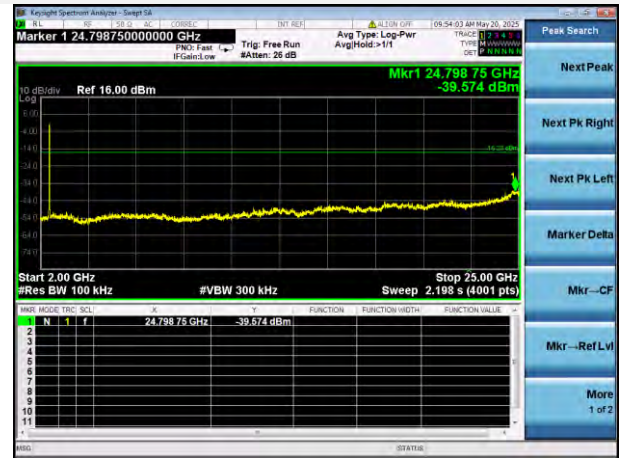
802.11ax-20 MHz(SU) LOW CHANNEL CARRIER LEVEL

802.11ax-20 MHz(SU) LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz802.11ax-20 MHz(SU) LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz802.11ax-20 MHz(SU) MIDDLE CHANNEL CARRIER
LEVEL

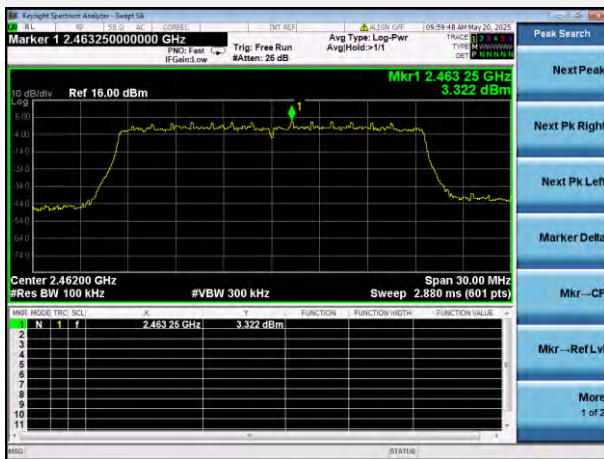
802.11ax-20 MHz(SU) MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



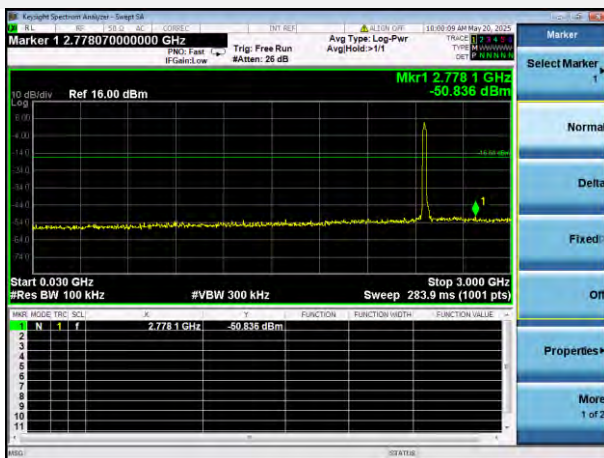
802.11ax-20 MHz(SU) MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



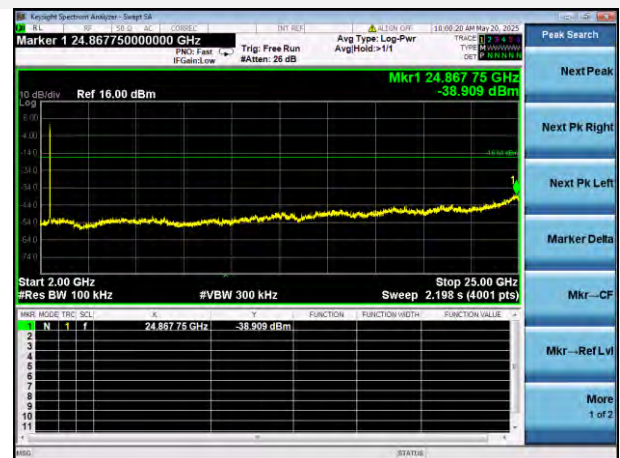
802.11ax-20 MHz(SU) HIGH CHANNEL CARRIER LEVEL



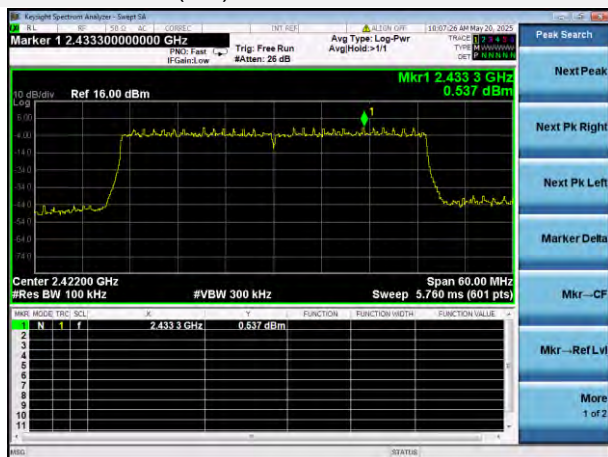
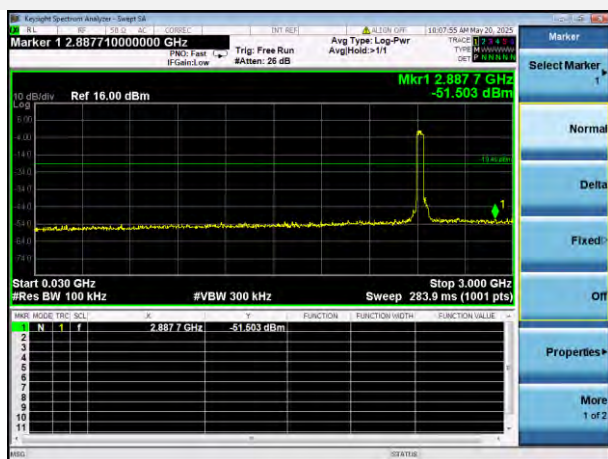
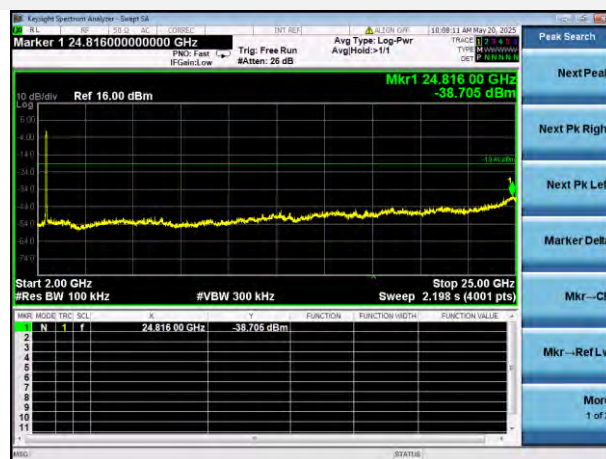
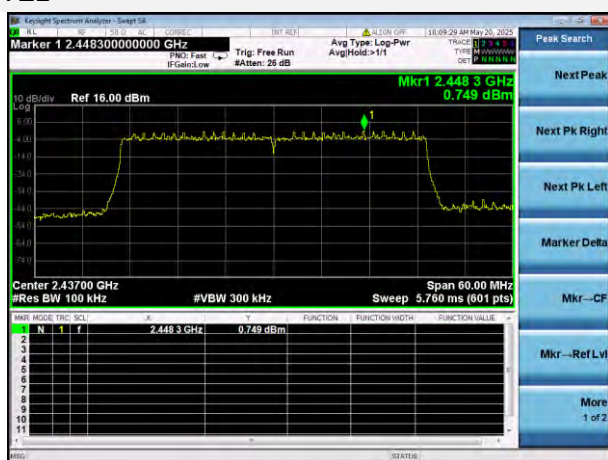
802.11ax-20 MHz(SU) HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



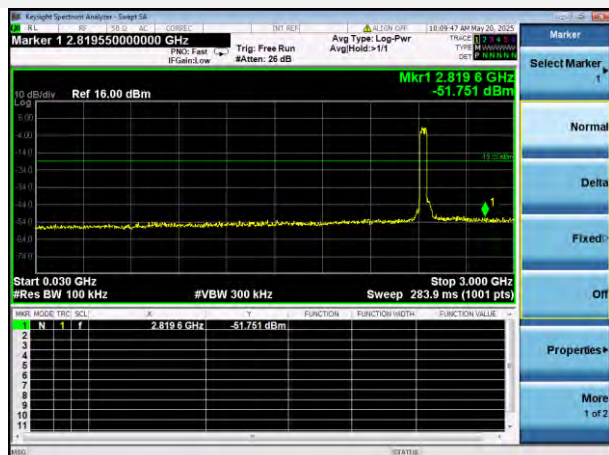
802.11ax-20 MHz(SU) HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



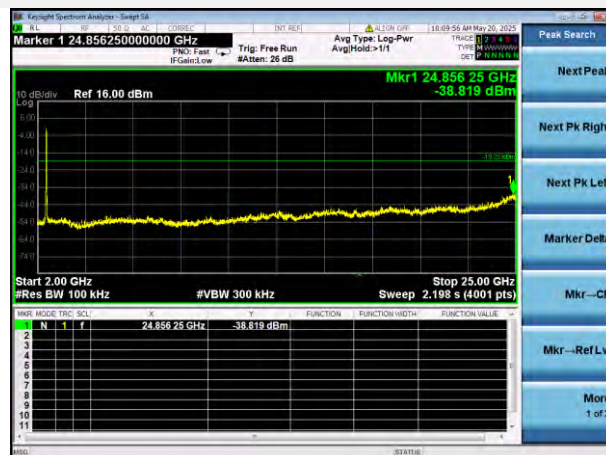
802.11ax-40 MHz(SU) LOW CHANNEL CARRIER LEVEL

802.11ax-40 MHz(SU) LOW CHANNEL, SPURIOUS
30 MHz ~ 3 GHz802.11ax-40 MHz(SU) LOW CHANNEL, SPURIOUS
2 GHz ~ 25 GHz802.11ax-40 MHz(SU) MIDDLE CHANNEL CARRIER
LEVEL

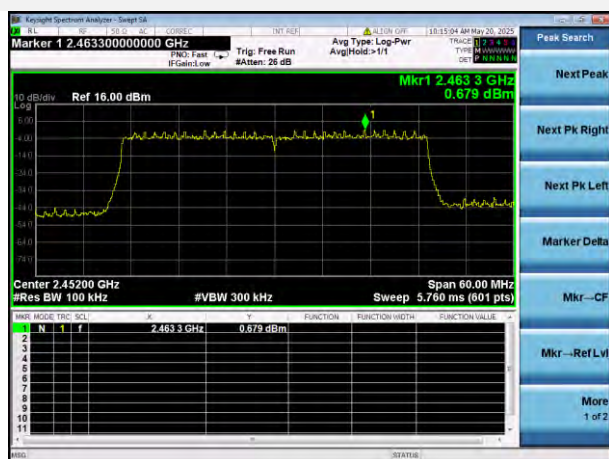
802.11ax-40 MHz(SU) MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



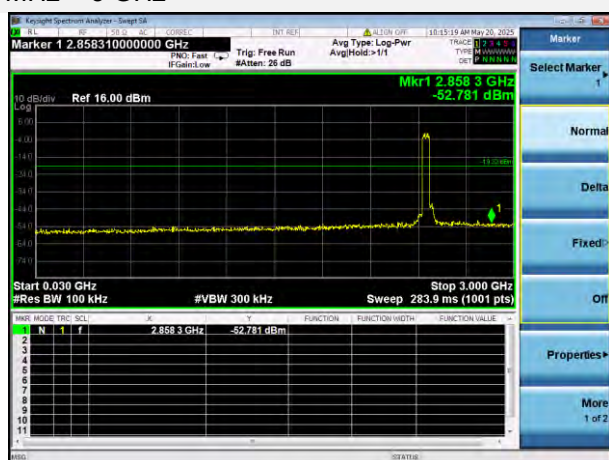
802.11ax-40 MHz(SU) MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



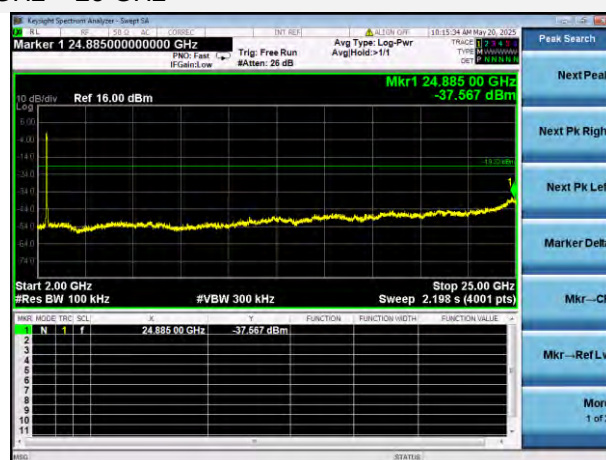
802.11ax-40 MHz(SU) HIGH CHANNEL CARRIER LEVEL



802.11ax-40 MHz(SU) HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



802.11ax-40 MHz(SU) HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



A.4 Band Edge (Authorized-band band-edge)

Note ¹: The 99% OBW of the fundamental emission is without 2 MHz of the authorized band.

Note ²: All antenna were pre tested, but only the worst case has been reported in this report.

Test Data

SISO-Antenna 1

802.11b Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-42.04	4.93	-15.07	Pass
High Channel	-48.90	4.87	-15.13	Pass

802.11g Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-44.70	3.61	-16.39	Pass
High Channel	-46.72	3.52	-16.48	Pass

802.11n-20 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-43.45	3.69	-16.31	Pass
High Channel	-43.56	4.10	-15.90	Pass

802.11n-40 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-44.27	0.73	-19.27	Pass
High Channel	-37.90	1.00	-19.00	Pass

802.11ax-20 MHz(SU) Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-43.84	3.42	-16.58	Pass
High Channel	-42.31	3.32	-16.68	Pass

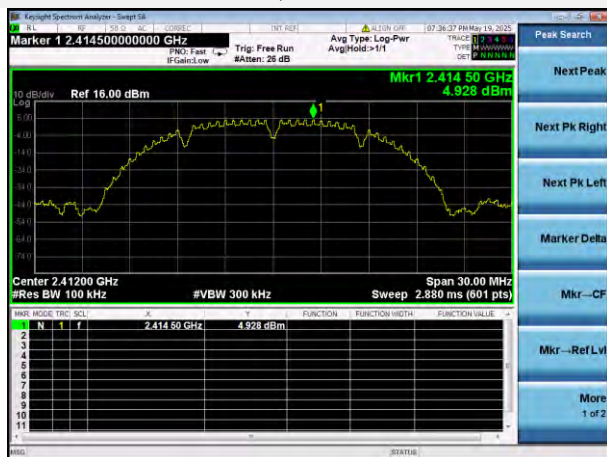
802.11ax-40 MHz(SU) Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-44.92	0.54	-19.46	Pass
High Channel	-37.30	0.68	-19.32	Pass

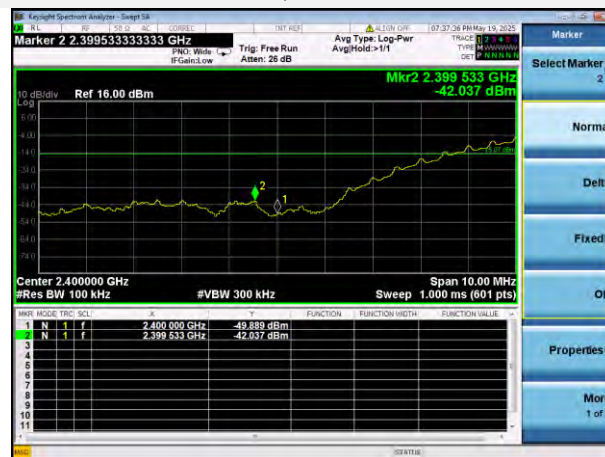
Test Plots

SISO-Antenna 1

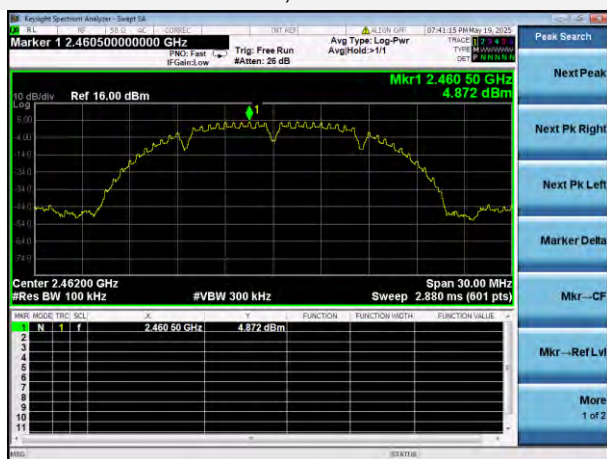
802.11b LOW CHANNEL, CARRIER LEVEL



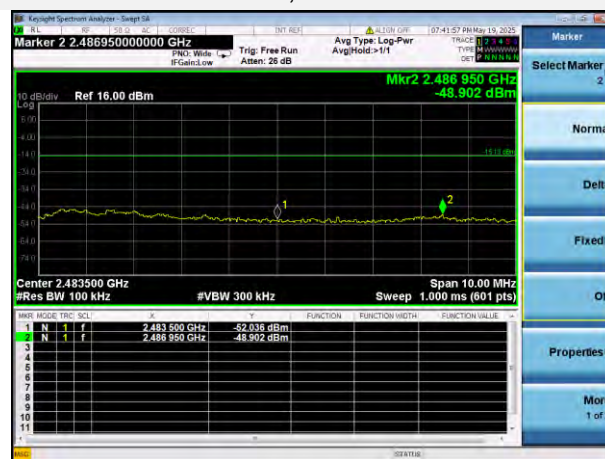
802.11b LOW CHANNEL, BAND EDGE



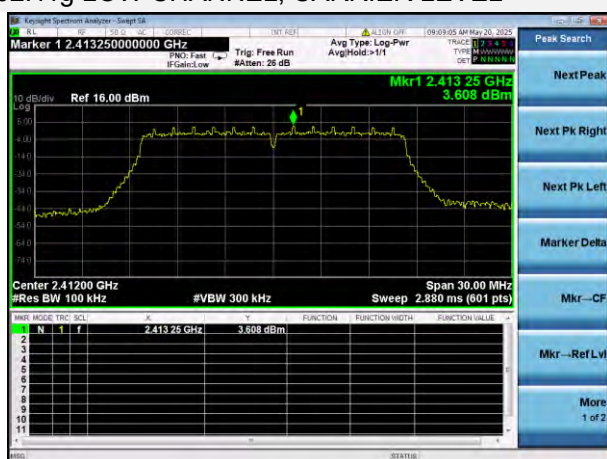
802.11b HIGH CHANNEL, CARRIER LEVEL



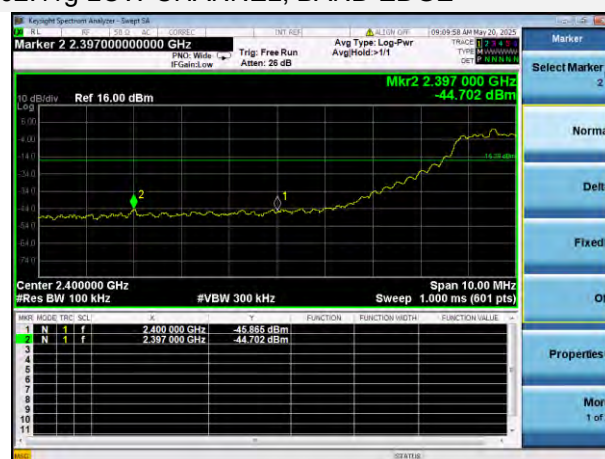
802.11b HIGH CHANNEL, BAND EDGE



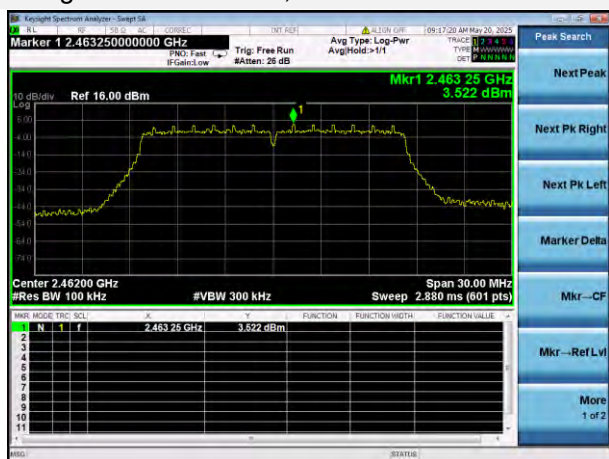
802.11g LOW CHANNEL, CARRIER LEVEL



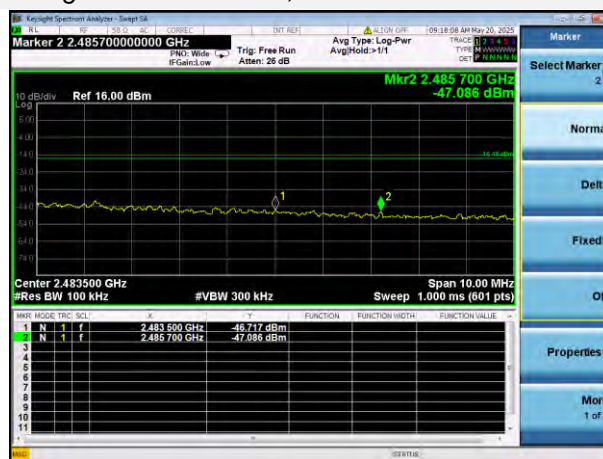
802.11g LOW CHANNEL, BAND EDGE



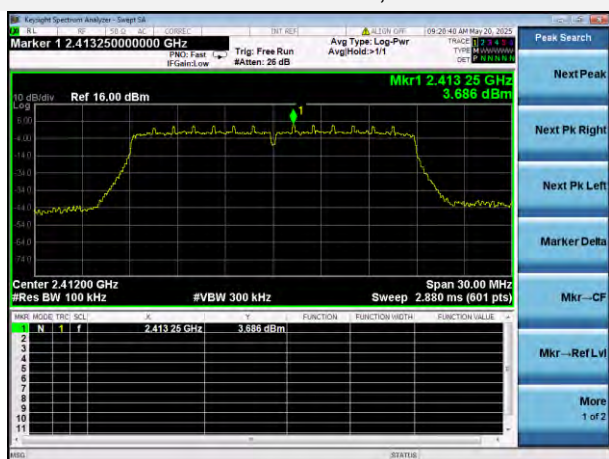
802.11g HIGH CHANNEL, CARRIER LEVEL



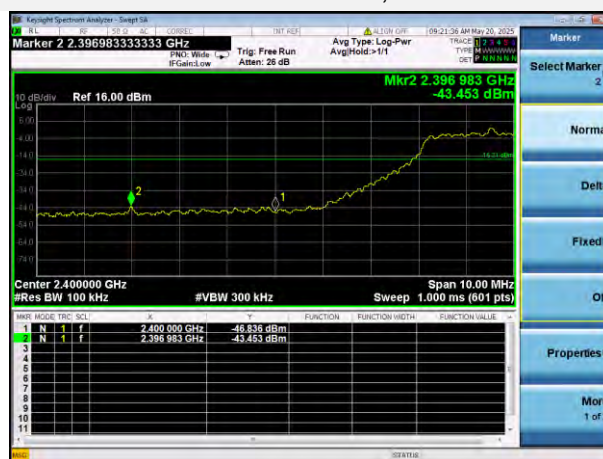
802.11g HIGH CHANNEL, BAND EDGE



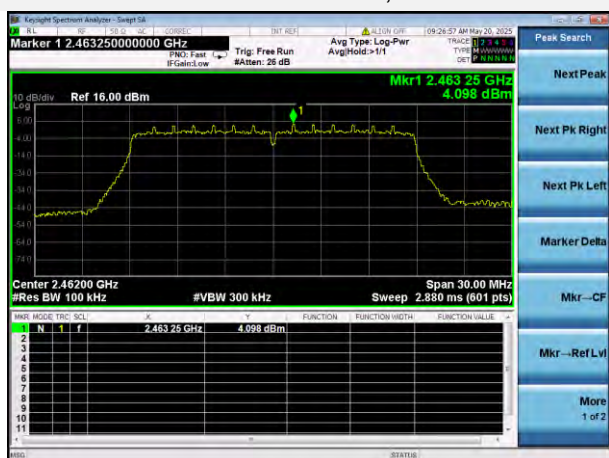
802.11n-20 MHz LOW CHANNEL, CARRIER LEVEL



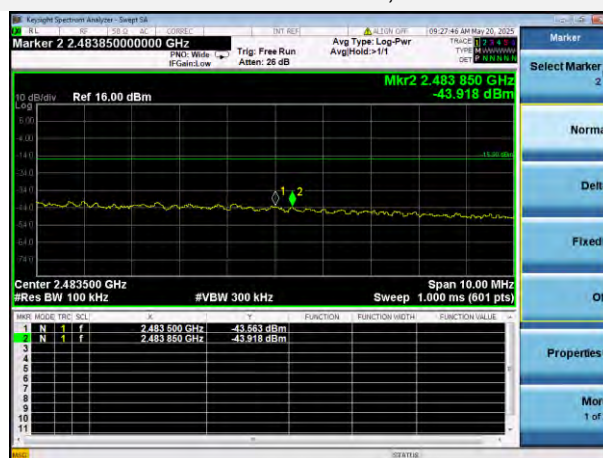
802.11n-20 MHz LOW CHANNEL, BAND EDGE



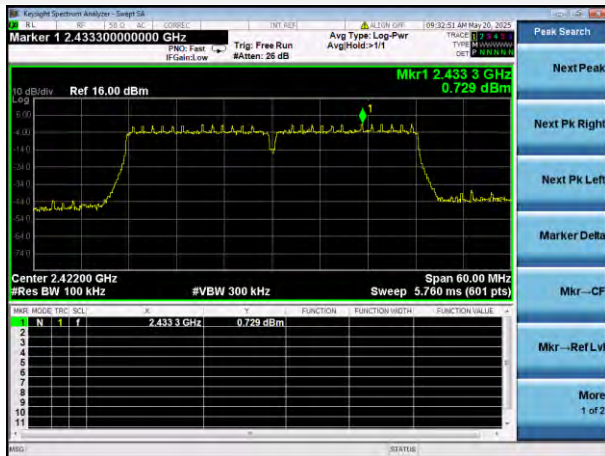
802.11n-20 MHz HIGH CHANNEL, CARRIER LEVEL



802.11n-20 MHz HIGH CHANNEL, BAND EDGE



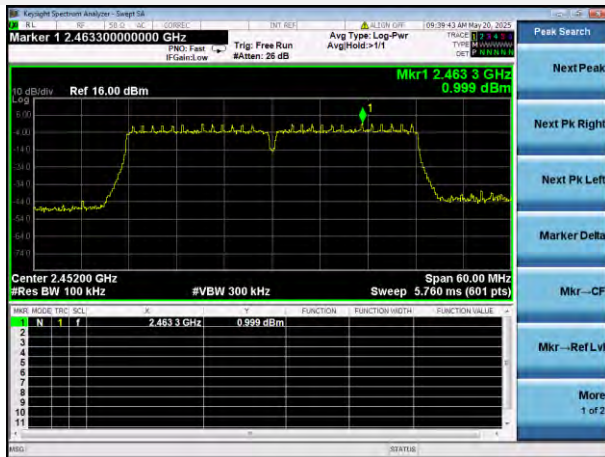
802.11n-40 MHz LOW CHANNEL, CARRIER LEVEL



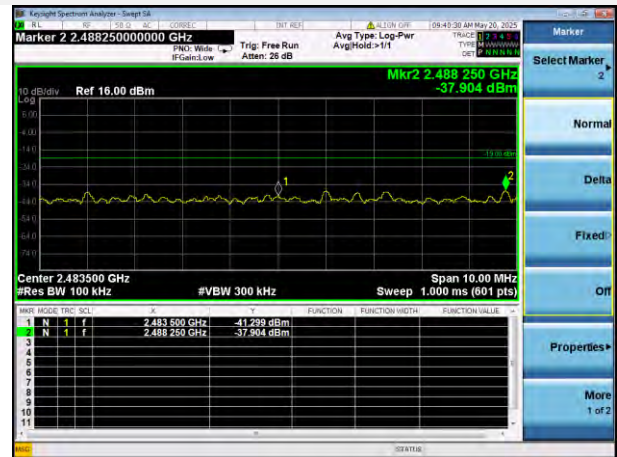
802.11n-40 MHz LOW CHANNEL, BAND EDGE



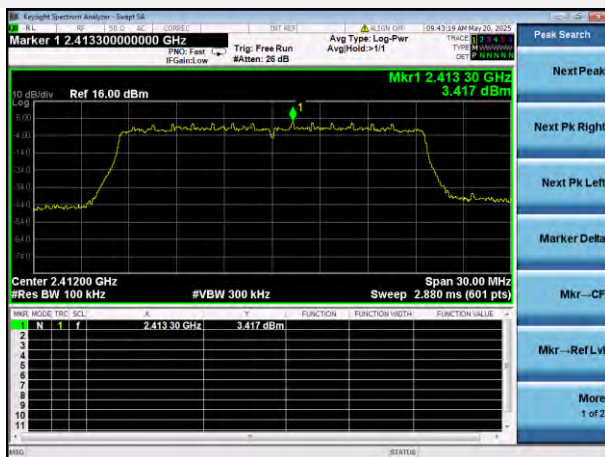
802.11n-40 MHz HIGH CHANNEL, CARRIER LEVEL



802.11n-40 MHz HIGH CHANNEL, BAND EDGE



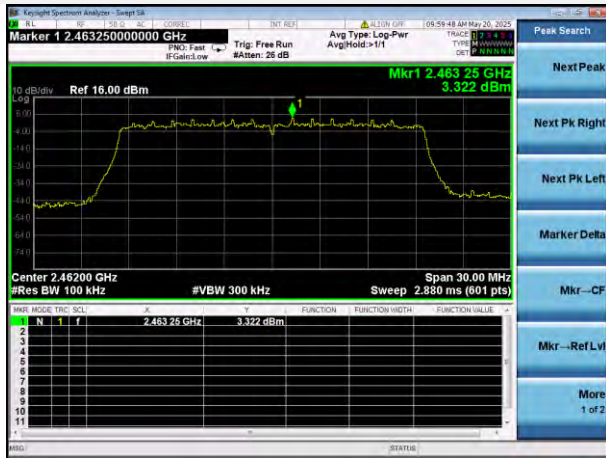
802.11ax-20 MHz(SU) LOW CHANNEL, CARRIER LEVEL



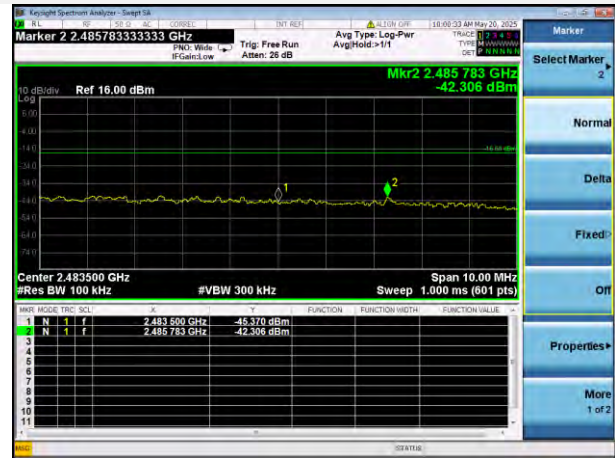
802.11ax-20 MHz(SU) LOW CHANNEL, BAND EDGE



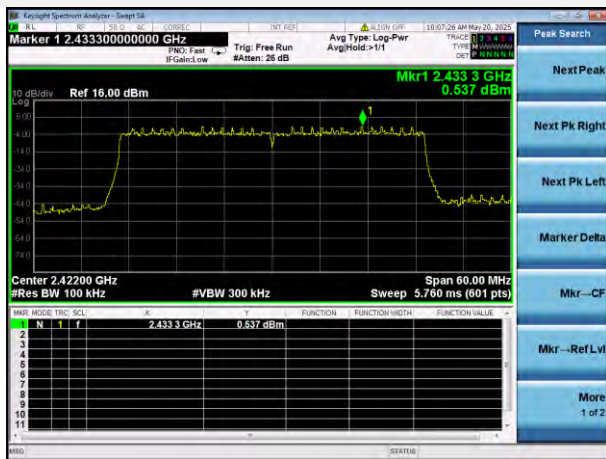
802.11ax-20 MHz(SU) HIGH CHANNEL, CARRIER LEVEL



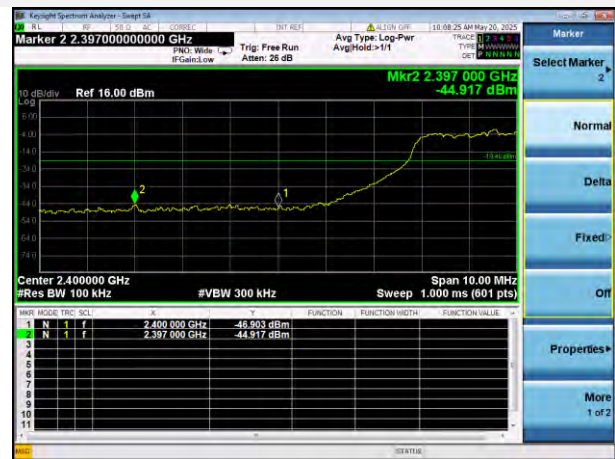
802.11ax-20 MHz(SU) HIGH CHANNEL, BAND EDGE



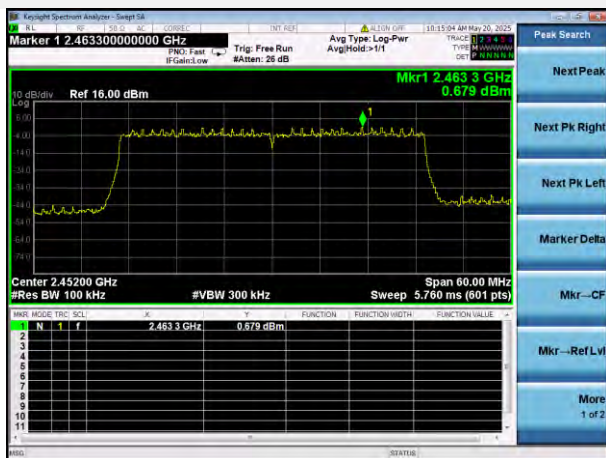
802.11ax-40 MHz(SU) LOW CHANNEL, CARRIER LEVEL



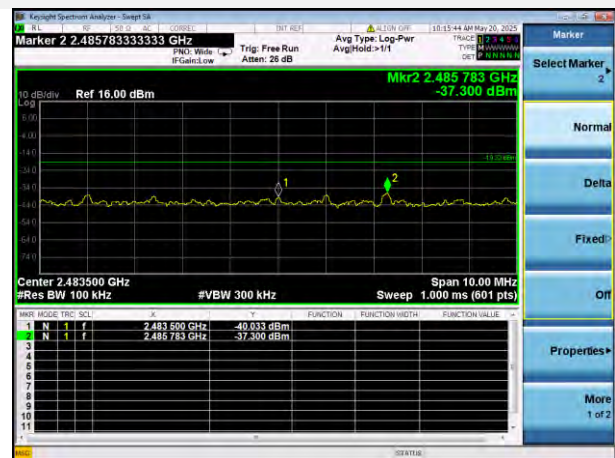
802.11ax-40 MHz(SU) LOW CHANNEL, BAND EDGE



802.11ax-40 MHz(SU) HIGH CHANNEL, CARRIER LEVEL



802.11ax-40 MHz(SU) HIGH CHANNEL, BAND EDGE



A.5 Conducted Emissions

Note¹: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

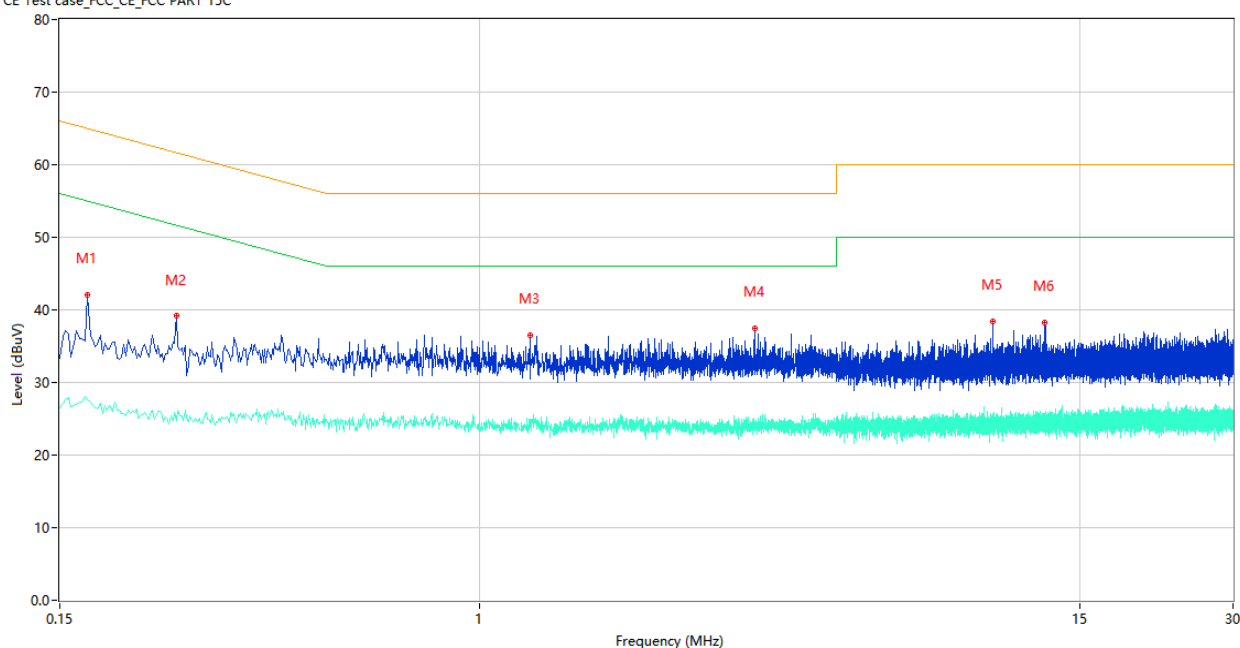
Note²: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

Note³: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)

Test Data and Plots

PHASE L

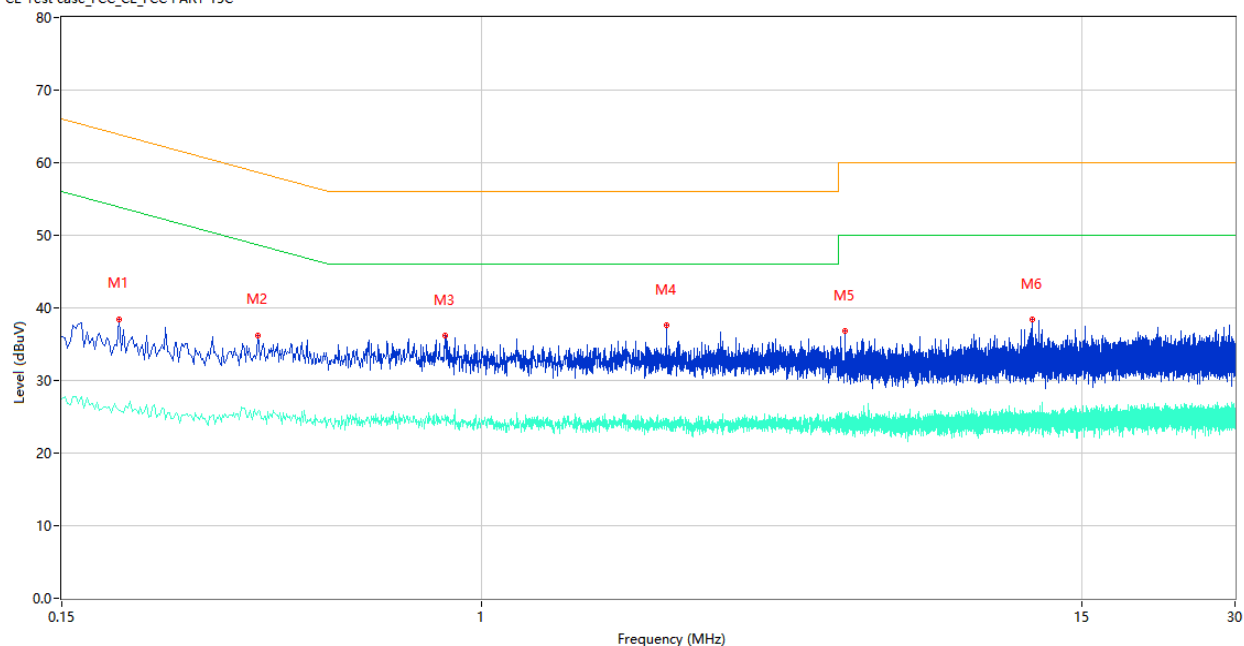
CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.170	42.07	9.83	64.96	22.89	Peak	L	Pass
1**	0.170	27.60	9.83	54.96	27.36	AV	L	Pass
2	0.254	39.20	9.82	61.63	22.43	Peak	L	Pass
2**	0.254	24.69	9.82	51.63	26.94	AV	L	Pass
3	1.254	36.54	10.46	56.00	19.46	Peak	L	Pass
3**	1.254	24.39	10.46	46.00	21.61	AV	L	Pass
4	3.456	37.47	10.27	56.00	18.53	Peak	L	Pass
4**	3.456	23.78	10.27	46.00	22.22	AV	L	Pass
5	10.126	38.48	10.21	60.00	21.52	Peak	L	Pass
5**	10.126	24.80	10.21	50.00	25.20	AV	L	Pass
6	12.812	38.27	10.46	60.00	21.73	Peak	L	Pass
6**	12.812	23.85	10.46	50.00	26.15	AV	L	Pass

PHASE N

CE Test case_FCC_CE_FCC PART 15C



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.194	38.48	9.83	63.86	25.38	Peak	N	Pass
1**	0.194	25.82	9.83	53.86	28.04	AV	N	Pass
2	0.364	36.27	10.74	58.64	22.37	Peak	N	Pass
2**	0.364	25.60	10.74	48.64	23.04	AV	N	Pass
3	0.848	36.17	10.62	56.00	19.83	Peak	N	Pass
3**	0.848	25.24	10.62	46.00	20.76	AV	N	Pass
4	2.304	37.59	10.31	56.00	18.41	Peak	N	Pass
4**	2.304	24.71	10.31	46.00	21.29	AV	N	Pass
5	5.152	36.81	10.19	60.00	23.19	Peak	N	Pass
5**	5.152	24.71	10.19	50.00	25.29	AV	N	Pass
6	12.016	38.36	10.40	60.00	21.64	Peak	N	Pass
6**	12.016	24.06	10.40	50.00	25.94	AV	N	Pass

A.6 Radiated Emission

Note¹: The symbol of “--” in the table which means not application.

Note²: For the test data above 1 GHz, According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

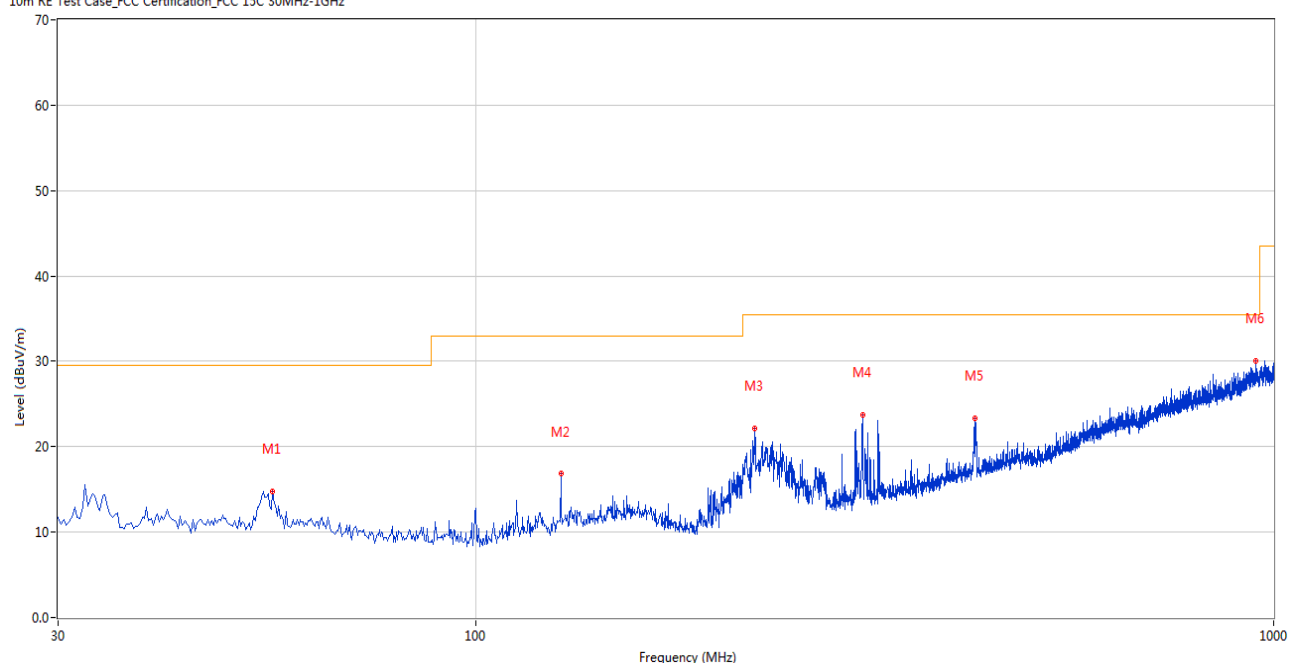
Note³: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note⁴: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and normal link mode is worst.

Test Data and Plots

30 MHz to 1 GHz, ANT H

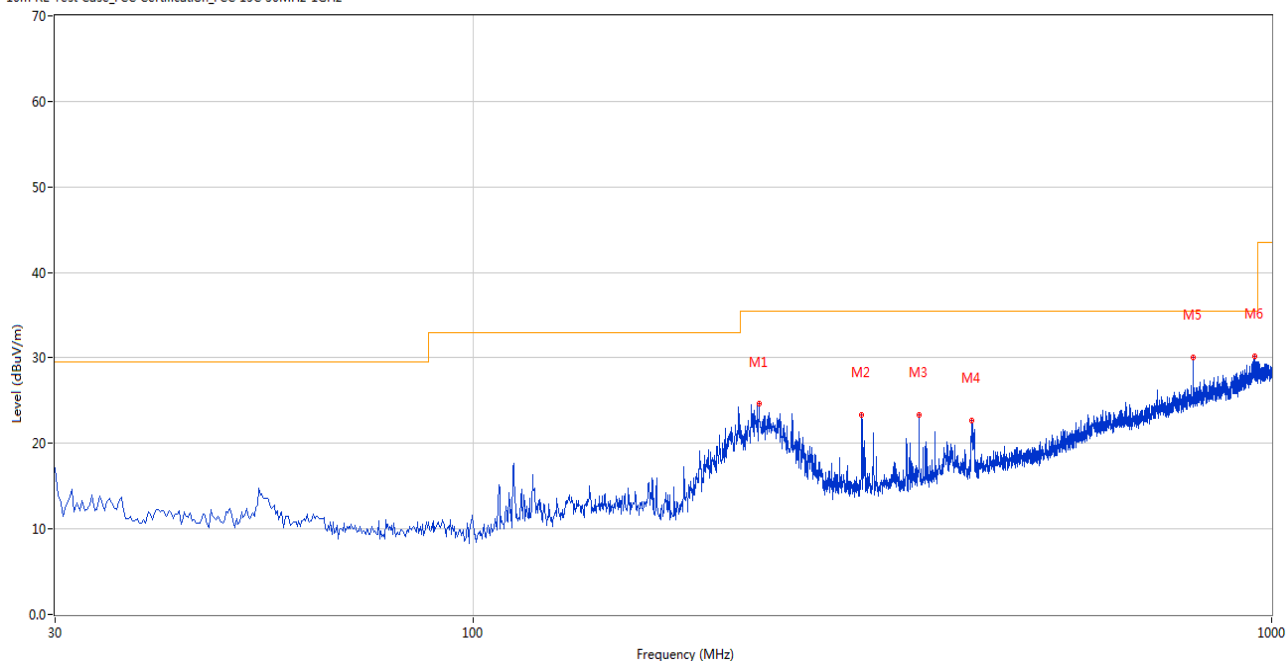
10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	55.699	14.79	-27.14	29.5	14.71	Peak	124.00	100	Horizontal	Pass
2	127.946	16.81	-27.47	33.0	16.19	Peak	0.00	200	Horizontal	Pass
3	223.467	22.16	-28.95	35.5	13.34	Peak	75.00	200	Horizontal	Pass
4	305.896	23.73	-25.26	35.5	11.77	Peak	0.00	200	Horizontal	Pass
5	422.024	23.37	-21.99	35.5	12.13	Peak	267.00	200	Horizontal	Pass
6	951.027	30.05	-9.57	35.5	5.45	Peak	34.00	200	Horizontal	Pass

30 MHz to 1 GHz, ANT V

10m RE Test Case_FCC Certification_FCC 15C 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	228.315	24.59	-28.91	35.5	10.91	Peak	0.00	200	Vertical	Pass
2	306.866	23.28	-25.22	35.5	12.22	Peak	347.00	200	Vertical	Pass
3	361.900	23.29	-23.77	35.5	12.21	Peak	230.00	100	Vertical	Pass
4	421.782	22.71	-22.00	35.5	12.79	Peak	192.00	100	Vertical	Pass
5	798.048	30.04	-12.49	35.5	5.46	Peak	183.00	200	Vertical	Pass
6	951.512	30.22	-9.59	35.5	5.28	Peak	220.00	100	Vertical	Pass

Note¹: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note²: The spurious above 18G is noise only, do not show on the report.

Note³: All antenna were pre tested, but only the worst case has been reported in this report.

SISO-Antenna 1

1 GHz to 18 GHz, ANT H 802.11b Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1325.929	42.70	74.0	31.30	Peak	124.00	100	Horizontal	Pass
1**	1325.929	35.63	54.0	18.37	AV	124.00	100	Horizontal	Pass
2	2999.839	51.26	74.0	22.74	Peak	259.00	200	Horizontal	Pass
2**	2999.839	42.47	54.0	11.53	AV	259.00	200	Horizontal	Pass
3	4933.078	51.70	74.0	22.30	Peak	342.00	200	Horizontal	Pass
3**	4933.078	41.14	54.0	12.86	AV	342.00	200	Horizontal	Pass
4	6809.808	51.93	74.0	22.07	Peak	33.00	300	Horizontal	Pass
4**	6809.808	42.11	54.0	11.89	AV	33.00	300	Horizontal	Pass
5	13411.826	56.82	74.0	17.18	Peak	106.00	300	Horizontal	Pass
5**	13411.826	44.72	54.0	9.28	AV	106.00	300	Horizontal	Pass
6	17423.744	54.48	74.0	19.52	Peak	59.00	400	Horizontal	Pass
6**	17423.744	44.49	54.0	9.51	AV	59.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11b Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1334.217	47.05	74.0	26.95	Peak	160.00	300	Vertical	Pass
1**	1334.217	36.85	54.0	17.15	AV	160.00	300	Vertical	Pass
2	2984.066	51.79	74.0	22.21	Peak	43.00	300	Vertical	Pass
2**	2984.066	41.16	54.0	12.84	AV	43.00	300	Vertical	Pass
3	4854.430	52.38	74.0	21.62	Peak	253.00	200	Vertical	Pass
3**	4854.430	39.88	54.0	14.12	AV	253.00	200	Vertical	Pass
4	6611.040	52.52	74.0	21.48	Peak	217.00	400	Vertical	Pass
4**	6611.040	47.31	54.0	6.69	AV	217.00	400	Vertical	Pass
5	13431.013	57.68	74.0	16.32	Peak	77.00	100	Vertical	Pass
5**	13431.013	48.22	54.0	5.78	AV	77.00	100	Vertical	Pass
6	17414.781	56.11	74.0	17.89	Peak	320.00	100	Vertical	Pass
6**	17414.781	45.64	54.0	8.36	AV	320.00	100	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11b Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.950	43.70	74.0	30.30	Peak	97.00	400	Horizontal	Pass
1**	1331.950	39.23	54.0	14.77	AV	97.00	400	Horizontal	Pass
2	2997.710	49.14	74.0	24.86	Peak	175.00	400	Horizontal	Pass
2**	2997.710	42.85	54.0	11.15	AV	175.00	400	Horizontal	Pass
3	4936.012	52.97	74.0	21.03	Peak	95.00	200	Horizontal	Pass
3**	4936.012	40.04	54.0	13.96	AV	95.00	200	Horizontal	Pass
4	6804.279	54.97	74.0	19.03	Peak	181.00	100	Horizontal	Pass
4**	6804.279	45.59	54.0	8.41	AV	181.00	100	Horizontal	Pass
5	13408.301	53.40	74.0	20.60	Peak	279.00	100	Horizontal	Pass
5**	13408.301	44.07	54.0	9.93	AV	279.00	100	Horizontal	Pass
6	17424.974	57.10	74.0	16.90	Peak	32.00	200	Horizontal	Pass
6**	17424.974	47.53	54.0	6.47	AV	32.00	200	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11b Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.591	48.13	74.0	25.87	Peak	123.00	100	Vertical	Pass
1**	1330.591	40.17	54.0	13.83	AV	123.00	100	Vertical	Pass
2	2980.179	52.94	74.0	21.06	Peak	147.00	100	Vertical	Pass
2**	2980.179	39.79	54.0	14.21	AV	147.00	100	Vertical	Pass
3	4855.275	48.72	74.0	25.28	Peak	268.00	200	Vertical	Pass
3**	4855.275	43.15	54.0	10.85	AV	268.00	200	Vertical	Pass
4	6605.338	55.49	74.0	18.51	Peak	1.00	300	Vertical	Pass
4**	6605.338	42.78	54.0	11.22	AV	1.00	300	Vertical	Pass
5	13432.686	53.54	74.0	20.46	Peak	336.00	200	Vertical	Pass
5**	13432.686	46.43	54.0	7.57	AV	336.00	200	Vertical	Pass
6	17417.796	54.88	74.0	19.12	Peak	187.00	400	Vertical	Pass
6**	17417.796	46.46	54.0	7.54	AV	187.00	400	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11b High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.320	43.21	74.0	30.79	Peak	248.00	100	Horizontal	Pass
1**	1330.320	36.42	54.0	17.58	AV	248.00	100	Horizontal	Pass
2	2993.673	49.46	74.0	24.54	Peak	356.00	300	Horizontal	Pass
2**	2993.673	42.92	54.0	11.08	AV	356.00	300	Horizontal	Pass
3	4932.116	54.33	74.0	19.67	Peak	232.00	200	Horizontal	Pass
3**	4932.116	38.87	54.0	15.13	AV	232.00	200	Horizontal	Pass
4	6810.362	53.62	74.0	20.38	Peak	53.00	100	Horizontal	Pass
4**	6810.362	42.61	54.0	11.39	AV	53.00	100	Horizontal	Pass
5	13414.022	58.21	74.0	15.79	Peak	205.00	200	Horizontal	Pass
5**	13414.022	48.06	54.0	5.94	AV	205.00	200	Horizontal	Pass
6	17422.422	54.90	74.0	19.10	Peak	50.00	400	Horizontal	Pass
6**	17422.422	48.40	54.0	5.60	AV	50.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11b High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1334.946	42.32	74.0	31.68	Peak	200.00	300	Vertical	Pass
1**	1334.946	34.71	54.0	19.29	AV	200.00	300	Vertical	Pass
2	2982.783	52.01	74.0	21.99	Peak	71.00	100	Vertical	Pass
2**	2982.783	39.90	54.0	14.10	AV	71.00	100	Vertical	Pass
3	4852.187	47.20	74.0	26.80	Peak	324.00	200	Vertical	Pass
3**	4852.187	43.36	54.0	10.64	AV	324.00	200	Vertical	Pass
4	6609.620	51.39	74.0	22.61	Peak	308.00	400	Vertical	Pass
4**	6609.620	42.37	54.0	11.63	AV	308.00	400	Vertical	Pass
5	13431.188	53.44	74.0	20.56	Peak	218.00	300	Vertical	Pass
5**	13431.188	44.01	54.0	9.99	AV	218.00	300	Vertical	Pass
6	17414.448	57.99	74.0	16.01	Peak	280.00	200	Vertical	Pass
6**	17414.448	47.60	54.0	6.40	AV	280.00	200	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11g Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.012	44.83	74.0	29.17	Peak	115.00	100	Horizontal	Pass
1**	1329.012	35.96	54.0	18.04	AV	115.00	100	Horizontal	Pass
2	2995.789	49.76	74.0	24.24	Peak	123.00	100	Horizontal	Pass
2**	2995.789	39.12	54.0	14.88	AV	123.00	100	Horizontal	Pass
3	4932.648	52.44	74.0	21.56	Peak	21.00	200	Horizontal	Pass
3**	4932.648	44.14	54.0	9.86	AV	21.00	200	Horizontal	Pass
4	6810.738	57.34	74.0	16.66	Peak	9.00	200	Horizontal	Pass
4**	6810.738	45.98	54.0	8.02	AV	9.00	200	Horizontal	Pass
5	13411.225	55.53	74.0	18.47	Peak	216.00	400	Horizontal	Pass
5**	13411.225	45.66	54.0	8.34	AV	216.00	400	Horizontal	Pass
6	17429.027	56.01	74.0	17.99	Peak	268.00	200	Horizontal	Pass
6**	17429.027	44.72	54.0	9.28	AV	268.00	200	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11g Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1336.004	44.64	74.0	29.36	Peak	72.00	200	Vertical	Pass
1**	1336.004	35.45	54.0	18.55	AV	72.00	200	Vertical	Pass
2	2985.394	49.36	74.0	24.64	Peak	287.00	100	Vertical	Pass
2**	2985.394	41.49	54.0	12.51	AV	287.00	100	Vertical	Pass
3	4853.883	51.76	74.0	22.24	Peak	356.00	200	Vertical	Pass
3**	4853.883	37.69	54.0	16.31	AV	356.00	200	Vertical	Pass
4	6604.342	53.95	74.0	20.05	Peak	72.00	200	Vertical	Pass
4**	6604.342	44.95	54.0	9.05	AV	72.00	200	Vertical	Pass
5	13434.565	53.99	74.0	20.01	Peak	250.00	200	Vertical	Pass
5**	13434.565	43.62	54.0	10.38	AV	250.00	200	Vertical	Pass
6	17417.659	58.68	74.0	15.32	Peak	30.00	400	Vertical	Pass
6**	17417.659	45.70	54.0	8.30	AV	30.00	400	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11g Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.383	42.09	74.0	31.91	Peak	97.00	100	Horizontal	Pass
1**	1328.383	34.82	54.0	19.18	AV	97.00	100	Horizontal	Pass
2	2995.731	52.21	74.0	21.79	Peak	345.00	400	Horizontal	Pass
2**	2995.731	41.83	54.0	12.17	AV	345.00	400	Horizontal	Pass
3	4931.116	52.37	74.0	21.63	Peak	216.00	200	Horizontal	Pass
3**	4931.116	40.72	54.0	13.28	AV	216.00	200	Horizontal	Pass
4	6805.666	54.89	74.0	19.11	Peak	199.00	200	Horizontal	Pass
4**	6805.666	41.95	54.0	12.05	AV	199.00	200	Horizontal	Pass
5	13411.246	54.81	74.0	19.19	Peak	323.00	100	Horizontal	Pass
5**	13411.246	47.13	54.0	6.87	AV	323.00	100	Horizontal	Pass
6	17422.394	58.98	74.0	15.02	Peak	183.00	200	Horizontal	Pass
6**	17422.394	45.54	54.0	8.46	AV	183.00	200	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11g Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1336.078	43.56	74.0	30.44	Peak	36.00	200	Vertical	Pass
1**	1336.078	35.58	54.0	18.42	AV	36.00	200	Vertical	Pass
2	2983.603	52.31	74.0	21.69	Peak	32.00	400	Vertical	Pass
2**	2983.603	40.17	54.0	13.83	AV	32.00	400	Vertical	Pass
3	4856.719	46.67	74.0	27.33	Peak	287.00	200	Vertical	Pass
3**	4856.719	41.07	54.0	12.93	AV	287.00	200	Vertical	Pass
4	6609.072	51.61	74.0	22.39	Peak	291.00	300	Vertical	Pass
4**	6609.072	45.91	54.0	8.09	AV	291.00	300	Vertical	Pass
5	13435.782	54.73	74.0	19.27	Peak	0.00	100	Vertical	Pass
5**	13435.782	47.11	54.0	6.89	AV	0.00	100	Vertical	Pass
6	17416.547	58.53	74.0	15.47	Peak	236.00	400	Vertical	Pass
6**	17416.547	45.04	54.0	8.96	AV	236.00	400	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11g High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1326.649	42.51	74.0	31.49	Peak	82.00	200	Horizontal	Pass
1**	1326.649	37.56	54.0	16.44	AV	82.00	200	Horizontal	Pass
2	2995.610	52.47	74.0	21.53	Peak	146.00	200	Horizontal	Pass
2**	2995.610	42.64	54.0	11.36	AV	146.00	200	Horizontal	Pass
3	4937.488	52.96	74.0	21.04	Peak	207.00	200	Horizontal	Pass
3**	4937.488	42.51	54.0	11.49	AV	207.00	200	Horizontal	Pass
4	6805.875	53.31	74.0	20.69	Peak	146.00	400	Horizontal	Pass
4**	6805.875	42.68	54.0	11.32	AV	146.00	400	Horizontal	Pass
5	13411.250	52.85	74.0	21.15	Peak	171.00	200	Horizontal	Pass
5**	13411.250	45.96	54.0	8.04	AV	171.00	200	Horizontal	Pass
6	17428.809	57.43	74.0	16.57	Peak	210.00	100	Horizontal	Pass
6**	17428.809	47.45	54.0	6.55	AV	210.00	100	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11g High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.583	43.60	74.0	30.40	Peak	197.00	300	Vertical	Pass
1**	1331.583	35.19	54.0	18.81	AV	197.00	300	Vertical	Pass
2	2981.676	48.22	74.0	25.78	Peak	194.00	300	Vertical	Pass
2**	2981.676	40.39	54.0	13.61	AV	194.00	300	Vertical	Pass
3	4852.508	46.59	74.0	27.41	Peak	134.00	200	Vertical	Pass
3**	4852.508	37.78	54.0	16.22	AV	134.00	200	Vertical	Pass
4	6603.438	53.01	74.0	20.99	Peak	108.00	300	Vertical	Pass
4**	6603.438	47.23	54.0	6.77	AV	108.00	300	Vertical	Pass
5	13438.608	55.00	74.0	19.00	Peak	178.00	400	Vertical	Pass
5**	13438.608	48.84	54.0	5.16	AV	178.00	400	Vertical	Pass
6	17419.155	56.49	74.0	17.51	Peak	243.00	100	Vertical	Pass
6**	17419.155	48.82	54.0	5.18	AV	243.00	100	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.017	46.51	74.0	27.49	Peak	264.00	400	Horizontal	Pass
1**	1331.017	39.70	54.0	14.30	AV	264.00	400	Horizontal	Pass
2	2997.095	53.16	74.0	20.84	Peak	244.00	100	Horizontal	Pass
2**	2997.095	40.78	54.0	13.22	AV	244.00	100	Horizontal	Pass
3	4930.624	53.65	74.0	20.35	Peak	177.00	200	Horizontal	Pass
3**	4930.624	39.24	54.0	14.76	AV	177.00	200	Horizontal	Pass
4	6808.788	52.56	74.0	21.44	Peak	265.00	100	Horizontal	Pass
4**	6808.788	46.40	54.0	7.60	AV	265.00	100	Horizontal	Pass
5	13414.457	55.98	74.0	18.02	Peak	102.00	100	Horizontal	Pass
5**	13414.457	48.51	54.0	5.49	AV	102.00	100	Horizontal	Pass
6	17429.700	58.66	74.0	15.34	Peak	289.00	400	Horizontal	Pass
6**	17429.700	46.93	54.0	7.07	AV	289.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.363	46.98	74.0	27.02	Peak	342.00	200	Vertical	Pass
1**	1330.363	36.41	54.0	17.59	AV	342.00	200	Vertical	Pass
2	2984.387	51.85	74.0	22.15	Peak	152.00	300	Vertical	Pass
2**	2984.387	41.86	54.0	12.14	AV	152.00	300	Vertical	Pass
3	4857.801	49.03	74.0	24.97	Peak	166.00	200	Vertical	Pass
3**	4857.801	39.27	54.0	14.73	AV	166.00	200	Vertical	Pass
4	6604.999	54.81	74.0	19.19	Peak	141.00	200	Vertical	Pass
4**	6604.999	45.16	54.0	8.84	AV	141.00	200	Vertical	Pass
5	13434.483	55.71	74.0	18.29	Peak	73.00	300	Vertical	Pass
5**	13434.483	46.31	54.0	7.69	AV	73.00	300	Vertical	Pass
6	17416.184	57.16	74.0	16.84	Peak	290.00	300	Vertical	Pass
6**	17416.184	47.18	54.0	6.82	AV	290.00	300	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.269	44.84	74.0	29.16	Peak	114.00	400	Horizontal	Pass
1**	1331.269	36.19	54.0	17.81	AV	114.00	400	Horizontal	Pass
2	2999.516	50.34	74.0	23.66	Peak	235.00	300	Horizontal	Pass
2**	2999.516	42.71	54.0	11.29	AV	235.00	300	Horizontal	Pass
3	4935.245	52.83	74.0	21.17	Peak	122.00	200	Horizontal	Pass
3**	4935.245	40.02	54.0	13.98	AV	122.00	200	Horizontal	Pass
4	6809.441	55.63	74.0	18.37	Peak	242.00	100	Horizontal	Pass
4**	6809.441	46.91	54.0	7.09	AV	242.00	100	Horizontal	Pass
5	13413.525	57.44	74.0	16.56	Peak	249.00	200	Horizontal	Pass
5**	13413.525	44.15	54.0	9.85	AV	249.00	200	Horizontal	Pass
6	17425.710	58.70	74.0	15.30	Peak	193.00	100	Horizontal	Pass
6**	17425.710	45.50	54.0	8.50	AV	193.00	100	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.544	43.92	74.0	30.08	Peak	125.00	100	Vertical	Pass
1**	1330.544	37.42	54.0	16.58	AV	125.00	100	Vertical	Pass
2	2985.364	52.64	74.0	21.36	Peak	165.00	200	Vertical	Pass
2**	2985.364	41.92	54.0	12.08	AV	165.00	200	Vertical	Pass
3	4855.578	48.86	74.0	25.14	Peak	291.00	200	Vertical	Pass
3**	4855.578	39.19	54.0	14.81	AV	291.00	200	Vertical	Pass
4	6606.260	51.99	74.0	22.01	Peak	76.00	300	Vertical	Pass
4**	6606.260	42.89	54.0	11.11	AV	76.00	300	Vertical	Pass
5	13432.759	56.95	74.0	17.05	Peak	180.00	200	Vertical	Pass
5**	13432.759	44.89	54.0	9.11	AV	180.00	200	Vertical	Pass
6	17417.336	58.64	74.0	15.36	Peak	4.00	200	Vertical	Pass
6**	17417.336	44.67	54.0	9.33	AV	4.00	200	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n20 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.030	42.56	74.0	31.44	Peak	61.00	200	Horizontal	Pass
1**	1329.030	37.87	54.0	16.13	AV	61.00	200	Horizontal	Pass
2	2992.994	49.43	74.0	24.57	Peak	356.00	300	Horizontal	Pass
2**	2992.994	44.34	54.0	9.66	AV	356.00	300	Horizontal	Pass
3	4932.640	50.14	74.0	23.86	Peak	65.00	200	Horizontal	Pass
3**	4932.640	39.20	54.0	14.80	AV	65.00	200	Horizontal	Pass
4	6804.972	51.97	74.0	22.03	Peak	97.00	100	Horizontal	Pass
4**	6804.972	45.77	54.0	8.23	AV	97.00	100	Horizontal	Pass
5	13413.987	53.34	74.0	20.66	Peak	91.00	400	Horizontal	Pass
5**	13413.987	46.01	54.0	7.99	AV	91.00	400	Horizontal	Pass
6	17422.752	53.19	74.0	20.81	Peak	255.00	300	Horizontal	Pass
6**	17422.752	49.69	54.0	4.31	AV	255.00	300	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n20 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.933	46.86	74.0	27.14	Peak	117.00	400	Vertical	Pass
1**	1330.933	39.01	54.0	14.99	AV	117.00	400	Vertical	Pass
2	2983.806	47.47	74.0	26.53	Peak	26.00	100	Vertical	Pass
2**	2983.806	43.16	54.0	10.84	AV	26.00	100	Vertical	Pass
3	4856.594	49.46	74.0	24.54	Peak	163.00	200	Vertical	Pass
3**	4856.594	40.72	54.0	13.28	AV	163.00	200	Vertical	Pass
4	6606.032	56.23	74.0	17.77	Peak	192.00	100	Vertical	Pass
4**	6606.032	43.71	54.0	10.29	AV	192.00	100	Vertical	Pass
5	13432.319	53.90	74.0	20.10	Peak	359.00	100	Vertical	Pass
5**	13432.319	45.49	54.0	8.51	AV	359.00	100	Vertical	Pass
6	17415.217	57.72	74.0	16.28	Peak	11.00	400	Vertical	Pass
6**	17415.217	47.75	54.0	6.25	AV	11.00	400	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1325.717	46.37	74.0	27.63	Peak	219.00	300	Horizontal	Pass
1**	1325.717	35.41	54.0	18.59	AV	219.00	300	Horizontal	Pass
2	2999.090	50.50	74.0	23.50	Peak	173.00	300	Horizontal	Pass
2**	2999.090	44.42	54.0	9.58	AV	173.00	300	Horizontal	Pass
3	4937.667	50.93	74.0	23.07	Peak	187.00	200	Horizontal	Pass
3**	4937.667	39.80	54.0	14.20	AV	187.00	200	Horizontal	Pass
4	6810.386	54.87	74.0	19.13	Peak	193.00	100	Horizontal	Pass
4**	6810.386	44.30	54.0	9.70	AV	193.00	100	Horizontal	Pass
5	13409.988	54.05	74.0	19.95	Peak	78.00	100	Horizontal	Pass
5**	13409.988	48.93	54.0	5.07	AV	78.00	100	Horizontal	Pass
6	17430.156	53.31	74.0	20.69	Peak	268.00	400	Horizontal	Pass
6**	17430.156	48.80	54.0	5.20	AV	268.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n40 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.377	44.05	74.0	29.95	Peak	90.00	100	Vertical	Pass
1**	1330.377	35.69	54.0	18.31	AV	90.00	100	Vertical	Pass
2	2981.416	52.88	74.0	21.12	Peak	346.00	300	Vertical	Pass
2**	2981.416	41.43	54.0	12.57	AV	346.00	300	Vertical	Pass
3	4850.266	50.84	74.0	23.16	Peak	148.00	200	Vertical	Pass
3**	4850.266	40.28	54.0	13.72	AV	148.00	200	Vertical	Pass
4	6606.215	53.21	74.0	20.79	Peak	245.00	200	Vertical	Pass
4**	6606.215	47.65	54.0	6.35	AV	245.00	200	Vertical	Pass
5	13436.225	54.06	74.0	19.94	Peak	143.00	100	Vertical	Pass
5**	13436.225	46.15	54.0	7.85	AV	143.00	100	Vertical	Pass
6	17415.808	57.81	74.0	16.19	Peak	122.00	200	Vertical	Pass
6**	17415.808	48.82	54.0	5.18	AV	122.00	200	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n40 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.631	44.69	74.0	29.31	Peak	226.00	400	Horizontal	Pass
1**	1330.631	34.87	54.0	19.13	AV	226.00	400	Horizontal	Pass
2	2995.963	50.04	74.0	23.96	Peak	93.00	300	Horizontal	Pass
2**	2995.963	40.23	54.0	13.77	AV	93.00	300	Horizontal	Pass
3	4932.446	50.28	74.0	23.72	Peak	21.00	200	Horizontal	Pass
3**	4932.446	38.72	54.0	15.28	AV	21.00	200	Horizontal	Pass
4	6804.005	54.64	74.0	19.36	Peak	121.00	200	Horizontal	Pass
4**	6804.005	44.38	54.0	9.62	AV	121.00	200	Horizontal	Pass
5	13407.488	53.00	74.0	21.00	Peak	116.00	200	Horizontal	Pass
5**	13407.488	47.28	54.0	6.72	AV	116.00	200	Horizontal	Pass
6	17425.937	53.06	74.0	20.94	Peak	351.00	300	Horizontal	Pass
6**	17425.937	44.74	54.0	9.26	AV	351.00	300	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n40 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1334.021	47.98	74.0	26.02	Peak	29.00	300	Vertical	Pass
1**	1334.021	39.04	54.0	14.96	AV	29.00	300	Vertical	Pass
2	2980.602	48.61	74.0	25.39	Peak	278.00	200	Vertical	Pass
2**	2980.602	38.75	54.0	15.25	AV	278.00	200	Vertical	Pass
3	4850.926	46.50	74.0	27.50	Peak	79.00	200	Vertical	Pass
3**	4850.926	38.85	54.0	15.15	AV	79.00	200	Vertical	Pass
4	6609.464	52.66	74.0	21.34	Peak	57.00	200	Vertical	Pass
4**	6609.464	43.19	54.0	10.81	AV	57.00	200	Vertical	Pass
5	13436.373	54.34	74.0	19.66	Peak	191.00	100	Vertical	Pass
5**	13436.373	45.19	54.0	8.81	AV	191.00	100	Vertical	Pass
6	17413.664	58.84	74.0	15.16	Peak	337.00	300	Vertical	Pass
6**	17413.664	47.22	54.0	6.78	AV	337.00	300	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11n40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.669	43.03	74.0	30.97	Peak	147.00	300	Horizontal	Pass
1**	1328.669	34.99	54.0	19.01	AV	147.00	300	Horizontal	Pass
2	2996.584	50.73	74.0	23.27	Peak	142.00	200	Horizontal	Pass
2**	2996.584	41.96	54.0	12.04	AV	142.00	200	Horizontal	Pass
3	4937.024	50.92	74.0	23.08	Peak	241.00	200	Horizontal	Pass
3**	4937.024	38.87	54.0	15.13	AV	241.00	200	Horizontal	Pass
4	6810.578	51.61	74.0	22.39	Peak	60.00	200	Horizontal	Pass
4**	6810.578	44.56	54.0	9.44	AV	60.00	200	Horizontal	Pass
5	13411.030	54.89	74.0	19.11	Peak	275.00	200	Horizontal	Pass
5**	13411.030	46.51	54.0	7.49	AV	275.00	200	Horizontal	Pass
6	17429.148	55.98	74.0	18.02	Peak	240.00	400	Horizontal	Pass
6**	17429.148	45.82	54.0	8.18	AV	240.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11n40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1335.235	47.69	74.0	26.31	Peak	150.00	300	Vertical	Pass
1**	1335.235	38.13	54.0	15.87	AV	150.00	300	Vertical	Pass
2	2984.322	50.59	74.0	23.41	Peak	221.00	300	Vertical	Pass
2**	2984.322	40.67	54.0	13.33	AV	221.00	300	Vertical	Pass
3	4857.358	51.45	74.0	22.55	Peak	10.00	200	Vertical	Pass
3**	4857.358	40.96	54.0	13.04	AV	10.00	200	Vertical	Pass
4	6606.825	55.94	74.0	18.06	Peak	60.00	200	Vertical	Pass
4**	6606.825	44.06	54.0	9.94	AV	60.00	200	Vertical	Pass
5	13431.848	52.70	74.0	21.30	Peak	234.00	100	Vertical	Pass
5**	13431.848	47.10	54.0	6.90	AV	234.00	100	Vertical	Pass
6	17417.471	59.93	74.0	14.07	Peak	10.00	200	Vertical	Pass
6**	17417.471	48.46	54.0	5.54	AV	10.00	200	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11ax20(SU) Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1332.880	41.91	74.0	32.09	Peak	207.00	100	Horizontal	Pass
1**	1332.880	35.84	54.0	18.16	AV	207.00	100	Horizontal	Pass
2	2995.318	51.17	74.0	22.83	Peak	55.00	200	Horizontal	Pass
2**	2995.318	43.31	54.0	10.69	AV	55.00	200	Horizontal	Pass
3	4934.846	50.76	74.0	23.24	Peak	11.00	200	Horizontal	Pass
3**	4934.846	42.52	54.0	11.48	AV	11.00	200	Horizontal	Pass
4	6807.752	54.16	74.0	19.84	Peak	30.00	300	Horizontal	Pass
4**	6807.752	43.94	54.0	10.06	AV	30.00	300	Horizontal	Pass
5	13410.331	56.23	74.0	17.77	Peak	185.00	300	Horizontal	Pass
5**	13410.331	48.46	54.0	5.54	AV	185.00	300	Horizontal	Pass
6	17429.240	55.11	74.0	18.89	Peak	231.00	400	Horizontal	Pass
6**	17429.240	45.37	54.0	8.63	AV	231.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V802.11ax20(SU) Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1332.898	45.59	74.0	28.41	Peak	216.00	100	Vertical	Pass
1**	1332.898	38.38	54.0	15.62	AV	216.00	100	Vertical	Pass
2	2979.440	47.61	74.0	26.39	Peak	357.00	400	Vertical	Pass
2**	2979.440	39.80	54.0	14.20	AV	357.00	400	Vertical	Pass
3	4855.875	48.94	74.0	25.06	Peak	289.00	200	Vertical	Pass
3**	4855.875	41.41	54.0	12.59	AV	289.00	200	Vertical	Pass
4	6604.879	53.13	74.0	20.87	Peak	4.00	400	Vertical	Pass
4**	6604.879	45.36	54.0	8.64	AV	4.00	400	Vertical	Pass
5	13438.713	56.42	74.0	17.58	Peak	51.00	400	Vertical	Pass
5**	13438.713	47.92	54.0	6.08	AV	51.00	400	Vertical	Pass
6	17420.559	57.77	74.0	16.23	Peak	162.00	100	Vertical	Pass
6**	17420.559	48.08	54.0	5.92	AV	162.00	100	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11ax20(SU) Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.176	44.25	74.0	29.75	Peak	194.00	200	Horizontal	Pass
1**	1329.176	34.64	54.0	19.36	AV	194.00	200	Horizontal	Pass
2	2996.038	49.08	74.0	24.92	Peak	24.00	200	Horizontal	Pass
2**	2996.038	43.91	54.0	10.09	AV	24.00	200	Horizontal	Pass
3	4932.226	49.84	74.0	24.16	Peak	112.00	200	Horizontal	Pass
3**	4932.226	41.30	54.0	12.70	AV	112.00	200	Horizontal	Pass
4	6807.600	54.71	74.0	19.29	Peak	27.00	100	Horizontal	Pass
4**	6807.600	47.60	54.0	6.40	AV	27.00	100	Horizontal	Pass
5	13407.592	57.15	74.0	16.85	Peak	221.00	300	Horizontal	Pass
5**	13407.592	44.01	54.0	9.99	AV	221.00	300	Horizontal	Pass
6	17423.544	54.11	74.0	19.89	Peak	107.00	400	Horizontal	Pass
6**	17423.544	46.88	54.0	7.12	AV	107.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11ax20(SU) Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.523	46.57	74.0	27.43	Peak	140.00	200	Vertical	Pass
1**	1330.523	35.36	54.0	18.64	AV	140.00	200	Vertical	Pass
2	2983.353	52.08	74.0	21.92	Peak	141.00	300	Vertical	Pass
2**	2983.353	42.06	54.0	11.94	AV	141.00	300	Vertical	Pass
3	4856.635	50.95	74.0	23.05	Peak	68.00	200	Vertical	Pass
3**	4856.635	42.56	54.0	11.44	AV	68.00	200	Vertical	Pass
4	6607.559	55.63	74.0	18.37	Peak	347.00	400	Vertical	Pass
4**	6607.559	44.93	54.0	9.07	AV	347.00	400	Vertical	Pass
5	13434.003	53.42	74.0	20.58	Peak	32.00	200	Vertical	Pass
5**	13434.003	43.91	54.0	10.09	AV	32.00	200	Vertical	Pass
6	17417.654	55.59	74.0	18.41	Peak	174.00	200	Vertical	Pass
6**	17417.654	45.40	54.0	8.60	AV	174.00	200	Vertical	Pass

1 GHz to 18 GHz, ANT H802.11ax20(SU) High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.987	43.25	74.0	30.75	Peak	175.00	300	Horizontal	Pass
1**	1329.987	35.04	54.0	18.96	AV	175.00	300	Horizontal	Pass
2	2993.517	48.60	74.0	25.40	Peak	234.00	400	Horizontal	Pass
2**	2993.517	39.13	54.0	14.87	AV	234.00	400	Horizontal	Pass
3	4933.551	52.72	74.0	21.28	Peak	2.00	200	Horizontal	Pass
3**	4933.551	43.30	54.0	10.70	AV	2.00	200	Horizontal	Pass
4	6809.990	55.85	74.0	18.15	Peak	88.00	300	Horizontal	Pass
4**	6809.990	43.33	54.0	10.67	AV	88.00	300	Horizontal	Pass
5	13412.030	56.48	74.0	17.52	Peak	135.00	100	Horizontal	Pass
5**	13412.030	47.59	54.0	6.41	AV	135.00	100	Horizontal	Pass
6	17423.785	56.12	74.0	17.88	Peak	167.00	300	Horizontal	Pass
6**	17423.785	48.96	54.0	5.04	AV	167.00	300	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11ax20(SU) High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.208	48.15	74.0	25.85	Peak	66.00	400	Vertical	Pass
1**	1331.208	36.01	54.0	17.99	AV	66.00	400	Vertical	Pass
2	2984.668	52.84	74.0	21.16	Peak	189.00	200	Vertical	Pass
2**	2984.668	41.42	54.0	12.58	AV	189.00	200	Vertical	Pass
3	4856.681	51.85	74.0	22.15	Peak	216.00	200	Vertical	Pass
3**	4856.681	41.47	54.0	12.53	AV	216.00	200	Vertical	Pass
4	6609.341	54.65	74.0	19.35	Peak	115.00	400	Vertical	Pass
4**	6609.341	47.52	54.0	6.48	AV	115.00	400	Vertical	Pass
5	13433.736	57.66	74.0	16.34	Peak	150.00	200	Vertical	Pass
5**	13433.736	45.09	54.0	8.91	AV	150.00	200	Vertical	Pass
6	17418.042	58.28	74.0	15.72	Peak	211.00	100	Vertical	Pass
6**	17418.042	50.29	54.0	3.71	AV	211.00	100	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11ax40(SU) Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1333.699	46.01	74.0	27.99	Peak	298.00	300	Horizontal	Pass
1**	1333.699	34.96	54.0	19.04	AV	298.00	300	Horizontal	Pass
2	2996.780	51.37	74.0	22.63	Peak	81.00	300	Horizontal	Pass
2**	2996.780	40.18	54.0	13.82	AV	81.00	300	Horizontal	Pass
3	4936.281	51.08	74.0	22.92	Peak	49.00	200	Horizontal	Pass
3**	4936.281	41.32	54.0	12.68	AV	49.00	200	Horizontal	Pass
4	6806.308	53.35	74.0	20.65	Peak	303.00	300	Horizontal	Pass
4**	6806.308	46.16	54.0	7.84	AV	303.00	300	Horizontal	Pass
5	13409.229	57.19	74.0	16.81	Peak	318.00	200	Horizontal	Pass
5**	13409.229	46.95	54.0	7.05	AV	318.00	200	Horizontal	Pass
6	17429.284	57.69	74.0	16.31	Peak	188.00	300	Horizontal	Pass
6**	17429.284	48.47	54.0	5.53	AV	188.00	300	Horizontal	Pass

1 GHz to 18 GHz, ANT V802.11ax40(SU) Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1335.480	47.16	74.0	26.84	Peak	337.00	100	Vertical	Pass
1**	1335.480	35.78	54.0	18.22	AV	337.00	100	Vertical	Pass
2	2982.735	50.58	74.0	23.42	Peak	192.00	300	Vertical	Pass
2**	2982.735	40.67	54.0	13.33	AV	192.00	300	Vertical	Pass
3	4855.547	50.99	74.0	23.01	Peak	65.00	200	Vertical	Pass
3**	4855.547	41.98	54.0	12.02	AV	65.00	200	Vertical	Pass
4	6604.594	55.02	74.0	18.98	Peak	6.00	400	Vertical	Pass
4**	6604.594	43.54	54.0	10.46	AV	6.00	400	Vertical	Pass
5	13431.554	53.63	74.0	20.37	Peak	199.00	200	Vertical	Pass
5**	13431.554	47.73	54.0	6.27	AV	199.00	200	Vertical	Pass
6	17420.208	58.85	74.0	15.15	Peak	345.00	300	Vertical	Pass
6**	17420.208	47.34	54.0	6.66	AV	345.00	300	Vertical	Pass

1 GHz to 18 GHz, ANT H 802.11ax40(SU) Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1328.779	45.57	74.0	28.43	Peak	310.00	300	Horizontal	Pass
1**	1328.779	34.65	54.0	19.35	AV	310.00	300	Horizontal	Pass
2	2993.750	52.77	74.0	21.23	Peak	312.00	100	Horizontal	Pass
2**	2993.750	38.49	54.0	15.51	AV	312.00	100	Horizontal	Pass
3	4935.901	51.53	74.0	22.47	Peak	90.00	200	Horizontal	Pass
3**	4935.901	39.77	54.0	14.23	AV	90.00	200	Horizontal	Pass
4	6810.793	51.52	74.0	22.48	Peak	33.00	400	Horizontal	Pass
4**	6810.793	46.28	54.0	7.72	AV	33.00	400	Horizontal	Pass
5	13409.684	53.21	74.0	20.79	Peak	276.00	200	Horizontal	Pass
5**	13409.684	48.69	54.0	5.31	AV	276.00	200	Horizontal	Pass
6	17422.365	54.74	74.0	19.26	Peak	188.00	200	Horizontal	Pass
6**	17422.365	50.32	54.0	3.68	AV	188.00	200	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11ax40(SU) Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1335.548	45.50	74.0	28.50	Peak	352.00	300	Vertical	Pass
1**	1335.548	37.68	54.0	16.32	AV	352.00	300	Vertical	Pass
2	2979.344	50.84	74.0	23.16	Peak	102.00	200	Vertical	Pass
2**	2979.344	44.03	54.0	9.97	AV	102.00	200	Vertical	Pass
3	4854.046	50.72	74.0	23.28	Peak	227.00	200	Vertical	Pass
3**	4854.046	38.76	54.0	15.24	AV	227.00	200	Vertical	Pass
4	6607.385	56.06	74.0	17.94	Peak	91.00	200	Vertical	Pass
4**	6607.385	46.43	54.0	7.57	AV	91.00	200	Vertical	Pass
5	13433.919	53.34	74.0	20.66	Peak	254.00	200	Vertical	Pass
5**	13433.919	44.83	54.0	9.17	AV	254.00	200	Vertical	Pass
6	17418.950	55.76	74.0	18.24	Peak	143.00	300	Vertical	Pass
6**	17418.950	48.33	54.0	5.67	AV	143.00	300	Vertical	Pass

1 GHz to 18 GHz, ANT H802.11ax40(SU) High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.195	46.24	74.0	27.76	Peak	68.00	300	Horizontal	Pass
1**	1329.195	36.35	54.0	17.65	AV	68.00	300	Horizontal	Pass
2	2997.607	47.41	74.0	26.59	Peak	72.00	400	Horizontal	Pass
2**	2997.607	39.04	54.0	14.96	AV	72.00	400	Horizontal	Pass
3	4931.573	54.63	74.0	19.37	Peak	151.00	200	Horizontal	Pass
3**	4931.573	40.32	54.0	13.68	AV	151.00	200	Horizontal	Pass
4	6803.414	56.59	74.0	17.41	Peak	340.00	400	Horizontal	Pass
4**	6803.414	44.61	54.0	9.39	AV	340.00	400	Horizontal	Pass
5	13410.441	56.52	74.0	17.48	Peak	190.00	300	Horizontal	Pass
5**	13410.441	48.39	54.0	5.61	AV	190.00	300	Horizontal	Pass
6	17422.206	53.46	74.0	20.54	Peak	347.00	400	Horizontal	Pass
6**	17422.206	50.40	54.0	3.60	AV	347.00	400	Horizontal	Pass

1 GHz to 18 GHz, ANT V 802.11ax40(SU) High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.489	44.27	74.0	29.73	Peak	26.00	200	Vertical	Pass
1**	1331.489	37.67	54.0	16.33	AV	26.00	200	Vertical	Pass
2	2985.921	49.86	74.0	24.14	Peak	81.00	100	Vertical	Pass
2**	2985.921	40.88	54.0	13.12	AV	81.00	100	Vertical	Pass
3	4855.611	51.72	74.0	22.28	Peak	177.00	200	Vertical	Pass
3**	4855.611	42.18	54.0	11.82	AV	177.00	200	Vertical	Pass
4	6606.412	54.44	74.0	19.56	Peak	99.00	400	Vertical	Pass
4**	6606.412	47.94	54.0	6.06	AV	99.00	400	Vertical	Pass
5	13434.544	55.72	74.0	18.28	Peak	121.00	300	Vertical	Pass
5**	13434.544	45.69	54.0	8.31	AV	121.00	300	Vertical	Pass
6	17420.387	59.18	74.0	14.82	Peak	315.00	200	Vertical	Pass
6**	17420.387	46.76	54.0	7.24	AV	315.00	200	Vertical	Pass

A.7 Band Edge (Restricted-band band-edge)

Note ¹: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

Note ²: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note ³: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note ⁴: All antenna were pre tested, but only the worst case has been reported in this report.

Test Data

SISO-Antenna 1

802.11b LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2385.498	57	74.0	17.00	Peak	323.00	200	Horizontal	Pass
1**	2385.498	48.33	54.0	5.67	AV	323.00	200	Horizontal	Pass
2	2390.000	57.12	74.0	16.88	Peak	301.00	300	Horizontal	Pass
2**	2390.000	43.76	54.0	10.24	AV	301.00	300	Horizontal	Pass

802.11b HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	57.62	74.0	16.38	Peak	19.00	200	Horizontal	Pass
1**	2483.500	44.94	54.0	9.06	AV	19.00	200	Horizontal	Pass
2	2487.292	56.46	74.0	17.54	Peak	1.00	200	Horizontal	Pass
2**	2487.292	47.54	54.0	6.46	AV	1.00	200	Horizontal	Pass

802.11g LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2383.843	56.36	74.0	17.64	Peak	208.00	200	Horizontal	Pass
1**	2383.843	49.37	54.0	4.63	AV	208.00	200	Horizontal	Pass
2	2390.000	56.92	74.0	17.08	Peak	44.00	100	Horizontal	Pass
2**	2390.000	46.83	54.0	7.17	AV	44.00	100	Horizontal	Pass

802.11g HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	54	74.0	20.00	Peak	309.00	300	Horizontal	Pass
1**	2483.500	44.3	54.0	9.70	AV	309.00	300	Horizontal	Pass
2	2488.460	59.5	74.0	14.50	Peak	2.00	100	Horizontal	Pass
2**	2488.460	47.97	54.0	6.03	AV	2.00	100	Horizontal	Pass

802.11n20 LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2385.929	59.29	74.0	14.71	Peak	214.00	100	Horizontal	Pass
1**	2385.929	47.32	54.0	6.68	AV	214.00	100	Horizontal	Pass
2	2390.000	53.98	74.0	20.02	Peak	89.00	300	Horizontal	Pass
2**	2390.000	43.84	54.0	10.16	AV	89.00	300	Horizontal	Pass

802.11n20 HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	56.04	74.0	17.96	Peak	242.00	200	Horizontal	Pass
1**	2483.500	44.11	54.0	9.89	AV	242.00	200	Horizontal	Pass
2	2486.440	56.54	74.0	17.46	Peak	190.00	200	Horizontal	Pass
2**	2486.440	46.7	54.0	7.30	AV	190.00	200	Horizontal	Pass

802.11n40 LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2384.036	57.55	74.0	16.45	Peak	30.00	300	Horizontal	Pass
1**	2384.036	47.38	54.0	6.62	AV	30.00	300	Horizontal	Pass
2	2390.000	55.33	74.0	18.67	Peak	52.00	100	Horizontal	Pass
2**	2390.000	45.79	54.0	8.21	AV	52.00	100	Horizontal	Pass

802.11n40 HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	54.69	74.0	19.31	Peak	131.00	100	Horizontal	Pass
1**	2483.500	44.91	54.0	9.09	AV	131.00	100	Horizontal	Pass
2	2487.896	59.36	74.0	14.64	Peak	142.00	200	Horizontal	Pass
2**	2487.896	44.14	54.0	9.86	AV	142.00	200	Horizontal	Pass

802.11ax20(SU) LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2385.776	56.27	74.0	17.73	Peak	21.00	300	Horizontal	Pass
1**	2385.776	46.4	54.0	7.60	AV	21.00	300	Horizontal	Pass
2	2390.000	57.26	74.0	16.74	Peak	128.00	100	Horizontal	Pass
2**	2390.000	44.35	54.0	9.65	AV	128.00	100	Horizontal	Pass

802.11ax20(SU) HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	56.76	74.0	17.24	Peak	89.00	200	Horizontal	Pass
1**	2483.500	45.88	54.0	8.12	AV	89.00	200	Horizontal	Pass
2	2487.833	58.18	74.0	15.82	Peak	81.00	300	Horizontal	Pass
2**	2487.833	46.21	54.0	7.79	AV	81.00	300	Horizontal	Pass

802.11ax40(SU) LOW CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2384.562	58.19	74.0	15.81	Peak	355.00	300	Horizontal	Pass
1**	2384.562	47.66	54.0	6.34	AV	355.00	300	Horizontal	Pass
2	2390.000	54.04	74.0	19.96	Peak	48.00	200	Horizontal	Pass
2**	2390.000	45.04	54.0	8.96	AV	48.00	200	Horizontal	Pass

802.11ax40(SU) HIGH CHANNEL

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	56.53	74.0	17.47	Peak	13.00	100	Horizontal	Pass
1**	2483.500	45.05	54.0	8.95	AV	13.00	100	Horizontal	Pass
2	2488.822	59.62	74.0	14.38	Peak	75.00	100	Horizontal	Pass
2**	2488.822	46.99	54.0	7.01	AV	75.00	100	Horizontal	Pass

A.8 Power Spectral Density (PSD)

Note: All antenna were pre tested, but only the worst case has been reported in this report.

Test Data

SISO-Antenna 1

802.11b Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-9.05	7.04
Middle	-9.94	7.04
High	-9.48	7.04

802.11g Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-13.55	7.04
Middle	-12.93	7.04
High	-12.68	7.04

802.11n-20 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-12.80	8
Middle	-12.20	8
High	-12.57	8

802.11n-40 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-14.91	8
Middle	-14.42	8
High	-14.30	8

802.11ax-20 MHz(SU) Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-12.10	8
Middle	-11.94	8
High	-12.04	8

802.11ax-40 MHz(SU) Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-13.73	8
Middle	-14.42	8
High	-13.55	8

Test Plots

SISO-Antenna 1

802.11b LOW CHANNEL



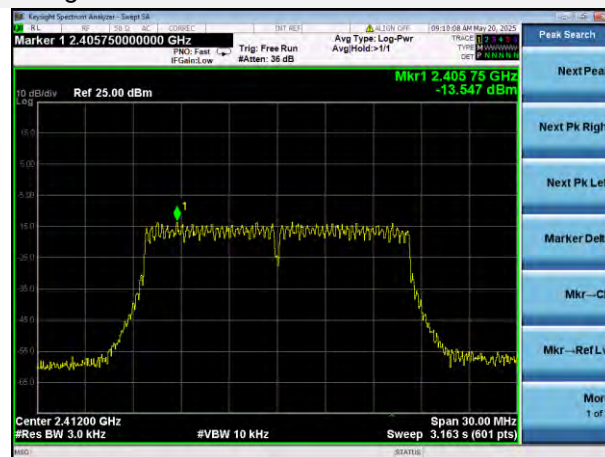
802.11b MIDDLE CHANNEL



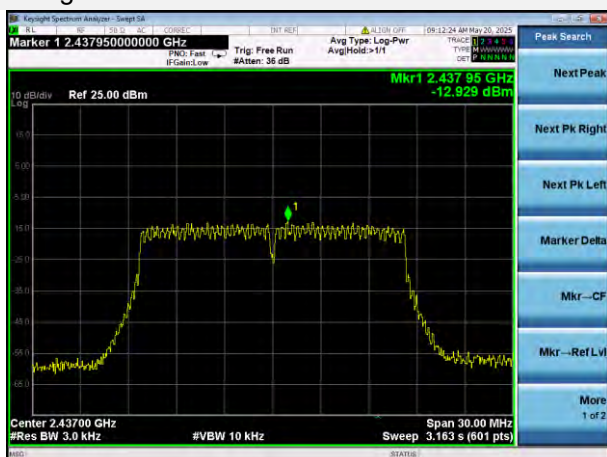
802.11b HIGH CHANNEL



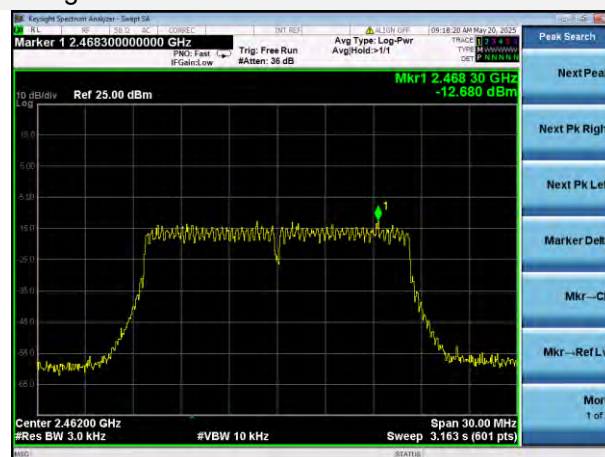
802.11g LOW CHANNEL



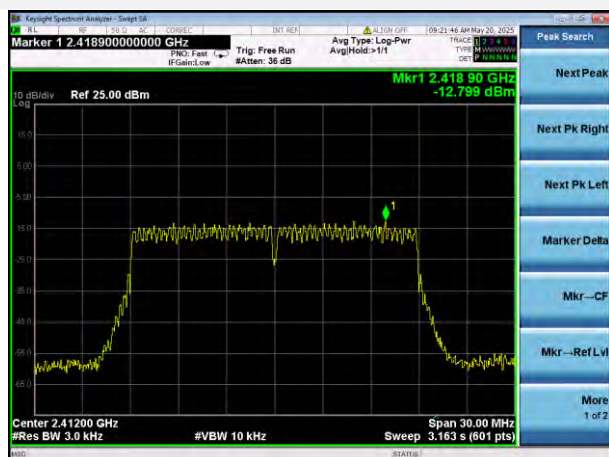
802.11g MIDDLE CHANNEL



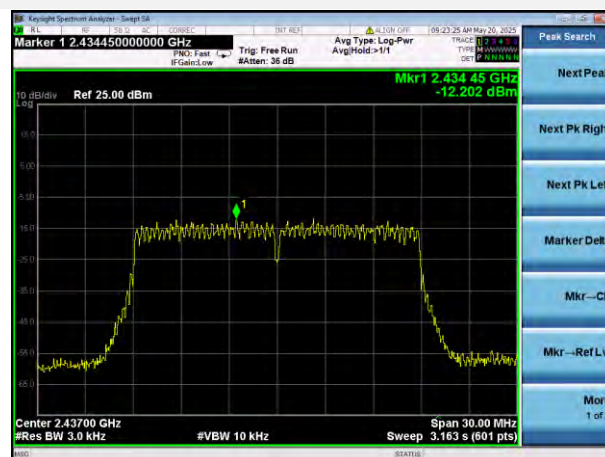
802.11g HIGH CHANNEL



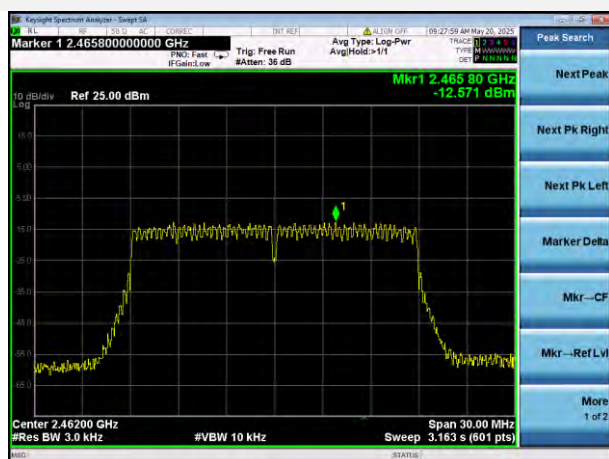
802.11n-20 MHz LOW CHANNEL



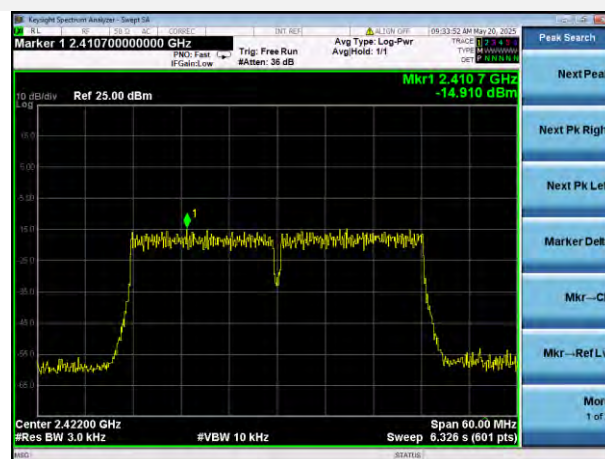
802.11n-20 MHz MIDDLE CHANNEL



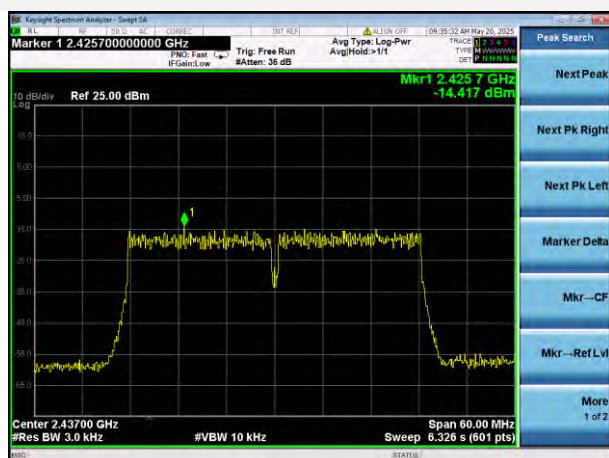
802.11n-20 MHz HIGH CHANNEL



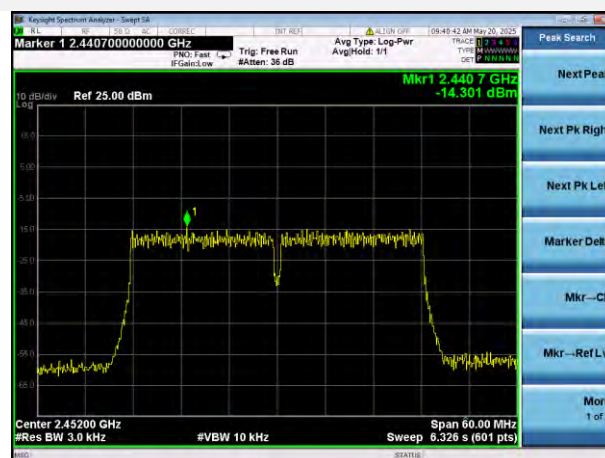
802.11n-40 MHz LOW CHANNEL



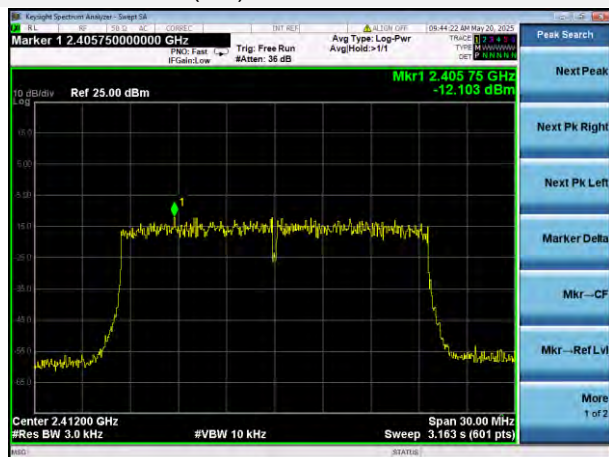
802.11n-40 MHz MIDDLE CHANNEL



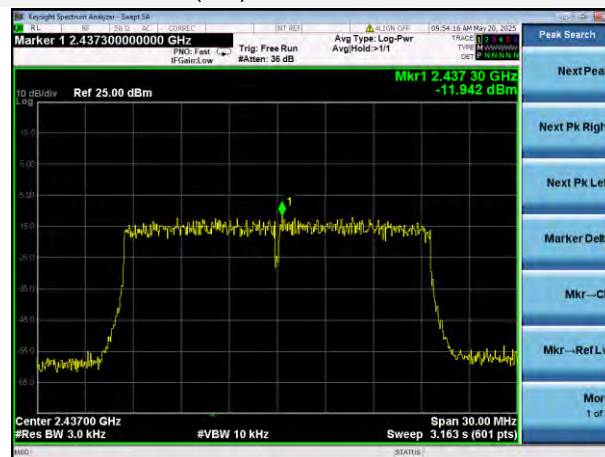
802.11n-40 MHz HIGH CHANNEL



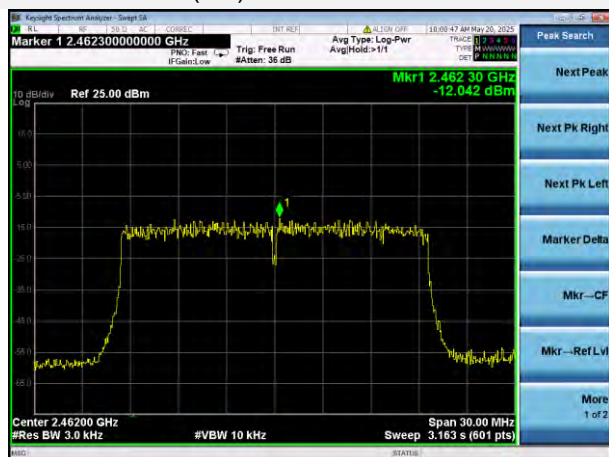
802.11ax-20 MHz(SU) LOW CHANNEL



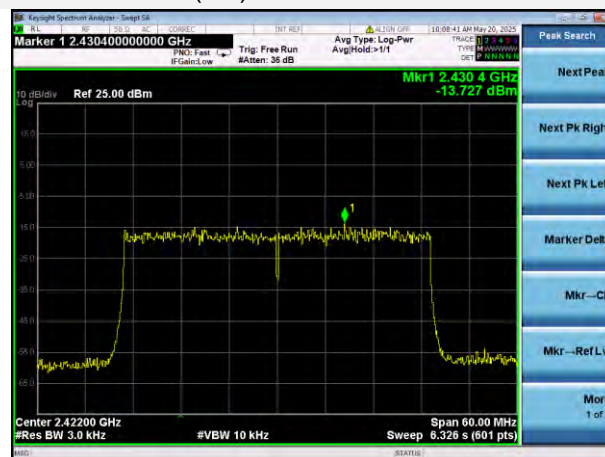
802.11ax-20 MHz(SU) MIDDLE CHANNEL



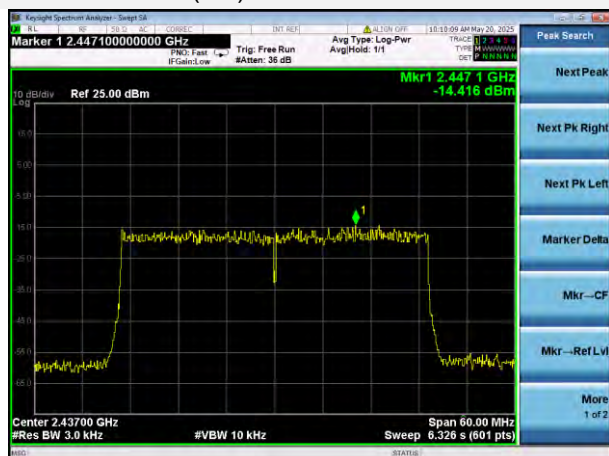
802.11ax-20 MHz(SU) HIGH CHANNEL



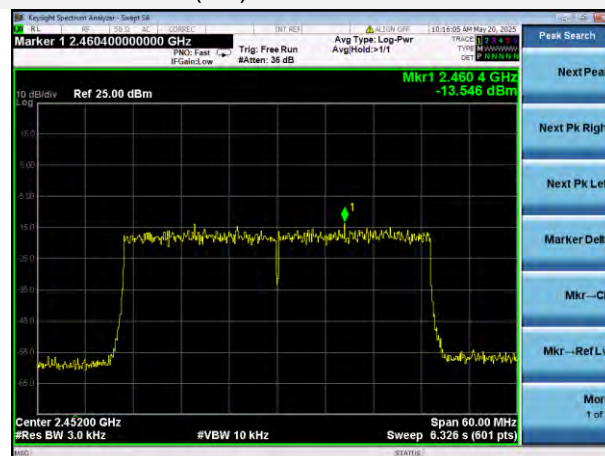
802.11ax-40 MHz(SU) LOW CHANNEL



802.11ax-40 MHz(SU) MIDDLE CHANNEL



802.11ax-40 MHz(SU) HIGH CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2541263-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2541263-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2541263-AI.PDF”.

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--END OF REPORT--